Supporting Information

Slow relaxation of the Magnetization Observed in an Antiferromagnetically Ordered Phase for SCM-based Two-Dimensional Layered Compounds

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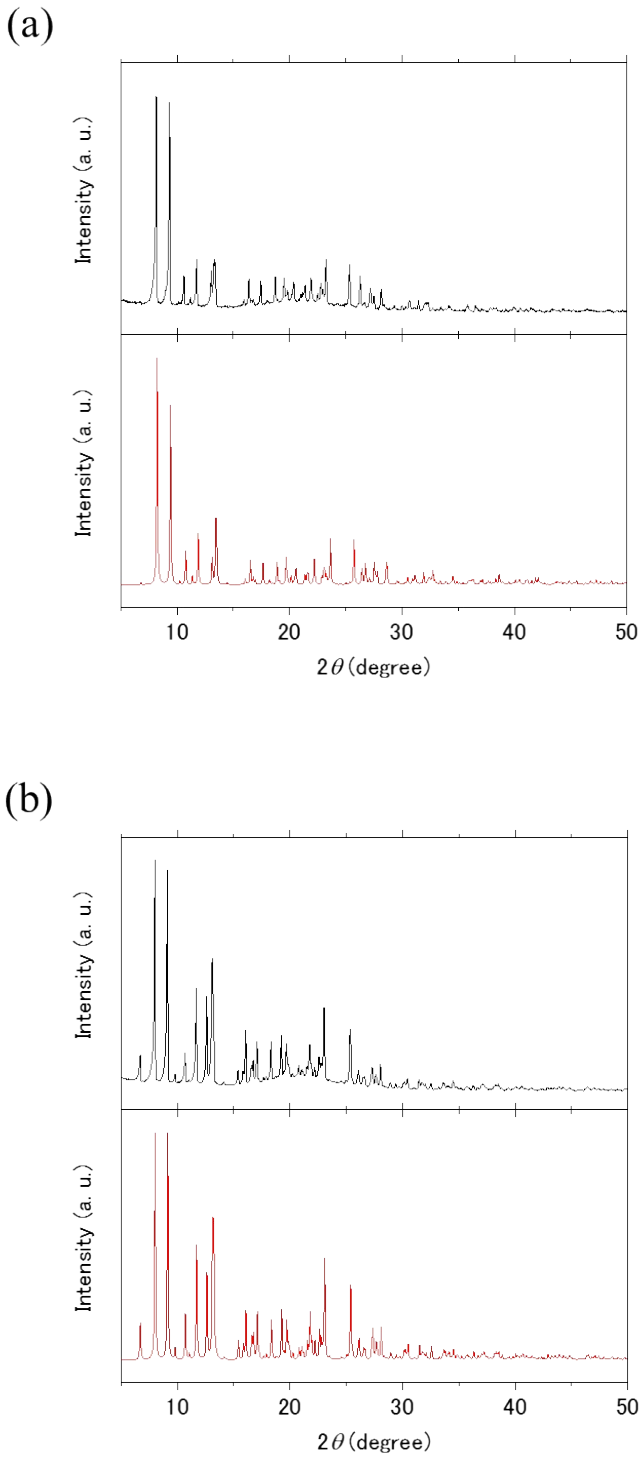


Figure S1. Powder X-ray diffraction (PXRD) patterns for (a) **1** and (b) **2**. PXRD measurements (black solid line) were performed at room temperature (*T*). Simulated patterns (red solid line) were made by using single-crystal X-ray crystallographic data.

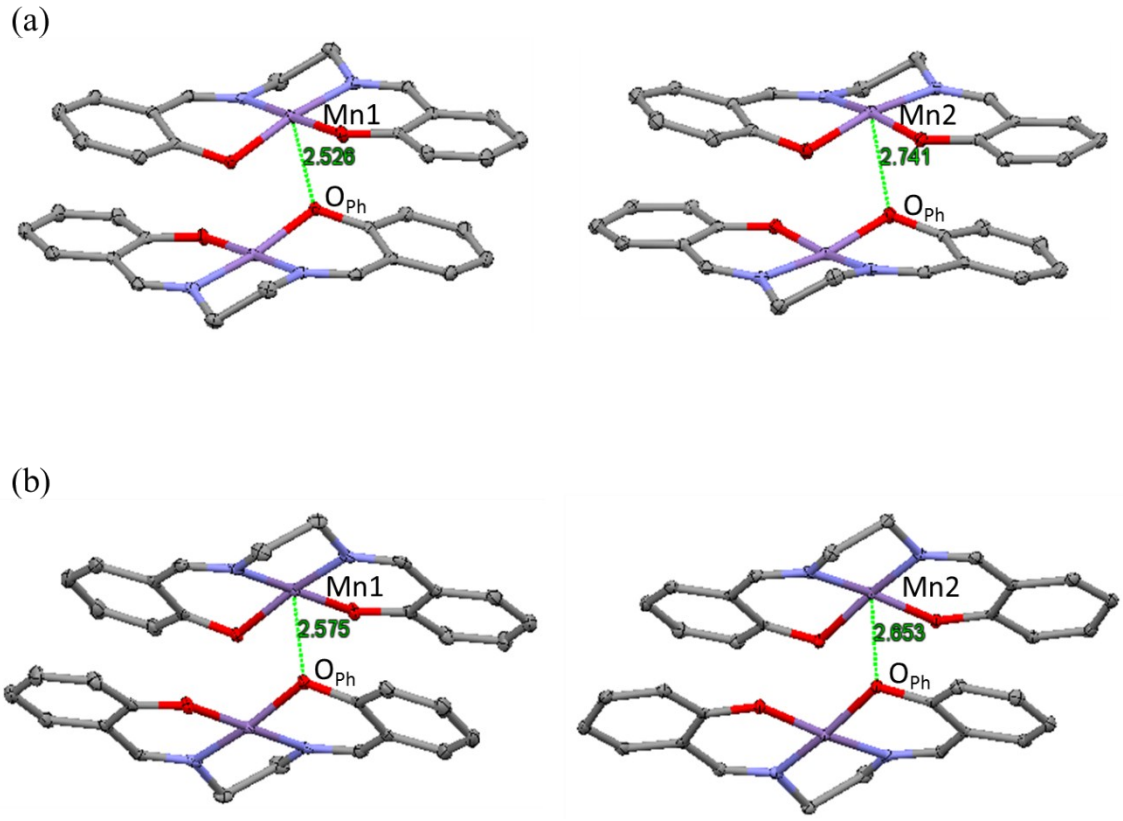
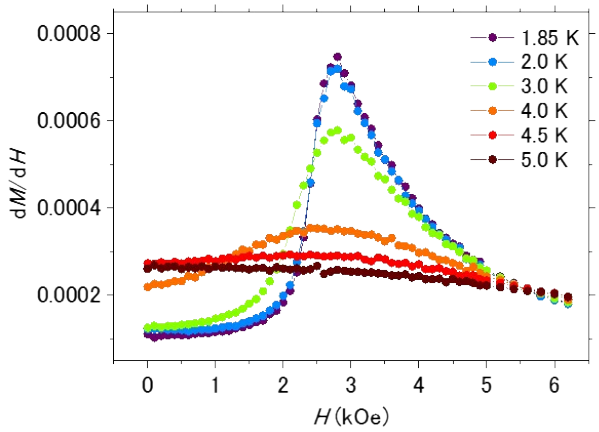


Figure S2. Crystal structures of dimer units [Mn(1)$_2$] and [Mn(2)$_2$] for (a) **1** and (b) **2** with thermal ellipsoids at the 50 % probability, where hydrogen atoms, counter anions, dicarboxylate dianions and solvent molecules were omitted for clarity.

(a)



(b)

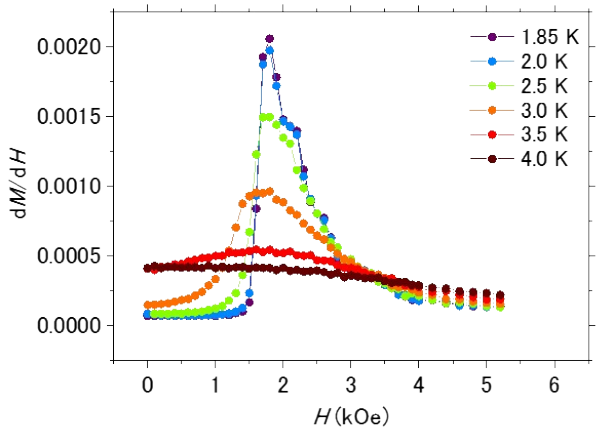
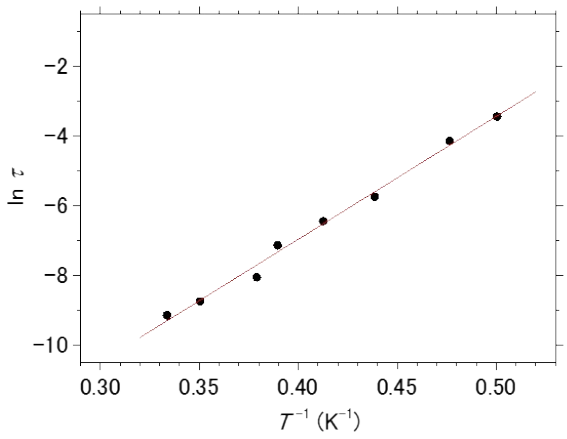


Figure S3. First *H* derivatives of the magnetization as a function of the applied *H* for (a) **1** and (b) **2**. Solid lines are guides for eyes.

(a)



(b)

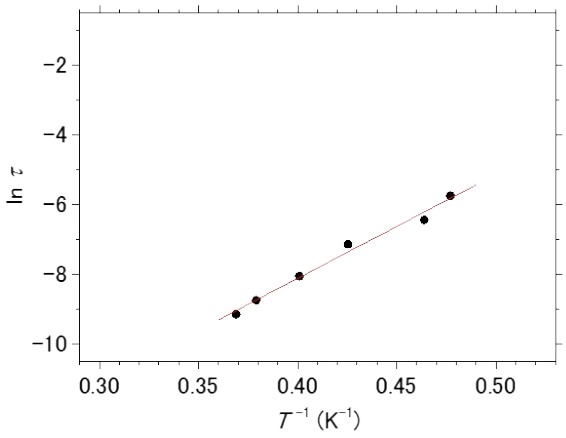
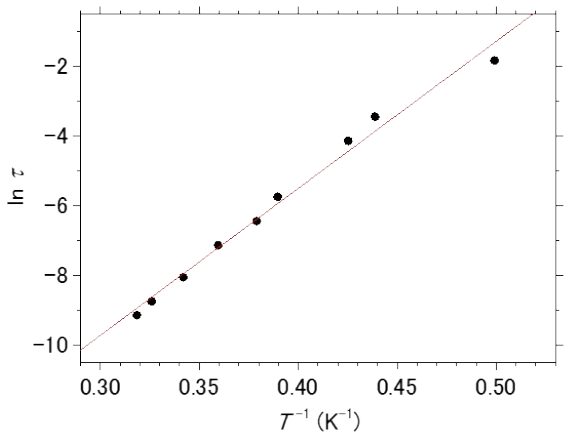


Figure S4. Logarithm of relaxation time (τ) as a function of T^{-1} in a zero H for (a) **1** and (b) **2**. Data are obtained from peak tops in Figure 7. Solid lines represent least-square linear fits obtained by using Arrhenius law.

(a)



(b)

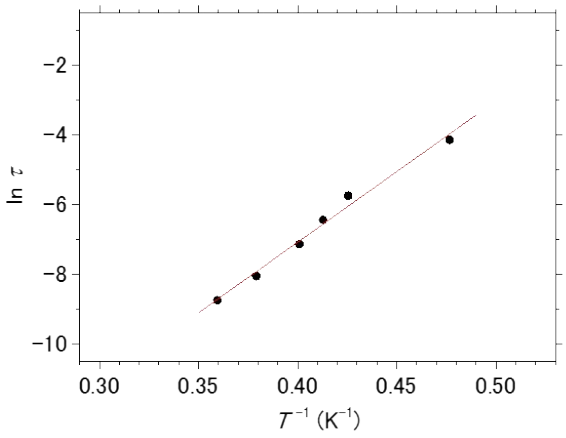


Figure S5. Logarithm of relaxation time (τ) as a function of T^{-1} in an H of (a) 2.0 kOe for **1** and (b) 3.0 kOe for **2**. Data are obtained from peak tops in Figure 8. Solid lines represent least-square linear fits obtained by using Arrhenius law.

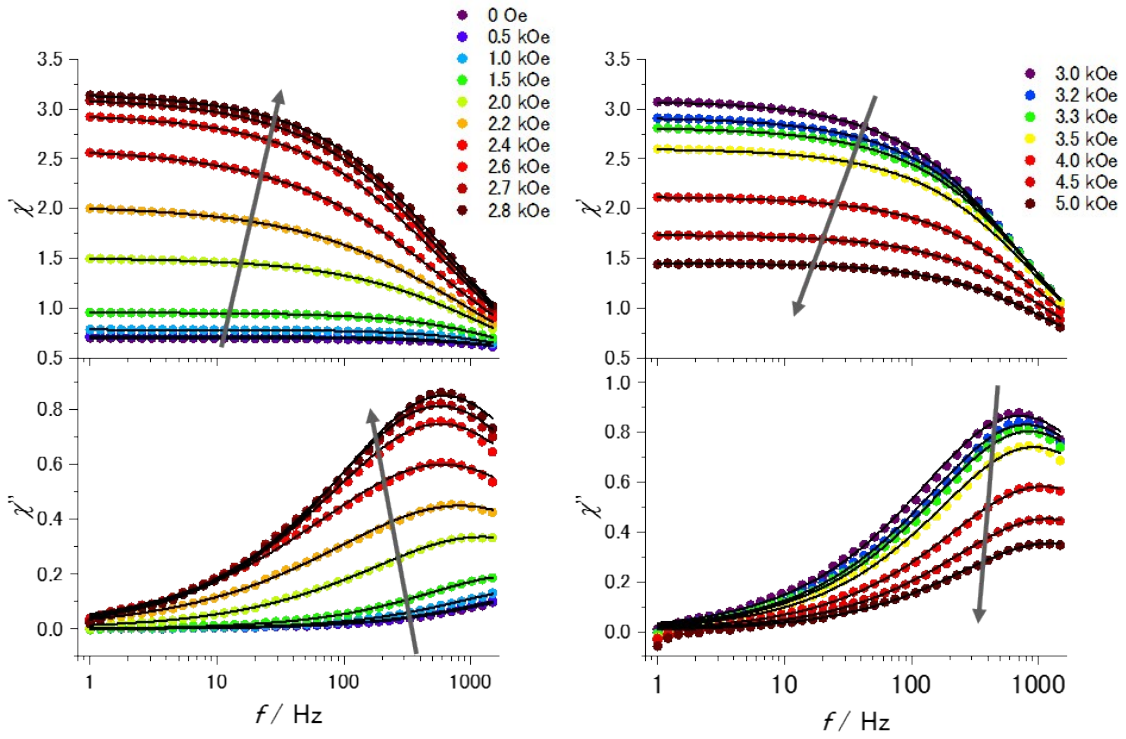


Figure S6. *f* dependence of in-phase (χ') and out-of-phase (χ'') AC susceptibilities for **1** , in the *H* range of 0−5.0 kOe at 3.0 K. Solid lines represent the best fits obtained by using generalized Debye model.

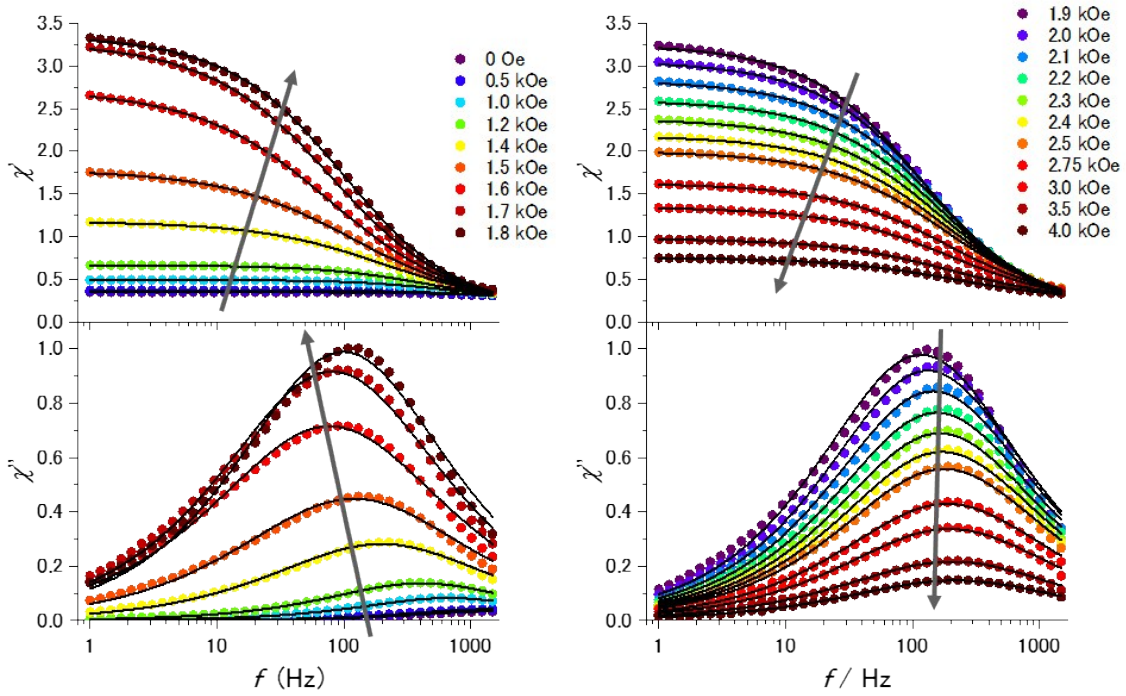


Figure S7. *f* dependence of in-phase (χ') and out-of-phase (χ'') AC susceptibilities for **2** , in the *H* range of 0−4.0 kOe at 2.5 K. Solid lines represent the best fits obtained by using generalized Debye model.

Table S1. Crystallographic data for **1** and **2**.

	1	**2**
Formula	$C_{37}H_{38}N_4F_4Mn_2O_7B$	$C_{37}H_{38}N_4F_6Mn_2O_7P$
Formula Weight	847.40	905.56
T / K	93	93
Crystal System	triclinic	triclinic
Space Group	$P\bar{1}$ (#2)	$P\bar{1}$ (#2)
Lattice Parameters		
a/Å	10.1662(7)	10.4231(14)
b/Å	13.6138(9)	13.9670(18)
c/Å	14.2716(10)	14. 2811(19)
α/°	101.3620(8)	102.486(2)
β/°	108.3570(8)	106.621(2)
γ/°	99.0050(9)	102.174(2)
V/Å^3	1786.5(2)	1860.6(4)
Z	2	2
D_{calc}/g/cm^3	1.575	1.616
F_{000}	870.0	942.00
μ(Mo Kα)/cm^{-1}	7.850	8.080
No. Variables	506	524
R_1 ($I > 2.00\sigma(I)$)[1)]	0.0273	0.0361
wR_2 (All reflections)[2)]	0.0699	0.0725
Goodness of fit	0.969	0.959

[1)] $R_1 = \Sigma||F_o| - |F_c||/\Sigma|F_o|$ ($I > 2.00\sigma(I)$), [2)] $wR_2 = [\Sigma w(F_o^2 - F_c^2)^2]/\Sigma w(F_o^2)^2]^{1/2}$ (All reflections).