

Abstract Submitted  
for the MAR06 Meeting of  
The American Physical Society

**Magnetic Properties of a Novel Fe(II) *meso*-tetra(4-pyridyl)porphyrin Network** DUSAN DANILOVIC, CHYAN LONG LIN, TAN YUEN, Department of Physics, Temple University, LONG PAN, JING LI, Department of Chemistry & Chemical Biology, Rutgers University, Piscataway, NJ 08854 — Magnetic properties of Fe(II) *meso*-tetra(4-pyridyl)porphyrin [Fe(TpyP)], a newly discovered metalloporphyrin network, were investigated using magnetic susceptibility  $M(T)/H$ , isothermal magnetization  $M(H)$ , and heat capacity  $C(T)$  measurements. The crystal structure of Fe(TpyP) at room temperature is orthorhombic with a space group  $Cmca$  (No. 64). And this network gives rise to an unprecedented two-dimensional paddle-wheel-like pattern (a  $4^4$  topology). The results of  $M(T)/H$  on powder samples of Fe(TpyP) show that the effective moment  $\mu_{eff}$  of  $Fe^{2+}$  is  $5.52 \mu_B$  at 340 K, close to the expected value for a high spin  $Fe^{2+}$  ( $S = 2$ ) ion.  $\mu_{eff}$  increases to  $5.90 \mu_B$  as  $T$  decreases to the range of  $170 \text{ K} < T < 220 \text{ K}$ , and then decreases monotonically as  $T$  decreases further. The behavior of  $\mu_{eff}$  in the high temperature region may be attributed to a positive  $Fe^{2+}$ - $Fe^{2+}$  coupling. The low field ( $H \leq 4 \text{ kG}$ )  $M(T)/H$  data reveal an anomalous behavior of this compound in the low temperature region which seems spin-glass-like. A small hysteresis was observed in  $M(H)$  measured at 2 K. No anomaly was seen in the  $C(T)$  data from 1.6 to 25 K.

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Date submitted: 01 Dec 2005

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