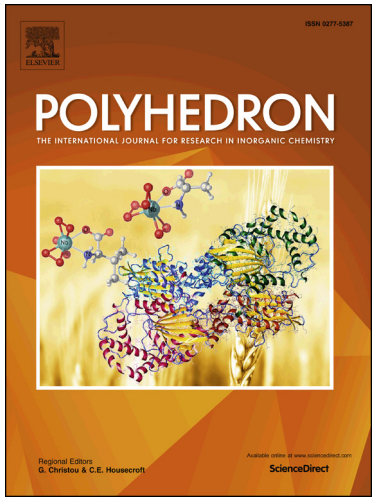

Five Metal-Organic Frameworks Based on Isomeric Chloro-Functionalized Azobenzenedicarboxylic Acids

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Five Metal-Organic Frameworks Based on Isomeric Chloro-Functionalized Azobenzenedicarboxylic Acids

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Abstract

Chloro-functionalized azobenzenedicarboxylic acids were prepared and their 2D and 3D metal-organic frameworks (MOFs), namely {[Co(4,4′-Cl_2abdc)(DMA)]·H_2O}$_n$ (**1**), {[Cu(4,4′-Cl_2abdc)(DMA)]·G}$_n$ (**2**), {[Zn(4,4′-Cl_2abdc)(DMSO)]·H_2O}$_n$ (**3**), {[Mn(3,3′-Cl_2abdc)(DMA)]·0.5DMA}$_n$ (**4**) and {[Cu(3,3′-Cl_2abdc)(DMA)]·0.5DMA}$_n$ (**5**), (4,4'-H_2Cl_2abdc: 3,3'-dichloro-4,4'-azobenzenedicarboxylic acid, 3,3'-H_2Cl_2abdc: 4,4'-dichloro-3,3'-azobenzenedicarboxylic acid), were systematically synthesized to investigate the positional isomer effect on the structures and characterized by elemental analysis, IR spectroscopy and single crystal X-ray diffraction. The X-ray results demonstrated that **1** and **3** possess a 2-fold interpenetrated 3D+3D→3D framework with the seh-4,6-Imma topology, while **2**, **4** and **5** display 2D layers. In **1** and **3**, infinite [$M_2O(COO)_2$] rod units occur, whilst well-known binuclear [$M_2(COO)_4$] units were observed in the other compounds. **4** and **5** display a lower dimension due to the *cis*-position of the carboxylate groups of 3,3'-Cl_2abdc as compared to compounds **1-3**, prepared with 4,4'-Cl_2abdc. Moreover, the thermal, photoluminescence and optical properties of the compounds were also examined.

Keywords: chloro-functionalized azobenzenedicarboxylic acid; positional isomer; structural diversity; rod SBU.

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