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# Proton Blockage Membrane with Tertiary Amine Groups for Concentration of Sulfonic Acid in Electrodialysis

Liang Wang,<sup>1\*</sup> Zhenxing Li<sup>1</sup>, Zhaozan Xu<sup>2</sup>, Fan Zhang<sup>1</sup>, Johnson E. Efome<sup>3\*</sup>, Nanwen Li<sup>2,\*</sup>

<sup>1</sup>State Key Laboratory of Separation Membranes and Membrane Processes, and School of Environmental and Chemical Engineering, Tianjin Polytechnic University, Tianjin 300387, PR China

<sup>2</sup>State Key Laboratory of Coal Conversion, Institute of Coal Chemistry, Chinese Academy of Sciences, Taiyuan 030001, China

<sup>3</sup>Industrial membrane research institute, Department of Chemical and Biochemical Engineering, University of Ottawa, 161 Louis Pasteur Ottawa ON Canada, K1N 6N5

mashi7822@163.com

jefom061@uottawa.ca

linanwen@sxicc.ac.cn

## ABSTRACT

The weak base of tertiary amine groups was introduced into poly (2, 6-dimethyl-1, 4-phenylene oxide) (PPO) anion exchange membranes (AEMs) by Cu(I)-catalyzed “click chemistry” in order to fabricate proton blockage membranes for sulfonic acid concentration in electrodialysis (ED). The degree of functionalization has been confirmed quantitatively by <sup>1</sup>H NMR spectroscopy. Fourier transform infrared spectroscopy (FTIR) was also used to confirm the functional groups in the membranes matrix. The prepared proton blockage membrane with tertiary ammonium groups showed lesser swelling and water uptake ratios than the typical AEMs with strong organic base of quaternary ammonium groups. It is believed that the strong organic base of quaternary ammonium has a stronger hydration effect on water than that of tertiary amine groups. Interestingly, the concentration limitation of membranes with tertiary amine groups was higher than that of the membrane with quaternary ammonium groups, indicative of the proton blocking capabilities of the AEMs as a result of the weak base introduced into the matrix. Moreover, it was found that the

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