

## Answer on Question #85835 – Chemistry – Inorganic Chemistry

1. The density of mercury is 13.6 g/mL, the water level in the graduated cylinder rises to 98 mL after mercury is added. What is the mass of mercury in grams?
2. What is the density of a 56.3 g rod that is 1.25 cm long and has a diameter of 2.4 cm?

### Solution:

$$1. \rho = \frac{m}{V}$$

If cylinder containing exactly 50 mL of water

$$V(\text{mercury}) = 98 \text{ mL} - 50 \text{ mL} = 28 \text{ mL}$$

$$m = \rho \times V = 13.6 \text{ g/mL} \times 28 \text{ mL} = 380.8 \text{ g}$$

$$2. \rho = \frac{m}{V}$$

$$R = D/2 = 2.4/2 = 1.2 \text{ cm}$$

$$H = 1.25 \text{ cm}$$

$$V(\text{cylinder}) = \pi R^2 h = 3.14 \times (1.2 \text{ cm})^2 \times 1.25 \text{ cm} = 5.65 \text{ cm}^3 = 5.65 \text{ mL}$$

$$\rho = \frac{m}{V} = \frac{56.3 \text{ g}}{5.65 \text{ mL}} = 9.96 \text{ g/mL}$$

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