

Question #59545, Chemistry / General Chemistry

16.26 milligrams of sample of an element x contains $1.66 \cdot 10^{23}$ atoms. What is the atomic mass of the element?

Solution:

Number of moles: $n = N/N_A = 1.66 \cdot 10^{23} / 6.022 \cdot 10^{23} \text{ mol}^{-1} = 0.276 \text{ mol}$

Atomic mass: $A_r = m/n = 16.26 \text{ mg} / 0.276 \text{ mol} = 59.0 \cdot 10^{-3} \text{ g/mol}$

Atomic mass can not be less than 1.

There is a mistake in the question. If weight of the sample is 16.26 g, then:

Atomic mass: $A_r = m/n = 16.26 \text{ g} / 0.276 \text{ mol} = 59.0 \text{ g/mol}$

Answer: 59.0 g/mol