Review of: "Flow Batteries From 1879 To 2022 And Beyond"

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Potential competing interests: No potential competing interests to declare.

The submitted review by Yuriy Tolmachev provides a nice chronological development of redox flow batteries. The review is timely and contains information unavailable in other previous reviews, such as detailed techno-economic data and comparison with LIBs. Therefore, this is a useful reference for engineers and decision makers. To further improve the quality, this reviewer suggests the following additions/discussion.

- Membrane is a key component in RFBs. Nafion is the state-of-the-art membrane, but a brief review on its application in RFBs will be valuable.
- Low efficiency is an issue for RFBs to compete with other batteries, such as LIBs. The author has provided a good discussion on this point. But it seems there is still a lack of details on the fundamental causes of low efficiency. Examples include high self-discharge rate, high pumping power, and electrolyte cross-over rate.
- Similarly, a section to discuss the degradation mechanisms will be very useful for readers.
- Energy density (gravimetric and volumetric) talks need to be emphasized, especially when comparing with LIBs, since this is a key metrics for all electrochemical cells.
- When comparing with LIBs, new LIB high energy density cathodes such as NMC, NCA could be mentioned and compared.

There are some minor editorial comments:

- Figure 1 is missing.
- Figure 11A is missing.
- Improving figure resolution by using SVG format.