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# Mixed sulfoisophthalate and 1,2,4-triazole directed $d^{10}$ metal coordination polymers: synthesis, property and structural diversity

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## Abstract

This work presents six  $d^{10}$ -metal coordination polymers based on mixed ligands of 5-sulfoisophthalate ( $H_2SIP^-$ ) and 1,2,4-triazoles (1H-1,2,4-triazole (Htr), 3-amino-1H-1,2,4-triazole (Hatr)), 3D  $[Zn_7(SIP)_2(tr)_8(H_2O)_4] \cdot 4H_2O$  (**1**), 3D  $[Zn_4(SIP)(atr)_5(H_2O)_2] \cdot 3H_2O$  (**2**), 2D  $[Zn_2(SIP)(atr)(H_2O)_3] \cdot 2H_2O$  (**3**), 2D  $[Ag(H_2SIP)(Hatr)]$  (**4** and **5**), and 3D  $[Cd_3(SIP)(tr)_2(OH)] \cdot H_2O$  (**6**) under hydrothermal conditions. The structural analysis indicates a ligand directed structural diversity in the metal-(H)SIP-triazole system. The characterizations of **1-6** indicate that the bulk samples are pure phases, the thermal decomposition temperatures are beyond 300 °C, and the fluorescence are blue. The maximum emissions of **1-3** and **6** at around 410 nm are related with the intraligand  $\pi \rightarrow \pi^*$  transitions of 1,2,4-triazole moieties, and those at ca. 350 nm in **4** and **5** are assigned to intraligand transitions of (H)SIP ligands. The temperature-dependent fluorescence of **1-6** show thermal

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