

Comparing the properties of ionic and covalent compounds

Material

burner
conductivity apparatus
scoopula
deflagrating spoons (2)
watchglass
beakers (7)
unknown solid

sodium chloride (A)
potassium iodide (B)
potassium chloride (C)
sugar (D)
benzoic acid (E)
camphor (F)

Method

1. Prepare a chart similar to the one shown.

Physical Property	Ionic			Covalent			Unknown
	A	B	C	D	E	F	
Odour							
Melting Point							
Hardness							
Conductor or Nonconductor							

2. Try to detect if any of the substances have an odour. Record your observations.
3. Ignite a burner. Place a small sample of one ionic substance (A) and one covalent substance (D) in two different deflagrating spoons. Hold both samples in the burner flame until one of them melts. Record the melting point of the substance that melted as **low** and the melting point of the one that did not melt as **high**.
4. Repeat step 3 for the second ionic and covalent compound (B and E).
5. Repeat step 3, using the final pair of compounds (C and F).
6. Determine whether each substance feels hard or soft. Do this by first rubbing a small sample of each between your fingers. Check your observations by trying to crush a few crystals of each. Place each compound in the watchglass one at a time, and use a scoopula to try to crush them.
7. Make a solution of each compound in separate beakers.
8. Use a conductivity apparatus to test the solutions of each of the six substances.
9. Repeat steps 3 through 8 for the unknown substance.

Questions and Conclusions

1. Which type of compounds have noticeable odours?
2. Which type of compound has higher melting points? What does this tell you about the strength of bonds?
3. Are ionic compounds harder or softer than covalent compounds? What does this tell you about the strength of ionic bonds?
4. Are solutions of covalent compounds good conductors of electricity?
5. Was your unknown an ionic compound or a covalent compound?