

Mock Experiment Data Analysis

I. Density

A. $r = 2.70 \text{ g / cm}^3$

B. $V = \frac{m}{r} = \frac{10.34 \text{ g}}{2.70 \text{ g / cm}^3} = 3.83 \text{ cm}^3$

II. Method 1

A. $l_w = l_h = l_d = 0.025 \text{ cm}$

B. $w = 3.34 \text{ cm}$

C. $h = 1.51 \text{ cm}$

D. $d = 0.080 \text{ cm}$

E. $V = whd = 4.03 \text{ cm}^3$

$$l_V = \sqrt{\left(\frac{\partial V}{\partial w}\right)^2 l_w^2 + \left(\frac{\partial V}{\partial h}\right)^2 l_h^2 + \left(\frac{\partial V}{\partial d}\right)^2 l_d^2}$$

F.
$$= \sqrt{(hd)^2 l_w^2 + (wd)^2 l_h^2 + (hw)^2 l_d^2}$$
$$= 0.145 \text{ cm}^3$$

III. Method 2

A. $V_1 = 27 \text{ cm}^3$

B. $V_2 = 30 \text{ cm}^3$

C. $l_{V_1} = l_{V_2} = 1 \text{ cm}^3$

D. $V_{tot} = V_2 - V_1 = 3 \text{ cm}^3$

$$l_{V_{tot}} = \sqrt{\left(\frac{\partial V_{tot}}{\partial V_1}\right)^2 l_{V_1}^2 + \left(\frac{\partial V_{tot}}{\partial V_2}\right)^2 l_{V_2}^2}$$

E.
$$= \sqrt{(-1)^2 l_{V_1}^2 + (1)^2 l_{V_2}^2}$$
$$= 1.41 \text{ cm}^3$$

IV. Method 3

A. $3.6 \pm 0.05 \text{ cm}^3$