KEY

Ionic and Covalent

Name - _____KEY_____

1.) What are two kinds of compounds?

Ionic and covalent.

2a.) In a water molecule, how many atoms are connected to each oxygen atom?

Each oxygen has two hydrogen attached, one on each side.

b.) How many are connected to hydrogen atoms?

Only one oxygen is connected to each hydrogen.

3.) If a phosphate ion has the chemical formula of PO_4^{3-} answer the following questions.

a.) What kind of chemical bond holds each oxygen atom to the phosphorus atom?

Because both oxygen and phosphorus are non-metals then the bond between them must be a bond that shares electrons so it is called a covalent or molecular bond.

b.) How many atoms does the phosphorus atom connect to?

The phosphorus connects to four oxygen atoms in each phosphate.

c.) What do you call an ion such as phosphate, which is a molecule that has an overall electric charge?

Polyatomic ion as it is composed of more than one atom (poly means many).

4.) In a compound that contains a polyatomic ion, there are both covalent bonds and ionic bonds. Where are the covalent bonds, and where are the ionic bonds?

The covalent bonds occur between the two non-metals and the ionic is between the metal and the polyatomic ion which is made of multiple non-metals. Therefore in the case of phosphate the covalent bonds are between the phosphorus and the four oxygen atoms and the ionic bond must be between the ENTIRE phosphate molecule and whatever metal it is bonding with.

5.) How many oxygen atoms are connected to each chromium atom in the dichromate ion?

Dichromate is $Cr_2O_7^{2-}$ so the chromium share one oxygen between them and then each has three more. So each chromium has four oxygen attached.

$$\begin{matrix} O & & O \\ O & Cr & O & Cr & O \\ O & & O \end{matrix}$$