

FLUX

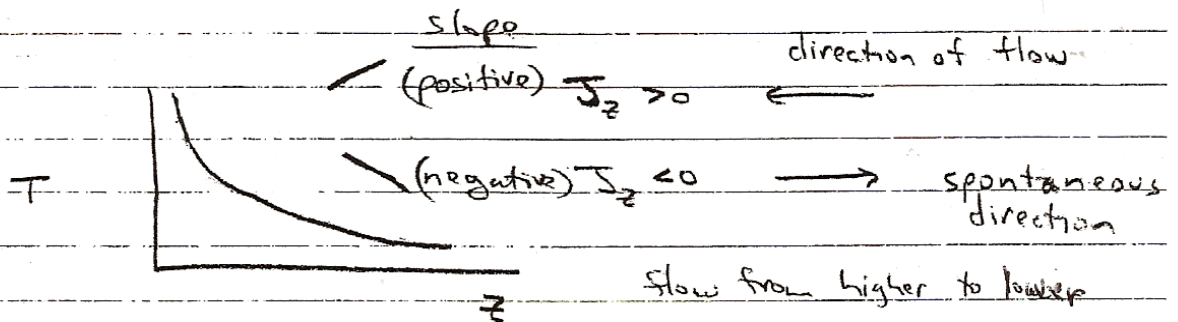
Flux - amount of property passing through unit area per time interval

mass \rightarrow $\text{kg m}^{-2} \text{s}^{-1}$
energy \rightarrow $\text{J m}^{-2} \text{s}^{-1}$

flux is proportional to gradient of some other property of system

$$J_z(\text{matter}) \propto \frac{d(\text{conc})}{dz} \leftarrow \text{concentration gradient} \quad \left| \frac{N}{V} = N \right.$$

$$J_z(\text{energy}) \propto \frac{dT}{dz} \quad \text{number per volume}$$



Fick's first law of Diffusion

$$J_z(\text{matter}) = -D \left(\frac{dN}{dz} \right)$$

D diffusion coefficient

$$J_z(\text{energy}) = -K \left(\frac{dT}{dz} \right)$$

K (kappa) coefficient of thermal conductivity