

Chapter 6

Part A Study Guide - Ionic Bonding

A. Bonding Basics

- The three types of strong bonds are: _____, _____, & _____.
- The type of bond formed between atoms has most to do with the difference in their _____.
 - _____ bonds form when the difference in electronegativities between atoms is less than 0.4. In this type of bond, electrons are shared _____.
 - _____ bonds form when the difference in electronegativities between atoms is between 0.4 & 2.0. In this type of bond, electrons are shared _____.
 - _____ bonds form when the difference in electronegativities between atoms is greater than 2.0. In this type of bond, electrons are _____.
 - When two atoms have a difference in electronegativity of _____ the bond is equally ionic and covalent in nature.
- Generally speaking:
 - ionic bonds form between a(n) _____ & a(n) _____,
 - covalent bonds forms between two _____, and
 - metallic bonds form between two _____.
- Define valence electrons: _____.
 - How is the Roman numeral of a group on the periodic table related to the number of valence electrons? _____

 - What is an octet? _____
 - What is a full valance shell? _____
 - Define the term isoelectronic: _____

B. Ionic Bonds

- An ionic bond is defined as _____
- What is the electrostatic force? _____
 - How is the electrostatic force related to ionic bonding? _____
 - How does the electrostatic force vary over a distance? _____
- Name three important properties of ionic compounds
_____, _____, _____
- Anions tend to form from _____ when they _____.
- Cations tend to form from _____ when they _____.
- An ion with a 1^+ charge has had _____ electrons stolen.
- An ion with a 3^- charge has stolen _____ electrons.
- Elements from group VIA tend to form ions with a _____ charge.
- Another name for the charge of an ion is its _____. Many transition metals have multiple _____. A(n) _____ is added to the ion's name to indicate this value.
- The names of monatomic anions end with _____.

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11. In an ionic compound the _____ must be equal to account for the transfer of all electrons.
12. What does “(IV)” mean when written in a compound’s name? _____
13. What does the octet rule say? _____
14. How many electrons does hydrogen have when it has a complete octet? _____

C. Lewis Structures

1. In a Lewis structure, there may be no more than _____ dots around an atomic symbol.
2. In the Lewis structure for N, there are _____ paired electrons and _____ bonding sites.

Draw Lewis dot diagrams for each of the following:

3. F
4. O
5. Si
6. C

D. Writing Formulas*

Write names for the following:

1. $\text{Mn}(\text{OH})_5$ _____
2. FeCO_3 _____
3. Na_2SO_4 _____
4. Li_3P _____

E. Naming Substances*

Next to each chemical name write the correct empirical formula for each of the following:

1. Titanium (IV) iodide _____
2. Nickel (II) fluoride _____
3. Iron (III) bromide _____
4. Sodium dihydrogen phosphate _____
5. Manganese (VII) oxalate _____
6. Sodium hydroxide _____
7. Silver nitrate _____
8. Lithium hydroxide _____

*** (Be sure you can do these!)**

F. Metallic Bonds

9. Define a metallic bond _____
10. The model used to describe the sharing of electrons in metallic bonds is referred to as the _____ model.
11. Name three important properties of metallic substances
_____, _____, _____
12. How do the terms “delocalized” and “highly mobile” relate to metallic bonding? _____
