

*Synthesis and X-ray characterization of a new hybrid based polyoxometalates*Maryam Bazargan¹, Masoud Mirzaei¹, Maryam Samanian¹, Atefeh Najafi¹, Joel Mague²¹Ferdowsi University Of Mashhad, Mashhad, Iran, Islamic Rep., ²Tulane University, New Orleans, United States
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The design and synthesis of inorganic-organic hybrid materials based on polyoxometalates (POMs) have attracted considerable attention over recent years, because of their intriguing architectures and properties as well as potential applications in catalysis, magnetism, and sensitive devices, supramolecular materials, electro/photochromic systems, sensors, macromolecular crystallography and medicine [1]. Also, Keggin-type POMs have been mostly employed due to its size suitability and structure stability. Furthermore, they are good candidates as linkers, because they have many nucleophilic surface oxygen atoms and various coordination modes which make them act as multidentate inorganic ligands [2].

As an extension of our attempts to synthesize new inorganic-organic hybrids, here, we would like to report a successful hydrothermally synthesis based on [SiW₁₂O₄₀]⁴⁻ as Keggin-type POMs. It has been characterized by single-crystal X-ray diffraction that formulated as { [Pr(pydc-OH)(H₂O)₄]₃ } [SiW₁₂O₄₀] • 7H₂O (**1**), in which pydc-OH = 4-hydroxypyridine-2,6-dicarboxylic acid or chelidamic acid. It has trigonal cell with *a* = 18.187 (2) Å, *b* = 18.187 (2) Å and *c* = 21.137 (4) Å. The results revealed that in **1** each trinuclear Pr-organic cluster is bound to three terminal oxygen atoms of the Keggin anion to yield discrete flower-like clusters (see Fig. 1). Also, discrete clusters can be assembled together by numerous of weak interactions like hydrogen bonding and anion-π interactions to generate 3D supramolecular frameworks. We concluded that these unique coordination modes of the Keggin anions and the pydc-OH ligands play significant roles in the formation of the discrete trinuclear lanthanoids structures [3].

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[2] Taleghani, S. et al. (2016). *Coord. Chem. Rev.* 309, 84–106.

[3] Mirzaei, M. et al. (2014). *Dalton Trans.* 43, 1906–1916.

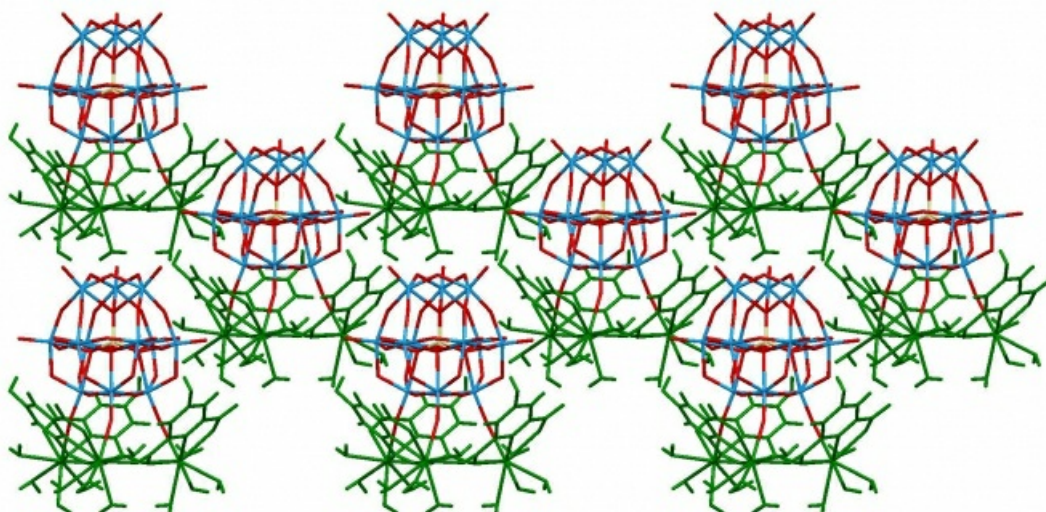


Figure 1. A flower-like view of the **1** that created by means of noncovalent interactions.

Keywords: [Polyoxometalates](#), [Inorganic-organic hybrids](#), [Keggin](#).