Supporting Information for

The Effect of Introducing an Ether Group into an Imidazolium-based Ionic Liquid on the Binary Mixtures with DMSO.

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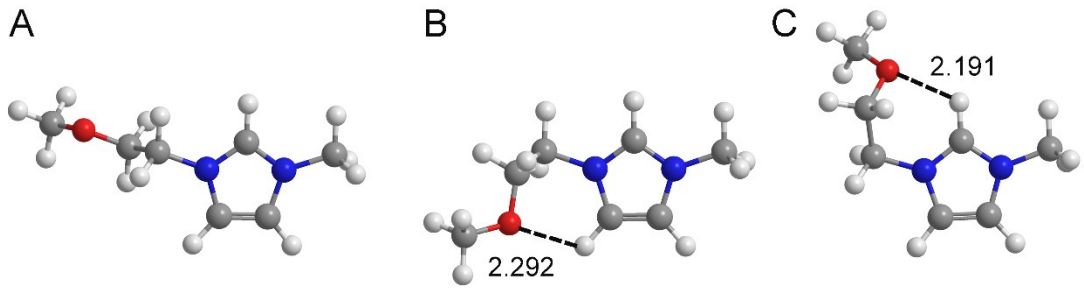

Figure S1. Optimized geometries for $[EOMIM]^+$. Hydrogen bonds are denoted by dashed lines, and the corresponding distances of H···O are labeled.

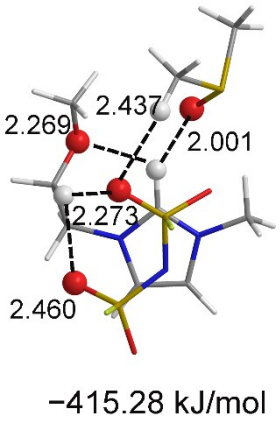

Figure S2. Optimized geometries for $[EOMIM]^+$-$[FSI]^-$-DMSO complex. The interaction energies are denoted below the structure. Hydrogen bonds are denoted by dashed lines, and the corresponding distances of H···O are labeled.

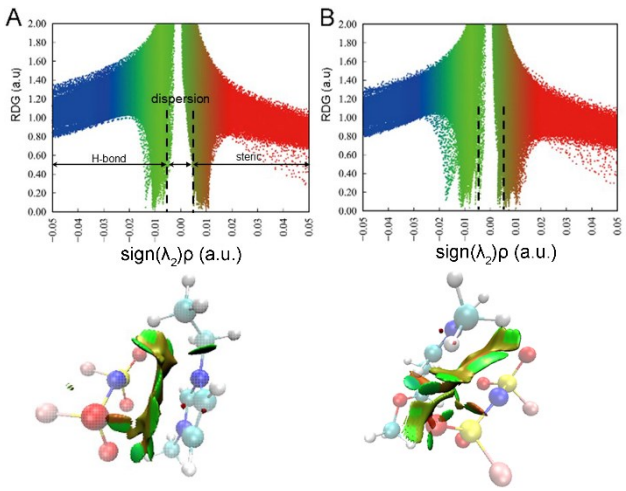

Figure S3. Plots of the reduced density gradient versus the electron density multiplied by the sign of the second Hessian eigenvalue for $[EMIM]^+[FSI]^-$ (A) and $[EOMIM]^+[FSI]^-$ (B) pairs.

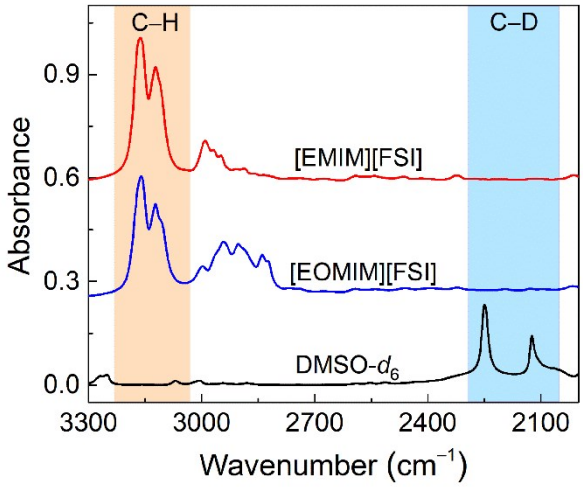

Figure S4. The infrared spectra of pure EMIMFSI, EOMIMFSI, and DMSO-d_6. The color region are selected to analyze.

Table S1. The calculated frequencies of C2−H of the possible complexes in EOMIMFSI DMSO-d_6 system.

	EOMIMFSI-DMSO
cation	3108.3
ion pair	3100.8
ion cluster	3123.2
cation−DMSO	2954.4
ion pair−DMSO	3086.3
ion cluster−DMSO	3111.8