Answer on Question #72470-Physics-Classical Mechanics

A lump of gold is suspected to contain some quantity of aluminium. If the gold sample has mass 500 grams and is found to have a related entity of 5.2 find what mass of gold is present if the relative densities of gold and aluminium are respectively 19.3 and 2.6

Solution

Let x be the fraction of gold, and 1-x be the fraction of aluminium. Then,

$$2.6(1 - x) + 19.3x = 5.2$$

$$2.6 - 2.6x + 19.3x - 5.2 = 0$$

$$16.7x = 2.6$$

$$x = 0.1557$$

The mass of gold is

$$m_{gold} = 0.1557 \cdot 500 \, g = 78 \, g$$

Answer: 78 g.