

Abstract Submitted
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Proving diamonds under ultra-high pressure with sound velocity measurements KEISUKE SHIGEMORI, ILE, Osaka Univ, KATSUYA SHIMIZU, YASUHIRO ASAKURA, KYOKUGEN, Osaka Univ., TATSUHIRO SAKAIYA, TADASHI KONDO, GSS, Osaka Univ., YOICHIRO HIRONAKA, ILE, Osaka Univ, TETSUO IRIFUNE, GRC, Ehime Univ., HITOSHI SUMIYA, Sumitomo Electro Industries, TOSHIHIKO KADONO, HIROSHI AZECHI, ILE, Osaka Univ — Diamond under terapascal (TPa) regime is of great interest on its phase transition to a post diamond phase. Many experimental works have been done on the diamond at the TPa regime by measuring the shock parameters (shock velocity, particle velocity). We measured sound velocities of shock-compressed diamond under several pressures by means of x-ray backlighting technique. Experiments were done on GEKKO-HIPER laser irradiation facility at Institute of Laser Engineering, Osaka University. We obtained sound velocities at a pressure of 0.4 - 2.0 TPa by changing the laser intensity. The experimental sound velocity suggests that a clear discontinuity at around 0.7 TPa where the melting of the diamond starts. The sound velocity drops then slightly increases with increasing pressure. The slope of the sound velocity over 1 TPa is lower than that under 0.7 TPa, indicating the melting of the diamond.

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