

Nanocrystals in the Manufacture of Target for Inertial Confinement Fusion.

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The efficiency of power generation in inertial confinement fusion is related, among other phenomena, to development in the manufacture of deuterium tritium target, in particular the solid layer of this material (DT ice). The requirements for the target manufacture are several, within the most salient this roughness and thickness variation of the solid layer [1], these are related to the hydrodynamic instabilities that occur at the time of compression, decreasing the efficiency ignition and burning of fuel, for example the Rayleigh-Taylor instability [2].

One of the ways to reduce these instabilities is the growth of nanocrystals in the solid layer of DT-ice, thus obtained solid structures more rigid and with a speed of sound propagation uniform [3]. In this work we present a simulation methodology [4] which is obtained by varying the speed of sound, to the solid structures of atomic isotopes of hydrogen in high pressure conditions. These simulations are performed for different grain sizes. The study is a first step in the analysis of the relationship between the growth of nanocrystals and ignition efficiency.

References:

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