

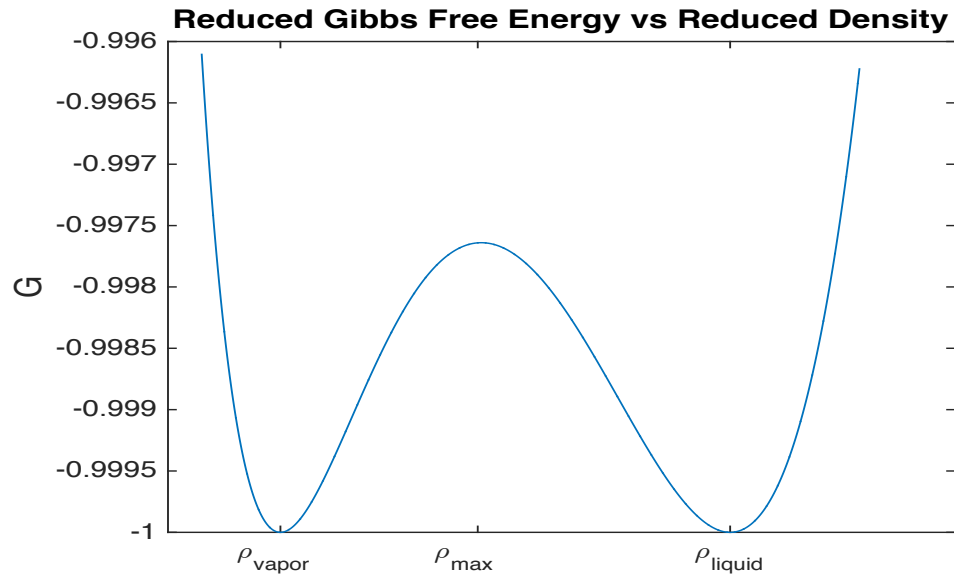
Production of Highly Mono Disperse Polymers by Evaporative Purification

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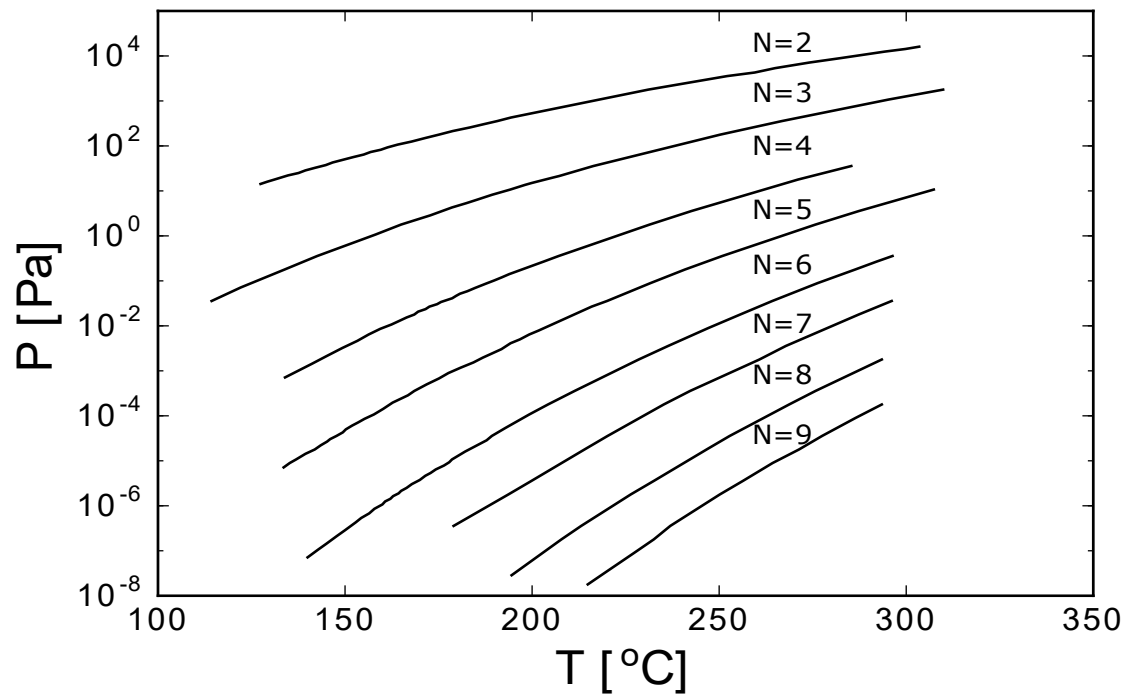
Binodal Condition:

$$G[T, P, \rho_{\text{vapor}}] = G[T, P, \rho_{\text{liquid}}]$$

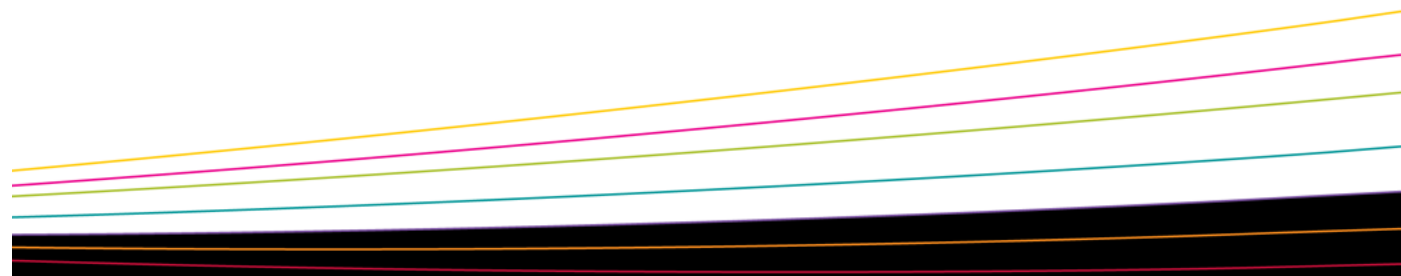
Vapor phase and liquid phase **coexist**.

Vapor Pressure

Sanchez, Isaac C., and Robert H. Lacombe, The Journal of Physical Chemistry 80.21 (1976): 2352-2362.



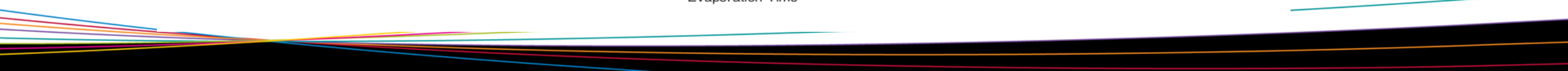
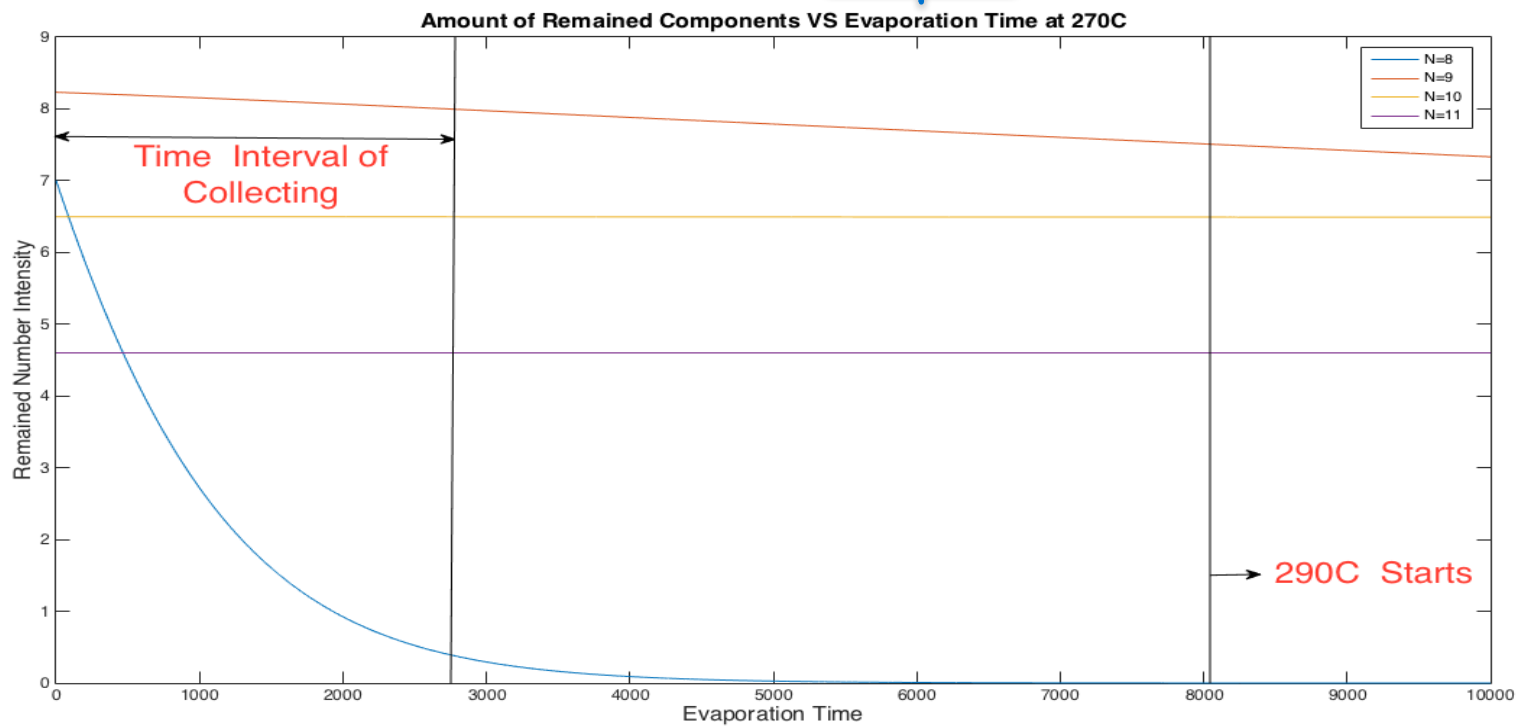
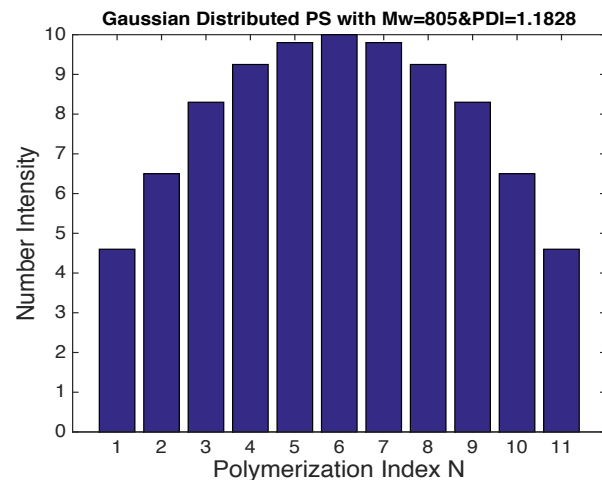
Calculated vapor pressure for polystyrene as a function of temperature and polymerization index N

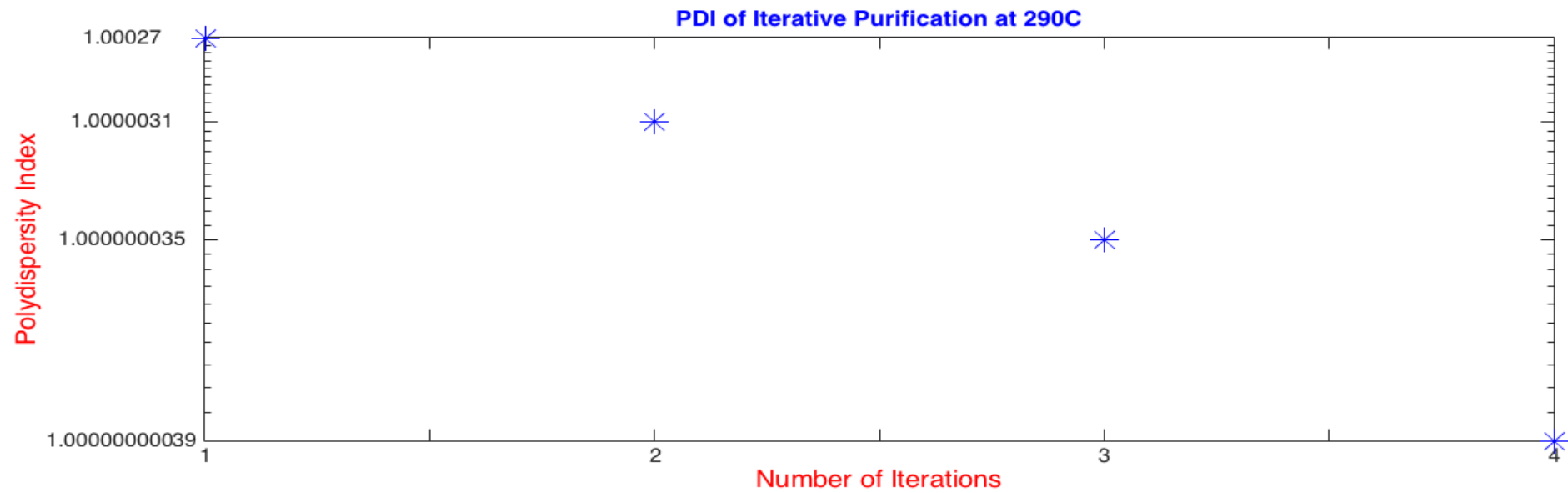
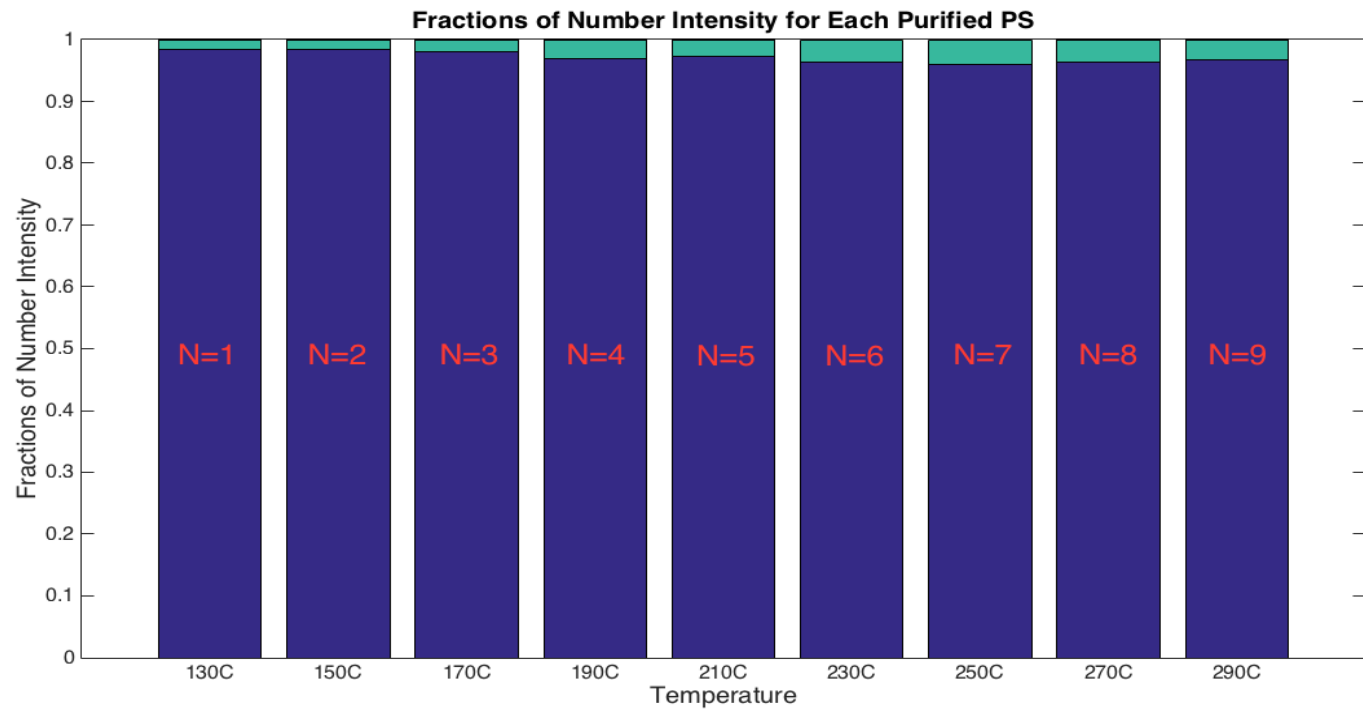


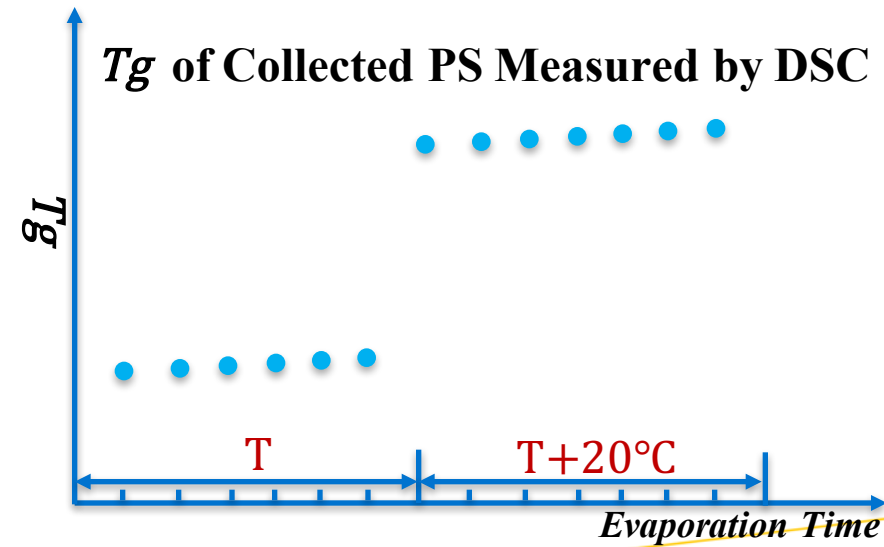
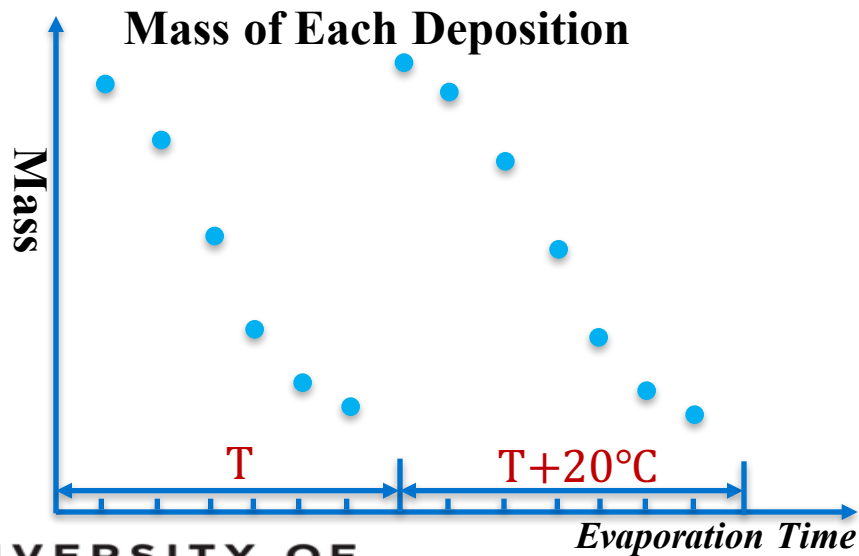
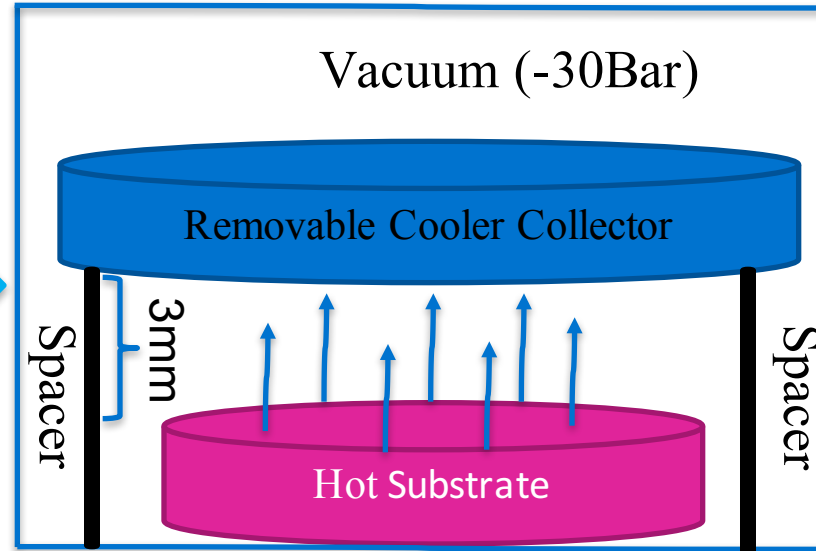
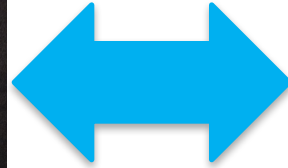
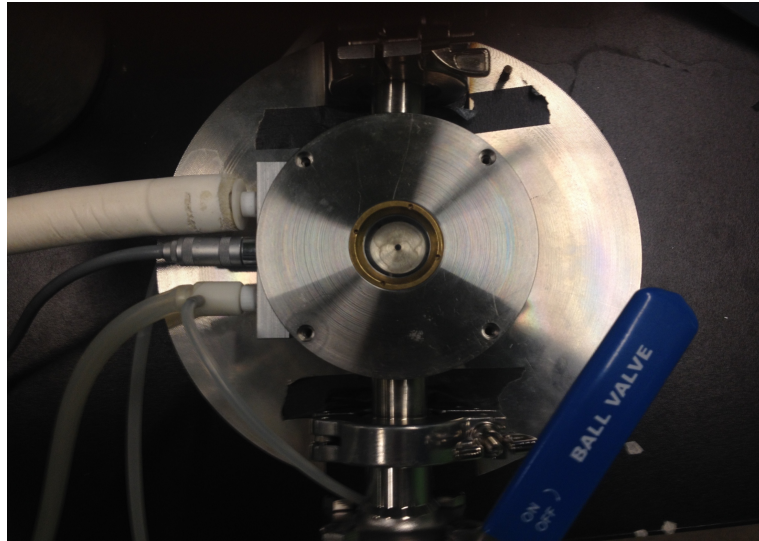
Evaporation rate expressed by mole number fraction: $\frac{dn_i}{dt} = -\frac{\alpha P_i n_i}{\sqrt{T} \sqrt{N_i} \sum n_i}$

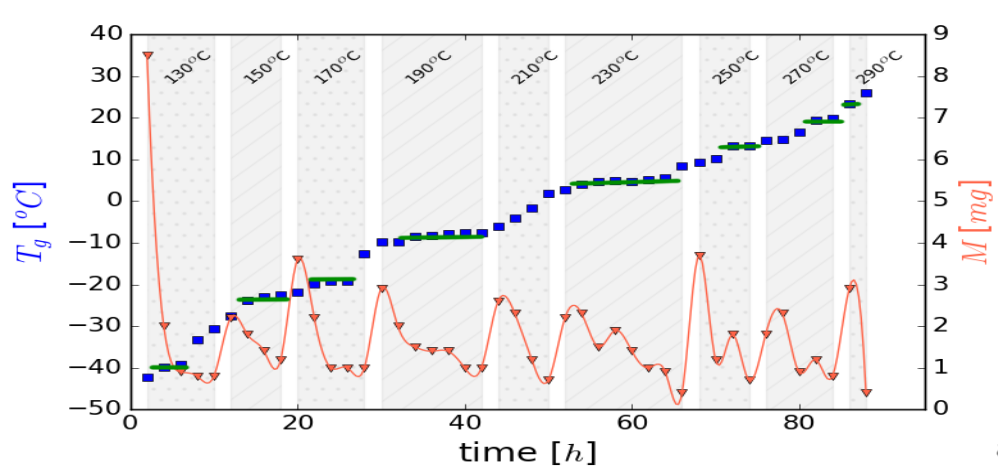
Langmuir Equation

Raoult's Law

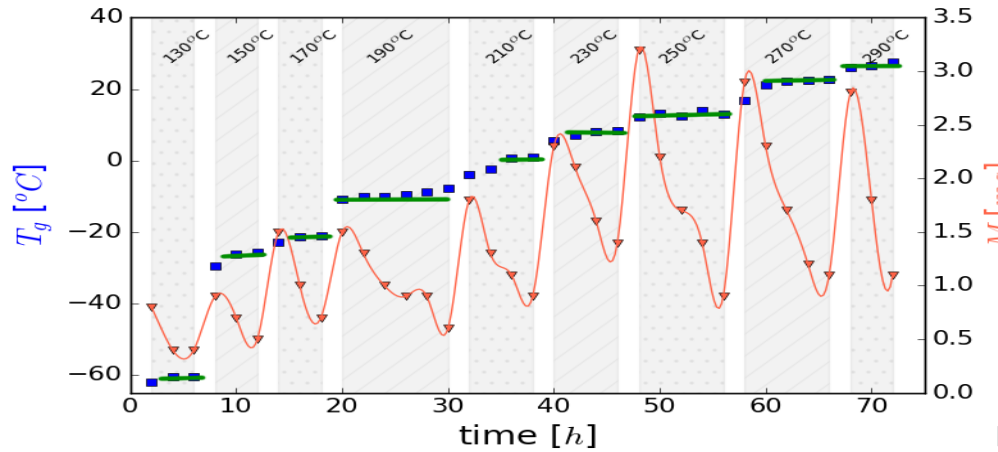




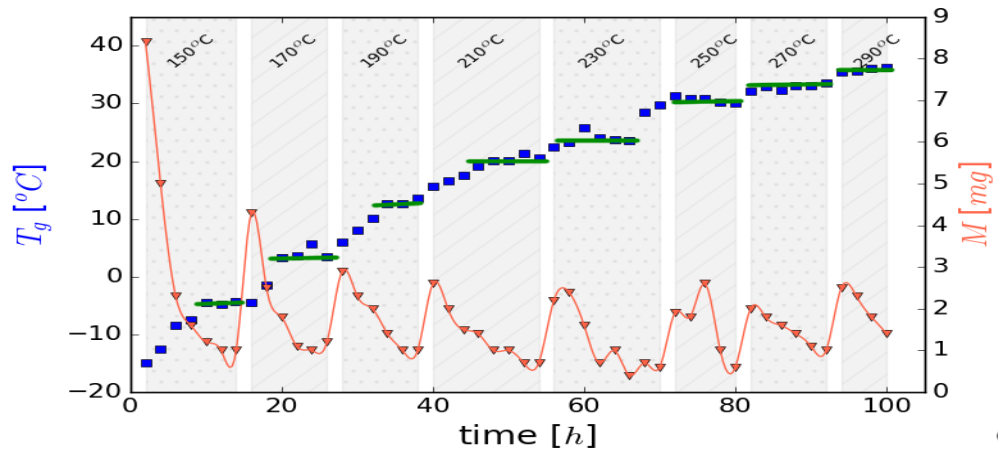




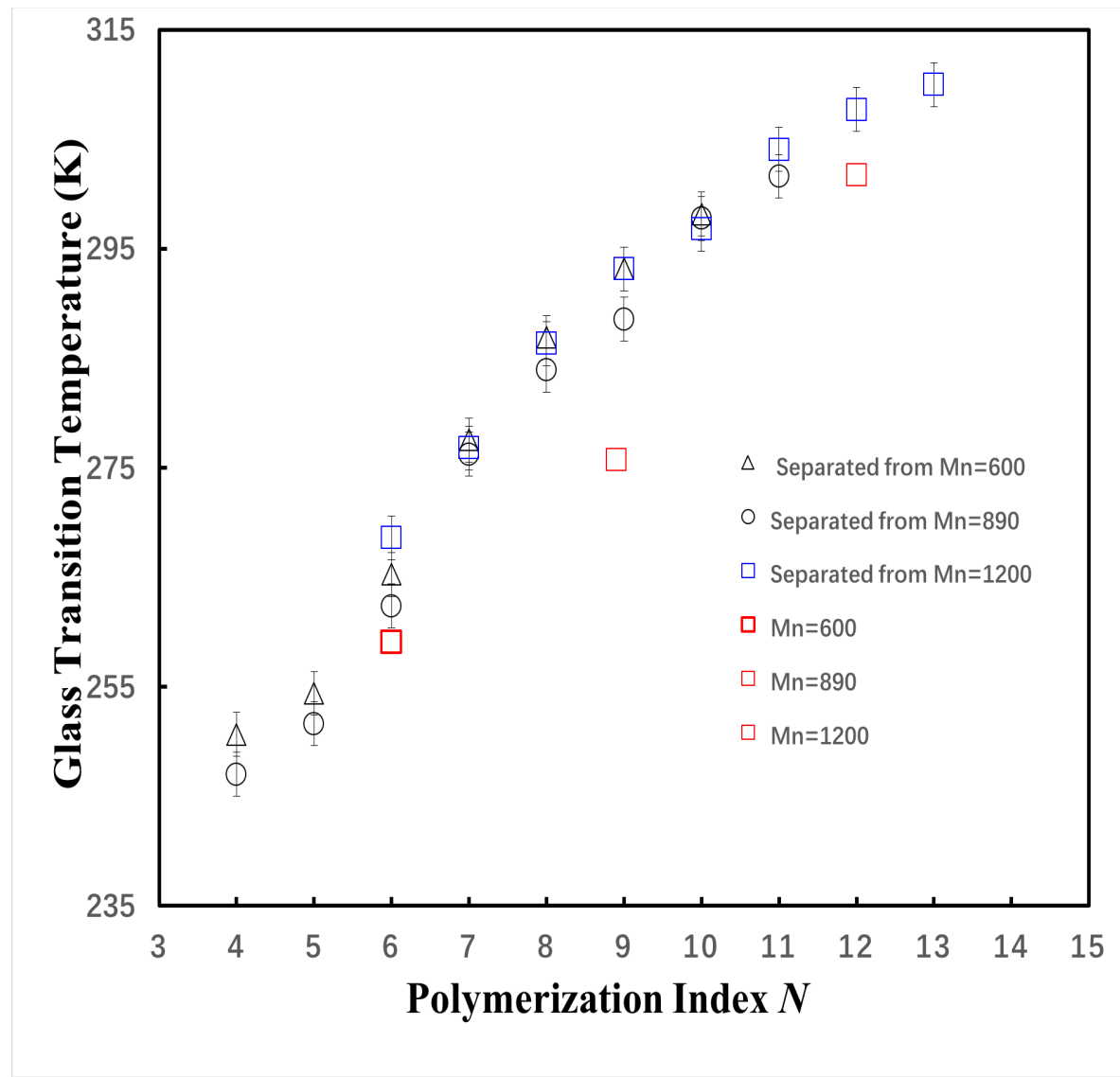
(a) Evaporative purification of PS with $\overline{M}_w = 600$ & $PDI = 1.2$



(b) Evaporative purification of PS with $\overline{M}_w = 890$ & $PDI = 1.12$



(c) Evaporative purification of PS with $\overline{M}_w = 1200$ & $PDI = 1.6$



T_g values of N -styrene as isolated from 3 different initial polymers.

