Supporting Information

Effects of repeat unit charge density on physical and electrochemical properties of novel heterocationic poly(ionic liquid)s

Merlin Cotessat,[a] Dimitri Flachard,[b] Daniil Nosov,[a] Elena I. Lozinskaya,[c] Denis O. Ponkratov,[c] Daniel F. Schmidt,[a] Eric Drockenmuller[b] and Alexander S. Shaplov*[a]*

[a]Luxembourg Institute of Science and Technology (LIST), 5 avenue des Hauts-Fourneaux, L-4362 Esch-sur-Alzette, Luxembourg

[b]Univ Lyon, Université Lyon 1, CNRS, Ingénierie des Matériaux Polymères, UMR 5223, F-69003, Lyon, France

[c]A.N. Nesmeyanov Institute of Organoelement Compounds Russian Academy of Sciences (INEOS RAS), Vavilov str. 28, 119991, Moscow, Russia

* Corresponding authors:

E-mails: alexander.shaplov@list.lu and eric.drockenmuller@univ-lyon1.fr

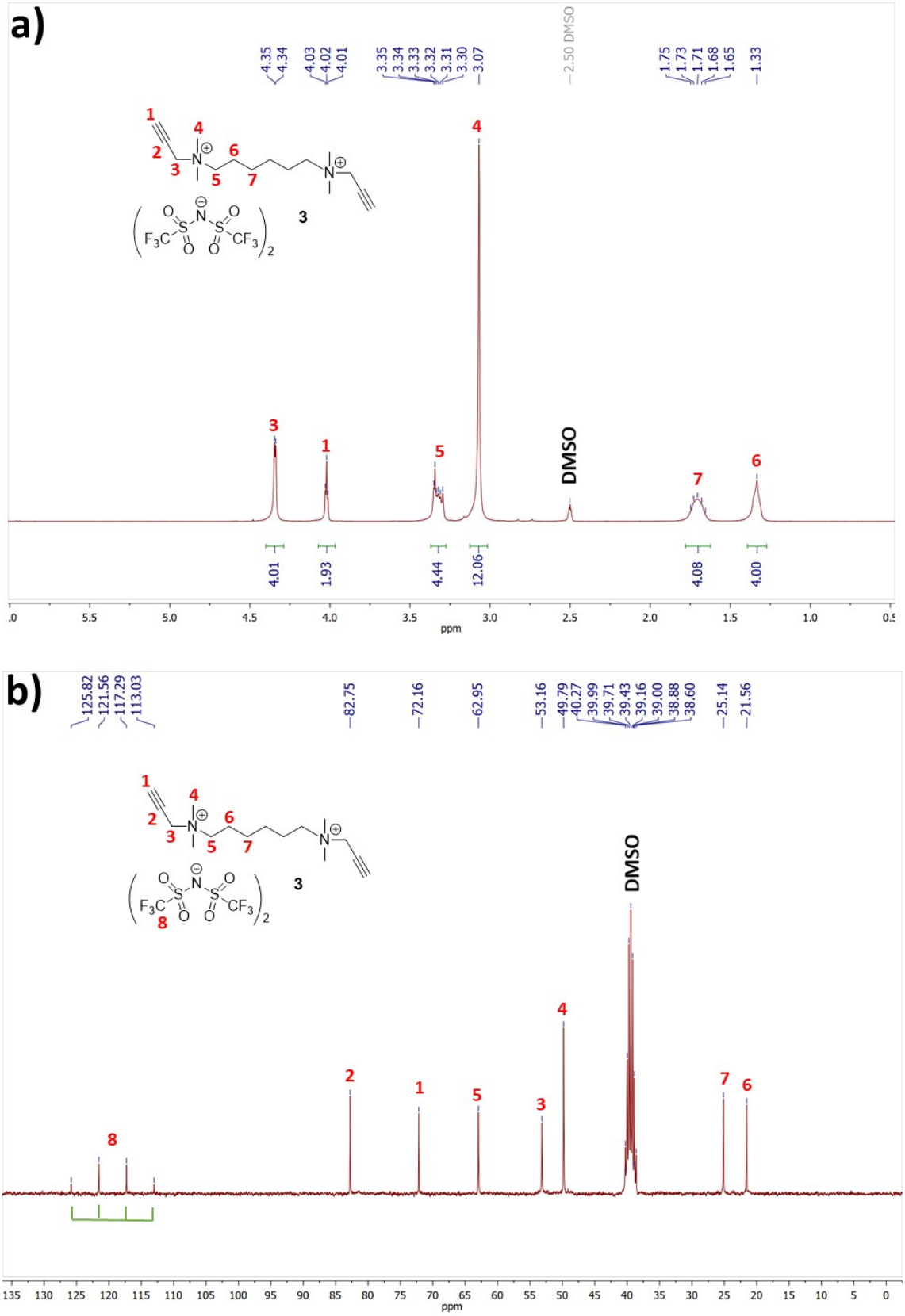

Figure S1. ^{1}H (a) and ^{13}C (b) NMR of monomer **3** (25 °C, DMSO-d_6).

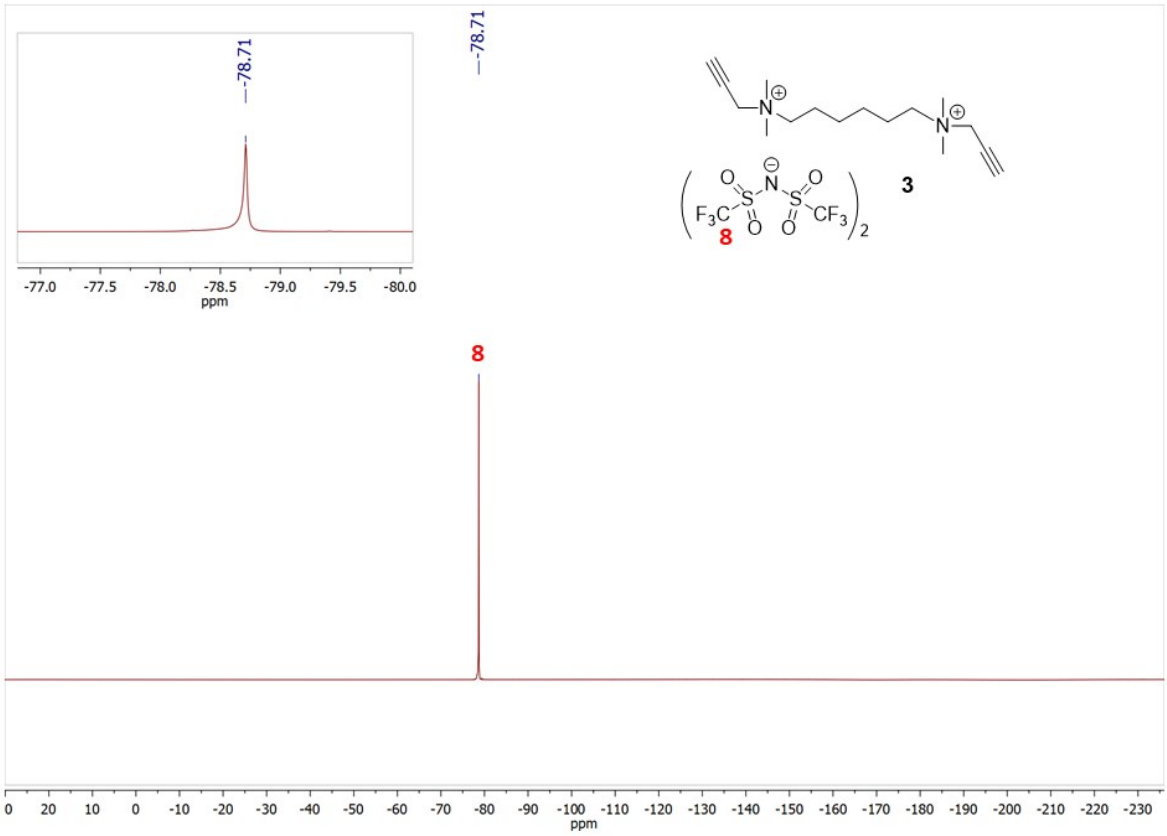

Figure S2. ^{19}F NMR of monomer **3** (25 °C, DMSO-d_6).

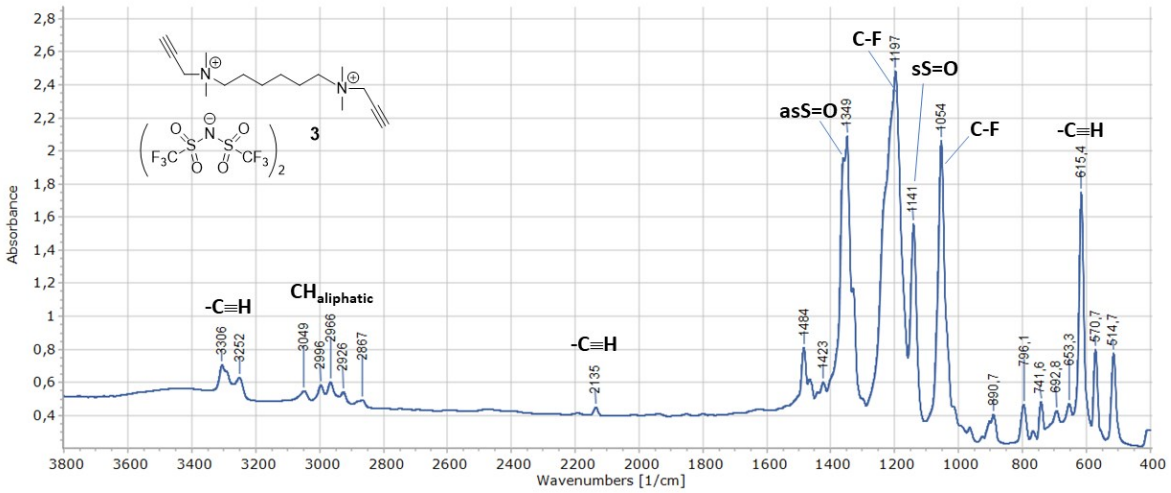

Figure S3. FT-IR spectrum of monomer **3**.

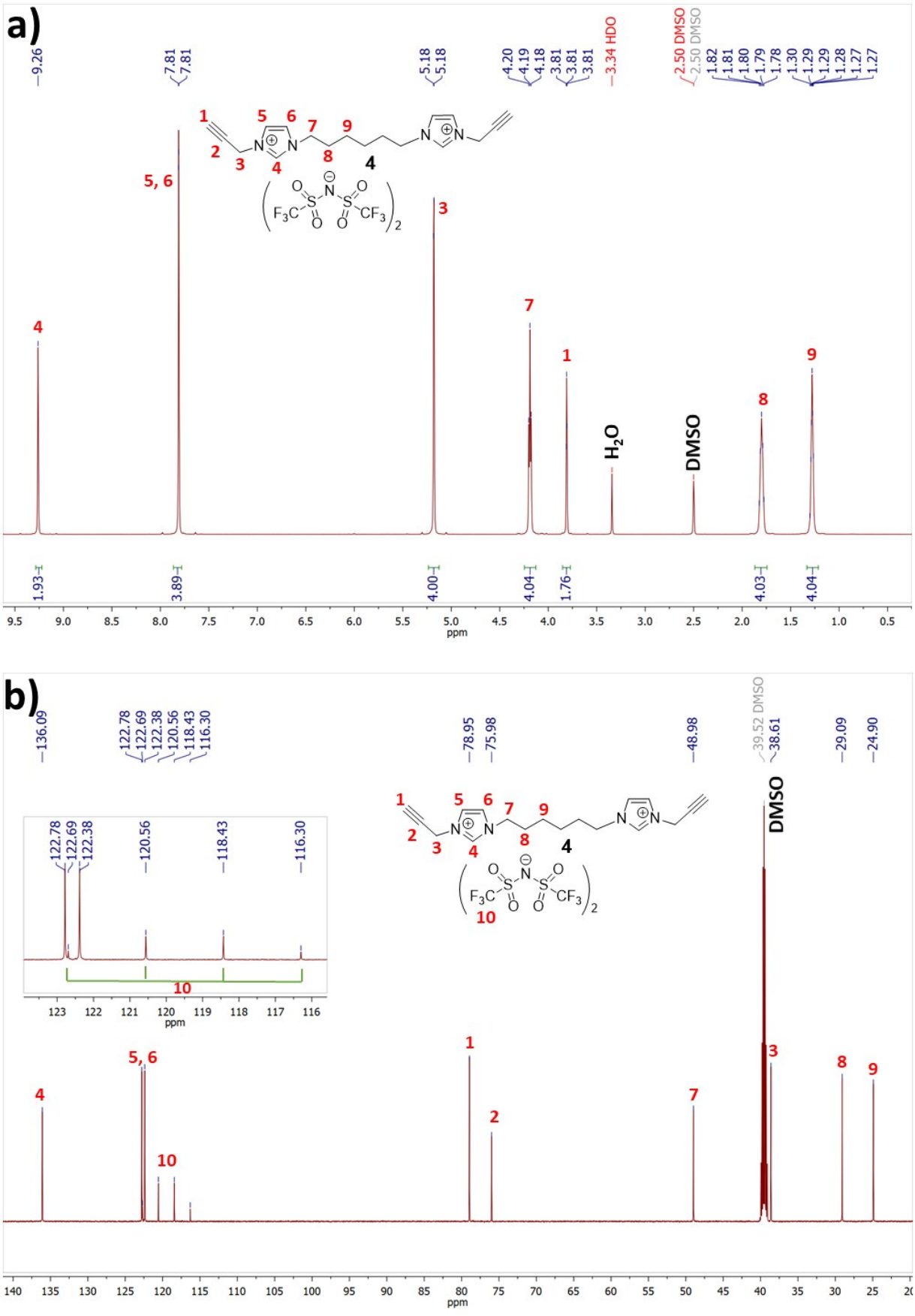

Figure S4. ^{1}H (a) and ^{13}C (b) NMR of monomer **4** (25 °C, DMSO-d_6).

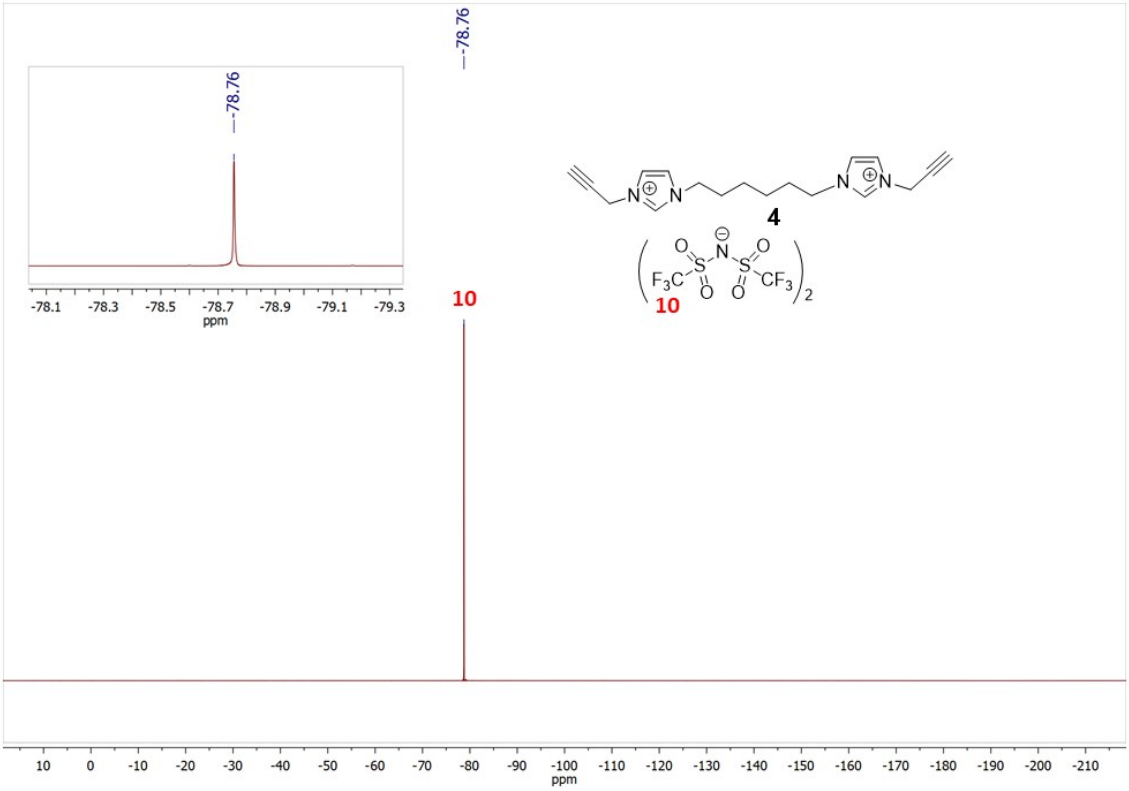

Figure S5. ^{19}F NMR of monomer **4** (25 °C, DMSO-d_6).

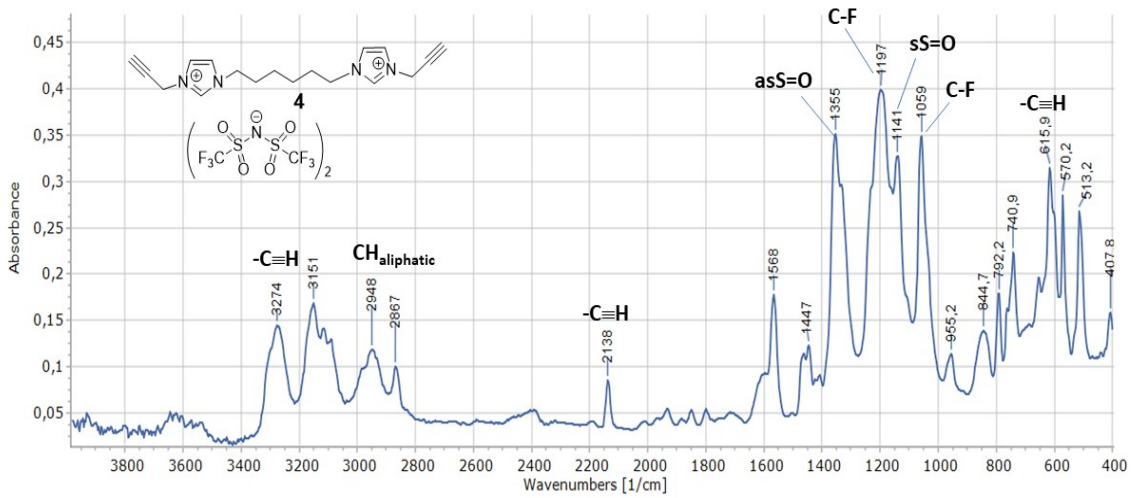

Figure S6. FT-IR spectrum of monomer **4**.

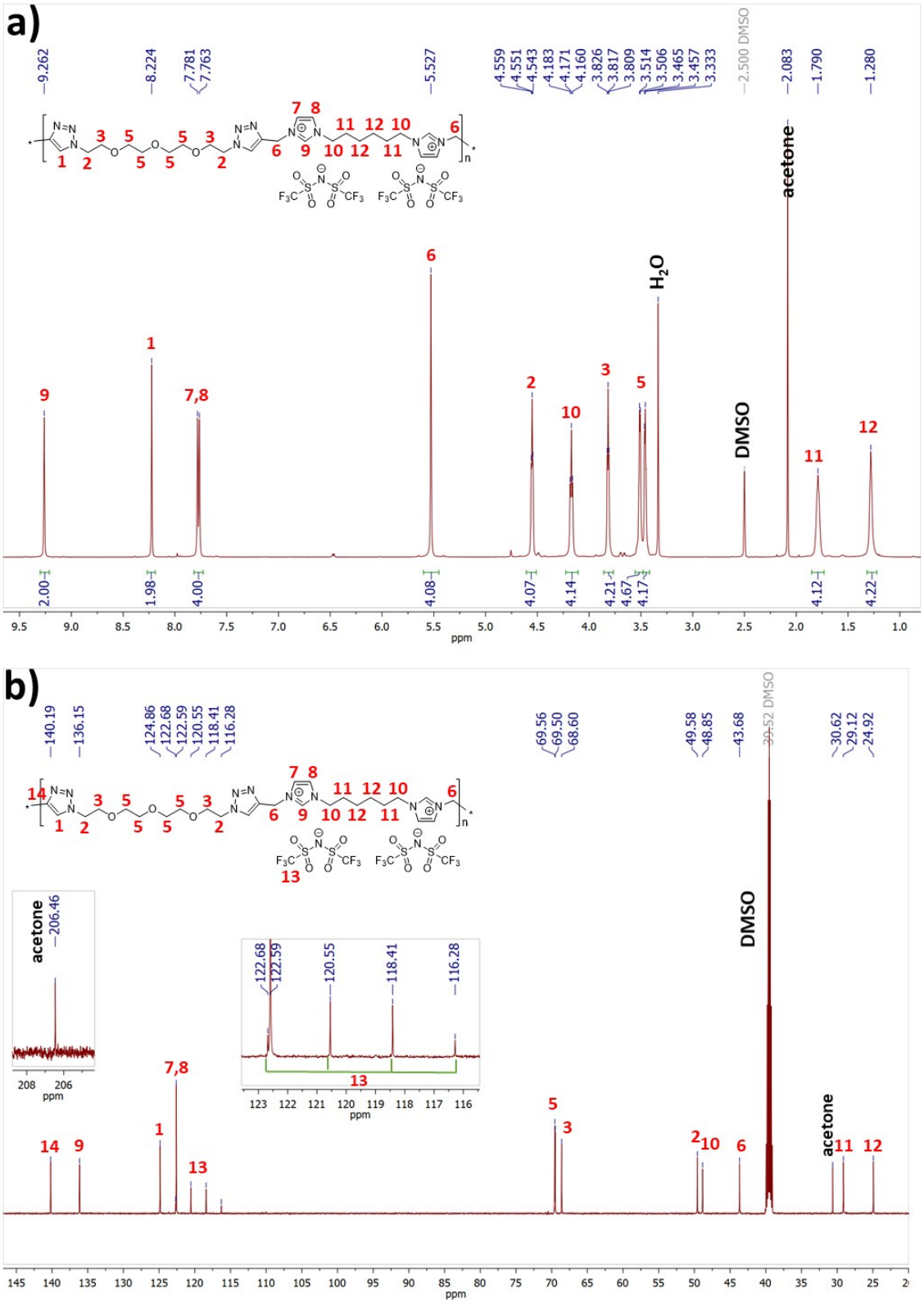

Figure S7. ^{1}H (a) and ^{13}C (b) NMR of polymer **10** (25 °C, DMSO-d_6).

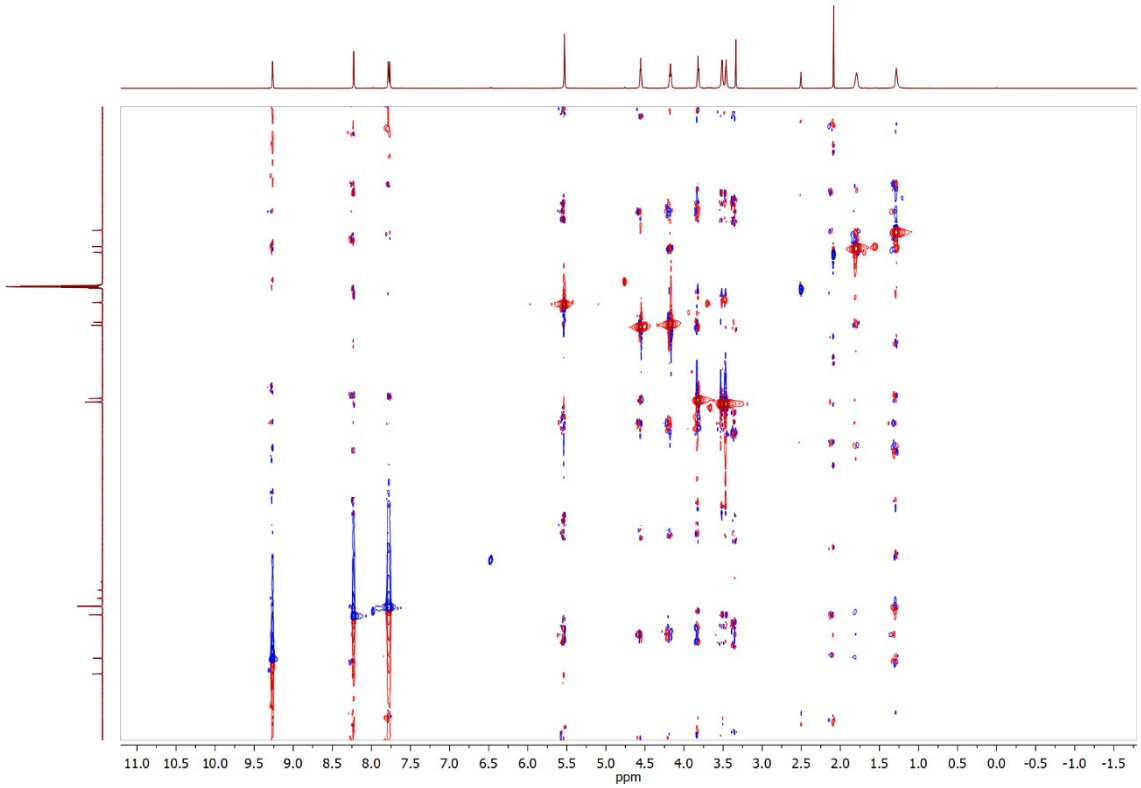

Figure S8. HSQC of polymer **10** (25 °C, DMSO-d_6).

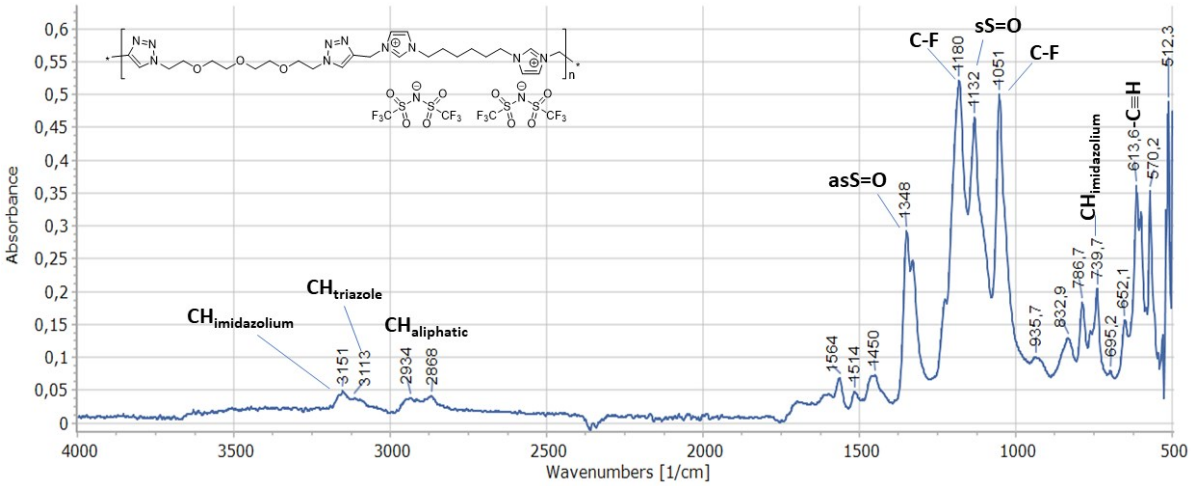

Figure S9. FT-IR spectrum of polymer **10**.

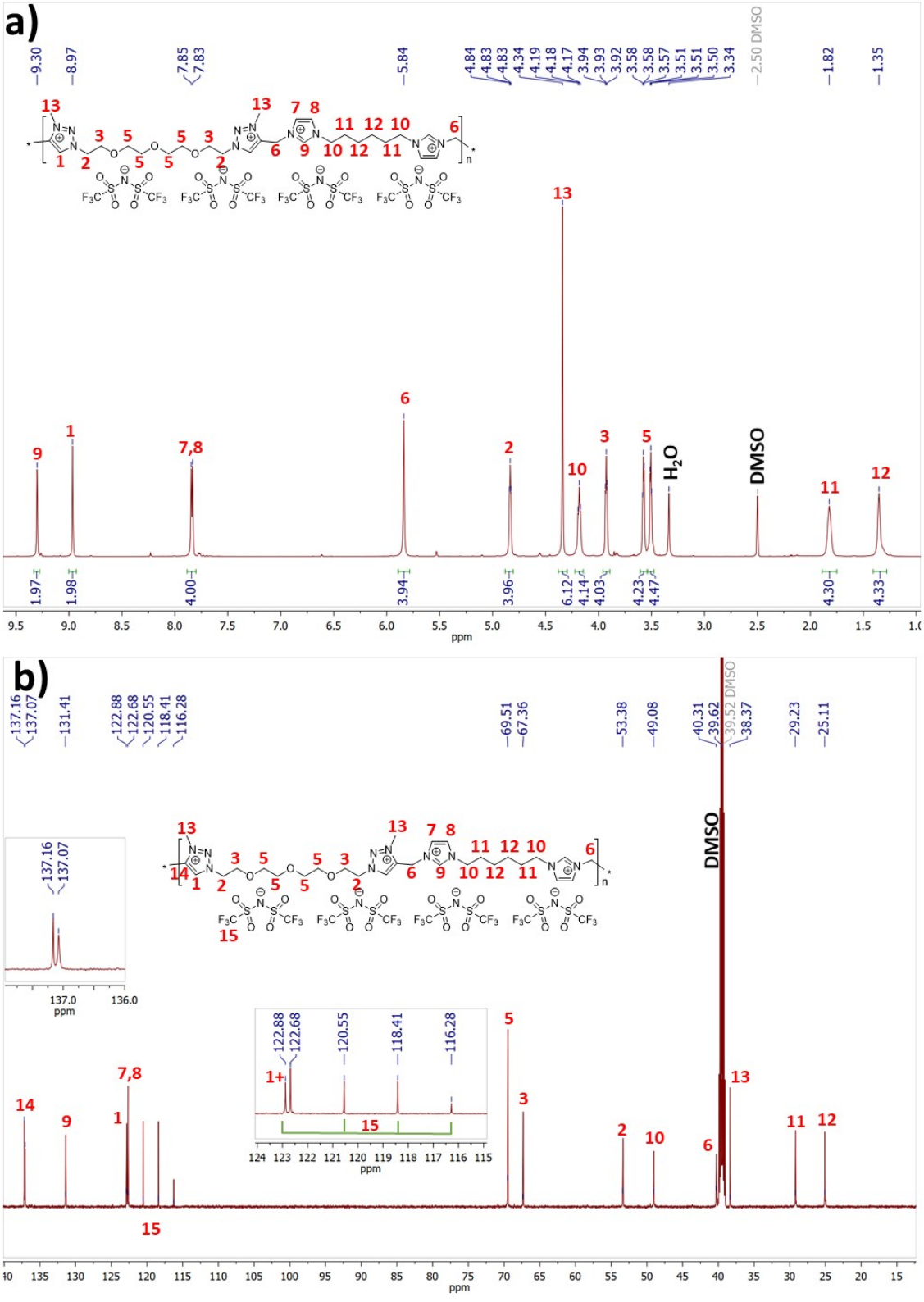

Figure S10. ^{1}H (a) and ^{13}C (b) NMR of polymer **14** (25 °C, DMSO-d_6).

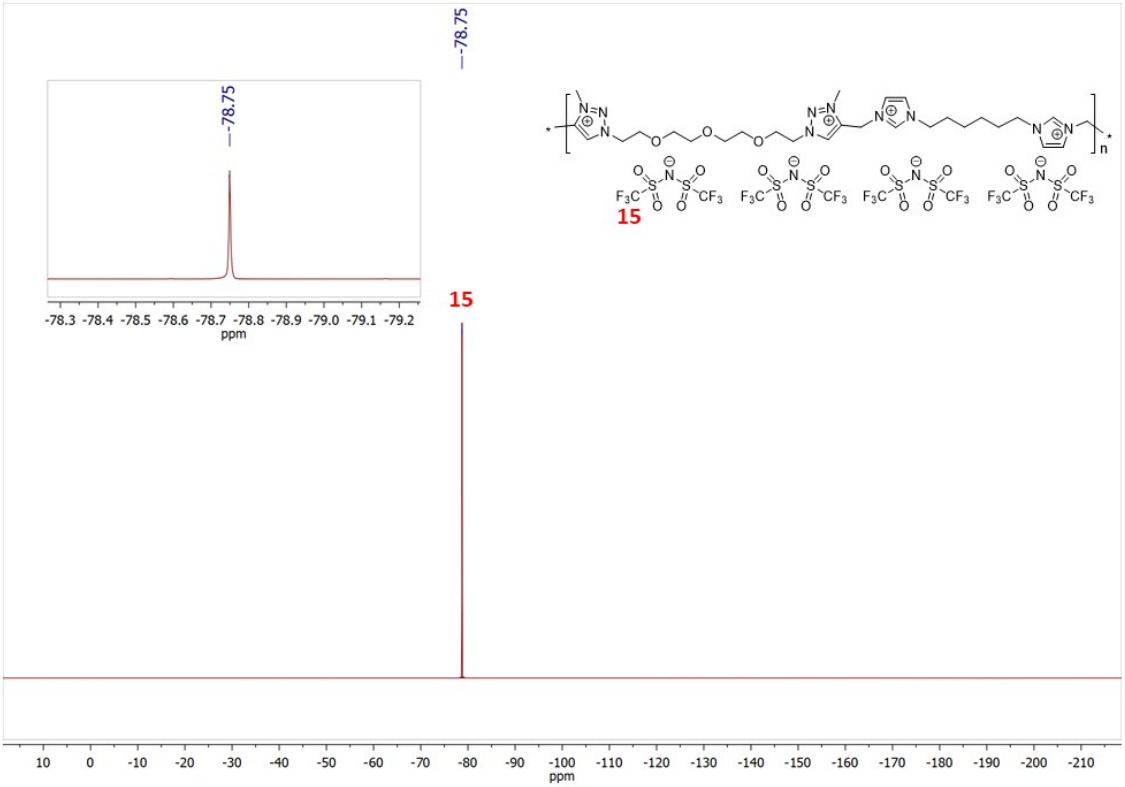

Figure S11. ^{19}F NMR of polymer **14** (25 °C, DMSO-d_6).

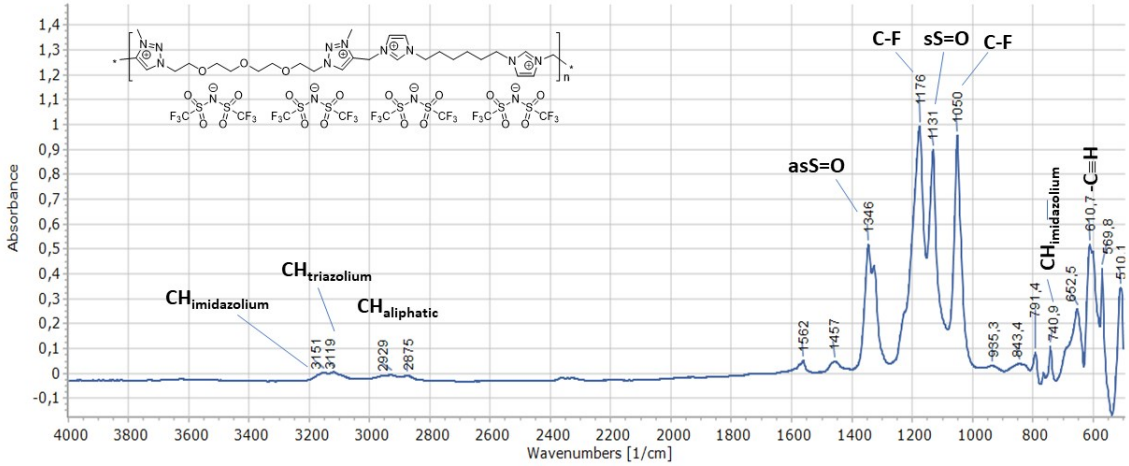

Figure S12. FT-IR spectrum of polymer **14**.

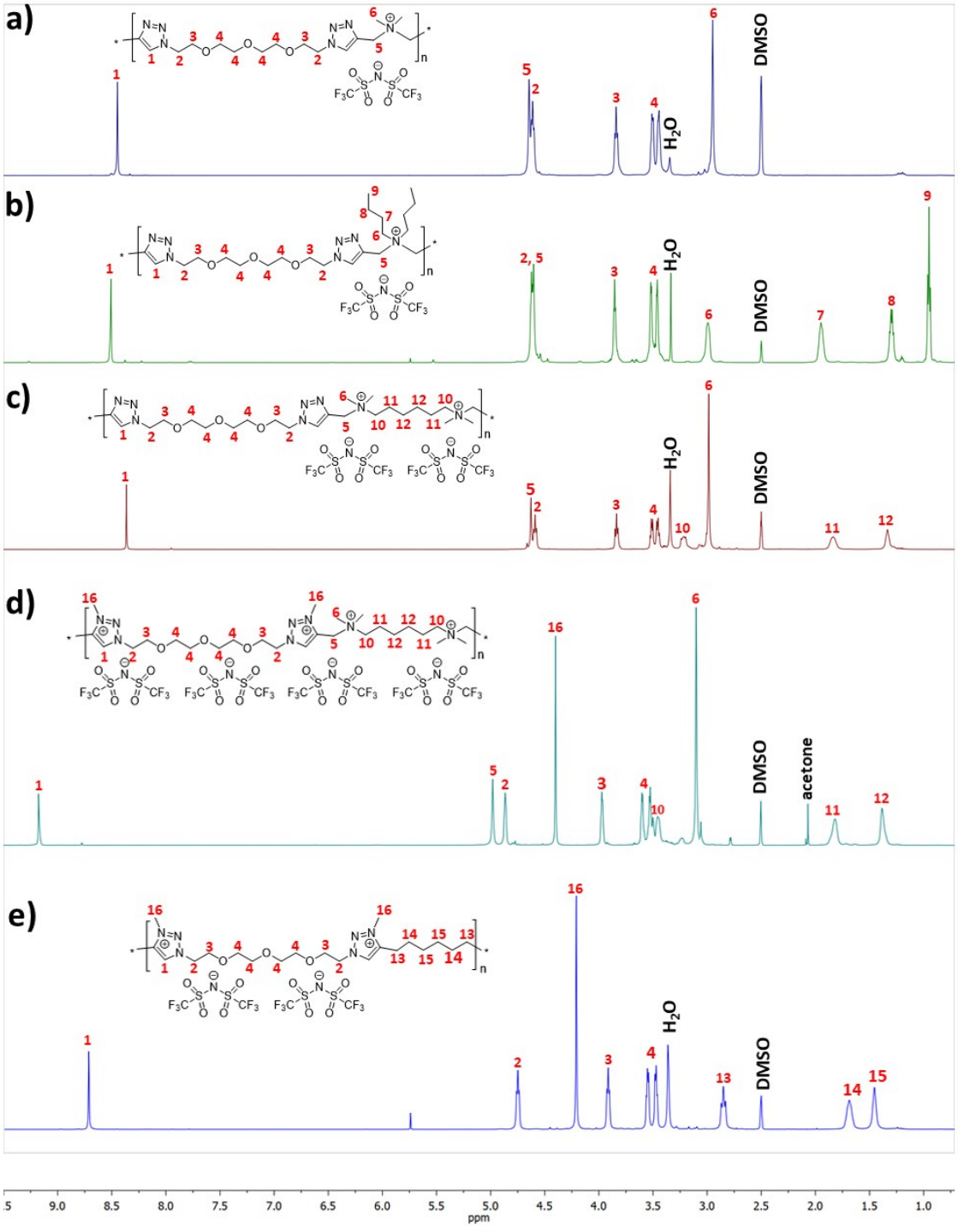

Figure S13. ^{1}H NMR of polymers **7** (a), **8** (b), **9** (c), **13** (d) and **15** (e) (25 °C, DMSO-d_6).

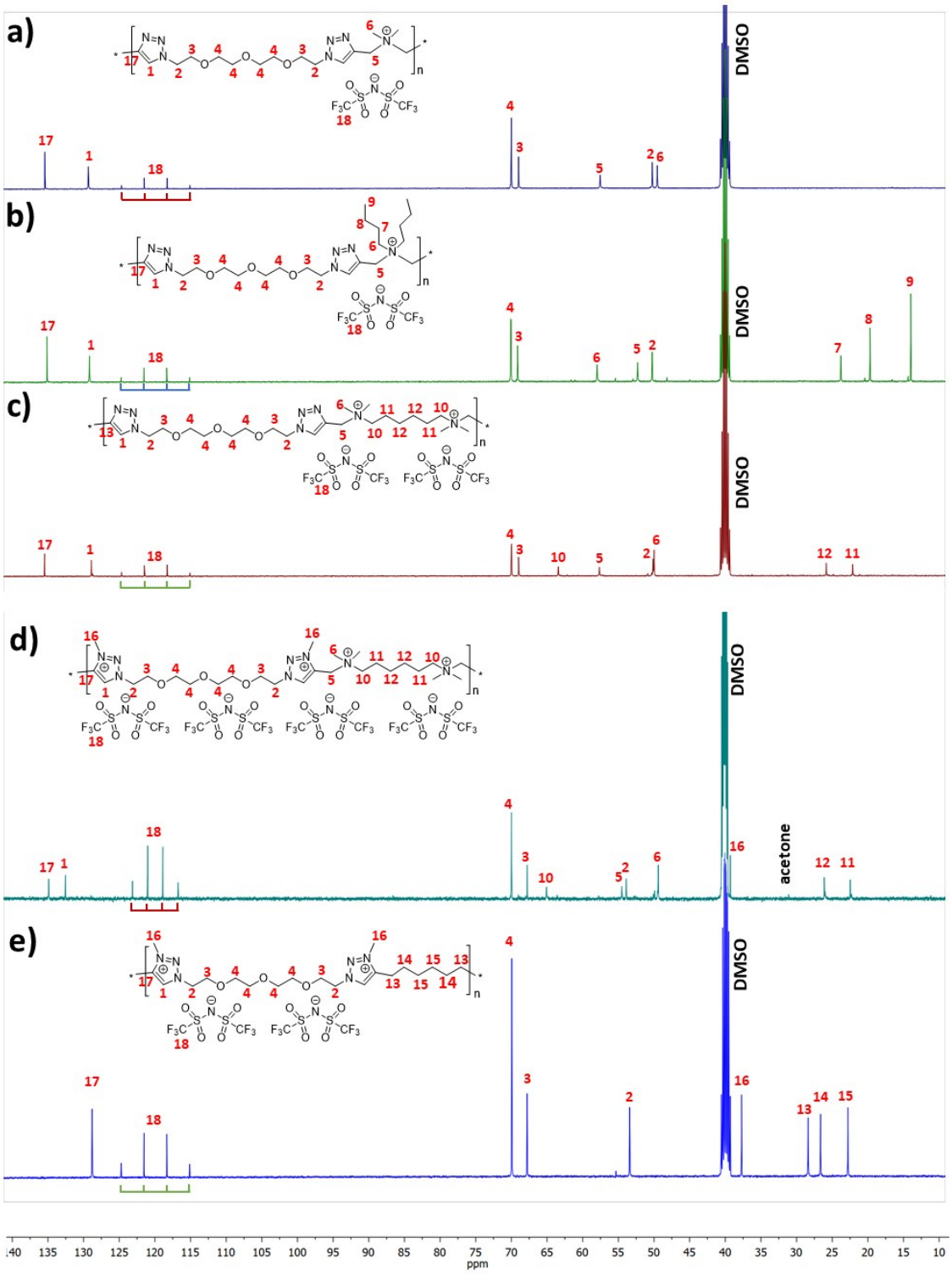

Figure S14. ^{13}C NMR of polymers **7** (a), **8** (b), **9** (c), **13** (d) and **15** (e) (25 °C, DMSO-d_6).

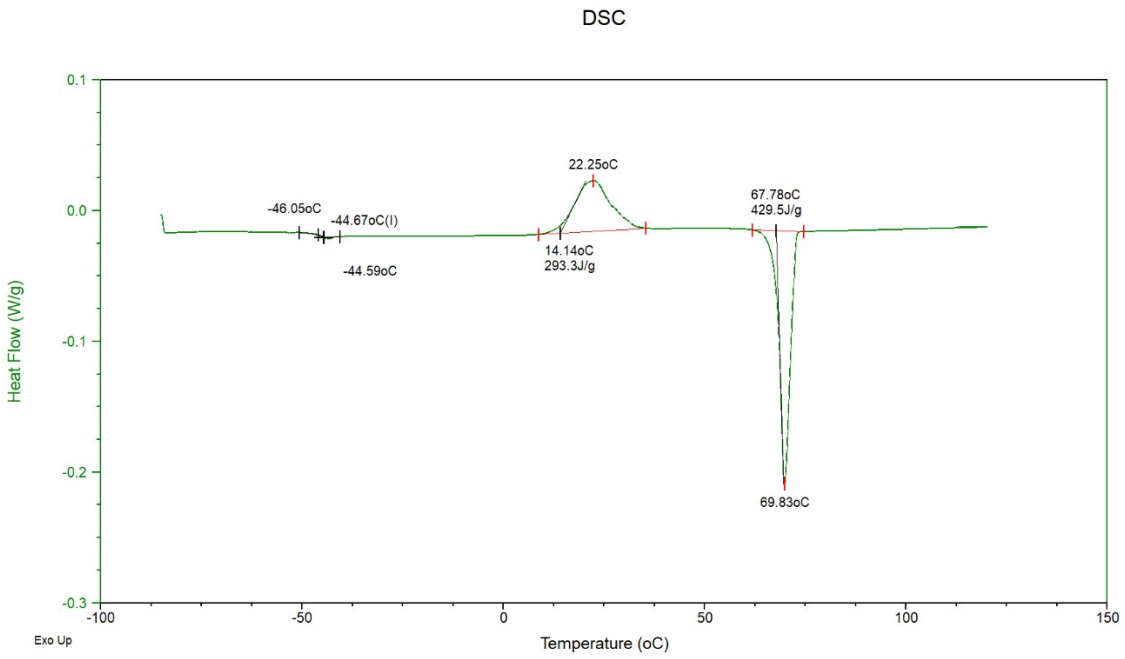

Figure S15. DSC curve for monomer **3** (second heating cycle, 3°C min^{-1}).

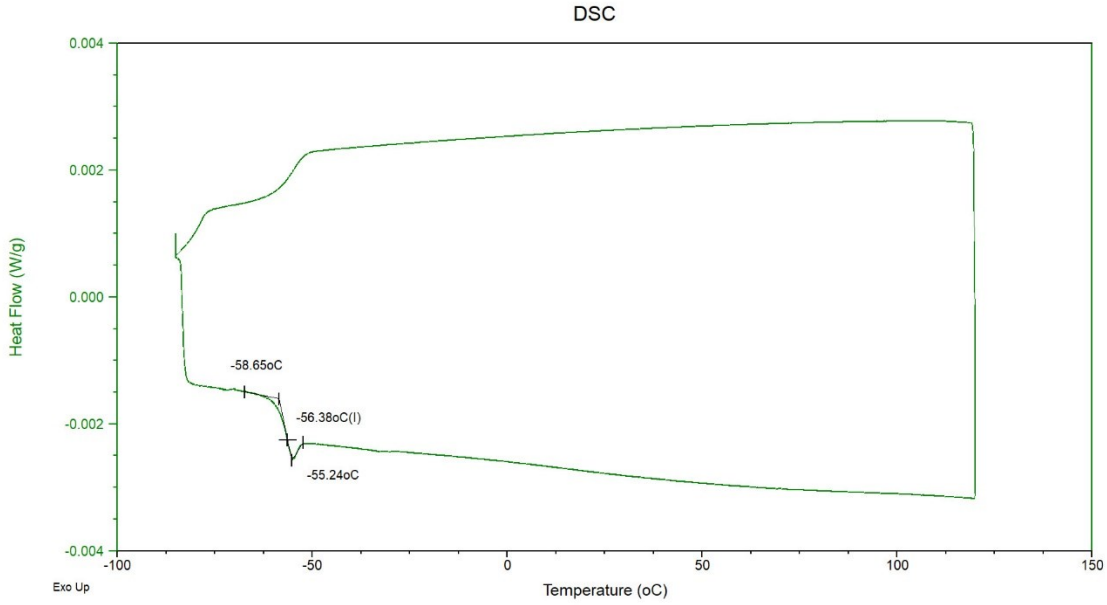

Figure S16. DSC curves for monomer **4** (second heating/cooling cycle, 3°C min^{-1}).

Examples of DSC curves:

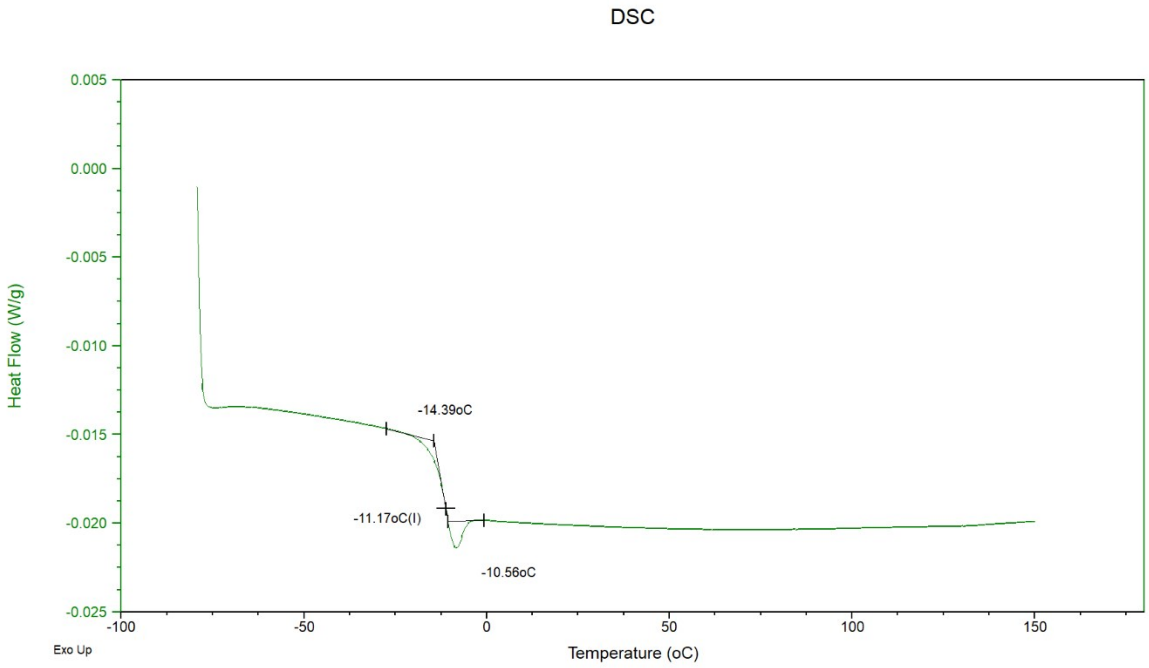

Figure S17. DSC curve for polymer **10** (second heating cycle, 10^{o}C min^{-1}).

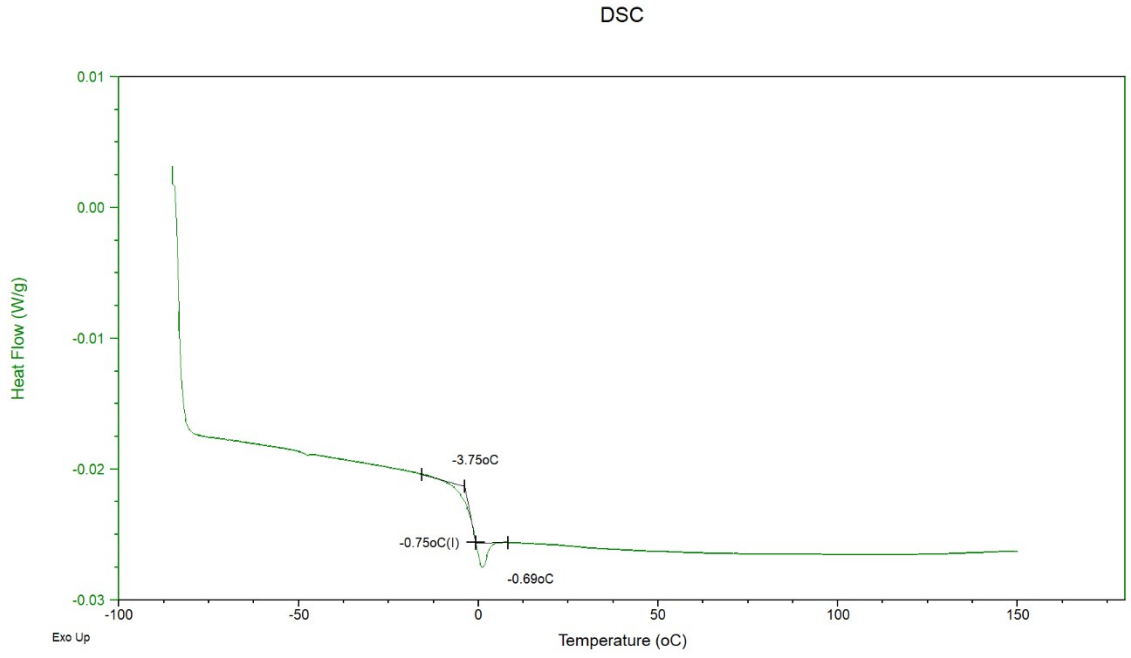

Figure S18. DSC curve for polymer **14** (second heating cycle, 10^{o}C min^{-1}).

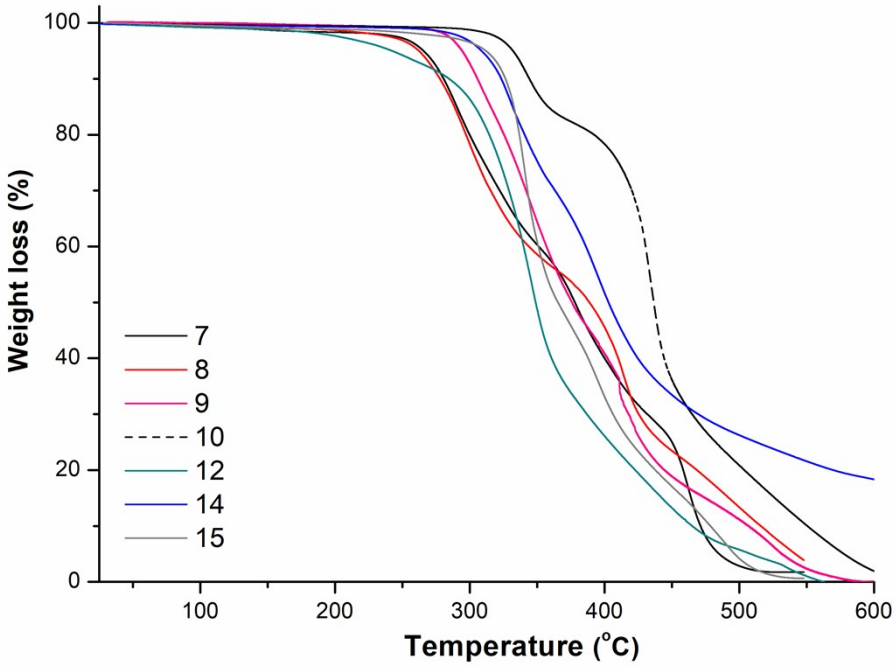

Figure S19. TGA traces of PILs (5°C min^{-1}, under air).

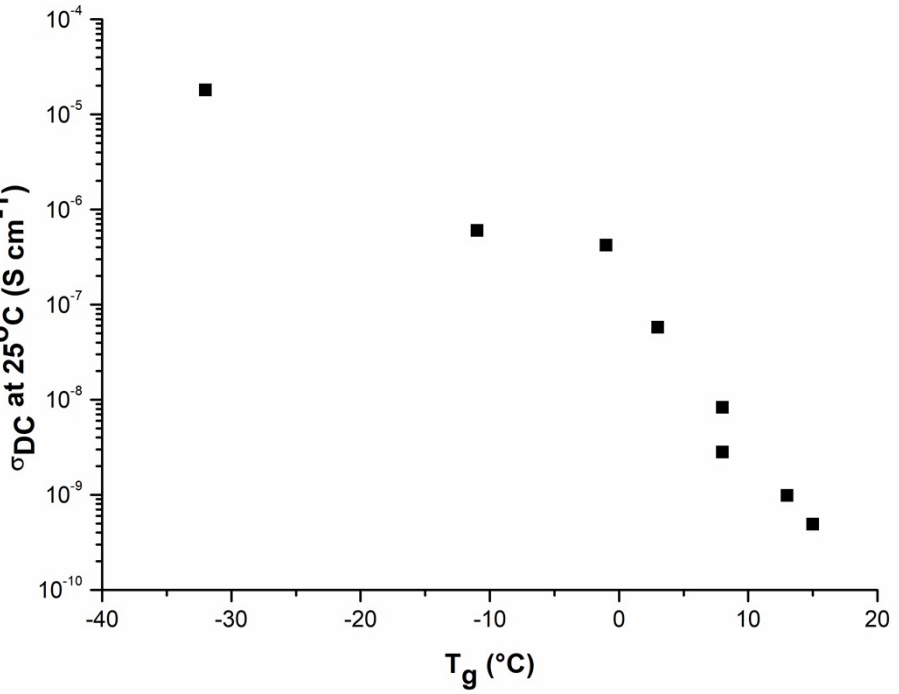

Figure S20. Ionic conductivity at 25°C vs T_g of PILs.

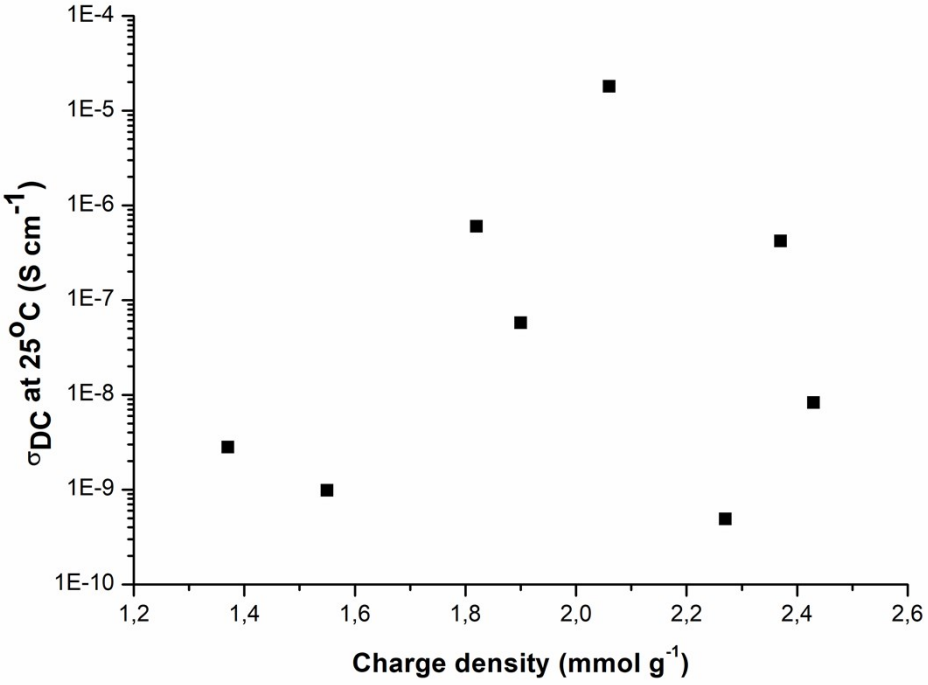

Figure S21. Ionic conductivity at 25°C vs charge density of PILs.