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Electronic Supplementary Information

A new family of oxime-based hexanuclear manganese(III) single molecule magnets with high anisotropy energy barriers

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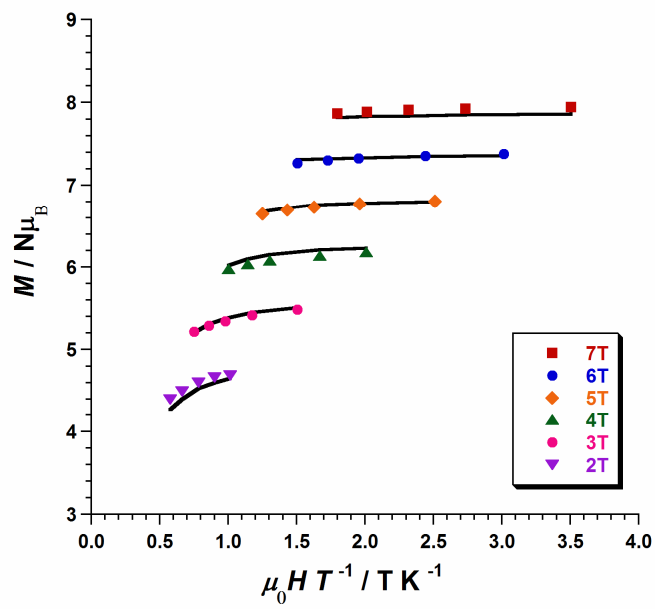

Figure S1. Magnetization *vs* H/T for compound **1** in the 2-7 Tesla field range and 2-10 K temperature range.

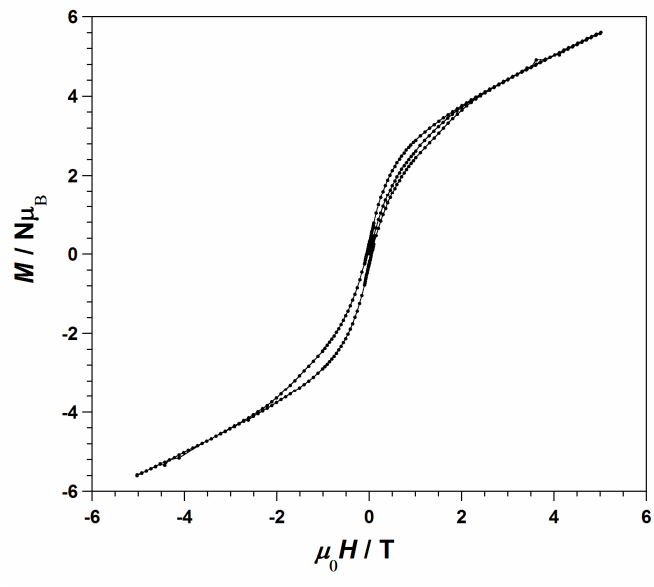

Figure S2. Hysteresis loop (Magnetization *vs* field) for **1** at 1.8 K (introduction of the sample in the SQUID at 200 K). The opening of the loop is consistent with a SMM behaviour.

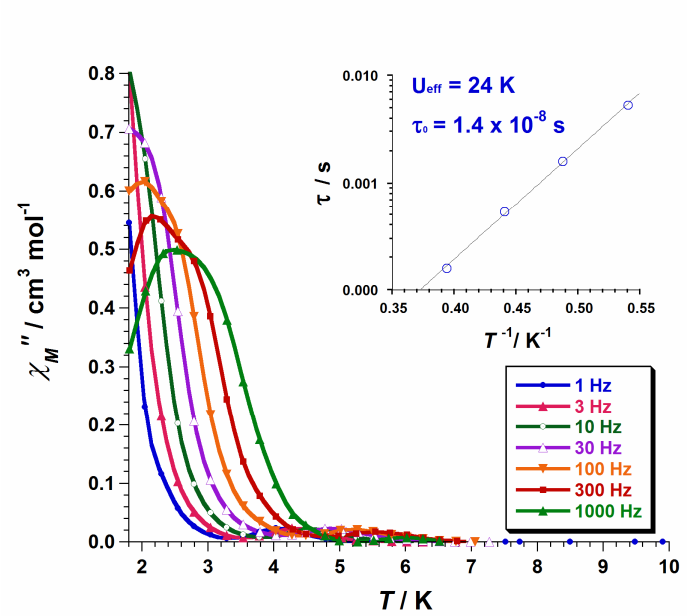

Figure S3. Out-of-phase *ac* susceptibility (χ_M'') and Arrhenius plot for **1** (introduction of the sample in the SQUID at 200 K).

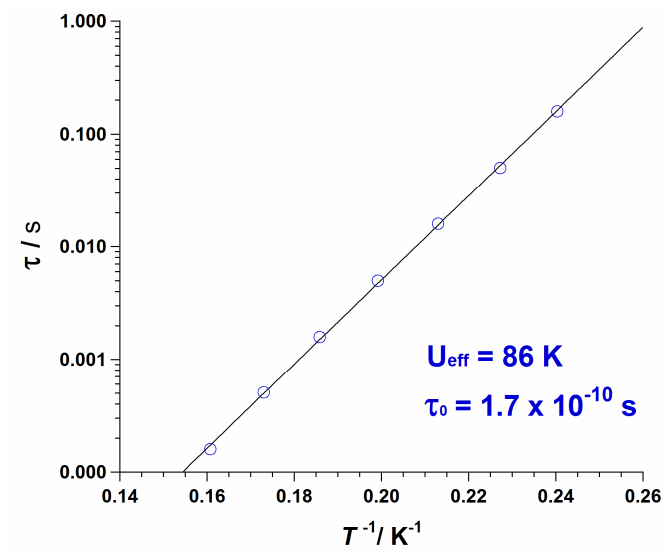

Figure S4. Arrhenius plot for the slowest relaxation process displayed by desolvated **1** (data from Figure 3a).

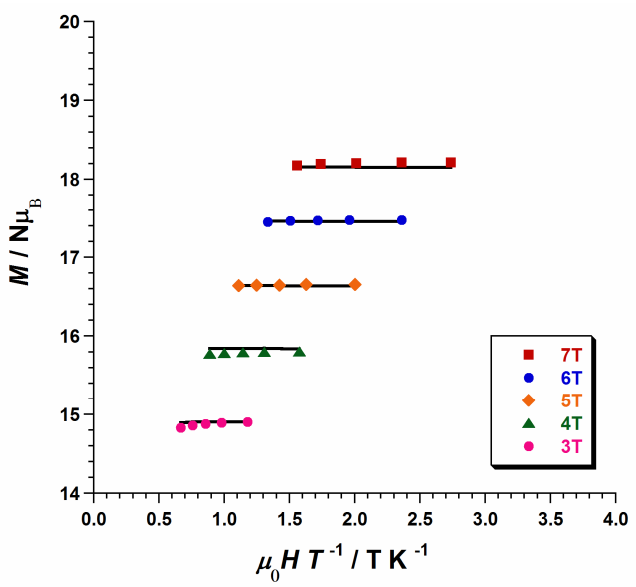

Figure S5. Magnetization *vs* H/T for compound **2** in the 3-7 Tesla field range and 2-10 K temperature range.

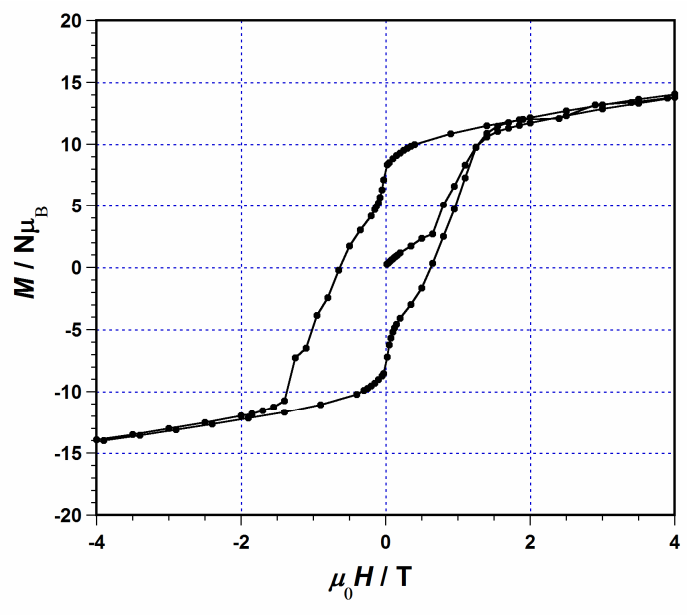

Figure S6. First magnetization curve *vs* magnetic field and hysteresis loop at 2 K for **2**.

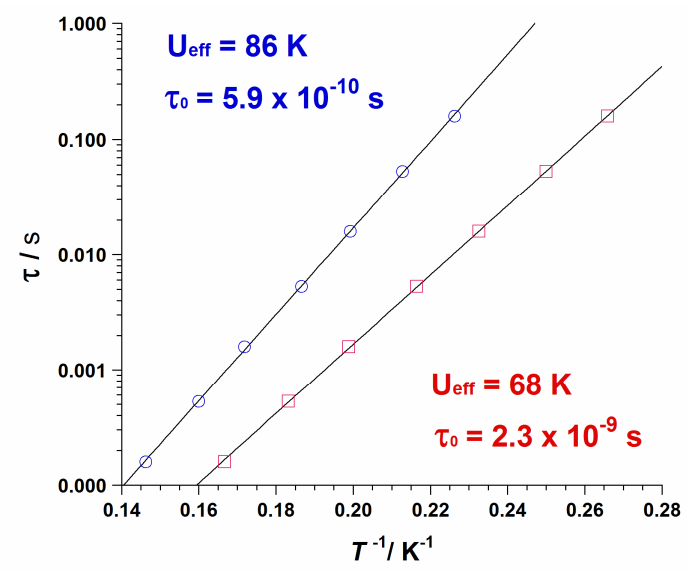

Figure S7. Arrhenius plots for the two relaxation processes in **2** (data from Figure 3b).

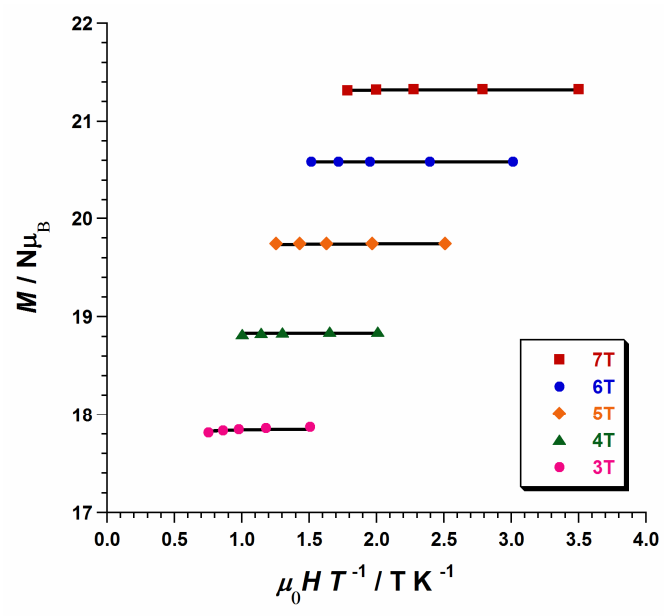

Figure S8. Magnetization *vs* H/T for **2'** in the 3-7 Tesla field range and 2-10 K temperature range.

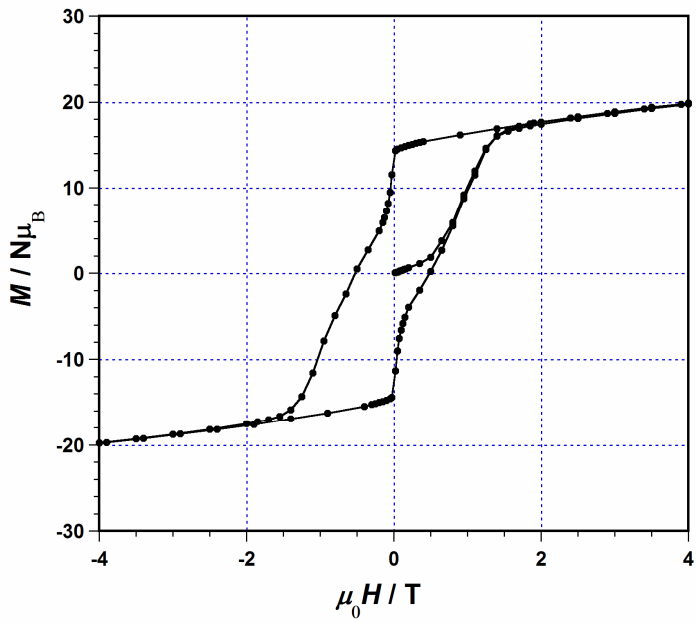

Figure S9. First magnetization curve *vs* magnetic field and hysteresis loop at 2 K for **2'**.

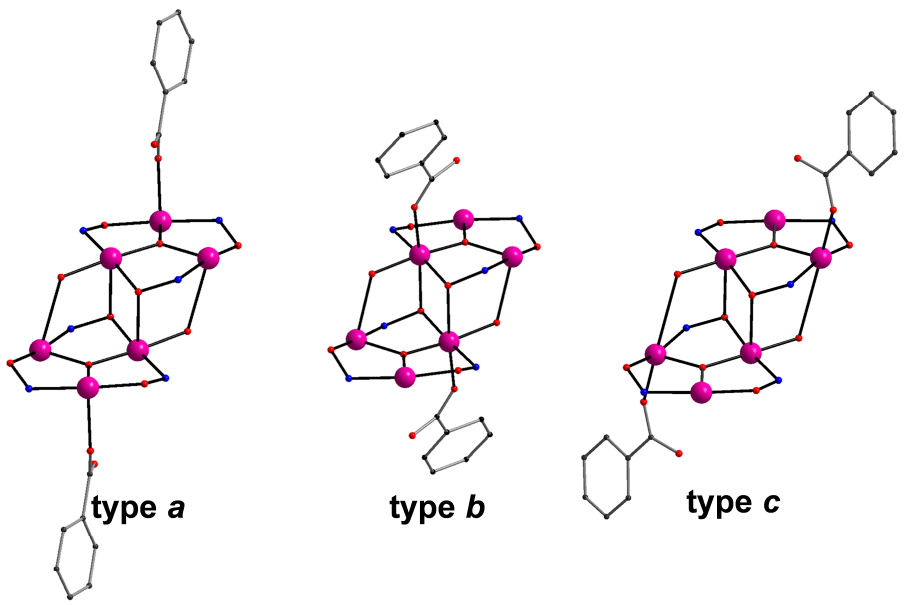

Figure S10. Three structural types for the carboxylate coordination found in Mn_6 complexes (*a* = *trans* to solvent ligand, *b* = *trans* to oximate oxygen atom and *c* = *trans* to phenolate oxygen atom).