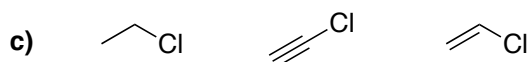


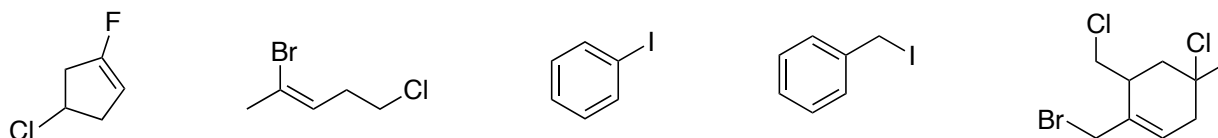
**Chemistry 233**  
**Chapter 10 Problem Set**

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1) Rank each series of organohalides in order of increasing C-X bond strength.



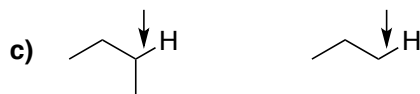
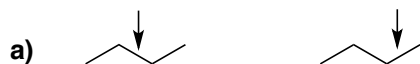
2) Classify each halogen in every molecule below as: 1°, 2°, 3°, allylic, benzylic, vinyl, or aryl.



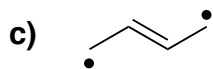
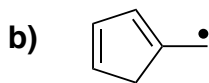
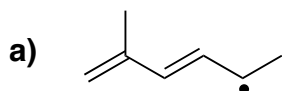
3) Rank the radical species below in order of increasing stability.



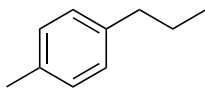
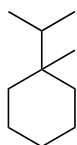
4) For each pair, circle the molecule that has the stronger indicated bond. *Hint: strength can be assessed by considering the stability of the resulting radicals from bond homolysis – A stronger bond will result in less stable radicals.*



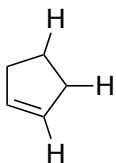
5) Draw all relevant resonance structure for each of the radical species shown below.



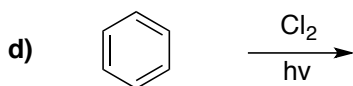
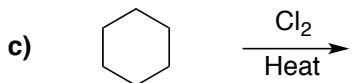
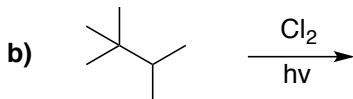
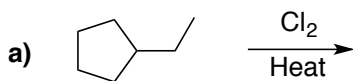
6) In each compound below, circle the H that is most likely to be abstracted by Br• radical. You will need to draw in the hydrogen.



7) Rank the C-H bonds in the structure below in order of increasing bond strength.

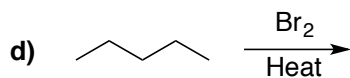
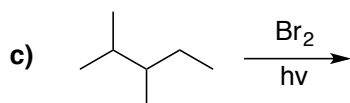
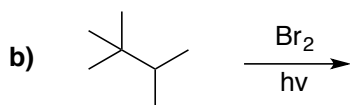
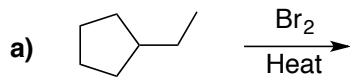


8) Predict the products for the radical chlorination reactions shown below.

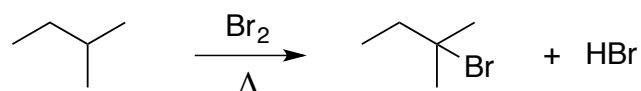


- 9) There are three constitutional isomers with the formula  $C_5H_{12}$ . Monochlorination of one of these isomers yields only one product. Identify the isomer and draw the chlorination product.

- 10) Predict the major organic product(s) for each of the radical bromination reactions shown below.

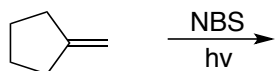
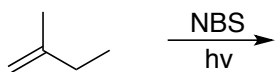
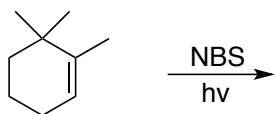


- 11) Provide a full electron pushing mechanism for the following radical reaction. Designate the three steps: initiation, propagation, and termination.



12) Draw the structure of NBS

13) Predict the products for each of the reactions shown below. Circle the major product(s).



14) Write the complete electron pushing mechanism for the reaction shown below.

