Electronic Supplementary Information (ESI)

Amphiphilic chiral block-poly(thiophene)s: Tuning the blocks.

Michiel Verswyvel, Karel Goossens and Guy Koeckelberghs.

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A. ^{1}H and ^{13}C NMR spectra

Figure S1: *1H NMR spectrum of* ***2****.*

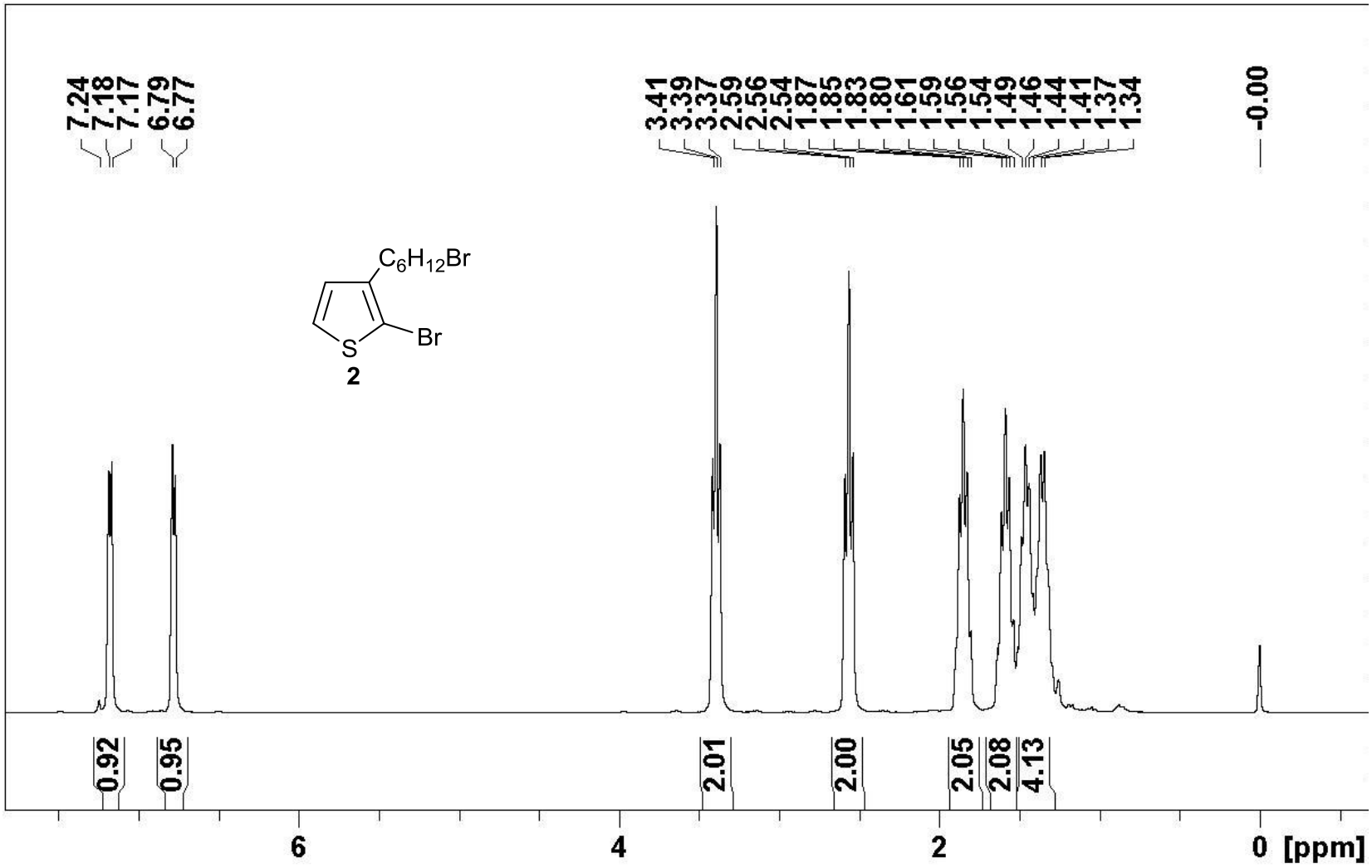


Figure S2: *^{13}C NMR spectrum of **2**.*

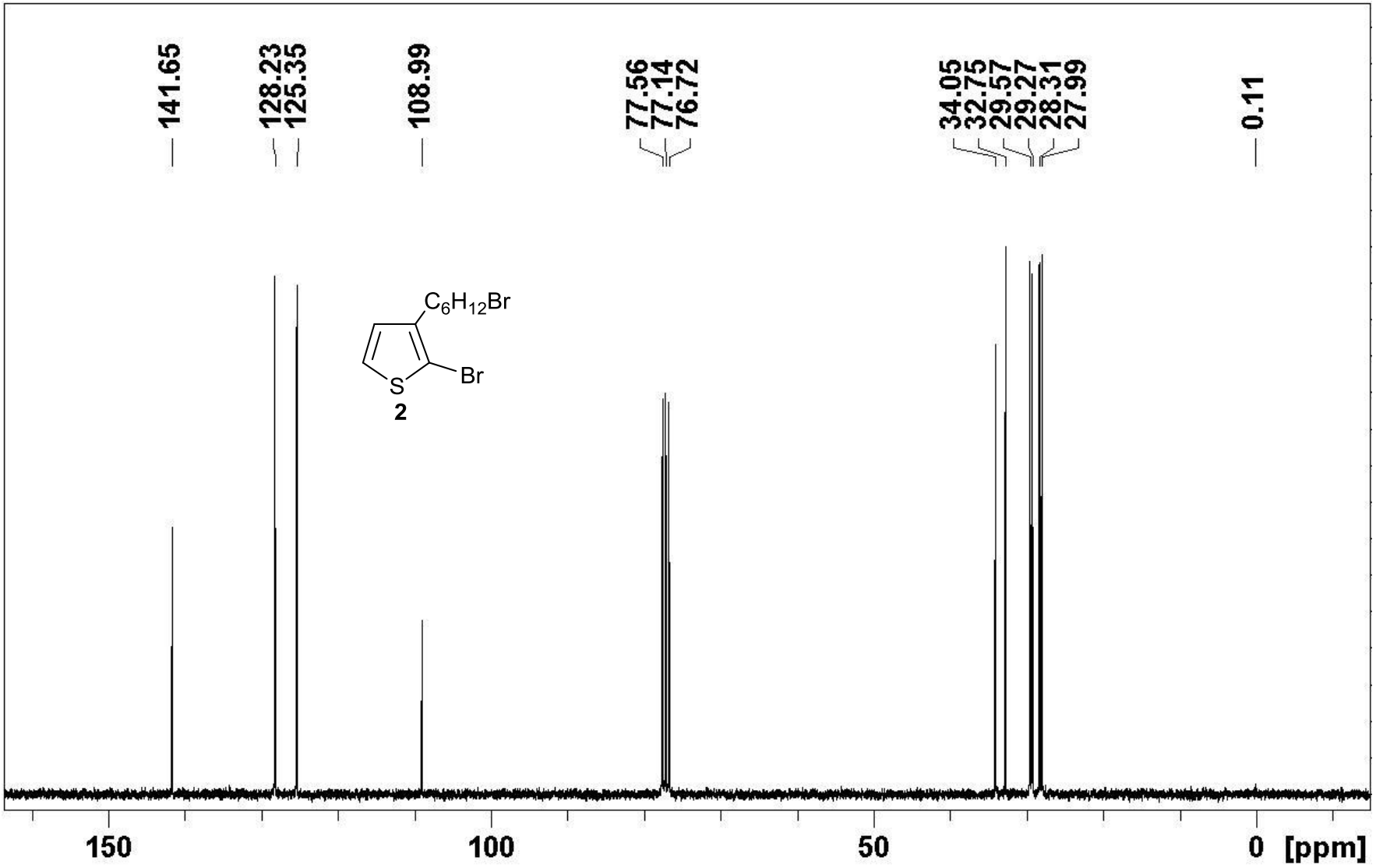


Figure S3: *^{1}H NMR spectrum of* ***3****.*

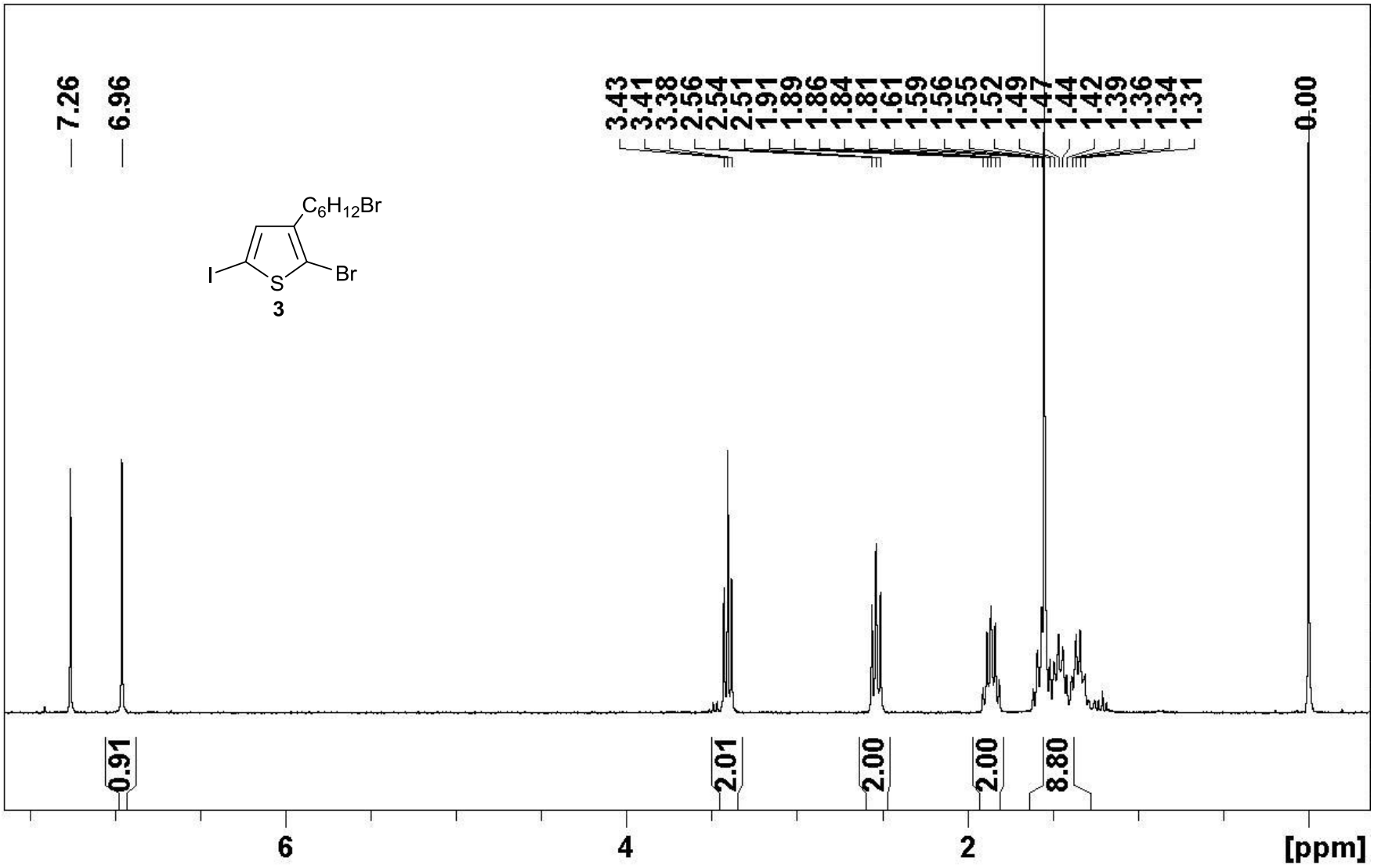


Figure S4: *^{13}C NMR spectrum of **3**.*

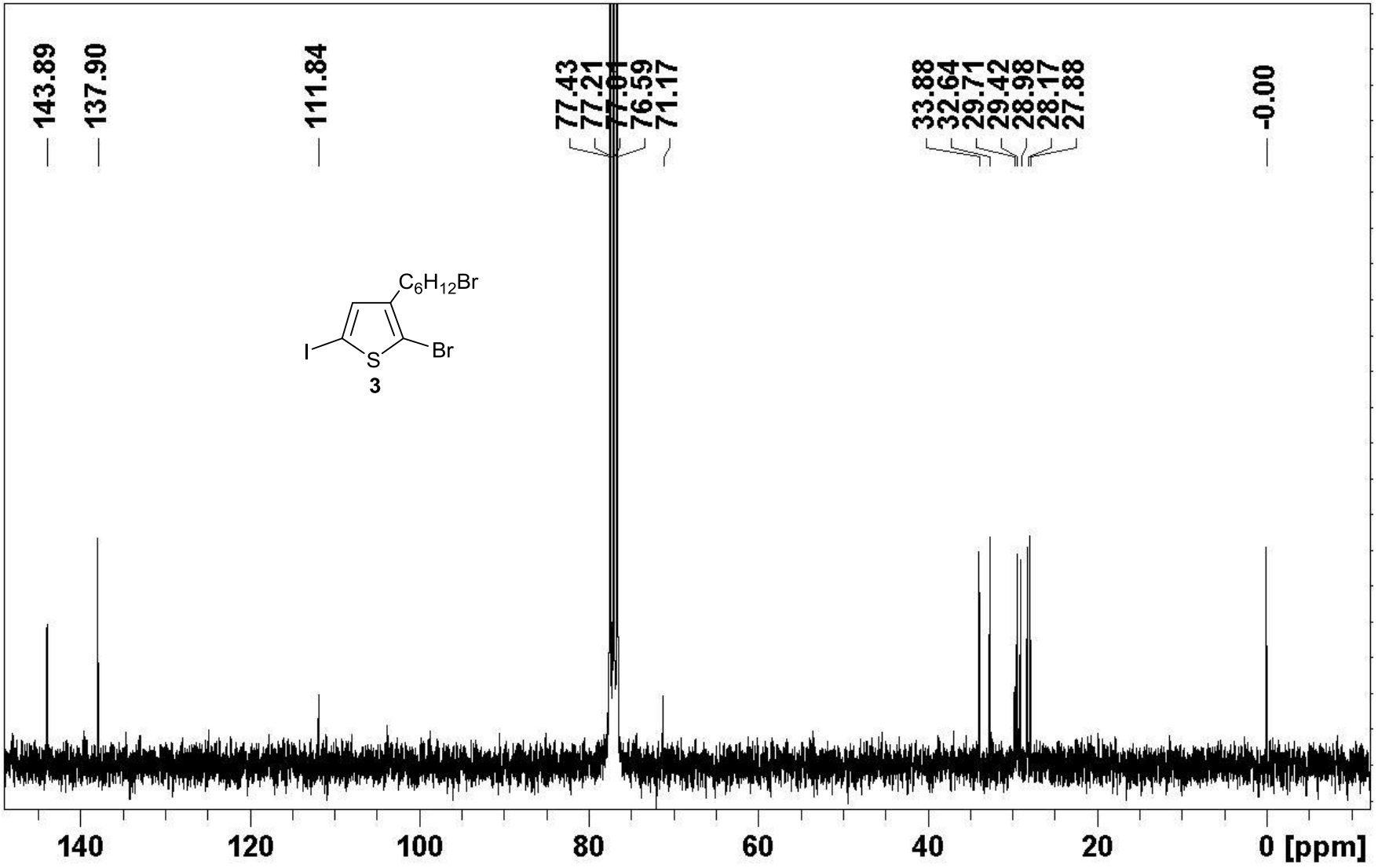


Figure S5: *^{1}H NMR spectrum of* ***4****.*

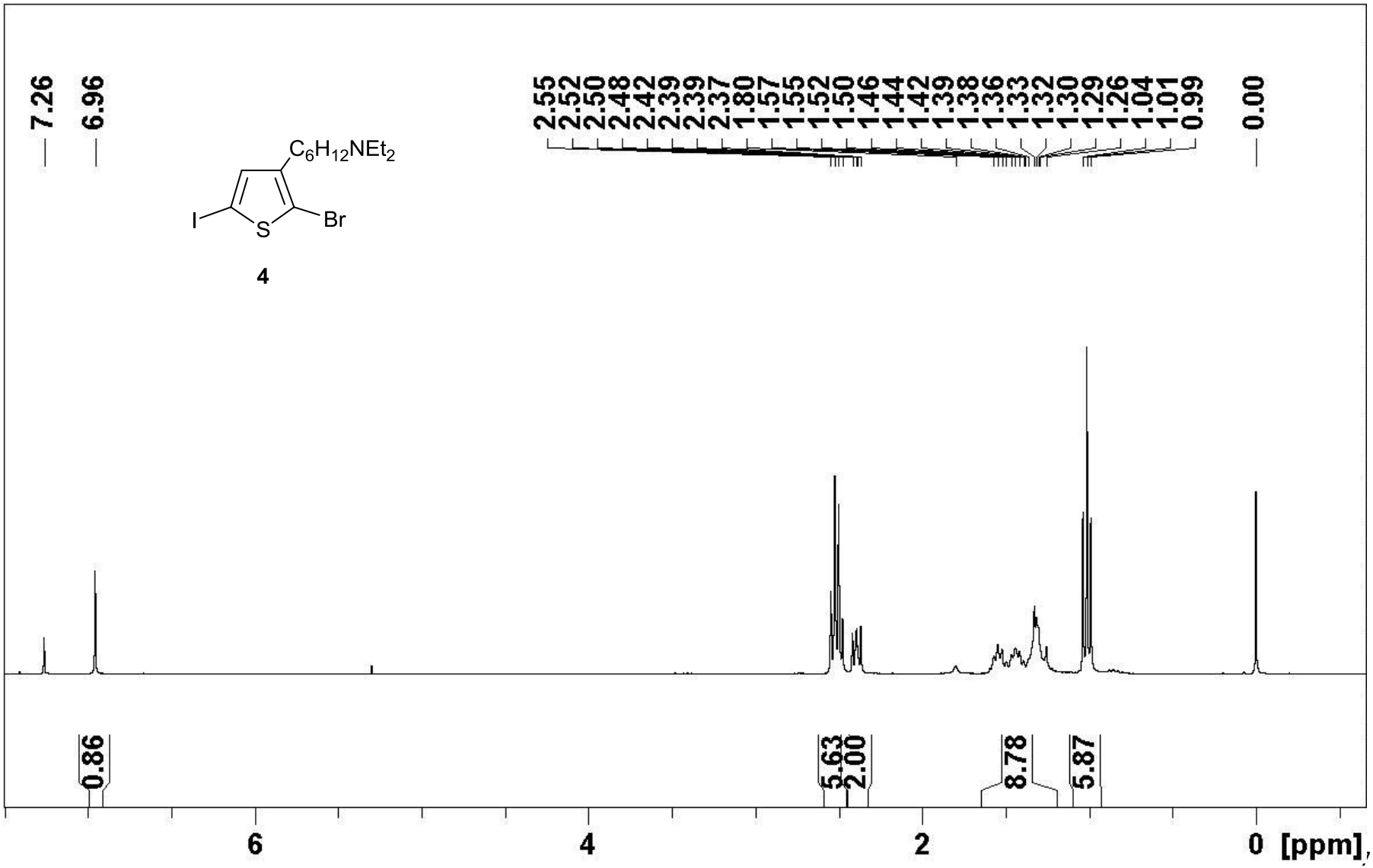


Figure S6: *^{13}C NMR spectrum of* ***4****.*

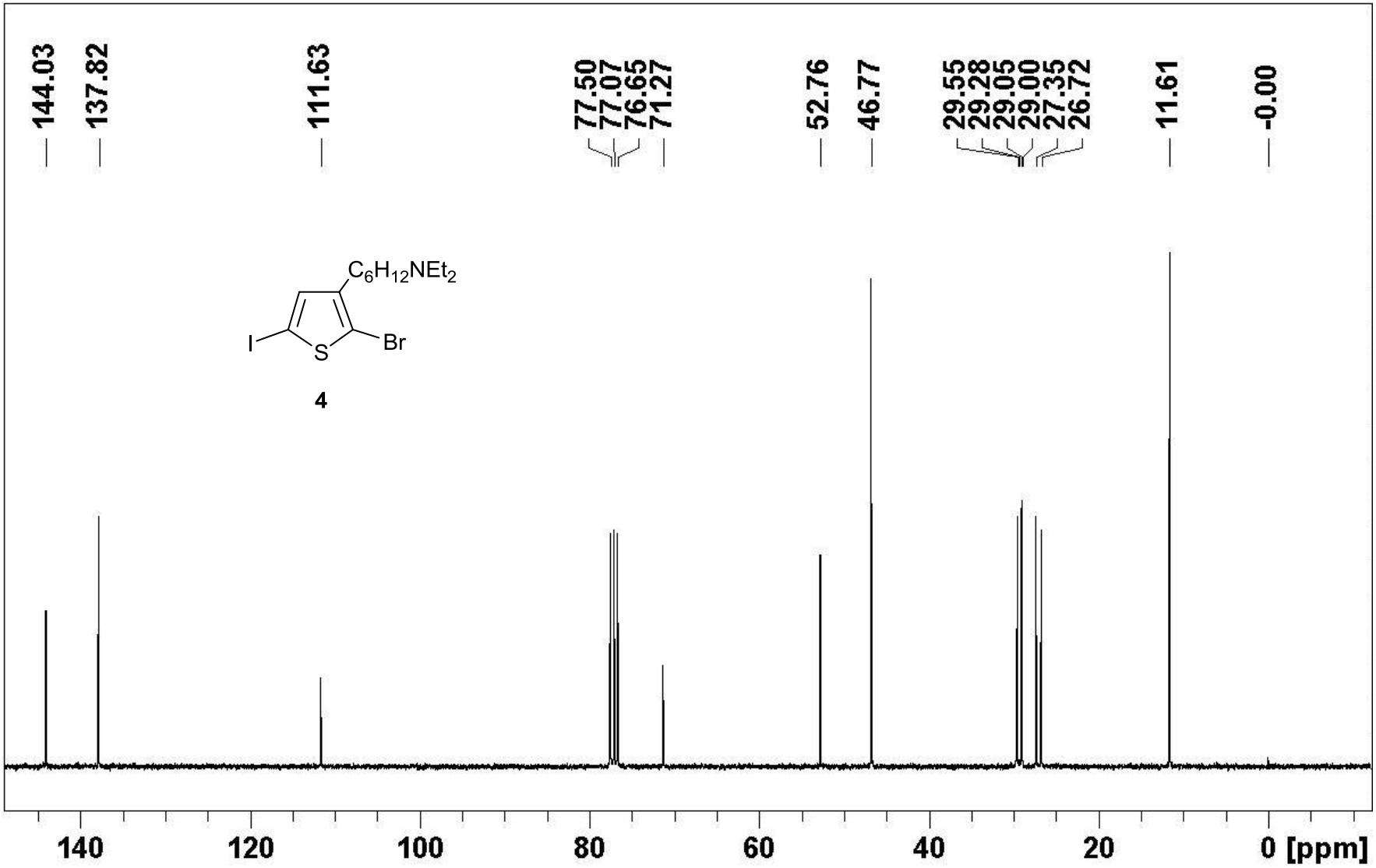


Figure S7: *^{1}H NMR spectrum of* ***P2****.*

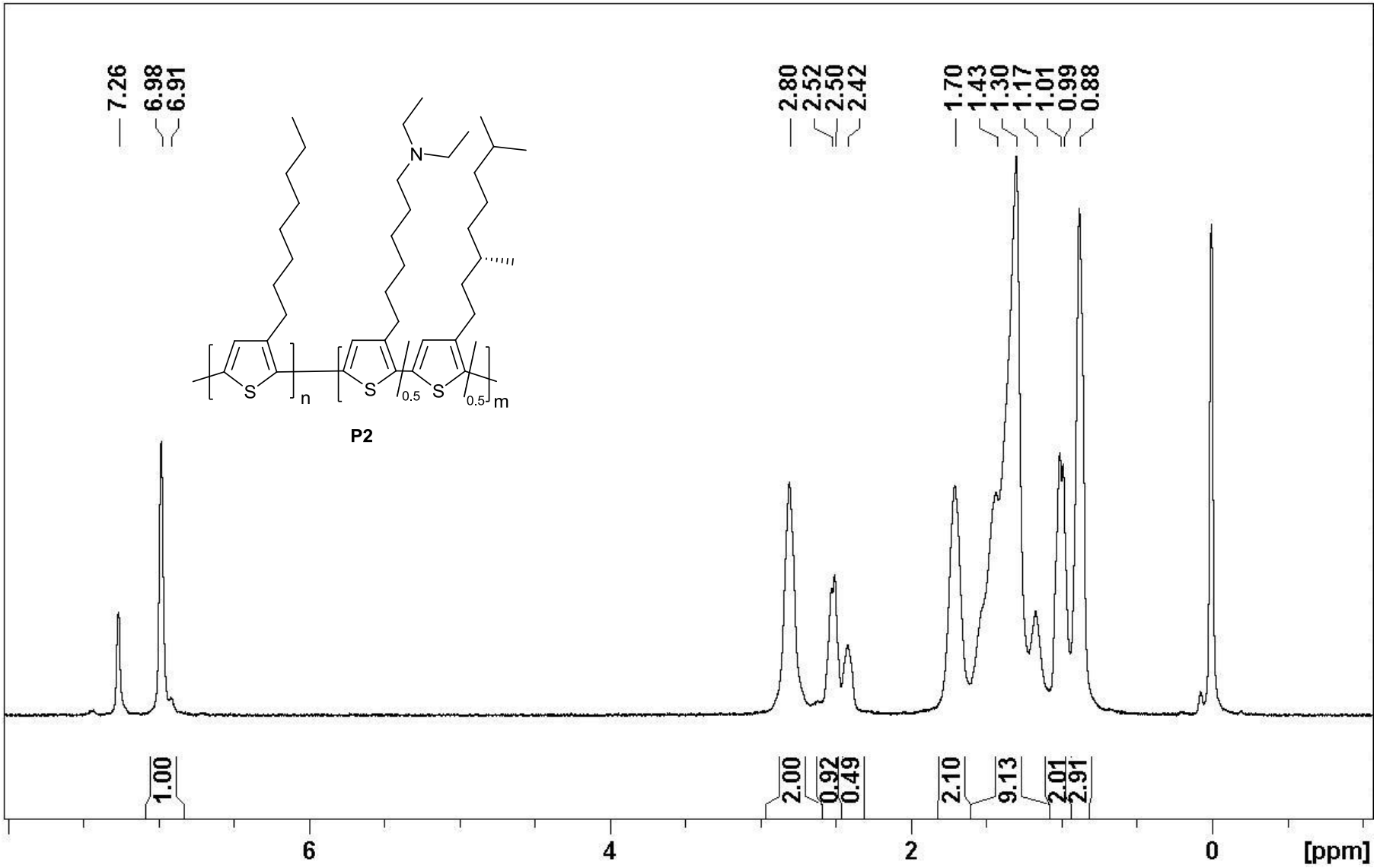


Figure S8: *^{1}H NMR spectrum of* ***P4****.*

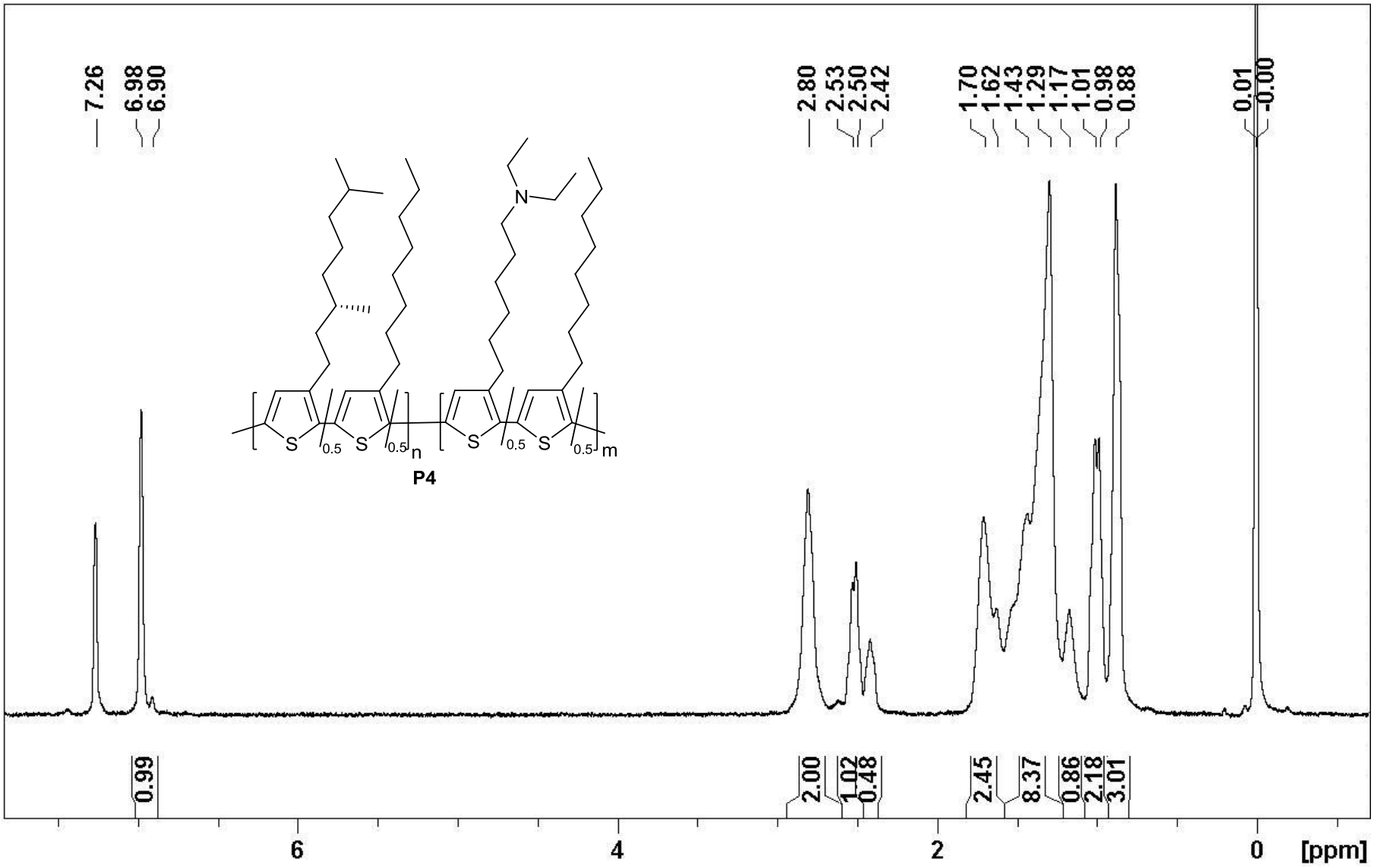


Figure S9: *^{1}H NMR spectrum of* ***P5****.*

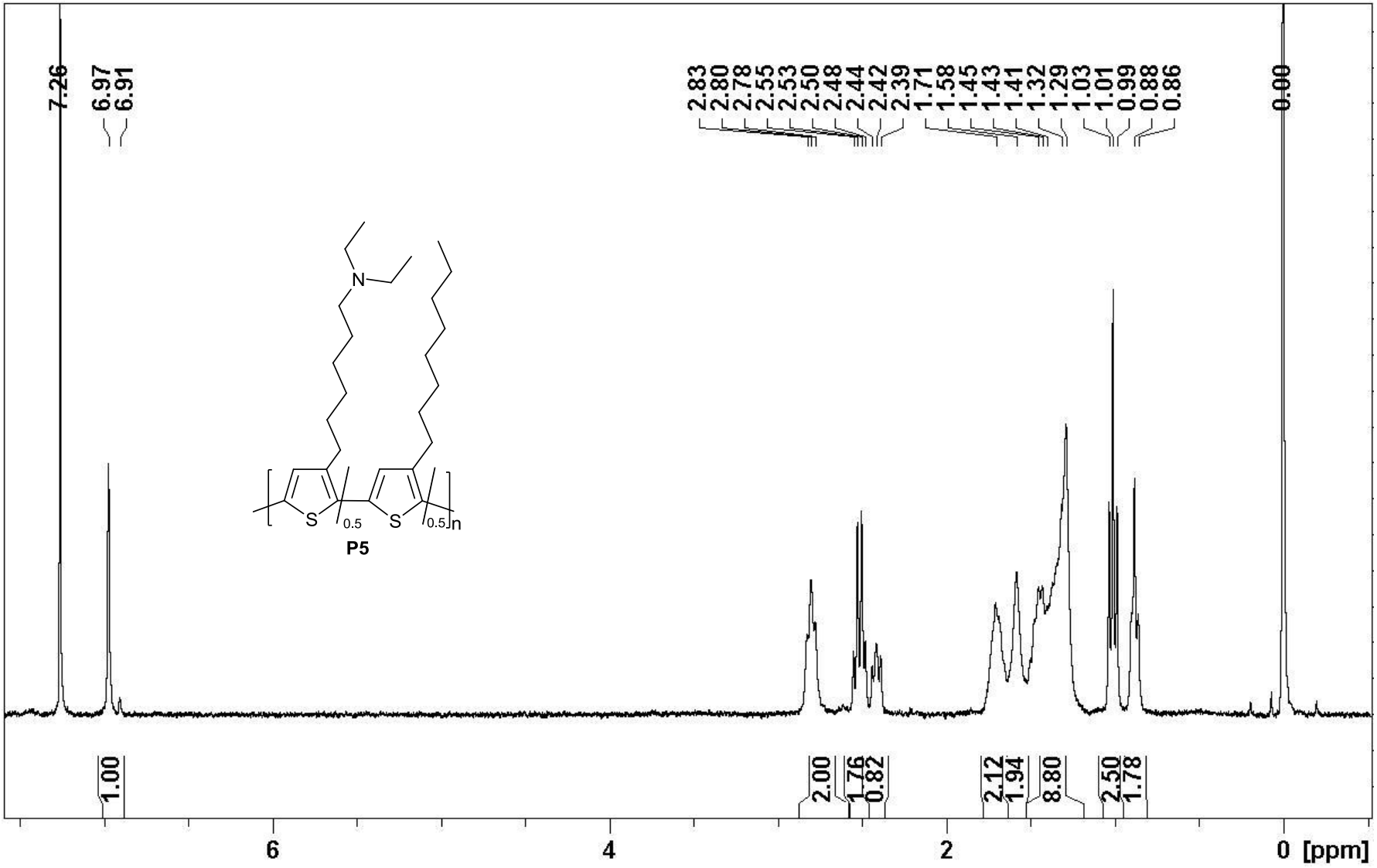
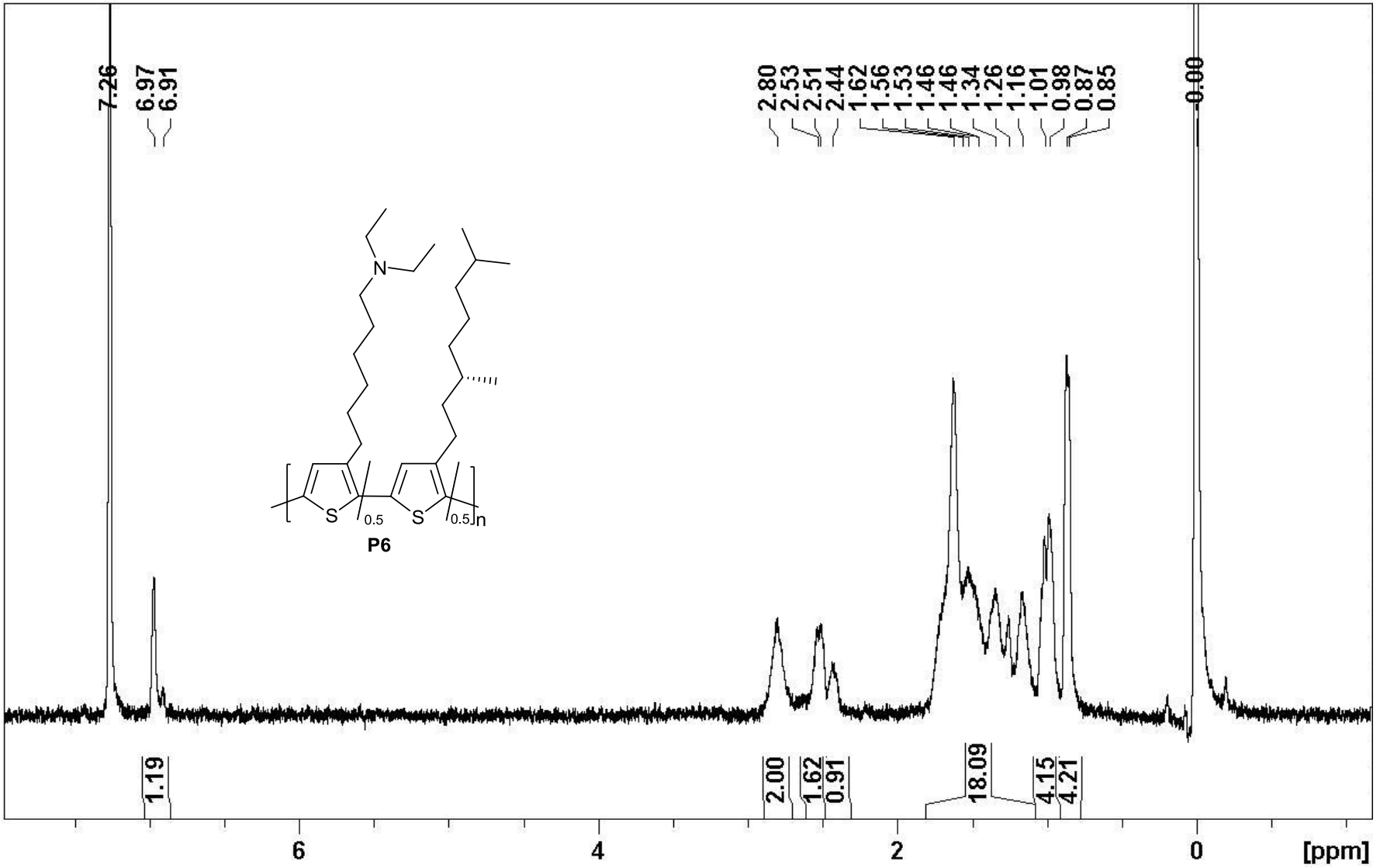


Figure S10: *^{1}H NMR spectrum of* ***P6****.*



B. UV-vis & CD spectroscopy

1. *In solution*

i. *Neutral media*

Figure S11: *UV-vis, CD and gabs spectra for the solvatochroism experiments of* ***P2*** *in a neutral THF/MeOH mixture.* The ratio THF/MeOH is given in the legend.

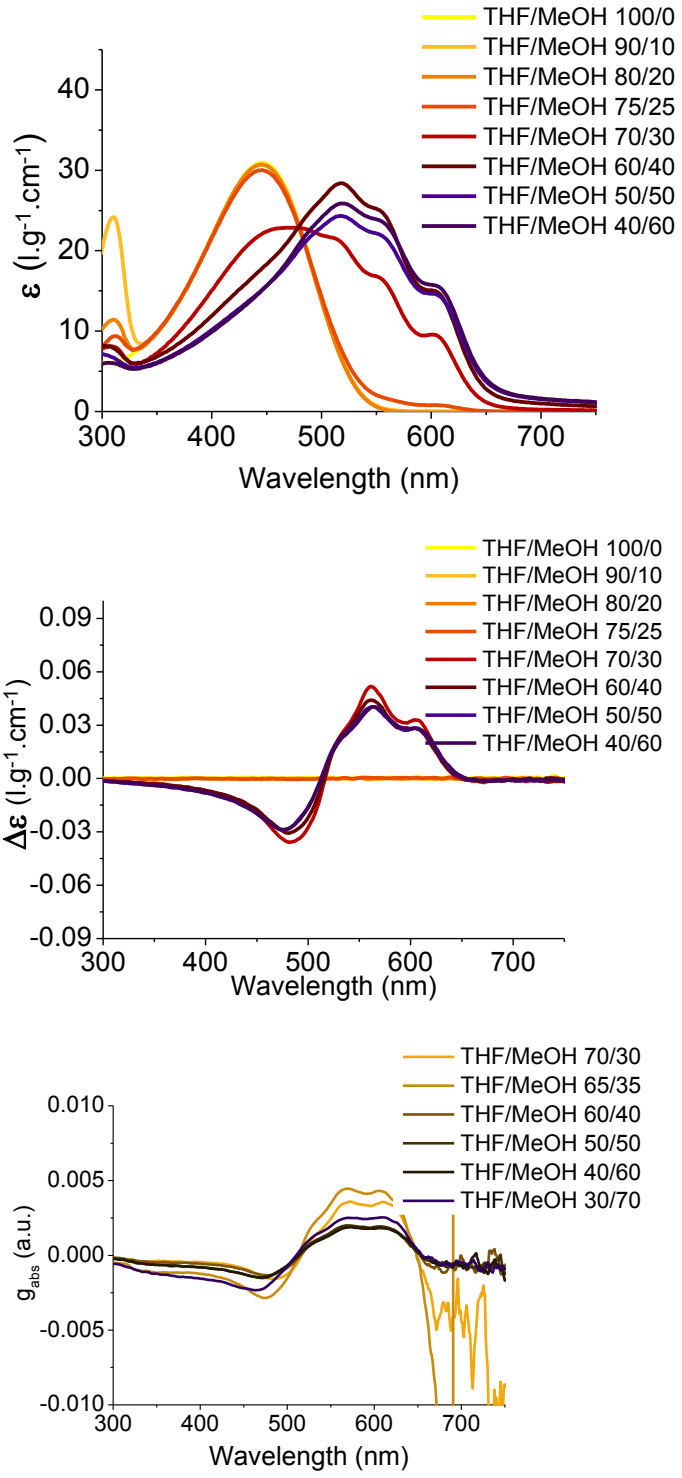


Figure S12: *UV-vis, CD and g_{abs} spectra for the addition of acid to* ***P2*** *in a neutral THF/MeOH mixture of THF/MeOH 40/60.*
The ratio THF/MeOH is given in the legend.

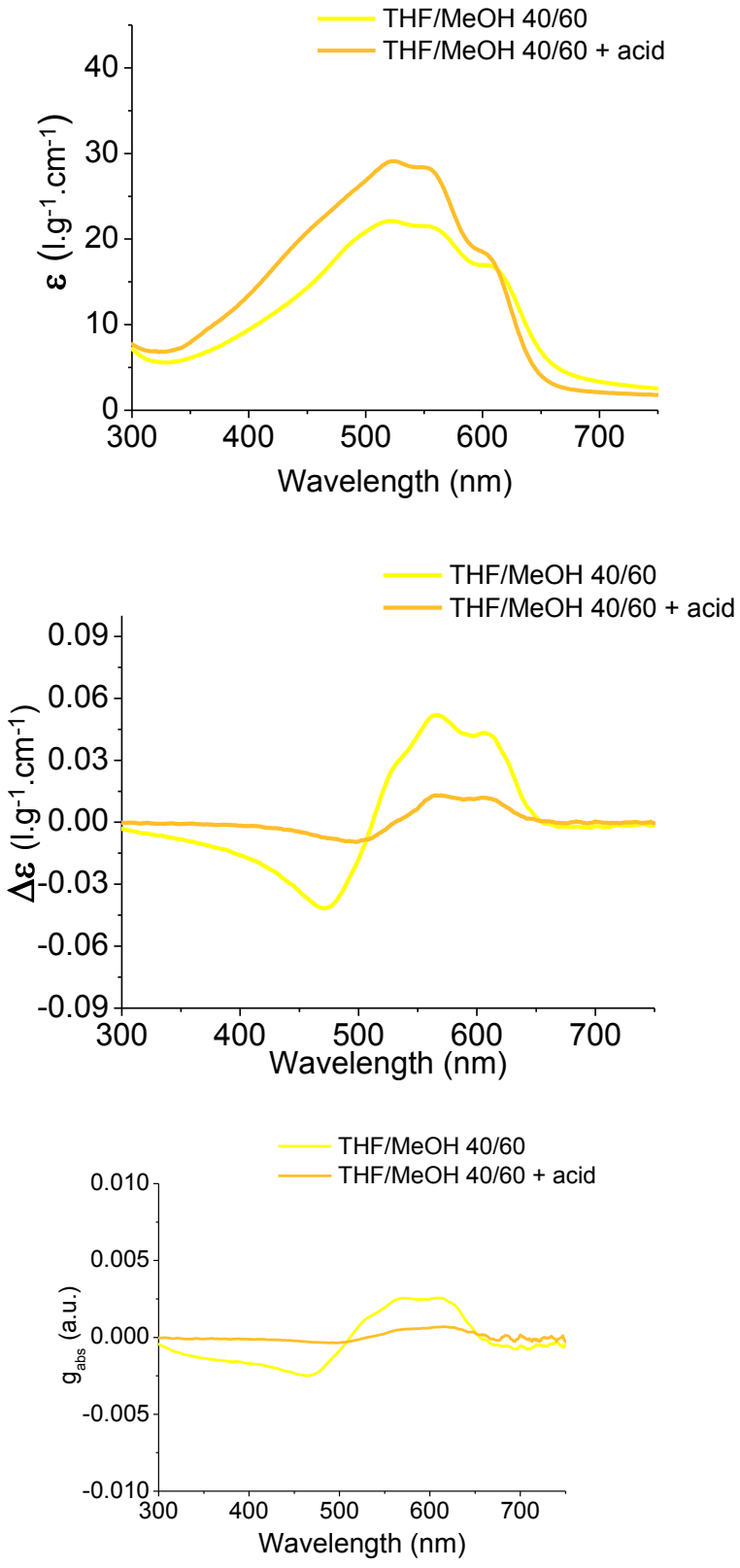


Figure S13: *g_{abs} spectra of* ***P3*** *in a neutral THF/MeOH mixture.*
The ratio THF/MeOH is 40/60.

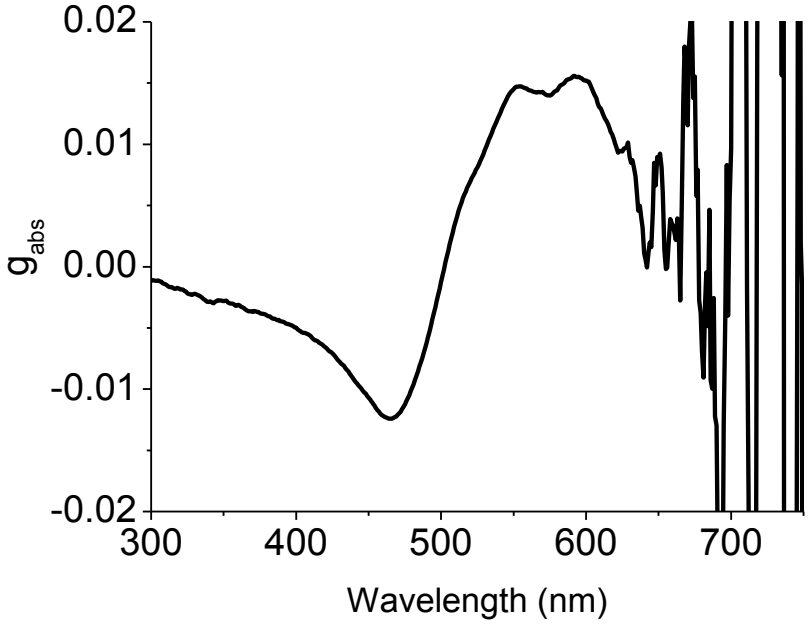


Figure S14: *UV-vis, CD and g_{abs} spectra for the addition of acid to* ***P4*** *in a neutral THF/MeOH mixture of THF/MeOH 40/60.*
The ratio THF/MeOH is given in the legend.

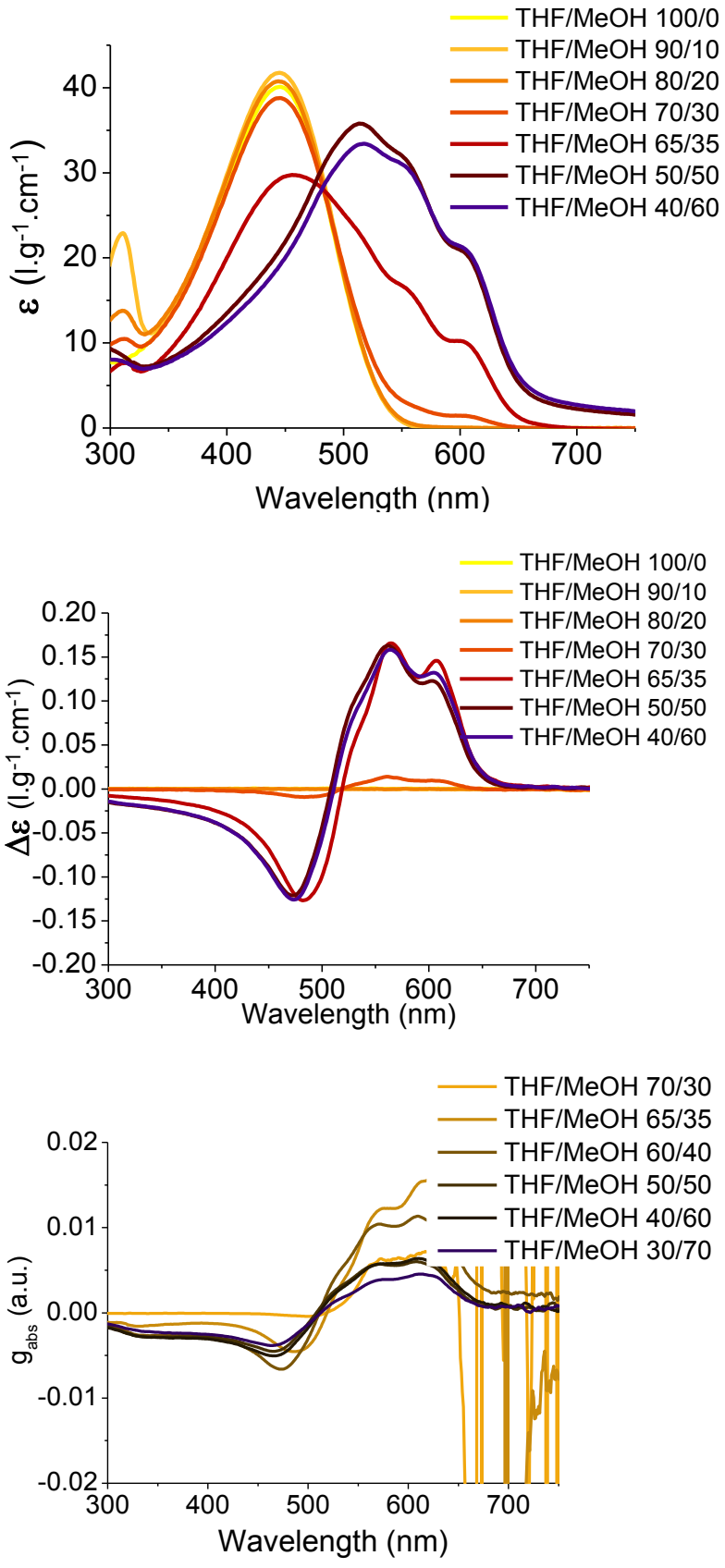


Figure S15: *UV-vis, CD and g_{abs} spectra for the addition of acid to* ***P4*** *in neutral THF/MeOH 40/60 mixture.* The ratio THF/MeOH is given in the legend.

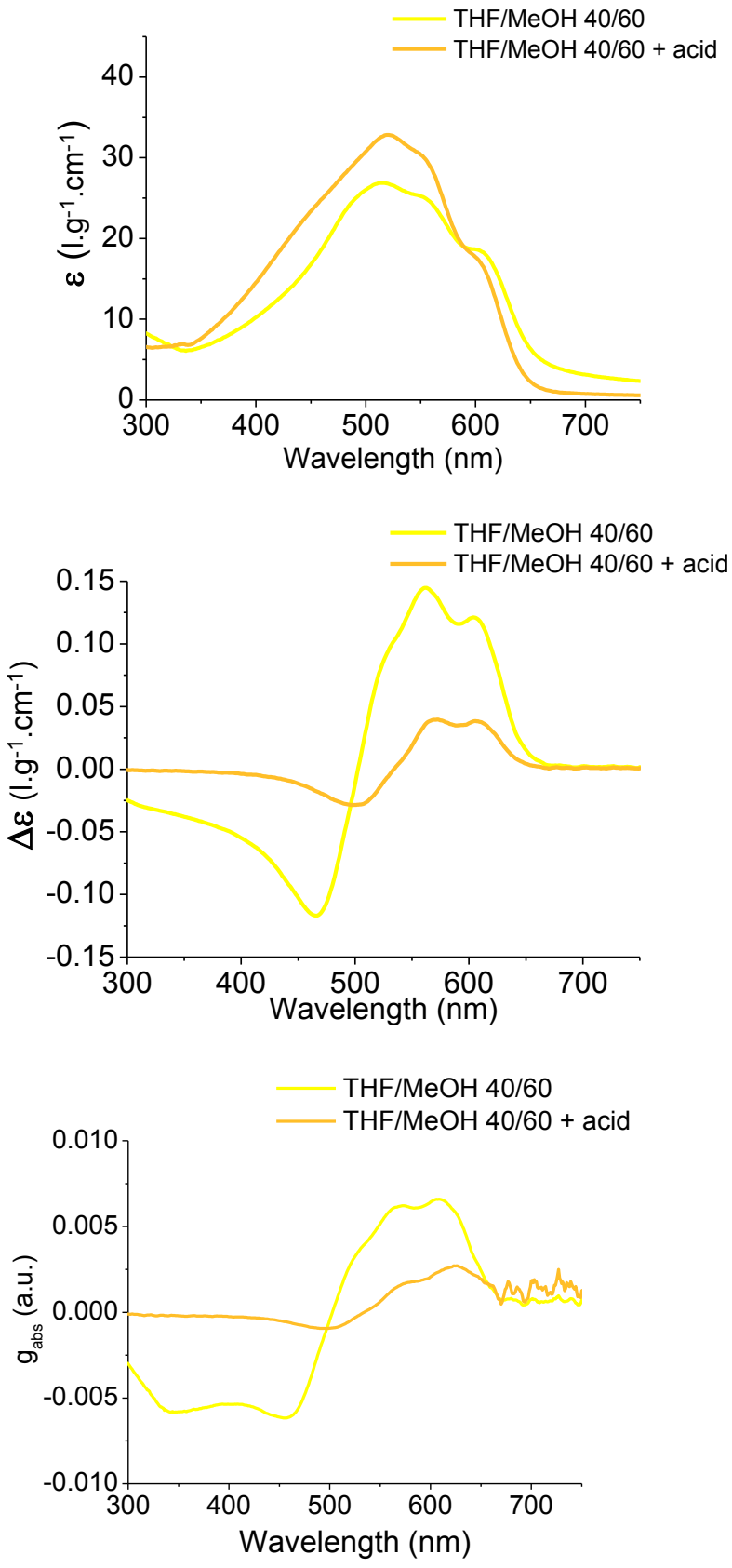


Figure S16: *UV-vis, CD and g_{abs} spectra for the solvatochroism experiments of* ***P5*** *in a neutral THF/MeOH mixture.* The ratio THF/MeOH is given in the legend.

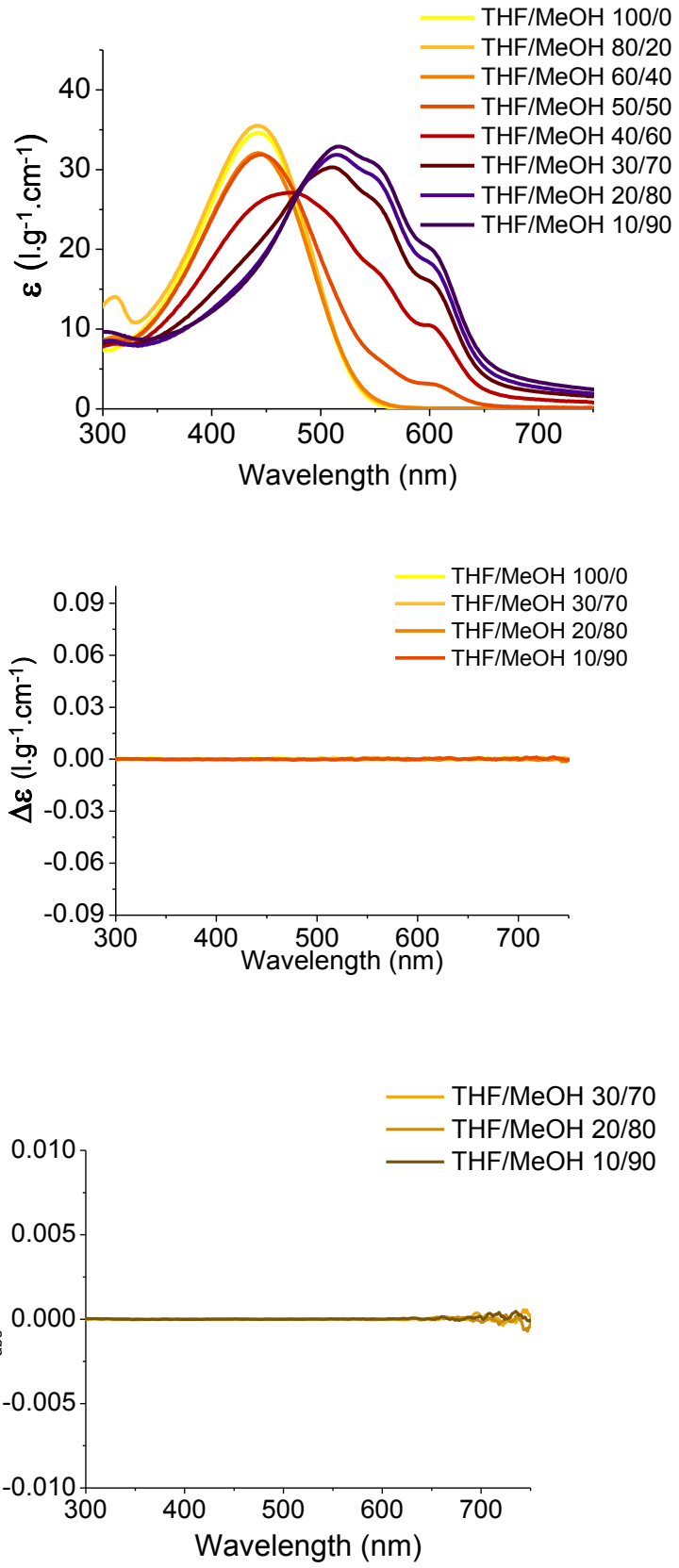


Figure S17: *UV-vis, CD and g_{abs} spectra for the addition of acid to* ***P5*** *in a neutral THF/MeOH 20/80 mixture.* The ratio THF/MeOH is given in the legend.

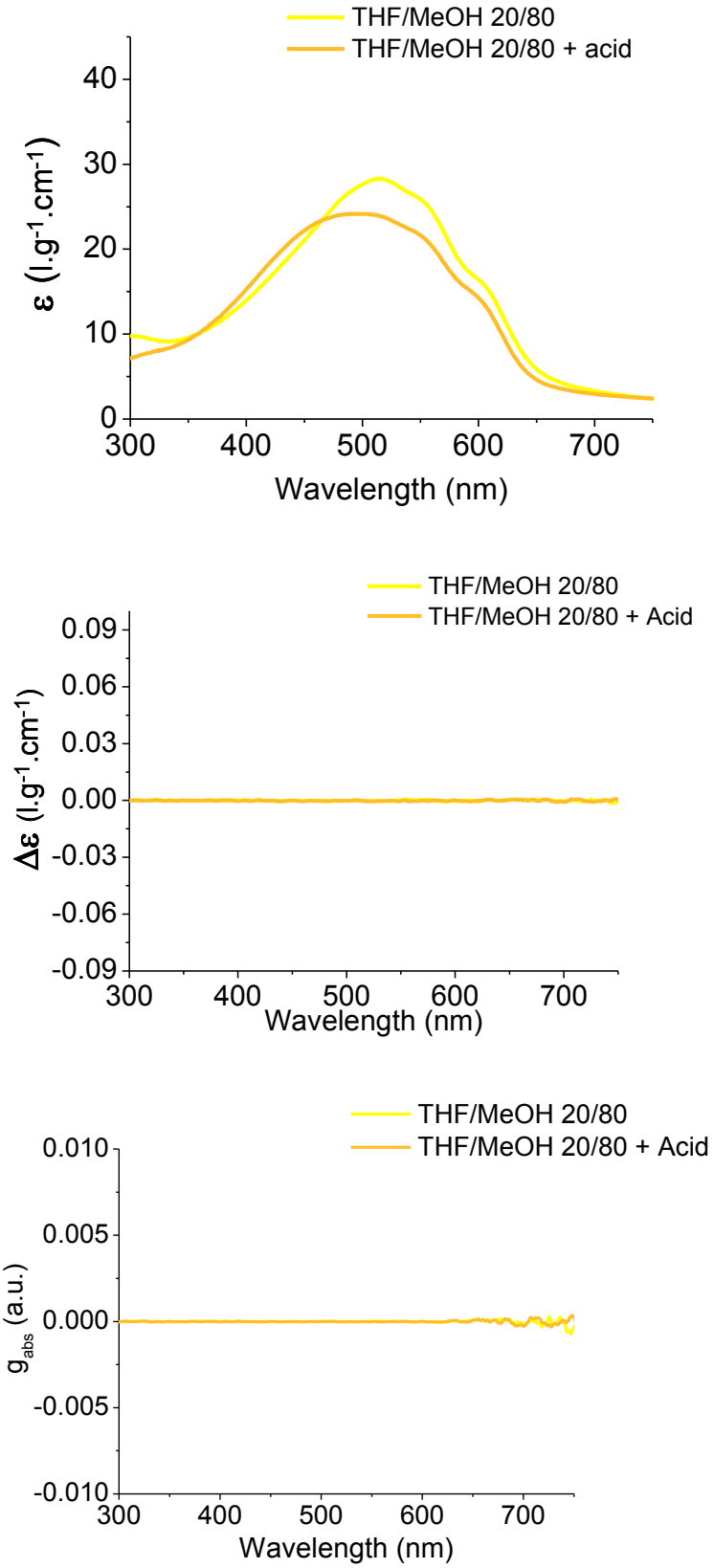


Figure S18: *UV-vis, CD and g_{abs} spectra for the solvatochroism experiments of* ***P6*** *in a neutral THF/MeOH mixture.* The ratio THF/MeOH is given in the legend.

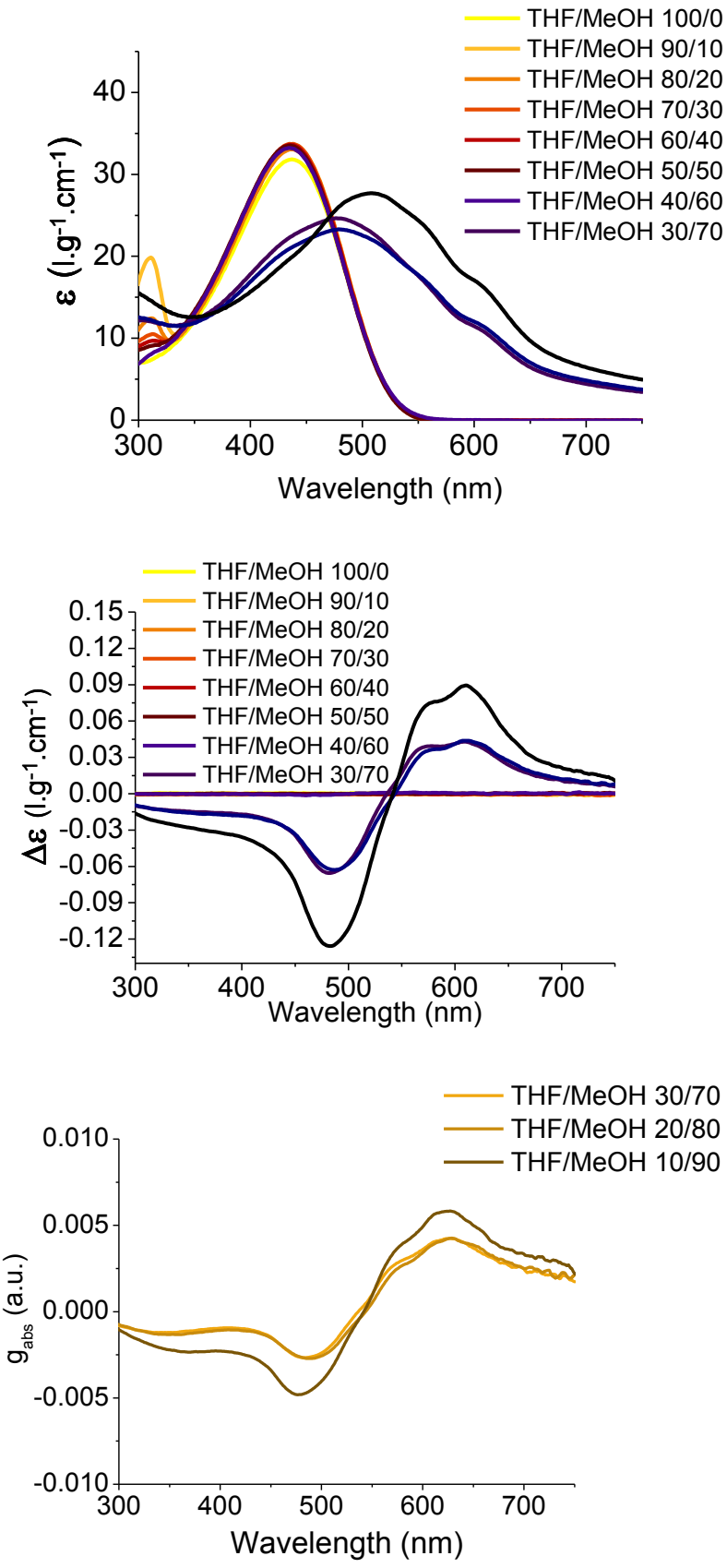
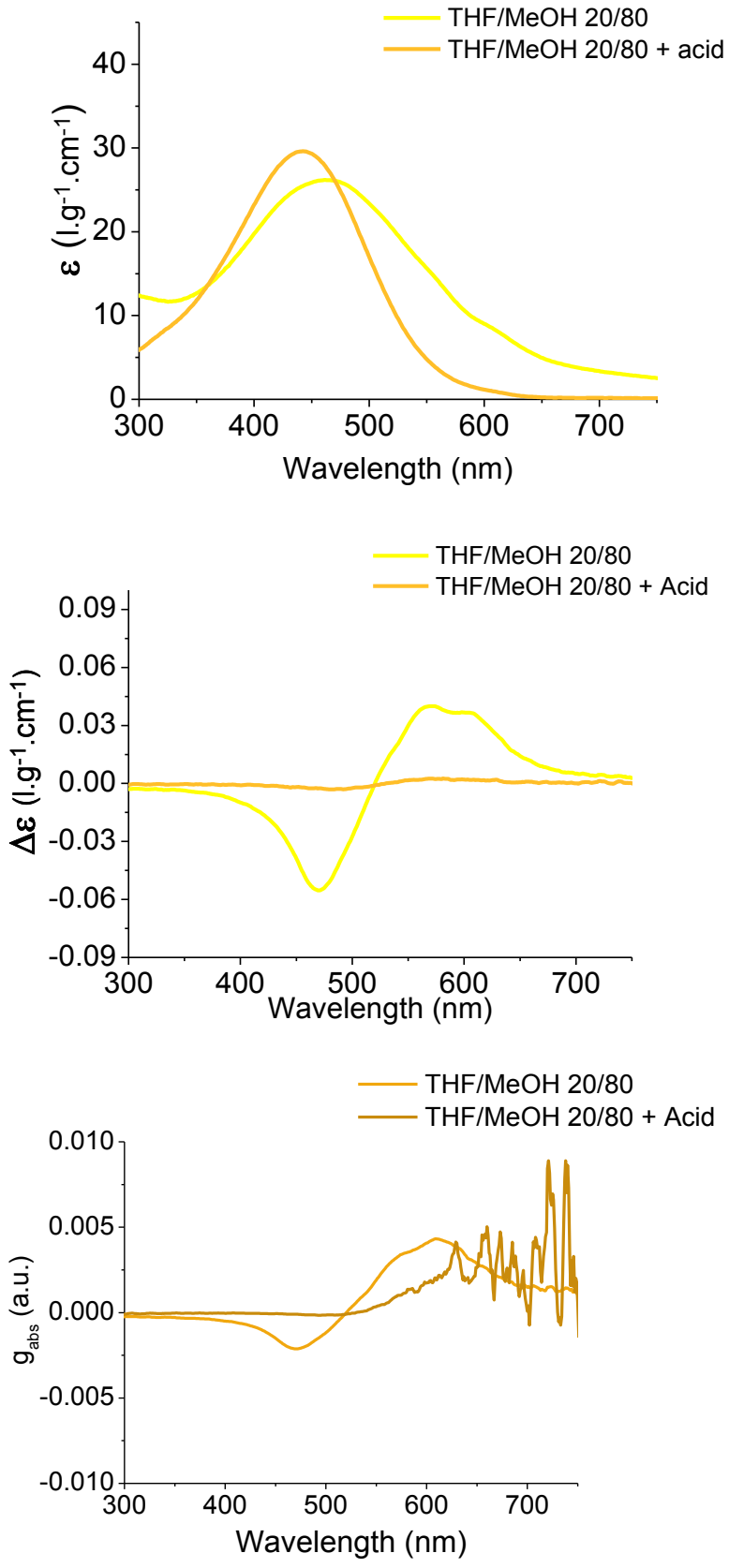


Figure S19: *UV-vis, CD and g_{abs} spectra for the addition of acid to* ***P6*** *in a neutral THF/MeOH 20/80 mixture.* The ratio THF/MeOH is given in the legend.



ii. Acidic media

Figure S20: *UV-vis, CD and g_{abs} spectra for the solvatochroism experiments of* ***P2*** *in an acidic THF/MeOH mixture.* The ratio THF/MeOH is given in the legend.

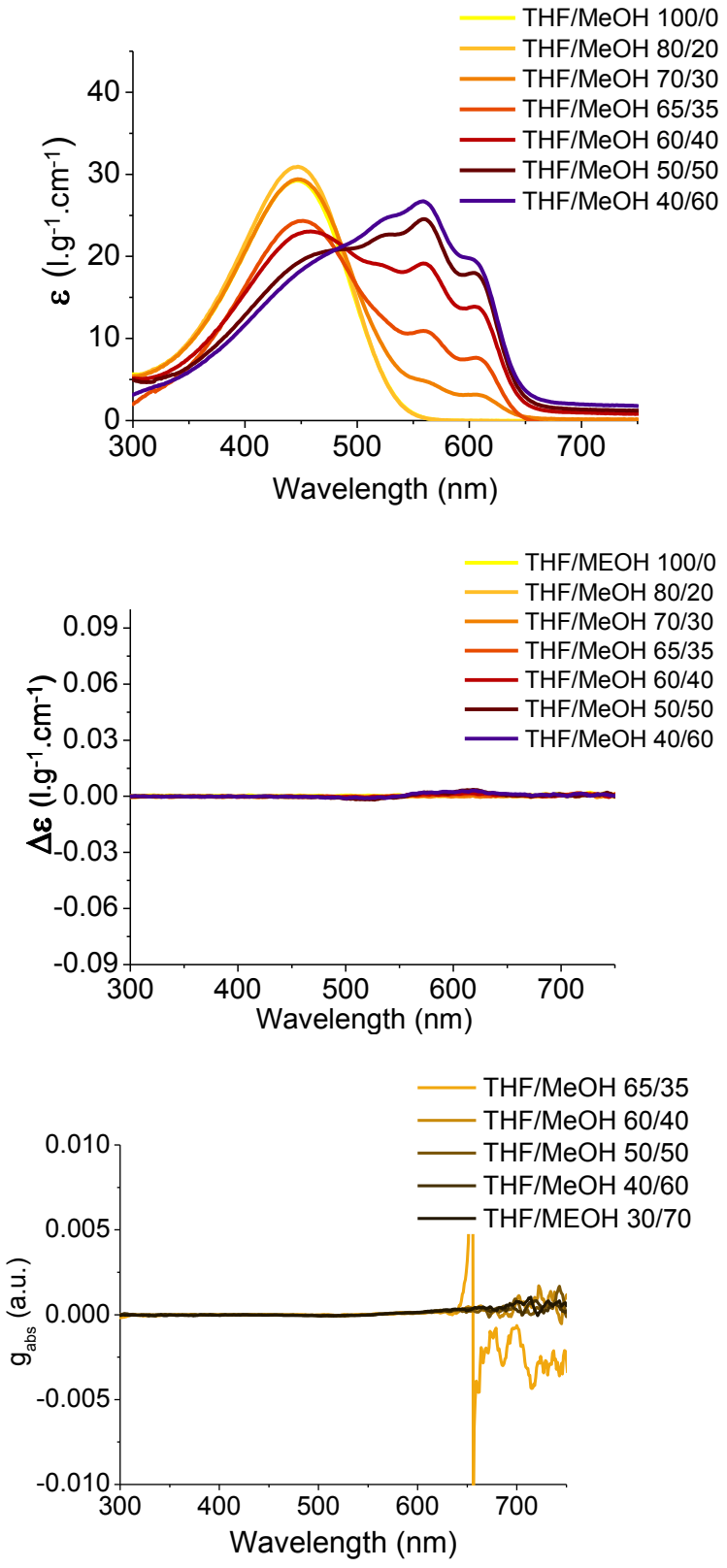


Figure S21: *UV-vis, CD and g_{abs} spectra for the addition of base to* ***P2*** *in an acidic THF/MeOH 40/60 mixture.* The ratio THF/MeOH is given in the legend.

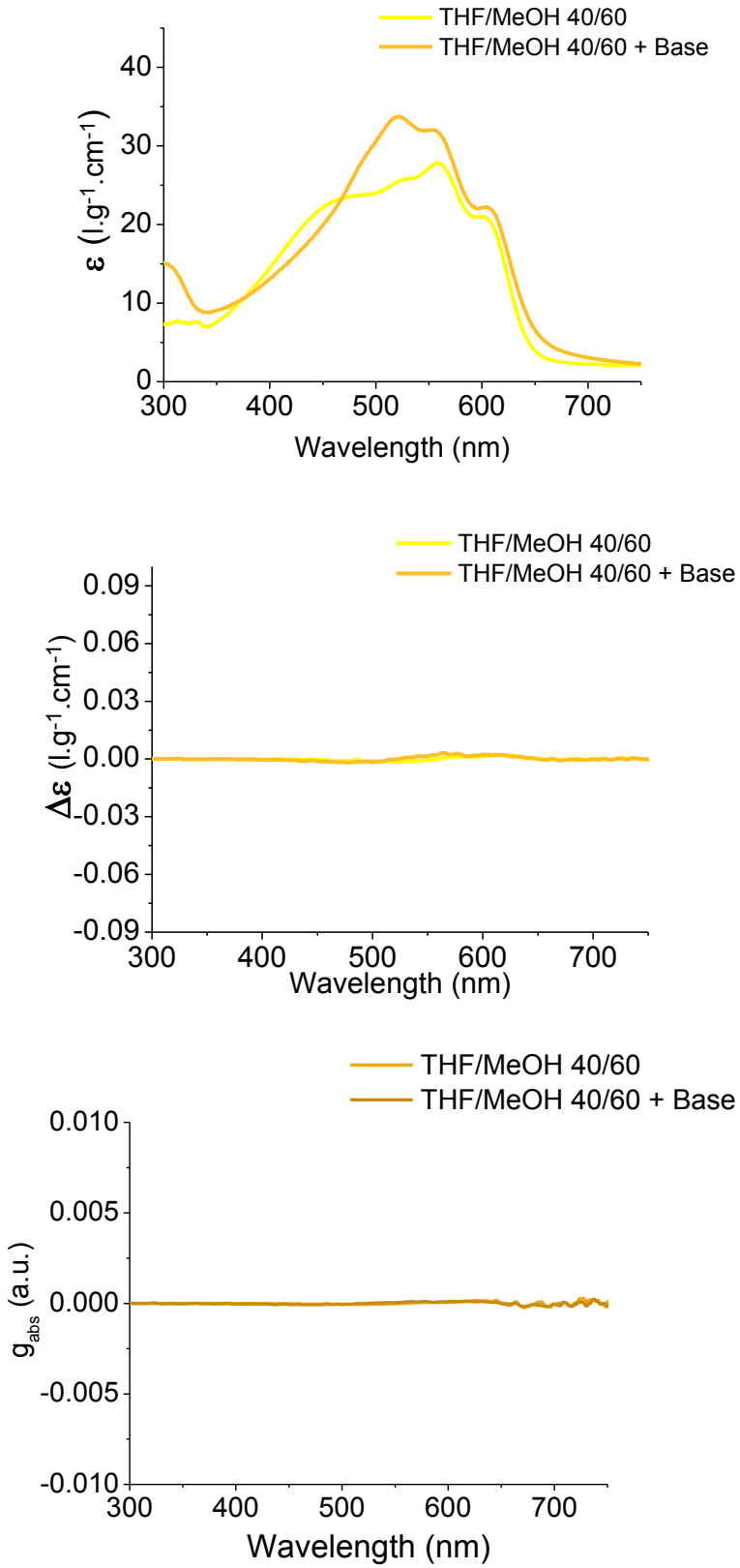


Figure S22: *UV-vis, CD and g_{abs} spectra for the solvatochroism experiments of* ***P4*** *in an acidic THF/MeOH mixture.* The ratio THF/MeOH is given in the legend.

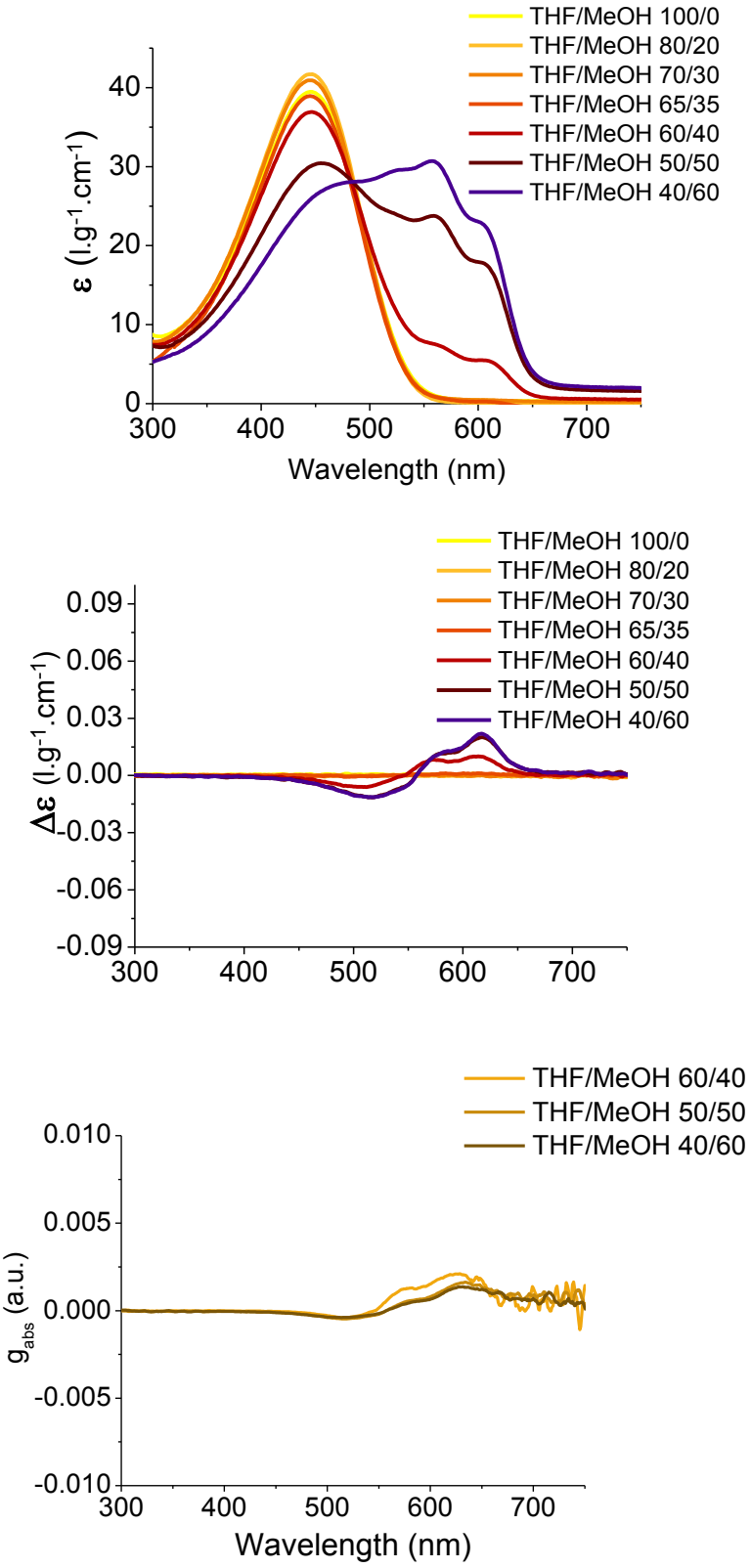


Figure S23: *UV-vis, CD and g_{abs} spectra for the addition of base to* ***P4*** *in an acidic THF/MeOH 40/60 mixture.* The ratio THF/MeOH is given in the legend.

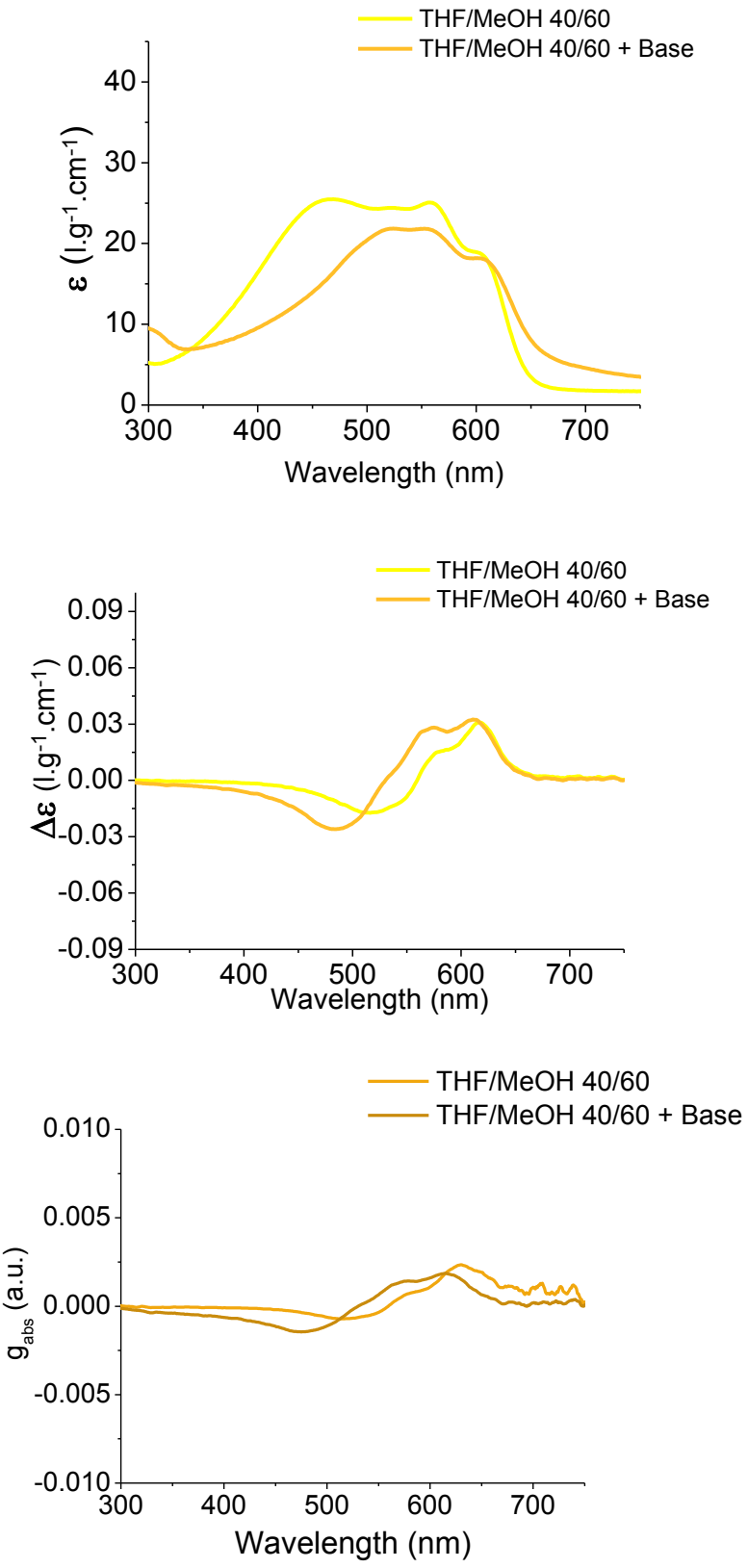


Figure S24: *UV-vis, CD and g_{abs} spectra for the solvatochroism experiments of* ***P5*** *in an acidic THF/MeOH mixture.* The ratio THF/MeOH is given in the legend.

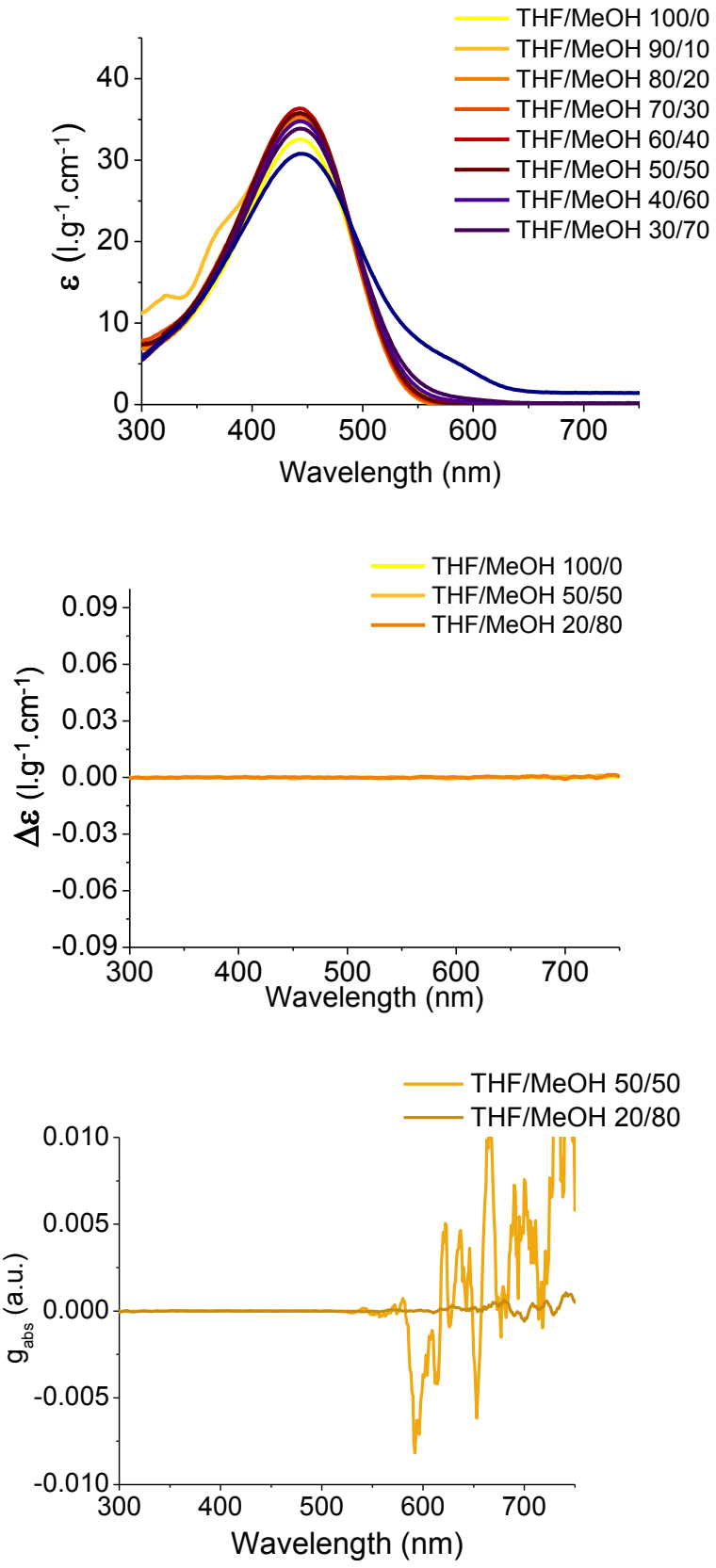


Figure S25: *UV-vis, CD and g_{abs} spectra for the addition of base to* ***P5*** *in an acidic THF/MeOH 20/80 mixture.* The ratio THF/MeOH is given in the legend.

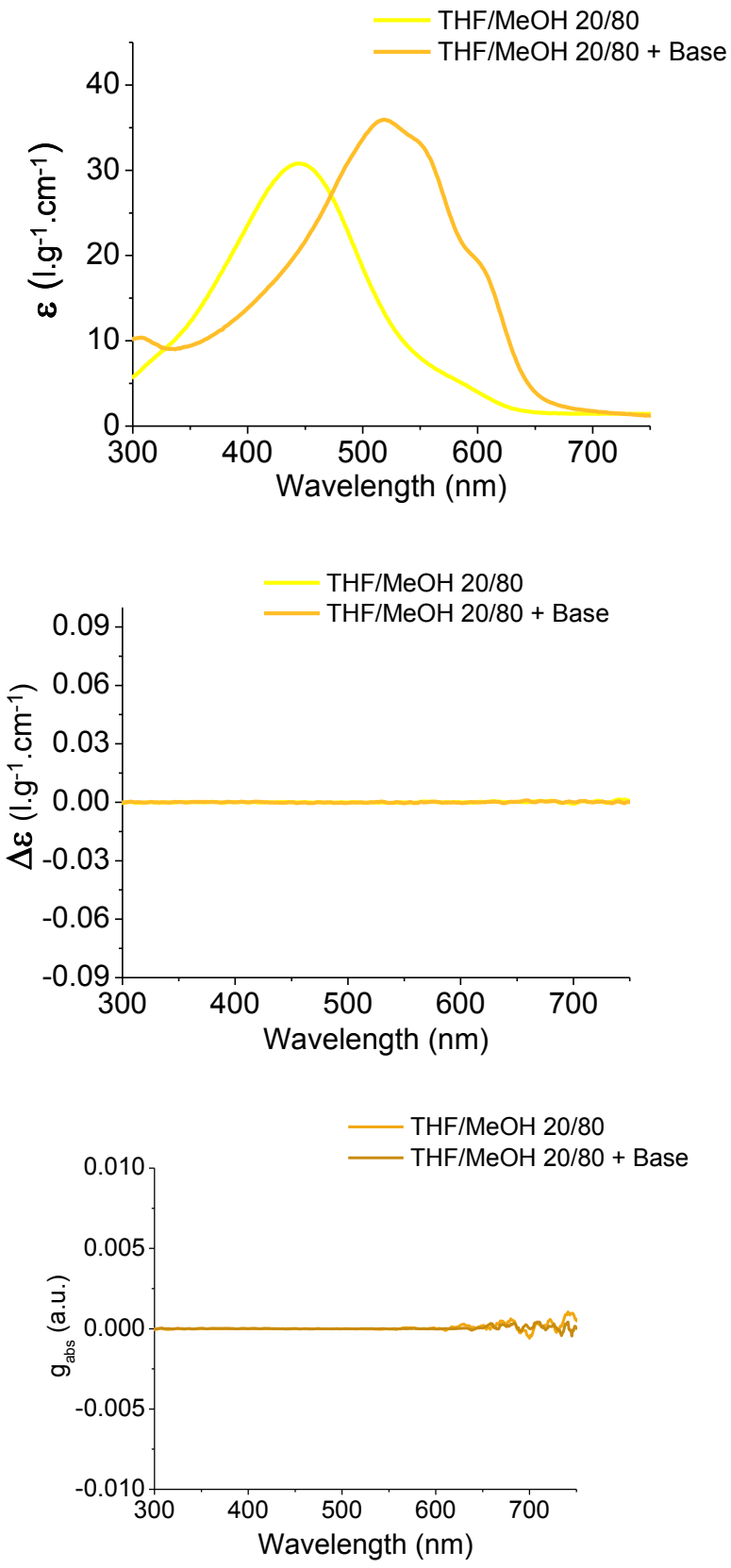


Figure S26: *UV-vis, CD and g_{abs} spectra for the solvatochroism experiments of* ***P6*** *in an acidic THF/MeOH mixture.* The ratio THF/MeOH is given in the legend.

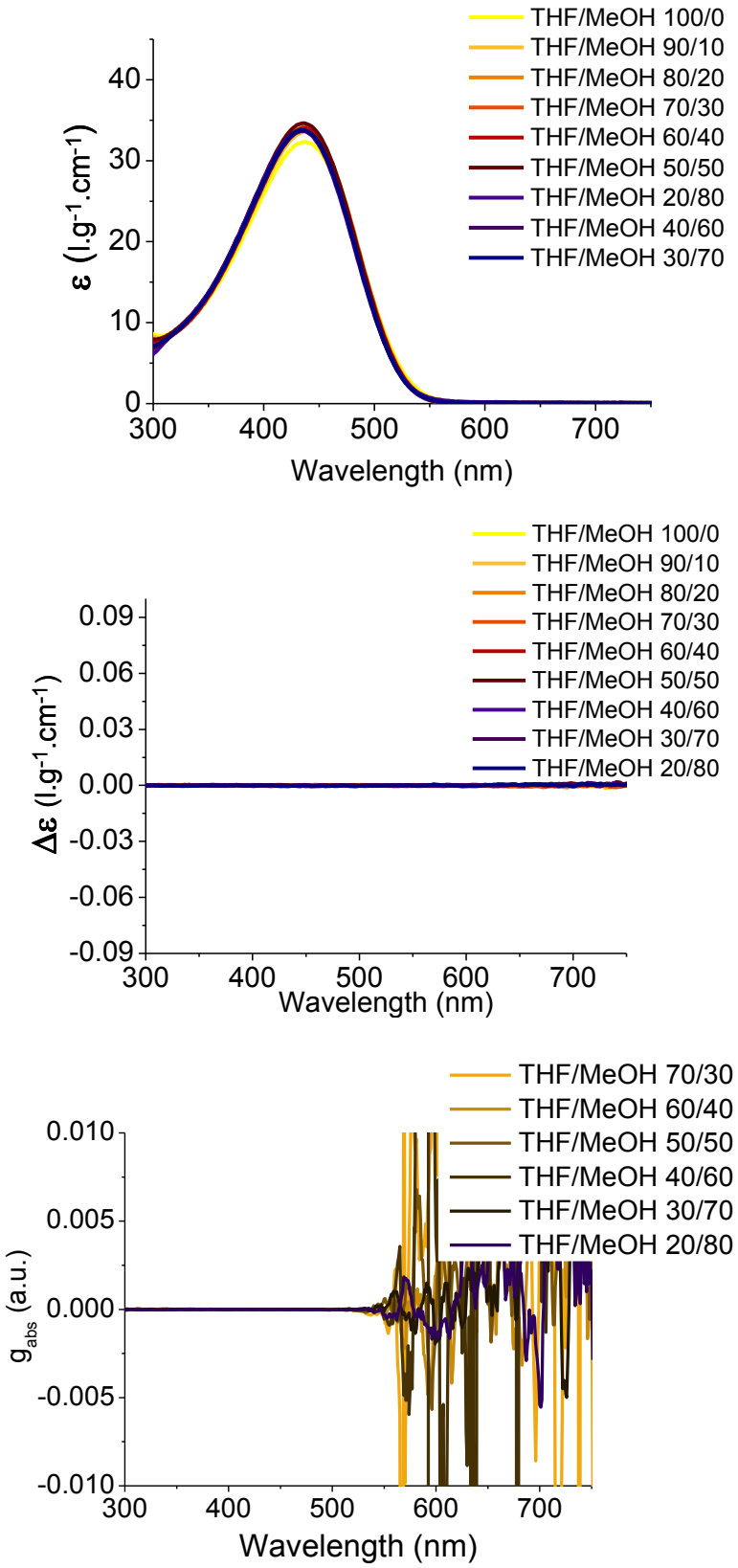
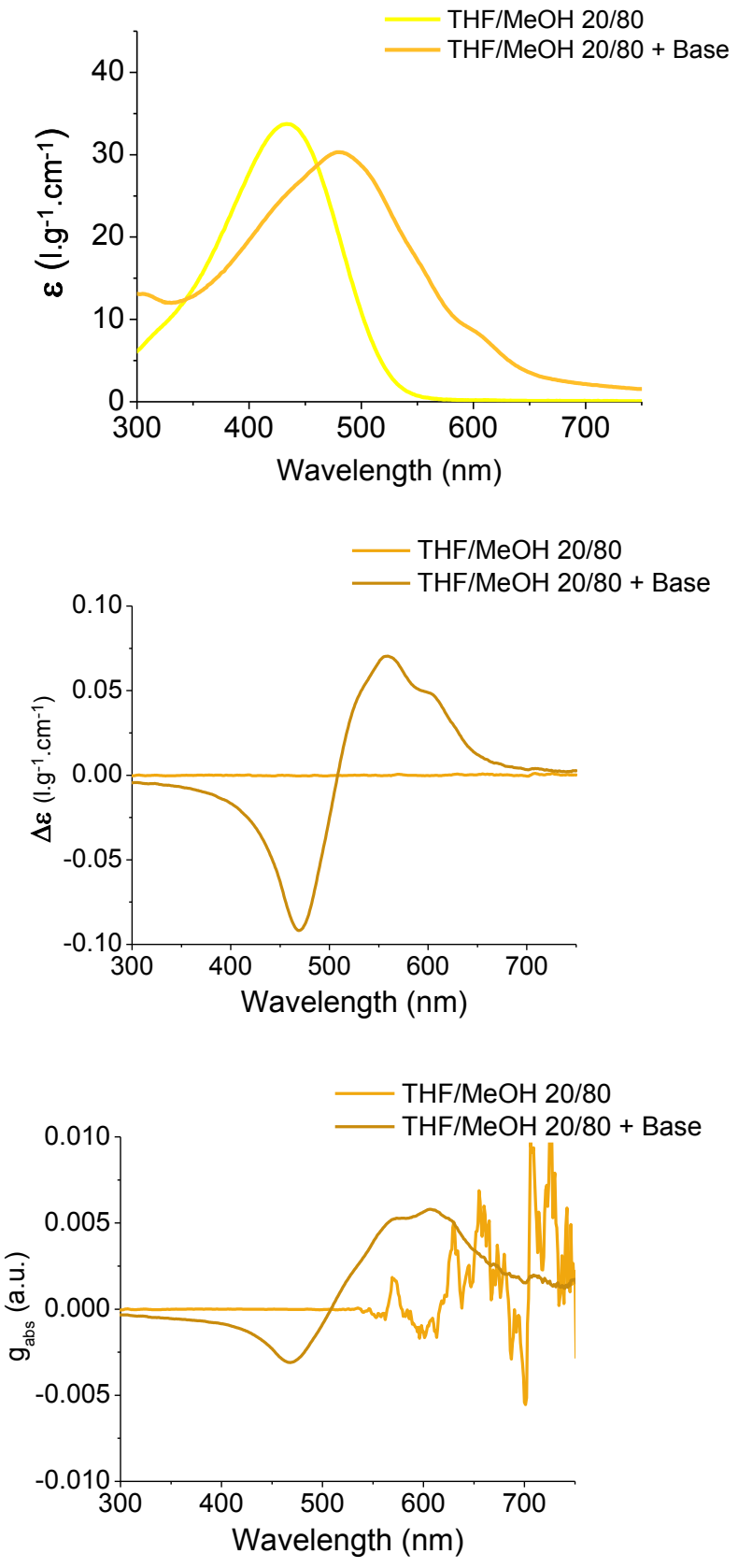


Figure S27: *UV-vis, CD and g_{abs} spectra for the addition of base to* ***P6*** *in an acidic THF/MeOH 20/80 mxiture.* The ratio THF/MeOH is given in the legend.

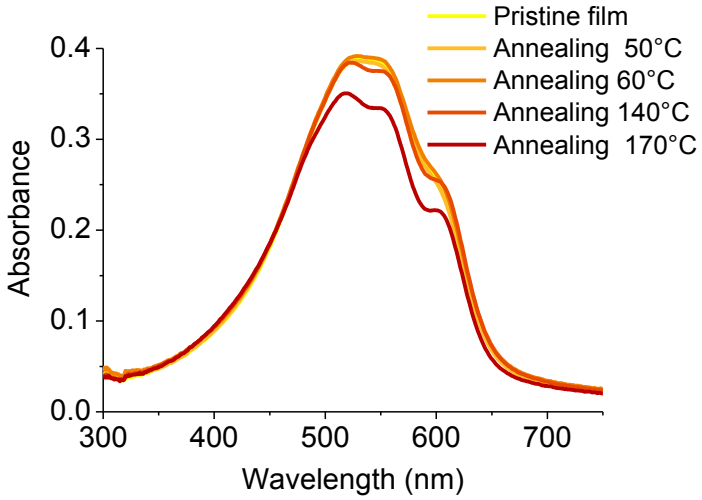


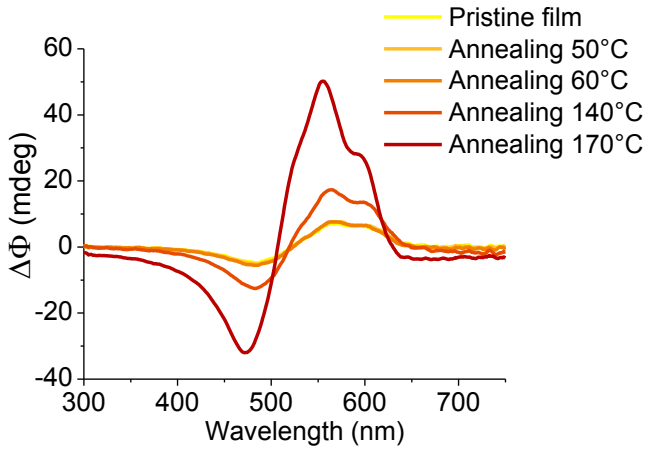
2. *In film*

Films were prepared by spin coating from neutral or acidified THF solutions (1200 rpm, 20 s) and the solutions were filtered with a 0.20 µm filter prior to spin coating.

i. *Spincoated from neutral media*

Figure S28: *UV-vis, CD and g_{abs} spectra for the annealing experiments with* ***P2*** *with fast cooling.*
Each run, the film is annealed for 1 min at the temperature given in the legend and cooled fast at room T.





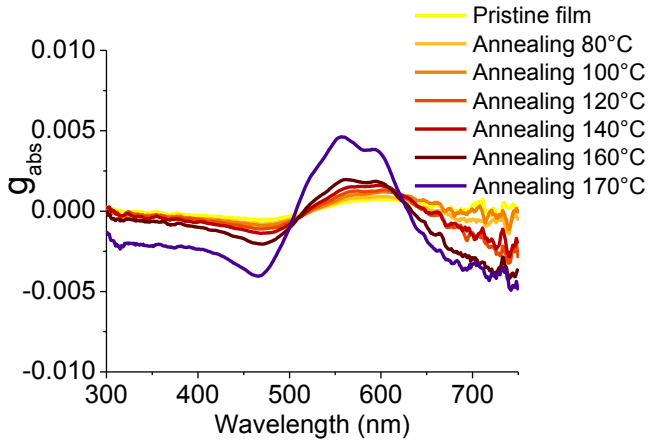


Figure S29: *UV-vis, CD and g_{abs} spectra for the annealing experiments with* ***P2*** *with slow cooling.*
Each run, the film is annealed for 1 min at the temperature given in the legend and cooled slow at 2 °C min^{-1}.

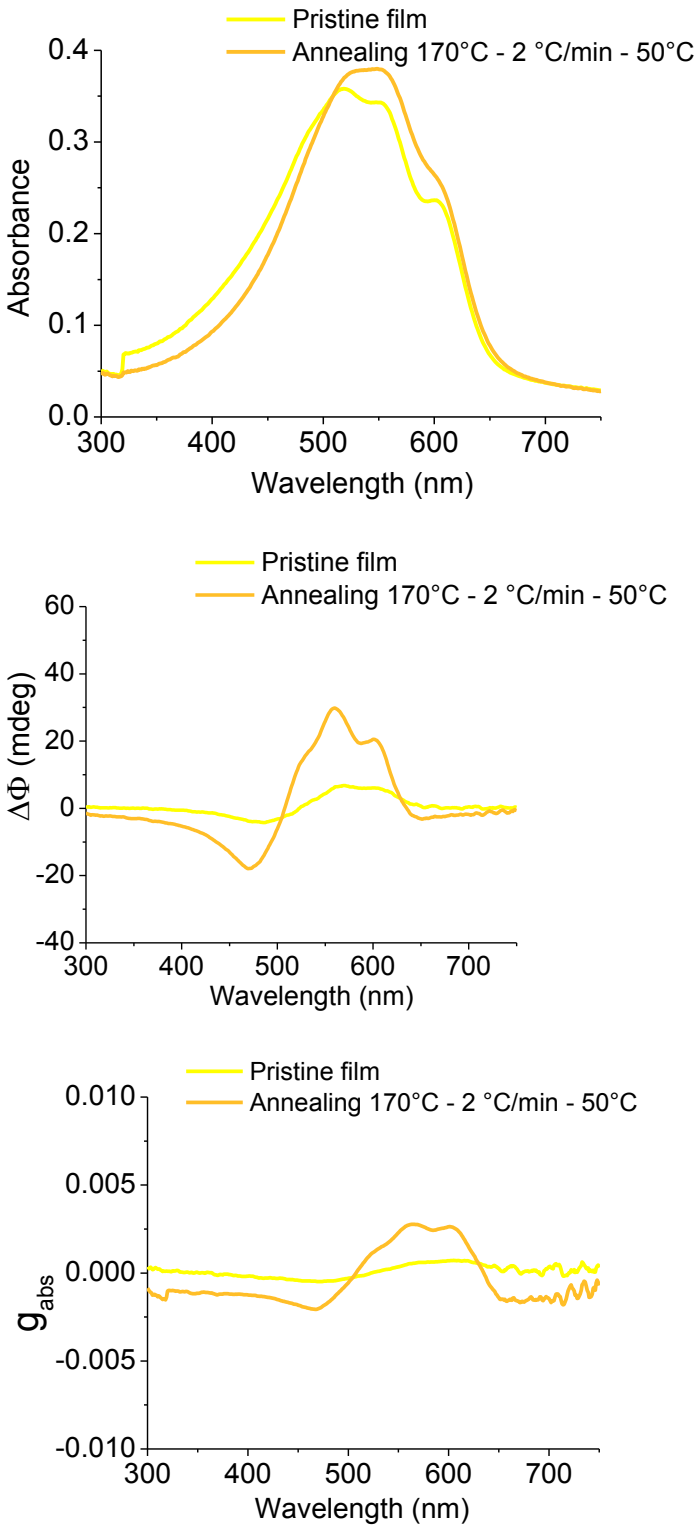


Figure S30: *UV-vis, CD and g_{abs} spectra for the annealing experiments with* ***P3*** *with fast cooling.*
Each run, the film is annealed for 1 min at the temperature given in the legend and cooled fast at room T.

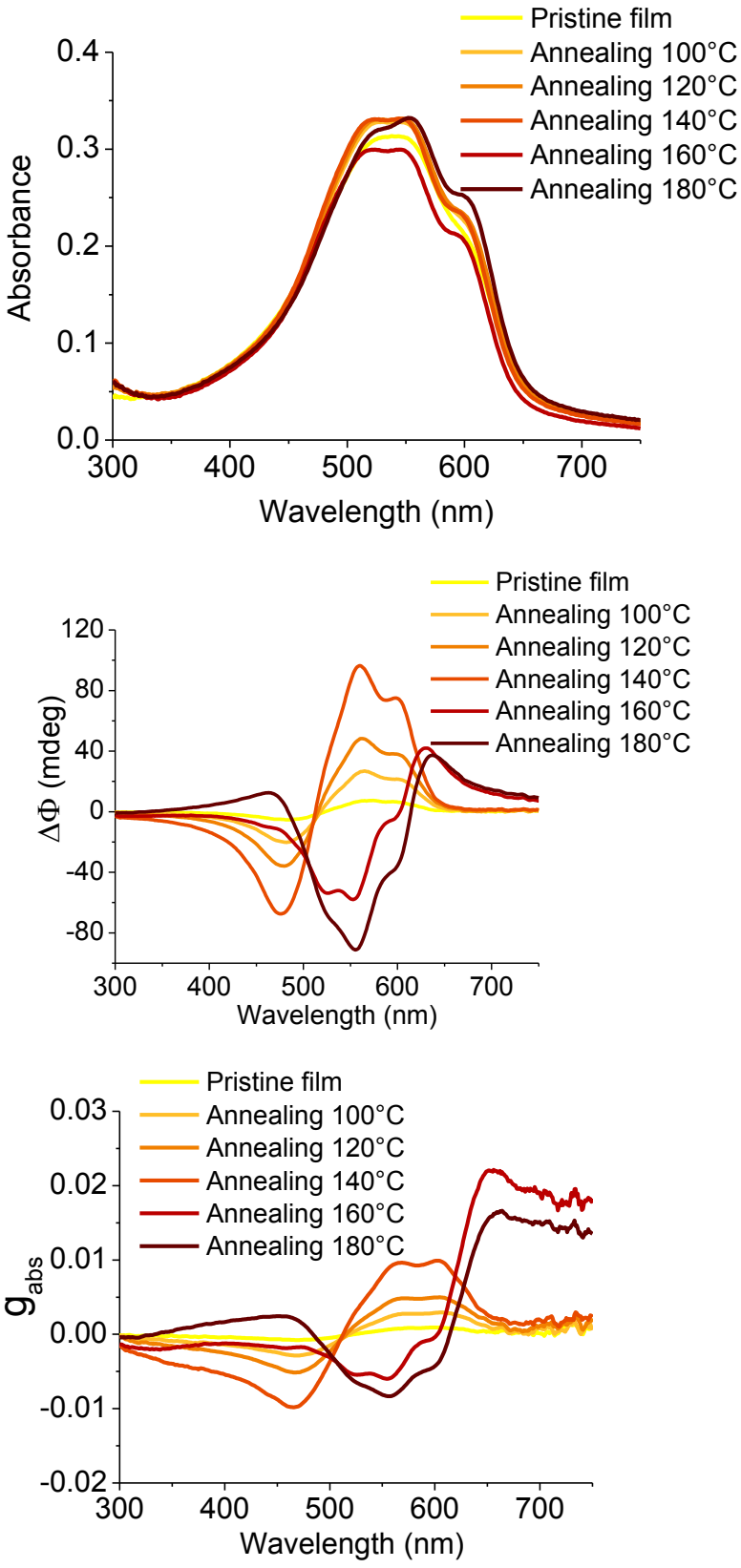


Figure S31: *UV-vis, CD and g_{abs} spectra for the annealing experiments with* ***P4*** *with fast cooling.*
Each run, the film is annealed for 1 min at the temperature given in the legend and cooled fast at room T.

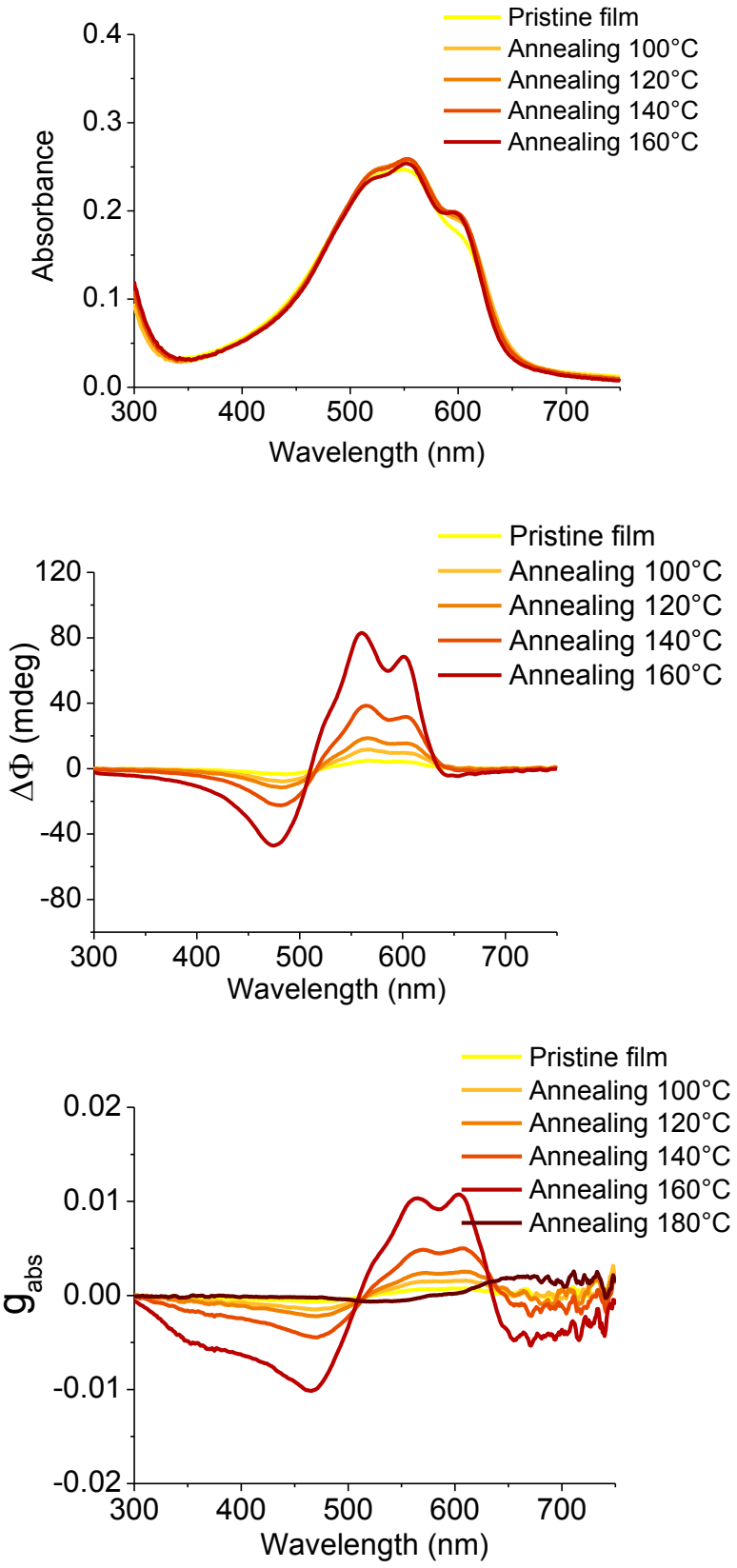


Figure S32: *UV-vis, CD and g_{abs} spectra for the annealing experiments with* ***P4*** *with slow cooling.*
Each run, the film is annealed for 1 min at the temperature given in the legend and cooled slow at 2 °C min^{-1}.

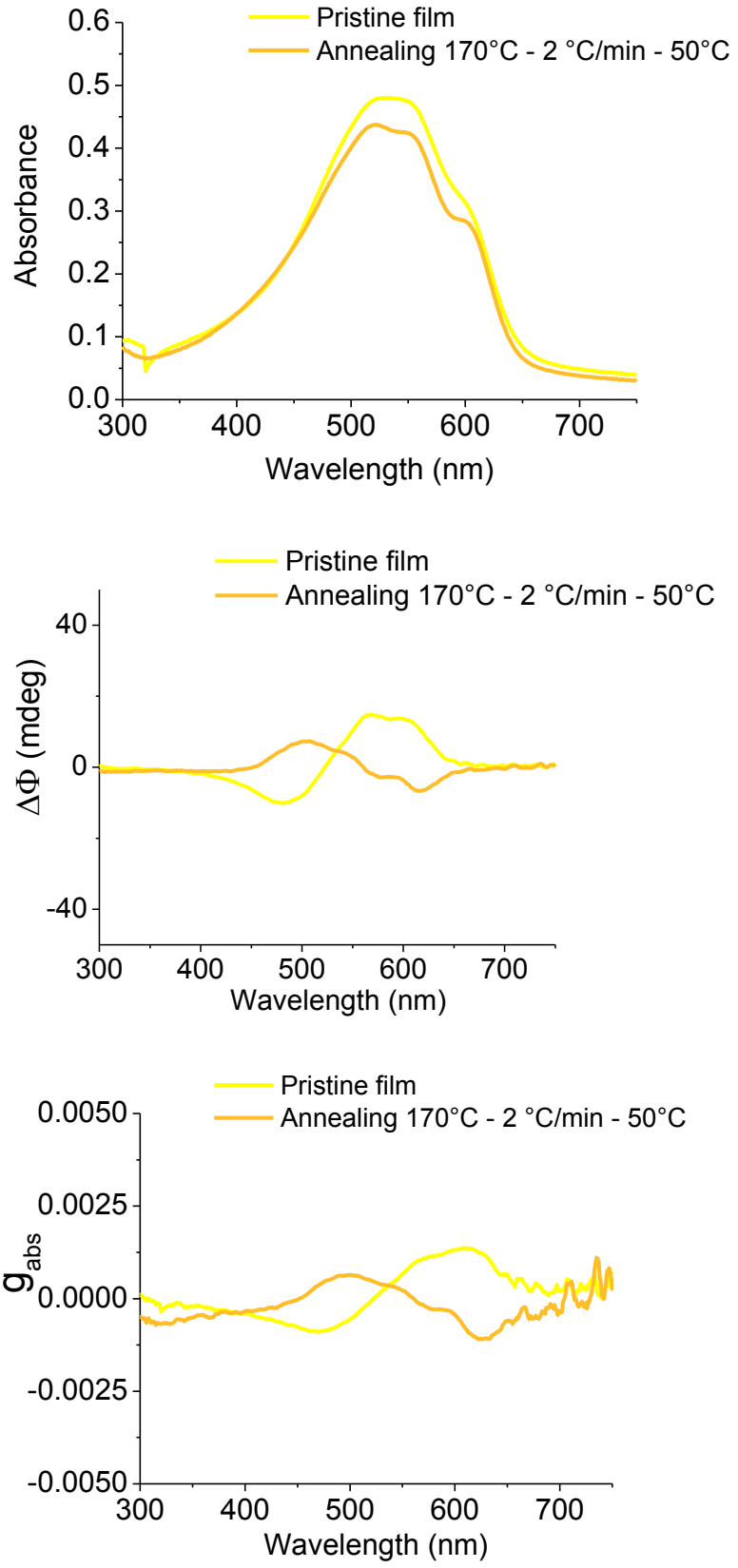


Figure S33: *UV-vis, CD and g_{abs} spectra for the annealing experiments with* ***P5*** *with fast cooling.*
Each run, the film is annealed for 1 min at the temperature given in the legend and cooled fast at room T.

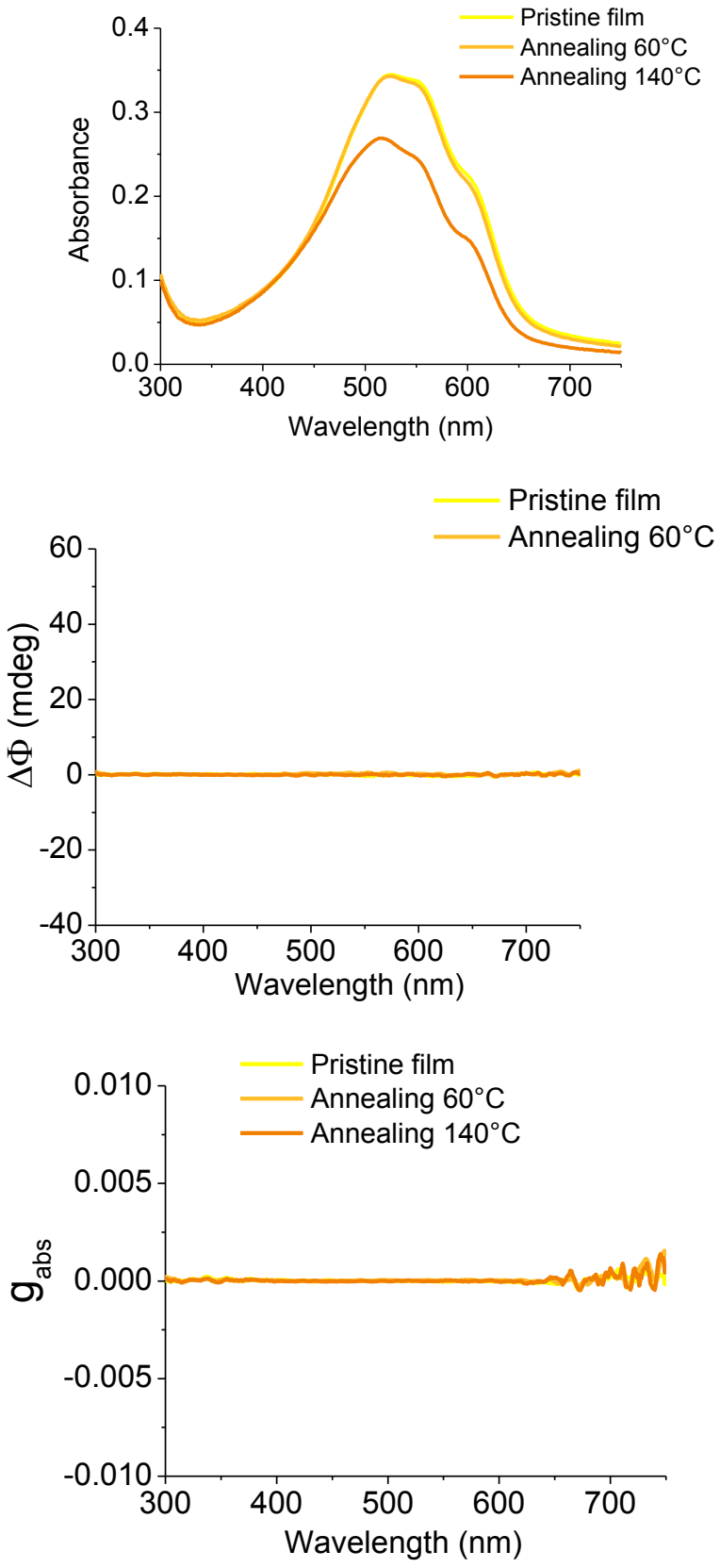


Figure S34: *UV-vis, CD and g_{abs} spectra for the annealing experiments with* ***P6*** *with fast cooling.*
Each run, the film is annealed for 1 min at the temperature given in the legend and cooled fast at room T.

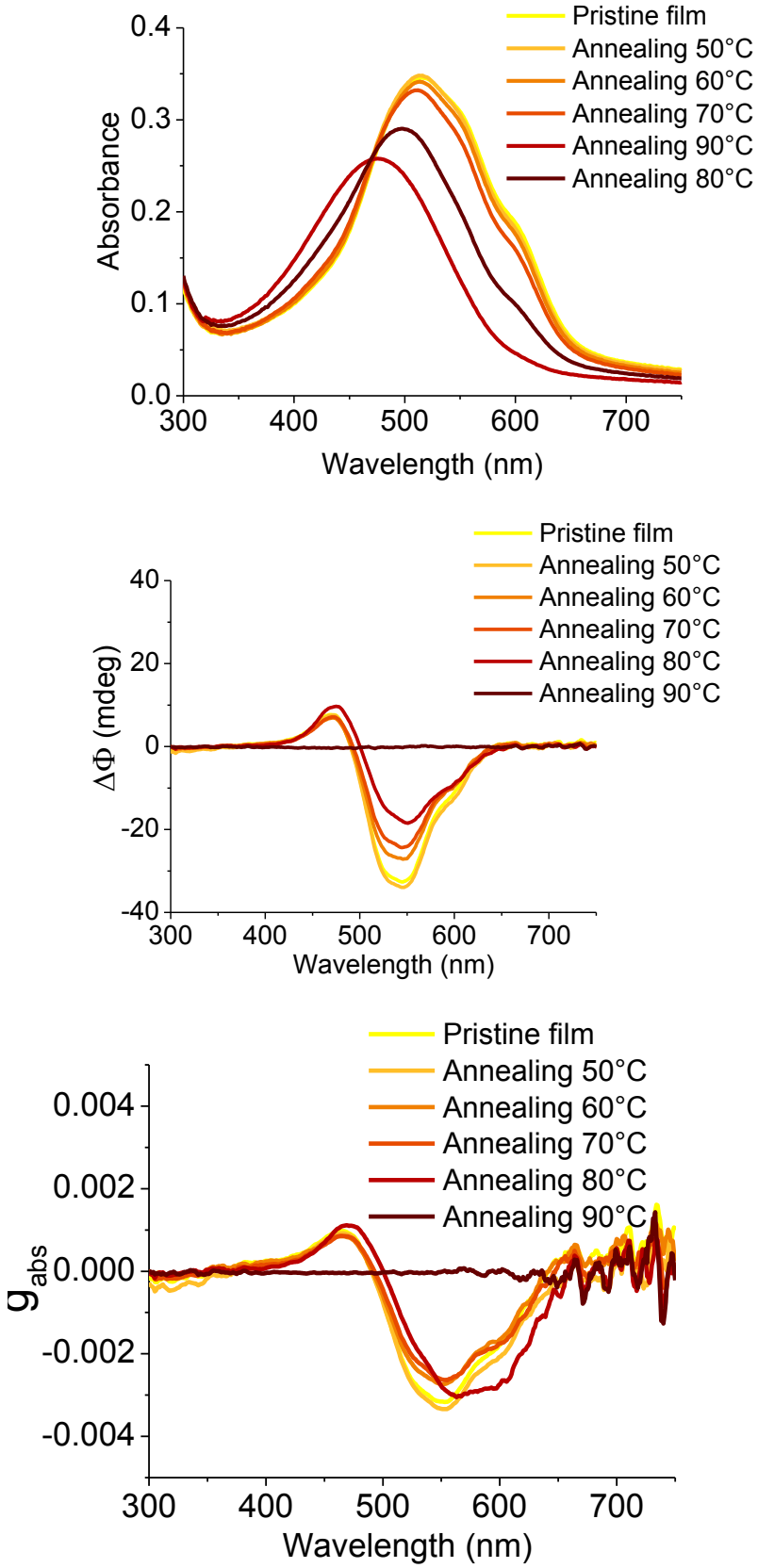
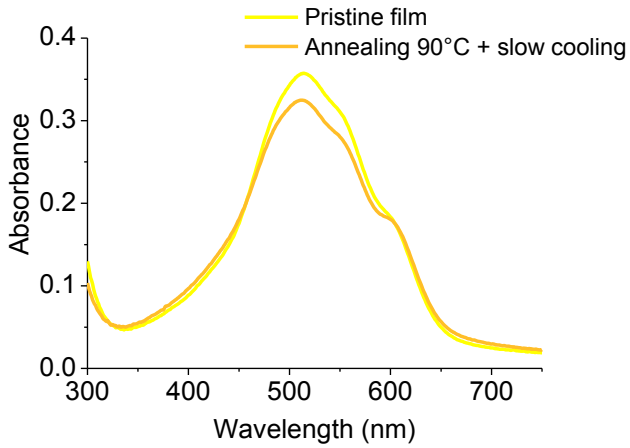
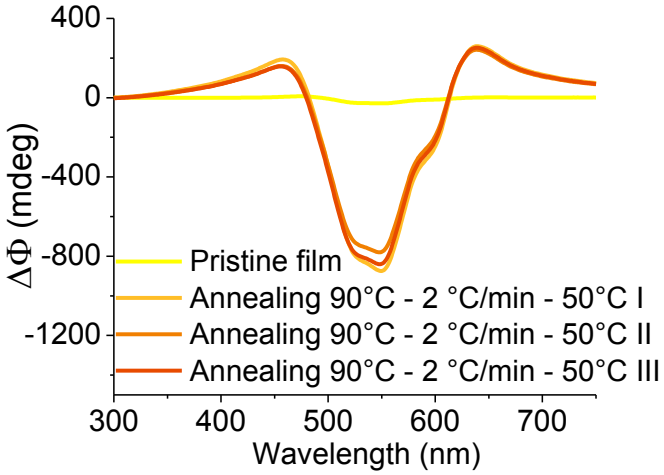
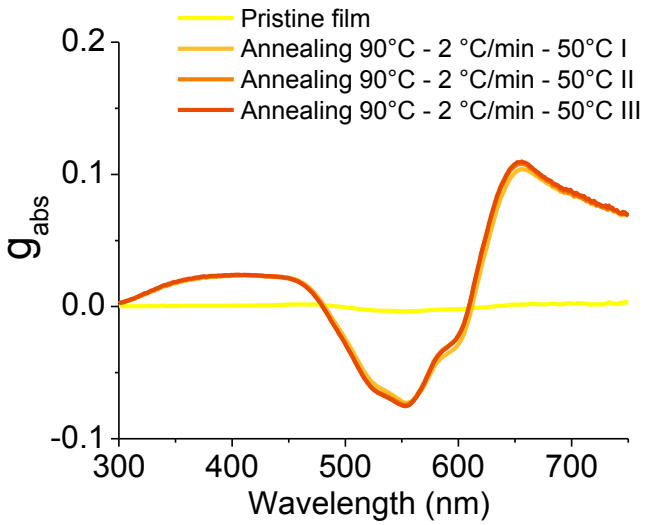


Figure S35: *UV-vis, CD and g_{abs} spectra for the annealing experiments with* ***P6*** *with slow cooling.*
Each run, the film is annealed for 1 min at the temperature given in the legend and cooled slow at 2 °C min^{-1}.





I, II an III holds different measurements of the same film but under different angles. .



ii. Spincoated from acidic media

Figure S36: *UV-vis, CD and g_{abs} spectra for the annealing experiments with* ***P2*** *with fast cooling.*
Each run, the film is annealed for 1 min at the temperature given in the legend and cooled fast at room T.

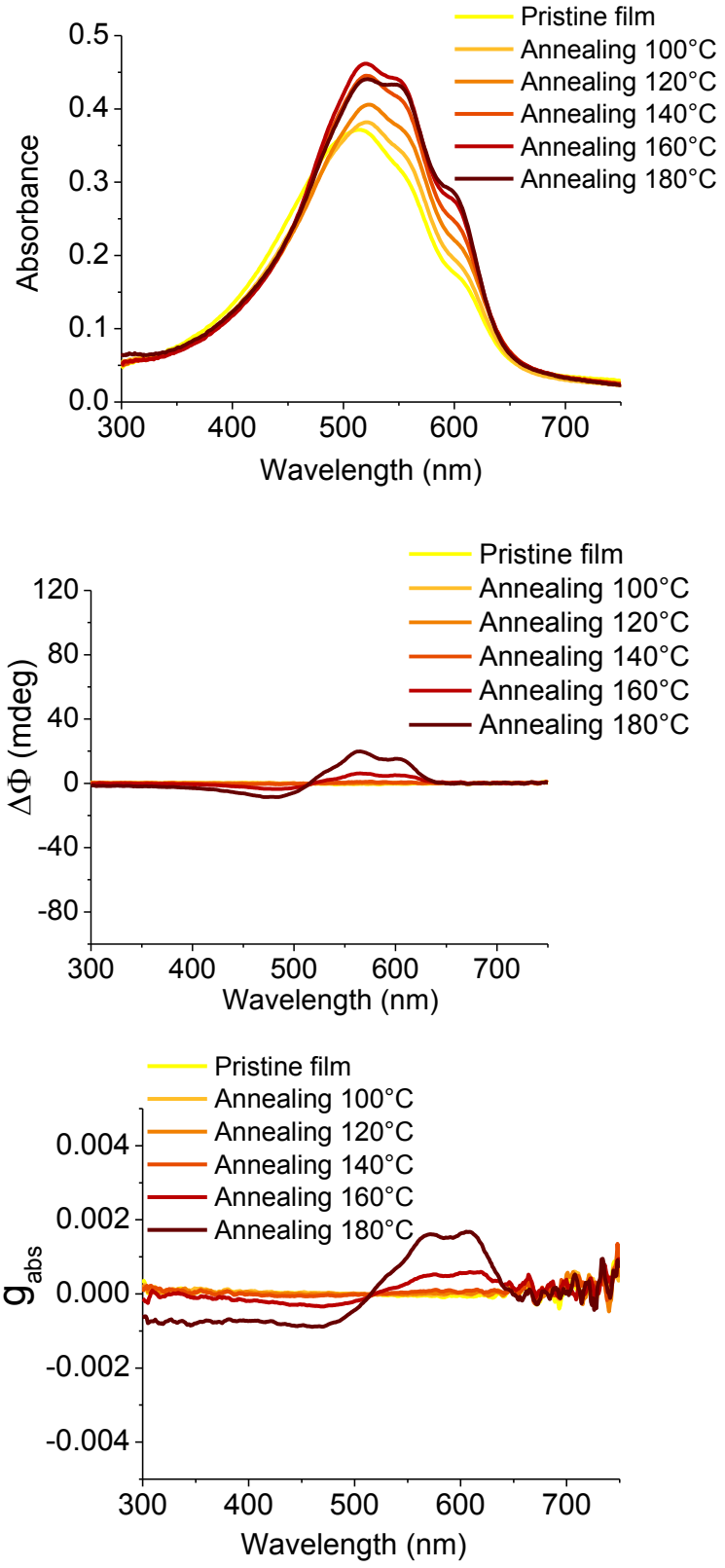


Figure S37: *UV-vis, CD and g_{abs} spectra for the annealing experiments with* ***P3*** *with fast cooling.*
Each run, the film is annealed for 1 min at the temperature given in the legend and cooled fast at room T.

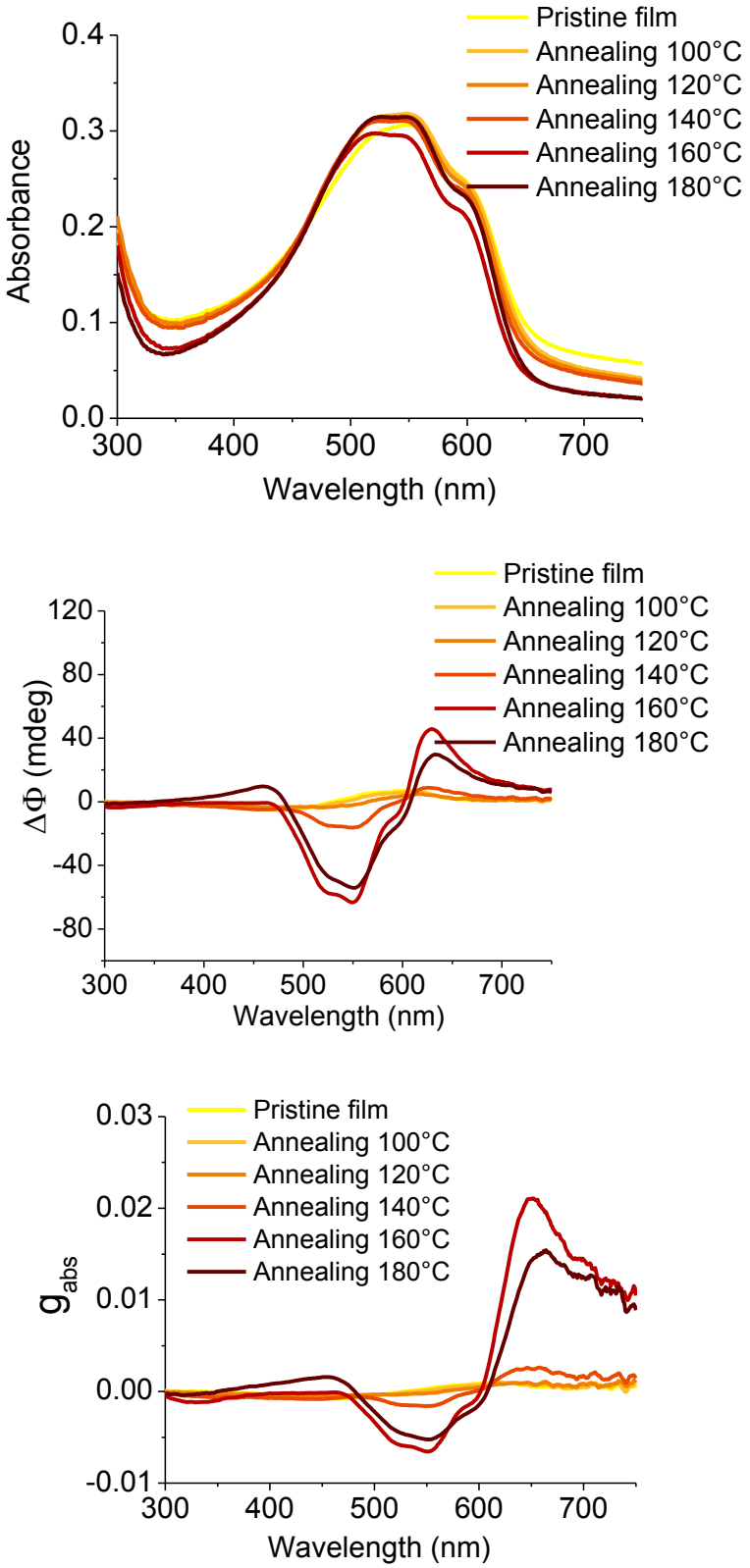


Figure S38: *UV-vis, CD and g_{abs} spectra for the annealing experiments with* ***P4*** *with fast cooling.*
Each run, the film is annealed for 1 min at the temperature given in the legend and cooled fast at room T.

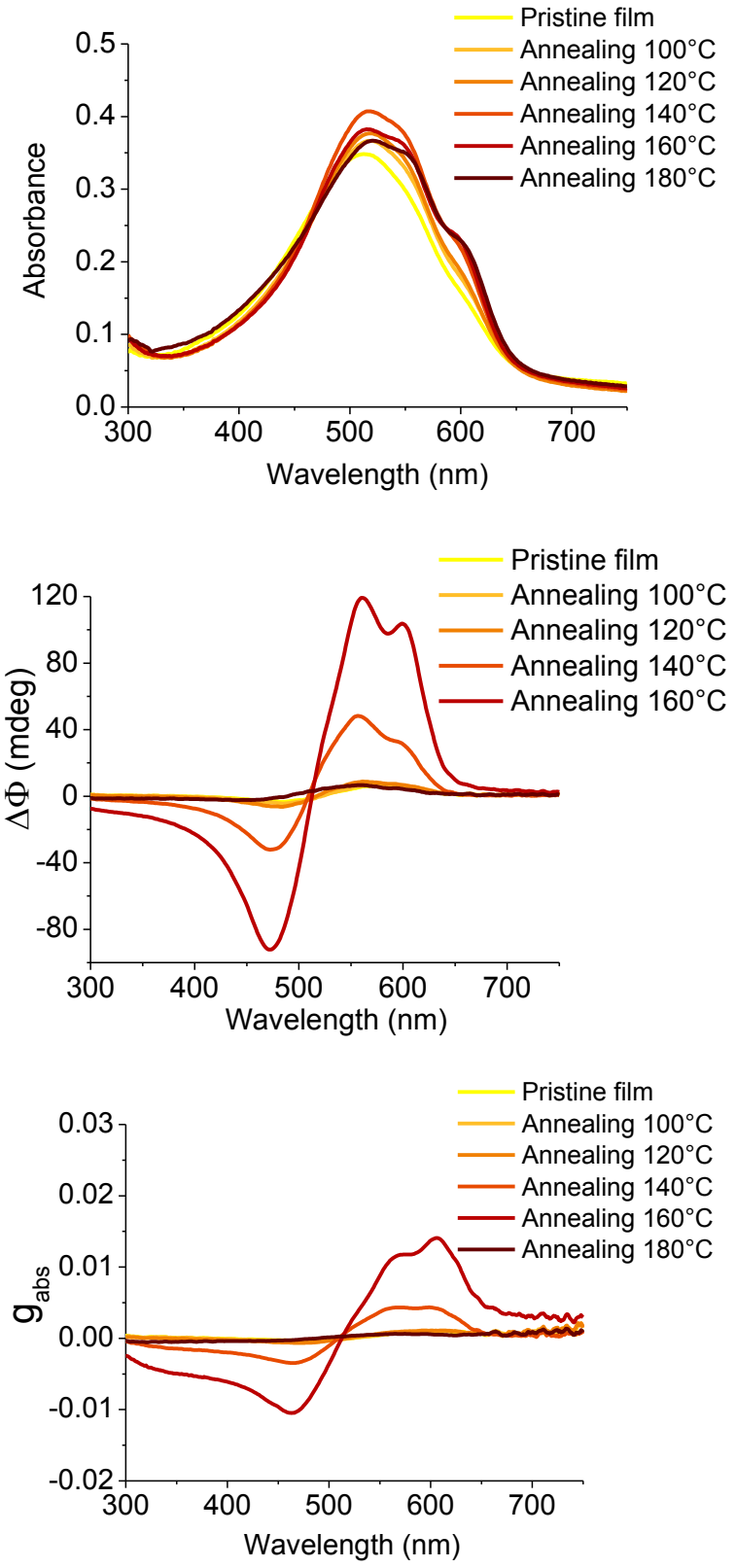


Figure S39: *UV-vis, CD and g_{abs} spectra for the annealing experiments with* ***P6*** *with fast cooling.*
Each run, the film is annealed for 1 min at the temperature given in the legend and cooled fast at room T.

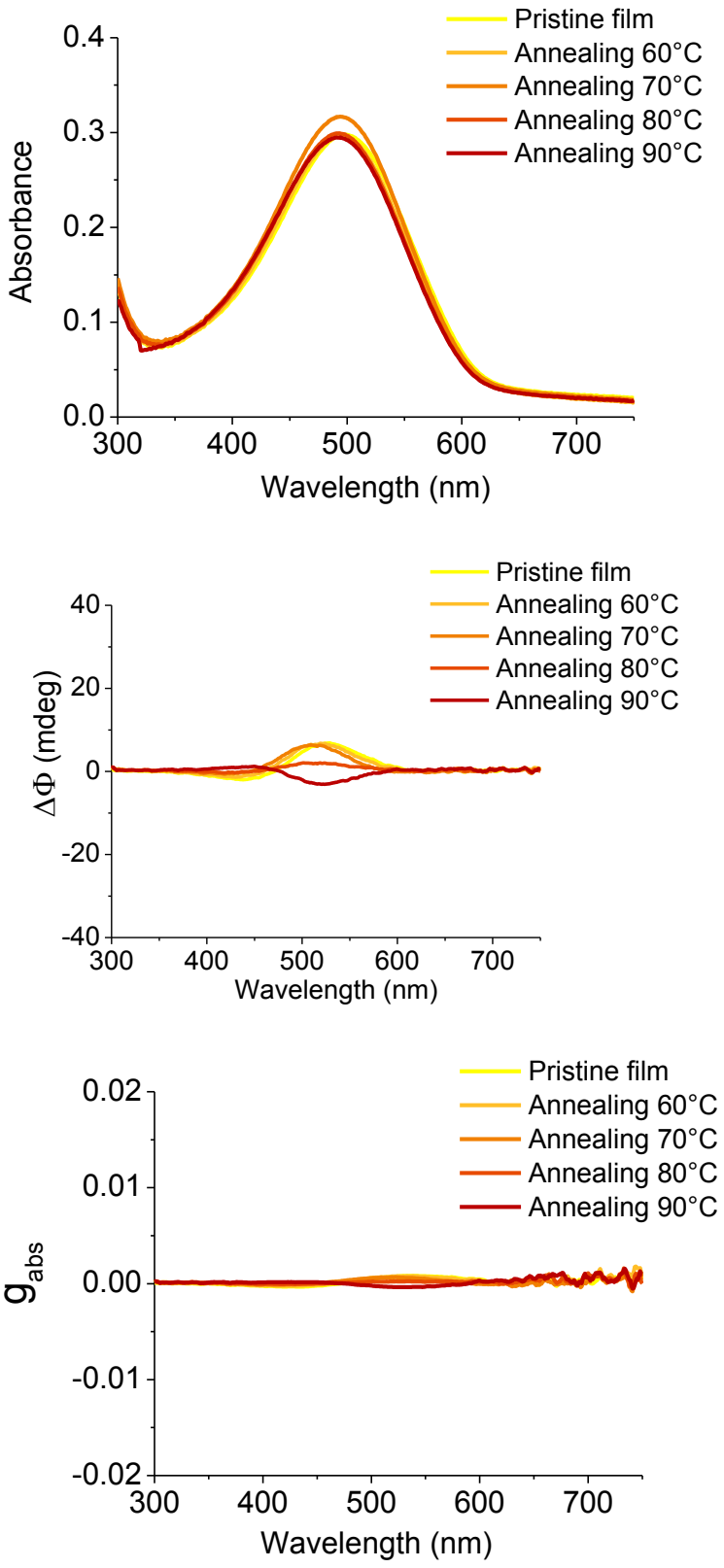


Figure S40: *UV-vis, CD and g_{abs} spectra for the annealing experiments with* ***P6*** *with slow cooling.*
Each run, the film is annealed for 1 min at the temperature given in the legend and cooled slow at 2 °C min^{-1}.

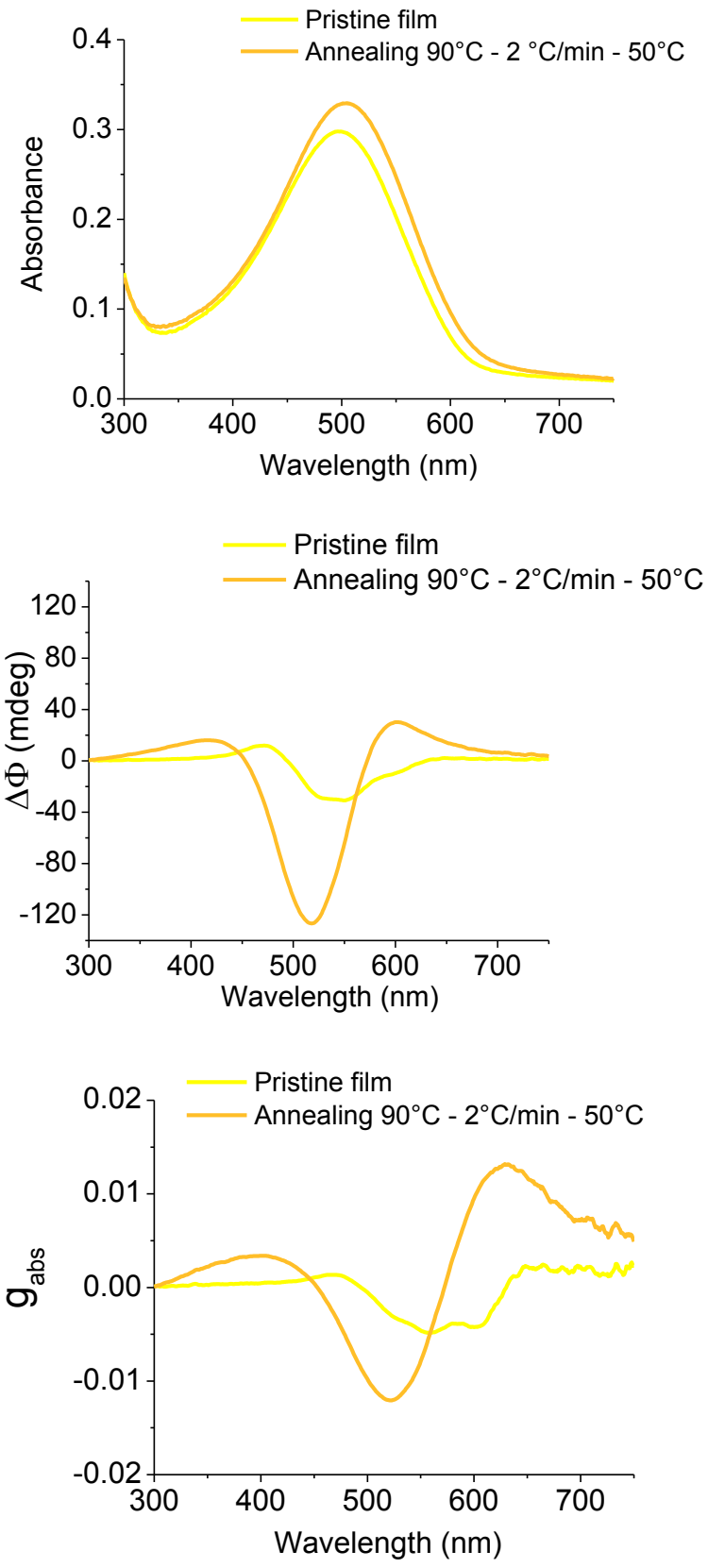


Figure S41: *UV-vis, CD and g_{abs} spectra for the spincoated films of* ***P6*** *with different film thicknesses.*
The concentration of the solution in mg/ml used for spincoating is given at the end of the label in the legend.

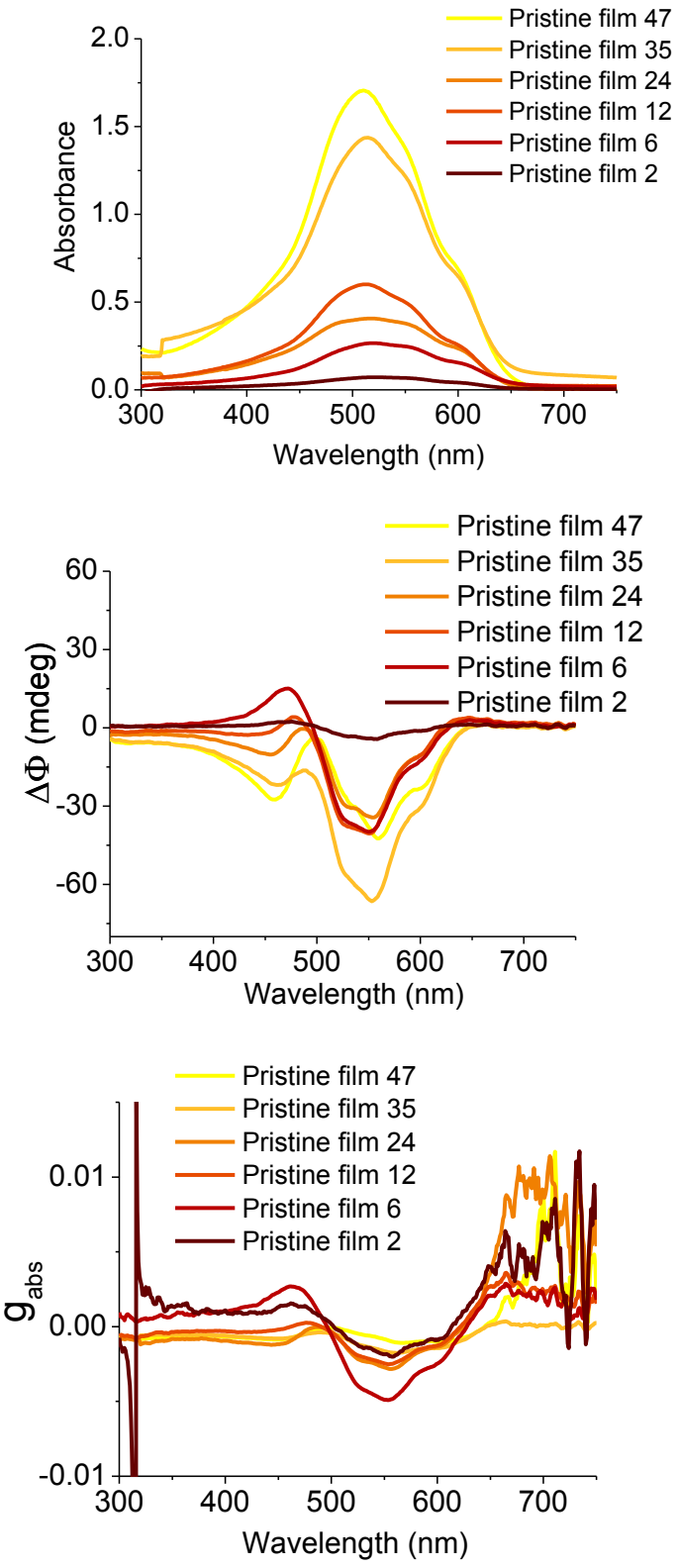


Figure S42: *UV-vis, CD and g_{abs} spectra for the annealing experiments with* ***P6*** *with different film thicknesses and fast cooling.*
Each run, the film is annealed for 1 min at the temperature given in the legend and cooled fast at room T. The concentration of the solution in mg/ml used for spincoating is given at the end of the label in the legend.

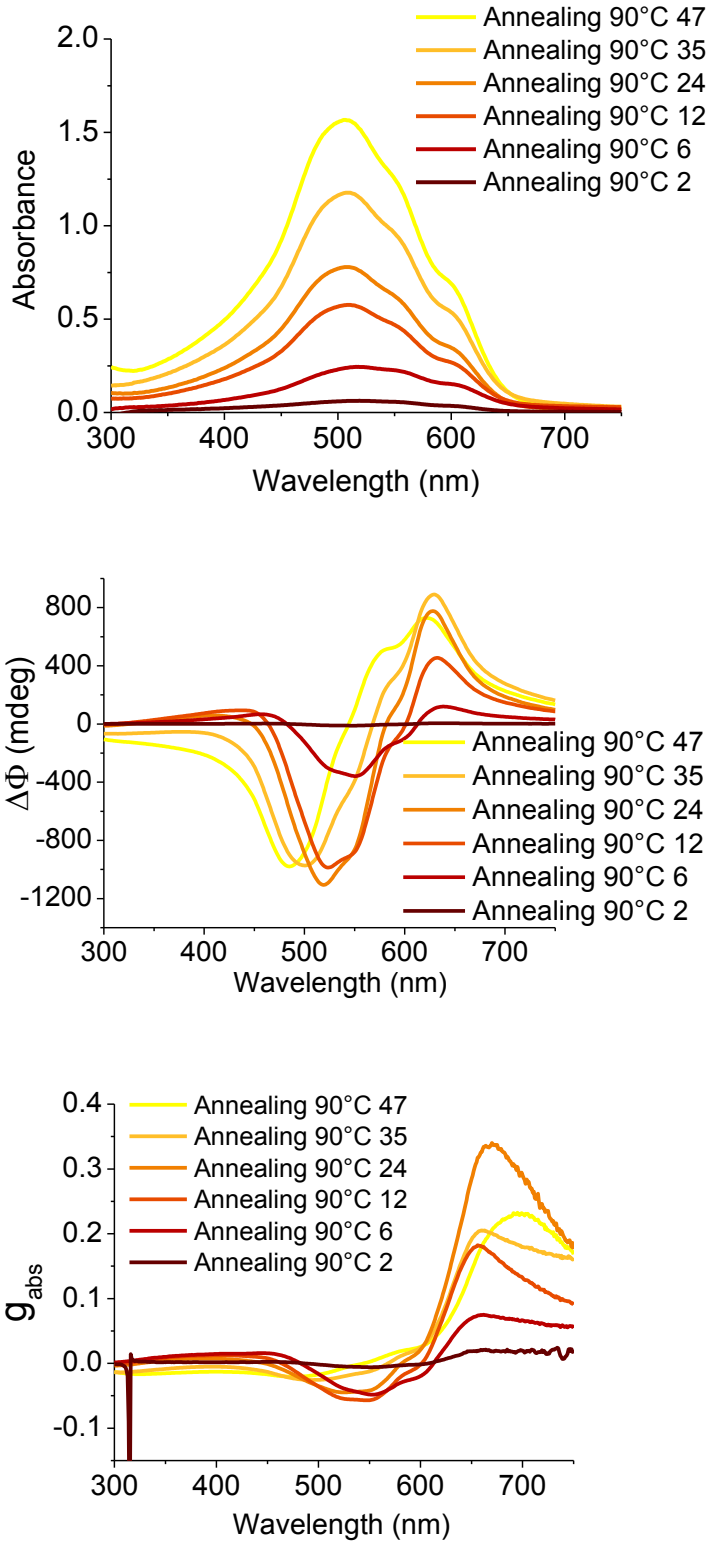
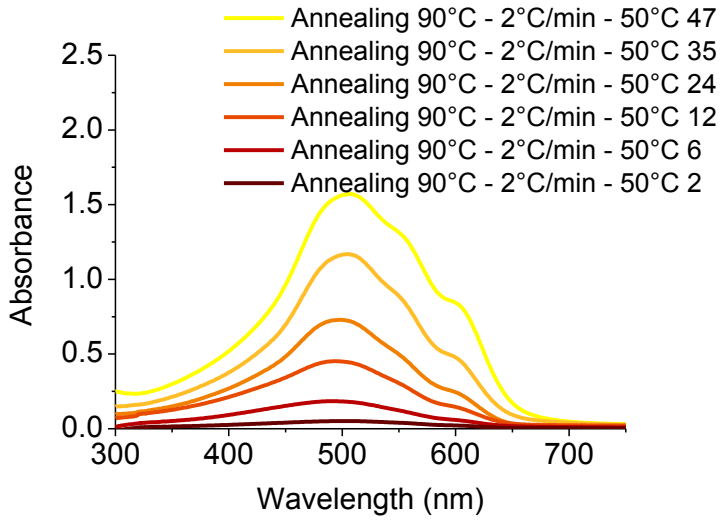
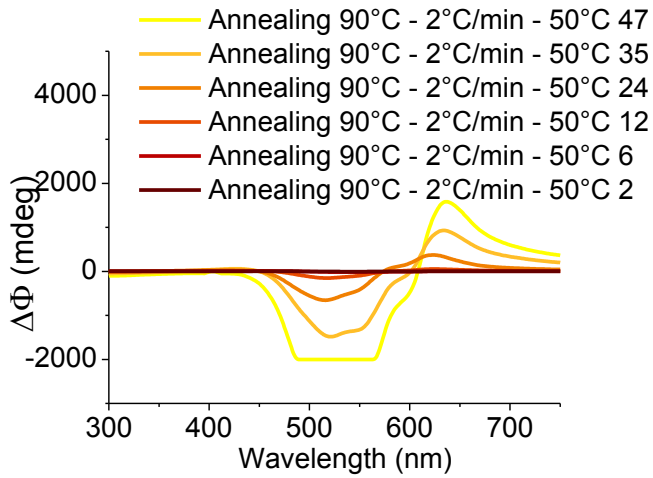
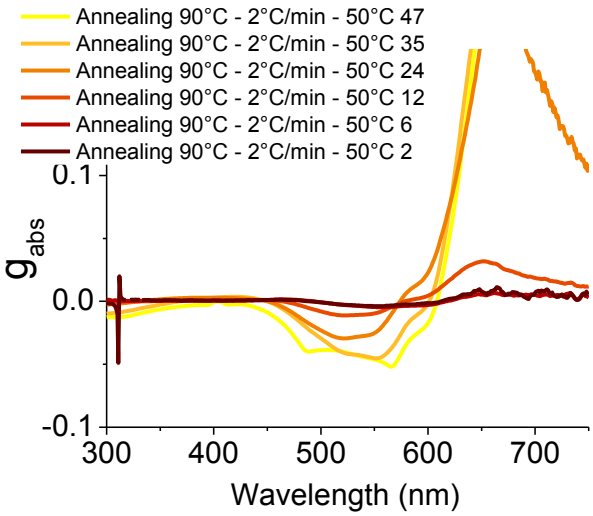


Figure S43: *UV-vis, CD and g_{abs} spectra for the annealing experiments with* ***P6*** *with different film thicknesses and slow cooling.*

Each run, the film is annealed for 1 min at the temperature given in the legend and cooled slow at 2 °C min^{-1}. The concentration of the solution in mg/ml used for spincoating is given at the end of the label in the legend.



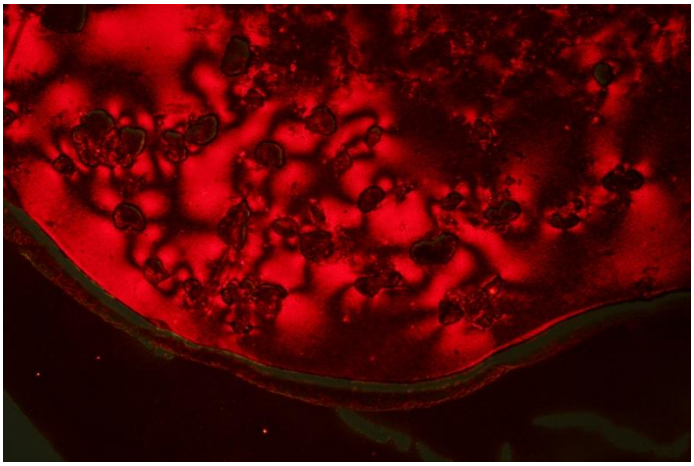




C. Polarizing optical microscopy (POM)

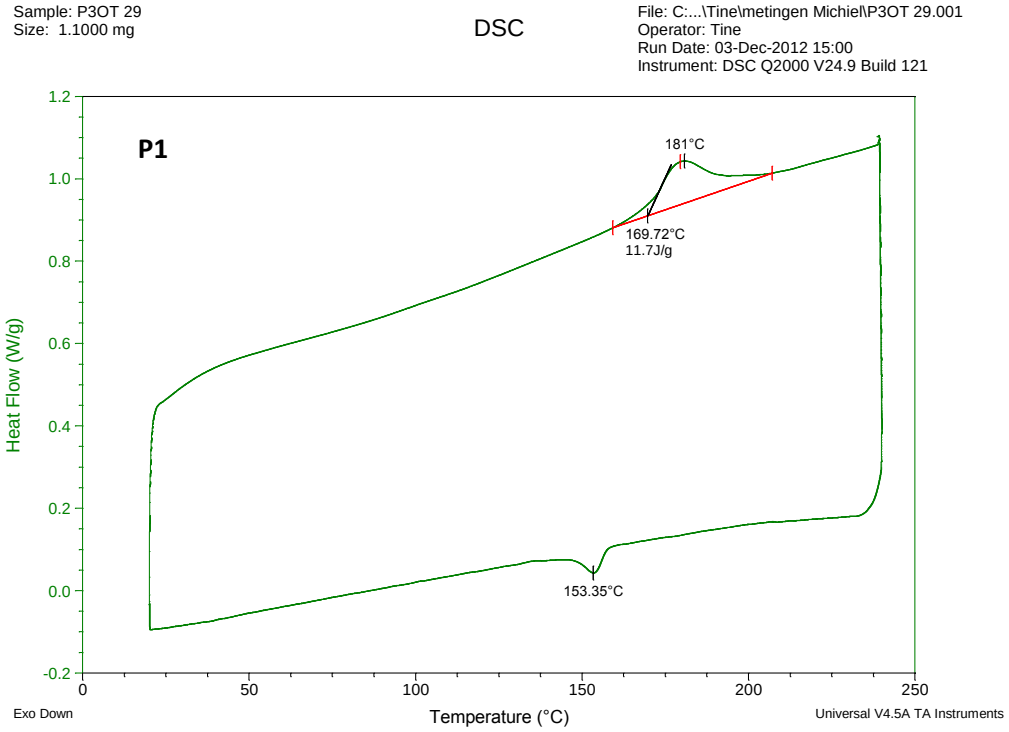
Figure S44: *POM picture of the* ***P6*** *polymer sample during slow cooling from 90 °C.*

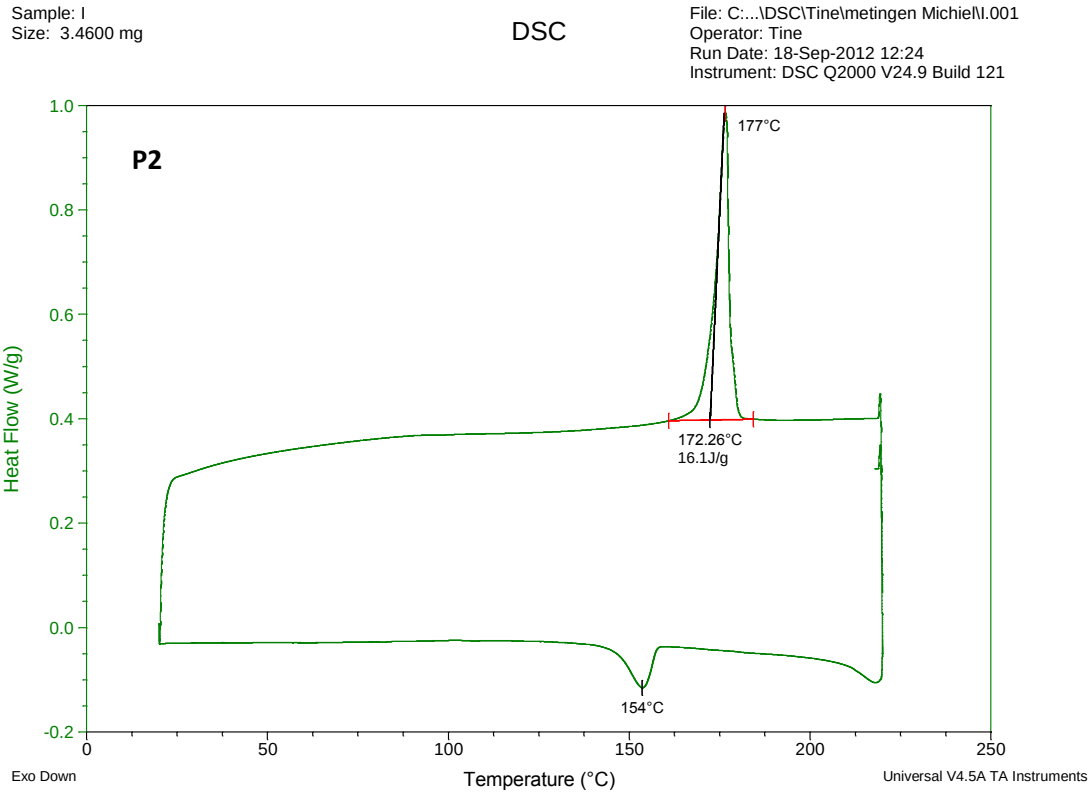
The picture of the defect texture was taken at 68 °C (100 × magnification).

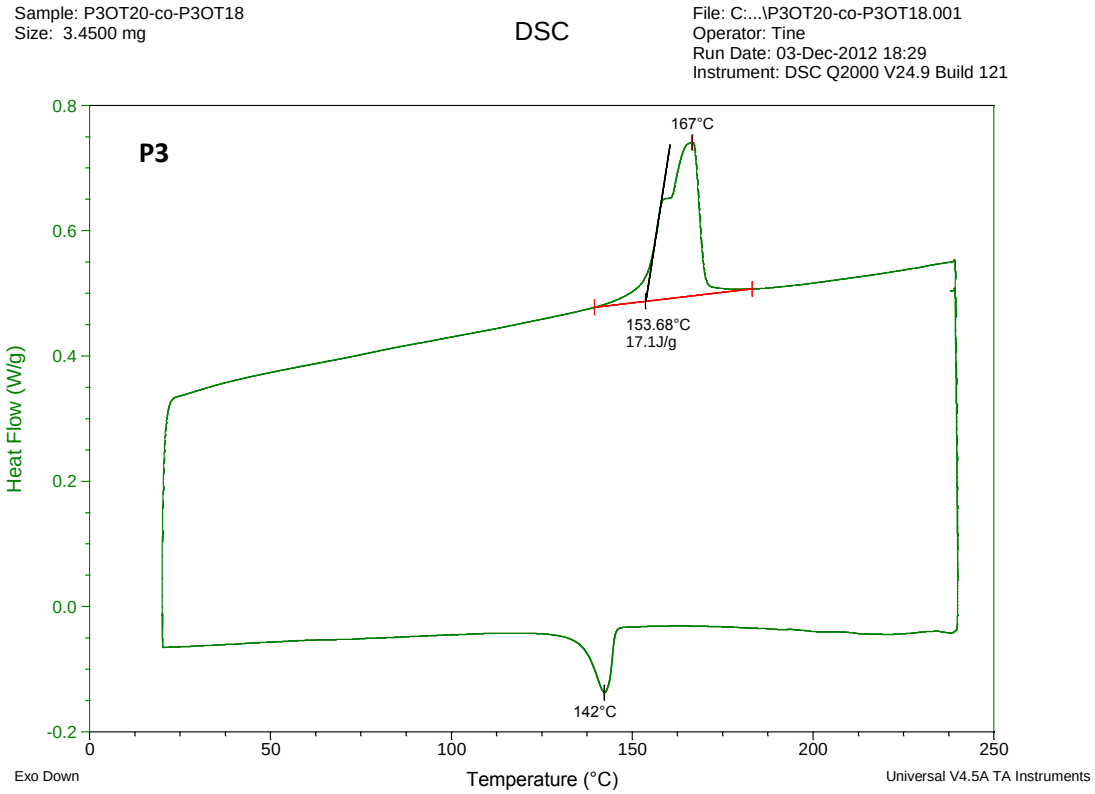


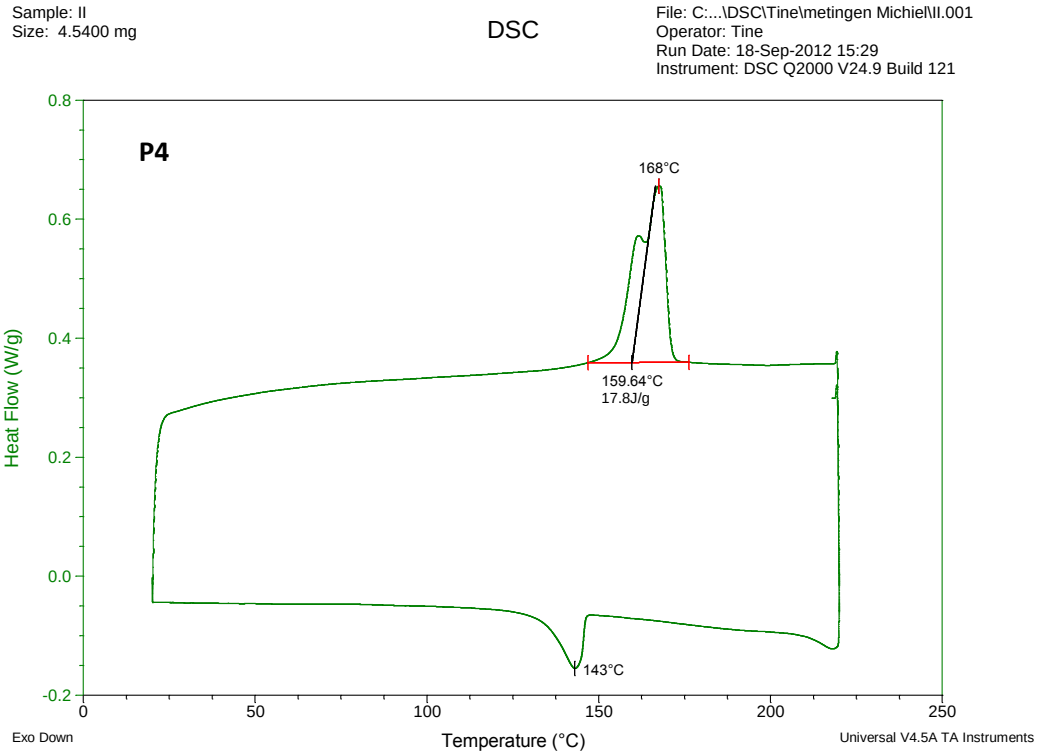
D. Differential scanning calorimetry (DSC) of polymers P1-P6

The polymers were first heated well above their melting temperature, kept at this temperature for 15 minutes and then slowly cooled down at 2°C min^{-1}. Finally, the melting temperatures were also determined by reheating the samples at 10°C min^{-1}.






Sample: P3OT20-co-P3OT18
Size: 3.4500 mg
DSC
File: C:...\P3OT20-co-P3OT18.001
Operator: Tine
Run Date: 03-Dec-2012 18:29
Instrument: DSC Q2000 V24.9 Build 121
P3
167°C
153.68°C
17.1J/g
142°C
Heat Flow (W/g)
Temperature (°C)
Exo Down
Universal V4.5A TA Instruments


Sample: II
Size: 4.5400 mg
DSC
File: C:...\DSC\Tine\metingen Michiel\II.001
Operator: Tine
Run Date: 18-Sep-2012 15:29
Instrument: DSC Q2000 V24.9 Build 121
P4
168°C
159.64°C
17.8J/g
143°C
Heat Flow (W/g)
Temperature (°C)
Exo Down
Universal V4.5A TA Instruments