9.7 cm

$CsDy(MoO_4)_2$ AND $KEr(MoO_4)_2$ - LOW-DIMENSIONAL ISING MAGNETS

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$KEr(MoO_4)_2$ (I) and $CsDy(MoO_4)_2$ (II) represent low-dimensional magnetic systems with dominant dipolar interactions with ordering temperatures $T_c \approx 1$ K. Previous studies in zero magnetic field, B, revealed that at helium temperatures (I) resembles a behaviour of S=3/2 rectangular Blume-Capel model with intrachain interaction J_1/k_B=0.85 K, interchain interaction $J_2/k_B \approx 0.2$ K and single-ion anisotropy $2.D/k_B$=21 K, while in (II) - S=1/2 Ising system, more intensive strength of interchain correlations was observed, $J_2/J_1 \approx 1$, J_1/k_B=0.6 K. In the present work the behaviour of cluster excitations in B parallel to the easy axis was experimentally studied by the measurements of specific heat, C, vs. B dependence studied at constant temperatures. Corresponding Monte Carlo (MC) simulations of C revealed that despite of the fact that exchange-coupling models proved useful for a sufficient description of the dipolar systems in B=0, the analysis of current experimental data requires a partial renormalization of previously obtained J_1, J_2 parameters. The influence of crystal field effects and long-range character of spin correlations is discussed. Furthermore, MC calculations revealed that the formation of cluster excitations in paramagnetic regime, studied in the chain direction, resembles the behaviour of S=1/2 Ising chain.

13.4 cm

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