Amityville Memorial High School Chemistry Lab # ____

Name/Date/Period_____ Lab #_____

Properties of Ionic and Molecular Compounds

Question: Do covalent compounds have properties different from ionic compounds?

Pre- Lab Question:

1. Define: ionic bond, covalent bond, molecular solid, ionic solid:

a) Ionic Bond: _____

b) Covalent Bond: _____

c) Molecular solid: _____

d) Ionic solid: _____

2. Complete the chart.

Compound	**Formula**	**Bond Type**	**Solid Type**
Salt			
Sugar (glucose)			

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Materials:

Salt, 2 medium test tubes, glass- marking pencil, test tube holder, Bunsen burner, clock, sugar, distilled water, 2 100- ml beakers, conductivity tester.

Safety:

***Always wear *protective goggles* when using the Bunsen burner. Use *test tube holders (not tongs)* when heating test tubes and be aware that hot test tubes look exactly like cool ones. Point the *open end of the test tube away from yourself* or others as heated objects can boil or splash out of the tube.

Procedure:

Part I

1. Place a small sample of salt in a test tube. Place an equal amount of sugar in another test tube. Label the test tubes.
2. Using the test tube holder, heat the test tube of salt over the flame of the Bunsen burner. CAUTION: Observe all safety precautions when using the Bunsen burner.***. Heat for 10 seconds. *If nothing happens after ten seconds, heat for another 20 seconds*. Allow the test tube to cool off before putting it back into the test tube rack.
3. Record your observations.
4. Repeat step 2 using the test tube of sugar.
5. Thoroughly clean out both test tubes with a test tube brush when finished.

Part I Results:

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Part II

1. Fill half of your beaker (containing salt) with distilled water. Stir until dissolved. Fill half of your beaker (containing sugar) with distilled water. Stir until dissolved. You should have two solutions. Label each solution properly.
2. Test each solution with the conductivity apparatus. Record your observations.

	Observations
Conductivity of Salt Solution	
Conductivity of Sugar Solution	

Observations:

1. Which compound, if any, melts?_____
2. Which solution is a better conductor of electricity?

_____

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Analyzing Data and Drawing Conclusions From Data:

1. Which *type of substance* (ionic or molecular), if any, is generally a poor conductor of electricity?_____

2. Which *type of substance*, if any, is generally a good conductor of electricity?_____

_____

3. Explain, in terms of freely floating ions, why one compound is a better conductor of electricity than the other (use your notes)._____

_____

4. Which substance used in this lab has a high melting point? _____

What observations led you to make this conclusion?_____

_____

5. Which substance used in this lab has a low melting point? _____

What observations led you to make this conclusion?_____

_____

6. How do the melting point of each type of compound relate to the **strength of the forces between the molecules**? _____

_____

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Additional Questions Related to the topic of Bonding:

Base your answers to questions 1 through 3 on the information below.

A metal, M, was obtained from a compound in a rock sample. Experiments have determined that the element is a member of *group 2* on the periodic table of elements.

1. What is the phase of the element M at STP? _____
2. Explain, in terms of electrons, why element M is a good conductor of electricity.

_____

3. Explain why the radius of a positive *ion* of element M is smaller than the radius of an *atom* of element M. _____
4. Which type of bond is found in sodium bromide, NaBr? _____
5. A solid substance was tested in sodium bromide and has the following properties:
    - Dissolves in water
    - Is an electrolyte (conducts electricity in water)
    - Melts at a high temperatures

Based on these results, which molecular below could be the solid substance tested?

(a) Cu (b) C (c) $CuBr_2$ (d) $C_6H_{12}O_6$

Explanation in terms of bonding:

_____

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