# Article information:

Multifunctional polymer coating cooperated with γ-Fe2O3 for boosting photoelectrochemical water oxidation - ScienceDirect  
<https://www.sciencedirect.com/science/article/pii/S0926337322008104>

# Article summary:

1. A ternary structure of γ-Fe2O3-PDAAQ@BiVO4 was prepared using a solvothermal method to improve the photocurrent of BiVO4 photoanode.

2. PDAAQ can form type II heterojunction with BiVO4 to inhibit carrier recombination and promote water oxidation kinetics by accelerating proton coupled electron transfer process.

3. The photocurrent of γ-Fe2O3-PDAAQ@BiVO4 photoanode reach to 5.35 mAcm2 at 1.23 VRHE, which is 3.3 times higher than that of pure BiVO4.

# 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:

The article “Multifunctional polymer coating cooperated with γ-Fe2O3 for boosting photoelectrochemical water oxidation” provides an overview of the use of a ternary structure of γ-Fe2O3-PDAAQ@BiVO4 as a means to improve the photocurrent of BiVO4 photoanodes for PEC water splitting applications. The article is generally well written and provides a comprehensive overview of the research conducted, including theoretical calculations and isotope effect experiments to support its claims.

However, there are some potential biases in the article that should be noted. For example, the authors do not provide any evidence or discussion on possible risks associated with using this ternary structure in PEC water splitting applications, such as environmental impacts or safety concerns related to handling the materials used in this study. Additionally, while the authors discuss how PDAAQ can form type II heterojunctions with BiVO4 and promote water oxidation kinetics by accelerating proton coupled electron transfer processes, they do not explore any counterarguments or alternative explanations for these phenomena that could be considered when interpreting their results.

In addition, it should also be noted that while the authors present their findings in a balanced manner, they do not provide equal coverage for both sides of their argument; instead, they focus primarily on discussing how their proposed ternary structure improves photocurrents without providing much detail on other potential solutions or approaches that could be used to achieve similar results. Furthermore, there is some promotional content in the article as well; for example, the authors emphasize how iron-based catalysts are non-toxic and efficient without providing any evidence or discussion on why these characteristics make them preferable over other types of catalysts available on the market today.

In conclusion, while this article provides an informative overview of how a ternary structure composed of γ-Fe2O3-PDAAQ@BiVO4 can be used to improve photocurrents in PEC water splitting applications, there are some potential biases and missing points of consideration that should be taken into account when evaluating its trustworthiness and reliability.

# Topics for further research:

* Environmental impacts of PEC water splitting
* Safety concerns related to handling materials used in PEC water splitting
* Alternative explanations for proton coupled electron transfer processes
* Other approaches to improving photocurrents in PEC water splitting
* Advantages of iron-based catalysts over other types of catalysts
* Promotional content in scientific articles

# Report location:

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