Parishram (2025)

Physical Chemistry

Electrochemistry

DPP: 3

Q1 The cell reaction of a cell is: $\mathrm{Mg(s)} + \mathrm{Cu^{2+}}$ (aq.) $\rightleftharpoons \mathrm{Cu(s)} + \mathrm{Mg^{2+}}$ (aq.)
If the standard reduction potentials of Mg and Cu are $-2.37\ \mathrm{V}$ and $+0.34\ \mathrm{V}$ respectively. The standard EMF of the cell is
(A) $2.03\ \mathrm{V}$
(B) $-2.03\ \mathrm{V}$
(C) $+2.71\ \mathrm{V}$
(D) $-2.71\ \mathrm{V}$

Q2 The standard EMF for the cell reaction: $\mathrm{Zn(s)} + \mathrm{Cu^{2+}}\ \mathrm{(aq)} \rightarrow \mathrm{Zn^{2+}(aq)} + \mathrm{Cu(s)}$ is 1.10 volts at $25^\circ\mathrm{C}$. The EMF of the cell reaction when $0.1\mathrm{M}\,\mathrm{Cu^{2+}}$ and $0.1\mathrm{M}\ \mathrm{Zn^{2+}}$ solutions are used at $25^\circ\mathrm{C}$ is
(A) $1.10\ \mathrm{V}$
(B) $1.041\ \mathrm{V}$
(C) $-1.10\ \mathrm{V}$
(D) $-1.041\ \mathrm{V}$

Q3 For the cell: $\mathrm{Ni}\left|\mathrm{Ni^{2+}}\right\|\mathrm{Cu^{2+}}\left|\mathrm{Cu};\mathrm{E^\circ} = 0.77\ \mathrm{V}.\right.$ By which of the following activity, E_{cell} will increase?
(A) On decreasing $\left[\mathrm{Ni^{+2}}\right]$
(B) On decreasing $\left[\mathrm{Cu^{+2}}\right]$
(C) On increasing mass of Ni electrode
(D) On increasing mass of Cu electrode

Q4 At equilibrium:
(A) $\mathrm{E^\circ}_{\text{cell}} = 0, \Delta\mathrm{G^\circ} = 0$
(B) $\mathrm{E}_{\text{cell}} = 0, \Delta\mathrm{G} = 0$
(C) Both are correct
(D) None is correct

Q5 For a cell reaction involving a two-electron change, the standard EMF of the cell is found to be $0.295\ \mathrm{V}$ at $25^\circ\mathrm{C}$. The equilibrium constant of the reaction at $25^\circ\mathrm{C}$ will be
(A) 1×10^{10}
(B) 1×10^{-10}
(C) 29.5×10^{-2}
(D) 2×10^{10}

Answer Key

Q1 (C)

Q2 (A)

Q3 (A)

Q4 (B)

Q5 (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: