

Ionic vs. Covalent Compounds

Nicolas Wiesner

Research Questions-

- What is the difference between ionic and covalent compounds experimentally?
- How can we break the bonds of compounds?

Introduction-

A compound when being classified can be put into one of two groups: Ionic or covalent. A compound is covalent when it doesn't conduct electricity when put in water.

Vocabulary-

- Compound- A thing that is composed of two or more separate elements; a mixture
- Chemical reaction- A process that involves rearrangement of the molecular or ionic structure of a substance, as opposed to a change in physical form or a nuclear reaction.
- Ionic compound- ions that form charged particles when an atom (or group of atoms) gains or loses electrons.
- Covalent compound- covalent compounds are formed when the electronegativity values of the elements in a compound are identical or similar.
- Electrolysis- The process of using electricity to split water into hydrogen and oxygen.

Procedure-

Pour approximately 150 mL of water into each beaker. Put one rounded spatula full of sugar into one beaker of H₂O and mix thoroughly. Put one rounded spatula of baking soda into the other beaker of H₂O and mix thoroughly (Use different spatula). Prepare your battery with leads. Stick the battery with attached leads into sugar water first. Observe and record. Stick the battery with leads into baking soda solution next. Observe and record.

Results- Nothing happened when we put the battery leads in the sugar water. Tiny bubble streams floated up from the battery leads in the baking soda solution. When the leads were shaken, more bubbles would stream faster. When we put all the baking soda in the baking soda solution, twice as many bubbles streamed.

Conclusions-

Ionic compounds conduct electricity, while covalent compounds do not. You can test using electrical currents, a process called electrolysis. Baking soda is the ionic, sugar is the covalent. Ionics have metals, metals conduct electricity, so the baking soda conducts electricity in the water. The electricity in the water splits molecules into hydrogen and oxygen gas, oxidizing the tip of the lead. This turned the tip green.