Chemical Bonds

Chemistry Name

1 What is a covalent bond? How does it differ from an ionic bond?

2 What are the four most electronegative elements?

3 With respect to electronegativity, why is fluorine such an important atom? What combination of atoms on the periodic table results in the most ionic bond?

**4** Identify two reasons why fluorine has a much higher electronegativity than neon.

**5.** When one electron is removed from an atom of Li it has two left. Helium atoms also have two electrons. Why is more energy required to remove the second electron from Li than to remove the first from He?

6 Using the table of electronegativity values, indicate which element is more positive and which is more negative in these compounds:

(a) Pb S (b) Na F (c) N H3 (d) N O (e) H2 O (f) C H4

**7** Classify the bond between these pairs of elements as principally ionic or principally covalent (use the table):

(a) sulfur and oxygen (b) barium and nitrogen (c) potassium and bromine

8 Determine whether the following atoms will form an ionic compound or a molecular compound, and give the formula of the compound.

(a) sodium and chlorine (b) carbon and 4 hydrogen (c) magnesium and bromine

(d) 2 bromine (e) carbon and 2 oxygen

9 State the number of valence electrons in an atom of each of the following elements:

 (a) sulfur (b) phosphorus (c) bromine (d) helium

10 How many electrons must be gained or lost for the following to achieve a noble gas electron configuration?

 (a) potassium (b) aluminum (c) bromine (d) selenium

11 Predict the type of bond that would be formed between the following pairs of atoms:

 (a) N and S (b) Na and N (c) Br and I

12 Let E be any representative element. Following the pattern in the table of hydrides and oxides, write formulas for the hydrogen and oxygen compounds of the following:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Ca | P | I | Al |
| *Hydride* |  |  |  |  |
| *Oxide* |  |  |  |  |