

SECTION

LOW-DIMENSIONAL SYSTEMS AND NANO-SYSTEMS

Abnormal Magnetism of Nano- and Microscaled Tetrafluorites LiTbF_4 and LiDyF_4

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Rare earth tetrafluorides LiReF_4 , $\text{Re} = \text{La—Lu}$, are a promising material for laser technology [1, 2], medicine and biotechnology[3]. LiTbF_4 is an Ising dipolar uniaxial ferromagnet; $T_C = 2.8741(16)$ K [5]. LiDyF_4 is a layered antiferromagnet; $T_N = 0.610(15)$ K [5].

Nanosized powders of LiTbF_4 were synthesized using hydrothermal method[6]. Microsized LiTbF_4 and LiDyF_4 powders were baked at 650. XRD patterns, TEM HR and optical microscope were used for characterization. Temperature and field dependencies of magnetization were measured at the vibrational magnetometer. LiTbF_4 nanopowder at $B = 10$ mT showed reduction of Curie temperature compared with monocrystal. Field dependence of LiDyF_4 micropowder's magnetization at temperatures below 7 K takes the form of antiferroelectric hysteresis. Temperature dependence of loops' area is measured. Also, this sample's magnetisation does not set instantly when the external field is set, but follows exponential law $\exp(-t/\tau)$. Values of τ are different for magnetization and demagnetization of LiDyF_4 micropowder.

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