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Magnetic Properties of Porous Metal-Organic Frameworks: $Ni_2(BODC)_2(TED)$ and $Ni_2(BDC)_2(TED)$ YOUCEF HAMIDA, DUSAN DANILOVIC, CHYAN LIN, TAN YUEN, Temple University, KUNHAO LI, MOOTHETTY PADMANABHAN, JING LI, Rutgers University, TEMPLE UNIVERSITY PHYSICS DEPARTMENT TEAM, RUTGERS UNIVERSITY DEPT. OF CHEMISTRY & CHEMICAL BIOLOGY TEAM — Results of $\chi(T)$, $M(H)$, and heat capacity $C(T)$ measurements on two Ni dimer based porous materials $Ni_2(BODC)_2(TED)$ and $Ni_2(BDC)_2(TED)$ are reported. These materials form a tetragonal crystal structure of space group P4/ncc with $a = b = 14.9$ Å and $c = 19.4$ Å and Ni-Ni separation of 2.61Å within the dimer. Magnetic data of $Ni_2(BODC)_2(TED)$ revealed a ferromagnetic-like transition at about 17 K with $\theta =$ 8 K, and a coercivity field of 1700 G was observed in the hysteresis curve. Though isostructural to $Ni_2(BODC)_2(TED)$, $\chi(T)$ and $M(H)$ results of $Ni_2(BDC)_2(TED)$ showed an antiferromagnetic transition at 10 K with $\theta =$ - 132 K, and no hysteresis was observed. Although specific heat data $C(T)$ showed no clear transition in both compounds, nonlinear behavior is clearly seen in C/T vs. T plots, and a fit to the electron and phonon contributions to $C(T)$ gives a large heavy-fermion-like γ in both cases. A model for the magnetic interactions is proposed and a comparison to the Cu and Co analogues is also made.

Youcef Hamida
Temple University

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