

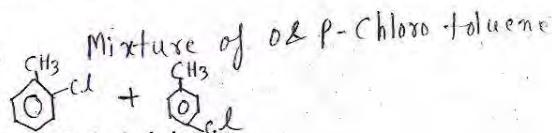
62. Which one of the following is an unsaturated fatty acid?

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

☐ C 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



64. The standard temperature used in thermo chemical calculations is

- a) 273 K
☒ b) 298 K
c) 297 K
d) 303 K

$$273 + 25 = 298 \text{ K}$$

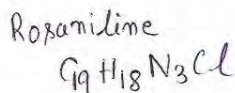
65. Which of the following is an intensive property?

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

Density

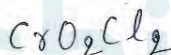
66. Schiff's reagent contains

- a) Rochelle salt
b) Resorcinol
☒ c) Rosaniline
d) α -naphthol



67. The formula of chromyl chloride is

- a) CrCl
b) CrCl_3
c) CrOCl_2
☒ d) CrO_2Cl_2

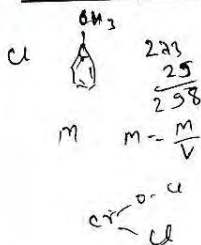


68. Horn silver is

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

Halide ore

Space for calculation / rough work



69. Tetrahedral structure is formed by

sp^3 hybridization

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

70. NO^+ ligand is

nitrosonium

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

71. Cationic Complex is

hexa amino platinum chloride

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

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

$2p_x$ orbital

- a) $2p_y$ orbital
- ☒ b) $2p_x$ orbital
- c) Both $2p_y$ 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

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

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

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

Addition of ethanol

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

Space for calculation / rough work

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

Physics and Chemistry

76. The lowering in vapour pressure is maximum for

- a) 0.1M urea
- b) 0.1M NaCl
- c) 0.1M $MgCl_2$
- d) 0.1M $K_4[Fe(CN)_6]$

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



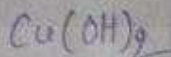
78. To dry ammonia gas the drying agent used is

- a) Con. H_2SO_4
- b) P_2O_5
- c) soda lime
- d) anhydrous $CaCl_2$

The moisture present in ammonia can't be dried by conc. H_2SO_4 , anhydrous $CaCl_2$ and P_2O_5 .

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. H_2SO_4
- c) NH_4OH
- 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

$$100 ; \text{Eq weight of NaOH} = 40$$

82. 5 liters of NaOH solution of pH 12 contains

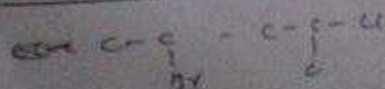
- a) 200g
- b) 0.2g
- c) 20g
- d) 2g

$$pOH = 2 ; [OH^-] = 1 \times 10^{-2} M$$

$$\text{Weight (NaOH)} = 40g$$

$$\text{In 5 Litre} = 5 \times 40 \times 1 \times 10^{-2} = 2g$$

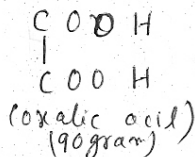
Space for calculation / rough work



$$\frac{0.5}{E} = \frac{0.125 \times 40}{1000} = 1000 \quad 40 \times 5 \times 10^{-2}$$

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

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



- ✓ a) $\text{pH} = 7$
b) Litmus has no effect
c) It is free from dissolved salts
d) $\text{pH} = 0$

$\text{pH} = 7$

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

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

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

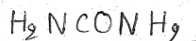
$$b) \quad t_{\frac{1}{2}} \propto \frac{1}{a^{(n+2)}}$$

c) $t_{\frac{1}{2}} \propto \frac{1}{a^n}$

$$\text{d)} \quad t_{\frac{1}{2}} \propto \frac{1}{a^{(n-1)}}$$

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

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



- a) 0.2M
b) 0.3M
✓ c) 0.1M
d) 0.02M

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

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

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

Space for calculation / rough work

$$n \times 500 = 25 \times 0.20$$

CH₃COOH

$$10^2 = \frac{96}{2} \times \frac{500}{1000}$$

$l_{1/2}$

$$n = \frac{25 \times 0.20}{500} = \frac{20}{20 \times 100} = 10^{-2} \quad \begin{array}{r} 32 \\ 7 \\ 12 \end{array}$$

$$\frac{CO_2 \cdot COO^-}{C_2H_2O_2} \cdot 10^{-2} = \frac{500}{20} \times \frac{2448}{2} \times \frac{560}{1000}$$

$\frac{12}{78}$
 64

$$\begin{array}{r} 24 \times 24 \\ 96 \\ 960 \\ \hline 576 \end{array}$$

$$\frac{30}{2} \quad 4.5 \times 5$$

$15 \times 5 = 75$
 $22.5 \times 5 = 112.5$

$$\frac{8}{60} + \frac{90}{18}$$

$$\frac{1}{10} + \frac{1}{15} = \frac{3}{30} + \frac{2}{30} = \frac{5}{30} = \frac{1}{6}$$

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) 1 Molar solution
- ☒ b) 1 Molal 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

$Al(SO_4)_3$ PNH

Space for calculation / rough work

$$m_0 = \frac{9.305}{30} \log$$

$$0.3 = \frac{9}{80} \times 20$$

$$9 = 400 \times 0.3$$

$$= 120 \quad 0.12$$

$$0.3 \in \frac{9}{80}$$

$$16$$

$$m = \frac{0.3 \times 250}{100} = 0.75$$

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^{2+}
- d) Ni^{2+}

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

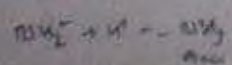
102. In 3d series as we move from scandium to zinc the paramagnetism

- 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 electron in the $3d$ suborbital.

Space for calculation / rough work

Alum Fe^{2+}



$\text{Fe} = 4s^2 3d^6$

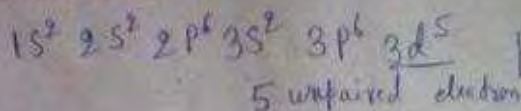
$\text{Co} = 4s^2 3d^7$

$\text{Cr} = 4s^2 3d^4$

10
100
22
108
22
220

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

- a) 2
b) 3
c) 4
☒ d) 5



1	1	1	1	1
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104. The IUPAC name of $\text{K}_3[\text{Fe}(\text{CN})_6]$ is

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

Potassium Hexacyanoferrate(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

$$-6 - -4$$

$$2$$

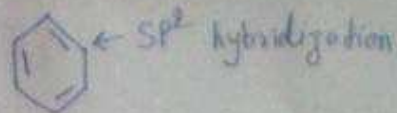
110. In the Molisch reagent, the substance used is

- a) β naphthol in alcohol
- ☒ b) α naphthol in alcohol
- c) Resorcinol in alcohol
- d) Rosaniline in water

α naphthol in alcohol

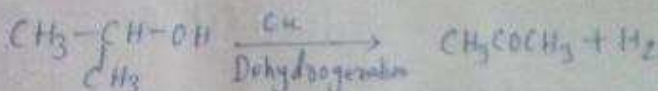
111. In benzene, each carbon atom undergoes

- 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



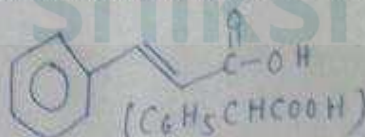
113. $\text{CH}_3 - \text{N}(\text{CH}_3) - \text{CH}_3$ is the IUPAC name of

- a) trimethylamine
- 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

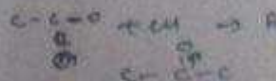


115. When a mixture of Calcium Benzoate & Calcium formate is dry distilled, we get

- a) Formaldehyde
- b) Acetaldehyde
- ☒ c) Benzaldehyde
- d) Salicylaldehyde

Benzaldehyde

Space for calculation / rough work



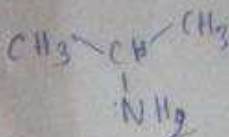
$$10 \times 50 = 500$$

$$10 = \frac{500}{50}$$

$$0.10 = \frac{10}{100}$$

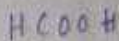
116. Which one of the following is strongly basic?

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



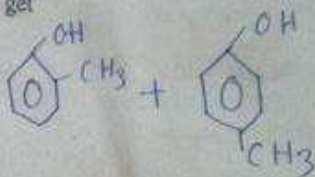
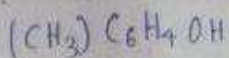
117. Which one of the following is bi functional compound?

- ☒ 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) $K_p = K_c (RT)^{-1}$

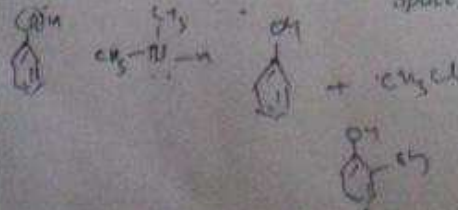
$$\Delta n = -2$$

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

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



$$2p = k \cdot p^m \cdot n \cdot Si$$

$$\Delta n = 2 - m$$

$$= -2$$