

SUPPLEMENTARY

NaNTf ₂	Phase IV-III		Phase III-II		Phase II-I		Eutectic		melt	
/ % mol	T/ °C	ΔH /Jg ⁻¹	T/ °C	ΔH /Jg ⁻¹	T/ °C	ΔH /Jg ⁻¹	T/ °C	ΔH /Jg ⁻¹	T/ °C	ΔH /Jg ⁻¹
0	-84	4.6	18	1.9	42	0.1	-	-	91	24.7
1	-84	5.6	17	1.9	42	0.1	62	0.6	89	20.7
6	-85	4.0	18	2.2	42	0.1	63	6.5	80	12.9
15	-84	4.1	18	1.5	42	0.1	65	32.5		
35	-87	0.3	18	0.8	46	0.1	64	18.1	82	2.6
40	-87	0.3	18	0.6	46	0.2	65	12.5	81	3.8
45	-86	0.3	19	0.7	46	0.2	65	16.9	81	4.8
50	-86	0.3	18	0.8	42	0.2	62	6.7	82	5.8

Table S1: Enthalpy (in J/g) for the phase transitions calculated from the area under the peaks in DSC traces and the corresponding transition temperatures of mixed systems

Assignment

Raman
□/cm⁻¹

FTIR
□/cm⁻¹

\square CF ₃	278(ms)	
\square CF ₃ , \square_a CS	297(m)	
\square SO ₂ , \square CF ₃ , \square_a CS	314(w)	
\square SO ₂	341(w)	
\square SO ₂	397(m)	397(vw)
\square SO ₂		408(w)
\square_a CF ₃		512(s)
	537(vw)	
\square N-C, \square_s SO ₂	552(w)	
\square N-C, \square_s SO ₂ , \square_a CF ₃ , \square_a R,	570(w)	568(s)
\square^{ip}_s R		
\square_a CF ₃ , \square_a^{ip} SO ₂ , \square_s N-SO ₂	590(w)	
\square_a SO ₂ , \square^{op}_a R, \square_s SNS,		611(vs)
\square_a^{op} SO ₂		
\square_s CF ₃ , \square_s N-SO ₂	631(vw)	
	715(vw)	
\square_s CF ₃	741(vs)	739(m)
\square_s SNS		762(w)
\square CS	798(vw)	790(m)
	824(vw)	
Ring mode	880(vw)	879(vw)
Ring mode	902(m)	
Ring mode		936(w)
Ring mode	998(w)	999(w)
		1035(vw)
\square_a R, \square CC, \square N-	1054(w)	1052(s)
CH ₃ , \square_a SNS, \square_a SNS		
\square_s SO ₂	1141(m)	1137(s)
\square_s R, \square N-CH ₃ , \square_a CF ₃ ,		1177(vs)
\square_s CF ₃ , \square CH ₂	1243(ms)	
\square_a^{op} SO ₂ , \square CH ₃ , \square (R)	1336(w)	1333(m)
\square_a^{ip} SO ₂ , \square (R), \square_a^{ip} SO ₂	1355(w)	1347(m)
		1405(vw)
		1434(vw)
\square CH ₃ , \square^{ip}_a R		
\square CH ₂ , \square CH ₃ ,	1455(m)	
\square CH ₂ , \square CH ₃		1467(w)
\square CH ₂	2852(w)	
\square CH ₂	2904(s)	2904(w)
\square CH ₂	2962(w)	2964(vw)
\square CH ₂	3000(s)	2997(s)
	3041(w)	3042(w)

Table S2: Assignment of observed Raman and FTIR bands of [C₂mpyr][NTf₂] at room temperature based on literature reports [17, 47, 48, 50, 52] for related cations and anions. [Letters representing the vibrational modes : ν - stretching, δ - bending, τ - twisting, ρ - rocking, ω - wagging, ip - in phase, op - out of phase, s - symmetric, as - asymmetric Letters indicating relative intensities: vw - very weak, w - weak, m - medium, s - strong, vs - very strong]

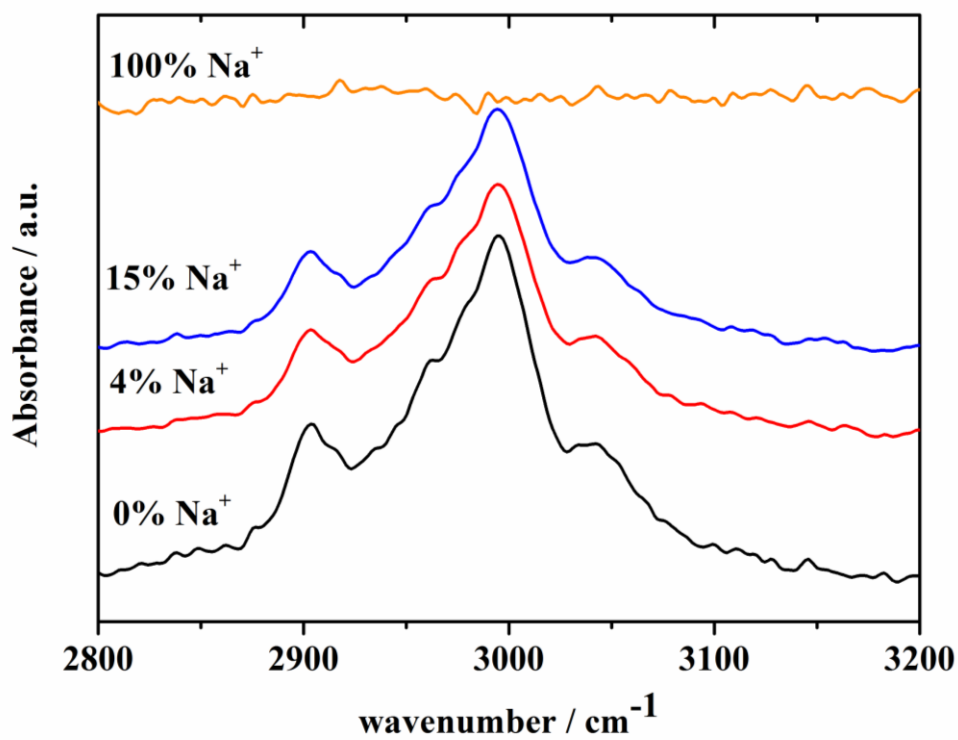


Figure S1. FTIR spectra of pure and mixed materials from 2800 – 3200 cm^{-1}

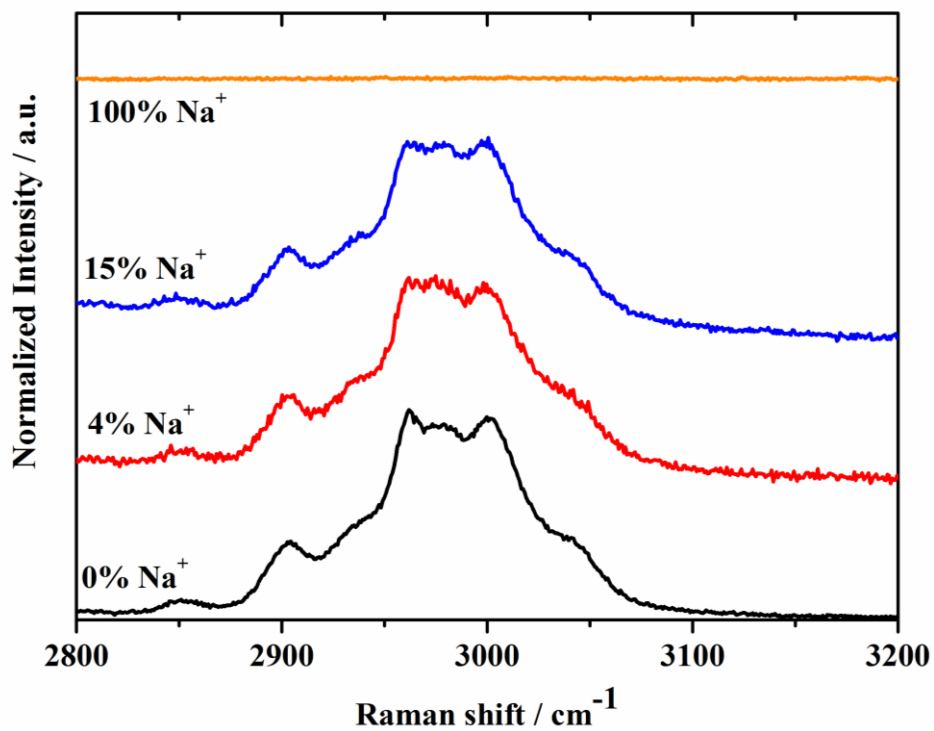


Figure S2. Raman spectra of pure and mixed materials from 2800 – 3200 cm^{-1}