**Bonding**Unit 5 Page 1

**Learning Target:**

**I will be able to** define ionic bond, explain how ionic bonds form ionic compounds, and discuss the characteristics of ionic bonding.  **I** **can** explain how ionic compounds form formula units by transferring valence electrons in ways that make the atoms more stable.

**Criteria for Success:**

**I can** construct electrons dot formulas to illustrate ionic bonds

**Introduction to Bonding**

**A.** A chemical \_\_\_\_\_\_\_\_\_ is a mutual electrical attraction between the \_\_\_\_\_\_\_\_\_\_\_\_\_ charges in the \_\_\_\_\_\_\_\_\_\_\_\_ and the \_\_\_\_\_\_\_\_\_\_\_\_\_ charges in the valence levels of different atoms that binds the atoms together.

**B.** \_\_\_\_\_\_\_\_\_\_\_ tend to form so that each atom, by gaining, losing, or sharing electrons has an \_\_\_\_\_\_\_\_\_\_ of electrons in its \_\_\_\_\_\_\_\_\_\_\_\_ level.

**1.** The resulting arrangement of electrons \_\_\_\_\_\_\_\_\_\_\_\_\_\_ the overall potential \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the system.

**Ionic Bonding**

1. The electrical attraction between oppositely charged \_\_\_\_\_\_\_\_\_\_ is called an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bond.

**1.** An ion is an atom in which the total number of electrons is \_\_\_\_\_\_\_\_\_\_\_ equal to the total number of protons, giving the atom a net \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or net \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ charge.

**2.** An atom that loses an electron(s) to form a positive ion is called a \_\_\_\_\_\_\_\_\_\_\_\_\_. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ typically lose electrons.

**3.** An atom that gains an electron(s) to form a negative ion is called an \_\_\_\_\_\_\_\_\_\_\_\_. \_\_\_\_\_\_\_\_\_\_\_\_\_ typically gain electrons.

**4.** Ionic bonds form between both \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ions.

**a.** A monatomic ion is an ion consisting of a single \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**b.** A polyatomic ion is a charged chemical ion composed of two or more bonded atoms that can be considered to be acting as a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ unit.

**5.** The ions in ionic compounds exist in a ratio so that the overall charge of compound is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ represents the smallest ratio of ions that gives an overall \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ charge.

**Characteristics of Ionic Bonding**

**A.** The ions in an ionic compound arrange themselves in such a fashion so as to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ their potential energy. This arrangement is described as a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**B.** Ionic compounds have relatively \_\_\_\_\_\_\_\_\_\_\_\_\_\_ melting points and boiling points.

**C.** Ionic compounds are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**D.** Many ionic compounds conduct \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ when in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ solutions.

**Ionic Bonding Examples**

**2.** 1 atom of magnesium and 1 atom of oxygen

Formula Unit of Compound: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**1.** 1 atom of lithium and 1 atom of fluorine

Formula Unit of Compound: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**4.** 1 atom of calcium and 1 atom of sulfur

Formula Unit of Compound: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**3.** 1 atom of aluminum and 3 atoms of chlorine

Formula Unit of Compound: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**6.** 1 atom of potassium and ? atoms of chlorine

Formula Unit of Compound: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**5.** 1 atom of magnesium and ? atoms of bromine

Formula Unit of Compound: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_