

## Isotopes 2

Key

1. Assuming neutral atoms of the following isotopes, complete the following table.

Isotope Name	Isotope Symbol	Atomic Number (Z)	Mass Number (A)	protons	electrons	neutrons
platinum-197	$^{197}_{78}\text{Pt}$	78	197	78	78	119
rubidium-37	$^{87}_{37}\text{Rb}$	37	87	37	37	50
lead-206	$^{206}_{82}\text{Pb}$	82	206	82	82	124
plutonium-242	$^{242}_{94}\text{Pu}$	94	242	94	94	148
magnesium-26	$^{26}_{12}\text{Mg}$	12	26	12	12	14
zirconium-91	$^{91}_{40}\text{Zr}$	40	91	40	40	51

2. Magnesium is composed of three naturally occurring isotopes:

Isotope	Percent Natural Abundance	Isotopic Mass (amu)
Mg-24	78.99%	23.9850
Mg-25	10.00%	24.9858
Mg-26	11.01%	25.9826

frac. abund.

$x$

0.1000

$y$

$$x + y + 0.1000 = 1.0000$$

$$x + y = 0.9000$$

$$y = 0.9000 - x$$

Calculate the % abundance of the other two isotopes.

$$24.305 \text{ amu} = (23.9850 \text{ amu})x + (24.9858 \text{ amu})(0.1) + (25.9826 \text{ amu})y$$

$$24.305 = 23.985x + 2.49858 + 25.9826(0.9 - x)$$

$$-1.57792 = -1.9976x$$

$$x = 0.7899 = 78.99\%$$

$$y = 0.1101 = 11.01\%$$