

Name _____ Date _____ Class _____

CHAPTER 8 STUDY GUIDE FOR CONTENT MASTERY

Ionic Compounds

Section 8.1 Forming Chemical Bonds

In your textbook, read about *chemical bonds* and *formation of ions*.

Use each of the terms below just once to complete the passage.

chemical bond	electrons	energy level	ions	noble gases
nucleus	octet	pseudo-noble gas formations		valence

The force that holds two atoms together is called a(n) **(1) chemical bond**.

Such an attachment may form by the attraction of the positively charged

(2) nucleus of one atom for the negatively charged

(3) electrons of another atom, or by the attraction of charged atoms,

which are called **(4) ions**. The attractions may also involve

(5) valence electrons, which are the electrons in the outermost

(6) energy level. The **(7) noble gases** are a family of elements that

have very little tendency to react. Most of these elements have a set of eight outermost

electrons, which is called a stable **(8) octet**. The relatively stable electron

structures developed by loss of electrons in certain elements of groups 1B, 2B, 3A, and 4A

are called **(9) pseudo-noble gas formations**.

For each statement below, write *true* or *false*.

false 10. A positively charged ion is called an anion.

true 11. Elements in group 1A lose their one valence electron, forming an ion with a 1+ charge.

false 12. Elements tend to react so that they acquire the electron structure of a halogen.

true 13. A sodium atom tends to lose one electron when it reacts.

true 14. The electron structure of a zinc ion (Zn^{2+}) is an example of a pseudo-noble gas formation.

false 15. A Cl^- ion is an example of a cation.

true 16. The ending *-ide* is used to designate an anion.

false 17. Nonmetals form a stable outer electron configuration by losing electrons and becoming anions.

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CHAPTER 8 STUDY GUIDE FOR CONTENT MASTERY

Section 8.4 Metallic Bonds and Properties of Metals

In your textbook, read about *metallic bonds*.

Use the diagram of metallic bonding to answer the following questions.

1. What is the name of the model of metallic bonding that is illustrated?
electron sea model

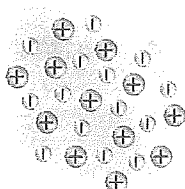
2. Why are the electrons in a metallic solid described as delocalized?
They are free to move from one atom to another.

3. Which electrons from the metal make up the delocalized electrons?
the valence electrons

4. Are the metal atoms that are shown cations or anions? How can you tell?
Cations; they are positively charged.

5. How do the metallic ions differ from the ions that exist in ionic solids?
The electrons are not completely lost by the metal atoms, as they are in an ionic solid.

6. Explain what holds the metal atoms together in the solid.
They are bonded by the oppositely charged electron sea that surrounds them.



In your textbook, read about the *properties of metals*.

For each property, write *yes* if the property is characteristic of most metals, or *no* if it is not. If the property is a characteristic of metals, explain how metallic bonding accounts for the property.

7. Malleable **Yes; when the metal is hammered, the delocalized electrons move, keeping the metallic bonds intact.**

8. Brittle **no**

9. Lustrous **Yes; the delocalized electrons absorb and release protons.**

10. High melting point **Yes; the metallic bonds are strong.**

11. Low boiling point **no**

12. Ductile **Yes; when the metal is pulled, the delocalized electrons move, keeping the metallic bonds intact.**

13. Poor conduction of heat **no**

14. Good conduction of electricity **Yes; the delocalized electrons are mobile.**