Answer to Question #61131, Chemistry / Physical Chemistry

1 dm^3 of a solution of 2M $CuSO_4$ is electrolyzed using platinum electrodes by passing 4.500 A current for 9000 s.
Calculate
a) the mass of Cu deposited
b) the amount of Cu^{2+} in the solution at the end of electrolysis

Answer:
1 dm^3 = 1 L

$$m = \frac{I \times t \times M}{F \times z}$$

$$n = \frac{I \times t}{F \times z}$$

$$m(Cu) = \frac{4.5 \: A \times 9000 \: s \times 63.546 \frac{g}{mol}}{96485 \times 2} = 13.34 \: g$$

a) the mass of Cu deposited is 13.34 g

$$n = \frac{4.5 \: A \times 9000 \: s}{96485 \times 2} = 0.21 \: mol$$

$$n_{end} = 2.00 \: mol - 0.21 \: mol = 1.79 \: mol$$

b) the amount of Cu^{2+} in the solution at the end of electrolysis is 1.79 mol