

MASS NUMBERS

The atomic weights of the elements that you find on your periodic table are said to be “relative” atomic weights. They are relative because all of the atomic weights are related to atoms of what we call C-12. But do you know what C-12 means?

When you see a chemical symbol written like the “C-12” that you see here, the number following the symbol of the element is called the mass number. The mass number of an atom is simply the sum of the protons and neutrons in the nucleus (the center region) of that atom.

The mass of the proton and neutron are both very close to 1 a.m.u. (atomic mass unit) and since the mass of the electron is so small that it is not considered in chemical reactions, we simply add up the number of protons and the number of neutrons in an atom to give us the mass number for that atom.

EXAMPLE 1

How many protons and neutrons are present in the nucleus of an atom of F-19?

SOLUTION 2

First look up the atomic number of F on your periodic table. It is 9... do you see? Thus all Fluorine atoms have 9 protons. For a Fluorine atom to have a mass of 19 as in the F-19, the sum of the protons and neutrons must be 19. Since all Fluorine atoms have 9 protons, an atom of F-19 must have 10 neutrons. ($9 + 10 = 19$)

EXAMPLE 2

Write the symbol for an atom that contains 17 protons and 18 neutrons.

SOLUTION 2

With 17 protons the atom must have an atomic number of 17. Element 17 on your periodic table is Chlorine... do you see? The mass number is the sum of the protons and neutrons ($17 + 18 = 35$). Thus the symbol for this atom is... Cl-35.

STUDENT PRACTICE

1. Give the number of protons and neutrons that are found in each of the following...

P-31 p = n =

Au-200 p = n =

C-14 p = n =

I-127 p = n =

Ra-226 p = n =

U-235 p = n =

2. Write the symbol for atoms which have...

30 protons & 35 neutrons

82 protons & 125 neutrons

1 proton & 1 neutron