

Q.1(a)(i) Second law of thermodynamics and its significance.

ii) Le Chatelier's principle and the effect of concentration, temperature on equilibrium.

(b) Describe the term entropy and write its significance.

(c) Estimate the amount of change in internal energy if 2000 J of heat leaves the system and 2500 J of work is done on the system.

Q.2(a) Explain the effect of dilution on.

(i) Conductance (ii) Specific conductance

(iii) Molar conductance (iv) Equivalent conductance

(b)(i) Write Faraday's first law of electrolysis

(ii) Calculate the mass of copper deposited at the cathode if a solution of CuSO_4 is electrolyzed by passing 15 ampere current for 10 minutes.
(Molar mass of Cu = 63.546)

(c) Write a note on Electrolytic refining.

Q.3(a) Explain construction, working advantages and disadvantages of Ni-metal hydride battery.

(b) Explain the following terms.

- (i) power density
- (ii) super capacitor.
- (iii) Energy Efficiency.

(c) Write advantage and disadvantages of Li-ion battery.

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