Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Thermodynamic properties of a layered S = 7/2 Heisenberg magnet $Gd(OH)CO_3$[1] MARTIN ORENDAC, MARTIN ULICNY, ERIK CIZMAR, ALZBETA ORENDACOVA, P. J. Safarik University, Park Angelinum 9, 040 01 Kosice, Slovakia, YAN-CONG CHEN, ZHAO-SHA MENG, MING-LIANG TONG, Sun Yat-Sen University, Guangzhou, 510275, P. R. China. — Thermodynamic quantities and ESR spectra of $Gd(OH)CO_3$ (I) are reported. The material may be considered to consist of weakly coupled layers with potentially triangular arrangement of exchange paths within each layer. Different bridging groups and distances among Gd^{3+} ions may be responsible for spatial anisotropy of magnetic coupling. Preliminary analysis of magnetic susceptibility using Curie-Weiss law yielded θ =-1.05 K indicating weak antiferromagnetic coupling and consequently, spin frustration in (I). More detailed simultaneous analysis of specific heat, susceptibility and magnetization studied down to nominally 0.45 K revealed non-negligible role of single-ion anisotropy. Using the model of weakly interacting S=7/2 trimers, the gross features of measured data may be explained while assuming single-ion anisotropy $D/k_B \approx 0.6$ K and effective *intra*trimer magnetic coupling $|J/k_B| \approx 0.3$ K. The obtained D value reasonably reproduces the position and shape of ESR line. The performed analysis suggests that magnetism in (I) is governed predominantly by crystal field effects and frustration plays a minor role.

[1]Supported by ITMS26220120005 and VEGA 1/0143/13.

Martin Orendac
PJ Safarik Univ

Date submitted: 12 Nov 2014 Electronic form version 1.4