DPP – 02

CLASS – 12th

TOPIC – ELECTRODE POTENTIAL

Q.1 E° for F_2 + 2e gives 2F- is 2.8 V, E° for 1/2F2+ e gives F-is

(A) 2.8 V

(B) 1.4 V

(C) -2.8 V

(D) - 1.4 V

Q.2 If a spoon of copper metal is placed in a solution of ferrous sulphate-

(A) Cu will precipitate out

(B) iron will precipitate

(C) Cu and Fe will precipitate

(D) no reaction will take place

Q.3 The position of some metals in the electrochemical series in decreasing electropositive character is given as Mg > AI > Zn > Cu > Ag. What will happen if a copper spoon is used to stir a solution of aluminium nitrate ?

(A) The spoon will get coated with aluminium

(B) An alloy of aluminium and copper is formed

(C) The solution becomes blue

(D) There is no reaction

Q.4 For Zn_2+/ Zn, E° = -0.76 V, for Ag+/Ag, E° = -0.799 V. The correct statement is -

(A) the reaction Zn getting reduced Ag getting oxidized is spontaneous

(B) Zn undergoes reduction and Ag is oxidized

(C) Zn undergoes oxidation Ag+ gets reduced

(D) No suitable answer

Q.5 Electrode potential data are given below.

Fe_3+ (aq) + e- gives Fe_2+ (aq);

E° = +0.77

Al_3+ (aq) + 3e- gives Al (s);

E° = -1.66 V

Br_2 (aq) + 2e- gives 2Br-(aq);

E° = + 1.08V

Based one the data given above, reducing power of Fe2+, Al and Br-will increase in the order:

(A) Br-< Fe_2+ < Al

(B) Fe_2+< Al < Br-

(C) AI < Br-< Fe_2+

(D) AI < Fe_2+ < Br-

SOLUTION

(CHEMISTRY) ELECTROCHEMISTRY

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TOPIC –ELECTRODE POTENTIAL

Sol.1 EO is intensive property and it does not depend on mass of F_2 taking part. Hence no change in cell potential.

Sol.2 Cu lies below Fe in electrochemical or reactivity series. Hence, it cannot displace Fe from its solution and thus, no reaction will take place.

Sol.3 The electrochemical series is a list of metals and other substances arranged in rank order of how easily their atoms may lose electrons. The further apart the metals are in the electrochemical series, the higher the voltage produced across the cell.

In electrochemical series the metal in higher position can displace the metal in lower position from its salt solution.

But here, Copper is less reactive than Aluminium and is placed lower in electrochemical series with respect to Aluminium and hence can't displace Al from its salt solution. Hence,no reaction occurs.

Sol.4 The standard electrode potential for silver is higher than the standard electrode potential for zinc. This shows that silver ions have higher tendency to gain an electron than zinc ions. Hence, zinc is oxidized and silver ions are reduced.

Sol.5 Addition of electrons is Reduction. So, here elements are undergoing reduction. The given Eo values are Reduction potential of the elements. We have to keep in mind that Higher the Reduction potential, lower is its reducing power. Here Reduction potential increasing order is $Br_2 > Fe_3+ > Al_3+$.

And the order of reducing power is the reverse of it.