Electronic Supplementary Information

One-pot preparation of crosslinked network membranes via knitting strategy for application in high-temperature proton-exchange membrane fuel cells

Lei Huang [a,b], Qian Wang [a,b], Zimo Wang [c], Xi Sun [a,b], Jiayu Guan [a,b], Jifu Zheng[a]*, Shenghai Li[a,b], Suobo Zhang [a,b*]

[a] Key Laboratory of Polymer Ecomaterials, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Changchun, 130022, China

[b] University of Science and Technology of China, Hefei, 230026, China

[c] Key Laboratory of Physics and Technology for Advanced Batteries (Ministry of Education), College of Physics, Jilin University, Changchun, 130012, China.

* Corresponding author email: jfzheng@ciac.ac.cn (J. Zheng.); sbzhang@ciac.ac.cn (S. Zhang)

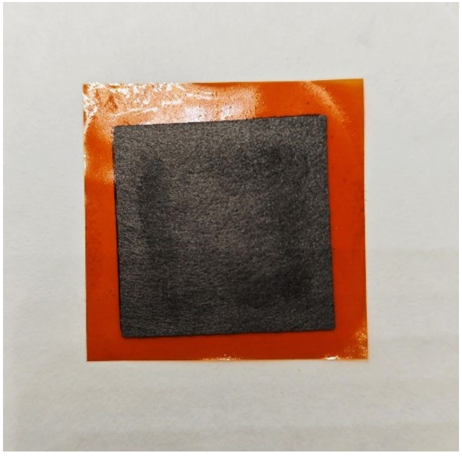

Fig.S1 Digital photograph of MEA.

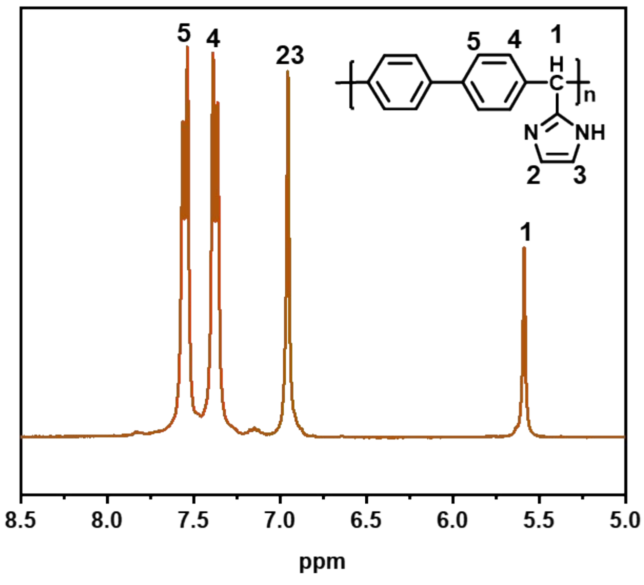

Fig.S2 ^{1}H NMR spectra of linear polymer in DMSO-d_6.

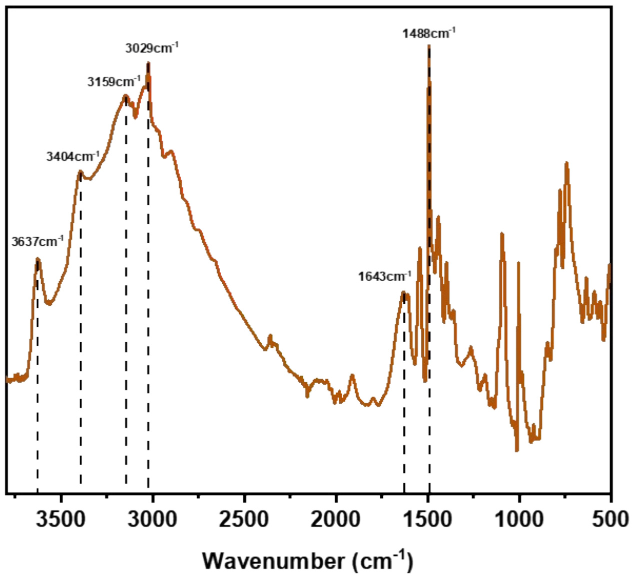

Fig.S3 FT-IR spectra of linear polymer membrane.

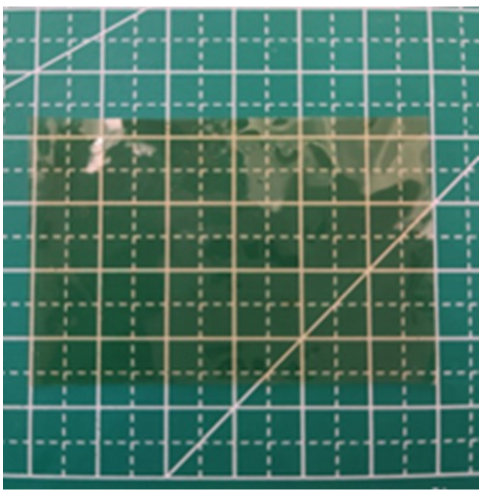

Fig.S4 Digital photograph of linear polymer membrane.

Table S1 Solubility test of linear polymer in different kinds of solvents.

polymer	solvent				
	DMSO	NMP	DMF	DMAc	Acetonitrile
	++	++	+	++	-

++, Soluble at room temperature; +, soluble on heating; -, insoluble even on heating.

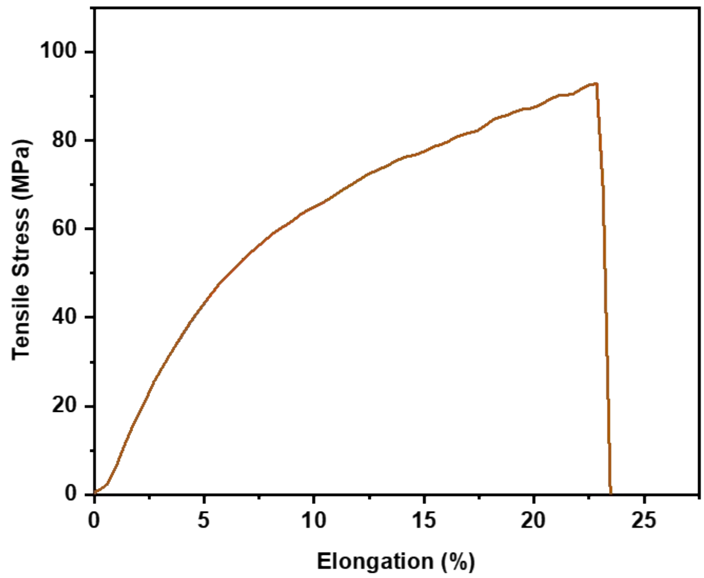

Fig.S5 Mechanical properties of linear polymer membrane.

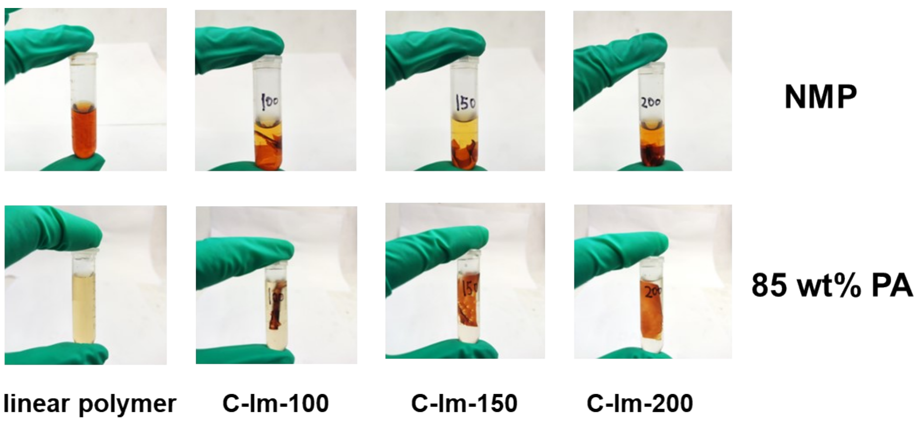

Fig.S6 Solubility test of linear polymer and crosslinked polymers in NMP and 85 wt% PA.

Table S2 Gel content of crosslinked polymers.

	C-Im-100	C-Im-150	C-Im-200
Gel content (%)	52	61	73

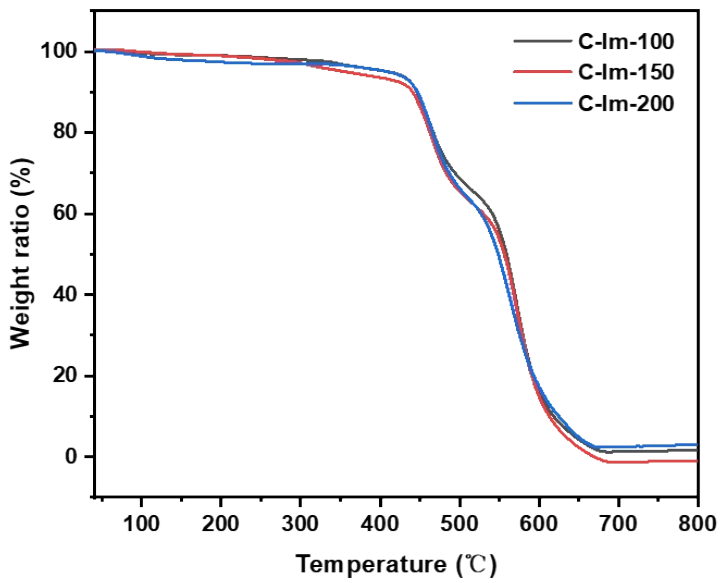

Fig.S7 TGA curves of knitted-network membranes in air atmosphere.

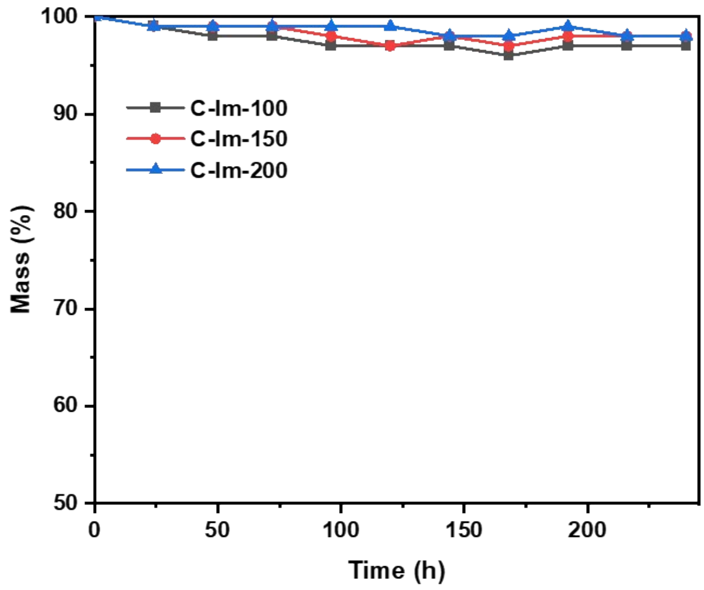

Fig.S8 Fenton test in 3 wt% H_2O_2 and 4 ppm Fe^{2+} solution at 80 °C of knitted-network membranes.

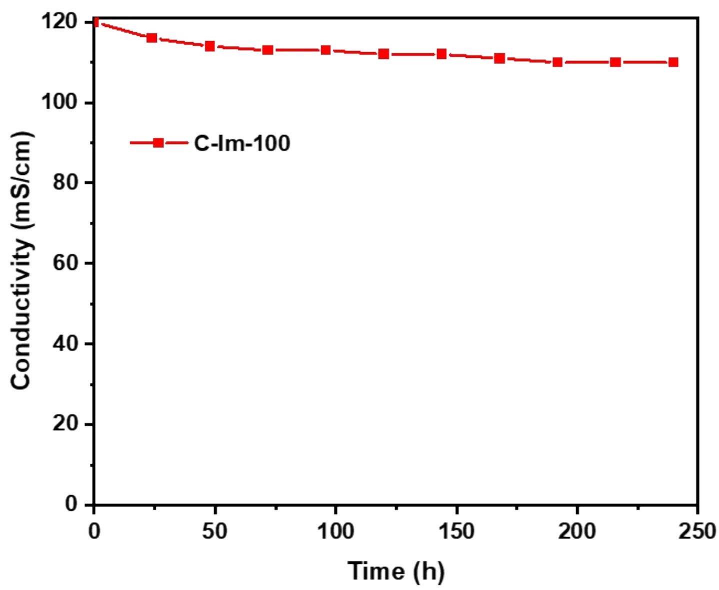

Fig.S9 Proton conductivity of C-Im-100 membrane at 160 °C.