Supplementary Materials

to

Melt-Spinning of an Intrinsically Flame-Retardant Polyacrylonitrile Copolymer

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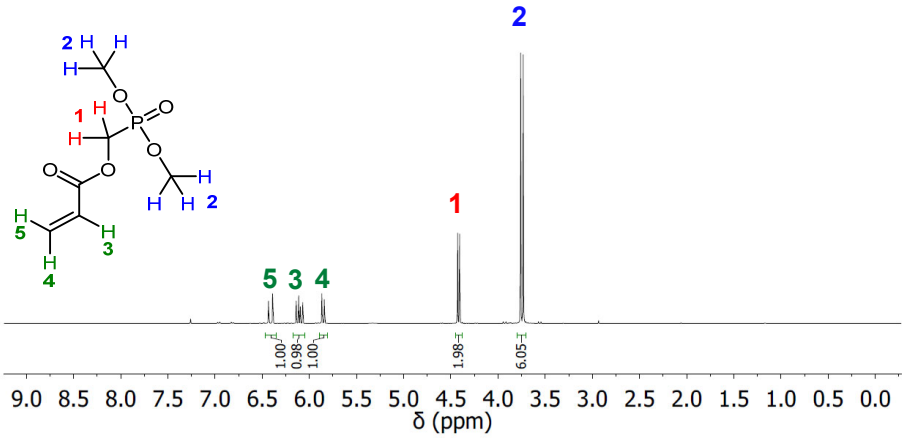


Figure S1. [1]H NMR spectrum of DPA after vacuum distillation.

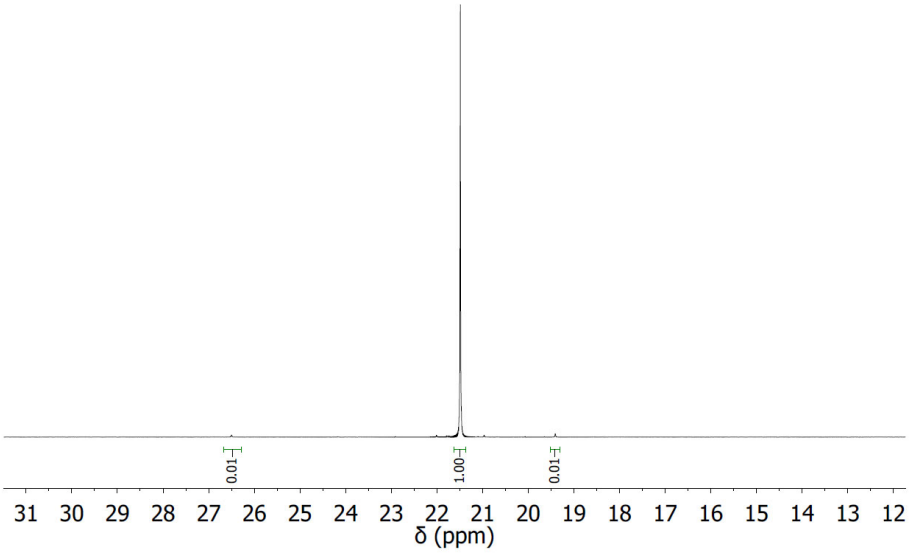


Figure S2. [31]P NMR spectrum of DPA after vacuum distillation.

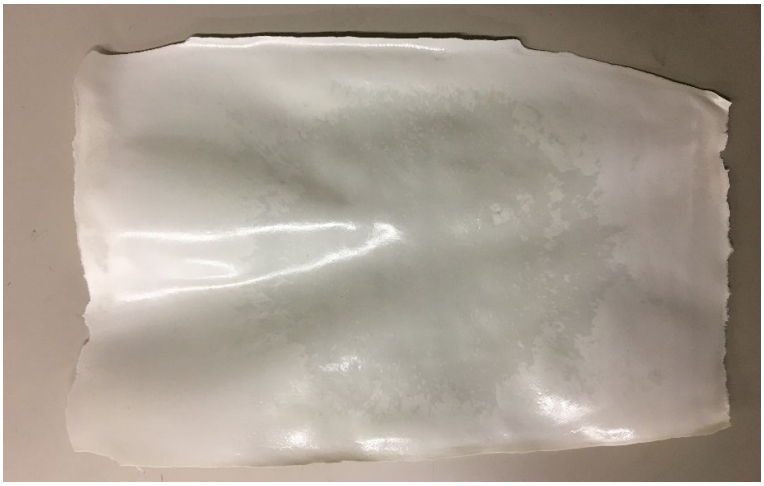


Figure S3. Example of a PAN film made of PAN F3.

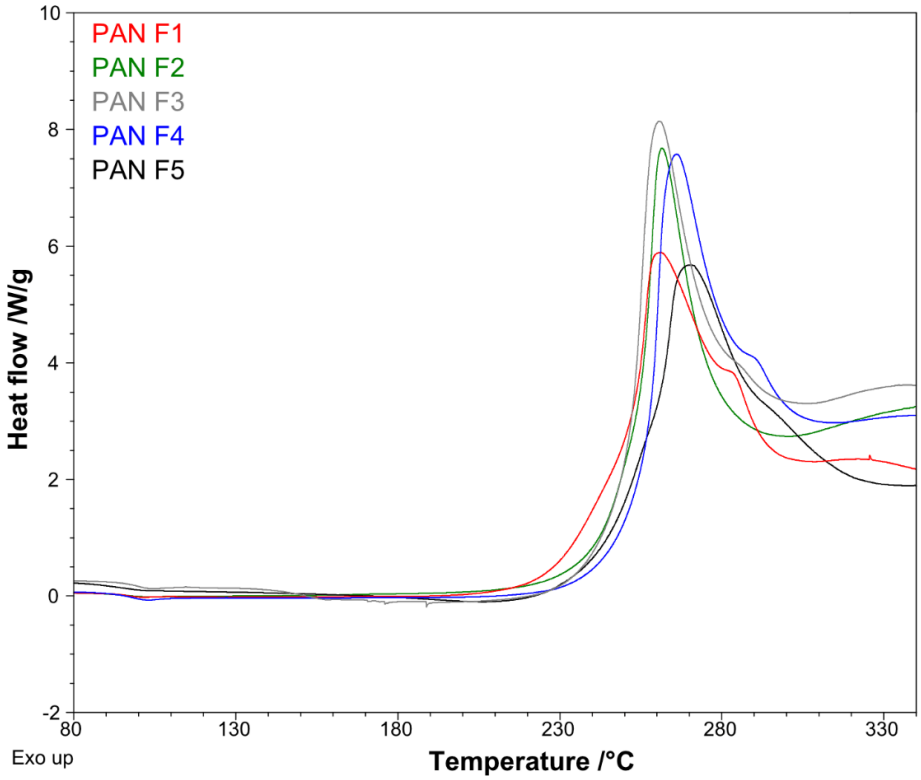


Figure S4. DSC measurements in air of PAN samples F1–F5 applying a heating rate of 10 °C/min.

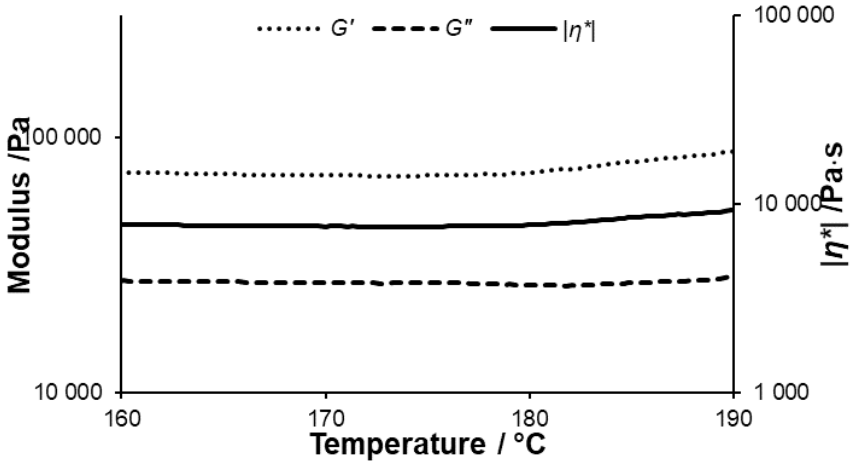


Figure 5. Temperature sweep from 150 to 190 °C of PAN sample F1 (8.1 mol-% DPA, $\bar{M}_n$ = 43, 000 g/mol, $Đ$ = 5.5), mixed with 22.5 wt.-% PC. γ = 0.5 %, ω = 10 rad/s, heating rate = 1 K/min.

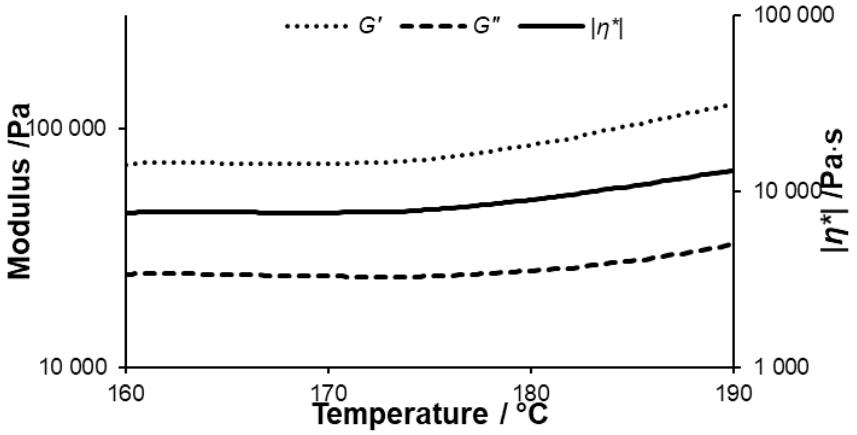


Figure S6. Temperature sweep from 150 to 190 °C of PAN sample F2 (8.1 mol-% DPA, $\bar{M}_n$ = 35, 000 g/mol, Đ = 5.3), mixed with 22.5 wt.-% PC. γ = 0.5 %, ω = 10 rad/s, heating rate = 1 K/min.

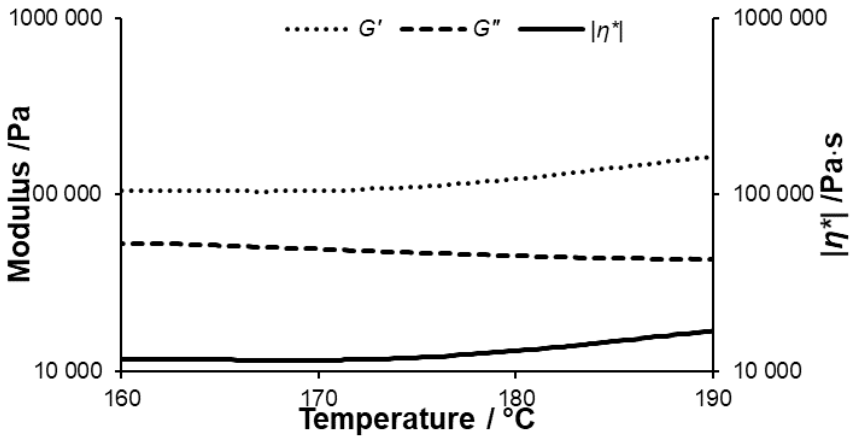


Figure S7. Temperature sweep from 150 to 190 °C of PAN sample F4 (6.1 mol-% DPA, 3.7 mol-% MA, $\bar{M}_n$ = 57, 000 g/mol, Đ = 5.5), mixed with 22.5 wt.-% PC. γ = 0.5 %, ω = 10 rad/s, heating rate = 1 K/min.

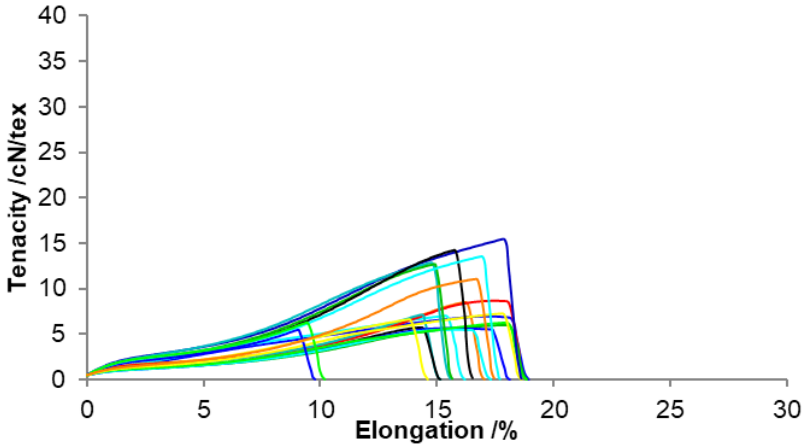


Figure S8. Stress-strain diagram (tensile test) of PAN F5 fibers (8.2 mol-% DPA, 3.8 mol-% MA, $\bar{M}_n$ = 43, 000 g/mol, Đ = 5.1) containing 22.5 wt.% PC wound at a winding speed of 30 m/min.

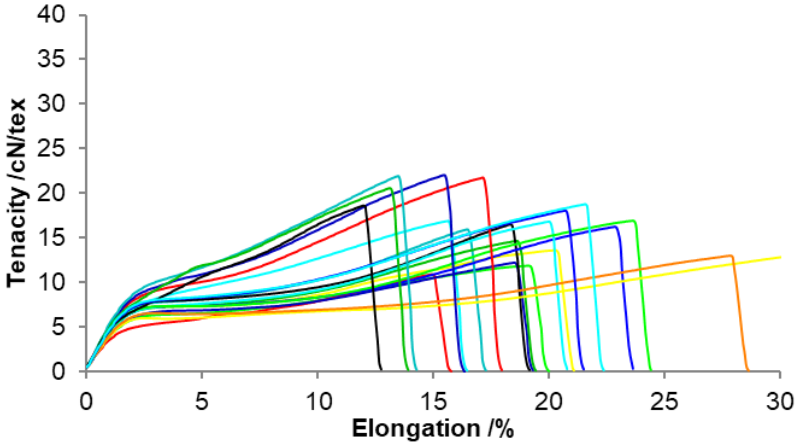


Figure S9. Stress-strain diagram (tensile test) of PAN F5 fibers spun (8.2 mol-% DPA, 3.8 mol-% MA, $\bar{M}_n$ = 43, 000 g/mol, Đ = 5.1), spun with 22.5 wt.% PC at a winding speed of 30 m/min. PC was washed out in demineralized water at 90 °C over 5 min.



Figure S10. Photograph of PAN F5 (8.2 mol-% DPA, 3.8 mol-% MA, $\bar{M}_n$ = 43, 000 g/mol, Đ = 5.1) fibers containing 22.5 wt.% PC. Fibers were wound at a winding speed of 30 m/min.