Answer on Question #73673-Physics-Other

A sintered sample was weighed in air and water suing an analytical balance. The mass of the sample in air is 2.67 g and its apparent mass in water is 1.67 g. The density of the Sample is? Density of water is 1g/cc.

Solution

$$W_{air} = mg.$$

$$W_{water} = m'g = mg - \rho_{water}Vg.$$

$$\frac{W_{water}}{W_{air}} = \frac{m'}{m} = 1 - \frac{\rho_{water}}{\rho_{sample}}$$

$$\frac{\rho_{water}}{\rho_{sample}} = 1 - \frac{m'}{m}$$

The density of the Sample is

$$\rho_{sample} = \frac{\rho_{water}}{1 - \frac{m'}{m}} = \frac{1}{1 - \frac{1.67}{2.67}} = 2.67\,\frac{g}{cc}.$$