

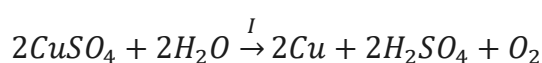
Question # 82484

A current of 2A flows for 2 hours 40 minutes 55 seconds through a solution of copper sulphate in a platinum electrode. calculate:

- how many faradays were consumed.
- calculate the quantity of electricity passed.
- what volume of O₂ gas would be liberated at the anode.
- what happens to the CuSO₄ AT THE END OF THE ELECTROLYSIS

Solution:

The electrolysis of CuSO₄ provides according to the chemical equation:



- a. During the electrolysis, it was consumed:

$$C = \frac{I * \tau}{F} = \frac{2 * (160 * 60 + 55)}{96485} = \frac{19310}{96485} = 0.2 F$$

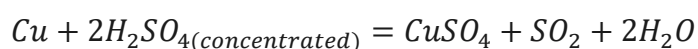
- b. The quantity of electricity passed through a solution is equal to:

$$Q = I * \tau = 2 * (160 * 60 + 55) = 19310 C$$

- c. The volume of O₂ liberated at the anode is:

$$V(\text{O}_2) = \frac{22.4 * 2 * (160 * 60 + 55)}{4 * 96485} = 1.121 l$$

- d. At the end of electrolysis, the concentration of CuSO₄ is reduced. The liberated copper precipitates at the cathode, the concentration of obtained H₂SO₄ is maximal. If the cathode remains in the solution after power shutdown and the concentration of H₂SO₄ is high, the following reverse reaction occurs:



Answer:

a. During the electrolysis, it was consumed 0.2 F (faradays).

b. The quantity of electricity passed through a solution is 19310 C (coulombs).

c. The volume of O₂ liberated at the anode is 1.121 l (liters).

d. At the end of electrolysis, the concentration of CuSO₄ is reduced. The liberated copper precipitates at the cathode, the concentration of obtained H₂SO₄ is maximal. If the cathode remains in the solution after power shutdown and the concentration of H₂SO₄ is high, the following reverse reaction occurs:

