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Magnetic properties of $\text{Mn}_{11}\text{Si}_{19}$ and Mn_4Si_7 in their bulk and powdery states KIYOTAKA HAMMURA, Hitachi Cambridge Laboratory, HARUHIKO UDONO, TOMOSUKE AONO, Ibaraki University, ISAO OHSUGI, Salesio Polytechnic, ELISA DE RANIERI, Hitachi Cambridge Laboratory, KENICHI YAJIMA, YUSUKE UJIIE, Ibaraki University — The purpose of this paper is to determine by experiment whether $\text{Mn}_{11}\text{Si}_{19}$ and Mn_4Si_7 in their bulk and powdery states have a finite magnetic moment or not. High quality bulk samples for both were prepared using the temperature gradient solution growth method. Powery samples for both were prepared by pounding bulk crystals in a mortar. Magnetisation measurements were carried out using both SQUID system and Kerr rotation system. SQUID measurements revealed that $\text{Mn}_{11}\text{Si}_{19}$ has finite magnetism while Mn_4Si_7 does not in their bulk states. It was also confirmed that Mn_4Si_7 became magnetic and $\text{Mn}_{11}\text{Si}_{19}$ exhibited a distinctive hysteresis, in their powdery state. The enhancement of magnetism in their powery states implied that the surface of the samples was to a great extent linked to its magnetism.

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