



ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

SOLUTION-30(CLASS-12)

TOPIC- ELECTROCHEMISTRY

SUBTOPIC- ELECTROCHEMICAL CELL



SUBJECT – CHEMISTRY

DURATION – 30 mins

F.M. - 15

DATE -26.06.20

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

What is emf of the cell?



(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 $\text{Pt}|\text{H}_2| \text{H}^+$ if $E_{\text{H}^+/\text{H}_2}^\circ = -0.0295 \text{ V}$

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

Ans. c



1.4 ($E_{\text{cell}}^\circ = 0.059 \text{ V}$)

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 $\Delta_r G$ of cell reaction both are extensive properties.

(b) E_{Cell} and $\Delta_r G$ of cell reaction both are intensive properties.

(c) E_{Cell} is an intensive property while $\Delta_r G$ of cell reaction is an extensive property.

(d) E_{Cell} is an extensive property while $\Delta_r G$ of cell reaction is an intensive property.

Ans. c

1.6 $E_{\text{Cell}}^\circ = 1.1 \text{ V}$ for Daniel cell. Which of the following expressions are correct description of state of equilibrium in this cell?

(a) $1.1 = K_c$

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

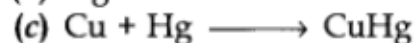
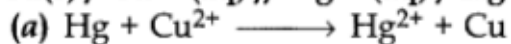
(c) $\log K_c = \frac{2.2}{0.059}$

(d) $\log K_c = 1.1$

Ans. c

1.7 The cell reaction of the galvanic cell.

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



Ans. d

1.8 The reaction, $3\text{ClO}^-(\text{aq}) \rightarrow \text{ClO}_3^-(\text{aq}) + 2\text{Cl}^-(\text{aq})$ 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:

$\text{Ni} / \text{Ni}^{2+} (1.0 \text{ M}) // \text{Au}^{3+} (1.0 \text{ M}) / \text{Au}$ ($E^\circ = -0.25 \text{ V}$ for Ni^{2+}/Ni ; $E^\circ = 1.5 \text{ V}$ 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 found 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 $F = 96500 (\text{mol}^{-1})$; $R = 8.314 \text{ JK}^{-1} \text{ mol}^{-1}$]

Ans. a

1.11 If $E^\circ_{\text{Fe}^{2+}/\text{Fe}} = -0.441 \text{ V}$ and $E^\circ_{\text{Fe}^{2+}/\text{Fe}^{3+}} = 0.771 \text{ V}$, the standard EMF of the reaction, $\text{Fe} + 2\text{Fe}^{3+} \rightarrow 3\text{Fe}^{2+}$ 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 ZnSO_4 . 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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