Abstract Submitted
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Analysis on the Magnetic and Thermodynamic behavior of a Linear Magnetic Chain [Co(bpdc)(H_2O)$_2$].H_2O YOUCEF HAMIDA, DUSAN DANILOVIC[1], TAN YUEN, Temple University, QIHAN GONG, JING LI, Rutgers University, DEPT. PHYSICS, TEMPLE UNIVERSITY COLLABORATION, DEPT. CHEMISTRY AND CHEMICAL BIOLOGY, RUTGERS UNIVERSITY COLLABORATION — [Co(bpdc)(H_2O)$_2$].H_2O (bpdc=biphenyldicarboxylate) was found to be a one dimensional ferromagnetic Co (II) chain system that orders below 5.5 K due to a weak antiferromagnetic inter-chain coupling. Classical Fisher Model (CFM), Mean Field Theory (MFT), and Ising Model (IM) were applied to the high temperature susceptibility data of [Co(bpdc)(H_2O)$_2$].H_2O. The fit to CFM yielded a J/k$_B$ = + 7.40 K with R^2 = 0.993; MFT gave a J/k$_B$ = + 5.31 K with a low R^2 = 0.391. The ratio interchain interactions (J') to that of intra-chain interactions was estimated to be J'/J = - 0.005. The magnetic specific heat was obtained via direct subtraction of the specific heat data for Zinc analogue from that of [Co(bpdc)(H_2O)$_2$].H_2O . The magnetic specific heat data was fit to the Ising Model for spin $^1/_2$ yielding J/k$_B$ = + 15.27 K. The interpretations on the spin state of the Co(II) at different temperatures in the compound are consistent with the behavior of Co(II) in other compounds with similar octahedral sites.

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