Inquiry Lab:
Using Properties to Identify Ionic and Covalent Compounds

Available Compounds for use

NaCl(s)	$C_{12}H_{22}O_{11}$(s)	3M HCl(aq)
$Ba(OH)_2$(s)	C_6H_5COOH(s)	C_3H_6O(l)
KI(s)	Tap Water (l)	Cu(s)

Choose the five properties you would like to test of each of chemical. From there, develop a purpose and hypothesis for your lab.

Procedure

Develop a procedure on how you will test each of your five properties. Create a step-by-step procedure for your group to follow. Remember to include amounts in your procedure.

Results

Create a data table to note both qualitative and quantitative information for each test. This table will be used to analyze and classify the provided compounds in your lab.

Create a second table of THEORETICAL information to confirm or challenge your lab results.

Analysis of Results

With your team try to find a way to group your chemicals into three categories: ionic, polar covalent, non-polar covalent, metal

In your analysis discuss in writing ALL of the evidence (of all 5 tests). Explain why you achieved the results you achieved, and what scientific principles support your results.

- List the physical properties that indicate ionic bonding exists in a compound.
- List the physical properties that indicate covalent bonding exists in a compound.
- Is there any one property that best indicates whether a compound is molecular or ionic? Explain.
- Find a relationship between the volatility of a substance and its type of bond.
- Does the strength of a bond have anything to do with the melting point? Explain.
- Why can ionic compounds conduct electricity but covalent compounds cannot?
- If a compound is not soluble in water (does not dissolve in water), is there a possibility that it will conduct electricity? Explain.

Conclusion

Develop a proper conclusion based on your results and hypothesis

Extension

Explain one area in every day life that this knowledge can be applied to. Provide sufficient explanation and relevant examples and chemical reactions in your extension.

Error Analysis

Completely describe 3 errors that occurred in your lab. Determine the effect of each error and describe how to scientifically correct the error in a new experiment.

Sources

Minimum 5 sources should be cited throughout your lab report, as well as in a source list at the end of your work.