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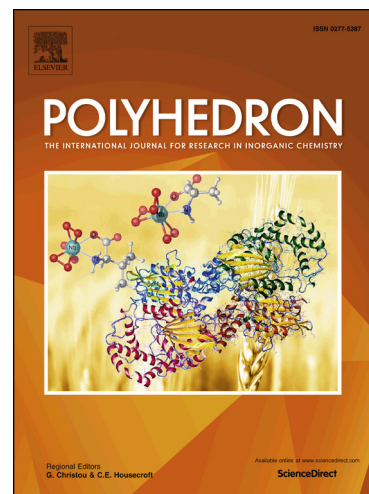
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Syntheses, structures, luminescent properties and antibacterial activities of seven polymers based on an asymmetric triazole dicarboxylate ligand

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Abstract: By controlling different reaction conditions in hydrothermal process, seven metal salts react with 1-(carboxymethyl)-1*H*-1,2,4-triazole-3-carboxylic acid (H₂cta), which result in seven new polymers, namely, [Cd(cta)(H₂O)]_n (1), [La(cta)(OH)]_n (2), {[Pb(cta)]·H₂O}_n (3), [Sr(cta)(H₂O)₂]_n (4), {[Zn₂(cta)₂(H₂SO₄)]·2CH₃CH₂OH}_n (5), [Mn(cta)(H₂O)₂]_n (6), [Ba(cta)(H₂O)₃]_n (7). Their structures have been determined by single-crystal X-ray diffraction analysis and characterized by elemental analysis, IR spectroscopy. Polymers 1-2 are isostructural and topological analysis revealed that 1-4 can be described as a *sra* topology with Schläfli symbol of (4²·6³·8). 5 possesses two-dimensional bilayer network with a total potential solvent accessible volume of 27.1%. 6 exhibits a 2D framework *sql* topology with Schläfli symbol of (4⁴·6²). 7 crystallizes in the triclinic crystal system of *P*₁ space group and can be considered as a (3,8)-connected *tfz-d* topology with the point symbol of (4³)₂(4⁶·6¹⁸·8⁴). The luminescent properties (1-5, 7) are performed in the solid state. Remarkably, 3 exhibits strong fluorescent emission in the solid state at room temperature, which be attributed to the corresponding structure factors. In addition, the microbiological properties of 1-7 were also studied. Compared with six clinical drugs, 3 and 5 showed pretty good antibacterial activities. The higher activities of 3 and 5 may be due to the chelation effect or to the influence of the metal ion on the normal cell process. Solid state thermal analyses of some polymers indicate the formation of the metal oxide as an end product.

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Electronic supplementary information (ESI) available: The X-ray crystallographic files in CIF format. CCDC reference numbers 1437775-1437781 are for 1-7, respectively.

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