

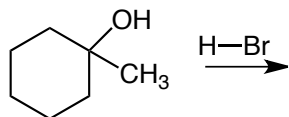
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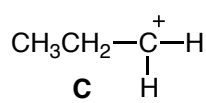
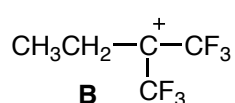
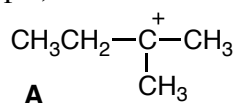
Chem. 121, Sect 005, Quiz 2

Fall, 2011, 50 points

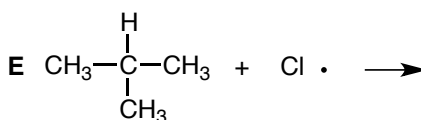
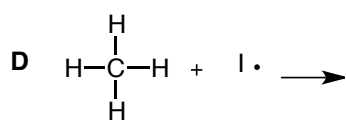
1. Give the product of the following reaction, giving the full reaction mechanism, showing all of the steps and intermediates and showing the movement of the electrons using the arrow formalism. (10 pts)



2. Which carbocation would be MOST stable? LEAST stable. Explain briefly in each case. (10 pts)



3. (a) Complete each reaction shown below. (b) Which reaction is more favorable? Explain your choice by calculating the ΔH for each reaction. (10 pts)



| BDE's | ΔH , KJ/mol |
|------------------------------------|---------------------|
| CH_3-H | 439 |
| $\text{I}-\text{H}$ | 298 |
| $\text{Cl}-\text{H}$ | 432 |
| $(\text{CH}_3)_3\text{C}-\text{H}$ | 400 |

4. In experiment 2, the separation of acids and bases, one student separated her organic layer from her aqueous layer and poured both of them into beakers. She forgot to label her beakers. How could she quickly determine which layer is which? (5 pts)

5. In the preparation of *t*-butyl chloride (2-chloro-2-methylpropane, MW 92.57 g/mol, density 0.85 g/mL) from 12.0 mL of *t*-butanol (2-methyl-2-propanol, MW 74.12 g/mol, density = 0.775 g/mL), using an excess of concentrated hydrochloric acid, one student isolated 7.3 g of *t*-butyl chloride. Calculate the percent yield. (5 pts)

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6. If you have a solution containing 1.0 gram of benzoic acid (PhCO_2H) and 1.0 gram of 4-chloroaniline in methyl-*t*-butyl ether, explain how you could separate them from each other and the organic solvent, showing all reactions that you would perform. You have available 10% sodium hydroxide, 3M hydrochloric acid and concentrated hydrochloric acid. (10 pts)