

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Meta-stable solid hydrogen¹ BERNARD KOZIOZIEMSKI, ALEXANDER CHERNOV, Lawrence Livermore National Laboratory, JOHN LUGTEN, EVAN MAPOLES, JAMES PIPES, JAMES SATER — A meta-stable solid of the hydrogen isotopes H₂, D₂, and the deuterium-tritium mixture to be used for inertial confinement fusion (ICF) studies is observed when solidified through their respective triple-points. The meta-stable solid is distinguished from the stable hexagonal-close-packed (HCP) solid by three observations. First, the “triple-point” temperature of the meta-stable solid is 16 - 35 mK below that of the HCP solid, with the value isotope dependent. Second, the shape of the solid spreading over the surface is approximately isotropic in contrast to the anisotropic growth shape of the HCP solid. Finally, the meta-stable solid will rapidly transform to an often polycrystalline HCP solid. The meta-stable solid grows from the 5 - 20 μm diameter borosilicate fill-tubes recently used for ICF capsule assemblies much more often than from the 30 - 40 μm diameter silica glass tubes previously used in the hydrogen ICF layering studies. The meta-stable solid has reached sizes up to 50 μm thick and 1 mm in diameter. We will discuss our hypotheses for the nature of this meta-stable solid.

¹This work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344

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Date submitted: 19 Nov 2009

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