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Observations on the nucleation of ice VII in shock compressed water[1] SAMUEL J.P. STAFFORD, DAVID J. CHAPMAN, DANIEL E. EAKINS, SIMON N. BLAND, Institute of Shock Physics, Imperial College London — The ability of water to freeze into the ice VII phase under dynamic compression is a good example of a liquid to solid phase change. The ice VII is thought to nucleate and grow from the window surfaces in a relatively slow process (on the order of 100ns) that can be seen in wave profiles and a visible darkening of the sample. On silica windows the process is evident but from sapphire surfaces the heterogeneous nucleation appears to be entirely absent and the water remains metastable. To investigate the influence of silica, and under what conditions sapphire might heterogeneously nucleate ice VII, we present an experimental technique incorporating multiple liquid targets diagnosed with PDV and high speed imaging of the nucleation process from a variety of surfaces and additives.

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