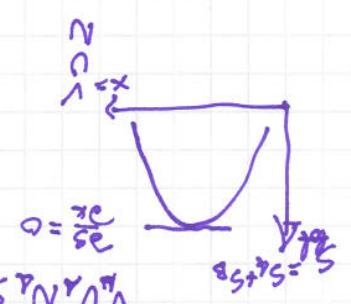
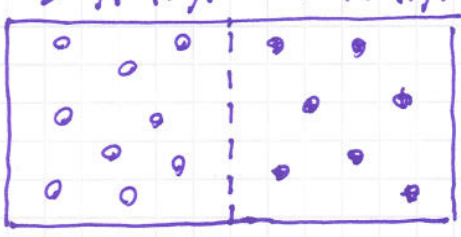


Equilibrium : maximizes Entropy = most probable state

Thermal : temperatures the same
 Mechanical : force balance / stresses / pressures the same
 Diffusive :



Mech. $\left(\frac{\partial S}{\partial V_A} \right)_{N_A, V_B} = 0$

Thermal $\left(\frac{\partial S}{\partial T_A} \right)_{N_A, V_A} = 0$

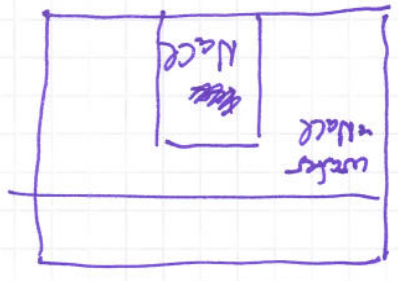
Diffusive $\left(\frac{\partial S}{\partial N_A} \right)_{V_A, U_A} = 0$

$\left(\frac{\partial S}{\partial N_A} \right)_{U_A, V_A} + \left(\frac{\partial S}{\partial N_B} \right)_{U_B, V_B} = 0$
 $\Rightarrow \frac{\partial S_A}{\partial N_A} = - \frac{\partial S_B}{\partial N_B}$

$\mu_A \equiv -T \left(\frac{\partial S_A}{\partial N_A} \right)_{U_A, V_A} = -T \left(\frac{\partial S_B}{\partial N_B} \right)_{U_B, V_B} \equiv \mu_B$

$\mu_A > \mu_B \Rightarrow$ particle flow from A to B

same for



Near : out of equilibrium ;
 Acetone