Advanced Chemistry Name: Block:

1. Explain what the formula of water, H2O, tells us in your own words.

Draw a picture of at

least 3 water molecules

1. What is the difference between 2N and N2?

Draw a picture of each to support your explanation

1. Is there a difference between a homogeneous mixture of hydrogen gas and oxygen gas in a 2:1 ratio and a sample of water vapor? Explain using microscopic level sketches (drawings).

homogenous mixture of water vapor H2O (g)

hydrogen and oxygen gas in 2:1 ratio

1. How do the properties of a compound, in general, compare with the properties of the elements of which it is composed? Give an example of a common compound and the elements of which it is composed to illustrate your answer.

Compound Elements that make up the compound

1. Examine the water model and salt model. Water is a molecule of H2O with covalent bonds while salt is an ionic compound of NaCl described in formula units with a ratio of 1:1. Draw the sample models below and use the models to explain how they are the same and how they are different.

Water Salt Salt

1. Write the formula for each of the following substances, listing the elements in the order given, classify the substance and then draw a picture to illustrate each:
   1. A molecule containing one nitrogen atom   
      \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

and three hydrogen atoms.

* 1. A molecule containing two boron atoms \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

and six hydrogen atoms.

* 1. A compound containing one calcium atom \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

for every two chlorine atoms.

* 1. A compound containing two iron atoms \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

for every three oxygen atoms.

* 1. A molecule containing three hydrogen atoms, \_\_\_\_\_\_\_\_\_\_\_\_\_

one phosphorous atom and four oxygen atoms.

1. Indicate how many atoms of each element are present in the samples indicated below, classify the substance and draw the sample.

1 molecule of CH4 1 molecule of O2

1 formula unit of Li2S 2 molecules of PCl3

4 Formula units of Fe3N2 3 molecules HCl