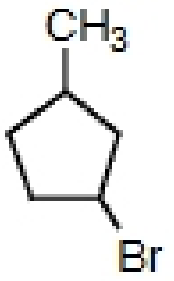
CHM 2211-Organic Chemistry I Name_____
December 5, 2002
Practice quiz #13 (Recitation #13)

1. Indicate what the letter 'S', the letter 'N', and the number 2 mean in the S_N2 reaction.

2. Rank the following alkyl iodides in decreasing order of reactivity in an S_N1 reaction. Use **1** for the most reactive and **3** for the least reactive.

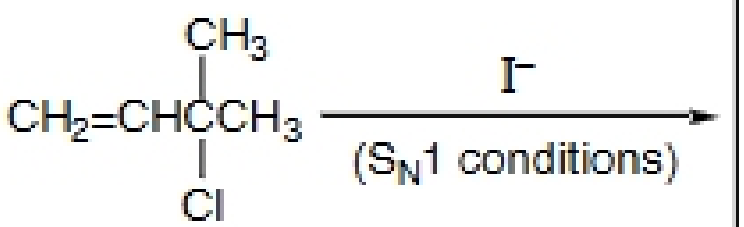
   2-iodo-3-methylbutane, 2-iodo-2-methylbutane, 1-iodopentane

3. Which of the following alkyl bromides form a substitution product from an S_N1 reaction that is different from the substitution product formed from an S_N2 reaction. You must show your work/reasoning!

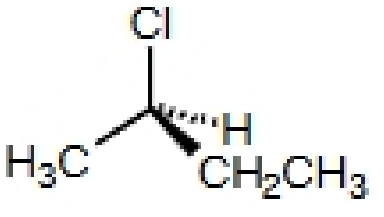
a) 

b) $CH_3CHC(CH_3)_3$
Br

4. Draw the major product(s) for the following reactions. Indicate any relevant stereochemistry in the product(s) where important.



(two products!)



5. An S_N2 reaction with an anionic nucleiphile proceeds faster in a polar aprotic solvent compared to a polar protic solvent because:

   A. polar aprotic solvents are really, in fact, quite non-polar.
   B. polar aprotic solvents cannot readily solvate the nucleophile since they are not hydrogen bond donors.
   C. polar protic solvents can cause carbocation rearrangements.
   D. all of the above.

6. The relative leaving abilities of the halide ions is $I^- > Br^- > Cl^- > F^-$ because:

   A. weaker bases are better leaving groups.
   B. these measurements are always performed in a protic solvent.
   C. leaving group ability parallels nucleophile strength.
   D. none of the above.

7. Draw a reaction coordinate diagram for a general S_N1 reaction involving an alkyl halide (R–X) with an anionic nucleophile represented as $Nu:^-$. Label all parts of the diagram indicating where the starting materials, intermediate, and products are located. Assume the overall reaction is exothermic. I'll get you started with the axes labeled!