Name Key Date Class

Section 7.2 Ionic Bonds and Ionic Compounds

In your textbook, read about forming ionic bonds and the characteristics of ionic compounds.

Circle the letter of the choice that best completes the statement or answers the question.

1. An ionic bond is
   - **a.** attraction of an atom for its electrons.
   - **b.** attraction of atoms for electrons they share.
   - **c.** a force that holds together atoms that are oppositely charged.
   - **d.** the movement of electrons from one atom to another.

2. The formula unit of an ionic compound shows the
   - **a.** total number of each kind of ion in a sample.
   - **b.** simplest ratio of the ions.
   - **c.** numbers of atoms within each molecule.
   - **d.** number of nearest neighboring ions surrounding each kind of ion.

3. The overall charge of a formula unit for an ionic compound
   - **a.** is always zero.
   - **b.** is always negative.
   - **c.** is always positive.
   - **d.** may have any value.

4. How many chloride (Cl^-) ions are present in a formula unit of magnesium chloride, given that the charge on a Mg ion is 2+?
   - **a.** one-half
   - **b.** one
   - **c.** two
   - **d.** four

5. Ionic bonds generally occur between
   - **a.** metals.
   - **b.** nonmetals.
   - **c.** a metal and a nonmetal.
   - **d.** noble gases.

6. Salts are examples of
   - **a.** nonionic compounds.
   - **b.** metals.
   - **c.** nonmetals.
   - **d.** ionic compounds.

7. A three-dimensional arrangement of particles in an ionic solid is called a(n)
   - **a.** crystal lattice.
   - **b.** sea of electrons.
   - **c.** formula unit.
   - **d.** electrolyte.

8. In a crystal lattice of an ionic compound,
   - **a.** ions of a given charge are clustered together, far from ions of the opposite charge.
   - **b.** ions are surrounded by ions of the opposite charge.
   - **c.** a sea of electrons surrounds the ions.
   - **d.** neutral molecules are present.

Section 7.2 *continued*

9. What is the relationship between lattice energy and the strength of the attractive force holding ions in place?
   - **a.** The more positive the lattice energy is, the greater the force.
   - **b.** The more negative the lattice energy is, the greater the force.
   - **c.** The closer the lattice energy is to zero, the greater the force.
   - **d.** There is no relationship between the two quantities.

10. The formation of a stable ionic compound from ions
   - **a.** is always exothermic.
   - **b.** may be either exothermic or endothermic.
   - **c.** is always endothermic.
   - **d.** neither absorbs nor releases energy.

11. In electron transfer involving a metallic atom and a nonmetallic atom during ion formation, which of the following is correct?
   - **a.** The metallic atom gains electrons from the nonmetallic atom.
   - **b.** The nonmetallic atom gains electrons from the metallic atom.
   - **c.** Both atoms gain electrons.
   - **d.** Neither atom gains electrons.

Underline the word that correctly describes each property in ionic compounds.

12. Melting point	Low	High
13. Boiling point	Low	High
14. Hardness	Hard	Soft
15. Brittleness	Flexible	Brittle
16. Electrical conductivity in the solid state	Good	Poor
17. Electrical conductivity in the liquid state	Good	Poor
18. Electrical conductivity when dissolved in water	Good	Poor

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

True **19.** The crystal lattice of ionic compounds affects their melting and boiling points.

True **20.** The lattice energy is the energy required to separate the ions of an ionic compound.

False **21.** The energy of an ionic compound is higher than that of the separate elements that formed it.

False **22.** Large ions tend to produce a more negative value for lattice energy than smaller ions do.

True **23.** Ions that have larger charges tend to produce a more negative lattice energy than ions with smaller charges do.