

Pre-AP Chemistry/Chemistry
Unit #6—Compounds

Investigation of Conductivity of Compounds

Introduction

The salt and sugar on your kitchen table both dissolve easily in water, but the solutions they form have an important difference. One of those kinds of white crystals is an ionic compound and when it dissolves, it dissociates into ions. The ions are free to move in the solution, and that solution, therefore, conducts electricity. The other kind of crystal, however, is a molecular compound, and its molecules remain whole when they are dissolved. With no ions, that solution conducts no electricity.

When you measure the conductivity of each liquid, you will find that some are good conductors, some are fair conductors, some are poor conductors, or some are nonconductors. Using the conductivities you have measured, you will decide which solutions contain ionic compounds and which contain molecular compounds.

Purpose

In this experiment, you will understand the conductivity of several different liquids to determine if the liquid is an ionic compound or molecular compound.

Questions

1. Which bonds are good conductors of electricity: ionic, polar, or non-polar covalent? Explain.
2. What type of bonds do you think the nonconductors of electricity have? Explain.

3. How can you account for the fair and poor conductors of electricity? Explain.
4. What kind of ions does sodium chloride produce when it dissolves?
5. Do the relative positions of sodium and chlorine in the Periodic Table agree with the prediction made in the introduction about their structure? Explain

Test Solution	Conductivity			
	Good	Fair	Poor	None
Salt Water				
Sugar Water				
Antacid in Water				
Dishwasher Detergent in Water				
Borax in Water				
Tap Water				
1 M HCl, Hydrochloric Acid				
1 M NaOH, Sodium Hydroxide				
Aspirin in Water				
Vinegar				