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Chapter 12 Standardized Test Practice

Use Table 1 to answer questions 1–2.

1. Table 1 below lists four different chemical bonds and the amount of energy released when 1 mole of each compound is formed.

Table 1	
Bond	Energy Released in Formation (kcal/mole)
H—F	135
H—Cl	103
H—Br	87
H—I	71

Which bond is the most stable?

A. H—F **B.** H—Cl **C.** H—Br **D.** H—I

2. Based on Table 1, which has the greatest bond energy?

F. 1 mole of H—F **H.** 1.6 moles of H—Br

G. 1.4 moles of H—Cl **J.** 2.0 moles of H—I

3. Which ion has the largest radius?

A. I^- **B.** Cl^- **C.** Br^- **D.** F^-

4. What is the correct electron dot formula for hydrogen chloride?

F. H:Cl **G.** **H.** **J.**

5. Which of the following is a binary compound?

A. Sodium nitrate **C.** Potassium chloride

B. Silver nitrate **D.** Ammonium sulfide

6. To attain a noble gas configuration, an atom of sulfur must:

F. gain two electrons. **H.** gain one electron.

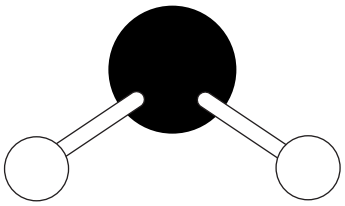
G. lose two electrons. **J.** lose one electron.

7. A bond formed between two elements that have a very large difference in electronegativity is called:

A. a covalent bond. **C.** a double bond.

B. a polar covalent bond. **D.** an ionic bond.

8. The diagram below represents a water molecule.



This molecule is best described as:

F. polar with polar covalent bonds.

G. polar with nonpolar covalent bonds.

H. nonpolar with polar covalent bonds.

J. nonpolar with nonpolar covalent bonds.

9. Which two atoms will form an ionic bond?

A. K and H **B.** I and H **C.** N and H **D.** C and H

10. Which of the following shows the electron configuration of a calcium ion and gives the name of the noble gas that has the same configuration?

F. $1s^2 2s^2 2p^6 3s^2 3p^6$, argon

G. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$, argon

H. $1s^2 2s^2 2p^6 3s^2 3p^6$, krypton

J. $1s^2 2s^2 2p^6 3s^2 3p^8$, argon

Passage I

Use the following passage and table to answer questions 11–13.

A student researched the properties of both ionic and covalent compounds. To summarize his findings, he created a table comparing the characteristics of the two compounds. Table 2 is shown below.

Table 2

Comparison of Ionic and Covalent Compounds

Characteristic	Covalent Compound	Ionic Compound
How bond is formed	atoms in bond share electrons	attraction between closely packed, oppositely charged ions
Elements involved in bond	nonmetal atoms	requires metal and nonmetal atoms
Physical state	solid, liquid, or gas	solid
Electrical conductivity (in aqueous solution)	nonconducting or poor	good
Melting point	low (often < 300°C)	high (often > 300°C)

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11. Silicon carbide is a network solid, a compound in which all the silicon and carbon atoms are covalently bonded to each other. The melting point of silicon carbide is about 2700°C. How is silicon carbide an exception to the general characteristics of covalent compounds?

A. Unlike most covalent compounds, the atoms in silicon carbide do not share electrons in forming covalent bonds.

B. Whereas most covalent compounds are formed from two nonmetals, silicon carbide is formed from a metal and a nonmetal.

C. Silicon carbide's very high melting point is uncharacteristic of covalent compounds.

D. none of the above

12. An unknown compound is a solid that has a melting point of approximately 300°C and is:

F. an ionic compound.

G. a covalent compound.

H. a network solid.

J. There is not enough information to determine the type of compound.

13. Which of the following statements explains why ionic compounds generally conduct an electrical current?

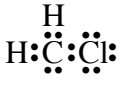
A. The shared electrons of the molecular bonds become free to move when the compound is dissolved in water.

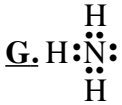
B. When ionic compounds dissolve in water, their ions dissociate and become free to move through the solution and conduct electricity.

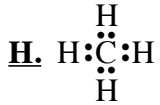
C. When an ionic compound dissolves in water, the compound remains intact but takes on a negative charge that allows it to flow through the solution and conduct electricity.

D. Dipole moments form hydrogen bonds in solution and allow electrical current to flow.

14. Which electron dot formula represents a nonpolar molecule?

F. 

G. 

H. 

J. 

15. Consider the three compounds NH_3, PH_3, and AsH_3. Which of the following statements is not true?

A. Each of the three molecules has a lone pair of electrons.

B. Each of the three molecules is trigonal planar.

C. Each of the three molecules is polar.

D. Each of the three molecules has covalent bonds.