## A New Opposed-Anvil type High-Pressure and High-Temperature Apparatus Using Sintered Diamond

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A new opposed-anvil type high-pressure and high-temperature apparatus was developed using sintered diamond as anvil material. This apparatus can generate up to at least 30 GPa and 1700 K. Compared to diamond anvil apparatus combined with laser heating, this apparatus has much larger sample volume and has higher stability in temperature. Compared to "Kawai-type" double stage multi-anvil apparatus, this apparatus requires much lower running cost and is easier to use. High pressure and temperature in-situ X-ray diffraction study can be performed when combined with synchrotron radiation.

Basic design is a "Drickamer-type" apparatus with a culet diameter of 3 mm. A combination of metal gasket and pressure transmitting medium made of diamond powder improved the stability of pressure generation dramatically. All the parts for heater, electrode, sample capsule, and so on, has either disc shape or a part of disc shape, and once all these parts are prepared, it is very easy to assemble them because all we need is to put all these parts by stacking them in a small central hall of the pressure transmitting medium. The detail of the apparatus and some examples of the performance will be described.