

研究快报

新颖的 $[\text{Cu}^{\text{I}}(\text{dpq})_2]^+$ 配合物阳离子修饰的砷钒酸盐 $[\text{Cu}(\text{dpq})_2]_4[\text{As}_8\text{V}_{14}\text{O}_{42}(\text{H}_2\text{O})]\cdot 2\text{H}_2\text{O}$ 的水热合成与结构表征

董宝霞, 张朋朋, 彭军

东北师范大学化学学院, 多酸科学教育部重点实验室, 长春 130024

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摘要 采用水热方法制备了一个新颖的 $[\text{Cu}^{\text{I}}(\text{dpq})_2]^+$ 配合物阳离子修饰的砷钒酸盐 $[\text{Cu}(\text{dpq})_2]_4[\text{As}_8\text{V}_{14}\text{O}_{42}(\text{H}_2\text{O})]\cdot 2\text{H}_2\text{O}$, X射线单晶衍射结果表明, 该化合物的结构是由4个 $[\text{Cu}^{\text{I}}(\text{dpq})_2]^+$ 阳离子和1个 $[\text{As}_8\text{V}_{14}\text{O}_{42}(\text{H}_2\text{O})]^{4-}$ 簇阴离子以及2个结晶水组成的, 簇阴离子内部包含一个孤立的水分子.

关键词 [水热合成](#) [多金属氧酸盐](#) [晶体结构](#)

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Hydrothermal Synthesis and Structure Characterization of a Novel $[\text{Cu}^{\text{I}}(\text{dpq})_2]^+$ Complex Cations Modified Arsenic-Vanadium Polyoxometalate $[\text{Cu}(\text{dpq})_2]_4[\text{As}_8\text{V}_{14}\text{O}_{42}(\text{H}_2\text{O})]\cdot 2\text{H}_2\text{O}$

DONG Bao-Xia, ZHANG Peng-Peng, PENG Jun*

Key Laboratory of Polyoxometalate Science of Ministry of Education, Faculty of Chemistry, Northeast Normal University, Changchun 130024, China

Abstract A novel inorganic-organic hybrid compound $[\text{Cu}(\text{dpq})_2]_4[\text{As}_8\text{V}_{14}\text{O}_{42}(\text{H}_2\text{O})]\cdot 2\text{H}_2\text{O}$ (dpq = dipyrido[3,2-d:2',3'-f]quinoxaline) was synthesized under the hydrothermal condition and its structure was characterized via single-crystal X-ray diffraction, elemental analysis, IR and XPS spectra. The title compound crystallizes in a monoclinic crystal system, space group $P2_1/c$ with crystal parameters $a=1.8973(3)$ nm, $b=2.5816(2)$ nm, $c=2.8941(2)$ nm, $\beta=106.61(2)^\circ$, $V=13.5846(12)$ nm³, $Z=4$, $R_1=0.0674$, $wR_2=0.1750$. It possesses a spherical $[\text{As}_8\text{V}_{14}\text{O}_{42}(\text{H}_2\text{O})]^{4-}$ cluster anion, four $[\text{Cu}^{\text{I}}(\text{dpq})_2]^+$ counter cations and two lattice water molecules. The cationic complexes form ca. 0.8 nm×0.8 nm stellate channels along the c axis through strong $\pi\cdots\pi$ stacking interactions due to the multiple aryls in the dpq ligands. The polyoxoanions are embedded in the channels through extensive C—H \cdots O short contact interactions.

Key words [Hydrothermal synthesis](#) [Polyoxometalate](#) [Crystal structure](#)

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通讯作者 彭军 jpeng@nenu.edu.cn

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