# Article information:

A Long‐Life Manganese Oxide Cathode Material for Aqueous Zinc Batteries with a Negatively Charged Porous Host to Promote the Back‐Deposition of Dissolved Mn2+ - Liu - 2022 - Advanced Functional Materials - Wiley Online Library
<https://onlinelibrary.wiley.com/doi/10.1002/adfm.202106994>

# Article summary:

1. Manganese oxide is a promising cathode material for aqueous zinc batteries due to its abundant storage, good environment friendliness, and electrochemical activity.

2. Capacity decay of manganese oxide is caused by the dissolution of active material, mainly Mn2+ species formed by disproportionation or proton reduction.

3. A composite of manganese oxide and negatively charged porous carbon derived from a metal-organic framework (MOF) is proposed to promote the back-deposition of dissolved Mn2+ in electrolytes without pre-added Mn2+ salts.

# Article rating:

May be slightly imbalanced: The article presents the information in a generally reliable way, but there are minor points of consideration that could be explored further or claims that are not fully backed by appropriate evidence. Some perspectives may also be omitted, and you are encouraged to use the research topics section to explore the topic further.

# Article analysis:

The article “A Long‐Life Manganese Oxide Cathode Material for Aqueous Zinc Batteries with a Negatively Charged Porous Host to Promote the Back‐Deposition of Dissolved Mn2+” by Liu et al., published in Advanced Functional Materials in 2022, presents an innovative approach to address the capacity decay issue associated with manganese oxide cathode materials in aqueous zinc batteries. The authors propose a composite of manganese oxide and negatively charged porous carbon derived from a metal-organic framework (MOF) as an effective solution to promote the back-deposition of dissolved Mn2+ in electrolytes without pre-added Mn2+ salts.

The article is well written and provides sufficient evidence to support its claims. The authors provide an overview of current strategies used to suppress dissolution and explain why they are not ideal solutions for practical applications. They then present their proposed solution and provide detailed information on its synthesis process, morphology, XRD pattern, electrochemical performance, etc., which are all supported by relevant figures and data. The article also includes references to other studies that have explored similar topics or related concepts, providing further evidence for its claims.

However, there are some points that could be improved upon in this article. For example, while the authors discuss potential risks associated with their proposed solution such as corrosion or instability issues due to high acidity levels in electrolytes, they do not provide any evidence or data on how these risks can be mitigated or avoided altogether. Additionally, while the authors discuss various strategies used to suppress dissolution such as surface coating or intercalation into layered MnO2 structures, they do not explore any counterarguments against these strategies or discuss any potential drawbacks associated with them.

In conclusion, this article provides an innovative approach towards addressing capacity decay issues associated with manganese oxide cathode materials in aqueous zinc batteries and presents sufficient evidence to support its claims; however it could benefit from further exploration into potential risks associated with their proposed solution as well as counterarguments against existing strategies used to suppress dissolution.

# Topics for further research:

* Manganese oxide cathode material dissolution
* Metal-organic framework (MOF) for aqueous zinc batteries
* Surface coating for manganese oxide cathode materials
* Intercalation into layered MnO2 structures
* Risks associated with aqueous zinc batteries
* Drawbacks of existing strategies for dissolution suppression

# Report location:

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