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Influence of Peak Shock Stress on the Quasi-static Reload Response of HCP Metals E.K. CERRETA, Los Alamos National Laboratory, G.T. GRAY III, C.P. TRUJILLO, D.W. BROWN, C.N. TOME — Textured, crystal-barpurity hafnium has been shock loaded at 5 and 10 GPa, below the pressure reported for the $\alpha \rightarrow \omega$ phase transformation, 23 GPa. The specimens were "soft caught" for post-shock characterization. The substructure of the shocked materials was investigated through optical and transmission electron microscopy and the texture evolution was probed with neutron diffraction. Shocked materials were reloaded quasi-statically in compression. The deformation behavior of as-annealed hafnium under quasi-static conditions is compared to its response following shock prestraining. The reload response is correlated to differences in defect density due to shock loading and compared with similar observations in other HCP metals. The microstructural development during quasi-static loading of the preshocked specimens is compared to that of the as-annealed specimens.

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