

Mass of an Atom



$$6n^0 : 6 \text{ amu} \quad 6p^+ : 6 \text{ amu}$$

$$\text{Mass \#} = 12 \text{ amu}$$

$$1 \text{ amu} = 1.67 \times 10^{-24} \text{ g}$$

$$\begin{aligned} {}^6_{12}\text{C} &= 12 \cdot 1.67 \times 10^{-24} \text{ g} \\ &= 2.004 \times 10^{-23} \text{ g} \end{aligned}$$

Atomic Mass w/ e^-



$${}^6_{12}\text{C} (\text{no } e^-) = 2.004 \times 10^{-23} \text{ g}$$

$$\begin{aligned} 6e^- &: 6 \cdot 9.109 \times 10^{-28} \text{ g} \\ &= 5.465 \times 10^{-27} \text{ g} \end{aligned}$$

$$\begin{aligned} {}^6_{12}\text{C} (\text{w/ } e^-) &= 2.004 \times 10^{-23} \text{ g} \\ &+ 5.465 \times 10^{-27} \text{ g} \\ &= 2.004 \times 10^{-23} \text{ g} \end{aligned}$$

Atomic Mass w/ sub atomic particles

Element - X
(atom) (mass#)
(mass#) X Element
(atomic#) Z (symbol)

$$\begin{aligned} \text{Atomic \#} &= \# p^+ \\ \text{Count} & \quad \text{Mass} \\ \# p^+ & \quad \# p^+ \text{ amu} \\ \# n^0 & \quad \# n^0 \text{ amu} \\ \# n^0 &= \text{Mass \#} - \text{Atomic \#} \end{aligned}$$

$$\begin{aligned} \text{Mass \#} \\ p^+ + n^0 \\ \text{Atomic Mass} \\ \text{Mass \# amu} \end{aligned}$$

Example

27 ← Mass #
13 ← Atomic #
Al ← symbol
Aluminum-27
(name)

$$\begin{aligned} \text{Atomic \#} &= 13 \\ \# p^+ &= 13 \\ p^+ \text{ mass} &= 13 \text{ amu} \end{aligned}$$

$$\begin{aligned} \text{Mass \#} &= 27 \\ \text{Atomic Mass} &= 27 \text{ amu} \end{aligned}$$

$$\# n^0 = \text{Mass \#} - \text{Atomic \#}$$

$$\# n^0 = 27 - 13 = 14$$

$$n^0 \text{ mass} = 14 \text{ amu}$$