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Experiment 2.2

Research Question:

How can we experimentally determine the difference between ionic and covalent compounds?

Introduction:

An ionic bond is a transfer of electrons, while a covalent bond is the sharing of electrons. To form ionic bonds, there has to be a strong negative attraction between two atoms, causing them to have high polarity. Covalent bonds on the other hand, must have almost equal force between them.

Procedure:

First, we poured about 100-150ml of distilled water into each beaker. Second, we mixed one spatula of baking soda into one beaker, and mixed one spatula of sugar into the other beaker. Thirdly, we put the lead attachment on a 9v battery. We then put the leads into the sugar water and observed what happened. Next, we put the leads into the baking soda water and observed what happened.

Results:

When we put the leads in the sugar water, nothing happened. When we put the leads into the baking soda water, bubbles started to appear on both of the wires. Then, when we took the leads out of the water, the positive one had turned green.

Conclusion:

When we put the baking soda in the water and put in the leads, the baking soda allowed the water to conduct electricity. When the electric current was running through the water, it caused a chemical reaction, resulting in the water's molecules to split. So the bubbles we saw were the gasses that make up water (hydrogen and oxygen) were splitting and bubbling to the surface. When the positive wire turned green, it was because the oxygen molecules, which have a negative charge, are attracted to the wire that had the positive charge, oxidising the positive copper wire and turning it green. So, the way to determine the difference between ionic and covalent compounds is to dissolve them in distilled water and see which one conducts electricity.

The main difference between a compound and a mixture is that all of the things in a mixture aren't bonded, while a compound is just a group of bonded elements. An ionic compound is a bond of a metal and nonmetal elements, while a covalent compound is a bond of two nonmetal elements. A chemical reaction is when two compounds react to each other, causing a molecular change in a compound. When we saw the breaking down of the water, that was called electrolysis. Electrolysis is where a chemical breaks down because of an electric current running through it. A solution is a compound that can be dissolved in something else, which is called a solvent.

Results pictures:

Negative Wire

Positive Wire

