

Resonant Ultrasound Spectroscopy measurements of High Pressure Minerals: Synthesis and measurement of stishovite single crystal

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Elastic constants of minerals are one of the most important physical properties useful in understanding the deep earth interiors due to its feasibility of comparison with the seismological observations.

Resonant Ultrasound Spectroscopy (RUS) is one of the leading methods of determining elastic constants of materials by measuring the number of natural vibration modes even for low symmetric materials. Owing to its ability of studying sub millimeter sized specimens, this technique is more applicable in study of high pressure mineral phases where sample volume is restricted.

Large single crystals of Stishovite were synthesized at 11 GPa from single crystal quartz and water as starting materials by slow cooling method in Kawai-type high pressure multi anvil apparatus. We synthesized crystals up to 0.8*0.8*1.5mm size by cooling SiO₂+15wt% H₂O system in platinum capsule from 1450C to 900C. Quality of crystal is confirmed by polarized microscope study, micro focus x-ray diffractometry and precision x-ray diffractometry. Now we are going to make cylindrical specimens from synthesized crystals along c-axis to be used in RUS measurements.