

Homework 4 – 2017/04/24

1) Often people will add a catalytic amount (~0.1 stoichiometric equivalent, 10%) of an iodide salt, usually KI, to nucleophilic substitution reactions. For an example, see below.

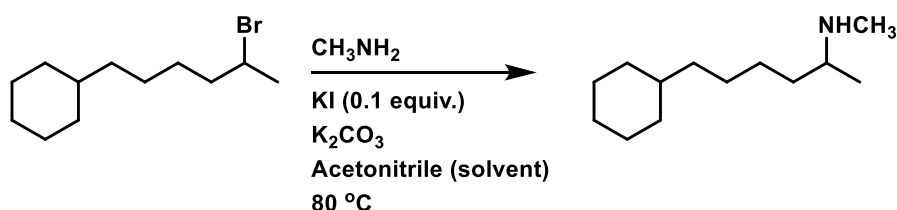
a) Based on what you know about the mechanisms of these reactions, suggest an explanation for why this is a good idea.

b) How would you confirm your suggestion? (That is, propose a starting material/reagent(s)/reaction conditions/etc, whatever is needed, that can help you investigate this. You can assume to have access to whatever compounds and equipment you might need.)

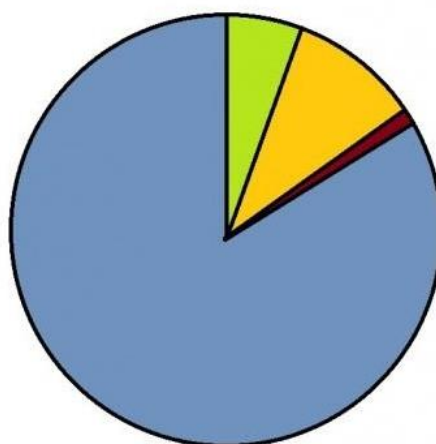
c) Are there reactions where this is just a waste of iodide? If not, why not? If yes, give an example, and explain.

d) What is the by-product of the reaction?

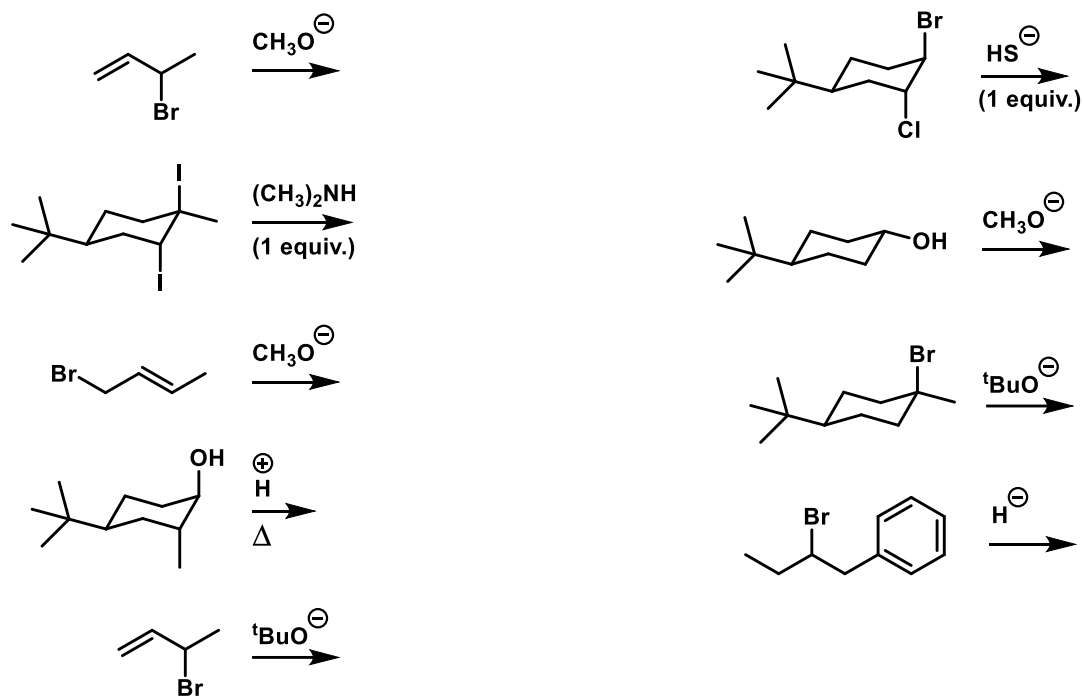
e) What is the role of the K_2CO_3 ?



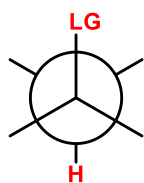
Things I learned in Organic Chemistry



2) Nucleophilic substitution and elimination reactions can occur under similar conditions, and are often competing with each other. In the reactions below, draw the most likely product (or products), with a very short explanation about why you think it (they) will be dominant. Pay attention to the stereochemistry, when relevant!



3) For E2 reactions the leaving group and the H have to be in a so-called anti-periplanar conformation (see below). This means, that if such a conformation is inaccessible for the molecule, then there will be no E2. (There might be substitution or E1 taking place of course.)



a) Of the compounds below, which ones can do E2? Draw all the possible E2-products.



b) Which one of the cyclohexane derivatives reacts faster in an E2-reaction? (Hint: think about the favored chair-conformations of cyclohexanes, and how large substituents like to be placed in a chair.)



Solutions can be handed in to Daniel Kovacs or to me in person, or you can mail them to eszter.borbas@kemi.uu.se

As long as you attempt to answer at least one question you will get feedback.

/Eszter

