

DAC-GHz ultrasonic P wave velocity measurement on KCl and natural olivine

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GHz ultrasonic velocity measurements has been developed up to 14 GPa in diamond anvil cell (DAC). In order for GHz ultrasonic measurement, both P and S wave buffer rods were manufactured through sputtering ZnO piezoelectric film on single crystal rods, such as sapphire, rutile, and YAG. Several technical breakthroughs were achieved before observing stable signals from the specimen squeezed in DAC: (1) Wiping by aqueous ammonia on the contact surfaces enhances transmissibility of GHz wave from buffer rod to diamond. (2) Cleaning by lathery detergent and water jet is effective to remove sticky stuff on rear surface of diamond. (3) Steel ball supporter provides easier adjustment of contact between buffer rod and diamond. Consequently, we succeeded to demonstrate performance of DAC-GHz system through KCl and natural olivine samples.

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