CHM 2211 – Ch 16 Homework

1. Show all reactants, intermediates, and major products involved with the nitration of toluene. Include the reactions forming the nitronium ion.

2. Show all reactants, intermediates, and major products for the Friedel-Crafts alkylation between toluene and chloroethane. Include the catalyst reactions as well.

 Draw the most stable (or least destabilized) cation intermediates which occur during the bromination of the following reactants: toluene, aniline (show resonance), and nitrobenzene. Explain the stabilities in terms of electronic effects. (Refer to Figures 16.13 – 16.16 and Table 16.2) Show all reactants and major products involved with the sulfonation of both 3-bromophenol and 4-bromophenol. Include the formation of the electrophile (E⁺), and the product names as well. (Use benzenesulfonic acid as the parent name.)

5. Propose a synthesis route to create m-bromoethylbenzene from benzene, bromine, organic chlorides, inorganic reagents, and catalysts. Show all intermediates. (See synthesis problems at the end of chapter 16.)