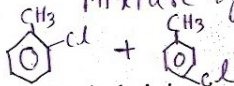


62. Which one of the following is an unsaturated fatty acid?

- a) Palmitic acid
 - b) Lauric acid
 - c) Linolenic acid
 - d) Myristic acid
- Linolenic acid

63. When chlorine is passed through boiling toluene we get

- a) o-Chloro toluene
 - b) p-Chloro toluene
 - c) Mixture of o & p-Chloro toluene
 - d) Benzyl chloride
- Mixture of o & p-Chloro-toluene



64. The standard temperature used in thermo chemical calculations is

- a) 273 K
 - b) 298 K
 - c) 297 K
 - d) 303 K
- $273 + 25 = 298 K$

65. Which of the following is an intensive property?

- a) Enthalpy
 - b) Entropy
 - c) Density
 - d) Mass
- Density

66. Schiff's reagent contains

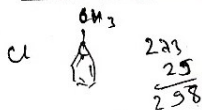
- a) Rochelle salt
 - b) Resorcinol
 - c) Rosaniline
 - d) α -naphthol
- Rosaniline
 $C_{19}H_{18}N_3Cl$

67. The formula of chromyl chloride is

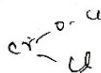
- a) CrCl
 - b) CrCl₃
 - c) CrOCl₂
 - d) CrO₂Cl₂
- CrO_2Cl_2

- a) Oxide ore
 - b) Sulfide ore
 - c) Halide ore
 - d) Carbonate ore
- Halide ore

Space for calculation / rough work



$m = \frac{M}{V}$



Physics and Chemistry

Ver. C

69. Tetrahedral structure is formed by

- a) sp^3 hybridization
- b) sp^3 hybridization
- c) dsp^3 hybridization
- d) d^2sp^3 hybridization

sp^3 hybridization

70. NO^+ ligand is

- a) nitronium
- b) nitrosyl
- c) nitrosonium
- d) nitro

nitrosonium

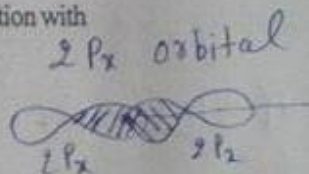
71. Cationic Complex is

- a) hexa amino platinum chloride
- b) potassium ferro cyanide
- c) sodium argento cyanide
- d) nickel carbonyl

hexa amino platinum chloride

72. $2p_x$ atomic orbital undergoes linear combination with

- a) $2p_x$ orbital
- b) $2p_x$ orbital
- c) Both $2p_x$ and $2p_z$ orbitals
- d) $2p_z$ orbital



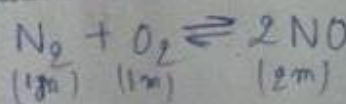
73. In a first order reaction, molar concentration of a reactant decreases from 0.1 to 0.01 in 100 seconds, The rate constant of the reaction is

- a) 2.3030
- b) 0.02303
- c) 0.2303
- d) 0.002303

$$k = \frac{2.303}{t} \log \frac{a}{a-x} = \frac{2.303}{100} \log \frac{0.1}{0.01} = 0.02303$$

74. In which one of the following equilibria, pressure has no effect

- a) $PCl_5 \rightleftharpoons PCl_3 + Cl_2$
- b) $2NH_3 \rightleftharpoons N_2 + 3H_2$
- c) $2SO_2 + O_2 \rightleftharpoons 2SO_3$
- d) $N_2 + O_2 \rightleftharpoons 2NO$



75. Conductivity of a solution is not affected by

- a) Addition of water
- b) Process of heating
- c) Addition of acetic acid
- d) Addition of ethanol

Addition of ethanol

Space for calculation / rough work

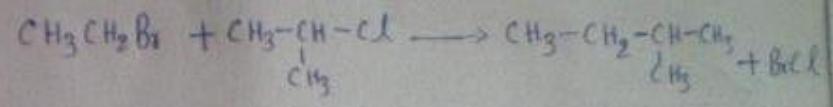
$$k = \frac{2.303}{100} \log \frac{0.1}{0.01} = 0.02303$$

Physics and Chemistry

Ver. C

76. The lowering in vapour pressure is maximum for
 a) 0.1M urea
 b) 0.1M NaCl
 c) 0.1M MgCl₂
 d) 0.1M K₄[Fe(CN)₆]

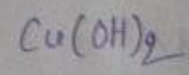
77. Bromo ethane and isopropyl chloride with metallic sodium in ether forms
 a) Pentane
 b) 2-methyl butane
 c) 3-methyl butane
 d) 2:3 dimethyl butane



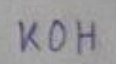
78. To dry ammonia gas the drying agent used is
 a) Con. H₂SO₄
 b) P₂O₅
 c) soda lime
 d) anhydrous CaCl₂

The moisture present in ammonia can't be dried by conc. H₂SO₄, anhydrous CaCl₂ and P₂O₅.

79. The metal hydroxide which is soluble in excess of ammonium hydroxide is
 a) Fe(OH)₂
 b) Fe(OH)₃
 c) Cu(OH)₂
 d) Al(OH)₃



80. Potassium dichromate can be converted to potassium chromate by adding
 a) KOH
 b) Con. H₂SO₄
 c) NH₄OH
 d) acetic acid



81. 0.5g of an acid is neutralized by 40cc of 0.125N NaOH. The equivalent mass of the acid is
 a) 50
 b) 100
 c) 40
 d) 80

100 ; Eqr weight of NaOH = 40

82. 5 liters of NaOH solution of pH 12 contains
 a) 200g
 b) 0.2g
 c) 20g
 d) 2g

pOH = 2 ; [OH⁻] = 1 x 10⁻² M
 Weight (NaOH) = 40g
 In 5 liters = 5 x 40 x 1 x 10⁻² = 2g

Space for calculation / rough work

$$E = \frac{0.5}{0.125 \times 40} = \frac{0.5 \times 1000}{1000} = 1000$$

$$E = \frac{0.5 \times 1000}{0.125 \times 40} = \frac{500}{5} = 100$$

$$10^{-2} = \frac{40}{40 \times 5}$$

$$M = \frac{100 \times 1000}{1000} = 100$$

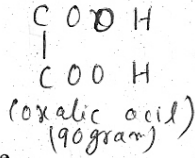
$$M = \frac{100 \times 1000}{1000} = 100$$

C **Physics and Chemistry**

Ver C

83. 50cc of oxalic acid is oxidized by 25cc of 0.20 N $KMnO_4$. The mass of oxalic acid present in 500cc of the solution is

- a) 3.15g
- b) 31.5g
- c) 6.3g
- d) 63g



84. Pure water is neutral because

- a) $PH = 7$
- b) Litmus has no effect
- c) It is free from dissolved salts
- d) $PH = 0$

$$PH = 7$$

85. In the titration of Mohr salt against $KMnO_4$, the indicator used is

- a) diphenyl amine
- b) $KMnO_4$
- c) phenolphthalein
- d) Methyl orange

$KMnO_4$; Mohr salt against $KMnO_4$, doesn't need any external indicator.

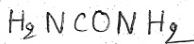
86. The relationship between half life of a reaction and the order of reaction is

- a) $t_{1/2} \propto \frac{1}{a^{(n+1)}}$
- b) $t_{1/2} \propto \frac{1}{a^{(n+2)}}$
- c) $t_{1/2} \propto \frac{1}{a^n}$
- d) $t_{1/2} \propto \frac{1}{a^{(n-1)}}$

$$t_{1/2} \propto \frac{1}{a^{(n-1)}}$$

87. 6gm of urea is dissolved in 90g of water. Relative lowering of vapour pressure is

- a) 0.02
- b) 0.2
- c) 0.002
- d) 0.04



88. 6.84g of sucrose is dissolved in 200g of water. The molality of the solution is

- a) 0.2M
- b) 0.3M
- c) 0.1M
- d) 0.02M

Molecular Weight of SUCROSE ($C_{12}H_{22}O_{11}$) = 342

$$1000g \text{ of water} \equiv 5 \times 6.84 = 34.2$$

$$\text{molality} = \frac{34.2}{342} = 0.1M$$

Space for calculation / rough work

$N \times 500 = 25 \times 0.20$
 $N = \frac{25 \times 0.20}{500} = \frac{20}{20 \times 100} = 10^{-2}$
 $10^{-2} = \frac{49}{2448} \times \frac{5600}{10000}$
 $g = 10^{-2} \times 120$

C_2H_5COOH
 $10^{-2} = \frac{12}{79} \times \frac{24}{24} \times \frac{24}{2} \times \frac{45}{5}$
 $10^{-2} = \frac{12 \times 24 \times 24 \times 45}{79 \times 2 \times 5}$
 $10^{-2} = \frac{12 \times 24 \times 24 \times 45}{79 \times 10}$
 $10^{-2} = \frac{12 \times 24 \times 24 \times 45}{79 \times 10}$

$H_2S_2O_8$
 $10^{-2} = \frac{60}{60} + \frac{16}{18} + \frac{10}{18}$
 $10^{-2} = \frac{10}{15} \times \frac{10000}{25}$

When common salt is added to a saturated solution of soap, soap is precipitated. This is based on the principle of

- a) Common ion effect
- b) Principle of solubility product
- c) Adsorption from solution
- d) Peptisation

Common ion effect

Highest osmotic pressure is shown by a solution of

- a) 0.1M Aluminium sulfate
- b) 0.1M Potassium Nitrate
- c) 0.1M Magnesium Chloride
- d) 0.1M Barium Chloride

0.1M Aluminium sulfate

50% of a first order reaction is completed in 30min. The velocity constant of the reaction is

- a) 0.231
- b) 2.31
- c) 0.00231
- d) 0.0231

$t_{1/2} = 30 \text{ min}$

$k = \frac{0.693}{30} = 0.0231$

The ebullioscopic constant is the elevation in boiling point produced by

- a) 1Molar solution
- b) 1Molal solution
- c) 1N solution
- d) 10% solution

1 Molal solution

The mass of glucose to be dissolved in 50g of water to get 0.3 Molal solution is

- a) 27g
- b) 0.27g
- c) 2.7g
- d) 5.4g

25ml of 0.08N Mohr salt solution is Oxidised by 20ml of $K_2Cr_2O_7$ in acid medium. The Mass of Mohr salt present in 500cc is

- a) 3.96g
- b) 19.6g
- c) 39.6g
- d) 39.2g

19.6g

A reaction is spontaneous at all temperature when

- a) ΔH is -ve and ΔS is +ve
- b) ΔH is +ve and ΔS is -ve
- c) Both ΔH & ΔS are -ve
- d) Both ΔH & ΔS are +ve

ΔH is -ve and ΔS is +ve

$Al_2(SO_4)_3$ P.V.K

$k = \frac{0.693}{30} \log$

$k = \frac{0.693}{30}$

$\Delta G = \Delta H - T\Delta S < 0 \Rightarrow 0.0231$

Space for calculation / rough work

$0.3 = \frac{3}{80} \times 20$

$3 = 400 \times 0.3$
 $= \frac{120}{1000}$ 0.12

$0.3 = \frac{120}{1000}$

$M = \frac{0.12 \times 1000}{100} = 1.2$

$K_2Cr_2O_7$

$25 \times 0.08 = 20 \times \frac{3}{80}$

48

36

12

96. The coordination number of sodium chloride is

- a) 4
- b) 8
- c) 6
- d) 12

97. Conjugate acid of NH_2^- is

- a) NH_3
- b) NH_4^+
- c) N^{3-}
- d) NH_2^+



98. Highest molar conductivity is given by

- a) 0.005 M NaCl
- b) 0.1 M NaCl
- c) 0.05 M NaCl
- d) 0.01 M NaCl

Molar Conductivity is defined as the conductivity of an electrolyte solution divided by molar concentration.

99. In the detection of III group basic radicals NH_4OH is added after NH_4Cl to

- a) increase in the ionization of NH_4OH
- b) increase in the ionization of salt solution
- c) decrease in the ionization of salt solution
- d) decrease in the ionization of NH_4OH

decrease in the ionization of NH_4OH

100. Just before attaining the chemical equilibrium

- a) Rate of forward reaction decreases & Rate of backward reaction increases ✓
- b) Rate of forward reaction increases & Rate of backward reaction decreases.
- c) No change in the rates of forward & backward reactions.
- d) Rate of forward reaction equals the rate backward reaction.

101. Which one of the following shows highest magnetic moment?

- a) Fe^{2+}
- b) Co^{2+}
- c) Cr^{3+}
- d) Ni^{2+}

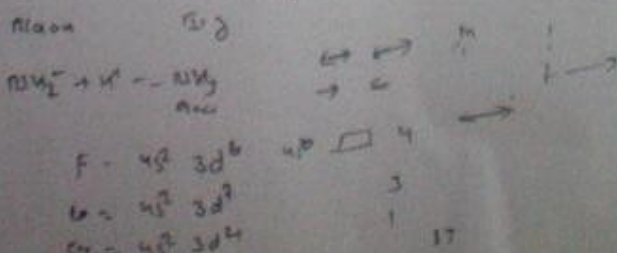
Fe^{2+} ; becoz it has 4 unpaired electrons.

102. In 3d series as we move from scandium to zinc the paramagnetism

- a) increases
- b) decreases
- c) first increases to a maximum & then decreases
- d) first decreases to a minimum & then increases

"C"; Paramagnetism in the transition elements is caused by the presence of unpaired electrons in the d suborbital.

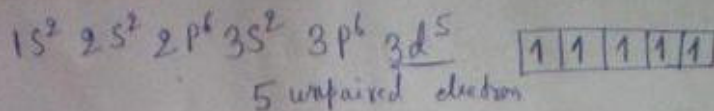
Space for calculation / rough work



$20 \times 10^{-4} \times \frac{1}{100}$
 $\frac{20}{100}$
 $\frac{22}{100}$
 $\frac{198}{100}$
 $\frac{22}{100}$
 $\frac{220}{100}$
 $\frac{6189 \times 1000}{200 \times 1000}$
 $\frac{3}{10}$

103. The number of unpaired electrons in Fe^{3+} is

- a) 2
- b) 3
- c) 4
- d) 5



104. The IUPAC name of $K_3[Fe(CN)_6]$ is

- a) Potassium ferri cyanide
- b) Potassium ferro cyanide
- c) Potassium Hexa cyano ferrate (II)
- d) Potassium Hexa cyano ferrate (III)

Potassium Hexacyano ferrate(II)

105. The adsorption of an inert gases on activated charcoal increases with

- a) decrease of pressure
- b) increase of temperature
- c) decrease of atomic mass
- d) decrease of temperature

decrease of temperature

106. Electrolysis of brine gives a mixture of

- a) H_2 , Na, Cl_2
- b) Cl_2 , H_2 , NaOH
- c) H_2 , O_2 , NaOH
- d) O_2 , Cl_2 , NaOH

107. Sucrose is a non reducing sugar due to

- a) 1-2 linkage
- b) 1-4 linkage
- c) 1-5 linkage
- d) 1-6 linkage

1-2 linkage

108. Sulfur containing amino acid is

- a) alanine
- b) proline
- c) tyrosine
- d) cysteine

109. Lysine is

- a) Neutral amino acid
- b) Acidic amino acid
- c) Basic amino acid
- d) Heterocyclic amino acid

Basic amino acid

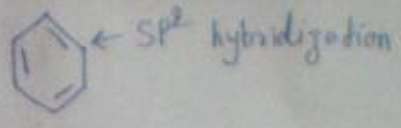
Space for calculation / rough work

-6 = -4
2

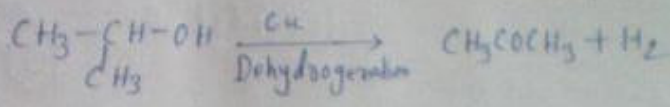
110. In the Molisch reagent, the substance used is
- a) β naphthol in alcohol
 - b) α naphthol in alcohol
 - c) Resorcinol in alcohol
 - d) Rosaniline in water

α naphthol in alcohol

111. In benzene, each carbon atom undergoes
- a) sp hybridization
 - b) sp^2 hybridization
 - c) sp^3 hybridization
 - d) dsp^2 hybridization



112. When vapours of isopropyl alcohol is passed over heated copper we get acetone. It is an example for
- a) dehydration
 - b) dehalogenation
 - c) dehydrohalogenation
 - d) dehydrogenation

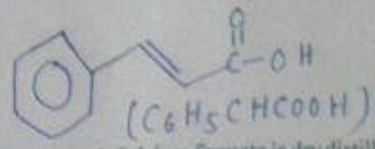


113. $\begin{matrix} \text{CH}_3 \\ | \\ \text{CH}_3-\text{N}-\text{CH}_3 \end{matrix}$ is the IUPAC name of

- a) tri methyl amine
- b) 2 methyl ethanamine
- c) N-N dimethyl methanamine
- d) trimethyl ammonia

N-N dimethyl methanamine

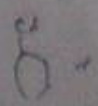
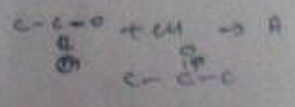
114. When Benzaldehyde is condensed with acetic anhydride in presence of fused sodium acetate we get
- a) Crotonic acid
 - b) Cinnamic acid
 - c) Aspartic acid
 - d) Salicylic acid



115. When a mixture of Calcium Benzoate & Calcium formate is dry distilled, we get
- a) Formaldehyde
 - b) Acetaldehyde
 - c) Benzaldehyde
 - d) Salicylaldehyde

Benzaldehyde

Space for calculation / rough work



$n \times 50 = 250$

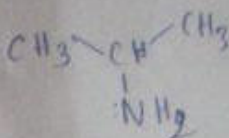
$n = \frac{250}{50}$

$5 \times 10 = 50$

Physics and Chemistry

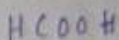
116. Which one of the following is strongly basic?

- a) Dimethyl amine
- b) Methyl amine
- c) Ammonia
- d) Aniline



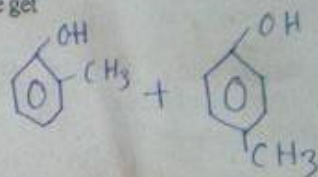
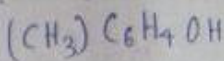
117. Which one of the following is bi functional compound?

- a) Formic acid
- b) Acetic acid
- c) Benzoic acid
- d) Cinnamic acid



118. When phenol is treated with Chloro methane in presence of AlCl_3 we get

- a) o-cresol
- b) m-cresol
- c) p-cresol
- d) mixture of o & p-cresol



119. In the synthesis of ammonia $\text{N}_2 + 3\text{H}_2 \rightleftharpoons 2\text{NH}_3$

- a) $K_p = K_c RT$
- b) $K_p = K_c$
- c) $K_p = K_c (RT)^{-2}$
- d) $K_p = K_c (RT)^{-1}$

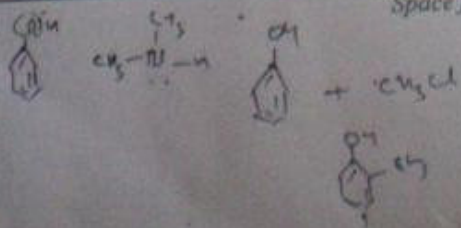
$$\Delta n = -2$$

$$K_p = K_c (RT)^{-2}$$

120. When the same amount of electricity is passed through solutions of silver nitrate and copper sulfate, 0.4g copper is deposited. The amount of silver deposited is

- a) 1.35g
- b) 2.7g
- c) 5.1g
- d) 5.4g

Space for calculation / rough work



$$z_p = k A P^{an} S^c$$

$$an = 2 - 4$$

$$= -2$$