***Chemistry: Molecular Nature of Matter, 8e* (Jespersen)**

**Chapter 2 Elements, Compounds, and the Periodic Table**

1) All of the following are alkali metals *except*

A) Sr.

B) Na.

C) Fr.

D) Cs.

E) Rb.

Answer: A

Diff: 1

Section: 2.1

2) Which element is a halogen?

A) Te

B) O

C) Se

D) Uuh

E) I

Answer: E

Diff: 1

Section: 2.1

3) Each statement accurately describes the noble gases *except* for which one?

A) They were once known as the inert gases.

B) He, Ne, Ar, Kr, Xe, Rn, and Uuo are part of the group.

C) Their heavier elements do react with other elements.

D) They belong to group VIIIA (or 18).

E) They contain at least one metalloid.

Answer: E

Diff: 1

Section: 2.1

4) The transition metals begin in period \_\_\_\_\_\_\_\_ of the periodic table.

A) 2

B) 3

C) 4

D) 1

E) 5

Answer: B

Diff: 1

Section: 2.1

5) In which family of elements does Ca belong?

A) alkali metals

B) alkaline earth metals

C) halogens

D) noble gases

E) transition metals

Answer: B

Diff: 1

Section: 2.1

6) The elements in a specific column of the periodic table are known as

A) a row.

B) a period.

C) transition elements.

D) a group or family.

E) transitive elements.

Answer: D

Diff: 1

Section: 2.1

7) The elements in a row of the periodic table are known as

A) a column.

B) a period.

C) transition elements.

D) a group or family.

E) transitive elements.

Answer: B

Diff: 1

Section: 2.1

8) Which of these elements has the most similar chemical properties to sulfur?

A) calcium

B) oxygen

C) phosphorus

D) bromine

E) nitrogen

Answer: B

Diff: 1

Section: 2.1

9) Which of these elements has the most similar chemical properties to magnesium?

A) calcium

B) sodium

C) aluminum

D) iron

E) cesium

Answer: A

Diff: 1

Section: 2.1

10) Which of these elements has the most similar chemical properties silicon?

A) aluminum

B) phosphorus

C) nitrogen

D) silver

E) germanium

Answer: E

Diff: 1

Section: 2.1

11) Some elements have properties that fit between metals and nonmetals. These elements are known most specifically as the

A) metals.

B) nonmetals.

C) halogens.

D) alkaline earth metals.

E) metalloids.

Answer: E

Diff: 1

Section: 2.2

12) Which metal is a liquid at room temperature (about 25°C)?

A) hydrogen

B) bromine

C) tungsten

D) mercury

E) chromium

Answer: D

Diff: 1

Section: 2.2

13) Which element is a gas at room temperature (about 25°C)?

A) neon

B) bromine

C) tungsten

D) mercury

E) chromium

Answer: A

Diff: 1

Section: 2.2

14) Diamond and graphite are different forms of which element?

A) sodium

B) carbon

C) mercury

D) gold

E) calcium

Answer: B

Diff: 1

Section: 2.2

15) Which of the following is *not* a property of metals?

A) They have a shine called a metallic luster.

B) They are good conductors of electricity.

C) They are generally poor conductors of heat.

D) They can be rolled into thin sheets.

E) Some metals are quite hard, while some are soft.

Answer: C

Diff: 2

Section: 2.2

16) Classify the following three elements as a metal, metalloid, or nonmetal: P, Si, Al.

A) P, metal; Si, metalloid; Al, nonmetal

B) P, metal; Al, metalloid; Si, nonmetal

C) Al, metal; P, metalloid; Si, nonmetal

D) Si, metal; Al, metalloid; P, nonmetal

E) Al, metal; Si, metalloid; P, nonmetal

Answer: E

Diff: 2

Section: 2.2

17) Classify the following three elements as a metal, metalloid, or nonmetal: Ti, S, Sb.

A) Ti, metal; S, metalloid; Sb, nonmetal

B) Sb, metal; S, metalloid; Ti, nonmetal

C) S, metal; Sb, metalloid; Ti, nonmetal

D) Sb, metal; Ti, metalloid; S, nonmetal

E) Ti, metal; Sb, metalloid; S, nonmetal

Answer: E

Diff: 2

Section: 2.2

18) Which of these element types tend to be poor conductors of heat and electricity?

A) metals

B) metalloids

C) nonmetals

D) alkaline earth metals

E) alkali metals

Answer: C

Diff: 1

Section: 2.2

19) Which of the following is used to represent molecular bromine?

A) Be

B) B

C) 2Br

D) Br2

E) Br

Answer: D

Diff: 1

Section: 2.3

20) Which combination is used to represent molecular hydrogen and atomic hydrogen, respectively?

A) H2, H

B) He, H-

C) H, H

D) 2H, H+

E) Hy, H

Answer: A

Diff: 2

Section: 2.3

21) Which compound exists as a diatomic molecule in its free state?

A) magnesium

B) manganese

C) silicon

D) arsenic

E) chlorine

Answer: E

Diff: 1

Section: 2.3

22) Which compound exists as a diatomic molecule in its free state?

A) C

B) N

C) Ga

D) Ge

E) P

Answer: B

Diff: 1

Section: 2.3

23) Which compound exists as a diatomic molecule in its free state?

A) helium

B) fluorine

C) neon

D) argon

E) xenon

Answer: B

Diff: 1

Section: 2.3

24) Which compound is correctly represented as a hydrate?

A) C2H5OH2+

B) MgSO4·7H2O

C) FeH2(CO)4

D) O2S(OH)2

E) [CrCl(H2O)5]Cl

Answer: B

Diff: 2

Section: 2.3

25) Which compound is correctly represented as a hydrate?

A) CuSO4·5H2O

B) HC2H3O2

C) O2S(OH)2

D) H2S2O7

E) C6(H2O)6

Answer: A

Diff: 2

Section: 2.3

26) How many oxygen atoms are in one molecule of Mg(NO3)2?

A) 1

B) 2

C) 3

D) 5

E) 6

Answer: E

Diff: 2

Section: 2.4

27) How many oxygen atoms are in one formula unit of Mg(NO3)2?

A) 1

B) 2

C) 3

D) 5

E) 6

Answer: E

Diff: 2

Section: 2.4

28) How many hydrogen atoms are in one molecule of HC2H3O2?

A) 1

B) 2

C) 3

D) 4

E) 5

Answer: D

Diff: 1

Section: 2.4

29) How many carbon atoms are in one molecule of C6H6?

A) 1

B) 2

C) 4

D) 6

E) 12

Answer: D

Diff: 1

Section: 2.4

30) The number of atoms in one formula unit of the substance, CO(NH2)2, is

A) 4

B) 5

C) 7

D) 8

E) 10

Answer: D

Diff: 2

Section: 2.4

31) The number of atoms in one formula unit of C2H4(COOH)2 is

A) 10

B) 11

C) 12

D) 14

E) 16

Answer: D

Diff: 2

Section: 2.4

32) The number of atoms in one formula unit of the substance Cs2SO4·5H2O is

A) 4

B) 17

C) 22

D) 25

E) 33

Answer: C

Diff: 2

Section: 2.4

33) How many oxygen atoms are in one formula unit of Cu(NO3)2·5H2O?

A) 2

B) 3

C) 5

D) 6

E) 11

Answer: E

Diff: 2

Section: 2.4

34) The number of atoms in one formula unit of the substance (NH4)3Co(CN)6 is

A) 21

B) 26

C) 28

D) 31

E) 33

Answer: C

Diff: 2

Section: 2.4

35) How many atoms are there in one formula unit of (NH4)4Fe(CN)6?

A) 15

B) 25

C) 28

D) 33

E) 35

Answer: D

Diff: 2

Section: 2.4

36) How many atoms are there in one formula unit of NiSO4 ∙7H2O?

A) 9

B) 14

C) 27

D) 28

E) 33

Answer: C

Diff: 2

Section: 2.4

37) How many atoms of each element are shown in the formula H2S2O7?

A) 2H, 2S, 7O

B) 1H, 2S, 4O

C) 2H, 1S, 1O

D) 2H, 4S, 4O

E) 1H, 1S, 1O

Answer: A

Diff: 2

Section: 2.4

38) How many atoms of each element shown are in the formula Ni(ClO4)2?

A) 2Ni, 1Cl, 4O

B) 1Ni, 2 Cl, 8O

C) 2Ni, 1 Cl, 1O

D) 2Ni, 4 Cl, 4O

E) 1Ni, 1 Cl, 8O

Answer: B

Diff: 2

Section: 2.4

39) How many hydrogen atoms appear on the right side of the equation following equation:

4NH3 + 3O2 → 2N2 + 6H2O?

A) 2

B) 4

C) 6

D) 10

E) 12

Answer: E

Diff: 2

Section: 2.4

40) How many atoms are in one molecule of Mo2(O2CC(CH3)3)4?

**Hint: Remember to distribute the subscripts to all elements inside the parenthesis. Start on the inside and work your way out.**

A) 17

B) 30

C) 60

D) 66

E) 64

Answer: D

Diff: 3

Section: 2.4

41) How many atoms of each element appear on each side of the arrow in the following chemical equation? 2Fe(NO3)3 + 3Na2CO3 → Fe2(CO3)3 + 6NaNO3

**Hint: Distribute coefficients across the entire compound for each reactant and product. Be sure to account for parenthesis.**

A) 2Fe, 6N, 18O, 6Na, 3C

B) 2Fe, 6N, 27O, 6Na, 9C

C) 2Fe, 6N, 27O, 6Na, 3C

D) 2Fe, 6N, 27O, 9Na, 3C

E) 2Fe, 6N, 21O, 18Na, 3C

Answer: C

Diff: 3

Section: 2.4

42) How many atoms of each element appear on each side of the arrow in the following chemical equation? 3Cl3BNH2CH3 + 6(CH3)3N → 6(CH3)3NHCl + B3N3Cl3(CH3)3

**Hint: Distribute coefficients across the entire compound for each reactant and product. Be sure to account for parenthesis.**

A) 9Cl, 3B, 9N, 54H, 6C

B) 9Cl, 3B, 9N, 69H, 21C

C) 3Cl, 3B, 9N, 15H, 21C

D) 9Cl, 1B, 9N, 54H, 9C

E) 3Cl, 3B, 9N, 69H, 18C

Answer: B

Diff: 3

Section: 2.4

43) A student attempts to balance a chemical equation and comes up with the following result:

8KClO3 + C12H22O10 → 8KCl + 12CO2 + 11H2O

However, he wrote the initial equation wrong and therefore could not balance the equation. Which element(s) are not balanced in this result?

**Hint: Make a chart and identify how many elements you have on each side of the arrow.**

A) Cl

B) O

C) H

D) O and H

E) C

Answer: B

Diff: 3

Section: 2.4

44) Which of these pairs of elements would be most likely to form an ionic compound?

A) P and Br

B) Cu and K

C) C and O

D) O and Zn

E) Al and Rb

Answer: D

Diff: 1

Section: 2.5

45) Which of these pairs of elements would be most likely to form a molecular compound?

A) P and Br

B) Cu and K

C) K and O

D) O and Zn

E) Al and Rb

Answer: A

Diff: 1

Section: 2.5

46) The formula for the phosphate ion is

A) PO42-.

B) PO43-.

C) PO4-.

D) P2O4-.

E) P2O42-.

Answer: B

Diff: 1

Section: 2.5

47) The correct formula for the carbonate ion is

A) C2H3O2-.

B) C2O42-.

C) CO2-.

D) CO3-.

E) CO32-.

Answer: E

Diff: 1

Section: 2.5

48) When barium metal reacts with chlorine gas, it forms an ionic compound, BaCl2. In the course of the reaction, each Ba atom

A) loses two protons.

B) loses two electrons.

C) gains two protons.

D) gains two electrons.

E) loses two neutrons.

Answer: B

Diff: 2

Section: 2.5

49) When barium metal reacts with chlorine gas, it forms an ionic compound, BaCl2. In the course of the reaction, each Cl atom

A) loses one proton.

B) loses one electron.

C) gains one proton.

D) gains one electron.

E) loses one neutron.

Answer: D

Diff: 2

Section: 2.5

50) Write the formula for the ionic compound formed from magnesium and sulfur.

A) MgS2

B) MgS

C) Mg2S

D) Mg3S2

E) MgS3

Answer: B

Diff: 2

Section: 2.5

51) Write the most likely formula for the ionic compound formed from magnesium and phosphorus.

A) MgP2

B) Mg3P

C) Mg2P

D) Mg3P2

E) MgP3

Answer: D

Diff: 2

Section: 2.5

52) Write the most likely formula for the ionic compound formed from calcium and selenium.

A) CaSe

B) Ca2Se

C) CaSe2

D) Ca3Se

E) CaSe3

Answer: A

Diff: 2

Section: 2.5

53) Write the most likely formula for the ionic compound formed from magnesium and iodine.

A) MgI

B) Mg2I

C) MgI2

D) MgI3

E) Mg3I

Answer: C

Diff: 2

Section: 2.5

54) An alkaline earth metal, which we will represent by the symbol X, reacts with a halogen, which we will represent by the symbol Q. What would be the formula of the resulting compound?

A) XQ

B) XQ2

C) XQ4

D) X2Q

E) X4Q

Answer: B

Diff: 2

Section: 2.5

55) Aluminum reacts with a second element, which we will represent by the symbol E, to form a compound whose formula is AlE3. Element E is most probably

A) an actinide element.

B) an alkali metal.

C) a chalcogen.

D) a halogen.

E) a transition metal.

Answer: D

Diff: 2

Section: 2.5

56) Aluminum reacts with another element, which we will represent by the symbol Gr, to form a compound whose formula is AlGr. Element Gr is most probably

A) an actinide element.

B) group 2A element.

C) a chalcogen.

D) group 5A element.

E) a transition metal.

Answer: D

Diff: 2

Section: 32.5

57) Bromine reacts with a metal, which we will represent by the symbol M, to form a compound whose formula is M2Br. Element M is most probably

A) a metalloid.

B) a group 2A element.

C) a chalcogen.

D) a group 5A element.

E) There are no elements that can react with bromine to give the formula M2Br.

Answer: E

Diff: 2

Section: 2.5

58) Oxygen reacts with a metal, which we will represent by the symbol Wp, to form a compound whose formula is Wp2O. Element Wp is most probably

A) a metalloid.

B) a group 2A element.

C) a chalcogen.

D) a group 1A element.

E) there are no elements that can react with oxygen to give the formula Wp2O.

Answer: D

Diff: 2

Section: 2.5

59) Which formula is correct because it represents a known ionic compound?

A) Li2Br

B) Pb2I2

C) KBr2

D) Rb2Se4

E) Al2S3

Answer: E

Diff: 2

Section: 2.5

60) Which formula is correct because it represents a known ionic compound?

A) Be2Br4

B) Ca2I2

C) K2S

D) Rb2Br

E) Ca2S3

Answer: C

Diff: 2

Section: 2.5

61) Which formula is incorrect because it does not represent a known ionic compound?

A) BeCl2

B) CaI2

C) K2S

D) RbBr

E) Ca2O3

Answer: E

Diff: 2

Section: 2.5

62) Which formula is incorrect because it does not represent a correctly written ionic compound?

A) BaCl2

B) Al2F3

C) Na2O

D) RbBr

E) CaO

Answer: B

Diff: 2

Section: 2.5

63) Select the examples in which the formula for the ionic compound is not written correctly or cannot exist as written.

I. (NH4)2As

II. CuO

III. Mg(C2H3O)2

IV. Na3(HCO3)2

A) I only

B) II and III

C) III and IV

D) I and IV

E) I, II and IV

Answer: D

Diff: 2

Section: 2.6

64) What is the formula for the oxalate ion?

A) CO32

B) C4O22

C) C4O42

D) C2O42

E) C2H3O2

Answer: D

Diff: 2

Section: 2.5

65) The formula of the compound formed from the calcium ion and acetate ion is

A) CaC2H3O2.

B) Ca2C2H3O2.

C) Ca2(C2H3O2)4.

D) Ca(C2H3O2)2.

E) Ca(C2H3O2)3.

Answer: D

Diff: 2

Section: 2.5

66) Write the formula for the ionic compound formed from calcium ions and nitrate ions?

A) Ca3N2

B) Ca(NO3)2

C) Ca2NO3

D) Ca2NO2

E) Ca(NO2)2

Answer: B

Diff: 2

Section: 2.5

67) The formula of the compound formed from the strontium ion and chromate ion is

A) SrCrO3.

B) SrCrO4.

C) Sr2CrO4.

D) Sr(CrO4)2.

E) Sr2(CrO4)3.

Answer: B

Diff: 2

Section: 2.5

68) Which compound below has its formula written incorrectly?

A) Al(H2PO4)3

B) Al(HCO3)3

C) Ca(HCO3)2

D) KHPO4

E) Ca(NO3)2

Answer: D

Diff: 2

Section: 2.5

69) Which compound below has its formula written incorrectly?

A) Al(H2CO3)3

B) Al(H2PO4)3

C) Ba(HCO3)2

D) KH2PO4

E) Ca(NO2)2

Answer: A

Diff: 2

Section: 2.5

70) How many protons, neutrons, and electrons are in the ion, 57Fe3+?

A) 27 protons, 30 neutrons, and 30 electrons

B) 26 protons, 31 neutrons, and 23 electrons

C) 29 protons, 28 neutrons, and 26 electrons

D) 26 protons, 31 neutrons, and 29 electrons

E) 25 protons, 32 neutrons, and 22 electrons

Answer: B

Diff: 2

Section: 2.5

71) How many protons, neutrons, and electrons are in the ion, 129Te2-?

A) 52 protons, 77 neutrons, and 50 electrons

B) 53 protons, 76 neutrons, and 55 electrons

C) 52 protons, 77 neutrons, and 54 electrons

D) 50 protons, 79 neutrons, and 52 electrons

E) 51 protons, 78 neutrons, and 53 electrons

Answer: C

Diff: 2

Section: 2.5

72) How many protons, neutrons, and electrons are in the ion, 37Cl-?

A) 37 protons, 18 neutrons, and 37 electrons

B) 18 protons, 37 neutrons, and 17 electrons

C) 17 protons, 20 neutrons, and 18 electrons

D) 37 protons, 20 neutrons, and 18 electrons

E) 17 protons, 17 neutrons, and 37 electrons

Answer: C

Diff: 2

Section: 2.5

73) How many protons, neutrons, and electrons are in the cation of the compound, 55MnP?

A) 25 protons, 30 neutrons, and 25 electrons

B) 23 protons, 33 neutrons, and 28 electrons

C) 28 protons, 27 neutrons, and 25 electrons

D) 23 protons, 32 neutrons, and 26 electrons

E) 25 protons, 30 neutrons, and 22 electrons

Answer: E

Diff: 2

Section: 2.5

74) How many protons, neutrons, and electrons are in the anion of the compound, CrCl337?

A) 17 protons, 20 neutrons, and 18 electrons

B) 18 protons, 23 neutrons, and 21 electrons

C) 21 protons, 21 neutrons, and 16 electrons

D) 14 protons, 23 neutrons, and 17 electrons

E) 17 protons, 17 neutrons, and 20 electrons

Answer: A

Diff: 2

Section: 2.5

75) List the polyatomic ions, including the number of each type, present in the compound, (NH4)3PO4.

**Hint: Think about the requirements for forming ionic compounds and how this affects the number of each ion present in the formula.**

A) 4N3-, 12H+, PO42-

B) 3NH4+, 4PO43-

C) N3-, 12H+, P3- ; 4O2-

D) 3NH4+, PO43-

E) 4NH+, 3PO43-

Answer: D

Diff: 3

Section: 2.5

76) List the ions, including the number of each type, present in the compound, Fe2(C2O4)3·2H2O.

**Hint: Think about the requirements for forming ionic compounds and how this affects the number of each ion present in the formula.**

A) 2Fe3+, 6C4+, 12O2-

B) 3Fe4+, 2CO43-; 2OH-

C) 3Fe2+, 3C2O42-

D) 3Fe4+, 2CO43-; 2H2O2-

E) 2Fe3+, 3CO22-; 2 H2O

Answer: C

Diff: 3

Section: 2.5

77) Which compound below is correctly indicated as magnesium sulfate heptahydrate?

A) CaSO4·2H2O

B) MgSO4·7H2O

C) CuSO4·5H2O

D) CoCl2·6H2O

E) 7MnSO4·2H2O

Answer: B

Diff: 1

Section: 2.6

78) The name of the compound Al(SO4)3 is

A) aluminum sulfide.

B) aluminum sulfate.

C) aluminum trisulfate.

D) aluminum(III) sulfate.

E) aluminum sulfite.

Answer: B

Diff: 2

Section: 2.6

79) What is the name of the compound, V(NO3)3?

A) vanadium trinitrate

B) vanadium nitrite

C) vanadium(III) nitrite

D) vanadium nitrate

E) vanadium(III) nitrate

Answer: E

Diff: 2

Section: 2.6

80) What is the name for the compound, Ba(NO3)2?

A) barium dinitrate

B) barium dinitrite

C) barium nitrate

D) barium(II) nitrite

E) barium(II) nitrate

Answer: C

Diff: 2

Section: 2.6

81) Which compound is correctly written as a hydride?

A) CoCl2·6H2O

B) HC2H3O2

C) NaOH

D) CaH2

E) C6H12O6

Answer: D

Diff: 2

Section: 2.6

82) What is the name for the compound V2O5?

A) divanadium pentoxide

B) vanadic oxide

C) vanadium(V) oxide

D) vanadium(V) pentoxide

E) vanadous oxide

Answer: C

Diff: 2

Section: 2.6

83) What is the name for the compound NaCl3?

A) sodium chlorate

B) sodium chlorite

C) sodium perchloride

D) sodium trichloride

E) There is no such compound.

Answer: E

Diff: 2

Section: 2.6

84) What is the name for the compound CuBr2?

A) copper(I) bromide(II)

B) copper(II) bromide

C) copper(II) bromite

D) copper dibromide

E) cuprous bromide

Answer: B

Diff: 2

Section: 2.6

85) What is the correct name for the compound Na2O?

A) disodium oxide

B) sodium oxide

C) sodium(I) oxide

D) sodium peroxide

E) sodium superoxide

Answer: B

Diff: 2

Section: 2.6

86) Which is the correct name for the compound FeBr3?

A) ferrous bromide

B) iron(III) bromide

C) iron bromite

D) iron tribromide

E) iron tribromine

Answer: B

Diff: 2

Section: 2.6

87) What is the formula for the compound iron(II) sulfate?

A) FeSO4

B) Fe(SO4)2

C) Fe2SO4

D) Fe2(SO4)3

E) Fe3(SO4)2

Answer: A

Diff: 2

Section: 2.6

88) Which is a correct name for the compound Hg2Cl2?

**Hint: Consider the charge on the mercury ion.**

A) dimercury dichloride

B) mercuric chloride

C) mercury(I) chloride

D) mercury(II) dichloride

E) There is no correct name; the formula should be HgCl.

Answer: C

Diff: 3

Section: 2.6

89) Which is a correct name for the compound CoF3?

A) cobalt fluoride

B) cobalt trifluoride

C) cobalt(III) fluoride

D) cobaltic trifluoride

E) cobaltous fluoride

Answer: C

Diff: 2

Section: 2.6

90) A correct name for SnF4 is

A) stannic tetrafluoride.

B) stannous fluoride.

C) stannous(IV) fluoride.

D) tin(IV) fluoride.

E) tin tetrafluoride.

Answer: D

Diff: 2

Section: 2.6

91) The correct formula for tin(II) nitrate is

A) Sn(NO2)2.

B) Sn(NO3)2.

C) Sn(NO3)3.

D) Sn(NO3)4.

E) Sn2NO3.

Answer: B

Diff: 2

Section: 2.6

92) What is the formula for magnesic perchlorate?

A) MgClO3

B) Mg(ClO3)2

C) Mg2ClO3

D) MgO(ClO3)2

E) There is no such compound.

Answer: E

Diff: 2

Section: 2.6

93) What is the name for Na2Cr2O7?

A) sodium chromium(VII)ate

B) sodium dichromate

C) sodium dichromium heptaoxide

D) sodium heptaoxochromate

E) sodium perchromate

Answer: B

Diff: 2

Section: 2.6

94) The compound Na2S2O3 is used extensively in photographic film processing. What is its chemical name?

A) sodium bisulfite

B) sodium disulfur trioxide

C) sodium oxosulfate(IV)

D) sodium thiosulfate

E) sodium trioxosulfite

Answer: D

Diff: 2

Section: 2.6

95) If the NtO42 ion is called nortonate, what is the correct name for the compound K2NtO4?

A) dipotassium nortonium tetraoxide

B) dipotassium nortonate

C) potassium nortonate

D) potassium(I) nortonate

E) potassium(II) nortonate

Answer: C

Diff: 2

Section: 2.6

96) What is the name for Cu2SO3?

A) copper(I) sulfite

B) copper(II) sulfite

C) copper thiosulfate

D) cuprous sulfate

E) dicopper sulfur trioxide

Answer: A

Diff: 2

Section: 2.6

97) What is a correct name for the FeCrO4?

A) iron(II) chromate

B) iron dichromate

C) iron(III) chromium tetraoxide

D) iron monochromate

E) ferrous chrome

Answer: A

Diff: 2

Section: 2.6

98) What is the name for CuC2H3O2?

A) copper(I) acetate

B) carbon hydrocarbonate

C) copper monocarbonate

D) copper(I) oxalate

E) dicarbon acetate

Answer: A

Diff: 2

Section: 2.6

99) What is a correct name for KHCr2O7?

A) potassium bichromite

B) potassium bichromate

C) potassium dichromic acid

D) potassium monohydrogen chromite

E) potassium monohydrogen dichromate

Answer: E

Diff: 2

Section: 2.6

100) What is the name for LiHPO4?

A) lithium monohydrogen phosphate

B) lithium hydrogen phosphoric acid

C) lithium hydrogen phosphorus tetraoxide

D) lithium monohydrogen phosphite

E) There is no known ionic compound with that formula.

Answer: E

Diff: 2

Section: 2.6

101) What is the name for Li2HPO4?

A) lithium monohydrogen phosphate

B) There is no compound with that formula.

C) dilithium monohydrogen phosphate

D) lithium hydrogen phosphorus tetraoxide

E) lithium phosphoric acid

Answer: A

Diff: 2

Section: 2.6

102) What is the name for CuHSO4?

A) copper(I) hydrogen sulfate

B) copper(II) bisulfate acid

C) copper hydrogen sulfur tetraoxide

D) copper hydrogen sulfate

E) copper sulfuric acid

Answer: A

Diff: 2

Section: 2.6

103) Which compound is correctly indicated as cobalt(II) chloride hexahydrate?

A) CoCl2·6H2O

B) CaSO4·2H2O

C) CuSO4·5H2O

D) NiSO4·6H2O

E) Na2CO3·10H2O

Answer: A

Diff: 2

Section: 2.6

104) Which is a correct formula for mercury(I) phosphate?

**Hint: Remember that mercury (I) is not a single atom.**

A) HgPO3

B) HgPO4

C) Hg3PO4

D) Hg2PO3

E) (Hg2)3(PO4)2

Answer: E

Diff: 3

Section: 2.6

105) Select the examples in which the formulas do not correctly match the names of the compounds indicated.

I. Sodium thiosulfate Na2SO3

II. Barium oxalate BaC2O4

III. Iron(II) sulfate hexahydrate FeSO4·6H2O

IV. Calcium phosphate Ca3PO4

**Hint: Write the correct name of each formula without looking at the names and then compare it to the choices.**

A) II only

B) II and III

C) I, II and IV

D) I and IV

E) II, III and IV

Answer: D

Diff: 3

Section: 2.6

106) Select the examples in which the names do not correctly match the formulas of the compounds indicated.

I. Fe2(CO3)3 iron(III) carbonate

II. Cr2(C2O4)3 chromium(III) oxalate

III. Mg (C2H3O)2 magnesium hydrogen carbonate

IV. PbSO3 lead sulfate

**Hint: Write the correct name of each formula without looking at the names and then compare it to the choices.**

A) II only

B) II and III

C) III and IV

D) I and IV

E) I, II and IV

Answer: C

Diff: 3

Section: 2.6

107) Select the examples in which the names do not correctly match the formulas of the compounds indicated.

I. NaClO3 Sodium chlorate

II. II. (NH4)2CO3 Ammonium(I) carbonate

III. Cd(H2PO4)2 Cadmium dihydrogen phosphate

IV. KMnO4 Potassium-manganese(VII) oxide

**Hint: Write the correct name of each formula without looking at the names and then compare it to the choices.**

A) II only

B) II and IV

C) III and IV

D) I and IV

E) I, II and IV

Answer: B

Diff: 3

Section: 2.6

108) Which compound is correctly classified as a hydrocarbon?

A) C6H12O6

B) C8H16

C) HC2H3O2

D) NaHCl

E) C2H5OH

Answer: B

Diff: 1

Section: 2.7

109) One of the components of kerosene is an alkane with 16 carbon atoms. Which formula is an alkane?

A) C16H12

B) C16H22

C) C16H32

D) C16H34

E) C16H40

Answer: D

Diff: 2

Section: 2.7

110) The common name for the compound, CH4, is

A) carbon(IV) hydride.

B) carbon tetrahydride.

C) hydrocarbonate.

D) methane.

E) carbonic acid.

Answer: D

Diff: 2

Section: 2.7

111) The common name for the compound, C2H6, is

A) carbon hydride.

B) carbon hexahydride.

C) ethane.

D) methane.

E) propane.

Answer: C

Diff: 2

Section: 2.7

112) Which of the following is the correct formula for the hydrocarbon hexane?

A) CH4

B) C2H4

C) CH6

D) C6H14

E) C2H5OH

Answer: D

Diff: 2

Section: 2.7

113) Which compound is not a simple hydrocarbon?

A) C6H12

B) C8H16

C) C2H6

D) C5H5N

E) C3H6

Answer: D

Diff: 2

Section: 2.7

114) The formula for the compound formed between arsenic (As) and hydrogen is

A) AsH.

B) As2H.

C) AsH2.

D) As3H.

E) AsH3.

Answer: E

Diff: 2

Section: 2.7

115) The most likely formula for the compound formed between antimony and chlorine is

A) SbCl.

B) SbCl2.

C) SbCl3.

D) SbCl4.

E) SbCl6.

Answer: C

Diff: 2

Section: 2.7

116) What is the name of the compound, HI(*g*)?

A) hydriodic acid

B) hydrogen monoiodide

C) hydrogen iodide

D) iodic acid

E) monohydrogen monoiodide

Answer: C

Diff: 1

Section: 2.8

117) What is the name of the compound, IBr3?

A) bromic iodide

B) iodine bromate

C) iodine tribromide

D) iodine tribromine

E) monoiodine tribromite

Answer: C

Diff: 2

Section: 2.8

118) What is the name of the compound, S2Cl2?

A) disulfur chlorate

B) disulfur dichloride

C) disulfur dichlorine

D) sulfur(I) chloride

E) sulfur(II) chlorine(II)

Answer: B

Diff: 2

Section: 2.8

119) What is the name of the compound, HCN(*g*)?

A) hydrocarbonitride

B) hydrocyanic acid

C) hydrogen carbonitride

D) hydrogen cyanate

E) hydrogen cyanide

Answer: E

Diff: 2

Section: 2.8

120) A typographical error on an exam produced the formula, P4Se7, in one of the questions. How would you name this compound?

A) tetraphosphorus hexaselenide

B) tetraphosphorus heptaselenide

C) phosphorus heptaselenite

D) phosphorus(IV) selenide

E) phosphorus(VII) selenide

Answer: B

Diff: 2

Section: 2.8

121) Select the examples in which the formulas do not correctly match the names of the compounds indicated.

I. dichlorine heptoxide Cl2O6

II. iodine heptafluoride I2F7

III. dinitrogen difluoride N2F2

IV. tetraarsenic hexoxide As4O8

**Hint: Write the correct name of each formula without looking at the names and then compare it to the choices.**

A) II only

B) II and III

C) I, II and IV

D) I and IV

E) II, III and IV

Answer: C

Diff: 3

Section: 2.8

122) Select the examples in which the names do not correctly match the formulas of the compounds indicated.

I. PF5 potassium pentafluoride

II. N2O4 dinitrogen(IV) oxide

III. XeO4 xenon tetroxide

IV. Cl2O5 dichlorine pentoxide

**Hint: Write the correct name of each formula without looking at the names and then compare it to the choices.**

A) II only

B) II and III

C) III and IV

D) I and II

E) I, II and IV

Answer: D

Diff: 3

Section: 2.8

123) What is the name of the compound, N2O5(*g*)?

A) nitrogen oxide

B) dinitrogen tetroxide

C) nitrogen pentoxide

D) dinitrogen pentoxide

E) trinitrogen pentoxide

Answer: D

Diff: 2

Section: 2.8

124) The vertical columns in the periodic table are numbered sequentially, 1 through \_\_\_\_\_\_\_\_ using Arabic numerals.

Answer: 18

Diff: 1

Section: 2.1

125) Selenium is found in which group of the periodic table?

Answer: group VIA

Diff: 1

Section: 2.1

126) The group 1 elements form compounds with oxygen that dissolve in water to give solutions that

are strongly \_\_\_\_\_\_\_\_.

Answer: alkaline

Diff: 2

Section: 2.1

127) Which group of nonmetallic elements is called "inert"?

Answer: noble gases

Diff: 1

Section: 2.2

128) Metalloids' electrical conductivity tends to be lower than metals, but they can have higher conductivity than many metals when they are used in materials called \_\_\_\_\_\_\_\_.

Answer: semiconductors

Diff: 2

Section: 2.2

129) The symbol Te belongs to a metalloid in group \_\_\_\_\_\_\_\_.

Answer: VIA, 16

Diff: 2

Section: 2.2

130) An element is found to have a high conductivity in its pure form, is malleable, and is ductile. Based on these properties, this element would be best classified as \_\_\_\_\_\_\_\_.

Answer: metal

Diff: 2

Section: 2.2

131) An element is found to be a solid with low electrical conductivity but does conduct electricity. It also has a high density, is shiny, and is also brittle, shattering when hit with a hammer. Based on these properties, this element would be best classified as \_\_\_\_\_\_\_\_.

Answer: metalloid

Diff: 2

Section: 2.2

132) Two atoms of nitrogen combine with one atom of oxygen to form one compound, whereas two atoms of nitrogen combine with five atoms of oxygen to form another compound. The ratio of the masses of oxygen in the two compounds must be \_\_\_\_\_\_\_\_.

Answer: 1/5

Diff: 2

Section: 2.3

133) What formula is used to represent molecular chlorine?

Answer: Cl2

Diff: 2

Section: 2.3

134) List the seven diatomic molecules that are the most stable form of their given element.

Answer: H2, N2, O2, F2, Cl2, Br2, I2

Diff: 1

Section: 2.3

135) To show how atoms are connected in certain compounds, the chemical symbols are used to represent the atoms, and dashes are used to indicate the chemical bonds. The resulting formula is therefore referred to as \_\_\_\_\_\_\_\_.

Answer: a structural formula

Diff: 2

Section: 2.3

136) Write the formula for the compound that has the atoms and, or groups in the order given: 3 Fe, and two groups made up of 1 As and 4 O.

**Hint: The groups of atoms are polyatomic ions.**

Answer: Fe3(AsO4)2

Diff: 3

Section: 2.3

137) Write the formula for the hydrated compound that has the atoms and, or groups in the order given: 1 K, 1 Al, two groups of 1 S and 4 O, and twelve groups made up of 2 H and 1 O.

**Hint: The groups of atoms are clusters such as polyatomic ions or water.**

Answer: KAl(SO4)2·12 H2O

Diff: 3

Section: 2.3

138) List how many of each type of element are present in one molecule of sucrose, C12H22O11.

Answer: 12 carbon, 22 hydrogen, 11 oxygen

Diff: 1

Section: 2.4

139) List how many oxygen atoms are present in one molecule of H3PO4

Answer: 4

Diff: 1

Section: 2.4

140) List how many oxygen atoms are present in one formula unit of CoSO4·6H2O.

Answer: 10

Diff: 2

Section: 2.4

141) How many hydrogen atoms are present in the formula, (NH4)3PO4?

Answer: 12

Diff: 2

Section: 2.4

142) How many hydrogen atoms appear on the reactant side of the equation,

4NH3 + 3O2 → 2N2 + 6H2O?

Answer: 12

Diff: 2

Section: 2.4

143) How many of each type of atoms are needed on the left to balance the equation?

3H2SO4 + ?? → Al2(SO4)3 + 6H2O

**Hint: Distribute coefficients across the entire compound and remember how subscripts apply to everything inside the parentheses.**

Answer: 2Al, 6H, 6O

Diff: 3

Section: 2.4

144) How many additional hydrogen atoms and oxygen atoms are required on the right side to balance the given equation?

Ba(OH)2·8H2O + 2NH4NO3 → 2NH3 + H2O + Ba(NO3)2

**Hint: Distribute coefficients across the entire compound and remember how subscripts apply to everything inside the parentheses.**

Answer: 18H, 9O

Diff: 3

Section: 2.4

145) What molecule is missing that would balance the given equation?

2AgBr + 2NaOH + C6H6O2 → 2Ag + ?? + 2NaBr + C6H4O2.

Balance the equation by entering the correct coefficient and formula for the missing molecule.

**Hint: Figure out which elements are missing and consider the ratio of those elements.**

Answer: 2H2O

Diff: 3

Section: 2.4

146) What molecule is missing that would balance the given equation?

4Au + 8NaCN + ?? + 2H2O → 4NaAu(CN)2 + 4NaOH.

If a coefficient other than one is needed provide the coefficient.

**Hint: Figure out which elements are missing and consider the ratio of those elements.**

Answer: O2

Diff: 3

Section: 2.4

147) Balance the following equation:

VCl3 + Na + CO → V(CO)6 + NaCl

Answer: VCl3 + 3Na + 6CO → V(CO)6 + 3NaCl

Diff: 2

Section: 2.4

148) Balance the following equation:

CoS + CO + Cu → Co2(CO)8 + Cu2S

Answer: 2CoS + 8CO + 4Cu → Co2(CO)8 + 2Cu2S

Diff: 2

Section: 2.4

149) What is the charge on all the ions of metals of Group IIA?

Answer: 2+

Diff: 1

Section: 2.5

150) What is the charge on all the ions of non-metals of Group VIIA?

Answer: -1

Diff: 1

Section: 2.5

151) What is the formula for the sulfide ion?

Answer: S2

Diff: 1

Section: 2.5

152) How many protons and electrons are in the N3- ion?

Answer: 7 protons; 10 electrons

Diff: 2

Section: 2.5

153) How many protons and electrons are in the S2- ion?

Answer: 16 protons; 18 electrons

Diff: 2

Section: 2.5

154) How many protons and electrons are in the Ca2+ ion?

Answer: 20 protons; 18 electrons

Diff: 2

Section: 2.5

155) How many electrons are lost when aluminum forms a cation?

Answer: 3

Diff: 2

Section: 2.5

156) How many electrons are lost when zinc forms a cation?

Answer: 2

Diff: 2

Section: 2.5

157) How many electrons are gained when sulfur forms an anion?

Answer: 2

Diff: 2

Section: 2.5

158) The correct formula for the compound formed from the lithium ion and PO43- is \_\_\_\_\_\_\_\_.

Answer: Li3PO4

Diff: 2

Section: 2.5

159) The formula for the compound formed from the barium ion and SO32- is \_\_\_\_\_\_\_\_.

Answer: BaSO3

Diff: 2

Section: 2.5

160) The formula formed from the calcium ion and ClO2- is \_\_\_\_\_\_\_\_.

Answer: Ca(ClO2)2

Diff: 2

Section: 2.5

161) What is the formula of the compound formed from Cr3+ and H2PO4-?

Answer: Cr(H2PO4)3

Diff: 2

Section: 2.5

162) What is the formula of the compound formed from the calcium ion and HCO3-?

Answer: Ca(HCO3)2

Diff: 2

Section: 2.5

163) What is the name of the following compound: (NH4)2SO4?

Answer: ammonium sulfate

Diff: 2

Section: 2.5

164) What is the name of the following compound: Cr2(SO4)3?

Answer: chromium(III) sulfate

Diff: 2

Section: 2.6

165) What is the name of the following compound: V3(PO4)4?

Answer: vanadium(IV) phosphate

Diff: 2

Section: 2.6

166) What is the name of the following compound: Mn2O7?

Answer: manganese(VII) oxide

Diff: 2

Section: 2.6

167) What is the name of the following compound: NH4NO3?

Answer: ammonium nitrate

Diff: 2

Section: 2.6

168) What is the name of the following compound: Ba(OH)2?

Answer: barium hydroxide

Diff: 2

Section: 2.6

169) What is the name of the following compound: KHCO3?

Answer: potassium hydrogen carbonate or potassium bicarbonate

Diff: 2

Section: 2.6

170) What is the correct formula for lead(IV) chloride?

Answer: PbCl4

Diff: 2

Section: 2.6

171) What is the correct formula for calcium phosphate?

Answer: Ca3(PO4)2

Diff: 2

Section: 2.6

172) What is the correct formula for magnesium sulfate?

Answer: MgSO4

Diff: 2

Section: 2.6

173) What is the correct formula for sodium sulfide?

Answer: Na2S

Diff: 2

Section: 2.6

174) What is the correct formula for chromium(VI) oxide?

Answer: CrO3

Diff: 2

Section: 2.6

175) Predict the formula of the compound formed between chlorine and hydrogen.

Answer: HCl

Diff: 1

Section: 2.7

176) Predict the formula of the compound formed between sulfur and hydrogen.

Answer: H2S

Diff: 2

Section: 2.7

177) Hydrocarbons are organic compounds which have general formula \_\_\_\_\_\_\_\_.

Answer: CnH2n+2

Diff: 2

Section: 2.7

178) Write the formula of the alkane hydrocarbon with seven carbon atoms.

Answer: C7H16

Diff: 2

Section: 2.7

179) What is the name for the compound PBr3?

Answer: phosphorus tribromide

Diff: 1

Section: 2.8

180) What is the name for the compound Si3N4?

Answer: trisilicon tetranitride

Diff: 1

Section: 2.8

181) The name for As4S10 is \_\_\_\_\_\_\_\_.

Answer: tetraarsenic decasulfide

Diff: 2

Section: 2.8

182) What is the formula for dichlorine heptoxide?

Answer: Cl2O7

Diff: 2

Section: 2.8

183) The alkali metals like sodium and potassium are soft metals, so they are unreactive towards water.

Answer: FALSE

Diff: 2

Section: 2.1

184) The number of protons in the nucleus of an atom, determines the order of elements in the periodic table.

Answer: TRUE

Diff: 2

Section: 2.1

185) Due to their properties, and where they exist in nature, the group 2A metals are called the lanthanides.

Answer: FALSE

Diff: 2

Section: 2.1

186) Elements that are part of the actinides are all composed of radioactive gases.

Answer: FALSE

Diff: 2

Section: 2.1

187) Some of the nonmetals are solids at room temperature.

Answer: TRUE

Diff: 1

Section: 2.2

188) Metalloids are capable of conducting an electric current.

Answer: TRUE

Diff: 1

Section: 2.2

189) From left to right, across a row on the periodic table, there is a gradual change in properties from nonmetallic to metallic properties.

Answer: FALSE

Diff: 1

Section: 2.2

190) Metalloids tend to be malleable and ductile in nature.

Answer: FALSE

Diff: 1

Section: 2.2

191) The formula, N2, is used to represent elemental nitrogen.

Answer: TRUE

Diff: 1

Section: 2.3

192) When interpreting the formula, CO(NH2)2, it should be noted that the group of atoms within the parentheses occurs twice.

Answer: TRUE

Diff: 1

Section: 2.3

193) An important characteristic of a compound's formula is it specifies the atomic composition of the compound.

Answer: TRUE

Diff: 2

Section: 2.3

194) When iron and sulfur combine chemically, the properties of the resulting compound are similar to that of each of the elements.

Answer: FALSE

Diff: 1

Section: 2.4

195) Four molecules of the only product formed in the incomplete equation below are needed to ensure that the equation is balanced. P4O10 + 6H2O → ??

Answer: TRUE

Diff: 2

Section: 2.4

196) Ionic compounds are generally formed when metals react with nonmetals.

Answer: TRUE

Diff: 1

Section: 2.5

197) The phosphide ion has 18 electrons and 18 protons.

Answer: FALSE

Diff: 2

Section: 2.5

198) The subscripts in the formulas do not normally produce an electrically neutral formula unit in ionic compounds.

Answer: FALSE

Diff: 2

Section: 2.5

199) The name of MnCl3 is magnesium(III) chloride.

Answer: FALSE

Diff: 1

Section: 2.6

200) It is important to specify how many cations and anions are present in ionic compounds.

Answer: FALSE

Diff: 2

Section: 2.6

201) The formula for magnesium phosphide is Mg3P2.

Answer: TRUE

Diff: 2

Section: 2.6

202) As a general rule, molecular compounds are formed when nonmetallic elements combine.

Answer: TRUE

Diff: 1

Section: 2.7

203) The elements, carbon and oxygen, can combine to form only one compound.

Answer: FALSE

Diff: 1

Section: 2.7

204) Phosphorus can combine with hydrogen to form the compound, PH3.

Answer: TRUE

Diff: 1

Section: 2.7

205) The compound N2O4 is named nitrate tetraoxide.

Answer: FALSE

Diff: 1

Section: 2.8

206) The name for ZnBr2, is zirconium bromide.

Answer: FALSE

Diff: 1

Section: 2.8

207) A name for the compound P4Se10 is phosphorus(IV) selenium.

Answer: FALSE

Diff: 2

Section: 2.8

208) A name for CrBr2, is chromic bromide.

Answer: FALSE

Diff: 2

Section: 2.8

209) The name for RbClO4, is rubidium(I) perchlorate.

Answer: FALSE

Diff: 2

Section: 2.8

210) A name for Ni(OCl)2 is nickel(II) hypochlorite.

Answer: TRUE

Diff: 2

Section: 2.8

211) A name for the compound Mn(ClO4)2, is magnesium chlorate.

Answer: FALSE

Diff: 2

Section: 2.8

212) The name for K2Cr2O7, is potassium dichromium heptaoxide.

Answer: FALSE

Diff: 2

Section: 2.8

213) A compound is known to contain one C atom for each water molecule (H2O). If the compound has six carbon atoms, what is the general formula representing the compound?

Answer: C6H12O6

Diff: 2

Section: 2.3

214) How many silicon and oxygen atoms are in the formula, Ca3Mg5(Si4O11)2(OH)2?

A) 3 Si, 5 O

B) 8 Si, 24 O

C) 4 Si, 11 O

D) 2 Si, 2 O

E) 5 Si, 3 O

Answer: B

Diff: 2

Section: 2.3

215) What is the total number of atoms represented by the following formula?

Mg5Al(OH)8AlSi3O10

A) 36

B) 28

C) 8

D) 24

E) 42

Answer: A

Diff: 2

Section: 2.3

216) What is the total number of atoms represented by the following?

3Co(NO3)2·6H2O

A) 35

B) 28

C) 8

D) 81

E) 42

Answer: D

Diff: 2

Section: 2.3

217) Through analysis it was found that an unknown molecule contains 19.8 g of nitrogen for every 65.0 g of the molecule. How many grams of nitrogen would 1.35 grams of the molecule contain?

**Hint: Use the masses of the elements to find the ratio of the elements.**

A) 0.305 g

B) 3.28 g

C) 0.411 g

D) 0.0681 g

E) 0.226 g

Answer: C

Diff: 3

Section: 2.3

218) What is the total number of atoms reacting in the chemical reaction below?

2C6H14 + 19O2 → 12CO2 + 14H2O

A) 35

B) 82

C) 41

D) 78

E) 21

Answer: D

Diff: 2

Section: 2.4

219) How many hydrogen atoms are on the reactant side of the chemical equation below?

2(NH4)3PO4 + 3Ba(C2H3O2)2 → Ba3(PO4)2 + 6NH4C2H3O2

A) 35

B) 28

C) 8

D) 24

E) 42

Answer: E

Diff: 2

Section: 2.4

220) What single coefficient is needed on the water formula to balance the following chemical equation?

As2O3 + 6KI + 6HCl → 2AsI3 + 6KCl + H2O

A) 2

B) 3

C) 4

D) 5

E) 6

Answer: B

Diff: 2

Section: 2.4

221) What single coefficient is needed on the water formula to balance the following chemical equation?

C2H5OH + 3O2 → 2CO2 + H2O

A) 2

B) 3

C) 4

D) 5

E) 6

Answer: B

Diff: 2

Section: 2.4

222) Write the formula of the single product in the reaction below if its coefficient is 5.

3P4O10 + 2P4S10 → 5 ???

**Hint: Determine the necessary ratio of elements on the reactant side.**

A) P6O6S5

B) P4O6S4

C) P4O16S6

D) P8O3S8

E) P12O3S10

Answer: B

Diff: 3

Section: 2.4

223) Two elements, Qr and E, combine to form an ionic compound whose formula is QrE2. Qr also combines with element Z to form an ionic compound, Qr3Z2. Based on this information, what is a reasonable value for the charge on E? (Assume that Qr has the same charge in both compounds.)

**Hint: Consider the rules for forming ionic compounds to figure out what the possible charge is. Remember ionic compounds are neutral.**

A) 1+

B) 1

C) 2+

D) 2

E) 3

Answer: B

Diff: 3

Section: 2.5

224) Two elements, Qr and Z, combine to form an ionic compound containing simple ions whose formula is Qr2Z3. Calcium also combines with element Z to form an ionic compound containing simple ions whose formula is CaZ. Qr combines with a third element, E, to form an ionic compound containing simple ions whose formula is QrE3. Based on this information, what is a reasonable formula for the compound formed when magnesium combines with element E to form a simple ionic compound? (Assume that Qr has the same charge in both compounds.)

**Hint: Consider the rules for forming ionic compounds to figure out what the possible charge is. Remember ionic compounds are neutral.**

A) MgE

B) Mg2E

C) MgE2

D) Mg2E3

E) Mg3E2

Answer: C

Diff: 3

Section: 2.5

225) Vitellium phosphate has the formula, Vi3(PO4)2, while sodium nortonate has the formula, Na2NtO4. Which of the following would be the expected formula for vitellium nortonate? (Imaginary elements are used in this question.)

**Hint: Consider the rules for forming ionic compounds to figure out what the possible charge is. Remember ionic compounds are neutral.**

A) ViNtO4

B) Vi2NtO4

C) Vi(NtO4)2

D) Vi2(NtO4)3

E) Vi3(NtO4)2

Answer: A

Diff: 3

Section: 2.5

226) Engrium sulfate has the formula, En2(SO4)3, while sodium nortonite has the formula Na2NtO3. Based on these names and formulas, what would you expect for the formula of engrium nortonate? (Imaginary elements are used in this question.)

**Hint: Consider the rules for forming ionic compounds to figure out what the possible charge is. Remember ionic compounds are neutral.**

A) EnNtO4

B) En2NtO4

C) En(NtO4)2

D) En2(NtO4)3

E) En3(NtO4)2

Answer: D

Diff: 3

Section: 2.5

227) What is the name for the ionic compound CuH2CrO4?

A) copper(I) hydrogen chromate

B) copper(II) bichromic acid

C) copper hydrogen chromate tetraoxide

D) copper hydrogen sulfate

E) There is no known ionic compound with this formula.

Answer: E

Diff: 2

Section: 2.6

228) What is the formula for manganese(III) monohydrogen phosphate?

A) MnHO4

B) MnHPO4

C) MnHPO3

D) Mn2(HPO4)3

E) Mn3HPO4

Answer: D

Diff: 2

Section: 2.6

229) What is the formula for cobalt(III) dihydrogen phosphate?

A) Co3HPO4

B) Co2H(PO4)3

C) Co(H2PO4)

D) Co(H2PO4)3

E) CoH3PO4

Answer: D

Diff: 2

Section: 2.6

230) What are the likely formulas of three different hydrocarbons each with 12 hydrogen atoms?

A) C12H12; COH12 ; C5H12

B) C12H12; C7H12 ; CH12

C) C5H12; C6H12; C7H12

D) C12H12; C9H12 ; CH12

E) CH12; C12H12 ; C8H12

Answer: C

Diff: 2

Section: 2.7

231) What are the likely formulas of three different hydrocarbons each with 5 carbon atoms?

A) C5H2; C5H12 ; C5H14

B) C5H12; C5H10 ; C5H8

C) C5H12; C5H19; C5H11

D) C5H12; C5H19 ; C5H30

E) C5H3; C5H12 ; C5H22

Answer: B

Diff: 2

Section: 2.7

232) Starting with the hydrocarbon, C6H14, what is the most likely formula of the alcohol formed from this hydrocarbon?

A) C6H15(OH)2

B) C6HOH

C) C5H14OH

D) C6H13OH

E) C5H12OH

Answer: D

Diff: 2

Section: 2.7

233) What is the most likely name for BrF?

A) bromine monofluoride

B) bromine fluorine

C) monobromide fluoride

D) bromine difluorine

E) bromide fluorine

Answer: A

Diff: 2

Section: 2.8

234) What is the best name for the I2O5 molecule?

A) diiodine pentoxide

B) iodine pentoxygen

C) pentoxygen iodide

D) iodine dioxide

E) diiodide oxide

Answer: A

Diff: 2

Section: 2.8

235) What is the most likely name for IF7?

A) diiodine pentafluoride

B) iodine heptafluoride

C) pentafluorine iodide

D) iodine fluoride

E) diiodide hexafluoride

Answer: B

Diff: 2

Section: 2.8

236) What is the formula for the compound named hydrogen sulfide?

Answer: H2S

Diff: 2

Section: 2.8

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