

Abstract Submitted
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Laser Compression of Nanocrystalline Tantalum CHIA-HUI LU, UC San Diego, BRIAN MADDOX, BRUCE REMINGTON, LLNL, EDUARDO BRINGA, Conicet & ICB, U. N. Cuyo, MEGUMI KAWASAKI, TERENCE LANGDON, USC, HYE-SOOK PARK, LLNL, BIMAL KAD, MARC MEYERS, UCSD — Nanocrystalline tantalum was prepared by HPT (High Pressure Torsion) from monocrystalline [100] stock yielding a grain size of 70 nm. It was subjected to laser driven compression at energy levels of ~ 350 J to ~ 850 J in the Omega facility (LLE, U. of Rochester) yielding pressures as high as ~ 180 GPa. The laser beam created a crater of significant depth ($\sim 100\mu\text{m}$). Transmission electron microscopy (TEM) revealed dislocations in the grains but no twins in contrast with monocrystalline tantalum. Hardness measurements were conducted and show the same trend as single crystalline tantalum. The grain size was found to increase close to the energy deposition surface.

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