You have mastered this topic when you can:

1) define the terms **compound**, **ionic compound**, **molecular compound**, **electrolyte**, **non-electrolyte**, **soluble**, **low solubility**, **dissociate**, **non-electrolyte**, **chemical bond**and **intramolecular force**.

2) demonstrate a knowledge that bonding involves valence electrons.

**DEFINING CHARACTERISTICS OF COMPOUNDS**

I) Compounds are either ***ionic*** or ***molecular***. Each type of compound has unique characteristics that can be used to classify them as either being ***ionic*** and ***molecular***. In this topic you will complete a lab activity designed to introduce you to some physical characteristics of ***ionic compounds*** and ***molecular compounds*** as well as some defining characteristics that will allow you to classify a compound as ***ionic*** or ***molecular***.

II) **LAB ACTIVITY:** “Defining characteristics of Ionic and Molecular Compounds”

A) The purpose of this **LAB ACTIVITY** is to discover a diagnostic test that can be used to distinguish between ionic and molecular compounds.

1) The lab activity requires you to classify the compounds as ***ionic*** and ***molecular*** then record your observations of the physical characteristics of each compound in their satp.

2) The lab activity also requires you create ***aqueous solutions*** by mixing several pure compounds with water. Substances are either ***soluble*** or have ***low solubility*** in water. ***Substances that dissolve readily in water are soluble while substances that do not have low solubility*:** **e.g.** The compounds table salt and sugar mix readily with water and thus they are ***soluble*** while the substances olive oil and gasoline do not mix readily with water thus they have ***low solubility***.

3) The lab activity also requires you create to test the electrical conductivity of each of the ***solutions*** to determine if the compound is an ***electrolyte*** or a ***non-electrolyte***. ***Substances that form solutions that conduct electricity are electrolytes while substances that form solutions that do not conduct electricity are non-electrolytes***.

B) Use the template below as a ***ROUGH DRAFT*** of the lab reports that you will submit for marking.

***DEFINING CHARACTERISTICS OF IONIC AND MOLECULAR COMPOUNDS***

***Object:*** .

 .

 .

***Materials:*** List the materials that were used to complete this Lab Activity.

***Procedure:***

***Part 1: Physical properties in satp state***

1. Create Table 1 having these column headings: Name, Formula, Ionic or Molecular, State at satp, Electrical conductivity in satp state and Physical description. ***Be sure you give the table a title.***

2. Place 2 g of each compound then place into a beaker. Record your observations of each compound’s physical appearance in the Table 1.

3. Use the electrical conductivity apparatus to test the electrical conductivity of each compound. Record your observations of each compound in the Table 1.

***Part 2: Solubility***

1. Create Table 2 having these column headings: Name, Formula, Ionic or Molecular, Solubility, Description of Solution and Electrolyte or Non-electrolyte. ***Be sure you give the table a title.***

2. Add 15.0 mL of distilled water to each of the beakers containing a compound.

3. Mix the compound with the water using the stirring rod.

4. Record your observations of each solution’s appearance in the Table 2.

5. State weather the compound is soluble or has low solubility in the Table 2.

***Part 3: Electrical Conductivity***

1. Use the electrical conductivity apparatus to determine the electrical conductivity of each solution created in ***Part 2: Solubility***.

2. Record your observations in Table 2.

***Part 4: Clean-up***

1. Empty all solutions in the sink. Rinse and dry all beakers and stirring rods.

2. Place the clean dry materials back in the cart.

3. Place all chemicals back in the cart.

***Analysis:*** Answer these questions.

1. What kinds of elements are found in the ionic compounds tested?

2. At satp, before being mixed with water, which state or states did the ionic compounds tested exist?

3. In their satp state, did the ionic compounds tested conduct electricity?

4. Were the ionic compounds tested electrolytes or non-electrolytes?

5. Predict the physical characteristics shared by all ionic compounds.

6. What kinds of elements are found in the molecular compounds tested?

7. At satp, before being mixed with water, which state or states did the molecular compounds tested exist?

8. In their satp state, did the molecular compounds tested conduct electricity?

9. Were the molecular compounds tested electrolytes or non-electrolytes?

10. Predict the physical characteristics shared by all molecular compounds.

11. Can the physical characteristics of compounds in their satp state be used to definitively classify a compound as ionic or molecular? Justify your answer using the appropriate data.

12. Which type of compounds are electrolytes? Justify your answer using the appropriate data.

13. Which type of compounds are non-electrolytes? Justify your answer using the appropriate data.

14. Can the electrical conductivity of a compound in solution be used to definitively classify a compound as ionic or molecular? Justify your answer using the appropriate data.

15. Describe a diagnostic test that can be used to determine if an unknown compound is ionic or molecular.

***Conclusion:*** Describe a diagnostic test that can be used to classify an unknown compound as being ionic or molecular.

**ASSIGNMENT**

At the top of your assignment, please print **“Lab: Diagnostic Test for Ionic & Molecular Compounds”, your LAST then First name, block and date**. Complete these questions in the order given here. *[Marks indicated in italicized brackets.]*

1. Complete and submit a typed report of your Lab Activity to be submitted for marking using this format:

- Title page: Title of lab, author, lab partners

- Purpose/Object

- Introduction: A paragraph describing what you are doing in the lab, including any relevant information useful to helping the reader understand the your lab report.

- Materials

- Procedure

- Results/Data

- Analysis

- Error Analysis

- Conclusions

***BE SURE YOU PREPARE FOR TEST-2 ON T1 – T17!!***