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ブリッジマナイトの単結晶弾性と下部マントルの地震波速度異常の関連性
Single-crystal elastic property of bridgmanite and seismic anomalies in the lower mantle

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Single crystal elasticity of bridgmanite is essential information to understand the seismic velocity structure of the lower mantle from the viewpoint of chemical and thermal structures. We have performed inelastic x-ray scattering measurement at BL35XU of SPring-8 on 100-micron size (Mg,Fe,Al)(Si,Al)O_3 single crystals synthesized by thermal gradient method. Analysis of the obtained spectra gives single crystal elastic stiffness constants. The cation substitution is seen to cause the anti-correlation between the bulk sound and shear wave velocities as well as to enhance the elastic anisotropy of bridgmanite, and consequently allows us to make a quantitative model that is consistent with seismological observations.

キーワード: ブリッジマナイト, X線非弾性散乱, 単結晶弾性, 陽イオン置換, 下部マントル, 弾性波速度異常
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