

Supporting Information

Solid-State ^1H and ^{13}C NMR Studies of New Ionic Plastic-Crystals with Branched Structures: $[\text{NEt}_x\text{Me}_{(3-x)}(i\text{-Pr})][\text{BEt}_{(4-y)}\text{Me}_y]$ ($x = 1\text{--}3$, $y = 0, 1$)

Katsuumi Nagai, Yuuna Okubo and Hisashi Honda*

Graduate School of Nanobioscience, Yokohama City University, Kanazawa-ku, Yokohama, 236-0027

Table S1 Melting (T_{mp}) and phase transition temperatures of some alkylammonium salts with the BEt_3Me and BEt_4 anions. Here, symbols of T_{R} and T_{P} are transition temperatures from solid to rotator and plastic phases, respectively. M_{w} is molecular weight of the cations.

	M_{w}	BEt_3Me			BEt_4		
		T_{R}	T_{P}	T_{mp}	T_{R}	T_{P}	T_{mp}
NMe_4^*	74	-	252.6	dec.	-	333	dec.
NEtMe_3^*	88	-	239.8	dec.	-	278	dec.
$\text{NEt}_2\text{Me}_2^*$	102	-	-	dec.	-	242	dec.
$\text{NMe}_3(i\text{-Pr})$	102	-	227	dec.	-	271	dec.
NEt_3Me^*	116	-	-	dec.	-	238	dec.
$\text{NEtMe}_2\text{Pr}^{**}$	116	267	325	355	253	-	345
$\text{NEtMe}_2(i\text{-Pr})$	116	-	197	dec.	-	242	dec.
NEt_4^*	130	-	233.4	dec.	-	295	dec.
$\text{NEt}_2\text{MePr}^{**}$	130	240	322	370	235	-	325
$\text{NEtMe}_2\text{Bu}^{**}$	130	202	-	326	210	-	320
$\text{NEt}_2\text{Me}(i\text{-Pr})$	130	-	-	dec.	-	235	dec.
NEt_3Pr^*	144	-	243.3	391.2	341	-	363
$\text{NEt}_2\text{MeBu}^{**}$	144	222	-	310	-	-	303
$\text{NEt}_3(i\text{-Pr})$	144	-	184	dec.	-	245	dec.
$\text{NEt}_2\text{Pr}_2^*$	158	269.1	-	358.7	341	-	361
NEtPr_3^*	172	328.4	-	359.3	358	-	366
NPr_4^*	186	-	-	377.9	-	-	388
NBu_4^*	242	-	-	423.7	-	-	418

Data of * and ** are employed in reference [6, 37, 38, 40, 41].

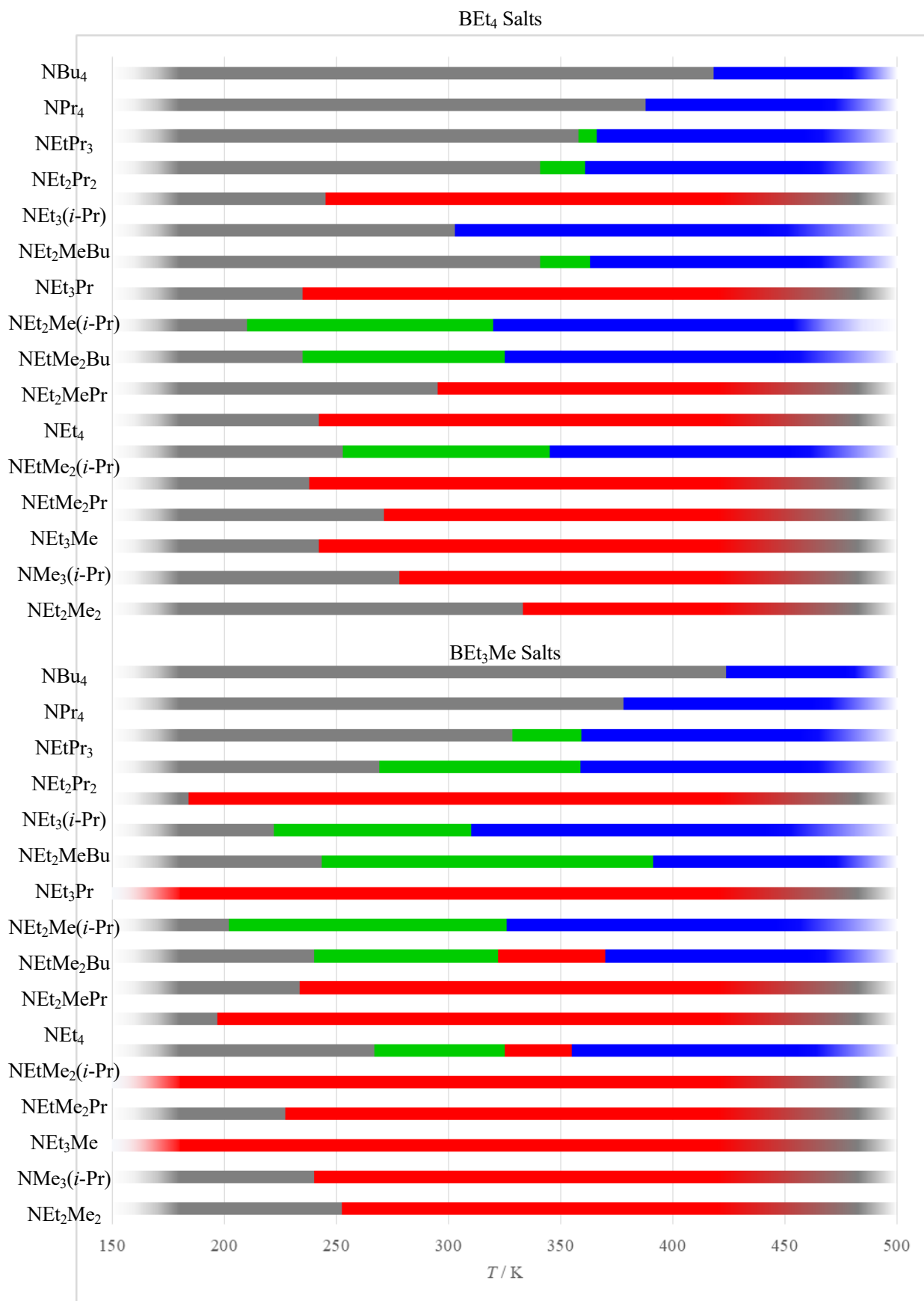


Figure S1 Phase transition temperatures. Gray, green, red, and blue lines are ordinal crystal, rotator,

plastic, and liquid phases, respectively. In this figure, the values listed in [Table S1](#) are employed.

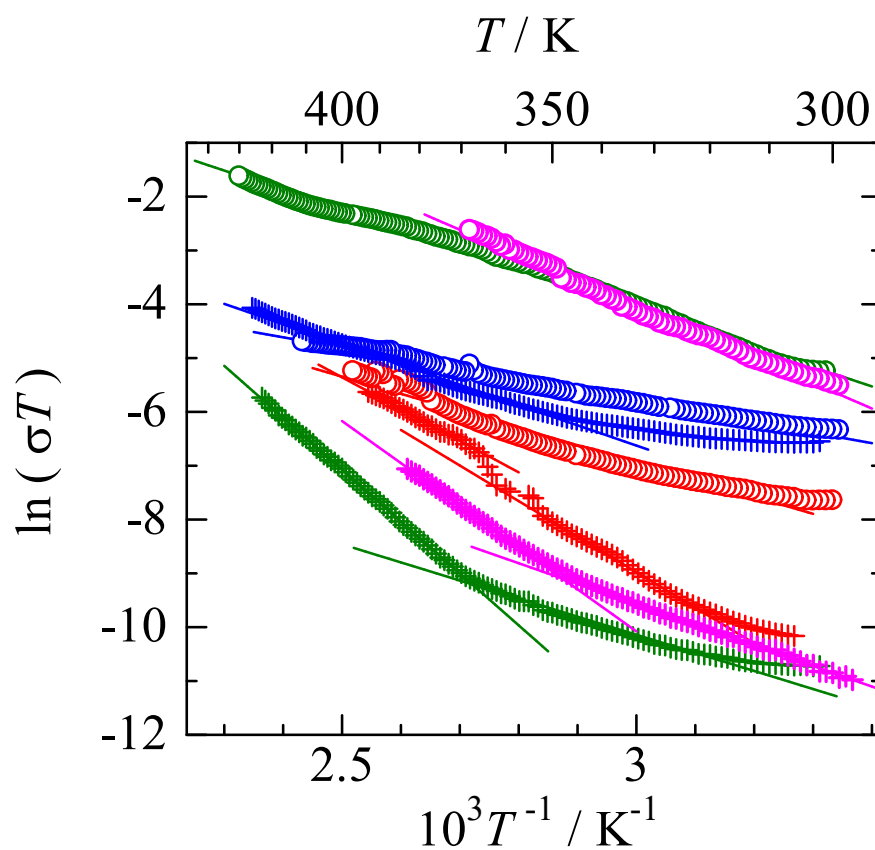


Figure S2 Arrhenius plots of electrical conductivity.

[NMe₃(*i*-Pr)][BEt₃Me] (○), [NEtMe₂(*i*-Pr)][BEt₃Me] (⊙), [NEt₂Me(*i*-Pr)][BEt₃Me] (⊚), [NEt₃(*i*-Pr)][BEt₃Me] (⊛), [NMe₃(*i*-Pr)][BEt₄] (+), [NEtMe₂(*i*-Pr)][BEt₄] (+), [NEt₂Me(*i*-Pr)][BEt₄] (+), [NEt₃(*i*-Pr)][BEt₄] (+)