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Highly stable aromatic poly (ether sulfone) composite ion exchange membrane for vanadium flow battery

Zhizhang Yuan^{a,b1}, Qing Dai^{a,b1}, Lin Qiao^{a,b}, Yuyue Zhao^{a,b}, Huamin Zhang^{a,c} and Xianfeng Li^{a,c*}

^aDivision of Energy Storage, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, 457 Zhongshan Road, Dalian 116023 (P. R. China),

^bUniversity of Chinese Academy of Sciences, Beijing 100049 (P. R. China).

^cCollaborative Innovation Center of Chemistry for Energy Materials (iChEM), Dalian 116023 (P. R. China).

lixianfeng@dicp.ac.cn.

Abstract: Enhancing the chemical stability of ion exchange membranes is essential for improving cycle life and enabling the widespread utilization of flow batteries. Although numerous studies have been devoted to generate ion exchange membranes with high efficiency and stability, the progress is heavy going, especially for the non-fluorinated ion exchange membranes. Here we describe the preparation and utilization of an aromatic poly (ether sulfone) composite ion exchange membrane for vanadium flow battery application. The ion exchange groups are constructed by fixing the phosphotungstic acid into the alkaline poly (vinyl pyrrolidone) through the acid-base reaction, while the aromatic poly (ether sulfone) is used as the matrix. The stability and performance of the prepared membrane are verified by utilizing it in a

¹ Zhizhang Yuan and Qing Dai contributed equally to this work.

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