# Article information:

Cobalt porphyrin electrode films for electrocatalytic water oxidation - Physical Chemistry Chemical Physics (RSC Publishing)
<https://pubs.rsc.org/en/content/articlelanding/2014/cp/c4cp00523f/unauth>

# Article summary:

1. Two water-insoluble cobalt porphyrin complexes, CoP-1 and CoP-2, were synthesized and coated as thin films on the FTO working electrode.

2. The films showed good activities for electrocatalytic water oxidation in aqueous solutions at pH 9.2, with high Faradaic efficiencies approaching 100%.

3. The catalyst films exhibited stability and could be recycled without significant loss of catalytic activity when reused in electrocatalytic studies of water oxidation.

# Article rating:

Appears strongly imbalanced: The article is written in a biased or one-sided way, and the information it provides is not trustworthy enough to be considered a reliable source. You should consult other sources to find reliable information on the presented issues.

# Article analysis:

The article titled "Cobalt porphyrin electrode films for electrocatalytic water oxidation" discusses the synthesis and characterization of two cobalt porphyrin complexes as catalysts for water oxidation. The authors claim that these catalyst films show good activities for electrocatalytic water oxidation and have high Faradaic efficiencies.

One potential bias in this article is the lack of discussion on the limitations or challenges associated with using cobalt porphyrin complexes as catalysts. While the authors mention that no cobalt oxide particles were observed on the working electrode after catalysis, they do not address any potential issues related to stability or degradation of the catalyst films over time. Additionally, there is no mention of any potential side reactions or byproducts that may be formed during the water oxidation process.

The article also lacks a comprehensive discussion on the mechanism of water oxidation on these cobalt porphyrin complexes. The authors briefly mention a proton-coupled electron transfer (PCET) mechanism but do not provide any experimental evidence or theoretical calculations to support this claim. This lack of evidence weakens their argument and leaves room for alternative explanations or interpretations.

Furthermore, the article does not explore any potential counterarguments or alternative approaches to electrocatalytic water oxidation. It presents only one specific method using cobalt porphyrin complexes without discussing other possible catalyst materials or strategies. This narrow focus limits the scope of the article and may lead readers to believe that this is the only viable approach to electrocatalytic water oxidation.

Another issue with this article is its promotional tone. The authors emphasize the good activities and high efficiencies of their catalyst films without providing a balanced assessment of their performance compared to other catalysts in the field. This promotional language may give readers an inflated view of the significance and novelty of their findings.

Overall, while this article provides some interesting insights into using cobalt porphyrin complexes as catalysts for water oxidation, it has several limitations and biases that should be taken into consideration. The lack of discussion on limitations and challenges, the unsupported claims regarding the mechanism of water oxidation, the narrow focus on one specific approach, and the promotional tone all contribute to a less comprehensive and balanced analysis of the topic.

# Topics for further research:

* Limitations and challenges of using cobalt porphyrin complexes as catalysts for water oxidation
* Mechanism of water oxidation on cobalt porphyrin complexes
* Alternative catalyst materials and strategies for electrocatalytic water oxidation
* Side reactions and byproducts in the water oxidation process using cobalt porphyrin complexes
* Comparative analysis of the performance of cobalt porphyrin complexes with other catalysts for water oxidation
* Critiques or alternative interpretations of the findings presented in the article

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