

Isolation and identification of 12-deoxyphorbol esters from *Euphorbia resinifera* Berg latex. Targeted and biased non-targeted identification of 12-deoxyphorbol esters by UHPLC-HRMS^E.

Abdellah Ezzanad^{1,2}, Carolina De los Reyes^{1,2}, Antonio J. Macías-Sánchez^{1,2,*}, Rosario Hernández Galán^{1,2,*}

¹ *Departamento de Química Orgánica, Facultad de Ciencias, Campus Universitario Puerto Real, Universidad de Cádiz, 11510 Puerto Real, Cádiz, Spain*

² *Instituto de Investigación en Biomoléculas (INBIO), Universidad de Cádiz, 11510 Puerto Real, Cádiz, Spain*

Corresponding Authors

Antonio J. Macías-Sánchez - *Departamento de Química Orgánica, Facultad de Ciencias, Campus Universitario Puerto Real, Universidad de Cádiz, 11510 Puerto Real, Cádiz, Spain; Instituto de Investigación en Biomoléculas (INBIO), Universidad de Cádiz, 11510 Puerto Real, Cádiz, Spain; <https://orcid.org/0000-0001-6002-4977>; Tel: +34956012704; E-mail: antoniojose.macias@uca.es*

Rosario Hernández Galán - *Departamento de Química Orgánica, Facultad de Ciencias, Campus Universitario Puerto Real, Universidad de Cádiz, 11510 Puerto Real, Cádiz, Spain; Instituto de Investigación en Biomoléculas (INBIO), Universidad de Cádiz, 11510 Puerto Real, Cádiz, Spain; <https://orcid.org/0000-0003-1887-4796>; Tel: +34956012771; E-mail: rosario.hernandez@uca.es*

Supplementary Material

Table of Contents

1- NMR spectra

Figure S1a. ^1H NMR spectrum of DPPI (1) in CD_3OD (600 MHz).....	9
Figure S1b. ^{13}C NMR spectrum of DPPI (1) in MeOD (150 MHz).....	9
Figure S2a. ^1H -NMR spectrum DPPT (2) in CD_3OD (500 MHz).	10
Figure S2b. ^{13}C -NMR spectrum of DPPT (2) in CD_3OD (150 MHz).....	10
Figure S3a. ^1H -NMR spectrum of DPPBz (3) in CD_3OD (400 MHz).....	11
Figure S3b. ^{13}C -NMR spectrum of DPPBz (3) in CD_3OD (100 MHz).....	11
Figure S3c. COSY spectrum of DPPBz (3) in CD_3OD	12
Figure S3d. HSQC spectrum of DPPBz (3) in CD_3OD	12
Figure S3e. Expansion (δ_{H} 4.7-0.6, δ_{C} 80-2) of HSQC spectrum of DPPBz (3) in CD_3OD	13
Figure S3f. Expansion (δ_{H} 8.3-5.4, δ_{C} 162-120) of HSQC spectrum of 3 in CD_3OD	13
Figure S3g. HMBC spectrum of DPPBz (3) in CD_3OD	14
Figure S3h. Expansion (δ_{H} 8.9-0.2, δ_{C} 218-119) of HMBC spectrum of 3 in CD_3OD	14
Figure S3i. Expansion (δ_{H} 8.4-0.4, δ_{C} 82-5) of HMBC spectrum of DPPBz (3) in CD_3OD	15
Figure S3j. NOESY2D spectrum of DPPBz (3) in CD_3OD	15
Figure S4a. ^1H -NMR spectrum of AcDPPI (4) in CD_3OD . (400 MHz)	16
Figure S4b. ^{13}C -NMR spectrum of AcDPPI (4) in CD_3OD . (100 MHz).....	16
Figure S4c. COSY spectrum of AcDPPI (4) in CD_3OD	17
Figure S4d. HSQC spectrum of AcDPPI (4) in CD_3OD	17
Figure S4e. Expansion (δ_{H} 4.7-0.5, δ_{C} 77-2) of HSQC spectrum of AcDPPI (4) in CD_3OD	18
Figure S4f. Expansion (δ_{H} 4.7-0.5, δ_{C} 77-2) of HSQC spectrum of AcDPPI (4) in CD_3OD	18
Figure S4g. HMBC spectrum of AcDPPI (4) in CD_3OD	19
Figure S4h. Expansion (δ_{H} 8.0-0.4, δ_{C} 91-5) of HMBC spectrum of AcDPPI (4) in CD_3OD ...	19
Figure S4i. Expansion (δ_{H} 8.0-0.4, δ_{C} 220-120) of HMBC spectrum of 4 in CD_3OD	20
Figure S4j. NOESY2D spectrum of AcDPPI (4) in CD_3OD	20
Figure S5a. ^1H NMR spectrum of AcDPPT (5) in CD_3OD (400 MHz).....	21
Figure S5b. ^{13}C NMR spectrum of AcDPPT (5) in CD_3OD (100 MHz).	21
Figure S5c. COSY spectrum of AcDPPT (5) in CD_3OD	22
Figure S5d. HSQC spectrum of AcDPPT (5) in CD_3OD	22
Figure S5e. Expansion (δ_{H} 4.7-0.5, δ_{C} 78-4) of HSQC spectrum of AcDPPT (5) in CD_3OD . ..	23
Figure S5f. Expansion (δ_{H} 7.9-5.0, δ_{C} 165-120) of HSQC spectrum of 5 in CD_3OD	23
Figure S5g. HMBC spectrum of AcDPPT (5) in CD_3OD	24
Figure S5h. Expansion (δ_{H} 8.5-0.5, δ_{C} 80-2) of HMBC spectrum of 5 in CD_3OD	24
Figure S5i. Expansion (δ_{H} 8.5-0.5, δ_{C} 215-120) of HMBC spectrum of 5 in CD_3OD	25
Figure S5j. NOESY2D spectrum of AcDPPT (5) in CD_3OD	25
Figure S6a. ^1H -NMR spectrum of AcDPPBz (6) in CD_3OD (400 MHz).	26
Figure S6b. ^{13}C -NMR spectrum of AcDPPBz (6) in CD_3OD (125 MHz).....	26
Figure S6c. COSY spectrum of AcDPPBz (6) in CD_3OD	27

Supplementary Material

Figure S6d. HSQC spectrum of AcDPPBz (6) in CD ₃ OD.....	27
Figure S6e. Expansion (δ_{H} 4.7-0.6, δ_{C} 80-4) of HSQC spectrum of 6 in CD ₃ OD.....	28
Figure S6f. Expansion (δ_{H} 8.5-5.5, δ_{C} 165-123) of HSQC spectrum of 6 in CD ₃ OD.....	28
Figure S6g. HMBC spectrum of AcDPPBz (6) in CD ₃ OD.....	29
Figure S6h. Expansion (δ_{H} 8.3-0.5, δ_{C} 80-3) of HMBC spectrum of 6 in CD ₃ OD.....	29
Figure S6i. Expansion (δ_{H} 9.0-0.5, δ_{C} 215-120) of HMBC spectrum of 6 in CD ₃ OD.....	30
Figure S6j. NOESY2D spectrum of AcDPPBz (6) in CD ₃ OD.	30
Figure S7a. ¹ H-NMR spectrum of DPB (7) in CDCl ₃ (400 MHz).....	31
Figure S7b. ¹³ C-NMR spectrum of DPB (7) in CDCl ₃ (400 MHz).....	31
Figure S8a. ¹ H-NMR spectrum of DPA (8) in CDCl ₃ (400 MHz).....	32
Figure S8b. ¹³ C-NMR spectrum of DPA (8) in CDCl ₃ (100 MHz).	32
Figure S9a. ¹ H-NMR spectrum of DPP (9) in CDCl ₃ (400 MHz).	33
Figure S9b. ¹³ C NMR spectrum of DPP (9) in CDCl ₃ (100 MHz).	33
Figure S10a. ¹ H-NMR spectrum of AcDPB (10) in CD ₃ OD (400 MHz).	34
Figure S10b. ¹³ C-NMR spectrum of AcDPB (10) in CD ₃ OD (100 MHz).....	34
Figure S11a. ¹ H-NMR spectrum of AcDPA (11) in CD ₃ OD (400 MHz)	35
Figure S11b. ¹³ C-NMR spectrum of AcDPA (11) in CD ₃ OD (100 MHz).....	35
Figure S12a. ¹ H-NMR spectrum of AcDPP (12) in CD ₃ OD (400 MHz).....	36
Figure S12b. ¹³ C-NMR spectrum of AcDPP (12) in CD ₃ OD (100 MHz).	36
Figure S13a. ¹ H-NMR spectrum of AcDPiPn (13) in CD ₃ OD (500 MHz).....	37
Figure S13b. ¹³ C-NMR spectrum of AcDPiPn (13) in CD ₃ OD (125 MHz).	37
Figure S13c. COSY spectrum of AcDPiPn (13) in CD ₃ OD.....	38
Figure S13d. HSQC spectrum of AcDPiPn (13) in CD ₃ OD.	38
Figure S13e. Expansion (δ_{H} 3.8-0.2, δ_{C} 62-3) of HSQC spectrum of 13 in CD ₃ OD.....	39
Figure S13f. Expansion (δ_{H} 7.8-4.2, δ_{C} 170-65) of HSQC spectrum of 13 in CD ₃ OD.....	39
Figure S13g. HMBC spectrum of AcDPiPn (13) in CD ₃ OD.	40
Figure S13h. Expansion (δ_{H} 8.7-0.2, δ_{C} 90-3) of HMBC spectrum of 13 in CD ₃ OD.....	40
Figure S13i. Expansion (δ_{H} 8.7-0.2, δ_{C} 215-128) of HMBC spectrum of 13 in CD ₃ OD.....	41
Figure S13j. NOESY2D spectrum of AcDPiPn (13) in CD ₃ OD.	41
Figure S13k. DEPT spectrum of AcDPiPn (13) in CD ₃ OD.	42
Figure S14a. ¹ H-NMR spectrum of AcDPMeOP (14) in CD ₃ OD (400 MHz).....	42
Figure S14b. ¹³ C-MNR spectrum of AcDPMeOP (14) in CD ₃ OD (100 MHz).	43
Figure S14c. COSY spectrum of AcDPMeOP (14) in CD ₃ OD..	43
Figure S14d. HSQC spectrum of AcDPMeOP (14) in CD ₃ OD.	44
Figure S14e. Expansion (δ_{H} 4.7-0.1, δ_{C} 77-2) of HSQC spectrum of 14 in CD ₃ OD.....	44
Figure S14f. Expansion (δ_{H} 7.7-5.5, δ_{C} 165-110) of HSQC spectrum of 14 in CD ₃ OD.....	45
Figure S14g. HMBC spectrum of AcDPMeOP (14) in CD ₃ OD..	45
Figure S14h. Expansion (δ_{H} 7.7-0.5, δ_{C} 90-3) of HMBC spectrum of 14 in CD ₃ OD.....	46
Figure S14i. Expansion (δ_{H} 8.0-0.5, δ_{C} 215-105) of HMBC spectrum of 14 in CD ₃ OD.....	46
Figure S15a. ¹ H-NMR spectrum of diDPB (15) in CD ₃ OD (500 MHz).....	47
Figure S15b. ¹³ C-NMR spectrum of diDPB (15) in CD ₃ OD (125 MHz).....	47

Supplementary Material

Figure S15c. COSY spectrum of diDPB (15) in CD ₃ OD.....	48
Figure S15d. HSQC spectrum of diDPB (15) in CD ₃ OD.	48
Figure S15e. Expansion (δ_{H} 3.6-0.4, δ_{C} 65-5) of HSQC spectrum of diDPB (15) in CD ₃ OD...49	
Figure S15f. HMBC spectrum of diDPB (15) in CD ₃ OD.	49
Figure S15g. Expansion (δ_{H} 3.6-0.4, δ_{C} 65-5) of HMBC spectrum of 15 in CD ₃ OD.....50	
Figure S15h. Expansion (δ_{H} 8.0-0.3, δ_{C} 210-120) of HMBC spectrum of 15 in CD ₃ OD.....50	
Figure S15i. NOESY2D spectrum of diDPB (15) in CD ₃ OD.....	51
Figure S15j. ¹³ C-DEPT spectrum of diDPB (15) in CD ₃ OD.	51
Figure S16a. ¹ H NMR spectrum of RTX (16) in CDCl ₃ (400 MHz).....	52
Figure S16b. ¹³ C NMR spectrum of RTX (16) in CDCl ₃ (100 MHz).....	52
Figure S17a. ¹ H-NMR spectrum of EOF1 (17) in CD ₃ OD (400 MHz).....	53
Figure S17b. ¹³ C-NMR spectrum of EOF1 (17) in CD ₃ OD. (100 MHz).	53
Figure S18a. ¹ H-NMR spectrum of EOF2 (18) in CD ₃ OD (400 MHz).....	54
Figure S18b. ¹³ C-NMR spectrum of EOF2 (18) in CD ₃ OD (100 MHz).....	54

2- ECD spectra.

Figure S19. Experimental ECD spectra of DPPI (1), DPPT (2), DPPBz (3), AcDPPT (5) and AcDPPBz (6).....	55
--	----

3- UHPLC-HRMS^E data. Figures.

Figure S20. Proposed fragmentation route for selected ions on HRMS ^E spectrum (Data Independent Acquisition (DIA)) [1], in ESI positive mode, for DPPI (1), DPPT (2), DPPBz (3) and DPPU ₁ (19). In red, common daughter ions with group B compounds (see section 2.2 and Figure S22).....	56
Figure S21. Comparison of HRMS ^E spectra (DIA) [1] for (a) DPPT (2), (b) AcDPPI (4), (c) AcDPPT (5), (d) AcDPPBz (6), (e) AcDPPU ₂ (20) and (f) AcDPPU ₃ (21), m/z range 240-680 (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 60-120 eV).).....	57
Figure S22. Proposed fragmentation route for selected ions on HRMS ^E spectrum (DIA) [1], in ESI positive mode, for AcDPPI (4), AcDPPT (5), AcDPPBz (6), AcDPPU ₂ (20) and AcDPPU ₃ (21). In red, common daughter ions with group A compounds (see section 2.2 and Figure S20).....	58
Figure S23. Comparison of HRMS ^E spectra (DIA) [1] for (a) DPB (7), (b) DPA (8) and (c) DPP (9), m/z range 240-540 (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 10-40 eV).....	59
Figure S24. Comparison of HRMS ^E spectra (DIA) [1] for: (a) DPB (7), (b) DPA (8) and, (c) DPP (9) X23; m/z range 240-365 (m/z range 240-540 in Figure S23) (data acquired in positive ionization with a ramp trap collision energy of the high-energy function set at 10-40 eV). Compounds 7 , 8 and 9 show daughter ions from their corresponding [M+Na] ⁺ molecular ions (see Figure S23) in their HRMS ^E spectra at m/z 313.1804, 295.1698, 277.1592, 267.1749 and 249.1643 (calculated) (in green in Scheme 3, Figures S24 and S25) which could be assigned to losses of water (1, 2 and 3 molecules), 2 molecules of water and CO and 3 molecules of water	

and CO, respectively, from a precursor ion at m/z 353.1729 (calculated) (in red in Scheme 3, Figures S24 and S25) (Table S2). Last mentioned ion, which is relatively abundant in HRMS ^E spectra of DPB (7) DPA (8) and DPP (9) (Table S2, Figures S23 and S23a) originates from a loss of an ester group at C-13 from parent molecular ions in each compound (Figure S23).....	60
Figure S25. Proposed fragmentation route for selected ions on HRMS ^E spectrum (DIA) [1], in ESI positive mode, for DPB (7), DPA (8) and DPP (9). In green, common daughter ions with group D compounds (see section 2.2 and Figure S29).....	61
Figure S26. Comparison of HRMS ^E spectra (DIA) [1], for (a) AcDPB (10), (b) AcDPA (11), (c) and AcDPP (12), m/z range 240-560 (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 10-40 eV).	62
Figure S27. Comparison of HRMS ^E spectra (DIA) [1] for (a) AcDPB (10), (b) AcDPA (11), (c) and AcDPP (12), m/z range 240-410 (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 10-40 eV).	63
Figure S28. Comparison of HRMS ^E spectra (DIA) [1] for (a) AcDPiPn (13) and (b) AcDPMeOP (14), m/z range 240-600 (m/z range 240-410 in Figure 7) (data acquired in in ESI positive mode with a ramp trap collision energy of the high-energy function set at 10-40 eV).	64
Figure S29. Proposed fragmentation route for selected ions on HRMS ^E spectrum (DIA) [1], in ESI positive mode, for AcDPB (10), AcDPA (11), AcDPP (12), AcDPiPn (13) and AcDPMeOP (14). In green, common daughter ions with group C compounds (see section 2.2 and Figure S25).....	65
Figure S30. Proposed fragmentation route for selected ions on HRMS ^E spectrum (DIA) [1], in ESI positive mode, for diDPB (15) and diDPU ₄ (22).....	66
Figure S31. Total Ion Current (TIC) and eXtracted Ion Chromatograms (XICs), at selected m/z previously observed in high energy HRMS ^E of 12-deoxyphorbol 20-acetate-13-acyl derivatives, obtained from UHPLC-HRMS ^E experiments for chromatographic fraction F of <i>E. resinifera</i> (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 10-40 eV; high-energy function (2: TOF MS ES ⁺)). XICs for 12-deoxyphorbol 20-acetate-13-acyl derivatives [M+Na] ⁺ molecular ions: m/z 483.2359 calculated mass for (a) C ₂₆ H ₃₆ O ₇ Na (AcDPB (10)); (b) m/z 495.2359 calculated mass for C ₂₇ H ₃₆ O ₇ Na (AcDPA (11)); (c) m/z 531.236, calculated mass for C ₃₀ H ₃₆ O ₇ Na (AcDPP (12)) and (d) m/z 497.2515, calculated mass for C ₂₇ H ₃₈ O ₇ Na (AcDPiPn (13)). XICs for selected featured ions of 12-deoxyphorbol 20-acetate-13-acyl derivatives HRMS ^E spectra (see Scheme 4 and Figure S29) at: (e) m/z 395.1834; (f) m/z 335.1623; (g) m/z 295.1698. (h) UHPLC-HRMS ^E chromatographic profile (TIC) of fraction F from <i>E. resinifera</i> extract.....	67
Figure S32. Total Ion Current (TIC) and eXtracted Ion Chromatograms (XICs), at selected m/z previously observed in high energy HRMS ^E of 12-deoxy-16-hydroxyphorbol 20-acetate-13,16-diacyl derivatives, obtained from UHPLC-HRMS ^E experiments for chromatographic fraction G-6 of <i>E. resinifera</i> (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 60-120 eV; high-energy function (2: TOF MS ES ⁺)). XIC for 12-deoxy-16-hydroxyphorbol 20-acetate-16-benzoate-13-phenylacetate (AcDPPBz (6)) [M+Na] ⁺ molecular ion: (a) m/z 651.2565, calculated mass for C ₃₇ H ₄₀ O ₉ Na. XICs for selected characteristic ions of 16-hydroxy-12-deoxyphorbol 20-acetate-13,16-diacyl derivatives HRMS ^E spectra (see Scheme 2 and Figure S22) at (b) m/z 529.2202, (c) m/z 411.1784, (d) m/z 393.1678, (e) m/z 333.1467 and m/z (f) 293.1542. (g) TIC of UHPLC-HRMS ^E chromatographic profile of fraction G-6 from <i>E. resinifera</i> extract.....	68

Figure S33. Total Ion Current (TIC) and eXtracted Ion Chromatograms (XICs), at selected m/z previously observed in high energy HRMS^E of 12-deoxyphorbol 20-acetate-13-acyl derivatives, obtained from UHPLC-HRMS^E experiments for chromatographic fraction G-6 of *E. resinifera* (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 10-40 eV; high-energy function (2: TOF MS ES⁺)). XIC for 12-deoxyphorbol 20-acetate-13-(*p*-methoxyphenyl)acetate (AcDPMeOP (**14**)) [M+Na]⁺ molecular ion: (a) m/z 561.2464 calculated mass for C₃₁H₃₈O₈Na. XICs for selected featured ions of 12-deoxyphorbol 20-acetate-13-acyl derivatives HRMS^E spectra (see Scheme 4 and Figure S29) at: (b) m/z 395.1834; (c) m/z 335.1623; (d) m/z 295.1698. (e) UHPLC-HRMS^E chromatographic profile (TIC) of fraction G-6 from *E. resinifera* extract..... 69

Figure S34. Total Ion Current (TIC) and eXtracted Ion Chromatograms (XICs), at selected m/z previously observed in high energy HRMS^E of 12,20-dideoxyphorbol 13-acyl derivatives, obtained from UHPLC-HRMS^E experiments for chromatographic fraction G-6 of *E. resinifera* (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 10-40 eV; high-energy function (2: TOF MS ES⁺)). XIC for 12,20-dideoxyphorbol 13-isobutyrate (diDPB (**15**)) [M+Na]⁺ molecular ion: (a) m/z 425.2304 calculated mass for C₂₄H₃₄O₅Na. XICs for selected featured ions of 12,20-dideoxyphorbol 13-acyl derivatives HRMS^E spectra (see Scheme 5 and Figure S30) at: (b) m/z 337.1780; (c) m/z 297.1855; (d) m/z 279.1749 and (e) m/z 269.1905. (f) UHPLC-HRMS^E chromatographic profile (TIC) of fraction G-6 from *E. resinifera* extract..... 70

Figure S35. Total Ion Current (TIC) and eXtracted Ion Chromatograms (XICs), at selected m/z previously observed in high energy HRMS^E of 12-deoxy-16-hydroxyphorbol 20-acetate-13,16-diacyl derivatives, obtained from UHPLC-HRMS^E experiments for chromatographic fraction G-7 of *E. resinifera* (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 60-120 eV; high-energy function (2: TOF MS ES⁺)). XIC for 12-deoxy-16-hydroxyphorbol 20-acetate-13,16-diacyl derivatives [M+Na]⁺ molecular ions: (a) m/z 617.2727, calculated mass for C₃₄H₄₂O₉Na (AcDPPI (**4**)); (b) m/z 629.2727, calculated mass for C₃₅H₄₂O₉Na (AcDPPT (**5**)); (c) m/z 651.2565, calculated mass for C₃₇H₄₀O₉Na (AcDPPBz (**6**)); (d) m/z 603.2570, calculated mass for C₃₃H₄₀O₉Na (AcDPPU₂ (**20**)). XICs for selected characteristic ions of 16-hydroxy-12-deoxyphorbol 20-acetate-13,16-diacyl derivatives HRMS^E spectra (see Scheme 2 and Figure S22) at (e) m/z 529.2202, (f) m/z 411.1784, (g) m/z 393.1678, (h) m/z 333.1467 and (i) m/z 293.1542. (j) TIC of UHPLC-HRMS^E chromatographic profile of fraction G-7 from *E. resinifera* extract..... 71

Figure S36. Total Ion Current (TIC) and eXtracted Ion Chromatograms (XICs), at selected m/z previously observed in high energy HRMS^E of 12-deoxyphorbol 20-acetate-13-acyl derivatives, obtained from UHPLC-HRMS^E experiments for chromatographic fraction G-7 of *E. resinifera* (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 10-40 eV; high-energy function (2: TOF MS ES⁺)). XICs for 12-deoxyphorbol 20-acetate-13-acyl derivatives [M+Na]⁺ molecular ions: (a) m/z 531.236, calculated mass for C₃₀H₃₆O₇Na (AcDPP (**12**)); (b) m/z 561.2464 calculated mass for C₃₁H₃₈O₈Na (AcDPMeOP (**14**)). XICs for selected featured ions of 12-deoxyphorbol 20-acetate-13-acyl derivatives HRMS^E spectra (see Scheme 4 and Figure S29) at: (c) m/z 395.1834; (d) m/z 335.1623; (e) m/z 295.1698. (f) UHPLC-HRMS^E chromatographic profile (TIC) of fraction G-7 from *E. resinifera* extract..... 72

Supplementary Material

Figure S37. Total Ion Current (TIC) and eXtracted Ion Chromatograms (XICs), at selected m/z previously observed in high energy HRMS^E of 12,20-dideoxyphorbol 13-acyl derivatives, obtained from UHPLC-HRMS^E experiments for chromatographic fraction G-7 of *E. resinifera* (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 10-40 eV; high-energy function (2: TOF MS ES⁺)). XIC for 12,20-dideoxyphorbol 13-acyl derivatives [M+Na]⁺ molecular ion: (a) m/z 437.2304 calculated mass for C₂₅H₃₄O₅Na (diDPU₄ (22)). XICs for selected featured ions of 12,20-dideoxyphorbol 13-acyl derivatives HRMS^E spectra (see Scheme 5 and Figure S30) at: (b) m/z 337.1780; (c) m/z 297.1855; (d) m/z 279.1749 and (e) m/z 269.1905. (f) UHPLC-HRMS^E chromatographic profile (TIC) of fraction G-7 2019-Ac-FR11 from *E. resinifera* extract..... 73

Figure S38. Total Ion Current (TIC) and eXtracted Ion Chromatograms (XICs), at selected m/z previously observed in high energy HRMS^E of 12-deoxy-16-hydroxyphorbol 20-acetate-13,16-diacyl derivatives, obtained from UHPLC-HRMS^E experiments for chromatographic fraction G-8 of *E. resinifera* (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 60-120 eV; high-energy function (2: TOF MS ES⁺)). XIC for 12-deoxy-16-hydroxyphorbol 20-acetate-13,16-diacyl derivatives [M+Na]⁺ molecular ions: (a) m/z 617.2727, calculated mass for C₃₄H₄₂O₉Na (AcDPPI (4)); (b) m/z 629.2727, calculated mass for C₃₅H₄₂O₉Na (AcDPPT (5)); (c) m/z 631.2883, calculated mass for C₃₅H₄₄O₉Na (AcDPPU₃ (21)). XICs for selected characteristic ions of 16-hydroxy-12-deoxyphorbol 20-acetate-13,16-diacyl derivatives HRMS^E spectra (see Scheme 2 and Figure S22) at (d) m/z 529.2202, (e) m/z 411.1784, (f) m/z 393.1678, (g) m/z 333.1467 and (h) m/z 293.1542. (i) TIC of UHPLC-HRMS^E chromatographic profile of fraction G-8 from *E. resinifera* extract..... 74

Figure S39. Total Ion Current (TIC) and eXtracted Ion Chromatograms (XICs), at selected m/z previously observed in high energy HRMS^E of 12-deoxyphorbol 20-acetate-13-acyl derivatives, obtained from UHPLC-HRMS^E experiments for chromatographic fraction G-8 of *E. resinifera* (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 10-40 eV; high-energy function (2: TOF MS ES⁺)). XIC for 12-deoxyphorbol 20-acetate-13-phenylacetate (AcDPP (12)) [M+Na]⁺ molecular ion: (a) m/z 531.2359 calculated mass for C₃₀H₃₆O₇Na. XICs for selected featured ions of 12-deoxyphorbol 20-acetate-13-acyl derivatives HRMS^E spectra (see Scheme 4 and Figure S29) at: (b) m/z 395.1834; (c) m/z 335.1623; (d) m/z 295.1698. (e) UHPLC-HRMS^E chromatographic profile (TIC) of fraction G-8 from *E. resinifera* extract..... 75

Figure S40. Total Ion Current (TIC) and eXtracted Ion Chromatograms (XICs), at selected m/z previously observed in high energy HRMS^E of 12-deoxy-16-hydroxyphorbol 13,16-diacyl derivatives, obtained from UHPLC-HRMS^E experiments for chromatographic fraction G-9 of *E. resinifera* (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 60-120 eV; high-energy function (2: TOF MS ES⁺)). XIC for 12-deoxy-16-hydroxyphorbol 13,16-diacyl derivatives [M+Na]⁺ molecular ions: (a) m/z 575.2621, calculated mass for C₃₂H₄₀O₈Na (DPPI (1)); (b) m/z 587.2621, calculated mass for C₃₃H₄₀O₈Na (DPPT (2)); (c) m/z 609.2464, calculated mass for C₃₅H₃₈O₈Na (DPPBz (3)); (d) m/z 589.2777, calculated mass for C₃₃H₄₂O₈Na (DPPU₁ (19)). XICs for selected characteristic ions of 12-deoxy-16-hydroxyphorbol 13,16-diacyl derivatives HRMS^E spectra (see Scheme 1 and Figure S20) at (e) m/z 487.2097, (f) m/z 369.1678, (g) m/z 351.1572, (h) m/z 323.1623 and (i) m/z 293.1542. (j) TIC of UHPLC-HRMS^E chromatographic profile of fraction G-9 from *E. resinifera* extract..... 76

Supplementary Material

Figure S41. Total Ion Current (TIC) and eXtracted Ion Chromatograms (XICs), at selected m/z previously observed in high energy HRMS^E of 12-deoxyphorbol 13-acyl derivatives, obtained from UHPLC-HRMS^E experiments for chromatographic fraction G-9 of *E. resinifera* (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 10-40 eV; high-energy function (2: TOF MS ES+)). XICs for 12-deoxyphorbol 13-acyl derivatives [M+Na]⁺ molecular ions: (a) m/z 441.2253 calculated mass for C₂₄H₃₄O₆Na (DPB (7)); (b) m/z 453.2253 calculated mass for C₂₅H₃₄O₆Na (DPA (8)) and (c) m/z 489.2253, calculated mass for C₂₈H₃₄O₆Na (DPP (9)). XICs for selected featured ions of 12-deoxyphorbol 13-acyl derivatives HRMS^E spectra (see Scheme 3 and Figure S25) at: (d) m/z 395.1834; (e) m/z 335.1623; (f) m/z 295.1698. (g) UHPLC-HRMS^E chromatographic profile (TIC) of fraction from *E. resinifera* extract..... 77

4- UHPLC-HRMS^E data. Tables.

Table S1. Selected ions of high energy HRMS^E experiment (DIA) [1] of DPPI (1) and DPPT (2) (data acquired in ESI positive ionization with a ramp trap collision energy of the high-energy function set at 60-120 eV). 78

Table S2. Selected ions of high energy HRMS^E experiment (DIA) [1] of DPA (8) and DPP (9) (data acquired in ESI positive ionization with a ramp trap collision energy of the high-energy function set at 10-40 eV). 79

Table S3. Selected ions of high energy HRMS^E experiment (DIA) [1] of AcDPB (10), AcDPA (11) and AcDPP (12) (data acquired in ESI positive ionization with a ramp trap collision energy of the high-energy function set at 10-40 eV). 80

References. 81

Supplementary Material

1- NMR Spectra

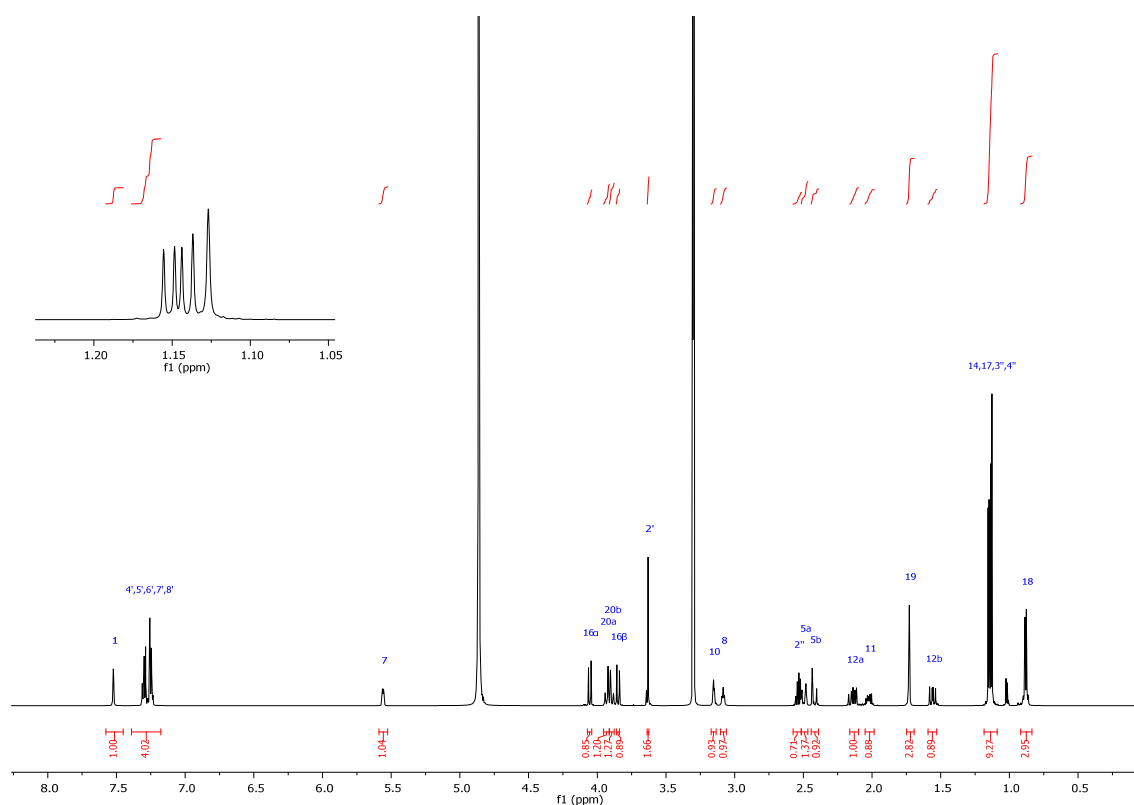


Figure S1a. ^1H NMR spectrum of DPPI (1) in CD_3OD (600 MHz).

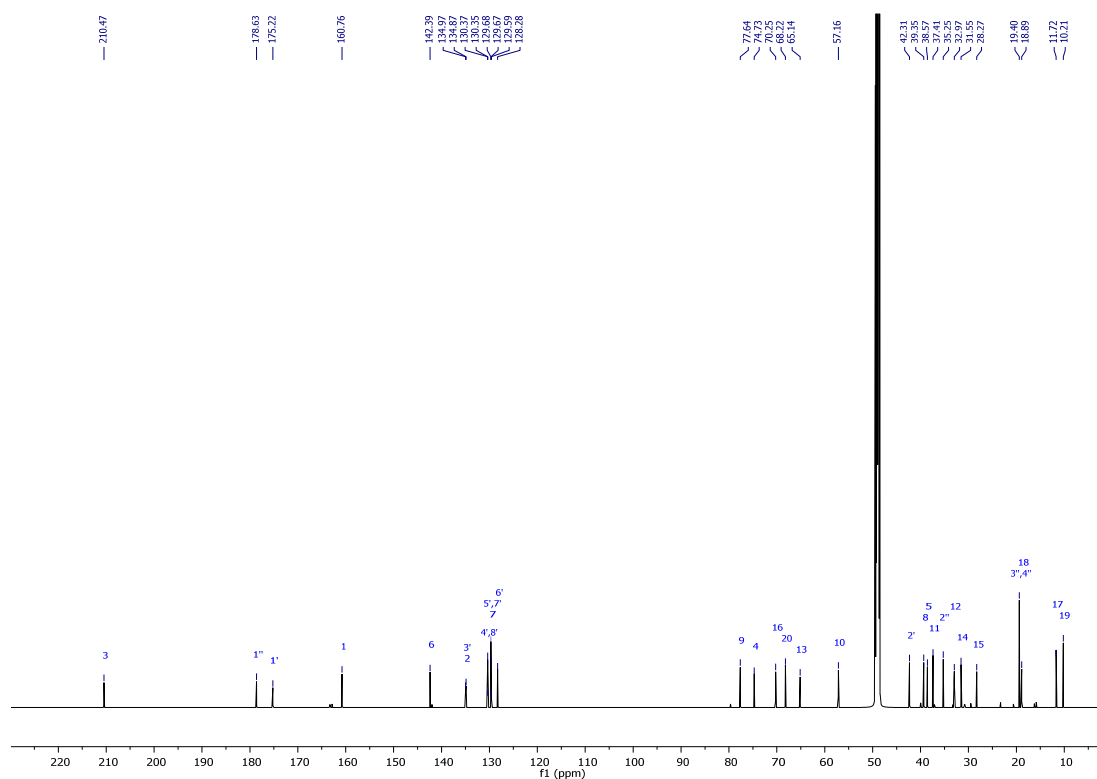


Figure S1b. ^{13}C NMR spectrum of DPPI (1) in MeOD (150 MHz).

Supplementary Material

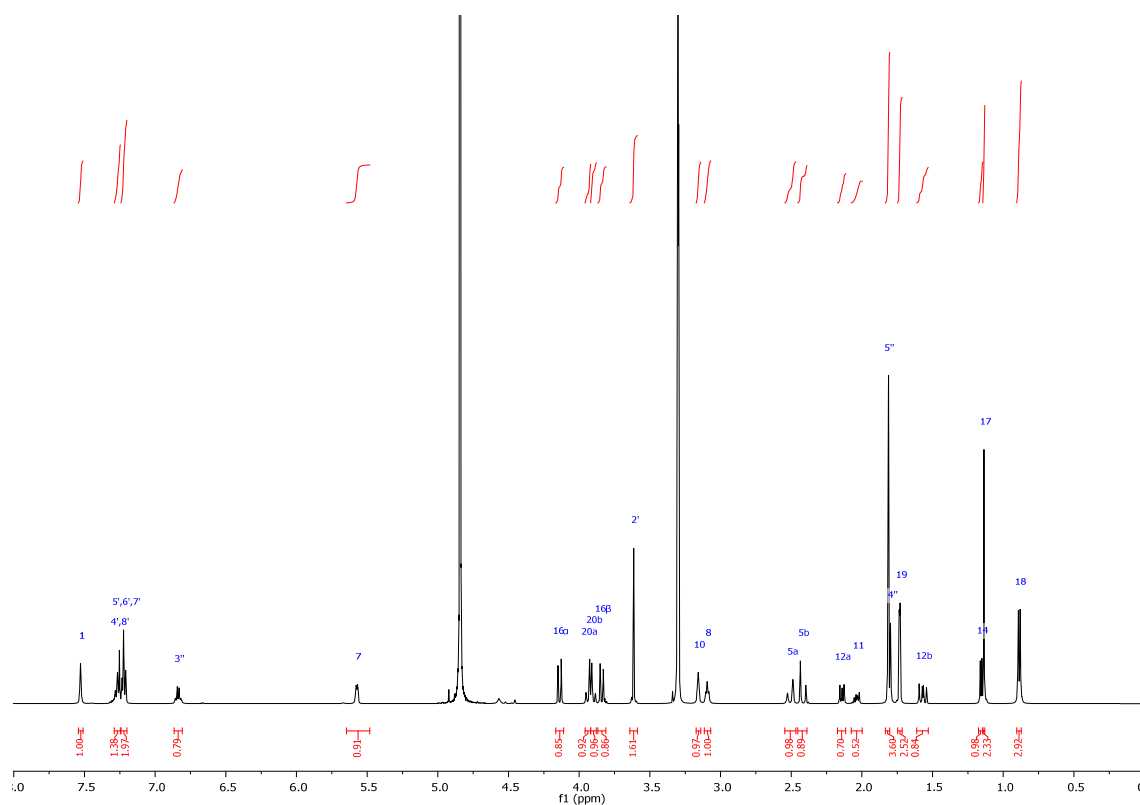


Figure S2a. ¹H-NMR spectrum DPPT (2) in CD₃OD (500 MHz).

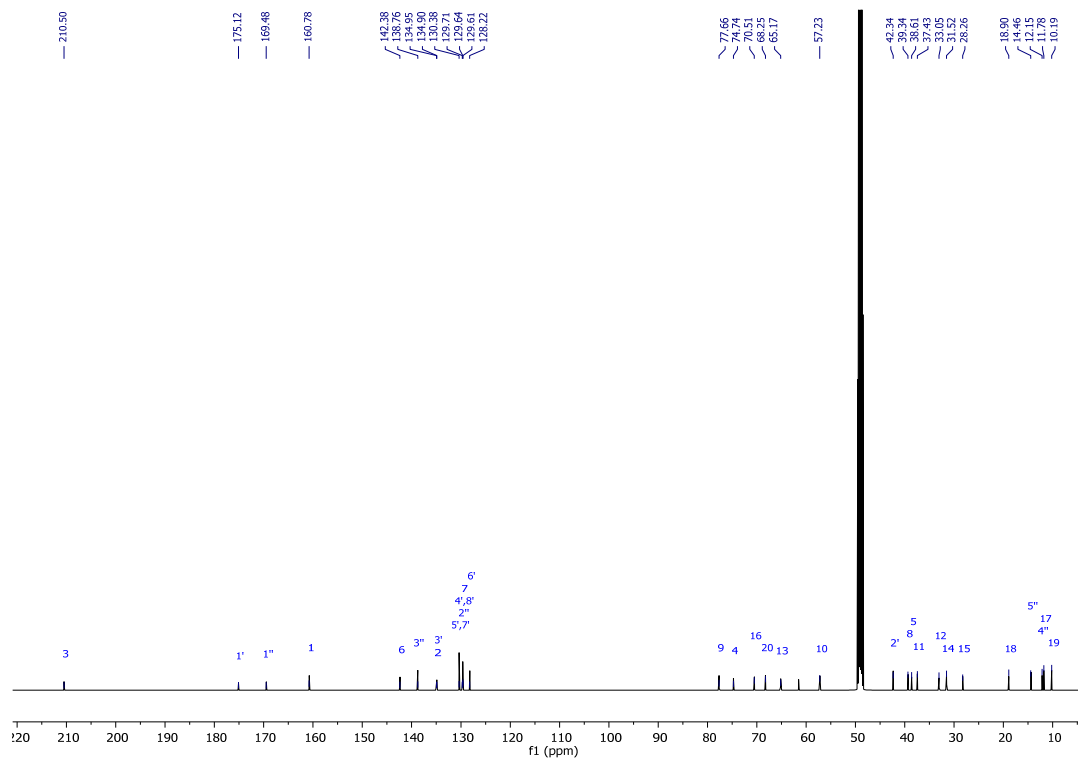


Figure S2b. ¹³C-NMR spectrum of DPPT (2) in CD₃OD (150 MHz).

Supplementary Material

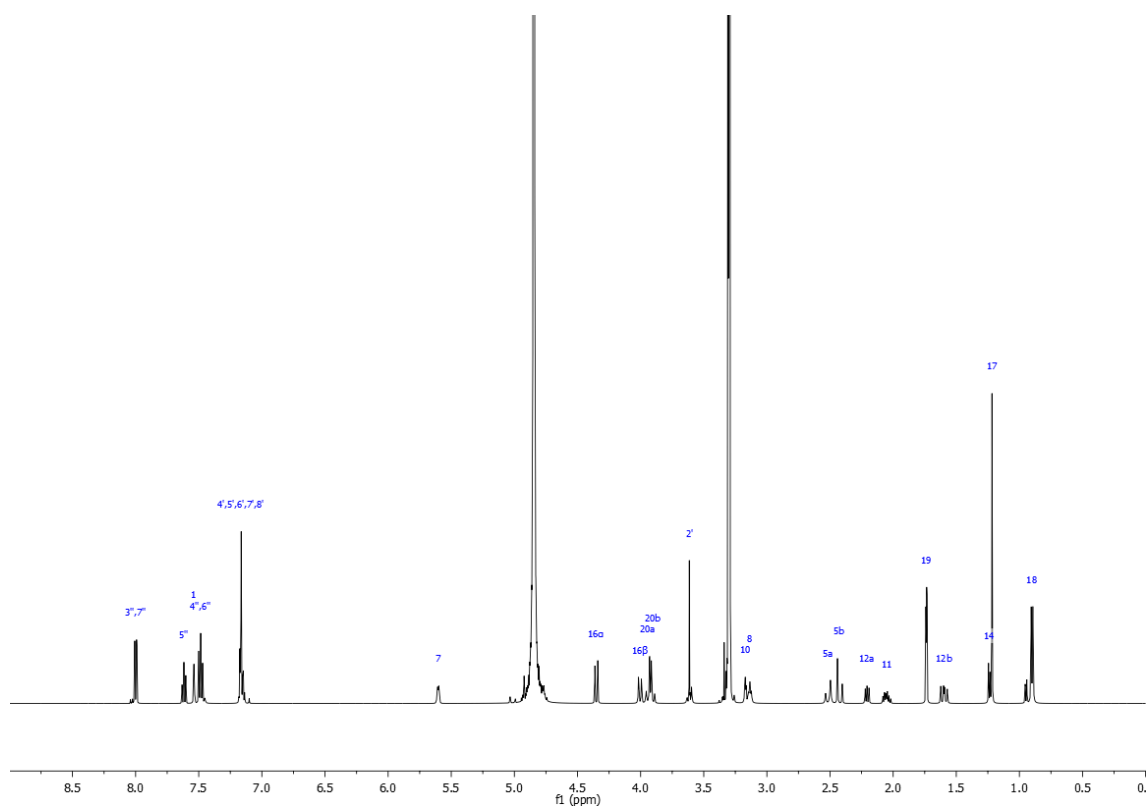


Figure S3a. ^1H -NMR spectrum of DPPBz (**3**) in CD_3OD (400 MHz).

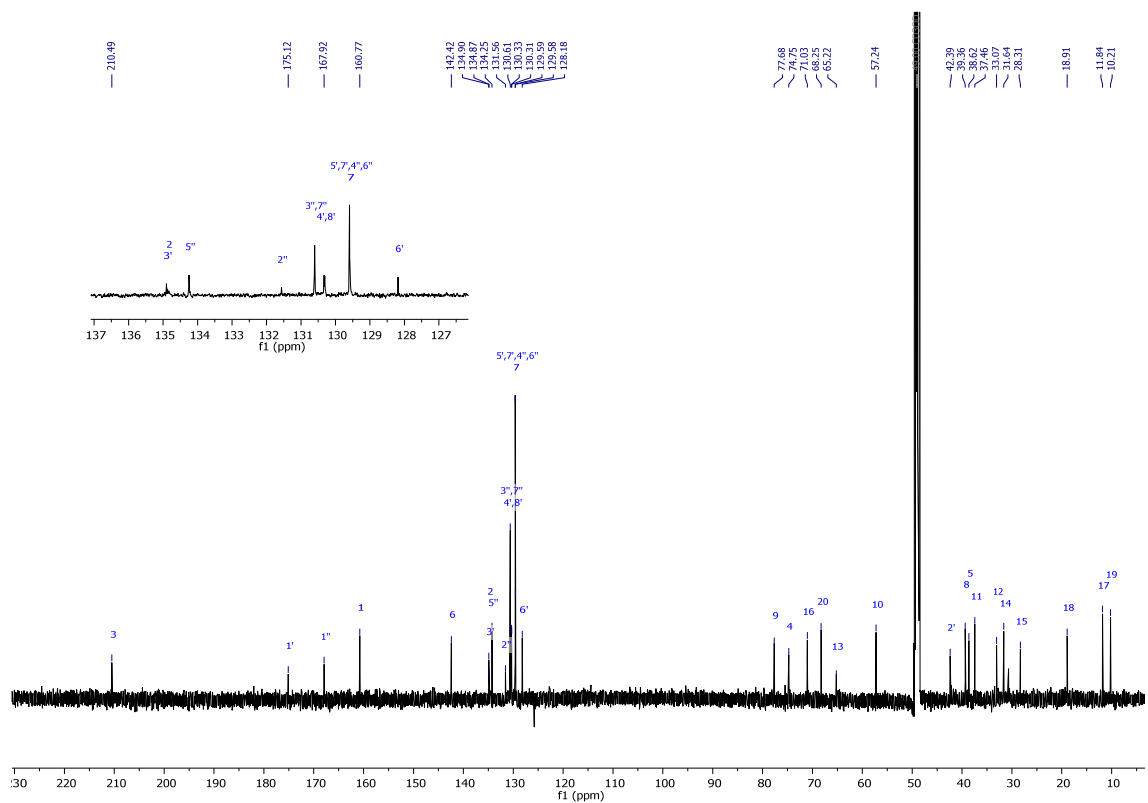


Figure S3b. ^{13}C -NMR spectrum of DPPBz (**3**) in CD_3OD (100 MHz).

Supplementary Material

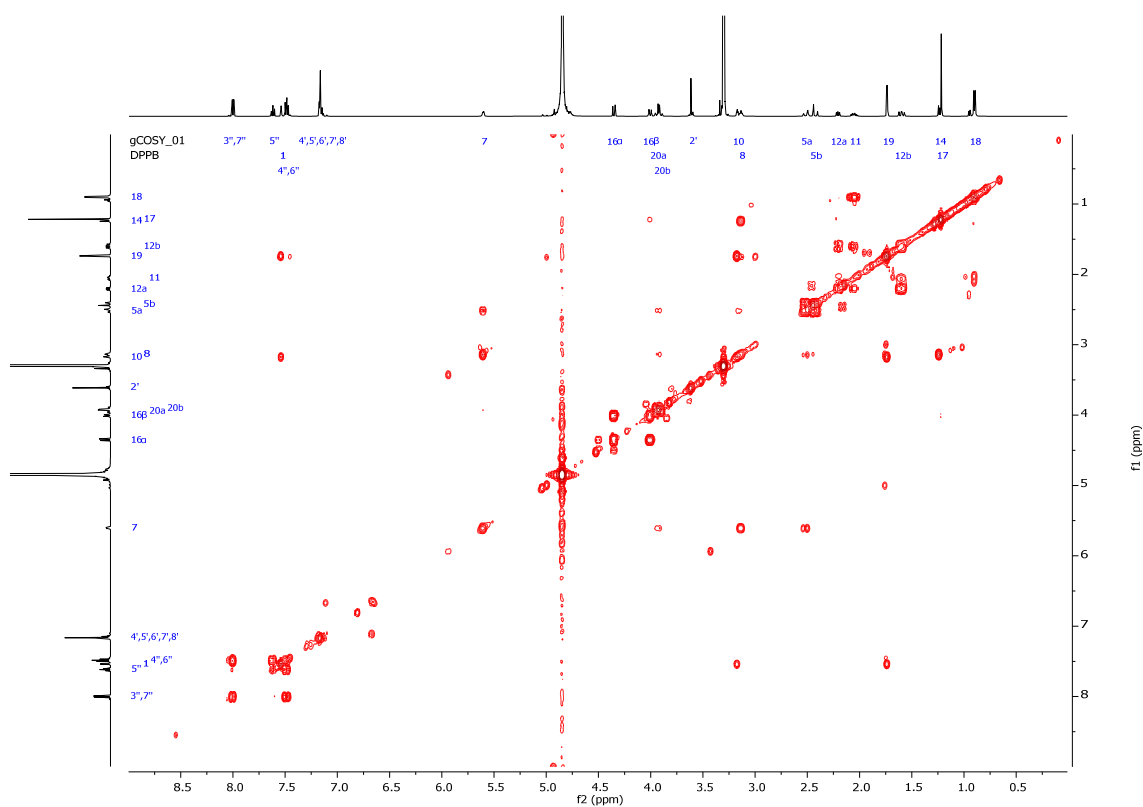


Figure S3c. COSY spectrum of DPPBz (**3**) in CD₃OD.

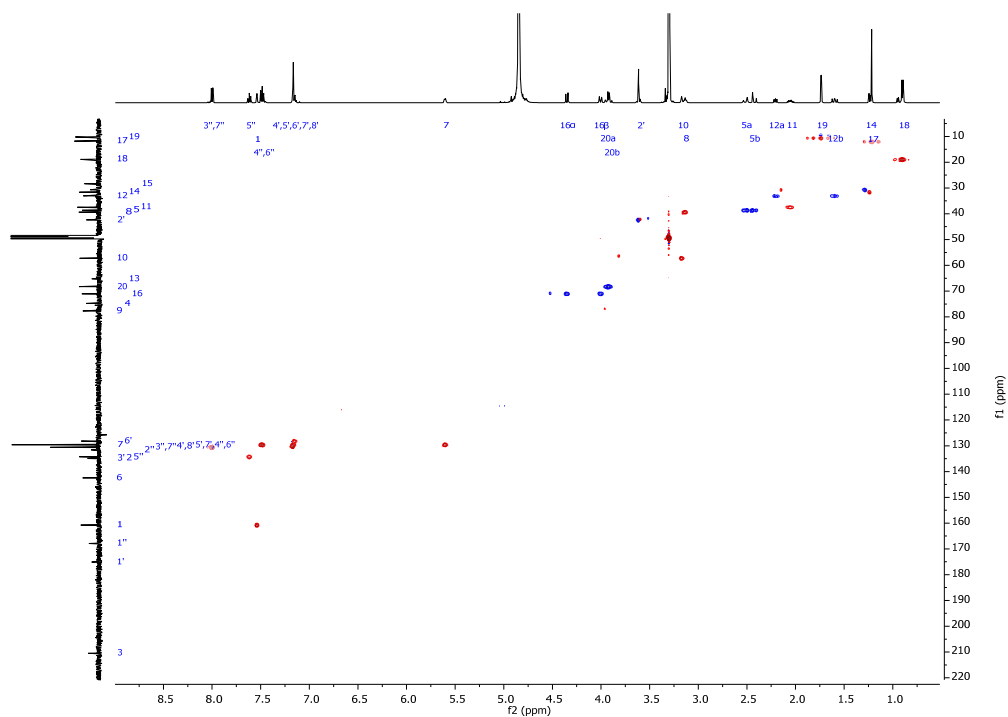


Figure S3d. HSQC spectrum of DPPBz (**3**) in CD₃OD.

Supplementary Material

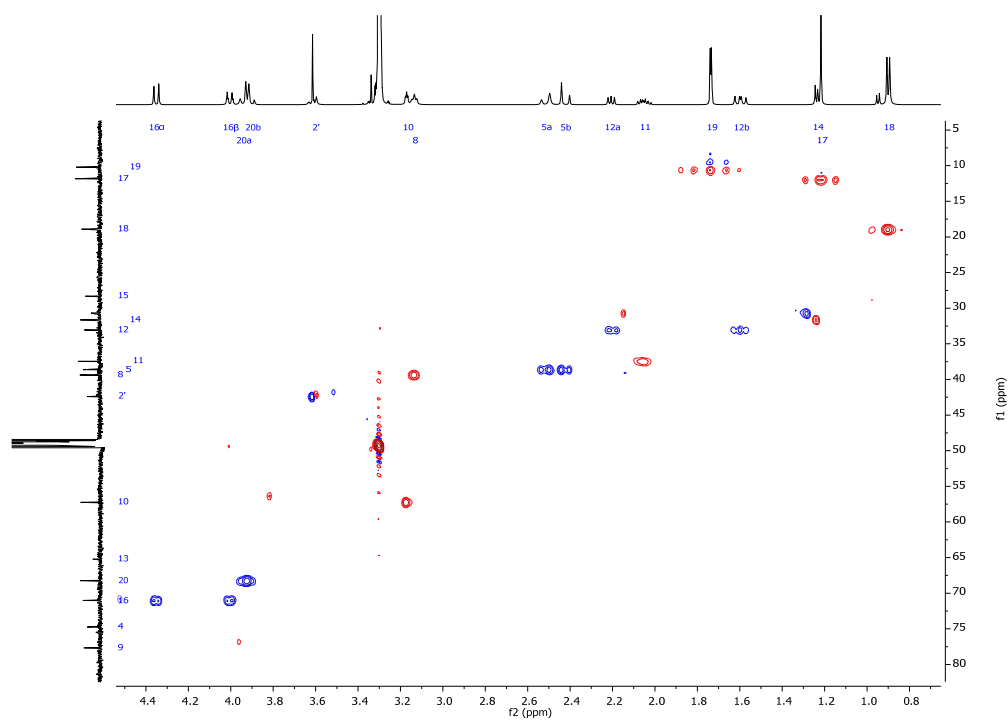


Figure S3e. Expansion (δ_{H} 4.7-0.6, δ_{C} 80-2) of HSQC spectrum of DPPBz (**3**) in CD_3OD .

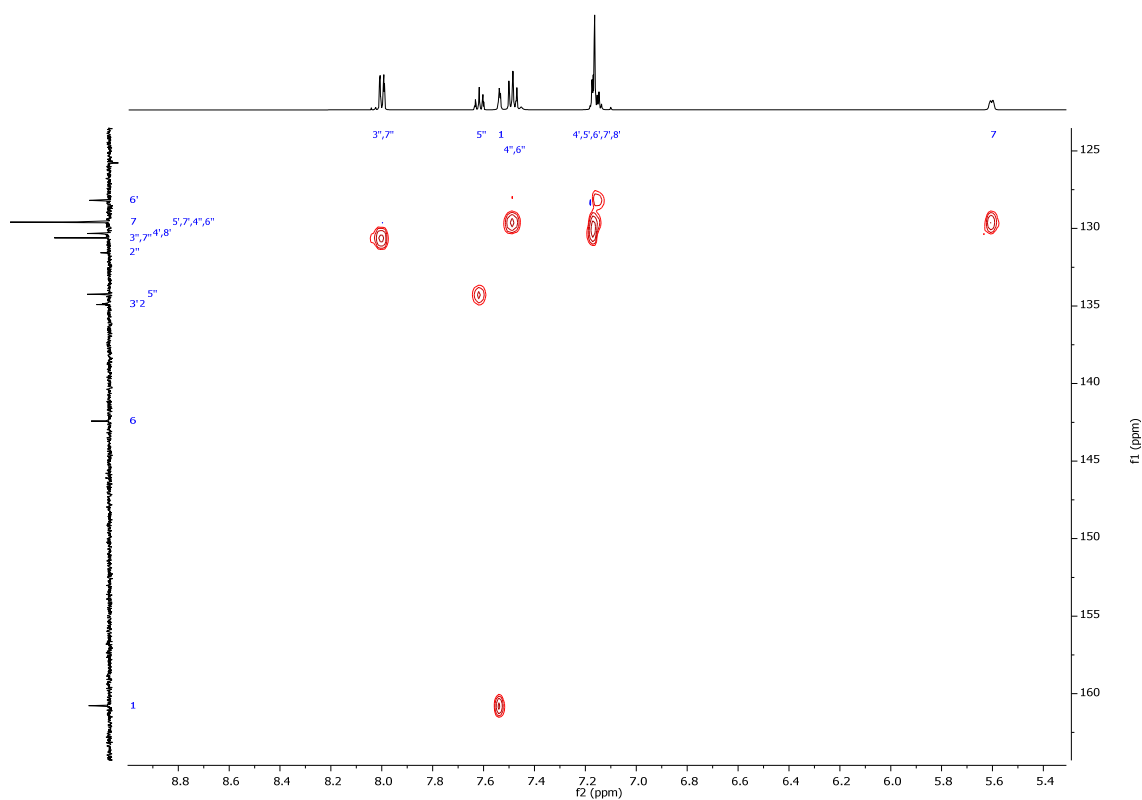


Figure S3f. Expansion (δ_{H} 8.3-5.4, δ_{C} 162-120) of HSQC spectrum of DPPBz (**3**) in CD_3OD .

Supplementary Material

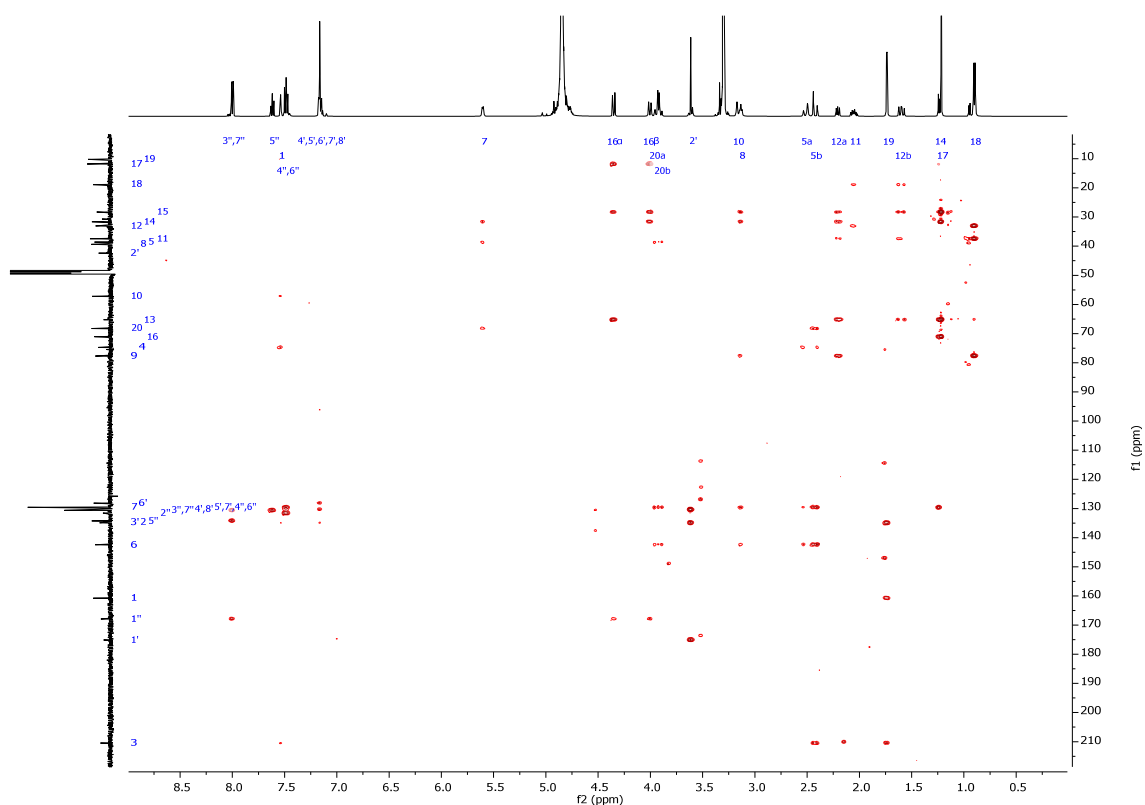


Figure S3g. HMBC spectrum of DPPBz (**3**) in CD₃OD.

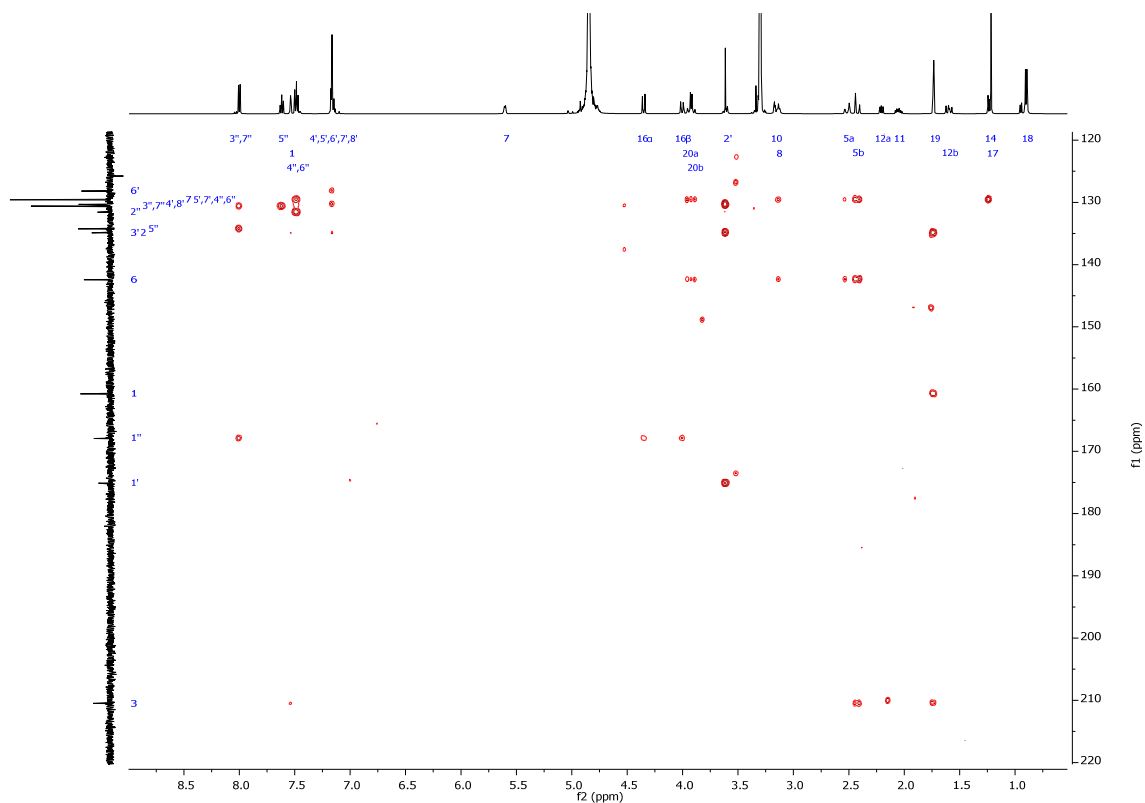


Figure S3h. Expansion (δ_H 8.9-0.2, δ_C 218-119) of HMBC spectrum of DPPBz (**3**) in CD₃OD.

Supplementary Material

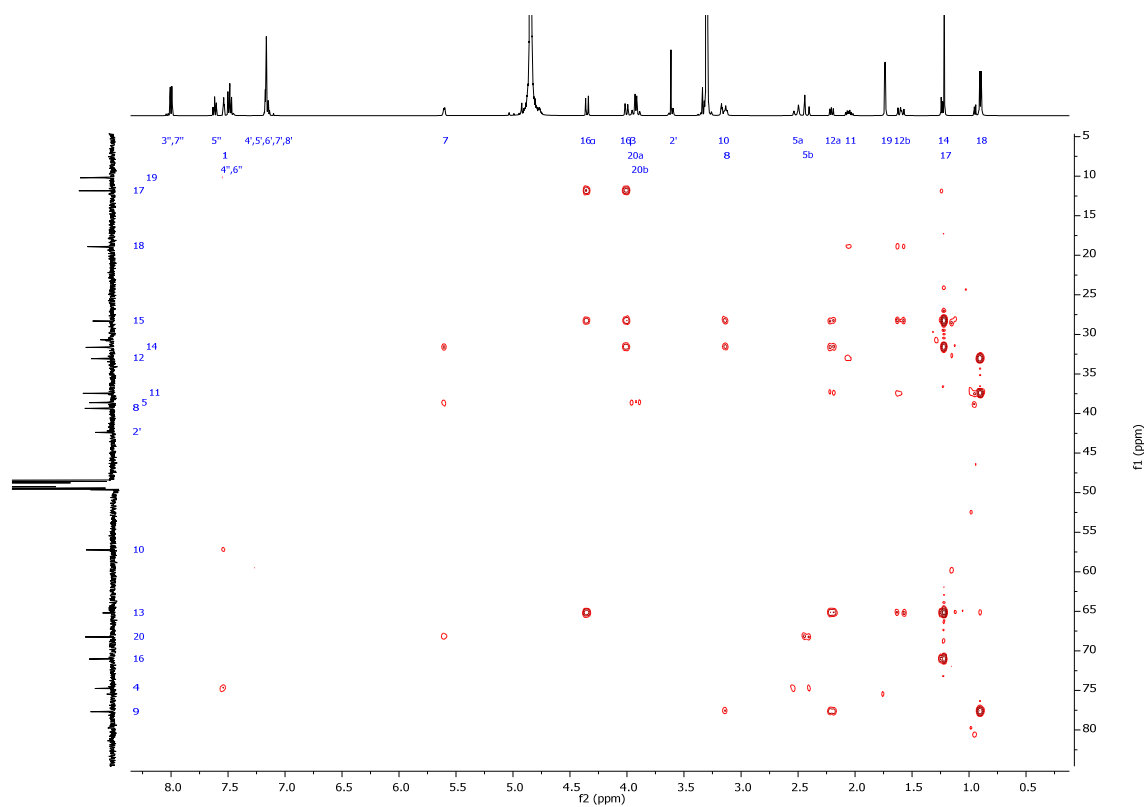


Figure S3i. Expansion (δ_{H} 8.4-0.4, δ_{C} 82-5) of HMBC spectrum of DPPBz (**3**) in CD_3OD .

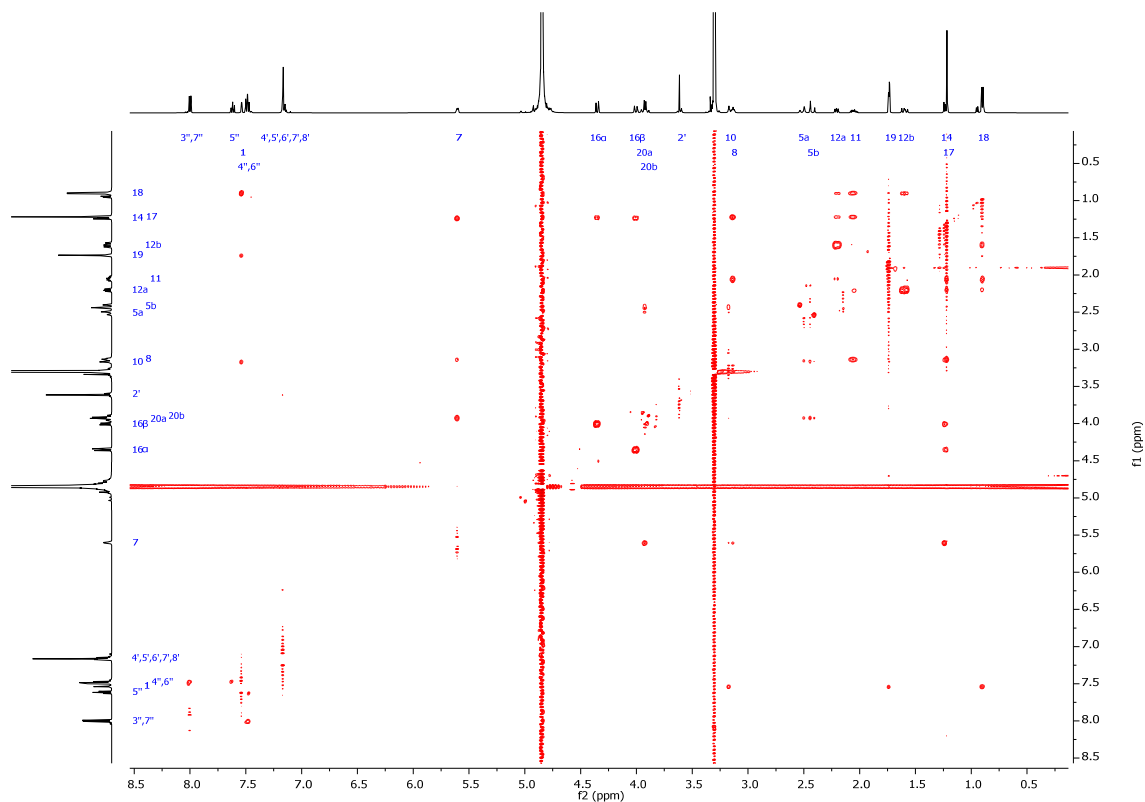
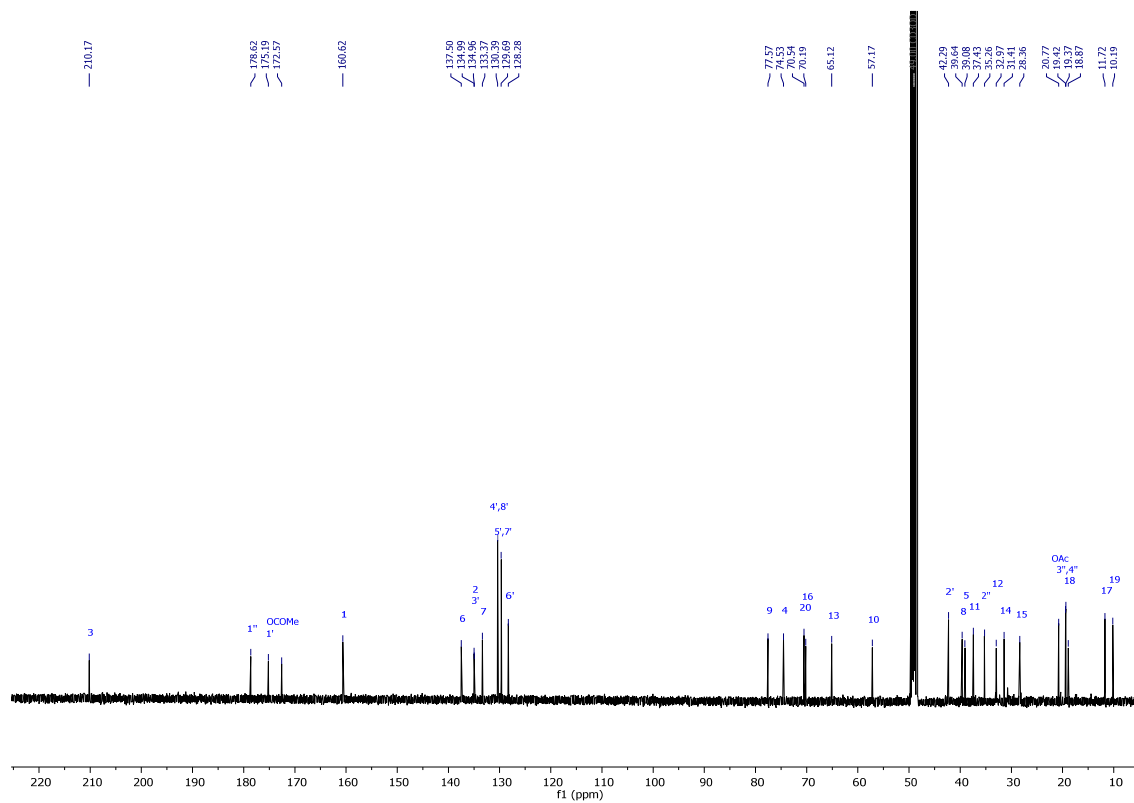
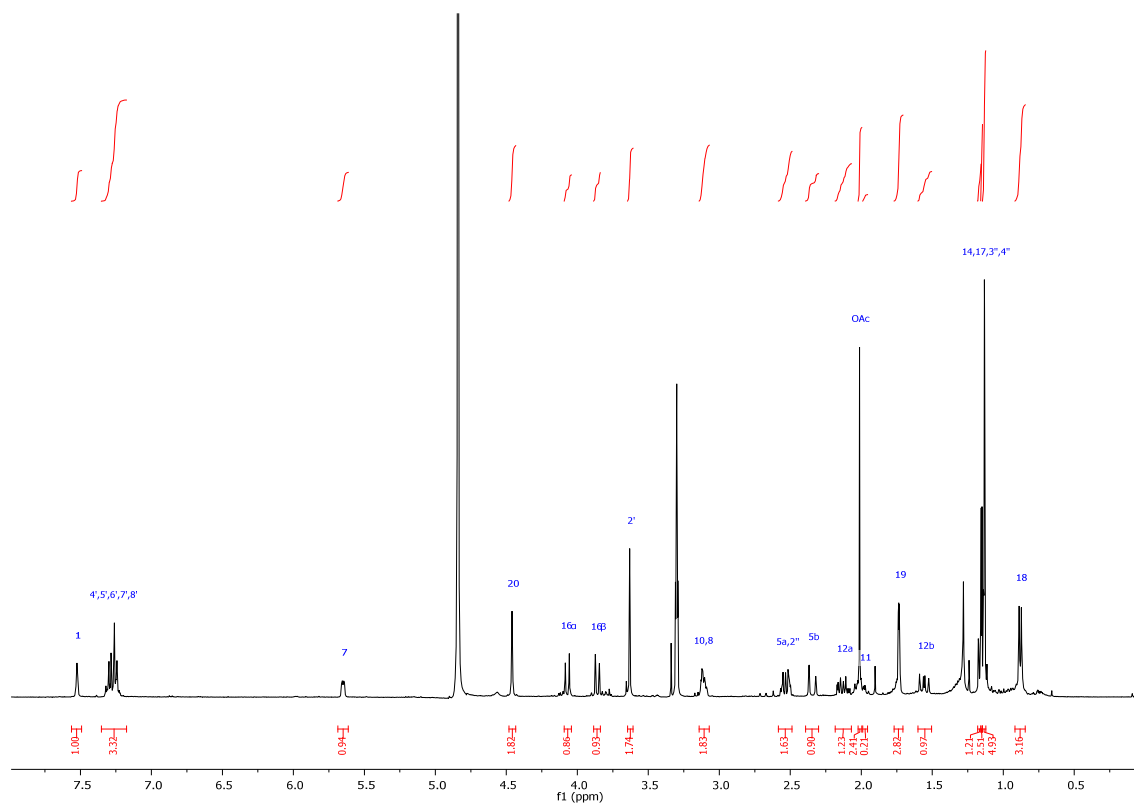


Figure S3j. NOESY2D spectrum of DPPBz (**3**) in CD_3OD

Supplementary Material



Supplementary Material

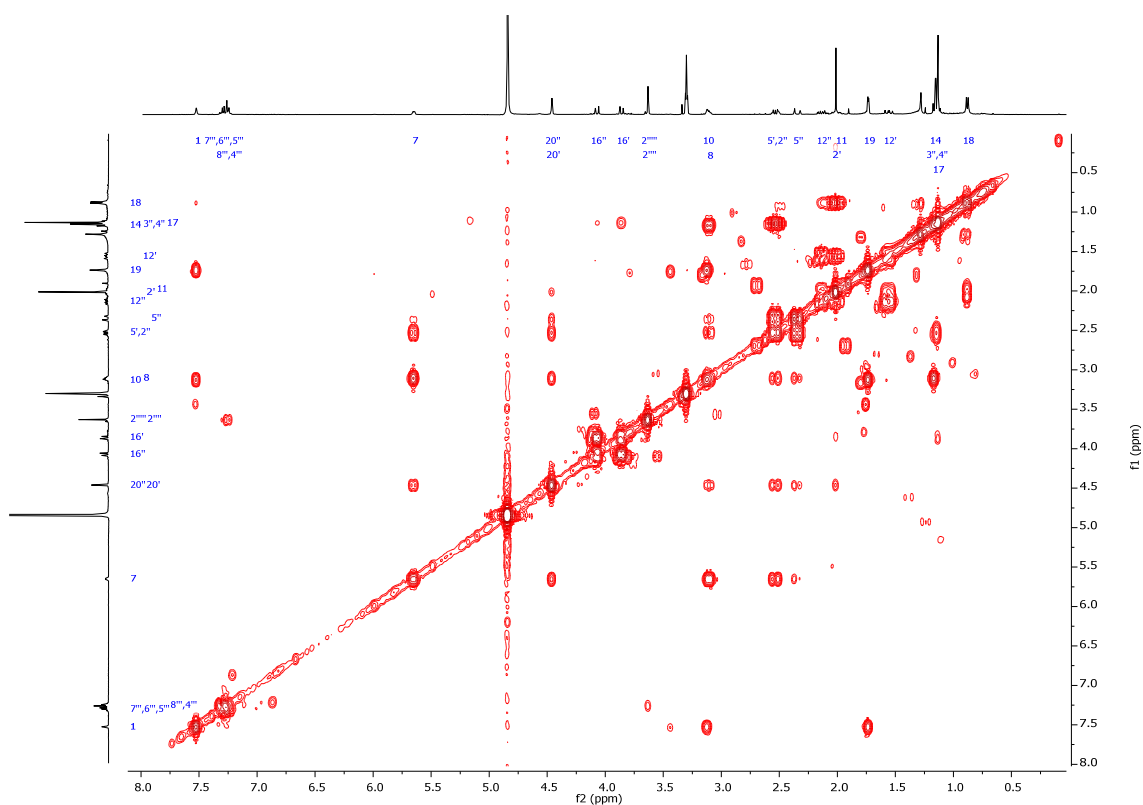


Figure S4c. COSY spectrum of AcDPPI (4) in CD₃OD.

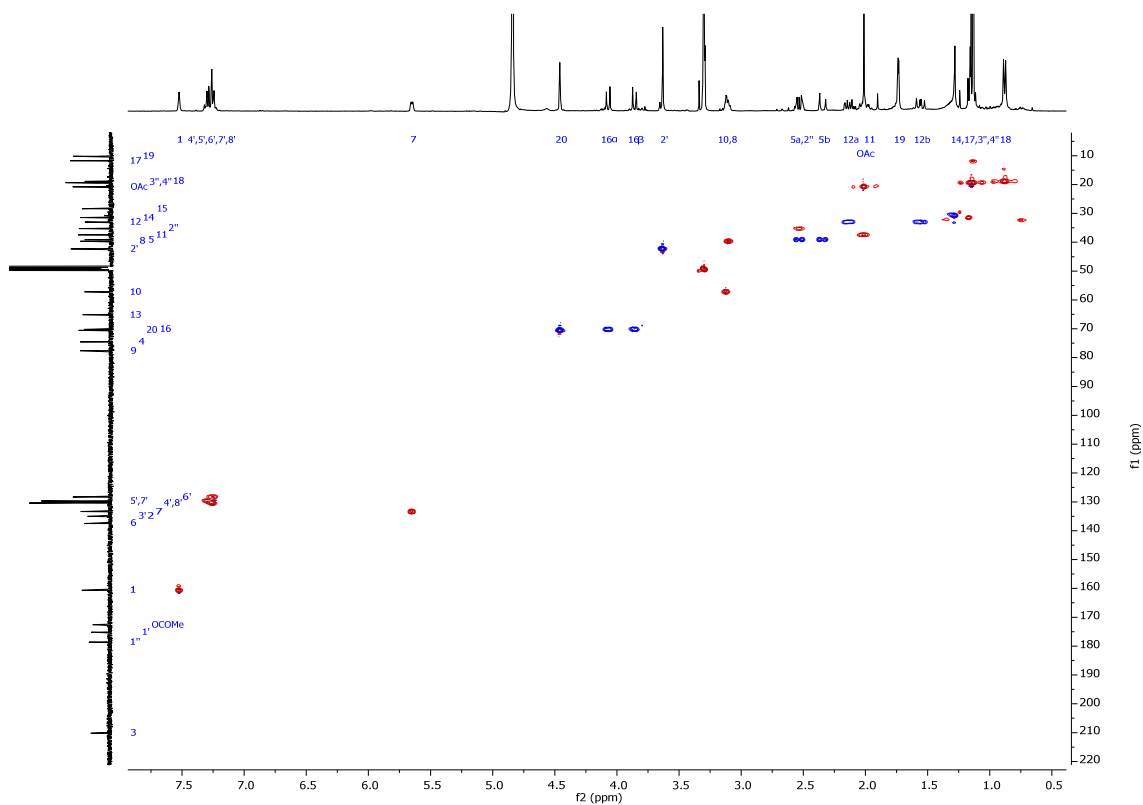


Figure S4d. HSQC spectrum of AcDPPI (4) in CD₃OD.

Supplementary Material

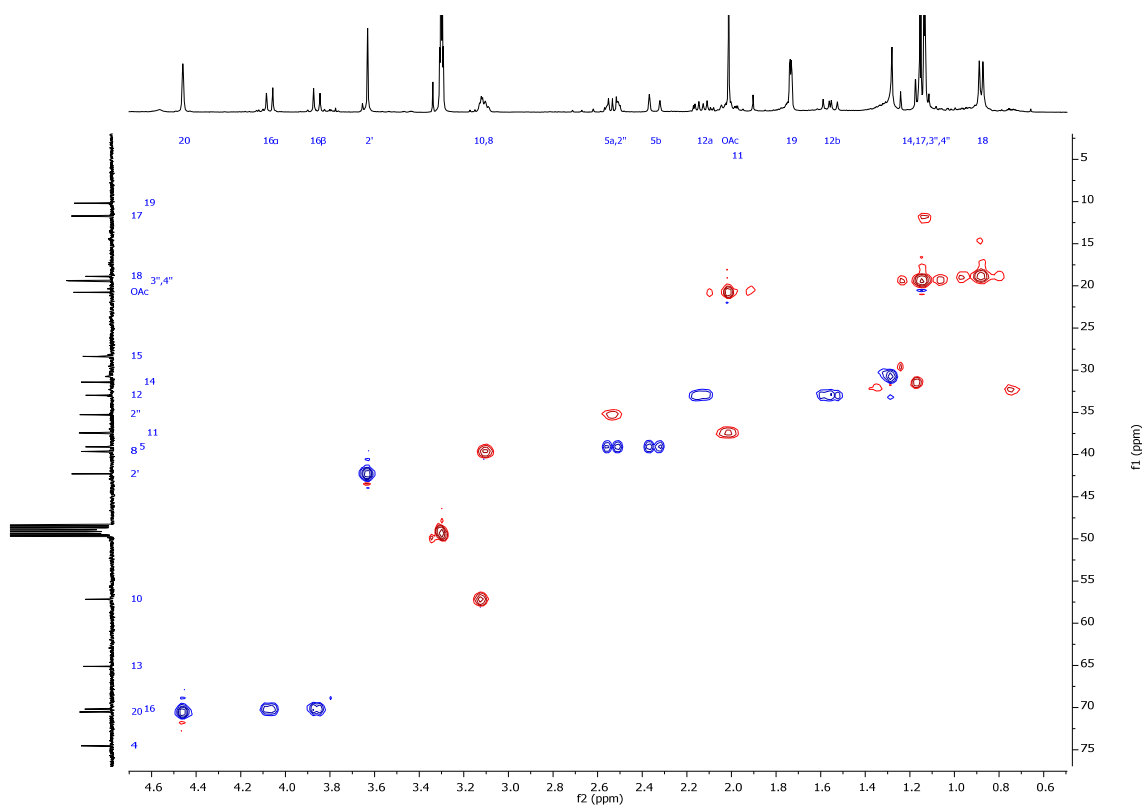


Figure S4e. Expansion (δ_{H} 4.7-0.5, δ_{C} 77-2) of HSQC spectrum of AcDPPI (**4**) in CD_3OD .

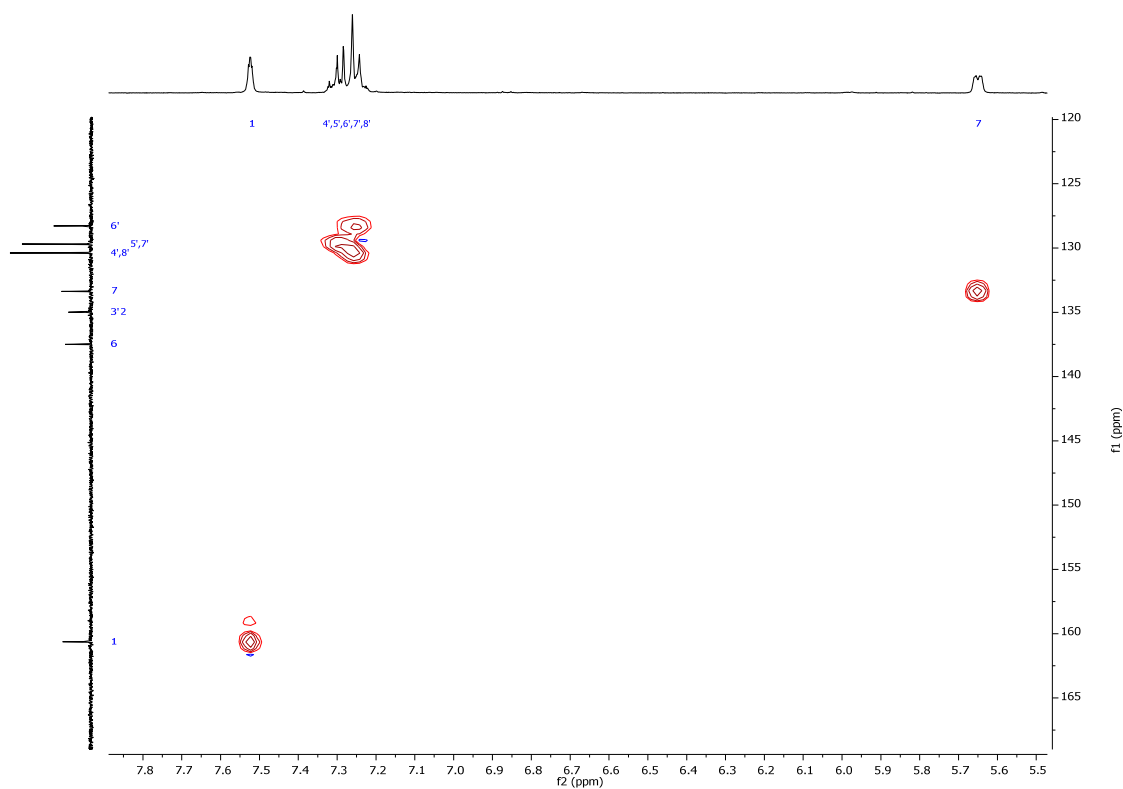


Figure S4f. Expansion (δ_{H} 7.8-5.5, δ_{C} 165-120) of HSQC spectrum of AcDPPI (**4**) in CD_3OD .

Supplementary Material

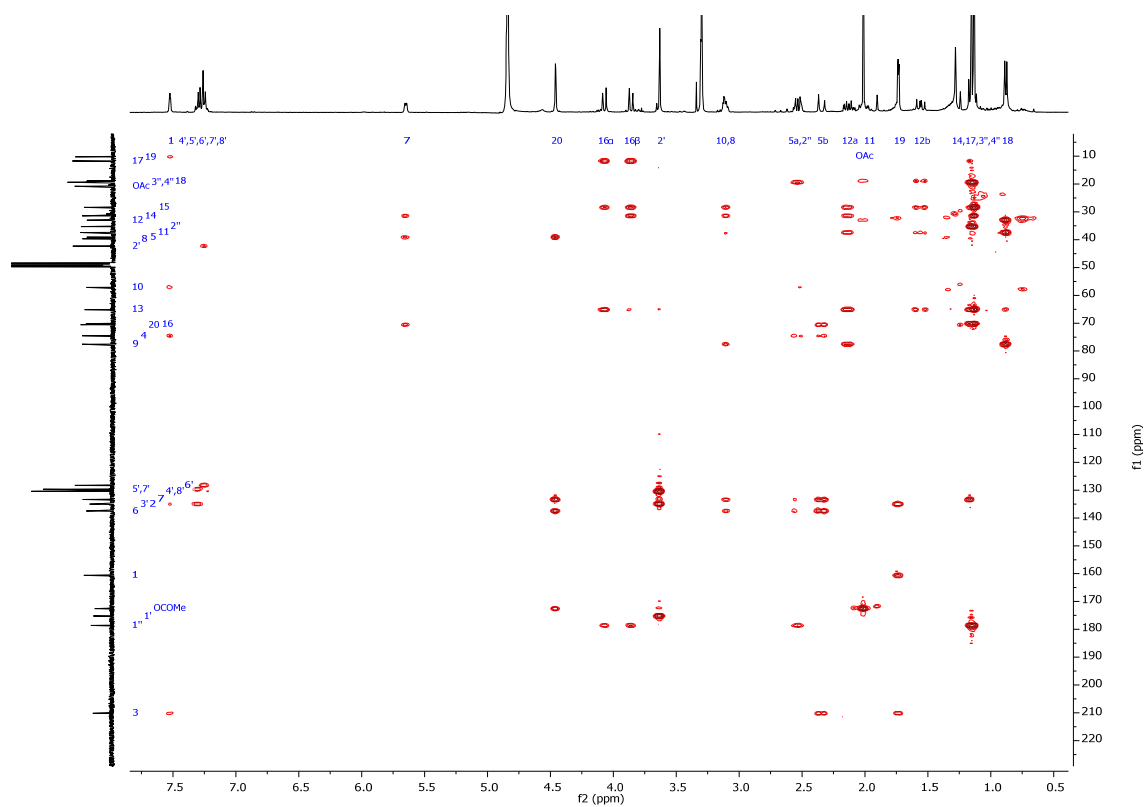


Figure S4g. HMBC spectrum of AcDPPI (4) in CD₃OD.

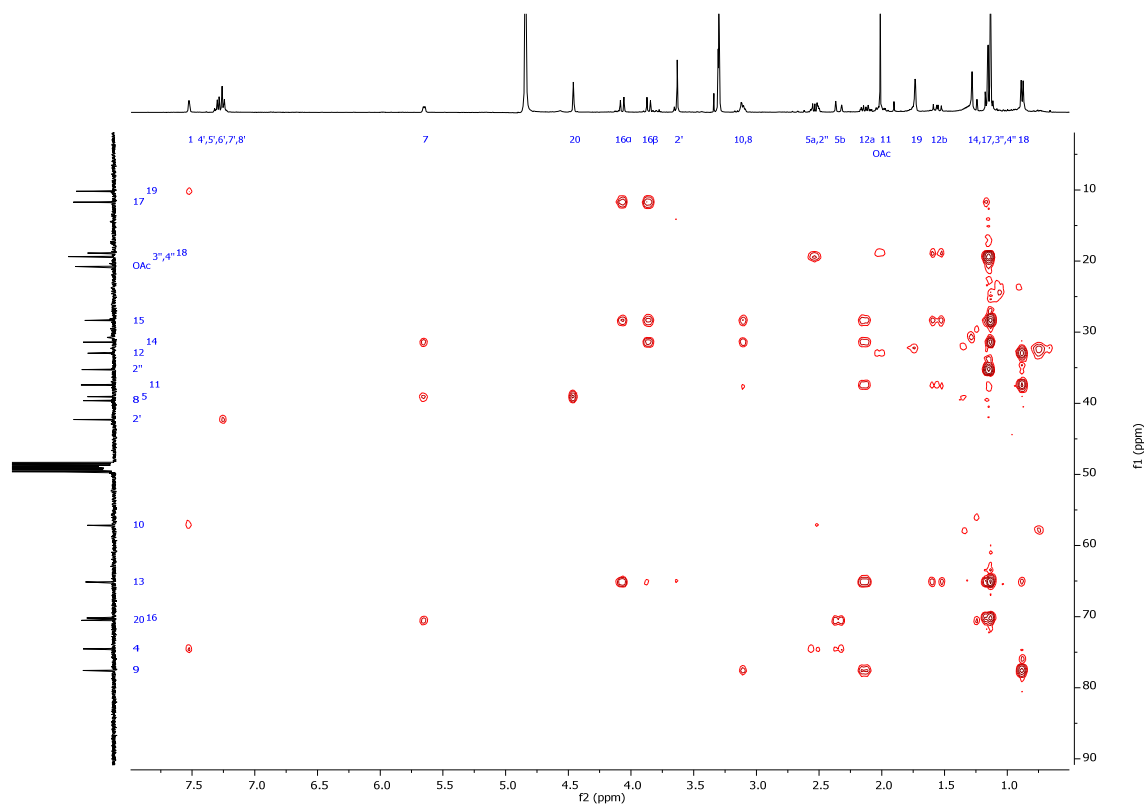


Figure S4h. Expansion (δ_H 8.0-0.4, δ_C 91-5) of HMBC spectrum of AcDPPI (4) in CD₃OD

Supplementary Material

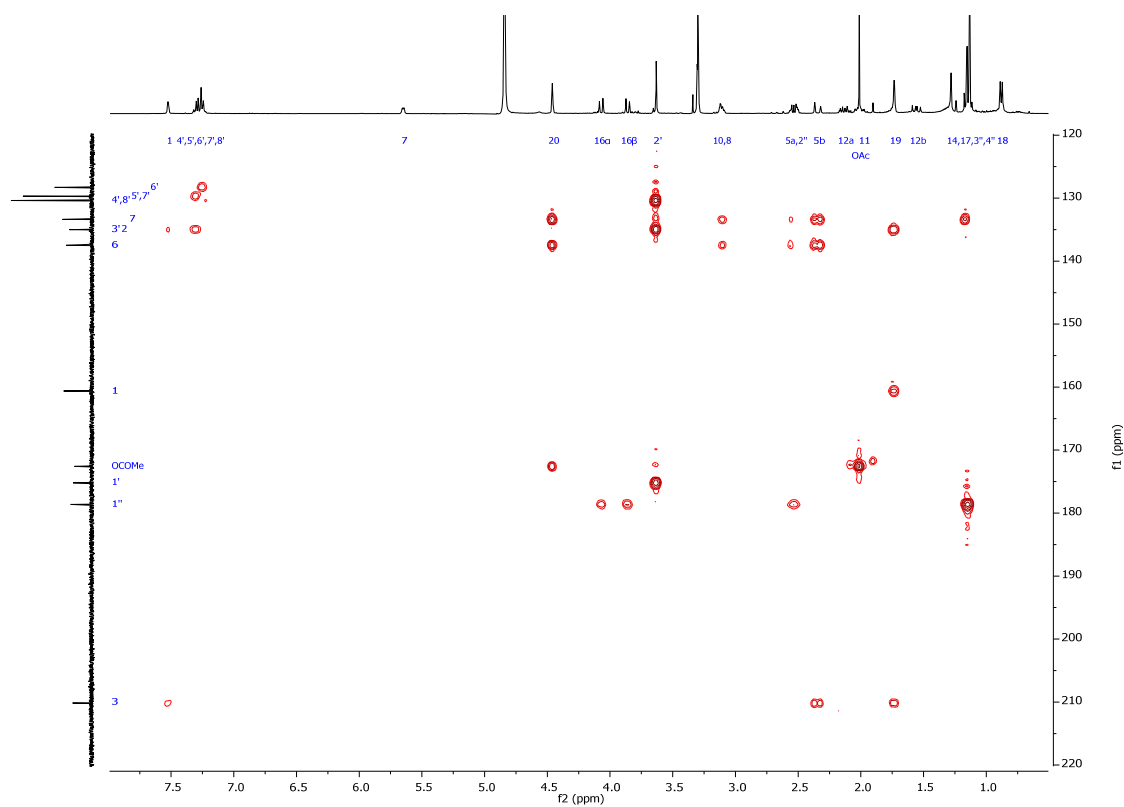


Figure S4i. Expansion (δ_{H} 8.0-0.4, δ_{C} 220-120) of HMBC spectrum of AcDPPI (4) in CD₃OD

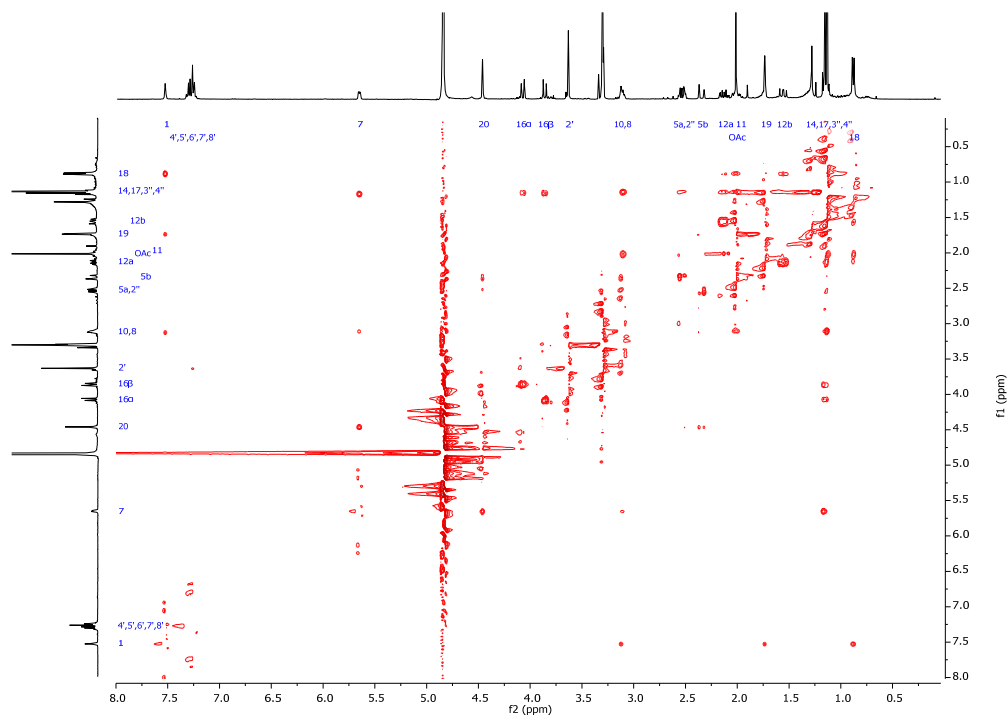


Figure S4j. NOESY2D spectrum of AcDPPI (4) in CD₃OD.

Supplementary Material

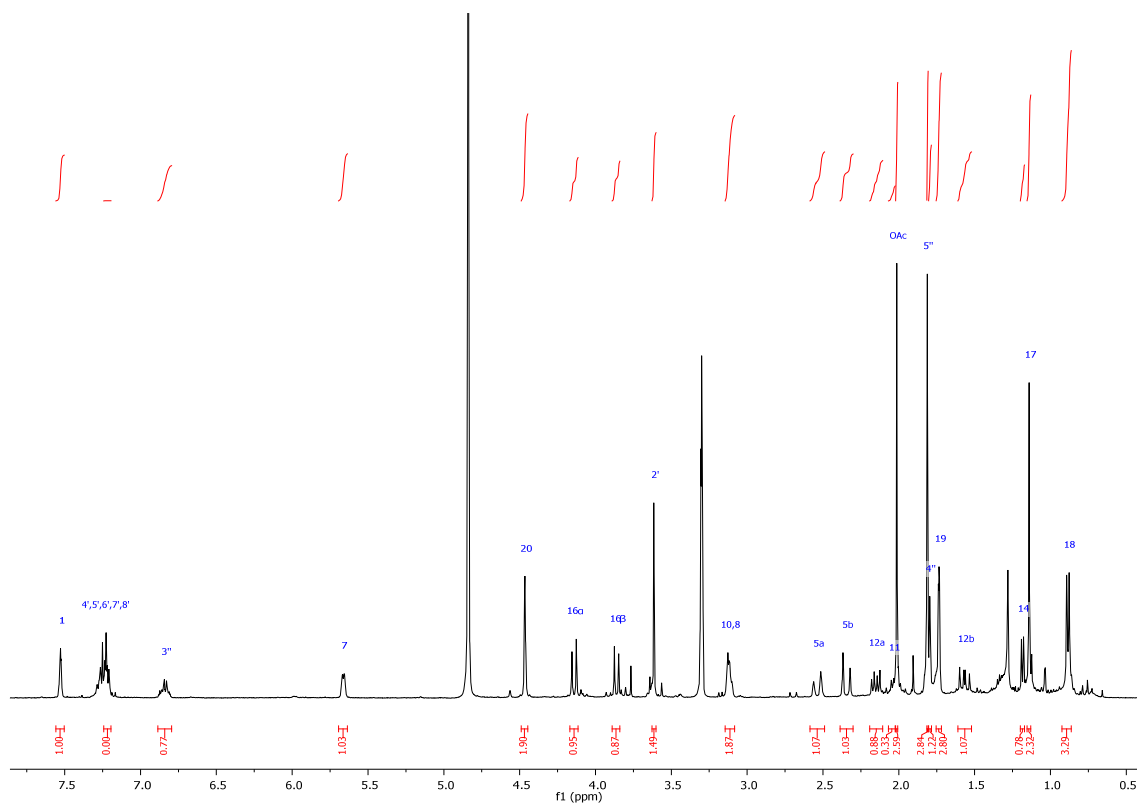


Figure S5a. ^1H NMR spectrum of AcDPPT (**5**) in CD_3OD (400 MHz).

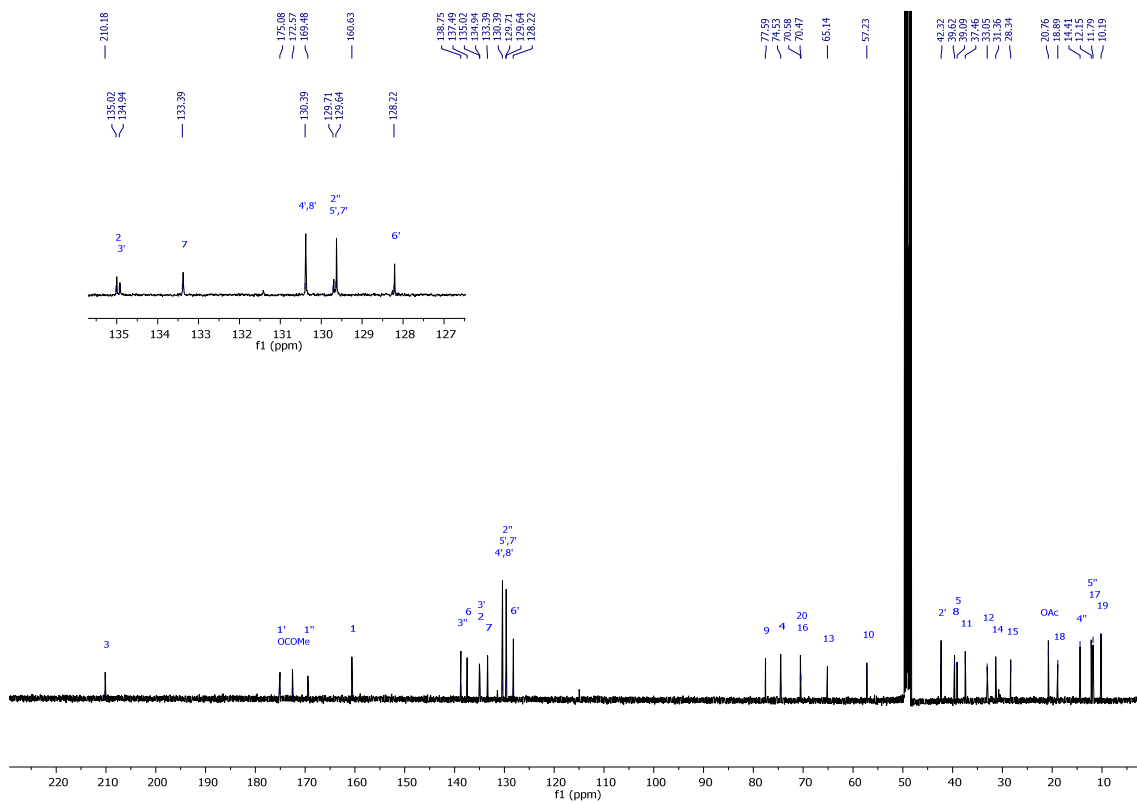


Figure S5b. ^{13}C NMR spectrum of AcDPPT (**5**) in CD_3OD (100 MHz).

Supplementary Material

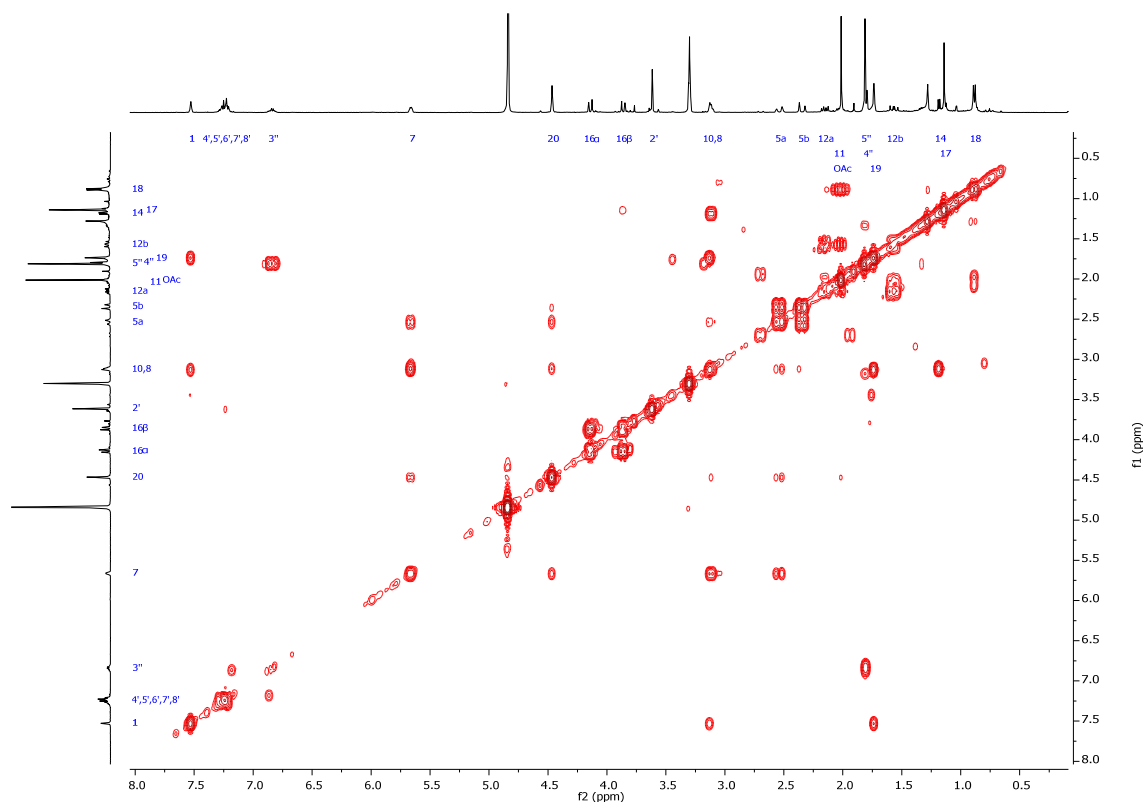


Figure S5c. COSY spectrum of AcDPPT (**5**) in CD₃OD.

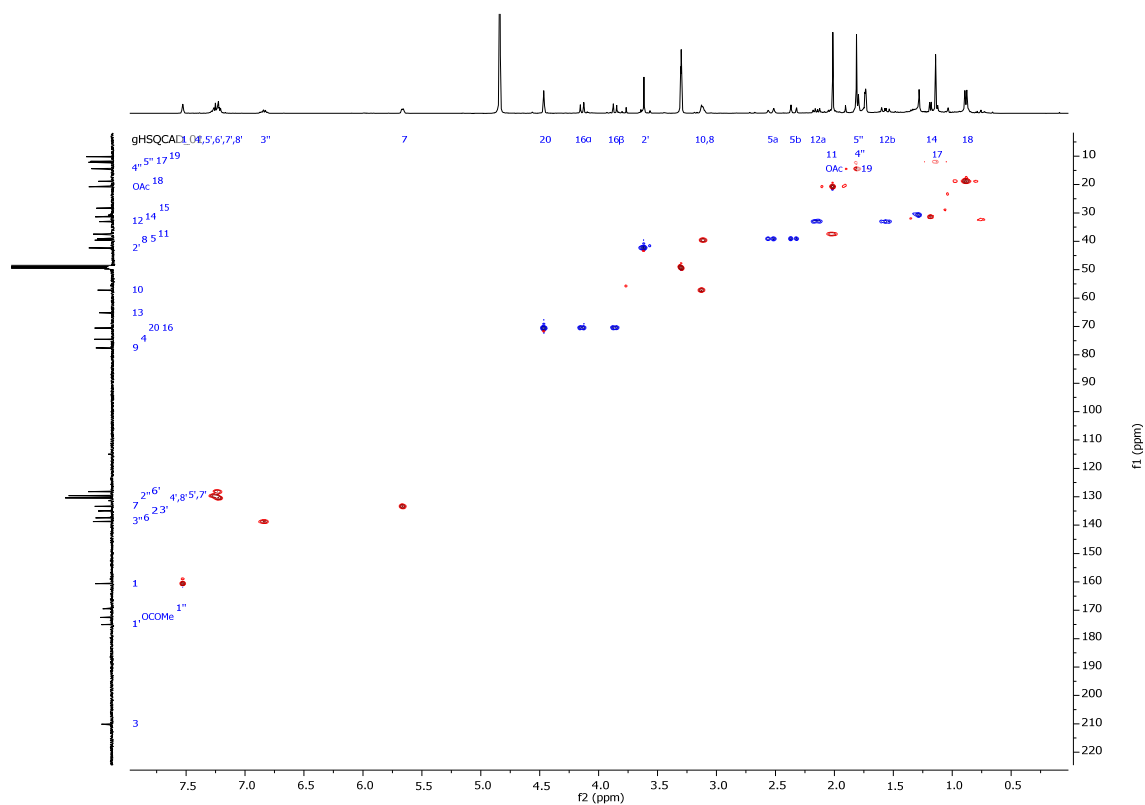


Figure S5d. HSQC spectrum of AcDPPT (**5**) in CD₃OD.

Supplementary Material

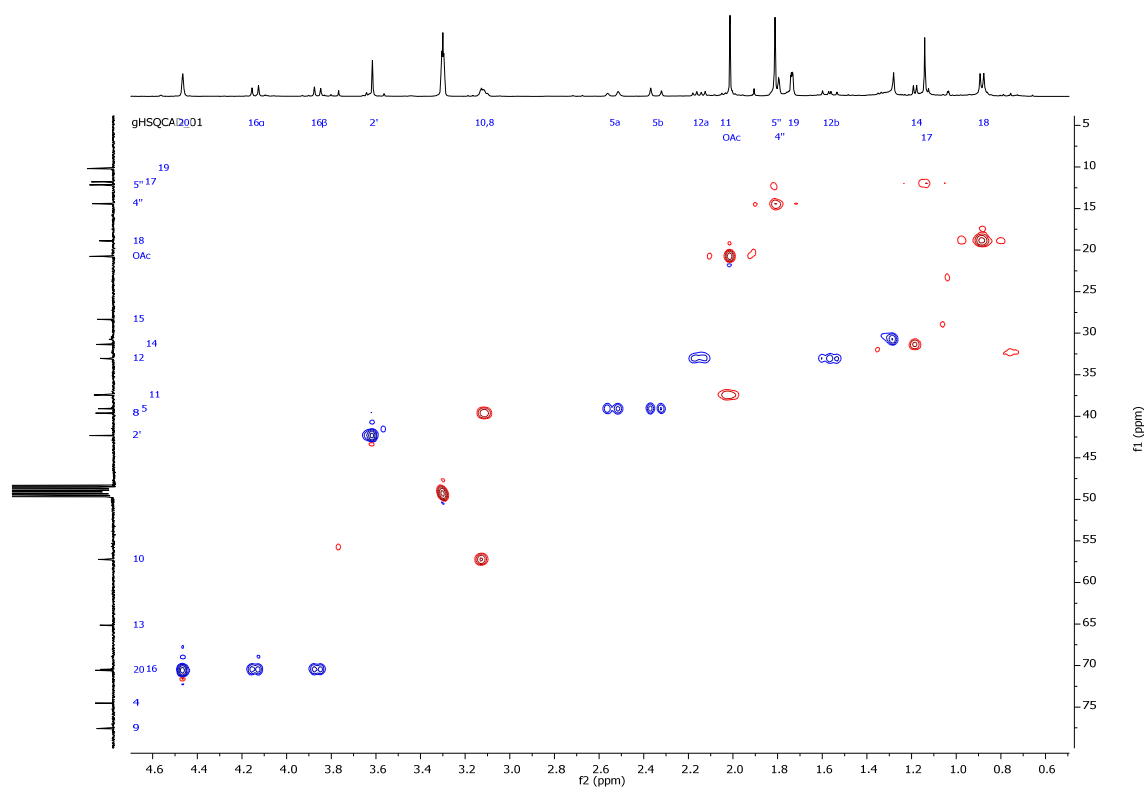


Figure S5e. Expansion (δ_{H} 4.7-0.5, δ_{C} 78-4) of HSQC spectrum of AcDPPT (5) in CD₃OD.

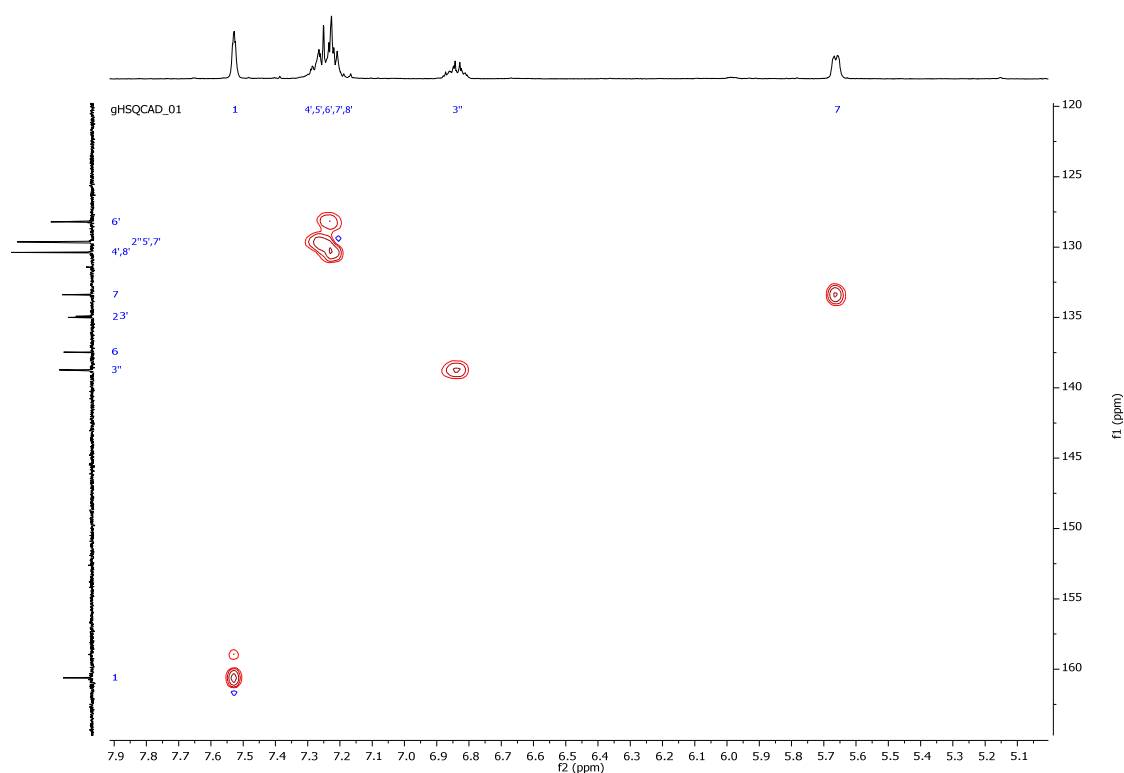


Figure S5f. Expansion (δ_{H} 7.9-5.0, δ_{C} 165-120) of HSQC spectrum of AcDPPT (5) in CD₃OD.

Supplementary Material

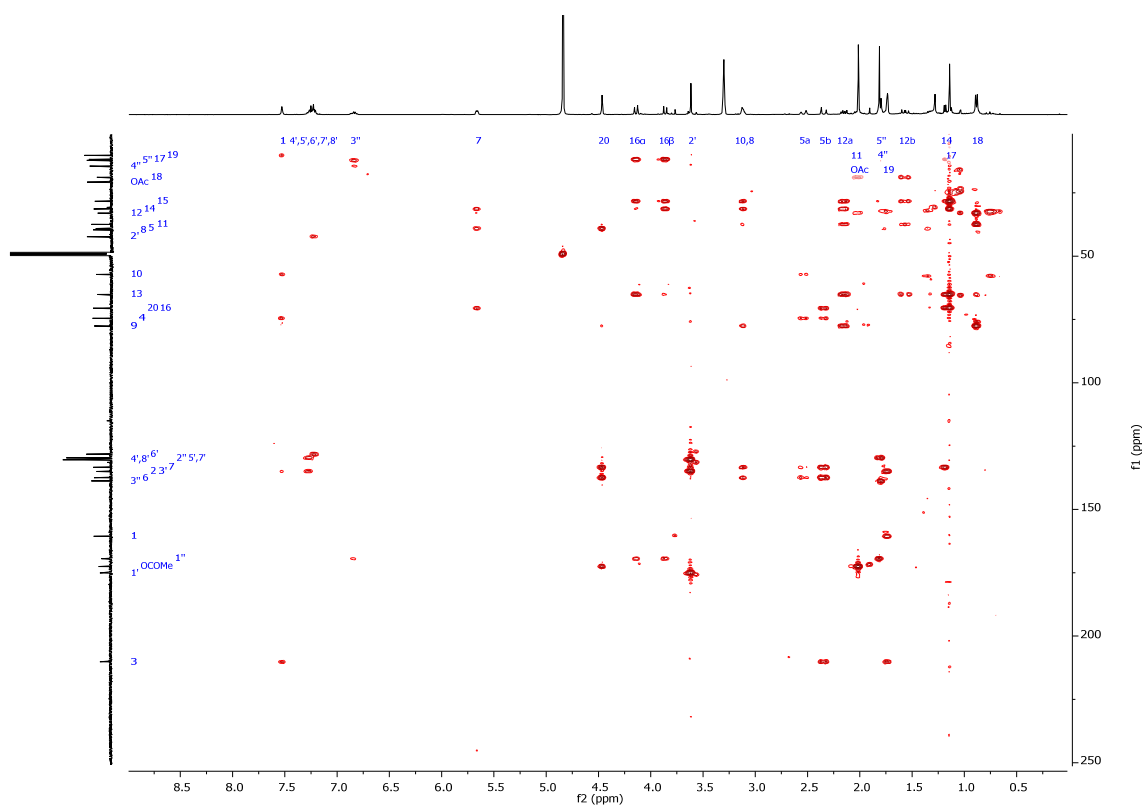


Figure S5g. HMBC spectrum of AcDPPT (**5**) in CD₃OD.

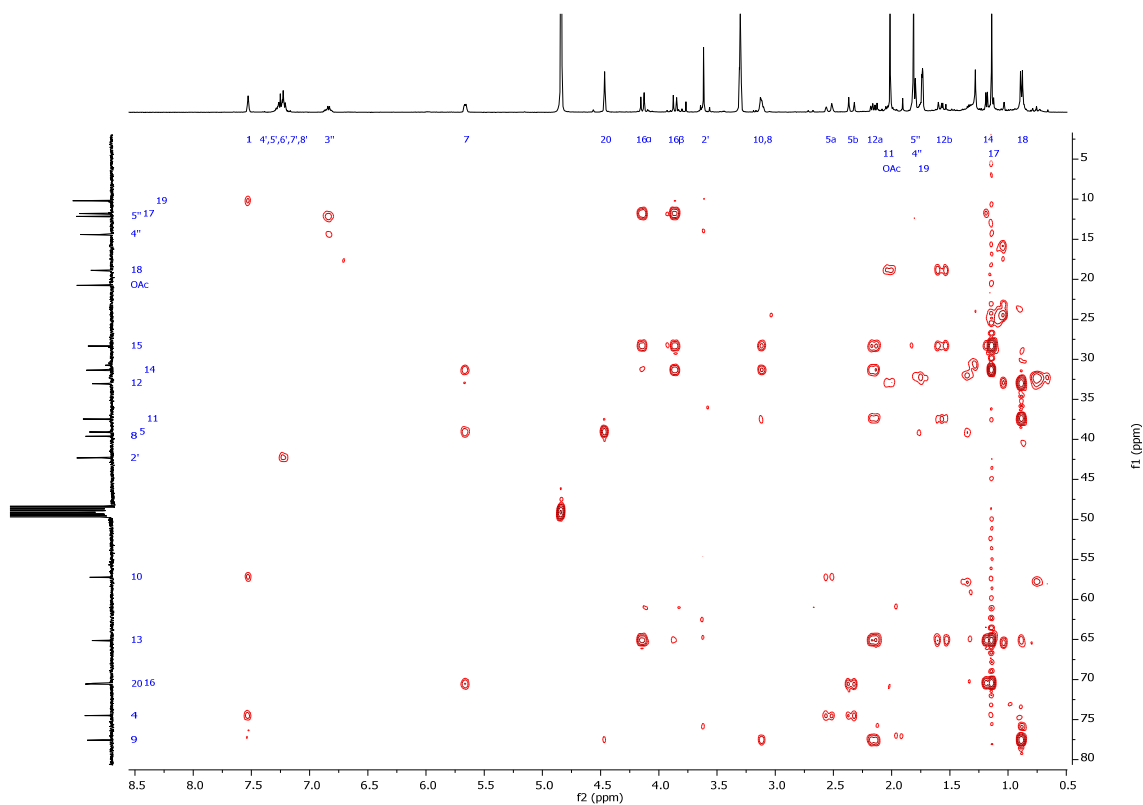


Figure S5h. Expansion (δ_{H} 8.5-0.5, δ_{C} 80-2) of HMBC spectrum of AcDPPT (**5**) in CD₃OD.

Supplementary Material

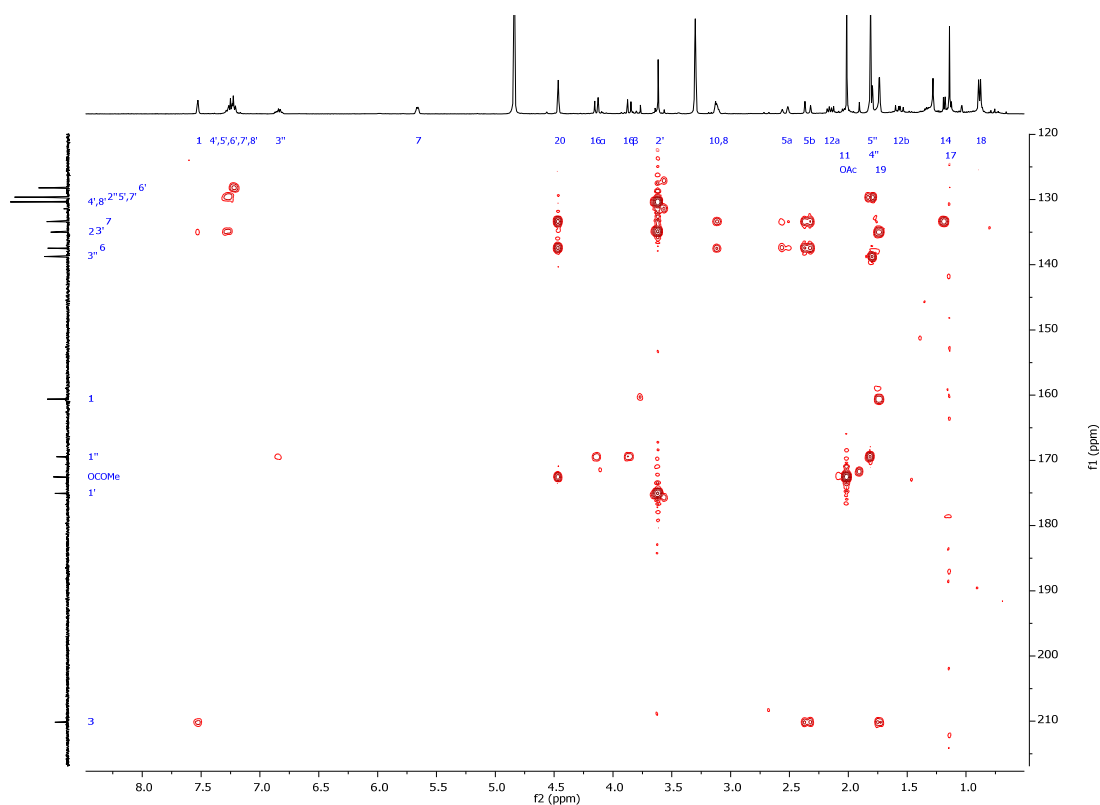


Figure S5i. Expansion (δ_{H} 8.5-0.5, δ_{C} 215-120) of HMBC spectrum of AcDPPT (**5**) in CD_3OD .

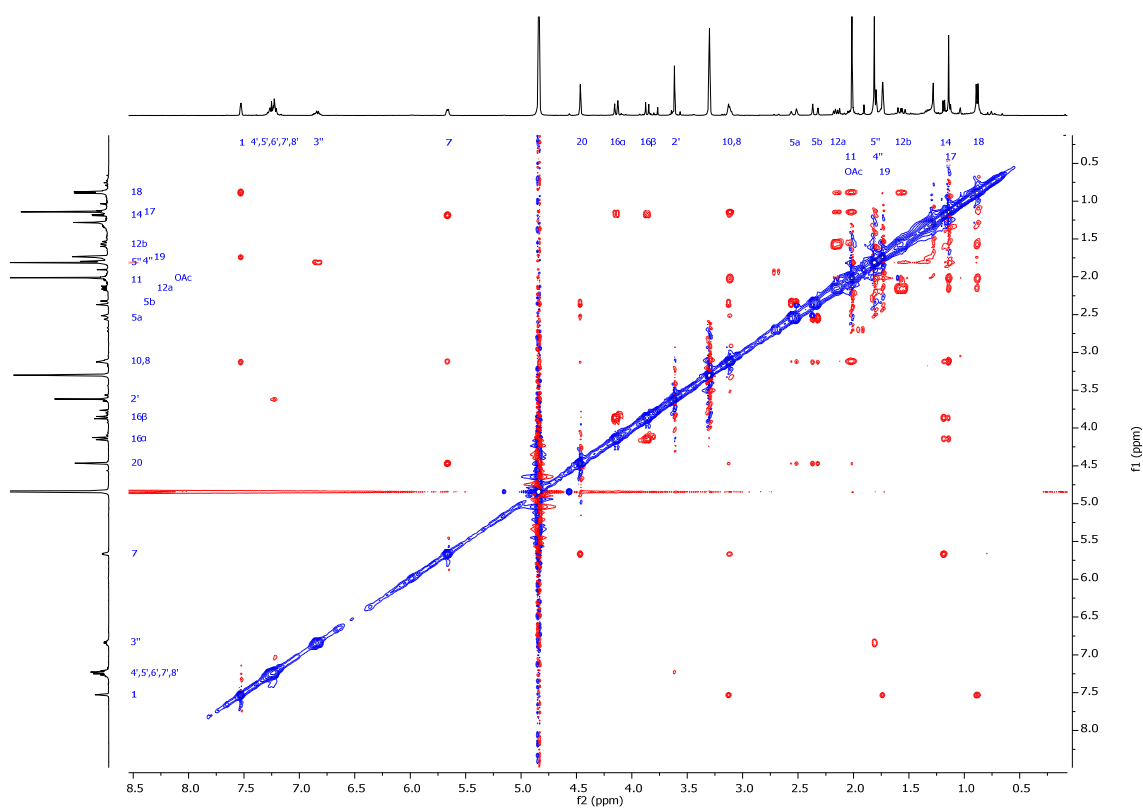


Figure S5j. NOESY2D spectrum of AcDPPT (**5**) in CD_3OD .

Supplementary Material

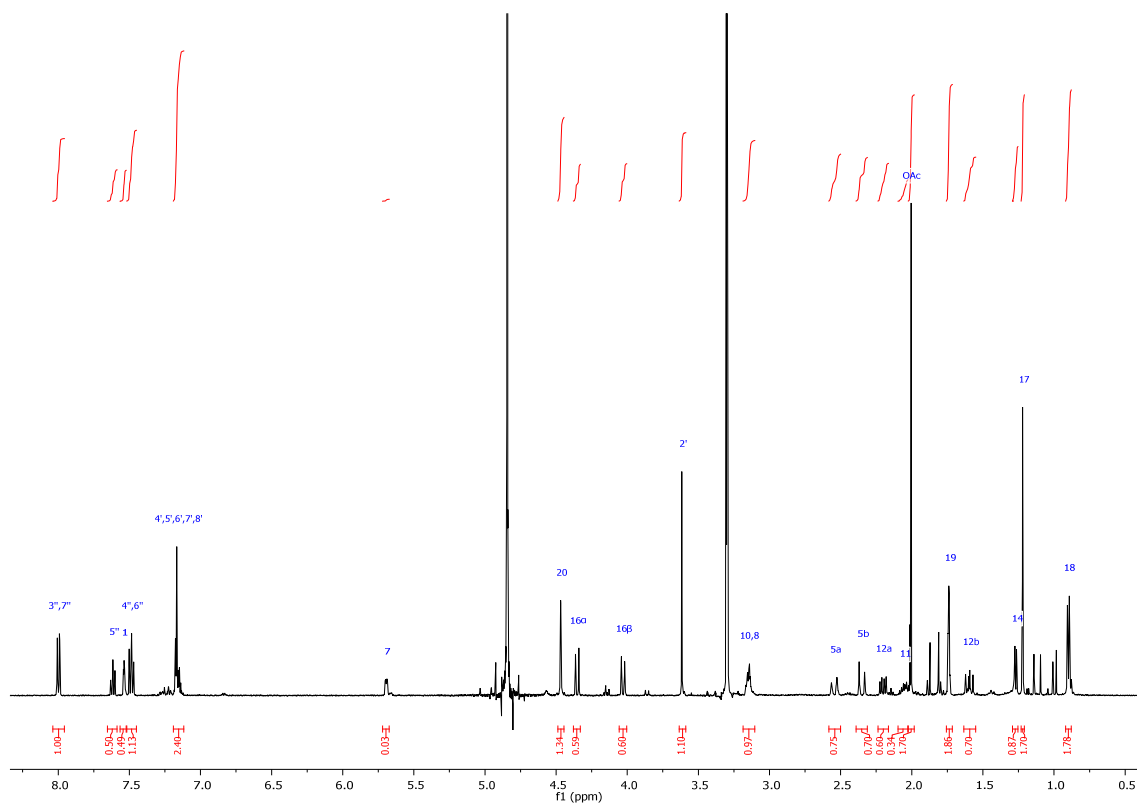


Figure S6a. ^1H -NMR spectrum of AcDPPBz (**6**) in CD_3OD (400 MHz).

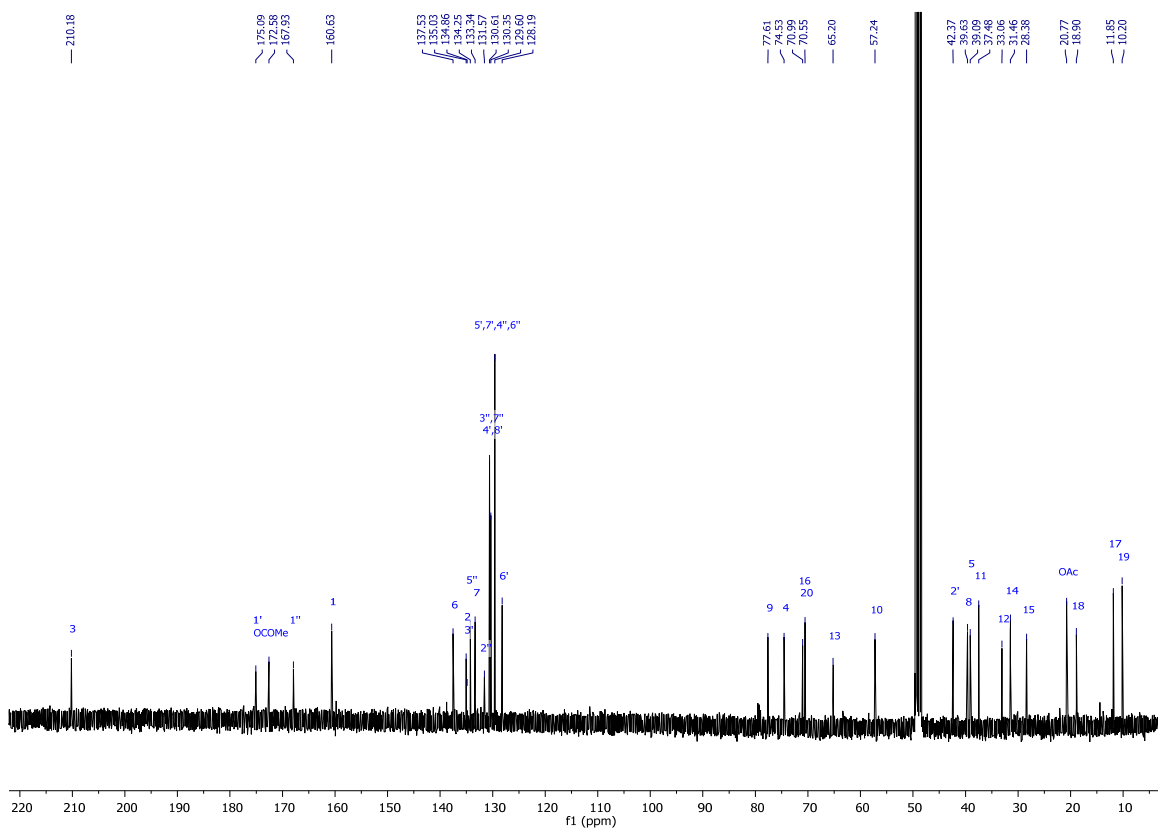


Figure S6b. ^{13}C -NMR spectrum of AcDPPBz (**6**) in CD_3OD (125 MHz).

Supplementary Material

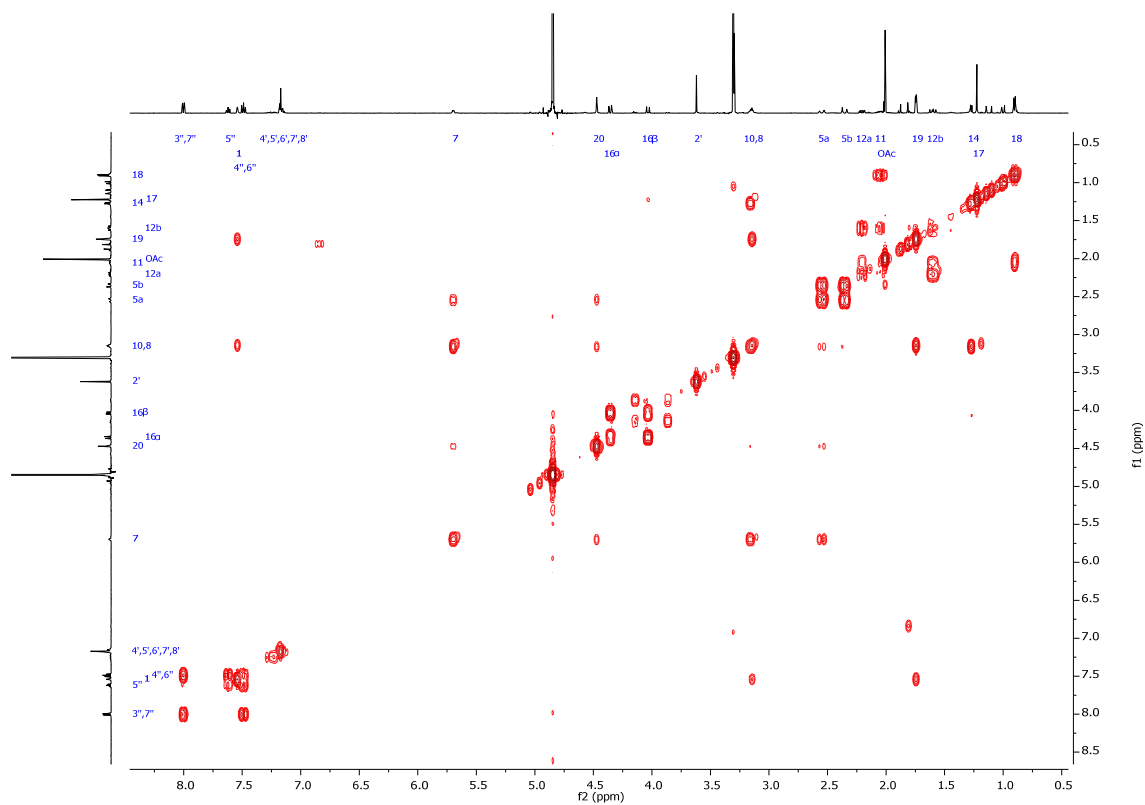


Figure S6c. COSY spectrum of AcDPPBz (**6**) in CD₃OD.

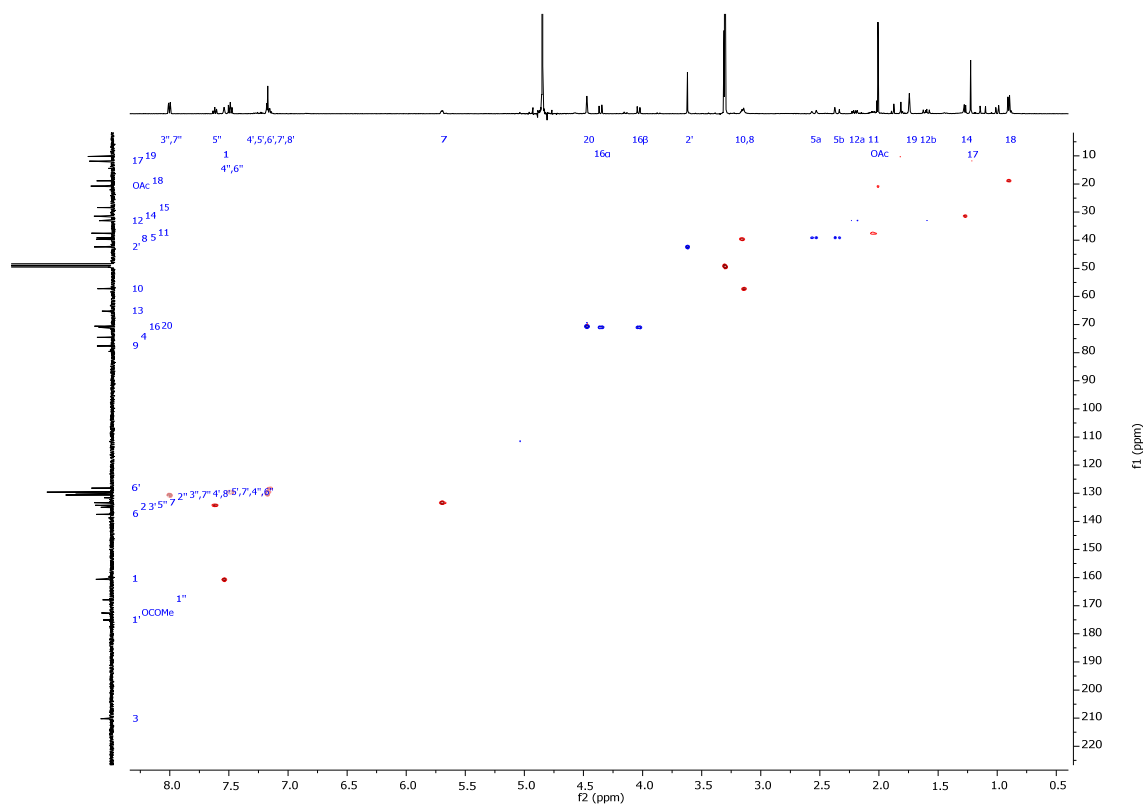


Figure S6d. HSQC spectrum of AcDPPBz (**6**) in CD₃OD.

Supplementary Material

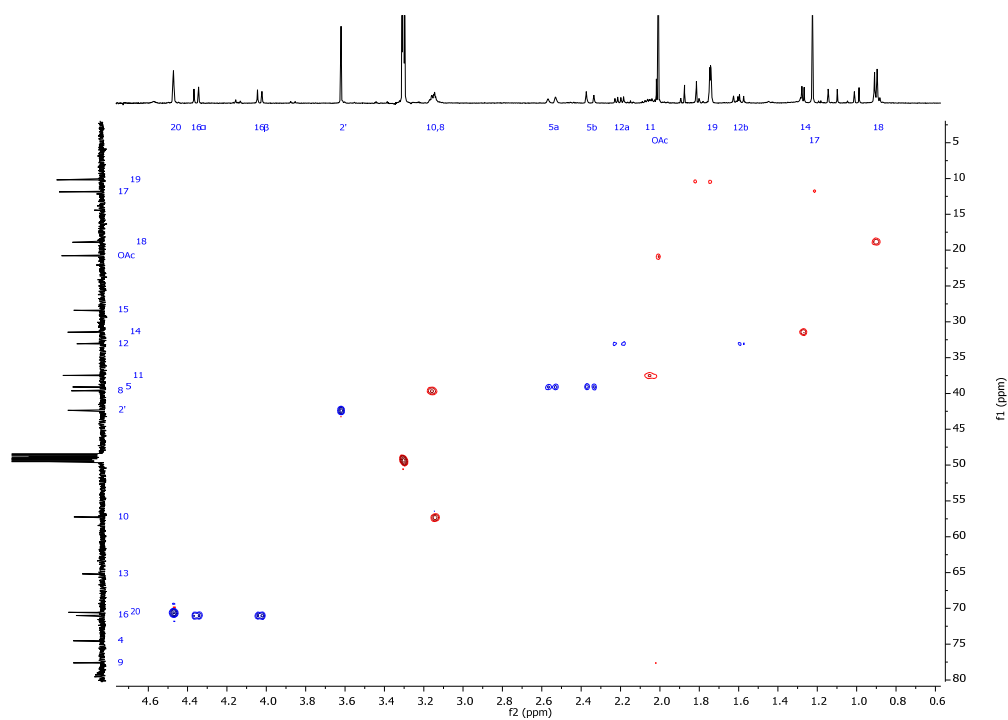


Figure S6e. Expansion (δ_{H} 4.7-0.6, δ_{C} 80-4) of HSQC spectrum of AcDPPBz (**6**) in CD_3OD .

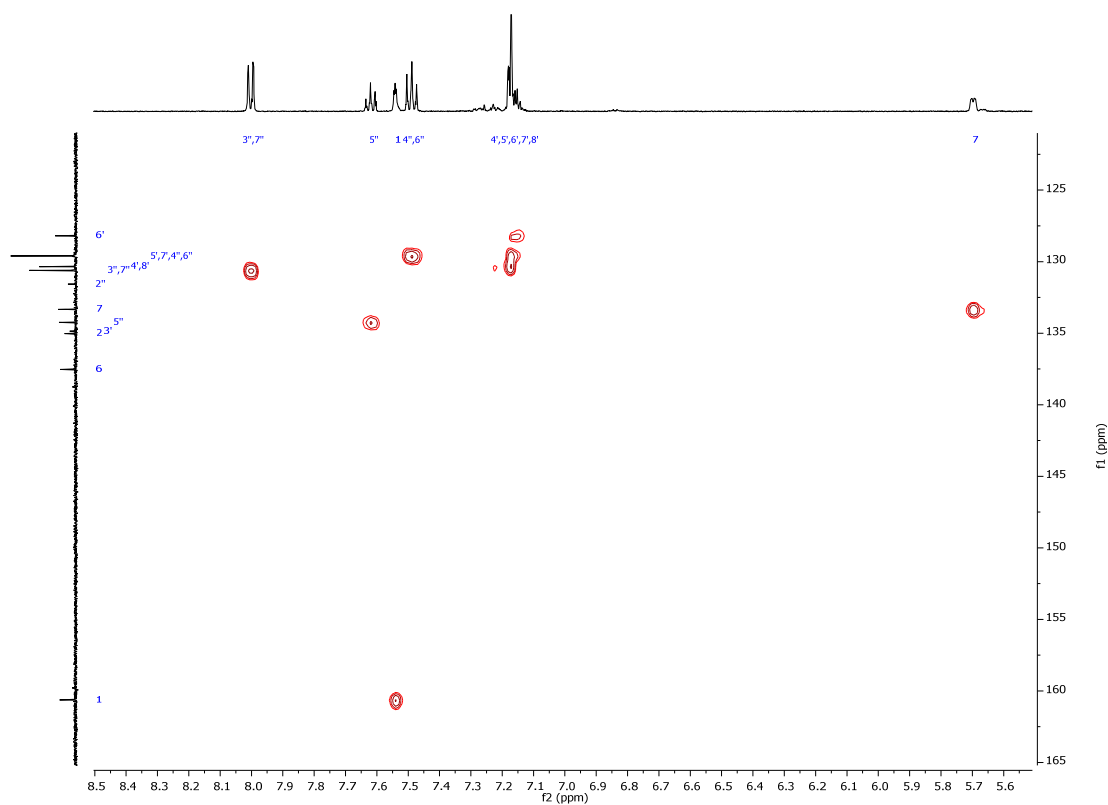


Figure S6f. Expansion (δ_{H} 8.5-5.5, δ_{C} 165-123) of HSQC spectrum of AcDPPBz (**6**) in CD_3OD .

Supplementary Material

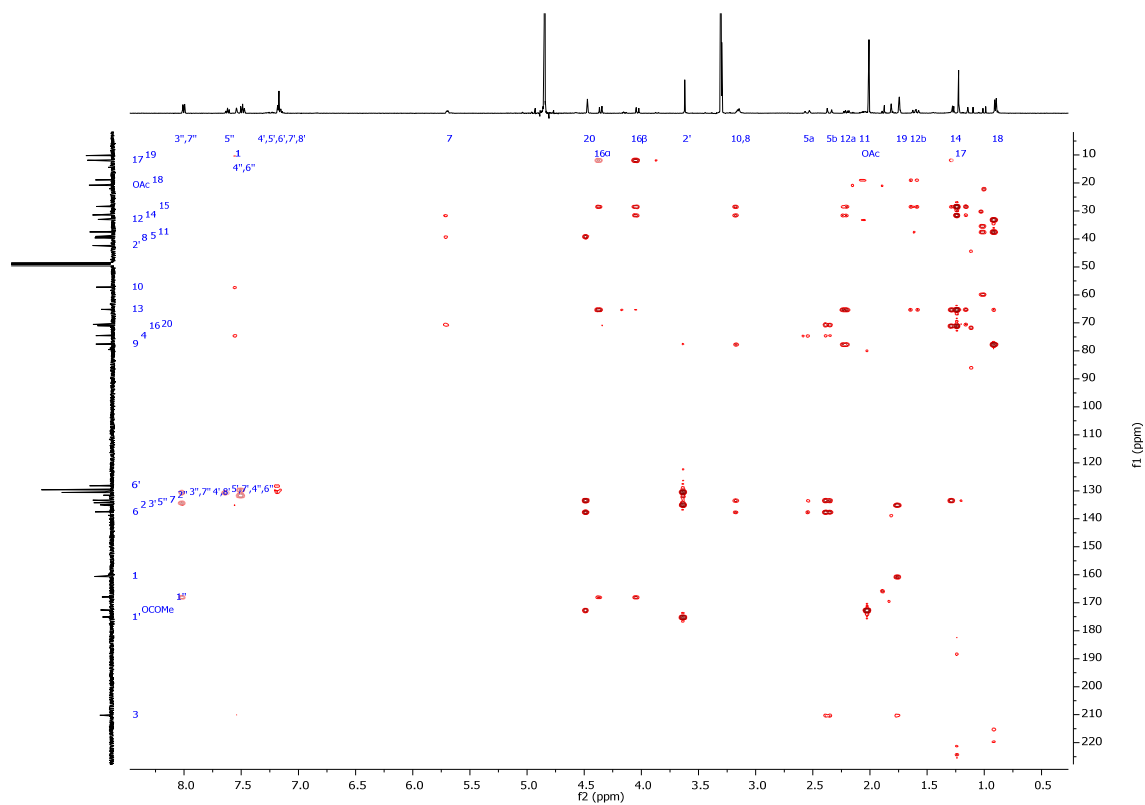


Figure S6g. HMBC spectrum of AcDPPBz (**6**) in CD₃OD.

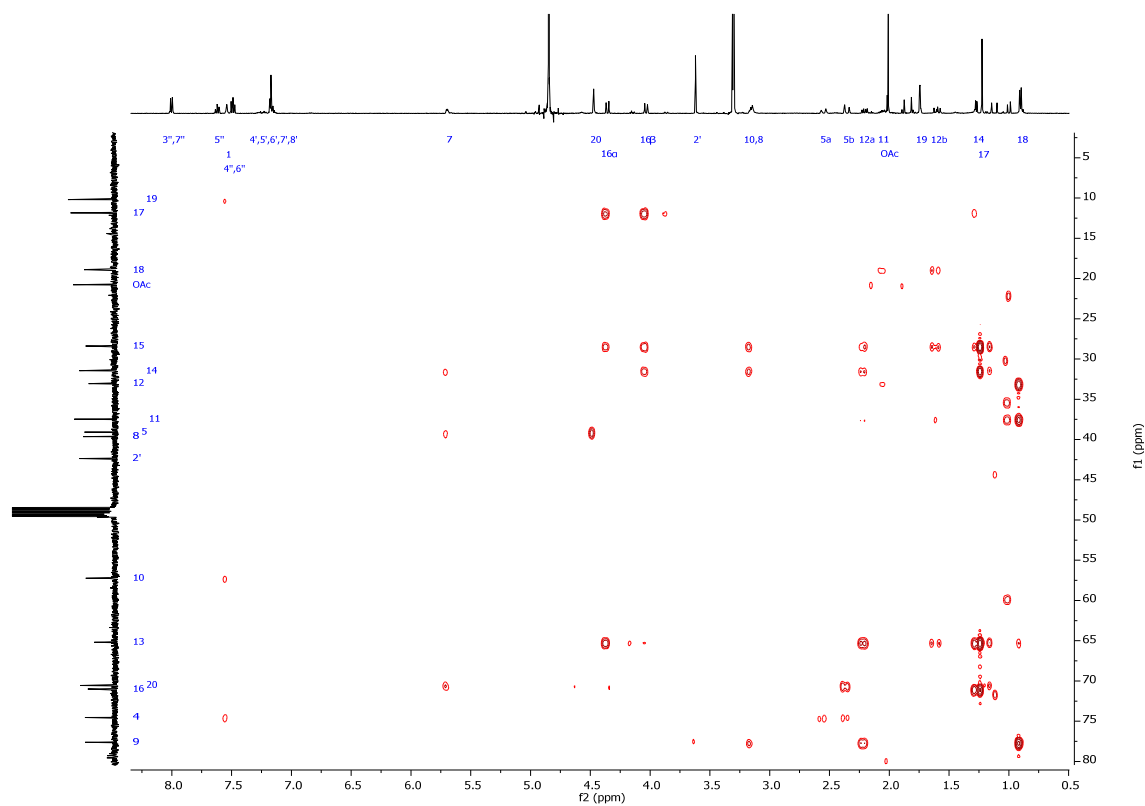


Figure S6h. Expansion (δ_H 8.3-0.5, δ_C 80-3) of HMBC spectrum of AcDPPBz (**6**) in CD₃OD.

Supplementary Material

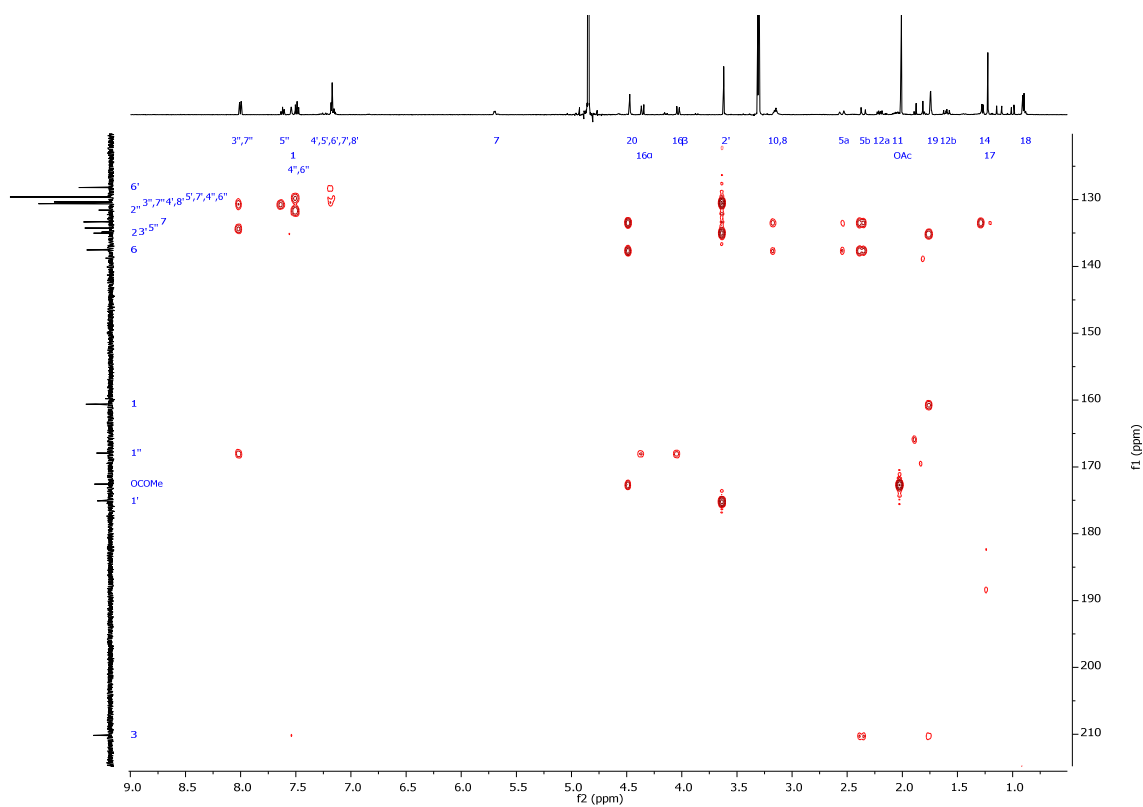


Figure S6i. Expansion (δ_{H} 9.0-0.5, δ_{C} 215-120) of HMBC spectrum of AcDPPBz (**6**) in CD_3OD .

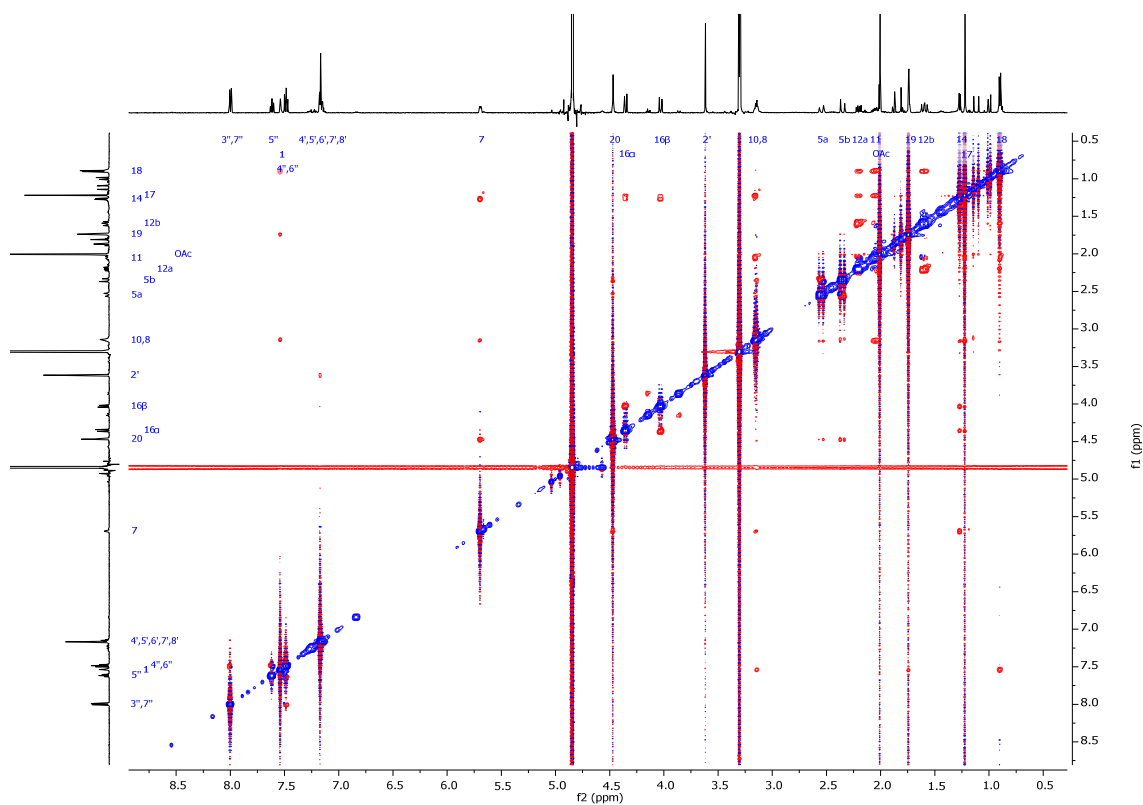


Figure S6j. NOESY2D spectrum of AcDPPBz (**6**) in CD_3OD .

Supplementary Material

PROTON_01

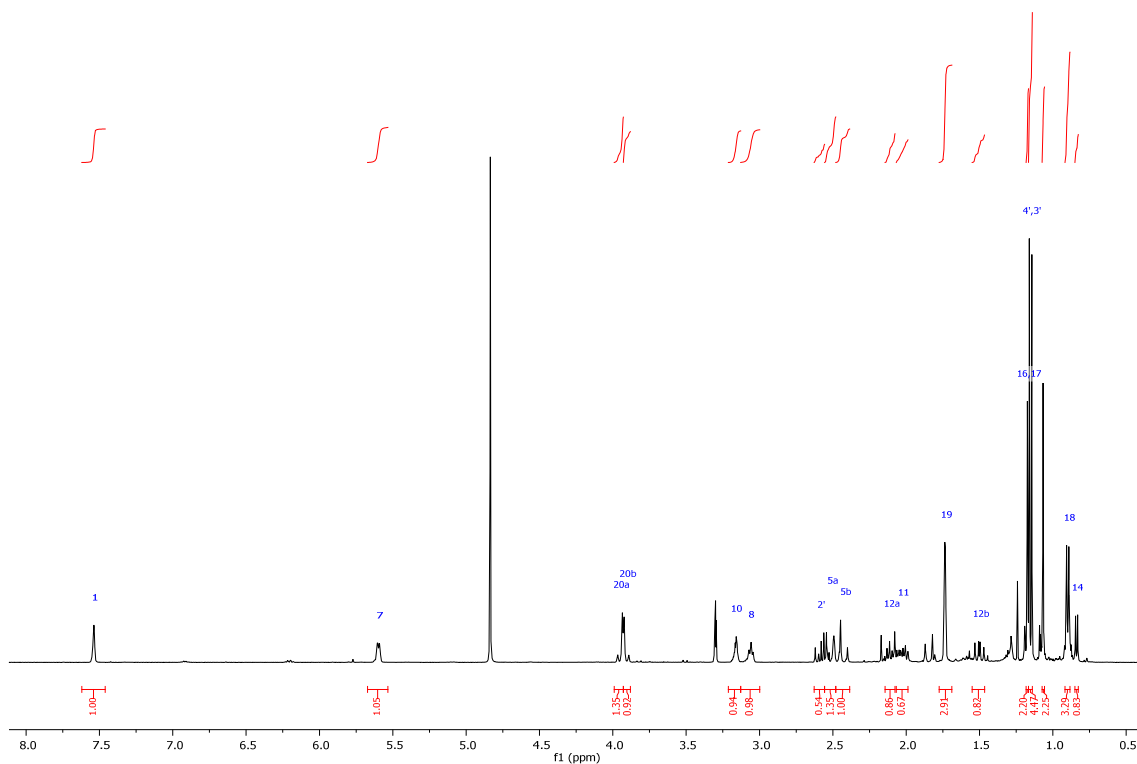


Figure S7a. ^1H -NMR spectrum of DPB (7) in CDCl_3 (400 MHz).

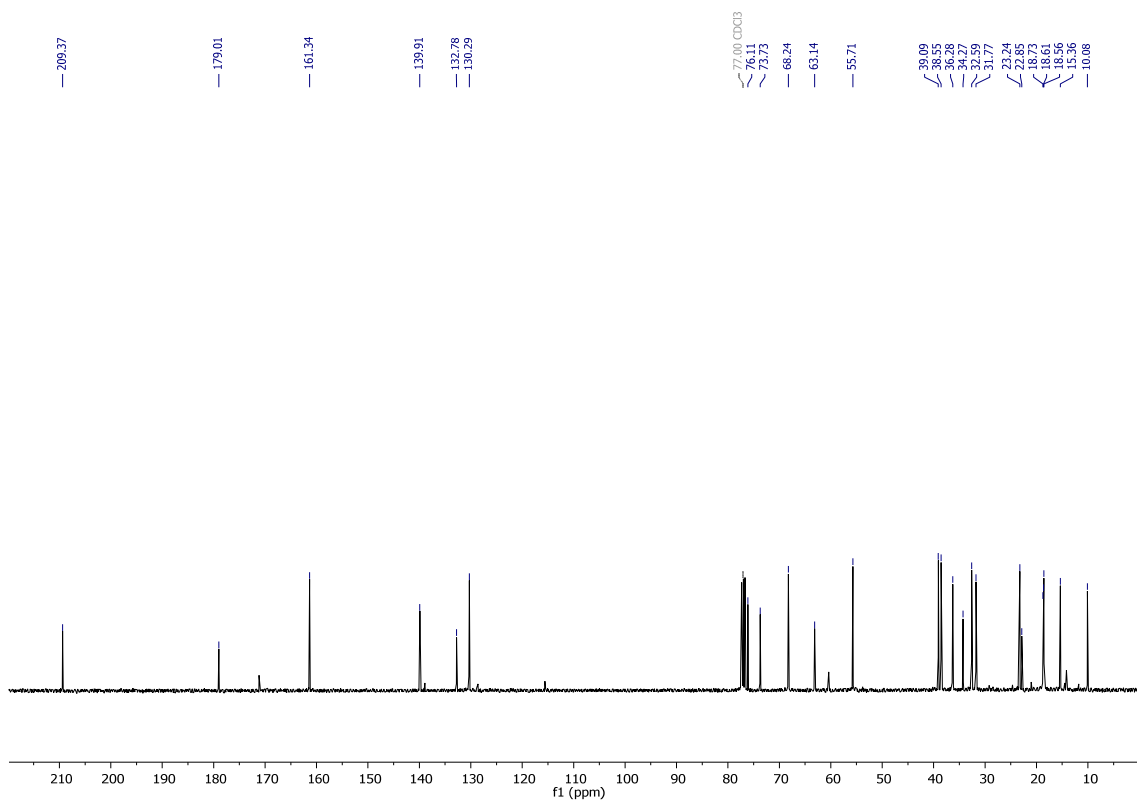


Figure S7b. ^{13}C -NMR spectrum of DPB (7) in CDCl_3 (100 MHz).

Supplementary Material

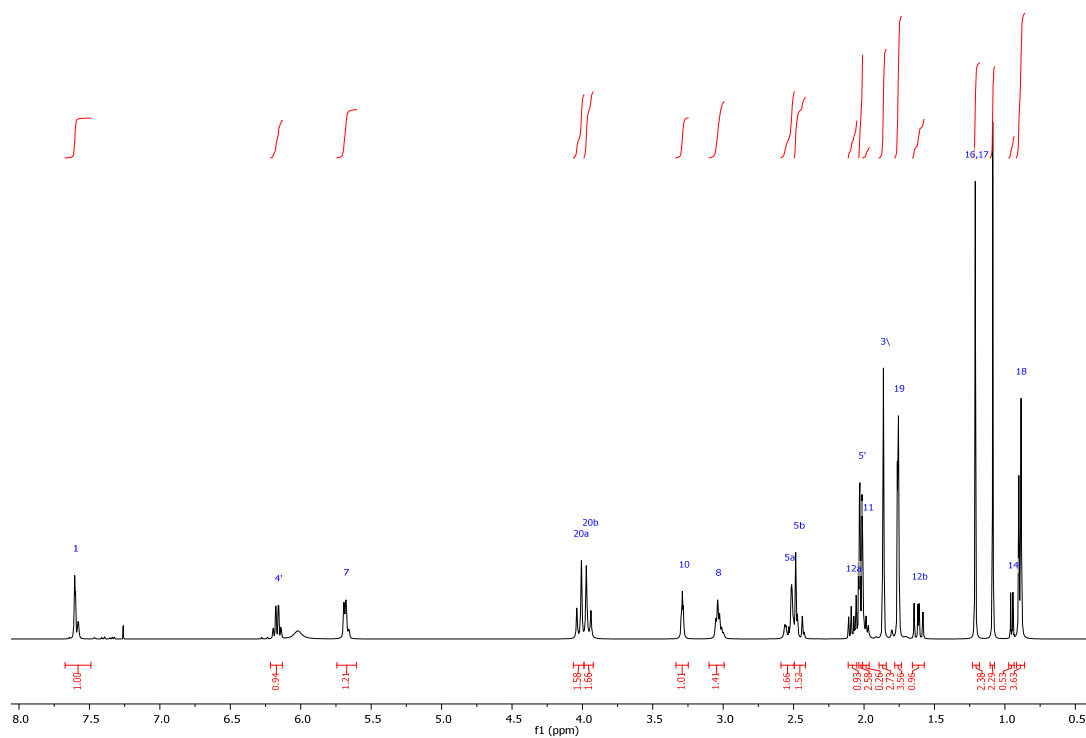


Figure S8a. ¹H-NMR spectrum of DPA (**8**) in CDCl₃ (400 MHz).

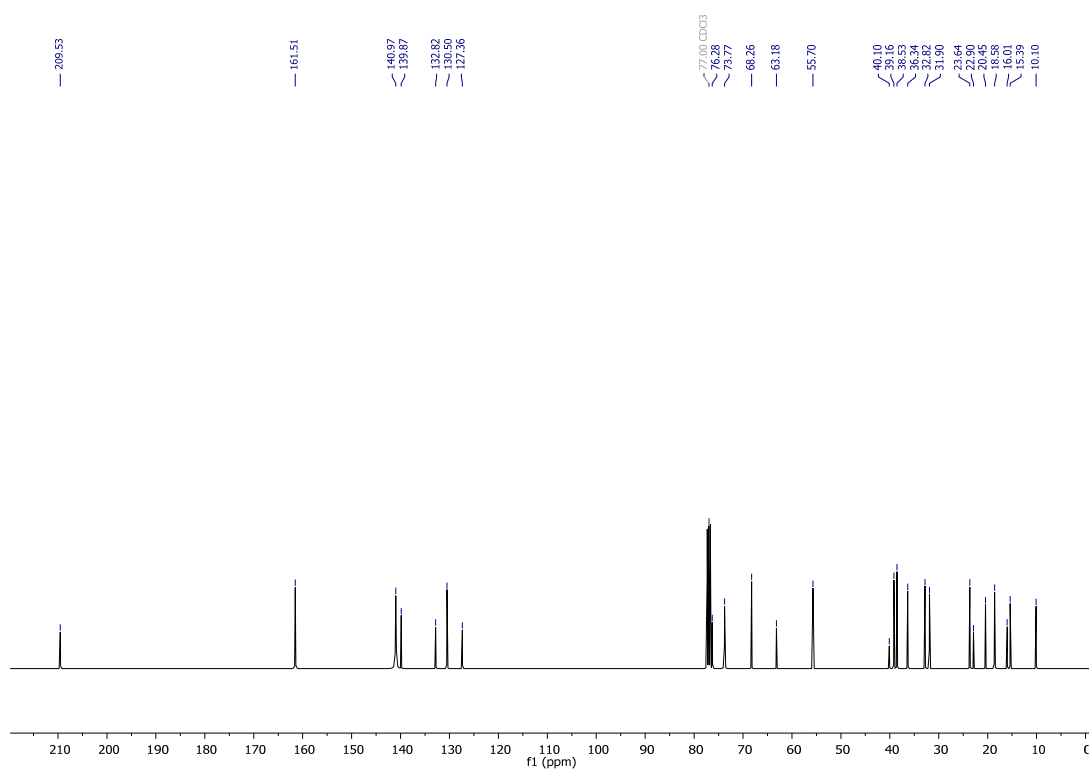


Figure S8b. ¹³C-NMR spectrum of DPA (**8**) in CDCl₃ (100 MHz).

Supplementary Material

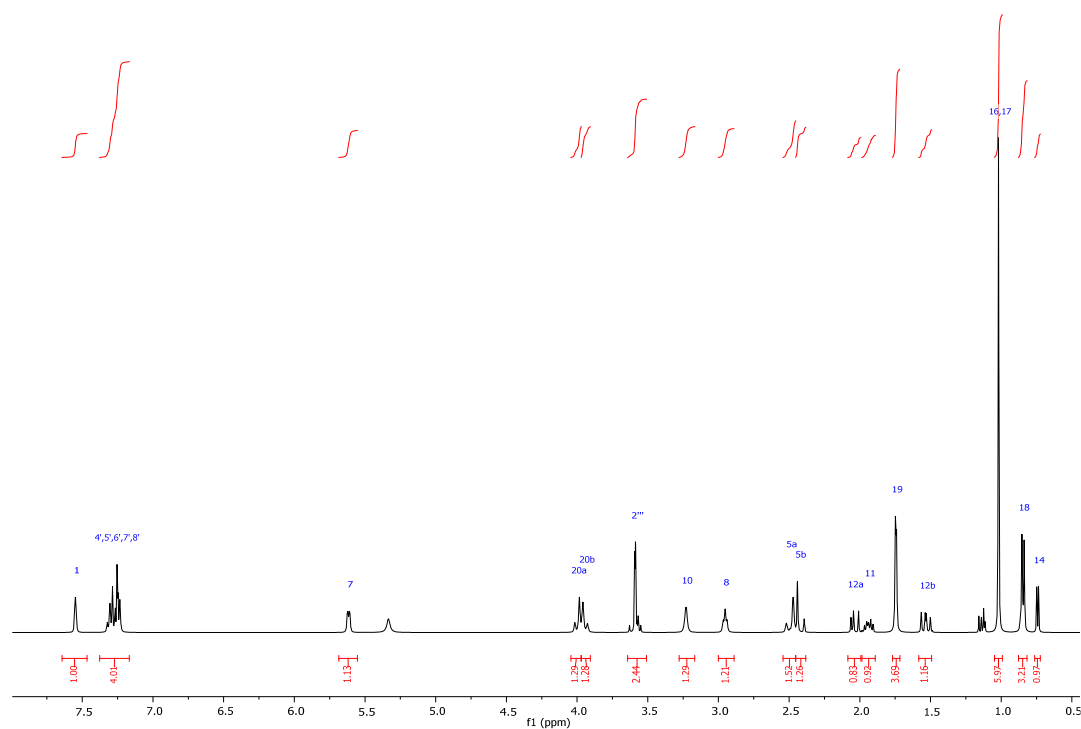


Figure S9a. ¹H-NMR spectrum of DPP (9) in CDCl₃ (400 MHz).

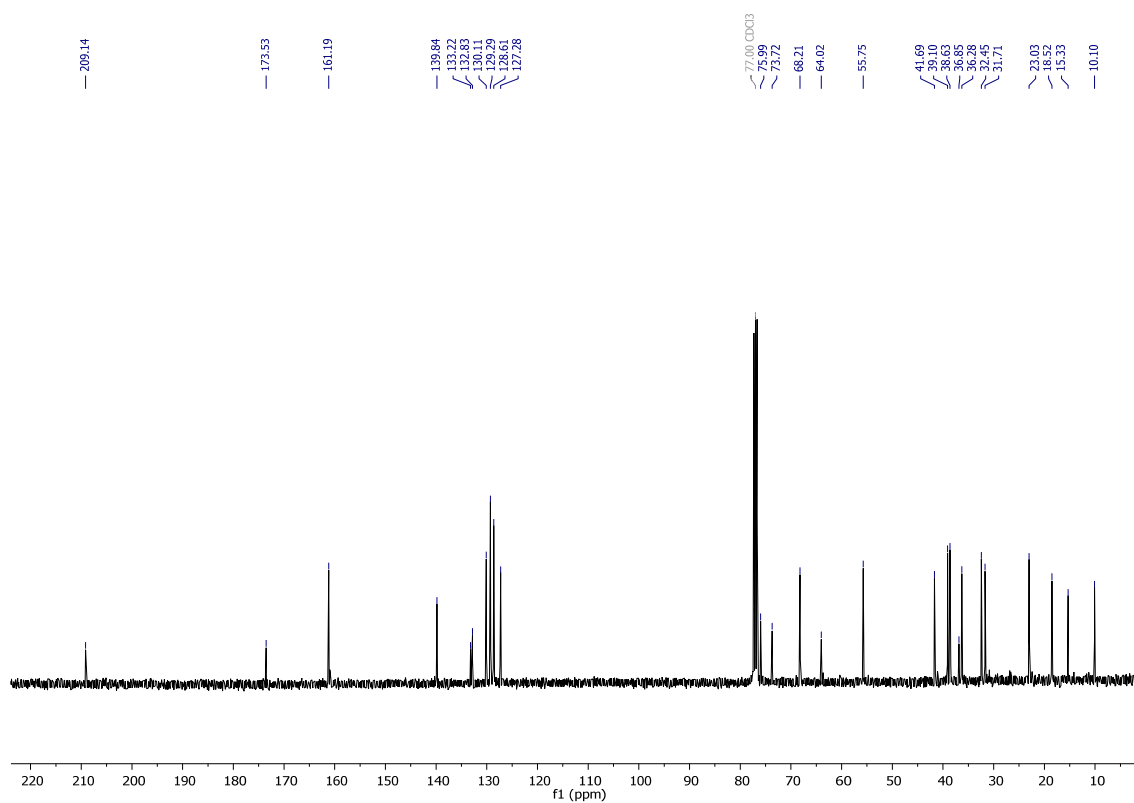


Figure S9b. ¹³C-NMR of DPP (9) in CDCl₃ (100 MHz).

Supplementary Material

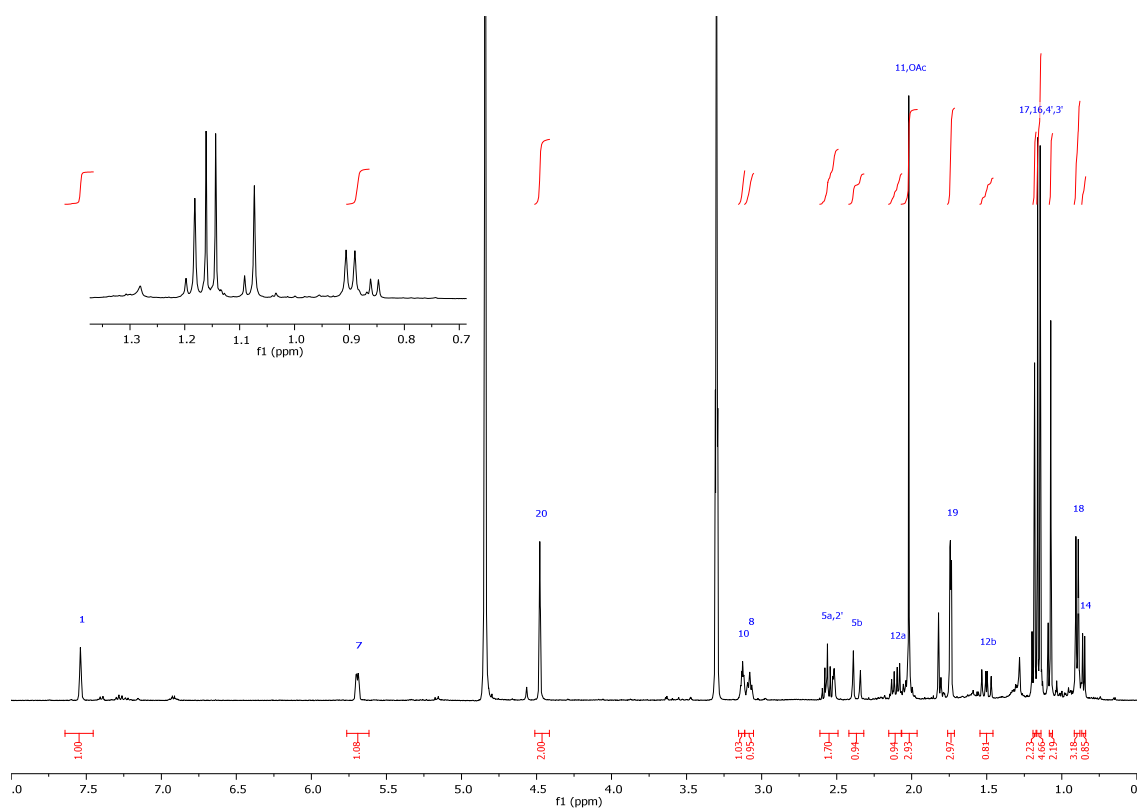


Figure S10a. ¹H-NMR spectrum of AcDPB (10) in CD₃OD (400 MHz).

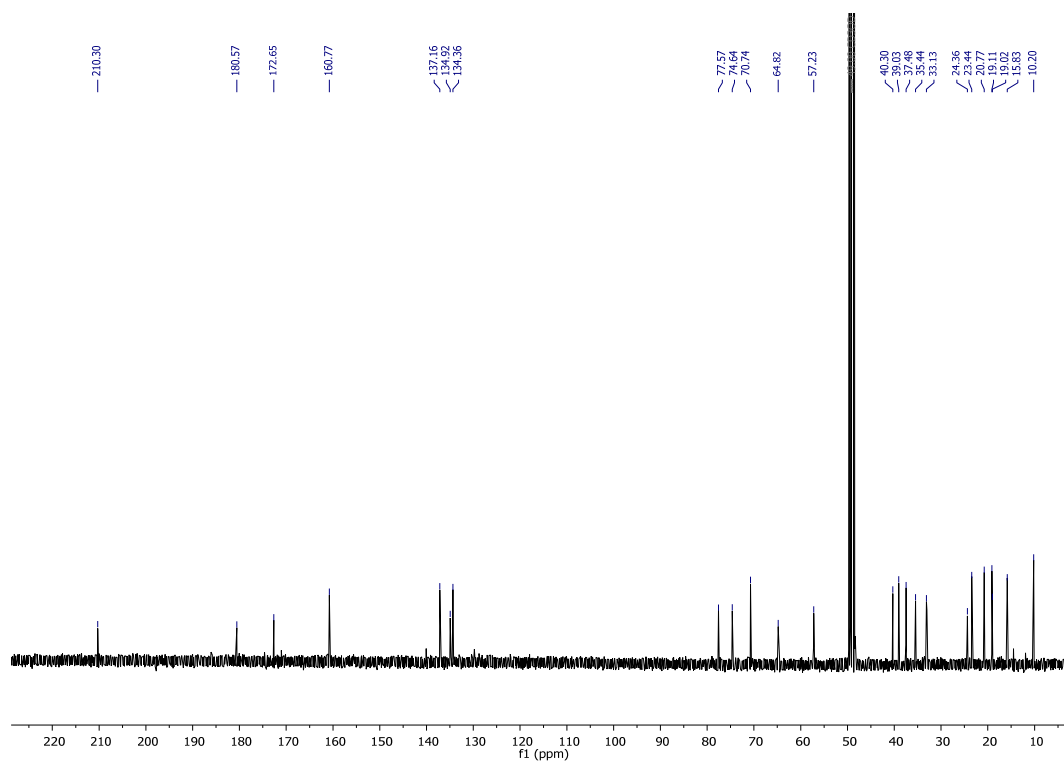


Figure S10b. ¹³C-NMR spectrum of AcDPB (10) in CD₃OD (100 MHz).

Supplementary Material

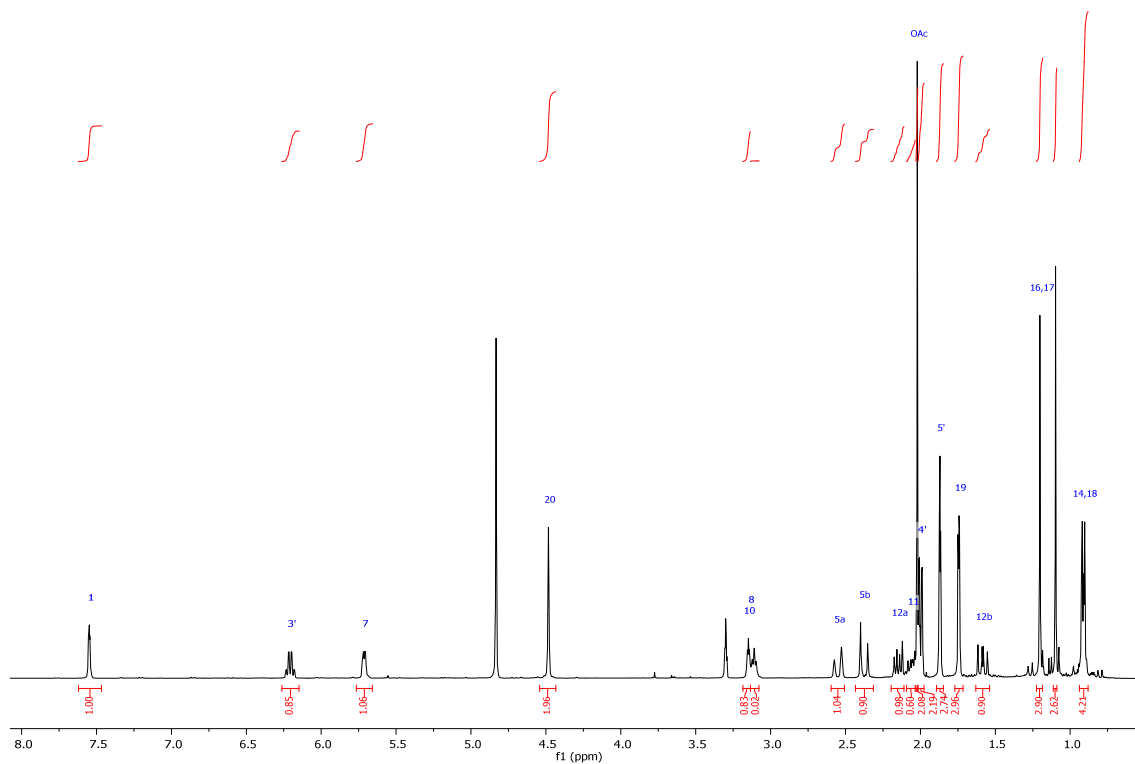


Figure S11a. ¹H-NMR spectrum AcDPA (11) in CD₃OD (400 MHz).

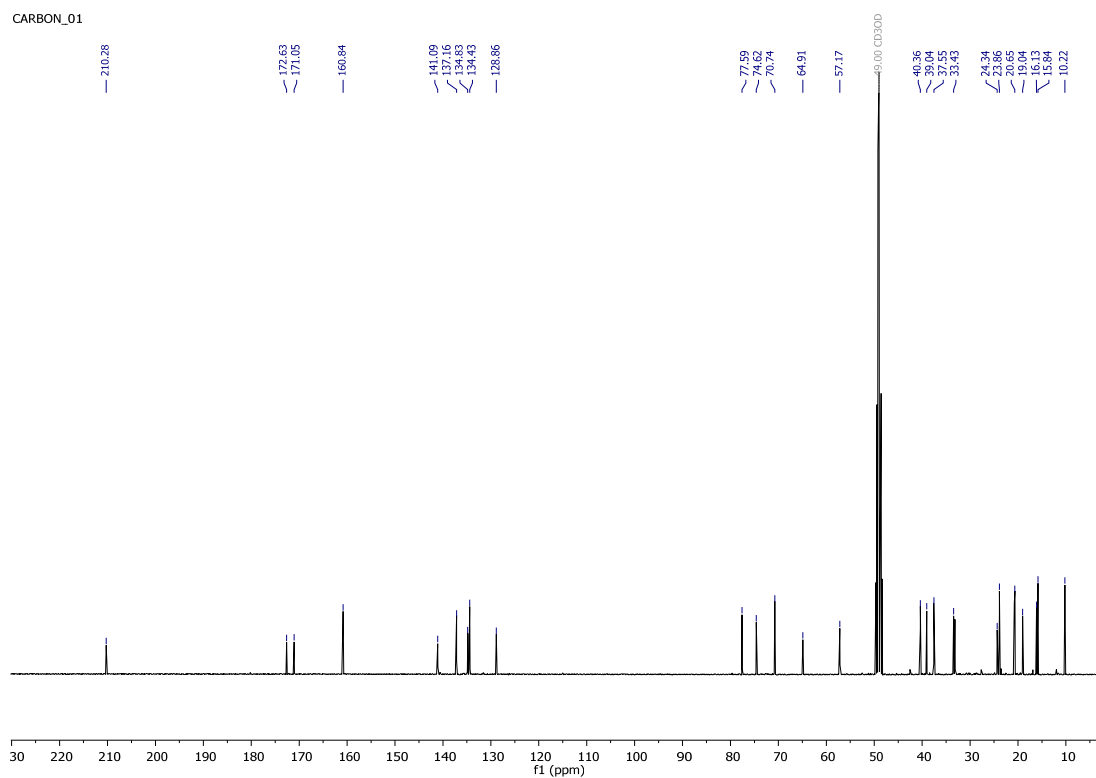


Figure S11b. ¹³C-NMR spectrum of AcDPA (11) in CD₃OD (100 MHz).

Supplementary Material

PROTON_01

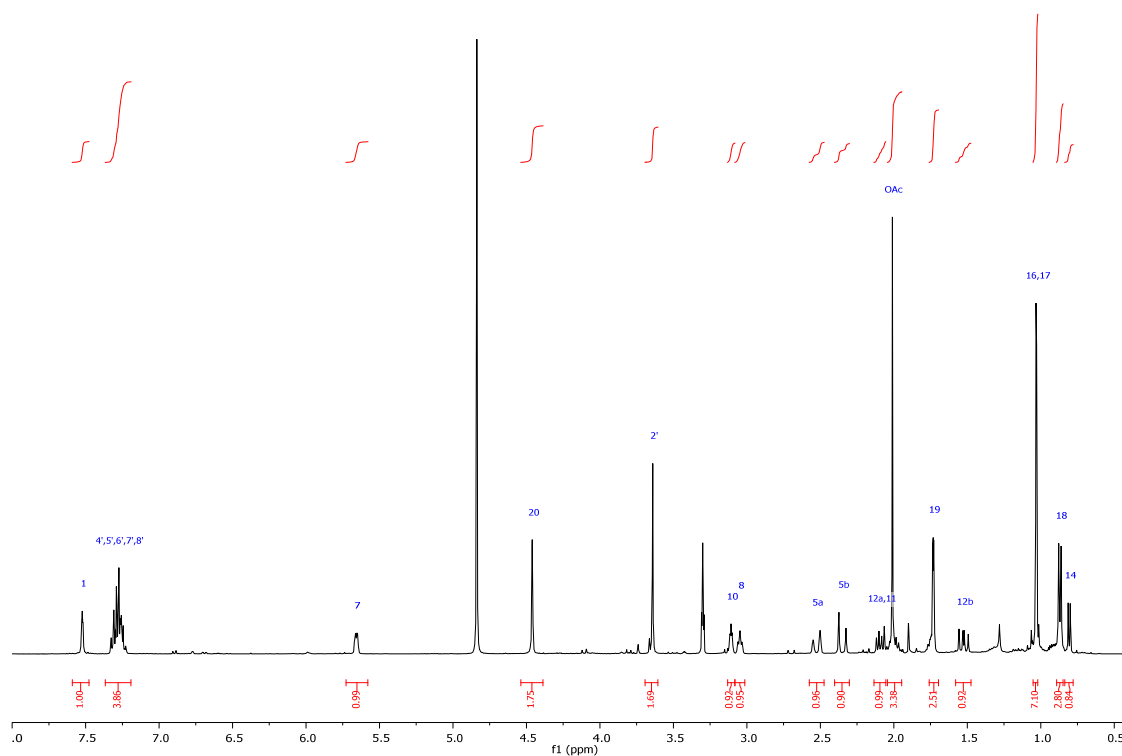


Figure S12a. ¹H-NMR spectrum of AcDPP (12) in CD₃OD (400 MHz).

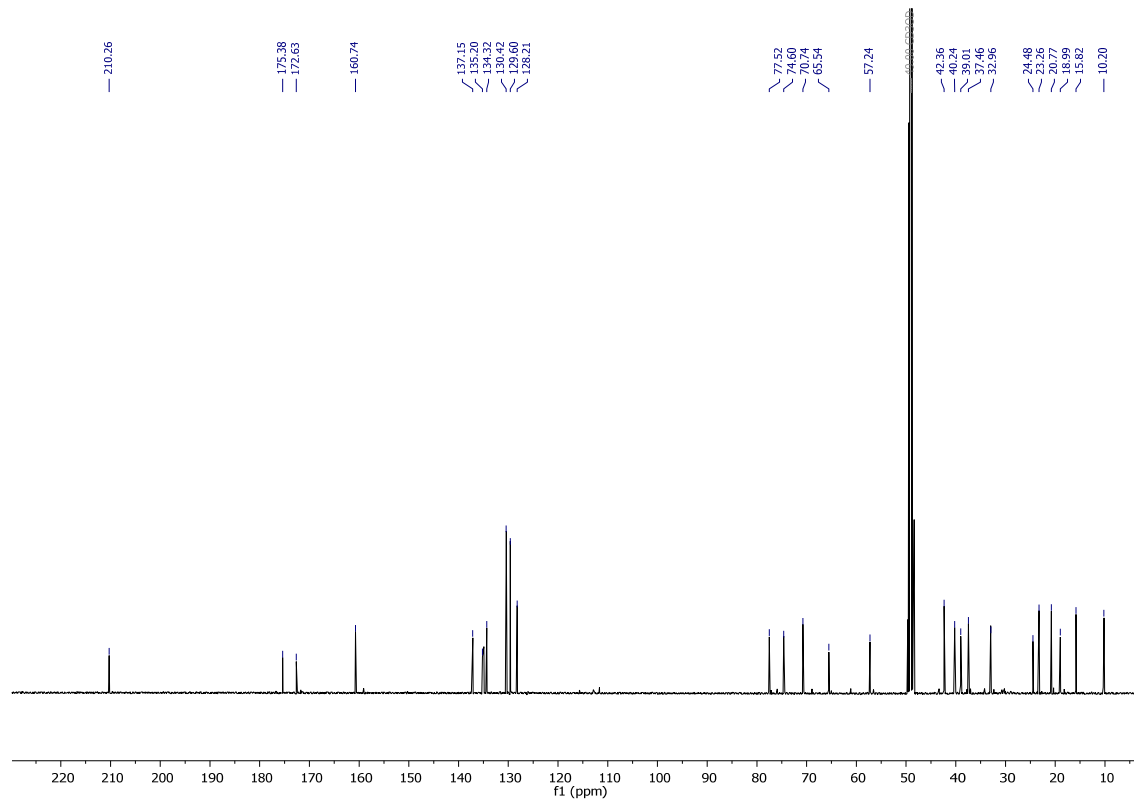


Figure S12b. ¹³C-NMR spectrum of AcDPP (12) in CD₃OD (100 MHz).

Supplementary Material

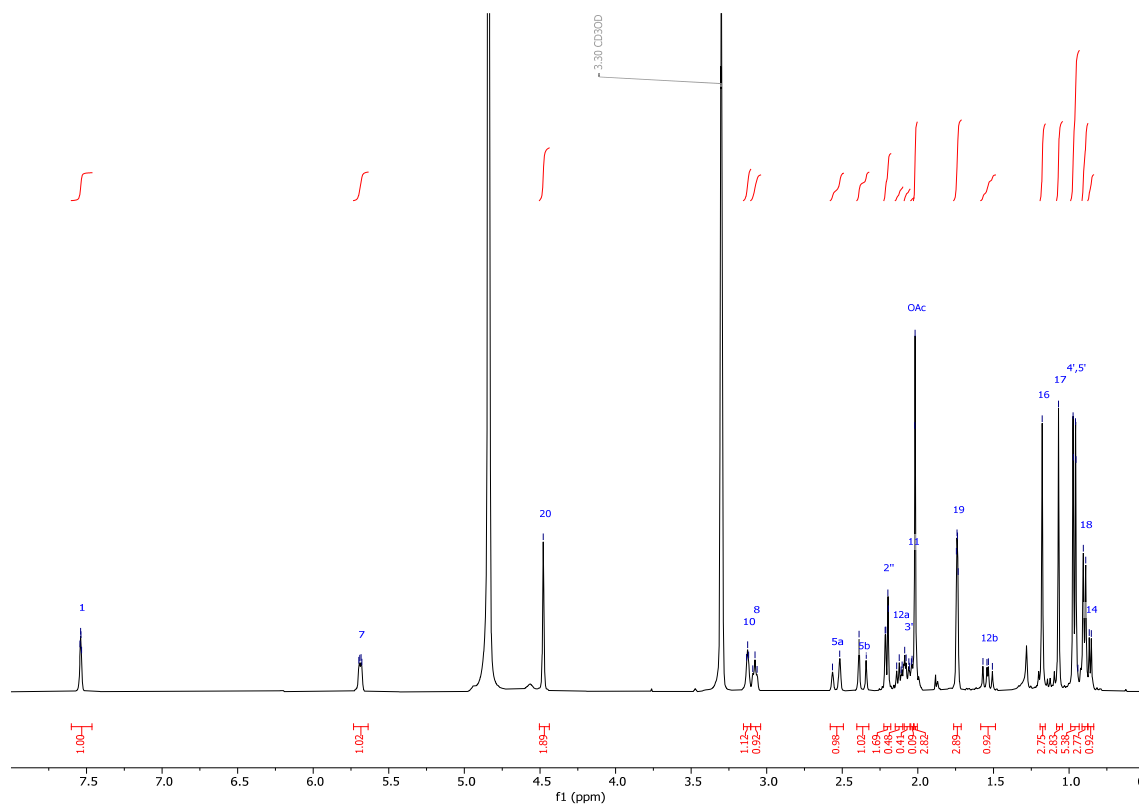


Figure S13a. ¹H-NMR spectrum of AcDPiPn (13) in CD₃OD (500 MHz).

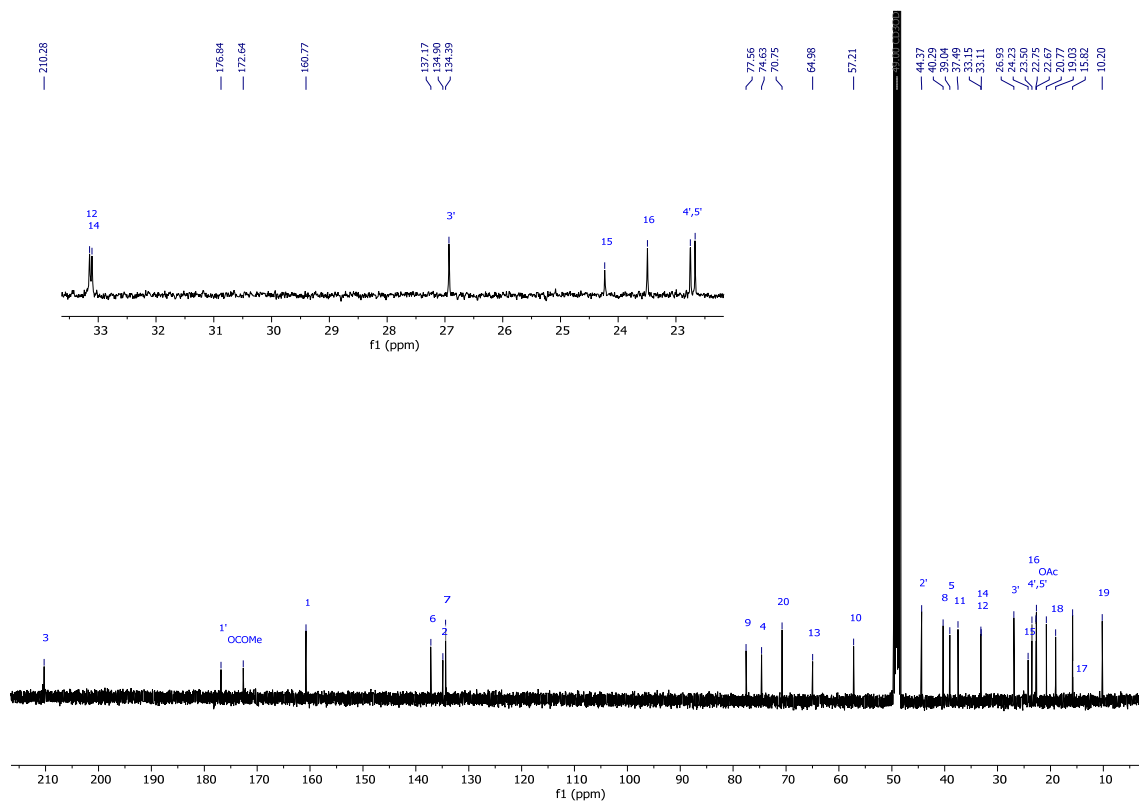


Figure S13b. ¹³C-NMR spectrum of AcDPiPn (13) in CD₃OD (125 MHz).

Supplementary Material

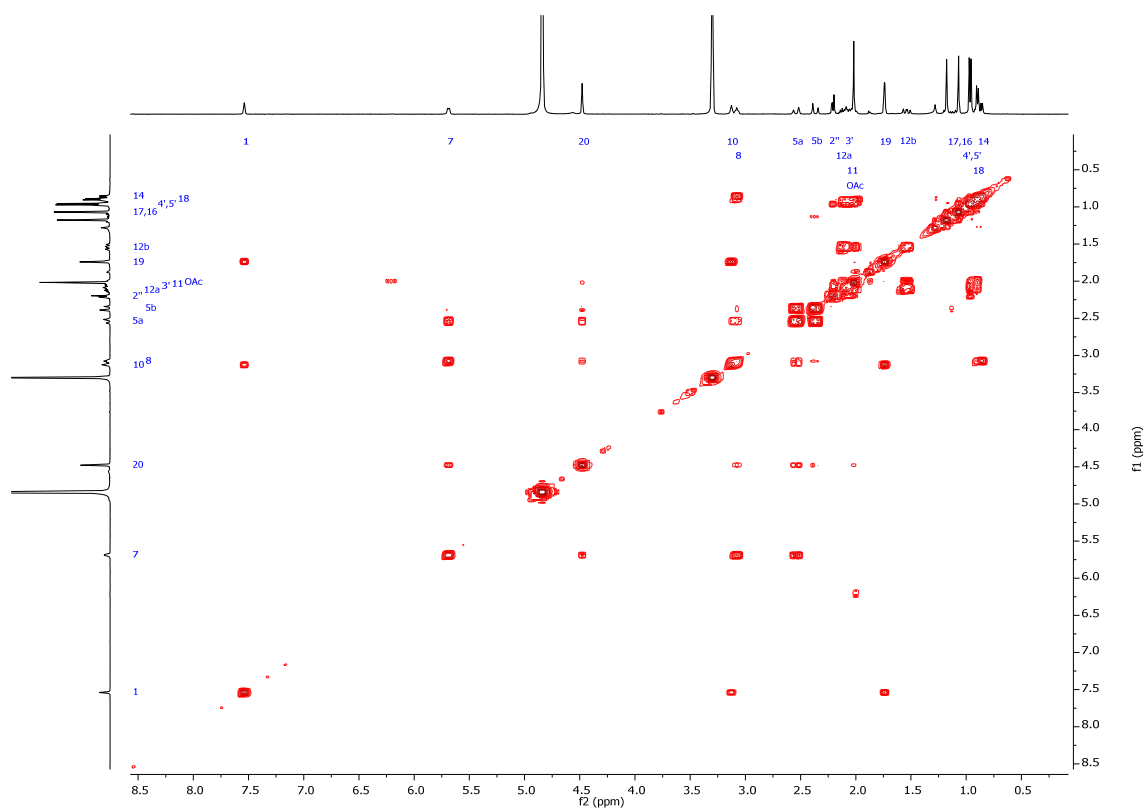


Figure S13c. COSY spectrum of AcDPiPn (**13**) in CD₃OD.

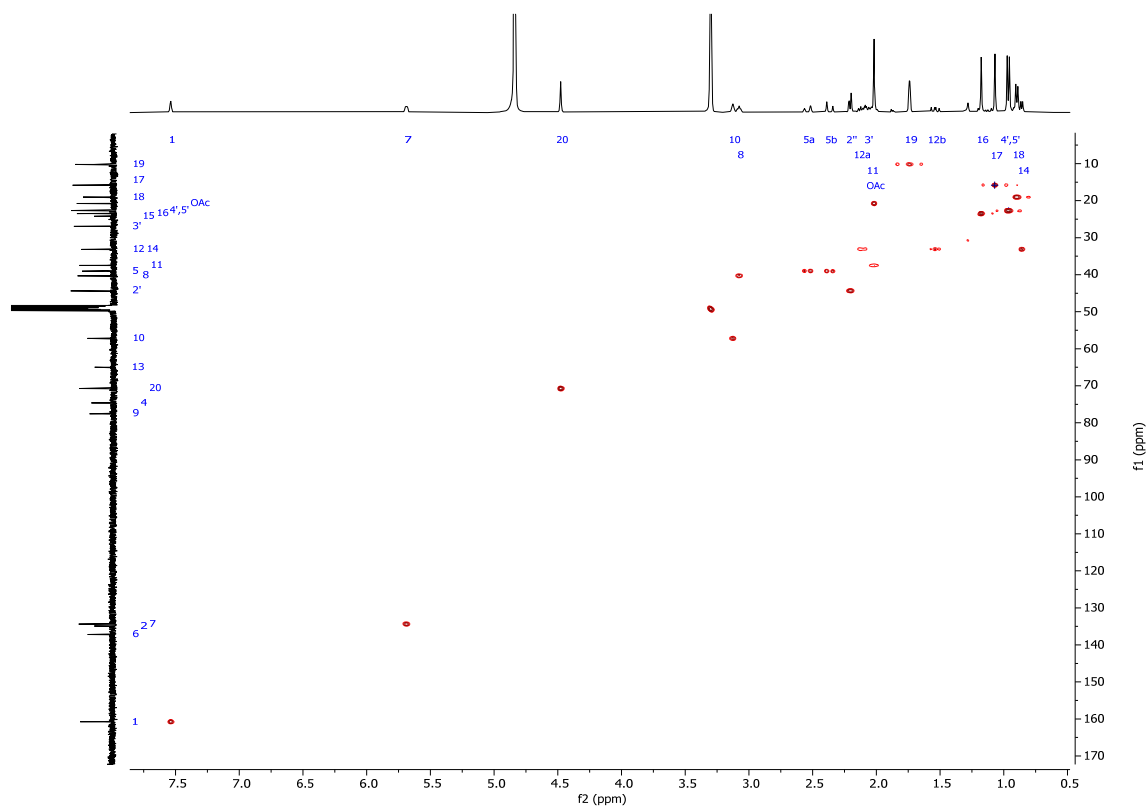


Figure S13d. HSQC spectrum of AcDPiPn (**13**) in CD₃OD.

Supplementary Material

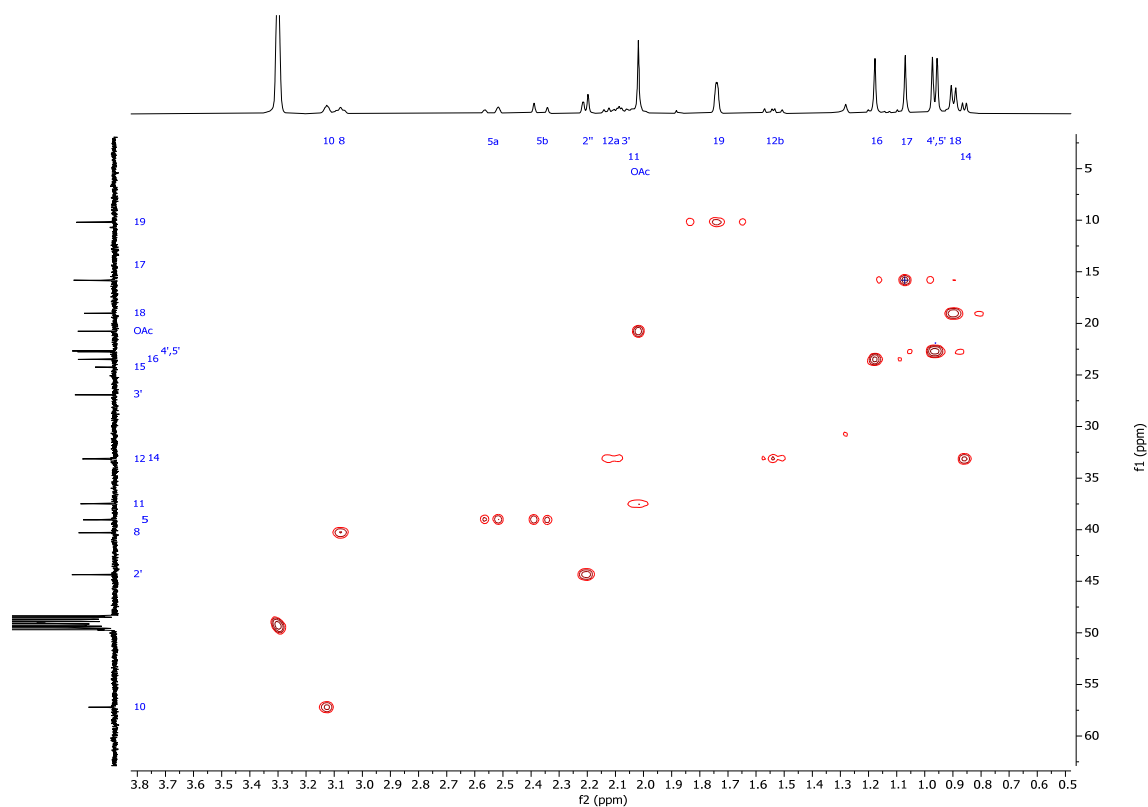


Figure S13e. Expansion (δ_{H} 3.8-0.2, δ_{C} 62-3) of HSQC spectrum of AcDPiPn (**13**) in CD₃OD.

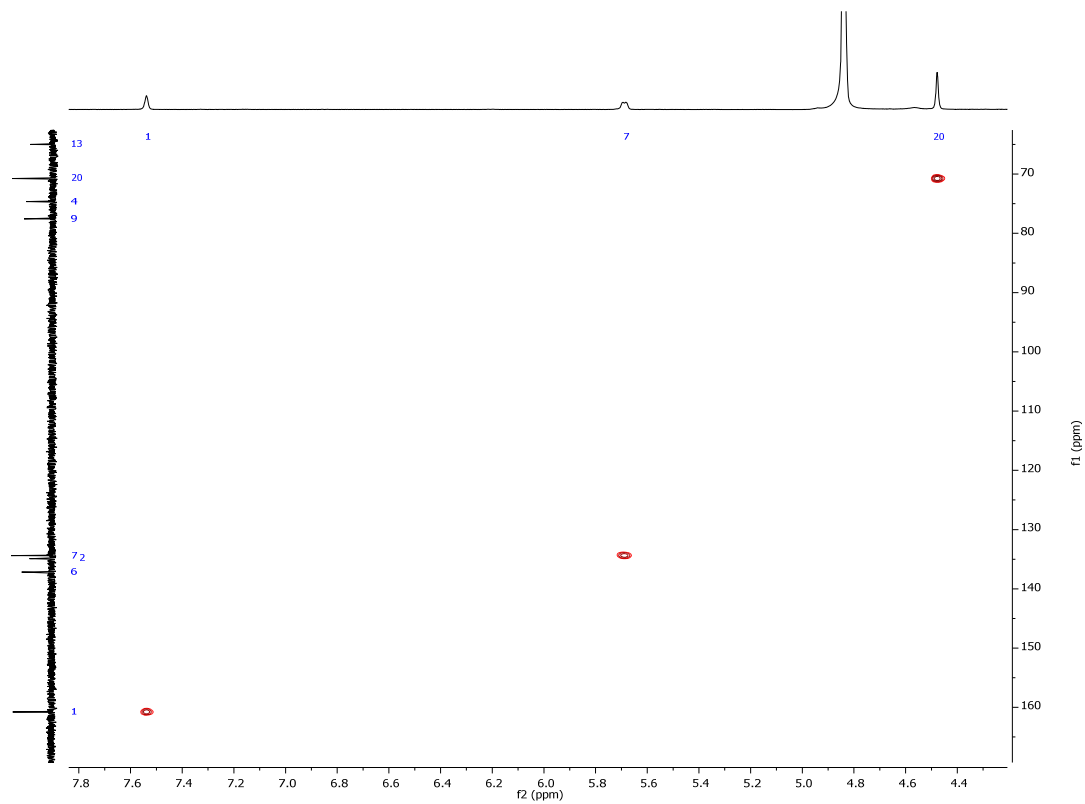


Figure S13f. Expansion (δ_{H} 7.8-4.2, δ_{C} 170-65) of HSQC spectrum of AcDPiPn (**13**) in CD₃OD.

Supplementary Material

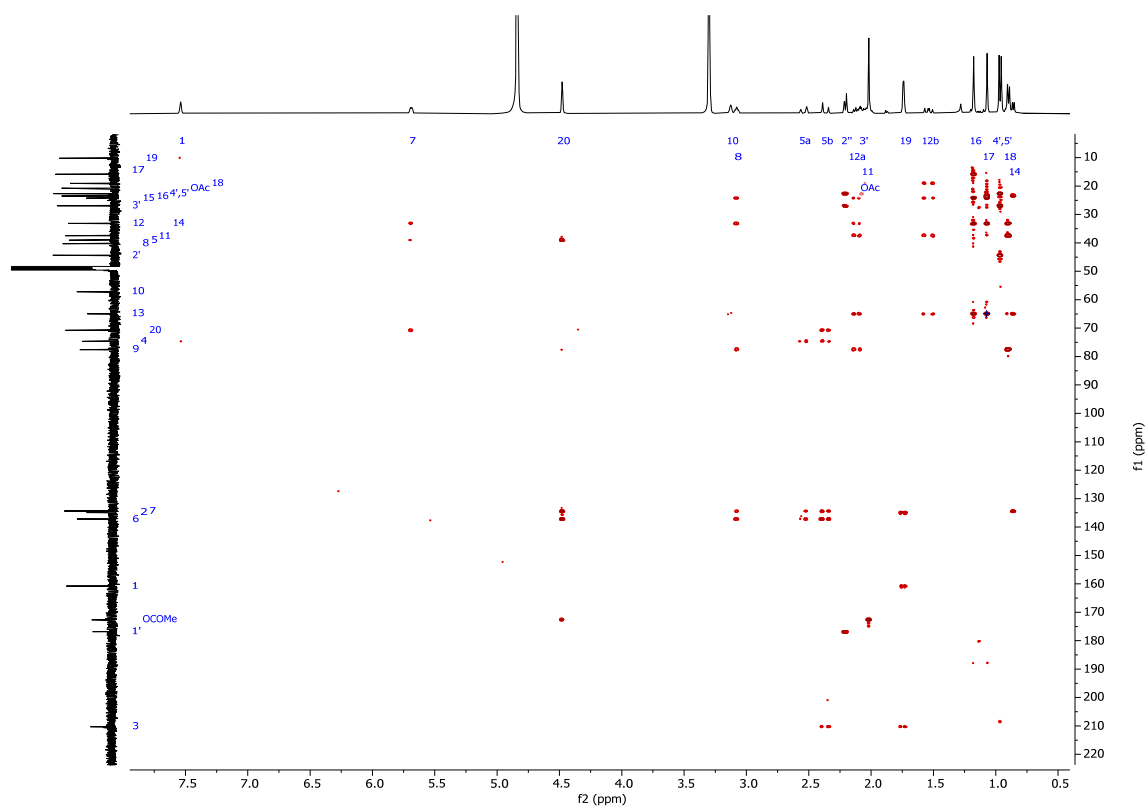


Figure S13g. HMBC spectrum of AcDPiPn (**13**) in CD₃OD.

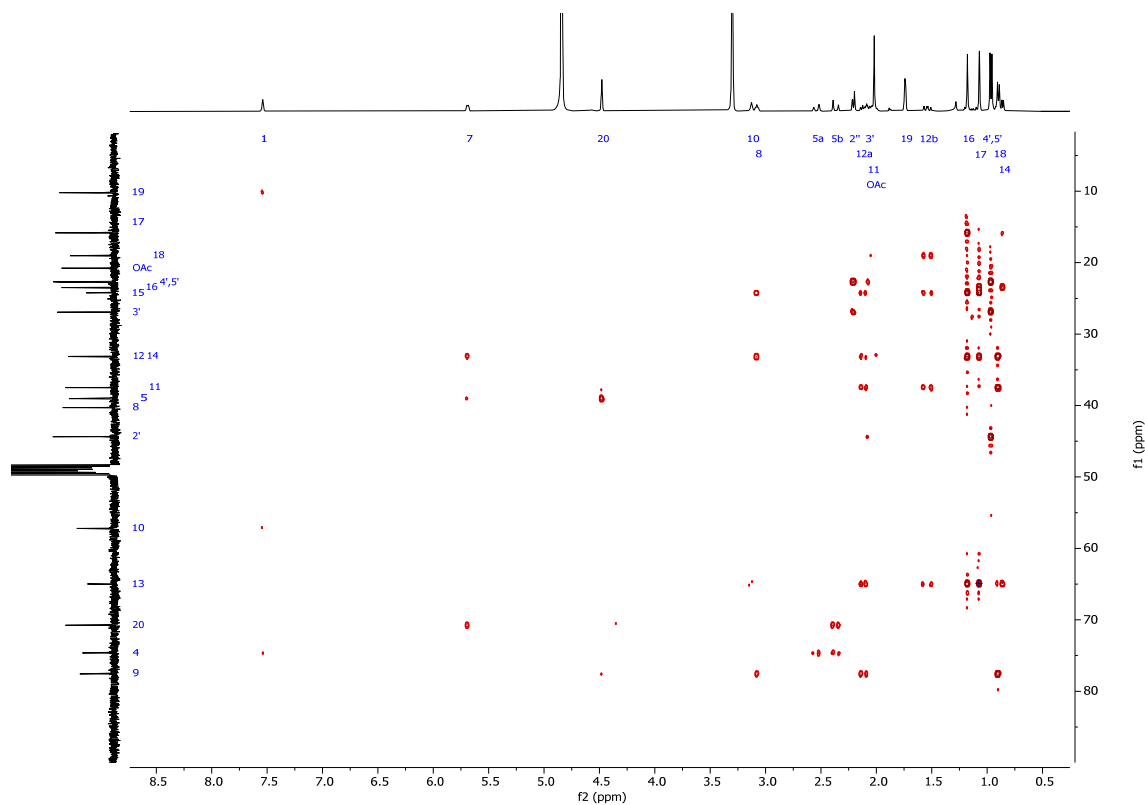


Figure S13h. Expansion (δ_H 8.7-0.2, δ_C 90-3) of HMBC spectrum of AcDPiPn (**13**) in CD₃OD.

Supplementary Material

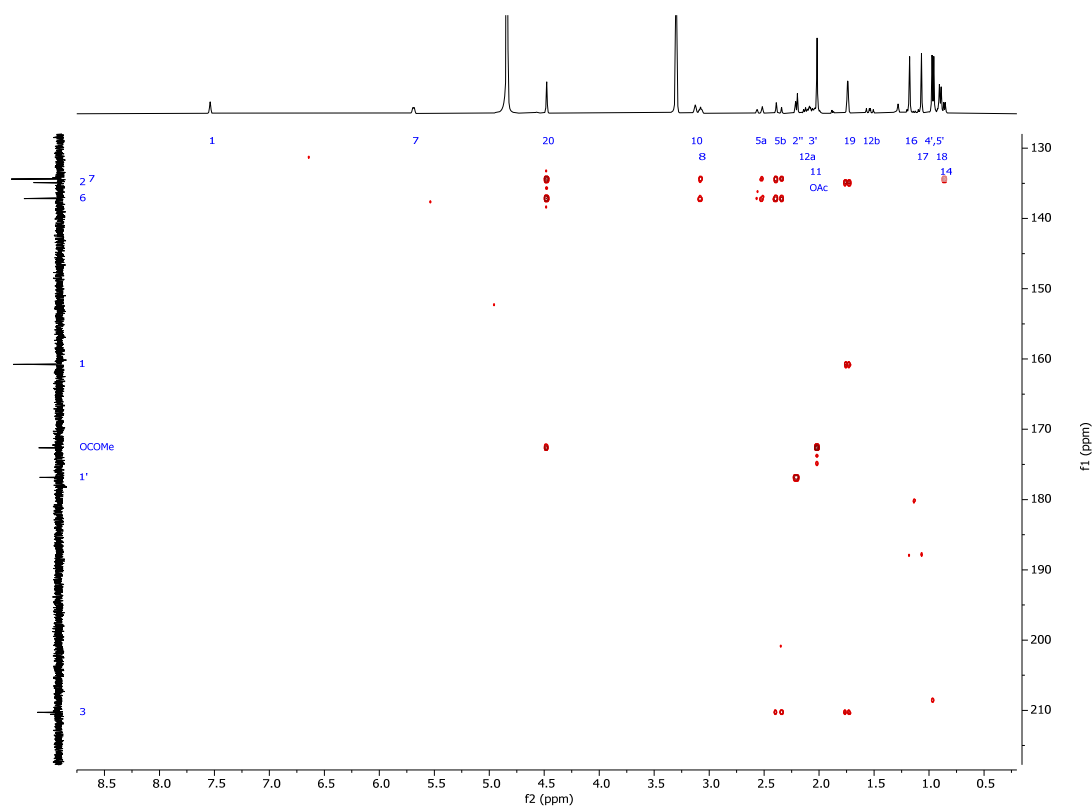


Figure S13i. Expansion (δ_{H} 8.7-0.2, δ_{C} 215-128) of HMBC spectrum of AcDPiPn (**13**) in CD_3OD .

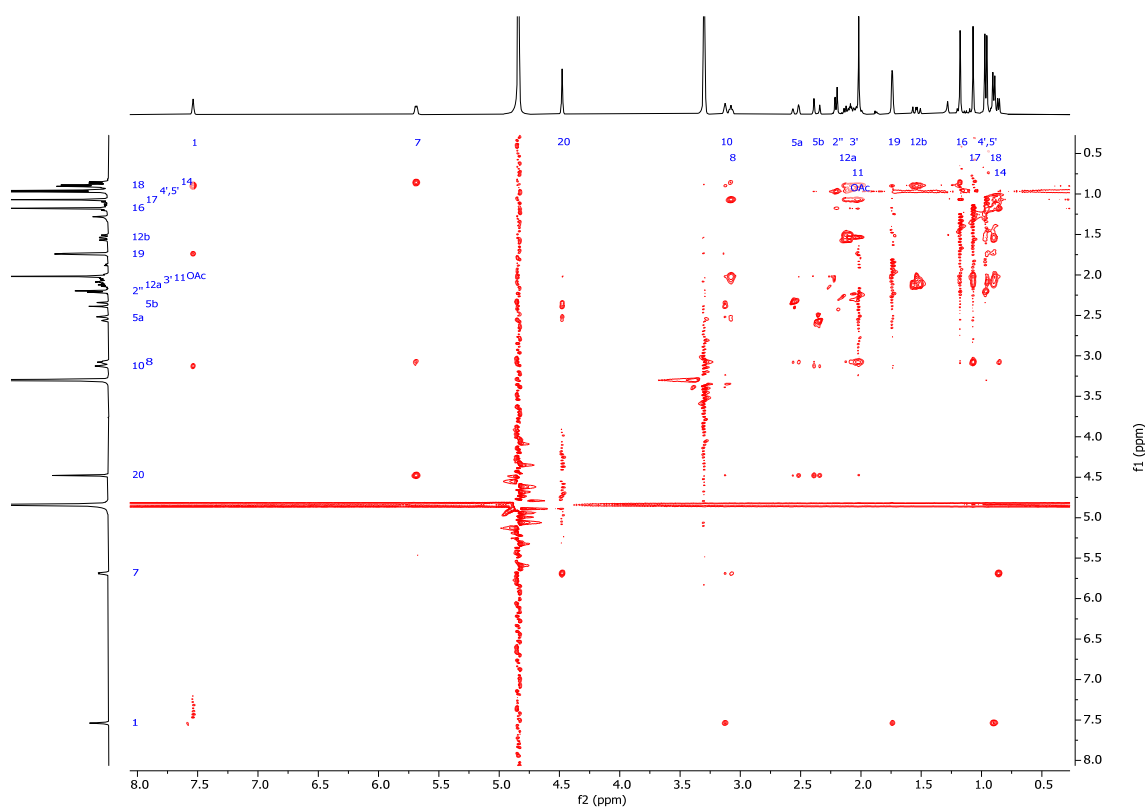


Figure S13j. NOESY2D spectrum of AcDPiPn (**13**) in CD_3OD .

Supplementary Material

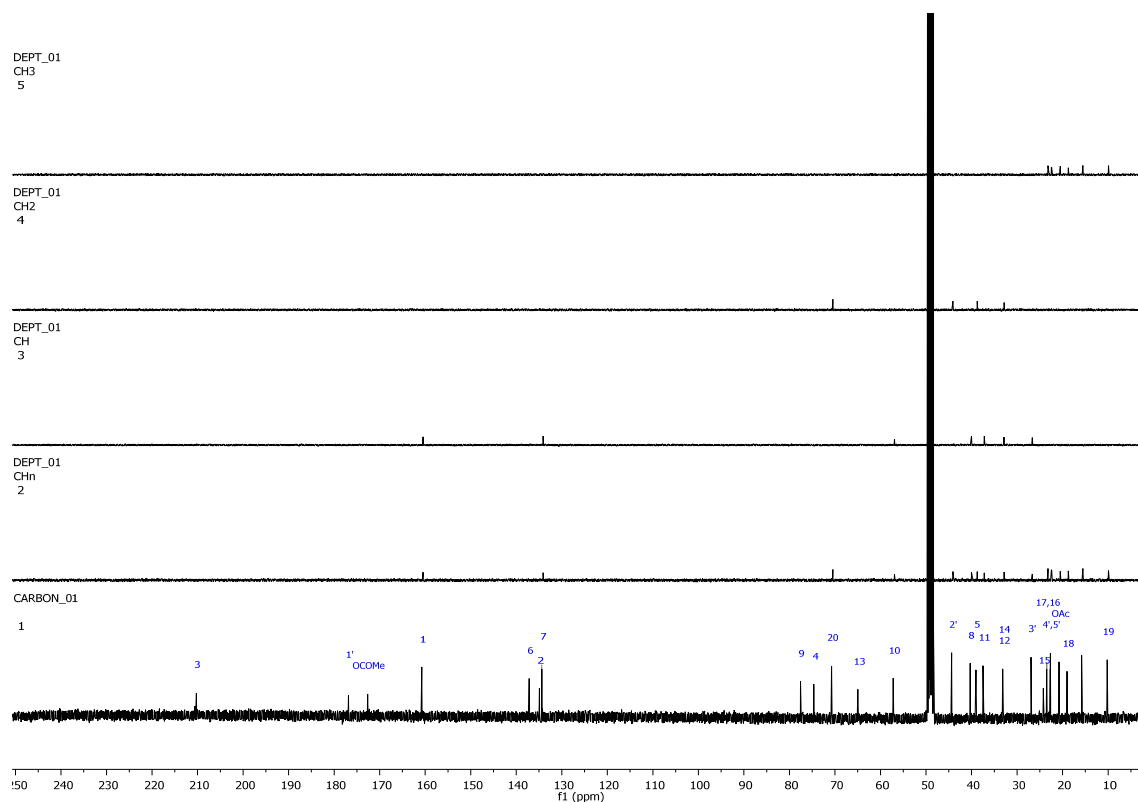


Figure S13k. DEPT spectrum of AcDPiPn (**13**) in CD₃OD.

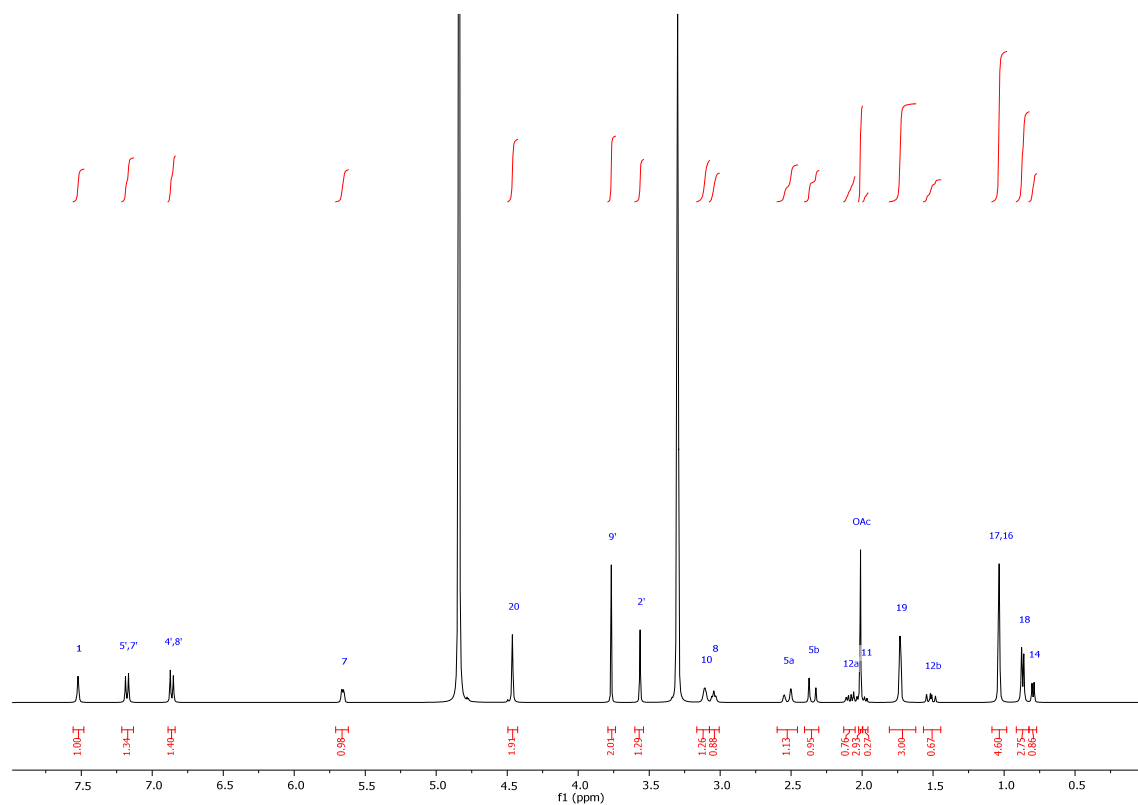


Figure S14a. ¹H-NMR spectrum of AcDPMcOP (**14**) in CD₃OD (400 MHz).

Supplementary Material

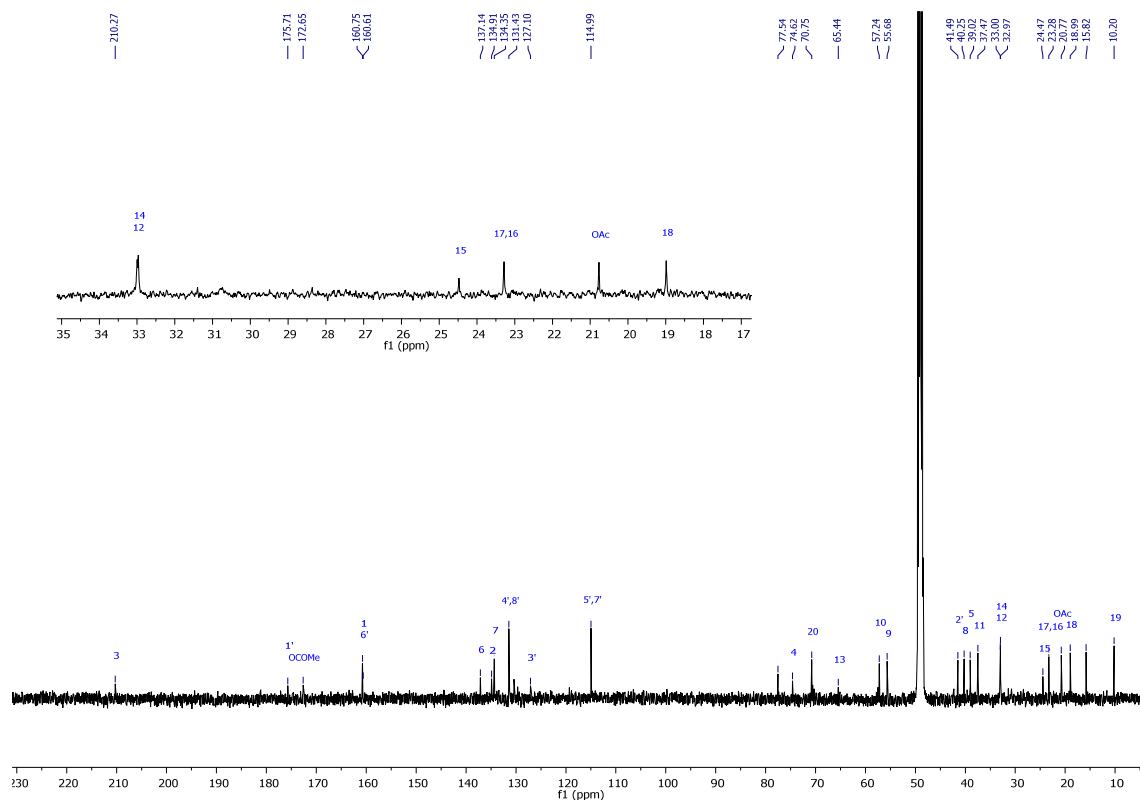


Figure S14b. ^{13}C -NMR spectrum of AcDPMcOP (**14**) in CD_3OD (100 MHz).

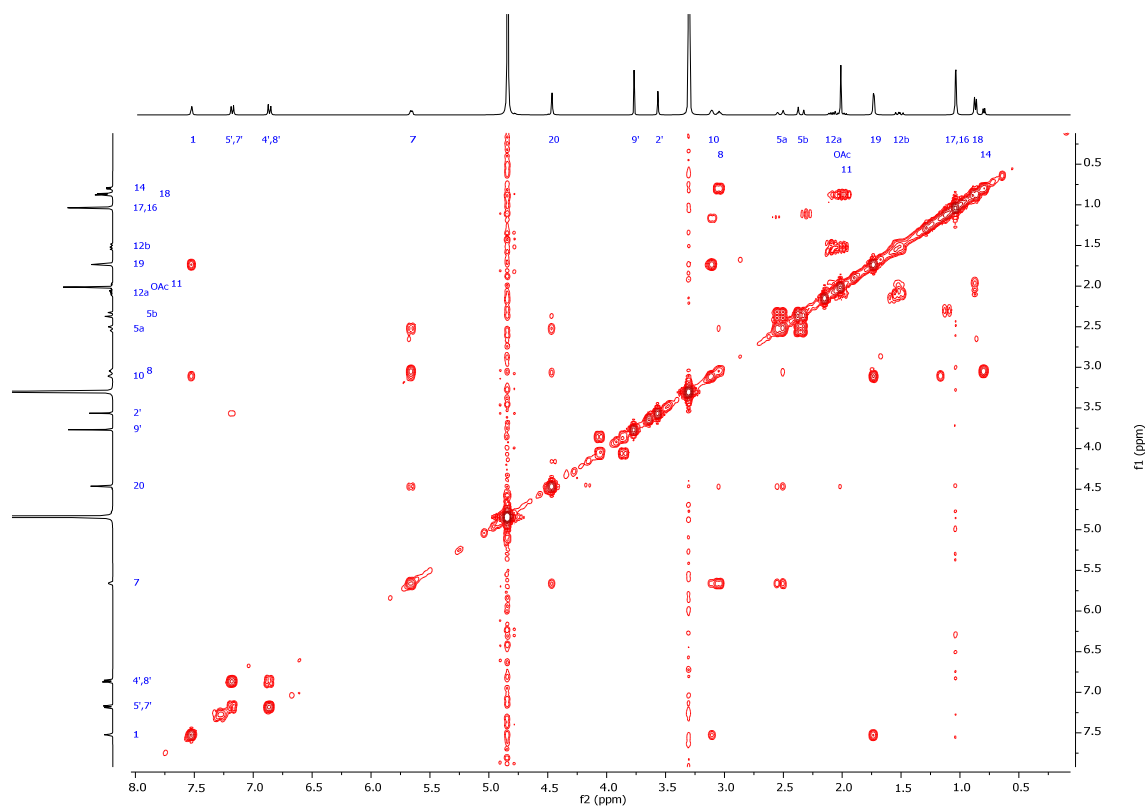


Figure S14c. COSY spectrum of AcDPMcOP (**14**) in CD_3OD .

Supplementary Material

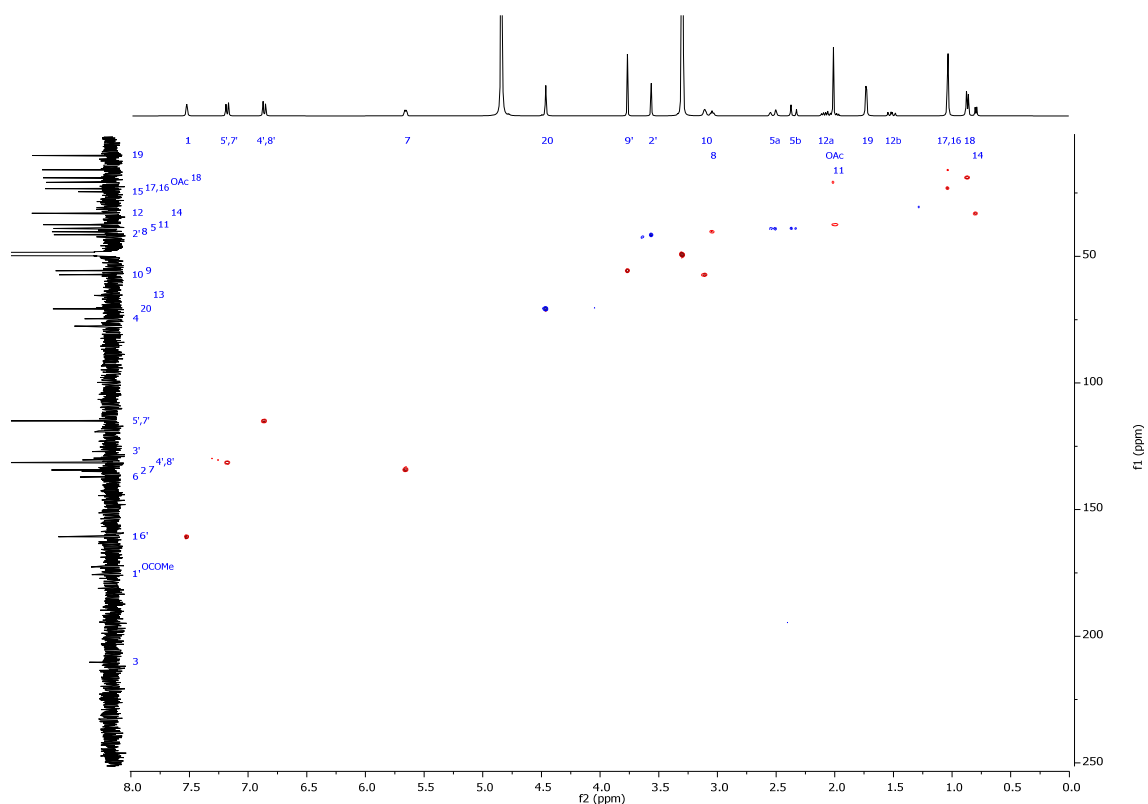


Figure S14d. HSQC spectrum of AcDPMcOP (**14**) in CD₃OD.

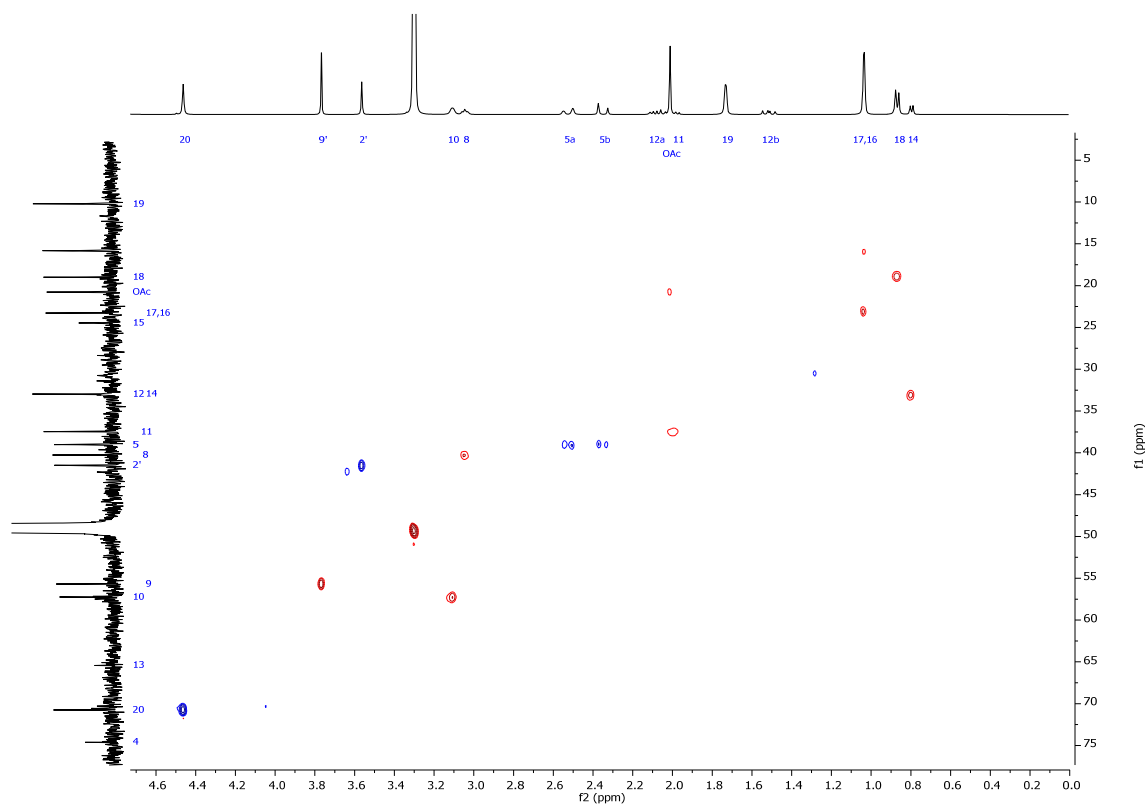


Figure S14e. Expansion (δ_{H} 4.7-0.1, δ_{C} 77-2) of HSQC spectrum of AcDPMcOP (**14**) in CD₃OD.

Supplementary Material

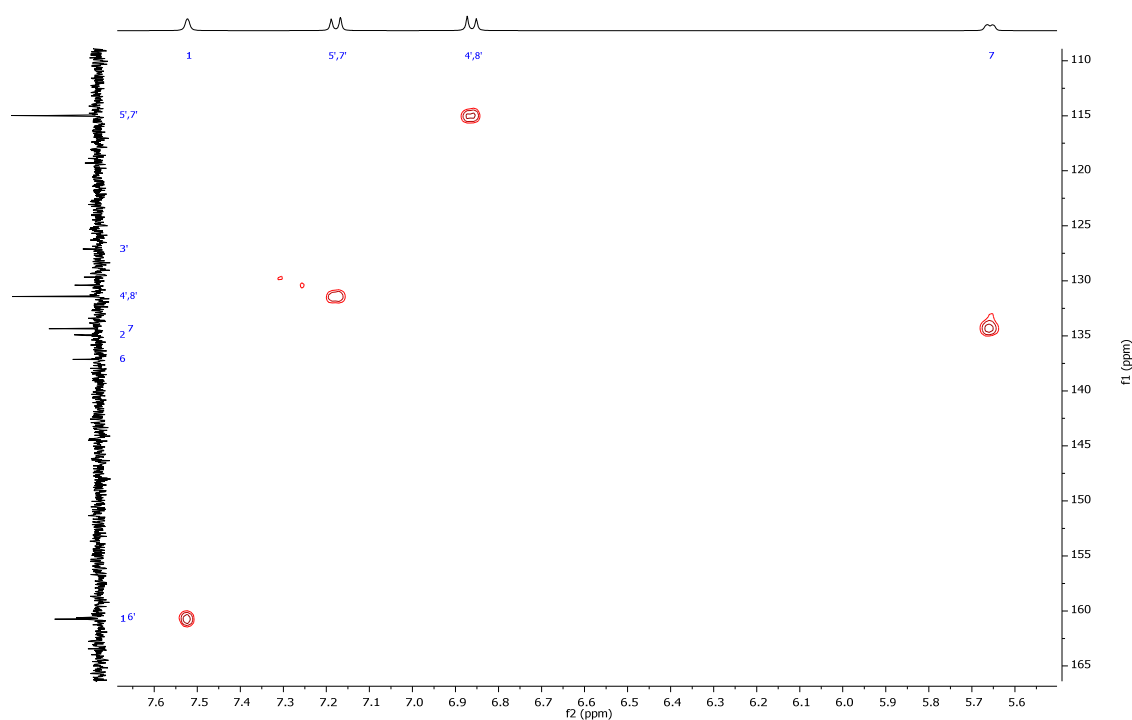


Figure S14f. Expansion (δ_{H} 7.7-5.5, δ_{C} 165-110) of HSQC spectrum of AcDPMcOP (**14**) in CD₃OD.

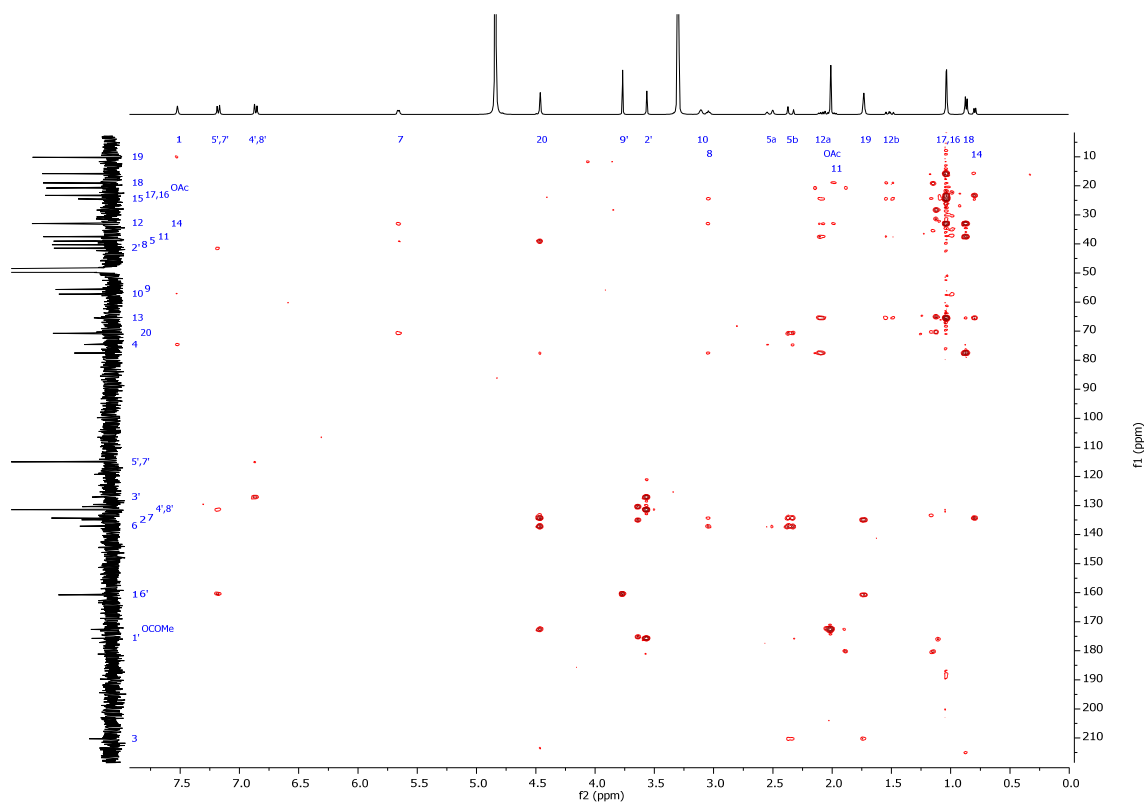


Figure S14g. HMBC spectrum of AcDPMcOP (**14**) in CD₃OD.

Supplementary Material

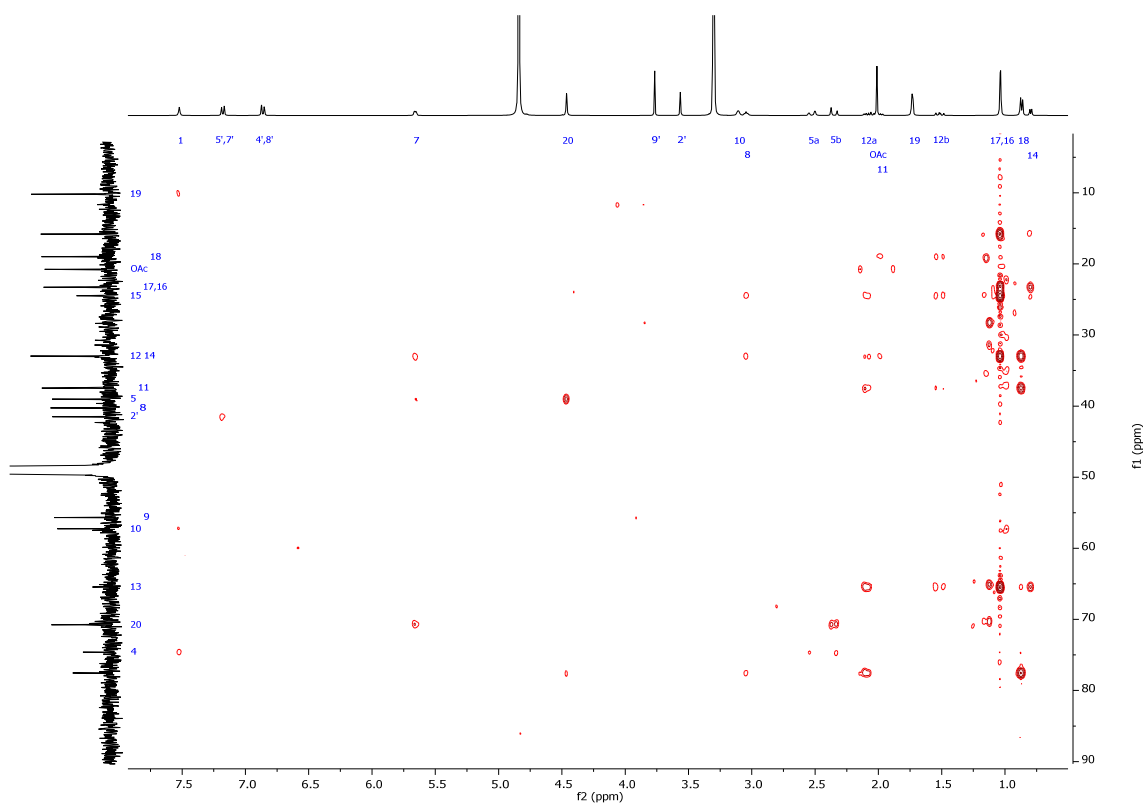


Figure S14h. Expansion (δ_{H} 7.7-0.5, δ_{C} 90-3) of HMBC spectrum of AcDPMcOP (**14**) in CD₃OD.

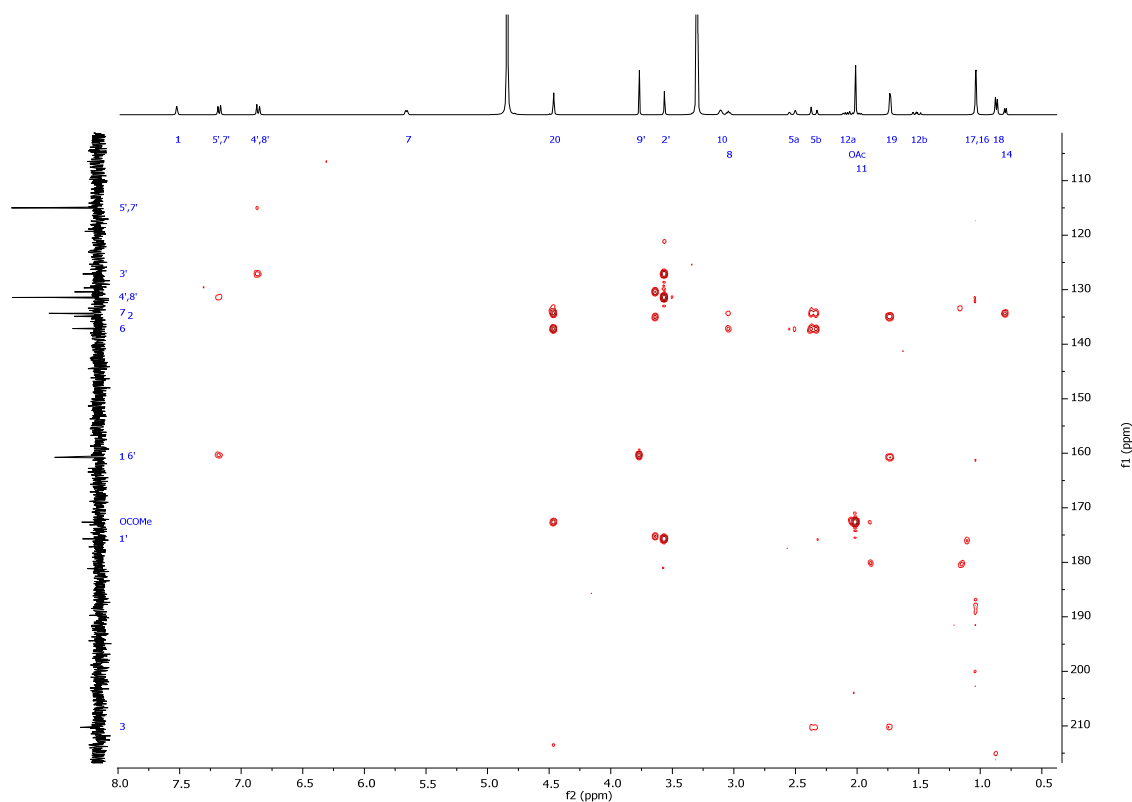


Figure S14i. Expansion (δ_{H} 8.0-0.5, δ_{C} 215-105) of HMBC spectrum of AcDPMcOP (**14**) in CD₃OD.

Supplementary Material

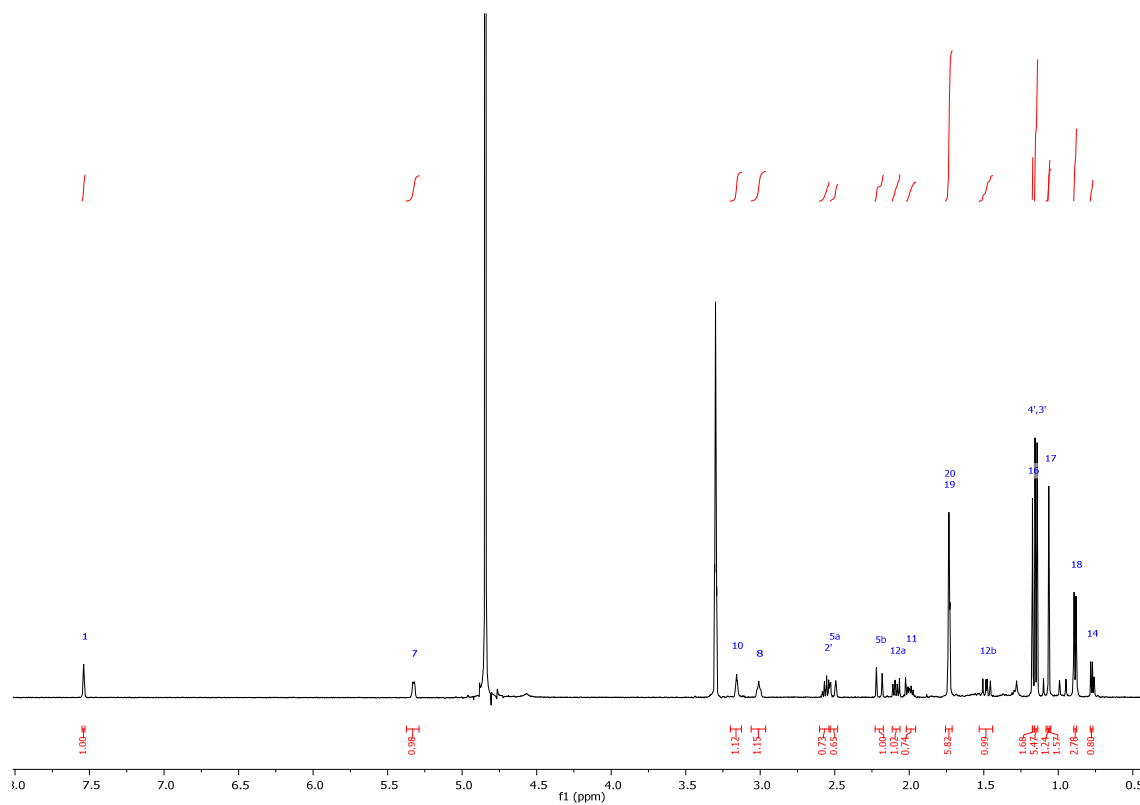


Figure S15a. ^1H -NMR spectrum of diDPB (**15**) in CD_3OD (500 MHz).

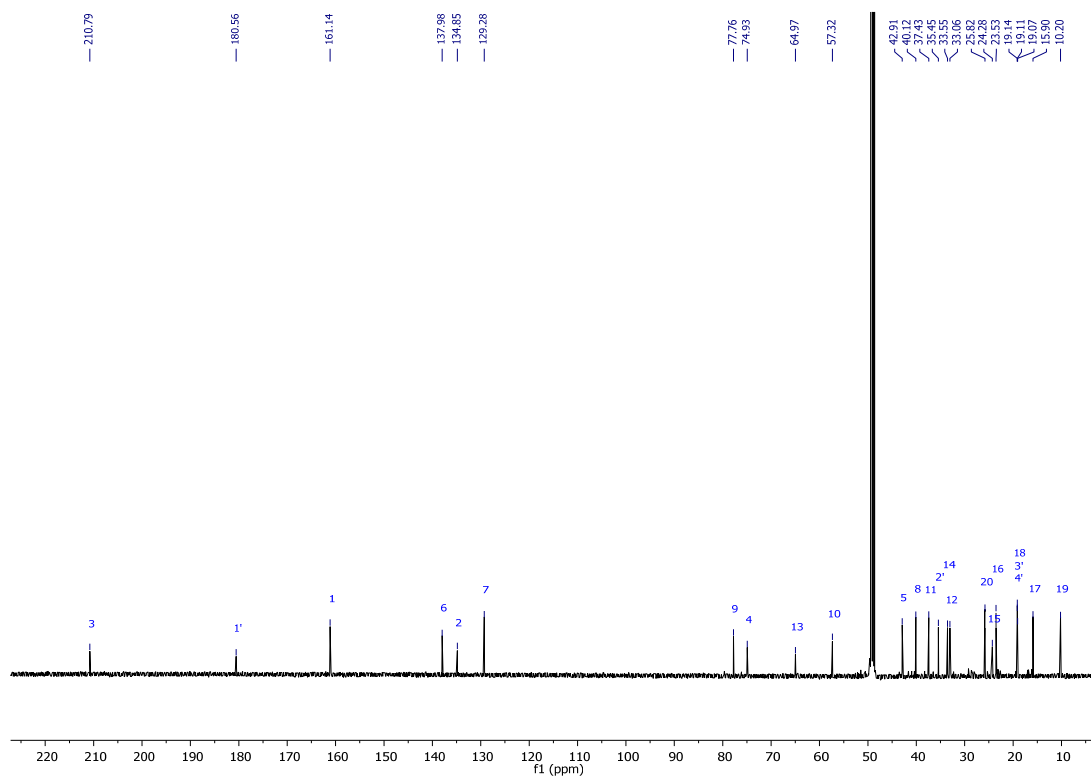


Figure S15b. ^{13}C -NMR spectrum of diDPB (**15**) in CD_3OD (125 MHz)

Supplementary Material

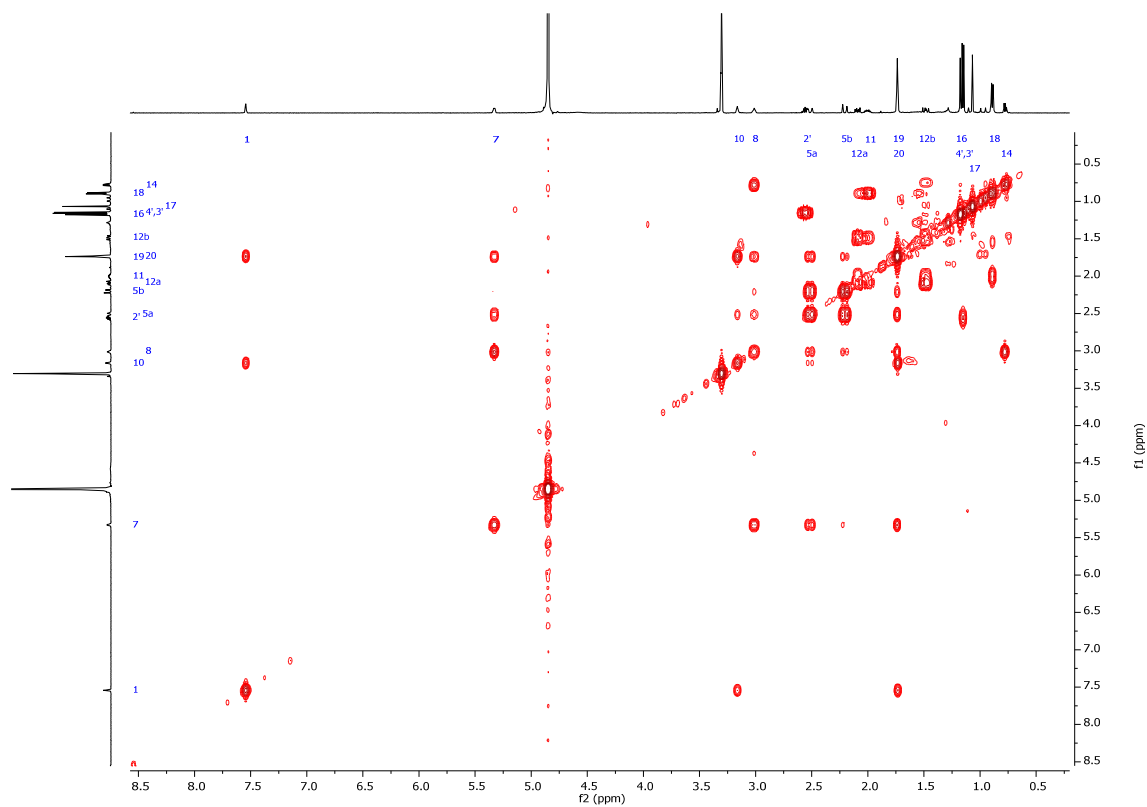


Figure S15c. COSY spectrum of diDPB (**15**) in CD₃OD.

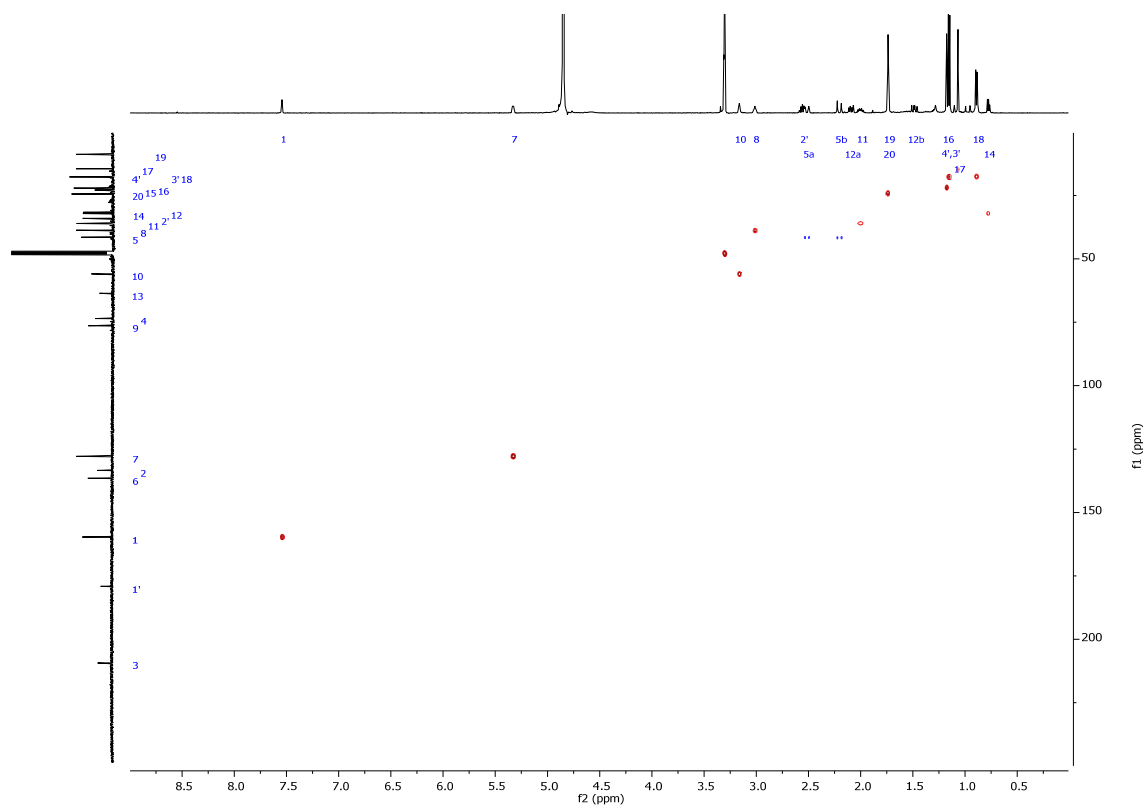


Figure S15d. HSQC spectrum of diDPB (**15**) in CD₃OD.

Supplementary Material

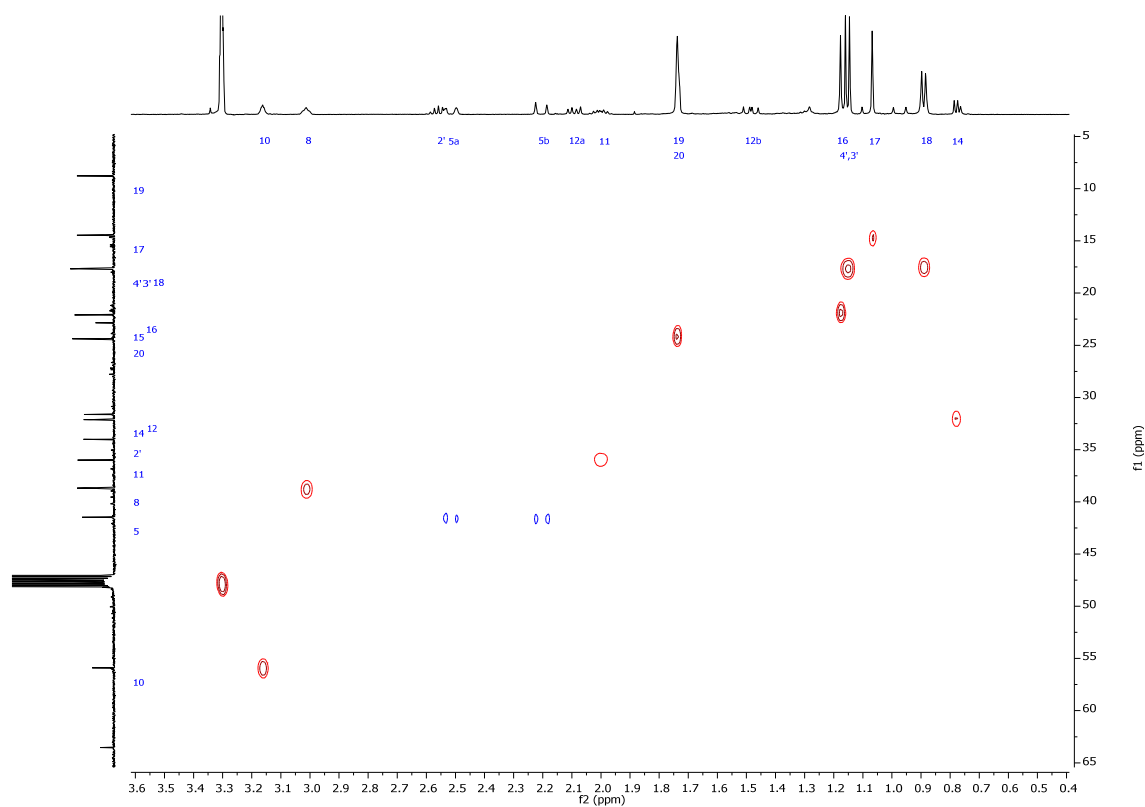


Figure S15e. Expansion (δ_{H} 3.6-0.4, δ_{C} 65-5) of HSQC spectrum of diDPB (**15**) in CD_3OD .

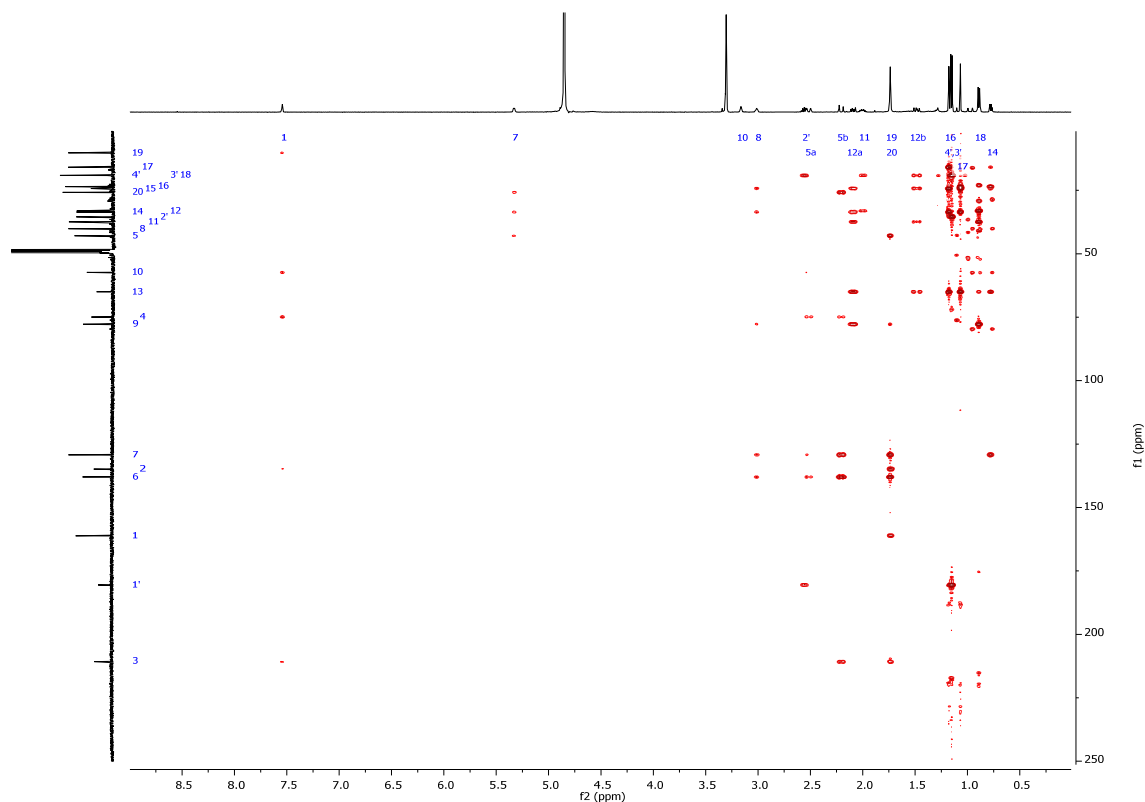


Figure S15f. HMBC spectrum of diDPB (**15**) in CD_3OD .

Supplementary Material

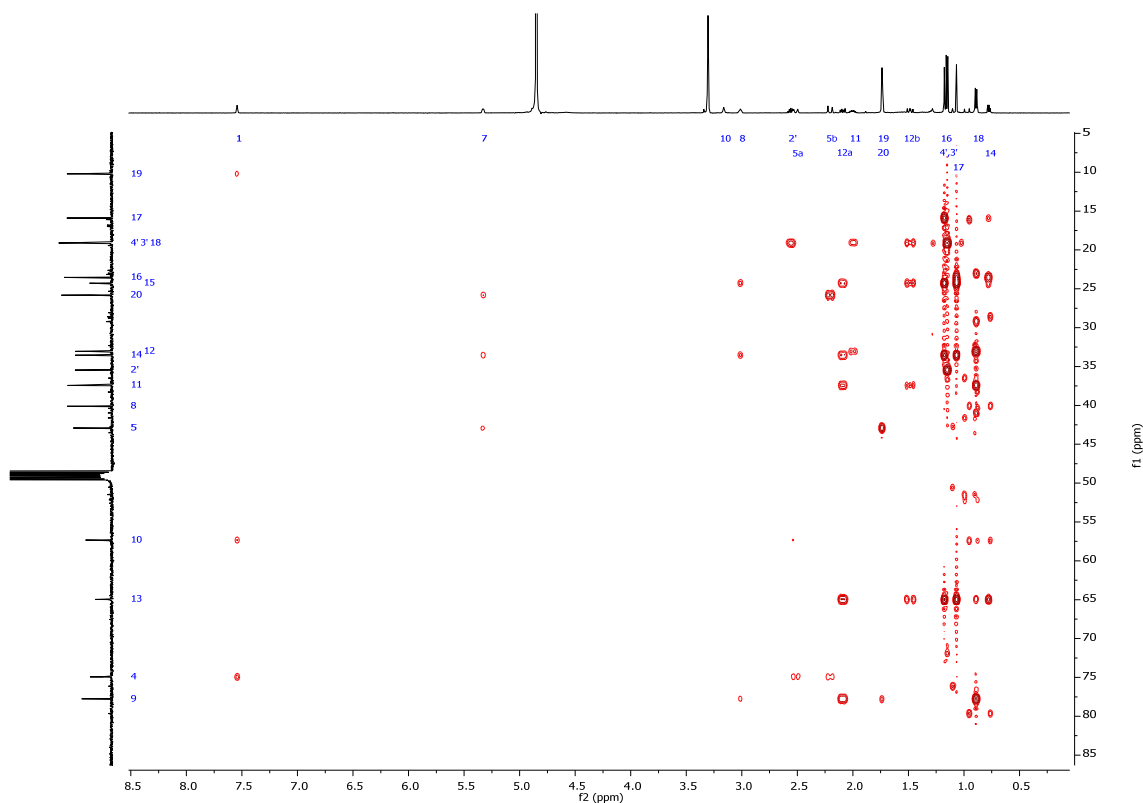


Figure S15g. Expansion (δ_{H} 8.5-0.3, δ_{C} 85-5) of HMBC spectrum of diDPB (**15**) in CD_3OD .

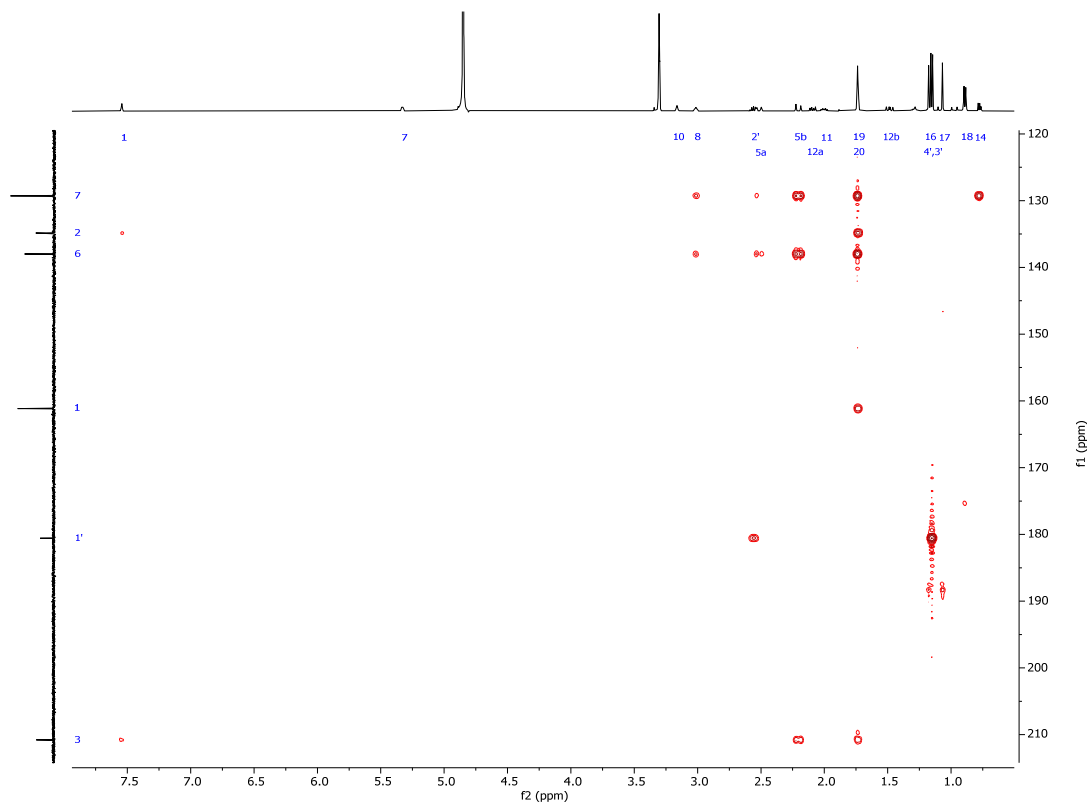


Figure S15h. Expansion (δ_{H} 8.0-0.3, δ_{C} 210-120) of HMBC spectrum of diDPB (**15**) in CD_3OD .

Supplementary Material

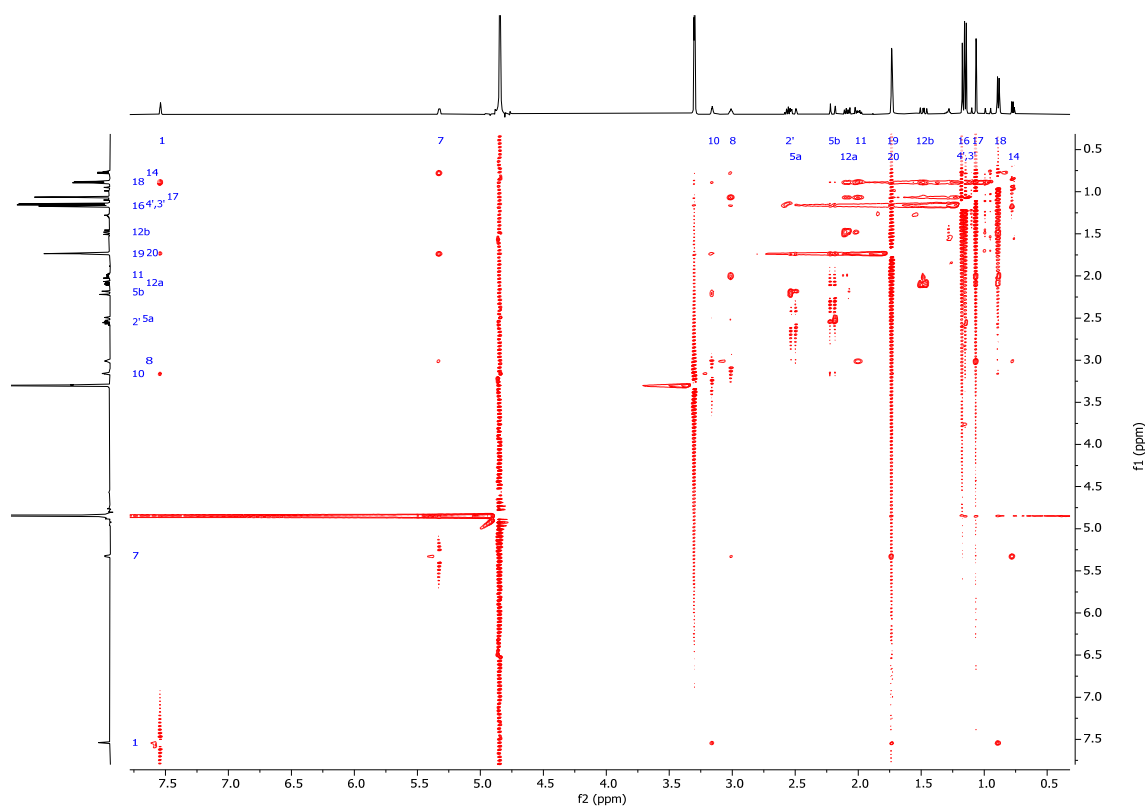


Figure S15i. NOESY2D spectrum of diDPB (**15**) in CD₃OD.

DEPT_01
CH3
AB-01Y03-17-LA-Fr-1-2-3-hplc6-2-24



DEPT_01
CH2
AB-01Y03-17-LA-Fr-1-2-3-hplc6-2-23



DEPT_01
CH
AB-01Y03-17-LA-Fr-1-2-3-hplc6-2-22



DEPT_01
CHn
AB-01Y03-17-LA-Fr-1-2-3-hplc6-2-21

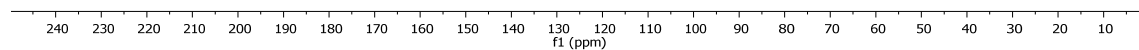


Figure S15j. DEPT spectrum of diDPB (**15**) in CD₃OD.

Supplementary Material

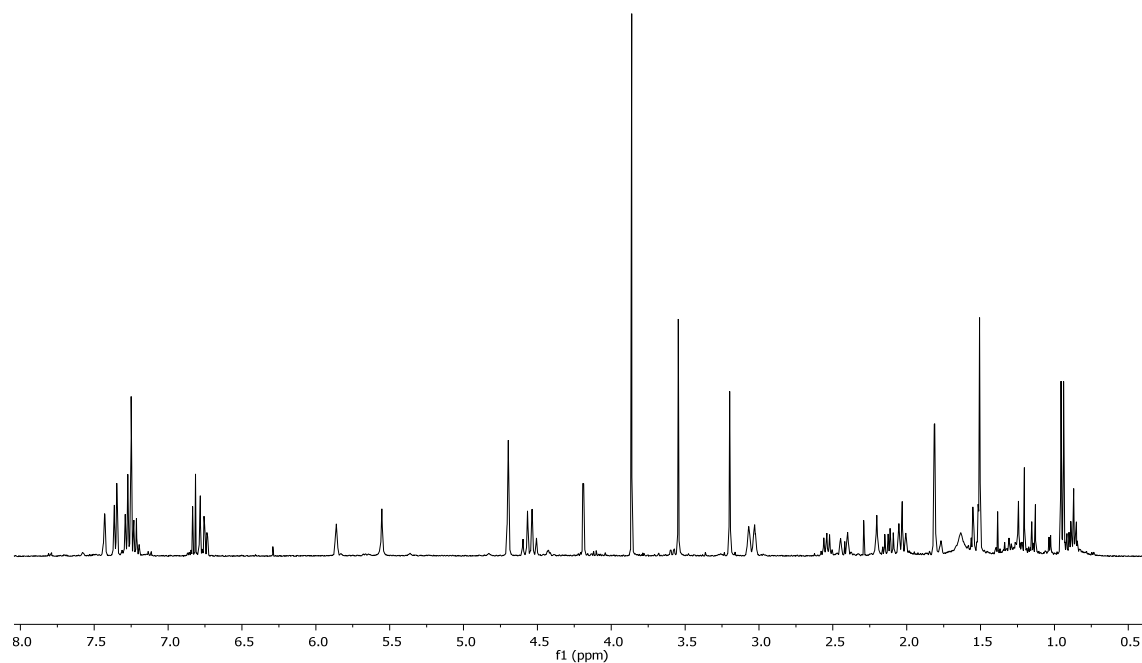


Figure S16a. ¹H NMR spectrum of RTX (**16**) in CDCl₃ (400 MHz).

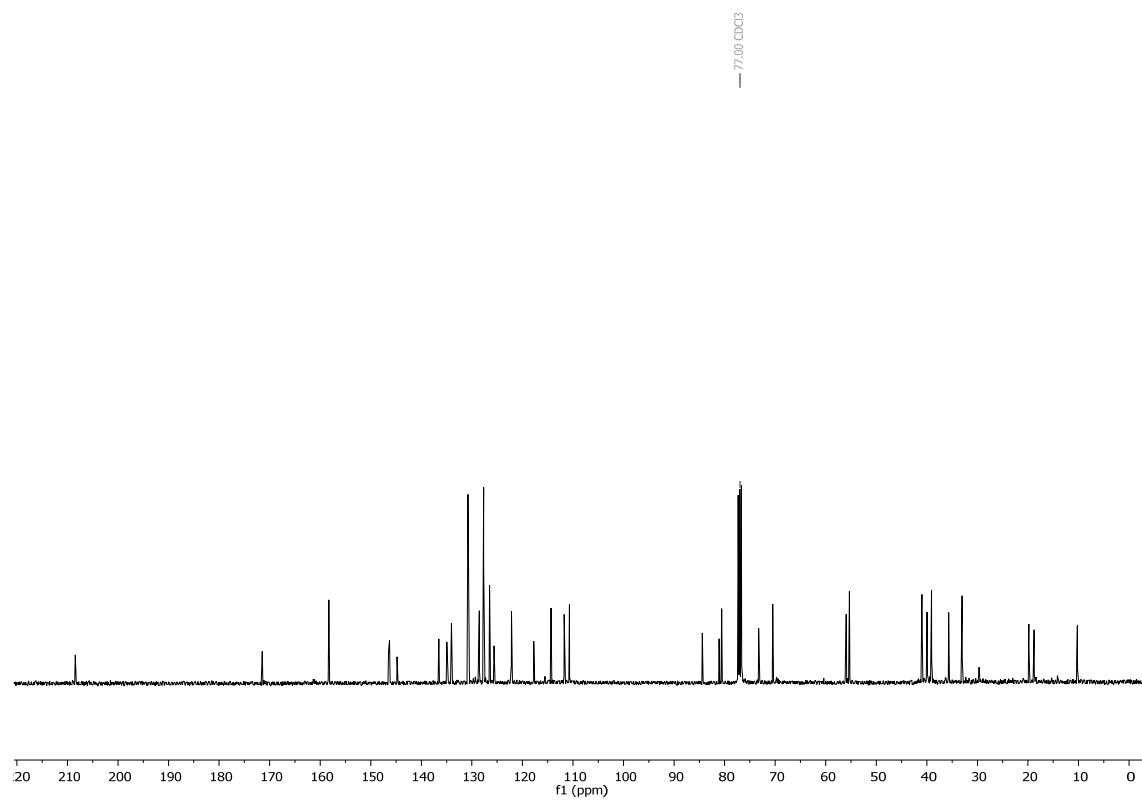


Figure S16b. ¹³C NMR spectrum of RTX (**16**) in CDCl₃ (100 MHz).

Supplementary Material

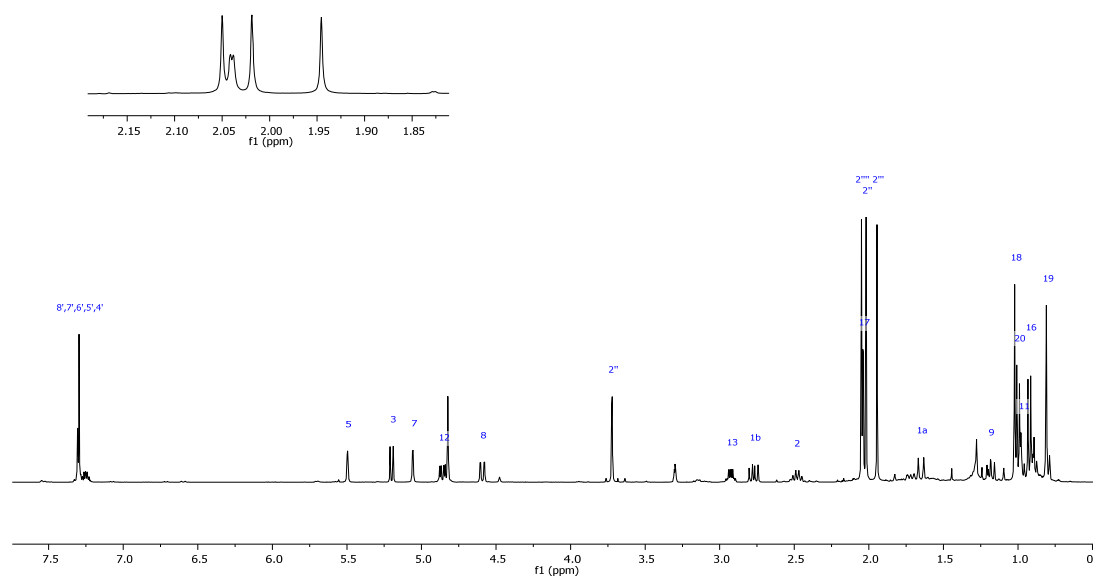


Figure S17a. ^1H -NMR spectrum of EOF1 (**17**) in CD_3OD (400 MHz).

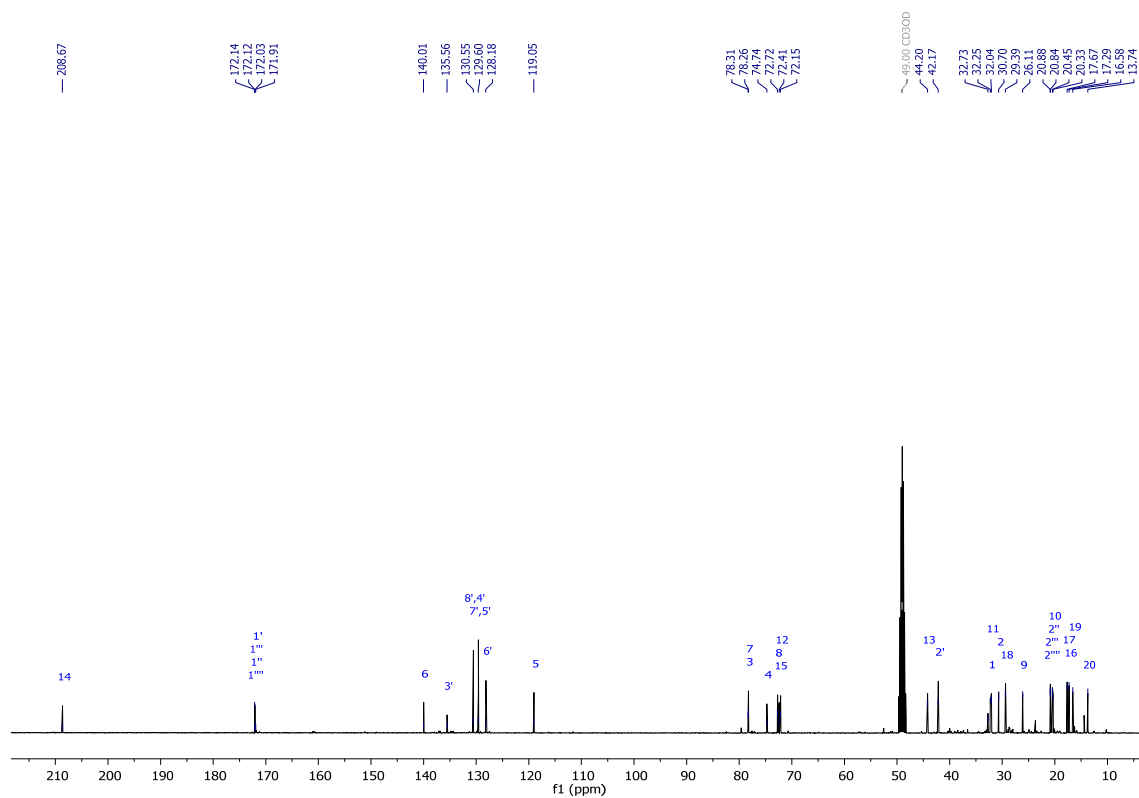


Figure S17b. ^{13}C -NMR spectrum of EOF1 (**17**) in CD_3OD . (100 MHz).

Supplementary Material

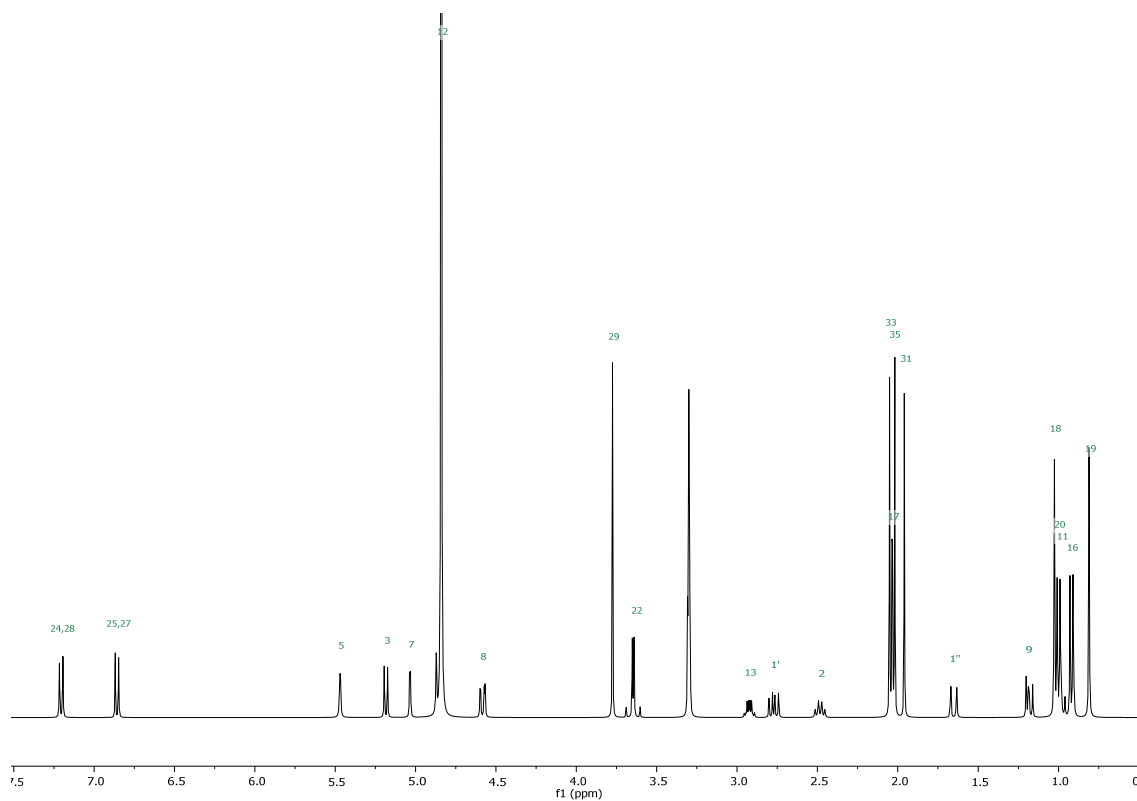


Figure S18a. ¹H-NMR spectrum of EOF2 (**18**) in CD₃OD (400 MHz).

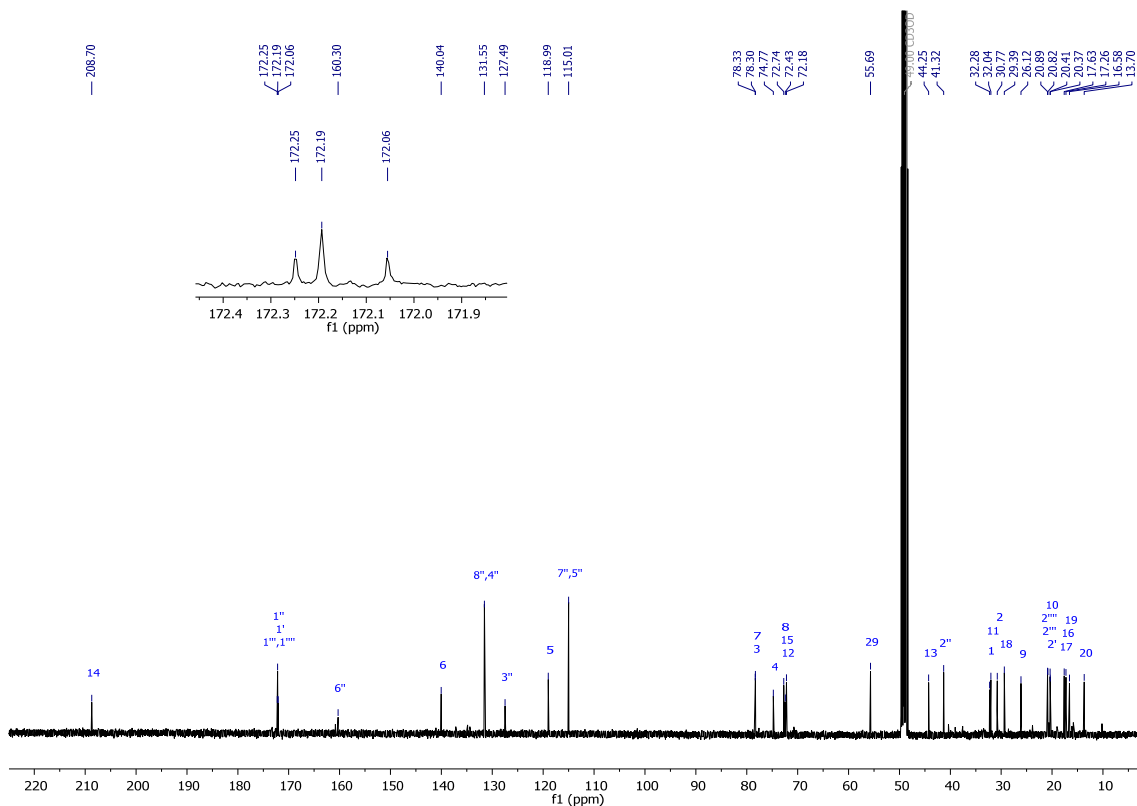


Figure S18b. ¹³C-NMR spectrum of EOF2 (**18**) in CD₃OD (100 MHz).

2- ECD data

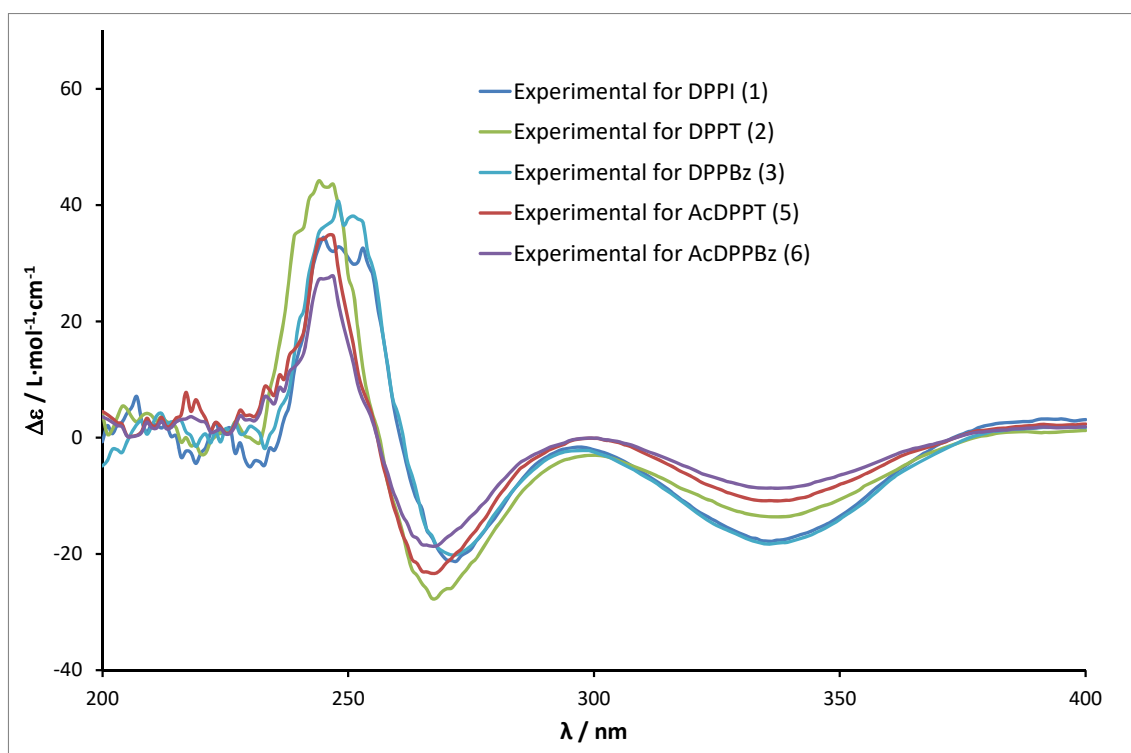


Figure S19. Experimental ECD spectra of DPPI (1), DPPT (2), DPPBz (3), AcDPPT (5) and AcDPPBz (6).

3- UHPLC-HRMS^E data. Figures.

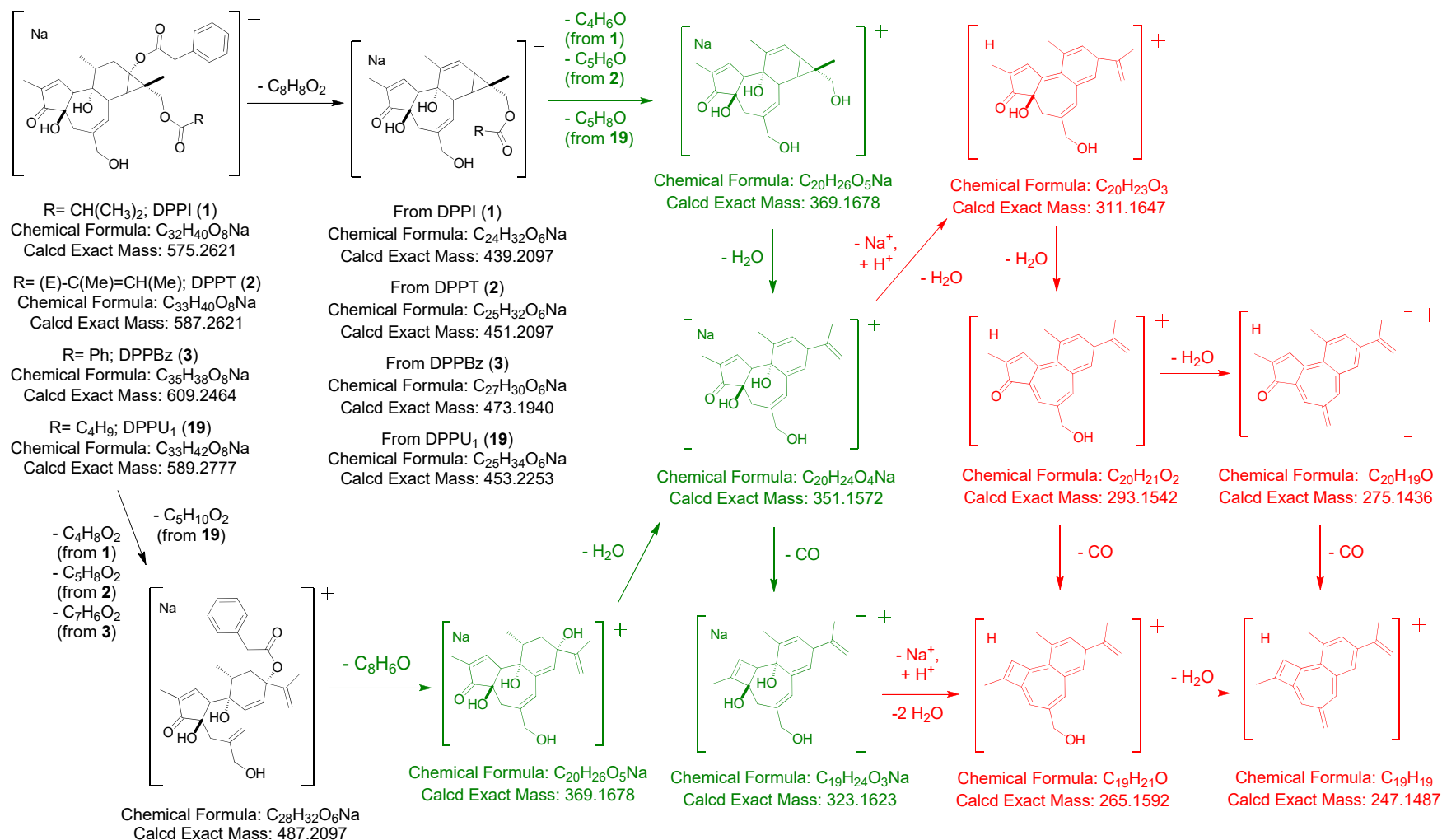


Figure S20. Proposed fragmentation route for selected ions on HRMS^E spectrum (Data Independent Acquisition (DIA)) [1], in ESI positive mode, for DPPI (**1**), DPPT (**2**), DPPBz (**3**) and DPPU₁ (**19**). In red, common daughter ions with group B compounds (see section 2.2 and Figure S22).

Supplementary Material

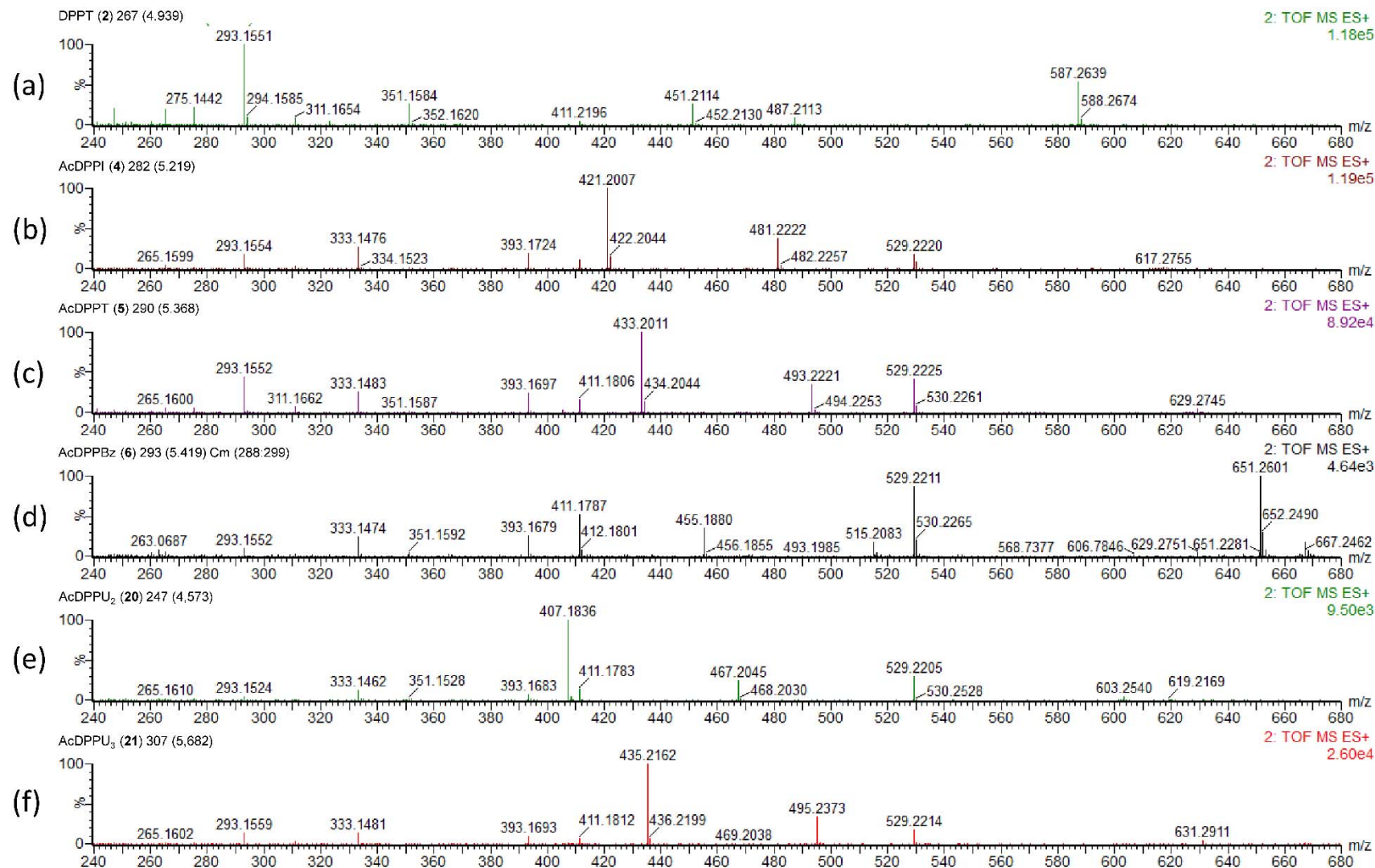


Figure S21. Comparison of HRMS^E spectra (DIA) [1] for (a) DPPT (2), (b) AcDPPI (4), (c) AcDPPT (5), (d) AcDPPBz (6), (e) AcDPPU₂ (20) and (f) AcDPPU₃ (21), m/z range 240-680 (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 60-120 eV).

Supplementary Material

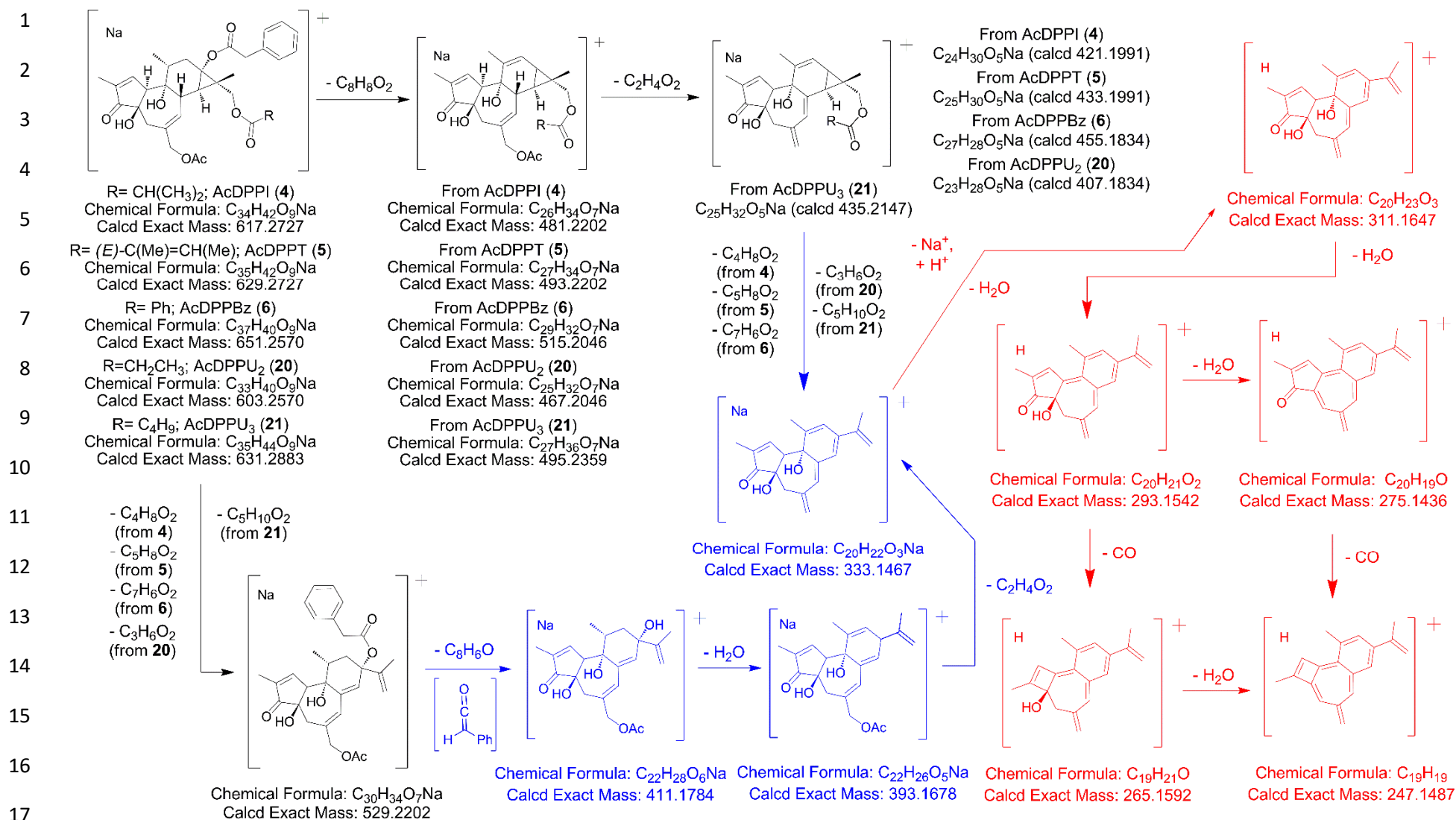


Figure S22. Proposed fragmentation route for selected ions on HRMS^E spectrum (DIA) [1], in ESI positive mode, for AcDPPI (4), AcDPPT (5), AcDPPBz (6), AcDPPU₂ (20) and AcDPPU₃ (21). In red, common daughter ions with group A compounds (see section 2.2 and Figure S20).

Supplementary Material

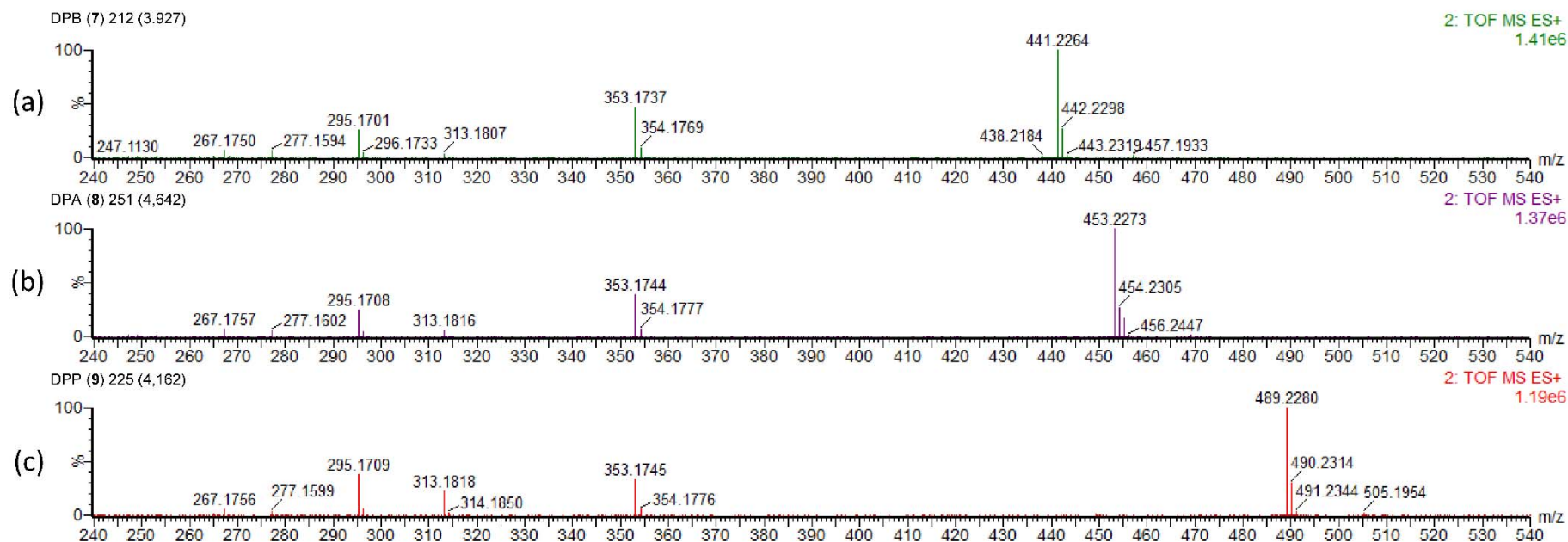


Figure S23. Comparison of HRMS^E spectra (DIA) [1] for (a) DPB (7), (b) DPA (8) and (c) DPP (9), m/z range 240-540 (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 10-40 eV).

Supplementary Material

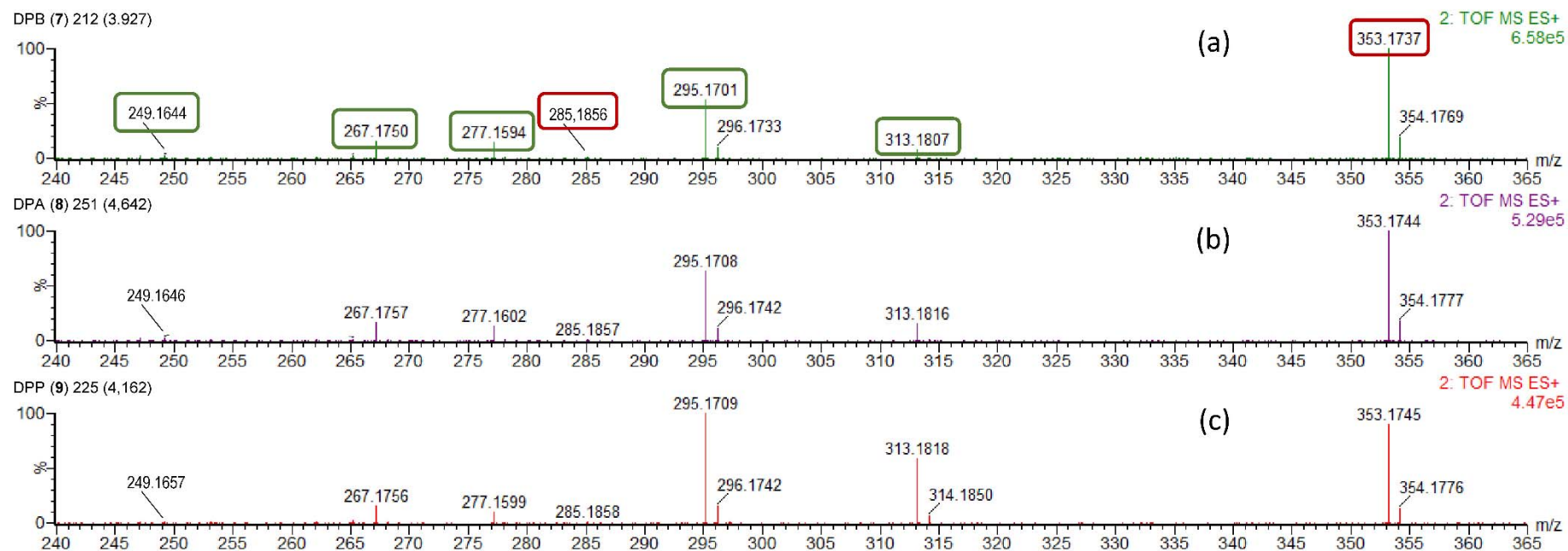


Figure S24. Comparison of HRMS^E spectra (DIA) [1] for: (a) DPB (7), (b) DPA (8) and, (c) DPP (9) X23; m/z range 240-365 (m/z range 240-540 in Figure S23) (data acquired in positive ionization with a ramp trap collision energy of the high-energy function set at 10-40 eV). Compounds 7, 8 and 9 show daughter ions from their corresponding [M+Na]⁺ molecular ions (see Figure S23) in their HRMS^E spectra at m/z 313.1804, 295.1698, 277.1592, 267.1749 and 249.1643 (calculated) (in green in Scheme 3, Figures S24a and S25) which could be assigned to losses of water (1, 2 and 3 molecules), 2 molecules of water and CO and 3 molecules of water and CO, respectively, from a precursor ion at m/z 353.1729 (calculated) (in red in Scheme 3, Figures S24a and S25) (Table S2). Last mentioned ion, which is relatively abundant in HRMS^E spectra of DPB (7) DPA (8) and DPP (9) (Table S2, Figures S23 and S24) originates from a loss of an ester group at C-13 from parent molecular ions in each compound (Figure S23). See proposed fragmentation route for selected ions mentioned above in Scheme 3 and Figure S25, together with colour key

Supplementary Material

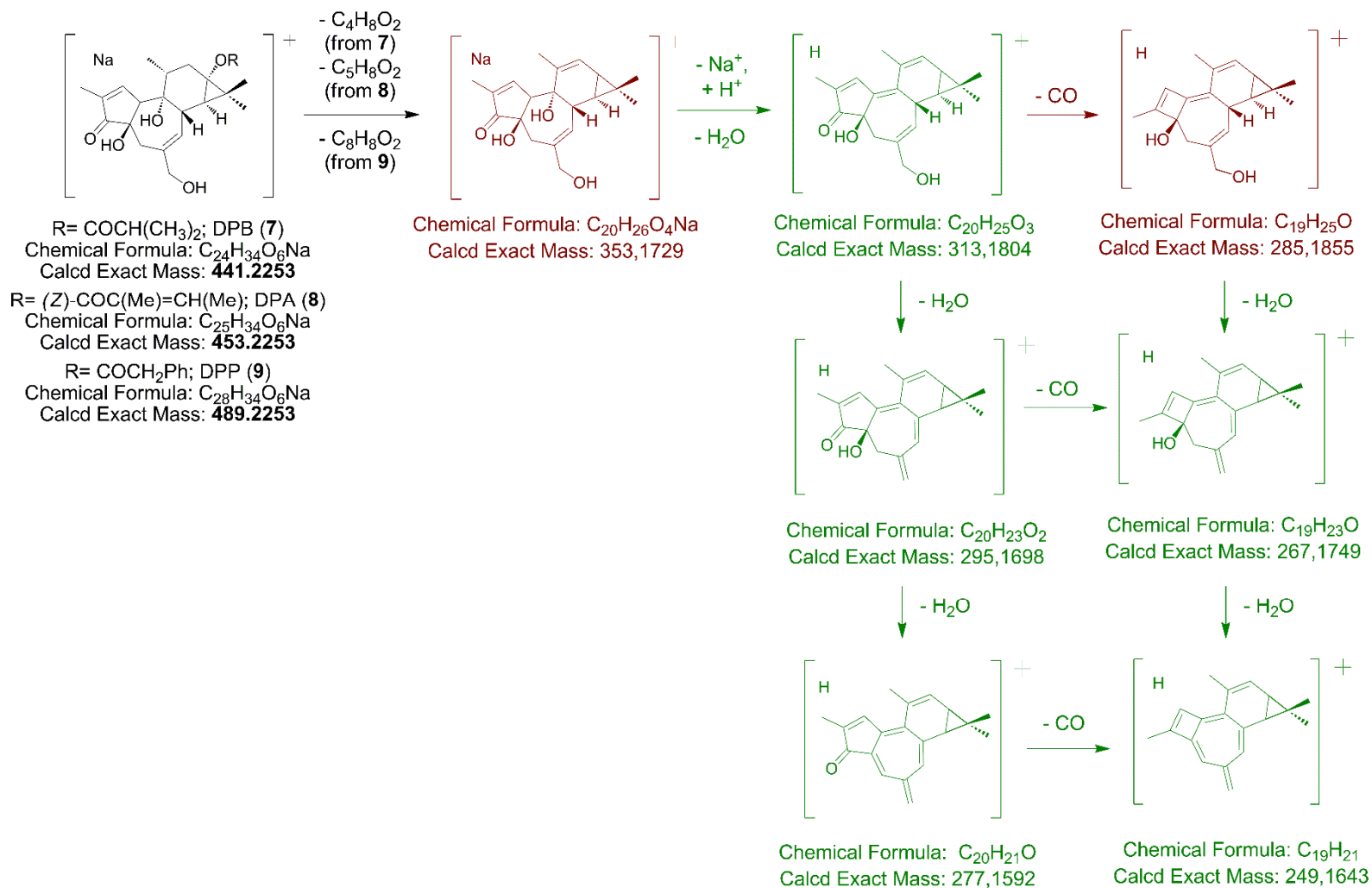


Figure S25. Proposed fragmentation route for selected ions on HRMS^E spectrum (DIA) [1], in ESI positive mode, for DPB (7), DPA (8) and DPP (9). In green, common daughter ions with group D compounds (see section 2.2 and Figure S29).

Supplementary Material

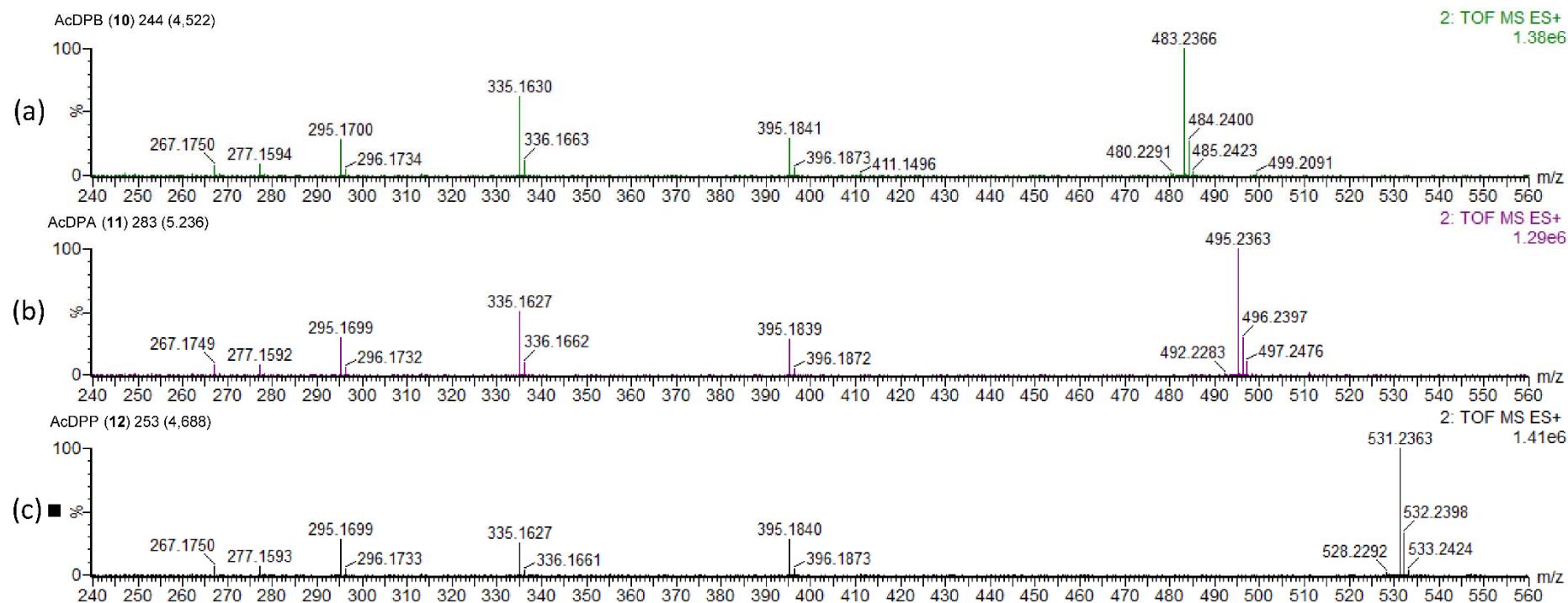


Figure S26. Comparison of HRMS^E spectra (DIA) [1] for (a) AcDPB (10), (b) AcDPA (11), and (c) AcDPP (12), m/z range 240-560 (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 10-40 eV).

Supplementary Material

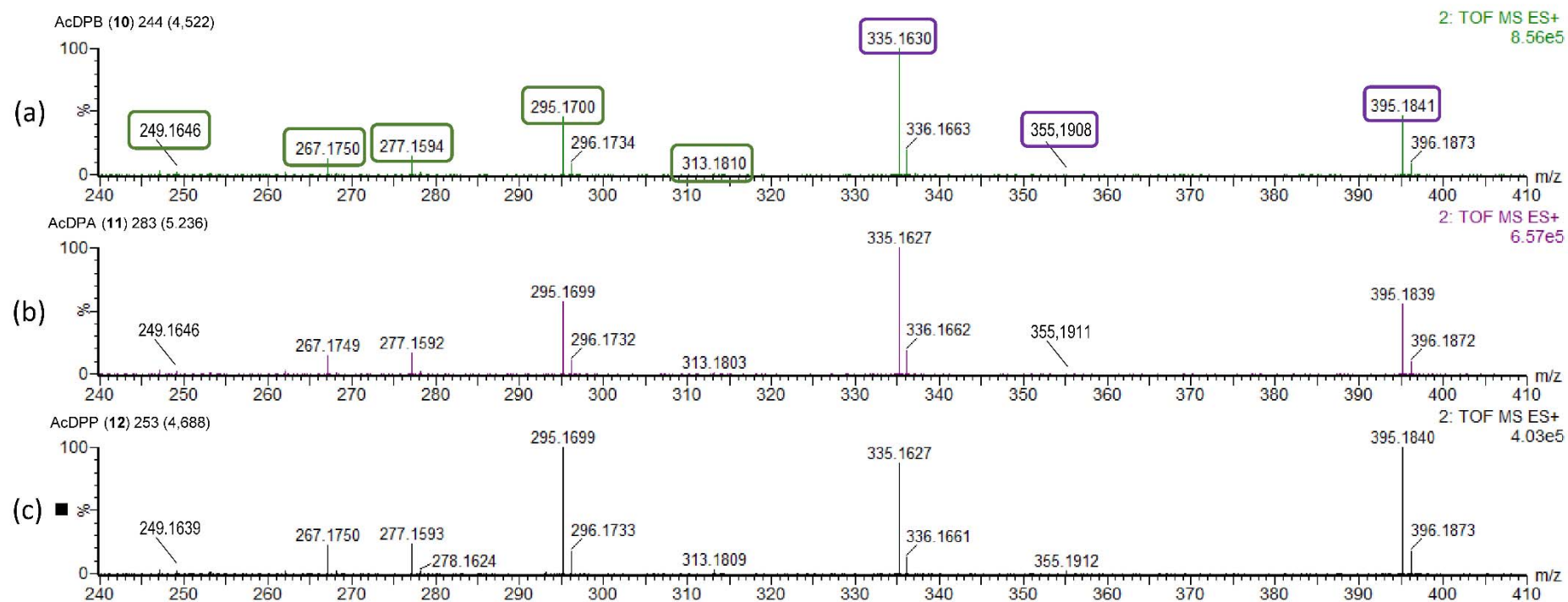


Figure S27. Comparison of HRMS^E spectra (DIA) [1] for (a) AcDPB (10), (b) AcDPA (11), and (c) AcDPP (12), m/z range 240-410 (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 10-40 eV).

Supplementary Material

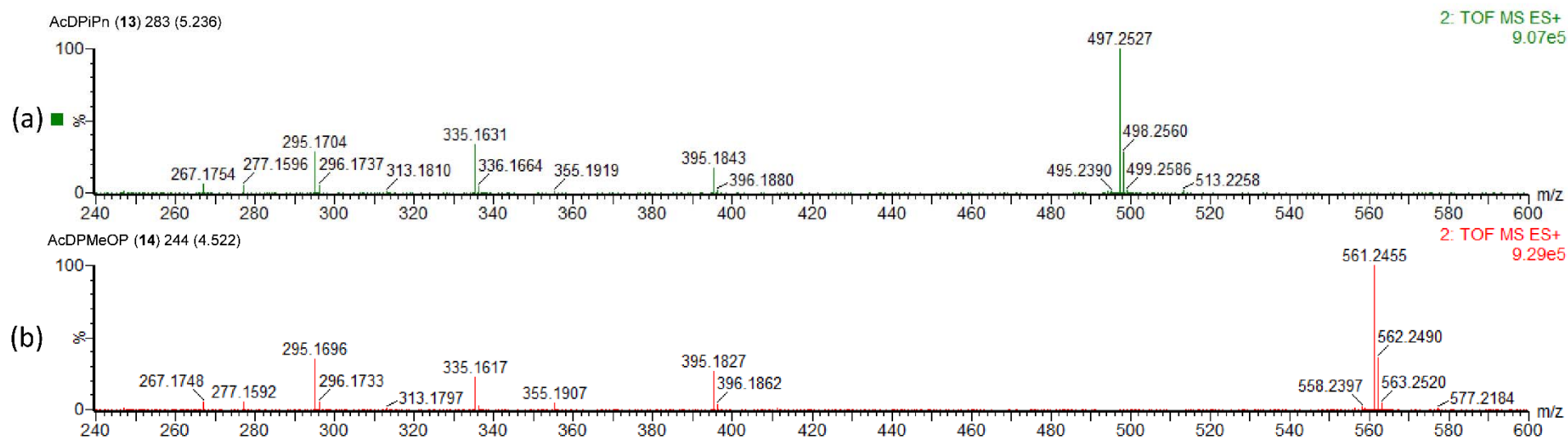
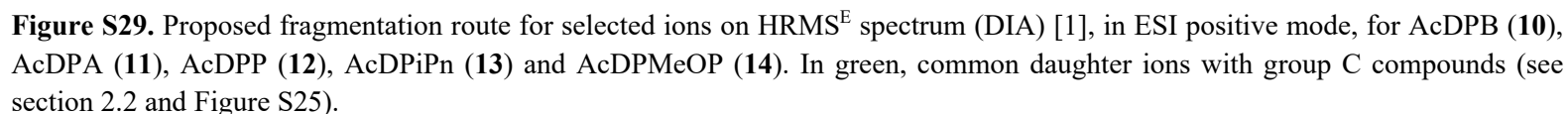


Figure S28. Comparison of HRMS^E spectra (DIA) [1] for (a) AcDPiPn (13) and (b) AcDPMeOP (14), m/z range 240-600 (m/z range 240-410 in Figure 7) (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 10-40 eV).

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 19
- 20
- 21
- 22
- 23
- 24
- 25
- 26
- 27
- 28



Supplementary Material

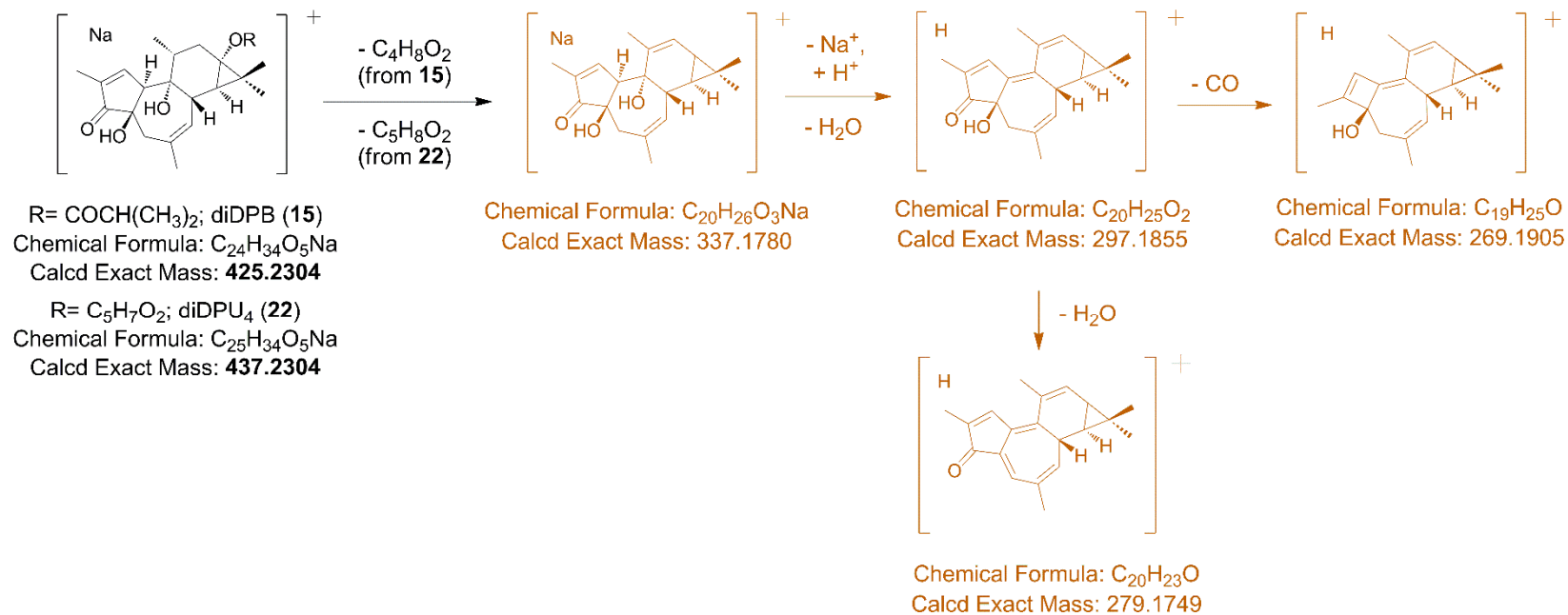


Figure S30. Proposed fragmentation route for selected ions on HRMS^E spectrum (DIA) [1], in ESI positive mode, for diDPB (15) and diDPU₄ (22).

Supplementary Material

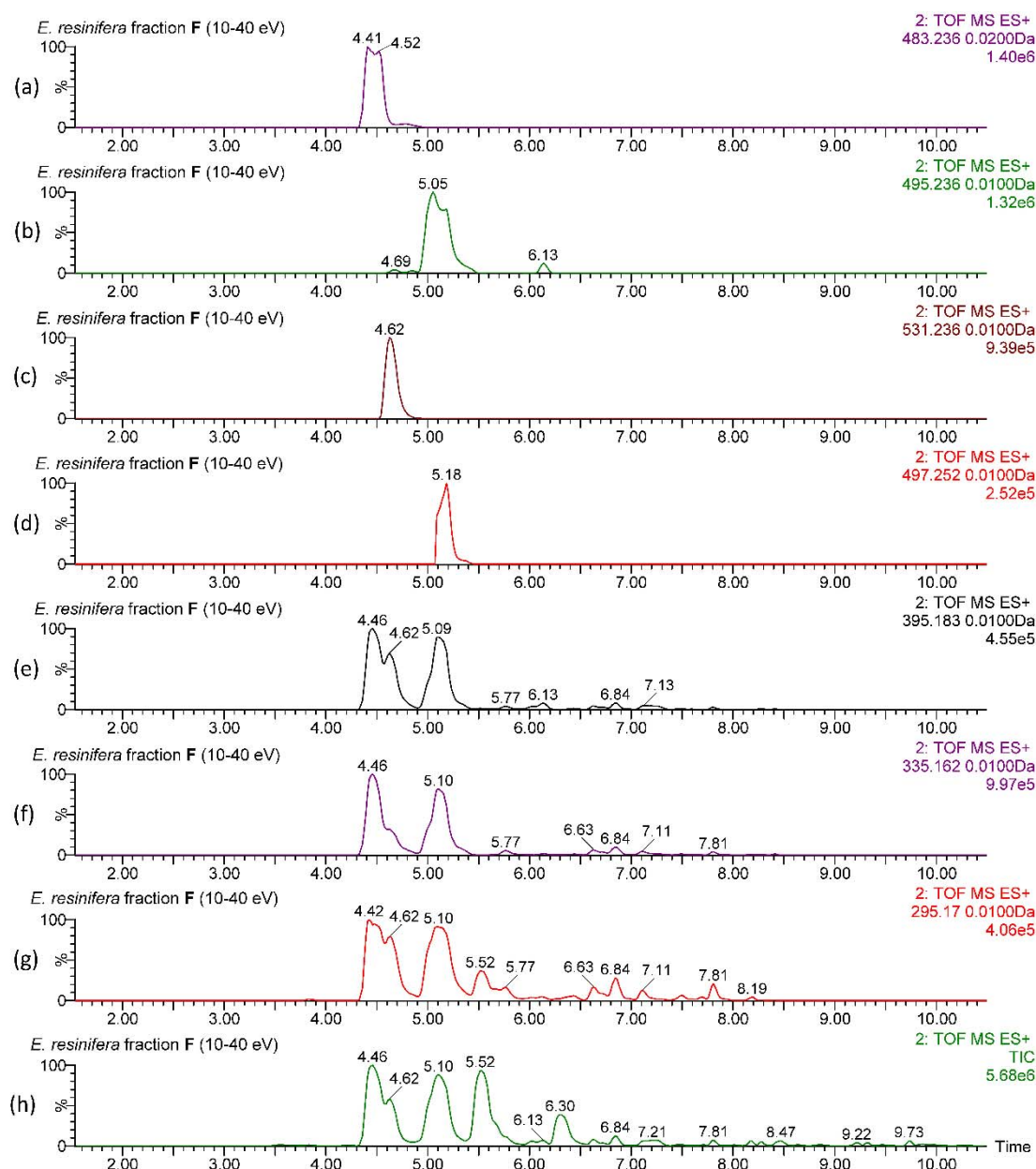


Figure S31. Total Ion Current (TIC) and eXtracted Ion Chromatograms (XICs), at selected m/z previously observed in high energy HRMS^E of 12-deoxyphorbol 20-acetate-13-acyl derivatives, obtained from UHPLC-HRMS^E experiments for chromatographic fraction F of *E. resinifera* (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 10-40 eV; high-energy function (2: TOF MS ES+)). XICs for 12-deoxyphorbol 20-acetate-13-acyl derivatives $[M+Na]^+$ molecular ions: m/z 483.2359 calculated mass for (a) C₂₆H₃₆O₇Na (AcDPB (10)); (b) m/z 495.2359 calculated mass for C₂₇H₃₆O₇Na (AcDPA (11)); (c) m/z 531.236, calculated mass for C₃₀H₃₆O₇Na (AcDPP (12)) and (d) m/z 497.2515, calculated mass for C₂₇H₃₈O₇Na (AcDPiPn (13)). XICs for selected featured ions of 12-deoxyphorbol 20-acetate-13-acyl derivatives HRMS^E spectra (see Scheme 4 and Figure S29) at: (e) m/z 395.1834; (f) m/z 335.1623; (g) m/z 295.1698. (h) UHPLC-HRMS^E chromatographic profile (TIC) of fraction F from *E. resinifera* extract.

Supplementary Material

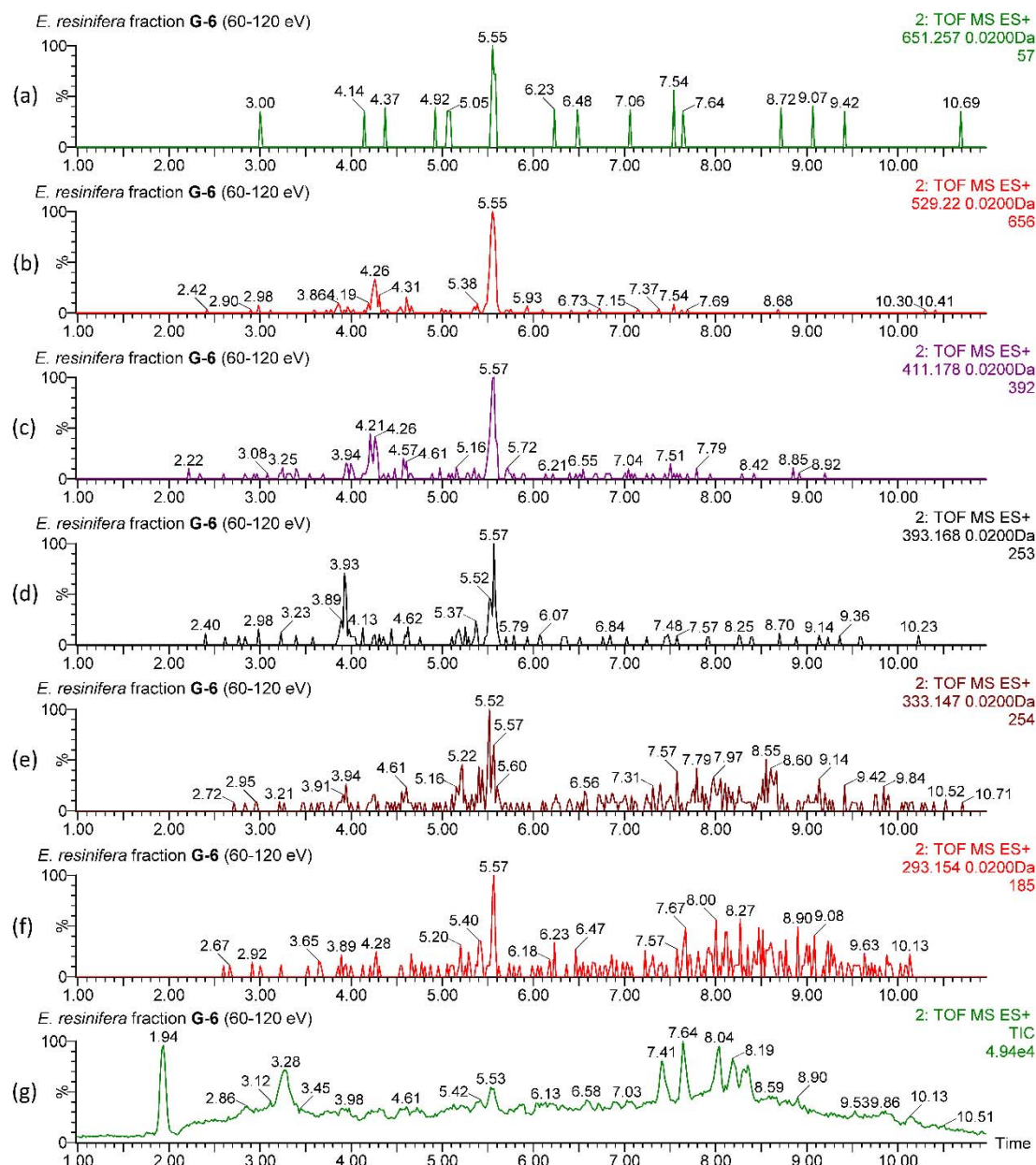


Figure S32. Total Ion Current (TIC) and eXtracted Ion Chromatograms (XICs), at selected m/z previously observed in high energy HRMS^E of 12-deoxy-16-hydroxyphorbol 20-acetate-13,16-diacyl derivatives, obtained from UHPLC-HRMS^E experiments for chromatographic fraction G-6 of *E. resinifera* (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 60-120 eV; high-energy function (2: TOF MS ES⁺)). XIC for 12-deoxy-16-hydroxyphorbol 20-acetate-16-benzoate-13-phenylacetate (AcDPPBz (6)) [M+Na]⁺ molecular ion: (a) m/z 651.2565, calculated mass for C₃₇H₄₀O₉Na. XICs for selected characteristic ions of 16-hydroxy-12-deoxyphorbol 20-acetate-13,16-diacyl derivatives HRMS^E spectra (see Scheme 2 and Figure S22) at (b) m/z 529.2202, (c) m/z 411.1784, (d) m/z 393.1678, (e) m/z 333.1467 and m/z (f) 293.1542. (g) TIC of UHPLC-HRMS^E chromatographic profile of fraction G-6 from *E. resinifera* extract.

Supplementary Material

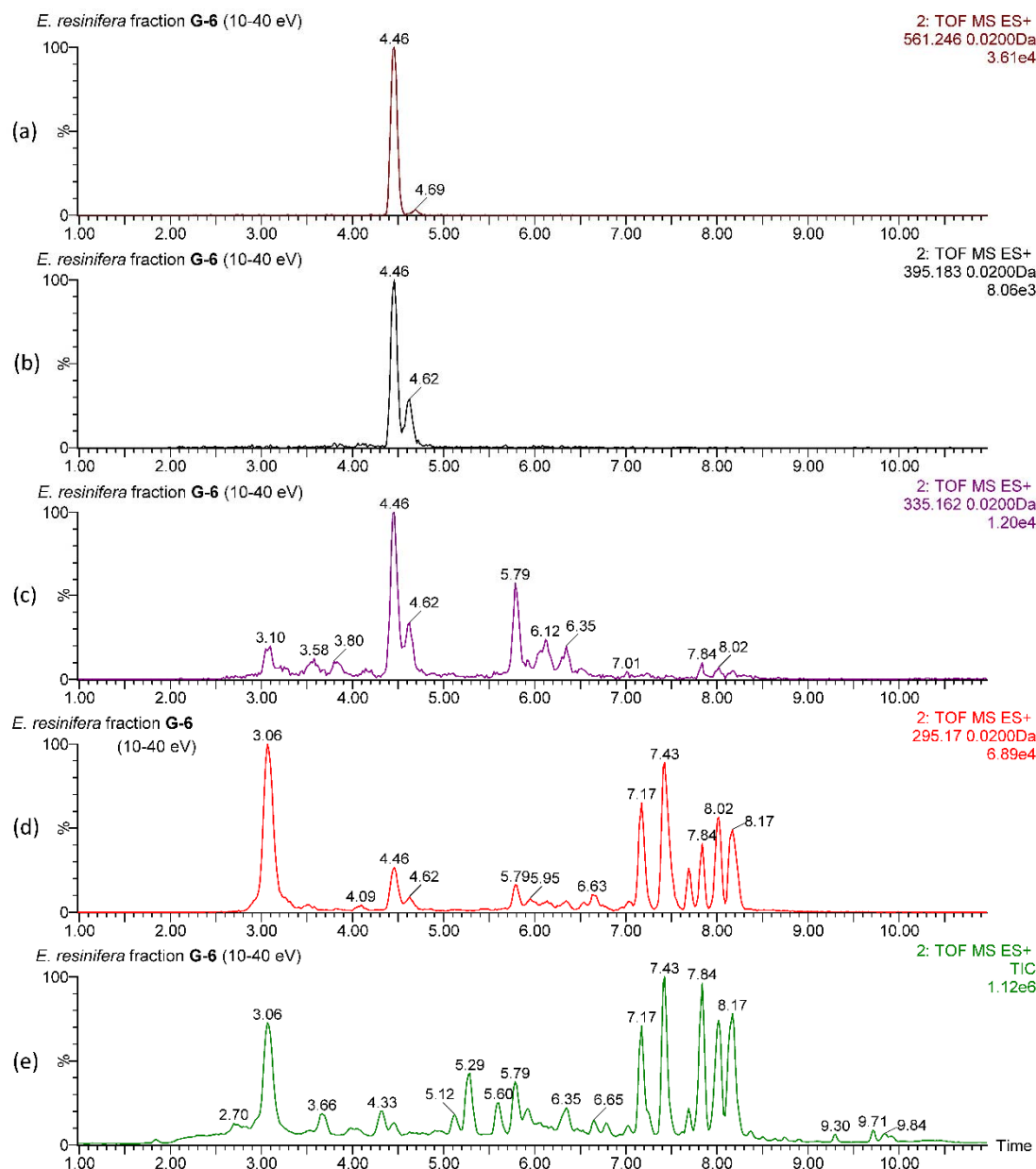


Figure S33. Total Ion Current (TIC) and eXtracted Ion Chromatograms (XICs), at selected m/z previously observed in high energy HRMS^E of 12-deoxyphorbol 20-acetate-13-acyl derivatives, obtained from UHPLC-HRMS^E experiments for chromatographic fraction G-6 of *E. resinifera* (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 10-40 eV; high-energy function (2: TOF MS ES+)). XIC for 12-deoxyphorbol 20-acetate-13-(*p*-methoxyphenyl)acetate (AcDPMOP (**14**)) $[M+Na]^+$ molecular ion: (a) m/z 561.2464 calculated mass for C₃₁H₃₈O₈Na. XICs for selected featured ions of 12-deoxyphorbol 20-acetate-13-acyl derivatives HRMS^E spectra (see Scheme 4 and Figure S29) at: (b) m/z 395.1834; (c) m/z 335.1623; (d) m/z 295.1698. (e) UHPLC-HRMS^E chromatographic profile (TIC) of fraction G-6 from *E. resinifera* extract.

Supplementary Material

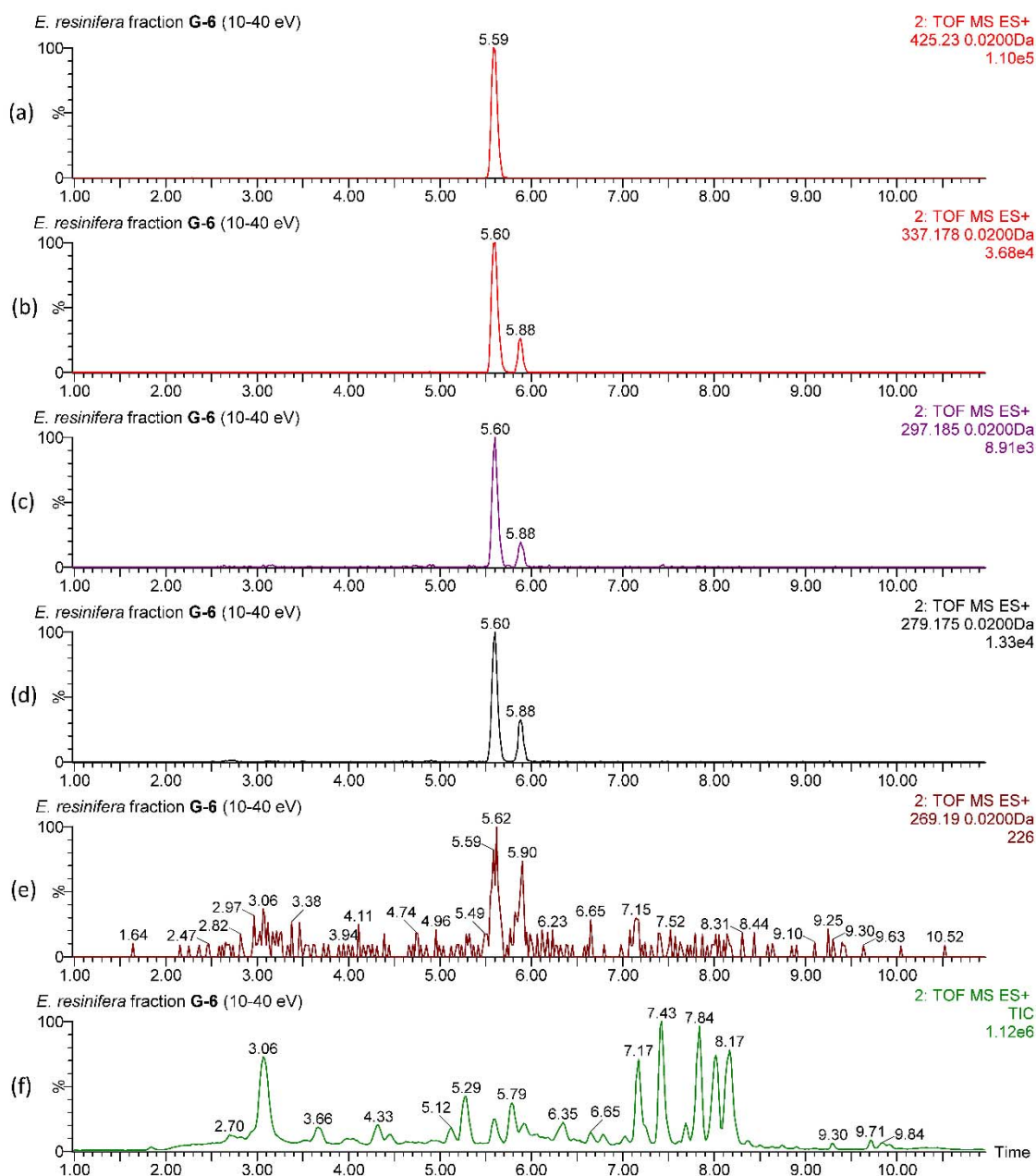


Figure S34. Total Ion Current (TIC) and eXtracted Ion Chromatograms (XICs), at selected m/z previously observed in high energy HRMS^E of 12,20-dideoxyphorbol 13-acyl derivatives, obtained from UHPLC-HRMS^E experiments for chromatographic fraction G-6 of *E. resinifera* (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 10-40 eV; high-energy function (2: TOF MS ES+)). XIC for 12,20-dideoxyphorbol 13-isobutyrate (diDPB (**15**)) $[M+Na]^+$ molecular ion: (a) m/z 425.2304 calculated mass for $C_{24}H_{34}O_5Na$. XICs for selected featured ions of 12,20-dideoxyphorbol 13-acyl derivatives HRMS^E spectra (see Scheme 5 and Figure S30) at: (b) m/z 337.1780; (c) m/z 297.1855; (d) m/z 279.1749 and (e) m/z 269.1905. (f) UHPLC-HRMS^E chromatographic profile (TIC) of fraction G-6 from *E. resinifera* extract.

Supplementary Material

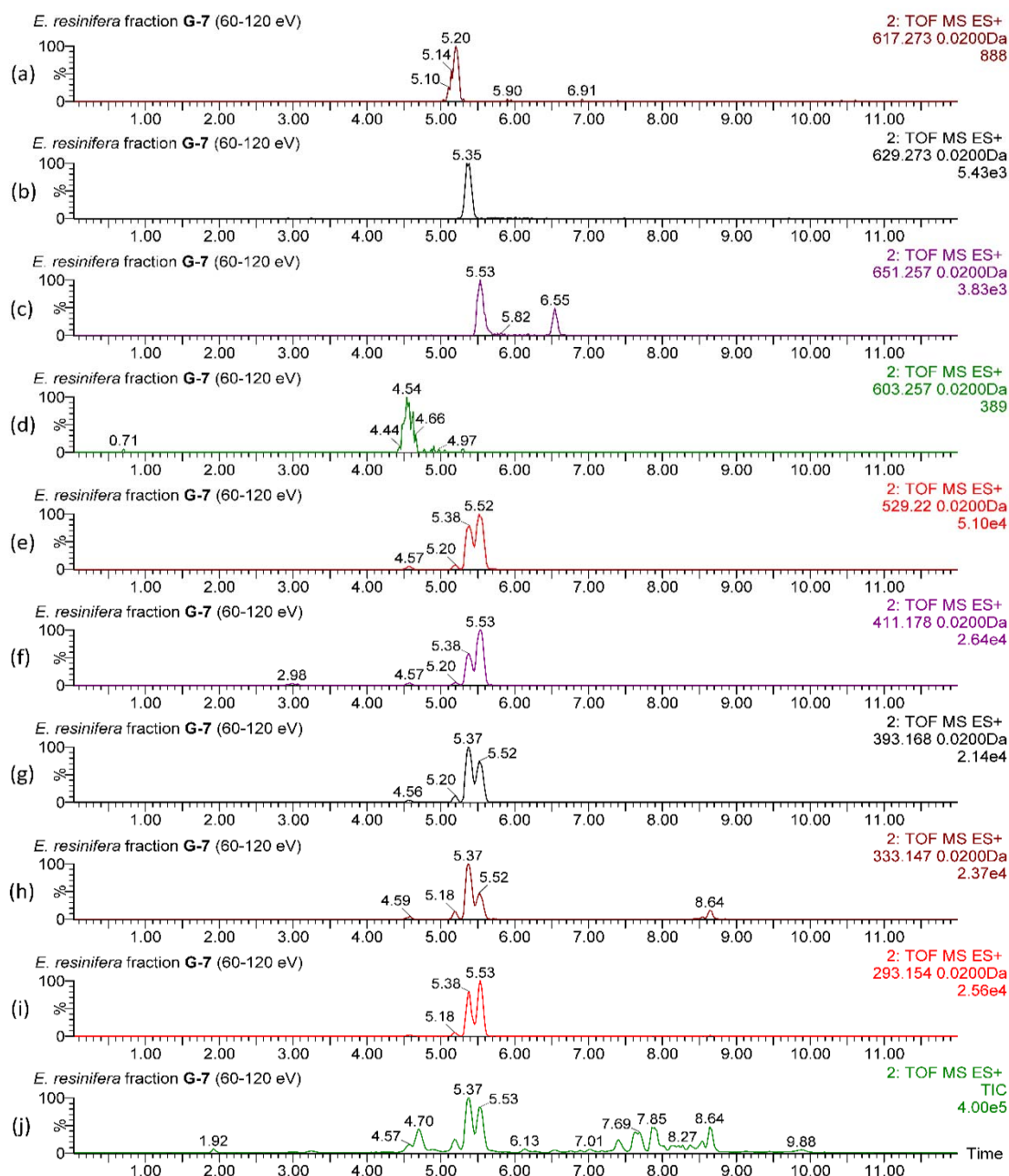


Figure S35. Total Ion Current (TIC) and eXtracted Ion Chromatograms (XICs), at selected m/z previously observed in high energy HRMS^E of 12-deoxy-16-hydroxyphorbol 20-acetate-13,16-diacyl derivatives, obtained from UHPLC-HRMS^E experiments for chromatographic fraction G-7 of *E. resinifera* (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 60-120 eV; high-energy function (2: TOF MS ES⁺)). XIC for 12-deoxy-16-hydroxyphorbol 20-acetate-13,16-diacyl derivatives $[M+Na]^+$ molecular ions: (a) m/z 617.2727, calculated mass for $C_{34}H_{42}O_9Na$ (AcDPPI (4)); (b) m/z 629.2727, calculated mass for $C_{35}H_{42}O_9Na$ (AcDPPT (5)); (c) m/z 651.2565, calculated mass for $C_{37}H_{40}O_9Na$ (AcDPPBz (6)); (d) m/z 603.2570, calculated mass for $C_{33}H_{40}O_9Na$ (AcDPPU₂ (20)). XICs for selected characteristic ions of 16-hydroxy-12-deoxyphorbol 20-acetate-13,16-diacyl derivatives HRMS^E spectra (see Scheme 2 and Figure S22) at (e) m/z 529.2202, (f) m/z 411.1784, (g) m/z 393.1678, (h) m/z 333.1467 and (i) m/z 293.1542. (j) TIC of UHPLC-HRMS^E chromatographic profile of fraction G-7 from *E. resinifera* extract.

Supplementary Material

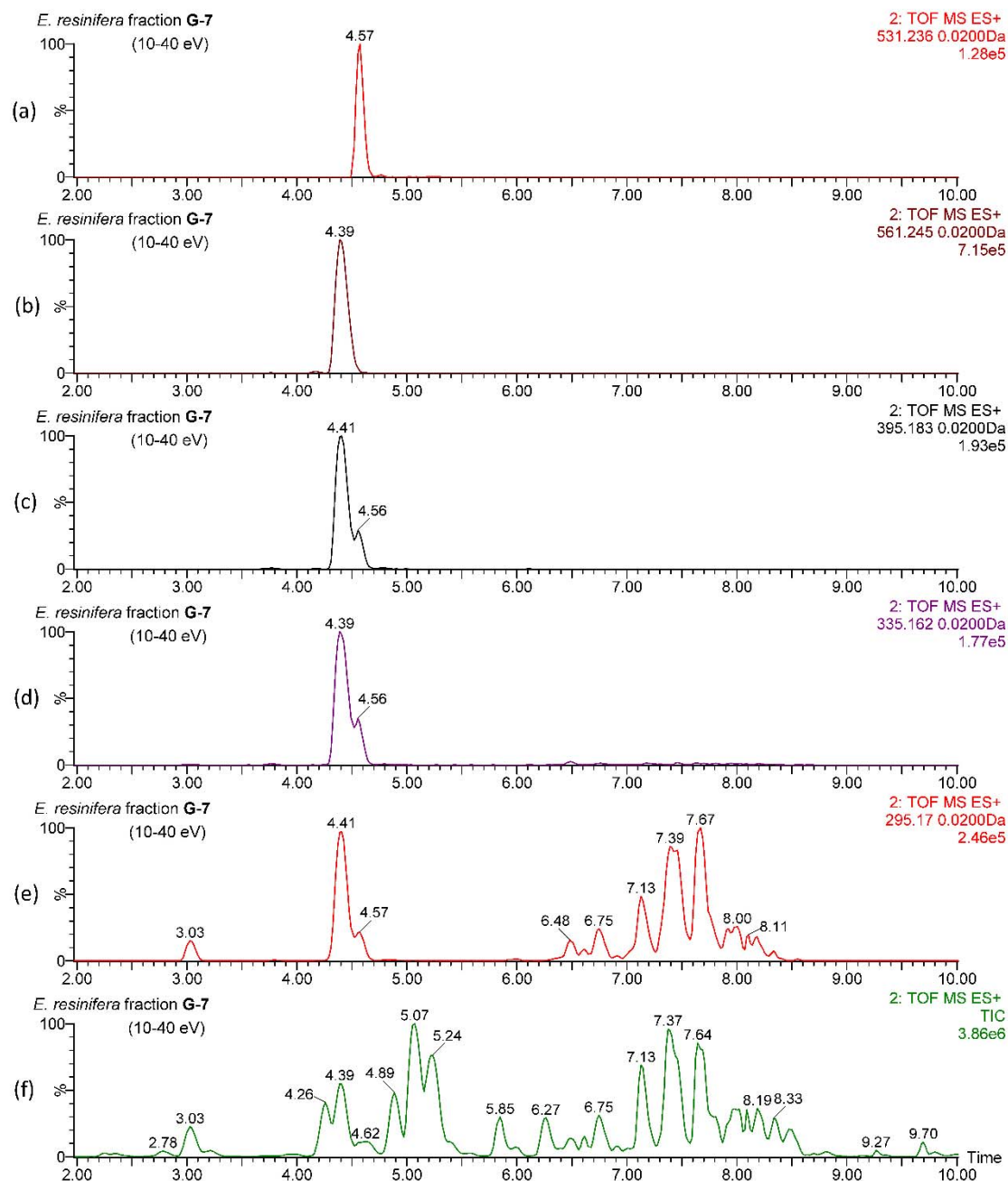


Figure S36. Total Ion Current (TIC) and eXtracted Ion Chromatograms (XICs), at selected m/z previously observed in high energy HRMS^E of 12-deoxyphorbol 20-acetate-13-acyl derivatives, obtained from UHPLC-HRMS^E experiments for chromatographic fraction G-7 of *E. resinifera* (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 10-40 eV; high-energy function (2: TOF MS ES+)). XICs for 12-deoxyphorbol 20-acetate-13-acyl derivatives $[M+Na]^+$ molecular ions: (a) m/z 531.236, calculated mass for $C_{30}H_{36}O_7Na$ (AcDPP (**12**)); (b) m/z 561.2464 calculated mass for $C_{31}H_{38}O_8Na$ (AcDPMOP (**14**)). XICs for selected featured ions of 12-deoxyphorbol 20-acetate-13-acyl derivatives HRMS^E spectra (see Scheme 4 and Figure S29) at: (c) m/z 395.1834; (d) m/z 335.1623; (e) m/z 295.1698. (f) UHPLC-HRMS^E chromatographic profile (TIC) of fraction G-7 from *E. resinifera* extract.

Supplementary Material

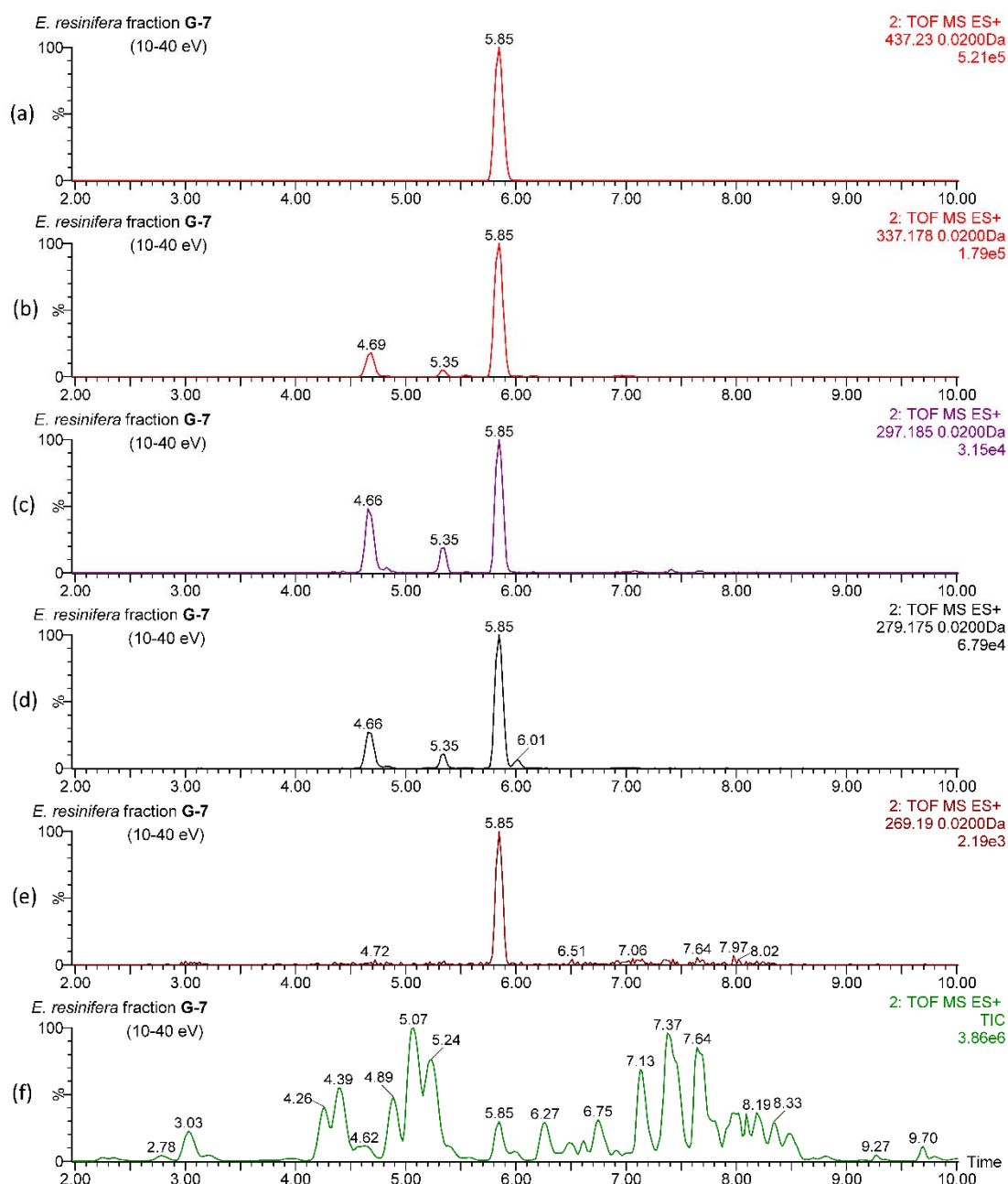


Figure S37. Total Ion Current (TIC) and eXtracted Ion Chromatograms (XICs), at selected m/z previously observed in high energy HRMS^E of 12,20-dideoxyphorbol 13-acyl derivatives, obtained from UHPLC-HRMS^E experiments for chromatographic fraction G-7 of *E. resinifera* (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 10-40 eV; high-energy function (2: TOF MS ES+)). XIC for 12,20-dideoxyphorbol 13-acyl derivatives $[M+Na]^+$ molecular ion: (a) m/z 437.2304 calculated mass for C₂₅H₃₄O₅Na (diDPU₄ (22)). XICs for selected featured ions of 12,20-dideoxyphorbol 13-acyl derivatives HRMS^E spectra (see Scheme 5 and Figure S30) at: (b) m/z 337.1780; (c) m/z 297.1855; (d) m/z 279.1749 and (e) m/z 269.1905. (f) UHPLC-HRMS^E chromatographic profile (TIC) of fraction G-7 from *E. resinifera* extract.

Supplementary Material

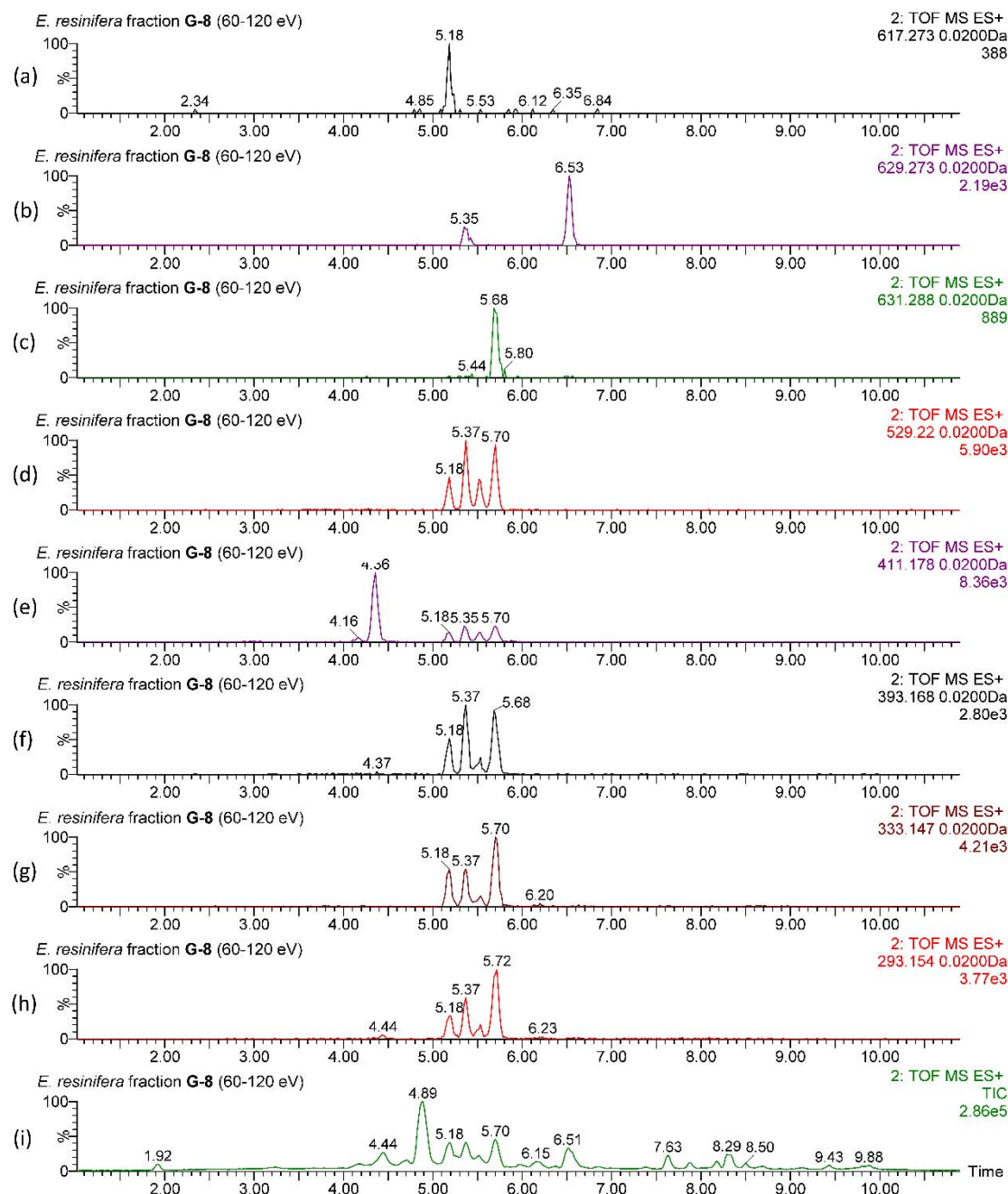


Figure S38. Total Ion Current (TIC) and eXtracted Ion Chromatograms (XICs), at selected m/z previously observed in high energy HRMS^E of 12-deoxy-16-hydroxyphorbol 20-acetate-13,16-diacyl derivatives, obtained from UHPLC-HRMS^E experiments for chromatographic fraction G-8 of *E. resinifera* (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 60-120 eV; high-energy function (2: TOF MS ES⁺)). XIC for 12-deoxy-16-hydroxyphorbol 20-acetate-13,16-diacyl derivatives $[M+Na]^+$ molecular ions: (a) m/z 617.2727, calculated mass for C₃₄H₄₂O₉Na (AcDPPI (4)); (b) m/z 629.2727, calculated mass for C₃₅H₄₂O₉Na (AcDPPT (5)); (c) m/z 631.2883, calculated mass for C₃₅H₄₄O₉Na (AcDPPU₃ (21)). XICs for selected characteristic ions of 16-hydroxy-12-deoxyphorbol 20-acetate-13,16-diacyl derivatives HRMS^E spectra (see Scheme 2 and Figure S22) at (d) m/z 529.2202, (e) m/z 411.1784, (f) m/z 393.1678, (g) m/z 333.1467 and (h) m/z 293.1542. (i) TIC of UHPLC-HRMS^E chromatographic profile of fraction G-8 from *E. resinifera* extract.

Supplementary Material

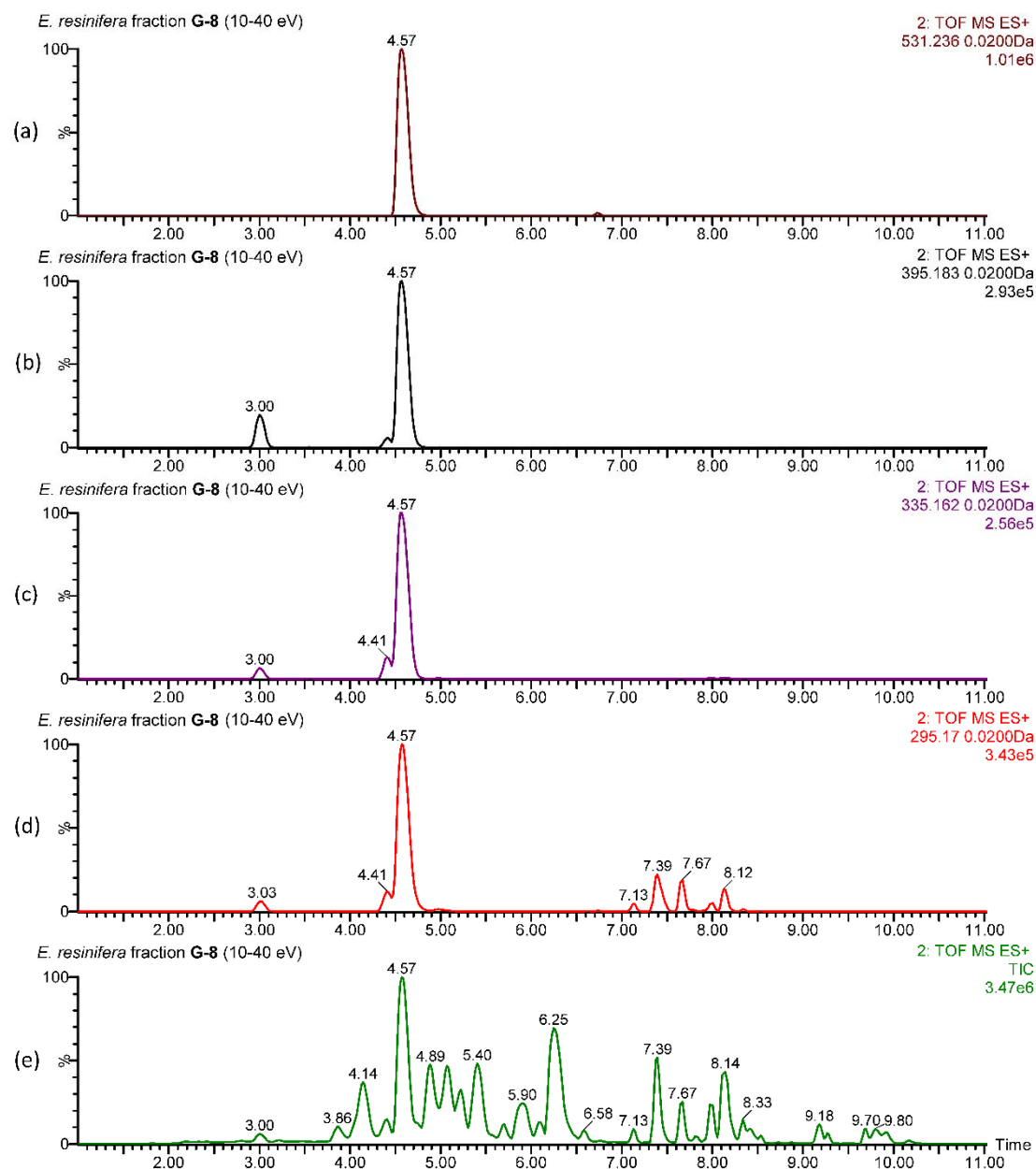


Figure S39. Total Ion Current (TIC) and eXtracted Ion Chromatograms (XICs), at selected m/z previously observed in high energy HRMS^E of 12-deoxyphorbol 20-acetate-13-acyl derivatives, obtained from UHPLC-HRMS^E experiments for chromatographic fraction G-8 of *E. resinifera* (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 10-40 eV; high-energy function (2: TOF MS ES+)). XIC for 12-deoxyphorbol 20-acetate-13-phenylacetate (AcDPP (**12**)) $[M+Na]^+$ molecular ion: (a) m/z 531.2359 calculated mass for $C_{30}H_{36}O_7Na$. XICs for selected featured ions of 12-deoxyphorbol 20-acetate-13-acyl derivatives HRMS^E spectra (see Scheme 4 and Figure S29) at: (b) m/z 395.1834; (c) m/z 335.1623; (d) m/z 295.1698. (e) UHPLC-HRMS^E chromatographic profile (TIC) of fraction G-8 from *E. resinifera* extract.

Supplementary Material

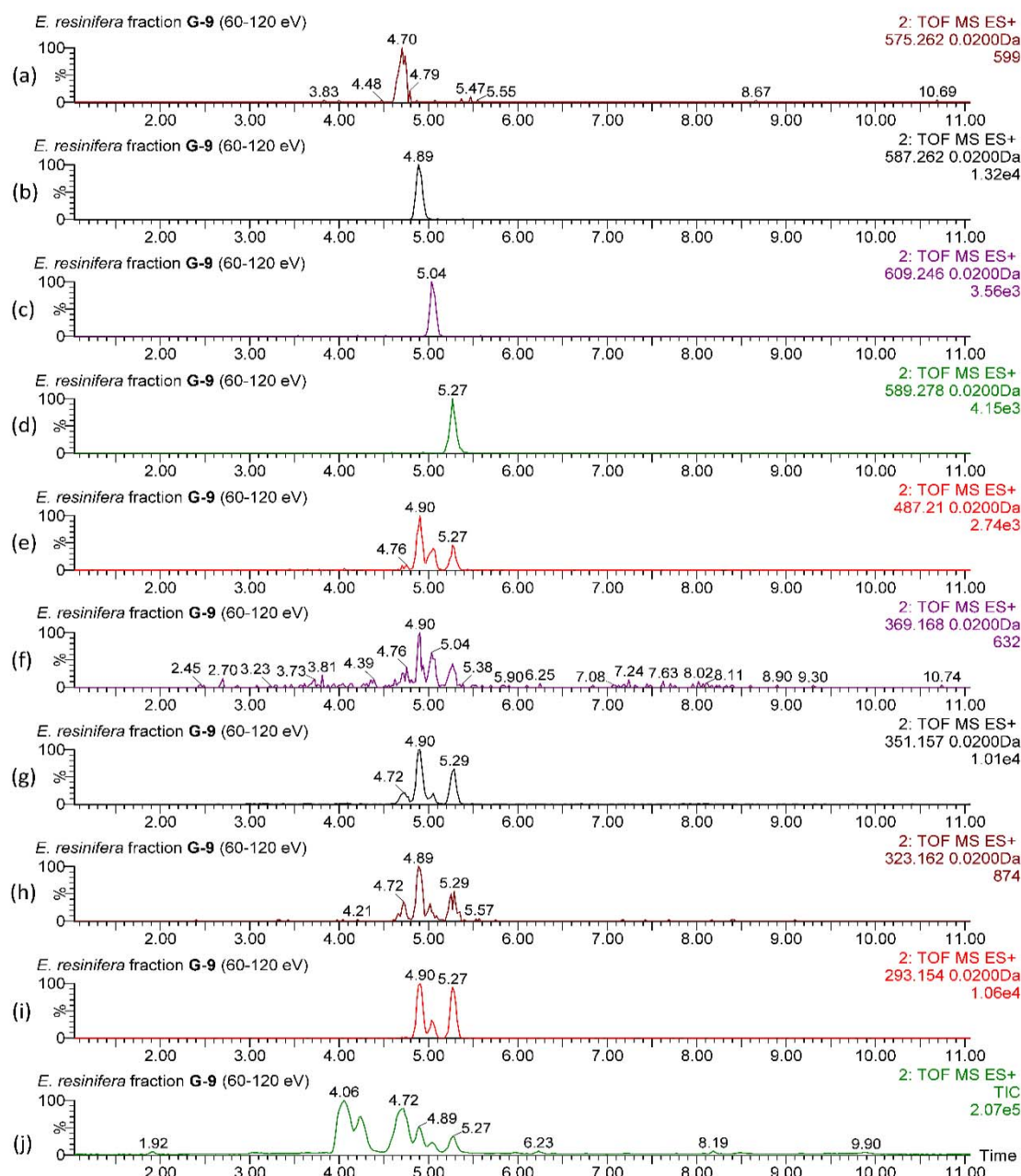


Figure S40. Total Ion Current (TIC) and eXtracted Ion Chromatograms (XICs), at selected m/z previously observed in high energy HRMS^E of 12-deoxy-16-hydroxyphorbol 13,16-diacyl derivatives, obtained from UHPLC-HRMS^E experiments for chromatographic fraction G-9 of *E. resinifera* (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 60-120 eV; high-energy function (2: TOF MS ES⁺)). XIC for 12-deoxy-16-hydroxyphorbol 13,16-diacyl derivatives $[M+Na]^+$ molecular ions: (a) m/z 575.2621, calculated mass for C₃₂H₄₀O₈Na (DPPI (1)); (b) m/z 587.2621, calculated mass for C₃₃H₄₀O₈Na (DPPT (2)); (c) m/z 609.2464, calculated mass for C₃₅H₃₈O₈Na (DPPBz (3)); (d) m/z 589.2777, calculated mass for C₃₃H₄₂O₈Na (DPPU₁ (19)). XICs for selected characteristic ions of 12-deoxy-16-hydroxyphorbol 13,16-diacyl derivatives HRMS^E spectra (see Scheme 1 and Figure S20) at (e) m/z 487.2097, (f) m/z 369.1678, (g) m/z 351.1572, (h) m/z 323.1623 and (i) m/z 293.1542. (j) TIC of UHPLC-HRMS^E chromatographic profile of fraction G-9 from *E. resinifera* extract.

Supplementary Material

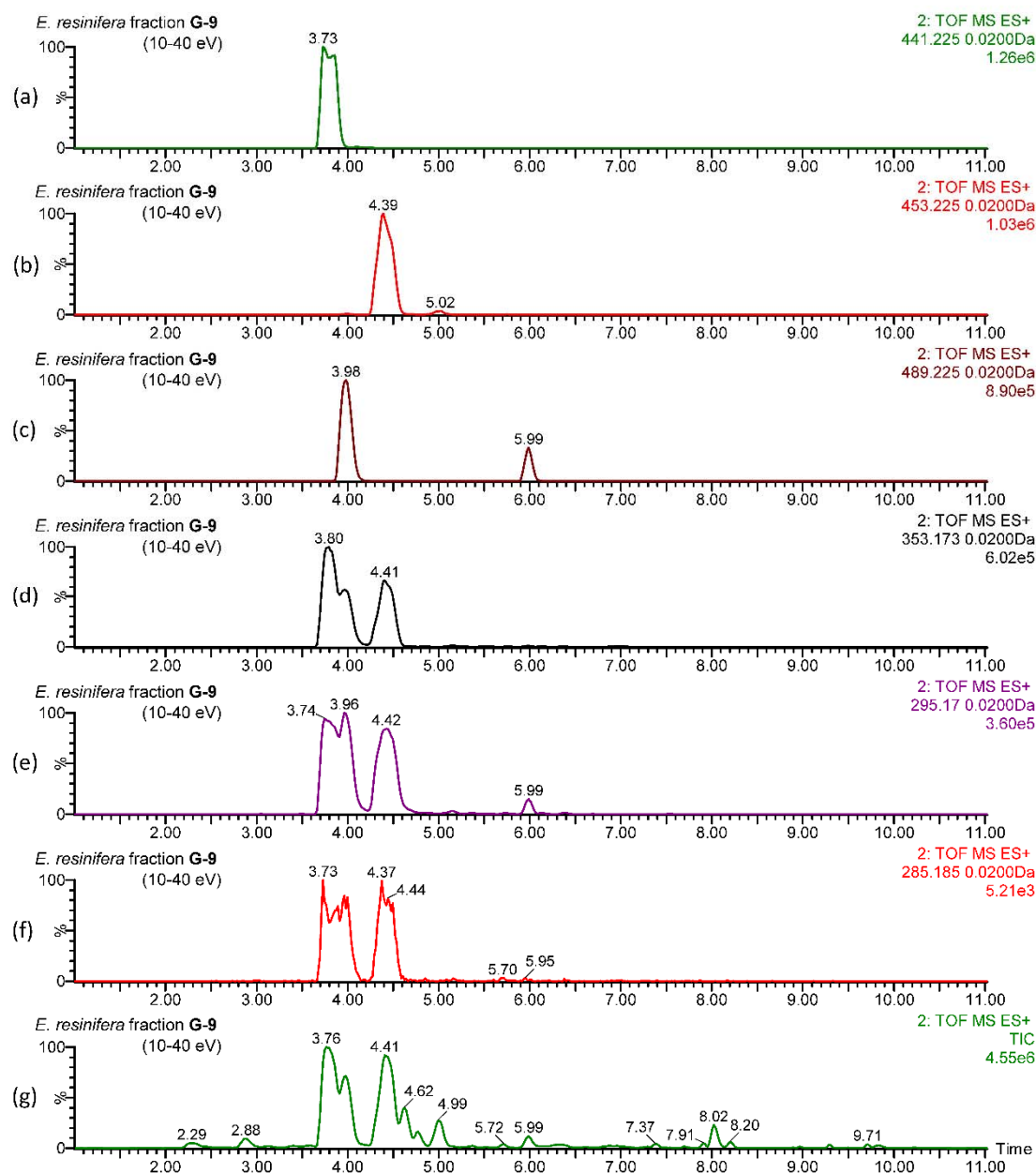


Figure S41. Total Ion Current (TIC) and eXtracted Ion Chromatograms (XICs), at selected m/z previously observed in high energy HRMS^E of 12-deoxyphorbol 13-acyl derivatives, obtained from UHPLC-HRMS^E experiments for chromatographic fraction G-9 of *E. resinifera* (data acquired in ESI positive mode with a ramp trap collision energy of the high-energy function set at 10-40 eV; high-energy function (2: TOF MS ES+)). XICs for 12-deoxyphorbol 13-acyl derivatives $[M+Na]^+$ molecular ions: (a) m/z 441.2253 calculated mass for C₂₄H₃₄O₆Na (DPB (7)); (b) m/z 453.2253 calculated mass for C₂₅H₃₄O₆Na (DPA (8)) and (c) m/z 489.2253, calculated mass for C₂₈H₃₄O₆Na (DPP (9)). XICs for selected featured ions of 12-deoxyphorbol 13-acyl derivatives HRMS^E spectra (see Scheme 3 and Figure S25) at: (d) m/z 395.1834; (e) m/z 335.1623; (f) m/z 295.1698. (g) UHPLC-HRMS^E chromatographic profile (TIC) of fraction from *E. resinifera* extract.

Supplementary Material

4- UHPLC-HRMS^E data. Tables.

Table S1. Selected ions of high energy HRMS^E experiment (DIA) [1], of DPPI (1) and DPPT (2) (data acquired in ESI positive ionization with a ramp trap collision energy of the high-energy function set at 60-120 eV).

Compound	Observed m/z (%)	Calculated m/z	Δm (mDa)	Elemental composition	Annotation
DPPI (1)	575.2619 (18)	575.2621	-0.2	C ₃₂ H ₄₀ O ₈ Na	[M+Na] ⁺
	487.2097 (13)	487.2097	0.0	C ₂₈ H ₃₂ O ₆ Na	[M-C ₄ H ₈ O ₂ +Na] ⁺
	439.2099 (44)	439.2097	+0.2	C ₂₄ H ₃₂ O ₆ Na	[M-C ₈ H ₈ O ₂ +Na] ⁺
	369.1688 (3)	369.1678	+1.0	C ₂₀ H ₂₆ O ₅ Na	[M-C ₈ H ₈ O ₂ -C ₄ H ₆ O+Na] ⁺
	351.1575 (32)	351.1572	+0.3	C ₂₀ H ₂₄ O ₄ Na	[M-C ₈ H ₈ O ₂ -C ₄ H ₆ O-H ₂ O+Na] ⁺
	323.1627 (8)	323.1623	+0.4	C ₁₉ H ₂₄ O ₃ Na	[M-C ₈ H ₈ O ₂ -C ₄ H ₆ O-H ₂ O-CO+Na] ⁺
	311.1651 (12)	311.1647	+0.4	C ₂₀ H ₂₃ O ₃	[M-C ₈ H ₈ O ₂ -C ₄ H ₆ O-2H ₂ O+H] ⁺
	293.1542 (100)	293.1542	0.0	C ₂₀ H ₂₁ O ₂	[M-C ₈ H ₈ O ₂ -C ₄ H ₆ O-3H ₂ O+H] ⁺
	275.1434 (23)	275.1436	-0.2	C ₂₀ H ₁₉ O	[M-C ₈ H ₈ O ₂ -C ₄ H ₆ O-4H ₂ O+H] ⁺
	265.1588 (25)	265.1592	-0.4	C ₁₉ H ₂₁ O	[M-C ₈ H ₈ O ₂ -C ₄ H ₆ O-3H ₂ O-CO+H] ⁺
	247.1484 (23)	247.1487	-0.3	C ₁₉ H ₁₉	[M-C ₈ H ₈ O ₂ -C ₄ H ₆ O-4H ₂ O-CO+H] ⁺
DPPT (2)	587.2639 (53)	587.2621	+1.8	C ₃₃ H ₄₀ O ₈ Na	[M+Na] ⁺
	487.2113 (9)	487.2097	+1.6	C ₂₈ H ₃₂ O ₆ Na	[M-C ₅ H ₈ O ₂ +Na] ⁺
	451.2114 (26)	451.2097	+1.7	C ₂₅ H ₃₂ O ₆ Na	[M-C ₈ H ₈ O ₂ +Na] ⁺
	369.1700 (1)	369.1678	+2.2	C ₂₀ H ₂₆ O ₅ Na	[M-C ₈ H ₈ O ₂ -C ₅ H ₆ O+Na] ⁺
	351.1584 (25)	351.1572	+1.2	C ₂₀ H ₂₄ O ₄ Na	[M-C ₈ H ₈ O ₂ -C ₅ H ₆ O-H ₂ O+Na] ⁺
	323.1636 (4)	323.1623	+1.3	C ₁₉ H ₂₄ O ₃ Na	[M-C ₈ H ₈ O ₂ -C ₅ H ₆ O-H ₂ O-CO+Na] ⁺
	311.1654 (8)	311.1647	+0.7	C ₂₀ H ₂₃ O ₃	[M-C ₈ H ₈ O ₂ -C ₅ H ₆ O-2H ₂ O+H] ⁺
	293.1551 (100)	293.1542	+0.9	C ₂₀ H ₂₁ O ₂	[M-C ₈ H ₈ O ₂ -C ₅ H ₆ O-3H ₂ O+H] ⁺
	275.1442 (21)	275.1436	+0.6	C ₂₀ H ₁₉ O	[M-C ₈ H ₈ O ₂ -C ₅ H ₆ O-4H ₂ O+H] ⁺
	265.1597 (19)	265.1592	+0.5	C ₁₉ H ₂₁ O	[M-C ₈ H ₈ O ₂ -C ₅ H ₆ O-3H ₂ O-CO+H] ⁺
	247.1493 (20)	247.1487	+0.6	C ₁₉ H ₁₉	[M-C ₈ H ₈ O ₂ -C ₅ H ₆ O-4H ₂ O-CO+H] ⁺

Supplementary Material

Table S2. Selected ions of high energy HRMS^E experiment (DIA) [1], of DPB (7), DPA (8) and DPP (9) (data acquired in ESI positive ionization with a ramp trap collision energy of the high-energy function set at 10-40 eV).

Compound	Observed m/z (%)	Calculated m/z	Δm (mDa)	Elemental composition	Annotation
DPB (7)	441.2264 (100)	441.2253	+1.1	C ₂₄ H ₃₄ O ₆ Na	[M+Na] ⁺
	353.1737 (47)	353.1729	0.8	C ₂₀ H ₂₆ O ₄ Na	[M-C ₄ H ₈ O ₂ +Na] ⁺
	313.1807 (4)	313.1804	+0.3	C ₂₀ H ₂₅ O ₃	[M-C ₄ H ₈ O ₂ -H ₂ O+H] ⁺
	295.1701 (25)	295.1698	+0.3	C ₂₀ H ₂₃ O ₂	[M-C ₄ H ₈ O ₂ -2H ₂ O+H] ⁺
	285.1856 (0.3)	285.1855	+0.1	C ₁₉ H ₂₅ O ₂	[M-C ₄ H ₈ O ₂ -H ₂ O-CO+H] ⁺
	277.1594 (7)	277.1592	+0.2	C ₂₀ H ₂₁ O	[M-C ₄ H ₈ O ₂ -3H ₂ O+H] ⁺
	267.1750 (7)	267.1749	+0.1	C ₁₉ H ₂₃ O	[M-C ₄ H ₈ O ₂ -2H ₂ O-CO+H] ⁺
	249.1644 (1)	249.1643	+0.1	C ₁₉ H ₂₁	[M-C ₄ H ₈ O ₂ -3H ₂ O-CO+H] ⁺
DPA (8)	453.2273 (100)	453.2253	+2.0	C ₂₅ H ₃₄ O ₆ Na	[M+Na] ⁺
	353.1744 (39)	353.1729	+1.5	C ₂₀ H ₂₆ O ₄ Na	[M-C ₅ H ₈ O ₂ +Na] ⁺
	313.1816 (6)	313.1804	+1.2	C ₂₀ H ₂₅ O ₃	[M-C ₅ H ₈ O ₂ -H ₂ O+H] ⁺
	295.1708 (24)	295.1698	+1.0	C ₂₀ H ₂₃ O ₂	[M-C ₅ H ₈ O ₂ -2H ₂ O+H] ⁺
	285.1857 (0.4)	285.1855	+0.2	C ₁₉ H ₂₅ O ₂	[M-C ₅ H ₈ O ₂ -H ₂ O-CO+H] ⁺
	277.1602 (5)	277.1592	+1.0	C ₂₀ H ₂₁ O	[M-C ₅ H ₈ O ₂ -3H ₂ O+H] ⁺
	267.1757 (6)	267.1749	+0.8	C ₁₉ H ₂₃ O	[M-C ₅ H ₈ O ₂ -2H ₂ O-CO+H] ⁺
	249.1646 (1)	249.1643	+0.3	C ₁₉ H ₂₁	[M-C ₅ H ₈ O ₂ -3H ₂ O-CO+H] ⁺
DPP (9)	489.2280 (100)	489.2253	+2.7	C ₂₈ H ₃₄ O ₆ Na	[M+Na] ⁺
	353.1745 (34)	353.1729	+1.6	C ₂₀ H ₂₆ O ₄ Na	[M-C ₈ H ₈ O ₂ +Na] ⁺
	313.1818 (22)	313.1804	+1.4	C ₂₀ H ₂₅ O ₃	[M-C ₈ H ₈ O ₂ -H ₂ O+H] ⁺
	295.1709 (37)	295.1698	+1.1	C ₂₀ H ₂₃ O ₂	[M-C ₈ H ₈ O ₂ -2H ₂ O+H] ⁺
	285.1858 (0.5)	285.1855	+0.3	C ₁₉ H ₂₅ O ₂	[M-C ₈ H ₈ O ₂ -H ₂ O-CO+H] ⁺
	277.1599 (4)	277.1592	+0.7	C ₂₀ H ₂₁ O	[M-C ₈ H ₈ O ₂ -3H ₂ O+H] ⁺
	267.1756 (6)	267.1749	+0.7	C ₁₉ H ₂₃ O	[M-C ₈ H ₈ O ₂ -2H ₂ O-CO+H] ⁺
	249.1657 (0.3)	249.1643	+1.4	C ₁₉ H ₂₁	[M-C ₈ H ₈ O ₂ -3H ₂ O-CO+H] ⁺

Supplementary Material

Table S3. Selected ions of high energy HRMS^E experiment (DIA) [1], of AcDPB (**10**), AcDPA (**11**) and AcDPP (**12**) (data acquired in ESI positive ionization with a ramp trap collision energy of the high-energy function set at 10-40 eV).

Compound	Observed m/z (%)	Calculated m/z	Δm (mDa)	Elemental composition	Annotation
AcDPB (10)	483.2366 (100)	483.2359	+0.7	C ₂₆ H ₃₆ O ₇ Na	[M+Na] ⁺
	395.1841 (29)	395.1834	+0.7	C ₂₂ H ₂₈ O ₅ Na	[M-C ₄ H ₈ O ₂ +Na] ⁺
	355.1908 (0.1)	355.1909	-0.1	C ₂₂ H ₂₇ O ₄	[M-C ₄ H ₈ O ₂ -H ₂ O+H] ⁺
	335.1620 (62)	335.1623	-0.3	C ₂₀ H ₂₄ O ₃ Na	[M-C ₄ H ₈ O ₂ -AcOH+Na] ⁺
	313.1810 (1)	313.1804	+0.6	C ₂₀ H ₂₅ O ₃	[M-C ₄ H ₈ O ₂ -H ₂ O-C ₃ H ₂ O+H] ⁺
	295.1700 (28)	295.1698	+0.2	C ₂₀ H ₂₃ O ₂	[M-C ₄ H ₈ O ₂ -AcOH-H ₂ O+H] ⁺
	277.1594 (9)	277.1592	+0.2	C ₂₀ H ₂₁ O	[M-C ₄ H ₈ O ₂ -AcOH-2H ₂ O+H] ⁺
	267.1750 (8)	267.1749	+0.1	C ₁₉ H ₂₃ O	[M-C ₄ H ₈ O ₂ -AcOH-H ₂ O-CO+H] ⁺
	249.1646 (1)	249.1643	+0.3	C ₁₉ H ₂₁	[M-C ₄ H ₈ O ₂ -AcOH-2H ₂ O-CO+H] ⁺
AcDPA (11)	495.2363 (100)	495.2359	+0.4	C ₂₇ H ₃₆ O ₇ Na	[M+Na] ⁺
	395.1839 (28)	395.1834	+0.5	C ₂₂ H ₂₈ O ₅ Na	[M-C ₅ H ₈ O ₂ +Na] ⁺
	355.1911 (0.2)	355.1909	+0.2	C ₂₂ H ₂₇ O ₄	[M-C ₅ H ₈ O ₂ -H ₂ O+H] ⁺
	335.1627 (51)	335.1623	+0.4	C ₂₀ H ₂₄ O ₃ Na	[M-C ₅ H ₈ O ₂ -AcOH+Na] ⁺
	313.1803 (1)	313.1804	-0.1	C ₂₀ H ₂₅ O ₃	[M-C ₅ H ₈ O ₂ -H ₂ O-C ₃ H ₂ O+H] ⁺
	295.1699 (29)	295.1698	+0.1	C ₂₀ H ₂₃ O ₂	[M-C ₅ H ₈ O ₂ -AcOH-H ₂ O+H] ⁺
	277.1592 (8)	277.1592	+0.0	C ₂₀ H ₂₁ O	[M-C ₅ H ₈ O ₂ -AcOH-2H ₂ O+H] ⁺
	267.1749 (8)	267.1749	+0.0	C ₁₉ H ₂₃ O	[M-C ₅ H ₈ O ₂ -AcOH-H ₂ O-CO+H] ⁺
	249.1646 (1)	249.1643	+0.3	C ₁₉ H ₂₁	[M-C ₅ H ₈ O ₂ -AcOH-2H ₂ O-CO+H] ⁺
AcDPP (12)	531.2363 (100)	531.2359	+0.4	C ₃₀ H ₃₆ O ₇ Na	[M+Na] ⁺
	395.1840 (29)	395.1834	+0.6	C ₂₂ H ₂₈ O ₅ Na	[M-C ₈ H ₈ O ₂ +Na] ⁺
	355.1912 (0.6)	355.1909	+0.3	C ₂₂ H ₂₇ O ₄	[M-C ₈ H ₈ O ₂ -H ₂ O+H] ⁺
	335.1627 (25)	335.1623	+0.4	C ₂₀ H ₂₄ O ₃ Na	[M-C ₈ H ₈ O ₂ -AcOH+Na] ⁺
	313.1809 (1)	313.1804	+0.5	C ₂₀ H ₂₅ O ₃	[M-C ₈ H ₈ O ₂ -H ₂ O-C ₃ H ₂ O+H] ⁺
	295.1699 (29)	295.1698	+0.1	C ₂₀ H ₂₃ O ₂	[M-C ₈ H ₈ O ₂ -AcOH-H ₂ O+H] ⁺
	277.1593 (7)	277.1592	+0.1	C ₂₀ H ₂₁ O	[M-C ₈ H ₈ O ₂ -AcOH-2H ₂ O+H] ⁺
	267.1750 (6)	267.1749	+0.1	C ₁₉ H ₂₃ O	[M-C ₈ H ₈ O ₂ -AcOH-H ₂ O-CO+H] ⁺
	249.1639 (1)	249.1643	-0.4	C ₁₉ H ₂₁	[M-C ₈ H ₈ O ₂ -AcOH-2H ₂ O-CO+H] ⁺

Supplementary Material

References

1. Plumb, R.S.; Johnson, K.A.; Rainville, P.; Smith, B.W.; Wilson, I.D.; Castro-Perez, J.M.; Nicholson, J.K. UPLC/MSE; a new approach for generating molecular fragment information for biomarker structure elucidation. *Rapid Commun. Mass Spectrom.* **2006**, *20*, 1989–1994, doi:<https://doi.org/10.1002/rcm.2550>.