

Supplementary materials

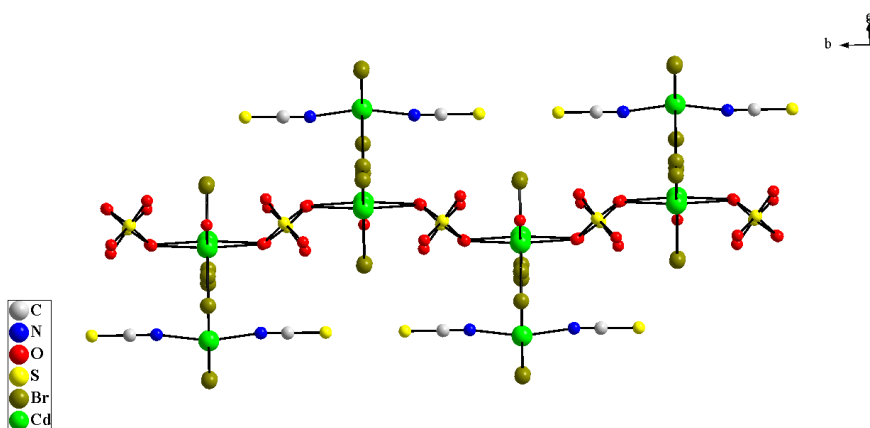


Fig. S1 Two such parallel chains extend along the *b*-axial direction, and the Cd1 octahedra sit alternately above and below the plane of the two chains in compound 1.

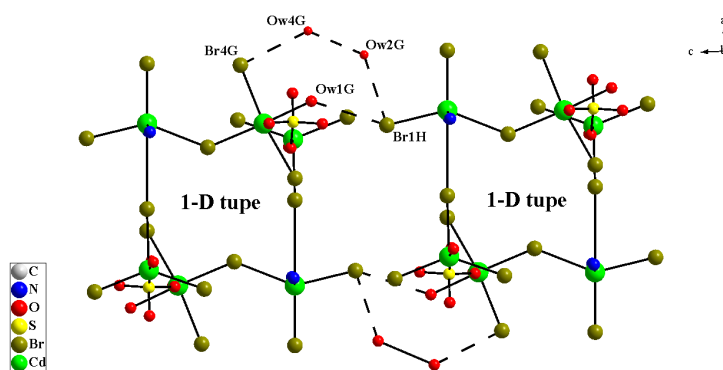
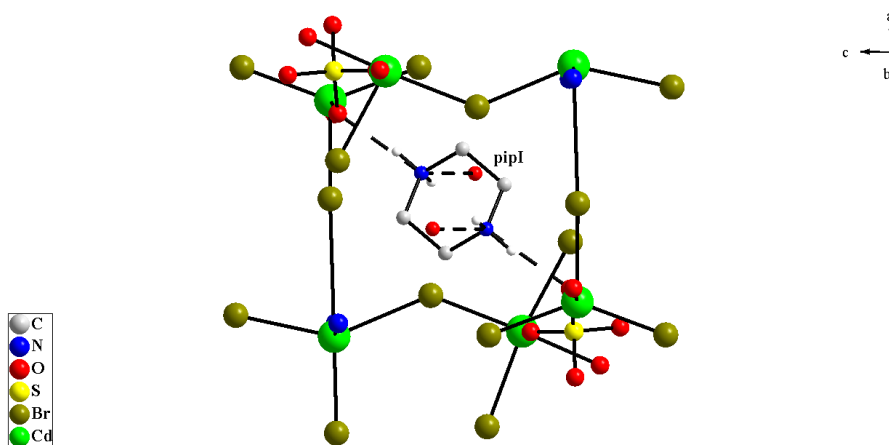


Fig. S2 The 2-D supramolecular sheet constructed up from the 1-D tube by the intermolecular hydrogen bondings in compound 1.



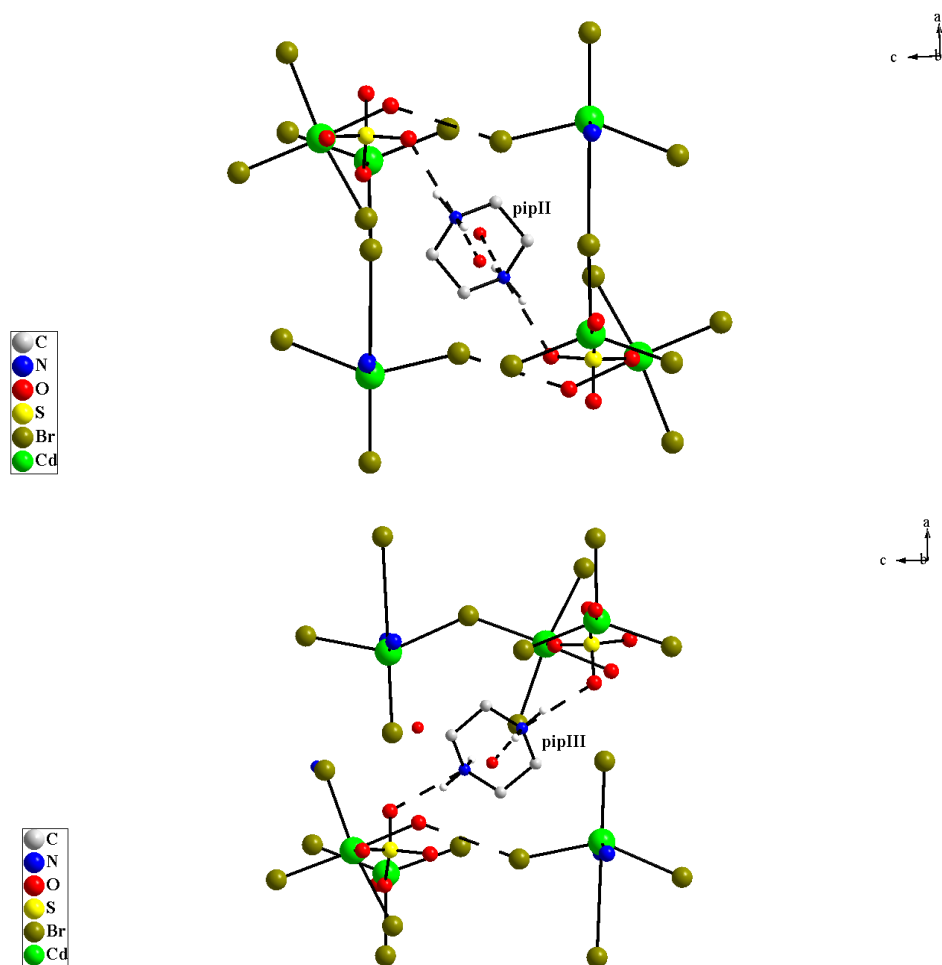


Fig. S3 The N-H $\cdots$ O(SO_4^{2-}) hydrogen bonds between the $\text{H}_2\text{pip}^{2+}$ cations and the host frameworks, and the N-H $\cdots$ Ow hydrogen bonds between the $\text{H}_2\text{pip}^{2+}$ cations and the lattice H_2O molecules in compound **1**.