SCH 4C – Lab: Ionic vs Covalent Molecular Compounds

1. Create a very well done table of your results. This will require two pages to ensure adequate space. Include detail in your observations. This table should have the column headings of:

   - appearance
   - hardness
   - solubility
   - conductivity
   - melting point (include reference that you used)
   - chemical formula (include reference)
   - classification according to formula

   And use row headings for each compound:

   - citric acid
   - copper(II) sulphate
   - p-dichlorobenzene
   - fructose
   - D-glucose
   - potassium bromide
   - potassium nitrate
   - salicylic acid
   - sodium iodide
   - sodium phosphate (tribasic)
   - sodium sulphate
   - urea

2. Based on the rule that ionic compounds requires a metallic cation, classify each compound as either ionic or covalent molecular based on its formula. Place this classification in the last column in your table. This classification will be used to compare all physical properties.

3. Analyse your hardness observations. Can this property be used to classify ionic vs covalent molecular. Are there exceptions?

4. Analyse your solubility in water observations. Can this property be used to classify ionic vs covalent molecular compounds. Are there exceptions? What role does the polarity of covalent molecules play in solubility in water?

5. Create an organized list of compound names based on conductivity. Put the most conductive at the top of your list. State the numerical value for conductivity. Also state if the compound was ionic or covalent molecular. Use

a table such as the one on the next page to organize your work.

Compound Name	Conductivity	Classification

Now look at your table. Can generalizations be made about ionic vs covalent molecular compounds based on their conductivity in solution? Are there exceptions? Are all ionic compounds fairly conductive? Are all covalent molecular compounds non-conductive. What might account for the differences.

6. Create a table similar to the table in the last question to organize the compounds based on melting points, again from highest to lowest. Can generalizations be made about ionic vs covalent molecular compounds based on their melting point? Are there exceptions? What differences might you have noticed if the ionic compound is a hydrate?

7. How difficult or straight forward is it to determine the classification of a compound based on its physical properties? What in your opinion is the best physical property to use and why?

8. How would you classify each of the following:

    1. NaCl
    2. KI
    3. CO_2
    4. H_2O

    Verify agreement with the “best physical property”. You will need to look up the best physical property for each compound.