

Abstract Submitted  
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**X-ray diffraction studies of Mg<sub>2</sub>Si and Ag-doped Mg<sub>2</sub>Si under pressure**<sup>1</sup> YOSHIHISA MORI, YUJI KAIHARA, KEN-ICHI TAKARABE, Okayama University of Science — The magnesium disilicide (Mg<sub>2</sub>Si) is one of the thermoelectric material in 500-800 K temperature range. The *p*- and *n*-Mg<sub>2</sub>Si materials are necessary for the high-performance thermoelectric device, however Mg<sub>2</sub>Si is *n*-type semiconductor and stable *p*-type Mg<sub>2</sub>Si has not developed. Because it was reported that Ag-doped Mg<sub>2</sub>Si was *p*-type Mg<sub>2</sub>Si, we performed the X-ray diffraction studies of Mg<sub>2</sub>Si and Ag-doped Mg<sub>2</sub>Si under high-pressure at NE-5C beam line (PF-AR). Four samples which were a high-purity Mg<sub>2</sub>Si powder, a mixture of Mg and Si powders, and Ag-doped these powders were prepared. Mg<sub>2</sub>Si decomposed with increasing temperature, and new peaks of MgO and SiO<sub>2</sub> appeared beyond 673 K. The Mg<sub>2</sub>Si with Ag also decomposed and the oxide peaks appeared, and Ag peaks did not disappear. In the case of Mg and Si powder, Mg<sub>2</sub>Si was synthesized at 573 K and Mg peaks disappeared with increasing temperature but MgO or SiO<sub>2</sub> peaks did not appear. In the case of Ag-doped Mg and Si powder, Mg<sub>2</sub>Si was synthesized at 523 K, and Ag peaks disappeared at 823 K and MgO or SiO<sub>2</sub> peaks did not also appear. The result means the possibility of the synthesis of Ag-doped Mg<sub>2</sub>Si under pressure.

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