

Supporting Information

Decoupled ion conduction in poly(2-acrylamido 2methyl-1-propane-sulfonic acid) homopolymers

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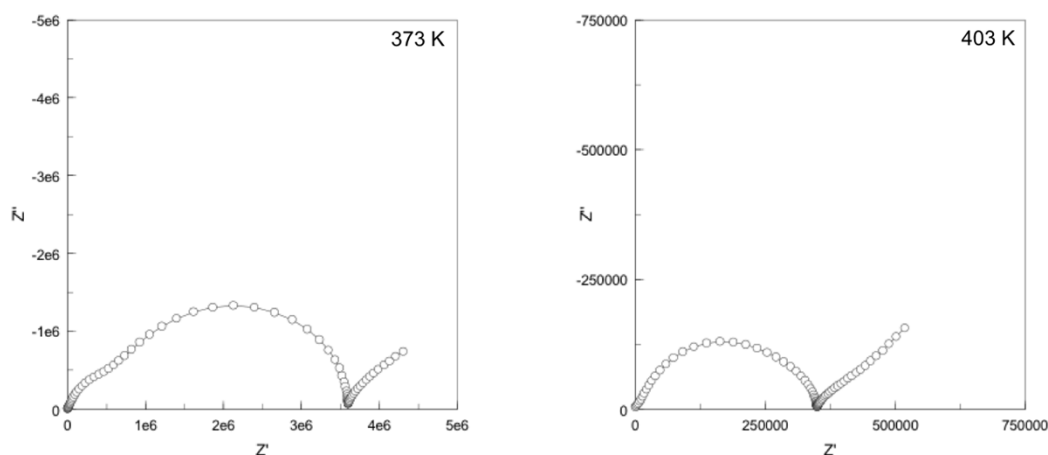


Fig S1 Nyquist plots of (poly(N₁₂₂₂)_{0.9}Na_{0.1}[AMPS]). Na at 303 K and 403 K

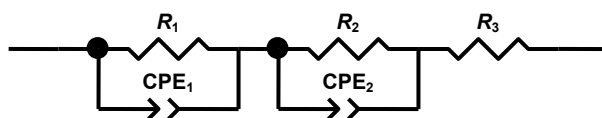


Fig S2 Series circuit for fitting two semi-circles of impedance data

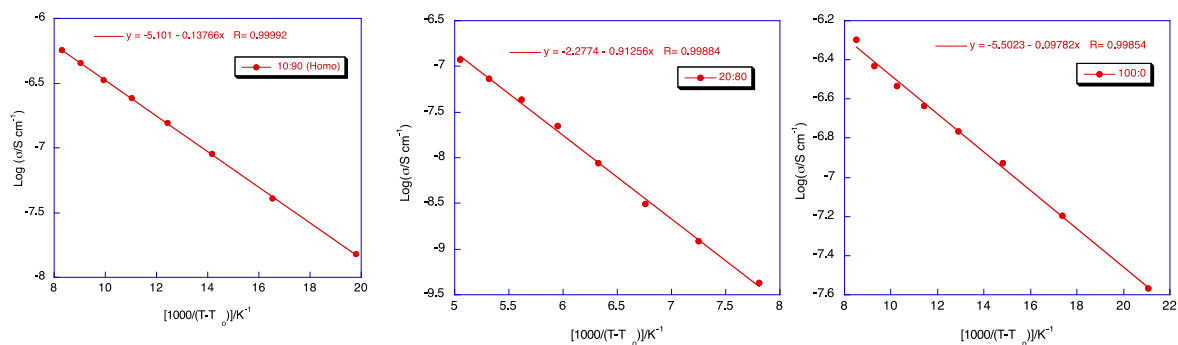


Fig S3 Plot of log conductivity versus $1000/(T-T_0)$ of poly((N₁₂₂₂)_{0.9}Na_{0.1}[AMPS])

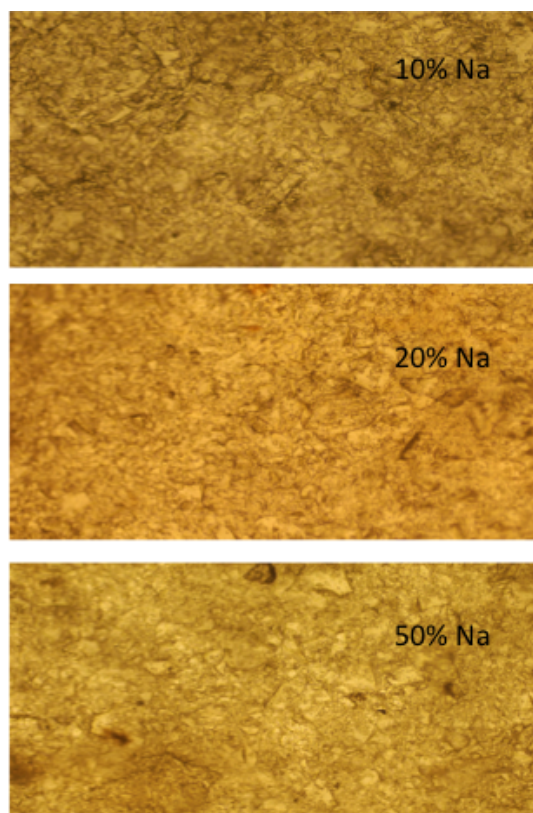


Fig S4 Optical microscope images of (Poly(N₁₂₂₂)_zNa_{1-z}[AMPS]) ionomers with various mol% of Na (a) 10% (b) 20% (c) 50%.

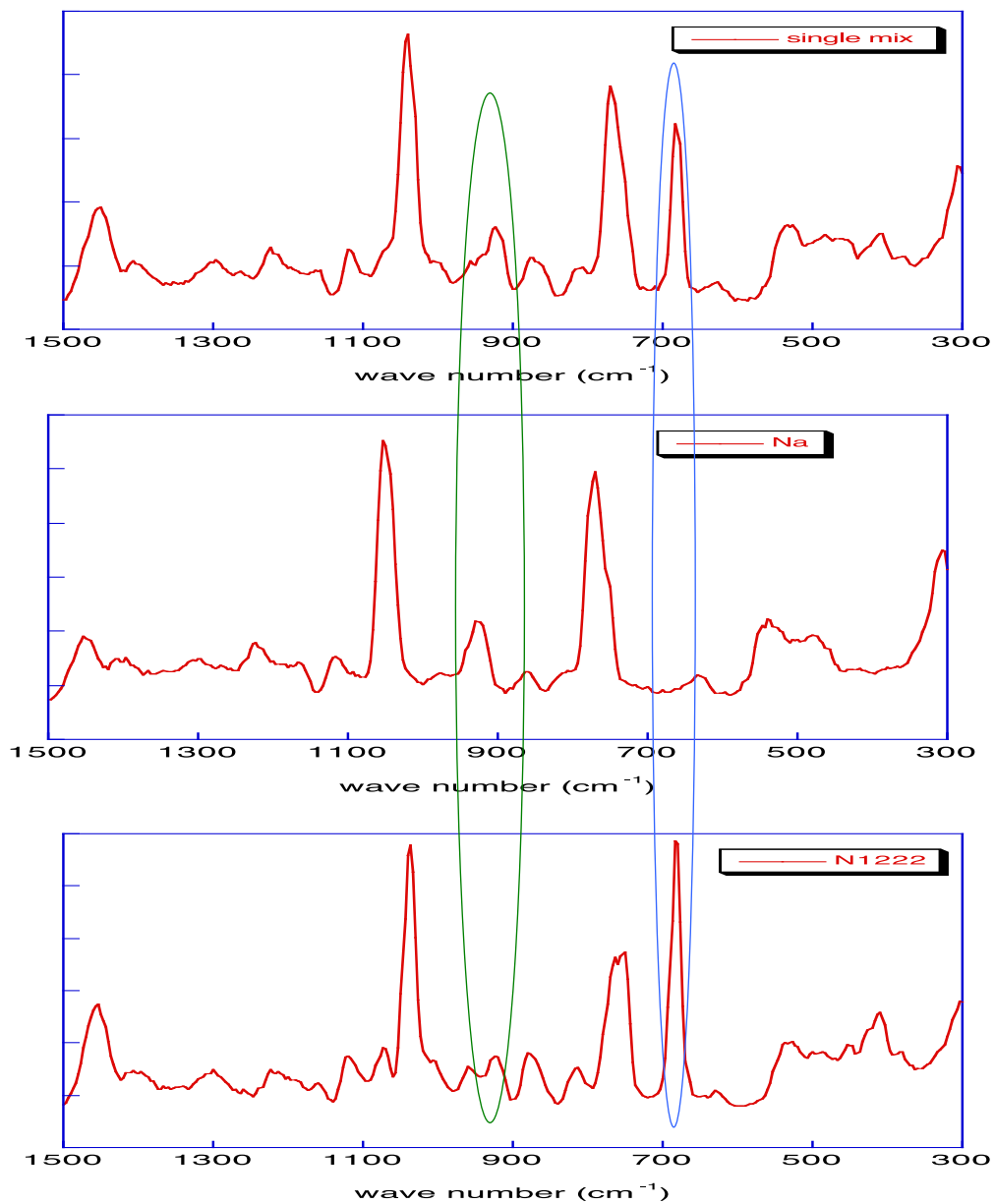


Fig S5 Raman spectra of (Poly(N₁₂₂₂)_zNa_{1-z}[AMPS]), z=1.0, 0.5, and 0.0

Table S1 Examples of fitting parameters of series circuit for fitting two semi-circles of impedance data

Sample	Temperature (K)	Element	Value	Error (%)
Poly((N ₁₂₂₂) _{0.9} Na _{0.1} [AMPS])	373	R1	6.3E5	6.8
		CPE1-T	2.9E-11	11.6
		CPE1-P	0.9	0.9
		R2	3.0E6	1.7
		CPE2-T	5.2E-11	8.2
		CPE2-P	0.9	1.1
Poly((N ₁₂₂₂) _{0.9} Na _{0.1} [AMPS])	383	R1	4.3E5	9.0
		CPE1-T	2.2E-11	12.7
		CPE1-P	0.9	1.0
		R2	9.0E5	4.5
		CPE2-T	6.2E-11	10.0
		CPE2-P	0.9	1.6
Poly((N ₁₂₂₂)[AMPS])	373	R1	1.8E6	5.4
		CPE1-T	5.8E-11	11.4
		CPE1-P	0.9	1.9
		R2	1.1E6	8.3
		CPE2-T	2.3E-11	11.3
		CPE2-P	0.8	0.9