

Chemistry: Atomic structure and Elements

Key word	Definition
Atom	The smallest object of a chemical element that can exist.
Nucleus	The positively charged centre of the atom consisting of protons and neutrons where all the mass is concentrated.
Shells	A grouping of electrons surrounding the nucleus of an atom
Subatomic particle	An extremely small piece of matter that is smaller than an atom or found inside an atom (proton, neutron, electron)
Element	Is made up of only one type of atom.
Isotope	Different forms of the same element with a different number of neutrons and same number of protons.


Subatomic particle	Location	Charge	Size/Mass
Proton	Nucleus	+1	1
Neutron	Nucleus	0	1
Electrons	Shells	-1	Very small

Atomic theory - Ideas about atoms have changed over time. Scientists developed new atomic **models** as they gathered new experimental evidence.

↓

"Billiard Ball" Model


1803



Dalton proposes the indivisible unit of an element is the atom.

"Plum Pudding" Model


1904



Thomson discovers electrons, believed to reside within a sphere of uniform positive charge (the plum pudding model).

Rutherford Model


1911



Rutherford demonstrates the existence of a positively charged nucleus that contains nearly all the mass of an atom.

Bohr Model

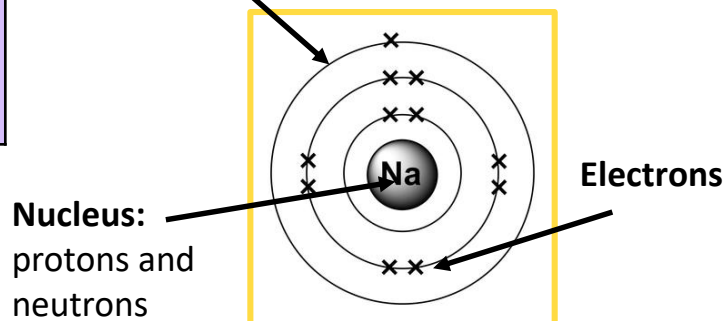
1913



Bohr proposes fixed circular orbits around the nucleus for electrons.

Shells

Rules for filling electrons in to shells: **2,8, 8 (Maximum)**



Mass number:
Protons **and** neutrons

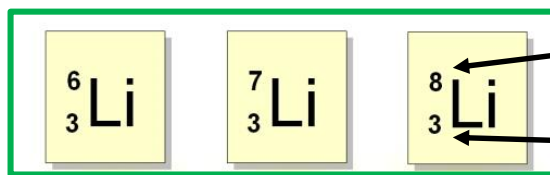
23

Na

11

Atomic number:
Protons **or** electrons

Neutrons = mass number – atomic number



Isotopes:
Different mass number and same atomic number

