

Performance of Aqueous Organic Redox Flow Battery Using Quinones

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Vanadium redox flow battery (VRFB) has been widely considered because this could offer the advantages like the tolerance to deep discharge and the long lifecycle. However, in spite of such advantage of VRFB, there are still problems to be addressed. High vanadium price, narrow available temperature range are the main difficulties. As one of the solutions to address the problems of VRFB, aqueous organic redox flow battery (AORFB) can be considered because the aqueous organic redox couples are usually eco-friendly. As the redox couple candidates, the quinones and their derivatives can be promising due to the merit like a low cost, low toxicity, and high reversibility in electrochemical reactions. We suggest two new quinones as the aqueous redox couple for AORFB. When the quinones are used, the performance and long-cycle stability of AORFB are considerably improved.