CHEM/MATS/CHEN 5221/8221 **Fall 2005**

Problem Set #2

15.–16. Hiemenz and Lodge, Chapter 2, Problems 1, 2, 4

17. Given a poly(methyl methacrylate) molecule with M= 500,000, estimate (to one significant figure) how big it could possibly be in physical extent; how small could it be; what its likely average characteristic size would be.

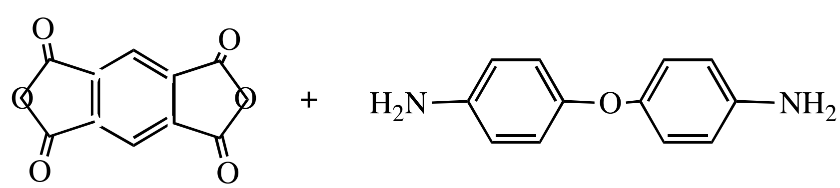
18. Proton NMR is used to attempt to quantify the molecular weight of a poly(ethylene oxide) molecule with methyoxy end groups at each terminus. If the integration of the methyl protons relative to the methylene protons gave a ratio of 1:20, what can you say about the molecular weight?

20. What would be M_w and M_n for a sample obtained by mixing 10 g of polystyrene (M_w = 100,000, M_n = 70,000) with 20 g of another polystyrene (M_w = 60,000, M_n = 20,000)?

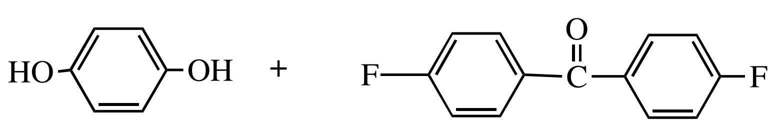
21. What would M_w and M_n be for an equimolar mixture of tetradecane and decane? (Ignore isotope effects).

22. Show the reaction sequence and the structure of the resulting polymer from the polycondensation of these two monomers; note that the reaction (a) has two distinct steps, and that (b) is base-catalyzed.

(a)



(b)



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