Laboratory Investigation Name _____

Chemistry: Form L4.1A Date _____ Period _____

Detecting Ions

PROBLEM

Is there any evidence of ions in ionic compounds?

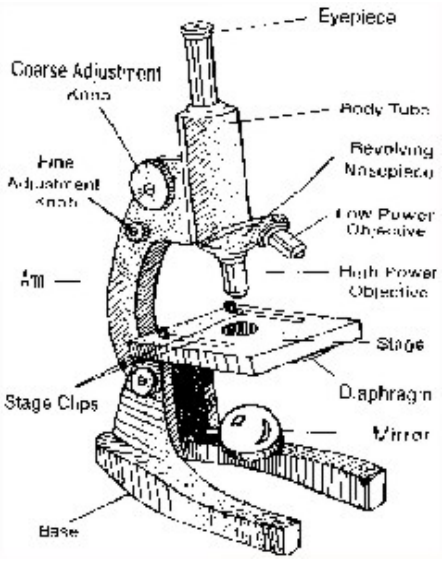
INTRODUCTION

Ionic compounds are solids composed of charged particles called ions. The ions are both postively and negatively charged. The attraction between oppositely charged particles is what holds ionic crystals together. Like other solids, when ionic crystals dissolve in water, the particles separate and disperse through the liquid. Ionic compounds such as table salt look very similar to covalent solids such as table sugar. When they dissolve, they produce clear solutions that look identical as well. There is one difference, however. Solutions of ionic solids contain electrically charged particles. As a result, they can conduct electricity. In this laboratory investigation, you will examine the evidence for this difference.

MATERIALS (*per group*)

Beaker; conductivity tester; deionized water; depression slides; microscope; scoop; stirring rod; table salt (NaCl) ; table sugar

PROCEDURE



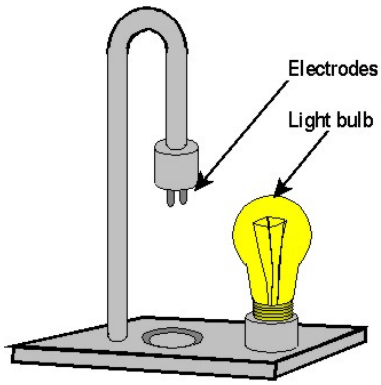
1. Using a scoop, put a small amount of table salt on a clean glass slide. Do *NOT* put any water on the slide.

2. Refer to the diagram of the microscope to the right as you follow the directions below for using the microscope: [a] Place the slide containing the crystals on the stage of the microscope. **[b]** Turn to the low power objective (the shortest one). **[c]** Turning the coarse adjustment away from you, lower the objectives as far as you can without touching the crystals. **[d]** Look through the eyepiece and adjust the mirror so that the field of view is bright. **[e]** As you look through the eyepiece, turn the coarse adjustment toward you until the crystals come into view. **[f]** Then use the fine adjustment to focus the image of the crystals.

3. Draw a diagram of the salt crystals showing the characteristic faces and angles in the space provided on the next page.

4. Repeat the procedure described in step 1 through step 3 using table sugar.

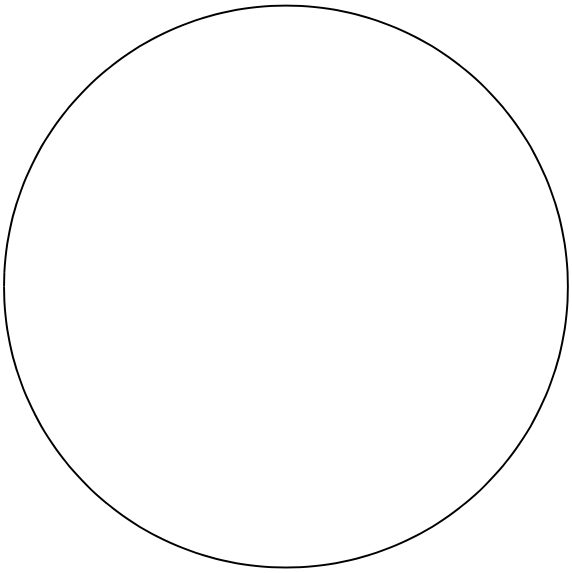
5. Fill a beaker partway with deionized water. Add a scoop of table salt. Mix with a stirring rod until the salt is dissolved. Note the appearance of the solution. Record your observations on the next page.



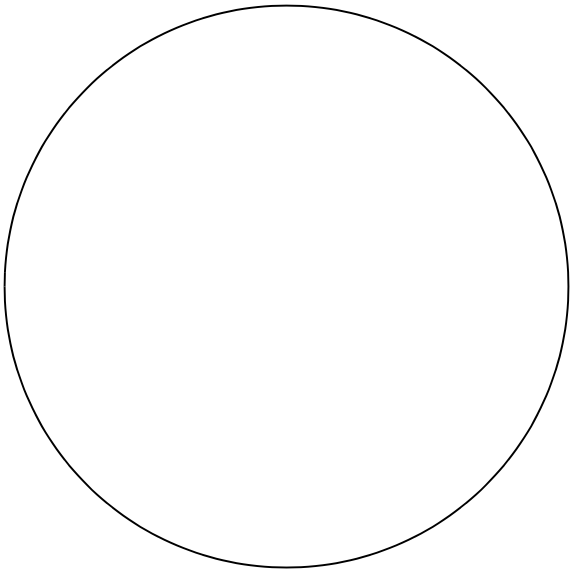
6. Plug in a conductivity tester such as the one pictured to the right. Test the conductivity of the salt solution by dipping the electrodes of the conductivity tester into the beaker of salt solution. If the light bulb lights, then the solution is a CONDUCTOR. Otherwise, it is a NONCONDUCTOR. Record your observations in the data table on the next page

7. Clean the electrodes with deionized water. Repeat steps 5 and 6 of the procedure using table sugar instead of table salt.

OBSERVATIONS



Salt Crystals



SugarCrystals

Solution	Table Salt	Table Sugar
Appearance		
Conductivity		

CONCLUSIONS

1. How does the appearance of the salt crystals compare to the appearance of the sugar crystals? _____

2. How does the appearance of the salt solution compare to the appearance of the sugar solution? _____

3. Based on their appearance, how easy or difficult is it to distinguish between ionic compounds such as salt and covalent compounds such as sugar? _____

4. Based on their conductivity, what is the difference between solutions of ionic compounds and covalent compounds? Why is this so? _____