

Answer on Question #73679 - Chemistry - General Chemistry

Calculate mass of 10 atoms of Zinc

Solution:

To calculate the mass of a single atom, first look up the atomic mass of zinc from the Periodic Table.

This number, 65.38, is the mass in grams of one mole of zinc. One mole of zinc is 6.022×10^{23} atoms of zinc (Avogadro's number). This relation is then used to 'convert' a zinc atom to grams by the ratio:

$$\text{mass of 1 atom} / 1 \text{ atom} = \text{mass of a mole of atoms} / 6.022 \times 10^{23} \text{ atoms}$$

Plug in the atomic mass of carbon to solve for the mass of 1 atom:

$$\text{mass of 1 atom} = \text{mass of a mole of atoms} / 6.022 \times 10^{23}$$

$$\text{mass of 10 Zn atoms} = 65.38 \times 10 / 6.022 \times 10^{23} \text{ C atoms}$$

$$\text{mass of 10 Zn atoms} = 108.6 \times 10^{-23} \text{ g}$$

Answer

The mass of 10 atoms of Zinc is $108.6 \times 10^{-23} \text{ g}$.

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