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高温高圧下における金の単結晶弾性の測定
Measurement of single crystal elasticity of Gold (Au) under high temperature and high pressure

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Single crystal elasticity of gold (Au) has been measure by inelastic X ray scattering method under high pressure. A few tens micrometer Au single crystal was prepared from a large commercial crystal by using FIB technique. The small crystal was placed inside a gasket hole of DAC apparatus. We succeeded to measure single crystal elasticity at 0.8 GPa and 3.2 GPa; the pressures were determined by the Ruby scale. ~100 peaks were observed at each pressure, and used to constrain the three independent constants of C_{11}, C_{12}, and C_{44}. The resulted elastic constants are consistent with the previous data at ambient pressure.

We observed that C_{11} and C_{44} increase with increasing pressure, and C_{12} decreases with increasing pressure. We will expand the pressure range and temperature range of the measurement to establish the equation of state of gold with unprecedented accuracy.

キーワード: 金, 単結晶, 弾性, 高圧
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