

***Test Bank for Chemistry The Central Science 14th Edition by
Brown LeMay Bursten Murphy Woodward Stoltzfus ISBN
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Chemistry: The Central Science, 14e (Brown, et al.)

Chapter 2 Atoms, Molecules, and Ions

2.1 Multiple-Choice Questions

1) A molecule of water contains hydrogen and oxygen in a 1:8 ratio by mass. This is a statement of _____.

- A) the law of multiple proportions
- B) the law of constant composition
- C) the law of conservation of mass
- D) the law of conservation of energy
- E) none of the above

Answer: B

Diff: 2 Var: 1 Page Ref: Sec. 2.1

LO: 2.1

GO: G2

2) Which one of the following is not one of the postulates of Dalton's atomic theory? A) Atoms are composed of protons, neutrons, and electrons.

- B) All atoms of a given element are identical; the atoms of different elements are different and have different properties.
- C) Atoms of an element are not changed into different types of atoms by chemical reactions: atoms are neither created nor destroyed in chemical reactions.
- D) Compounds are formed when atoms of more than one element combine; a given compound always has the same relative number and kind of atoms.
- E) Each element is composed of extremely small particles called atoms.

Answer: A

Diff: 1 Var: 1 Page Ref: Sec. 2.1

LO: 2.1

GO: G2

3) Consider the following selected postulates of Dalton's atomic theory:

(i) Each element is composed of extremely small particles called atoms.

(ii) Atoms are indivisible.

(iii) Atoms of a given element are identical.

(iv) Atoms of different elements are different and have different properties.

Which of the postulates is(are) no longer considered valid?

A) (i) and (ii)

B) (ii) only

C) (ii) and (iii)

D) (iii) only

E) (iii) and (iv)

Answer: C

Diff: 2 Var: 1 Page Ref: Sec. 2.1

LO: 2.1

GO: G2

4) Which pair of substances could be used to illustrate the law of multiple proportions?

A) SO_2 , H_2SO_4

B) CO , CO_2

C) H_2O , O_2

D) CH_4 , $\text{C}_6\text{H}_{12}\text{O}_6$

E) NaCl , KCl

Answer: B

Diff: 1 Var: 1 Page Ref: Sec. 2.1

LO: 2.1

GO: G2

5) Which statement below correctly describes the responses of alpha, beta, and gamma radiation to an electric field?

A) Both beta and gamma are deflected in the same direction, while alpha shows no response.

B) Both alpha and gamma are deflected in the same direction, while beta shows no response.

C) Both alpha and beta are deflected in the same direction, while gamma shows no response.

D) Alpha and beta are deflected in opposite directions, while gamma shows no response.

E) Only alpha is deflected, while beta and gamma show no response.

Answer: D

Diff: 2 Var: 1 Page Ref: Sec. 2.2

LO: 2.2

GO: G2

- 6) Which one of the following is not true concerning cathode rays? A) They originate from the negative electrode.
B) They travel in straight lines in the absence of electric or magnetic fields.
C) They impart a negative charge to metals exposed to them.
D) They are made up of electrons.
E) The characteristics of cathode rays depend on the material from which they are emitted.

Answer: E

Diff: 2 Var: 1 Page Ref: Sec. 2.2

LO: 2.2

GO: G2

- 7) The charge on an electron was determined in the _____.

- A) cathode ray tube, by J. J. Thomson
B) Rutherford gold foil experiment
C) Millikan oil drop experiment
D) Dalton atomic theory
E) atomic theory of matter

Answer: C

Diff: 1 Var: 1 Page Ref: Sec. 2.2

LO: 2.2

GO: G2

- 8) _____-rays consist of fast-moving electrons.

- A) Alpha
B) Beta
C) Gamma
D) X
E) none of the above

Answer: B

Diff: 1 Var: 1 Page Ref: Sec. 2.2

LO: 2.2

GO: G2

- 9) The gold foil experiment performed in Rutherford's lab _____.

- A) confirmed the plum-pudding model of the atom
B) led to the discovery of the atomic nucleus
C) was the basis for Thomson's model of the atom
D) utilized the deflection of beta particles by gold foil
E) proved the law of multiple proportions

Answer: B

Diff: 1 Var: 1 Page Ref: Sec. 2.2

LO: 2.2

GO: G2

10) In the Rutherford nuclear-atom model,_____.

- A) the heavy subatomic particles, protons and neutrons, reside in the nucleus
- B) the three principal subatomic particles (protons, neutrons, and electrons) all have essentially the same mass
- C) the light subatomic particles, protons and neutrons, reside in the nucleus
- D) mass is spread essentially uniformly throughout the atom
- E) the three principal subatomic particles (protons, neutrons, and electrons) all have essentially the same mass and mass is spread essentially uniformly throughout the atom

Answer: A

Diff: 1 Var: 1 Page Ref: Sec. 2.2

LO: 2.2

GO: G2

11) Cathode rays are_____.

- A) neutrons
- B) X-rays
- C) electrons
- D) protons
- E) atoms

Answer: C

Diff: 1 Var: 1 Page Ref: Sec. 2.2

LO: 2.2

GO: G2

12) Cathode rays are deflected away from a negatively charged plate because_____.

- A) they are not particles
- B) they are positively charged particles
- C) they are neutral particles
- D) they are negatively charged particles
- E) they are emitted by all matter

Answer: D

Diff: 1 Var: 1 Page Ref: Sec. 2.2

LO: 2.2

GO: G2

13) In the absence of magnetic or electric fields, cathode rays_____.

- A) do not exist
- B) travel in straight lines
- C) cannot be detected
- D) become positively charged
- E) bend toward a light source

Answer: B

Diff: 1 Var: 1 Page Ref: Sec. 2.2

LO: 2.2

GO: G2

14) Of the three types of radioactivity characterized by Rutherford, which is/are electrically charged?

- A) β -rays
 - B) α -rays and β -rays
 - C) α -rays, β -rays, and γ -rays
 - D) α -rays E) α -rays and γ -rays
- Answer: B

Diff: 1 Var: 1 Page Ref: Sec. 2.2

LO: 2.2

GO: G2

15) Of the three types of radioactivity characterized by Rutherford, which is/are not electrically charged?

- A) α -rays
- B) α -rays, β -rays, and γ -rays
- C) γ -rays
- D) α -rays and β -rays
- E) α -rays and γ -rays

Answer: C

Diff: 1 Var: 1 Page Ref: Sec. 2.2

LO: 2.2

GO: G2

16) Of the three types of radioactivity characterized by Rutherford, which are particles?

- A) β -rays
- B) α -rays, β -rays, and γ -rays
- C) γ -rays
- D) α -rays and γ -rays
- E) α -rays and β -rays

Answer: E

Diff: 1 Var: 1 Page Ref: Sec. 2.2

LO: 2.2

GO: G2

17) Of the three types of radioactivity characterized by Rutherford, which type does not become deflected by a electric field?

- A) β -rays
 - B) α -rays and β -rays
 - C) α -rays
 - D) γ -rays E) α -rays, β -rays, and γ -rays
- Answer: D

Diff: 1 Var: 1 Page Ref: Sec. 2.2

LO: 2.2

GO: G2

18) Of the following, the smallest and lightest subatomic particle is the_____.

- A) neutron
- B) proton
- C) electron
- D) nucleus
- E) alpha particle

Answer: C

Diff: 1 Var: 1 Page Ref: Sec. 2.3

LO: 2.3

GO: G2

19) All atoms of a given element have the same_____.

- A) mass
- B) number of protons
- C) number of neutrons
- D) number of electrons and neutrons
- E) density

Answer: B

Diff: 1 Var: 1 Page Ref: Sec. 2.3

LO: 2.3

GO: G2

20) Which atom has the smallest number of neutrons?

- A) carbon-14
- B) nitrogen-14
- C) oxygen-16
- D) fluorine-19
- E) neon-20

Answer: B

Diff: 2 Var: 1 Page Ref: Sec. 2.3

LO: 2.3

GO: G2

21) Which of the following atoms has the smallest number of neutrons?

- A) carbon-14
- B) chlorine-35
- C) carbon-12
- D) carbon-13
- E) bromine-79

Answer: C

Diff: 2 Var: 1 Page Ref: Sec. 2.3

LO: 2.3

GO: G2

22) There are _____ electrons, _____ protons, and _____ neutrons in an atom of $^{132}_{54}\text{Xe}$.

- A) 132, 132, 54
- B) 54, 54, 132
- C) 78, 78, 54
- D) 54, 54, 78
- E) 78, 78, 132

Answer: D

Diff: 2 Var: 1 Page Ref: Sec. 2.3

LO: 2.3, 2.4

GO: G2

23) An atom of the most common isotope of gold, ^{197}Au , has _____ protons, _____ neutrons, and _____ electrons.

- A) 197, 79, 118
- B) 118, 79, 39
- C) 79, 197, 197
- D) 79, 118, 118 E) 79, 118, 79

Answer: E

Diff: 2 Var: 1 Page Ref: Sec. 2.3

LO: 2.3, 2.4

GO: G2

24) Which combination of protons, neutrons, and electrons is correct for the isotope of copper, $^{63}_{29}\text{Cu}$?

- A) 29 p+, 34 n°, 29 e-
- B) 29 p+, 29 n°, 63 e-
- C) 63 p+, 29 n°, 63 e- D) 34 p+, 29 n°, 34 e-
- E) 34 p+, 34 n°, 29 e- Answer:

A

Diff: 2 Var: 1 Page Ref: Sec. 2.3

LO: 2.3, 2.4

GO: G2

25) Which isotope has 45 neutrons?

45 A) Sc
21

80 B) Br
35

78 C) Se
34

34 D) Cl
17

103 E) Rh
45

Answer: B

Diff: 2 Var: 1 Page Ref: Sec. 2.3

LO: 2.3, 2.4

GO: G2

26) Which pair of atoms constitutes a pair of isotopes of the same element?

${}^{14}_6\text{X}$ ${}^{14}_7\text{X}$ A) X

${}^{14}_6\text{X}$ ${}^{12}_6\text{X}$

${}^{17}_9\text{X}$ ${}^{17}_8\text{X}$

${}^{19}_{10}\text{X}$ ${}^{19}_9$

${}^{20}_{10}\text{X}$ ${}^{21}_{11}\text{X}$

B)

C)

D) X

E)

Answer: B

Diff: 1 Var: 1 Page Ref: Sec. 2.3

LO: 2.3, 2.4

GO: G2

27) Which isotope has 36 electrons in an atom?

80 A) Kr
36

80 B) Br
35

78 C) Se
34

34 D) Cl
17

36 E) Hg
80

Answer: A

Diff: 2 Var: 1 Page Ref: Sec. 2.3

LO: 2.3, 2.4

GO: G2

28) Isotopes are atoms that have the same _____ but differing _____.

- A) atomic masses, charges
- B) mass numbers, atomic numbers
- C) atomic numbers, mass numbers
- D) charges, atomic masses
- E) mass numbers, charges

Answer: C

Diff: 1 Var: 1 Page Ref: Sec. 2.3

LO: 2.3

GO: G2

29) The nucleus of an atom does not contain _____.

- A) protons
- B) protons or neutrons
- C) neutrons
- D) subatomic particles
- E) electrons

Answer: E

Diff: 1 Var: 1 Page Ref: Sec. 2.3

LO: 2.3

GO: G2

30) The subatomic particles located in the nucleus with no overall charges are _____. A) electrons

- B) protons
- C) neutrons
- D) protons and neutrons
- E) protons, neutrons, and electrons

Answer: C

Diff: 1 Var: 1 Page Ref: Sec. 2.3

LO: 2.3

GO: G2

31) Different isotopes of a particular element contain the same number of_____.

- A) protons
- B) neutrons
- C) protons and neutrons
- D) protons, neutrons, and electrons
- E) subatomic particles

Answer: A

Diff: 1 Var: 1 Page Ref: Sec. 2.3

LO: 2.3

GO: G2

32) Different isotopes of a particular element contain different numbers of_____.

- A) protons
- B) neutrons
- C) protons and neutrons
- D) protons, neutrons, and electrons
- E) None of the above is correct.

Answer: B

Diff: 1 Var: 1 Page Ref: Sec. 2.3

LO: 2.3

GO: G2

33) In the symbol shown below, x =_____.



- A) 7
- B) 13
- C) 12
- D) 6
- E) not enough information to determine

Answer: D

Diff: 2 Var: 1 Page Ref: Sec. 2.3

LO: 2.3, 2.4

GO: G2

34) In the symbol below, X =_____.



- A) N
- B) C
- C) Al

- D) K
E) not enough information to determine

Answer: B

Diff: 2 Var: 1 Page Ref: Sec. 2.3

LO: 2.3, 2.4 GO:

G2

35) In the symbol below, $x =$ _____.

$${}^x_8\text{O}$$

- A) 17
B) 8
C) 6
D) 7
E) not enough information to determine

Answer: E

Diff: 2 Var: 1 Page Ref: Sec. 2.3

LO: 2.3, 2.4

GO: G2

36) In the symbol below, x is _____.

$${}^x_6\text{C}$$

- A) the number of neutrons
B) the atomic number
C) the mass number
D) the number of electrons
E) the elemental symbol

Answer: C

Diff: 1 Var: 1 Page Ref: Sec. 2.3

LO: 2.3, 2.4

GO: G2

37) Which one of the following basic forces is so small that it has no chemical significance?

- A) weak nuclear force
B) strong nuclear force
C) electromagnetism
D) gravity
E) Coulomb's law

Answer: D

Diff: 2 Var: 1 Page Ref: Sec. 2.3

LO: 2.3

GO: G2

38) Gravitational forces act between objects in proportion to their_____.

- A) volumes
- B) masses
- C) charges
- D) polarizability
- E) densities

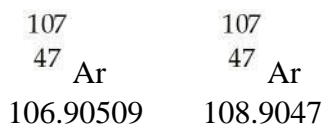
Answer: B

Diff: 1 Var: 1 Page Ref: Sec. 2.3

LO: 2.3

GO: G2

39) Silver has two naturally occurring isotopes with the following isotopic masses:



The average atomic mass of silver is 107.8682 amu. The fractional abundance of the lighter of the two isotopes is_____.

- A) 0.24221
- B) 0.48168 C) 0.51835
- D) 0.75783
- E) 0.90474

Answer: C

Diff: 4 Var: 1 Page Ref: Sec. 2.4

LO: 2.5

GO: G4

40) The atomic mass unit is presently based on assigning an exact integral mass (in amu) to an isotope of_____.

- A) hydrogen
- B) oxygen
- C) sodium
- D) carbon
- E) helium

Answer: D

Diff: 1 Var: 1 Page Ref: Sec. 2.4

LO: 2.5

GO: G4

41) The element X has three naturally occurring isotopes. The masses (amu) and % abundances of the isotopes are given in the table below. The average atomic mass of the element is _____ amu.

Isotope	Abundance	Mass
221X	74.22	220.9
220X	12.78	220.0
218X	13.00	218.1

- A) 219.7
- B) 220.4
- C) 220.42
- D) 218.5
- E) 221.0

Answer: B

Diff: 3 Var: 1 Page Ref: Sec. 2.4

LO: 2.5

GO: G4

42) Element X has three naturally occurring isotopes. The masses (amu) and % abundances of the isotopes are given in the table below. The average atomic mass of the element is _____ amu.

Isotope	Abundance	Mass
38X	5.07	37.919
39X	15.35	39.017
42X	79.85	42.111

- A) 41.54
- B) 39.68
- C) 39.07
- D) 38.64 E) 33.33

Answer: A

Diff: 3 Var: 1 Page Ref: Sec. 2.4

LO: 2.5

GO: G4

43) The element X has three naturally occurring isotopes. The isotopic masses (amu) and % abundances of the isotopes are given in the table below. The average atomic mass of the element is __amu.

Isotope	Abundance	Mass
159X	30.60	159.37
163X	15.79	162.79
164X	53.61	163.92

- A) 161.75
- B) 162.03
- C) 162.35
- D) 163.15
- E) 33.33

Answer: C

Diff: 3 Var: 1 Page Ref: Sec. 2.4

LO: 2.5

GO: G4

44) The element X has three naturally occurring isotopes. The isotopic masses (amu) and % abundances of the isotopes are given in the table below. The average atomic mass of the element is __amu.

Isotope	Abundance	Mass
^{53}X	19.61	52.62
^{56}X	53.91	56.29
^{58}X	26.48	58.31

A) 33.33

B) 55.74

C) 56.11

D) 57.23 E) 56.29

Answer: C

Diff: 3 Var: 1 Page Ref: Sec. 2.4

LO: 2.5

GO: G4

45) The element X has two naturally occurring isotopes. The masses (amu) and % abundances of the isotopes are given in the table below. The average atomic mass of the element is _____amu.

Isotope	Abundance (%)	Mass (amu)
^{31}X	35.16	31.16
^{34}X	64.84	34.30

A) 30.20

B) 33.20

C) 34.02

D) 35.22 E) 32.73

Answer: B

Diff: 3 Var: 1 Page Ref: Sec. 2.4

LO: 2.5

GO: G4

46) The average atomic weight of copper, which has two naturally occurring isotopes, is 63.5. One of the isotopes has an atomic weight of 62.9 amu and constitutes 69.1% of the copper isotopes. The other isotope has an abundance of 30.9%. The atomic weight (amu) of the second isotope is _____amu.

A) 63.2

B) 63.8

C) 64.1

D) 64.8

E) 28.1

Answer: D

Diff: 4 Var: 1 Page Ref: Sec. 2.4

LO: 2.5

GO: G4

47) The element X has three naturally occurring isotopes. The masses (amu) and % abundances of the isotopes are given in the table below. The average atomic mass of the element is _____ amu.

Isotope	Abundance (%)	Mass (amu)
^{15}X	28.60	15.33
^{17}X	13.30	17.26
^{16}X	58.10	18.11

A) 17.20

B) 16.90

C) 17.65

D) 17.11

E) 16.90

Answer: A

Diff: 3 Var: 1 Page Ref: Sec. 2.4

LO: 2.5

GO: G4

48) Vanadium has two naturally occurring isotopes, ^{50}V with an atomic mass of 49.9472 amu and ^{51}V with an atomic mass of 50.9440. The atomic weight of vanadium is 50.9415. The percent abundances of the vanadium isotopes are _____% ^{50}V and _____% ^{51}V . A) 0.25, 99.75

B) 99.75, 0.25

C) 49, 51

D) 1.0, 99

E) 99, 1.0

Answer: A

Diff: 4 Var: 1 Page Ref: Sec. 2.4

LO: 2.5

GO: G4

49) An unknown element is found to have three naturally occurring isotopes with atomic masses of 35.9675 (0.337%), 37.9627 (0.063%), and 39.9624 (99.600%). Which of the following is the unknown element? A) Ar

B) K

C) Cl

D) Ca

E) None of the above could be the unknown element.

Answer: A

Diff: 2 Var: 1 Page Ref: Sec. 2.4

LO: 2.5

GO: G4

50) In the periodic table, the elements are arranged in_____.

- A) alphabetical order
- B) order of increasing atomic number
- C) order of increasing metallic properties
- D) order of increasing neutron content
- E) increasing atomic mass

Answer: B

Diff: 1 Var: 1 Page Ref: Sec. 2.5

LO: 2.6

GO: G2

51) Elements_____exhibit similar physical and chemical properties.

- A) with similar chemical symbols
- B) with similar atomic masses
- C) in the same period of the periodic table
- D) on opposite sides of the periodic table
- E) in the same group of the periodic table

Answer: E

Diff: 1 Var: 1 Page Ref: Sec. 2.5

LO: 2.6

GO: G2

52) Which pair of elements would you expect to exhibit the greatest similarity in their physical and chemical properties?

- A) H, Li
- B) Cs, Ba
- C) Ca, Sr
- D) Ga, Ge E) C, O

Answer: C

Diff: 1 Var: 1 Page Ref: Sec. 2.5

LO: 2.6

GO: G2

53) Which pair of elements would you expect to exhibit the greatest similarity in their physical and chemical properties?

- A) O, S
- B) C, N
- C) K, Ca
- D) H, He
- E) Si, P

Answer: A

Diff: 1 Var: 1 Page Ref: Sec. 2.5

LO: 2.6

GO: G2

54) Which pair of elements would you expect to exhibit the greatest similarity in their physical and chemical properties?

- A) As, Br
- B) Mg, Al
- C) I, Br
- D) Br, Kr
- E) N, O

Answer: C

Diff: 1 Var: 1 Page Ref: Sec. 2.5

LO: 2.6

GO: G2

55) The elements in groups 1A, 6A, and 7A are called _____, respectively.

- A) alkaline earth metals, halogens, and chalcogens
- B) alkali metals, chalcogens, and halogens
- C) alkali metals, halogens, and noble gases
- D) alkaline earth metals, transition metals, and halogens
- E) halogens, transition metals, and alkali metals

Answer: B

Diff: 2 Var: 1 Page Ref: Sec. 2.5

LO: 2.6

GO: G2

56) Which pair of elements below should be the most similar in chemical properties?

- A) C and O
- B) B and As
- C) I and Br
- D) K and Kr
- E) Cs and He

Answer: C

Diff: 1 Var: 1 Page Ref: Sec. 2.5

LO: 2.6

GO: G2

57) An element in the upper right corner of the periodic table _____.

- A) is either a metal or metalloid
- B) is definitely a metal
- C) is either a metalloid or a nonmetal
- D) is definitely a nonmetal
- E) is definitely a metalloid

Answer: D

Diff: 1 Var: 1 Page Ref: Sec. 2.5

LO: 2.11

GO: G2

58) An element that appears in the lower left corner of the periodic table is_____.

- A) either a metal or metalloid
- B) definitely a metal
- C) either a metalloid or a nonmetal
- D) definitely a nonmetal
- E) definitely a metalloid

Answer: B

Diff: 1 Var: 1 Page Ref: Sec. 2.5

LO: 2.11

GO: G2

59) Elements in the same group of the periodic table typically have_____.

- A) similar mass numbers
- B) similar physical properties only
- C) similar chemical properties only
- D) similar atomic masses
- E) similar physical and chemical properties

Answer: E

Diff: 1 Var: 1 Page Ref: Sec. 2.5

LO: 2.6

GO: G2

60) Which one of the following molecular formulas is also an empirical formula?

- A) C₆H₆O₂ B) C₂H₆SO
- C) H₂O₂
- D) H₂P₄O₆ E) C₆H₆

Answer: B

Diff: 2 Var: 1 Page Ref: Sec. 2.6

LO: 2.9

GO: G2

61) Which compounds do not have the same empirical formula?

- A) C₂H₂, C₆H₆
- B) CO, CO₂
- C) C₂H₄, C₃H₆
- D) C₂H₄O₂, C₆H₁₂O₆
- E) C₂H₅COOCH₃, CH₃CHO

Answer: B

Diff: 2 Var: 1 Page Ref: Sec. 2.6

LO: 2.9

GO: G2

62) Of the choices below, which one is not an ionic compound?

- A) PCl_5
- B) MoCl_6
- C) RbCl
- D) PbCl_2
- E) NaCl

Answer: A

Diff: 1 Var: 1 Page Ref: Sec. 2.6, 2.7

LO: 2.8

GO: G2

63) Which type of formula provides the most information about a compound?

- A) empirical
- B) molecular
- C) simplest
- D) structural
- E) chemical

Answer: D

Diff: 1 Var: 1 Page Ref: Sec. 2.6

LO: 2.10a GO:

G2

64) A molecular formula always indicates_____.

- A) how many of each atom are in a molecule
- B) the simplest whole-number ratio of different atoms in a compound
- C) which atoms are attached to which in a molecule
- D) the isotope of each element in a compound
- E) the geometry of a molecule

Answer: A

Diff: 1 Var: 1 Page Ref: Sec. 2.6

LO: 2.10a

GO: G2

65) An empirical formula always indicates_____.

- A) which atoms are attached to which in a molecule
- B) how many of each atom are in a molecule
- C) the simplest whole-number ratio of different atoms in a compound
- D) the isotope of each element in a compound
- E) the geometry of a molecule

Answer: C

Diff: 1 Var: 1 Page Ref: Sec. 2.6

LO: 2.9

GO: G2

66) The molecular formula of a compound is always _____ the empirical formula.

- A) more complex than
- B) different from
- C) an integral multiple of
- D) the same as
- E) simpler than

Answer: C

Diff: 1 Var: 1 Page Ref: Sec. 2.6

LO: 2.10a GO:

G2

67) Formulas that show how atoms are attached in a molecule are called _____.

- A) molecular formulas
- B) ionic formulas
- C) empirical formulas
- D) diatomic formulas
- E) structural formulas

Answer: E

Diff: 1 Var: 1 Page Ref: Sec. 2.6

LO: 2.10a GO:

G2

68) Of the following, _____ contains the greatest number of electrons.

- A) P^{3+}
- B) P
- C) P^{2-} D) P^{3-}
- E) P^{2+}

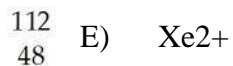
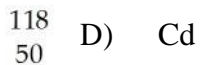
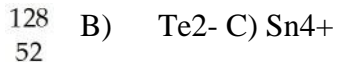
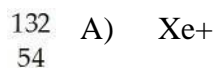
Answer: D

Diff: 2 Var: 1 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

69) Which species has 54 electrons?



Answer: B

Diff: 2 Var: 1 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

70) Which species has 16 protons?



A)

B) C)

D)

E)

Answer: B

Diff: 2 Var: 1 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

71) Which species has 18 electrons?

A) $^{39}_{19}\text{K}$

B) $^{32}_{16}\text{S}^{2-}$

C) $^{35}_{17}\text{Cl}$

D) $^{27}_{13}\text{Al}^{3+}$ E) $^{45}_{21}\text{Sc}^{3+}$

Answer: B

Diff: 2 Var: 1 Page Ref: Sec 2.7

LO: 2.11

GO: G2

72) Which of the following species contains 18 electrons?

A) $^{31}_{15}\text{P}$

B) $^{34}_{16}\text{S}^{2-}$

- C) ^{36}Cl
- D) $^{80}\text{Br}^-$
- E) ^{16}O

Answer: B

Diff: 2 Var: 1 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

73) Which of the following species is an isotope of ^{79}Br ?

- A) $^{40}\text{Ar}^+$
- B) $^{34}\text{S}^{2-}$
- C) $^{79}\text{Br}^-$
- D) ^{80}Br
- E) ^{79}Se

Answer: D

Diff: 1 Var: 1 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

74) Which one of the following species has as many electrons as it has neutrons?

- A) ^1H
- B) $^{40}\text{Ca}^{2+}$
- C) ^{14}C
- D) $^{19}\text{F}^-$ E) $^{14}\text{C}^{2+}$

Answer: D

Diff: 2 Var: 1 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

75) There are _____ protons, _____ neutrons, and _____ electrons in $^{131}\text{I}^-$.

- A) 131, 53, 54
- B) 131, 53, 52
- C) 53, 78, 54
- D) 53, 131, 52
- E) 53, 78, 52

Answer: C

Diff: 2 Var: 1 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

- 76) There are _____ protons, _____ neutrons, and _____ electrons in $^{238}\text{U}^{5+}$. A) 146, 92, 92
B) 92, 146, 87
C) 92, 146, 92
D) 92, 92, 87
E) 146, 92, 97

Answer: B

Diff: 2 Var: 1 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

77) Which species contains 68 neutrons?

- $\begin{matrix} 118 \\ 50 \end{matrix}$ A) Sn^{+2}
 $\begin{matrix} 116 \\ 50 \end{matrix}$ B) Sn^{+2}
 $\begin{matrix} 112 \\ 48 \end{matrix}$ C) Cd^{+2}
 $\begin{matrix} 68 \\ 31 \end{matrix}$ D) Ga
 $\begin{matrix} 48 \\ 22 \end{matrix}$ E) Ti

Answer: A

Diff: 1 Var: 1 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

78) Which of the following compounds would you expect to be ionic?

- A) H_2O
B) CO_2
C) SrCl_2
D) SO_2 E) H_2S

Answer: C

Diff: 1 Var: 1 Page Ref: Sec. 2.7

LO: 2.12

GO: G2

79) Which pair of elements is most apt to form an ionic compound with each other?

- A) barium, bromine
B) calcium, sodium
C) oxygen, fluorine

- D) sulfur, fluorine
- E) nitrogen, hydrogen

Answer: A

Diff: 1 Var: 1 Page Ref: Sec. 2.7

LO: 2.12

GO: G2

80) Which pair of elements is most apt to form a molecular compound with each other?

- A) aluminum, oxygen
- B) magnesium, iodine
- C) sulfur, fluorine
- D) potassium, lithium
- E) barium, bromine

Answer: C

Diff: 1 Var: 1 Page Ref: Sec. 2.7

LO: 2.12

GO: G2

81) Which species below is the nitride ion?

- A) Na⁺
- B) NO₃⁻
- C) NO₂⁻ D) NH₄⁺

E) N³⁻ Answer:

E

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

82) Barium reacts with a polyatomic ion to form a compound with the general formula Ba₃(X)₂. What would be the most likely formula for the compound formed between sodium and the polyatomic ion X?

- A) NaX
- B) Na₂X
- C) Na₂X₂
- D) Na₃X
- E) Na₃X₂

Answer: D

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

83) Aluminum reacts with a certain nonmetallic element to form a compound with the general formula Al_2X_3 . Element X must be from Group _____ of the Periodic Table of Elements.

- A) 3A
- B) 4A
- C) 5A
- D) 6A
- E) 7A

Answer: D

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

84) The formula for a salt is XBr . The X-ion in this salt has 46 electrons. The metal X is _____.

- A) Ag
- B) Pd
- C) Cd
- D) Cu
- E) Cs

Answer: A

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

85) Which formula/name pair is incorrect?

- A) $Mn(NO_2)_2$ manganese(II) nitrite
- B) $Mg(NO_3)_2$ magnesium nitrate
- C) $Mn(NO_3)_2$ manganese(II) nitrate
- D) Mg_3N_2 magnesium nitrite
- E) $Mg(MnO_4)_2$ magnesium permanganate

Answer: D

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

86) Which formula/name pair is incorrect?

- A) $FeSO_4$ iron(II) sulfate
- B) $Fe_2(SO_3)_3$ iron(III) sulfite
- C) FeS iron(II) sulfide
- D) $FeSO_3$ iron(II) sulfite

E) $\text{Fe}_2(\text{SO}_4)_3$ iron(III) sulfide

Answer: E

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

87) Which one of the following is the formula of hydrochloric acid?

A) HClO_3

B) HClO_4

C) HClO

D) HCl

E) HClO_2

Answer: D

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

88) The suffix -ide is used primarily_____.

A) for monatomic anion names

B) for polyatomic cation names

C) for the name of the first element in a molecular compound

D) to indicate binary acids

E) for monoatomic cations

Answer: A

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

89) Which one of the following compounds is chromium(III) oxide?

A) Cr_2O_3

B) CrO_3

C) Cr_3O_2

D) Cr_3O

E) Cr_2O_4

Answer: A

Diff: 1 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

90) Which one of the following compounds is copper(I) chloride?

A) CuCl

B) CuCl_2 C) Cu_2Cl

D) Cu_2Cl_3 E)

Cu_3Cl_2

Answer: A

Diff: 1 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

91) The correct name for MgF_2 is _____.

A) monomagnesium difluoride

B) magnesium difluoride

C) manganese difluoride

D) manganese bifluoride

E) magnesium fluoride

Answer: E

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

92) The correct name for NaHCO_3 is _____.

A) sodium hydride

B) persodium carbonate

C) persodium hydroxide

D) sodium bicarbonate

E) carbonic acid

Answer: D

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

93) A correct name for $\text{Fe}(\text{NO}_3)_2$ is _____.

A) iron nitrite

B) ferrous nitrite

C) ferrous nitrate

D) ferric nitrite

E) ferric nitrate

Answer: C

Diff: 3 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

94) The correct name for HNO_2 is _____.

- A) nitrous acid
- B) nitric acid
- C) hydrogen nitrate
- D) hyponitrous acid E) pernitric acid

Answer: A

Diff: 3 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

95) The proper formula for the hydronium ion is _____.

A) H- B)

OH-

C) N_3^- D)

H_3O^+

E) NH_4^+

Answer: D

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

96) The charge on the _____ ion is -3.

- A) sulfate
- B) acetate
- C) permanganate
- D) oxide
- E) nitride

Answer: E

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

97) Which one of the following polyatomic ions has the same charge as the hydroxide ion?

- A) ammonium
- B) carbonate
- C) nitrate
- D) sulfate
- E) phosphate

Answer: C

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

98) Which element forms an ion with the same charge as the ammonium ion? A)

potassium

B) chlorine

C) calcium

D) oxygen

E) nitrogen

Answer: A

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

99) The formula for the compound formed between aluminum ions and phosphate ions is

_____.

A) $Al_3(PO_4)_3$

B) $AlPO_4$

C) $Al(PO_4)_3$

D) $Al_2(PO_4)_3$

E) AlP

Answer: B

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

100) Which metal does not form cations of differing charges?

A) Na

B) Cu

C) Co

D) Fe

E) Sn

Answer: A

Diff: 1 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

101) Which metal forms cations of differing charges?

A) K

B) Cs

C) Ba

D) Al

E) Sn

Answer: E

Diff: 1 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

102) The correct name for $\text{Ni}(\text{CN})_2$ is _____.

- A) nickel (I) cyanide
- B) nickel cyanate
- C) nickel carbonate
- D) nickel (II) cyanide
- E) nickel (I) nitride

Answer: D

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2 103)

What is the molecular formula for 1-propanol?

- A) CH_4O
- B) $\text{C}_2\text{H}_6\text{O}$ C) $\text{C}_3\text{H}_8\text{O}$
- D) $\text{C}_4\text{H}_{10}\text{O}$ E) $\text{C}_5\text{H}_{12}\text{O}$

Answer: C

Diff: 3 Var: 1 Page Ref: Sec. 2.9

LO: 2.15

GO: G2

2.2 Bimodal Questions

1) Methane and ethane are both made up of carbon and hydrogen. In methane, there are 12.0 g of carbon for every 4.00 g of hydrogen, a ratio of 3:1 by mass. In ethane, there are 24.0 g of carbon for every 6.00 g of hydrogen, a ratio of 4:1 by mass. This is an illustration of the law of _____.

- A) constant composition
- B) multiple proportions
- C) conservation of matter
- D) conservation of mass
- E) octaves

Answer: B

Diff: 2 Var: 1 Page Ref: Sec. 2.1

LO: 2.1

GO: G2

2) _____ and _____ reside in the atomic nucleus.

- A) Protons, electrons
- B) Electrons, neutrons
- C) Protons, neutrons
- D) Neutrons, only neutrons
- E) none of the above

Answer: C

Diff: 1 Var: 1 Page Ref: Sec. 2.2

LO: 2.2

GO: G2

3) 520 pm is the same as _____ Å.

- A) 5200
- B) 52
- C) 520
- D) 5.2
- E) 0.00052

Answer: D

Diff: 1 Var: 1 Page Ref: Sec. 2.3

LO: 2.3, 2.4

GO: G4

4) The atomic number indicates_____.

- A) the number of neutrons in a nucleus
- B) the total number of neutrons and protons in a nucleus
- C) the number of protons or electrons in a neutral atom
- D) the number of atoms in 1 g of an element
- E) the number of different isotopes of an element

Answer: C

Diff: 1 Var: 1 Page Ref: Sec. 2.3

LO: 2.3, 2.4

GO: G2

5) The nucleus of an atom contains_____.

- A) electrons
- B) protons, neutrons, and electrons
- C) protons and neutrons
- D) protons and electrons
- E) protons

Answer: C

Diff: 1 Var: 1 Page Ref: Sec. 2.3

LO: 2.3, 2.4 GO:

G2

6) In the periodic table, the elements touching the steplike line are known as_____.

- A) transition elements
- B) noble gases
- C) metalloids

GO: G2

D) nonmetals

E) metals

Answer: C

Diff: 1 Var: 1 Page Ref: Sec. 2.5

LO: 2.6

7) Which group in the periodic table contains only nonmetals?

A) 1A

B) 6A

C) 2B

D) 2A

E) 8A

Answer: E

Diff: 1 Var: 1 Page Ref: Sec. 2.5

LO: 2.6

GO: G2

8) Horizontal rows of the periodic table are known as_____.

A) periods

B) groups

C) metalloids

D) metals

E) nonmetals

Answer: A

Diff: 1 Var: 1 Page Ref: Sec. 2.5

LO: 2.6

GO: G2

9) Vertical columns of the periodic table are known as_____.

A) metals

B) periods

C) nonmetals D) groups

E) metalloids

Answer: D

Diff: 1 Var: 1 Page Ref: Sec. 2.5

LO: 2.6

GO: G2

10) Elements in Group 1A are known as the_____.

GO: G2

- A) chalcogens
- B) alkaline earth metals
- C) alkali metals
- D) halogens
- E) noble gases

Answer: C

Diff: 1 Var: 1 Page Ref: Sec. 2.5

LO: 2.6

11) Elements in Group 2A are known as the_____.

- A) alkaline earth metals
- B) alkali metals
- C) chalcogens
- D) halogens
- E) noble gases

Answer: A

Diff: 1 Var: 1 Page Ref: Sec. 2.5

LO: 2.6

GO: G2

12) Elements in Group 6A are known as the_____.

- A) alkali metals
- B) chalcogens
- C) alkaline earth metals
- D) halogens
- E) noble gases

Answer: B

Diff: 1 Var: 1 Page Ref: Sec. 2.5

LO: 2.6

GO: G2

13) Elements in Group 7A are known as the_____.

- A) chalcogens
- B) alkali metals
- C) alkaline earth metals
- D) halogens
- E) noble gases

Answer: D

Diff: 1 Var: 1 Page Ref: Sec. 2.5

GO: G2

LO: 2.6

GO: G2

14) Elements in Group 8A are known as the_____.

- A) halogens
- B) alkali metals
- C) alkaline earth metals
- D) chalcogens
- E) noble gases

Answer: E

Diff: 1 Var: 1 Page Ref: Sec. 2.5

LO: 2.6

15) Potassium is a_____and chlorine is a_____.

- A) metal, nonmetal B)
metal, metal
- C) metal, metalloid
- D) metalloid, nonmetal
- E) nonmetal, metal

Answer: A

Diff: 1 Var: 1 Page Ref: Sec. 2.5

LO: 2.7

GO: G2

16) Lithium is a_____and magnesium is a_____.

- A) nonmetal, metal
- B) nonmetal, nonmetal
- C) metal, metal
- D) metal, metalloid
- E) metalloid, metalloid

Answer: C

Diff: 1 Var: 1 Page Ref: Sec. 2.5

LO: 2.7

GO: G2

17) Oxygen is a_____and nitrogen is a_____.

- A) metal, metalloid
- B) nonmetal, metal
- C) metalloid, metalloid
- D) nonmetal, nonmetal

GO: G2

E) nonmetal, metalloid

Answer: D

Diff: 1 Var: 1 Page Ref: Sec. 2.5

LO: 2.7

GO: G2

18) Calcium is a _____ and silver is a _____.

A) nonmetal, metal B)

metal, metal

C) metalloid, metal

D) metal, metalloid

E) nonmetal, metalloid

Answer: B

Diff: 1 Var: 1 Page Ref: Sec. 2.5

LO: 2.7

GO: G2

19) _____ are found uncombined, as monatomic species in nature.

- A) Noble gases
- B) Chalcogens
- C) Alkali metals
- D) Alkaline earth metals
- E) Halogens

Answer: A

Diff: 1 Var: 1 Page Ref: Sec. 2.5

LO: 2.6

GO: G2

20) When a metal and a nonmetal react, the _____ tends to lose electrons and the _____ tends to gain electrons. A) metal, metal

- B) nonmetal, nonmetal
- C) metal, nonmetal
- D) nonmetal, metal
- E) None of the above; these elements share electrons.

Answer: C

Diff: 1 Var: 1 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

21) The empirical formula of a compound with molecules containing 12 carbon atoms, 14 hydrogen atoms, and 6 oxygen atoms is _____.

- A) C₁₂H₁₄O₆ B) CHO
- C) CH₂O
- D) C₆H₇O₃ E) C₂H₄O

Answer: D

Diff: 2 Var: 1 Page Ref: Sec. 2.6

LO: 2.9

GO: G2

22) _____ only form ions with a 2+ charge.

- A) Alkaline earth metals
- B) Halogens
- C) Chalcogens
- D) Alkali metals
- E) Transition metals

Answer: A

Diff: 2 Var: 1 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

23) What is the formula of the compound formed between strontium ions and nitrogen ions? A)

SrN

B) Sr₃N₂ C)

Sr₂N₃

D) SrN₂ E)

SrN₃

Answer: B

Diff: 3 Var: 1 Page Ref: Sec. 2.7

LO: 2.12

GO: G2

24) Magnesium reacts with a certain element to form a compound with the general formula MgX.

What would the most likely formula be for the compound formed between potassium and element

X? A) K₂X

B) KX₂

C) K₂X₃

D) K₂X₂

E) KX

Answer: A

Diff: 2 Var: 1 Page Ref: Sec. 2.7

LO: 2.12

GO: G2

25) The charge on the manganese in the salt MnF₃ is _____.

A) 1+

B) 1- C) 2+

D) 2- E)

3+

Answer: E

Diff: 2 Var: 1 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

26) Aluminum reacts with a certain nonmetallic element to form a compound with the general formula AlX. Element X is a diatomic gas at room temperature. Element X must be _____.

A) oxygen

B) fluorine

C) chlorine

D) nitrogen

E) sulfur

Answer: D

Diff: 2 Var: 1 Page Ref: Sec. 2.7

LO: 2.12

GO: G2

27) Sodium forms an ion with a charge of _____.

A) 1+

B) 1- C) 2+

D) 2- E)

0

Answer: A

Diff: 1 Var: 1 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

28) Potassium forms an ion with a charge of _____.

A) 2+

B) 1- C) 1+

D) 2- E)

0

Answer: C

Diff: 1 Var: 1 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

29) Calcium forms an ion with a charge of _____.

A) 1-

B) 2- C) 1+

D) 2+

E) 0

Answer: D

Diff: 1 Var: 1 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

30) Barium forms an ion with a charge of _____.

A) 1+

B) 2- C) 3+

D) 3- E)

2+

Answer: E

Diff: 1 Var: 1 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

31) Aluminum forms an ion with a charge of _____.

A) 2+

B) 3- C) 1+

D) 3+

E) 1- Answer: D

Diff: 1 Var: 1 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

32) Fluorine forms an ion with a charge of _____.

A) 1- B)

1+

C) 2+

D) 3+

E) 3- Answer: A

Diff: 1 Var: 1 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

33) Iodine forms an ion with a charge of _____.

A) 7- B)

1+

C) 2- D)

2+

E) 1- Answer:

E

Diff: 1 Var: 1 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

34) Oxygen forms an ion with a charge of _____.

A) 2- B)

2+

C) 3- D)

3+

E) 6+

Answer: A

Diff: 1 Var: 1 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

35) Sulfur forms an ion with a charge of _____.

- A) 2+
- B) 2- C) 3+
- D) 6- E)
- 6+

Answer: B

Diff: 2 Var: 1 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

36) Predict the empirical formula of the ionic compound that forms from sodium and fluorine.

- A) NaF
- B) Na₂F C)
- NaF₂
- D) Na₂F₃ E)
- Na₃F₂

Answer: A

Diff: 2 Var: 1 Page Ref: Sec. 2.7

LO: 2.12

GO: G2

37) Predict the empirical formula of the ionic compound that forms from magnesium and fluorine.

- A) Mg₂F₃
- B) MgF
- C) Mg₂F
- D) Mg₃F₂ E) MgF₂

Answer: E

Diff: 1 Var: 1 Page Ref: Sec. 2.7

LO: 2.12

GO: G2

38) Predict the empirical formula of the ionic compound that forms from magnesium and oxygen. A) Mg₂O

- B) MgO
- C) MgO₂
- D) Mg₂O₂ E) Mg₃O₂

Answer: B

Diff: 1 Var: 1 Page Ref: Sec. 2.7

LO: 2.12

GO: G2

39) Predict the empirical formula of the ionic compound that forms from aluminum and oxygen.

- A) AlO
- B) Al₃O₂ C)
- Al₂O₃
- D) AlO₂ E)
- Al₂O

Answer: C

Diff: 1 Var: 1 Page Ref: Sec. 2.7

LO: 2.12

GO: G2

40) The correct name for K₂S is_____.

- A) potassium sulfate
- B) potassium disulfide
- C) potassium bisulfide
- D) potassium sulfide
- E) dipotassium sulfate

Answer: D

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

41) The correct name for Al₂O₃ is_____.

- A) aluminum oxide
- B) dialuminum oxide
- C) dialuminum trioxide
- D) aluminum hydroxide
- E) aluminum trioxide

Answer: A

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

42) The correct name for CaH₂ is_____.

- A) hydrocalcium
- B) calcium dihydride
- C) calcium hydroxide
- D) calcium dihydroxide
- E) calcium hydride

Answer: E

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

43) The correct name for SO is_____.

- A) sulfur oxide
- B) sulfur monoxide
- C) sulfoxide
- D) sulfate
- E) sulfite

Answer: B

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

44) The correct name for CCl₄ is_____.

- A) carbon chloride
- B) carbon tetrachlorate
- C) carbon perchlorate
- D) carbon tetrachloride
- E) carbon chlorate

Answer: D

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

45) The correct name for N₂O₅ is_____.

- A) nitrous oxide
- B) nitrogen pentoxide
- C) dinitrogen pentoxide
- D) nitric oxide
- E) nitrogen oxide

Answer: C

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

46) The correct name for H₂CO₃ is_____.

- A) carbonous acid

LO: 2.14

GO: G2

- B) hydrocarbonate
- C) carbonic acid
- D) carbohydrate
- E) carbohydric acid

Answer: C

Diff: 2 Var: 1 Page Ref: Sec. 2.8

47) The correct name for H_2SO_3 is _____.

- A) sulfuric acid
- B) sulfurous acid
- C) hydrosulfuric acid
- D) hydrosulfic acid
- E) sulfur hydroxide

Answer: B

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

48) The correct name for H_2SO_4 is _____.

- A) sulfuric acid
- B) sulfurous acid
- C) hydrosulfuric acid
- D) hydrosulfic acid
- E) sulfur hydroxide

Answer: A

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

49) The correct name for HNO_3 is _____.

- A) nitrous acid
- B) nitric acid
- C) hydronitroxide acid
- D) nitroxide acid
- E) nitrogen hydroxide

Answer: B

LO: 2.14

GO: G2

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

50) The correct name for HClO_3 is_____.

- A) hydrochloric acid
- B) perchloric acid
- C) chloric acid
- D) chlorous acid
- E) hydrochlorous acid

Answer: C

Diff: 2 Var: 1 Page Ref: Sec. 2.8

51) The correct name for HClO is_____.

- A) hydrochloric acid
- B) perchloric acid
- C) chloric acid
- D) chlorous acid
- E) hypochlorous acid

Answer: E

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

52) The correct name for HBrO_4 is_____.

- A) hydrobromic acid
- B) perbromic acid
- C) bromic acid
- D) bromous acid
- E) hydrobromous acid

Answer: B

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

53) The correct name for HBrO is_____.

LO: 2.14

GO: G2

- A) hydrobromic acid
- B) perbromic acid
- C) bromic acid
- D) bromous acid
- E) hypobromous acid

Answer: E

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

54) The correct name for HBrO_2 is _____.

- A) hydrobromic acid
- B) perbromic acid
- C) bromic acid
- D) bromous acid
- E) hydrobromous acid

Answer: D

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

55) The correct name for HClO_2 is _____.

- A) perchloric acid
- B) chloric acid
- C) hypochlorous acid
- D) hypochloric acid
- E) chlorous acid

Answer: E

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

56) The correct name of the compound Na_3N is _____.

- A) sodium nitride
- B) sodium azide
- C) sodium trinitride
- D) sodium(III) nitride
- E) trisodium nitride

Answer: A

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

57) The formula of bromic acid is _____.

- A) HBr
- B) HBrO_4
- C) HBrO
- D) HBrO_3 E) HBrO_2

Answer: D

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

58) The correct formula for molybdenum (IV) hypochlorite is _____.

- A) $\text{Mo}(\text{ClO}_3)_4$
- B) $\text{Mo}(\text{ClO})_4$
- C) $\text{Mo}(\text{ClO}_2)_4$
- D) $\text{Mo}(\text{ClO}_4)_4$ E) MoCl_4

Answer: B

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

59) The name of PCl_3 is _____.

- A) potassium chloride
- B) phosphorus trichloride
- C) phosphorous(III) chloride
- D) monophosphorous trichloride
- E) trichloro potassium

Answer: B

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

60) The ions Ca^{2+} and PO_4^{3-} form a salt with the formula _____.

- A) CaPO_4
- B) $\text{Ca}_2(\text{PO}_4)_3$
- C) Ca_2PO_4
- D) $\text{Ca}(\text{PO}_4)_2$
- E) $\text{Ca}_3(\text{PO}_4)_2$

Answer: E

Diff: 2 Var: 1 Page Ref: Sec. 2.7

LO: 2.12

GO: G2

61) The correct formula of iron (III) bromide is _____.

- A) FeBr_2
- B) FeBr_3
- C) FeBr
- D) Fe_3Br_3
- E) Fe_3Br

Answer: B

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

62) Magnesium and sulfur form an ionic compound with the formula _____.

- A) MgS
- B) Mg_2S C) MgS_2

D) Mg_2S_2 E)

Mg_2S_3

Answer: A

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

63) The formula of ammonium carbonate is _____.

A) $(\text{NH}_4)_2\text{CO}_3$ B)

NH_4CO_2

C) $(\text{NH}_3)_2\text{CO}_4$

D) $(\text{NH}_3)_2\text{CO}_3$ E) $\text{N}_2(\text{CO}_3)_3$

Answer: A

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

64) The formula of the chromate ion is _____.

A) CrO_4^{2-}

B) CrO_3^{2-}

C) CrO^-

D) CrO_3^{2-}

E) CrO_2^- Answer: A

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

65) The formula of the carbonate ion is _____.

A) CO_2^{2-}

B) CO_3^{2-} C) CO_3^{3-}

D) CO_2^-

E) CO^- Answer: B

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

66) The correct name for $\text{Mg}(\text{ClO}_3)_2$ is _____.

- A) magnesium chlorate
- B) manganese chlorate
- C) magnesium chloroxide
- D) magnesium perchlorate
- E) manganese perchlorate

Answer: A

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

67) What is the correct formula for ammonium sulfide?

- A) NH_4SO_3
- B) $(\text{NH}_4)_2\text{SO}_4$
- C) $(\text{NH}_4)_2\text{S}$
- D) NH_3S E) N_2S_3

Answer: C

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

68) When calcium reacts with sulfur the compound formed is_____.

- A) Ca_2S_2
- B) Ca_3S_2
- C) CaS
- D) CaS_2
- E) Ca_2S_3

Answer: C

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

69) Chromium and chlorine form an ionic compound whose formula is CrCl_3 . The name of this compound is_____.

- A) chromium chlorine
- B) chromium (III) chloride
- C) monochromium trichloride
- D) chromium (III) trichloride
- E) chromic trichloride

Answer: B

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

70) Iron and chlorine form an ionic compound whose formula is FeCl_3 . The name of this compound is_____.

- A) iron chlorine
- B) iron (III) chloride
- C) moniron trichloride
- D) iron (III) trichloride
- E) ferric trichloride

Answer: B

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

71) Copper and chlorine form an ionic compound whose formula is CuCl_2 . The name of this compound is_____.

- A) copper chlorine
- B) copper (III) dichloride
- C) monocopper dichloride
- D) copper (II) dichloride
- E) cupric chloride

Answer: E

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

72) The name of the binary compound N_2O_4 is_____.

- A) nitrogen oxide
- B) nitrous oxide
- C) nitrogen (IV) oxide
- D) dinitrogen tetroxide
- E) oxygen nitride

Answer: D

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

73) The formula for zinc phosphate is $\text{Zn}_3(\text{PO}_4)_2$. What is the formula for cadmium arsenate?

- A) $\text{Cd}_4(\text{AsO}_2)_3$
- B) $\text{Cd}_3(\text{AsO}_4)_2$
- C) $\text{Cd}_3(\text{AsO}_3)_4$
- D) $\text{Cd}_2(\text{AsO}_4)_3$ E) $\text{Cd}_2(\text{AsO}_4)_4$

Answer: B

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

74) The formula for aluminum hydroxide is_____.

- A) AlOH
- B) Al3OH
- C) Al2(OH)3
- D) Al(OH)3 E) Al2O3

Answer: D

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

75) The name of the ionic compound V2O3 is_____.

- A) vanadium (III) oxide
- B) vanadium oxide
- C) vanadium (II) oxide
- D) vanadium (III) trioxide
- E) divanadium trioxide

Answer: A

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

76) The name of the ionic compound NH4CN is _____.

- A) nitrogen hydrogen cyanate
- B) ammonium carbonitride
- C) ammonium cyanide
- D) ammonium hydrogen cyanate
- E) cyanonitride

Answer: C

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

77) The name of the ionic compound (NH4)3PO4 is_____.

- A) ammonium phosphate
- B) nitrogen hydrogen phosphate
- C) tetrammonium phosphate
- D) ammonia phosphide
- E) triammonium phosphate

Answer: A

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

78) What is the formula for perchloric acid?

- A) HClO
- B) HClO₃ C) HClO₄
- D) HClO₂
- E) HCl

Answer: C

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

79) The correct name for HIO₂ is_____.

- A) hypoiodic acid
- B) hydriodic acid
- C) periodous acid
- D) iodous acid
- E) periodic acid

Answer: D

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

80) What is the molecular formula for propane?

- A) C₂H₈
- B) C₃H₆ C) C₃H₈
- D) C₄H₈
- E) C₄H₁₀

Answer: C

Diff: 2 Var: 1 Page Ref: Sec. 2.9

LO: 2.15

GO: G2

81) What is the molecular formula for butane?

- A) C₂H₈
- B) C₃H₆ C) C₃H₈
- D) C₄H₈
- E) C₄H₁₀

Answer: E

Diff: 2 Var: 1 Page Ref: Sec. 2.9

LO: 2.15

GO: G2

82) What are the primary atoms found in alkanes?

- A) carbon, hydrogen, and oxygen
- B) carbon and nitrogen
- C) oxygen and hydrogen
- D) carbon and oxygen
- E) carbon and hydrogen

Answer: E

Diff: 2 Var: 1 Page Ref: Sec. 2.9

LO: 2.15

GO: G2 83)

What is the correct name for the following alkane, C_5H_{12} ?

- A) heptane
- B) propane
- C) hexane
- D) pentane
- E) butane

Answer: D

Diff: 1 Var: 1 Page Ref: Sec. 2.9

LO: 2.15

GO: G2

84) How many carbon and hydrogen atoms are found in decane?

- A) 10 carbons and 22 hydrogens
- B) 9 carbons and 20 hydrogens
- C) 10 carbons and 20 hydrogens
- D) 9 carbons and 18 hydrogens
- E) 10 carbons and 24 hydrogens

Answer: A

Diff: 2 Var: 1 Page Ref: Sec. 2.9

LO: 2.15

GO: G2

85) What is the molecular formula for heptane?

- A) C₆H₁₂
- B) C₆H₁₄ C) C₇H₁₄
- D) C₇H₁₆ E) C₇H₁₈

Answer: D

Diff: 2 Var: 1 Page Ref: Sec. 2.9

LO: 2.15

GO: G2

86) What is the molecular formula for 1-hexanol?

- A) C₆H₁₃O
- B) C₆H₁₄O C) C₆H₁₅O
- D) C₇H₁₄O E) C₇H₁₅O

Answer: B

Diff: 2 Var: 1 Page Ref: Sec. 2.9

LO: 2.15

GO: G2

2.3 Algorithmic Questions

1) A certain mass of carbon reacts with 128 g of oxygen to form carbon monoxide. _____ grams of oxygen would react with that same mass of carbon to form carbon dioxide, according to the law of multiple proportions.

- A) 25.6
- B) 64.0
- C) 128
- D) 1280
- E) 256

Answer: E

Diff: 3 Var: 5 Page Ref: Sec. 2.1

LO: 2.1

GO: G4

2) An atom of ¹³C contains _____ protons.

- A) 6
- B) 19
- C) 7
- D) 9
- E) 13

Answer: A

Diff: 2 Var: 17 Page Ref: Sec. 2.3

LO: 2.3, 2.4

GO: G2

3) Of the following, the subatomic particle with the smallest mass is the_____.

- A) proton
- B) neutron
- C) electron
- D) alpha particle
- E) isotope

Answer: C

Diff: 1 Var: 15 Page Ref: Sec. 2.3

LO: 2.3

GO: G2

4) An atom of ^{118}Xe contains_____neutrons.

- A) 54
- B) 172
- C) 64
- D) 110
- E) 118

Answer: C

Diff: 2 Var: 17 Page Ref: Sec. 2.3

LO: 2.3, 2.4

GO: G2

5) There are _____protons, _____electrons, and _____neutrons in an atom of

129

^{54}Xe .

- A) 129, 129, 129
- B) 129, 129, 75
- C) 54, 75, 129
- D) 54, 54, 75
- E) 54, 54, 129

Answer: D

Diff: 2 Var: 5 Page Ref: Sec. 2.3

LO: 2.3, 2.4

GO: G2

6) An atom of ^{14}C contains_____electrons.

- A) 14
- B) 20

- C) 8
- D) 10
- E) 6

Answer: E

Diff: 1 Var: 17 Page Ref: Sec. 2.3

LO: 2.3, 2.4

GO: G2

7) 87 pm is the same as _____Angstroms.

- A) 870
- B) 8.7
- C) 87
- D) .87
- E) .087

Answer: D

Diff: 2 Var: 5 Page Ref: Sec. 2.3

LO: 2.3

GO: G4

8) 200 pm is the same as _____Å.

- A) 2000
- B) 20
- C) 200
- D) 2
- E) 0.0002

Answer: D

Diff: 1 Var: 5 Page Ref: Sec. 2.3

LO: 2.3

GO: G4

9) In the symbol below, X = _____.



- A) Zr
- B) K
- C) Sc
- D) Br
- E) not enough information to determine

Answer: B

Diff: 1 Var: 5 Page Ref: Sec. 2.3

LO: 2.3, 2.4 GO:

G2

10) In the symbol below, x = _____.



- A) 17
- B) 34
- C) 16
- D) 36
- E) not enough information to determine

Answer: E

Diff: 2 Var: 5 Page Ref: Sec. 2.3

LO: 2.3, 2.4 GO:

G2

11) The mass number of an atom of ${}^{14}\text{C}$ is _____.

- A) 6
- B) 20
- C) 8
- D) 14
- E) 10

Answer: D

Diff: 2 Var: 17 Page Ref: Sec. 2.3

LO: 2.3, 2.4 GO:

G2

12) Which atom has the largest number of neutrons?

- A) silicon-30
- B) sulfur-36
- C) argon-38
- D) calcium-44
- E) magnesium-24

Answer: D

Diff: 3 Var: 50+ Page Ref: Sec. 2.3

LO: 2.3, 2.4

GO: G2

13) How many neutrons are there in one atom of ${}^{184}\text{W}$?

- A) 74
- B) 112
- C) 258
- D) 110
- E) 184

Answer: D

Diff: 3 Var: 4 Page Ref: Sec. 2.3

LO: 2.3, 2.4 GO:

G2

14) How many protons are there in one atom of ^{71}Ga ?

- A) 40
- B) 70
- C) 71
- D) 31
- E) 13

Answer: D

Diff: 3 Var: 5 Page Ref: Sec. 2.3

LO: 2.3, 2.4 GO:

G2

15) How many electrons are there in one atom of ^{71}Ga ?

- A) 40
- B) 70
- C) 71
- D) 31
- E) 13

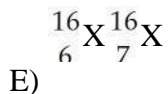
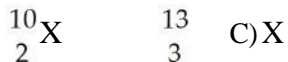
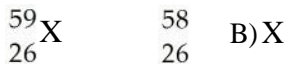
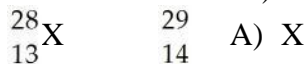
Answer: D

Diff: 3 Var: 5 Page Ref: Sec. 2.3

LO: 2.3, 2.4

GO: G2

16) Which pair of atoms constitutes a pair of isotopes of the same element?



Answer: B

Diff: 1 Var: 50+ Page Ref: Sec. 2.3

LO: 2.3, 2.4 GO:

G2

17) The atomic number of an atom of ^{80}Br is _____.

- A) 115
- B) 35
- C) 45
- D) 73

E) 80

Answer: B

Diff: 1 Var: 17 Page Ref: Sec. 2.3

LO: 2.3, 2.4

GO: G2 A)

2

B)

3

C)

4

D)

7

E) Answer: A

8

18) How many total electrons are in the Li^+ ion?

Diff: 1 Var: 5 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

19) How many total electrons are in the O^{2-} ion?

A) 10

B) 8

C) 6

D) 16

E) 4

Answer: A

Diff: 1 Var: 5 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

20) If a iron atom loses 2 electrons to make an ion, what is the charge on that ion?

A) 2+

B) 1+

C) 3+

D) 2- E) 1-

Answer: A

Diff: 1 Var: 5 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

21) If an atom gains 3 electrons to make an ion, what is the charge on that ion?

A) 3+

B) 1+

C) 2+

D) 1- E) 3-

Answer: E

Diff: 1 Var: 3 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

22) The element X has three naturally occurring isotopes. The masses (amu) and % abundances of the isotopes are given in the table below. The average atomic mass of the element is _____ amu.

Isotope	Abundance	Mass
^{221}X	55.700	220.90
^{220}X	38.800	220.00
^{218}X	5.5000	218.10

- A) 33.333
- B) 220.40
- C) 220.24
- D) 219.00 E) 219.67

Answer: B

Diff: 3 Var: 5 Page Ref: Sec. 2.4

LO: 2.5

GO: G4

23) The element X has three naturally occurring isotopes. The masses (amu) and % abundances of the isotopes are given in the table below. The average atomic mass of the element is _____ amu.

Isotope	Abundance	Mass
^{159}X	40.80	159.37
^{163}X	8.000	162.79
^{164}X	51.20	163.92

- A) 159.4
- B) 162.0
- C) 163.1
- D) 161.5
- E) 163.0

Answer: B

Diff: 3 Var: 5 Page Ref: Sec. 2.4

LO: 2.5

GO: G4

24) The element X has three naturally occurring isotopes. The masses (amu) and % abundances of the isotopes are given in the table below. The average atomic mass of the element is _____ amu.

Isotope	Abundance	Mass
^{53}X	25.00	52.62
^{56}X	37.00	56.29
^{58}X	38.00	58.31

- A) 52.62
- B) 56.14
- C) 55.70
- D) 55.40 E) 55.74

Answer: B

Diff: 3 Var: 5 Page Ref: Sec. 2.4

LO: 2.5

GO: G4

25) The element _____ is the most similar to helium in chemical and physical properties. A)

O

B) Mg

C) Be

D) Ar

E) Sr

Answer: D

Diff: 3 Var: 4 Page Ref: Sec. 2.5

LO: 2.6

GO: G2

26) Which pair of elements would you expect to exhibit the greatest similarity in their physical and chemical properties?

A) Li, F

B) Sr, Te C) O, S

D) In, Sb

E) Ti, Ne

Answer: C

Diff: 1 Var: 50+ Page Ref: Sec. 2.5

LO: 2.6

GO: G2

27) Which one of the following is a metalloid?

A) Se

B) Hf

C) Zr

D) Xe

E) Si

Answer: E

Diff: 1 Var: 5 Page Ref: Sec. 2.5

LO: 2.7

GO: G2

28) The element lithium is in a group known as the _____.

A) transition metals

B) alkaline earth metals

- C) noble gases
- D) halogens
- E) alkali metals

Answer: E

Diff: 1 Var: 4 Page Ref: Sec. 2.5

LO: 2.6

GO: G2

29) The element chlorine is in a group known as the_____.

- A) transition metals
- B) noble gases
- C) alkali metals
- D) alkaline earth metals
- E) halogens

Answer: E

Diff: 1 Var: 4 Page Ref: Sec. 2.5

LO: 2.6

GO: G2

30) The element calcium is in a group known as the_____.

- A) transition metals
- B) alkali metals
- C) halogens
- D) noble gases
- E) alkaline earth metals

Answer: E

Diff: 1 Var: 4 Page Ref: Sec. 2.5

LO: 2.6

GO: G2

31) Of the following, only_____ is not a metalloid.

- A) B
- B) Po
- C) Si
- D) Ge
- E) As

Answer: B

Diff: 1 Var: 4 Page Ref: Sec. 2.5

LO: 2.7

GO: G2

32) Which of the following elements is a nonmetal?

- A) At
- B) Rh
- C) Tc

D) Mo

E) Zr

Answer: A

Diff: 1 Var: 4 Page Ref: Sec. 2.5

LO: 2.7

GO: G2

33) Which one of the following will occur as diatomic molecules in elemental form?

A) helium

B) argon

C) chlorine

D) phosphorous

E) sodium

Answer: C

Diff: 1 Var: 50+ Page Ref: Sec. 2.6

LO: 2.8

GO: G2

34) How many electrons does the Al^{3+} ion possess?

A) 16

B) 10

C) 6

D) 0

E) 13

Answer: B

Diff: 1 Var: 10 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

35) How many protons does the Br^- ion possess?

A) 34

B) 36

C) 6

D) 8

E) 35

Answer: E

Diff: 1 Var: 10 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

36) Which one of the following is most likely to gain electrons when forming an ion?

A) Mn

B) Zn

- C) F
D) Li E) Al

Answer: C

Diff: 2 Var: 50+ Page Ref: Sec. 2.7

LO: 2.11

GO: G2

37) The formula of a salt is $\text{XC}^{1/2}$. The X-ion in this salt has 24 electrons. The metal X is

_____.

- A) Ni
B) Fe
C) Zn
D) Cr
E) Ti

Answer: B

Diff: 2 Var: 5 Page Ref: Sec. 2.7

LO: 2.12

GO: G2

38) Predict the charge of the most stable ion of bromine. A)

2+

B) 1+ C)

3+

D) 1- E)

2-

Answer: D

Diff: 1 Var: 10 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

39) Predict the charge of the most stable ion of aluminum.

A) 3- B)

1+

C) 2+

D) 1- E) 3+

Answer: E

Diff: 1 Var: 10 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

40) Which of the following compounds would you expect to be ionic?

A) C_2H_6

B) NH_3

- C) H_2O_2
- D) LiBr
- E) None of the above.

Answer: D

Diff: 1 Var: 50+ Page Ref: Sec. 2.6, 2.7

LO: 2.8

GO: G2

41) Which species below is the sulfate ion?

A) CN^-

SO_4^{2-}

C) OH^-

SO_3^{2-}

E) None of the above

Answer: B

Diff: 1 Var: 4 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

42) Which species below is the nitrate ion?

A) NO_2^-

B) NO_3^- C) ClO_3^- D) ClO_4^-

E) MnO_4^-

Answer: B

Diff: 1 Var: 5 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

43) Which species below is the chromate ion?

A) $\text{Cr}_2\text{O}_7^{2-}$

B) CrO_4^{2-} C) CH_3COO^-

D) CO_3^{2-}

E) None of the above

Answer: B

Diff: 1 Var: 4 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

44) The correct name for CaO is_____.

- A) calcium oxide
- B) calcium hydroxide C) calcium peroxide
- D) calcium monoxide
- E) calcium dioxide

Answer: A

Diff: 2 Var: 4 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

45) Element M reacts with fluorine to form an ionic compound with the formula M^{F_3} . The M-ion has 21 electrons. Element M is_____.

- A) Al
- B) Cr
- C) Mn
- D) Fe
- E) Sc

Answer: B

Diff: 2 Var: 5 Page Ref: Sec. 2.8

LO: 2.12

GO: G2

46) The charge on the copper ion in the salt CuO is_____.

- A) +1
- B) +2
- C) +4
- D) +3
- E) +5

Answer: B

Diff: 2 Var: 5 Page Ref: Sec. 2.8

LO: 2.12

GO: G2

47) The charge on the silver ion in the salt AgCl is_____.

- A) +2
- B) +1
- C) +3
- D) +4
- E) +5

Answer: B

Diff: 2 Var: 4 Page Ref: Sec. 2.8

LO: 2.12

GO: G2

48) The name of the ionic compound NaBrO_4 is _____.

- A) sodium perbromate
- B) sodium bromate
- C) sodium hypobromate
- D) sodium perbromite
- E) sodium bromide

Answer: A

Diff: 2 Var: 4 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

49) When a bromine atom forms the bromide ion, it has the same charge as the _____ ion. A) sulfide

- B) ammonium
- C) nitrate
- D) phosphate
- E) sulfite

Answer: C

Diff: 1 Var: 4 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

50) Which element forms an ion with the same charge as the sulfate ion?

- A) magnesium
- B) sodium
- C) fluorine
- D) vanadium E) sulfur

Answer: E

Diff: 2 Var: 50+ Page Ref: Sec. 2.7

LO: 2.11

GO: G2

51) The correct name for Na_2O_2 is _____.

- A) sodium oxide
- B) sodium dioxide
- C) disodium dioxide
- D) sodium peroxide
- E) disodium oxide

Answer: D

Diff: 2 Var: 4 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

52) Which metal is not required to have its charge specified in the names of ionic compounds it forms? A) Cr

B) Ni

C) Zr

D) Na

E) Mo

Answer: D

Diff: 1 Var: 50+ Page Ref: Sec. 2.7

LO: 2.11

GO: G2

2.4 Short Answer Questions

X

1) The following hypothetical element : X : can be found in which group on the periodic table?

Answer: VIA

Diff: 2 Var: 1 Page Ref: Sec. 2.5

LO: 2.6

GO: G2

2) Which element is found in Period 2 and Group VIIA?

Answer: fluorine

Diff: 2 Var: 1 Page Ref: Sec. 2.5

LO: 2.6

GO: G2

3) The formula for potassium sulfide is _____.

Answer: K₂S

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2

4) What is the name of an alcohol derived from hexane?

Answer: hexanol

Diff: 2 Var: 1 Page Ref: Sec. 2.9

LO: 2.15

GO: G2

2.5 True/False Questions

1) The possible oxidation numbers for iron are +1 and +2.

Answer: FALSE

Diff: 1 Var: 1 Page Ref: Sec. 2.7

LO: 2.11

GO: G2

2) The formula for chromium (II) iodide is CrI₂.

Answer: TRUE

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

3) H₂SeO₄ is called selenic acid.

Answer: TRUE

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.14

GO: G2

4) The correct name for Na₃N is sodium azide.

Answer: FALSE

Diff: 2 Var: 1 Page Ref: Sec. 2.8

LO: 2.13

GO: G2