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JAZZ PUBLIC SCHOOL [MATRIC HR. SEC]

Grade : 12 Sub: Chemistry PTA - 2 marks Revision [Vol - II]

Q.No:1 What is flocculation value?

[Unit - 10 Surface chemistry pg.no: 96]

Ans: The precipitation power of electrolyte is determined by finding the minimum concentration (millimoles/lit) required to cause precipitation of a sol in 2 hours. This value is called flocculation value. The smaller the flocculation value greater will be precipitation.

Q.No:2 How cathodic protection helps to protect the metal from corrosion? [Unit - 9 - Electrochemistry - Bookback]

Q.no: 25 but it is indirectly question, Ans is same].

Ans: Cathodic protection: In this technique, the metal to be protected is connected with metals like Mg (or) Zn which is corroded more easily than iron. It can be used as a sacrificial anode and the iron materials act as a cathode. So iron is protected, but Mg (or) Zn is corroded. Hence it is called sacrificial protection.

Q.No:3 What are antiseptics? Give an example.

[Unit - 15 chemistry in Everyday life]

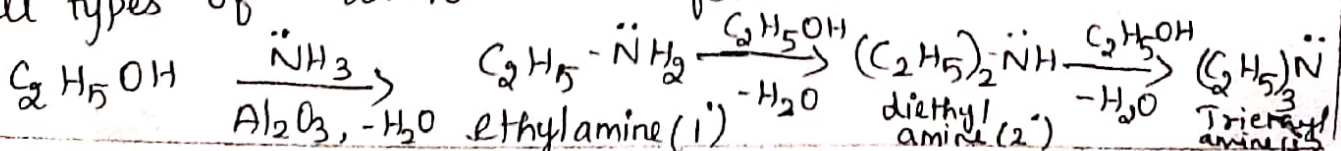
Ans: Antiseptics: Stop (or) slow down the growth of microorganisms applied to living tissue.

Uses: To reduce the risk of infection during surgery and other procedures. E.g., H_2O_2 , povidone-iodine.

Q.No:4 Write a note on Sabatier - Mailhe method.

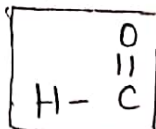
[Unit - 13 - Organic Nitrogen compounds]

Ans: When vapour of an alcohol and ammonia are passed over alumina, W_2O_5 (or) silica at $400^\circ C$, all types of amines are formed.

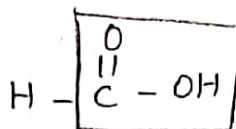


Q.No: 5 Why formic acid acts as strong reducing agent?
[Unit - 12 Carbonyl compounds and carboxylic acids].

Ans:



aldehyde group



carboxylic acid group.

1. Formic acid contains both an aldehyde & carboxyl group
2. It reduces Fehling's solution and Tollen's reagent.
3. It decolourises pink coloured KMnO_4 solution.

Q.No: 6 Define ionic product of water.

[Unit - 8 Ionic Equilibrium. Book back Q.No: 10 pg.no: 31]

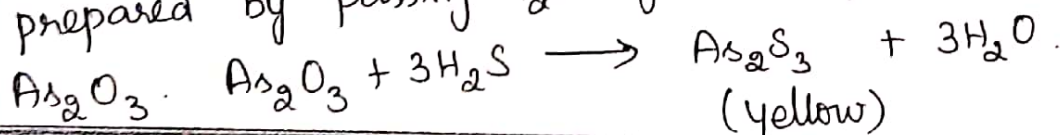
Ans: It is defined as "the product of concentrations of $[\text{H}_3\text{O}^+]$ and $[\text{OH}^-]$ at 25°C .

$$K_w = [\text{H}_3\text{O}^+][\text{OH}^-]$$

$$K_w = (1 \times 10^{-7})(1 \times 10^{-7}) \quad K_w = 1 \times 10^{-14}$$

Q.No: 7 What happens when hydrogen sulphide gas is passed through a solution of arsenic oxide? Name the chemical method. [Unit - 10 - Surface Chemistry].

Ans: Double decomposition: An arsenic sulphide sol is prepared by passing H_2S gas through a cold solution of



Q.No: 8 Write a note on denaturation of proteins.

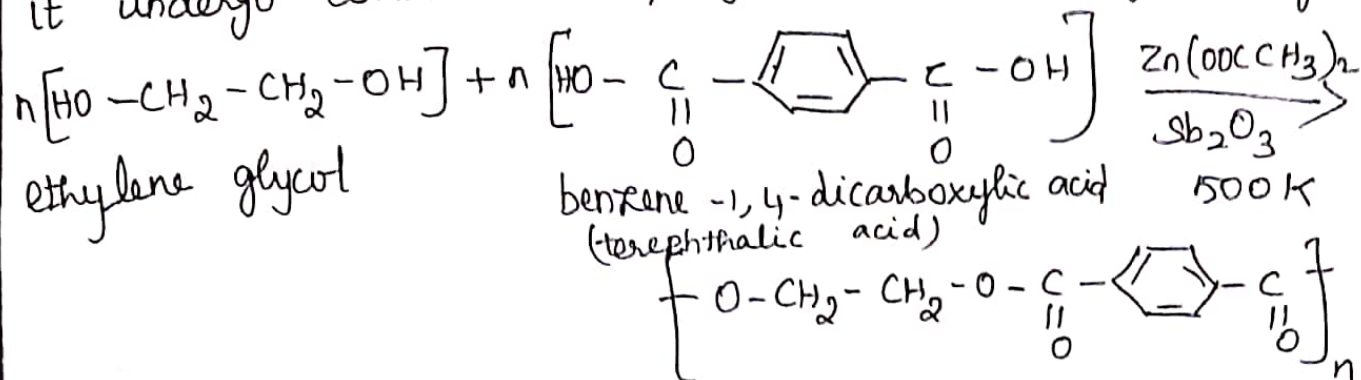
[Unit - 14 - Biomolecules - Book back Q.No: 8 pg.no: 270]

Ans: ① The process of a protein - losing its higher order structure without losing the primary structure, it called denaturation. ② When a protein denatures, its biological function is also lost. ③ Since the primary structure is intact, this process can be reversed in certain proteins. ④ This can happen spontaneously upon restoring the original conditions (or) with the help of special enzymes called cheperons (proteins that help protein fold correctly) eg. coagulation of egg white by heat.

Q. NO: 9 How is terylene prepared?

[Unit - 15 Chemistry in everyday life - Q. NO: 17 pg. no: 296]

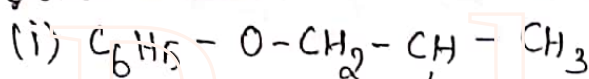
When ethylene glycol is mixed with terephthalic acid, are mixed and heated at 500 K it undergo condensation polymerisation to give Terylene.



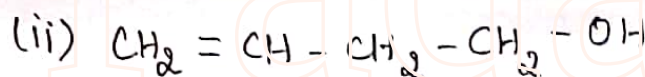
Terylene (an polyester)

Dacron.

Q. NO: 10 Write the IUPAC name of the following:



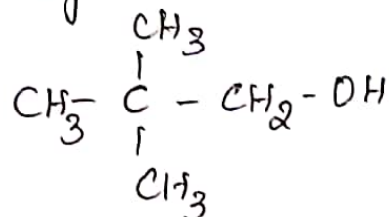
Ans: 2-methyl-propoxy benzene.



But-3-en-1-ol

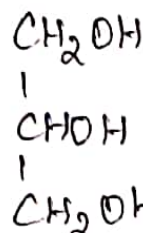
But-3-en-1-ol

(iii) Neopentyl alcohol



2,2-dimethyl propan-1-ol

(iv) Glycerol



propane-1,2,3-triol.

Q. NO: 11 What is common ion effect? Give an example.

[Unit - 8 - Ionic Equilibrium - Book back Q. NO: 11 pg. no: 31]

Ans: The dissociation of weak acid is suppressed in the presence of a salt containing an ion common

to the weak electrolyte.

e.g., The dissociation of CH_3COOH is suppressed in the presence of CH_3COONa containing CH_3COO^- act as common ion.

Q.No: 12 Give four uses of diethyl ether.

[Unit - 11 Hydroxy compounds and ethers]

- ① It is used as a surgical anaesthetic agent.
- ② Good solvent for organic reactions and extraction.
- ③ A volatile starting fluid for diesel and gasoline engine.
- ④ As a refrigerant.

Q.No: 13 Write the zwitter ion structure of alanine.

[Unit - 14 - Biomolecules. Q.no: 4 Pg.no: 270]

Ans:
$$\begin{array}{c} \text{COO}^- \\ | \\ \text{H} - \text{C} - \text{NH}_3^+ \\ | \\ \text{CH}_3 \end{array}$$
 Neutral pH, net charge = 0.

Q.No: 14 What are food preservatives?

[Unit - 15 - Chemistry in everyday life. B.B Q.no: 6 Pg. 296]

Ans: Preservatives are capable of inhibiting, retarding (or) arresting the process of fermentation, acidification (or) other decomposition of food by growth of microorganisms. e.g., Sodium metabisulphite, benzoic acid, sorbic acid and their salts.

Q.No: 15 What are hormones? Give examples. [Unit - 14 Biomolecules]

Ans: It is an organic substance that is secreted by one tissue into the blood stream and induces a physiological response in other tissues. They are not stored in the body but are continuously produced.

Q.No: 16 What are active centers? [Unit - 10 Surface chemistry]

- ① The surface of a catalyst is not smooth. It bears steps, cracks and corners.

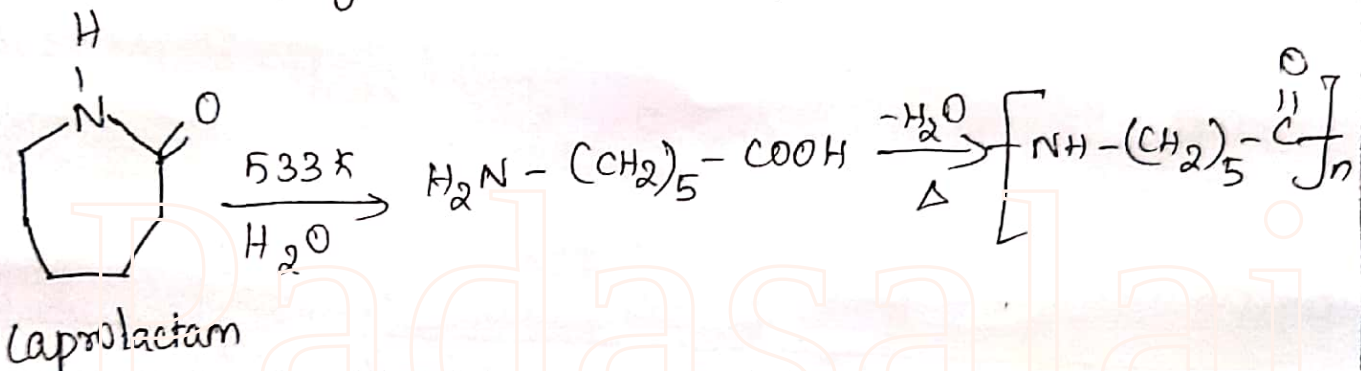
② Hence the atoms on such locations of the surface are co-ordinatively unsaturated.

③ So, they have much residual force of attraction. Such sites are called active centres. So, the surface carries high surface free energy.

④ The presence of such active centres increases the rate of reaction by adsorbing and activating the reactants.

Q.No: 17 How nylon-6 is prepared? [Unit - 15 Chemistry in Everyday Life]

Ans: Caprolactam on heating at 533K in an inert atmosphere with traces of water gives a amino caproic acid which polymerises to give nylon-6



Q.No: 18 What are the characteristics of adsorption? [Unit - 10 - Surface Chemistry]

Ans: 1. Adsorption can occur in all interfacial surfaces.
 2. It is always accompanied by decrease in free energy.
 3. It is a spontaneous process.
 4. Adsorption is an exothermic process.

Q.No: 19 What is buffer index? [Unit - 8 - Ionic Equilibrium]

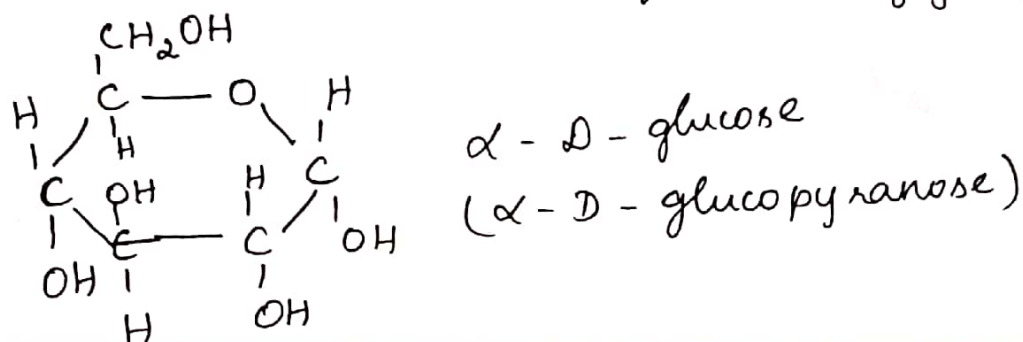
Ans: It is defined as "The number of gram equivalents of acid (or) base added to 1 litre of the buffer solution to change its pH by unity".

$$\beta = \frac{dB}{d(\text{pH})} \quad \text{dB} = \text{number of gram equivalents of acid/base added to 1 litre of buffer solution}$$

$d(\text{pH})$ = the change in the pH after the addition of acid/base.

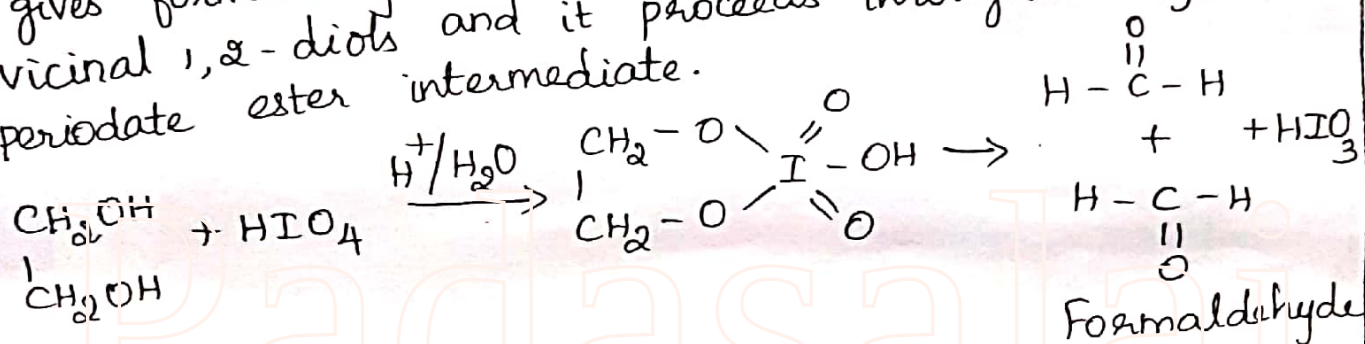
Q.No: 20 Write the structure of α -D(+) glycopyranose.

Ans:



Q.No: 21 Write the chemical equation for oxidation of ethylene glycol with periodic acid.

[Unit - 11 - Hydroxy Compounds and Ethers]
Ans: Ethylene glycol on treatment with periodic acid gives formaldehyde. This reaction is selective for vicinal 1,2-diols and it proceeds through a cyclic periodate ester intermediate.



Q.No: 22 How the tranquilizers work in body?

[Unit - 15 Chemistry in everyday life] Book back Q.No: 9 Pg.no: 296

Ans: They are neurologically active drugs. It acts on the central nervous system by blocking the neurotransmitter dopamine in the brain.

Uses: reducing stress, anxiety depression and sleep disorders and severe mental diseases.

Q.No: 23 Define solubility product of a compound.

[Unit - 8 - Ionic Equilibrium Book back Q.no: 9 Pg: 31]

Ans: It is defined as "The product of the molar concentration of the constituent ions, each raised to the power of its stoichiometric coefficient in a balanced equilibrium equation."

Q.No: 24 Peptising agent is added to convert Precipitate into colloidal solution. Illustrate with an example. [Unit - 10 - Surface chemistry Book back Q.no: 7 Pg.no: 103]

When peptising agent is added to freshly prepared precipitate, it changes into colloidal sol. It is called peptisation. During peptisation, the precipitate adsorbs one of the ions of the electrolyte on its surface. For eg, when we add a small volume of v. dil. HCl solution (peptizing agent) to a fresh precipitate of aluminium hydroxide.

Q. NO: 25 Is it possible to oxidise t-butyl alcohol using acidified dichromate to form a carbonyl compound? [Unit-11-Hydroxy compounds and ethers. Q.no: 8 pg.no: 142]

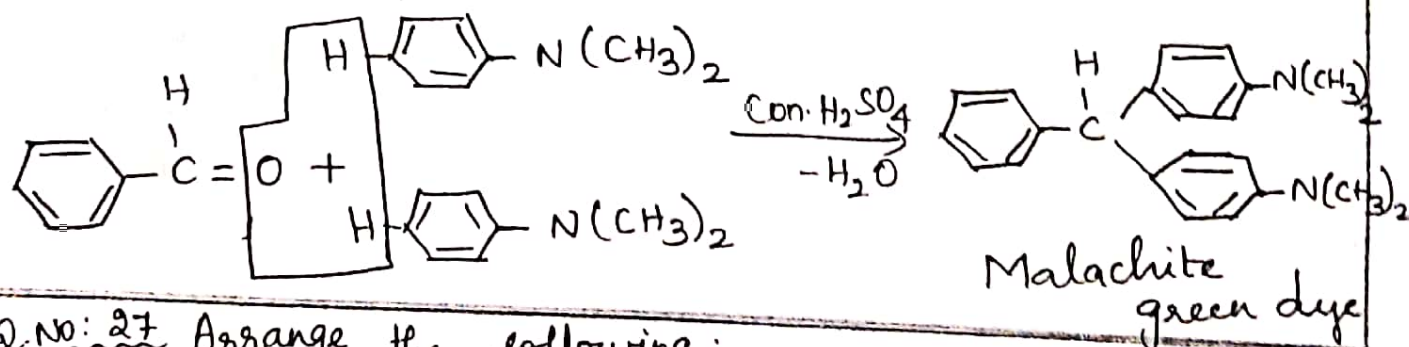
Ans:

No, tertiary alcohols do not undergo oxidation reaction under normal conditions, but at elevated temperatures, under strong oxidising agent cleavage of C-C bond takes place to give a mixture of carboxylic acid.

Q. NO: 26 How will you prepare Malachite green dye from benzaldehyde? [Unit-12 Carbonyl compounds]

Ans:

Benzaldehyde condenses with tertiary aromatic amines like N,N-dimethyl aniline in the presence of strong acids to form triphenyl methane dye.



Q. NO: 27 Arrange the following:

(i) In decreasing order of pK_b values:

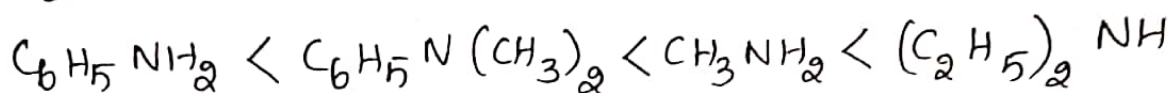
$\text{C}_2\text{H}_5\text{NH}_2$, $\text{C}_6\text{H}_5\text{N}(\text{CH}_3)_2$, $(\text{C}_2\text{H}_5)_2\text{NH}$, CH_3NH_2

[Unit-13 - Organic Nitrogen Compounds] Book back Q.no: 9

Ans: $\text{C}_6\text{H}_5\text{NH}_2 > \text{C}_6\text{H}_5\text{NHCH}_3 > \text{C}_2\text{H}_5\text{NH}_2 > (\text{C}_2\text{H}_5)_2\text{NH}$ (iv)

(ii) In increasing order of basic strength

[Book back Q. no: 9(vi) pg. no: 234]



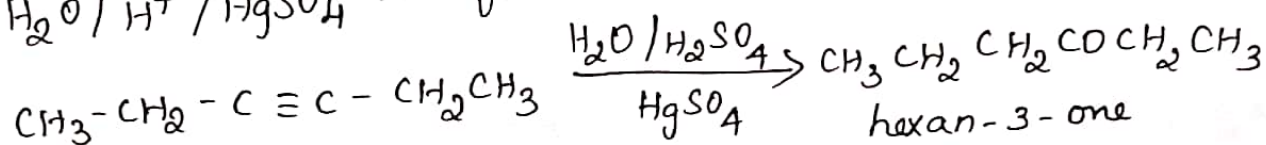
Conversions

Q. no: 28. How are the following conversions effected?

[Unit - 12 Carbonyl compounds Book back Q. no: 12(b) pg. no: 194]

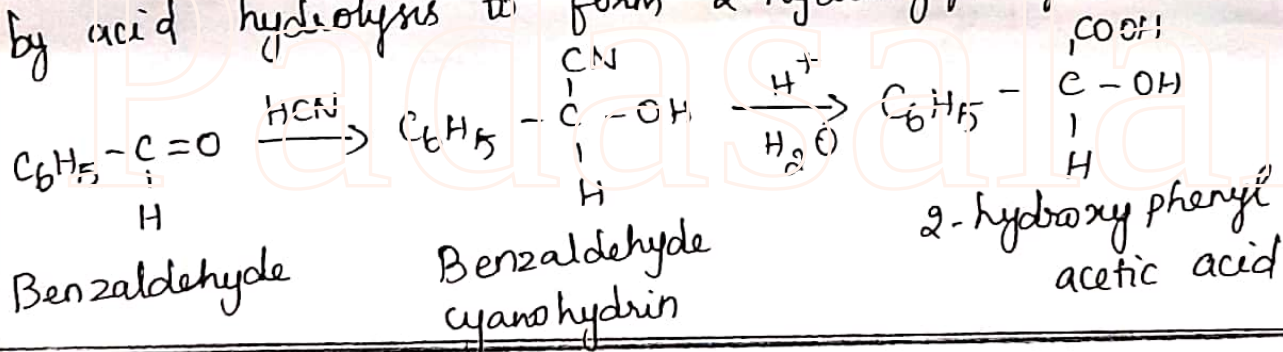
i) Hex-3-yne into hexan-3-one

When hexan-3-yne undergoes hydration with $H_2O / H^+ / HgSO_4$ to form hexan-3-one



(ii) Benzaldehyde $\rightarrow$ 2-hydroxy phenyl acetic acid.

Benzaldehyde is treated with HCN and followed by acid hydrolysis to form 2-hydroxy phenyl acetic acid.



Problems.

Q. No: 29 The equivalent conductance of $M/36$ solution of a weak monobasic acid is $6 \text{ mho cm}^2 \text{ eq}^{-1}$ and at a infinite dilution is $400 \text{ mho cm}^2 \text{ eq}^{-1}$. Calculate the dissociation constant of this acid.

Soln:

$$\alpha = \frac{\lambda_{eq}}{\lambda_{eq}^0} = \frac{6 \text{ mho cm}^2 \text{ eq}^{-1}}{400 \text{ mho cm}^2 \text{ eq}^{-1}} = 0.015$$

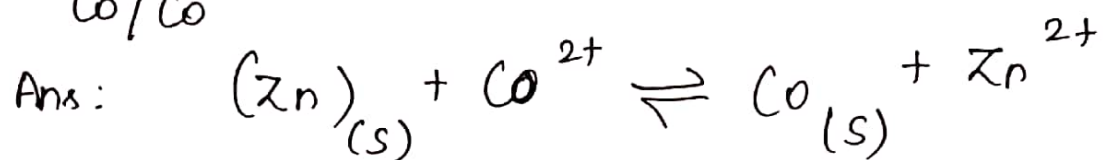
$$K_a = C \times \alpha^2$$

$$= \frac{1}{36} \times (1.5 \times 10^{-2})^2$$

$$K_a = 6.25 \times 10^{-6}$$

Q. No: 30 The reaction $(Zn)_{(s)} + Co^{2+} \rightleftharpoons Co_{(s)} + Zn^{2+}$ occurs in a cell. Compute the standard emf of the cell. Given that $E^{\circ}_{Zn/Zn^{2+}} = +0.76 V$ and

$$E^{\circ}_{Co/Co^{2+}} = +0.28 V$$



Oxidation potential of Co^{2+} ion is change into reduction potential.

$$+0.28 V = -0.28 V$$

$$E^{\circ}_{cell} = E^{\circ}_{oxidation (Zn/Zn^{2+})} + E^{\circ}_{reduction (Co^{2+}/Co)}$$

$$E^{\circ}_{cell} = +0.76 + (-0.28)$$

$$E^{\circ}_{cell} = +0.48 V$$

This reaction is feasible.

Q. No: 31 Is it possible to store copper sulphate in an iron vessel for a long time? [Book back Pg: 66 Q. No: 15]

Ans: Given: $E^{\circ}_{Cu^{2+}/Cu} = 0.34 V$ and $E^{\circ}_{Fe^{2+}/Fe} = -0.44 V$

$$(E^{\circ}_{ox})_{Fe/Fe^{2+}} = 0.44 V, (E^{\circ}_{red})_{Cu^{2+}/Cu} = 0.34 V$$

These +ve emf values show that iron will oxidise and copper will get reduced i.e., the vessel will dissolve. Hence it is not possible to store copper sulphate in an iron vessel.

Q. No: 32 A conductivity cell has two platinum electrodes separated by a distance 1.5 cm and the cross sectional area of each electrode is 4.5 sq cm. Using this cell, the resistance of 0.5 N electrolytic solution was measured 15 Ω . Find the specific conductance of the solution. [Example pg: 35, 36].

Soln: $K = \frac{1}{R} \left(\frac{l}{A} \right)$

$$l = 1.5 \text{ cm} = 1.5 \times 10^{-2} \text{ m}$$

$$A = 4.5 \text{ cm}^2 = 4.5 \times 10^{-4} \text{ m}^2$$

$$K = \frac{1}{15 \Omega} \times \frac{1.5 \times 10^{-2} \text{ m}}{4.5 \times 10^{-4} \text{ m}^2}$$

$$R = 15 \Omega$$

$$= 2.22 \text{ Sm}^{-1}$$

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