Answer on Question#74678 – Chemistry – General chemistry

Question: A wood block, 10 in x 6.0 in x 2.0 in, "weighs" 3 lb 10 oz. What is the density of the wood?

Solution:

1. Find the volume of the wood block in cm^3.

$1\text{ in} = 2.54\text{ cm}$

$10\text{ in} = 10 \times 2.54\text{ cm} = 25.4\text{ cm}$

$6.0\text{ in} = 6.0 \times 2.54\text{ cm} = 15.24\text{ cm}$

$2.0\text{ in} = 2.0 \times 2.54\text{ cm} = 5.08\text{ cm}$

$V(\text{wood block}) = 25.4\text{ cm} \times 15.24\text{ cm} \times 5.08\text{ cm} = 1966.45\text{ cm}^3$.

2. Find the mass of the wood block in g.

$1\text{ lb} = 16\text{ oz}$

$3\text{ lb} = 3 \times 16\text{ oz} = 48\text{ oz}$

$3\text{ lb }10\text{ oz} = 48\text{ oz} + 10\text{ oz} = 58\text{ oz}$

$1\text{ oz} = 28.35\text{ g}$

$m(\text{wood block}) = 58\text{ oz} = 58 \times 28.35\text{g} = 1644.3\text{ g}$

3. Find the density of the wood block.

$$d = \frac{m(wood\ block)}{V(wood\ block)} = \frac{1644.3\ g}{1966.45\ cm^3} = 0.84\ \frac{g}{cm^3}$$

Answer: 0.84 g/cm^3