

CHIMICA GENERALE ED INORGANICA E LABORATORIO

cod. 00966

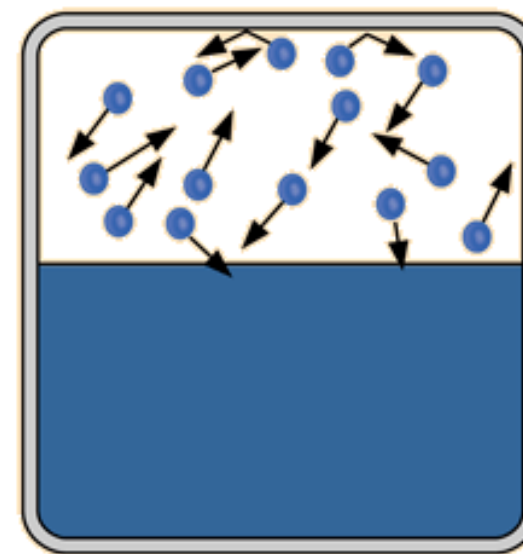
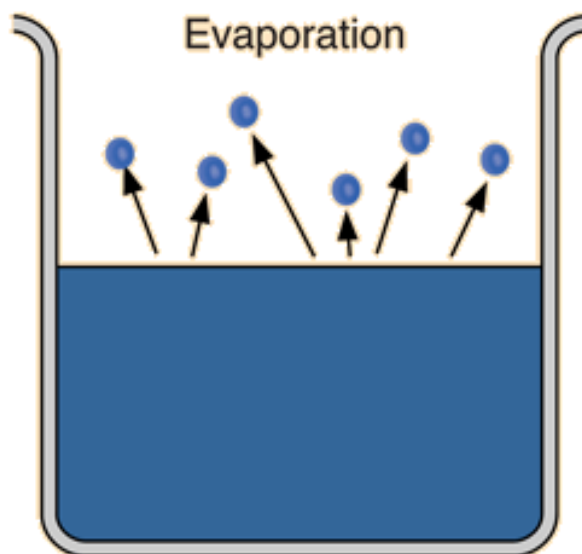
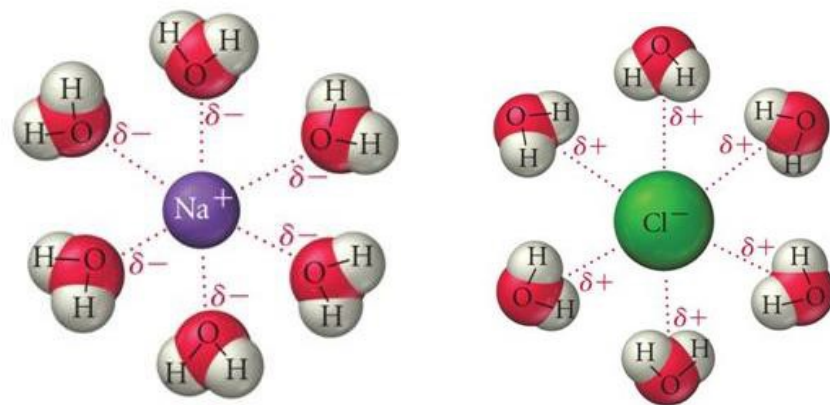
Docente:

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Lezione 13

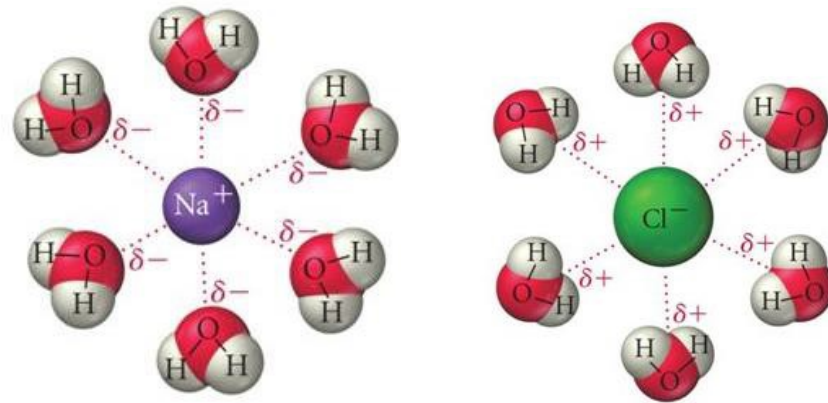
- Proprietà colligative (legge di Raoult, innalzamento ebulloscopico, abbassamento crioscopico, pressione osmotica)

Legge di Raoult:



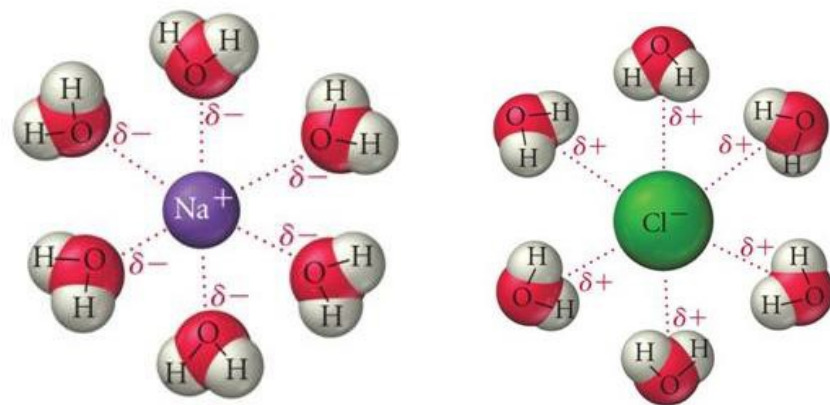
Evaporation which has reached equilibrium with the liquid surface is said to have reached saturation.

Legge di Raoult:



$$P_{\text{soluzione}} = \chi P^0_{\text{solvente}}$$

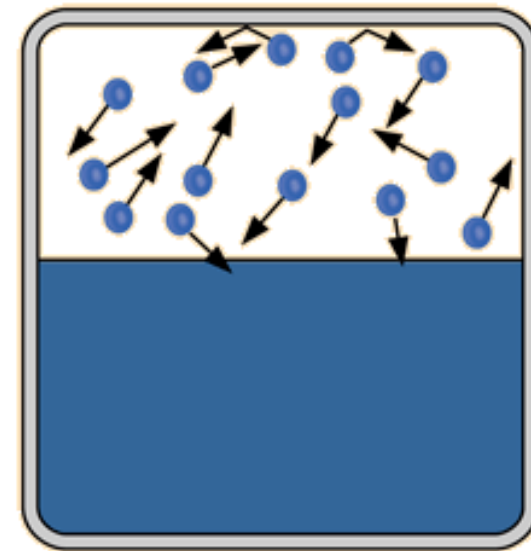
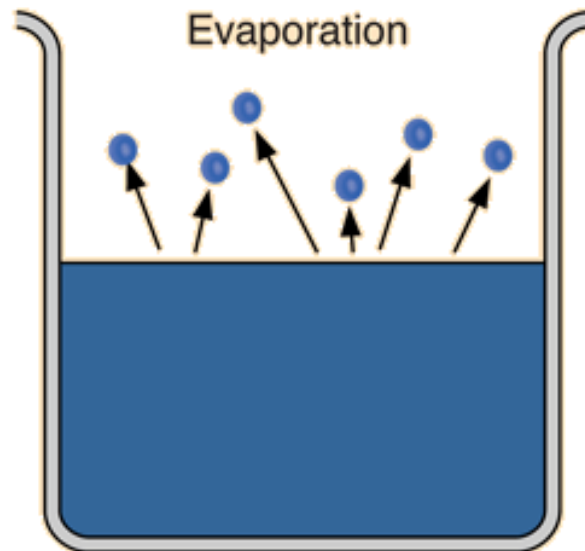
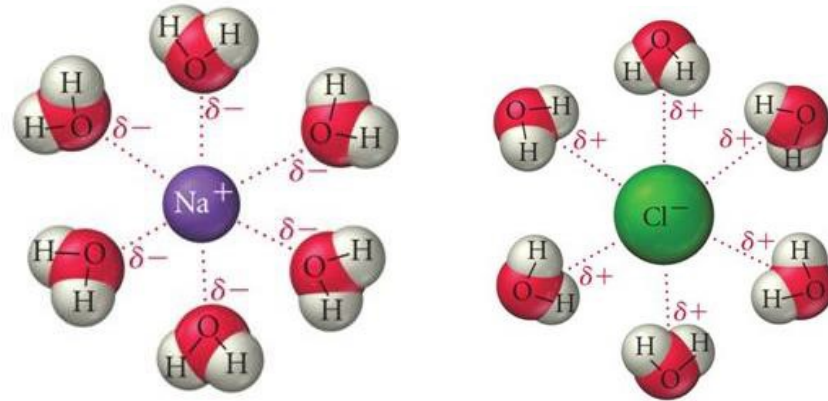
Legge di Raoult:



$$P_{\text{soluzione}} = \chi P^0_{\text{solvente}}$$

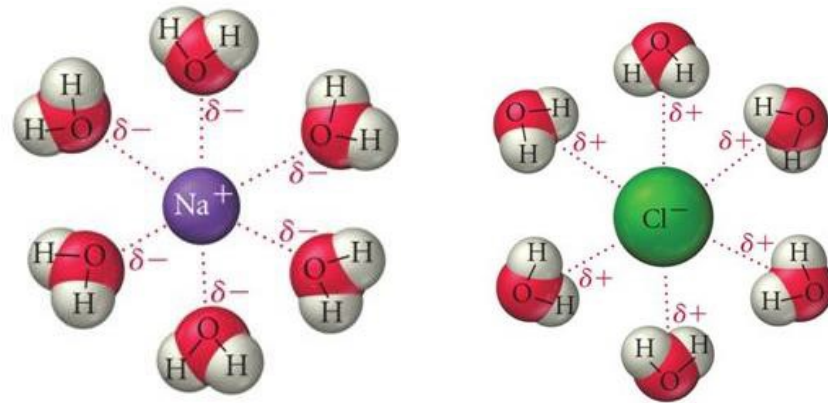
- Calcolare la tensione di vapore di una soluzione acquosa, a 25°C, ottenuta aggiungendo 20.00 g di saccarosio ($C_{12}H_{22}O_{11}$, MM.: 342.30 g/mol) a 500.0 g di acqua (MM.: 18.01 g/mol; $P^0 = 23.80$ mmHg).
- Calcolare la tensione di vapore di una soluzione acquosa, a 25°C, ottenuta aggiungendo 20.00 g di NaCl (PF.: 58.44 g/mol) a 500,0 mL ($d = 1.00$ g/mL; MM.: 18.01 g/mol; $P^0 = 23.80$ mmHg).

Innalzamento ebullioscopico:



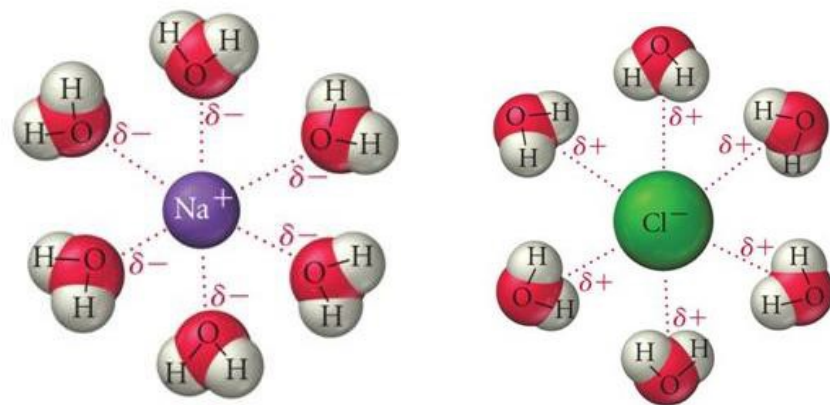
Evaporation which has reached equilibrium with the liquid surface is said to have reached saturation.

Innalzamento ebullioscopico:



$$\Delta T = k_{eb} m i$$

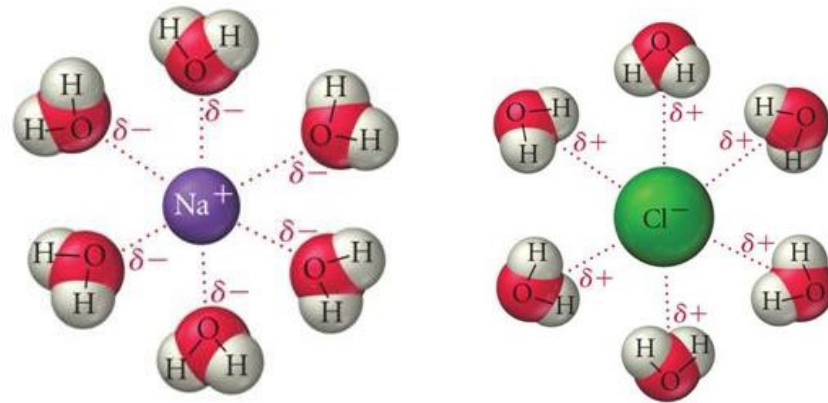
Innalzamento ebullioscopico:



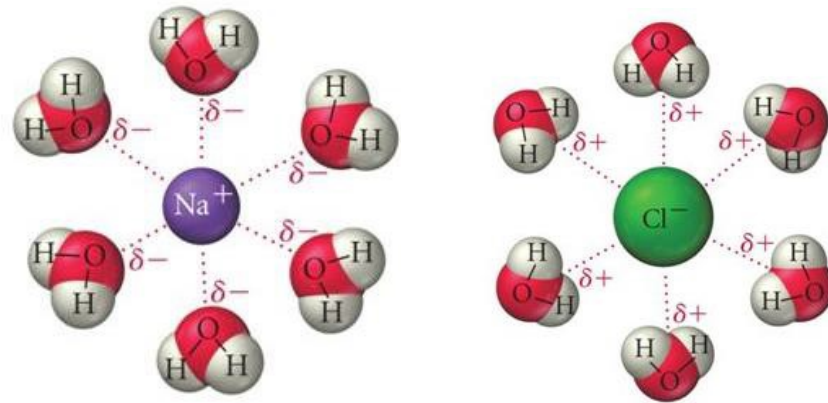
$$\Delta T = k_{eb} m i$$

- Calcolare la temperatura a cui bolle una soluzione di una soluzione acquosa ottenuta aggiungendo 20.00 g di saccarosio ($C_{12}H_{22}O_{11}$, MM.: 342.30 g/mol) a 500.0 g di acqua (MM.: 18.01 g/mol; $k_{eb} = 0.52$).
- Calcolare la temperatura a cui bolle una soluzione una soluzione acquosa ottenuta aggiungendo 20.00 g di NaCl (PF.: 58.44 g/mol) a 500.0 mL ($d = 1.000$ g/mL; MM.: 18.01 g/mol; $k_{eb} = 0.5200$).

Abbassamento crioscopico:

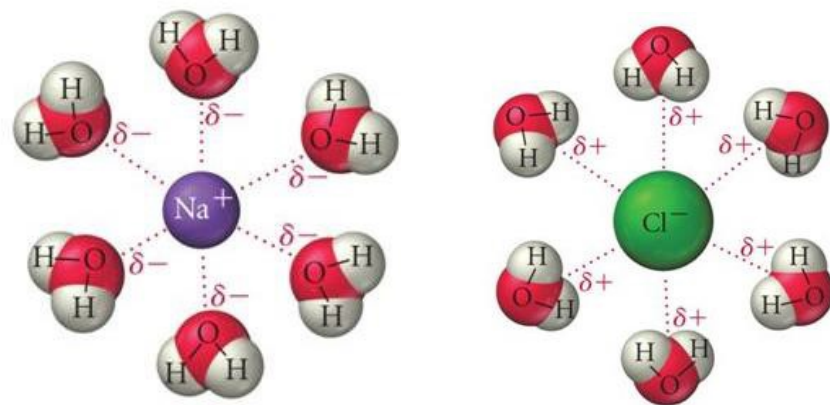


Abbassamento crioscopico:



$$\Delta T = k_{cr} m i$$

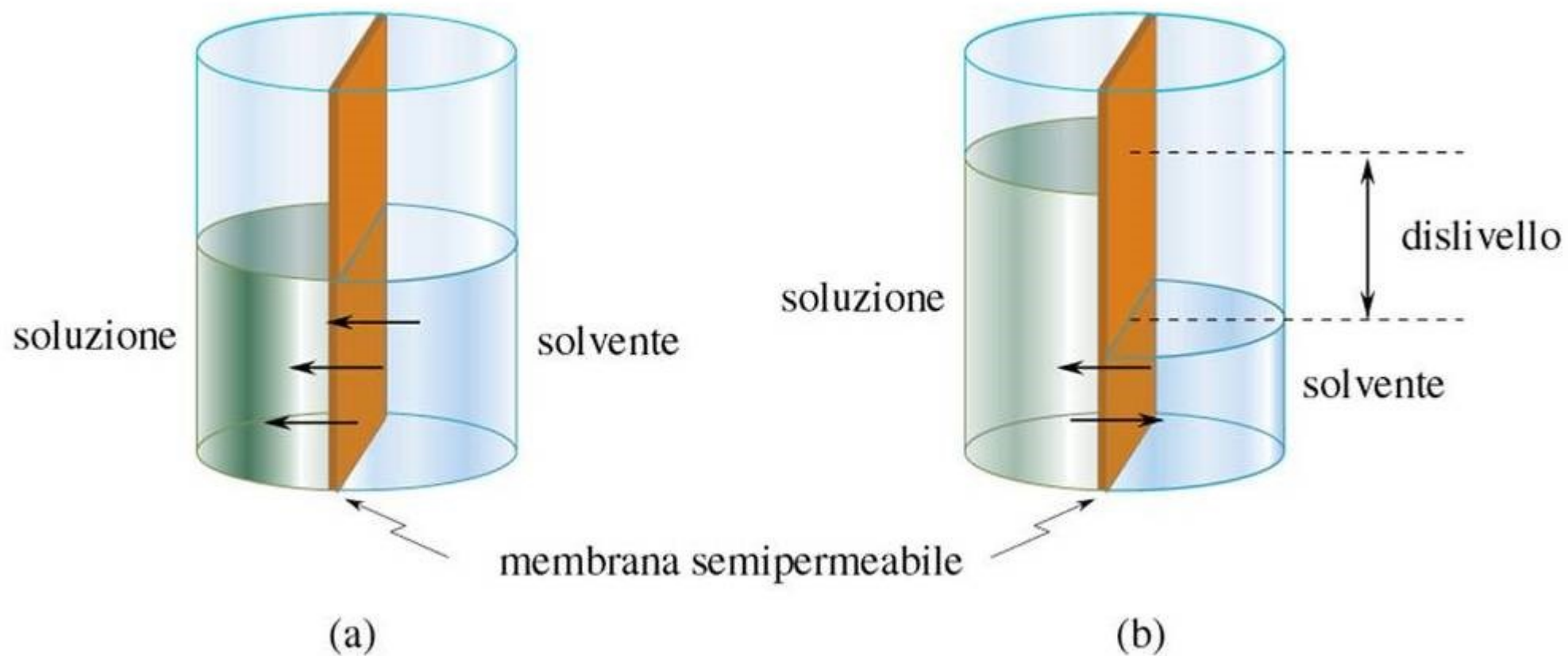
Abbassamento crioscopico:



$$\Delta T = k_{cr} m i$$

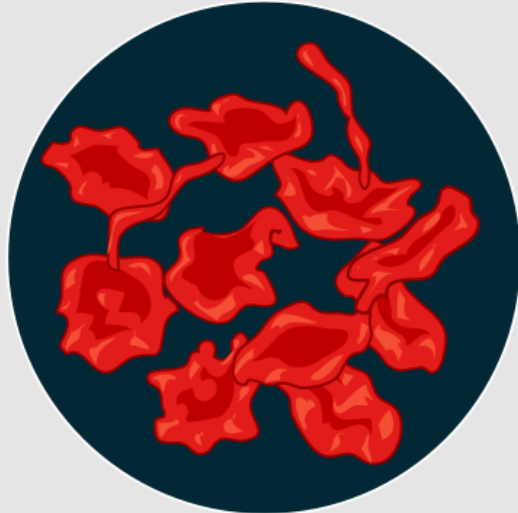
- Calcolare la temperatura a cui congela una soluzione acquosa ottenuta aggiungendo 20.00 g di saccarosio ($C_{12}H_{22}O_{11}$, MM.: 342.30 g/mol) a 500.0 g di acqua (MM.: 18.01 g/mol; $k_{cr} = 1.86$).
- Calcolare la temperatura a cui congela una soluzione acquosa ottenuta aggiungendo 20.00 g di NaCl (PF.: 58.44 g/mol) a 500.0 mL ($d = 1.000$ g/mL; MM.: 18.01 g/mol; $k_{cr} = 1.86$).

Pressione osmotica:

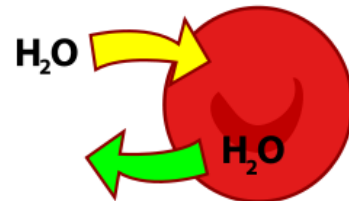


Pressione osmotica:

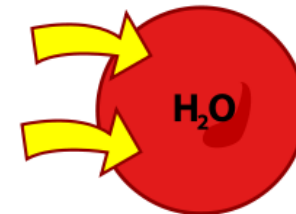
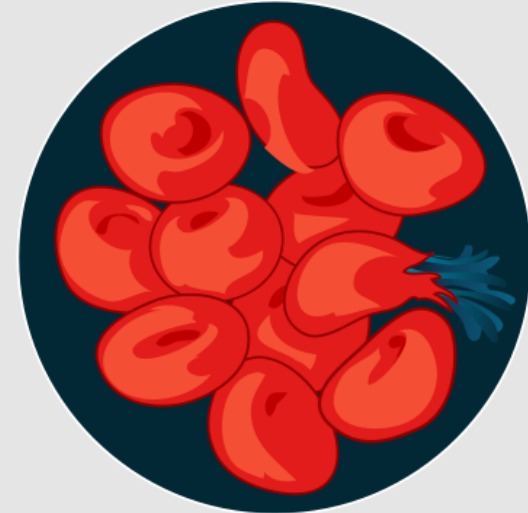
Ipertonico



Isotonico

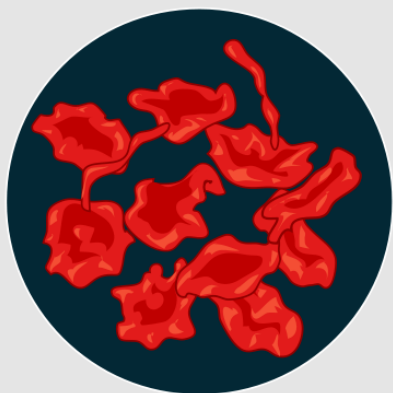


Ipotonico



Pressione osmotica:

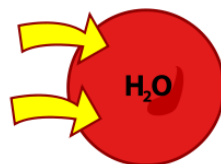
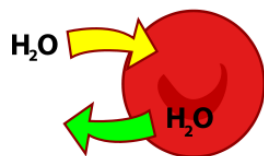
Iperotonico



Isotonico



Ipotonico



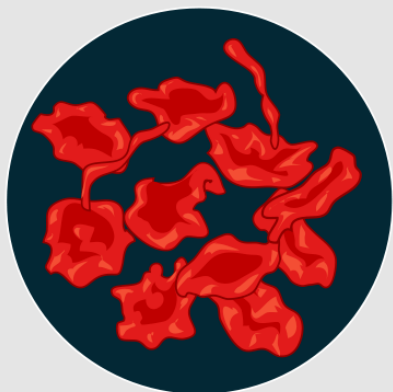
$$(P V = n R T)$$

$$\Pi V = n R T$$

$$\Pi = C R T i$$

Pressione osmotica:

Ipertonico



Isotonico



Ipotonico



$$\Pi = CRTi$$

- Calcolare la pressione osmotica di una soluzione acquosa, a 25°C, ottenuta aggiungendo 20.00 g di saccarosio ($C_{12}H_{22}O_{11}$, MM.: 342.30 g/mol) a 500.0 g di acqua ($d = 1.000$ g/mL; MM.: 18.01 g/mol).
- Calcolare la pressione osmotica di una soluzione acquosa, a 25°C, ottenuta aggiungendo 20.00 g di NaCl (PF.: 58.44 g/mol) a 500.0 mL (MM.: 18.01 g/mol).