

Chemistry Final Exam Review

Multiple Choice

Identify the letter of the choice that best completes the statement or answers the question.

- ___ 1. The study of chemicals that, in general, do not contain carbon is traditionally called what type of chemistry?
a. bio
b. inorganic
c. physical
d. analytical
- ___ 2. Which of the following is NOT an example of matter?
a. air
b. heat
c. smoke
d. water vapor
- ___ 3. A golf ball has more mass than a tennis ball because it _____.
a. takes up more space
b. contains more matter
c. contains different kinds of matter
d. has a definite composition
- ___ 4. An example of an extensive property of matter is _____.
a. temperature
b. pressure
c. mass
d. hardness
- ___ 5. All of the following are physical properties of matter EXCEPT _____.
a. mass
b. color
c. melting point
d. ability to rust
- ___ 6. Which state of matter has a definite volume and takes the shape of its container?
a. solid
b. liquid
c. gas
d. both b and c
- ___ 7. Which of the following CANNOT be classified as a substance?
a. table salt
b. air
c. nitrogen
d. gold
- ___ 8. Which of the following is a heterogeneous mixture?
a. air
b. salt water
c. steel
d. soil
- ___ 9. Which of the following is a heterogeneous mixture?
a. vinegar in water
b. milk
c. oil and vinegar
d. air
- ___ 10. Separating a solid from a liquid by evaporating the liquid is called _____.
a. filtration
b. condensation
c. solution
d. distillation
- ___ 11. A substance that can be separated into two or more substances only by a chemical change is a(n) _____.
a. solution
b. element
c. mixture
d. compound
- ___ 12. The chemical symbol for iron is _____.
a. fe
b. FE
c. Fe
d. Ir

- ___ 13. Which of the following is a chemical property?
- color
 - hardness
 - freezing point
 - ability to react with oxygen
- ___ 14. Which of the following is NOT a physical change?
- grating cheese
 - melting cheese
 - fermenting of cheese
 - mixing two cheeses in a bowl
- ___ 15. Which of the following does NOT involve a physical change?
- mixing
 - melting
 - grinding
 - decomposing
- ___ 16. A chemical change occurs when a piece of wood ____.
- is split
 - is painted
 - decays
 - is cut
- ___ 17. When an iron nail is ground into powder, its mass ____.
- stays the same
 - decreases
 - increases
 - cannot be determined
- ___ 18. The expression of 5008 km in scientific notation is ____.
- 5.008×10^{-4} km
 - 50.08×10^{-4} km
 - 5.008×10^{-3} km
 - 5.008×10^{-4} km
- ___ 19. The closeness of a measurement to its true value is a measure of its ____.
- precision
 - accuracy
 - reproducibility
 - usefulness
- ___ 20. If the temperature changes by 100 K, by how much does it change in °C?
- 0°C
 - 37°C
 - 100°C
 - 273°C
- ___ 21. What is the density of an object having a mass of 8.0 g and a volume of 25 cm³ ?
- 0.32 g/cm³
 - 2.0 g/cm
 - 3.1 g/cm³
 - 200 g/cm
- ___ 22. As the density of a substance increases, the volume of a given mass of that substance ____.
- increases
 - is not affected
 - decreases
 - fluctuates
- ___ 23. The smallest particle of an element that retains the properties of that element is a(n) ____.
- atom
 - electron
 - proton
 - neutron
- ___ 24. Which of the following is NOT a part of Dalton's atomic theory?
- All elements are composed of atoms.
 - Atoms are always in motion.
 - Atoms of the same element are identical.
 - Atoms that combine do so in simple whole-number ratios.

- ___ 25. Which of the following is true about subatomic particles?
- Electrons are negatively charged and are the heaviest subatomic particle.
 - Protons are positively charged and the lightest subatomic particle.
 - Neutrons have no charge and are the lightest subatomic particle.
 - The mass of a neutron nearly equals the mass of a proton.
- ___ 26. All atoms are ____.
- positively charged, with the number of protons exceeding the number of electrons
 - negatively charged, with the number of electrons exceeding the number of protons
 - neutral, with the number of protons equaling the number of electrons
 - neutral, with the number of protons equaling the number of electrons, which is equal to the number of neutrons
- ___ 27. The particles that are found in the nucleus of an atom are ____.
- neutrons and electrons
 - electrons only
 - protons and neutrons
 - protons and electrons
- ___ 28. As a consequence of the discovery of the nucleus by Rutherford, which model of the atom is thought to be true?
- Protons, electrons, and neutrons are evenly distributed throughout the volume of the atom.
 - The nucleus is made of protons, electrons, and neutrons.
 - Electrons are distributed around the nucleus and occupy almost all the volume of the atom.
 - The nucleus is made of electrons and protons.
- ___ 29. The nucleus of an atom is ____.
- the central core and is composed of protons and neutrons
 - positively charged and has more protons than neutrons
 - negatively charged and has a high density
 - negatively charged and has a low density
- ___ 30. The atomic number of an element is the total number of which particles in the nucleus?
- neutrons
 - protons
 - electrons
 - protons and electrons
- ___ 31. An element has an atomic number of 76. The number of protons and electrons in a neutral atom of the element are ____.
- 152 protons and 76 electrons
 - 76 protons and 0 electrons
 - 38 protons and 38 electrons
 - 76 protons and 76 electrons
- ___ 32. The sum of the protons and neutrons in an atom equals the ____.
- atomic number
 - nucleus number
 - atomic mass
 - mass number
- ___ 33. What does the number 84 in the name krypton-84 represent?
- the atomic number
 - the mass number
 - the sum of the protons and electrons
 - twice the number of protons
- ___ 34. All atoms of the same element have the same ____.
- number of neutrons
 - number of protons
 - mass numbers
 - Mass

- ___ 35. Isotopes of the same element have different ____.
- numbers of neutrons
 - numbers of protons
 - numbers of electrons
 - atomic numbers
- ___ 36. The mass number of an element is equal to ____.
- the total number of electrons in the nucleus
 - the total number of protons and neutrons in the nucleus
 - less than twice the atomic number
 - a constant number for the lighter elements
- ___ 37. Which of the following sets of symbols represents isotopes of the same element?
- ${}_{42}^{91}\text{J}$ ${}_{42}^{92}\text{J}$ ${}_{40}^{93}\text{J}$
 - ${}_{19}^{50}\text{L}$ ${}_{20}^{50}\text{L}$ ${}_{21}^{50}\text{L}$
 - ${}_{38}^{84}\text{M}$ ${}_{38}^{86}\text{M}$ ${}_{38}^{87}\text{M}$
 - ${}_{59}^{138}\text{Q}$ ${}_{55}^{133}\text{Q}$ ${}_{54}^{133}\text{Q}$
- ___ 38. In which of the following is the number of neutrons correctly represented?
- ${}_{9}^{19}\text{F}$ has 0 neutrons.
 - ${}_{33}^{75}\text{As}$ has 108 neutrons.
 - ${}_{12}^{24}\text{Mg}$ has 24 neutrons.
 - ${}_{92}^{238}\text{U}$ has 146 neutrons.
- ___ 39. What unit is used to measure weighted average atomic mass?
- amu
 - gram
 - angstrom
 - nanogram
- ___ 40. In the Bohr model of the atom, an electron in an orbit has a fixed ____.
- position
 - color
 - energy
 - size
- ___ 41. How does the energy of an electron change when the electron moves closer to the nucleus?
- It decreases.
 - It increases.
 - It stays the same.
 - It doubles.
- ___ 42. What is the shape of the $3p$ atomic orbital?
- sphere
 - dumbbell
 - bar
 - two perpendicular dumbbells
- ___ 43. How many energy sublevels are in the second principal energy level?
- 1
 - 2
 - 3
 - 4
- ___ 44. What is the maximum number of d orbitals in a principal energy level?
- 1
 - 2
 - 3
 - 5
- ___ 45. The shape (not the size) of an electron cloud is determined by the electron's ____.
- energy sublevel
 - position
 - speed
 - principal quantum number
- ___ 46. The letter " p " in the symbol $4p^3$ indicates the ____.
- spin of an electron
 - orbital shape
 - principle energy level
 - speed of an electron

- ___ 47. What is the next atomic orbital in the series $1s, 2s, 2p, 3s, 3p$?
- $2d$
 - $3d$
 - $3f$
 - $4s$
- ___ 48. According to the aufbau principle, ____.
- an orbital may be occupied by only two electrons
 - electrons in the same orbital must have opposite spins
 - electrons enter orbitals of highest energy first
 - electrons enter orbitals of lowest energy first
- ___ 49. What is the electron configuration of potassium?
- $1s^2 2s^2 2p^2 3s^2 3p^2 4s^1$
 - $1s^2 2s^2 2p^{10} 3s^2 3p^3$
 - $1s^2 2s^2 3s^2 3p^6 3d^1$
 - $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1$
- ___ 50. How many unpaired electrons are in a sulfur atom (atomic number 16)?
- 0
 - 1
 - 2
 - 3
- ___ 51. How does the speed of visible light compare with the speed of gamma rays, when both speeds are measured in a vacuum?
- The speed of visible light is greater.
 - The speed of gamma rays is greater.
 - The speeds are the same.
 - No answer can be determined from the information given.
- ___ 52. Which color of visible light has the shortest wavelength?
- yellow
 - green
 - blue
 - violet
- ___ 53. Which of the following electromagnetic waves have the highest frequencies?
- ultraviolet light waves
 - X-rays
 - microwaves
 - gamma rays
- ___ 54. Which type of electromagnetic radiation includes the wavelength 10^{-7} m?
- gamma ray
 - microwave
 - radio wave
 - visible light
- ___ 55. How are the frequency and wavelength of light related?
- They are inversely proportional to each other.
 - Frequency equals wavelength divided by the speed of light.
 - Wavelength is determined by dividing frequency by the speed of light.
 - They are directly proportional to each other.
- ___ 56. The light given off by an electric discharge through sodium vapor is ____.
- a continuous spectrum
 - an emission spectrum
 - of a single wavelength
 - white light
- ___ 57. Which scientist developed the quantum mechanical model of the atom?
- Albert Einstein
 - Erwin Schrodinger
 - Niels Bohr
 - Ernest Rutherford

- ___ 58. According to the Heisenberg uncertainty principle, if the position of a moving particle is known, what other quantity CANNOT be known?
- mass
 - charge
 - spin
 - velocity
- ___ 59. What is another name for the representative elements?
- Group A elements
 - Group B elements
 - Group C elements
 - transition elements
- ___ 60. What is another name for the transition metals?
- noble gases
 - Group A elements
 - Group B elements
 - Group C elements
- ___ 61. Which of the following elements is in the same period as phosphorus?
- carbon
 - magnesium
 - nitrogen
 - oxygen
- ___ 62. Each period in the periodic table corresponds to ____.
- a principal energy level
 - an energy sublevel
 - an orbital
 - a suborbital
- ___ 63. The modern periodic table is arranged in order of increasing atomic ____.
- mass
 - charge
 - number
 - radius
- ___ 64. Of the elements Pt, V, Li, and Kr, which is a nonmetal?
- Pt
 - V
 - Li
 - Kr
- ___ 65. To what category of elements does an element belong if it is a poor conductor of electricity?
- transition elements
 - metalloids
 - nonmetals
 - metals
- ___ 66. What element has the electron configuration $1s^2 2s^2 2p^6 3s^2 3p^2$?
- nitrogen
 - selenium
 - silicon
 - silver
- ___ 67. Elements that are characterized by the filling of p orbitals are classified as ____.
- groups 3A through 8A
 - transition metals
 - inner transition metals
 - groups 1A and 2A
- ___ 68. Which subatomic particle plays the greatest part in determining the properties of an element?
- proton
 - electron
 - neutron
 - none of the above
- ___ 69. Which of the following elements is a transition metal?
- cesium
 - copper
 - tellurium
 - tin
- ___ 70. Which of the following groupings contains only representative elements?
- Cu, Co, Cd
 - Ni, Fe, Zn
 - Al, Mg, Li
 - Hg, Cr, Ag

- ___ 71. How does atomic radius change from top to bottom in a group in the periodic table?
- It tends to decrease.
 - It tends to increase.
 - It first increases, then decreases.
 - It first decreases, then increases.
- ___ 72. How does atomic radius change from left to right across a period in the periodic table?
- It tends to decrease.
 - It tends to increase.
 - It first increases, then decreases.
 - It first decreases, then increases.
- ___ 73. Atomic size generally ____.
- increases as you move from left to right across a period
 - decreases as you move from top to bottom within a group
 - remains constant within a period
 - decreases as you move from left to right across a period
- ___ 74. What element in the second period has the largest atomic radius?
- carbon
 - lithium
 - potassium
 - neon
- ___ 75. Which of the following elements has the smallest atomic radius?
- sulfur
 - chlorine
 - selenium
 - bromine
- ___ 76. What is the charge of a cation?
- a positive charge
 - no charge
 - a negative charge
 - The charge depends on the size of the nucleus.
- ___ 77. The metals in Groups 1A, 2A, and 3A ____.
- gain electrons when they form ions
 - all form ions with a negative charge
 - all have ions with a 1^+ charge
 - lose electrons when they form ions
- ___ 78. What is the element with the lowest electronegativity value?
- cesium
 - helium
 - calcium
 - fluorine
- ___ 79. What is the element with the highest electronegativity value?
- cesium
 - helium
 - calcium
 - fluorine
- ___ 80. What is the energy required to remove an electron from an atom in the gaseous state called?
- nuclear energy
 - ionization energy
 - shielding energy
 - electronegative energy
- ___ 81. Compared with the electronegativities of the elements on the left side of a period, the electronegativities of the elements on the right side of the same period tend to be ____.
- lower
 - higher
 - the same
 - Unpredictable

- ___ 82. Which of the following statements correctly compares the relative size of an ion to its neutral atom?
- The radius of an anion is greater than the radius of its neutral atom.
 - The radius of an anion is identical to the radius of its neutral atom.
 - The radius of a cation is greater than the radius of its neutral atom.
 - The radius of a cation is identical to the radius of its neutral atom.
- ___ 83. How many valence electrons are in an atom of phosphorus?
- 2
 - 3
 - 4
 - 5
- ___ 84. What is the electron configuration of the gallium ion?
- $1s^2 2s^2 2p^6 3s^2 3p^5$
 - $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 4p^6$
 - $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 4p^6$
 - $1s^2 2s^2 2p^6 3s^2 3p^6 3d^1$
- ___ 85. The octet rule states that, in chemical compounds, atoms tend to have ____.
- the electron configuration of a noble gas
 - more protons than electrons
 - eight electrons in their principal energy level
 - more electrons than protons
- ___ 86. A compound held together by ionic bonds is called a ____.
- diatomic molecule
 - polar compound
 - covalent molecule
 - salt
- ___ 87. What is the formula unit of aluminum oxide?
- AlO
 - Al₃O
 - AlO₃
 - Al₂O₃
- ___ 88. Which of the following is true about the melting temperature of potassium chloride?
- The melting temperature is relatively high.
 - The melting temperature is variable and unpredictable.
 - The melting temperature is relatively low.
 - Potassium chloride does not melt.
- ___ 89. Which of the following is NOT a characteristic of most ionic compounds?
- They are solids.
 - They have low melting points.
 - When melted, they conduct an electric current.
 - They are composed of metallic and nonmetallic elements.
- ___ 90. Which of these elements does not exist as a diatomic molecule?
- Ne
 - F
 - H
 - I
- ___ 91. Why do atoms share electrons in covalent bonds?
- to become ions and attract each other
 - to attain a noble-gas electron configuration
 - to become more polar
 - to increase their atomic numbers

- ___ 92. Which of the following is the name given to the pairs of valence electrons that do not participate in bonding in diatomic oxygen molecules?
- unvalenced pair
 - outer pair
 - inner pair
 - unshared pair
- ___ 93. Which of the following diatomic molecules is joined by a double covalent bond?
- O₂
 - Cl₂
 - N₂
 - He₂
- ___ 94. When one atom contributes both bonding electrons in a single covalent bond, the bond is called a(n) ____.
- one-sided covalent bond
 - unequal covalent bond
 - coordinate covalent bond
 - ionic covalent bond
- ___ 95. A bond formed between a silicon atom and an oxygen atom is likely to be ____.
- ionic
 - coordinate covalent
 - polar covalent
 - nonpolar covalent
- ___ 96. Which of the following covalent bonds is the most polar?
- H—F
 - H—C
 - H—H
 - H—N
- ___ 97. When placed between oppositely charged metal plates, the region of a water molecule attracted to the negative plate is the ____.
- hydrogen region of the molecule
 - geometric center of the molecule
 - H—O—H plane of the molecule
 - oxygen region of the molecule
- ___ 98. What type of ions have names ending in *-ide*?
- only cations
 - only anions
 - only metal ions
 - only gaseous ions
- ___ 99. When naming a transition metal ion that can have more than one common ionic charge, the numerical value of the charge is indicated by a ____.
- prefix
 - suffix
 - Roman numeral following the name
 - superscript after the name
- ___ 100. An *-ate* or *-ite* at the end of a compound name usually indicates that the compound contains ____.
- fewer electrons than protons
 - neutral molecules
 - only two elements
 - a polyatomic anion
- ___ 101. Which of the following compounds contains the Mn³⁺ ion?
- MnS
 - MnBr₂
 - Mn₂O₃
 - MnO
- ___ 102. How are chemical formulas of binary ionic compounds generally written?
- cation on left, anion on right
 - anion on left, cation on right
 - Roman numeral first, then anion, then cation
 - subscripts first, then ions
- ___ 103. Which of the following formulas represents an ionic compound?
- CS₂
 - BaI₂
 - N₂O₄
 - PCl₃

- ___ 104. Which element, when combined with fluorine, would most likely form an ionic compound?
- lithium
 - carbon
 - phosphorus
 - chlorine
- ___ 105. Which of the following compounds contains the lead(II) ion?
- PbO
 - PbCl₄
 - Pb₂O
 - Pb₂S
- ___ 106. What is the correct formula for potassium sulfite?
- KHSO₃
 - KHSO₄
 - K₂SO₃
 - K₂SO₄
- ___ 107. Sulfur hexafluoride is an example of a ____.
- monatomic ion
 - polyatomic ion
 - binary compound
 - polyatomic compound
- ___ 108. In naming a binary molecular compound, the number of atoms of each element present in the molecule is indicated by ____.
- Roman numerals
 - superscripts
 - prefixes
 - suffixes
- ___ 109. When dissolved in water, acids produce ____.
- negative ions
 - polyatomic ions
 - hydrogen ions
 - oxide ions
- ___ 110. When naming acids, the prefix *hydro-* is used when the name of the acid anion ends in ____.
- ide*
 - ite*
 - ate*
 - ic*
- ___ 111. When the name of an anion that is part of an acid ends in *-ite*, the acid name includes the suffix ____.
- ous*
 - ic*
 - ate*
 - ite*
- ___ 112. What is the formula for phosphoric acid?
- H₂PO₃
 - H₃PO₄
 - HPO₂
 - HPO₄
- ___ 113. Suppose you encounter a chemical formula with H as the cation. What do you know about this compound immediately?
- It is a polyatomic ionic compound.
 - It is an acid.
 - It is a base.
 - It has a +1 charge.
- ___ 114. What does an *-ite* or *-ate* ending in a polyatomic ion mean?
- Oxygen is in the formula.
 - Sulfur is in the formula.
 - Nitrogen is in the formula.
 - Bromine is in the formula.
- ___ 115. What SI unit is used to measure the number of representative particles in a substance?
- kilogram
 - ampere
 - kelvin
 - mole
- ___ 116. Avogadro's number of representative particles is equal to one ____.
- kilogram
 - gram
 - kelvin
 - mole

- ___ 117. How many molecules are in 2.10 mol CO_2 ?
- a. 2.53×10^{24} molecules c. 3.49×10^{-24} molecules
b. 3.79×10^{24} molecules d. 1.26×10^{24} molecules
- ___ 118. The atomic masses of any two elements contain the same number of ____.
- a. atoms c. ions
b. grams d. milliliters
- ___ 119. What is the molar mass of $(\text{NH}_4)_2\text{CO}_3$?
- a. 144 g c. 96 g
b. 138 g d. 78 g
- ___ 120. What is the mass in grams of 5.90 mol C_8H_{18} ?
- a. 0.0512 g c. 389 g
b. 19.4 g d. 673 g
- ___ 121. What is the number of moles in 432 g $\text{Ba}(\text{NO}_3)_2$?
- a. 0.237 mol c. 1.65 mol
b. 0.605 mol d. 3.66 mol
- ___ 122. The volume of one mole of a substance is 22.4 L at STP for all ____.
- a. gases c. solids
b. liquids d. compounds
- ___ 123. The molar volume of a gas at STP occupies ____.
- a. 22.4 L c. 1 kilopascal
b. 0°C d. 12 grams
- ___ 124. What is the volume, in liters, of 0.500 mol of C_3H_8 gas at STP?
- a. 0.0335 L c. 16.8 L
b. 11.2 L d. 22.4 L
- ___ 125. If the density of a noble gas is 1.783 g/L at STP, that gas is ____.
- a. Kr c. Ar
b. Xe d. He
- ___ 126. If 60.2 grams of Hg combines completely with 24.0 grams of Br to form a compound, what is the percent composition of Hg in the compound?
- a. 28.5% c. 71.5%
b. 39.9% d. 60.1%
- ___ 127. What is the percent by mass of carbon in acetone, $\text{C}_3\text{H}_6\text{O}$?
- a. 20.7% c. 1.61%
b. 62.1% d. 30.0%
- ___ 128. The lowest whole-number ratio of the elements in a compound is called the ____.
- a. empirical formula c. binary formula
b. molecular formula d. representative formula

- ___ 129. What is the empirical formula of a compound that is 40% sulfur and 60% oxygen by weight?
- SO
 - SO₂
 - SO₃
 - S₆O₄
- ___ 130. What does the symbol Δ in a chemical equation mean?
- Heat is supplied to the reaction.
 - A catalyst is needed.
 - yields
 - precipitate
- ___ 131. In the chemical equation $\text{H}_2\text{O}_2(aq) \rightarrow \text{H}_2\text{O}(l) + \text{O}_2(g)$, the O_2 is a ____.
- catalyst
 - solid
 - product
 - reactant
- ___ 132. This symbol (\rightleftharpoons) indicates that ____.
- heat must be applied
 - an incomplete combustion reaction has occurred
 - a gas is formed by the reaction
 - the reaction is reversible
- ___ 133. What are the coefficients that will balance the skeleton equation below?
 $\text{AlCl}_3 + \text{NaOH} \rightarrow \text{Al}(\text{OH})_3 + \text{NaCl}$
- 1, 3, 1, 3
 - 3, 1, 3, 1
 - 1, 1, 1, 3
 - 1, 3, 3, 1
- ___ 134. When the equation $\text{Fe} + \text{Cl}_2 \rightarrow \text{FeCl}_3$ is balanced, what is the coefficient for Cl_2 ?
- 1
 - 2
 - 3
 - 4
- ___ 135. Chemical equations must be balanced to satisfy ____.
- the law of definite proportions
 - the law of multiple proportions
 - the law of conservation of mass
 - Avogadro's principle
- ___ 136. In every balanced chemical equation, each side of the equation has the same number of ____.
- atoms of each element
 - molecules
 - moles
 - coefficients
- ___ 137. What are the missing coefficients for the skeleton equation below?
 $\text{Al}_2(\text{SO}_4)_3(aq) + \text{KOH}(aq) \rightarrow \text{Al}(\text{OH})_3(aq) + \text{K}_2\text{SO}_4(aq)$
- 1, 3, 2, 3
 - 2, 12, 4, 6
 - 4, 6, 2, 3
 - 1, 6, 2, 3
- ___ 138. The type of reaction that takes place when one element reacts with a compound to form a new compound and a different element is a ____.
- combination reaction
 - decomposition reaction
 - single-replacement reaction
 - double-replacement reaction
- ___ 139. Which of the following is a balanced equation representing the decomposition of lead(IV) oxide?
- $\text{PbO}_2 \rightarrow \text{Pb} + 2\text{O}$
 - $\text{PbO}_2 \rightarrow \text{Pb} + \text{O}_2$
 - $\text{Pb}_2\text{O} \rightarrow 2\text{Pb} + \text{O}$
 - $\text{PbO} \rightarrow \text{Pb} + \text{O}_2$
- ___ 140. In the activity series of metals, which metal(s) will displace hydrogen from an acid?
- only metals above hydrogen
 - only metals below hydrogen
 - any metal
 - only metals from Li to Na

- ___ 150. What happens to the temperature of a gas when it is compressed?
- The temperature increases.
 - The temperature does not change.
 - The temperature decreases.
 - The temperature becomes unpredictable.
- ___ 151. When the Kelvin temperature of an enclosed gas doubles, the particles of the gas ____.
- move faster
 - strike the walls of the container with less force
 - decrease in average kinetic energy
 - decrease in volume
- ___ 152. Boyle's law states that ____.
- the volume of a gas varies inversely with pressure
 - the volume of a gas varies directly with pressure
 - the temperature of a gas varies inversely with pressure
 - the temperature of a gas varies directly with pressure
- ___ 153. Charles's law states that ____.
- the pressure of a gas is inversely proportional to its temperature in kelvins
 - the volume of a gas is directly proportional to its temperature in kelvins
 - the pressure of a gas is directly proportional to its temperature in kelvins
 - the volume of a gas is inversely proportional to its temperature in kelvins
- ___ 154. As the temperature of a fixed volume of a gas increases, the pressure will ____.
- vary inversely
 - decrease
 - not change
 - increase
- ___ 155. If a sealed syringe is plunged into cold water, in which direction will the syringe piston slide?
- in
 - out
 - No movement will occur.
 - The direction cannot be predicted.
- ___ 156. A gas occupies a volume of 2.4 L at 14.1 kPa. What volume will the gas occupy at 84.6 kPa?
- 497 L
 - 2.5 L
 - 14 L
 - 0.40 L
- ___ 157. A sample of gas occupies 17 mL at -112°C . What volume does the sample occupy at 70°C ?
- 10.6 mL
 - 27 mL
 - 36 mL
 - 8.0 mL
- ___ 158. At high pressures, how does the volume of a real gas compare with the volume of an ideal gas under the same conditions?
- It is much greater.
 - It is much less.
 - There is no difference.
 - It depends on the type of gas.
- ___ 159. Under what conditions of temperature and pressure is the behavior of real gases most like that of ideal gases?
- low temperature and low pressure
 - low temperature and high pressure
 - high temperature and low pressure
 - high temperature and high pressure
- ___ 160. A breathing mixture used by deep-sea divers contains helium, oxygen, and carbon dioxide. What is the partial pressure of oxygen at 101.4 kPa if $P_{\text{He}} = 82.5 \text{ kPa}$ and $P_{\text{CO}_2} = 0.4 \text{ kPa}$?
- 82.9 kPa
 - 19.3 kPa
 - 18.5 kPa
 - 101.0 kPa

- ___ 161. The tendency of molecules to move toward areas of lower concentration is called ____.
- suffusion
 - suspension
 - effusion
 - diffusion
- ___ 162. Which of the following gases will effuse the most rapidly?
- bromine
 - chlorine
 - ammonia
 - hydrogen
- ___ 163. If a crystal added to an aqueous solution causes many particles to come out of the solution, the original solution was ____.
- unsaturated
 - saturated
 - an emulsion
 - supersaturated
- ___ 164. Which of the following occurs as temperature increases?
- Solubility decreases.
 - Solubility increases.
 - Solubility remains the same.
 - Molarity doubles.
- ___ 165. What is the molarity of a solution that contains 6 moles of solute in 2 liters of solution?
- 6M
 - 12M
 - 7M
 - 3M
- ___ 166. What is the molarity of a solution containing 7.0 moles of solute in 569 mL of solution?
- 81M
 - 0.081M
 - 12M
 - 4.0M
- ___ 167. If an atom is reduced in a redox reaction, what must happen to another atom in the system?
- It must be oxidized.
 - It must be reduced.
 - It must be neutralized.
 - Nothing needs to happen to another atom in the system.
- ___ 168. What is another name for an oxidation-reduction reaction?
- O-reaction
 - R-reaction
 - redox reaction
 - oxred reaction
- ___ 169. In which of the following types of reaction are electrons gained?
- decomposition
 - oxidation
 - neutralization
 - reduction
- ___ 170. Oxidation is ____.
- a loss of oxygen
 - a gain of electrons
 - a loss of electrons
 - a gain of hydrogen
- ___ 171. $\text{Cu} \rightarrow \text{Cu}^{2+} + 2 \text{e}^-$
The equation above represents the type of reaction called ____.
- redox
 - hydrolysis
 - reduction
 - oxidation
- ___ 172. Which type of reaction does $\text{Sn}^{2+} \rightarrow \text{Sn}^{4+}$ represent?
- oxidation
 - reduction
 - hydrolysis
 - none of the above

____ 173. The oxidation number of magnesium in magnesium chloride is ____.

a. -1	c. +1
b. 0	d. +2

____ 174. The oxidation number of hydrogen when it is in a compound other than a hydride is ____.

a. -2	c. 0
b. -1	d. +1

____ 175. The oxidation number of bromine in bromine gas is ____.

a. -2	c. 0
b. -1	d. +1