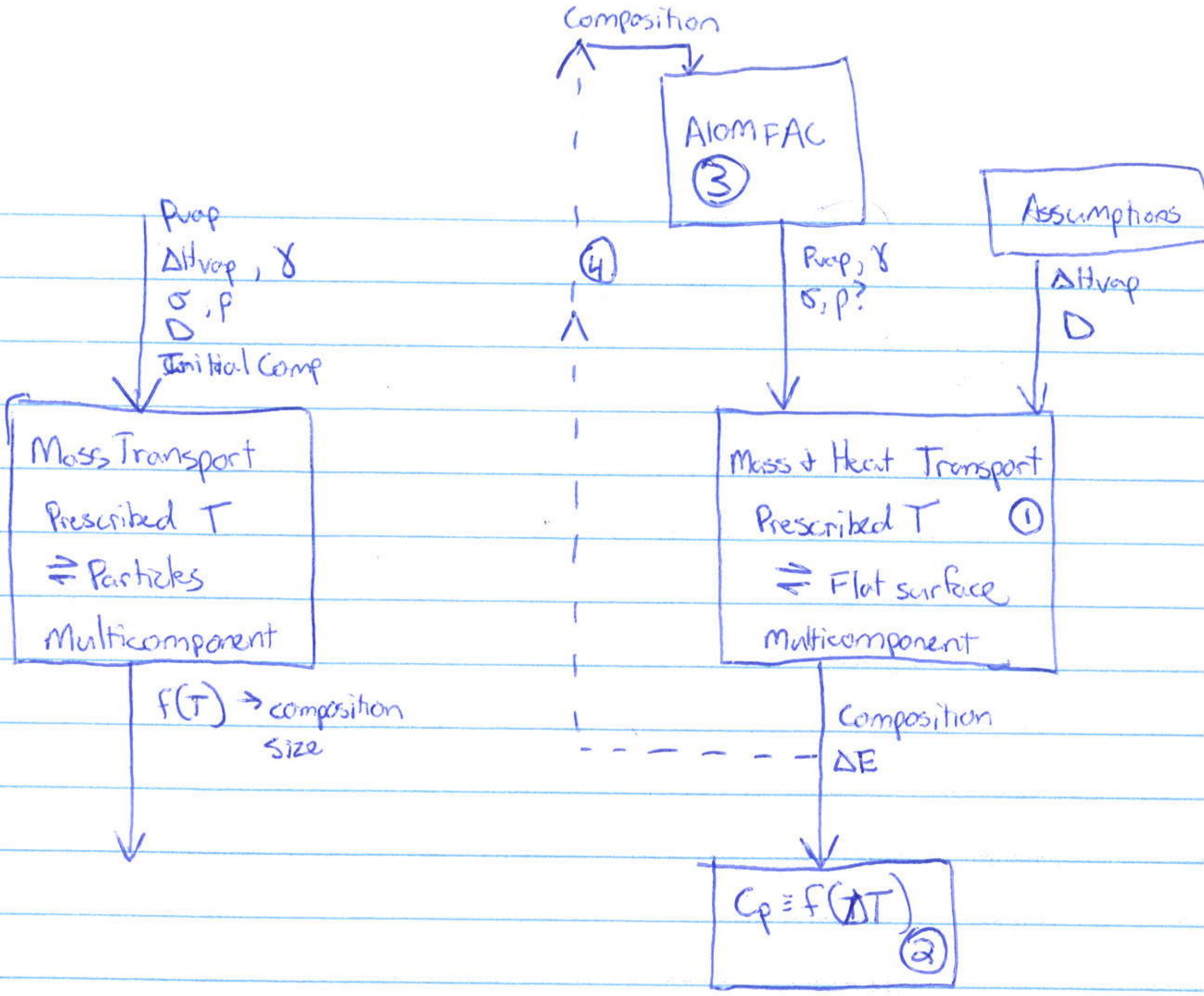


(0) What version do we start with?

(1) Rewrite mass transfer code to handle Energy
Change particle assumption (i.e. Kelvin eqn) to flat surface

(2) Output Heat capacity plot.

(3) Incorporate AIOMFAC

(4) Feedback composition on mixture properties

DSC Model

Energy Eqns.

[Mass transfer]

$$\frac{dm_A}{dt} = +\text{Condensation} - \text{Evaporation} = I$$

$$\frac{d[A]}{dt} = \text{Evaporation} - \text{Condensation} = -I$$

$$\cancel{\frac{dT}{dt} = Q_{in} - \Delta H_{vap}}$$

Δ Liquid ~~System~~ Energy = Flux In - Evaporation

Δ Vapor Energy = + Evaporation

$$\Delta E = mC_p\Delta T$$

$$\frac{dE}{dt} = \dot{Q}_{in} = mC_p\frac{dT}{dt}\Big|_{liquid} + mC_p\frac{dT}{dt}\Big|_{vapor} + m\Delta H_{vap}\Big|_{\text{Evap Species}}$$

$$\frac{dT}{dt} = \frac{Q_{in} - (m\Delta H_{vap})_{liq} + (m\Delta H_{vap})_{vap}}{(mC_p)_{liq} + (mC_p)_{vap}}$$

→ Start Subroutine Mass & Heat Xfer

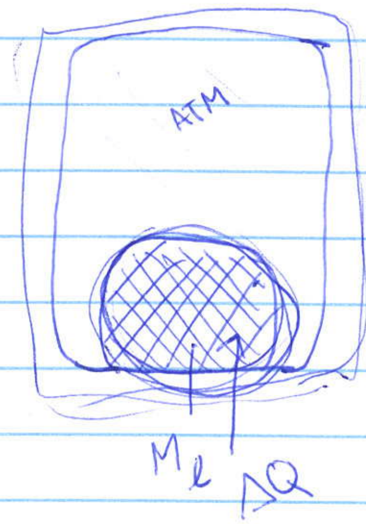
~~Calc T, P~~

M_v, M_l, T

Calc P

Calc $\frac{dM}{dt} = f(M_v, M_l, T, P)$

$\frac{dT}{dt} = f\left(\frac{dM}{dt}, M_v, M_l, Q\right)$



$$P = \frac{\Delta Q}{\Delta t \, m} \qquad D = \frac{\Delta T}{\Delta t} = \text{CONSTANT}$$

$$c_p = \frac{\Delta Q}{\Delta T \, m}$$

$$P = \frac{D}{\Delta T} \cdot \frac{\Delta Q}{m} \qquad \frac{\Delta Q}{m} = \frac{P \, \Delta T}{D}$$

$$c_p = \frac{1}{D} \cdot \frac{1}{\Delta t} \cdot \frac{\Delta Q}{m}$$

$$= \frac{P}{D^2} \cdot \underbrace{\frac{\Delta T}{\Delta t}}_{D} = \frac{P}{D}$$

Cloud Outflow - what is happening?

Nucleation is seen; organics are important

Can the properties of organic compounds/aerosols affect predictions of nucleation + growth

Need a transport model for it

Upgrade model; Run sensitivities

Any measurements at all??