

WISCONSIN
UNIVERSITY OF WISCONSIN-MADISON

LIGAND-EXCHANGE ION ELECTROLYTES FOR ELECTROLYSIS SYSTEMS AND RELATED METHODS

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The Invention

UW-Madison researchers discovered that anions (e.g., tetrafluoroborate) that undergo Lewis acid-base ligand exchange to coordinate, or "trap," interfacial hydroxide can substantially promote the rate of water reduction to hydrogen under conditions where the bulk pH is strongly basic. This concept represents a new chemical mechanism for modulating water activity at interfaces under conditions where water reduction to generate hydrogen is typically prohibited due to large interfacial hydroxide activity, which competes to suppress the productive hydrogen evolution pathway via hydroxide chemical attack of surface bound hydrogen intermediates. Their preliminary data demonstrates that they can obtain remarkably high hydrogen evolution rates under strong base conditions (pH exceeding 14) and completely decouple interfacial hydrogen evolution activity from bulk pH.

Tech Fields

- [Materials & Chemicals : Catalysts](#)
- [Materials & Chemicals : Synthesis](#)

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