Electronic Supplementary Information for MS:

An unprecedented fivefold interpenetrated lvt network containing the exceptional racemic motifs originated from nine interwoven helices

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The synthesis of compound 1:


**[Cu(oba)(H$_2$O)]$_2$·0.5H$_2$O (1):** A mixture of CuCl$_2$·2H$_2$O (0.5 mmol, 0.085 g), H$_2$oba (0.5 mmol, 0.129 g), triethylamine (0.15 mL) and water (10 mL) was stirred for 15 min in air, then transferred and sealed in a 23ml Parr Teflon-lined stainless steel vessel, heated to 160°C for 5 days and then cooled to room temperature at a rate of 10°C/h. The resulting blue block crystals were filtered, washed, and dried in air, yield 0.154 g, 45% based on Cu. Elemental analysis found: C, 49.28%; H, 3.26%. Calcd. for: C, 49.13%; H, 3.09%.
**Fig. S1** ORTEP representation showing the local coordination geometries of the two crystallographically distinct Cu atoms in 1 (50% probability ellipsoids).

**Fig. S2** Perspective views of the 3D $4^28^4$ network (left) and a helical fragment (right). R and L represent right-handed and left-handed, respectively.
Fig. S3 PtS topology

Fig. S4 A space-filling view of a single net, showing the two types of channels.
**Fig. S5** The detail of the interpenetration of any 8-membered ring (black) with four others from four independent nets.

**Fig. S6** A space-filling diagram of the five-fold interpenetrated lvt network viewed down the c axis (guest water molecules have been omitted); gray C, red O, blue Cu.