Supporting information

A Hydrophilic Polyethylene Glycol-Blended Anion Exchange Membrane to Facilitate the Migration of Hydroxide Ions

Huaiming Gao [1], Chenglou Jin [1], Xia Li [1], Yat-Ming So [2] and Yu Pan [1,*]

[1] Institute of Functional Textiles and Advanced Materials, College of Textiles and Clothing, State Key Laboratory of Bio-Fibers and Eco-Textiles, Qingdao University, Qingdao 266071, China; huaiminggao@163.com (H.G.); jcl990209@163.com (C.J.); lixia0323@foxmail.com (X.L.)
[2] Department of Chemistry, The Hong Kong University of Science and Technology, Clear Water Bay, Kowloon, Hong Kong, China; yatmingso@ust.hk
* Correspondence: ypan@qdu.edu.cn

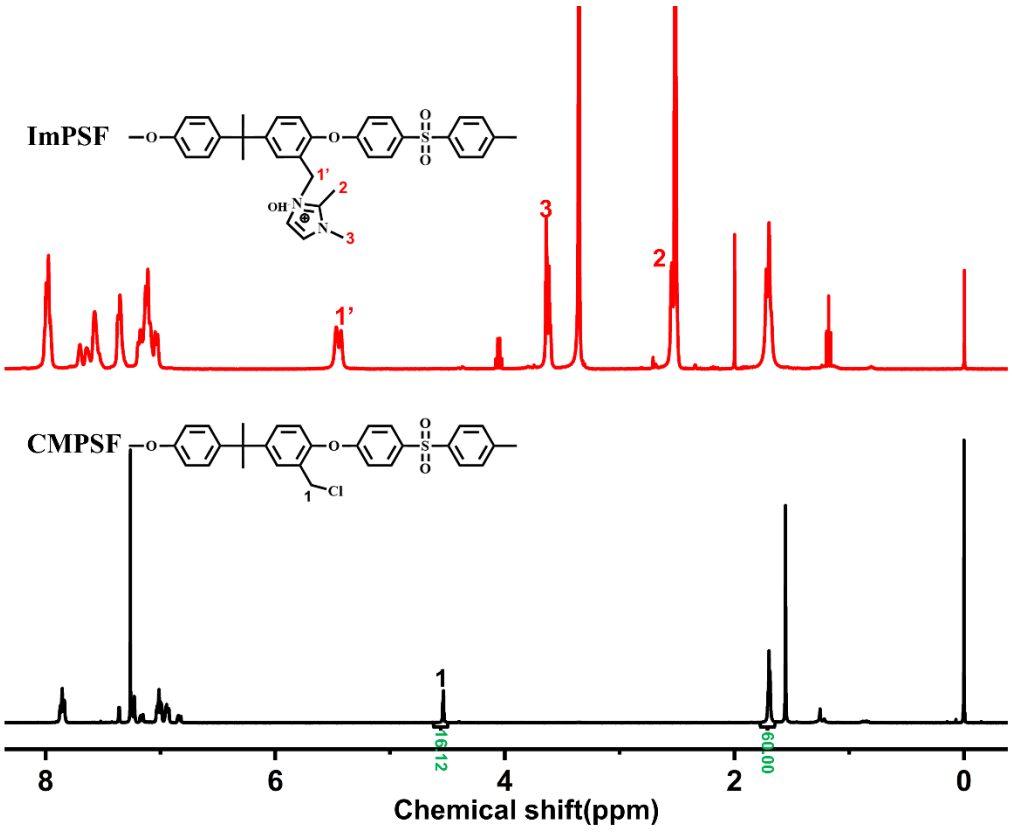


Figure S1. ^{1}H NMR spectra (500 MHz, 25 °C) of CMPSF (in $CDCl_3$) and ImPSF (in *d*-DMSO).

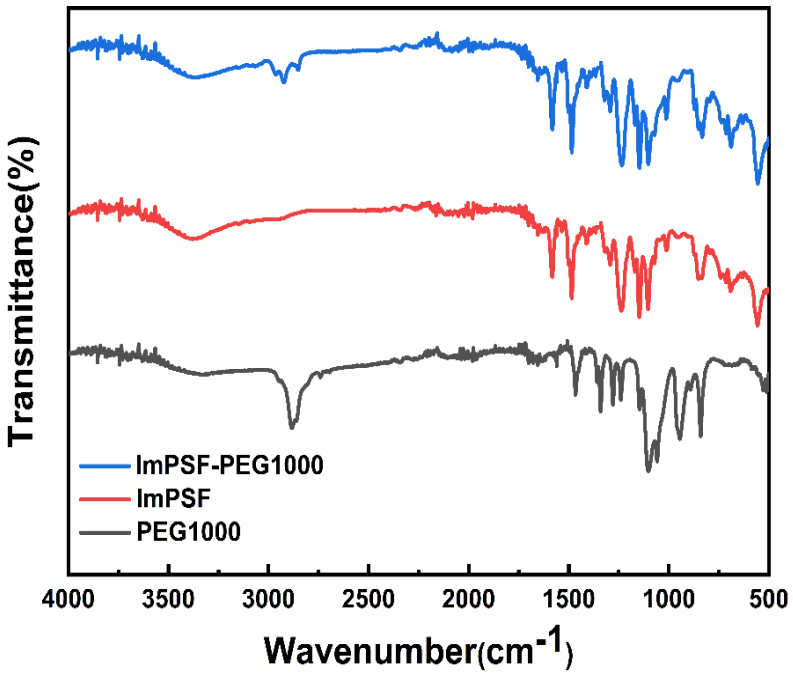


Figure S2. FT-IR spectra of PEG1000, ImPSF and ImPSF-PEG1000.



Figure S3. Digital photographs of ImPSF-PEG1000.

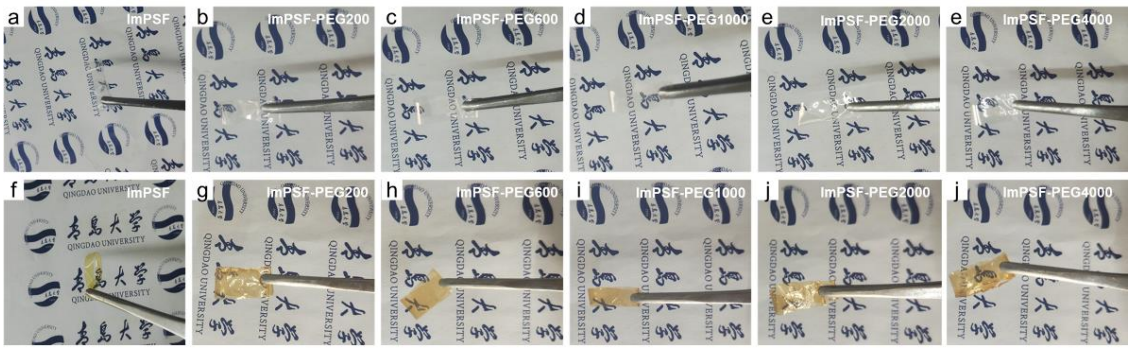


Figure S4. Digital photographs of ImPSF and ImPSF-PEGx original (a–e) and after alkaline treatment (f–j).

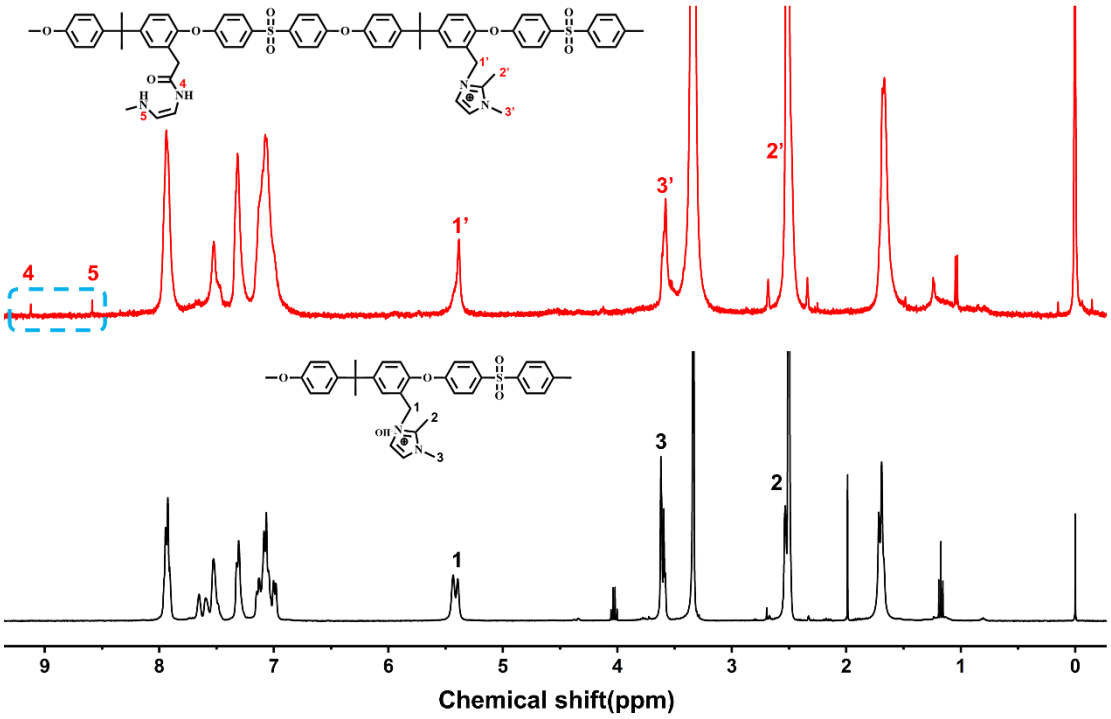


Figure S5. The ^{1}H NMR spectra of original ImPSF and alkaline treated ImPSF.

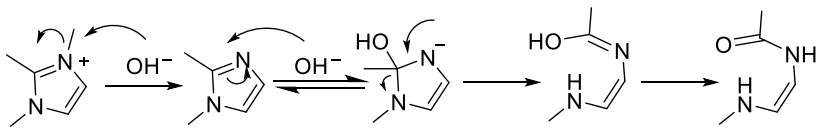


Figure S6. Possible degradation mechanism of imidazolium in KOH solution.

Table S1 Comparison of electrolyzer performance of AEMs.

Membrane	σ (mS cm^{-1})	Catalyst loading		T (°C)	Feed (KOH)	Performance @2 V, mA cm^{-2}	Reference
		Anode	Cathode				
ImPSF-PEG1000	82.6 (80°C)	IrO_2	Pt/C	80	1 M	606	This work
Sustainion® X37-50	90.0 (40°C)	NiFe	Ni	40	1 M	300	[a]
Fumasep FAA-3-50	55.0 (100°C)	$NiMn_2O_4$	Pt/C	80	1 M	530	[b]
PISPVA46	89.7 (60°C)	IrO_2	Pt/C	60	0.5 M	547	[c]
C-IL-100	95.0 (80°C)	NiFeCO	NiFeCO	80	1 M	550	[d]
AF1-HNN8-25	-	NiFe	Ni	60	1 M	620	[e]
PTFE-Sustainions	-	Ni–Fe	Ni–Fe	60	1 M	840	[f]
Co-PAES-QA-25-60	43.0 (80°C)	IrO_2	PtRu/C,	80	2 M	1646	[g]
PDTP-10	110.0 (80°C)	IrO_2	Pt/C	80	1 M	2000	[h]
BNTP-MP11	181.2 (90°C)	IrO_2	Pt/C	80	1 M	2700	[i]
PTP-OEG4	104.2 (80°C)	IrO_2	Pt/C	80	1 M	5900	[j]

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