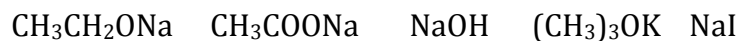


CHM2123 Problem Set #3 - Competition between Substitution and Elimination Reactions of Alkyl Halides

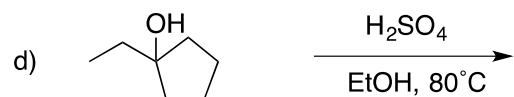
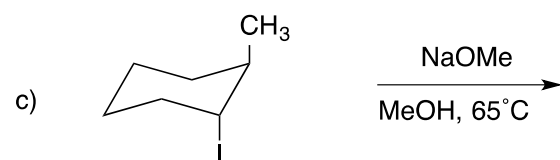
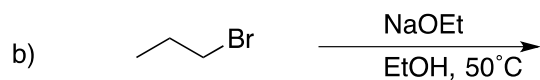
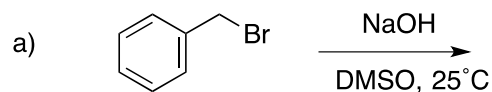
1. Substitution and elimination reactions can often compete to yield a range of products. Rank the nucleophiles/bases in descending order (best to worst) in favour of the following reactions, and briefly justify your choice.

a. A substitution reaction

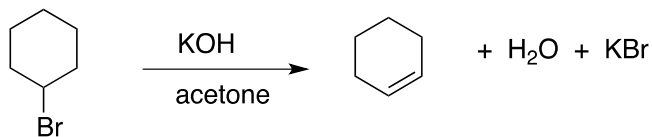
b. An elimination reaction



2. Predict the major product for each of the following reactions.



3. You perform the following E2 reaction starting with 9.0 g KOH and 3.8 mL 1-bromocyclohexane (1.32 g/cm^3), and produce 2.7 mL of cyclohexene (0.81 g/cm^3).



a) Determine the number of equivalents of each reagent.

b) Calculate the yield of your product

4. Based on your knowledge of elimination reactions, propose a synthetic method for the synthesis of 2-methyl-2-butene, and indicate your choice of alkyl halide, nucleophile, solvent, and temperature.

