

Supporting Information

Synthesis and characterisation of bio-derived furan-based polyamides copolymers from dimethyl furan-2,5-dicarboxylate

Zoe Paganelli,^a Lauri Välinen,^a Onsi Hanafi,^a Sami-Pekka Hirvonen,^b Hossein Baniyadi^a
Jukka Niskanen^a

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^a Polymer Synthesis Technology, School of Chemical Engineering, Aalto University, Kemistintie 1, 02150 Espoo, Finland. E-mail: jukka.niskanen@aalto.fi

^b Department of Chemistry, Faculty of Science, University of Helsinki, 00014 Helsinki, Finland

1 Images of Polyamides and Copolyamides

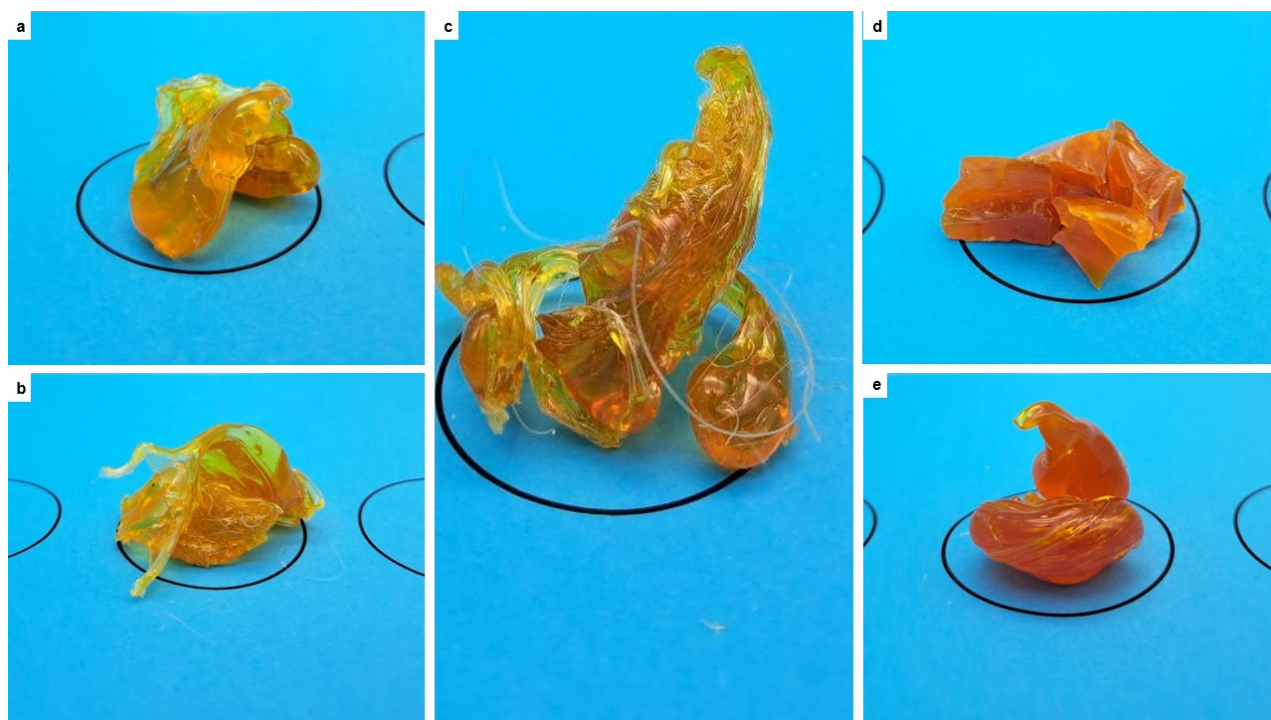


Figure S1: Figures of polyamides and copolyamides: a) PAF10, b) PAF10,6_75-25, c) PAF10,6_95-5, d) PAF6, e) PAF10,6_50-50.

2 Nuclear Magnetic Resonance

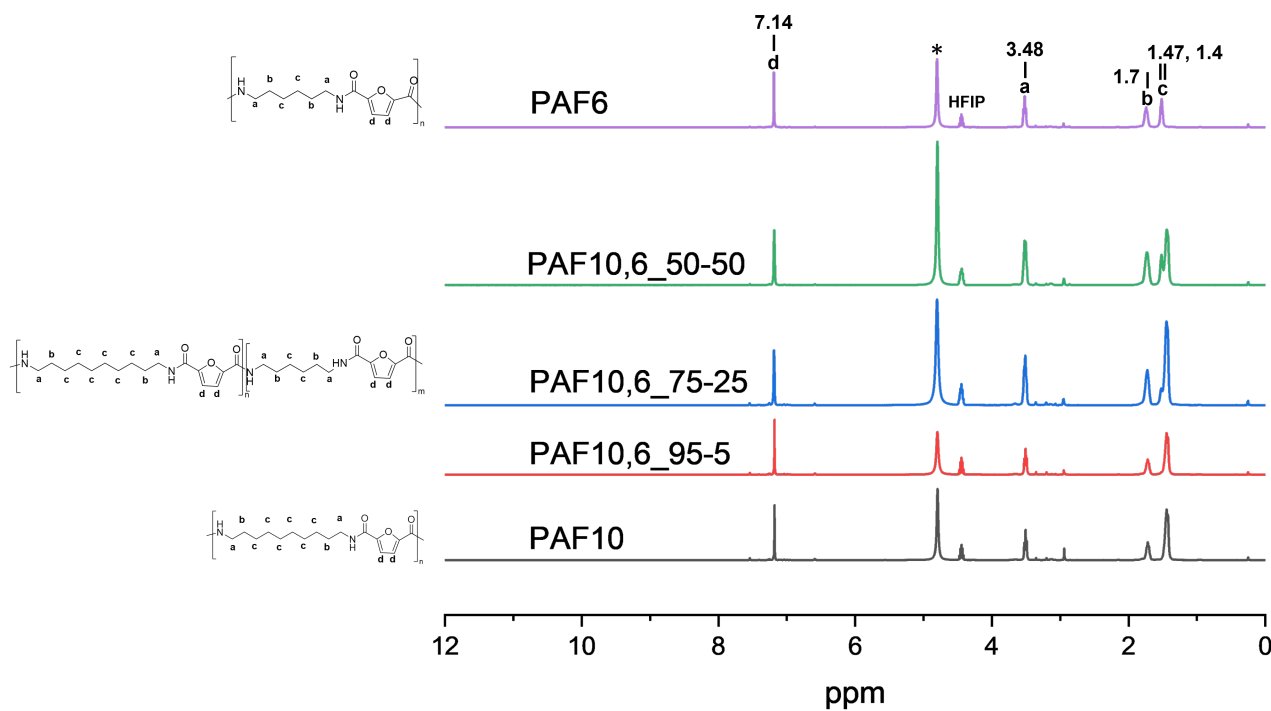


Figure S2: Full ^1H -NMR spectrum of the polyamides and copolyamides in HFIP-d_2 .

* is used to mark the water peak.

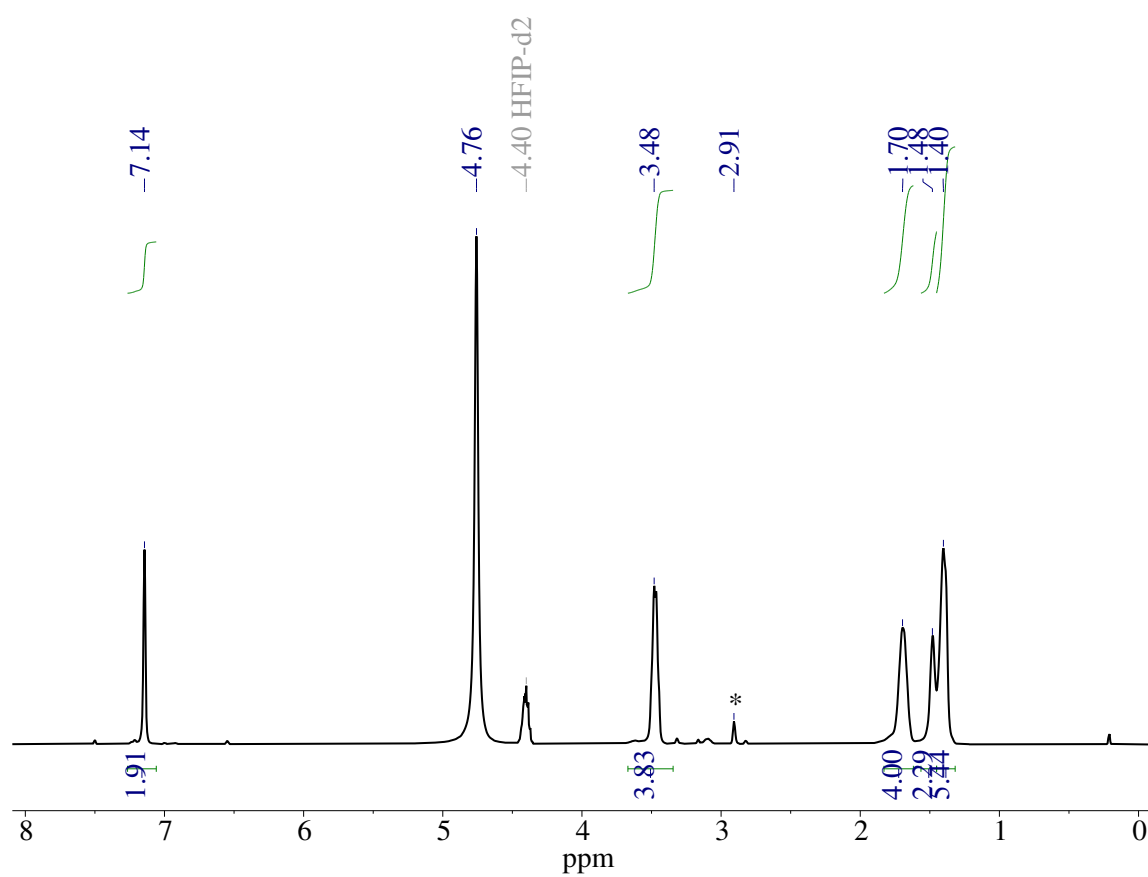


Figure S3: ^1H -NMR spectrum of PAF10,6_50-50 in HFIP-d_2 .

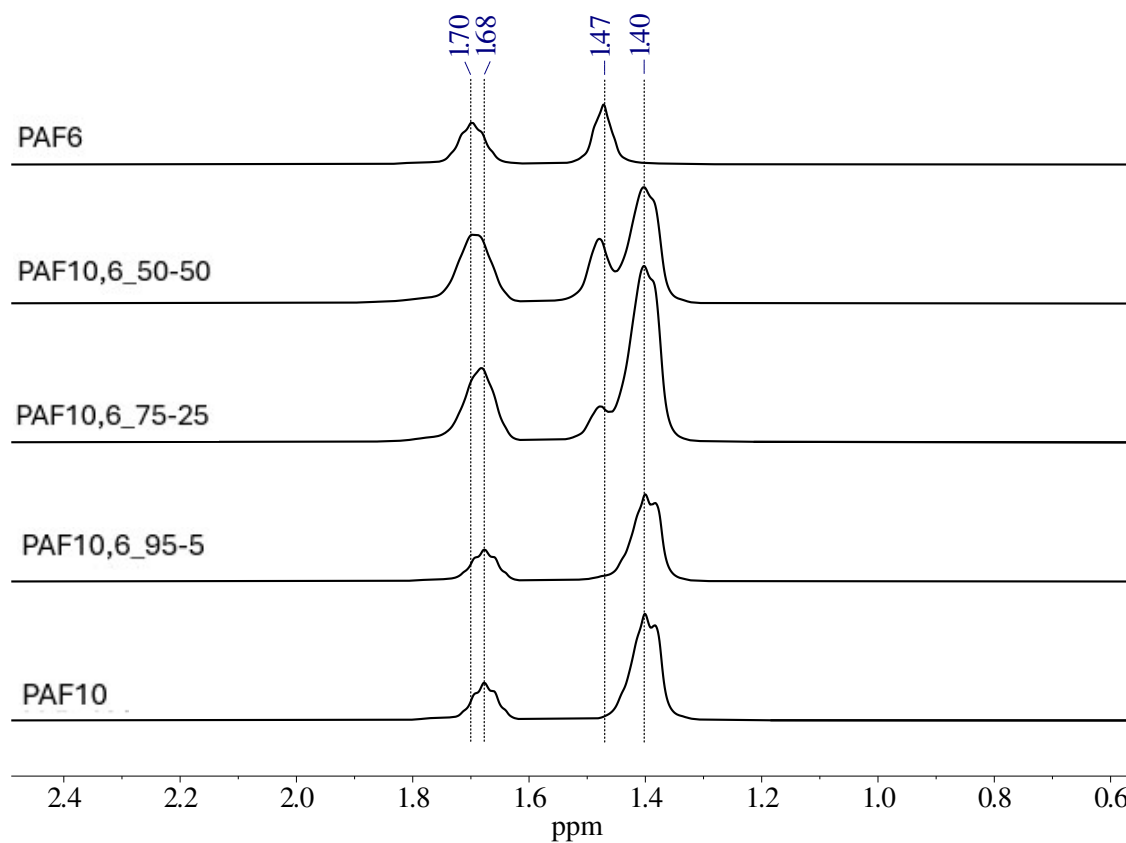


Figure S4: The alkane region of ^1H -NMR spectra of the polyamides, showing the upfield shift of the signals with increasing amount of decanediamine.

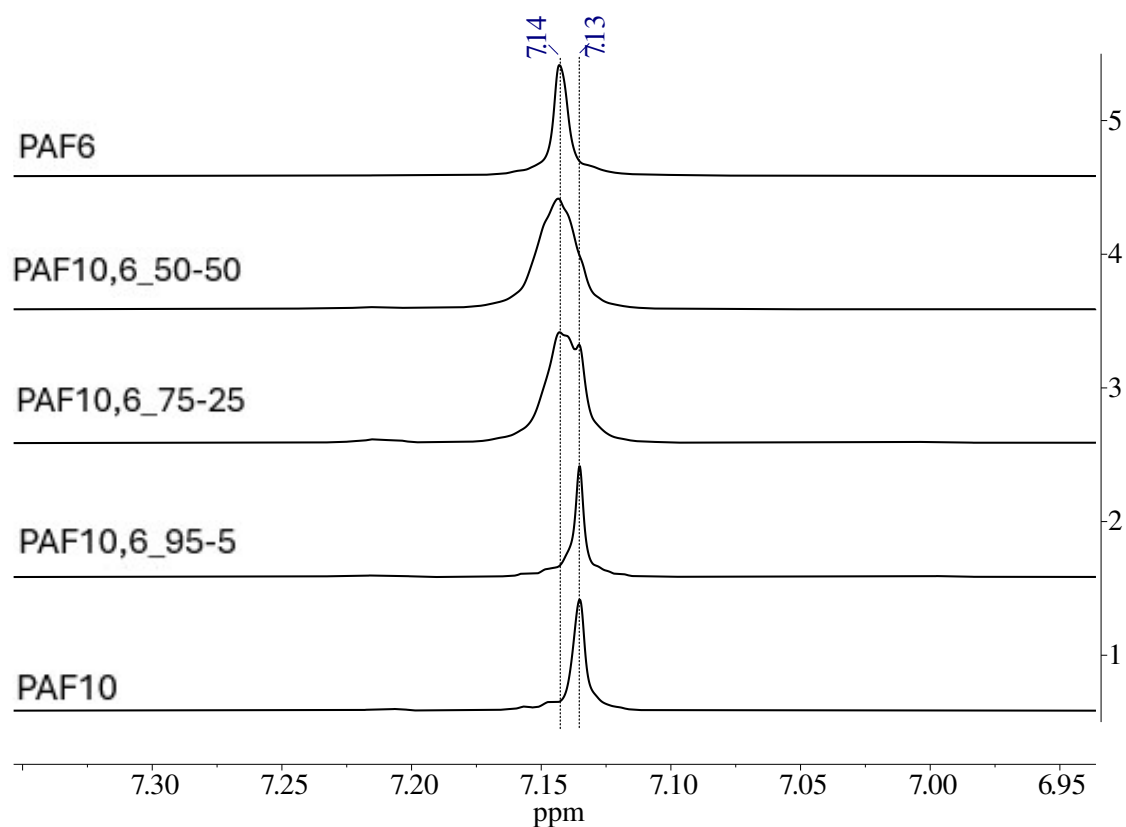


Figure S5: The aromatic region of ^1H -NMR spectra of the polyamides, showing the upfield shift of the signals with increasing amount of decanediamine.

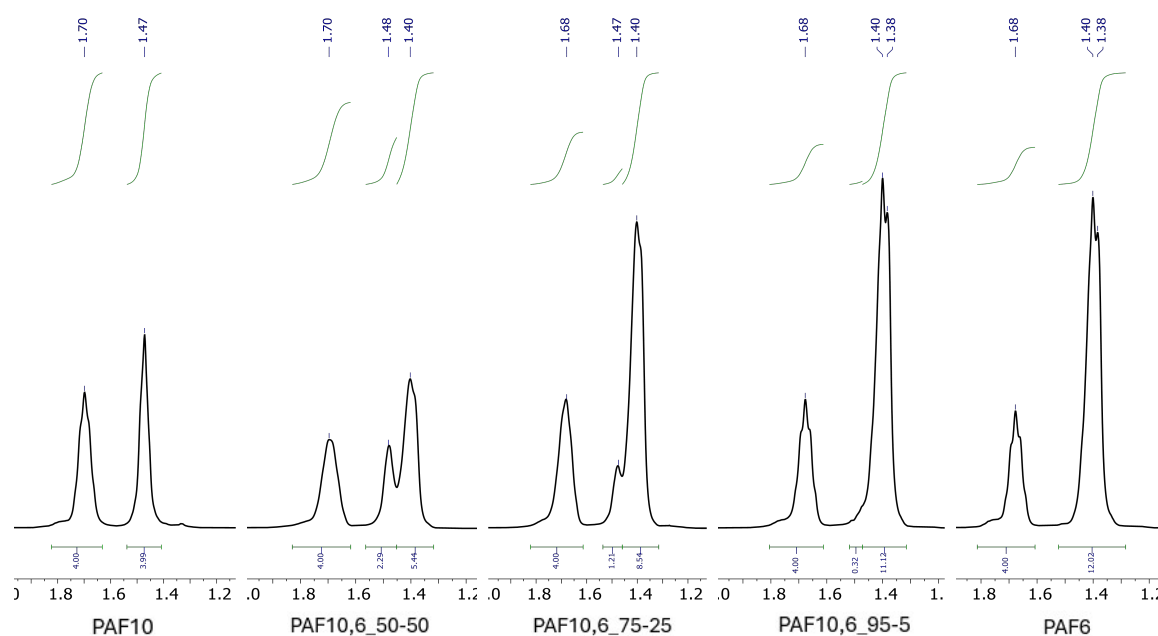


Figure S6: The alkane region of ^1H -NMR spectra of the polyamides showing the integrals of the methylene signals used to confirm the decanediamine content of the polyamides and copolyamides.

3 Differential Scanning Calorimetry

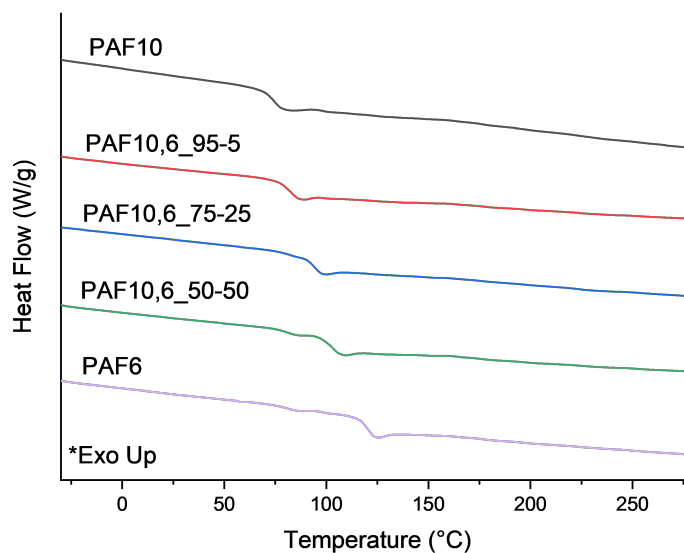


Figure S7: DSC traces from the second heating of the polyamides. Only the glass transition temperature, T_g , can be observed, while no peaks or transitions showing melting or crystallisation can be observed.

4 Thermogravimetric Analysis

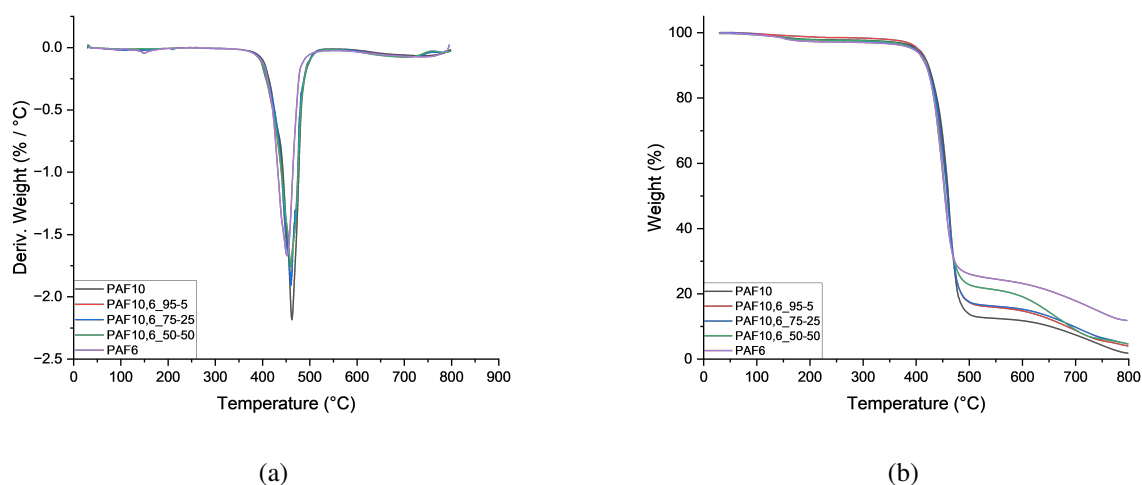


Figure S8: Thermograms from TGA of the polyamides and copolyamides: (a) Derivative thermogravimetry (DTG), and (b) degradation analysis over temperature.

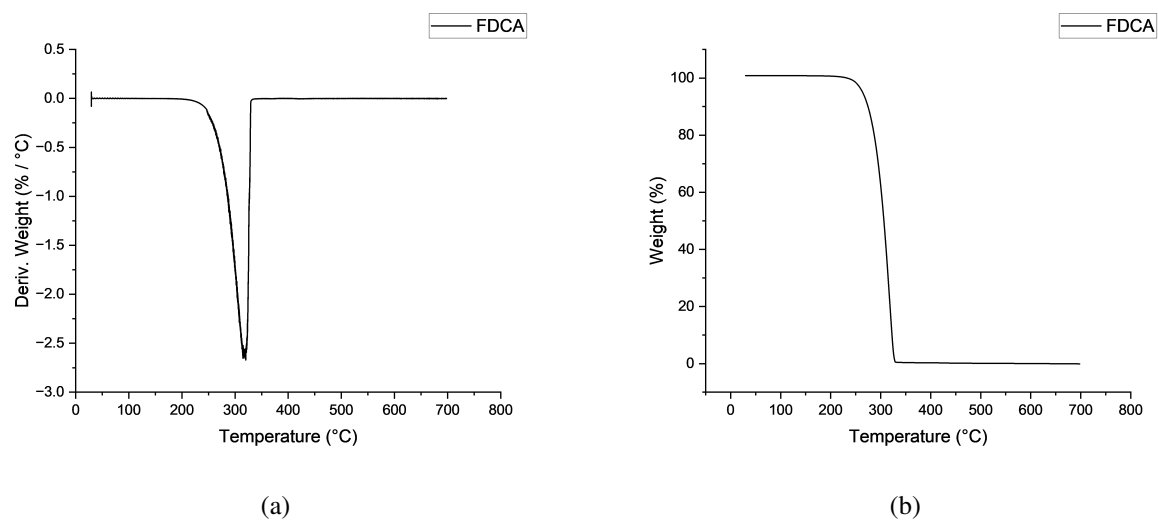


Figure S9: Thermograms from TGA of FDCA: (a) Derivative thermogravimetry (DTG), and (b) degradation analysis over temperature.

Table S1: Thermal properties and residue at 800 °C of the synthesised polyamides and copolyamides.

Sample	$T_{10\%}$ (°C)	Residue at 800 °C (%)
FDCA	261.4	0
PAF10	423.0	1.9
PAF10,6_95-5	419.1	4.0
PAF10,6_75-25	419.6	4.7
PAF10,6_50-50	418.3	4.7
PAF6	420.1	11.9

5 Dynamic Mechanical Analysis

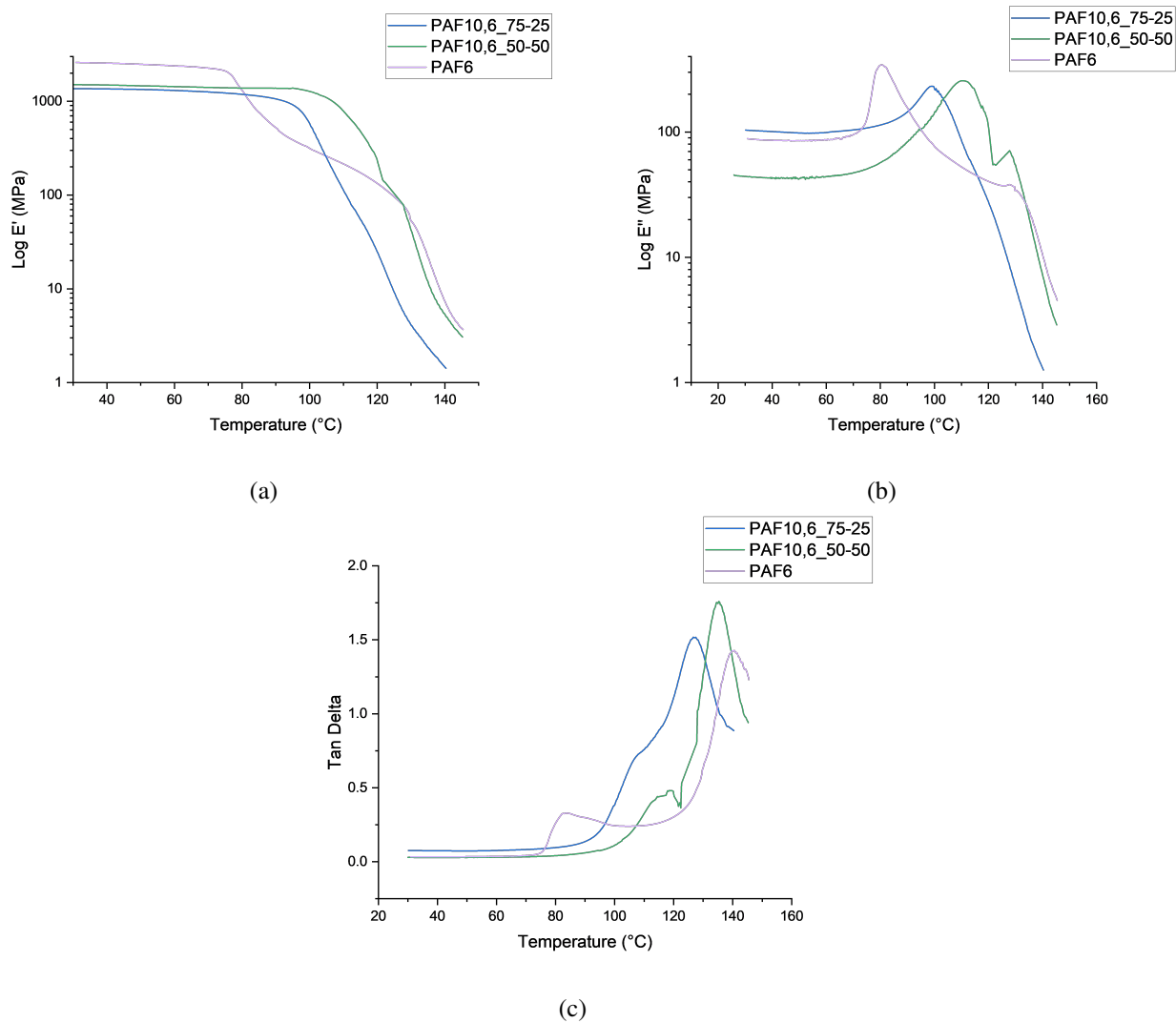


Figure S10: Viscoelastic properties graphs from DMA analysis: (a) storage modulus (E') vs temperature (b) loss modulus (E'') vs. temperature, (c) tan delta vs temperature.