UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO

FACULTAD DE QUÍMICA

Identificación de Fuerzas Intermoleculares en la Interfase mediante Ecuaciones de Langmuir

T   E   S   I   S

QUE PARA OBTENER EL TÍTULO DE:

I N G E   N I E R O   Q U Í M I C O

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ESTEBAN OLVERA MAGAÑA

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1er. SUPLENTE:	Jose Fernando Barragan Aroche
2° SUPLENTE:	Angel Piñeiro Guillen

SITIO DONDE SE DESARROLLÓ EL TEMA:

Laboratorio de Superficies
Departamento de Fisicoquímica
Facultad de Química
Ciudad Universitaria
Universidad Nacional Autónoma de México

ASESOR DEL TEMA:

Dr. Jesús Gracia Fadrique

SUSTENTANTE:

Esteban Olvera Magaña

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TERMODINÁMICA DEL EQUILIBRIO DE FASES

1.0.1.   Primera ley de la termodinámica

Una de las manifestaciones en la naturaleza es la energía asociada a los cambios y transformaciones; el calor y el trabajo son dos formas de energía que estan contenidas en un principio fundamental conocido como *primera ley de la termodinámica* o ley de la conservación de la energía, cuyo planteamiento formal indica que la energía no puede crearse o destruirse. sólo cambia de una forma a otra. Para un sistema cerrado homogéneo y en equilibrio, la primera ley se expresa:

$$dQ = dU + dW \tag{1.1}$$

donde dQ es el calor transferido al sistema durante un proceso, dU el cambio de energía interna total del sistema y dW el cambio en el trabajo efectuado por el sistema.

El trabajo puede dividirse en dos partes, trabajo mecánico PdV, donde P es la presión y dV el cambio de volumen, y trabajo hecho por otro medio dW' (eléctrico, de tensión superficial, elástico, etc.), es decir

$$dW = PdV + dW' \tag{1.2}$$

la ecuación (1.1) toma la forma:

$$dQ = dU + PdV + dW' \tag{1.3}$$

si se tiene solo trabajo mecánico

$$dQ = dU + PdV \tag{1.4}$$

1.0.2. Entalpía

Para los cambios térmicos a presión constante se define una función llamada entalpía H o contenido calórico de un sistema

$$H = U + PV \tag{1.5}$$

En donde U, P y V son la energía interna, presión y volumen respectivamente, puesto que estas variables son funciones de estado, H tambien es una función de estado; para un cambio diferencial se tiene

$$dH = dU + PdV + VdP \tag{1.6}$$

si se tiene un sistema a presión constante, resulta

$$dH = dU + PdV \tag{1.7}$$

1.0.3. Segunda ley de la termodinámica

La primera ley de la termodinámica establece la relación entre el calor absorbido y el trabajo realizado por un sistema, pero no señala ninguna restricción en la fuente de calor o la dirección del flujo. La segunda ley establece restricciones sobre el sistema:

- *El flujo de calor es unidireccional y se lleva a cabo desde una temperatura más elevada a otra menor*

- *Es imposible que un sistema realice un proceso cíclico cuyos únicos efectos sean el flujo de calor desde una fuente de calor al sistema y la realización, por el sistema, de una cantidad de trabajo equivalente sobre el entorno.*

Entropía

Para llegar a un enunciado general de la segunda ley y expresarla en forma matemática, se define una nueva función S, denominada entropía del sistema. La entropía se define como

$$dS \geqslant \frac{dQ}{T} \tag{1.8}$$

Esta relación es válida tanto para los procesos reversibles ($=$) como para los irreversibles ($>$) que tengan lugar en cualquier sistema. Al analizar los distintos procesos termodinámicos interesará la variación de la entropía, es decir, la diferencia de entropía en los estados inicial y final del proceso.

1.0.4. Ecuación Fundamental de la Termodinámica

El segundo principio de la termodinámica se expresa analíticamente por la ecuación (1.8), que puede escribirse :

$$TdS \geqslant dQ \tag{1.9}$$

sustituyendo la ecuación (1.4) que describe el primer principio de la termodinámica en la ec. (1.9), se obtiene:

$$TdS \geqslant dU + PdV \tag{1.10}$$

Esta relación recibe el nombre de ecuación unificada de los principios primero y segundo de la termodinámica o *ecuación fundamental de la termodinámica*. La ecuación (1.10) incluye las propiedades termodinámicas P, V, T, U y S . Las propiedades termodinámicas adicionales aparecen sólo por **definición** en relación con estas propiedades.

1.0.5. Energia libre

El trabajo máximo que un proceso puede proporcionar, no es necesariamente igual a la cantidad de energía disponible para realizar un trabajo útil, aunque el proceso se efectúe reversiblemente. De la cantidad total de trabajo disponible, una parte se emplea en realizar trabajo presión-volumen, bien sea debido a una contracción o expansión del sistema durante el proceso.

Para obtener el máximo de energía disponible en un proceso se definen otras dos propiedades adicionales, como la *energía de Helmholtz*,

$$F = U - TS \tag{1.11}$$

y la *energía de Gibbs*,

$$G = H - TS \tag{1.12}$$

Cada una de estas propiedades definidas conduce directamente a una ecuación similar a la (1.10).

Al derivar (1.5), se obtiene

$$dH = dU + P\,dV + V\,dP \tag{1.13}$$

Cuando dU de la ecuación (1.10) se sustituye, ésta se reduce a

$$dH = T\,dS + V\,dP \tag{1.14}$$

De manera similar, de la ecuación (1.11),

$$dF = dU - T\,dS - S\,dT \tag{1.15}$$

Al sustituir dU de la ecuación (1.10)

$$dF = -PdV - SdT \qquad (1.16)$$

De manera análoga, de las ecuaciones (1.12) y (1.14) se tiene que

$$dG = VdP - SdT \qquad (1.17)$$

Las ecuaciones (1.14) a (1.17) están sujetas a los mismos requisitos que la ecuación (1.10). Todas ellas están escritas para la masa total de cualquier sistema cerrado. Resumiendo

$$dU = TdS - PdV$$

$$dH = TdS + VdP$$

$$dF = -PdV - SdT$$

$$dG = VdP - SdT$$

Estas *relaciones entre propiedades fundamentales* son ecuaciones de índole general para un fluido homogéneo de un componente.

1.1. Potencial químico

Anteriormente se ha supuesto implícitamente que el sistema está compuesto de una sustancia pura, si se tiene una mezcla o se realiza una reacción química la composición del sistema varía, cambiando, por lo tanto, las propiedades termodinámicas. En consecuencia, se introduce en las ecuaciones termodinámicas la dependencia de la composición. Para una sustancia pura o para una mezcla de composición fija,

la ecuación fundamental para la energía libre (1.17) es :

$$d(nG) = (nV)dP - (nS)dT$$

Si no se tiene reacción química, el sistema es cerrado y de composición constante, la ecuación toma la forma:

$$\left[\frac{\partial(nG)}{\partial P}\right]_{T,n} = nV \tag{1.18}$$

$$\left[\frac{\partial(nG)}{\partial T}\right]_{P,n} = -nS \tag{1.19}$$

en donde el subíndice n indica que el número de moles de todas las especies químicas se mantiene constante.

Ahora se puede tratar el caso más general de un sistemas *abierto* de una sola fase que puede intercambiar materia con el ambiente que lo rodea. La energía total de Gibbs nG es aún una función de T y P. Dado que el material puede ser tomado o añadido al sistema, ahora nG es también una función del número de moles (n_i), de las distintas especies químicas presentes. Así

$$nG = nG(P, T, n_1, n_2, \ldots, n_i, \ldots) \tag{1.20}$$

en donde las n_i son el número de moles de las especies. La diferencial total de nG es

$$d(nG) = \left(\frac{\partial(nG)}{\partial P}\right)_{T,n_i} dP + \left(\frac{\partial(nG)}{\partial T}\right)_{P,n_i} dT + \left(\frac{\partial G}{\partial n_1}\right)_{T,P,n_j} dn_1 +$$
$$\left(\frac{\partial G}{\partial n_2}\right)_{T,P,n_j} dn_2 + \ldots, \tag{1.21}$$

$$d(nG) = \left(\frac{\partial(nG)}{\partial P}\right)_{T,n_i} dP + \left(\frac{\partial(nG)}{\partial T}\right)_{P,n_i} dT +$$

$$\sum_i \left(\frac{\partial(nG)}{\partial n_i}\right)_{P,T,n_j} dn_i \quad (1.22)$$

en donde la suma se da sobre todas las especies existentes, y el subíndice n_j indica que todos los moles, excepto el *i*ésimo, se mantienen constantes. Se pueden reemplazar las dos primeras derivadas parciales por las ecs. (1.18) y (1.19):

$$d(nG) = (nV)dP - (nS)dT + \sum_i \left(\frac{\partial(nG)}{\partial n_i}\right)_{P,T,n_j} dn_i \qquad (1.23)$$

Se define el *potencial químico* de la especie *i* en la mezcla como

$$\mu_i \equiv \left(\frac{\partial nG}{\partial n_i}\right)_{T,P,n_{j\neq i}} \qquad (1.24)$$

Expresada en términos de μ_i, la ecuación general para $d(nG)$ es

$$\boxed{d(nG) = (nV)dP - (nS)dT + \sum_i \mu_i dn_i} \qquad (1.25)$$

Esta ecuación se aplica a procesos en los que un sistema de una sola fase está en equilibrio mecánico y térmico, pero no necesariamente en equilibrio químico. La expresión se cumple durante una reacción química irreversible y durante el intercambio de materia con los alrededores. Las ecuaciones anteriores son válidas para sistemas cerrados, pero ahora se tiene una ecuación aplicable a sistemas abiertos.

De manera similar y tomando una mol de referencia las ecuaciones (1.14) a (1.17) para procesos químicos irreversibles:

$$dU = TdS - PdV + \sum_i \mu_i dn_i \qquad (1.26)$$

$$dH = TdS + VdP + \sum_i \mu_i dn_i \tag{1.27}$$

$$dF = -SdT - PdV + \sum_i \mu_i dn_i \tag{1.28}$$

$$dG = -SdT + VdP + \sum_i \mu_i dn_i \tag{1.29}$$

Que son las ecuaciones fundamentales para un sistema abierto.

1.1.1. Energía de Gibbs

El hecho de que los μ_i sean propiedades intensivas implica que sólo pueden depender de otras propiedades intensivas de composición como las fracciones mol. Imaginemos una superficie matemática diferencial y cerrada, como una esfera que se halla completamente en el interior de una mezcla y forma la frontera que encierra el sistema termodinámico. Designamos la energía de Gibbs de este sistema por G^0 y el número de moles de la especie i-ésima del sistema, por n_i^0. Nos preguntamos ahora cuánto aumentará la energía de Gibbs del sistema si se hace crecer esta superficie de modo que contenga mayor cantidad de mezcla. Podemos imaginar que la frontera final se amplia y deforma de tal manera que encierre cualquier cantidad deseada de mezcla en un recipiente de cualquier forma. Supongamos que la energía de Gibbs del sistema ampliado sea G y que el número de moles sea n_i. Obtenemos el cambio en energía de Gibbs integrando la ecuación (1.29) a T y P constantes, esto es,

$$\int_{G^0}^{G} dG = \sum_i \mu_i \int_{n_i^0}^{n_i} dn_i \tag{1.30}$$

$$G - G^0 = \sum_i \mu_i(n_i - n_i^0) \tag{1.31}$$

Imaginemos ahora que esta pequeña frontera inicial se reduce hasta cerrar un volumen cero, entonces $n_i^0 = 0$ y $G^0 = 0$. Esto reduce la ecuación (1.31) a

$$G = \sum_i n_i \mu_i \tag{1.32}$$

La regla de adición de esta ecuación es una propiedad importante de los potenciales químicos. Conociendo los potenciales químicos y el número de moles de cada constituyente de una mezcla puede calcularse, empleando la ecuación (1.32), la energía de Gibbs total, G, de la mezcla a temperatura y presión fijas. Si el sistema contiene sólo una sustancia, entonces la ecuación (1.32) se reduce a $G = n\mu$, o

$$\mu = \frac{G}{n} \tag{1.33}$$

Según esta ecuación μ de una sustancia pura es simplemente la *energía de Gibbs molar*.

1.1.2. Ecuación de Gibbs-Duhem

Diferenciando la ecuación (1.32) se obtiene una relación adicional para μ_i:

$$dG = \sum_i (n_i d\mu_i + \mu_i dn_i)$$

igualando con la ecuación (1.29) se obtiene:

$$\sum_i n_i d\mu_i = -SdT + VdP \tag{1.34}$$

que corresponde a la ecuación de Gibbs-Duhem. Si la temperatura y presión permanecen constantes y sólo se producen variaciones en la composición, la ecuación (1.34) adquiere la forma

$$\sum_i n_i d\mu_i = 0 \quad (T, P \text{ constantes}) \tag{1.35}$$

Esta ecuación muestra que si la composición varía, los potenciales químicos no cambian independientemente, por ejemplo, en un sistema de dos constituyentes la ecuación (1.35) se transforma en

$$n_1 d\mu_1 + n_2 d\mu_2 = 0 \quad (T, P \text{ constantes}) \tag{1.36}$$

reordenando, tenemos

$$d\mu_2 = -\left(\frac{n_1}{n_2}\right) d\mu_1 \tag{1.37}$$

1.1.3. Potencial químico de un gas ideal

La energía de Gibbs para un material puro se expresa de forma conveniente integrando la ec. (1.18) a temperatura constante desde la presión estándar p^0, hasta otro valor p de la presión:

$$\int_{G^0}^{G} dG = \int_{P^0}^{P} V dP \tag{1.38}$$

$$G - G^0 = \int_{P^0}^{P} V dP \tag{1.39}$$

o bien

$$G = G^0(T) + \int_{P^0}^{P} V dP \tag{1.40}$$

donde $G^0(T)$ es la energía de Gibbs de la sustancia a 1 atm de presión, la energía de Gibbs *estándar*, que es una función de la temperatura.

El volumen de los gases es mucho más grande que el de los sólidos y los líquidos, y depende en gran medida de la presión. Aplicando a un gas ideal la ecuación (1.40), tenemos

$$G = G^0(T) + \int_{P^0}^{P} \frac{nRT}{P} dP \tag{1.41}$$

si $P^0 = 1$atm

$$\frac{G}{n} = \frac{G^0}{n} + RTlnP \qquad (1.42)$$

sustituyendo la ecuación (1.33), para la energía molar del gas ideal, tenemos

$$\mu = \mu^0(T) + RTlnP \qquad (1.43)$$

Esta ecuación muestra que a una temperatura dada, la presión es una medida del potencial químico del gas.

1.1.4. Potencial químico de una solución ideal

La ley de Raoult establece que la presión de vapor del disolvente sobre una solución (P_i) es igual a la presión de vapor del disolvente puro (P^0) multiplicada por la fracción mol del disolvente en la solución ideal (x_i).

$$P_i = P^0 x_i \qquad (1.44)$$

Si en una solución está en equilibrio con el vapor, el potencial químico del disolvente tiene el mismo valor en la solución que en el vapor.

$$\mu_{\text{liq}} = \mu_{\text{vap}} \qquad (1.45)$$

donde μ_{liq} y μ_{vap} son los potenciales químicos del disolvente en la fase líquida y en el vapor respectivamente. Como el vapor es disolvente puro a una presión P, la expresión para μ_{vap} esta dadá por la ecuación (1.43) suponiendo que el vapor es un gas ideal, $\mu_{\text{vap}} = \mu_{\text{vap}}^0 + RTlnP$. Entonces la ecuación (1.45) se transforma en

$$\mu_{\text{liq}} = \mu_{\text{vap}}^0 + RTlnP \qquad (1.46)$$

Aplicando la ley de Raoult ec. (1.44), en esta ecuación se obtiene:

$$\mu_{\text{liq}} = \mu_{\text{vap}}^0 + RTlnP^0 + RTlnx_i \qquad (1.47)$$

Si estuviese en equilibrio el disolvente puro con el vapor, la presión sería P^0. La condición de equilibrio es

$$\mu_{\text{liq}}^0 = \mu_{\text{vap}}^0 \tag{1.48}$$

donde μ_{liq}^0 representa el potencial químico del disolvente líquido puro. Restando esta ecuación de la anterior, obtenemos

$$\mu_{\text{liq}} - \mu_{\text{liq}}^0 = RT ln x_i \tag{1.49}$$

En está ecuación no aparece nada relacionado con la fase de vapor, por tanto, la ecuación se transforma en

$$\mu - \mu^0 = RT ln x_i \tag{1.50}$$

Donde μ es el potencial químico del disolvente en la solución, μ^0 es el potencial químico del estado líquido puro, una función de T y P, y x es la fracción mol del disolvente en la solución.

2

TERMODINÁMICA DE SUPERFICIES

2.1. Tensión Superficial

La región tridimensional formada por la frontera entre dos fases parcialmente miscibles es llamada *interfase* y representa una región de transición en la cual las características químicas y físicas en el seno de líquido sufren un cambio abruto en una escala macroscópica de una fase a otra. El término *superficie* se aplica cuando una fase es gas, vapor o vacio y la otra fase un líquido o sólido.

Una molécula localizada en el seno de la fase líquida está sujeta a fuerzas iguales de atracción en todas direcciones, mientras que una molécula situada en la superficie experimenta fuerzas atractivas hacia el seno del líquido, y por tanto, presenta una energía media superior a la de las moléculas en el seno de la fase líquida; a este fenómeno se le conoce como *tensión superficial* y se interpreta en términos de este desbalance de fuerzas de atracción de tipo van der Waals de las moléculas situadas en la superficie.

Debido a este desequilibrio de fuerzas las moléculas situadas en la superficie tienden a migrar hacia el seno provocando una contracción espontánea del área superficial, como se representa esquemáticamente en la figura 2.1; por lo que cuando una gota de un líquido puro se encuentra en equilibrio con su vapor y no hay campo externo (gravedad), la gota asume la forma esférica.

La tensión superficial es una energía asociada a la formación de un área o superficie
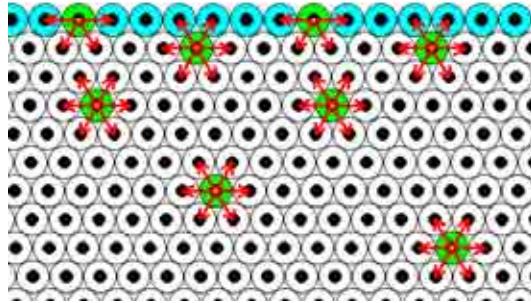
Figura 2.1: Tensión Superficial

entre un líquido y un vapor (o gas) y se puede definir como el trabajo requerido
para incrementar el área de la superficie isotérmica y reversiblemente, se puede
expresar como:

$$dW^* = \sigma dA \qquad (2.1)$$

Donde W^* [1] es el trabajo invertido en crear el área de superficie A y σ es la energía
por unidad de área llamada tensión superficial, se expresa en ergios por centimetro
cuadrado, dinas por centimetro o milinewtons por metro.

2.1.1. Tensión superficial de soluciones

Debido a la diferencia entre la forma, el tamaño y naturaleza química del soluto
en relación al disolvente en una solución, la presencia de éste ocasiona un cambio
en la tensión superficial del disolvente en relación a su estado puro. Es común que
sea una disminución en la tensión superficial, aunque el efecto opuesto tambien
se presenta. El efecto de una sustancia disuelta sobre la tensión superficial del
disolvente se puede representar por por tres tipos de comportamientos figura 2.2.
En soluciones tipo I el soluto produce un incremento en la tensión superficial, tal
incremento no es grande, este comportamiento se presenta en electrólitos fuertes

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[1]el superíndice * se utiliza para referir propiedades en la superficie

en solución acuosa. Los no electrólitos o electrólitos débiles en agua se comportan según la curva II, esta conducta es muy común y las soluciones presentan tensiones superficiales que disminuyen con cierta regularidad cuando aumenta la concentración de soluto. El tipo III corresponde a soluciones acuosas de jabón, ácidos sulfónicos y sulfonatos, así como otros tipos de compuestos orgánicos. Estas sustancias, denominadas agentes activos superficiales o tensoactivos, tienen la capacidad de disminuir la tensión del agua a un valor bajo incluso en concentraciones muy pequeñas.
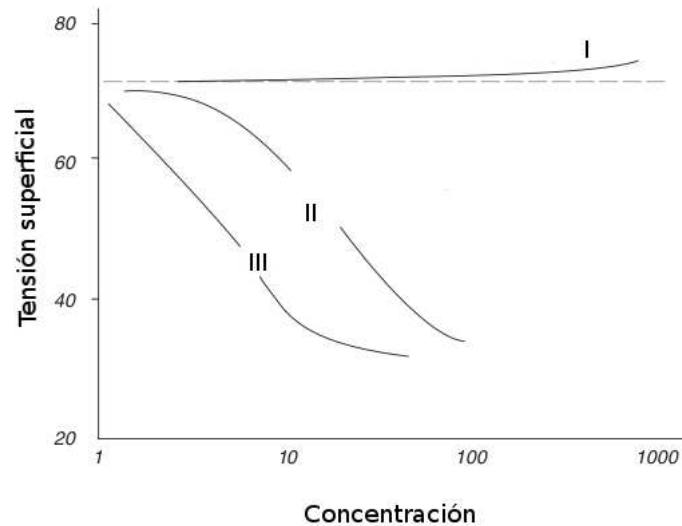
Figura 2.2: Dependencia de la tensión superficial de las soluciones respecto a la concentración de soluto

2.1.2. Presión de Superficie

La presión de superficie (π) se define como la diferencia entre la tensión superficial del disolvente puro (σ^0) y la tensión superficial de la solución a cualquier composición (σ).

$$\pi = \sigma^0 - \sigma \qquad (2.2)$$

diferenciando:

$$d\sigma = -d\pi \qquad (2.3)$$

Por lo tanto los decrementos de la tensión superficial corresponden a incrementos en la presión de superficie. La presión definida por la ecuación (2.2) representa una presión de expansión ejercida por la monocapa actuando contra la tensión superficial del líquido puro que actua como sustrato (contracción) fig. 2.3. La presión de superficie es una energía relativa y característica para cada sistema ya que sin efectos de cambios de temperatura mide únicamente el decremento energético de la superficie con respecto al solvente puro, por efecto de la composición.
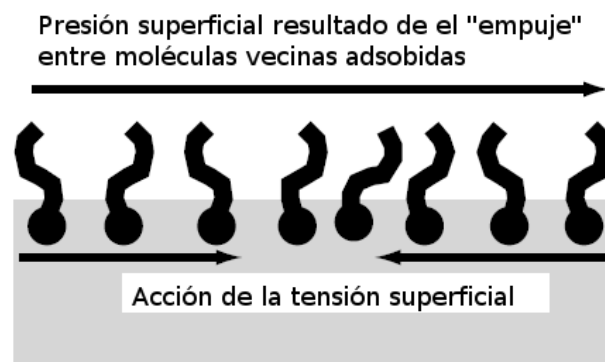
Figura 2.3: La presión superficial es el resultado de el empuje de las moléculas vecinas trabajando contra la fuerza hacia el interior de la tensión superficial del líquido

2.2. Representación termodinámica de la superficie

Considere un sistema compuesto por fases homogéneas α, β y S (Figura 2.4), Gibbs propone un sistema hipotético en el que introduce la presencia de la interfase por

medio de una fase bidimensional con volumen nulo (llamada superficie divisora), con valores distintos de cero para el resto de las propiedades termodinámicas. Las moléculas que se encuentran en la zona de contacto entre las fases α y β o muy próximas a ella, tienen un entorno molecular distinto al de las moléculas que se encuentran en el interior de cada una de las fases.
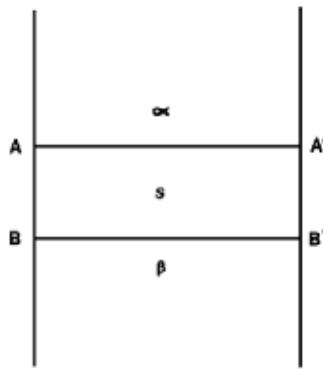
Figura 2.4: Interfase

La localización de la superficie divisora en el modelo es, en cierto sentido, arbitraria, pero normalmente se sitúa en el interior o muy cerca de la interfase real. Las magnitudes medibles experimentalmente deben ser independientes de la localización de la superficie divisora que se elija, ya que ésta es solo una abstracción. Vamos a restringir el tratamiento a una interfase plana.

El modelo de Gibbs asigna a la superficie divisora los valores de las propiedades termodinámicas que sean necesarios para hacer que el modelo hipotético tenga volumen total, energía interna, entropía y cantidades de los componentes iguales que los que existen en el sistema real. La superficie divisora tiene espesor nulo y volumen nulo, V^*=0. Si V es el volumen del sistema real, y V^α y V^β son los volúmenes de las fases α y β en el modelo, es necesario que $V = V^\alpha + V^\beta + V^*$

Debido a las diferencias en las interacciones intermoleculares, las moléculas de la interfase tienen una energía promedio de interacción distinta a la de las moléculas

que se encuentran en el interior de cada fase. Por tanto, un cambio adiabático en el área de la superficie interfacial existente entre α y β cambiaría la energía interna U del sistema.

Además del trabajo $-PdV$ asociado con cualquier cambio de volumen, existe el trabajo σdA necesario para cambiar la superficie ecs.(1.2) y (2.1), siendo P la presión en el interior de cada fase y V el volumen total del sistema. Por tanto, el trabajo realizado sobre un sistema cerrado formado por las fases α y β es

$$dW = -PdV + \sigma dA \qquad \text{interfase plana} \tag{2.4}$$

2.2.1. Energía interna

Una variación de la energía interna de el sistema de dos fases de acuerdo con el primer y segundo principio de la termodinámica ec. (1.26), y tomando en cuenta el trabajo debido a la superficie ec. (2.1) es

$$dU = TdS - PdV + \sum \mu_i dn_i + dW^* \tag{2.5}$$

La ecuación (2.5) contiene al trabajo superficial σdA. La suma es sobre todos los componentes, esto significa sobre todas las sustancias diferentes quimicamente, μ_i es el potencial de la sustancia i.

Analizaremos primero la energía interna, y no la entalpía, la energía libre, o la energía libre de Gibbs, porque la energía interna sólo contiene cantidades extensivas (S, V, n_i, A) como variables, esto simplifica el siguiente calculo. Desglosando la energía interna:

$$
\begin{aligned}
dU = dU^\alpha + dU^\beta + dU^* \\
= TdS^\alpha + \sum \mu_i^\alpha dn_i^\alpha - P^\alpha dV^\alpha + TdS^\beta \\
+ \sum \mu_i^\beta dn_i^\beta - P^\beta dV^\beta + TdS^* + \sum \mu_i^* dn_i^* + \sigma dA
\end{aligned} \tag{2.6}
$$

El término TdS es el cambio en la energía interna, el cual es causado por un cambio de entropía, ej. flujo de calor. Los términos $\mu_i dn_i$ consideran el cambio de energía causadas por un cambio en la composición. Ambos términos PdV corresponden al trabajo volumétrico de las dos fases. La interfase es infinitamente delgada y no se puede representar el trabajo volumétrico.

Con $dV = dV^\alpha + dV^\beta \Rightarrow dV^\alpha = dV - dV^\beta$ y agrupando los términos de entropía, la ecuación (2.6) se simplifica a:

$$dU = TdS - P^\alpha dV - (P^\beta - P^\alpha)dV^\beta$$
$$+ \sum \mu_i^\alpha dn_i^\alpha + \sum \mu_i^\beta dn_i^\beta + \sum \mu_i^* dn_i^* + \sigma dA \quad (2.7)$$

Ahora se considera la energía libre de Helmholtz. El cambio en la energía del sistema es $dF = -SdT - PdV + \sum \mu_i dn_i + dW$. Que nos lleva a

$$dF = -SdT - P^\alpha dV - (P^\beta - P^\alpha)dV^\beta$$
$$+ \sum \mu_i^\alpha dn_i^\alpha + \sum \mu_i^\beta dn_i^\beta + \sum \mu_i^* dn_i^* + \sigma dA \quad (2.8)$$

Cuando la temperatura y el volumen son constantes ($dV = 0$, $dT = 0$) los primeros dos terminos son cero.

La interfase se considera también como un sistema que puede ser abierto o cerrado; se considera abierto cuando permite la transferencia de materia y energía a través de su frontera y cerrado cuando solo existe transferencia de energía. Si consideramos el trabajo realizado por la superficie y el calor transferido; añadiendo el trabajo de superficie la ec. (2.1) en la ecuación que involucra un cambio en el potencial químico, ec. (1.26)

$$dU^* = TdS^* - PdV^* + \sigma dA + \sum_i \mu_i dn_i^* \quad (2.9)$$

2.2.2. Entalpía

Tenemos la ecuación de la entalpía en su forma diferencial para un sistema a presión constante (1.27), si se considera un sistema abierto de composición variable y se toma en cuenta el trabajo de superficie, resulta:

$$dH^* = TdS^* + V^*dP + \sigma dA + \sum_i \mu_i dn_i^* \qquad (2.10)$$

2.2.3. Energía libre de Helmholtz

La energia libre de definio por la ec. (1.28), para la superficie y tomando un sistema abierto esta ecuación se transforma en

$$dF^* = -S^*dT - PdV^* + \sigma dA + \sum_i \mu_i dn_i^* \qquad (2.11)$$

2.2.4. Energía libre de Gibss

La energía libre de Gibss se definio por la ec. (1.29), considerando energia de superficie y sistema abierto

$$dG^* = -S^*dT + V^*dP + \sigma dA + \sum_i \mu_i dn_i^* \qquad (2.12)$$

resumiendo las ecuaciones fundamentales para un sistema abierto y tomando en cuenta el trabajo superficial, resultan:

$$dU^* = TdS^* - PdV^* + \sigma dA + \sum_i \mu_i dn_i^*$$

$$dH^* = TdS^* + V^*dP + \sigma dA + \sum_i \mu_i dn_i^*$$

$$dF^* = -S^*dT - PdV^* + \sigma dA + \sum_i \mu_i dn_i^*$$

$$dG^* = -S^*dT + V^*dP + \sigma dA + \sum_i \mu_i dn_i^*$$

2.3. Ecuación de Gibss-Duhem

La energía interna quedo definida como la ecuación (2.9), de la cual se obtiene la energía total:

$$U^* = TS^* - PV^* + \sigma dA + \sum_i \mu_i dn_i^*$$

diferenciando esta ecuación:

$$dU^* = TdS^* + S^*dT - PdV^* - V^*dP + \sigma dA + Ad\sigma + \sum_i \mu_i dn_i^* + \sum_i n_i^* d\mu_i \quad (2.13)$$

igualando las ecuaciones (2.13) y (2.9), se obtiene:

$$S^*dT - V^*dP + Ad\sigma + \sum_i n_i^* d\mu_i = 0 \qquad (2.14)$$

esta es la ecuación de Gibbs-Duhem para la interfase.

2.4. Ecuación de adsorción de Gibbs

Partiendo de la ecuación de Gibbs-Duhem para la interfase (2.14) bajo condiciones isotérmicas y recurriendo a la primera convención de Gibbs que considera a la superficie como un plano de separación $(V^* = 0)$

$$Ad\sigma + \sum_i n_i^* d\mu_i = 0 \qquad (2.15)$$

se define la concentración de superficie (Γ_i) como:

$$\Gamma_i = \frac{n_i^*}{A} \qquad (2.16)$$

sustituyendo ec. (2.16) en ec. (2.15)

$$- d\sigma = \sum_i \Gamma_i d\mu_i \tag{2.17}$$

Esta ecuación indica que el decremento de la tensión superficial de una solución, depende del material concentrado en la superficie y del potencial químico de cada especie; es frecuente expresar la ecuación (2.17) en términos de la presión superficial, ec. (2.3):

$$d\pi = \sum_i \Gamma_i d\mu_i \tag{2.18}$$

Para un sistema simple consistente de un disolvente y un soluto, denotado por los subíndices 1 y 2 respectivamente, la ecuación (2.18) se expresa como

$$d\pi = \Gamma_1 d\mu_1 + \Gamma_2 d\mu_2 \tag{2.19}$$

Gibss tambien considera que la concentración superficial representa la concentración de superficie en exceso del componente i con respecto a los demas componentes. En el caso de un sistema binario, el componente de interés es el que tiene actividad superficial (soluto). Por lo tanto se considera que en la superficie se adsorbe el soluto y como resultado la concentración del disolvente con respecto al soluto es cero, es decir $\Gamma_1 = 0$, entonces la ecuación (2.19) se simplifica a

$$d\pi = \Gamma_2 d\mu_2 \tag{2.20}$$

Se omite el subindice 2 ya que solo se refiere soluto en el seno del líquido:

$$d\pi = \Gamma d\mu \tag{2.21}$$

El potencial químico ideal esta dado por la ecuación (1.50), para la fase en el seno del líquido:

$$\mu^b = \mu^{0b} + RTlnx \tag{2.22}$$

diferenciando la ec. (2.22) y sustituyendo en la ec. (2.21) se obtiene:

$$d\pi = \Gamma RT\, dlnx \qquad (2.23)$$

resolviendo la ec. (2.23) para Γ, obtenemos:

$$\Gamma = \frac{1}{RT}\left(\frac{d\pi}{dlnx}\right)_T \qquad (2.24)$$

o en función de la derivada de π vs X

$$\Gamma = \frac{x}{RT}\left(\frac{d\pi}{dx}\right)_T \qquad (2.25)$$

estas son las expresiones mas frecuentes en la literatura de la ecuación de adsorción de Gibbs. Estas ecuaciones permiten calcular la concentración superficial (Γ) en función del cambio en la presión superficial y de la fracción mol (x). La ecuación (2.24) es especialmente útil para análisis de los datos experimentales en la región concentrada y la (2.25) para la región diluida ya que las derivadas en turno son máximas en esas regiones.

ISOTERMA DE LANGMUIR

La isoterma de adsorción propuesta por Langmuir en 1917[20], es uno de los modelos más usados para explicar e interpretar datos de concentración superficial en relación a la composición del seno del líquido de diversos sistemas. Así, se pueden encontrar en la literatura todo tipo de sistemas estudiados por este modelo como son interfases líquido - vapor, líquido - líquido, sólido - líquido, sólido - vapor y sólido - gas, las cuales inciden en muy diferentes aplicaciones tecnológicas como catalizadores, adsorbentes, tensoactivos y proteínas. El establecimiento de este modelo tiene como fundamento los siguientes postulados:

3.1. Postulados de Langmuir

- La superficie esta constituida por una monocapa

- Las posiciones en la superficie son igualmente probables

- No existe interacción de las moléculas en la superficie

Para un sistema binario soluto-disolvente, la isoterma de Langmuir resulta de considerar el equilibrio entre los procesos de adsorción y desorción en la superficie.

Asi, la velocidad de adsorción es proporcional a la fracción de espacios disponibles en la superficie $(1 - \theta)$ y la concentración en la solución (x)

$$v_{ads} = k_{ads}(1 - \theta)x \tag{3.1}$$

y la velocidad de desorción es proporcional a la fracción de espacios ocupados (θ) en la superficie

$$v_{des} = k_{des}\theta \tag{3.2}$$

donde k_{ads} y k_{des} son las constantes de rapidez de adsorción y desorción. En el equilibrio $v_{ads} = v_{des}$ entonces igualando (3.1) y (3.2):

$$k_{ads}(1 - \theta)x = k_{des}\theta \tag{3.3}$$

rearreglando:

$$\frac{k_{ads}}{k_{des}}x = \frac{\theta}{1 - \theta} \tag{3.4}$$
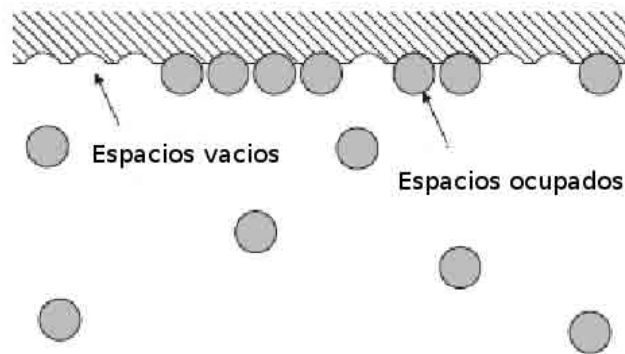
Figura 3.1: Adsorción localizada según Langmuir

donde

$$\theta = \frac{\Gamma}{\Gamma_s} \tag{3.5}$$

Donde Γ_s es la concentración de superficie en la saturación, y se define $\beta = \frac{k_{ads}}{k_{des}}$, este parámetro indica la tendencia del soluto a ubicarse en la superficie y por tanto, su reparto entre disolución y superficie, tambien es llamado efecto liofóbico
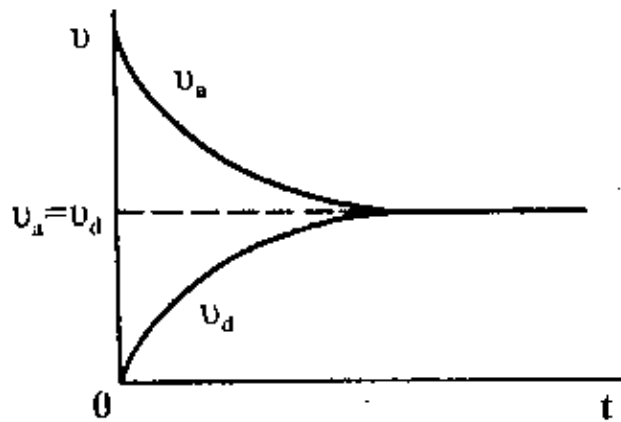
Figura 3.2: Cambio en las velocidades de adsorción y desorción

(hidrofóbico en el caso acuoso),; la ec. (3.4) resulta:

$$\beta x = \frac{\theta}{1 - \theta} \tag{3.6}$$

si se expresa de manera explicita para θ:

$$\boxed{\theta = \frac{\beta x}{1 + \beta x}} \tag{3.7}$$

esta ecuación es la isotérma de Langmuir, que relaciona los espacios ocupados en la superficie y la concentración del seno del líquido

Cuando la concentración en el seno del líquido tiende a cero se tiene una depencia lineal cuya pendiente es βx

$$\lim_{x \to 0} \theta = \beta x \tag{3.8}$$

Esta ecuación corresponde a la isoterma ideal de Henry en dos dimensiones.

En el otro extremo

$$\lim_{x \to 1} \theta = 1 \tag{3.9}$$

Igualando la ecuación de adsorción de Gibbs (2.25) con (3.5) y (3.7) tenemos:

$$\frac{x}{\Gamma_s RT}\left(\frac{d\pi}{dx}\right)_T = \frac{\beta x}{1 + \beta x} \tag{3.10}$$

separando variables:

$$d\pi = \Gamma_s RT \frac{\beta dx}{1 + \beta x} \tag{3.11}$$

e integrando:

$$\int_0^\pi d\pi = \Gamma_s RT \int_0^x dln(1 + \beta x) \tag{3.12}$$

finalmente obtenemos:

$$\boxed{\pi = \Gamma_s RT ln(1 + \beta x)} \tag{3.13}$$

que es la ecuación de estado de Langmuir, equivalente a la propuesta empirica-mente por Szyszkowski [56]

Se hace notar que esta ecuación de estado se obtiene por medio de una ecuación fenomenológica y una ecuación que proviene de la termodinámica fundamental, la ecuación de estado de Langmuir indica una relación entre propiedades de superficie como la tensión superficial (σ) y la concentración (x).

Otra forma de expresar la ecuación de estado de Langmuir se obtiene a partir de la ecuación (3.7), de donde se obtiene la siguiente expresión

$$1 + \beta x = \frac{1}{1 - \theta} \tag{3.14}$$

al sustituir esta ecuación en la ecuación de Langmuir (3.13) se obtiene:

$$\pi = -\Gamma_s RT ln(1 - \theta) \tag{3.15}$$

La ecuación (3.15) es conocida en la literatura como la ecuación de estado de Frumkin[7]. Nótese que en los dos casos ecs. (3.13) y (3.15) en el límite de dilución infiníta conducen a la ecuación de estado ideal (3.8)

3.1.1. Potencial Químico derivado de la ecuación Langmuir-Frumkin

Expresando la ecuación de adsorción de Gibbs (2.21) en términos de la fracción de espacios ocupados en la superficie ec. (3.5).

$$d\pi = \Gamma d\mu = \Gamma_s \theta d\mu \tag{3.16}$$

Para obtener el potencial químico en función de θ se utiliza la ecuación propuesta por Frumkin (3.15), la diferencial de esta ecuación es como

$$d\pi = \Gamma_s RT \frac{d\theta}{1-\theta} \tag{3.17}$$

igualando las ecuaciones (3.16) y (3.17)

$$\Gamma_s \theta d\mu = \Gamma_s RT \frac{d\theta}{1-\theta} \tag{3.18}$$

$$d\mu = RT \frac{d\theta}{\theta(1-\theta)} \tag{3.19}$$

separando en fracciones parciales el segundo término a la derecha en la ec. (3.19), la ecuación toma la forma

$$d\mu = RT \left[\frac{d\theta}{\theta} - \frac{-d\theta}{1-\theta} \right] \tag{3.20}$$

ó

$$d\mu = RT \left[dln\theta - dln(1-\theta) \right] \tag{3.21}$$

integrando

$$\int_{\mu^0}^{\mu} d\mu = RT \int_{\frac{1}{2}}^{\theta} \left[dln\theta - dln(1-\theta) \right] \tag{3.22}$$

Es conveniente emplear $\theta^0 = \frac{1}{2}$ como estado de referencia para lograr una regresión libre de constantes

$$\mu = \mu^0 + RTln\left(\frac{\theta}{1-\theta}\right) \tag{3.23}$$

para el seno del líquido por la ecuación fundamental de la solución ideal

$$\mu = \mu^0 + RTln\beta x \tag{3.24}$$

si $x = \beta^{-1}$ se obtiene el potencial químico de referencia

3.1.2. Potencial Químico derivado de la ecuación Langmuir-Szyszkowski

Partiendo de la ecuación de adsorción de Gibbs en términos de la fracción de espacios ocupados en la superficie ec. (3.16) para obtener el potencial químico en función de la concentración de bulto en la superficie (x) se emplea la ecuación propuesta por Szyszkowski (3.13), cuya diferencial de la ecuación es como

$$d\pi = \Gamma_s RT \frac{\beta}{1+\beta x} dx \tag{3.25}$$

igualando las ecuaciones (3.16) y (3.25)

$$\Gamma_s \theta d\mu = \Gamma_s RT \frac{\beta}{1+\beta x} dx \tag{3.26}$$

en función de la concentración de bulto θ

$$\Gamma_s \frac{\beta x}{1+\beta x} d\mu = \Gamma_s RT \frac{\beta}{1+\beta x} dx \tag{3.27}$$

integrando

$$\int_{\mu^0}^{\mu} d\mu = RT \int_1^x dlnx \tag{3.28}$$

$$\mu = \mu^0 + RTlnx \tag{3.29}$$

que corresponde al potencial químico ideal

IDENTIFICACIÓN DE EFECTOS ATRACTIVOS EN LA INTERFASE

4.1. Fuerzas intermoleculares

Las propiedades de las sustancias puras dependen de las fuerzas entre las moléculas que las conforman llamadas fuerzas intermoleculares, de igual manera en una mezcla dependen de las fuerzas intermoleculares que actúan entre las moléculas de la mezcla; en este caso el fenómeno es más complejo ya que se debe considerar no sólo las interacciones entre moléculas del mismo componente, sino, también, las interacciones entre moléculas distintas.

Cuando se acercan dos moléculas, se atraen y se repelen. En general, las fuerzas son de atracción hasta que las moléculas se acercan tanto que traspasan sus respectivos radios atómicos, cuando esto sucede, la fuerza de atracción se transforma rápidamente en una gran fuerza de repulsión y las moléculas se alejan. Las atracciones entre las moléculas son de particular importancia en los sólidos y líquidos, en estas fases condensadas las moléculas están en contacto continuo. A continuación se realiza una breve descripción de el momento dipolar y algunas fuerzas intermoleculares que se pueden encontrar:

4.2. Momento dipolar

Un enlace en el que los electrones de enlace esten compartidos por igual entre dos átomos enlazados se llama enlace no polar. A un par de electrones de enlace compartido de manera desigual se le llama enlace polar. La polaridad del enlace se

mide mediante su momento dipolar μ, que se define como la cantidad de diferencia de carga (δ^+ y δ^-) multiplicada por la longitud de enlace.

Un momento dipolar molecular es el correspondiente a la molécula en su totalidad. El momento dipolar molecular es un indicador de la polaridad general de una molécula, su valor es igual a la suma vectorial de los momentos dipolares de los enlaces individuales. Esta suma vectorial refleja tanto la magnitud como la dirección de cada momento individual de enlace. La cancelación de los momentos dipolares sólo se presenta en moléculas simétricas, donde los momentos dipolares sólo de enlaces individuales se orientan en direcciones opuestas.

4.3. Fuerzas entre dipolos permanentes

La mayor parte de las moléculas tienen momentos dipolares permanentes como resultado de sus enlaces polares. Cada momento dipolar molecular tiene un extremo positivo y otro negativo. El arreglo más estable tiene el extremo positivo cerca del extremo negativo de otra molécula. Cuando se acercan dos extremos positivos o dos negativos, experimentan una repulsión moderada. Las moléculas pueden girar y orientarse en el arreglo positivo a negativo, más estable. Las fuerzas entre dipolos, o fuerzas dipolo-dipolo, por tanto, son fuerzas de atracción intermolecular que provienen de la atracción de los extremos positivo y negativo de los momentos dipolares de las moléculas polares.

4.4. Fuerzas entre iones y dipolos permanentes

Cuando un dipolo se sitúa en un campo eléctrico, intenta orientarse ya alinearse con el gradiente del campo. Si el campo es producido por un ion, el dipolo se orientará de tal forma que la parte terminal que ejerce la atracción (parte terminal con carga opuesta a la del ion) se dirigirá hacia el ion, en tanto que la porción terminal de repulsión se orientará en dirección contraria. En este sentido, cabe considerar a las fuerzas ion-dipolo como direccionales, ya que conducen a una

orientación preferente de las moléculas, a pesar de que las fuerzas electrostáticas no sean direccionales. Las interacciones ion-dipolo son similares a las interacciones ion-ion, excepto en que son más sensibles a la distancia ($\frac{1}{r^2}$ en lugar de $\frac{1}{r}$) y tienen a se más débiles, ya que las cargas (q^+, q^-) que forman el dipolo, son considerablemente menores que una carga electrónica completa.

4.5. Fuerzas entre iones y dipolos inducidos

Si una partícula cargada, (un ion, por ejemplo), se introduce en las proximidades de una molécula no polar, sin carga (por ejemplo un átomo de gas noble como el xenón) deformará la nube electrónica del átomo o molécula en forma muy semejante como un catión cargado distorsiona la nube electrónica de un anión blando y grande. La polarización de la especie neutra dependerá de su capacidad de polarización inherente, y del campo polarizante producido por el ion cargado.

4.6. Fuerzas repulsivas

En contraposición a las fuerzas de atracción existen fuerzas de repulsión que provienen de las repulsiones nucleo-nucleo y de las de las capas de electrones internos que son aún más importantes. A distancias interatómicas extremadamente pequeñas, las nubes electrónicas internas de los átomos que, interactúan comienzan a traslaparse, y la repulsión aumenta extraordinariamente de magnitud.

4.7. Enlaces de hidrógeno

Un puente de hidrógeno no es un enlace verdadero, sino una forma especialmente fuerte de atracción entre dipolos. Un átomo de hidrógeno puede participar en un puente de hidrógeno si está ligado a oxígeno, nitrógeno y flúor. Los enlaces O-H y N-H estan muy polarizados, dejando al átomo de hidrógeno con una carga positiva parcial. Este átomo de hidrógeno tiene una gran afinidad hacia electrones no compartidos, y forma agregados intermoleculares con los electrones no compartidos en

los átomos de oxígeno o de nitrógeno.

4.8. Fuerzas entre moléculas no polares (fuerzas de dispersión de London)

En las moléculas no polares, como las del tetracloruro de carbono, la principal fuerza de atracción es la fuerza de dispersión de London, una de las fuerzas de van der Waals. La fuerza de London surge debido a momentos dipolares temporales que se inducen en una molécula por otras moléculas cercanas. Aun cuando el tetracloruro de carbono no tiene momento dipolar permanente, los electrones no siempre están distribuidos de manera uniforme. Se induce un momento dipolar pequeño y temporal cuando una molécula se acerca a otra en la que los electrones estén ligeramente desplazados con respecto a un arreglo simétrico. Los electrones en la molécula que se acerca, se desplazarán ligeramente de modo que resulta una interacción entre dipolos de atracción.

Estos dipolos temporales sólo duran una fracción de segundo, y cambian continuamente; son embargo, se correlacionan de modo que su fuerza neta es de atracción. Esta fuerza de atracción depende de un contacto superficial estrecho de dos moléculas, y por lo tanto, es proporcional aproximandamente al área superficial molecular.

4.9. Ecuaciones Tipo Langmuir

Como se describió en el capitulo (3) la isoterma de Langmuir en fases fluidas contiene tres postulados: la condición de monocapa, la misma probabilidad de ocupación superficial y la no interacción de moléculas en la superficie; el último postulado es el mas controvertido y limitante para la aplicación del modelo.

Las representaciones más comunes de sistemas binarios en coordenadas π vs lnx, son de dos tipos. En el primero la pendiente aumenta conforme aumenta la composición de la solución de manera monótona hasta la presión máxima o diferencia
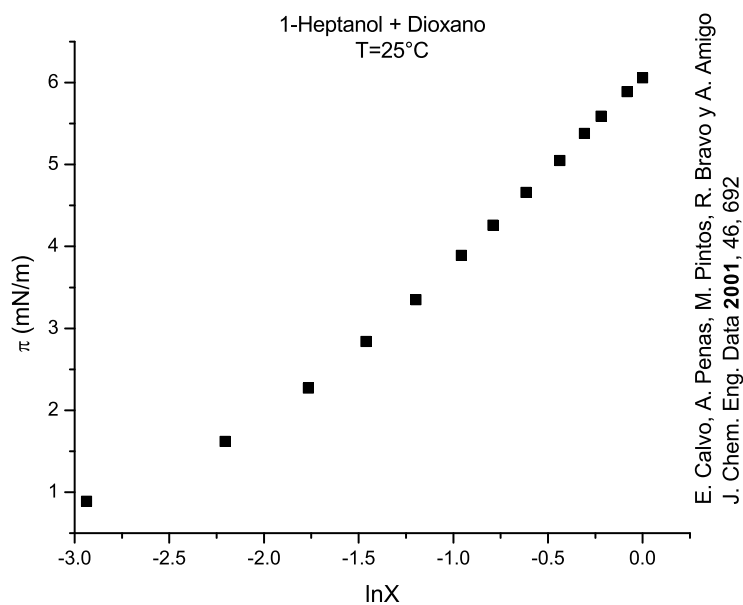
Figura 4.1: Comportamiento monotono creciente

de las tensiones superficiales de los componentes puros figura (4.1). En el segundo caso, el aumento sistemático de la derivada se interrumpe en un valor característico, para continuar con una tasa menor en el incremento de la presión superficial figura (4.2). Este cambio de régimen responde a la manifestación de fuerzas intermoleculares en la superficie, que se traducen en un decremento de la presión superficial esperada. Este comportamiento experimental es opuesto al postulado de Langmuir de no interacción molecular en la superficie.

Para eliminar este postulado, es posible acoplar a la ecuación de estado de Langmuir un termino atractivo construido con la misma fenomenología del modelo de Van der Waals. La ecuación de adsorción de Gibbs bajo potencial químico ideal y la isoterma de Langmuir muestran dos diferentes ecuaciones superficiales de estado; la primera en función de la composición de la solución y la segunda en términos de la concentración de la superficie

Los efectos atractivos ocurren en la superficie a consecuencia de la cercanía y au-
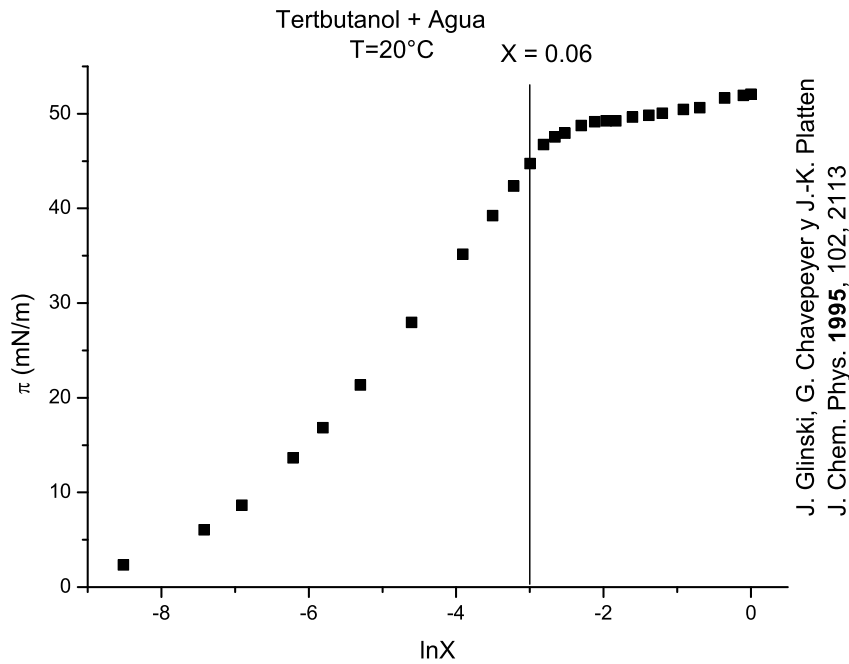
Figura 4.2: Comportamiento discontinuo

mento de la concentración de moléculas en la región, por lo cual, las ecuaciones en turno serán expresadas en términos de la concentración superficial (θ). Esta propuesta conduce a las siguientes expresiones:

Se tiene la ecuación de Langmuir-Frumkin (3.15) $\pi = -\Gamma_s RTln(1-\theta)$, esta ecuación no contiene efectos atractivos; para su inclusión se propone una función general $f(\theta)$ que contemple estos efectos atractivos

$$\pi = -\Gamma_s RTln(1-\theta) - f(\theta) \tag{4.1}$$

La propuesta mas elemental para esta función atractiva consiste en asignar la parte atractiva a una función lineal de la concentración en la superficie.

$$f(\theta) = \alpha_1\theta \tag{4.2}$$

donde α_1 es una constante; sustituyendo esta función a la ecuación (4.1)

$$\pi = -\Gamma_s RT ln(1-\theta) - \alpha_1\theta \qquad (4.3)$$

Si expresamos esta ecuación en función de la concentración x tenemos

$$\pi = \Gamma_s RT ln(1+\beta x) - \alpha_1\left(\frac{\beta x}{1+\beta x}\right) \qquad (4.4)$$

Esta ecuación se llamará de un sufijo por analogía con la ecuación propuesta por Margules

La segunda propuesta es una función cuadrática llamada de dos sufijos

$$f(\theta) = \alpha_2\theta^2 \qquad (4.5)$$

donde α_2 es una constante; se sustituye en la ecuación (4.1)

$$\pi = -\Gamma_s RT ln(1-\theta) - \alpha_2\theta^2 \qquad (4.6)$$

expresando en función de la concentración de el seno del líquido x

$$\pi = \Gamma_s RT ln(1+\beta x) - \alpha_2\left(\frac{\beta x}{1+\beta x}\right)^2 \qquad (4.7)$$

La tercera propuesta en términos de n sufijos

$$f(\theta) = \alpha_n\left(\frac{\theta^2}{2} + \frac{\theta^3}{3} + \frac{\theta^4}{4} + \ldots\right) \qquad (4.8)$$

donde α_n es una constante; esta propuesta indica las fuerzas atractivas para una molécula con sus primeros, segundos y n-esimos vecinos

se sustituye en la ecuación (4.1)

$$\pi = -\Gamma_s RT ln(1 - \theta) - \alpha_n \left(\frac{\theta^2}{2} + \frac{\theta^3}{3} + \frac{\theta^4}{4} + \dots \right) \tag{4.9}$$

el logaritmo se puede expandir de la siguiente manera:

$$ln(1 - \theta) = \left(-\theta - \frac{\theta^2}{2} - \frac{\theta^3}{3} - \frac{\theta^4}{4} - \dots \right) \tag{4.10}$$

sustituyendo en la ecuación (4.9)

$$\pi = \Gamma_s RT \left(\theta + \frac{\theta^2}{2} + \frac{\theta^3}{3} + \frac{\theta^4}{4} + \dots \right) - \alpha_n \left(\frac{\theta^2}{2} + \frac{\theta^3}{3} + \frac{\theta^4}{4} + \dots \right) \tag{4.11}$$

si $\alpha_n = \Gamma_s RT$ entonces

$$\pi = \Gamma_s RT \left(\theta + \frac{\theta^2}{2} + \frac{\theta^3}{3} + \frac{\theta^4}{4} + \dots \right) - \Gamma_s RT \left(\frac{\theta^2}{2} + \frac{\theta^3}{3} + \frac{\theta^4}{4} + \dots \right) \tag{4.12}$$

finalmente resulta:

$$\pi = \Gamma_s RT \theta \tag{4.13}$$

expresando esta ecuación en función de x

$$\pi = \Gamma_s RT \left(\frac{\beta x}{1 + \beta x} \right) \tag{4.14}$$

Se tienen 3 propuestas (4.4), (4.7) y (4.14) para la descripción de los datos experimentales en todo el intervalo de composición, estas ecuaciones contienen un término de interacción. Cada sistema se probo con estas propuestas, reportando para cada sistema la mejor propuesta que ajusto a los datos.

5

DISCUSIÓN DE RESULTADOS

A continuación se muestran los resultados de los ajustes realizados a los datos para los diferentes modelos estudiados en los capitulos anteriores, la selección del modelo se hizo en base al valor de correlación (R) proporcionado por el programa de tratamiento de datos Origin®, para la mayoría de los sistemas dicho valor fue mayor a 0.999. En las siguientes tablas se muestra los parámetros calculados asi como los momentos dipolares cada compuesto μ_d y la diferencia de estos $\Delta\mu_d$ consultados de la literatura, se presentan interacciones dipolo-dipolo, puentes de hidrogeno, dipolo-dipolo inducido y fuerzas de dispersión.

5.1. Langmuir

Tabla 5.1: **Sistemas tipo langmuir** $\pi = \Gamma_s RT ln(1+\beta x)$

Sistema	T($^\circ$C)	$\Gamma_s RT$	$\pm$	β	$\pm$	Ref.	μ_d	$\Delta\mu_d$
n-n-Dimetilforamida+Agua	25	6.7	0.3	175	37	[11]	3.24-1.82	1.42
	60	6.5	0.2	174	25	[11]	3.24-1.82	1.42
Dietanolamina + Agua	25	5.2	0.1	106	9	[53]	2.81-1.82	0.99
	30	5.2	0.1	107	9	[53]	2.81-1.82	0.99
	40	5.2	0.1	108	9	[53]	2.81-1.82	0.99
	45	5.2	0.1	108	10	[53]	2.81-1.82	0.99
	50	5.2	0.1	109	10	[53]	2.81-1.82	0.99
Monoetanolamina + Agua	25	5.3	0.1	67	5	[52]	2.27-1.82	0.45
	30	5.3	0.1	67	5	[52]	-	-
	35	5.3	0.1	67	5	[52]	-	-
	40	5.3	0.1	66	5	[52]	-	-
	45	5.3	0.1	66	5	[52]	-	-
	50	5.3	0.1	66	5	[52]	-	-
Triclorometano+Dimetilsulfoxido	30	17.1	2.4	1.6	0.3	[1]	1.04-3.96	2.92
Etanol+Dimetilsulfoxido	20	15.8	0.3	2.7	0.1	[47]	1.66-3.96	2.3
2-Propanona+Ác. Fórmico	25	11	1	2.7	0.3	[50]	2.69-1.425	1.265
2-Pentanona+Ác. Fórmico	25	3.4	0.1	43	6	[50]	2.70-1.425	1.275
Etilenglicol+Agua	30	7.6	0.1	27	1	[30]	2.31-1.82	0.49
Etanol+Acetonitrilo	20	8.4	0.2	1.28	0.04	[45]	1.66-3.925	2.265

Sistema	T(°C)	$\Gamma_s RT$	$\pm$	β	$\pm$	Ref.	μ_d	$\Delta\mu_d$
Etanol+Propano-1,2,3-triol	25	9.9	0.2	54	4	[6]	1.66-2.56	0.9
1-Propanol+Acetonitrilo	20	3.4	0.2	4.1	0.5	[45]	1.58-3.925	2.345
Dietileter+Tetrabromoetano	20	17	1	5.3	0.5	[48]	1.15-1.38	0.23
Ác. acético+Ác. acético Anh.	20	6.1	0.4	1.5	0.1	[12]	1.70-1.70	0
Dietileter+Triclorometano	18	25	2	0.48	0.05	[57]	1.15-1.04	0.11
Etanol+Anilina	25	29	6	1.0	0.3	[23]	1.66-1.13	0.53
2-Metil-2-butanol+Tolueno	30	5.9	0.2	1.5	0.1	[29]	1.82-0.375	1.445
Ácido Fórmico	20	11.0	0.2	25	1	[2]	1.425-1.82	0.395
+	25	11.0	0.2	25	1	[2]	-	-
Agua	30	11.0	0.2	25	1	[2]	-	-
	30	9.8	0.1	34	1	[25]	-	-
	35	10.8	0.2	25	1	[2]	-	-
	40	10.7	0.2	25	1	[2]	-	-
	45	10.7	0.2	25	1	[2]	-	-
	50	10.6	0.2	25	1	[2]	-	-
1-Propanol+1,4-Dioxano	25	14	0.5	0.97	0.05	[5]	1.58-0.45	1.13
1-Hexanol+Dioxano	25	3.82	0.06	5.04	0.14	[4]	1.55-0.45	1.1
1-Heptanol+Dioxano	25	2.96	0.05	6.9	0.2	[4]	1.71-0.45	1.26
1-Octanol+Dioxano	25	1.4	0.5	0.97	0.05	[4]	1.76-0.45	1.31

Sistema	T(°C)	$\Gamma_s RT$	$\pm$	β	$\pm$	Ref	μ_d	$\Delta\mu_d$
1-Decanol+Dioxano	25	1.52	0.04	18	1	[4]	-0.45	-
Pentano+Diclorometano	25	13.1	1.7	1.4	0.3	[35]	0.13-1.60	1.47
Benceno + Nitrobenceno	20	16	0.7	1.5	0.1	[43]	0-4.22	4.22
	30	13	1	2.1	0.2	[43]	0-4.22	4.22
Ciclohexano + Nitrobenceno	20	10	1	5	1	[43]	0-4.22	4.22
Tetraclorometano+Nitrobenceno	44	12	1	2.9	0.3	[40]	0-4.22	4.22
1,4-Dioxano+Nitrometano	20	2.3	0.1	3.5	0.2	[44]	0.45-3.56	3.11
Tolueno+Nitroetano	30	6	1	0.9	0.3	[27]	0.375-3.23	2.85
Benceno+Nitroetano	30	2.8	0.5	3	1	[27]	0-3.23	3.23
Tetraclorometano+Acetonitrilo	25	0.81	0.02	18	1	[46]	0-3.925	3.925
Etilenglicol + Ciclohexanol	25	2.6	0.1	324	56	[3]	2.31-0	2.31
	30	2.7	0.1	275	51	[3]	-	-
	35	2.7	0.1	245	41	[3]	-	-
	40	2.9	0.1	213	31	[3]	-	-
	45	2.9	0.1	199	27	[3]	-	-
	50	3.0	0.1	174	26	[3]	-	-
Etilenglicol + Ciclopentanol	20	3.3	0.1	119	17	[3]	2.31-0	2.31
	25	3.4	0.1	114	16	[3]	-	-
	30	3.5	0.1	100	13	[3]	-	-
	35	3.6	0.1	88	11	[3]	-	-
	40	3.7	0.1	80	9	[3]	-	-
	45	3.7	0.1	76	8	[3]	-	-
	50	3.9	0.1	70	7	[3]	-	-
Anilina + Benceno	25	8.3	0.3	4.7	0.3	[33]	1.13-0	1.13

Sistema	T(°C)	$\Gamma_s RT$	$\pm$	β	$\pm$	Ref	μ_d	$\Delta\mu_d$
Benceno+Oxileno	25	1.9	0.3	0.9	0.2	[19]	0-0.64	0.64
2-Metil-2-butanol+Benceno	30	3.4	0.1	4.2	0.2	[29]	1.82-0	1.82
Etanol+1,4-Diclorobenceno	55	18	3	0.9	0.2	[41]	1.66-0	1.66
Ciclohexano+Tolueno	25	2.3	0.1	3.8	0.4	[19]	0-0.375	0.375
Ciclopentano+Tolueno	25	9.7	0.2	0.88	0.02	[19]	0-0.375	0.375
Octano+1-Hexanol	25	2.4	0.1	5.9	0.5	[38]	0-1.55	1.55
Octano+1-Octanol	25	4.0	0.1	3.5	0.2	[38]	0-1.76	1.76
Benceno+2-Cloroetanol	30	2.8	0.1	46	3	[21]	0-1.88	1.88
Benceno + Fenol	35	7.9	0.1	3.6	0.1	[24]	0-1.224	1.224
Ciclohexano + Dioxano	20	15.7	2.6	0.7	0.1	[43]	0-0.45	0.45
	30	6.5	0.46	2.6	0.3	[43]	0-0.45	0.45
Ciclopentano+Benceno	25	7.6	1.1	1.2	0.2	[19]	-	-
Ciclohexano + Benceno	20	1.78	0.14	8	1	[43]	-	-
	30	3.1	0.3	2.3	0.3	[43]	-	-
Ciclohexano	25	4.2	0.1	3.7	0.2	[10]	-	-
+	30	4.5	0.1	2.7	0.1	[10]	-	-
2,2,4-Trimetilpentano	35	4.5	0.2	2.6	0.2	[10]	-	-
	40	4.9	0.3	2.2	0.2	[10]	-	-
	45	4.4	0.2	2.4	0.2	[10]	-	-
Ciclopentano+Tetracloroetileno	25	14	0.5	0.96	0.04	[19]	-	-
Ciclohexano+Tetraclorometano	20	2.7	0.2	1.6	0.2	[39]	-	-
Hexametil-d+Tetraclorometano	30	3.2	0.1	12	1	[28]	-	-
Ciclopentano+Tetracloroeteno	25	14	0.5	0.95	0.04	[19]	-	-
Ciclohexano+Tetracloroeteno	25	6.1	0.2	2.1	0.1	[19]	-	-
Ciclohexano+Tetracloroetileno	25	6.1	0.2	2.1	0.1	[19]	-	-

Para los sistemas tipo Langmuir se puede notar que existen todo tipo de fuerzas intermoleculares involucradas. Los parámetros ajustados en el modelo de Langmuir para el caso de sistemas a diferentes temperaturas para la dietanolamina, mono-etanolamina y ácido fórmico más agua no se nota variación en dichos parámetros conforme cambia la temperatura; para etilenglicol con ciclohexanol y ciclopentanol y ciclohexano más 2,2,4-trimetilpentano conforme aumenta la temperatura aumenta $\Gamma_s RT$ y β disminuye, aunque para el primer parámetro el cambio no se aprecia tanto como en el segundo.

5.2. Langmuir 1 sufijo

Tabla 5.2: **Sistemas tipo no langmuir 1 sufijo** $\pi = \Gamma_s RT ln(1 + \beta x) - \alpha_1 \left(\dfrac{\beta x}{1 + \beta x} \right)$

Sistema	T(°C)	$\Gamma_s RT$	$\pm$	β	$\pm$	$-\alpha$	$\pm$	Ref.	μ_d	$\Delta\mu_d$
Metanol + Agua	20	4.2	0.6	7.4	0.2	46.6	1.8	[51]	1.70-1.82	0.12
	25	4.3	0.6	7.5	0.2	45.9	1.7	[51]	-	-
	30	4.5	0.6	7.7	0.2	44.8	1.6	[51]	-	-
	35	4.9	0.5	7.9	0.2	43.1	1.4	[51]	-	-
	40	6	1.8	9	1	38	5	[51]	-	-
	45	4.9	0.4	8.1	0.2	42	1	[51]	-	-
	50	5.1	0.3	8.3	0.1	40.8	0.8	[51]	-	-
Etanol + Agua	20	1.7	0.3	24.5	0.6	46.6	0.09	[51]	1.66-1.82	0.16
	25	1.7	0.3	24.6	0.6	46.3	0.9	[51]	-	-
	25	1.9	0.4	27	1	44.5	1.4	[42]	-	-
	30	1.7	0.3	24.7	0.7	45.9	0.8	[51]	-	-
	35	1.7	0.3	24.9	0.6	45.4	0.9	[51]	-	-
	40	1.7	0.2	24.9	0.6	45.0	0.8	[51]	-	-
	45	1.7	0.2	25.1	0.7	44.7	0.8	[51]	-	-
	50	1.7	0.2	25.1	0.7	40.0	0.8	[51]	-	-
1,3-Butanodiol+Agua	30	2.9	0.3	46.6	3.4	23.2	1.2	[30]	-	-
1,3-Propanodiol+Agua	30	2.3	0.3	28.9	2.2	16.8	1.1	[30]	1.66-1.82	0.16

Para este modelo se tiene mezclas acuosas de alcoholes, para el metanol y etanol α diminuye respecto al aumento de temperatura, $beta$ aumenta y $\Gamma_s RT$ se mantiene prácticamente constante.

5.3. Langmuir 2 sufijos

Tabla 5.3: **Sistemas tipo langmuir 2 sufijos** $\pi = \Gamma_s RT ln(1 + \beta x) - \alpha_2 \left(\dfrac{\beta x}{1 + \beta x} \right)^2$

Sistema	T(°C)	$\Gamma_s RT$	$\pm$	β	$\pm$	$-\alpha$	$\pm$	Ref.	μ_d	$\Delta\mu_d$
Acetona+Agua	0	4.8	0.5	103	10	29	3	[24]	2.88-1.82	1.06
	20	3.8	0.5	94	8	32	2	[14]	-	-
	25	4.4	0.4	110	8	29	2	[24]	-	-
	37.78	6.3	0.5	177	23	17	3	[14]	-	-
	45	4.1	0.3	110	7	29	2	[24]	-	-
Dimetiletanolamina	25	3.8	0.4	127	15	23	2	[22]	2.81-1.82	1.06
+	35	3.6	0.4	124	14	23	2	[22]	-	-
Agua	45	3.6	0.4	134	15	22	2	[22]	-	-
	55	3.5	0.3	136	13	21	2	[22]	-	-
Propano-1,3-diol+Agua	30	2.9	0.2	80	4	11	1	[30]	2.55-1.82	0.73
Acido Acético+Agua	20	6.4	0.2	75	2	18	1	[2]	1.68-1.82	0.14
	25	6.3	0.2	75	3	18	1	[2]	-	-
	30	6.8	0.2	48.2	3.6	18.4	1.3	[25]	-	-
	30	6.3	0.2	76	3	17	1	[2]	-	-
	35	6.2	0.2	77	3	17	1	[2]	-	-
	40	6.2	0.2	78	3	17	1	[2]	-	-
	45	6.1	0.2	78	3	18	1	[2]	-	-
	50	6.1	0.2	79	3	16	1	[2]	-	-

Sistema	T(°C)	$\Gamma_s RT$	$\pm$	β	$\pm$	$-\alpha$	$\pm$	Ref.	μ_d	$\Delta\mu_d$
1,4-Butanodiol+Agua	30	3.8	0.1	129	6	9.1	0.6	[30]	2.58-1.82	0.76
Butano-1,3-diol+Agua	30	3.7	0.3	129	10	17	1	[30]	-	-
Glicerol+Agua	25	21	1	3.5	0.2	35	1	[29]	2.56-1.82	0.74
Ácido propanóico+Agua	30	4.4	0.3	179	22	23	2	[58]	1.68-1.82	0.14
Ácido butanóico+Agua	30	4.3	0.3	579	236	19	4	[58]	1.65-1.82	0.17
2-Amino-2metil-1-propanol	25	3.5	0.2	159	7	22	1	[52]	-	-
+	30	3.5	0.2	153	7	22	1	[52]	-	-
Agua	35	3.5	0.2	149	7	22	1	[52]	-	-
	40	3.5	0.2	146	6	22	1	[52]	-	-
	45	3.4	0.2	145	6	22	1	[52]	-	-
	50	3.5	0.2	142	6	22	1	[52]	-	-
Amino-2metil-1-propanol	50	4.3	0.3	159	15	16	1.6	[54]	-	-
+	60	4.0	0.3	151	12	17	1.4	[54]	-	-
Agua	70	3.7	0.3	145	12	18	1	[54]	-	-
	80	3.5	0.3	140	12	18	2	[54]	-	-
	90	3.2	0.3	131	15	19	2	[54]	-	-
	100	3.04	0.3	130	15	19	2	[54]	-	-
1-Heptanol+Octano	25	1.5	0.1	5.4	0.1	3.4	0.2	[38]	-	-
Ciclohexano+Benceno	20	0.7	0.2	6.5	0.2	3.6	0.6	[19]	-	-
	30	0.8	0.2	5.9	0.2	3.2	0.5	[19]	-	-

La mayoría de los sistemas que se pudieron representarse por este modelo fueron acuosos y la tendencia general para los parámetros es para $\Gamma_s RT$ disminuye, β aumenta y α permanece constante con respecto al aumento de temperatura

5.4. Langmuir n sufijos

Tabla 5.4: **Sistemas tipo langmuir n sufijos** $\pi = \Gamma_s RT \left(\frac{\beta x}{1+\beta x} \right)$

Sistema	T(°C)	$\Gamma_s RT$	$\pm$	β	$\pm$	Ref.	μ_d	$\Delta\mu_d$
Acetonitrilo+Agua	20	48.8	0.7	20	1	[55]	3.925-1.82	1.43
1-Butanol+Acetonitrilo	20	7.2	0.2	1.9	0.1	[45]	1.66-3.925	2.265
1-Pentanol+Acetonitrilo	20	5.1	0.2	3.3	0.4	[45]	1.7-3.925	2.25
Ác. Acético+Propano-triol	25	70.7	4.6	0.9	0.1	[15]	1.68-2.56	0.88
2-Propanona+Agua	25	47.6	1.2	36.5	5.4	[49]	2.88-1.82	1.06
2-Butanona+Agua	25	47.8	0.5	81.8	5.4	[26]	2.779-1.82	0.959
Trietanolamina+Agua	25	27.15	0.03	22.3	0.1	[53]	3.57-1.82	1.75
	30	27.14	0.03	22.3	0.1	[53]	-	-
	35	27.14	0.03	22.4	0.1	[53]	-	-
	40	27.14	0.02	22.4	0.1	[53]	-	-
	45	27.14	0.02	22.4	0.1	[53]	-	-
	50	27.15	0.02	22.4	0.1	[53]	-	-
Metildietanolamina+Agua	25	35.2	0.3	20	1	[22]	-	-
	35	34.1	0.3	20	1	[22]	-	-
	45	33.0	0.4	19.5	1	[22]	-	-
	55	31.8	0.3	19	1	[22]	-	-

Sistema	T(°C)	$\Gamma_s RT$	$\pm$	β	$\pm$	Ref.	μ_d	$\Delta\mu_d$
EGMEE+Agua	25	44.7	0.3	11.3	0.4	[18]	2.36-1.82	0.54
EGDME+Agua	25	51	1	21	2	[18]	1.97-1.82	0.15
DEGMME+Agua	25	39.8	0.5	15	1	[18]	1.6-1.82	0.22
TEGMEE+Agua	25	37.6	0.6	18	2	[18]	-	-
Butano-1,2-diol+Agua	25	38.5	0.6	10.4	0.7	[16]	2.58-1.82	0.76
1,2-Propanodiol+Agua	30	38.3	0.4	13.5	0.5	[30]	2.25-1.82	0.43
Tertbutanol+Agua	05	53	0.5	116	8	[8]	1.66-1.82	0.16
	10	52.5	0.5	123	8	[8]	-	-
	15	52.0	0.4	131	8	[8]	-	-
	20	51.5	0.4	138	7	[8]	-	-
	25	51.0	0.4	144	8	[8]	-	-
	30	50.6	0.3	153	7	[8]	-	-
n-Propanol+Agua	25	49	0.3	83	3	[9]	1.55-1.82	0.27
1-Propanol+Agua	20	49.7	0.2	103	3	[51]	1.55-1.82	0.27
	25	49.3	0.2	104	3	[51]	-	-
	30	48.9	0.2	105	3	[51]	-	-
	35	48.5	0.2	106	3	[51]	-	-
	40	47.9	0.2	107	3	[51]	-	-
	45	47.6	0.2	108	3	[51]	-	-
	50	46.5	0.2	139	8	[51]	-	-
2-Propanol+Agua	20	52.3	0.3	50	2	[51]	1.58-1.82	0.24
	25	52.0	0.3	51	2	[51]	-	-
	30	52.0	0.3	51	2	[51]	-	-
	35	51.3	0.3	51	2	[51]	-	-
	40	50.9	0.3	51	2	[51]	-	-
	45	50.7	0.3	52	2	[51]	-	-
	50	50.2	0.3	52	2	[51]	-	-

Sistema	T(°C)	$\Gamma_s RT$	±	β	±	Ref.	μ_d	$\Delta\mu_d$
Ác. Acético+Tolueno	15	3.5	0.8	0.97	0.37	[37]	1.68-0.375	1.305
Dioxano+Agua	25	40.2	0.5	23	2	[31]	0.45-1.82	1.37
1-Propanol+Octano	25	2.72	0.05	5.8	0.4	[38]	1.55-0	1.55
1-Butanol+Octano	25	3.9	0.1	2.8	0.2	[38]	1.66-0	1.66
1-Pentanol+Octano	25	5.3	0.1	2.5	0.1	[38]	1.7-0	1.77
Hexano+Metanol	30	4.45	0.03	15	1	[36]	0.08-1.7	1.61
Hexano+Etanol	25	4.9	0.1	4.6	0.3	[34]	0.08-1.66	1.57
n-Nonano+Hexanol	15	4.4	0.2	1.6	0.1	[32]	0-1.55	1.55
	25	4.6	0.1	1.6	0.1	[32]	-	-
	35	4.8	0.1	1.6	0.1	[32]	-	-
Tetraclorometano+Iodometano	25	5.3	0.1	3.5	0.1	[46]	0-1.64	1.64
Tetraclorometano+Nitrometano	30	10.1	0.2	6.6	0.6	[13]	0-3.46	3.46
Tetraclorometano+Nitroetano	30	7.1	0.5	1.4	0.2	[13]	0-3.23	3.23
Tetraclorometano+DMSO	30	29	2	1.5	0.2	[1]	0-3.96	3.96
Ác. Met est ac+Iodometano	40	8.6	0.2	2.1	0.1	[12]	-	-
Benceno+Nitrometano	20	11.2	0.2	3.1	0.1	[44]	0-3.46	3.46
Ciclohexano+Nitroetano	30	9.2	0.3	5	1	[27]	0-3.23	3.23
Hexano+Nitroetano	30	15.2	0.5	10	2	[27]	0.08-3.23	3.14
Octametil−+Tetraclorometano	30	9.5	0.2	5.0	0.3	[28]	-	-

Para los sistemas que se tienen a diferentes temperaturas, el cambio de los paráme-
tros con respecto al aumento de ésta, de manera general $\Gamma_s RT$ disminuye y β
aumenta.

6

CONCLUSIONES

- La ecuación de adsorción de Gibbs, expresada en términos de la derivada de la presión superficial versus el logaritmo de la composición de la solución, constituye una base de importancia para la identificación de fuerzas intermoleculares en la interfase. El cambio de regimen de esta derivada, indica de manera evidente, la manifestación de efectos atractivos superficiales que se traducen en una disminución en la presión bidimensional.

- La hipótesis fundamental de este trabajo postula que el cambio de regimen en una composición crítica característica (Xc), de la relación presión superficial y el logaritmo de la composición, señala el intervalo de operación del modelo de Langmuir, donde la presión superficial en X < Xc es monótona y creciente. Esta hipótesis fué aceptada ya que confirma y certifica el tercer postulado de Langmuir el cual no acepta interacciones soluto-soluto en la superficie.

- La aceptación de estas hipótesis, se encuentran soportadas por el análisis de doscientos sistemas bajo estudio selecionados de la literatura. La región interactiva donde se manifiestan los efectos atractivos, se trató con la adición de un término tipo van der Waals constituido con la misma fenomenología del modelo de Langmuir.

- Todo comportamiento monótono creciente de la presión superficial en relación al logaritmo de la composición en todo el intervalo, es representada por la ecuación de estado de Langmuir. Todo comportamiento de la presión superficial monotono con cambio de regimen es parcialmente representado por la ecuación de estado de Langmuir. Todo comportamiento de la presión superficial monotono creciente con cambio de regimen identifica fuerzas atractivas.

- El término adicional permitió la correcta descripción de todos los sistemas no Langmuirianos mediante diferentes sufijos; estos sufijos que contienen la interacción de partículas en la superficie y por tanto eliminan una de las restricciones de Langmuir, fueron suficientes para la descripción de los diferentes sistemas en todo el ámbito de composición.

- En un intento por explicar qué tipo de sistemas son de tipo Langmuir y no Langmuir, se incorporó el momento dipolar y la correspondiente diferencia en cada sistema binario. La hipótesis subyacente es la cercanía de momentos dipolares para los sistemas de tipo Langmuir y la de diferencia notables para los no langmuir. Como se puede apreciar en los resultados esta hipótesis fue rechazada, el fenómeno de interacción depende de fuerzas específicas diversas como puentes de hidrógeno, dispersión de London, momentos dipolares inducidos y otros. En resumen una sola variable relacionada con el fenómeno interactivo es insuficiente para explicar el proceso complejo de interacción molecular entre especies distintas en la superficie.

LANGMUIR

N,N-Dimetil-formamida + Agua
T=25°C

Granzhan, V.A., Kirillova, O.G.
Trudy GIAP **1972**, 13, 5
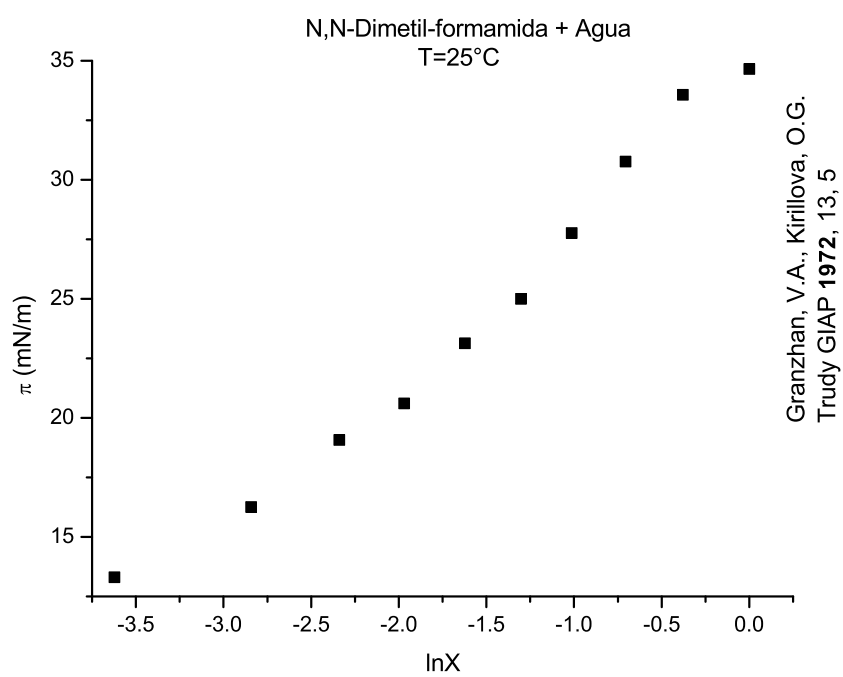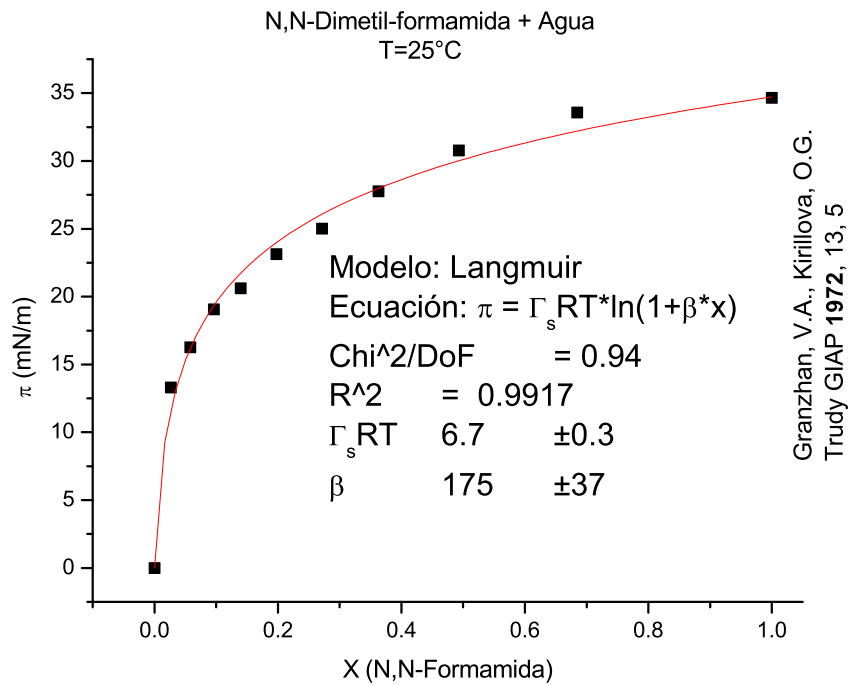
Tabla A.1: n-n-Dimetil-formamida + Agua a 25 °C [11]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	71.96	0	–
0.0267	58.647	13.313	-3.62309
0.0583	55.697	16.263	-2.84215
0.0964	52.89	19.07	-2.33925
0.1396	51.349	20.611	-1.96897
0.1975	48.825	23.135	-1.62202
0.2717	46.954	25.006	-1.30306
0.3629	44.19	27.77	-1.01363
0.4932	41.19	30.77	-0.70684
0.685	38.391	33.569	-0.37834
1	37.31	34.65	0

N,N-Dimetil-formamida + Agua
T=60°C

Granzhan, V.A., Kirillova, O.G.
Trudy GIAP **1972**, 13, 5

N,N-Dimetil-formamida + Agua
T=60°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.41
R^2   = 0.99606
$\Gamma_s RT$ 6.5   ±0.2
β 174   ±25

Granzhan, V.A., Kirillova, O.G.
Trudy GIAP **1972**, 13, 5
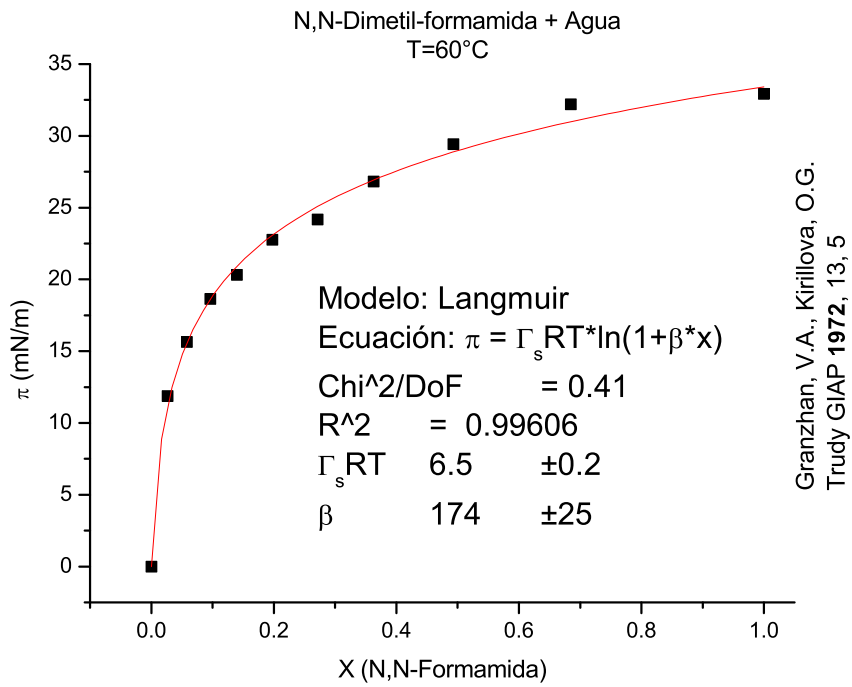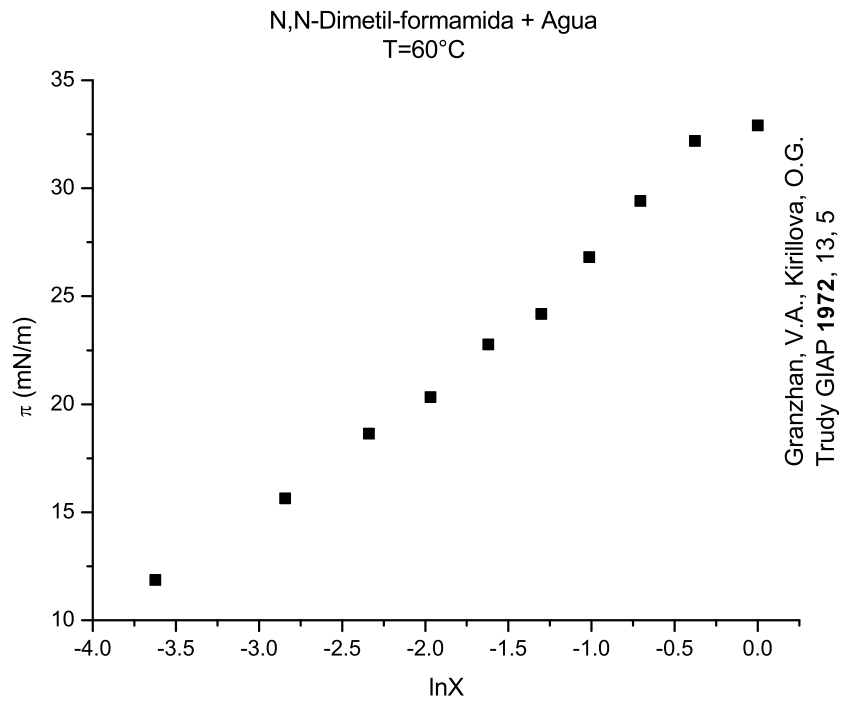
Tabla A.2: n-n-Dimetil-formamida + Agua a 60°C [11]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	66.2	0	–
0.0267	54.33	11.87	-3.62309
0.0583	50.551	15.649	-2.84215
0.0964	47.56	18.64	-2.33925
0.1396	45.875	20.325	-1.96897
0.1975	43.428	22.772	-1.62202
0.2717	42.024	24.176	-1.30306
0.3629	39.39	26.81	-1.01363
0.4932	36.78	29.42	-0.70684
0.685	34.001	32.199	-0.37834
1	33.28	32.92	0

Dietanolamina+Agua
T=25°C

G. Vázquez, E. Alvarez, R. Rendo,
E. Romero y J. M. Navaza
J. Chem. Eng. Data **1996**, 41, 806

Dietanolamina+Agua
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.12
R^2   = 0.998
$\Gamma_s RT$ 5.2   ±0.1
β 106   ±9

X (Dietanolamina)

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J. Chem. Eng. Data **1996**, 41, 806
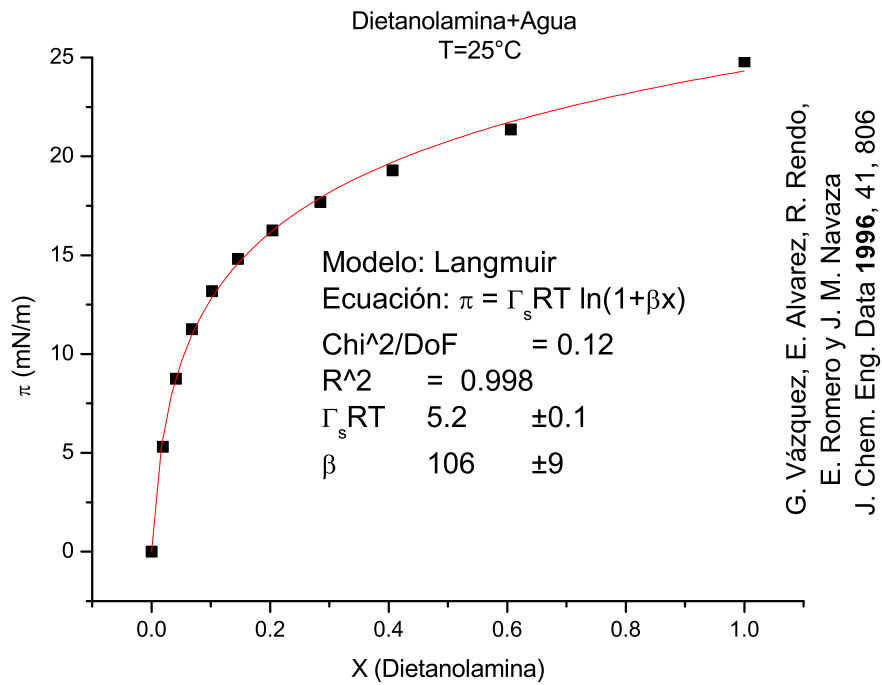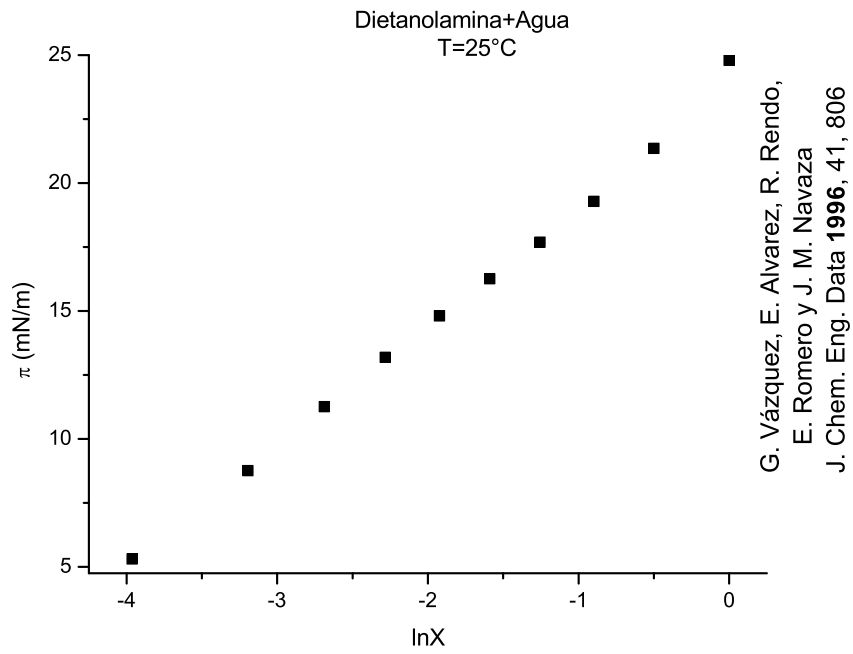
Tabla A.3: Dietanolamina + Agua a 25°C [53]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	72.01	0	–
0.019	66.7	5.31	-3.96332
0.041	63.25	8.76	-3.19418
0.068	60.75	11.26	-2.68825
0.102	58.82	13.19	-2.28278
0.146	57.2	14.81	-1.92415
0.204	55.75	16.26	-1.58964
0.285	54.32	17.69	-1.25527
0.407	52.72	19.29	-0.89894
0.606	50.65	21.36	-0.50088
1	47.21	24.8	0

Dietanolamina+Agua
T=30°C

Dietanolamina+Agua
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.12
R^2   = 0.998
$\Gamma_s RT$ 5.2   ±0.1
β 107   ±9.5

Tabla A.4: Dietanolamina + Agua a 30°C [53]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	72.01	0	–
0.019	66.7	5.31	-3.96332
0.041	63.25	8.76	-3.19418
0.068	60.75	11.26	-2.68825
0.102	58.82	13.19	-2.28278
0.146	57.2	14.81	-1.92415
0.204	55.75	16.26	-1.58964
0.285	54.32	17.69	-1.25527
0.407	52.72	19.29	-0.89894
0.606	50.65	21.36	-0.50088
1	47.21	24.8	0

Dietanolamina+Agua
T=35°C

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J. Chem. Eng. Data **1996**, 41, 806

Dietanolamina+Agua
T=35°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.12
R^2   = 0.99799
$\Gamma_s RT$ 5.2   ±0.1
β 107   ±9

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Tabla A.5: Dietanolamina + Agua a 35°C [53]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	70.42	0	–
0.019	65.1	5.32	-3.96332
0.041	61.65	8.77	-3.19418
0.068	59.15	11.27	-2.68825
0.102	57.23	13.19	-2.28278
0.146	55.62	14.8	-1.92415
0.204	54.17	16.25	-1.58964
0.285	52.74	17.68	-1.25527
0.407	51.14	19.28	-0.89894
0.606	49.1	21.32	-0.50088
1	45.66	24.76	0
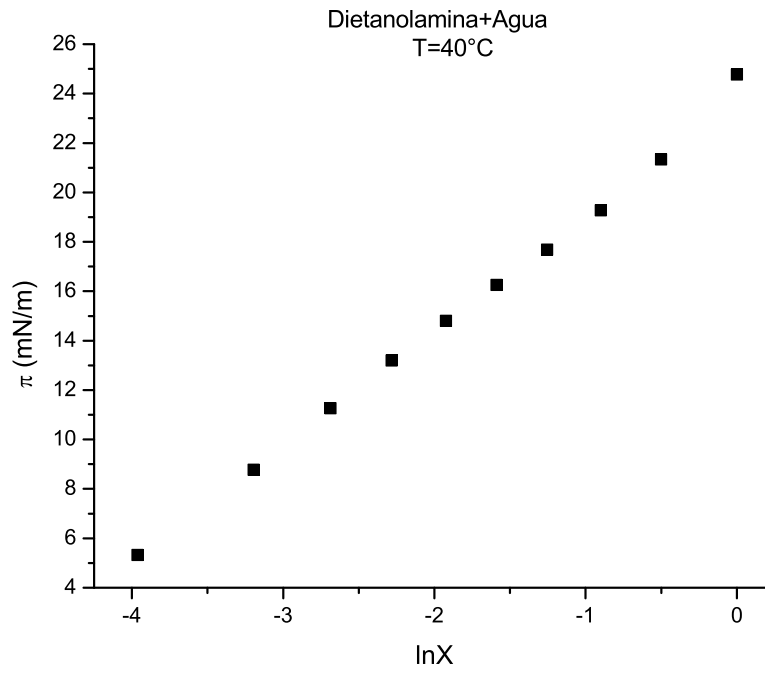
Dietanolamina+Agua
T=40°C

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J. Chem. Eng. Data **1996**, 41, 806

Dietanolamina+Agua
T=40°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.12
R^2   = 0.99801
$\Gamma_s RT$ 5.2   ±0.1
β 108   ±9
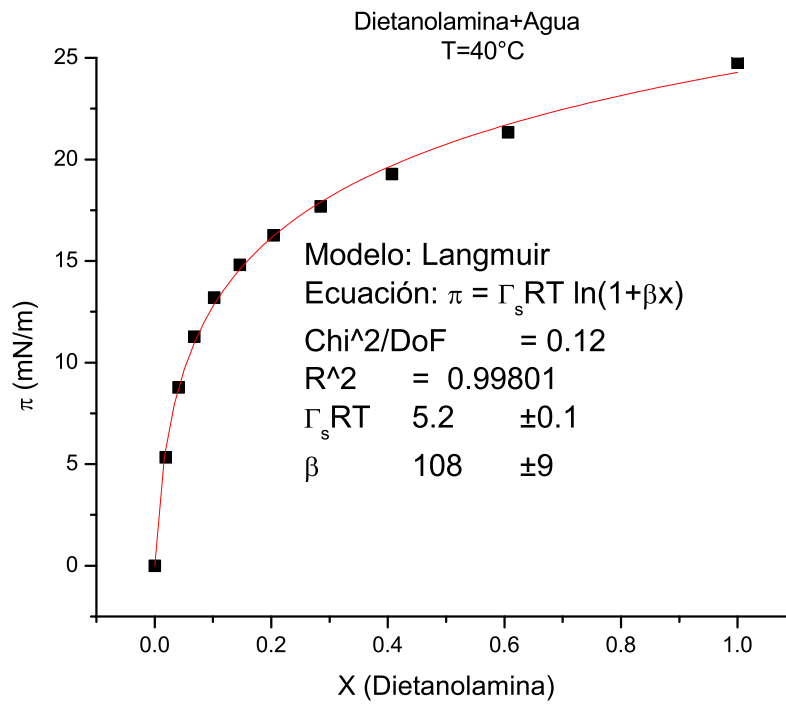
G. Vázquez, E. Alvarez, R. Rendo,
E. Romero y J. M. Navaza
J. Chem. Eng. Data **1996**, 41, 806

Tabla A.6: Dietanolamina + Agua a 40°C [53]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	69.52	0	–
0.019	64.19	5.33	-3.96332
0.041	60.74	8.78	-3.19418
0.068	58.25	11.27	-2.68825
0.102	56.32	13.2	-2.28278
0.146	54.71	14.81	-1.92415
0.204	53.26	16.26	-1.58964
0.285	51.83	17.69	-1.25527
0.407	50.24	19.28	-0.89894
0.606	48.18	21.34	-0.50088
1	44.75	24.77	0
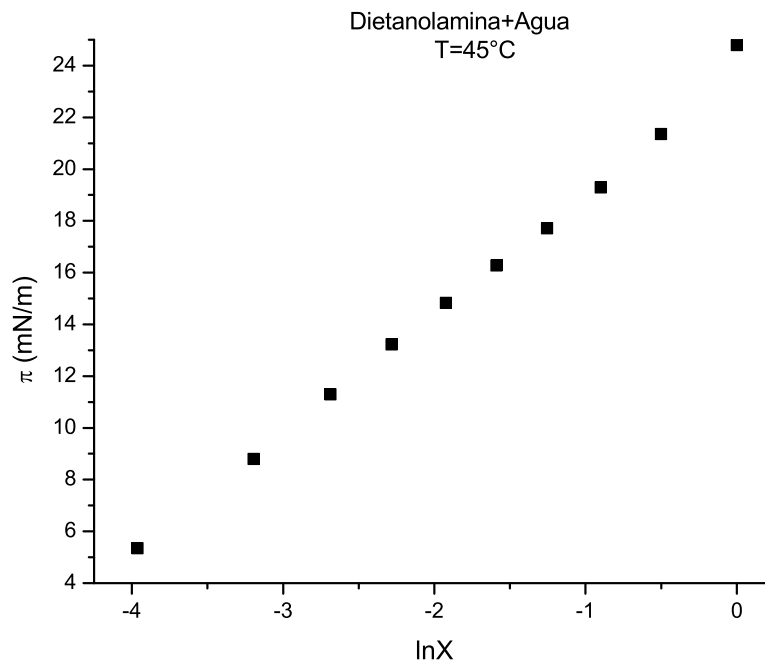
Dietanolamina+Agua
T=45°C

Dietanolamina+Agua
T=45°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.12
R^2   = 0.99799
$\Gamma_s RT$ 5.2   ±0.1
β 108   ±10
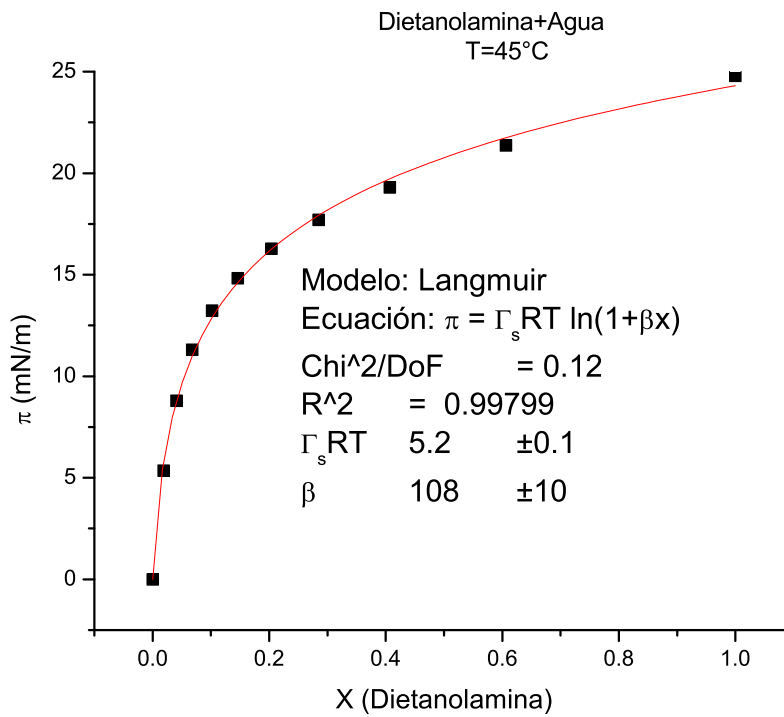
Tabla A.7: Dietanolamina + Agua a 45°C [53]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	68.84	0	–
0.019	63.49	5.35	-3.96332
0.041	60.04	8.8	-3.19418
0.068	57.54	11.3	-2.68825
0.102	55.61	13.23	-2.28278
0.146	54.01	14.83	-1.92415
0.204	52.56	16.28	-1.58964
0.285	51.13	17.71	-1.25527
0.407	49.54	19.3	-0.89894
0.606	47.48	21.36	-0.50088
1	44.05	24.79	0

Dietanolamina+Agua
T=50°C

Dietanolamina+Agua
T=50°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.12
R^2   = 0.99798
$\Gamma_s RT$ 5.2   ±0.1
β 109   ±10

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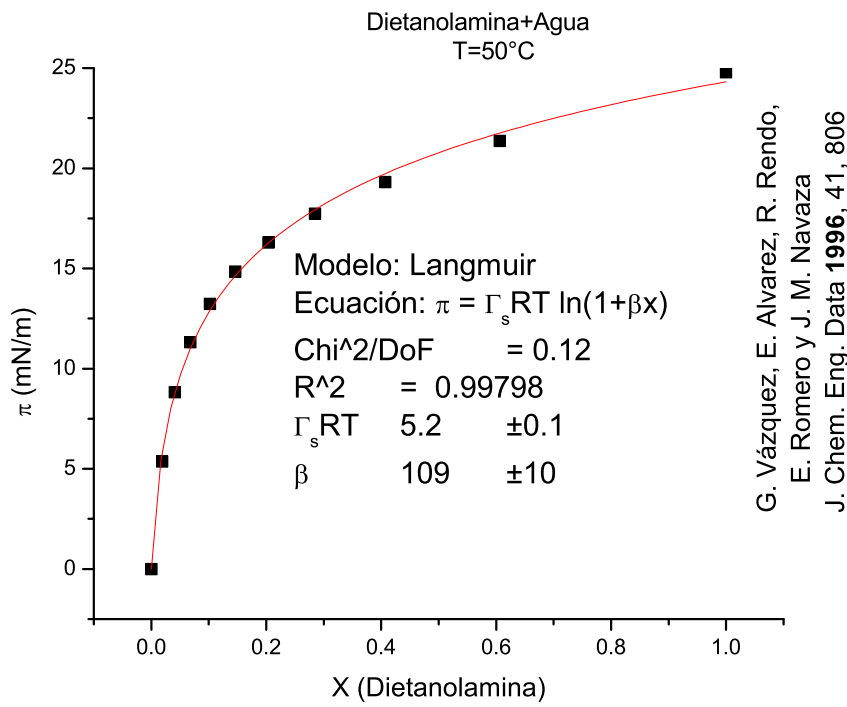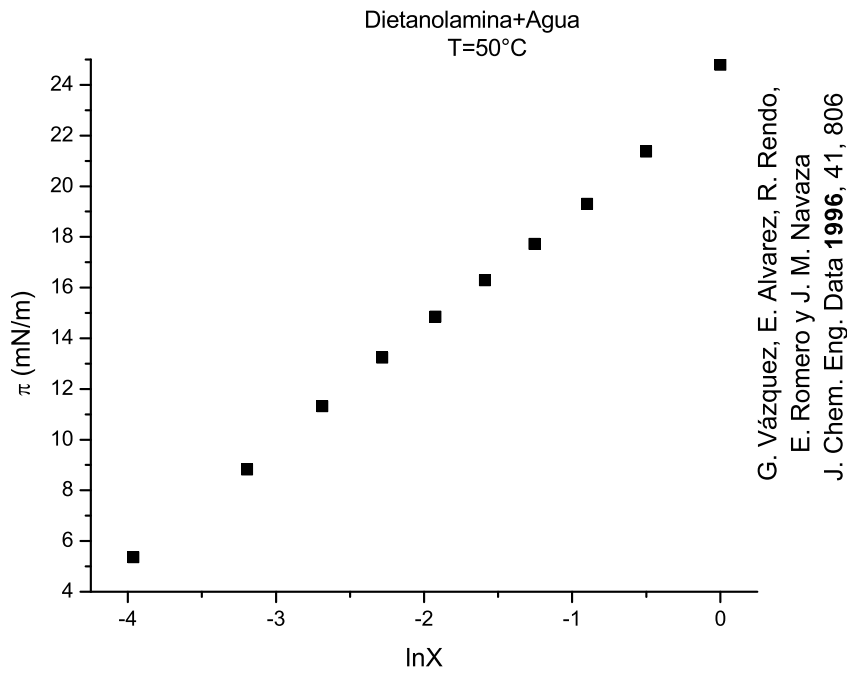
Tabla A.8: Dietanolamina + Agua a 50°C [53]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	67.92	0	–
0.019	62.56	5.36	-3.96332
0.041	59.1	8.82	-3.19418
0.068	56.6	11.32	-2.68825
0.102	54.68	13.24	-2.28278
0.146	53.07	14.85	-1.92415
0.204	51.63	16.29	-1.58964
0.285	50.19	17.73	-1.25527
0.407	48.61	19.31	-0.89894
0.606	46.55	21.37	-0.50088
1	43.12	24.8	0

Monoetanolamina + Agua
T=25°C

Monoetanolamina + Agua
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT * \ln(1 + \beta * x)$

Chi^2/DoF   = 0.09
R^2   = 0.99825
$\Gamma_s RT$ 5.3   ±0.1
β 67   ±5
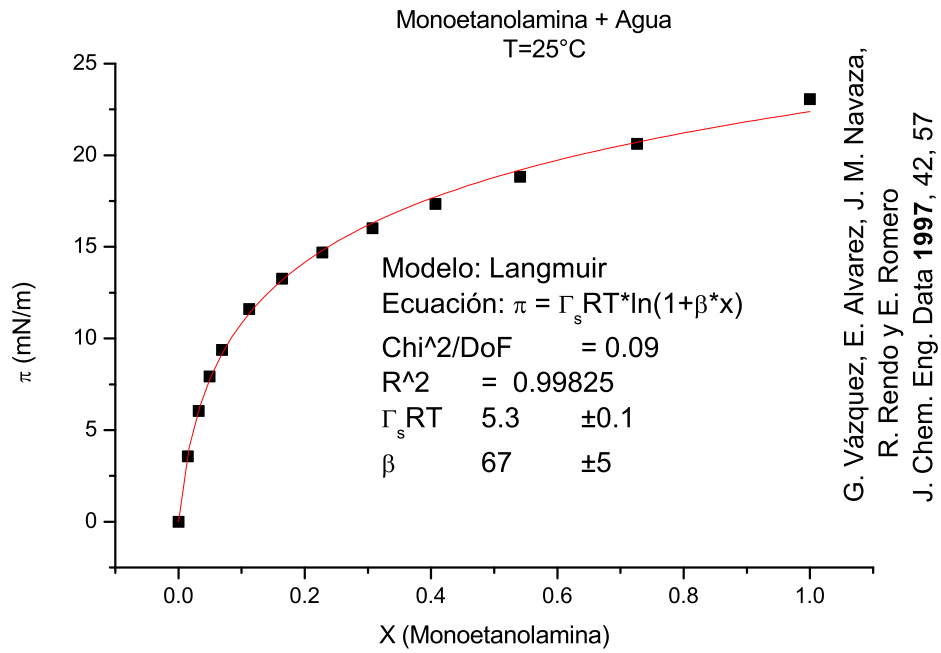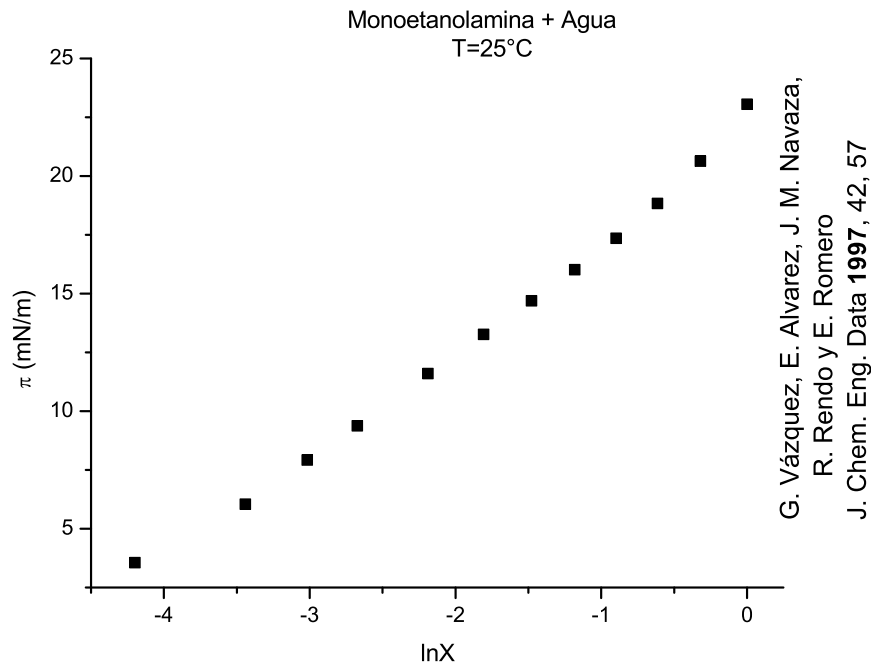
Tabla A.9: Monoetanolamina + Agua a 25°C [52]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	72.01	0	–
0.019	66.7	5.31	-3.96332
0.041	63.25	8.76	-3.19418
0.068	60.75	11.26	-2.68825
0.102	58.82	13.19	-2.28278
0.146	57.2	14.81	-1.92415
0.204	55.75	16.26	-1.58964
0.285	54.32	17.69	-1.25527
0.407	52.72	19.29	-0.89894
0.606	50.65	21.36	-0.50088
1	47.21	24.8	0

Monoetanolamina + Agua
T=30°C

π (mN/m)

ln X

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Monoetanolamina + Agua
T=30°C

π (mN/m)

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF   = 0.09
R^2   = 0.99823
$\Gamma_s RT$ 5.3   ±0.1
β 67   ±5

X (Monoetanolamina)

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Tabla A.10: Monoetanolamina + Agua a 30°C [52]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	71.21	0	–
0.015	67.66	3.55	-4.19971
0.032	65.17	6.04	-3.44202
0.049	63.29	7.92	-3.01593
0.069	61.84	9.37	-2.67365
0.112	59.61	11.6	-2.18926
0.164	57.94	13.27	-1.80789
0.228	56.52	14.69	-1.47841
0.307	55.2	16.01	-1.18091
0.407	53.86	17.35	-0.89894
0.541	52.37	18.84	-0.61434
0.726	50.57	20.64	-0.32021
1	48.14	23.07	0

Monoetanolamina + Agua
T=35°C

G. Vázquez, E. Alvarez, J. M. Navaza,
R. Rendo y E. Romero
J. Chem. Eng. Data **1997**, 42, 57

Monoetanolamina + Agua
T=35°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF		= 0.09
R^2	=	0.99821
$\Gamma_s RT$	5.3	±0.1
β	67	±5

G. Vázquez, E. Alvarez, J. M. Navaza,
R. Rendo y E. Romero
J. Chem. Eng. Data **1997**, 42, 57
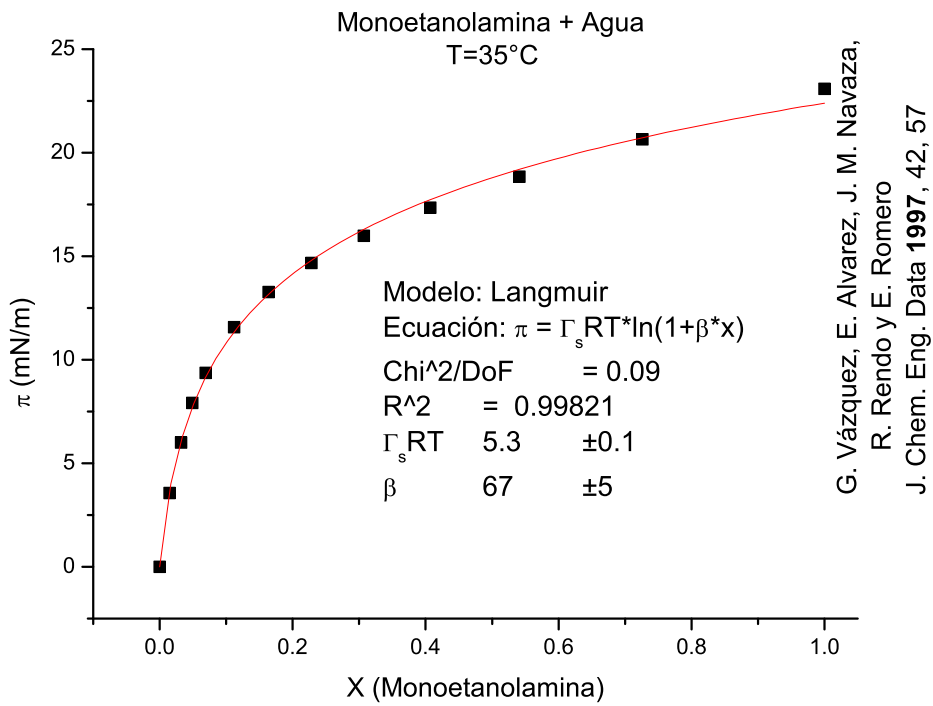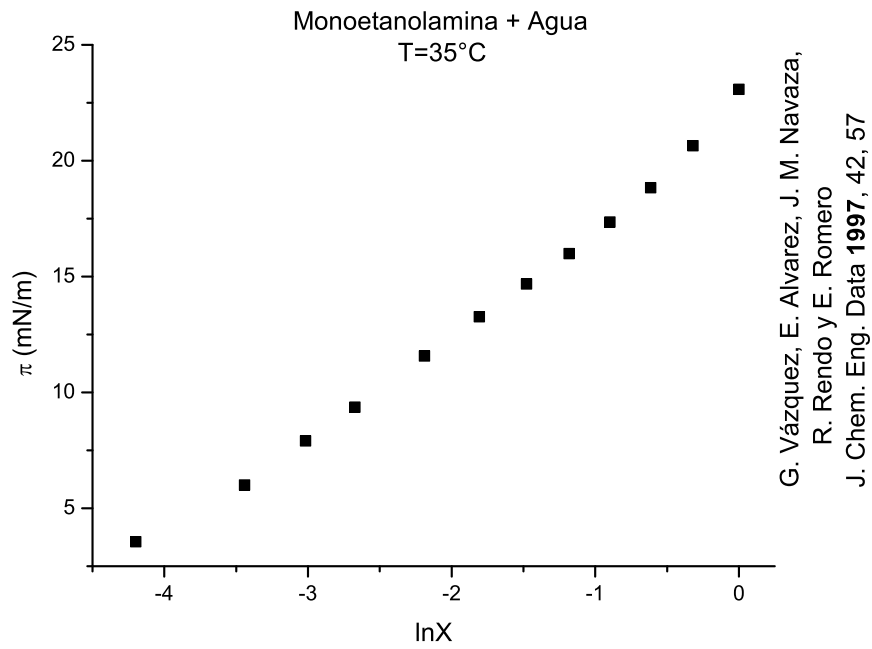
Tabla A.11: Monoetanolamina + Agua a 35°C [52]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	70.42	0	–
0.015	66.86	3.56	-4.19971
0.032	64.41	6.01	-3.44202
0.049	62.51	7.91	-3.01593
0.069	61.06	9.36	-2.67365
0.112	58.84	11.58	-2.18926
0.164	57.15	13.27	-1.80789
0.228	55.74	14.68	-1.47841
0.307	54.43	15.99	-1.18091
0.407	53.07	17.35	-0.89894
0.541	51.58	18.84	-0.61434
0.726	49.77	20.65	-0.32021
1	47.34	23.08	0
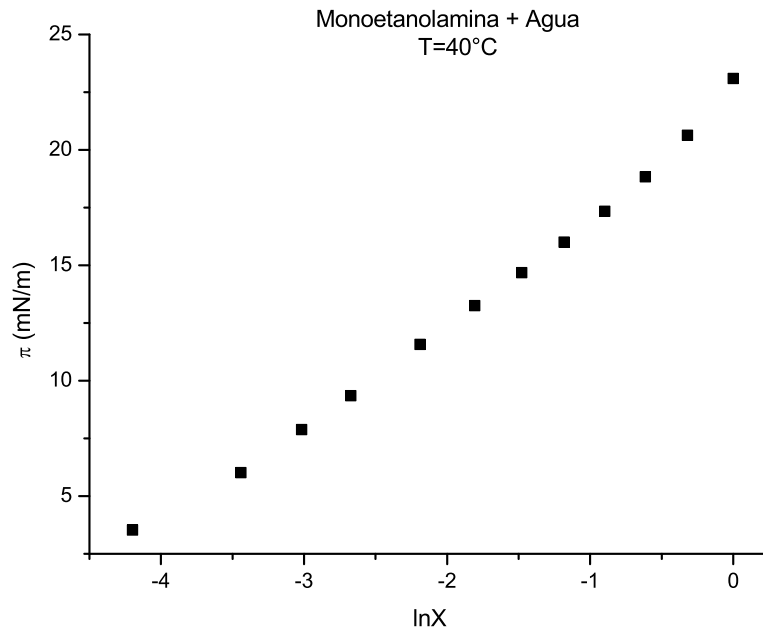
Monoetanolamina + Agua
T=40°C

G. Vázquez, E. Alvarez, J. M. Navaza,
R. Rendo y E. Romero
J. Chem. Eng. Data **1997**, 42, 57

Monoetanolamina + Agua
T=40°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF	= 0.09	
R^2	= 0.99819	
$\Gamma_s RT$	5.3	±0.1
β	66	±5
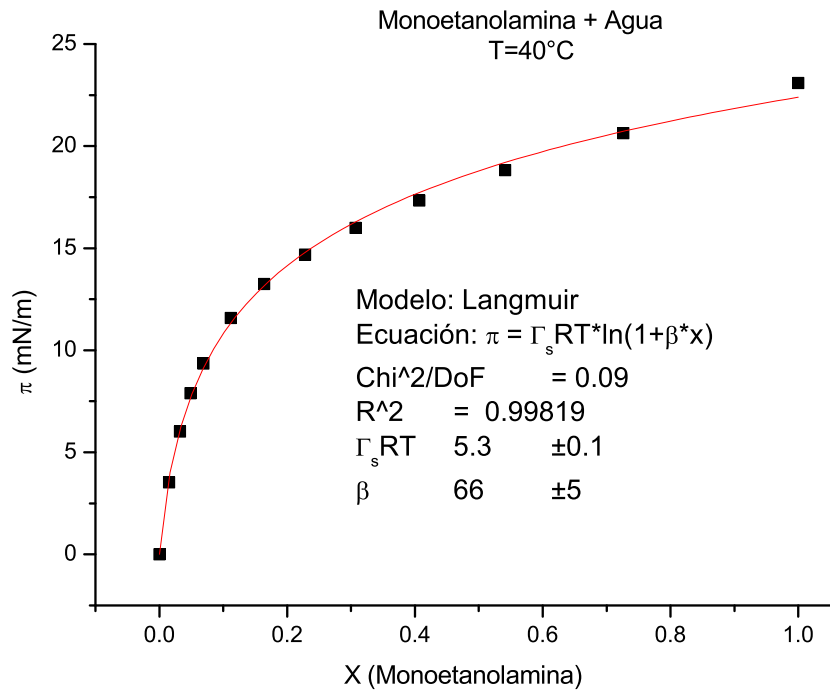
G. Vázquez, E. Alvarez, J. M. Navaza,
R. Rendo y E. Romero
J. Chem. Eng. Data **1997**, 42, 57

Tabla A.12: Monoetanolamina + Agua a 40°C [52]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	69.52	0	–
0.015	65.99	3.53	-4.19971
0.032	63.5	6.02	-3.44202
0.049	61.63	7.89	-3.01593
0.069	60.17	9.35	-2.67365
0.112	57.94	11.58	-2.18926
0.164	56.27	13.25	-1.80789
0.228	54.84	14.68	-1.47841
0.307	53.52	16	-1.18091
0.407	52.18	17.34	-0.89894
0.541	50.69	18.83	-0.61434
0.726	48.88	20.64	-0.32021
1	46.43	23.09	0
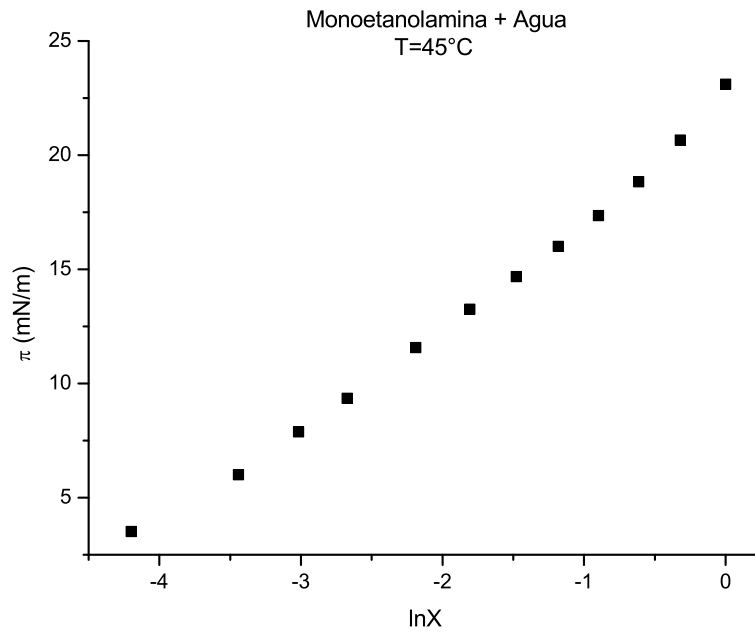
Monoetanolamina + Agua
T=45°C

Monoetanolamina + Agua
T=45°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF   = 0.09
R^2   = 0.99818
$\Gamma_s RT$ 5.3   ±0.1
β 66   ±5
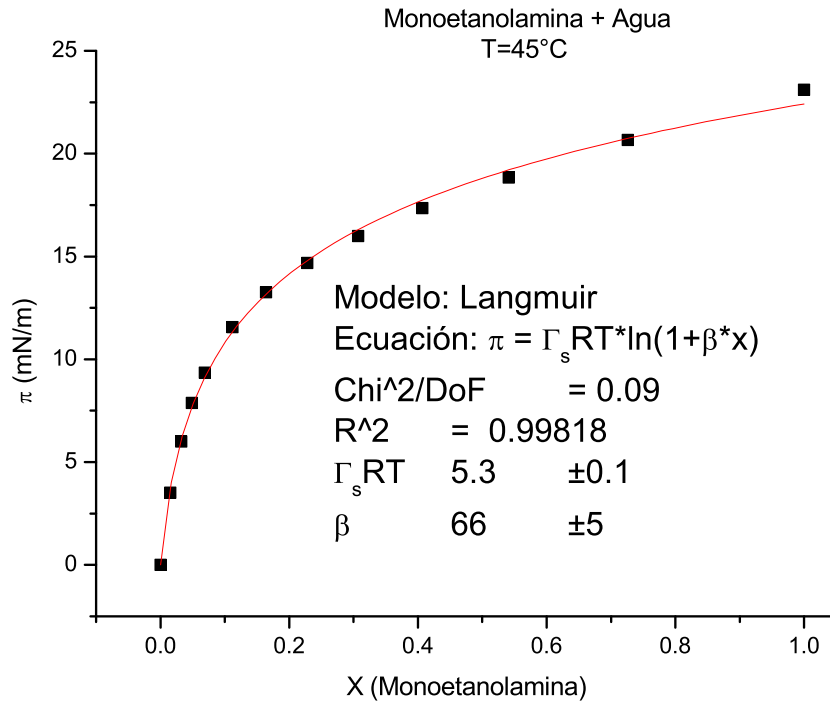
Tabla A.13: Monoetanolamina + Agua a 45°C [52]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	68.84	0	–
0.015	65.32	3.52	-4.19971
0.032	62.83	6.01	-3.44202
0.049	60.96	7.88	-3.01593
0.069	59.49	9.35	-2.67365
0.112	57.27	11.57	-2.18926
0.164	55.58	13.26	-1.80789
0.228	54.16	14.68	-1.47841
0.307	52.84	16	-1.18091
0.407	51.49	17.35	-0.89894
0.541	50	18.84	-0.61434
0.726	48.18	20.66	-0.32021
1	45.73	23.11	0
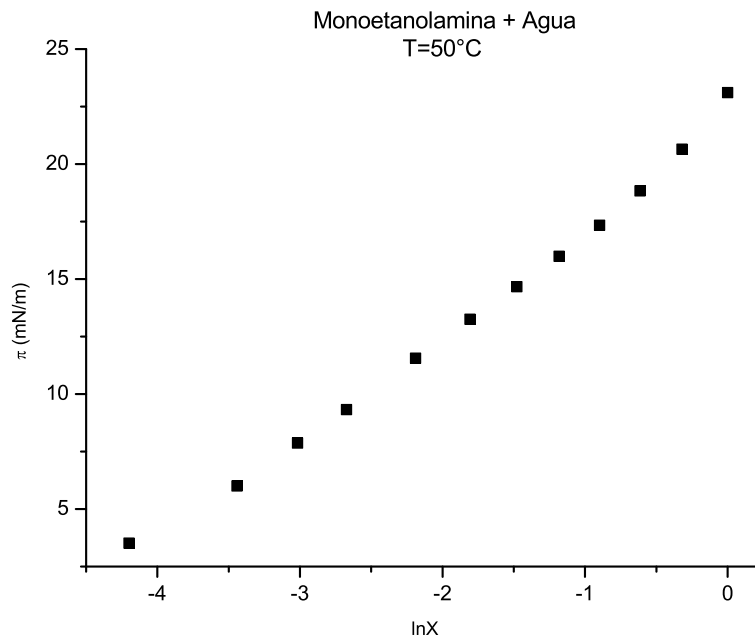
Monoetanolamina + Agua
T=50°C

Monoetanolamina + Agua
T=50°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT * \ln(1 + \beta * x)$

Chi^2/DoF = 0.09
R^2 = 0.99817
$\Gamma_s RT$ 5.3 ±0.1
β 66 ±5
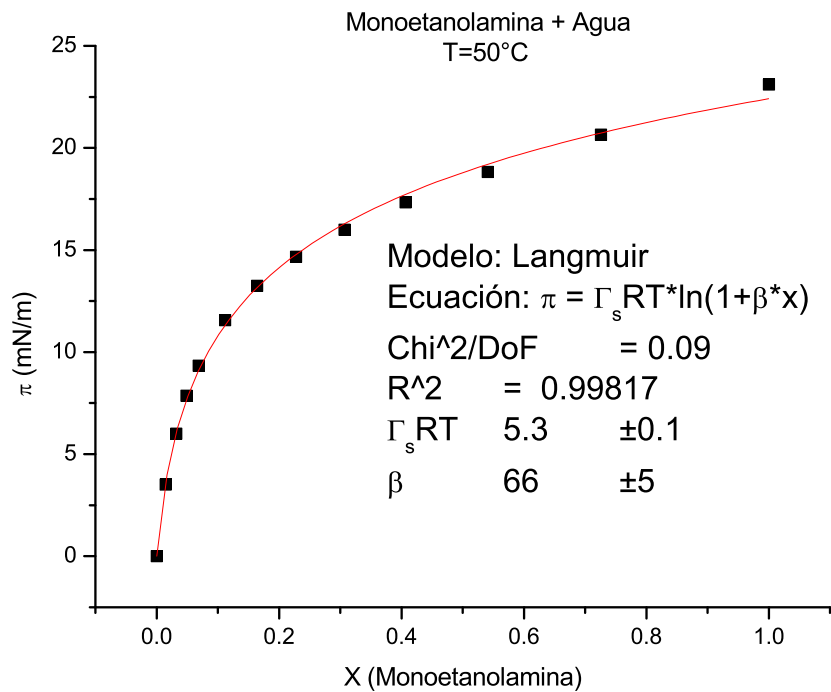
Tabla A.14: Monoetanolamina + Agua a 50°C [52]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	67.92	0	–
0.015	64.4	3.52	-4.19971
0.032	61.92	6	-3.44202
0.049	60.05	7.87	-3.01593
0.069	58.59	9.33	-2.67365
0.112	56.36	11.56	-2.18926
0.164	54.67	13.25	-1.80789
0.228	53.25	14.67	-1.47841
0.307	51.93	15.99	-1.18091
0.407	50.58	17.34	-0.89894
0.541	49.09	18.83	-0.61434
0.726	47.27	20.65	-0.32021
1	44.81	23.11	0

Triclorometano+Dimetilsulfoxido
T=30°C

Agarwal, D.K., Gopal, R. Agarwal, S.
J. Chem. Eng. Data **1979**, 24, 181

Triclorometano+Dimetilsulfoxido
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF	= 0.13	
R^2	= 0.9961	
$\Gamma_s RT$	17.1	±2.4
β	1.6	±0.3

Agarwal, D.K., Gopal, R. Agarwal, S.
J. Chem. Eng. Data **1979**, 24, 181
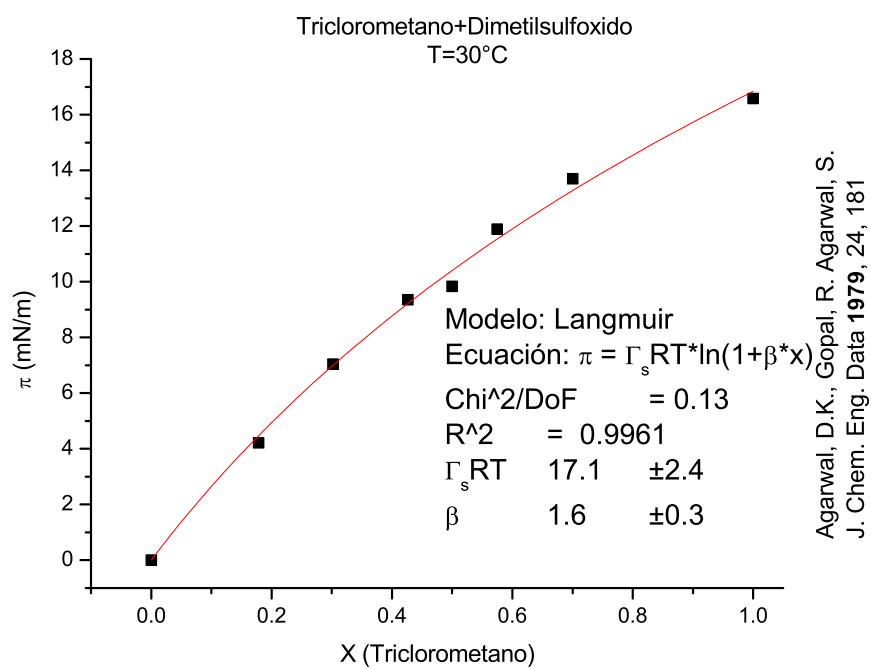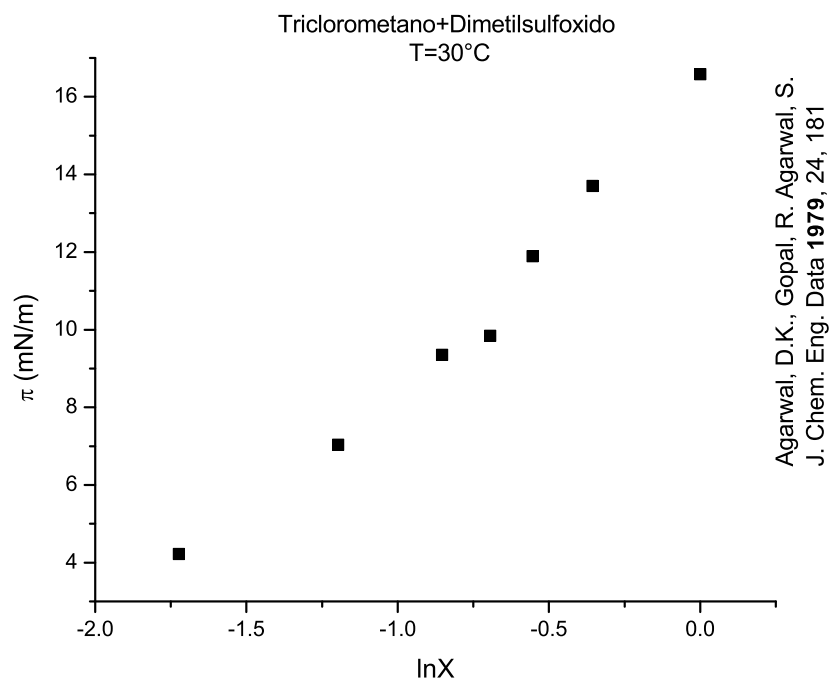
Tabla A.15: Triclorometano + Dimetilsulfoxido a 30°C [1]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	42.41	0	–
0.1784	38.19	4.22	-1.72373
0.3021	35.37	7.04	-1.197
0.4262	33.06	9.35	-0.85285
0.4996	32.57	9.84	-0.69395
0.5748	30.52	11.89	-0.55373
0.7004	28.71	13.7	-0.3561
1	25.83	16.58	0

Etanol + Dimetilsulfoxido
T=20°C

Tommila, E., Autio, T.
Suomen Kemkistilehti **1969**, 42B, 107

Etanol + Dimetilsulfoxido
T=20°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT * \ln(1 + \beta * x)$

Chi^2/DoF   = 0.01
R^2   = 0.99981
$\Gamma_s RT$ 15.8   ±0.3
β 2.7   ±0.1

Tommila, E., Autio, T.
Suomen Kemkistilehti **1969**, 42B, 107
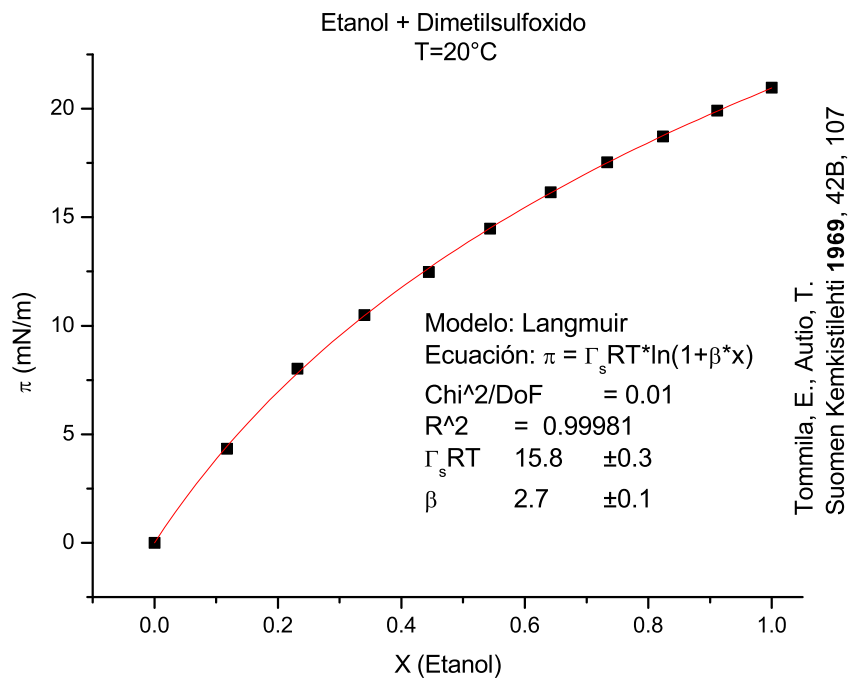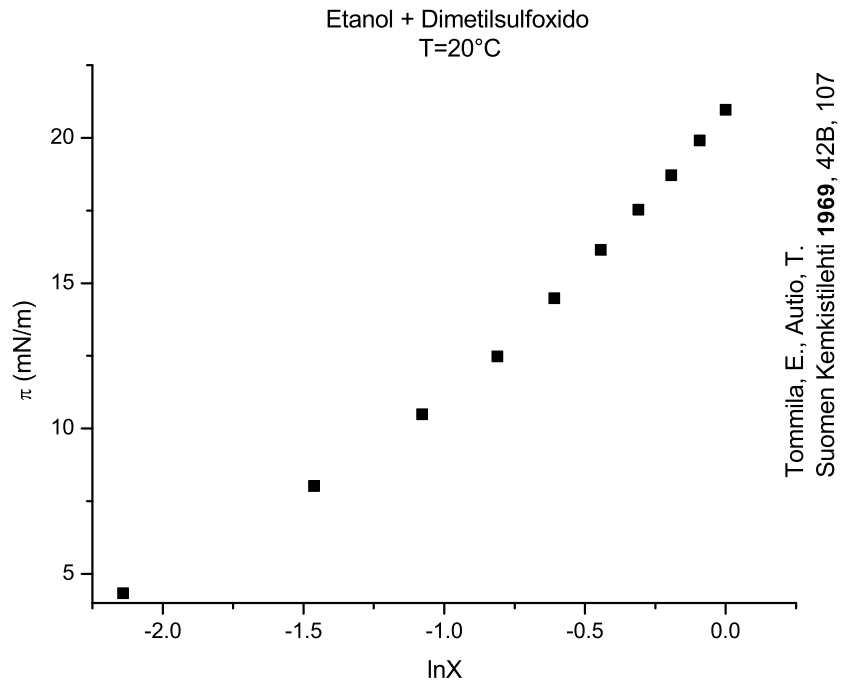
Tabla A.16: Etanol + Dimetilsulfoxido a 20°C [47]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	43.3	0	−
0.1175	38.96	4.34	-2.14132
0.2317	35.28	8.02	-1.46231
0.3401	32.81	10.49	-1.07852
0.4444	30.82	12.48	-0.81103
0.5435	28.82	14.48	-0.60973
0.6417	27.15	16.15	-0.44363
0.7333	25.77	17.53	-0.3102
0.8239	24.58	18.72	-0.19371
0.9115	23.39	19.91	-0.09266
1	22.33	20.97	0

2-Propanona + Ácido Fórmico
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF	= 0.08	
R^2	= 0.99658	
$\Gamma_s RT$	11	±1
β	2.7	±0.3

Tabla A.17: 2-Propanona + Ácido Fórmico a 25°C [50]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
1	23.6	14	0
0.9506	24.1	13.5	-0.05066
0.9013	24.3	13.3	-0.10392
0.7927	25.6	12	-0.23231
0.7004	26.1	11.5	-0.3561
0.5897	27.6	10	-0.52814
0.4974	28.4	9.2	-0.69836
0.393	30	7.6	-0.93395
0.3061	31.1	6.5	-1.18384
0.2313	32.2	5.4	-1.46404
0.1649	33.3	4.3	-1.80242
0.103	35.8	1.8	-2.27303
0.0499	36.2	1.4	-2.99773
0	37.6	0	–

2-Pentanona + Ácido Fórmico
T=25°C

Udovenko, V.V., Sichkova, E.V., Toropov, A.P.
Zh. Obshch. Khim. **1939**, 9, 2048

2-Pentanona + Ácido Fórmico
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT * \ln(1 + \beta * x)$

Chi^2/DoF		= 0.07
R^2	= 0.99666	
Γ_sRT	3.4	±0.1
β	43	±6

Udovenko, V.V., Sichkova, E.V., Toropov, A.P.
Zh. Obshch. Khim. **1939**, 9, 2048
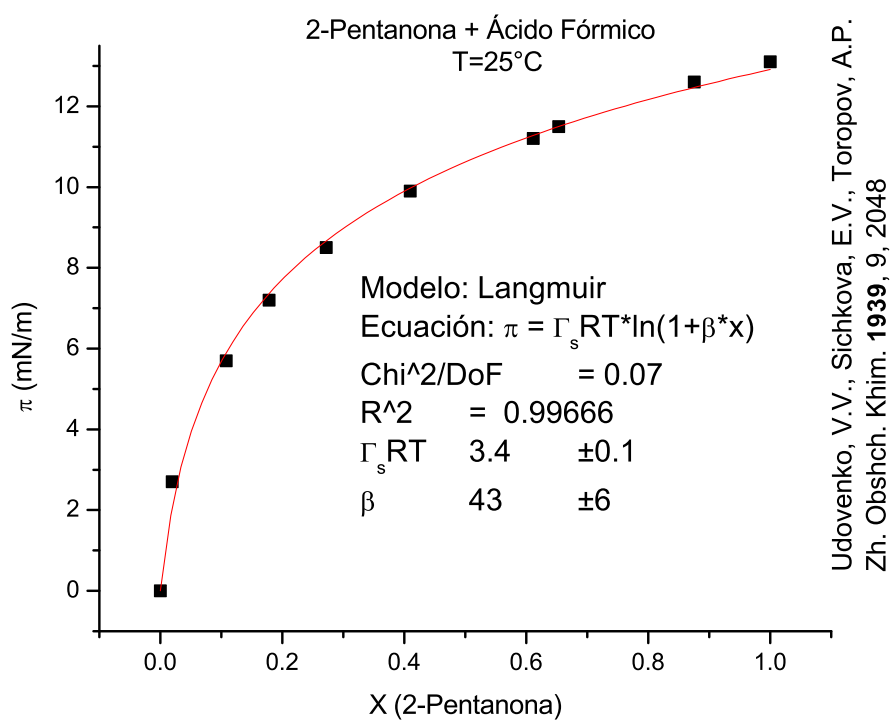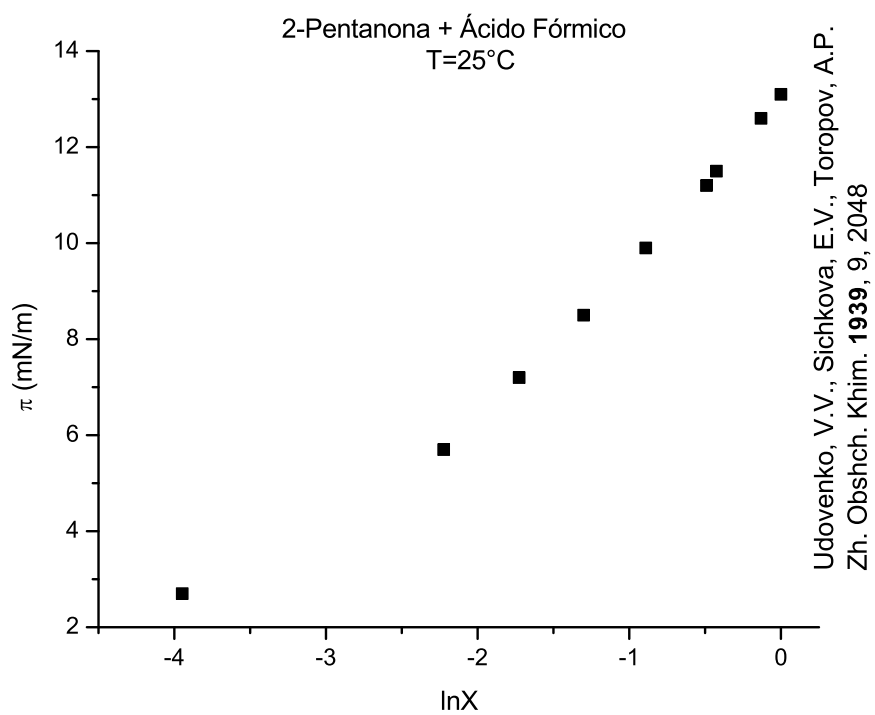
Tabla A.18: 2-Pentanona + Ácido Fórmico a 25°C [50]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
1	24.5	13.1	0
0.8755	25	12.6	-0.13296
0.653	26.1	11.5	-0.42618
0.6117	26.4	11.2	-0.49151
0.4097	27.7	9.9	-0.89233
0.272	29.1	8.5	-1.30195
0.178	30.4	7.2	-1.72597
0.108	31.9	5.7	-2.22562
0.0193	34.9	2.7	-3.94765
0	37.6	0	–

Etilenglicol + Agua
T=30°C

Etilenglicol + Agua
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF	= 0.04	
R^2	= 0.99932	
$\Gamma_s RT$	7.6	±0.1
β	27	±1
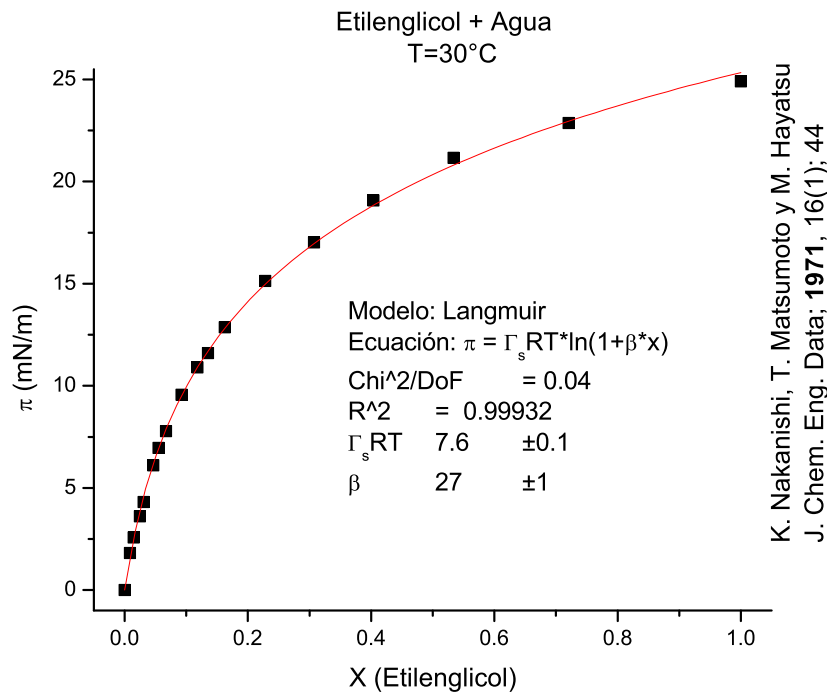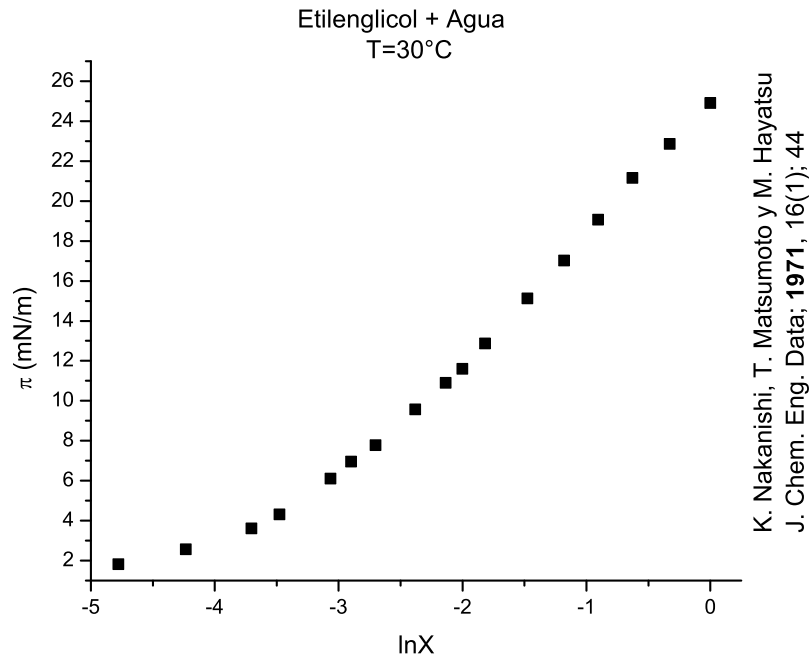
Tabla A.19: Etilenglicol + Agua a 30°C [30]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	71.15	0	–
0.0084	69.33	1.82	-4.77952
0.0145	68.58	2.57	-4.23361
0.0246	67.54	3.61	-3.70501
0.0309	66.84	4.31	-3.477
0.0466	65.04	6.11	-3.06615
0.055	64.19	6.96	-2.90042
0.0671	63.37	7.78	-2.70157
0.0923	61.58	9.57	-2.38271
0.118	60.25	10.9	-2.13707
0.1351	59.54	11.61	-2.00174
0.1624	58.28	12.87	-1.81769
0.2282	56.02	15.13	-1.47753
0.3074	54.13	17.02	-1.17961
0.4037	52.08	19.07	-0.90708
0.5337	49.99	21.16	-0.62792
0.7206	48.28	22.87	-0.32767
1	46.24	24.91	0
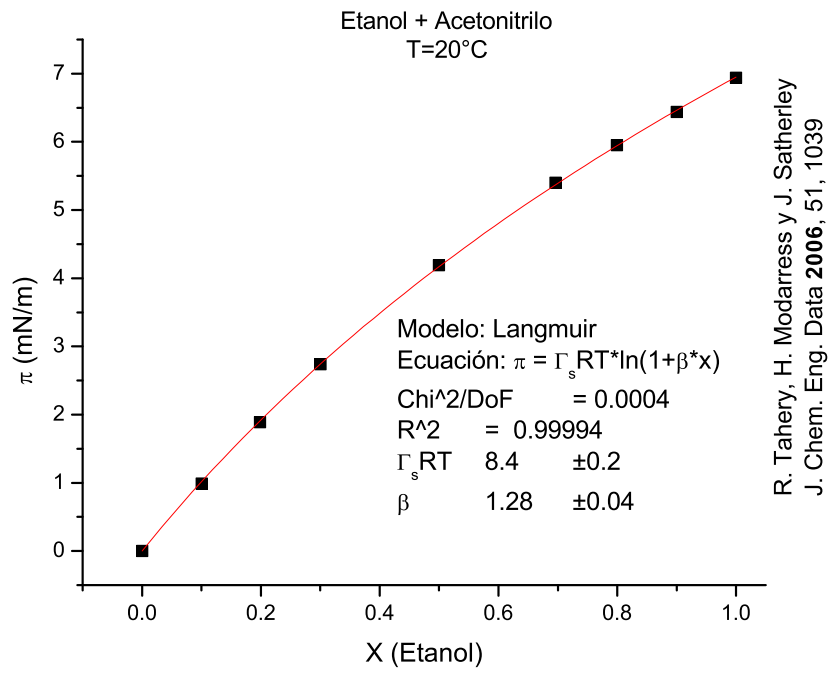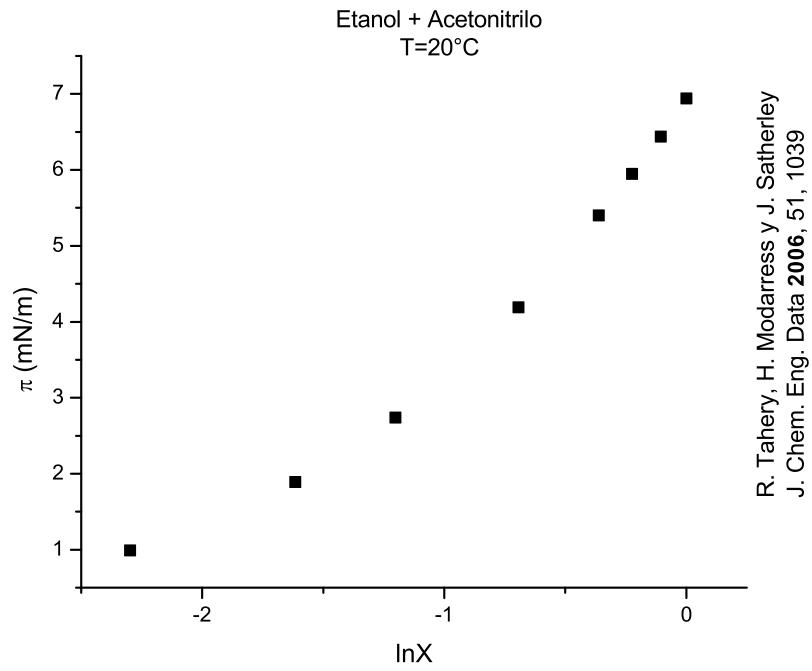
Tabla A.20: Etanol + Acetonitrilo a 20°C [45]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
1	22.31	6.94	0
0.9001	22.81	6.44	-0.10525
0.7993	23.3	5.95	-0.22402
0.6961	23.85	5.4	-0.36226
0.4999	25.06	4.19	-0.69335
0.3006	26.51	2.74	-1.20197
0.1987	27.36	1.89	-1.61596
0.1004	28.26	0.99	-2.29859
0	29.25	0	–
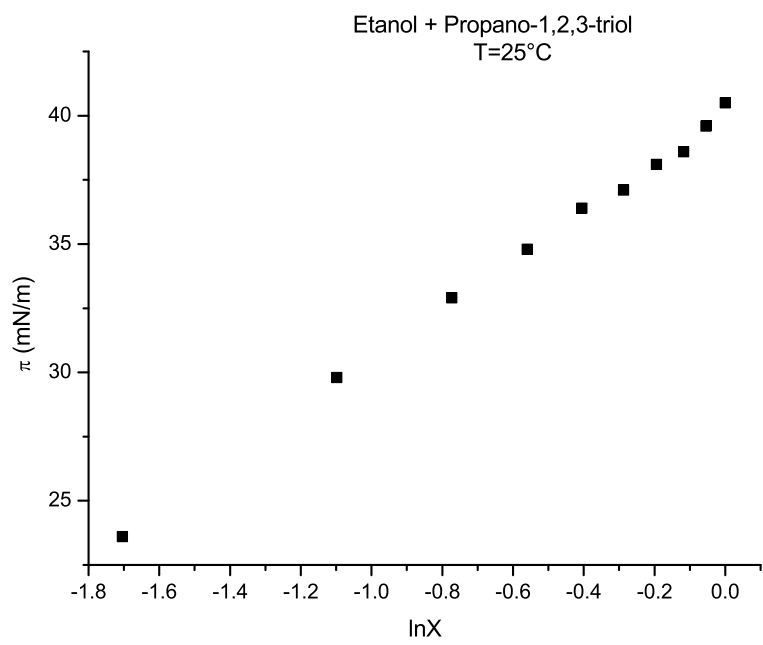
Etanol + Propano-1,2,3-triol
T=25°C

Etanol + Propano-1,2,3-triol
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF   = 0.07
R^2   = 0.99953
$\Gamma_s RT$ 9.9   ±0.2
β 54   ±4
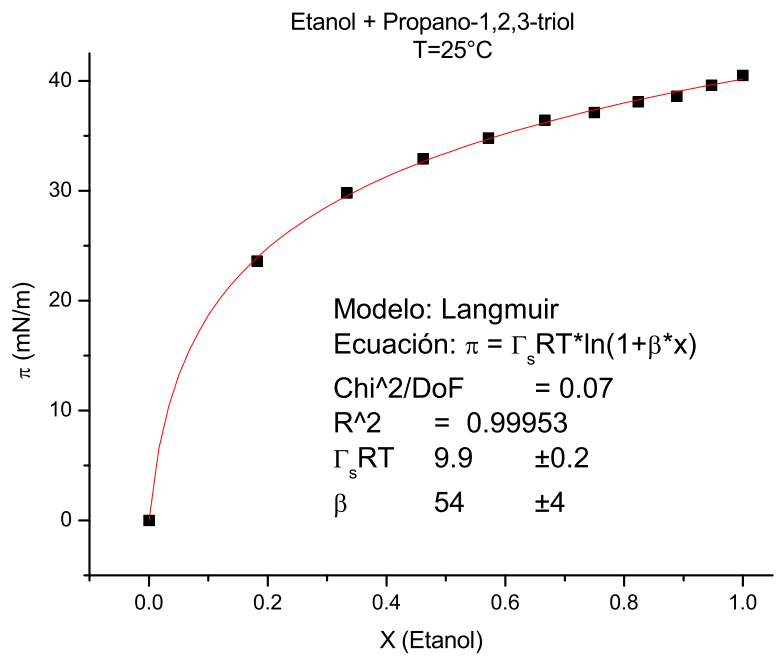
Tabla A.21: Etanol + Propano-1,2,3-triol a 25°C [6]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
1	22	40.5	0
0.94737	22.9	39.6	-0.05407
0.88889	23.9	38.6	-0.11778
0.82353	24.4	38.1	-0.19416
0.75	25.4	37.1	-0.28768
0.66667	26.1	36.4	-0.40547
0.57143	27.7	34.8	-0.55962
0.46154	29.6	32.9	-0.77319
0.33333	32.7	29.8	-1.09861
0.18182	38.9	23.6	-1.70475
0	62.5	0	–

1-Propanol + Acetonitrilo
T=20°C

Tahery R., Modarress H., y Satherley J.
J. of Chem. Eng. Data **2006**, 51, 1039

1-Propanol + Acetonitrilo
T=20°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF = 0.01
R^2 = 0.99812
$\Gamma_s RT$ 3.4 ±0.2
β 4.1 ±0.5

Tahery R., Modarress H., y Satherley J.
J. of Chem. Eng. Data **2006**, 51, 1039
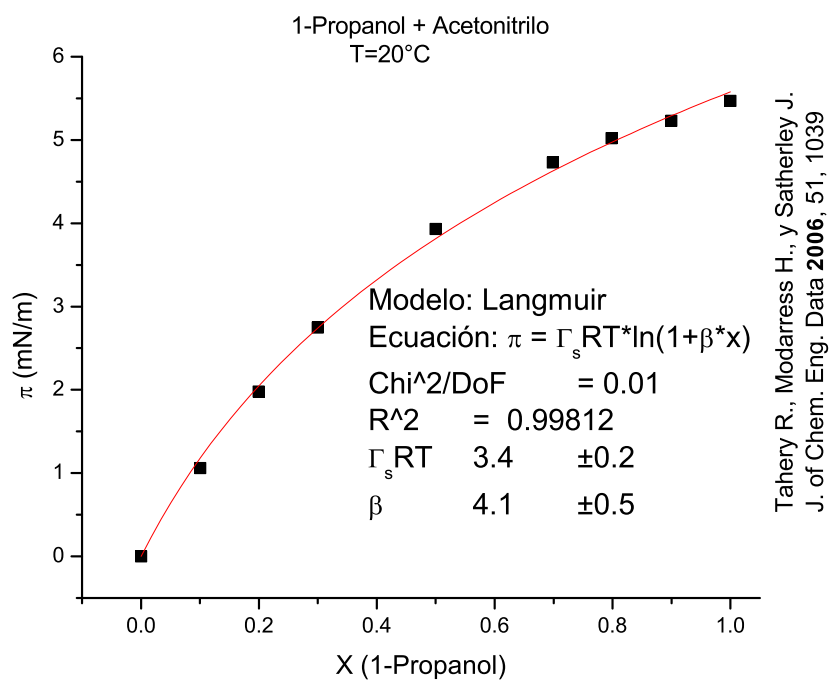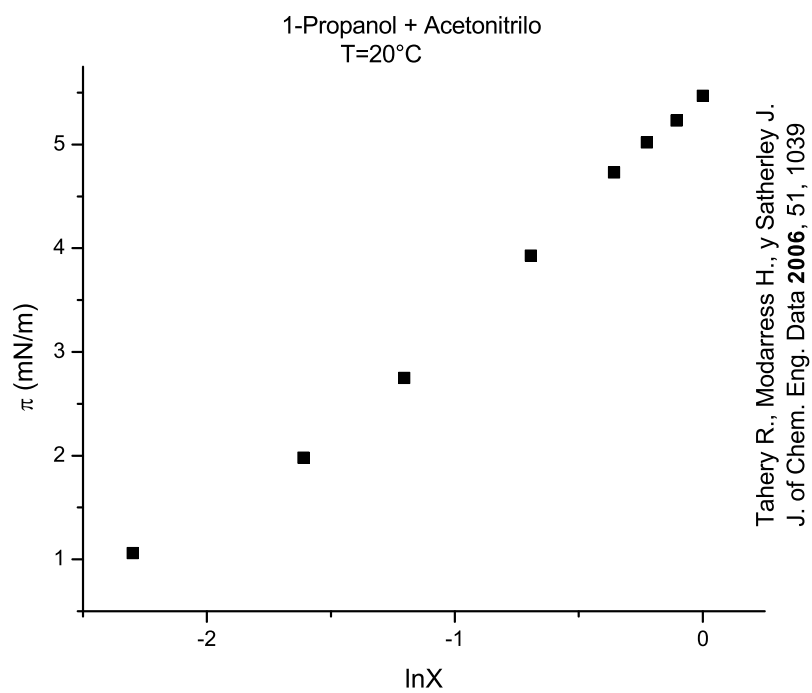
Tabla A.22: 1-Propanol + Acetonitrilo a 20°C [45]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
1	23.78	5.47	0
0.8996	24.02	5.23	-0.10581
0.7982	24.23	5.02	-0.2254
0.6987	24.52	4.73	-0.35853
0.4996	25.32	3.93	-0.69395
0.2997	26.5	2.75	-1.20497
0.1998	27.27	1.98	-1.61044
0.1003	28.19	1.06	-2.29959
0	29.25	0	–

Dietil eter+ 1,1,2,2-tetrabromoetano
T=20°C

Toropov, A.P., Kabanova, V.M.
Uzb. Khim. Zh. **1961**, 1, 23

Dietil eter+ 1,1,2,2-tetrabromoetano
T=20°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT * \ln(1+\beta * x)$

Chi^2/DoF = 0.26
R^2 = 0.99763
$\Gamma_s RT$ 17   ±1
β 5.3   ±0.5

Toropov, A.P., Kabanova, V.M.
Uzb. Khim. Zh. **1961**, 1, 23
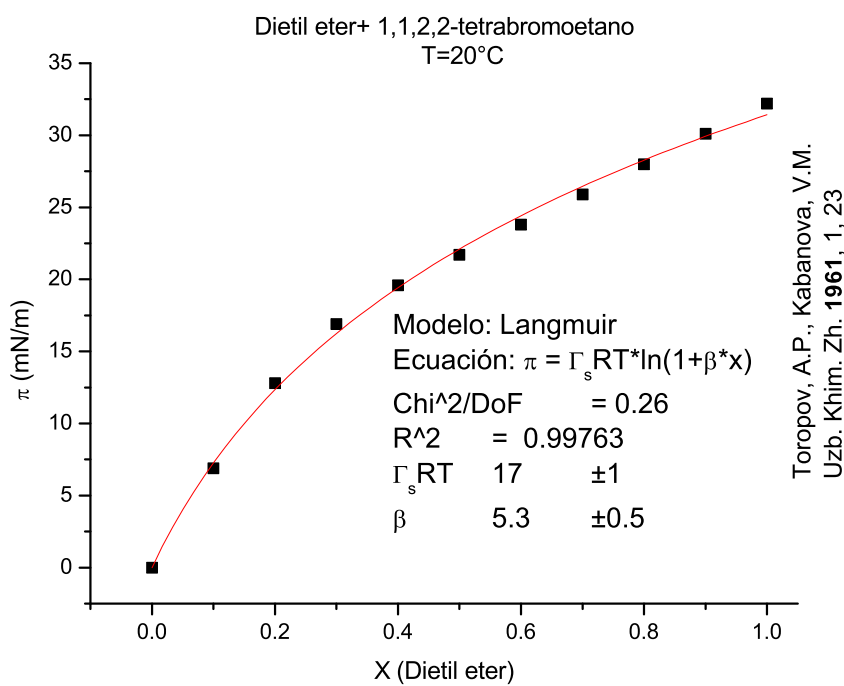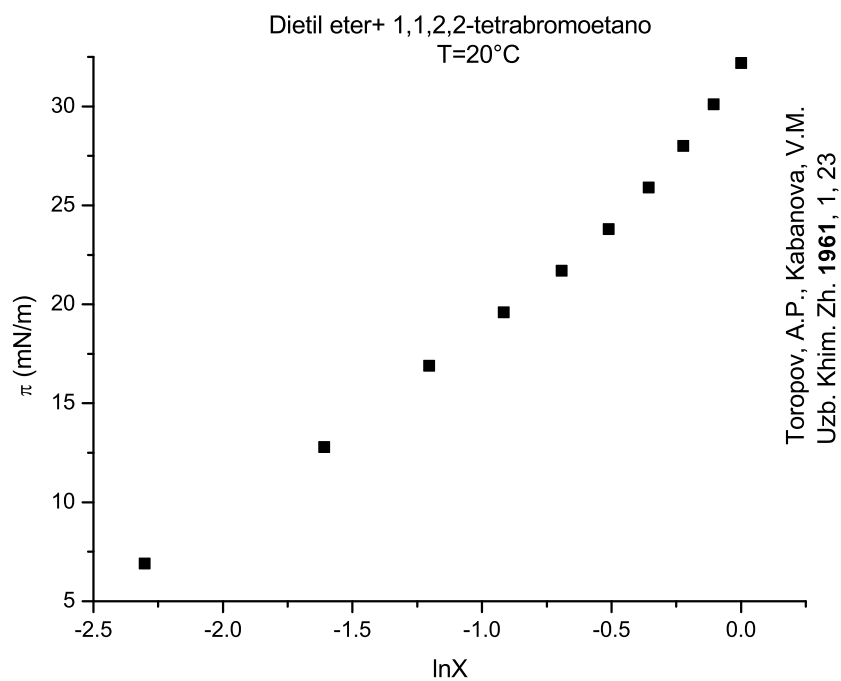
Tabla A.23: Dietileter + 1,1,2,2-Tetrabromoetano a 20°C [48]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
1	17	32.2	0
0.9	19.1	30.1	-0.10536
0.8	21.2	28	-0.22314
0.7	23.3	25.9	-0.35667
0.6	25.4	23.8	-0.51083
0.5	27.5	21.7	-0.69315
0.4	29.6	19.6	-0.91629
0.3	32.3	16.9	-1.20397
0.2	36.4	12.8	-1.60944
0.1	42.3	6.9	-2.30259
0	49.2	0	–

Ácido acético+Ácido acético anhidrido
T=20°C

Granzhan, V.A., Laktionova, S.K.
Report, VINITI Depos. Doc. **1976**, 3699-76

Ácido acético+Ácido acético anhidrido
T=20°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT^* \ln(1+\beta^* x)$

Chi^2/DoF   = 0.00364
R^2   = 0.99908
Γ_sRT   6.1   ±0.4
β 1.5   ±0.1

Granzhan, V.A., Laktionova, S.K.
Report, VINITI Depos. Doc. **1976**, 3699-76
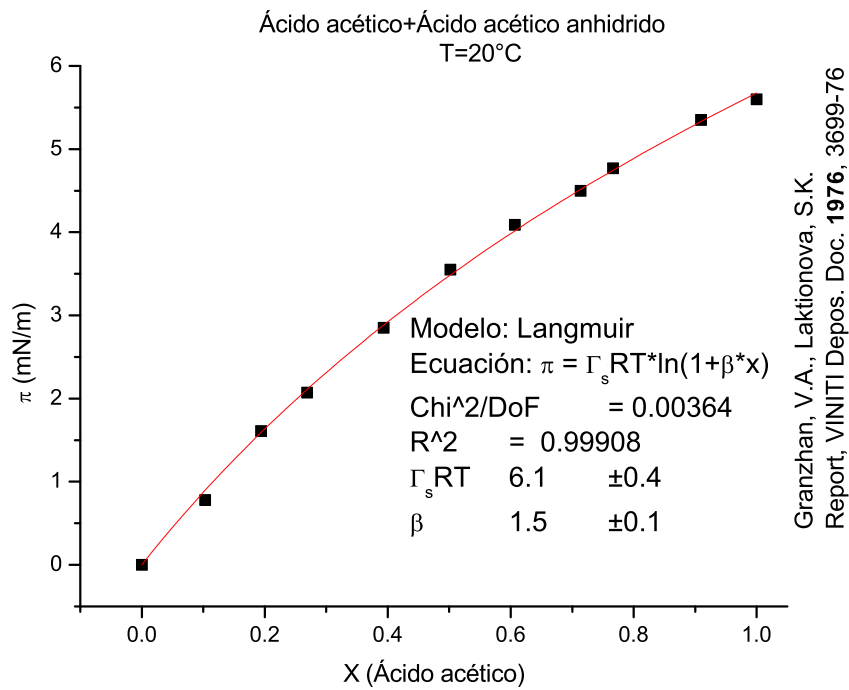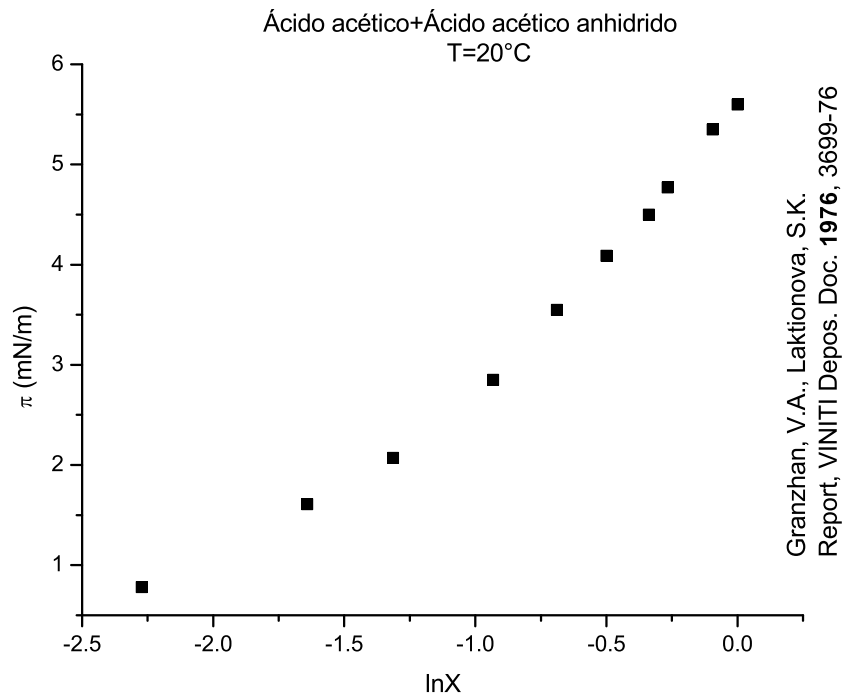
Tabla A.24: Ácido acético + Ácido acético anhidrido a 20°C [12]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	33.1	0	–
0.103	32.32	0.78	-2.27303
0.1938	31.49	1.61	-1.64093
0.2687	31.03	2.07	-1.31416
0.3936	30.25	2.85	-0.93242
0.5019	29.55	3.55	-0.68935
0.6068	29.01	4.09	-0.49956
0.7136	28.6	4.5	-0.33743
0.7662	28.33	4.77	-0.26631
0.9095	27.75	5.35	-0.09486
1	27.5	5.6	0

Dietil Eter + Triclorometano
T=18°C

Whatmough, W.H.
Z. Phys. Chem. **1902**, 39, 129

Dietil Eter + Triclorometano
T=18°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.004
R^2   = 0.9996
$\Gamma_s RT$ 25   ±2
β 0.48   ±0.05

Whatmough, W.H.
Z. Phys. Chem. **1902**, 39, 129
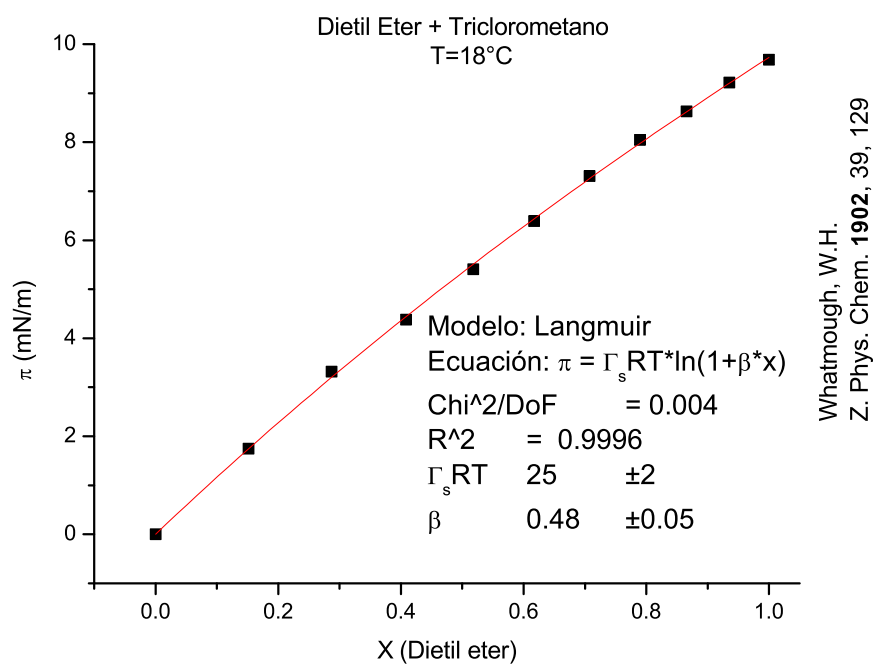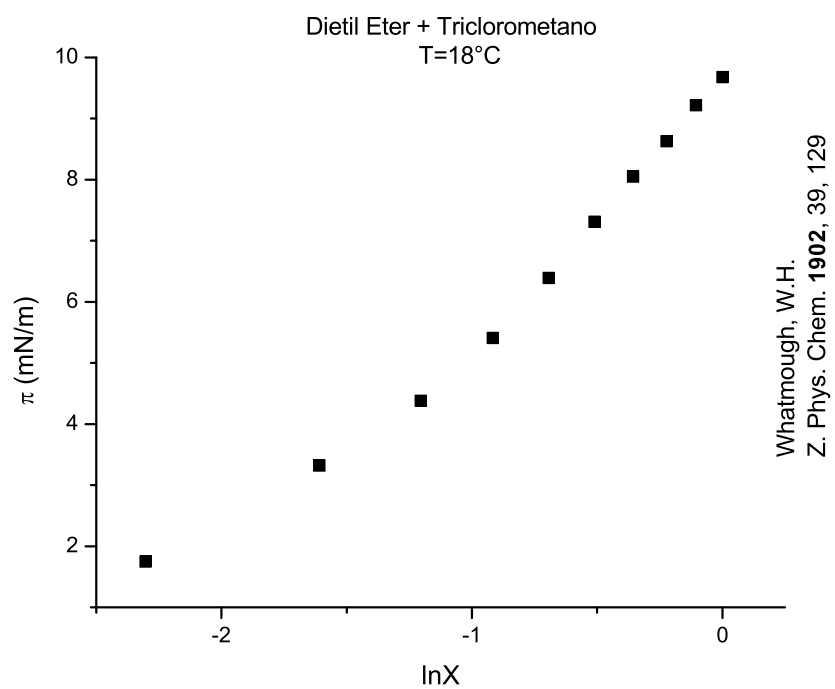
Tabla A.25: Dietil Eter + Triclorometano a 18°C [57]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	26.82	0	–
0.15179	25.07	1.75	-2.30259
0.28706	23.5	3.32	-1.60944
0.40836	22.44	4.38	-1.20397
0.51777	21.41	5.41	-0.91629
0.61694	20.43	6.39	-0.69315
0.70724	19.51	7.31	-0.51083
0.78982	18.77	8.05	-0.35667
0.86563	18.19	8.63	-0.22314
0.93546	17.6	9.22	-0.10536
1	17.14	9.68	0

Etanol + Anilina
T=25°C

π (mN/m)

lnX

Etanol + Anilina
T=25°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF = 0.16
R^2 = 0.99786
$\Gamma_s RT$ 29 ±6
β 1.0 ±0.3

π (mN/m)
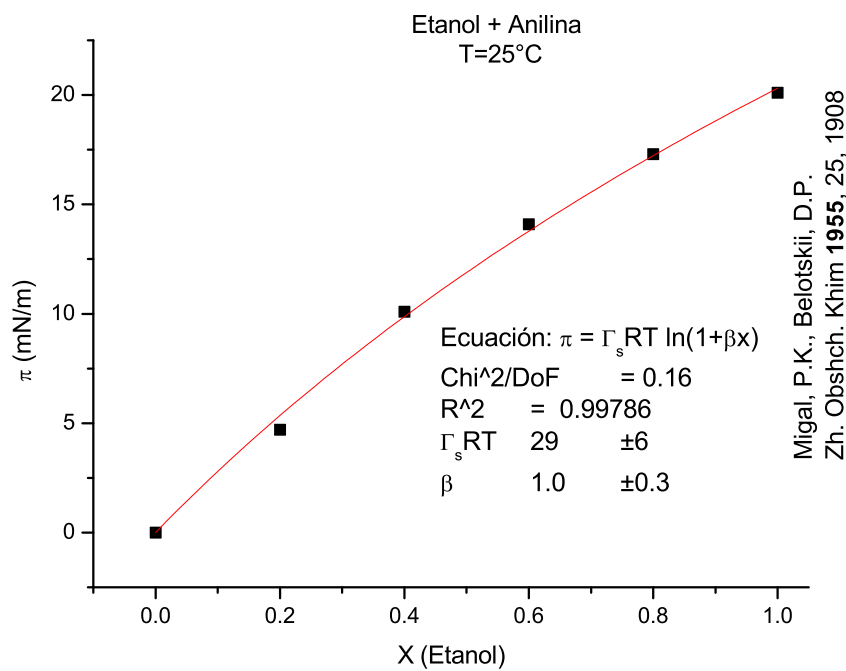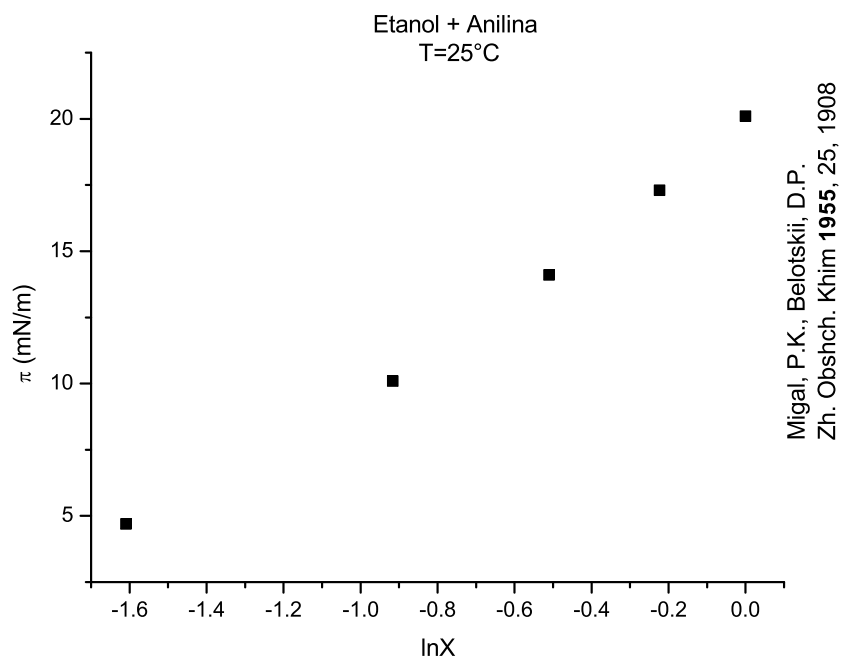
X (Etanol)

Tabla A.26: Etanol + Anilina a 25°C [23]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	42.1	0	–
0.2	37.4	4.7	-1.60944
0.4	32	10.1	-0.91629
0.6	28	14.1	-0.51083
0.8	24.8	17.3	-0.22314
1	22	20.1	0

2-Metil,2-butanol + Tolueno
T=30°C

2-Metil,2-butanol + Tolueno
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT * \ln(1+\beta*x)$

Chi^2/DoF   = 0.001
R^2   = 0.99979
$\Gamma_s RT$ 5.9   ±0.2
β 1.5   ±0.1
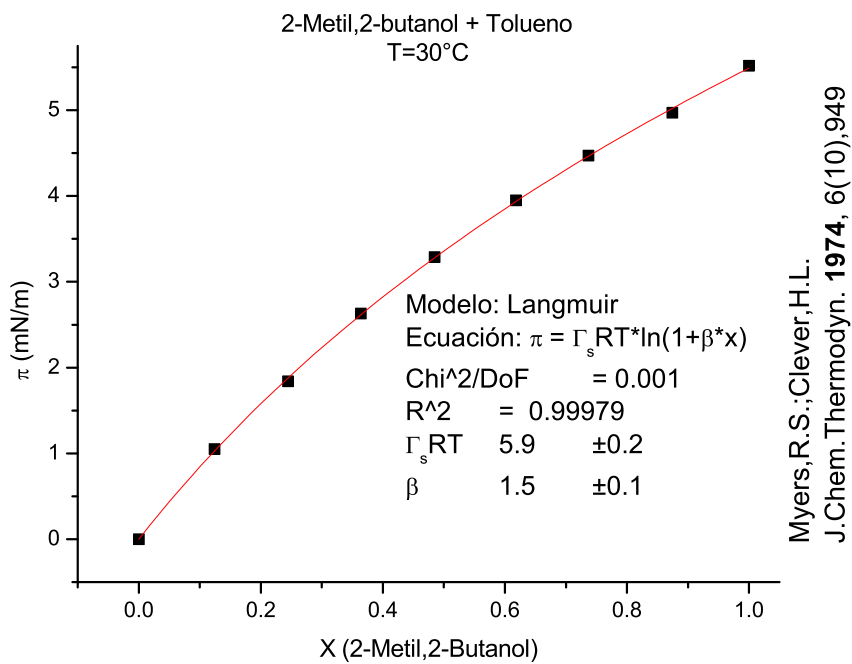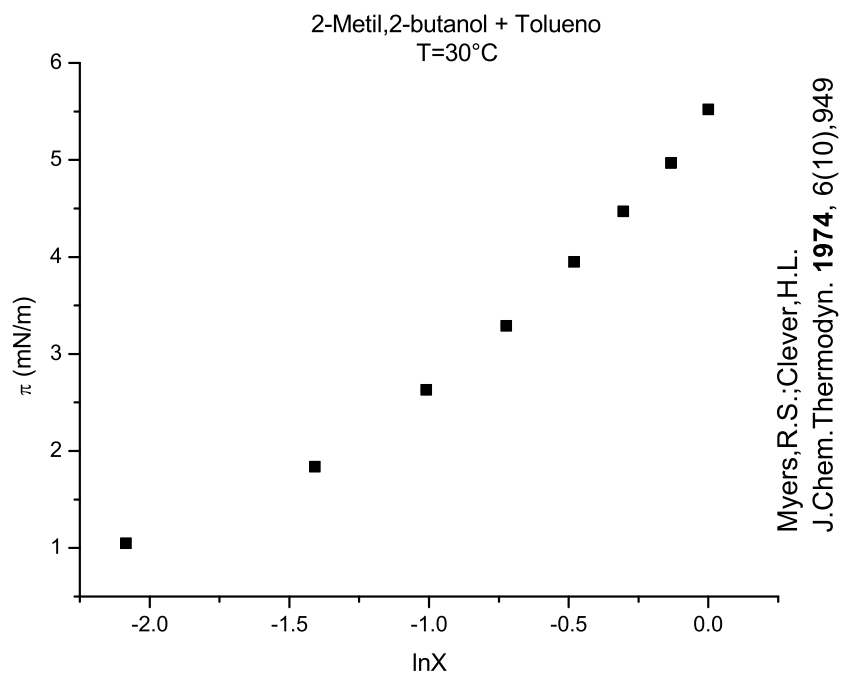
Tabla A.27: 2-Metil,2-butanol + Tolueno a 30°C [29]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	27.41	0	–
0.1243	26.36	1.05	-2.08506
0.2444	25.57	1.84	-1.40895
0.364	24.78	2.63	-1.0106
0.4849	24.12	3.29	-0.72381
0.6183	23.46	3.95	-0.48078
0.737	22.94	4.47	-0.30517
0.8742	22.44	4.97	-0.13445
1	21.89	5.52	0

Ácido Fórmico+Agua
T=20°C

G. Vázquez, M. Sánchez-Vilas, B. Sanjurjo
y J. Navaza
J. Chem. Eng. Data **1997**, 42, 957

Ácido Fórmico+Agua
T=20°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.16
R^2   = 0.99883
$\Gamma_s RT$ 11.0   ±0.2
β 25   ±1

G. Vázquez, M. Sánchez-Vilas, B. Sanjurjo
y J. Navaza
J. Chem. Eng. Data **1997**, 42, 957
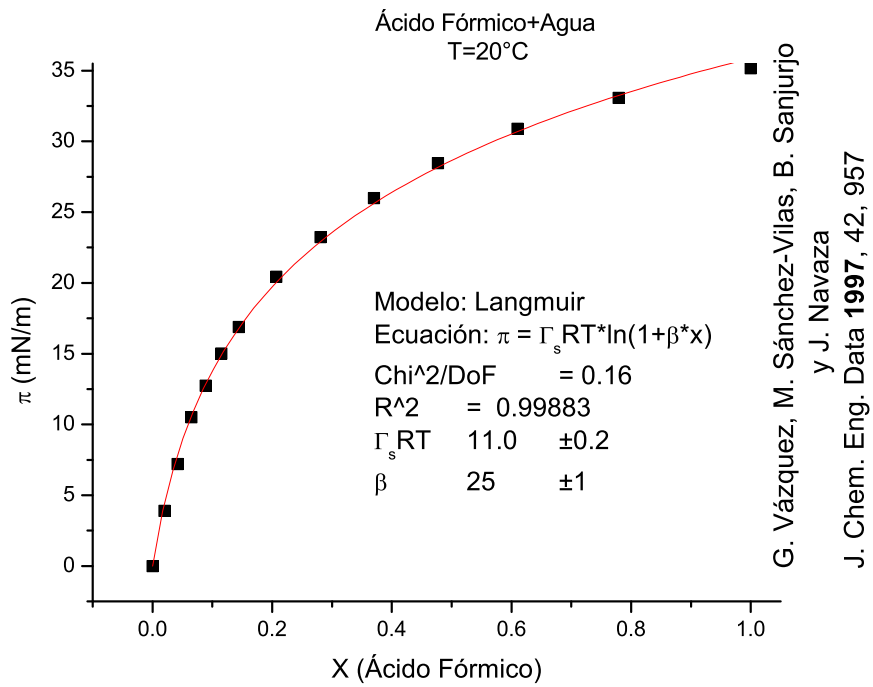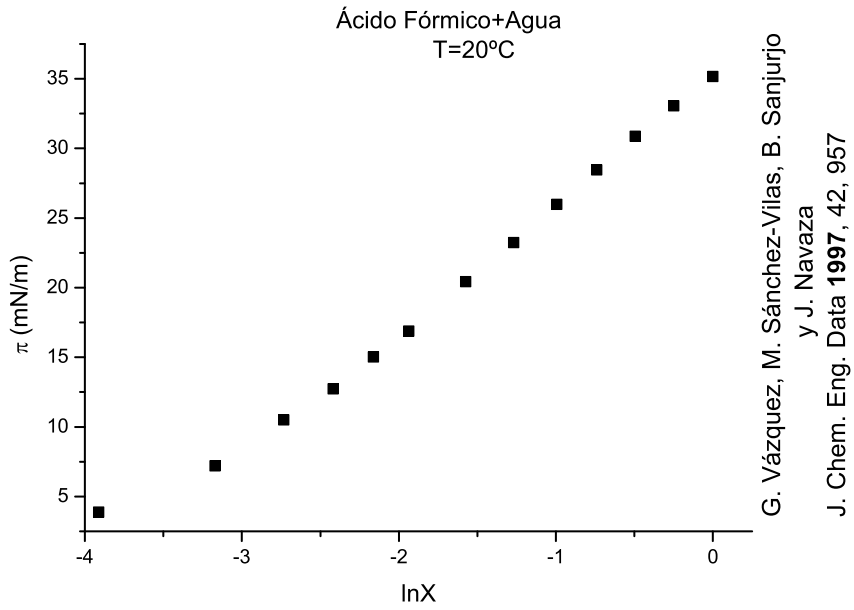
Tabla A.28: Ácido Fórmico + Agua a 20°C [2]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	72.75	0	–
0.02	68.86	3.89	-3.91202
0.042	65.54	7.21	-3.17009
0.065	62.24	10.51	-2.73337
0.089	60.02	12.73	-2.41912
0.115	57.73	15.02	-2.16282
0.144	55.87	16.88	-1.93794
0.207	52.31	20.44	-1.57504
0.281	49.52	23.23	-1.2694
0.37	46.76	25.99	-0.99425
0.477	44.28	28.47	-0.74024
0.61	41.87	30.88	-0.4943
0.779	39.68	33.07	-0.24974
1	37.58	35.17	0
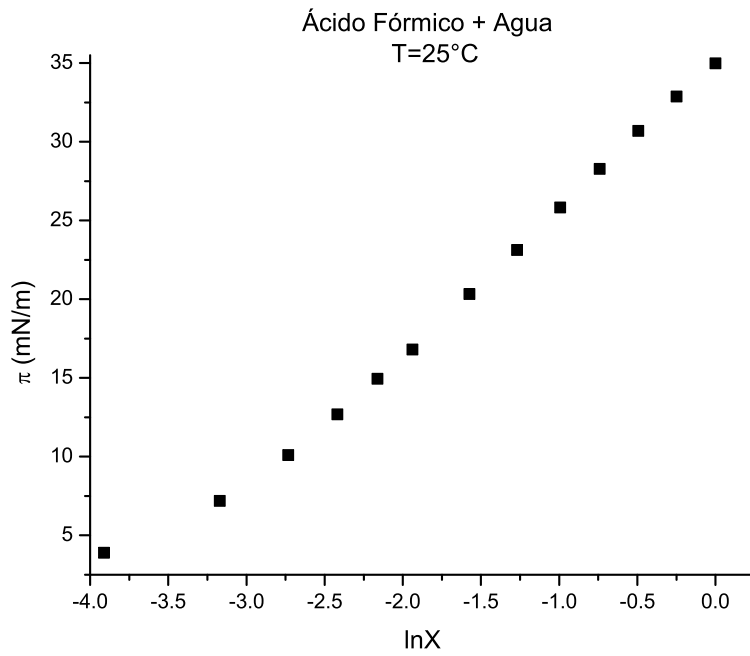
Ácido Fórmico + Agua
T=25°C

Ácido Fórmico + Agua
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.16
R^2   = 0.99877
$\Gamma_s RT$ 11.0   ±0.2
β 24.6   ±1.3
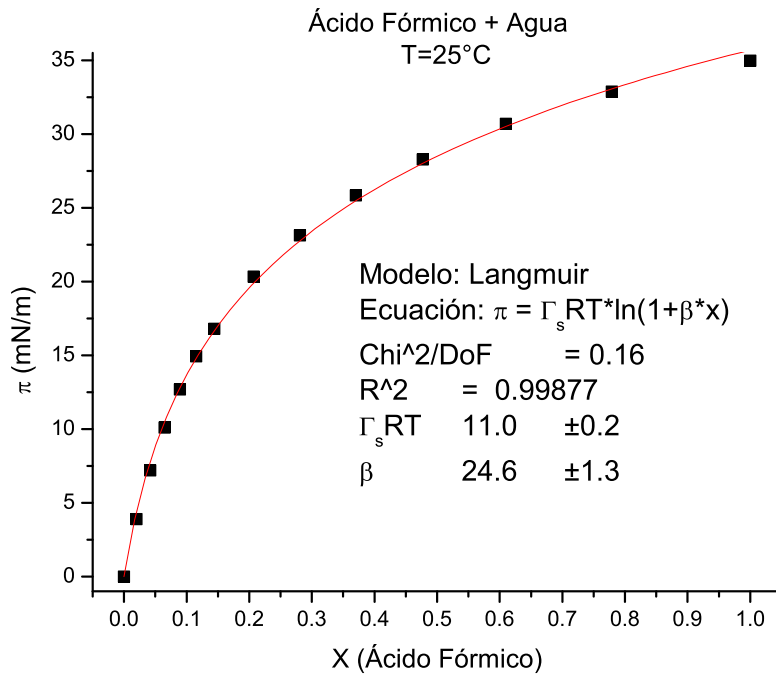
Tabla A.29: Ácido Fórmico + Agua a 25°C [2]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	72.01	0	–
0.02	68.11	3.9	-3.91202
0.042	64.82	7.19	-3.17009
0.065	61.91	10.1	-2.73337
0.089	59.33	12.68	-2.41912
0.115	57.07	14.94	-2.16282
0.144	55.21	16.8	-1.93794
0.207	51.68	20.33	-1.57504
0.281	48.88	23.13	-1.2694
0.37	46.18	25.83	-0.99425
0.477	43.73	28.28	-0.74024
0.61	41.31	30.7	-0.4943
0.779	39.14	32.87	-0.24974
1	37.03	34.98	0
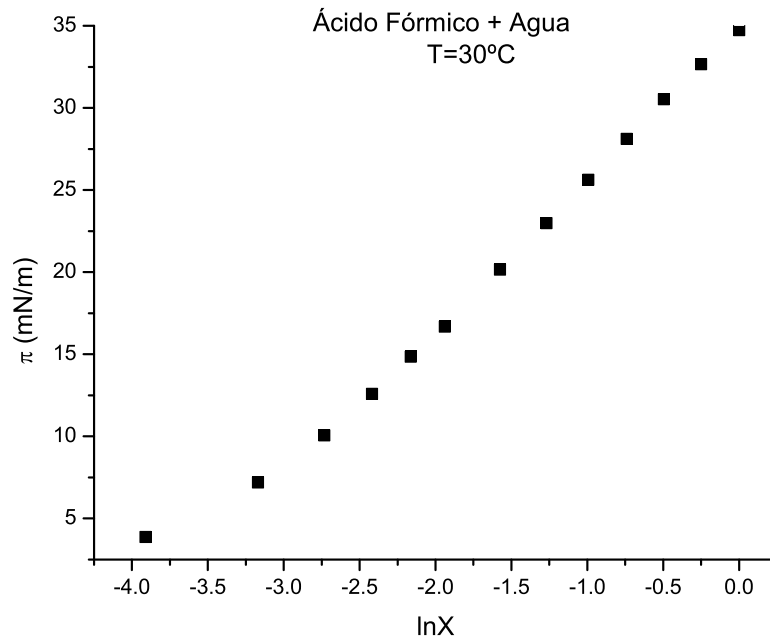
Ácido Fórmico + Agua
T=30ºC

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Ácido Fórmico + Agua
T=30ºC

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF = 0.15
R^2 = 0.99884
$\Gamma_s RT$ 11 ±0.2
β 25 ±1
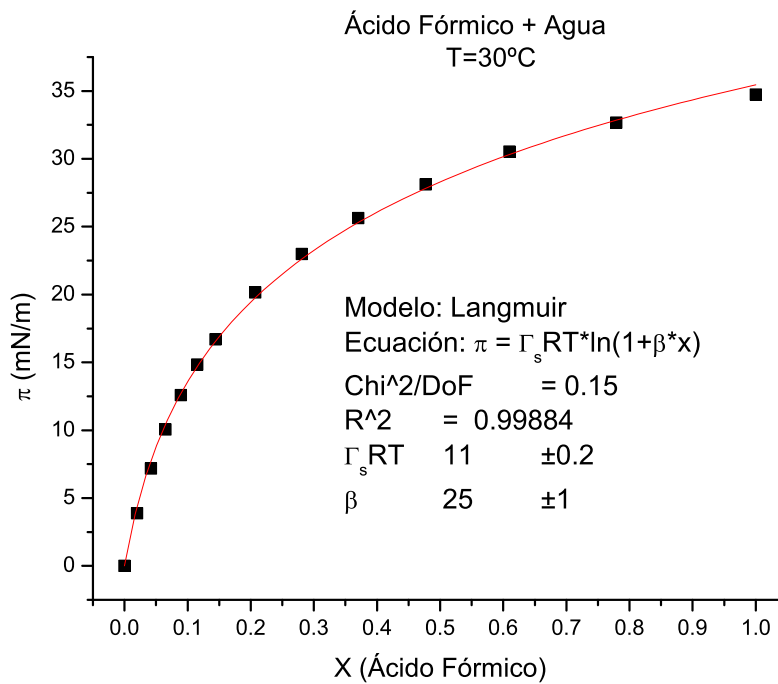
G. Vázquez, M. Sánchez-Vilas, B. Sanjurjo y J. Navaza
J. Chem. Eng. Data **1997**, 42, 957

Tabla A.30: Ácido Fórmico + Agua a 30°C [2]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	71.21	0	–
0.02	67.33	3.88	-3.91202
0.042	64.02	7.19	-3.17009
0.065	61.14	10.07	-2.73337
0.089	58.61	12.6	-2.41912
0.115	56.36	14.85	-2.16282
0.144	54.52	16.69	-1.93794
0.207	51.06	20.15	-1.57504
0.281	48.23	22.98	-1.2694
0.37	45.58	25.63	-0.99425
0.477	43.1	28.11	-0.74024
0.61	40.68	30.53	-0.4943
0.779	38.54	32.67	-0.24974
1	36.47	34.74	0

Ácido Fórmico + Agua
T=30°C

Ácido Fórmico + Agua
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT * \ln(1 + \beta * x)$

Chi^2/DoF   = 0.09
R^2   = 0.99934
$\Gamma_s RT$ 9.8   ±0.1
β 34   ±1
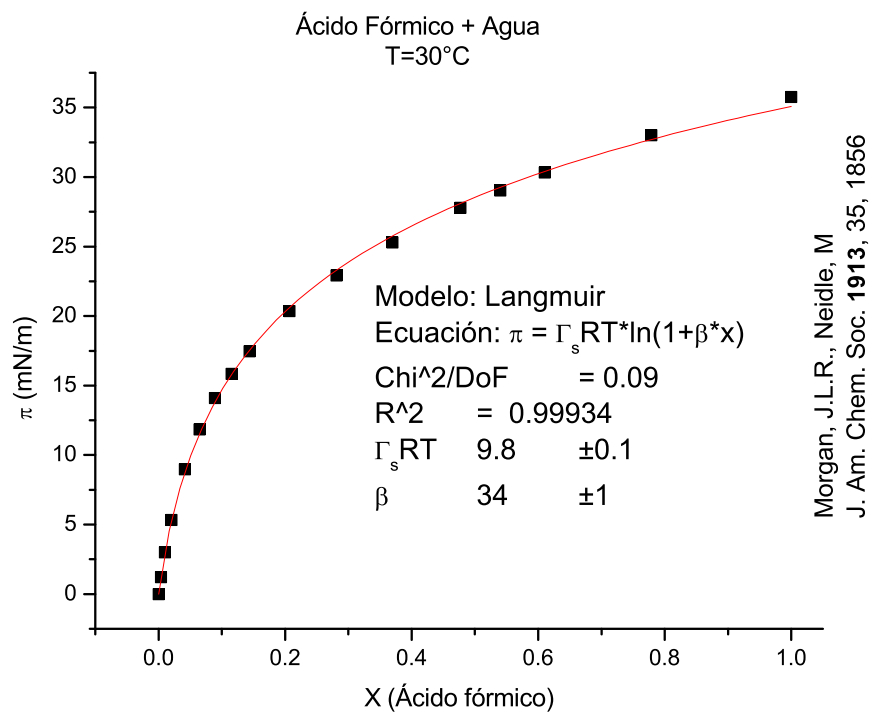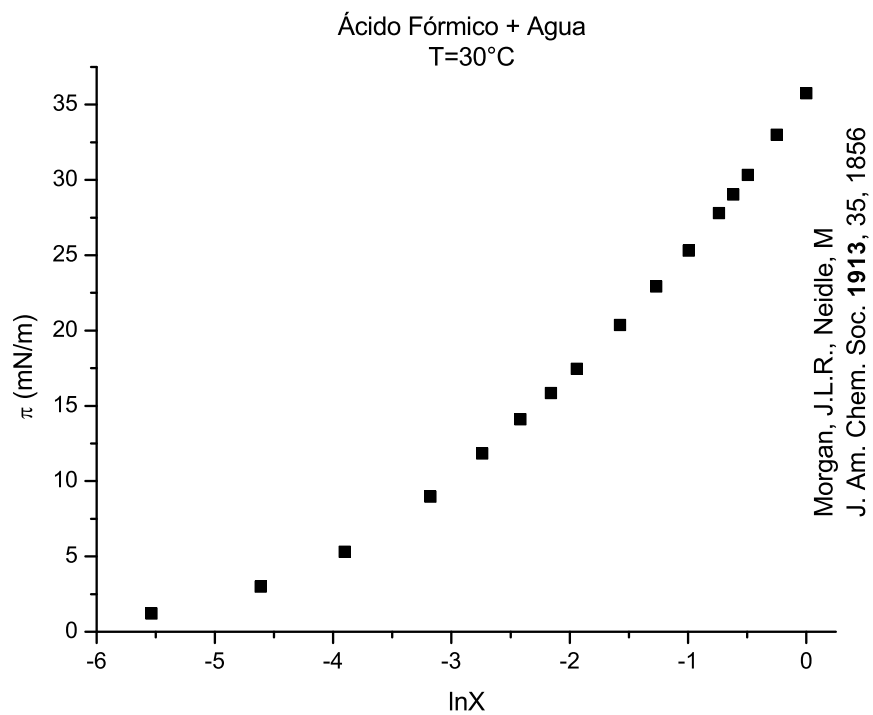
Tabla A.31: Ácido Fórmico + Agua a 30°C [25]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	71.03	0	–
0.00394	69.816	1.214	-5.53733
0.00993	68.024	3.006	-4.61181
0.02018	65.706	5.324	-3.90309
0.04167	62.061	8.969	-3.17805
0.06459	59.197	11.833	-2.73964
0.08911	56.917	14.113	-2.4179
0.11538	55.19	15.84	-2.15948
0.14362	53.575	17.455	-1.94061
0.2069	50.664	20.366	-1.57554
0.28125	48.112	22.918	-1.26851
0.36986	45.731	25.299	-0.99462
0.47727	43.24	27.79	-0.73967
0.54	41.99	29.04	-0.61619
0.61017	40.703	30.327	-0.49402
0.77885	38.026	33.004	-0.24994
1	35.281	35.749	0
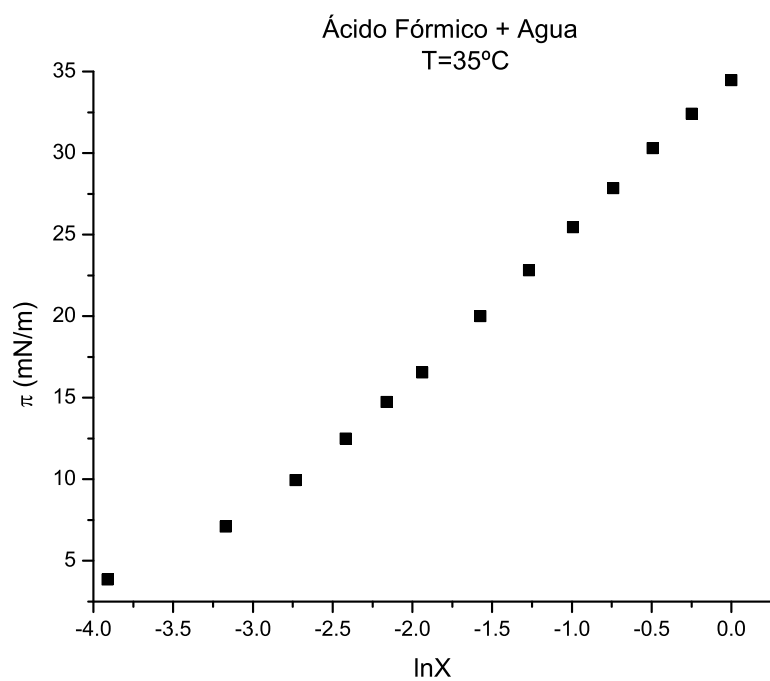
Ácido Fórmico + Agua
T=35ºC

Ácido Fórmico + Agua
T=35ºC

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT * \ln(1 + \beta * x)$

Chi^2/DoF   = 0.15
R^2   = 0.99881
$\Gamma_s RT$ 10.8   ±0.2
β 25   ±1
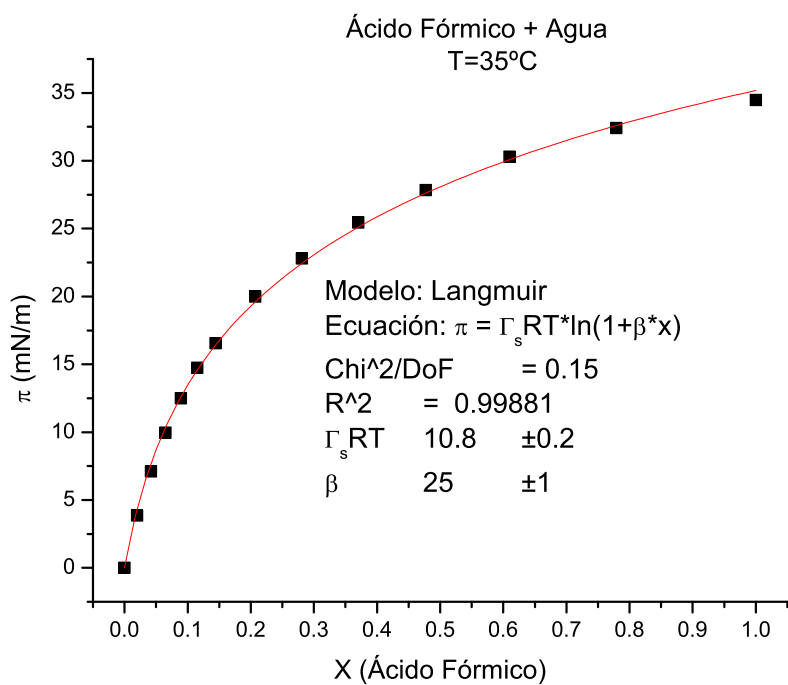
Tabla A.32: Ácido Fórmico + Agua a 35°C [2]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	70.42	0	–
0.02	66.57	3.85	-3.91202
0.042	63.31	7.11	-3.17009
0.065	60.46	9.96	-2.73337
0.089	57.92	12.5	-2.41912
0.115	55.68	14.74	-2.16282
0.144	53.86	16.56	-1.93794
0.207	50.42	20	-1.57504
0.281	47.61	22.81	-1.2694
0.37	44.97	25.45	-0.99425
0.477	42.57	27.85	-0.74024
0.61	40.12	30.3	-0.4943
0.779	38.01	32.41	-0.24974
1	35.94	34.48	0

Ácido Fórmico + Agua
T=40ºC

Ácido Fórmico + Agua
T=40ºC

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF	= 0.15	
R^2	= 0.9988	
$\Gamma_s RT$	10.7	±0.2
β	24	±1
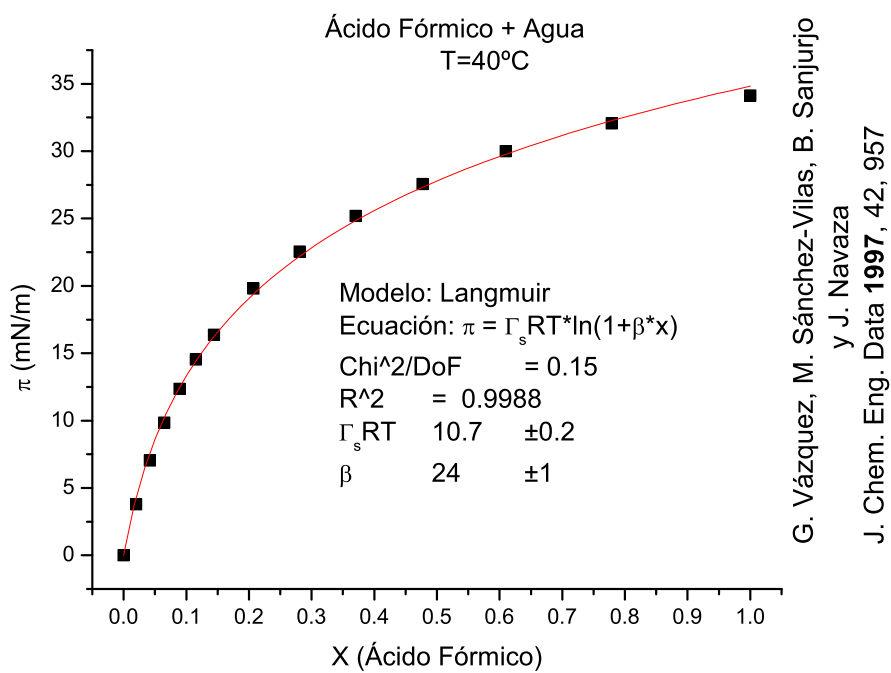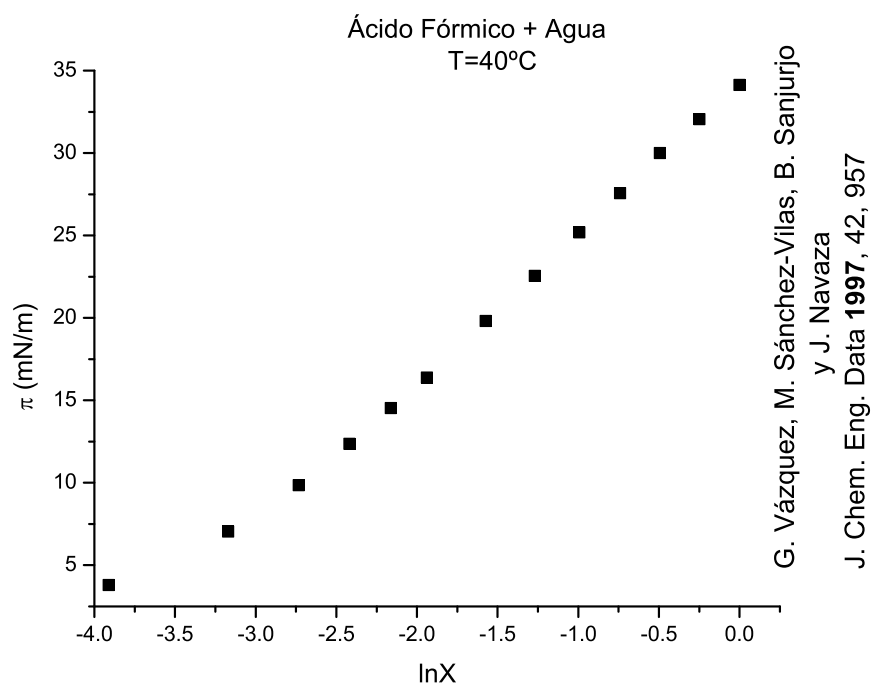
Tabla A.33: Ácido Fórmico + Agua a 40°C [2]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	69.52	0	–
0.02	65.72	3.8	-3.91202
0.042	62.48	7.04	-3.17009
0.065	59.67	9.85	-2.73337
0.089	57.16	12.36	-2.41912
0.115	54.98	14.54	-2.16282
0.144	53.14	16.38	-1.93794
0.207	49.71	19.81	-1.57504
0.281	46.96	22.56	-1.2694
0.37	44.33	25.19	-0.99425
0.477	41.96	27.56	-0.74024
0.61	39.51	30.01	-0.4943
0.779	37.46	32.06	-0.24974
1	35.39	34.13	0
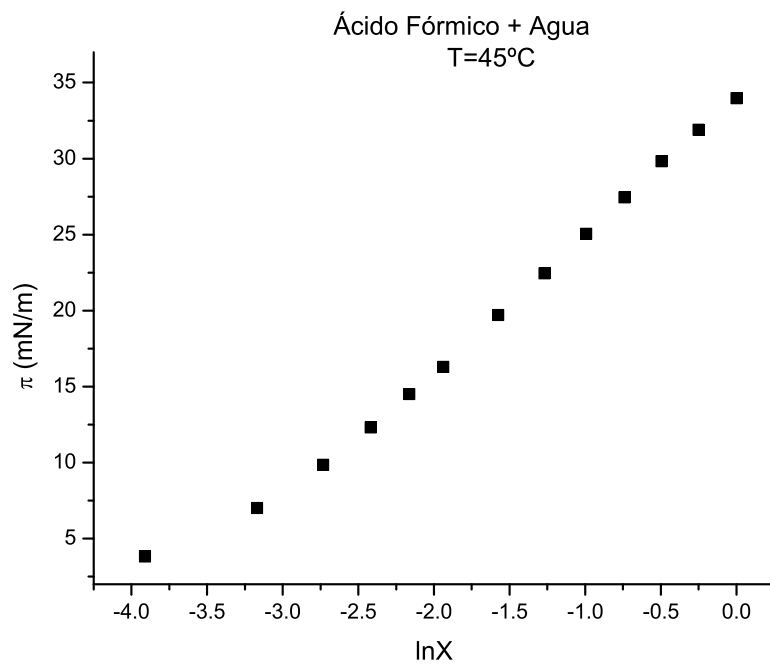
Ácido Fórmico + Agua
T=45ºC

Ácido Fórmico + Agua
T=45ºC

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.14
R^2   = 0.99886
$\Gamma_s RT$ 10.7   ±0.2
β 25   ±1
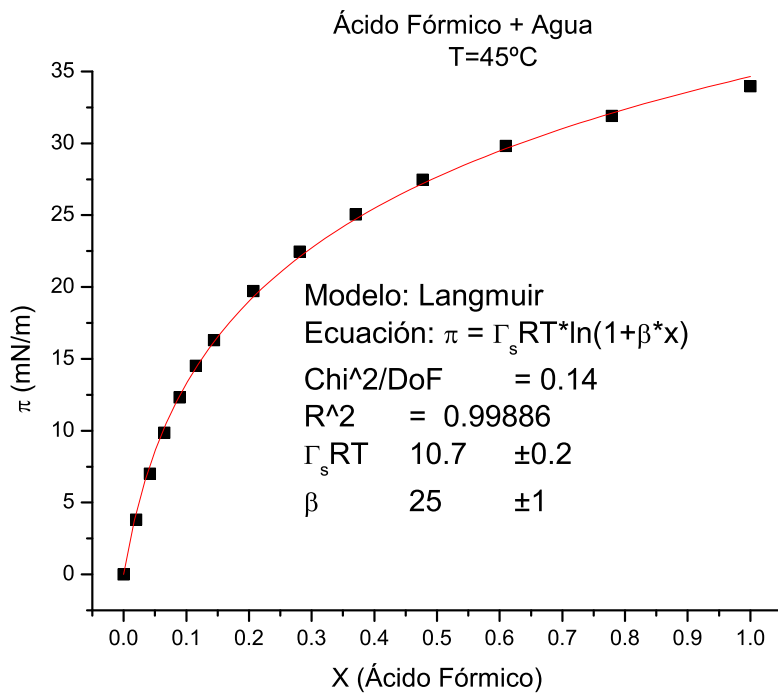
Tabla A.34: Ácido Fórmico + Agua a 45°C [2]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	68.84	0	–
0.02	65.02	3.82	-3.91202
0.042	61.82	7.02	-3.17009
0.065	58.98	9.86	-2.73337
0.089	56.52	12.32	-2.41912
0.115	54.33	14.51	-2.16282
0.144	52.53	16.31	-1.93794
0.207	49.12	19.72	-1.57504
0.281	46.38	22.46	-1.2694
0.37	43.78	25.06	-0.99425
0.477	41.38	27.46	-0.74024
0.61	39.01	29.83	-0.4943
0.779	36.93	31.91	-0.24974
1	34.87	33.97	0
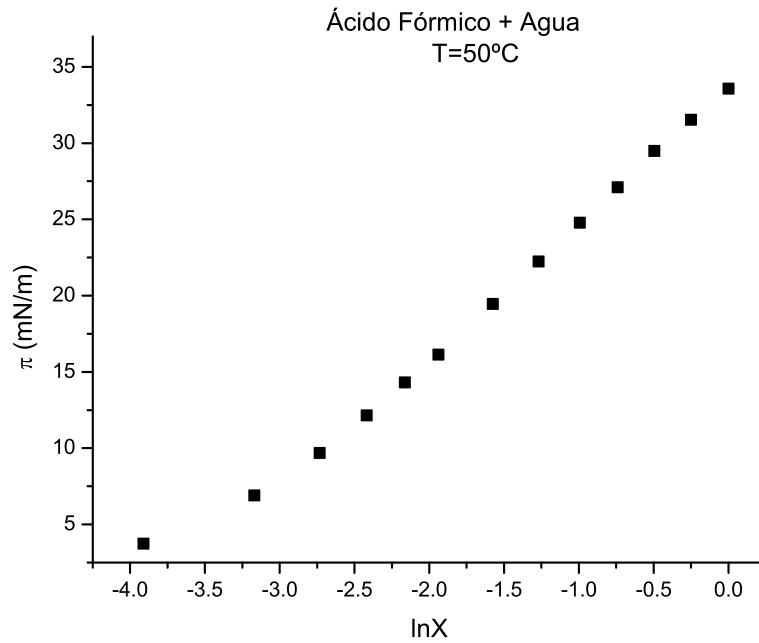
Ácido Fórmico + Agua
T=50ºC

G. Vázquez, M. Sánchez-Vilas, B. Sanjurjo
y J. Navaza
J. Chem. Eng. Data **1997**, 42, 957

Ácido Fórmico + Agua
T=50ºC

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF   = 0.15
R^2   = 0.99879
$\Gamma_s RT$ 10.6   ±0.2
β 25   ±1
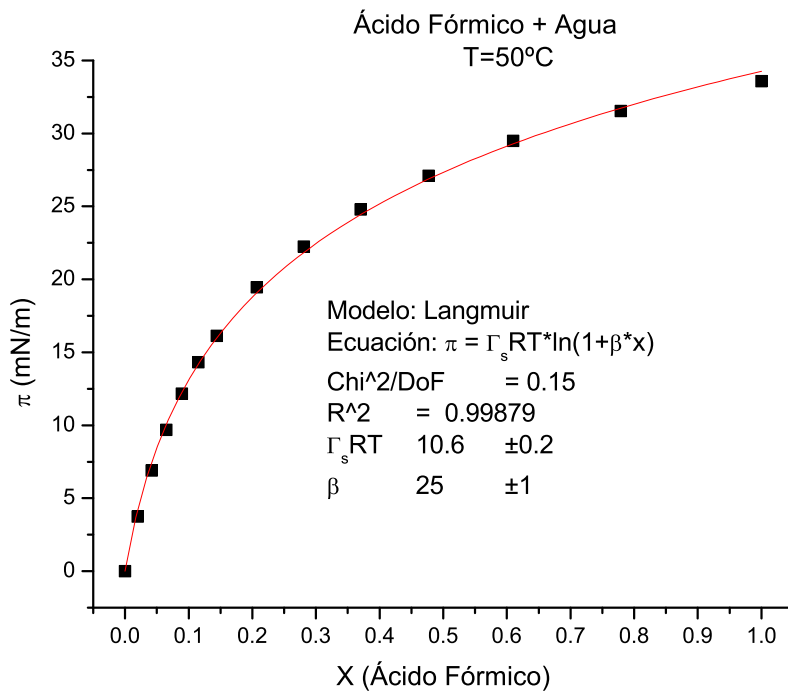
G. Vázquez, M. Sánchez-Vilas, B. Sanjurjo
y J. Navaza
J. Chem. Eng. Data **1997**, 42, 957

Tabla A.35: Ácido Fórmico + Agua a 50°C [2]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	67.92	0	–
0.02	64.18	3.74	-3.91202
0.042	61.01	6.91	-3.17009
0.065	58.23	9.69	-2.73337
0.089	55.76	12.16	-2.41912
0.115	53.6	14.32	-2.16282
0.144	51.79	16.13	-1.93794
0.207	48.46	19.46	-1.57504
0.281	45.68	22.24	-1.2694
0.37	43.13	24.79	-0.99425
0.477	40.82	27.1	-0.74024
0.61	38.42	29.5	-0.4943
0.779	36.38	31.54	-0.24974
1	34.34	33.58	0

1-Propanol + 1,4-Dioxano
T=25°C

E. Calvo,M. Pintos, A. Amigo y R. Bravo
J. Coll. Int. Science **2002**, 253, 203

1-Propanol + 1,4-Dioxano
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.003
R^2   = 0.99973
$\Gamma_s RT$ 14   ±0.5
β 0.97   ±0.05

E. Calvo,M. Pintos, A. Amigo y R. Bravo
J. Coll. Int. Science **2002**, 253, 203
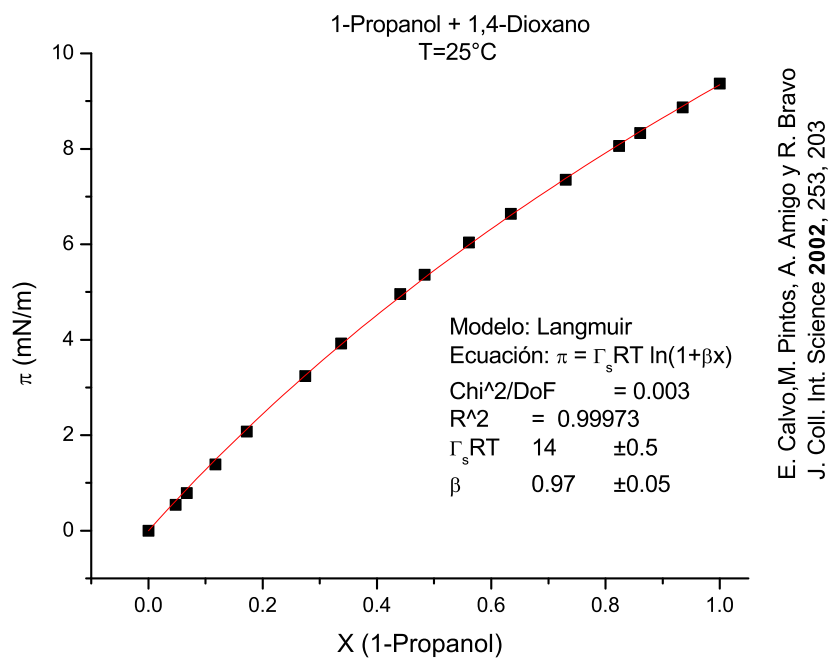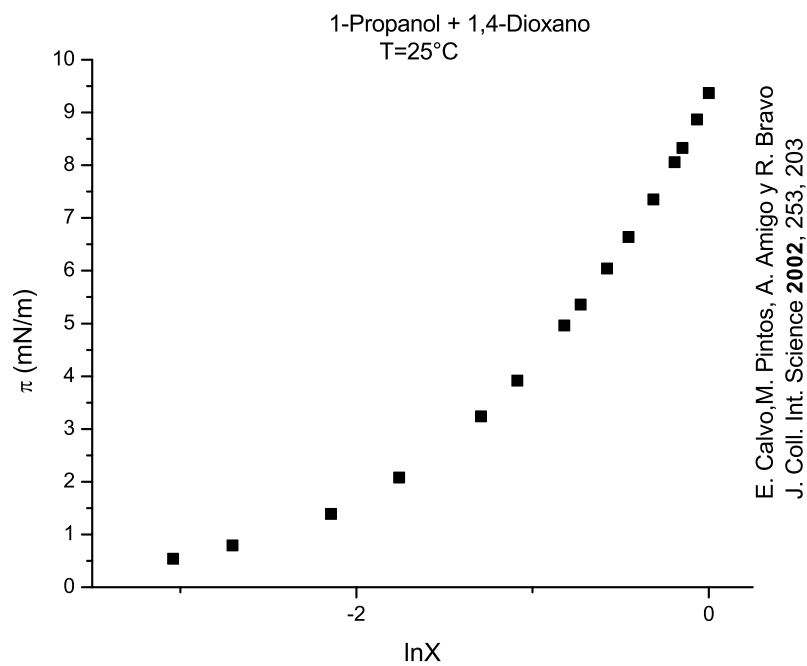
Tabla A.36: 1-Propanol + 1,4-Dioxano a 25°C [5]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	32.75	0	–
0.0478	32.21	0.54	-3.04073
0.067	31.96	0.79	-2.70306
0.1172	31.36	1.39	-2.14387
0.1724	30.67	2.08	-1.75794
0.2745	29.51	3.24	-1.2928
0.3372	28.83	3.92	-1.08708
0.4406	27.79	4.96	-0.81962
0.4835	27.39	5.36	-0.7267
0.561	26.71	6.04	-0.57803
0.6344	26.11	6.64	-0.45508
0.7303	25.4	7.35	-0.3143
0.8237	24.69	8.06	-0.19395
0.8608	24.42	8.33	-0.14989
0.935	23.88	8.87	-0.06721
1	23.38	9.37	0

1-Hexanol + Dioxano
T=25°C

E. Calvo, A. Penas, M. Pintos, R. Bravo y A. Amigo
J. Chem. Eng. Data **2001**, 46, 692

1-Heptanol + Dioxano
T=25°C

E. Calvo, A. Penas, M. Pintos, R. Bravo y A. Amigo
J. Chem. Eng. Data **2001**, 46, 692
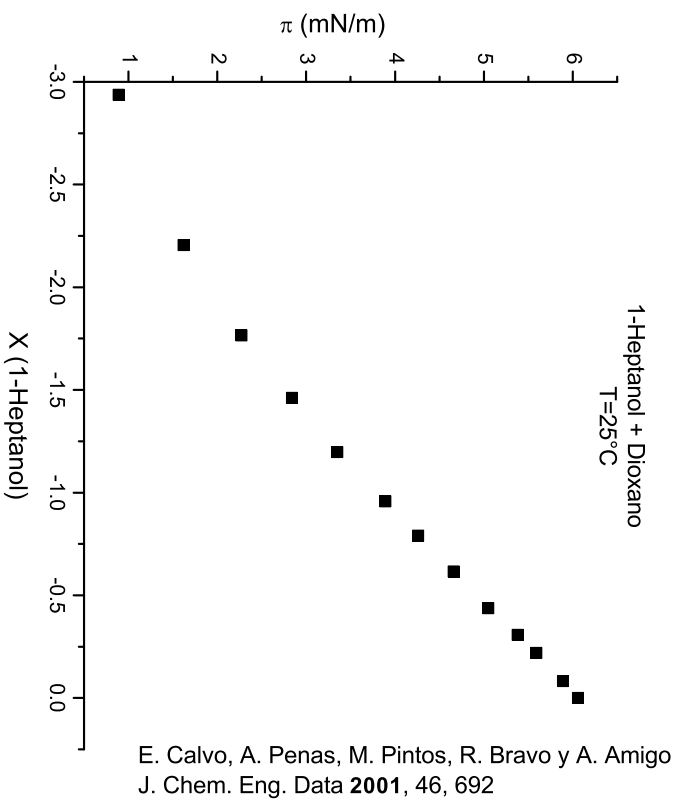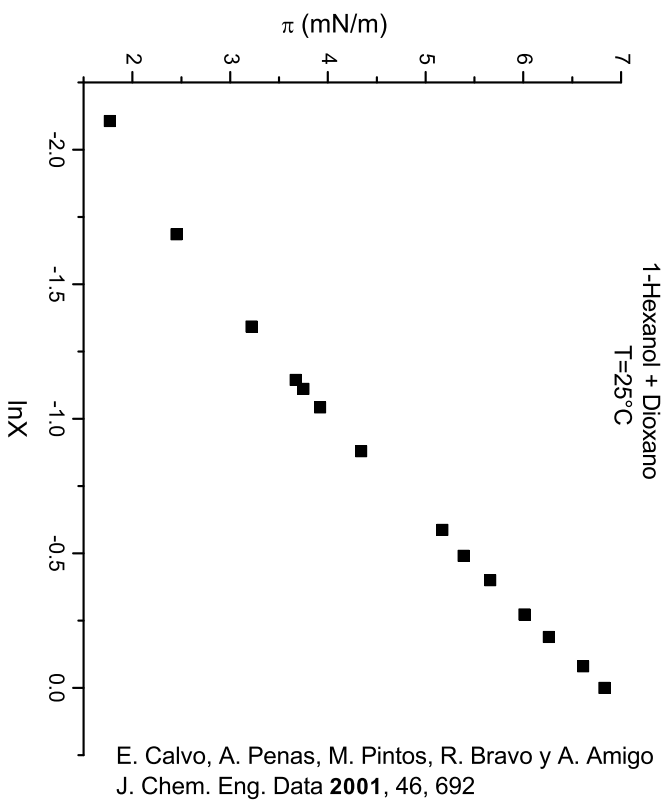
Tabla A.37: 1-Hexanol + Dioxano a 25°C [4]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
1	25.67	6.83	0
0.9233	25.89	6.61	-0.0798
0.8275	26.24	6.26	-0.18935
0.761	26.49	6.01	-0.27312
0.6701	26.84	5.66	-0.40033
0.6121	27.11	5.39	-0.49086
0.5558	27.33	5.17	-0.58735
0.4149	28.16	4.34	-0.87972
0.3527	28.58	3.92	-1.04214
0.3293	28.75	3.75	-1.11079
0.3184	28.83	3.67	-1.14445
0.261	29.28	3.22	-1.34323
0.1853	30.05	2.45	-1.68578
0.1217	30.73	1.77	-2.1062
0	32.5	0	–

Modelo: Langmuir

Ecuación: $\pi = \Gamma_s RT * \ln(1 + \beta * x)$

Chi^2/DoF		= 0.002
R^2	= 0.99956	
$\Gamma_s RT$	2.96	±0.05
β	6.9	±0.2
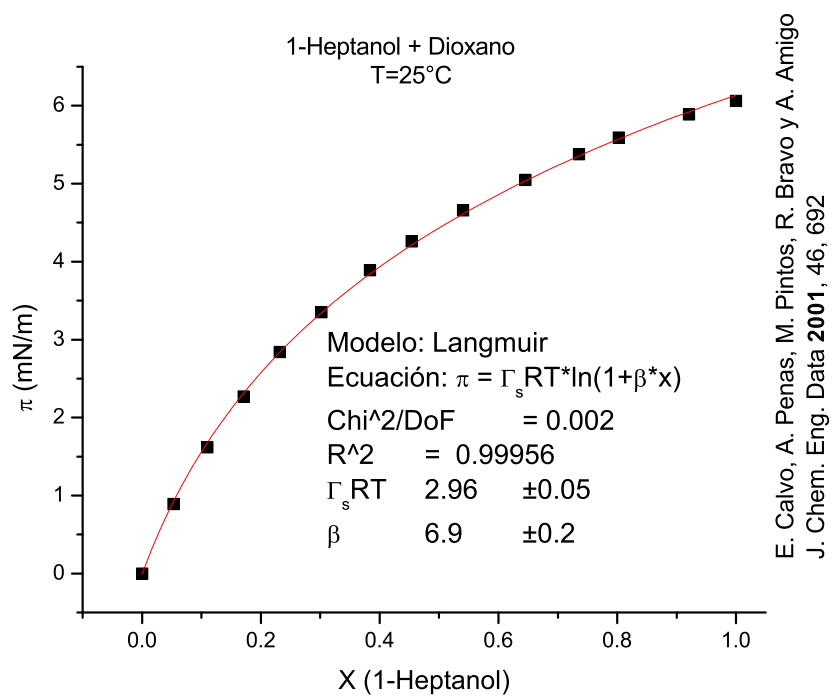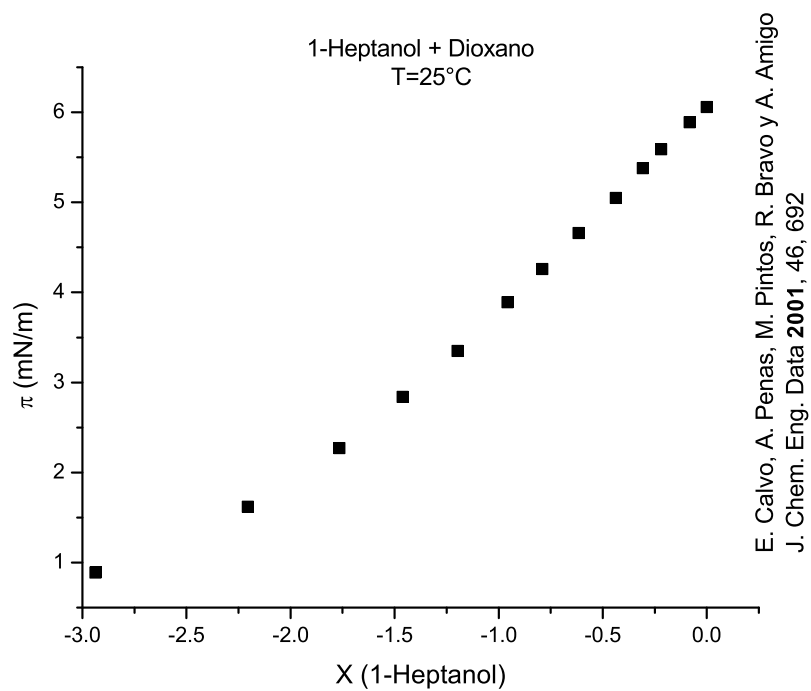
Tabla A.38: 1-Heptanol + Dioxano a 25°C [4]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
1	26.44	6.06	0
0.9209	26.61	5.89	-0.0824
0.8028	26.91	5.59	-0.21965
0.7357	27.12	5.38	-0.30693
0.6454	27.45	5.05	-0.43788
0.5404	27.84	4.66	-0.61545
0.4539	28.24	4.26	-0.78988
0.384	28.61	3.89	-0.95711
0.302	29.15	3.35	-1.19733
0.2319	29.66	2.84	-1.46145
0.1711	30.23	2.27	-1.76551
0.1102	30.88	1.62	-2.20546
0.053	31.61	0.89	-2.93746
0	32.5	0	–
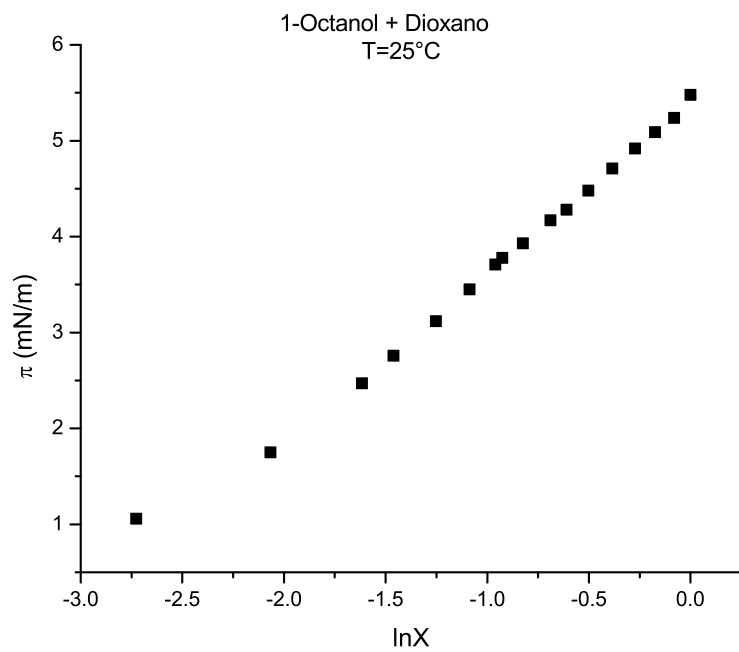
1-Octanol + Dioxano
T=25°C

1-Octanol + Dioxano
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1 + \beta \cdot x)$

Chi^2/DoF   = 0.004
R^2   = 0.99814
$\Gamma_s RT$ 2.3   ±0.1
β 10.2   ±0.6
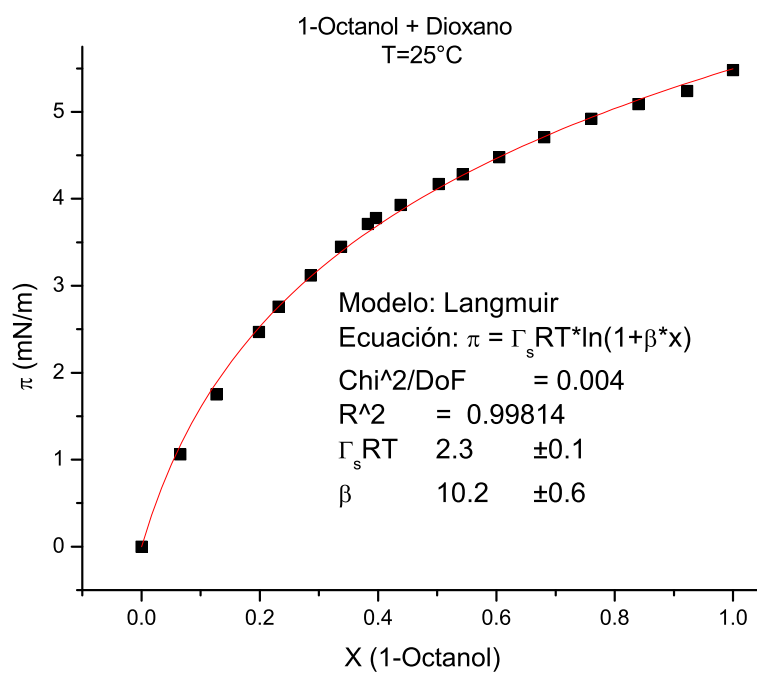
Tabla A.39: 1-Octanol + Dioxano a 25°C [4]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
1	27.02	5.48	0
0.9226	27.26	5.24	-0.08056
0.8399	27.41	5.09	-0.17447
0.7604	27.58	4.92	-0.27391
0.6807	27.79	4.71	-0.38463
0.6048	28.02	4.48	-0.50286
0.5433	28.22	4.28	-0.61009
0.5022	28.33	4.17	-0.68876
0.4381	28.57	3.93	-0.82531
0.3963	28.72	3.78	-0.92558
0.3826	28.79	3.71	-0.96077
0.3371	29.05	3.45	-1.08738
0.2859	29.38	3.12	-1.25211
0.232	29.74	2.76	-1.46102
0.1985	30.03	2.47	-1.61697
0.1266	30.75	1.75	-2.06672
0.0654	31.44	1.06	-2.72723
0	32.5	0	–
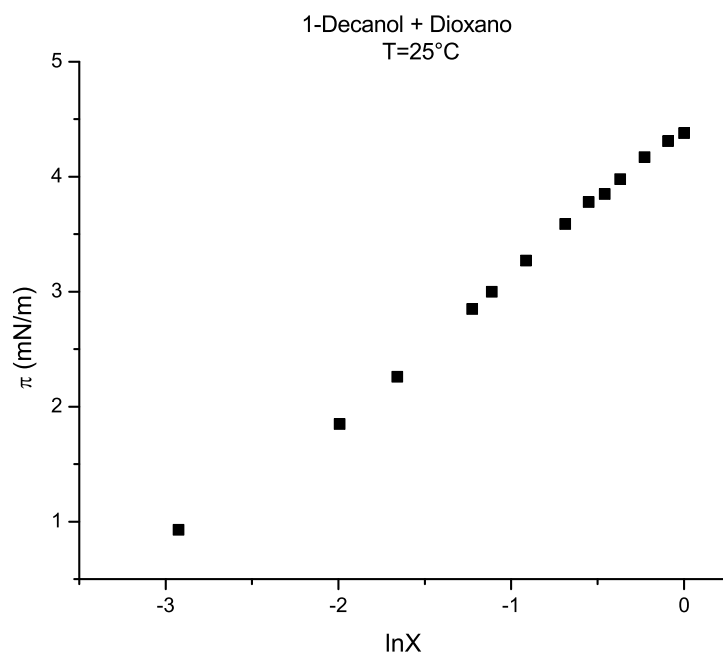
1-Decanol + Dioxano
T=25°C

E. Calvo, A. Penas, M. Pintos, R. Bravo y A. Amigo
J. Chem. Eng. Data **2001**, 46, 692

1-Decanol + Dioxano
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT^* \ln(1+\beta^* x)$

Chi^2/DoF   = 0.004
R^2   = 0.99805
$\Gamma_s RT$ 1.52   ±0.04
β 18   ±1
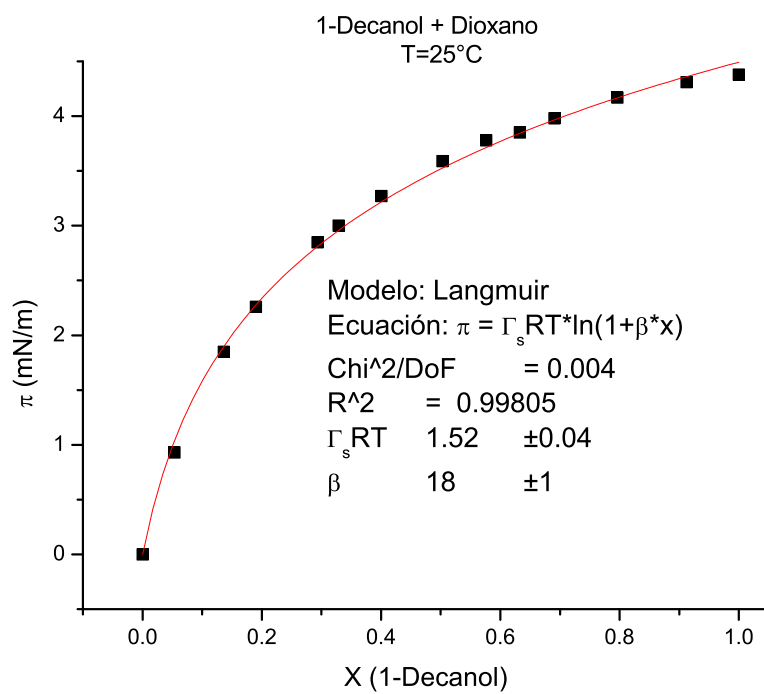
E. Calvo, A. Penas, M. Pintos, R. Bravo y A. Amigo
J. Chem. Eng. Data **2001**, 46, 692

Tabla A.40: 1-Decanol + Dioxano a 25°C [4]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
1	28.12	4.38	0
0.9125	28.19	4.31	-0.09157
0.7963	28.33	4.17	-0.22778
0.691	28.52	3.98	-0.36962
0.6326	28.65	3.85	-0.45792
0.5762	28.72	3.78	-0.5513
0.5031	28.91	3.59	-0.68697
0.4004	29.23	3.27	-0.91529
0.3287	29.5	3	-1.11261
0.2934	29.65	2.85	-1.22622
0.1902	30.24	2.26	-1.65968
0.1363	30.65	1.85	-1.9929
0.0536	31.57	0.93	-2.92621
0	32.5	0	–

Pentano + Diclorometano
T=25°C

Postigo, M.A., Zurita, J.L., De Soria, M.L.G., Katz, M.
Can. J. Chem. **1986** 64, 1966

Pentano + Diclorometano
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT * \ln(1 + \beta * x)$

Chi^2/DoF = 0.07
R^2 = 0.99565
$\Gamma_s RT$ 13.1 ±1.7
β 1.4 ±0.3

Postigo, M.A., Zurita, J.L., De Soria, M.L.G., Katz, M.
Can. J. Chem. **1986** 64, 1966
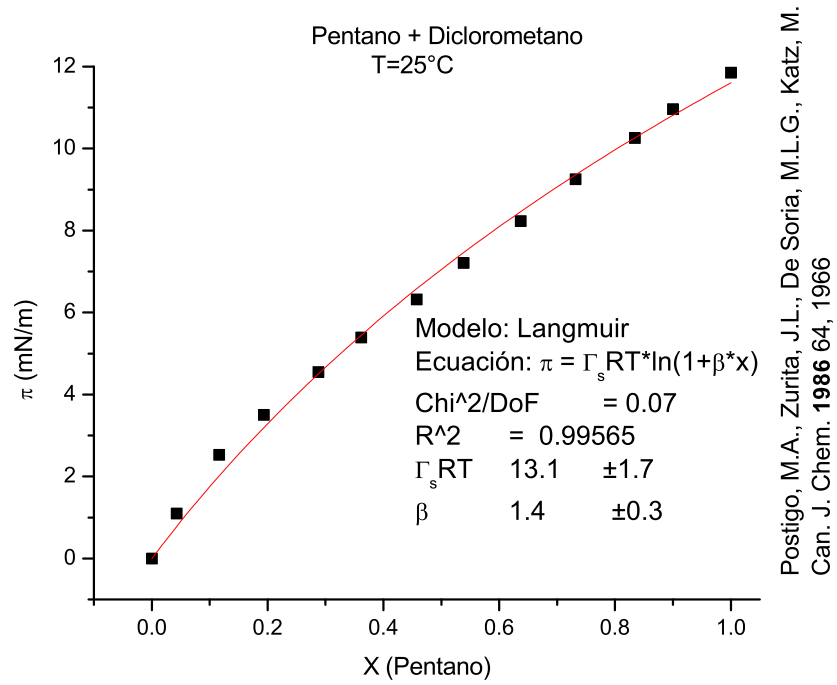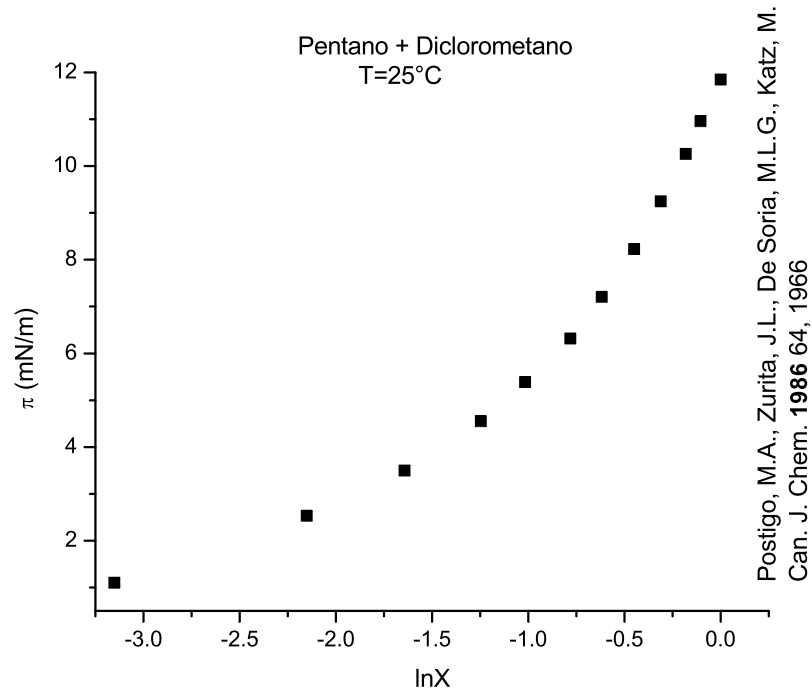
Tabla A.41: Pentano + Diclorometano a 25°C [35]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	27.36	0	–
0.0428	26.26	1.1	-3.15122
0.1162	24.83	2.53	-2.15244
0.1934	23.86	3.5	-1.64299
0.2875	22.81	4.55	-1.24653
0.3615	21.97	5.39	-1.01749
0.4573	21.04	6.32	-0.78242
0.5387	20.15	7.21	-0.6186
0.6371	19.13	8.23	-0.45083
0.7321	18.11	9.25	-0.31184
0.8345	17.1	10.26	-0.18092
0.8999	16.4	10.96	-0.10547
1	15.51	11.85	0

Benceno+Nitrobenceno
T=20°C

Benceno+Nitrobenceno
T=20°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF	= 0.01	
R^2	= 0.99953	
Γ_sRT	16.0	±0.7
β	1.5	±0.1

S. K. Suri y V. Ramakrishna
J. of Physical Chem. **1968**, 72, 3073
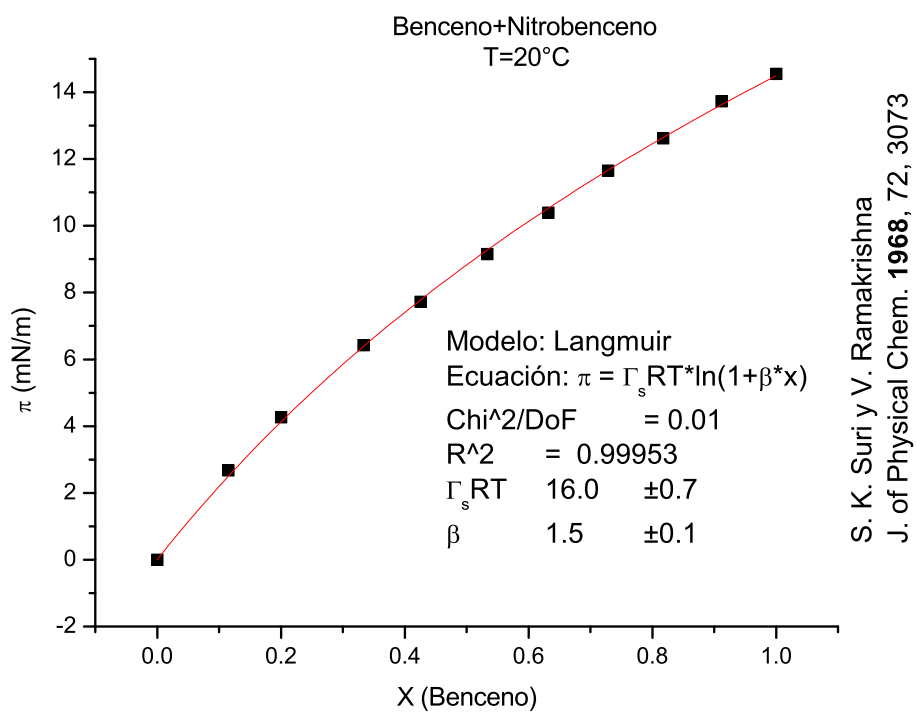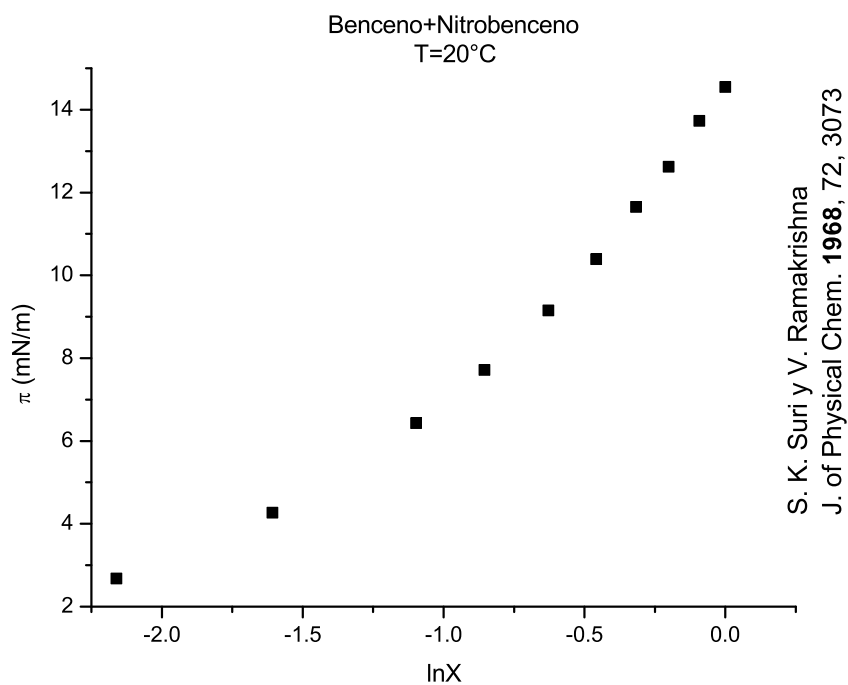
Tabla A.42: Benceno + Nitrobenceno a T=20°C [43]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	43.4	0	–
0.1152	40.72	2.68	-2.16109
0.2003	39.13	4.27	-1.60794
0.3335	36.97	6.43	-1.09811
0.4254	35.68	7.72	-0.85473
0.5333	34.25	9.15	-0.62867
0.632	33.01	10.39	-0.45887
0.7285	31.75	11.65	-0.31677
0.8177	30.78	12.62	-0.20126
0.9117	29.67	13.73	-0.09244
1	28.85	14.55	0

Benceno+Nitrobenceno
T=30°C

S. K. Suri y V. Ramakrishna
J. of Physical Chem. **1968**, 72, 3073

Benceno+Nitrobenceno
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.04
R^2   = 0.99821
$\Gamma_s RT$ 13   ±1
β 2.1   ±0.2

S. K. Suri y V. Ramakrishna
J. of Physical Chem. **1968**, 72, 3073
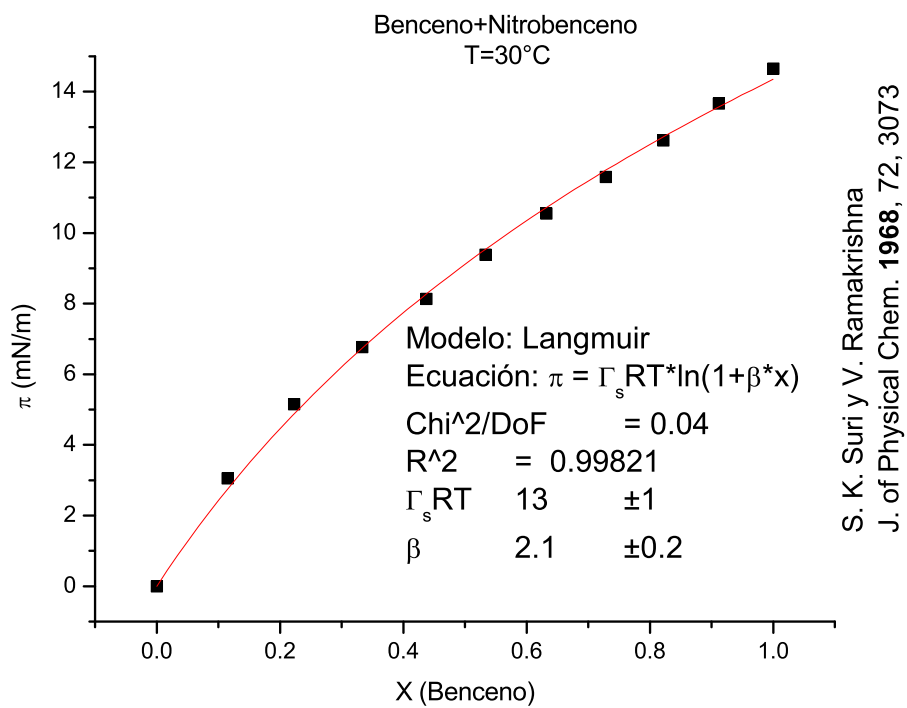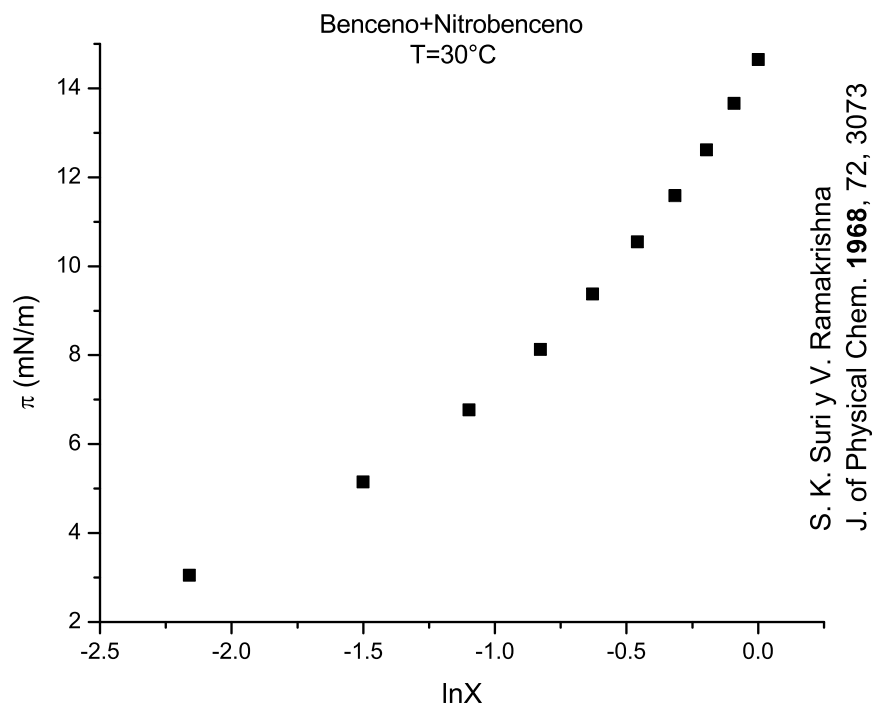
Tabla A.43: Benceno + Nitrobenceno a T=30°C [43]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	42.2	0	–
0.1152	39.15	3.05	-2.16109
0.2228	37.05	5.15	-1.50148
0.3335	35.43	6.77	-1.09811
0.4374	34.07	8.13	-0.82691
0.5333	32.82	9.38	-0.62867
0.632	31.65	10.55	-0.45887
0.7285	30.61	11.59	-0.31677
0.8217	29.58	12.62	-0.19638
0.9118	28.54	13.66	-0.09233
1	27.55	14.65	0

Ciclohexano+Nitrobenceno
T=20°C

Ciclohexano+Nitrobenceno
T=20°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ast \ln(1+\beta \ast x)$

Chi^2/DoF = 0.20
R^2 = 0.99629
$\Gamma_s RT$ 10   ±1
β 5   ±1

S. K. Suri y V. Ramakrishna
J. of Physical Chem. 1968, 72, 3073
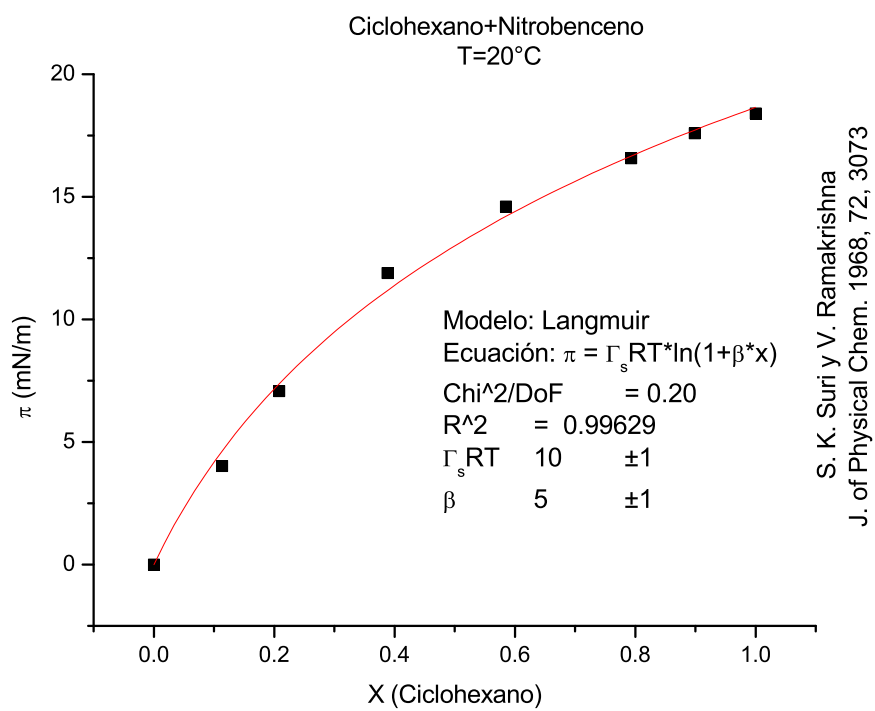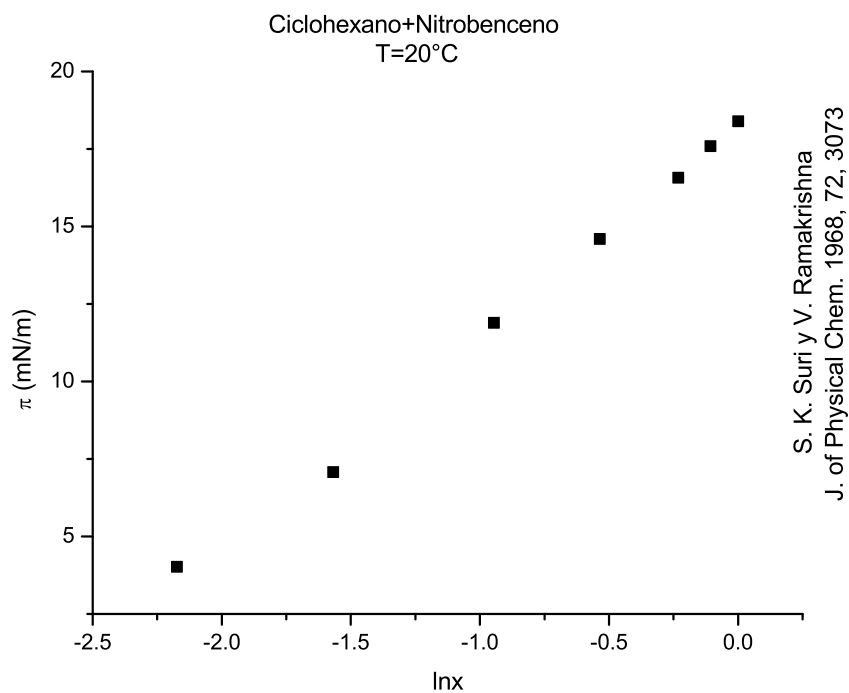
Tabla A.44: Ciclohexano + Nitrobenceno a 20°C [43]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	43.4	0	–
0.1137	39.38	4.02	-2.17419
0.2084	36.32	7.08	-1.5683
0.3884	31.51	11.89	-0.94572
0.5854	28.8	14.6	-0.53546
0.7932	26.83	16.57	-0.23168
0.8988	25.81	17.59	-0.10669
1	25	18.4	0

Tetraclorometano+Nitrobenceno
T=44°C

Soucek, B.
Coll.Czech.Chem.Commun. **1938**, 10, 459

Tetraclorometano+Nitrobenceno
T=44°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.09
R^2   = 0.99633
$\Gamma_s RT$ 12   ±1
β 2.9   ±0.3

Soucek, B.
Coll.Czech.Chem.Commun. **1938**, 10, 459
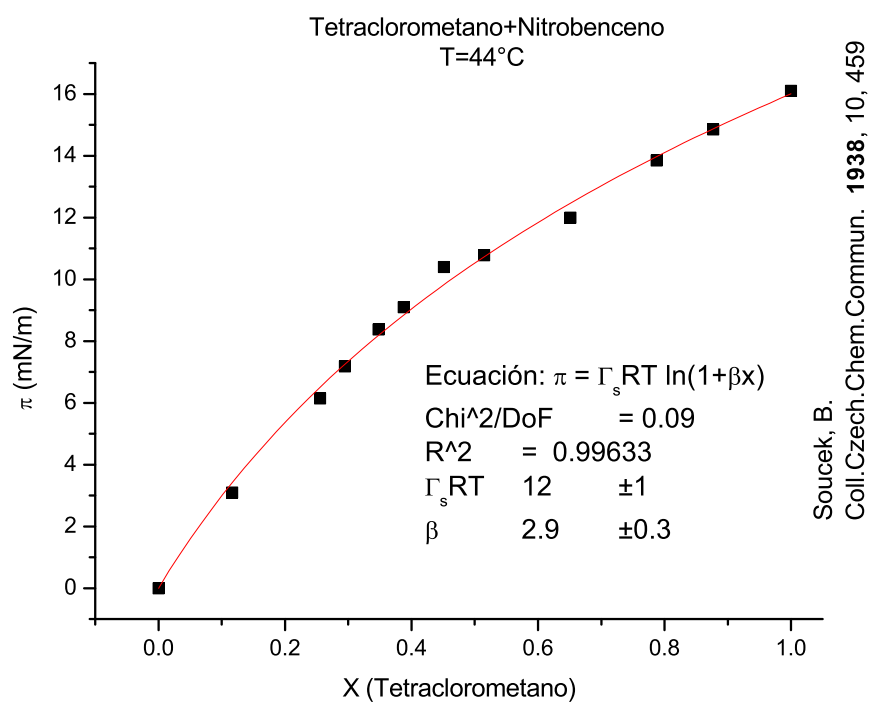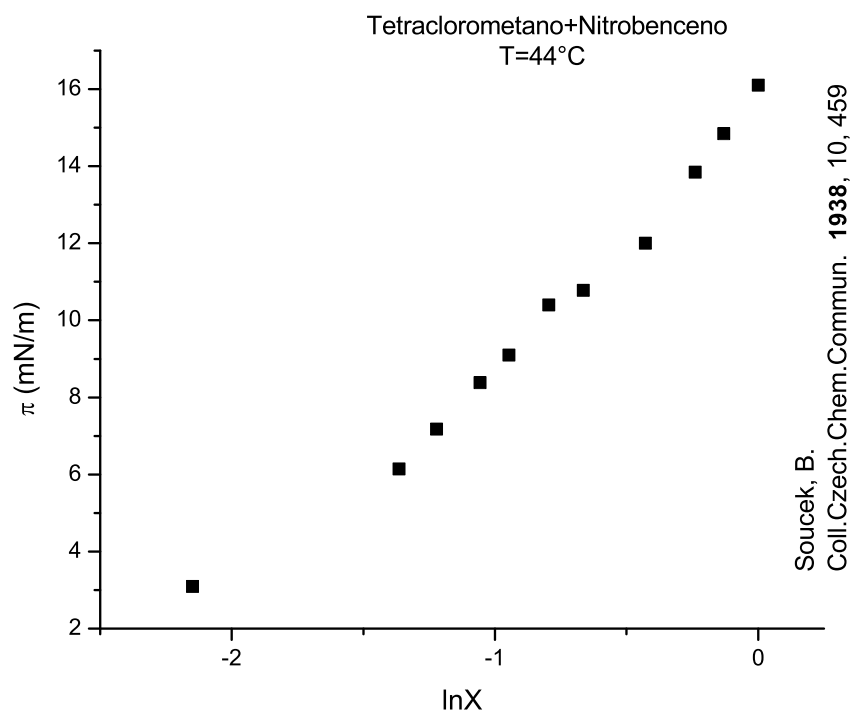
Tabla A.45: Tetraclorometano+Nitrobenceno a 44°C [40]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
1	24.8	16.1	0
0.87691	26.05	14.85	-0.13135
0.78752	27.05	13.85	-0.23886
0.65106	28.9	12	-0.42915
0.5148	30.12	10.78	-0.66398
0.4513	30.5	10.4	-0.79563
0.38791	31.8	9.1	-0.94697
0.34766	32.52	8.38	-1.05654
0.29471	33.72	7.18	-1.22175
0.25541	34.76	6.14	-1.36487
0.11655	37.81	3.09	-2.14945
0	40.9	0	–

1,4-Dioxano + Nitrometano
T=20°C

Suri, S.K., Ramakrishna, V.
Indian J. Chem. **1969**, 7, 243

1,4-Dioxano + Nitrometano
T=20°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF	= 0.001	
R^2	= 0.99906	
$\Gamma_s RT$	2.3	±0.1
β	3.5	±0.2

Suri, S.K., Ramakrishna, V.
Indian J. Chem. **1969**, 7, 243
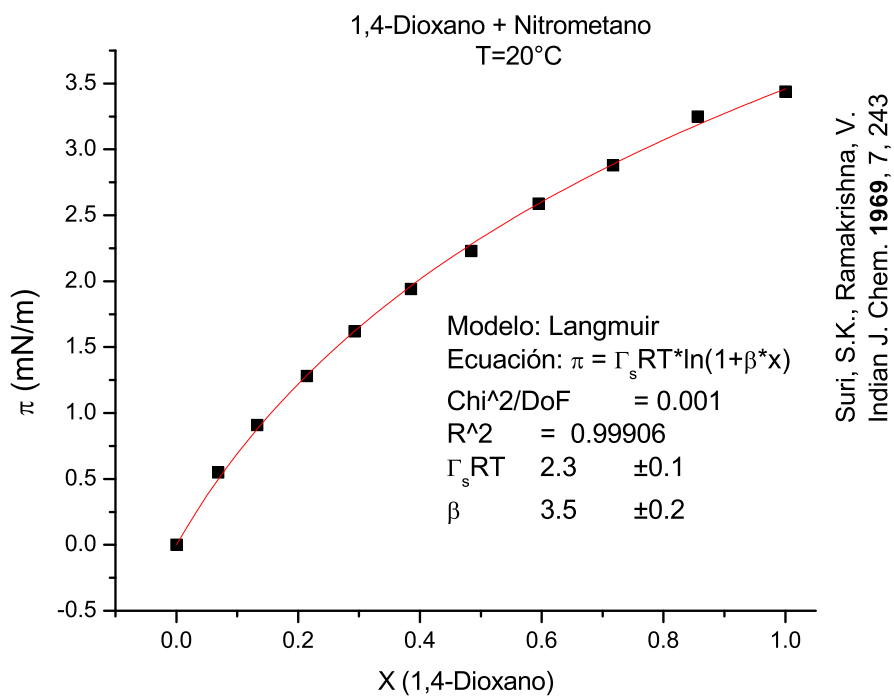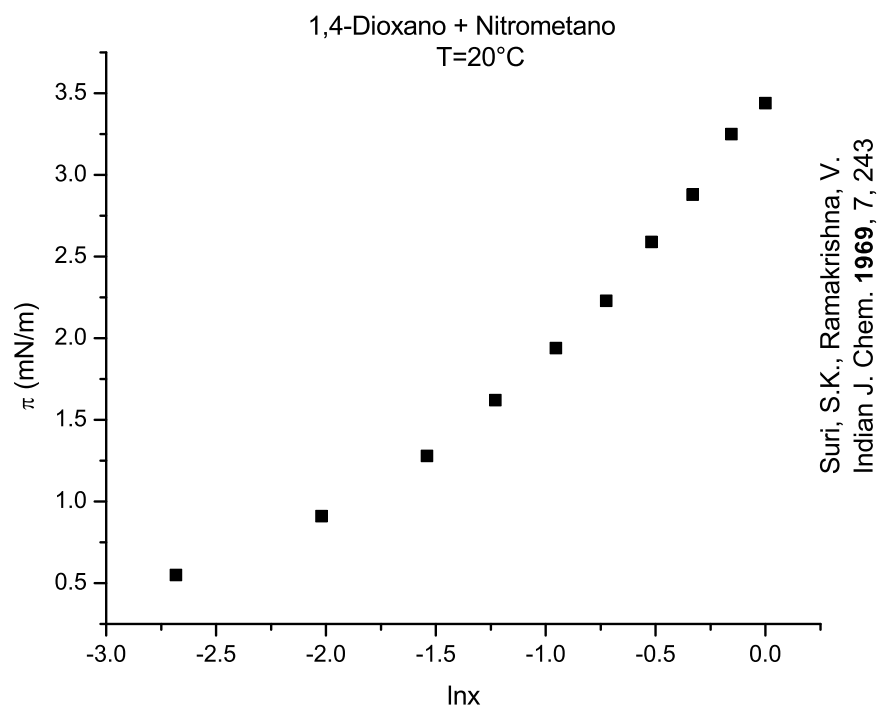
Tabla A.46: 1,4-Dioxano + Nitrometano a 20°C [44]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	37.19	0	–
0.0684	36.64	0.55	-2.68238
0.1327	36.28	0.91	-2.01966
0.2144	35.91	1.28	-1.53991
0.2924	35.57	1.62	-1.22963
0.3852	35.25	1.94	-0.95399
0.4842	34.96	2.23	-0.72526
0.5952	34.6	2.59	-0.51886
0.7171	34.31	2.88	-0.33254
0.856	33.94	3.25	-0.15548
1	33.75	3.44	0

Tolueno + Nitroetano
T=30°C

Tolueno + Nitroetano
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.01
R^2   = 0.99538
$\Gamma_s RT$ 6   ±1
β 0.9   ±0.3
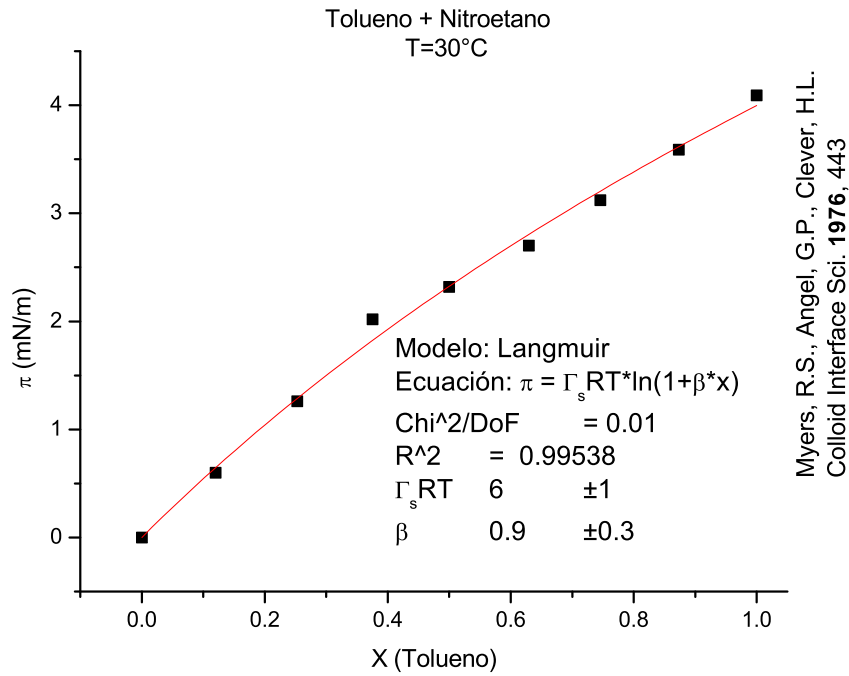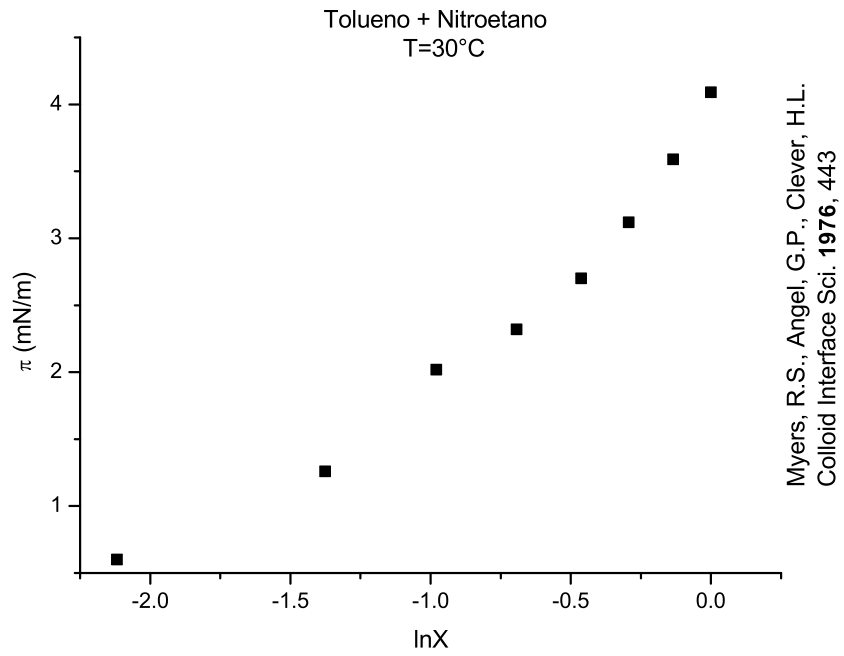
Tabla A.47: Tolueno + Nitroetano a 30°C [27]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
1	27.41	4.09	0
0.8731	27.91	3.59	-0.13571
0.7459	28.38	3.12	-0.29316
0.6294	28.8	2.7	-0.46299
0.4996	29.18	2.32	-0.69395
0.3752	29.48	2.02	-0.9803
0.2526	30.24	1.26	-1.37595
0.1202	30.9	0.6	-2.1186
0	31.5	0	–

Benceno + Nitroetano
T=30°C

Benceno + Nitroetano
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF = 0.03
R^2 = 0.98599
$\Gamma_s RT$ 2.8 ±0.5
β 3 ±1
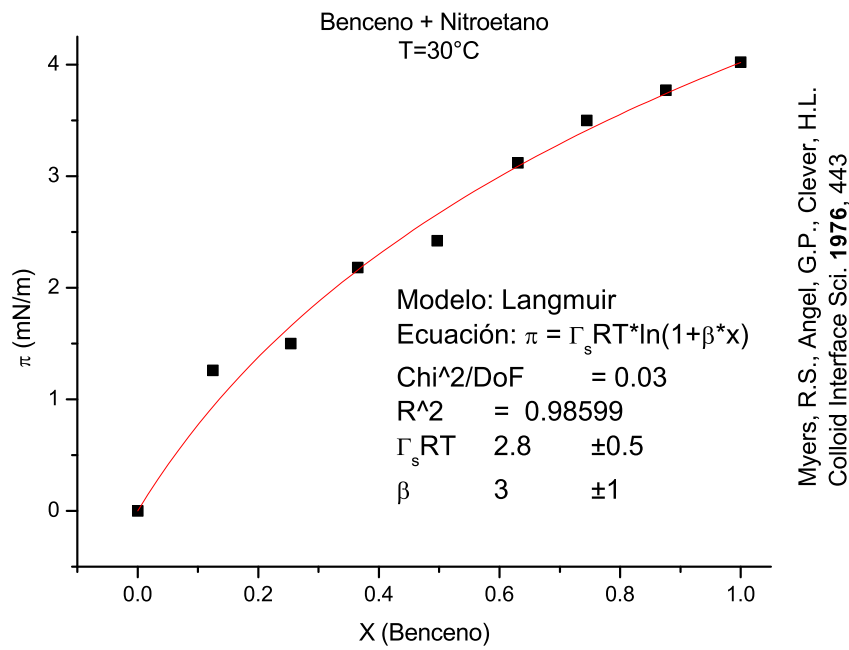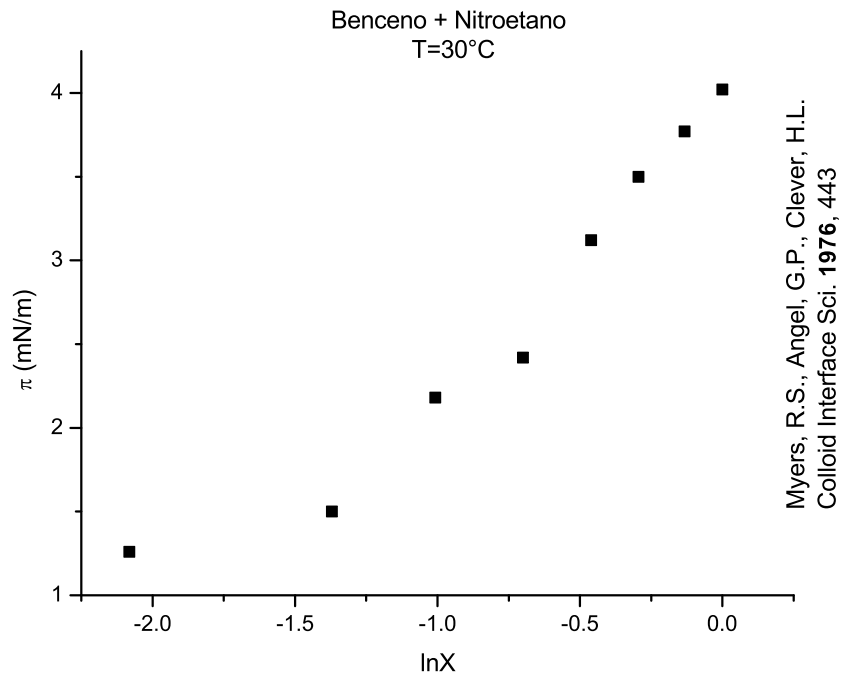
Tabla A.48: Benceno + Nitroetano a 30°C [27]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
1	27.48	4.02	0
0.8757	27.73	3.77	-0.13273
0.7445	28	3.5	-0.29504
0.6307	28.38	3.12	-0.46092
0.4966	29.08	2.42	-0.69997
0.3648	29.32	2.18	-1.00841
0.2539	30	1.5	-1.37081
0.1247	30.24	1.26	-2.08184
0	31.5	0	–

Tetraclorometano+Acetonitrilo
T=25°C

Tetraclorometano+Acetonitrilo
T=25°C

Modelo: Langmuir

Ecuación: $\pi = \Gamma_s RT \cdot \ln(1 + \beta \cdot x)$

Chi^2/DoF   = 0.0007
R^2   = 0.99893
$\Gamma_s RT$ 0.81   ±0.02
β 18   ±1
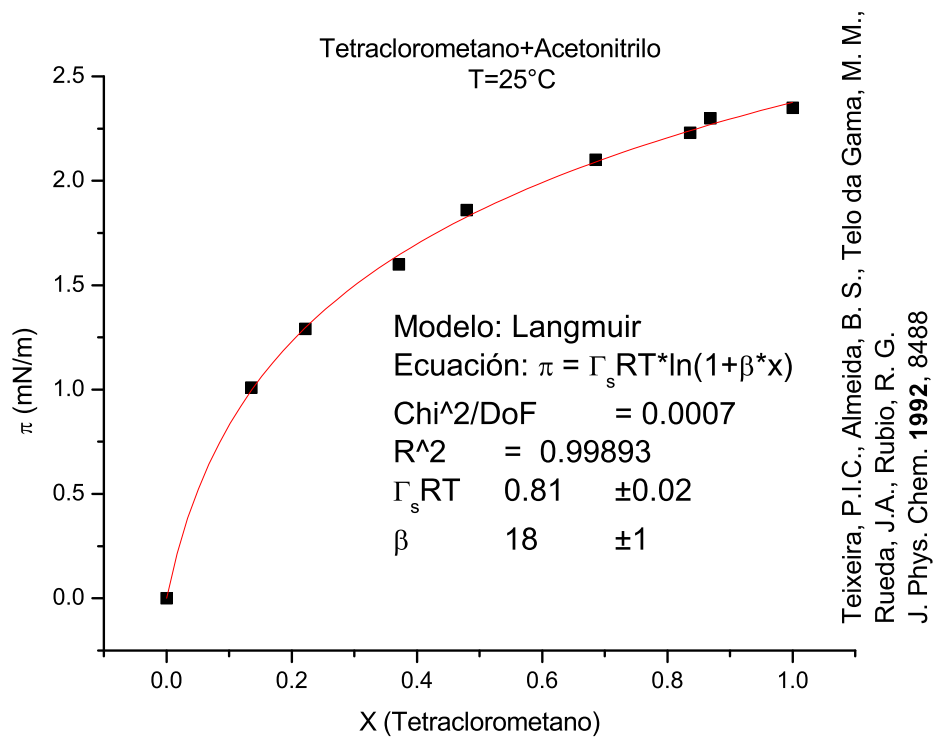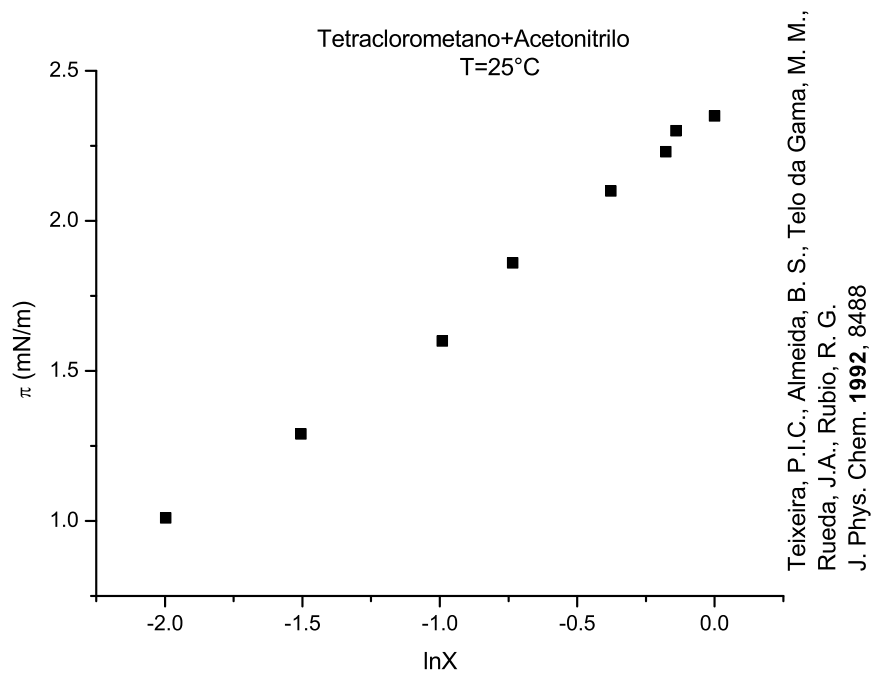
Tabla A.49: Tetraclorometano + Acetonitrilo a 25°C [46]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
1	26.31	2.35	0
0.8686	26.36	2.3	-0.14087
0.8366	26.43	2.23	-0.17841
0.6852	26.56	2.1	-0.37804
0.4796	26.8	1.86	-0.7348
0.371	27.06	1.6	-0.99155
0.2219	27.37	1.29	-1.50553
0.1357	27.65	1.01	-1.99731
0	28.66	0	–

Etilenglicol+Ciclohexanol
T=25°C

Etilenglicol+Ciclohexanol
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT * \ln(1 + \beta * x)$

Chi^2/DoF   = 0.03
R^2   = 0.9984
$\Gamma_s RT$ 2.6   ±0.1
β 324   ±56

S. Azizian, N. Bashavard
Colloids and Surfaces A
Physicochem. Eng. Aspects **2004**, 240, 69
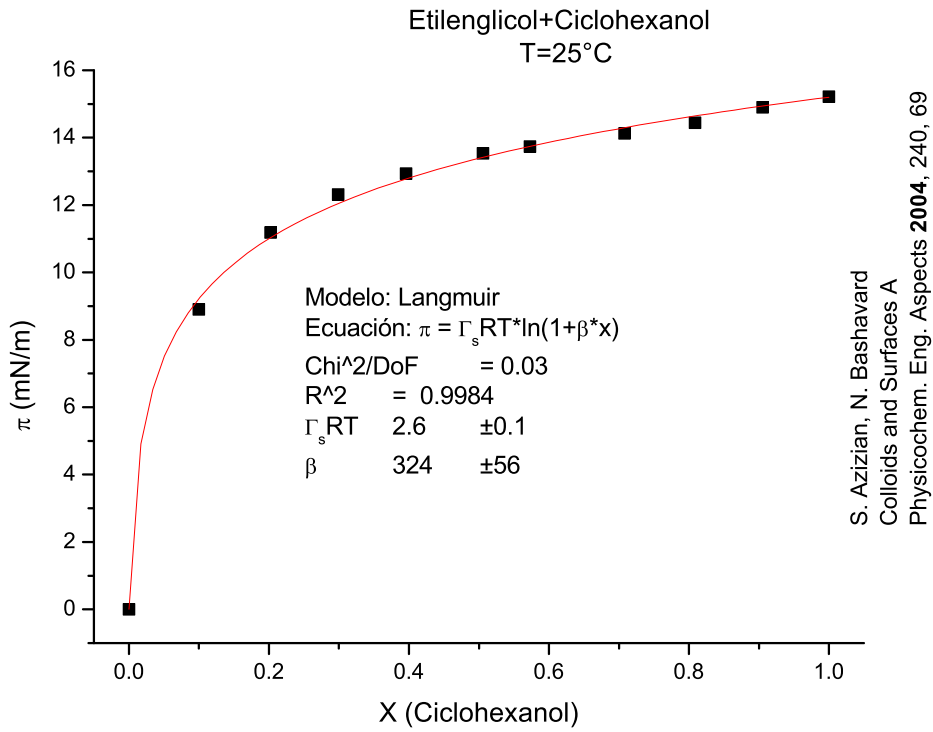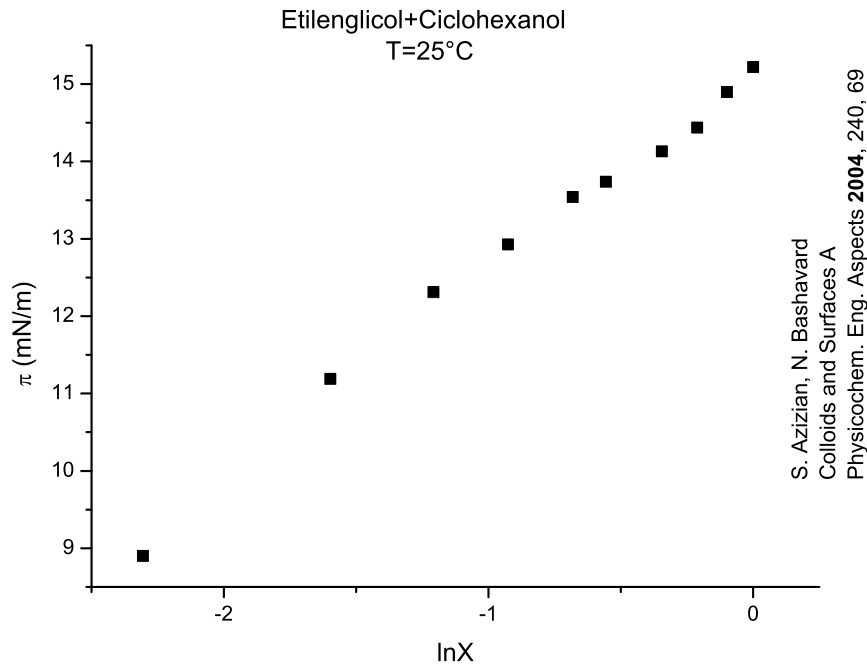
Tabla A.50: Etilenglicol + Ciclohexanol a 25°C [3]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	48.04	0	–
0.0997	39.14	8.9	-2.30559
0.2023	36.85	11.19	-1.598
0.2988	35.73	12.31	-1.20798
0.3958	35.11	12.93	-0.92685
0.5056	34.5	13.54	-0.68201
0.573	34.3	13.74	-0.55687
0.7081	33.91	14.13	-0.34517
0.8086	33.6	14.44	-0.21245
0.905	33.14	14.9	-0.09982
1	32.82	15.22	0

Etilenglicol+Ciclohexanol
T=30°C

π (mN/m)

lnX

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Etilenglicol+Ciclohexanol
T=30°C

π (mN/m)

X (Ciclohexanol)

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF = 0.04
R^2 = 0.99797
$\Gamma_s RT$ 2.7 ±0.1
β 275 ±51

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Colloids and Surfaces A
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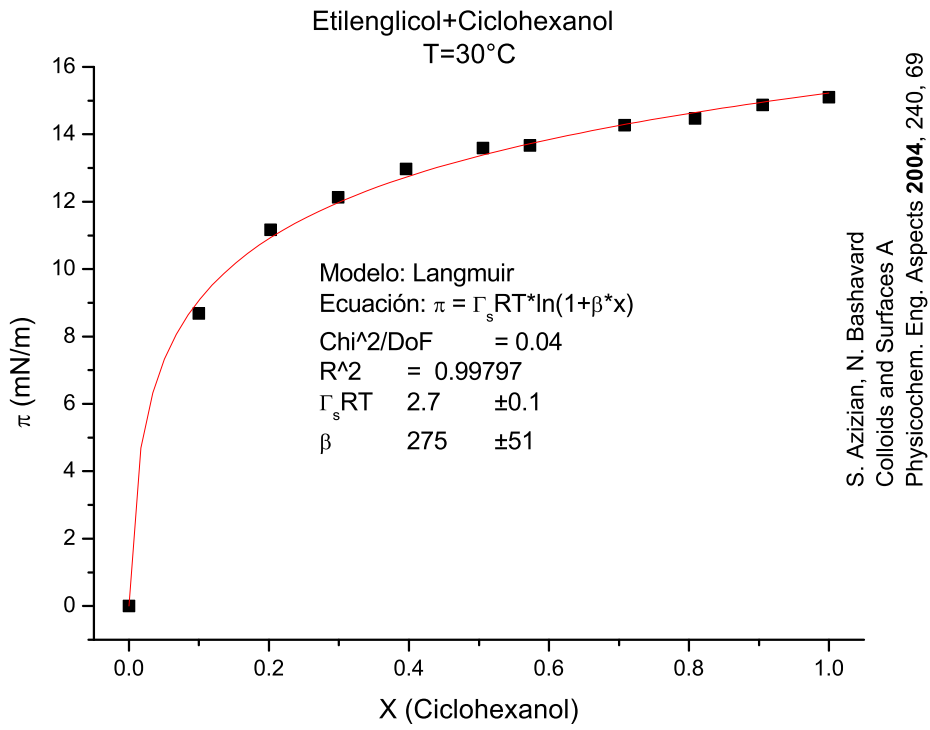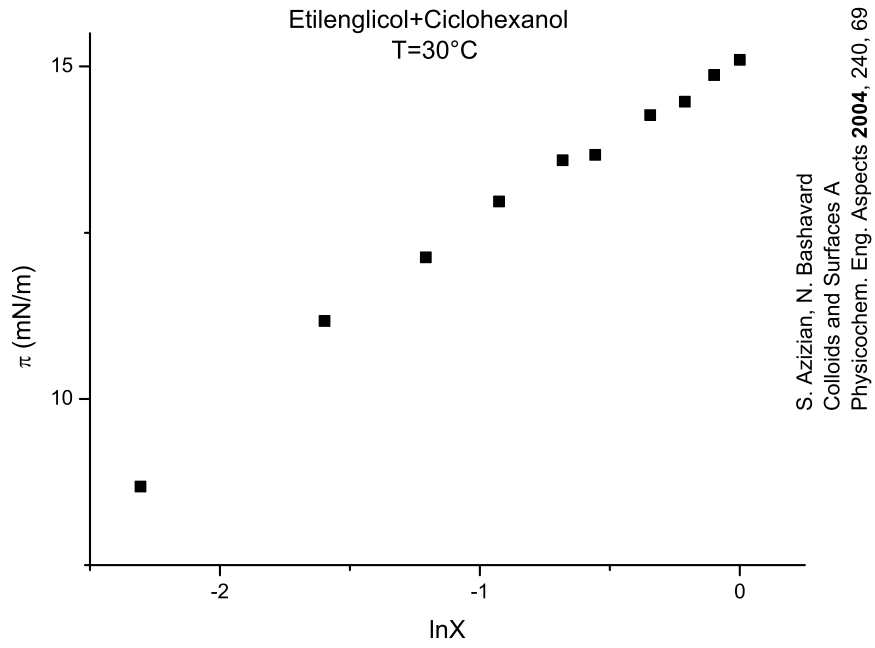
Tabla A.51: Etilenglicol + Ciclohexanol a 30°C [3]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	47.57	0	–
0.0997	38.89	8.68	-2.30559
0.2023	36.4	11.17	-1.598
0.2988	35.44	12.13	-1.20798
0.3958	34.6	12.97	-0.92685
0.5056	33.98	13.59	-0.68201
0.573	33.9	13.67	-0.55687
0.7081	33.3	14.27	-0.34517
0.8086	33.1	14.47	-0.21245
0.905	32.7	14.87	-0.09982
1	32.47	15.1	0

Etilenglicol+Ciclohexanol
T=35°C

Etilenglicol+Ciclohexanol
T=35°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF   = 0.04
R^2   = 0.99824
$\Gamma_s RT$ 2.7   ±0.1
β 245   ±41
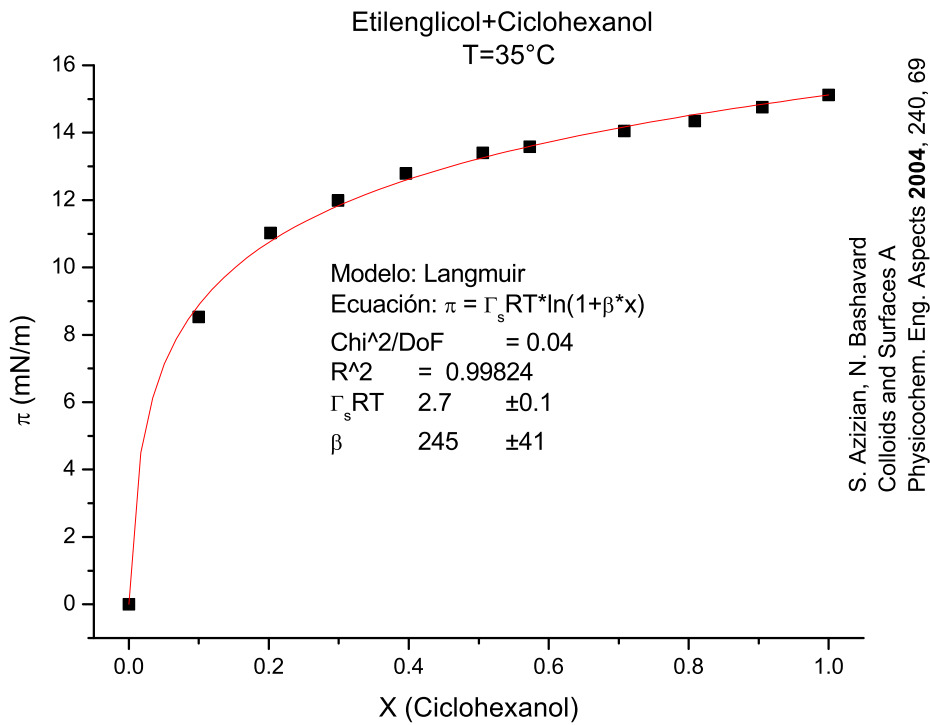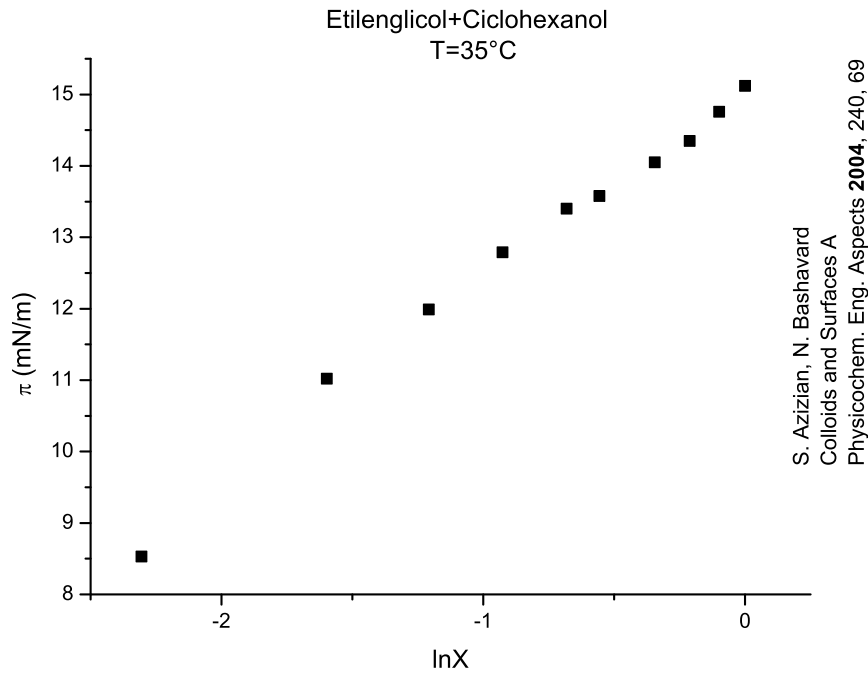
Tabla A.52: Etilenglicol + Ciclohexanol a 35°C [3]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	47.03	0	–
0.0997	38.5	8.53	-2.30559
0.2023	36.01	11.02	-1.598
0.2988	35.04	11.99	-1.20798
0.3958	34.24	12.79	-0.92685
0.5056	33.63	13.4	-0.68201
0.573	33.45	13.58	-0.55687
0.7081	32.98	14.05	-0.34517
0.8086	32.68	14.35	-0.21245
0.905	32.27	14.76	-0.09982
1	31.91	15.12	0

Etilenglicol+Ciclohexanol
T=40°C

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Etilenglicol+Ciclohexanol
T=40°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF   = 0.03
R^2   = 0.99852
$\Gamma_s RT$ 2.9   ±0.1
β 213   ±31

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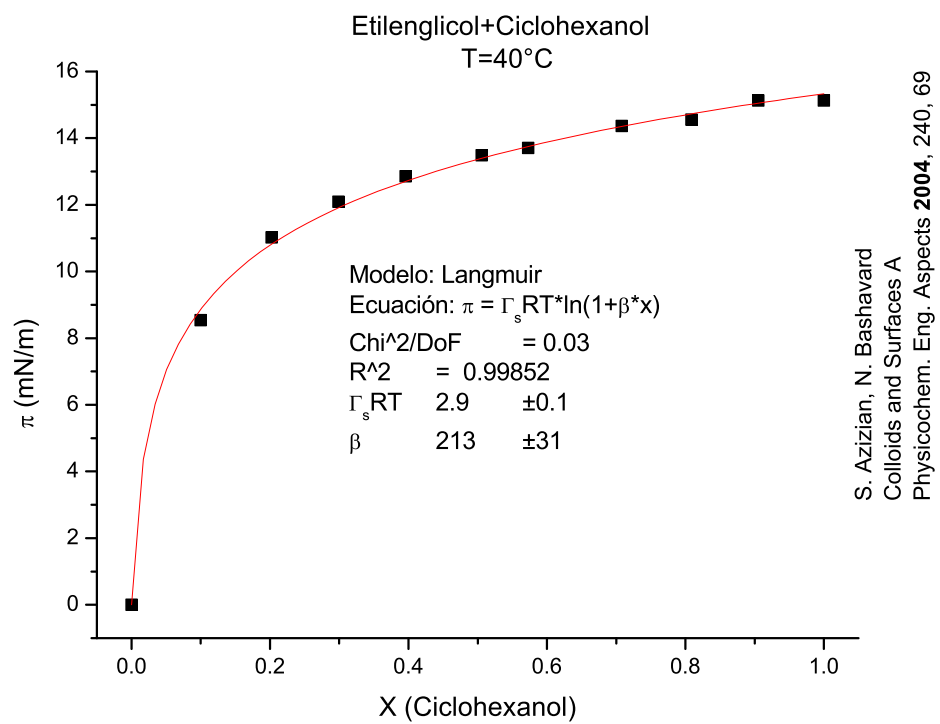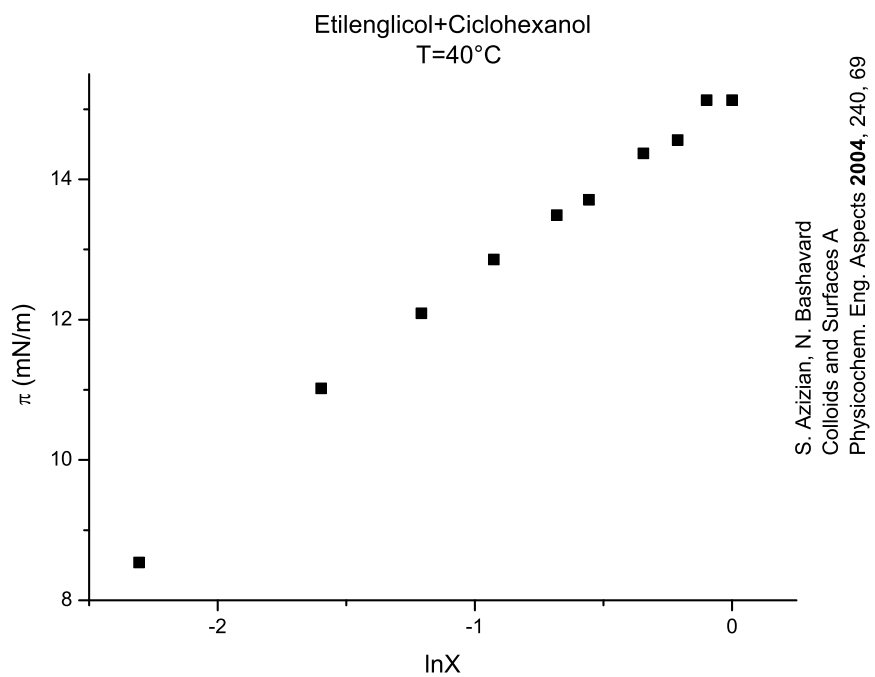
Tabla A.53: Etilenglicol + Ciclohexanol a 40°C [3]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	46.76	0	–
0.0997	38.22	8.54	-2.30559
0.2023	35.74	11.02	-1.598
0.2988	34.67	12.09	-1.20798
0.3958	33.9	12.86	-0.92685
0.5056	33.27	13.49	-0.68201
0.573	33.05	13.71	-0.55687
0.7081	32.39	14.37	-0.34517
0.8086	32.2	14.56	-0.21245
0.905	31.63	15.13	-0.09982
1	31.63	15.13	0

Etilenglicol+Ciclohexanol
T=45°C

Etilenglicol+Ciclohexanol
T=45°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF   = 0.03
R^2   = 0.99867
$\Gamma_s RT$ 2.9   ±0.1
β 199   ±27
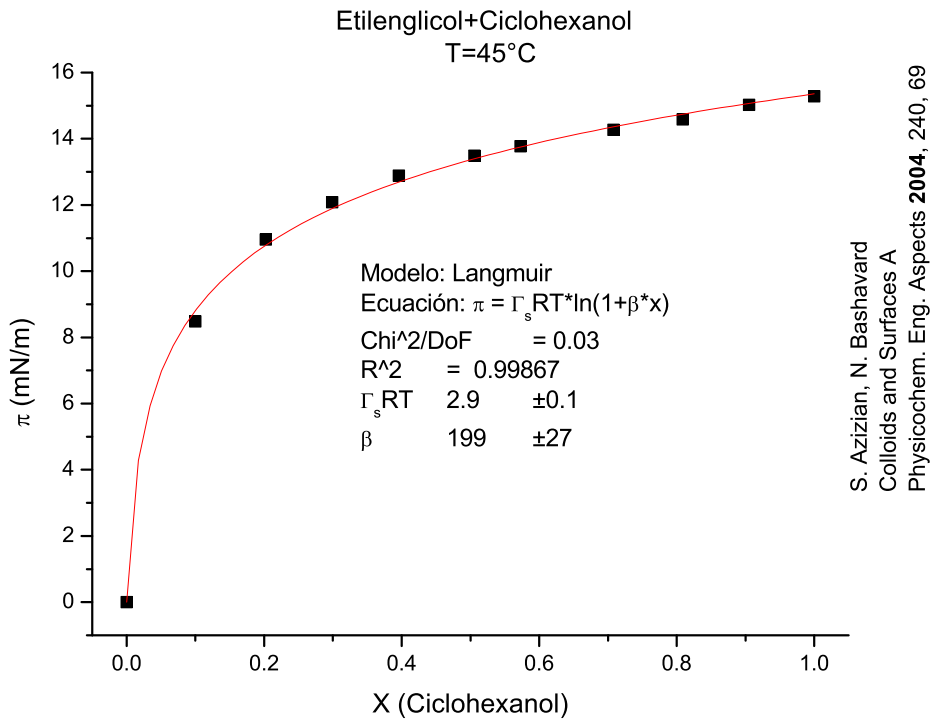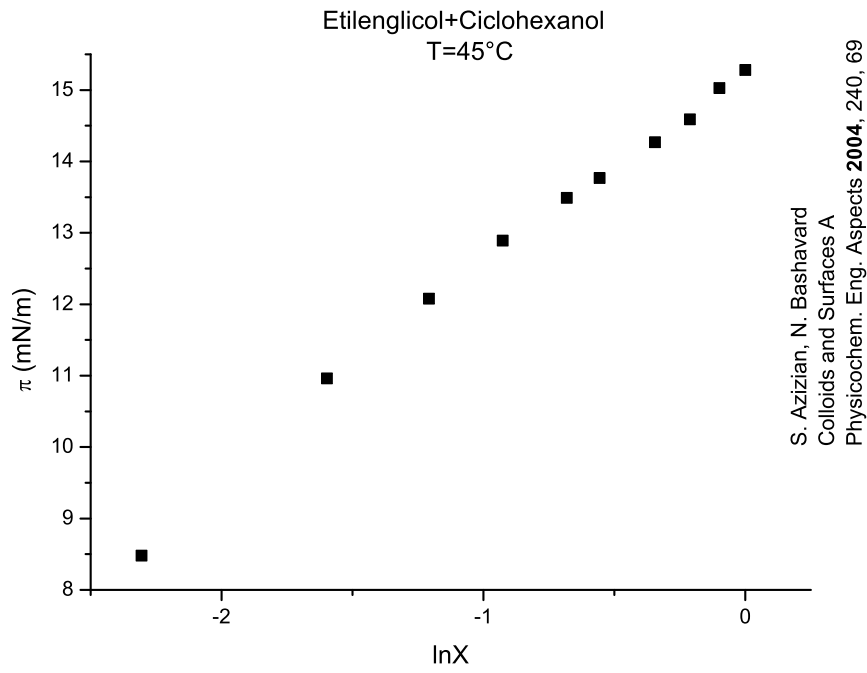
Tabla A.54: Etilenglicol + Ciclohexanol a 45°C [3]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	46.38	0	–
0.0997	37.9	8.48	-2.30559
0.2023	35.42	10.96	-1.598
0.2988	34.3	12.08	-1.20798
0.3958	33.49	12.89	-0.92685
0.5056	32.89	13.49	-0.68201
0.573	32.61	13.77	-0.55687
0.7081	32.11	14.27	-0.34517
0.8086	31.79	14.59	-0.21245
0.905	31.35	15.03	-0.09982
1	31.1	15.28	0

Etilenglicol+Ciclohexanol
T=50°C

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Etilenglicol+Ciclohexanol
T=50°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT * \ln(1+\beta * x)$

Chi^2/DoF   = 0.04
R^2   = 0.99826
$\Gamma_s RT$ 3.0   ±0.1
β 174   ±26

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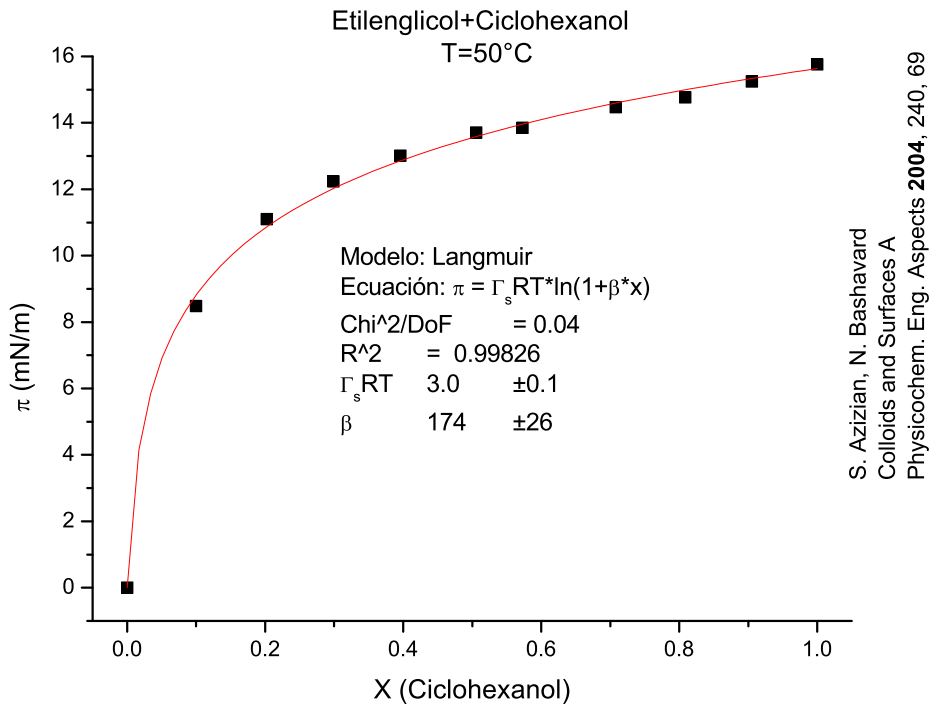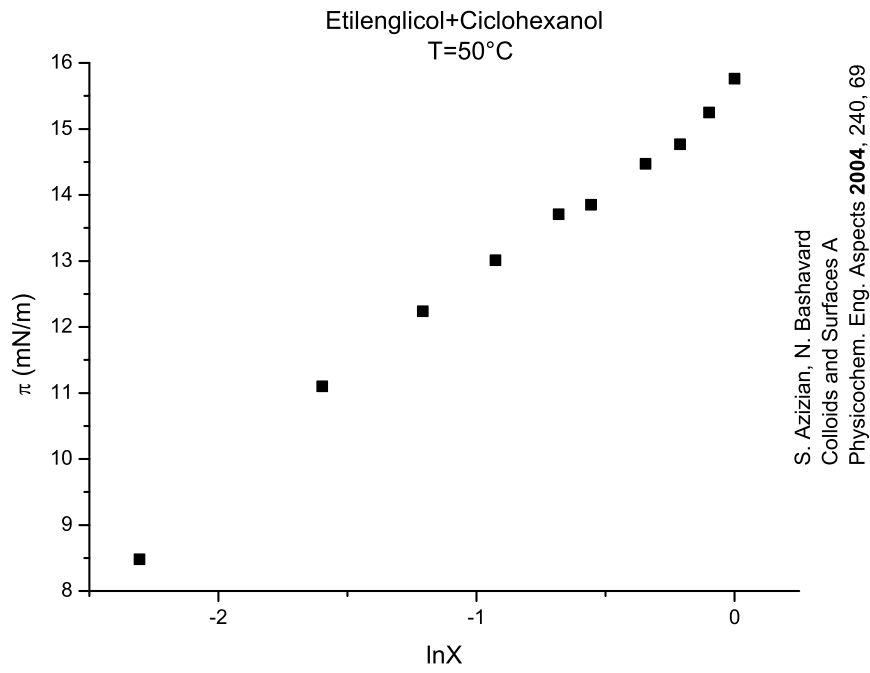
Tabla A.55: Etilenglicol + Ciclohexanol a 50°C [3]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	46.11	0	–
0.0997	37.63	8.48	-2.30559
0.2023	35.01	11.1	-1.598
0.2988	33.87	12.24	-1.20798
0.3958	33.1	13.01	-0.92685
0.5056	32.4	13.71	-0.68201
0.573	32.26	13.85	-0.55687
0.7081	31.64	14.47	-0.34517
0.8086	31.34	14.77	-0.21245
0.905	30.86	15.25	-0.09982
1	30.35	15.76	0

Etilenglicol+Ciclopentanol
T=20°C

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Etilenglicol+Ciclopentanol
T=20°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ast \ln(1+\beta \ast x)$

Chi^2/DoF   = 0.04
R^2   = 0.99807
$\Gamma_s RT$ 3.3   ±0.1
β 119   ±17

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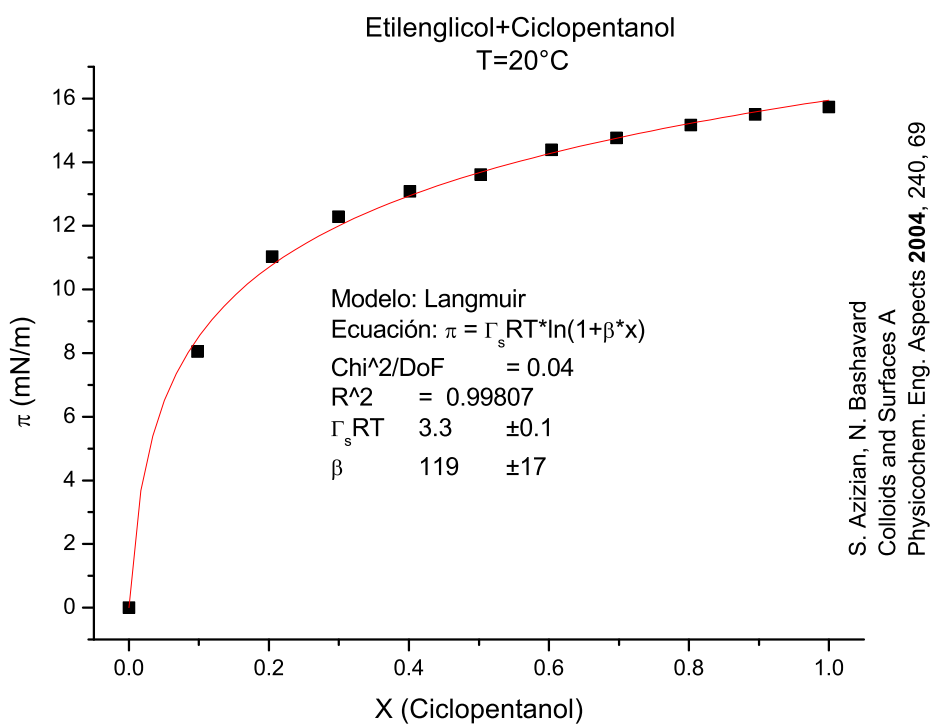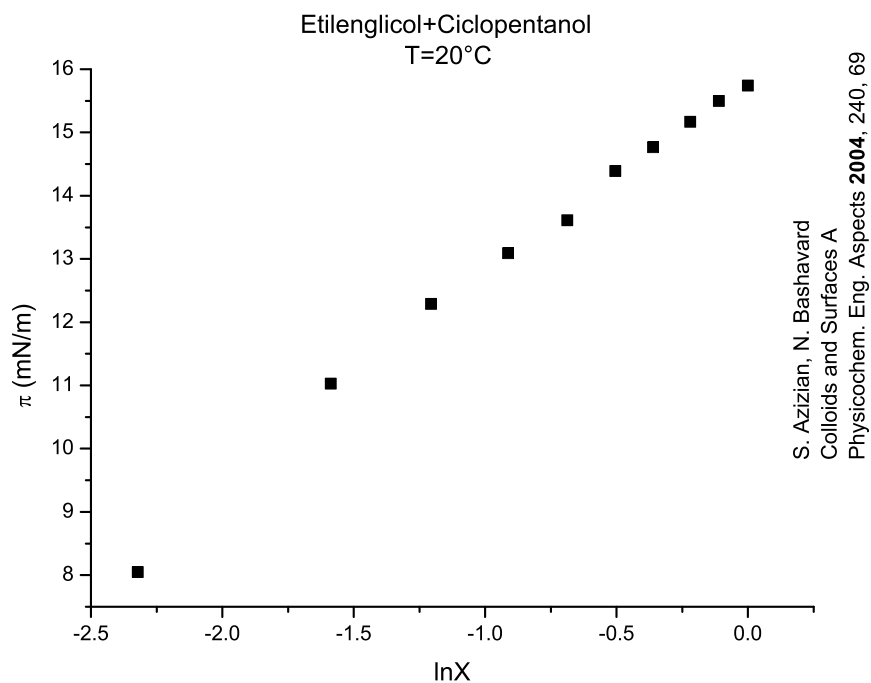
Tabla A.56: Etilenglicol + Ciclopentanol a 20°C [3]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	48.37	0	–
0.0981	40.32	8.05	-2.32177
0.2045	37.34	11.03	-1.58719
0.2993	36.08	12.29	-1.20631
0.4015	35.28	13.09	-0.91255
0.5025	34.76	13.61	-0.68816
0.6035	33.98	14.39	-0.50501
0.6965	33.6	14.77	-0.36169
0.8026	33.2	15.17	-0.2199
0.8946	32.87	15.5	-0.11138
1	32.63	15.74	0

Etilenglicol+Ciclopentanol
T=25°C

Etilenglicol+Ciclopentanol
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.05
R^2   = 0.99807
$\Gamma_s RT$ 3.4   ±0.1
β 114   ±16
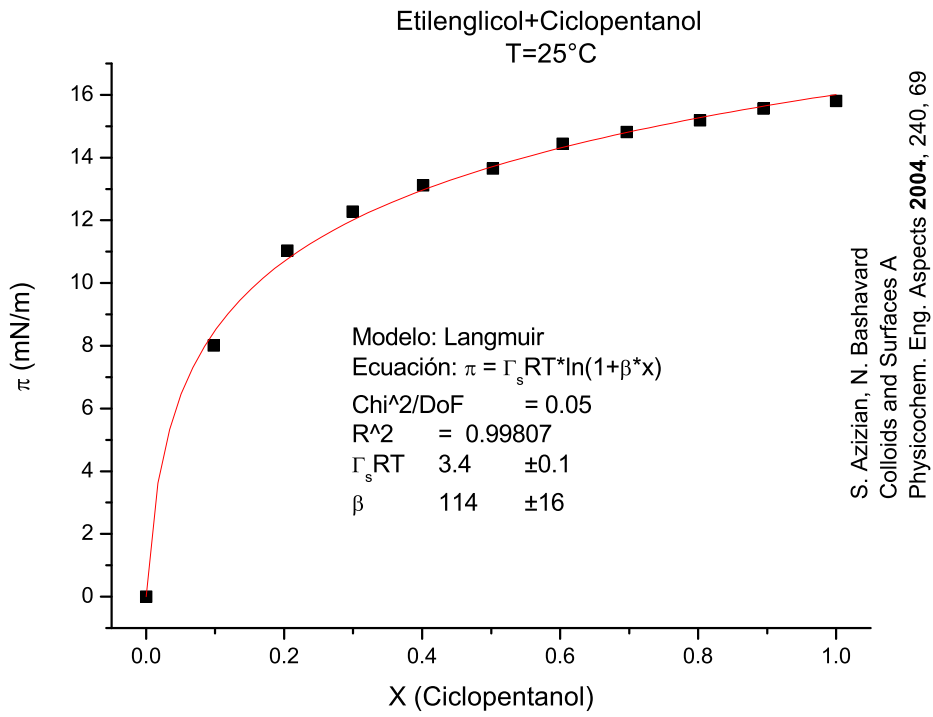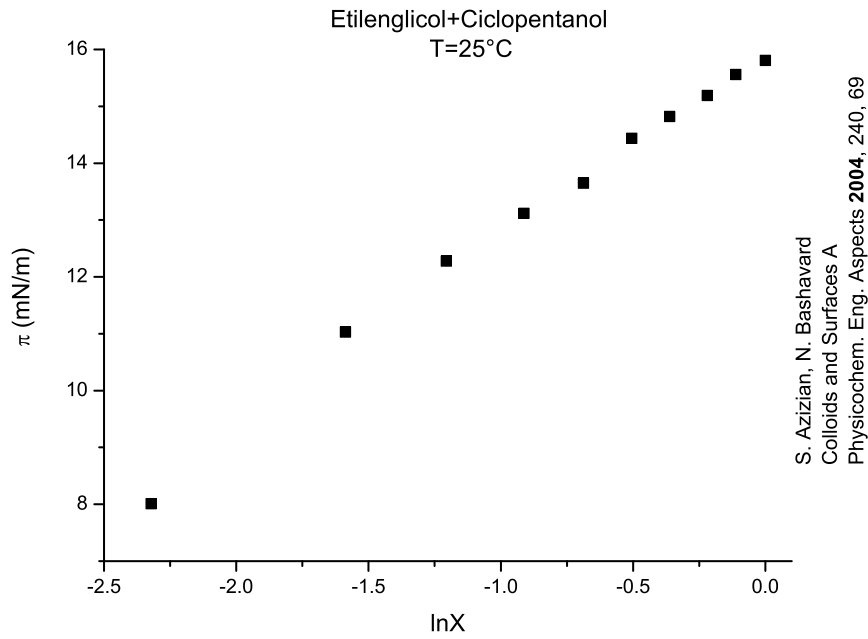
Tabla A.57: Etilenglicol + Ciclopentanol a 25°C [3]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	48	0	–
0.0981	39.99	8.01	-2.32177
0.2045	36.97	11.03	-1.58719
0.2993	35.72	12.28	-1.20631
0.4015	34.88	13.12	-0.91255
0.5025	34.35	13.65	-0.68816
0.6035	33.56	14.44	-0.50501
0.6965	33.18	14.82	-0.36169
0.8026	32.81	15.19	-0.2199
0.8946	32.44	15.56	-0.11138
1	32.19	15.81	0

Etilenglicol+Ciclopentanol
T=30°C

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Etilenglicol+Ciclopentanol
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF   = 0.05
R^2   = 0.99808
$\Gamma_s RT$ 3.5   ±0.1
β 100   ±13

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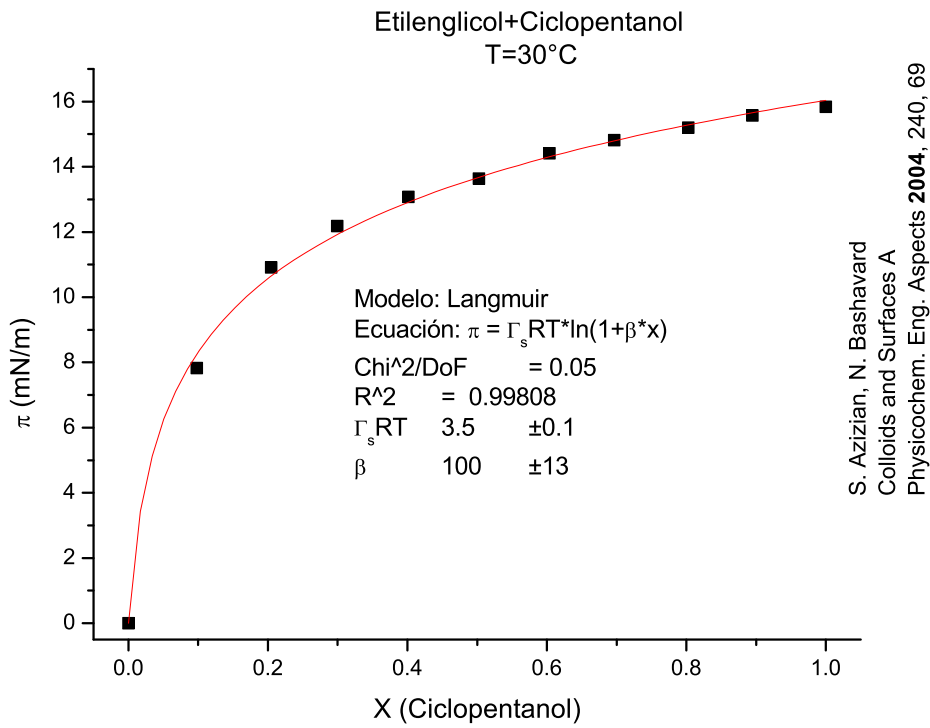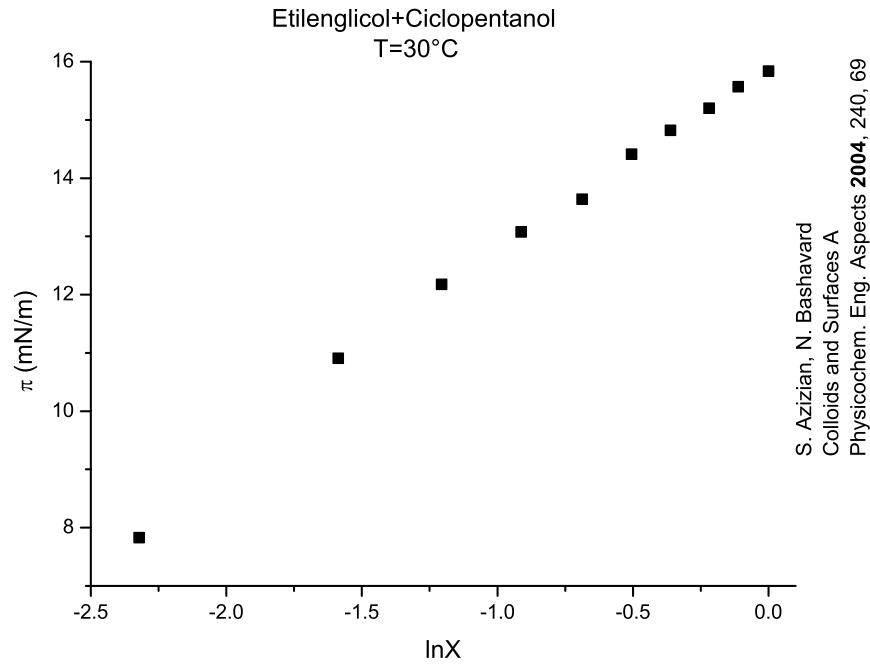
Tabla A.58: Etilenglicol + Ciclopentanol a 30°C [3]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	47.54	0	–
0.0981	39.71	7.83	-2.32177
0.2045	36.63	10.91	-1.58719
0.2993	35.36	12.18	-1.20631
0.4015	34.46	13.08	-0.91255
0.5025	33.9	13.64	-0.68816
0.6035	33.13	14.41	-0.50501
0.6965	32.72	14.82	-0.36169
0.8026	32.34	15.2	-0.2199
0.8946	31.97	15.57	-0.11138
1	31.7	15.84	0

Etilenglicol+Ciclopentanol
T=35°C

Etilenglicol+Ciclopentanol
T=35°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF = 0.04
R^2 = 0.99834
$\Gamma_s RT$ 3.6 ±0.1
β 88 ±11
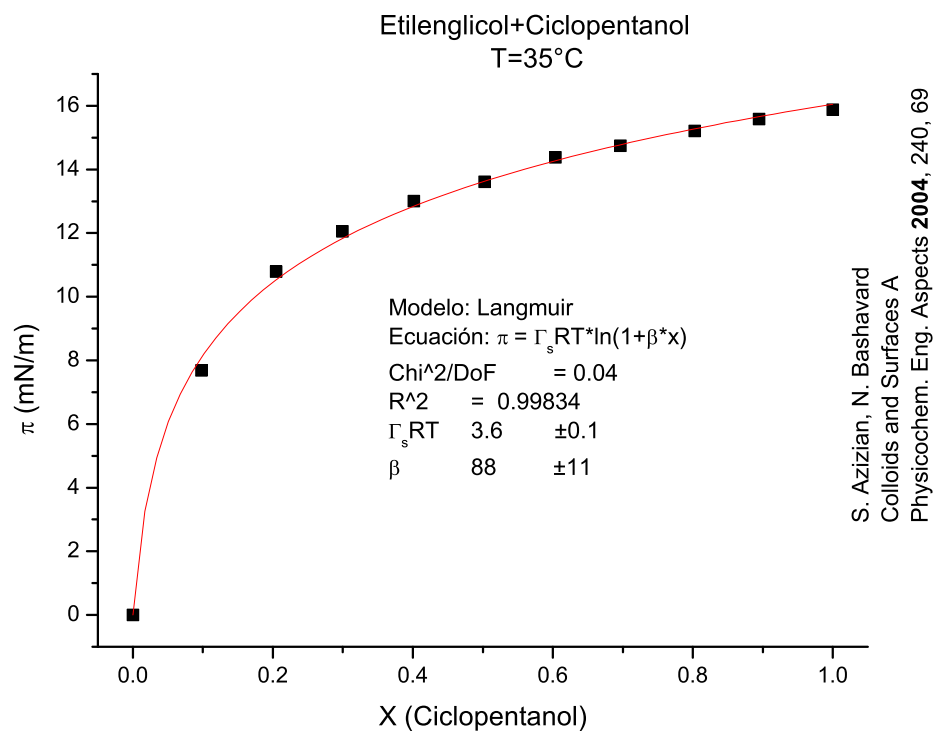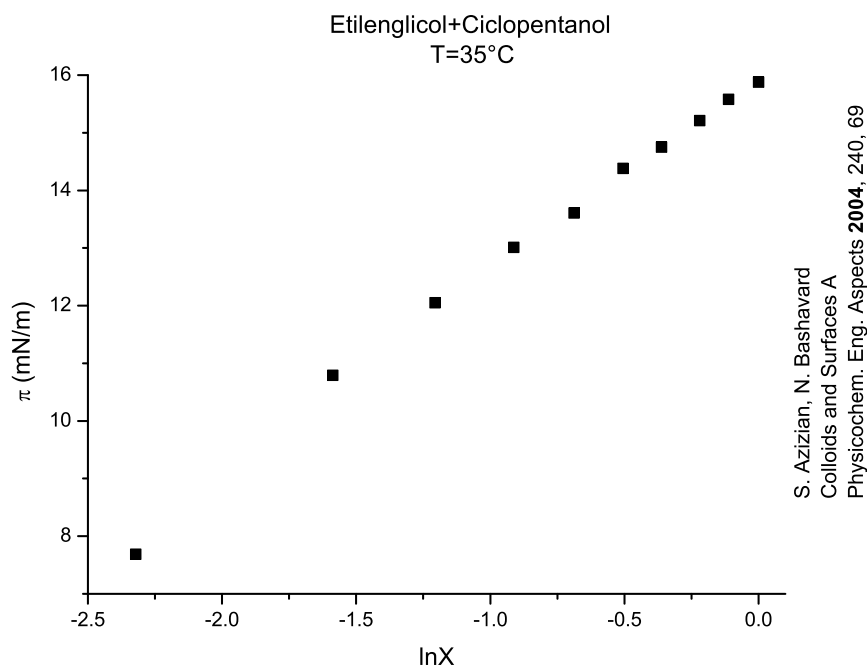
Tabla A.59: Etilenglicol + Ciclopentanol a 35°C [3]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	47.09	0	–
0.0981	39.4	7.69	-2.32177
0.2045	36.3	10.79	-1.58719
0.2993	35.04	12.05	-1.20631
0.4015	34.08	13.01	-0.91255
0.5025	33.48	13.61	-0.68816
0.6035	32.71	14.38	-0.50501
0.6965	32.34	14.75	-0.36169
0.8026	31.88	15.21	-0.2199
0.8946	31.51	15.58	-0.11138
1	31.21	15.88	0

Etilenglicol+Ciclopentanol
T=40°C

Etilenglicol+Ciclopentanol
T=40°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.04
R^2   = 0.99856
$\Gamma_s RT$ 3.7   ±0.1
β 80   ±9
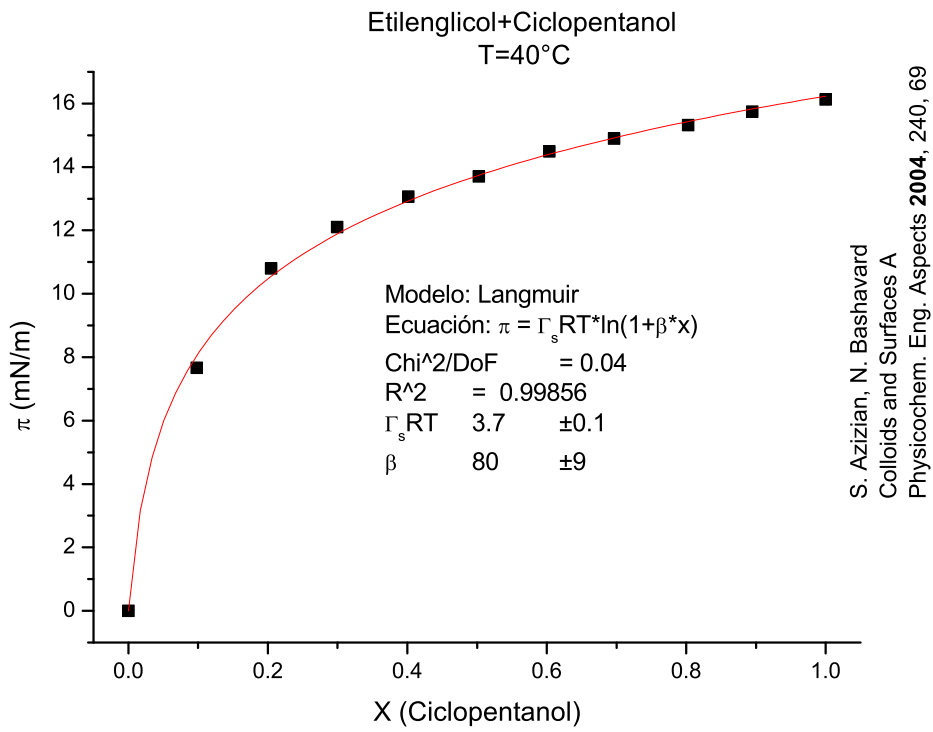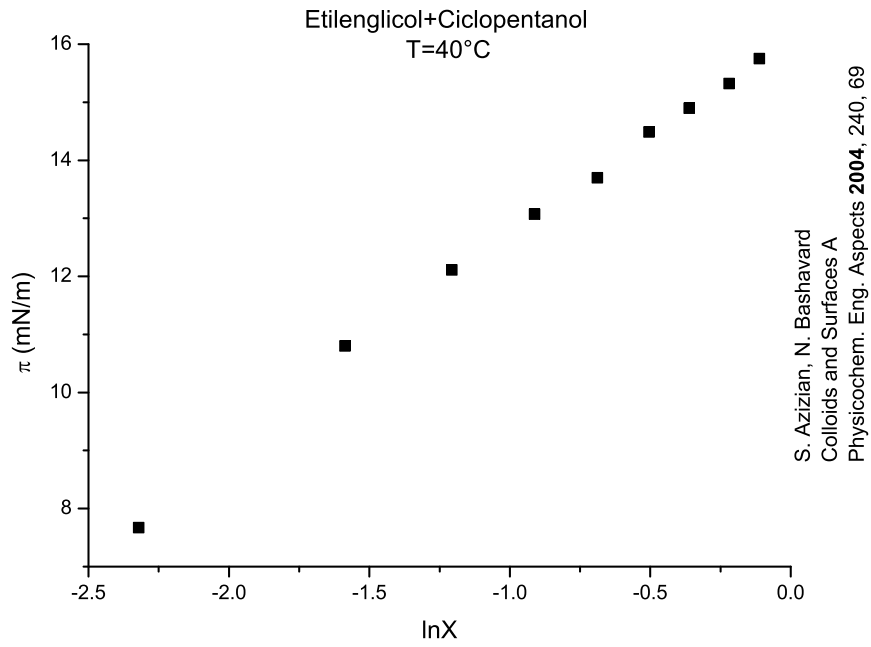
Tabla A.60: Etilenglicol + Ciclopentanol a 40°C [3]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	46.77	0	–
0.0981	39.1	7.67	-2.32177
0.2045	35.97	10.8	-1.58719
0.2993	34.66	12.11	-1.20631
0.4015	33.7	13.07	-0.91255
0.5025	33.07	13.7	-0.68816
0.6035	32.28	14.49	-0.50501
0.6965	31.87	14.9	-0.36169
0.8026	31.45	15.32	-0.2199
0.8946	31.02	15.75	-0.11138
1	30.64	16.13	0
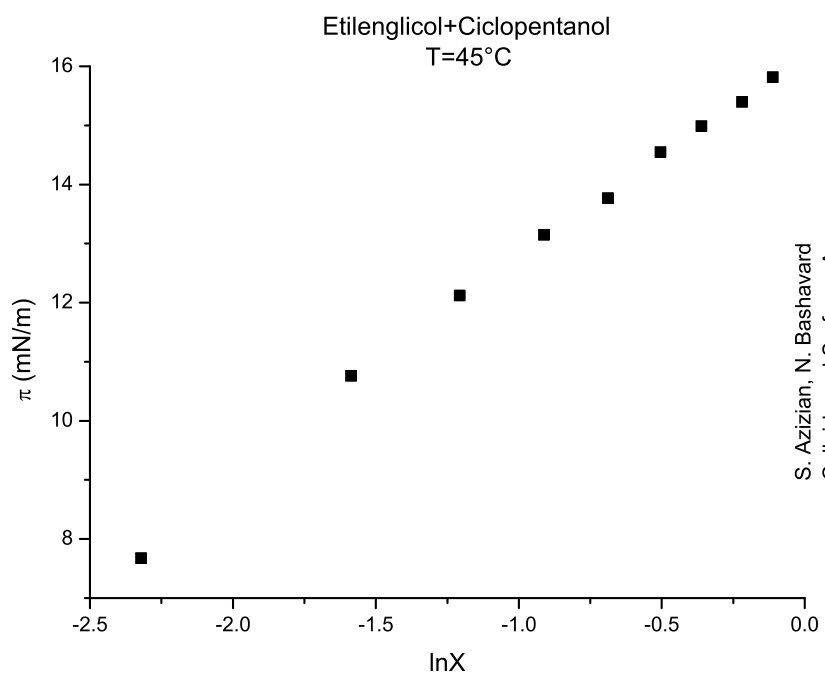
Etilenglicol+Ciclopentanol
T=45°C

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Etilenglicol+Ciclopentanol
T=45°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF   = 0.03
R^2   = 0.99876
$\Gamma_s RT$ 3.7   ±0.1
β 76   ±8
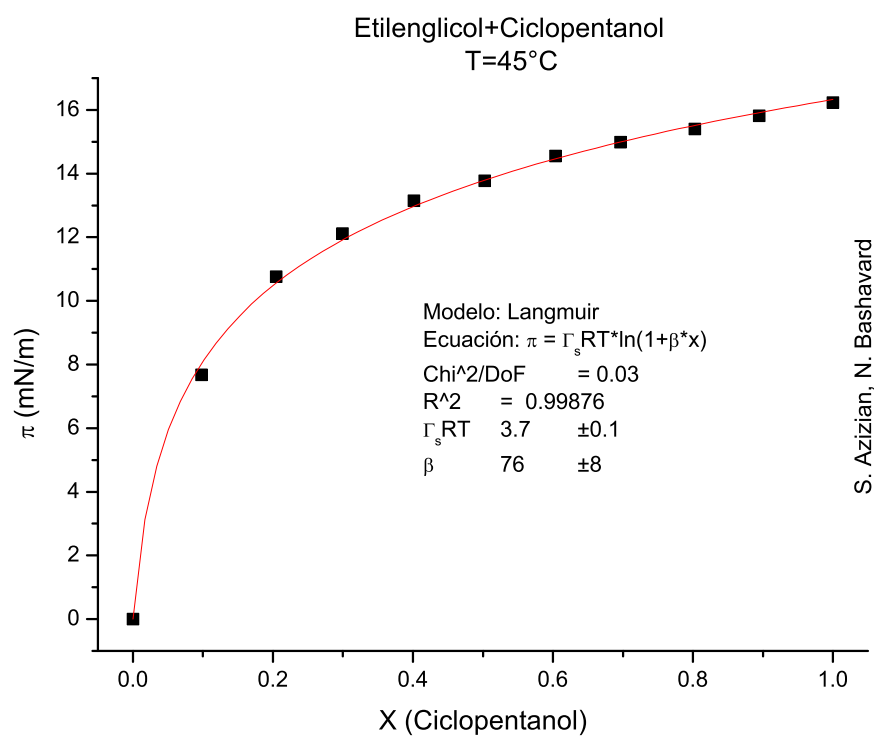
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Tabla A.61: Etilenglicol + Ciclopentanol a 45°C [3]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	46.47	0	–
0.0981	38.79	7.68	-2.32177
0.2045	35.71	10.76	-1.58719
0.2993	34.35	12.12	-1.20631
0.4015	33.32	13.15	-0.91255
0.5025	32.7	13.77	-0.68816
0.6035	31.92	14.55	-0.50501
0.6965	31.48	14.99	-0.36169
0.8026	31.07	15.4	-0.2199
0.8946	30.65	15.82	-0.11138
1	30.24	16.23	0

Etilenglicol+Ciclopentanol
T=50°C

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Etilenglicol+Ciclopentanol
T=50°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF   = 0.03
R^2   = 0.99882
$\Gamma_s RT$ 3.9   ±0.1
β 70   ±7

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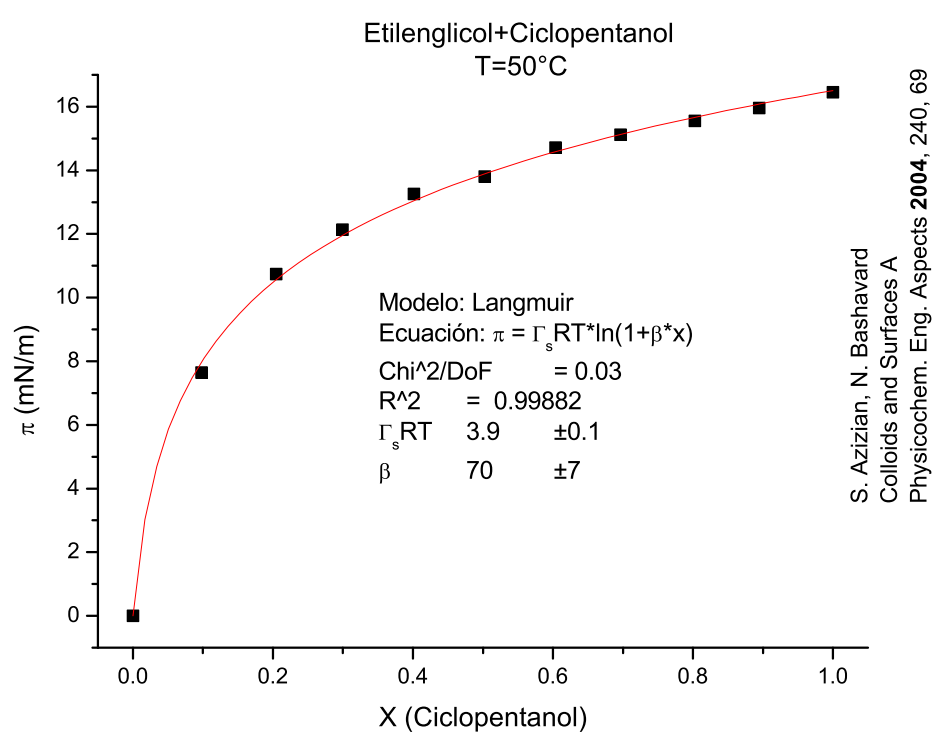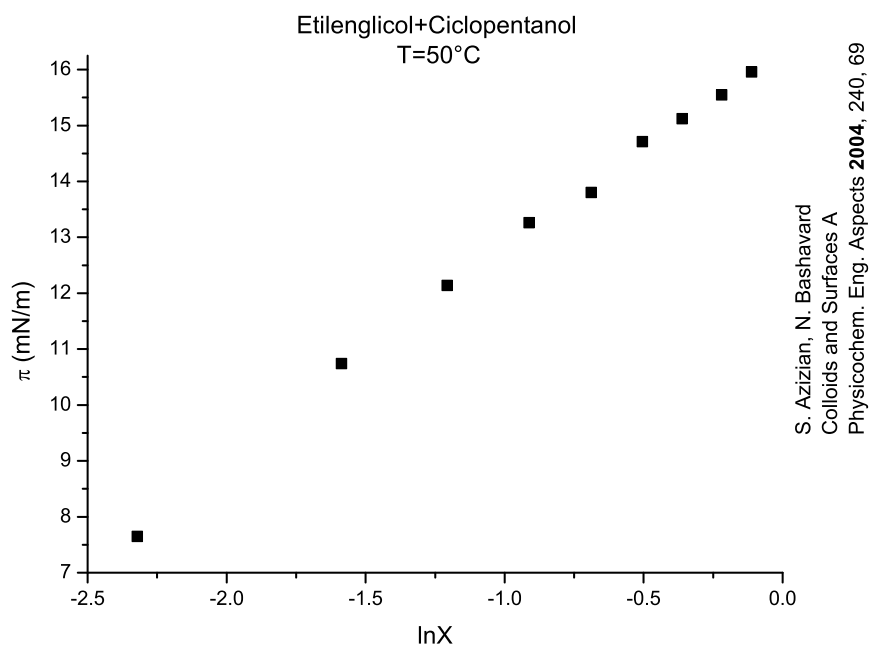
Tabla A.62: Etilenglicol + Ciclopentanol a 50°C [3]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	46.16	0	–
0.0981	38.51	7.65	-2.32177
0.2045	35.42	10.74	-1.58719
0.2993	34.02	12.14	-1.20631
0.4015	32.9	13.26	-0.91255
0.5025	32.36	13.8	-0.68816
0.6035	31.45	14.71	-0.50501
0.6965	31.04	15.12	-0.36169
0.8026	30.61	15.55	-0.2199
0.8946	30.2	15.96	-0.11138
1	29.71	16.45	0
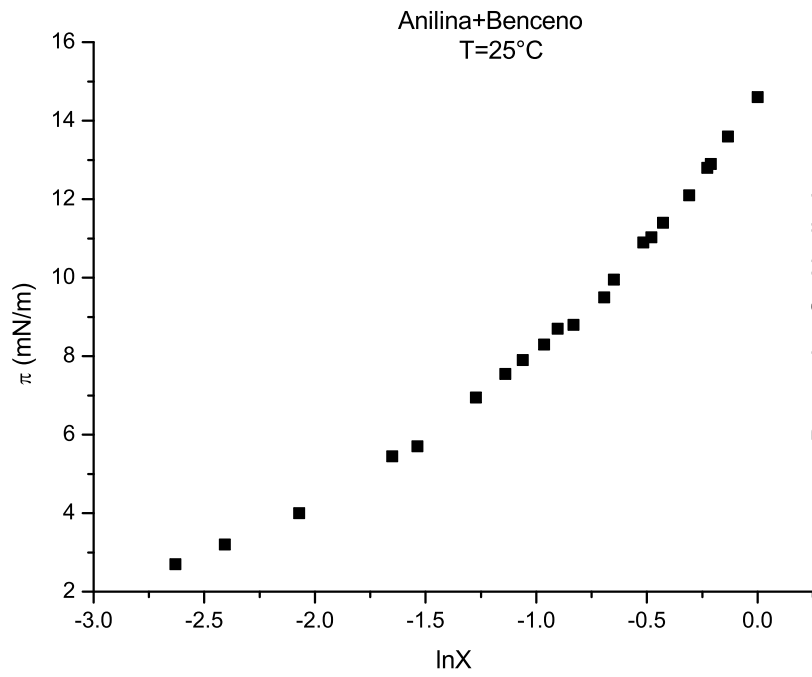
Anilina+Benceno
T=25°C

Pannetier,G.;Abello,L.
Bull.Soc.Chim.Fr. **1916** ,7, 2048

Anilina+Benceno
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.04
R^2   = 0.99742
$\Gamma_s RT$ 8.3   ±0.3
β 4.7   ±0.3
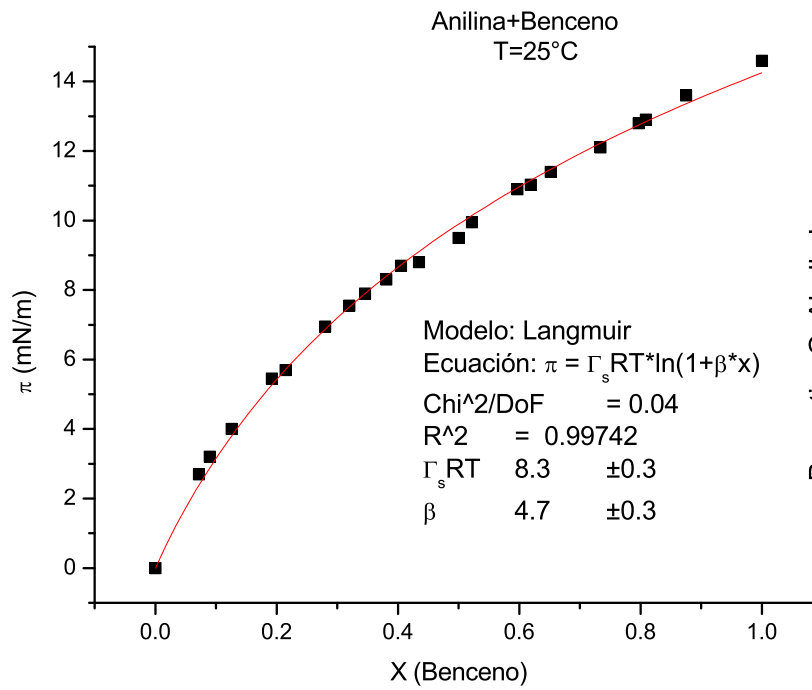
Pannetier,G.;Abello,L.
Bull.Soc.Chim.Fr. **1916** ,7, 2048

Tabla A.63: Anilina + Benceno a T=25°C [33]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	42.8	0	–
0.072	40.1	2.7	-2.63109
0.09	39.6	3.2	-2.40795
0.126	38.8	4	-2.07147
0.192	37.35	5.45	-1.65026
0.215	37.1	5.7	-1.53712
0.28	35.85	6.95	-1.27297
0.32	35.25	7.55	-1.13943
0.346	34.9	7.9	-1.06132
0.381	34.5	8.3	-0.96496
0.405	34.1	8.7	-0.90387
0.435	34	8.8	-0.83241
0.5	33.3	9.5	-0.69315
0.522	32.85	9.95	-0.65009
0.597	31.9	10.9	-0.51584
0.619	31.77	11.03	-0.47965
0.652	31.4	11.4	-0.42771
0.734	30.7	12.1	-0.30925
0.797	30	12.8	-0.2269
0.809	29.9	12.9	-0.21196
0.875	29.2	13.6	-0.13353
1	28.2	14.6	0

Benceno+Oxileno
T=25°C

Benceno+Oxileno
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.0006
R^2   = 0.99649
$\Gamma_s RT$ 1.9   ±0.3
β 0.9   ±0.2
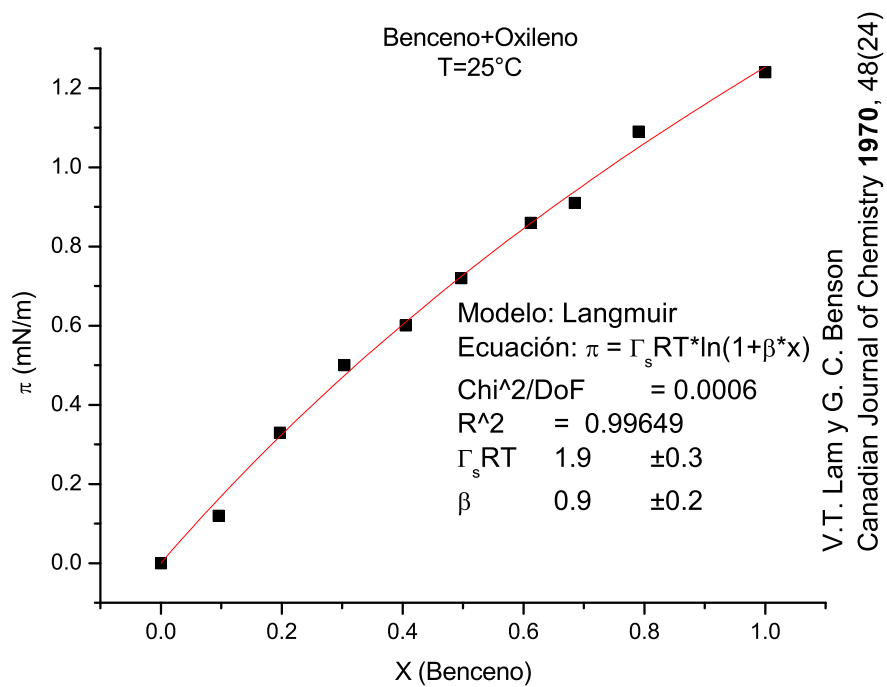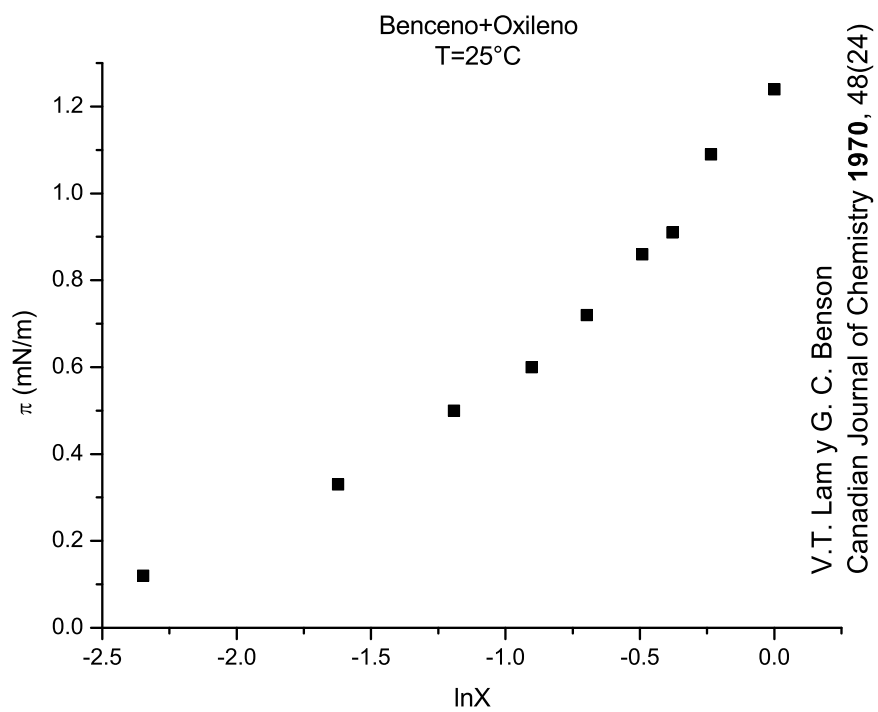
Tabla A.64: Benceno + Oxileno a 25°C [19]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	29.44	0	–
0.0955	29.32	0.12	-2.34863
0.1973	29.11	0.33	-1.62303
0.3038	28.94	0.5	-1.19139
0.4053	28.84	0.6	-0.90313
0.4975	28.72	0.72	-0.69816
0.6121	28.58	0.86	-0.49086
0.6847	28.53	0.91	-0.37877
0.7905	28.35	1.09	-0.23509
1	28.2	1.24	0

2-Metil-2-Butanol + Benceno
T=30°C

Myers,R.S.;Clever,H.L.
J.Chem.Thermodyn. **1974**, 6(10), 949

2-Metil-2-Butanol + Benceno
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT * \ln(1+\beta*x)$

Chi^2/DoF   = 0.002
R^2   = 0.99946
$\Gamma_s RT$ 3.4   ±0.1
β 4.2   ±0.2

Myers,R.S.;Clever,H.L.
J.Chem.Thermodyn. **1974**, 6(10), 949
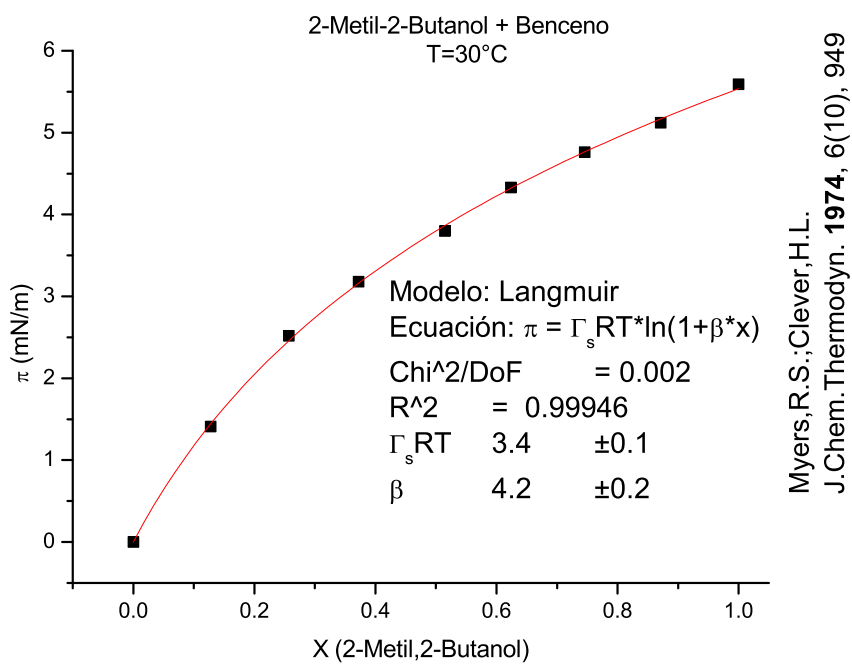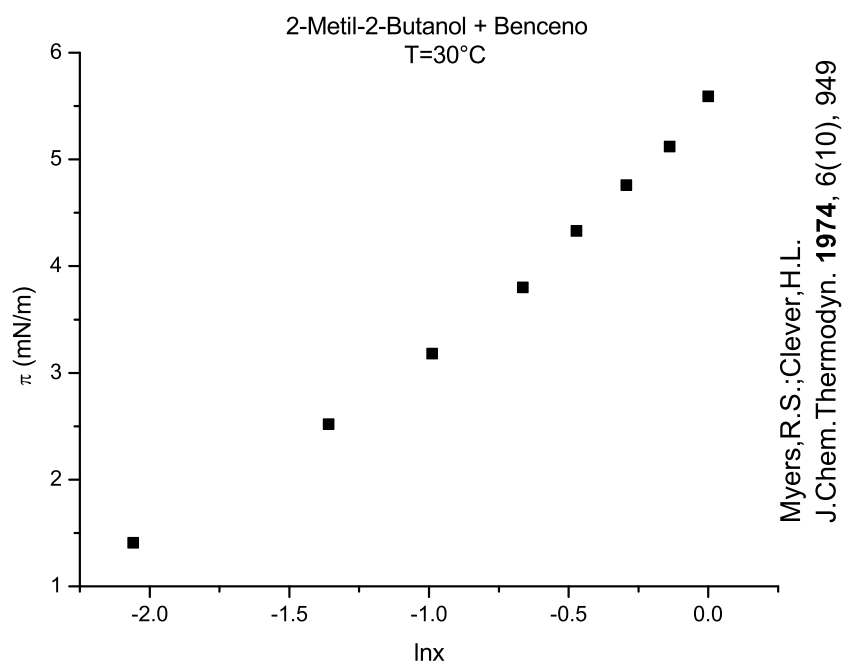
Tabla A.65: 2-Metil-2-Butanol + Benceno a 30°C [29]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	27.48	0	–
0.1276	26.07	1.41	-2.05885
0.2569	24.96	2.52	-1.35907
0.3722	24.3	3.18	-0.98832
0.5146	23.68	3.8	-0.66437
0.6239	23.15	4.33	-0.47177
0.7456	22.72	4.76	-0.29357
0.871	22.36	5.12	-0.13811
1	21.89	5.59	0

Etanol + 1,4-Diclorobenceno
T=55°C

Etanol + 1,4-Diclorobenceno
T=55°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ast \ln(1+\beta \ast x)$

Chi^2/DoF   = 0.05
R^2   = 0.99704
$\Gamma_s RT$ 18   ±3
β 0.9   ±0.2
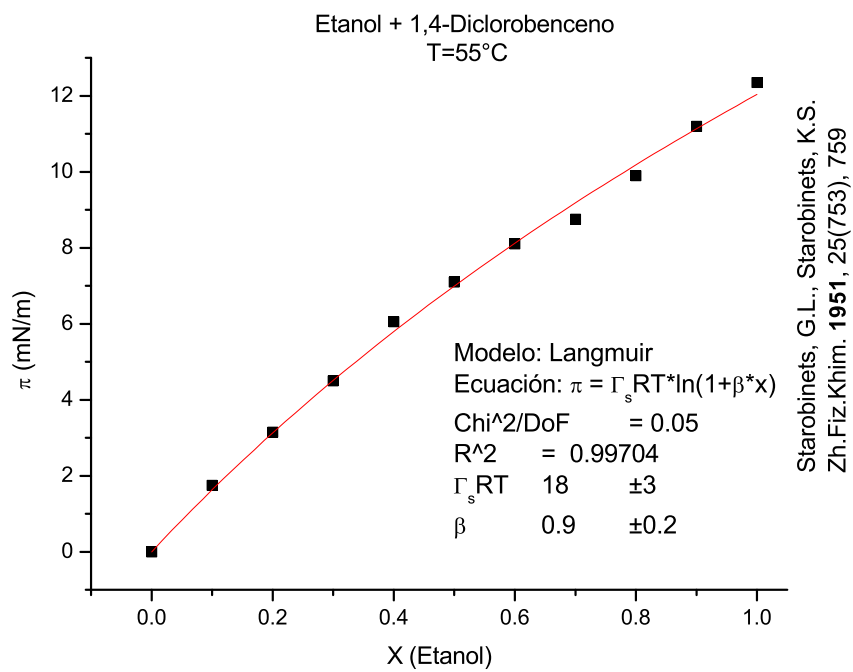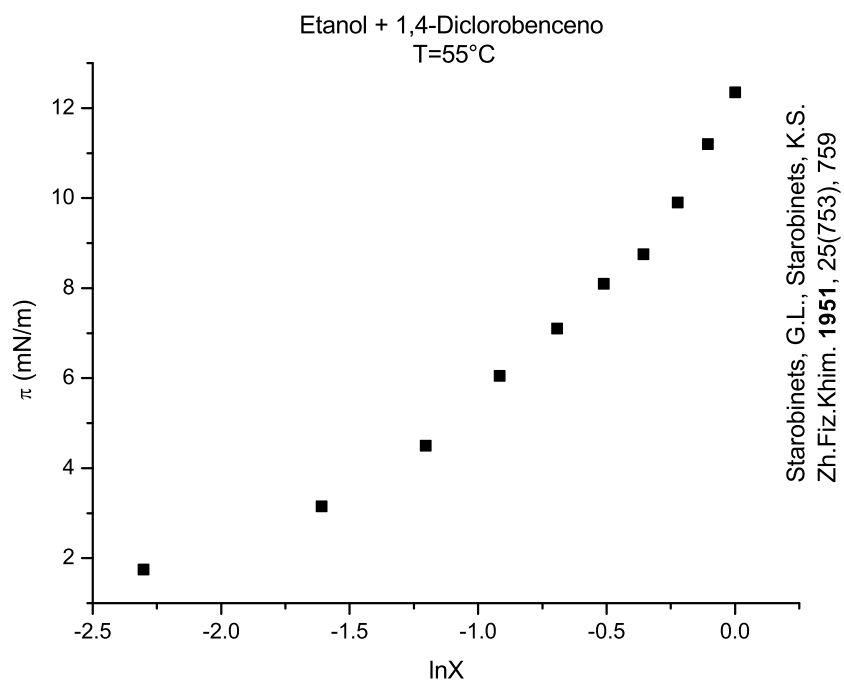
Tabla A.66: Etanol + 1,4-Diclorobenceno a 55°C [41]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	32	0	–
0.1	30.25	1.75	-2.30259
0.2	28.85	3.15	-1.60944
0.3	27.5	4.5	-1.20397
0.4	25.95	6.05	-0.91629
0.5	24.9	7.1	-0.69315
0.6	23.9	8.1	-0.51083
0.7	23.25	8.75	-0.35667
0.8	22.1	9.9	-0.22314
0.9	20.8	11.2	-0.10536
1	19.65	12.35	0

Ciclohexano+Tolueno
T=25°C

Ciclohexano+Tolueno
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF   = 0.005
R^2   = 0.99659
Γ_sRT   2.3   ±0.1
β 3.8   ±0.4
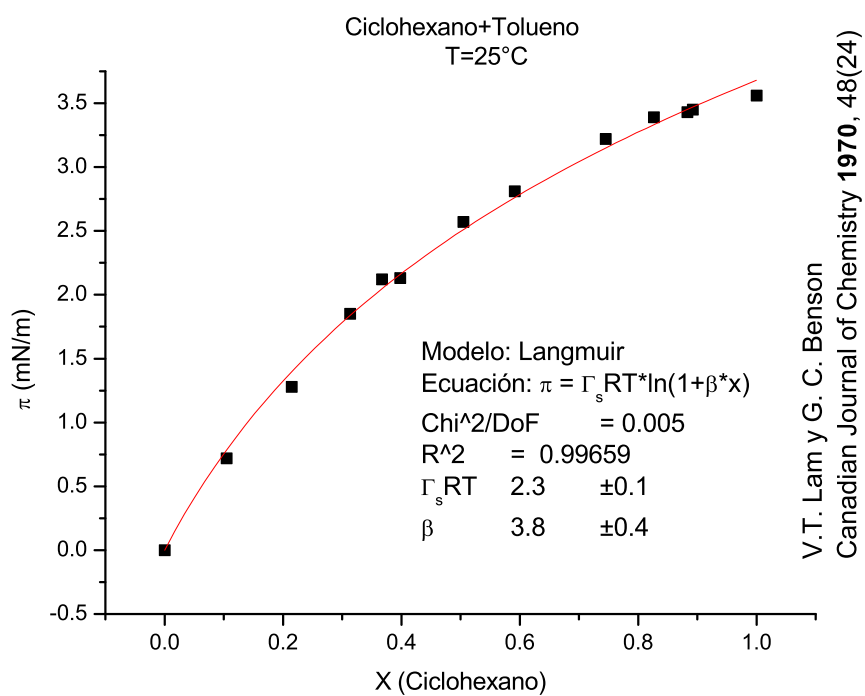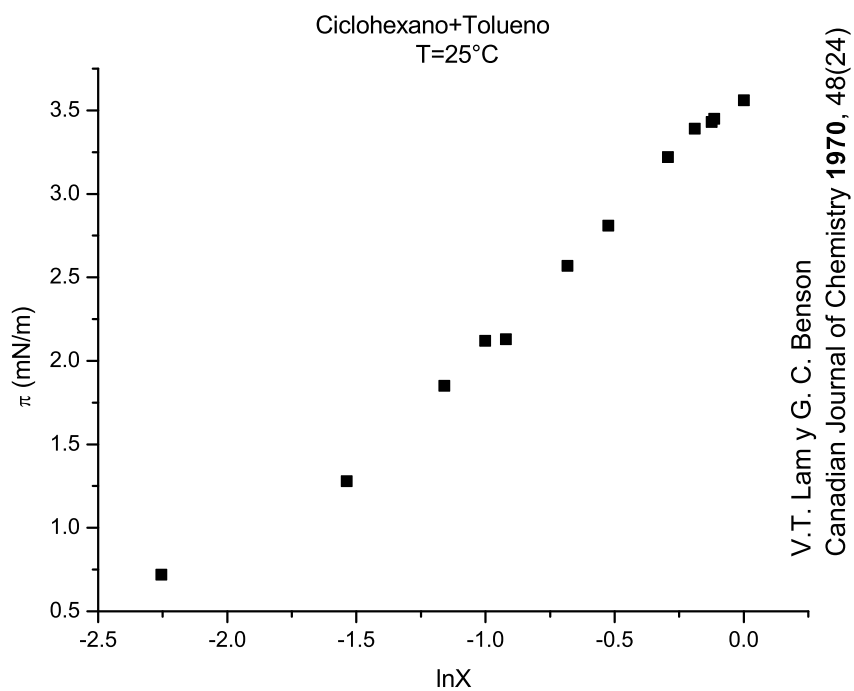
Tabla A.67: Ciclohexano + Tolueno a 25°C [19]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	27.94	0	–
0.1048	27.22	0.72	-2.2557
0.2148	26.66	1.28	-1.53805
0.3135	26.09	1.85	-1.15996
0.3674	25.82	2.12	-1.0013
0.3982	25.81	2.13	-0.9208
0.505	25.37	2.57	-0.6832
0.5918	25.13	2.81	-0.52459
0.7455	24.72	3.22	-0.2937
0.8268	24.55	3.39	-0.19019
0.8833	24.51	3.43	-0.12409
0.8924	24.49	3.45	-0.11384
1	24.38	3.56	0

Ciclopentano+Tolueno
T=25°C

Ciclopentano+Tolueno
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.0003
R^2   = 0.99993
$\Gamma_s RT$ 9.7   ±0.2
β 0.88   ±0.02
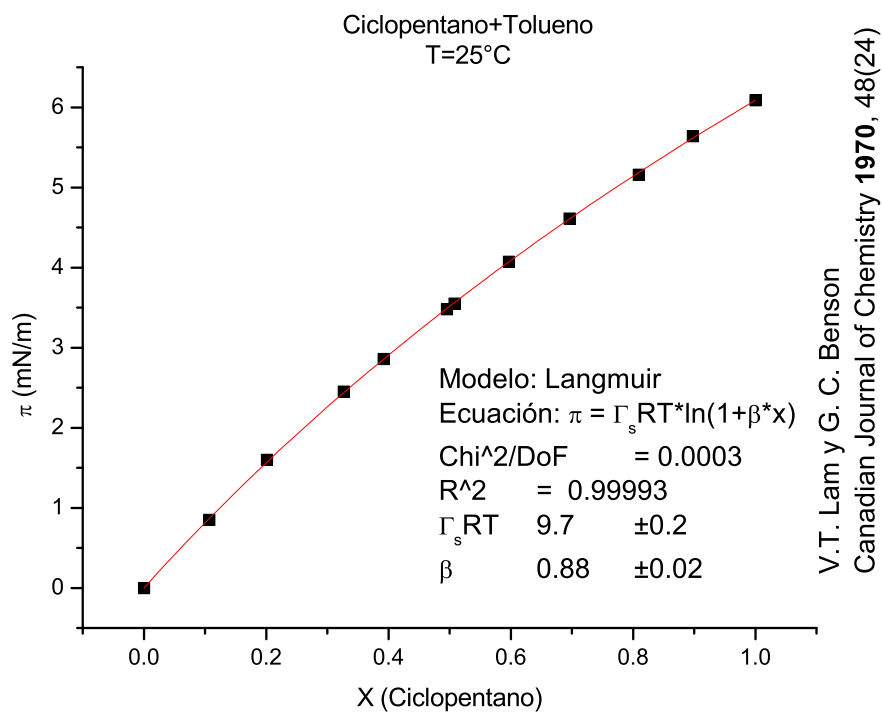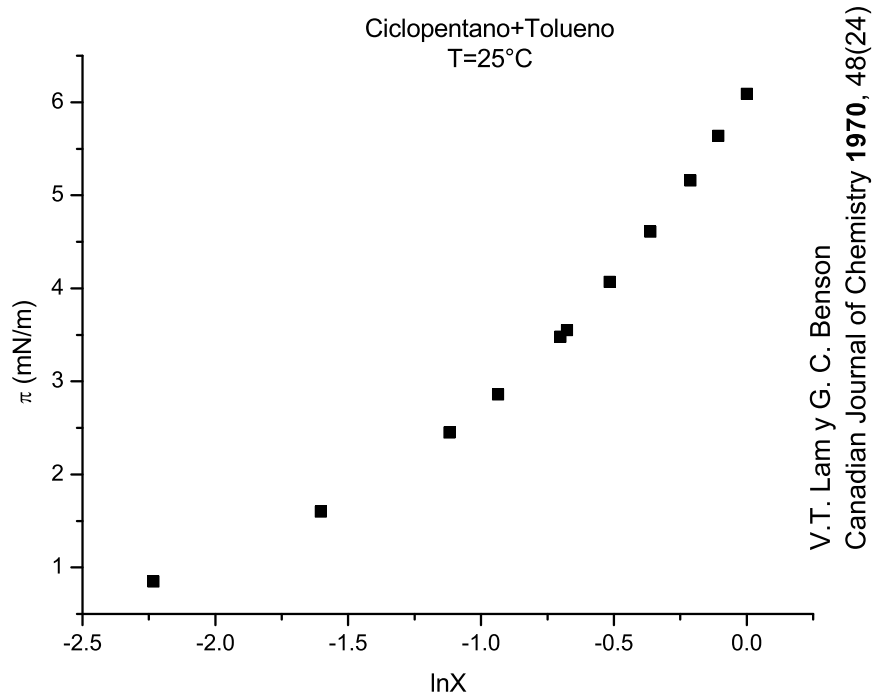
Tabla A.68: Ciclopentano + Tolueno a 25°C [19]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	27.94	0	–
0.1072	27.09	0.85	-2.23306
0.2012	26.34	1.6	-1.60346
0.3268	25.49	2.45	-1.11841
0.392	25.08	2.86	-0.93649
0.4959	24.46	3.48	-0.70138
0.5081	24.39	3.55	-0.67708
0.5973	23.87	4.07	-0.51534
0.6961	23.33	4.61	-0.36226
0.8093	22.78	5.16	-0.21159
0.898	22.3	5.64	-0.10759
1	21.85	6.09	0
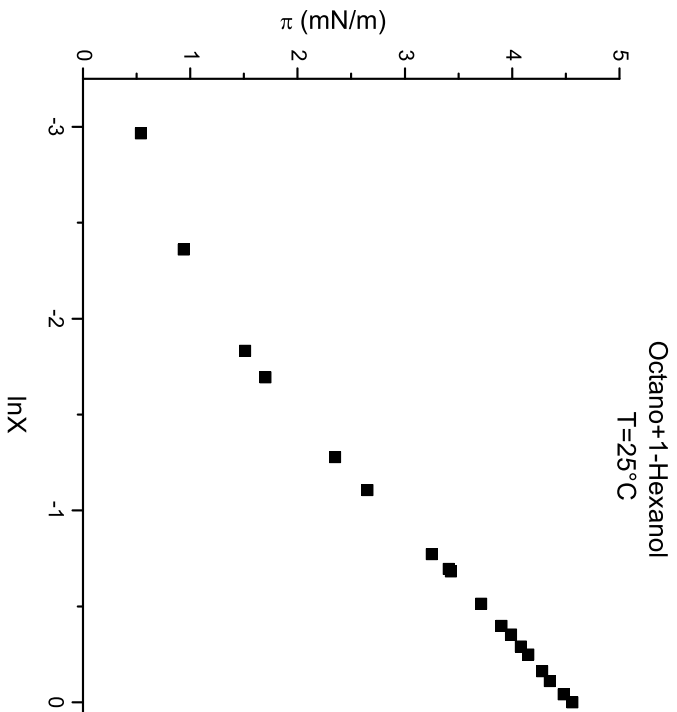
Octano+1-Hexanol
T=25°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF = 0.006
R^2 = 0.99725
Γ_sRT   2.4   ±0.1
β 5.9   ±0.5

π (mN/m)

X (1-Hexanol)

L. Segade, J. Jiménez, M. Domínguez, Ó. Cabeza,
M. Cabanas y E. Jiménez
J. Chem. Eng. Data **2003**, 48, 1251

Octano+1-Hexanol
T=25°C

π (mN/m)

lnX
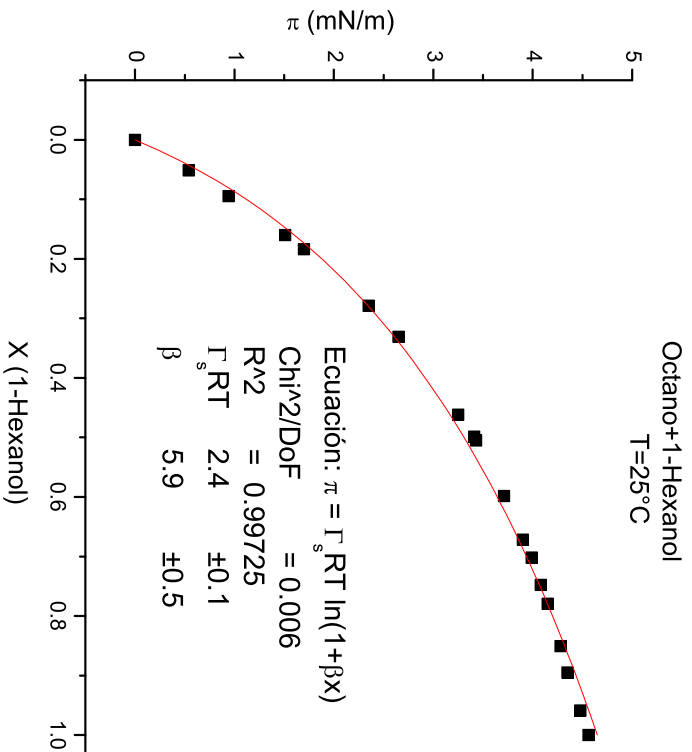
L. Segade, J. Jiménez, M. Domínguez, Ó. Cabeza,
M. Cabanas y E. Jiménez
J. Chem. Eng. Data **2003**, 48, 1251

Tabla A.69: Octano + 1-Hexanol a 25°C [38]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	25.73	0	–
0.0515	25.19	0.54	-2.96617
0.0944	24.79	0.94	-2.36021
0.16	24.22	1.51	-1.83258
0.1837	24.03	1.7	-1.69445
0.2785	23.38	2.35	-1.27834
0.3309	23.08	2.65	-1.10594
0.4619	22.48	3.25	-0.77241
0.4987	22.32	3.41	-0.69575
0.5049	22.3	3.43	-0.68339
0.5984	22.02	3.71	-0.5135
0.6717	21.83	3.9	-0.39794
0.7019	21.74	3.99	-0.35396
0.7478	21.65	4.08	-0.29062
0.7794	21.58	4.15	-0.24923
0.8504	21.45	4.28	-0.16205
0.895	21.38	4.35	-0.11093
0.959	21.25	4.48	-0.04186
1	21.17	4.56	0
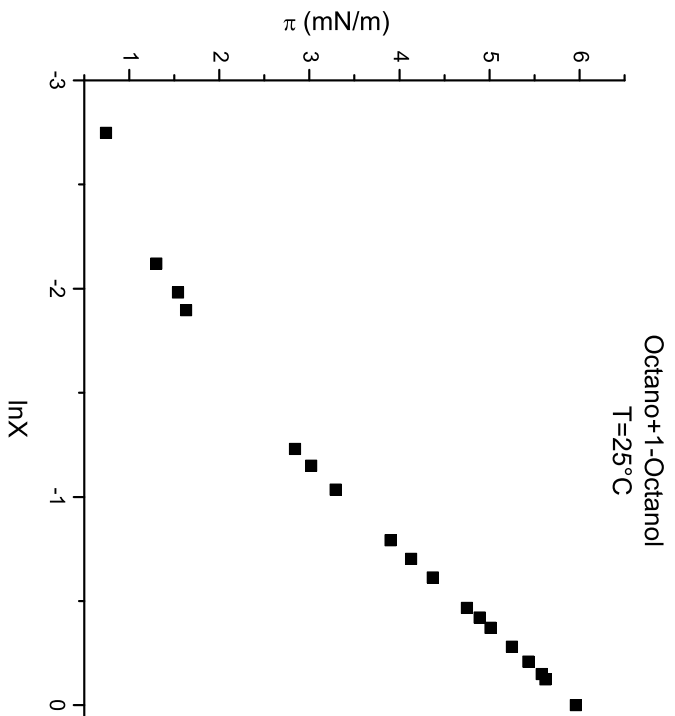
Octano+1-Octanol
T=25°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF = 0.004
R^2 = 0.99878

$\Gamma_s RT$	4.0	±0.1
β	3.5	±0.2

X (1-Octanol)

L. Segade, J. Jiménez, M. Domínguez, Ó. Cabeza,
M. Cabanas y E. Jiménez
J. Chem. Eng. Data **2003**, 48, 1251

Octano+1-Octanol
T=25°C

lnX
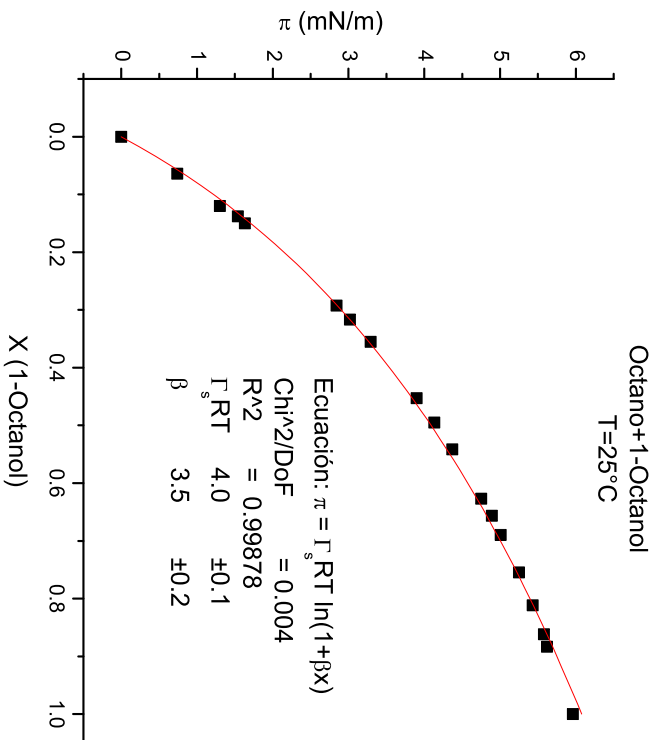
L. Segade, J. Jiménez, M. Domínguez, Ó. Cabeza,
M. Cabanas y E. Jiménez
J. Chem. Eng. Data **2003**, 48, 1251

Tabla A.70: Octano + 1-Octanol a 25°C [38]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	27.13	0	–
0.0641	26.39	0.74	-2.74731
0.12	25.83	1.3	-2.12026
0.1378	25.59	1.54	-1.98195
0.1501	25.5	1.63	-1.89645
0.2923	24.29	2.84	-1.22997
0.3168	24.11	3.02	-1.14948
0.3554	23.84	3.29	-1.03451
0.4526	23.23	3.9	-0.79275
0.495	23	4.13	-0.7032
0.5413	22.76	4.37	-0.61378
0.6269	22.38	4.75	-0.46697
0.6566	22.24	4.89	-0.42068
0.6897	22.12	5.01	-0.3715
0.7547	21.88	5.25	-0.28143
0.8114	21.7	5.43	-0.20899
0.8617	21.55	5.58	-0.14885
0.8832	21.51	5.62	-0.1242
1	21.17	5.96	0

Benceno + 2-Cloroetanol
T=30°C

Ling, T.D., van Winkle, M.
J.Chem.Eng.Data **1958**, 3, 88

Benceno + 2-Cloroetanol
T=30°C

Modelo: Langmuir

Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.002

R^2   = 0.99992

$\Gamma_s RT$ 2.8   ±0.1

β 46   ±3

Ling, T.D., van Winkle, M.
J.Chem.Eng.Data **1958**, 3, 88
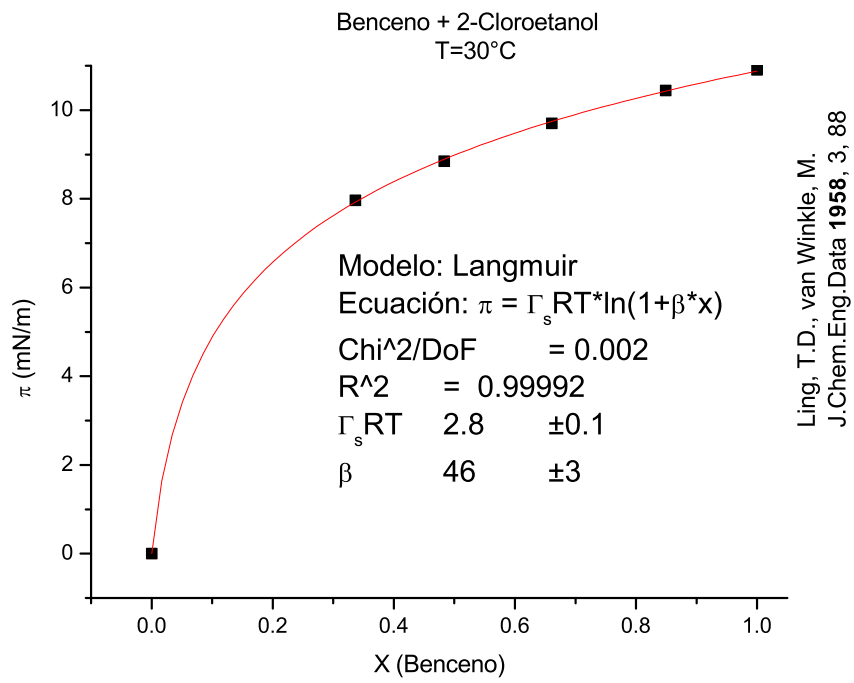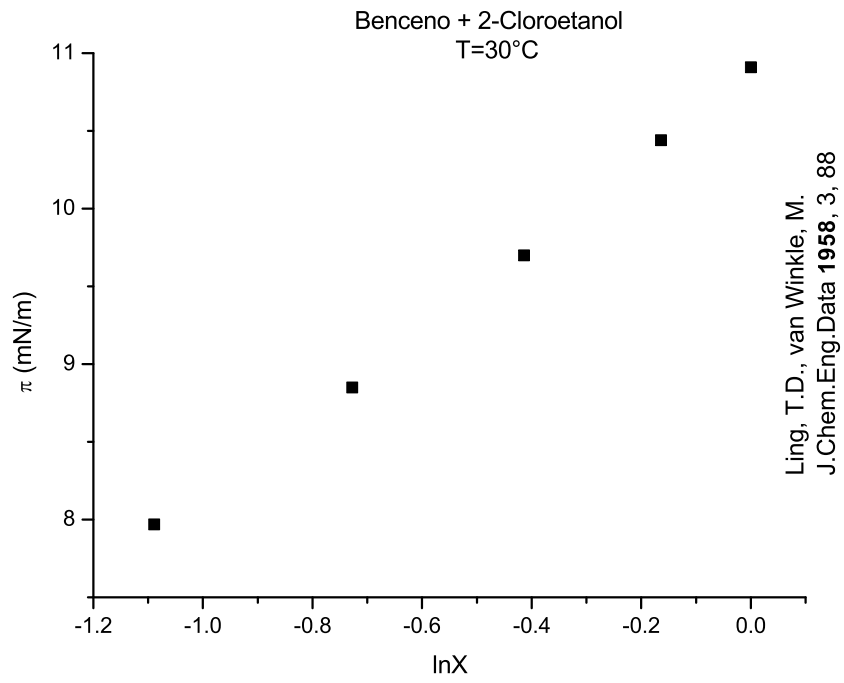
Tabla A.71: Benceno + 2-Cloroetanol a 30°C [21]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	38.48	0	–
0.3365	30.51	7.97	-1.08916
0.4832	29.63	8.85	-0.72732
0.6611	28.78	9.7	-0.41385
0.849	28.04	10.44	-0.1637
1	27.57	10.91	0

Benceno+Fenol
T=35°C

Benceno+Fenol
T=35°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF	= 0.001	
R^2	= 0.9999	
$\Gamma_s RT$	7.9	±0.1
β	3.6	±0.1
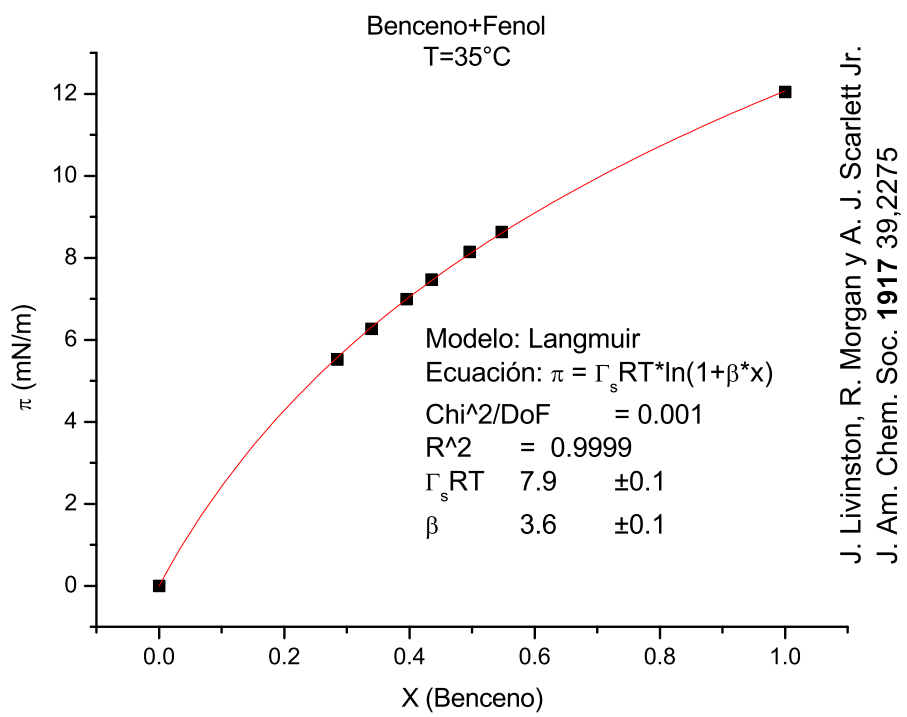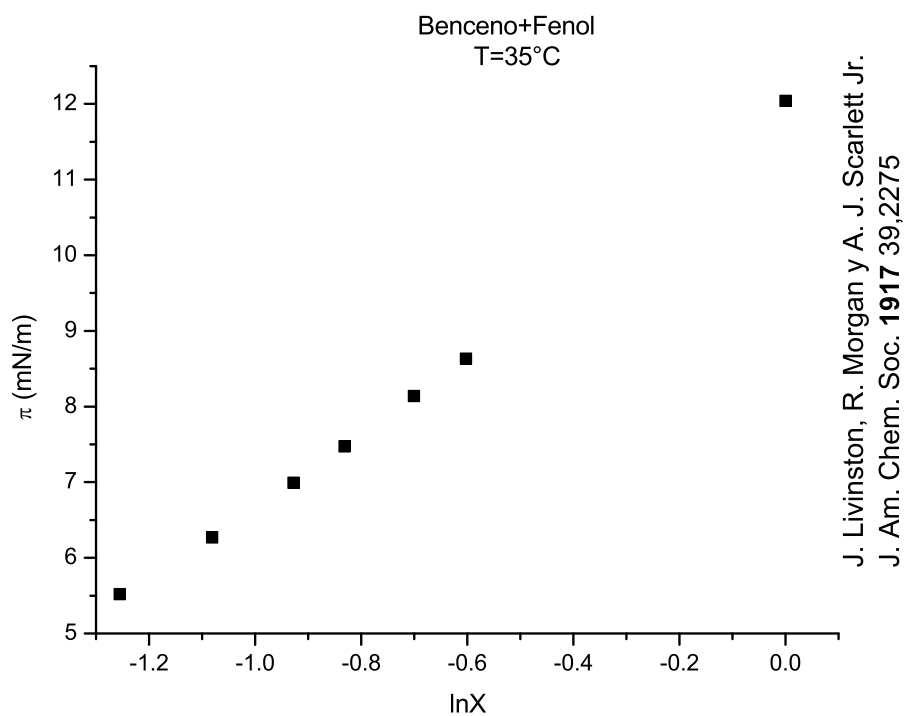
Tabla A.72: Benceno + Fenol a 35°C [24]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	38.033	0	−
0.285	32.513	5.52	-1.25527
0.3392	31.764	6.269	-1.08117
0.3954	31.038	6.995	-0.92786
0.4354	30.561	7.472	-0.83149
0.4964	29.892	8.141	-0.70037
0.5475	29.4	8.633	-0.60239
1	25.991	12.042	0

Ciclohexano+Dioxano
T=20°C

S. K. Suri y V. Ramakrishna
J. of Physical Chem. 1968, 72, 3073

Ciclohexano+Dioxano
T=20°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.02
R^2   = 0.99814
$\Gamma_s RT$ 15.7   ±2.6
β 0.75   ±0.15

S. K. Suri y V. Ramakrishna
J. of Physical Chem. 1968, 72, 3073
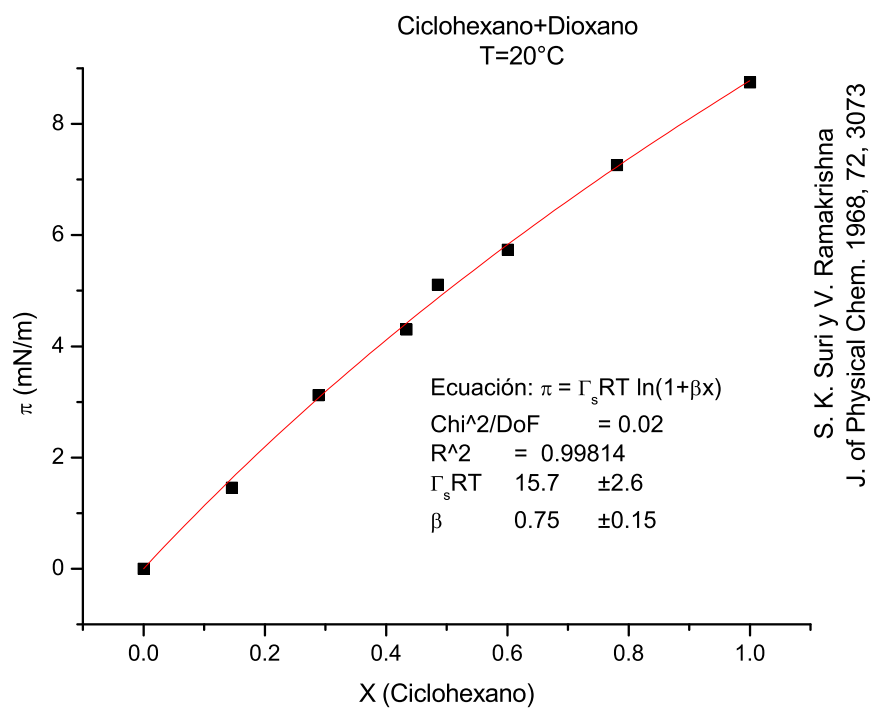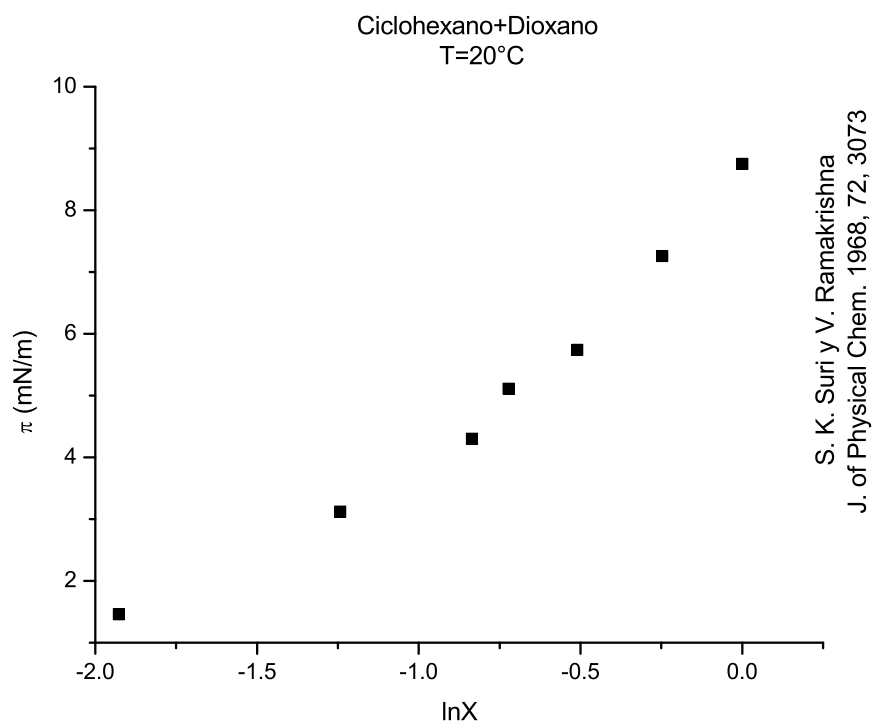
Tabla A.73: Ciclohexano + Dioxano a 20°C [43]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	33.75	0	–
0.1456	32.29	1.46	-1.92689
0.2885	30.63	3.12	-1.24306
0.4335	29.45	4.3	-0.83586
0.4857	28.64	5.11	-0.72216
0.6006	28.01	5.74	-0.50983
0.7807	26.49	7.26	-0.24756
1	25	8.75	0

Ciclohexano+Dioxano
T=30°C

π (mN/m)

lnX

S. K. Suri y V. Ramakrishna
J. of Physical Chem. 1968, 72, 3073

Ciclohexano+Dioxano
T=30°C

π(mN/m)

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.01282
R^2   = 0.99856
$\Gamma_s RT$ 6.5   ±0.46
β 2.6   ±0.3

X (Ciclohexano)

S. K. Suri y V. Ramakrishna
J. of Physical Chem. 1968, 72, 3073
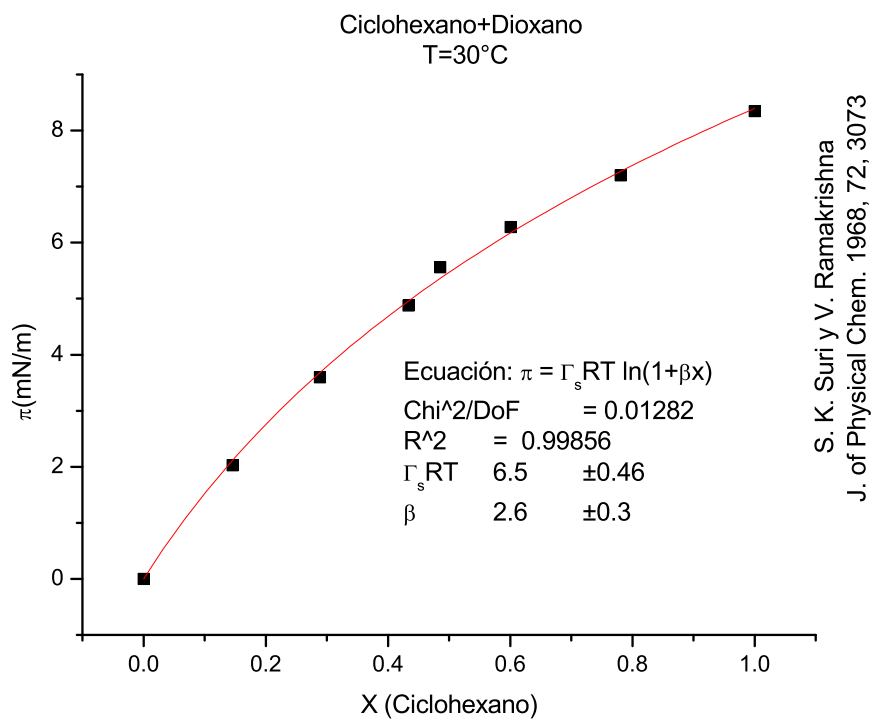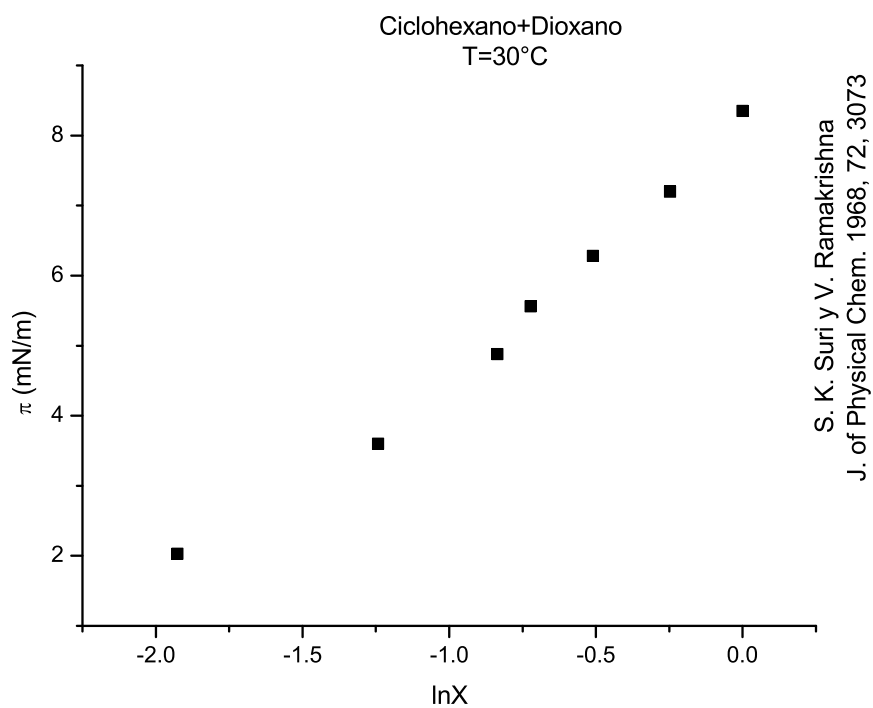
Tabla A.74: Ciclohexano + Dioxano a 30°C [43]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	32.2	0	–
0.1456	30.17	2.03	-1.92689
0.2885	28.6	3.6	-1.24306
0.4335	27.32	4.88	-0.83586
0.4857	26.64	5.56	-0.72216
0.6006	25.92	6.28	-0.50983
0.7807	25	7.2	-0.24756
1	23.85	8.35	0

Ciclopentano+Benceno
T=25 C

V.T. Lam y G. C. Benson
Canadian Journal of Chemistry **1970**, 48(24)

Ciclopentano+Benceno
T=25 C

Modelo: Langmuir
Ecuaci n: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.02
R^2   = 0.99617
$\Gamma_s RT$ 7.6   −1.1
β   1.2   −0.2

V.T. Lam y G. C. Benson
Canadian Journal of Chemistry **1970**, 48(24)
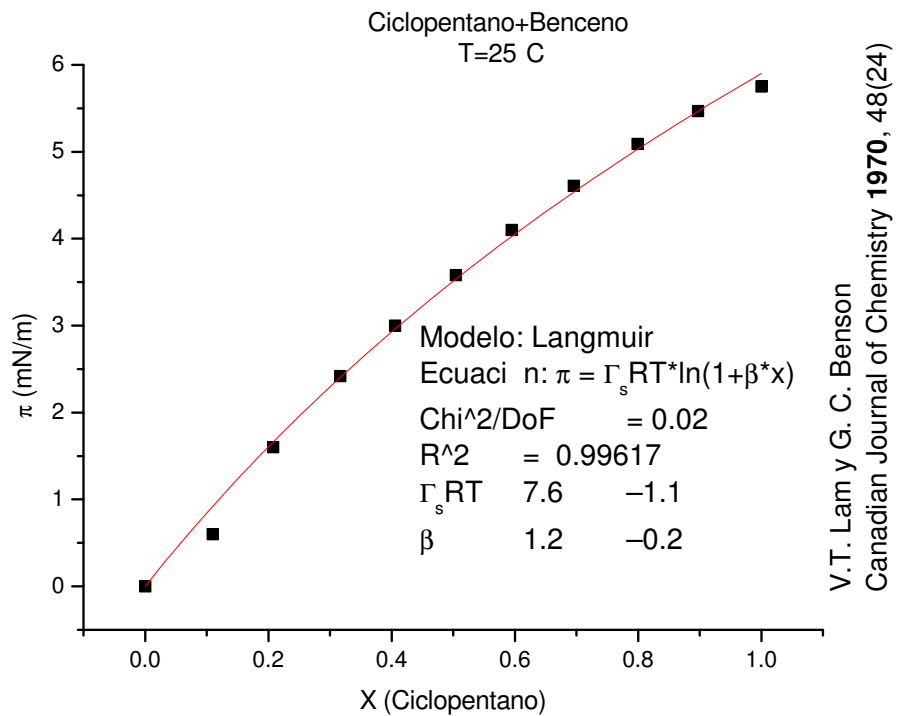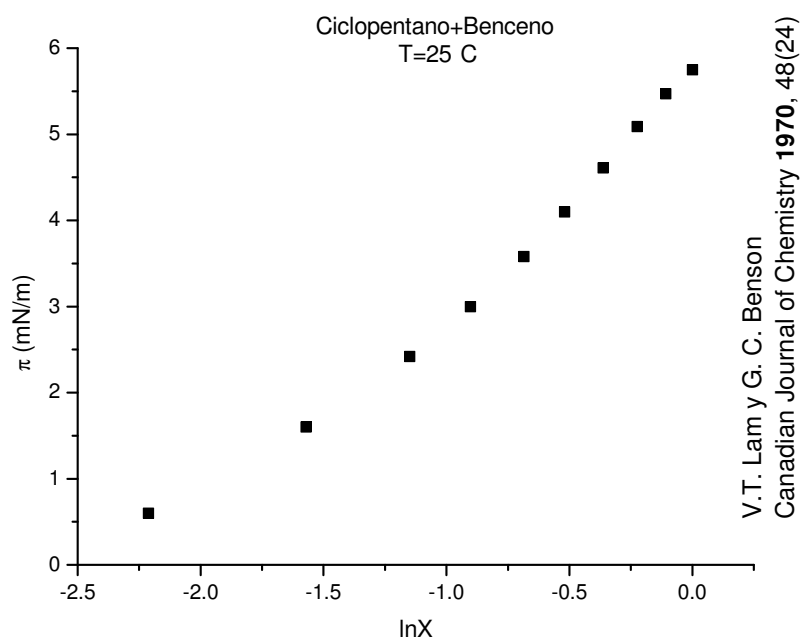
Tabla A.75: Ciclopentano + Benceno a 25°C [19]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	27.6	0	–
0.1095	27	0.6	-2.21183
0.2078	26	1.6	-1.57118
0.3168	25.18	2.42	-1.14948
0.4055	24.6	3	-0.90263
0.5042	24.02	3.58	-0.68478
0.5949	23.5	4.1	-0.51936
0.6959	22.99	4.61	-0.36255
0.7993	22.51	5.09	-0.22402
0.8972	22.13	5.47	-0.10848
1	21.85	5.75	0

Ciclohexano+Benceno
T=20°C

Ciclohexano+Benceno
T=20°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF	= 0.008	
R^2	= 0.99581	
$\Gamma_s RT$	1.78	±0.14
β	8	±1
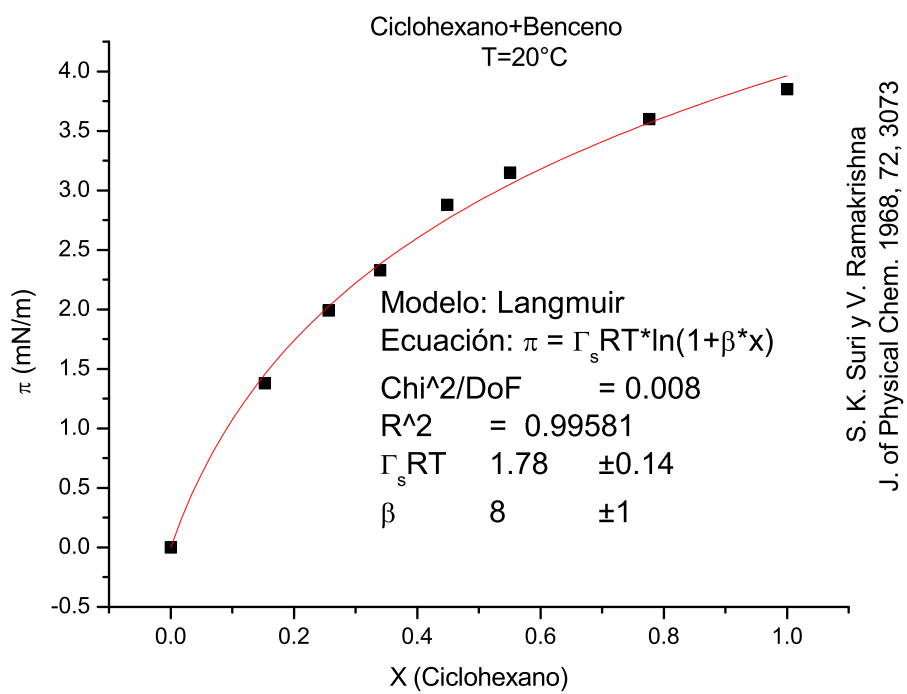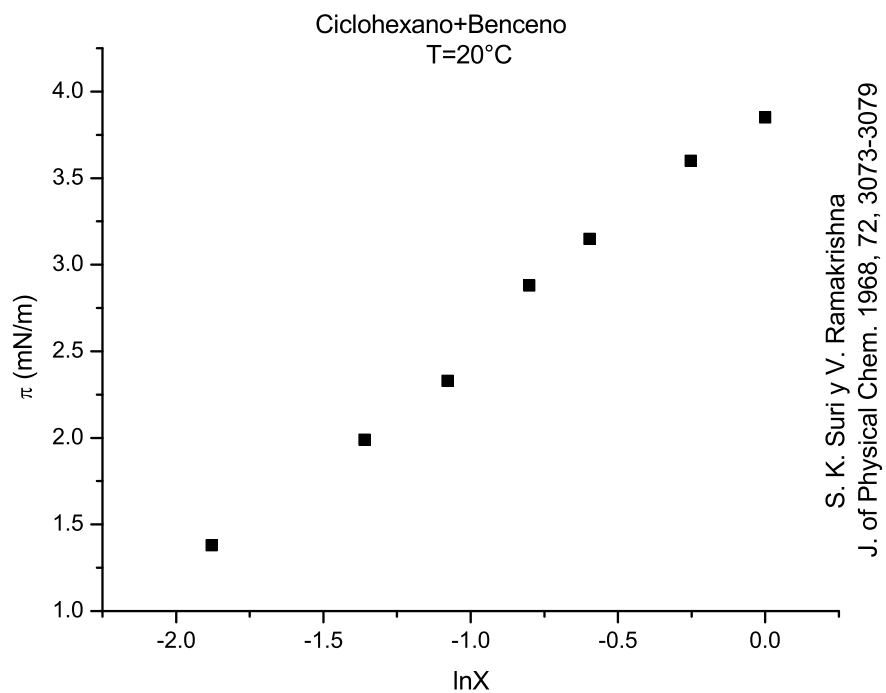
Tabla A.76: Ciclohexano + Benceno a 20°C [43]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
1	25	3.85	0
0.7764	25.25	3.6	-0.25309
0.5505	25.7	3.15	-0.59693
0.449	25.97	2.88	-0.80073
0.3399	26.52	2.33	-1.0791
0.2564	26.86	1.99	-1.36102
0.1526	27.47	1.38	-1.87994
0	28.85	0	–

Ciclohexano+Benceno
T=30°C

S. K. Suri y V. Ramakrishna
J. of Physical Chem. 1968, 72, 3073

Ciclohexano+Benceno
T=30°C

S. K. Suri y V. Ramakrishna
J. of Physical Chem. 1968, 72, 3073
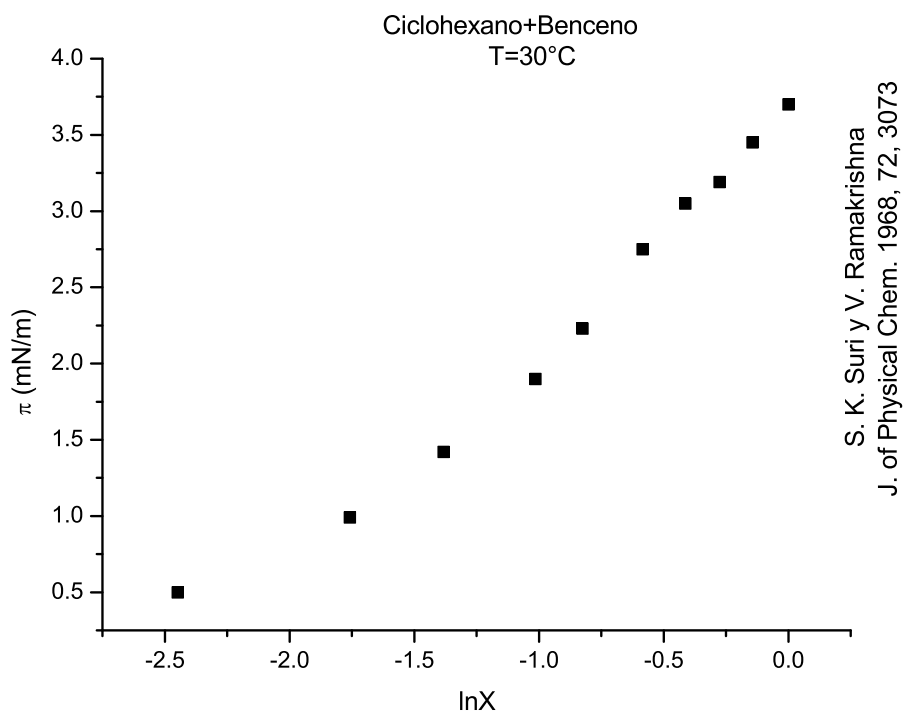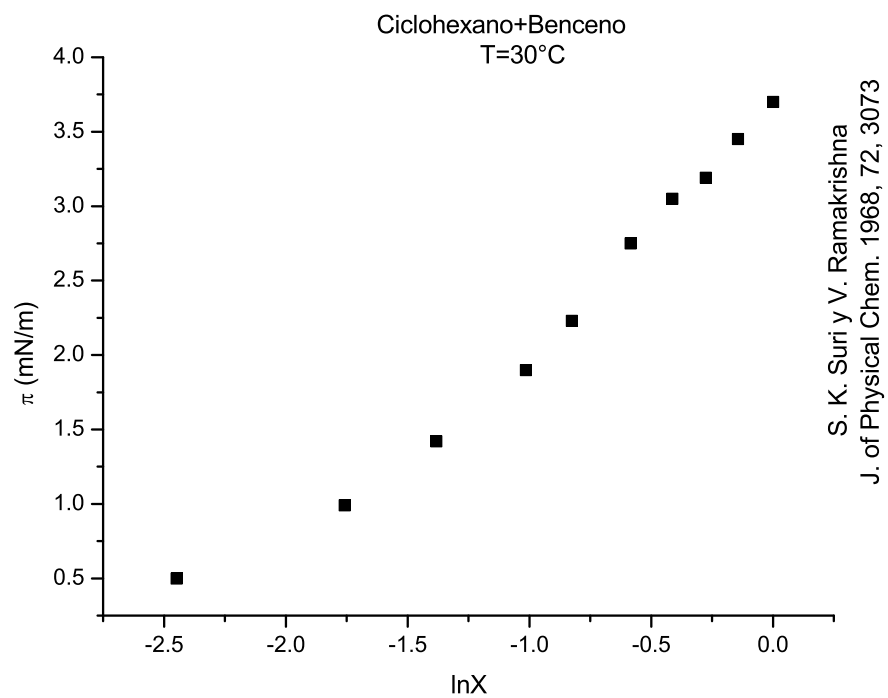
Tabla A.77: Ciclohexano + Benceno a 30°C [43]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
1	23.85	3.7	0
0.8668	24.1	3.45	-0.14295
0.7595	24.36	3.19	-0.27509
0.662	24.5	3.05	-0.41249
0.5574	24.8	2.75	-0.58447
0.4379	25.32	2.23	-0.82576
0.3627	25.65	1.9	-1.01418
0.2509	26.13	1.42	-1.3827
0.1723	26.56	0.99	-1.75852
0.0864	27.05	0.5	-2.44877
0	27.55	0	–
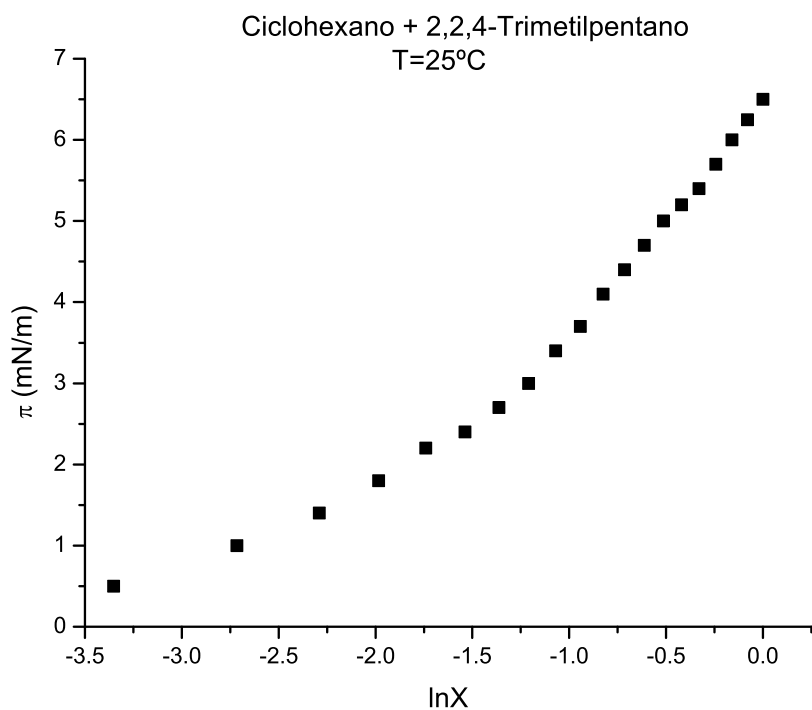
Ciclohexano + 2,2,4-Trimetilpentano
T=25ºC

Ciclohexano + 2,2,4-Trimetilpentano
T=25ºC

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF = 0.004
R^2 = 0.99895
$\Gamma_s RT$ 4.2   ±0.1
β 3.7   ±0.2
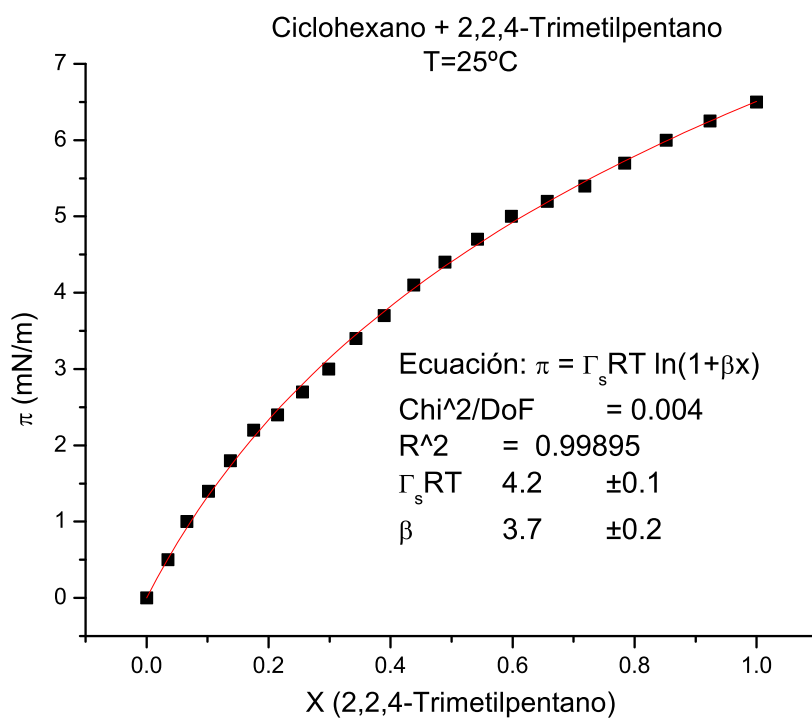
Tabla A.78: Ciclohexano + 2-2-4-Trimetilpentano a T=25°C [10]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
1	18.6	6.5	0
0.9238	18.85	6.25	-0.07926
0.8517	19.1	6	-0.16052
0.7834	19.4	5.7	-0.24411
0.7185	19.7	5.4	-0.33059
0.6569	20.1	5	-0.51383
0.5423	20.4	4.7	-0.61194
0.4891	20.7	4.4	-0.71519
0.4382	21	4.1	-0.82508
0.3895	21.4	3.7	-0.94289
0.343	21.7	3.4	-1.07002
0.2984	22.1	3	-1.20932
0.2557	22.4	2.7	-1.36375
0.2147	22.7	2.4	-1.53851
0.1754	22.9	2.2	-1.74069
0.1376	23.3	1.8	-1.9834
0.1012	23.7	1.4	-2.29066
0.0662	24.1	1	-2.71507
0.035	24.6	0.5	-3.35241
0	25.1	0	–
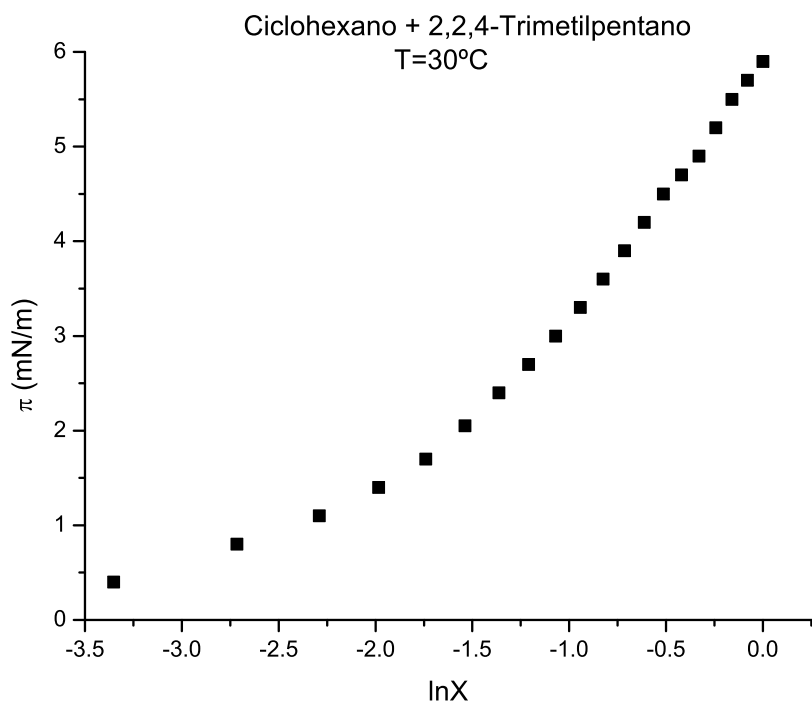
Ciclohexano + 2,2,4-Trimetilpentano
T=30ºC

Ciclohexano + 2,2,4-Trimetilpentano
T=30ºC

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.002
R^2   = 0.99938
$\Gamma_s RT$ 4.5   ±0.1
β 2.7   ±0.1
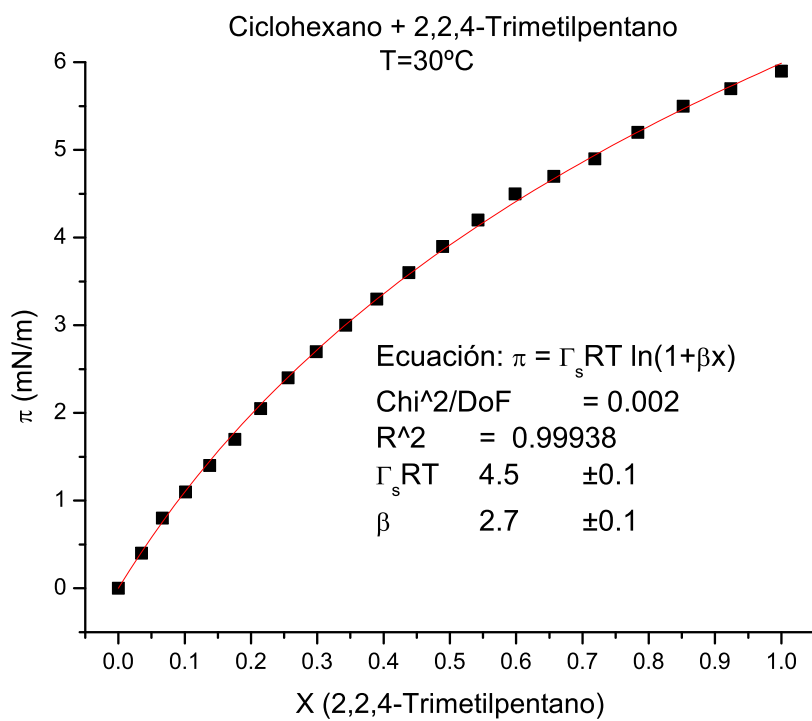
Tabla A.79: 2-2-4-Trimetilpentano + Ciclohexano a T=30°C [10]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
1	18.2	5.9	0
0.9238	18.4	5.7	-0.07926
0.8517	18.6	5.5	-0.16052
0.7834	18.9	5.2	-0.24411
0.7185	19.2	4.9	-0.33059
0.6569	19.4	4.7	-0.42022
0.5982	19.6	4.5	-0.51383
0.5423	19.9	4.2	-0.61194
0.4891	20.2	3.9	-0.71519
0.4382	20.5	3.6	-0.82508
0.3895	20.8	3.3	-0.94289
0.343	21.1	3	-1.07002
0.2984	21.4	2.7	-1.20932
0.2557	21.7	2.4	-1.36375
0.2147	22.05	2.05	-1.53851
0.1754	22.4	1.7	-1.74069
0.1376	22.7	1.4	-1.9834
0.1012	23	1.1	-2.29066
0.0662	23.3	0.8	-2.71507
0.035	23.7	0.4	-3.35241
0	24.1	0	–
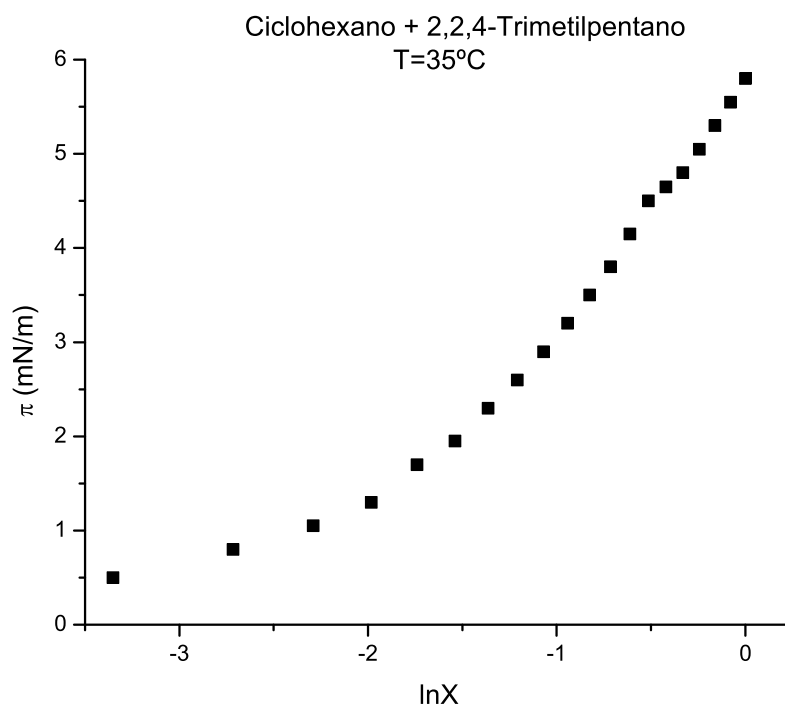
Ciclohexano + 2,2,4-Trimetilpentano
T=35ºC

Ciclohexano + 2,2,4-Trimetilpentano
T=35ºC

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.006
R^2   = 0.99825
$\Gamma_s RT$ 4.5   ±0.2
β 2.6   ±0.2
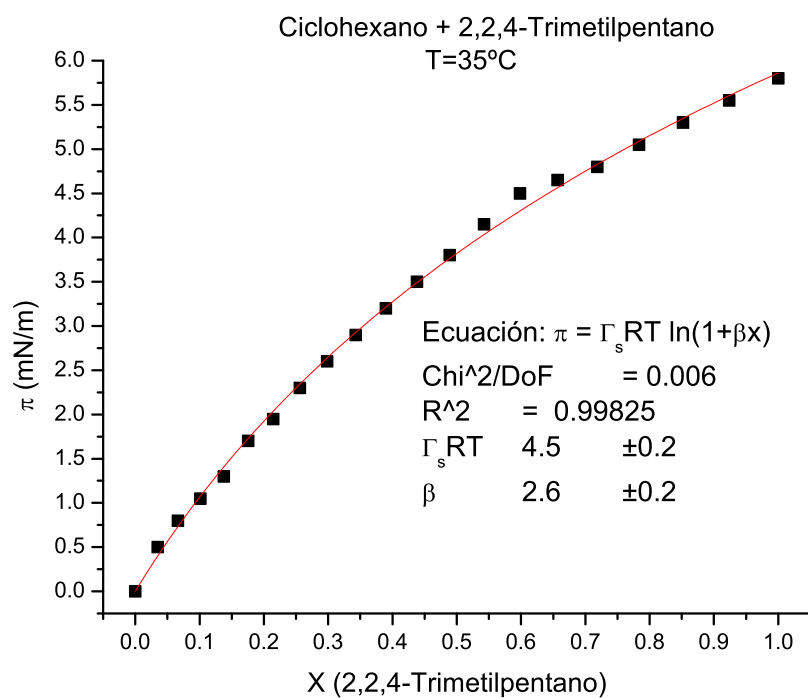
Tabla A.80: Ciclohexano + 2-2-4-Trimetilpentano a T=35°C [10]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
1	17.7	5.8	0
0.9238	17.95	5.55	-0.07926
0.8517	18.2	5.3	-0.16052
0.7834	18.45	5.05	-0.24411
0.7185	18.7	4.8	-0.33059
0.6569	18.85	4.65	-0.42022
0.5982	19	4.5	-0.51383
0.5423	19.35	4.15	-0.61194
0.4891	19.7	3.8	-0.71519
0.4382	20	3.5	-0.82508
0.3895	20.3	3.2	-0.94289
0.343	20.6	2.9	-1.07002
0.2984	20.9	2.6	-1.20932
0.2557	21.2	2.3	-1.36375
0.2147	21.55	1.95	-1.53851
0.1754	21.8	1.7	-1.74069
0.1376	22.2	1.3	-1.9834
0.1012	22.45	1.05	-2.29066
0.0662	22.7	0.8	-2.71507
0.035	23	0.5	-3.35241
0	23.5	0	–
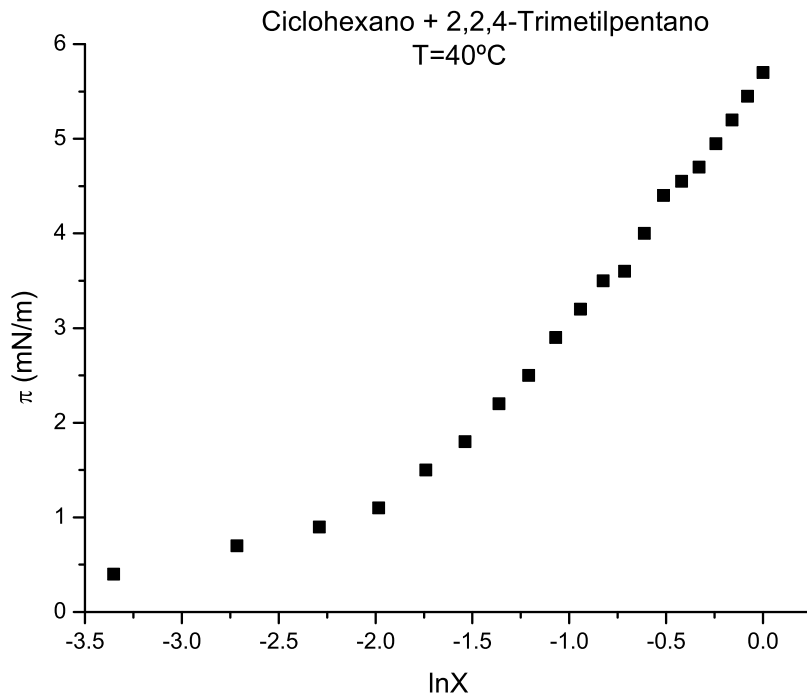
Ciclohexano + 2,2,4-Trimetilpentano
T=40ºC

Ciclohexano + 2,2,4-Trimetilpentano
T=40ºC

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF = 0.01
R^2 = 0.9966
$\Gamma_s RT$ 4.9 ±0.3
β 2.2 ±0.2
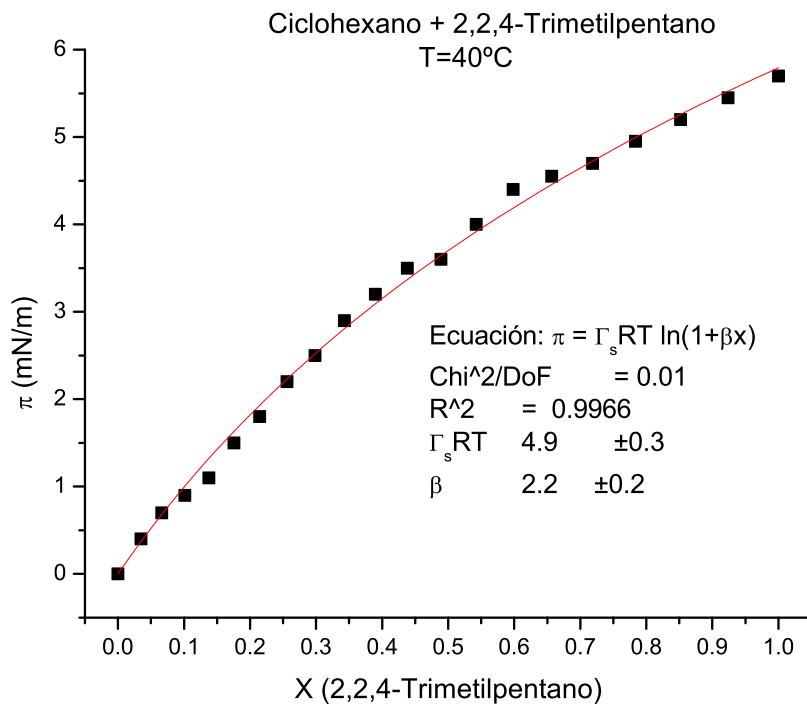
Tabla A.81: Ciclohexano + 2-2-4-Trimetilpentano a T=40°C[10]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
1	17.2	5.7	0
0.9238	17.45	5.45	-0.07926
0.8517	17.7	5.2	-0.16052
0.7834	17.95	4.95	-0.24411
0.7185	18.2	4.7	-0.33059
0.6569	18.35	4.55	-0.42022
0.5982	18.5	4.4	-0.51383
0.5423	18.9	4	-0.61194
0.4891	19.3	3.6	-0.71519
0.4382	19.4	3.5	-0.82508
0.3895	19.7	3.2	-0.94289
0.343	20	2.9	-1.07002
0.2984	20.4	2.5	-1.20932
0.2557	20.7	2.2	-1.36375
0.2147	21.1	1.8	-1.53851
0.1754	21.4	1.5	-1.74069
0.1376	21.8	1.1	-1.9834
0.1012	22	0.9	-2.29066
0.0662	22.2	0.7	-2.71507
0.035	22.5	0.4	-3.35241
0	22.9	0	–
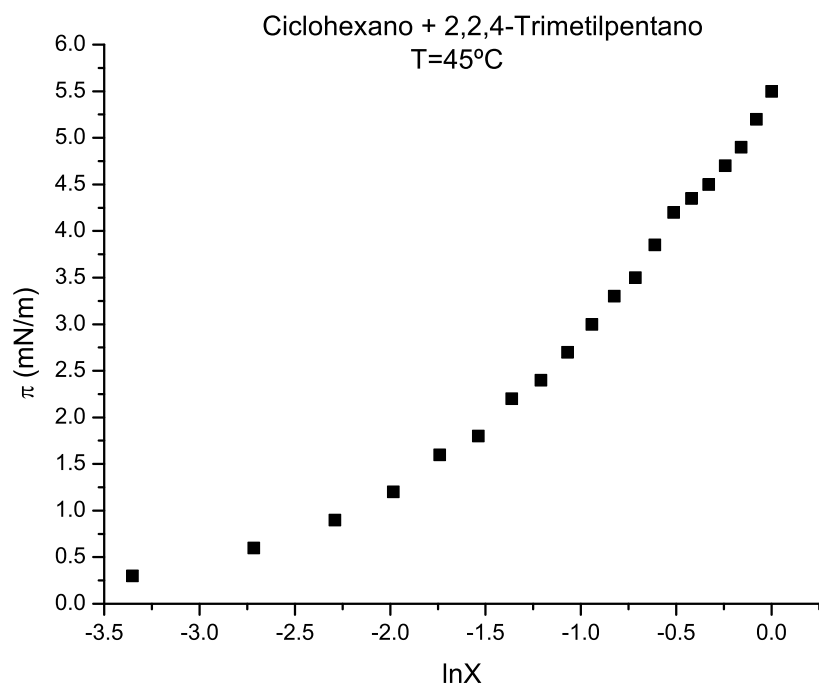
Ciclohexano + 2,2,4-Trimetilpentano
T=45ºC

Ciclohexano + 2,2,4-Trimetilpentano
T=45ºC

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.006
R^2   = 0.99813
$\Gamma_s RT$ 4.4   ±0.2
β 2.4   ±0.2
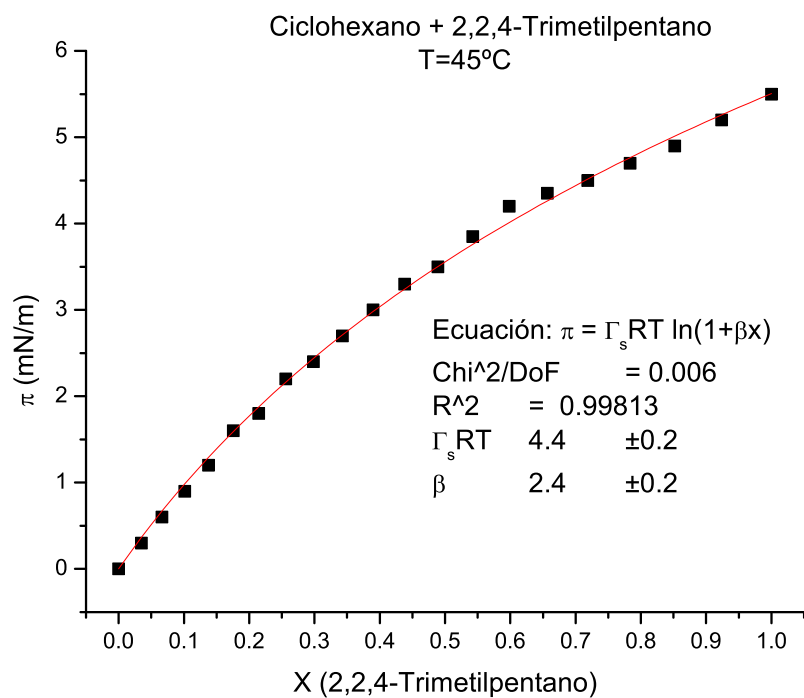
X (2,2,4-Trimetilpentano)

Tabla A.82: Ciclohexano + 2-2-4-Trimetilpentano a T=45°C [10]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
1	16.7	5.5	0
0.9238	17	5.2	-0.07926
0.8517	17.3	4.9	-0.16052
0.7834	17.5	4.7	-0.24411
0.7185	17.7	4.5	-0.33059
0.6569	17.85	4.35	-0.42022
0.5982	18	4.2	-0.51383
0.5423	18.35	3.85	-0.61194
0.4891	18.7	3.5	-0.71519
0.4382	18.9	3.3	-0.82508
0.3895	19.2	3	-0.94289
0.343	19.5	2.7	-1.07002
0.2984	19.8	2.4	-1.20932
0.2557	20	2.2	-1.36375
0.2147	20.4	1.8	-1.53851
0.1754	20.6	1.6	-1.74069
0.1376	21	1.2	-1.9834
0.1012	21.3	0.9	-2.29066
0.0662	21.6	0.6	-2.71507
0.035	21.9	0.3	-3.35241
0	22.2	0	–

Ciclohexano + 2,2,4-Trimetilpentano
T=50ºC

π (mN/m)

lnX

Ciclohexano + 2,2,4-Trimetilpentano
T=50ºC

π (mN/m)

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.007
R^2   = 0.99783
$\Gamma_s RT$ 4.2   ±0.2
β 2.7   ±0.2

X (2,2,4-Trimetilpentano)
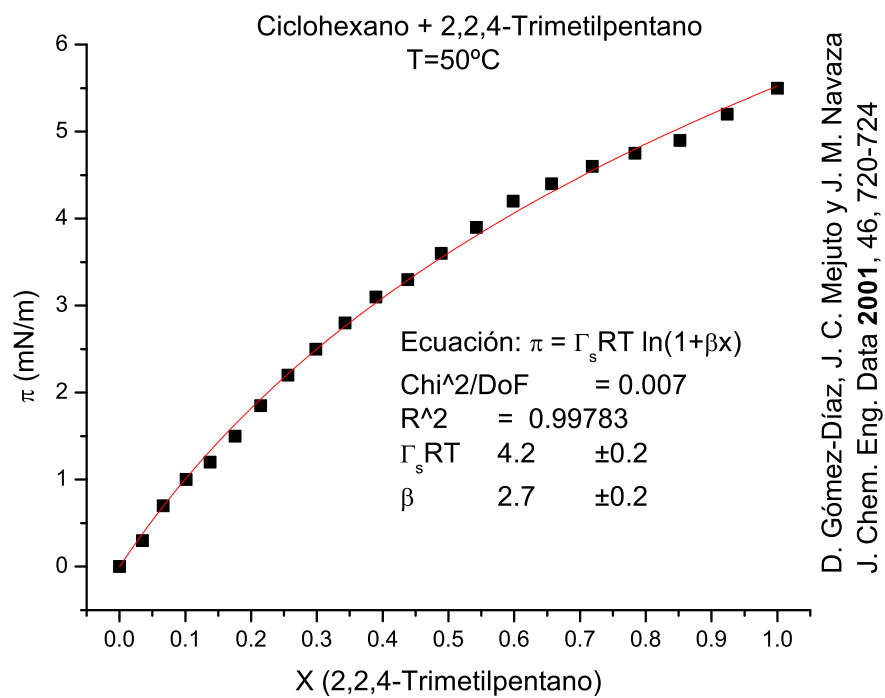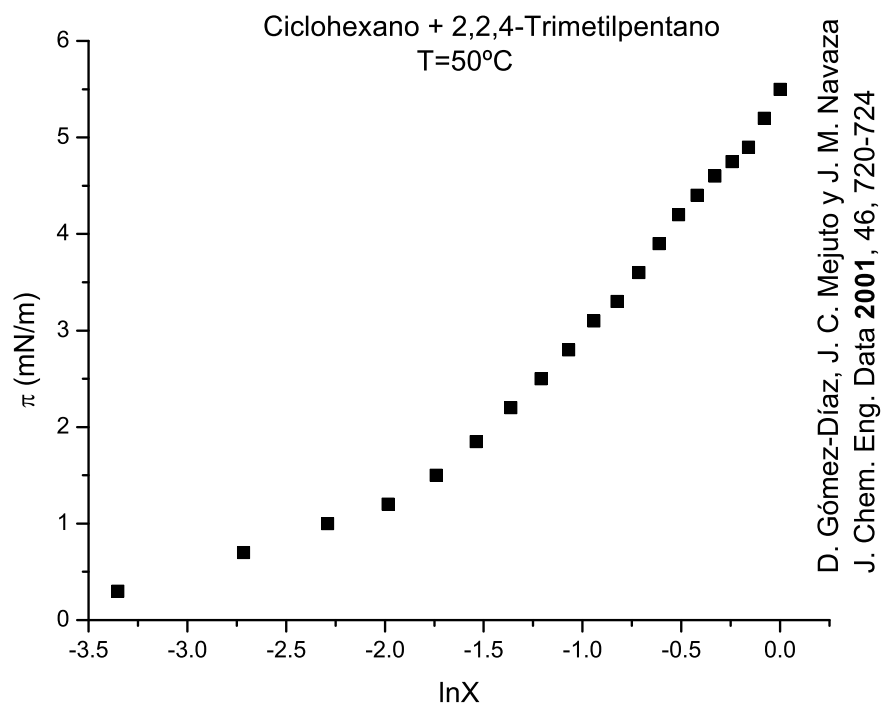
Tabla A.83: Ciclohexano + 2-2-4-Trimetilpentano a T=50°C [10]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
1	16.2	5.5	0
0.9238	16.5	5.2	-0.07926
0.8517	16.8	4.9	-0.16052
0.7834	16.95	4.75	-0.24411
0.7185	17.1	4.6	-0.33059
0.6569	17.3	4.4	-0.42022
0.5982	17.5	4.2	-0.51383
0.5423	17.8	3.9	-0.61194
0.4891	18.1	3.6	-0.71519
0.4382	18.4	3.3	-0.82508
0.3895	18.6	3.1	-0.94289
0.343	18.9	2.8	-1.07002
0.2984	19.2	2.5	-1.20932
0.2557	19.5	2.2	-1.36375
0.2147	19.85	1.85	-1.53851
0.1754	20.2	1.5	-1.74069
0.1376	20.5	1.2	-1.9834
0.1012	20.7	1	-2.29066
0.0662	21	0.7	-2.71507
0.035	21.4	0.3	-3.35241
0	21.7	0	–

Ciclopentano + Tetracloroetileno
T=25°C

V.T. Lam y G. C. Benson
Canadian Journal of Chemistry **1970**, 48(24)

Ciclopentano + Tetracloroetileno
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF   = 0.002
R^2   = 0.99984
$\Gamma_s RT$ 14   ±0.5
β 0.96   ±0.04

V.T. Lam y G. C. Benson
Canadian Journal of Chemistry **1970**, 48(24)
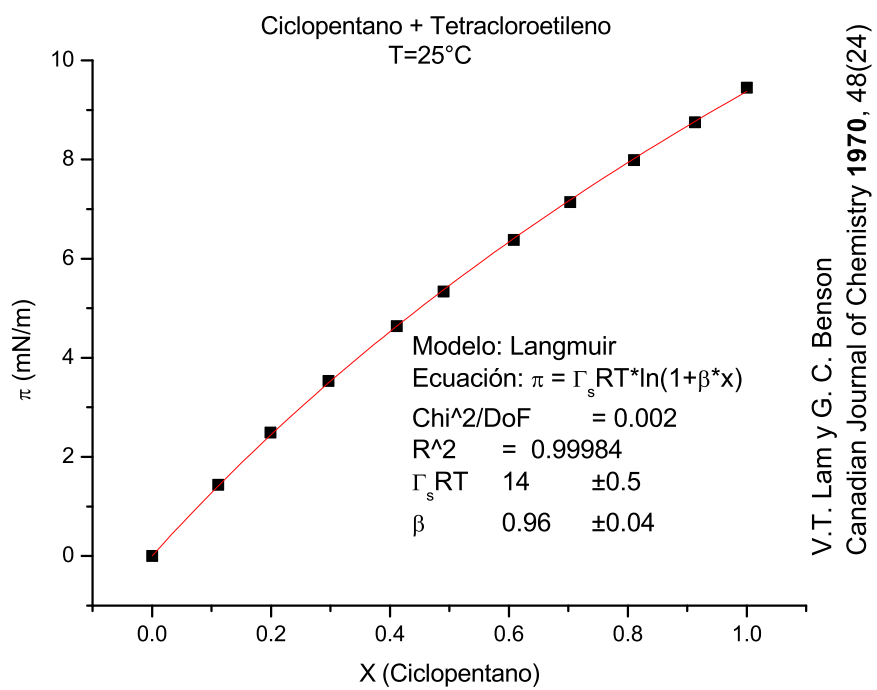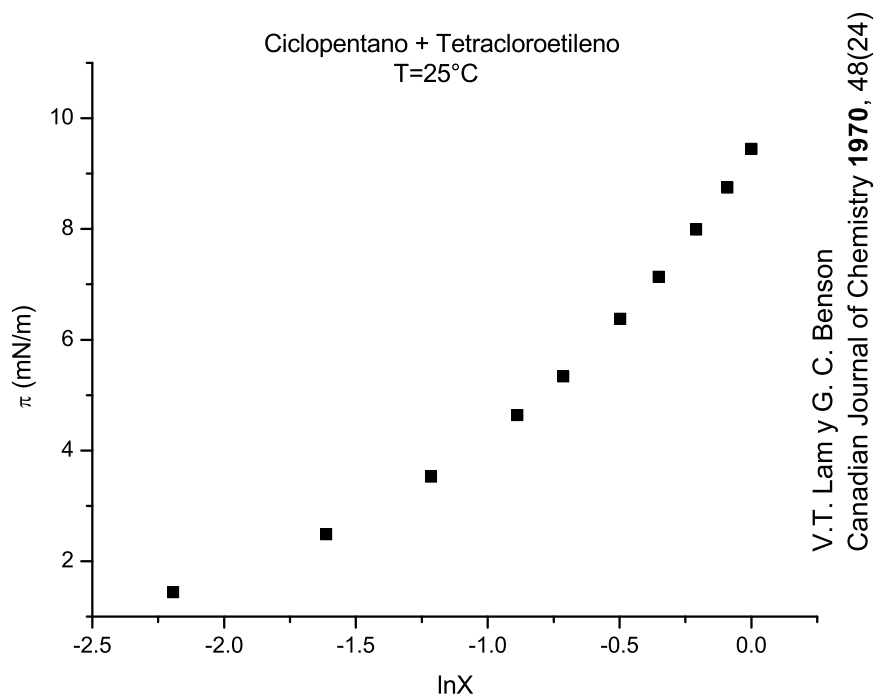
Tabla A.84: Ciclopentano + Tetracloroetileno a 25°C [19]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	31.3	0	–
0.1115	29.86	1.44	-2.19373
0.1993	28.81	2.49	-1.61294
0.2966	27.77	3.53	-1.21537
0.4117	26.66	4.64	-0.88746
0.4901	25.96	5.34	-0.71315
0.6081	24.92	6.38	-0.49742
0.7031	24.16	7.14	-0.35226
0.8107	23.31	7.99	-0.20986
0.9127	22.55	8.75	-0.09135
1	21.85	9.45	0

Tetraclorometano+Ciclohexano
T=20°C

Siskova, M., Secova, V.
Collect.Czech.Chem.Commun. **1970**, 35, 2702

Tetraclorometano+Ciclohexano
T=20°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.002
R^2   = 0.99836
$\Gamma_s RT$ 2.7   ±0.2
β 1.6   ±0.2

Siskova, M,, Secova, V.
Collect.Czech.Chem.Commun. **1970**, 35, 2702

Tabla A.85: Tetraclorometano + Ciclohexano a 20°C [39]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	26.71	0	–
0.1143	26.2857	0.4243	-2.16893
0.2311	25.8289	0.8811	-1.4649
0.3522	25.4078	1.3022	-1.04356
0.4708	25.0692	1.6408	-0.75332
0.6041	24.8459	1.8641	-0.50402
0.735	24.555	2.155	-0.30788
0.8629	24.2771	2.4329	-0.14746
1	24	2.71	0

Hexametil disilazano+Tetraclorometano
T=30°C

Hexametil-disilazano+Tetraclorometano
T=30°C

Modelo: Langmuir

Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF = 0.007

R^2 = 0.99915

$\Gamma_s RT$ 3.2   ±0.1

β 12   ±1

Myers, R.S., Clever, H.L.
J.Chem.Eng.Data **1969**, 14, 161
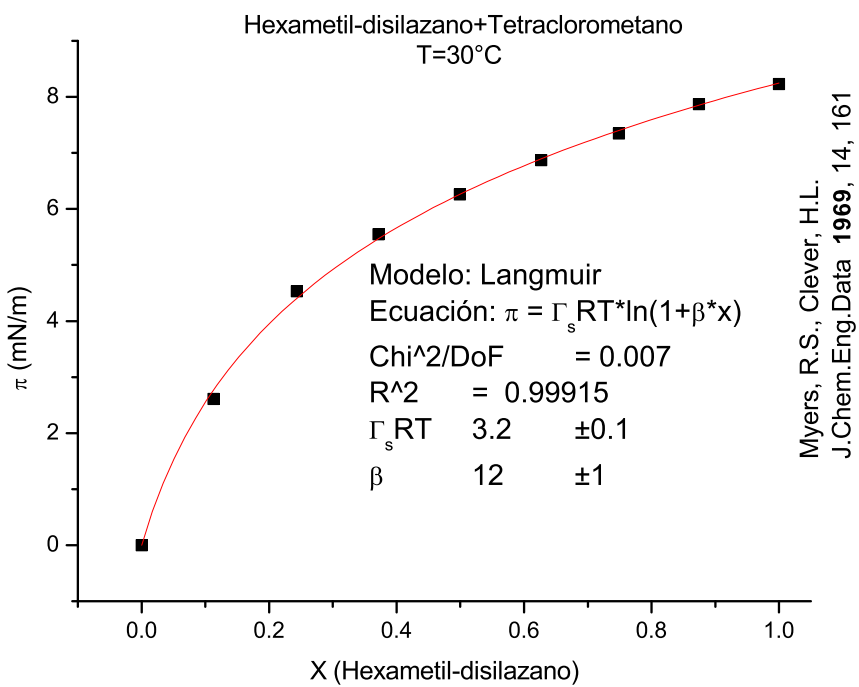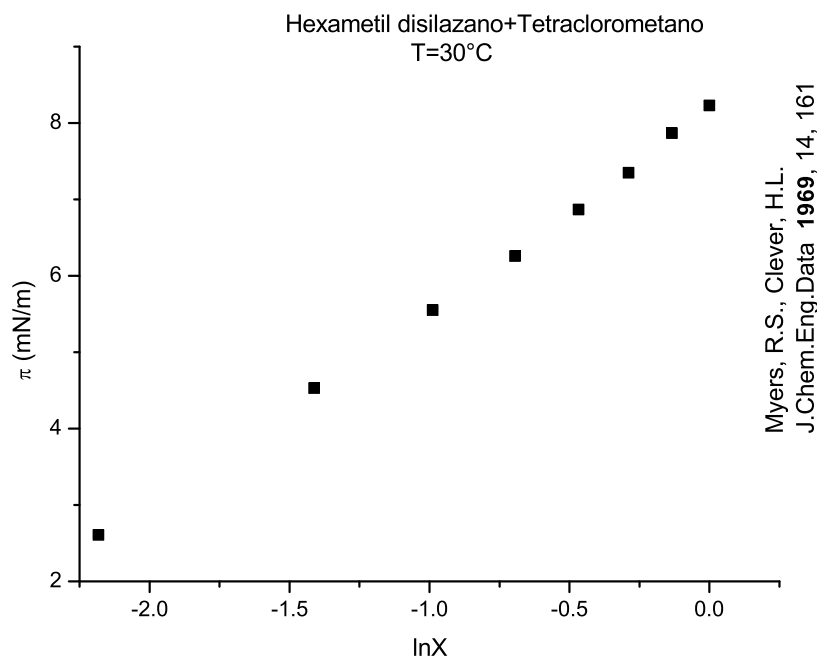
Tabla A.86: Hexametil-disilazano + Tetraclorometano a 30°C [28]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	25.95	0	–
0.1128	23.34	2.61	-2.18214
0.2435	21.42	4.53	-1.41264
0.3719	20.4	5.55	-0.98913
0.4991	19.69	6.26	-0.69495
0.6267	19.08	6.87	-0.46729
0.7489	18.6	7.35	-0.28915
0.8743	18.08	7.87	-0.13433
1	17.72	8.23	0

Ciclopentano + 1,1,2,2-Tetracloroeteno
T=25°C

Lam, V.T., Benson, G.C.
Can. J. Chem. **1970**, 24, 3773

Ciclopentano + 1,1,2,2-Tetracloroeteno
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF	= 0.002	
R^2	= 0.99984	
$\Gamma_s RT$	14	±0.5
β	0.95	±0.04

Lam, V.T., Benson, G.C.
Can. J. Chem. **1970**, 24, 3773
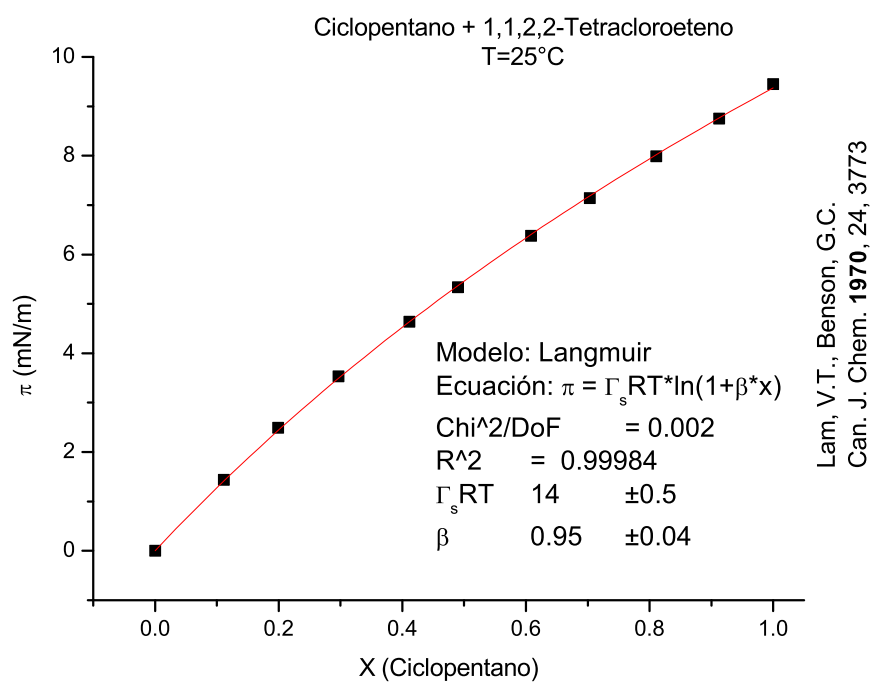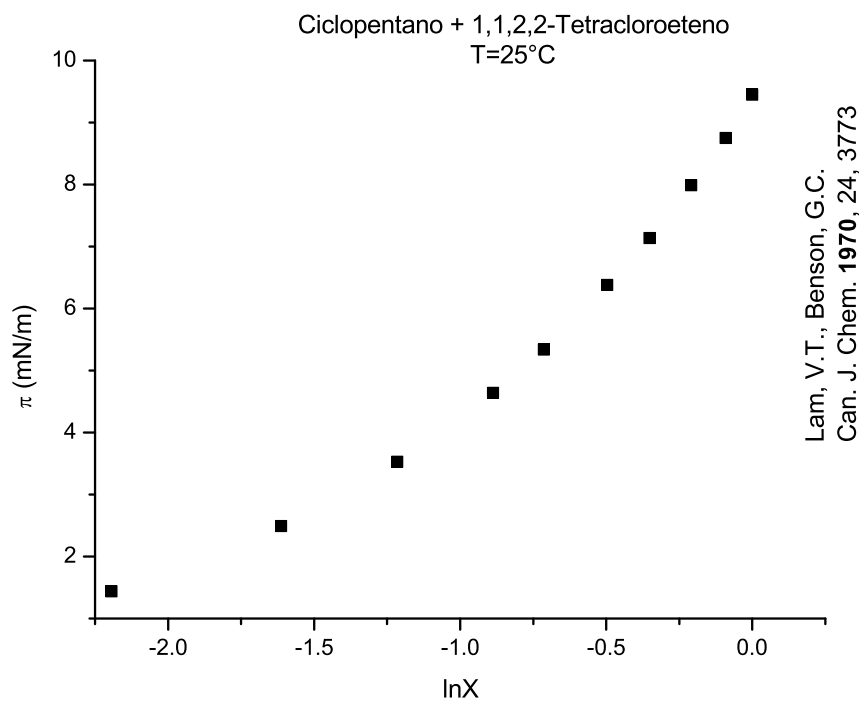
Tabla A.87: Ciclopentano + 1,1,2,2-Tetracloroeteno a 25°C [19]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	31.3	0	–
0.1115	29.86	1.44	-2.19373
0.1993	28.81	2.49	-1.61294
0.2966	27.77	3.53	-1.21537
0.4117	26.66	4.64	-0.88746
0.4901	25.96	5.34	-0.71315
0.6081	24.92	6.38	-0.49742
0.7031	24.16	7.14	-0.35226
0.8107	23.31	7.99	-0.20986
0.9127	22.55	8.75	-0.09135
1	21.85	9.45	0

Ciclohexano + 1,1,2,2-Tetracloroeteno
T=25°C

Lam, V.T., Benson, G.C.
Can. J. Chem. **1970**, 24, 3773

Ciclohexano + 1,1,2,2-Tetracloroeteno
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.001
R^2   = 0.99976
$\Gamma_s RT$ 6.1   ±0.2
β 2.1   ±0.1

Lam, V.T., Benson, G.C.
Can. J. Chem. **1970**, 24, 3773

Tabla A.88: Ciclohexano + 1,1,2,2-Tetracloroeteno a 25°C [19]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	31.3	0	–
0.0918	30.19	1.11	-2.38814
0.2112	29.13	2.17	-1.55495
0.309	28.18	3.12	-1.17441
0.4141	27.45	3.85	-0.88165
0.5139	26.81	4.49	-0.66573
0.6081	26.23	5.07	-0.49742
0.7065	25.71	5.59	-0.34743
0.8128	25.15	6.15	-0.20727
0.892	24.81	6.49	-0.11429
1	24.38	6.92	0

Ciclohexano+Tetracloroetileno
T=25°C

V.T. Lam y G. C. Benson
Canadian Journal of Chemistry **1970**, 48(24)

π (mN/m)

lnX

Ciclohexano+Tetracloroetileno
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT * \ln(1+\beta * x)$

Chi^2/DoF   = 0.001
R^2   = 0.99976
$\Gamma_s RT$ 6.1   ±0.2
β 2.1   ±0.1

π (mN/m)

X (Ciclohexano)

V.T. Lam y G. C. Benson
Canadian Journal of Chemistry **1970**, 48(24)

Tabla A.89: Ciclohexano + Tetracloroetileno a 25°C [19]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	31.3	0	–
0.0918	30.19	1.11	-2.38814
0.2112	29.13	2.17	-1.55495
0.309	28.18	3.12	-1.17441
0.4141	27.45	3.85	-0.88165
0.5139	26.81	4.49	-0.66573
0.6081	26.23	5.07	-0.49742
0.7065	25.71	5.59	-0.34743
0.8128	25.15	6.15	-0.20727
0.892	24.81	6.49	-0.11429
1	24.38	6.92	0

LANGMUIR 1 SUFIJO

Metanol+Agua
T=20°C

Vazquez, G., Alvarez, E., Navaza, J.M.
J.Chem.Eng.Data **1995**,40, 611

Metanol+Agua
T=20°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.3
R^2   = 0.99866
$\Gamma_s RT$ 15.5   ±0.4
β 32   ±2

$0 \leq X \leq 0.568$

Vazquez, G., Alvarez, E., Navaza, J.M.
J.Chem.Eng.Data **1995**,40, 611

Metanol + Agua
T=20°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)-\alpha(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.03
R^2   = 0.99991
$\Gamma_s RT$ 4.2   ±0.6
β 7.4   ±0.2
α -46.6   ±1.8

Vazquez, G., Alvarez, E., Navaza, J.M.
J.Chem.Eng.Data **1995**,40, 611
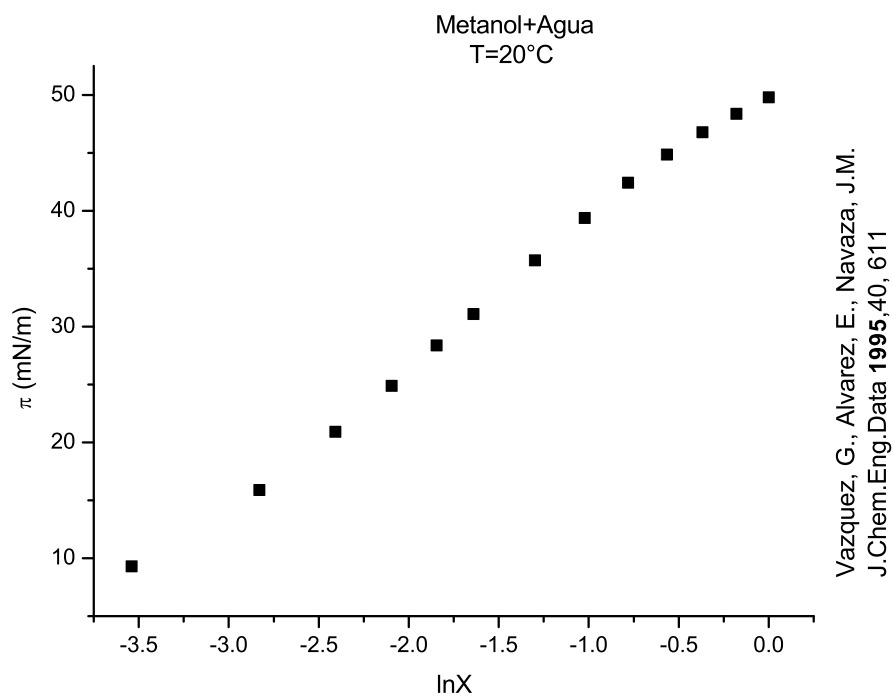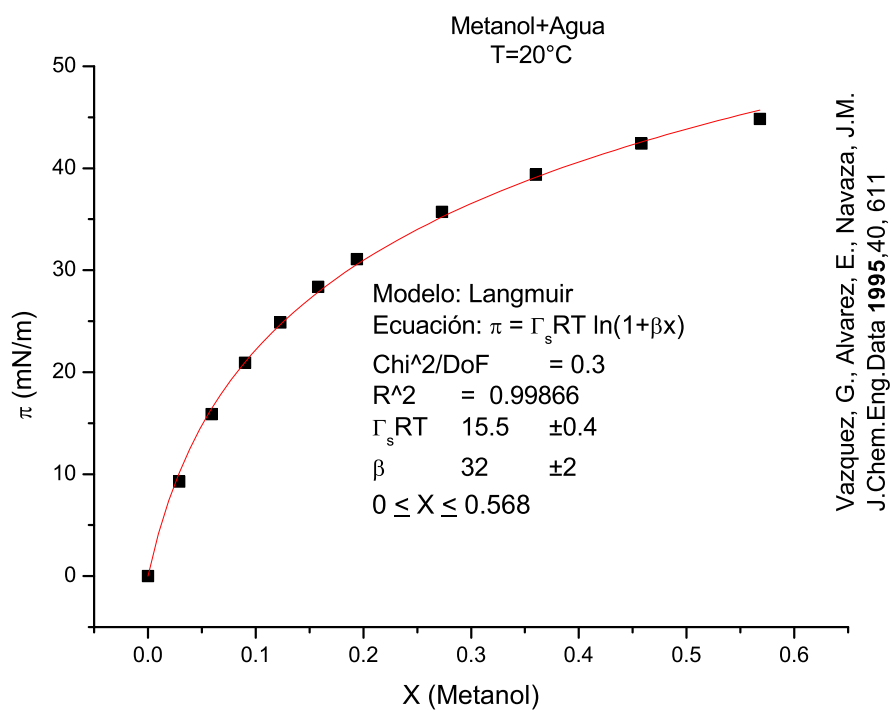
Tabla B.1: Metanol + Agua a T=20°C [51]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	72.75	0	–
0.029	63.46	9.29	-3.54046
0.059	56.87	15.88	-2.83022
0.09	51.83	20.92	-2.40795
0.123	47.86	24.89	-2.09557
0.158	44.38	28.37	-1.84516
0.194	41.67	31.08	-1.6399
0.273	37.02	35.73	-1.29828
0.36	33.37	39.38	-1.02165
0.458	30.32	42.43	-0.78089
0.568	27.91	44.84	-0.56563
0.692	25.98	46.77	-0.36817
0.835	24.37	48.38	-0.18032
1	22.95	49.8	0

Metanol+Agua
T=25°C

Vazquez, G., Alvarez, E., Navaza, J.M.
J.Chem.Eng.Data **1995**,40, 611

Metanol+Agua
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.2
R^2   = 0.99909
$\Gamma_s RT$ 16.0   ±0.4
β 30   ±2

$0 \leq X \leq 0.458$

Vazquez, G., Alvarez, E., Navaza, J.M.
J.Chem.Eng.Data **1995**,40, 611

Metanol + Agua
T=25°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))$

Chi^2/DoF	= 0.02	
R^2	= 0.99991	
$\Gamma_s RT$	4.3	±0.6
β	7.5	±0.25
α	-45.9	±1.7

π (mN/m)

X (Metanol)

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Tabla B.2: Metanol + Agua a T=25°C [51]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	72.01	0	–
0.029	62.77	9.24	-3.54046
0.059	56.18	15.83	-2.83022
0.09	51.17	20.84	-2.40795
0.123	47.21	24.8	-2.09557
0.158	43.78	28.23	-1.84516
0.194	41.09	30.92	-1.6399
0.273	36.51	35.5	-1.29828
0.36	32.86	39.15	-1.02165
0.458	29.83	42.18	-0.78089
0.568	27.48	44.53	-0.56563
0.692	25.54	46.47	-0.36817
0.835	23.93	48.08	-0.18032
1	22.51	49.5	0
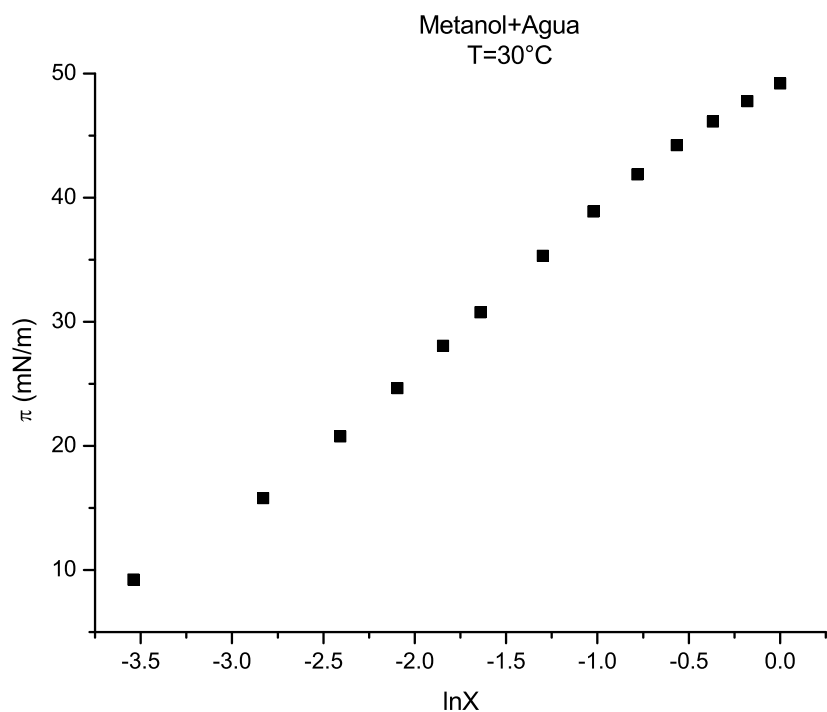
Metanol+Agua
T=30°C

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Metanol+Agua
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.2
R^2   = 0.99907
$\Gamma_s RT$ 15.7   ±0.4
β 30   ±2
$0 \le X \le 0.458$

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Metanol + Agua
T=30°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.02
R^2   = 0.99992
$\Gamma_s RT$ 4.5   ±0.6
β 7.7   ±0.2
α -44.8   ±1.6

π (mN/m)
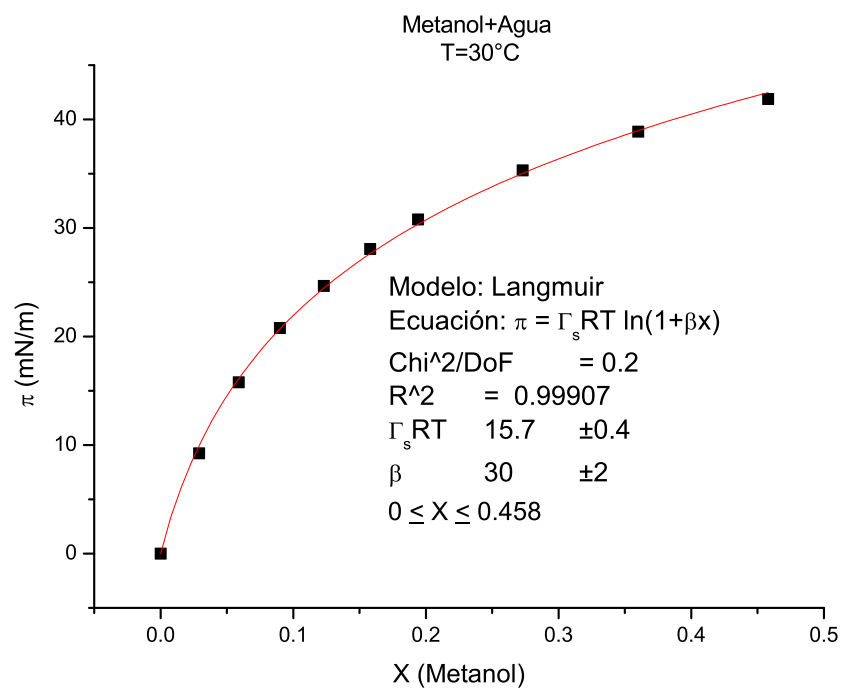
X (Metanol)

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Tabla B.3: Metanol + Agua a T=30°C [51]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	71.21	0	–
0.029	61.98	9.23	-3.54046
0.059	55.41	15.8	-2.83022
0.09	50.43	20.78	-2.40795
0.123	46.56	24.65	-2.09557
0.158	43.14	28.07	-1.84516
0.194	40.43	30.78	-1.6399
0.273	35.9	35.31	-1.29828
0.36	32.33	38.88	-1.02165
0.458	29.34	41.87	-0.78089
0.568	26.99	44.22	-0.56563
0.692	25.06	46.15	-0.36817
0.835	23.43	47.78	-0.18032
1	22.01	49.2	0
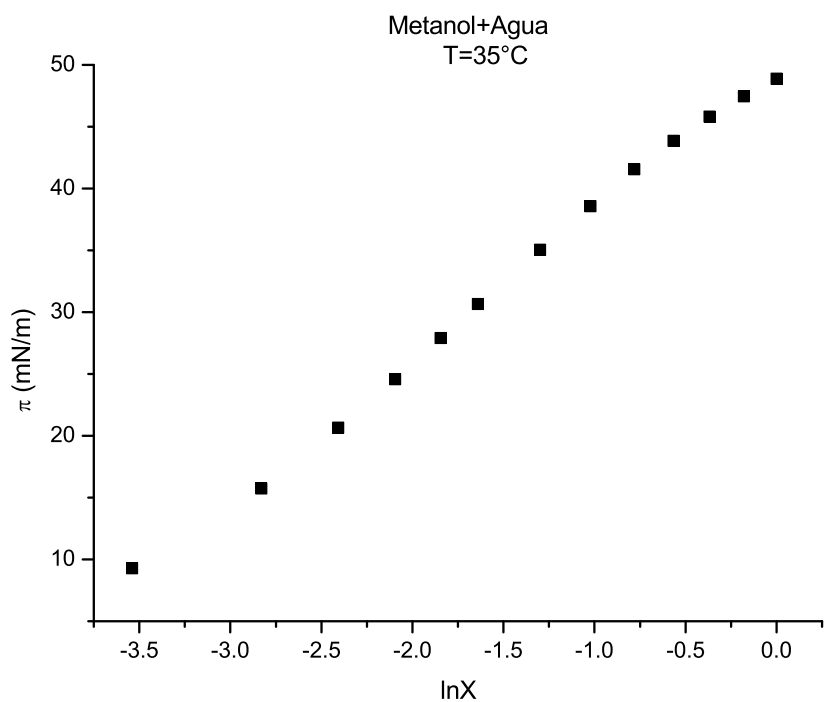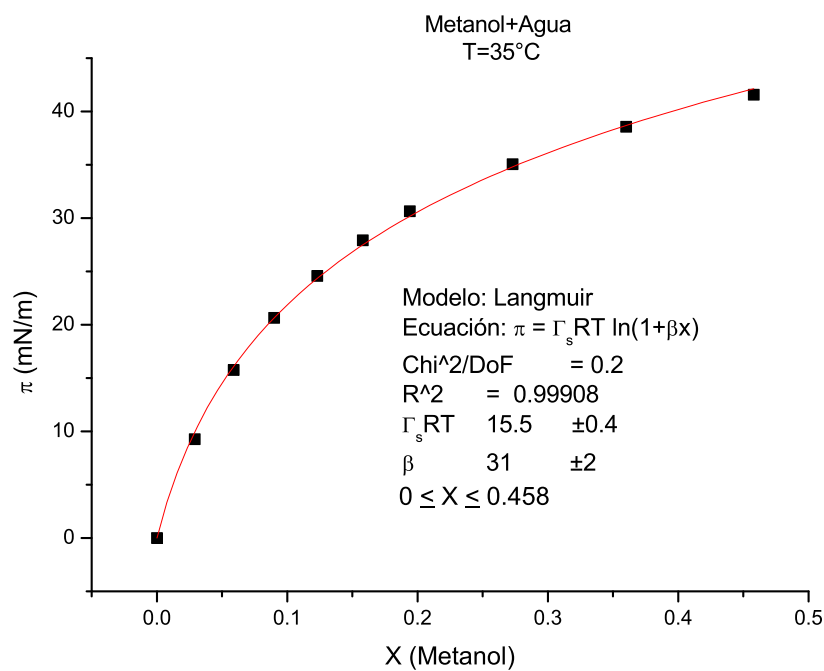
Metanol+Agua
T=35°C

π (mN/m)

lnX

Metanol+Agua
T=35°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.2
R^2   = 0.99908
$\Gamma_s RT$ 15.5   ±0.4
β 31   ±2
$0 \le X \le 0.458$

π (mN/m)

X (Metanol)

Metanol + Agua
T=35°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.02
R^2   = 0.99993
$\Gamma_s RT$ 4.9   ±0.5
β 7.9   ±0.2
α -43.1   ±1.4

π (mN/m)

X (Metanol)

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Tabla B.4: Metanol + Agua a T=35°C [51]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	70.42	0	–
0.029	61.14	9.28	-3.54046
0.059	54.67	15.75	-2.83022
0.09	49.76	20.66	-2.40795
0.123	45.84	24.58	-2.09557
0.158	42.51	27.91	-1.84516
0.194	39.77	30.65	-1.6399
0.273	35.36	35.06	-1.29828
0.36	31.85	38.57	-1.02165
0.458	28.86	41.56	-0.78089
0.568	26.56	43.86	-0.56563
0.692	24.6	45.82	-0.36817
0.835	22.95	47.47	-0.18032
1	21.52	48.9	0

Metanol+Agua
T=40°C

Metanol+Agua
T=40°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.6
R^2   = 0.99675
$\Gamma_s RT$ 15   ±1
β 35   ±4

$0 \le X \le 0.458$

Metanol + Agua
T=40°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.31
R^2   = 0.99883
$\Gamma_s RT$ 6   ±1.8
β 9   ±1
α -38   ±5
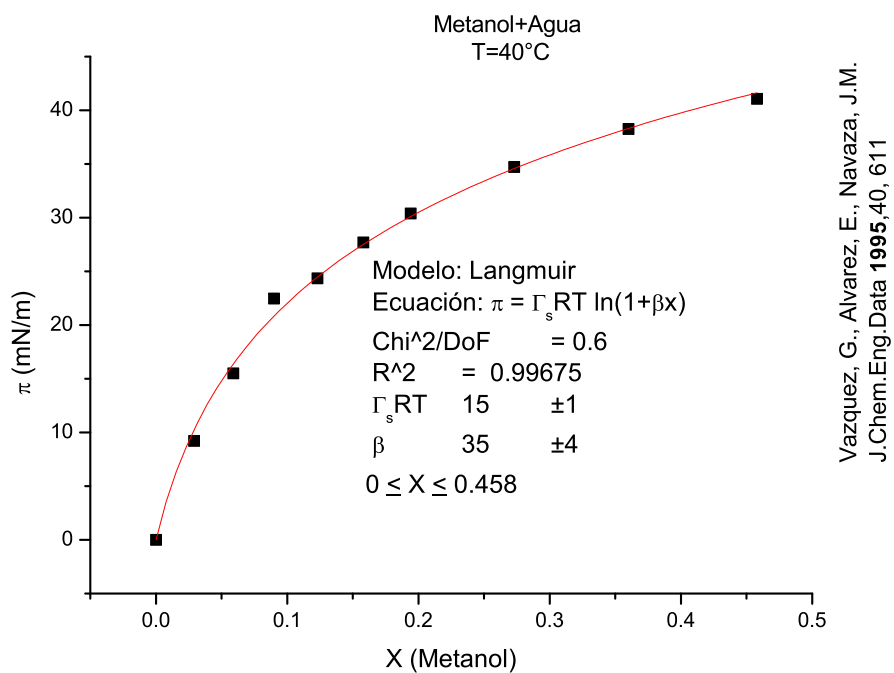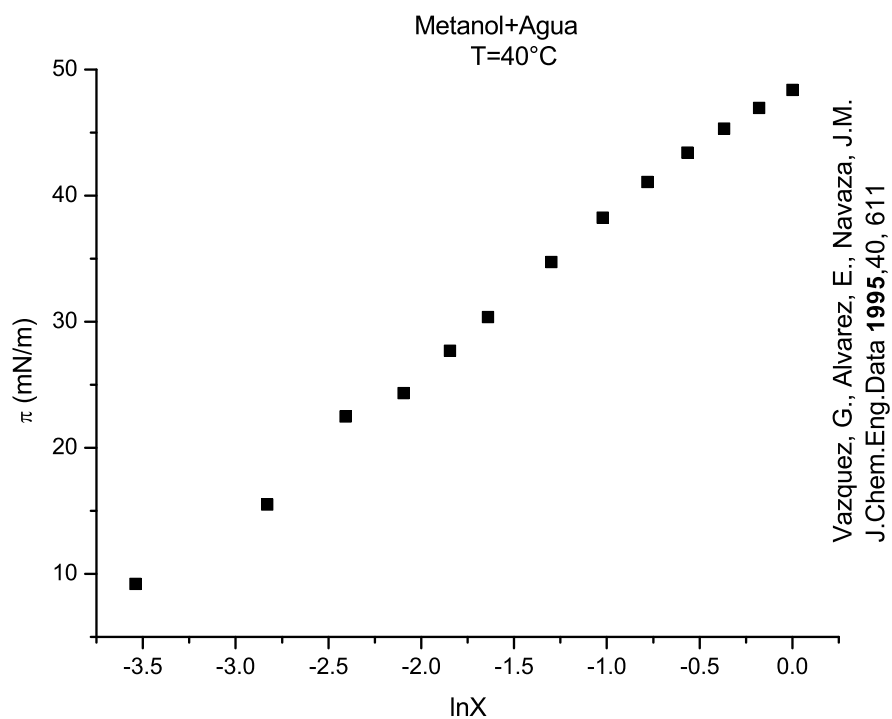
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Tabla B.5: Metanol + Agua a T=40°C [51]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	69.52	0	–
0.029	60.32	9.2	-3.54046
0.059	54.01	15.51	-2.83022
0.09	47.04	22.48	-2.40795
0.123	45.17	24.35	-2.09557
0.158	41.82	27.7	-1.84516
0.194	39.14	30.38	-1.6399
0.273	34.79	34.73	-1.29828
0.36	31.26	38.26	-1.02165
0.458	28.44	41.08	-0.78089
0.568	26.12	43.4	-0.56563
0.692	24.21	45.31	-0.36817
0.835	22.57	46.95	-0.18032
1	21.13	48.39	0

Metanol+Agua
T=45°C

Metanol+Agua
T=45°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF	= 0.2	
R^2	= 0.99895	
$\Gamma_s RT$	15.1	±0.4
β	32	±2

$0 \leq X \leq 0.458$

Metanol + Agua
T=45°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.01
R^2   = 0.99996
$\Gamma_s RT$ 4.9   ±0.4
β 8.1   ±0.2
α -42   ±1

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Tabla B.6: Metanol + Agua a T=45°C [51]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	68.84	0	–
0.029	59.58	9.26	-3.54046
0.059	53.27	15.57	-2.83022
0.09	48.39	20.45	-2.40795
0.123	44.48	24.36	-2.09557
0.158	41.21	27.63	-1.84516
0.194	38.53	30.31	-1.6399
0.273	34.18	34.66	-1.29828
0.36	30.77	38.07	-1.02165
0.458	27.93	40.91	-0.78089
0.568	25.64	43.2	-0.56563
0.692	23.72	45.12	-0.36817
0.835	22.06	46.78	-0.18032
1	20.61	48.23	0

Metanol+Agua
T=50°C

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Metanol+Agua
T=50°C

Modelo: Langmuir

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF $= 0.3$

R^2 $= 0.99838$

$\Gamma_s RT$ 14.3   ±0.4

β 35   ±3

$0 \le X \le 0.568$

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Metanol + Agua
T=50°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))$

Chi^2/DoF = 0.006
R^2 = 0.99998
$\Gamma_s RT$ 5.1 ±0.3
β 8.3 ±0.1
α -40.8 ±0.8

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π (mN/m)
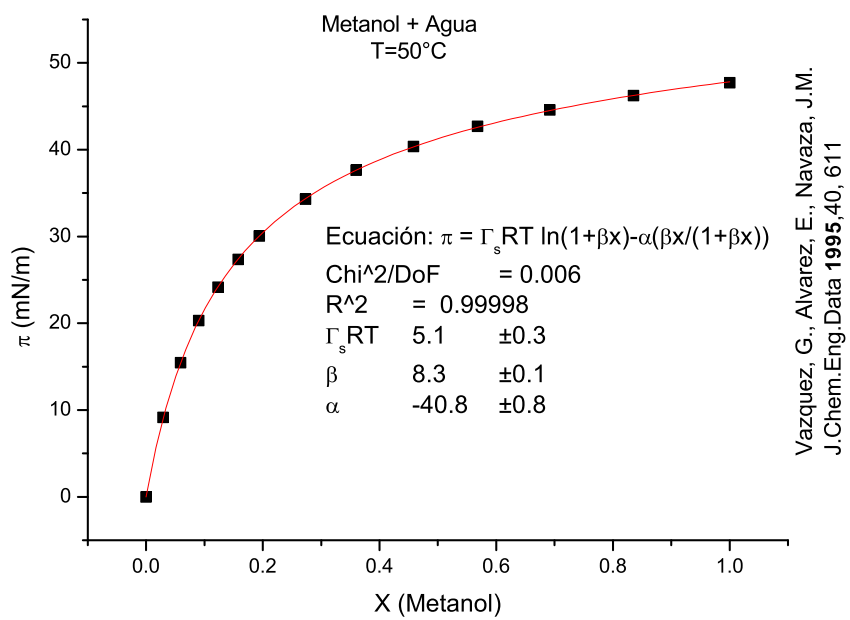
X (Metanol)

Tabla B.7: Metanol + Agua a T=50°C [51]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	67.92	0	–
0.029	58.77	9.15	-3.54046
0.059	52.46	15.46	-2.83022
0.09	47.62	20.3	-2.40795
0.123	43.76	24.16	-2.09557
0.158	40.57	27.35	-1.84516
0.194	37.88	30.04	-1.6399
0.273	33.62	34.3	-1.29828
0.36	30.28	37.64	-1.02165
0.458	27.54	40.38	-0.78089
0.568	25.23	42.69	-0.56563
0.692	23.33	44.59	-0.36817
0.835	21.67	46.25	-0.18032
1	20.21	47.71	0

Etanol+Agua
T=20°C

Etanol+Agua
T=20°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.17433
R^2   = 0.99924
$\Gamma_s RT$ 13.6   ±0.5
β 121   ±11

$0 \leq X \leq 0.144$

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Etanol + Agua
T=20°C

π (mN/m)

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))$

Chi^2/DoF	= 0.03	
R^2	= 0.99986	
$\Gamma_s RT$	1.7	±0.3
β	24.5	±0.6
α	-46.6	±0.9
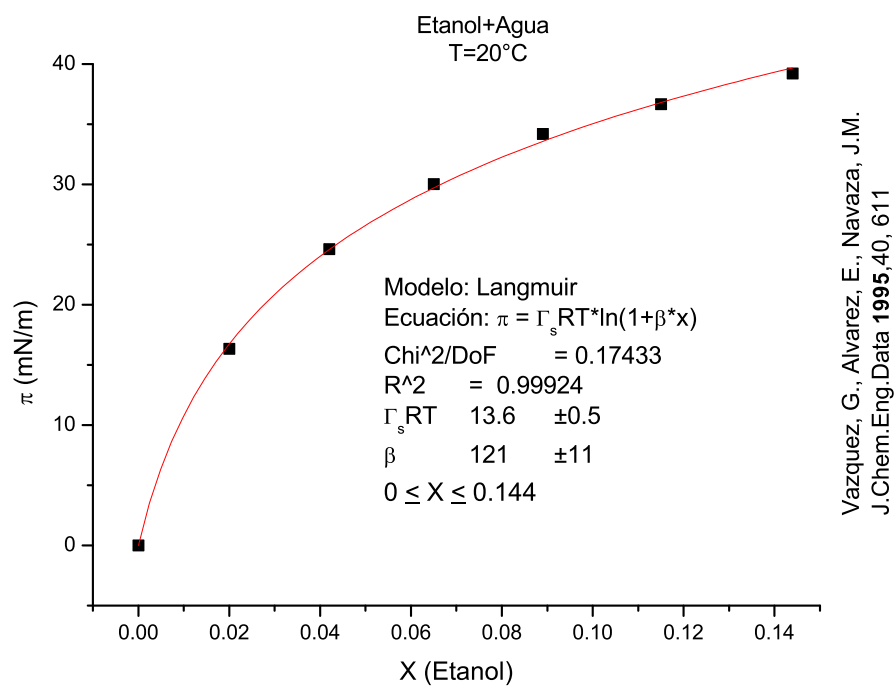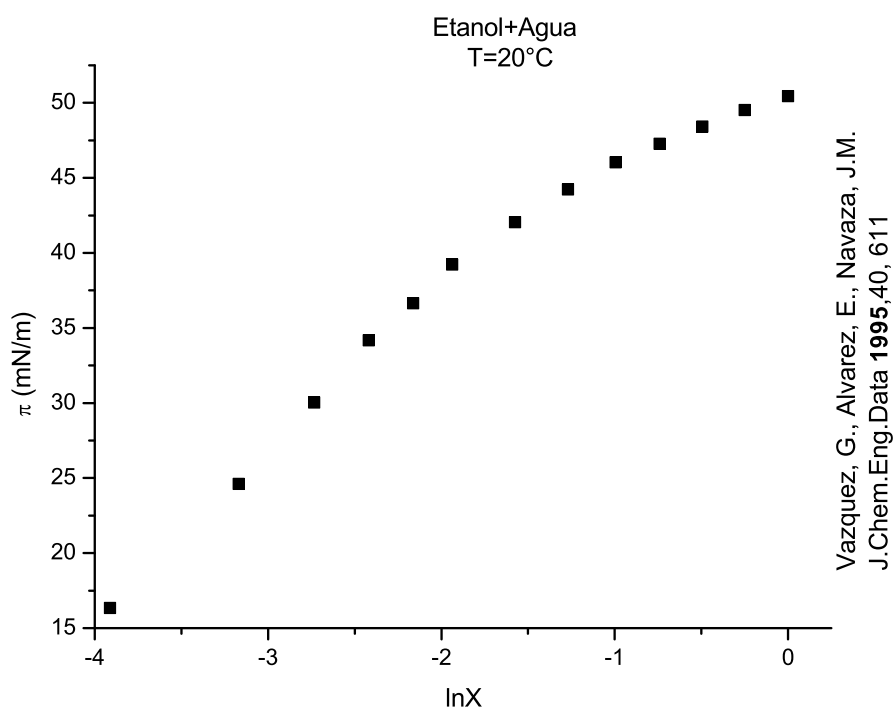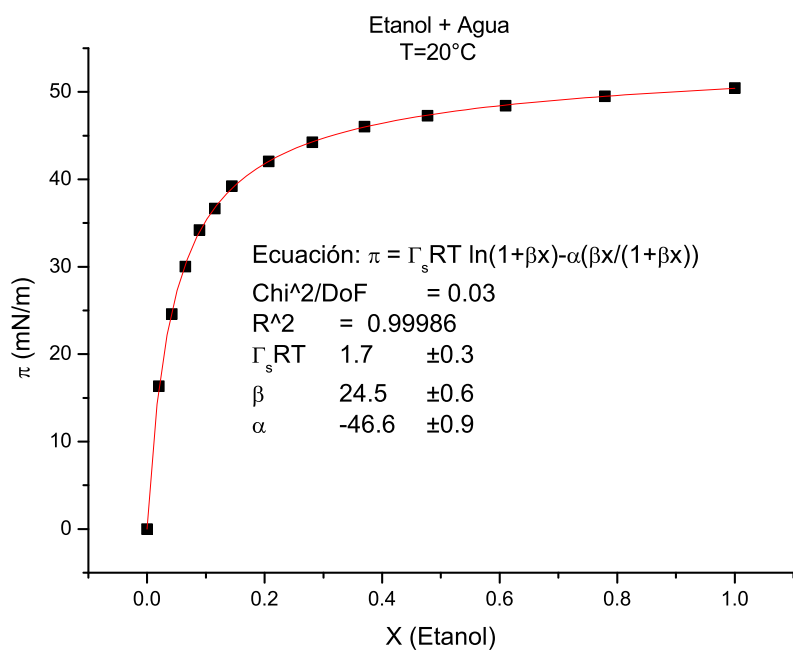
X (Etanol)

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Tabla B.8: Etanol + Agua a T=20°C [51]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	72.75	0	–
0.02	56.41	16.34	-3.91202
0.042	48.14	24.61	-3.17009
0.065	42.72	30.03	-2.73337
0.089	38.56	34.19	-2.41912
0.115	36.09	36.66	-2.16282
0.144	33.53	39.22	-1.93794
0.207	30.69	42.06	-1.57504
0.281	28.51	44.24	-1.2694
0.37	26.72	46.03	-0.99425
0.477	25.48	47.27	-0.74024
0.61	24.32	48.43	-0.4943
0.779	23.23	49.52	-0.24974
1	22.31	50.44	0

Etanol+Agua
T=25°C

Etanol+Agua
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT^* \ln(1+\beta^* x)$

Chi^2/DoF   = 0.17828
R^2   = 0.99921
$\Gamma_s RT$ 13.5   ±0.5
β 121   ±11

$0 \le X \le 0.144$

Etanol + Agua
T=25°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.03
R^2   = 0.99986
$\Gamma_s RT$ 1.7   ±0.3
β 24.6   ±0.6
α -46.3   ±0.9
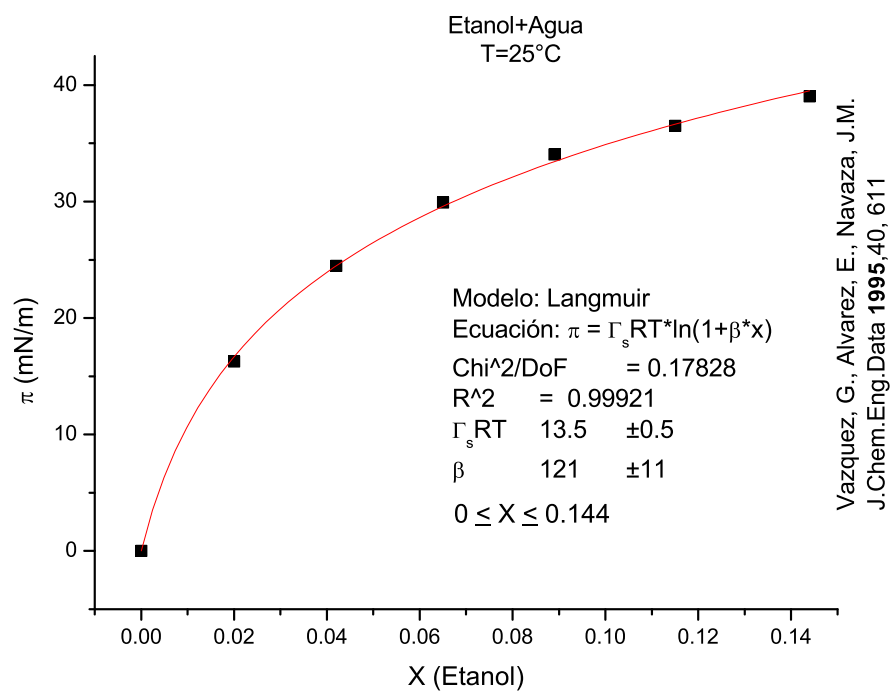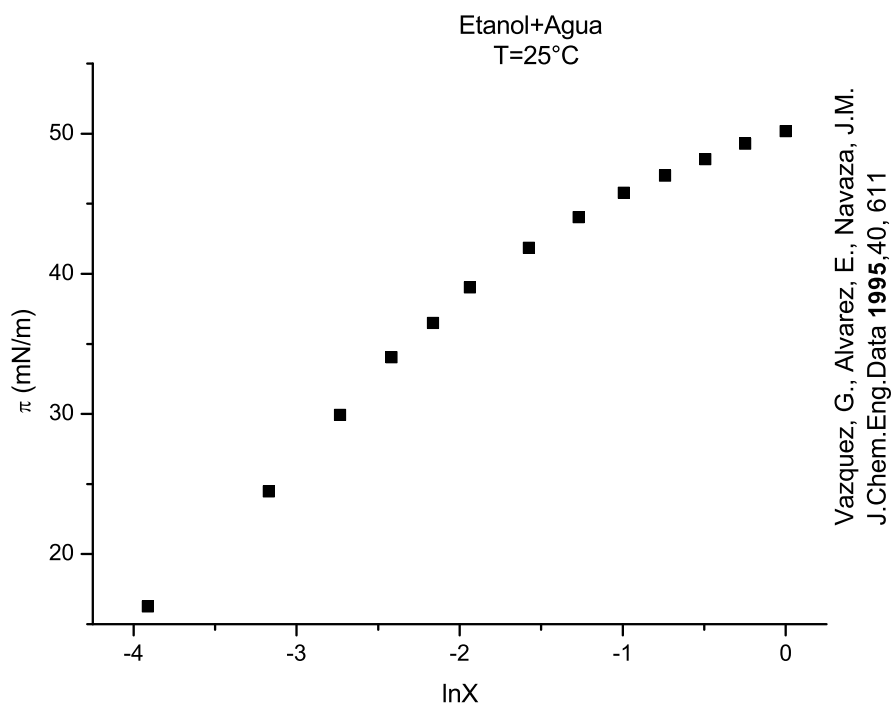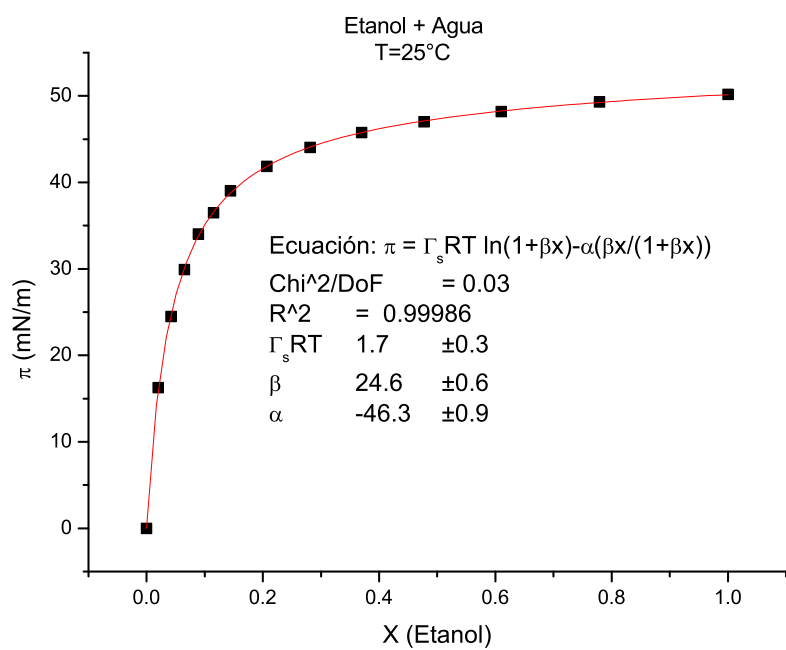
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Tabla B.9: Etanol + Agua a T=25°C [51]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	72.01	0	–
0.02	55.73	16.28	-3.91202
0.042	47.53	24.48	-3.17009
0.065	42.08	29.93	-2.73337
0.089	37.97	34.04	-2.41912
0.115	35.51	36.5	-2.16282
0.144	32.98	39.03	-1.93794
0.207	30.16	41.85	-1.57504
0.281	27.96	44.05	-1.2694
0.37	26.23	45.78	-0.99425
0.477	25.01	47	-0.74024
0.61	23.82	48.19	-0.4943
0.779	22.72	49.29	-0.24974
1	21.82	50.19	0
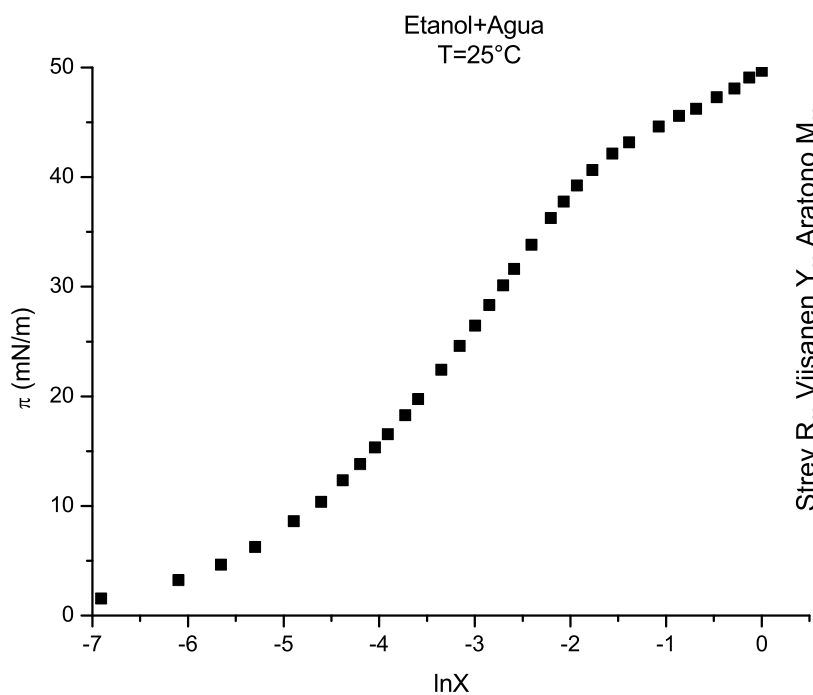
Etanol+Agua
T=25°C

Strey R., Viisanen Y., Aratono M.,
Kratohvil J.P., Friberg S.E.
J. Phys. Chem. B **1999**, 103, 9112

Etanol+Agua
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF   = 0.07
R^2   = 0.99959
$\Gamma_s RT$ 13.5   ±0.1
β 120.6   ±2.8

$0 \leq X \leq 0.145$

Strey R., Viisanen Y., Aratono M.,
Kratohvil J.P., Friberg S.E.
J. Phys. Chem. B **1999**, 103, 9112

Etanol + Agua
T=25°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.370
R^2   = 0.99861
$\Gamma_s RT$ 50.6   ±0.3
β 23.3   ±0.4
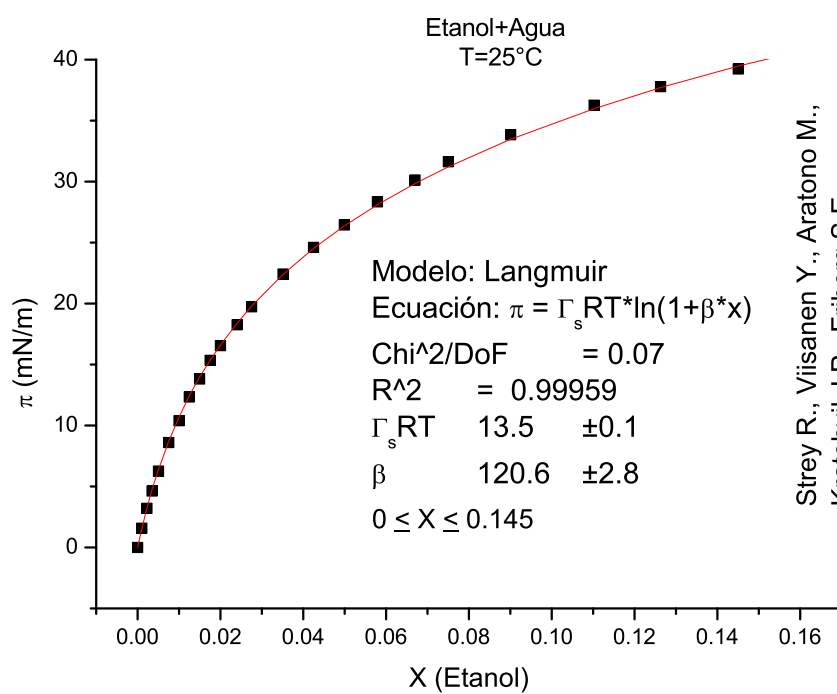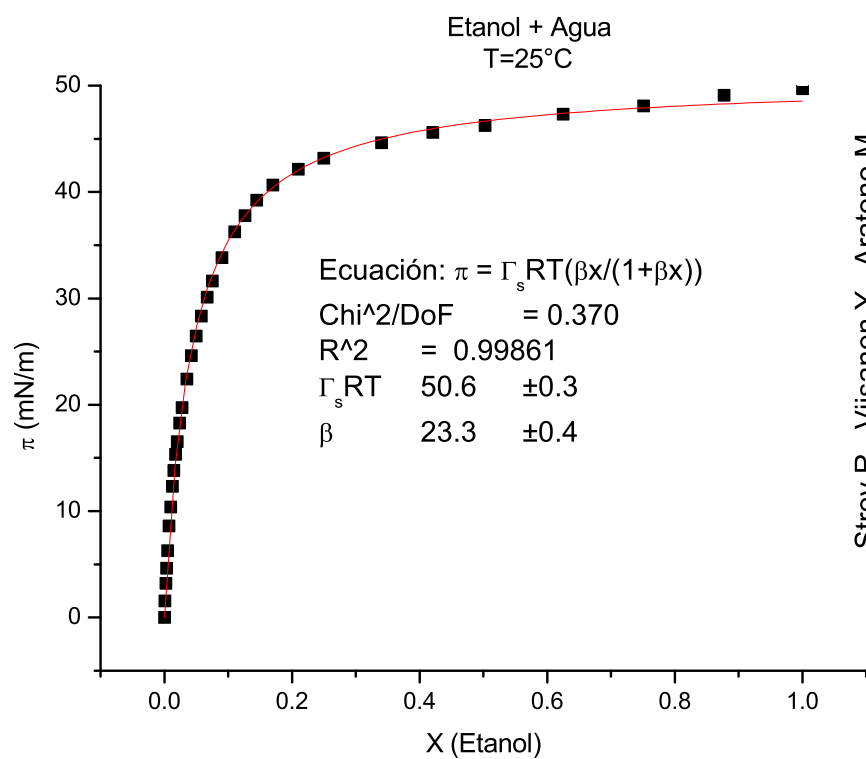
Strey R., Viisanen Y., Aratono M.,
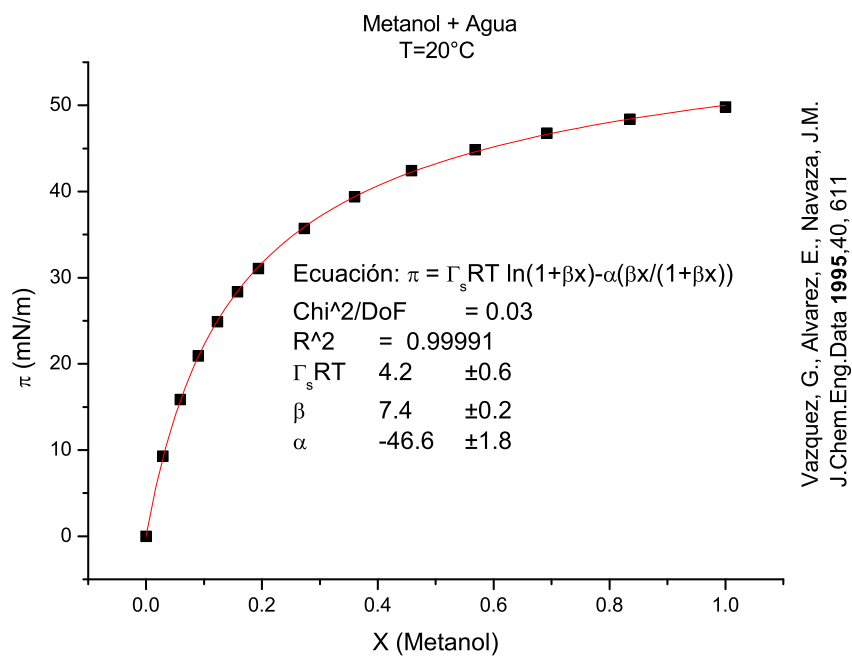Kratohvil J.P., Friberg S.E.
J. Phys. Chem. B **1999**, 103, 9112

Tabla B.10: Etanol + Agua a T=25°C [51]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx	x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	71.94	0	–	0.06698	41.82	30.12	-2.70336
9.99E-4	70.37	1.57	-6.90876	0.07505	40.31	31.63	-2.5896
0.00224	68.72	3.22	-6.10128	0.09011	38.11	33.83	-2.40672
0.0035	67.3	4.64	-5.65499	0.1102	35.67	36.27	-2.20546
0.005	65.67	6.27	-5.29832	0.1263	34.16	37.78	-2.0691
0.00749	63.33	8.61	-4.89419	0.145	32.71	39.23	-1.93102
0.00999	61.55	10.39	-4.60617	0.1702	31.29	40.65	-1.77078
0.0125	59.6	12.34	-4.38203	0.2098	29.79	42.15	-1.5616
0.01498	58.13	13.81	-4.20104	0.2499	28.76	43.18	-1.38669
0.0175	56.6	15.34	-4.04555	0.3402	27.32	44.62	-1.07822
0.02003	55.39	16.55	-3.91052	0.4208	26.34	45.6	-0.8656
0.024	53.67	18.27	-3.7297	0.5029	25.7	46.24	-0.68736
0.02752	52.19	19.75	-3.59284	0.6252	24.63	47.31	-0.46968
0.03508	49.52	22.42	-3.35012	0.7512	23.84	48.1	-0.28608
0.0425	47.33	24.61	-3.15825	0.8772	22.86	49.08	-0.13102
0.04993	45.49	26.45	-2.99713	1	22.22	49.72	0
0.05788	43.59	28.35	-2.84938				

Etanol+Agua
T=30°C

Etanol+Agua
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.18
R^2   = 0.99921
$\Gamma_s RT$ 13.5   ±0.5
β 121   ±11

$0 \leq X \leq 0.144$

Etanol + Agua
T=30°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))$

Chi^2/DoF = 0.04
R^2 = 0.99985
$\Gamma_s RT$ 1.7 ±0.3
β 24.7 ±0.7
α -45.9 ±0.8

π (mN/m)
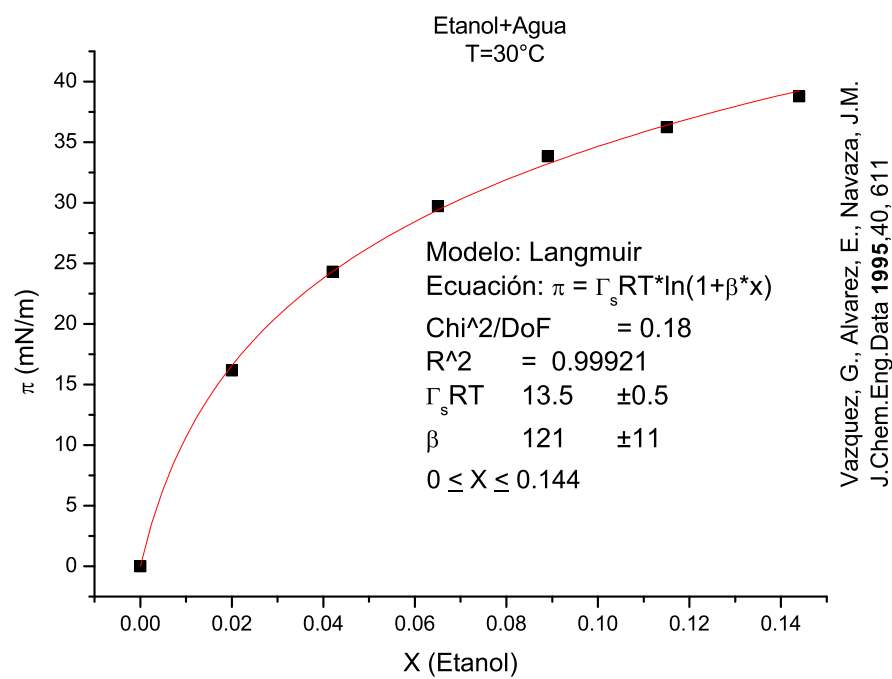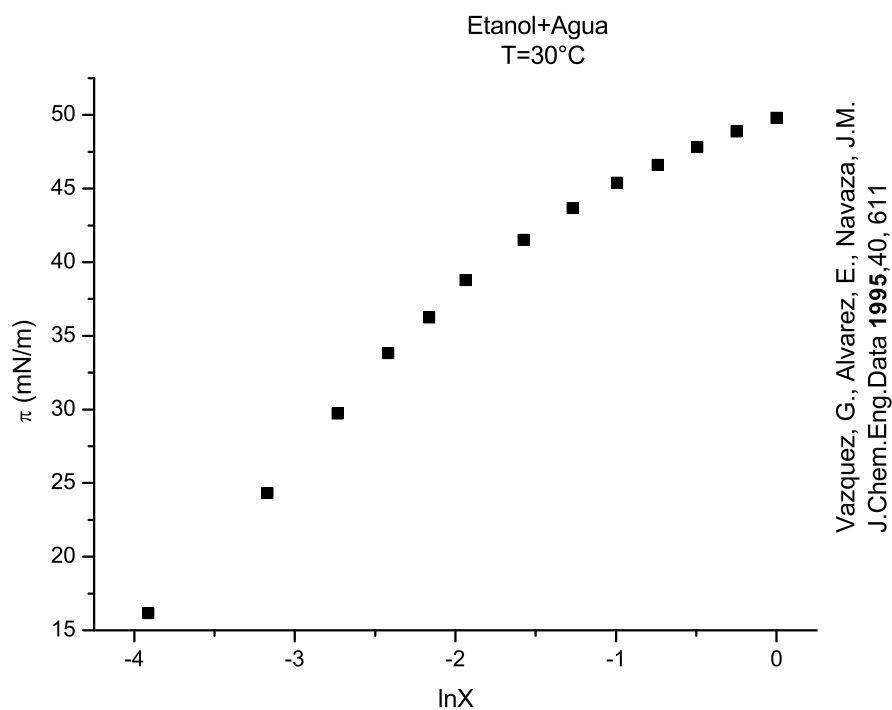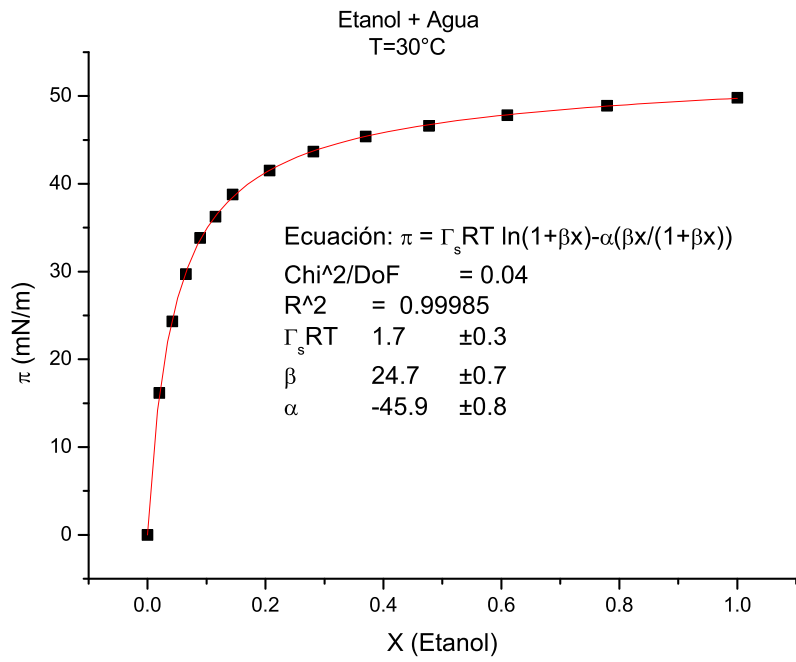
X (Etanol)

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Tabla B.11: Etanol + Agua a T=30°C [51]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	71.21	0	–
0.02	55.04	16.17	-3.91202
0.042	46.88	24.33	-3.17009
0.065	41.49	29.72	-2.73337
0.089	37.38	33.83	-2.41912
0.115	34.96	36.25	-2.16282
0.144	32.43	38.78	-1.93794
0.207	29.68	41.53	1.57504
0.281	27.53	43.68	-1.2694
0.37	25.81	45.4	-0.99425
0.477	24.6	46.61	-0.74024
0.61	23.39	47.82	-0.4943
0.779	22.32	48.89	-0.24974
1	21.41	49.8	0

Etanol+Agua
T=35°C

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J.Chem.Eng.Data **1995**,40, 611

Etanol+Agua
T=35°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF   = 0.18
R^2   = 0.99917
$\Gamma_s RT$ 13.3   ±0.5
β 122   ±11

$0 \leq X \leq 0.144$

Vazquez, G., Alvarez, E., Navaza, J.M.
J.Chem.Eng.Data **1995**,40, 611
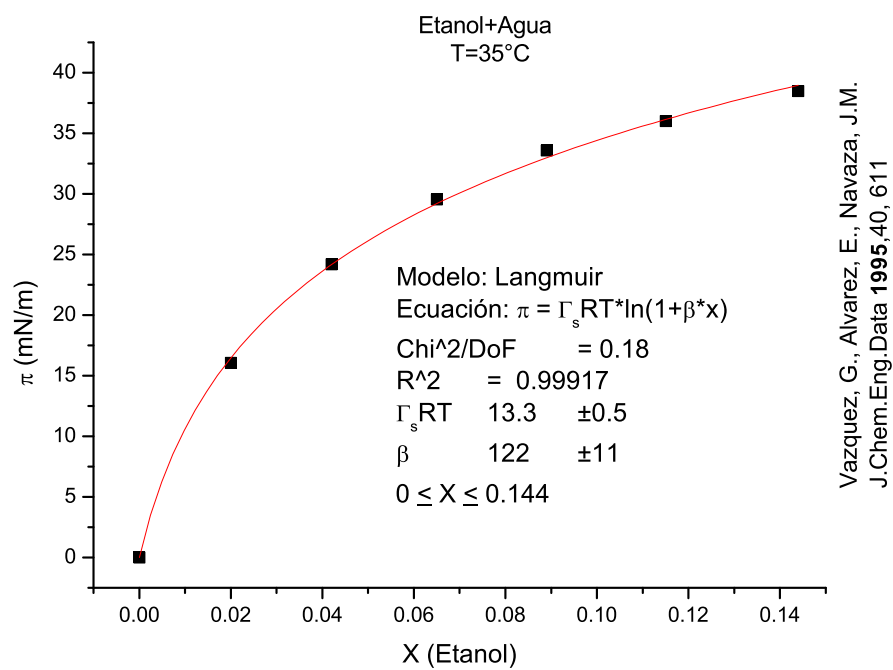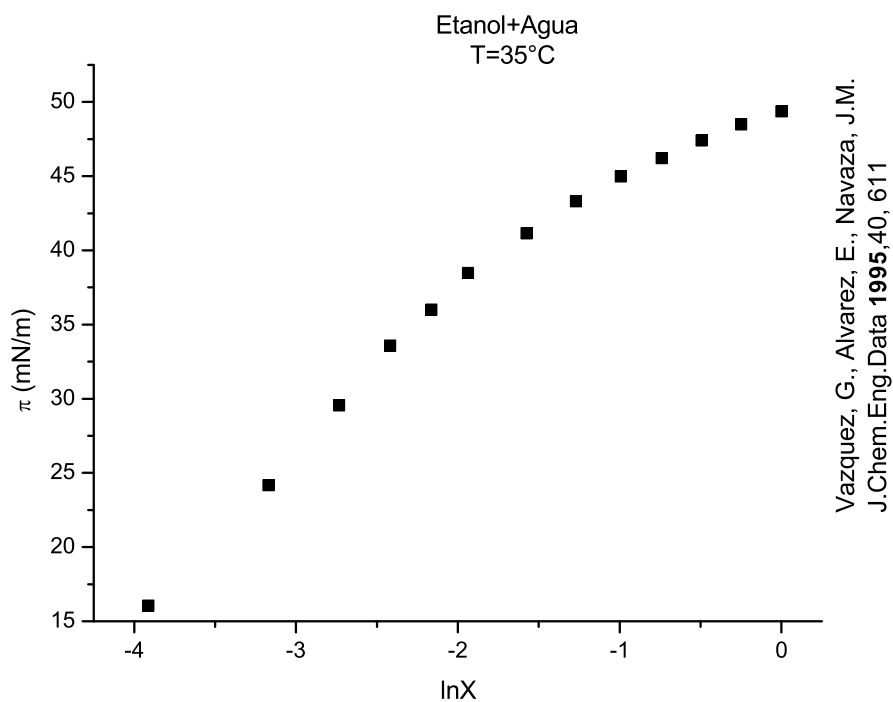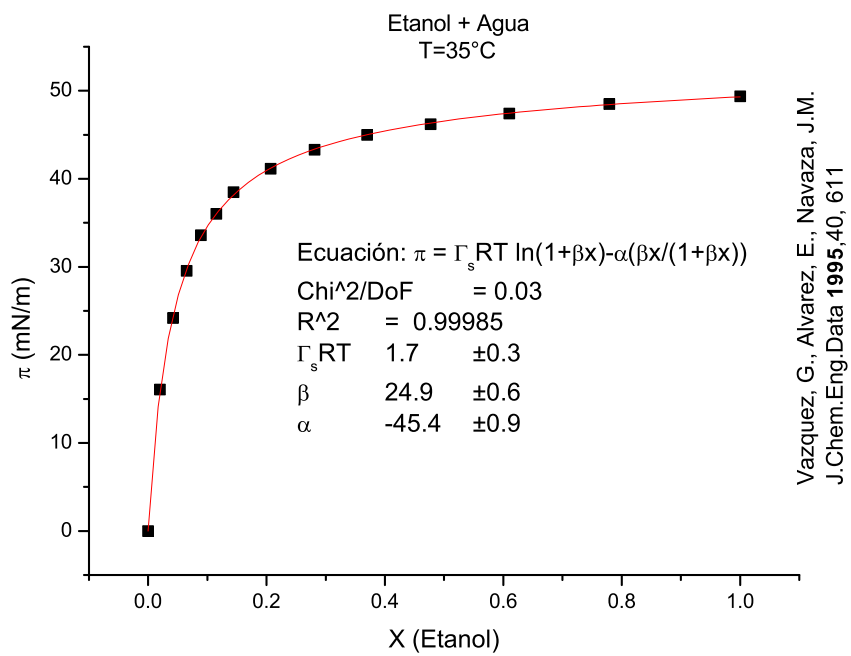
Tabla B.12: Etanol + Agua a T=35°C [51]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	70.42	0	–
0.02	54.36	16.06	-3.91202
0.042	46.24	24.18	-3.17009
0.065	40.88	29.54	-2.73337
0.089	36.83	33.59	-2.41912
0.115	34.41	36.01	-2.16282
0.144	31.94	38.48	-1.93794
0.207	29.27	41.15	-1.57504
0.281	27.11	43.31	-1.2694
0.37	25.43	44.99	-0.99425
0.477	24.21	46.21	-0.74024
0.61	23.01	47.41	-0.4943
0.779	21.94	48.48	-0.24974
1	21.04	49.38	0

Etanol+Agua
T=40°C

π (mN/m)

lnX

Vazquez, G., Alvarez, E., Navaza, J.M.
J.Chem.Eng.Data **1995**,40, 611

Etanol+Agua
T=40°C

π (mN/m)

X (Etanol)

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT * \ln(1+\beta * x)$

Chi^2/DoF   = 0.17
R^2   = 0.99919
$\Gamma_s RT$ 13.2   ±0.5
β 122   ±11

$0 \leq X \leq 0.144$

Vazquez, G., Alvarez, E., Navaza, J.M.
J.Chem.Eng.Data **1995**,40, 611

Etanol + Agua
T=40°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.03
R^2   = 0.99986

$\Gamma_s RT$	1.7	±0.2
β	24.9	±0.6
α	-45.0	±0.8

π (mN/m)

X (Etanol)

Vazquez, G., Alvarez, E., Navaza, J.M.
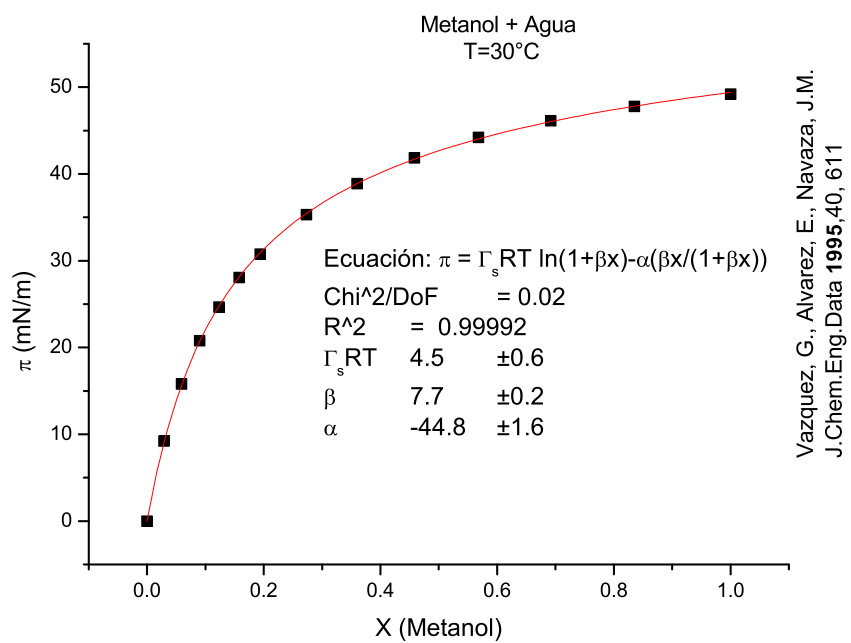J.Chem.Eng.Data **1995**,40, 611
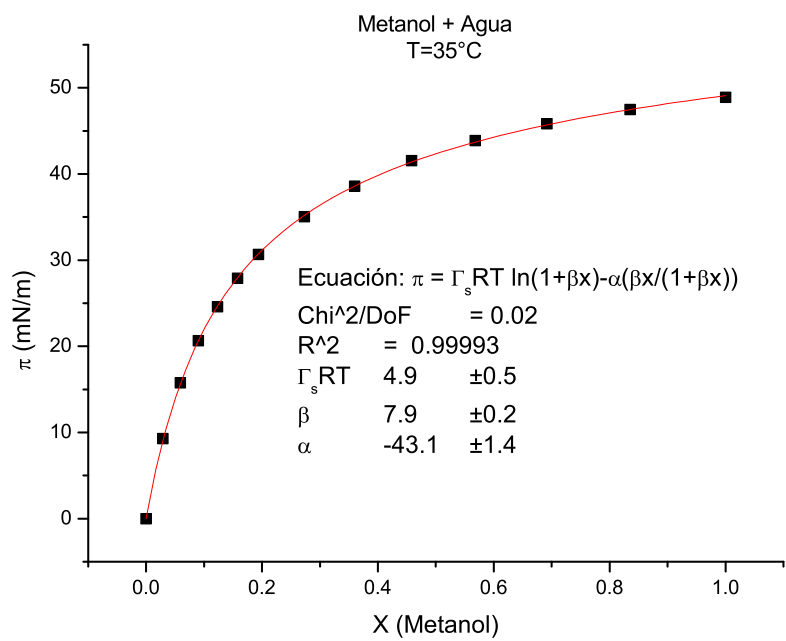
Tabla B.13: Etanol + Agua a T=40°C [51]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	69.52	0	–
0.02	53.63	15.89	-3.91202
0.042	45.58	23.94	-3.17009
0.065	40.27	29.25	-2.73337
0.089	36.28	33.24	-2.41912
0.115	33.86	35.66	-2.16282
0.144	31.42	38.1	-1.93794
0.207	28.77	40.75	-1.57504
0.281	26.64	42.88	-1.2694
0.37	24.97	44.55	-0.99425
0.477	23.76	45.76	-0.74024
0.61	22.54	46.98	-0.4943
0.779	21.53	47.99	-0.24974
1	20.62	48.9	0
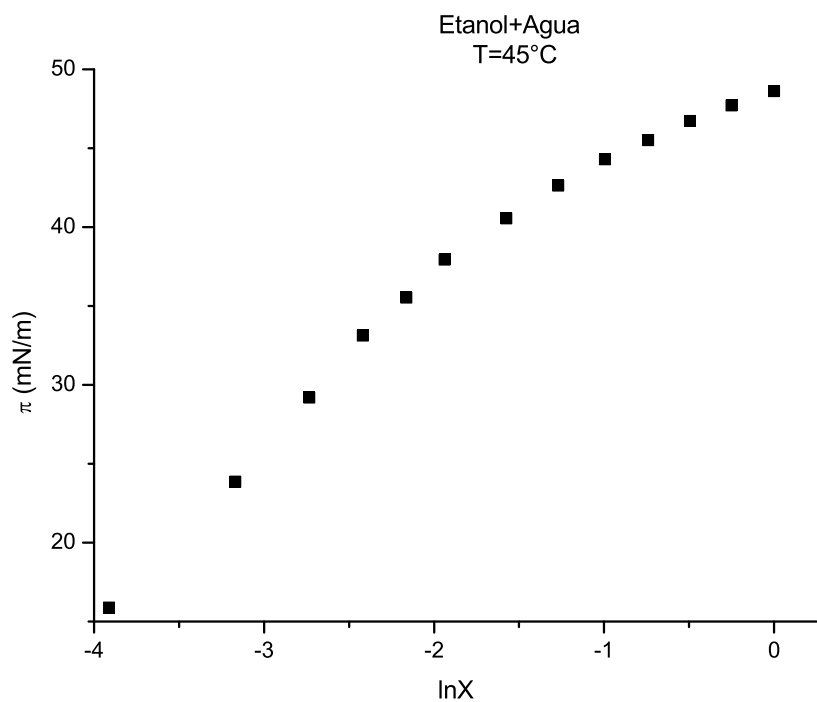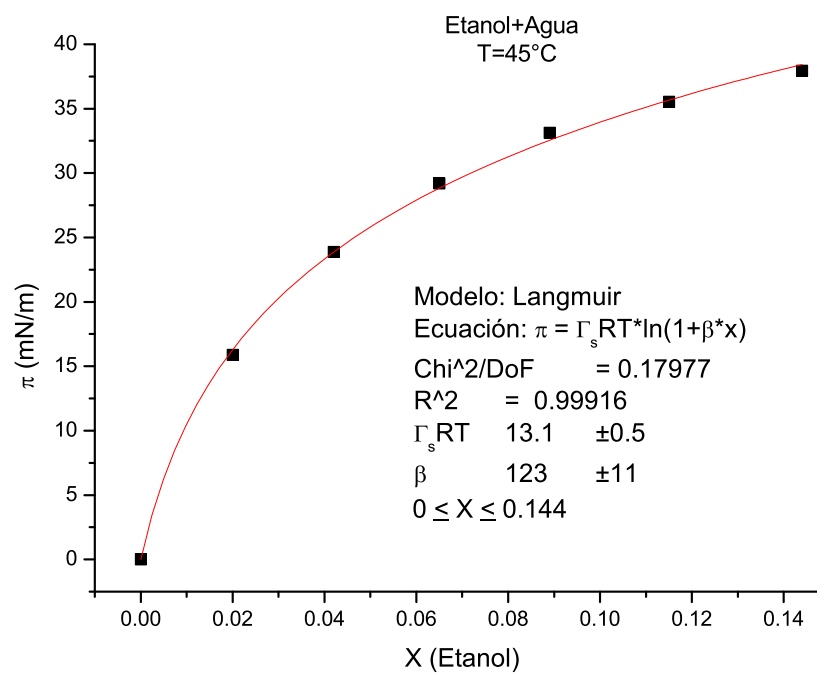
Etanol+Agua
T=45°C

Vazquez, G., Alvarez, E., Navaza, J.M.
J.Chem.Eng.Data **1995**,40, 611

Etanol+Agua
T=45°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF   = 0.17977
R^2   = 0.99916
$\Gamma_s RT$ 13.1   ±0.5
β 123   ±11
$0 \leq X \leq 0.144$

Vazquez, G., Alvarez, E., Navaza, J.M.
J.Chem.Eng.Data **1995**,40, 611

Etanol + Agua
T=45°C

π (mN/m)

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.03
R^2   = 0.99985
$\Gamma_s RT$ 1.7   ±0.2
β 25.1   ±0.7
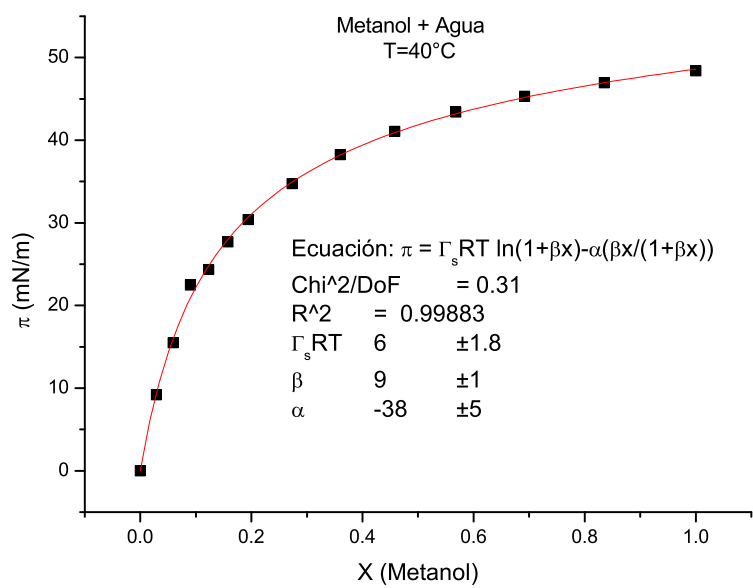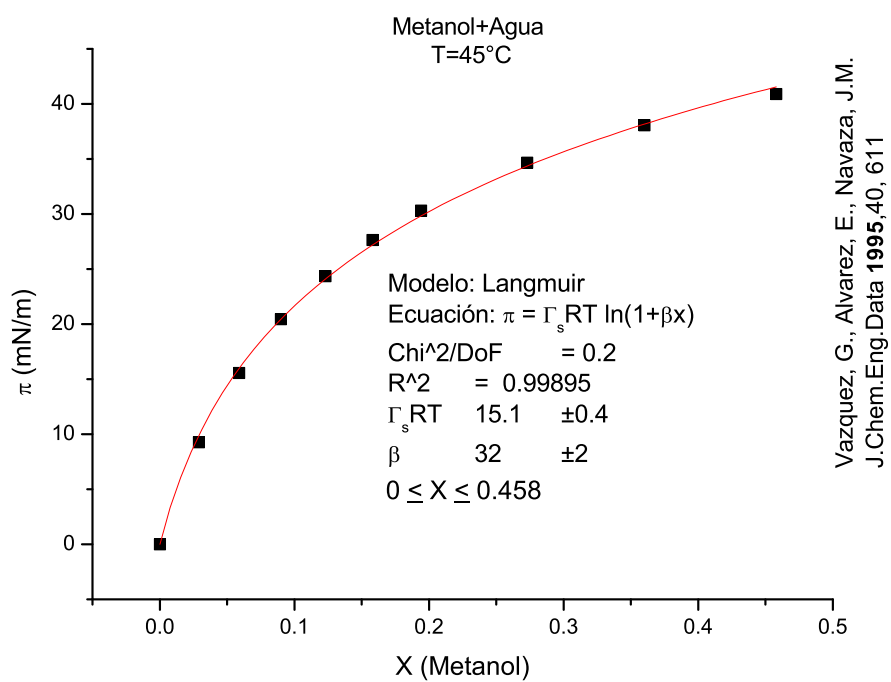α -44.71   ±0.81
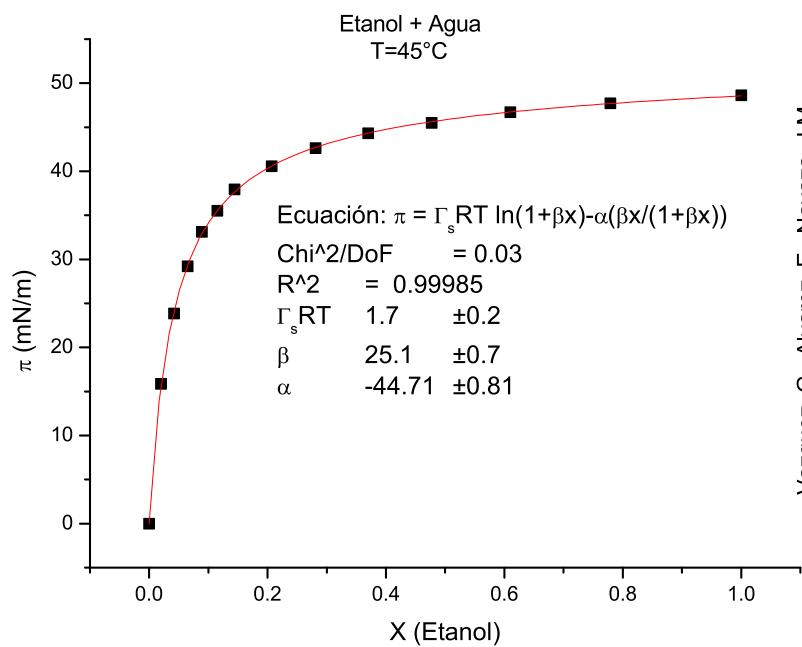
X (Etanol)

Vazquez, G., Alvarez, E., Navaza, J.M.
J.Chem.Eng.Data **1995**,40, 611

Tabla B.14: Etanol + Agua a T=45°C [51]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	68.84	0	–
0.02	52.96	15.88	-3.91202
0.042	44.97	23.87	-3.17009
0.065	39.64	29.2	-2.73337
0.089	35.71	33.13	-2.41912
0.115	33.31	35.53	-2.16282
0.144	30.89	37.95	-1.93794
0.207	28.28	40.56	-1.57504
0.281	26.21	42.63	-1.2694
0.37	24.54	44.3	-0.99425
0.477	23.33	45.51	-0.74024
0.61	22.12	46.72	-0.4943
0.779	21.13	47.71	-0.24974
1	20.22	48.62	0
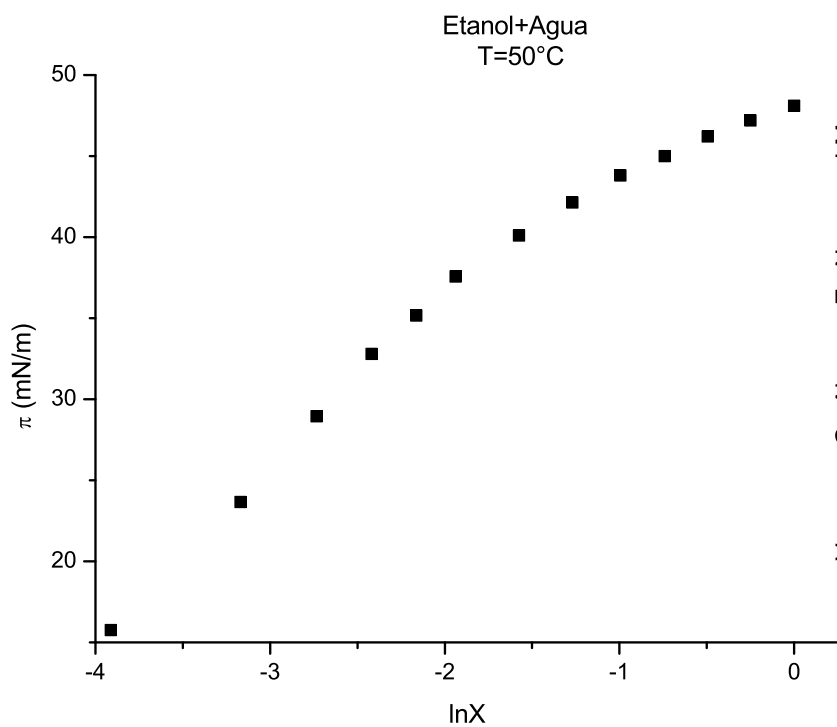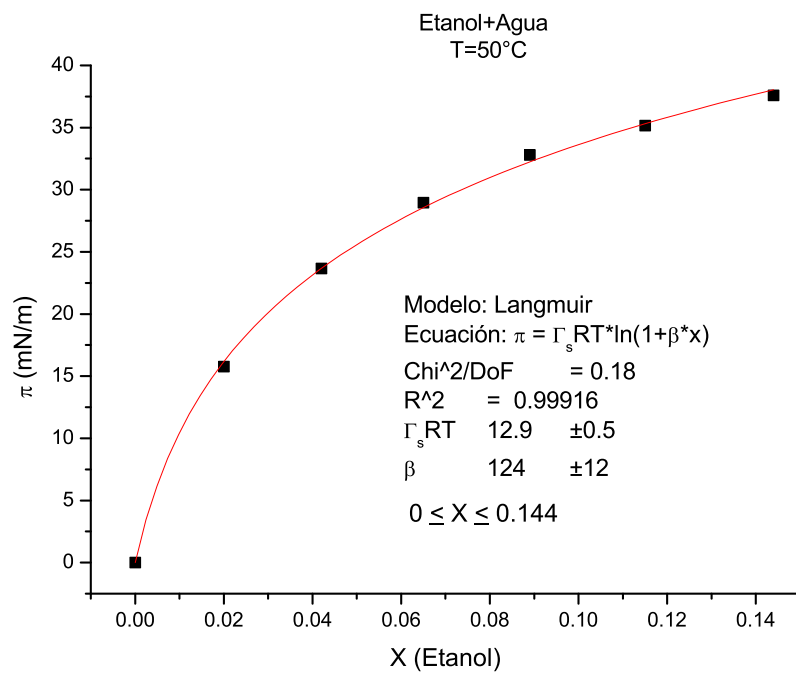
Etanol+Agua
T=50°C

π (mN/m)

lnX

Vazquez, G., Alvarez, E., Navaza, J.M.
J.Chem.Eng.Data **1995**,40, 611

Etanol+Agua
T=50°C

π (mN/m)

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.18
R^2   = 0.99916
$\Gamma_s RT$ 12.9   ±0.5
β 124   ±12

$0 \le X \le 0.144$

X (Etanol)

Vazquez, G., Alvarez, E., Navaza, J.M.
J.Chem.Eng.Data **1995**,40, 611

Etanol + Agua
T=50°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.03
R^2   = 0.99985
$\Gamma_s RT$ 1.7   ±0.2
β 25.4   ±0.7
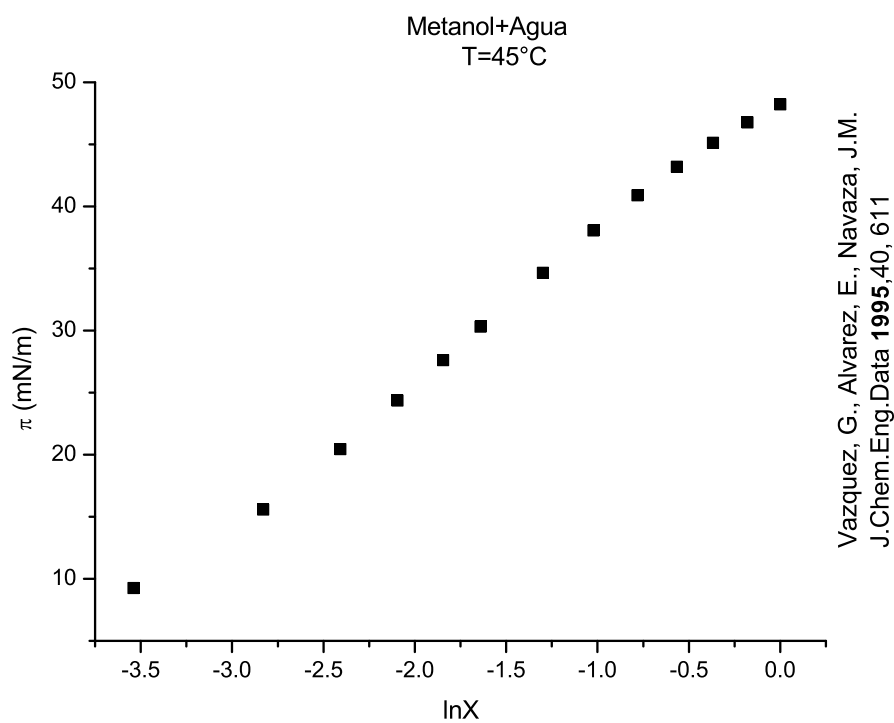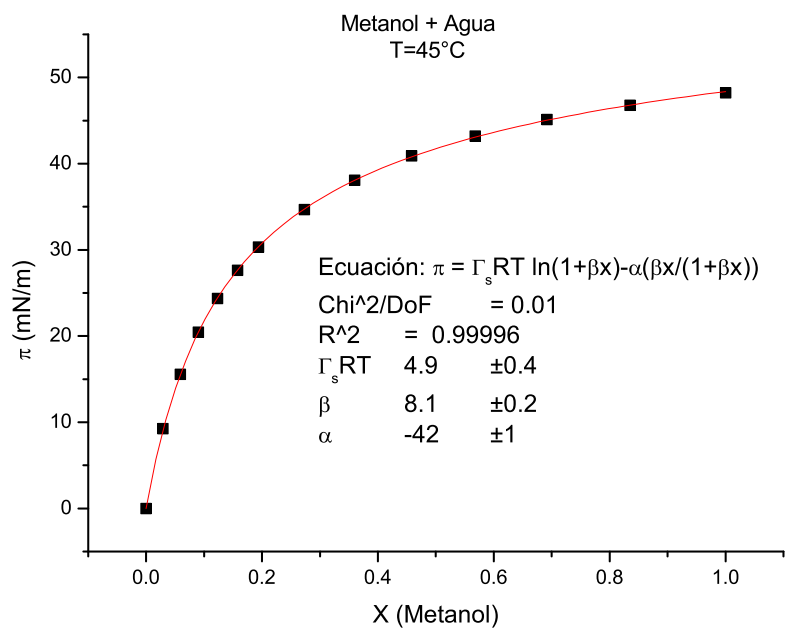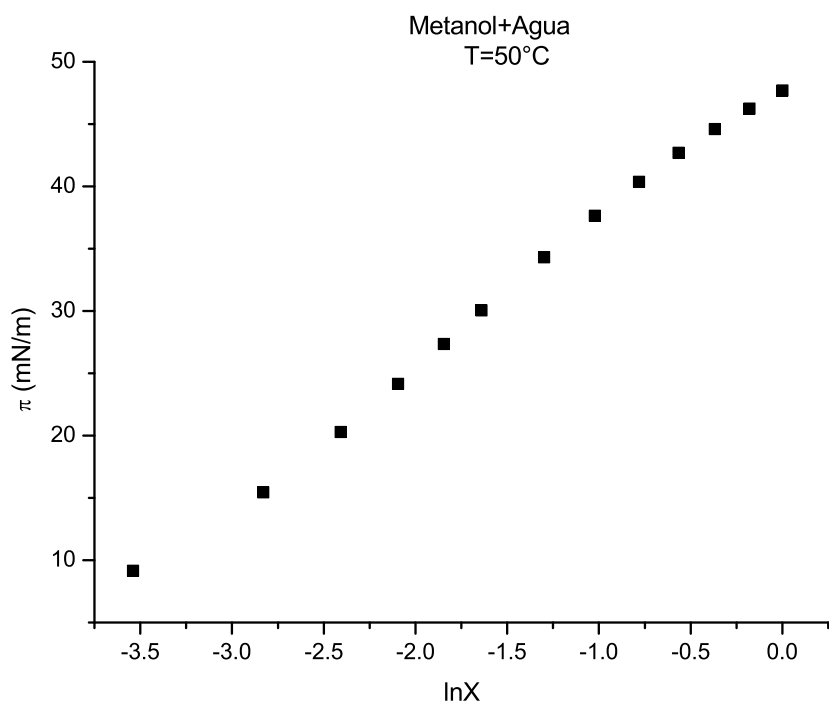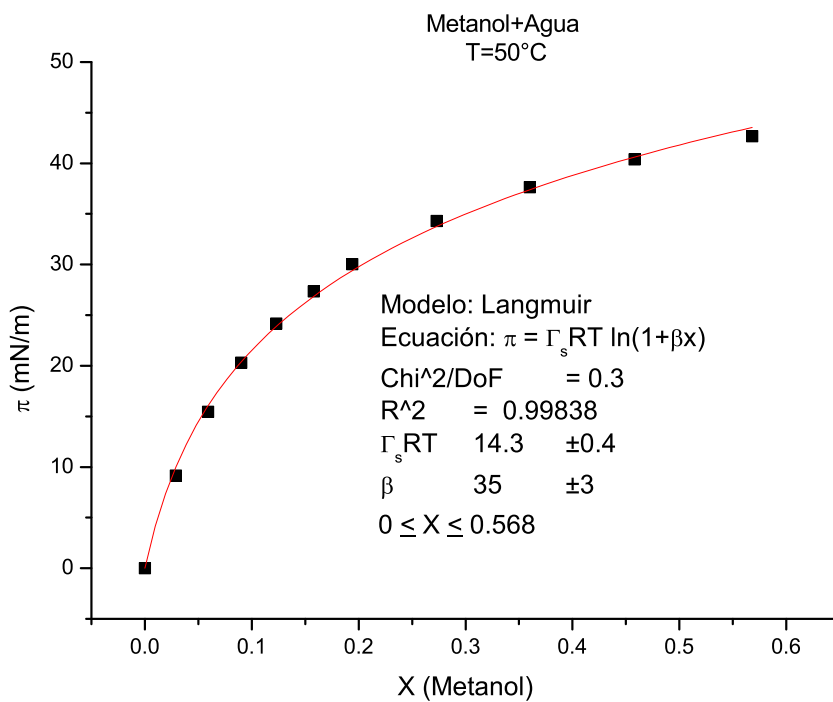α -44.0   ±0.8

π (mN/m)
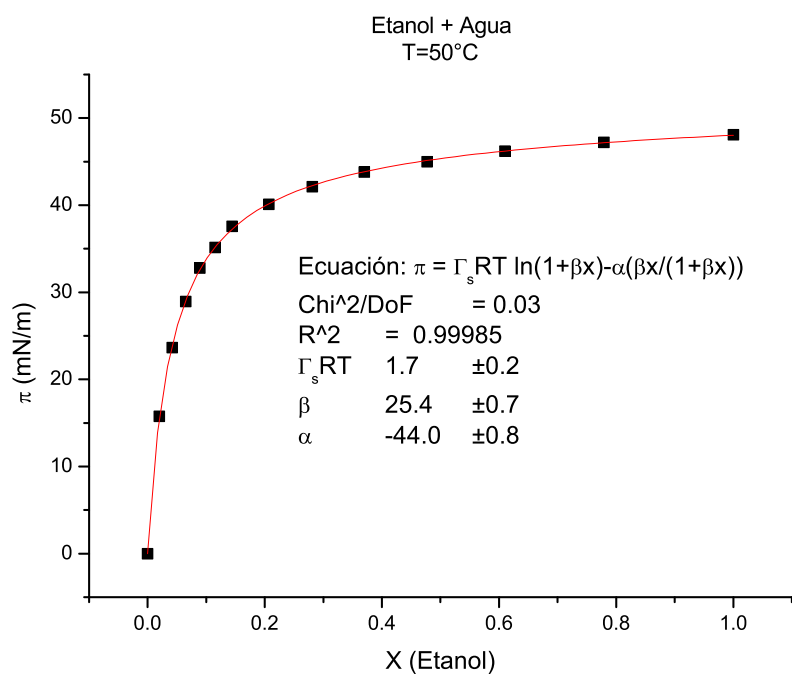
X (Etanol)

Vazquez, G., Alvarez, E., Navaza, J.M.
J.Chem.Eng.Data **1995**,40, 611

Tabla B.15: Etanol + Agua a T=50°C [51]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	67.92	0	–
0.02	52.16	15.76	-3.91202
0.042	44.26	23.66	-3.17009
0.065	38.96	28.96	-2.73337
0.089	35.12	32.8	-2.41912
0.115	32.76	35.16	-2.16282
0.144	30.34	37.58	-1.93794
0.207	27.82	40.1	-1.57504
0.281	25.78	42.14	-1.2694
0.37	24.11	43.81	-0.99425
0.477	22.92	45	-0.74024
0.61	21.71	46.21	-0.4943
0.779	20.71	47.21	-0.24974
1	19.82	48.1	0
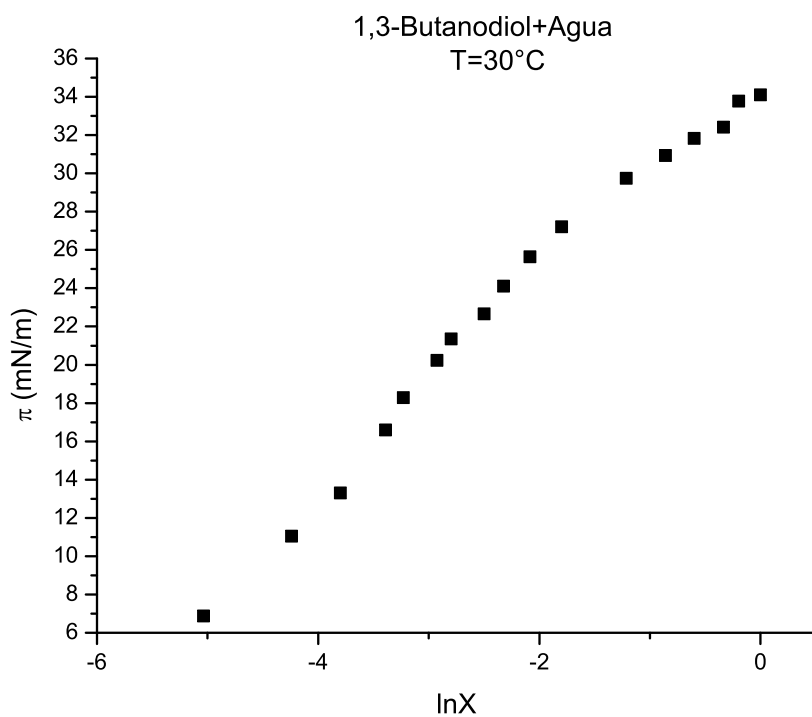
1,3-Butanodiol+Agua
T=30°C

1,3-Butanodiol+Agua
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.20
R^2   = 0.99727
$\Gamma_s RT$ 7.5   ±0.2
β 245   ±24

$0 \leq X \leq 0.1655$

X (1,3-Butanodiol)

1,3-Butanodiol+Agua
T=30°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.13
R^2   = 0.99883
$\Gamma_s RT$ 2.9   ±0.3
β 46.6   ±3.4
α -23.2   ±1.2

π (mN/m)
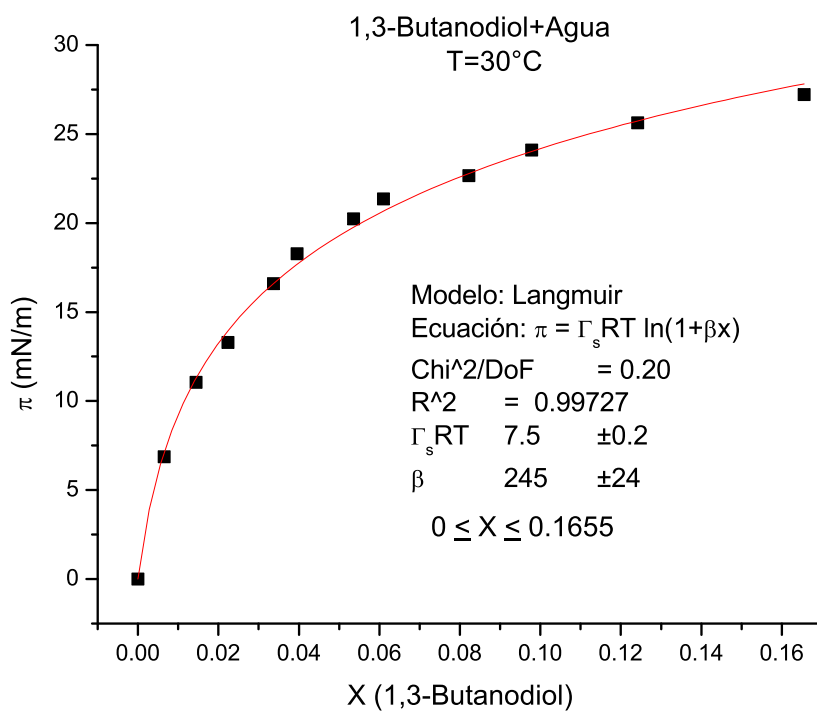
X (1,3-Butanodiol)

K. Nakanishi, T. Matsumoto y M. Hayatsu
J. Chem. Eng. Data **1971**, 16, 44
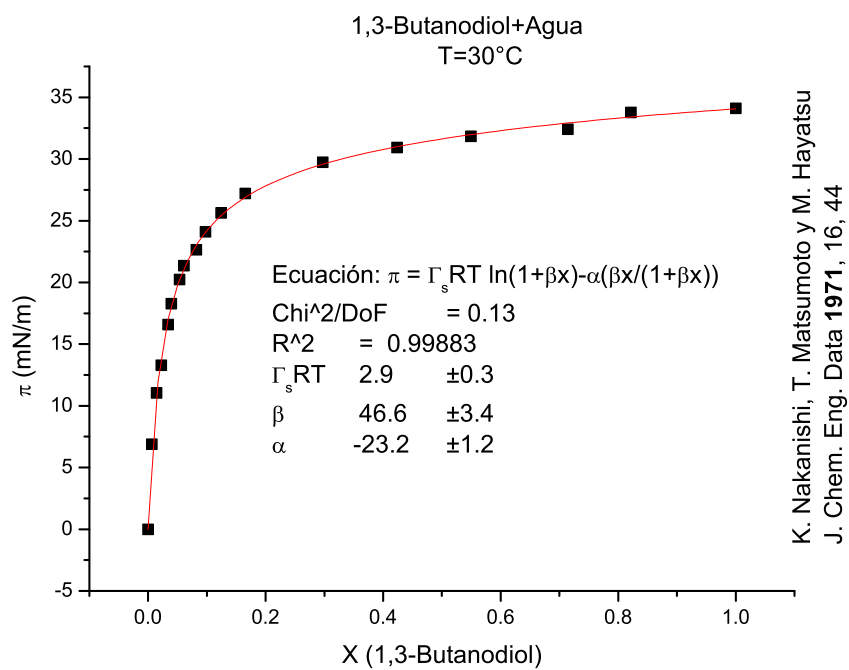
Tabla B.16: 1,3-Butanodiol + Agua a T=30°C [30]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	71.15	0	–
0.0065	64.27	6.88	-5.03595
0.0144	60.1	11.05	-4.24053
0.0224	57.85	13.3	-3.79869
0.0337	54.56	16.59	-3.39026
0.0395	52.87	18.28	-3.23145
0.0536	50.91	20.24	-2.92621
0.061	49.79	21.36	-2.79688
0.0822	48.49	22.66	-2.4986
0.0978	47.04	24.11	-2.32483
0.1242	45.51	25.64	-2.08586
0.1655	43.94	27.21	-1.79878
0.2972	41.41	29.74	-1.21335
0.4236	40.21	30.94	-0.85897
0.5494	39.32	31.83	-0.59893
0.7146	38.73	32.42	-0.33603
0.8217	37.38	33.77	-0.19638
1	37.04	34.11	0

1,3-Propanodiol+Agua
T=30°C

K. Nakanishi, T. Matsumoto y M. Hayatsu
J. Chem. Eng. Data **1971**, 16, 44

1,3-Propanodiol+Agua
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.05
R^2   = 0.9986
$\Gamma_s RT$ 6.8   ±0.2
β 92   ±6

$0 \leq X \leq 0.1259$

K. Nakanishi, T. Matsumoto y M. Hayatsu
J. Chem. Eng. Data **1971**, 16, 44

1,3-Propanodiol+Agua
T=30°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)-\alpha(\beta x/(1+\beta x))$

Chi^2/DoF	= 0.07	
R^2	= 0.99882	
$\Gamma_s RT$	2.3	±0.3
β	28.9	±2.2
α	-16.8	±1.

π (mN/m)

X (1,3-Propanodiol)

K. Nakanishi, T. Matsumoto y M. Hayatsu
J. Chem. Eng. Data **1971**, 16, 44

Tabla B.17: 1,3-Propanodiol + Agua a T=30°C [30]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	71.15	0	–
0.007	68.18	2.97	-4.96185
0.008	67.38	3.77	-4.82831
0.0154	65.23	5.92	-4.17339
0.025	62.72	8.43	-3.68888
0.0326	61.74	9.41	-3.42344
0.0435	60.25	10.9	-3.13499
0.0631	57.75	13.4	-2.76303
0.0747	57.1	14.05	-2.59428
0.0929	55.6	15.55	-2.37623
0.1091	54.97	16.18	-2.21549
0.1259	54.11	17.04	-2.07227
0.1916	52.82	18.33	-1.65235
0.2936	51.29	19.86	-1.22554
0.4073	50.39	20.76	-0.89821
0.5396	49.14	22.01	-0.61693
0.8112	47.64	23.51	-0.20924
1	46.95	24.2	0

LANGMUIR 2 SUFIJOS

C

Acetona + Agua
T=0°C

π (mN/m)

lnX

J. Livingston, R. Morgan y A. J. Scarlett Jr.
J. Am. Chem. Soc., **1917**, 39, 2275

Agua+Acetona
T=0°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.15
R^2   = 0.99938
$\Gamma_s RT$ 10.85   ±0.24
β 244   ±18
$0 \leq X \leq 0.237$

X (Acetona)

Acetona + Agua
T=0°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF   = 0.56
R^2   = 0.99795
$\Gamma_s RT$ 4.8   ±0.5
β 103   ±10
α -29   ±3

X (Acetona)

Tabla C.1: Acetona + Agua a T=0°C [24]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	75.87	0	–
0.016	58.8	17.07	-4.13517
0.033	52.25	23.62	-3.41125
0.072	43.98	31.89	-2.63109
0.094	41.06	34.81	-2.36446
0.117	38.73	37.14	-2.14558
0.171	34.94	40.93	-1.76609
0.237	32.32	43.55	-1.4397
0.482	28.5	47.37	-0.72981
0.637	27.46	48.41	-0.45099
0.736	26.92	48.95	-0.30653
0.855	26.23	49.64	-0.15665
1	25.17	50.7	0
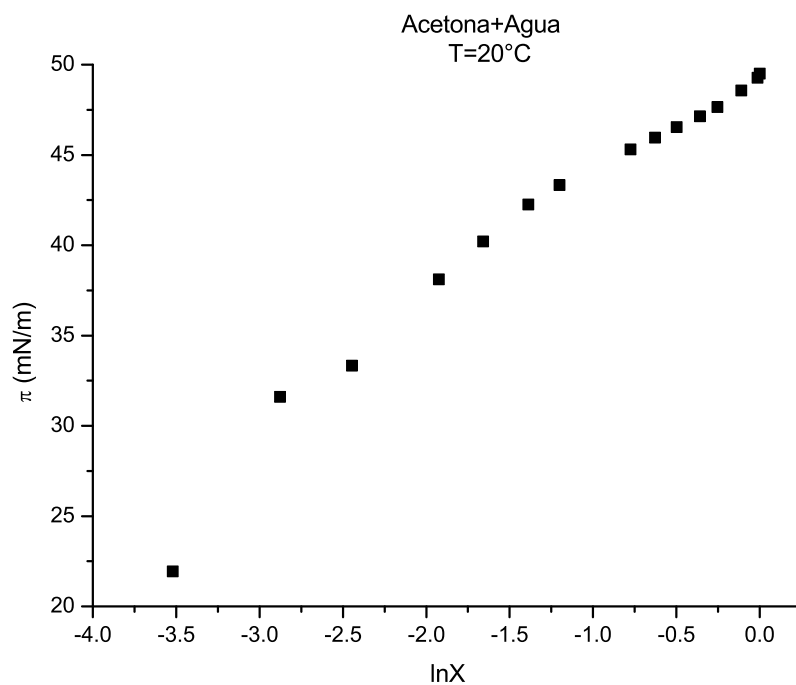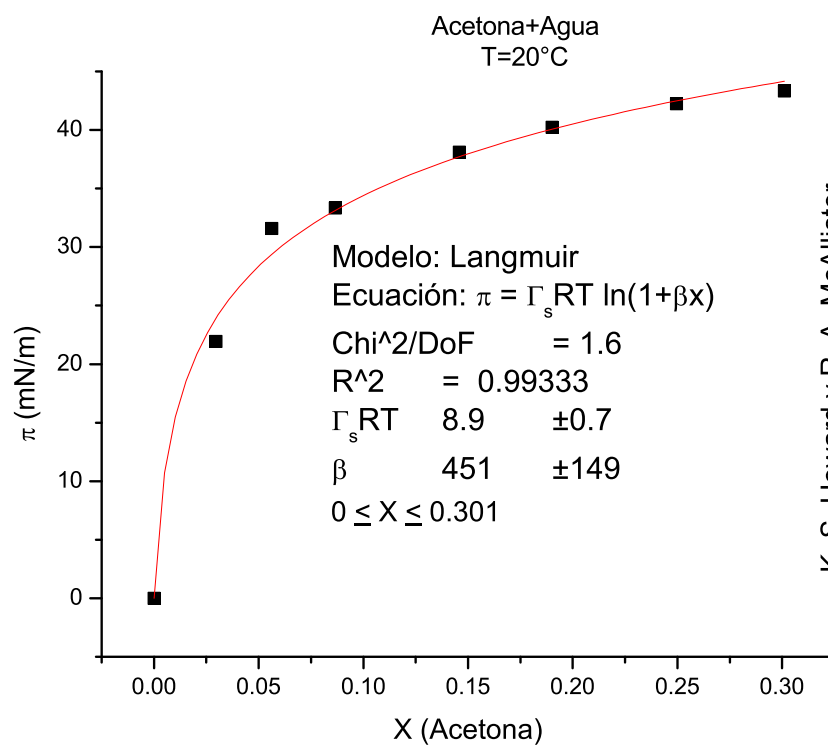
Acetona+Agua
T=20°C

K. S. Howard y R. A. McAllister
A.I.Ch.E. Journal **1957**, 3, 325

Acetona+Agua
T=20°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 1.6
R^2   = 0.99333
$\Gamma_s RT$ 8.9   ±0.7
β 451   ±149
$0 \leq X \leq 0.301$

K. S. Howard y R. A. McAllister
A.I.Ch.E. Journal **1957**, 3, 325

Acetona + Agua
T=20°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF   = 0.35
R^2   = 0.99819
$\Gamma_s RT$ 3.8   ±0.5
β 94.4   ±8.5
α -32   ±2

π (mN/m)
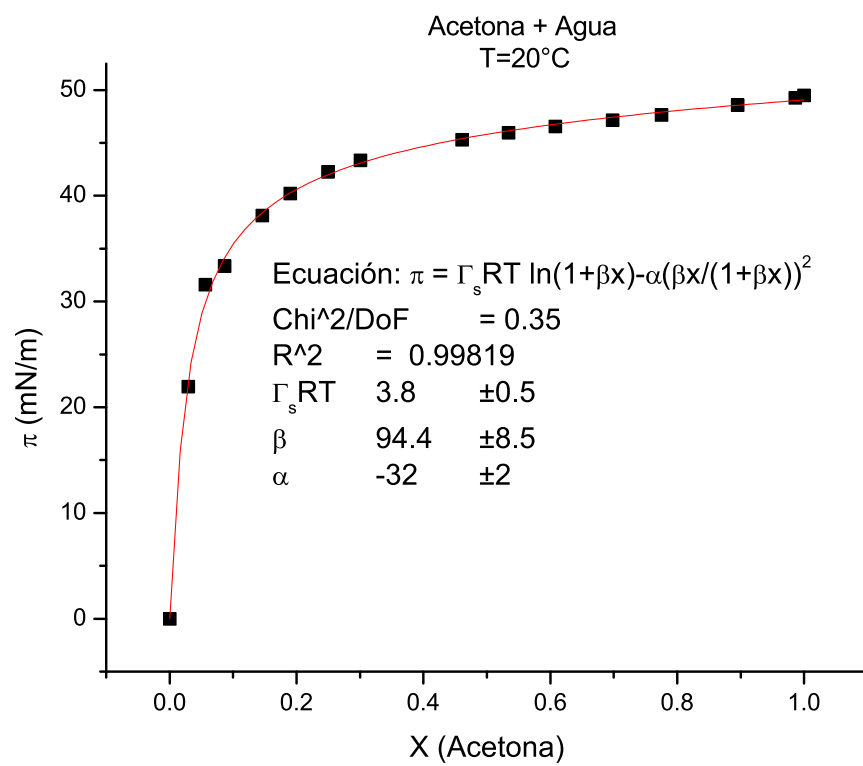
X (Acetona)

K. S. Howard y R. A. McAllister
A.I.Ch.E. Journal **1957**, 3, 325

Tabla C.2: Acetona + Agua a T=20°C [14]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	72.74	0	–
0.0296	50.8	21.94	-3.51998
0.0563	41.14	31.6	-2.87706
0.0866	39.4	33.34	-2.44646
0.1459	34.62	38.12	-1.92483
0.1902	32.52	40.22	-1.65968
0.2495	30.49	42.25	-1.3883
0.301	29.4	43.34	-1.20065
0.461	27.43	45.31	-0.77436
0.534	26.77	45.97	-0.62736
0.608	26.2	46.54	-0.49758
0.698	25.59	47.15	-0.35954
0.775	25.09	47.65	-0.25489
0.895	24.17	48.57	-0.11093
0.986	23.47	49.27	-0.0141
1	23.24	49.5	0

Acetona+Agua
T=25°C

Acetona+Agua
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.09
R^2   = 0.99964
$\Gamma_s RT$ 10.7   ±0.2
β 256   ±16

$0 \le X \le 0.171$

Acetona + Agua
T=25°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF	= 0.35	
R^2	= 0.99866	
$\Gamma_s RT$	4.4	±0.4
β	110	±8
α	-29	±2

π (mN/m)
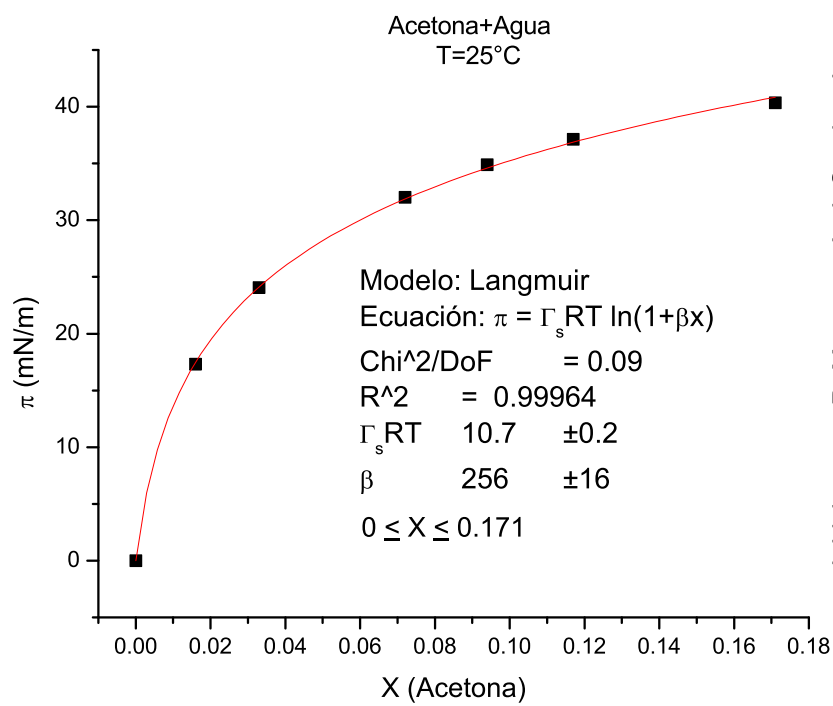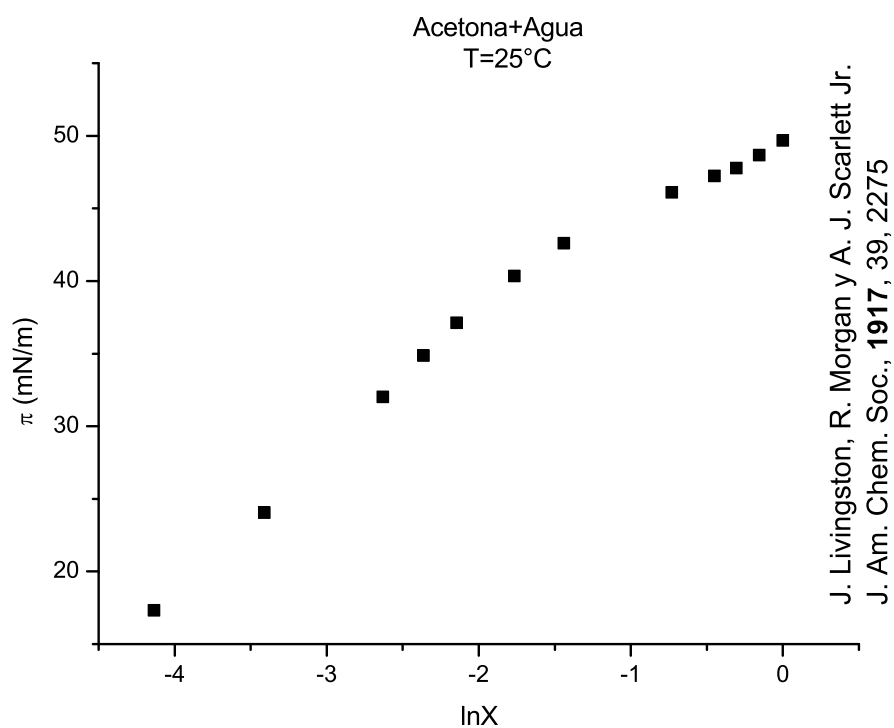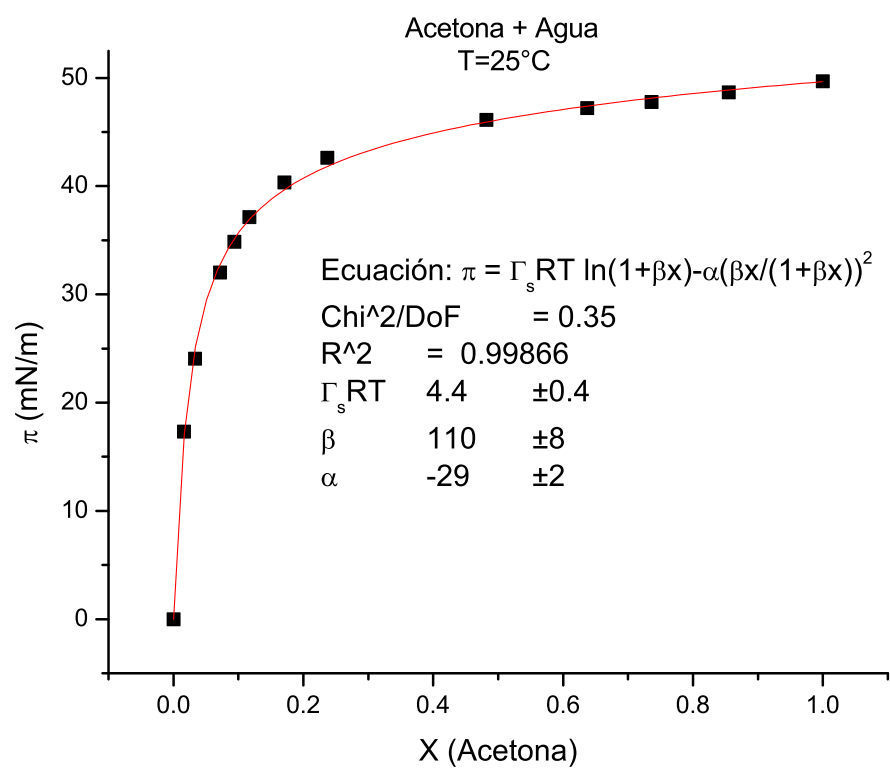
X (Acetona)

J. Livingston, R. Morgan y A. J. Scarlett Jr.
J. Am. Chem. Soc., **1917**, 39, 2275

Tabla C.3: Acetona + Agua a T=25°C [24]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	71.86	0	−
0.016	54.54	17.32	-4.13517
0.033	47.81	24.05	-3.41125
0.072	39.83	32.03	-2.63109
0.094	36.98	34.88	-2.36446
0.117	34.73	37.13	-2.14558
0.171	31.5	40.36	-1.76609
0.237	29.25	42.61	-1.4397
0.482	25.75	46.11	-0.72981
0.637	24.63	47.23	-0.45099
0.736	24.08	47.78	-0.30653
0.855	23.19	48.67	-0.15665
1	22.17	49.69	0

Acetona+Agua
T=37.78 °C

K. S. Howard y R. A. McAllister
A.I.Ch.E. Journal **1957**, 3, 325

Acetona+Agua
T=37.78 °C

Model: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF		= 0.10
R^2		= 0.99934
$\Gamma_s RT$	10.3	±0.2
β	270	±13

$0 \leq X \leq 0.1463$

K. S. Howard y R. A. McAllister
A.I.Ch.E. Journal **1957**, 3, 325

Acetona + Agua
T=37.78 °C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF   = 1.14
R^2   = 0.99686
$\Gamma_s RT$ 6.3   ±0.5
β 177   ±23
α -17   ±3

π (mN/m)

X (Acetona)

Tabla C.4: Acetona + Agua a T=37.78°C [14]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	69.91	0	–
0.0011	66.69	3.22	-6.81245
0.0034	62.9	7.01	-5.68398
0.0071	58.8	11.11	-4.94766
0.01225	55.04	14.87	-4.40223
0.0154	53.14	16.77	-4.17339
0.0208	50.54	19.37	-3.8728
0.0299	47.5	22.41	-3.5099
0.0586	40.29	29.62	-2.83702
0.1463	31.78	38.13	-1.9221
0.2513	27.96	41.95	-1.38111
0.473	24.99	44.92	-0.74866
0.683	23.25	46.66	-0.38126
0.879	21.79	48.12	-0.12897
0.983	21.07	48.84	-0.01715
1	20.88	49.03	0

Acetona+Agua
T=45°C

Acetona+Agua
T=45°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.15
R^2   = 0.99933
$\Gamma_s RT$ 10.5   ±0.3
β 260   ±23

$0 \leq X \leq 0.171$

Acetona + Agua
T=45°C

π (mN/m)

X (Acetona)

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF	= 0.26	
R^2	= 0.99895	
$\Gamma_s RT$	4.1	±0.3
β	110	±7
α	-29	±2

Tabla C.5: Acetona + Agua a T=45°C [24]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	68.46	0	–
0.016	51.52	16.94	-4.13517
0.033	44.67	23.79	-3.41125
0.072	36.87	31.59	-2.63109
0.094	34	34.46	-2.36446
0.117	31.98	36.48	-2.14558
0.171	28.94	39.52	-1.76609
0.237	26.81	41.65	-1.4397
0.482	23.54	44.92	-0.72981
0.637	22.4	46.06	-0.45099
0.736	21.79	46.67	-0.30653
0.855	20.89	47.57	-0.15665
1	19.78	48.68	0

Dimetiletanolamina+Agua
T=25°C

Dimetiletanolamina+Agua
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.06
R^2   = 0.99966
$\Gamma_s RT$ 7.4   ±0.2
β 510   ±48
$0 \leq X \leq 0.2034$

Dimetiletanolamina + Agua
T=25°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF   = 0.26
R^2   = 0.9985
$\Gamma_s RT$ 3.8   ±0.4
β 127   ±15
α -23   ±2

π (mN/m)

X (Dimetiletanolamina)
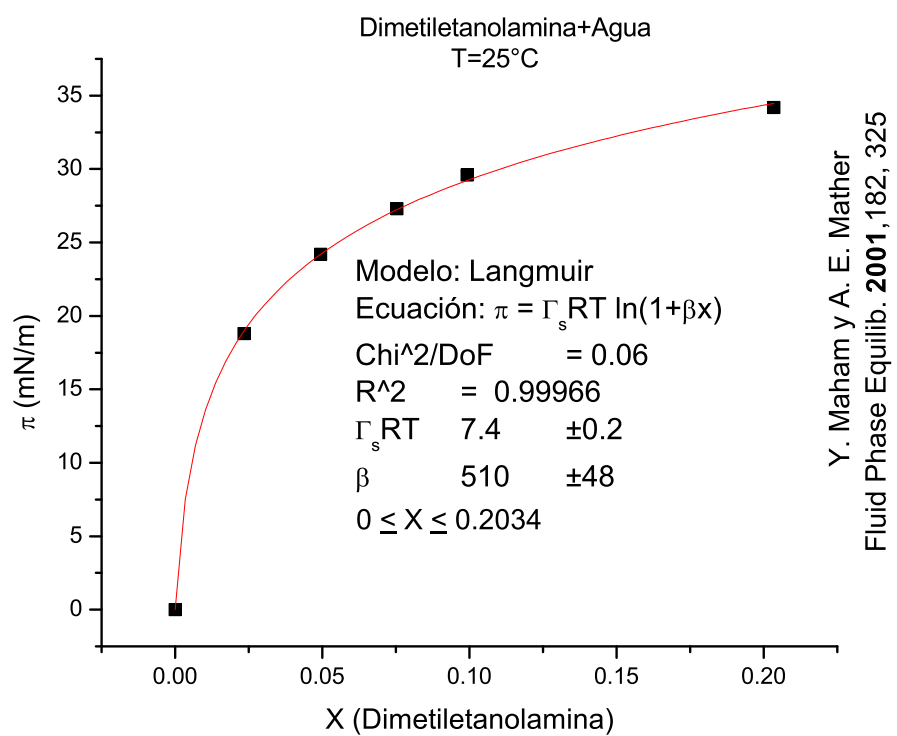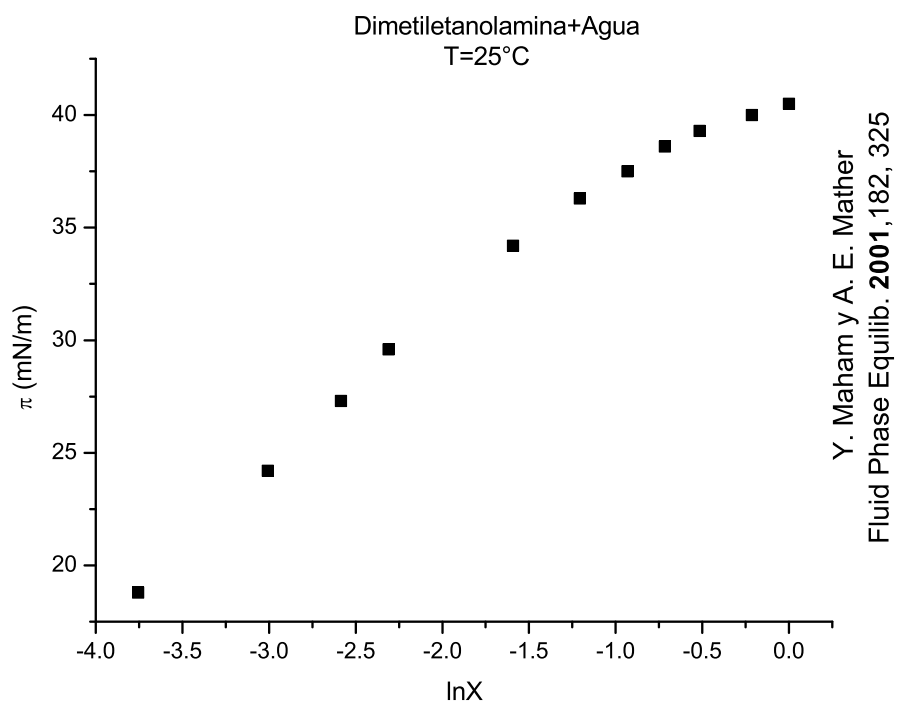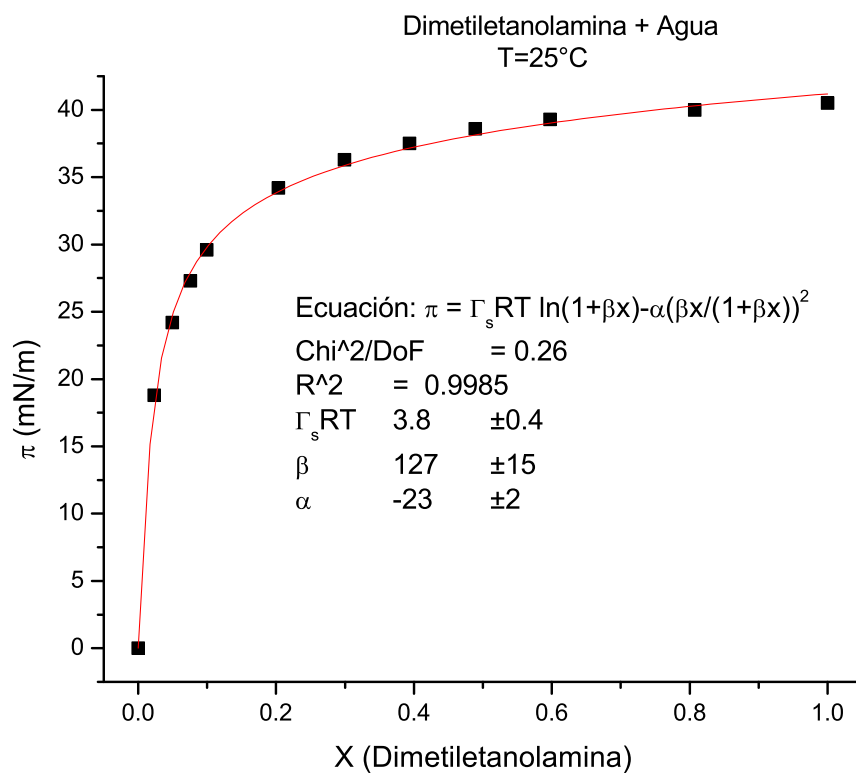
Y. Maham y A. E. Mather
Fluid Phase Equilib. **2001**,182, 325

Tabla C.6: Dimetiletanolamina+Agua a T=25°C [22]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	72	0	–
0.0234	53.2	18.8	-3.75502
0.0494	47.8	24.2	-3.0078
0.0754	44.7	27.3	-2.58495
0.0992	42.4	29.6	-2.31062
0.2034	37.8	34.2	-1.59258
0.2994	35.7	36.3	-1.20597
0.3936	34.5	37.5	-0.93242
0.4888	33.4	38.6	-0.7158
0.5973	32.7	39.3	-0.51534
0.8075	32	40	-0.21381
1	31.5	40.5	0
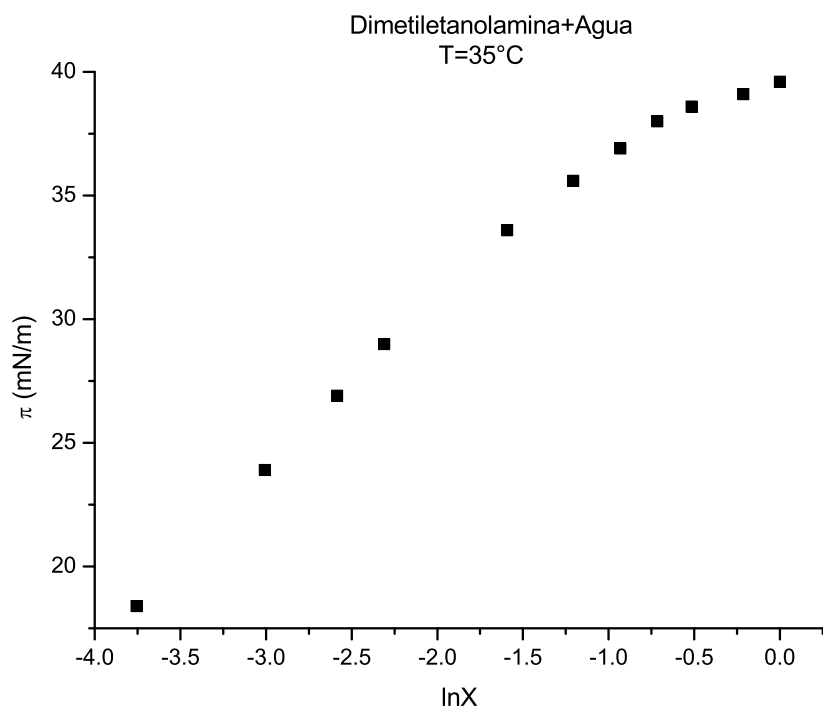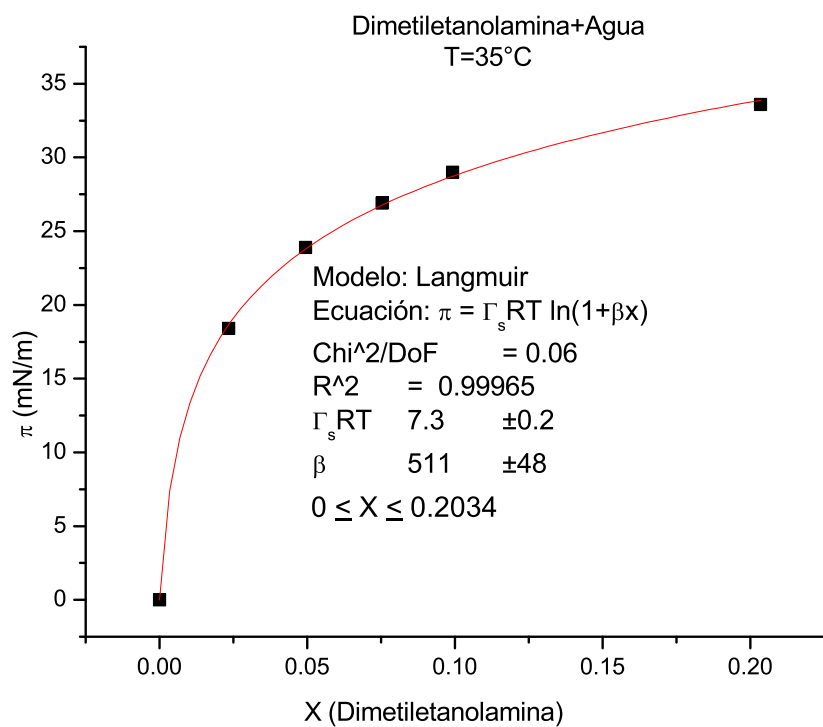
Dimetiletanolamina+Agua
T=35°C

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Dimetiletanolamina+Agua
T=35°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.06
R^2   = 0.99965
$\Gamma_s RT$ 7.3   ±0.2
β 511   ±48

$0 \leq X \leq 0.2034$

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Dimetiletanolamina + Agua
T=35°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)-\alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF   = 0.27
R^2   = 0.99836
$\Gamma_s RT$ 3.6   ±0.4
β 124   ±14
α -23   ±2

π (mN/m)

X (Dimetiletanolamina)
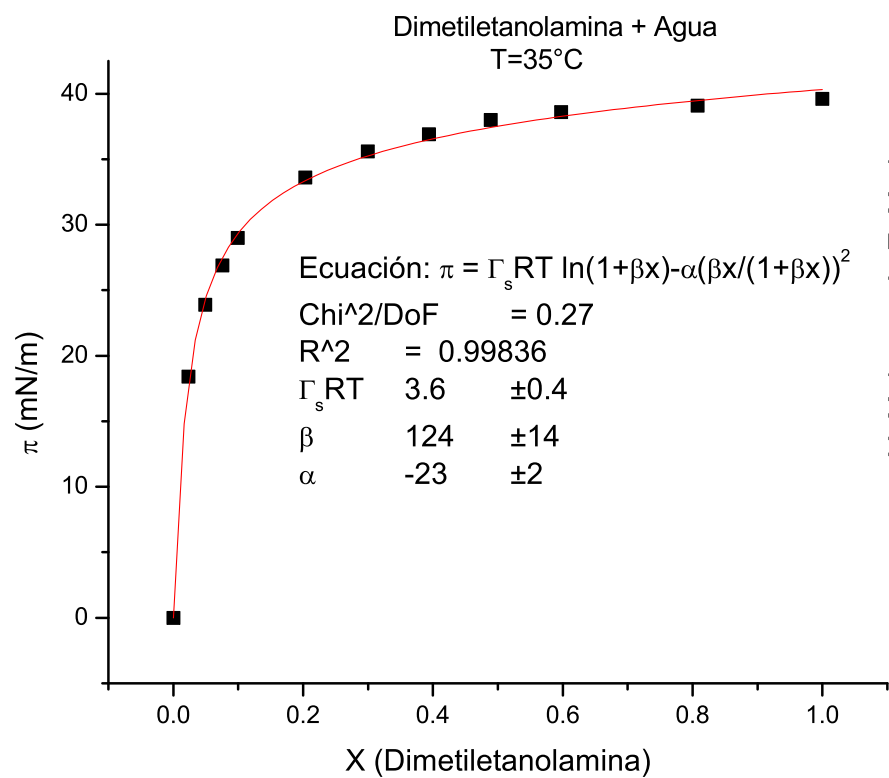
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Fluid Phase Equilib. **2001**,182, 325

Tabla C.7: Dimetiletanolamina+Agua a T=35°C [22]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	70.4	0	–
0.0234	52	18.4	-3.75502
0.0494	46.5	23.9	-3.0078
0.0754	43.5	26.9	-2.58495
0.0992	41.4	29	-2.31062
0.2034	36.8	33.6	-1.59258
0.2994	34.8	35.6	-1.20597
0.3936	33.5	36.9	-0.93242
0.4888	32.4	38	-0.7158
0.5973	31.8	38.6	-0.51534
0.8075	31.3	39.1	-0.21381
1	30.8	39.6	0
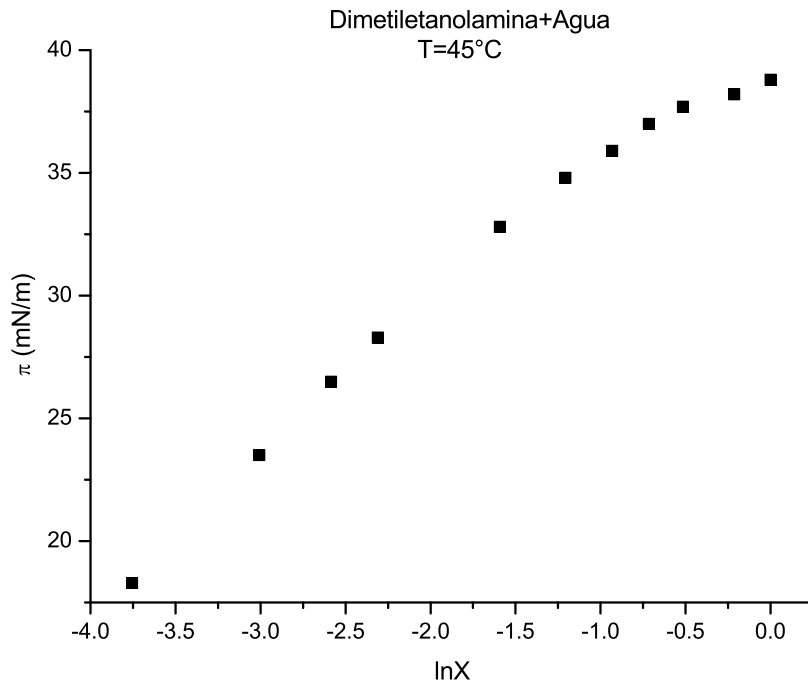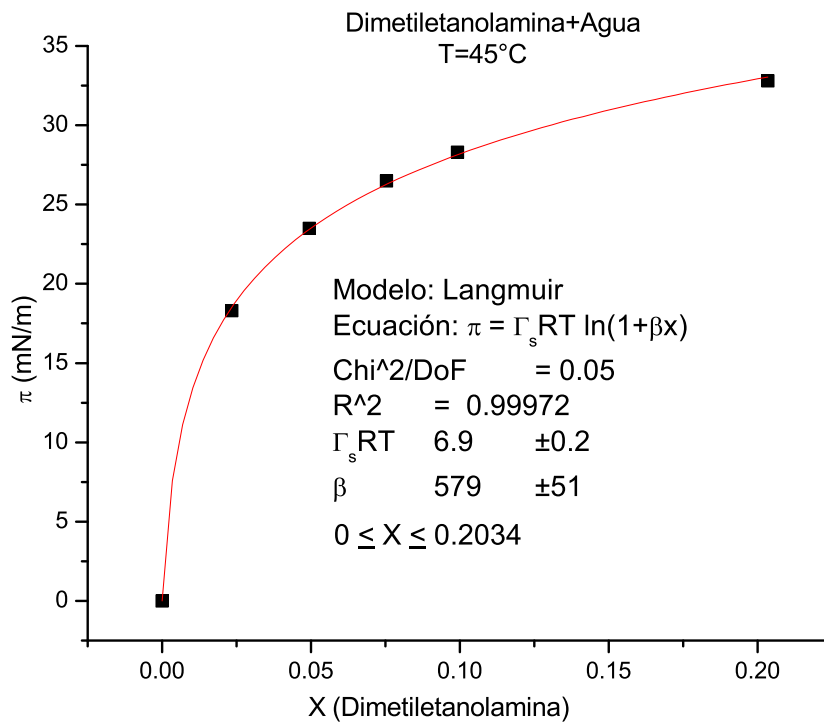
Dimetiletanolamina+Agua
T=45°C

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Fluid Phase Equilib. **2001**,182, 325

Dimetiletanolamina+Agua
T=45°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.05
R^2   = 0.99972
$\Gamma_s RT$ 6.9   ±0.2
β 579   ±51

$0 \leq X \leq 0.2034$

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Dimetiletanolamina + Agua
T=45°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF	= 0.22	
R^2	= 0.99861	
$\Gamma_s RT$	3.6	±0.4
β	134	±15
α	-22	±2

π (mN/m)

X (Dimetiletanolamina)
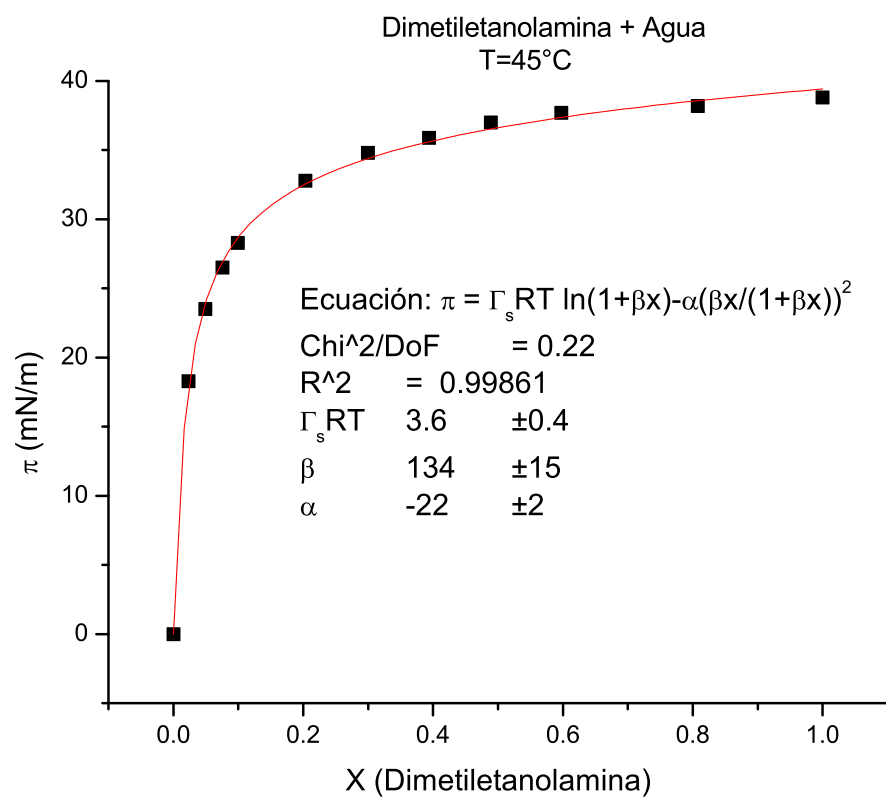
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Fluid Phase Equilib. **2001**,182, 325

Tabla C.8: Dimetiletanolamina+Agua a T=45°C [22]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	68.8	0	–
0.0234	50.5	18.3	-3.75502
0.0494	45.3	23.5	-3.0078
0.0754	42.3	26.5	-2.58495
0.0992	40.5	28.3	-2.31062
0.2034	36	32.8	-1.59258
0.2994	34	34.8	-1.20597
0.3936	32.9	35.9	-0.93242
0.4888	31.8	37	-0.7158
0.5973	31.1	37.7	-0.51534
0.8075	30.6	38.2	-0.21381
1	30	38.8	0

Dimetiletanolamina+Agua
T=55°C

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Dimetiletanolamina+Agua
T=55°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF	= 0.10	
R^2	= 0.99937	
$\Gamma_s RT$	6.7	±0.2
β	603	±81

$0 \leq X \leq 0.2034$

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Dimetiletanolamina + Agua
T=55°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF = 0.15
R^2 = 0.99899
$\Gamma_s RT$ 3.5 ±0.3
β 136 ±13
α -21 ±2

π (mN/m)

X (Dimetiletanolamina)
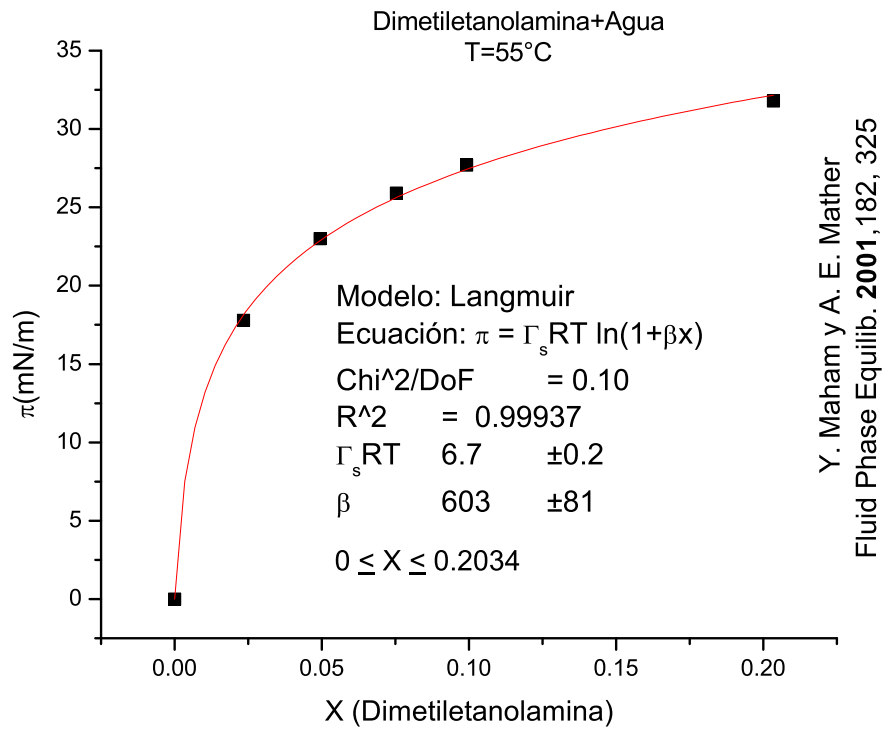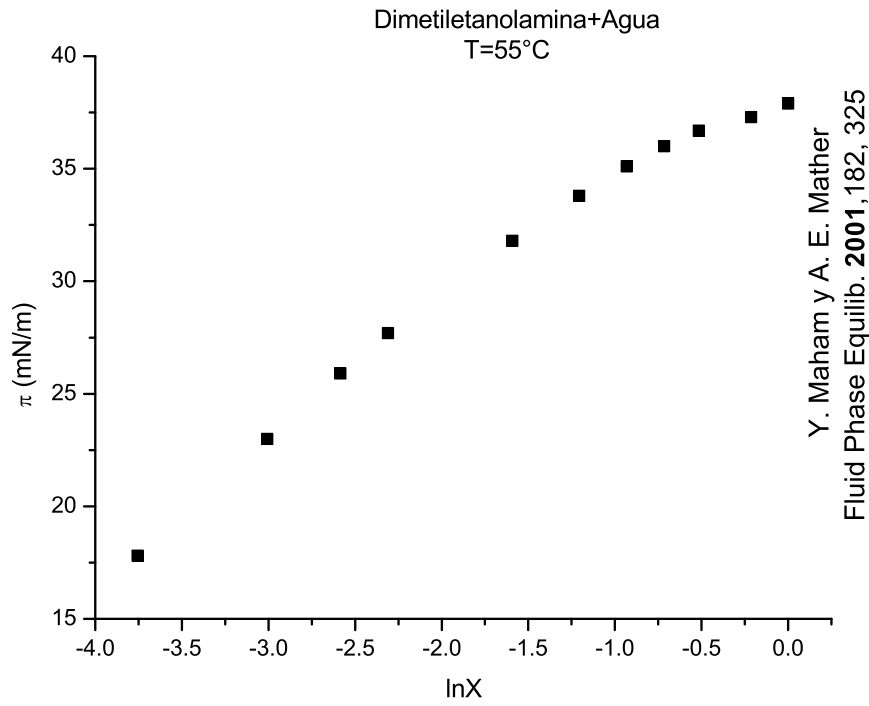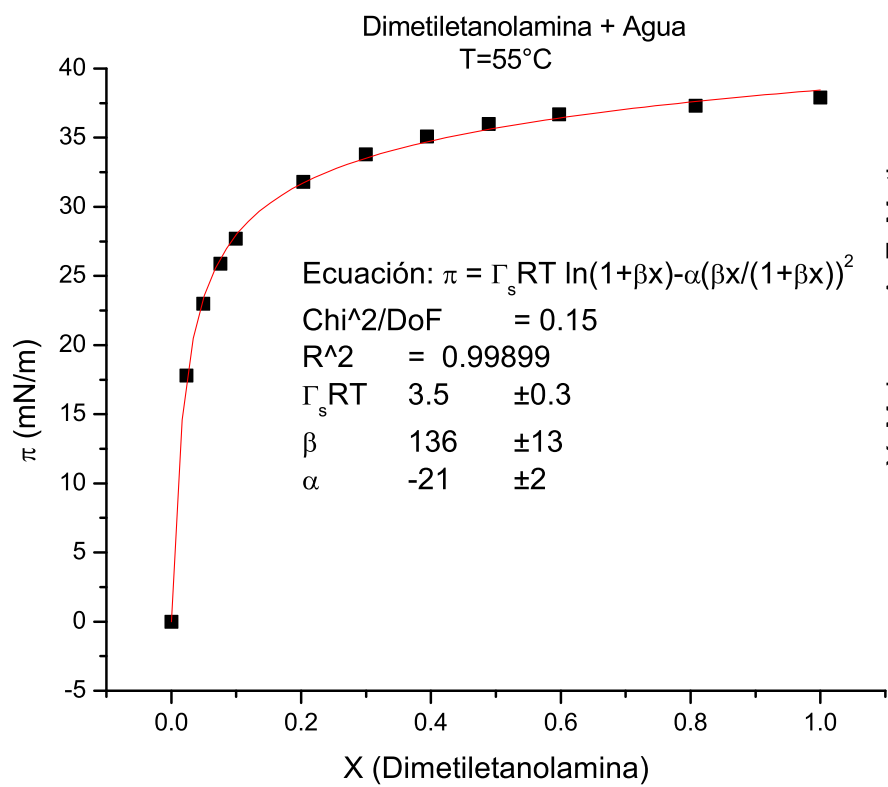
Y. Maham y A. E. Mather
Fluid Phase Equilib. **2001**,182, 325

Tabla C.9: Dimetiletanolamina+Agua a T=55°C [22]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	67.1	0	–
0.0234	49.3	17.8	-3.75502
0.0494	44.1	23	-3.0078
0.0754	41.2	25.9	-2.58495
0.0992	39.4	27.7	-2.31062
0.2034	35.3	31.8	-1.59258
0.2994	33.3	33.8	-1.20597
0.3936	32	35.1	-0.93242
0.4888	31.1	36	-0.7158
0.5973	30.4	36.7	-0.51534
0.8075	29.8	37.3	-0.21381
1	29.2	37.9	0

1,4-Butanodiol+Agua
T=30°C

1,4-Butanodiol+Agua
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.06
R^2   = 0.99829
$\Gamma_s RT$ 6.3   ±0.2
β 177   ±13

$0 \leq X \leq 0.1189$

1,4-Butanodiol+Agua
T=30°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF	= 0.04	
R^2	= 0.99936	
$\Gamma_s RT$	3.8	±0.1
β	129	±6
α	-9.1	±0.6

π (mN/m)
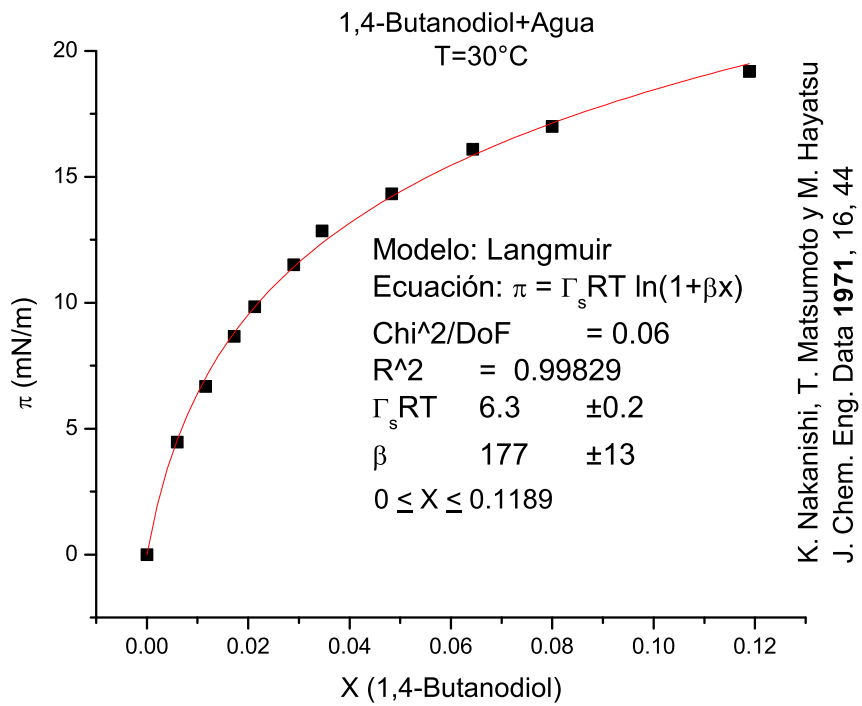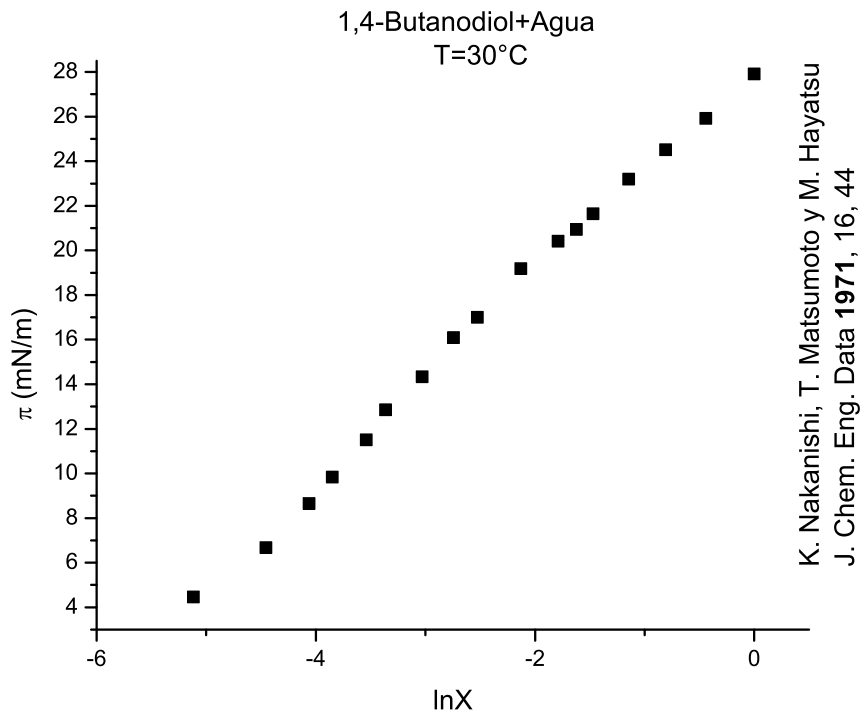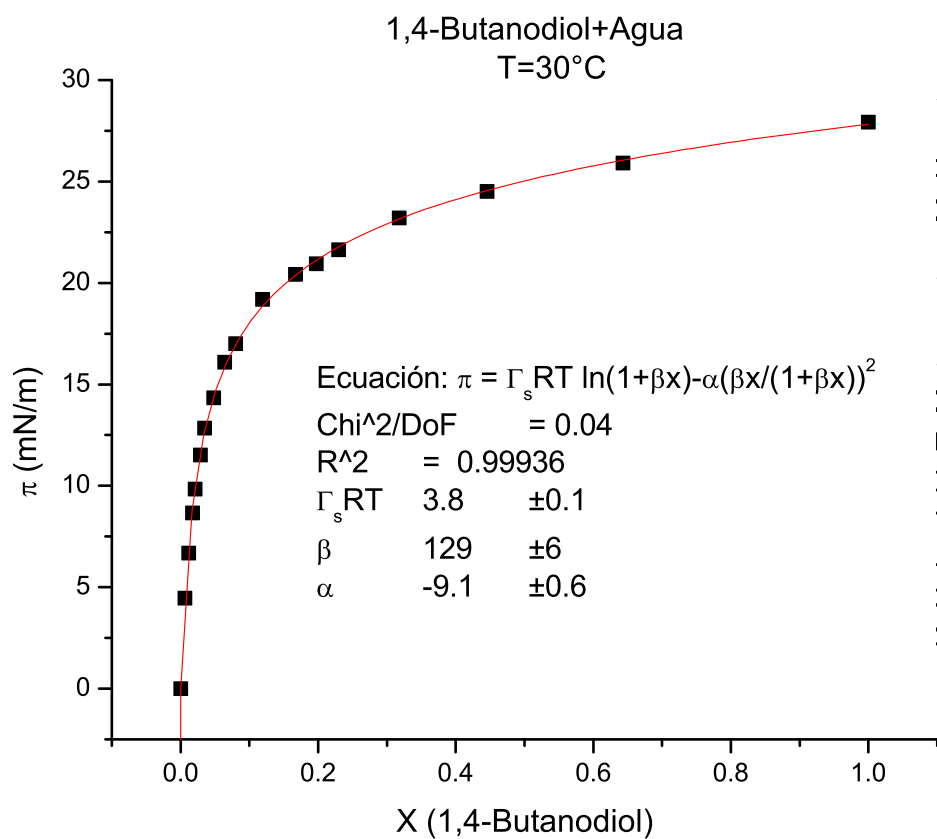
X (1,4-Butanodiol)

Tabla C.10: 1,4-Butanodiol + Agua a T=30°C [30]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	71.15	0	–
0.006	66.69	4.46	-5.116
0.0116	64.47	6.68	-4.45675
0.0172	62.49	8.66	-4.06285
0.0213	61.31	9.84	-3.84905
0.029	59.64	11.51	-3.54046
0.0346	58.3	12.85	-3.3639
0.0483	56.82	14.33	-3.03032
0.0643	55.05	16.1	-2.7442
0.08	54.15	17	-2.52573
0.1189	51.96	19.19	-2.12947
0.167	50.73	20.42	-1.78976
0.1974	50.21	20.94	-1.62252
0.2298	49.51	21.64	-1.47055
0.3177	47.95	23.2	-1.14665
0.4455	46.63	24.52	-0.80856
0.6432	45.23	25.92	-0.4413
1	43.23	27.92	0

Glicerol + Agua
T=25°C

π (mN/m)

lnX

Glicerol + Agua
T=25°C

π (mN/m)

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.01
R^2   = 0.99664
$\Gamma_s RT$ 1.8   ±0.1
β 66   ±10

$0 \leq X \leq 0.31$

X (Glicerol)

Glicerol + Agua
T=25°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF   = 0.02
R^2   = 0.99818
Γ_sRT   21   ±1
β 3.5   ±0.2
α 35   ±1

π (mN/m)
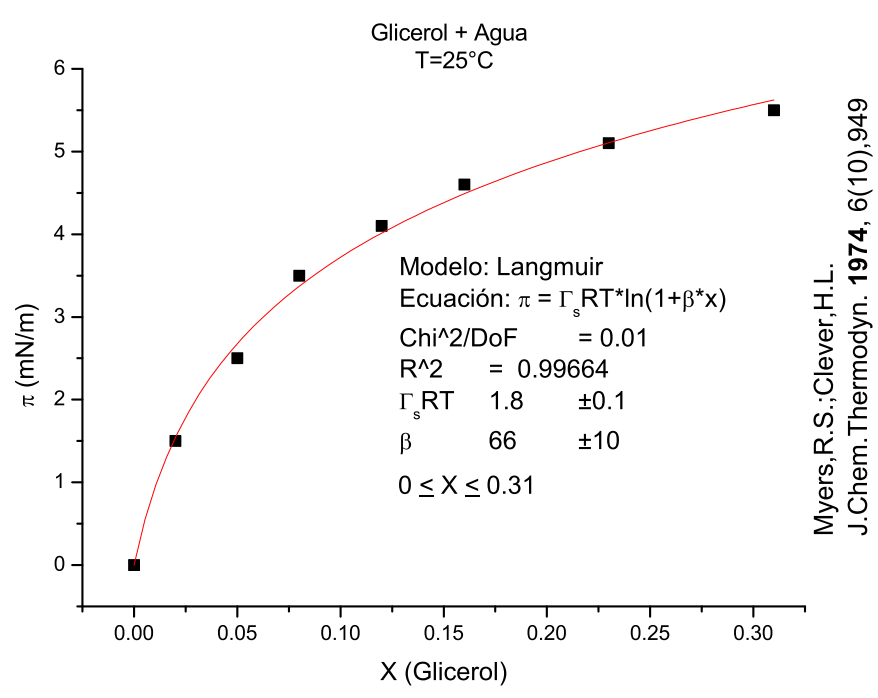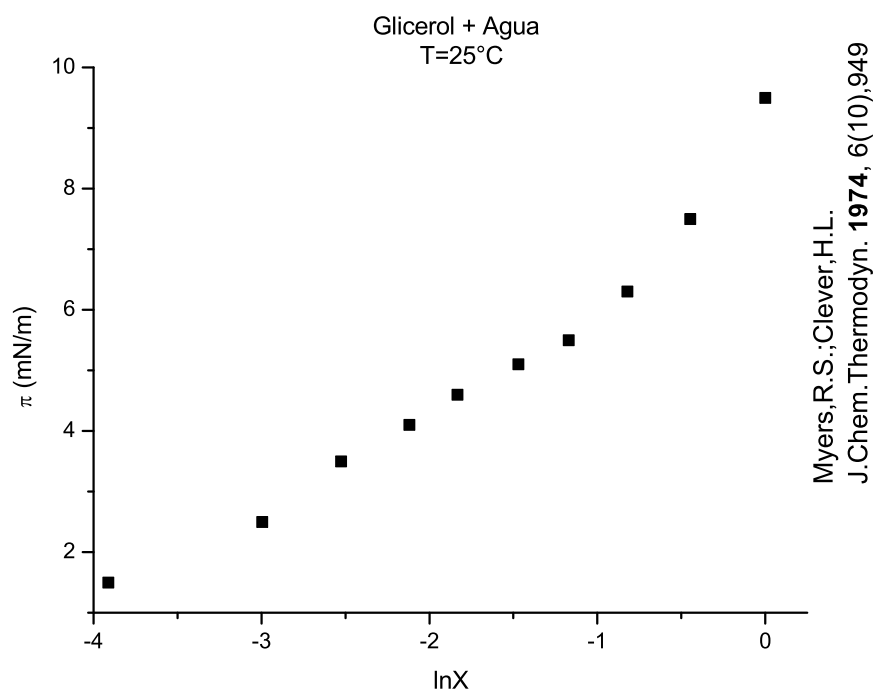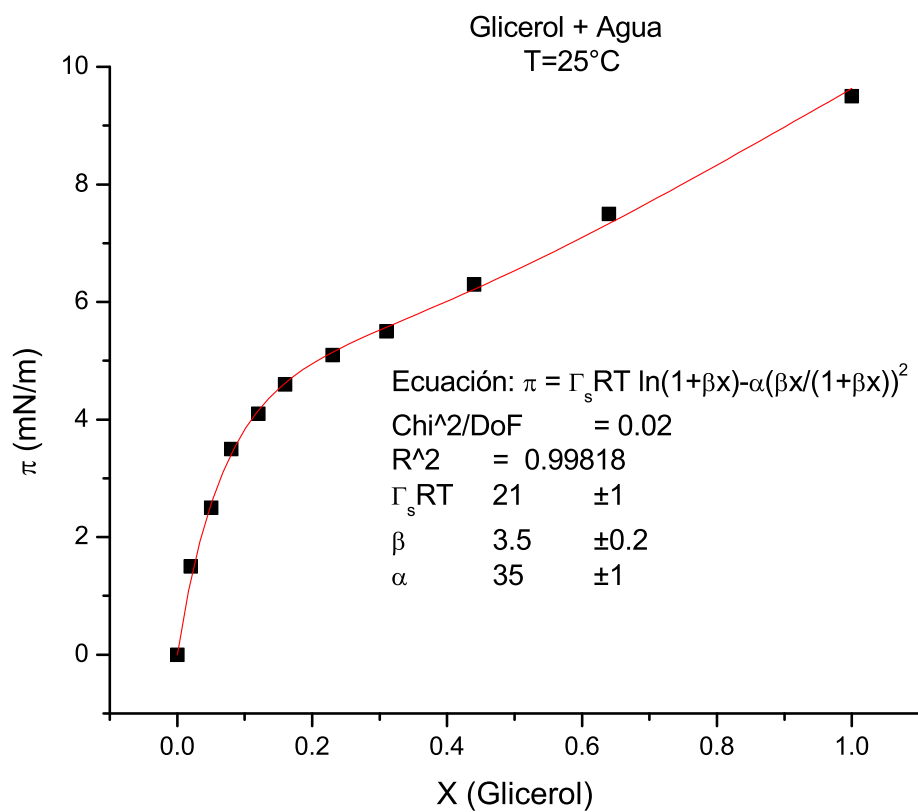
X (Glicerol)

Myers,R.S.;Clever,H.L.
J.Chem.Thermodyn. **1974**, 6(10),949

Tabla C.11: Glicerol + Agua a T=25°C [29]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
1	62.5	9.5	0
0.64	64.5	7.5	-0.44629
0.44	65.7	6.3	-0.82098
0.31	66.5	5.5	-1.17118
0.23	66.9	5.1	-1.46968
0.16	67.4	4.6	-1.83258
0.12	67.9	4.1	-2.12026
0.08	68.5	3.5	-2.52573
0.05	69.5	2.5	-2.99573
0.02	70.5	1.5	-3.91202
0	72	0	–

Butano-1,3-diol + Agua
T=30°C

Butano-1,3-diol + Agua
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF   = 0.2
R^2   = 0.99727
$\Gamma_s RT$ 7.5   ±0.2
β 245   ±24

$0 \leq X \leq 0.1655$

Butano-1,3-diol + Agua
T=30°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF	= 0.256	
R^2	= 0.99764	
$\Gamma_s RT$	3.7	±0.3
β	129	±10
α	-16.7	±1.4

π (mN/m)
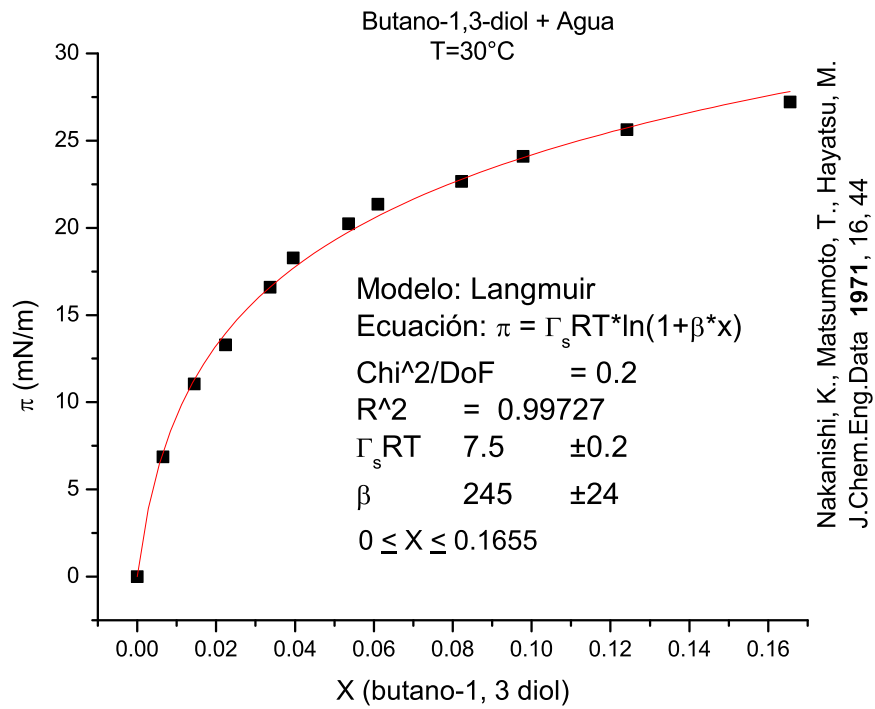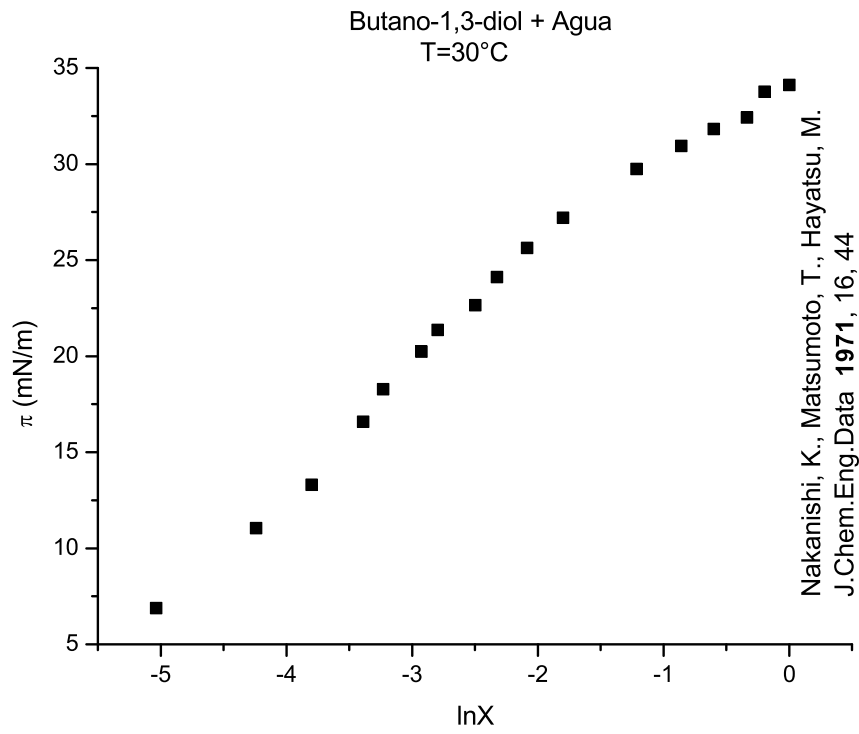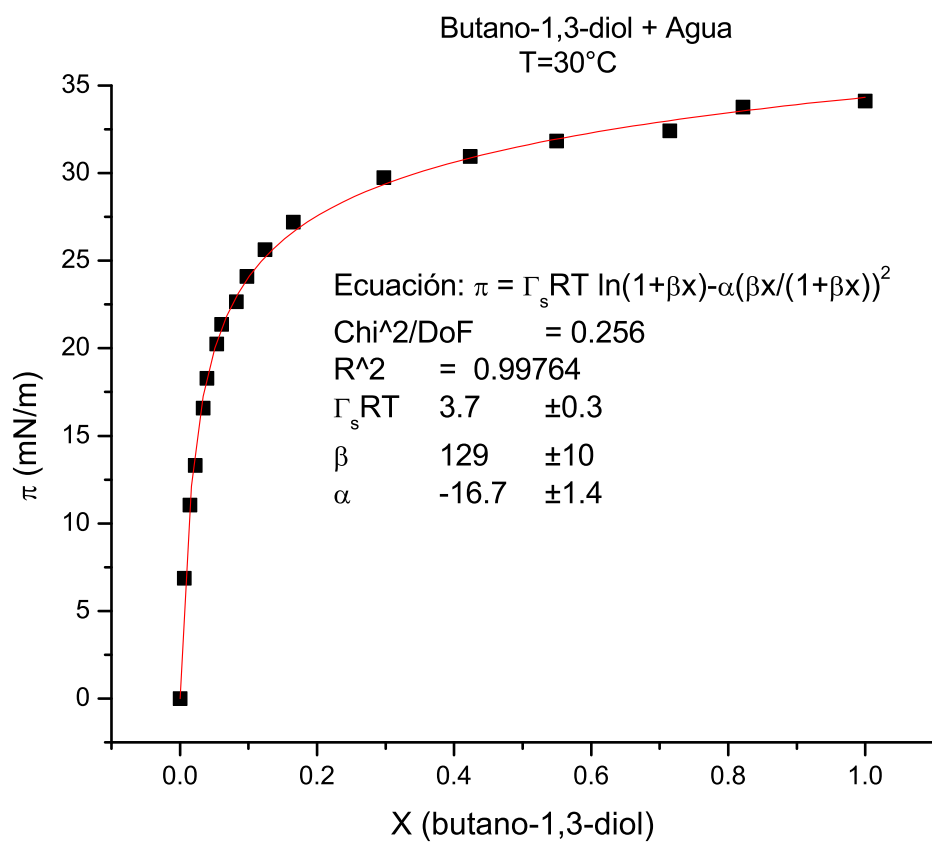
X (butano-1,3-diol)

Nakanishi, K., Matsumoto, T., Hayatsu, M. J.Chem.Eng.Data **1971**, 16, 44

Tabla C.12: Butano-1,3-diol + Agua a T=30°C [30]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	71.15	0	–
0.0065	64.27	6.88	-5.03595
0.0144	60.1	11.05	-4.24053
0.0224	57.85	13.3	-3.79869
0.0337	54.56	16.59	-3.39026
0.0395	52.87	18.28	-3.23145
0.0536	50.91	20.24	-2.92621
0.061	49.79	21.36	-2.79688
0.0822	48.49	22.66	-2.4986
0.0978	47.04	24.11	-2.32483
0.1242	45.51	25.64	-2.08586
0.1655	43.94	27.21	-1.79878
0.2972	41.41	29.74	-1.21335
0.4236	40.21	30.94	-0.85897
0.5494	39.32	31.83	-0.59893
0.7146	38.73	32.42	-0.33603
0.8217	37.38	33.77	-0.19638
1	37.04	34.11	0

Propano-1,3-diol + Agua
T=30°C

Propano-1,3-diol + Agua
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.05
R^2   = 0.9987
$\Gamma_s RT$ 6.9   ±0.2
β 88.9   ±5.8

$0 \leq X \leq 0.1259$

Propano-1,3-diol + Agua
T=30°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF   = 0.07
R^2   = 0.99889
$\Gamma_s RT$ 2.9   ±0.2
β 80   ±4
α -11.5   ±0.8

π (mN/m)

X (Propano-1,3-diol)

Nakanishi, K., Matsumoto, T., Hayatsu, M.
J.Chem.Eng.Data **1971**, 16, 44

Tabla C.13: Propano-1,3-diol + Agua a T=30°C [30]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	71.15	0	–
0.007	68.18	2.97	-4.96185
0.0088	67.38	3.77	-4.733
0.0154	65.23	5.92	-4.17339
0.025	62.72	8.43	-3.68888
0.0326	61.74	9.41	-3.42344
0.0435	60.25	10.9	-3.13499
0.0651	57.75	13.4	-2.73183
0.0747	57.1	14.05	-2.59428
0.0929	55.6	15.55	-2.37623
0.1091	54.97	16.18	-2.21549
0.1259	54.11	17.04	-2.07227
0.1916	52.82	18.33	-1.65235
0.2936	51.29	19.86	-1.22554
0.4073	50.39	20.76	-0.89821
0.5396	49.14	22.01	-0.61693
0.8112	47.64	23.51	-0.20924
1	46.95	24.2	0

Ácido Propanóico + Agua
T=30°C

π (mN/m)

lnX

Ácido Propanóico + Agua
T=30°C

π (mN/m)

X (Ácido propanoico)

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.11
R^2   = 0.99953
$\Gamma_s RT$ 7.7   ±0.2
β 730   ±93

$0 \leq X \leq 0.17$

Ácido Propanóico + Agua
T=30°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF	= 0.28	
R^2	= 0.99864	
$\Gamma_s RT$	4.4	±0.34
β	179	±22
α	-23	±2

π (mN/m)

X (Ácido propanoico)

Wright, E.H.M., Akhtar, B.A.
J.Chem.Soc. **1970**, B, 151

Tabla C.14: Ácido Propanóico + Agua a T=30°C [58]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	71.25	0	–
0.02	50	21.25	-3.91202
0.06	42	29.25	-2.81341
0.09	38.1	33.15	-2.40795
0.12	36.6	34.65	-2.12026
0.17	34	37.25	-1.77196
0.25	32	39.25	-1.38629
0.31	31.06	40.19	-1.17118
0.44	28.96	42.29	-0.82098
0.6	27.35	43.9	-0.51083
0.85	27	44.25	-0.16252
1	25.75	45.5	0

Ácido butanóico + Agua
T=30°C

Ácido butanóico + Agua
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.06
R^2   = 0.99977
$\Gamma_s RT$ 5.4   ±0.1
β 7603   ±1019

$0 \le X \le 0.07243$

Ácido butanóico + Agua
T=30°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF   = 0.34
R^2   = 0.99863
$\Gamma_s RT$ 4.3   ±0.3
β 579   ±236
α -19   ±4

π (mN/m)
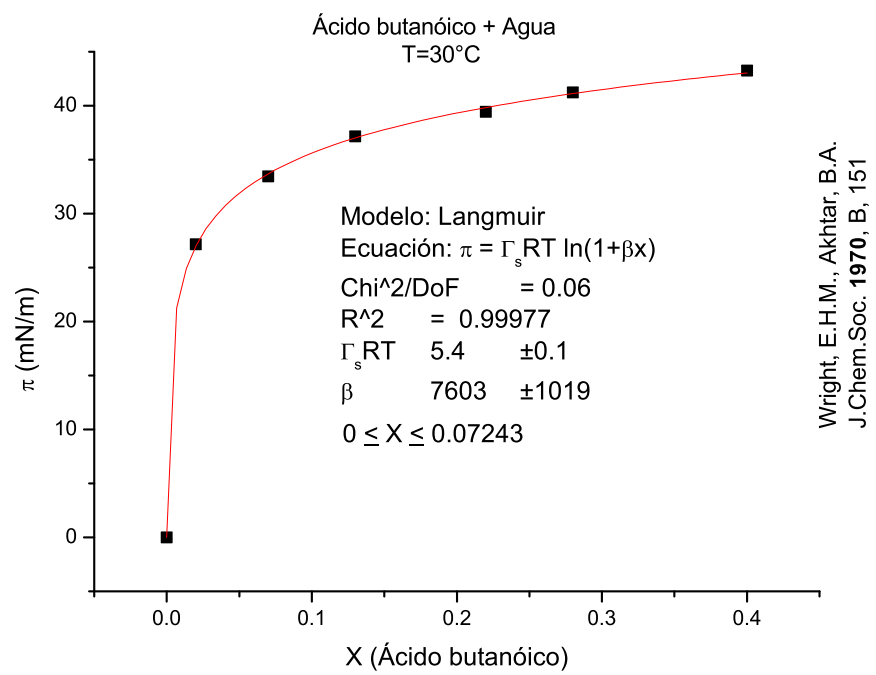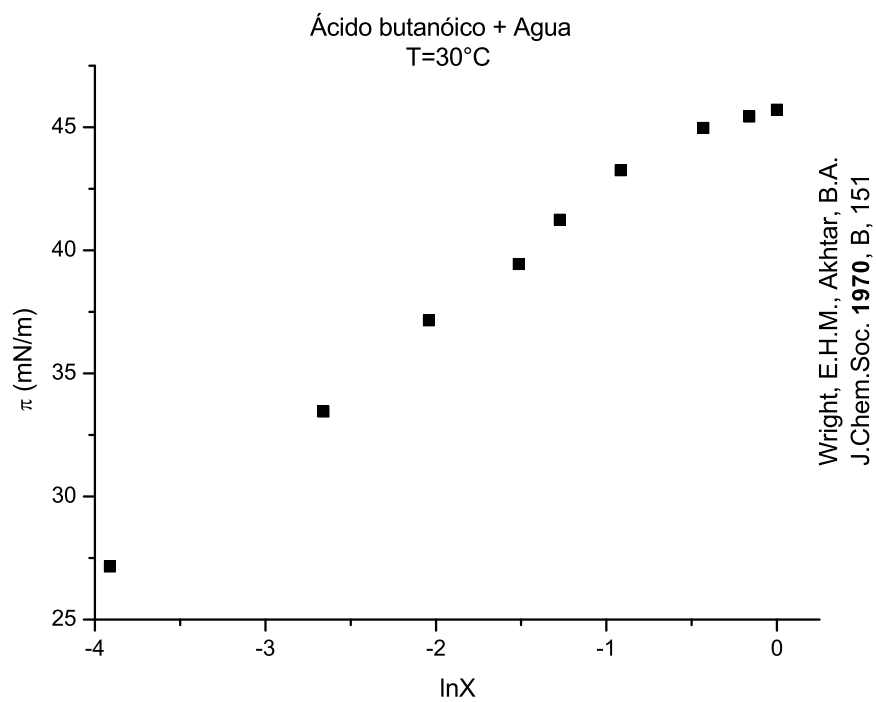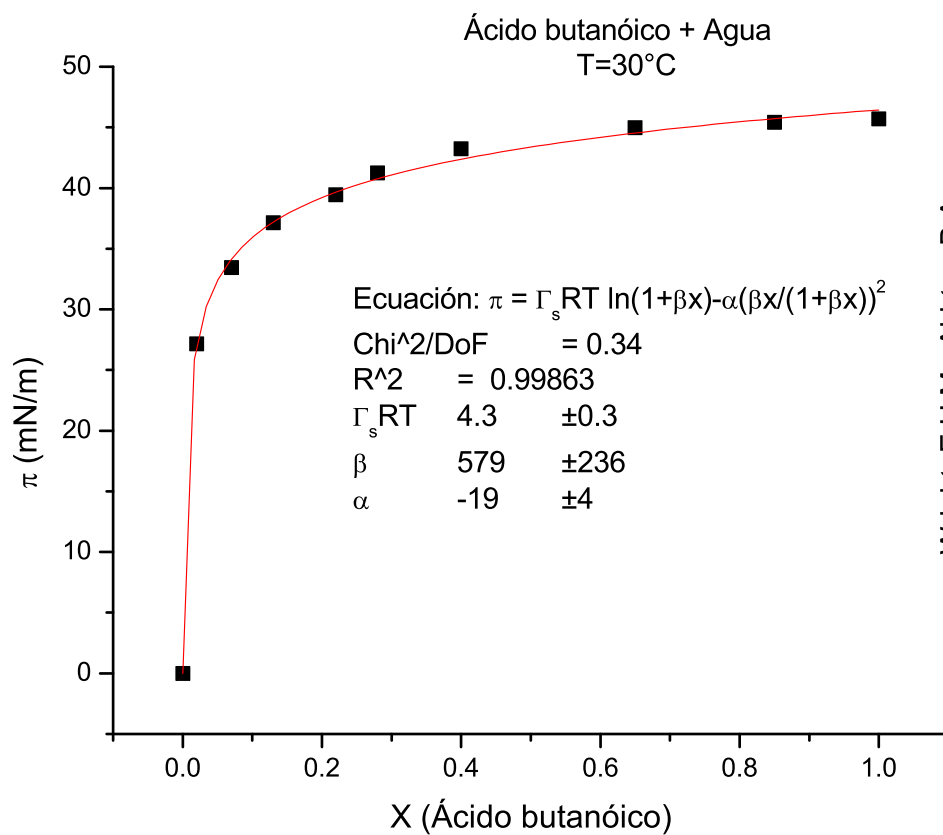
X (Ácido butanóico)

Wright, E.H.M., Akhtar, B.A.
J.Chem.Soc. **1970**, B, 151

Tabla C.15: Ácido Butanóico + Agua a T=30°C [58]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	71.25	0	–
0.02	44.1	27.15	-3.91202
0.07	37.8	33.45	-2.65926
0.13	34.1	37.15	-2.04022
0.22	31.8	39.45	-1.51413
0.28	30	41.25	-1.27297
0.4	28	43.25	-0.91629
0.65	26.28	44.97	-0.43078
0.85	25.82	45.43	-0.16252
1	25.54	45.71	0
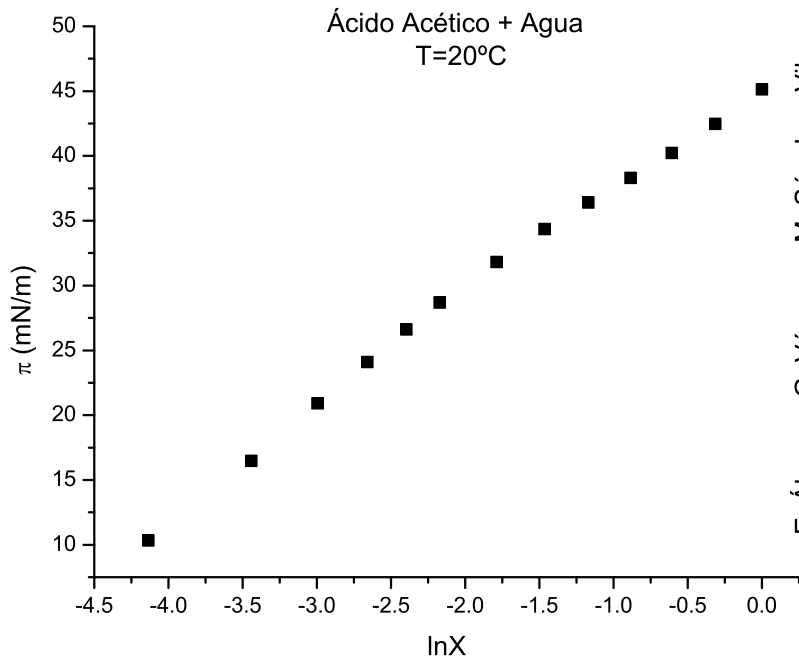
Ácido Acético + Agua
T=20ºC

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B. Sanjurjo y J. M. Navaza
J. Chem. Eng. Data **1997**, 42, 957

Ácido Acético + Agua
T=20ºC

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF   = 0.2517
R^2   = 0.99807
$\Gamma_s RT$ 11.0   ±0.5
β 108   ±12

$0 \leq X \leq 0.167$

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B. Sanjurjo y J. M. Navaza
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Ácido Acético + Agua
T=20ºC

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF	= 0.04	
R^2	= 0.99979	
$\Gamma_s RT$	6.4	±0.2
β	75.5	±2.4
α	-18	±1

π (mN/m)
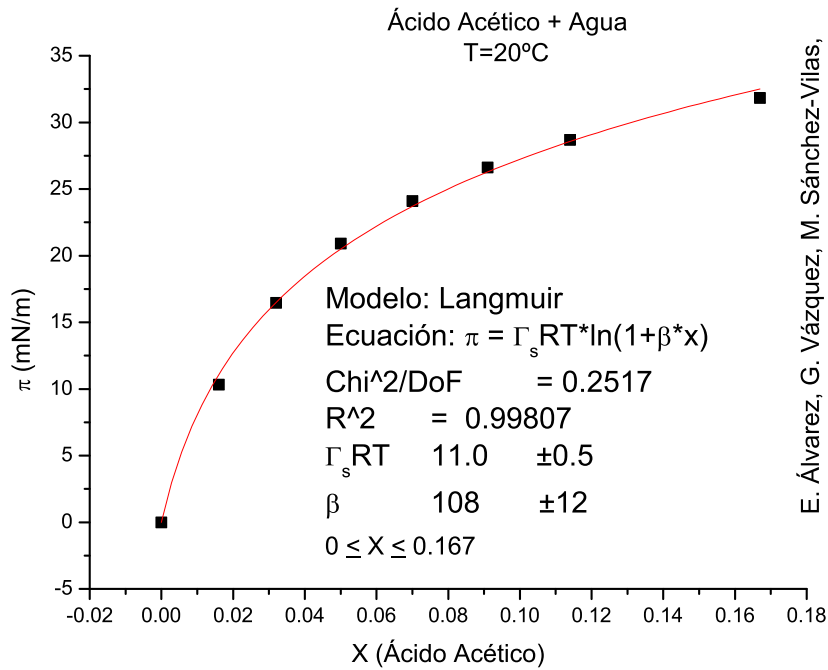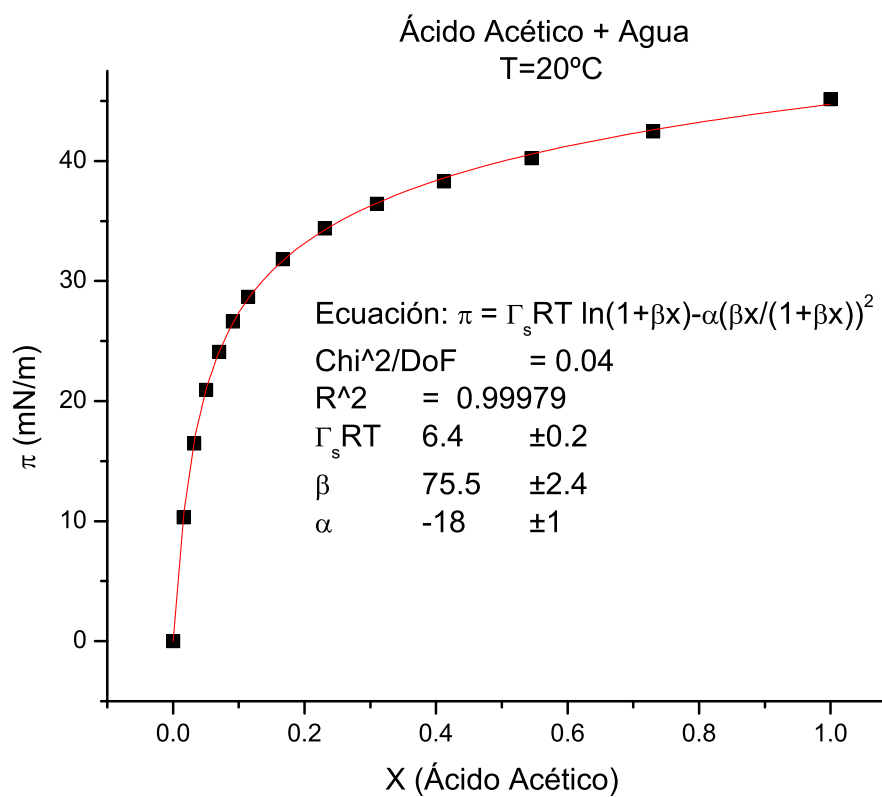
X (Ácido Acético)

Tabla C.16: Ácido acético + Agua a T=20°C [2]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	72.75	0	–
0.016	62.42	10.33	-4.13517
0.032	56.28	16.47	-3.44202
0.05	51.83	20.92	-2.99573
0.07	48.64	24.11	-2.65926
0.091	46.13	26.62	-2.3969
0.114	44.06	28.69	-2.17156
0.167	40.92	31.83	-1.78976
0.231	38.38	34.37	-1.46534
0.31	36.33	36.42	-1.17118
0.412	34.44	38.31	-0.88673
0.545	32.51	40.24	-0.60697
0.73	30.28	42.47	-0.31471
1	27.61	45.14	0
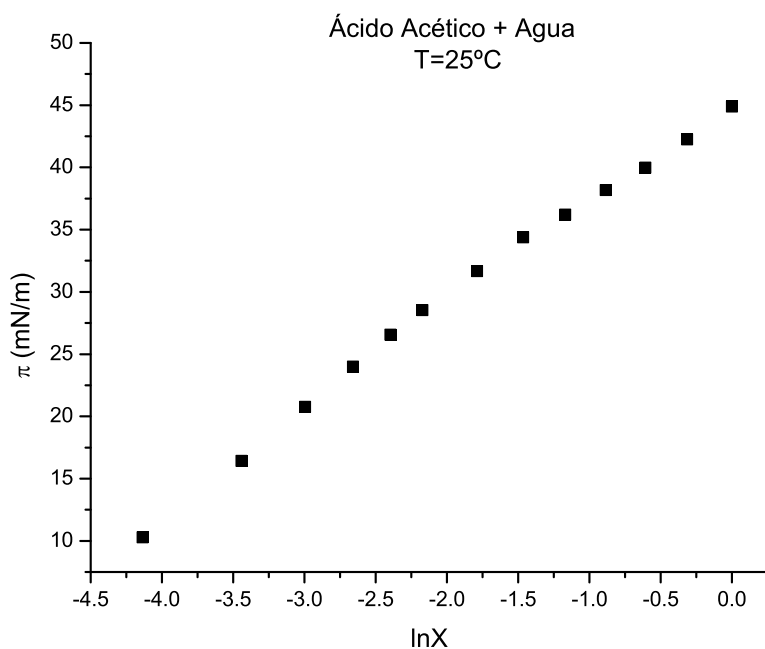
Ácido Acético + Agua
T=25ºC

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Ácido Acético + Agua
T=25ºC

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF   = 0.25
R^2   = 0.99805
$\Gamma_s RT$ 11   ±0.5
β 109   ±12
$0 \leq X \leq 0.167$

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Ácido Acético + Agua
T=25°C

π (mN/m)

X (Ácido Acético)

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF = 0.05
R^2 = 0.99976
$\Gamma_s RT$ 6.3 ±0.2
β 75 ±3
α -18 ±1
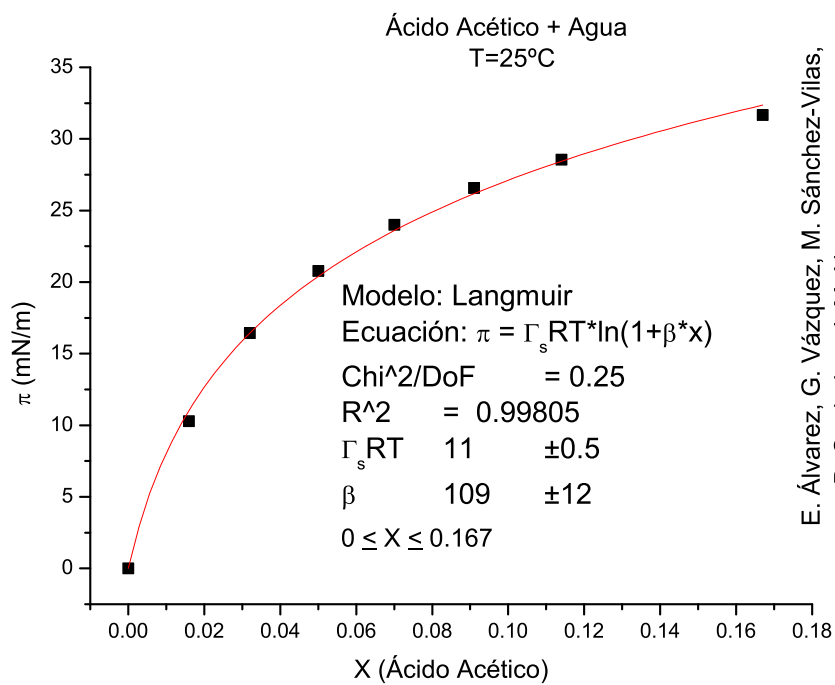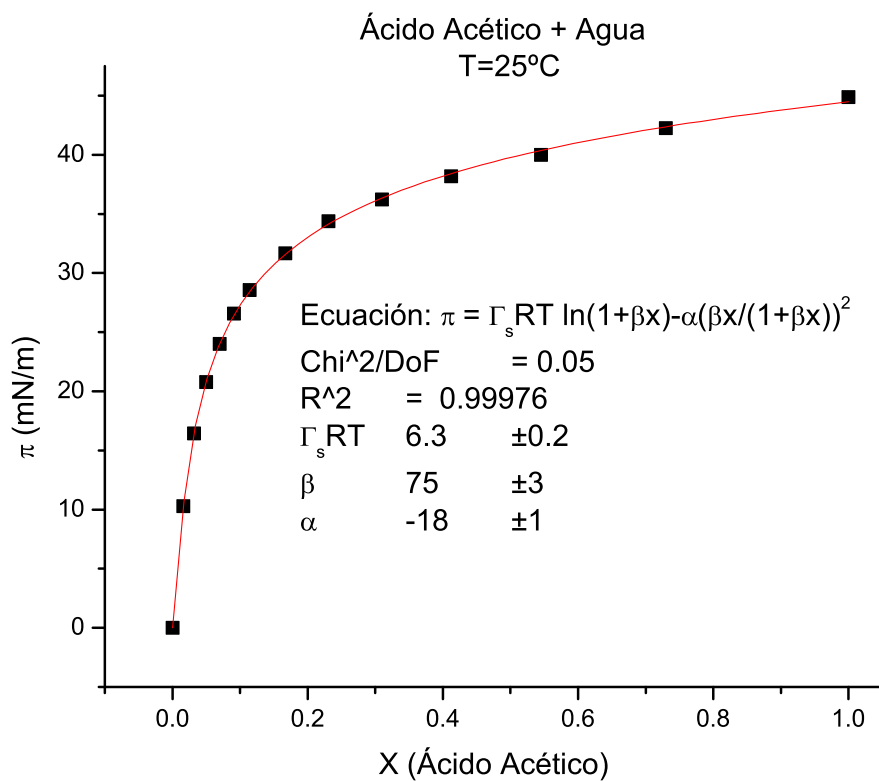
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Tabla C.17: Ácido acético + Agua a T=25°C [2]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	72.01	0	–
0.016	61.72	10.29	-4.13517
0.032	55.58	16.43	-3.44202
0.05	51.24	20.77	-2.99573
0.07	48.01	24	-2.65926
0.091	45.44	26.57	-2.3969
0.114	43.46	28.55	-2.17156
0.167	40.34	31.67	-1.78976
0.231	37.62	34.39	-1.46534
0.31	35.79	36.22	-1.17118
0.412	33.82	38.19	-0.88673
0.545	32.03	39.98	-0.60697
0.73	29.76	42.25	-0.31471
1	27.12	44.89	0

Ácido Acético + Agua
T=30ºC

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Ácido Acético + Agua
T=30ºC

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF   = 0.24
R^2   = 0.99811
$\Gamma_s RT$ 10.8   ±0.5
β 110   ±12
$0 \le X \le 0.167$

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Ácido Acético + Agua
T=30ºC

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF	= 0.04	
R^2	= 0.99977	
$\Gamma_s RT$	6.3	±0.2
β	76	±3
α	-17	±1

π (mN/m)
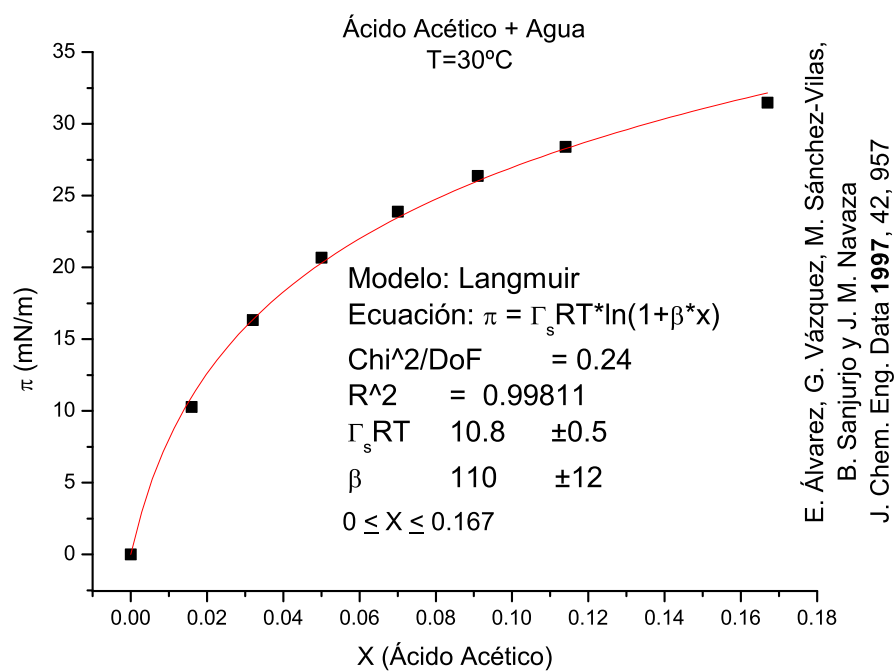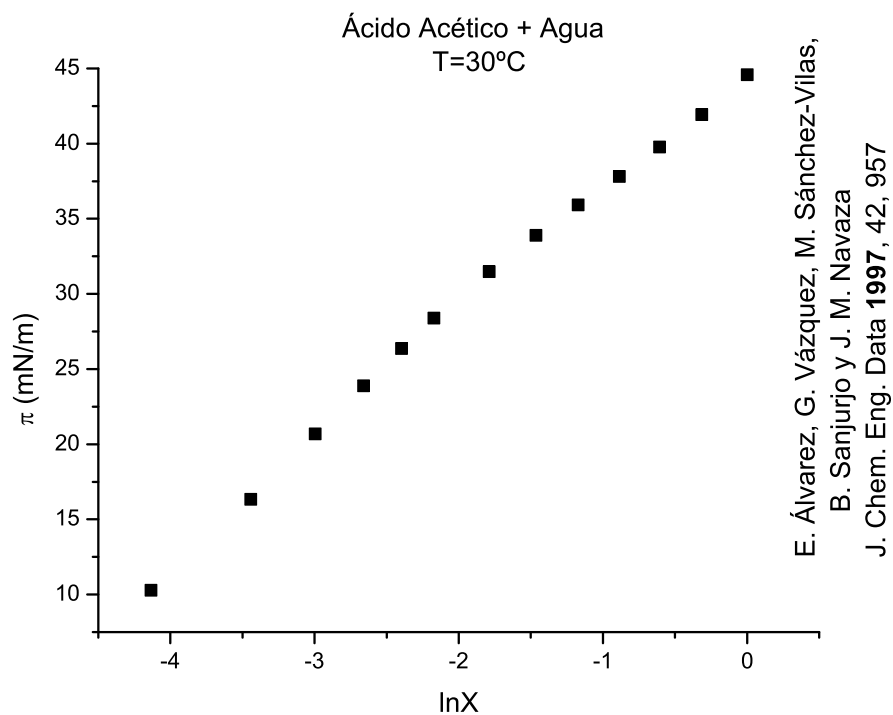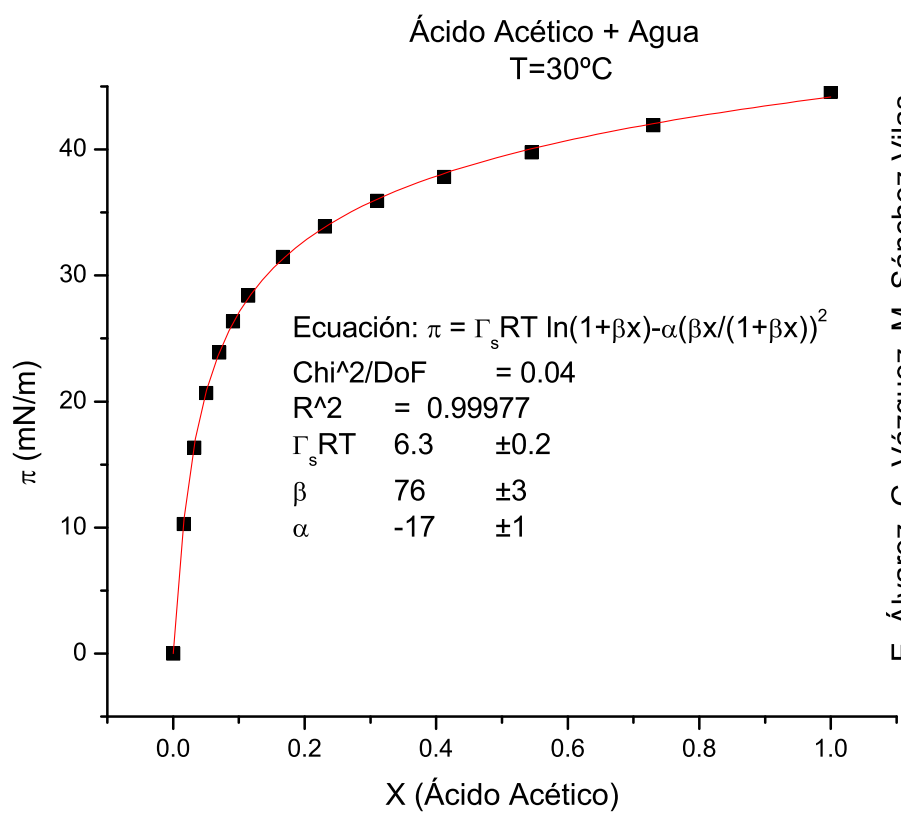
X (Ácido Acético)

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Tabla C.18: Ácido acético + Agua a T=30°C [2]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	71.21	0	–
0.016	60.93	10.28	-4.13517
0.032	54.88	16.33	-3.44202
0.05	50.53	20.68	-2.99573
0.07	47.32	23.89	-2.65926
0.091	44.84	26.37	-2.3969
0.114	42.82	28.39	-2.17156
0.167	39.73	31.48	-1.78976
0.231	37.31	33.9	-1.46534
0.31	35.28	35.93	-1.17118
0.412	33.4	37.81	-0.88673
0.545	31.44	39.77	-0.60697
0.73	29.27	41.94	-0.31471
1	26.63	44.58	0

Ácido Acético + Agua
T=30ºC

J. Livingston, R. Morgan y M. Neidle
J. Am. Chem. Soc. **1913**, 35, 1856

Ácido Acético + Agua
T=30ºC

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF   = 0.16
R^2   = 0.99891
$\Gamma_s RT$ 9.98   ±0.29
β 146   ±11

$0 \leq X \leq 0.167$

J. Livingston, R. Morgan y M. Neidle
J. Am. Chem. Soc. **1913**, 35, 1856

Ácido Acético + Agua
T=30ºC

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.08
R^2   = 0.99969
$\Gamma_s RT$ 6.83   ±0.24
β 48.4   ±3.6
α -18.44   ±1.31

π (mN/m)
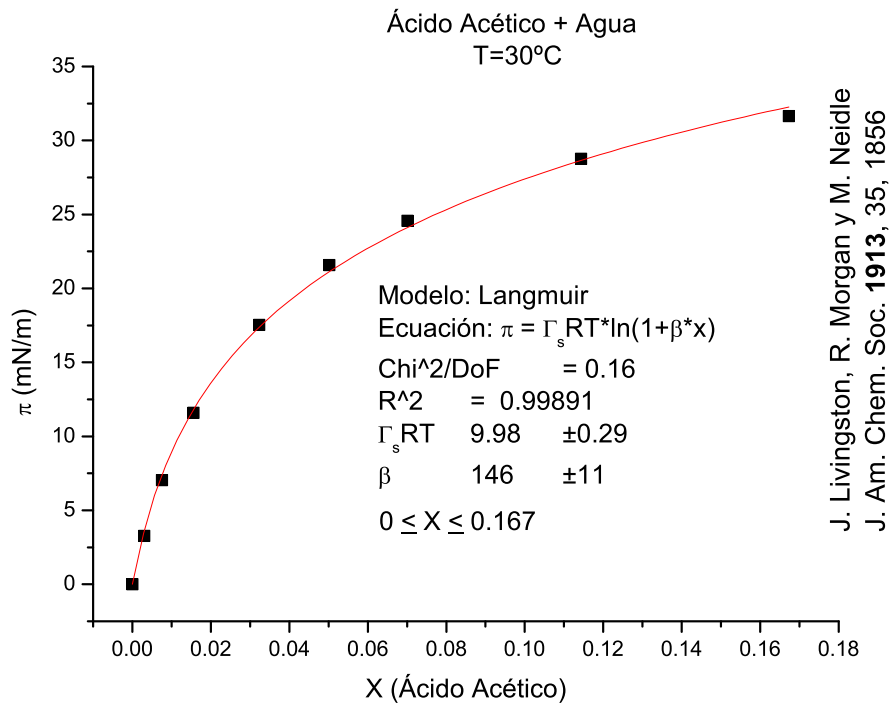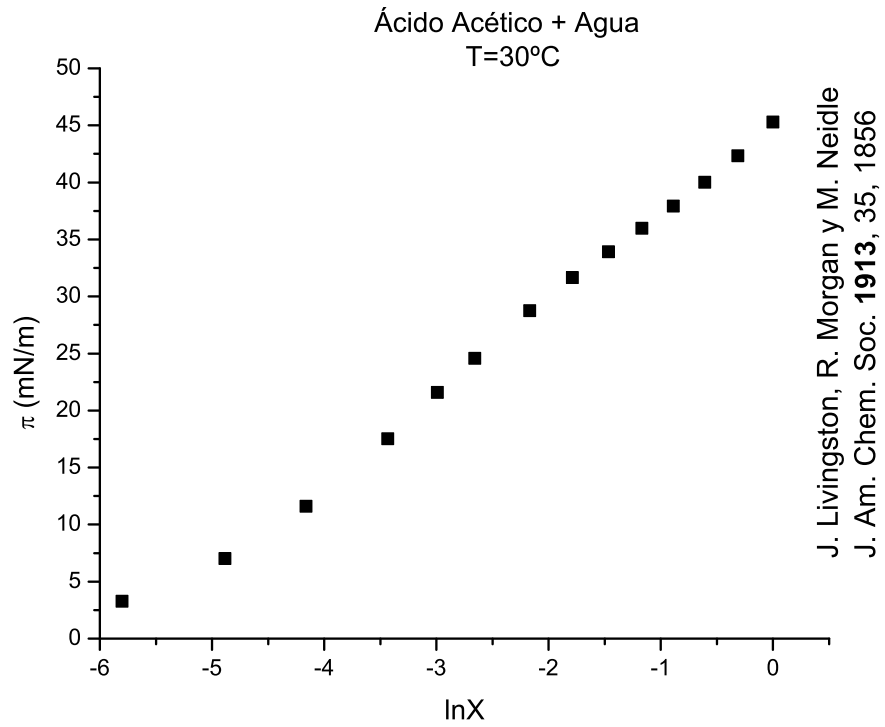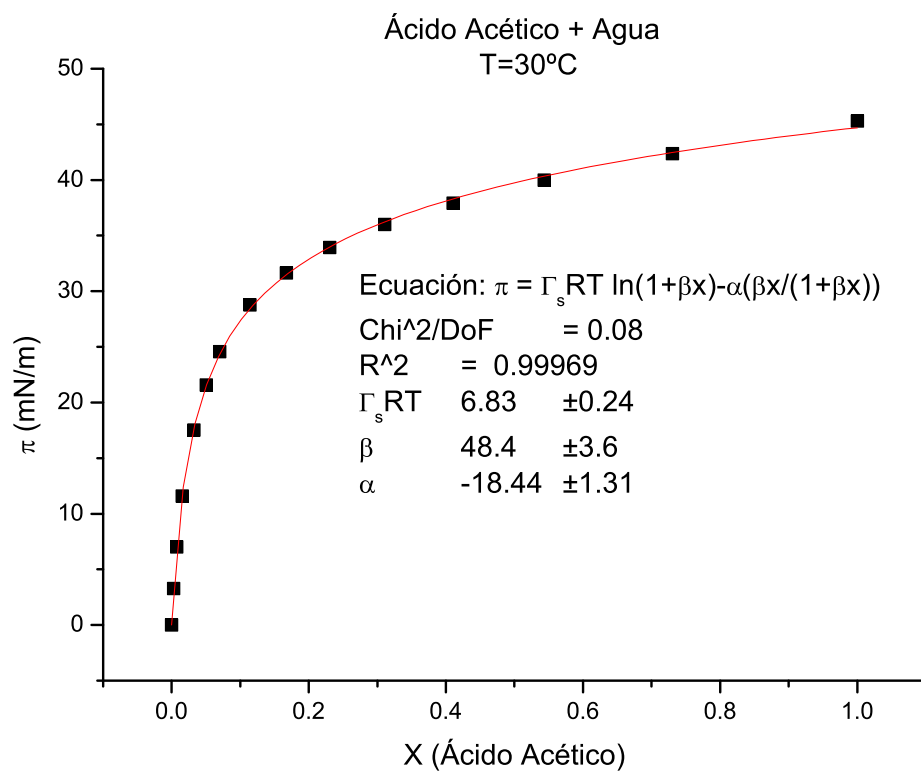
X (Ácido Acético)

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J. Am. Chem. Soc. **1913**, 35, 1856

Tabla C.19: Ácido acético + Agua a T=30°C [25]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	71.03	0	–
0.00302	67.756	3.274	-5.80214
0.00756	63.995	7.035	-4.88545
0.01555	59.435	11.595	-4.16389
0.03229	53.5	17.53	-3.43293
0.0502	49.451	21.579	-2.99167
0.07013	46.455	24.575	-2.65739
0.11435	42.269	28.761	-2.16845
0.1673	39.374	31.656	-1.78796
0.23048	37.109	33.921	-1.46759
0.31079	35.035	35.995	-1.16865
0.41072	33.099	37.931	-0.88984
0.54359	31.026	40.004	-0.60955
0.7306	28.677	42.353	-0.31389
1	25.725	45.305	0
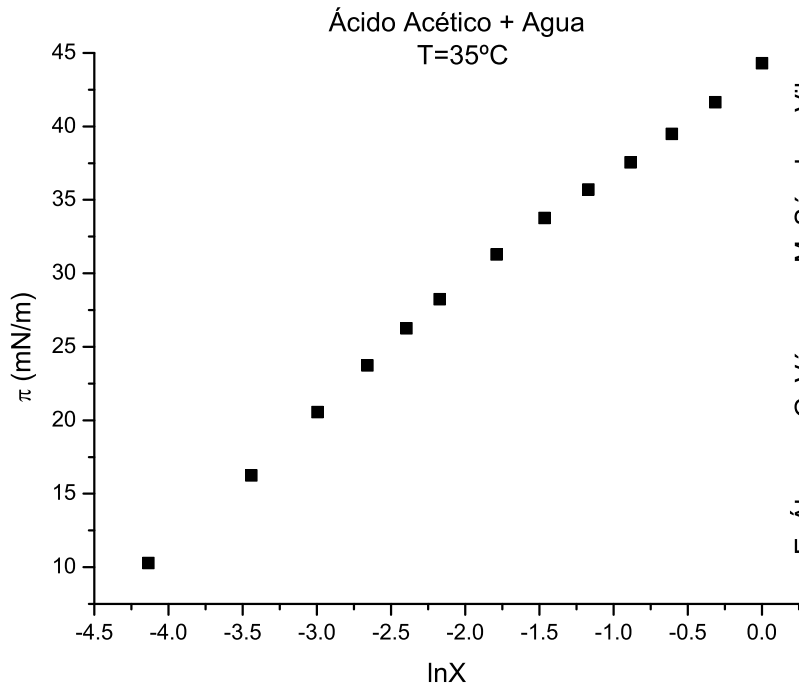
Ácido Acético + Agua
T=35ºC

π (mN/m)

X (Ácido Acético)

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF   = 0.05
R^2   = 0.99974
$\Gamma_s RT$ 6.2   ±0.2
β 77   ±3
α -17   ±1
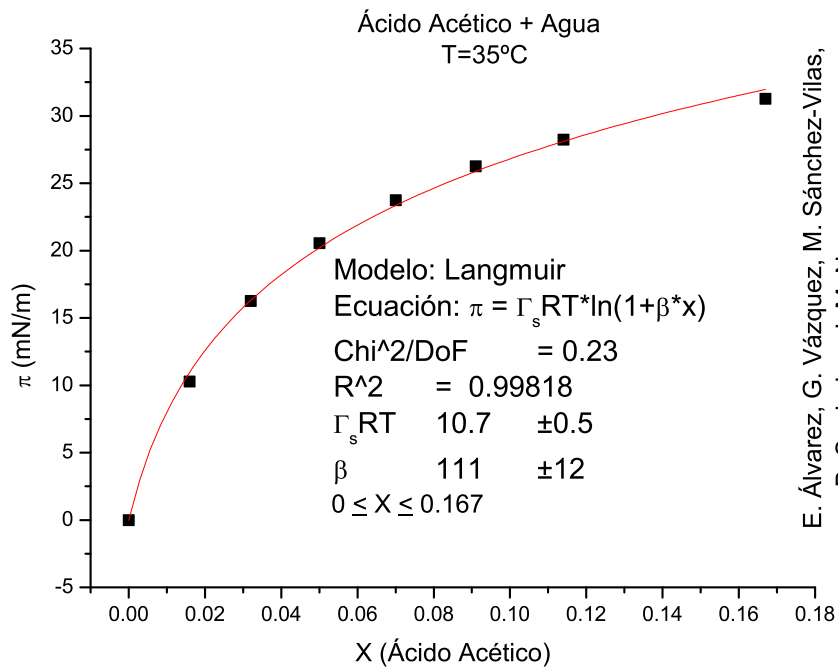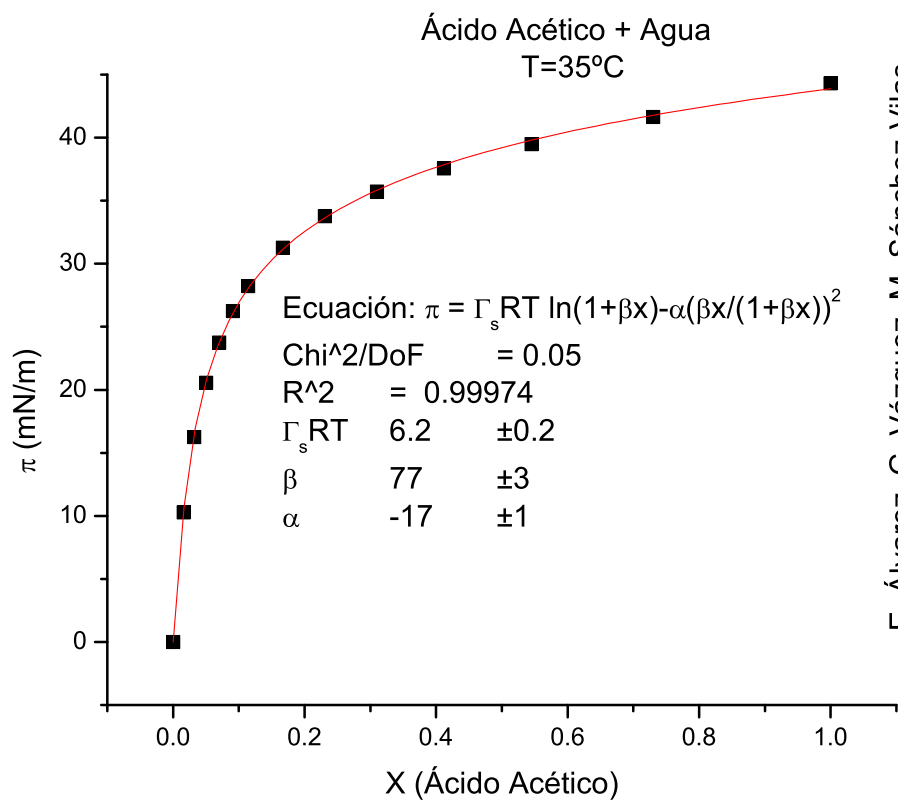
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Tabla C.20: Ácido acético + Agua T=35°C [2]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	70.42	0	–
0.016	60.13	10.29	-4.13517
0.032	54.16	16.26	-3.44202
0.05	49.86	20.56	-2.99573
0.07	46.68	23.74	-2.65926
0.091	44.16	26.26	-2.3969
0.114	42.18	28.24	-2.17156
0.167	39.14	31.28	-1.78976
0.231	36.66	33.76	-1.46534
0.31	34.71	35.71	-1.17118
0.412	32.86	37.56	-0.88673
0.545	30.92	39.5	-0.60697
0.73	28.78	41.64	-0.31471
1	26.11	44.31	0
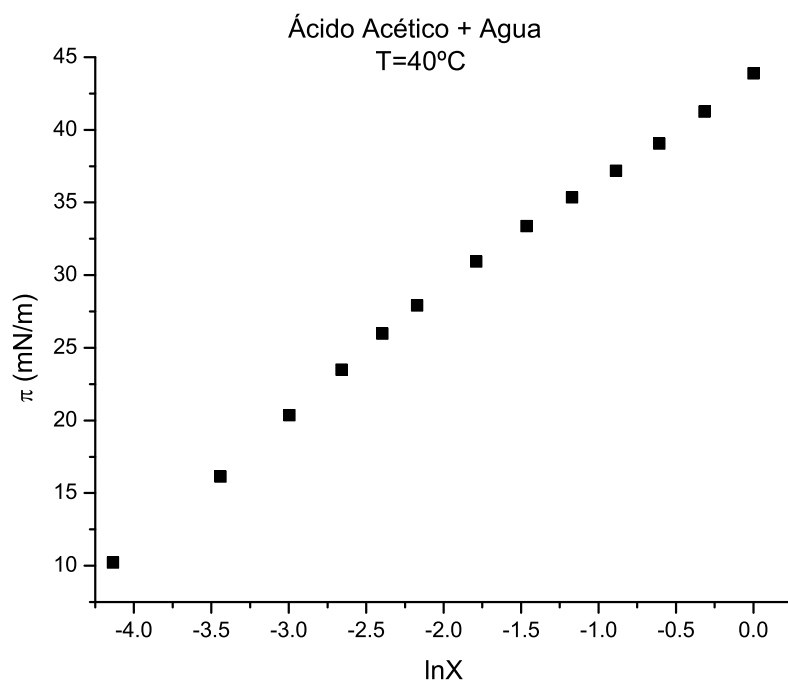
Ácido Acético + Agua
T=40ºC

Ácido Acético + Agua
T=40ºC

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.22
R^2   = 0.99822
$\Gamma_s RT$ 10.6   ±0.4
β 112   ±12
$0 \leq X \leq 0.167$

Ácido Acético + Agua
T=40ºC

π (mN/m)

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF   = 0.05

R^2   = 0.99975

$\Gamma_s RT$ 6.2   ±0.2

β 78   ±3

α -17   ±1
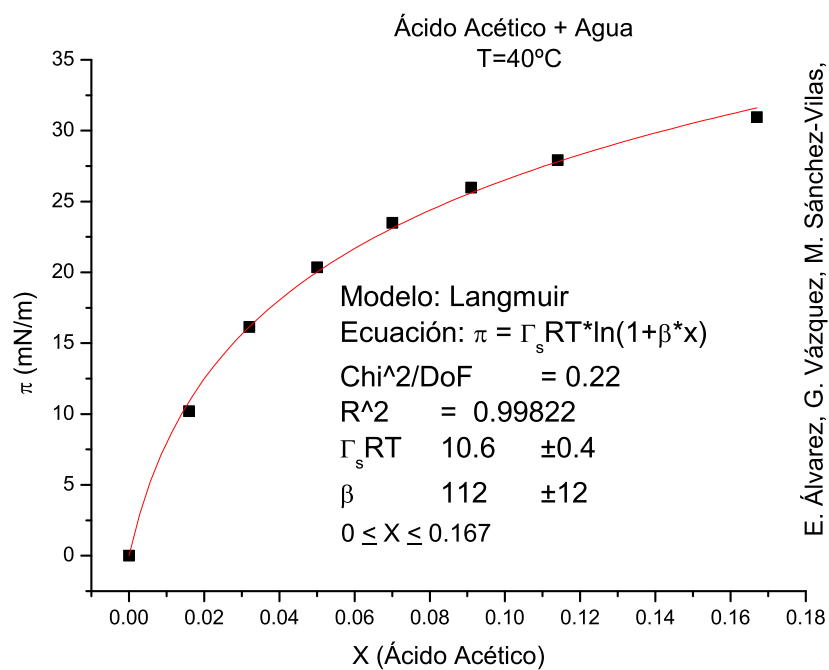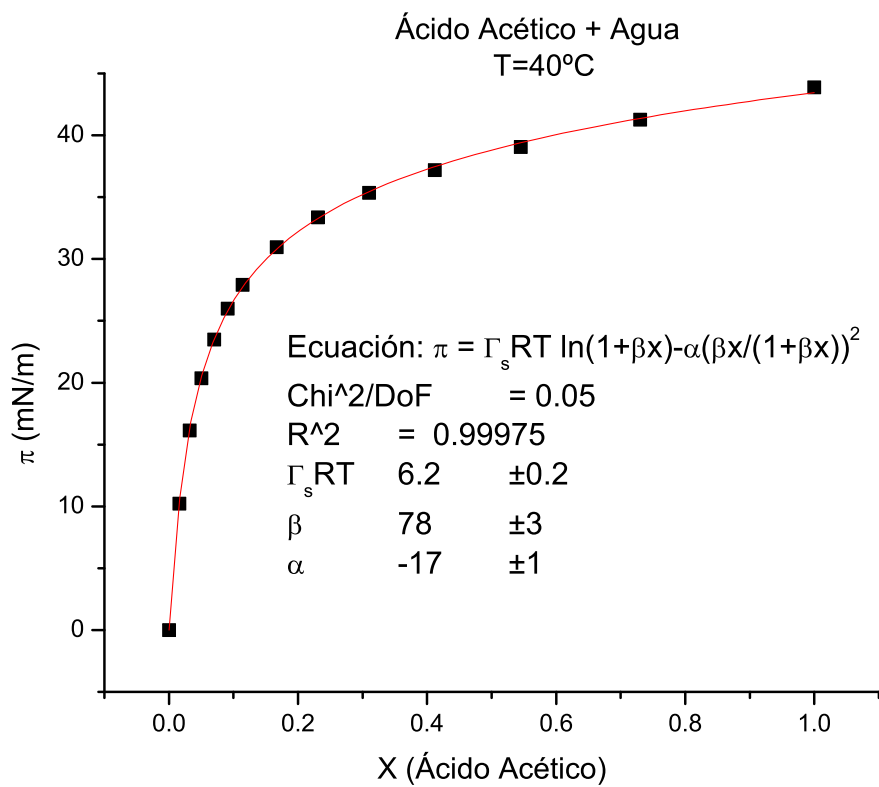
X (Ácido Acético)

Tabla C.21: Ácido acético + Agua T=40°C [2]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	69.52	0	–
0.016	59.31	10.21	-4.13517
0.032	53.38	16.14	-3.44202
0.05	49.16	20.36	-2.99573
0.07	46.02	23.5	-2.65926
0.091	43.54	25.98	-2.3969
0.114	41.6	27.92	-2.17156
0.167	38.57	30.95	-1.78976
0.231	36.14	33.38	-1.46534
0.31	34.16	35.36	-1.17118
0.412	32.34	37.18	-0.88673
0.545	30.46	39.06	-0.60697
0.73	28.26	41.26	-0.31471
1	25.64	43.88	0
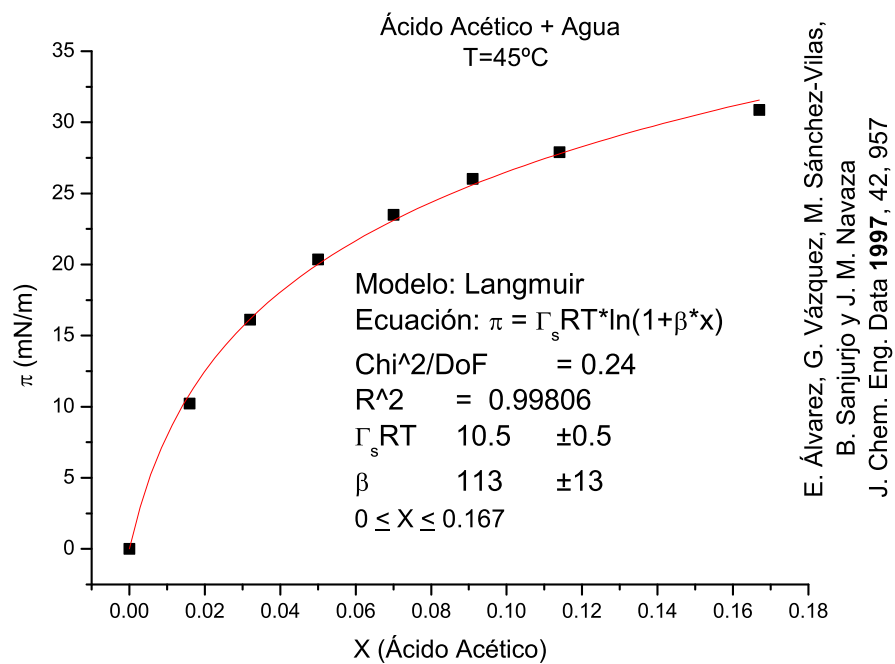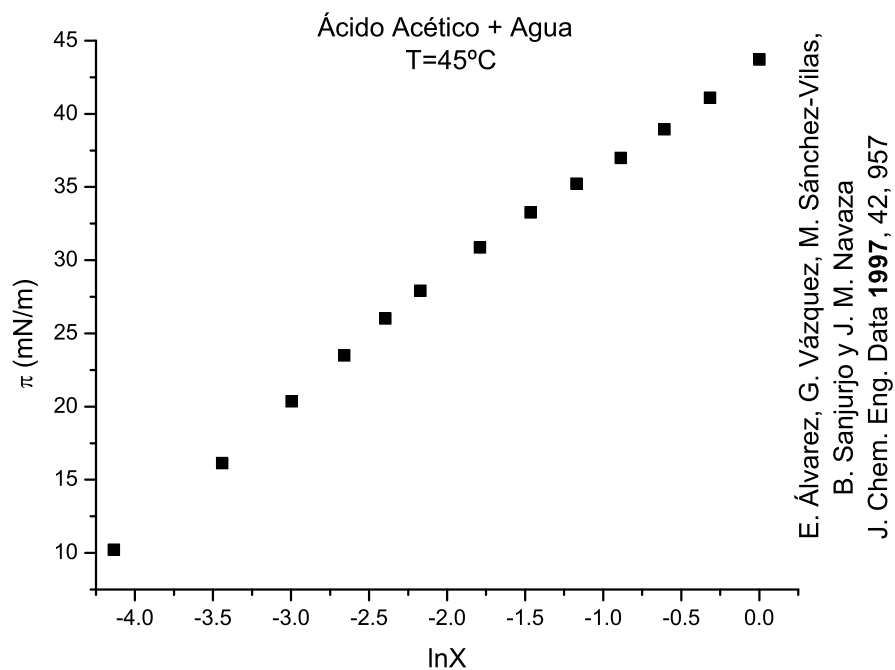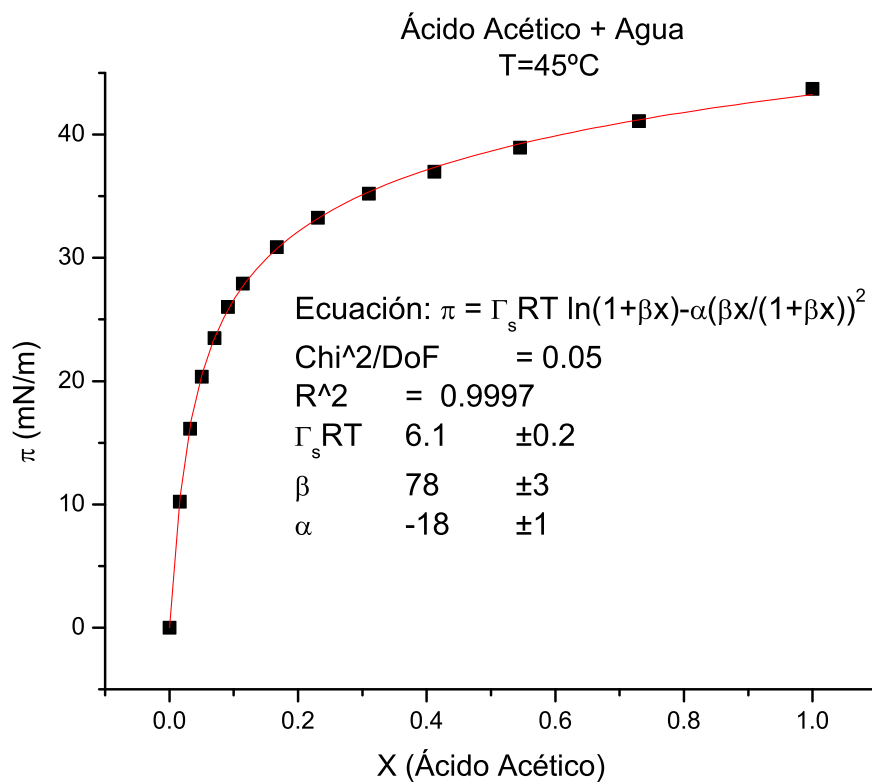
Ácido Acético + Agua
T=45ºC

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Ácido Acético + Agua
T=45ºC

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF	= 0.24	
R^2	= 0.99806	
$\Gamma_s RT$	10.5	±0.5
β	113	±13

$0 \leq X \leq 0.167$

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Ácido Acético + Agua
T=45ºC

π (mN/m)

X (Ácido Acético)

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF   = 0.05
R^2   = 0.9997
$\Gamma_s RT$ 6.1   ±0.2
β 78   ±3
α -18   ±1

Tabla C.22: Ácido acético + Agua a T=45°C [2]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	68.84	0	–
0.016	58.62	10.22	-4.13517
0.032	52.71	16.13	-3.44202
0.05	48.48	20.36	-2.99573
0.07	45.34	23.5	-2.65926
0.091	42.82	26.02	-2.3969
0.114	40.93	27.91	-2.17156
0.167	37.96	30.88	-1.78976
0.231	35.58	33.26	-1.46534
0.31	33.62	35.22	-1.17118
0.412	31.86	36.98	-0.88673
0.545	29.89	38.95	-0.60697
0.73	27.74	41.1	-0.31471
1	25.13	43.71	0
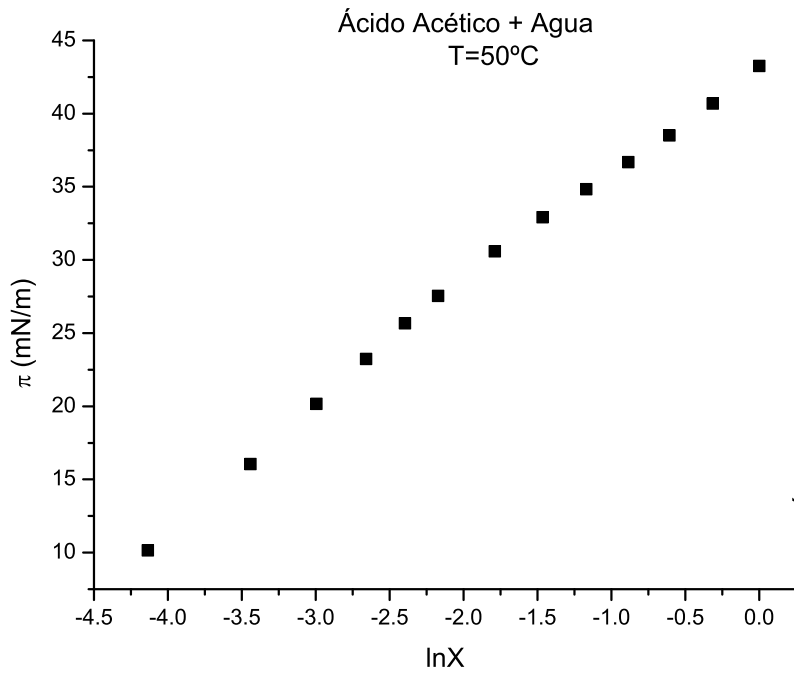
Ácido Acético + Agua
T=50ºC

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Ácido Acético + Agua
T=50ºC

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1 + \beta \cdot x)$

Chi^2/DoF   = 0.20
R^2   = 0.9983
$\Gamma_s RT$ 10.4   ±0.4
β 115   ±12
$0 \leq X \leq 0.167$

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Ácido Acético + Agua
T=50ºC

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)-\alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF	= 0.05	
R^2	= 0.99975	
$\Gamma_s RT$	6.1	±0.2
β	79	±3
α	-16	±1

π (mN/m)
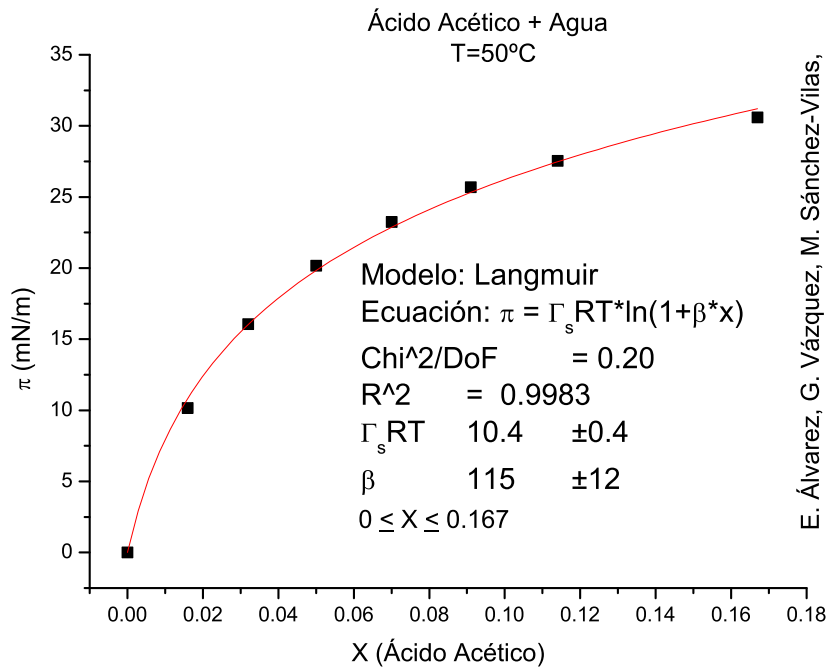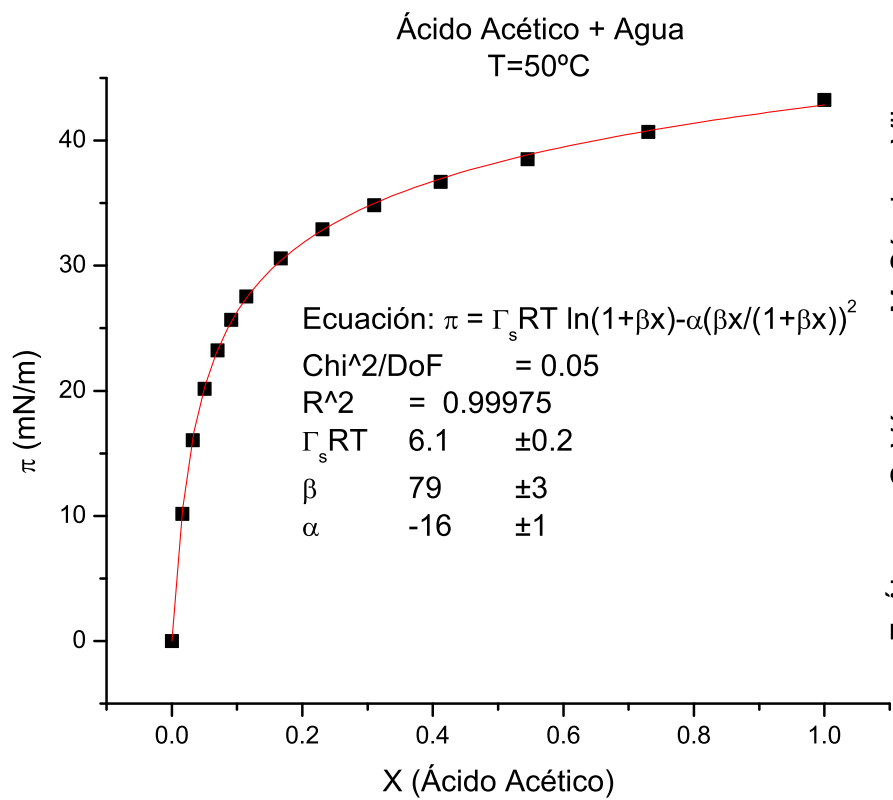
X (Ácido Acético)

E. Álvarez, G. Vázquez, M. Sánchez-Vilas, B. Sanjurjo y J. M. Navaza
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Tabla C.23: Ácido acético + Agua a T=50°C [2]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	67.92	0	–
0.016	57.76	10.16	-4.13517
0.032	51.87	16.05	-3.44202
0.05	47.76	20.16	-2.99573
0.07	44.68	23.24	-2.65926
0.091	42.24	25.68	-2.3969
0.114	40.37	27.55	-2.17156
0.167	37.33	30.59	-1.78976
0.231	35	32.92	-1.46534
0.31	33.08	34.84	-1.17118
0.412	31.23	36.69	-0.88673
0.545	29.41	38.51	-0.60697
0.73	27.23	40.69	-0.31471
1	24.66	43.26	0

2-Amino-2-metil-1-propanol+Agua
T=25°C

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2-Amino-2-metil-1-propanol+Agua
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.12
R^2   = 0.99907
$\Gamma_s RT$ 10.7   ±0.6
β 205   ±29
$0 \leq X \leq 0.048$

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2-Amino-2-metil-1-propanol + Agua
T=25°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF		= 0.10
R^2	=	0.99934
$\Gamma_s RT$	3.5	±0.2
β	155	±7
α	-22	±1

π (mN/m)

X (Amino-2-metil-1-propanol)
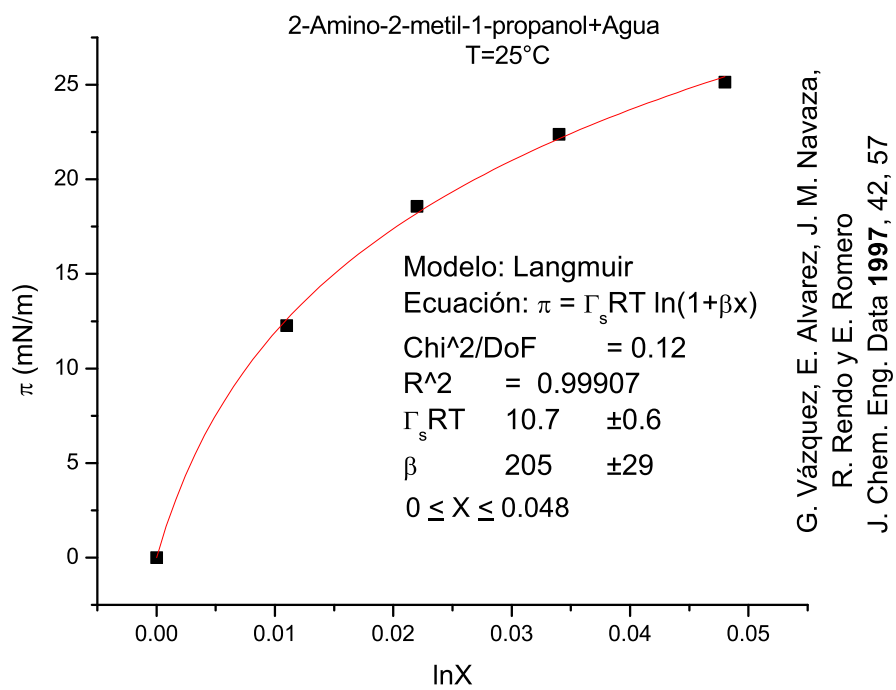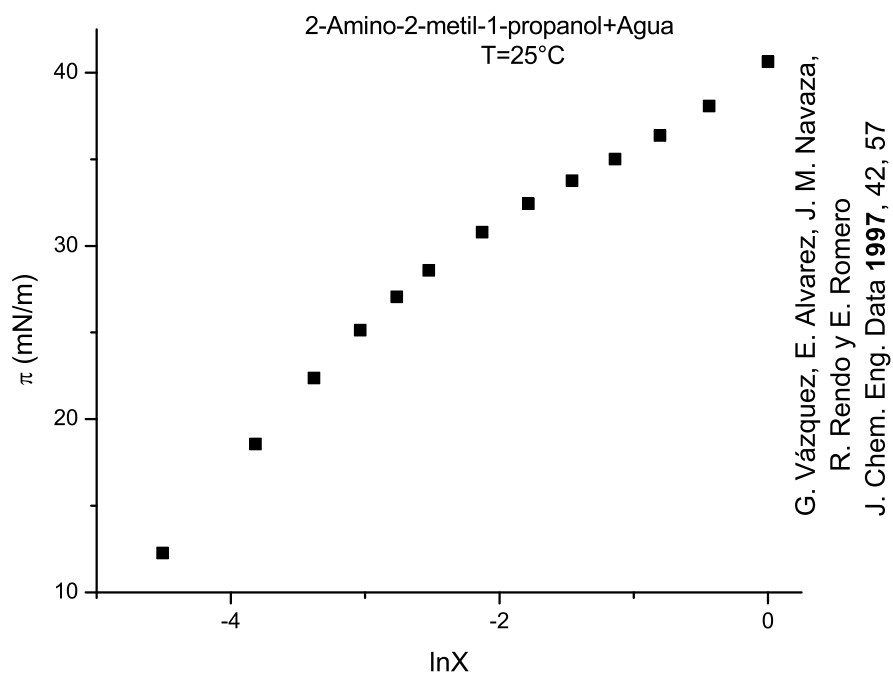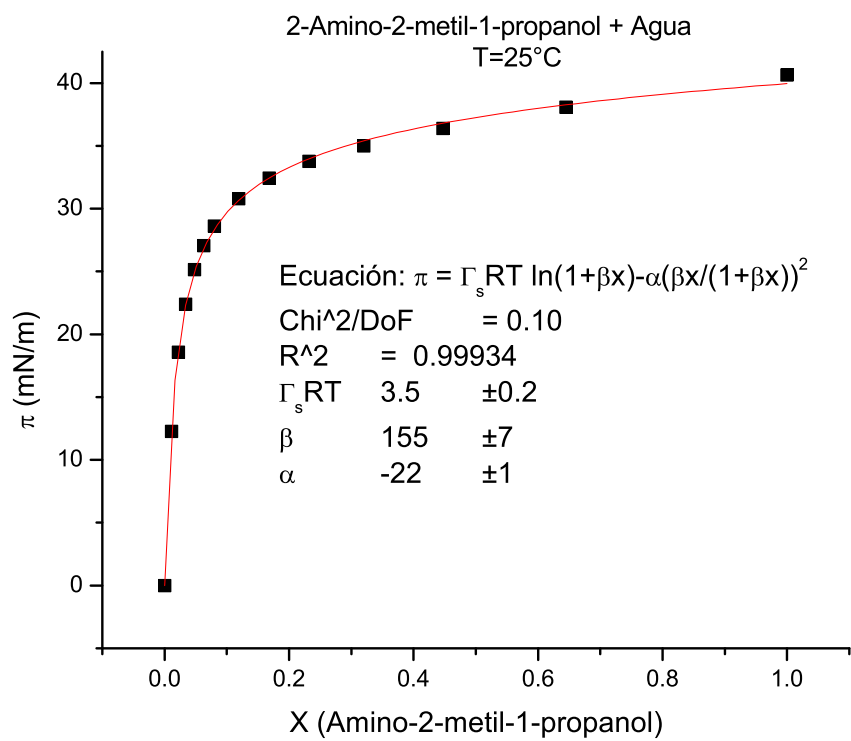
G. Vázquez, E. Alvarez, J. M. Navaza,
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J. Chem. Eng. Data **1997**, 42, 57

Tabla C.24: 2-Amino-2-metil-1-propanol + Agua a T=25°C [52]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	72.01	0	–
0.011	59.74	12.27	-4.50986
0.022	53.44	18.57	-3.81671
0.034	49.63	22.38	-3.38139
0.048	46.87	25.14	-3.03655
0.063	44.95	27.06	-2.76462
0.08	43.41	28.6	-2.52573
0.119	41.22	30.79	-2.12863
0.168	39.58	32.43	-1.78379
0.232	38.25	33.76	-1.46102
0.32	37	35.01	-1.13943
0.447	35.63	36.38	-0.8052
0.645	33.94	38.07	-0.4385
1	31.37	40.64	0

2-Amino-2-metil-1-propanol+Agua
T=30°C

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2-Amino-2-metil-1-propanol+Agua
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF = 0.22
R^2 = 0.99826
$\Gamma_s RT$ 10 ±0.5
β 233 ±37
$0 \le X \le 0.063$

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2-Amino-2-metil-1-propanol + Agua
T=30°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF		= 0.09
R^2		= 0.9994
$\Gamma_s RT$	3.5	±0.2
β	153	±7
α	-22	±1

π (mN/m)
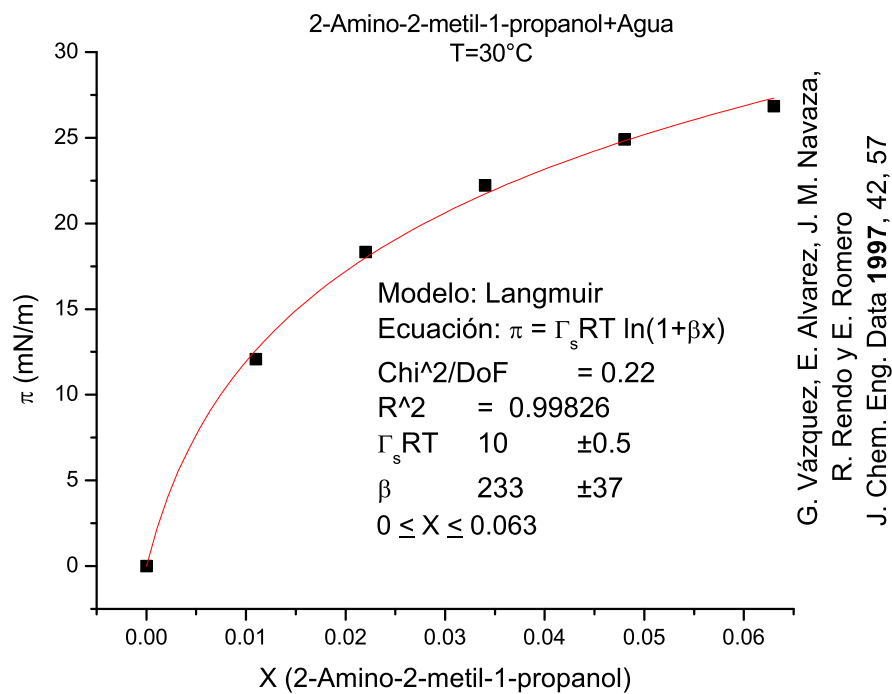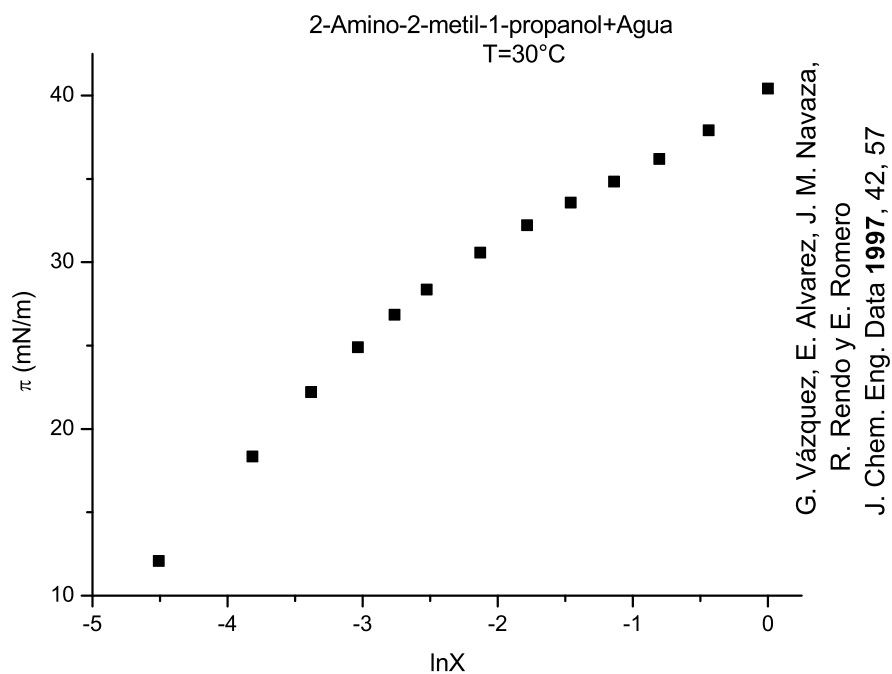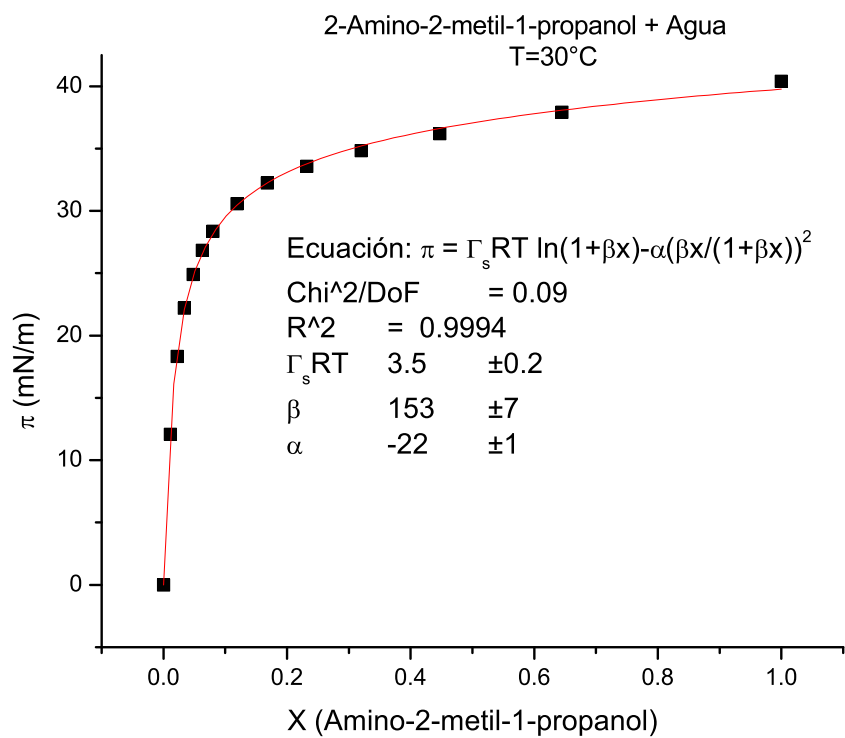
X (Amino-2-metil-1-propanol)

Tabla C.25: 2-Amino-2-metil-1-propanol + Agua a T=30°C [52]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	71.21	0	−
0.011	59.13	12.08	-4.50986
0.022	52.87	18.34	-3.81671
0.034	49	22.21	-3.38139
0.048	46.3	24.91	-3.03655
0.063	44.36	26.85	-2.76462
0.08	42.85	28.36	-2.52573
0.119	40.63	30.58	-2.12863
0.168	38.98	32.23	-1.78379
0.232	37.63	33.58	-1.46102
0.32	36.37	34.84	-1.13943
0.447	35.01	36.2	-0.8052
0.645	33.3	37.91	-0.4385
1	30.8	40.41	0

2-Amino-2-metil-1-propanol+Agua
T=35°C

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2-Amino-2-metil-1-propanol+Agua
T=35°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.22
R^2   = 0.9982
$\Gamma_s RT$ 9.9   ±0.6
β 223   ±35

$0 \leq X \leq 0.063$

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2-Amino-2-metil-1-propanol + Agua
T=35°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF		= 0.09
R^2	= 0.99939	
$\Gamma_s RT$	3.5	±0.2
β	149	±7
α	-22	±1

π (mN/m)

X (Amino-2-metil-1-propanol)
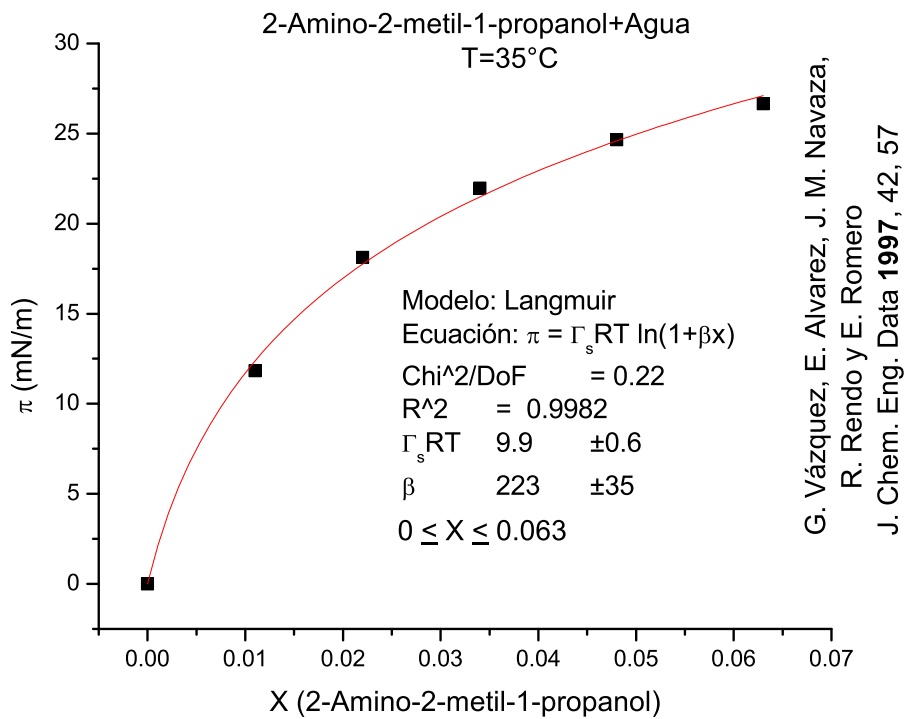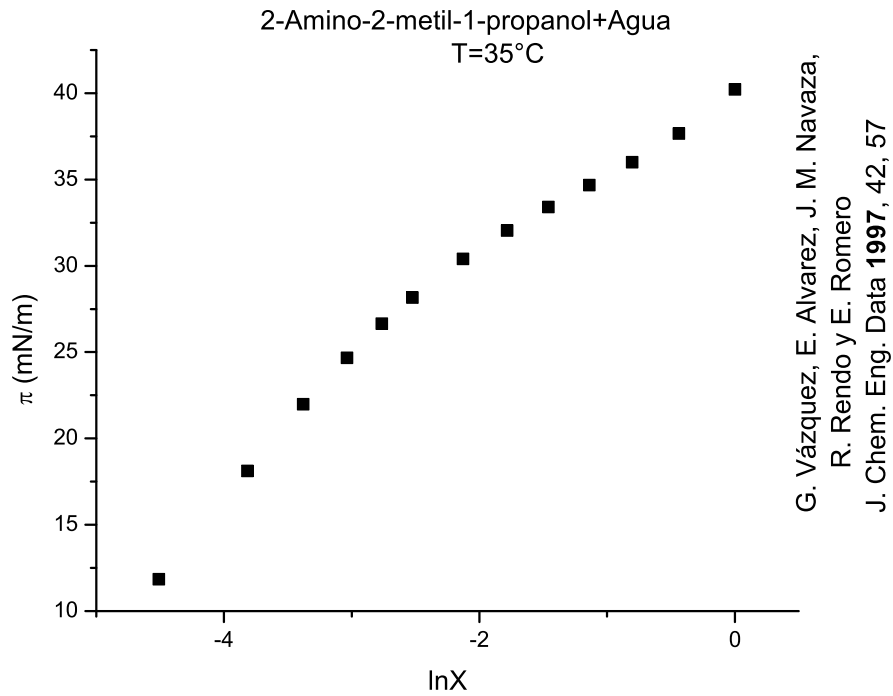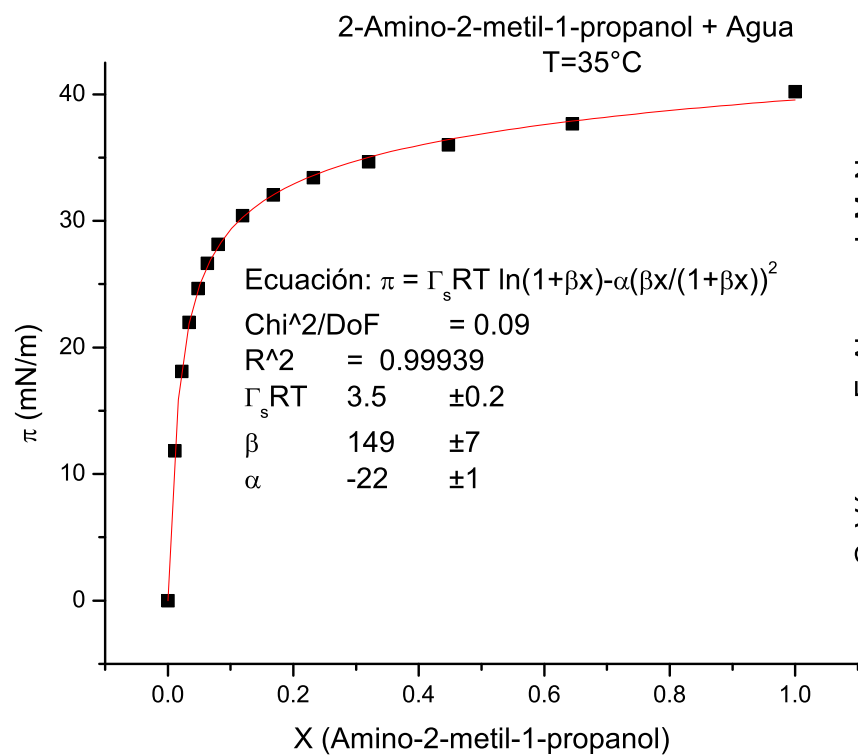
G. Vázquez, E. Alvarez, J. M. Navaza, R. Rendo y E. Romero
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Tabla C.26: 2-Amino-2-metil-1-propanol + Agua a T=35°C [52]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	70.42	0	–
0.011	58.58	11.84	-4.50986
0.022	52.3	18.12	-3.81671
0.034	48.44	21.98	-3.38139
0.048	45.75	24.67	-3.03655
0.063	43.77	26.65	-2.76462
0.08	42.26	28.16	-2.52573
0.119	40.02	30.4	-2.12863
0.168	38.37	32.05	-1.78379
0.232	37.01	33.41	-1.46102
0.32	35.74	34.68	-1.13943
0.447	34.41	36.01	-0.8052
0.645	32.75	37.67	-0.4385
1	30.2	40.22	0

2-Amino-2-metil-1-propanol+Agua
T=40°C

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2-Amino-2-metil-1-propanol+Agua
T=40°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF	= 0.21	
R^2	= 0.99821	
$\Gamma_s RT$	10.0	±0.6
β	215	±34

$0 \le X \le 0.063$

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2-Amino-2-metil-1-propanol + Agua
T=40°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF	= 0.08	
R^2	= 0.99944	
$\Gamma_s RT$	3.5	±0.2
β	146	±6
α	-22	±1

X (Amino-2-metil-1-propanol)

π (mN/m)
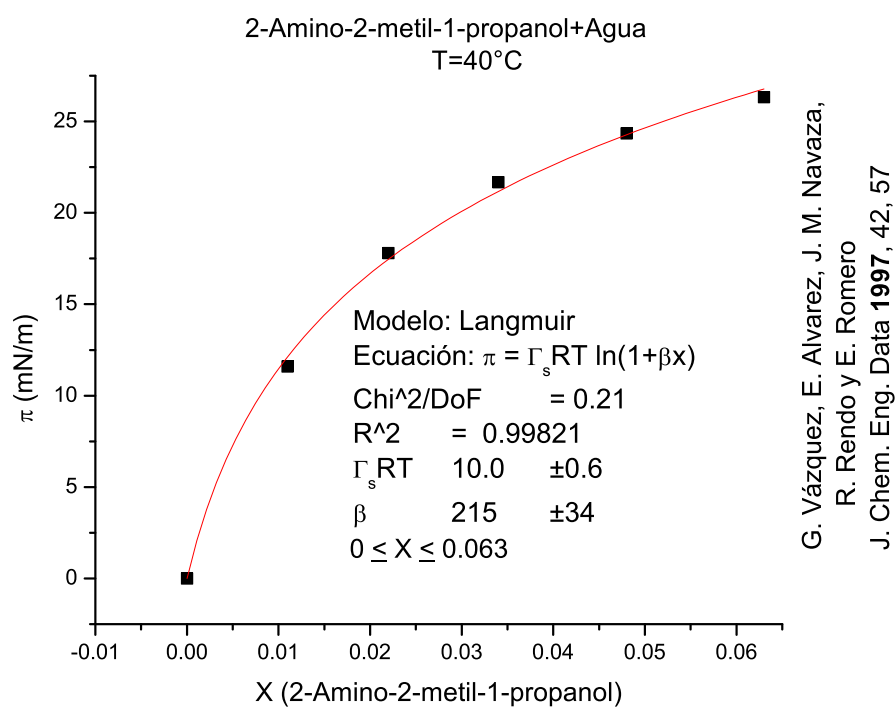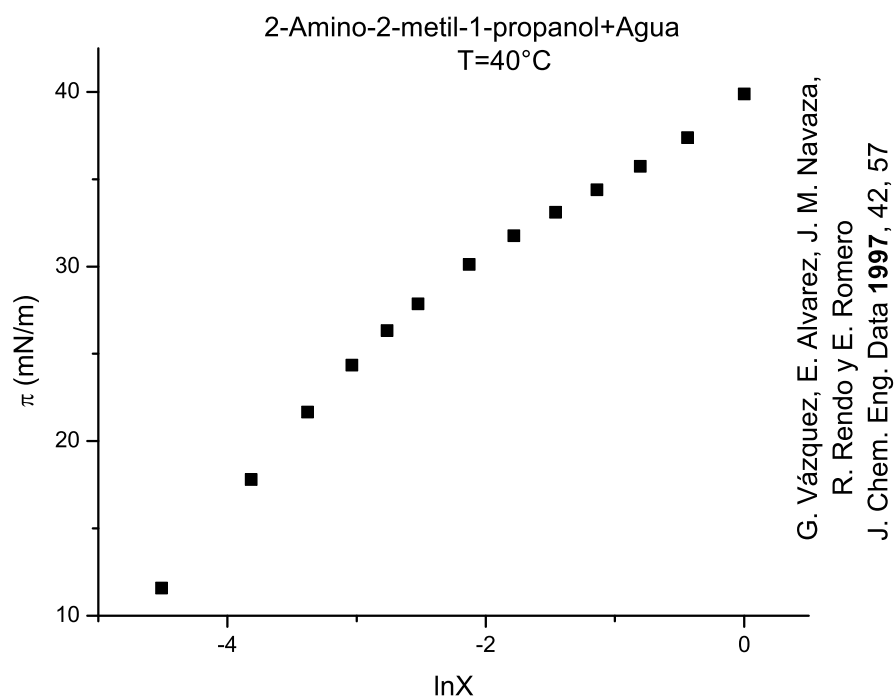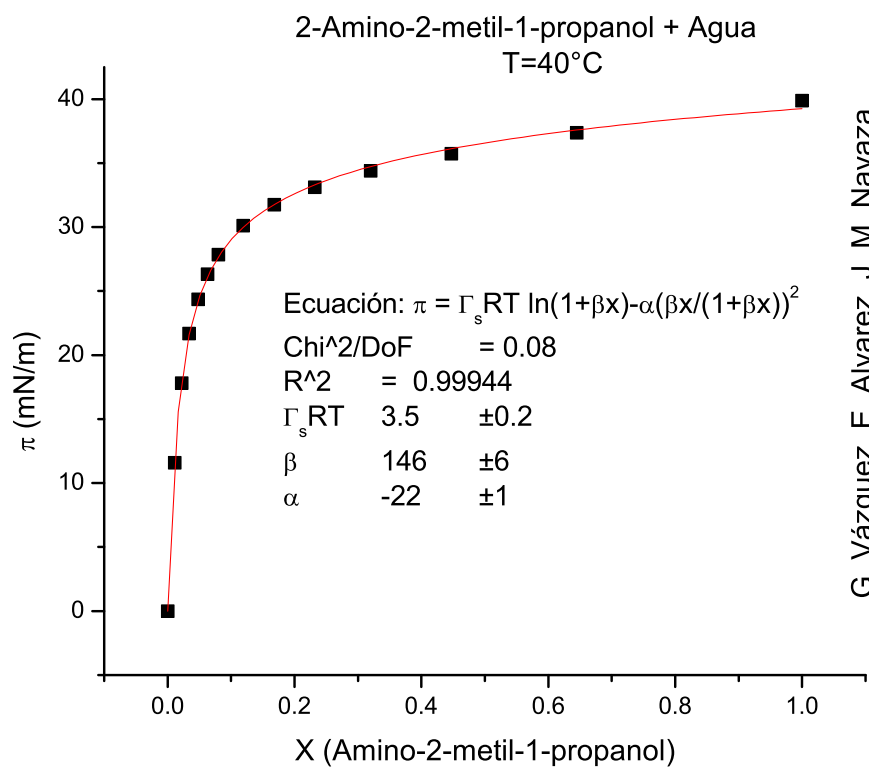
G. Vázquez, E. Alvarez, J. M. Navaza,
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Tabla C.27: 2-Amino-2-metil-1-propanol + Agua a T=40°C [52]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	69.52	0	–
0.011	57.93	11.59	-4.50986
0.022	51.72	17.8	-3.81671
0.034	47.85	21.67	-3.38139
0.048	45.17	24.35	-3.03655
0.063	43.19	26.33	-2.76462
0.08	41.66	27.86	-2.52573
0.119	39.4	30.12	-2.12863
0.168	37.76	31.76	-1.78379
0.232	36.41	33.11	-1.46102
0.32	35.12	34.4	-1.13943
0.447	33.78	35.74	-0.8052
0.645	32.14	37.38	-0.4385
1	29.64	39.88	0

2-Amino-2-metil-1-propanol+Agua
T=45°C

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2-Amino-2-metil-1-propanol+Agua
T=45°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF = 0.32
R^2 = 0.99725
$\Gamma_s RT$ 9.4 ±0.6
β 247 ±42
$0 \leq X \leq 0.08$

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2-Amino-2-metil-1-propanol + Agua
T=45°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF	= 0.08	
R^2	= 0.99946	
$\Gamma_s RT$	3.4	±0.2
β	145	±6
α	-22	±1

π (mN/m)

X (Amino-2-metil-1-propanol)
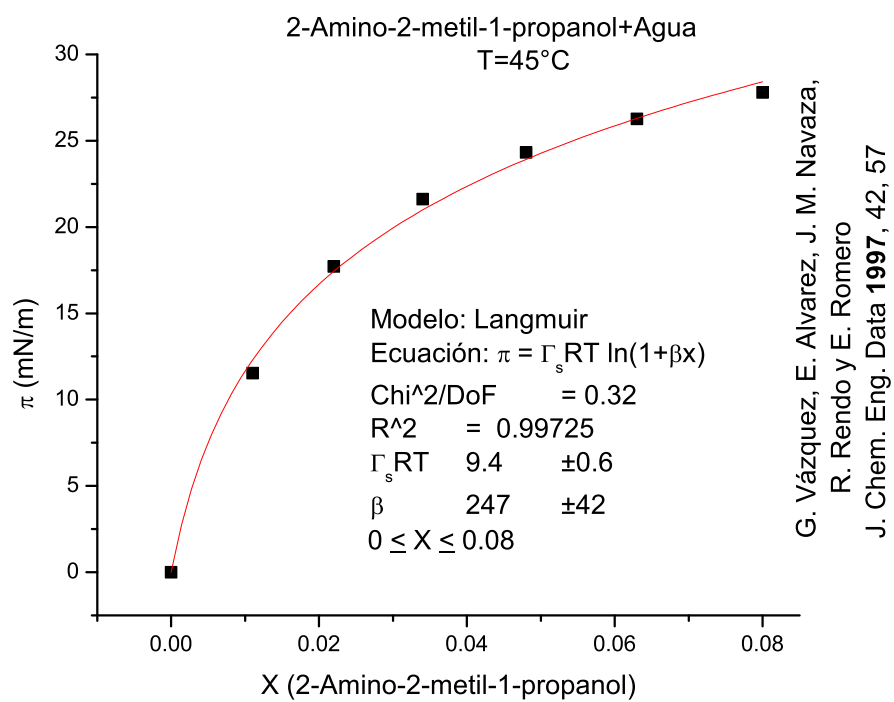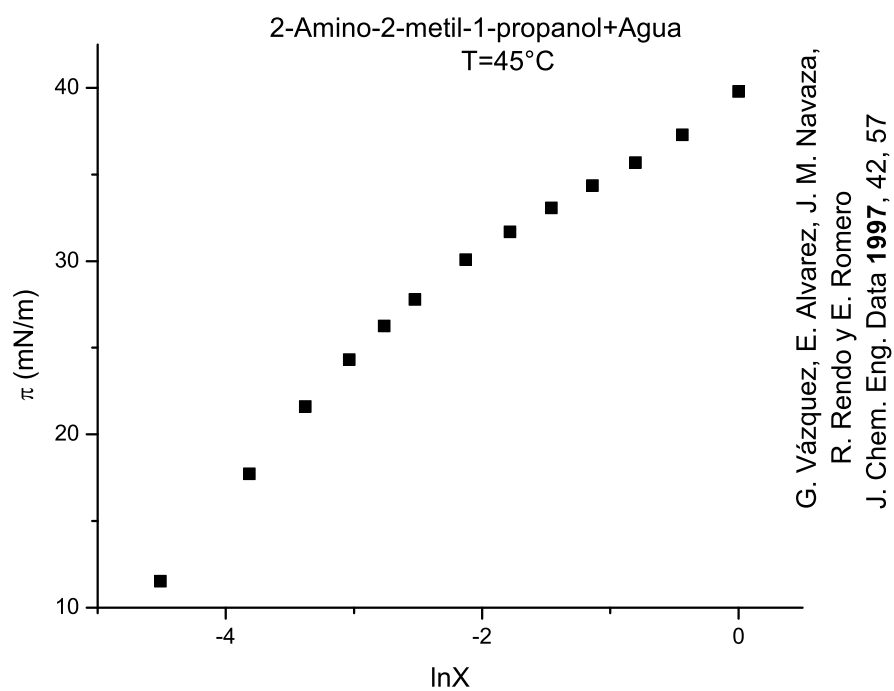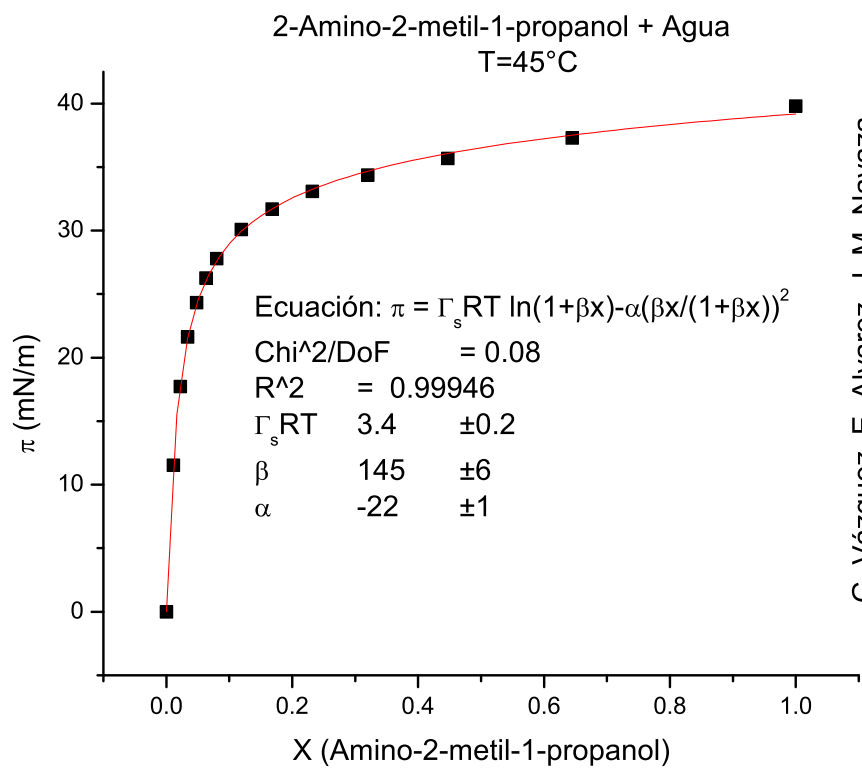
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Tabla C.28: 2-Amino-2-metil-1-propanol + Agua a T=45°C [52]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	68.84	0	–
0.011	57.3	11.54	-4.50986
0.022	51.12	17.72	-3.81671
0.034	47.22	21.62	-3.38139
0.048	44.52	24.32	-3.03655
0.063	42.58	26.26	-2.76462
0.08	41.05	27.79	-2.52573
0.119	38.76	30.08	-2.12863
0.168	37.14	31.7	-1.78379
0.232	35.76	33.08	-1.46102
0.32	34.48	34.36	-1.13943
0.447	33.15	35.69	-0.8052
0.645	31.54	37.3	-0.4385
1	29.04	39.8	0

2-Amino-2-metil-1-propanol+Agua
T=50°C

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2-Amino-2-metil-1-propanol+Agua
T=50°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF		= 0.22
R^2	= 0.99814	
$\Gamma_s RT$	10	±0.6
β	204	±32

$0 \leq X \leq 0.063$

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2-Amino-2-metil-1-propanol + Agua
T=50°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF	= 0.07	
R^2	= 0.99952	
$\Gamma_s RT$	3.5	±0.2
β	142	±6
α	-22	±1

π (mN/m)

X (Amino-2-metil-1-propanol)
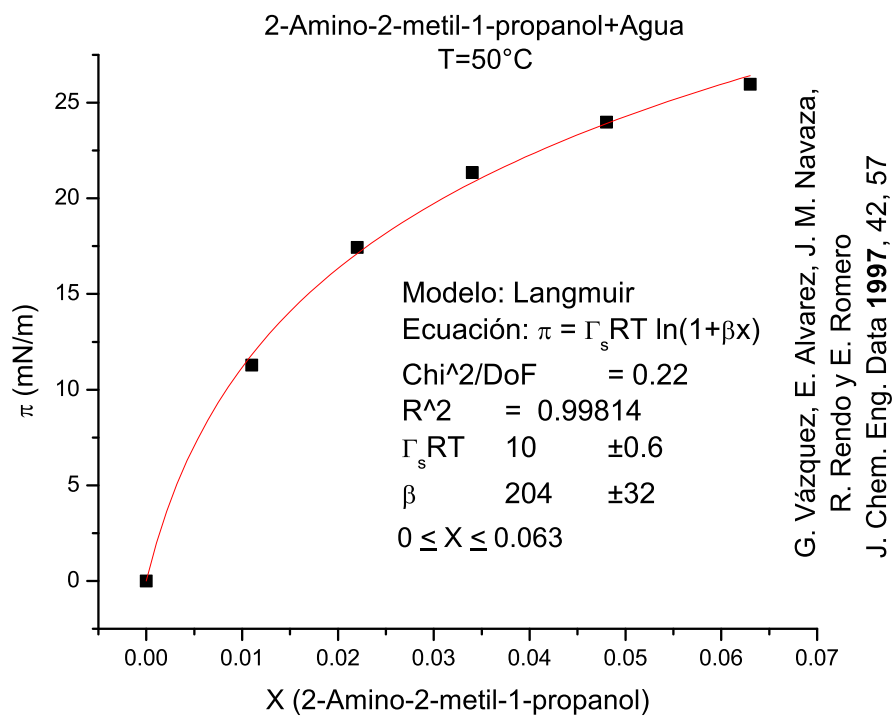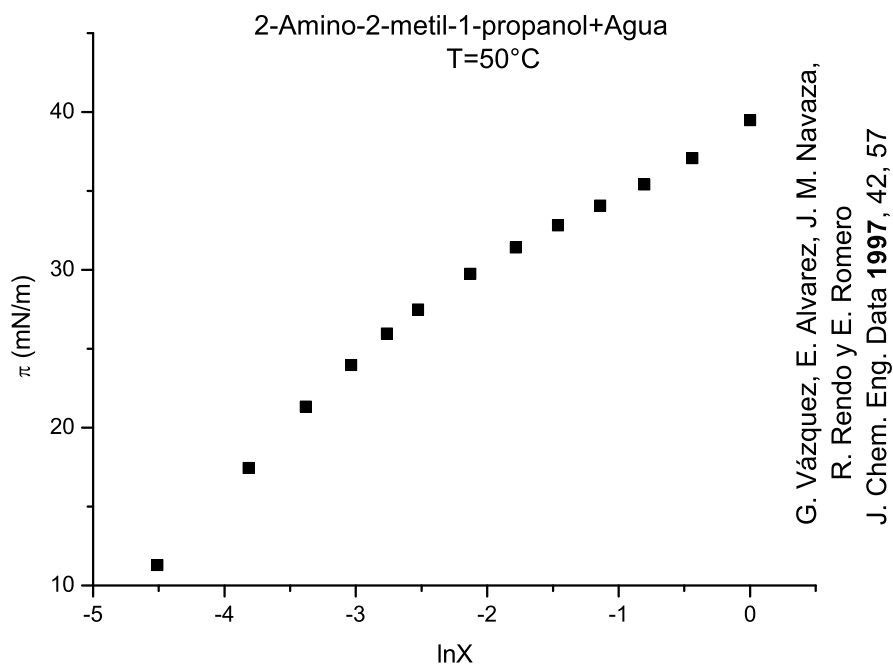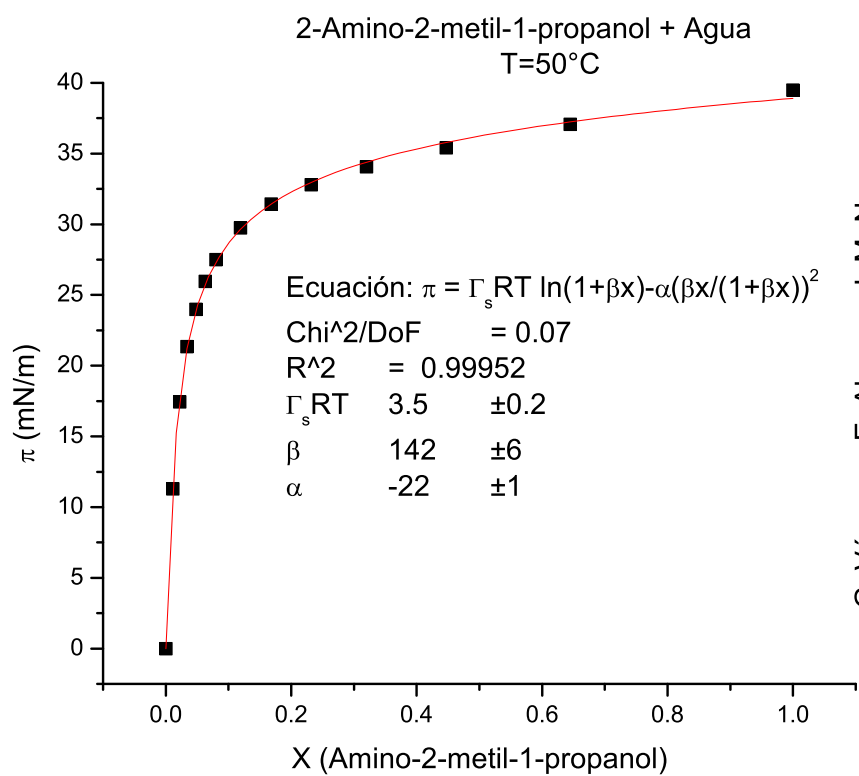
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Tabla C.29: 2-Amino-2-metil-1-propanol + Agua a T=50°C [52]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	67.92	0	–
0.011	56.63	11.29	-4.50986
0.022	50.48	17.44	-3.81671
0.034	46.58	21.34	-3.38139
0.048	43.94	23.98	-3.03655
0.063	41.95	25.97	-2.76462
0.08	40.43	27.49	-2.52573
0.119	38.17	29.75	-2.12863
0.168	36.5	31.42	-1.78379
0.232	35.11	32.81	-1.46102
0.32	33.85	34.07	-1.13943
0.447	32.5	35.42	-0.8052
0.645	30.85	37.07	-0.4385
1	28.44	39.48	0

Amino-2-metil-1-propanol+Agua
T=50°C

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Amino-2-metil-1-propanol + Agua
T=50°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.96
R^2   = 0.99428
$\Gamma_s RT$ 6.6   ±0.4
β 457   ±108

$0 \leq X \leq 0.3916$

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Amino-2-metil-1-propanol + Agua
T=50°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF		= 0.20
R^2	=	0.99881
$\Gamma_s RT$	4.3	±0.3
β	159	±15
α	-16	±1.6

π (mN/m)

X (Amino-2-metil-1-propanol)
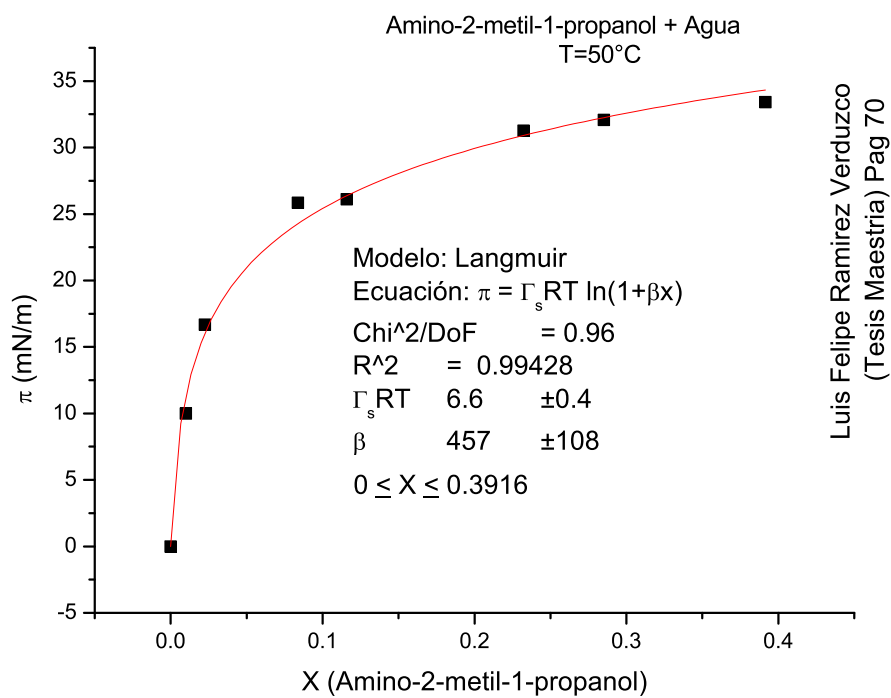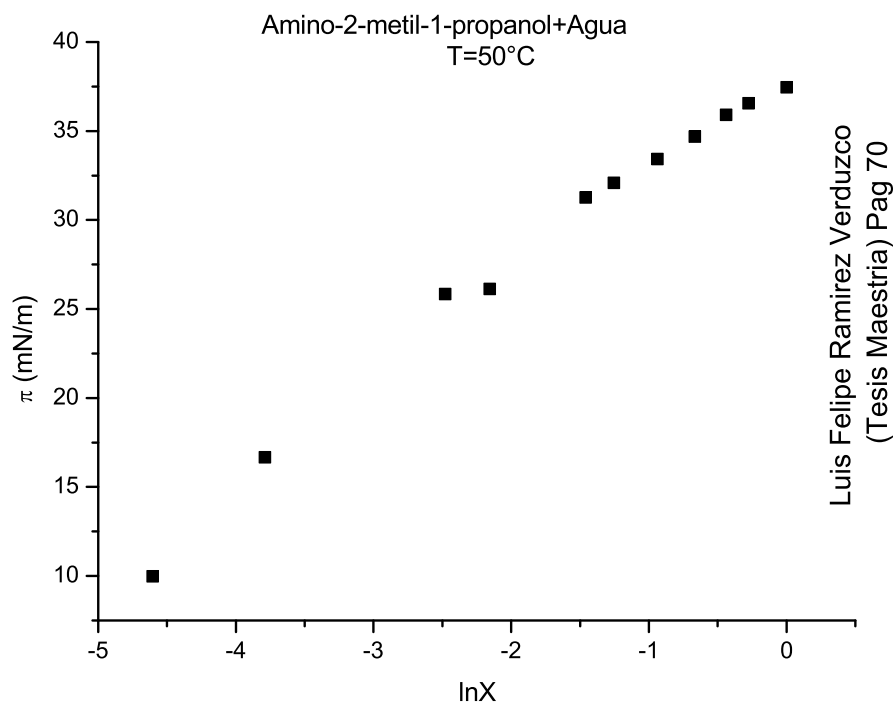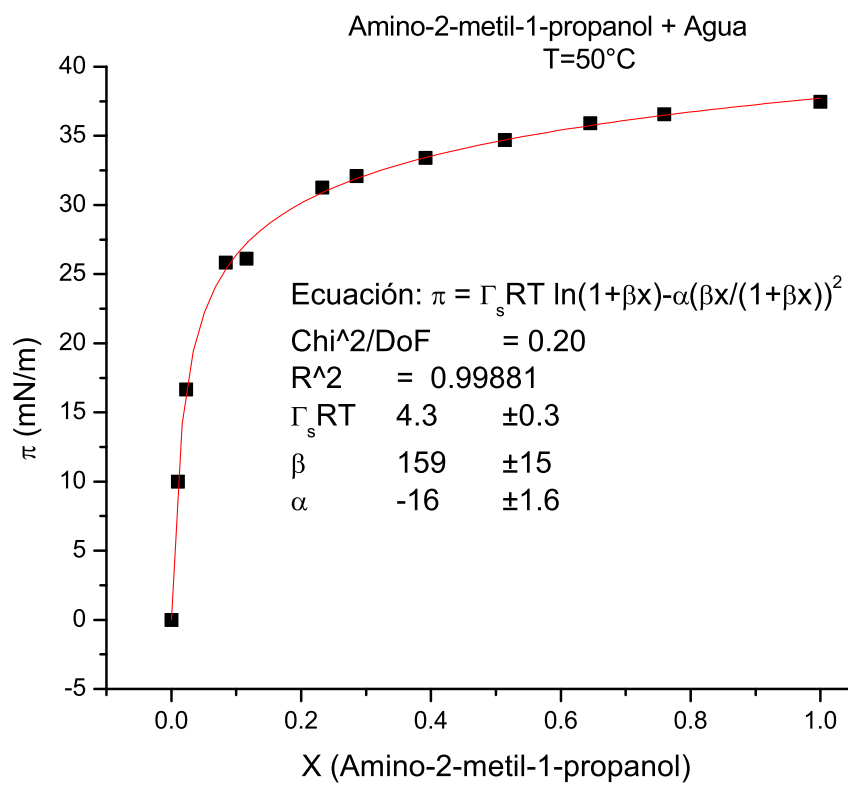
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Tabla C.30: Amino-2-metil-1-propanol + Agua a T=50°C [54]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	67.87	0	–
0.01	57.88	9.99	-4.60517
0.0226	51.2	16.67	-3.78981
0.0838	42.03	25.84	-2.47932
0.1159	41.75	26.12	-2.15503
0.2323	36.61	31.26	-1.45973
0.2852	35.78	32.09	-1.25456
0.3916	34.45	33.42	-0.93751
0.514	33.18	34.69	-0.66553
0.6452	31.96	35.91	-0.43819
0.759	31.3	36.57	-0.27575
1	30.41	37.46	0

Amino-2-metil-1-propanol+Agua
T=60°C

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Amino-2-metil-1-propanol+Agua
T=60°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.88
R^2   = 0.99481
$\Gamma_s RT$ 7   ±0.5
β 356   ±91
$0 \le X \le 0.2323$

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Amino-2-metil-1-propanol + Agua
T=60°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF		= 0.16
R^2	=	0.99904
$\Gamma_s RT$	4	±0.3
β	151	±12
α	-17	±1.4

π (mN/m)

X (Amino-2-metil-1-propanol)
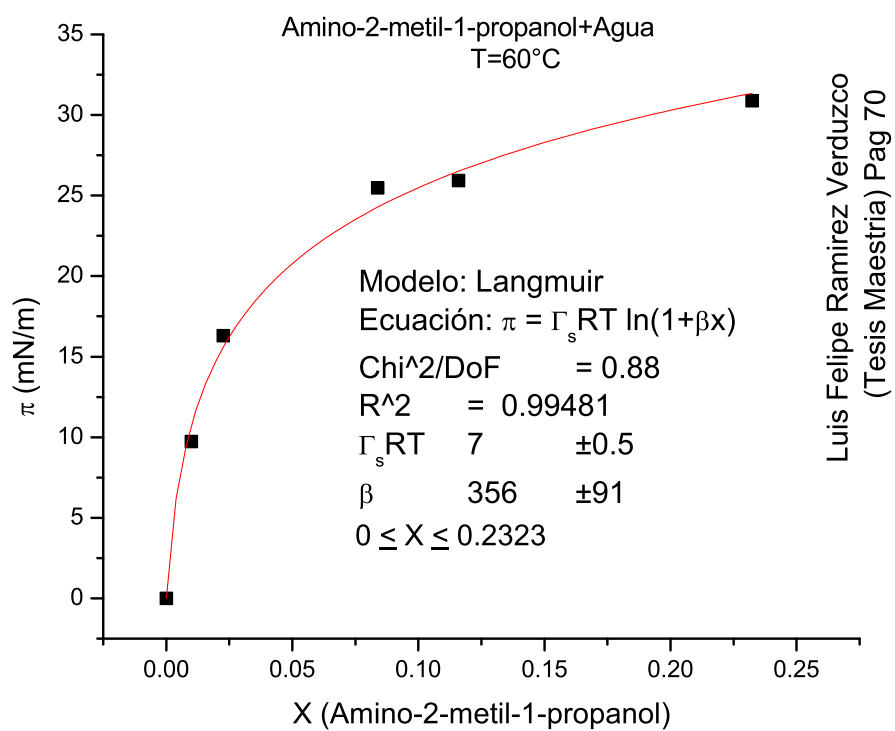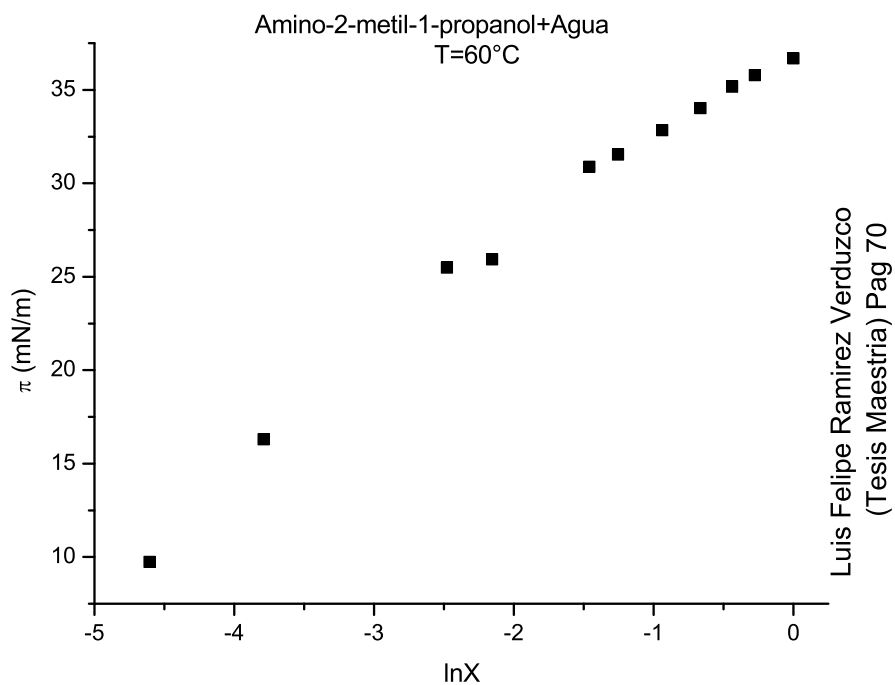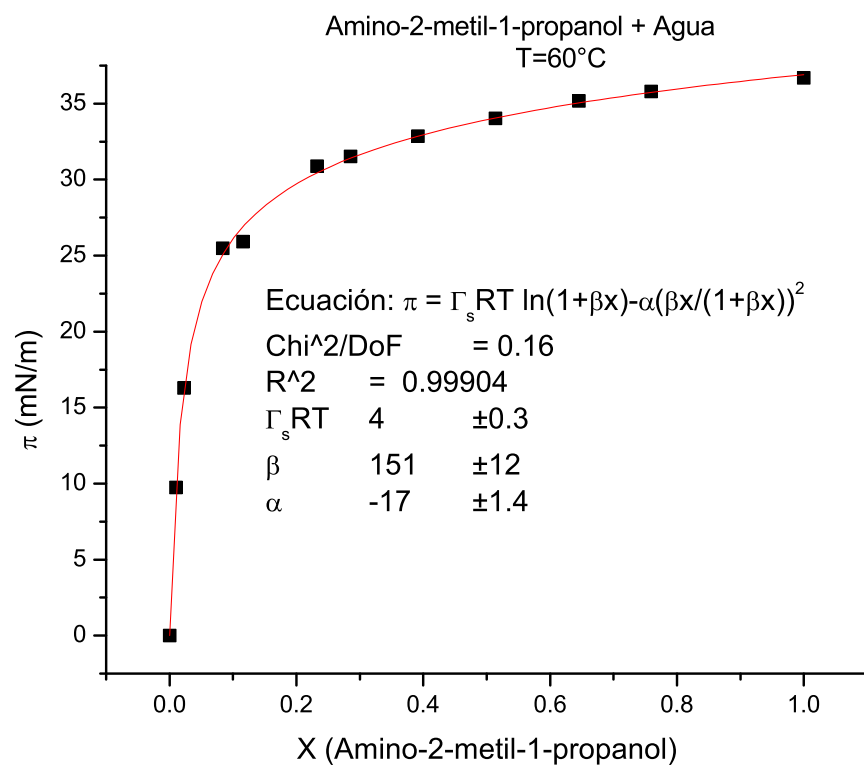
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Tabla C.31: Amino-2-metil-1-propanol + Agua a T=60°C [54]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	66.14	0	–
0.01	56.4	9.74	-4.60517
0.0226	49.84	16.3	-3.78981
0.0838	40.65	25.49	-2.47932
0.1159	40.21	25.93	-2.15503
0.2323	35.26	30.88	-1.45973
0.2852	34.61	31.53	-1.25456
0.3916	33.29	32.85	-0.93751
0.514	32.11	34.03	-0.66553
0.6452	30.97	35.17	-0.43819
0.759	30.35	35.79	-0.27575
1	29.45	36.69	0

Amino-2-metil-1-propanol+Agua
T=70°C

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(Tesis Maestria) Pag 70

Amino-2-metil-1-propanol+Agua
T=70°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 1.1
R^2   = 0.99281
$\Gamma_s RT$ 7.5   ±0.8
β 294   ±100

$0 \leq X \leq 0.1159$

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(Tesis Maestria) Pag 70

Amino-2-metil-1-propanol + Agua
T=70°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF	= 0.19	
R^2	= 0.99879	
$\Gamma_s RT$	3.7	±0.3
β	145	±12
α	-17.6	±1.5

π (mN/m)

X (Amino-2-metil-1-propanol)
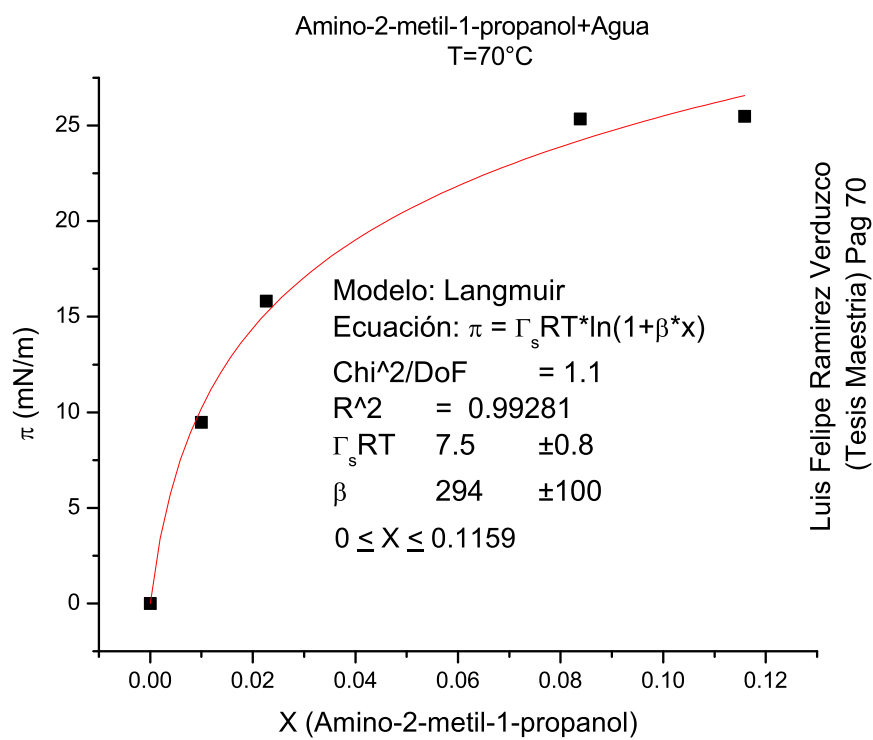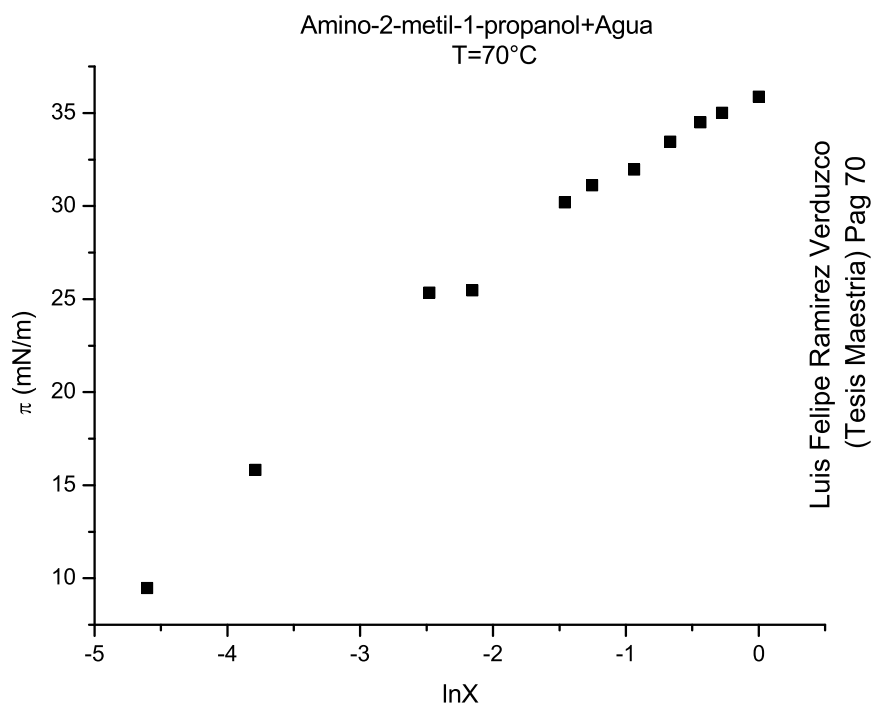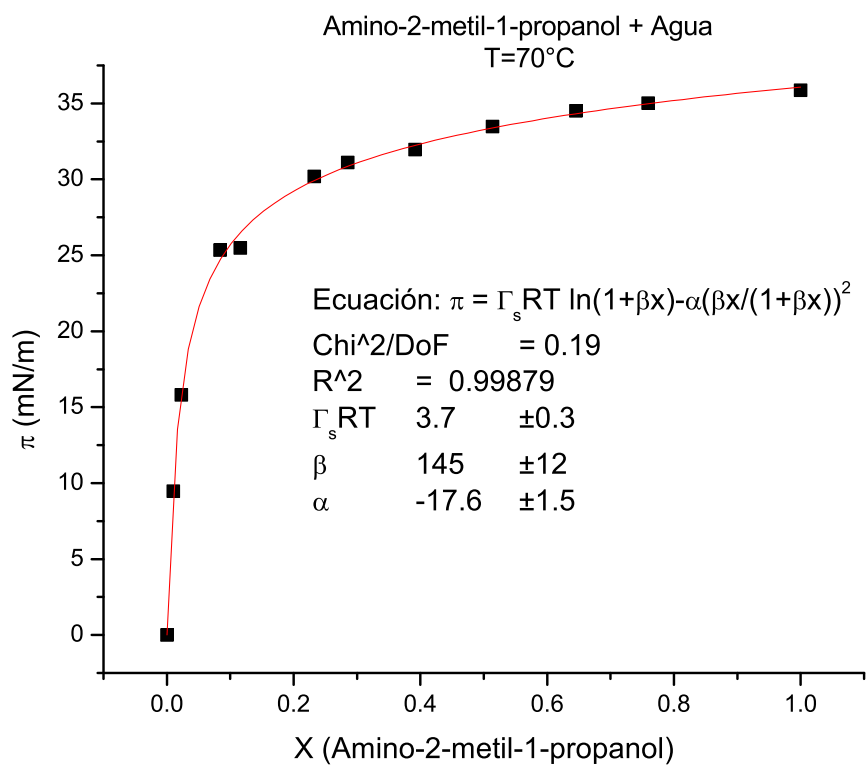
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(Tesis Maestria) Pag 70

Tabla C.32: Amino-2-metil-1-propanol + Agua a T=70°C [54]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	64.37	0	–
0.01	54.89	9.48	-4.60517
0.0226	48.55	15.82	-3.78981
0.0838	39.03	25.34	-2.47932
0.1159	38.89	25.48	-2.15503
0.2323	34.17	30.2	-1.45973
0.2852	33.26	31.11	-1.25456
0.3916	32.4	31.97	-0.93751
0.514	30.9	33.47	-0.66553
0.6452	29.86	34.51	-0.43819
0.759	29.35	35.02	-0.27575
1	28.49	35.88	0

Amino-2-metil-1-propanol+Agua
T=80°C

Luis Felipe Ramirez Verduzco
(Tesis Maestria) Pag 70

Amino-2-metil-1-propanol+Agua
T=80°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF = 1.17
R^2 = 0.99239
$\Gamma_s RT$ 7.4 ±0.8
β 284 ±99
$0 \le X \le 0.1159$

Luis Felipe Ramirez Verduzco
(Tesis Maestria) Pag 70

Amino-2-metil-1-propanol + Agua
T=80°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF	= 0.22	
R^2	= 0.99857	
$\Gamma_s RT$	3.5	±0.3
β	140	±12
α	-18	±2

X (Amino-2-metil-1-propanol)

π (mN/m)
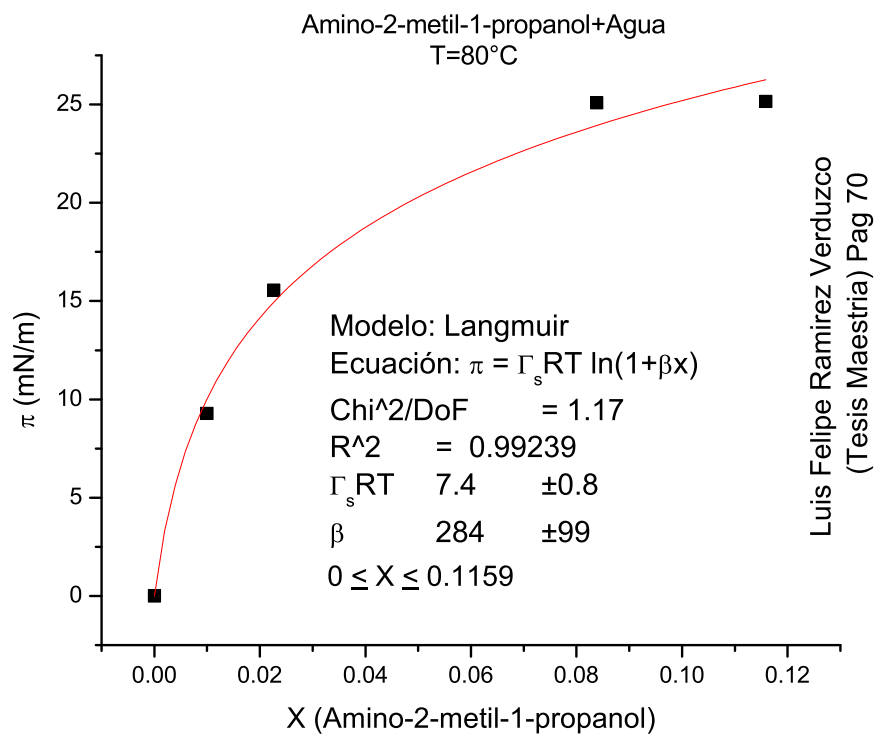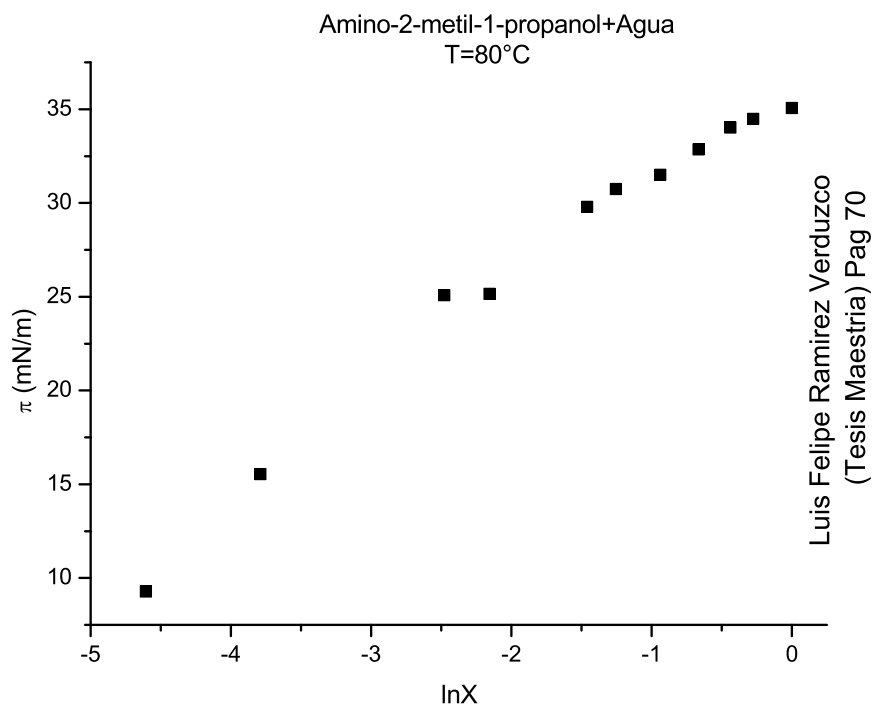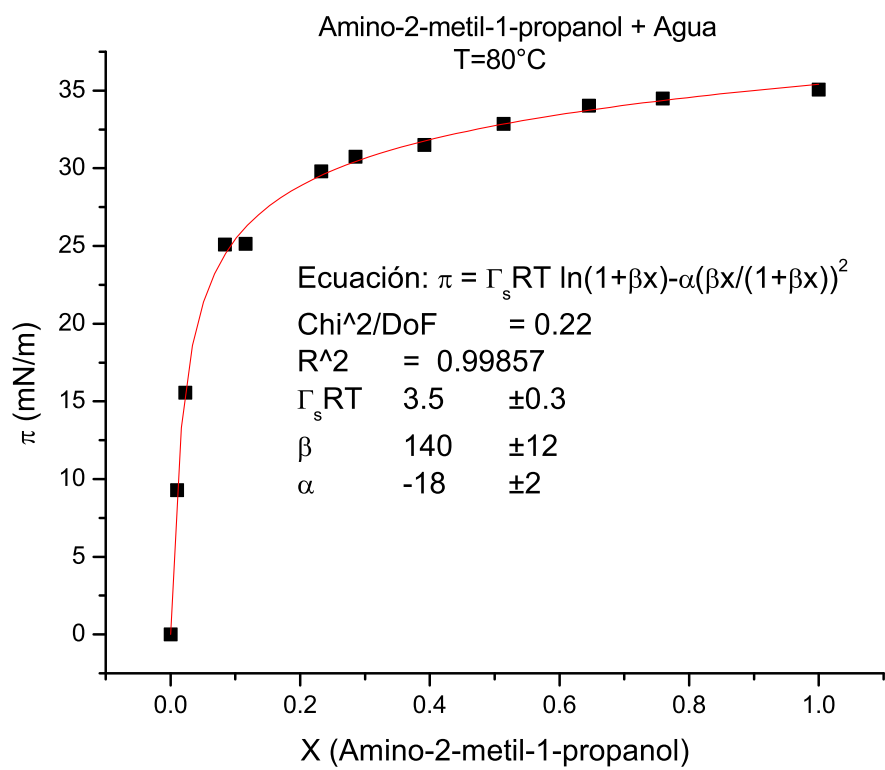
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(Tesis Maestria) Pag 70

Tabla C.33: Amino-2-metil-1-propanol + Agua a T=80°C [54]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	62.59	0	–
0.01	53.31	9.28	-4.60517
0.0226	47.04	15.55	-3.78981
0.0838	37.5	25.09	-2.47932
0.1159	37.44	25.15	-2.15503
0.2323	32.79	29.8	-1.45973
0.2852	31.84	30.75	-1.25456
0.3916	31.09	31.5	-0.93751
0.514	29.72	32.87	-0.66553
0.6452	28.57	34.02	-0.43819
0.759	28.1	34.49	-0.27575
1	27.53	35.06	0
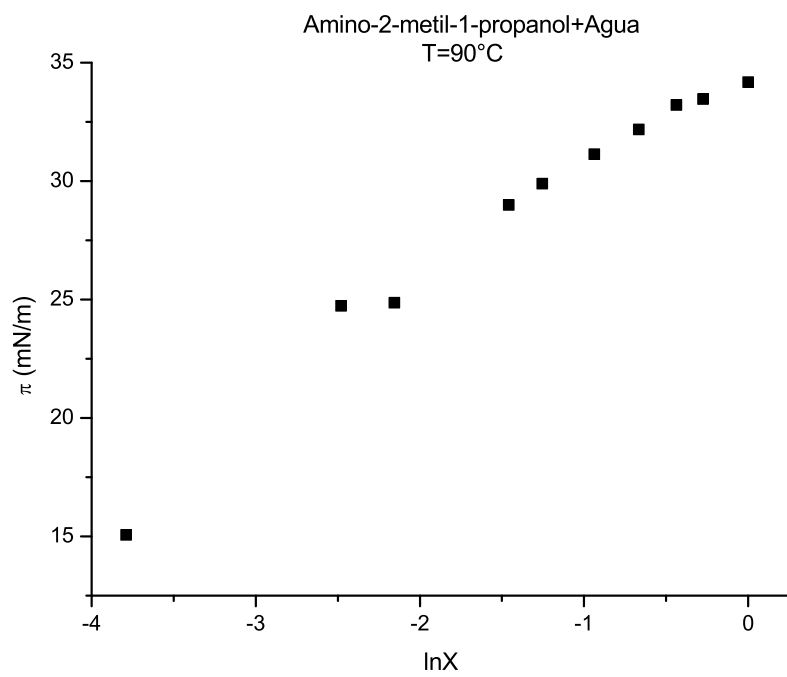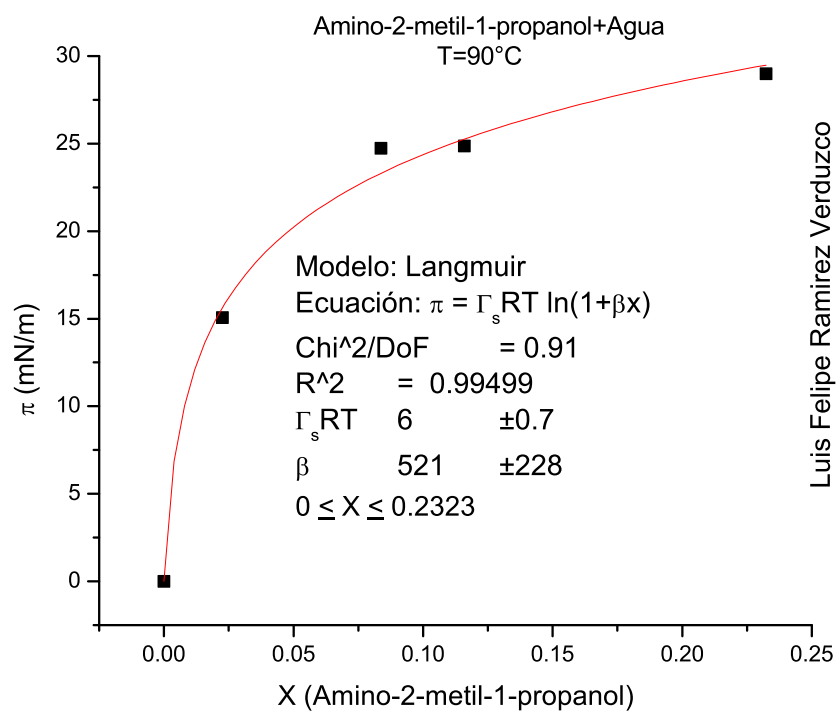
Amino-2-metil-1-propanol+Agua
T=90°C

Luis Felipe Ramirez Verduzco
(Tesis Maestria) Pag 70

Amino-2-metil-1-propanol+Agua
T=90°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$
Chi^2/DoF   = 0.91
R^2   = 0.99499
$\Gamma_s RT$ 6   ±0.7
β 521   ±228
$0 \leq X \leq 0.2323$

Luis Felipe Ramirez Verduzco
(Tesis Maestria) Pag 70

Amino-2-metil-1-propanol + Agua
T=90°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF   = 0.18
R^2   = 0.99862
$\Gamma_s RT$ 3.2   ±0.3
β 131   ±15
α -19   ±2

π (mN/m)

X (Amino-2-metil-1-propanol)
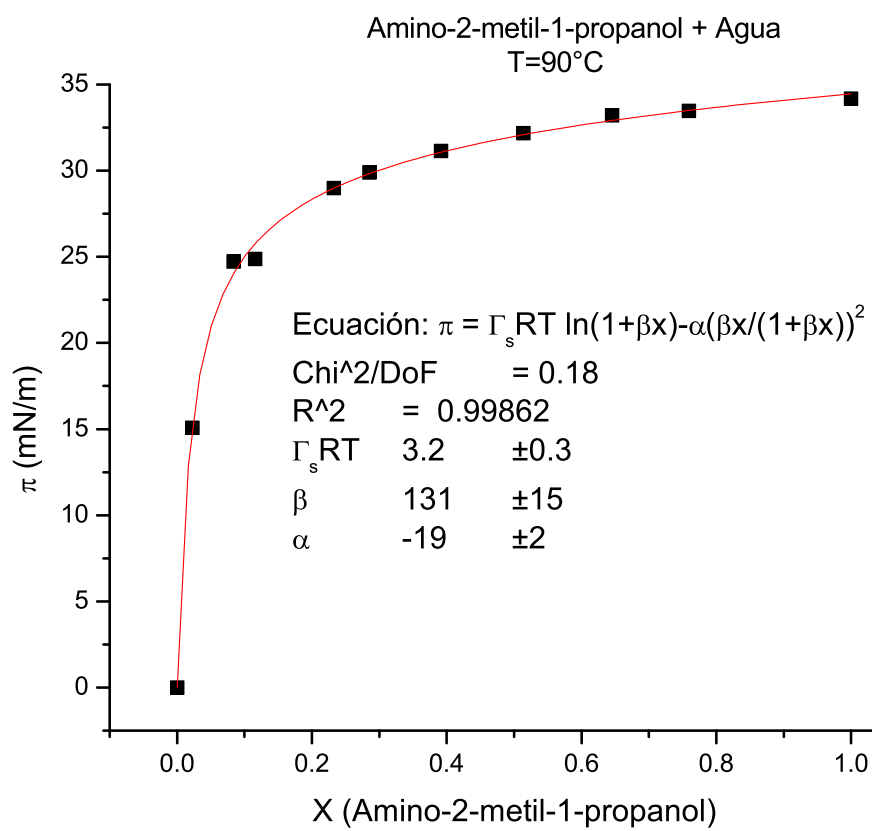
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(Tesis Maestria) Pag 70

Tabla C.34: Amino-2-metil-1-propanol + Agua a T=90°C [54]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	60.75	0	–
0.01	–	–	-4.60517
0.0226	45.68	15.07	-3.78981
0.0838	36.02	24.73	-2.47932
0.1159	35.88	24.87	-2.15503
0.2323	31.76	28.99	-1.45973
0.2852	30.86	29.89	-1.25456
0.3916	29.61	31.14	-0.93751
0.514	28.57	32.18	-0.66553
0.6452	27.54	33.21	-0.43819
0.759	27.28	33.47	-0.27575
1	26.57	34.18	0

Amino-2-metil-1-propanol+Agua
T=100°C

Amino-2-metil-1-propanol+Agua
T=100°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF   = 0.8
R^2   = 0.99473
$\Gamma_s RT$ 5.7   ±0.5
β 604   ±238
$0 \leq X \leq 0.301$

Amino-2-metil-1-propanol + Agua
T=100°C

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF   = 0.19
R^2   = 0.99848
$\Gamma_s RT$ 3.04   ±0.3
β 130   ±15
α -19   ±2

π (mN/m)

X (Amino-2-metil-1-propanol)

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(Tesis Maestria) Pag 70
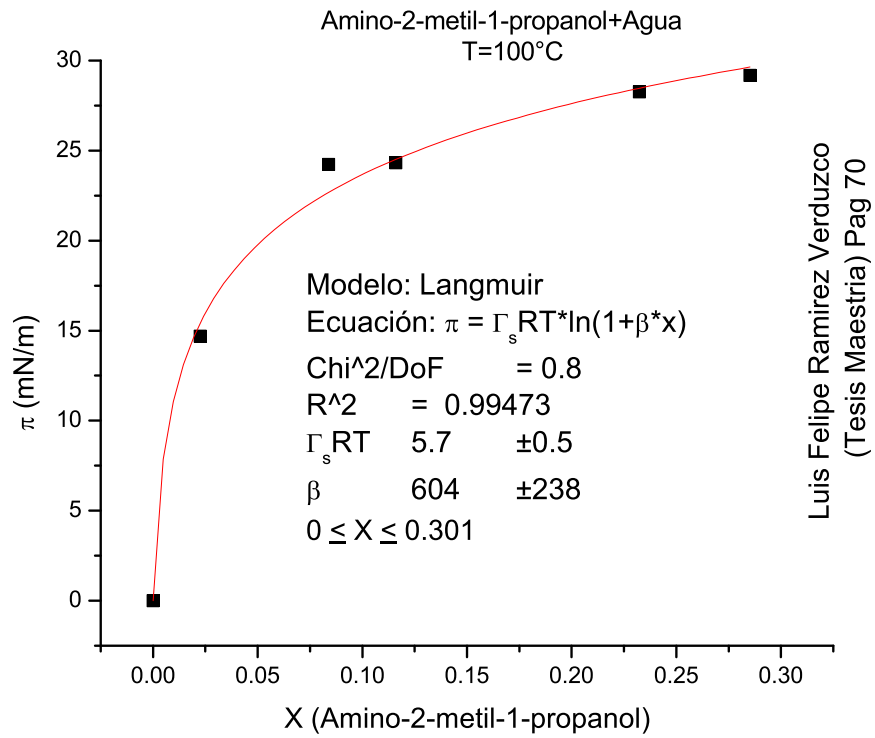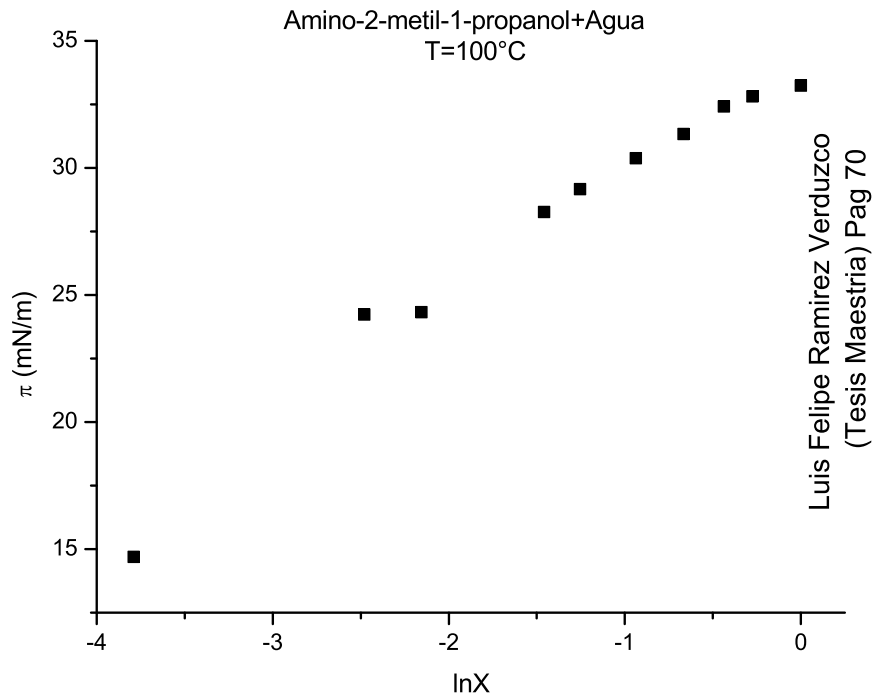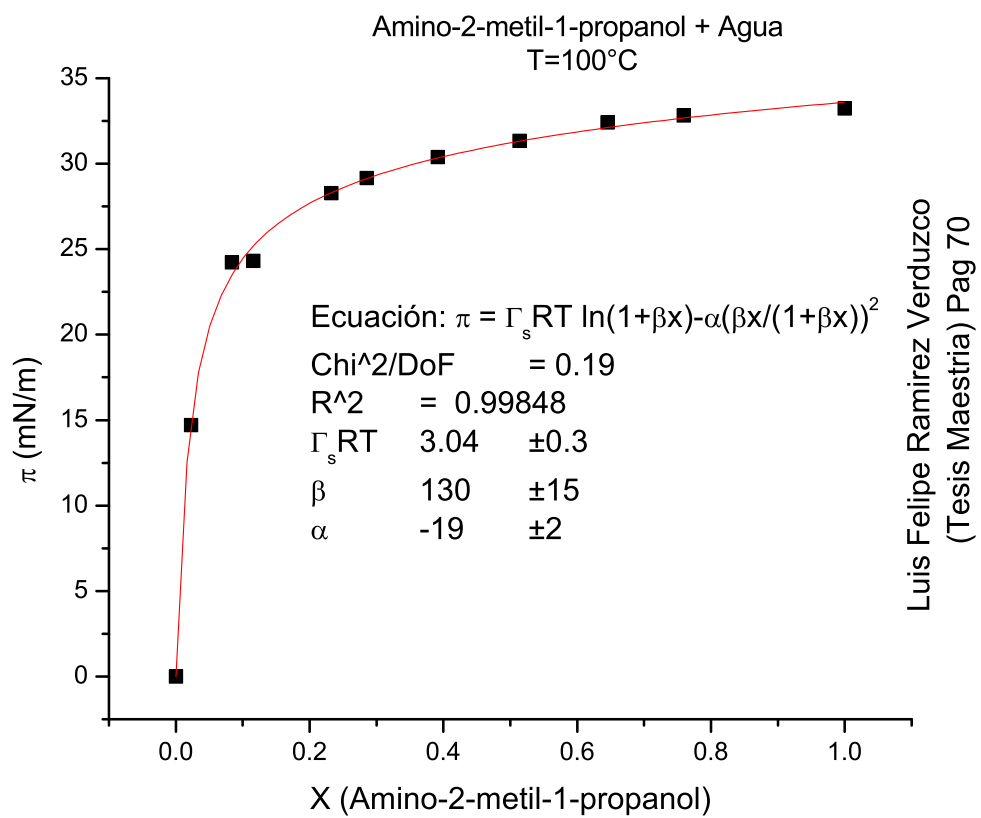
Tabla C.35: Amino-2-metil-1-propanol + Agua a T=100°C [54]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	58.85	0	–
0.01	–	–	-4.60517
0.0226	44.15	14.7	-3.78981
0.0838	34.62	24.23	-2.47932
0.1159	34.53	24.32	-2.15503
0.2323	30.58	28.27	-1.45973
0.2852	29.68	29.17	-1.25456
0.3916	28.46	30.39	-0.93751
0.514	27.51	31.34	-0.66553
0.6452	26.43	32.42	-0.43819
0.759	26.03	32.82	-0.27575
1	25.61	33.24	0
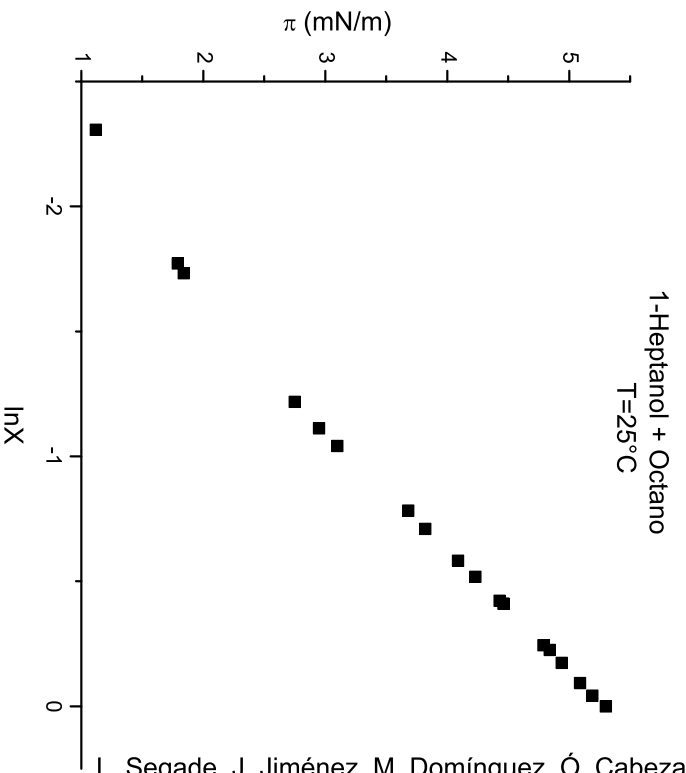
π (mN/m)

1-Heptanol + Octano
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF = 0.004
R^2 = 0.99819
$\Gamma_s RT$ 2.9   ±0.1
β 5.3   ±0.3

X (1-Heptanol)

L. Segade, J. Jiménez, M. Domínguez, Ó. Cabeza,
M. Cabanas y E. Jiménez
J. Chem. Eng. Data **2003**, 48, 1251

π (mN/m)

1-Heptanol + Octano
T=25°C

lnX

L. Segade, J. Jiménez, M. Domínguez, Ó. Cabeza,
M. Cabanas y E. Jiménez
J. Chem. Eng. Data **2003**, 48, 1251

1-Heptanol + Octano
T=25°C

π (mN/m)

X (1-Heptanol)

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF = 0.0004
R^2 = 0.99986
$\Gamma_s RT$ 1.5 ±0.1
β 5.4 ±0.1
α -3.4 ±0.2
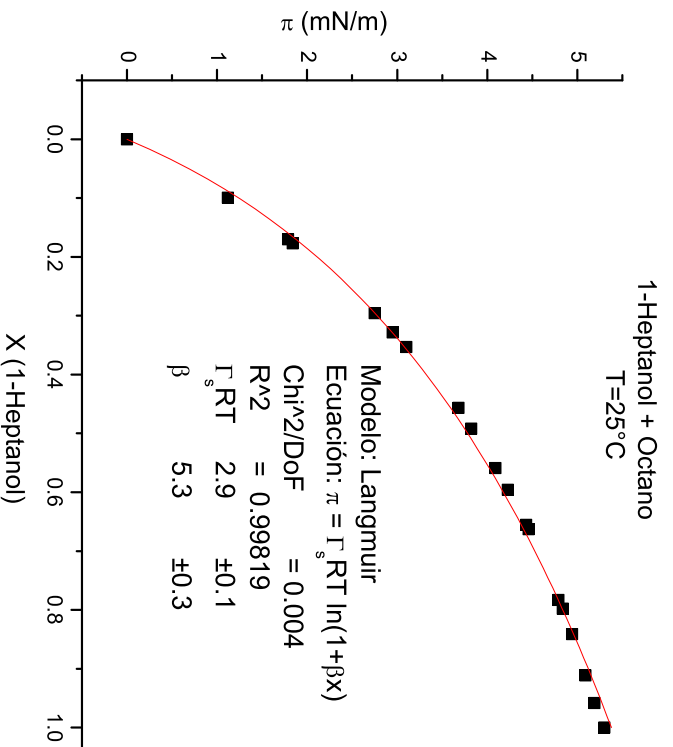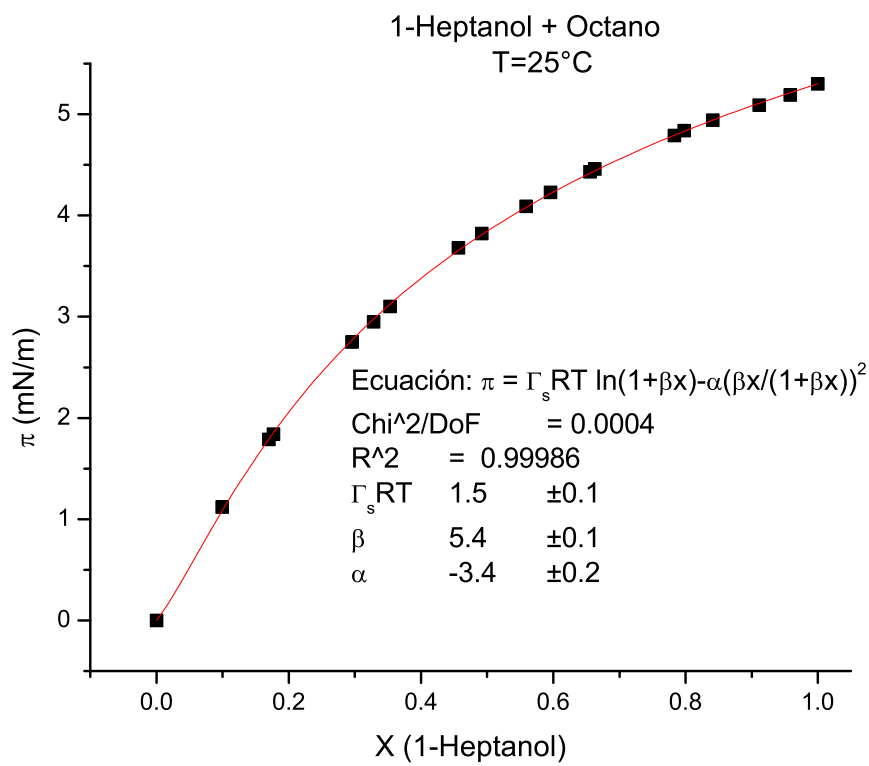
Tabla C.36: 1-Heptanol + Octano a T=25°C [38]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	26.47	0	–
0.0995	25.35	1.12	-2.3076
0.1699	24.68	1.79	-1.77255
0.1767	24.63	1.84	-1.7333
0.2957	23.72	2.75	-1.21841
0.3286	23.52	2.95	-1.11291
0.353	23.37	3.1	-1.04129
0.4567	22.79	3.68	-0.78373
0.4918	22.65	3.82	-0.70968
0.5587	22.38	4.09	-0.58214
0.5956	22.24	4.23	-0.51819
0.6554	22.04	4.43	-0.42251
0.6626	22.01	4.46	-0.41158
0.783	21.68	4.79	-0.24462
0.7981	21.63	4.84	-0.22552
0.8409	21.53	4.94	-0.17328
0.9111	21.38	5.09	-0.0931
0.958	21.28	5.19	-0.04291
1	21.17	5.3	0

Ciclohexano + Benceno
T= 20°C

π (mN/m)

lnX

V.T. Lam y G. C. Benson
Canadian Journal of Chemistry **1970**, 48(24)

Ciclohexano + Benceno
T=20°C

π (mN/m)

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.0008
R^2   = 0.99955
$\Gamma_s RT$ 2.5   ±0.1
β 4.7   ±0.3

$0 \leq X \leq 0.6077$

X (Ciclohexano)

V.T. Lam y G. C. Benson
Canadian Journal of Chemistry **1970**, 48(24)

Ciclohexano + Benceno
T= 20°C

π (mN/m)

X (Ciclohexano)

Modelo: Langmuir Tipo 2
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$
Chi^2/DoF   = 0.002
R^2   = 0.99927
$\Gamma_s RT$ 0.7   ±0.2
β   6.5   ±0.2
α   -3.6   ±0.6

Tabla C.37: Ciclohexano + Benceno a T=20°C [19]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	28.86	0	–
0.1056	27.86	1	-2.2481
0.2041	27.14	1.72	-1.58915
0.3033	26.54	2.32	-1.19303
0.3962	26.15	2.71	-0.92584
0.5063	25.73	3.13	-0.68063
0.6077	25.42	3.44	-0.49807
0.6922	25.26	3.6	-0.36788
0.7957	25.03	3.83	-0.22853
0.8949	24.96	3.9	-0.11104
1	24.81	4.05	0

Ciclohexano + Benceno
T=30°C

V.T. Lam y G. C. Benson
Canadian Journal of Chemistry **1970**, 48(24)

Ciclohexano + Benceno
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ast \ln(1+\beta \ast x)$

Chi^2/DoF   = 0.002
R^2   = 0.9976
$\Gamma_s RT$ 2.6   ± 0.1
β 4.2   ±0.4

$0 \leq X \leq 0.6077$

V.T. Lam y G. C. Benson
Canadian Journal of Chemistry **1970**, 48(24)

Ciclohexano + Benceno
T=30°C

π (mN/m)

X (Ciclohexano)

Modelo: Langmuir Tipo 2
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x) - \alpha(\beta x/(1+\beta x))^2$

Chi^2/DoF	= 0.002	
R^2	= 0.99865	
$\Gamma_s RT$	0.8	±0.2
β	5.9	±0.2
α	-3.2	±0.5
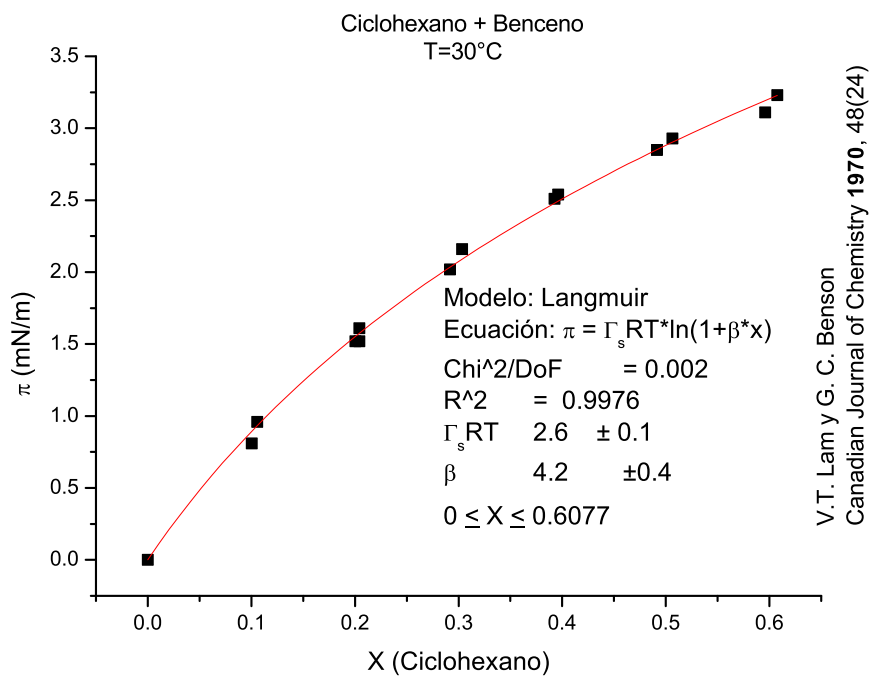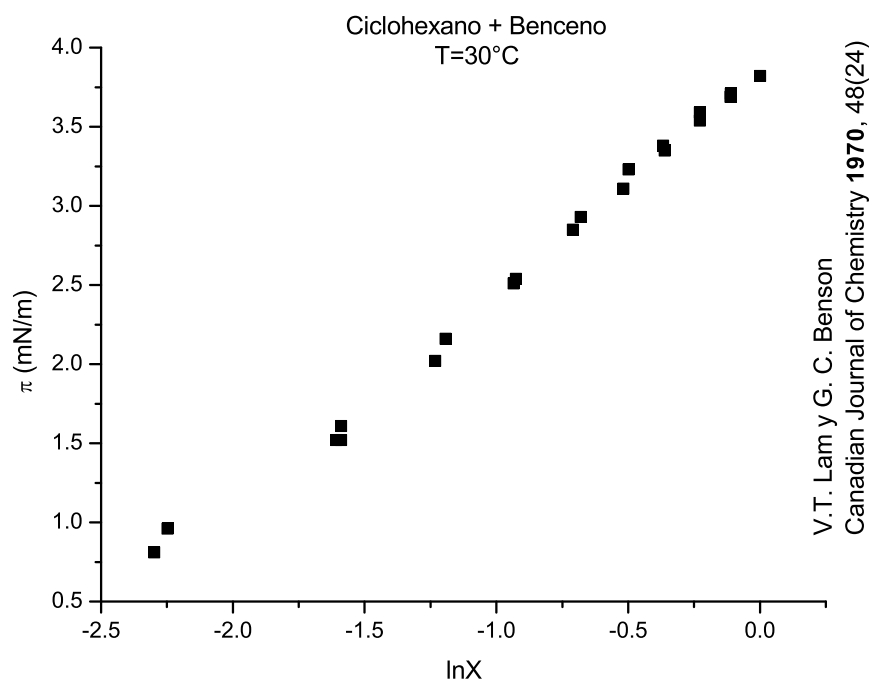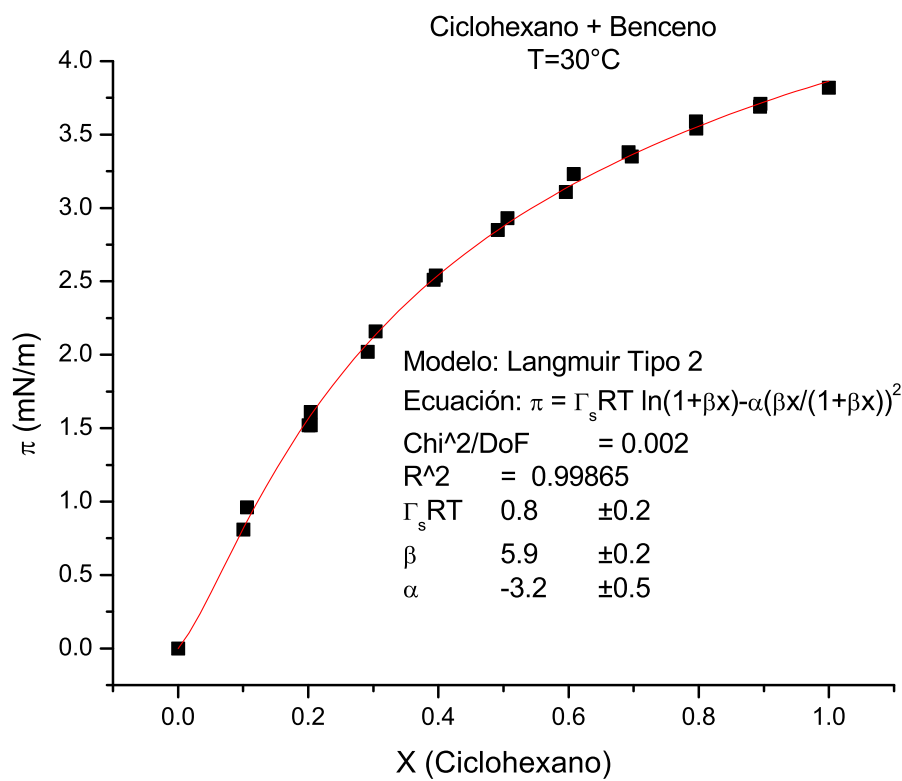
V.T. Lam y G. C. Benson
Canadian Journal of Chemistry **1970**, 48(24)

Tabla C.38: Ciclohexano + Benceno a T=30°C [19]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	27.6	0	–
0.1004	26.79	0.81	-2.29859
0.1056	26.64	0.96	-2.2481
0.2004	26.08	1.52	-1.60744
0.2041	25.99	1.61	-1.58915
0.2041	26.08	1.52	-1.58915
0.2916	25.58	2.02	-1.23237
0.3033	25.44	2.16	-1.19303
0.3925	25.09	2.51	-0.93522
0.3962	25.06	2.54	-0.92584
0.4914	24.75	2.85	-0.7105
0.5063	24.67	2.93	-0.68063
0.5958	24.49	3.11	-0.51785
0.6077	24.37	3.23	-0.49807
0.6922	24.22	3.38	-0.36788
0.697	24.25	3.35	-0.36097
0.7957	24.01	3.59	-0.22853
0.7959	24.06	3.54	-0.22828
0.894	23.91	3.69	-0.11205
0.8949	23.89	3.71	-0.11104
1	23.78	3.82	0

LANGMUIR N SUFIJOS

Acetonitrilo + Agua
T=20°C

π (mN/m)

lnX

Vierk, A.-L.
Z.Anorg.Chem. **1950**, 261, 283

Acetonitrilo + Agua
T=20°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.38251
R^2   = 0.9975
$\Gamma_s RT$ 19   ±1
β 47   ±4

Vierk, A.-L.
Z.Anorg.Chem. **1950**, 261, 283

Acetonitrilo + Agua
T=20°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF   = 1.74
R^2   = 0.99217
$\Gamma_s RT$ 48.8   ±0.7
β 20   ±1

Vierk, A.-L.
Z.Anorg.Chem. **1950**, 261, 283
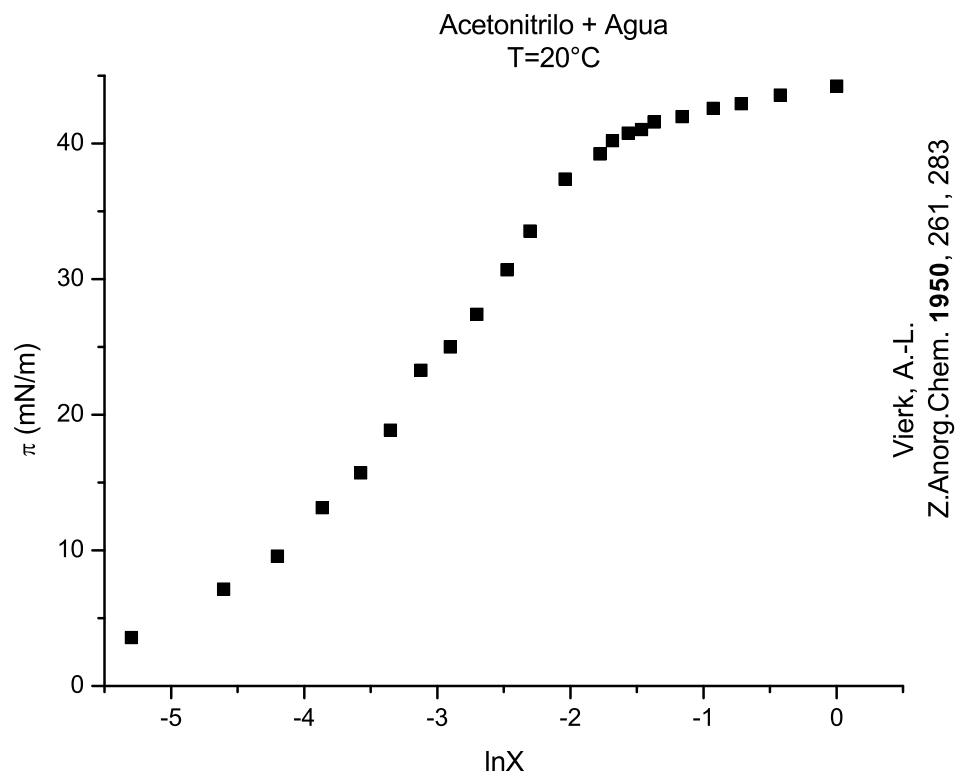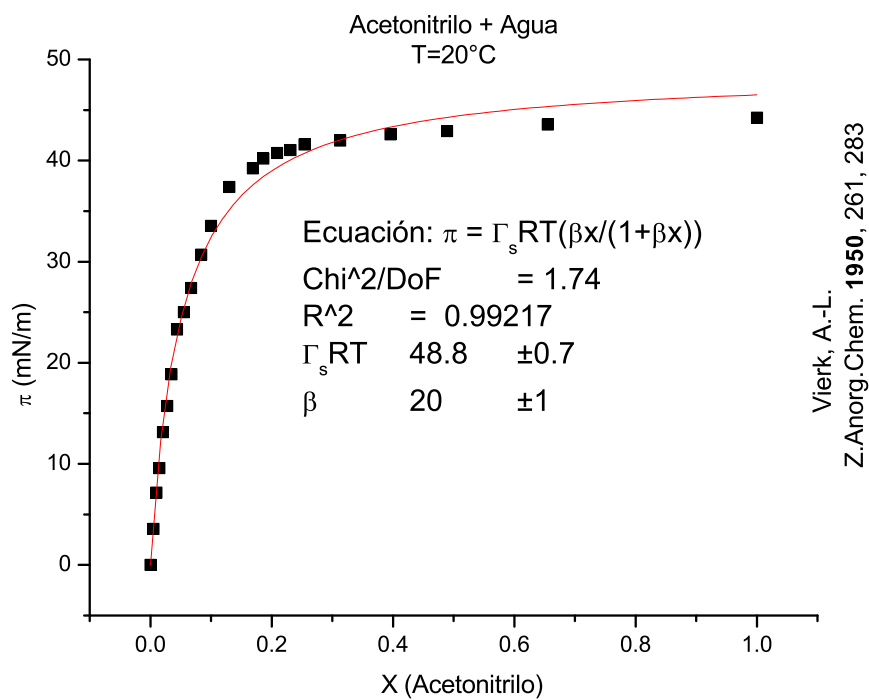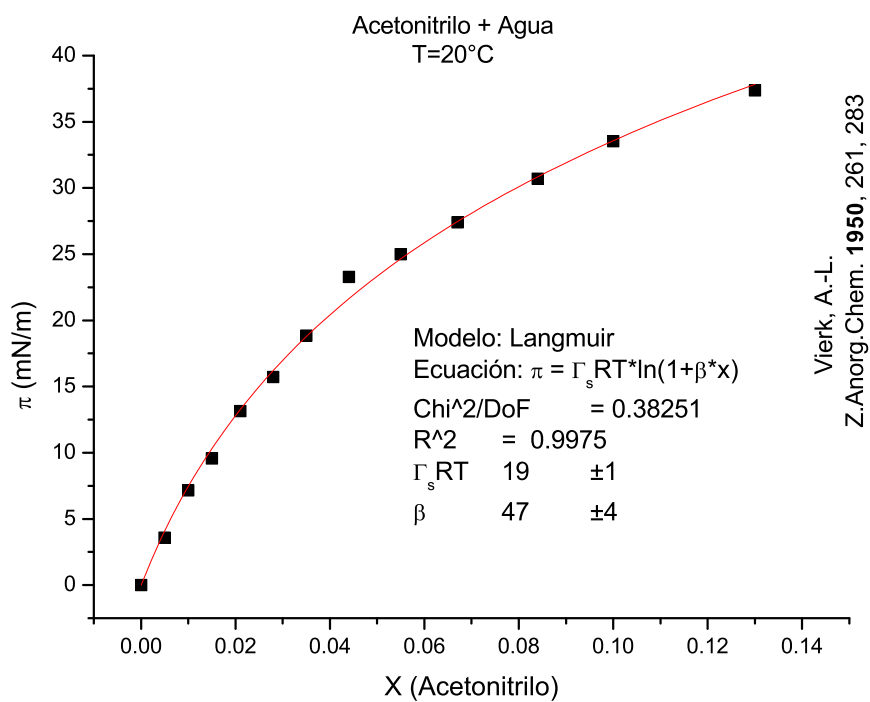
Tabla D.1: Acetonitrilo + Agua a T=20°C [55]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	72.6	0	–
0.005	69.02	3.58	-5.29832
0.01	65.45	7.15	-4.60517
0.015	63.03	9.57	-4.19971
0.021	59.46	13.14	-3.86323
0.028	56.89	15.71	-3.57555
0.035	53.75	18.85	-3.35241
0.044	49.32	23.28	-3.12357
0.055	47.61	24.99	-2.90042
0.067	45.19	27.41	-2.70306
0.084	41.91	30.69	-2.47694
0.1	39.06	33.54	-2.30259
0.13	35.22	37.38	-2.04022
0.169	33.38	39.22	-1.77786
0.186	32.4	40.2	-1.68201
0.209	31.84	40.76	-1.56542
0.231	31.56	41.04	-1.46534
0.254	31.01	41.59	-1.37042
0.313	30.61	41.99	-1.16155
0.396	30.02	42.58	-0.92634
0.489	29.67	42.93	-0.71539
0.655	29.02	43.58	-0.42312
1	28.37	44.23	0

1-Butanol + Acetonitrilo
T=20°C

Tahery R., Modarress H., y Satherley J.
J. of Chem. Eng. Data **2006**, 51, 1039

1-Butanol + Acetonitrilo
T=20°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.001
R^2   = 0.99961
$\Gamma_s RT$ 3.5   ±0.2
β 3.9   ±0.3
$0 \leq X \leq 0.4976$

Tahery R., Modarress H., y Satherley J.
J. of Chem. Eng. Data **2006**, 51, 1039

1-Butanol + Acetonitrilo
T=20°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF	= 0.01	
R^2	= 0.99805	
$\Gamma_s RT$	7.2	±0.2
β	1.9	±0.1

π (mN/m)
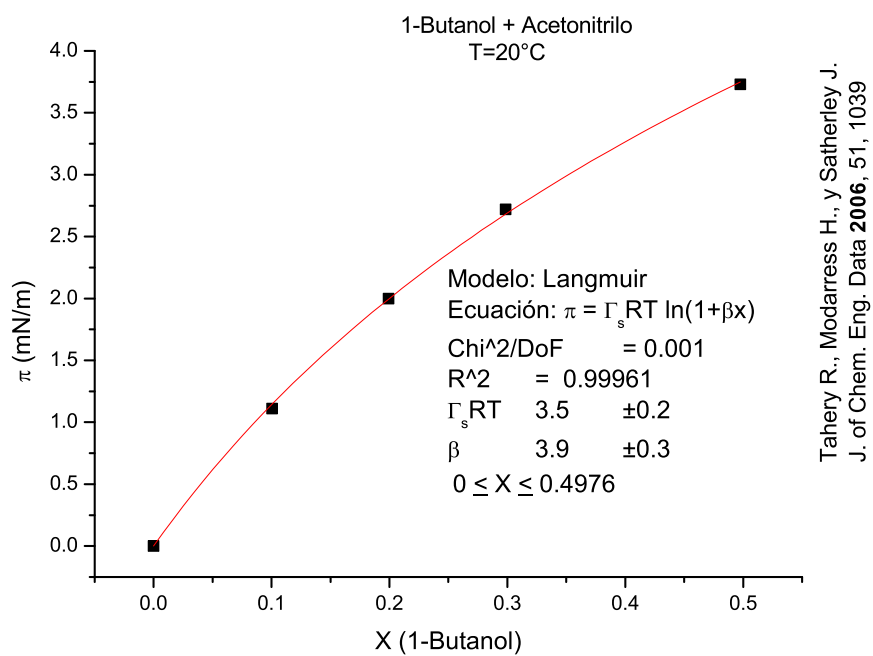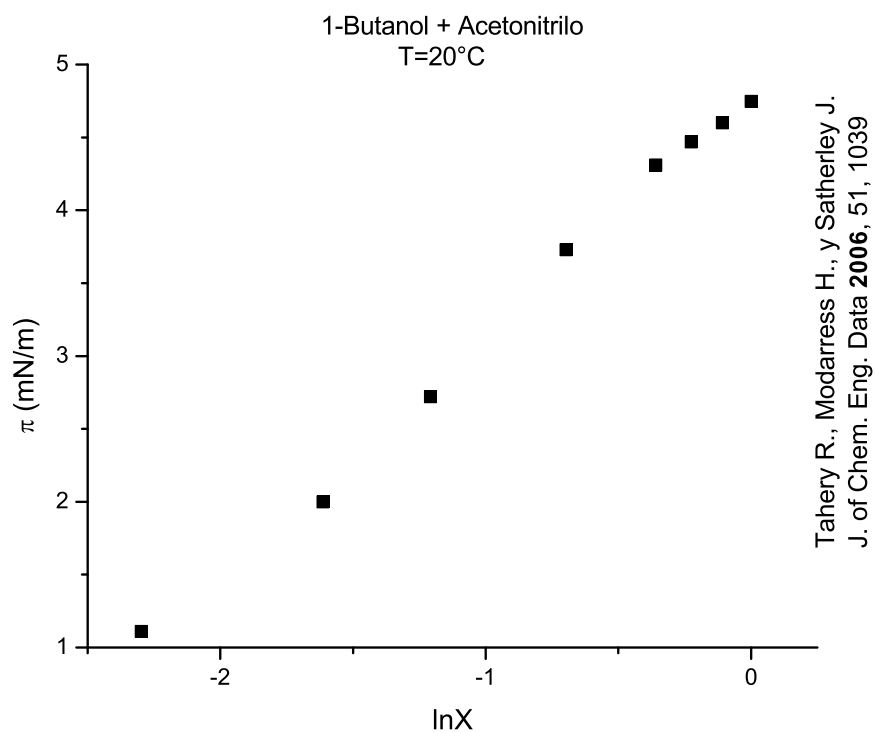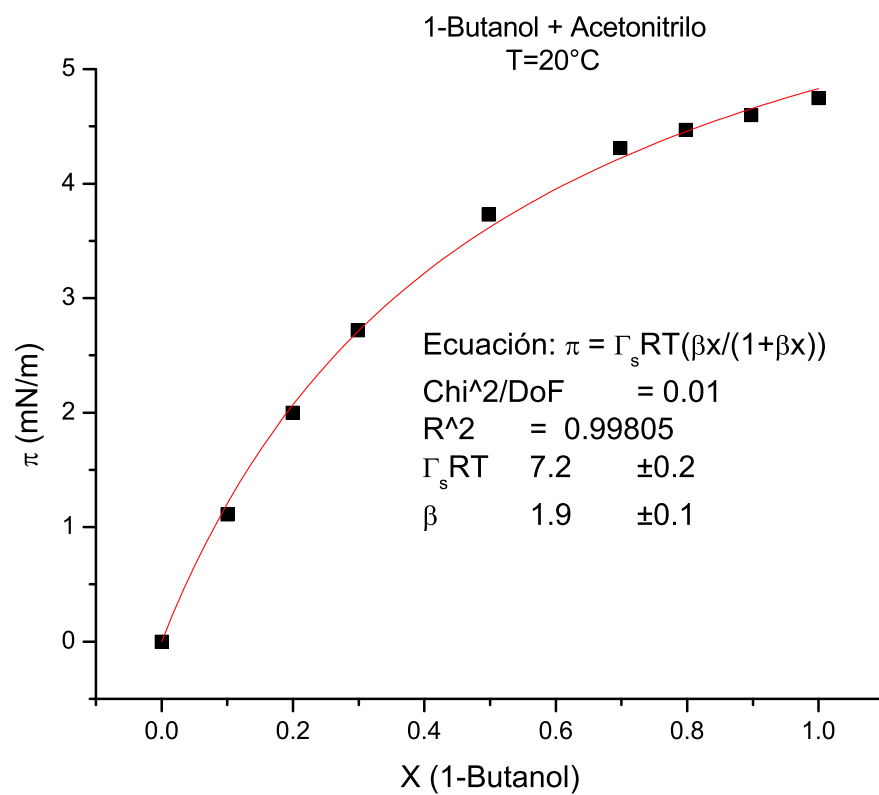
X (1-Butanol)

Tahery R., Modarress H., y Satherley J.
J. of Chem. Eng. Data **2006**, 51, 1039

Tabla D.2: 1-Butanol + Acetonitrilo a T=20°C [45]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
1	24.503	4.747	0
0.8974	24.65	4.6	-0.10825
0.7979	24.78	4.47	-0.22577
0.698	24.94	4.31	-0.35954
0.4976	25.52	3.73	-0.69796
0.2986	26.53	2.72	-1.20865
0.1993	27.25	2	-1.61294
0.1005	28.14	1.11	-2.2976
0	29.25	0	–

1-Pentanol + Acetonitrilo
T=20°C

1-Pentanol + Acetonitrilo
T=20°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.0013
R^2   = 0.99944
$\Gamma_s RT$ 2.5   ±0.1
β 5.9   ±0.6
$0 \leq X \leq 0.4997$

1-Pentanol + Acetonitrilo
T=20°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.02
R^2   = 0.99192
$\Gamma_s RT$ 5.1   ±0.2
β 3.3   ±0.4

π (mN/m)
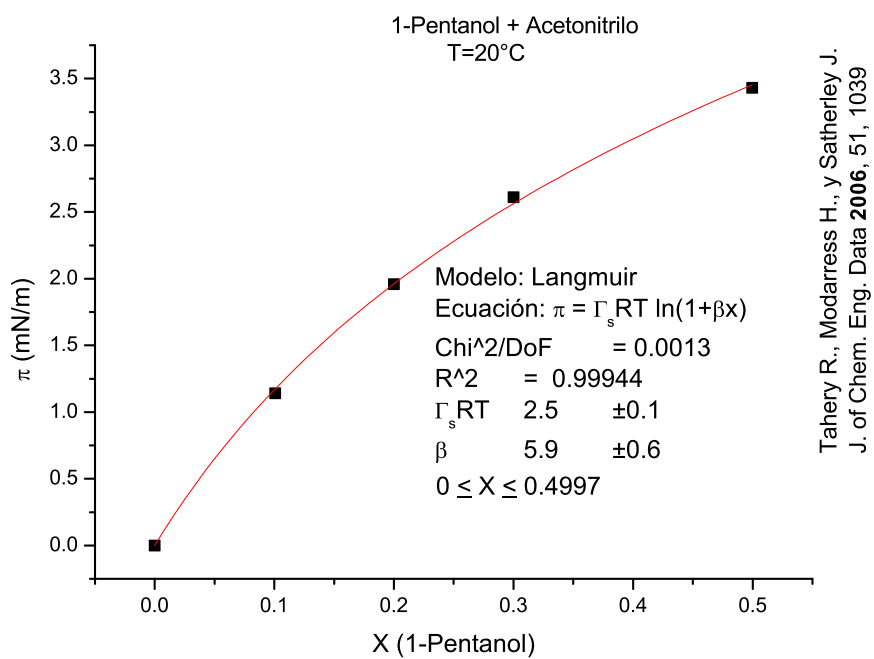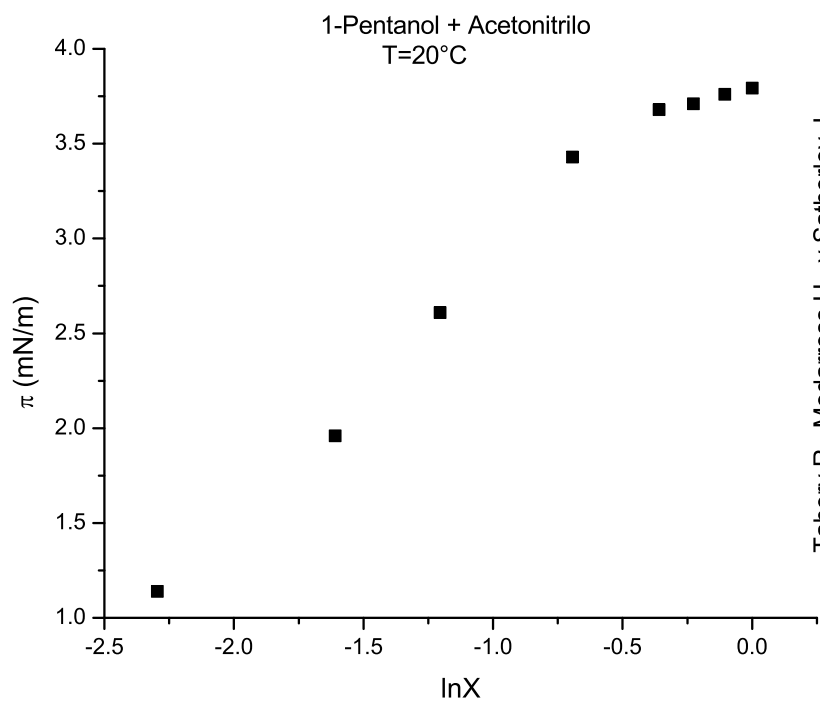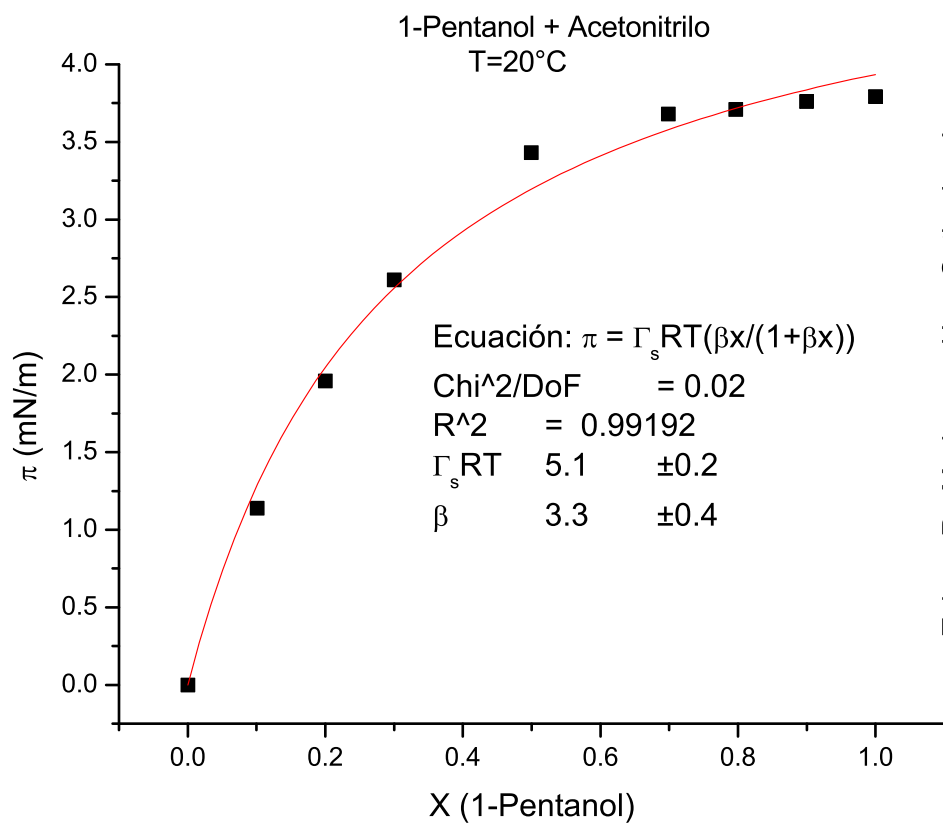
X (1-Pentanol)

Tahery R., Modarress H., y Satherley J.
J. of Chem. Eng. Data **2006**, 51, 1039

Tabla D.3: 1-Pentanol + Acetonitrilo a T=20°C [45]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
1	25.457	3.793	0
0.8997	25.49	3.76	-0.10569
0.7969	25.54	3.71	-0.22703
0.6986	25.57	3.68	-0.35868
0.4997	25.82	3.43	-0.69375
0.3	26.64	2.61	-1.20397
0.1999	27.29	1.96	-1.60994
0.1007	28.11	1.14	-2.29561
0	29.25	0	–

Ácido Acético + Propano-1,2,3-triol
T=25°C

Iqbal, M.J., Rauf, M.A., Ijaz, N.
J.Chem.Eng.Data **1992**, 37, 45

Ácido Acético + Propano-1,2,3-triol
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1 + \beta \cdot x)$

Chi^2/DoF = 0.004
R^2 = 0.99996
$\Gamma_s RT$ 17.4 ±0.5
β 5 ±0.2

Iqbal, M.J., Rauf, M.A., Ijaz, N.
J.Chem.Eng.Data **1992**, 37, 45

Ácido Acético + Propano-1,2,3-triol
T=25°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF = 0.5
R^2 = 0.99615
$\Gamma_s RT$ 70.7 ±4.6
β 0.9 ±0.1

π (mN/m)

X (Acido Acético)

Iqbal, M.J., Rauf, M.A., Ijaz, N.
J.Chem.Eng.Data **1992**, 37, 45

Tabla D.4: Ácido Acético + Propano-1,2,3-triol a T=20°C [15]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	62.5	0	–
0.1654	52	10.5	-1.79939
0.2766	47.5	15	-1.28518
0.3962	43.5	19	-0.92584
0.506	39.5	23	-0.68122
0.6037	36	26.5	-0.50468
0.6971	35.5	27	-0.36083
0.7808	33	29.5	-0.24744
0.8586	31	31.5	-0.15245
0.9316	29	33.5	-0.07085
1	27	35.5	0

2-Propanona + Agua
T=25°C

Toryanik, A.I., Pogrebnik, V.G.
Zh.Strukt.Khim. **1976**, 17, 536

2-Propanona + Agua
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF	= 0.7	
R^2	= 0.99818	
$\Gamma_s RT$	8.6	±0.4
β	544	±112

Toryanik, A.I., Pogrebnik, V.G.
Zh.Strukt.Khim. **1976**, 17, 536

2-Propanona + Agua
T=25°C

Modelo: Langmuir Tipo 1
Ecuación: $\pi = \Gamma_s RT^*(\beta^*x/(1+\beta^*x))$
Chi^2/DoF   = 4.03
R^2   = 0.98816
$\Gamma_s RT$ 47.6   ±1.2
β 36.5   ±5.4

Toryanik, A.I., Pogrebnik, V.G.
Zh.Strukt.Khim. **1976**, 17, 536

Tabla D.5: 2-Propanona + Agua a T=25°C [49]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	72	0	–
0.0129	54.8	17.2	-4.35053
0.0396	44	28	-3.22893
0.15	34.4	37.6	-1.89712
0.237	30.1	41.9	-1.4397
0.5	28.6	43.4	-0.69315
0.757	24.3	47.7	-0.27839
1	23.1	48.9	0

2-Butanona + Agua
T=25°C

Murphy, N.F., Lastovica, J.E., Fallis, J.G.
Ind.Eng.Chem. **1957**, 49, 1035

2-Butanona + Agua
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF = 1.11
R^2 = 0.99655
$\Gamma_s RT$ 13 ±1
β 398 ±66

$0 \leq X \leq 0.07243$

Murphy, N.F., Lastovica, J.E., Fallis, J.G.
Ind.Eng.Chem. **1957**, 49, 1035

2-Butanona + Agua
T=25°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF = 1.5

R^2 = 0.99557

$\Gamma_s RT$ 47.8   ±0.5

β 81.8   ±5.4

π (mN/m)

X (2-Butanona)

Murphy, N.F., Lastovica, J.E., Fallis, J.G.
Ind.Eng.Chem. **1957**, 49, 1035

Tabla D.6: 2-Butanona + Agua a T=25°C [26]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
1	24.3	47.3	0
0.98419	24.7	46.9	-0.01594
0.97258	24.7	46.9	-0.02781
0.89328	24.4	47.2	-0.11285
0.77409	25.1	46.5	-0.25607
0.66021	25.4	46.2	-0.4152
0.07243	28	43.6	-2.62516
0.05102	32.4	39.2	-2.97547
0.03206	37.7	33.9	-3.44003
0.01791	44.6	27	-4.0222
0.00741	53.4	18.2	-4.90476
0.00227	65.2	6.4	-6.09005
0.001	65.6	6	-6.90475
0	71.6	0	–

Trietanoamina + Agua
T=25 °C

Vazquez G., Alvarez E.,Rendo R., Romero E. and Navaza J. M.
J. Chem. Eng. Data 1996, 41, 806-808

Trietanoamina + Agua
T=25 °C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.1
R^2   = 0.99878
$\Gamma_s RT$ 7.9   ±0.4
β 96   ±11
$0 \le X \le 0.108$

Vazquez G., Alvarez E.,Rendo R., Romero E. and Navaza J. M.
J. Chem. Eng. Data 1996, 41, 806-808

Trietanoamina + Agua
T=25 °C

Ecuación: $\pi = \Gamma_s RT\ (\beta x/(1+\beta x))$

Chi^2/DoF   = 0.002
R^2   = 0.99998
$\Gamma_s RT$ 27.15   ±0.03
β 22.3   ±0.1

π (mN/m)

X (Trietanolamina)

Vazquez G., Alvarez E.,Rendo R., Romero E.
and Navaza J. M.
J. Chem. Eng. Data 1996, 41, 806-808

Tabla D.7: Trietanolamina + Agua a T=25°C [53]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	72.01	0	–
0.013	65.85	6.16	-4.34281
0.029	61.32	10.69	-3.54046
0.049	57.8	14.21	-3.01593
0.074	55.1	16.91	-2.60369
0.108	52.88	19.13	-2.22562
0.153	51.03	20.98	-1.87732
0.22	49.48	22.53	-1.51413
0.326	48.16	23.85	-1.12086
0.521	47	25.01	-0.65201
1	45.95	26.06	0

Trietanoamina + Agua
T=30 °C

π (mN/m)

X Axis Title

Vazquez G., Alvarez E.,Rendo R., Romero E.
and Navaza J. M.
J. Chem. Eng. Data 1996, 41, 806-808

Trietanoamina + Agua
T=30 °C

π (mN/m)

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.07793
R^2   = 0.99878
$\Gamma_s RT$ 7.9   ±0.4
β 96   ±11
$0 \leq X \leq 0.108$

X (Trietanolamina)

Vazquez G., Alvarez E.,Rendo R., Romero E.
and Navaza J. M.
J. Chem. Eng. Data 1996, 41, 806-808

Trietanoamina + Agua
T=30 °C

Ecuación: $\pi = \Gamma_s RT (\beta x/(1+\beta x))$

Chi^2/DoF = 0.00147
R^2 = 0.99998
$\Gamma_s RT$ 27.14 ±0.03
β 22.3 ±0.1

π (mN/m)

X (Trietanolamina)

Vazquez G., Alvarez E.,Rendo R., Romero E. and Navaza J. M.
J. Chem. Eng. Data 1996, 41, 806-808

Tabla D.8: Trietanolamina + Agua a T=30°C [53]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	71.21	0	–
0.013	65.05	6.16	-4.34281
0.029	60.52	10.69	-3.54046
0.049	57	14.21	-3.01593
0.074	54.3	16.91	-2.60369
0.108	52.08	19.13	-2.22562
0.153	50.23	20.98	-1.87732
0.22	48.68	22.53	-1.51413
0.326	47.36	23.85	-1.12086
0.521	46.21	25	-0.65201
1	45.16	26.05	0

Trietanoamina + Agua
T=35 °C

Trietanoamina + Agua
T=35 °C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT\ \ln(1+\beta x)$

Chi^2/DoF   = 0.07941
R^2   = 0.99876
$\Gamma_s RT$ 7.9   ±0.4
β 96   ±11
$0 \le X \le 0.108$

Trietanoamina + Agua
T=35 °C

Ecuación: $\pi = \Gamma_s RT\,(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.00139
R^2   = 0.99998
$\Gamma_s RT$ 27.14   ±0.03
β 22.4   ±0.1

π (mN/m)

X (Trietanolamina)

Vazquez G., Alvarez E.,Rendo R., Romero E. and Navaza J. M.
J. Chem. Eng. Data 1996, 41, 806-808

Tabla D.9: Trietanolamina + Agua a T=35°C [53]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	70.42	0	–
0.013	64.26	6.16	-4.34281
0.029	59.73	10.69	-3.54046
0.049	56.2	14.22	-3.01593
0.074	53.51	16.91	-2.60369
0.108	51.29	19.13	-2.22562
0.153	49.44	20.98	-1.87732
0.22	47.89	22.53	-1.51413
0.326	46.57	23.85	-1.12086
0.521	45.42	25	-0.65201
1	44.38	26.04	0

Trietanoamina + Agua
T=40 °C

Vazquez G., Alvarez E.,Rendo R., Romero E.
and Navaza J. M.
J. Chem. Eng. Data 1996, 41, 806-808

Trietanoamina + Agua
T=40 °C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.15208
R^2   = 0.99775
$\Gamma_s RT$ 7.4   ±0.4
β 113   ±15
$0 \leq X \leq 0.153$

Vazquez G., Alvarez E.,Rendo R., Romero E.
and Navaza J. M.
J. Chem. Eng. Data 1996, 41, 806-808

Trietanoamina + Agua
T=40 °C

Ecuación: $\pi = \Gamma_s RT\,(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.00118
R^2   = 0.99998
$\Gamma_s RT$ 27.14   ±0.02
β 22.4   ±0.1

π (mN/m)

X (Trietanolamina)

Vazquez G., Alvarez E.,Rendo R,, Romero E.
and Navaza J. M.
J. Chem. Eng. Data 1996, 41, 806-808

Tabla D.10: Trietanolamina + Agua a T=40°C [53]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	69.52	0	–
0.013	63.35	6.17	-4.34281
0.029	58.82	10.7	-3.54046
0.049	55.31	14.21	-3.01593
0.074	52.61	16.91	-2.60369
0.108	50.37	19.15	-2.22562
0.153	48.53	20.99	-1.87732
0.22	46.99	22.53	-1.51413
0.326	45.66	23.86	-1.12086
0.521	44.52	25	-0.65201
1	43.48	26.04	0

Trietanoamina + Agua
T=45 °C

Vazquez G., Alvarez E.,Rendo R., Romero E.
and Navaza J. M.
J. Chem. Eng. Data 1996, 41, 806-808

Trietanoamina + Agua
T=45 °C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.1552
R^2   = 0.99771
$\Gamma_s RT$ 7.4   ±0.4
β 113   ±15
$0 \leq X \leq 0.153$

Vazquez G., Alvarez E.,Rendo R., Romero E.
and Navaza J. M.
J. Chem. Eng. Data 1996, 41, 806-808

Trietanoamina + Agua
T=45 °C

π (mN/m)

X (Trietanolamina)

Ecuación: $\pi = \Gamma_s RT\ (\beta x/(1+\beta x))$

Chi^2/DoF   = 0.00103
R^2   = 0.99999
$\Gamma_s RT$ 27.14   ±0.02
β 22.4   ±0.1
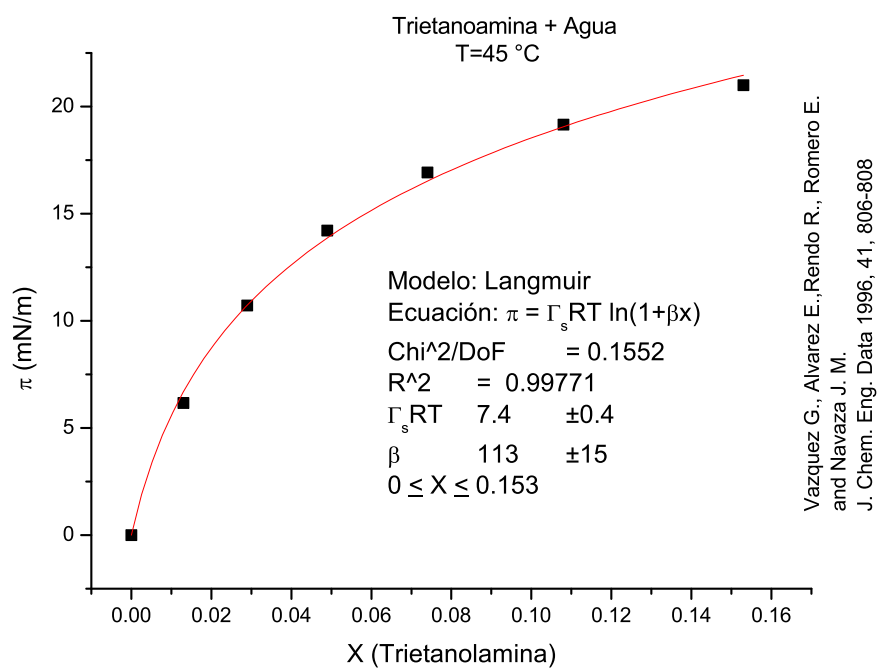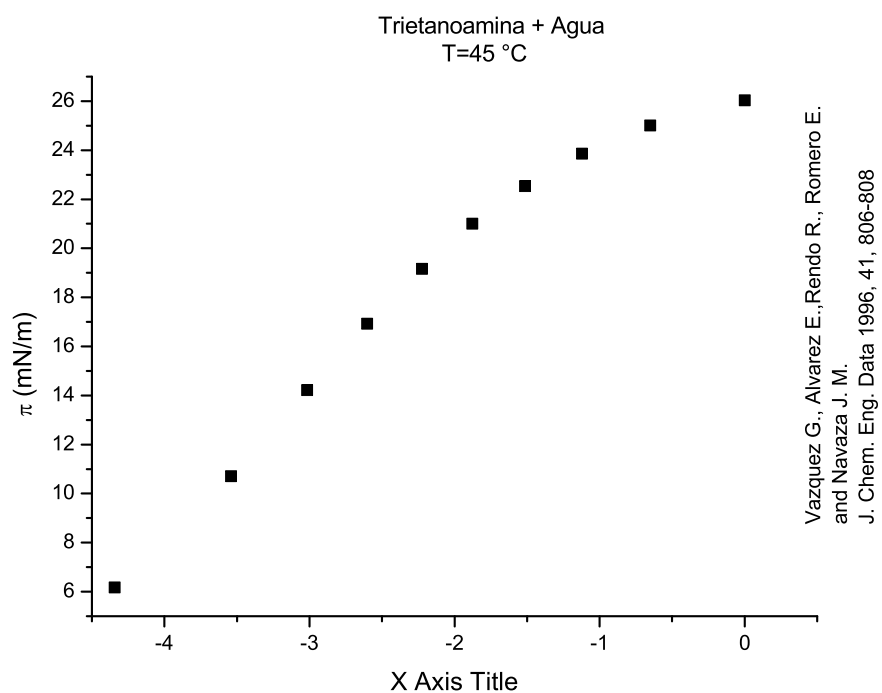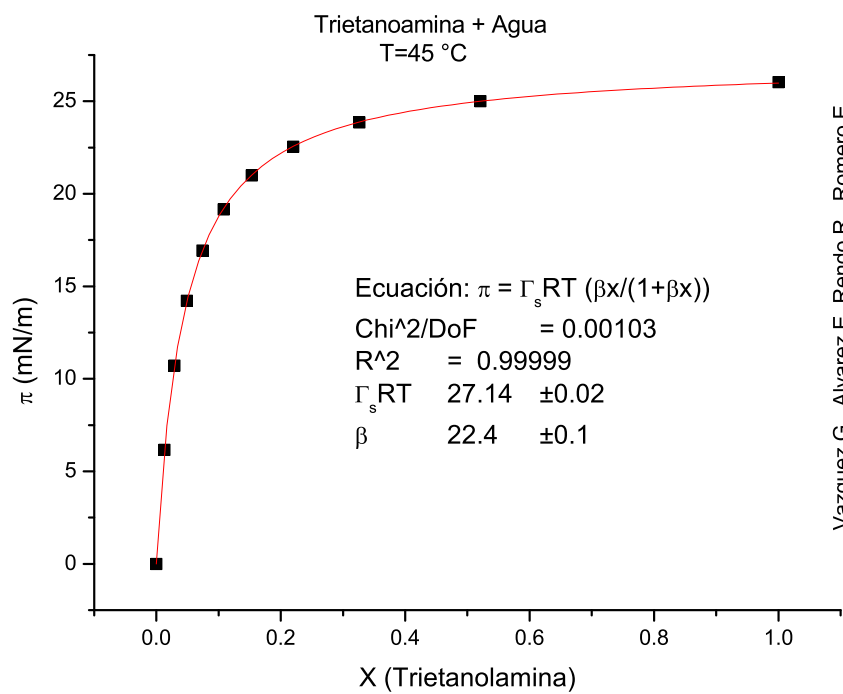
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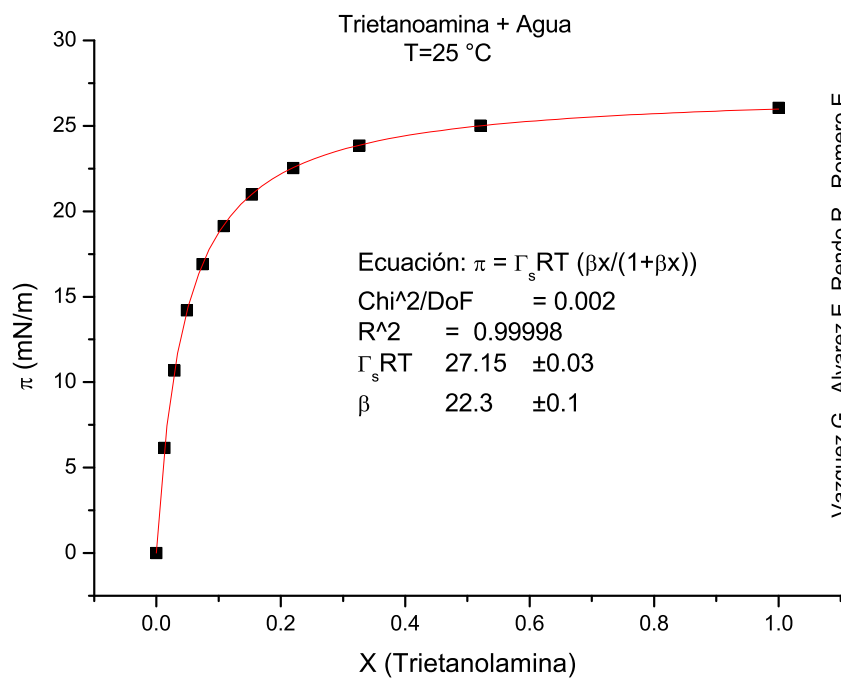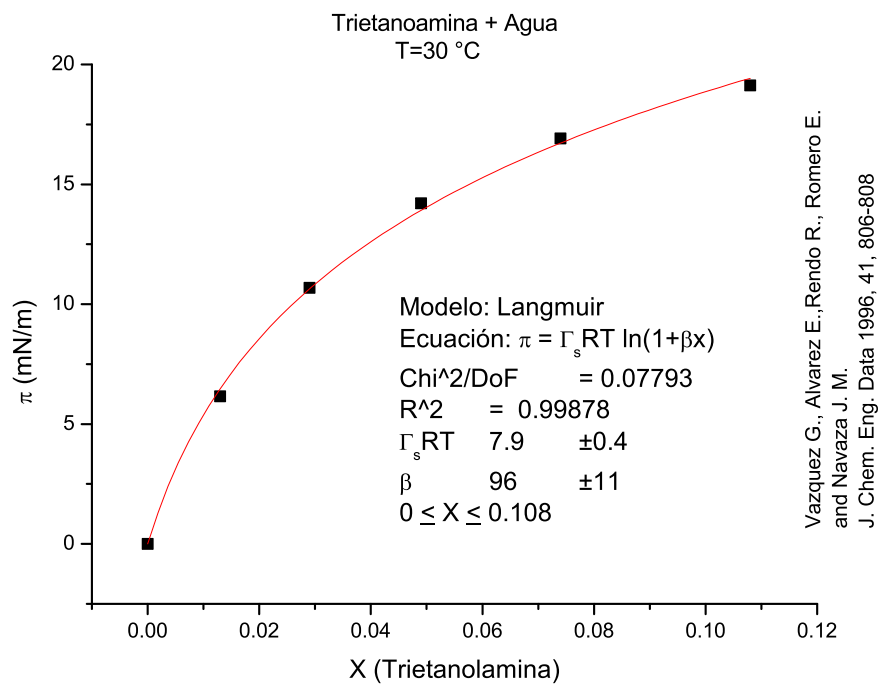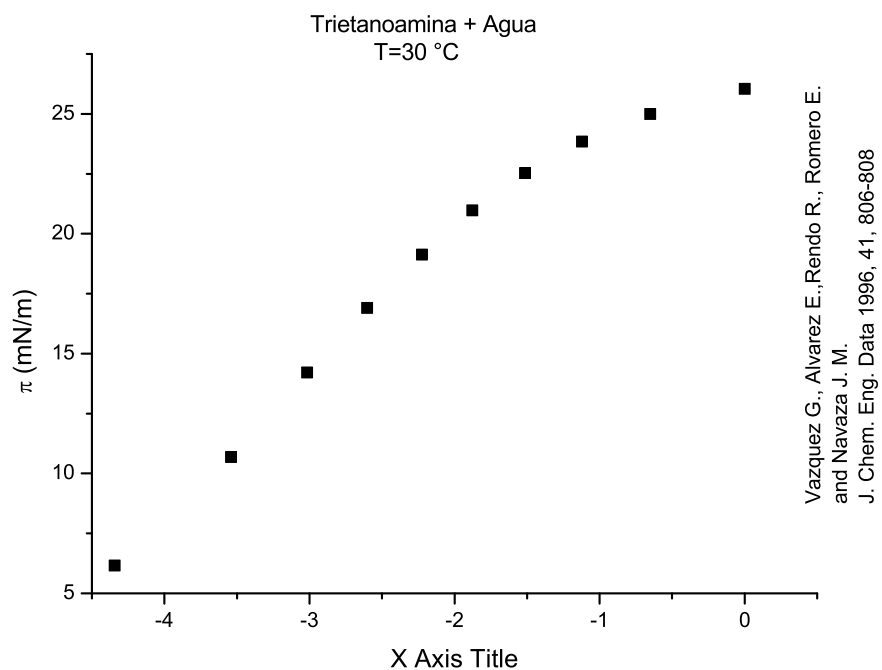and Navaza J. M.
J. Chem. Eng. Data 1996, 41, 806-808

Tabla D.11: Trietanolamina + Agua a T=45°C [53]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	68.84	0	−
0.013	62.67	6.17	-4.34281
0.029	58.13	10.71	-3.54046
0.049	54.62	14.22	-3.01593
0.074	51.91	16.93	-2.60369
0.108	49.68	19.16	-2.22562
0.153	47.84	21	-1.87732
0.22	46.3	22.54	-1.51413
0.326	44.98	23.86	-1.12086
0.521	43.83	25.01	-0.65201
1	42.8	26.04	0

Trietanoamina + Agua
T=50 °C

X Axis Title

π (mN/m)

Vazquez G., Alvarez E.,Rendo R., Romero E.
and Navaza J. M.
J. Chem. Eng. Data 1996, 41, 806-808

Trietanoamina + Agua
T=50 °C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.07568
R^2   = 0.99882
$\Gamma_s RT$ 7.9   ±0.4
β 96   ±11
$0 \leq X \leq 0.153$

π (mN/m)

X (Trietanolamina)

Vazquez G., Alvarez E.,Rendo R., Romero E.
and Navaza J. M.
J. Chem. Eng. Data 1996, 41, 806-808

Trietanoamina + Agua
T=50 °C

Ecuación: $\pi = \Gamma_s RT\ (\beta x/(1+\beta x))$

Chi^2/DoF = 0.00111
R^2 = 0.99999
Γ_sRT   27.14975   ±0.02
β 22.4   ±0.1

π (mN/m)

X (Trietanolamina)

Vazquez G., Alvarez E.,Rendo R., Romero E.
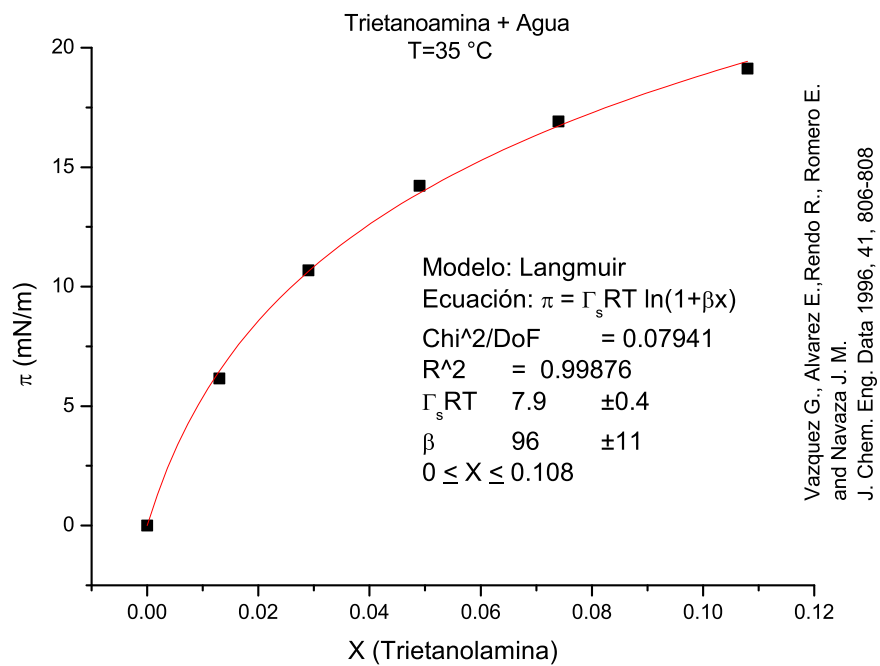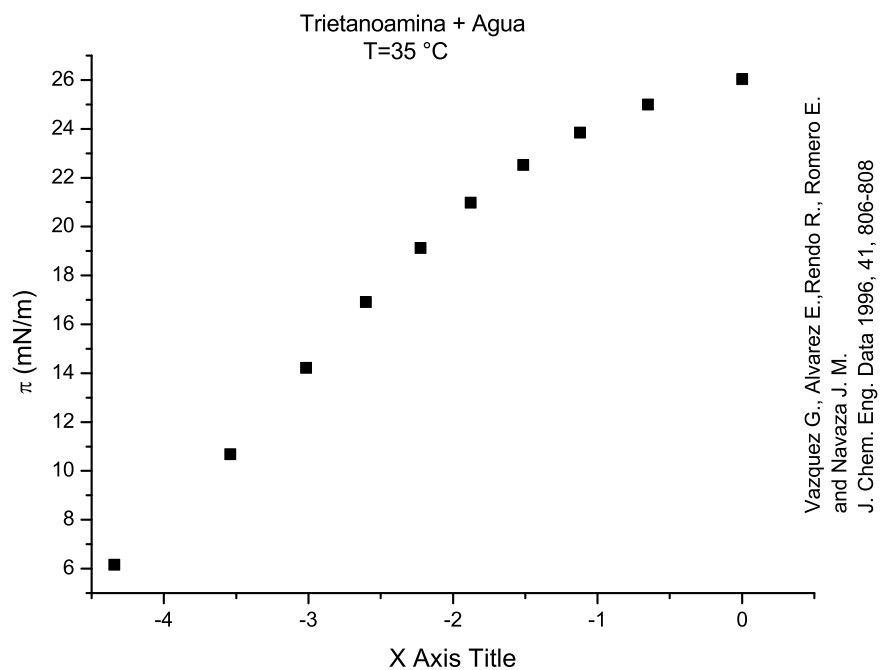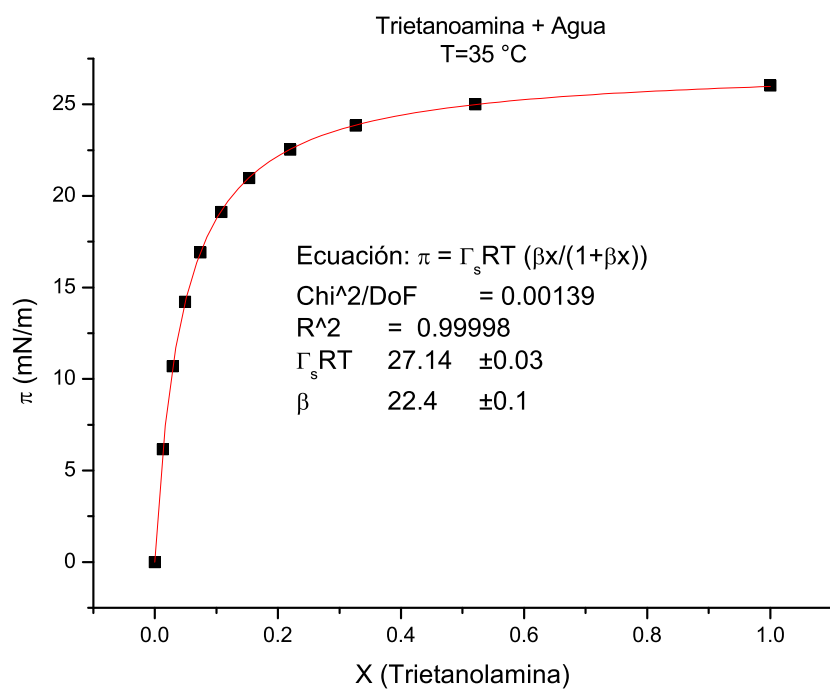and Navaza J. M.
J. Chem. Eng. Data 1996, 41, 806-808

Tabla D.12: Trietanolamina + Agua a T=50°C [53]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	67.92	0	–
0.013	61.74	6.18	-4.34281
0.029	57.21	10.71	-3.54046
0.049	53.69	14.23	-3.01593
0.074	50.99	16.93	-2.60369
0.108	48.76	19.16	-2.22562
0.153	46.92	21	-1.87732
0.22	45.37	22.55	-1.51413
0.326	44.05	23.87	-1.12086
0.521	42.9	25.02	-0.65201
1	41.88	26.04	0

Metildietanolamina+Agua
T=25°C

Metildietanolamina+Agua
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF = 0.29
R^2 = 0.99769
$\Gamma_s RT$ 7.3 ±0.3
β 205 ±31

$0 \leq X \leq 0.3108$

Metildietanolamina + Agua
T=25°C

Ecuación: $\pi = \Gamma_s RT\,(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.29
R^2   = 0.99757
$\Gamma_s RT$ 35.2   ±0.3
β 20   ±1

π (mN/m)

X (Metildietanolamina)

Y. Maham y A. E. Mather
Fluid Phase Equilib. **2001**,182, 325
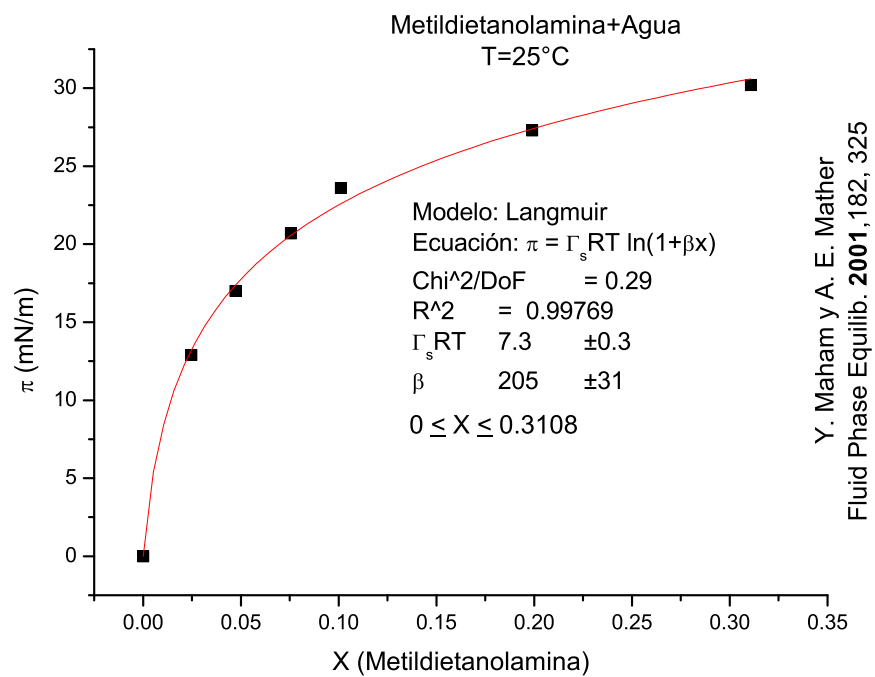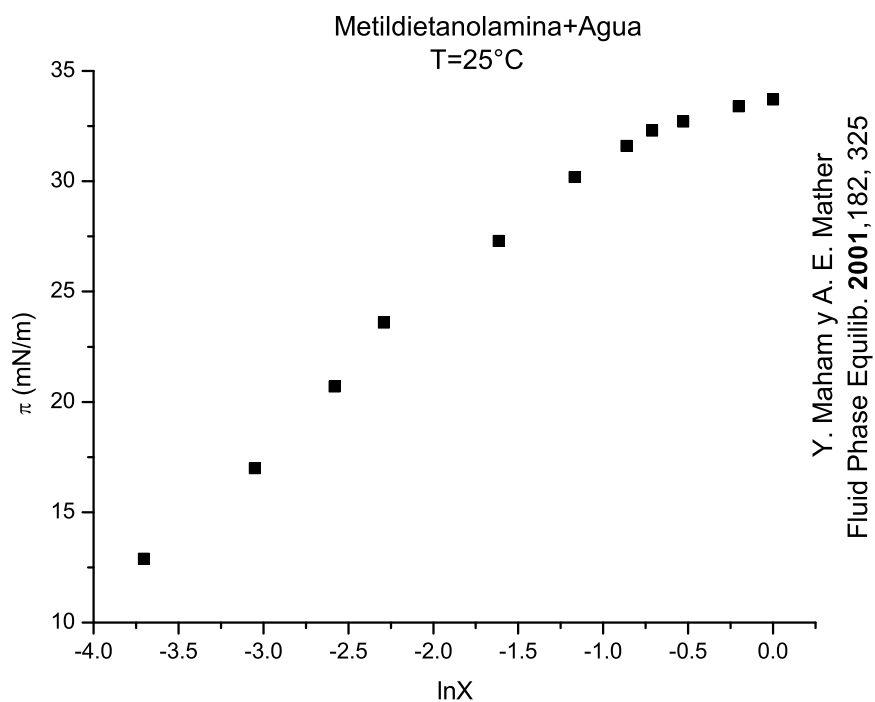
Tabla D.13: Metildietanolamina + Agua a T=25°C [22]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	72	0	–
0.0246	59.1	12.9	-3.70501
0.0473	55	17	-3.05124
0.0756	51.3	20.7	-2.5823
0.1012	48.4	23.6	-2.29066
0.199	44.7	27.3	-1.61445
0.3108	41.8	30.2	-1.16861
0.422	40.4	31.6	-0.86275
0.4902	39.7	32.3	-0.71294
0.5891	39.3	32.7	-0.52916
0.8174	38.6	33.4	-0.20163
1	38.3	33.7	0

Metildietanolamina+Agua
T=35°C

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Fluid Phase Equilib. **2001**,182, 325

Metildietanolamina+Agua
T=35°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.26
R^2   = 0.99775
$\Gamma_s RT$ 6.5   ±0.2
β 261   ±34

$0 \leq X \leq 0.4902$

Y. Maham y A. E. Mather
Fluid Phase Equilib. **2001**,182, 325

Metildietanolamina + Agua
T=35°C

π (mN/m)

X (Metildietanolamina)

Ecuación: $\pi = \Gamma_s RT \, (\beta x/(1+\beta x))$

Chi^2/DoF   = 0.37
R^2   = 0.99665
$\Gamma_s RT$ 34.1   ±0.3
β 20   ±1
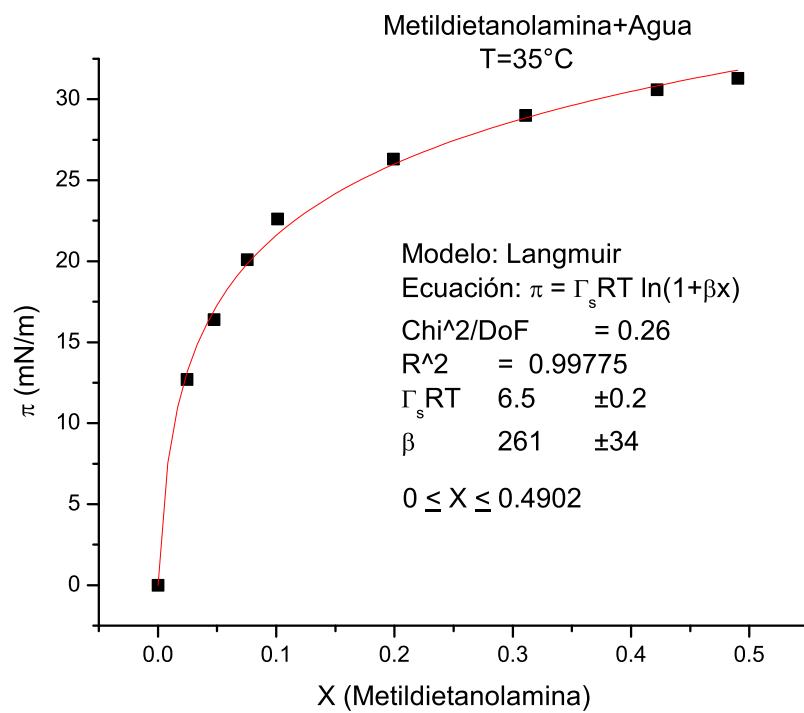
Y. Maham y A. E. Mather
Fluid Phase Equilib. **2001**, 182, 325
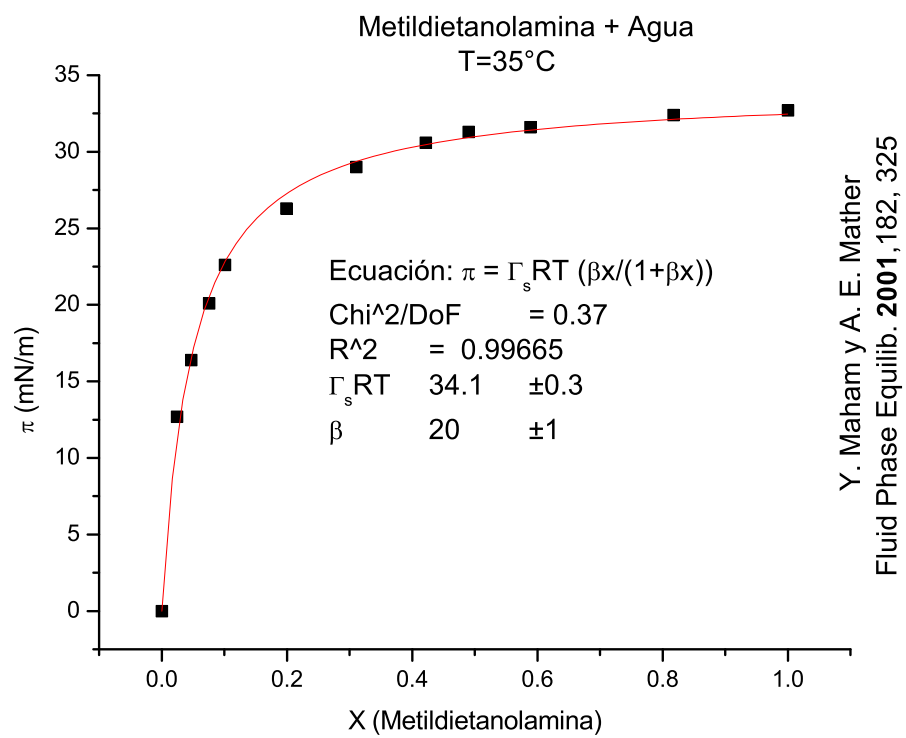
Tabla D.14: Metildietanolamina + Agua a T=35°C [22]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	70.4	0	–
0.0246	57.7	12.7	-3.70501
0.0473	54	16.4	-3.05124
0.0756	50.3	20.1	-2.5823
0.1012	47.8	22.6	-2.29066
0.199	44.1	26.3	-1.61445
0.3108	41.4	29	-1.16861
0.422	39.8	30.6	-0.86275
0.4902	39.1	31.3	-0.71294
0.5891	38.8	31.6	-0.52916
0.8174	38	32.4	-0.20163
1	37.7	32.7	0
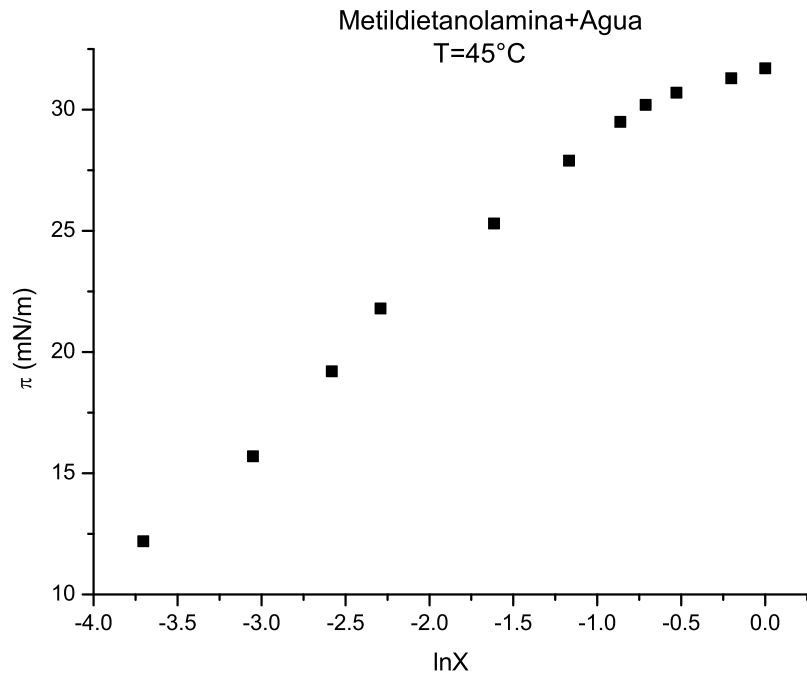
Metildietanolamina+Agua
T=45°C

Y. Maham y A. E. Mather
Fluid Phase Equilib. **2001**,182, 325

Metildietanolamina+Agua
T=45°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.25
R^2   = 0.99771
$\Gamma_s RT$ 6.3   ±0.2
β 253   ±33

$0 \le X \le 0.4902$

Y. Maham y A. E. Mather
Fluid Phase Equilib. **2001**,182, 325

Metildietanolamina + Agua
T=45°C

Ecuación: $\pi = \Gamma_s RT\ (\beta x/(1+\beta x))$

Chi^2/DoF   = 0.39
R^2   = 0.99622
$\Gamma_s RT$ 33.0   ±0.4
β 19.5   ±1

π (mN/m)

X (Metildietanolamina)
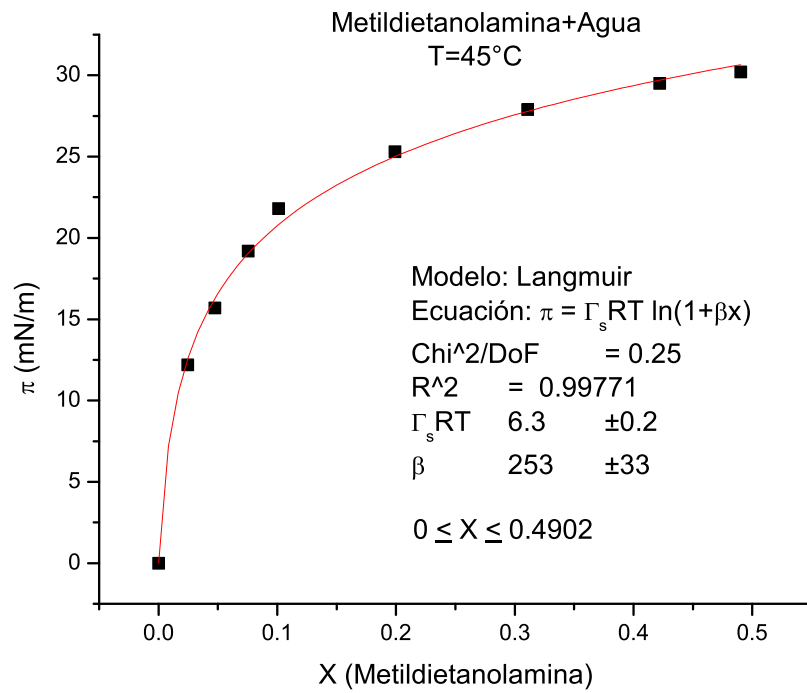
Y. Maham y A. E. Mather
Fluid Phase Equilib. **2001**,182, 325
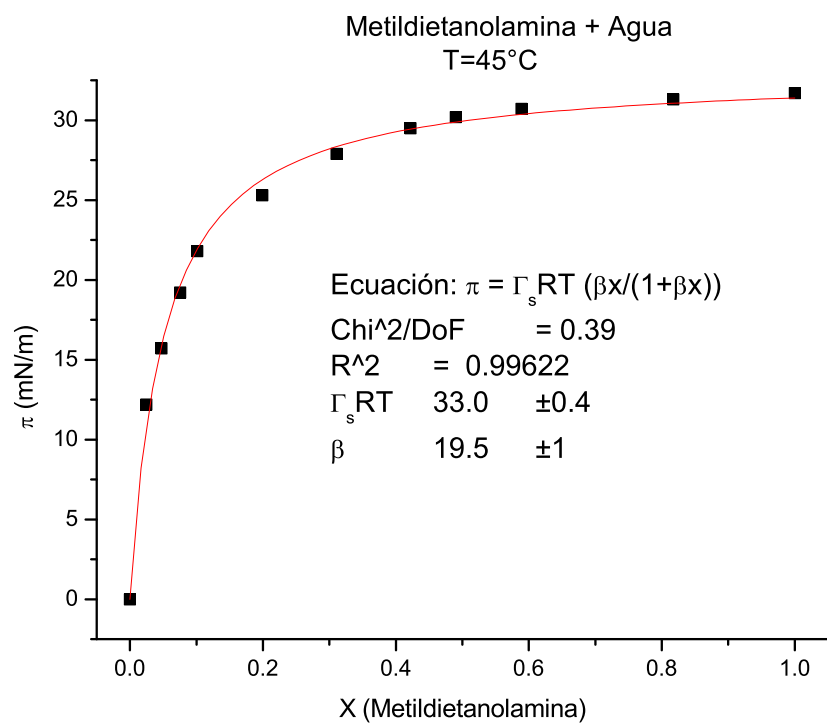
Tabla D.15: Metildietanolamina + Agua a T=45°C [22]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	68.8	0	–
0.0246	56.6	12.2	-3.70501
0.0473	53.1	15.7	-3.05124
0.0756	49.6	19.2	-2.5823
0.1012	47	21.8	-2.29066
0.199	43.5	25.3	-1.61445
0.3108	40.9	27.9	-1.16861
0.422	39.3	29.5	-0.86275
0.4902	38.6	30.2	-0.71294
0.5891	38.1	30.7	-0.52916
0.8174	37.5	31.3	-0.20163
1	37.1	31.7	0

Metildietanolamina+Agua
T=55°C

Metildietanolamina+Agua
T=55°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.24
R^2   = 0.99765
$\Gamma_s RT$ 6.2   ±0.21
β 232   ±30

$0 \le X \le 0.4902$

Y. Maham y A. E. Mather
Fluid Phase Equilib. **2001**,182, 325

Metildietanolamina + Agua
T=55°C

Ecuación: $\pi = \Gamma_s RT\,(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.36
R^2   = 0.99632
$\Gamma_s RT$ 31.8   ±0.3
β 19   ±1

π (mN/m)

X (Metildietanolamina)
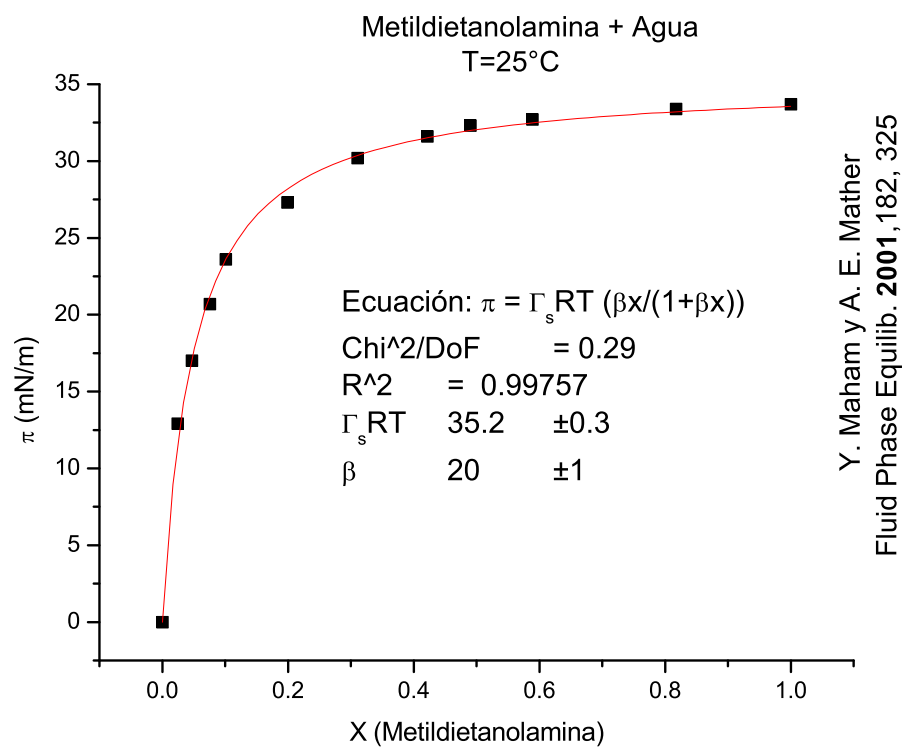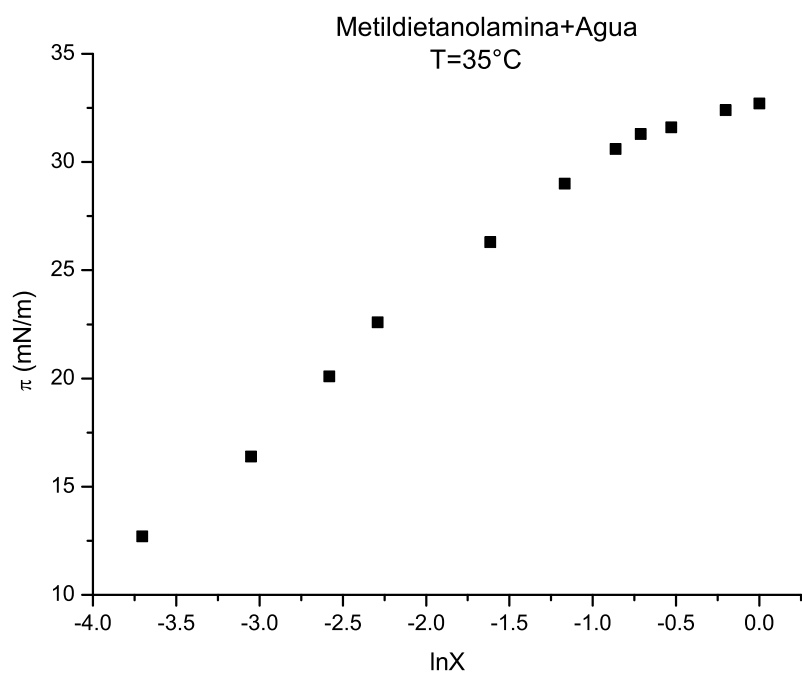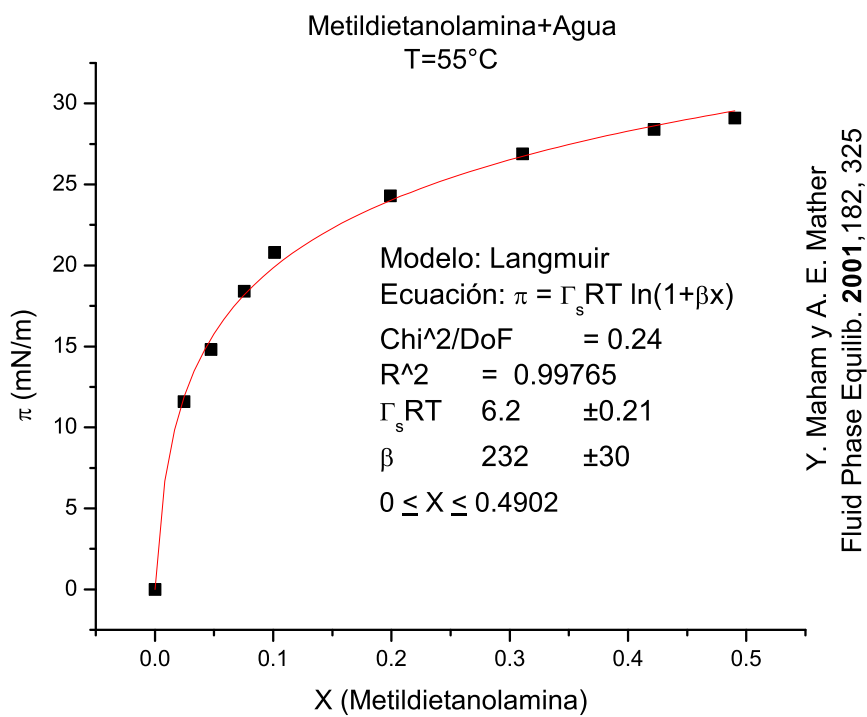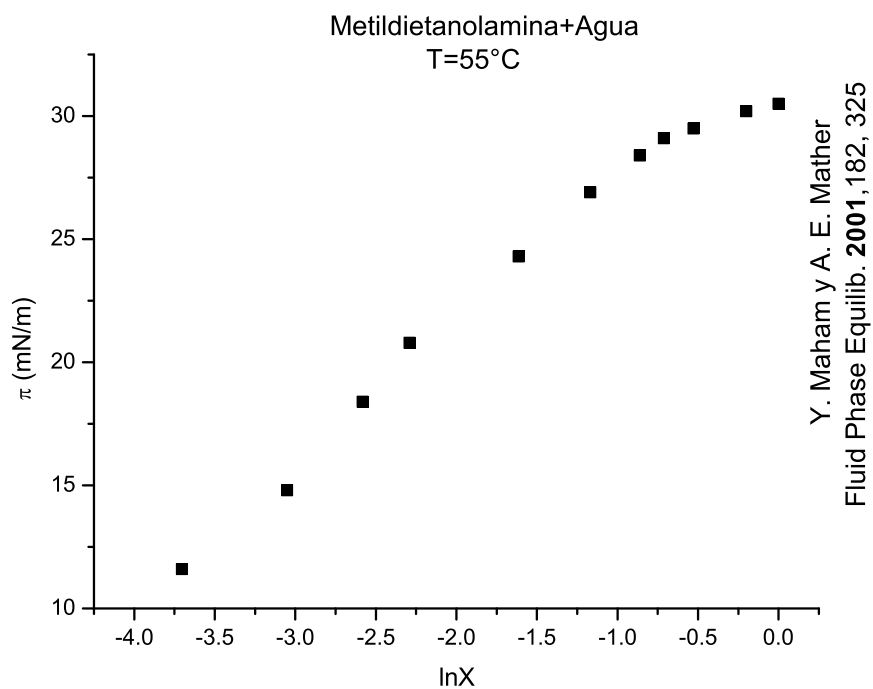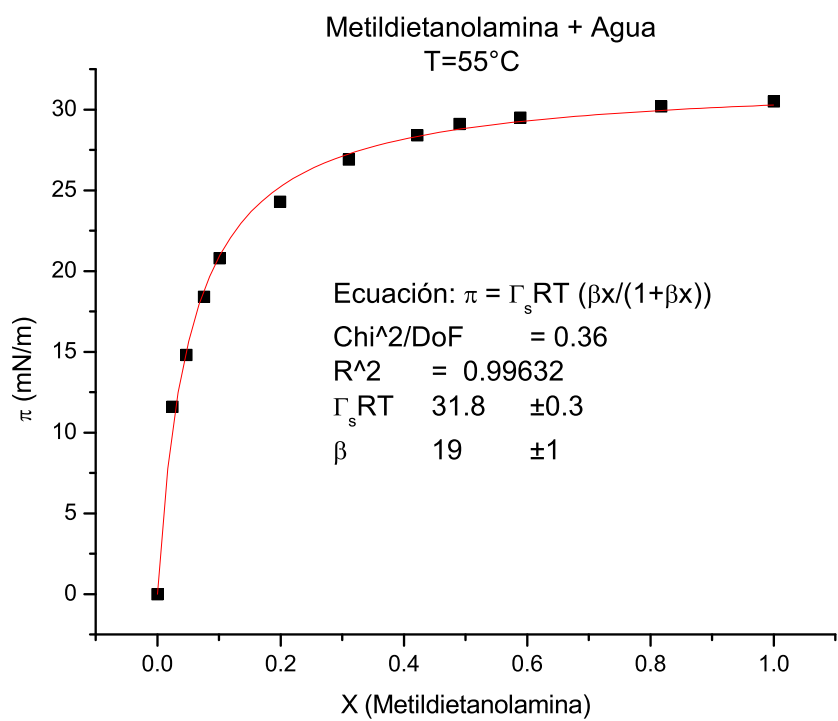
Y. Maham y A. E. Mather
Fluid Phase Equilib. **2001**,182, 325

Tabla D.16: Metildietanolamina + Agua a T=55°C [22]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	67.1	0	–
0.0246	55.5	11.6	-3.70501
0.0473	52.3	14.8	-3.05124
0.0756	48.7	18.4	-2.5823
0.1012	46.3	20.8	-2.29066
0.199	42.8	24.3	-1.61445
0.3108	40.2	26.9	-1.16861
0.422	38.7	28.4	-0.86275
0.4902	38	29.1	-0.71294
0.5891	37.6	29.5	-0.52916
0.8174	36.9	30.2	-0.20163
1	36.6	30.5	0

Etilen glicol monoetil eter + Agua
T=25°C

Kumar A., Mohandas V. P. y Ghosh P. K.
J. Chem. Eng. Data, **2003**, 48

Etilen glicol monoetil eter + Agua
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF   = 0.7
R^2   = 0.99614
$\Gamma_s RT$ 14.0   ±1.3
β 43   ±9

$0 \leq X \leq 0.2215$

X (Dietilen glicol monometil eter)

Kumar A., Mohandas V. P. y Ghosh P. K.
J. Chem. Eng. Data, **2003**, 48

Etilen glicol monoetil eter + Agua
T=25°C

Ecuación: $\pi = \Gamma_s RT\ (\beta x/(1+\beta x))$

Chi^2/DoF   = 0.2
R^2   = 0.9986
$\Gamma_s RT$ 44.7   ±0.3
β 11.3   ±0.4

π (mN/m)

X (Etilen glicol monoetil eter)

Kumar A., Mohandas V. P. y Ghosh P. K.
J. Chem. Eng. Data, **2003**, 48

Tabla D.17: Etilen glicol monoetil eter + Agua a T=25°C [18]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	71.99	0	–
0.0509	56.33	15.66	-2.97789
0.0559	55.11	16.88	-2.88419
0.1052	46.86	25.13	-2.25189
0.1494	43.31	28.68	-1.90113
0.2215	39.7	32.29	-1.50733
0.3373	36.75	35.24	-1.08678
0.4783	35.02	36.97	-0.73752
0.6258	32.91	39.08	-0.46872
0.7814	31.78	40.21	-0.24667
0.8912	31.02	40.97	-0.11519
1	30.82	41.17	0

Etilen glicol dimetil eter+Agua
T=25°C

Kumar A., Mohandas V. P. y Ghosh P. K.
J. Chem. Eng. Data, **2003**, 48

Etilen glicol dimetil eter + Agua
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.14
R^2   = 0.99953
Γ_sRT   20.4   ±1.1
β 48   ±5

$0 \le X \le 0.1286$

Kumar A., Mohandas V. P. y Ghosh P. K.
J. Chem. Eng. Data, **2003**, 48
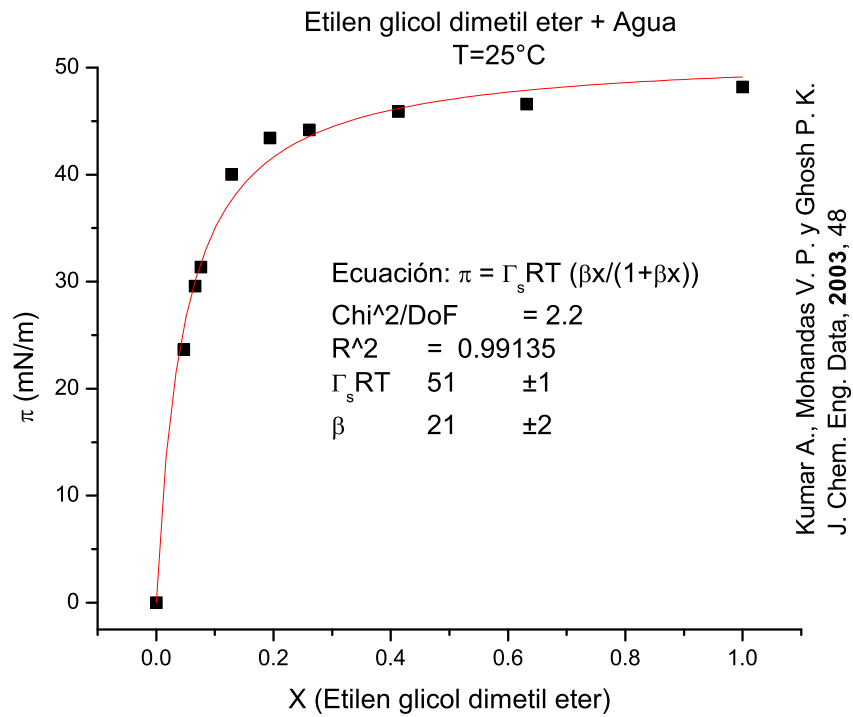
Tabla D.18: Etilen glicol dimetil eter + Agua a T=25°C [18]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	71.99	0	–
0.047	48.35	23.64	-3.05761
0.066	42.42	29.57	-2.7181
0.0759	40.62	31.37	-2.57834
0.1286	31.96	40.03	-2.05105
0.1942	28.55	43.44	-1.63887
0.2612	27.81	44.18	-1.34247
0.4132	26.08	45.91	-0.88382
0.6313	25.41	46.58	-0.45997
1	23.79	48.2	0

Dietilen glicol monometil eter+Agua
T=25°C

Kumar A., Mohandas V. P. y Ghosh P. K.
J. Chem. Eng. Data, **2003**, 48

Dietilen glicol monometil eter+Agua
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.8
R^2   = 0.99593
$\Gamma_s RT$ 14.1   ±1.6
β 43   ±10

$0 \leq X \leq 0.1951$

Kumar A., Mohandas V. P. y Ghosh P. K.
J. Chem. Eng. Data, **2003**, 48

Dietilen glicol monometil eter + Agua
T=25°C

π (mN/m)

X (Dietilen glicol monometil eter)

Ecuación: $\pi = \Gamma_s RT\ (\beta x/(1+\beta x))$

Chi^2/DoF   = 0.76
R^2   = 0.99499
$\Gamma_s RT$ 39.8   ±0.5
β 15   ±1
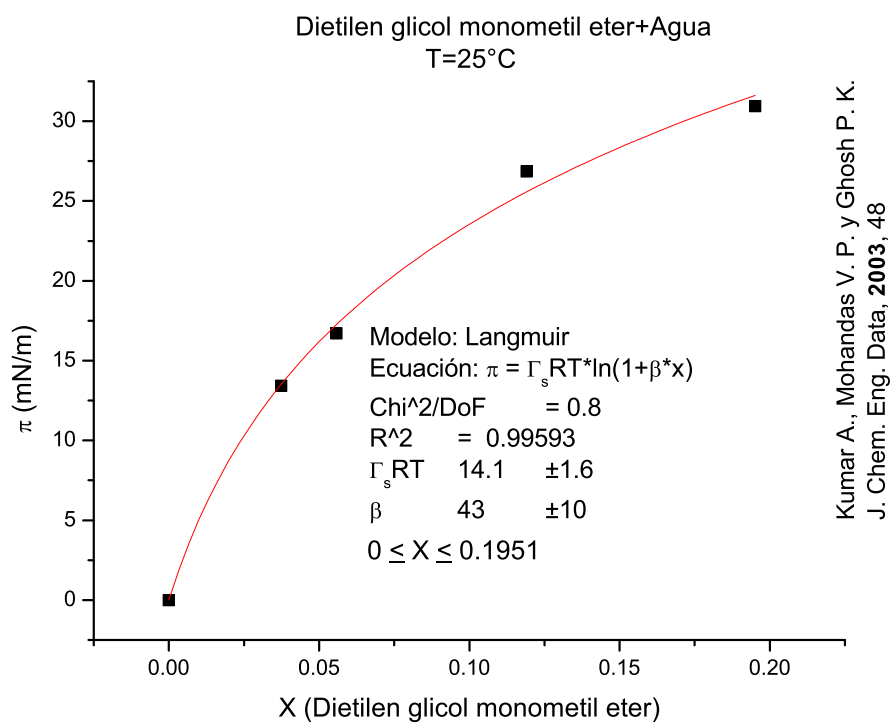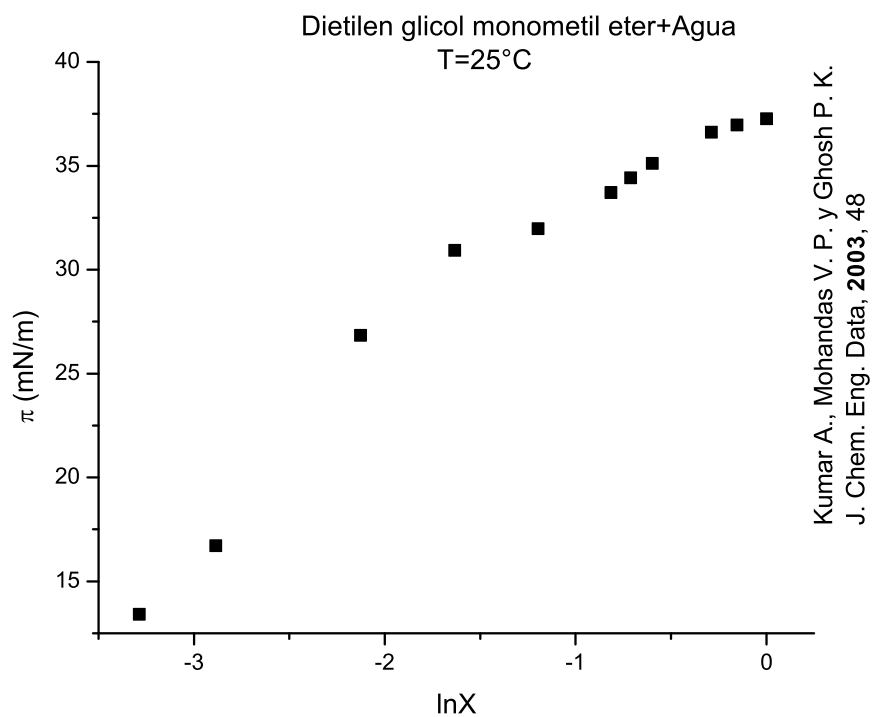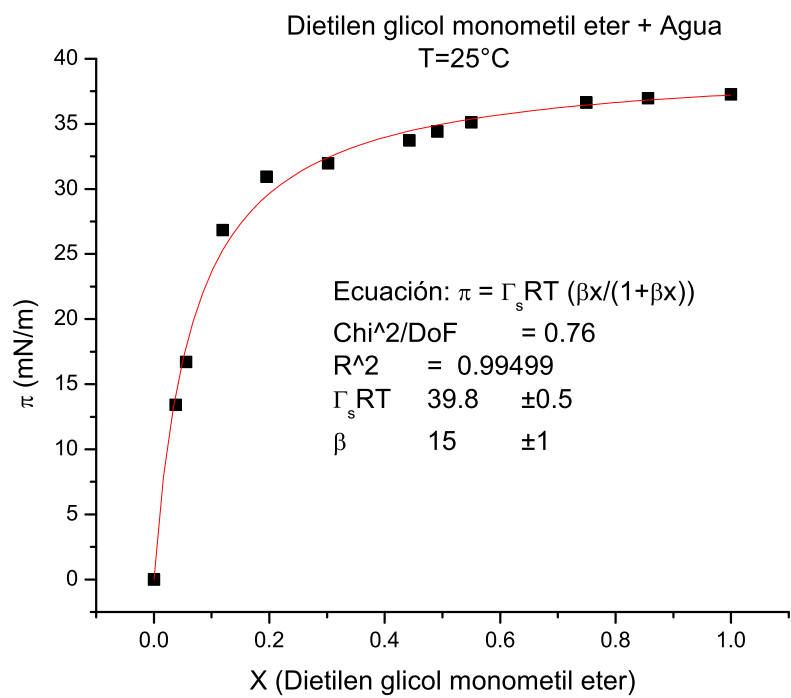
Kumar A., Mohandas V. P. y Ghosh P. K.
J. Chem. Eng. Data, **2003**, 48

Tabla D.19: Dietilen glicol monometil eter + Agua a T=25°C [18]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	71.99	0	–
0.0374	58.57	13.42	-3.28608
0.0558	55.28	16.71	-2.88598
0.1191	45.14	26.85	-2.12779
0.1951	41.05	30.94	-1.63424
0.3021	40.02	31.97	-1.197
0.4427	38.27	33.72	-0.81486
0.491	37.57	34.42	-0.71131
0.5502	36.87	35.12	-0.59747
0.7494	35.37	36.62	-0.28848
0.8564	35.02	36.97	-0.15502
1	34.73	37.26	0

Trietilen glicol monoetileter + Agua
T=25°C

Kumar A., Mohandas V. P. y Ghosh P. K.
J. Chem. Eng. Data, **2003**, 48

Trietilen glicol monoetileter + Agua
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.5
R^2   = 0.99819
$\Gamma_s RT$ 15   ±2
β 42   ±11

$0 \leq X \leq 0.1673$

Kumar A., Mohandas V. P. y Ghosh P. K.
J. Chem. Eng. Data, **2003**, 48

Trietilen glicol monoetileter + Agua
T=25°C

Ecuación: $\pi = \Gamma_s RT\,(\beta x/(1+\beta x))$

Chi^2/DoF	= 0.96	
R^2	= 0.9928	
$\Gamma_s RT$	37.6	±0.6
β	18	±2

π (mN/m)
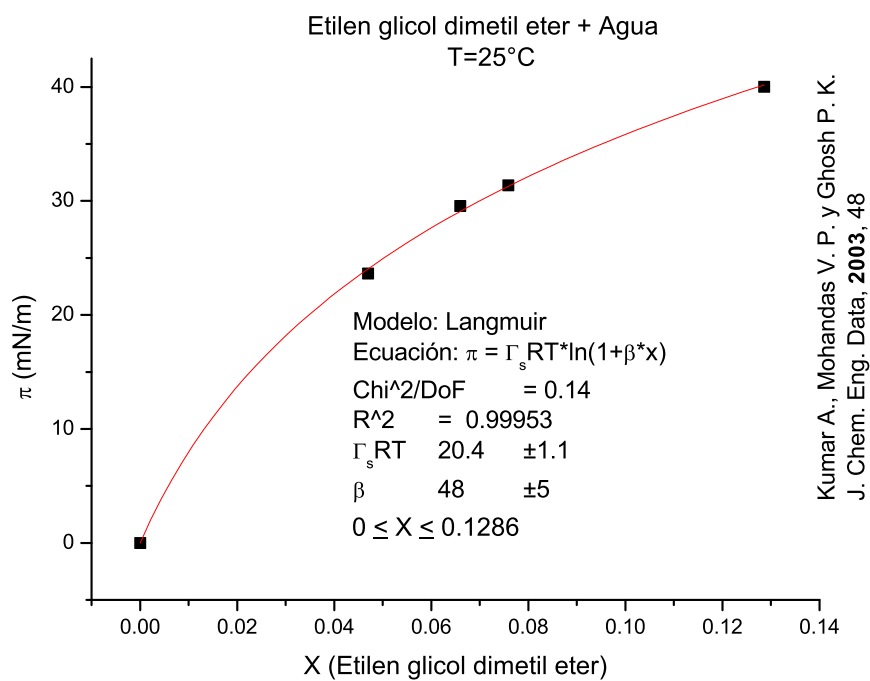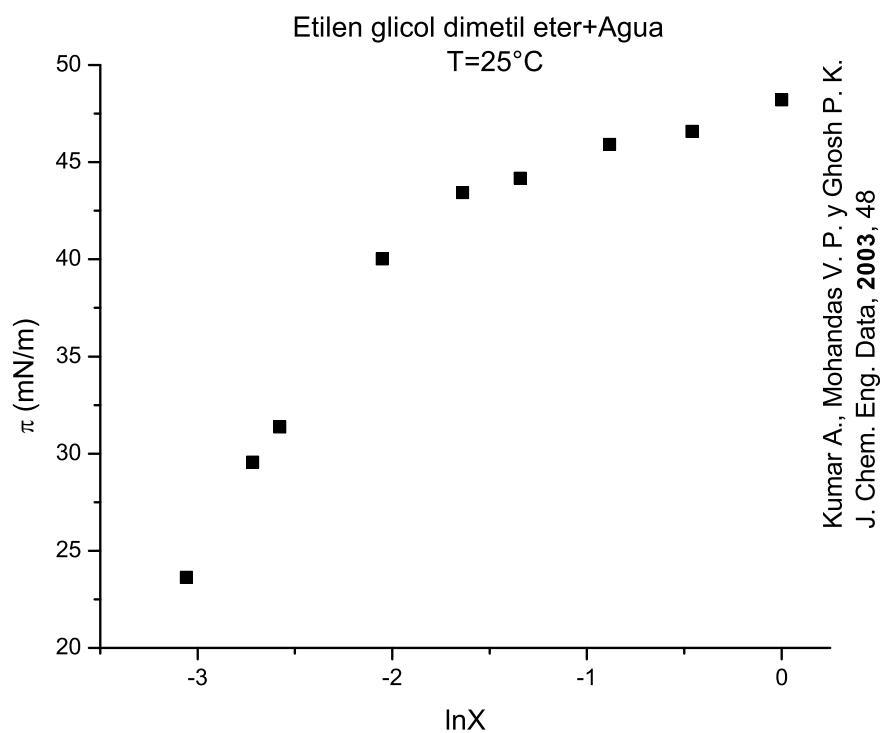
X (Trietilen glicol monoetileter)

Kumar A., Mohandas V. P. y Ghosh P. K.
J. Chem. Eng. Data, **2003**, 48

Tabla D.20: Trietilen glicol monoetileter + Agua a T=25°C [18]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	71.99	0	−
0.0564	54.62	17.37	-2.87529
0.0964	47.43	24.56	-2.33925
0.1673	41.73	30.26	-1.78797
0.3525	40.45	31.54	-1.0427
0.474	39.1	32.89	-0.74655
0.5536	37.76	34.23	-0.59131
0.6606	37.13	34.86	-0.41461
0.7512	36.91	35.08	-0.28608
0.8736	36.69	35.3	-0.13513
1	36.28	35.71	0

Butano-1,2-diol + Agua
T=25°C

Kinart, C.M., Kinart, W.J.
Phys.Chem.Liq. **1995**, 30, 243

Butano-1,2-diol + Agua
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.04
R^2   = 0.99965
$\Gamma_s RT$ 21   ±1
β 15.6   ±1.1

$0 \leq X \leq 0.1669$

Kinart, C.M., Kinart, W.J.
Phys.Chem.Liq. **1995**, 30, 243

Butano-1,2-diol + Agua
T=25°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.91
R^2   = 0.99445
$\Gamma_s RT$ 38.5   ±0.6
β 10.4   ±0.7

π (mN/m)

X (Butano-1,2-diol)

Kinart, C.M., Kinart, W.J.
Phys.Chem.Liq. **1995**, 30, 243
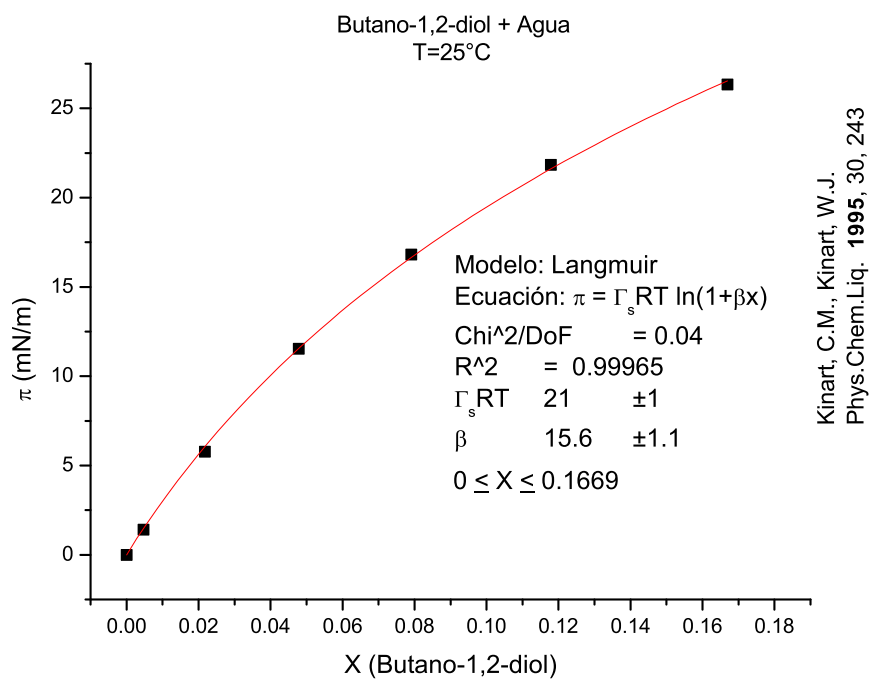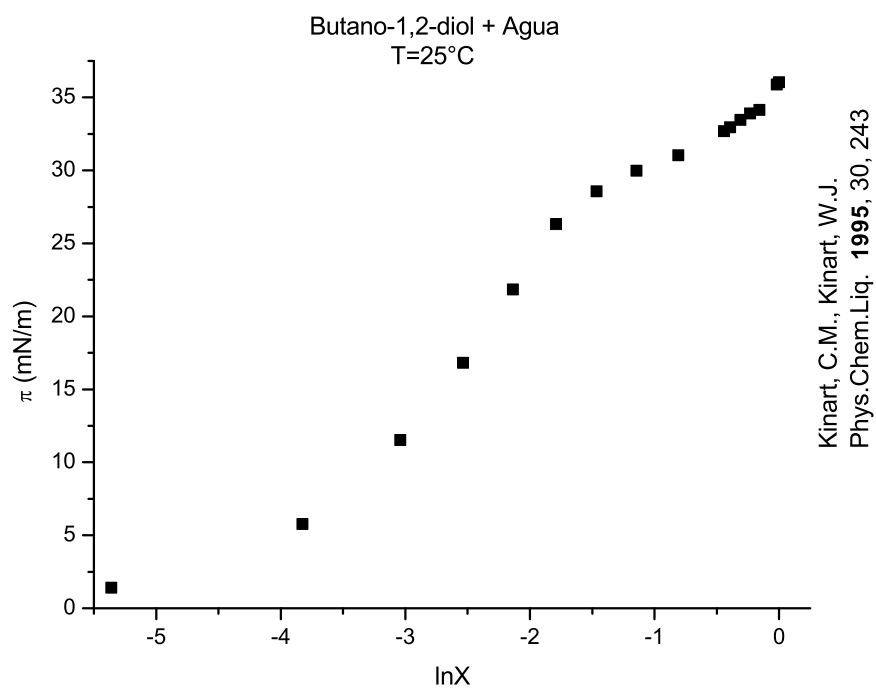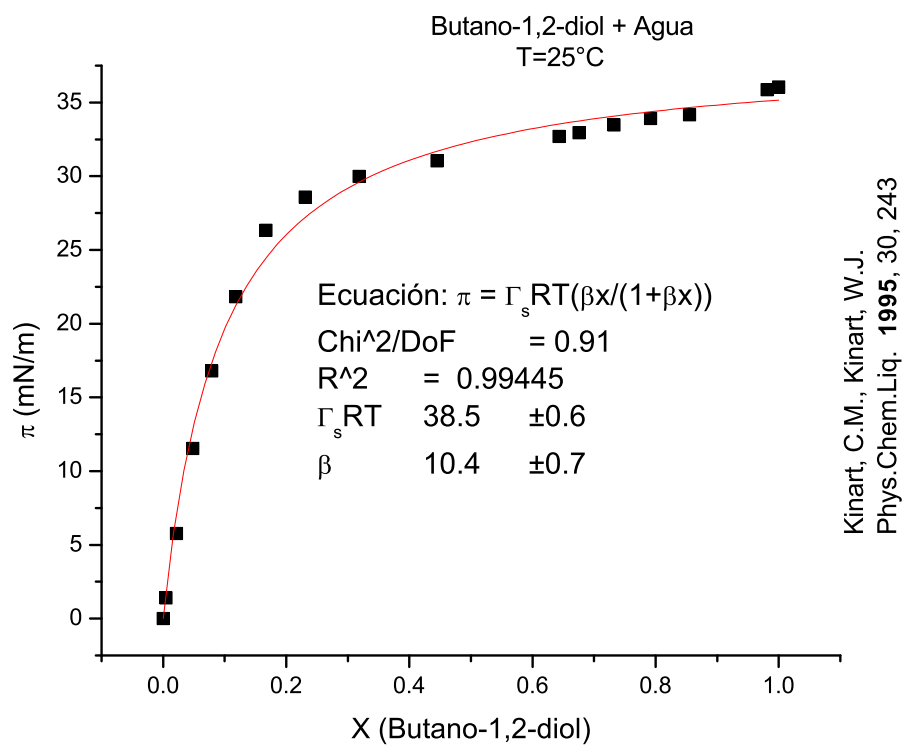
Tabla D.21: Butano-1,2-diol + Agua a T=25°C [16]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	71.89	0	–
0.0047	70.48	1.41	-5.36019
0.0218	66.12	5.77	-3.82585
0.0478	60.35	11.54	-3.04073
0.0791	55.08	16.81	-2.53704
0.1179	50.05	21.84	-2.13792
0.1669	45.56	26.33	-1.79036
0.2311	43.31	28.58	-1.4649
0.3186	41.9	29.99	-1.14382
0.4449	40.85	31.04	-0.80991
0.6433	39.19	32.7	-0.44114
0.6756	38.93	32.96	-0.39215
0.7324	38.42	33.47	-0.31143
0.792	37.98	33.91	-0.23319
0.8548	37.73	34.16	-0.15689
0.9811	36.01	35.88	-0.01908
1	35.84	36.05	0
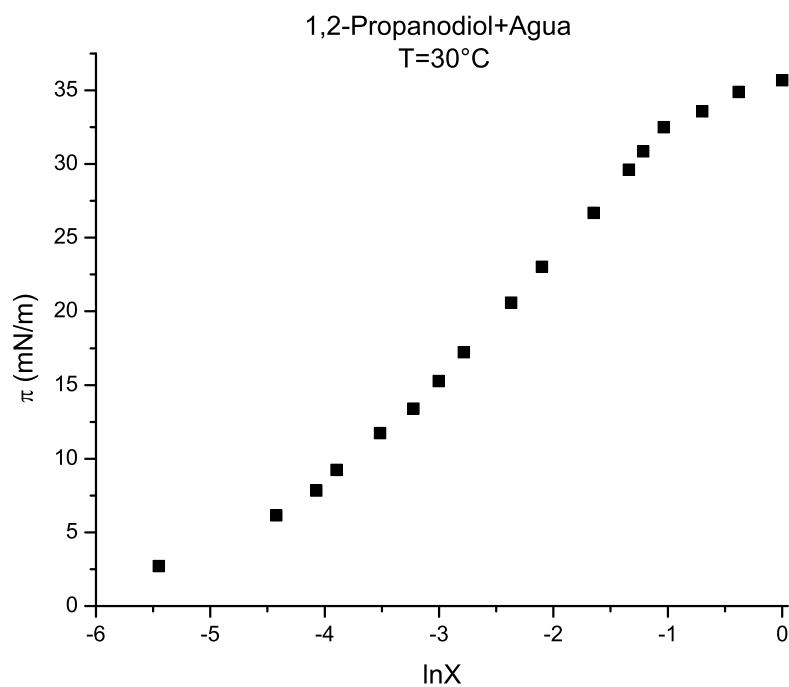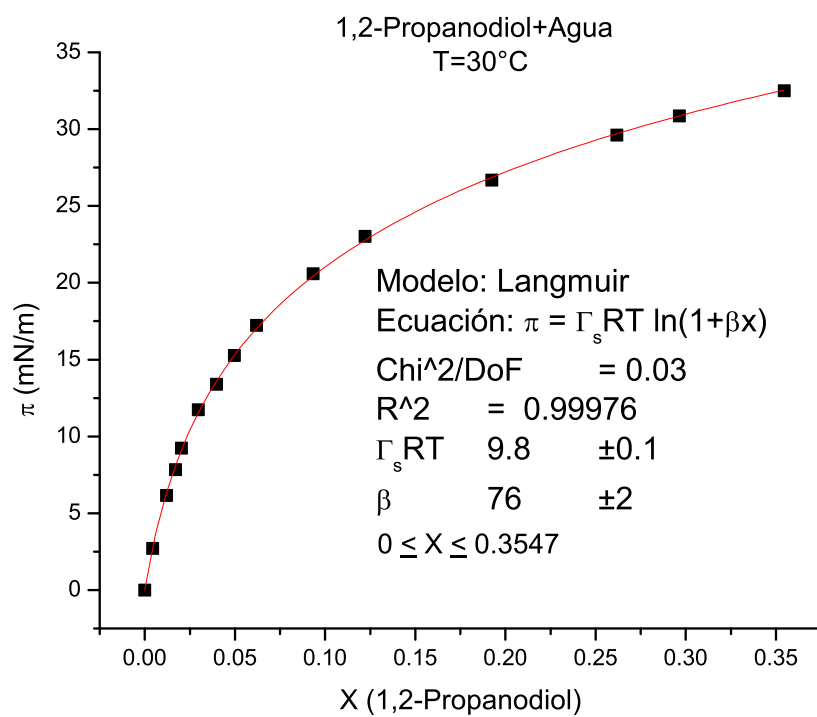
1,2-Propanodiol+Agua
T=30°C

1,2-Propanodiol+Agua
T=30°C

Modelo: Langmuir

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF		= 0.03
R^2	=	0.99976
$\Gamma_s RT$	9.8	±0.1
β	76	±2

$0 \leq X \leq 0.3547$

1,2-Propanodiol+Agua
T=30°C

Ecuación: $\pi = \Gamma_s RT\,(\beta x/(1+\beta x))$

Chi^2/DoF = 0.39
R^2 = 0.9973
$\Gamma_s RT$ 38.3 ±0.4
β 13.5 ±0.5

π (mN/m)
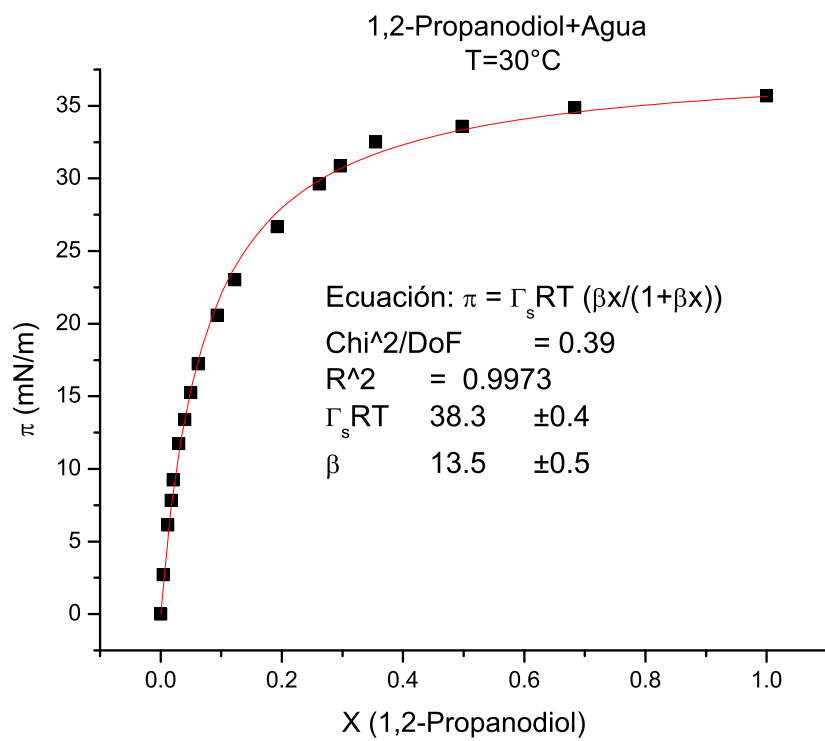
X (1,2-Propanodiol)

K. Nakanishi, T. Matsumoto y M. Hayatsu
J. Chem. Eng. Data **1971**, 16, 44

Tabla D.22: 1,2-Propanodiol + Agua a T=30°C [30]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	71.15	0	–
0.0043	68.43	2.72	-5.44914
0.012	65	6.15	-4.42285
0.017	63.32	7.83	-4.07454
0.0203	61.92	9.23	-3.89713
0.0297	59.41	11.74	-3.51661
0.0398	57.75	13.4	-3.22389
0.0497	55.88	15.27	-3.00175
0.0619	53.92	17.23	-2.78224
0.0934	50.56	20.59	-2.37086
0.1222	48.13	23.02	-2.1021
0.1924	44.46	26.69	-1.64818
0.2617	41.53	29.62	-1.34056
0.2965	40.28	30.87	-1.21571
0.3547	38.64	32.51	-1.03648
0.4973	37.56	33.59	-0.69856
0.6834	36.26	34.89	-0.38067
1	35.46	35.69	0
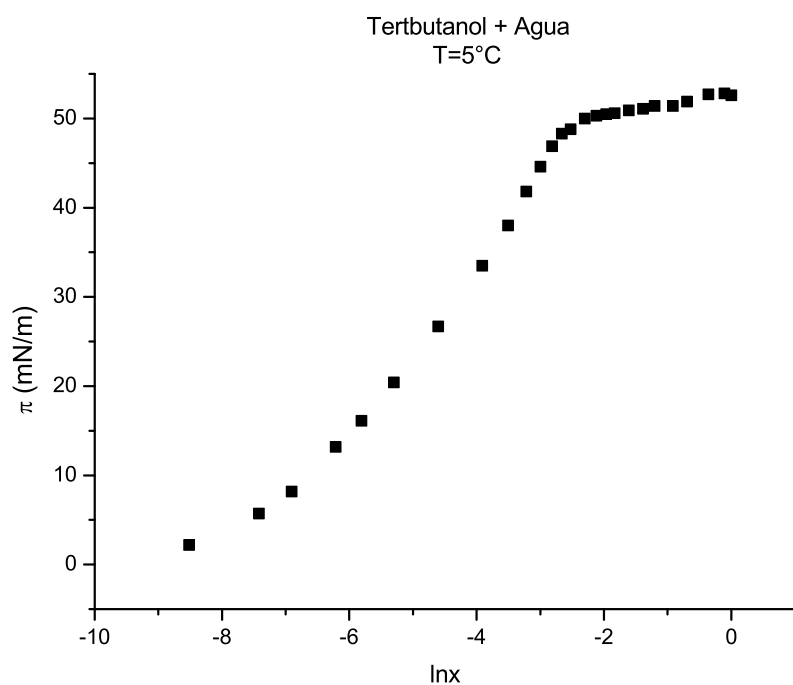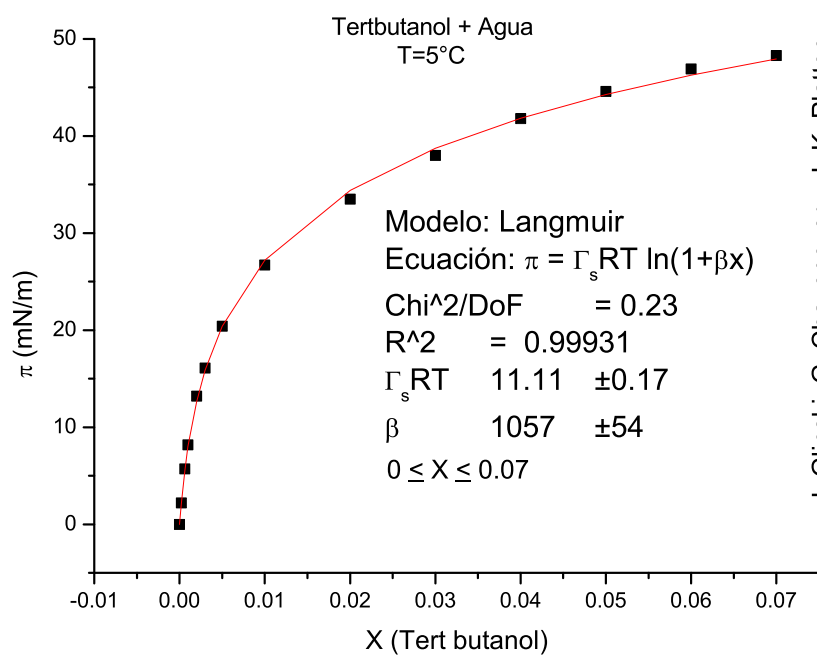
Tertbutanol + Agua
T=5°C

J. Glinski, G. Chavepeyer y J.-K. Platten
J. Chem. Phys. **1995**, 102, 2113

Tertbutanol + Agua
T=5°C

Modelo: Langmuir

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.23

R^2   = 0.99931

$\Gamma_s RT$ 11.11   ±0.17

β 1057   ±54

$0 \leq X \leq 0.07$

X (Tert butanol)

J. Glinski, G. Chavepeyer y J.-K. Platten
J. Chem. Phys. **1995**, 102, 2113

Tertbutanol + Agua
T=5°C

Ecuación: $\pi = \Gamma_s RT\,(\beta x/(1+\beta x))$

Chi^2/DoF   = 2.61
R^2   = 0.99251
$\Gamma_s RT$ 53   ±0.5
β 116   ±8

π (mN/m)
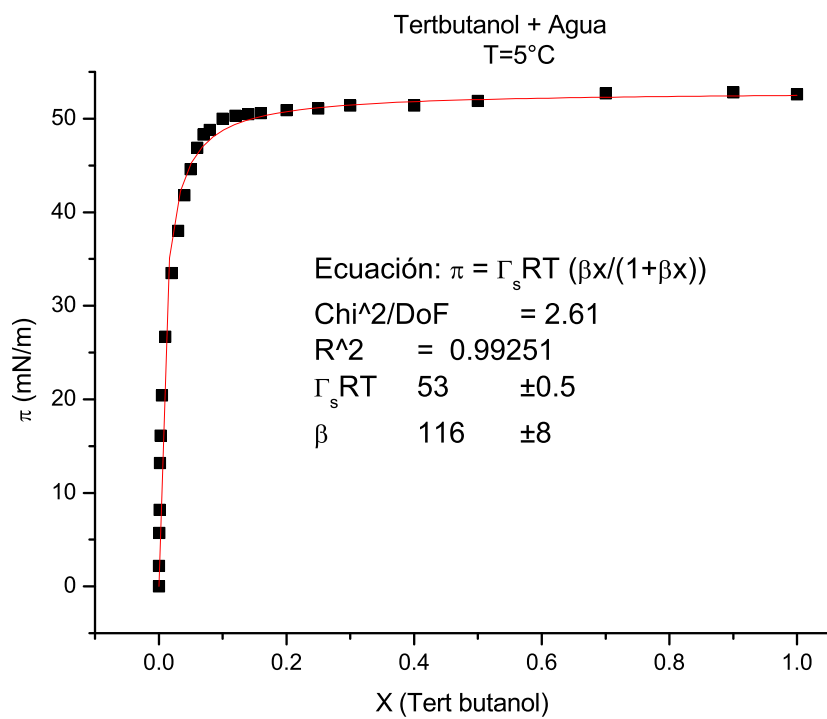
X (Tert butanol)

J. Glinski, G. Chavepeyer y J.-K. Platten
J. Chem. Phys. **1995**, 102, 2113

Tabla D.23: Tertbutanol + Agua a T=5°C [8]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	74.9	0	–
2E-4	72.7	2.2	-8.51719
6E-4	69.2	5.7	-7.41858
1E-3	66.7	8.2	-6.90776
0.002	61.7	13.2	-6.21461
0.003	58.8	16.1	-5.80914
0.005	54.5	20.4	-5.29832
0.01	48.2	26.7	-4.60517
0.02	41.4	33.5	-3.91202
0.03	36.9	38	-3.50656
0.04	33.1	41.8	-3.21888
0.05	30.3	44.6	-2.99573
0.06	28	46.9	-2.81341
0.07	26.6	48.3	-2.65926
0.08	26.1	48.8	-2.52573
0.1	24.9	50	-2.30259
0.12	24.6	50.3	-2.12026
0.14	24.4	50.5	-1.96611
0.16	24.3	50.6	-1.83258
0.2	24	50.9	-1.60944
0.25	23.8	51.1	-1.38629
0.3	23.5	51.4	-1.20397
0.4	23.5	51.4	-0.91629
0.5	23	51.9	-0.69315
0.7	22.2	52.7	-0.35667
0.9	22.1	52.8	-0.10536
1	22.3	52.6	0

Tertbutanol + Agua
T=10°C

Tertbutanol + Agua
T=10°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.18
R^2   = 0.99946
$\Gamma_s RT$ 10.9   ±0.1
β 1136   ±51

$0 \leq X \leq 0.07$

Tertbutanol + Agua
T=10°C

Ecuación: $\pi = \Gamma_s RT\ (\beta x/(1+\beta x))$

Chi^2/DoF   = 2.43
R^2   = 0.99285
$\Gamma_s RT$ 52.5   ±0.5
β 123   ±8

π (mN/m)

X (Tert butanol)

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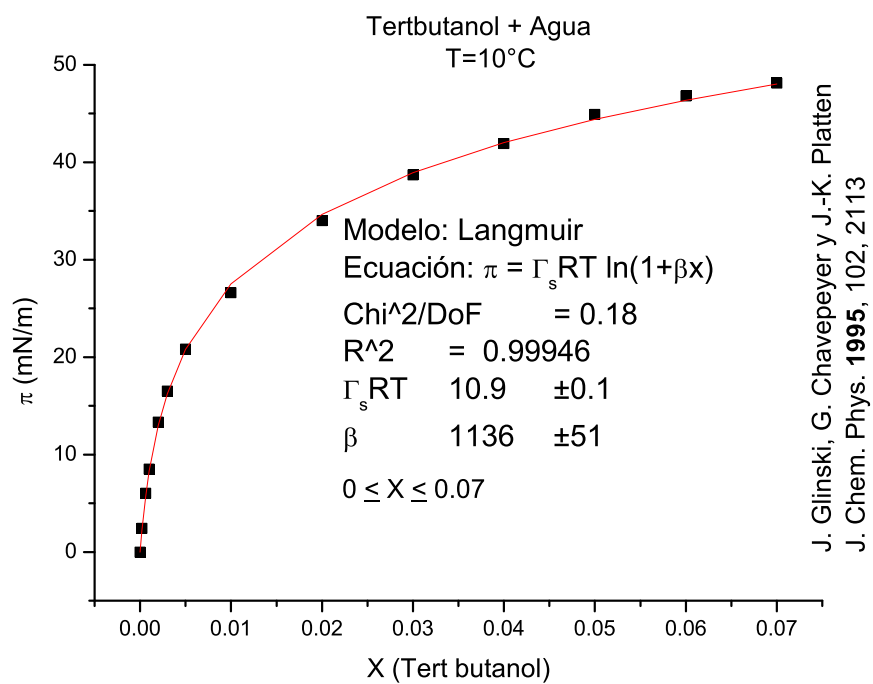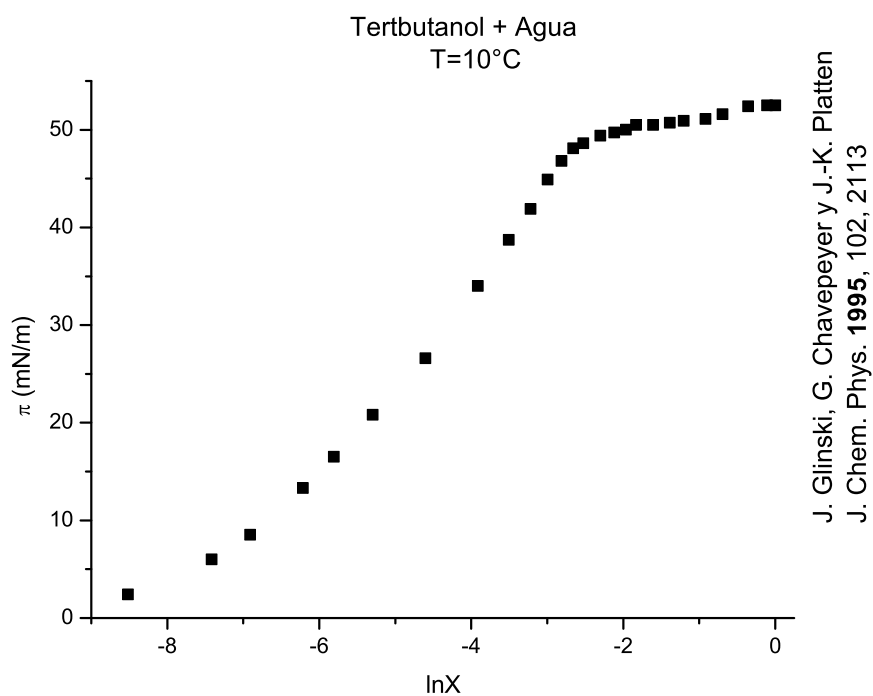
Tabla D.24: Tertbutanol + Agua a T=10°C [8]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	74.22	0	–
2E-4	71.8	2.42	-8.51719
6E-4	68.2	6.02	-7.41858
1E-3	65.7	8.52	-6.90776
0.002	60.9	13.32	-6.21461
0.003	57.7	16.52	-5.80914
0.005	53.4	20.82	-5.29832
0.01	47.6	26.62	-4.60517
0.02	40.2	34.02	-3.91202
0.03	35.5	38.72	-3.50656
0.04	32.3	41.92	-3.21888
0.05	29.3	44.92	-2.99573
0.06	27.4	46.82	-2.81341
0.07	26.1	48.12	-2.65926
0.08	25.6	48.62	-2.52573
0.1	24.8	49.42	-2.30259
0.12	24.5	49.72	-2.12026
0.14	24.2	50.02	-1.96611
0.16	23.7	50.52	-1.83258
0.2	23.7	50.52	-1.60944
0.25	23.5	50.72	-1.38629
0.3	23.3	50.92	-1.20397
0.4	23.1	51.12	-0.91629
0.5	22.6	51.62	-0.69315
0.7	21.8	52.42	-0.35667
0.9	21.7	52.52	-0.10536
1	21.7	52.52	0
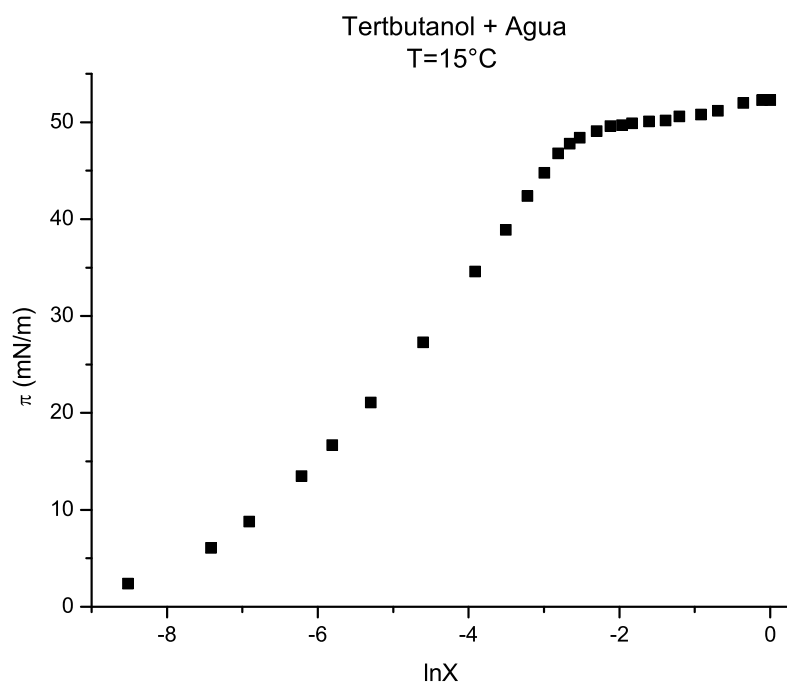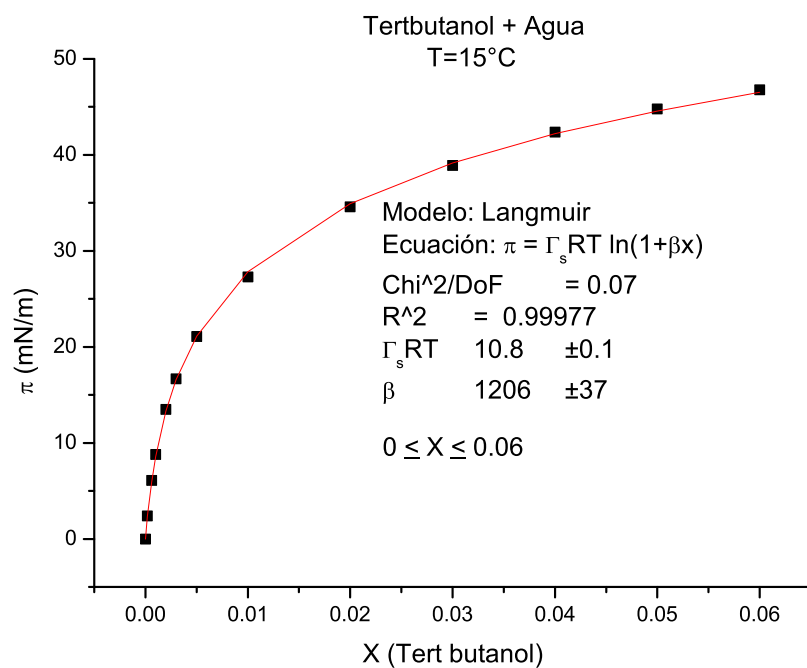
Tertbutanol + Agua
T=15°C

Tertbutanol + Agua
T=15°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF = 0.07
R^2 = 0.99977
$\Gamma_s RT$ 10.8 ±0.1
β 1206 ±37

$0 \leq X \leq 0.06$

Tertbutanol + Agua
T=15°C

Ecuación: $\pi = \Gamma_s RT\,(\beta x/(1+\beta x))$

Chi^2/DoF   = 2.12
R^2   = 0.99364
Γ_sRT   52.0   ±0.4
β 131   ±8

π (mN/m)
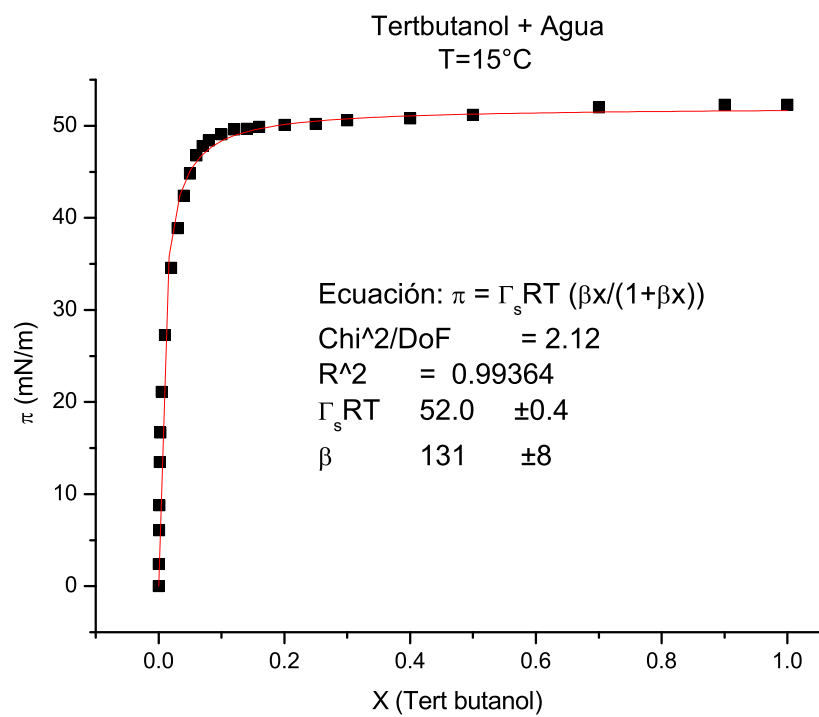
X (Tert butanol)

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Tabla D.25: Tertbutanol + Agua a T=15°C [8]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	73.49	0	–
2E-4	71.1	2.39	-8.51719
6E-4	67.4	6.09	-7.41858
1E-3	64.7	8.79	-6.90776
0.002	60	13.49	-6.21461
0.003	56.8	16.69	-5.80914
0.005	52.4	21.09	-5.29832
0.01	46.2	27.29	-4.60517
0.02	38.9	34.59	-3.91202
0.03	34.6	38.89	-3.50656
0.04	31.1	42.39	-3.21888
0.05	28.7	44.79	-2.99573
0.06	26.7	46.79	-2.81341
0.07	25.7	47.79	-2.65926
0.08	25.1	48.39	-2.52573
0.1	24.4	49.09	-2.30259
0.12	23.9	49.59	-2.12026
0.14	23.8	49.69	-1.96611
0.16	23.6	49.89	-1.83258
0.2	23.4	50.09	-1.60944
0.25	23.3	50.19	-1.38629
0.3	22.9	50.59	-1.20397
0.4	22.7	50.79	-0.91629
0.5	22.3	51.19	-0.69315
0.7	21.5	51.99	-0.35667
0.9	21.2	52.29	-0.10536
1	21.2	52.29	0

Tertbutanol + Agua
T=20°C

Tertbutanol + Agua
T=20°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.006
R^2   = 0.99998
$\Gamma_s RT$ 10.77   ±0.03
β 1252   ±11

$0 \leq X \leq 0.06$

Tertbutanol + Agua
T=20°C

Ecuación: $\pi = \Gamma_s RT\ (\beta x/(1+\beta x))$

Chi^2/DoF	= 1.72	
R^2	= 0.99472	
$\Gamma_s RT$	51.5	±0.4
β	138	±7

π (mN/m)
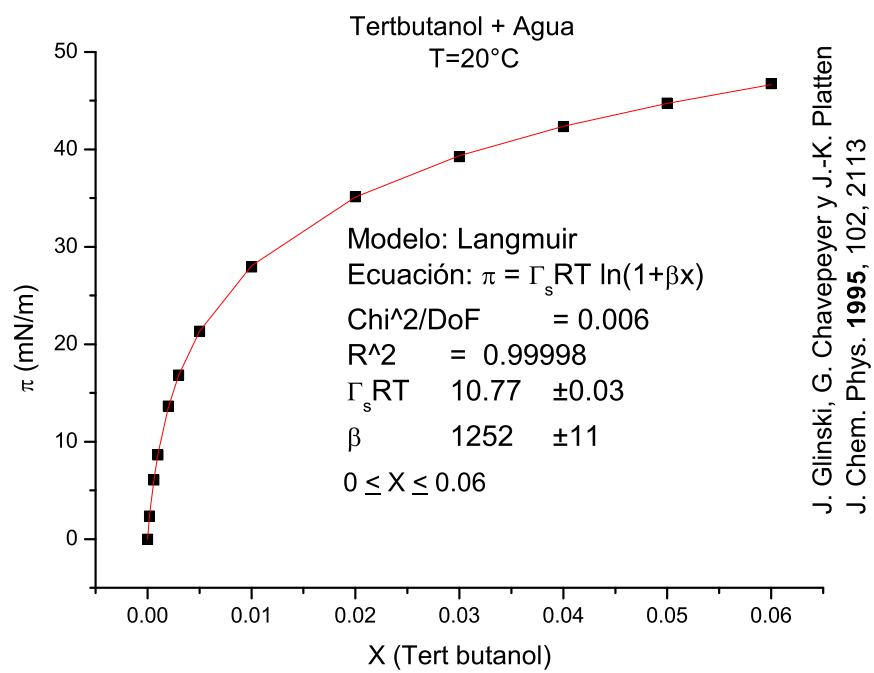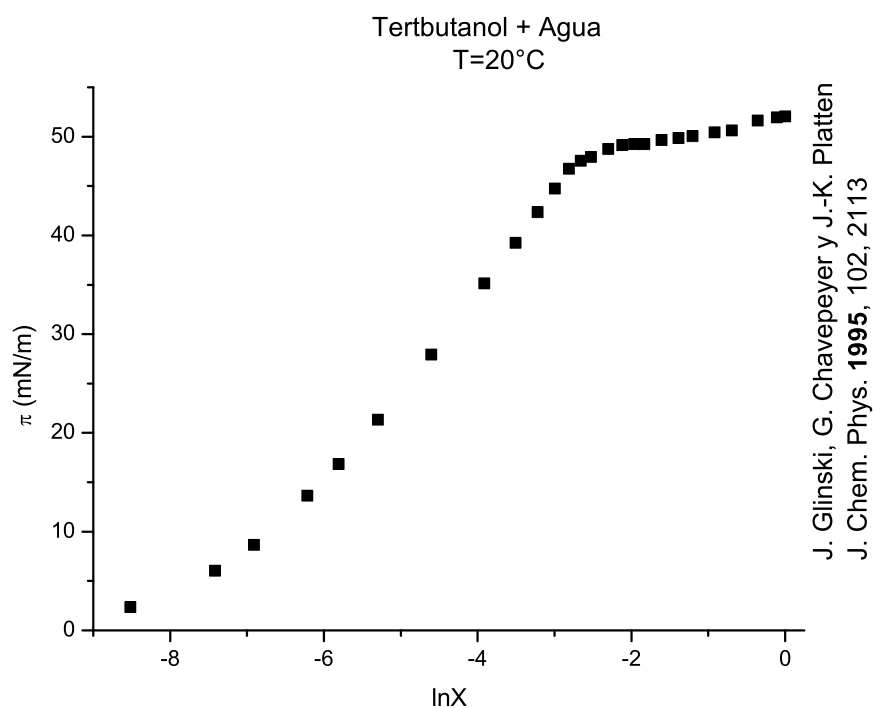
X (Tert butanol)

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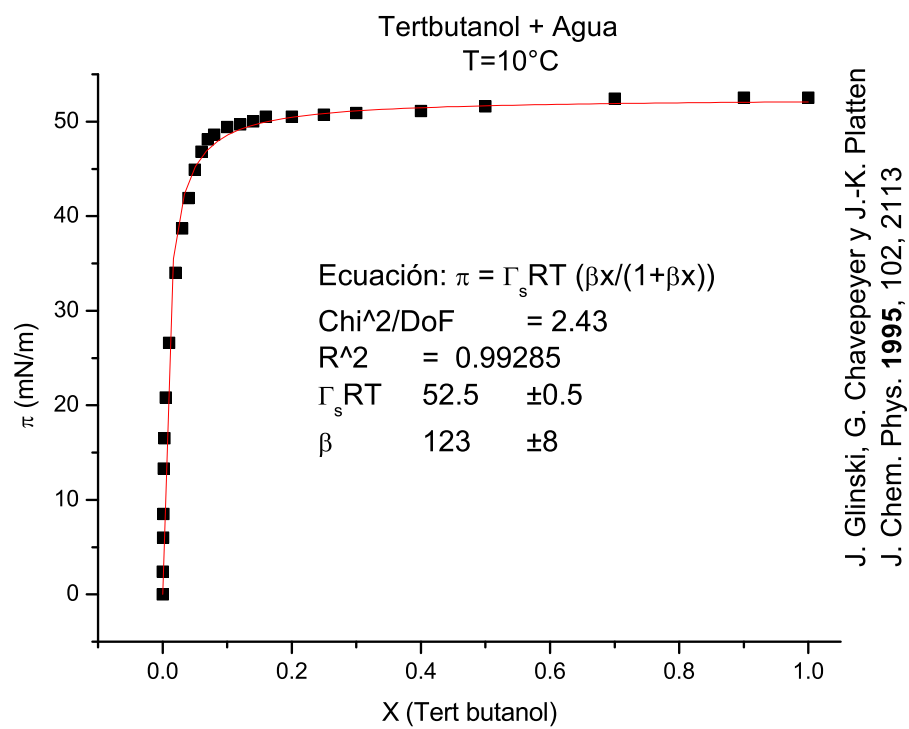J. Chem. Phys. **1995**, 102, 2113

Tabla D.26: Tertbutanol + Agua a T=20°C [8]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	72.75	0	–
2E-4	70.4	2.35	-8.51719
6E-4	66.7	6.05	-7.41858
1E-3	64.1	8.65	-6.90776
0.002	59.1	13.65	-6.21461
0.003	55.9	16.85	-5.80914
0.005	51.4	21.35	-5.29832
0.01	44.8	27.95	-4.60517
0.02	37.6	35.15	-3.91202
0.03	33.5	39.25	-3.50656
0.04	30.4	42.35	-3.21888
0.05	28	44.75	-2.99573
0.06	26	46.75	-2.81341
0.07	25.2	47.55	-2.65926
0.08	24.8	47.95	-2.52573
0.1	24	48.75	-2.30259
0.12	23.6	49.15	-2.12026
0.14	23.5	49.25	-1.96611
0.16	23.5	49.25	-1.83258
0.2	23.1	49.65	-1.60944
0.25	22.9	49.85	-1.38629
0.3	22.7	50.05	-1.20397
0.4	22.3	50.45	-0.91629
0.5	22.1	50.65	-0.69315
0.7	21.1	51.65	-0.35667
0.9	20.8	51.95	-0.10536
1	20.7	52.05	0

Tertbutanol + Agua
T=25°C

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Tertbutanol + Agua
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.03
R^2   = 0.99991
$\Gamma_s RT$ 10.6   ±0.1
β 1319   ±24

$0 \leq X \leq 0.06$

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Tertbutanol + Agua
T=25°C

Ecuación: $\pi = \Gamma_s RT\,(\beta x/(1+\beta x))$

Chi^2/DoF   = 1.63
R^2   = 0.99488
$\Gamma_s RT$ 51.0   ±0.4
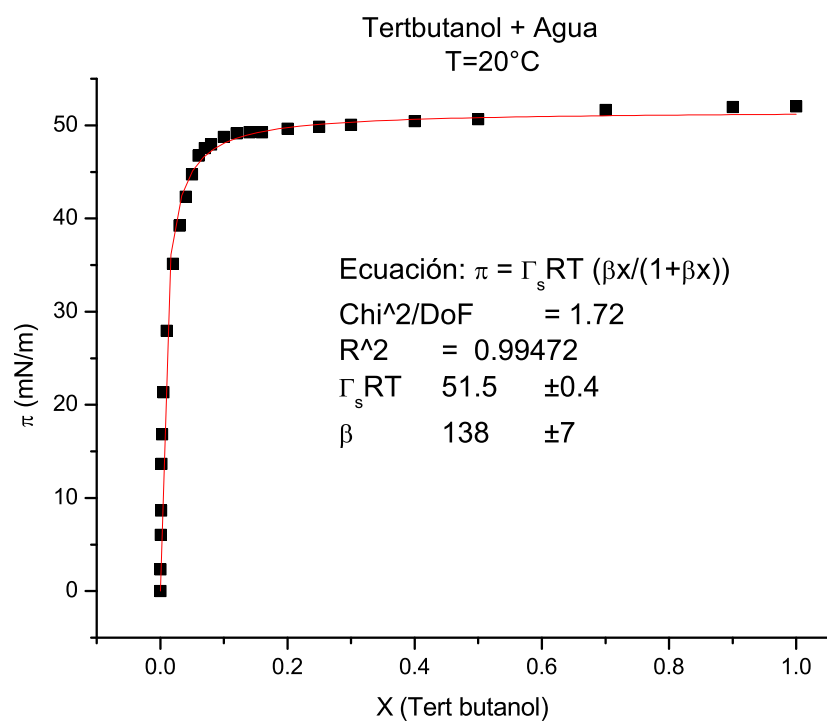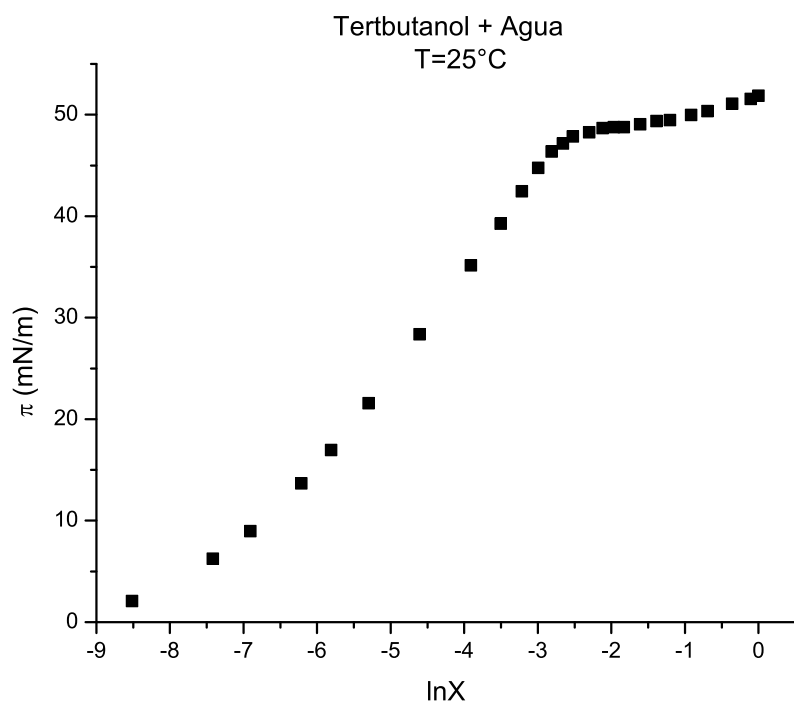β 144   ±8

π (mN/m)

X (Tert butanol)

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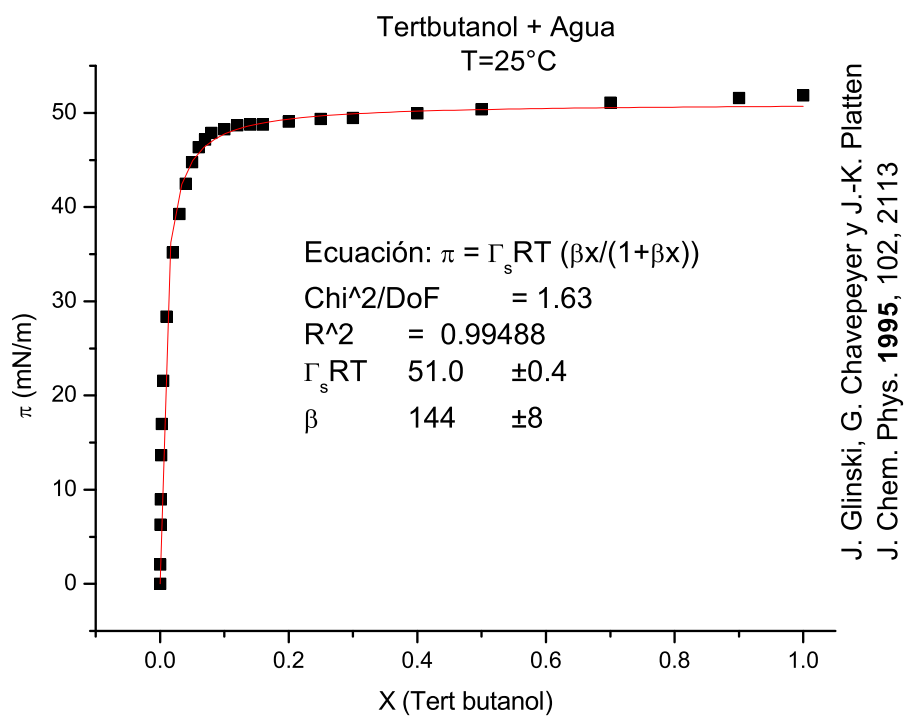
Tabla D.27: Tertbutanol + Agua a T=25°C [8]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	71.97	0	–
2E-4	69.9	2.07	-8.51719
6E-4	65.7	6.27	-7.41858
1E-3	63	8.97	-6.90776
0.002	58.3	13.67	-6.21461
0.003	55	16.97	-5.80914
0.005	50.4	21.57	-5.29832
0.01	43.6	28.37	-4.60517
0.02	36.8	35.17	-3.91202
0.03	32.7	39.27	-3.50656
0.04	29.5	42.47	-3.21888
0.05	27.2	44.77	-2.99573
0.06	25.6	46.37	-2.81341
0.07	24.8	47.17	-2.65926
0.08	24.1	47.87	-2.52573
0.1	23.7	48.27	-2.30259
0.12	23.3	48.67	-2.12026
0.14	23.2	48.77	-1.96611
0.16	23.2	48.77	-1.83258
0.2	22.9	49.07	-1.60944
0.25	22.6	49.37	-1.38629
0.3	22.5	49.47	-1.20397
0.4	22	49.97	-0.91629
0.5	21.6	50.37	-0.69315
0.7	20.9	51.07	-0.35667
0.9	20.4	51.57	-0.10536
1	20.1	51.87	0
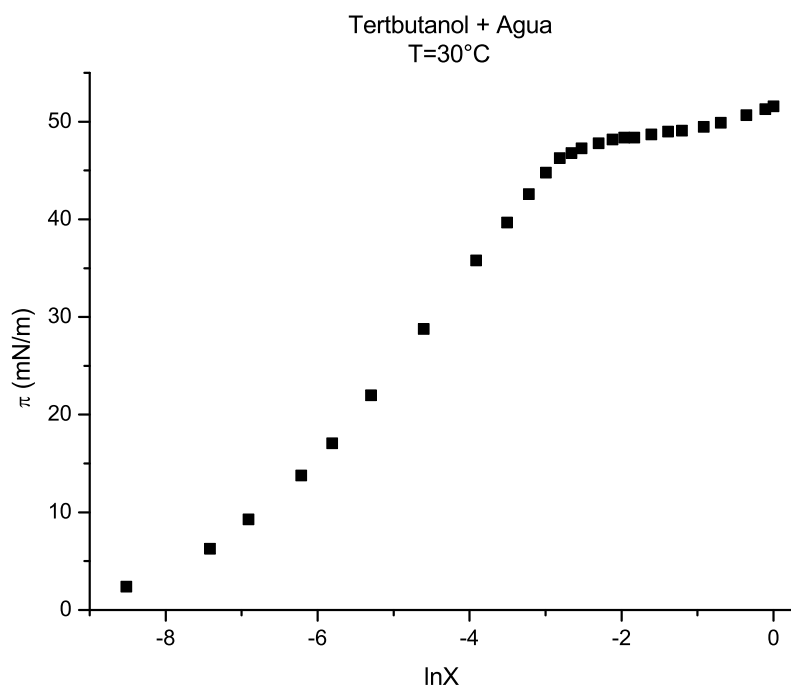
Tertbutanol + Agua
T=30°C

Tertbutanol + Agua
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.06
R^2   = 0.99981
$\Gamma_s RT$ 10.5   ±0.1
β 1394   ±38

$0 \leq X \leq 0.06$

Tertbutanol + Agua
T=30°C

Ecuación: $\pi = \Gamma_s RT \, (\beta x/(1+\beta x))$

Chi^2/DoF   = 1.38
R^2   = 0.99556
$\Gamma_s RT$ 50.6   ±0.3
β 153   ±7
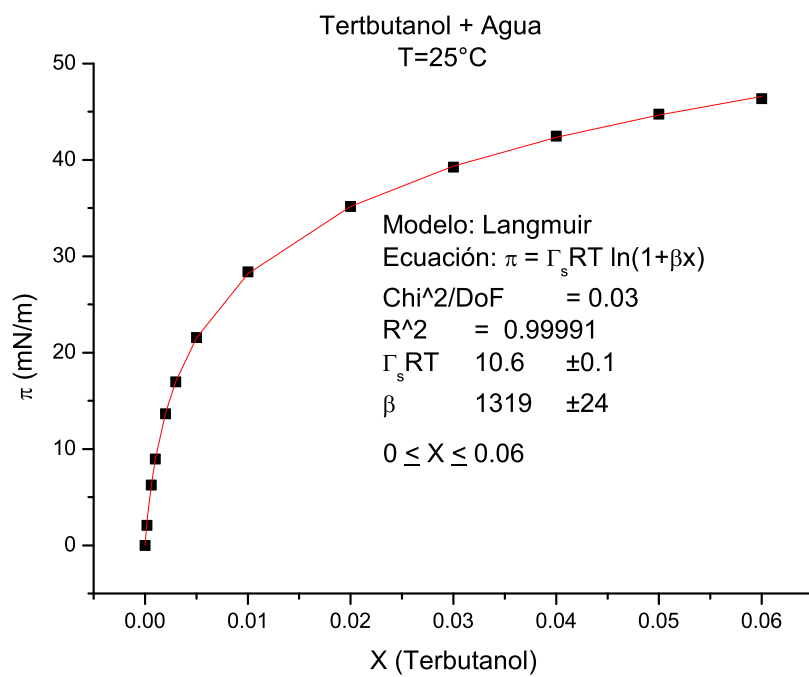
π (mN/m)
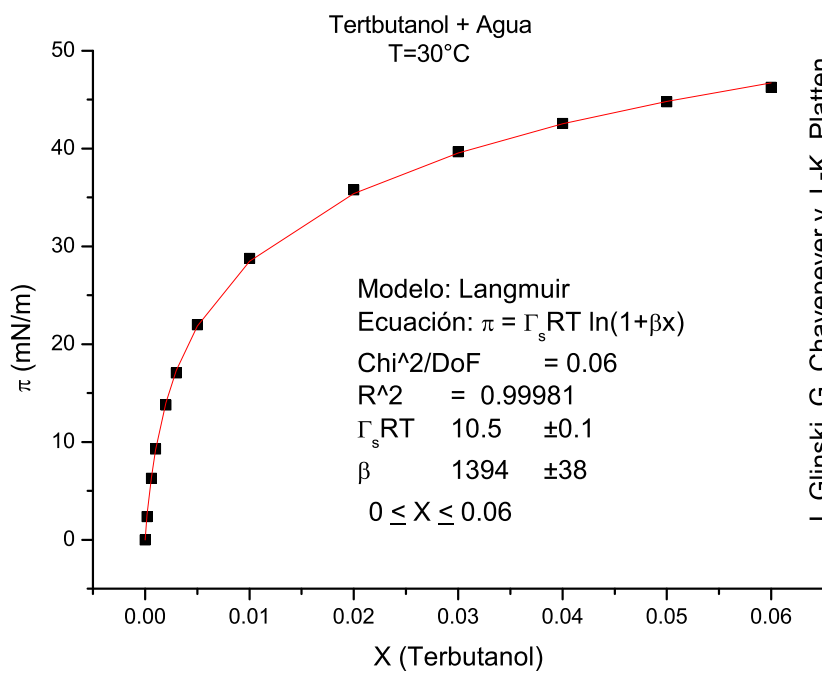
X (Tert butanol)

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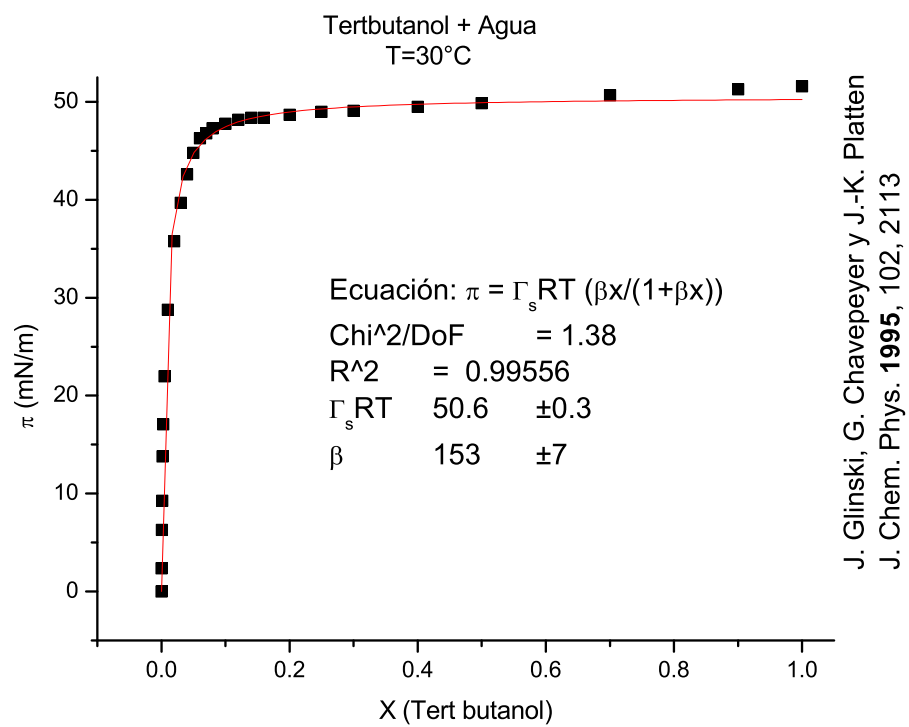
Tabla D.28: Tertbutanol + Agua a T=30°C [8]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	71.18	0	–
2E-4	68.8	2.38	-8.51719
6E-4	64.9	6.28	-7.41858
1E-3	61.9	9.28	-6.90776
0.002	57.4	13.78	-6.21461
0.003	54.1	17.08	-5.80914
0.005	49.2	21.98	-5.29832
0.01	42.4	28.78	-4.60517
0.02	35.4	35.78	-3.91202
0.03	31.5	39.68	-3.50656
0.04	28.6	42.58	-3.21888
0.05	26.4	44.78	-2.99573
0.06	24.9	46.28	-2.81341
0.07	24.4	46.78	-2.65926
0.08	23.9	47.28	-2.52573
0.1	23.4	47.78	-2.30259
0.12	23	48.18	-2.12026
0.14	22.8	48.38	-1.96611
0.16	22.8	48.38	-1.83258
0.2	22.5	48.68	-1.60944
0.25	22.2	48.98	-1.38629
0.3	22.1	49.08	-1.20397
0.4	21.7	49.48	-0.91629
0.5	21.3	49.88	-0.69315
0.7	20.5	50.68	-0.35667
0.9	19.9	51.28	-0.10536
1	19.6	51.58	0
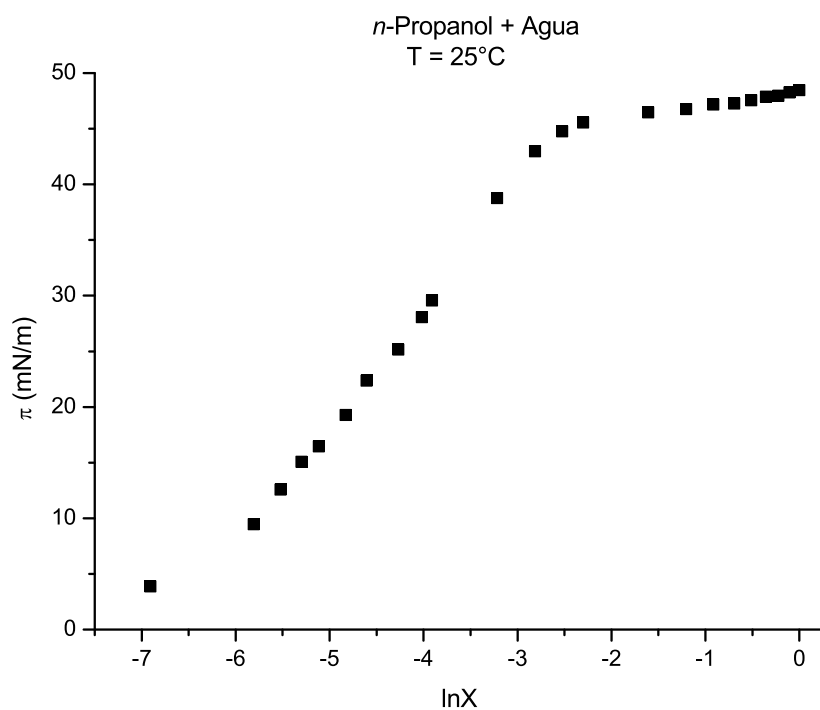
n-Propanol + Agua
T = 25°C

n-Propanol + Agua
T = 25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.23
R^2   = 0.99852
$\Gamma_s RT$ 13.7   ±0.3
β 381   ±21
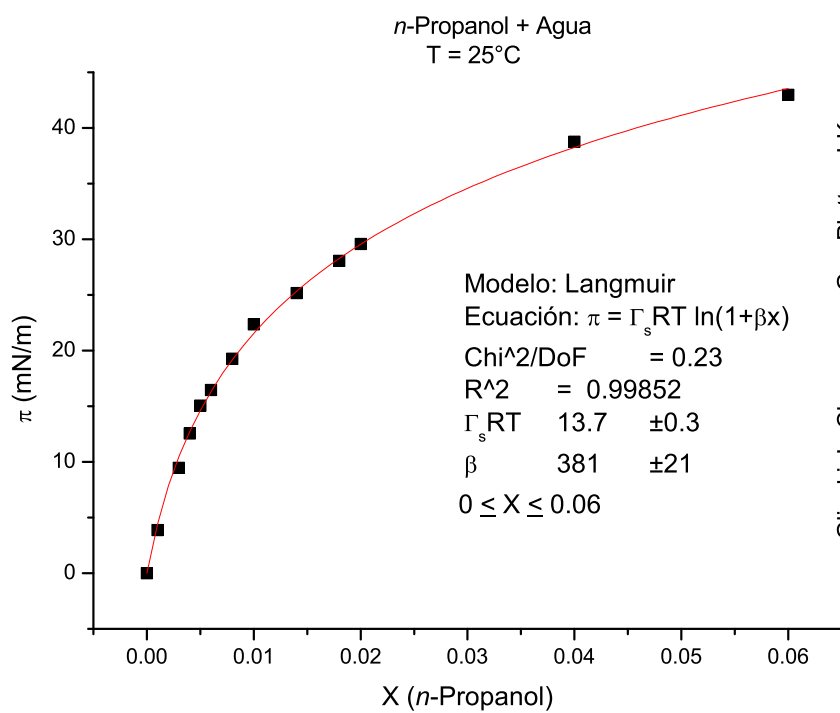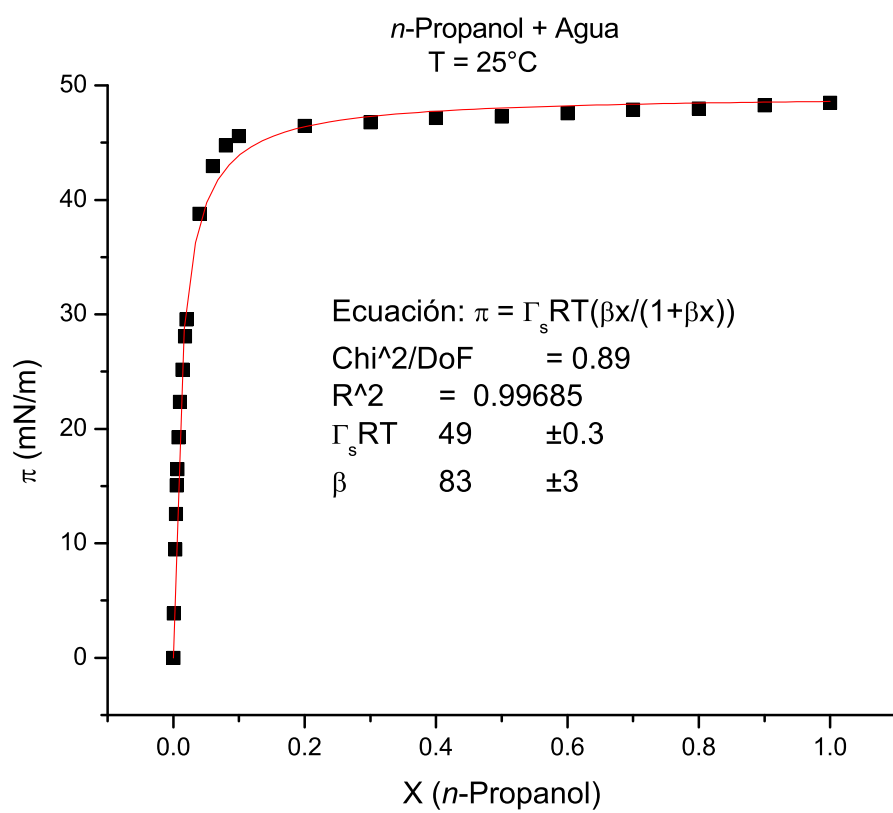
$0 \le X \le 0.06$

Tabla D.29: n-Propanol + Agua a T=25°C [9]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	71.97	0	–
1E-3	68.1	3.87	-6.90776
0.003	62.5	9.47	-5.80914
0.004	59.4	12.57	-5.52146
0.005	56.9	15.07	-5.29832
0.006	55.5	16.47	-5.116
0.008	52.7	19.27	-4.82831
0.01	49.6	22.37	-4.60517
0.014	46.8	25.17	-4.2687
0.018	43.9	28.07	-4.01738
0.02	42.4	29.57	-3.91202
0.03	–	–	-3.50656
0.04	33.2	38.77	-3.21888
0.06	29	42.97	-2.81341
0.08	27.2	44.77	-2.52573
0.1	26.4	45.57	-2.30259
0.2	25.5	46.47	-1.60944
0.3	25.2	46.77	-1.20397
0.4	24.8	47.17	-0.91629
0.5	24.7	47.27	-0.69315
0.6	24.4	47.57	-0.51083
0.7	24.1	47.87	-0.35667
0.8	24	47.97	-0.22314
0.9	23.7	48.27	-0.10536
1	23.5	48.47	0
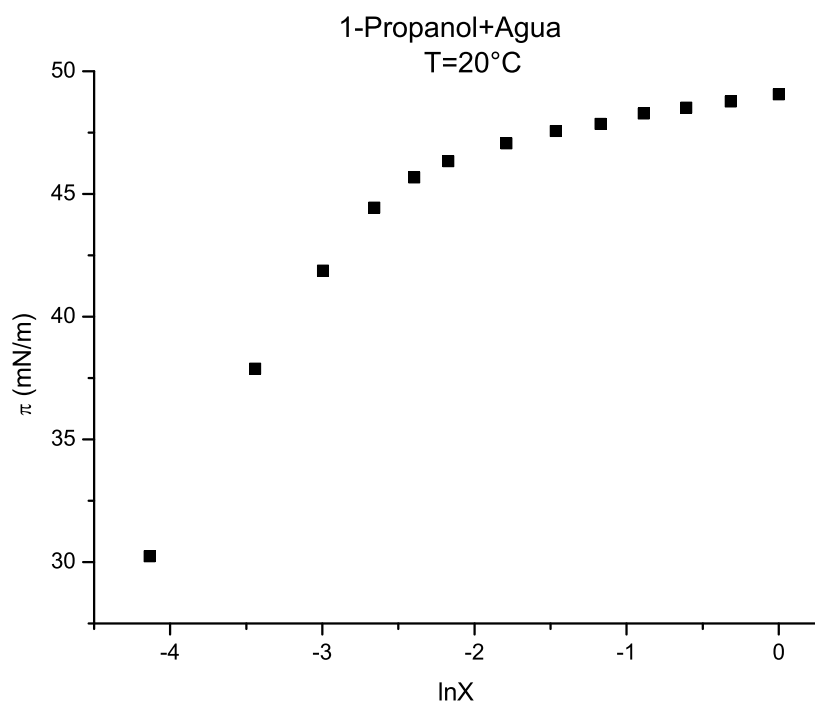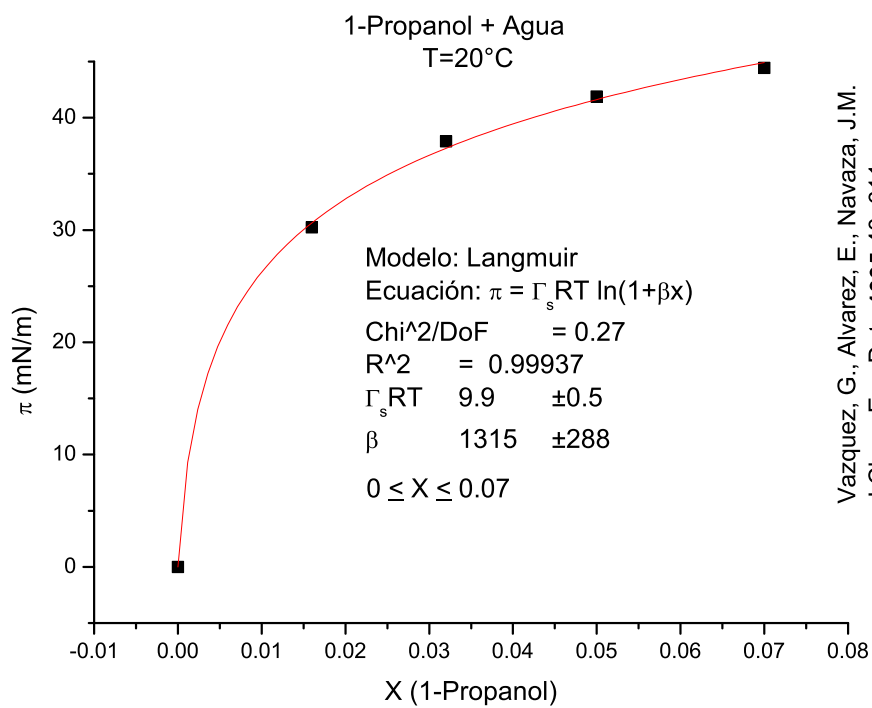
1-Propanol+Agua
T=20°C

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J.Chem.Eng.Data **1995**,40, 611

1-Propanol + Agua
T=20°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.27
R^2   = 0.99937
$\Gamma_s RT$ 9.9   ±0.5
β 1315   ±288

$0 \leq X \leq 0.07$

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1-Propanol + Agua
T=20°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.21
R^2   = 0.99887
$\Gamma_s RT$ 49.7   ±0.2
β 103   ±3

π (mN/m)
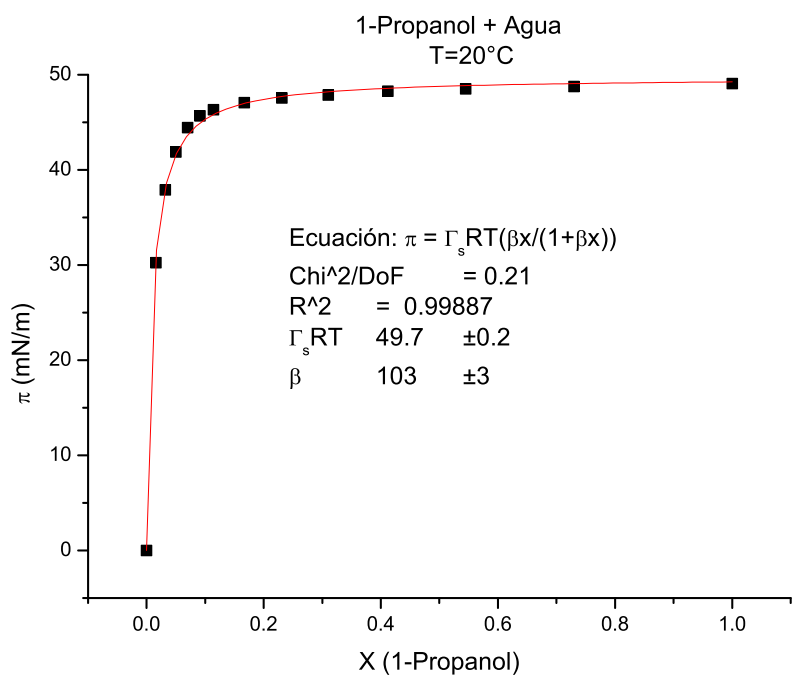
X (1-Propanol)

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Tabla D.30: 1-Propanol + Agua a T=20°C [51]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	72.75	0	–
0.016	42.51	30.24	-4.13517
0.032	34.86	37.89	-3.44202
0.05	30.87	41.88	-2.99573
0.07	28.31	44.44	-2.65926
0.091	27.08	45.67	-2.3969
0.114	26.41	46.34	-2.17156
0.167	25.68	47.07	-1.78976
0.231	25.18	47.57	-1.46534
0.31	24.89	47.86	-1.17118
0.412	24.47	48.28	-0.88673
0.545	24.23	48.52	-0.60697
0.73	23.98	48.77	-0.31471
1	23.69	49.06	0

1-Propanol+Agua
T=25°C

π (mN/m)

lnX

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1-Propanol+Agua
T=25°C

π (mN/m)

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.25
R^2   = 0.99941
$\Gamma_s RT$ 9.7   ±0.5
β 1371   ±295

$0 \le X \le 0.07$

X (1-Propanol)

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1-Propanol + Agua
T=25°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.20
R^2   = 0.99889
$\Gamma_s RT$ 49.3   ±0.2
β 104   ±3

π (mN/m)
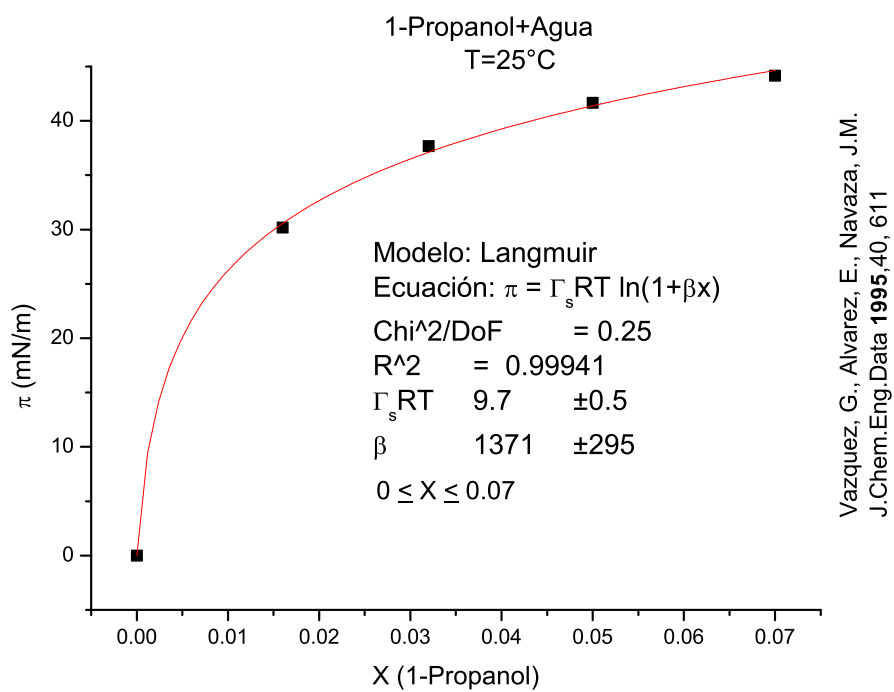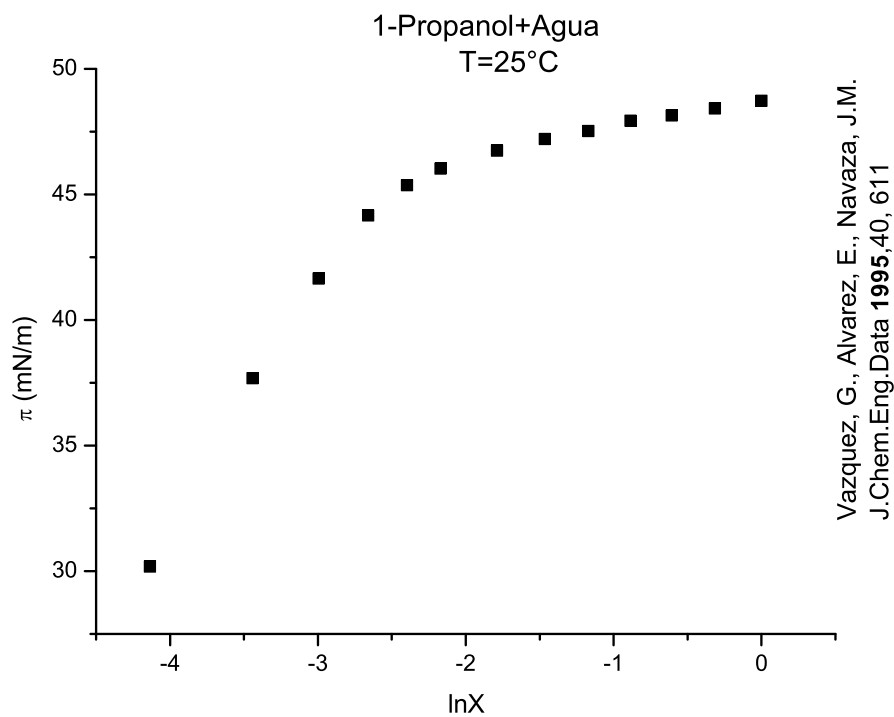
X (1-Propanol)

Vazquez, G., Alvarez, E., Navaza, J.M.
J.Chem.Eng.Data **1995**,40, 611

Tabla D.31: 1-Propanol + Agua a T=25°C [51]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	72.01	0	–
0.016	41.83	30.18	-4.13517
0.032	34.32	37.69	-3.44202
0.05	30.36	41.65	-2.99573
0.07	27.84	44.17	-2.65926
0.091	26.64	45.37	-2.3969
0.114	25.98	46.03	-2.17156
0.167	25.26	46.75	-1.78976
0.231	24.8	47.21	-1.46534
0.31	24.49	47.52	-1.17118
0.412	24.08	47.93	-0.88673
0.545	23.86	48.15	-0.60697
0.73	23.59	48.42	-0.31471
1	23.28	48.73	0

1-Propanol+Agua
T=30°C

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1-Propanol+Agua
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF = 0.23
R^2 = 0.99945
$\Gamma_s RT$ 9.6 ±0.5
β 1430 ±302
$0 \leq X \leq 0.07$

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1-Propanol + Agua
T=30°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.19
R^2   = 0.99893
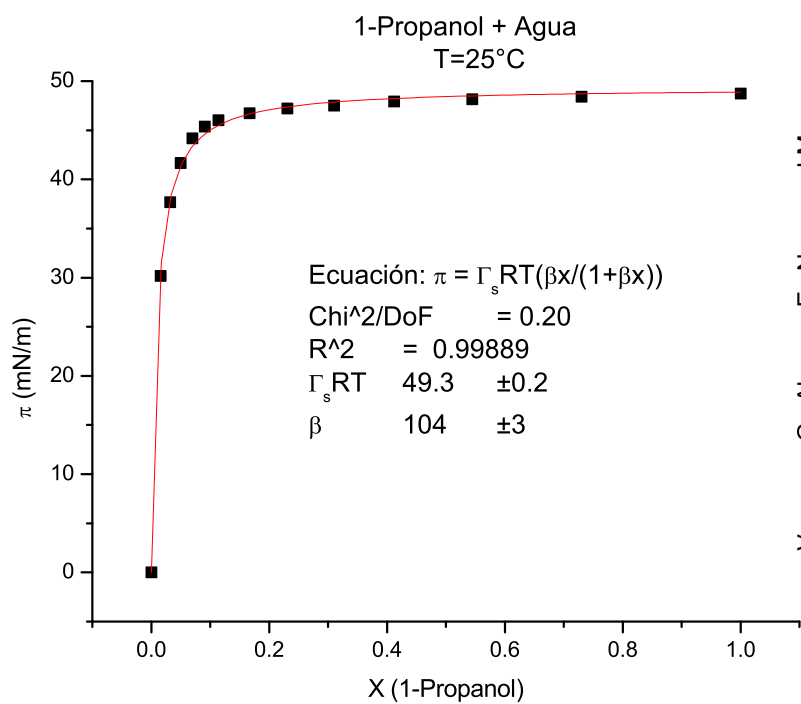$\Gamma_s RT$ 48.9   ±0.2
β 105   ±3
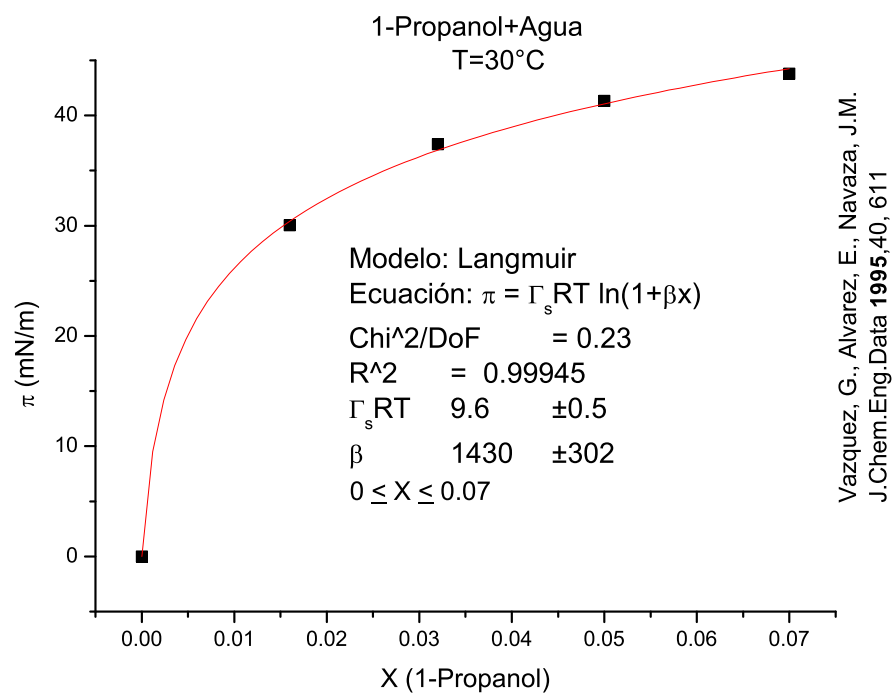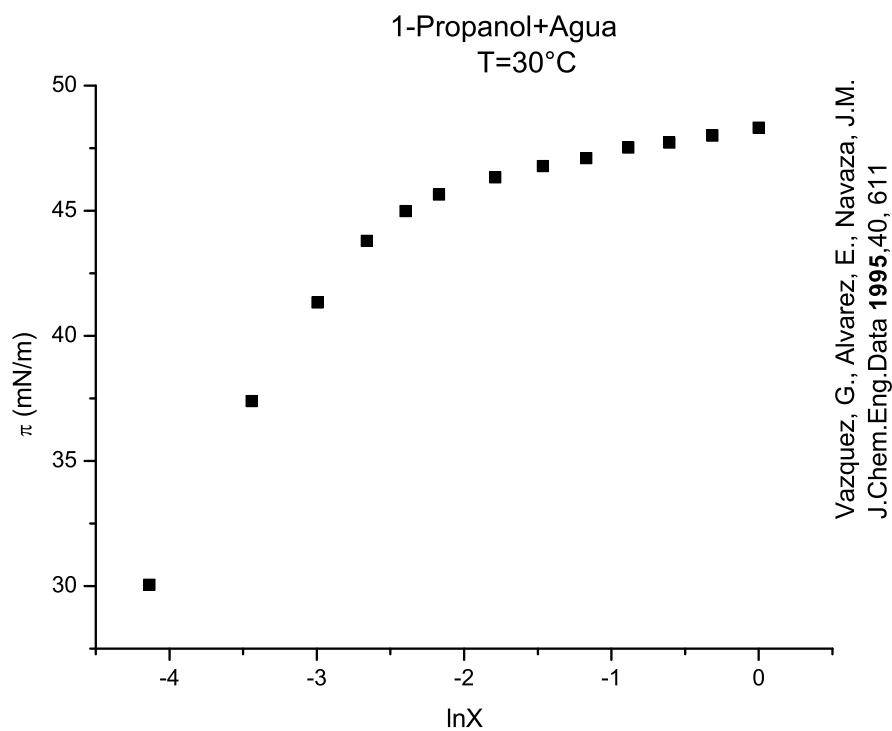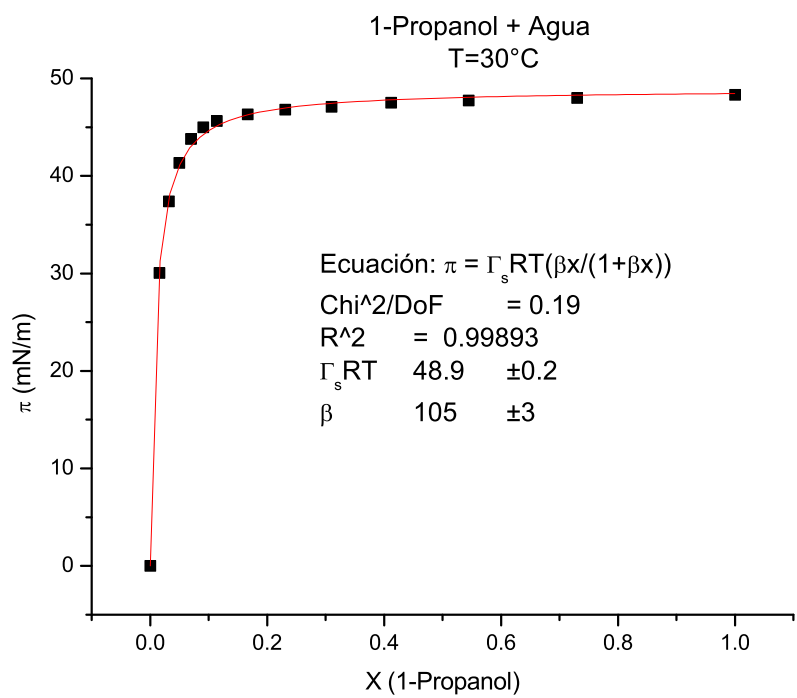
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Tabla D.32: 1-Propanol + Agua a T=30°C [51]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	71.21	0	–
0.016	41.16	30.05	-4.13517
0.032	33.81	37.4	-3.44202
0.05	29.88	41.33	-2.99573
0.07	27.41	43.8	-2.65926
0.091	26.22	44.99	-2.3969
0.114	25.56	45.65	-2.17156
0.167	24.88	46.33	-1.78976
0.231	24.42	46.79	-1.46534
0.31	24.11	47.1	-1.17118
0.412	23.69	47.52	-0.88673
0.545	23.48	47.73	-0.60697
0.73	23.21	48	-0.31471
1	22.89	48.32	0

1-Propanol+Agua
T=35°C

1-Propanol+Agua
T=35°C

Modelo: Langmuir

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.23

R^2   = 0.99944

$\Gamma_s RT$ 9.4   ±0.5

β 1471   ±317

$0 \leq X \leq 0.07$

1-Propanol + Agua
T=35°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.18
R^2   = 0.99895
$\Gamma_s RT$ 48.5   ±0.2
β 106   ±3

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π (mN/m)

X (1-Propanol)

Tabla D.33: 1-Propanol + Agua a T=35°C [51]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	70.42	0	–
0.016	40.53	29.89	-4.13517
0.032	33.26	37.16	-3.44202
0.05	29.39	41.03	-2.99573
0.07	26.96	43.46	-2.65926
0.091	25.79	44.63	-2.3969
0.114	25.16	45.26	-2.17156
0.167	24.51	45.91	-1.78976
0.231	24.02	46.4	-1.46534
0.31	23.73	46.69	-1.17118
0.412	23.31	47.11	-0.88673
0.545	23.09	47.33	-0.60697
0.73	22.84	47.58	-0.31471
1	22.51	47.91	0

1-Propanol+Agua
T=40°C

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1-Propanol+Agua
T=40°C

Modelo: Langmuir

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.23

R^2   = 0.99943

$\Gamma_s RT$ 9.3   ±0.5

β 1517   ±334

$0 \leq X \leq 0.07$

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1-Propanol + Agua
T=40°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.17
R^2   = 0.99898
$\Gamma_s RT$ 47.9   ±0.2
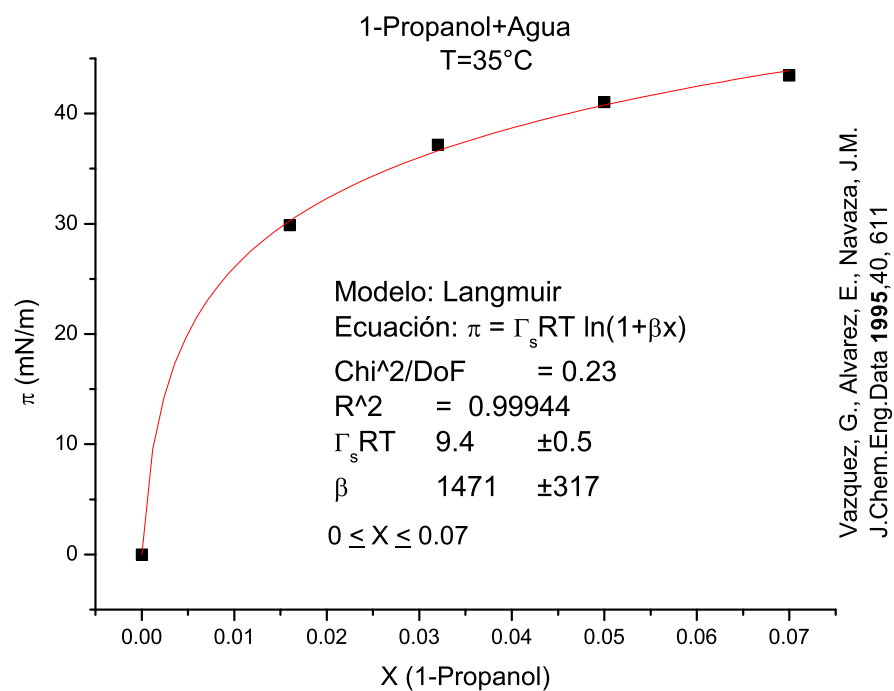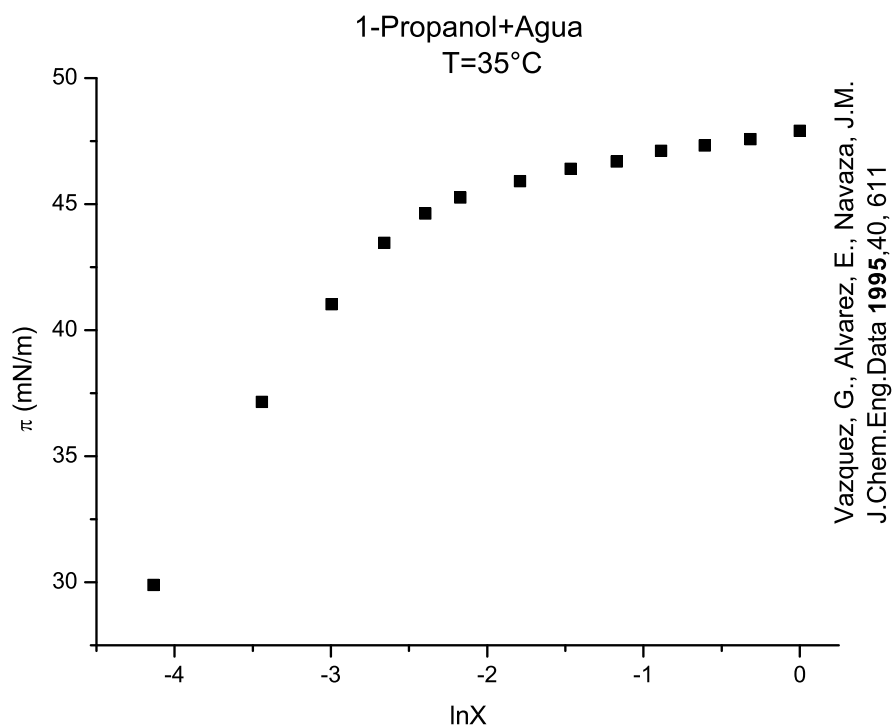β 107   ±3
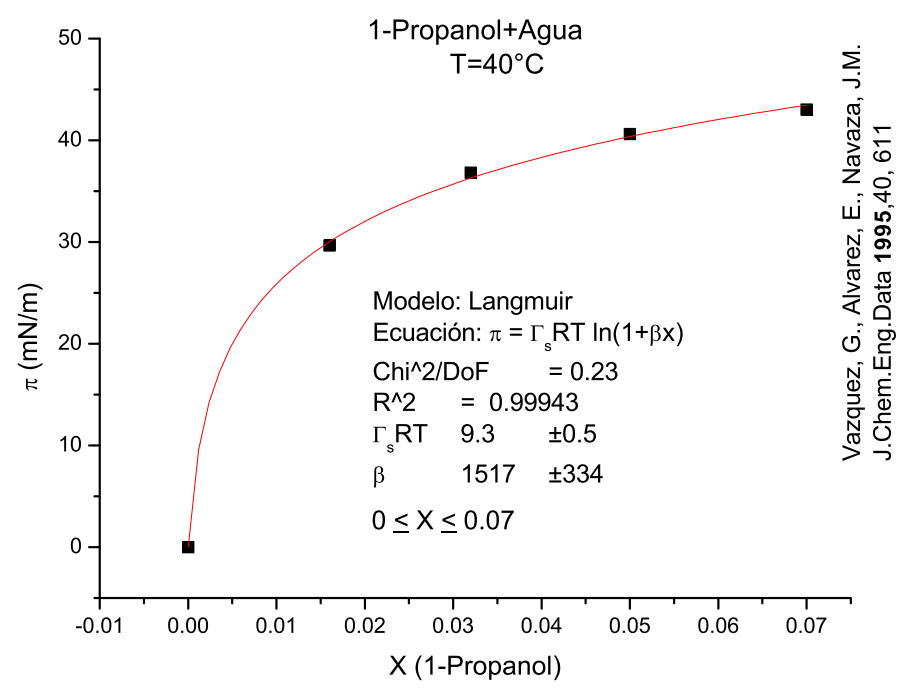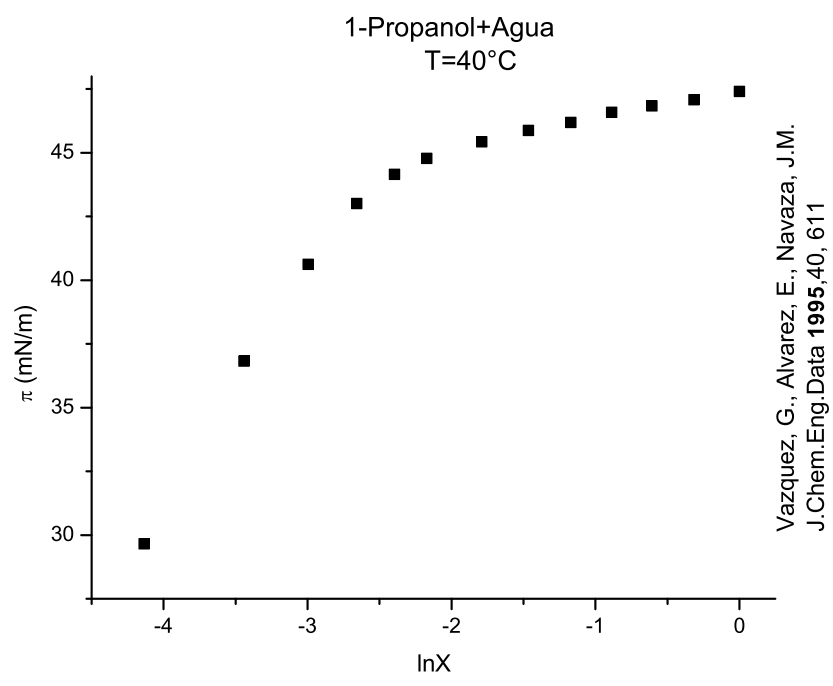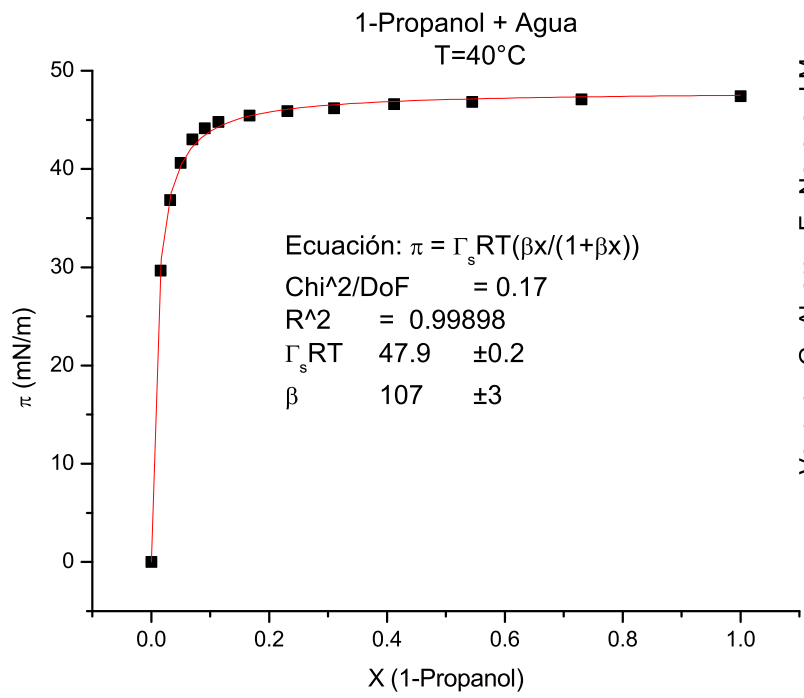
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Tabla D.34: 1-Propanol + Agua a T=40°C [51]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	69.52	0	–
0.016	39.86	29.66	-4.13517
0.032	32.69	36.83	-3.44202
0.05	28.89	40.63	-2.99573
0.07	26.51	43.01	-2.65926
0.091	25.36	44.16	-2.3969
0.114	24.74	44.78	-2.17156
0.167	24.09	45.43	-1.78976
0.231	23.64	45.88	-1.46534
0.31	23.33	46.19	-1.17118
0.412	22.93	46.59	-0.88673
0.545	22.68	46.84	-0.60697
0.73	22.44	47.08	-0.31471
1	22.11	47.41	0

1-Propanol+Agua
T=45°C

π (mN/m)

lnX

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1-Propanol+Agua
T=45°C

π (mN/m)

X (1-Propanol)

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF   = 0.25
R^2   = 0.99938
$\Gamma_s RT$ 9.2   ±0.5
β 1581   ±367

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1-Propanol + Agua
T=45°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.17
R^2   = 0.99899
$\Gamma_s RT$ 47.6   ±0.2
β 108   ±3

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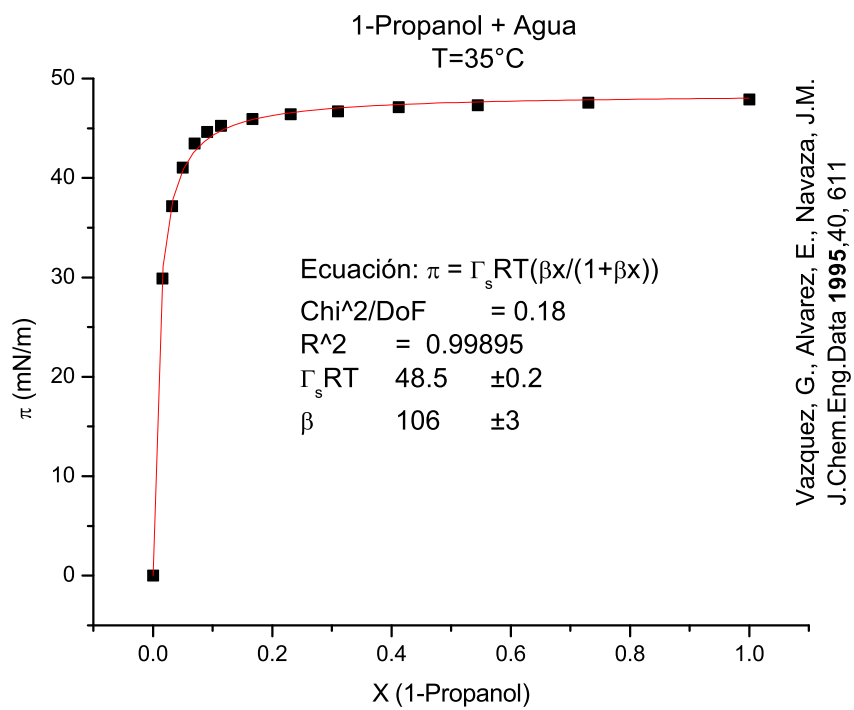J.Chem.Eng.Data **1995**,40, 611

Tabla D.35: 1-Propanol + Agua a T=45°C [51]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
0	68.84	0	–
0.016	39.22	29.62	-4.13517
0.032	32.08	36.76	-3.44202
0.05	28.36	40.48	-2.99573
0.07	26.03	42.81	-2.65926
0.091	24.91	43.93	-2.3969
0.114	24.29	44.55	-2.17156
0.167	23.69	45.15	-1.78976
0.231	23.24	45.6	-1.46534
0.31	22.92	45.92	-1.17118
0.412	22.54	46.3	-0.88673
0.545	22.28	46.56	-0.60697
0.73	22.04	46.8	-0.31471
1	21.69	47.15	0

1-Propanol+Agua
T=50°C

π (mN/m)

lnX

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1-Propanol+Agua
T=50°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT * \ln(1+\beta * x)$

Chi^2/DoF   = 0.29
R^2   = 0.99928
$\Gamma_s RT$ 6.1   ±0.5
β 13400 ±6776
$0 \le X \le 0.07$

π (mN/m)

X (1-Propanol)

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1-Propanol + Agua
T=50°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.41
R^2   = 0.99745
$\Gamma_s RT$ 46.5   ±0.2
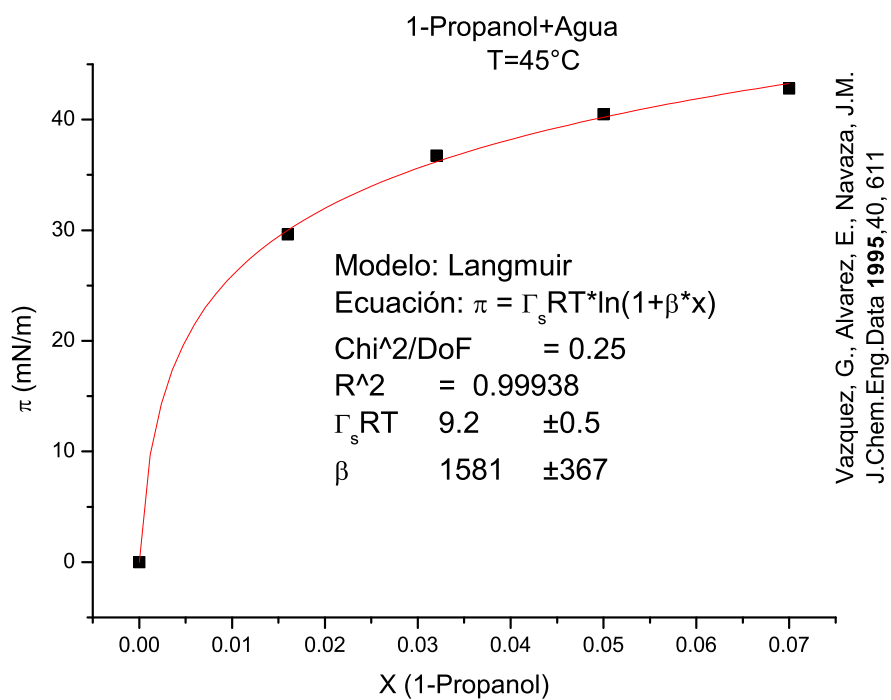β 139   ±8
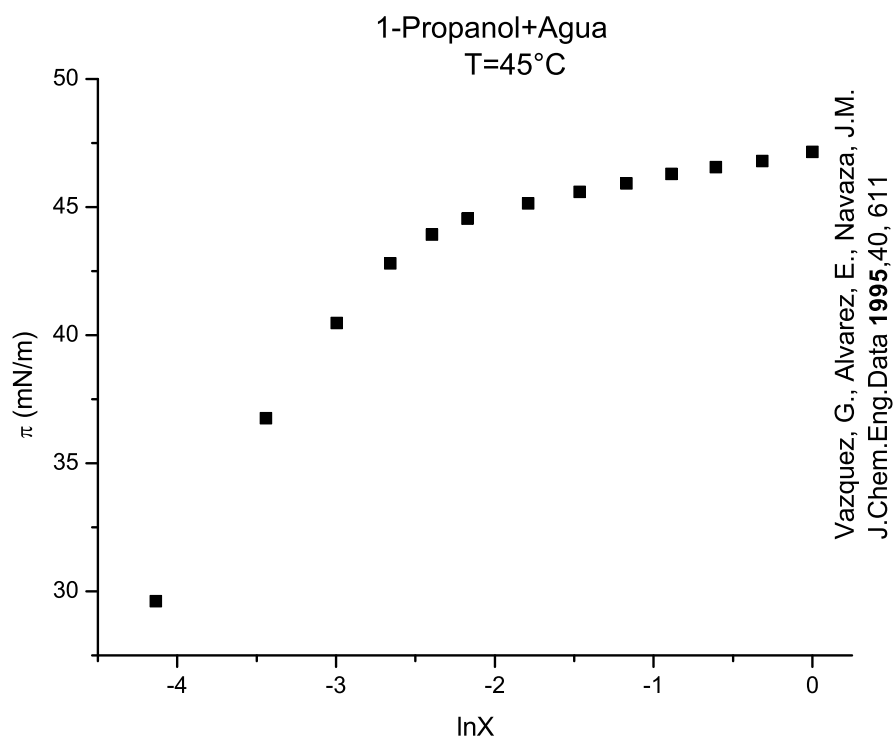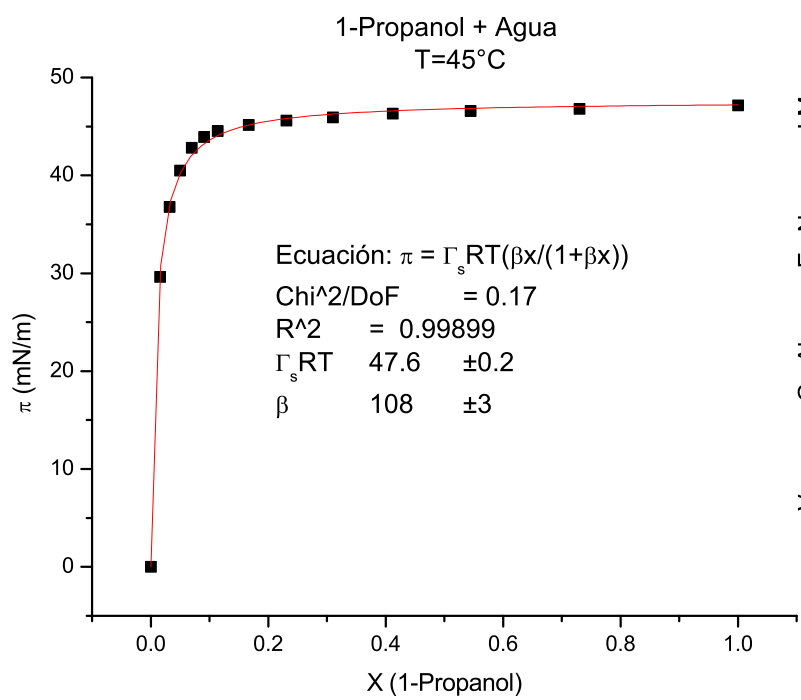
π (mN/m)

X (1-Propanol)

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Tabla D.36: 1-Propanol + Agua a T=50°C [51]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	67.92	0	–
0.016	34.54	33.38	-4.13517
0.032	31.48	36.44	-3.44202
0.05	27.9	40.02	-2.99573
0.07	25.59	42.33	-2.65926
0.091	24.49	43.43	-2.3969
0.114	23.88	44.04	-2.17156
0.167	23.32	44.6	-1.78976
0.231	22.86	45.06	-1.46534
0.31	22.54	45.38	-1.17118
0.412	22.14	45.78	-0.88673
0.545	21.91	46.01	-0.60697
0.73	21.66	46.26	-0.31471
1	21.31	46.61	0

2-Propanol+Agua
T=20°C

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2-Propanol+Agua
T=20°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT * \ln(1+\beta * x)$

Chi^2/DoF   = 0.09
R^2   = 0.99974
$\Gamma_s RT$ 15   ±0.5
β 225   ±18
$0 \le X \le 0.07$

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2-Propanol + Agua
T=20°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.36
R^2   = 0.99836
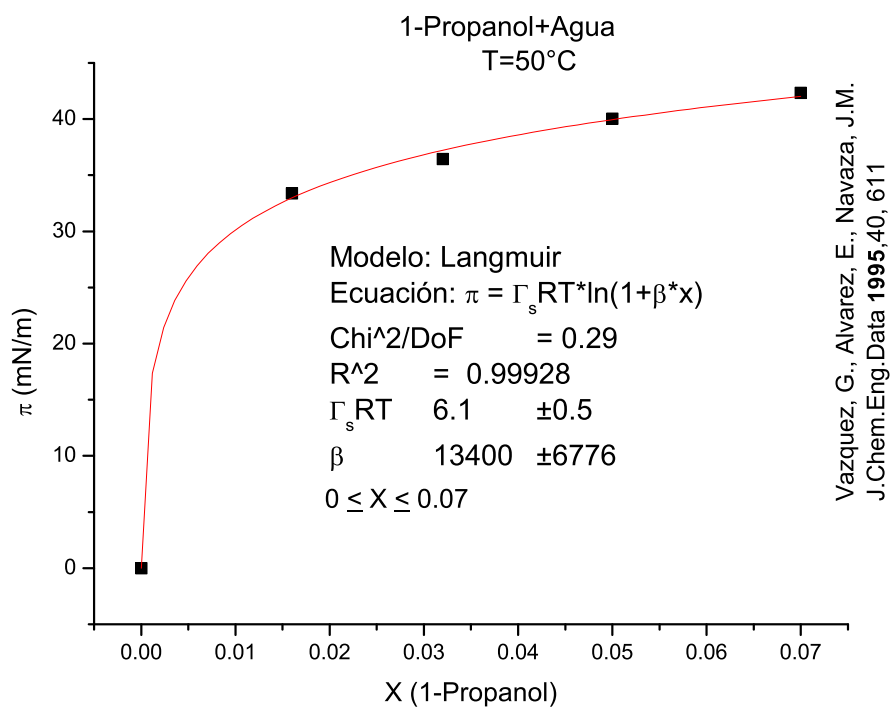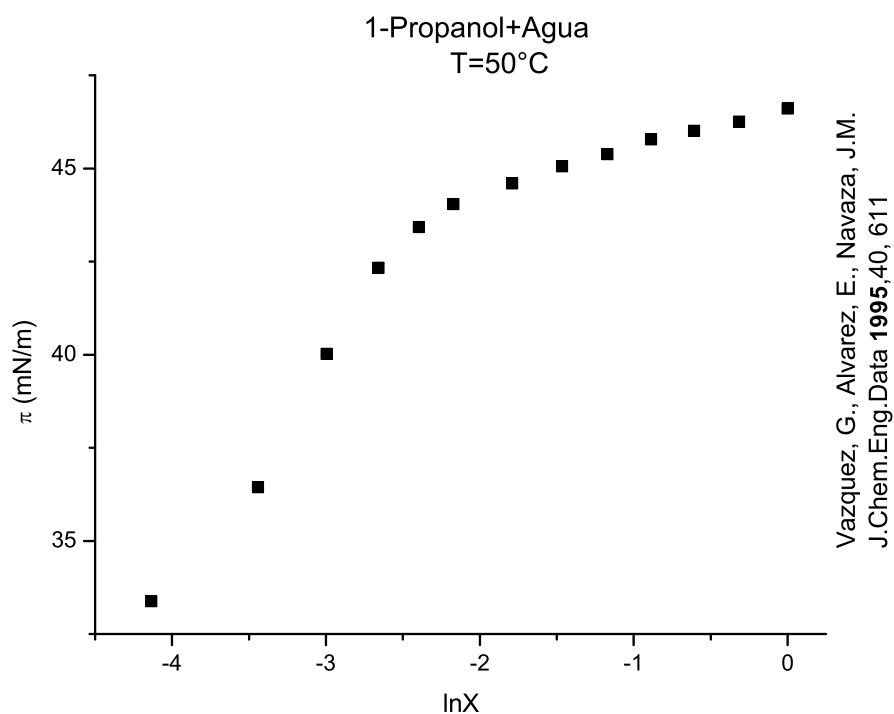$\Gamma_s RT$ 52.3   ±0.3
β 50   ±2

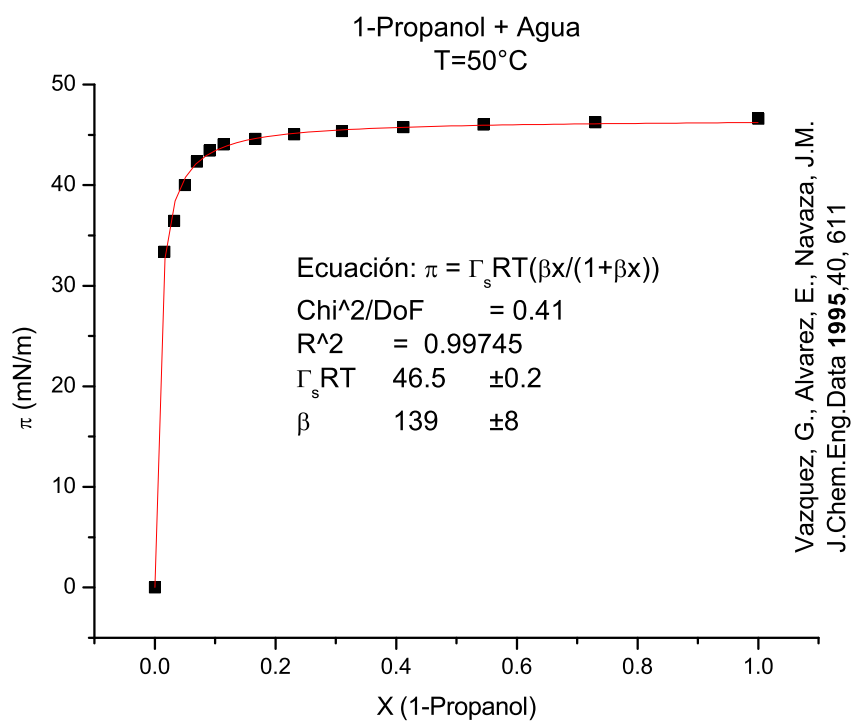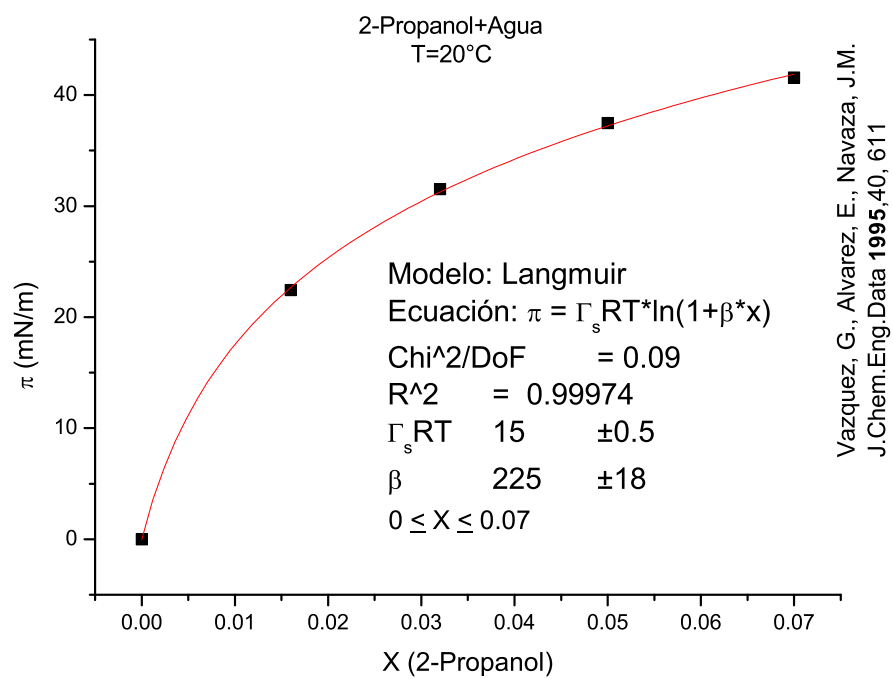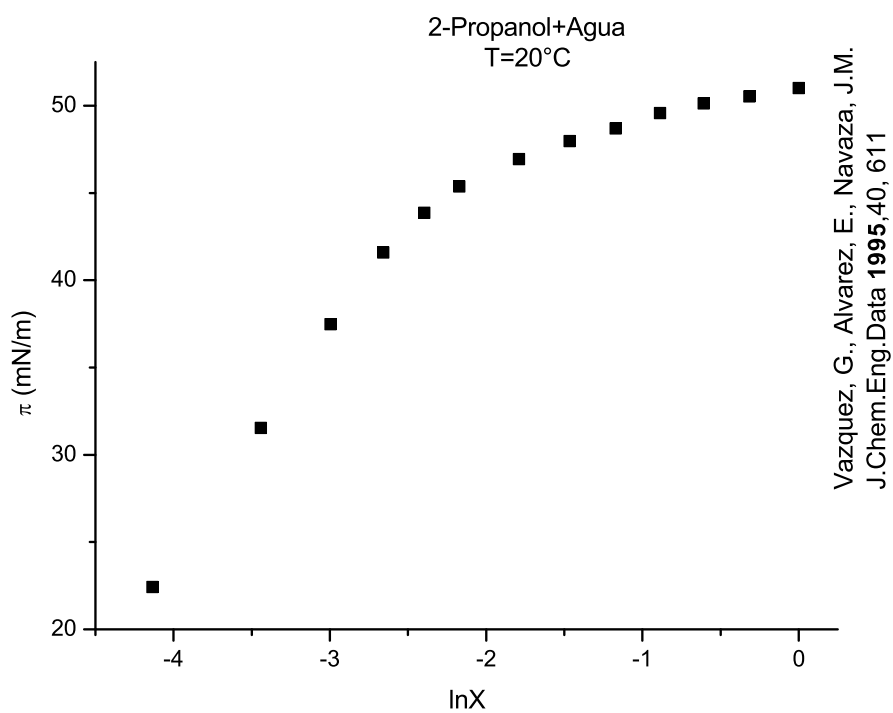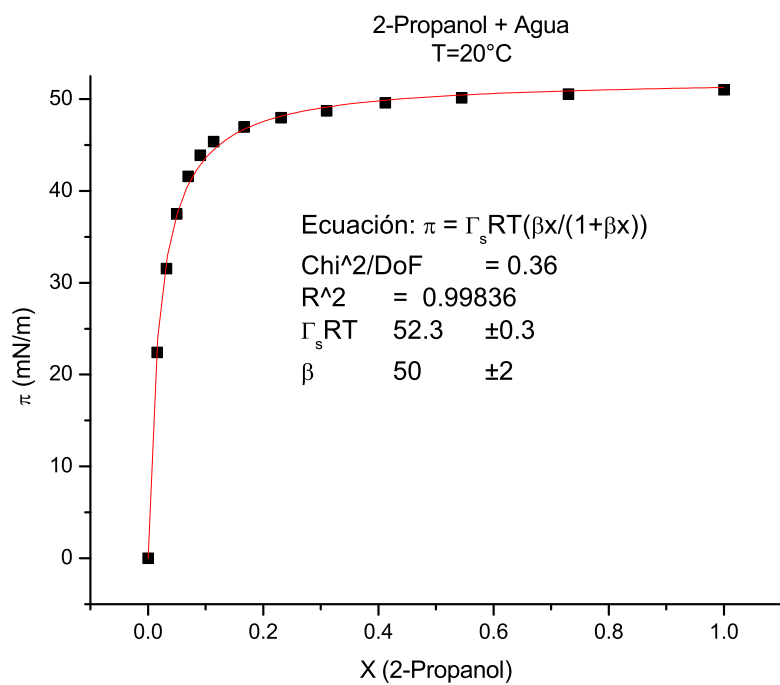Vazquez, G., Alvarez, E., Navaza, J.M.
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Tabla D.37: 2-Propanol + Agua a T=20°C [51]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	72.75	0	–
0.016	50.32	22.43	-4.13517
0.032	41.21	31.54	-3.44202
0.05	35.27	37.48	-2.99573
0.07	31.16	41.59	-2.65926
0.091	28.88	43.87	-2.3969
0.114	27.38	45.37	-2.17156
0.167	25.81	46.94	-1.78976
0.231	24.78	47.97	-1.46534
0.31	24.05	48.7	-1.17118
0.412	23.17	49.58	-0.88673
0.545	22.62	50.13	-0.60697
0.73	22.21	50.54	-0.31471
1	21.74	51.01	0

2-Propanol+Agua
T=25°C

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2-Propanol + Agua
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF   = 0.12
R^2   = 0.99967
$\Gamma_s RT$ 15   ±0.5
β 232   ±21
$0 \leq X \leq 0.07$

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2-Propanol + Agua
T=25°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.34
R^2   = 0.99842
$\Gamma_s RT$ 52.0   ±0.3
β 51   ±2

π (mN/m)

X (2-Propanol)
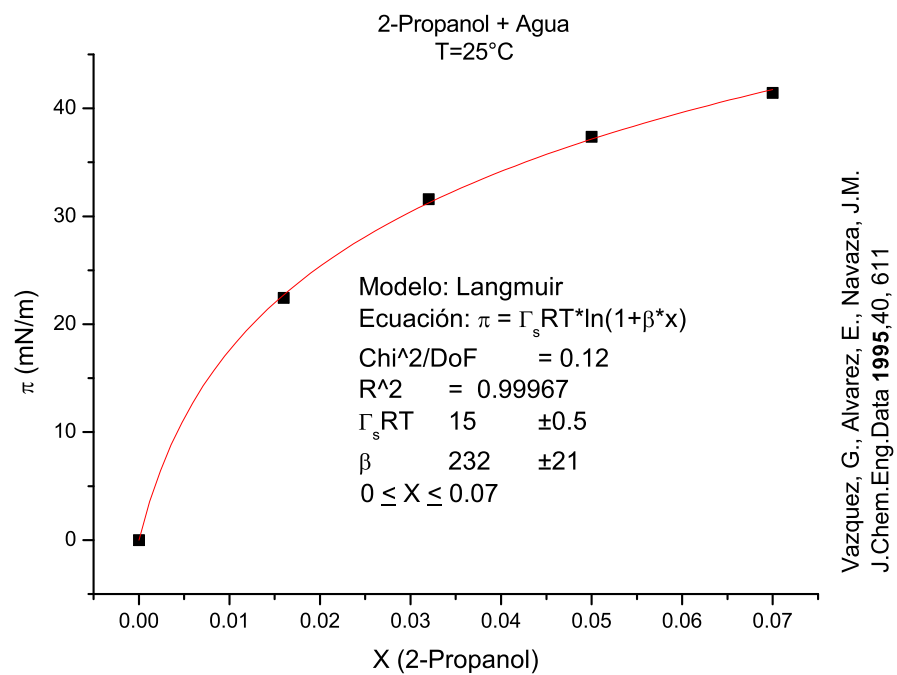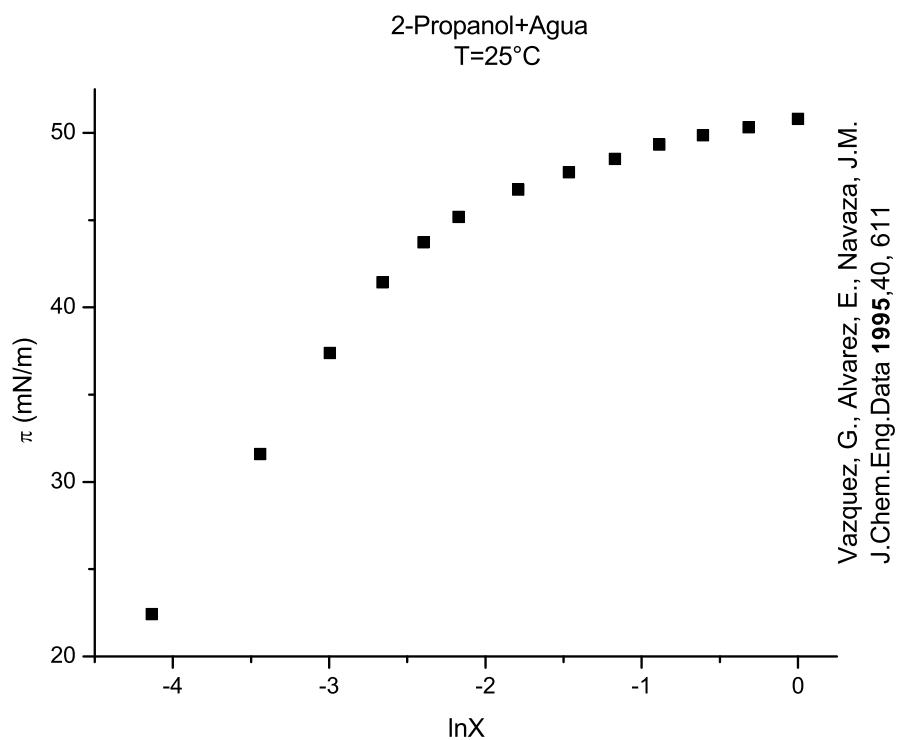
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Tabla D.38: 2-Propanol + Agua a T=25°C [51]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	72.01	0	–
0.016	49.58	22.43	-4.13517
0.032	40.42	31.59	-3.44202
0.05	34.63	37.38	-2.99573
0.07	30.57	41.44	-2.65926
0.091	28.28	43.73	-2.3969
0.114	26.82	45.19	-2.17156
0.167	25.27	46.74	-1.78976
0.231	24.26	47.75	-1.46534
0.31	23.51	48.5	-1.17118
0.412	22.68	49.33	-0.88673
0.545	22.14	49.87	-0.60697
0.73	21.69	50.32	-0.31471
1	21.22	50.79	0

2-Propanol+Agua
T=30°C

π (mN/m)

lnX

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2-Propanol+Agua
T=30°C

π (mN/m)

X (2-Propanol)

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.13
R^2   = 0.99964
$\Gamma_s RT$ 14.6   ±0.5
β 233   ±22

$0 \leq X \leq 0.07$

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2-Propanol + Agua
T=30°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.34
R^2   = 0.99841
$\Gamma_s RT$ 52   ±0.3
β 51   ±2

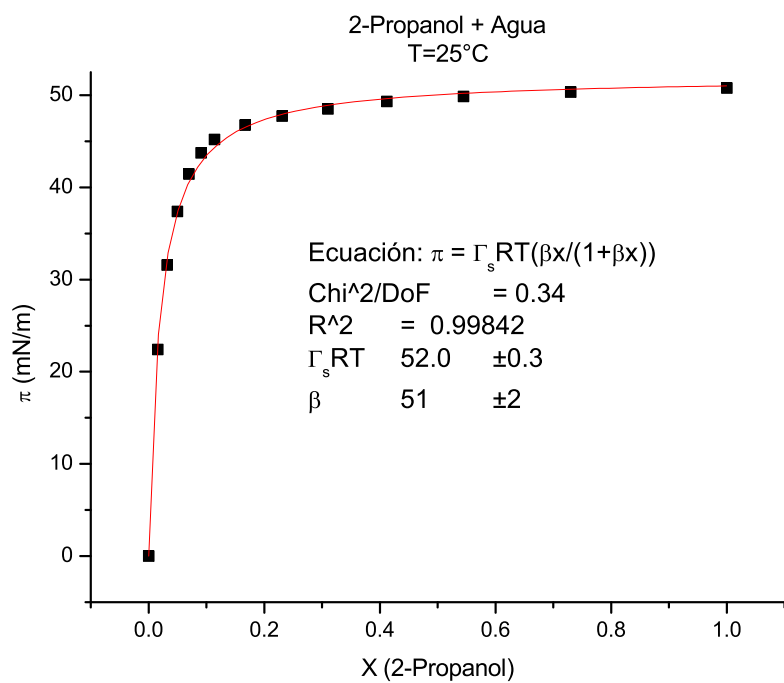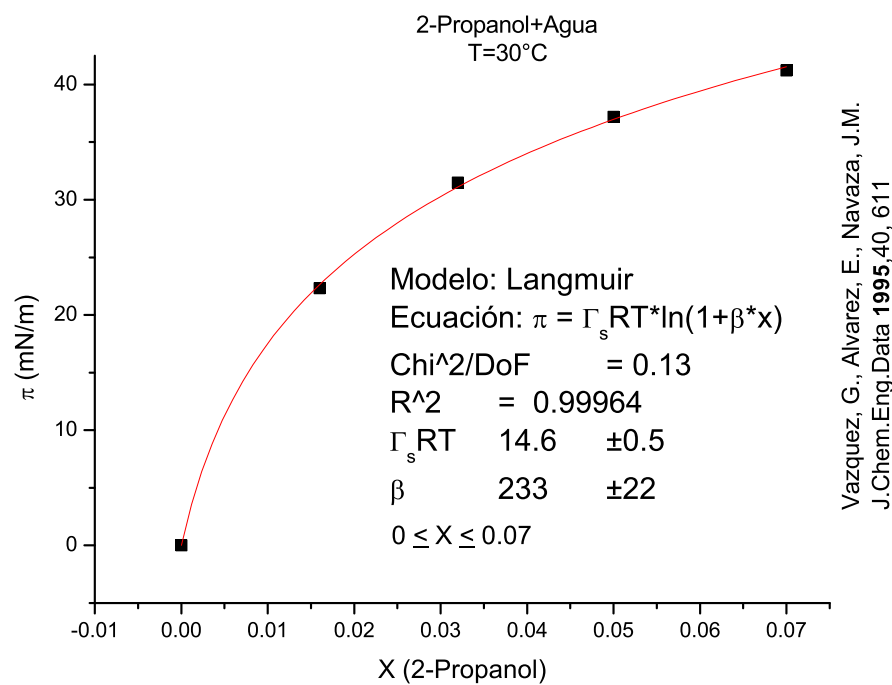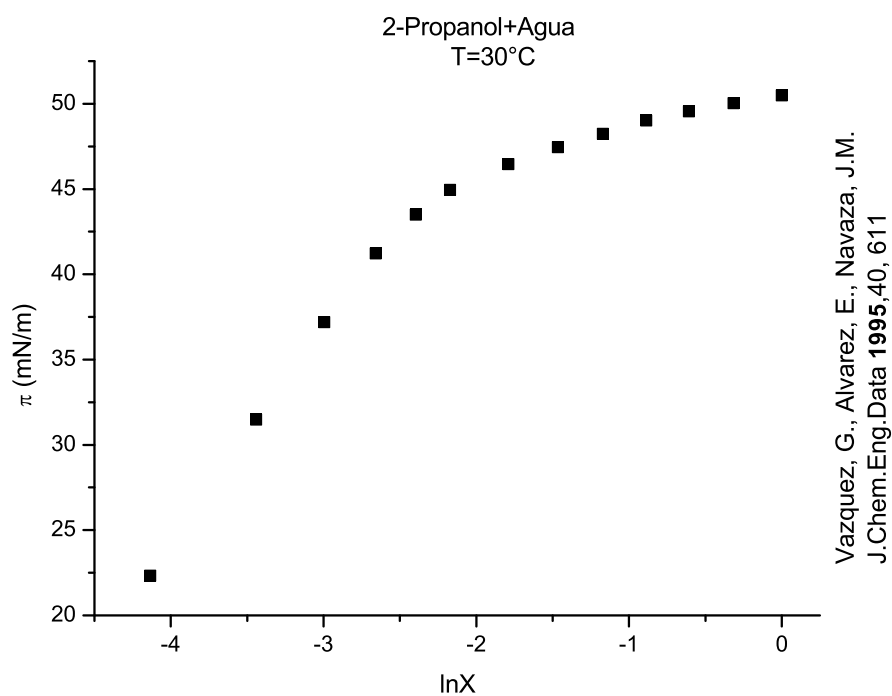π (mN/m)

X (2-Propanol)

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Tabla D.39: 2-Propanol + Agua a T=30°C [51]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	71.21	0	–
0.016	48.88	22.33	-4.13517
0.032	39.73	31.48	-3.44202
0.05	34.01	37.2	-2.99573
0.07	29.98	41.23	-2.65926
0.091	27.71	43.5	-2.3969
0.114	26.26	44.95	-2.17156
0.167	24.74	46.47	-1.78976
0.231	23.76	47.45	-1.46534
0.31	22.97	48.24	-1.17118
0.412	22.18	49.03	-0.88673
0.545	21.66	49.55	-0.60697
0.73	21.18	50.03	-0.31471
1	20.72	50.49	0
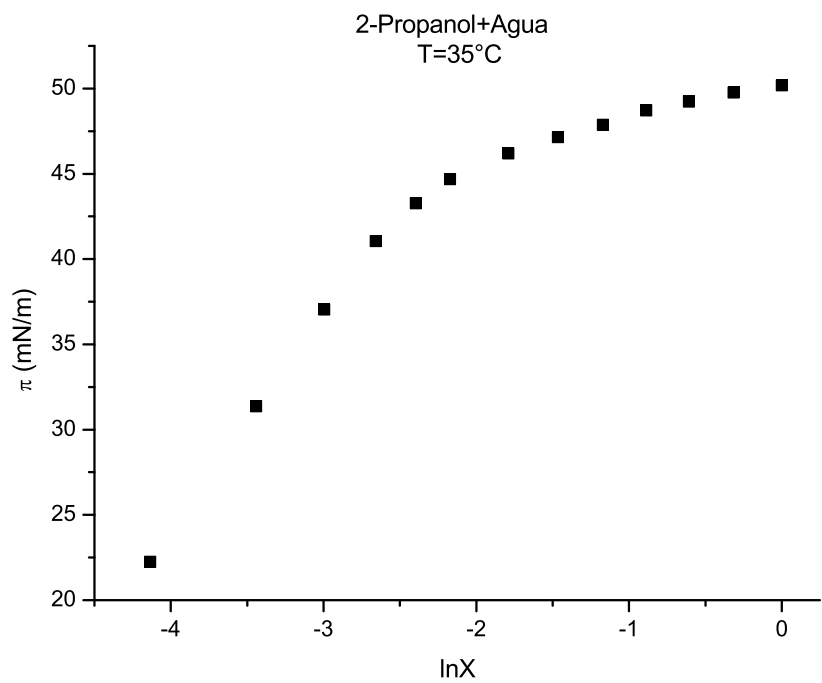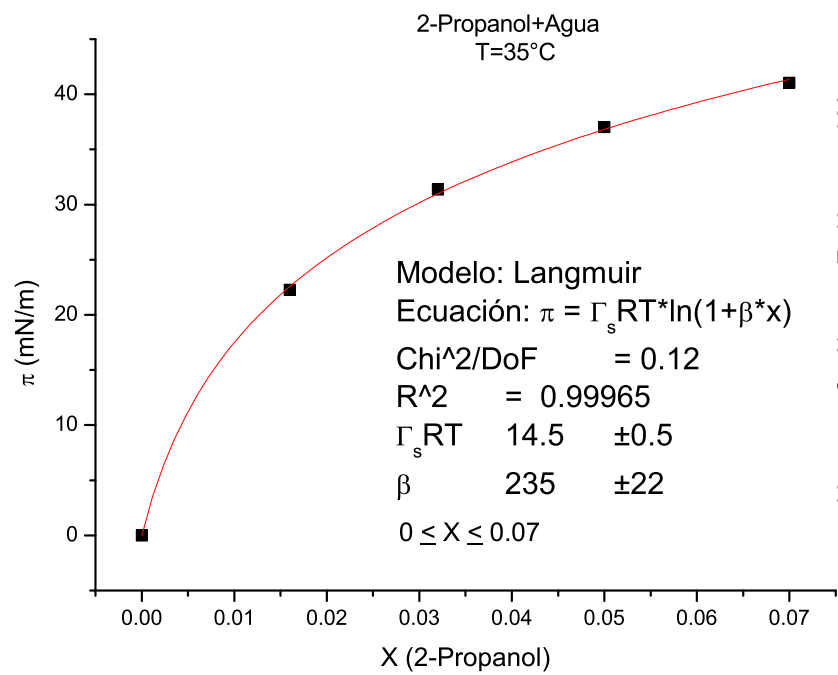
2-Propanol+Agua
T=35°C

π (mN/m)

lnX

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2-Propanol+Agua
T=35°C

π (mN/m)

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.12
R^2   = 0.99965
Γ_sRT   14.5   ±0.5
β 235   ±22

$0 \le X \le 0.07$

X (2-Propanol)

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2-Propanol+Agua
T=35°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF = 0.35

R^2 = 0.99837

$\Gamma_s RT$ 51.3 ±0.3

β 51 ±2

π (mN/m)
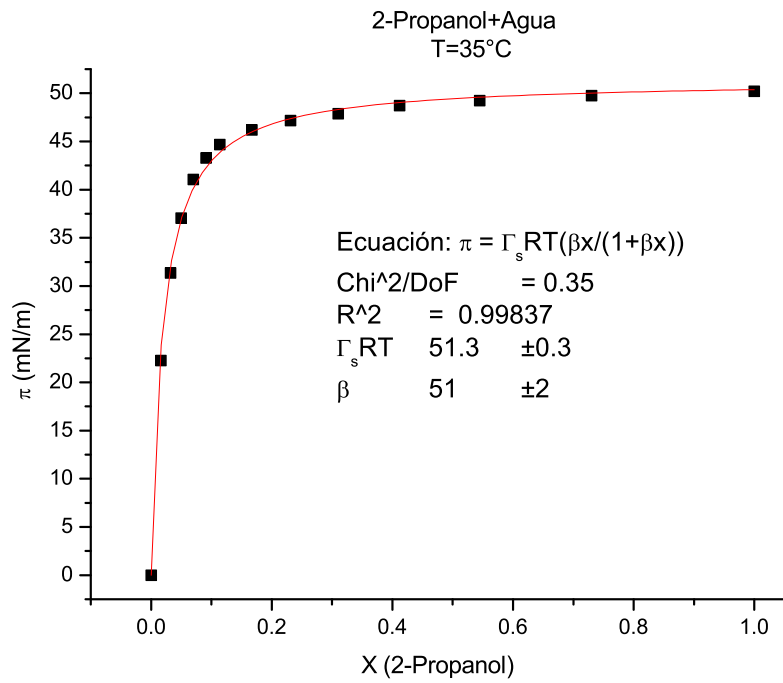
X (2-Propanol)

Vazquez, G., Alvarez, E., Navaza, J.M.
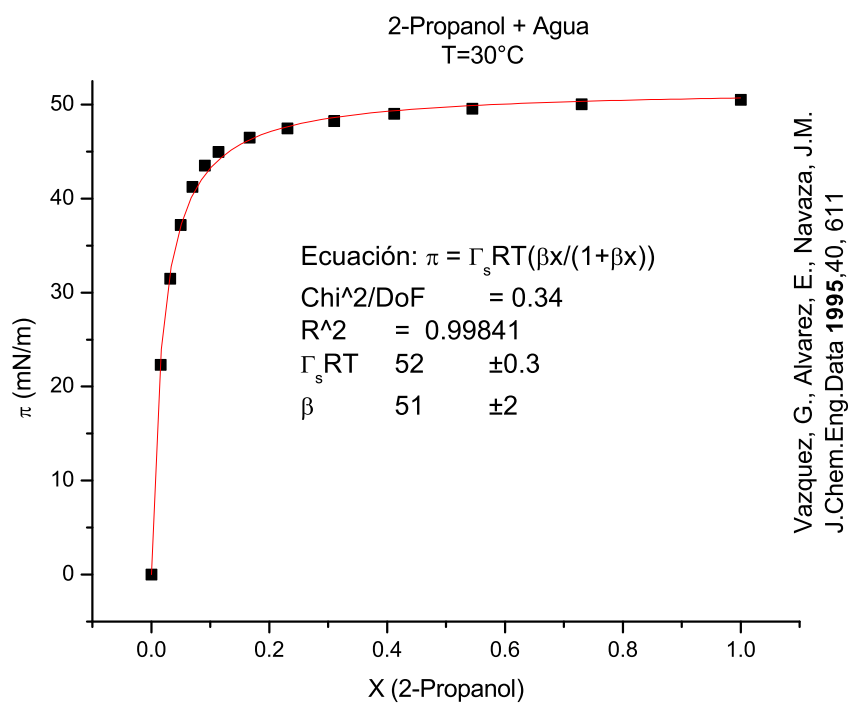J.Chem.Eng.Data **1995**,40, 611

Tabla D.40: 2-Propanol + Agua a T=35°C [51]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	70.42	0	–
0.016	48.16	22.26	-4.13517
0.032	39.06	31.36	-3.44202
0.05	33.38	37.04	-2.99573
0.07	29.37	41.05	-2.65926
0.091	27.14	43.28	-2.3969
0.114	25.73	44.69	-2.17156
0.167	24.23	46.19	-1.78976
0.231	23.27	47.15	-1.46534
0.31	22.54	47.88	-1.17118
0.412	21.71	48.71	-0.88673
0.545	21.18	49.24	-0.60697
0.73	20.66	49.76	-0.31471
1	20.23	50.19	0

2-Propanol+Agua
T=40°C

Vazquez, G., Alvarez, E., Navaza, J.M.
J.Chem.Eng.Data **1995**,40, 611

2-Propanol+Agua
T=40°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT^* \ln(1+\beta^* x)$

Chi^2/DoF   = 0.11
R^2   = 0.99969
$\Gamma_s RT$ 14.3   ±0.5
β 237   ±21
$0 \le X \le 0.07$

Vazquez, G., Alvarez, E., Navaza, J.M.
J.Chem.Eng.Data **1995**,40, 611

2-Propanol-Agua
T=40°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.34
R^2   = 0.99837
$\Gamma_s RT$ 50.9   ±0.3
β 51   ±2

π (mN/m)

X (2-Propanol)

Vazquez, G., Alvarez, E., Navaza, J.M.
J.Chem.Eng.Data **1995**,40, 611

Tabla D.41: 2-Propanol + Agua a T=40°C [51]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	69.52	0	–
0.016	47.37	22.15	-4.13517
0.032	38.43	31.09	-3.44202
0.05	32.76	36.76	-2.99573
0.07	28.79	40.73	-2.65926
0.091	26.58	42.94	-2.3969
0.114	25.18	44.34	-2.17156
0.167	23.72	45.8	-1.78976
0.231	22.78	46.74	-1.46534
0.31	22.03	47.49	-1.17118
0.412	21.22	48.3	-0.88673
0.545	20.71	48.81	-0.60697
0.73	20.16	49.36	-0.31471
1	19.71	49.81	0

2-Propanol+Agua
T=45°C

Vazquez, G., Alvarez, E., Navaza, J.M.
J.Chem.Eng.Data **1995**,40, 611

2-Propanol+Agua
T=45°C

Modelo: Langmuir

Ecuación: $\pi = \Gamma_s RT*ln(1+\beta*x)$

Chi^2/DoF = 0.101

R^2 = 0.99971

$\Gamma_s RT$ 14.2   ±0.5

β 241   ±21

$0 \leq X \leq 0.07$

Vazquez, G., Alvarez, E., Navaza, J.M.
J.Chem.Eng.Data **1995**,40, 611

2-Propanol+Agua
T=45°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.34

R^2   = 0.99837

$\Gamma_s RT$ 50.7   ±0.3

β 52   ±2

Vazquez, G., Alvarez, E., Navaza, J.M.
J.Chem.Eng.Data **1995**,40, 611
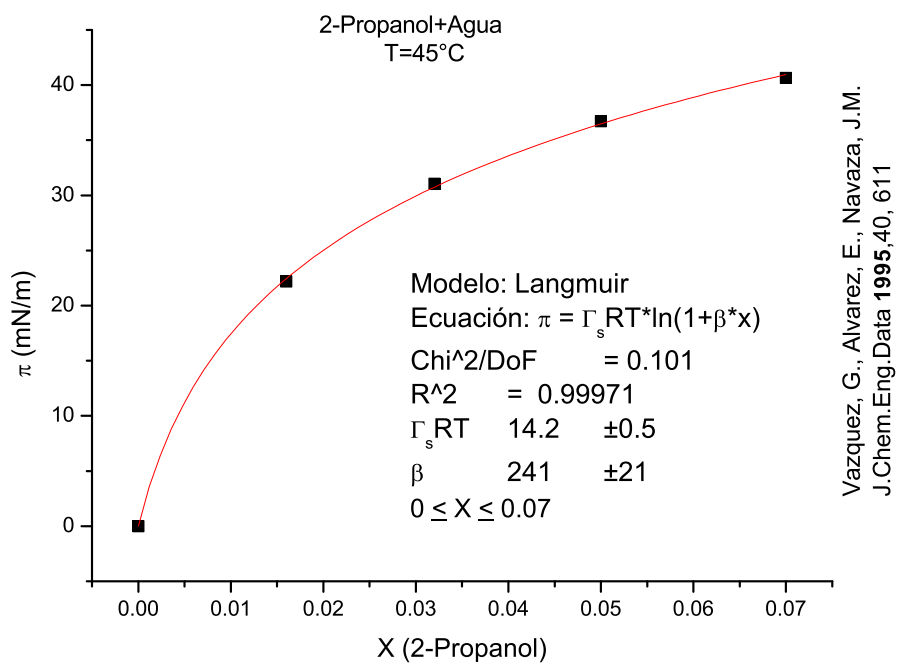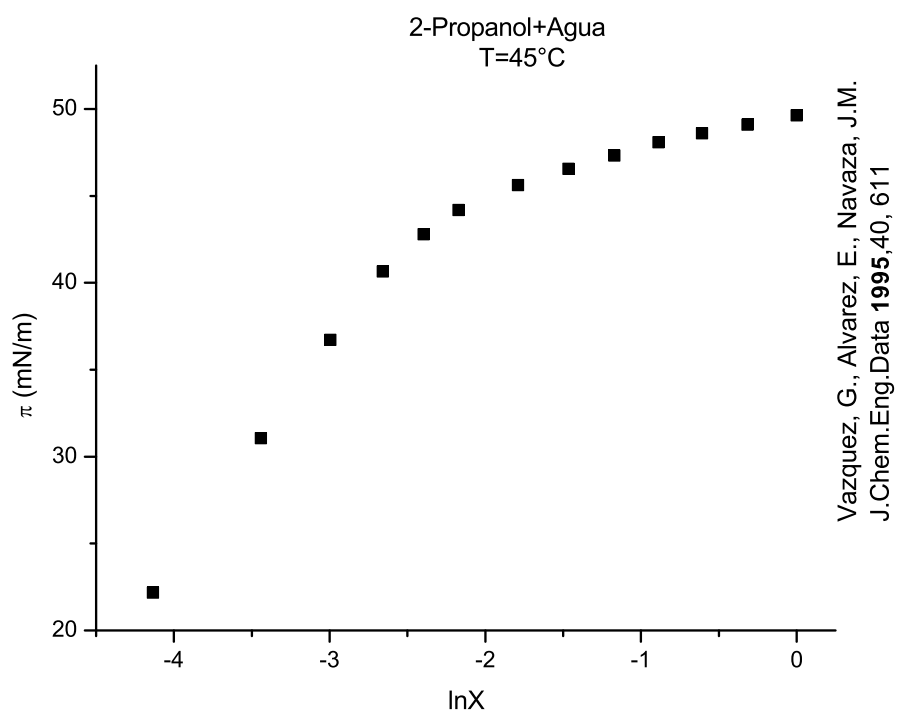
Tabla D.42: 2-Propanol + Agua a T=45°C[51]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	68.84	0	–
0.016	46.66	22.18	-4.13517
0.032	37.78	31.06	-3.44202
0.05	32.13	36.71	-2.99573
0.07	28.18	40.66	-2.65926
0.091	26.04	42.8	-2.3969
0.114	24.66	44.18	-2.17156
0.167	23.21	45.63	-1.78976
0.231	22.29	46.55	-1.46534
0.31	21.52	47.32	-1.17118
0.412	20.76	48.08	-0.88673
0.545	20.23	48.61	-0.60697
0.73	19.74	49.1	-0.31471
1	19.21	49.63	0

2-Propanol+Agua
T=50°C

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2-Propanol+Agua
T=50°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT * \ln(1+\beta * x)$

Chi^2/DoF   = 0.096
R^2   = 0.99972
$\Gamma_s RT$ 14   ±0.4
β 248   ±21

$0 \leq X \leq 0.07$

Vazquez, G., Alvarez, E., Navaza, J.M.
J.Chem.Eng.Data **1995**,40, 611

2-Propanol+Agua
T=50°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.32
R^2   = 0.99842
$\Gamma_s RT$ 50.2   ±0.3
β 52   ±2

π (mN/m)
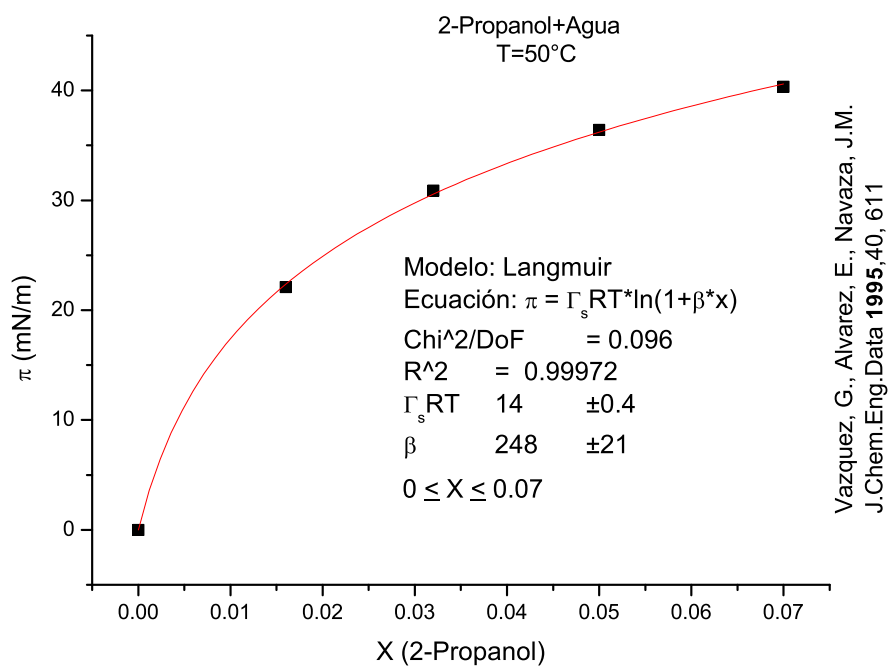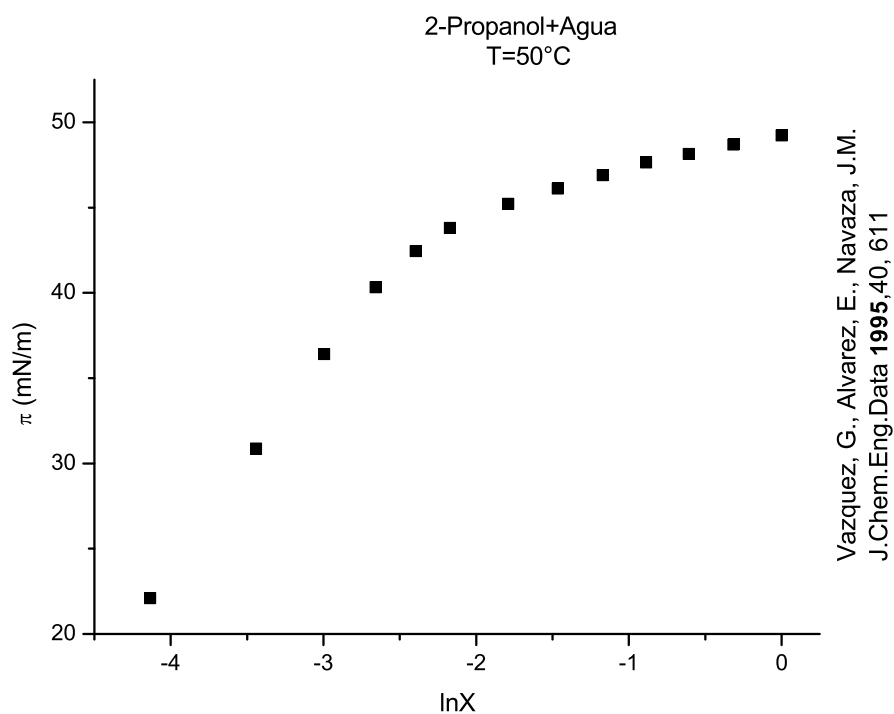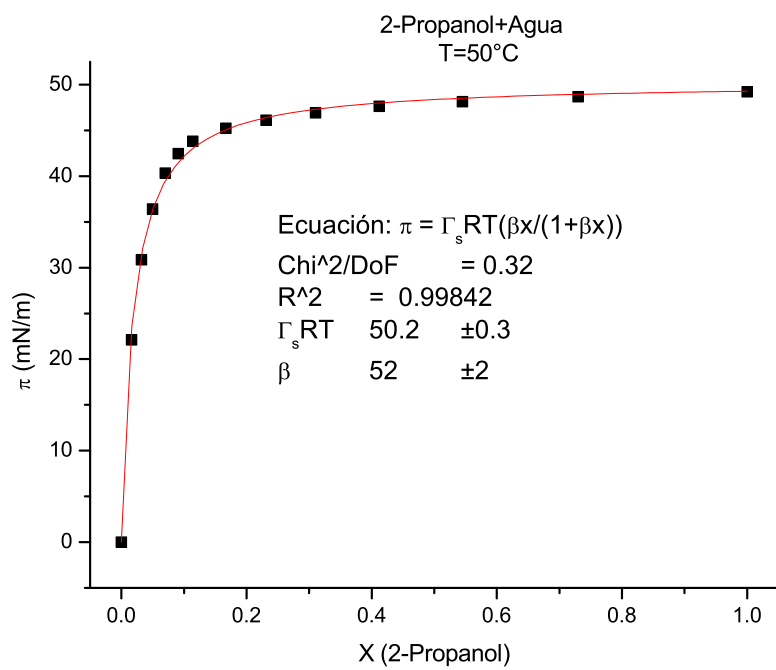
X (2-Propanol)

Vazquez, G., Alvarez, E., Navaza, J.M.
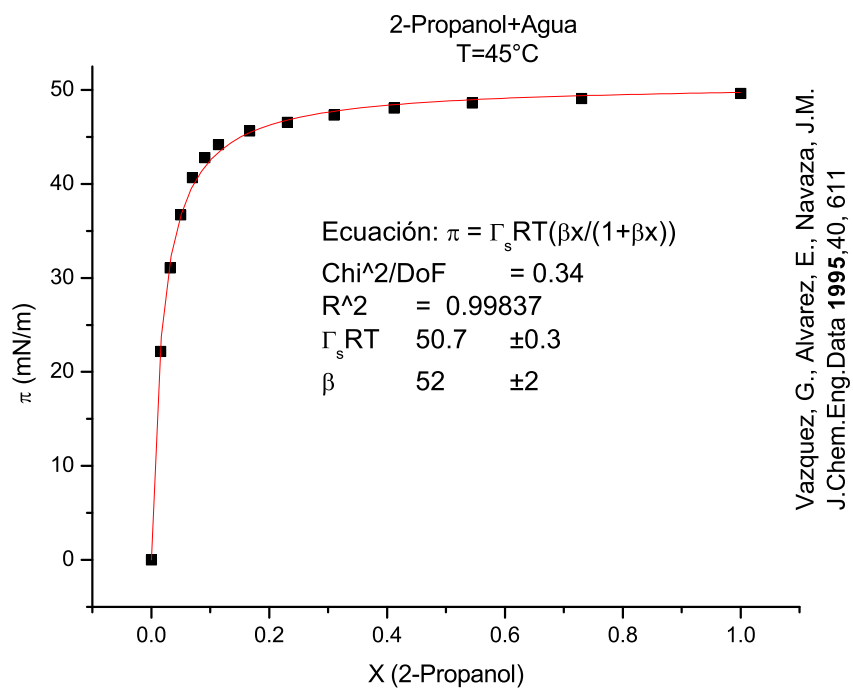J.Chem.Eng.Data **1995**,40, 611

Tabla D.43: 2-Propanol + Agua a T=50°C [51]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	67.92	0	–
0.016	45.82	22.1	-4.13517
0.032	37.04	30.88	-3.44202
0.05	31.51	36.41	-2.99573
0.07	27.59	40.33	-2.65926
0.091	25.47	42.45	-2.3969
0.114	24.11	43.81	-2.17156
0.167	22.69	45.23	-1.78976
0.231	21.81	46.11	-1.46534
0.31	21.01	46.91	-1.17118
0.412	20.28	47.64	-0.88673
0.545	19.78	48.14	-0.60697
0.73	19.23	48.69	-0.31471
1	18.69	49.23	0

Dioxano + Agua
T=25°C

Dioxano + Agua
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.24
R^2   = 0.9985
$\Gamma_s RT$ 8.7   ±0.3
β 198   ±20

$0 \leq X \leq 0.2$

Dioxano + Agua
T=25°C

Ecuación: $\pi = \Gamma_s RT\,(\beta x/(1+\beta x))$

Chi^2/DoF   = 1.22
R^2   = 0.99476
$\Gamma_s RT$ 40.2   ±0.5
β 23   ±2

π (mN/m)
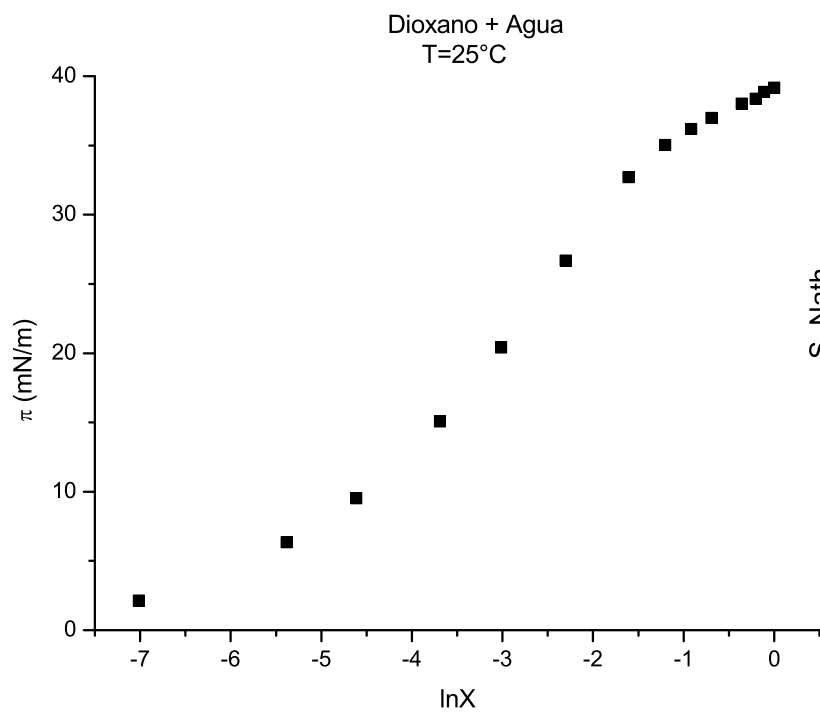
X (Dioxano)

S. Nath
J. Colloid Interface Sci. **1999**, 209, 116-122
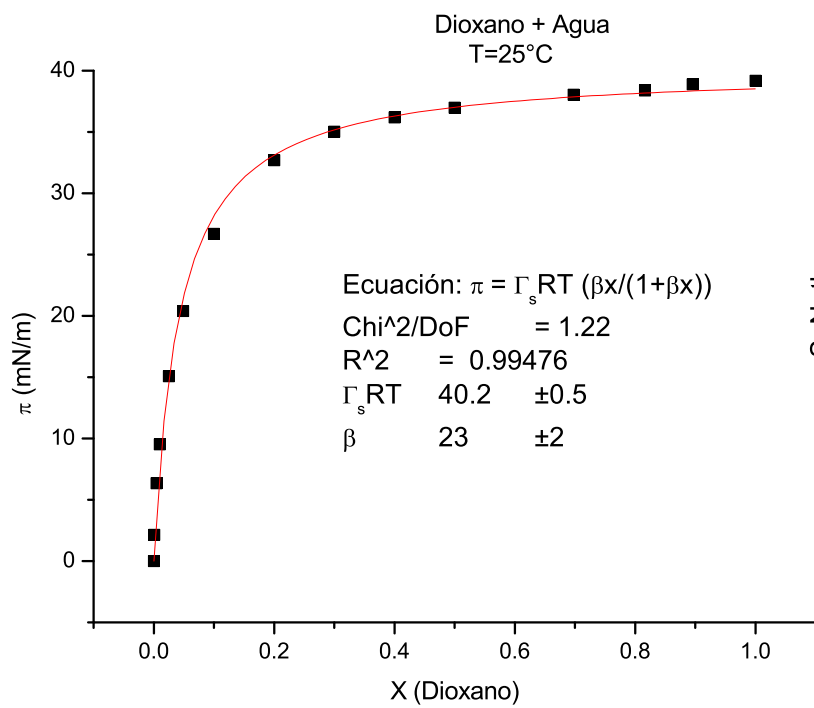
Tabla D.44: Dioxano + Agua a T=25°C [31]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	71.98	0	–
9E-4	69.83	2.15	-7.01312
0.0046	65.64	6.34	-5.3817
0.0099	62.45	9.53	-4.61522
0.025	56.9	15.08	-3.68888
0.049	51.57	20.41	-3.01593
0.1	45.3	26.68	-2.30259
0.2	39.27	32.71	-1.60944
0.3	36.95	35.03	-1.20397
0.4	35.8	36.18	-0.91629
0.5	35	36.98	-0.69315
0.698	33.95	38.03	-0.35954
0.8163	33.6	38.38	-0.20297
0.8956	33.1	38.88	-0.11026
1	32.8	39.18	0

1-Propanol + Octano
T=25°C

1-Propanol + Octano
T=25°C

Modelo: Langmuir

Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF = 0.001

R^2 = 0.99734

$\Gamma_s RT$ 1.03   ±0.08

β 14.6   ±2.4

$0 \leq X \leq 0.4493$

1-Propanol + Octano
T=25°C

π (mN/m)

X (1-Propanol)

Ecuación: $\pi = \Gamma_s RT\,(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.003
R^2   = 0.99031
$\Gamma_s RT$ 2.72   ±0.05
β 5.8   ±0.4

L. Segade, J. Jiménez, M. Domínguez, Ó. Cabeza, M. Cabanas y E. Jiménez
J. Chem. Eng. Data **2003**, 48, 1251
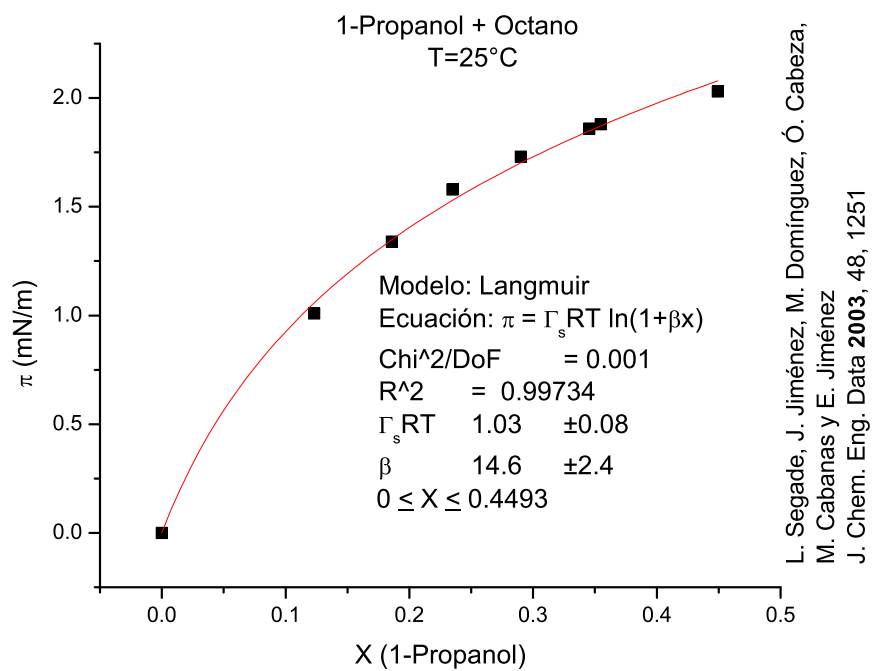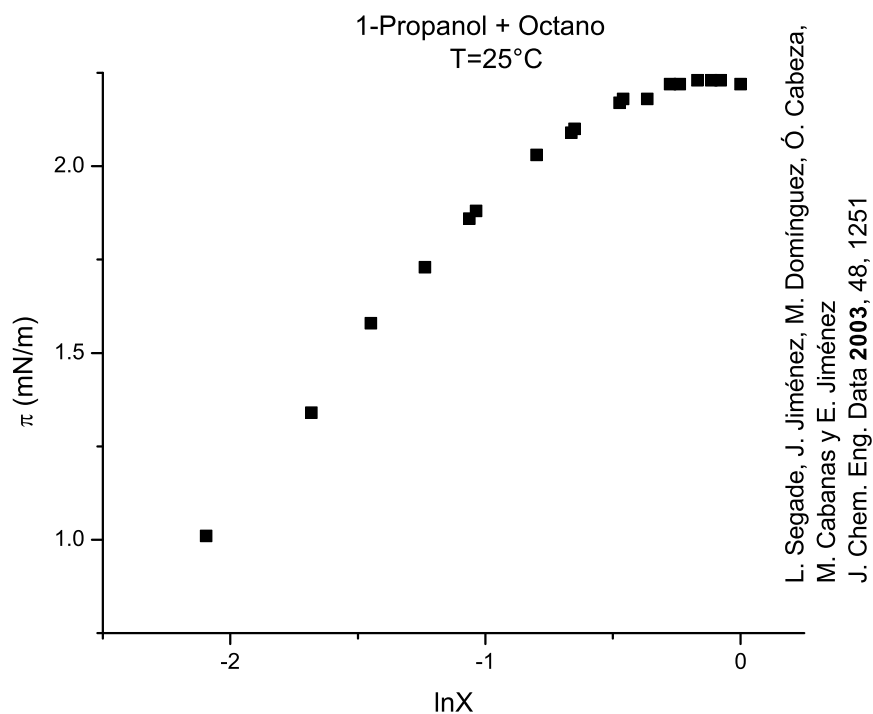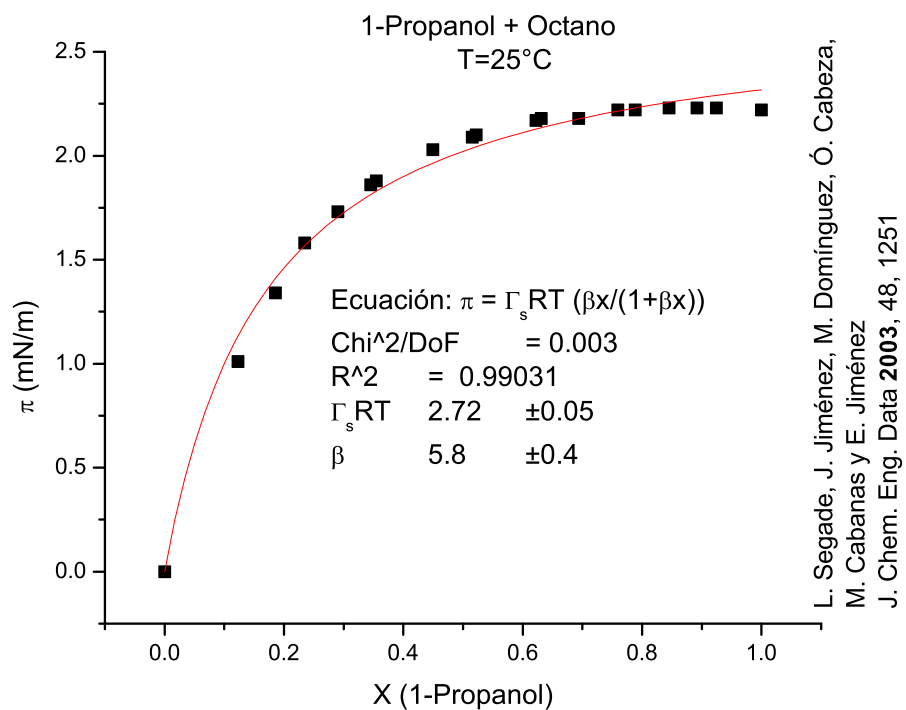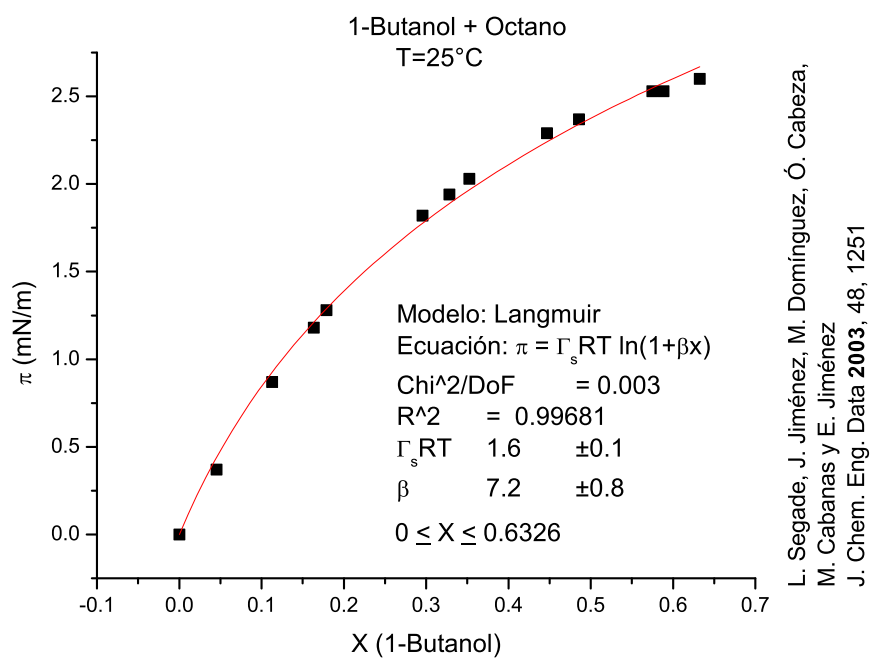
Tabla D.45: 1-Propanol + Octano a T=25°C [38]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	23.39	0	–
0.123	22.38	1.01	-2.09557
0.1859	22.05	1.34	-1.68255
0.2349	21.81	1.58	-1.4486
0.29	21.66	1.73	-1.23787
0.3454	21.53	1.86	-1.06305
0.3547	21.51	1.88	-1.03648
0.4493	21.36	2.03	-0.80006
0.5154	21.3	2.09	-0.66281
0.5218	21.29	2.1	-0.65047
0.6224	21.22	2.17	-0.47417
0.6308	21.21	2.18	-0.46077
0.6938	21.21	2.18	-0.36557
0.7592	21.17	2.22	-0.27549
0.7884	21.17	2.22	-0.23775
0.8449	21.16	2.23	-0.16854
0.8918	21.16	2.23	-0.11451
0.9245	21.16	2.23	-0.0785
1	21.17	2.22	0

1-Butanol + Octano
T=25°C

π (mN/m)

lnX

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1-Butanol + Octano
T=25°C

π (mN/m)

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF	= 0.003	
R^2	= 0.99681	
$\Gamma_s RT$	1.6	±0.1
β	7.2	±0.8

$0 \leq X \leq 0.6326$

X (1-Butanol)

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M. Cabanas y E. Jiménez
J. Chem. Eng. Data **2003**, 48, 1251

1-Butanol + Octano
T=25°C

π (mN/m)

X (1-Butanol)

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.004
R^2   = 0.99539
$\Gamma_s RT$ 3.9   ±0.1
β 2.8   ±0.2

L. Segade, J. Jiménez, M. Domínguez, Ó. Cabeza,
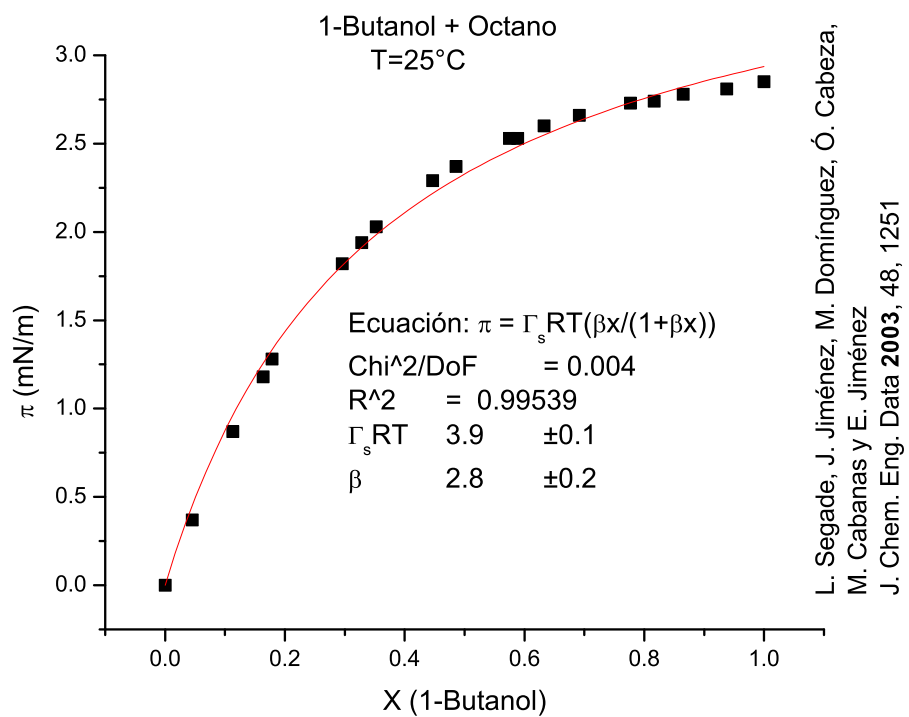M. Cabanas y E. Jiménez
J. Chem. Eng. Data **2003**, 48, 1251

Tabla D.46: 1-Butanol + Octano a T=25°C [38]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	24.02	0	–
0.0453	23.65	0.37	-3.09445
0.113	23.15	0.87	-2.18037
0.1636	22.84	1.18	-1.81033
0.1788	22.74	1.28	-1.72149
0.2956	22.2	1.82	-1.21875
0.3281	22.08	1.94	-1.11444
0.3526	21.99	2.03	-1.04242
0.4467	21.73	2.29	-0.80587
0.4857	21.65	2.37	-0.72216
0.5747	21.49	2.53	-0.55391
0.5886	21.49	2.53	-0.53001
0.6326	21.42	2.6	-0.45792
0.6918	21.36	2.66	-0.36846
0.777	21.29	2.73	-0.25231
0.8167	21.28	2.74	-0.20248
0.865	21.24	2.78	-0.14503
0.9376	21.21	2.81	-0.06443
1	21.17	2.85	0
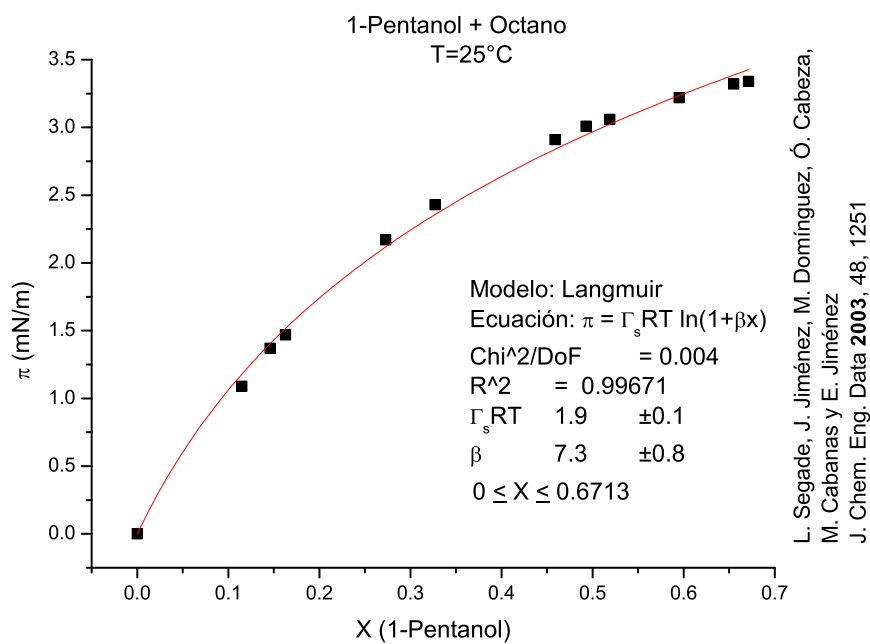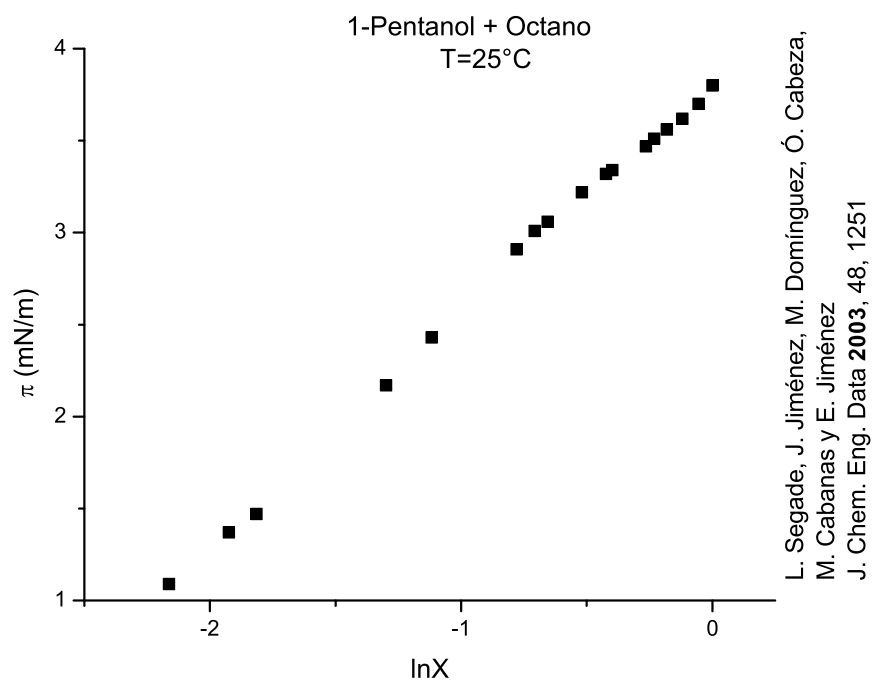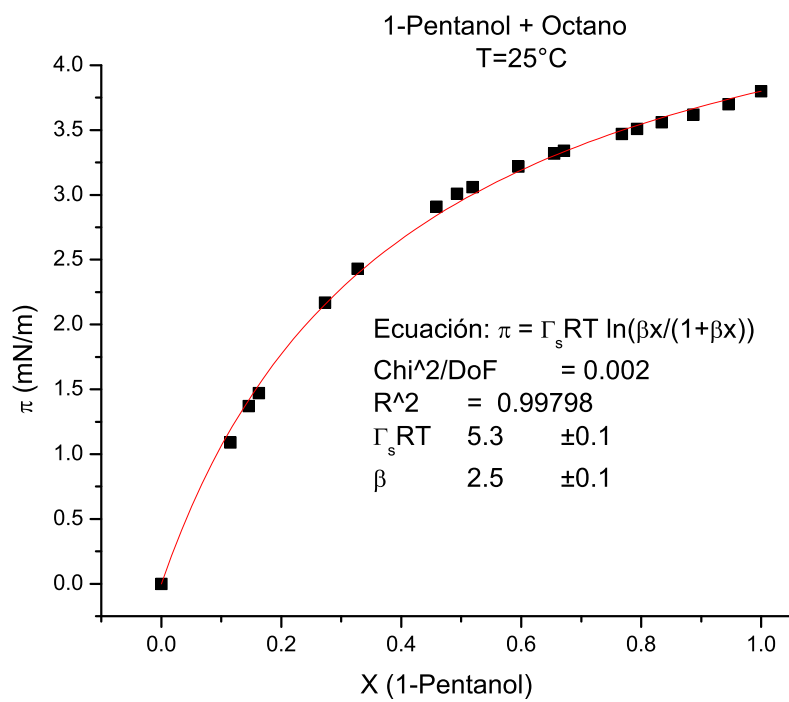
1-Pentanol + Octano
T=25°C

π (mN/m)

lnX

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M. Cabanas y E. Jiménez
J. Chem. Eng. Data **2003**, 48, 1251

1-Pentanol + Octano
T=25°C

π (mN/m)

X (1-Pentanol)

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.004
R^2   = 0.99671
$\Gamma_s RT$ 1.9   ±0.1
β 7.3   ±0.8

$0 \leq X \leq 0.6713$

L. Segade, J. Jiménez, M. Domínguez, Ó. Cabeza,
M. Cabanas y E. Jiménez
J. Chem. Eng. Data **2003**, 48, 1251

1-Pentanol + Octano
T=25°C

Ecuación: $\pi = \Gamma_s RT \ln(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.002
R^2   = 0.99798
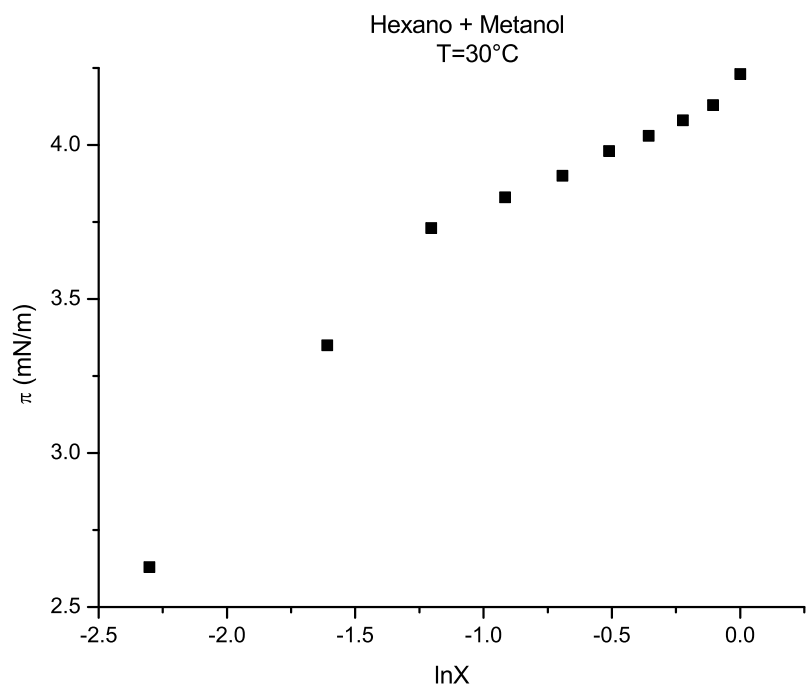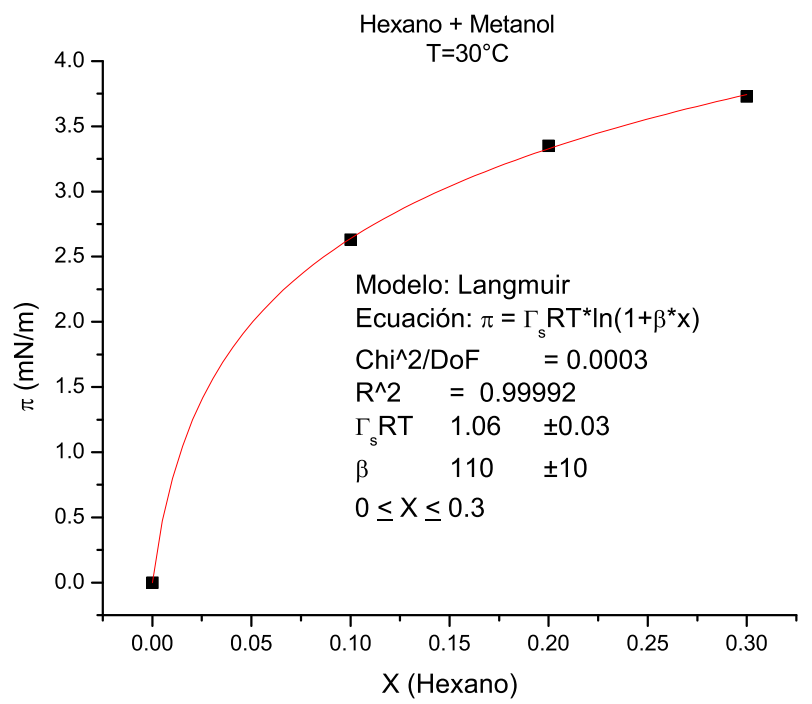$\Gamma_s RT$ 5.3   ±0.1
β 2.5   ±0.1

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M. Cabanas y E. Jiménez
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Tabla D.47: 1-Pentanol + Octano a T=25°C [38]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	24.97	0	–
0.115	23.88	1.09	-2.16282
0.1459	23.6	1.37	-1.92483
0.1629	23.5	1.47	-1.81462
0.2727	22.8	2.17	-1.29938
0.3271	22.54	2.43	-1.11749
0.4586	22.06	2.91	-0.77958
0.4927	21.96	3.01	-0.70785
0.5188	21.91	3.06	-0.65624
0.5951	21.75	3.22	-0.51903
0.655	21.65	3.32	-0.42312
0.6713	21.63	3.34	-0.39854
0.7676	21.5	3.47	-0.26449
0.7932	21.46	3.51	-0.23168
0.834	21.41	3.56	-0.18152
0.8869	21.35	3.62	-0.12002
0.9457	21.27	3.7	-0.05583
1	21.17	3.8	0

Hexano + Metanol
T=30°C

Hexano + Metanol
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.0003
R^2   = 0.99992
$\Gamma_s RT$ 1.06   ±0.03
β 110   ±10
$0 \leq X \leq 0.3$

Hexano + Metanol
T=30°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.002
R^2   = 0.9989
$\Gamma_s RT$ 4.45   ±0.03
β 15   ±1

π (mN/m)

X (Hexano)
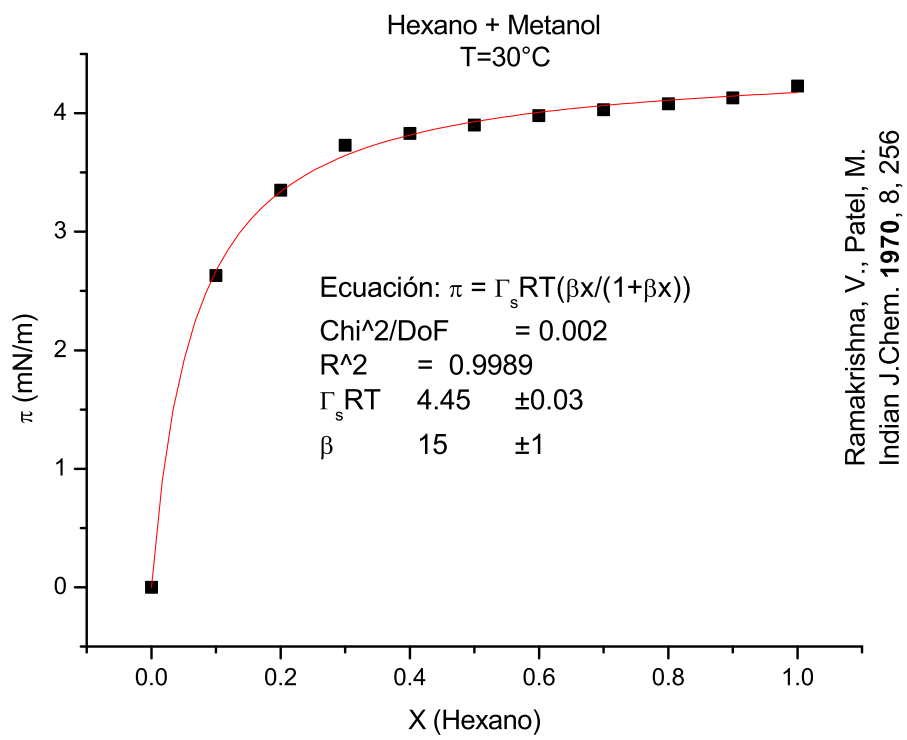
Ramakrishna, V., Patel, M.
Indian J.Chem. **1970**, 8, 256
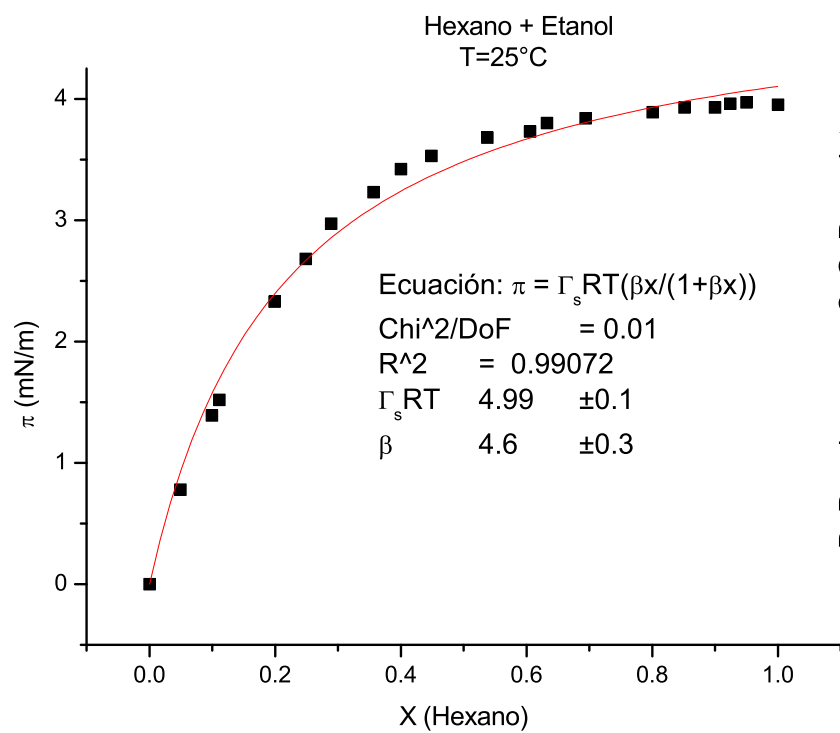
Tabla D.48: Hexano + Metanol a T=30°C [36]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	21.58	0	–
0.1	18.95	2.63	-2.30259
0.2	18.23	3.35	-1.60944
0.3	17.85	3.73	-1.20397
0.4	17.75	3.83	-0.91629
0.5	17.68	3.9	-0.69315
0.6	17.6	3.98	-0.51083
0.7	17.55	4.03	-0.35667
0.8	17.5	4.08	-0.22314
0.9	17.45	4.13	-0.10536
1	17.35	4.23	0

Hexano + Etanol
T=25°C

E. Jiménez, H. Casas, L. Segade y C. Franjo
J. Chem. Eng. Data **2000**, 45, 862

Hexano + Etanol
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.002
R^2   = 0.99891
$\Gamma_s RT$ 2.4   ±0.1
β 8.1   ±0.7
$0 \leq X \leq 0.4004$

D. Papaioannou y C. G. Panayiotou
J. Chem. Eng. Data **1994**, 39, 457

Hexano + Etanol
T=25°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF = 0.01
R^2 = 0.99072
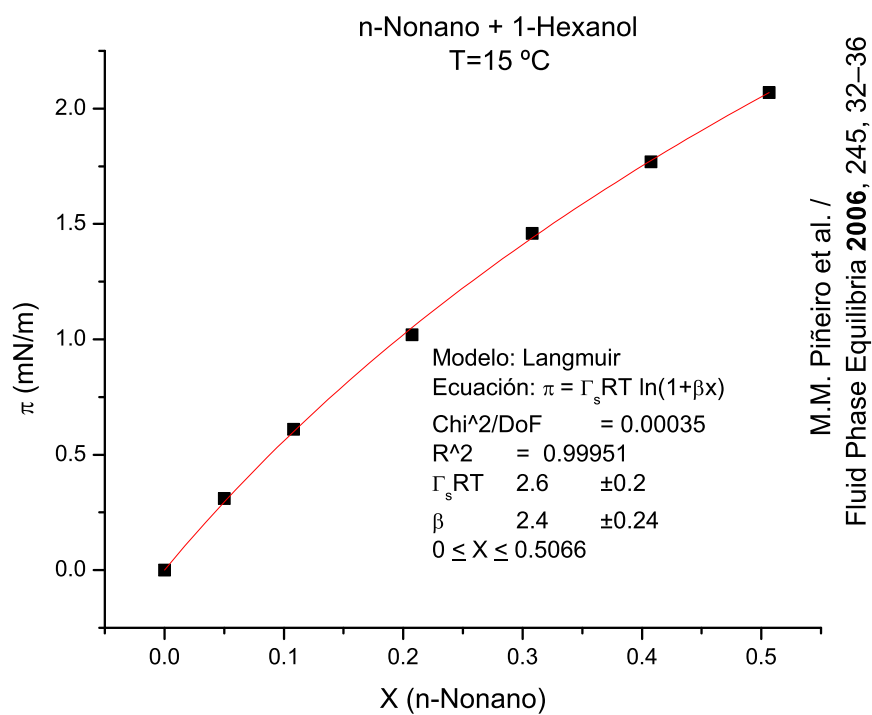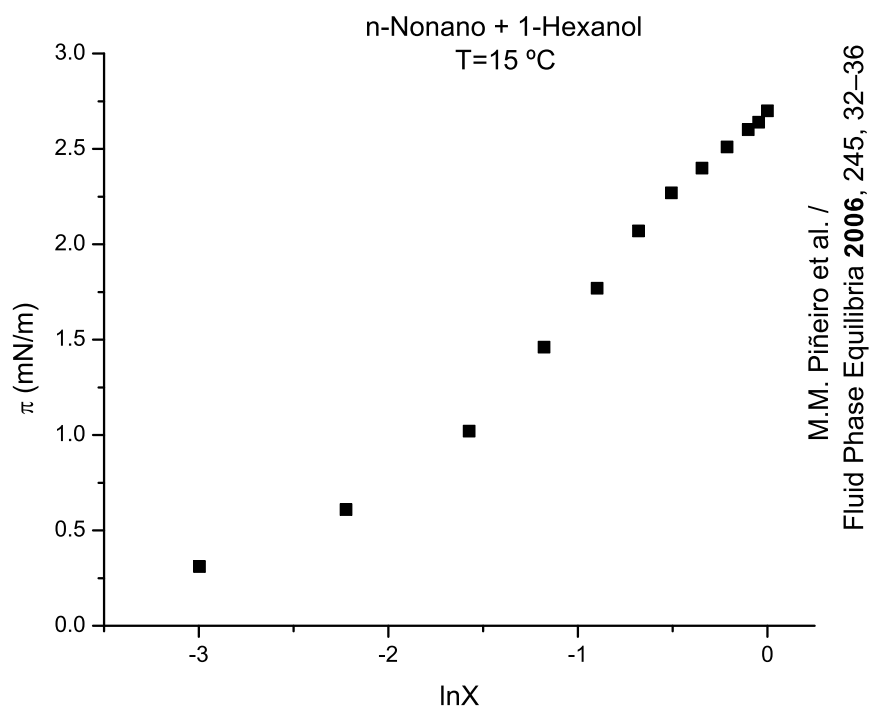$\Gamma_s RT$ 4.99 ±0.1
β 4.6 ±0.3
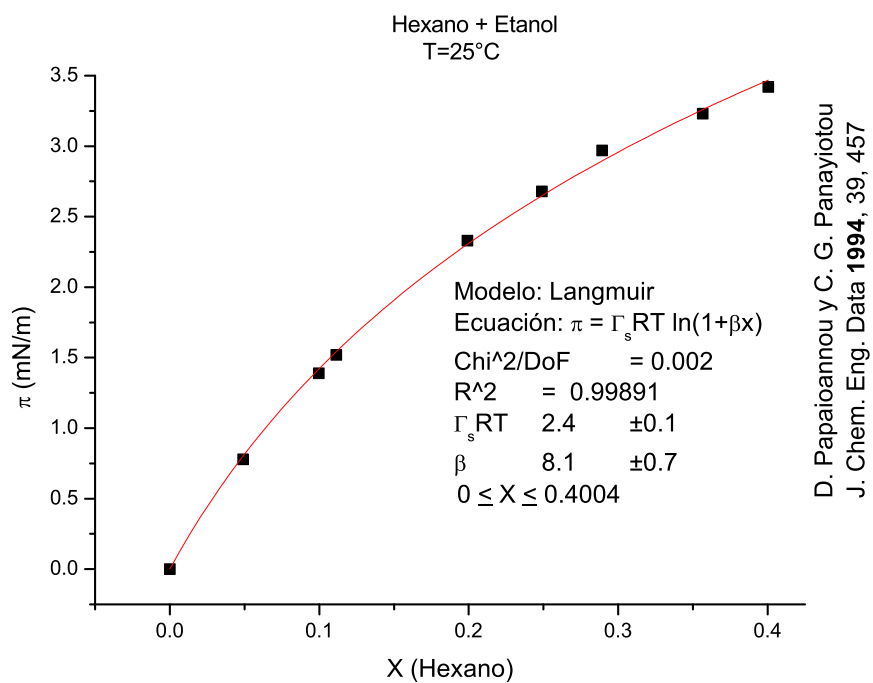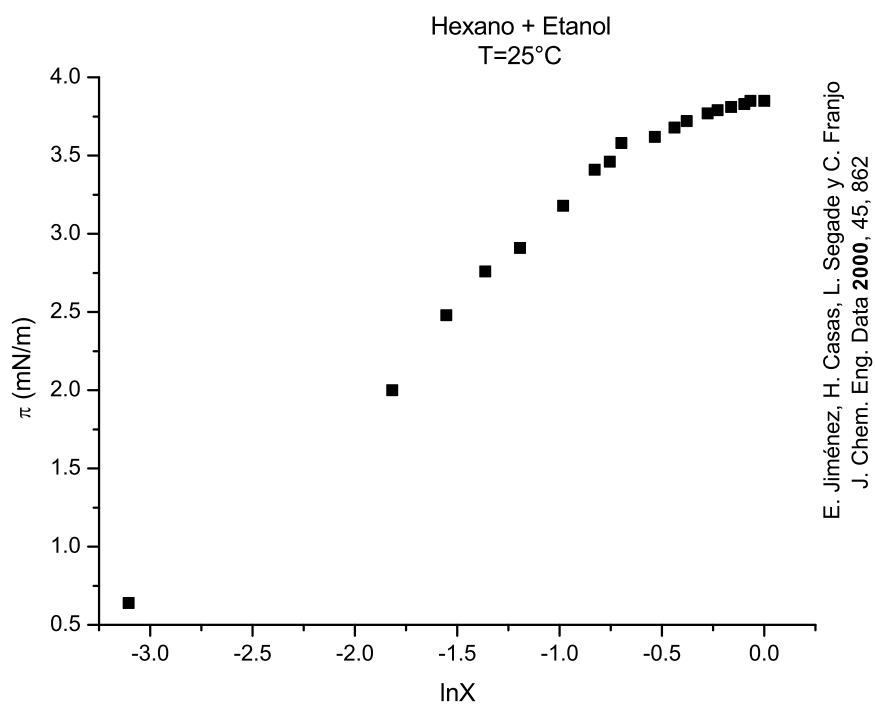
D. Papaioannou y C. G. Panayiotou
J. Chem. Eng. Data **1994**, 39, 457

Tabla D.49: Hexano + Etanol a T=25°C [34]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	21.74	0	–
0.0448	21.1	0.64	-3.10555
0.1625	19.74	2	-1.81708
0.2116	19.26	2.48	-1.55306
0.2559	18.98	2.76	-1.36297
0.3034	18.83	2.91	-1.1927
0.3745	18.56	3.18	-0.98216
0.4366	18.33	3.41	-0.82874
0.47	18.28	3.46	-0.75502
0.4974	18.16	3.58	-0.69836
0.5863	18.12	3.62	-0.53392
0.6452	18.06	3.68	-0.43819
0.6841	18.02	3.72	-0.37965
0.7584	17.97	3.77	-0.27654
0.7963	17.95	3.79	-0.22778
0.85	17.93	3.81	-0.16252
0.9067	17.91	3.83	-0.09794
0.9347	17.89	3.85	-0.06753
1	17.89	3.85	0

n-Nonano + 1-Hexanol
T=15 ºC

M.M. Piñeiro et al. /
Fluid Phase Equilibria **2006**, 245, 32–36

n-Nonano + 1-Hexanol
T=15 ºC

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.00035
R^2   = 0.99951
$\Gamma_s RT$ 2.6   ±0.2
β 2.4   ±0.24
$0 \leq X \leq 0.5066$

M.M. Piñeiro et al. /
Fluid Phase Equilibria **2006**, 245, 32–36

n-Nonano + 1-Hexanol
T=15 °C

Ecuación: $\pi = \Gamma_s RT \ (\beta x/(1+\beta x))$

Chi^2/DoF   = 0.003
R^2   = 0.99719
$\Gamma_s RT$ 4.44   ±0.16
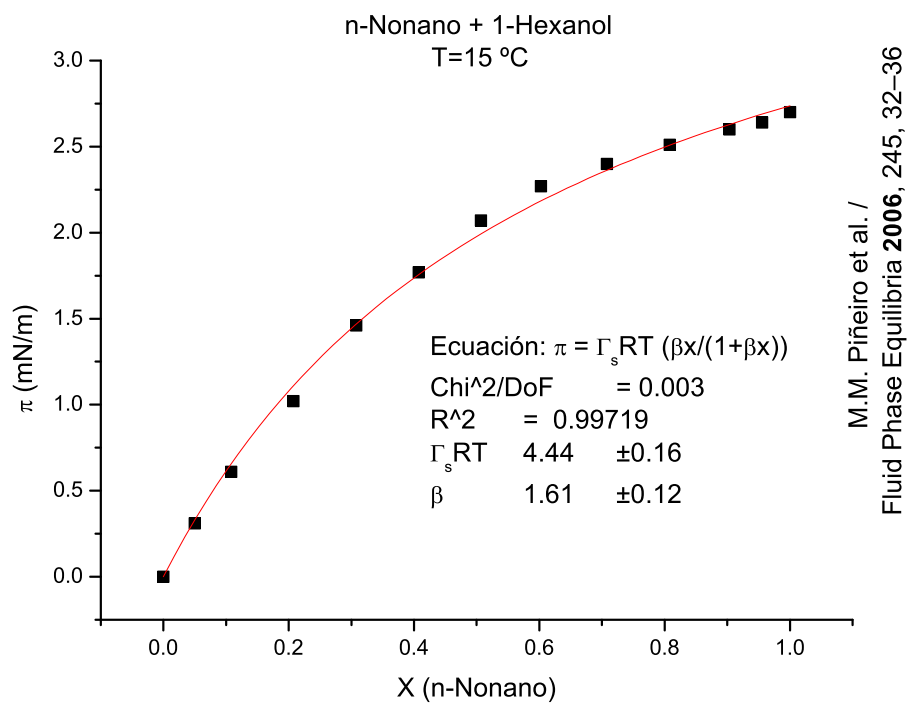β 1.61   ±0.12

π (mN/m)

X (n-Nonano)
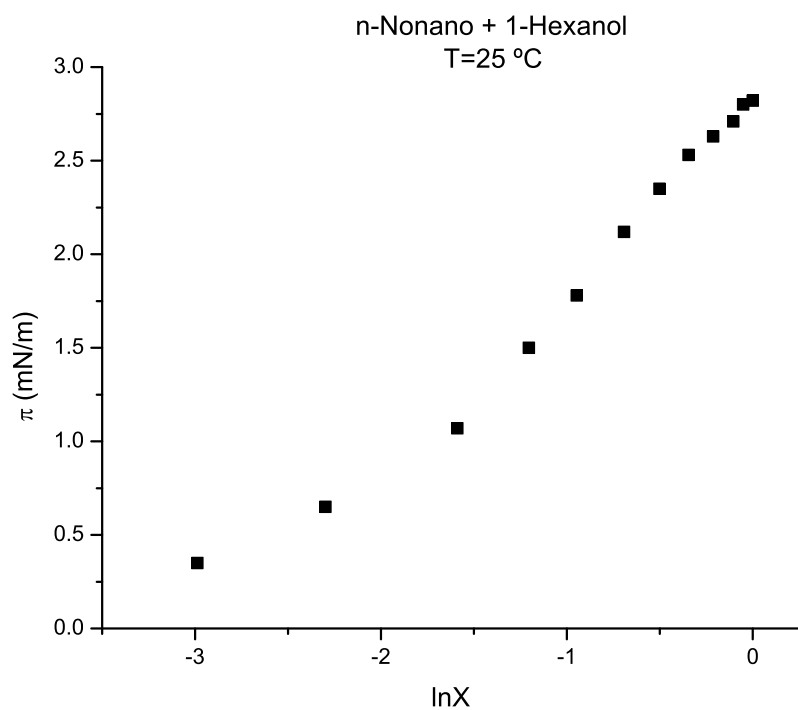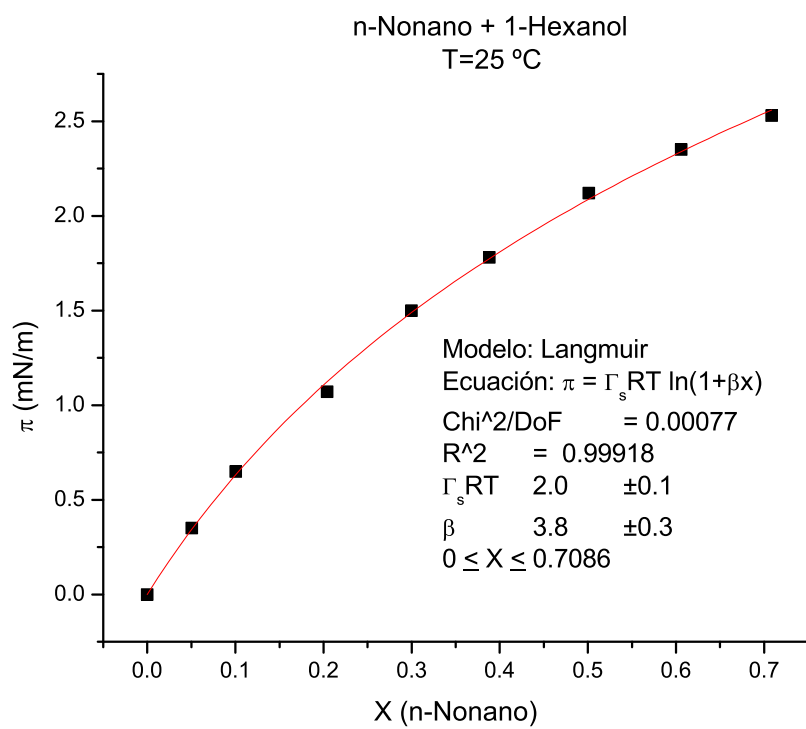
Tabla D.50: n-Nonano + 1-Hexanol a T=15°C [32]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	26.08	0	–
0.05	25.77	0.31	-2.99573
0.1082	25.47	0.61	-2.22377
0.2075	25.06	1.02	-1.57262
0.3079	24.62	1.46	-1.17798
0.4075	24.31	1.77	-0.89771
0.5066	24.01	2.07	-0.68003
0.6024	23.81	2.27	-0.50683
0.7079	23.68	2.4	-0.34545
0.8081	23.57	2.51	-0.21307
0.9036	23.48	2.6	-0.10137
0.9554	23.44	2.64	-0.04563
1	23.38	2.7	0

n-Nonano + 1-Hexanol
T=25 ºC

M.M. Piñeiro et al. /
Fluid Phase Equilibria **2006**, 245, 32–36

n-Nonano + 1-Hexanol
T=25 ºC

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF   = 0.00077
R^2   = 0.99918
$\Gamma_s RT$ 2.0   ±0.1
β 3.8   ±0.3
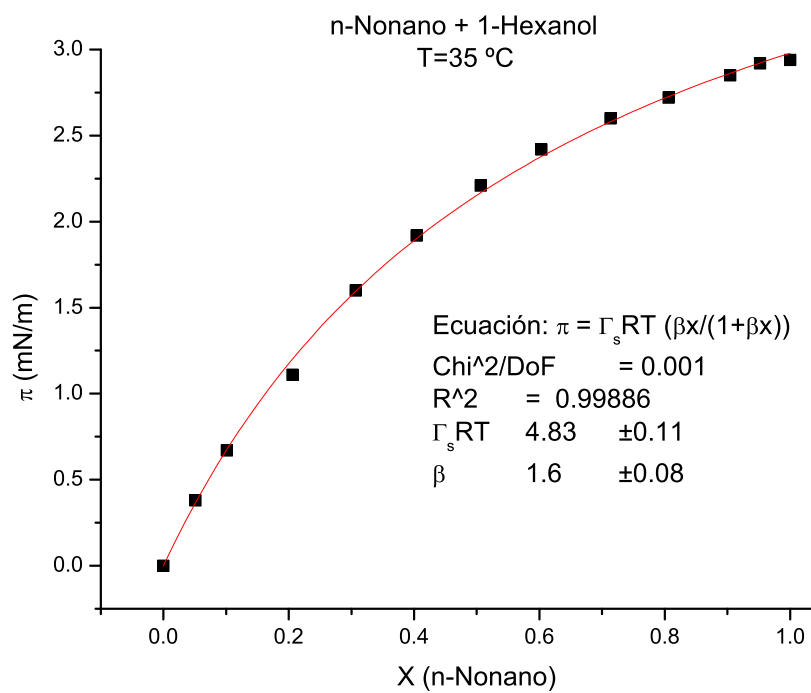$0 \le X \le 0.7086$
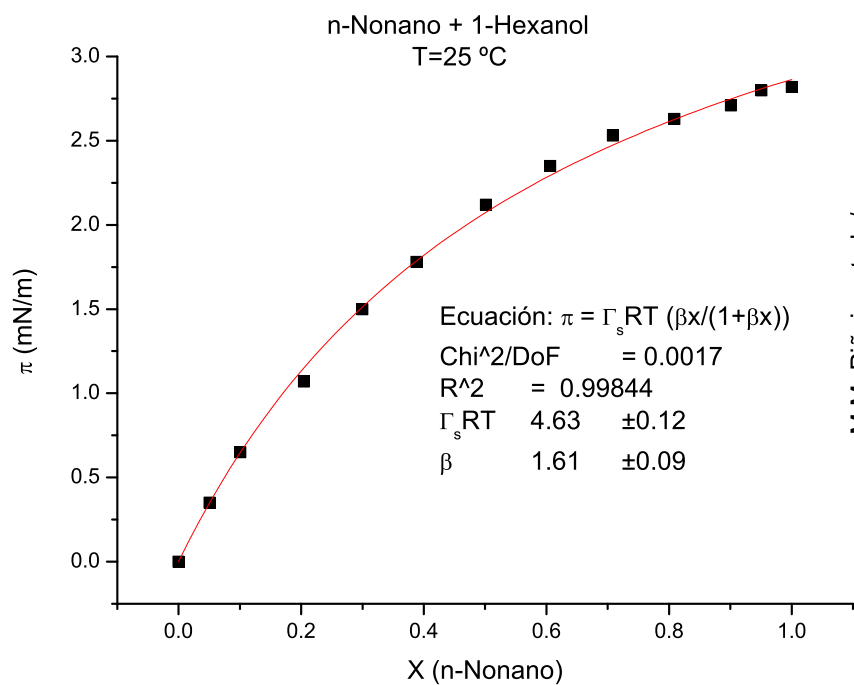
M.M. Piñeiro et al. /
Fluid Phase Equilibria **2006**, 245, 32–36

Tabla D.51: n-Nonano + 1-Hexanol a T=25°C [32]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	25.19	0	–
0.0504	24.84	0.35	-2.98776
0.1004	24.54	0.65	-2.29859
0.2042	24.12	1.07	-1.58866
0.2998	23.69	1.5	-1.20464
0.388	23.41	1.78	-0.94675
0.5011	23.07	2.12	-0.69095
0.606	22.84	2.35	-0.50088
0.7086	22.66	2.53	-0.34446
0.8085	22.56	2.63	-0.21257
0.9007	22.48	2.71	-0.10458
0.9508	22.39	2.8	-0.05045
1	22.37	2.82	0

n-Nonano + 1-Hexanol
T=35 °C

M.M. Piñeiro et al. /
Fluid Phase Equilibria **2006**, 245, 32–36

X (n-Nonano)

n-Nonano + 1-Hexanol
T=35 °C

M.M. Piñeiro et al. /
Fluid Phase Equilibria **2006**, 245, 32–36

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \ln(1+\beta x)$

Chi^2/DoF	= 0.00152	
R^2	= 0.99849	
$\Gamma_s RT$	1.9	±0.1
β	4.1	±0.5

$0 \le X \le 0.7135$

X (n-Nonano)

n-Nonano + 1-Hexanol
T=35 ºC

Ecuación: $\pi = \Gamma_s RT\,(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.001
R^2   = 0.99886
$\Gamma_s RT$ 4.83   ±0.11
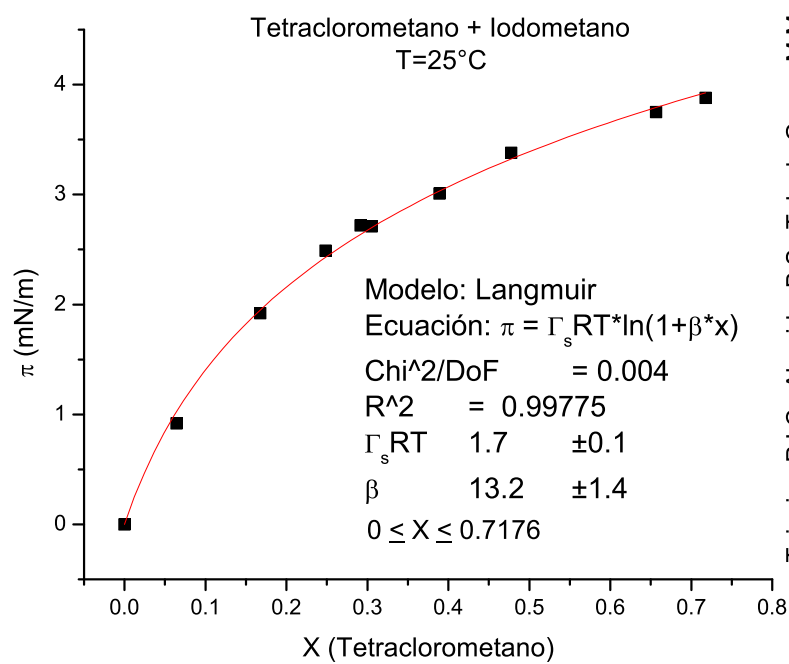β 1.6   ±0.08
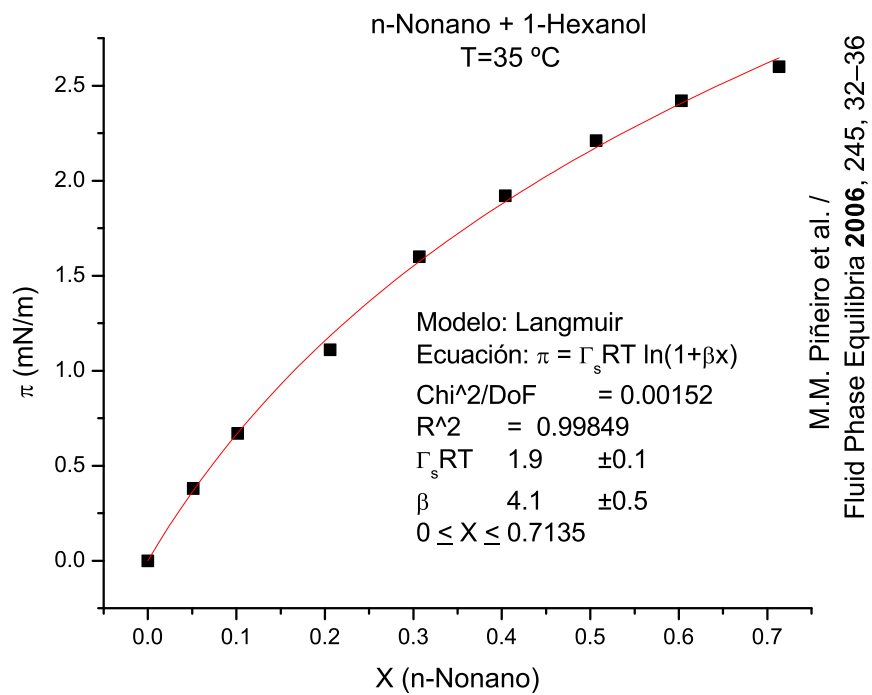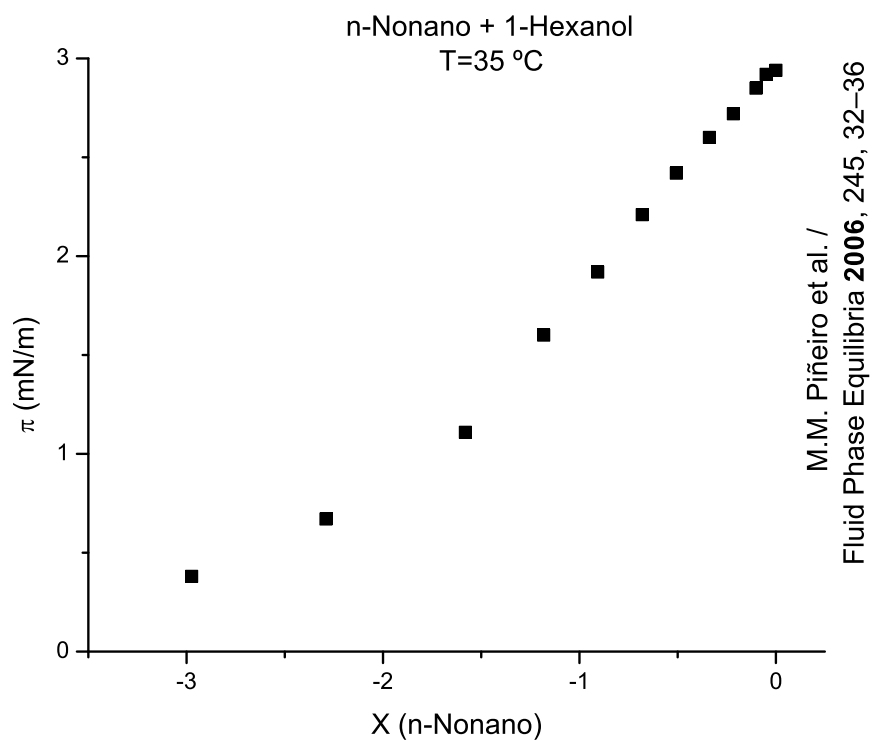
M.M. Piñeiro et al. /
Fluid Phase Equilibria **2006**, 245, 32–36

Tabla D.52: n-Nonano + 1-Hexanol a T=35°C [32]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	24.19	0	–
0.0511	23.81	0.38	-2.97397
0.1013	23.52	0.67	-2.28967
0.2059	23.08	1.11	-1.58036
0.3066	22.59	1.6	-1.18221
0.404	22.27	1.92	-0.90634
0.5065	21.98	2.21	-0.68023
0.6028	21.77	2.42	-0.50617
0.7135	21.59	2.6	-0.33757
0.8059	21.47	2.72	-0.2158
0.9043	21.34	2.85	-0.10059
0.9519	21.27	2.92	-0.0493
1	21.25	2.94	0
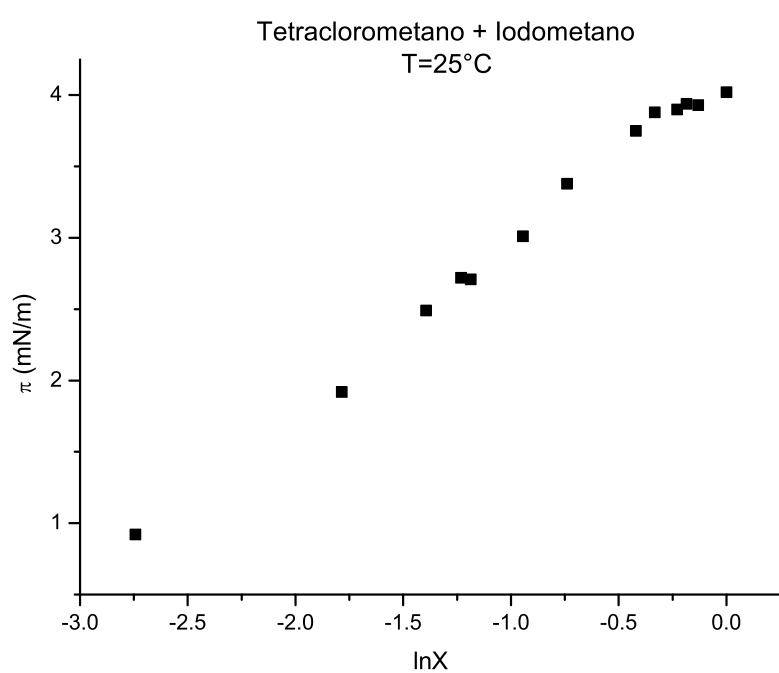
Tetraclorometano + Iodometano
T=25°C

Teixeira, P.I.C., Almeida, B.S., Telo da Gama, M.M., Rueda, J.A., Rubio,R.G. J.Phys.Chem. **1992**, 96, 8488

Tetraclorometano + Iodometano
T=25°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT \cdot \ln(1+\beta \cdot x)$

Chi^2/DoF   = 0.004
R^2   = 0.99775
$\Gamma_s RT$ 1.7   ±0.1
β 13.2   ±1.4
$0 \le X \le 0.7176$

Teixeira, P.I.C., Almeida, B.S., Telo da Gama, M.M., Rueda, J.A., Rubio,R.G. J.Phys.Chem. **1992**, 96, 8488

Tetraclorometano + Iodometano
T=25°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF	= 0.003	
R^2	= 0.99797	
$\Gamma_s RT$	5.3	±0.1
β	3.5	±0.1

π (mN/m)

X (Tetraclorometano)

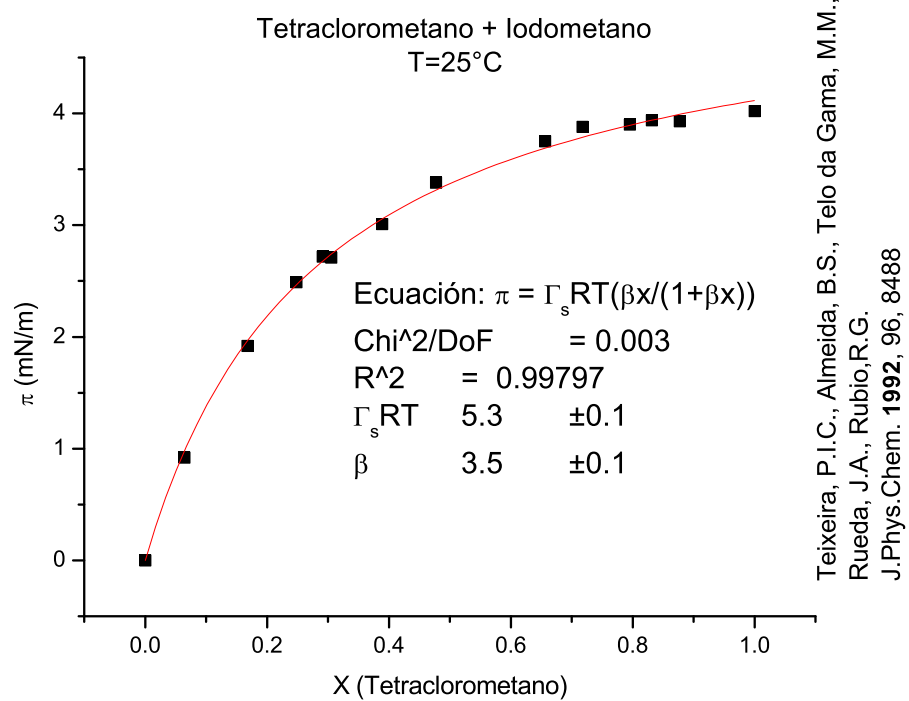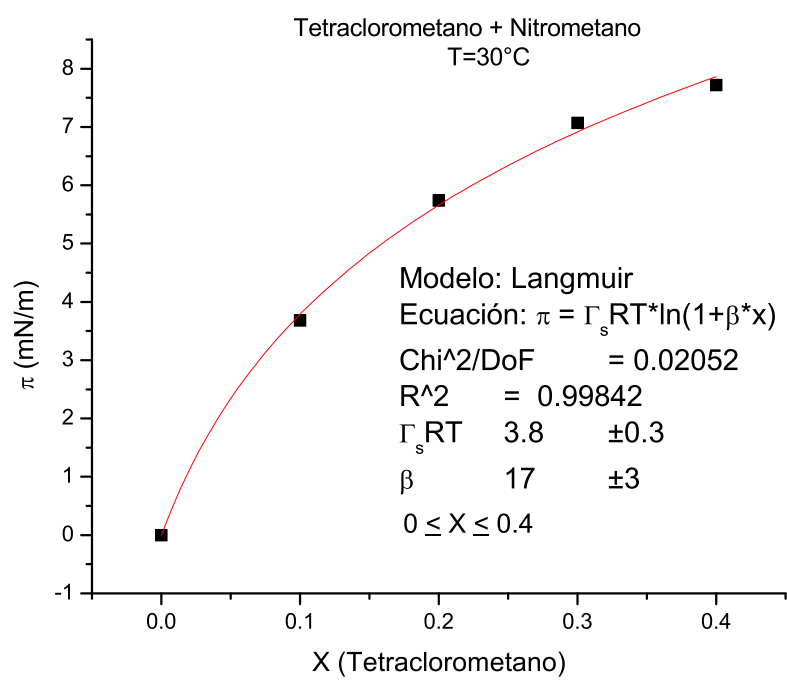Teixeira, P.I.C., Almeida, B.S., Telo da Gama, M.M., Rueda, J.A., Rubio,R.G. J.Phys.Chem. **1992**, 96, 8488
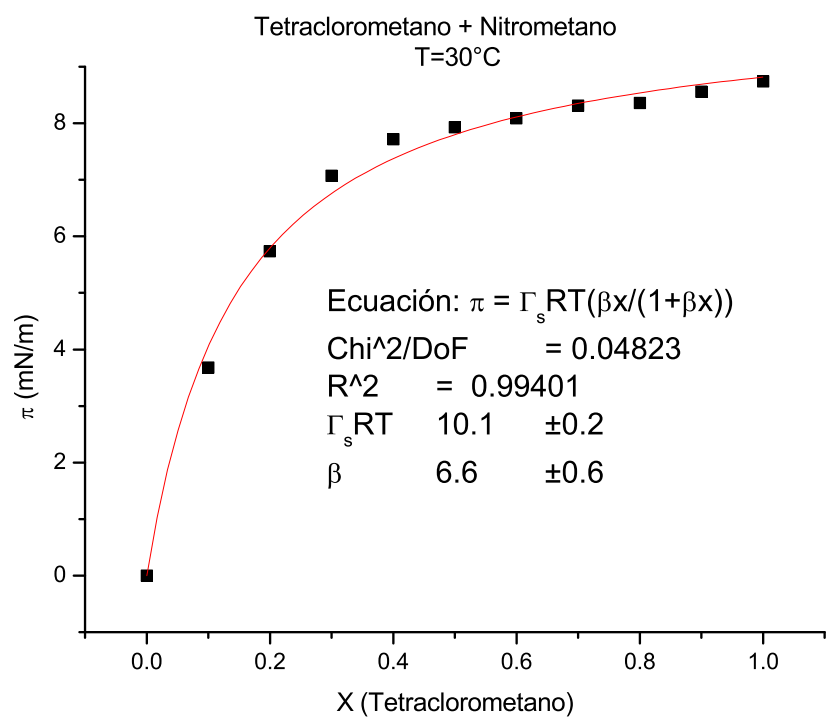
Tabla D.53: Tetraclorometano + Iodometano a T=25°C [46]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
1	26.31	4.02	0
0.8775	26.4	3.93	-0.13068
0.8315	26.39	3.94	-0.18452
0.7954	26.43	3.9	-0.22891
0.7176	26.45	3.88	-0.33184
0.6565	26.58	3.75	-0.42083
0.4775	26.95	3.38	-0.73919
0.3889	27.32	3.01	-0.94443
0.3054	27.62	2.71	-1.18613
0.2916	27.61	2.72	-1.23237
0.2481	27.84	2.49	-1.39392
0.1677	28.41	1.92	-1.78558
0.0644	29.41	0.92	-2.74264
0	30.33	0	–
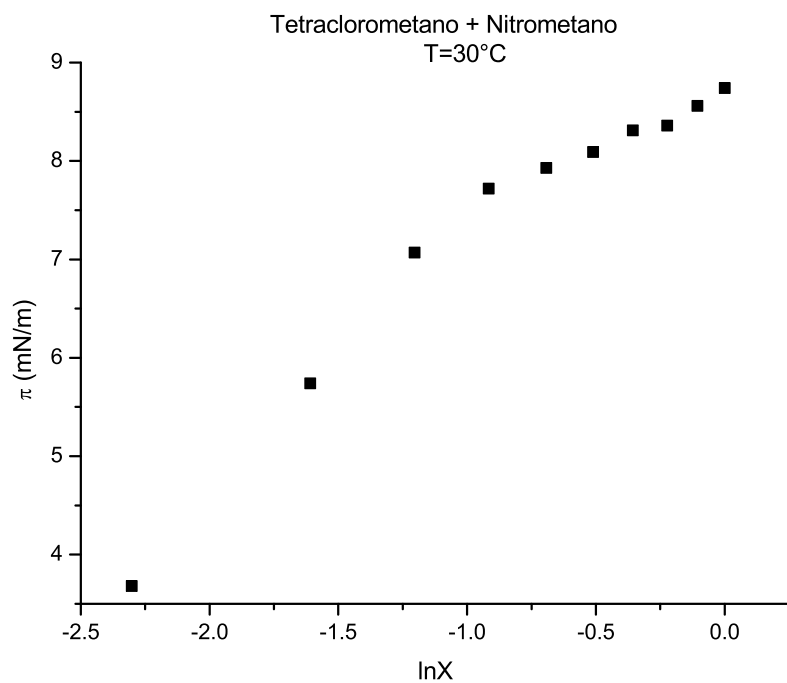
Tetraclorometano + Nitrometano
T=30°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.04823
R^2   = 0.99401
$\Gamma_s RT$ 10.1   ±0.2
β 6.6   ±0.6
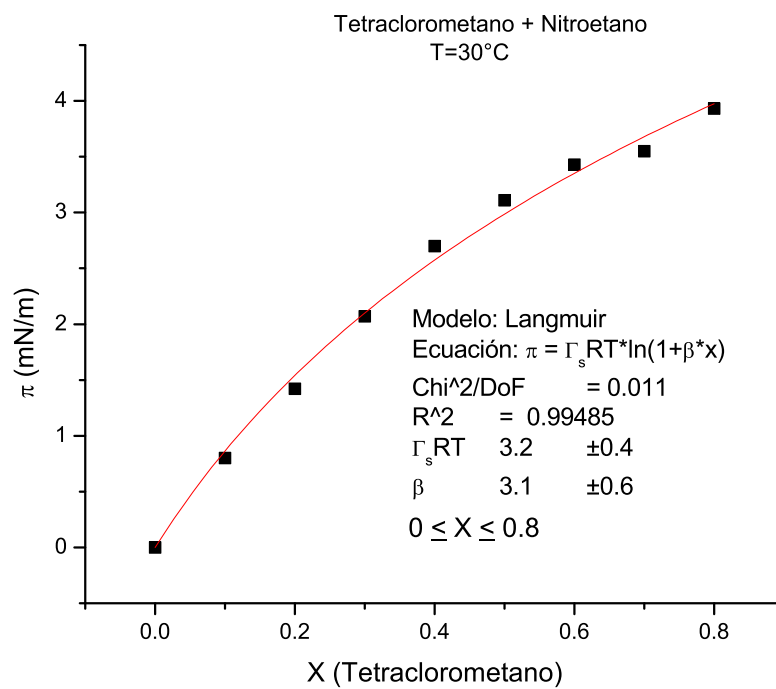
π (mN/m)

X (Tetraclorometano)

Gunter, C.R., Madding, R.D., Jr., Hanson, T.E., Musulin, B.
Trans.Illinois State Acad.Sci. **1971**, 64, 55

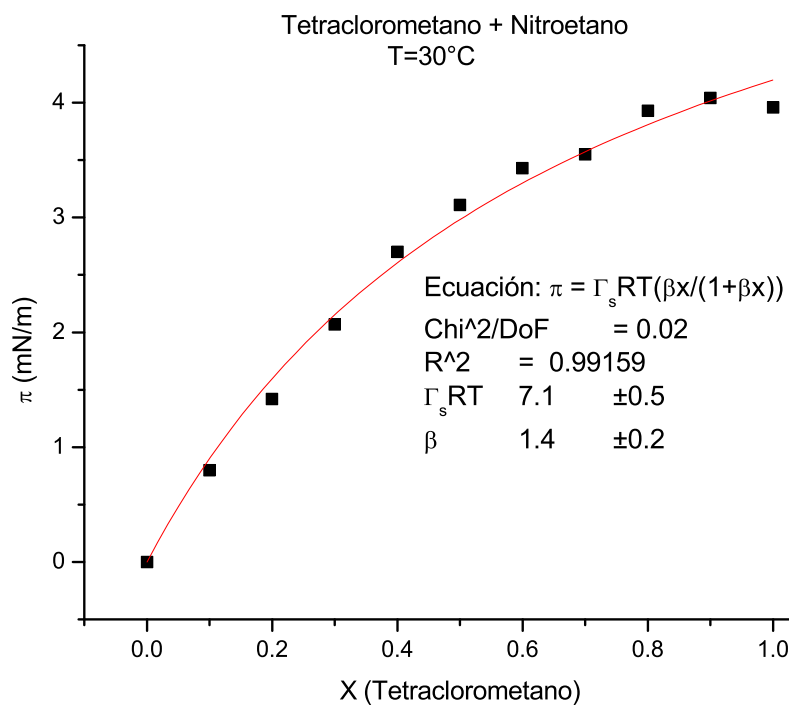Tabla D.54: Tetraclorometano + Nitrometano a T=30°C [13]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
1	26.7	8.74	0
0.9	26.88	8.56	-0.10536
0.8	27.08	8.36	-0.22314
0.7	27.13	8.31	-0.35667
0.6	27.35	8.09	-0.51083
0.5	27.51	7.93	-0.69315
0.4	27.72	7.72	-0.91629
0.3	28.37	7.07	-1.20397
0.2	29.7	5.74	-1.60944
0.1	31.76	3.68	-2.30259
0	35.44	0	–
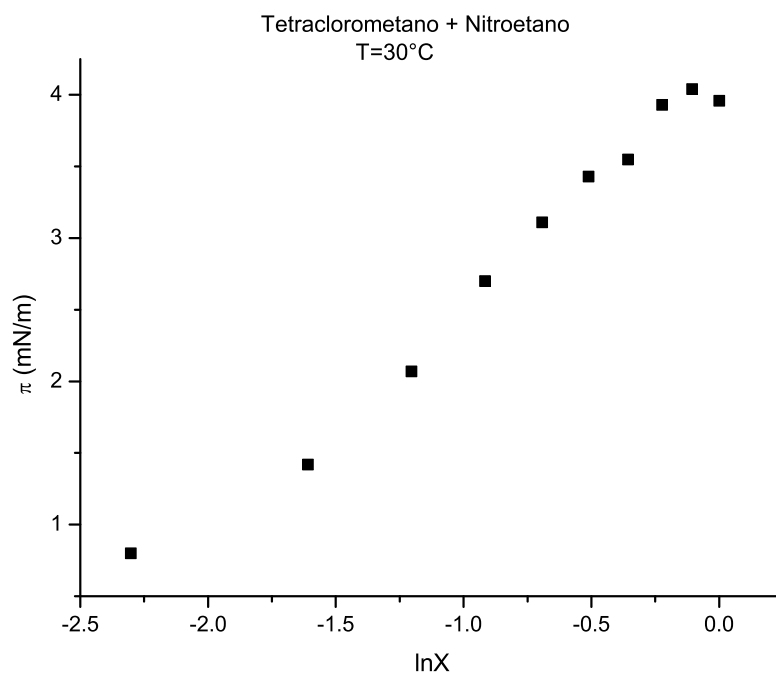
Tetraclorometano + Nitroetano
T=30°C

Tetraclorometano + Nitroetano
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF = 0.011
R^2 = 0.99485
$\Gamma_s RT$ 3.2 ±0.4
β 3.1 ±0.6

$0 \leq X \leq 0.8$

Tetraclorometano + Nitroetano
T=30°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.02
R^2   = 0.99159
$\Gamma_s RT$ 7.1   ±0.5
β 1.4   ±0.2

π (mN/m)

X (Tetraclorometano)

Gunter, C.R., Madding, R.D., Jr., Hanson, T.E., Musulin, B.
Trans.Illinois State Acad.Sci. **1971**, 64, 55

Tabla D.55: Tetraclorometano + Nitroetano a T=30°C [13]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
1	26.7	3.96	0
0.9	26.62	4.04	-0.10536
0.8	26.73	3.93	-0.22314
0.7	27.11	3.55	-0.35667
0.6	27.23	3.43	-0.51083
0.5	27.55	3.11	-0.69315
0.4	27.96	2.7	-0.91629
0.3	28.59	2.07	-1.20397
0.2	29.24	1.42	-1.60944
0.1	29.86	0.8	-2.30259
0	30.66	0	–

Tetraclorometano + Dimetilsulfoxido
T=30°C

Agarwal, D.K., Gopal, R., Agarwal, S.
J.Chem.Eng.Data **1979**, 24, 181

Tetraclorometano + Dimetilsulfoxido
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*ln(1+\beta*x)$

Chi^2/DoF   = 0.005
R^2   = 0.99982
$\Gamma_s RT$ 28.5   ±2.6
β 1.17   ±0.13

$0 \leq X \leq 0.5243$
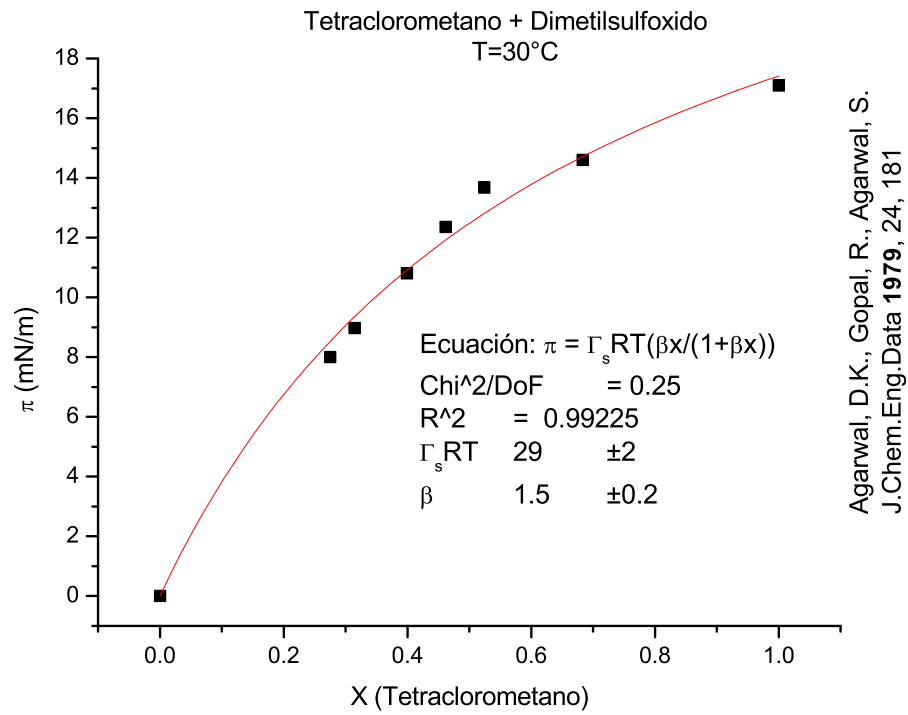
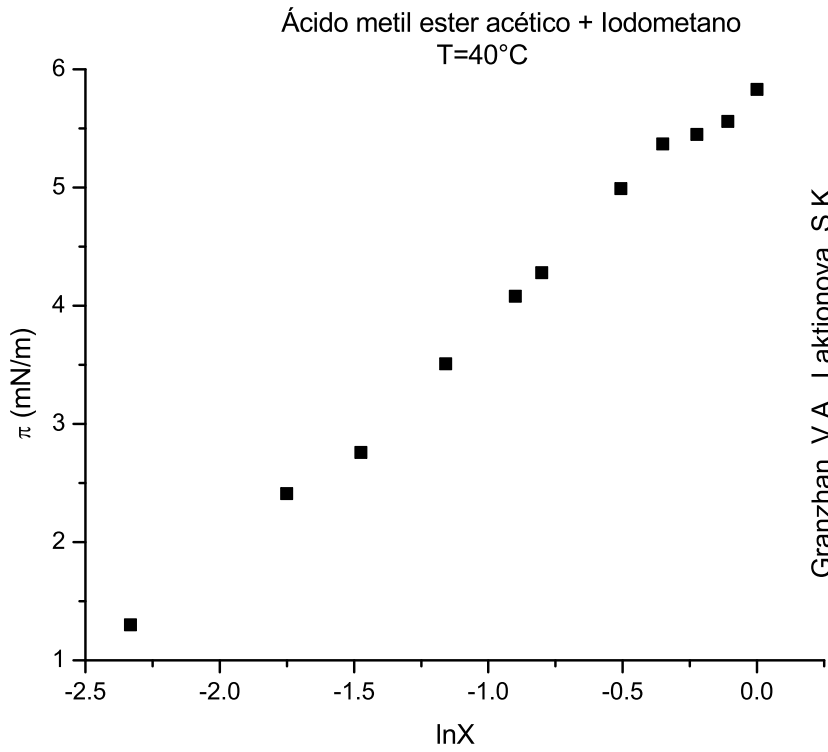Agarwal, D.K., Gopal, R., Agarwal, S.
J.Chem.Eng.Data **1979**, 24, 181
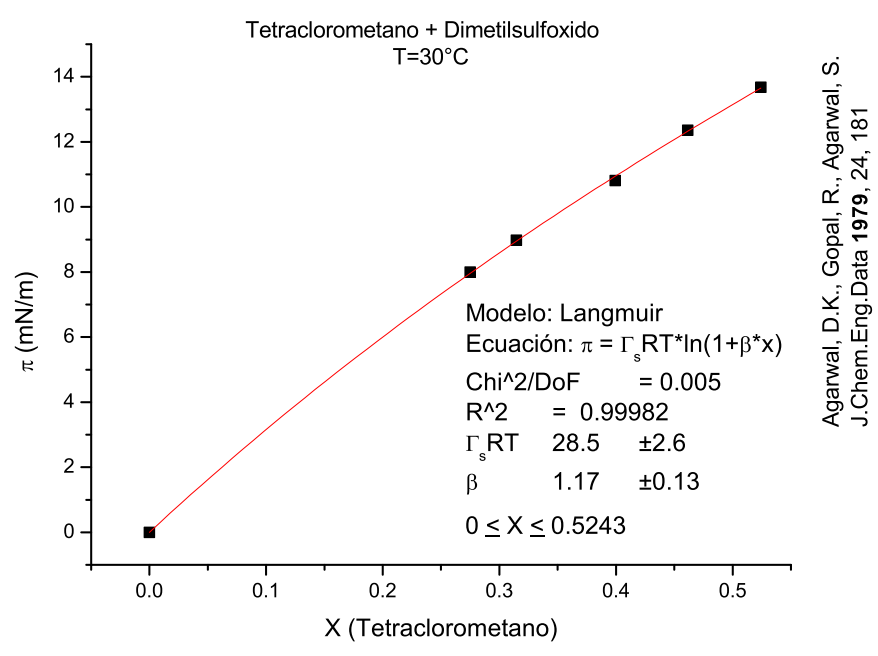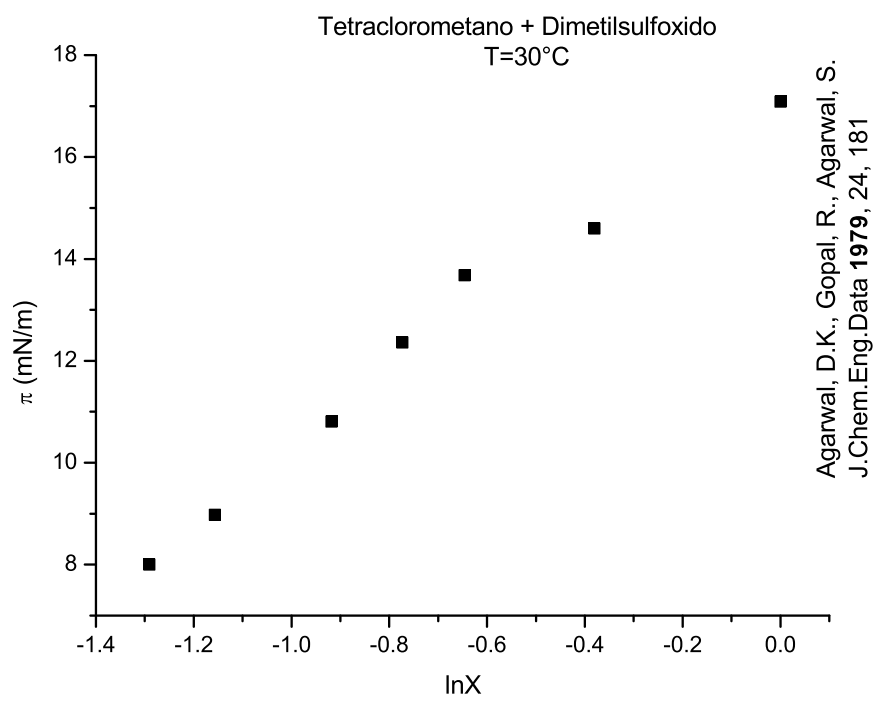
Tabla D.56: Tetraclorometano + Dimetilsulfoxido a T=30°C [1]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	42.41	0	–
0.275	34.41	8	-1.29098
0.3146	33.43	8.98	-1.15645
0.3992	31.6	10.81	-0.91829
0.4615	30.05	12.36	-0.77327
0.5243	28.73	13.68	-0.64569
0.6835	27.81	14.6	-0.38053
1	25.32	17.09	0
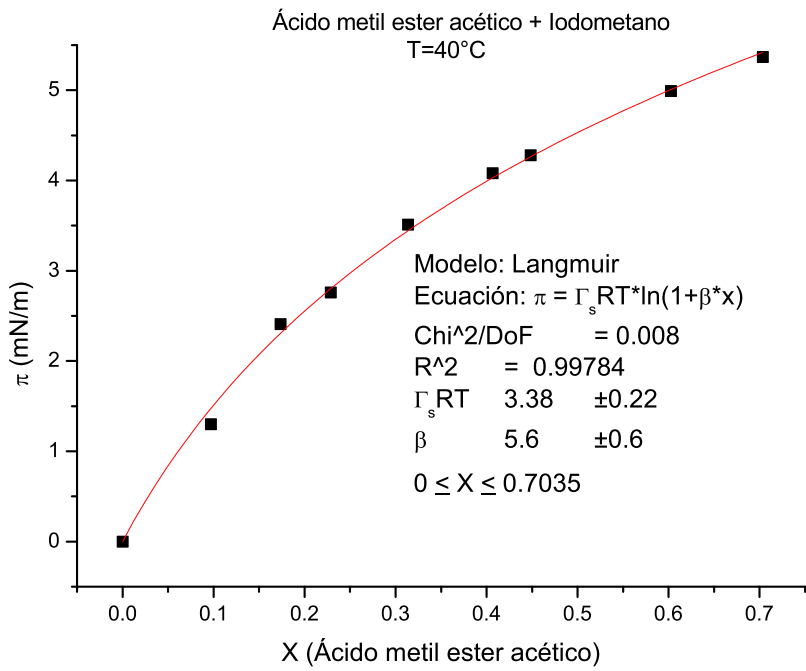
Ácido metil ester acético + Iodometano
T=40°C

Ácido metil ester acético + Iodometano
T=40°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.008
R^2   = 0.99784
$\Gamma_s RT$ 3.38   ±0.22
β 5.6   ±0.6

$0 \leq X \leq 0.7035$

Ácido metil ester acético + Iodometano
T=40°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF	= 0.01	
R^2	= 0.99694	
$\Gamma_s RT$	8.6	±0.2
β	2.1	±0.1

π (mN/m)

X (Ácido metil ester acético)
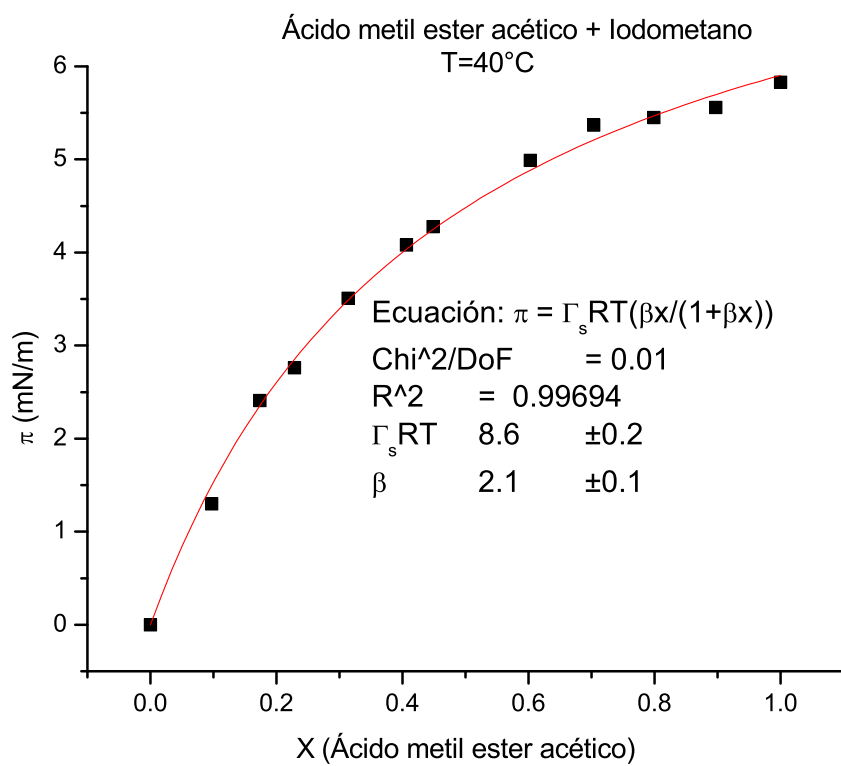
Granzhan, V.A., Laktionova, S.K.
Report, VINITI Depos. Doc. **1976**, 3996-76

Tabla D.57: Acido metil ester acetico + Iodometano a T=40°C [12]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
1	21.73	5.83	0
0.8972	22	5.56	-0.10848
0.7991	22.11	5.45	-0.22427
0.7035	22.19	5.37	-0.35169
0.6026	22.57	4.99	-0.5065
0.4485	23.28	4.28	-0.80185
0.4065	23.48	4.08	-0.90017
0.3138	24.05	3.51	-1.159
0.2288	24.8	2.76	-1.47491
0.1736	25.15	2.41	-1.751
0.0971	26.26	1.3	-2.33201
0	27.56	0	–

Benceno + Nitrometano
T=20°C

π (mN/m)

lnX

Suri, S.K., Ramakrishna, V.
Indian J.Chem. **1969**, 7, 243

Benceno + Nitrometano
T=20°C

π (mN/m)

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT * \ln(1+\beta*x)$

Chi^2/DoF   = 0.015
R^2   = 0.99798
$\Gamma_s RT$ 3.8   ±0.3
β 10   ±1.4

$0 \leq X \leq 0.5921$

X (Benceno)

Suri, S.K., Ramakrishna, V.
Indian J.Chem. **1969**, 7, 243

Benceno + Nitrometano
T=20°C

π (mN/m)

X (Benceno)

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.01
R^2   = 0.99866
$\Gamma_s RT$ 11.2   ±0.2
β 3.1   ±0.1
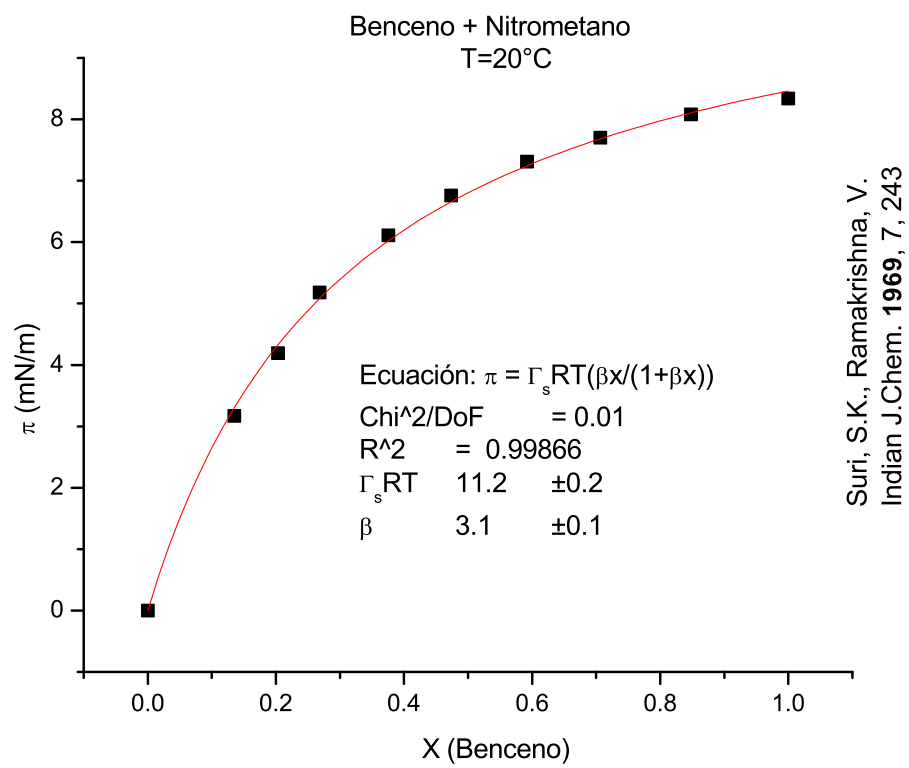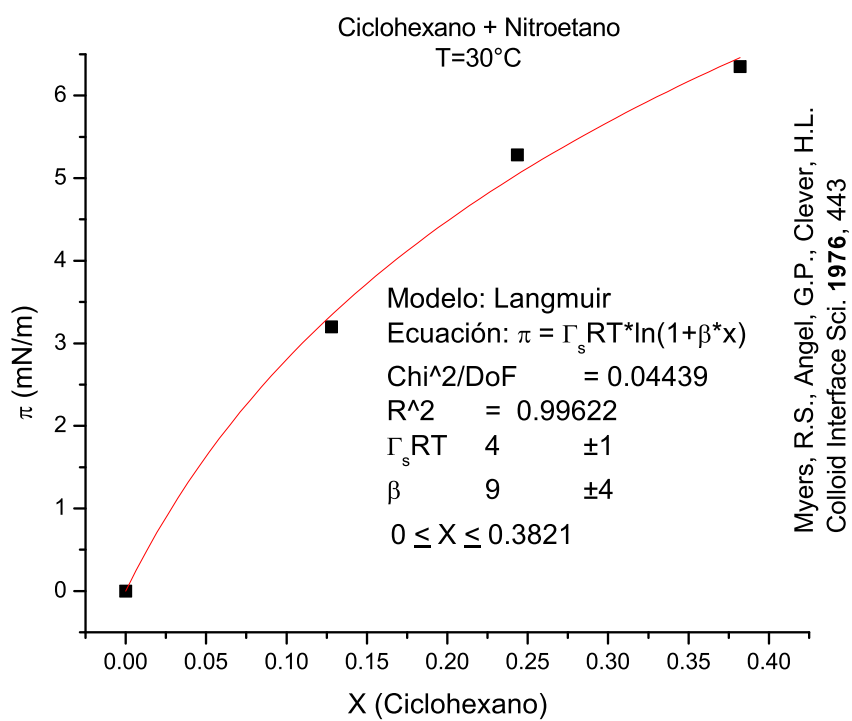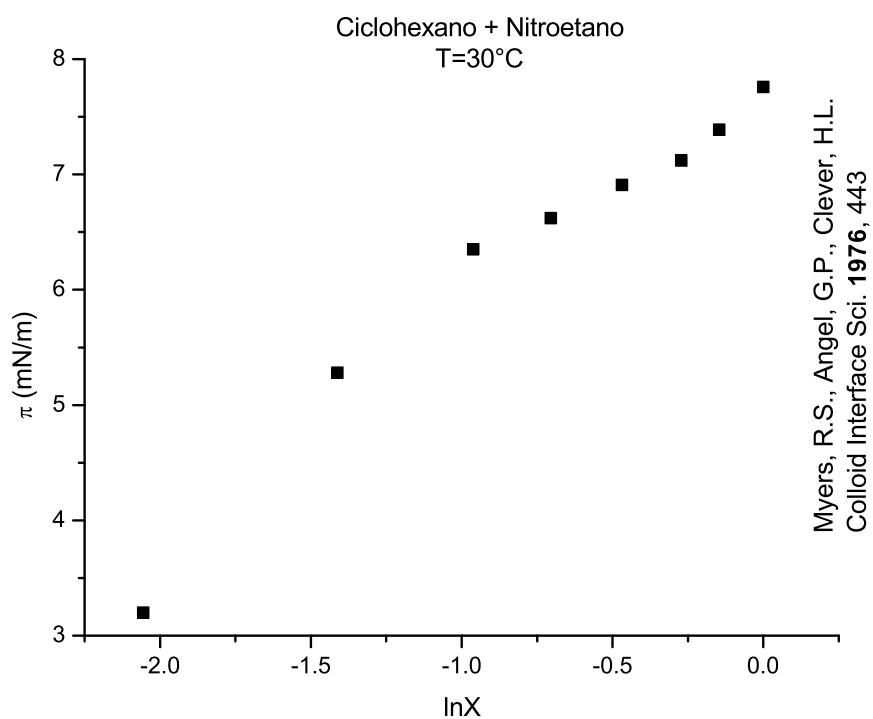
Suri, S.K., Ramakrishna, V.
Indian J.Chem. **1969**, 7, 243

Tabla D.58: Benceno + Nitrometano a T=20°C [44]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
0	37.19	0	–
0.1349	34.02	3.17	-2.00322
0.2033	33	4.19	-1.59307
0.2685	32.01	5.18	-1.3149
0.3758	31.08	6.11	-0.9787
0.4737	30.43	6.76	-0.74718
0.5921	29.88	7.31	-0.52408
0.7066	29.49	7.7	-0.34729
0.8478	29.11	8.08	-0.16511
1	28.85	8.34	0

Ciclohexano + Nitroetano
T=30°C

Myers, R.S., Angel, G.P., Clever, H.L.
Colloid Interface Sci. **1976**, 443

Ciclohexano + Nitroetano
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.04439
R^2   = 0.99622
$\Gamma_s RT$ 4   ±1
β 9   ±4

$0 \leq X \leq 0.3821$

Myers, R.S., Angel, G.P., Clever, H.L.
Colloid Interface Sci. **1976**, 443

Ciclohexano + Nitroetano
T=30°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF   = 0.05
R^2   = 0.99307
Γ_sRT   9.2   ±0.3
β 5   ±1

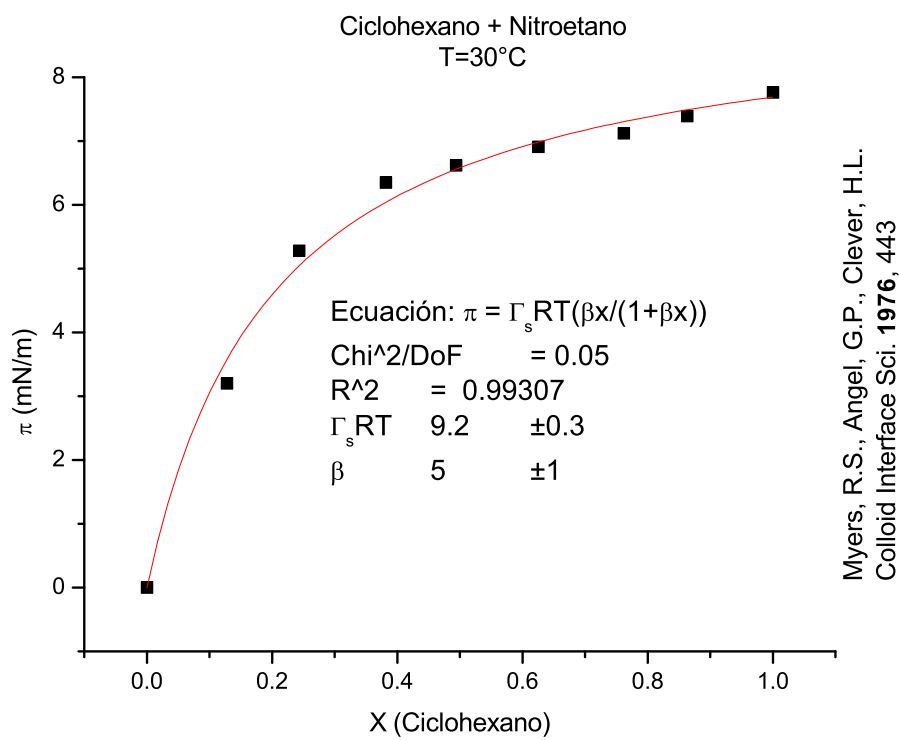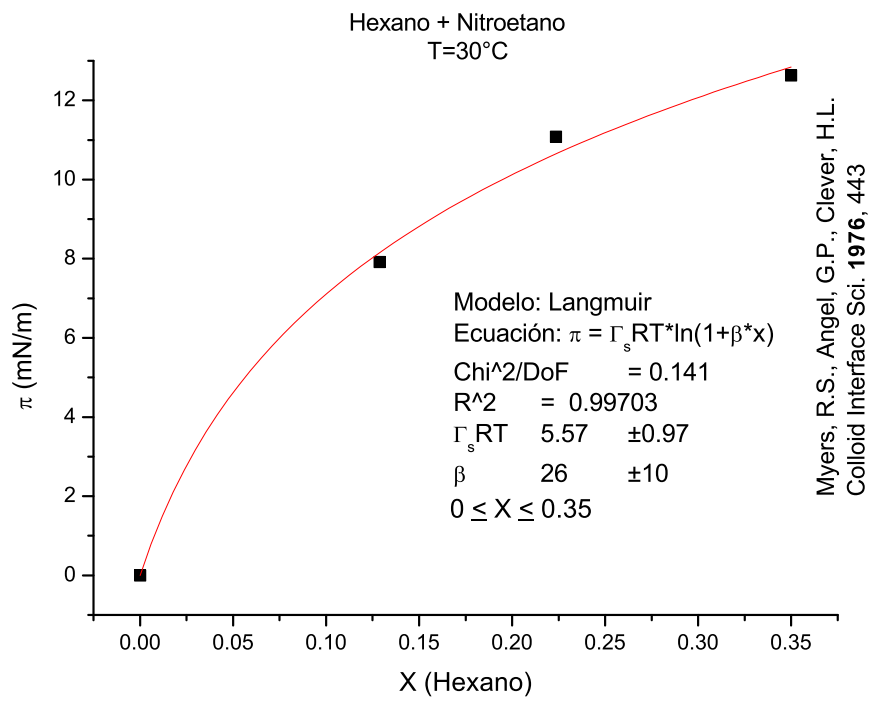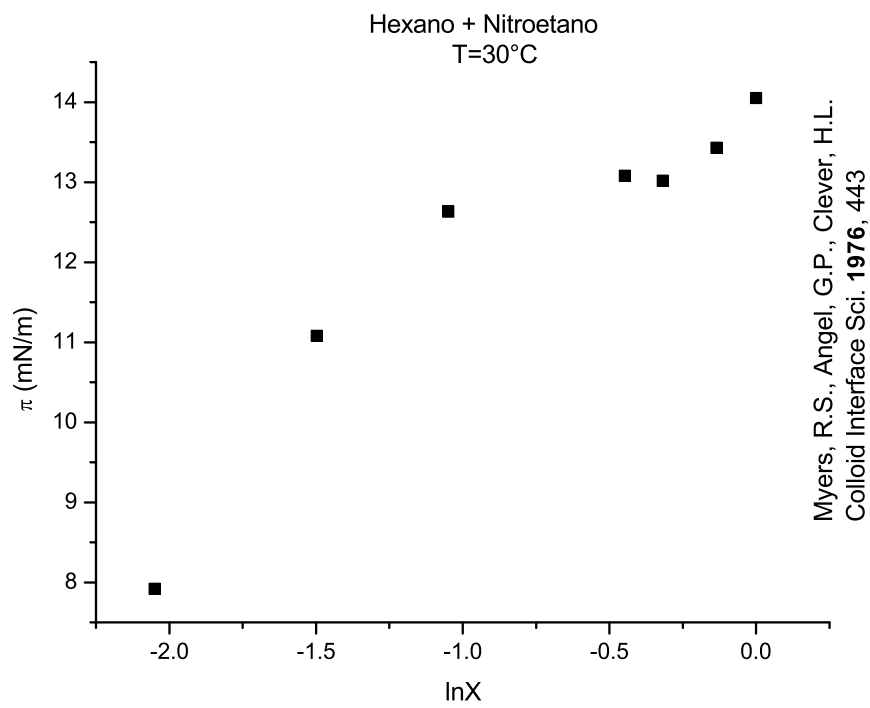Myers, R.S., Angel, G.P., Clever, H.L.
Colloid Interface Sci. **1976**, 443

Tabla D.59: Ciclohexano + Nitroetano a T=30°C [27]

x	$\sigma\left(\frac{mN}{m}\right)$	$\pi\left(\frac{mN}{m}\right)$	lnx
1	23.74	7.76	0
0.8636	24.11	7.39	-0.14665
0.7619	24.38	7.12	-0.27194
0.6255	24.59	6.91	-0.4692
0.4942	24.88	6.62	-0.70481
0.3821	25.15	6.35	-0.96207
0.2435	26.22	5.28	-1.41264
0.128	28.3	3.2	-2.05573
0	31.5	0	–

Hexano + Nitroetano
T=30°C

Hexano + Nitroetano
T=30°C

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.141
R^2   = 0.99703
$\Gamma_s RT$ 5.57   ±0.97
β 26   ±10
$0 \leq X \leq 0.35$

Hexano + Nitroetano
T=30°C

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF = 0.26
R^2 = 0.98986
$\Gamma_s RT$ 15.2 ±0.5
β 10 ±2

Myers, R.S., Angel, G.P., Clever, H.L.
Colloid Interface Sci. **1976**, 443
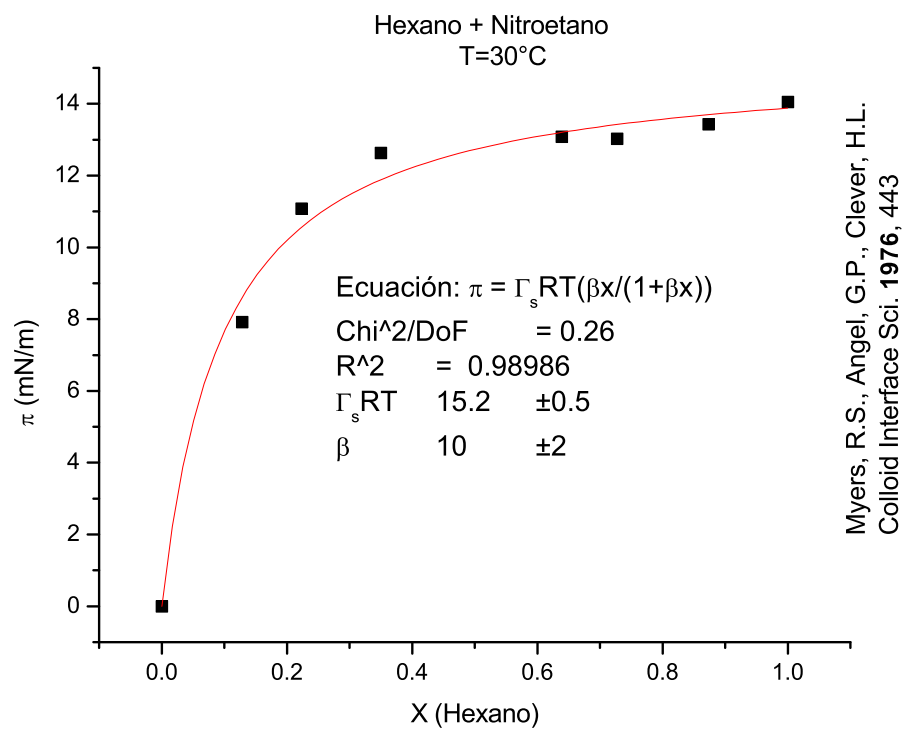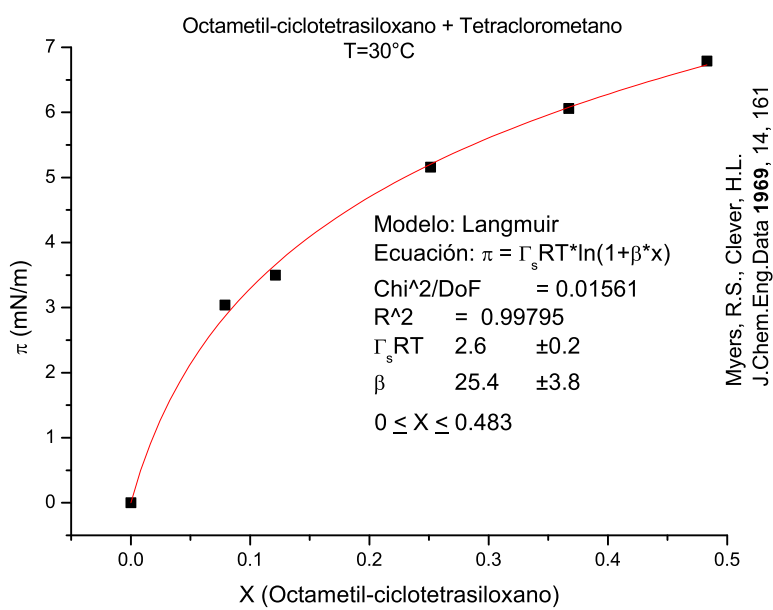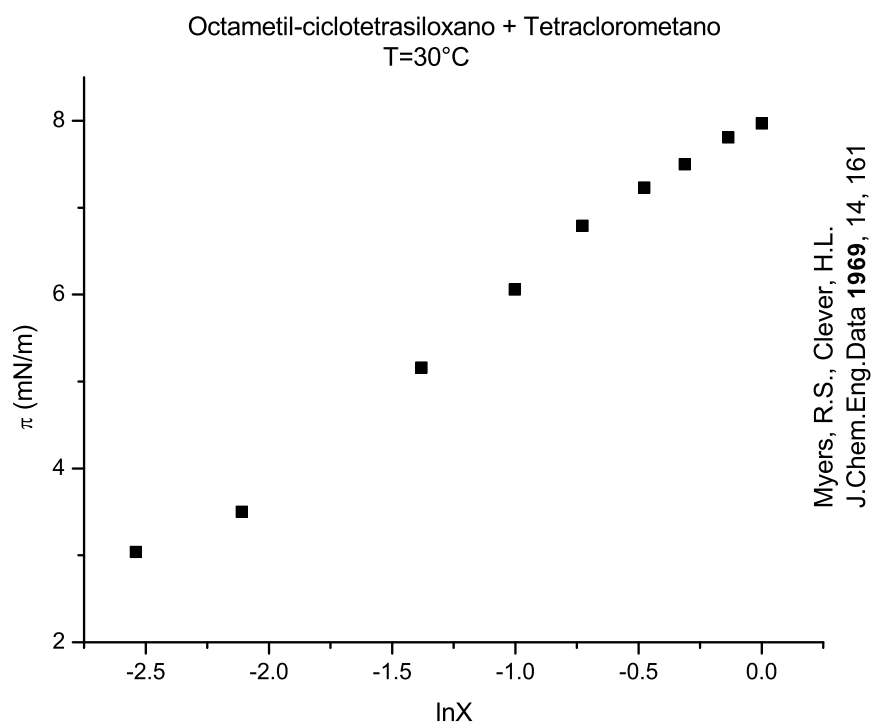
Tabla D.60: Hexano + Nitroetano a T=30°C [27]

x	$\sigma \left(\frac{mN}{m}\right)$	$\pi \left(\frac{mN}{m}\right)$	lnx
1	17.45	14.05	0
0.8736	18.07	13.43	-0.13513
0.7274	18.48	13.02	-0.31828
0.6391	18.42	13.08	-0.44769
0.35	18.87	12.63	-1.04982
0.2236	20.42	11.08	-1.4979
0.1287	23.58	7.92	-2.05027
0	31.5	0	–

Octametil-ciclotetrasiloxano + Tetraclorometano
T=30°C

π (mN/m)

lnX

Myers, R.S., Clever, H.L.
J.Chem.Eng.Data **1969**, 14, 161

Octametil-ciclotetrasiloxano + Tetraclorometano
T=30°C

π (mN/m)

Modelo: Langmuir
Ecuación: $\pi = \Gamma_s RT*\ln(1+\beta*x)$

Chi^2/DoF   = 0.01561
R^2   = 0.99795
$\Gamma_s RT$ 2.6   ±0.2
β 25.4   ±3.8

$0 \leq X \leq 0.483$

X (Octametil-ciclotetrasiloxano)

Myers, R.S., Clever, H.L.
J.Chem.Eng.Data **1969**, 14, 161

Octametil-ciclotetrasiloxano + Tetraclorometano
T=30°C

π (mN/m)

Ecuación: $\pi = \Gamma_s RT(\beta x/(1+\beta x))$

Chi^2/DoF	= 0.02	
R^2	= 0.99725	
$\Gamma_s RT$	9.5	±0.2
β	5.0	±0.3

X (Octametil-ciclotetrasiloxano)
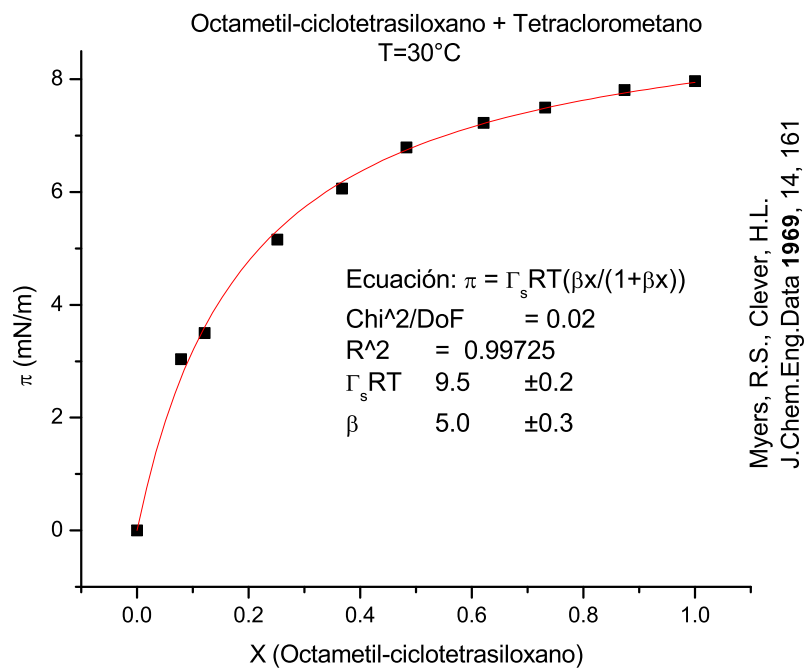
Myers, R.S., Clever, H.L.
J.Chem.Eng.Data **1969**, 14, 161

Tabla D.61: Octametil-ciclotetrasiloxano + Tetraclorometano a T=30°C [28]

x	$\sigma \left(\frac{mN}{m} \right)$	$\pi \left(\frac{mN}{m} \right)$	lnx
0	25.95	0	–
0.0789	22.91	3.04	-2.53957
0.1212	22.45	3.5	-2.11031
0.2513	20.79	5.16	-1.38111
0.3672	19.89	6.06	-1.00185
0.483	19.16	6.79	-0.72774
0.6214	18.72	7.23	-0.47578
0.7316	18.45	7.5	-0.31252
0.8738	18.14	7.81	-0.1349
1	17.98	7.97	0

LISTA DE SÍMBOLOS

T	temperatura
Q	calor
U	energía interna
W	trabajo
S	entropía
P	presión
V	volumen
H	entalpía
F	energía libre de Helmholtz
G	energía libre de Gibbs
n	número de moles
μ	potencial químico
x	fracción mol
σ	tensión superficial
π	presión de superficie
$\alpha,\ \beta$	fases
$\alpha_1,\ \alpha_2,\ \alpha_n,$ N	constantes de interaccón
Γ	concentración de superficie
A	área
v_{ads}	velocidad de adsorción
v_{des}	velocidad de desorción
v_{ads}	constante de rapidez de adsorción
v_{des}	constante de rapidez de desorción
θ	fracción de espacios ocupados
R	constante de los gases
β	efecto liofobico ó coeficiente de reparto

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