

Cooperative Assignment 5

Chapter 6, 7, & 8 - Nucleophilic Substitution and Elimination Reactions

1. For each of the following reactions write out the reaction with the major product, indicate the major reaction pathway and which reaction will occur faster. Explain your reasoning for each, keeping it brief and concise. This should be done on a separate sheet of paper, I haven't left you enough room here.
 - a) 1-Bromobutane or 1-iodobutane with sodium cyanide in dimethyl sulfoxide.
 - b) 1-Chloro-2-methyl butane or 1-chloropentane with sodium iodide in acetone.
 - c) Solvolysis of isobutyl bromide or *sec*-butyl bromide in aqueous formic acid.
 - d) Reaction of 1-chlorobutane with sodium acetate in acetic acid or with sodium methoxide in methanol.
 - e) Reaction of benzyl bromide with potassium methoxide in acetonitrile (CH_3CN) or in 50% aqueous methanol.
2. The nucleophilicity of ionic nucleophiles can change dramatically from polar protic solvents to polar aprotic solvents while the nucleophilicity of molecular nucleophiles remains relatively the same in both solvents. Explain these trends using examples of both types of nucleophiles interacting with common protic and aprotic solvents. (Excellent example of an exam question!)

3. On a separate sheet of paper, indicate the major reaction pathway and draw the major product of the following reactions.

