

## NUCLEAR FUELS

Nuclear energy producing elements are Uranium, Thorium, Plutonium

Uranium is important nuclear fuel.

It exist in three different form  $U^{234}$   $U^{235}$  and  $U^{238}$

$U^{235}$  is called primary fuel - Naturally available in uranium ore 0.7 %

$U^{235}$  Most unstable and suitable for chain reaction process. It is sustainable and gives out a very continuity in chain reaction to be prolonged.

$U^{233}$  and  $Pu^{239}$  are known as Secondary fuel. These are produced artificially from  $Th^{232}$  and  $U^{238}$

Radioactive element ( actually three ) emits two things one is alpha  $\alpha$  particle and neutron. Some other also emitted but they are very merger very small sized.

Alpha particle is  ${}^4He$  nucleus. Atomic nucleus has positive ( + ) proton and neutral Neutron . So nucleus in overall carries positive charges. Therefore another particle with positive charge is (added) launched and be there due to attraction force of magnetism.

Positive particle and positive nucleus will repel each other. The alpha particle positive because it has two proton and two neutrons. Its positive proton gives positive charge and repelled away from another positive nucleus. As neutron is electrically neutral it stay and not gets repelled.

The massive nucleus  $U^{235}$  breaks apart (fissions) there will be a net yield of energy. Some of masses of the fragments less than that of parent  $U^{235}$ . For element higher than iron, fusion will yield energy.

Slow neutron or thermal neutron absorption is implemented in  $U^{235}$  fission reactors for triggering. Other fissionable isotopes induced to fission by slow neutrons are Plutonium  $Pu^{239}$ , Uranium  $U^{233}$  and Thorium  $Th^{232}$