Recent Progress in Large-volume High P-T in situ X-ray Observation at SPring-8

Tomoo Katsura[a], Eiji Ito[a], Ken-ichi Funakoshi[b], Akefumi Nozawa[b], [a]*Institute for Study of the Earth's Interior, Okayama University, Misasa, Japan.* [b]*Japan Synchrotron Radiation Institute, Kouto, Japan.*
E-mail: tkatsura@misasa.okayama-u.ac.jp

In 1997, a 15 MN multi-anvil apparatus was install in the beam line BL04B1 at SPring-8. This apparatus makes it possible to generate pressures up to 26 GPa and temperatures up to 2000 K using WC anvils. Workers have produced a number of experimental results such as determination of precise phase relations, equation of state, and viscosity measurement.

In 2002, another 15 MN multi-anvil apparatus was designed and installed also in BL04B1 [1]. Two major improvements were made in this apparatus. One is a precise guide block system, which prevents from deformation of the cubic compression space. This system makes it possible to generate further higher pressures using sintered diamond anvils. Pressure of 63 GPa was first achieved by a multi-anvils apparatus.

The other improvement is an oscillation system, which a large-volume press is equipped with in the first time. This system makes it possible to obtain high-quality diffraction patterns against grain growth at high temperatures. The phase boundary of the B1-B2 transition in NaCl was determined by utilizing this function.

[1] Katsura T., *et al.*, *Phys. Earth Planet. Int.*, 2004, **497**, 143-144.

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