200 Ways to Pass the Chemistry

**Physical Setting Regents Exam**

1. \_\_\_\_\_\_\_\_\_\_\_are positively charged (+).

2. ***\_\_\_\_\_\_\_\_\_\_\_***have no charge.

3. ***\_\_\_\_\_\_\_\_\_\_\_***are small and are negatively charged (-).

4. Protons & neutrons are in an atom’s nucleus and are called \_\_\_\_\_\_\_\_\_\_

5. Electrons are found in “clouds” or \_\_\_\_\_\_\_\_\_around an atom’s nucleus.

6. The ***\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_***is equal to an atom’s number of protons and neutrons added together.

7. The ***\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_***is equal to the number of protons in the nucleus of an atom.

8. The ***\_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_*** = mass number – atomic number.

9. ***\_\_\_\_\_\_\_\_\_\_*** are atoms with equal numbers of protons, but differ in their neutron numbers.

10. ***\_\_\_\_\_\_\_\_*** are *positive* (+) ions and form when a neutral atom *loses* electrons. They are *smaller* than their parent atom.

11. ***\_\_\_\_\_\_\_\_\_*** are negative ions and form when a neutral atom *gains* electrons. They are *larger* than their parent atom.

12. **\_\_\_\_\_\_\_\_\_ *\_\_\_\_\_\_\_\_\_\_*** *gold foil experiment* showed that an atom is mostly empty space with a small, dense, positively-charged nucleus.

13. ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_*** discovered the electron and developed the “plum-pudding” model of the atom.

 + - + - Positive & negative

 + - + - + particles spread throughout

 - + - + entire atom.

 -

14. ***\_\_\_\_\_\_\_\_\_\_\_*** ***model*** of the atom was a solid sphere of matter that was uniform throughout.

15. The ***\_\_\_\_\_\_ model*** of the atom placed electrons in “planet-like” orbits around the nucleus of an atom.

16. The current, ***\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_ model*** of the atom has electrons in “clouds”

 (orbitals) around the nucleus.

17. USE THE REFERENCE TABLE!!!

18. ***\_\_\_\_\_\_*** means “***S***tandard ***T***emperature and ***P***ressure.” (273 Kelvin & 1 atm)

19. Electrons emit energy as light when they jump from higher energy levels back

 down to lower (***\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_***) energy levels. ***\_\_\_\_\_\_ \_\_\_\_\_ spectra*** are produced.

20. ***\_\_\_\_\_\_\_\_\_*** are pure substances composed of only one kind of atom.

21. ***\_\_\_\_\_\_\_\_ compounds*** are substances made up of only *two* kinds of atoms.

 (examples: H2O, NH3, CO2)

22. ***\_\_\_\_\_\_\_\_\_ molecules*** are elements that form two atom molecules in their natural form at STP. Remember the phrase – “HOFBrINCl” (H2, O2, F2, Br2, I2, N2, Cl2)

23. Use this diagram to help determine the ***number of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_figures*** in a measured value…

 **Pacific Atlantic**

If the decimal point is ***present***, start counting digits from the ***Pacific*** (left) side, starting with the first non-zero digit.

 1 2 3

 0.00310 (3 sig. figs.)

If the decimal point is absent, start counting digits from the Atlantic (right) side, starting with the first non-zero digit.

 3 2 1

 31,400 (3 sig. figs.)

24. ***\_\_\_\_\_\_\_\_\_\_\_\_***are the best examples of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ***mixtures***. (Air, salt water, etc.)

25. ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mixtures*** have discernable components and *are not* uniform throughout. (Chocolate-chip cookies, vegetable soup, soil, muddy water, etc.)

26. A ***\_\_\_\_\_\_\_\_\_***is the substance being dissolved, while the ***\_\_\_\_\_\_\_\_***is the substance that dissolves the solute. (Water is the solvent in Kool-Aid, while sugar is the solute.)

27. Isotopes are written in a number of ways: C-14 is also Carbon-14, and is also

 *mass number* 14C

 *atomic number* 6

28. The distribution of electrons in an atom is its ***electron \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***.

29. Electron configurations are written in the bottom center of an element’s box on the periodic table in your reference tables.

**24.305**

**Mg**

**2-8-2**

**12**

 # of electrons in 3rd principal energy level

 # of electrons in 2nd principal energy level

 # of electrons in 1st principal energy level

30. Use the mole formula on Table \_\_\_ or the mole hole to solve mole-mass problems.

31. USE THE REFERENCE TABLE!!!

32. Polyatomic ions (Table E) are groups of atoms with an overall charge.

No. of Particles

 NO31-, NH41+, SO42-, etc.

33. ***\_\_\_\_\_\_\_\_\_\_\_\_\_*** are written in front of the formulas of reactants and products in chemical equations. They give us the ratios of reactants and products in a balanced chemical equation.

34. Chemical formulas are written so that the charges of cations and anions

 neutralize one another. “Criss-Cross”

 Example: *calcium phosphate*:

 Ca2+ PO43- = Ca3(PO4)2

35. When naming binary ionic compounds, write the name of the positive ion (cation) first, followed by the name of the negative ion (anion) with the name ending in “-ide.” Example:

 KCl MgS

 *Potassium chloride Magnesium sulfide*

36. When naming compounds containing polyatomic ions, keep the name of the

 polyatomic ion the same as it is written in Table E.

 Example:

 NH4Cl NH4NO3

 *Ammonium chloride Ammonium nitrate*

37. ***\_\_\_\_\_\_\_\_\_\_\_\_ changes*** do not form new substances. They merely change the

 appearance of the original material. (The melting of ice)

38. ***\_\_\_\_\_\_\_\_\_\_\_\_ changes*** result in the formation of new substances.

 (The burning of hydrogen gas to produce water vapor)

39. ***\_\_\_\_\_\_\_\_\_\_\_\_\_***are on the left side of the reaction arrow and ***\_\_\_\_\_\_\_\_\_\_\_***are on the right.

40. ***\_\_\_\_\_\_\_\_\_\_\_\_ reactions*** absorb heat. The energy value *is on the left(reactant) side* of the reaction arrow in a forward reaction.

41. ***\_\_\_\_\_\_\_\_\_\_\_\_\_ reactions*** release energy and the *energy is a product* in the reaction.

42. *Only* \_\_\_\_\_\_\_\_\_\_\_\_\_\_ can be changed when balancing chemical equations!

43. ***\_\_\_\_\_\_\_\_\_\_\_\_\_ reactions*** occur when two or more reactants combine to form a single product. *Example*: 2H2(g) + O2(g) → 2H2O(g)

44. \_\_\_\_\_\_\_\_\_\_\_\_\_ ***reactions*** occur when a single reactant forms two or more

 products. *Example:* CaCO3(s) → CaO(s) + CO2(g)

45. \_\_\_\_\_\_\_\_\_\_\_\_\_ reactions occur when one element replaces another

 element in a compound.

 *Example:* Mg + 2HCl → MgCl2 + H2

46. ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_ reactions*** occur when two compounds react to form two

 new compounds. *Example:* AgNO3 + KCl → AgCl + KNO3

47. The masses of the reactants in a chemical equation is always equal to the masses of the products. “***Law of Conservation of \_\_\_\_\_\_\_\_***.”

48. The gram formula mass of a substance is the sum of the atomic masses of all of

 the atoms in it. H2SO4 = 98 g/mole

 2 x H = 2 x 1 g/mole = 2 g/mole

 1 x S = 1 x 32 g/mole = 32 g/mole sum = 98 g/mole

 4 x O = 4 x 16 g/mole = 64 g/mole

49. Know how to calculate the percentage composition of a compound. (Formula is

 on Table \_\_\_.)

50. USE THE REFERENCE TABLE!!

51. The particles in a ***\_\_\_\_\_\_\_\_\_***are rigidly held together.

52. ***\_\_\_\_\_\_\_\_\_*** have a definite shape and volume.

53. \_\_\_\_\_\_\_\_\_ have closely-spaced particles that easily slide past one another.

54. ***\_\_\_\_\_\_\_\_\_*** have no definite shape, but have a definite volume.

55. ***\_\_\_\_\_\_\_\_\_*** have widely-spaced particles that are in random motion.

56. ***\_\_\_\_\_\_\_\_\_*** are easily compressed and have no definite shape or volume.

57. Be able to read and interpret heating/cooling curves as pictured below.

58. Substances that ***\_\_\_\_\_\_\_\_\_\_\_*** turn from a solid directly into a gas. (CO2 & I2)

59. Degrees Kelvin = °C + \_\_\_\_\_\_\_\_\_\_

60. Use this formula to calculate heat absorbed/released by substances.

q = mcΔT

 q = heat absorbed or released (Joules)

 m = mass of substance in grams

 c = specific heat capacity of substance (J/g•°C) … for water it’s 4.18

 ΔT = temperature change in degrees Celsius

61. The heat absorbed or released when 1 gram of a substance changes between the solid and liquid phases is the substance’s ***heat of \_\_\_\_\_\_\_\_\_***. (334 J/g for water)

62. The heat absorbed or released when 1 gram of a substance changes between the liquid and gaseous phases is the substance’s ***heat of \_\_\_\_\_\_\_\_\_\_***. (2260 J/g for water)

63. As the ***\_\_\_\_\_\_\_\_\_\_\_*** on a gas increases, ***\_\_\_\_\_\_\_\_\_\_\_*** decreases proportionally.

64. As the \_\_\_\_\_\_\_\_\_\_\_ on a gas increases, ***\_\_\_\_\_\_\_\_\_\_\_*** increases.

65. As the ***\_\_\_\_\_\_\_\_\_\_\_*** of a gas increases, ***\_\_\_\_\_\_\_\_\_\_\_\_***increases.

66. *Always* *use Kelvins* for temperature when using the ***combined \_\_\_\_\_\_\_ law***.

 P1V1 = P2V2

 T1 T2

67.\_\_\_\_\_\_ ***gas*** particles have volume and are attracted to one another, and thus do not always behave like ***\_\_\_\_\_\_gases***.

68. Real gases behave more like ideal gases at *low pressures and high*

 *temperatures.*

69. ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***separates mixtures with different boiling points.

70. ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***separates mixtures of solids and liquids.

71. ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***can also be used to separate mixtures of liquids and mixtures of gases.

72. ***The \_\_\_\_\_\_\_\_\_\_\_ Law*** states that the properties of elements are periodic functions of their *atomic numbers.*

73. ***\_\_\_\_\_\_\_\_\_\_\_\_***are horizontal rows on the Periodic Table.

74. ***\_\_\_\_\_\_\_\_\_\_\_\_*** are vertical columns on the Periodic Table.

75. ***\_\_\_\_\_\_\_\_\_\_***are found left of the “staircase” on the Periodic Table, ***\_\_\_\_\_\_\_\_\_\_\_*** are above it, and ***\_\_\_\_\_\_\_\_\_\_\_\_***border it.

76. Memorize this chart.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Metals | Malleable | Ductile | Lustrous | Good conductors of heat & electricity | Low ionization energy and electroneg. | Tend to form + ions |
| Nonmetals | Brittle when solid | Mostly gases at STP | Dull | Good insulators | High ionization energy and electroneg. | Tend to form - ions |

77. ***\_\_\_\_\_\_\_\_\_\_*** (Group 18) are inert and stable due to the fact that their valence level of electrons is completely filled.

78. ***\_\_\_\_\_\_\_\_\_\_\_energy*** increases as you go up and to the right on the Periodic Table.

79. ***\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_*** *decrease* left to right across a period due to increasing nuclear charge.

80. ***\_\_\_\_\_\_\_\_\_\_ radii*** *increase* as you go down a group.

81. ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*** is a measure of an element’s attraction for electrons.

82. Electronegativity *\_\_\_\_\_\_\_\_\_\_* as you go up and to the right on the Periodic Table.

83. The elements in Group 1 are the ***\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_***.

84. The elements in Group 2 are the ***\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_***.

85. The elements in Group 17 are the ***\_\_\_\_\_\_\_\_\_\_***.

86. The elements in Group 18 are the ***\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_***.

87. Use ***Table \_\_\_*** to compare and look up the properties of specific elements.

88. Energy is **released** when a chemical bond *\_\_\_\_\_\_\_*. The more energy that is

 released, the more stable the bond is.

89. The last digit of an element’s group number is equal to its ***number of \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_***.

90. Draw one dot for each valence electron when drawing an element’s or ion’s ***\_\_\_\_\_\_ diagram***.

91. The ***kernel*** of an atom includes everything in an atom *except* the atom’s valence

 electrons.

92. Metallic bonds can be thought of as a crystalline lattice of kernels surrounded by a “sea” of mobile valence electrons.

93. Atoms are most stable when they have 8 valence electrons (an ***\_\_\_\_\_\_\_\_***) and tend to form ions to obtain such a configuration of electrons.

94. ***\_\_\_\_\_\_\_\_\_\_ bonds*** form when two atoms ***share*** a pair of electrons.

95. ***\_\_\_\_\_\_\_\_\_\_ bonds*** form when one atom ***transfers*** an electron to another atom when forming a bond with it.

96. ***\_\_\_\_\_\_\_\_\_\_ covalent bonds*** form when two atoms of the *same element* bond

 together or when the electronegativity difference between two atoms is zero.

97. ***\_\_\_\_\_\_\_\_\_\_covalent bonds*** form when the electronegativity difference between two bonding atoms is between 0.5 and 1.6.

98. ***\_\_\_\_\_\_\_\_\_ bonds*** form when the electronegativity difference between two bonding atoms is *1.7 or more*.

99. Substances containing mostly covalent bonds are called ***\_\_\_\_\_\_\_\_\_\_\_substances***.

100. Substances containing mostly ionic bonds are called ***\_\_\_\_\_\_\_\_\_\_\_ compounds***.

101. Memorize this table.

|  |  |
| --- | --- |
| Substance Type | Properties |
| **\_\_\_\_\_\_\_\_\_\_\_\_** | HardHigh melting and boiling pointsConduct electricity when molten or when aqueous |
| **\_\_\_\_\_\_\_\_\_\_\_\_\_ (Molecular)** | SoftLow melting and boiling pointsDo not conduct electricity (insulators) |

102. ***\_\_\_\_\_\_\_\_\_\_\_\_\_ bonds*** form when hydrogen bonds to the elements N, O, or F and gives the compound unusually high melting and boiling points.

103. Use ***Table*** \_\_\_ to predict the solubilites of compounds.

104. Remember substances tend to be soluble in solvents with similar properties….

 “Like dissolves \_\_\_\_\_\_\_\_\_”

105. As temperature increases, solubility \_\_\_\_\_\_\_\_\_\_\_ for most solids.

106. At low temperatures and high pressures solubility *\_\_\_\_\_\_\_\_\_\_\_*for most gases.

107. Use *Table \_\_\_\_\_*to determine whether a solution is ***saturated***, ***unsaturated***, or

 ***supersaturated***.

supersaturated

g solute/

100 g solvent

saturated

unsaturated

 Temperature (°C)

108. ***\_\_\_\_\_\_\_\_\_\_*** is a way to measure the *concentration* of a solution. Molarity is equal to the number of moles of solute divided by the number of liters of solution. The formula is on the back of the reference tables.

109. ***\_\_\_\_\_\_\_\_\_ by \_\_\_\_\_\_\_\_\_*** = mass of the part / mass of the whole x 100%

110. ***\_\_\_\_\_\_\_ per \_\_\_\_\_\_\_\_(ppm)*** = grams of solute / grams of solution x 1,000,000

111. Solutes \_\_\_\_\_\_\_\_ the boiling points and \_\_\_\_\_\_\_\_\_ the melting points of solvents.

112. Liquids ***\_\_\_\_\_\_\_\_\_***when their vapor pressure is equal to the atmospheric pressure.

113. The ***normal boiling point*** of a substance is the temperature at which it boils at

 1 atm (101.3kPa) of pressure. (Take note of Table H)

114. Covalently bonded substances tend to react more slowly than ionic compounds.

115. Increasing the concentration of reactants will \_\_\_\_\_\_\_\_\_\_\_\_reaction rate.

116. Increasing the surface areas of the reactants will \_\_\_\_\_\_\_\_\_\_\_\_ reaction rate.

117. Increasing the pressure on gases \_\_\_\_\_\_\_\_\_\_\_\_\_\_ reaction rate.

118. ***\_\_\_\_\_\_\_\_\_\_\_*** speed up reactions by lowering their ***activation energies***. They are not changed themselves and can be reused many times over.

119. Increasing temperature \_\_\_\_\_\_\_\_\_\_\_reaction rate.

120. Be able to recognize and read ***potential energy diagrams***.

Ea

reactants

products

Potential energy

Potential energy

Ea

-ΔH

+ΔH

products

reactants

 Reaction Coordinate Reaction Coordinate

 **Exothermic Endothermic**

 **“downhill” “uphill”**

121. ΔH is (+) for \_\_\_\_\_\_\_\_\_\_\_\_\_ reactions and is (-) for \_\_\_\_\_\_\_\_\_\_\_\_\_reactions.

122. The rates of the forward and reverse reactions are equal at equilibrium.

123. ***\_\_\_\_\_\_\_\_\_\_\_\_***any reactant or product to a system at equilibrium will shift the equilibrium away from the added substance.

124. ***\_\_\_\_\_\_\_\_\_\_\_\_***any reactant or product from a system at equilibrium will shift the equilibrium point toward that removed substance.

125. An ***\_\_\_\_\_\_\_\_\_\_\_ in temperature*** shifts an equilibrium system in the ***endothermic direction***. (Move away from the heat)

126. A ***\_\_\_\_\_\_\_\_\_\_\_\_ in temperature*** shifts an equilibrium system in the ***exothermic direction***. (Move toward the heat)

127. ***\_\_\_\_\_\_\_\_\_\_\_\_\_ the pressure*** on a gaseous equilibrium will shift the equilibrium point toward the side with ***fewer moles of gas***. (Because the volume was decreased)

128. ***\_\_\_\_\_\_\_\_\_\_\_\_\_the pressure*** on a gaseous equilibrium will shift the equilibrium point toward the side with ***more moles of gas***.

129. ***Catalysts*** have ***\_\_\_\_\_\_\_\_ effect*** on an ***equilibrium***. It just establishes itself quicker.

130. ***\_\_\_\_\_\_\_\_\_\_\_\_ (ΔH)*** is the heat energy gained or lost in a reaction.

131***. \_\_\_\_\_\_\_\_\_\_\_\_*** is high in a highly unorganized system, such as a gas, a messy

 room, etc.

132. USE THE REFERENCE TABLES

133. ***Oxidation*** is the ***\_\_\_\_\_\_\_ of electrons*** by an atom or ion. The oxidation number *\_\_\_\_\_\_\_\_\_* as a result. The electrons are on the *right side* of the reaction arrow.

 **Zn → Zn2+ + 2e-**

134. ***Reduction*** is the ***\_\_\_\_\_\_\_ of electrons*** by an atom or ion. The oxidation number *\_\_\_\_\_\_\_\_\_*(is reduced!) as a result. The electrons are on the *left* side of the reaction arrow.

 **Cl + e- → Cl-**

135. Redox reactions ***always*** involve the exchange of ***\_\_\_\_\_\_\_\_\_\_\_***.

1. Remember…. “LEO the lion says GER!”

 **L**ose **G**ain

 **E**lectrons **E**lectrons

 **O**xidation **R**eduction

1. ***Identify redox reactions*** by seeking an uncombined element on one side of a

 reaction that is in a compound on the other side.

 Zn + 2HCl → ZnCl2 + H2

 Uncombined Zn is combined with Cl

1. ***Oxidizing agents*** are what *get reduced* in a redox reaction.

 ***Reducing agents*** are what *get oxidized* in a redox reaction.

1. ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_cells*** produce electricity with a *spontaneous* redox reaction.
2. The *left electrode* is usually the site of *oxidation* in an electrochemical cell diagram.
3. Memorize this saying… “I have ***AN OX*** and a ***RED CAT***.”

In electrochemical cells, the ***AN***ode gets ***OX***idized and ***RED***uction occurs at the ***CAT***hode.

1. ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cells*** use a battery to force a nonspontaneous reaction.
2. Electrolytic cells are usually used for metal plating of objects.
3. ***Acids*** and ***bases*** are both ***good \_\_\_\_\_\_\_\_\_\_\_\_***. Their solutions conduct electricity well.
4. Weak acids taste *\_\_\_\_\_\_*.
5. Weak bases taste *\_\_\_\_\_\_\_*.
6. Acids and bases turn ***\_\_\_\_\_\_\_\_\_\_***different colors. They’re listed on ***Table \_\_\_\_***.
7. \_\_\_\_\_\_\_\_ have a pH < 7.
8. \_\_\_\_\_\_\_\_ have a pH > 7.
9. ***Tables \_\_\_ & \_\_\_*** list names and formulas of common acids and bases asked about on the Regents.
10. The metals above H2 on ***Table \_\_\_*** will react with acids to make H2 gas bubbles.
11. ***Arrhenius*** says:

“\_\_\_\_\_\_\_\_ give off H+ or H3O+ ions in solution.”

“\_\_\_\_\_\_\_\_ give off OH- ions in solution.”

1. Acids and bases react in ***neutralization*** reactions to make ***\_\_\_\_\_\_*** and a ***\_\_\_\_\_\_***.
2. ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***are controlled neutralization reactions used to find the concentration of an acid or base sample. Note the formula for it on Table T.
3. ALL organic compounds contain the element ***\_\_\_\_\_\_\_\_\_\_\_\_***.
4. ***Carbon*** ALWAYS makes ***\_\_\_\_\_\_\_\_ bonds*** in molecules.
5. ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***hydrocarbons have all *single* bonds within them (alkanes).
6. ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***hydrocarbons have *double* or *triple* bonds in them (alkenes & alkynes).
7. ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*** contain ONLY the elements hydrogen and carbon.
8. The ***homologous*** ***series*** of hydrocarbons’ formulas are on ***Reference Table \_\_\_***.
9. The ***functional groups*** on organic molecules are listed on ***Reference Table*** \_\_\_.
10. ***\_\_\_\_\_\_\_\_\_\_\_\_*** of organic compounds have *different* structural formulas but the *same* molecular formula.
11. Number the parent carbon chain in an organic molecule from the end closest to the alkyl group(s).
12. ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ reactions*** occur when a hydrocarbon reacts with oxygen to make CO2 and H2O.
13. ***Organic \_\_\_\_\_\_\_\_\_\_\_reactions*** occur when an alkane and a halogen (Group 17) reacts so that one or more hydrogen atoms on the alkane are replaced with oxygen.
14. ***Organic \_\_\_\_\_\_\_\_\_\_\_ reactions*** occur when an alkene or alkyne combine with a halogen to make one product (halide).
15. ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_***occurs when an organic acid and an alcohol react to make water and an ***\_\_\_\_\_\_\_\_\_***.
16. ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_*** occurs when an ester reacts with a base to make alcohol and a ***\_\_\_\_\_\_\_\_\_***.
17. ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*** reactions occur when yeast catalyze a sugar (C6H12O6) to make carbon dioxide and ethanol.
18. ***\_\_\_\_\_\_\_\_\_\_\_\_\_***are long chains of repeating units called ***monomers***.
19. Polymers form by ***polymerization*** reactions.
20. ***\_\_\_\_\_\_\_\_\_\_\_\_\_ polymerization*** occurs when unsaturated monomers join in a long polymer chain.

nC2H2 → (C2H2)n

173. USE YOUR REFERENCE TABLES!!!

174. ***\_\_\_\_\_\_\_\_\_\_\_\_\_ polymerization*** occurs when monomers join to form a polymer *by removing water.* Water is a product!

1. ***Natural polymers*** include starch, cellulose, and proteins.
2. ***Synthetic polymers*** include plastics such as nylon, rayon, and polyester.
3. Unstable atoms that are radioactive are called ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***. (***Table N***)
4. Radioisotopes can decay by giving off any of the particles/emanations listed in ***Table \_\_\_\_***.
5. ***\_\_\_\_\_\_\_\_\_particles*** (see Table O) are positively charged (+).

***\_\_\_\_\_\_\_\_\_\_ particles*** (see Table O) are negatively charged (-).

1. The sum of the mass numbers and atomic numbers must be equal on both sides

 of the reaction arrow for nuclear equations.

 18 18

14N + 4He → 17O + 1 H

1

8

2

7

 9 9

181. ***\_\_\_\_\_\_\_\_\_\_\_ reactions*** split heavy nuclei into smaller ones.

1n + 235U → 139Ba + 94Kr + 3 1n + Energy

0

36

56

94

0

1. ***\_\_\_\_\_\_\_\_\_\_\_ reactions*** occur when light nuclei combine to form a heavy nucleus and *a lot of energy*.

 2H + 2H → 4He + ENERGY

1

1

2

1. The ***\_\_\_\_\_\_\_life*** of a radioisotope is the *length of time* it takes for one half of the atoms in a sample to radioactively decay. (Table N)
2. C-14 is used to determine the ages of organic material up to 23,000 years old.
3. U-238 is used to determine the ages of rocks.
4. I-131 is used to treat thyroid disorders.
5. Co-60 is used to treat cancer tumors.
6. Radiation can be used to kill bacteria on foods to slow the spoilage process.
7. Disposal of radioactive waste is a problem associated with nuclear reactors.
8. USE THE REFERENCE TABLES!!!
9. Be sure to answer every question. If you don’t know the answer, take a guess.

 Some chance of getting it right is better than none at all.

1. You have three hours to take the test, so take your time.

193. Try substituting words that seem confusing with a different word. Sometimes this makes the question make more sense. (ex.: substitute the word “false” for “not true”)

194. ***Consider on every question if the answer is in the reference tables or if the reference tables could help you.***

195. Your first choice is usually your best one. Only change an answer if you find an obvious mistake when checking your work.

196. Even if you think you know a formula, look it up. Most are on last page.

197. Skip a question if it is giving you a hard time. Go back to it later. Something else in the test may help you answer the harder problem.

198. Eat a healthy meal the night before and for breakfast as well.

199. Get a good night’s sleep. A tired mind is not as sharp and clear as a well-rested one.

200. Relax – you’ve seen all this stuff before!