Parishram (2025)

Physical Chemistry

Electrochemistry

DPP: 2

Q1 In a galvanic cell, which of following statement(s) is/are correct regarding salt bridge.
(A) To complete the electrical circuit.
(B) To maintain the electrical neutrality of both anodic and cathodic compartment.
(C) For smooth flow of current.
(D) All are correct

Q2 A standard hydrogen electrode has a zero potential because
(A) Hydrogen is the lightest element.
(B) Hydrogen has only one electron.
(C) Hydrogen can be most easily oxidized.
(D) The electrode potential is assumed to be zero at standard condition.

Q3 It is impossible to measure the actual voltage of any half-cell by itself because
(A) Both half-cell reactions take place simultaneously.
(B) Of resistance of the wire.
(C) A reaction does not take place on its own.
(D) None of the above

Q4 Two half cells have reduction potential $-0.76\ \text{V}$ and $-0.13\ \text{V}$ respectively. A galvanic cell is made from these two half cells. Which of following statements is correct.
I. Electrode of half-cell potential $-0.76\ \text{V}$ serves as cathode.
II. Electrode of half-cell potential $-0.76\ \text{V}$ serves as anode.
III. Electrode of half-cell potential $-0.13\ \text{V}$ serves as anode.
IV. Electrode of half-cell potential $-0.13\ \text{V}$ serves as cathode.
(A) I, III
(B) II, IV
(C) All are correct
(D) Data not sufficient

Q5 Calculate E° for a given cell
$\text{Zn(s)}\,|\text{ZnSO}_4\text{(aq)}||\text{CuSO}_4\text{(aq)}|\,\text{Cu(s)}$
Given that,

$$\text{E}^{\text{O}}_{\text{Zn/Zn}^{+2}} = 0.76\ \text{V}$$
$$\text{E}^{\text{o}}_{\text{Cu/Cu}^{+2}} = -0.34\ \text{V}$$

(A) $-1.1\ \text{V}$
(B) $0.0\ \text{V}$
(C) $1.1\ \text{V}$
(D) $0.42\ \text{V}$

Q6 Standard electrode potentials for $\text{Sn}^{+4}/\text{Sn}^{+2}$ couple is $+0.15\ \text{V}$ and that for the Cr^{+3}/Cr. Couple is $-0.74\ \text{V}$.These two couples in their standard state are connected to make a cell. The cell potential will be
(A) $0.89\ \text{V}$
(B) $+0.18\ \text{V}$
(C) $1.83\ \text{V}$
(D) $+1.19\ \text{V}$

Q7 A hypothetical electrochemical cell is shown below $\text{A}\,|\,\text{A}^+(\text{xM})\,||\,\text{B}^+\,(\text{yM})\,|\,\text{B}$

The e.m.f. measured is $+0.20\ \mathrm{V}$. The cell reaction is

(A) $\mathrm{A} + \mathrm{B}^{+} \rightarrow \mathrm{A}^{+} + \mathrm{B}$

(B) $\mathrm{A}^{+} + \mathrm{B} \rightarrow \mathrm{A} + \mathrm{B}^{+}$

(C) $\mathrm{A}^{+} + \mathrm{e}^{-} \rightarrow \mathrm{A}$

(D) $\mathrm{B}^{+} + \mathrm{e}^{-} \rightarrow \mathrm{B}$

Answer Key

Q1 (D)

Q2 (D)

Q3 (C)

Q4 (B)

Q5 (C)

Q6 (A)

Q7 (A)

Hints & Solutions

Note: scan the QR code to watch video solution

Q1 Video Solution:

Q2 Video Solution:

Q3 Video Solution:

Q4 Video Solution:

Q5 Video Solution:

Q6 Video Solution:

Q7 Video Solution: