1. Electrolysis and Faraday's laws

1. What current is to be passed for 0·25 s for deposition of a certain weight of metal which is +-equal to its electrochemical equivalent ?

(*a*) 4 A (*b*) 100 A

(*c*) 200 A (*d*) 2 A

2. In an experiment 0·04 F was passed through 400 ml of 1 M solution of NaCl. What would be the pH of the solution after the electrolysis ?

(*a*) 8 (*b*) 10

(*c*) 13 (*d*) 6

(*e*) 9

3. Electrolysis of dilute aqueous NaCl solution was carried out by passing 10 milli ampere current. The time required to liberate 0·01 mol of H_2 gas at the cathode is (1 Faraday = 96500 C mol^{-1})

(*a*) $9{\cdot}65 \times 10^4$ sec (*b*) $19{\cdot}3 \times 10^4$ sec

(*c*) $28{\cdot}95 \times 10^4$ sec (*d*) $38{\cdot}6 \times 10^4$ sec

(IIT 2008)

4. One faraday of electricity is passed through molten Al_2O_3, aqueous solution of $CuSO_4$ and molten NaCl taken in three different electrolytic cells connected in series. The mole ratio of Al, Cu and Na deposited at the respective cathodes is

(*a*) 2 : 3 : 6 (*b*) 6 : 2 : 3

(*c*) 6 : 3 : 2 (*d*) 1 : 2 : 3

(*e*) 3 : 6 : 2 **(Kerala PET 2010)**

5. 9·65 C electric current is passed through fused anhydrous magnesium chloride. The magnesium metal thus obtained is completely converted into a Grignard reagent. The number of moles of the Grignard reagent obtained is

(*a*) 5×10^{-4} (*b*) 1×10^{-4}

(*c*) 5×10^{-5} (*d*) 1×10^{-5}

(Karnataka CET 2010)

6. A current of 2·0 A passed for 5 hours through a molten metal salt deposits 22·2 g of metal (At wt. = 177). The oxidation state of the metal in the metal salt is

(*a*) +1 (*b*) +2

(*c*) +3 (*d*) +4.

7. Same quantity of electricity was passed through solutions of salts of elements A, B and C with atomic weights 7, 27 and 48 respectively. The masses of A, B and C deposited were 2·1 g, 2·7 g and 7·2 g respectively. The valencies of A, B and C respectively are

(*a*) 3, 2 and 1 (*b*) 1, 2 and 3

(*c*) 1, 3 and 2 (*d*) 2, 3 and 2

8. Al_2O_3 is reduced by electrolysis at low potentials and high currents. If $4{\cdot}0 \times 10^4$ amperes of current is passed through molten Al_2O_3 for 6 hours, what mass of aluminium is produced ? (Assume 100% current efficiency. At. mass of Al =