## Synthesis of novel sulfonated poly(arylene ether)s containing tetratrifluoromethyl side chain and multi-phenyl for proton exchange membrane fuel cell application

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Figure S1: <sup>1</sup>H NMR (CDCl<sub>3</sub>) spectrum of monomer 1.



Figure S2: MALDI-MS spectra of monomer 1, m/z calcd: 677.95, found 677.42.



Figure S3: <sup>1</sup>H NMR (CDCl<sub>3</sub>) spectrum of monomer 2.



Figure S4: MALDI-MS spectra of monomer 2, m/z calcd: 675.97, found 685.7.







Figure S6: MALDI-MS spectra of monomer 3, m/z calcd: 842.17, found 841.20.



Figure S6: <sup>19</sup>F NMR spectrum of (a) FC1 (b) SFC2-1.55 (c) FC2 (d) FC2 treated with HCl (e) SFC2-2.53 sodium form (f) SFC2-2.53 acid form.