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Magnetic properties of the $S = 1/2$ antiferromagnetic spin-chain $\alpha-\mathbf{Cu_2V_2O_7}$ GANATEE GITGEATPONG, Mahidol University, Thailand, YANG ZHAO, NIST Center for Neutron Research, National Institute of Standards and Technology, USA, MAXIM AVDEEV, ROSS PILTZ, Australian Nuclear Science and Technology Organisation, Australia, TAKU SATO, IMRAM, Tohoku University, Japan, KITTIWIT MATAN, Mahidol University, Thailand — Magnetic properties of the $S = 1/2$ antiferromagnetic spin-chain, $\alpha-Cu_2V_2O_7$, have been studied using magnetization and neutron scattering measurements on powder and single-crystal samples. Magnetic susceptibility reveals a Curie-Weiss temperature of Θ = -73.2(9) K with a magnetic phase transition at T_N = 33 K while the Bonner-Fisher fit to the magnetic susceptibility for $T > T_N$ with magnetic field perpendicular to the crystallographic $a-$axis yields the intra-chain coupling of $|J|/k$ = 46.0(2) K. Small ferromagnetism below T_N is due to spin-canting caused by Dzyaloshinskii-Moriya interactions. Analysis of the neutron diffraction data reveals that the Cu^{2+} spins are coupled antiferromagnetically along zigzag chains, which run alternately along [011] and [01-1] directions. The ordered moment of 0.925(3) μ_B is predominantly along the $a-$axis. Our recent inelastic neutron scattering, which reveals atypical magnetic excitations centered at commensurate wave vectors (0, $\pm$0.25, 0) around the magnetic zone center, will also be discussed.

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