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Class 12

2023-24

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LATEST COMPULSORY QUESTIONS -2024

COLLECTED FROM 2024 REV. AND DEC 2023 HLF YRLY

SUBJECT:

CHEMISTRY

MR. SS PRITHVI

HALF YEARLY 2023

From the following reaction, identify A and B

$$C_6H_5NO_2 \xrightarrow[6[H]]{Sn/HCl} A$$

$$C_6H_5NO_2 \xrightarrow[4[H]]{Zn/NH_4Cl} B$$

Show that in case of first order reaction the time required for 99.9% completion is nearly ten times the time required for half completion of the reaction. **[repeated]**

Identify A and B

Ethanoic acid $\xrightarrow{SoCl_2}$ (A) $\xrightarrow{Pd/BaSO_4}$ (B)

Calculate the pH of 1.5×10^{-3} M solution of $Ba(OH)_2$?

An element has bcc structure with a cell edge of 288 pm. The density of the element is 7.2 gcm^{-3}. How many atoms are present in 208 g of the element

Complete the following.

i)  $\xrightarrow[OH^-]{C_6H_5COCl}$ A $\xrightarrow{Nitration}$ 'B'

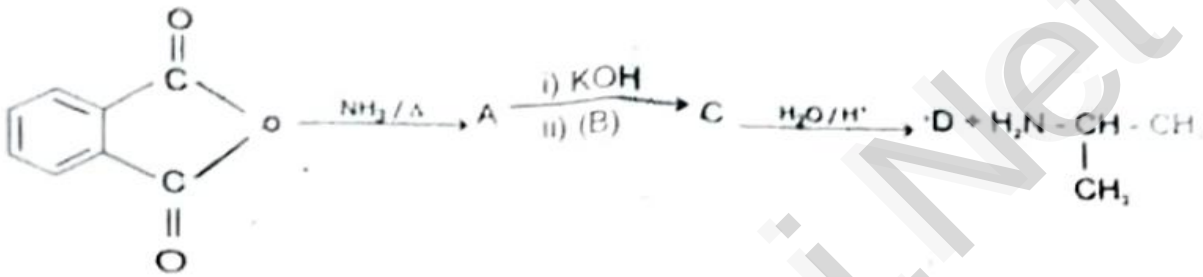
ii) $C_2H_5COOH \xrightarrow{SOCl_2}$ 'A' $\xrightarrow{Pd/BaSO_4}$ 'B' $\xrightarrow{NaOH}$ 'C' $\xrightarrow{\Delta}$ 'D'

Calculate pH of 0.04M HNO_3 solution.

The conductivity of a 0.01M solution of a 1:1 weak electrolyte at 298K is 1.5×10^{-4} S cm^{-1}. i) molar conductivity of the solution.
ii) degree of dissociation of the solution.
Given that $\lambda^{o}_{cation} = 248.2 S\ cm^2\ mol^{-1}$. and $\lambda^{o}_{anion} = 248.2 S\ cm^2\ mol^{-1}$

The rate constant for a first order reaction is 1.54 x 10^-3 S^-1, Calculate its half life time.

33. Predict A, B, C and D for the following reaction



Write the (i) IUPAC name & (ii) Co-ordination number for the following compound. $[Co(CO_3)(NH_3)_4]C\ell$

Identify compounds A,B & C in the following sequence of reactions.

$C_6H_5NO_2 \xrightarrow{Fe/HCl} A \xrightarrow[273k]{HNO_2} B \xrightarrow{C_6H_5OH} C$

REVISION-2024

A Copper electrode is dipped in 0.1 M copper sulphate Solution at 25°C. Calculate the electrode potential of copper (Given: $E^{\circ}_{Cu^{2+}/Cu} = 0.34$ V)

An organic compound (A) – $C_3H_8O_3$ used as a sweetening agent,which on oxidation with Fenton's reagent gives a mixture of compounds B and C. Identify A, B and C. Write possible reactions.

Identify A and B Ethanoic acid $\xrightarrow{SOCl_2}$ A $\xrightarrow{Pd/BaSO_4}$ B

Ionic conductance at infinite dilution of Al^{3+} and SO_4^{2-} are 189 and 160 mho cm^2 $equiv^{-1}$. Calculate the equivalent and molar conductance of the electrolyte $Al_2(SO_4)_3$ at infinite dilution.

Write the following for the complex $[Ag(NH_3)_2]^+$.
(a) Central metal ion (ii) IUPAC name

33) Identify A, B and C.

$$CH_3COOH \xrightarrow{SOCl_2} A \xrightarrow{Pd/BaSO_4} B \xrightarrow{NaOH} C$$

24. Identify the compounds A and B in the following sequence of reactions

$$C_6H_5NO_2 \xrightarrow{Sn/HCl} A \xrightarrow[\text{பிரிடின்}]{C_6H_5-\overset{\overset{O}{\|}}{C}-Cl} B$$

	Ionic conductance at infinite dilution of Al^{3+} and SO_4^{2-} are 189 and 160 mho cm^2 $equiv^{-1}$. Calculate the equivalent and molar conductance of the electrolyte $Al_2(SO_4)_3$ at infinite dilution.
	A Solution of 0.10 m of a weak electrolyte is found to be disassociated to the extent of 1.20% at 25° C. find the disassociation constant of the acid.
	Compound 'A' of M.F C_2H_3N reduced by Na-Hg/C_2H_5OH to give 'B' of M.F C_2H_7N. Compound 'B' reacts with HNO_2 to give 'C'. 'C' gives red colour in Victor Meyor test. Identify A, B & C.
	Identify A,B and C : $CH_4 \xrightarrow{HNO_3} A \xrightarrow{LiAlH_4} B \xrightarrow{2CH_3CH_2Br} C$
	Calculate the molar conductance of 0.01 M aqueous KCl solution at 25°C. The specific conductance of KCl at 25°C is 14.114 x 10^{-3} Sm^{-1}?
	Identify A, B and C $C_6H_5NO_2 \xrightarrow{Fe/HCl} (A) \xrightarrow{HNO_2/273K} (B) \xrightarrow{C_6H_5OH} (C)$
	Identify A, B, C and D in the following reaction. $CH_3CH_2COOH \xrightarrow{LiAlH_4} A \xrightarrow{PCl_5} B \xrightarrow{Alc.KOH} C \xrightarrow{HI/Peroxide} D$
	Complete the following reactions. i) $P_4 + NaOH + H_2O \rightarrow$ ii) $XeF_6 + H_2O \rightarrow$ iii) $Cu + Conc.H_2SO_4 \rightarrow$
	24) Complete the reaction $P_4 + NaOH + H_2O \rightarrow$

Aluminium Crystalizes in cubic close packed structure. Its metallic radius is 125 pm. Calculate the Edge length of the unit cell.

The rate constant for a first order reaction is $1.54 \times 10^{-4}\ S^{-1}$. Calculate the half life time.

Identify A and B

A $\xrightarrow[4\,[H]]{Na\,(Hg)\,/\,C_2H_5OH}$ $CH_3CH_2NH_2$

B $\xrightarrow[4\,[H]]{Ng\,(Hg)\,/\,C_2H_5OH}$ CH_3NHCH_3

Rate constant of first order reactions $1.54 \times 10^{-3}\ S^{-1}$ Find the value of half life period.

Write the following for the complex $[Ag(NH_3)_2]^+$

a) Ligand b) central metalion c) IUPAC Name

Find the pH of a buffer solution containing 0.2 mol/lit sodium acetate and 0.18 mol/lit acetic acid? (The PKa value is 4.74)

Find out A,B and C in the following reaction.

$C_6H_5N_2Cl \xrightarrow{CuCN} A \xrightarrow{H_2O/H^+} B \xrightarrow{NH_3} C$

The reaction $Zn_{(s)} + Co^{2+} \rightleftharpoons Co_{(s)} + Zn^{2+}$ occurs in a cell. Compute the standard emf of the cell.

Given that $E^\circ_{Zn|Zn^{2+}} = 0.76\ V$ $E^\circ_{Co|Co^{2+}} = 0.28V$.

A first order reaction is 40% complete in 50 minutes. Calculate the value of the rate constant. In what time will the reaction be 80% complete?

PART - IV

Benzoic acid $\xrightarrow{PCl_5} A \xrightarrow[\text{anhydrous } AlCl_3]{PCl_5} B$ identify A and B.

A, $\xrightarrow{SOCl_2} A \xrightarrow{NH_3} B \xrightarrow{LiAlH_4} C$ B Identify A, B and C.

$C_6H_5CHO + HCHO \xrightarrow{50\% \text{ NaOH}} A + B$ Identify A and B

Calculate the PH of 0.1 mol of NH_4OH solution dissociation constant of NH_4OH 1.8×10^{-5}

24. Calculate the molar conductance of 0.01M aqueous KCl solution at 25°C the specific conductance of KCl at 25°C is $14.114 \times 10^{-2} Sm^{-1}$

Identify compounds A, B, in the following sequence of reactions.

$CH_3 - CH_2Br + AgCN \xrightarrow[\Delta]{C_2H_5OH} A \xrightarrow[[H]]{Na(Hg)/C_2H_5OH} B$

Calcualte the pH of the buffer solution containing 0.20 mole per litre sodium acetate and 0.18 mole per litre acetic acid. Ka for acetic is 1.8×10^{-5} [Given log 1.8 = 0.26, log 9 = 9.5]

Convert Glycol ____, formaldehyde.

An atom crystallizes in fcc crystal lattice and has a density of $10 gcm^{-3}$ with unit cell edge length of 100pm. Calculate the number of atoms present in 1g of crystal.

Calculate the molar conductance of 0.01 M aqueous KCl solution at 25°C. The specific conductance of KCl at 25°C is $14.114 \times 10^{-2} Sm^{-1}$?

Identify A, B and C

$$C_6H_5NO_2 \xrightarrow{Fe/HCl} (A) \xrightarrow{HNO_2/273K} (B) \xrightarrow{C_6H_5OH} (C)$$

Sodium metal crystallise in BCC structure with the edge length of the unit cell is 4.3×10^{-8} cm. Calculate the radius of sodium metal atom.

Acetic acid $\xrightarrow{PCl_5}$ A $\xrightarrow{Pd/BaSO_4}$ B $\xrightarrow{CH_3MgBr/H_3O^+}$ C. Identify A, B and C.

How will you prepare acetylchloride from Acetic acid?

Calculate the pH of 0.04M HNO_3 solution. [log4=0.6021]

Calculate the Magnetic moment and magnetic property of $[Fe(CN)_6]^{3-}$

The conductivity of a 0.01M solution of a 1 :1 weak electrolyte at 298K is 1.5×10^{-4} S cm $^{-1}$ Calculate molar conductivity of the solution

i) $nCH_2 = CH_2 \xrightarrow[1000\ atm]{200^0 - 300^0 C} ?$

ii) $nCF_2 = CF_2 \xrightarrow{\Delta} ?$

Write the a) ligand b) CMI c) IUPAC name of $[Co(NH_3)_6]^{3+}$

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