CHEMISTRY NAME _____ DATE _____

COVALENT & IONIC BONDING

Two first year chemistry students conducted an experiment in which the properties of various ionic and covalent compounds were studied. After the physical description of each compound was recorded, the compounds were heated to determine if they melted. Next the substances were tested for solubility in water and ethanol. Finally the water solution of each compound was tested to determine if it conducted electricity. The data table below contains the results from the experiment.

DATA TABLE

Compound	Description	Melting test	Sol in water	Sol in ethanol	Solution Conductivity
$CaCl_2$	white crystal	No	soluble	insoluble	Yes
citric acid	white crystal	Yes	insoluble	soluble	No
phenyl salicylate	white crystal	Yes	insoluble	soluble	No
KI	white crystal	No	soluble	insoluble	Yes
$BaCl_2$	white crystal	No	soluble	insoluble	Yes
naphthalene	white crystal	Yes	insoluble	soluble	No

1. Group the substances into two groups according to their properties. (You do not have to use all the space provided.)

GROUP 1	GROUP 2
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

2. List the properties of each group. (You do not have to use all the space provided.)

GROUP 1	GROUP 2
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

3. Determine which group above consists of ionic compounds and which group consists of covalent compounds. Defend your conclusion with an explanation for each group using only the space below.

DRAW LEWIS STRUCTURES AND DRAW DIPOLES FOR THE FOLLOWING SUBSTANCES IN THE SPACE BELOW. TELL THE SHAPE OF EACH MOLECULE. PREDICT THE TYPE OF MOLECULE - WHETHER POLAR OR NONPOLAR.

A) Sulfur dichloride SHAPE: _____ TYPE: _____

C) C_2H_2 SHAPE: _____ TYPE: _____

F) Phosphorus triiodide SHAPE: _____ TYPE: _____

A) $COCl_2$ SHAPE: _____ TYPE: _____

ILLUSTRATE IONIC BONDING BETWEEN THE FOLLOWING ATOMS, AND IN THE SPACE BESIDE EACH, WRITE THE FORMULA FOR ONE FORMULA UNIT OF EACH.

(A) calcium and bromine **FORMULA UNIT: _____**

(B) gallium and oxygen **FORMULA UNIT: _____**