

Electronic Supplementary Information

Slow magnetic relaxation of a $S=1/2$ copper(II)-substituted
Keggin-type silicotungstate

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Table S3 Fitting parameters of used in the generalized Debye model of **1** measured at 1.8 K

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Table S4 Fitting parameters used in the generalized Debye model of **1** measured in a field of $H_{\text{dc}} = 3000$ Oe

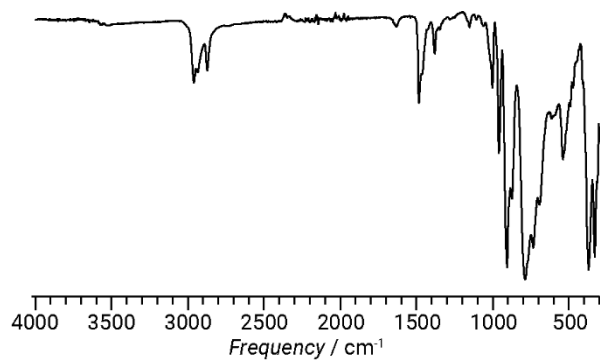


Fig. S1 Infrared absorption spectrum of **1**.

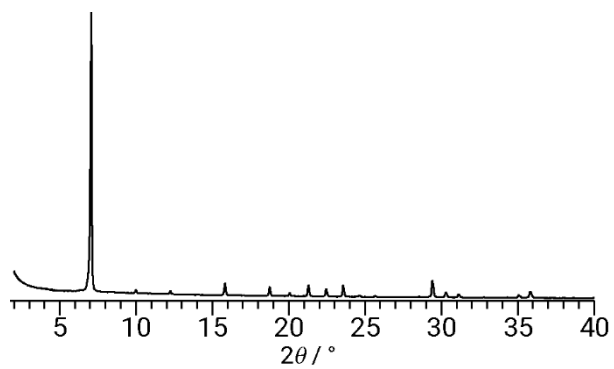


Fig. S2 Powder X-ray diffraction pattern of **1**.

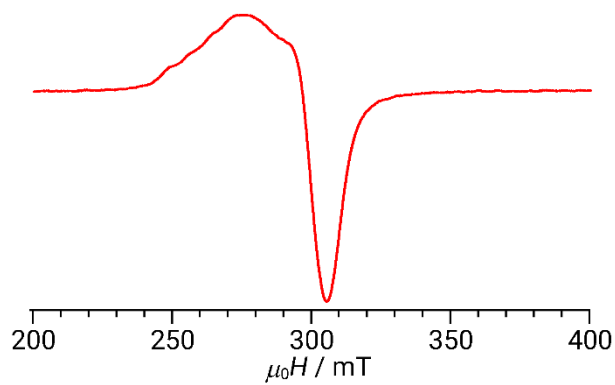


Fig. S3 Continuous-wave X-band electron spin resonance spectrum of $\text{K}_6[\text{SiW}_{11}\text{O}_{39}\text{Cu}(\text{H}_2\text{O})] \cdot 13\text{H}_2\text{O}$ measured at room temperature.

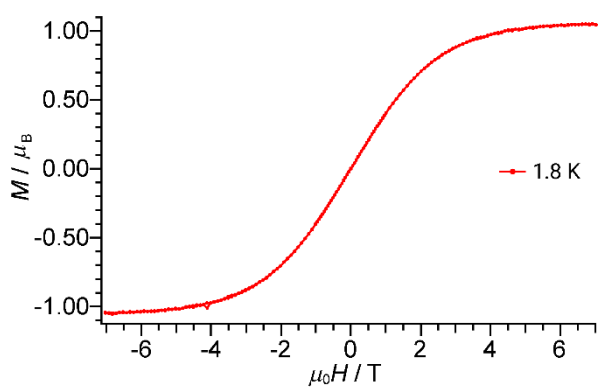


Fig. S4 Magnetization (M)- magnetic field ($\mu_0 H$) plot of **1** at measured 1.8 K.

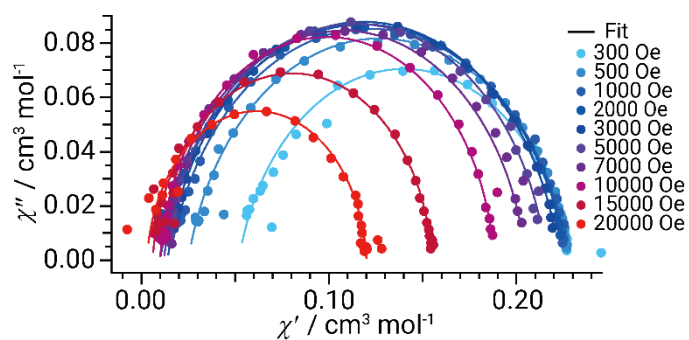


Fig. S5 The $\chi' - \chi''$ (Cole-Cole) plots, and fitting curves, for **dil.1** measured at 1.8 K in the indicated fields H_{dc} (dots).

Table S1 Fitting parameters used in the generalized Debye model of **dil.1** at 1.8 K

$\mu_0 H / \text{Oe}$	$\chi_T / \text{cm}^3 \text{mol}^{-1}$	$\chi_s / \text{cm}^3 \text{mol}^{-1}$	α	τ / s
300	0.228	0.052	0.14	1.70×10^{-2}
500	0.229	0.025	0.14	2.20×10^{-2}
1000	0.228	0.015	0.14	3.10×10^{-2}
2000	0.227	0.010	0.14	5.00×10^{-2}
3000	0.223	0.014	0.11	7.00×10^{-2}
5000	0.216	0.012	0.10	9.20×10^{-2}
7000	0.205	0.010	0.09	9.00×10^{-2}
10000	0.188	0.010	0.05	6.40×10^{-2}
15000	0.155	0.006	0.05	2.30×10^{-2}
20000	0.120	0.003	0.04	8.00×10^{-3}

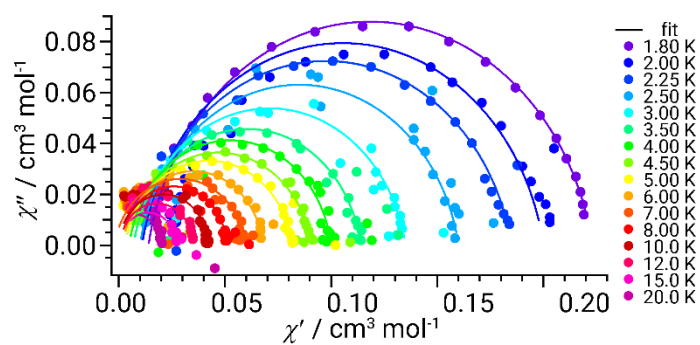


Fig. S6 The $\chi' - \chi''$ (Cole-Cole) plots for **dil.1** in a field of $H_{dc} = 3000$ Oe at the indicated temperatures.

Table S2 Fitting parameters used in the generalized Debye model of **dil.1** measured in a field of $H_{dc} = 3000$ Oe

T / K	$\chi_T / \text{cm}^3 \text{mol}^{-1}$	$\chi_S / \text{cm}^3 \text{mol}^{-1}$	α	τ / s
1.80	0.223	0.014	0.11	7.00×10^{-2}
2.00	0.200	0.011	0.11	5.80×10^{-2}
2.25	0.185	0.010	0.12	4.80×10^{-2}
2.50	0.160	0.010	0.11	3.50×10^{-2}
3.00	0.135	0.007	0.11	2.30×10^{-2}
3.50	0.114	0.007	0.10	1.70×10^{-2}
4.00	0.091	0.003	0.12	1.07×10^{-2}
5.00	0.082	0.003	0.11	8.50×10^{-3}
6.00	0.068	0.002	0.08	5.60×10^{-3}
7.00	0.060	-0.002	0.11	4.00×10^{-3}
8.00	0.051	0.001	0.05	3.20×10^{-3}
10.00	0.042	0.0001	0.03	1.80×10^{-3}
12.00	0.035	0.001	0.02	1.50×10^{-3}
15.00	0.027	0.001	0.01	8.30×10^{-4}
20.00	0.020	-0.005	0.02	3.20×10^{-4}

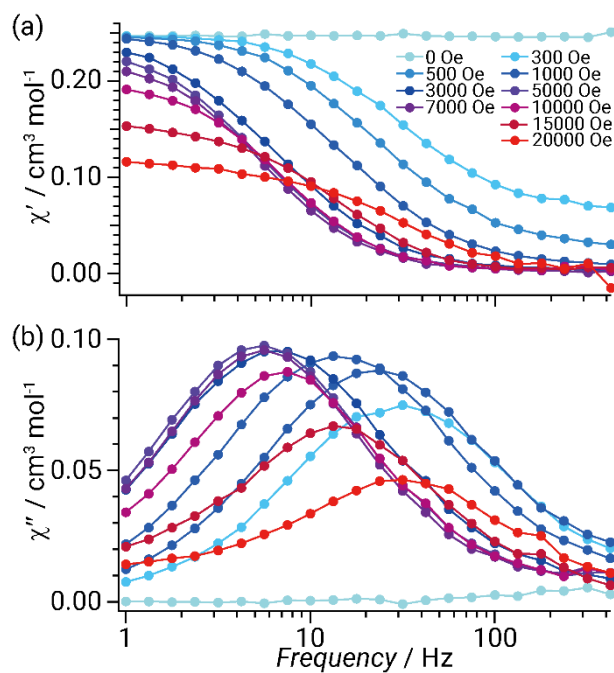


Fig. S7 The (a) in-phase (χ') and (b) out-of-phase (χ'') magnetic susceptibilities of **1** at different AC frequencies measured at 1.8 K in the indicated static magnetic fields (H_{dc}).

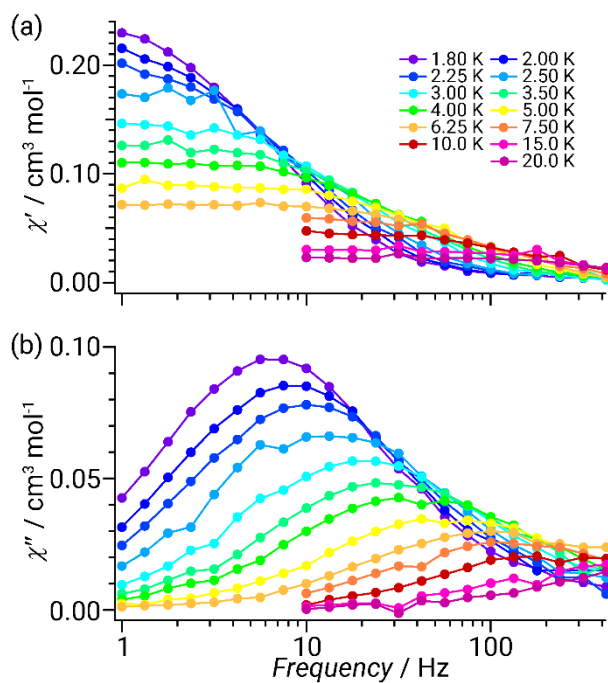


Fig. S8 The (a) in-phase (χ') and (b) out-of-phase (χ'') magnetic susceptibilities of **1** in an applied field H_{dc} of 3000 Oe at the indicated temperatures.

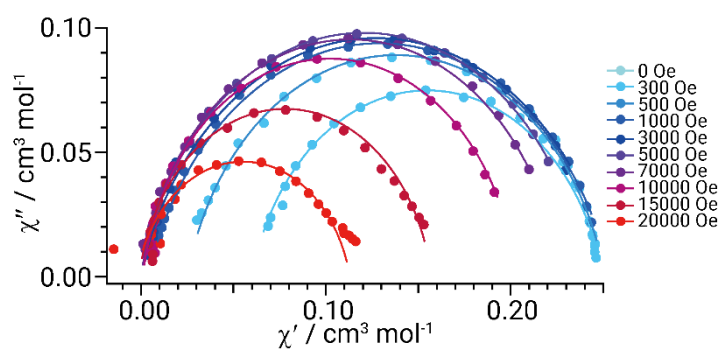


Fig. S9 The $\chi' - \chi''$ (Cole-Cole) plots, and fitting curves (lines), of **1** at 1.8 K in the indicated fields H_{dc} (dots).

Table S3 Fitting parameters used in the generalized Debye model of **1** measured at 1.8 K

$\mu_0 H / \text{Oe}$	$\chi_T / \text{cm}^3 \text{mol}^{-1}$	$\chi_S / \text{cm}^3 \text{mol}^{-1}$	α	τ / s
300	0.250	0.06	0.15	5.20×10^{-3}
500	0.251	0.025	0.15	6.80×10^{-3}
1000	0.254	0.004	0.18	1.10×10^{-2}
3000	0.255	-0.0005	0.18	2.40×10^{-2}
5000	0.241	0.0001	0.13	3.00×10^{-2}
7000	0.227	0.0001	0.11	2.80×10^{-2}
10000	0.203	0.001	0.09	2.30×10^{-2}
15000	0.152	-0.006	0.10	1.20×10^{-2}
20000	0.113	-0.025	0.14	5.30×10^{-3}

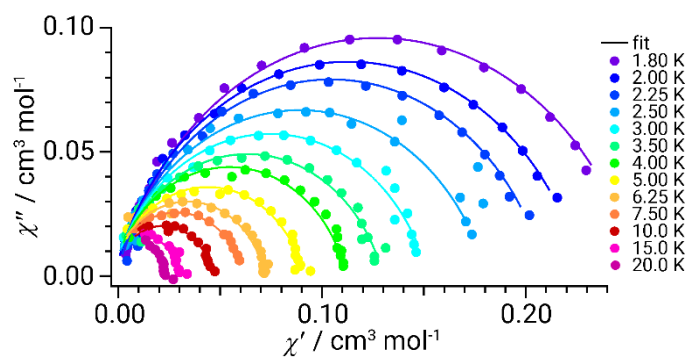


Fig. S10 The $\chi' - \chi''$ (Cole-Cole) plots of **1** in $H_{dc}=3000$ Oe at indicated temperatures (dots) and fitting curves (lines).

Table S4 Fitting parameters used in the generalized Debye model of **1** measured in a field of $H_{dc} = 3000$ Oe

T / K	$\chi_T / \text{cm}^3 \text{mol}^{-1}$	$\chi_S / \text{cm}^3 \text{mol}^{-1}$	α	τ / s
1.80	0.255	-0.0005	0.18	2.40×10^{-2}
2.00	0.228	-0.002	0.18	1.92×10^{-2}
2.25	0.210	-0.001	0.18	1.60×10^{-2}
2.50	0.181	-0.003	0.20	1.20×10^{-2}
3.00	0.152	-0.003	0.19	7.80×10^{-3}
3.50	0.130	-0.003	0.19	5.50×10^{-3}
4.00	0.112	-0.003	0.17	4.00×10^{-3}
5.00	0.091	-0.003	0.17	2.70×10^{-3}
6.25	0.072	-0.004	0.15	1.75×10^{-3}
7.50	0.062	-0.005	0.17	1.25×10^{-3}
10.00	0.046	-0.002	0.11	8.50×10^{-4}
15.00	0.0303	-0.012	0.13	3.20×10^{-4}
20.00	0.0228	-0.02	0.11	1.70×10^{-4}