**Answer on Question#39642 – Physics – Other**

A steel ball of vol. 1 cm3 is recat in a hollow sphere to float in water.what should be the minimum volume of this sphere.

**Solution:**

$V_{ball} = 1\ cm^3 - $ volume of the steel ball;

$\rho_{steel} = 7.8\frac{g}{cm^3} - $ density of the steel;

$\rho_{water} = 1\frac{g}{cm^3} - $ density of the water;

Minimum volume should be enough to satisfy the condition of buoyancy (Archimedes force compensates for the weight of the ball):

$$m_{ball}g = \rho_{water}gV_{min} \quad (1)$$

$$m_{ball} = V_{ball} \cdot \rho_{steel} \quad (2)$$

$(2) in (1)$:

$$V_{ball} \cdot \rho_{steel} = \rho_{water}V_{min}$$

$$V_{min} = \frac{V_{ball} \cdot \rho_{steel}}{\rho_{water}} = \frac{1\ cm^3 \cdot 7.8\frac{g}{cm^3}}{1\frac{g}{cm^3}} = 7.8cm^3$$

**Answer:** minimum volume of this sphere is $7.8cm^3$