

High pressure generation and EoS of feropericlaase ($\text{Mg}_{1-x}\text{Fe}_x\text{O}$) using the Kawai-cell equipped with sintered diamond cubes

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High pressure generation was tried by using the Kawai-cell equipped with sintered diamond (SD) cubes and the synchrotron radiation at SPring-8 in conjunction with investigation of P-V-T relations of feropericlaase ($\text{Mg}_{1-x}\text{Fe}_x\text{O}$) ($x = 0.17$ and

0.25). The SD cubes with 14 mm edge length and 1.0 mm truncation were adopted together with an octahedral pressure medium of $\text{MgO} + 5\%\text{Cr}_2\text{O}_3$ with edge length of 4.7 mm. A powdered mixture of $\text{Mg}_{1-x}\text{Fe}_x\text{O} + 0.1 \text{ Au}$ (in weight ratio) was directly put into a cylindrical heater of TiB_2 which was set at

the center of the octahedron normal to the opposed triangles. Energy dispersive method was adopted for X-ray diffraction study to determine unit cell volumes for both the

$\text{Mg}_{1-x}\text{Fe}_x\text{O}$ and Au. Generated pressure was determined from the volume of Au based on the Anderson et al's [1989] scale. The maximum attainable pressure reached 90.4 GPa at 300 K as of December 2008 which is read as 95.5 GPa on the Tsuchiya's [2003] scale. The P-V data were acquired for $\text{Mg}_{0.83}\text{Fe}_{0.17}\text{O}$ at 300 and 700 K up to 80 GPa. Conspicuous shift in the compression curves associated with the electronic spin transition of Fe [e.g., Lin and Tsuchiya, 2008] was not observed at 300 and 700 K.