Silver(I) 1,3,5-triaza-7-phosphaadamantane coordination polymers driven by substituted glutarate and malonate building blocks: self-assembly synthesis, structural features, and antimicrobial properties.

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Rok wydania

2016

Czasopismo

Inorganic Chemistry

Numer woluminu

55

Strony

5886-5894

DOI

10.1021/acs.inorgchem.6b00186

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

Three new bioactive silver(I) coordination polymers formulated as $[Ag_2(\mu_2\text{-PTA})(\mu_3\text{-PTA})(\mu_2\text{-pga})(H_2O)]_n \cdot 6H_2O$ (**1**), $[Ag_2(\mu_2\text{-PTA})(\mu_3\text{-PTA})(Hpmal)_2]_n \cdot 2H_2O$ (**2**), and $[Ag(\mu_3\text{-PTA})(Hdmga)]_n$ (**3**) were self-assembled from Ag_2O, 1,3,5-triaza-7-phosphaadamantane (PTA), and a substituted dicarboxylic acid (3-phenylglutaric acid (H_2pga), phenylmalonic acid (H_2pmal), or 3,3-dimethylglutaric acid (H_2dmga)) as an ancillary ligand. Compounds **1**–**3** were fully characterized by IR and NMR spectroscopy, ESI-MS(±), elemental analysis, and single-crystal X-ray diffraction, revealing that their architectural and topological diversity is governed by structural modulation of a dicarboxylate building block. The structures vary from a 1D cyclic chain with the SP 1-periodic net (4,4)(0,2) topology in **2** to distinct 2D metal–organic layers with the **cem-d** and **hcb** topologies in **1** and **3**, respectively. In addition, compounds **1**–**3** exhibit a notable antimicrobial efficiency against a panel of common Gram-negative (*E. coli* and *P. aeruginosa*) and Gram-positive (*S. aureus*) bacteria and yeast (*C. albicans*). The best normalized minimum inhibitory concentrations (normalized MIC) of 11–23 nmol mL^{-1} (for bacterial strains) or 68 nmol mL^{-1} (for a yeast strain) are shown by compound **2**, and the eventual structure–bioactivity correlations are discussed.

Adres publiczny

http://dx.doi.org/10.1021/acs.inorgchem.6b00186

Strona internetowa wydawcy

https://www.acs.org/content/acs/en.html