**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per \_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Unit 2 TEST Review: Bonding, Naming, Lewis Structures, Shapes and IMFs**

Answer all of the following questions and use Learning Goals, Labs, and Worksheets to prepare for the U-4 test.

1. Complete the following table.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Element** | **Valence Electrons** | **Number of e- lost or gained** | **Most likely charge on ion** | **Metal or Nonmetal** | **Type of compound formed with nitrogen (ionic/covalent)** |
| O |  |  |  |  |  |
| Sr |  |  |  |  |  |
| Al |  |  |  |  |  |

1. Write what you would expect to observe for each substance in each of the following situations. Explain each answer.

a. paradichlorobenzene (C6H4Cl2) and potassium carbonate (K2CO3) are both heated on a hot plate

b. zinc metal and sodium chloride are both stirred into separate beakers of water

c. glucose (C6H12O6) and calcium chloride are both dissolved in water and the conductivity is tested

1. Write the name or the formula of the following compounds. (first, decide if it’s ionic or covalent)

|  |  |
| --- | --- |
| **Compound Name** | **Compound Formula** |
| Barium hydroxide |  |
|  | P2S5 |
|  | AlPO4 |
| Carbon tetrafluoride |  |
| Iron (III) oxide |  |
|  | Cu(NO3)2 |
|  | ZnBr2 |
| Nitrogen monoxide |  |

1. Identify the type of bonds in each substance below and describe how the bonds are formed (electron behavior).

a. SO2 b. Ni c. KF

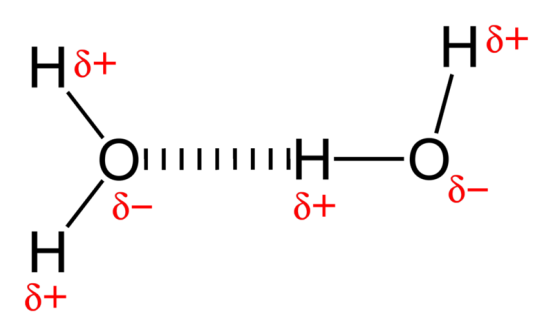
1. Draw Lewis Structures for the following ionic and covalent compounds. **For ionic compounds, the shape is a lattice.**

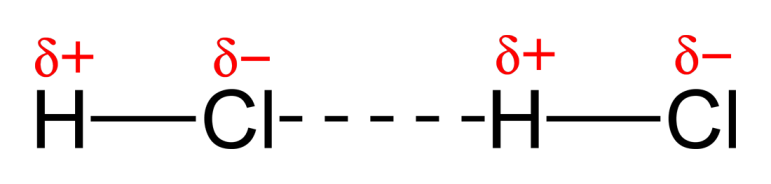
|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Compound** | **Lewis Structure** | **Number of bonds and unshared pairs on central atom** | **Shape and bond angle** | **Molecular Polarity**  **(polar, nonpolar or ionic)** | **Intermolecular forces** |
| KBr |  |  |  | **NA** | **NA** |
| CF3OH |  |  |  |  |  |
| Br2 |  |  |  |  |  |
| MgF2 |  |  |  | **NA** | **NA** |
| PBr3 |  |  |  |  |  |
| NO2-1 |  |  |  |  |  |
| CHOOH |  |  |  |  |  |

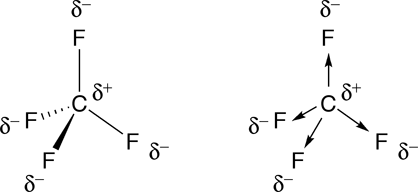
1. State what VSEPR stands for and how the VSEPR theory is used to predict the shapes of molecules.

Compare the shapes of H2S and SiS2 to support your explanation. (draw Lewis structures)

1. Explain the difference between a polar and a nonpolar molecule. Use 2 examples from the table in question (2) to support your explanation. Show where the (+) and (-) poles would be on each molecule.
2. Intermolecular forces and bonds.
   1. Identify the most significant intermolecular force that occurs in the examples shown below and indicate where it is with a label and an arrow.







b. Identify a covalent bond in each molecule and indicate where it is with a label and an arrow.

c. Explain what happens to the molecules above during melting or evaporation.

d. Explain why the 2 molecules above, H2Oand HCl, would have different melting points or rates of evaporation.

e. Identify any molecules above that would dissolve in water and any that would not. Explain why.

1. Use the following substances to answer a-d:

**H2S, CaI2, Cl2, NH2F**

* 1. Write Lewis structures, identify shapes, and state polarity for each substance above.
  2. Identify the type of IMF in each substance and rank them in order from weakest IMFs to strongest IMFs.
  3. Explain your ranking by comparing IMF’s.
  4. Which substance would evaporate the fastest? Explain why.
  5. Identify the substance that must be a solid at room temperature. Explain your choice.
  6. Draw a diagram showing how an NH2F molecule and an adjacent water molecule would align and identify (label) the intermolecular forces.