

## Magnetic Properties of the Orthoferrites $\text{TbFeO}_3$ and $\text{ErFeO}_3$

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The magnetic properties of the single-crystalline orthoferrites  $\text{TbFeO}_3$  and  $\text{ErFeO}_3$  were investigated by using a vibrating sample magnetometer (VSM). Both ferrites exhibit weak ferromagnetism with the maximum saturated moment being 0.125 and  $0.054 \mu_B/\text{Fe}$  for  $\text{TbFeO}_3$  and  $\text{ErFeO}_3$ , respectively. We confirmed the spin reorientation transition (SRT) in both systems. These two ferrites display different temperature-dependent behaviors of the magnetization, which we analyzed within the molecular field model. The results suggest that the Fe 3d-Er 4f magnetic coupling through the molecular field of the ordered Fe net moment is unexpectedly antiferromagnetism, opposite to the ferromagnetic Fe 3d-Tb 4f coupling. Further, the coupling widely varies with temperature and/or with the SRT, indicating that the Tb/Er moment is not simply explained by the partial polarization of the paramagnetic spins experiencing the molecular field of the net Fe moment.

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