

Supporting information

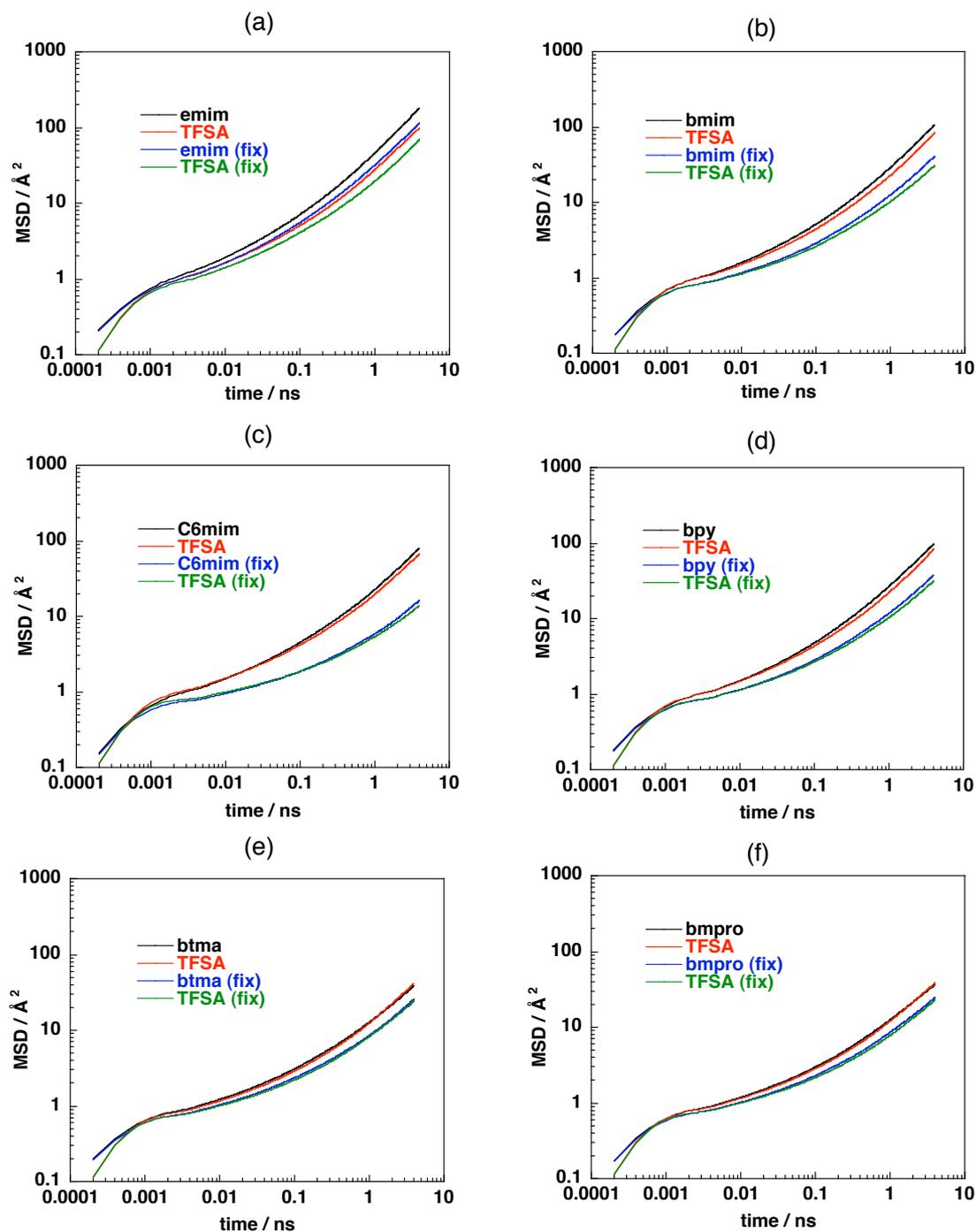


Figure 1S Mean-square displacements of the ions in ionic liquids obtained from molecular dynamic simulations with and without torsional constraint. (a) The [emim][TFSA] ionic liquid. The $C_2-N_1-C_7-C_8$ bond was fixed when the torsional

constraint was imposed. (b) The [bmim][TFSA] ionic liquid. The $C_2-N_1-C_7-C_8$, $N_1-C_7-C_8-C_9$ and $C_7-C_8-C_9-C_{10}$ bonds were fixed. (c) The [C₆mim][TFSA] ionic liquid. The $C_2-N_1-C_7-C_8$, $N_1-C_7-C_8-C_9$, $C_7-C_8-C_9-C_{10}$, $C_8-C_9-C_{10}-C_{11}$, and $C_9-C_{10}-C_{11}-C_{12}$ bonds were fixed. (d) The [bpy][TFSA] ionic liquid. The $C_2-N_1-C_7-C_8$, $N_1-C_7-C_8-C_9$ and $C_7-C_8-C_9-C_{10}$ bonds were fixed. (e) The [btma][TFSA] ionic liquid. The $C_6-N_1-C_2-C_3$, $N_1-C_2-C_3-C_4$ and $C_2-C_3-C_4-C_5$ bonds were fixed. (f) The [bmpro][TFSA] ionic liquid. The $C_2-N_1-C_7-C_8$, $N_1-C_7-C_8-C_9$ and $C_7-C_8-C_9-C_{10}$ bonds were fixed.