Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_

**Melting Point**

1) Define melting point

2) Briefly identify or explain:

(a) two useful functions served by knowing the melting point of an organic compound.

(b) why a finely powdered sample should be used in a melting point measurement.

(c) why it is important to heat a sample slowly to obtain an accurate melting point.

(e) what two effects a soluble impurity usually has on the melting point of a compound.

3) What does the eutectic point represent?

4) Provide a Data Table containing the composition of your known samples and the melting point range you measured for each sample

5) Provide a properly labeled scatter plot of composition vs. melting range for your known mixtures

* Add extrapolated or best fit trend lines to your scatter plot
* Use your graph to estimate and identify the eutectic melting point and eutectic composition

6) How did your melting point ranges compare to literature values for each substance?

7) Discuss how your results support what you know about melting point range.

8) Provide the identity of your unknown and explain how you arrived at your conclusion.

* Include a table of your experimentally determined melting point ranges in your answer.

9) A sample has an experimental melting point of 100-101 °C. Can you conclude that the sample is pure? Briefly explain your reasoning.

10) An unknown compound melted at 131-133 °C. It is thought to be one of the following compounds: trans-cinnamic acid, benzamide, DL-malic acid, or benzoin. The melting ranges of these compounds are:

trans-cinnamic acid 133 – 134

benzamide 128 – 130

DL-malic acid 131 – 133

Benzoin 135 – 137

After performing a series of mixture melting range determinations you obtain the following data:

unknown + trans-cinnamic acid 110-120

unknown + benzamide 130-132

unknown + DL-malic acid 114-124

unknown + benzoin 108-116

What is the identity of the unknown?