Supporting Information

High affinity of nanoparticles and matrices based on acid-base interaction for nanoparticle-filled membrane

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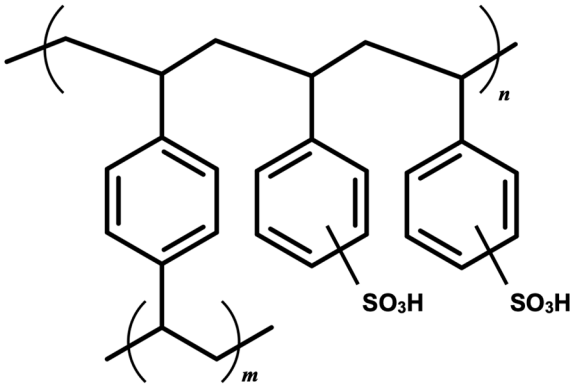


Figure S1. Chemical structure of DIAION™.

(a) (b)

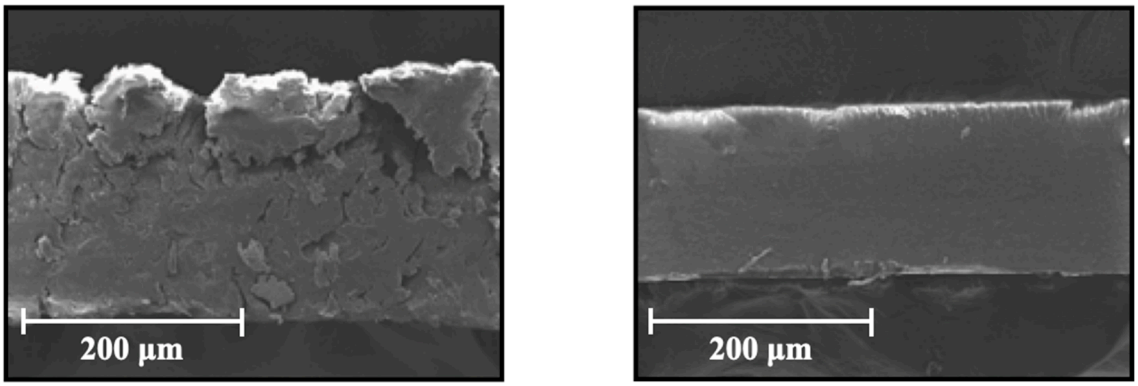


Figure S2. Cross-section SEM images (a) silica@PSSNa/P1VIm-*co*-PBA, and (b) silica@PSSA/P1VIm-*co*-PBA.

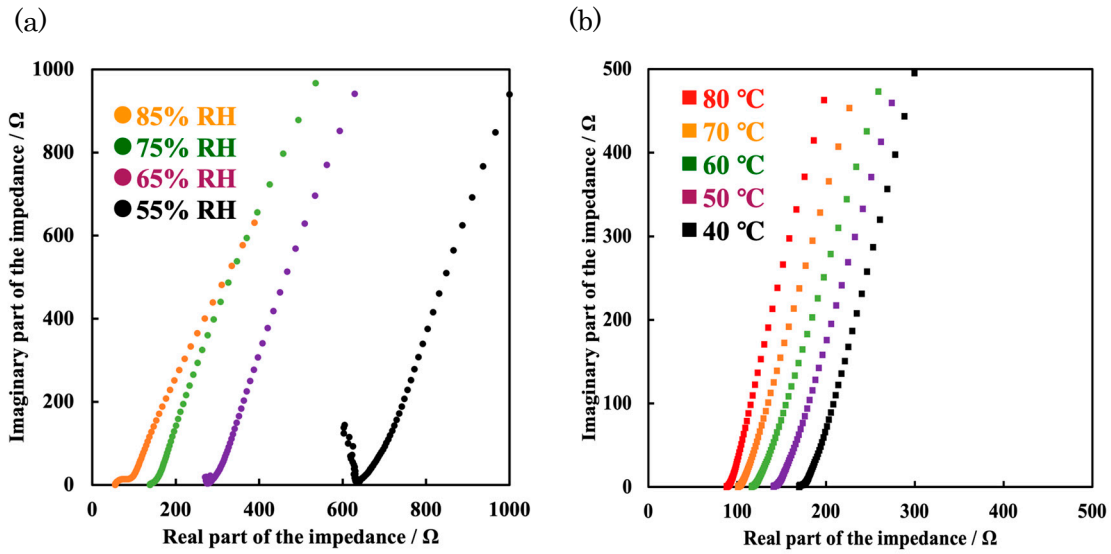


Figure S3. Cole-Cole plots of silica@PSSA pellet at the (a) different temperature and (b) different relative humidity.

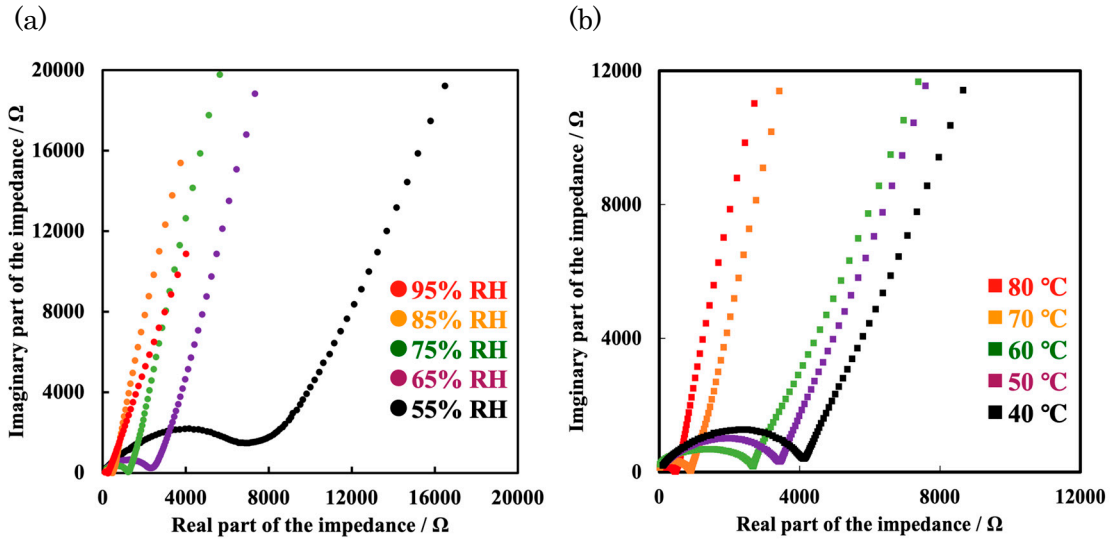


Figure S4. Cole-Cole plots of silica@PSSA/P1VIm-*co*-PBA membrane at the (a) different temperature and (b) different relative humidity.

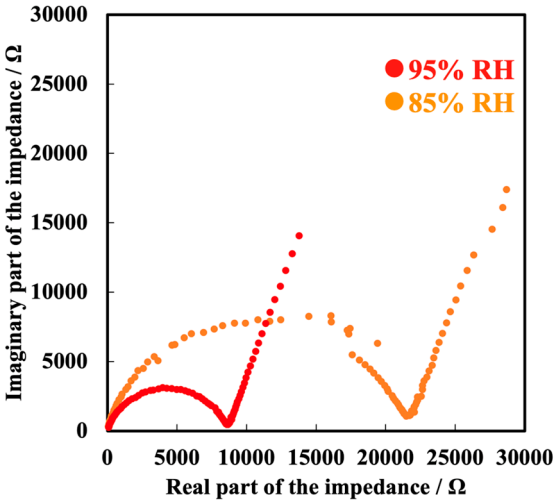


Figure S5. Cole-Cole plots of P1VIm-*co*-PBA membrane at the different relative humidity.

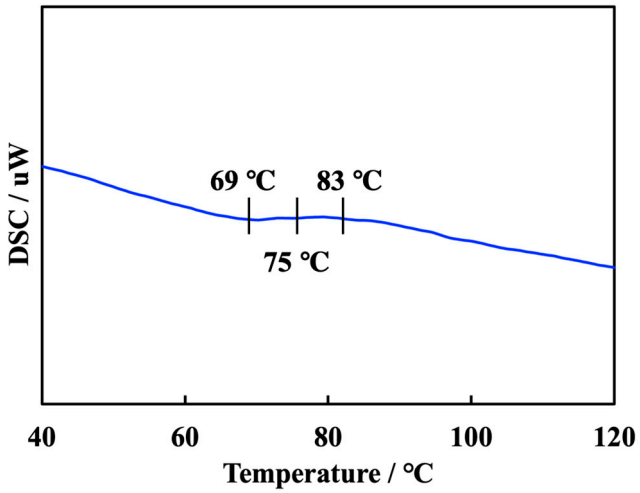


Figure S6. DSC curve of silica@PSSA/P1VIm-*co*-PBA.

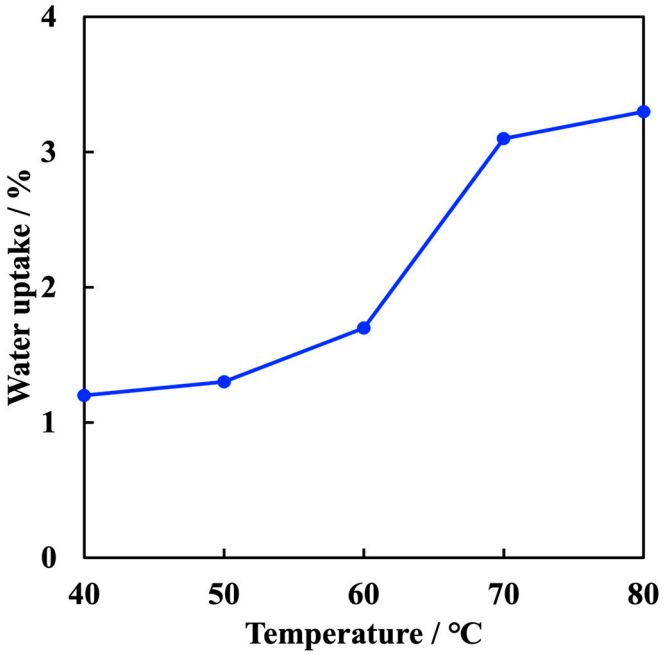


Figure S7. Water uptake of silica@PSSA/P1VIm-*co*-PBA.

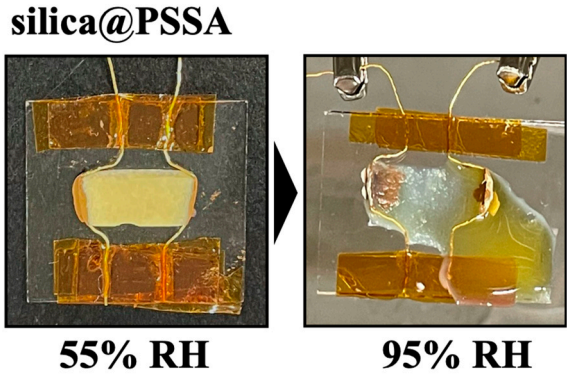


Figure S8. Photographs of silica@PSSA pellet at 55% RH and 95% RH.

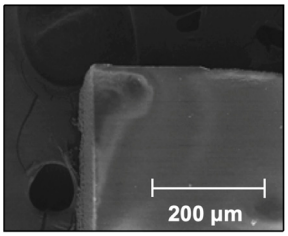
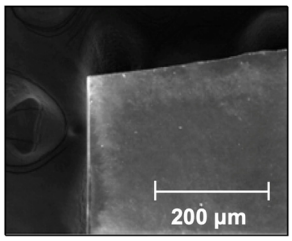
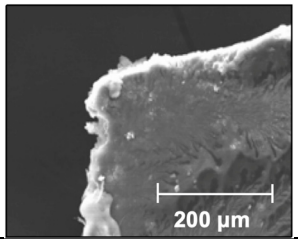
Particle concentration [wt%]	SEM image	Proton conductivity [S/cm]
30		7.42×10^{-5}
40		4.20×10^{-4}
50		3.91×10^{-4}

Table S1. SEM images and proton conductivity of different particle concentrations of silica@PSSA/P1VIm-*co*-PBA.