Supporting Information for Publication

Exploration of phase diagram, structural and dynamic behavior of [HMG][FSI] mixtures with NaFSI across an extended composition range

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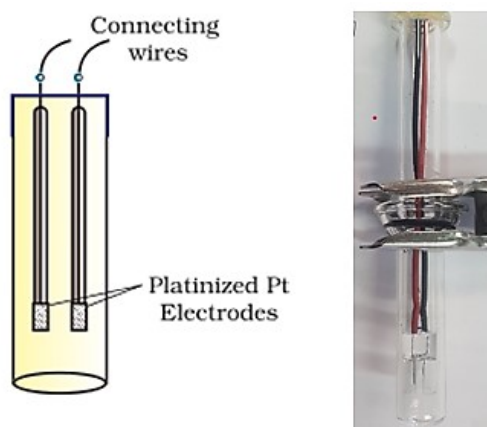
Figure S1. The design of the locally made dip-cell that was used for ionic conductivity measurements.
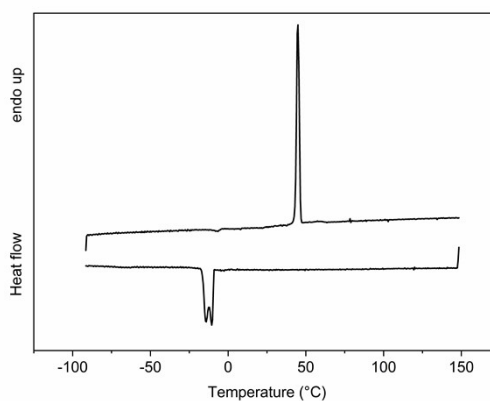

Figure S2. DSC thermogram of 25mol% NaFSI in [HMG][FSI], recorded during the second heating scan after melting and cooling the sample to - 40°C, measured at 2 °C/min.
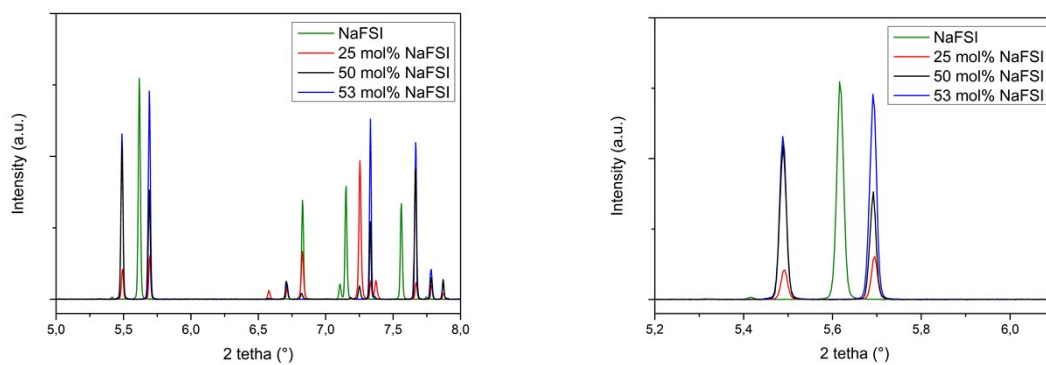
Figure S3. Synchrotron powder patterns measured at 25°C of pure NaFSI (green), with 25 mol% NaFSI (red), 50 mol% NaSFI (black) and 53 mol% NaFSI (blue). The left panel displays the powder patterns between 5 and 8° in 2θ, while the right panel show the patterns between 5,2 and 6° in 2θ.
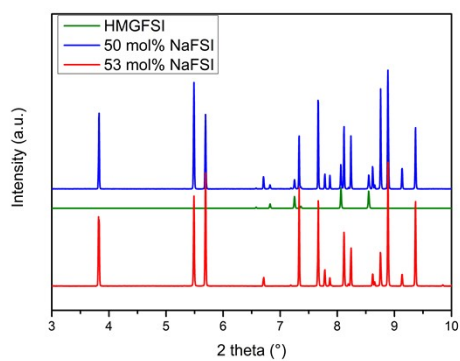

Figure S4. Synchrotron X-Ray Powder Diffraction patterns measured at 25°C of 50 mol % NaFSI (blue), 53 mol% NaFSI (red) and [HMG][FSI] (green). The 50 mol% NaFSI pattern (blue) is a combination of the [HMG][FSI] pattern (green) and 53 mol% NaFSI pattern (red).
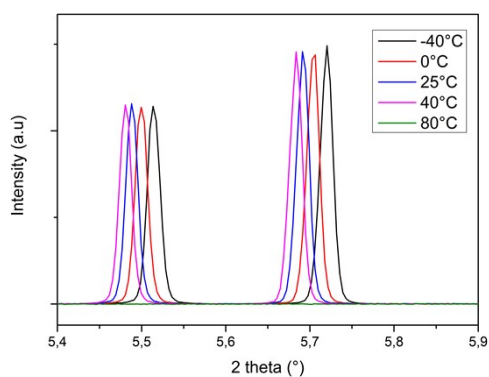

Figure S5. Temperature controlled Synchrotron X-Ray Powder Diffraction patterns of 53 mol% NaFSI ranging from -40°C to 80°C. A regular shift toward the low angles (higher d-spacing) is observed when the temperature is increasing.
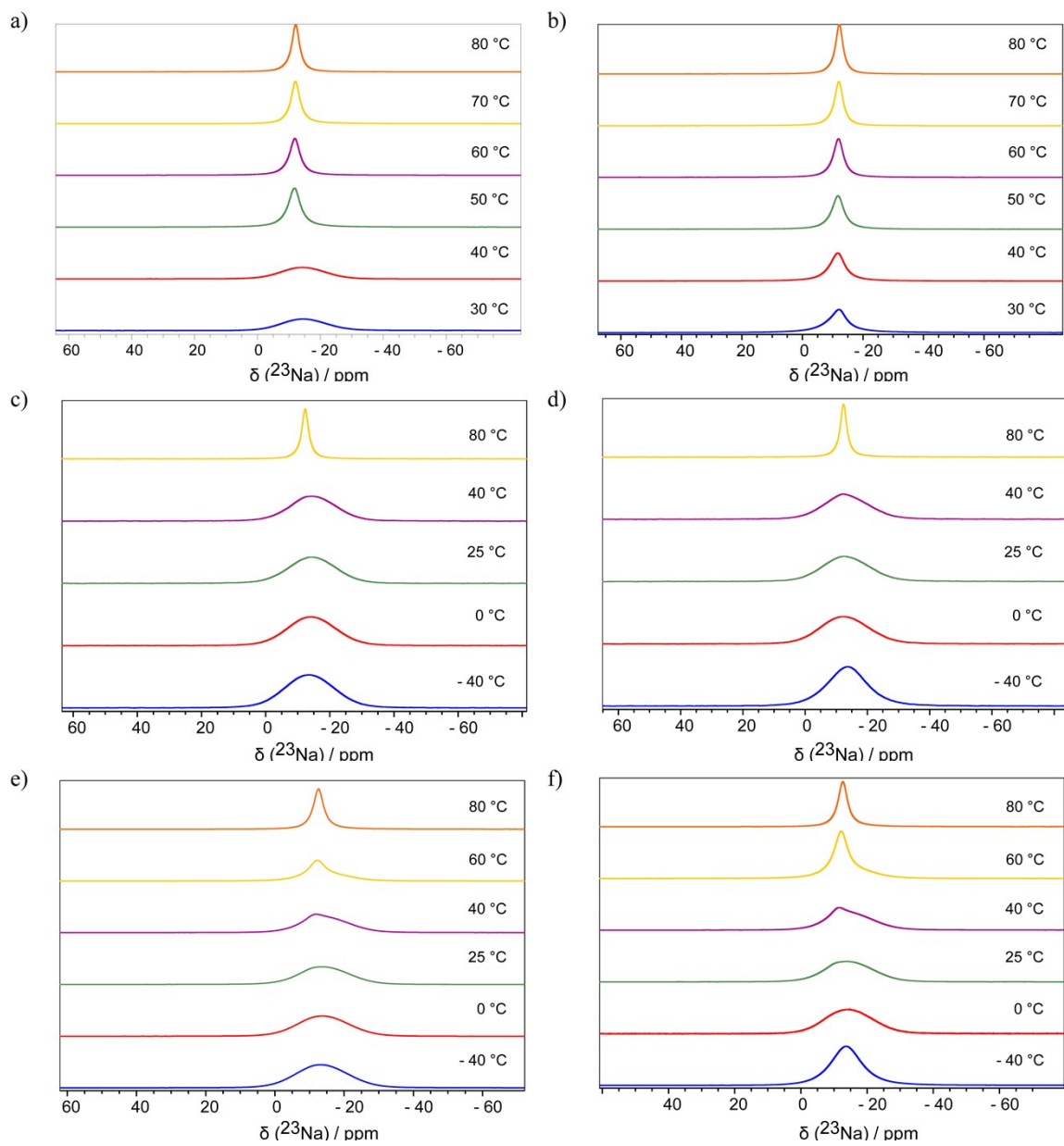
Figure S6. The evolution of 23Na spectra versus temperature for 25 mol% NaFSI recorded during first (a) and second (b) heating scan 30 to 80 °C and first (c) and second (d) heating scan -40 to 80 °C. ^{23}Na spectra: stack spectra of 50 mol% NaFSI mixture recorded at various temperatures during the first (e) and second (f) heating scan from -40 to 80 °C.
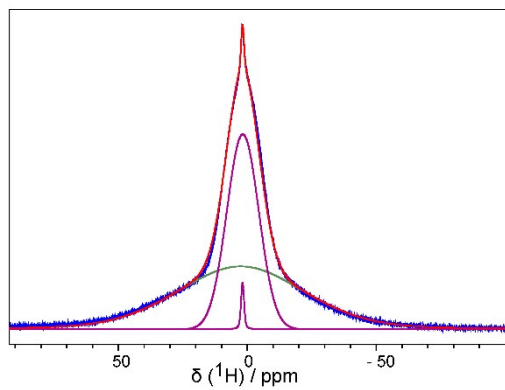
Figure S7. Deconvolution of ^1H spectra recorded during second heating cycle at 0 °C for 25 mol% NaFSI (blue). Component 1, the broadest part of the peak in green, components 2 and 3 are represented by purple linewidths. Sum of all three components displayed in red.