

Complete this assignment if you were absent from class when the demonstration was performed. The chart on page 2 lists observations that would have occurred if the given solute was placed into the solvent. Use your understanding of what allows substances to conduct electricity to fill in the column on conductivity (answer yes or no).

Ionic & Covalent Bonding – *Follow-Along Demonstration*

Ionic bonds involve a transfer of one or more electrons from a metal to a nonmetal

Covalent bonds involve the sharing of one or more pairs of electrons between two nonmetals

OBJECTIVES:

1. To distinguish between ionic and covalent solutes. (A solute is a substance that is dissolved into another substance)
2. To use the properties of conductivity and solubility to help determine whether a given substance is ionic or covalent in nature.
3. To write appropriate chemical equations expressing the dissolving of each solute.
4. To answer the concept questions at the end of the activity.

DATA: Record conductivity and associated brightness of the bulb in the data table.

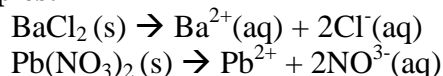
QUESTIONS:

1. Make a list of the substances that were *ionically* bonded and a list of the substances that were *covalently* bonded.

2. What type of elements make up ionically bonded substances?

3. When a solution conducts electricity, it is because ions are present in solution. In the case of ionic compounds, this occurs due to the dissociation of ions by the water molecules. The charges of the ions can be determined by the number of electrons gained or lost to have the same electron configuration as a noble gas. (Note: polyatomic ions such as CO₃ do not break up!)

Examples:



Write the dissolving equation for all of the ionic solutes as shown in the above example.

4. An important concept is “**likes dissolve likes**” which means that ionic substances will easily dissolve other ionic substances. Covalently bonded substances easily dissolve other covalent substances. Compare the solubility of the ionic compounds in water and alcohol. What type of molecules (ionic or covalent) are water and alcohol as indicated by the substances that easily dissolved into them?

DATA TABLE:Sucrose = $C_{12}H_{22}O_{11}$ Ethanol = C_2H_5OH

	A	B	C	D
	Solute	Solvent	Conductivity	Observations
1	NaCl	water		Soluble
2	NaCl	ethanol		Insoluble
3	KBr	water		Soluble
4	KBr	ethanol		Insoluble
5	sucrose	water		Soluble
6	sucrose	ethanol		Soluble (slightly)
7	CaCl ₂	water		Soluble (slightly)
8	CaCl ₂	ethanol		Insoluble
9	Na ₂ CO ₃	water		Soluble
10	Na ₂ CO ₃	ethanol		Insoluble
11	[none]	ethanol		
12	[none]	water		