Test Bank for Chemistry 11th Edition by Chang ISBN 007766695X 9780077666958

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Chapter 2: Atoms, Molecules, and Ions

A peri

erio	odic table is required to work many	of the problems	s in this chapter.
1.	In a cathode ray tube A) electrons pass from the anod B) electrons pass from the cathod C) protons pass from the anode D) protons pass from the cathod Ans: B Category: Medium S	ode to the anode to the cathode. le to the anode.	
2.	The scientist who determined the r A) John Dalton. B) Robert Millikan. C) J. J. Thomson. Ans: B Category: Easy Section	D) E)	e electric charge of the electron was Henry Moseley. R. Chang.
3.	he measure?		t physical property of the electron did
	 A) its charge, e B) its charge-to-mass ratio, e/m C) its temperature, T Ans: B Category: Easy Section 		its mass, m its atomic number, Z
4.	 Which of the following scientists of A) John Dalton B) Robert Millikan C) J. J. Thomson Ans: E Category: Easy Section 	D) E)	uclear model of the atom? Henry Moseley Ernest Rutherford
5.	Rutherford's experiment with alpha A) protons are not evenly distrib	-	

electrons have a negative charge. electrons have a positive charge.

B)

C)

D)	atoms are made of protons, neutrons, and electrons.				

E) protons are 1840 times heavier than electrons.

Ans: A Category: Medium Section: 2.2

6. Atoms of the same element with different mass numbers are called

A) ions. B) neutrons. C) allotropes. D) chemical families. E) isotopes.

Ans: E Category: Easy Section: 2.3

7.	An at electr			sotope	¹³⁷ Ba co	onsists o	f how mar	ny protons (p	o), neutrons ((n), and
	A)	56	p, 137 r	ı, 56 e			D)	56 p, 56 n	, 56 e	
			p, 81 n,				E)	-		
			7 p, 81 r				,	1,	,	
			-		Medium	Section	on: 2.3			
8.	Give	the	number	of pro	otons (p)	, neutroi	ns (n), and	electrons (e	e) in one ator	n of ²³⁸ U.
	A)		6 p, 92 r				D)	146 p, 28	n, 146 e	
	B)	92	p, 92 n,	92 e			E)	238 p, 146	5 n, 238 e	
	C)	92	p, 146 r	ı, 92e						
	Ans:	C	Catego	ory: N	Medium	Section	on: 2.3			
9.	Whic	ch o	f the foll	owing	g are isot	opes?				
	A)		C and ^{13}C				D)	12 C and 12		
	B)		$^{\circ}$ and 14 N				E)	14 N and 14	N_2	
	C)	14 N	14 N and 14 N	$\sqrt{3}$						
	Ans:	A	Categ	ory: I	Easy S	ection: 2	2.3			
10.	Com	plet	e the fol	lowing	g chart, i	n order i	from left t	o right		
			Isoto		Mass Nu	ımber	Protons	Neutrons	Electrons	
			¹⁴ N	1						
		1.4			•		D)	7 14 7 7		1
			, 7, 7, 7	-			D)			
	,		, 7, 14, 7	/			E)	Some other	er answer	
	C)	,	7, 7, 7		e 1:	a	2.2			
	Ans:	A	Categ	ory: N	Medium	Section	on: 2.3			
11.	Com	plet	e the fol				from left to			
			Isoto	pe	Mass Ni		Protons	Neutrons	Electrons	
					4	-0	19		19	
	A) 40	⁰ Zr,	21 B)	¹⁹ K,	40 C)	²¹ K, 19	D) ⁴⁰ K,	21 E) ³⁸ S ₁	r, 19	

12. Complete the following chart, in order from left to right

Ans: D Category: Medium Section: 2.3

-		<u> </u>				
	Isotope	Mass Number	Protons	Neutrons	Electrons	
Ī			40	57	40	

A) 97 Zr, 97 B) 40 Zr, 57 C) 57 La, 40 D) 97 Bk, 80 E) 80 Hg, 97 Ans: A Category: Medium Section: 2.3

13. Complete the following chart, in order from left to right

Ion	Mass Number	Protons	Neutrons	Electrons
$^{40}\text{Ca}^{2+}$				

A) 40, 20, 20, 20

D) 40, 20, 20, 22

B) 40, 20, 20, 18

E) 20, 40, 20, 22

C) 20, 20, 40, 20

Ans: B Category: Medium Section: 2.3

14. Complete the following chart, in order from left to right

T	N / N / 1	D 4	T14	
lon	Mass Number	Protons	neutrons	Electrons
	4	2		0

A) ⁴He, 2 B) ⁴Be, 4 C) ⁴Be, 2 D) ⁴He, 4 E) ²H, 2

Ans: A Category: Medium Section: 2.3

- 15. The elements in a column of the periodic table are known as
 - A) metalloids. B) a period. C) noble gases. D) a group. E) nonmetals.

Ans: D Category: Easy Section: 2.4

16. Which of the following elements is most likely to be a good conductor of electricity?

A) N B) S C) He D) Cl E) Fe

Ans: E Category: Easy Section: 2.4

17. Which of the following elements is chemically similar to magnesium?

A) sulfur B) calcium C) iron D) nickel E) potassium

Ans: B Category: Easy Section: 2.4

18. Which of the following elements is chemically similar to oxygen?

A) sulfur B) calcium C) iron D) nickel E) sodium

Ans: A Category: Easy Section: 2.4

19. Which of the following elements is chemically similar to potassium?

A) calcium B) arsenic C) phosphorus D) cerium E) cesium

Ans: E Category: Easy Section: 2.4

- 20. An *anion* is defined as
 - A) a charged atom or group of atoms with a net negative charge.
 - B) a stable atom.
 - C) a group of stable atoms.
 - D) an atom or group of atoms with a net positive charge.

Ans: A Category: Easy Section: 2.5

21.	Which one of the following is an ion? A) B ³⁺ B) NaCl C) He D) ¹⁴ C E) Ans: A Category: Easy Section: 2.5	none o	f the above
22.	Which one of the following elements is mo A) calcium B) carbon C) fluorine D Ans: A Category: Easy Section: 2.5		-
23.	Which one of the following elements is mo A) scandium B) selenium C) silicon Ans: B Category: Easy Section: 2.5		
24.	 A magnesium ion, Mg²⁺, has A) 12 protons and 13 electrons. B) 24 protons and 26 electrons. C) 12 protons and 10 electrons. Ans: C Category: Medium Section: 2 	D) E)	1
25.	An aluminum ion, Al ³⁺ , has: A) 13 protons and 13 electrons B) 27 protons and 24 electrons C) 16 protons and 13 electrons Ans: D Category: Medium Section: 2	D) E)	13 protons and 10 electrons 10 protons and 13 electrons
26.	An oxide ion, O ²⁻ , has: A) 8 protons and 10 electrons B) 10 protons and 8 electrons C) 8 protons and 9 electrons Ans: A Category: Medium Section:	E)	8 protons and 7 electrons 10 protons and 7 electrons
27.	A phosphide ion has: A) 10 protons and 13 electrons B) 12 protons and 15 electrons C) 15 protons and 15 electrons Ans: D Category: Medium Section: 2	E)	15 protons and 18 electrons 18 protons and 21 electrons
28.	An iron(II) ion has: A) 24 electrons and a charge of 2+ B) 24 electrons and a charge of 2- C) 26 electrons and a charge of 2+ Ans: A Category: Medium Section: 2	D) E)	<u>e</u>
29.	How many protons and electrons are preser A) 35 p, 35 e B) 80 p, 81 e C) 35 p, 3 Ans: D Category: Medium Section: 2	4 e - E	

30.	What are the two different ions present in the compound CaS? A) Ca ⁺ , S ⁻ B) Ca ²⁻ , S ²⁺ C) Ca ⁻ , S ⁺ D) Ca ²⁺ , S ²⁻ E) Ca, S Ans: D Category: Medium Section: 2.6
31.	What are the two different ions present in the compound Na ₂ S? A) Na ₂ ⁺ , S ²⁻ B) Na ⁺ , S ²⁻ C) Na ²⁺ , S ²⁻ D) Na ⁺ , S ⁻ E) Na ²⁺ , S ⁻ Ans: B Category: Medium Section: 2.6
32.	What are the two different ions present in the compound Li ₃ N? A) Li ⁺ , N ³⁻ B) Li ₃ ⁺ , N ⁻ C) Li ₃ ³⁺ , N ³⁻ D) Li ⁺ , N ⁻ E) Li ³⁺ , N ³⁻ Ans: A Category: Medium Section: 2.6
33.	What are the two different ions present in the compound FeCl ₃ ? A) Fe ²⁺ , Cl ₃ B) Fe ³⁺ , Cl ³⁻ C) Fe ⁺ , Cl ⁻ D) Fe ³⁺ , Cl ⁻ E) Fe ⁺ , Cl ⁻ Ans: D Category: Medium Section: 2.6
34.	What are the ions present in the compound CO_2 ? A) C^{4+} , $2 O^{2-}$ B) C^{2+} , $2 O^{-}$ C) C^{2+} , O^{2-} D) C^{2+} , O_2^{2-} E) no ions present Ans: E Category: Medium Section: 2.6
35.	What are the ions present in the compound CH ₄ ? A) C ⁴⁺ , H ⁺ B) C ⁴⁻ , H ⁺ C) C ⁻ , H ⁺ D) C ⁴⁻ H ⁴⁺ E) no ions present Ans: E Category: Medium Section: 2.6
36.	Which of the following is an example of an empirical formula? A) C_9H_{12} B) $C_9H_{18}Cl_2$ C) C_6H_6 D) N_2O_4 E) $C_2H_2O_2$ Ans: B Category: Medium Section: 2.6
37.	What is the empirical formula for $C_{10}H_{22}O_2$? A) $C_{10}H_{22}O_2$ B) $C_5H_{11}O$ C) $C_{20}H_{44}O_4$ D) $C_2H_{11}O$ E) $C_5H_{11}O_2$ Ans: B Category: Medium Section: 2.6
38.	What is the empirical formula for $C_6H_{14}O$? A) $C_6H_{14}O$ B) C_3H_7O C) C_2H_7O D) $C_{12}H_{28}O_2$ E) CHO Ans: A Category: Medium Section: 2.6
39.	What is the ion ClO ₄ ⁻ named? A) chloride ion B) chlorite ion C) hypochlorite ion Ans: E Category: Medium Section: 2.7
40.	What is the formula for the ionic compound containing calcium ions and nitrate ions? A) Ca_3N_2 B) $Ca(NO_3)_2$ C) Ca_2NO_3 D) Ca_2NO_2 E) $CaNO_3$ Ans: B Category: Medium Section: 2.7

4	 What is the formula for the ionic compound containing calcium ions and oxide ions? A) CaO B) Ca₂O C) CaO₂ D) Ca₃O E) CaO₃ Ans: A Category: Medium Section: 2.7
4	2. What is the formula for the ionic compound containing iron (III) ions and iodide ions? A) FeI B) Fe ₂ I C) FeI ₂ D) FeI ₃ E) Fe ₃ I Ans: D Category: Medium Section: 2.7
4	3. What is the formula for the ionic compound containing sodium ions and nitride ions? A) NaN B) Na ₂ N C) NNa ₂ D) Na ₃ N E) NNa ₃ Ans: D Category: Medium Section: 2.7
4	4. What is the formula for the ionic compound containing barium ions and sulfate ions? A) BaSO ₄ B) Ba ₂ SO ₄ C) BaS D) Ba(SO ₄) ₂ E) Ba ₃ S ₂ Ans: A Category: Medium Section: 2.7
4	5. What are the two different ions present in the compound Al(NO ₃) ₃ ? A) Al ³⁺ , (NO ₃) ₃ D) Al ³⁺ , NO ₃ ³⁻ B) Al ⁺ , NO ₃ E) Al ⁺ , (NO ₃) ₃ C) Al ³⁺ , NO ₃ E) Al ⁺ , (NO ₃) ₃ Ans: C Category: Medium Section: 2.7
4	6. What are the two different ions present in the compound NH ₄ NO ₃ ? A) NH ₄ ⁻ , NO ₃ ⁺ B) NH ₄ ⁺ , NO ₃ ⁻ C) N ³⁻ , H ⁺ , O ²⁻ Ans: B Category: Medium Section: 2.7
4	7. Which is the correct formula for iron(II) phosphate? A) Fe ₂ PO ₄ B) Fe ₃ (PO ₄) ₂ C) Fe ₂ PO ₃ D) Fe(PO ₄) ₂ E) Fe(PO ₃) ₂ Ans: B Category: Medium Section: 2.7
4	8. Which of the following is the formula for hydroiodic acid? A) HIO ₄ B) HIO ₃ C) HIO ₂ D) HIO E) HI Ans: E Category: Medium Section: 2.7
4	9. The formula for calcium phosphate is A) CaPO ₄ . B) Ca ₃ (PO ₄) ₂ . C) Ca ₂ (PO ₄) ₃ . D) Ca ₃ P ₂ . E) Ca ₃ (PO ₃) ₂ . Ans: B Category: Medium Section: 2.7
5	0. The formula for magnesium sulfate is A) MnS B) MgS C) MnSO ₃ D) MgSO ₄ E) MgSO ₃ Ans: D Category: Medium Section: 2.7

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51. The formula for sodium sulfide is
    A) NaS. B) K<sub>2</sub>S. C) NaS<sub>2</sub>. D) Na<sub>2</sub>S. E) SeS.
    Ans: D
               Category: Medium
                                      Section: 2.7
52. The name for NH<sub>4</sub>NO<sub>3</sub> is
          ammonium nitrate.
                                                        hydrogen nitrogen oxide.
    A)
                                                  D)
    B)
          ammonium nitrogen trioxide.
                                                  E)
                                                        hydrogen nitrate.
    C)
          ammonia nitrogen oxide.
    Ans: A
               Category: Medium
                                      Section: 2.7
53. The name for Ba(OH)_2 is
          barium hydrogen oxide.
                                                  D)
                                                        beryllium hydroxide.
    A)
    B)
          boron hydroxide.
                                                  E)
                                                        barium hydroxide.
    C)
          barium hydrate.
    Ans: E
              Category: Medium
                                      Section: 2.7
54. The name for KHCO<sub>3</sub> is
          calcium bicarbonate.
    A)
                                                  D)
                                                        calcium hydrogen carbon trioxide.
    B)
          calcium carbonate.
                                                  E)
                                                        potassium hydrogen carbonate.
    C)
          potassium carbonate.
    Ans: E
              Category: Medium
                                      Section: 2.7
55. The name for CuSO<sub>4</sub>·5H<sub>2</sub>O is
          copper sulfate acid.
    A)
                                                  D)
                                                        copper(II) sulfate pentahydrate.
    B)
          copper sulfate pentahydrate.
                                                  E)
                                                        copper(V) sulfate hydrate.
          copper(II) sulfate acid.
    Ans: D Category: Medium
                                      Section: 2.7
56. Give the formula for cobalt(II) chlorate dihydrate
          CoCl_2 \cdot 2H_2O
                                                        Co(ClO_3)_2 \cdot 2H_2O
                                                  D)
    A)
          CoClO_3(H_2O)_2
                                                  E)
                                                        Co_2(ClO_3)_3 \cdot 2H_2O
    B)
          Co(ClO_3)_2(H_2O)_2
    C)
    Ans: D Category: Medium
                                      Section: 2.7
57. Name the compound Co(NO_3)_2
          Cobalt (I) nitrate
                                                        Cobalt nitrite
    A)
                                                  D)
    B)
          Cobalt (II) nitrate
                                                  E)
                                                        Cobalt (II) nitride
    C)
          Cobalt (I) nitride
               Category: Medium
                                      Section: 2.7
    Ans: B
58. Name the compound CuSO<sub>4</sub>
    A)
          Copper (I) sulfate
                                                  D)
                                                        Copper (II) sulfate
    B)
          Copper (I) sulfite
                                                  E)
                                                        Copper (IV) sulfate
          Copper (II) sulfite
    C)
               Category: Medium
                                      Section: 2.7
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59.	Name the compound Al ₂ O ₃ A) Aluminum oxide D) Aluminum trioxide B) Aluminum (II) oxide E) Aluminum (I) oxide C) Dialuminum trioxide Ans: A Category: Medium Section: 2.7
60.	Which is the formula for lead(IV) chloride? A) Pb ₄ Cl B) PbCl ₂ C) PbCl ₃ D) PbCl ₄ E) Pb ₂ Cl ₄ Ans: D Category: Medium Section: 2.7
61.	What type of compound is Mg(NO ₃) ₂ ? A) Ionic B) Molecular C) Acid D) Base E) Hydrate Ans: A Category: Medium Section: 2.7
62.	What type of compound is NH ₄ NO ₃ A) Ionic B) Molecular C) Acid D) Base E) Hydrate Ans: A Category: Medium Section: 2.7
63.	What type of compound is IF ₅ ? A) Ionic B) Molecular C) Acid D) Base E) Hydrate Ans: B Category: Medium Section: 2.7
64.	What type of compound is HBrO ₂ ? A) Ionic B) Binary C) Acid D) Base E) Hydrate Ans: C Category: Medium Section: 2.7
65.	What type of compound is NaOH? A) Binary B) Molecular C) Acid D) Base E) Hydrate Ans: D Category: Medium Section: 2.7
66.	What type of compound is H ₂ SO ₃ ? A) Ionic B) Binary C) Acid D) Base E) Hydrate Ans: C Category: Medium Section: 2.7
67.	What type of compound is NH ₃ ? A) Ionic B) Ternary C) Acid D) Base E) Hydrate Ans: D Category: Medium Section: 2.7
68.	Name the acid H ₃ PO ₄ (dissolved in water). A) Phosphoric acid D) Hydrophosphate acid B) Phosphorous acid E) Hydrophosphoric acid C) Hydrogen phosphate acid Ans: A Category: Medium Section: 2.7

69. Name the acid H ₂ SO ₃ (dissolved A) Sulfuric acid B) Sulfurous acid C) Hydrosulfuric acid Ans: B Category: Medium	D) Persulfuric acidE) Hyposulfurous acid
70. The chemical formula for iron(l A) Fe ₂ (NO ₃) ₃ B) Ir(NO ₂) ₂ Ans: D Category: Medium	C) Fe_2N_3 D) $Fe(NO_3)_2$ E) $Fe(NO_2)_2$
 71. Name the compound Co₂(SO₃)₃ A) cobalt sulfate B) cobalt(II) sulfate C) cobalt(II) sulfate Ans: D Category: Medium 	D) cobalt(III) sulfiteE) cobalt(III) sulfate
72. Name the compound CrO ₃ . A) chromium oxide B) chromium(II) oxide C) chromium(III) trioxide Ans: E Category: Medium	D) chromium(III) oxide E) chromium(VI) oxide Section: 2.7
 73. Name the compound Cl₂O₅ A) chlorine pentoxide B) dichlorine pentoxygen C) dichlorine pentoxide Ans: C Category: Medium 	D) chloride oxide E) dichloride pentoxide Section: 2.7
 74. Name the compound N₂O₄ A) nitrous oxide B) dinitrogen pentoxide C) nitrogen oxide Ans: D Category: Medium 	D) dinitrogen tetroxide E) nitrogen tetroxide Section: 2.7
 75. Name the compound NO₂ A) mononitrogen dioxygen B) nitrogen dioxide C) dinitrogen monoxide Ans: B Category: Medium 	D) nitrogen oxide E) nitrite Section: 2.7
76. Name the compounds SO₃A) sulfur trioxide B) sulfateAns: A Category: Medium	C) sulfite D) sulfur trioxygen E) sulfur oxide Section: 2.7

77. The straight chain hydrocarbon that contains six carbon atoms is

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

Ans: D Category: Medium Section: 2.8

78. What is the law of conservation of mass?

Ans: Matter can be neither created nor destroyed.

Category: Easy Section: 2.1

79. Describe the contributions of Marie Curie.

Ans: (note that answers will vary) Marie Curie discovered two new elements, and is one of three people to win two Nobel Prizes. She also suggested the term

"radioactivity" to describe the spontaneous emission of particles and/or radiation.

Category: Easy Section: 2.2

80. What are the three types of radiation that can be produced by the decay of radioactive substances like uranium?

Ans: Alpha, beta, and gamma radiation

Category: Easy Section: 2.2

81. Marie Curie suggested the name "radioactivity" to describe the spontaneous emission of particles and/or radiation.

Ans: True Category: Easy Section: 2.2

82. Using a cathode ray tube, J. J. Thomson determined the magnitude of the electric charge on the electron.

Ans: False Category: Easy Section: 2.2

83. When a beam of alpha particles passes between two electrically charged plates, the beam is deflected toward the positive plate.

Ans: False Category: Medium Section: 2.2

84. The proton is about 1840 times heavier than the electron.

Ans: True Category: Easy Section: 2.2

85. How many electrons, protons, and neutrons does an iron-55 atom have?

Ans: 26 electrons, 26 protons, and 29 neutrons

Category: Medium Section: 2.3

86. How many protons are there in one atom of nickel?

Ans: 28

Category: Easy Section: 2.3

87. How many protons are there in one atom of magnesium?

Ans: 12

Category: Easy Section: 2.3

88. How many protons are there in one atom of xenon?

Ans: 54

Category: Easy Section: 2.3

89. Almost all the mass of an atom is concentrated in the nucleus.

Ans: True Category: Easy Section: 2.3

90. The atomic number is equal to the number of protons in the nucleus of each atom of an element.

Ans: True Category: Easy Section: 2.3

91. The number of neutrons in all atoms of an element is the same.

Ans: False Category: Medium Section: 2.3

92. How many protons are there in one atom of uranium?

Ans: 92

Category: Easy Section: 2.3

93. What are *isotopes*?

Ans: Atoms of the same element that have the same atomic number but different mass numbers.

Category: Easy Section: 2.3

94. The table below describes four atoms.

	Atom A	Atom B	Atom C	Atom D
Number of protons	79	80	80	79
Number of neutrons	118	120	118	120
Number of electrons	79	80	80	79

Which atoms represent the same element?

Ans: Atoms A and D represent the same element, and atoms B and C represent the same element.

Category: Medium Section: 2.3

95. Consider a neutral atom of the following isotope of sulfur:

 $^{34}_{16}S$

How many electrons, protons, and neutrons does the atom contain?

Ans: 16 electrons, 16 protons, and 18 neutrons

96. How many electrons, protons, and neutrons are in a neutral atom of the following isotope of calcium?

$$^{44}_{20}$$
Ca

Ans: 20 electrons, 20 protons, and 24 neutrons

Category: Medium Section: 2.3

97. How many electrons, protons, and neutrons are in a neutral atom of the following isotope of krypton?

$$^{84}_{36}$$
Kr

Ans: 36 electrons, 36 protons, and 48 neutrons

Category: Medium Section: 2.3

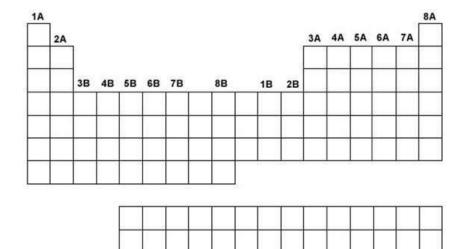
98. How many electrons, protons, and neutrons are in a neutral atom of the following isotope of gadolinium?

$$^{160}_{64}{
m Gd}$$

Ans: 64 electrons, 64 protons, and 96 neutrons

Category: Medium Section: 2.3

Use the following to answer questions 99-102:



99. Use the periodic table above to show where the alkali metals are located.

Ans: Group 1A or Group 1 Category: Easy Section: 2.4

100. Use the periodic table above to show where the alkaline earth metals are located.

Ans: Group 2A or Group 2 Category: Easy Section: 2.4 101. Use the periodic table above to show where the halogen elements are located.

Ans: Group 7A or Group 17 Category: Easy Section: 2.4

102. Use the periodic table above to show where the noble gases are located.

Ans: Group 8A or Group 18 Category: Easy Section: 2.4

103. The elements known as the halogens are useful as disinfectants. Name two halogens.

Ans: (two of these) fluorine, chlorine, bromine, iodine

Category: Easy Section: 2.4

104. Define the term *molecule*.

Ans: A molecule is an aggregate of at least two atoms in a definite arrangement held together by chemical forces.

Category: Easy Section: 2.5

105. What are the seven elements that naturally occur as diatomic molecules?

Ans: Hydrogen, nitrogen, oxygen, fluorine, chlorine, bromine, iodine

Category: Medium Section: 2.5

106. Define ion.

Ans: An ion is an atom or group of atoms that has a net positive or negative charge.

Category: Easy Section: 2.5

107. A molecule of antifreeze, ethylene glycol, has the formula C₂H₄(OH)₂. How many atoms are there in one molecule of antifreeze?

Ans: 10

Category: Easy Section: 2.5

108. How many carbon atoms are in one molecule of CH₃(CH₂)₃CH₃?

Ans: 5

Category: Easy Section: 2.5

109. How many hydrogen atoms are in one molecule of CH₃(CH₂)₃CH₃?

Ans: 12

Category: Easy Section: 2.5

110. The formula for isopropyl alcohol is sometimes written as (CH₃)₂CHOH to better indicate how the atoms are connected. How many hydrogen atoms would be contained in 3 dozen isopropyl alcohol molecules?

Ans: 288

111. Define allotrope.

Ans: An allotrope is one of the two or more distinct forms of an element.

Category: Easy Section: 2.6

112. An empirical formula tell us which elements are present in a compound and gives us the simplest, whole-number ratio of the atoms of these elements in the compound.

Ans: True Category: Easy Section: 2.6

113. Give the formula for potassium oxide.

Ans: K₂O

Category: Medium Section: 2.7

114. Give the formula for magnesium chloride.

Ans: MgCl₂

Category: Medium Section: 2.7

115. Give the formula for carbon disulfide.

Ans: CS₂

Category: Medium Section: 2.7

116. Give the formula for potassium hydroxide.

Ans: KOH

Category: Medium Section: 2.7

117. Give the formula for nickel(II) sulfite.

Ans: NiSO₃

Category: Medium Section: 2.7

118. Name the following binary compound: FeS.

Ans: iron(II) sulfide or ferrous sulfide

Category: Medium Section: 2.7

119. Name the following binary compound: NaH.

Ans: sodium hydride

Category: Medium Section: 2.7

120. Name the following binary compound: MnCl₂.

Ans: manganese(II) chloride or manganous chloride

Category: Medium Section: 2.7

121. Name the following binary compound: Fe₂O₃.

Ans: iron(III) oxide (or ferric oxide)

122. Name the following compound: CuCO₃.

Ans: copper(II) carbonate or cupric carbonate
Category: Medium Section: 2.7

123. Name the following compound: K₃PO₄.

Ans: potassium phosphate

Category: Medium Section: 2.7

124. Name the following compound: $Al(NO_2)_2$.

Ans: aluminum nitrite

Category: Medium Section: 2.7

125. Name the following compound: Cl₂O₇.

Ans: dichlorine heptoxide

Category: Medium Section: 2.7

126. Give the formula of magnesium nitrate.

Ans: $Mg(NO_3)_2$

Category: Medium Section: 2.7

127. Give the formula of calcium phosphate.

Ans: $Ca_3(PO_4)_2$

Category: Medium Section: 2.7

128. Give the formula of iron(II) phosphate.

Ans: $Fe_3(PO_4)_2$

Category: Medium Section: 2.7

129. Give the formula of copper(II) bromide.

Ans: CuBr₂

Category: Medium Section: 2.7

130. Give the formula of ammonium sulfate.

Ans: $(NH_4)_2SO_4$

Category: Medium Section: 2.7

131. Give the formula of hydrochloric acid.

Ans: HCl

Category: Medium Section: 2.7

132. Give the formula of carbonic acid.

Ans: H₂CO₃

133. Give the formula of nitrous acid.

Ans: HNO₂

Category: Medium Section: 2.7

134. Give the formula of sulfuric acid.

Ans: H₂SO₄

Category: Medium Section: 2.7

135. Name the following: HF.

Ans: hydrofluoric acid

Category: Medium Section: 2.7

136. Name the following H₃PO₃

Ans: phosphorous acid

Category: Medium Section: 2.7

137. Write the formula of ammonia.

Ans: NH₃

Category: Medium Section: 2.7

138. Write the formula of lead(II) chloride.

Ans: PbCl₂

Category: Medium Section: 2.7

139. Write the formula of calcium carbonate.

Ans: CaCO₃

Category: Medium Section: 2.7

140. Write the formula of an anion that contains a metal.

Ans: CrO₄² or Cr₂O₇² or MnO₄ Category: Medium Section: 2.7

141. Write the formula of a cation that contains a nonmetal.

Ans: NH4⁺

Category: Medium Section: 2.7

142. Give an example of an anion that contains a metal and write the name.

Ans: chromate or dichromate or permanganate

Category: Medium Section: 2.7

143. What is the nitride ion, nitrate ion, and nitrite ion, in that order?

Ans: N^{3-} , NO_{3-} , and NO_{2-}

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144. What is the sulfide ion, sulfate ion, and sulfite ion, in that order?

Ans: S²-, SO₄²-, SO ²-

Category: Medium Section: 2.7

145. What is the chloride ion, chlorate ion, and perchlorate ion, in that order?

Ans: Cl⁻, ClO₃⁻, and ClO₄⁻

Category: Medium Section: 2.7

146. What is chloric acid, chlorous acid, and hypochlorous acid, in that order?

Ans: HClO₃, HClO₂, HClO

Category: Medium Section: 2.7

147. What is ammonia and ammonium ion, in that order?

Ans: NH₃, NH₄⁺

Category: Medium Section: 2.7

148. What is the formula for dinitrogen monoxide?

Ans: N₂O

Category: Medium Section: 2.7

149. What is the formula for dibromine heptoxide?

Ans: Br₂O₇

Category: Medium Section: 2.7

150. What is the formula for xenon difluoride?

Ans: XeF₂

Category: Medium Section: 2.7

151. What is the formula for xenon hexafluoride?

Ans: XeF₆

Category: Medium Section: 2.7

152. What is the formula for the compound hydrogen peroxide

Ans: H₂O₂

Category: Medium Section: 2.7

153. Name the compound CH₃CH₂OH

Ans: Ethanol

Category: Medium Section: 2.8

154. Name the compound CH₃CH₂NH₂

Ans: Ethylamine

155. What is the formula for octane?

Ans: C₈H₁₈

Category: Medium Section: 2.8

156. What is the formula for nonane?

Ans: C₉H₂₀