

Abstract Submitted  
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**Thermoelectric transport properties of Mn<sub>4</sub>Si<sub>7</sub> thin films**  
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University of Ulsan — The deposition of transition metal layers on silicon and their reaction with substrate are important issues in semiconductor device technology. The interface between metal and semiconductor determines the device performance. The 3d transition metal monosilicides such as FeSi, CoSi, MnSi and CrSi have attracted much attention because they are easily formed in the interface between transition metal and Si. On the other hand, the Mn<sub>4</sub>Si<sub>7</sub> compound is well known a pseudo-direct band gap semiconductor (0.42 ~ 0.98 eV) with a fundamental gap increasing linearly with the compression along c- or a-axis. We have grown Mn thin films on Si (111) substrates at 600 °C using MBE, resulting in the formation of Mn<sub>4</sub>Si<sub>7</sub>. In order to investigate the correlation between magnetization and charge carrier transport, we performed magnetoresistance and Hall resistance measurements by using a physical property measurement system. Interestingly, we observed the Seebeck coefficient of -565  $\mu\text{V}/\text{K}$  and electrical resistivity of 2.26 m $\Omega$  cm in Mn<sub>4</sub>Si<sub>7</sub> films grown on Si substrate, resulting in the power factor of 14 mW/K<sup>2</sup>m.

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