Electronic Supplementary Material (ESI) for RSC Advances.

Proton Mobility by Solid State ^{1}H MAS NMR Spectroscopy in Novel Proton Conducting PEMFC Blend Membranes Composed of Fluorinated Copolymer Bearing 1,2,4-triazole Functions and sPEEK for Fuel Cell Operation at Low Relative Humidity.

Benjamin Campagne,[1,2] Gilles Silly,[3] Ghislain David,[1] Bruno Améduri,[1] Deborah J. Jones,[2] Jacques Rozière [2] and Ivan Roche.[4]

[1]Ingénierie et Architectures Macromoléculaires, Institut Charles Gerhardt UMR CNRS 5253, Ecole Nationale Supérieure de Chimie de Montpellier, 8 rue de l'Ecole Normale, 34296 Montpellier Cedex 5, France

[2]Agrégats, Interfaces et Matériaux pour l'Energie, Institut Charles Gerhardt UMR CNRS 5253, Université Montpellier 2, Place E. Bataillon, 34095 Montpellier Cedex 5, France

[3]Chalcogénures et verres, Institut Charles Gerhardt UMR CNRS 5253, Université Montpellier 2, Place E. Bataillon, 34095 Montpellier Cedex 5, France.

[4]PSA Peugeot-Citroën, Centre Technique de Vélizy A, Route de Gizy VV1404, Bâtiment 91, 78943 Vélizy Villacoublay Cedex, France

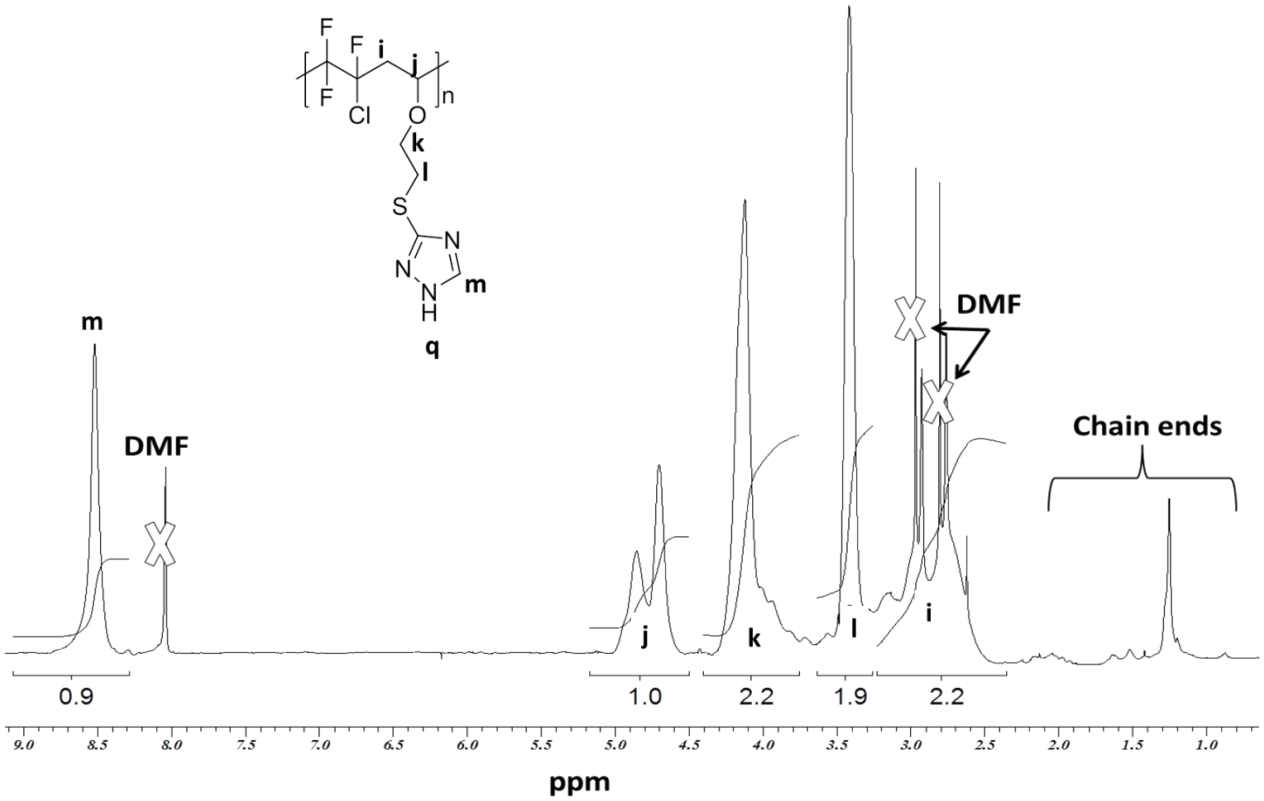

Figure SI1: Liquid ^{1}H NMR spectrum of poly(CTFE-*alt*-IEVE)-*g*-1H-1,2,4-triazole-3-thiol (II) copolymer in deuterated DMF, 20 °C

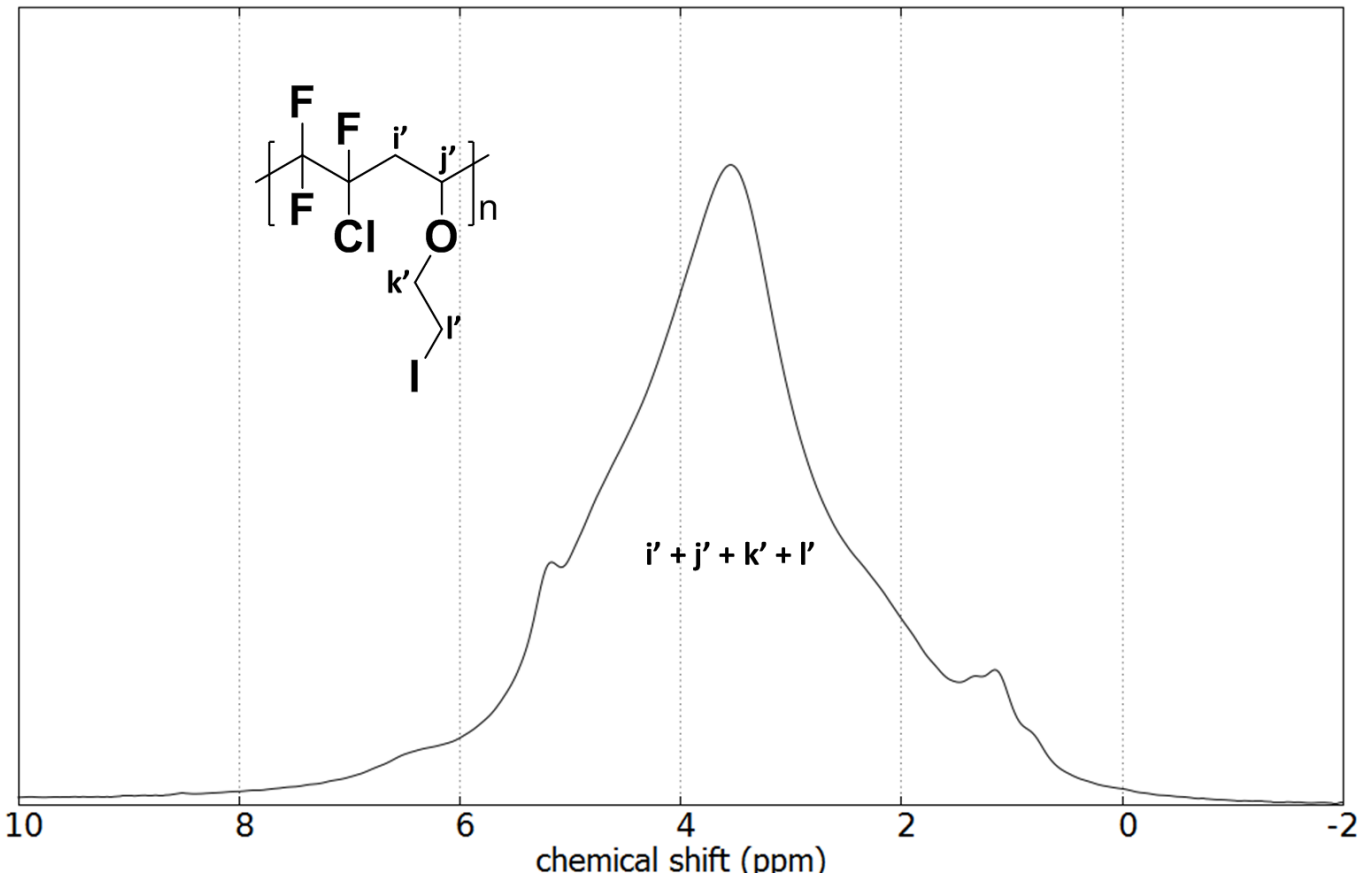

Figure SI2: 1D single pulse ^{1}H MAS SSNMR of poly(CTFE-*alt*-IEVE) (I) copolymer, 20 °C.

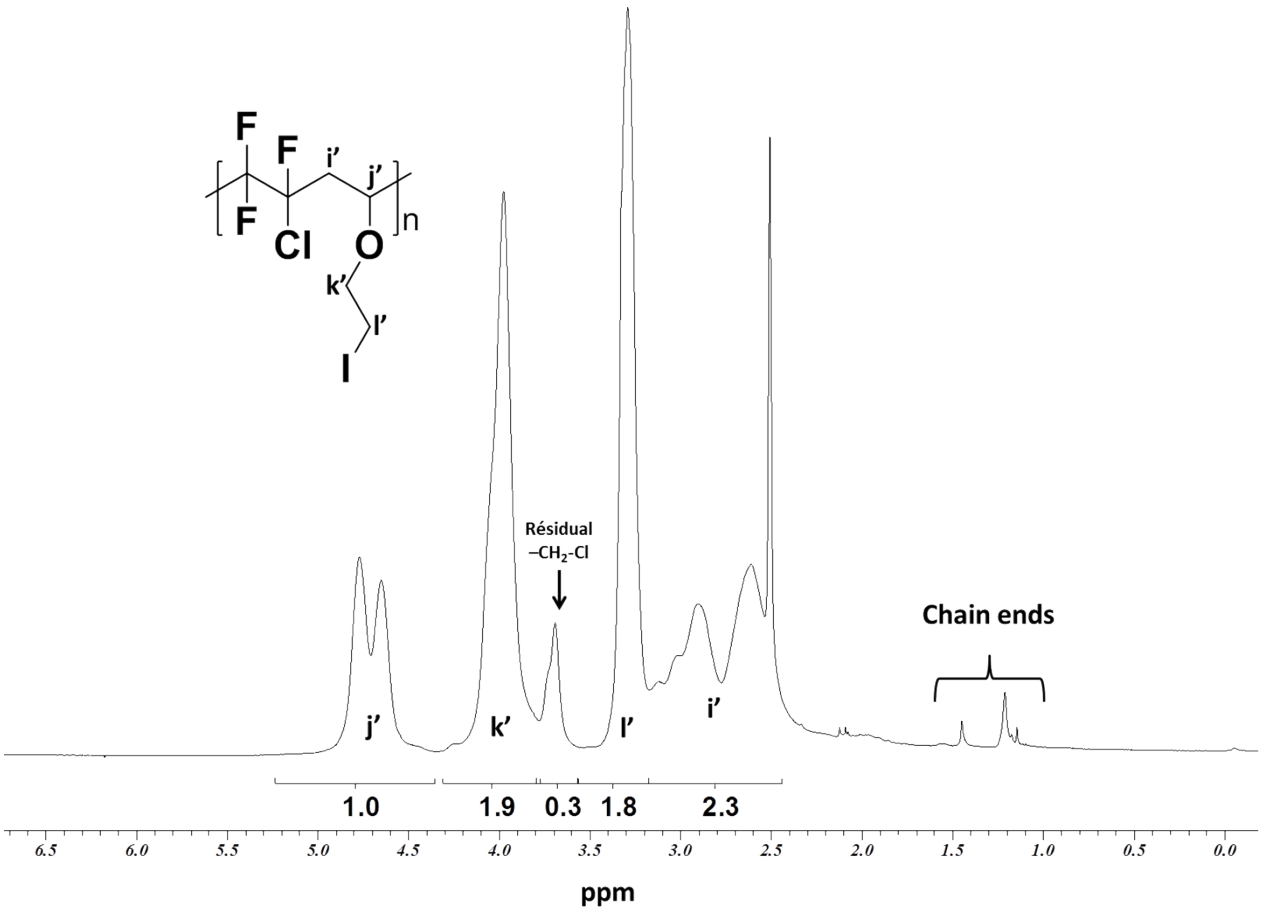

Figure SI3 : Liquid ^{1}H NMR spectrum of poly(CTFE-*alt*-IEVE) (I) copolymer in deuterated DMSO, 20 °C.

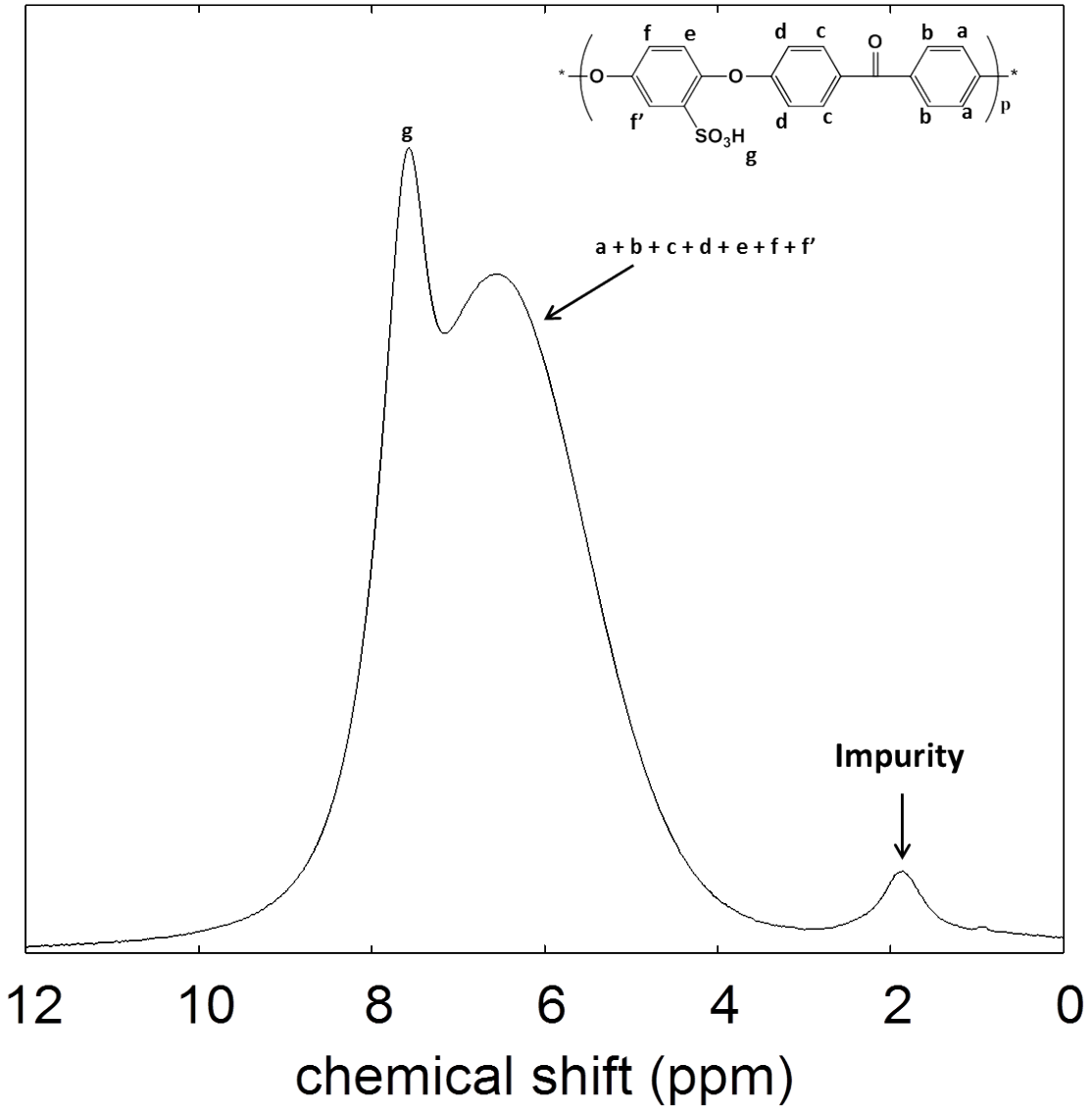

Figure SI4 : Single pulse ^{1}H MAS SSNMR spectrum of sulfonated PEEK (IEC = 1.3 meq.g^{-1}), 20 °C.

As already reported by Sabarinathan *et al*. on the effect of mechanical spinning on Nafion® structure and properties, a shift of the line position corresponding to the sulfonic acid proton (7.5 ppm) occurred *versus* time due to mechanical spinning ($f_{spinning}$ = 55 kHz). This arises from the mechanical spinning that leads to water molecules closer to acidic regions in Nafion®, probably closer to sulfonic acid sites.