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Compression and Shear of Tantalum to 64 GPa YANZHANG MA, Department of Mechanical Engineering, Texas Tech University, Lubbock TX 79409, USA, WENGE YANG, CHENG JI[1], High Pressure Synergetic Consortium, Carnegie Institution of Washington, Argonne, IL 60439, USA, YANG GAO, Department of Mechanical Engineering, Texas Tech University, Lubbock TX 79409, USA, OLIVER TSCHAUNER, High Pressure Science and Engineering Center, University of Nevada, Las Vegas, NV 89514, USA, STANISLAV SINOGEIKIN, High Pressure Collaborative Access Team, Geophysical Laboratory, Carnegie Institution of Washington, Argonne, IL 60439, USA — It has been reported that the β-phase (body-centered-cubic) of tantalum (Ta) is stable to pressures over mega-bar under hydrostatic compression.[1] However, the shock compression clearly indicates its transformation to the ω-phase (hexagonal) at 45 GPa.[2] Theoretical work suggests that the shear might have played an important role in inducing this phase transformation.[3] Here we report our experimental results on the effects of pressure and shear by use of a rotational diamond anvil cell and the synchrotron X-ray diffraction. The results indicate that under extensive shear and pressures over 60 GPa, Ta remains stable in the β phase.

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[2] L. M. Hsiung and D. H. Lassila, "Scr. Mater." **38**, 1371 (1998)
[3] D. Mukherjee, K. D. Joshi, S. C. Gupta, "J. Phys. Conf. Ser." 377, 012072 (2012)

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