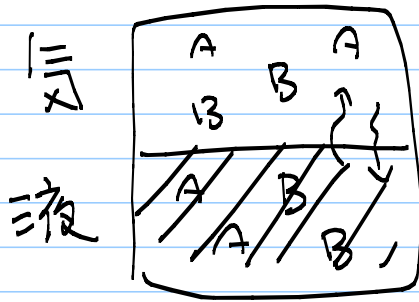


# Raoult (57-14) の法則



$$p_i \propto x_i(\text{liq})$$

蒸気圧

気-液平衡

$$\Leftrightarrow \mu_i(\text{gas}) = \mu_i(\text{liq}) \quad \dots (*)$$

平衡  $\rightarrow dG = 0$

$$\sum_i dn_i (\mu_i(\text{gas}) - \mu_i(\text{liq})) = 0$$

①  $dn_i$  は任意の微小量なので (\*) /  
 ② ③ より

$$\begin{aligned} \mu_i^\ominus(\text{gas}) + RT \ln p_i(\text{gas}) \\ = \mu_i^*(\text{liq}) + RT \ln x_i(\text{liq}) \end{aligned}$$

$$\rightarrow \ln \left( \frac{p_i(\text{gas})}{x_i(\text{liq})} \right) = \frac{\mu_i^*(\text{liq}) - \mu_i^\ominus(\text{gas})}{RT}$$

組成比に依存しない定数

$$\frac{p_i(\text{gas})}{x_i(\text{liq})} = \exp \left( \sim \right)$$

∴  $p_i(\text{gas}) \propto x_i(\text{liq})$

## 非理想溶液

$$\mu_i = \mu_i^\ominus + RT \ln a_i$$

となるように、活量 (activity)  $a_i$  を定義。標準状態で  $a_i = 1$

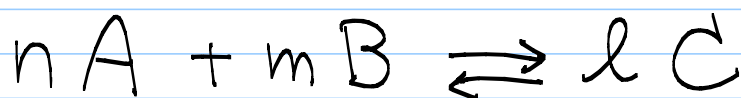
理想系  $\rightarrow a_i$  の代わりに  $\alpha_i, \beta_i$

$$a_i = \gamma_i \alpha_i$$

による活量係数  $\gamma_i$  を定義  
(理想系への補正因子)



分子間相互作用を反映  
質量作用の法則



$$\begin{aligned} \Delta G &= l\mu_C - n\mu_A - m\mu_B \\ &= l(\mu_C^\ominus + RT \ln a_C) \\ &\quad - n(\mu_A^\ominus + RT \ln a_A) \\ &\quad - m(\mu_B^\ominus + RT \ln a_B) \end{aligned}$$

= . . . .