DT Jiggling

Horace Heffner November 2003

A hydrogen gas where a large proportions, say 50 percent, of nuclei consist of one deuterium nucleus and one tritium nucleus, i.e. a 50-50 DT gas, might be used to generate neutrons. This is because the neutron is comparatively weekly bound to the proton in D by the strong force. A large proportion of the D nuclear bond consists of the magnetic bond between the proton and neutron.

In an atom the electron cloud is spherically symmetric and thus exerts no electrostatic force on the centrally located nucleus. In fact, if the cloud were located in a perfect spherical shell, then the nucleus would be free to wander about inside that shell in a nearly electrostatic force-free environment. However, the electron cloud has a small probability density near the nucleus which increases radially outwardly to a maximum and then diminishes rapidly as distance goes to infinity. As the electron moves away from the electron center of charge a centering force develops on the nucleus.

Suppose however, that the electron charge distribution were in the form of a planar ring. The centering capacity is lost, except in the axis normal to the plane. The charge, once even slightly off center, is then attracted radially outward to the point of maximum charge density in the ring.

Placing a hydrogen atom in a magnetic field causes the electron probability density cloud to flatten toward a plane normal to the magnetic field. If the magnetic field were sufficiently strong, the nuclei would be attracted outward and periodically in their gyrations within their respective rings could then tunnel the final distance in order to fuse.

In a sufficiently strong magnetic field the electron density is increased between the nuclei and the nuclei are further attracted to the plane of electron maximum charge, as well as to the periphery of the atom. Both electron screening and nuclear positioning are enhanced. In addition, at extended distances, the strong magnetic field tend to align both the proton and neutron such that their poles repel each other. This converts the magnetic bond into a magnetic repulsion, and thus detracts from strong force instead of adding to it. The opportunity for exchange reactions is thus vastly increased.

If a magnetic field is insufficiently strong for fusion to result with much probability, it still might be large enough to permit exchange reactions involving the neutron. The neutron is neutral and free to wander comparatively far from the proton, and almost equally free to wander in the direction of a neighboring nucleus as it is to wander the opposite direction, regardless of the nature of the space charge through which it travels. The neutron thus has a much higher probability of involvement in an exchange reaction than the proton.

In a sufficiently strong magnetic field, especially with appropriate stimulation, we then might expect to see an onslaught of exchange reactions of the type:

D + D -> p + T
D + T -> p + T4 -> T3 + n
T + T -> D + T4 -> T3 + n

In a pure deuterium environment, provided laser light is applied in a direction perpendicular to the magnetic field and provided its direction of polarization is orthogonal to the beam and magnetic field, we might expect to see:

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D + D -> p + T

and when the p eventually exchanges places with a D (more often happens in electrolytes) then we might see:

D + T -> p + T4 -> T3 + n

It thus seems important to measure the tritium evolving in laser stimulated cold fusion experiments conducted in strong magnetic fields. Tritium measurement is far easier than helium measurements, for example, and provide evidence of an exchange reaction. Exchange reactions tend to occur in high energy molecular collisions. It seems reasonable to me that the probability of such reactions would be greatly enhanced if a strong magnetic field exists parallel to the target plane. In the case of the negative charged wire experiments of Claytor et al the tritium production might be enhanced by inducing a powerful magnetic field parallel to the wire. As a D2+ ion hits the cathode a somewhat planar electron field molecule might develop enough to effect the neutron exchange. Also, neutron exchange reactions with the wire material should increase in probability.

Another method that might be more effective would be to create a neutral beam of D2 or DT atoms that hit a target with the appropriate magnetic field imposed. Energy can then be extracted from the resulting neutrons or from radioactive isotopes generated in the target.