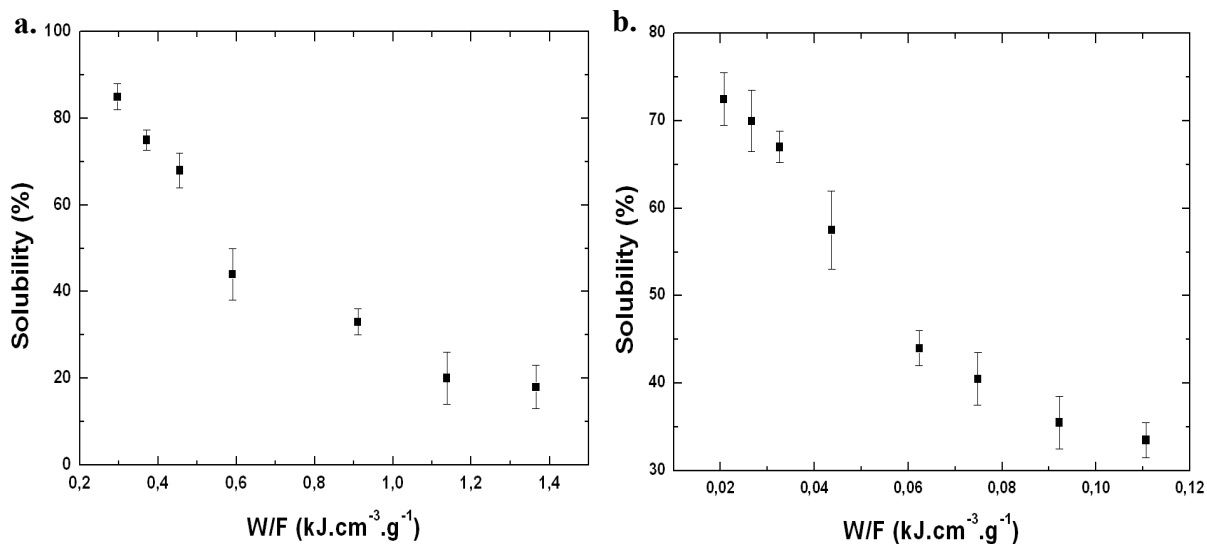


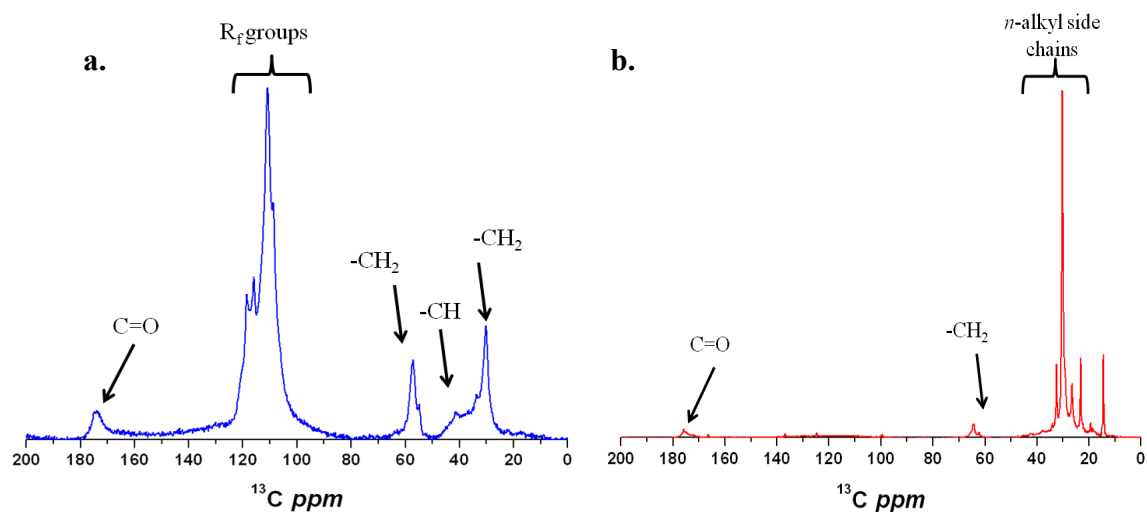
## Nano-ordered thin films achieved by soft plasma polymerization

J. Petersen, C. Becker, T. Fouquet, F. Addiego, V. Toniazzi, A. Dinia and D. Ruch

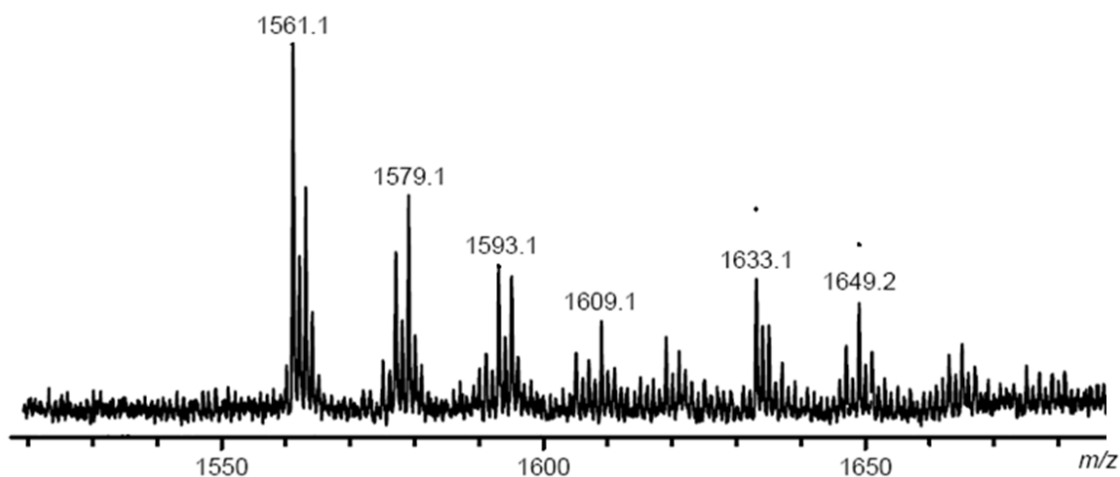
### Supporting information



**Figure S1:** Percentage of solubility part according to the energy per molecules units. The measurements have been performed with HFIP and THF solvent for *pp*-PFDA(a) and *pp*-DOCA (b), respectively.



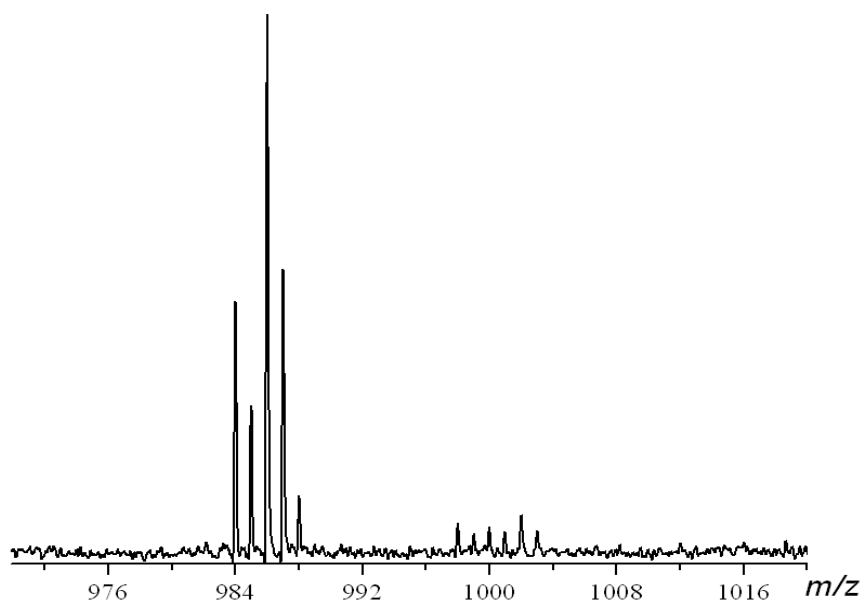
**Figure S2:** <sup>13</sup>C solid state NMR obtained on *pp*-PFDA (a) and *pp*-DOCA(b). Results evidence an extinction of peaks from the ethylenic groups



**Figure S3:** High magnification on trimer of pp-PFDA

**Table S1** – Accurate mass measurements of  $[\text{ppPFDA} + \text{Li}]^+$  3-mer pattern (from Fig. S3)

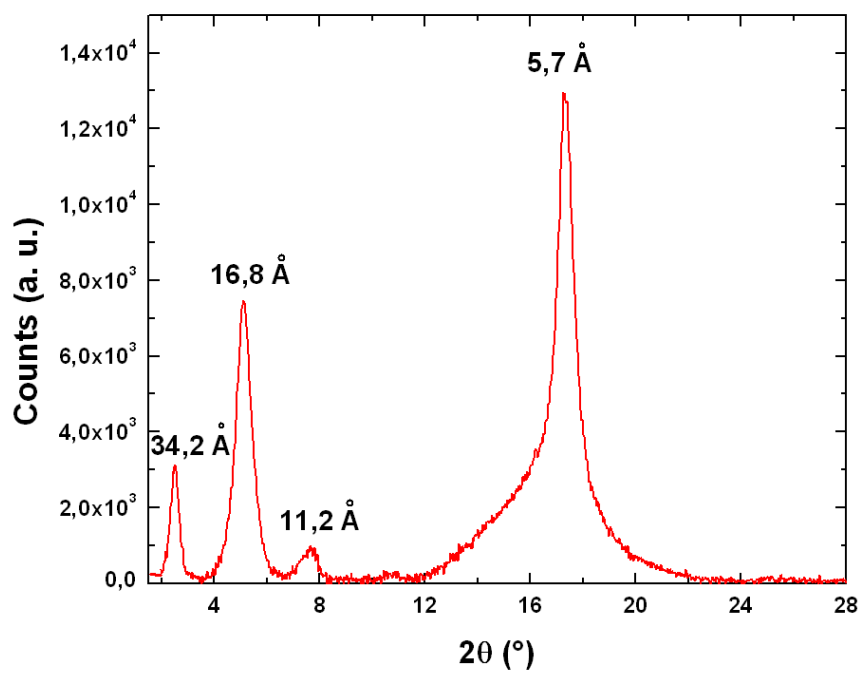
Assignment	Elemental composition	$(m/z)_{\text{theo}}$	$(m/z)_{\text{exp}}$	Error (ppm)
PFDA <sub>3</sub> + Li <sup>+</sup>	C <sub>39</sub> H <sub>21</sub> F <sub>51</sub> LiO <sub>6</sub> <sup>+</sup>	1561.0679	1561.0650	- 1.9
PFDA <sub>3</sub> (H <sub>2</sub> )+Li <sup>+</sup>	C <sub>39</sub> H <sub>23</sub> F <sub>51</sub> LiO <sub>6</sub> <sup>+</sup>	1563.0836	1563.0820	- 1.0
PFDA <sub>3</sub> (O)+Li <sup>+</sup>	C <sub>39</sub> H <sub>21</sub> F <sub>51</sub> LiO <sub>7</sub> <sup>+</sup>	1577.0628	1577.0605	- 1.5
PFDA <sub>3</sub> (OH <sub>2</sub> )+Li <sup>+</sup>	C <sub>39</sub> H <sub>23</sub> F <sub>51</sub> LiO <sub>7</sub> <sup>+</sup>	1579.0785	1579.0740	- 2.8
PFDA <sub>3</sub> (O <sub>2</sub> )+Li <sup>+</sup>	C <sub>39</sub> H <sub>21</sub> F <sub>51</sub> LiO <sub>8</sub> <sup>+</sup>	1593.0577	1593.0558	- 1.2
PFDA <sub>3</sub> (O <sub>2</sub> H <sub>2</sub> )+Li <sup>+</sup>	C <sub>39</sub> H <sub>23</sub> F <sub>51</sub> LiO <sub>8</sub> <sup>+</sup>	1595.0734	1595.0710	- 1.5
PFDA <sub>3</sub> (O <sub>3</sub> H <sub>2</sub> )+Li <sup>+</sup>	C <sub>39</sub> H <sub>23</sub> F <sub>51</sub> LiO <sub>9</sub> <sup>+</sup>	1613.0683	1611.0670	- 0.8
PFDA <sub>3</sub> (C <sub>3</sub> H <sub>4</sub> O <sub>3</sub> )+Li <sup>+</sup>	C <sub>42</sub> H <sub>25</sub> F <sub>51</sub> LiO <sub>9</sub> <sup>+</sup>	1649.0840	1649.0800	- 2.4



**Figure S4:** High magnification on tetramer of *pp*-DOCA

**Table S2 :** Accurate mass measurements of [*pp*-DOCA+Na]<sup>+</sup> 4-mer pattern (from Fig. S4)

Assignment	Elemental composition	( <i>m/z</i> ) <sub>theo</sub>	( <i>m/z</i> ) <sub>exp</sub>	Error (ppm)
DOCA <sub>4</sub> + Na <sup>+</sup>	C <sub>60</sub> H <sub>112</sub> NaO <sub>8</sub> <sup>+</sup>	983,8254	983,8225	-2.9
DOCA <sub>4</sub> (H <sub>2</sub> ) + Na <sup>+</sup>	C <sub>60</sub> H <sub>112</sub> NaO <sub>8</sub> <sup>+</sup>	985,8405	985,8397	-0.8
DOCA <sub>4</sub> (CH <sub>2</sub> ) + Na <sup>+</sup>	C <sub>60</sub> H <sub>112</sub> NaO <sub>8</sub> <sup>+</sup>	997,8405	997,8387	-1.8
DOCA <sub>4</sub> (CH <sub>2</sub> H <sub>2</sub> ) + Na <sup>+</sup>	C <sub>60</sub> H <sub>112</sub> NaO <sub>8</sub> <sup>+</sup>	999,8562	999,855	-1.2
DOCA <sub>4</sub> (OHH) + Na <sup>+</sup>	C <sub>60</sub> H <sub>112</sub> NaO <sub>8</sub> <sup>+</sup>	101,8355	1001,832	-3.1



**Figure S5:** X-Ray diffraction measurement performed in transmission mode on *pp*-PFDA at room temperature