



19CH101– ENGINEERING CHEMISTRY

Unit-5 ENERGY SOURCES AND STORAGE DEVICES

ENERGY

Sufficient sources of energy are necessary for industrialized nations. Energy is used for heating, cooking, transportation and manufacturing. Energy sources can be generally classified as conventional and non-conventional. Over 85% of the energy used in the world is from conventional sources such as fossil fuels (coal and oil) and nuclear power.

The conventional energy sources depend on coal and oil. The burnt fuels result in the release of CO₂ and other gases into the atmosphere causing environmental damage. There are abundant renewable sources of energy such as wind, sun, water, and biomass. These sources are pollution free and known as “ green energy “.

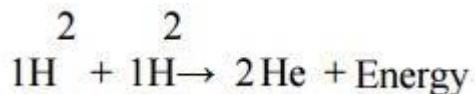
Nuclear Energy :

The enormous energy thus released during the Nuclear Fission & Fusion reaction is known as Nuclear Energy.

Nuclear fission: It is the nuclear reaction in which heavy isotopes are split into lighter nuclei on bombardment by neutrons. Fission reaction of U235 is given below

Nuclear fusion:

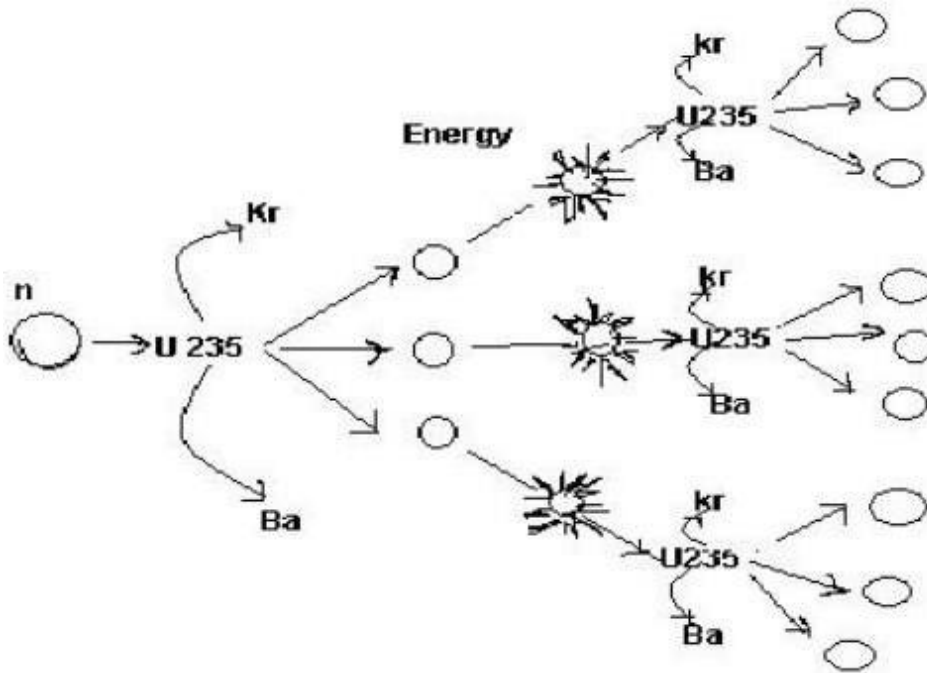
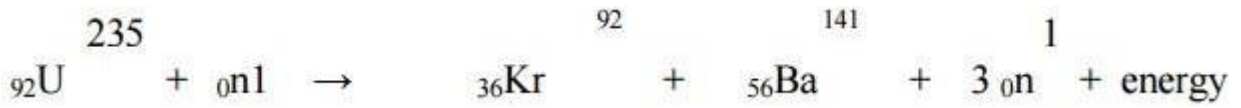
Process of combination of lighter nuclei into heavier nucleus with simultaneous liberation of large amount of energy. (e.g) solar system



Nuclear fusion reaction occurs in sun.



Nuclear chain reaction:





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Differences between fission and fusion reaction

S.No	Nuclear fission	Nuclear fusion
1	It is a process of breaking at heavier nucleus.	It is a process of combination of lighter nuclei
2	It emits radioactive rays	It does not emit any kind of radioactive rays
3	The mass number and atomic number of new elements are lower than	The mass number and atomic number of product is higher than that of starting elements
4	It occurs at ordinary temperature	It occurs at high Temperature
5	It gives rise to chain reaction	It does not give rise to chain reaction
6	It emits neutrons	It emits positrons
7	It can be controlled	It cannot be controlled