

Cost-effective nanorod electrodes for molecular hydrogen production

April 19 2024



Graphical abstract. Credit: *Journal of Applied Electrochemistry* (2024). DOI: 10.1007/s10800-023-02064-x



SUNY Polytechnic Institute (SUNY Poly) Associate Professor of Electrical and Computer Engineering Technology Dr. Iulian Gherasoiu and peers have published <u>research</u> in the *Journal of Applied Electrochemistry* titled "MoVN-coated MoNi₄-MoO₂ nanorods as a bifunctional electrode for electrochemical water splitting."

The emerging need for clean and renewable energy drives the exploration of effective strategies to produce <u>molecular hydrogen</u>, Gherasoiu explains. With the assistance of highly active, non-noble metal electrocatalysts, electrolysis of water is a promising candidate to generate pure hydrogen with <u>high efficiency</u>.

However, this reaction takes place almost exclusively on Pt/C catalysts at the <u>cathode</u> which is expensive and needs to be replaced by a metalbased catalyst that is cost effective and can show a comparable HER (<u>hydrogen evolution reaction</u>) activity.

This research uncovers the properties of cost-effective MoVN/MoNi₄-MoO₂ nanorods that are synthesized using a two-step facile hydrothermal method.

The electrodes having high specific electrochemical surface area, low overpotential for both half-cell reactions (HER and OER), and negligible degradation, performed exceptionally well providing a competitive path to the fabrication of low-cost and highly effective electrodes, as a potential replacement for Pt-based electrodes, for application in commercial electrolyzers.

More information: Yamini Kumaran et al, MoVN-coated MoNi4-MoO2 nanorods as a bifunctional electrode for electrochemical water splitting, *Journal of Applied Electrochemistry* (2024). DOI:



<u>10.1007/s10800-023-02064-x</u>

Provided by Colleges of Nanoscale Science and Engineering

Citation: Cost-effective nanorod electrodes for molecular hydrogen production (2024, April 19) retrieved 17 May 2024 from <u>https://phys.org/news/2024-04-effective-nanorod-electrodes-molecular-hydrogen.html</u>

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