

All-Iron Aqueous Redox Flow Battery Improved Stability and Performance Using Organometallic Complexes

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Redox Flow Battery (RFB) is one of the Energy Storage System (ESS) that has the advantages of high stability and design independence of capacity and power. The Vanadium Redox Flow Battery (VRFB) has been actively studied. However, it has difficulties in commercialization because of the high price of vanadium used as an active material.

To solve the problem, various active materials to replace vanadium are being studied. We have studied the Aqueous Redox Flow Battery (ARFB) system, which uses Metal-Ligand complex as the active materials. Among them, Iron-Triethanolamine (Fe(TEA)) has a good redox reactivity in alkaline conditions. However, Fe(TEA) complex has a problem of side reaction. Therefore, we tried to improve performance by introducing a new ligand-based organometallic active material. We compared the Fe-based active material complexes through the half-cell test, C-NMR test and performed a full cell test.