

During the electrolysis of zinc trioxonitrate a current of 4.5 amphere flows for 32 mins 10secs and deposits 0.325g of zinc . What is the charge on the zinc ion?

Solution:

According Faraday's laws of electrolysis $m = \frac{QM}{Fz}$, where m – a mass of obtained metal (in g), Q - is the total electric charge passed through the substance (in C), M is the molar mass of the substance (in g/mol), for zinc M = 65.38, F is the Faraday constant (96485 C/mol) and z is the moduli of charge of ions of the substance. The total electric charge $Q = It$, where I (4.5 A) is steady current flowing for a time t (32 min 10 sec = 1930 sec). Then, $z = \frac{ItM}{Fm} = \frac{4.5 \times 1930 \times 65.38}{96485 \times 0.325} = 2$. Therefore, the charge of zinc is +2, because zinc is cation in salts.

Answer: The charge of zinc is +2.

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