Week 5 Worksheet

1.  
   a. Which compounds may serve only as H-bond acceptors?  
   b. Which may serve as both H-bond acceptors and donors?  
   c. Which compounds will not participate in H-bonding?  

\[
\begin{align*}
\text{A} & \quad \text{B} & \quad \text{C} \\
\text{D} & \quad \text{E} & \quad \text{F}
\end{align*}
\]

2. Vitamin A, a fat-soluble vitamin and not water-soluble, can be retained in large amounts in the human body and cause toxicity. Vitamin A is obtained orally through foods and supplements. Based solely on this information and the structures of the two compounds, why is vitamin C toxicity not a concern?

\[
\begin{align*}
\text{Vitamin A} & \quad \text{Vitamin C}
\end{align*}
\]
3.  
   a. Rank in order of increasing solubility in hexane.  
   b. Rank in order of increasing solubility in water.  
   c. Which compound would be expected to have the highest boiling point? Lowest boiling point?  

\[ \text{A} \quad \text{B} \quad \text{C} \]

\[ \text{D} \quad \text{E} \]

4. Determine if the following reactions can occur. If so, label the nucleophile and electrophile.

   a.  
   \[ \text{H} + \text{OH} \rightarrow \ ? \]

   b.  
   \[ \text{Br} + \text{Br} \rightarrow \ ? \]

   c.  
   \[ \text{C} + \text{C} \rightarrow \ ? \]

   d.  
   \[ \text{Cl} + \text{O} \rightarrow \ ? \]
5. Name or draw the following compounds.

a. 

b. 2,2,4-trimethylbutane

c. 

d. 1-bromo-3-ethylcyclohexane

6. Rank the following molecules in order of increasing boiling point, then name each molecule according to its IUPAC definition.

[Chemical structures]