Electronic Supplementary Information

Magnetic, Electrochemical and Spectroscopic Properties of a Sulfate-bridged Co(II) Imidazole Dimer

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Table S1. Single crystal X-ray diffraction collection summary for **2**.

Compound	**2**
Formula of the Refinement Model	$C_{24}H_{38}Co_2N_{10}O_8S_2$
Molecular Weight	776.62
Crystal System	monoclinic
Space Group	$P2_1/c$ (#14)
***a* / Å**	10.9888(11)
***b* / Å**	8.6363(9)
***c* / Å**	17.4813(15)
***β* / º**	94.688(4)º
***V* / Å^3**	1653.5(3)
D_c / g cm^{-3}	1.560
Z	2
Crystal size / mm	0.120 x 0.075 x 0.054
Crystal colour	purple
Crystal habit	prismatic
Temperature / K	150(2)
λ(Mo-K$_\alpha$) / Å	0.71073
μ(Mo-K$_\alpha$) / mm^{-1}	1.190
***T*(SADABS)$_{min,max}$**	0.925, 1.0
2θ$_{max}$ / º	52.84
***hkl* range**	-13 to 13, -10 to 10, -21 to 21
N	49379
***N*$_{ind}$**	3393 (R_{merge} 0.0342)
***N*$_{obs}$**	3155 (I > 2σ(I))
***N*$_{var}$**	213
Residuals* *R*1(*F*), *wR*2(F^2)	0.0242, 0.1010
GoF(all)	1.179
Residual Extrema / e Å^{-3}	-1.046, 0.651

*$R1 = \Sigma||F_o| - |F_c||/\Sigma|F_o|$ for $F_o > 2\Sigma(F_o)$; $wR2 = (\Sigma w(F_o^2 - F_c^2)^2/\Sigma(wF_c^2)^2)^{1/2}$ all reflections. $w=1/[\sigma^2(F_o^2)+(0.0630P)^2+0.8196P]$ where $P=(F_o^2+2F_c^2)/3$

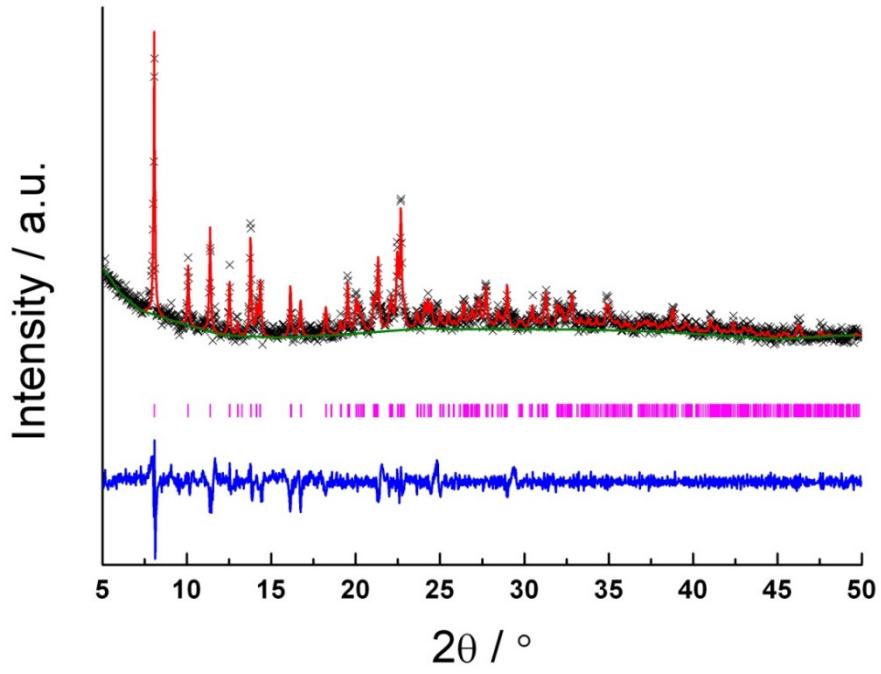

Figure S1. Le Bail fit of **2**: a = 11.025(4), b = 8.698(2), c = 17.677(5) Å, β = 93.29(3)° and V = 1692.4(8) Å^3.

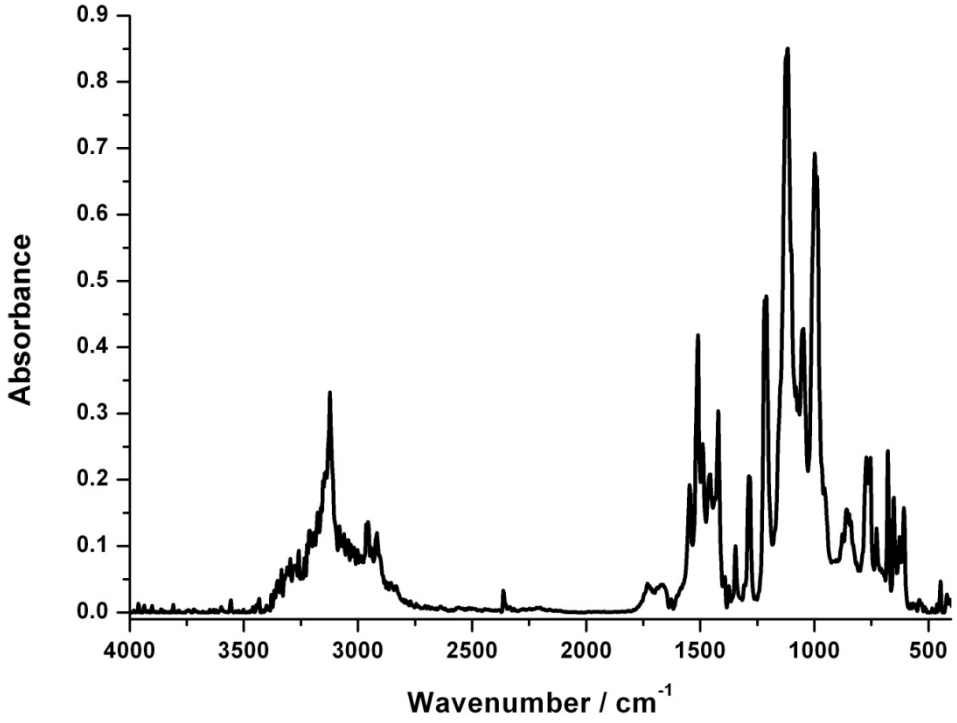

Figure S2. FT-IR spectrum of **2**.

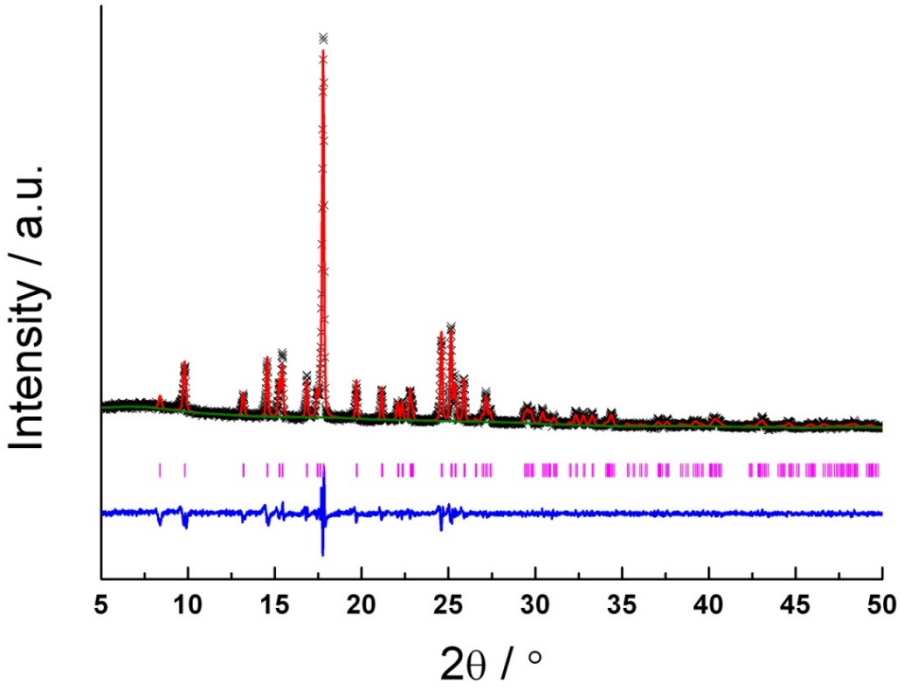

Figure S3. Le Bail fit of **1**: Space group $P3_221$ (#154), $a = b = 12.1377(9)$, $c = 17.393(2)$ Å and $V = 2219.1(3)$ Å^3.

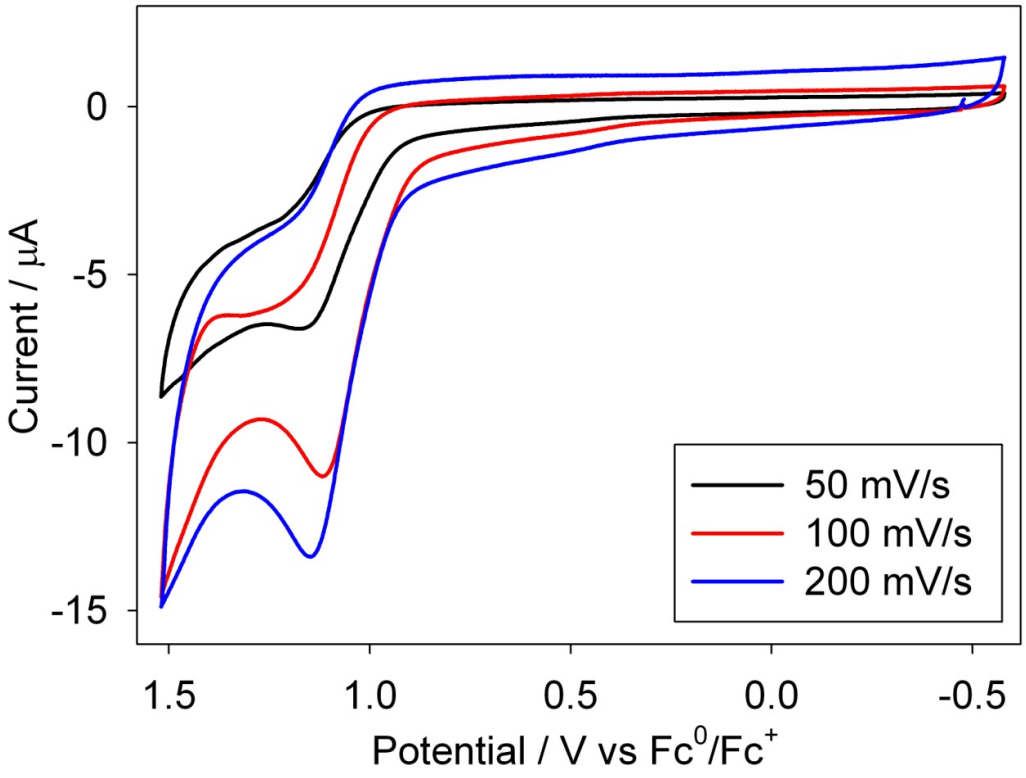

Figure S4. Solution-state cyclic voltammograms of **1** measured at different scan rates.

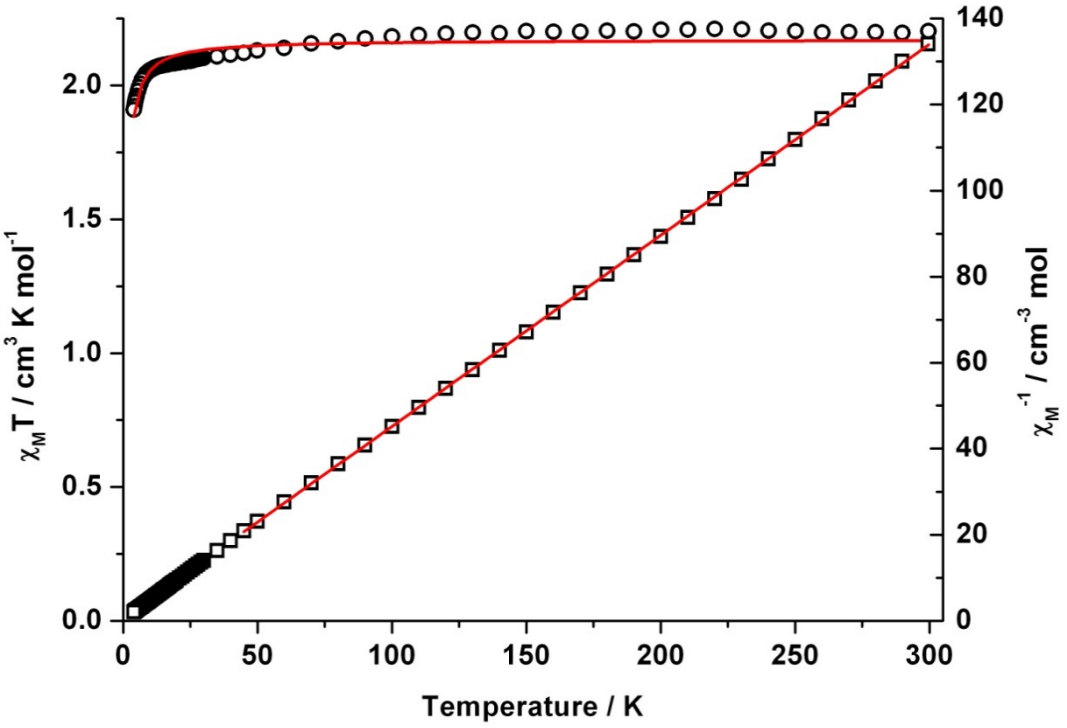

Figure S5. $\chi_M T$ (open circles) and χ^{-1}_M (open squares) vs. temperature plots of **1**. Best fits to the Heisenberg Hamiltonian and Curie-Weiss Law are shown as red lines.

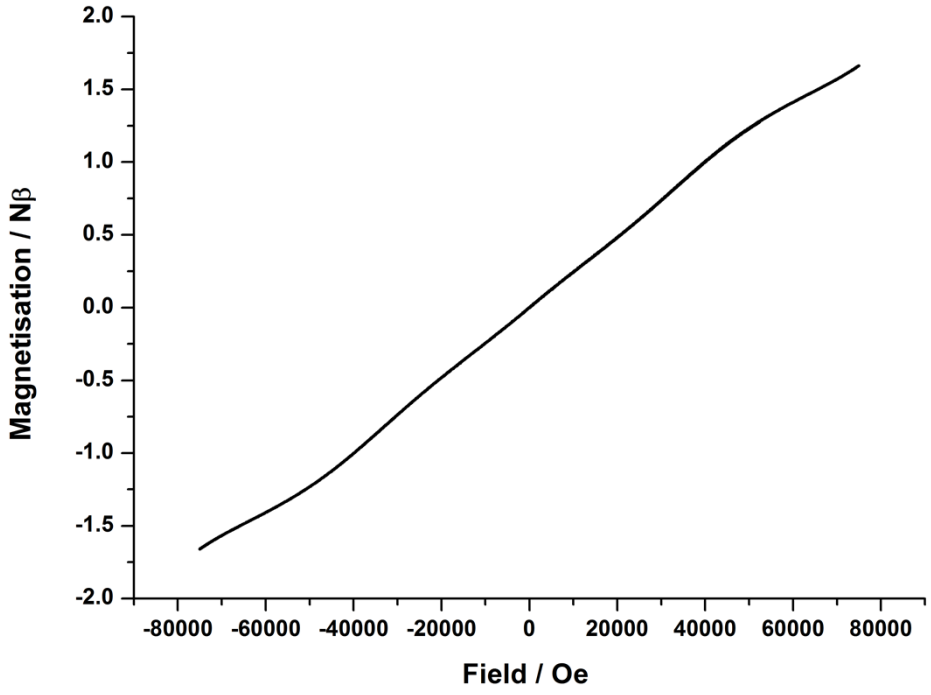

Figure S6. Magnetisation *vs.* field curve of **2** at 2.25 K.

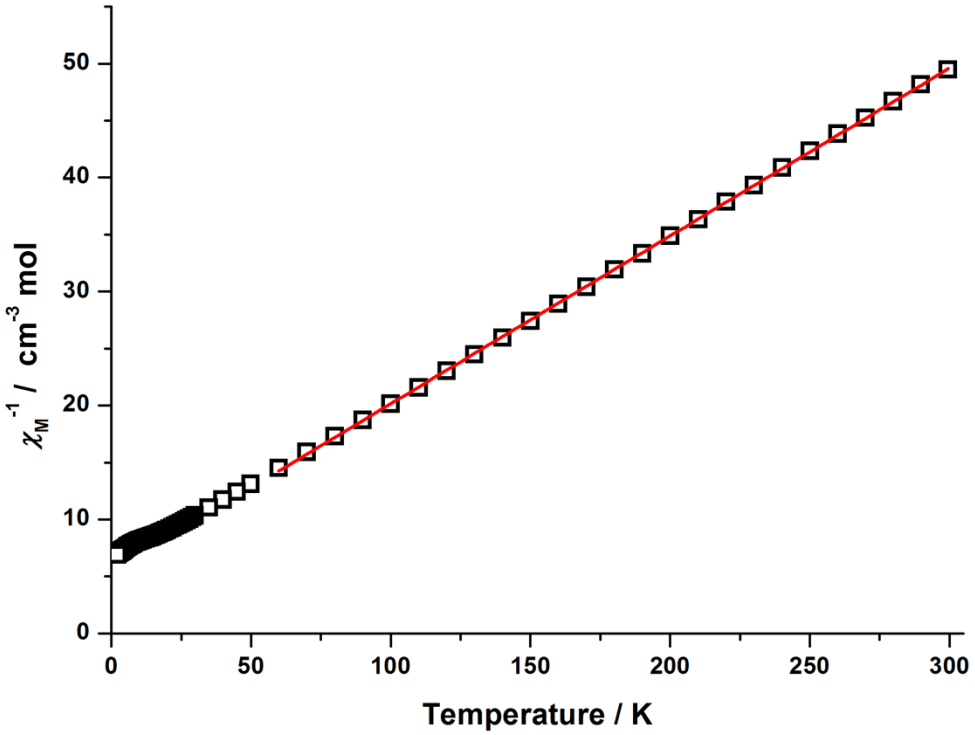

Figure S7. Plot of χ^{-1} *vs.* temperature for **2**. Red line is the best fit to the Curie Weiss Law.

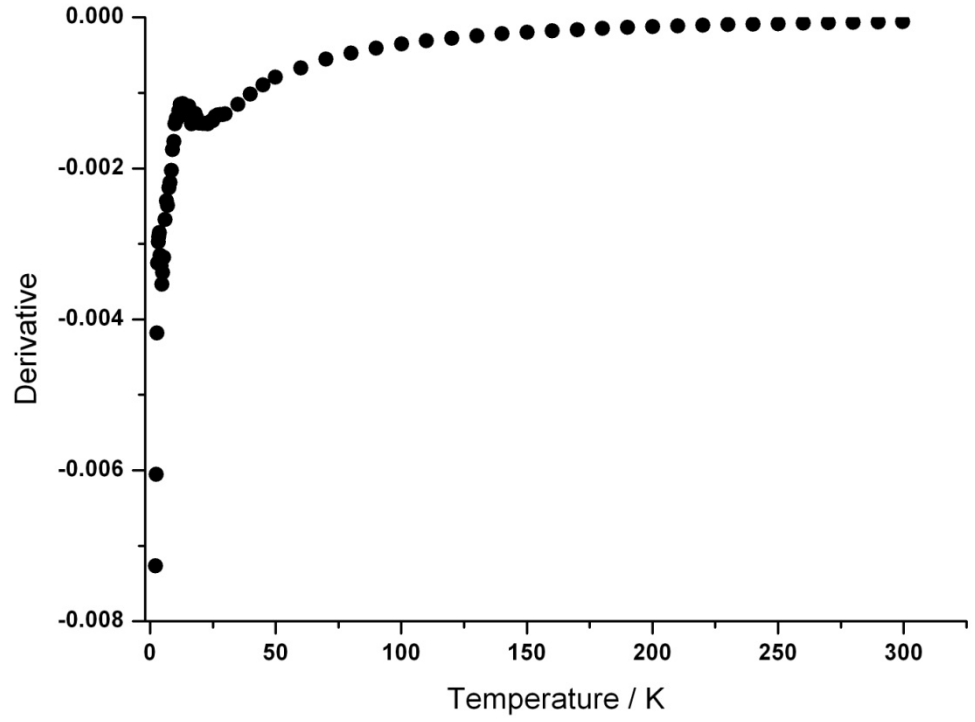

Figure S8. 1st derivative (dχ/dT) of magnetic susceptibility of **2**, indicating the T_N = 14.5 K.