Electronic Supplementary Material (ESI) for Dalton Transactions.

Supporting Information

Syntheses, Structures and Photocatalytic Properties of Five New Praseodymium–Antimony Oxochlorides: From Discrete Cluster to 3D Inorganic–Organic Hybrid Racemic Compound

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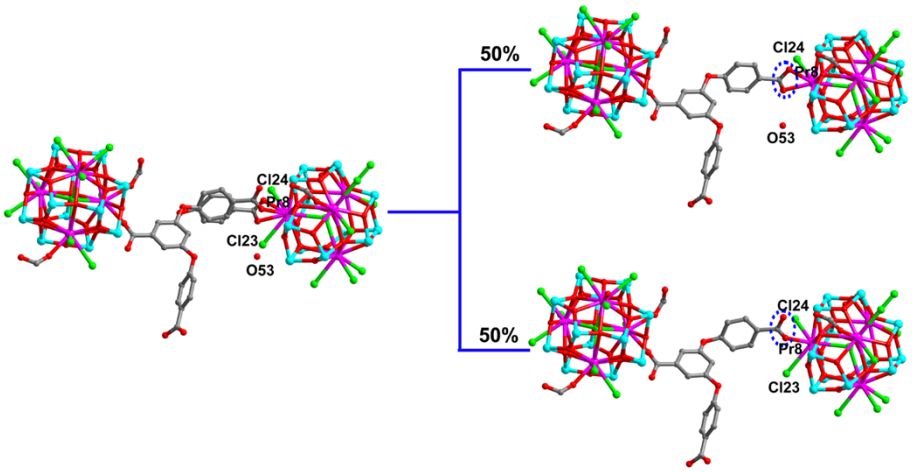

Fig. S1 The two possible structural types with equal probability in **2** shown schematically.

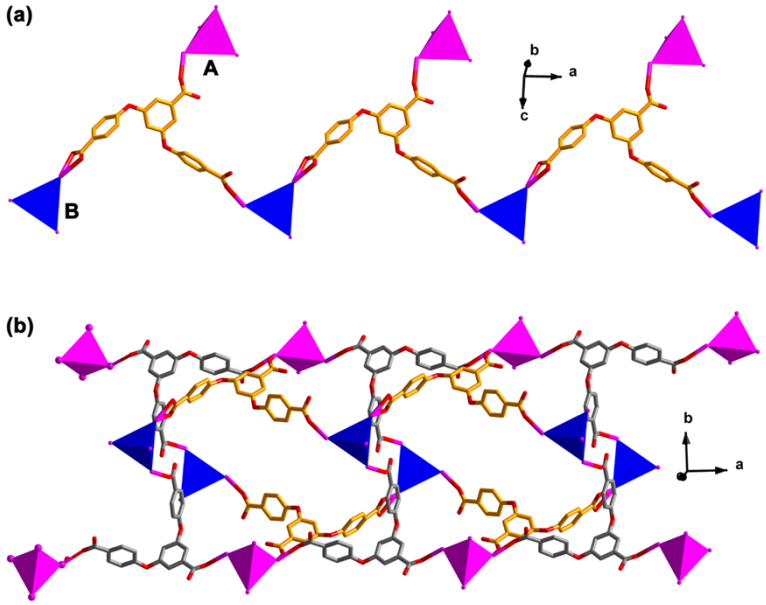

Fig. S2 (a) The zigzag-like chain in **2**; (b) the 1D nanotubular structure along the *a*-axis in **2**. All of the Sb, O, and Cl atoms (except for O atoms from the COO^- groups and the central Cl atoms) in the clusters are omitted for clarity.

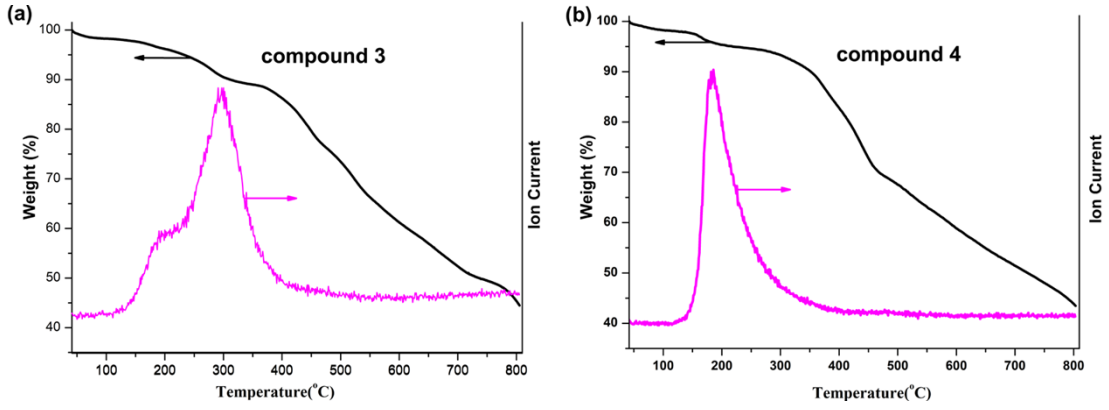

Fig. S3 TGA-MS curves: (a) for compound **3** and (b) for compound **4**.

As shown in Fig. S3a, TGA-MS analysis shows two obvious peaks at around 463 K and 573 K, respectively, which respectively respresent the neutral and protonated 3-Mepy escaping from compound **3**. Moreover, the relative intensities of both peaks are similar, revealing that the ratio of neutral and protonated 3-Mepy is 1:1.

As shown in Fig. S3b, different from that of compound **3**, TGA-MS analysis of the crystals of **4** shows that only the single molecular ion peaks of 3-Mepy was detected; and it was removed at about 450 K, which is close to the first peak at around 463 K on the TGA-MS curve of compound **3**. Therefore, we presume all three 3-Mepy in compound **4** are neutral.

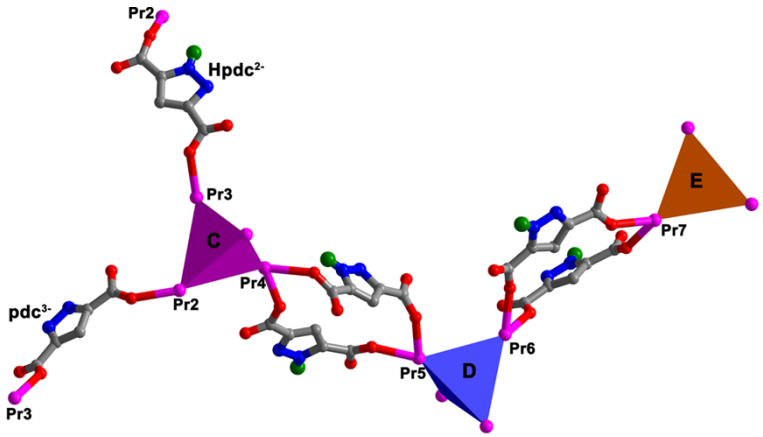

Fig. S4 The connecting modes of the six crystallographically independent H_3bpdc ligands in compound **5** (including five $Hpdc^{2-}$ and one pdc^{3-} ligands). Color codes: N atoms (blue), H atoms (green). All of the Sb, O, Cl and H atoms (except for O atoms from the COO^- groups, the central Cl atoms and the H atoms bonded to N atoms) in the clusters are omitted for clarity.

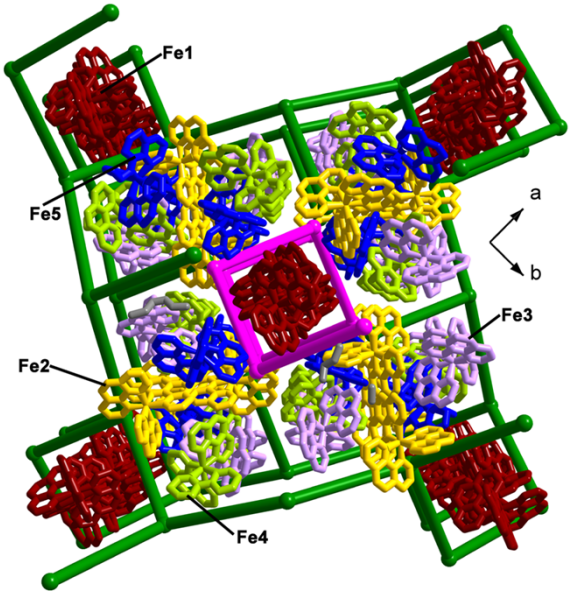

Fig. S5 Prospective view of the two-fold interpenetrating anionic network of **5** along the *c*-axis, with the $[Fe(1,10\text{-phen})_3]^{2+}$ complexes labeled.

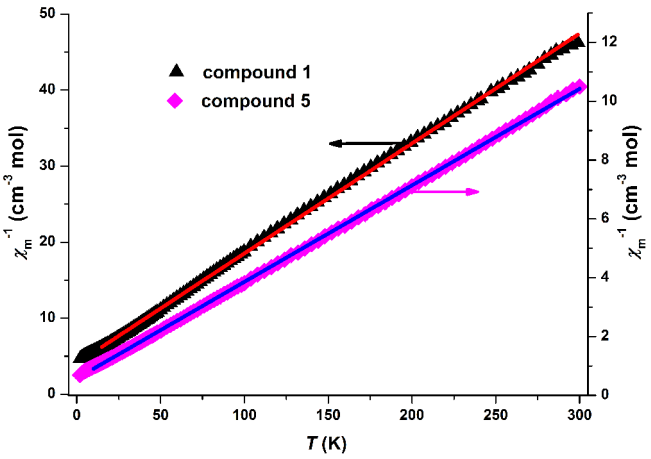

Fig. S6 χ_m^{-1} *vs T* plots for compounds **1** and **5**, respectively. The solid red line for compound **1** and blue line for compound **5** indicate fit to the Curie–Weiss law (for χ_m^{-1}).

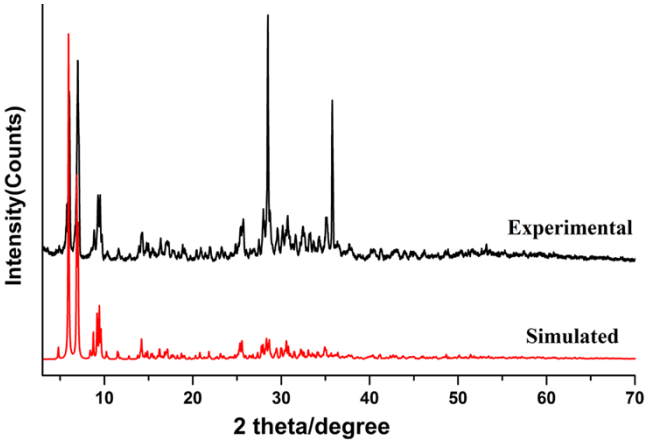

Fig. S7 PXRD patterns of compound **1**.

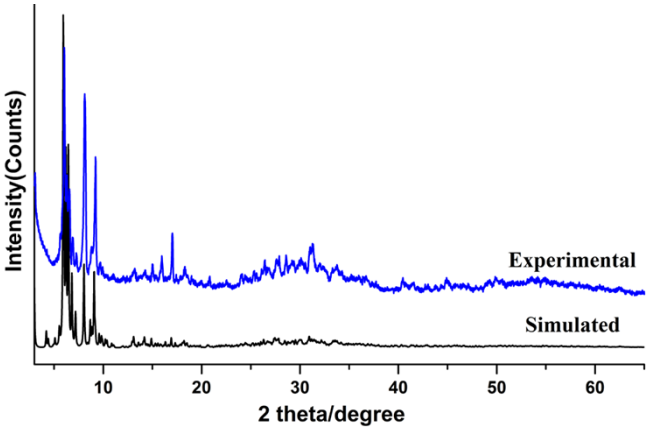

Fig. S8 PXRD patterns of compound **2**.

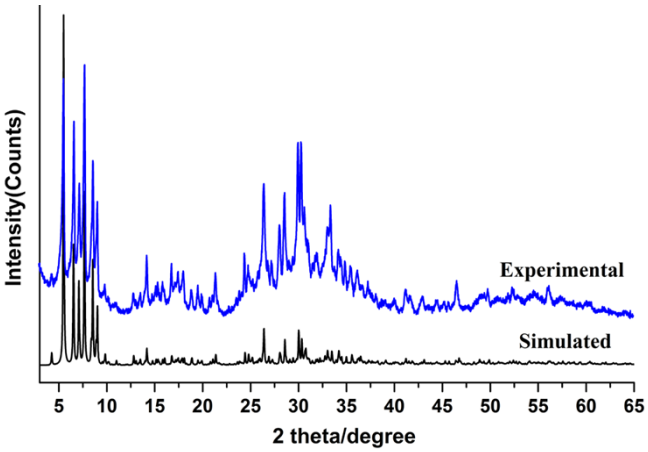

Fig. S9 PXRD patterns of compound **3**.

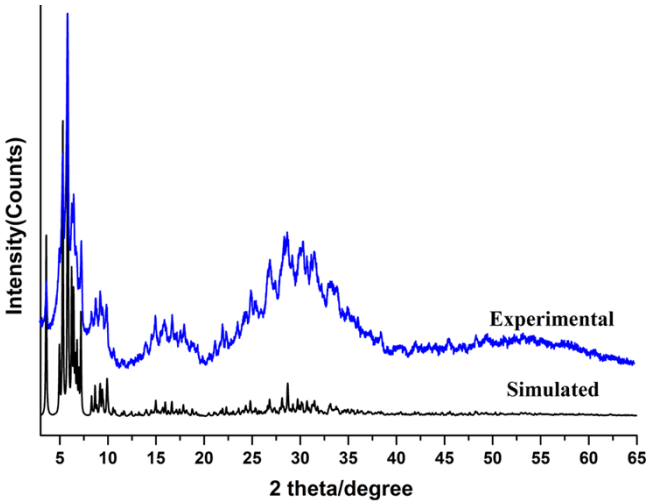

Fig. S10 PXRD patterns of compound **4**.

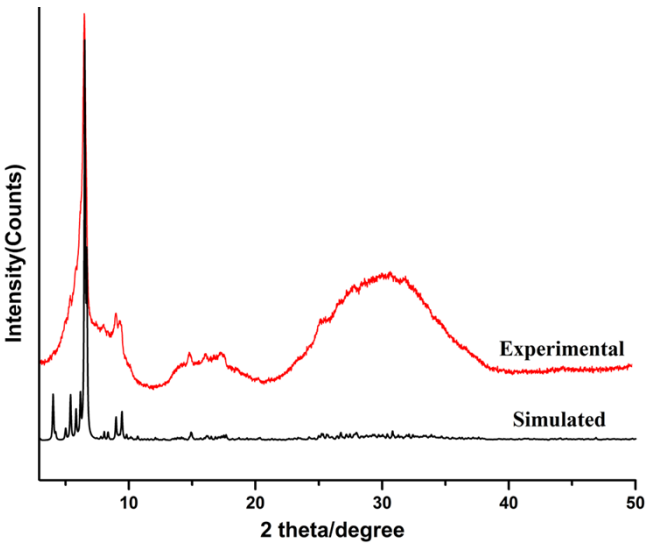

Fig. S11 PXRD patterns of compound **5**.

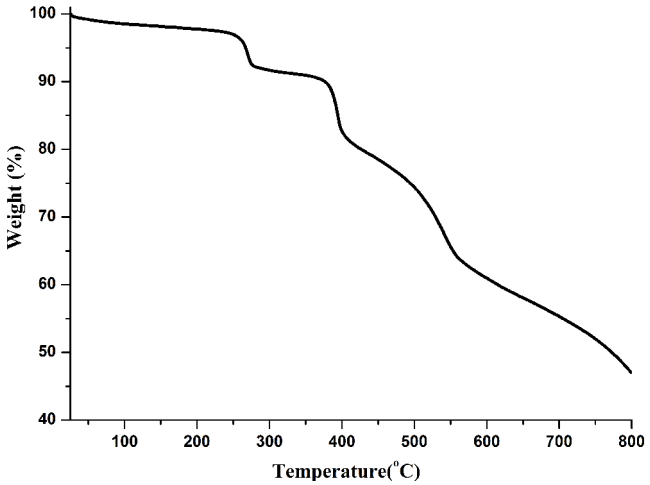

Fig. S12 TGA curve of compound **1**.

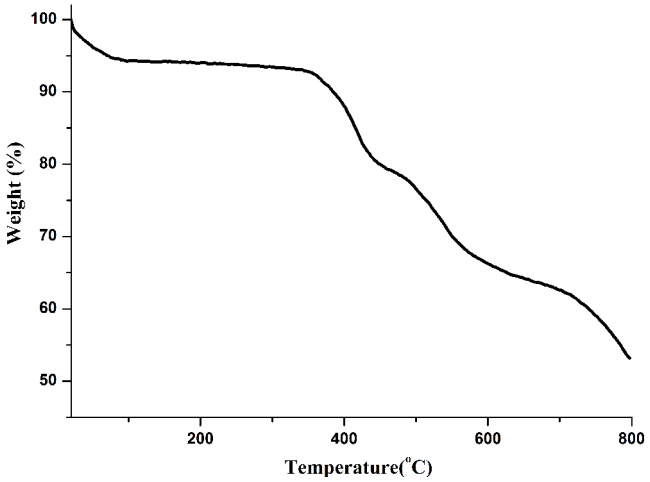

Fig. S13 TGA curve of compound **2**.

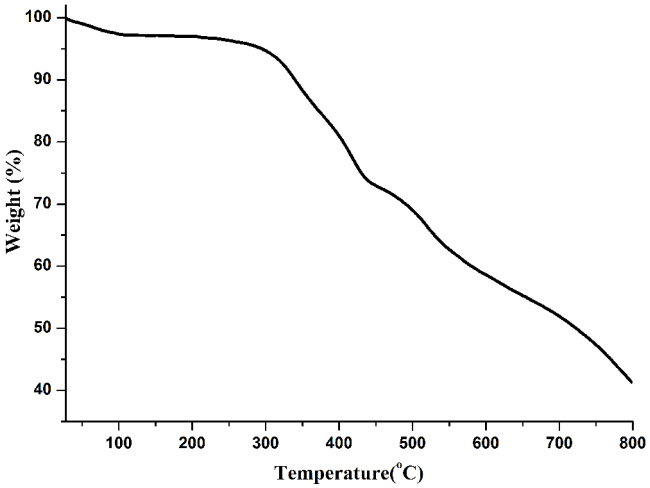

Fig. S14 TGA curve of compound **5**.