

Special Experiment

Unknown Determination Using Melting Points

CHEM 354 W 2004

Readings: Techniques 5 and 6, pp 558 – 595 in Pavia, Lampman, Kriz, and Engel, *Introduction to Organic Laboratory Techniques. A Microscale Approach*, Third Edition, Fort Worth, TX: Saunders College Publishing, 1999.

In Experiment 3, melting point data were used to determine the purity of a known substance. In some situations, melting point data can also be used to determine the identity of an *unknown* substance. In this experiment, your goal is to determine the identity of an unknown compound using only melting point data. Your compound is one of those listed below:

<i>Compound</i>	<i>Literature melting point (°C)</i>
1. acetylsalicylic acid	135
2. cinnamic acid	133
3. maleic acid	132
4. (<i>R</i>)-(-)-mandelic acid	131-133
5. (<i>S</i>)-(+)-mandelic acid	131-134
6. sebacic acid	135
7. sorbic acid	135
8. picolinic acid	134-136

Work with a partner. Obtain an unknown from your instructor, and *carefully* determine its melting point. Compare your data with the rest of your classmates—one other pair of students has the same compound as you. Using authentic standards, determine conclusively both the identity of your sample and who else in your class has the same compound.

Name: _____

Locker: _____

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UNKNOWN DETERMINATION USING MELTING POINTS

Pre-Lab Exercise

1. Draw the structures and verify the melting points for each compound used in this experiment:

acetylsalicylic acid

(*S*)-(+)-mandelic acid (use wedges/dashes for stereochemistry!)

cinnamic acid

sebacic acid

maleic acid

sorbic acid

(*R*)-(-)-mandelic acid (use wedges/dashes for stereochemistry!)

picolinic acid

