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Research paper

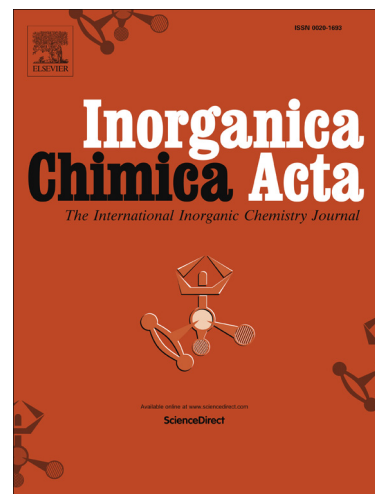
Structural Diversities, Magnetic, Luminescence and Photocatalytic Properties of Seven Inorganic-Organic Hybrid Supramolecular Complexes Based on 3,5-Dimethyl-2,6-bis(3-(pyrid-2-yl)-1,2,4-triazolyl) pyridine

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# Structural Diversities, Magnetic, Luminescence and Photocatalytic Properties of Seven Inorganic-Organic Hybrid Supramolecular Complexes Based on 3,5-Dimethyl-2,6-bis(3-(pyrid-2-yl)-1,2,4-triazolyl) pyridine

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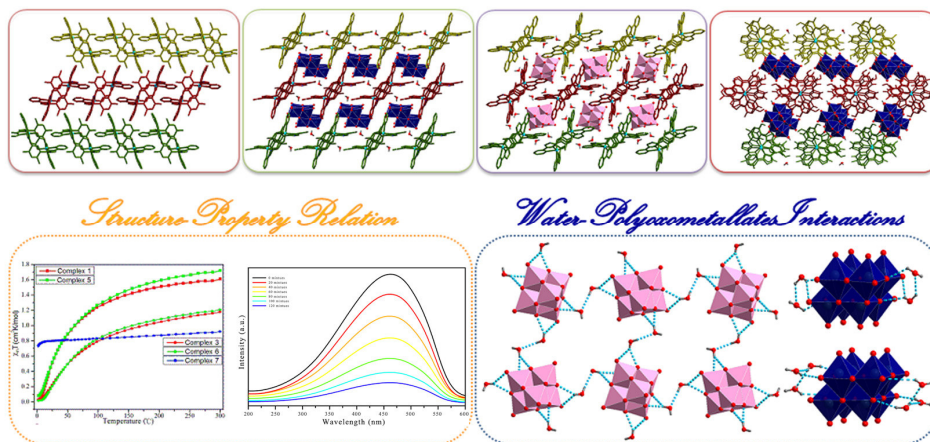
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## ABSTRACT

Seven inorganic-organic hybrid complexes, based on 3,5-dimethyl-2,6-bis(3-(pyrid-2-yl)-1,2,4-triazolyl) pyridine (H<sub>2</sub>DBPP), have been obtained under the solvothermal reactions, namely, [M<sub>2</sub>(HDBPP)<sub>2</sub>(ox)] (M = Co for **1**, Zn for **2**, and Ni for **3**), [Zn<sub>2</sub>(H<sub>2</sub>DBPP)<sub>2</sub>(ox)]·[Mo<sub>6</sub>O<sub>19</sub>]·4H<sub>2</sub>O (**4**), [M<sub>2</sub>(H<sub>2</sub>DBPP)<sub>2</sub>(ox)]·[β-H<sub>2</sub>Mo<sub>8</sub>O<sub>26</sub>]·2H<sub>2</sub>O (M = Co for **5**, and Ni for **6**), and [Ni<sub>2</sub>(H<sub>2</sub>DBPP)<sub>3</sub>]·[β-H<sub>2</sub>Mo<sub>8</sub>O<sub>26</sub>]·5H<sub>2</sub>O (**7**). Their structures were determined by single-crystal X-ray diffraction analyses and further characterized by elemental analyses, IR spectra, powder X-ray diffraction (PXRD), and thermogravimetric (TG) analyses. Crystal structural analysis revealed that these complexes composed of [M<sub>2</sub>(H<sub>2</sub>DBPP)<sub>2</sub>(ox)] or [Ni<sub>2</sub>(H<sub>2</sub>DBPP)<sub>3</sub>] cations and polyoxometallates interacted by electrostatic interactions and hydrogen bonds. Interestingly, the anions of these complexes took on [Mo<sub>6</sub>O<sub>19</sub>]<sup>2-</sup> cluster, single [β-H<sub>2</sub>Mo<sub>8</sub>O<sub>26</sub>]<sup>2-</sup> cluster, and twin [β-H<sub>2</sub>Mo<sub>8</sub>O<sub>26</sub>]<sup>2-</sup> clusters by changing the metal ions, and solvents. Besides, the magnetic property of complexes **1**, **3**, **5-7**, the solid state luminescence properties of complexes **2**, **4** and the photocatalytic activities of complexes **4**, **7** have been investigated.

**Keywords:** 3,5-Dimethyl-2,6-bis(3-(pyrid-2-yl)-1,2,4-triazolyl) pyridine, Polyoxometallates, Inorganic-organic hybrid materials, Magnetic property, Luminescent property, Photocatalytic activities.



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