## Structural Study of Solid Mercury at High Pressures

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Liquid mercury solidifies at about 1.2 GPa at room temperature. After solidification, it undergoes several structural phase transitions under high pressure. The highest-pressure ä-phase with the hcp structure appears above about 37 GPa [1], which is reported to be stable to at least 67 GPa [2]. We have investigated the structural stability of the ä-phase at ultrahigh pressures.

Angle-dispersive powder x-ray diffraction experiments have been done with the diamond-anvil cell at high pressures at room temperature on the beam line 10 XU at SPring-8. The ä-phase was found to be stable up to 193 GPa, the highest pressure investigated. The c/a axial ratio continuously decreased with pressure from 1.73 at 50 GPa to 1.64 at 193 GPa. The equation of state for the ä-phase was obtained over the pressure range 50-193 GPa. The bulk modulus and its pressure derivative for the ä-phase at 50 GPa were determined as 292 GPa and 5.5, respectively.

[1] Schulte O., Holzapfel W.B., *Phys. Rev. B*, 1993, **48**, 14009. [2] Schulte O., Holzapfel W.B., *Phys. Rev. B*, 1996, **53**, 569.

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