MULTI-ANVIL HIGH PRESSURE PRESS FOR SYNCHROTRON RADIATION USE AT THE SPRING-

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In situ x-ray diffraction under high pressure-temperatures is one of the most important techniques to determine the structure of minerals, phase equilibria, and P-T-V equation of state under these conditions. Various types of high pressure apparatus have been used for the x-ray diffraction study with synchrotron radiation. Among them, multi-anvil type large volume press has a unique character of compressing the pressure medium from multi-directions. Although its generated pressure is relatively limited compared with that of diamond anvil cell, the multi-anvil apparatus has the great advantage of maintaining stable high temperatures under high pressure owing to its larger sample volume. Its small pressure and temperature gradients makes it possible to carry out an accurate x-ray diffraction experiments under well controlled pressure and temperature condition.At the SPring-8, one of the third generation syncrotron radiation facilities in Japan, two multi-anvil large volume presses have been installed and opened for public use. Using these facilities, in situ diffraction, XAFS, and radiography experiments can be made under high pressure-temperatures up to 30GPa and 2000K. The performance of the facilities and the latest experimental results