# Article information:

Surface Reconstruction of Water Splitting Electrocatalysts - Zeng - 2022 - Advanced Energy Materials - Wiley Online Library  
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# Article summary:

1. Water electrolysis is an efficient and green method to produce hydrogen gas, but the electrocatalytic activity of applied catalysts restricts its efficiency and large-scale application.

2. The reconstruction phenomenon of electrocatalysts during a catalytic reaction has been discovered, which could form reactive sites for both the oxygen evolution and hydrogen evolution reactions. Regulation of the reconstruction process to generate a large number of reactive species with high activity has since been demonstrated as an effective strategy to enhance the catalytic performance of electrocatalysts.

3. The modulation strategies for promoting the reconstruction process include surface activation, defect engineering, partial dissolution of pre-catalysts, ionic doping, construction of heterostructures, and deep reconstruction. These strategies influence the triggering condition, reconstruction rate, conversion degree, and the reconstructed species’ catalytic activity.

# Article rating:

Appears moderately imbalanced: The article provides some useful information, but is missing several important points or pieces of evidence that would be required to present the discussed topics in a balanced and reliable way. You are encouraged to seek a more balanced perspective on the presented issues by exploring the provided research topics and looking at different information sources.

# Article analysis:

该文章是一篇关于水分解电催化剂表面重构的综述，介绍了近年来在调控重构过程中提高电催化剂催化性能方面的研究进展。文章首先介绍了水电解的机理和现有电催化剂的局限性，然后讨论了表面重构对提高电催化剂活性的作用，并总结了目前已报道的调控重构过程以提高活性的策略。最后，文章讨论了未来表面重构电催化剂在水分解中所面临的挑战。

从整体上看，该文章内容较为客观、全面，但也存在一些问题。首先，文章没有充分考虑到非均相反应条件下表面重构对实际应用的影响。其次，在介绍调控重构过程以提高活性的策略时，文章只列举了已报道的例子，并未进行系统比较和评价。此外，在讨论未来挑战时，文章也没有涉及到可能存在的风险和不确定性。

另外，该文章可能存在一定偏见。例如，在介绍现有电催化剂局限性时，作者强调了贵金属材料稀缺和不稳定等问题，并将其与非贵金属材料作为可行替代品进行对比。然而，这种对比可能存在一定的片面性，因为贵金属材料在某些情况下仍然是最优选择，而非贵金属材料也存在着自身的局限性和挑战。

总之，该文章提供了有价值的综述和讨论，但也需要更加全面、客观地考虑问题，并注意到可能存在的偏见和风险。

# Topics for further research:

* Non-homogeneous reaction conditions
* Systematic comparison and evaluation of strategies
* Risks and uncertainties
* Potential bias
* Limitations and challenges of non-precious metal materials
* Consideration of optimal choices for different situations

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