

I. 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) 9.65×10^4 sec (b) 19.3×10^4 sec
(c) 28.95×10^4 sec (d) 38.6×10^4 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 4.0×10^4 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 = 27)