**Honors Chem Study Guide**

**Ch. 1 sec. 5-9: Molecular Geometry, Polarity, Intermolecular Forces**

* **Read the bullet points for sec. 1-9 on page 57 (Ch. 1 sec. 13 Outcomes Review).**
* **Finish worksheets on Ch. 1 sec. 7 and Ch. 1 sec. 9.**
* **Review VSEPR handout and Models Lab.**
* **Review class notes and reading notes.**

**Practice Problems**

Consider the substance ethanol, CH3CH2OH.

1. a. Draw the Lewis structure for ethanol.

b. Draw bond polarity arrows for any polar bonds shown your Lewis structure in part a. (The C-H bond is nonpolar.)

2. Fill in the chart for each central atom in ethanol. Refer to your Lewis structure in #1.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Central Atom** | **VSEPR** | **Molecular Shape** | **Ideal bond angle** | **Observed bond angle** |
| C (terminal) |  |  |  |  |
| C (middle) |  |  |  |  |
| O |  |  |  |  |

3. Is the ethanol molecule polar or nonpolar? Explain.

4. Can ethanol form hydrogen bonds?\_\_\_\_\_\_\_ If so, draw 2 ethanol molecules and indicate where hydrogen bonding takes place.

5. List all types of intermolecular forces found in a sample of ethanol.

6. a. Ethanol is the type of alcohol found in wine.

Is ethanol a solid, liquid, or gas at room conditions?\_\_\_\_\_\_\_\_\_\_

b. Propane (C3H8) is used as a fuel for items such as gas grills.

Is propane a solid, liquid, or gas at room conditions? \_\_\_\_\_\_\_\_\_

c. The ethanol and propane molecules are about the same size, but are different

phases at room conditions. Explain why. Include Lewis structures to support

your answer.

7. a. How would ethanol molecules interact with methanol (CH3OH) molecules? Explain. Use Lewis structures to support your answer.

b. Would you expect ethanol and methanol to be miscible (able to be mixed together)? Explain.

8. Which has a higher boiling point, ethanol or methanol? Explain.

9. How could you separate a mixture of ethanol and methanol?