Stress Relaxation in MgO at High Pressure and High Temperarure	X17B1

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The perovskite (MgSiO3) and periclase (MgO) mixture has been proposed to be an important material in the subducted slab at the depth of the 660 km discontinuity. Rheological properties of the mixture of these two phase are critical to understanding the dynamics of the mantle and the deep focus earthquake. The objective for this study is to develop constitutive laws for MgO that described the flow processes under different deformation regimes. In this beam time, we have conducted one stress relaxation experiment on MgO powers with a grain size about 5 micron using a DIA type multi-anvil high-pressure apparatus. Stress-strain measurements were determined by *in situ* monitoring broadening of synchrotron x-ray diffraction peak. During the experiment, the MgO powders in the pressure chamber were first cold-compressed to 10 GPa at the room temperature. Then the sample was heated to 1800 K at a constant pressure with a rate of 500 K/hour. Results show: During the cold pressing, the peak width increases with increasing pressure. This means that the differential stress in the sample increases with increasing pressure. In the heating process, the peak width decreases with increasing temperature, demonstrating that the differential stress decreases with increasing temperature. The data analysis is still under progress to determine the stress exponent and activation energy.