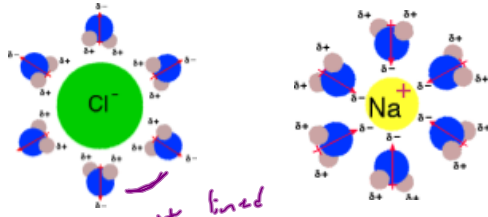


Freezing Point Depression - the theory

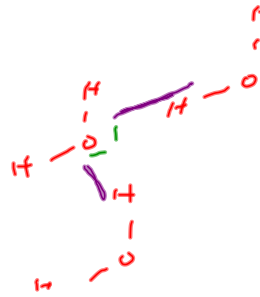
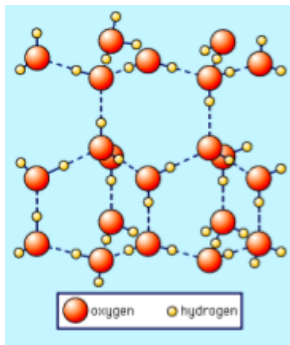


not lined
up to
be ice

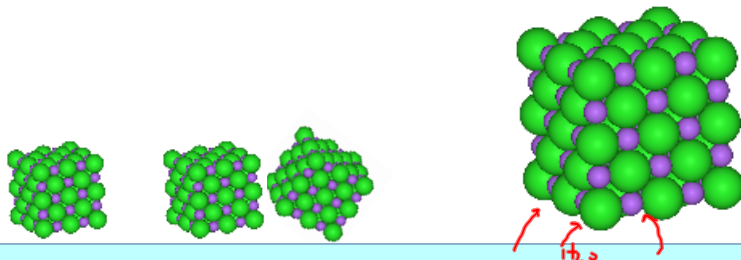
to form ice
need to pull H₂O's
away from
solvent

↓
slow down
(SSE)

T ↓



Melting Ice



Ice

H₂O's pulled
out of
crystal

Freezing Point Depression - the math

$$\Delta T = k_f m i$$

mols solute/kg solvent

so...

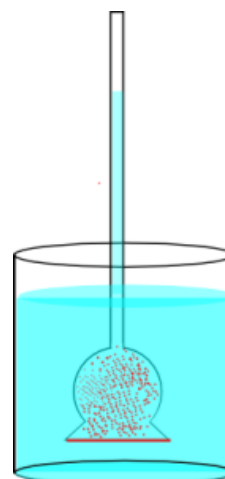
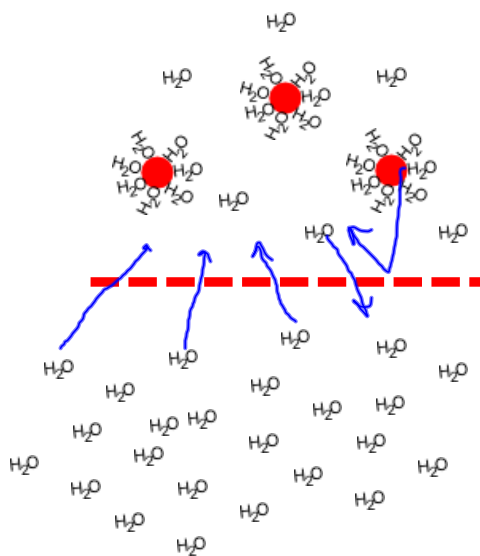
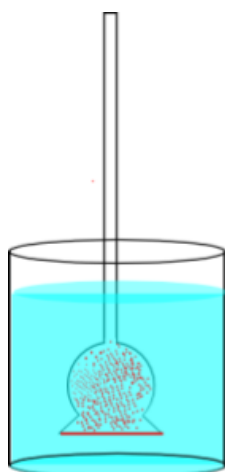
$$\Delta T = k_f \frac{(\text{mols solute}) i}{\text{kg solvent}}$$

and... mols solute = $\frac{\text{g solute}}{\text{molar mass}}$

so...

$$\Delta T = \frac{k_f (\text{g solute}) i}{(\text{kg solvent})(\text{molar mass of solute})}$$

Osmotic Pressure - the theory



Osmotic Pressure - the math

$$\Pi = MRT$$

↑
Os. pressure

↑
molarity

$$PV = nRT$$
$$\frac{P}{V} = \frac{n}{V} RT$$
$$P = \frac{n}{V} RT$$

Slugs

