Week 5 Worksheet

1. Draw the product formed when \((\text{CH}_3\text{)}_2\text{CHOH}\) is treated with each reagent.
   a. \(\text{SOCl}_2\), pyridine  
   c. \(\text{H}_2\text{SO}_4\)  
   e. \(\text{PBr}_3\) then \(\text{NaCN}\)
   
   b. \(\text{TsCl}\), pyridine  
   d. \(\text{HBr}\)  
   f. \(\text{POCl}_3\), pyridine

2. Draw the product of each reaction, indicating the stereochemistry at any stereogenic centers.
   a. [Diagram]
   b. [Diagram]

3. The cis and trans isomers of 2,3-dimethyloxirane both react with –OH to give 2,3-butanediol. One stereoisomer gives a single achiral product, and one gives two chiral enantiomers. Which epoxide gives one product and which gives two?
   cis-2,3-dimethyloxirane  
   one enantiomer of trans-2,3-dimethyloxirane
4. (a) Draw the structure of (1E,4R)-1,4-dimethylcyclodecene. (b) Draw the enantiomer and name it, including its E,Z and R,S prefixes. (c) Draw two diastereomers and name them, including the E,Z and R,S prefixes.

5. Although naturally occurring unsaturated fatty acids have the Z configuration, elaidic acid, a C18 fatty acid having an E double bond, is present in processed foods such as margarine and cooking oils. Predict how the melting point of elaidic acid compares with the melting points of stearic and oleic acids.

6. Draw the product formed when 1-butene is treated with each reagent: (a) Br2; (b) Br2 in H2O; (c) Br2 in CH3OH.