

Procedure

Record all data and observations directly in your notebook in ink.

A. Determination of the Density of Solids

Obtain a regularly shaped solid, and record its identification number. With a ruler, determine the physical dimensions (e.g., length, width, height, radius) of the solid to the nearest 0.2 mm. From the physical dimensions, calculate the volume of the solid.

Determine the mass of the regularly shaped solid to at least the nearest mg (0.001 g). From the mass and volume, calculate the density of the solid.

Obtain a sample of metal pellets (shot) and record the identification code number. Weigh a sample of the metal of approximately 50 g, but record the actual mass of metal taken to the nearest mg (0.001 g).

Add water to your 100-mL graduated cylinder to approximately the 50-mL mark. Record the exact volume of water in the cylinder to the precision permitted by the calibration marks of the cylinder.

Pour the metal sample into the graduated cylinder, *making sure that none of the pellets sticks to the walls of the cylinder above the water level*. Stir/shake the cylinder to make certain that no air bubbles have been trapped among the metal pellets. (See Figure 3-1.)

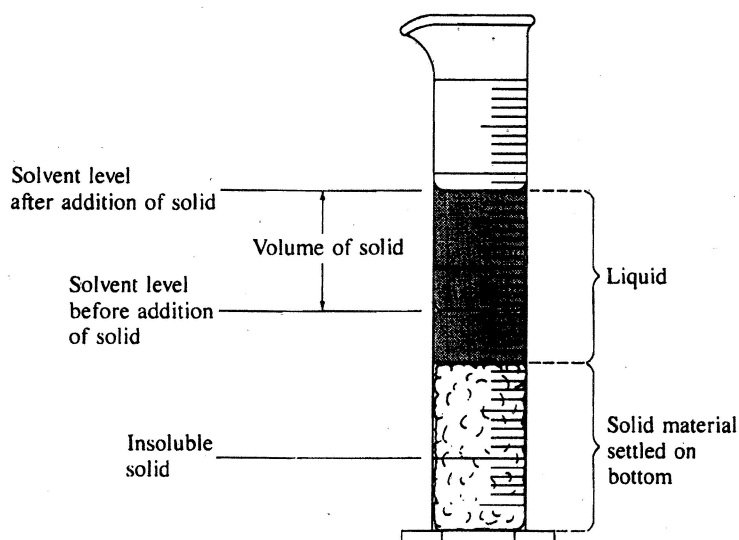


Figure 3-1. Measurement of volume by displacement. A non-soluble, non-reactive object displaces a volume of liquid equal to its own volume.

Read the level of the water in the graduated cylinder, again making your determination to the precision permitted by the calibration marks of the cylinder. Assuming that the metal sample does not dissolve in or react with water, the change in water levels represents the volume of the metal pellets.

Calculate the density of the unknown metal pellets.

After blotting them dry with a paper towel, turn in the metal pellets to your instructor (*do not discard*).