

# ISOTOPE PRACTICE

1. Define the word "isotope"

2. True or False: Is the mass number of a given isotope the same as the average atomic mass on the periodic table for that element? Explain!

3. What is the atomic mass of phosphorous if phosphorous-29 has a percent abundance of 35.5%, phosphorous-30 has a percent abundance of 42.6%, and phosphorous-31 has a percent abundance of 21.9%?

4. Assuming all atoms are neutral, complete the following chart:

Element	Symbol	Atomic Number	# of Electrons	# of Neutrons	Mass Number	Nuclear Symbol	Hyphen Notation
Helium			2	2			
	Ti		22		50		Ti - 50
		73	68	108			
Gallium			28	39			
						${}^{226}_{88}\text{Ra}$	
		83	83	127			

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## Answers

1. Define the word "isotope"

Isotopes are different versions of the same element. They have the same number of protons and electrons as the element but different mass numbers and the number of neutrons.

2. True or False: Is the mass number of a given isotope the same as the average atomic mass on the periodic table for that element? Explain!

False. The mass number of a specific isotope is not the same as the element's average atomic mass as listed on the periodic table. These are two distinct quantities with different meanings.

3. What is the atomic mass of phosphorous if phosphorous-29 has a percent abundance of 35.5%, phosphorous-30 has a percent abundance of 42.6%, and phosphorous-31 has a percent abundance of 21.9%?

The percentage abundances are given as follows: P-29: 35.5%, P-30: 42.6% and P-31: 21.9%

The atomic masses of these isotopes are approximately: P-29: 29 amu, P-30: 30 amu, and P-31: 31 amu

The average atomic mass is:  $(0.355 \times 29 \text{ amu}) + (0.426 \times 30 \text{ amu}) + (0.219 \times 31 \text{ amu}) = 29.874 \text{ amu}$

4. Assuming all atoms are neutral, complete the following chart:

Element	Symbol	Atomic Number	# of Electrons	# of Neutrons	Mass Number	Nuclear Symbol	Hyphen Notation
Helium	He	2	2	2	4	${}^4_2\text{He}$	He - 4
Titanium	Ti	22	22	28	50	${}^{50}_{22}\text{Ti}$	Ti - 50
Tantalum	Ta	73	68	108	181	${}^{176}_{73}\text{Ta}^{5+}$	Ta - 181
Gallium	Ga	31	28	39	70	${}^{70}_{31}\text{Ga}^{3+}$	Ga - 70
Carbon	C	6	6	7	13	${}^{13}_6\text{C}$	C - 13
Radium	Ra	88	88	138	226	${}^{226}_{88}\text{Ra}$	Ra - 226
Bismuth	Bi	83	83	127	210	${}^{210}_{83}\text{Bi}$	Bi - 210