MAGNETIC PROPERTIES OF LAYER-TYPE COMPOUNDS $TlGdS_2$ AND $TlGdSe_2$

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9.7 cm

Ternary thallium lanthanide dichalcogenides $TlLnX_2$ (X = S, Se or Te; Ln = lanthanide, except Ce and Pr) crystallize in the rhombohedral structure of α-$NaFeO_2$ type ($R\bar{3}m$). Their crystal lattice consists of the layers of Ln^{3+} ions separated by three layers of the non-magnetic ions (-Ln-X-Tl-X-Ln-). The magnetization was measured in the field range 0-14 T. The low temperature magnetic susceptibility was also measured (down to 2.2 K for $TlGdS_2$) in order to find a possible magnetic transition. The molecular field constants λ were estimated by fitting the Brillouin function to the experimental magnetization plots. The difference between the λ values for the thallium gadolinium sulphide and the selenide corresponds to the different character of Gd-S and Gd-Se bonds and gives rise to the different J_1 and J_2 exchange integrals.

13.4 cm

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