

Ultrasonic velocity measurements of polycrystalline clinopyroxene under high P - T conditions

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Ultrasonic elastic velocity measurements of polycrystalline clinopyroxene with submicron-sized grains were conducted under high P - T conditions in a piston-cylinder apparatus. We prepared nano-sized powders of clinopyroxene from naturally occurring clinopyroxene single crystal and successfully fabricated fine-grained polycrystalline clinopyroxene. P and S wave velocities are determined as a function of pressure to 1.0 GPa at temperatures up to 650 °C for V_p and 750 °C for V_s . At room temperature, V_p , V_s and V_p/V_s increased during pressurization. On the other hand, at 1.0 GPa, V_p and V_s decreased and V_p/V_s slightly increased with increasing temperature. From P and S wave velocities and estimated density, we calculated the elastic constants of clinopyroxene and found that the bulk modulus obtained in this study is smaller than previously published data.

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