1.21.14

→ which has highest vapor pressure?

- CH_3OH → weakest IMF
- CH_3CH_2OH
- $CH_3CH_2CH_2OH$

→ solution: solvent + (solute)
(greater amount → dissolved solute at solvent lesser amount)

- solubility - ability to be dissolved
- dissolution - process of dissolving

→ homogeneous solution - evenly mixed throughout, components not seen

→ sugar is a molecular solid - dissolves into individual molecules
- when sugar dissolves, intact units into individual sugar molecules

→ process of dissolution is endothermic (temperature ↓)
- "breaking" bonds"

→ change in enthalpy (breaking solute apart) + solvent change
- new solute - solvent interactions
(solvation energy) - Negative

$\Delta H_{solution} = \Delta H_{solute} + \Delta H_{solvation}$

↑ must be bigger for ΔH to be positive

$\Delta H_{solution} > 0$ (typical solute-solvent interactions are weaker)
→ depends on energy needed to up

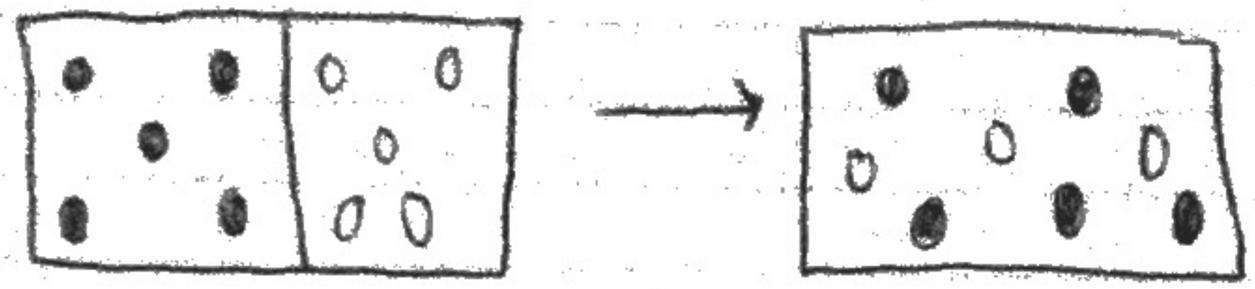
$\Delta H_{solution} < 0$ (unusual but possible)

→ increase in # of microstates results in an increase in entropy in dissolution, <u>always</u> $\Delta S_{solution} > 0$

→ If a gas dissolves into liquid= entropy is negative in dissolution

→ Reason why some substances dissolve and others don't is enthalpy(IMF)

→ The change of free energy for gases mixing is negative



Why does free energy decrease? ($\Delta G = \Delta H - T\Delta S$)
- ΔH is zero ; ΔS is positive
(in ideal gases there are no IMF)
↳ potential energy is the same

→ Spontaneous dissolution of the endothermic solution: must be entropically driven
- endothermic → enthalpy positive

→ change in free energy is positive (non-spontaneous)