Supporting Information for:

Synthesis and Evaluation of Scalable D-A-D π-Extended Oligomers as p-Type Organic Materials for Bulk-Heterojunction Solar Cells

Peshawa Osw, Andrea Nitti, Media N. Abdullah, Samuel I. Etkind, Jeremiah Mwaura, Alessandro Galbiati, and Dario Pasini

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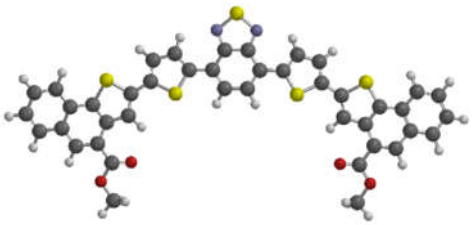
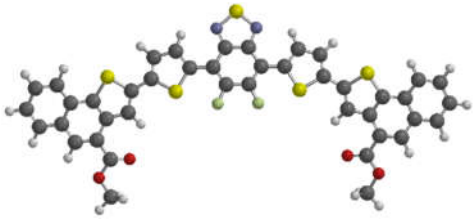
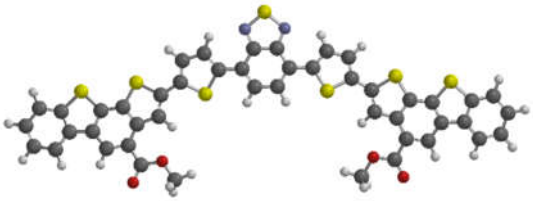
Compound **7**



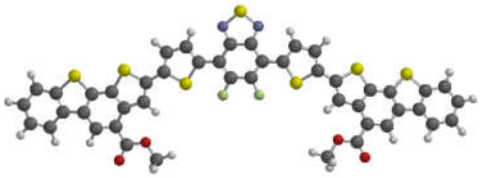
Compound **8**



Compound **9**



Compound **10**



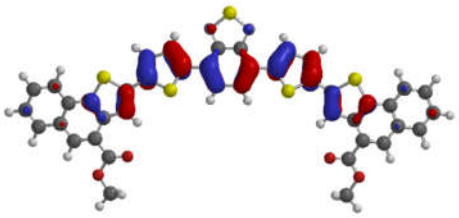
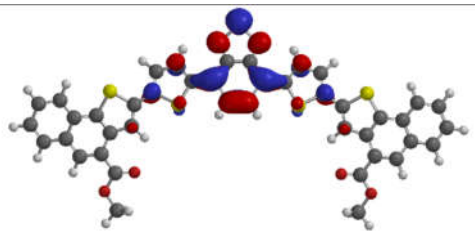
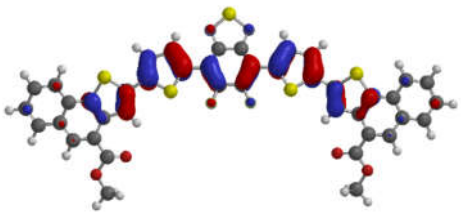
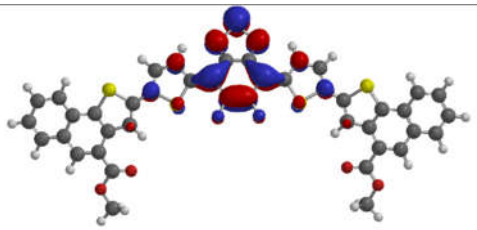
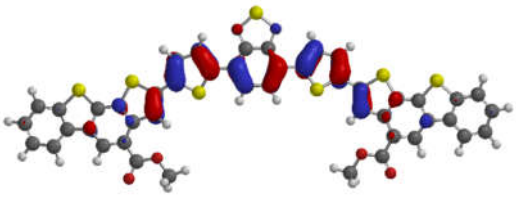
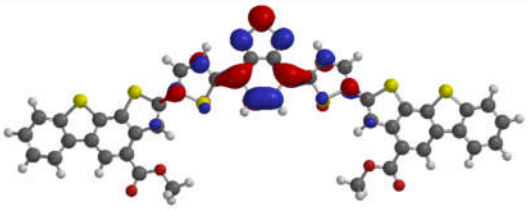
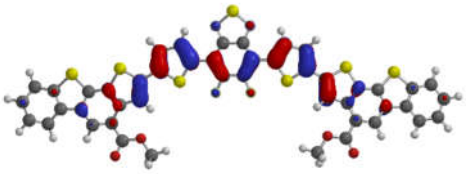
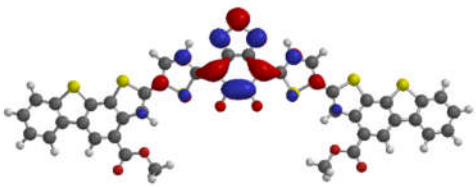
	HOMO	LUMO
7		
8		
9		
10		

Figure S1. Computationally determined structures of the HOMO and LUMO for compounds **7-10**.

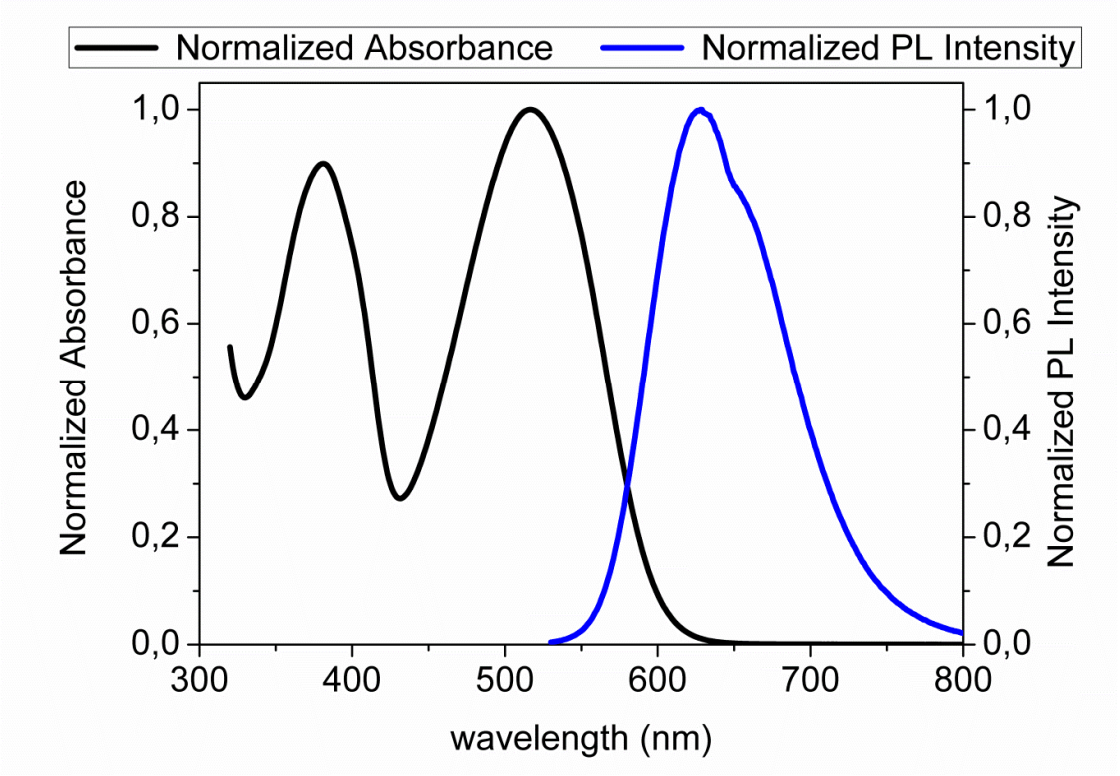


Figure S2. Normalized UV-Vis spectra (black) and PL spectra (Blue) of **7**.

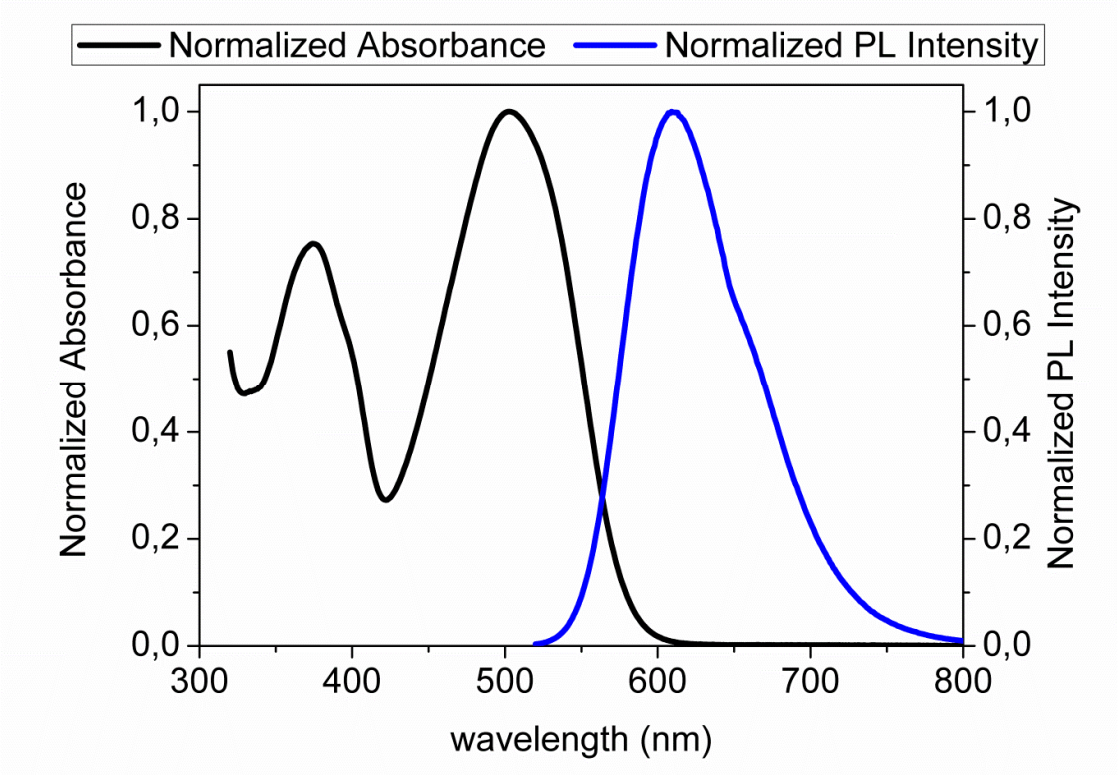


Figure S3. Normalized UV-Vis spectra (black) and PL spectra (Blue) of **8**.

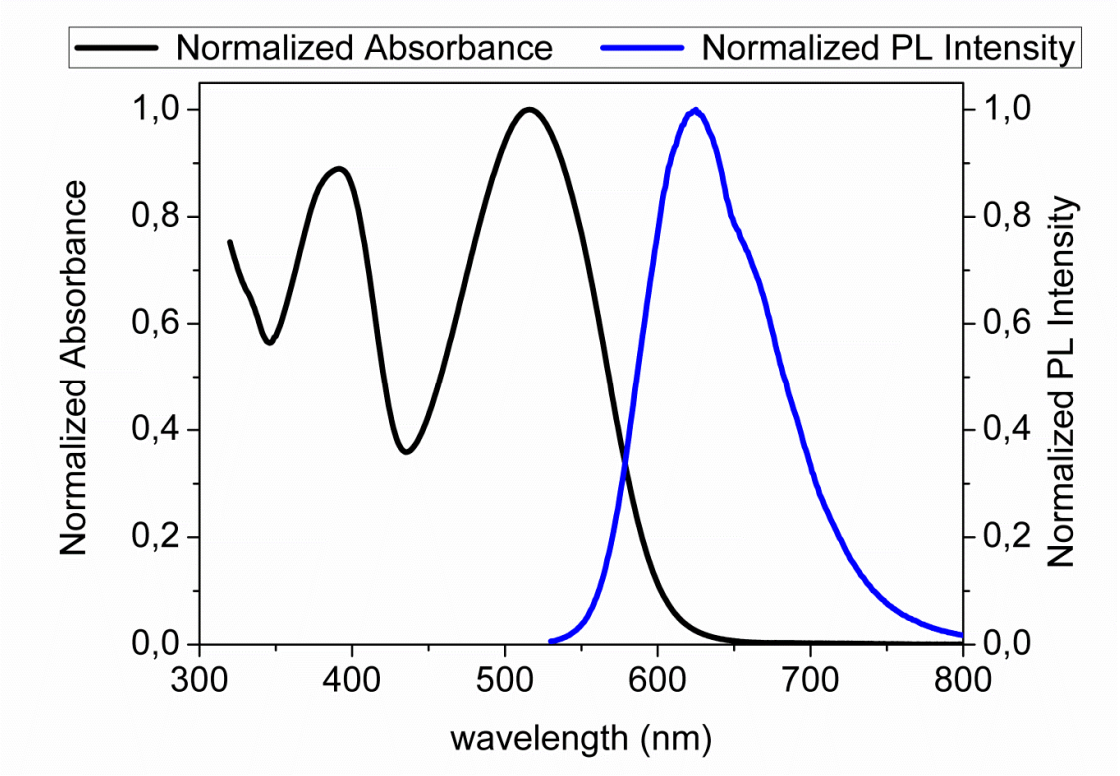


Figure S4. Normalized UV-Vis spectra (black) and PL spectra (Blue) of **9**.

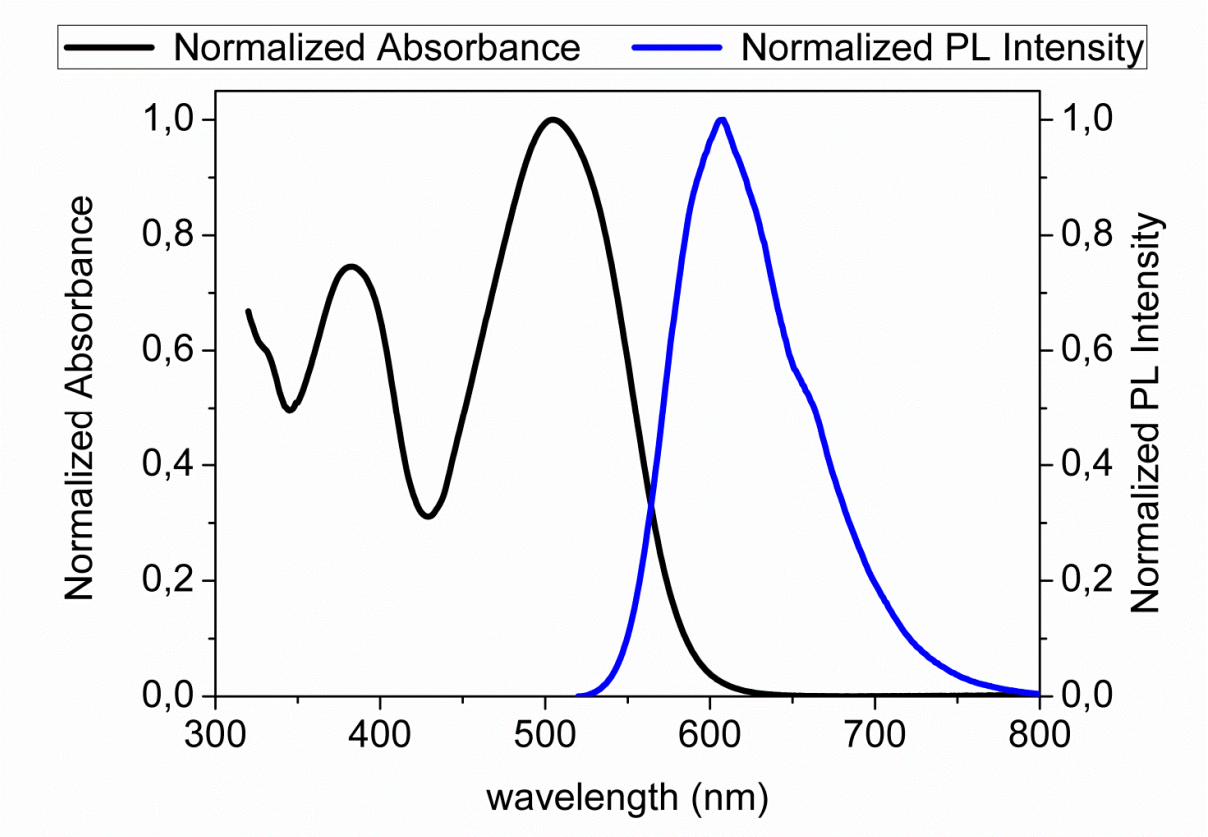


Figure S5. Normalized UV-Vis spectra (black) and PL spectra (Blue) of **10**.

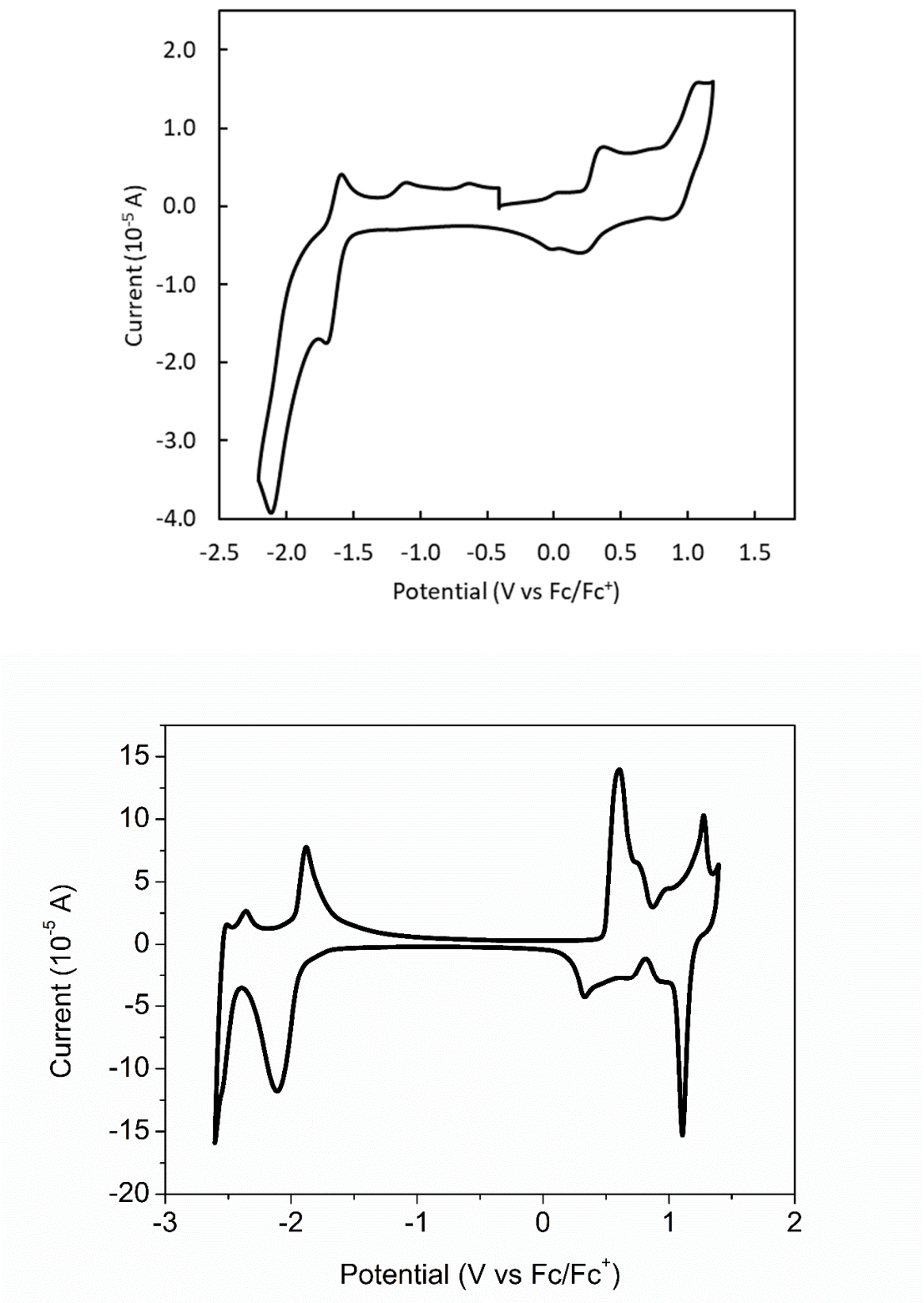


Figure S6. Cyclic Voltammogram of **7** in 0.1 M $TBAPF_6$ in CH_2Cl_2 (Top) and in solid state (Bottom).

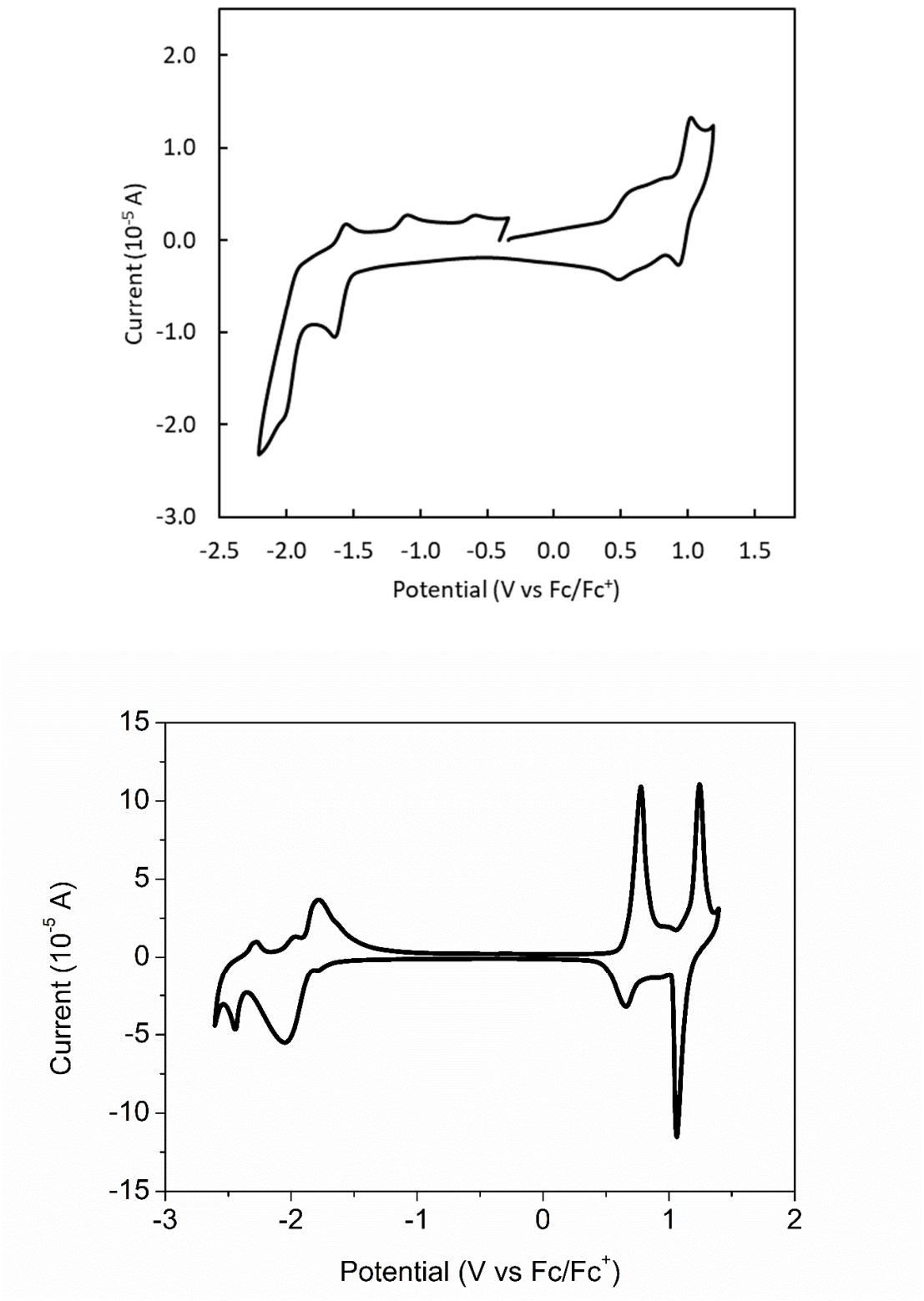


Figure S7. Cyclic Voltammogram of **8** in 0.1 M $TBAPF_6$ in CH_2Cl_2 (Top) and in solid state (Bottom).

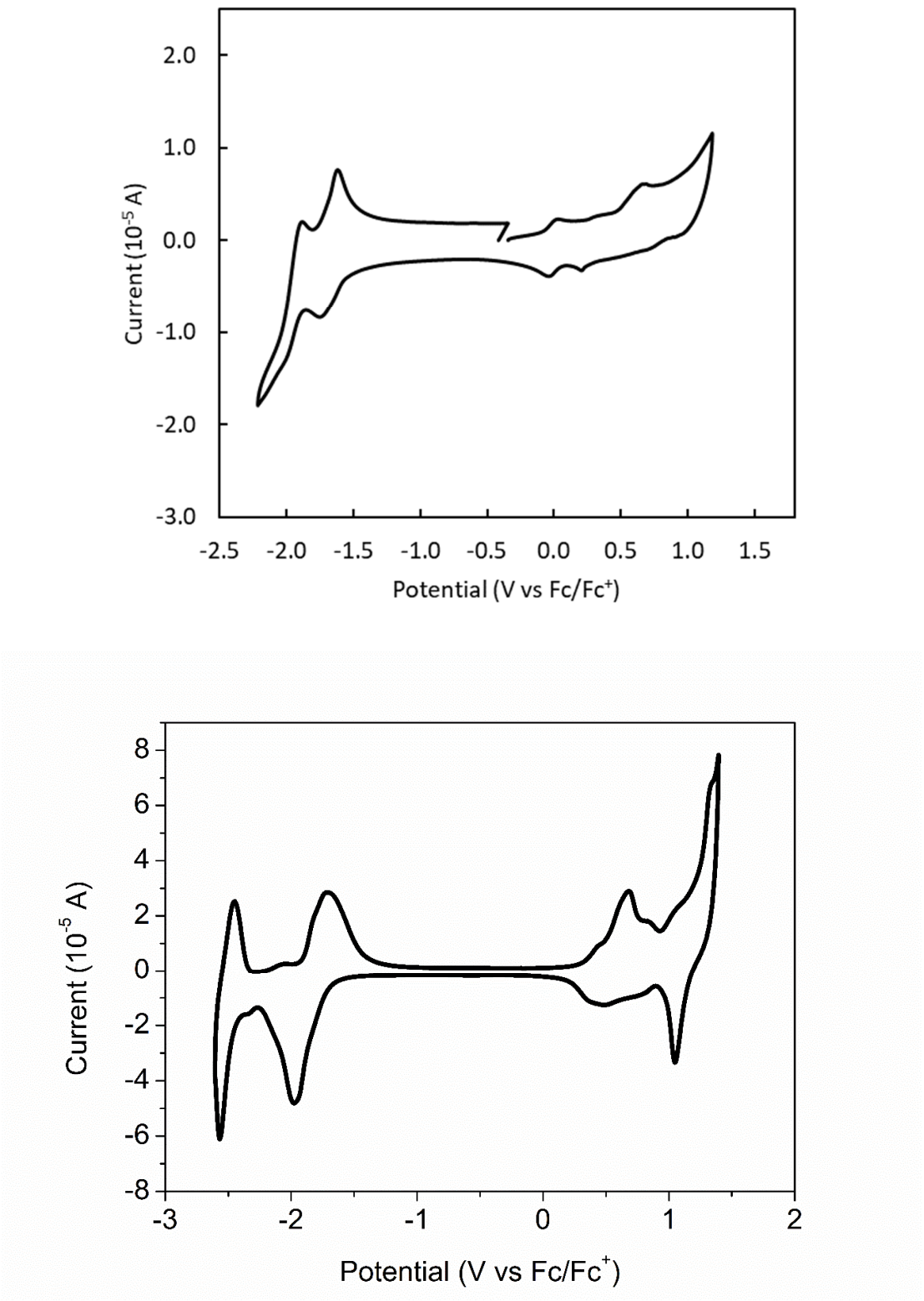


Figure S8. Cyclic Voltammogram of **9** in 0.1 M $TBAPF_6$ in CH_2Cl_2 (Top) and in solid state (Bottom).

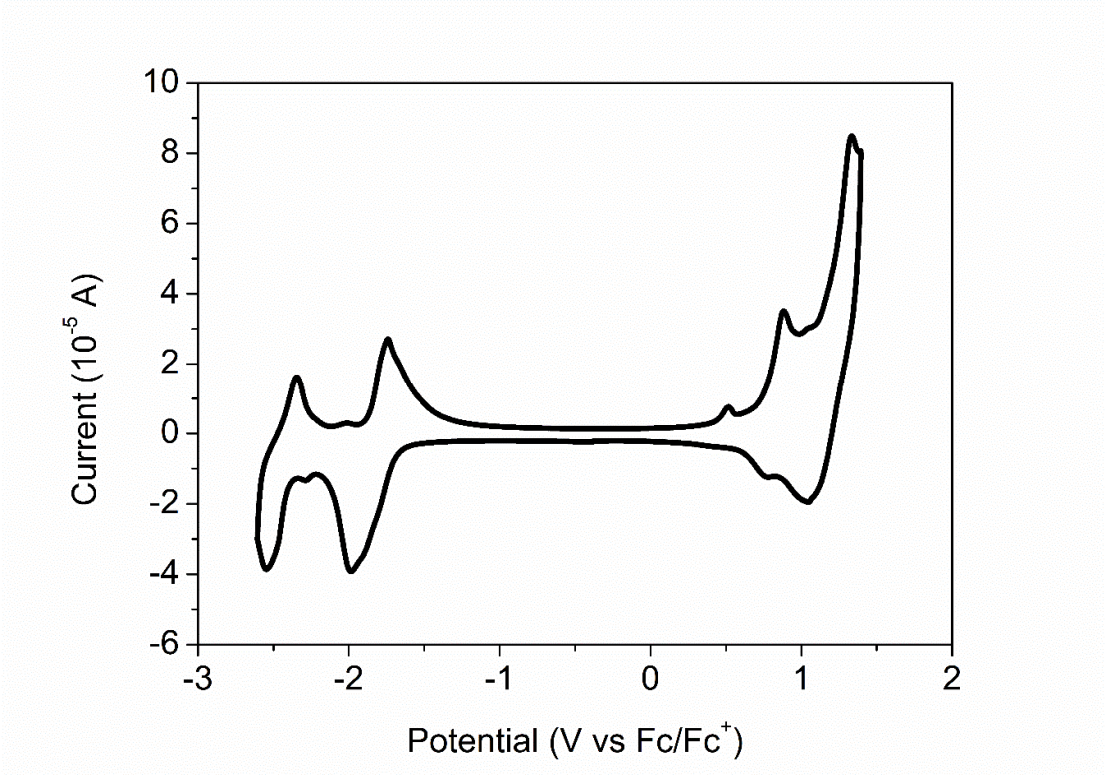


Figure S9. Cyclic Voltammogram of **10** in solid state.

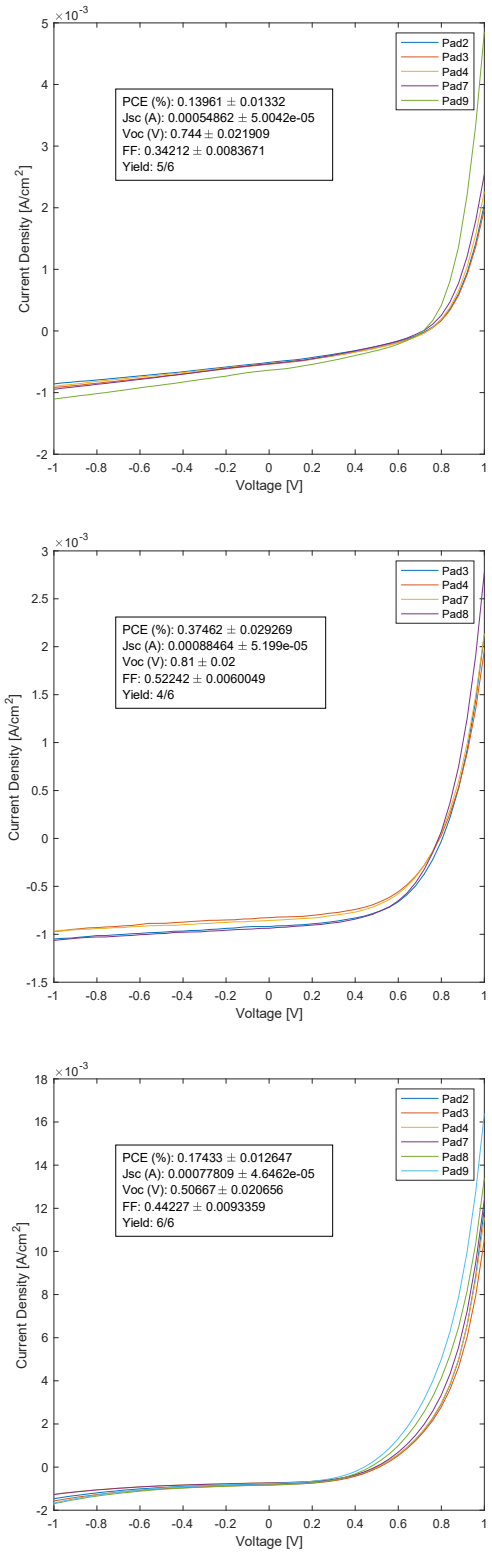
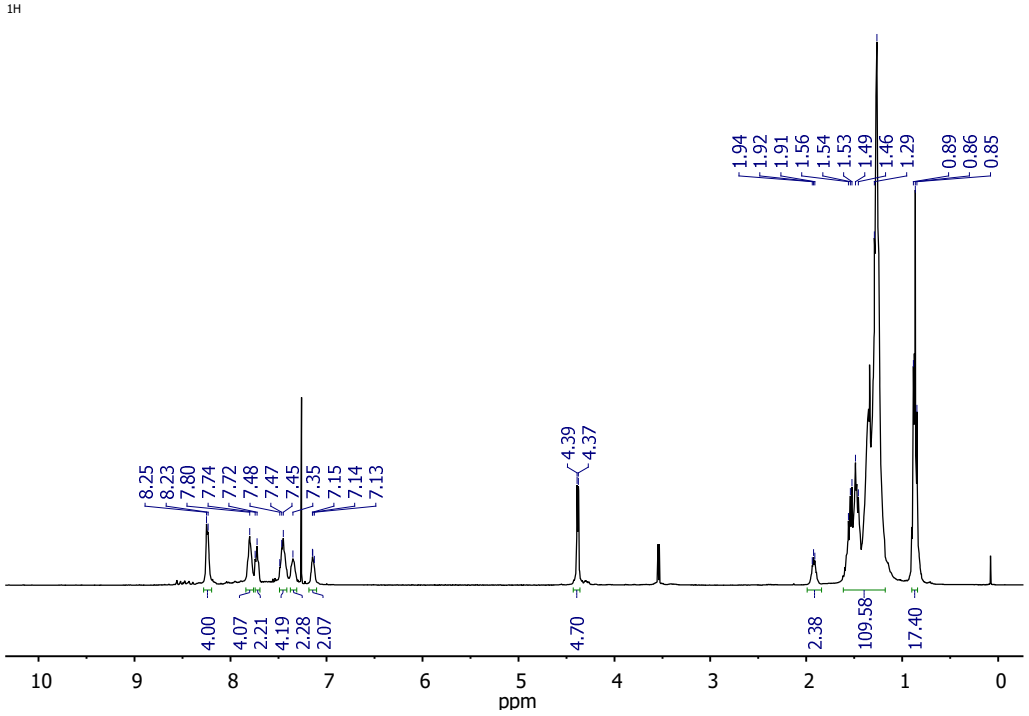


Figure S10. J-V curves of devices with the structure Glass/ITO/ZnO/Oligomer:$PC_{61}BM$/MoOx/Ag for oligomers (from top to bottom) **7**, **9**, **10**.

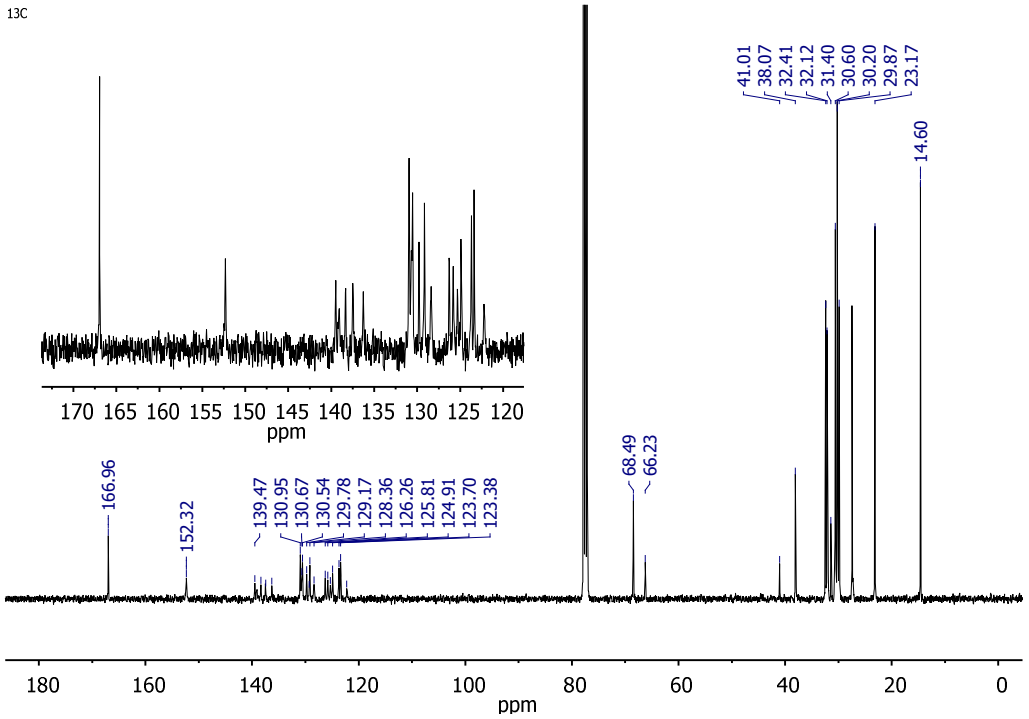
Spectra of New Compounds

Compound **7**

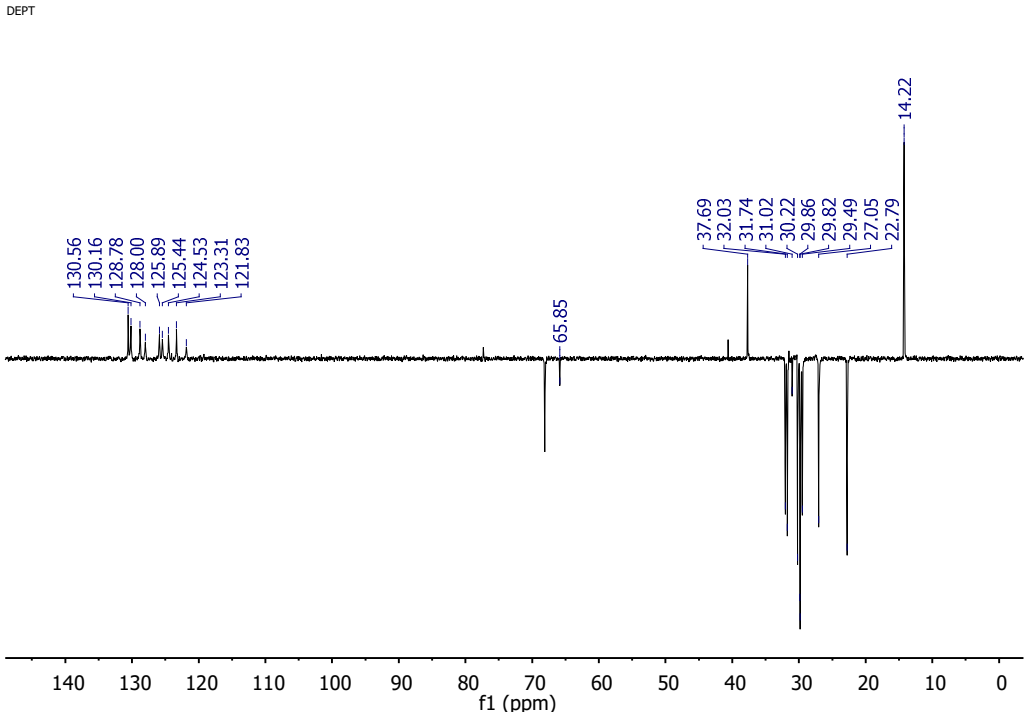
^{1}H NMR (400 MHz, $CDCl_3$)



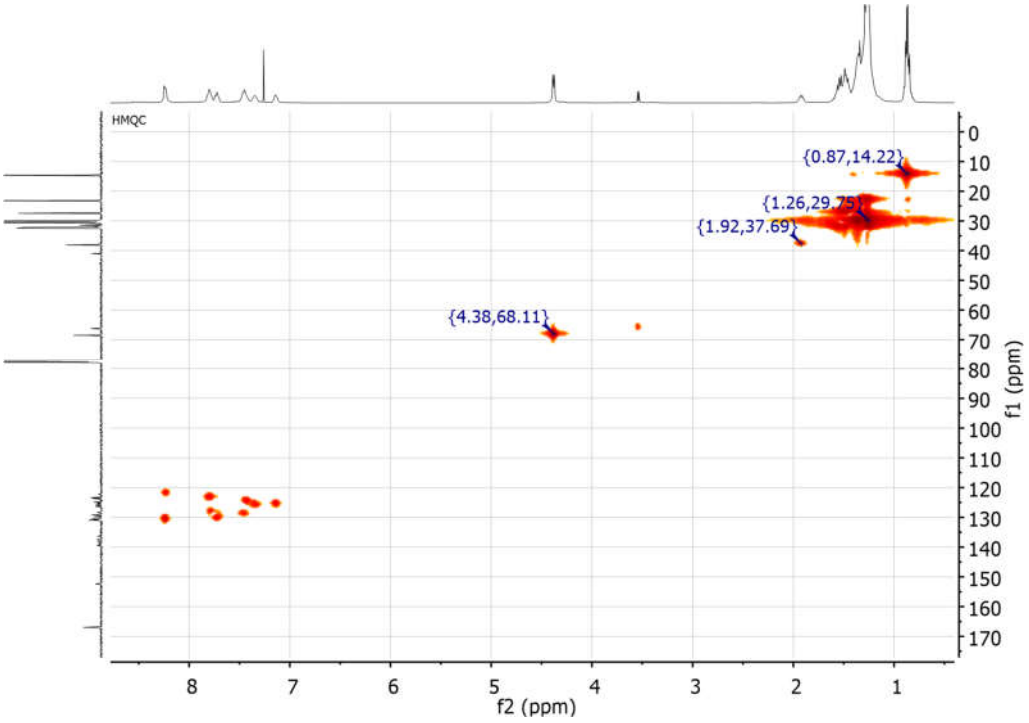
^{13}C NMR (101 MHz, $CDCl_3$)

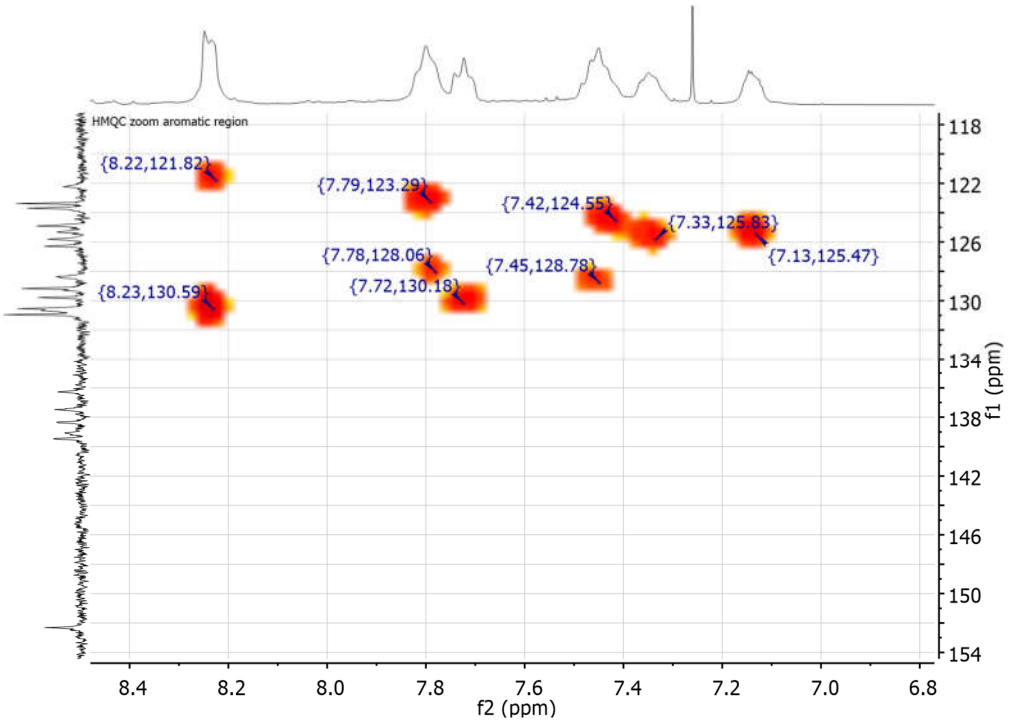


DEPT

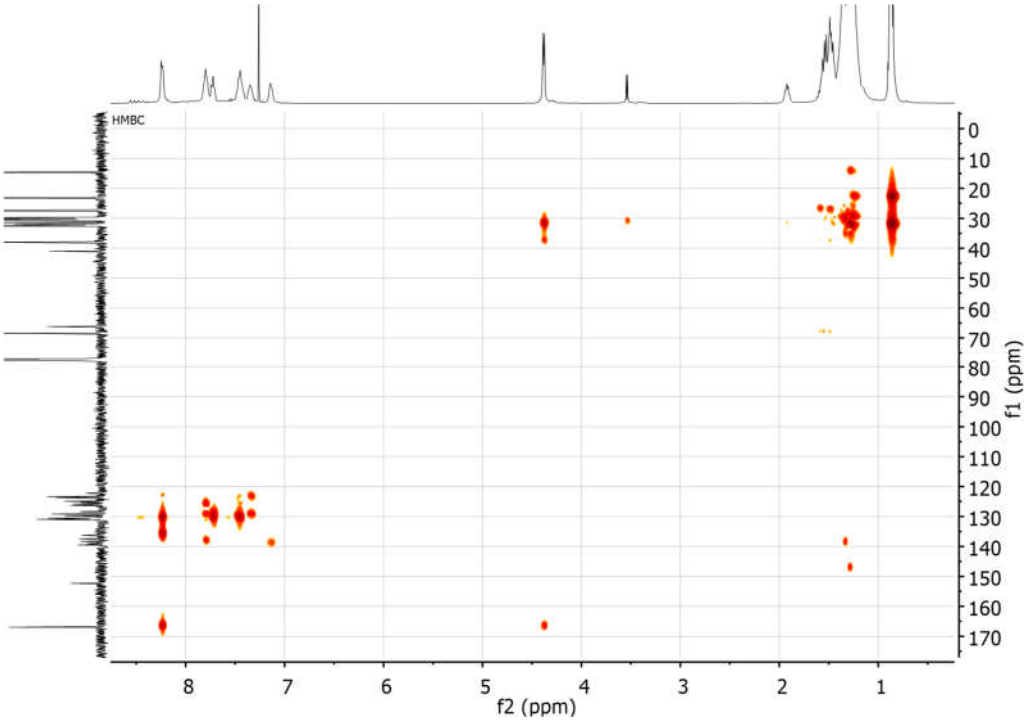

DEPT
14.22
37.69
32.03
31.74
31.02
30.22
29.86
29.82
29.49
27.05
22.79
130.56
130.16
128.78
128.00
125.89
125.44
124.53
123.31
121.83
65.85
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
f1 (ppm)

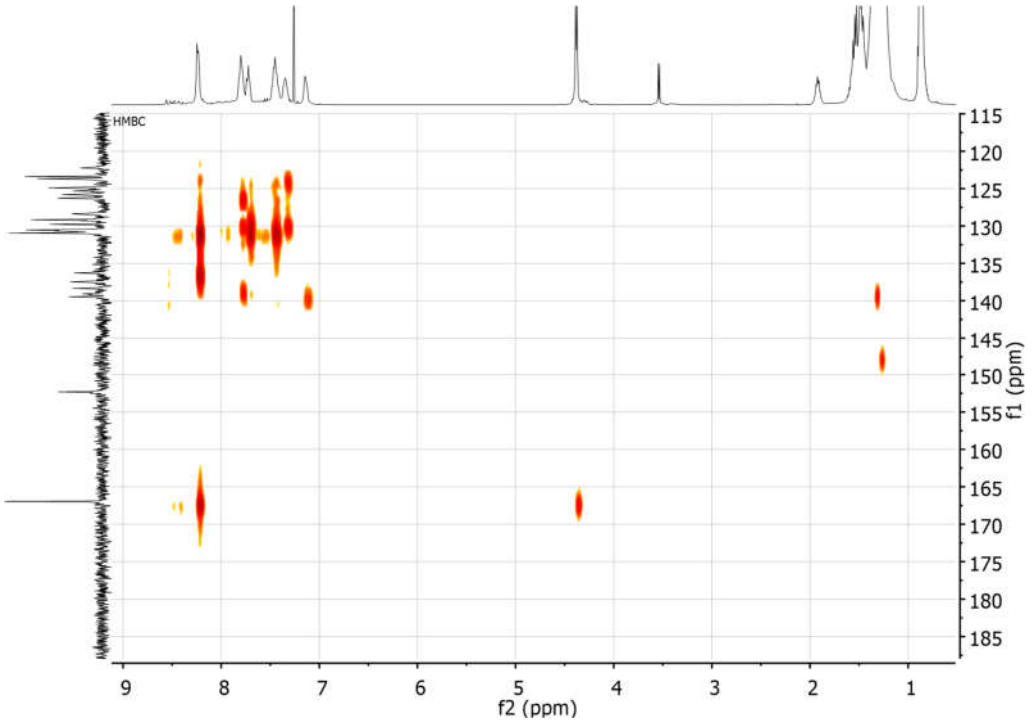
HMQC


HMQC
{0.87,14.22}
{1.26,29.75}
{1.92,37.69}
{4.38,68.11}
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
f1 (ppm)
8
7
6
5
4
3
2
1
f2 (ppm)

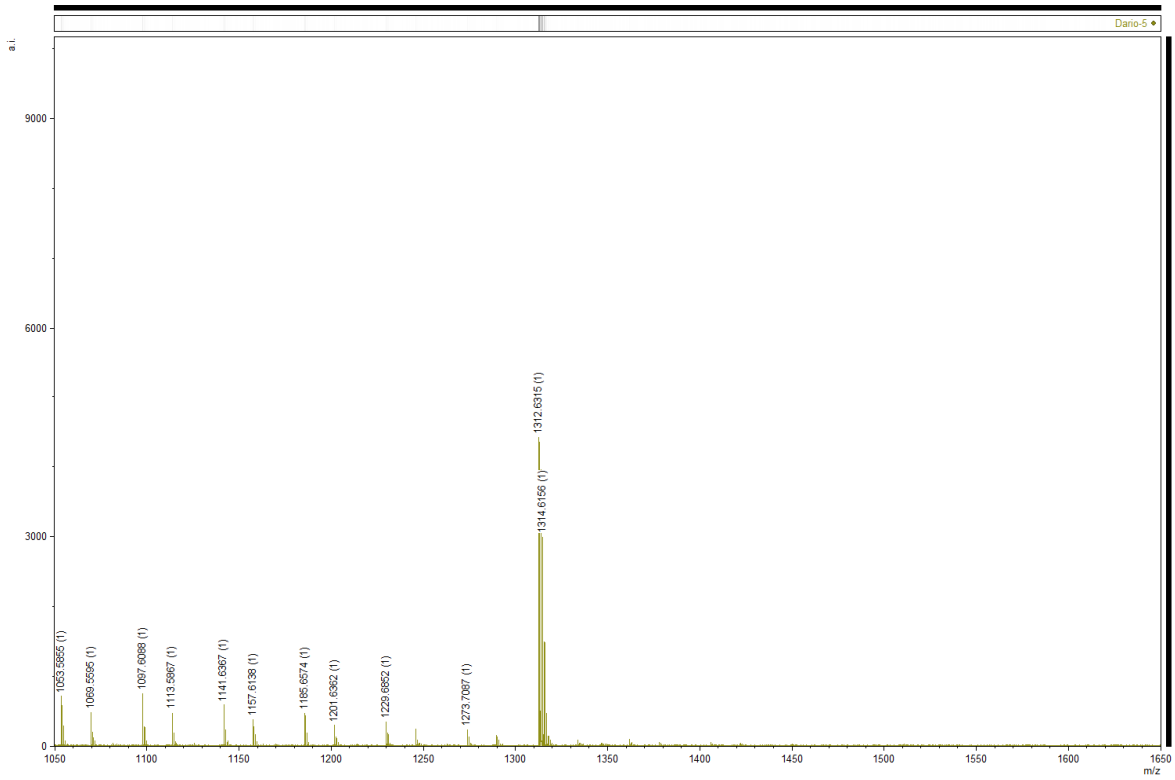

HMQC zoom aromatic region
{8.22,121.82}
{7.79,123.29}
{7.42,124.55}
{7.33,125.83}
{7.13,125.47}
{7.78,128.06}
{7.45,128.78}
{8.23,130.59}
{7.72,130.18}
f2 (ppm)
f1 (ppm)

HMBC


HMBC
f2 (ppm)
f1 (ppm)

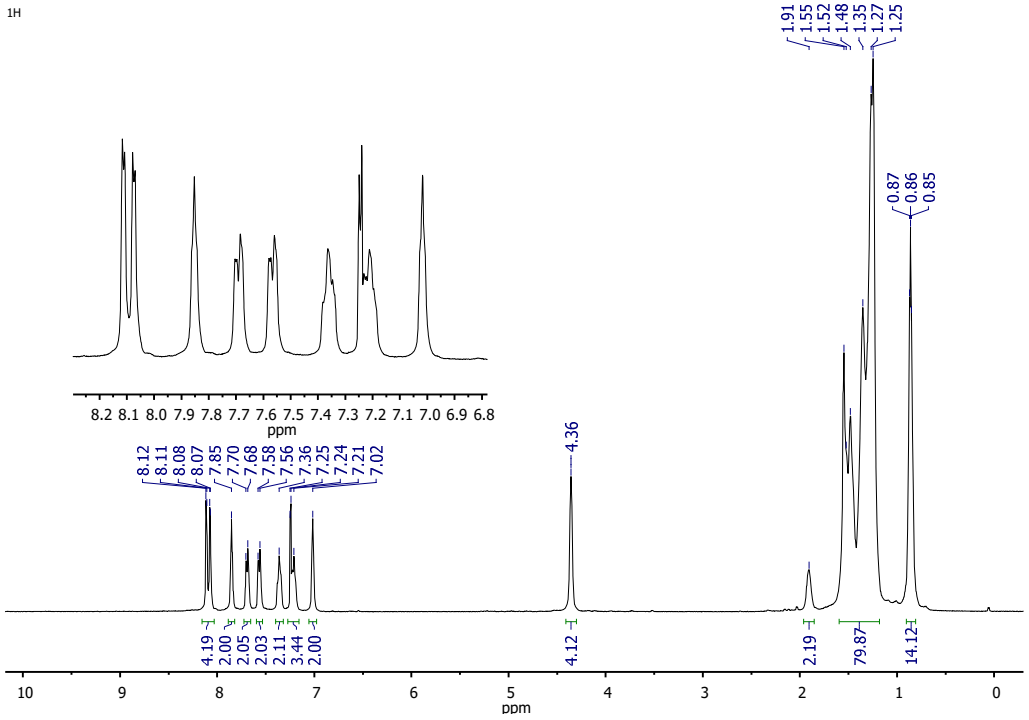


HRMS (MALDI-TOF)

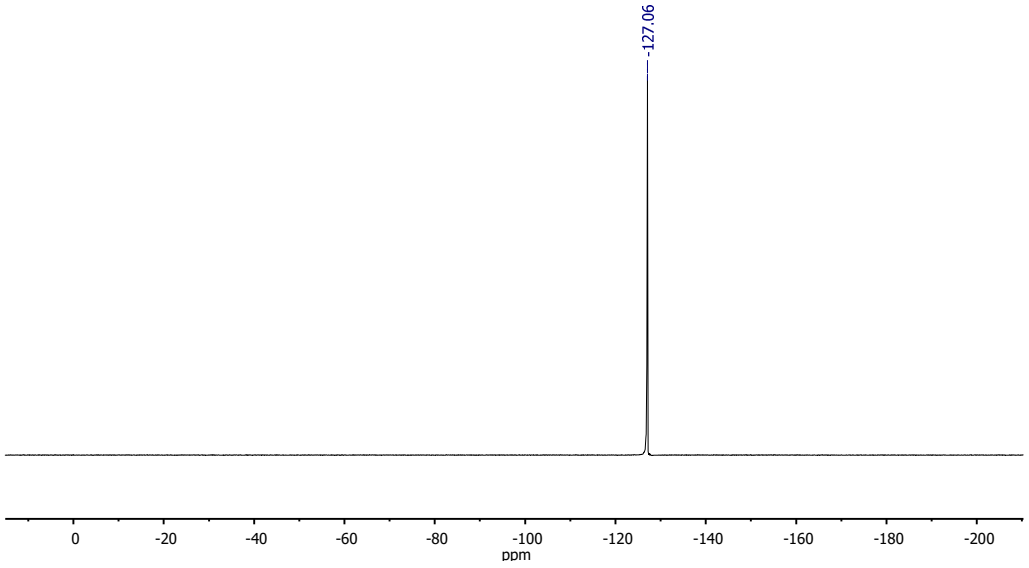


Compound **8**

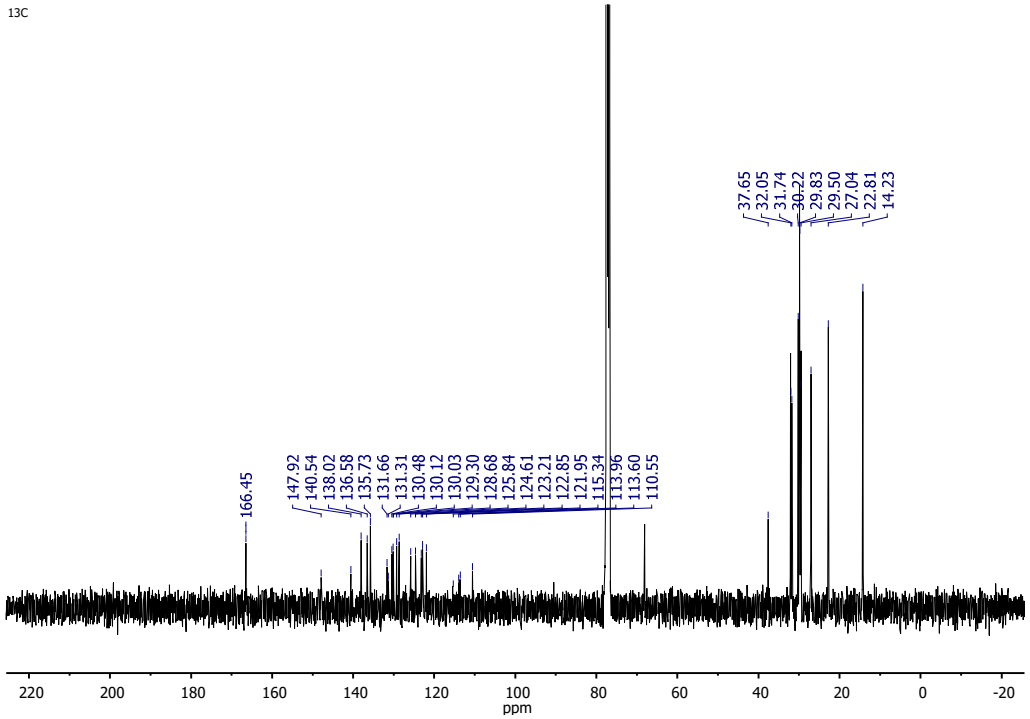
^{1}H NMR (400 MHz, $CDCl_3$)



^{19}F NMR (376 MHz, $CDCl_3$)



^{13}C NMR (101 MHz, $CDCl_3$)



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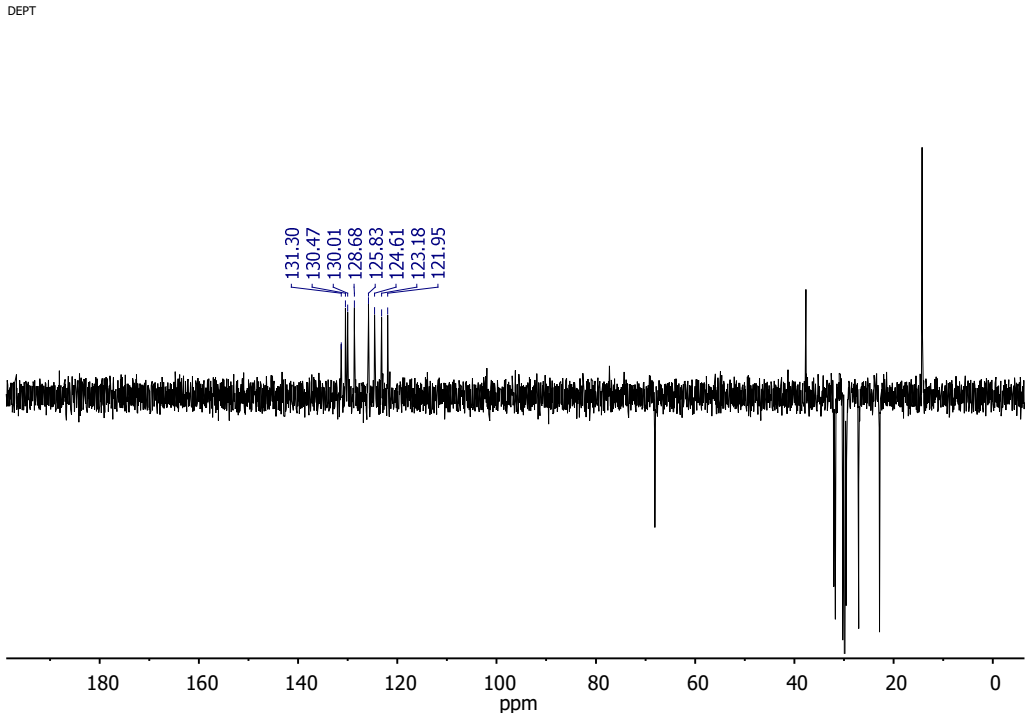

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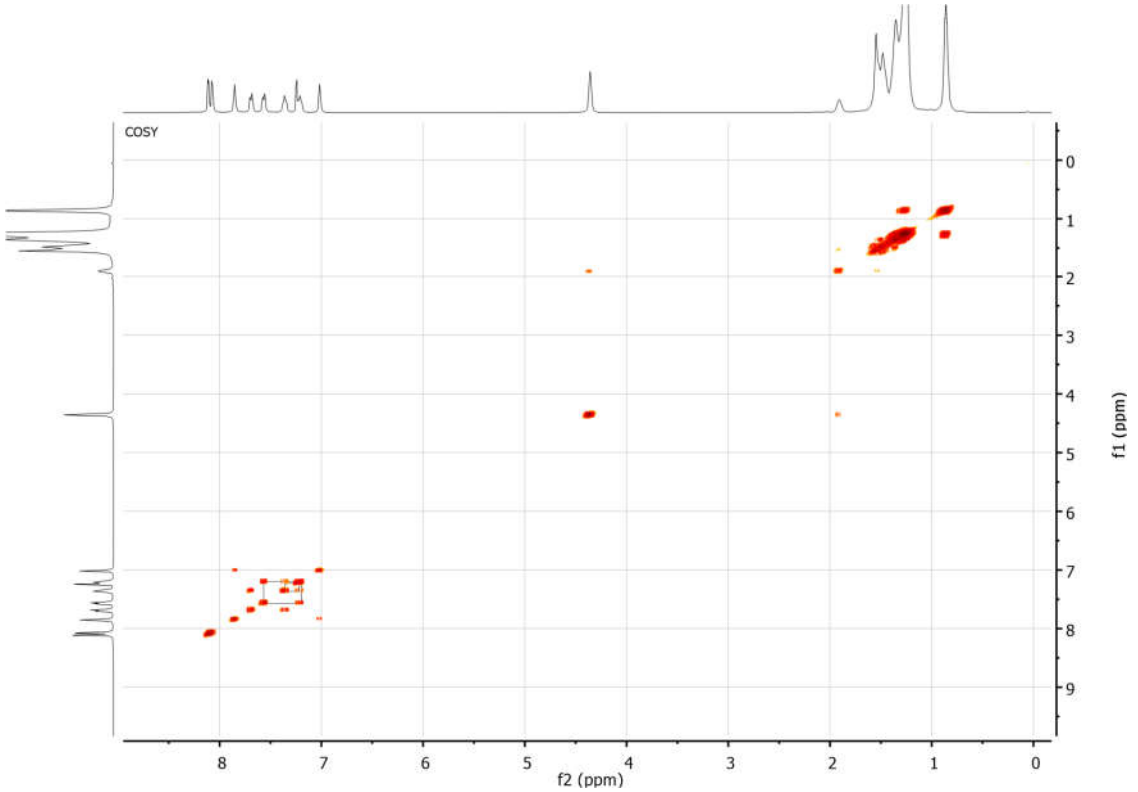
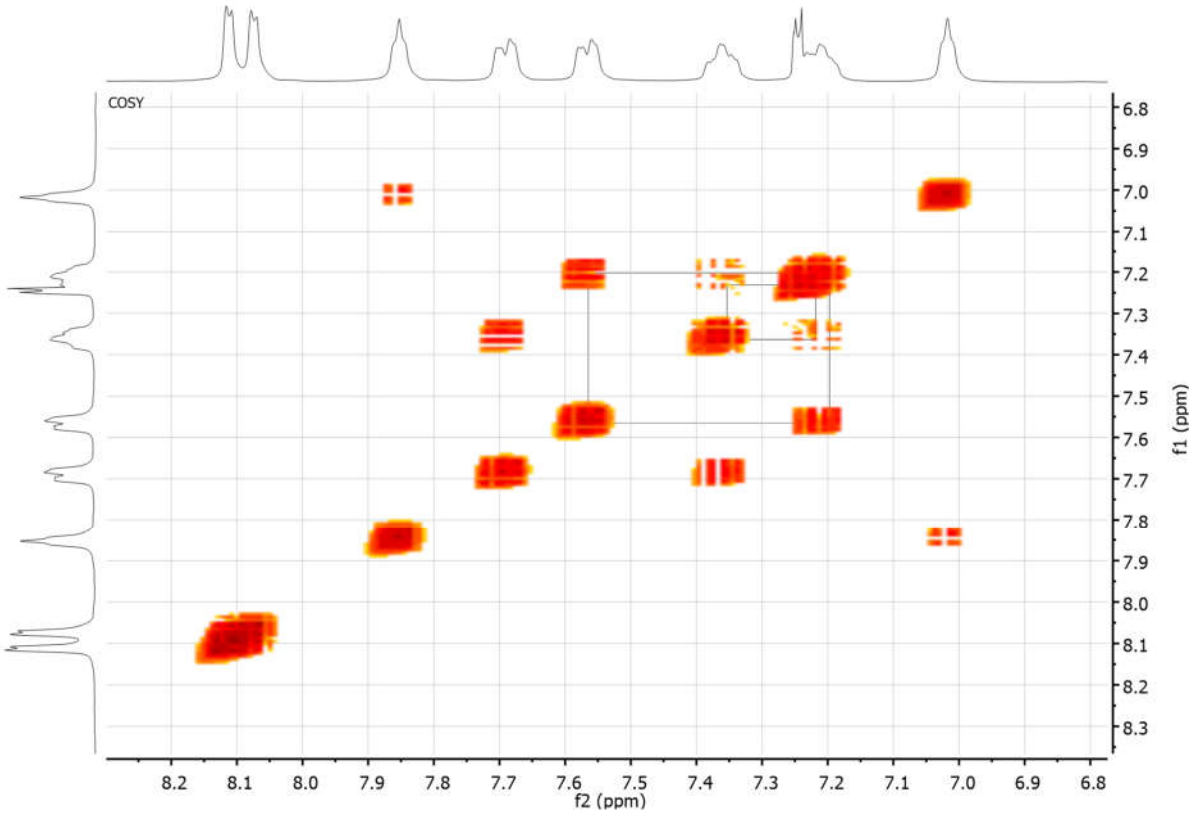


Zoom of aromatic region



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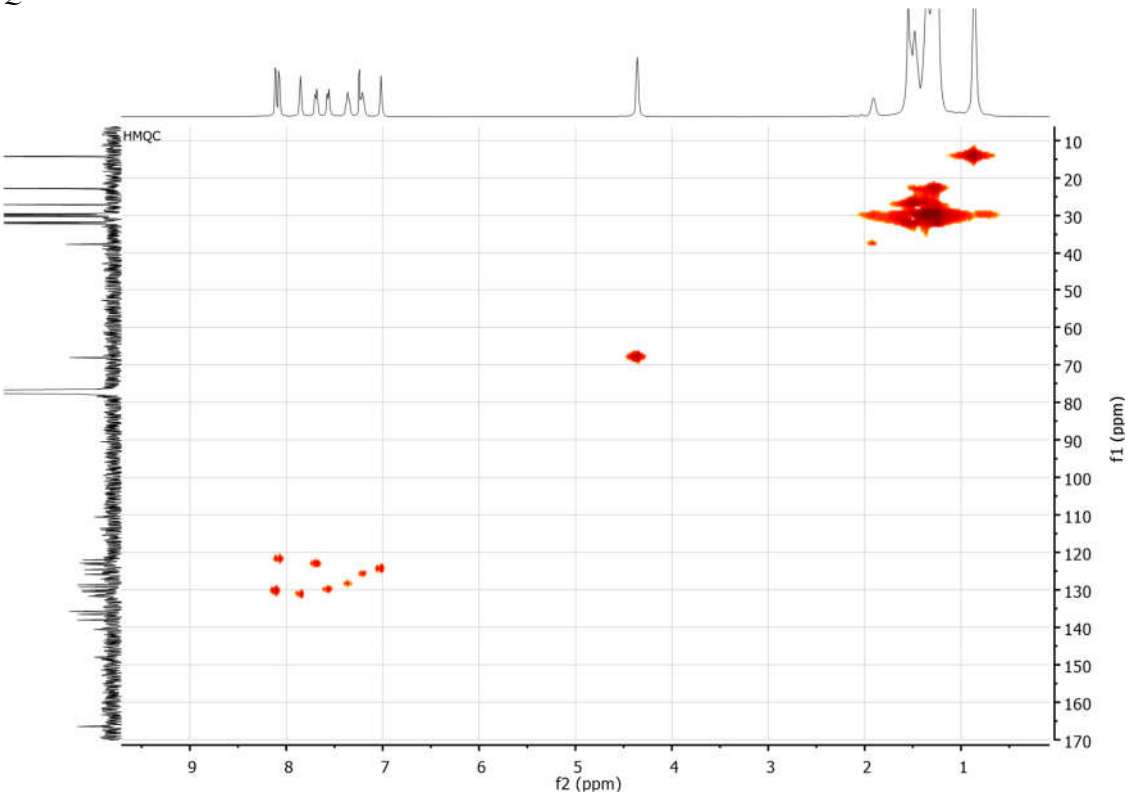
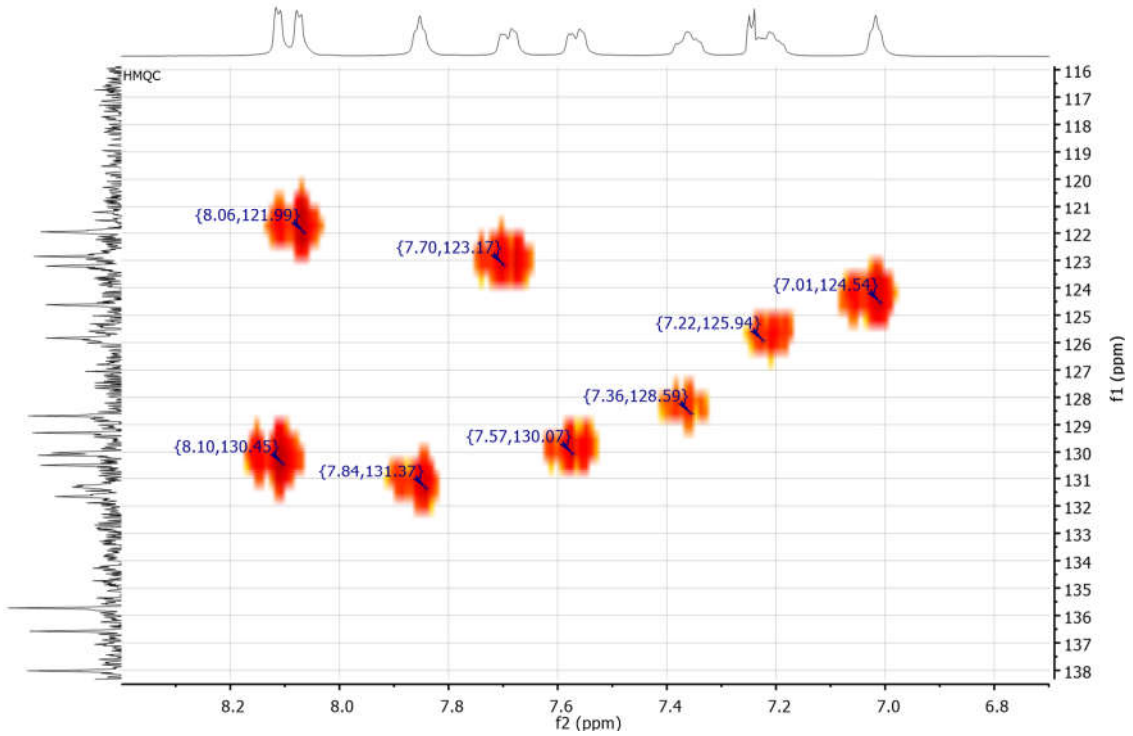


Zoom of aromatic region



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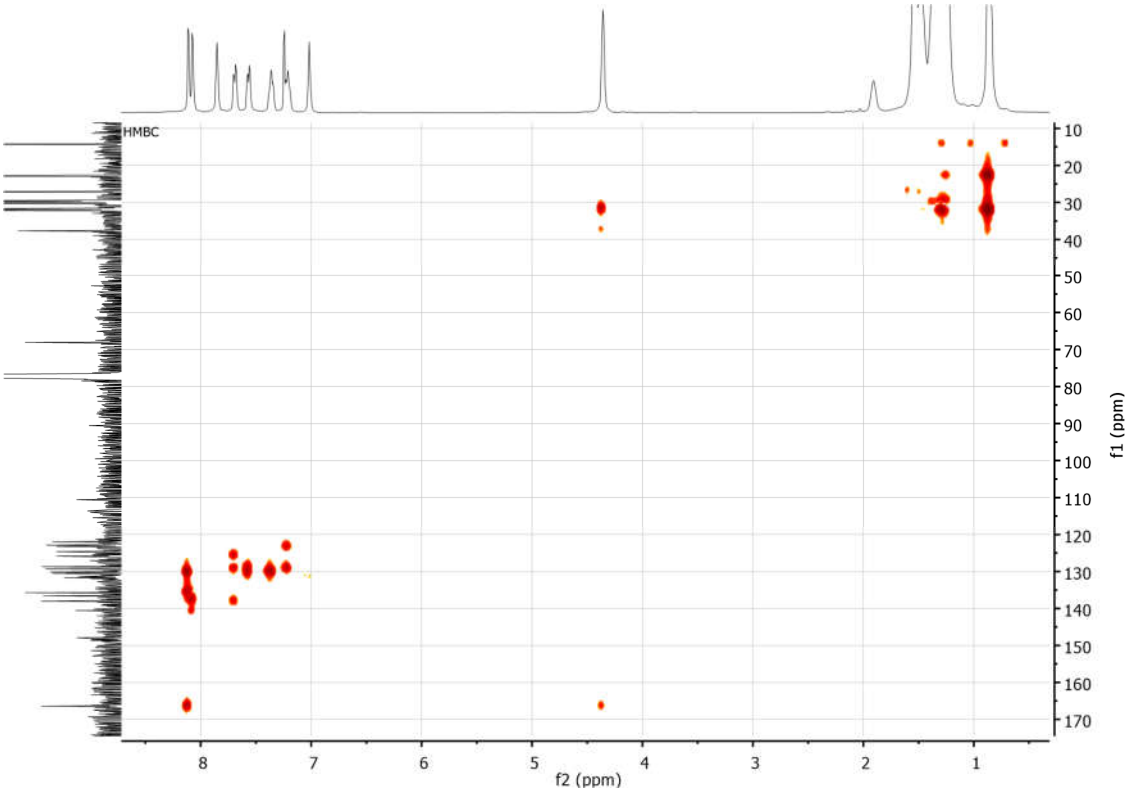
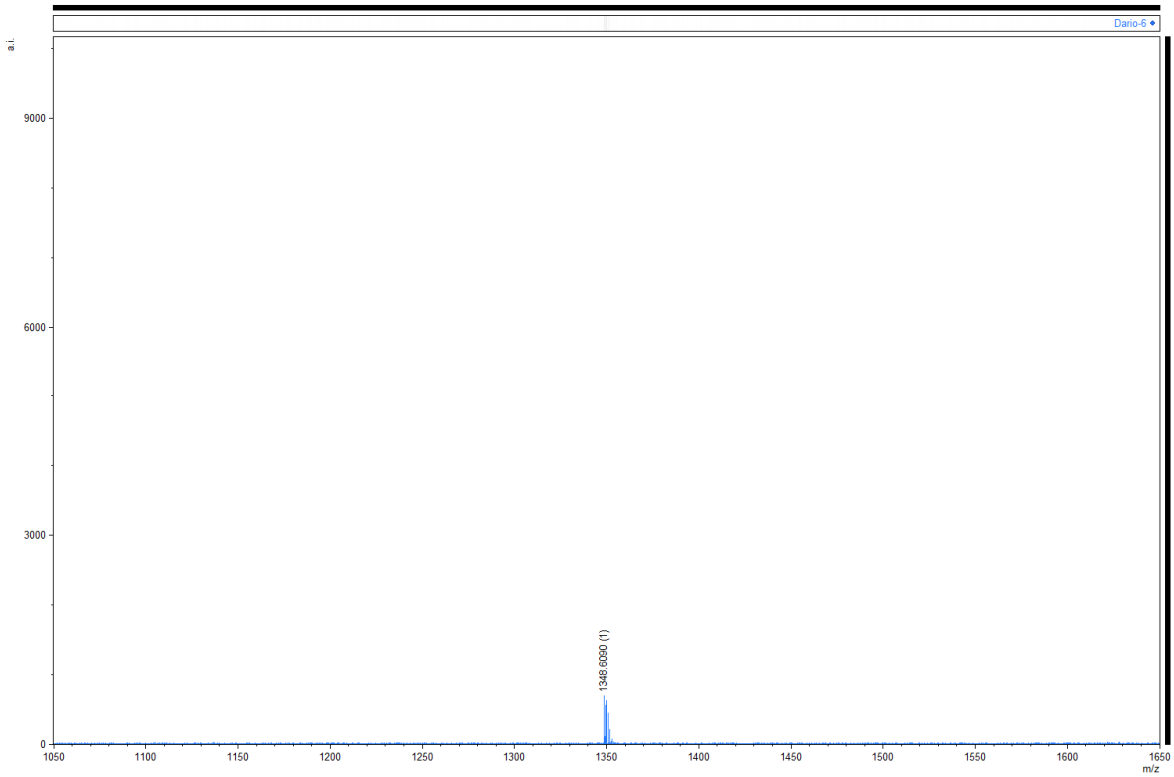
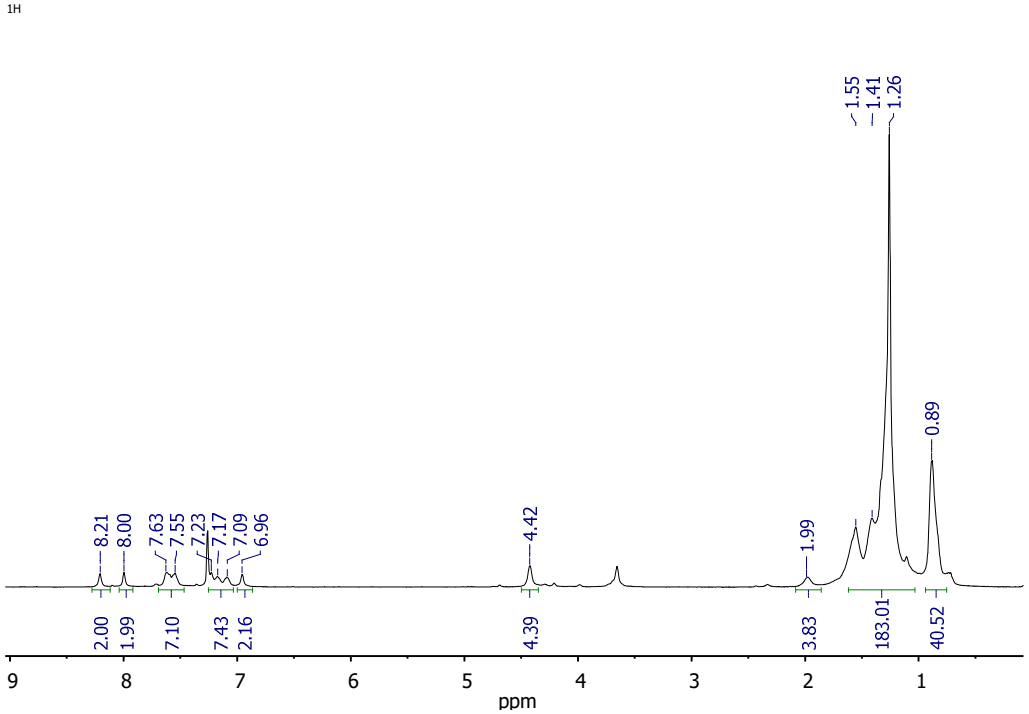


HRMS (MALDI-TOF)

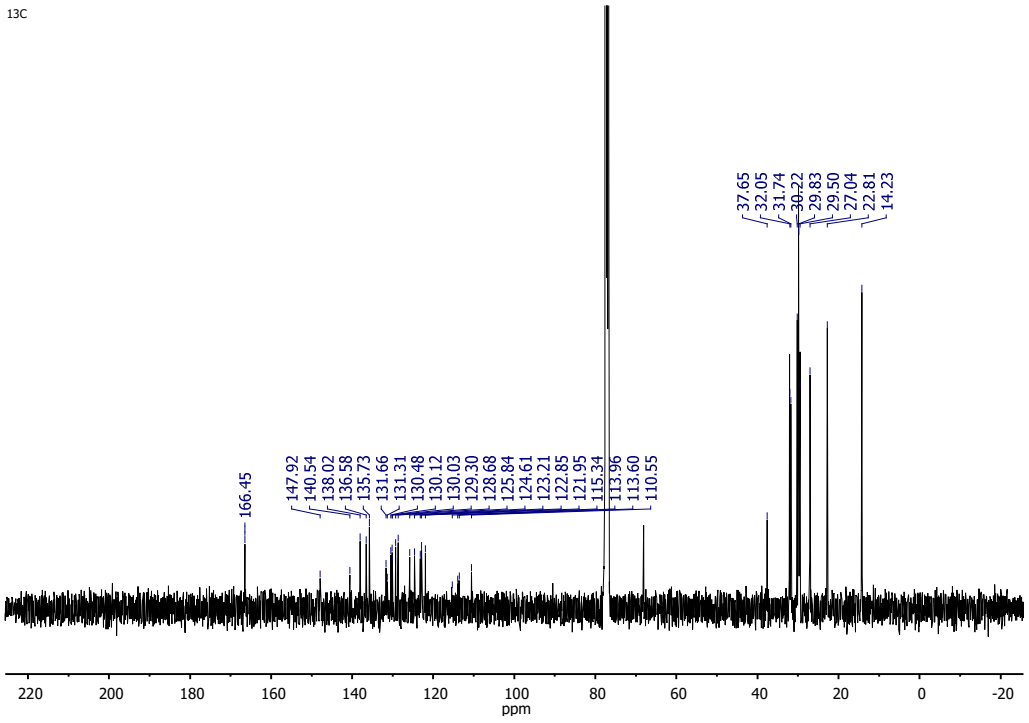


Compound **9**

^{1}H NMR (400 MHz, $CDCl_3$)



^{13}C NMR (101 MHz, $CDCl_3$)



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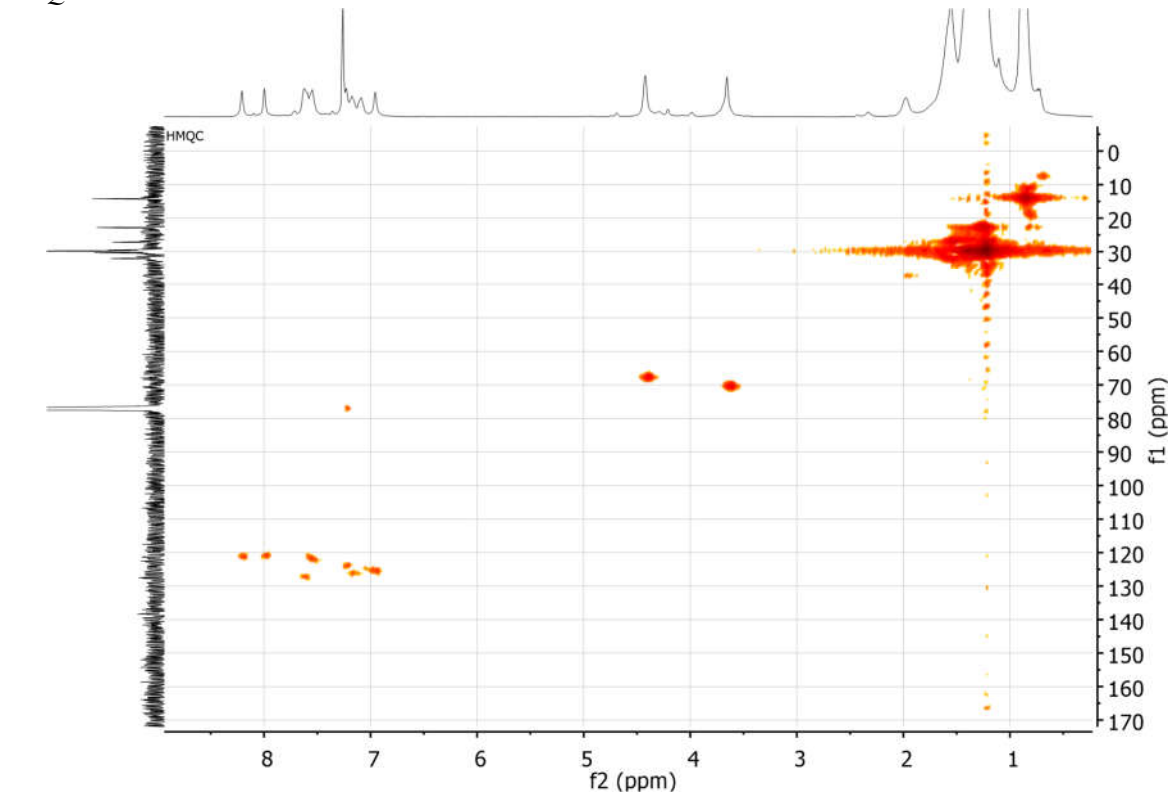

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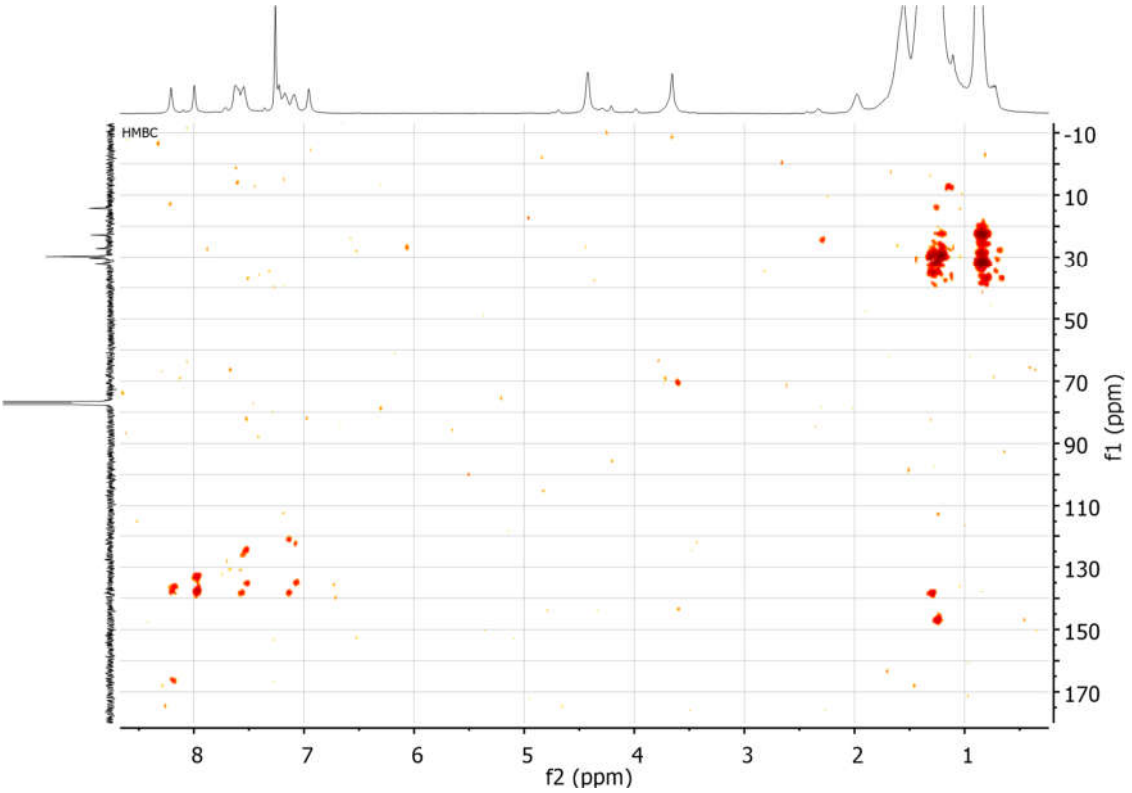

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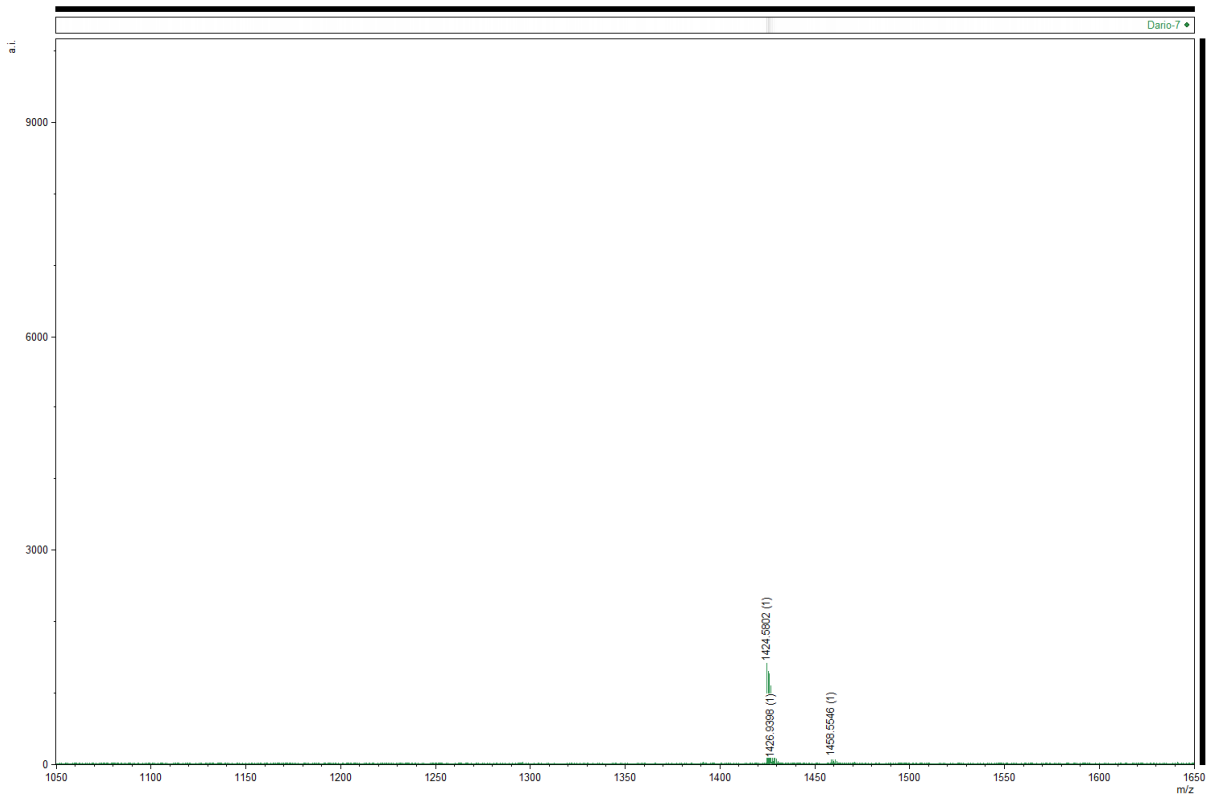
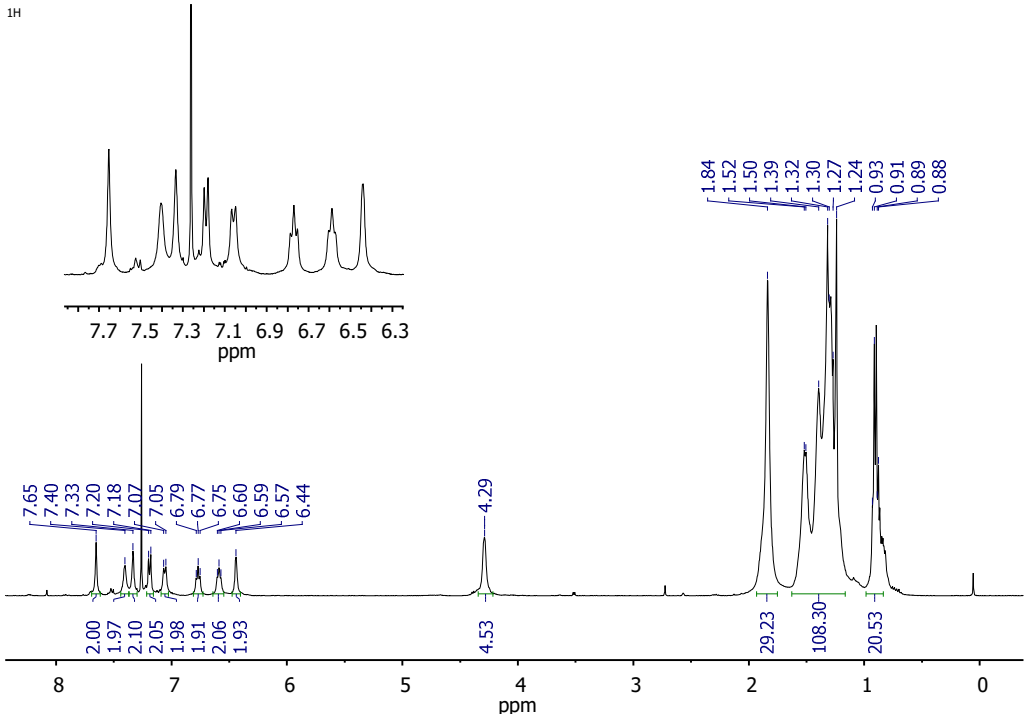
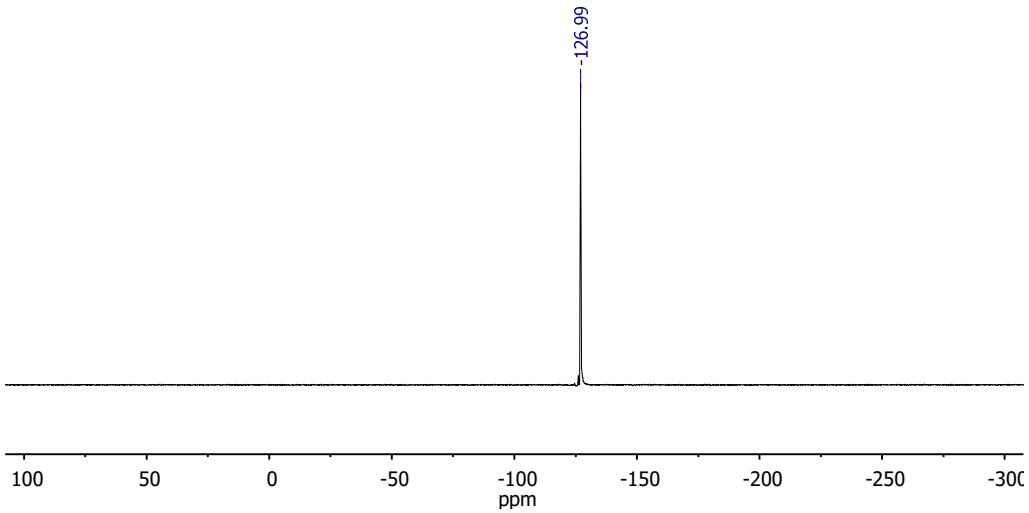


Compound **10**

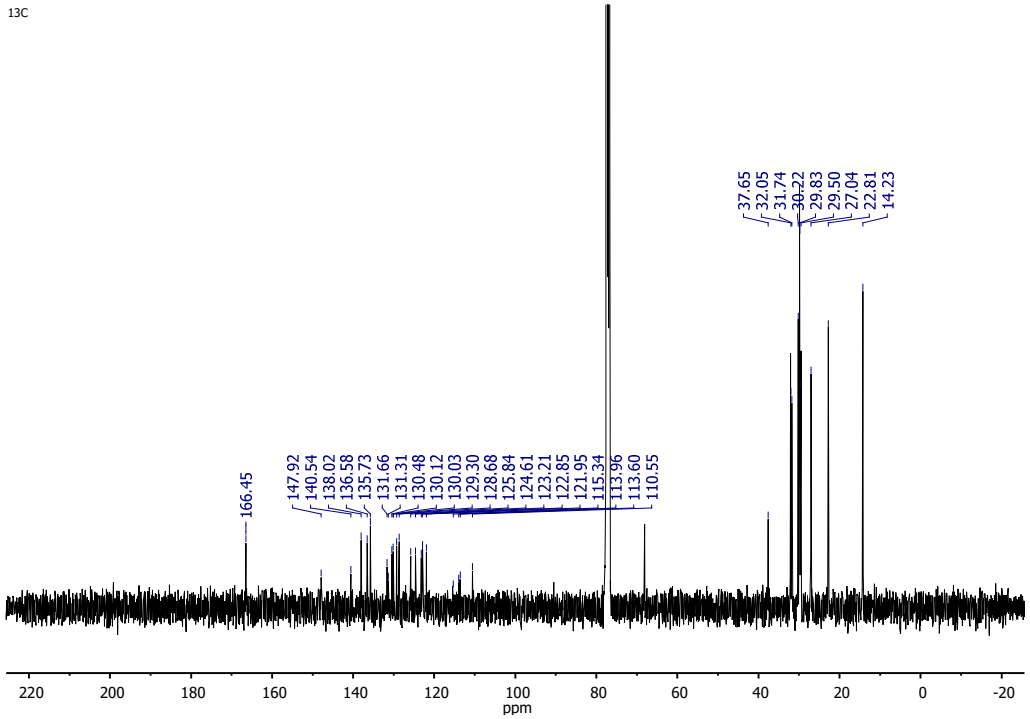
^{1}H NMR (400 MHz, $CDCl_3$)



^{19}F NMR (376 MHz, $CDCl_3$)



^{13}C NMR (101 MHz, $CDCl_3$)



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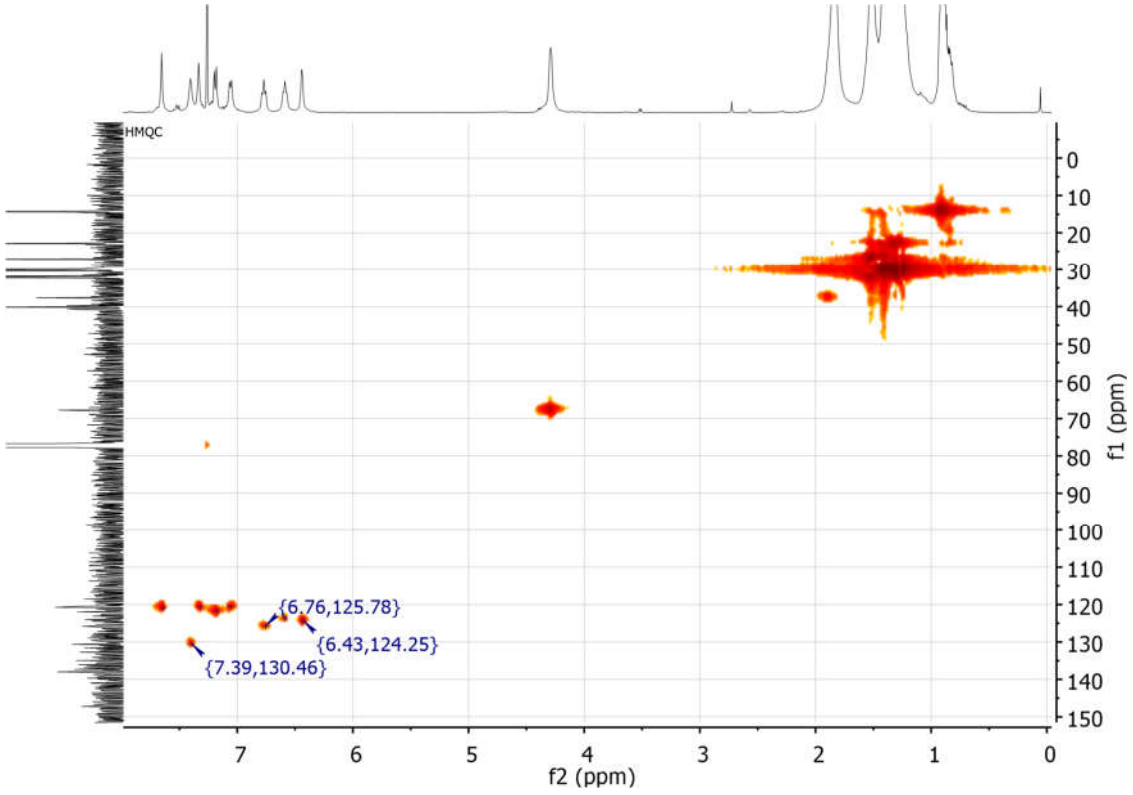
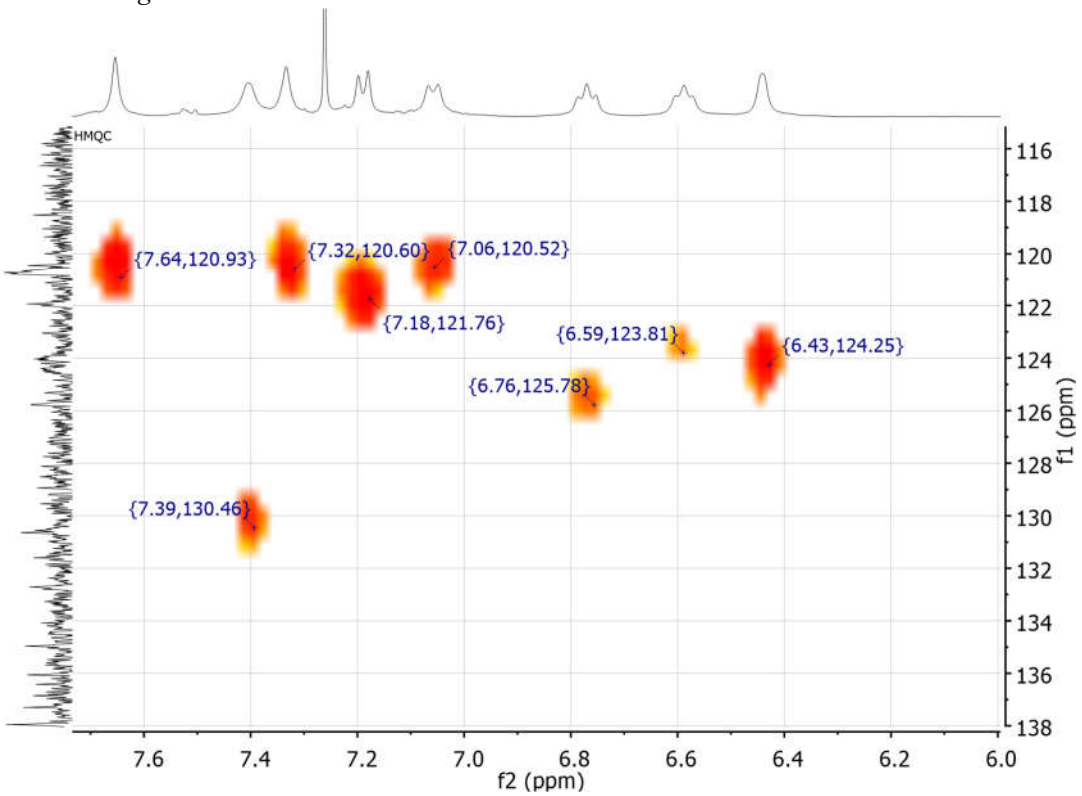


Zoom of aromatic region



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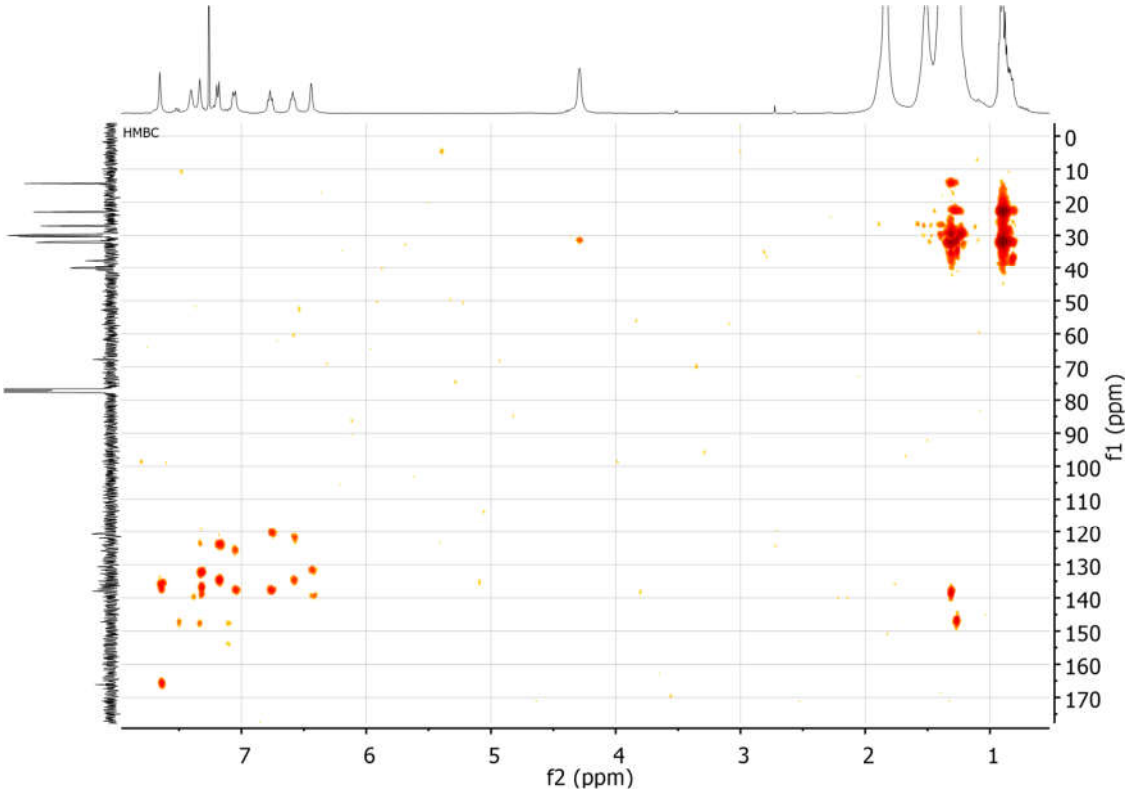

HRMS (MALDI-TOF)