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A very *clean* nuclear fusion reaction is fusion of Hydrogen and Boron 11 nuclei. Figure 10, from [5], shows this reaction culminating in: the energy of 3 charged helium ions (which can be converted directly to electricity); no harmful, radioactivity-causing neutron emissions; and, hence, little radiation shielding.

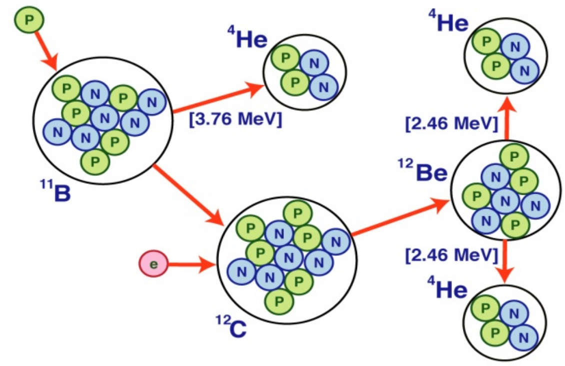

Figure 10. Aneutronic pB11fusion resulting in 8.68 MeV of energy and the electricity of 3 Helum 4 Ions

Effective, ion-attracting SU(2) EM field interactions would generate fusion power with less electrical input energy for any of the fusion reaction in Figure 8. However, "clean" p-B11 reactions, which result in very low radioactivity because very few neutrons are emitted, might benefit most from SU(2) EM fields.

Figure 8 shows p-B11 fusion reactions requiring about 15-times more input energy than less-clean DT fusion reactions to achieve a given fusion power. This results in higher ignition temperatures which can cause phenomenon such as bremsstrahlung radiation losses that certain fusion systems find very difficult to prevent or to cope with. Figure 11 compares reduced input energy needs for DT and p-B11 fusion for a given fusion output power and for a fairly modest SU(2) EM field efficiency ($\alpha\beta$) of only 10 percent.

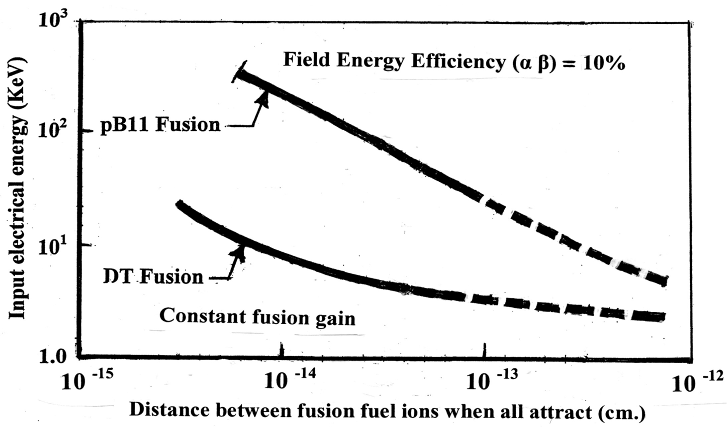

Figure 11. Obtaining longer ion-attracting range in SU(2) EM fields reduces DT and p-B11 fusion input energy needs

Aneutronic p-B11 fusion is seen to requires more input energy than D-T fusion for a given reaction distance. But, ion-attracting SU(2) EM fields are seen to enable larger input energy reductions for p-B11 fusion than for D-T fusion. If so, these reductions should avoid things such as bremsstrahlung radiation.

Conclusions

Barrett has shown the possibility of EM radiation fields with the same SU2 gauge symmetry as the ion-attracting matter fields associated with ion-attracting, weak nuclear forces in nuclei that cause fusion. If so, ion-attracting SU(2) EM radiation fields in fusion reactors could conceivably attract (rather than repel) fusion fuel ions to reduce the coulomb resistance and electrical compression energy needed for fusion of these ions. So, the authors have begun exploring this seemingly bizarre possibility theoretically. However, an experiment to modify a helicon plasma generator to create SU(2) EM discharges and ion beams, and to search for ion-ion attractions and ion-electron repulsions inside the generator is also a needed first step.

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