



Ionic and Covalent Compounds

Ionic bonds exist between positive ions, called cations (either metal ions or the ammonium ion) and negative ions, called anions (non-metallic ions or polyatomic ions). Covalent compounds exist between non-metals and do not involve attractions between ions. Due to these differences, ionic and covalent compounds have very dissimilar properties. We will examine properties such as melting point, electrical conductivity and solubility of several ionic and covalent compounds in this lab.

Materials:

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| 6 Test tubes | Ring stand with ring and wire gauze | Benzoic acid, C_6H_5COOH |
| Test tube rack | Graduated cylinder | Paradichlorobenzene, $C_6H_4Cl_2$ |
| 2-3 Stoppers | Safety goggles | Potassium chloride, KCl |
| Bunsen burner | Beaker | Sodium nitrate, $NaNO_3$ |
| Test tube clamp | | Sucrose, $C_{12}H_{22}O_{11}$ |
| | | Calcium chloride, $CaCl_2$ |
| | | Methanol, CH_3OH |

Procedure:

Place a small scoop, about the size of a pea, of each of the solid reactants into the separate test tubes.

Add approximately 10 mL of tap water to the solid each of the test tubes. Place a stopper into one of the test tubes and shake vigorously for about one minute. Record the solubility of this solid. Repeat this procedure with each of the test tubes. You may pour any of the test tubes with dissolved solids in them down the sink.

Prepare a hot water bath by boiling approximately 150 mL of water in the 250 mL beaker. If any of the solids did not dissolve in the cold tap water, place those test tubes into the hot water bath for about five minutes and record the solubility of each solid. **DO NOT DISPOSE OF THESE MATERIALS IN THE SINK. ASK YOUR TEACHER ABOUT DISPOSAL OF THESE CHEMICALS.**

Rinse the test tubes and again place a small scoop of each of the solid reactants into the separate test tubes. Add approximately 10 mL of methanol to the solids in each of the test tubes. Place the stopper into one the test tubes and shake vigorously for about one minute. Record the solubility of the solid in methanol. Repeat this procedure with each of the solid reagents in methanol. When this procedure is completed, all of the materials except the paradichlorobenzene and the benzoic acid may be poured down the sink. Your teacher will instruct you as to the disposal of these two chemicals. Rinse and dry each of the test tubes.

Rinse the test tubes again, and again place a small scoop of each of the solid reactants into the separate test tubes. Hold one of the test tubes over the Bunsen burner and record the time required to melt the chemical. Repeat this procedure with each of the solid reagents. Take the test tube containing the paradichlorobenzene and benzoic acid up to your teacher. Your teacher will dispose of these chemicals. The other test tubes may be rinsed with water and poured down the sink.

Your teacher will perform the test on electrical conductivity. Record the degree of electrical conductivity of each of the reagents.