# ELECTRONIC SUPPORTING INFORMATION

## A 1-D coordination polymer based on a $Mn_{40}$ octagonal super-structure

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**Experimental Procedure**

$\{(Et_4N)[Mn_{21}(\mu_3\text{-}O)_6(\mu_3\text{-}OH)_2(sao)_{12}Br_3(O_2CMe)_{12}(H_2O)_{10}(CH_3CN)]Br_2\}_n$ (**1**)$_n$**:** 1,3-butanediol ($H_2$bd) (0.502 ml, 0.505g, 5.60 mmol), sao$H_2$ (0.096 g, 0.70 mmol) and $Et_4NBr$ (0.147 g, 0.70 mmol) were added to a solution of $MnBr_2\cdot 4H_2O$ (0.200 g, 0.70 mmol) and $Mn(O_2CMe)_2\cdot 4H_2O$ (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 $Et_2O$. X-ray quality crystals of **1**·10MeCN·$H_2O$ were formed after three weeks in ~30% yield. Vacuum – dried microcrystalline solid was analyzed as **1**·MeCN. Calcd. (found): C 32.71 (32.89), H 3.29 (3.35), N 4.77 (4.82).

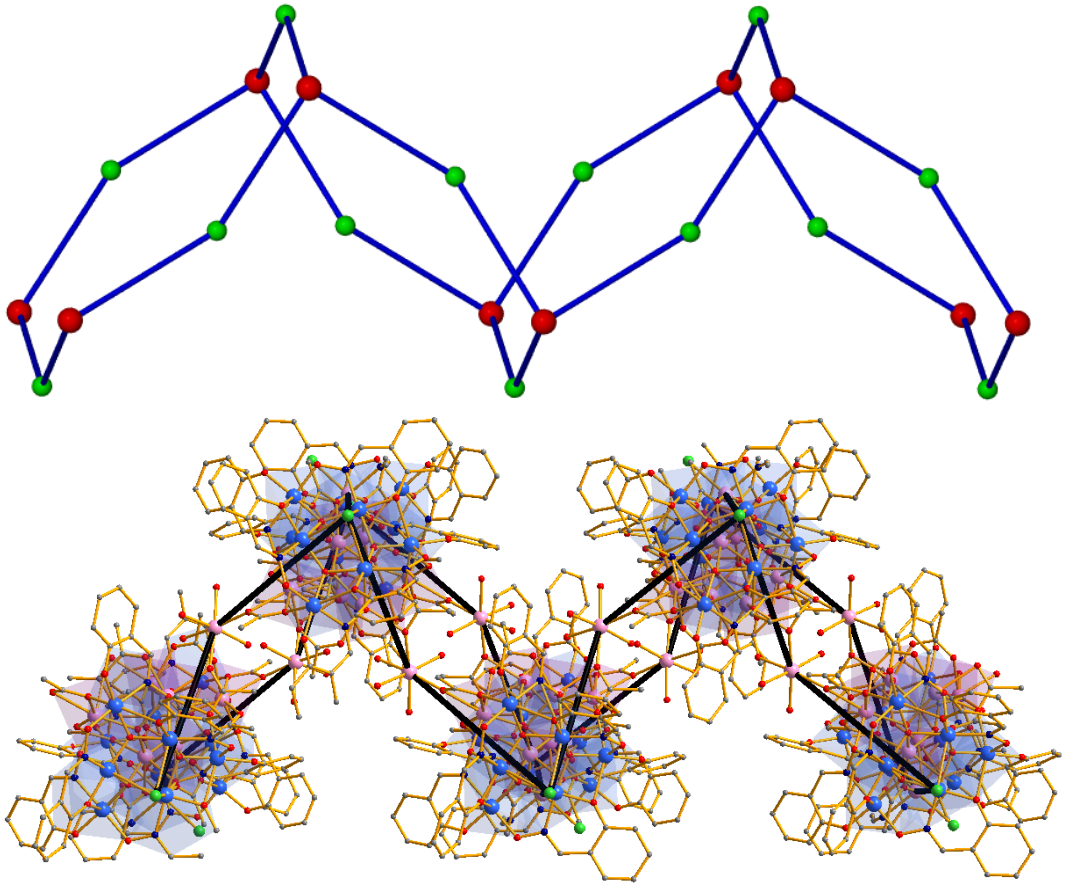

**Fig. S1.** A simplified (top) and ball and stick (bottom) representations of a part of the zig-zag chain of $(\mathbf{1})_n$ from a viewpoint that emphasizes the connection of the $Mn_{40}$ octagons to form the ribbon-shaped 1-D chain. The black solid line and metal ion polyhedra are included to emphasize the $Mn_{40}$ super-structure; Colour scheme: $Mn^{III}$: blue; $Mn^{II}$: pink; O: red; Br: green; N: dark blue; C: gray. Hydrogen atoms have been omitted for clarity

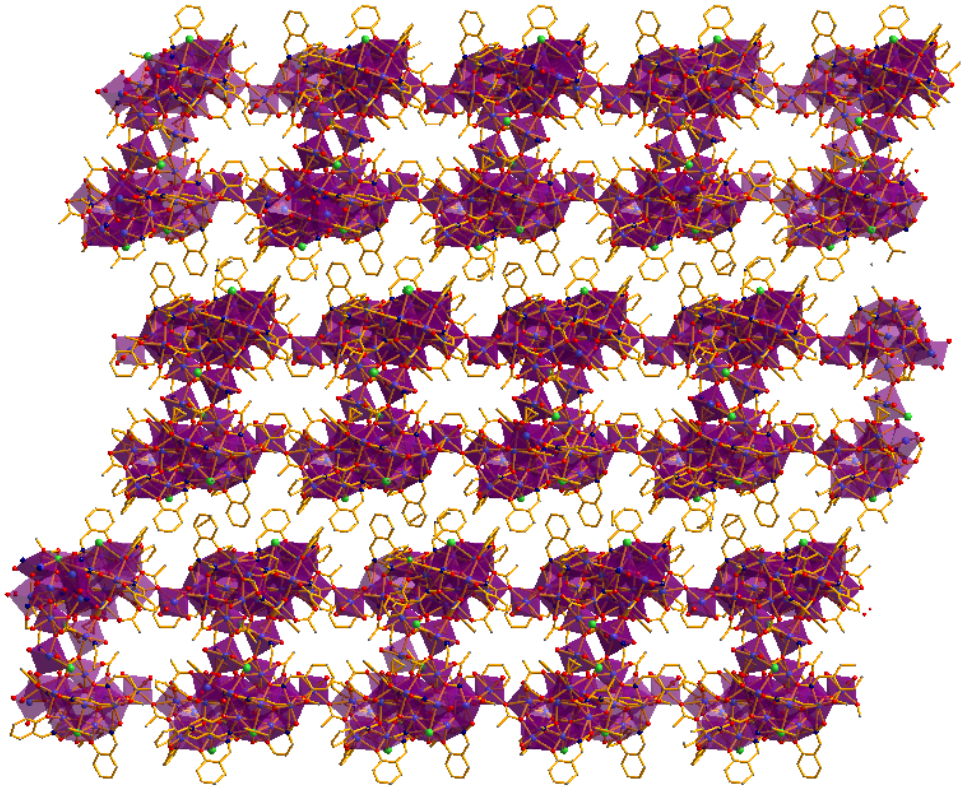

**Fig. S2.** Representation along the b axis of the packing of $(\mathbf{1})_n$. The metal ion polyhedra are included to emphasize the 1-D chains of $(\mathbf{1})_n$ consisting of $Mn_{40}$ octagons that run parallel in the crystal. Colour scheme: As in Fig. S1. Hydrogen atoms have been omitted for clarity.

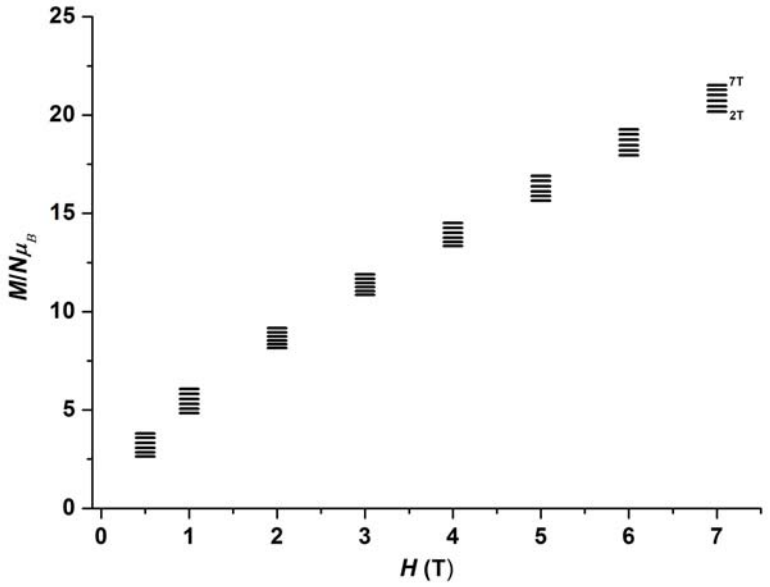


**Fig. S3.** Plot of magnetisation ($M/N\mu_B$) versus field for **1**·MeCN.

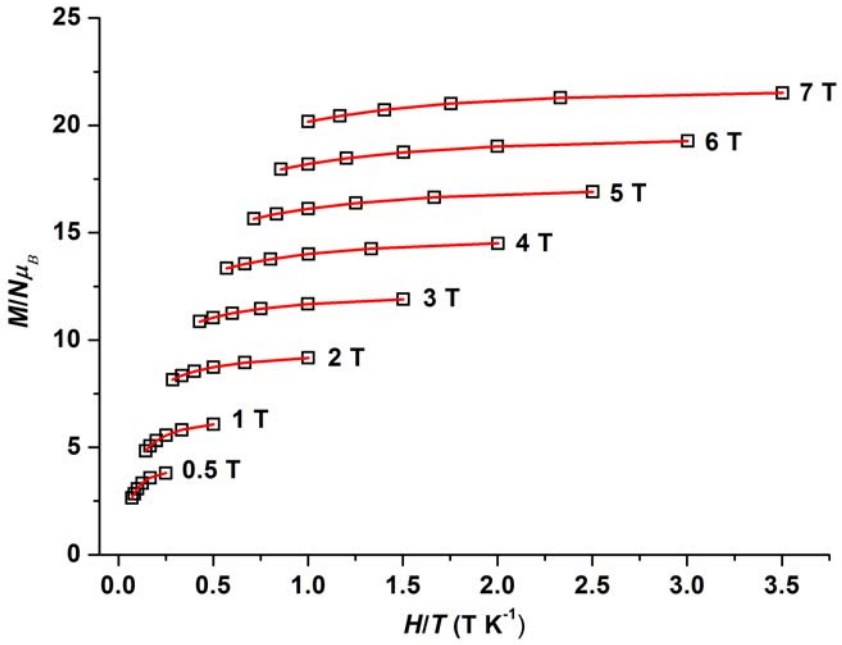


**Fig. S4.** Plot of $M/N\mu_B$ versus H/T for **1**·MeCN. The solid red lines are a guide to the eye only.

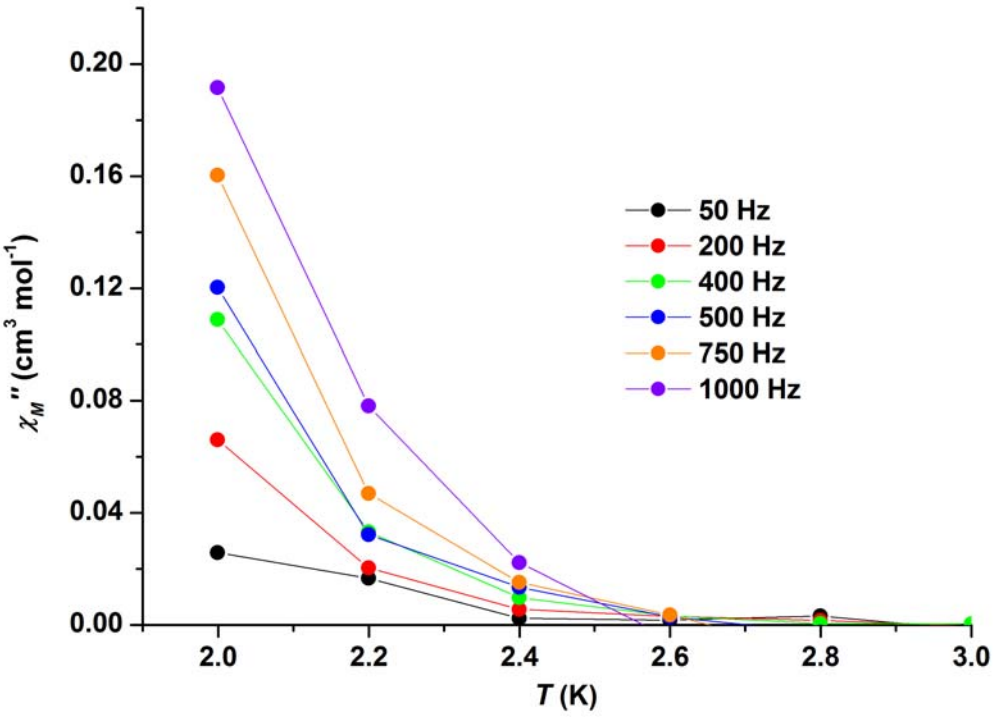


**Fig. S5.** Plot of the out-of-phase ($\chi_M$'') ac susceptibility versus T, in the indicated frequency range for **1**·MeCN. The data was collected in a 3.5G ac field and zero-applied dc field. The presence of frequency-dependent signals is indicative of slow relaxation of the magnetisation.