

Study notes

Atomic structure

Neutron

An elementary particle that can be found in the nucleus of an atom. It has no charge and a spin of $1/2$.

Proton

A positively charged elementary particle that can be found in the nucleus of an atom. Protons have a charge equal in magnitude to that of an electron and a spin of $1/2$. They are slightly lighter than neutrons with a mass of 1.673×10^{-27} kg.

Electron

A negatively charged elementary particle that is found in the electron cloud surrounding an atom. Has particle-wave duality. Has a charge of 1.602×10^{-19} coulombs and a mass of 9.108×10^{-31} kilograms, approximately $1/1800$ of the mass of a proton. Has a spin of $1/2$.

Charge

Electrons are negatively charged and are attracted to the positively charged protons. Protons must have a neutron between them as they repel each other.

Atoms are electrically neutral, which means they have the same amount of protons and electrons.

Atomic Number

The atomic number of an atom is defined by the number of protons in its nucleus.

Atomic Mass

AMU: atomic mass unit: a unit of mass equal to $1/12$ the mass of a carbon-12 atom used to express the mass of atomic and subatomic particles

The atomic mass of an atom is the weighted average of all its isotopes.

Electron arrangement

According to Bohr's model, electrons can only be arranged into different shells, or orbitals. The amount of electrons each shell is capable of holding is given by the equation $2n^2$, where n is the shell number

Ions

Ions are atoms that have either gained or lost electrons and therefore have a charge. Cations are positively charged and anions are negatively charged.

Electron clouds

The wave frequency function that narrows the whereabouts of an electron; the probability of an electron being found in a certain spot surrounding the nucleus of an atom

Valency

The combining capacity of an atom usually expressed in superscript

Trends

The group number is the number of electrons in its outer shell

The period number is the number of electron shells it has