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Magnetic Properties of a Canted Antiferromagnet $Mn(N_3)_2$(4,4'-bpy) YOUCEF HAMIDA, DUSAN DANILOVIC, C.L. LIN, TAN YUEN, Dept. of Physics, Temple University, Philadelphia, PA, KUNHAO LI, JING LI, Dept. of Chemistry & Chemical Biology, Rutgers University, Piscataway, NJ — Results of magnetic susceptibility $\chi(T)$, isothermal magnetization $M(H)$, and heat capacity $C(T)$ measurements on a manganese complex with mixed ligands $Mn(N_3)_2$(4,4'-bpy) (4,4'-bpy = 4,4'-bipyridine) are reported. The crystal structure of this three-dimensional manganese azide network is tetragonal, with lattice parameters $a = b$ = 8.1 Å and c = 16.7 Å. Fitting the high T data of $\chi(T)$ on powder samples resulted an effective moment μ_{eff} = 4.9 μ_B for the Mn^{2+} moments, and a strong antiferromagnetic interaction of θ = - 120 K. An antiferromagnetic transition with rather high transition temperature of 39 K was observed in the $M(T)/H$ data of $Mn(N_3)_2$(4,4'-bpy), and large non-compensated component in $\chi(T)$ below T_N was seen. The result of $M(H)$ measures showed that $Mn(N_3)_2$(4,4'-bpy) behaves like a ferrimagnet below T_N, with a small coercive field of H_{coe} = 150 G at 1.8 K. A sizable anomaly was observed in $C(T)$ data, and this confirms the long-range magnetic phase transition and the T_N. The magnetic behavior of this compound is discussed in terms of a strong Mn-Mn coupling through this unique network with end-to-end azido bridges, and compared with the magnetic behavior of its iron isostructural analogue $Fe(N_3)_2$(4,4'-bpy).

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