Chem 51A Dong Week 3 Worksheet

1. Atorvastatin (generic for Lipitor) is a HMG-CoA reductase inhibitor that is commonly prescribed to lower cholesterol levels in the blood, especially for at-risk diabetic patients. Circle and label the functional groups found in Atorvastatin. The molecular structure is shown below.

![Atorvastatin Molecular Structure]

2. Methamphetamine is a central nervous system stimulant that is highly addictive but is sometimes used to treat ADHD. What functional groups can be found in methamphetamine (shown below)?

![Methamphetamine Molecular Structure]

a. 1° amine and phenyl
b. 2° amine and phenyl
c. 3° amine and phenyl
d. 4° amine and phenyl
3. Describe the polarity of the molecule below. State its solubility in water, and in hexane (Hint: Remember rule of five)

\[ \text{O}(\text{CH}_2\text{CH}_2\text{O})_n\text{H} \]

\[ n = 7 \text{ to } 13 \]

4. Label the nucleophilic and electrophilic sites for each molecule below. Note some molecules below do not have both nucleophilic and electrophilic sites. (Hint: What characterizes an electrophile? What characterizes an electrophile?)

\[
\begin{array}{c}
\text{苯} \text{CH}=\text{CH} & \text{CH}_3\text{I} & \text{CH}_3\text{C}=\text{C}\text{Cl} \\
\end{array}
\]

5. (REVIEW): Rank the following in order of increasing acidity: describe how you came up with your answer (Hint: refer to the four effects)

\[
\begin{array}{c}
\text{H} & \text{N} & \text{F} \\
\end{array}
\]

\[
\begin{array}{c}
\text{H} \text{O} \text{H} & \text{H} \text{F} \\
\end{array}
\]
6. Malonic Acid is a compound characterized by its two COOH groups. When deprotonation of its COOH functional groups occurs, its pKa values are different values. Draw reaction mechanism for reaction when malonic acid is allowed to react with a strong base. Describe why the two functional groups have different pKa values.