

Status, prospects and basic research needs of p-11B fusion

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Proton-boron fusion is experiencing a renewed interest as a possible energy source. The reaction ($p + {}^{11}\text{B} \rightarrow 3\alpha + 8.6 \text{ MeV}$) is aneutronic and does not involve radioactive or rare isotopes. Ignition and burn of H-11B fuel, however, remains extremely challenging at present, because of severe physical and technological limitations [1-3]. Ideal ignition has been demonstrated only lately (and marginally) [4], thanks to revisited cross section data [5].

Starting from the basic physics of the p-11B reaction, the talk will review potentialities and issues of this candidate fusion fuel. In this connection, newly proposed [6] reference cross section and reactivity for p-11B fusion will be presented. The talk will also summarise the main experimental results achieved so far. Furthermore, approaches currently pursued toward energy production will be outlined, with a focus on inertial confinement. Finally, basic research needs for further progress in the field will be highlighted.

References

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