

Horizontal designed flow channel in Vanadium Redox battery Cell effect on performance

전영재, 양대륙[†]

고려대학교

(dryang@korea.ac.kr[†])

Vanadium Redox Battery (VRB) is promising energy storage device. High energy density and flexibility of setting capacity of cell makes VRB useful to renewable energy system such as smart grid. Therefore, improving cell efficiency is important in research of VRB.

VRB structure is very similar to PEMFC, because both cell use fluid as electrochemical energy source. However, VRB use Electrolyte -Vanadium ions are used in VRB- liquid. Liquid permeability on porous material is lower than gas. That is the reason that design VRB cell is effective in improving cell efficiency.

It is already known that the flow channel structure is very effective not only to reduce pumping power but also to enhance cell electric performance. Because flow channel help mass-transportation in electrochemical reaction. In this study, locates flow channel and porous electrodes horizontally. Ordinary structure stacked porous electrodes and channel vertically. certain electrodes region relatively for from channel would be poor mass transportation. Horizontal structure can reduce the poor region, thus cell performance will be improved. This study operated with COMSOL multi-physics.