**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Properties of Bonds**

Guiding Question: What conductivity and solubility properties does household bleach have?

Pre-Lab Questions:

1. Under what conditions will the light bulb light?
2. Does pure water light the light bulb? Why?

Procedure: Your teacher will demonstrate several properties of various compounds. As tests are preformed, record the results in your data table. For phase you should observe if each substance is a solid, liquid, or gas. For initial conductivity record if the substance conducts without the addition of water. For solubility, record if the substance appears to dissolve in water. For aqueous conductivity record if the substance conducts with the addition of water.

| **Chemical** | **Phase**  **(S, L, or G?)** | **Melting point (ºC)** | **Initial**  **Conductivity (Y or N?)** | **Solubility**  **(Y or N?)** | **Aqueous conductivity**  **(Y or N?)** |
| --- | --- | --- | --- | --- | --- |
| Salt |  | 801 |  |  |  |
| Sugar |  | 186 |  |  |  |
| Oil |  | -33 |  |  |  |
| Acetone |  | -95 |  |  |  |
| Baking soda |  | 50 |  |  |  |
| Starch |  | none |  |  |  |
| Vinegar |  | 16 |  |  |  |
| Rock Salt |  | 772 |  |  |  |

Questions:

1. Salt is known as sodium chloride and is an **ionic** substance because it contains a metal (sodium) and a nonmetal (chlorine). It is not always easy to determine the types of elements in a compound based on the name. Summarize the properties of sodium chloride that were tested in the lab which make it **ionic**.
2. Based on the properties you listed in question 1, record 3 other substances used in this lab that are **ionic**.
3. The substances that are not ionic in this lab are **covalent**. List the 4 remaining chemicals and explain their common properties.
   1. Substances:
   2. Properties:
4. Water is a **polar** compound because its structure is asymmetrical (it seems that there are two distinct and different sides of the molecule). Covalent substances that dissolve in water are also considered polar. Determine which 2 **covalent** substances that we tested are polar.
5. The rest of the **covalent** compounds are **nonpolar**. List the remaining 2 **covalent** substances and explain why they are **nonpolar**.
6. The melting points of the **ionic** compounds are much higher than those of the **covalent** compounds. What does this imply about the strength of ionic and covalent bonds?
7. Explain in terms of particles why **ionic** compounds can conduct electricity while **covalent** compounds cannot.
8. Construct a claim that answers the guiding question: “ What conductivity and solubility properties does household bleach have?” Bleach is an ionic substance. Provideevidence that supports your claim. Use yourreasoning skills to explain why your evidence is relevant.

