Chemistry 30B **Experiment 4**

Lab Instructor:_____ Name:_____

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Parts 1 and 2: Melting Point and Recrystallization of Aspirin

Substance	**Melting Point**
Impure Aspirin	
Purified Aspirin	

Part 3: Boiling Point

Substance	**Boiling Point**
1-Butanol	
2-Butanone	

Part 4: Density Determination

Unknown number	
Mass of vial	
Volume of unknown	
Mass of vial and unknown	
Mass of unknown	
Calculate the density of the unknown. Show your work here.	
Identity of your unknown	

Questions:

1. What are two ways that impurities affect the melting point of a solid substance?

2. What is the purpose of a boiling stone?

3. Explain how the process of recrystallization works to purify substances.

4. In part 3 of this lab (the boiling point determination), which substance had the higher boiling point?

   Explain the reason behind the differing boiling points, based on the intermolecular forces present in each substance.

5. In the recrystallization process that you performed in this lab, explain what would happen if you used 40 mL of ethanol instead of 4 mL of ethanol to dissolve the aspirin. Would your results be different?

6. Why should the ethanol used for washing the crystals be chilled? What would happen if this ethanol was <u>not</u> chilled?

7. The following data was obtained for an unknown liquid:

mass of vial	3.543 g
mass of vial and liquid	4.869 g
volume of liquid	1.55 mL

Calculate the density of the unknown liquid.

8. Often, different substances have similar densities. In order to help identify the substance, you would need additional information, such as the boiling point or melting point. The following compounds have very similar densities. Using a chemistry handbook, look up the boiling points of these substances to see if you could distinguish between the compounds on the basis of their boiling points.

Substance	**Density, g/mL**	**Boiling Point**
1-Pentyne	0.6901	
1,2-Pentadiene	0.6926	
3,3-Dimethylpentane	0.6933	
2,2-Dimethylhexane	0.6953	