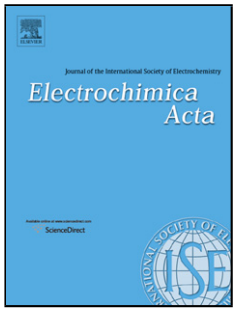

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PII: S0013-4686(17)31540-2
DOI: http://dx.doi.org/doi:10.1016/j.electacta.2017.07.122
Reference: EA 29939

To appear in: *Electrochimica Acta*

Received date: 23-3-2017
Revised date: 19-7-2017
Accepted date: 20-7-2017

Please cite this article as: Chunxiao Wu, Huijuan Bai, Yang Lv, Zhaoqian Lv, Yan Xiang, Shanfu Lu, Enhanced membrane ion selectivity by incorporating graphene oxide nanosheet for vanadium redox flow battery application, Electrochimica Actahttp://dx.doi.org/10.1016/j.electacta.2017.07.122

Enhanced membrane ion selectivity by incorporating graphene oxide nanosheet for vanadium redox flow battery application

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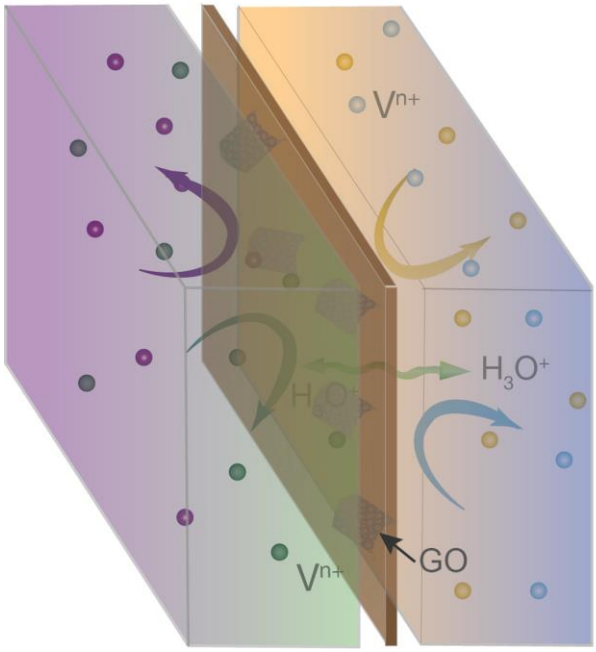
Graphical abstract



Abstract

High ion selectivity with high proton conductivity and low vanadium ionic permeability is one of the critical issues for an ideal ion conductive membrane (ICM) in vanadium redox flow battery (VRFB). In this work, a novel ICM is fabricated by-polyvinylpyrrolidone (PSF-PVP) membrane to enhance its membrane ion selectivity. Both the proton conductivity and vanadium ion permeability of the PSF-PVP/GO composite membranes are decreased with the loading of GO. However, the ion selectivity of the composite membranes shows volcano shape against the GO loading. After adding 0.05 wt% GO, the ion selectivity of the composite membrane