

Atomic Mass

1. Is atomic mass the same value as the atomic number?

No. The atomic mass is a weighted average of all isotopes of a particular element. The mass number is associated with a particular isotope.

2. How do you calculate the atomic mass of an element?

Atomic Mass =

(% abundance of isotope 1)(mass of isotope 1) +
(% abundance of isotope 2)(mass of isotope 2) +

Include every isotope for the given element in this calculation.

3. What is the atomic mass of copper if ^{63}Cu has a mass of 62.93 amu and percent abundance of 69.09% and isotope ^{65}Cu has a mass of 64.93 amu and percent abundance of 30.91%.

$$(62.93 \text{ amu})(0.6909) + (64.93 \text{ amu})(.3091) = 63.55 \text{ amu}$$

4. What are the percent abundances for ^{151}Eu and ^{153}Eu if the atomic mass of the element is 151.96 amu and the isotope masses are 150.9196 amu and 152.9209 amu respectively.

Remember that, as there are only 2 isotopes, their combined percent abundances must equal 100%. Thus...

$$151.96 = (150.9196)(x) + (152.9209)(y)$$

Where x equals the percent abundance (in decimal form) of ^{151}Eu and y equals the percent abundance of ^{153}Eu .

$$x\% + y\% = 100\% \text{ or } x + y = 1$$

so...

$$151.96 = (150.9196)(x) + (152.9209)(1-x)$$

$$x=0.48 \rightarrow \mathbf{48\%}$$

$$y=0.52 \rightarrow \mathbf{52\%}$$