Ans:- F.L.T:-03 20/03/2020

(46) In 100 cm^3 mass of fatty acid is ·27g.
∴ In 10 cm^3 mass of fatty acid is

$$\frac{·27}{100} \times 10 = ·027 \text{ gm.}$$

Now $d = \frac{\text{mass}}{\text{volume}}$

$$·9 = \frac{·027}{\pi r^2 \times h} = \frac{·027}{3 \times (10)^2 \times h}$$

$$h = 10^{-4} \text{ cm} = 10^{-6} \text{ m}$$

(47) In H_2O_2, oxidation state of O is −1
and it can extend from −2 to +2
∴ H_2O_2 is both oxidizing & reducing.

(48) b

(49) CO is diamagnetic because its M.O.T diagram.
is similar to $N_2 (14 e^-)$

(50) $Zr_3(PO_4)_4 \rightleftharpoons 3Zr^{2+} + 4PO_4^{3-}$
Let sofubility of $Zr_3(PO_4)_4$ is 's'

$$3s \qquad 4s$$

$$K_{sp} = (3s)^3 (4s)^4$$

$$s = \left(\frac{K_{sp}}{6912}\right)^{1/7}$$

(51) Strongest acid is $HClO_4$ or $ClO_3(OH)$

(52) for spontainity $\Delta G = -$ive.

$\Delta G = \Delta H - T.\Delta S$

if $\Delta H < 0$, $\Delta S = +$ive.

ΔG will be $-$ive NO matter what the temp is.

(53) X will be major if $\Delta G = +$ive or > 0

Y will be major if $\Delta G = -$ive or < 0

X & Y will be in equi. if $\Delta G = 0$

Hit & trial

putting $T = 315K$ to $\Delta G = 120 - \frac{3}{8}T$

$\Delta G = +$ive or > 0 $\therefore$ X is major.

(54) at 100°C & 1 atm $H_2O(l) \longrightarrow H_2O(g)$

$\therefore$ $\Delta S_{system} > 0$ but surrounding $\Delta S = \frac{-q}{T}$

$\Delta S_{surrounding} < 0$

(55) for zero order $t_{1/2} = \frac{a}{2K}$.

$6 = \frac{.2}{2K} \Rightarrow K = \frac{1}{60}$

Now $A_t = A_0 - Kt$.

$A_0 - A_t = Kt$

$.5 - .2 = \frac{1}{60} \times t$ $\quad t = .3 \times 60 = 18h.$

~~t = .3 / 600 / 200~~

(56) $r = K[A]^n$ — ①

$r8 = K[2A]^n$ — ②

dividing ② by ①

$8 = 2^n = 2^3$

$n = 2$

(57) rate expression is always difined for 1 mole

$\therefore r = -\frac{dN_2}{dt} = -\frac{1}{3}\frac{dH_2}{dt} = +\frac{1}{2}\frac{dNH_3}{dt}$.

(58) by electrophoresis colloids can be purified & precipitated.

(59) b

(60) $Ti < Mn < Ni < Zn$. $I.E \propto Z^*$ (effective nuclear charge)

(61) In dil HNO_3 oxidation state of 'N' will be less and In conc. HNO_3 O.S of 'N' will be greater

$\therefore$ d

(62) German silver is 56% Cu, Zn 24%, Ni 20%

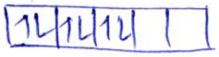
(63) In transition elements O.S is less

$\therefore$ given ligand must have lesser no. of -ive sites and in inner transition elements O.S is greater $\therefore$ ligands must have more -ive sites $\therefore$

C.N must be 6 & 8.

(64) given complex in H_2O gives Cl^- ion and complex in option b gives NO_2^- ion.

(65) CO is a strong ligand $\therefore$ $Cr(d^5s^1)$ will become $Cr(d^6s^0)$



(66) O.S of Fe in $[Fe(H_2O)_5NO]SO_4$

$x + 5\times 0 + 1 + (-2) = 0$

$x = +1$

Fe d^6s^2 Fe^+ d^6s^1

∴ In the given complex $Fe^+(d^7)$

$\boxed{\uparrow\downarrow|\uparrow\downarrow|\uparrow|\uparrow|\uparrow}$ has three unpaired e^-.

(67) b oxidation of Al is more spontanious above 800°c and oxidation of Zn is spontanious below 800°c

∴ Al can reduce ZnO above 800°c

(68) b Slag is always silicate or phosphate

(69) a $S_2O_3^{2-}$ is flexidentate (mono or bidentate)

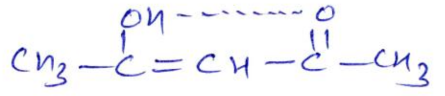
'X' $Ag(S_2O_3)_2$ Y $Ag_2S_2O_3$ Z Ag_2S.

(70) c Variation in oxidation state is measured by magnetic moment

(71) b sulphate is estimated as $BaSO_4$ (ppt)

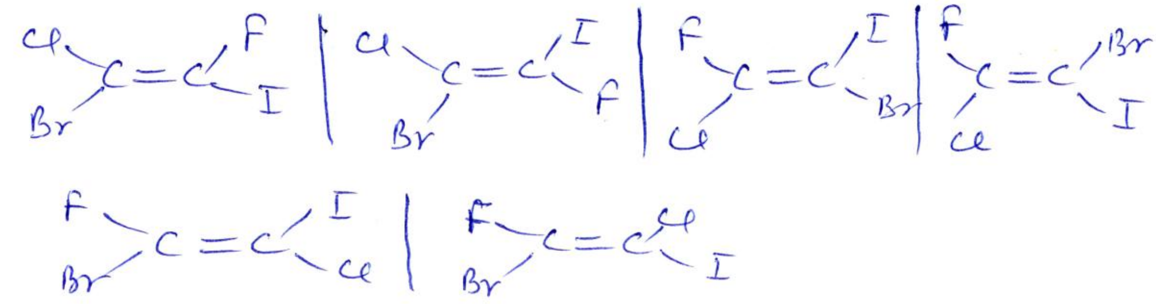
Ionic radius of $Mg^{2+} < Ba^{2+}$ but this is not the correct explanation.

(72) b maximum enol content, stronger α acidic H due to more withdrawing nature of Ketone and chelation



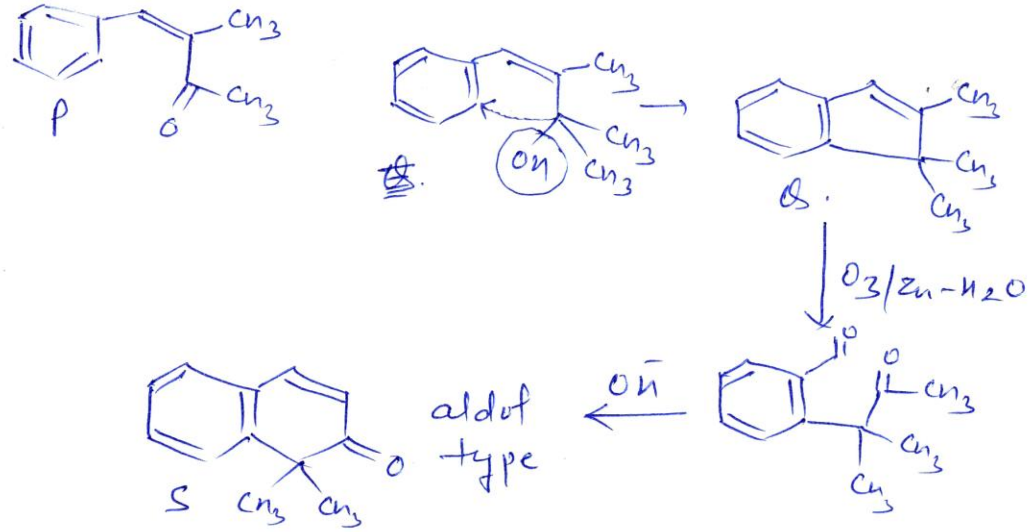
$CH_3-\overset{OH}{C}=CH-\overset{O}{\overset{\|}{C}}-CH_3$

(73) d



(74) a

(75)
b



(76) all have CHO group with α-H
c

(77) all are stronger acid than H_2CO_3 except phenol
(d)

(78) $SOCl_2$ changes $-OH$ into $-Cl$
c

(79) order of acidic strength $\propto$ E.W strength $\propto \frac{1}{E.R.}$
b

$NO_2 > Cl$

$\underline{III} > \underline{II} > I > \underline{IV}$

(80)
a

(81) $-NH_2$ is more donor
(b)

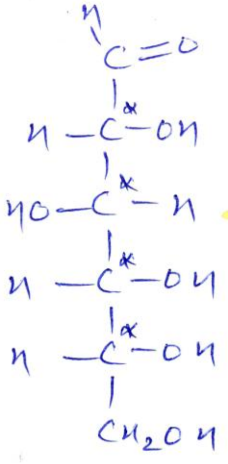
$$\therefore -NH_2 + CH_3-\overset{O}{\overset{||}{C}}-O-\overset{O}{\overset{||}{C}}-CH_3 \rightarrow -NH-\overset{O}{\overset{||}{C}}-CH_3 + CH_3COOH.$$

(82) c $C_6H_5SO_2Cl$

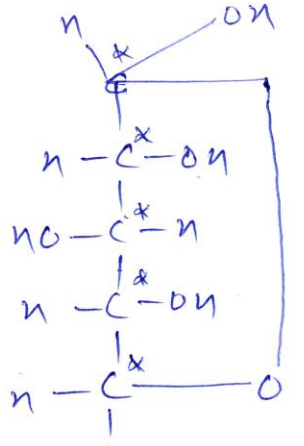
(83) c for SN_1 stability of carbocation & steric hinderence.

(84) b hydride transfer is slowest step.

(85)
a



4chiral

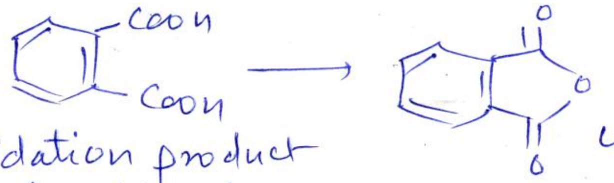


5chiral.

(86) d

(87) b

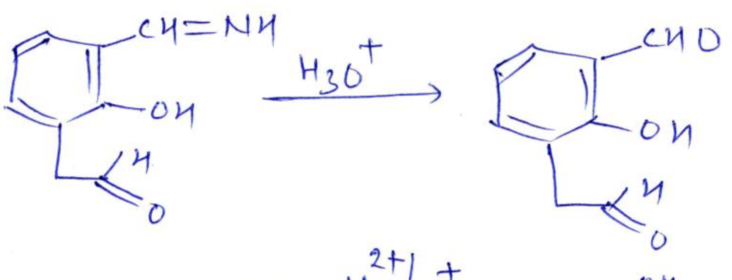
(88) c



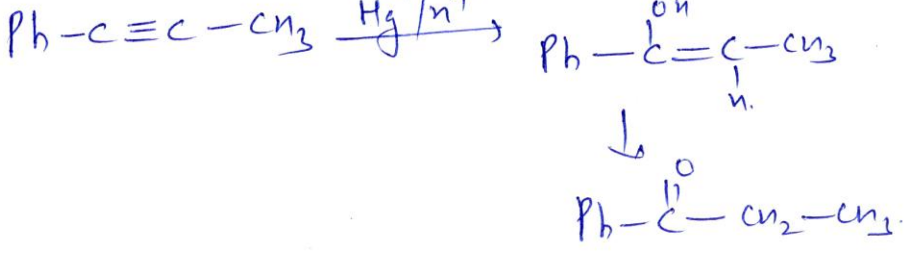
Oxidation product of option (b)

used in phenolpthalein.

(89) DiBAL-H is weak reducing agent and
d source of H^-



(90) a.



$Ph-C\equiv C-CH_3 \xrightarrow{Hg^{2+}/H^+} Ph-\overset{OH}{C}=\underset{H}{C}-CH_3 \downarrow Ph-\overset{O}{\overset{\|}{C}}-CH_2-CH_3$