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Neutron Magnetic Excitation Study of the Giant Magnetic Molecule $\{\text{Mo}_{72}\text{Fe}_{30}\}$ V.O. GARLEA, Ames Lab.& ISU, Ames, IA, USA, S.E. NAGLER, ORNL, Oak Ridge, TN, USA, J.L. ZARESTKY, C. STASSIS, D. VAKNIN, P. KOGERLER, Ames Lab.& ISU, Ames, IA, USA, D.F. MCMORROW, Univ. College London, UK, C. NIEDERMAYER, Lab. Neutron Scattering PSI, Switzerland, Y. QIU, NCNR, Gaithersburg, MA, USA, D.A. TENNANT, Univ. St Andrews, Scotland, UK, B. LAKE, Clarendon Lab, Univ. Oxford, UK, M. EXLER, J. SCHNACK, Univ. Osnabruck, Germany, M. LUBAN, Ames Lab.& ISU, Ames, IA, USA — We report cold-neutron inelastic scattering measurements on deuterated samples of $\{\text{Mo}_{72}\text{Fe}_{30}\}$ Keplerate. The nanocluster $\{\text{Mo}_{72}\text{Fe}_{30}\}$ is a molecular quasi-sphere in which 30 Fe^{3+} ions ($S = 5/2$) occupy the vertices of an icosidodecahedron. The spins interact via an isotropic AF exchange coupling between nearest-neighbors. The measurements reveal a magnetic excitation spectrum that can be interpreted within the context of an effective three-sublattice Hamiltonian model. At mK temperatures, an excitation at $E \sim 0.63$ meV is observed that can be attributed to the gap between the two lowest rotational-bands predicted by the model. Applied magnetic fields in the 0 – 8.5 Tesla range confirm the magnetic origin of the spectrum. The temperature and field dependence of the energy spectra are discussed.

Prefer Oral Session
 Prefer Poster Session

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