

## Types Of Bonds (p. 608 – 614)

### I. Gain Or Loss Of Electrons

1. Define the term ion.

Ion - a charged particle that has lost or gained electrons  
 (Cation = Positive Charge; Anion = Negative Charge)

2. Circle the letter of the statement that is false concerning ions?

- a. Ions either have more or less electrons than protons.
- b. Positive and negative charges of ions are not balanced.
- c. Compounds are held together by electric forces of ions.
- d. Ions from Group 1 and Group 18 commonly form compounds.

3. What do the superscripts in a chemical formula represent?

The charge of the ion. (Na<sup>+</sup> / Cl<sup>-</sup>)

4. Using electron dot diagrams, show how potassium and iodine form potassium iodide.  
 (The illustration on p. 609 may be helpful.)



### II. The Ionic Bond

1. Define the term ionic bond.

Ionic Bond - force of attraction between the opposite charges of the ions in an ionic compound

2. If an element loses electrons, another element must gain an equal number of electrons to remain neutral.

Circle One :  True  False

3. Using electron dot diagrams, show how magnesium & chlorine form magnesium chloride.  
 (The illustration on p. 610 may be helpful.)



4. When ions combine to forms compounds, the bond produces a neutral compound.

Circle One :  True  False

5. The overall number of protons and electrons of each ion equal the total number of protons and electrons in the resulting compound.

Circle One :  True  False

6. Ionic bonds usually form between metals and non-metals metalloids.

Circle One : True False

III. Sharing Electrons

Like A Clock!



Farthest away from 8.

1. Would an oxygen atom (6 valence electrons) most likely gain 2 electrons or lose 6 electrons to become stable?

Circle One : Gain 2 Electrons Lose 6 Electrons



2. Would an aluminum atom (3 valence electrons) most likely gain 5 electrons or lose 3 electrons to become stable?

Circle One : Gain 5 Electrons Lose 3 Electrons



3. Would a carbon atom (4 valence electrons) most likely gain or lose 4 electrons to become stable?

Neither, it would rather share electrons

4. Define the term covalent bond.

Covalent Bond - attraction that forms between atoms when they share electrons

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5. Define the term molecule.

Molecule - neutral particle that forms as a result of electron sharing

6. Match the type of bond with the diatomic molecule.

- |  |   |
|--|---|
| 1. <u>B.</u> - Single Bond                         | A. $N_2$ - (Elemental Nitrogen) $:N:::N:$ or $:N\equiv N:$                    |
| 2. <u>C.</u> - Double Bond                         | B. $H_2$ - (Elemental Hydrogen) $H:H$ or $H-H$                                |
| 3. <u>A.</u> - Triple Bond <u>p. 611</u><br>Bottom | C. $O_2$ - (Elemental Oxygen) $:\ddot{O}::\ddot{O}:$ or $:\ddot{O}=\ddot{O}:$ |

7. List three characteristics that determine the strength of an atom.

1. Size of atom 2. Charge of Nucleus 3. Total # of Electrons

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8. Why do chlorine atoms (Cl) have a stronger attraction of electrons than hydrogen (H) in hydrochloric acid (HCl)?

1. Chlorine has a stronger attraction for electrons (7)  
2. Chlorine has partial negative charge ( $\delta^-$ )

9. Define the term polar molecule.

Polar Molecule - molecule that has a slightly positive end and a slightly negative end  
(Overall molecule is neutral) Ex =  $H_2O$

10. Define the term non-polar molecule.

Non-Polar Molecule - molecule in which electrons are shared equally  
Ex =  $CO_2$

Ice vs. Dry Ice

weaker Bond

(\* Attractions between polar molecules are stronger than attractions between non-polar molecules.)