

Vanadium Redox battery performance simulation with changing flow field design

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Vanadium redox battery(VRB) is promising energy storage device. It is suitable for smart grid system because VRB capacity is easily controlled by changing Electrolyte tank size. Also VRB power is stable at wide region.

VRB cell usually use porous carbon as electrode which enhancing electrolyte ion redox reaction at electrode surface. Flow channel of the cell structure helps ion transportation so that VRB cell performance could be improved.

In this study, simulate cell performance with changing cell flow field designs. flow channel in the carbon felt electrode has various effect. Generally, flow channel is placed in the current collector. So flux in porous electrode is not uniform. The channel design used in this simulation placed channel in the porous electrode.

Briefly, flow channel structure reduces pressure drop through the cell remarkably. However, sum of transfer current decrease. current decrease ratio is relative to activation surface area loss ratio.