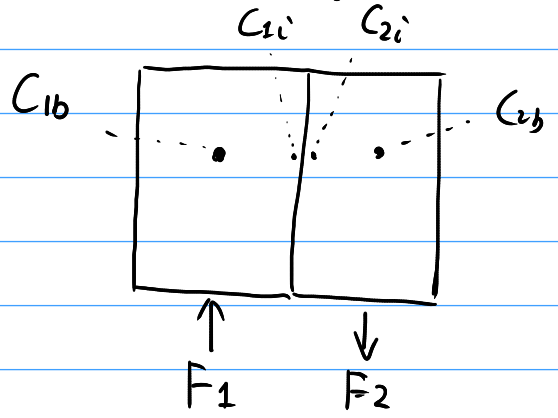
CHE 318 L22

Equilibrium Diagram & Interphase Transfer



Driving force for interface transfer

$(C_{1b} - C_{1i}) > 0$
$C_{2i} - C_{2b}) > 0$
$\Rightarrow N_A$ from 1 → 2

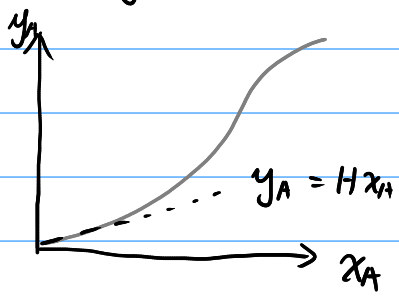
Flow rate units (usual notation)

Q (volumetric) = m^3/s $\quad (Q = S \cdot v_m)$
W (weight) = kg m/s
F (molar) = kg mol/s

{ Liquid usually writes L
{ Gas usually V

molar fraction { x_A Liquid
{ y_A Gas

Henry's Law & Solubility



Henry's law is $y_A = Hx_A$ or $p_A = Hx_A$ at low concentration

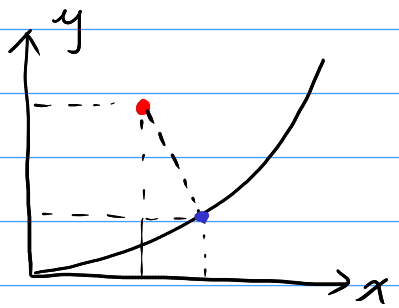
From the equilibrium plot, we can see

$$C_{Ai} = \frac{S \cdot p_A(atm)}{22.414} \left(kg\ mol/m^3\right)$$

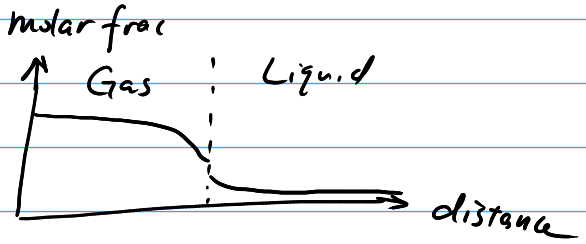
is another formalar for Henry's law

S is constant in this range

Slope to equilibrium $= -\frac{k_x}{k_y}$



$\Rightarrow$



Overall transfer coefficients