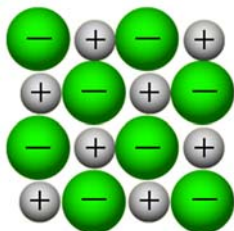


# Determining Bonding Types

Googles must be worn in the lab!

## PRE-LAB DISCUSSION:

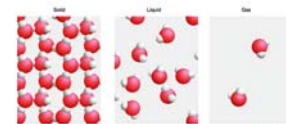


[http://www.bbc.co.uk/schools/gcsebitesize/science/add\\_ocr\\_21c/natural\\_environment/hydrosphererev2.shtml](http://www.bbc.co.uk/schools/gcsebitesize/science/add_ocr_21c/natural_environment/hydrosphererev2.shtml)

Ionic, Covalent & Metallic compounds each have physical properties that relate to their structures, so there are some tests we can do to help identify the type of bonding in a substance.

**Melting Points** An ionic bond is made when ions of opposite charges come together to create a crystal lattice structure. In order to melt an ionic compound the temperature has to rise until the ions move with enough force to break away from the oppositely charged ions around them. For table salt, this means you would need a temperature of 801°C to hit the melting point (that's over 1,000°F!).

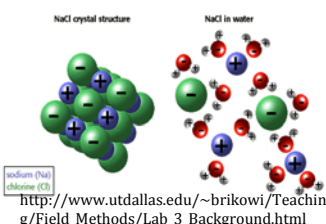
Covalent compounds don't break apart when they melt, so they only have to reach a temperature strong enough to pull them away from the other molecules to melt them. This is why most small covalent molecules are liquid or gas at room temperature because they have such low melting points.



<http://zube.brinkster.net/SCH3U21/Reactions/Reading/stateparticles.jpg>

**Solubility & Conductivity** Ionic compounds dissolve very easily in water to create an aqueous solution.

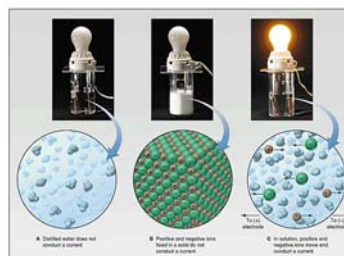
Since water is a polar molecule (meaning it has partial charges) it attracts the ions and surrounds each one as the compound dissociates in the water. Once water is full of charged particles it can conduct electricity very easily. Tap water conducts electricity because the chemicals used to treat the water are ions, so it makes the water into a conductor.



[http://www.utdallas.edu/~brikowi/Teaching/Field\\_Methods/Lab\\_3\\_Background.html](http://www.utdallas.edu/~brikowi/Teaching/Field_Methods/Lab_3_Background.html)

Nonpolar covalent dissolve well in water. They have no charges on are not attracted to the polar water. Some polar dissolve well in water; however, they do not the water because they do not have charges.

Today you will test certain properties of three (paraffin, dextrose and sodium bicarbonate) to bond present in each compound.



<https://chemistry11mrstanding.wikispaces.com/The+Conductivity+of+Aqueous+solutions>

compounds do not their outsides, so they covalent compounds do conduct electricity in

different compounds determine the type of

## CLAIM:

The bond type present in a substance can be determined by testing a substance's melting point, solubility and conductivity.

## PROCEDURE:

1. Create a foil "boat" with 3 sections. Label the sections "dextrose", "sodium bicarbonate", and "paraffin".
2. Add a small scoop of each compound to the appropriate section of the foil boat.
3. Use tongs to place the foil boat onto the hot plate (the hot plate should already be turned on). Wait for the substances to begin melting.
4. When the first substance melts, record a "1" next to that substance on the data table for melting order.
5. When the second substance melts, record a "2" next to that substance on the data table.

6. For the third substance you only have to record that it would melt third. Do not attempt to melt it as the melting point would be very high!
7. Use tongs to carefully remove the foil boat from the hot plate and turn the hot plate off.
8. Fill a small beaker halfway with tap water. Add a small scoop of dextrose to the water and stir. If the substance is fully dissolved, record "soluble" in your data table. If the substance is not fully dissolved, record "insoluble".
9. Place the conductivity tester into the beaker with the dextrose solution. Record the results in the "conductivity" column of the data table.
10. Empty and clean the beaker and wipe the conductivity meter. Repeat step #9 for sodium bicarbonate and paraffin.

**RESULTS:**

**Data Table: Results of Melting Point, Solubility, and Conductivity Tests**

	<b>Observations of Solid</b>	<b>Melting Point Order</b>	<b>Solubility</b>	<b>Conducts when dissolved in water?</b>
Dextrose				
Sodium bicarbonate				
Paraffin				