Density and Specific Gravity

1. An aluminum bar with a volume of 35 cm$^3$ has a mass of 94.5 g. What is the density of aluminum based on this information?  
   \[ d = \frac{m}{v} = \frac{94.5}{35} \text{ g/cm}^3 \]

2. A glass tube that holds exactly 75.0000 mL is filled with liquid mercury metal whose mass is shown to be 1020.0011 g. From these data, what is the density of mercury metal?  
   \[ d = \frac{m}{v} = \frac{1020.0011}{75.0000} \text{ g/mL} \]

3. The mass of 155 mL of ethyl alcohol is found to be exactly 122.5 g. What is the density of ethyl alcohol?  
   \[ d = \frac{m}{v} = \frac{122.5}{155} \text{ g/mL} \]

4. A block of ice with a mass of 519.0 g is found to occupy a volume of 565.8 cm$^3$. What is the density of the ice?  
   \[ d = \frac{m}{v} = \frac{519.0}{565.8} \text{ g/cm}^3 \]

5. Find the density of a sample of silicon which has a volume of 235.7 cm$^3$ and a mass of 570.44 g.  
   \[ d = \frac{m}{v} = \frac{570.44}{235.7} \text{ g/cm}^3 \]

6. Calculate the density of carbon monoxide gas if 24.56 L of the gas has a mass of 30.7 g.  
   \[ d = \frac{m}{v} = \frac{30.7}{24.56} \text{ g/L} \]
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7. A 5.00g sample of ether is found to have a volume of 6.76 mL. From these data calculate the density of ether.

\[ \text{d = } \frac{m}{v} = \frac{5.00 \text{ g}}{6.76 \text{ mL}} = 0.740 \text{ g/mL} \]

8. What is the mass of a block of tungsten metal (density =19.3 g/mL) which has a volume of 83.92 cm³?

\[ \text{m = d} \times v = 19.3 \text{ g/mL} \times 83.92 \text{ mL} = 1620 \text{ g W} \]

9. A brass bar, density 8.69 g/cm³, has a volume of 20.25 cm³. What is the mass of this brass bar?

\[ \text{m = d} \times v = 8.69 \text{ g/cm}^3 \times 20.25 \text{ cm}^3 = 176 \text{ g brass} \]

10. A solid cube of impure zinc metal, 3.50 cm on a side, has a density of 6.95 g/cm³. What is the mass of the cube?

\[ \text{m = d} \times v = 6.95 \text{ g/cm}^3 \times (3.50 \text{ cm})^3 = 298 \text{ g Zn} \]

10. An irregularly shaped piece of gold (density = 19.3 g/cm³) has a mass of 428.4 g. What is the volume of this piece of gold?

\[ \text{v = m} \times \frac{1}{d} = \frac{428.4 \text{ g}}{19.3 \text{ g/cm}^3} = 22.2 \text{ cm}^3 \]

Au