Supporting Information

Influence of phenolphthalein groups on the structure and properties of poly(arylene ether sulfone nitrile)s-based anion exchange membranes for fuel cells

Ao Nan Lai, Yi Zhi Zhuo, Chen Xiao Lin, Qiu Gen Zhang, Ai Mei Zhu, Mei Ling Ye, Qing Lin Liu*

Department of Chemical & Biochemical Engineering, Fujian Provincial Key Laboratory of Theoretical and Computational Chemistry, The College of Chemistry and Chemical Engineering, Xiamen University, Xiamen 361005, P. R. China

*Corresponding author:

E-mail: qlliu@xmu.edu.cn (Liu QL), tel: 86-592-2188072, fax: 86-592-2184822

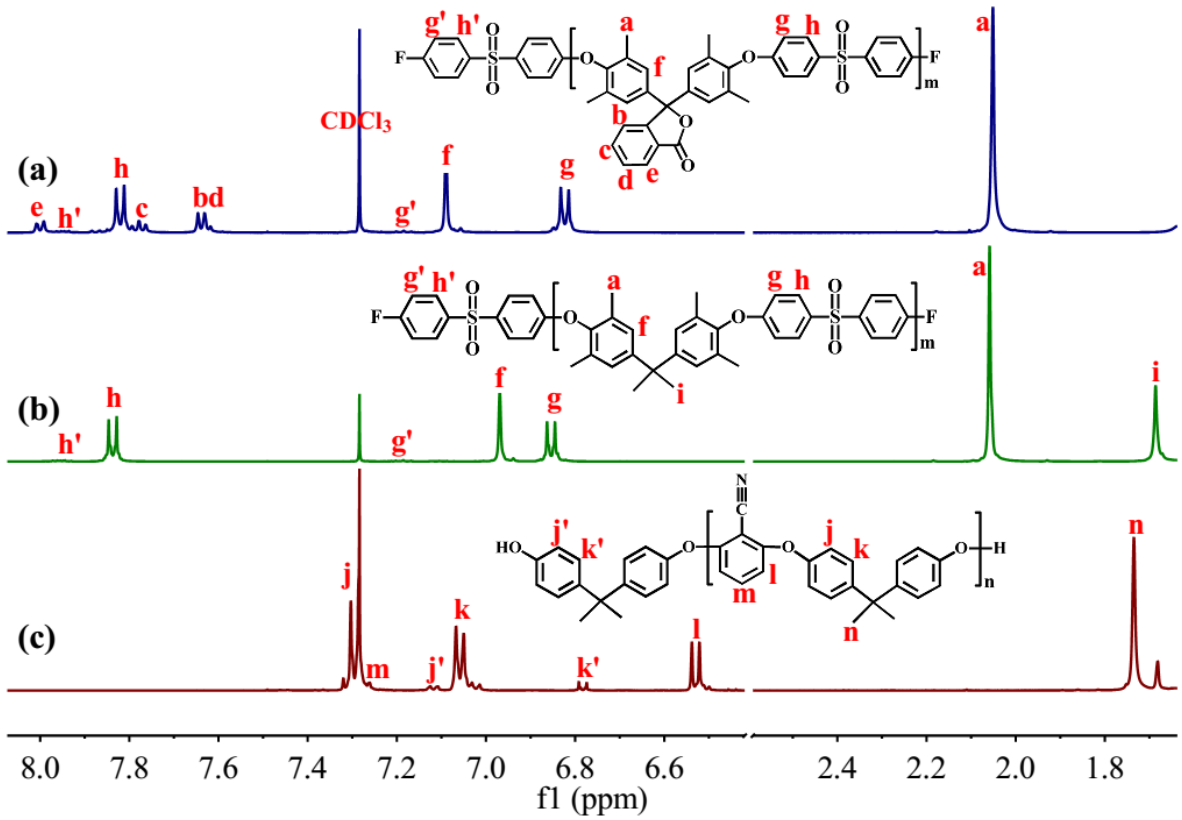

Fig. S1 [1]H NMR spectra of (a) oligomer-PF (m=19),[1] (b) oligomer-IF (m=17), and (c) oligomer-OH (n=22)[1].

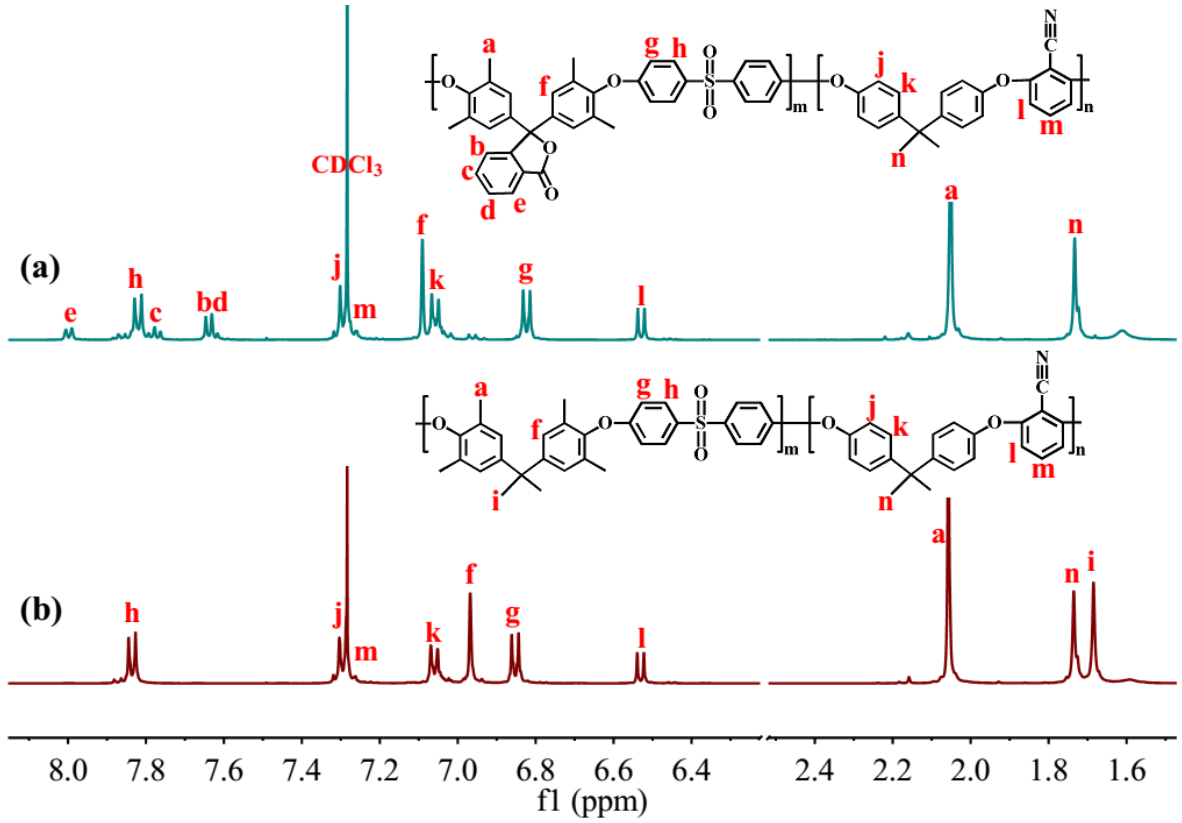

Fig. S2 [1]H NMR spectra of (a) MPPESN [1] and (b) MPESN.

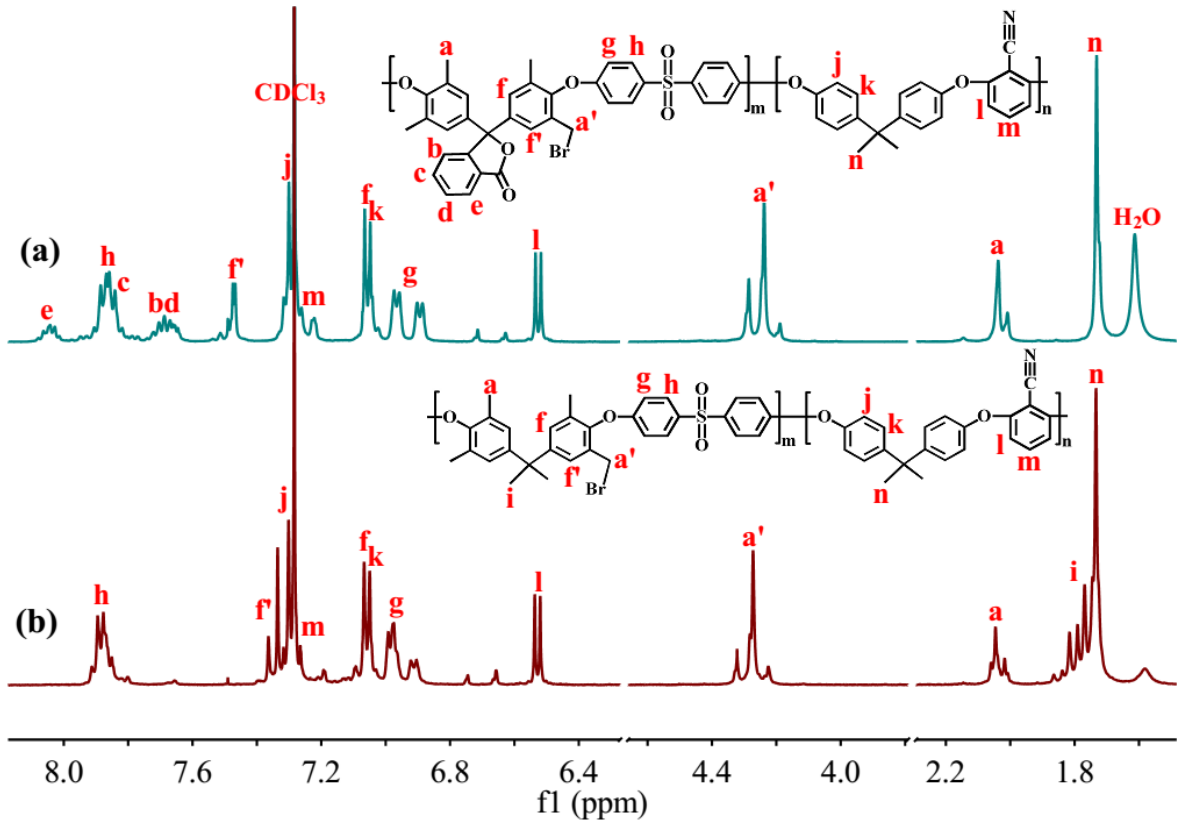

Fig. S3 [1]H NMR spectra of (a) BrPPESN-2.87 [1] and (b) BrPESN-2.92.

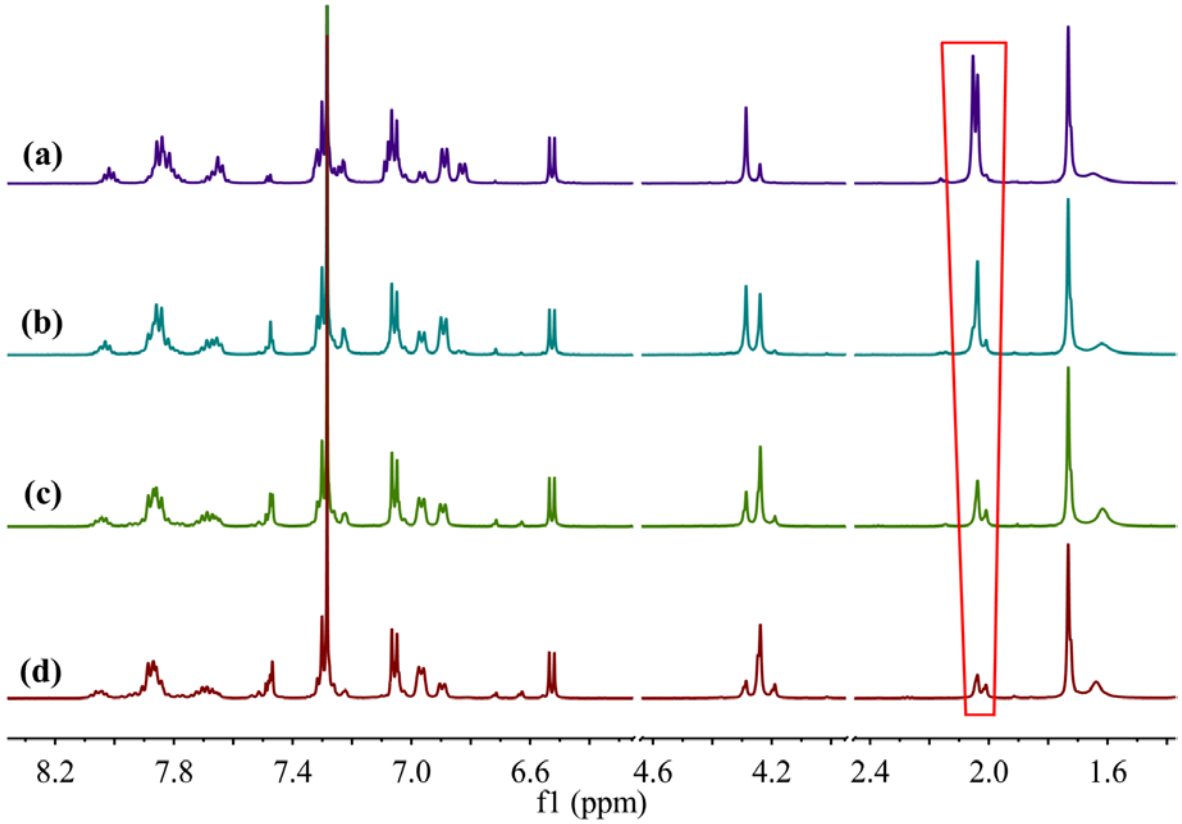

Fig. S4 [1]H NMR spectra of BrPPESN-x prepared with various molar ratios of NBS to MPPESN: (a) DF=0.94 (n(NBS)/n(–CH_3)=0.35); (b) DF=1.91 (n(NBS)/n(–CH_3)=0.7); (c) DF=2.87 (n(NBS)/n(–CH_3)=1.0); [1] (d) DF=3.36 (n(NBS)/ n(–CH_3)=2.0).

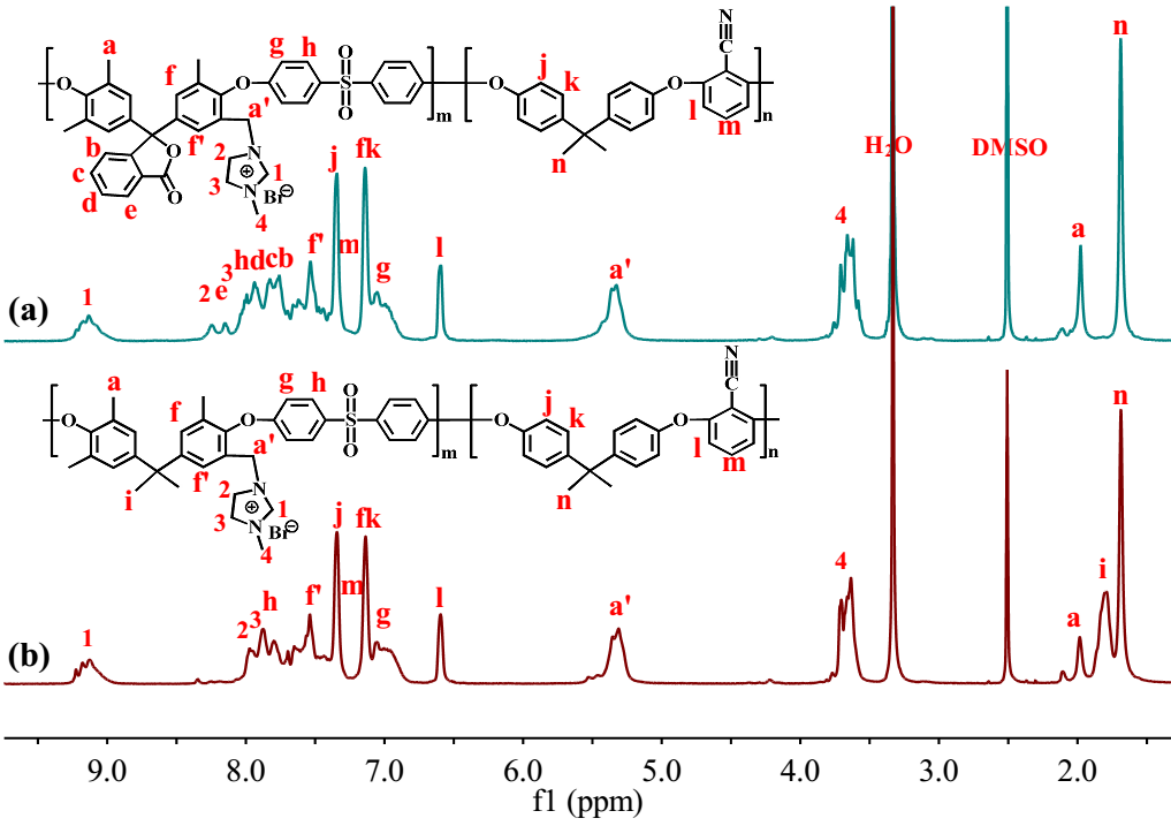

Fig. S5 [1]H NMR spectra of (a) ImPPESN-2.87 [1] and (b) ImPESN-2.92.

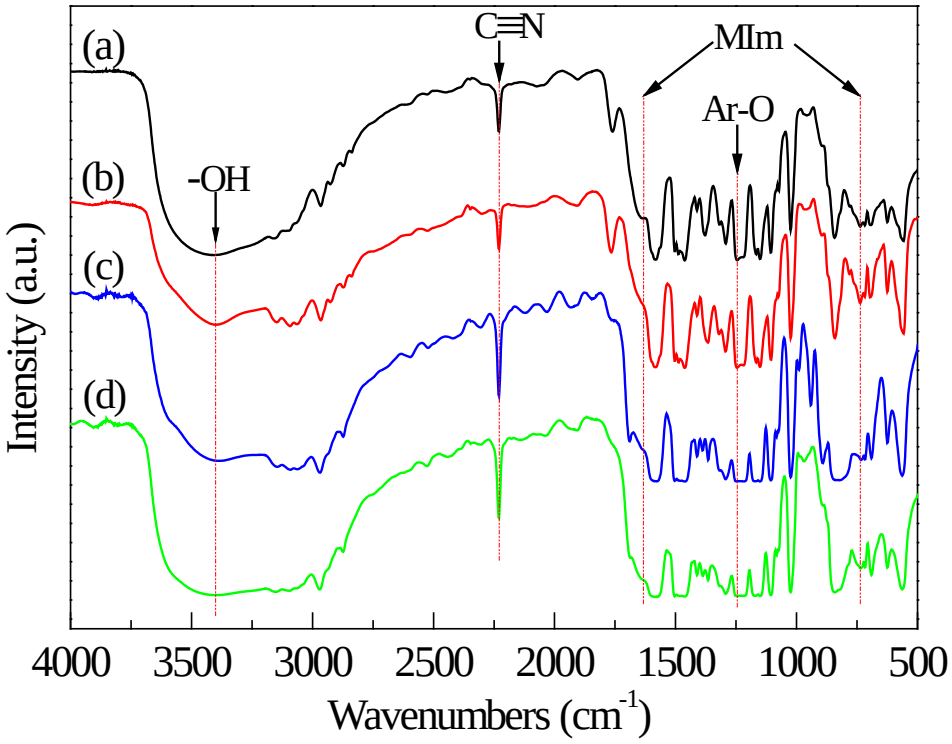

Fig. S6 FT-IR spectra of ImPPESN-2.87 [1] (a) before and (b) after the alkaline stability test and of ImPESN-2.92 (c) before and (d) after the alkaline stability test.

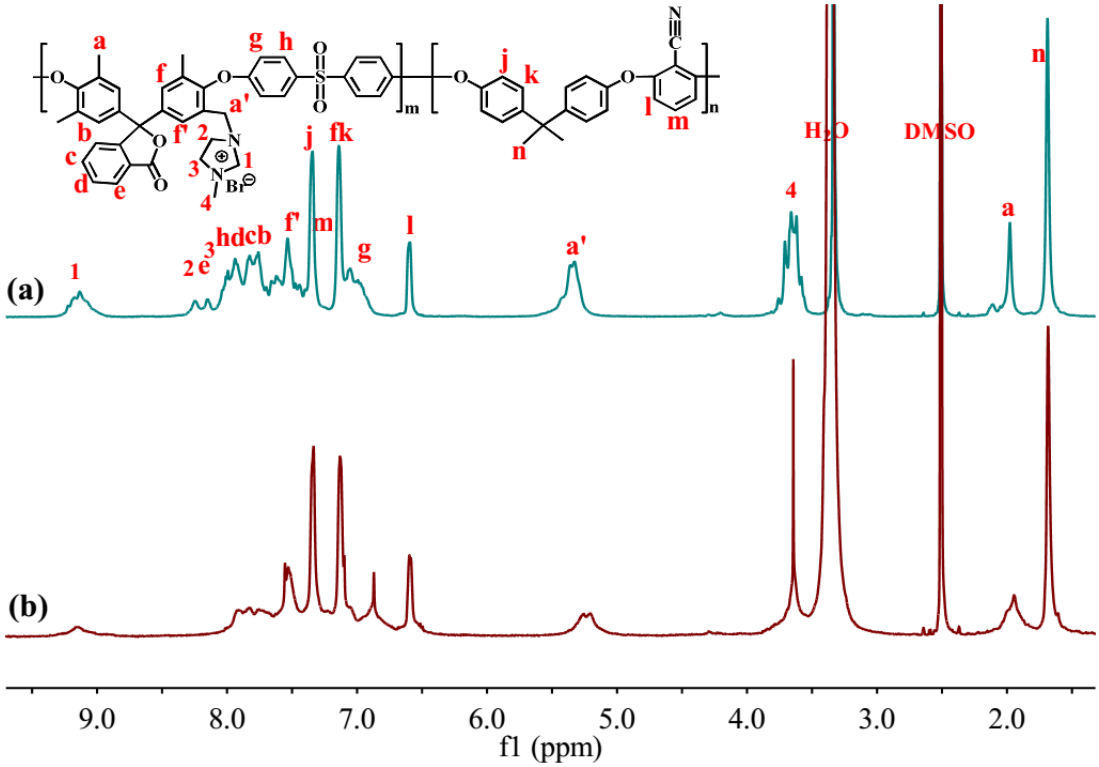

Fig. S7 [1]H NMR spectra of ImPPESN-2.87 [1] (a) before and (b) after the alkaline stability test.

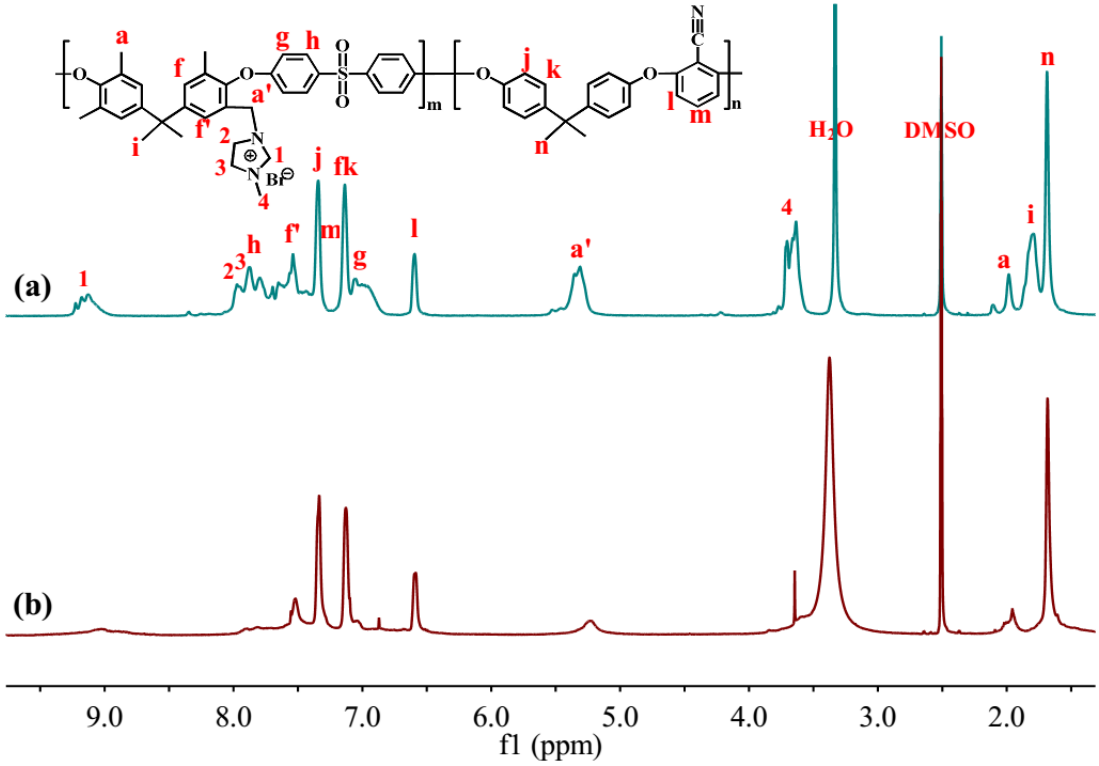

Fig. S8 [1]H NMR spectra of ImPESN-2.92 (a) before and (b) after the alkaline stability test.

References:

1 A. N. Lai, L. S. Wang, C. X. Lin, Y. Z. Zhuo, Q. G. Zhang, A. M. Zhu and Q. L. Liu, *ACS Appl. Mater. Interfaces*, 2015, **7**, 8284–8292.