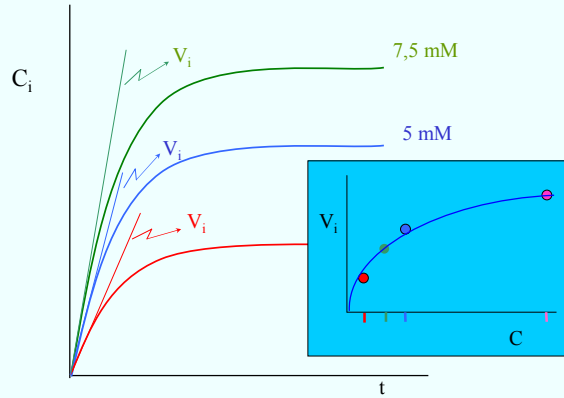
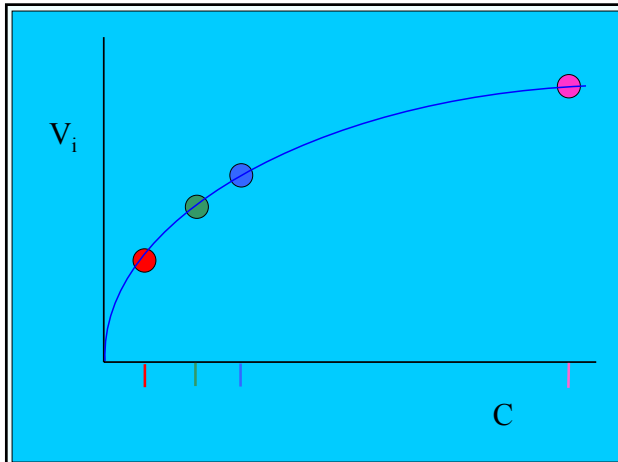
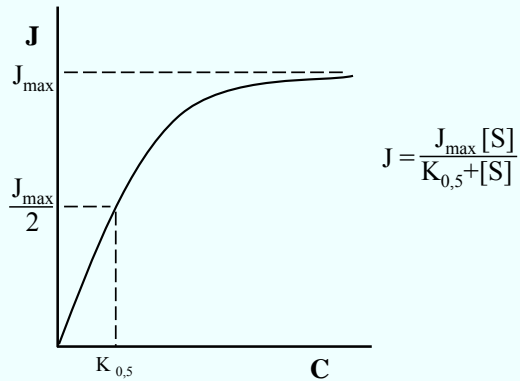


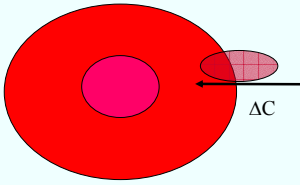
¿ Cuándo la velocidad de entrada al eritrocito es máxima ?





Curva de Saturación

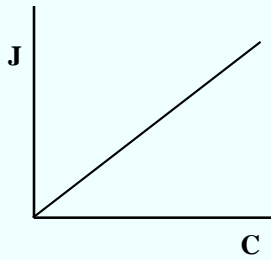




Transporte mediado pasivo

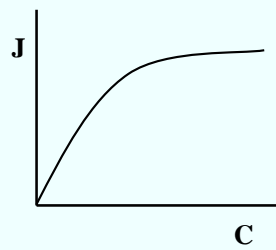
- Proteína integral de membrana (transportador)
- A favor de gradiente de concentración
- Proceso espontaneo
- Energía proviene del gradiente de potencial químico de la sustancia que se transporta

Difusión Simple



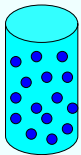
$$J = P (C_1 - C_2)$$

Transporte Mediado



$$J = \frac{J_{\max} [S]}{K_{0,5} + [S]}$$

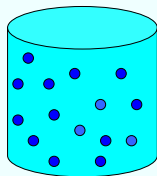
Estado INICIAL



$$P \cdot V = nRT$$

Ley de los gases ideales

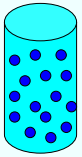
Estado FINAL



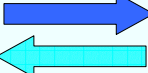
$$P \cdot V = nRT$$

Definimos Termodinámicamente
 $\Delta \text{Estado} \equiv \text{Estado final} - \text{Estado inicial}$

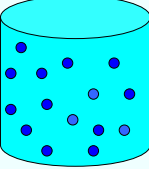
Estado INICIAL



$P_i \cdot V_i = nRT$



Estado FINAL



$P_f \cdot V_f = nRT$

¿ De donde proviene la energía para la expansión del gas ?

¿ De donde provendría la energía para la contracción del gas ?

$G = G^\circ + nRT \ln P$ Para un gas

Pero los procesos biológicos no ocurren en estado gaseoso

Ocurren en medios acuosos. En solución

UTILIZAREMOS LA CONCENTRACIÓN

$G = G^\circ + nRT \ln C$ En solución acuosa

$G = G^\circ + nRT \ln C$ En solución acuosa

Definición $\mu \equiv G/n$ $n = \text{numero de moles}$

μ energía libre disponible para hacer trabajo por mol

$$\frac{G}{n} = \frac{G^\circ}{n} + \frac{nRT \ln C}{n}$$

$$\mu = \mu^\circ + RT \ln C$$

Diagram illustrating the derivation of the chemical potential difference $\Delta\mu$ for a process from initial to final state.

Initial state: $\mu_i = \mu_i^\circ + RT \ln C_i$ (labeled "inicial")

Final state: $\mu_f = \mu_f^\circ + RT \ln C_f$ (labeled "final")

General chemical potential: $\mu = \mu^\circ + RT \ln C$

Definition of $\Delta\mu$: $\Delta\mu \equiv \mu_{\text{final}} - \mu_{\text{inicial}}$

Calculation of $\Delta\mu$:

$$\Delta\mu = \mu_f - \mu_i$$

$$\Delta\mu = \mu_f^\circ + RT \ln C_f - \mu_i^\circ + RT \ln C_i$$

Derivation of $\Delta\mu$ using standard chemical potentials:

$$\Delta\mu = \mu_f^\circ + RT \ln C_f - \mu_i^\circ + RT \ln C_i$$

$$\Delta\mu = \mu_f^\circ + RT \ln C_f - [\mu_i^\circ + RT \ln C_i]$$

Labels: "final" (pointing left), "inicial" (pointing right)

$$\Delta\mu = \mu_f^\circ + RT \ln C_f - \mu_i^\circ - RT \ln C_i$$

Pero $\mu_f^\circ = \mu_i^\circ$

$$\Delta\mu = RT \ln C_f - RT \ln C_i$$

Final simplified equation for $\Delta\mu$:

$$\Delta\mu = RT \ln C_f - RT \ln C_i$$

$$\Delta\mu = RT (\ln C_f - \ln C_i)$$

Por propiedad de los logaritmos

$$\Delta\mu = RT \ln C_f / C_i$$

$$\Delta\mu = RT \ln C_f/C_i$$

$$C_i > C_f \text{ entonces } \ln C_f/C_i < 0 \quad \therefore \Delta\mu < 0$$

$$C_f = C_i \text{ entonces } \ln C_f/C_i = 0 \quad \therefore \Delta\mu = 0$$

$$C_i < C_f \text{ entonces } \ln C_f/C_i > 0 \quad \therefore \Delta\mu > 0$$




Diagram illustrating a spontaneous process. A large crowd is shown with a yellow arrow pointing from a high concentration area (C_i) to a lower concentration area (C_f). The arrow is labeled "ESPONTANEO".

$C_i > C_f \text{ entonces } \ln C_f/C_i < 0 \quad \therefore \Delta\mu < 0$




Diagram illustrating a non-spontaneous process. A large crowd is shown with a yellow arrow pointing from a low concentration area (C_i) to a higher concentration area (C_f). The arrow is labeled "NO ESPONTANEO".

$C_i < C_f \text{ entonces } \ln C_f/C_i > 0 \quad \therefore \Delta\mu > 0$
