

### Question #80595

Brass is a mixture of copper (Cu) and zinc (Zn). Let's say you make brass by thoroughly mixing 10.00 g of Cu and 0.25 g of Zn. You then pour out some of this material to make a 4.40 g brass coin. how many zinc atoms are in the coin?

Answer:

There are  $9.95 \cdot 10^{20}$  zinc atoms in a 4.40 g brass coin.

First of all, I have to calculate the mass fraction of Zn in a mixture:

$$\omega(\text{Zn}) = \frac{0.25}{10 + 0.25} = 0.0244$$

So, the mass of Zn in 4.40 g brass coin is:

$$m(\text{Zn})_{\text{brass coin}} = 4.40 * 0.0244 = 0.1074 \text{ g}$$

Therefore, in the coin there are:

$$n(\text{Zn}) = \frac{0.1074}{65} * 6.022 * 10^{23} = 9.95 * 10^{20} \text{ atoms}$$