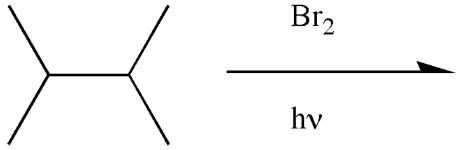
Chemistry 235, Winter 2006 Name:

Exercise 3: Radical substitutions

1. Write the accepted **mechanism** leading to the major **monosubstituted products** for the following reaction, and **name** the products.



2. Draw an **energy diagram** for the reaction, showing clearly the energy level of the reactants, the products and the path between them. Show also why there is a **preferred** product.

3. a. What would the highest value (not necessarily tallest) m/e peak be on the **mass spectrum** of the products (excluding isotopic effects)?

b. Give the value of a major mass spectrum peak, besides the one mentioned in part a. Show the molecular ion that it comes from, and explain why this would be a major peak (i.e., defend its stability).

c. Would **mass spectroscopy** be a useful way of distinguishing between the *major* products of the reaction? If yes, how would the m/e peaks be different? If not, why wouldn't mass spec be useful?

4. Would **IR spectroscopy** be a useful way of distinguishing between the *major* products of the reaction? If yes, how would the absorption bands be different? If not, why wouldn't IR be useful?

5. Would **NMR spectroscopy** be a useful way of distinguishing between the *major* products of the reaction? If yes, how would the chemical shifts or splitting be different? If not, why wouldn't NMR be useful?