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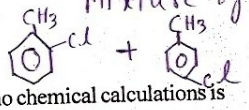
62. Which one of the following is an unsaturated fatty acid?
a) Palmitic acid
b) Lauric acid
c) Linolenic acid
d) Myristic acid

[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

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
c) α naphthol

Rosaniline
$C_{19}H_{18}N_3Cl$

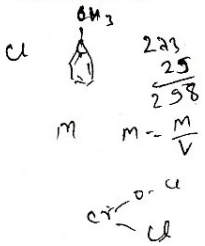
67. The formula of chromyl chloride is
a) CrCl
b) $CrCl_3$
c) $CrOCl_2$
d) CrO_2Cl_2

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



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Physics and Chemistry

Ver C

89. Tetrahedral structure is formed by
a) Sp^2 hybridization
b) Sp^3 hybridization
c) dsp^2 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) $2p_y$ orbital
b) $2p_x$ orbital
c) Both $2p_y$ and $2p_z$ orbitals
d) $2p_z$ orbital

2 P_x 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 equillibria, pressure has no effect
a) $PCl_5 \rightleftarrows PCl_3 + Cl_2$
b) $2NH_3 \rightleftarrows N_2 + 3H_2$
c) $2SO_2 + O_2 \rightleftarrows 2SO_3$
d) $N_2 + O_2 \rightleftarrows 2NO$

$N_2 + O_2 \rightleftharpoons 2NO$
(1m) (1m) (2m)

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

$K = \frac{2.303}{100} \log \frac{0.1}{0.01}$

$= \frac{2.303}{100} = 0.002$

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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

$CH_3CH_2Br + CH_3-CH(CH_3)-Cl \longrightarrow CH_3-CH_2-CH(CH_3)-CH_3 + BrCl$

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) $Al(OH)_3$

$Cu(OH)_2$

80. Potassium dichromate can be converted to potassium chromate by adding
a) KOH
b) Con. H_2SO_4
c) NH_4OH
d) acetic acid

KOH

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 ; Eqv 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
Weight (NaOH) = 40g
In 5 liter $= 5 \times 40 \times 1 \times 10^{-2} = 2$ g

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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

(oxalic acid) (90 gram)

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

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

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

H_2NCONH_2

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 of water = 5 × 6.84 = 34.2

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

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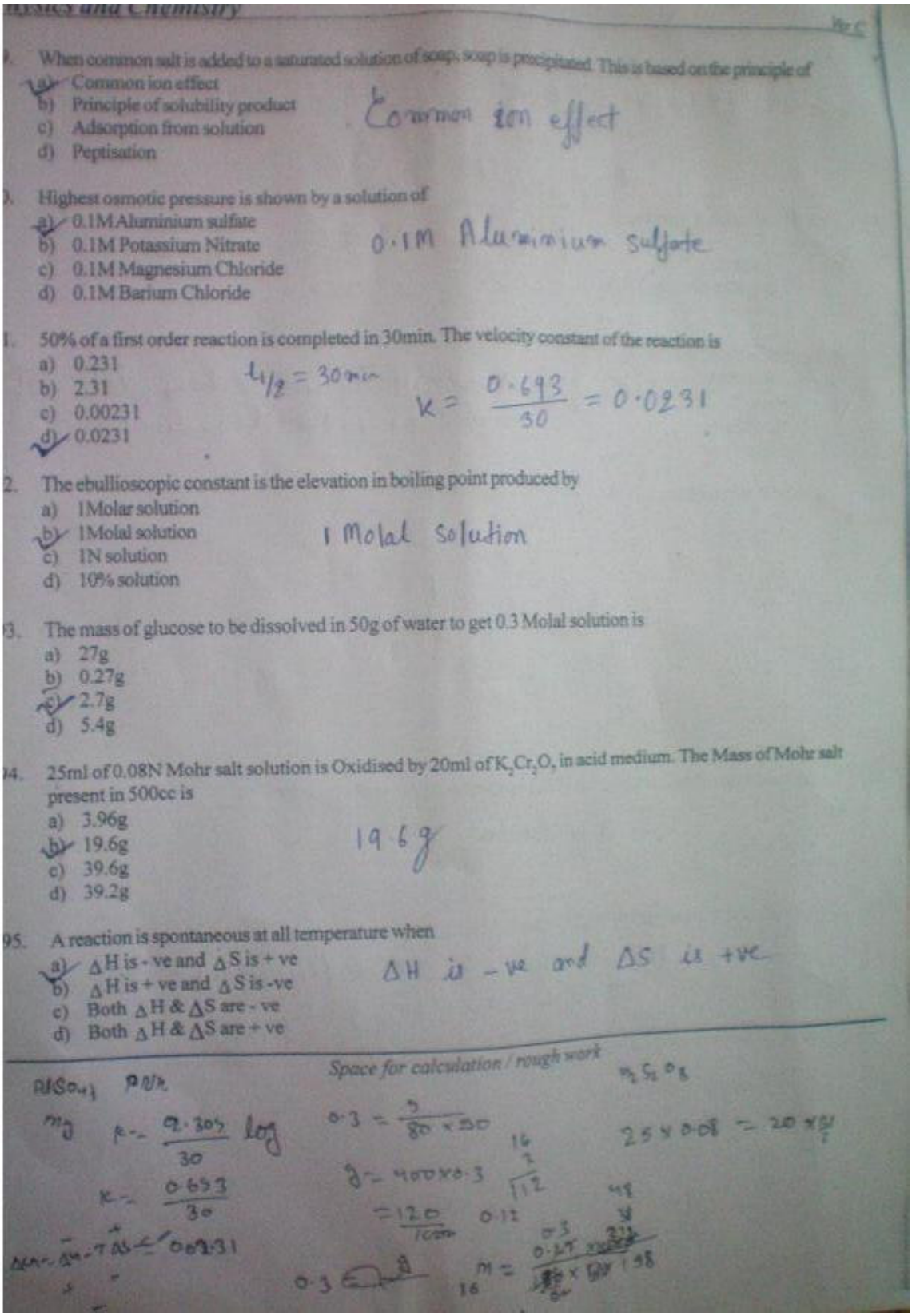

Physics and Chemistry

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

$t_{1/2} = 30\,min$ $\quad k = \frac{0.693}{30} = 0.0231$

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

Space for calculation / rough work

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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^{---}
d) NH_2^+

$NH_2^- + H^+ \longrightarrow NH_3$

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^{--}
b) Co^{--}
c) Cr^{---}
d) Ni^{--}

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 electrons in the 'd' suborbital.

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103. The number of unpaired electrons in Fe^{+++} is
a) 2
b) 3
c) 4
d) 5

$1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^5$ | 1 | 1 | 1 | 1 | 1 |
5 unpaired electron

104. The IUPAC name of $K_4[Fe(CN)_6]$ is
a) Potassium ferri cyanide
b) Potassium ferro cyanide
c) Potassium Hexa cyano ferrate (II)
d) Potassium Hexa cyano ferrate (III)

Potassium 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) cystein

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

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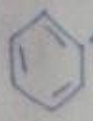
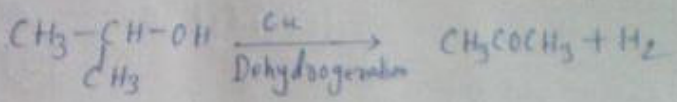
110. In the Molisch reagent, the substance used is
a) β naphthol in alcohol
b) α naphthol in alcohol
c) Resorcinol in alcohol
d) Rosaniline in water

α napthol in alcohol

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


← SP^2 hybridization

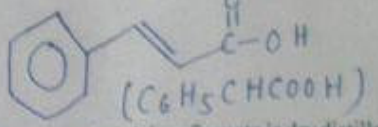
112. When vapours of isopropyl alcohol is passed over heated copper we get acetone. It is an example for
a) dehydration
b) dehalogenation
c) dehydrohalogenation
d) dehydrogenation



113. $CH_3-N(CH_3)-CH_3$ 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 is 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

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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 $N_2 + 3H_2 \rightleftarrows 2NH_3$
a) $K_p = K_c RT$
b) $K_p = K_c$
c) $K_p = K_c(RT)^{-2}$
d) $K_p = K_c(RT)^{-1}$

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