

## Supplementary Materials

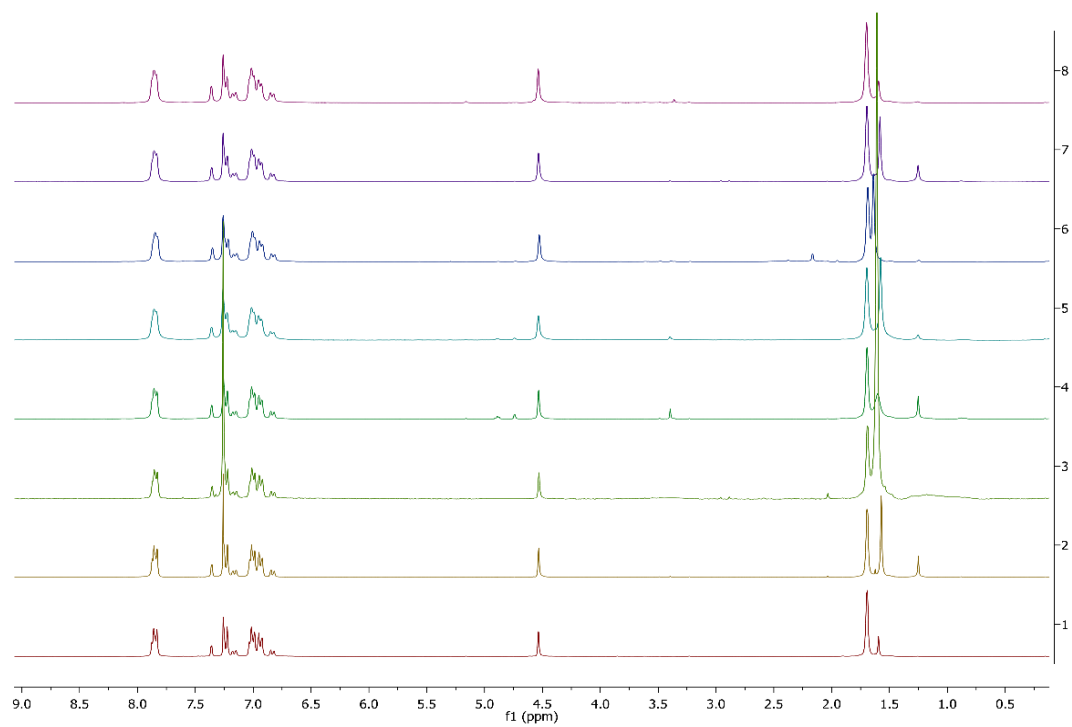


Figure S1 – Superimposed  $^1\text{H}$ -NMR of the kinetic study of chloromethylation of PSU from 65% to 100 %.

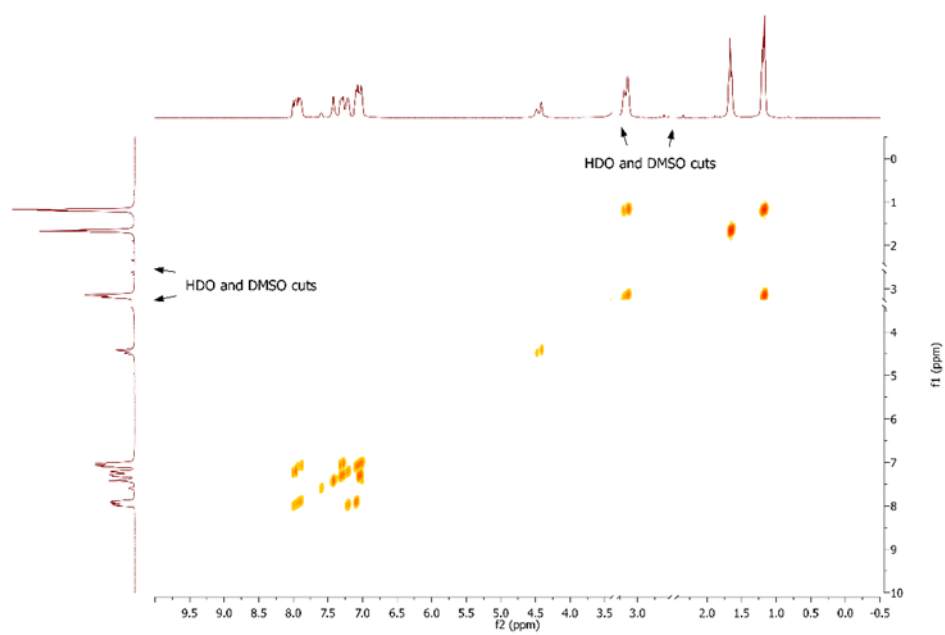


Figure SI2 COSY-PSU100QE

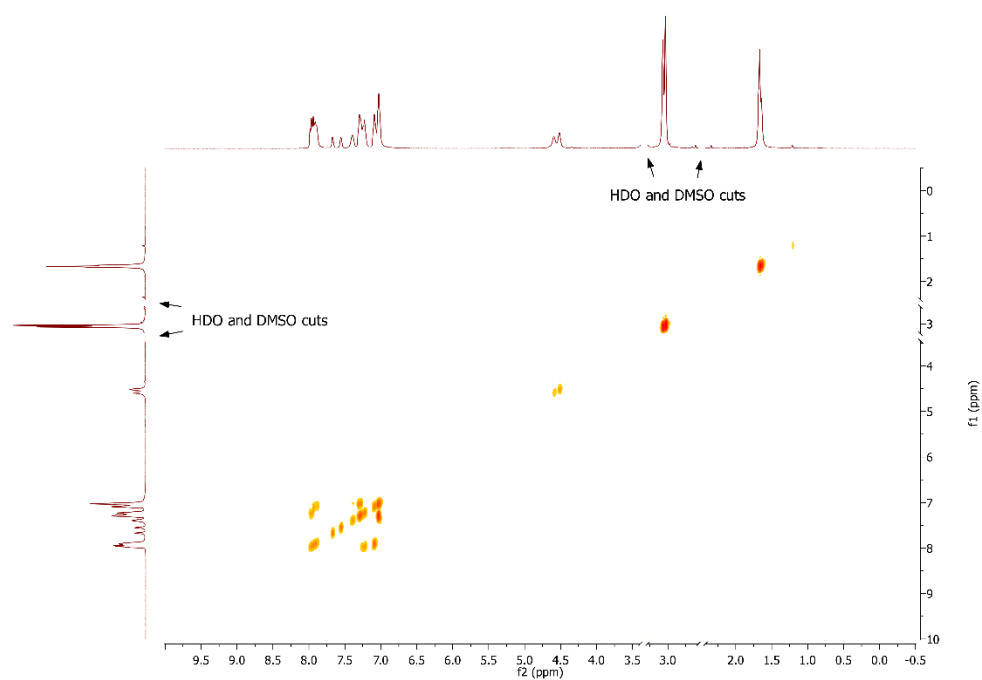


Figure SI3 2D-COSY-NMR PSU100QM

Table S1 – Water uptake, temperature of defunctionalization and decomposition of chloromethylated and quaternarized samples.

SAMPLE	Water loss, %	T <sub>fg</sub> , °C	T <sub>d</sub> , °C
PSU60Cl		329	393
PSU60QM-2	4.8	190	350
PSU60QE-1	4.0	157	350
PSU100Cl		153	348
PSU100QM-1	8.5	151	340
PSU100QE-3	8.2	149	336
PSU150Cl		147	314
PSU150QM-1	9.2	145	308
PSU150QE-2	11.0	138	291