ELECTRONIC SUPPORTING INFORMATION

A 1-D coordination polymer based on a Mn₄₀ octagonal super-structure

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Experimental Procedure
{(Et₄N)[Mn₁₂(μ₃-O)₁₀(μ₃-OH)₂(sao)₁₂Br₃(O₂CMe)₁₂(H₂O)₁₀(CH₃CN)]Br₂}ₙ (1): 1,3-butanediol (H₂bd) (0.502 ml, 0.505 g, 5.60 mmol), saoH₂ (0.096 g, 0.70 mmol) and Et₄NBr (0.147 g, 0.70 mmol) were added to a solution of MnBr₂·4H₂O (0.200 g, 0.70 mmol) and Mn(O₂CMe)₂·4H₂O (0.171 g, 0.70 mmol) in 12 ml MeCN. The resulting green-brown solution was stirred for 1 hour, filtered off and layered with Et₂O. X-ray quality crystals of 1·10MeCN·H₂O were formed after three weeks in ~30% yield. Vacuum – dried microcrystalline solid was analyzed as 1·MeCN. Caled. (found): C 32.71 (32.89), H 3.29 (3.35), N 4.77 (4.82).
**Fig. S1.** A simplified (top) and ball and stick (bottom) representations of a part of the zig-zag chain of (1)$_n$ from a viewpoint that emphasizes the connection of the Mn$_{40}$ octagons to form the ribbon-shaped 1-D chain. The black solid line and metal ion polyhedra are included to emphasize the Mn$_{40}$ superstructure; Colour scheme: Mn$^{III}$: blue; Mn$^{II}$: pink; O: red; Br: green; N: dark blue; C: gray. Hydrogen atoms have been omitted for clarity.
**Fig. S2.** Representation along the b axis of the packing of (1)$_n$. The metal ion polyhedra are included to emphasize the 1-D chains of (1)$_n$ consisting of Mn$_{40}$ octagons that run parallel in the crystal. Colour scheme: As in Fig. S1. Hydrogen atoms have been omitted for clarity.
Fig. S3. Plot of magnetisation ($M/N\mu_B$) versus field for $\text{I} \cdot \text{MeCN}$.

Fig. S4. Plot of $M/N\mu_B$ versus $H/T$ for $\text{I} \cdot \text{MeCN}$. The solid red lines are a guide to the eye only.
Fig. S5. Plot of the out-of-phase ($\chi_M''$) ac susceptibility versus T, in the indicated frequency range for 1·MeCN. The data was collected in a 3.5G ac field and zero-applied dc field. The presence of frequency-dependent signals is indicative of slow relaxation of the magnetisation.