Supporting information

Crosslinked terpolymers of vinylidene fluoride, perfluoro-3,6-dioxa-4-methyl-7-octene sulfonyl fluoride, and cure site monomers for membranes in PEMFC applications

Maxime Colpaert, Marta Zaton, Vincent Ladmiral, Deborah Jones, Jacques Rozière and Bruno Ameduri.

ICGM, Univ Montpellier, CNRS, ENSCM, Montpellier, France.

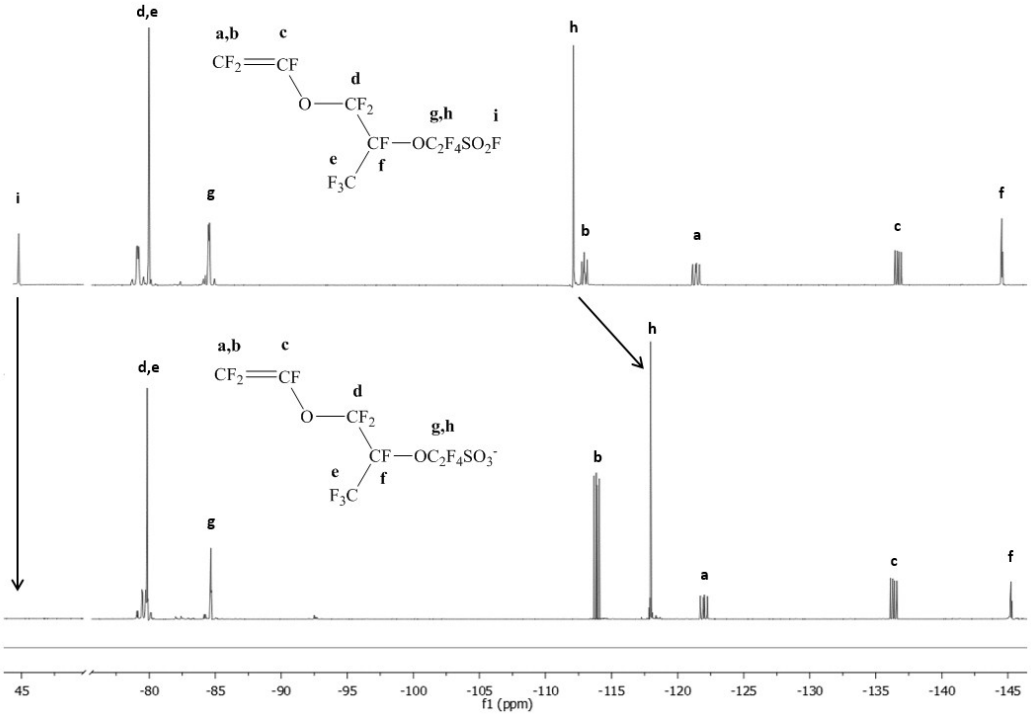

Fig. S1 ^{19}F NMR spectra of PFSVE and hPFSVE monomers. Hydrolysis by KOH in MeOH and after HCl, recorded in acetone-d_6 at 20 °C.

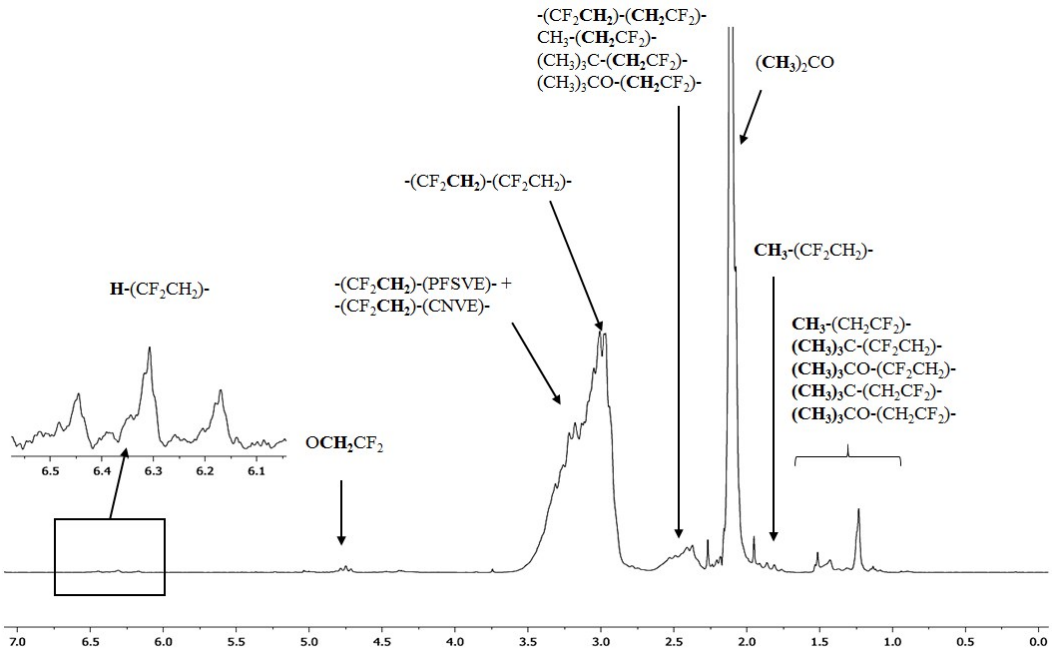

Fig. S2 ^{1}H NMR spectrum of poly(VDF-*ter*-PFSVE-*ter*-CNVE) terpolymer from a conventional radical terpolymerization of VDF with PFSVE and CNVE initiated by TBPPi at 73 °C in DMC (**P5** terpolymer, Table 1), recorded in acetone-d_6 at 20 °C. The signals at 2.05 ppm was assigned to acetone.

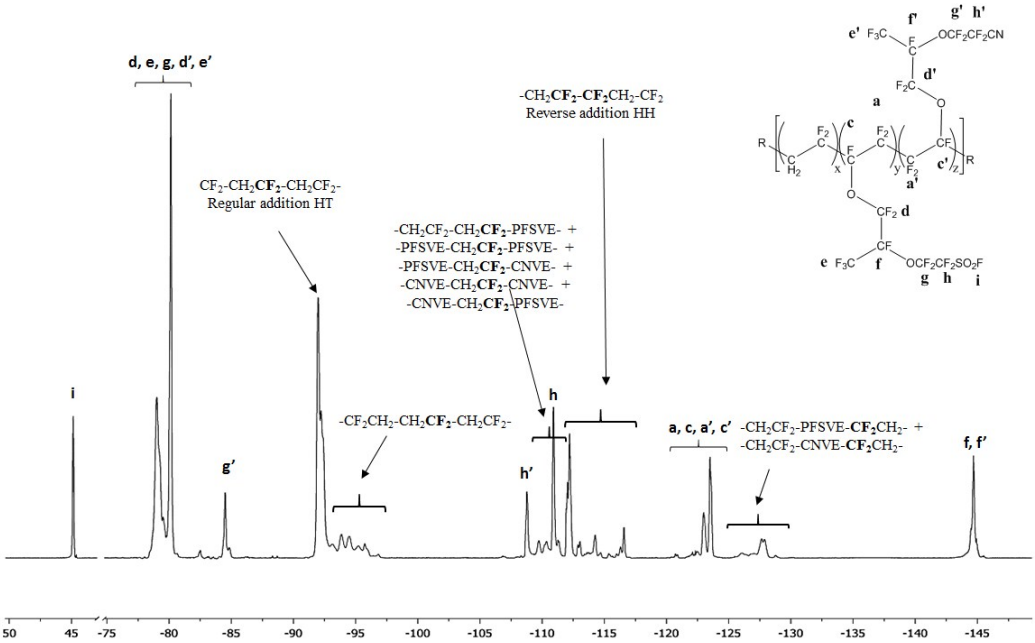

Fig. S3 ^{19}F NMR spectrum of poly(VDF-*ter*-PFSVE-*ter*-CNVE) terpolymer from a conventional radical terpolymerization of VDF with PFSVE and CNVE initiated by TBPPi at 73 °C in DMC (**P5** terpolymer, Table 1), recorded in acetone-d_6 at 20 °C.

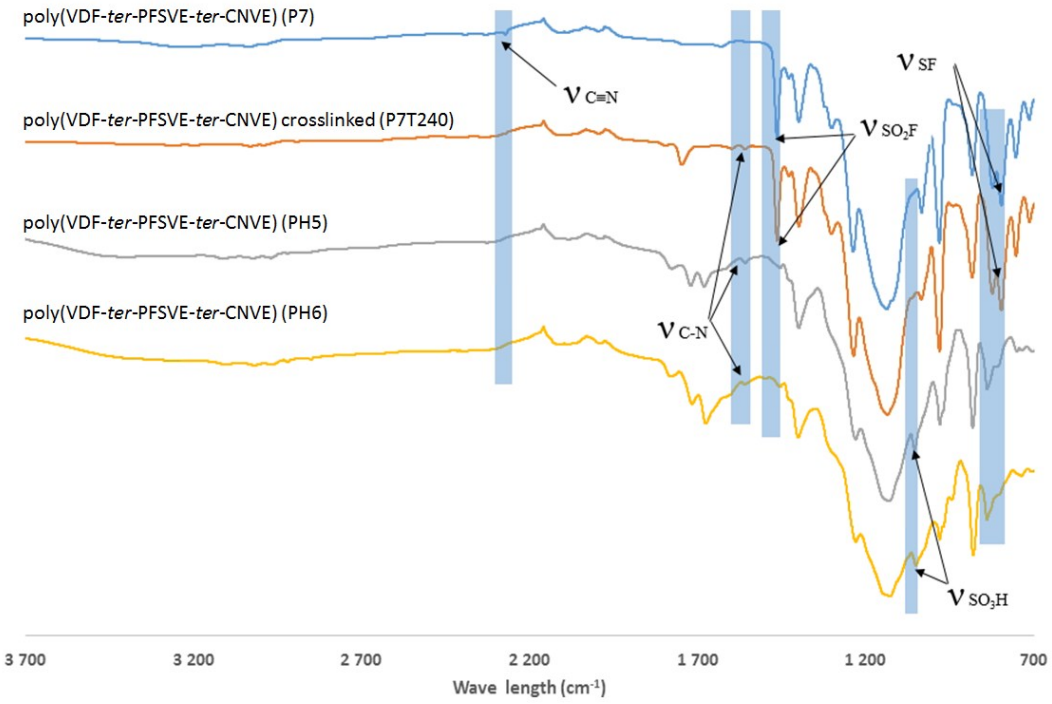

Fig. S4 ATR-IR spectra of poly(VDF-*ter*-PFSVE-*ter*-CNVE) terpolymer (P7, blue), poly(VDF-*ter*-PFSVE-*ter*-CNVE) crosslinked at 240 °C (P7T240, orange), hydrolysed 5 hours poly(VDF-*ter*-PFSVE-*ter*-CNVE) (PH5, grey) and hydrolysed 20 hours poly(VDF-*ter*-PFSVE-*ter*-CNVE) (PH6, yellow) (**P7,** Table 1**, PH5 and PH6** Table 2).

Fig. S5 Hastelloy autoclave Parr System 50 mL, equipped with a Bourdon pressure gauge, a rupture disk, inlet and outlet valves and an electronic device regulated and controlled both the stirring and the heating of the autoclave.

Fig. S6 Press having two independent heating plates ranging from 20 to 300 °C, controlled by a regulator, a hydraulic jack equipped with an oil pressure manometer from 0 to 400 bar and two steel plates.

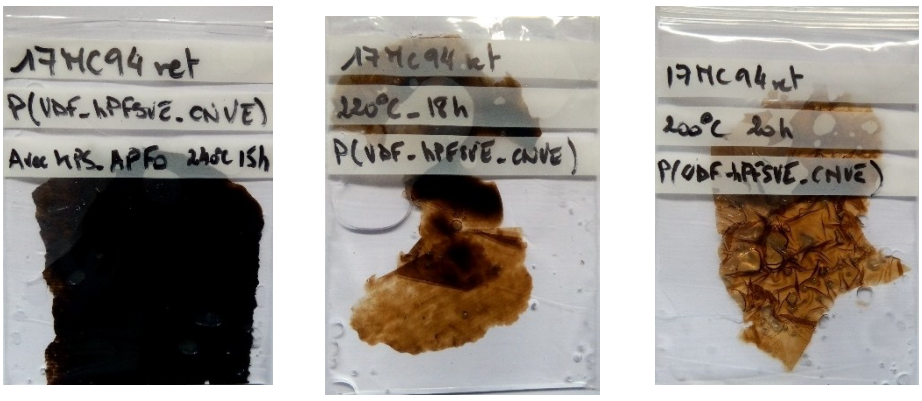

Fig. S7 Pictures of membranes after crosslinking, thermic tests: P11T240 (left), P11T220 (middle) and P11T200 (right)

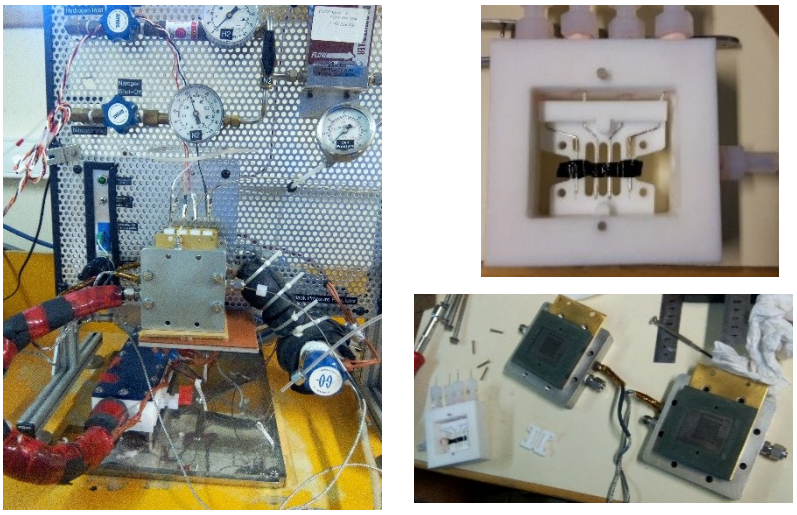

Fig. S8 Photos of BT-512 BekkTech Conductivity Test System which includes a Keithley 2400 Sourcemeter