

PROBING 3d-4f EXCHANGE INTERACTIONS BY HIGH-FIELD MAGNETIZATION MEASUREMENTS

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In a 4f-3d ferrimagnet the molecular field (a net value expressing the relevant exchange interactions) can be determined from high-field magnetization measurements. If the field is high enough, it breaks the ferrimagnetic ground state and drives the system towards ferromagnetic order via non-collinear intermediate phases. Magnetization curves of Er₂Fe₁₇ single crystal have been measured along the [100] and [001] crystallographic directions in magnetic fields up to 50 Tesla. An unfixed sample, free to rotate, was measured as well. The magnetization measured along the easy magnetization direction shows jumps at 37.5 and 44 Tesla. The first jump was used for the determination of the molecular field (66.4 Tesla). This agrees with the data for the unfixed sample where a kink in the magnetization at 33.5 Tesla yields a molecular field of 65.7 Tesla. The obtained values are in a good agreement with literature data.

← 13.4 cm →

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9.7 cm