

Exercise 8.72 – Electrolysis calculations

Q872-01 Metallic tin can be produced by the electrolysis of a molten salt containing Sn^{2+} ions. Which change(s) would double the amount of tin produced?

- I - Doubling the current passed during electrolysis
- II - Doubling the time used for electrolysis
- III - Using Sn^{4+} ions instead of Sn^{2+} ions

- A. I only
 - B. II only
 - C. I and II only
 - D. I, II and III
-

Q872-02 One Faraday of electricity was passed through some electrolytic cells placed in series containing solutions of $\text{Ag}^+(\text{aq})$, $\text{Ni}^{2+}(\text{aq})$ and $\text{Cr}^{3+}(\text{aq})$. What mass of Ag, Ni and Cr respectively will be deposited? [Ar values: Ag=108, Ni=59, Cr=52]

- A. 36g, 29.5g and 52g
 - B. 108g, 59g and 52g
 - C. 108g, 29.5g and 17.3g
 - D. 108g, 118g and 156g
-

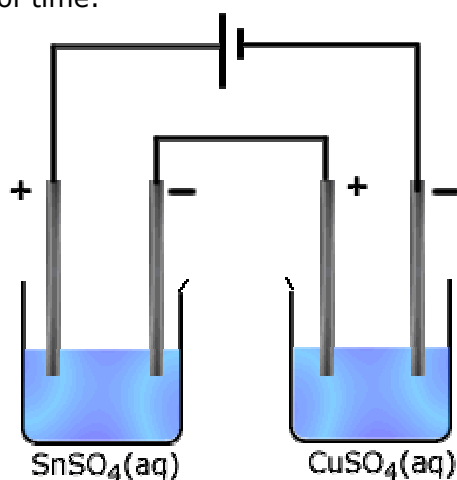
Q872-03 What factors affect the amount of metal formed during electrolysis?

- I - Charge in the metal ion
- II - Current
- III- Time

- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III
-

Exercise 8.72 – Electrolysis calculations

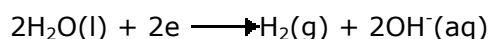
Q872-04 Two electrolytic cells are connected in series so that the same current flows through both cells for the same length of time:



The amount of tin deposited is 0.01 mol. How much copper is deposited?

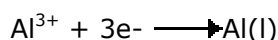
- A. 0.05 mol
- B. 0.01 mol
- C. 0.02 mol
- D. 0.05 mol

Q872-05 A membrane cell is used to electrolyse aqueous sodium chloride. Hydrogen and sodium hydroxide are produced according to the following equation:



A current of 20A is passed through the solution for 5 hours. Calculate the moles of OH^- ions that are produced and the mass of sodium hydroxide formed.

Q872-06 Aluminum oxide may be electrolyzed at 1000 °C to furnish aluminium metal. The cathode reaction is:



To prepare 5.12 kg of aluminum metal by this method would require which of the following?

- A. 5.49×10^7 C of electricity
- B. 1.83×10^7 C of electricity
- C. 5.49×10^4 C of electricity
- D. 5.49×10^1 C of electricity

Exercise 8.72 – Electrolysis calculations

Q872-07 A current of 10.0 amperes flows for 2.00 hours through an electrolytic cell containing a molten salt of metal M. This results in the decomposition of 0.250 mole of metal M at the cathode. The oxidation state of M in the molten salt is which of the following?

- A. 1+
- B. 2+
- C. 3+
- D. 4+

Q872-08 Calculate the time required to deposit 10g of silver using a current of 0.5A through a 0.1 mol dm^{-3} solution of silver nitrate (aq). [Ag=108]

Q872-09 In the electrolysis of water, a current was passed through a dilute solution of sulphuric acid for 30 minutes. If 2400 cm^3 of oxygen was produced at the anode, calculate the magnitude of the current used. What volume of hydrogen is also produced at the other electrode? [Gas molar volume at RTP = 24 dm^3]

Q872-10 Calculate the time needed to produce 100 cm^3 of hydrogen gas by passing 2.5 Amps of current through a sulphuric acid solution. [Gas molar volume at RTP = 24 dm^3]
