Electronic Supporting Information (ESI) for the manuscript:

A novel oxalate-based three-dimensional coordination polymer showing magnetic ordering and high proton conductivity

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Experimental Section

Physical Techniques. Elemental (C, H, N) analyses were performed at the Microanalytical Service of the Universitat de València. IR spectra were recorded in KBr pellets on a Bio-Rad FTS165 spectrophotometer.

Table S1. Summary of Crystallographic Data for 2

Compound	**2**	**2***
Formula	$C_{48}H_{42}Cr_4Mn_2N_{16}O_{49}$	$C_{48}H_{42}Cr_4Mn_2N_{16}O_{49}$
M (g mol^{-1})	1944.85	1944.85
Crystal system	Hexagonal	Hexagonal
Space group	$P6_522$	$P6_522$
a (Å)	18.80530(10)	18.80530(10)
b (Å)	18.80530(10)	18.80530(10)
c (Å)	43.3432(4)	43.3432(4)
V (Å^3)	13274.30(19)	13274.30(19)
Z	6	6
ρ_{calc} (g cm^{-3})	0.847	0.949
μ (mm^{-1})	0.713	1.008
T (K)	45.0	45.0
Measured reflections	137416	137416
Unique reflections (Rint)	8076 (0.0443)	8076 (0.0443)
Observed reflections [$I > 2\sigma(I)$]	7646	7646
Goof	1.744	1.048
R^a [$I > 2\sigma(I)$] (all data)	0.1279 (0.1301)	0.0540 (0.0563)
wR^b [$I > 2\sigma(I)$] (all data)	0.3485 (0.3537)	0.1728 (0.1765)
Flack parameter	0.07(6)	0.08(3)

^{a} $R = \sum(|F_o| - |F_c|)/\sum|F_o|$. ^{b} $wR = [\sum w(|F_o| - |F_c|)^2/\sum w|F_o|^2]^{1/2}$.

* Final model, after applying a Squeeze subroutine (see main text).

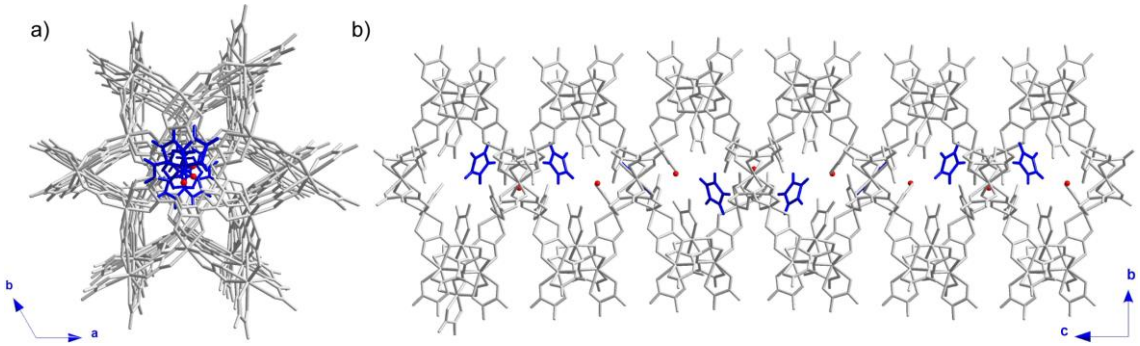

Figure S1. Views of the helical arrangement of the imidazolium cations in the smaller pores A of the anionic 3D network in the *ab* (a) and *bc* (b) planes, respectively. Oxalate ligands and imidazolium cations are depicted as grey and blue sticks, respectively, whereas the water molecule is represented with a red sphere.

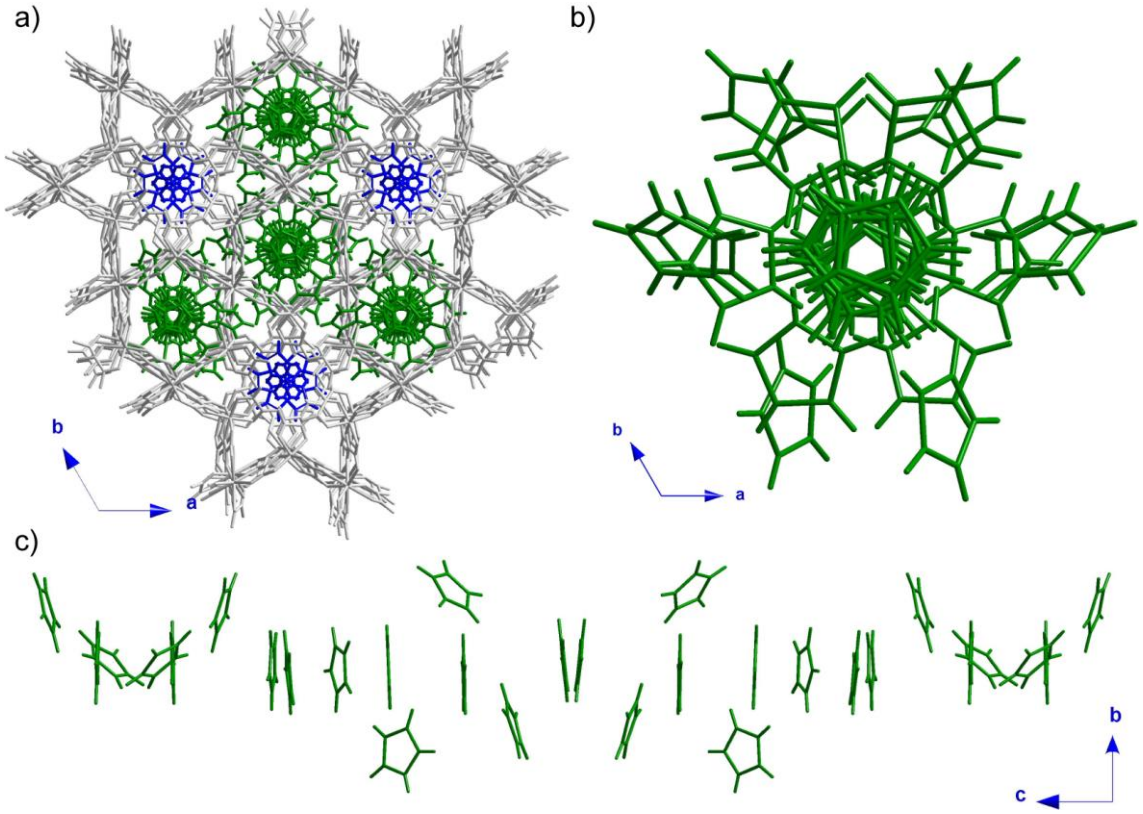

Figure S2. (a) View of the 3D structure of **2** along the *c* axis. Oxalate ligands are depicted as grey sticks. Refined and non-refined imidazolium cations are shown as blue and green sticks, respectively. Perspective view of the packing of the imidazolium cations located in the larger B pores in the *ab* (b) and *bc* (c) planes, respectively.

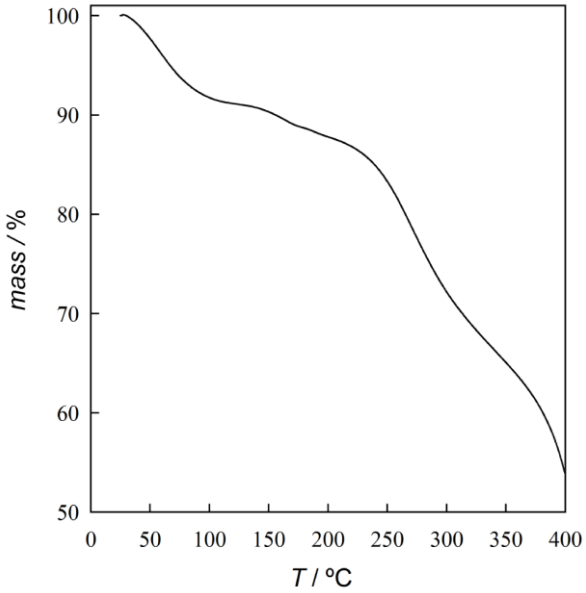

Figure S3. Thermogravimetric Analysis of **2** under dry N_2 atmosphere in the 25-400 ºC range.

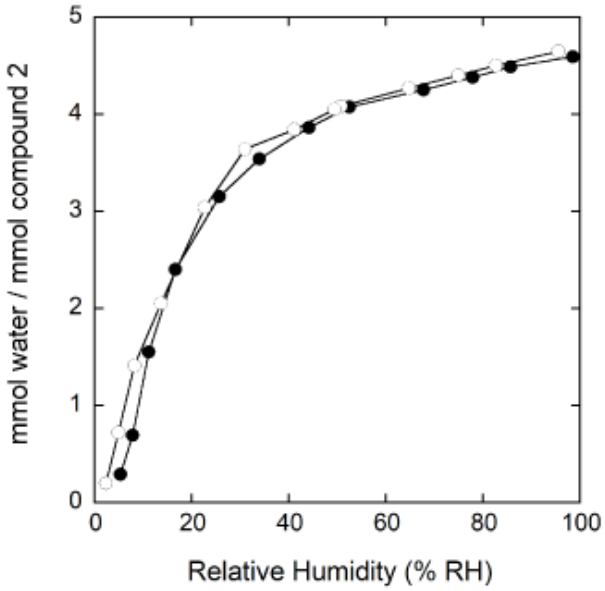

Figure S4. Water vapour adsorption isotherm acquired at 298 K for the activated compound **2**. Closed symbols represent adsorption and open symbols desorption branch.

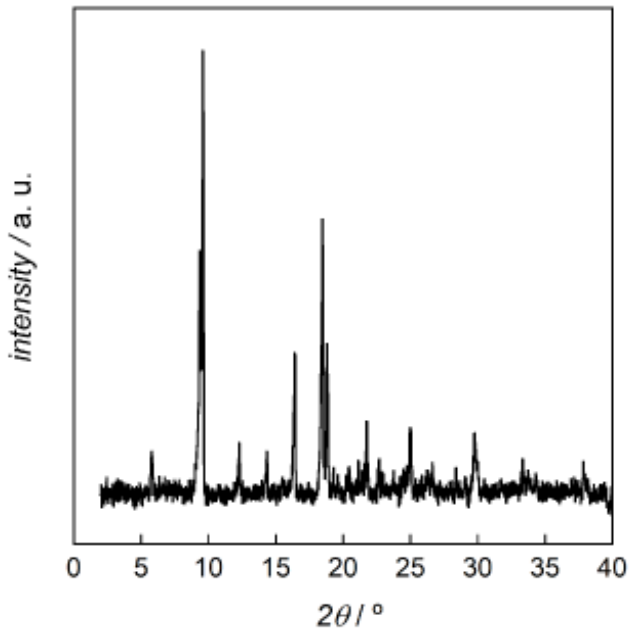

Figure S5. PXRD pattern profile of **2** after water adsorption isotherm measurement.

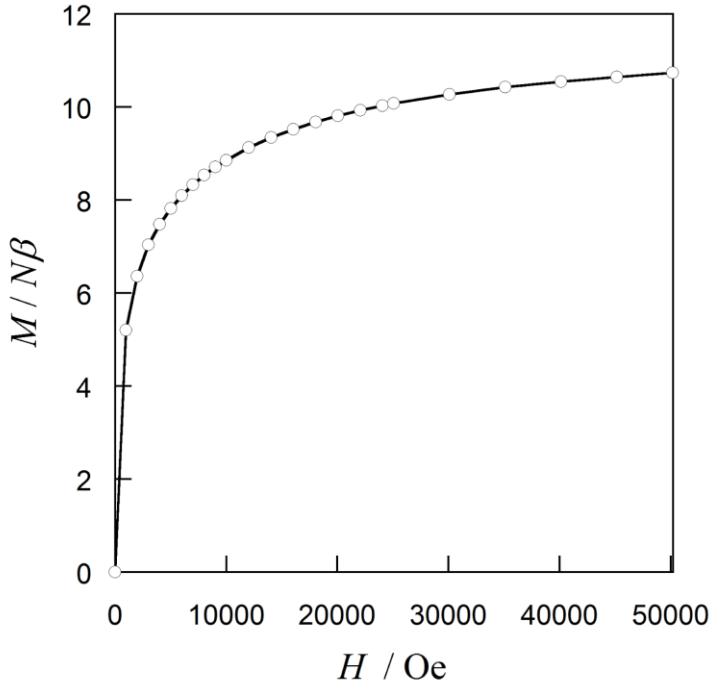

Figure S6. Field dependence of the magnetization (*M*) of **2** in Bohr magnetons Nβ, at *T* = 2.0 K (○). The solid line is a guide-line for the eyes.

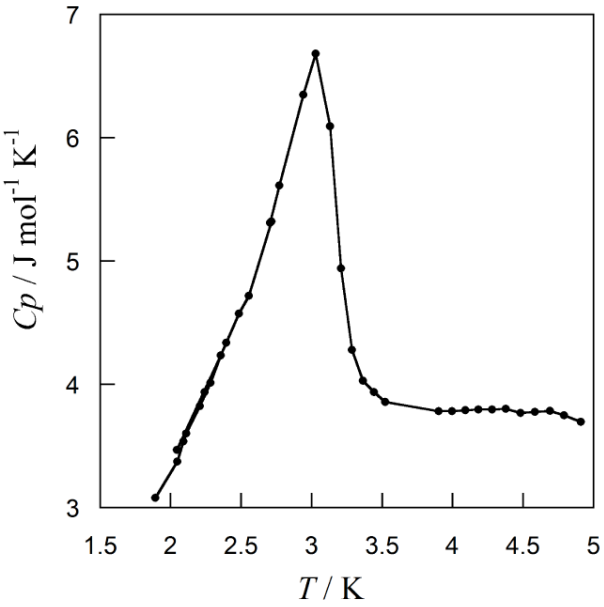

Figure S7. Temperature dependence the heat capacity of **2,** demonstrating the long range magnetic ordering phase transition at 3.0 K.