Spring Final Exam Practice Test #4

1. Which phase change results in the release of energy?

(1) $H_2O(s) \rightarrow H_2O(\ell)$
(2) $H_2O(s) \rightarrow H_2O(g)$
(3) $H_2O(\ell) \rightarrow H_2O(g)$
(4) $H_2O(g) \rightarrow H_2O(\ell)$

2. The strength of an atom's attraction for the electrons in a chemical bond is the atom's

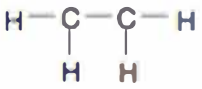
(1) electronegativity
(2) ionization energy
(3) heat of reaction
(4) heat of formation

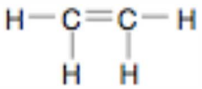
3. Given the equation:

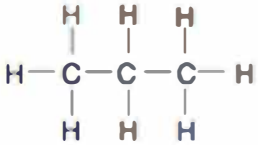
This equation represents the formation of a

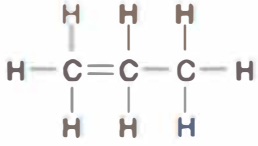
(1) fluoride ion, which is smaller in radius than a fluorine atom
(2) fluoride ion, which is larger in radius than a fluorine atom
(3) fluorine atom, which is smaller in radius than a fluoride ion
(4) fluorine atom, which is larger is radius than a fluoride ion

4. The empirical formula of a compound is CH_2. Which molecular formula is correctly paired with a structural formula for this compound?

(1) C_2H_4 

(2) C_2H_4 

(3) C_3H_8 

(4) C_3H_8 

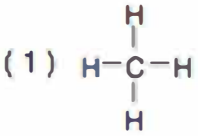
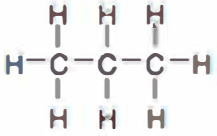
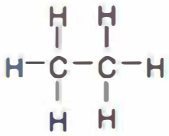
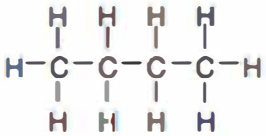
5. Which event must *always* occur for a chemical reaction to take place?

(1) formation of a precipitate
(2) formation of a gas
(3) effective collisions between reacting particles
(4) addition of a catalyst to the reaction system

6. An increase in the average kinetic energy of a sample of copper atoms occurs with an increase in

(1) concentration
(2) temperature
(3) pressure
(4) volume

7. Which compound has an isomer?

(1) 
(3) 
(2) 
(4) 

8. What occurs when NaCl(s) is added to water?

(1) The boiling point of the solution increases, and the freezing point of the solution decreases.
(2) The boiling point of the solution increases, and the freezing point of the solution increases.
(3) The boiling point of the solution decreases, and the freezing point of the solution decreases.
(4) The boiling point of the solution decreases, and the freezing point of the solution increases.

9. Which of these 1 M solutions will have the highest pH?

(1) NaOH
(2) CH_3OH
(3) HCl
(4) NaCl

10. In saturated hydrocarbons, carbon atoms are bonded to each other by

(1) single covalent bonds, only
(2) double covalent bonds, only
(3) alternating single and double covalent bonds
(4) alternating double and triple covalent bonds

11. In which list are the elements arranged in order of increasing atomic mass?

(1) Cl, K, Ar
(2) Fe, Co, Ni
(3) Te, I, Xe
(4) Ne, F, Na

12. Given the following solutions:

Solution *A*: pH of 10
Solution *B*: pH of 7
Solution *C*: pH of 5

Which list has the solutions placed in order of increasing H^+ concentration?

(1) *A*, *B*, *C*
(2) *B*, *A*, *C*
(3) *C*, *A*, *B*
(4) *C*, *B*, *A*

13. Which statement explains why nuclear waste materials may pose a problem?

(1) They frequently have short half-lives and remain radioactive for brief periods of time.
(2) They frequently have short half-lives and remain radioactive for extended periods of time.
(3) They frequently have long half-lives and remain radioactive for brief periods of time.
(4) They frequently have long half-lives and remain radioactive for extended periods of time.

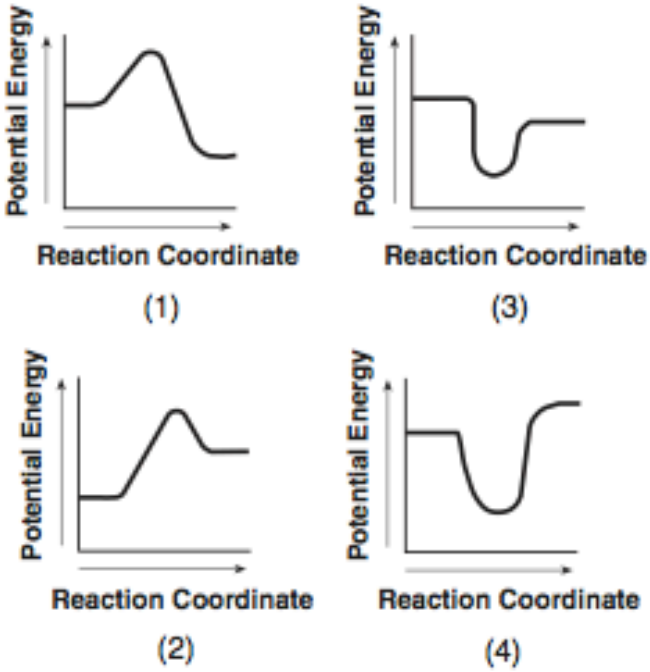
14. What is the molarity of a solution of NaOH if 2 liters of the solution contains 4 moles of NaOH?

(1) 0.5 M
(2) 2 M
(3) 8 M
(4) 80 M

15. Given the reaction:

$$S(s) + O_2(g) \rightarrow SO_2(g) + \text{energy}$$

Which diagram best represents the potential energy changes for this reaction?



16. Which phase change represents a *decrease* in entropy?

(1) solid to liquid
(2) gas to liquid
(3) liquid to gas
(4) solid to gas

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17. A chemist performs the same tests on two homogeneous white crystalline solids, *A* and *B*. The results are shown in the table below.

	Solid A	Solid B
Melting Point	High, 801°C	Low, decomposes at 186°C
Solubility in H_2O (grams per 100.0 g H_2O at 0°C)	35.7	3.2
Electrical Conductivity (in aqueous solution)	Good conductor	Nonconductor

The results of these tests suggest that

(1) both solids contain only ionic bonds
(2) both solids contain only covalent bonds
(3) solid *A* contains only covalent bonds and solid *B* contains only ionic bonds
(4) solid *A* contains only ionic bonds and solid *B* contains only covalent bonds

18. Given the equation:

$$C(s) + H_2O(g) \rightarrow CO(g) + H_2(g)$$

Which species undergoes reduction?

(1) $C(s)$
(2) H^+
(3) C^{2+}
(4) $H_2(g)$

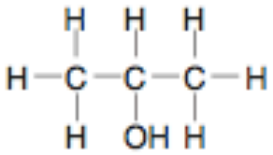
19. In which compound does chlorine have the highest oxidation number?

(1) $NaClO$
(2) $NaClO_2$
(3) $NaClO_3$
(4) $NaClO_4$

20. When a neutral atom undergoes oxidation, the atom's oxidation state

(1) decreases as it gains electrons
(2) decreases as it loses electrons
(3) increases as it gains electrons
(4) increases as it loses electrons

21. Which type of organic compound is represented by the structural formula shown below?



(1) aldehyde
(2) alcohol
(3) ether
(4) ester

22. Given the system at equilibrium:

$$N_2O_4(g) + 58.1\ kJ \rightleftharpoons 2\ NO_2(g)$$

What will be the result of an increase in temperature at constant pressure?

(1) The equilibrium will shift to the left, and the concentration of $NO_2(g)$ will decrease.
(2) The equilibrium will shift to the left, and the concentration of $NO_2(g)$ will increase.
(3) The equilibrium will shift to the right, and the concentration of $NO_2(g)$ will decrease.
(4) The equilibrium will shift to the right, and the concentration of $NO_2(g)$ will increase.

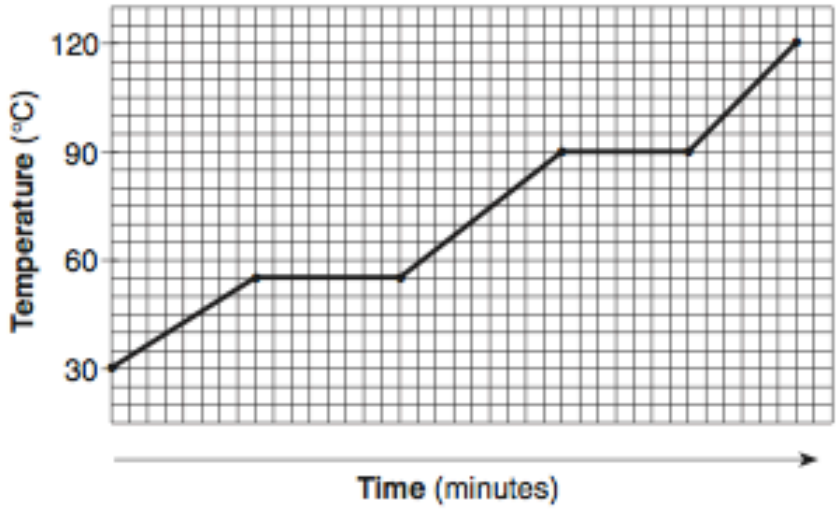
23. Solubility data for four different salts in water at 60°C are shown in the table below.

Salt	Solubility in Water at 60°C
A	10 grams / 50 grams H_2O
B	20 grams / 60 grams H_2O
C	30 grams / 120 grams H_2O
D	40 grams/ 80 grams H_2O

Which salt is most soluble at 60°C?

(1) *A*
(2) *B*
(3) *C*
(4) *D*

24. The graph below represents the heating curve of a substance that starts as a solid below its freezing point.



What is the melting point of this substance?

(1) 30°C
(2) 55°C
(3) 90°C
(4) 120°C

25. A student neutralized 16.4 milliliters of HCl by adding 12.7 milliliters of 0.620 M KOH. What was the molarity of the HCl acid?

(1) 0.168 M
(2) 0.480 M
(3) 0.620 M
(4) 0.801 M

26. Given the reaction:

$$2\ Al(s) + Fe_2O_3(s) \xrightarrow{heat} Al_2O_3(s) + 2\ Fe(s)$$

Which species undergoes reduction?

(1) Al
(2) Fe
(3) Al^{3+}
(4) Fe^{3+}

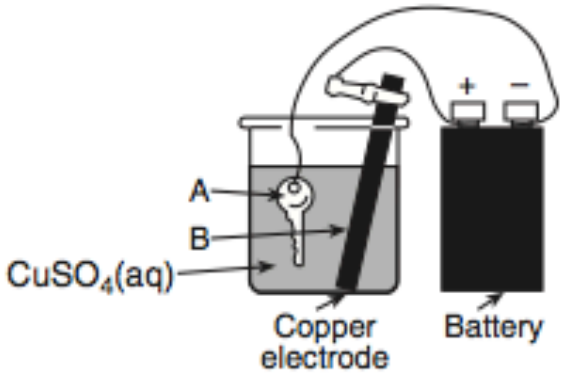
27. Which of these pH numbers indicates the highest level of acidity?

(1) 5
(2) 8
(3) 10
(4) 12

28. According to the Arrhenius theory, when a base dissolves in water it produces

(1) CO_3^{2-} as the only negative ion in solution
(2) OH^- as the only negative ion in solution
(3) NH_4^+ as the only positive ion in solution
(4) H^+ as the only positive ion in solution

29. The diagram below shows a key being plated with copper in an electrolytic cell.



Given the reduction reaction for this cell:

$$Cu^{2+}(aq) + 2e^- \rightarrow Cu(s)$$

This reduction occurs at

(1) *A*, which is the anode
(2) *A*, which is the cathode
(3) *B*, which is the anode
(4) *B*, which is the cathode

30. Which molecule is nonpolar?

(1) H_2O
(2) NH_3
(3) CO
(4) CO_2

31. Given the reaction at equilibrium:

$$H_2(g) + Br_2(g) \rightleftharpoons 2\ HBr(g)$$

The rate of the forward reaction is

(1) greater than the rate of the reverse reaction
(2) less than the rate of the reverse reaction
(3) equal to the rate of the reverse reaction
(4) independent of the rate of the reverse reaction

32. All organic compounds must contain the element

(1) phosphorus
(2) oxygen
(3) carbon
(4) nitrogen

33. Which of the following compounds has the highest boiling point?

(1) H_2O
(2) H_2S
(3) H_2Se
(4) H_2Te

34. The functional group —COOH is found in

(1) esters
(2) aldehydes
(3) alcohols
(4) organic acids

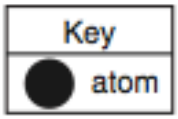
35. Which equation represents a spontaneous nuclear decay?

(1) $C + O_2 \rightarrow CO_2$
(2) $H_2CO_3 \rightarrow CO_2 + H_2O$
(3) $^{27}_{13}Al + {}^{4}_{2}He \rightarrow {}^{30}_{15}P + {}^{1}_{0}n$
(4) $^{90}_{38}Sr \rightarrow {}^{0}_{-1}e + {}^{90}_{39}Y$

36. The volume of a gas is 4.00 liters at 293 K and constant pressure. For the volume of the gas to become 3.00 liters, the Kelvin temperature must be equal to

(1) $\frac{3.00 \times 293}{4.00}$
(2) $\frac{4.00 \times 293}{3.00}$
(3) $\frac{3.00 \times 4.00}{293}$
(4) $\frac{293}{3.00 \times 4.00}$

37. Given the particle diagram:



At 101.3 kPa and 298 K, which element could this diagram represent?

(1) Rn
(2) Xe
(3) Ag
(4) Kr

38. The compound HNO_3 can be described as an

(1) Arrhenius acid and an electrolyte
(2) Arrhenius acid and a nonelectrolyte
(3) Arrhenius base and an electrolyte
(4) Arrhenius base and a nonelectrolyte

39. Given the reaction:

$$NH_3 + HCl \rightarrow NH_4Cl$$

In this reaction, ammonia molecules (NH_3) act as a base because they

(1) accept hydrogen ions (H^+)
(2) accept hydroxide ions (OH^-)
(3) donate hydrogen ions (H^+)
(4) donate hydroxide ions (OH^-)

40. Which change takes place in a nuclear fusion reaction?

(1) Matter is converted to energy.
(2) Energy is converted to matter.
(3) Ionic bonds are converted to covalent bonds.
(4) Covalent bonds are converted to ionic bonds.

41. Which statement best describes gamma radiation?

(1) It has a mass of 1 and a charge of 1.
(2) It has a mass of 0 and a charge of –1.
(3) It has a mass of 0 and a charge of 0.
(4) It has a mass of 4 and a charge of +2.

42. Which physical changes are endothermic?

(1) melting and freezing
(2) melting and evaporating
(3) condensation and sublimation
(4) condensation and deposition

43. What is the chemical formula for copper(II) hydroxide?

(1) CuOH
(2) $CuOH_2$
(3) $Cu_2(OH)$
(4) $Cu(OH)_2$

44. At STP, 4 liters of O_2 contains the same total number of molecules as

(1) 1 L of NH_3
(2) 2 L of Cl_2
(3) 8 L of He
(4) 4 L of CO_2

45. What is the total number of electron pairs that are shared between the two carbon atoms in a molecule of ethyne?

(1) 1
(2) 2
(3) 3
(4) 4

46. Which pair of compounds are isomers?

(1) NO_2 and N_2O_4
(2) P_2O_5 and P_4O_{10}
(3) HCOOH and CH_3COOH
(4) CH_3OCH_3 and C_2H_5OH

47. Which organic compound is unsaturated?

(1) 2-methylbutane
(2) 2-chloropropane
(3) 2-hexanol
(4) 2-pentene

48. Which change in oxidation number indicates oxidation?

(1) –1 to +2
(2) –1 to –2
(3) +2 to –3
(4) +3 to +2

49. Which reaction is an example of natural transmutation?

(1) $^{239}_{94}Pu \rightarrow {}^{235}_{92}U + {}^{4}_{2}He$

(2) $^{27}_{13}Al + {}^{4}_{2}He \rightarrow {}^{30}_{15}P + {}^{1}_{0}n$

(3) $^{238}_{92}U + {}^{1}_{0}n \rightarrow {}^{239}_{94}Pu + 2\,{}^{0}_{-1}e$

(4) $^{239}_{94}Pu + {}^{1}_{0}n \rightarrow {}^{147}_{56}Ba + {}^{90}_{38}Sr + 3{}^{1}_{0}n$

50. Given the redox reaction:

$$Cr^{3+} + Al \rightarrow Cr + Al^{3+}$$

As the reaction takes place, there is a transfer of

(1) electrons from Al to Cr^{3+}
(2) electrons from Cr^{3+} to Al
(3) protons from Al to Cr^{3+}
(4) protons from Cr^{3+} to Al

51. Which statement describes a chemical property that can be used to distinguish between compound *A* and compound *B*?

(1) *A* is a blue solid, and *B* is a white solid.
(2) *A* has a high melting point, and *B* has a low melting point.
(3) *A* dissolves in water, and *B* does not dissolve in water.
(4) *A* does not burn in air, and *B* does burn in air.

52. Given the nuclear equation:

$$^{19}_{10}\text{Ne} \rightarrow X + {}^{19}_{9}\text{F}$$

Which particle is represented by *X*?

(1) alpha
(2) beta
(3) neutron
(4) positron

53. Which of these changes produces the greatest increase in entropy?

(1) $CaCO_3(s) \rightarrow CaO(s) + CO_2(g)$
(2) $2\ Mg(s) + O_2(g) \rightarrow 2\ MgO(s)$
(3) $H_2O(g) \rightarrow H_2O(\ell)$
(4) $CO_2(g) \rightarrow CO_2(s)$

54. For most atoms with an atomic number less than 20, nuclear stability occurs when the ratio of neutrons to protons is 1:1. Which of the following atoms would be most likely to have an unstable nucleus?

(1) $^{4}_{2}\text{He}$
(2) $^{12}_{6}\text{C}$
(3) $^{16}_{7}\text{N}$
(4) $^{24}_{12}\text{Mg}$

55. Given the reaction:

$$Ba(OH)_2(aq) + H_2SO_4(aq) \rightarrow BaSO_4(s) + 2\ H_2O(\ell) + \text{energy}$$

As the barium hydroxide solution is added to the solution of sulfuric acid, the electrical conductivity of the acid solution decreases because the

(1) volume of the reaction mixture increases
(2) temperature of the reaction mixture decreases
(3) concentration of ions increases
(4) concentration of ions decreases

56. As the elements in Group 7A on the Periodic Table are considered from top to bottom, what happens to the atomic radius and the metallic character of each successive element?

(1) The atomic radius and the metallic character both increase.
(2) The atomic radius increases and the metallic character decreases.
(3) The atomic radius decreases and the metallic character increases.
(4) The atomic radius and the metallic character both decrease.

57. A sample of helium gas has a volume of 900. milliliters and a pressure of 2.50 atm at 298 K. What is the new pressure when the temperature is changed to 336 K and the volume is decreased to 450. milliliters?

(1) 0.177 atm
(2) 4.43 atm
(3) 5.64 atm
(4) 14.1 atm

58. Which chemical equation represents the reaction of an Arrhenius acid and an Arrhenius base?

(1) $HC_2H_3O_2(aq) + NaOH(aq) \rightarrow NaC_2H_3O_2(aq) + H_2O(\ell)$
(2) $C_3H_8(g) + 5\ O_2(g) \rightarrow 3\ CO_2(g) + 4\ H_2O(\ell)$
(3) $Zn(s) + 2\ HCl(aq) \rightarrow ZnCl_2(aq) + H_2(g)$
(4) $BaCl_2(aq) + Na_2SO_4(aq) \rightarrow BaSO_4(s) + 2\ NaCl(aq)$

59. Which half-reaction can occur at the anode in a voltaic cell?

(1) $Ni^{2+} + 2e^- \rightarrow Ni$
(2) $Sn + 2e^- \rightarrow Sn^{2+}$
(3) $Zn \rightarrow Zn^{2+} + 2e^-$
(4) $Fe^{3+} \rightarrow Fe^{2+} + e^-$

60. Which compound contains both ionic and covalent bonds?

(1) $CaCO_3$
(2) PCl_3
(3) MgF_2
(4) CH_2O

61. Which formula represents a nonpolar molecule?

(1) HCl
(2) H_2O
(3) NH_3
(4) CF_4

62. Which two nuclides are isotopes of the same element?

(1) $^{20}_{11}Na$ and $^{20}_{10}Ne$
(2) $^{39}_{19}K$ and $^{40}_{20}Ca$
(3) $^{39}_{19}K$ and $^{42}_{19}K$
(4) $^{14}_{6}C$ and $^{14}_{7}N$

63. An atom of oxygen is in an excited state. When an electron in this atom moves from the third shell to the second shell, energy is

(1) emitted by the nucleus
(2) emitted by the electron
(3) absorbed by the nucleus
(4) absorbed by the electron

64. Which trends are observed when the elements in Period 3 on the Periodic Table are considered in order of increasing atomic number?

(1) The atomic radius decreases, and the first ionization energy generally increases.
(2) The atomic radius decreases, and the first ionization energy generally decreases.
(3) The atomic radius increases, and the first ionization energy generally increases.
(4) The atomic radius increases, and the first ionization energy generally decreases.

65. Which chemical equation is correctly balanced?

(1) $H_2(g) + O_2(g) \rightarrow H_2O(g)$
(2) $N_2(g) + H_2(g) \rightarrow NH_3(g)$
(3) $2NaCl(s) \rightarrow Na(s) + Cl_2(g)$
(4) $2KCl(s) \rightarrow 2K(s) + Cl_2(g)$

66. Which type of bond is found in sodium bromide?

(1) covalent
(2) hydrogen
(3) ionic
(4) metallic

67. In a chemical reaction, the difference between the potential energy of the products and the potential energy of the reactants is defined as the

(1) activation energy
(2) ionization energy
(3) heat of reaction
(4) heat of vaporization

68. Which substance is an Arrhenius base?

(1) KCl
(2) CH_3Cl
(3) KOH
(4) CH_3OH

69. Given the balanced equation:

$$I_2(s) + \text{energy} \rightarrow I_2(g)$$

As a sample of $I_2(s)$ sublimes to $I_2(g)$, the entropy of the sample

(1) increases because the particles are less randomly arranged
(2) increases because the particles are more randomly arranged
(3) decreases because the particles are less randomly arranged
(4) decreases because the particles are more randomly arranged

70. The multiple covalent bond in a molecule of 1-butene is a

(1) double covalent bond that has 6 shared electrons
(2) double covalent bond that has 4 shared electrons
(3) triple covalent bond that has 6 shared electrons
(4) triple covalent bond that has 4 shared electrons

71. In an oxidation-reduction reaction, reduction is defined as the

(1) loss of protons
(2) gain of protons
(3) loss of electrons
(4) gain of electrons

72. What is the oxidation number assigned to manganese in $KMnO_4$?

(1) +7
(2) +2
(3) +3
(4) +4

73. Which of the following aqueous solutions is the best conductor of electricity?

(1) 0.10 M CH_3OH
(2) 1.0 M CH_3OH
(3) 0.10 M NaOH
(4) 1.0 M NaOH

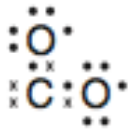
74. One acid-base theory states that an acid is

(1) an H^- donor
(2) an H^- acceptor
(3) an H^+ donor
(4) an H^+ acceptor

75. When an atom becomes a positive ion, the radius of the atom

(1) decreases
(2) increases
(3) remains the same

76. Which Lewis electron-dot diagram is correct for CO_2?



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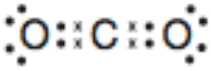

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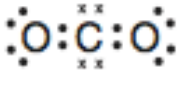

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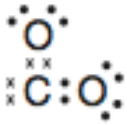
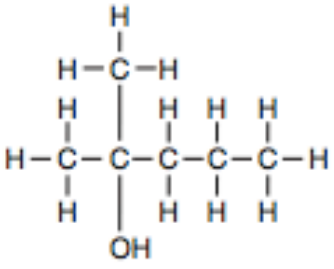


(4)

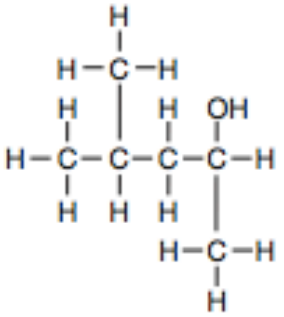
77. Types of nuclear reactions include fission, fusion, and

(1) single replacement
(2) neutralization
(3) oxidation-reduction
(4) transmutation

78. Which structural formula is correct for 2-methyl-3-pentanol?



(1)



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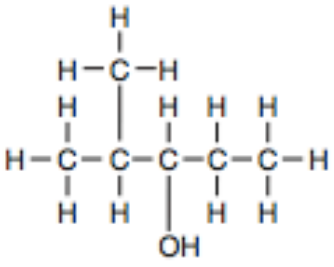
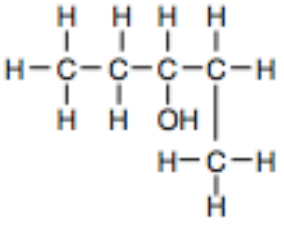


(2)



(4)

79. The amount of energy released from a fission reaction is much greater than the energy released from a chemical reaction because in a fission reaction

(1) mass is converted into energy
(2) energy is converted into mass
(3) ionic bonds are broken
(4) covalent bonds are broken

80. Compared to the freezing point of 1.0 M KCl(aq) at standard pressure, the freezing point of 1.0 M $CaCl_2$(aq) at standard pressure is

(1) lower
(2) higher
(3) the same

81. Elements *Q*, *X*, and *Z* are in the same group on the Periodic Table and are listed in order of increasing atomic number. The melting point of element *Q* is –219°C and the melting point of element *Z* is –7°C. Which temperature is closest to the melting point of element *X*?

(1) –7°C
(2) –101°C
(3) –219°C
(4) –226°C

82. Given the balanced equation:

$$2KClO_3 \rightarrow 2KCl + 3O_2$$

Which type of reaction is represented by this equation?

(1) synthesis
(2) decomposition
(3) single replacement
(4) double replacement

83. A solid substance was tested in the laboratory. The test results are listed below.

- dissolves in water
- is an electrolyte
- melts at a high temperature

Based on these results, the solid substance could be

(1) Cu
(2) $CuBr_2$
(3) C
(4) $C_6H_{12}O_6$

84. Given the balanced equation:

$$4Fe(s) + 3O_2(g) \rightarrow 2Fe_2O_3(s) + 1640\ kJ$$

Which phrase best describes this reaction?

(1) endothermic with $\Delta H = +1640$ kJ
(2) endothermic with $\Delta H = -1640$ kJ
(3) exothermic with $\Delta H = +1640$ kJ
(4) exothermic with $\Delta H = -1640$ kJ

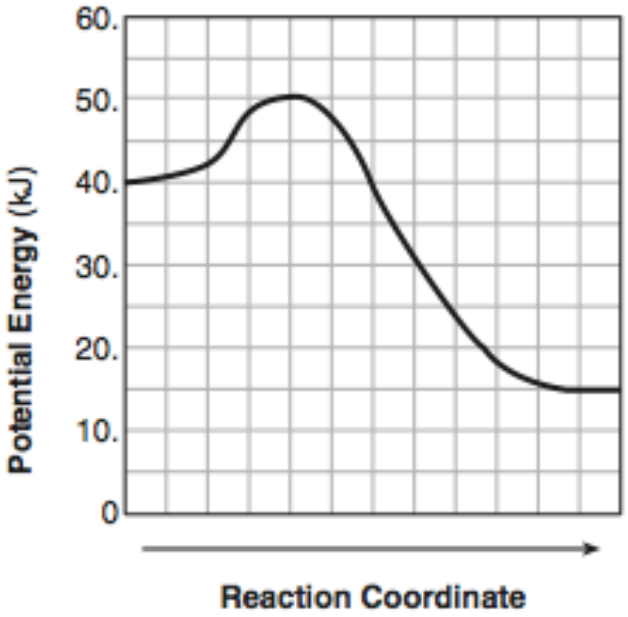
85. Given the incomplete equation for the combustion of ethane:

$$2C_2H_6 + 7O_2 \rightarrow 4CO_2 + 6\ \_\_\_\_$$

What is the formula of the missing product?

(1) CH_3OH (3) H_2O
(2) $HCOOH$ (4) H_2O_2

86. Given the potential energy diagram for a chemical reaction:



Which statement correctly describes the energy changes that occur in the forward reaction?

(1) The activation energy is 10. kJ and the reaction is endothermic.
(2) The activation energy is 10. kJ and the reaction is exothermic.
(3) The activation energy is 50. kJ and the reaction is endothermic.
(4) The activation energy is 50. kJ and the reaction is exothermic.

87. Which formula represents an unsaturated hydrocarbon?

(1) CH_2CHCl (3) $CH_3CH_2CH_3$
(2) CH_3CH_2Cl (4) CH_3CHCH_2

88. How many milliliters of 0.100 M NaOH(aq) would be needed to completely neutralize 50.0 milliliters of 0.300 M HCl(aq)?

(1) 16.7 mL (3) 150. mL
(2) 50.0 mL (4) 300. mL

89. Given the nuclear equation:

$$^{1}_{1}H + X \rightarrow {}^{6}_{3}Li + {}^{4}_{2}He$$

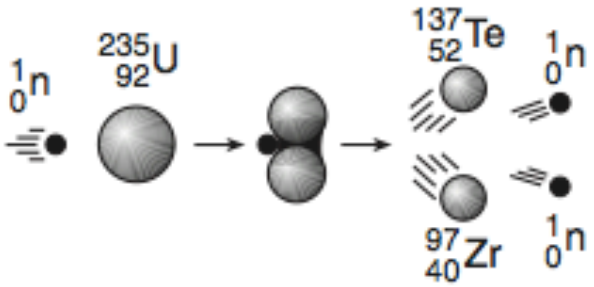
The particle represented by X is

(1) $^{9}_{4}Li$ (3) $^{10}_{5}Be$
(2) $^{9}_{4}Be$ (4) $^{10}_{6}C$

90. Which two substances are covalent compounds?

(1) $C_6H_{12}O_6(s)$ and KI(s)
(2) $C_6H_{12}O_6(s)$ and HCl(g)
(3) KI(s) and NaCl(s)
(4) NaCl(s) and HCl(g)

91. Given the diagram representing a reaction:



Which phrase best describes this type of reaction and the overall energy change that occurs?

(1) nuclear, and energy is released
(2) nuclear, and energy is absorbed
(3) chemical, and energy is released
(4) chemical, and energy is absorbed

92. The balanced equation below represents a molecule of bromine separating into two bromine atoms.

$$Br_2 \rightarrow Br + Br$$

What occurs during this change?

(1) Energy is absorbed and a bond is formed.
(2) Energy is absorbed and a bond is broken.
(3) Energy is released and a bond is formed.
(4) Energy is released and a bond is broken.

93. In which reaction are electrons transferred from one reactant to another reactant?

(1) $2Ca(s) + O_2(g) \rightarrow 2CaO(s)$
(2) $AgNO_3(aq) + KCl(aq) \rightarrow AgCl(s) + KNO_3(aq)$
(3) $HCl(aq) + NaOH(aq) \rightarrow NaCl(aq) + H_2O(\ell)$
(4) $H_3O^+(aq) + OH^-(aq) \rightarrow 2H_2O(\ell)$

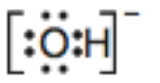
94. Which compound has hydrogen bonding between its molecules?

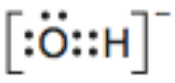
(1) CH_4
(2) CaH_2
(3) KH
(4) NH_3

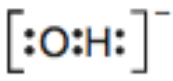
95. Which ion is the only negative ion produced by an Arrhenius base in water?

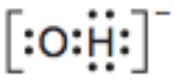
(1) NO_3^-
(2) Cl^-
(3) OH^-
(4) H^-

96. Which Lewis electron-dot diagram correctly represents a hydroxide ion?

(1) 

(3) 

(2) 

(4) 

97. At which temperature would atoms of a He(g) sample have the greatest average kinetic energy?

(1) 25°C
(2) 37°C
(3) 273 K
(4) 298 K

98. Given the system at equilibrium:

$$2POCl_3(g) + \text{energy} \rightleftharpoons 2PCl_3(g) + O_2(g)$$

Which changes occur when $O_2(g)$ is added to this system?

(1) The equilibrium shifts to the right and the concentration of $PCl_3(g)$ increases.
(2) The equilibrium shifts to the right and the concentration of $PCl_3(g)$ decreases.
(3) The equilibrium shifts to the left and the concentration of $PCl_3(g)$ increases.
(4) The equilibrium shifts to the left and the concentration of $PCl_3(g)$ decreases.

99. What is the oxidation number of chromium in the chromate ion, CrO_4^{2-}?

(1) +6
(2) +2
(3) +3
(4) +8

100. In which 0.01 M solution is phenolphthalein pink?

(1) $CH_3OH(aq)$
(2) $Ca(OH)_2(aq)$
(3) $CH_3COOH(aq)$
(4) $HNO_3(aq)$

Q	Ans	Test	#
1	D	Jan. 03	17
2	A	Jan. 03	10
3	B	Jan. 03	14
4	B	Jan. 03	13
5	C	Jan. 03	5
6	B	Jan. 03	12
7	D	Jan. 03	18
8	A	Jan. 03	19
9	A	Jan. 03	23
10	A	Jan. 03	25
11	A	Jan. 03	3
12	A	Jan. 03	32
13	D	Jan. 03	33
14	B	Jan. 03	44
15	A	Jan. 03	38
16	B	Jan. 03	41
17	D	Jan. 03	39
18	B	Jan. 03	28
19	D	Jan. 03	4
20	D	Jan. 03	27
21	B	Jan. 03	49
22	D	Jan. 03	50
23	D	Jan. 03	40
24	B	Jan. 03	47
25	B	Jan. 04	45
26	D	Jan. 04	23
27	A	Jan. 04	25
28	B	Jan. 04	26
29	B	Jan. 04	44
30	D	Jan. 04	10
31	C	Jan. 04	17
32	C	Jan. 04	19
33	A	Jan. 04	20
34	D	Jan. 04	21
35	D	Jan. 04	28
36	A	Jan. 04	40
37	C	Jan. 05	41
38	A	Jan. 05	25
39	A	Jan. 05	27
40	A	Jan. 05	30
41	C	Jan. 05	29
42	B	Jan. 05	17
43	D	Jan. 05	8
44	D	Jan. 05	19
45	C	Jan. 05	20
46	D	Jan. 05	21
47	D	Jan. 05	22
48	A	Jan. 05	23
49	A	Jan. 05	28
50	A	Jan. 05	24
51	D	Jan. 05	10
52	D	Jan. 05	50
53	A	Jan. 05	43
54	C	Jan. 05	42
55	D	Jan. 05	46
56	A	Jan. 05	33
57	C	Jan. 05	40
58	A	Jan. 05	47
59	C	Jan. 05	45
60	A	Jan. 05	11
61	D	Jan. 05	12
62	C	Jan. 06	1
63	B	Jan. 06	2
64	A	Jan. 06	7
65	D	Jan. 06	10
66	C	Jan. 06	12
67	C	Jan. 06	16
68	C	Jan. 06	17
69	B	Jan. 06	18
70	B	Jan. 06	19

Q	Ans	Test	#
71	D	Jan. 06	20
72	A	Jan. 06	21
73	D	Jan. 06	22
74	C	Jan. 06	23
75	A	Jan. 06	29
76	C	Jan. 06	26
77	D	Jan. 06	27
78	B	Jan. 06	28
79	A	Jan. 06	25
80	A	Jan. 06	30
81	B	Jan. 06	35
82	B	Jan. 06	37
83	B	Jan. 06	38
84	D	Jan. 06	40
85	C	Jan. 06	42
86	B	Jan. 06	43
87	D	Jan. 06	45
88	C	Jan. 06	48
89	B	Jan. 06	49
90	B	Jan. 07	12
91	A	Jan. 07	14
92	B	Jan. 07	16
93	A	Jan. 07	20
94	D	Jan. 07	29
95	C	Jan. 07	30
96	A	Jan. 07	37
97	B	Jan. 07	39
98	D	Jan. 07	44
99	A	Jan. 07	45
100	B	Jan. 07	47