

Determination of elastic constants for ferropericlase by inelastic X-ray scattering technique

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Elasticity is an important property of mantle minerals which contain a certain amount of iron. It is required to measure elasticity of opaque minerals at pressure conditions higher than that of the lower mantle. Inelastic X-ray Scattering (IXS) is a promising technique to determine elastic moduli of opaque minerals under the lower-mantle and the core pressure conditions. We have demonstrated the determination of elastic constants for ferropericlase under the ambient condition by IXS. Using the multi-analyzer spectrometer at BL35XU of SPring-8 and the Christoffel equation analysis, the elastic constants of MgO at the ambient condition have been determined with the error lower than 1 %. This precision is comparable with, or better than those of the other techniques. In the presentation, we will show the results of ferropericlase at the ambient and high-pressure conditions.