ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

SOLUTION-30(CLASS-12)

TOPIC- ELECTROCHEMISTRY

SUBTOPIC- ELECTROCHEMICAL CELL

SUBJECT – CHEMISTRY **F.M. - 15**

DURATION – 30 mins **DATE -26.06.20**

1.1 **$Ag^+(aq) + e^- \rightarrow Ag(s)$ $E° = + 0.80$ V, $Fe^{2+}(aq) + 2e^- \rightarrow Fe(s)$ $E° = – 0.44$ V**

What is emf of the cell?

$Fe(s) + 2Ag^+(aq) \rightarrow Fe^{2+}(aq) + 2Ag(s)$

(a) 1.16 V (b) 1.24 V (c) 2.04 V (d) -1.16 V

Ans. b

1.2 **A conductivity cell containing electrodes made up of-**

(a) Gold (b) Silver (c) Platinised platinum (d) Copper

Ans. c

1.3 **What is pH of the half-cell Pt|H2)|H^+ if $E^{\circ}_{H^+H_2}$ =-0.0295 V**

(a) 1 (b) 2 (c) 0.5 (d) 3

Ans. c

1.4 $X(s) + 2Y^+(aq) \rightleftharpoons X^{2+}(aq) + 2Y(s);$ $(E^{\circ}_{cell} = 0.059\ V)$

What is the value of 'K' for above reaction?

(a) 1×10^8 (b) 1×10^2 (c) 4×10^3 (d) 3×10^4

Ans. b

1.5 **Which of the following statement is correct?**

(a) E_{Cell} and Δ_rG of cell reaction both are extensive properties.

(b) E_{Cell} and Δ_rG of cell reaction both are intensive properties.

(c) E_{Cell} is an intensive property while Δ_rG of cell reaction is an extensive property.

(d) E_{Cell} is an extensive property while Δ_rG of cell reaction is an intensive property.

Ans. c

1.6 $E^{\ominus}_{Cell}$ **= 1.1V for Daniel cell. Which of the following expressions are correct description of state of equilibrium in this cell?**

(*a*) $1.1 = K_c$

(*b*) $\frac{2.303RT}{2F} \log K_c = 1.1$

(*c*) $\log K_c = \frac{2.2}{0.059}$

(*d*) $\log K_c = 1.1$

Ans. c

1.7 **The cell reaction of the galvanic cell.**

$Cu(s) / Cu^{2+}(aq) // Hg^{2+}(aq) / Hg(l)$ is

(*a*) $Hg + Cu^{2+} \longrightarrow Hg^{2+} + Cu$

(*b*) $Hg + Cu^{2+} \longrightarrow Cu^{+} + Hg^{+}$

(*c*) $Cu + Hg \longrightarrow CuHg$

(*d*) $Cu + Hg^{2+} \longrightarrow Cu^{2+} + Hg$

Ans. d

1.8 **The reaction, $3ClO^{-}(aq) \rightarrow ClO_3(aq) + 2Cl^{-}(aq)$ is an example of-**

(a) Oxidation reaction

(b) Reduction reaction

(c) Disproportionation reaction

(d) Decomposition reaction

Ans. c

1.9 **The emf of the cell:**

Ni / Ni^{2+} (1.0 M) // Au^{3+} (1.0 M) / Au ($E° = -0.25$ V for Ni^{2+}/Ni; $E° = 1.5$ V for Au^{3+}/Au) is-

(a) 1.25 V

(b) -1.25 V

(c) 1.75 V

(d) 2.0 V

Ans. c

1.10 **The standard emf of a galvanic cell involving cell reaction with n = 2 is formed to be 0.295 V at 25° C. The equilibrium constant of the reaction would be-**

(a) 1.0×10^{10}

(b) 2.0×10^{11}

(c) 4.0×10^{12}

(d) 1.0×10^{2}

[Given F = 96500 (mol^{-1}); R = 8.314 JK^{-1} mol^{-1}]

Ans. a

1.11**If $E^{\circ}_{Fe^{2+}/Fe}$ = -0.441 V and $E^{\circ}_{Fe^{2+}/Fe^{2+}}$ = 0.771 V, the standard EMF of the reaction, $Fe + 2Fe^{3+} \rightarrow 3Fe^{2+}$ will be**-

(a) 1.212 V

(b) 0.111 V

(C) 0.330 V

(d) 1.653 V

Ans. a

1.13 **Calculate the potential of hydrogen electrode in contact with a solution whose pH is 10.**

(a) -0.591V

(b) +0.591V

(c) +0.251V

(d) -0.251V

Ans. a

1.14 **Zinc rod is dipped in 0.1M solution of ZnSO4. The salt is 95% dissociated at this dilution at 298K. Calculate the electrode potential. Given the standard electrode potential is -0.76V.**

a) -0.852V

b) -9.584V

c) -0.790V

d) +0.790V

Ans. c

1.15 **The direction of movement of the electrons with an electrochemical cell is-**

a) From anode to cathode

b) From cathode to anode

c) In both directions

d) Can't be predicted

Ans. a

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