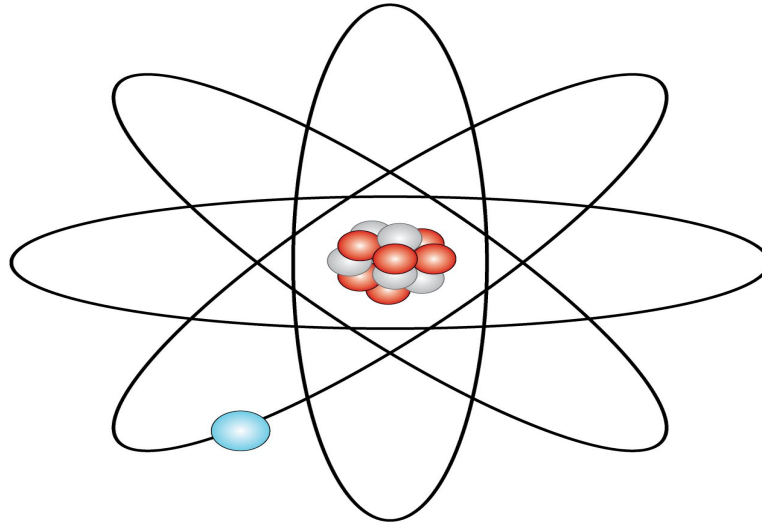


Models and Properties of Atoms

Picture Vocabulary

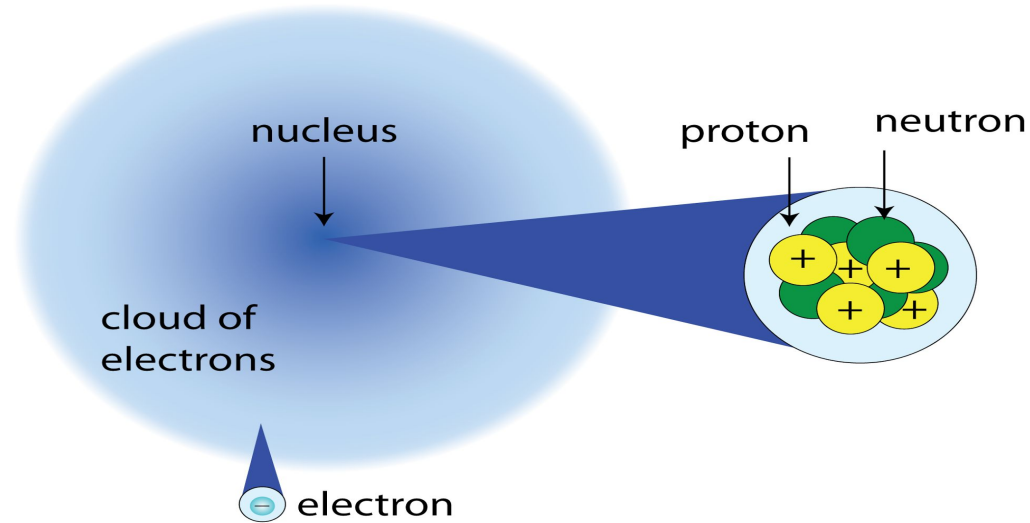
C1ABD Models and Properties of Atoms

Atom



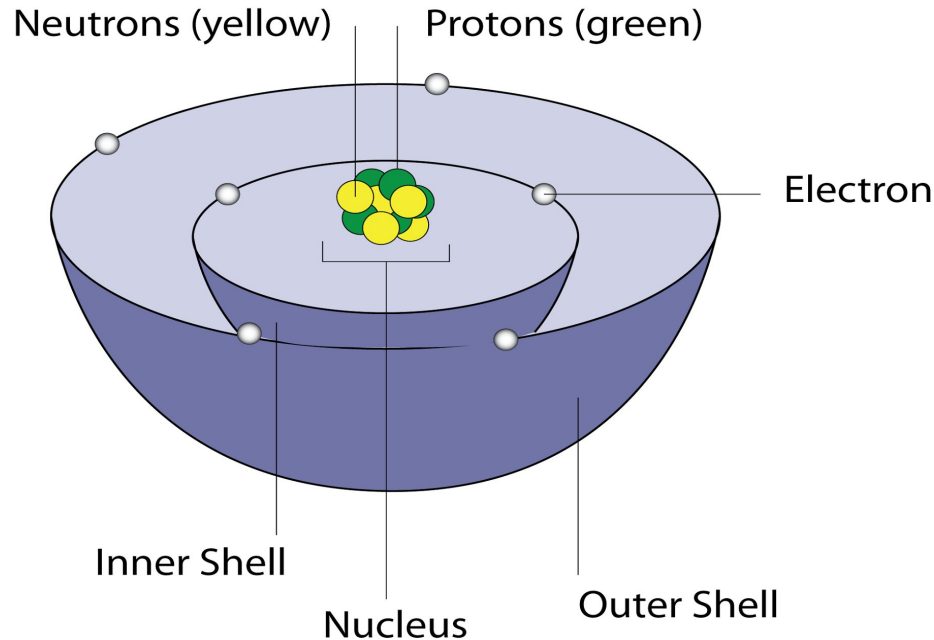
The smallest particle of an element maintaining the chemical identity of that element

Electron



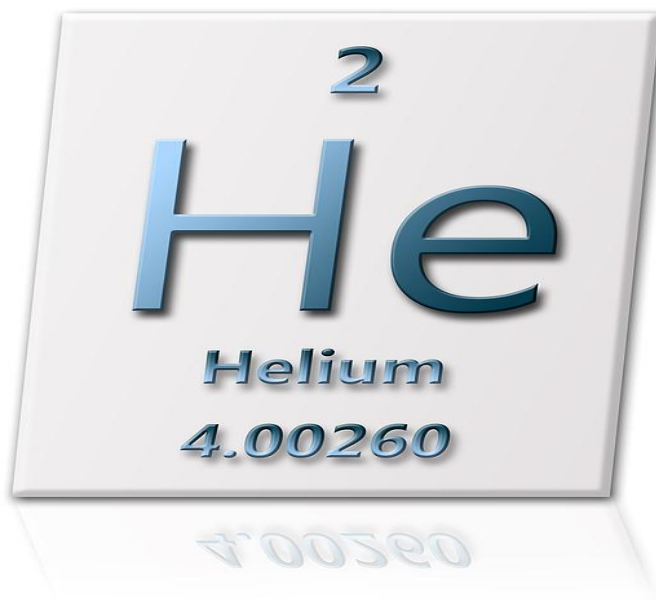
A negatively-charged subatomic particle of the electron cloud; involved in the formation of chemical bonds

Neutron



A subatomic particle of the nucleus of an atom that is without charge and contributes to the mass of an atom

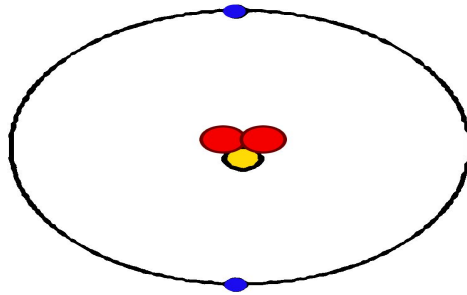
Element



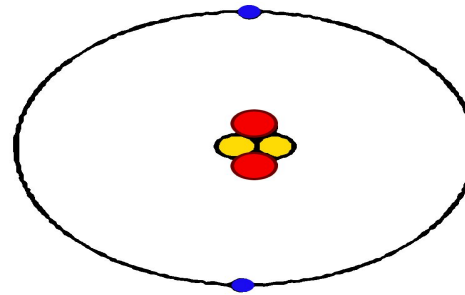
A pure substance that cannot be separated into simpler substances by physical or chemical means

Isotope

Natural Helium Isotopes



${}^3\text{He}$



${}^4\text{He}$

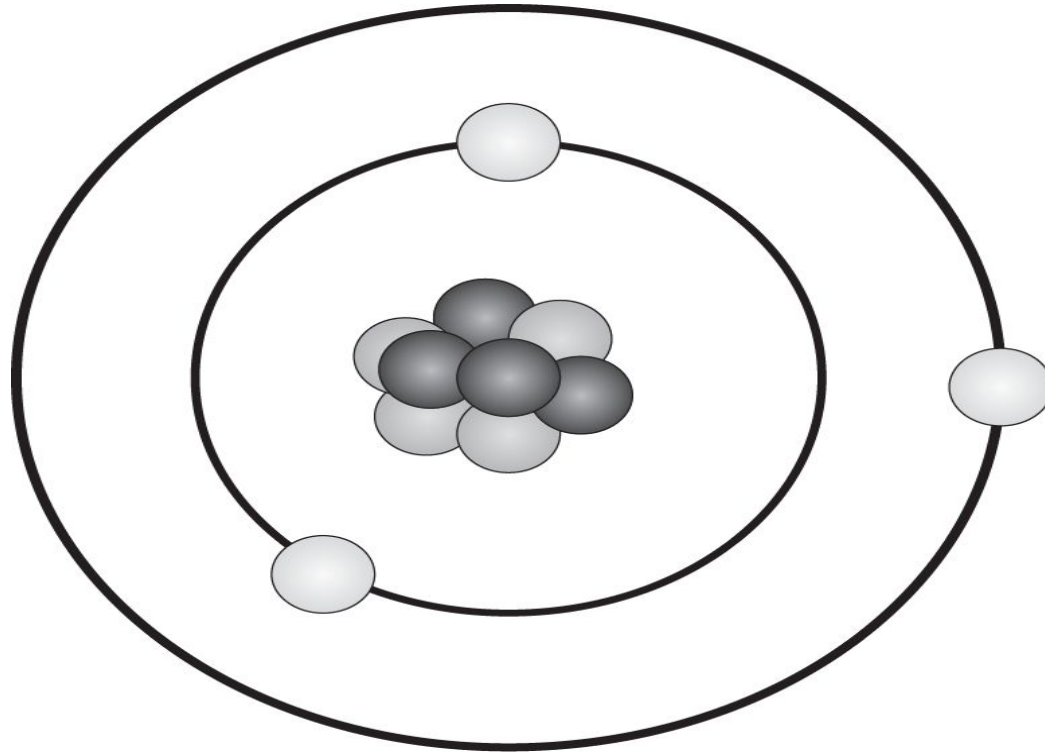
 Proton

 Neutron

 Electron

Any two or more forms of an element with the same number of protons in the nucleus, but a different number of neutrons

Ion



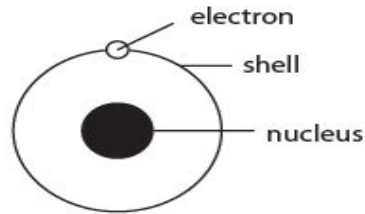
Atoms (or groups of atoms) that have an electrical charge due to unequal numbers of protons and electrons

Atomic mass

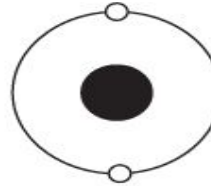
<p>Hydrogen 1 H 1.00794</p>	<p>Carbon 6 C 12.011</p>	<p>Oxygen 8 O 15.9994</p>
--	---	--

The mass of an atom, approximately equal to the number of protons and neutrons in the atom

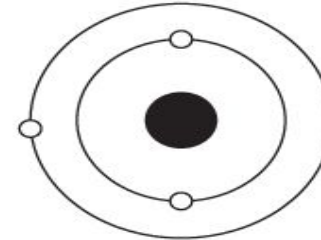
Atomic number



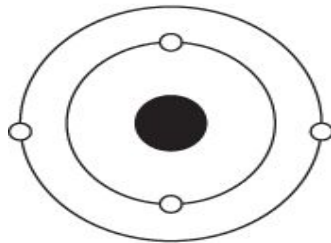
Hydrogen



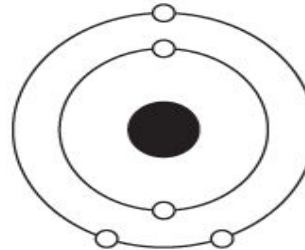
Helium



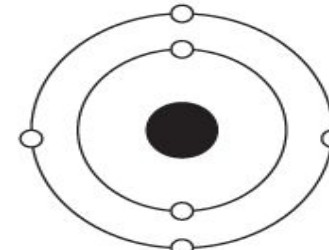
Lithium



Beryllium



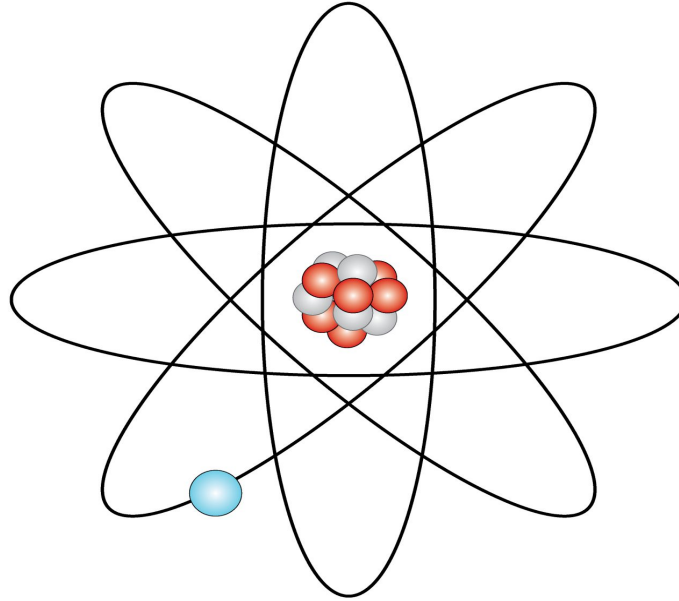
Boron



Carbon

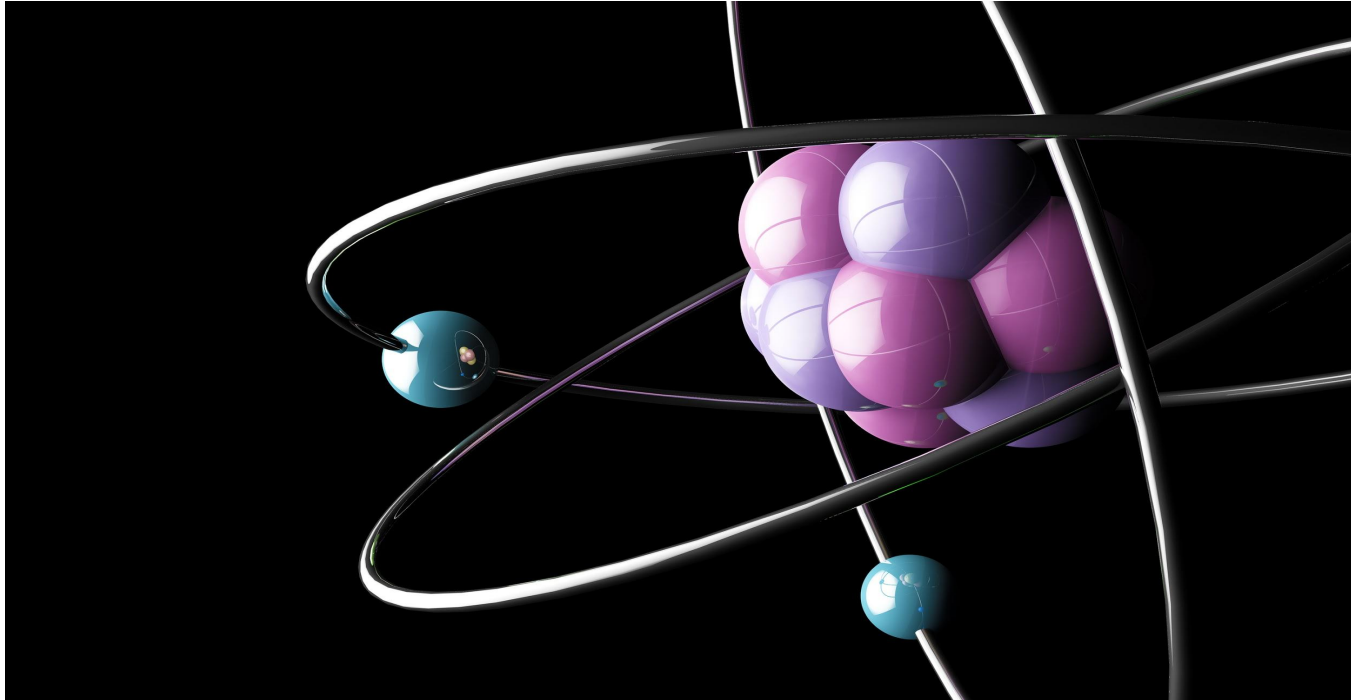
The number of protons found in the nucleus of an element, represented by the letter Z

Electron orbital



The specific regions around the nucleus of an atom
in which electrons travel

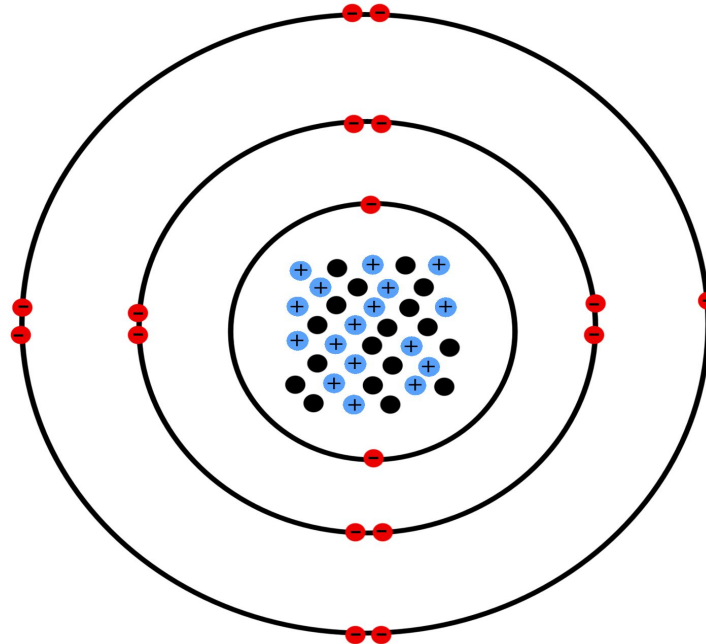
Nuclear model



This model, also known as the planetary model, was defined by Ernest Rutherford in 1911 and shows a dense, positively-charged core surrounded by negative charges.

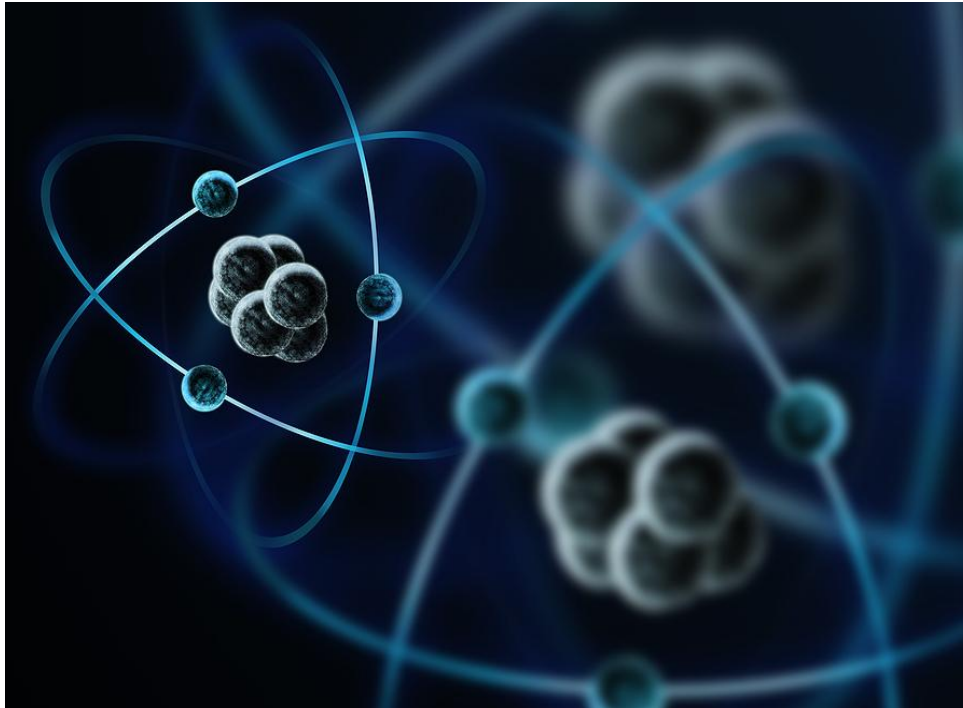
Bohr model

Chlorine



This model was defined by Niels Bohr in 1913 and shows the negatively-charged electrons of the atom travelling around the positively-charged nucleus in discrete circular orbits, much like the structure of the solar system.

Subatomic particles



Particles that are smaller than the atom

Average atomic mass

Calculating Average Atomic Mass

Chlorine has two isotopes; $^{35}_{17}\text{Cl}$ in 75 % and $^{37}_{17}\text{Cl}$ in 25%. To find average atomic mass of Cl atom we use following formula to find average atomic mass of isotopes:

$$W = w_1y_1 + w_2y_2 + \dots w_ny_n$$

W = average atomic mass

w = atomic mass of each isotope

y = percent of natural abundance

	I. isotope	II. isotope
Average Atomic Mass =	Mass number X Percent in nature	Mass number X Percent in nature

$$\text{Chlorine Average atomic mass} = 35 \times 75/100 + 37 \times 25/100$$

$$\text{Chlorine Average atomic mass} = 35.5 \text{ g}$$

Average mass of all known isotopes of an element based upon the abundance of the isotopes