

Thursday:

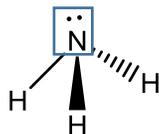
1. (8 points) For the molecules below, write the molecule's geometry about the boxed atom in the appropriate boxes. Circle all the polar molecules.

All Intermolecular Forces  
(2 points Extra credit R or W)

Lewis Structure

Molecule's Geometry

LDF, D-D, H-bond



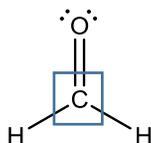
Trigonal pyramidal  
Polar

LDF



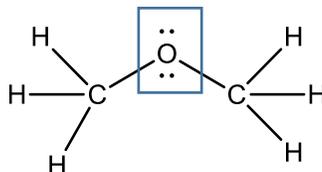
Linear,  
Not polar

LDF, D-D



Trigonal planer  
Polar

LDF, D-D



Bent  
Polar

2. (2 points) Benzene ( $C_6H_6$ ), boils at  $80\text{ }^\circ\text{C}$  and has a specific heat capacity of  $1.73\text{ J}/(\text{g} \cdot \text{K})$ . Pentane ( $C_5H_{10}$ ), boils at  $36\text{ }^\circ\text{C}$  and has a specific heat capacity of  $2.32\text{ J}/(\text{g} \cdot \text{K})$ . Water, has specific heat capacity of  $4.2\text{ J}/(\text{g} \cdot \text{K})$ .

- a. Rank the three solvents ( $C_6H_6$ ,  $C_5H_{10}$ ,  $H_2O$ ) in order of increasing equilibrium vapor pressure.

(lowest)  $H_2O < C_6H_6 < C_5H_{10}$  (highest)

Friday:

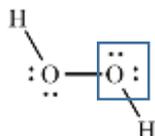
3. (8 points) For the molecules below, write the molecule's geometry around the boxed atom in the appropriate boxes. Circle all the polar molecules.

All Intermolecular Forces  
(2 points Extra credit R or W)

Lewis Structure

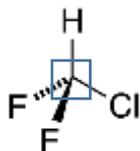
Molecule's Geometry

LDF, D-D, H-bond



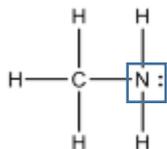
Bent  
Polar

LDF, D-D



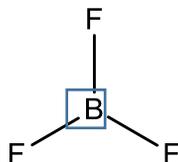
Tetrahedral  
Polar

LDF, D-D, H-bond



Trigonal pyramidal  
Polar

LDF



Trigonal planar  
Not polar

4. (2 points) Carbon tetrachloride ( $\text{CCl}_4$ ) boils at  $75^\circ\text{C}$  and has a specific heat capacity of  $0.90 \text{ J}/(\text{g} \cdot \text{K})$ . Chloroform ( $\text{CHCl}_3$ ) boils at  $61^\circ\text{C}$  and has a specific heat capacity of  $1.05 \text{ J}/(\text{g} \cdot \text{K})$ . Water has a density of  $1 \text{ g/mL}$  and specific heat capacity of  $4.2 \text{ J}/(\text{g} \cdot \text{K})$ .
- a. Rank the three solvents ( $\text{CCl}_4$ ,  $\text{CHCl}_3$ ,  $\text{H}_2\text{O}$ ) in order of increasing equilibrium vapor pressure.

(lowest)

$\text{H}_2\text{O}$

<

$\text{CCl}_4$

<

$\text{CHCl}_3$

(highest)