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Achieving High Anion Conductivity by Densely Grafting of Ionic Strings

Yubin He¹, Jianjun Zhang¹, Xian Liang, Muhammad A. Shehzad, Xiaolin Ge, Yuan Zhu, Min Hu,
Zhengjin Yang, Liang Wu^{*}, Tongwen Xu^{*}

CAS Key Laboratory of Soft Matter Chemistry, Collaborative Innovation Centre of Chemistry for Energy Materials, School of Chemistry and Material Science, University of Science and Technology of China, Hefei 230026, P.R. China

twxu@ustc.edu.cn (T. W. Xu).

Liangwu8@ustc.edu.cn (L. Wu)

*Corresponding author. Tel.: +86-551-6360-1587.

*Corresponding author. Tel.: +86-551-6360-2171.

Abstract

To access highly ion-conductive membrane materials which are urgently desired by the technologies like fuel cells, flow batteries, electro-dialysis etc., a novel polymer architecture featured by the densely grafting of three ionic strings onto each benzene ring was developed. Compared with the previous densely functionalized AEMs prepared by closely attaching multiple cations onto polymer main chain, this study aims to achieve the improved nano-phase separation ability through combing the advantages of high cation mobility and high cation density. As a result, distinct ion conducting channels were observed by atomic force microscopy and high Br⁻ conductivity of 50.6 mS/cm was achieved at 80 °C, suggesting the effectiveness of this strategy.

Graphic abstract:

¹ The two authors contribute equally to this work

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