

$$\text{A.M.} = \left(\text{mass}_{\text{isotope 1}} \cdot \% \text{isotope 1} \right) + \left(\text{mass}_{\text{isotope 2}} \cdot \% \text{isotope 2} \right) + \left(\text{mass}_{\text{isotope 3}} \cdot \% \text{isotope 3} \right) + \dots$$

Examples / Practice

(1) Calculate the atomic mass of sulfur, which has 3 isotopes.

isotopes	mass (amu)	abundance
³² S	31.972	95.00%
³³ S	32.971	0.76%
³⁴ S	33.967	4.22%

$$\text{A.M.} = \left(31.972 \text{ amu} \cdot .9500 \right) + \left(32.971 \text{ amu} \cdot .0076 \right) + \left(33.967 \text{ amu} \cdot .0422 \right)$$

$$\text{A.M.} = 32.057387 \text{ amu}$$

(2) Chlorine has an atomic mass of 35.45 amu, and has 2 isotopes.

isotopes	mass (amu)	abundance
³⁵ Cl	X	75.53%
³⁷ Cl	36.969 amu	24.47%

Find the mass of ³⁵Cl.

$$35.45 \text{ amu} = (X \cdot .7553) + (36.969 \text{ amu} \cdot .2447)$$

$$35.45 \text{ amu} = (X \cdot .7553) + 9.0463143 \text{ amu}$$

$$- 9.0463143 \text{ amu} \quad - 9.0463143 \text{ amu}$$

$$\frac{26.4036857 \text{ amu}}{.7553} = \frac{(X \cdot .7553)}{.7553}$$

$$34.95787859 \text{ amu} = X$$