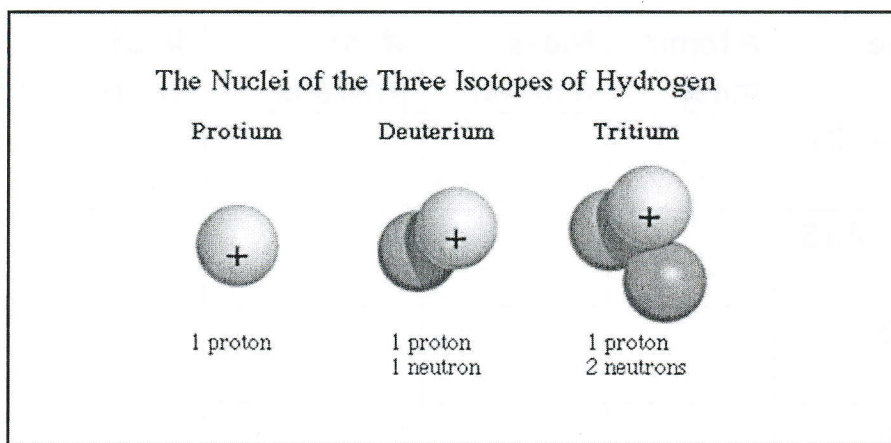


## Isotopes - Practice Worksheet

### Background Information:

Atoms of a given element which have the same number of protons but different numbers of neutrons are called isotopes. Thus, isotopes have the same position in the periodic table, the same chemical properties and the same atomic charge.

The simplest example of an atom with different isotopes is hydrogen. The three isotopes of hydrogen are shown below:



The increasing number of neutrons in the nucleus of the hydrogen atom adds mass to the atom and thus each isotope of a given element has a different mass.

Isotopes can be represented as follows:

For the isotopes of hydrogen,  $^1\text{H}$  (or hydrogen-1),  $^2\text{H}$  (or hydrogen-2) and  $^3\text{H}$  (or hydrogen-3) represent protium (usually just referred to as hydrogen), deuterium and tritium, respectively. Most of the light elements contain different proportions of at least two isotopes. Usually one isotope is the predominantly abundant isotope. For example, the average abundance of  $^{12}\text{C}$  is 98.89%, while the average abundance for  $^{13}\text{C}$  is 1.11%.

Answer the following questions.

1. What is an isotope?
2. How can you tell isotopes apart?

3. Here are three isotopes of an element:  ${}^12_6\text{C}$        ${}^{13}_6\text{C}$        ${}^{14}_6\text{C}$

- The element is \_\_\_\_\_
- The number 6 refers to the \_\_\_\_\_
- The numbers 12, 13, 14 refer to the \_\_\_\_\_
- In the 1<sup>st</sup> isotope, how many protons \_\_\_\_\_ how many neutrons \_\_\_\_\_
- In the 2<sup>nd</sup> isotope, how many protons \_\_\_\_\_ how many neutrons \_\_\_\_\_
- In the 3<sup>rd</sup> isotope, how many protons \_\_\_\_\_ how many neutrons \_\_\_\_\_

Complete the following chart:

Isotope Name	Atomic mass	Mass number	# of protons	# of neutrons	# of electrons
92 Uranium -238					
92 Uranium -235					
5 Boron - 10					
5 Boron - 11					

For each of the following isotopes, write the number of protons, neutrons, and electrons.

	Chromium-58	Chromium-63
# of protons		
# of neutrons		
# of electrons		

	Carbon-12	Carbon-16
# of protons		
# of neutrons		
# of electrons		