

Polyoxometalates

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Rare-earth-induced peroxo-phosphotungstates:
Enhanced proton conductivity in corresponding membranes



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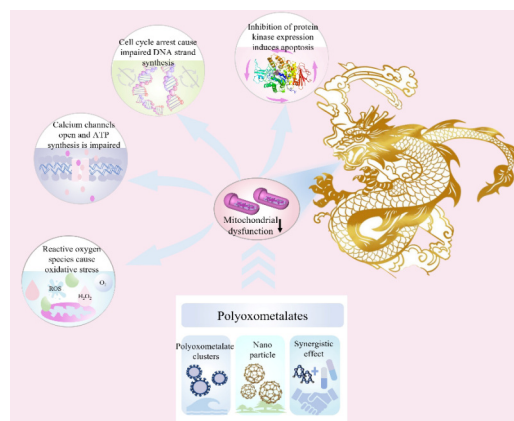
Review articles

Study on the regulatory mechanisms of mitochondrial biosynthesis by polyoxometalates

Shan Lei, Bingnian Chen, Li Wang*, and Jian Li*

Polyoxometalates, **2025**, 4, 9140074
<https://doi.org/10.26599/POM.2024.9140074>

Polyoxometalates affect the mechanism of mitochondrial functional synthesis.

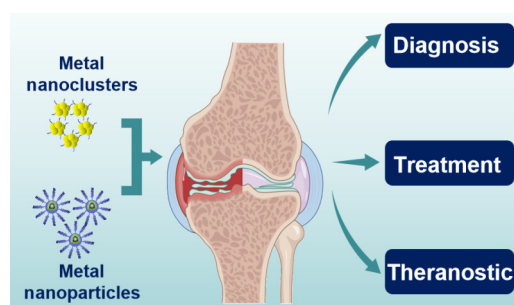


Advanced application of metal nanoparticles in the diagnosis and treatment of rheumatoid arthritis

Wenjing Zhang, Tingting Xu, Yu Chen, Guiyang Zhang*, and Yongbo Song*

Polyoxometalates, **2025**, 4, 9140082
<https://doi.org/10.26599/POM.2024.9140082>

This paper provides a comprehensive review and discussion on the utilization of metal nanoparticles (MNPs) in the diagnosis and treatment of rheumatoid arthritis (RA).



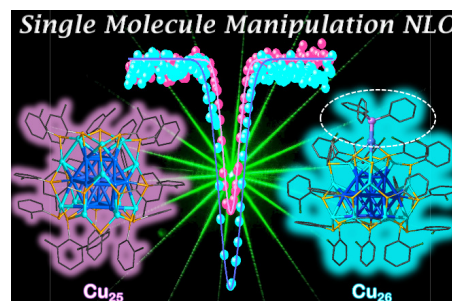
Research articles

Single-molecule manipulation of copper nanoclusters for modulating nonlinear optics

Xuekun Gong, Zhuang-Hua Liu, Qinghua Xu, Lin Wang, Qingxiang Guo, Jian Zhang, Qiao-Hong Li*, Wei-Hui Fang*, and Hui Shen*

Polyoxometalates, **2025**, 4, 9140072
<https://doi.org/10.26599/POM.2024.9140072>

The single molecule manipulation could significantly modulate the properties of copper nanoclusters, which include absorption characteristics, stability, and nonlinear optics.

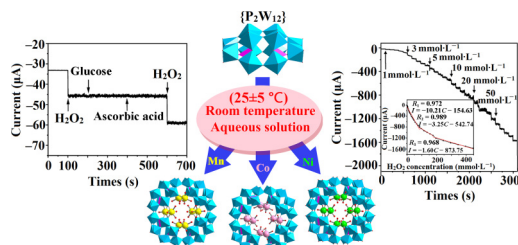


Room temperature self-assembly and nonenzymatic electrochemical sensing performance of transition metal-embedded wheel-shaped tungstophosphates

Wen-Da Liu, Hao-Tian Zhu*, Xue Zhang, Fang Su*, Xiao-Jing Sang, Xiao-Lan Zhang, and Lan-Cui Zhang*

Polyoxometalates, **2025**, 4, 9140073
<https://doi.org/10.26599/POM.2024.9140073>

Three wheel-shaped tungstophosphates with eight transition metal ions all embedded inside the $[P_8W_{48}O_{184}]^{40-}$ ($\{P_8W_{48}\}$) wheel have been obtained through room-temperature aqueous solution synthesis method, and they have good non-enzymatic activity for H_2O_2 electrochemical detection.

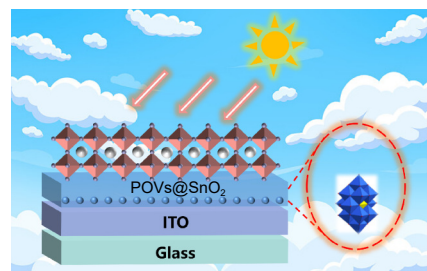


Polyoxovanadate-modified SnO₂ electron transport layer for perovskite photodetectors

Ziting Liu, Yijia Hao, Jing Zhang, Yi He, and Weilin Chen*

Polyoxometalates, **2025**, 4, 9140076
<https://doi.org/10.26599/POM.2024.9140076>

Polyoxovanadates (POVs) adjust the band structure of SnO₂ and accelerate the electron transport at the interface between perovskite and SnO₂. The perovskite photodetectors on the POVs@SnO₂ substrate exhibit excellent photoelectric performance.

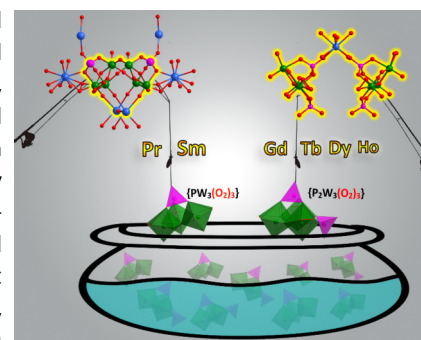


Rare-earth-induced peroxo-phosphotungstates: Enhanced proton conductivity in corresponding membranes

Qianqian Shang, Keqin Shen, Dongyan Zhao, Xiaoyue Wang, Yuting Wei, Haiying Wang*, Guan Wang, Dongdi Zhang*, and Jingyang Niu

Polyoxometalates, **2025**, 4, 9140077
<https://doi.org/10.26599/POM.2024.9140077>

Two types rare-earth-induced peroxopolytungstates, two-dimensional [Ln₂(H₂O)₄(OH)P₂W₆(O₂)₄O₂₃]³⁻ (**2D-Ln₂**, Ln = Pr, Sm) and one-dimensional [Ln(H₂O)₄P₄W₆(O₂)₆(OH)₄O₂₄]⁵⁻ (**1D-Ln**, Ln = Gd, Tb, Dy, Ho), have been successfully synthesized from the identical {P₃W₆(O₂)₆} system. **2D-Pr₂** and **1D-Tb** exhibited conductivities of 2.62 × 10⁻³ and 2.78 × 10⁻³ S·cm⁻¹ under 65 °C and 95% RH, respectively, while their corresponding Nafion membranes **2D-Pr₂/Nafion** and **1D-Tb/Nafion** exhibited better conductivities of 1.65 × 10⁻¹ and 1.44 × 10⁻¹ S·cm⁻¹ under the same condition.



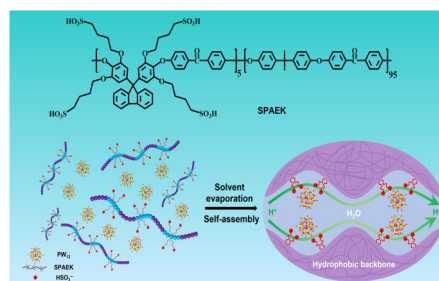
Front Cover

Facile construction of polyoxometalate-modified polyaryletherketone-based hybrid membranes with enhanced proton conductivity

Bo Hu, Qiuchen Du, Yang Yang, Dengdeng Li, Jiawang Fu, Bailing Liu*, Hong-Ying Zang*, Yangguang Li*, Haiming Xie, and Zhongmin Su

Polyoxometalates, **2025**, 4, 9140079
<https://doi.org/10.26599/POM.2024.9140079>

A novel proton exchange membrane SPAEK-PW₁₂ was constructed by introducing H₃PW₁₂O₄₀·nH₂O (PW₁₂) into a sulfonated polyarylether (SPAEK) with high ionic conductivity through regulation of the membrane microstructures achieved by molecular-level hybridization. SPAEK-PW₁₂-13% hybrid membrane showed a proton conductivity of 0.167 S·cm⁻¹ at 80 °C in aqueous solution, which is 220% times higher than that of SPAEK under identical conditions.



Supramolecular assembly of covalently modified Anderson-type polyoxometalates and crown ethers towards pseudo-rotaxane structures

Yi-An Yin, Wu-Ji Chen, Chun-Yan Liu, Meng-Meng Zhang, Chang-Gen Lin*, Haralampos N. Miras, and Yu-Fei Song*

Polyoxometalates, **2025**, 4, 9140081
<https://doi.org/10.26599/POM.2024.9140081>

We report here the first case of supramolecular assembly of Anderson hybrids and 18-crown-6 ethers towards pseudo-rotaxane structures manipulated via covalent modifications.

