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Lab: Charge of the Electron Course: Section: Date:

## Significant Numerical Results

$m_{a0} = 10.9515$ g
$m_{b0} = 8.6868$ g
$m_{af} = 11.4487$ g
$m_{bf} = 8.1941$ g
$It = Q = 1283.3$ C
Length = 4.800 cm
Width = 2.250 cm

## Part 1 Calculations

Cathode $\Delta m = 11.4487$ g $- 10.9515$ g
$= 4.972 \times 10^{-4}$ kg

$$e = \frac{QM}{2\Delta m N_A}$$

$$e = \frac{(1283.3 \text{ C})(6.354 \times 10^{-2} \text{ kg/mol})}{2(4.972 \times 10^{-4} \text{ kg})(6.022 \times 10^{23} \text{ mol}^{-1})}$$

$e = 1.362 \times 10^{-19}$ C/electron

Actual e $= 1.602 \times 10^{-19}$ C/electron

Error Percentage e $= \dfrac{(1.362 \times 10^{-19}) - (1.602 \times 10^{-19})}{1.602 \times 10^{-19}} \times 100\% = -14.98\%$

## Part 2 Calculations

Area $= LW = (4.800 \text{ cm})(2.250 \text{ cm}) = 10.80 \text{ cm}^2$

$$\rho_{Cu} = \frac{\Delta m}{Ad}$$

$$d = \frac{\Delta m}{A\rho_{Cu}}$$

Assuming $\rho_{Cu} = 8.92 \text{ g/cm}^3$

$$d = \frac{4.972 \times 10^{-1} \text{ g}}{(10.80 \text{ cm}^2)(8.92 \text{g/cm}^3)}$$

$$d = 5.16 \times 10^{-3} cm$$