

Chemistry 1
Chemical Bonding
Formation of Binary Ionic Compounds

Name _____
 Block _____ Date _____

An ionic bond forms when a metallic element transfers its valence electrons to a nonmetallic element. The result is a binary compound that is held together by an electrostatic attraction between oppositely charged ions.

Assignment: Complete each table below. The first one is done for you.

1.

Metal	Valence shell	e ⁻ dot symbol	Ion formed	Valence shell of ion	Chemical name and formula of compound
sodium	3s ¹	Na [•]	Na ⁺	2s ² 2p ⁶	Sodium chloride NaCl
Nonmetal	Valence shell	e ⁻ dot symbol	Ion formed	Valence shell of ion	
chlorine	3s ² 3p ⁵	$\begin{array}{c} \times \times \\ \times \text{Cl} \times \\ \times \times \end{array}$	$\left[\begin{array}{c} \times \times \\ \times \text{Cl} \times \\ \times \times \end{array} \right]^{-1}$	3s ² 3p ⁶	

Bonding model

$\begin{array}{ccc} \text{Na}^{\bullet} \rightarrow \begin{array}{c} \times \times \\ \times \text{Cl} \times \\ \times \times \end{array} & \longrightarrow & \text{Na}^{+} \left[\begin{array}{c} \times \times \\ \times \text{Cl} \times \\ \times \times \end{array} \right]^{-1} \\ \text{Before} & & \text{After} \end{array}$

2.

Metal	Valence shell	e ⁻ dot symbol	Ion formed	Valence shell of ion	Chemical name and formula of compound
barium					
Nonmetal	Valence shell	e ⁻ dot symbol	Ion formed	Valence shell of ion	
oxygen					

Bonding model

3.

Metal	Valence shell	e ⁻ dot symbol	Ion formed	Valence shell of ion	Chemical name and formula of compound
aluminum					
Nonmetal	Valence shell	e ⁻ dot symbol	Ion formed	Valence shell of ion	
phosphorus					
Bonding model					

4.

Metal	Valence shell	e ⁻ dot symbol	Ion formed	Valence shell of ion	Chemical name and formula of compound
calcium					
Nonmetal	Valence shell	e ⁻ dot symbol	Ion formed	Valence shell of ion	
fluorine					
Bonding model					

5.

Metal	Valence shell	e ⁻ dot symbol	Ion formed	Valence shell of ion	Chemical name and formula of compound
lithium					
Nonmetal	Valence shell	e ⁻ dot symbol	Ion formed	Valence shell of ion	
sulfur					
Bonding model <i>electron configuration</i>					

6.

Metal	Valence shell	e ⁻ dot symbol	Ion formed	Valence shell of ion	Chemical name and formula of compound
magnesium					
Nonmetal	Valence shell	e ⁻ dot symbol	Ion formed	Valence shell of ion	
nitrogen					
Bonding model					

7.

Metal	Valence shell	e ⁻ dot symbol	Ion formed	Valence shell of ion	Chemical name and formula of compound
potassium					
Nonmetal	Valence shell	e ⁻ dot symbol	Ion formed	Valence shell of ion	
iodine					
Bonding model					

8.

Metal	Valence shell	e ⁻ dot symbol	Ion formed	Valence shell of ion	Chemical name and formula of compound
rubidium					
Nonmetal	Valence shell	e ⁻ dot symbol	Ion formed	Valence shell of ion	
phosphorus					
Bonding model					

9.

Metal	Valence shell	e ⁻ dot symbol	Ion formed	Valence shell of ion	Chemical name and formula of compound
aluminum					
Nonmetal	Valence shell	e ⁻ dot symbol	Ion formed	Valence shell of ion	
bromine					
Bonding model					

10.

Metal	Valence shell	e ⁻ dot symbol	Ion formed	Valence shell of ion	Chemical name and formula of compound
gallium					
Nonmetal	Valence shell	e ⁻ dot symbol	Ion formed	Valence shell of ion	
chlorine					
Bonding model electron configuration					

