

# Low Temperature Static Magnetization of an Organic Ferromagnet, $\beta$ -*p*-NPNN

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Static magnetic measurements below 1 K is not very common, because most commercially-available magnetometers are limited to operation with <sup>4</sup>He. Instead, dynamical methods such as inductive detection using a pickup coil, which are compatible with almost any cryostat, are usually employed to study magnetic behavior below 1 K. These have lead to the findings of many molecular magnets showing long-range ordering at low temperatures. However, it is not easy to obtain precise values of magnetization by dynamical methods because of the difficulty in correction for the filling factor of the sample with respect to the pickup coil.

We report here the results of static magnetization measurements of the  $\beta$ -phase of *p*-NPNN, by use of a <sup>3</sup>He cryostat, iHelium3 (IQUANTUM, Inc.) designed for installation into a Quantum Design MPMS magnetometer. The ferromagnetism of  $\beta$ -*p*-NPNN, the first organic ferromagnet, has been established by ac susceptibility, specific heat etc.<sup>1)</sup> By the static measurements, we now confirm that the saturation magnetization in the ferromagnetic state truly amounts to the value expected for a spin-1/2 Heisenberg ferromagnet. The too small value reported previously<sup>1)</sup> should be due to insufficient correction for the filling factor in the dynamical method. We have also found that  $\beta$ -*p*-NPNN is a very soft magnet with negligible coercive force at around 0.55 K.

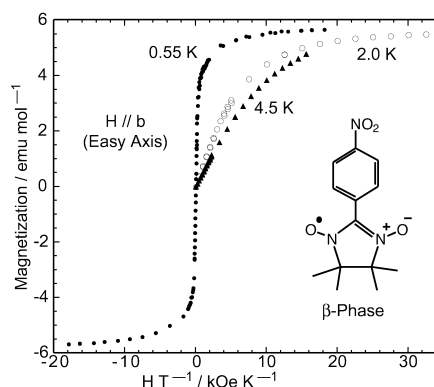


Fig. 1. Isothermal magnetization of  $\beta$ -*p*-NPNN plotted vs.  $H/T$ . The data are corrected for the diamagnetic contributions, but not yet for the demagnetization effect.

1) Y. Nakazawa et al.: Phys. Rev. B 46 (1992) 8906.