

## Isotopes and % Abundance

Name: \_\_\_\_\_

Section: \_\_\_\_\_

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1. Calculate the atomic mass for lithium given the following data for its naturally occurring isotopes.

Element	Isotopic Mass	% Abundance
${}^6\text{Li}$	6.015 amu	7.42%
${}^7\text{Li}$	7.016 amu	92.58%

$$\begin{aligned} & [(6.015 \times 0.0742) + (7.016 \times 0.9258)] = \text{average atomic mass} \\ & 0.446313 + 6.4954128 = 6.9417258 \text{ amu} \\ & \sim 6.941 \text{ amu} \end{aligned}$$

2. Calculate the atomic mass for magnesium given the following data for its naturally occurring isotopes.

${}^{24}\text{Mg}$	23.985 amu	78.70%
${}^{25}\text{Mg}$	24.986 amu	10.13%
${}^{26}\text{Mg}$	25.983 amu	11.17%

$$\begin{aligned} & [(23.985 \times 0.7870) + (24.986 \times 0.1013) + (25.983 \times 0.1117)] = \\ & 18.87619 + 2.5310818 + 2.9023011 = 24.3095779 \text{ amu} \\ & \sim 24.309 \text{ amu} \end{aligned}$$

3. Calculate the atomic mass for iron given the following data for its naturally occurring isotopes.

${}^{54}\text{Fe}$	53.940 amu	5.82%
${}^{56}\text{Fe}$	55.935 amu	91.66%
${}^{57}\text{Fe}$	56.935 amu	2.19%
${}^{58}\text{Fe}$	57.933 amu	<b>0.33%</b>

$$\begin{aligned} & [(53.940 \times 0.0582) + (55.935 \times 0.9166) + (56.935 \times 0.0219) + \\ & (57.933 \times 0.0028)] = \\ & 3.139308 + 51.270021 + 1.2468765 + 0.1911789 = \\ & 55.8473844 \text{ amu} \\ & \sim 55.847 \text{ amu} \end{aligned}$$

4. Chlorine has two naturally occurring isotopes:  ${}^{35}\text{Cl}$  and  ${}^{37}\text{Cl}$ . Which isotope is more abundant if the stated atomic mass of chlorine is 35.35 amu?

***The atomic mass of  ${}^{35}\text{Cl}$  is closer to the average atomic mass of chlorine than  ${}^{37}\text{Cl}$ .***