

Decoupled Electrolysis for Water Splitting and Beyond

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There has been much interest recently in electrocatalytic water splitting for storing intermittent renewably-generated power (e.g. solar) as chemical fuels such as hydrogen.¹ Conventional electrolyzers usually require stable power inputs in order to operate effectively and safely and so may be unsuited to harnessing renewable power, which is often intermittent and diffuse. Decoupled electrolysis using suitable redox mediators² allows oxygen and hydrogen production to be separated in both space and time. The advantages of this approach for harnessing intermittent power sources will be explained, such as the production of ultra-pure product gases^{3,4} and the potential benefits of using such a system in a more diffuse, solar-driven hydrogen production platform.^{5,6} The application of this technology to chemical hydrogenations⁷ and redox flow batteries with remarkably high energy densities will also be discussed.⁸

References

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