

# Sharath Gore

## Chemistry mock test 5 2022-23

Time : 60 Min

Chem : Full Portion Paper

Marks : 200

### Hints and Solutions

51) Ans: **B)**  $E_a' < E_a''$

Sol: Since  $K' > K''$ ,  $E_a' < E_a''$  (Greater is the rate constant, less is the activation energy).

52) Ans: **B)** New York and London.

Sol: Nylon was simultaneously discovered both in New York and in London.

53) Ans: **A)** + 1.9

Sol: By performing (ii) - (i),  $C_{gr} \rightarrow C_{dia}$ ,  $\Delta H = +1.9$ .

54) Ans: **D)**  $N_2H_5^+$

Sol:  $N_2H_5^+$

55) Ans: **A)** doubled.

Sol: Here,  $U_2 = U_1 \sqrt{\frac{T_2}{T_1}} = U_1 \sqrt{\frac{1200}{300}} = U_1 \times 2$

Thus the r. m. s. velocity will be doubled.

56) Ans: **A)** nitrogen.

Sol:  $(NH_4)_2Cr_2O_7 \rightarrow N_2 + Cr_2O_3 + 4H_2O$

57) Ans: **B)**  $LiAlH_4$

Sol:  $RCOOH \xrightarrow{LiAlH_4} RCH_2OH$

58) Ans: **D)**  $VOCl_2$  and  $CuCl_2$

Sol: Colour of transition metal ion salt is because of d-d transition of unpaired electrons of d-orbital. Metal ion salt having similar number of unpaired electron in d-orbitals shows similar colour in aqueous medium.

$V^{4+}$ : [Ar]  $3d^1$ 

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$Cu^{2+}$ : [Ar]  $3d^9$ 

↑↓	↑↓	↑↓	↑↓	↑
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Number of unpaired electrons = 1

59) Ans: **A)** 9

60) Ans: **C)** ketone.

Sol:

$R-C \equiv N + R-Mg-X \rightarrow R-\overset{\text{Alkyl cyanide}}{\underset{|}{C}} \equiv N-Mg-Br$

R

↓ Hydrolysis

$R-CO-R + NH_3 + Mg \begin{matrix} Br \\ \backslash \\ OH \end{matrix}$   
Ketone

61) Ans: **C)** P and NaOH

Sol:  $P_4 + 3NaOH + 3H_2O \rightarrow \underset{\text{(White)}}{PH_3} + \underset{\text{Phosphine}}{3NaH_2PO_2}$  Sod. hypophosphite

62) Ans: **D)**  $[Ag(NH_3)_2]^+$

Sol:  $[Ag(NH_3)_2]^+$

63) Ans: **A)**  $CH_3CHO$

Sol:  $CH_3CHO$

64) Ans: **C)** Both (1) and (2)

Sol:  $CaOCl_2 + H_2O \rightarrow Ca(OH)_2 + Cl_2$   
Bleaching powder

65) Ans: **A)** Graphite

66) Ans: **C)**  $TiCl_4 + Al(C_2H_5)_3$

Sol:  $nCH_3-CH=CH_2 \xrightarrow{(CH_3CH_2)_3Al+TiCl_4}$   
Propylene

$\left[ \begin{matrix} CH_3 \\ | \\ -CH_2-CH- \end{matrix} \right]_n$   
Polypropylene

67) Ans: **D)**  $F_2$

Sol: In halogens, fluorine is the most easily reduced.

68) Ans: **C)**  $\frac{e}{18}, \frac{p}{20}$

Sol: Third alkaline earth metal is calcium  ${}_{20}Ca^{40}$ . Number of electrons are 20 and Number of proton are 20 i.e.  $e/20, p/20$ .

69) Ans: **B)** KOH

Sol: The saponification value is the number of mg of KOH required to neutralize the fatty acid resulting from the complete hydrolysis of 1 gm of oil or fat.

70) Ans: **C)** 2 N

Sol: If 1 L of one gas contains N molecules, 2 L of any gas under the same conditions will contain 2N molecules.

71) Ans: **C)**  $AgNO_3 + NaCl \rightleftharpoons AgCl + NaNO_3$

Sol: This reaction is irreversible.

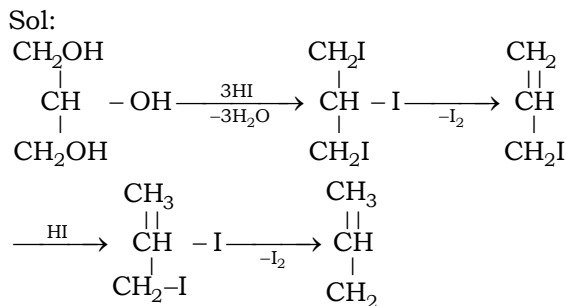
72) Ans: **B)** It can act both as oxidizing and reducing agent.

Sol: It acts both as a reducing agent as well as oxidizing agent.

73) Ans: **A)** Anti-oxidant

Sol: To prevent rancidification of food material, anti-oxidants are added which are known as oxidation inhibitor.

74) Ans: **B)** propene.



**75) Ans: A)** yellow colour in alkaline medium and red colour in acid medium.

Sol: Methyl orange is yellow in alkaline medium while red in acidic medium.

**76) Ans: A)** zinc is volatile hence easily separated.

**77) Ans: A)** Both Statement 1 and Statement 2 are true but Statement 2 is not the correct explanation of Statement 1

Sol: Oxidation of toluene with chromyl chloride gives benzaldehyde which react with acetic anhydride to give benzylidene acetate and thus further oxidation of benzaldehyde to benzoic acid is checked by acetic anhydride. The benzylidene acetate on treatment with HCl regenerates benzaldehyde.

**78) Ans: D)**  $\text{HSO}_4^-$

Sol: The species which can accept and donate  $\text{H}^+$  can act both as an acid and a base.



**79) Ans: C)** hydrogen chloride

Sol: HCl does not undergo H-bonding and its boiling point is affected by H-bonding.

**80) Ans: C)** They act as bioindicators of pollutions

**81) Ans: B)** 1 litre of solution.

**82) Ans: A)**  $\text{CaCO}_3$ ,  $\text{NaHCO}_3$ ,  $\text{KHCO}_3$

Sol: Increasing order of solubility is  $\text{CaCO}_3 > \text{NaHCO}_3 > \text{KHCO}_3$ .

**83) Ans: D)** Fe

Sol: The reduction potential of Fe is very high, thus it is the strongest reducing agent.

**84) Ans: A)** Butane-1-ol

**85) Ans: C)**  $\text{Al}_2\text{O}_3$

Sol:  $\text{Al}_2\text{O}_3$

**86) Ans: B)** the concentration of the solution decreases.

Sol: Activated charcoal adsorbed the impurity of acetic acid so that the concentration of acetic acid solution decreases.

**87) Ans: D)** Both  $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$ .

Sol: Zeolite when treated with hard water, exchange  $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$  ions that are present in hard water with  $\text{Na}^+$  ions.

**88) Ans: D)**  $\text{SO}_2$

Sol: We know,  $\text{Cu} + 2\text{H}_2\text{SO}_4 \rightarrow \text{CuSO}_4 + 2\text{H}_2\text{O} + \text{SO}_2$

**89) Ans: C)** Statement 1 is true but statement 2 is false.

Sol: Actually transition metal exhibits variable valency due to very small difference between the  $ns^2$  and  $(n-1)d$  electrons.

**90) Ans: A)** equal.

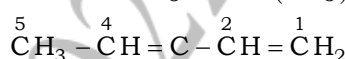
Sol: Heat of neutralization between strong acid as well as a strong base is about  $-13.7$  Kcal.

**91) Ans: B)** 24

Sol: In this case,  $-\text{CONH}_2 = 6 + 8 + 7 + 2 + 1$  (from other atom to form covalent bond) = 24.

**92) Ans: B)** 746.3 mm of Hg

**93) Ans: C)**  $\text{CH}_3\text{CH}=\text{C}(\text{CH}_3)\text{CH}=\text{CH}_2$



Sol:



3 - Methylpenta-1,3 - diene

**94) Ans: C)** orbits.

Sol: Generally electron is moving in orbits as per Bohr's principle.

**95) Ans: D)** the ionic product of an electrolyte in its saturated solution.

**96) Ans: B)**  $\text{SO}_3^{2-}$ ,  $\text{CO}_3^{2-}$ ,  $\text{NO}_3^-$

Sol: Here,  $\text{SO}_4^{2-}$  has 42 electrons;  $\text{CO}_3^{2-}$  has 32 electrons and  $\text{NO}_3^-$  has 32 electrons.

**97) Ans: A)** Both statement 1 and statement 2 are true and the statement 2 is the correct explanation of the statement 1.

Sol: Here, both statement 1 and statement 2 are true and the statement 2 is correctly explaining the statement 1.

**98) Ans: B)** 0.3177 g

Sol:  $\frac{\text{Wt. of Cu}}{\text{Wt. of Ag}} = \frac{\text{Eq. wt. of Cu}}{\text{Eq. wt. of Ag}}$

$$\frac{\text{Wt. of Cu}}{1.08} = \frac{63.5/2}{108} \quad \therefore \text{Wt. of Cu} = 0.3177 \text{ g}$$

**99) Ans: B)** trans-2-butene

Sol: The reduction of alkynes with liquid  $\text{NH}_3$  / Li gives trans alkenes.

**100) Ans: D)** acidic.

Sol:  $N_{\text{NaOH}} = 1 \times 1 = 1 \text{ N}$

$N_{\text{H}_2\text{SO}_4} = 2 \times 10 = 20 \text{ N}$

M. eq. of NaOH =  $1 \times 100 = 100$

M. eq. of  $\text{H}_2\text{SO}_4 = 20 \times 10 = 200$

So, M. eq. of acid are left and hence  $\text{pH} < 7$ , so the resulting mixture will be acidic.