Supplementary information

Redox-Active Glyme–Li Tetrahalogenoferrate(III) Solvate Ionic Liquids for Semi-Liquid Lithium Secondary Batteries

Yuta Kemmizaki[1], Yu Katayama[1,], Hiromori Tsutsumi[1], and Kazuhide Ueno[2,*]*

[1] Department of Applied Chemistry, Graduate School of Sciences and Technology for Innovation, Yamaguchi University, Tokiwadai, Ube 755-8611, Japan

[2] Department of Chemistry and Biotechnology, Yokohama National University, 79-5 Tokiwadai, Hodogaya-ku, Yokohama 240-8501, Japan

Telephone/Fax: +81-45-339-3951. E-mail: ueno-kazuhide-rc@ynu.ac.jp

Telephone/Fax: +81- 836-85-9285. E-mail: yuktym@yamaguchi-u.ac.jp

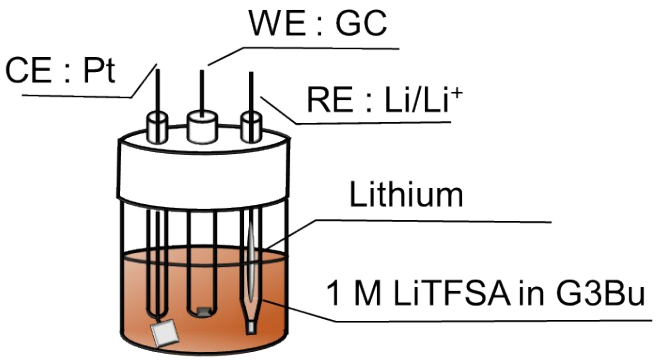

Figure S1 Schematic of the three-electrode cell for CV.

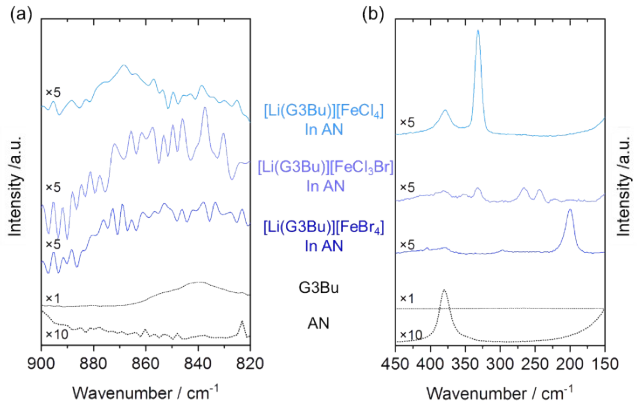

Figure S2 Raman spectra: (a) G3Bu region and (b) $[FeX]^-$ region, for SILs ([Li(G3Bu)][FeX] (X = Br_4, Cl_3Br, Cl_4)), and solvent (acetonitrile (AN) and pure G3), at room temperature. All [Li(G3Bu)][FeX] were dissolved in AN to maintain their liquid state.

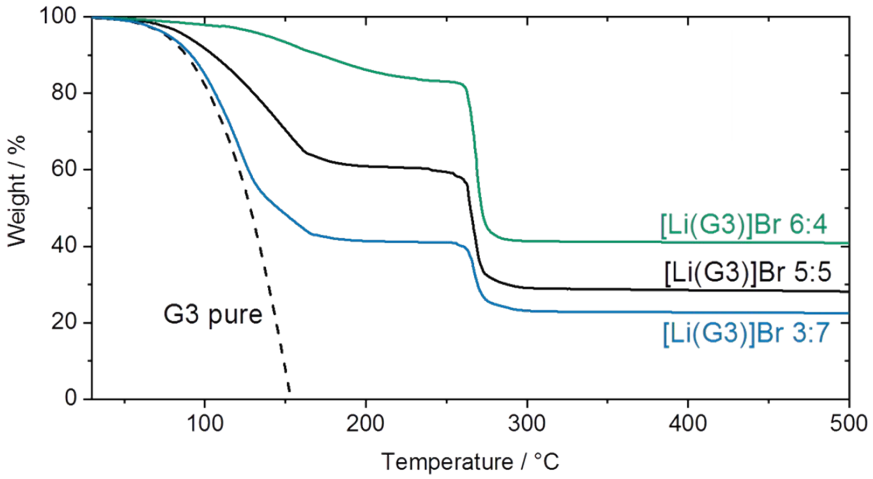

Figure S3 Thermogravimetric curves for [Li(G3)]Br, mixed LiBr:G3 = x:y, and pure G3.

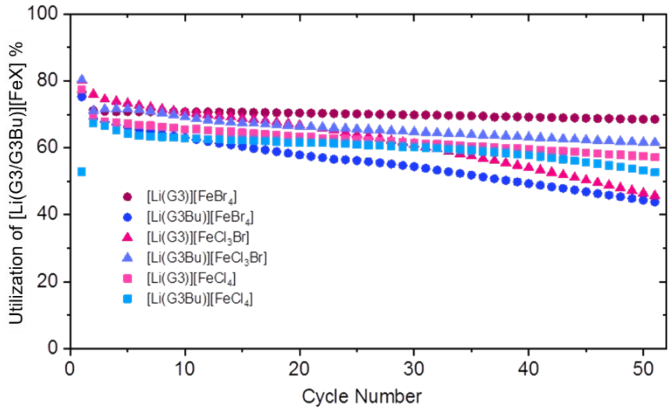

Figure S4 Utilization ratio (experimental/theoretical discharge capacities) for each catholyte using SIL-active species at 30°C at a rate of 0.2 C.