

## Chemistry Foundations #5: Isotopes and Ions

**Isotopes:** All atoms of an element have the same atomic number and therefore the same number of protons. However, for many elements, the number of neutrons can vary. Atoms of the same element with different numbers of neutrons are called isotopes. Isotopes are written as the name of the element followed by the mass number of that isotope.

	Isotope	Atomic #	Mass # (amu)	# of protons	# of neutrons
1.	Lead -204	82	204	82	122
2.	Lead -206				
3.	Lead -207	82	207	82	125
4.	Lead -208				
5.	Helium - 3	2	3	2	1
6.	Helium -4				
7.	Carbon - 12	6	12	6	6
8.	Carbon - 14				

**Ions:** An ion is an atom or group of atoms with an electrical charge. A positive charge indicates that the ion has more protons than electrons. A negative charge indicates that the ion has more electrons than protons. A neutral ion has the same number of protons and electrons.

	Symbol	Atomic #	Charge	# of protons	# of electrons
9.	O	8	0	8	8
10.	O <sup>-2</sup>				
11.	Na	11	0	11	11
12.	Na <sup>+</sup>				
13.	F	9	0	9	9
14.	F <sup>-</sup>				
15.	Mg	12	0	12	12
16.	Mg <sup>+2</sup>				
17.	N	7	0	7	7
18.	N <sup>-3</sup>				
19.	Al	13	0	13	13
20.	Al <sup>+3</sup>				