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Two Distinct Ferroelectric Phases in Multiferroic Y-type Hexaferrite $Ba_2Mg_2Fe_{12}O_{22}$ HAJIME SAGAYAMA, KOUJI TANIGUCHI, NOBUYUKI ABE, ARIMA TAKA-HISA, Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, YUSAKU NISHIKAWA, SHIN-ICHIRO YANO, YUSUKE KOUSAKA, JUN AKIMITSU, Department of Physics and Mathematics, Aoyama Gakuin University, MASATO MATSUURA, KAZUMA HIROTA, Department of Earth and Space Science, Graduate School of Science, Osaka University, ARIMA TEAM — The magnetic phase diagram of the Y-type hexaferrite $Ba_2Mg_2Fe_{12}O_{22}$ has been studied using single-crystal neutron diffraction. The result indicates successive phase transitions where the magnetic modulation wave number changed discontinuously, when a magnetic field is applied and the temperature is varied. For the low-temperature spin-driven ferroelectric state, we have found a 6-fold structure with q=(0 0 1/2) in weak magnetic fields and a 2-fold structure with q=(0 0 3/2) in strong magnetic fields, between which a first-order transition intervenes accompanied by a hysteresis.

Hajime Sagayama
Institute of Multidisciplinary Research for Advanced Materials,
Tohoku University

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