Week 5 Worksheet

Question 1:
Classify each reaction as oxidation, reduction, or neither.

a. CH₃CHO → CH₃CH₂OH
d. CH₂=CH₂ → H–C≡C–H
b. \[ \text{cycle} \rightarrow \text{cycle}=\text{O} \]
e. [Diagram of a benzene ring with a methyl group]
c. CH₂=CH₂ → HOCH₂CH₂OH
f. CH₃CH₂OH → CH₂=CH₂

Question 2:
Explain why beeswax is insoluble in H₂O, slightly soluble in ethanol (CH₃CH₂OH), and soluble in chloroform (CHCl₃).

Question 3:
Draw the structure of an alkane that:
   a) Contains only 1° and 4° carbons.
   b) Contains only 2° carbons.
   c) Contains only 1° and 2° hydrogens.
   d) Contains only 1° and 3° hydrogens.

Question 4:
Classify each sp³ hybridized carbon atom in bilobalide (the molecule below) as 1°, 2°, 3°, and 4°.

[Diagram of bilobalide molecule]
Question 5:
Which of the following compounds are lipids?

- a. mevalonic acid
- b. squalene
- c. estradiol
- d. sucrose

Question 6:
Draw a constitutional isomer and a stereoisomer for the compound.

Question 7:
Which group in each pair is assigned the higher priority in R,S nomenclature?

- a. –OH, –NH₂
- b. –CD₃, –CH₃
- c. –CH(CH₃)₂, –CH₂OH
Question 8:
Give the IUPAC name for each compound, including the $R,S$ designation for each stereogenic center.