CHEMISTRY PERIODIC TABLE WORKSHEET

Periodic Table Questions ***[Place your answer in the blank to the left of the question number.]***

___ 1. The elements characterized as nonmetals are located in the periodic table at the

(A) far left; (B) bottom; (C) center; (D) top right.

___ 2. An element that is a liquid at STP is in Group (A) IA; (B) IIA; (C) IB; (D) IIB.

___ 3. Elements that have properties of both metals and nonmetals are called

(A) metalloids; (B) halogens; (C) alkali metals; (D) transition elements.

___ 4. Which of the following noble gases has the lowest normal boiling point?

(A) Ne; (B) Ar; (C) Kr; (D) Xe.

___ 5. Which is the atomic number of an alkali metal?

(A) 10; (B) 11; (C) 12; (D) 13.

___ 6. Which element is a halogen?

(A) iron; (B) nitrogen; (C) iodine; (D) neon.

___ 7. Which element forms a colored ion in solution?

(A) Ni; (B) Li; (C) K; (D) Mg.

___ 8. Given the same conditions, which of the following Group VIIA elements has the least tendency to gain electrons?

(A) fluorine; (B) iodine; (C) bromine; (D) chlorine.

___ 9. The element in Period 3 with the most metallic character is

(A) sodium; (B) aluminum; (C) silicon; (D) phosphorus.

___ 10. The alkaline earth element having the largest atomic radius is found in Period

(A) 1; (B) 2; (C) 6; (D) 7.

___ 11. Which is the electron configuration of a transition element for the Bohr orbits K,L,M,N?

(A) 2-2; (B) 2-8-2; (C) 2-8-8-2; (D) 2-8-9-2.

___ 12. Which of the following atoms will lose an electron most readily?

(A) potassium; (B) calcium; (C) rubidium; (D) strontium.

___ 13. Which element in Group 16 (VIA) has the greatest tendency to gain electrons?

(A) Te; (B) Se; (C) S; (D) O.

___ 14. Which element would most likely form a compound whose water solution is colored?

(A) H; (B) P; (C) Mg; (D) Cu.

___ 15. Which element will form a +2 ion the easiest?

(A) calcium; (B) oxygen; (C) sodium; (D) aluminum.

___ 16. Which element has the highest electron affinity?

(A) lithium; (B) nitrogen; (C) boron; (D) fluorine.

___ 17. The elements known as the alkali metals are found in Group

(A) 1 (IA); (B) 2 (IIA); (C) 13 (IIIA); (D) 17 (VIIA).

___ 18. Which of the Group VIIA elements listed below has the greatest nuclear charge?

(A) F; (B) Cl; (C) Br; (D) I.

___ 19. The element in Period 3 that has the highest ionization energy is

(A) an inert gas; (B) a halogen; (C) an alkali metal; (D) an alkaline earth metal.

___ 20. Which element in Period 3 has both metallic and nonmetallic properties?

(A) Na; (B) Mg; (C) Si; (D) Ar.

___ 21. Which electron configuration represents an atom of an element having a completed third principal energy level?

(A) 2-8-2; (B) 2-8-6-2; (C) 2-8-10-2; (D) 2-8-18-2.

___ 22. Given the general formula XCl_2 Which element in Period 3 of the periodic table will form a chloride having the above formula?

(A) Mg; (B) Na; (C) Ar; (D) Si.

___ 23. Which element forms an ion larger than its atom?

(A) Na; (B) Ne; (C) Ba; (D) Br.

___ 24. Which element is most likely to form a compound with xenon?

(A) fluorine; (B) sodium; (C) bromine; (D) calcium.

___ 25. The elements in the present Periodic Table are arranged according to their

(A) atomic numbers; (B) atomic masses; (C) mass numbers; (D) oxidation state.

___ 26. Which ion would have the smallest radius?

(A) Ba^{2+} ; (B) Ca^{2+} ; (C) Mg^{2+} ; (D) Sr^{2+} .

___ 27. Elements in Period 3 are alike in that they all have the same number of

(A) protons; (B) neutrons; (C) electrons in the valence shell; (D) occupied principal energy levels.

___ 28. The majority of the elements in the Periodic Table are

(A) metals; (B) nonmetals; (C) metalloids; (D) noble gases.

___ 29. Given the general formula M_2O_3 The elements which form oxides with this formula are in Group

(A) 1 (IA); (B) 2 (IIA); (C) 13 (IIIA); (D) 14 (IVA).

___ 30. Which element in Period 3 is the most active nonmetal?

(A) sodium; (B) magnesium; (C) chlorine; (D) argon.

___ 31. What is the total number of electrons found in the valence shell of an alkaline earth element in the ground state?

(A) 1; (B) 2; (C) 3; (D) 4.

___ 32. The most active metals are in Group

(A) 1 (IA); (B) 15 (VA); (C) 13 (IIIA); (D) 17 (VIIA).

___ 33. Which is an example of a metalloid?

(A) sodium; (B) strontium; (C) silicon; (D) sulfur.

___ 34. Which element exists as a diatomic molecule at STP?

(A) bromine; (B) argon; (C) sulfur; (D) rubidium.

___ 35. The water solution of a compound is bright yellow. The compound could be

(A) KNO3; (B) K2CrO4; (C) KOH; (D) K3PO4.

___ 36. Which Period contains four elements which are gases at STP?

(A) 1; (B) 2; (C) 3; D) 4.

___ 37. An atom in the ground state with eight valence electrons would most likely be classified as

(A) an active metal; (B) an inactive metal; (C) a noble gas; (D) a halogen.

___ 38. The atomic number of a metalloid in Period 4 is

(A) 19; (B) 26; (C) 33; (D) 36.

___ 39. Which electron configuration represents the atom in period 2 with the largest covalent radius?

(A) $1s^2 2s^1$; (B) $1s^2 2s^2$; (C) $1s^2 2s^2 2p^1$; (D) $1s^2 2s^2 2p^2$.

___ 40. Which element is a liquid at STP?

(A) K; (B) I; (C) Ag; (D) Hg.

___ 41. All elements whose atoms in the ground state have a total of 5 electrons in their outermost p sublevel are called

(A) noble gases; (B) metalloids; (C) halogens; (D) alkaline earth metals.

___ 42. Which element will have the highest boiling point?

(A) sodium; (B) potassium; (C) silicon; (D) neon.

___ 43. Which solution contains colored ions?

(A) KCl(aq); (B) $NiCl_2$(aq); (C) HCl(aq); (D) LiCl(aq).

___ 44. An element that has an ionic radius larger than its atomic radius is

(A) Al; (B) Cl; (C) Li; (D) Ni.

___ 45. Which element may be prepared only by the electrolysis of its fused compounds?

(A) F_2; (B) I_2; (C) Cl_2; (D) Br_2.

___ 46. Which of the following elements has the highest electronegativity?

(A) phosphorous; (B) sulfur; (C) oxygen; (D) sodium.

___ 47. Which element has the highest ionization energy?

(A) barium; (B) magnesium; (C) calcium; (D) strontium.

___ 48. Which element will have the most vigorous reaction with water?

(A) sodium; (B) cesium; (C) magnesium; (D) barium.

__ 49. In which group do all the elements have the same number of electrons in the outermost principal energy level?

(A) 6 (VIB); (B) 18 (VIII); (C) 18 (O); (D) 14 (IVA).

___ 50. Which is an alkaline earth metal?

(A) Na; (B) Ca; (C) Ga; (D) Ta.

___ 51. As one proceeds from left to right across a given period on the Periodic Table the electronegativities of the elements generally

(A) decrease; (B) increase; (C) remain the same.

___ 52. As one proceeds from flourine to astatine in Group VIIA the electronegativity

(A) decreases and the atomic radius increases;

(B) decreases and the atomic radius decreases;

(C) increases and the atomic radius decreases;

(D) increases and the atomic radius increases.

___ 53. If X is the atomic number of an element in Group 12 (IIB), an element with the atomic number (X + 1) will be found in Group

(A) 11 (IB); (B) 2 (IIA); (C) 13 (IIIA); (D) 3 (IIIB).

___ 54. Which element will react violently with water at room temperature?

(A) aluminum; (B) potassium; (C) iodine; (D) zinc.

___ 55. Which group of elements exhibits all three phases of matter at room temperature?

(A) 2 (IIA); (B) 14 (IVA); (C) 15 (VA); (D) 17 (VIIA).

___ 56. Which element had its last electron go in an inner energy level?

(A) potassium; (B) scandium; (C) calcium; (D) bromine.

___ 57. Which element in Group IIA is the best reducing agent?

(A) Mg; (B) Sr; (C) Ca; (D) Ba.

___ 58. The element whose properties are most similar to those of tellurium is

(A) Be; (B) S; (C) O; (D) Po.

___ 59. Which period in the Periodic Table contains the most metals?

(A) 6; (B) 2; (C) 3; (D) 4.

___ 60. Which element will never have a positive oxidation number?

(A) fluorine; (B) oxygen; (C) sodium; (D) iodine.

___ 61. An atom of fluorine is smaller than an atom of oxygen. One possible explanation is that, compared with oxygen, fluorine has

(A) a smaller oxidation number; (B) a smaller atomic number;

(C) a greater nuclear charge; (D) more unpaired electrons.

___ 62. In Period 3, as the atomic numbers increase, the pattern according to which the properties of the elements change is

(A) metal = metalloid = nonmetal = noble gas;

(B) metal = nonmetal = noble gas = metalloid;

(C) nonmetal = metalloid = metal = noble gas;

(D) nonmetal = metal = noble gas = metalloid.

___ 63. All of the elements in Period 3 have a total of 2 electrons in the

(A) 2s sublevel; (B) 3s sublevel; (C) 2p sublevel; (D) 3p sublevel.

___ 64. If X represents an element of Group IA the formula of its oxide would be

(A) XO; (B) X_2O; (C) XO_2; (D) X_2O_3.

___ 65. At STP, which element is a solid?

(A) hydrogen; (B) carbon; (C) nitrogen; (D) argon.

___ 66. Which element exists as monatomic molecules at STP?

(A) hydrogen; (B) nitrogen; (C) argon; (D) chlorine.

___ 67. Which element in Period 2 is the most active metal?

(A) neon; (B) beryllium; (C) fluorine; (D) lithium.

___ 68. Beryllium is classified as

(A) an alkaline earth metal; (B) an alkali metal; (C) a transition element; (D) a noble gas.

___ 69. As the elements in group 1 (IA) are considered in order of increasing atomic number the atomic radius of each successive element increases. This is primarily due to an increase in the number of

(A) neutrons in the nucleus; (B) electrons in the outermost shell;

(C) unpaired electrons; (D) principal energy levels.

___ 70. Ozone is an allotropic form of the element

(A) oxygen; (B) phosphorus; (C) sulfur; (D) carbon.

___ 71. Given the general formula MCl2 Which group will form chlorides with the above formula?

(A) 1 (IA); (B) 2 (IIA); (C) 17 (VIIA); (D) 18.

___ 72. What is the total number of electrons found in the valence shell of a halogen in the ground state?

(A) 1; (B) 2; (C) 7; (D) 8.

___ 73. Which of the following elements is most likely to form a compound with radon?

(A) iodine; (B) fluorine; (C) sodium; (D) calcium.

___ 74. Which element has atoms with only one completely filled principal energy level?

(A) N; (B) P; (C) As; (D) Sb.

___ 75. The oxide of metal X has the formula XO. Which group in the Periodic Table contains metal X?

(A) 1 (IA); (B) 2 (IIA); (C) 13 (IIIA); (D) 15 (VA).

___ 76. When a fluorine atom becomes an ion, it will

(A) gain an electron and decrease in size; (B) gain an electron and increase in size;

(C) lose an electron and decrease in size; (D) lose an electron and increase in size.

___ 77. Which element in Period 3 of the Periodic Table is the strongest re- ducing agent?

(A) S; (B) Na; (C) Cl; (D) Al.

___ 78. Which element can form more than one binary compound with chlorine?

(A) K; (B) Ca; (C) Fe; (D) Zn.

___ 79. Which represents the electron configuration of a metalloid in the ground state?

(A) 2-3; (B) 2-5; (C) 2-8-5; (D) 2-8-6.

___ 80. In a given period of the Periodic Table the element with the lowest first ionization energy is always

(A) an alkaline earth metal; (B) an alkali metal; (C) a halogen; (D) an inert gas.

___ 81. What is the total number of elements in Period 2 that are gases at room temperature and standard pressure?

(A) 1; (B) 2; (C) 3; (D) 4.

___ 82. The atoms of the most active nonmetals have

(A) small atomic radii and high ionization energies;

(B) small atomic radii and low ionization energies;

(C) large atomic radii and low ionization energies;

(D) large atomic radii and high ionization energies.

___ 83. Which element has the largest ionic radius?

(A) sodium; (B) fluorine; (C) potassium; (D) chlorine.

___ 84. An element in which electrons from more than one energy level may be involved in bond formation is

(A) potassium; (B) calcium; (C) copper; (D) zinc.

___ 85. Which of the following periods contains the greatest number of metals?

(A) 1; (B) 2; (C) 3; (D) 4.

___ 86. An element that has a high ionization energy and tends to be chemically inactive would most likely be

(A) an alkali metal; (B) a transition element; (C) a noble gas; (D) a halogen.

___ 87. At STP which of the following elements has the most metallic character?

(A) C; (B) Si; (C) Ge; (D) Sn.

___ 88. An atom of the element in Period 2 Group 14 (IVA) is in the ground state. What total number of valence electrons does the atom have?

(A) 1; (B) 2; (C) 3; (D) 4.

___ 89. Proceeding from left to right in Period 2 of the Periodic Table the covalent radius of the elements generally

(A) decreases; (B) increases; (C) remains the same.

___ 90. Which element in Period 3 has the highest first ionization energy?

(A) Na; (B) Ar; (C) Cl; (D) Mg.

___ 91. When oxygen combines with any alkali metal, M, the formula of the compound produced usually is

(A) M_2O_3; (B) MO_2; (C) M_2O; (D) M_3O_2.

___ 92. Which group contains elements in the solid, liquid, and gas phases at 25 °C and 1 atmosphere?

(A) 16 ; (B) 2 ; (C) 17 ; (D) 18 .

___ 93. A characteristic of the halogens is that they have relatively

(A) low ionization energies; (B) low reduction potentials;

(C) high oxidation potentials; (D) high electronegativities.

___ 94. An element whose atoms have the electron configuration 2-8-18-1 is

(A) a transition element; (B) an alkali metal; (C) an alkali metal; (D) an alkaline earth.

___ 95. The elements of Period 2 have the same

(A) atomic mass; (B) atomic number;

(C) number of occupied principal energy levels; (D) number of occupied sublevels.

___ 96. On the Periodic Table of the Elements all the elements within Group VIA have the same number of

(A) valence electrons; (B) energy levels; (C) protons; (D) neutrons.

___ 97. Which element in Period 3 has the least tendency to lose an electron?

(A) argon; (B) sodium; (C) phosphorus; (D) aluminum.

___ 98. Which compound contains an alkali metal and a halogen?

(A) CaCl2; (B) CaS; (C) RbCl; (D) Rb2S.

___ 99. All atoms of Group IIA (B) elements in the ground state have the same number of electrons in which principal energy level?

(A) 1; (B) 2; (C) 3; (D) 4.

___ 100. Which represents the correct electron configuration of the outermost principal energy level of a Group O element in the ground state?

(A) s^2p^2; (B) s^2p^4; (C) s^2p^6; (D) s^2p^8.

___ 101. At STP which of the following substances is the best conductor of electricity?

(A) hydrogen; (B) mercury; (C) oxygen; (D) helium.

___ 102. An element with two valence electrons is

(A) an alkali metal; (B) an alkaline earth metal; (C) a halogen; (D) a transition element.

___ 103. Based on the Periodic Table of the Elements which Group 2 (IIA) element is most active?

(A) Sr; (B) Mg; (C) Ca; (D) Ba.

___ 104. Compared to the covalent atomic radius of a sodium atom, the covalent atomic radius of a magnesium atom is smaller. The smaller radius is primarily a result of the magnesium atom having

(A) a larger nuclear charge; (B) a smaller nuclear charge;

(C) more principal energy levels; (D) fewer principal energy levels.

___ 105. The pair of elements with the most similar chemical properties are

(A) Mg and S; (B) Ca and Br; (C) Mg and Ca; (D) S and Ar.

___ 106. More than two-thirds of the elements of the Periodic Table are

(A) metalloids; (B) metals; (C) nonmetals; (D) noble gases.

___ 107. Which element is a member of the halogen family?

(A) K; (B) B; (C) I; (D) S.

___ 108. Which of the following elements has the lowest electronegativity?

(A) carbon; (B) fluorine; (C) nitrogen; (D) oxygen.

___ 109. Which are the two properties of most nonmetals?

(A) low ionization energy and good electrical conductivity;

(B) high ionization energy and poor electrical conductivity;

(C) low ionization energy and poor electrical conductivity;

(D) high ionization energy and good electrical conductivity.

___ 110. Which group contains elements with a total of four electrons in the outermost principal energy level?

(A) 1 ; (B) 18; (C) 16; (D) 14.

___ 111. Which element exhibits a crystalline structure at STP?

(A) fluorine; (B) chlorine; (C) bromine; (D) iodine.

___ 112. Which period contains three elements that commonly exist as diatomic molecules?

(A) Period 1; (B) Period 2; (C) Period 3; (D) Period 4.

___ 113. Which is an alkaline earth metal?

(A) Mg; (B) Zn; (C) Li; (D) Pb.

___ 114. The S2- ion differs from the S atom in that the S2- ion has a

(A) smaller radius and fewer electrons; (B) smaller radius and more electrons;

(C) larger radius and fewer electrons; (D) larger radius and more electrons.

___ 115. An aqueous solution of XCl contains colored ions. Element X is most likely

(A) analkaline earth; (B) a halogen; (C) a transition metal; (D) an alkali metal.

___ 116. A reason why fluorine has a higher ionization energy than oxygen is that fluorine has a

(A) smaller nuclear charge; (B) larger nuclear charge;

(C) smaller number of neutrons; (D) larger number of neutrons.

___ 117. As the elements are considered from the top to the bottom of Group VA which sequence in properties occurs?

(A) metal---> metalloid---> nonmetal; (B) metal---> nonmetal---> metalloid;

(C) metalloid---> metal---> nonmetal; (D) nonmetal---> metalloid---> metal.

___ 118. The element found in Group 13 (IIIA) and in Period 2 is

(A) Be; (B) Mg; (C) B; (D) Al.

___ 119. Which element is considered malleable?

(A) gold; (B) hydrogen; (C) sulfur; (D) radon.

___ 120. Which is the most active nonmetal in the Periodic Table of the Elements?

(A) Na; (B) F; (C) I; (D) Cl.

___ 121. A chloride dissolves in water to form a colored solution. The chloride could be

(A) HCl; (B) KCl; (C) $CaCl_2$; (D) $CuCl_2$.

___ 122. Which of the following particles has the smallest radius?

(A) Na; (B) K; (C) Na1+; (D) K1+.

___ 123. In Period 2, as the elements are considered from left to right, there is a decrease in

(A) ionization energy; (B) atomic mass; (C) metallic character; (D) nonmetallic character.

___ 124. Which molecule is relatively inactive and contains a triple bond?

(A) N_2; (B) O_2; (C) Cl_2; (D) H_2.

___ 125. Atoms of metallic elements tend to

(A) gain electrons and form negative ions; (B) gain electrons and form positive ions;

(C) lose electrons and form negative ions; (D) lose electrons and form positive ions.