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Magnetic Structure and Spin Waves in $Co_2(OD)_3Cl$ SACHITH DISSANAYAKE, S. JI, Department of Physics, University of Virginia, C. CHAN, T.K. NG, Department of Physics, Hong Kong University of Science and Technology, J. LEE, Department of Physics, University of Virginia, Y. QIU, NIST Center for Neutron Research, K.C. RULE, B. LAKE, Helmholtz Zentrum Berlin, M. GREEN, NIST Center for Neutron Research, X.G. ZHENG, Department of Physics, Saga University, S.-H. LEE, Department of Physics, University of Virginia — We have examined the magnetic structure of $Co_2(OD)_3Cl$ with magnetic Co^{2+} ($3d^7$; s= 3/2) ions using neutron powder diffraction data. Magnetic structure that yields the best refinement factor is an "umbrella"-type antiferromagnetic structure with ab-components of magnetic moments in the kagome plane forming a q=0 120° structure and the moments are canted out of the plane by $\sim 40°$. The magnetic moments in the triangular plane are aligned ferromagnetically along the c-axis. We have performed linear spin wave calculations considering the nearest neighbor interactions J within the kagome plane and J_F between the kagome and the triangular plane. The effects of J_F/J and the canting angle to the spin wave dispersion was studied thoroughly, to find out an effective spin hamiltonian that explains our inelastic neutron scattering data with two prominent excitation modes centered at 3 meV and 19 meV. Single ion-type anisotropy was also included in the spin hamiltonian to study its effect to the spin wave excitation.

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