Homework 13

Due: Monday 4/29/19 by 5PM…in the Box

Read: Carothers, W.H., J. Am. Chem. Soc. 1929, *51*, 2548-58

http://ezproxy.lib.utexas.edu/login?url=https://pubs.acs.org/doi/abs/10.1021/ja01383a041

Supplemental Problems:

1. What are the first 4 words on the last line of the text (not footnote) on page 2558 in the Carothers paper?

2. Calculate the freezing point of a 0.2 *molar* aqueous solution of $CaCl_2$.

3. Bubba, A long time resident of College Station was trying to transport some livestock into Travis County for sale. He fell asleep and ran off the road. He was unhurt, but his entire herd was killed. His pickup carried 5 chickens, 3 dogs, and his pet pig. The chickens each weighed 5 pounds, the dogs each weighed 50 pounds, and the pig weighed 1500 pounds. Bubba hired a lawyer from UT, who successfully sued the insurance company arguing that the music on the radio in Travis County was too soothing. This lawyer negotiated a payment for Bubba of $1.00 times the number average mass of the lost population. The lawyer charged Bubba only $0.50 times the weight average mass of the population as his fee.
    a) How much does the insurance company pay? _____
    b) How much does the lawyer make? _____
    c) How much does Bubba get? _____

4. The polydispersity of a polymer sample is defined as the ratio, Mw/Mn. This value is measure of the molecular weight distribution. I have a 100 gram sample of poly(centuracene) that was made by blending several monodisperse (Mw/Mn = 1) samples of this valuable polymer. The ceturacene monomer has a molar mass of 100 Daltons (amu). My polymer blend consists of 25 grams of polymer with DP = 20 , 25 grams of polymer with DP = 15 and 50 grams of polymer with DP = 10. Disregarding end groups, what is the polydispersity of this blended sample? Show your work.