1.

During electrolysis of conc. H_2SO_4, perdisulphuric acid ($H_2S_2O_8$), and O_2 form in equimolar amount. The amount of H_2 that will form simultaneously will be

Hint: ($2H_2SO_4 \rightarrow H_2S_2O_8 + 2H^+ + 2e^-$)

1. thrice that of O_2 in moles
2. twice that of O_2 in moles
3. equal to that of O_2 in moles
4. half of that of O_2 in moles

2.

During discharge of a lead storage cell, the density of sulphuric acid in the cell-

1. Increases
2. Decreases
3. Remains unchanged
4. Initially increases but decreases subsequently

3.

The specific conductivity of a solution depends upon :

1. Number of ions as well as mobility of ions
2. Number of ions per cc of solution
3. Number of ions per cc as well as mobilities of ions
4. Mobilities of ions

4.

The molar conductance of $\frac{M}{32}$ solution of a weak monobasic acid is 8.0 mho $cm^2$and at infinite dilution is 400 mho cm^2. The dissociation constant of this acid is

1. 1.25×10^{-5}
2. 1.25×10^{-6}
3. 6.25×10^{-4}
4. 1.25×10^{-4}

5.

Pick out the salt with the highest electrolytic conductivity in solution?

1. $K_2[PtCl_6]$
2. $[Co(NH_3)_3(NO_2)_3]$
3. $K_4[Fe(CN)_6]$
4. $[Co(NH_3)_4]SO_4$

6.

The specific conductance of 0.01 M solution of the weak monobasic acid is 0.20 x 10^{-3} S cm^{-1}. The dissociation constant of the acid is-[given Λ^{∞}_{HA} = 400 S cm^2 mol^{-1}]

1. 5×10^{-2}
2. 2.5×10^{-5}
3. 5×10^{-4}
4. 2.2×10^{-11}

7.

At 25°C, molar conductance of 0.1 molar aqueous solution of ammonium hydroxide is 9.54 Ω^{-1} cm^2 mol^{-1} and at infinite dilution, its molar conductance is 238 Ω^{-1} cm^2 mol^{-1}. The degree of ionization of ammonium hydroxide at the same concentration and temperature is

1. 2.080 %
2. 20.800 %
3. 4.008 %
4. 40.800 %

8.

The specific conductance of a 0.1N KCl solution at 23°C is 0.012 Ω^{-1} cm^{-1}. The resistance of the cell containing the solution at the same temperature was found to be 55 Ω. The cell constant will be-

1. 0.142cm^{-1}
2. 0.66 cm^{-1}
3. 0.918 cm^{-1}
4. 1.12cm^{-1}

9.

The specific conductivity of a saturated solution of KI_3 is 4.59 × 10^{-6} ohm^{-1} cm^{-1} and its molar conductance is 1.53 ohm^{-1} cm^2 mol^{-1}. The K_{sp} Of KI_3 will be-

1. 4 x 10^{-12}
2. 27 x 27 x 10^{-9}
3. 9 x 10^{-6}
4. 4 x 10^{-6}

10.

Following limiting molar conductivities are given as

$\lambda_m^0(H_2SO_4) = x\ Scm^2\ mol^{-1}$

$\lambda_m^0(K_2SO_4) = y\ Scm^2\ mol^{-1}$

$\lambda_m^0(CH_3COOK) = z\ Scm^2\ mol^{-1}$

$\lambda_m^0(in\ Scm^2\ mol^{-1})\ for\ CH_3COOH$ will be-

1. $x - y + 2z$
2. $x + y + z$
3. x-y+z
4. $\frac{(x-y)}{2} + z$

11.

The conductivity of 0.00241 M acetic acid is 7.896 × 10^{-5} S cm^{-1}. If Λ_m^0 for acetic acid is 390.5 S cm^2 mol^{-1}, the dissociation constant will be -

1. 2.45×10^{-5} mol L^{-1}
2. 1.86×10^{-5} mol L^{-1}
3. 3.72×10^{-4} mol L^{-1}
4. 2.12×10^{-6} mol L^{-1}

12.

Which of the following statement is not correct about an inert electrode in a cell?

1. It does not participate in the cell reaction
2. It provides surface either for oxidation or for the reduction reaction
3. It provides a surface for the conduction of electrons
4. it provides a surface for redox reaction

13.

Which of the following statements about the solution of electrolytes is not correct?

1. Conductivity of solution depends upon the size of ions
2. Conductivity depends upon the viscosity of solution
3. Conductivity does not depend upon the solvation of ions present in solution
4. Conductivity of solution increases with temperature

14.

The cell constant of a conductivity cell-

1. Changes with the change of electrolyte
2. Changes with the change of concentration of electrolyte
3. Changes with the temperature of the electrolyte
4. Remains constant for a cell

15.

While charging the lead storage battery ..... .

1. $PbSO_4$ anode is reduced to Pb
2. $PbSO_4$ cathode is reduced to Pb
3. $PbSO_4$ cathode is oxidised to Pb
4. $PbSO_4$ anode is oxidised to PbO_2

16.

$\Lambda_m^\circ(NH_4OH)$ is equal to ..... .

1. $\Lambda^{\circ}{}_{m(NH_4OH)} + \Lambda^{\circ}{}_{m(NH_4Cl)} - \Lambda^{\circ}{}_{(HCl)}$
2. $\Lambda^{\circ}{}_{m(NH_4Cl)} + \Lambda^{\circ}{}_{m(NaOH)} - \Lambda^{\circ}{}_{(NaCl)}$
3. $\Lambda^{0}{}_{m(NH_4Cl)} + \Lambda^{0}{}_{m(NaCl)} - \Lambda^{0}{}_{(NaOH)}$
4. $\Lambda^{\circ}{}_{m(NaOH)} + \Lambda^{\circ}{}_{m(NaCl)} - \Lambda^{\circ}{}_{(NH_4Cl)}$

17.

Molar conductivities $(\wedge^{\circ}{}_m)$ at infinite dilution of NaCl, HCl and CH_3COONa are 126.4, 425.9 and 91.0 S $cm^2\ mol^{-1}$ respectively. $(\wedge^{\circ}{}_m)$ for CH_3COOH will be:

1. $180.5\ S\ cm^2 mol^{-1}$
2. $290.8\ S\ cm^2 mol^{-1}$
3. $390.5\ S\ cm^2 mol^{-1}$
4. $425.5\ S\ cm^2 mol^{-1}$

18.

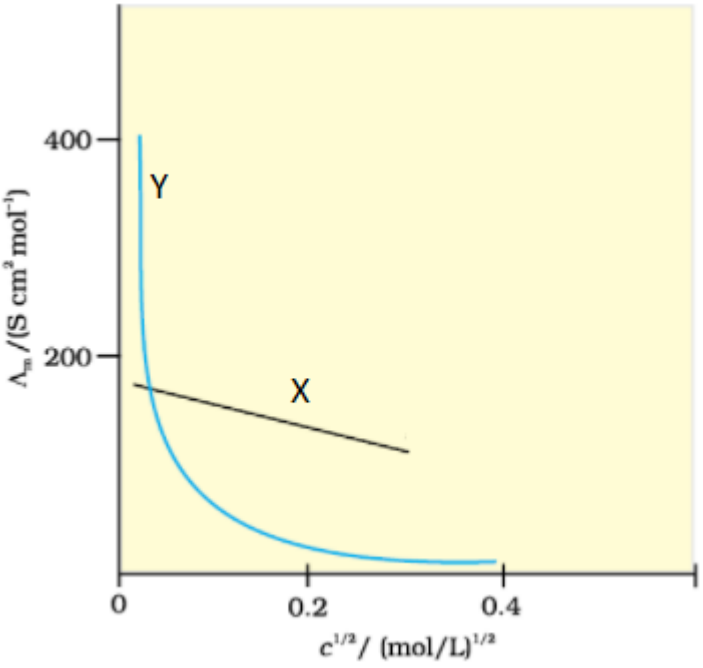
The correct increasing order of reducing power of the metals is :

(K^+/K = –2.93V, Ag^+/Ag = 0.80V, Hg^{2+}/Hg = 0.79V, Mg^{2+}/Mg = –2.37 V, Cr^{3+}/Cr = – 0.74V)

1. Cr < Mg < K < Ag < Hg
2. Mg < K < Ag < Hg < Cr
3. K < Ag < Hg < Cr < Mg
4. Ag < Hg < Cr < Mg < K

19.

Consider the following graph.

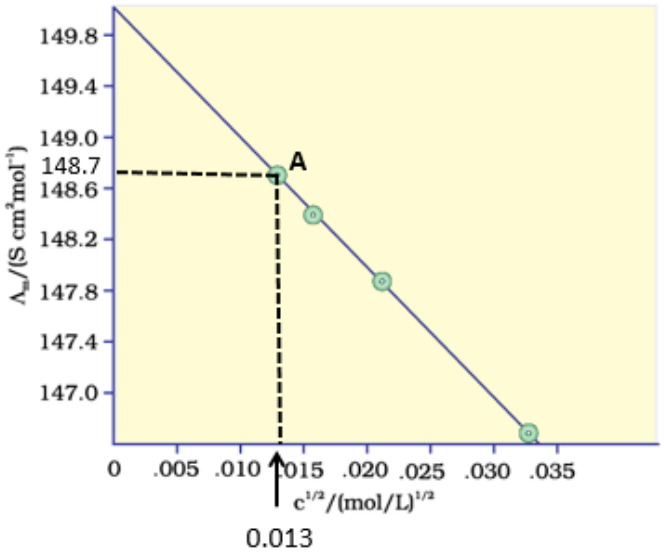


The strong electrolyte in the above graph is represented by -

1. X
2. Y
3. Both X and Y
4. Data given is not sufficient to predict

20.

Consider the following graph of molar conductivity of KCl solution at different concentrations.



The value of limiting molar conductivity for KCl is $150.0\ S\ cm^2\ mol^{-1}$. The value of the slope at the point A will be

1. 120
2. 100
3. 110
4. None of the above

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