

NOTES ON NUCLEAR FISSION & NUCLEAR FUSION



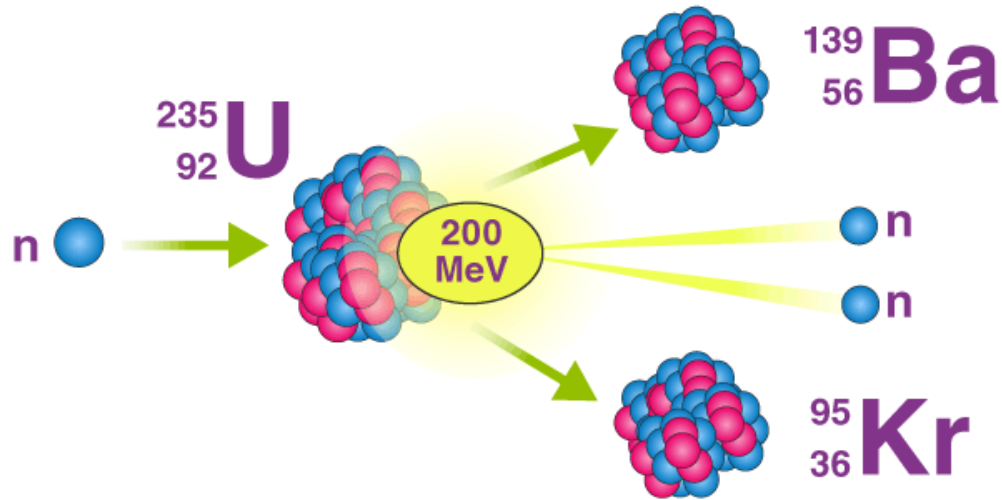
Notes on Nuclear Fission & Nuclear Fusion

There are two types of nuclear reactions called nuclear fission and nuclear fusion. Nuclear fission and fusion involve the disintegration and combination of the elemental nucleus. In the case of nuclear fission, an atom divides into two or more smaller or lighter atoms. Nuclear fusion occurs when two or more atoms join or fuse together to form a large or a heavier atom.

► Nuclear Fission

Nuclear fission is a nuclear reaction in which the nucleus of an atom is bombarded with low energy neutrons which split the nucleus into smaller nuclei. An abundant amount of energy is released in this process. Nuclear fission reactions are used in nuclear power reactors since it is easy to control and produces large amounts of energy.

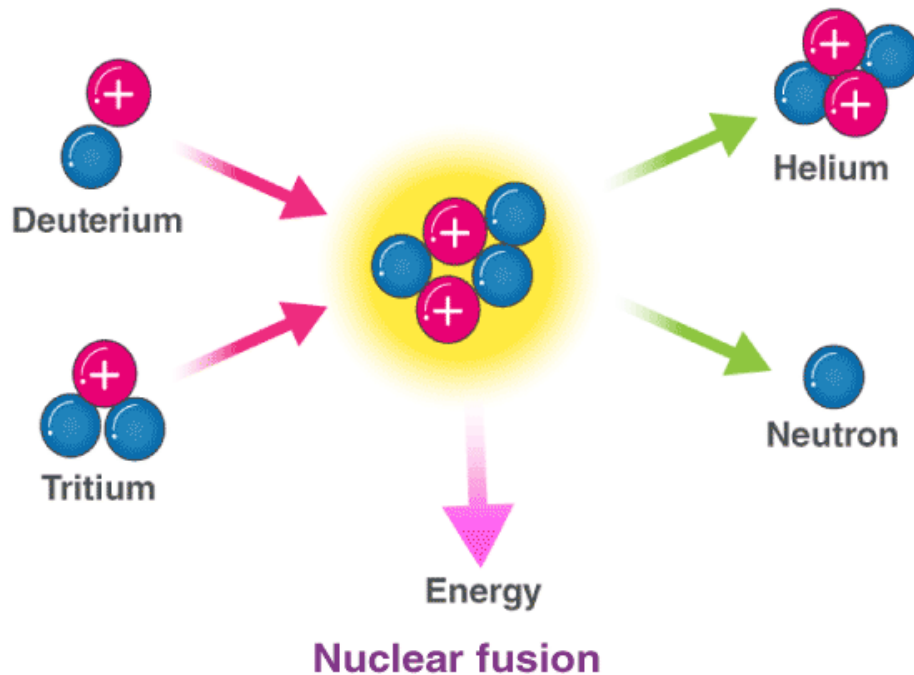
NUCLEAR FISSION



When uranium-235 atoms bombard with neutrons, the heavy nucleus of the uranium splits and produces krypton-94 and barium-139 with the emission of three neutrons.

► Nuclear Fusion

Nuclear Fusion is a reaction that occurs when two atoms combine together to form one or more different atomic nuclei and subatomic particles like protons and neutrons. An enormous amount of energy is released in this process, much greater than the energy released during the nuclear fission reaction.



Fusion occurs in the sun where the atoms of (isotopes of hydrogen, Hydrogen-3, and Hydrogen-2) Deuterium and Tritium combine in a huge pressure atmosphere with extremely high temperatures to produce an output in the form of a neutron and an isotope of Helium. Also, the amount of energy released in fusion is way greater than the energy produced by fission.

► Nuclear Fission vs Nuclear Fusion

The table below lists the various differences between nuclear fission and fusion:

Nuclear Fission	Nuclear Fusion
When the nucleus of an atom splits into lighter nuclei through a nuclear reaction the process is termed nuclear fission.	Nuclear fusion is a reaction through which two or more light nuclei collide with each other to form a heavier nucleus.

When each atom split, a tremendous amount of energy is released	The energy released during nuclear fusion is several times greater than the energy released during nuclear fission.
Fission reactions do not occur in nature naturally	Fusion reactions occur in stars and the sun
Little energy is needed to split an atom in a fission reaction	High energy is needed to bring fuse two or more atoms together in a fusion reaction
Atomic bomb works on the principle of nuclear fission	Hydrogen bomb works on the principle of a nuclear fusion bomb.