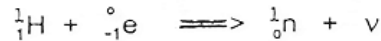


**PROTELF - (PROTon-ELEctron-Fusion) :**

It is well known that in nearly all cases in which a nucleus is unstable toward  $\beta^+$ -decay, it is also found to undergo another type of decay called electron capture which competes with the  $\beta^+$ -decay. In this process it is observed that one of the orbital electrons is absorbed by the nucleus, resulting in a decrease of the nuclear charge by one unit. The elementary process is inferred to be :

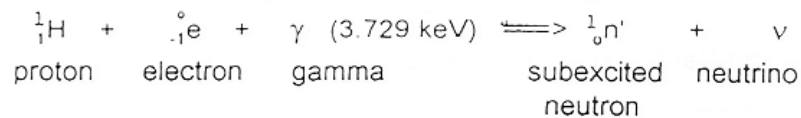


Unlike ordinary  $\beta^+$ -decay, wherein the emerging positron possesses a sizable fraction of the released energy, the absorbed electron, being one of the ordinary atomic electron, has definite energy, and so, therefore, has the neutrino. In fact, since the binding kinetic energy of an electron in an atom seldom exceeds a few kilo-electron volt (the lowest amount is 3.729 keV binding energy for K-electron shell of monatomic hydrogen), the neutrino can carry away and the antineutrino can deliver all of the required virtual energy.

***Subexcited neutron as a result of stimulated K-electron capture "PROTELF" is a practical discovery which is entirely due to the unified synergetics theory, the so called "GUST".***

The basic principle relates to the possibility of stopping K-electron motion with the use of a gamma ray which carries the same linear momentum, i.e. the same kinetic energy (3.729 keV). Consequently, the attraction of the proton makes the stopped electron fall and its negative charge annihilates with the proton positive one, the interaction is equivalent to an electron-positron annihilation, yet the gamma emission is replaced by an emitted neutrino (see synergetics scheme (1-6) :

1-6) - PROTELF - Subexcited neutron production  
by stimulated K-electron capture

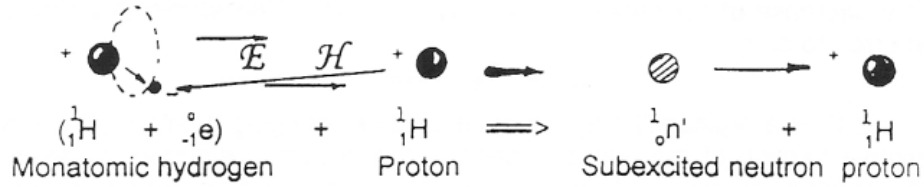


**SUBEXCITED NEUTRONS ARE ABSOLUTELY NECESSARY FOR TAMING NUCLEAR FUSION:**

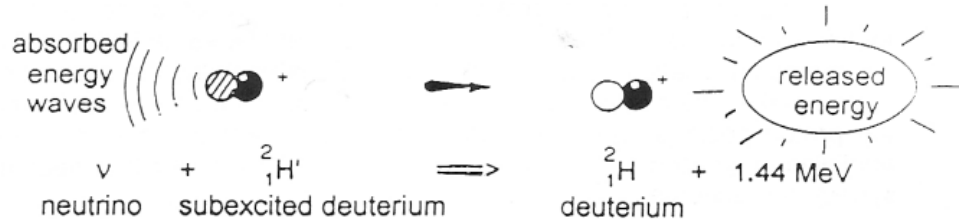
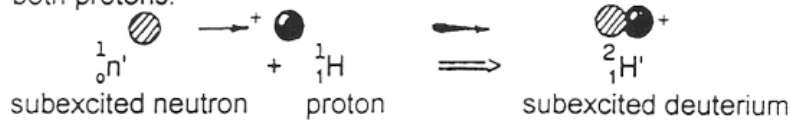
Fusion is the basic mechanism of the most powerful force man has created on earth : the hydrogen bomb. Since the bomb was designed, *many Scientists undertook the insuperable challenge of being the first to succeed in controlling nuclear particles at very high temperatures and high energies.* That was an absolutely wrong "thought" experimental way to choose : because obtaining nuclear fusion, between opposite launched electric charges, both positive or negative, is pure nonsense.

Ignoring the basic role which was actually played by electrons in fusion process, no Physicists could have even guess that "PROTELF" (PROTon ELEctron Fusion) was the fundamental interaction which primarily tamed the bursting heat of the hydrogen bomb. No one was aware that **Subexcited neutron** was finally the only confirmed particle which might consistently explain fusion.

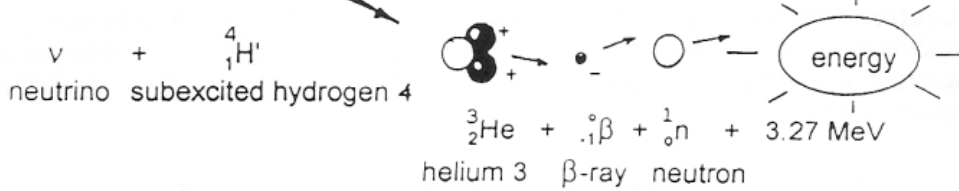
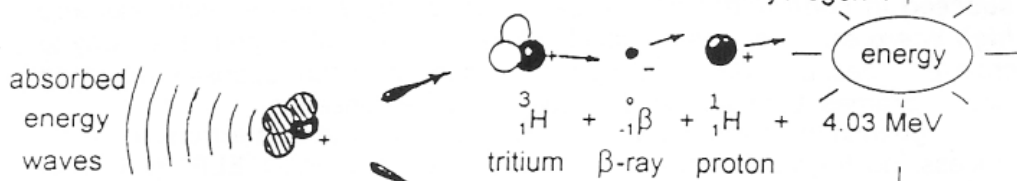
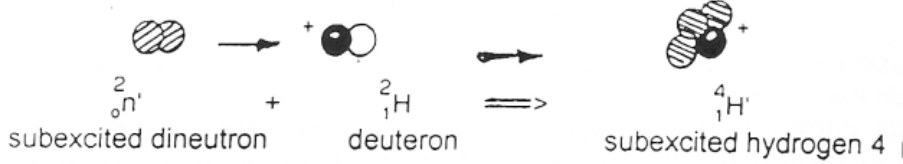
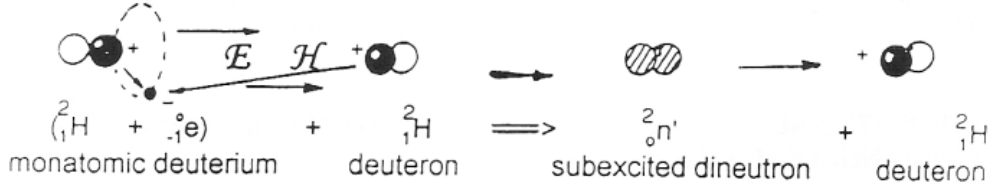
1) - Hydrogen-proton interaction (H - P)



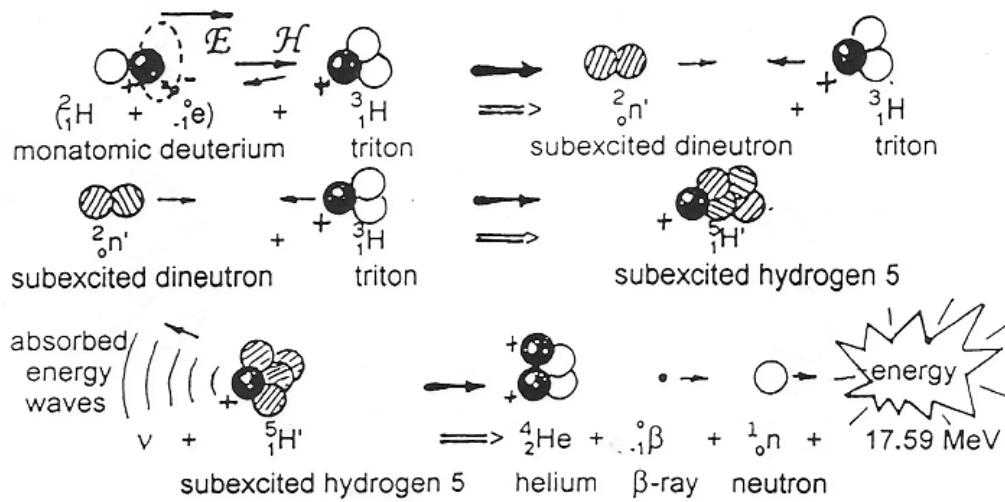
The directional oriented magnetic field ( $\mathcal{H}$ ) with ionization electric field ( $\mathcal{E}$ ) is necessary for maintaining Coulomb attraction between electron and both protons.



2) - Deuterium-Deuteron interaction (D - D)



3) - Deuterium-Triton interaction (D - T)



Thanks in large measure to the research achievements of the past decades (2) which led to the discoveries of subexcited neutron and subexcited particles, *it seems clear that clean nuclear fusion could now solve a major energy problem - the production of electricity - and it could do so with a valuable knowledge - the so called Grand Unified Synergetics Theory "GUST" - and with entirely acceptable environmental hazard.*

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