

Name _____

Dr. Slotsky Chemistry I

NOTE: For this lab, EVERY student must complete a writeup!

Ionic Compounds and Conductivity

Introduction: Ionic compounds break up into cations and anions in solution, which can move freely and carry an electric current. Watch! <https://www.youtube.com/watch?v=aKTmn2YLP2A>

Conductivity Testing:

- 1) Verify that your conductivity tester circuit is working correctly – the light should be off normally, and should turn on when you touch the two free wires together. The brighter the light, the more electrical current is flowing. If the light is off, no current is flowing.
- 2) You have cups containing distilled water. Try one. Does it conduct electricity? _____
- 3) Obtain a cup of tap water. Does it conduct electricity? _____
- 4) Cups containing sodium sulfate, calcium chloride, sugar, and isopropyl alcohol are available. Test each substance to see if it conducts electricity by itself. Also, dissolve a **small** amount of each in one of your distilled water cups and test to see if the resulting solution conducts electricity.

Substance	Conducts electricity by itself?	Conducts electricity in solution?
Sodium Sulfate (Na_2SO_4)		
Calcium Chloride (CaCl_2)		
Sugar ($\text{C}_6\text{H}_{12}\text{O}_6$)		
Isopropyl Alcohol ($\text{C}_3\text{H}_7\text{OH}$)		

- 5) Which substances conduct electricity by themselves? Which substances conduct electricity in solution? Why? HINTS – compounds containing a metallic element are ionic, whereas compounds containing only nonmetals are covalently bonded. Please mention behavior of ionic compounds in solution – reference page 172 for details. A full paragraph is necessary. You may write on the back of this handout.
- 6) Do you observe a difference in the conductivity of tap water and distilled water? Please write a hypothesis for your observation, explaining why tap water may be different from distilled water. Please answer in paragraph form. You may write on the back of this handout.
- 7) Extra credit (must complete all previous work to get points for this): Samples of 2 mystery elements are available upon request. One is a metal, and the other is a nonmetal. You may try your conductivity test on them. Which one do you think is the metal, and why?