

Cell constant and Electrochemical Cells

- (d) In the absence of electric field the ions in the solution move randomly due to thermal energy.
- (d) Since E_{A/A^-}° has large negative value, the tendency of A to be reduced to A^- is very small.

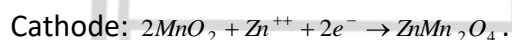
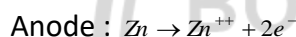
In other words tendency of A^- to be oxidized to A is very large.

- (d) Practically only 60-70% efficiency has been attained.

- (b) $K = \frac{1}{R} \times \text{Cell constant}$

$$\text{Cell constant} = K \times R; 0.012 \times 55 = 0.66 \text{ cm}^{-1}.$$

- (b) In common dry cell.



- (a) Because the reduction potential of Cu is highest.

- (c) Overall reaction - $2\text{H}_{2(g)} + \text{O}_{2(g)} \rightarrow 2\text{H}_2\text{O}(l).$

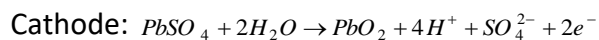
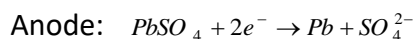
- Answer:** (b) H_2SO_4 is regenerated

Explanation:

- During charging, electrical energy drives the reverse of the discharge reactions.
- PbSO_4 on the electrodes is converted back to Pb (on the negative plate) and PbO_2 (on the positive plate), and **H_2SO_4 concentration in the electrolyte increases.**
- This regeneration of sulfuric acid is why a charged lead-acid battery has a stronger electrolyte.

- (b) During charging of a lead storage battery, the reaction at the anode and cathode are



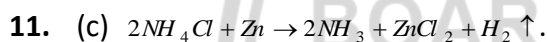


In both the reactions H_2SO_4 is regenerated.

10. Answer: (b) Reduction

Explanation:

- At the **cathode**, **cations gain electrons** (reduction occurs).
- In dilute H_2SO_4 , H^+ ions are reduced to form hydrogen gas:
 $2H^+ + 2e^- \rightarrow H_2$
- At the **anode**, water is oxidized:
 $2H_2O \rightarrow O_2 + 4H^+ + 4e^-$



13. (a) When platinum electrodes are dipped in dilute solution H_2SO_4 than H_2 is evolved at cathode.

14. (a) Electrode on which oxidation occurs is written on *L.H.S.* and the other on the *R.H.S.* as represented by



Reduction

15. (d) $Zn^{2+} + 2e^- \rightarrow Zn$. It shows reduction reaction.

16. (c) In the electrolytic cell electrical energy change into chemical energy.

17. (c) In the cell $Zn | Zn^{2+} || Cu^{2+} | Cu$ the negative electrode (anode) is Zn . In electrochemical cell representation anode is always written on left side while cathode on right side.

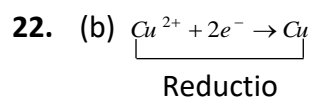
18. (a) Galvanic cell converts the chemical energy into electrical energy.





19. (b) Fuel-cells are used to provide power and drinking water to astronauts in space programme.

21. (b) $E_{\text{cell}}^{\circ} = \frac{2.303}{nF} RT \log K = \frac{0.0591}{n} \log K_c \text{ at } 298 \text{ K}.$



24. (b) The cell in which Cu and Zn rods are dipped in its solutions called Daniel cell.

25. (c) $K = C \times \text{Cell constant} = \frac{K}{C} = \frac{0.2}{0.04} = 5 \text{ cm}^{-1}.$

