## Sequential Post-Modification Reactions of

## Poly(pentafluorophenyl 4-vinylbenzenesulfonate)†

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## SUPPORTING INFORMATION

Structural Proof for the obtained polymers.

1) run 2



*Figure S-1.* <sup>19</sup>F NMR spectrum of the obtained polymer after the sulfonamidation reaction (run 2) in CDCl<sub>3</sub> in the presence of trifluoromethylbenzene as an internal reference.



Figure S-2. <sup>1</sup>H NMR spectrum of the obtained polymer after the Mitsunobu reaction (run 5) in CDCl<sub>3</sub>.



Figure S-3. <sup>1</sup>H NMR spectrum of the obtained polymer after the Mitsunobu reaction (run 6) in CDCl<sub>3</sub>.

4) run 7



*Figure S-4.* <sup>1</sup>H NMR spectrum of the obtained polymer after the Mitsunobu reaction (run 7) in CDCl<sub>3</sub>.



Figure S-5. <sup>1</sup>H NMR spectrum of the obtained polymer after the Mitsunobu reaction (run 8) in CDCl<sub>3</sub>.



Figure S-6. <sup>1</sup>H NMR spectrum of the obtained polymer after the Mitsunobu reaction (run 9) in CDCl<sub>3</sub>.



*Figure S-7.* <sup>19</sup>F NMR spectrum of the obtained polymer after the sulfonamidation reaction (run 10) in DMSO- $d_6$  in the presence of trifluoromethylbenzene as an internal reference.



*Figure S-8.* <sup>1</sup>H NMR spectrum of the obtained polymer after the sulfonamidation reaction (run 10) in DMSO- $d_6$ .



*Figure S-9.* <sup>1</sup>H NMR spectrum of the obtained polymer after the Mitsunobu reaction (run 10) in CDCl<sub>3</sub>.



*Figure S-10.* <sup>19</sup>F NMR spectrum of the obtained polymer after the sulfonamidation reaction (run 11) in DMSO- $d_6$  in the presence of trifluoromethylbenzene as an internal reference.



*Figure S-11.* <sup>1</sup>H NMR spectrum of the obtained polymer after the sulfonamidation reaction (run 11) in DMSO- $d_6$ .



Figure S-12. <sup>1</sup>H NMR spectrum of the obtained polymer after the Mitsunobu reaction (run 11) in CDCl<sub>3</sub>.



*Figure S-13.* <sup>19</sup>F NMR spectrum of the obtained polymer after the sulfonamidation reaction (run 12) in DMSO- $d_6$  in the presence of trifluoromethylbenzene as an internal reference.



*Figure S-14.* <sup>1</sup>H NMR spectrum of the obtained polymer after the sulfonamidation reaction (run 12) in DMSO- $d_6$ .



*Figure S-15.* <sup>1</sup>H NMR spectrum of the obtained polymer after the Mitsunobu reaction (run 12) in CDCl<sub>3</sub>. 10) run 13



*Figure S-16.* <sup>19</sup>F NMR spectrum of the obtained polymer after the sulfonamidation reaction (run 13) in DMSO- $d_6$  in the presence of trifluoromethylbenzene as an internal reference.



*Figure S-17.* <sup>1</sup>H NMR spectrum of the obtained polymer after the sulfonamidation reaction (run 13) in DMSO- $d_6$ .



Figure S-18. <sup>1</sup>H NMR spectrum of the obtained polymer after the Mitsunobu reaction (run 13) in CDCl<sub>3</sub>.

Deconvolution for the <sup>1</sup>H NMR spectra of the polymers before and after the Mitsunobu post-

modification reactions.



*Figure S-19.* <sup>1</sup>H NMR spectra in CDCl<sub>3</sub> and their deconvoluted spectra of the obtained polymers by the Mitsunobu post-polymerization modification between **poly**(4VSA-hexyl) and 4-methylbenzyl alcohol with different sulfonamide conversions (upper shows the spectrum of the polymer obtained in run 1 and the lower one shows the spectrum of the polymer obtained in run 2). The peak ratios gave a reasonable agreement with the conversions given in Table 2.

## Structural Proof for the model compounds.



Figure S-20. ESI-TOF MS spectrum of the St-MSA.



Figure S-21. <sup>1</sup>H-<sup>1</sup>H COSY NMR spectrum of St-MSA in CDCl<sub>3</sub>.

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Original data for the Figure 2.



*Figure S-22*. IR spectra of **poly**(**4VSA-hexyl**) (solid line) and the obtained polymer by the Mitsunobu post-polymerization modification between **poly**(**4VSA-hexyl**) and 4-methylbenzyl alcohol (dashed line) in the range from 1000 to 3500 cm<sup>-1</sup>.