

Assignment 13**Due:** *In Lecture*, Wednesday, March 8

In this Assignment, you will determine the chain-transfer constant C_S for dodecanethiol in your emulsion polymerization system from Lab 3, and verify that chain transfer behaved normally in your experiment. To do this you should use the class' measurements of average degree of polymerization with respect to dodecanethiol concentration (which should be posted on WebCT), and the equation we discussed in class:

$$\frac{1}{X_N} = \frac{1}{(X_N)_0} + C_S \frac{[S]}{[M]}$$

where S is the chain transfer agent, M is monomer, X_N is the number-averaged mean degree of polymerization, and $(X_N)_0$ is the mean degree of polymerization one would expect in the absence of chain transfer agent. Rather than trying to calculate a value for [S] in your complex emulsion, use the ratio $[S]/[M]$ as a variable instead. To do this, you will have to assume that S and M partition equally into both emulsion droplets and micelles (i.e., that $[S]/[M]$ is the same everywhere in your mixture). Given that S and M were both very hydrophobic in your polymerization, this is a safe assumption.

In addition, write a short paragraph that discusses your results. Your analysis should yield values for both C_S and $(X_N)_0$; discuss both of these values.