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## Synthesis, Magnetic Properties, Magnetic Entropy and Arrot Plot of Antiferromagnetic Frustrated Er2Ti2O7 Compound

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### Abstract

The pyrochlore was synthesized via a ceramic method using two different oxides (Er2O3 and TiO2). The compound was found to crystallize in the cubic system with the space group (No. 227). A magnetic study, carried out at 2 and 300 K under an applied magnetic field  $\mu(0)H=0.05$  T, has revealed a complex magnetic structure at low temperature. The effective paramagnetic moment, deduced from  $(\chi-\chi(0))^{-1}=f(T)$  curve, was found by assuming a zero moment on the transition metal atom Ti4+. The paramagnetic Curie-Weiss temperature  $\theta(CW)=-21.54$  K, the nearest neighbor interaction  $J(nn)=-2.30$  K, the classical nearest neighbor  $J(c)=-8.65$  K and the dipolar  $D(nn)=3.76$  K interactions' values have revealed an antiferromagnetic behavior for Er2Ti2O7 compound at low temperature. We have also studied the effects of the magnetic field splitting of rare-earth atom Er3+ in the compound Er2Ti2O7 curved Arrott plots.

### Keywords

**Author Keywords:** Pyrochlores oxides; Magnetic frustration properties; Antiferromagnetism; Magnetic entropy change; Second-order magnetic transition; Arrott plot

**KeyWords Plus:** SPIN-GLASSES; PYROCHLORES; ORDER; TEMPERATURE; DISORDER; LATTICE

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