

14

Ionic Bonds

QUIZ

A. Matching

Match each term in Column B with the correct description in Column A. Write the letter of the correct term in the blank provided.

Column A

Column B

- | | |
|---|--|
| <p>_____ 1. the forces of attraction that bind oppositely charged ions together 14.4</p> <p>_____ 2. a depiction of the valence electrons as dots around the symbol for an element 14.1</p> <p><u>G</u> 3. the attraction of the free-floating valence electrons for the positively charged metal ions 14.6</p> <p>_____ 4. ions of the halogen atoms 14.3</p> <p>_____ 5. the electrons in the highest occupied energy level of an atom 14.1</p> <p><u>F</u> 6. the number of ions of opposite charge that surround each ion in a crystal 14.5</p> <p>_____ 7. atoms in a compound tend to have the electron configuration of a noble gas 14.2</p> | <p>a. halide ions</p> <p>b. electron dot structure</p> <p>c. octet rule</p> <p>d. ionic bonds</p> <p>e. valence electron</p> <p>f. coordination number</p> <p>g. metallic bond</p> |
|---|--|

B. Multiple Choice

Choose the best answer and write its letter in the blank.

- | | | |
|---|---|-------------|
| <p>_____ 8. All the elements in a particular group of the periodic table have the same number of:</p> <p>a. electrons.</p> <p>b. energy levels.</p> | <p>c. valence electrons.</p> <p>d. protons.</p> | <p>14.1</p> |
| <p>_____ 9. What is the number of valence electrons in an atom of Al?</p> <p>a. 13</p> <p>b. 3</p> | <p>c. 10</p> <p>d. 8</p> | <p>14.1</p> |
| <p>_____ 10. Among the following, the element with six valence electrons is:</p> <p>a. C.</p> <p>b. Cs.</p> | <p>c. O.</p> <p>d. Ne.</p> | <p>14.1</p> |
| <p>_____ 11. The electron dot structure for Cl is:</p> <p>a. $\cdot\ddot{\text{Cl}}\cdot$</p> <p>b. Cl</p> | <p>c. $\cdot\ddot{\text{Cl}}\cdot$</p> <p>d. $\cdot\ddot{\text{Cl}}\cdot$</p> | <p>14.1</p> |

12. In general, metals react by:
- losing valence electrons.
 - gaining valence electrons.
 - sharing valence electrons.
 - sometimes gaining and sometimes losing valence electrons.

14.2

13. An ion of K has the same electron configuration as:

- K^+
- Ca
- Ar
- Kr

14.2

14. Calcium usually reacts by:

- gaining $2 e^-$
- losing $2 e^-$
- sharing $2 e^-$
- gaining $6 e^-$

14.3

15. The outer energy level configuration for O^{2-} is:

- $2s^2$
- $2p^4$
- $2p^5$
- $2p^6$

14.1

16. The general electron dot structure $\cdot X \cdot$ could represent:

- Li
- Na
- B
- N

14.1

17. The chemical properties of an element are largely determined by its:

- number of energy levels.
- period number.
- number of neutrons.
- number of valence electrons.

14.2

18. Which of the following has a noble gas electron configuration?

- Na
- Mg^+
- Al^{3+}
- Br

14.4

19. Atoms of Ca and S would be expected to react in a ratio of:

- 1:1
- 1:2
- 2:1
- 3:1

14.4

20. The chemical formula for the ionic compound formed when elements of Ca and N react is:

- CaN
- Ca_2N_3
- Ca_3N_2
- Ca_5N_2

14.4

21. In general, ionic compounds:

- are crystalline solids at room temperature.
- conduct electricity when in the molten state.
- conduct electricity when they are dissolved in water.
- all of these

14.6

22. Metals typically are:

- good conductors of electrical current.
- malleable.
- ductile.
- all of these

- 23 In forming chemical bonds, atoms tend to attain: 14.1
- a state of higher energy.
 - the electron configuration of noble gas atoms.
 - the electron configuration of halogen atoms.
 - all of the above
- 24 To attain a noble gas configuration a magnesium atom must: 14.2
- gain two electrons.
 - lose one electron.
 - lose two electrons.
 - gain three electrons.
- 25 An ionic compound is: 14.4
- generally a salt.
 - held together by ionic bonds.
 - composed of anions and cations.
 - all of the above
- 26 Which of these is not a characteristic of most ionic compounds? 14.5
- solid at room temperature
 - has a low melting point
 - conducts an electric current when melted
 - produced by reaction between metallic and nonmetallic elements
- A 27 A metallic bond is a bond between: 14.6
- valence electrons and positively charged metal ions.
 - the ions of two different metals.
 - a metal and nonmetal.
 - none of the above