

## Synthesis and performance of MOF/nafon composite membrane for vanadium redox flow battery systems

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Because of long life cycles and a high stability, VRFB(Vanadium Redox Flow Battery), a type of ESS(Energy Storage System), has been actively developed. Membrane is crucial components in VRFB system. Nafion as separator is the most widely used but it is expensive. In this study, MOF/nafon composite membranes were synthesized and performances were studied to solve cost problem. MOF(Metal Organic Framework) is crystalline compound, which is consisted of organic molecules and inorganic clusters. The pore size and properties can be controlled by using organic ligands has diverse functional groups. The aluminum based MOF, CAU-10, are stable in the strong acid, which is the condition of electrolyte in a VRFB, and low-priced. As using CAU which have mixed-linkers of sulfonic and hydroxyl groups, MOF/nafon composite membrane showed effects on reducing vanadium cross-over through the membrane. Consequently, the MOF/nafon composite membrane improved energy efficiency compared with nafion.