# Chemistry: Chapter 6 Test

See Below for Answers

## Matching

*Match each item with the correct statement below.*

a. electronegativity
b. ionization energy
c. atomic radius
d. metal
e. transition metal
f. periodic law (ab)
g. cation (ac)
h. period (ad)
i. group (ae)
j. electrons (bc)

____ 1. horizontal row in the periodic table
____ 2. vertical column in the periodic table
____ 3. A repetition of properties occurs when elements are arranged in order of increasing atomic number.
____ 4. type of element that is a good conductor of heat and electric current
____ 5. type of element characterized by the presence of electrons in the *d* orbital
____ 6. one-half the distance between the nuclei of two atoms when the atoms are joined
____ 7. type of ion formed by Group 2A elements
____ 8. subatomic particles that are transferred to form positive and negative ions
____ 9. ability of an atom to attract electrons when the atom is in a compound
____ 10. energy required to remove an electron from an atom

## Multiple Choice

*Identify the choice that best completes the statement or answers the question.*

____ 11. Which of the following elements is in the same period as phosphorus?
a. carbon
b. magnesium
c. nitrogen
d. oxygen

____ 12. Each period in the periodic table corresponds to ____.
a. an energy level
b. an electron
c. an orbital
d. a suborbital

____ 13. The modern periodic table is arranged in order of increasing atomic ____.
a. mass
b. charge
c. number
d. radius

____ 14. Who arranged the elements according to atomic mass and used the arrangement to predict the properties of missing elements?
a. Henry Moseley
b. Antoine Lavoisier
c. John Dalton
d. Dmitri Mendeleev

____ 15. Which of the following categories includes the majority of the elements?
a. metalloids
b. liquids
c. metals
d. nonmetals

____ 16. Of the elements Pt, V, Li, and Kr, which is a nonmetal?
a. Pt
b. V
c. Li
d. Kr

____ 17. To what category of elements does an element belong if it is a poor conductor of electricity?
a. transition elements
b. Group 2A
c. nonmetals
d. metals

____ 18. What element has the electron configuration $1s^2 2s^2 2p^6 3s^2 3p^2$?
a. nitrogen
b. selenium
c. silicon
d. silver

____ 19. Which of the following is true about the electron configurations of the noble gases?
a. The highest occupied *s* and *p* sublevels are completely filled.
b. The highest occupied *s* and *p* sublevels are partially filled.
c. The electrons with the highest energy are in a *d* sublevel.
d. The electrons with the highest energy are in an *f* sublevel.

____ 20. Elements that are characterized by the filling of *p* orbitals are classified as ____.
a. groups 3A through 8A
b. transition metals
c. inner transition metals
d. groups 1A and 2A

____ 21. Which of the following electron configurations is most likely to result in an element that is relatively inactive?
a. a half-filled energy sublevel
b. a filled energy sublevel
c. one empty and one filled energy sublevel
d. a filled highest occupied principal energy level

____ 22. Which subatomic particle plays the greatest part in determining the properties of an element?
a. proton
b. electron
c. neutron
d. none of the above

____ 23. Which of the following elements is a transition metal?
a. cesium
b. copper
c. tellurium
d. tin

____ 24. Which of the following groupings contains only representative elements?
a. Cu, Co, Cd
b. Ni, Fe, Zn
c. Al, Mg, Li
d. Hg, Cr, Ag

____ 25. Which of the following is true about the electron configurations of the representative elements?
a. The highest occupied *s* and *p* sublevels are completely filled.
b. The highest occupied *s* and *p* sublevels are partially filled.
c. The electrons with the highest energy are in a *d* sublevel.
d. The electrons with the highest energy are in an *f* sublevel.

____ 26. How does atomic radius change from top to bottom in a group in the periodic table?
a. It tends to decrease.
b. It tends to increase.
c. It first increases, then decreases.
d. It first decreases, then increases.

____ 27. How does atomic radius change from left to right across a period in the periodic table?
a. It tends to decrease.
b. It tends to increase.
c. It first increases, then decreases.
d. It first decreases, then increases.

____ 28. Atomic size generally ____.
a. increases as you move from left to right across a period
b. decreases as you move from top to bottom within a group
c. remains constant within a period
d. decreases as you move from left to right across a period

____ 29. What element in the second period has the largest atomic radius?
a. carbon
b. lithium
c. potassium
d. neon

____ 30. Which of the following factors contributes to the increase in atomic size within a group in the periodic table as the atomic number increases?
a. more shielding of the electrons by the highest occupied energy level

b. an increase in size of the nucleus
c. an increase in number of protons
d. fewer electrons in the highest occupied energy level

____ 31. Which of the following elements has the smallest atomic radius?
a. sulfur
b. chlorine
c. selenium
d. bromine

____ 32. What is the charge of a cation?
a. a positive charge
b. no charge
c. a negative charge
d. The charge depends on the size of the nucleus.

____ 33. Which of the following statements is true about ions?
a. Cations form when an atom gains electrons.
b. Cations form when an atom loses electrons.
c. Anions form when an atom gains protons.
d. Anions form when an atom loses protons.

____ 34. Which of the following statements is NOT true about ions?
a. Cations are positively charged ions.
b. Anions are common among nonmetals.
c. Charges for ions are written as numbers followed by a plus or minus sign.
d. When a cation forms, more electrons are transferred to it.

____ 35. In which of the following sets are the charges given correctly for all the ions?
a. $Na^{+}$, $Mg^{+}$, $Al^{+}$
b. $K^{+}$, $Sr^{2+}$, $O^{2-}$
c. $Rb^{-}$, $Ba^{2-}$, $P^{3+}$
d. $N^{-}$, $O^{2-}$, $F^{3-}$

____ 36. What is the element with the lowest electronegativity value?
a. cesium
b. helium
c. calcium
d. fluorine

____ 37. What is the element with the highest electronegativity value?
a. cesium
b. helium
c. calcium
d. fluorine

____ 38. Which of the following elements has the smallest ionic radius?
a. Li
b. K
c. O
d. S

____ 39. What is the energy required to remove an electron from an atom in the gaseous state called?
a. nuclear energy
b. ionization energy
c. shielding energy
d. electronegative energy

____ 40. For Group 2A metals, which electron is the most difficult to remove?
a. the first
b. the second
c. the third
d. All the electrons are equally difficult to remove.

____ 41. Which of the following elements has the smallest first ionization energy?
a. sodium
b. calcium
c. potassium
d. magnesium

____ 42. Which of the following elements has the lowest electronegativity?
a. lithium
b. carbon
c. bromine
d. fluorine

____ 43. Which statement is true about electronegativity?

a. Electronegativity is the ability of an anion to attract another anion.
b. Electronegativity generally increases as you move from top to bottom within a group.
c. Electronegativity generally is higher for metals than for nonmetals.
d. Electronegativity generally increases from left to right across a period.

____ 44. Compared with the electronegativities of the elements on the left side of a period, the electronegativities of the elements on the right side of the same period tend to be ____.
a. lower
b. higher
c. the same
d. unpredictable

____ 45. Which of the following decreases with increasing atomic number in Group 2A?
a. shielding effect
b. ionic size
c. ionization energy
d. number of electrons

____ 46. Which of the following statements correctly compares the relative size of an ion to its neutral atom?
a. The radius of an anion is greater than the radius of its neutral atom.
b. The radius of an anion is identical to the radius of its neutral atom.
c. The radius of a cation is greater than the radius of its neutral atom.
d. The radius of a cation is identical to the radius of its neutral atom.

____ 47. Which of the following factors contributes to the increase in ionization energy from left to right across a period?
a. an increase in the shielding effect
b. an increase in the size of the nucleus
c. an increase in the number of protons
d. fewer electrons in the highest occupied energy level

____ 48. As you move from left to right across the second period of the periodic table ____.
a. ionization energy increases
b. atomic radii increase
c. electronegativity decreases
d. atomic mass decreases

____ 49. Of the following elements, which one has the smallest first ionization energy?
a. boron
b. carbon
c. aluminum
d. silicon

____ 50. Which two elements have the most similar chemical and physical properties?
a. Carbon, Silicon
b. Flourine, Francium
c. Sodium, Magnesium
d. Carbon, Hydrogen

# Chemistry: Chapter 6 Test
# Answer Section

## MATCHING

1. ANS: H PTS: 1 DIF: L1 REF: p. 157
OBJ: 6.1.1
2. ANS: I PTS: 1 DIF: L1 REF: p. 157
OBJ: 6.1.1
3. ANS: F PTS: 1 DIF: L1 REF: p. 157
OBJ: 6.1.1
4. ANS: D PTS: 1 DIF: L1 REF: p. 158
OBJ: 6.1.3
5. ANS: E PTS: 1 DIF: L1 REF: p. 166
OBJ: 6.2.2
6. ANS: C PTS: 1 DIF: L1 REF: p. 170
OBJ: 6.3.1
7. ANS: G PTS: 1 DIF: L1 REF: p. 172
OBJ: 6.3.2
8. ANS: J PTS: 1 DIF: L1 REF: p. 172
OBJ: 6.3.2
9. ANS: A PTS: 1 DIF: L1 REF: p. 177
OBJ: 6.3.3
10. ANS: B PTS: 1 DIF: L1 REF: p. 173
OBJ: 6.3.3

## MULTIPLE CHOICE

11. ANS: B PTS: 1 DIF: L1 REF: p. 162 | p. 163
OBJ: 6.1.1
12. ANS: A PTS: 1 DIF: L2 REF: p. 157
OBJ: 6.1.1
13. ANS: C PTS: 1 DIF: L2 REF: p. 157
OBJ: 6.1.1 STA: C4.9c TOP: testout1
14. ANS: D PTS: 1 DIF: L1 REF: p. 156
OBJ: 6.1.2
15. ANS: C PTS: 1 DIF: L1 REF: p. 158
OBJ: 6.1.3 STA: C4.9b TOP: testout1
16. ANS: D PTS: 1 DIF: L2 REF: p. 158
OBJ: 6.1.3 STA: C4.9b TOP: testout1
17. ANS: C PTS: 1 DIF: L3 REF: p. 160
OBJ: 6.1.3
18. ANS: C PTS: 1 DIF: L2 REF: p. 164
OBJ: 6.2.2
19. ANS: A PTS: 1 DIF: L2 REF: p. 164
OBJ: 6.2.2
20. ANS: A PTS: 1 DIF: L2 REF: p. 166

OBJ: 6.2.2

21. ANS: D PTS: 1 DIF: L2 REF: p. 164
OBJ: 6.2.2

22. ANS: B PTS: 1 DIF: L2 REF: p. 164
OBJ: 6.2.2

23. ANS: B PTS: 1 DIF: L1 REF: p. 166
OBJ: 6.2.3

24. ANS: C PTS: 1 DIF: L1 REF: p. 164 | p. 166
OBJ: 6.2.3

25. ANS: B PTS: 1 DIF: L2 REF: p. 164
OBJ: 6.2.2 | 6.2.3

26. ANS: B PTS: 1 DIF: L1 REF: p. 171
OBJ: 6.3.1

27. ANS: A PTS: 1 DIF: L2 REF: p. 171
OBJ: 6.3.1

28. ANS: D PTS: 1 DIF: L2 REF: p. 171
OBJ: 6.3.1

29. ANS: B PTS: 1 DIF: L2 REF: p. 171
OBJ: 6.3.1

30. ANS: A PTS: 1 DIF: L3 REF: p. 171
OBJ: 6.3.1

31. ANS: B PTS: 1 DIF: L3 REF: p. 171 | p. 175
OBJ: 6.3.1

32. ANS: A PTS: 1 DIF: L1 REF: p. 172
OBJ: 6.3.2

33. ANS: B PTS: 1 DIF: L2 REF: p. 172
OBJ: 6.3.2

34. ANS: D PTS: 1 DIF: L2 REF: p. 172
OBJ: 6.3.2

35. ANS: B PTS: 1 DIF: L3 REF: p. 162 | p. 163 | p. 172
OBJ: 6.3.2

36. ANS: A PTS: 1 DIF: L1 REF: p. 177
OBJ: 6.3.3 STA: C4.9c TOP: testout1

37. ANS: D PTS: 1 DIF: L1 REF: p. 177
OBJ: 6.3.3

38. ANS: A PTS: 1 DIF: L2 REF: p. 175
OBJ: 6.3.3 STA: C4.9b TOP: testout1

39. ANS: B PTS: 1 DIF: L2 REF: p. 173
OBJ: 6.3.3

40. ANS: C PTS: 1 DIF: L2 REF: p. 173
OBJ: 6.3.3

41. ANS: C PTS: 1 DIF: L2 REF: p. 173
OBJ: 6.3.3 STA: C4.9b TOP: testout1

42. ANS: A PTS: 1 DIF: L2 REF: p. 177
OBJ: 6.3.3

43. ANS: D PTS: 1 DIF: L2 REF: p. 177
OBJ: 6.3.3

44. ANS: B PTS: 1 DIF: L2 REF: p. 177 | p. 178

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | OBJ: | 6.3.3 | | | | | | |
| 45. | ANS: | C | PTS: | 1 | DIF: | L2 | REF: | p. 178 |
| | OBJ: | 6.3.1 \| 6.3.3 | | | | | | |
| 46. | ANS: | A | PTS: | 1 | DIF: | L2 | REF: | p. 172 \| p. 176 |
| | OBJ: | 6.3.3 | | | | | | |
| 47. | ANS: | C | PTS: | 1 | DIF: | L3 | REF: | p. 174 |
| | OBJ: | 6.3.3 | | | | | | |
| 48. | ANS: | A | PTS: | 1 | DIF: | L3 | REF: | p. 178 |
| | OBJ: | 6.2.1 \| 6.3.3 | | | | | | |
| 49. | ANS: | C | PTS: | 1 | DIF: | L3 | REF: | p. 173 |
| | OBJ: | 6.3.3 | | | | | | |
| 50. | ANS: | A | PTS: | 1 | STA: | C4.9a | TOP: | testout1 |