

EXPERIMENT 18: COMPARATIVE MELTING BEHAVIOR OF SOLIDS

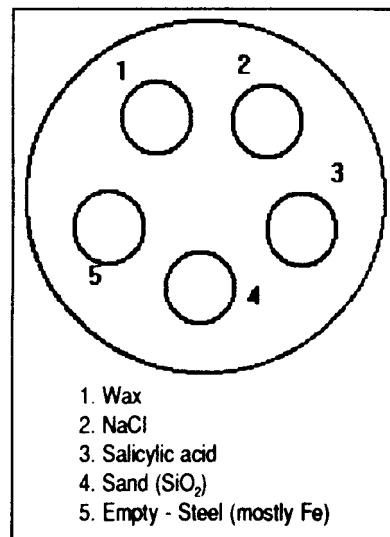
Equipment: can lid or disk, iron ring, Bunsen burner, scoopula.

Materials: wax, NaCl, salicylic acid, sand, matches, candle.

In this experiment you will see how the melting behavior of a solid can be related to the type of bonding which holds the solid together.

PROCEDURE:

1. Clean the lid or disk thoroughly by scraping with a scoopula. Make sure all traces of the above substances remaining from prior use are removed.
2. Place the lid or disk on an iron ring. Adjust the ring so that it is about 10cm. (about 4 inches) above the top of the Bunsen burner.
3. Place a **SMALL** amount (a quantity about the size of a match head) of each of the substances into different depression in the lid or disk. Use the diagram as a guide.
4. Place the ring stand under the hood. **HEAT THE LID NO LONGER THAN TWO MINUTES** with a small blue bunsen flame. Observe the melting behavior of each substance.
5. List the substances in the order in which they melt. 1 _____
 2 _____ 3 _____ 4 _____ 5 _____
6. **Teacher Demonstrations:**



- A. Heat a small amount of salt in a 6" test tube, using a Meker burner. Note observations. _____

- B. Repeat, heating sand. Note observations. _____

- C. Gently warm a crystal of iodine in a 250 mL beaker covered with a watch glass. Note observations. _____

SUMMARY QUESTIONS

1. Why is energy needed to melt a substance? _____

2. Why is more heat needed to melt salt than wax? _____

3. Wax molecules are non-polar. What forces of attraction hold the molecules together? _____

What bonds hold the atoms together in each molecule? _____

4. Salicylic acid is a polar molecule (a dipole). What forces of attraction hold the molecules together? _____

What bonds hold the atoms together in each molecule? _____

5. NaCl is ionic. What forces hold the crystal together? _____

6. Define sublimation. _____

If a substance sublimates, what must be true about the strength of its

intermolecular bonds? _____ What are these

bonds called? _____

7. What does this experiment show you about the strength of network bonds?

8. List the types of intermolecular bonds you encountered in this experiment in order of their increasing strength. _____
