

Skills Worksheet

Directed Reading B**Section: Covalent and Metallic Bonds** (pp. 236–241)**COVALENT BONDS**

covalent bond

1. What is formed when atoms share one or more pairs of electrons?

- a. a covalent bond
- b. a covalent compound
- c. an ionic bond
- d. an electric bond

a molecule

2. What usually consists of two or more atoms joined in a definite ratio?

- a. a bond
- b. a valence electron
- c. an atom
- d. a molecule

3. A model that shows only the valence electrons in an atom is a(n)

Lewis electron dot diagram

COVALENT COMPOUNDS AND MOLECULES

4. What is the smallest particle into which a covalently bonded compound can be divided?

an atom

5. What is the relationship between diatomic molecules and diatomic elements?

Name one example of a diatomic element.

Diatomic means there are two atoms bonded together with a covalent bond.

In a diatomic compound they are two different elements, ex. carbon monoxide is CO, one carbon and one oxygen atom bonded together.

In a diatomic element, both atoms are the same element, like Oxygen gas, both are oxygen atoms.

6. Name two examples of substances that contain complex molecules.

Macromolecules, like soap and plastic contain many repeating patterns of large molecules, (20 or more atoms). The atoms are held together with many covalent bonds.

METALLIC BONDS7. A bond formed by the attraction between positively charged metal ions and the electrons in the metal is a(n) **metallic bond**.

Directed Reading B *continued*

8. What allows valence electrons in metals to move throughout the metal?

The valence electrons can overlap with other valences from neighboring atoms. Therefore, all the valences share all their electrons in a large "Sea of Electrons" that drift around the closely packed ionic nuclei (and inside electrons) of the metal atoms.

PROPERTIES OF METALS

9. Give an example of how metallic bonding allows metals to conduct electric current.

A copper wire, or aluminum bar placed between the + and - terminals of a battery, will conduct a overall net flow of electrons through their "Sea of Electrons". This is an electric current traveling through the metal wire. Thus, the metal wire acts like a straw allowing the flow of fluid, which is really electrons traveling in a general direction.

10. The property of **ductility** means that a metal can be drawn into wires.

11. The property of **malleability** means that a metal can be hammered into sheets.

12. Why doesn't a piece of metal break when it is bent?

Because the grid like lattice of metal ions can move to new relative positions without repelling each other and fracturing. They are in a "Sea of Electrons" and can move when bent. They do not fracture like ionic salts.