

Supplementary Information

Discovery of structurally diverse sesquiterpenoids from *Streptomyces fulvorobeus* isolated from *Elephas maximus* feces and their antifungal activities

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Table S1 ¹H NMR (600 MHz) and ¹³C NMR (150 MHz) data for compound **26** in pyridine-*d*₅

no.	δ_C , type	δ_H (J in Hz)	HMBC	NOESY
1	25.4, CH	1.44, m		H-7
2	27.6, CH ₂	2.25, m	1.80, m	
3	38.9, CH ₂	1.81, m	1.37, m	
4	80.3, C			
5	38.1, CH	1.77, m	C-1, C-3, C-4, C-6	H-7
6	24.8, CH	0.55, dt (10.2, 3.3)	C-2, C-4	H-15
7	53.7, CH	1.08, ddd (10.2, 8.3, 3.7)	C-6, C-9, C-11, C-12	H-1, H-5
8	29.4, CH ₂	2.30, m	1.90, m	
9	41.0, CH ₂	2.18, m	1.75, m	C-8, C-10
10	68.7, CH	4.09, m		
11	74.4, C			
12	27.9, CH ₃	1.48, s	C-7, C-11, C-13	
13	31.6, CH ₃	1.57, s	C-7, C-11, C-12	
14	25.4, CH ₃	1.42, d (6.2)	C-9, C-10	
15	27.4, CH ₃	1.67, s	C-3, C-4, C-5	H-6
4-OH		5.71, s		
10-OH		5.80, s		
11-OH		5.32, s		

Table S2 Antifungal activities of test compounds (MIC μ g/mL, MIC₈₀ μ g/mL)

Comp	<i>C. albicans</i>		<i>C. parapsilosis</i>		<i>C. neoformans</i>		<i>C. gattii</i>	
	MIC	MIC ₈₀	MIC	MIC ₈₀	MIC	MIC ₈₀	MIC	MIC ₈₀
5	>400	100	>400	100	>400	>400	>400	>400
6	>400	200	>400	200	>400	>400	>400	>400
7	>400	200	>400	100	>400	>400	>400	>400
9	>400	100	>400	100	>400	>400	>400	>400
12	>400	200	>400	200	>400	>400	>400	>400
31	>400	200	>400	100	>400	>400	>400	>400
32	>400	400	>400	400	>400	>400	>400	>400
33	>400	400	>400	400	>400	>400	>400	>400
34	>400	>400	>400	>400	50	25	50	25
AmB	2	0.5	2	0.5	2	0.25	2	0.25

AmB, amphotericin B was served as the positive control.

Table S3 Antibacterial activities of compounds **5–7** (MIC μ g/mL)

Comp	MIC				
	<i>B. subtilis</i>	<i>S. aureus</i>	<i>E. faecium</i>	<i>E. coli</i>	<i>P. aeruginosa</i>
5	100	>200	200	100	>200
6	200	>200	200	200	>200
7	>200	>200	>200	200	>200
Cip	0.13	0.13	0.25	0.13	0.13

Cip, Ciprofloxacin was served as the positive control.

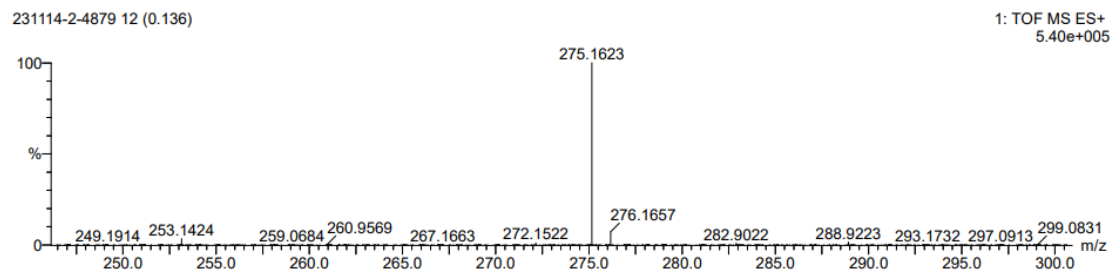


Figure S1. HRESI-MS spectrum of the new compound **1**

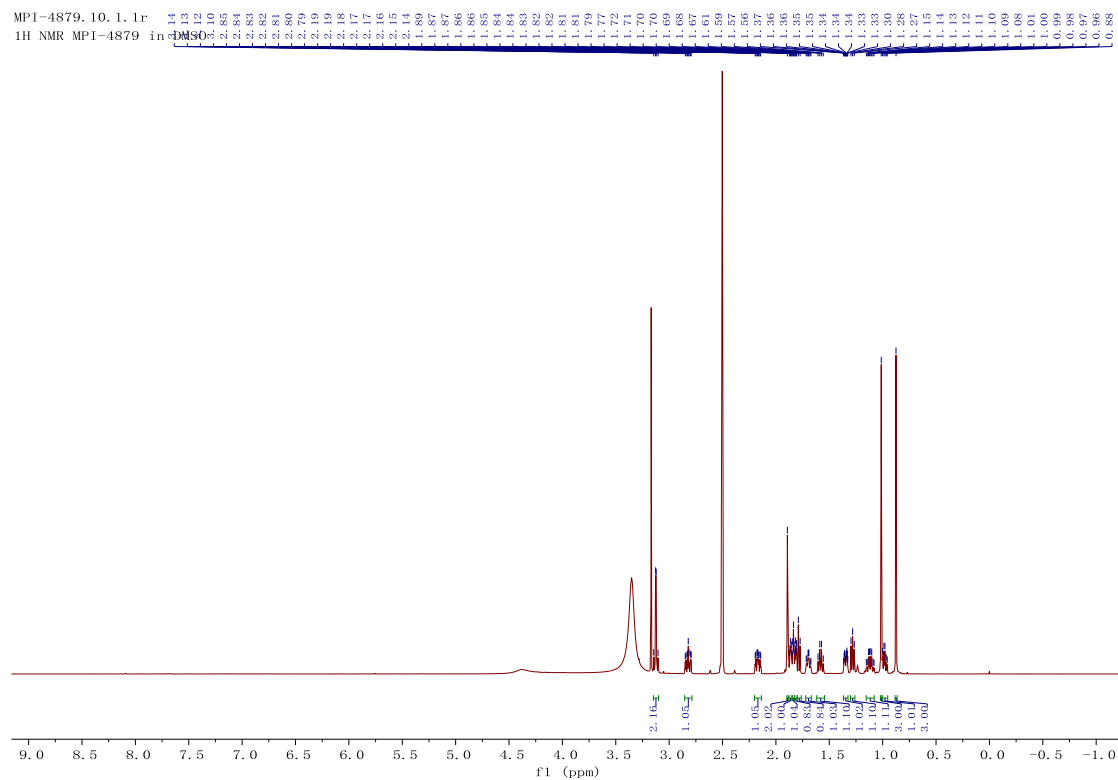


Figure S2. ¹H NMR (600 MHz, DMSO-*d*₆) spectrum of the new compound **1**

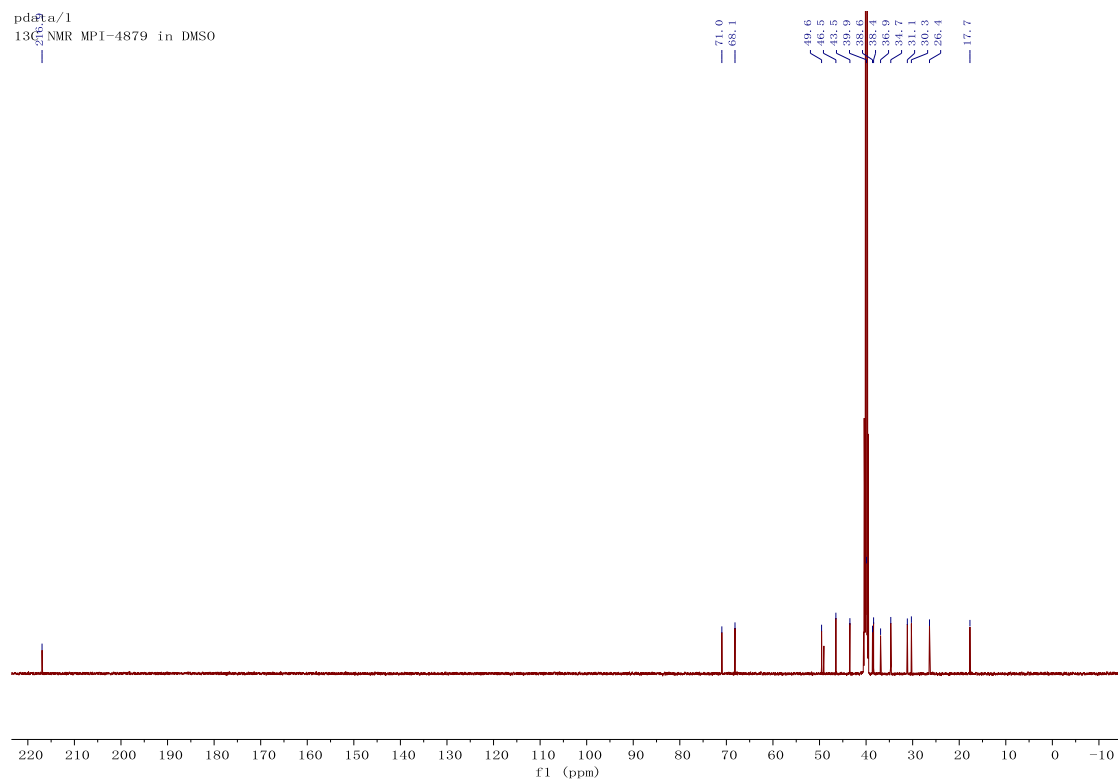


Figure S3. ^{13}C NMR (150 MHz, $\text{DMSO-}d_6$) spectrum of the new compound **1**

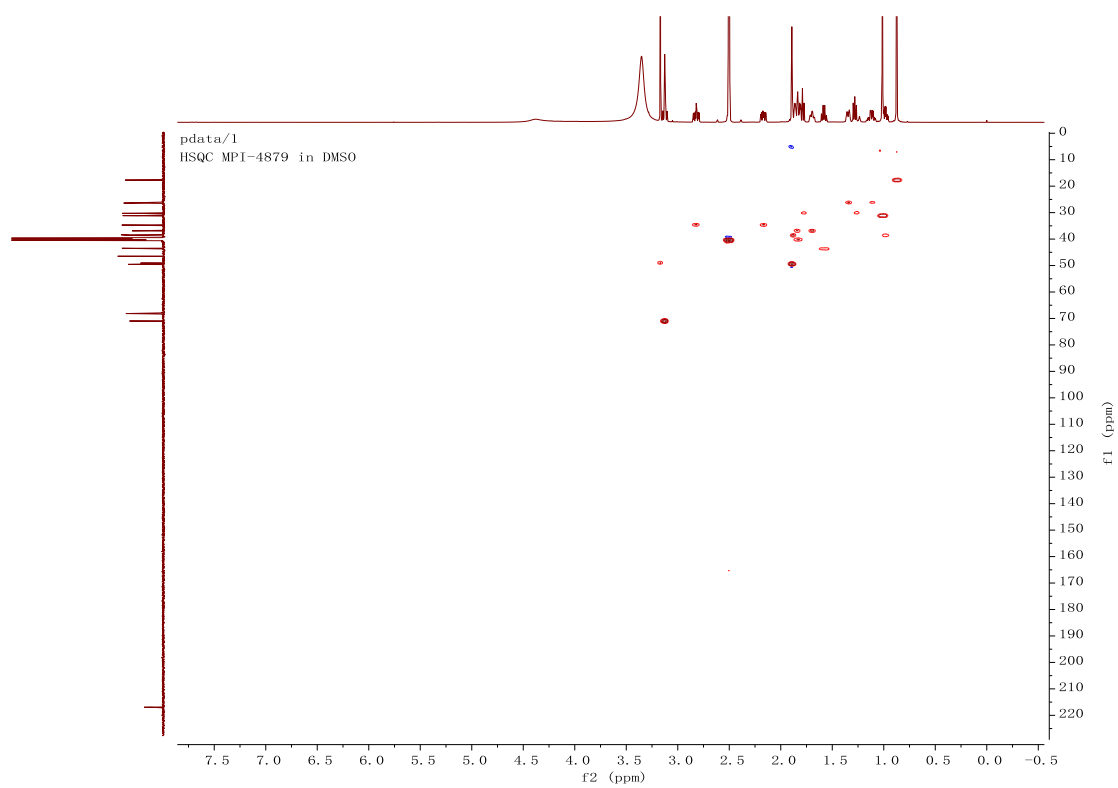


Figure S4. HSQC spectrum of the new compound **1**

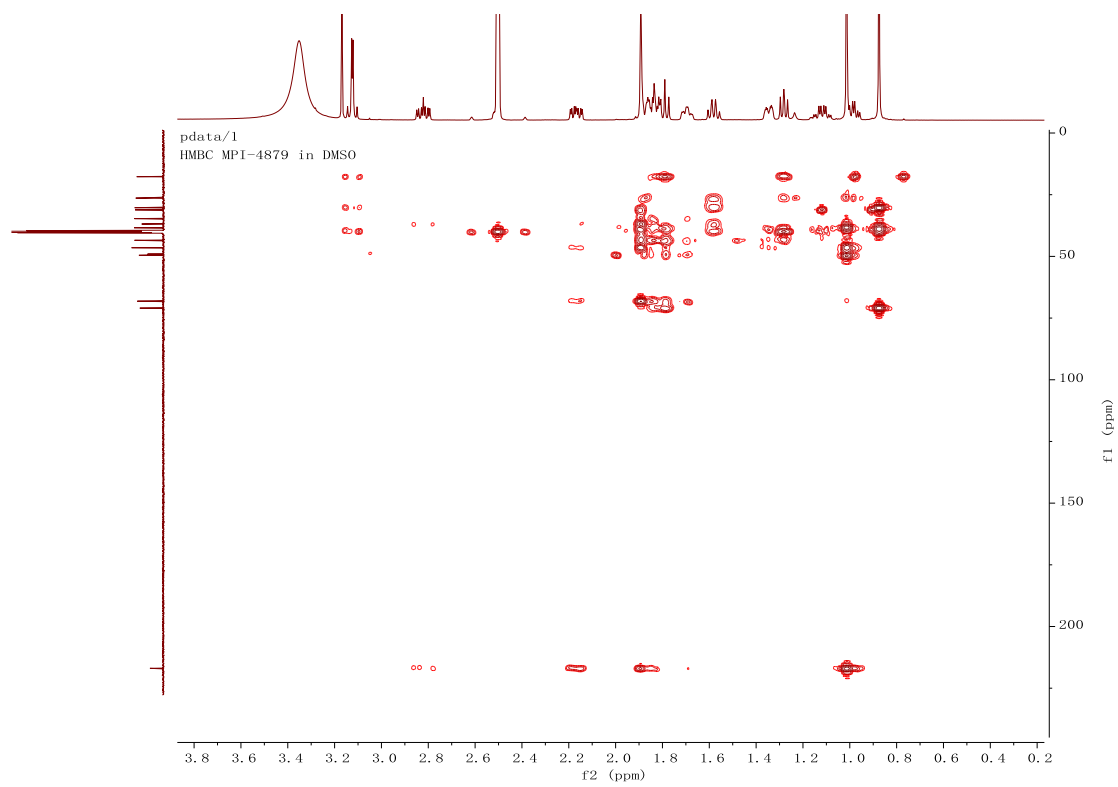


Figure S5. HMBC spectrum of the new compound **1**

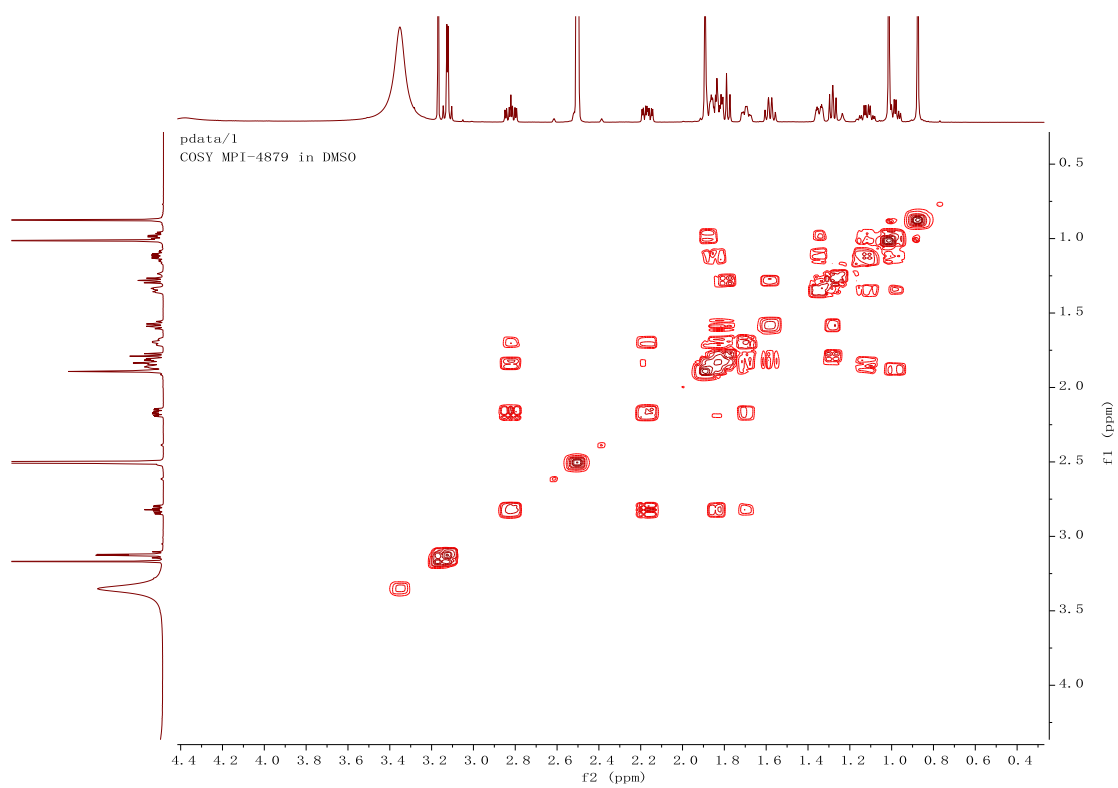


Figure S6. COSY spectrum of the new compound **1**

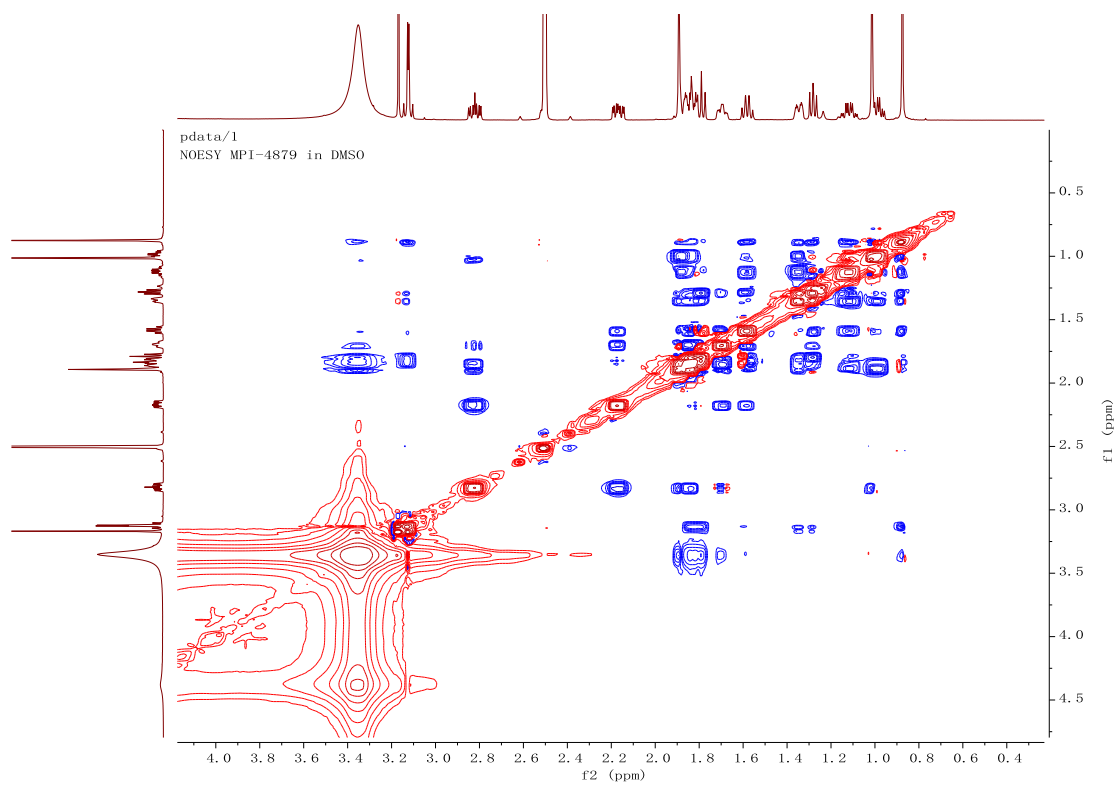


Figure S7. NOESY spectrum of the new compound **1**

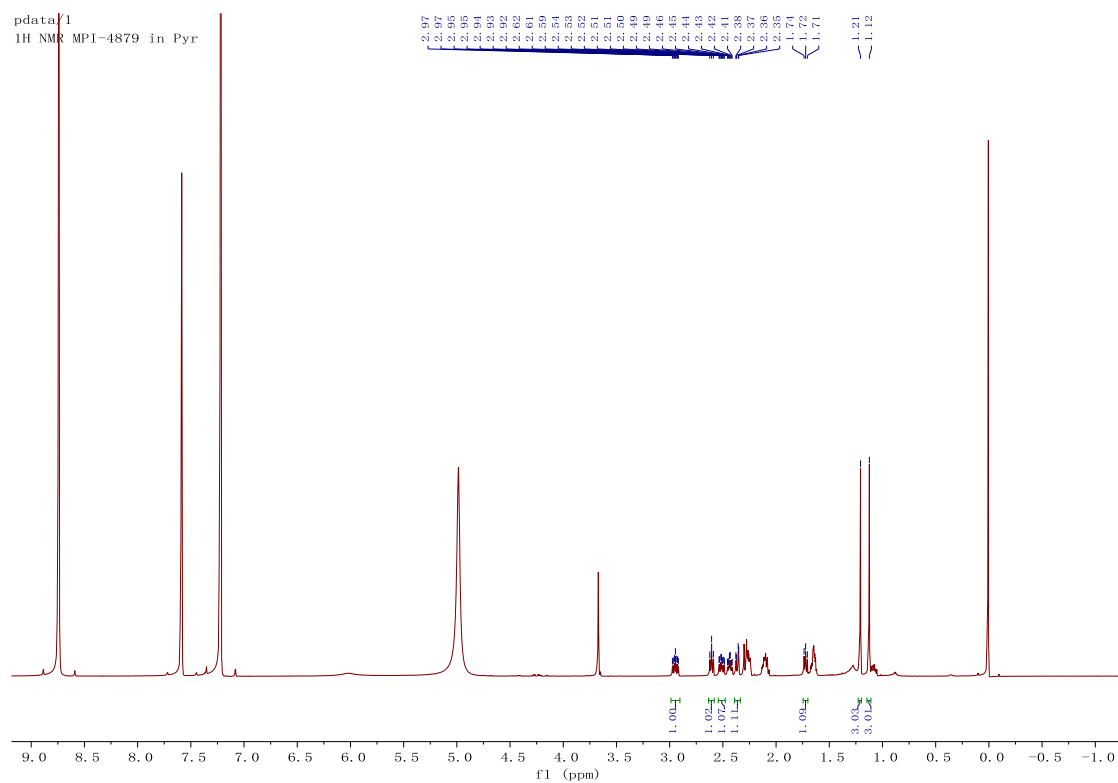


Figure S8. ^1H NMR (600 MHz, in pyridine- d_5) spectrum of the new compound **1**

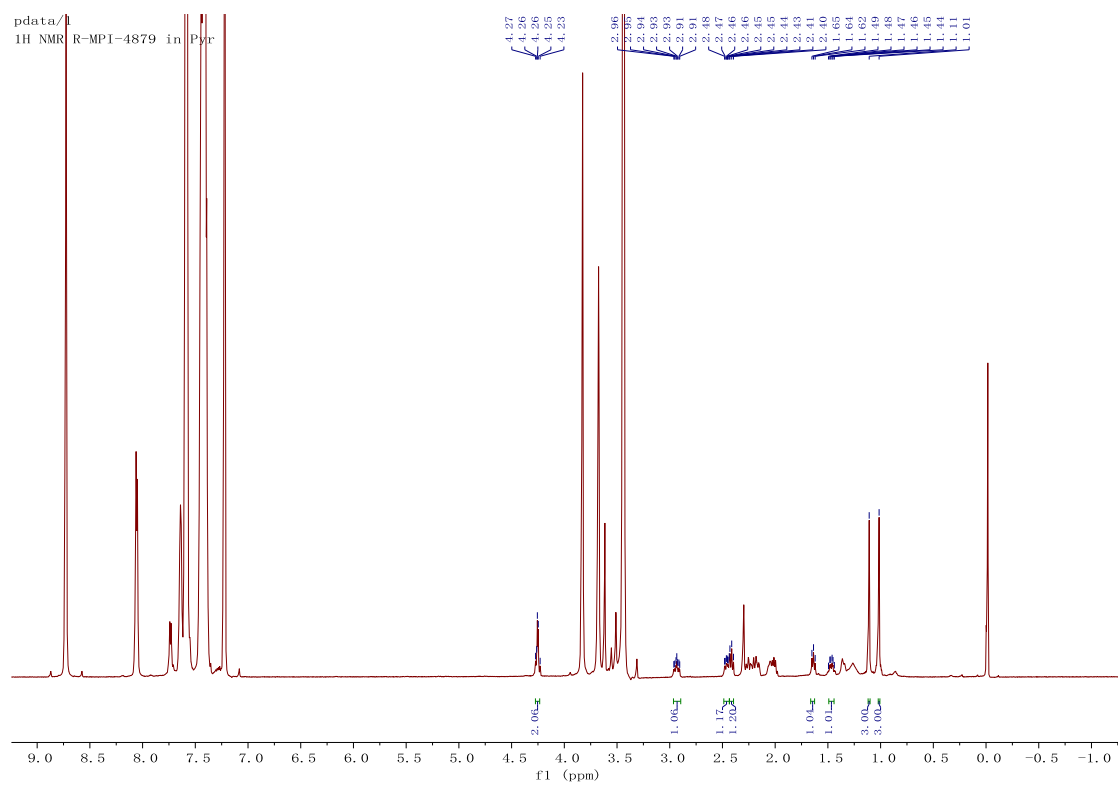


Figure S9. ^1H NMR spectrum of (*S*)-MTPA ester (**1a**) in pyridine- d_5

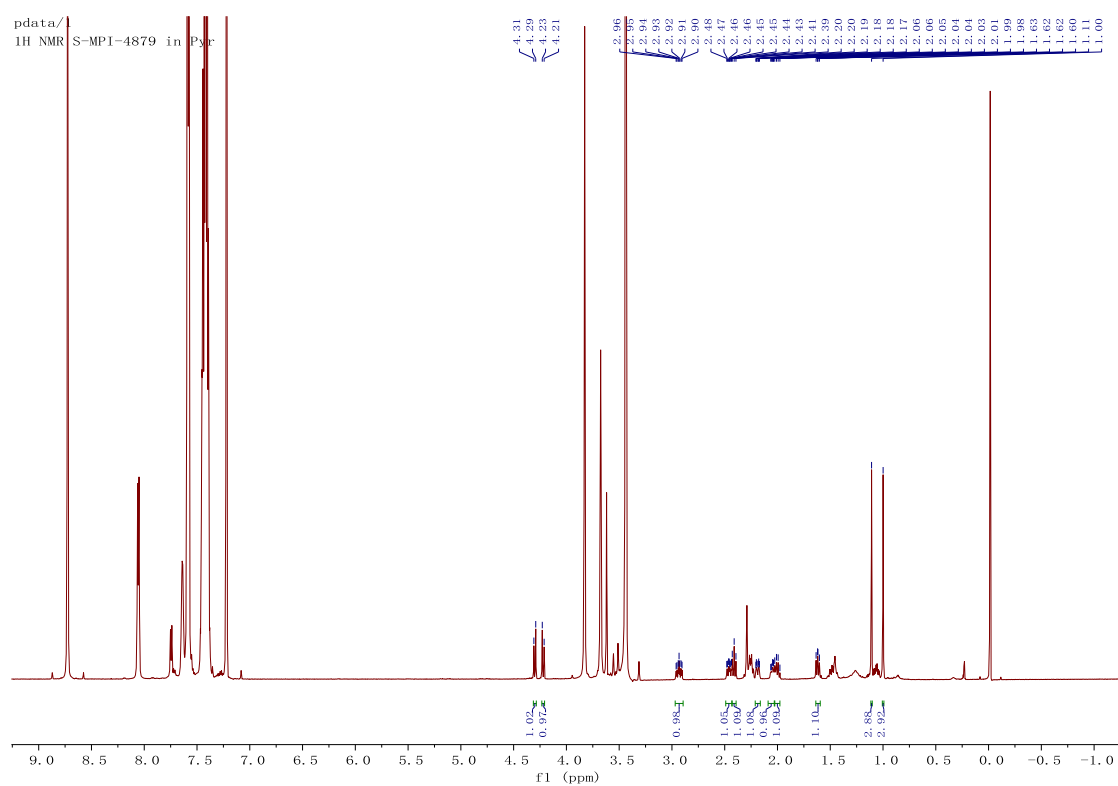


Figure S10. ^1H NMR spectrum of (*R*)-MTPA ester (**1b**) in pyridine- d_5

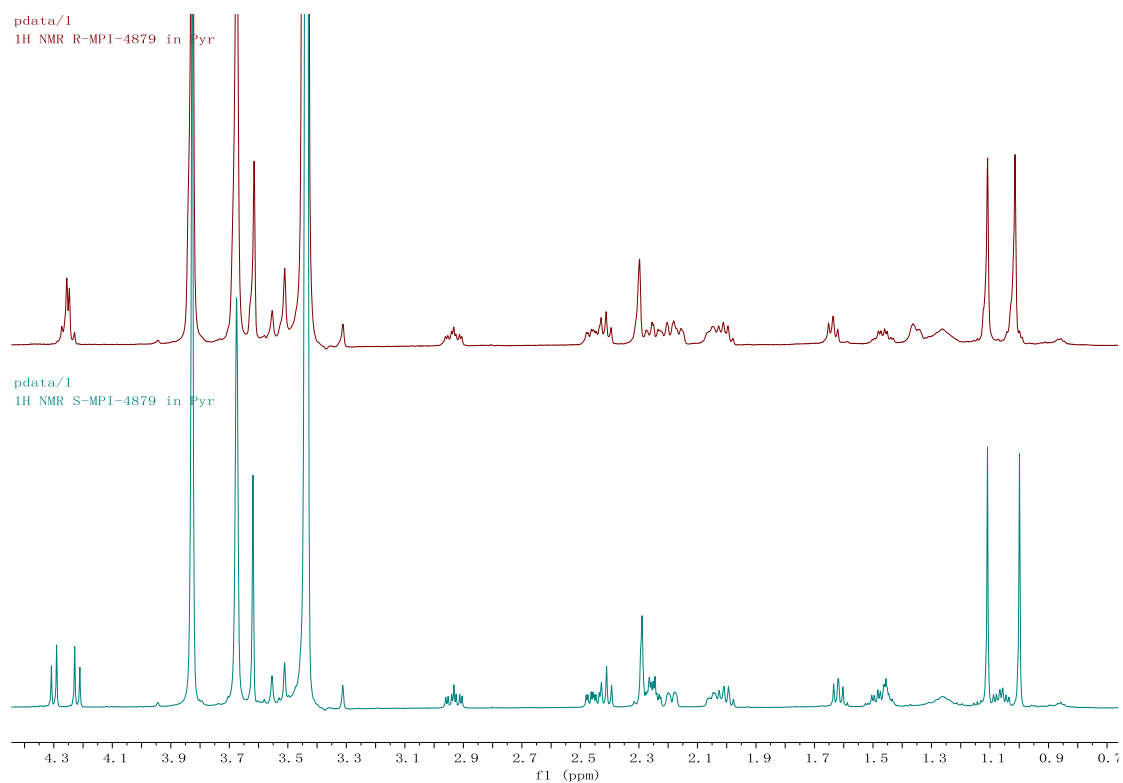


Figure S11. Comparison of ¹H NMR spectra of (*S*)-MTPA ester (**1a**) and (*R*)-MTPA ester (**1b**) in pyridine-*d*₅

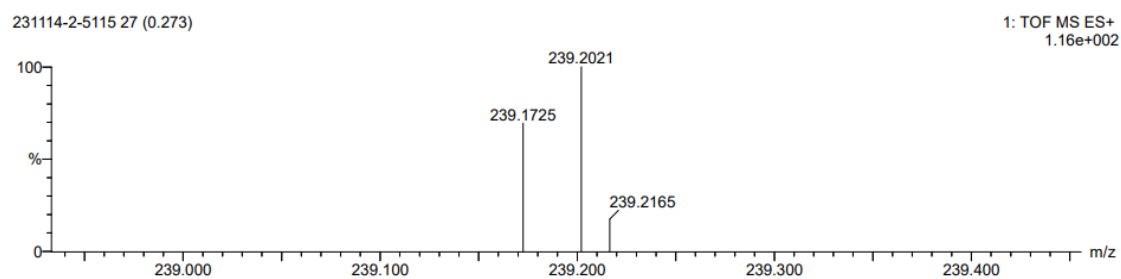


Figure S12. HRESI-MS spectrum of the new compound **2**

MPI-5115.10.1.1r
1H NMR MPI-5115 in DMSO

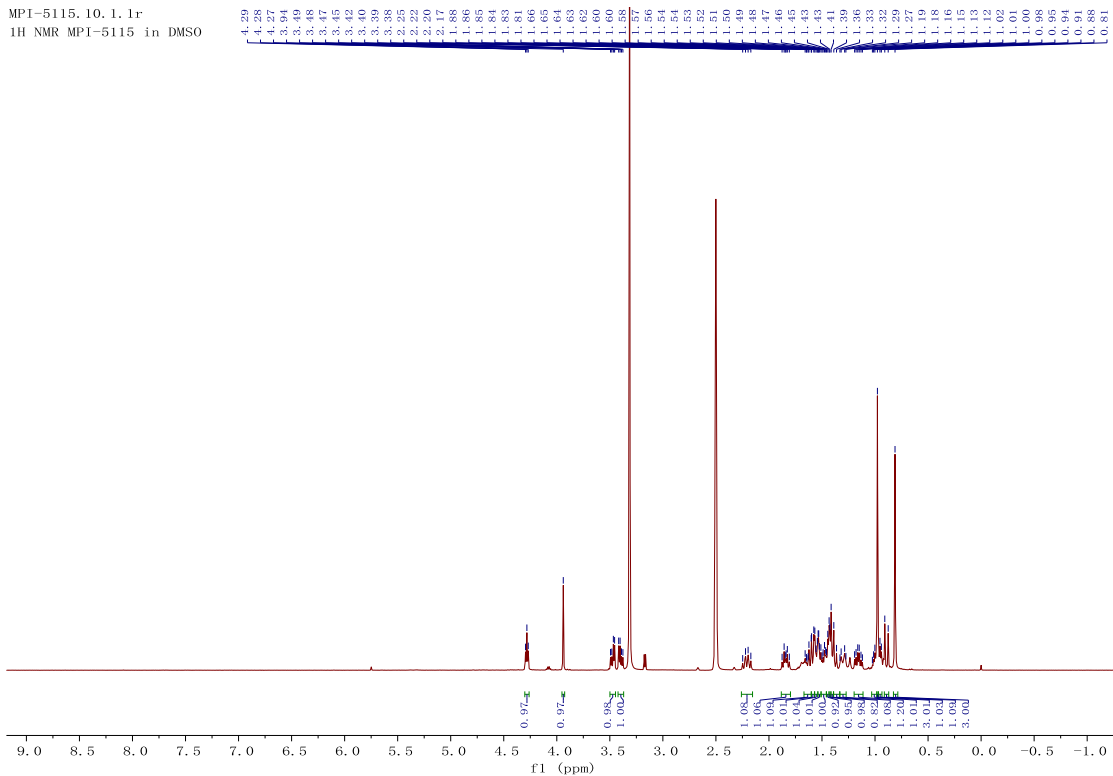


Figure S13. ^1H NMR (600 MHz, $\text{DMSO-}d_6$) spectrum of the new compound **2**

MPI-5115.20.1.1r
13C NMR MPI-5115 in DMSO

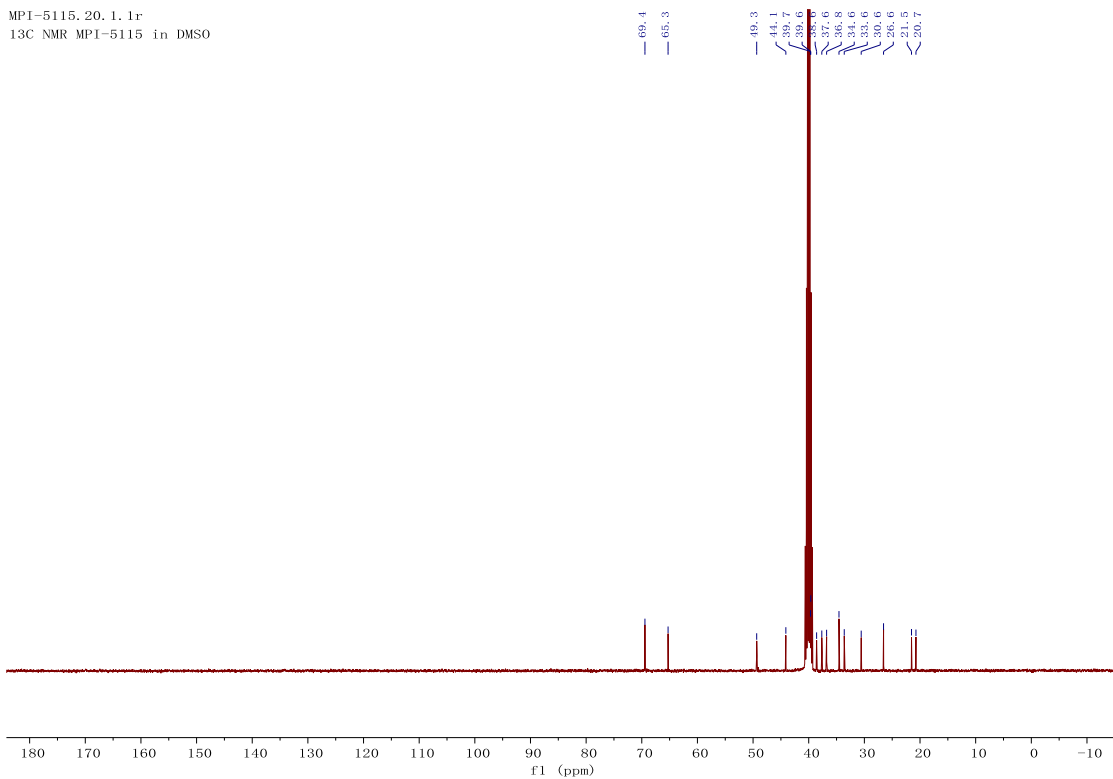


Figure S14. ^{13}C NMR (150 MHz, $\text{DMSO-}d_6$) spectrum of the new compound **2**

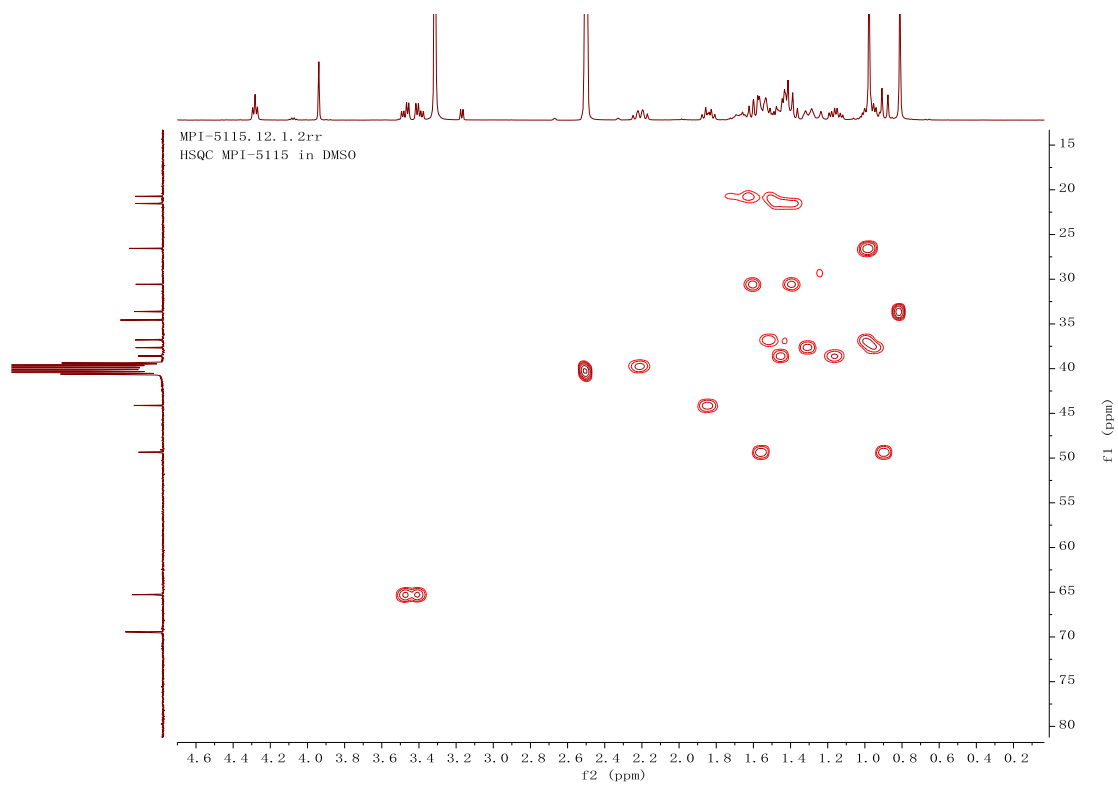


Figure S15. HSQC spectrum of the new compound **2**

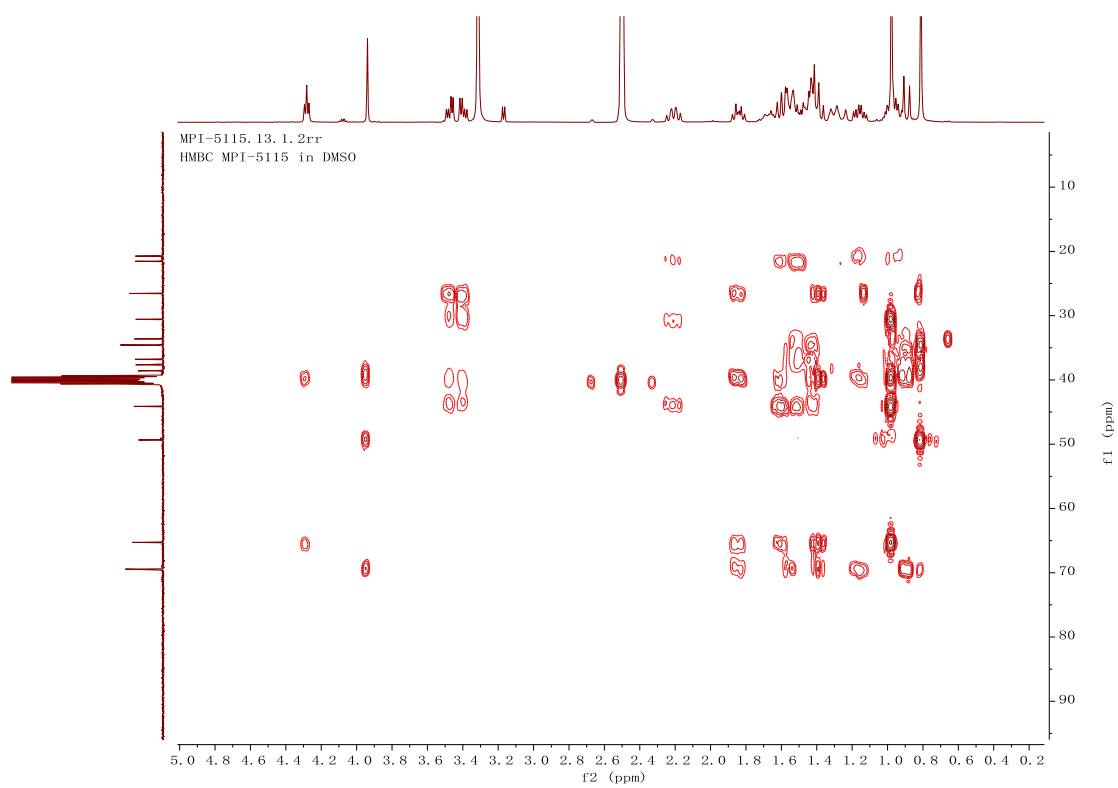


Figure S16. HMBC spectrum of the new compound **2**

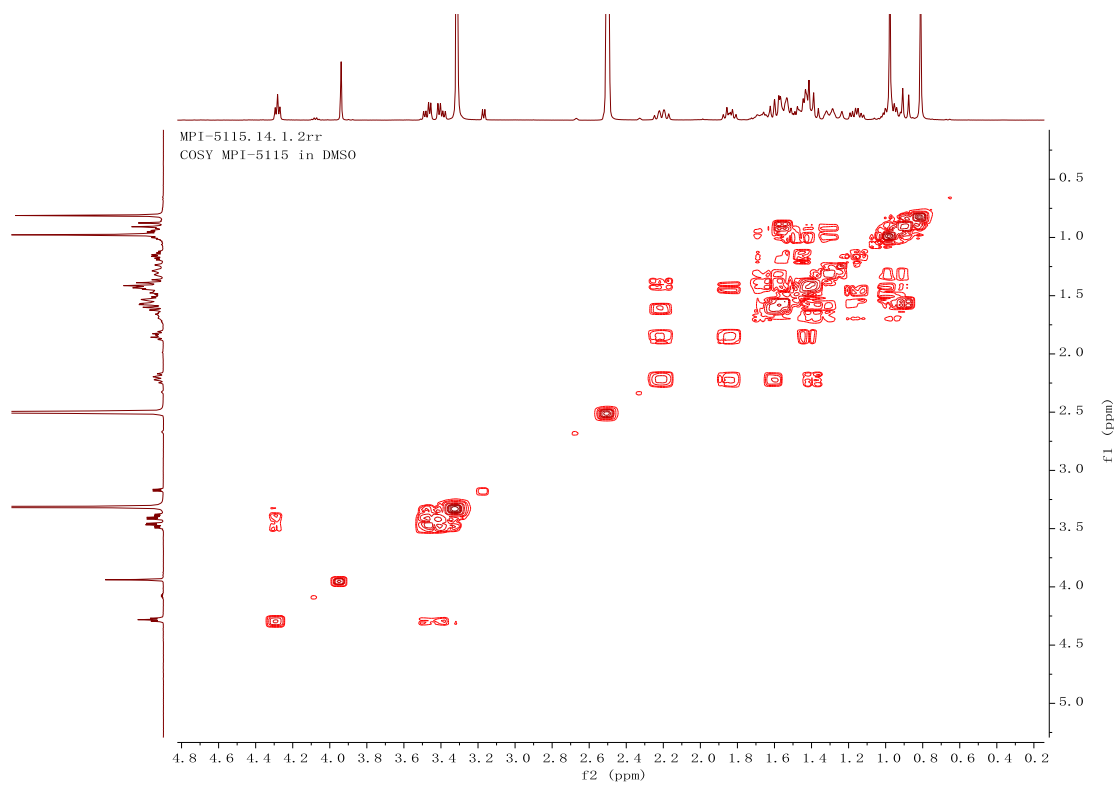


Figure S17. COSY spectrum of the new compound **2**

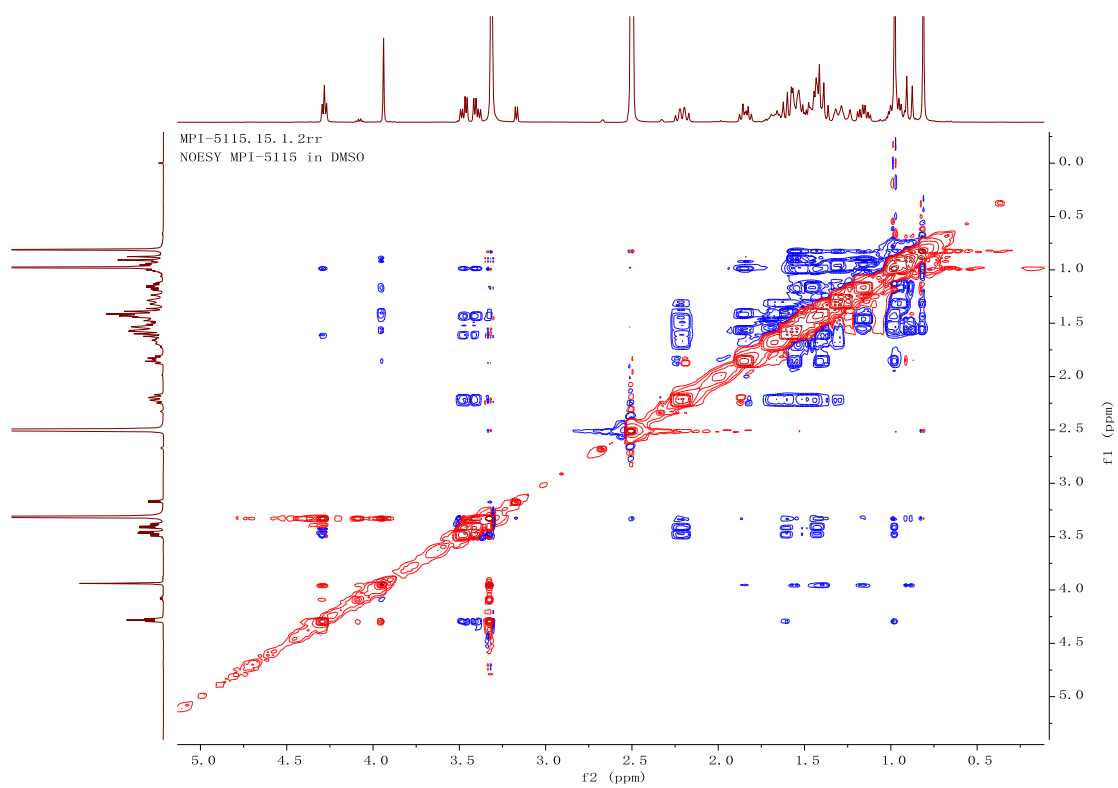


Figure S18. NOESY spectrum of the new compound **2**

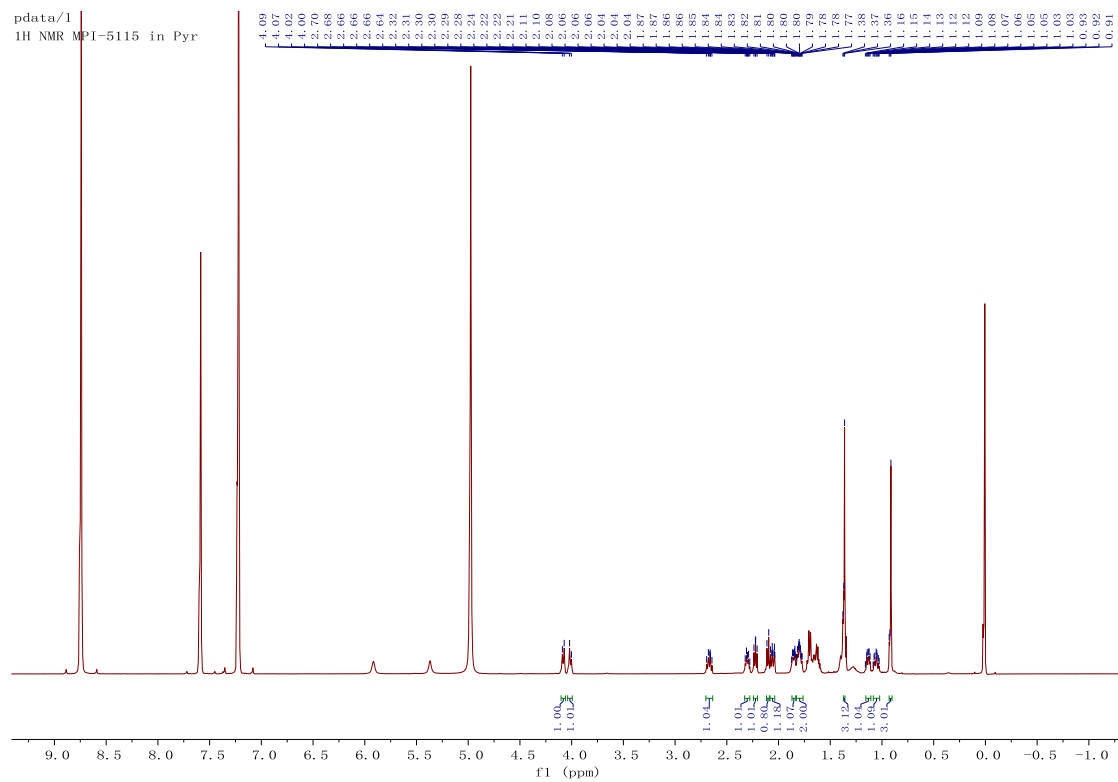


Figure S19. ^1H NMR (600 MHz, in pyridine- d_5) spectrum of the new compound **2**

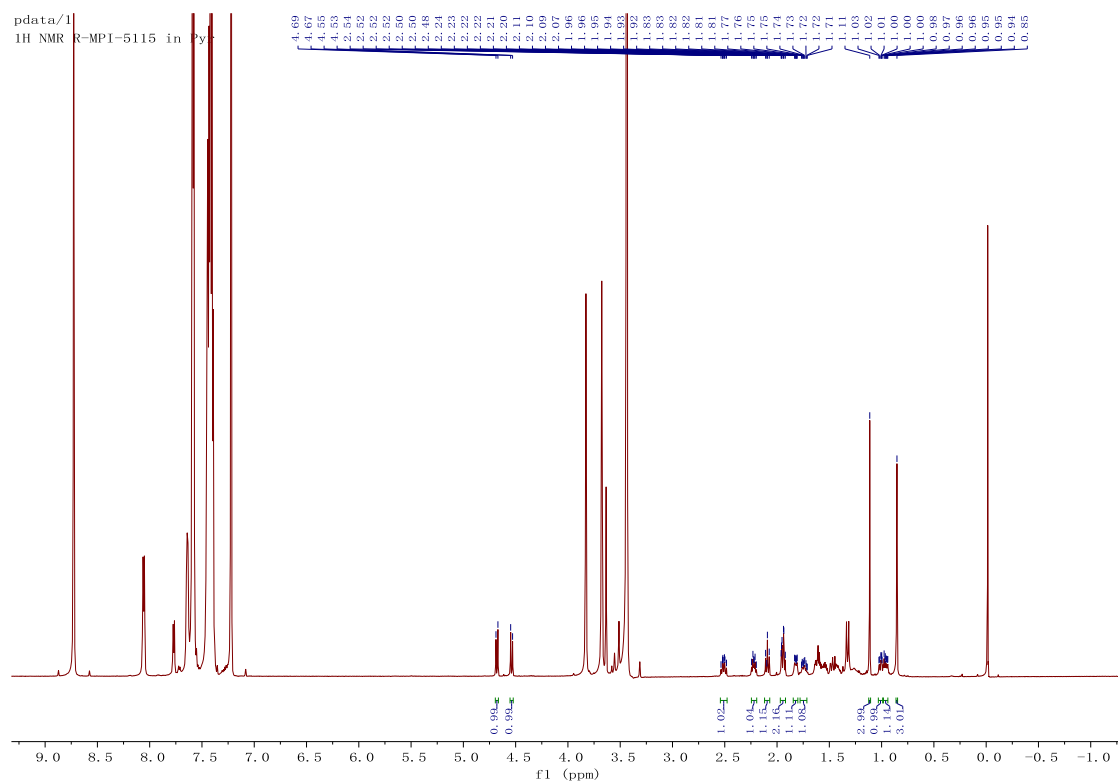


Figure S20. ^1H NMR spectrum of (*S*)-MTPA ester (**2a**) in pyridine- d_5

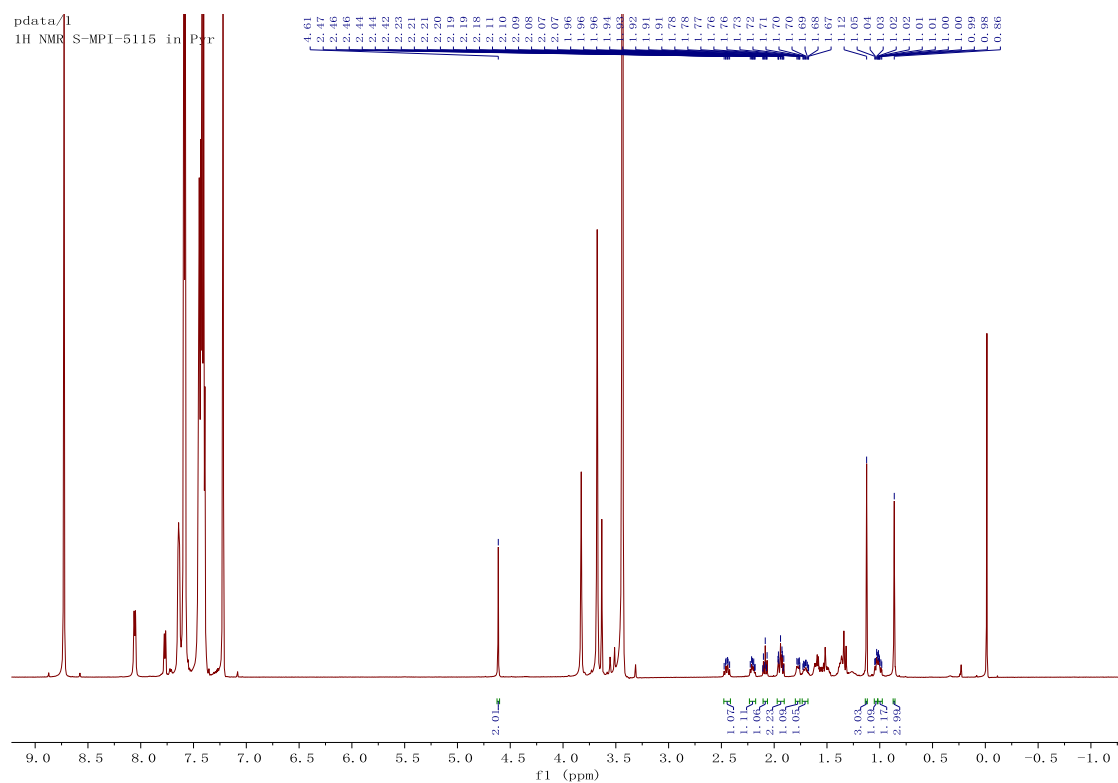


Figure S21. ^1H NMR spectrum of (*R*)-MTPA ester (**2b**) in pyridine- d_5

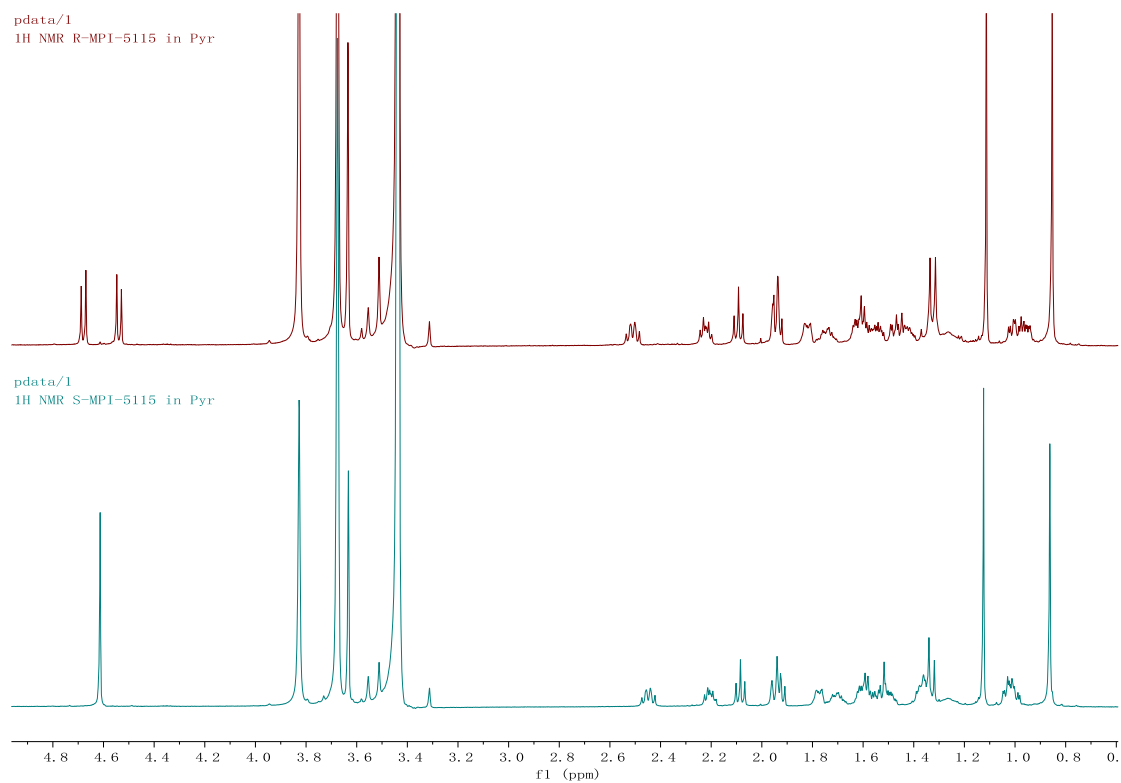


Figure S22. Comparison of ^1H NMR spectra of (*S*)-MTPA ester (**2a**) and (*R*)-MTPA ester (**2b**) in pyridine- d_5

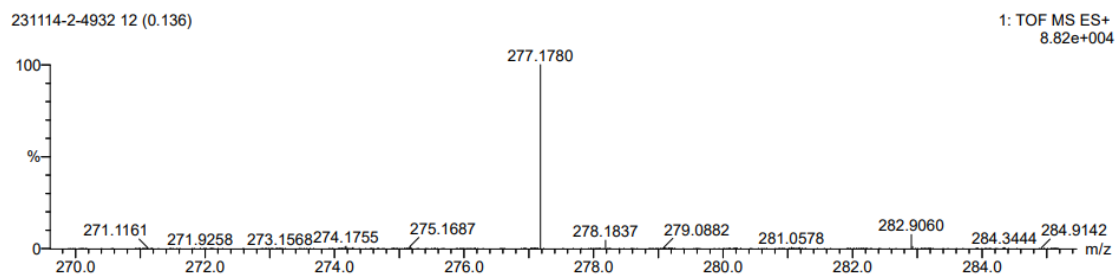


Figure S23. HRESI-MS spectrum of the new compound **3**

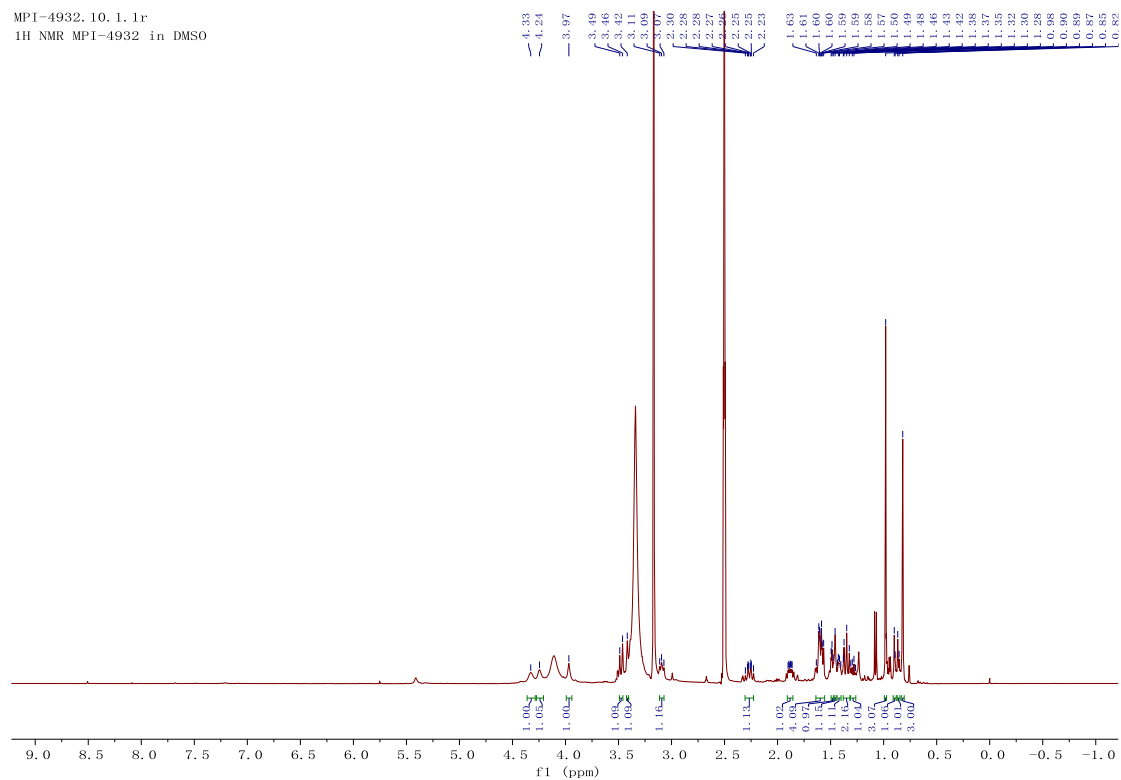


Figure S24. ^1H NMR (600 MHz, $\text{DMSO-}d_6$) spectrum of the new compound **3**

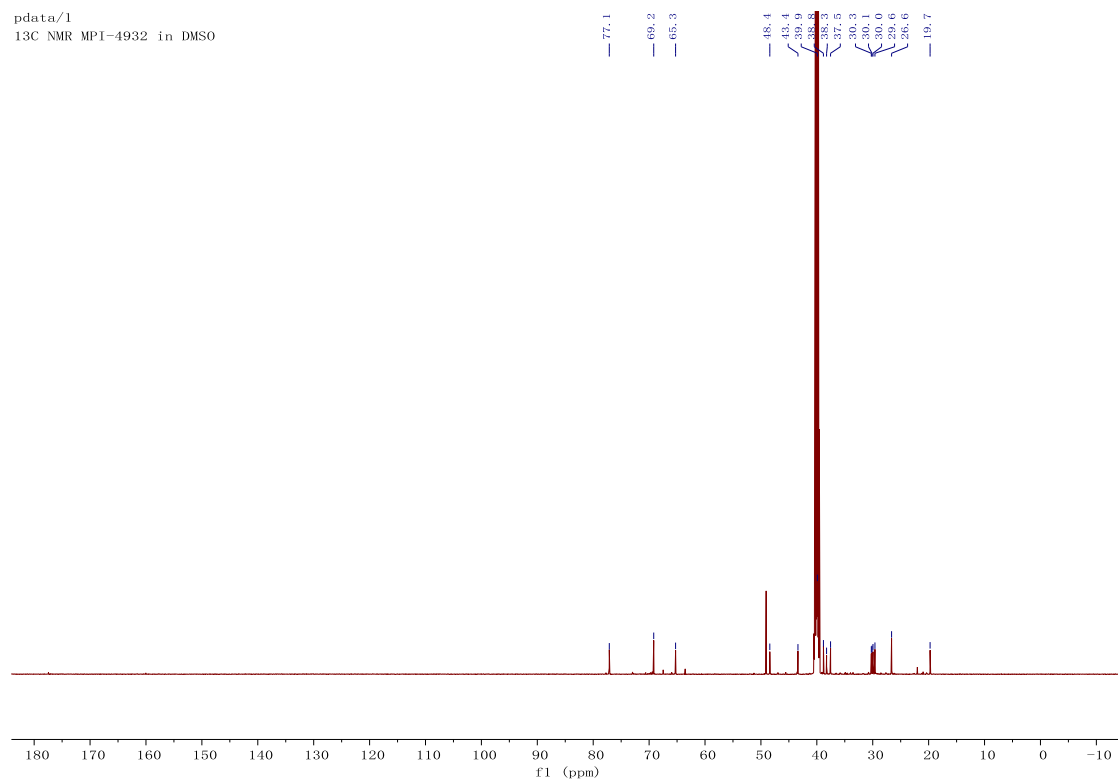


Figure S25. ¹³C NMR (150 MHz, DMSO-*d*₆) spectrum of the new compound **3**

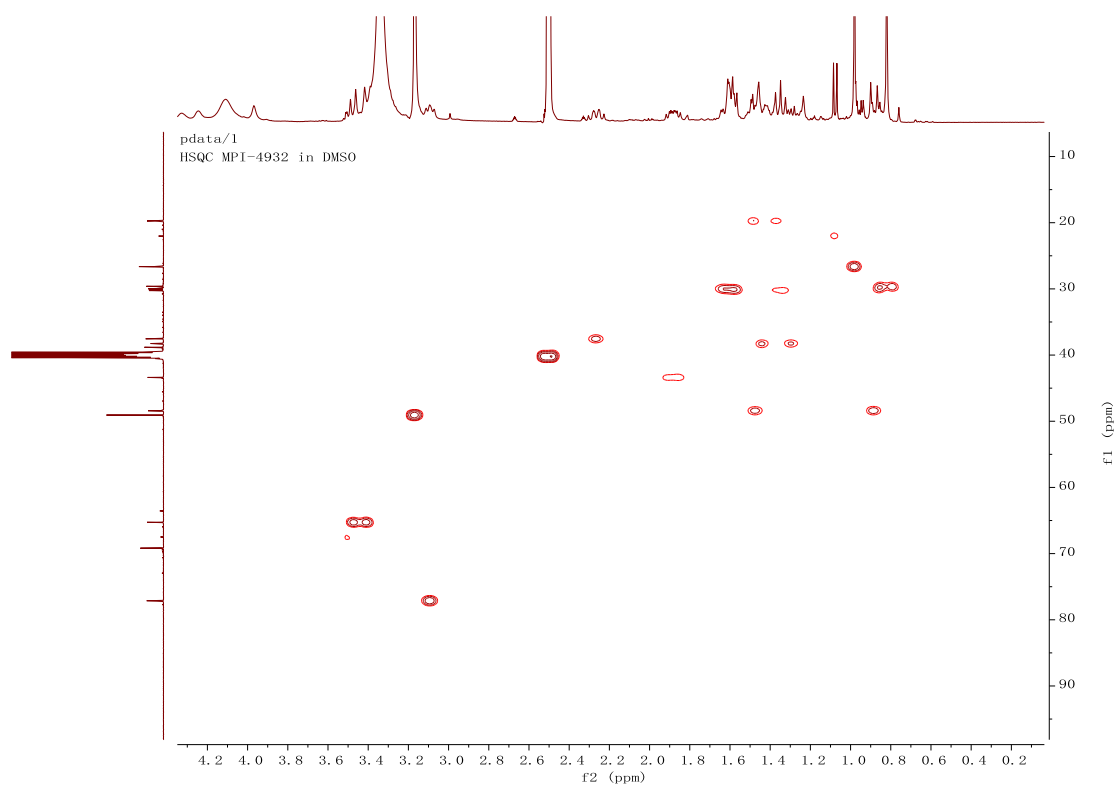


Figure S26. HSQC spectrum of the new compound **3**

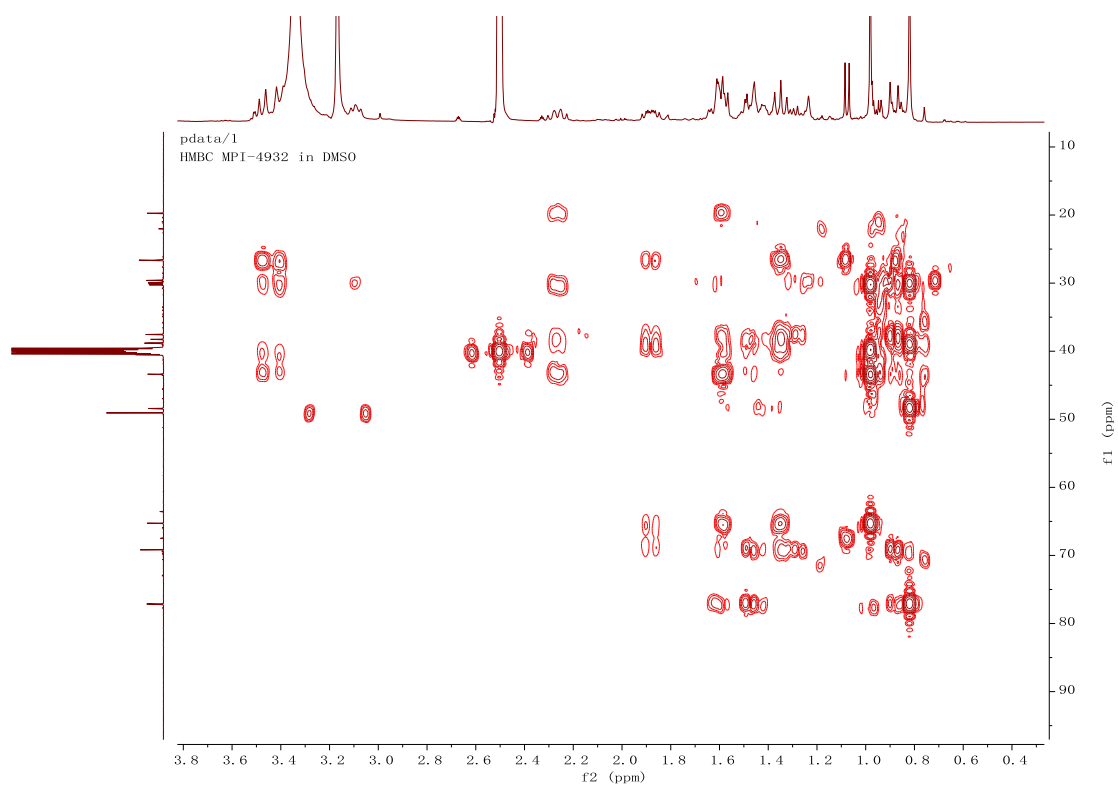


Figure S27. HMBC spectrum of the new compound **3**

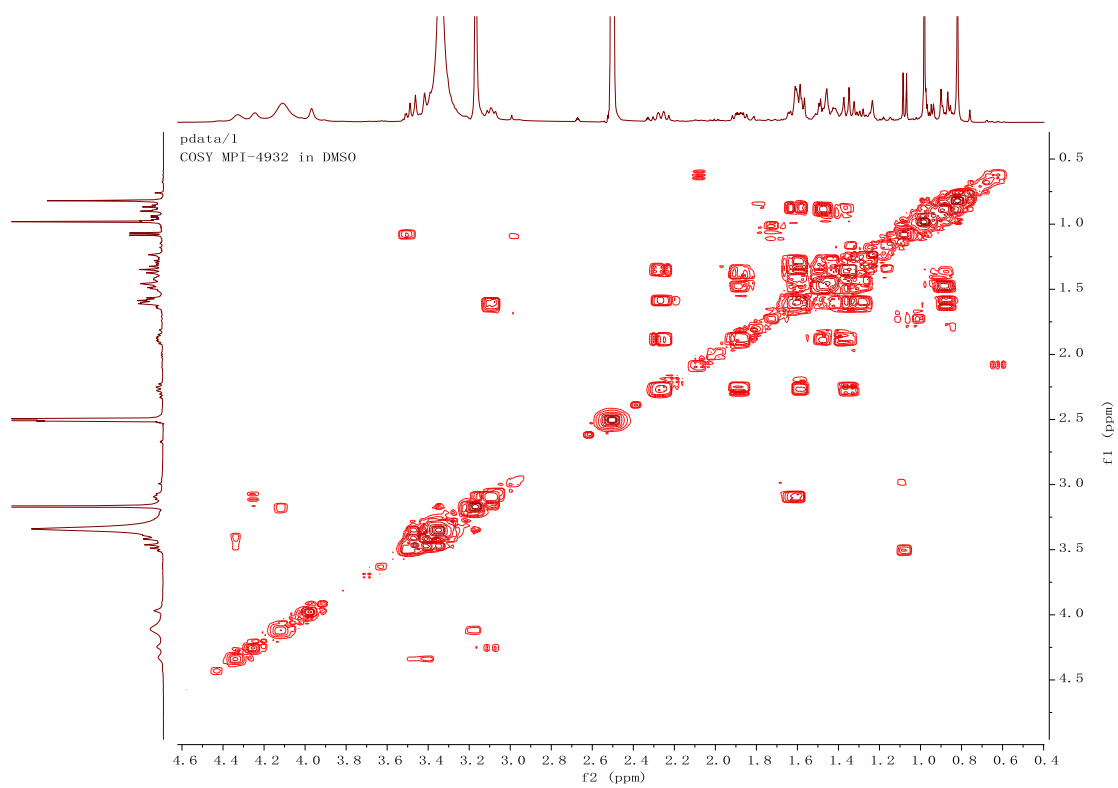


Figure S28. COSY spectrum of the new compound **3**

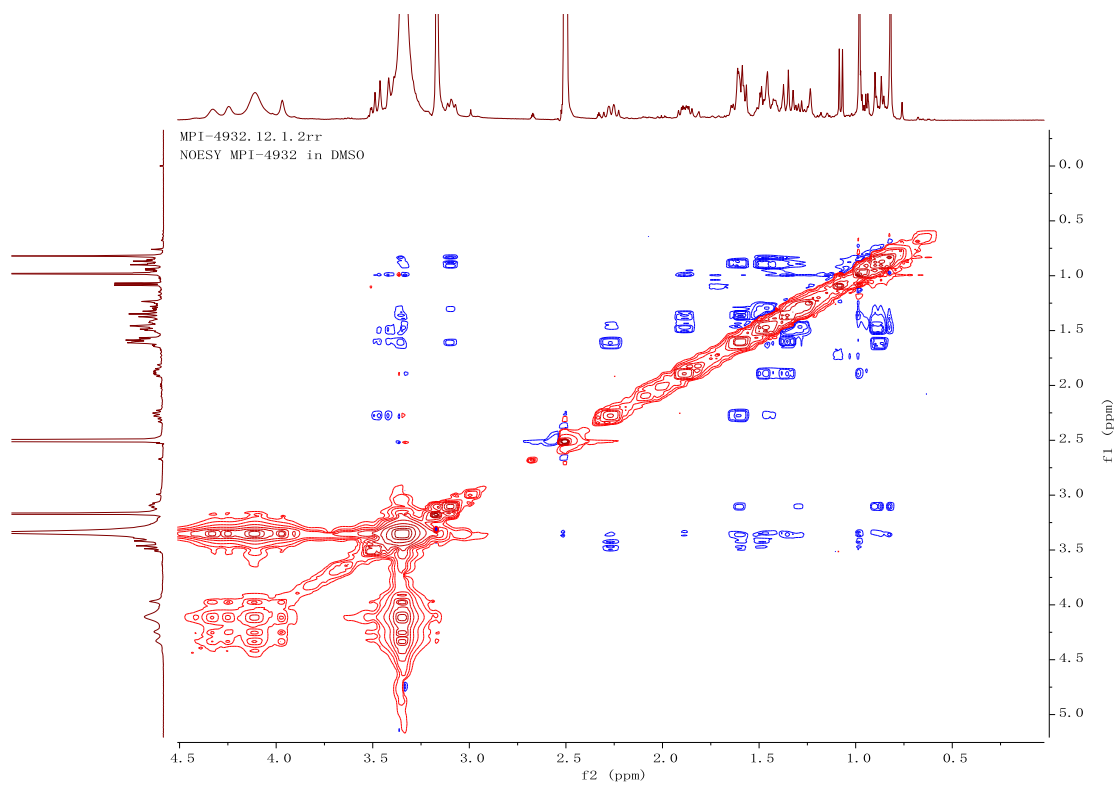


Figure S29. NOESY spectrum of the new compound **3**

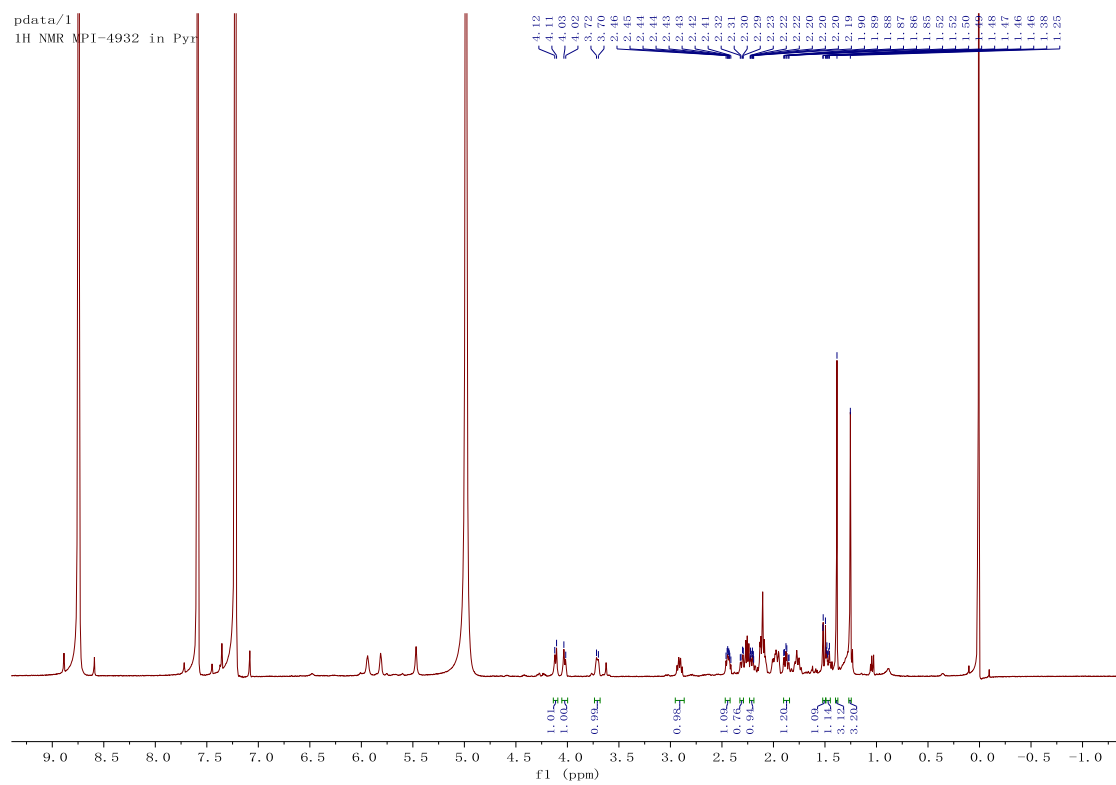


Figure S30. ^1H NMR (600 MHz, in pyridine- d_5) spectrum of the new compound **3**

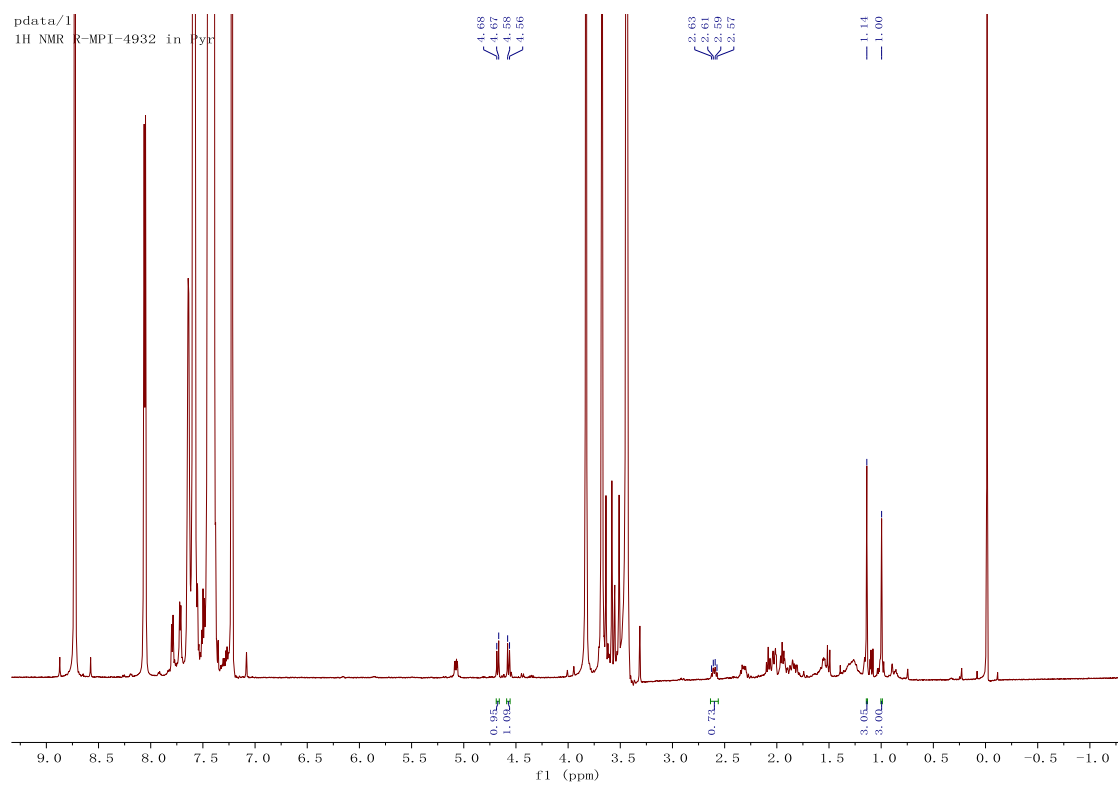


Figure S31. ^1H NMR spectrum of (*S*)-MTPA ester (**3a**) in pyridine- d_5

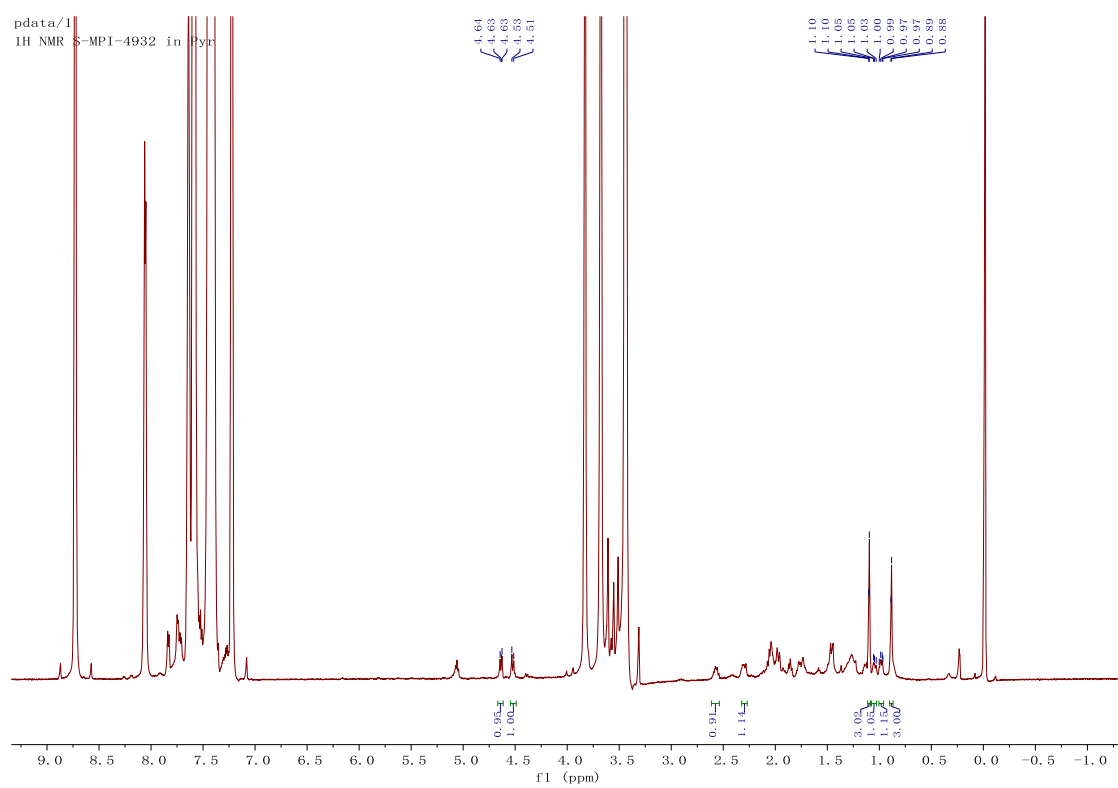


Figure S32. ^1H NMR spectrum of (*R*)-MTPA ester (**3b**) in pyridine- d_5

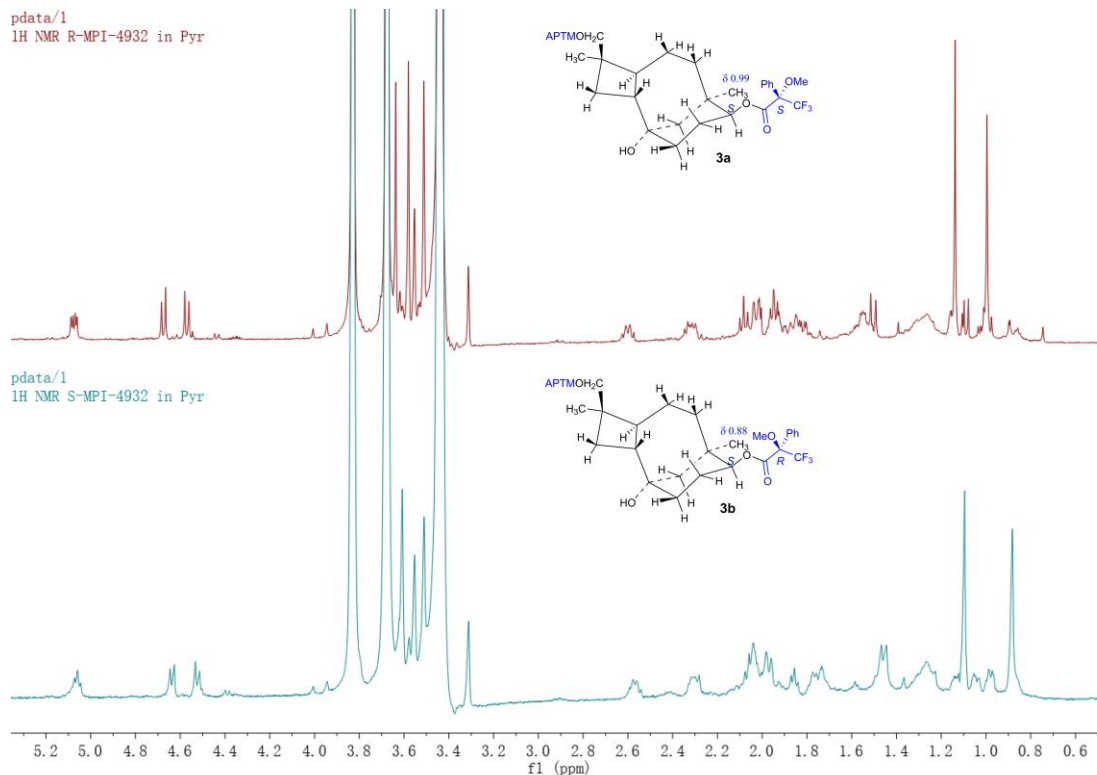


Figure S33. Comparison of ^1H NMR spectra of (*S*)-MTPA ester (**3a**) and (*R*)-MTPA ester (**3b**) in pyridine- d_5

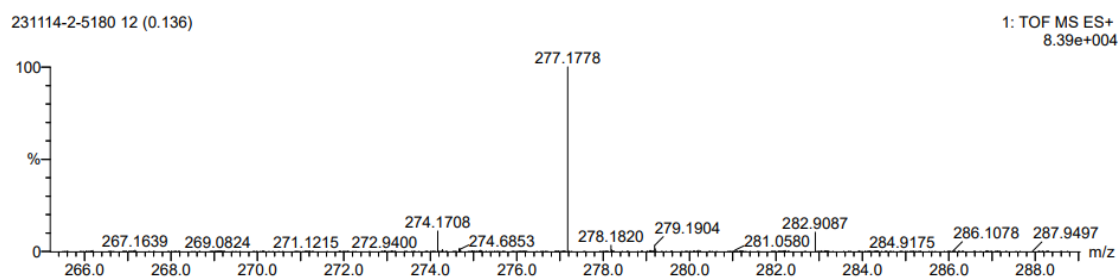


Figure S34. HRESI-MS spectrum of the new compound **4**

MPI-5108.10.1.1r
1H NMR MPI-5108 in DMSO

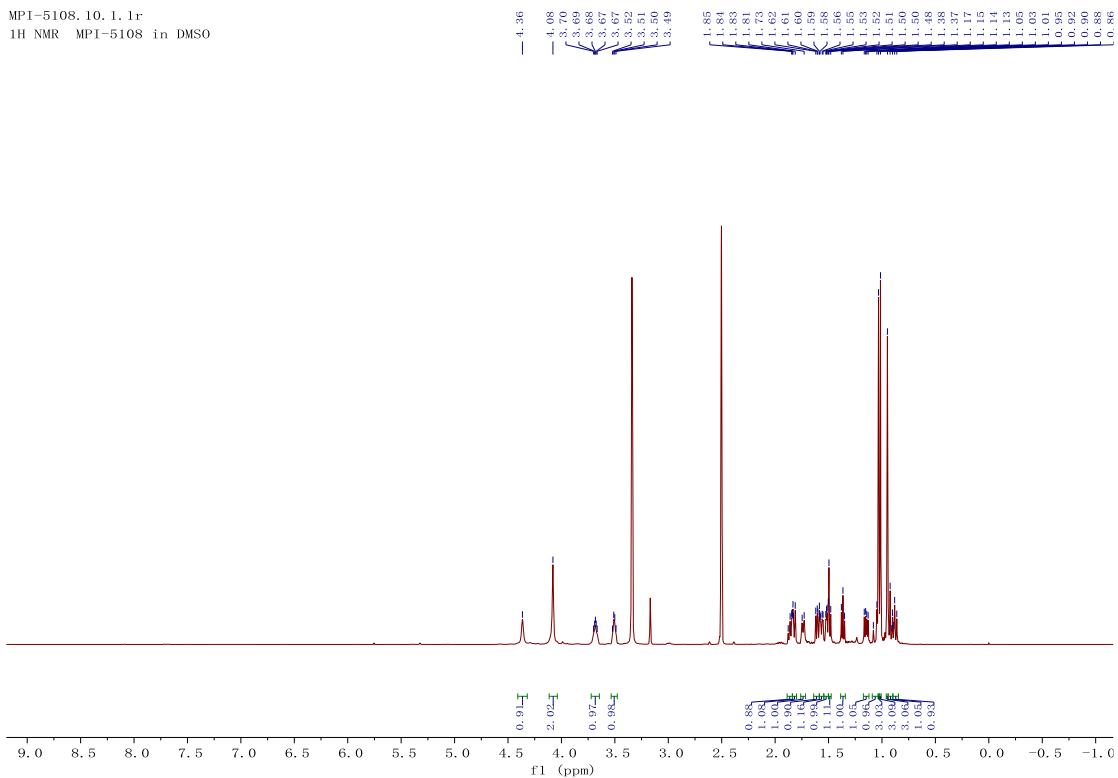


Figure S35. ^1H NMR (600 MHz, $\text{DMSO-}d_6$) spectrum of the new compound **4**

pdata/1
13C NMR MPI-5108 in DMSO

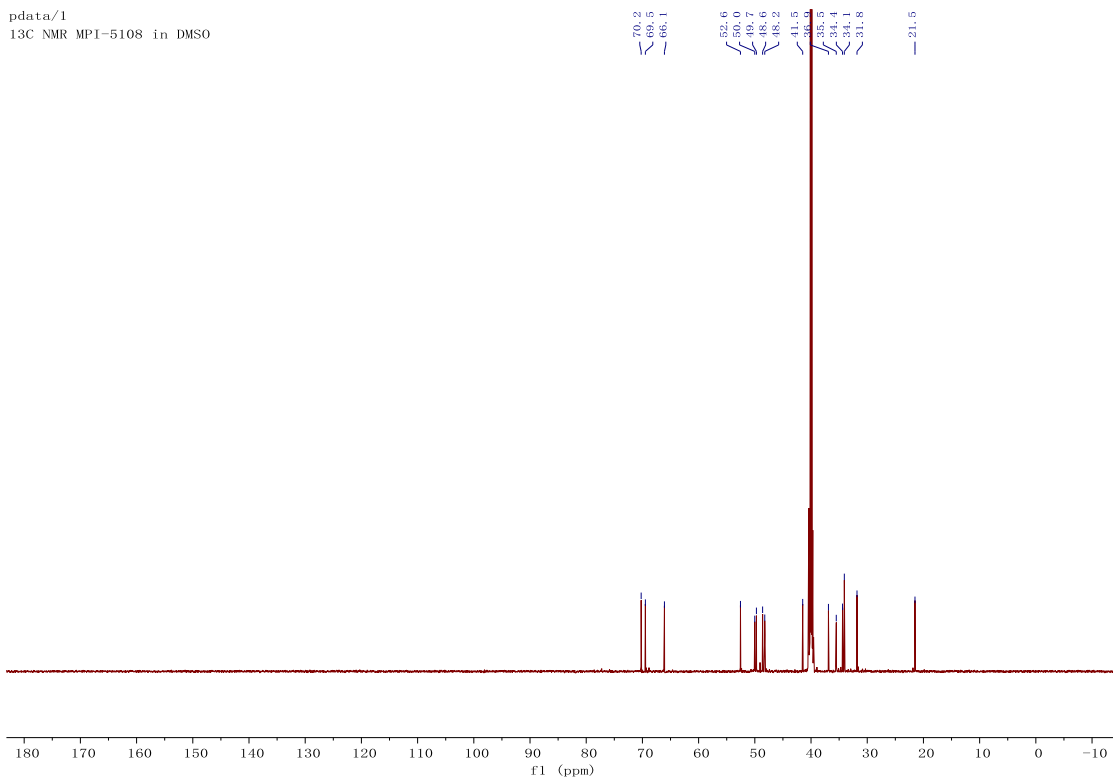


Figure S36. ^{13}C NMR (150 MHz, $\text{DMSO-}d_6$) spectrum of the new compound **4**

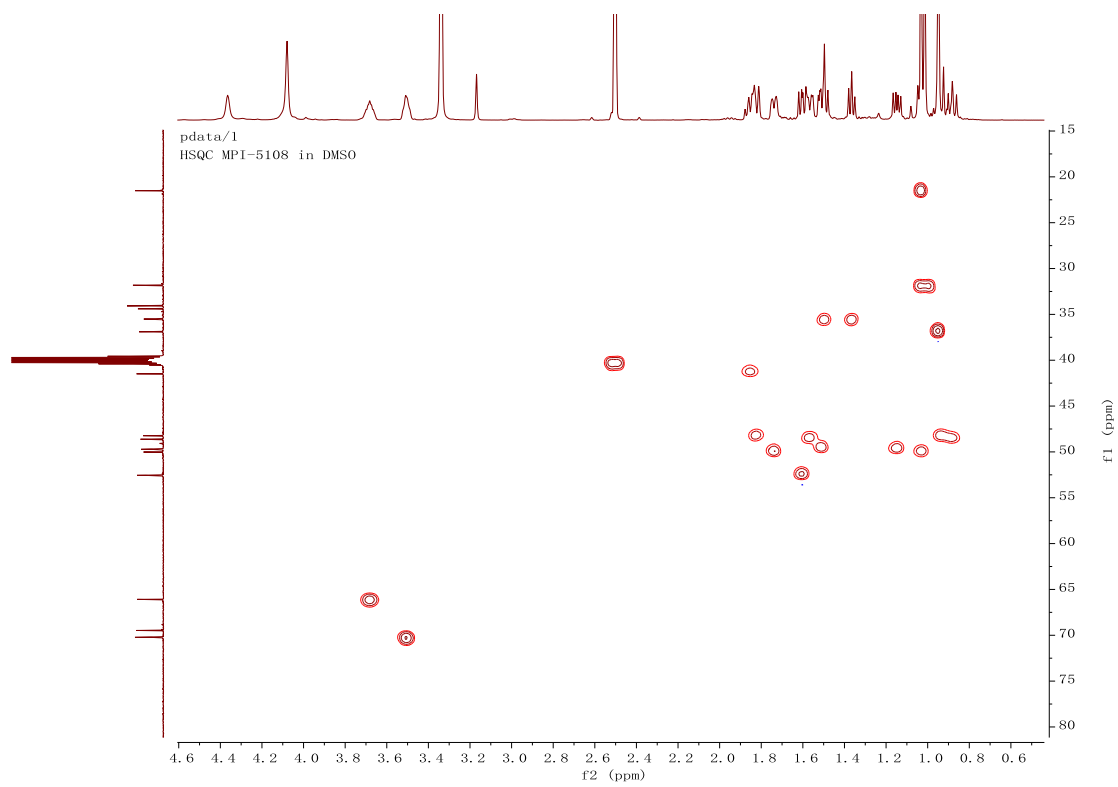


Figure S37. HSQC spectrum of the new compound **4**

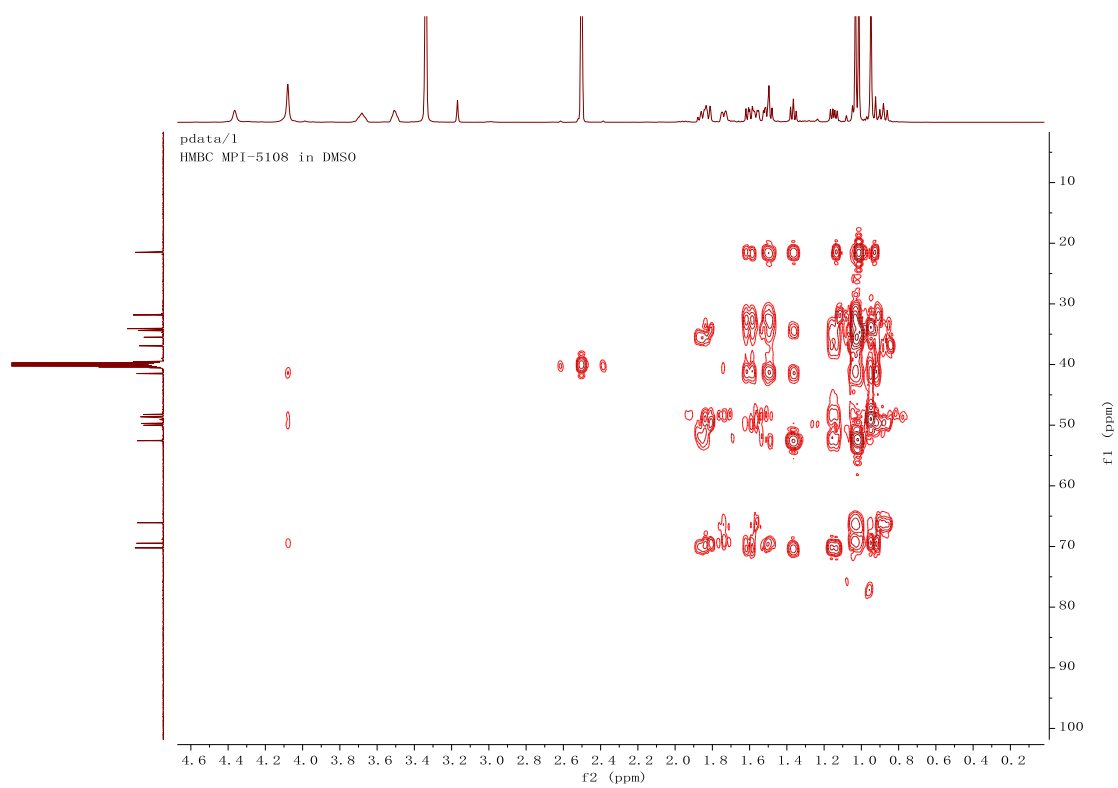


Figure S38. HMBC spectrum of the new compound **4**

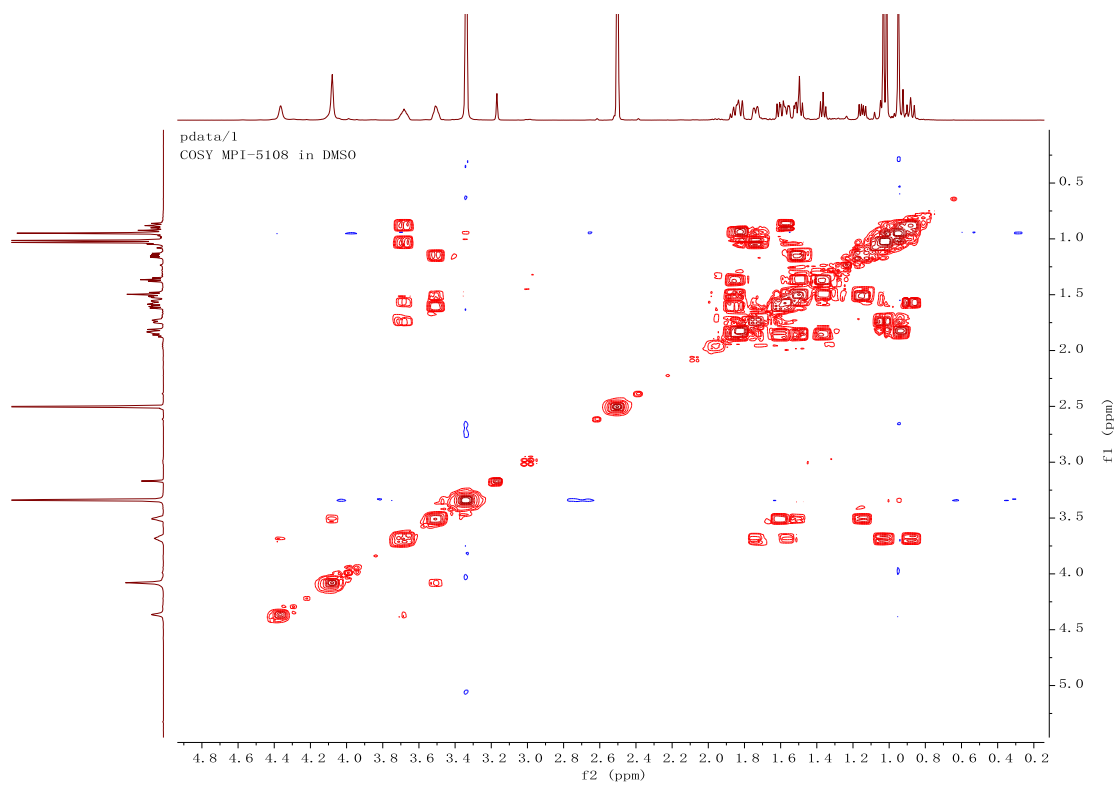


Figure S39. COSY spectrum of the new compound **4**

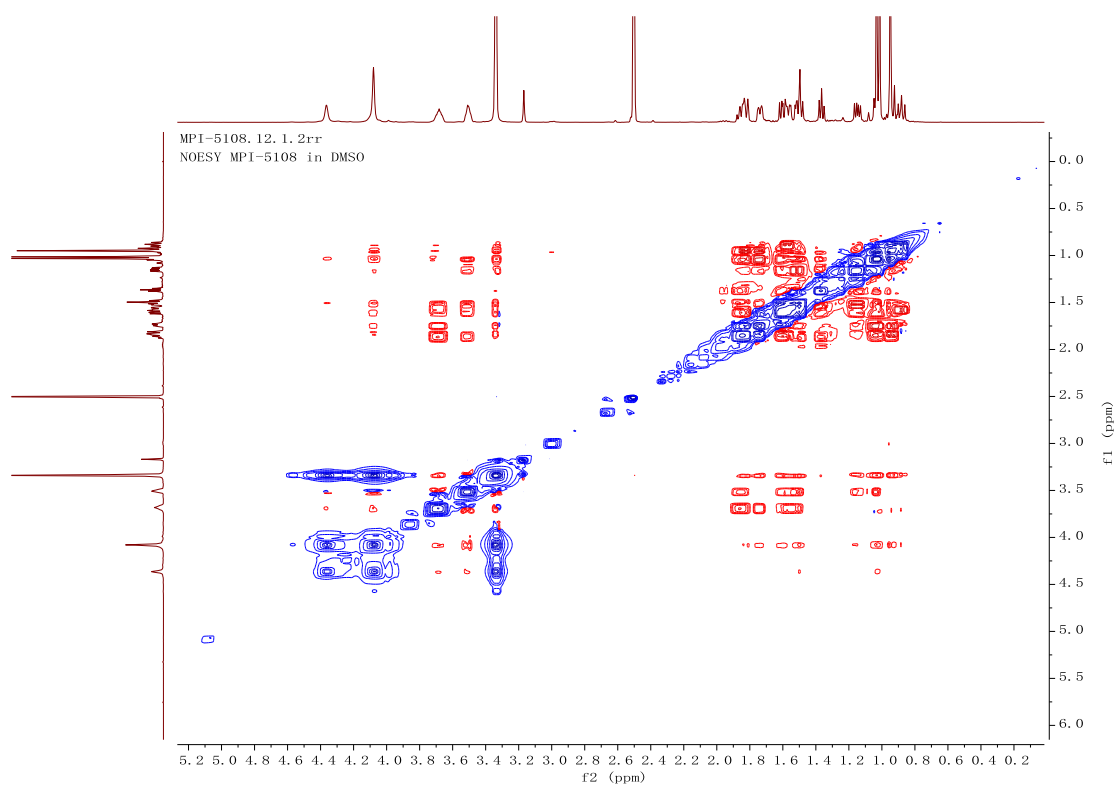


Figure S40. NOESY spectrum of the new compound **4**

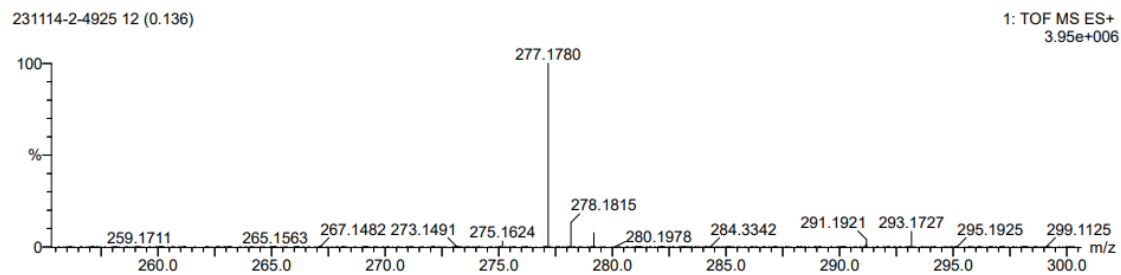


Figure S41. HRESI-MS spectrum of the new compound **13**

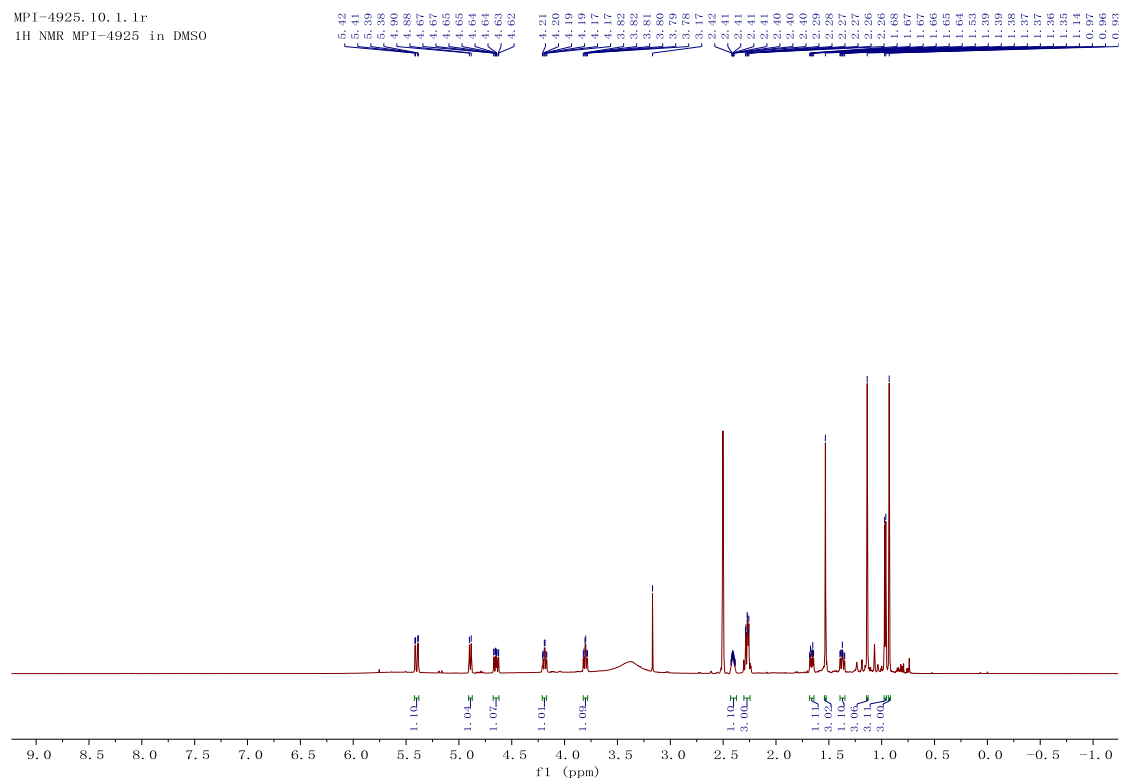


Figure S42. ^1H NMR (600 MHz, $\text{DMSO}-d_6$) spectrum of the new compound **13**

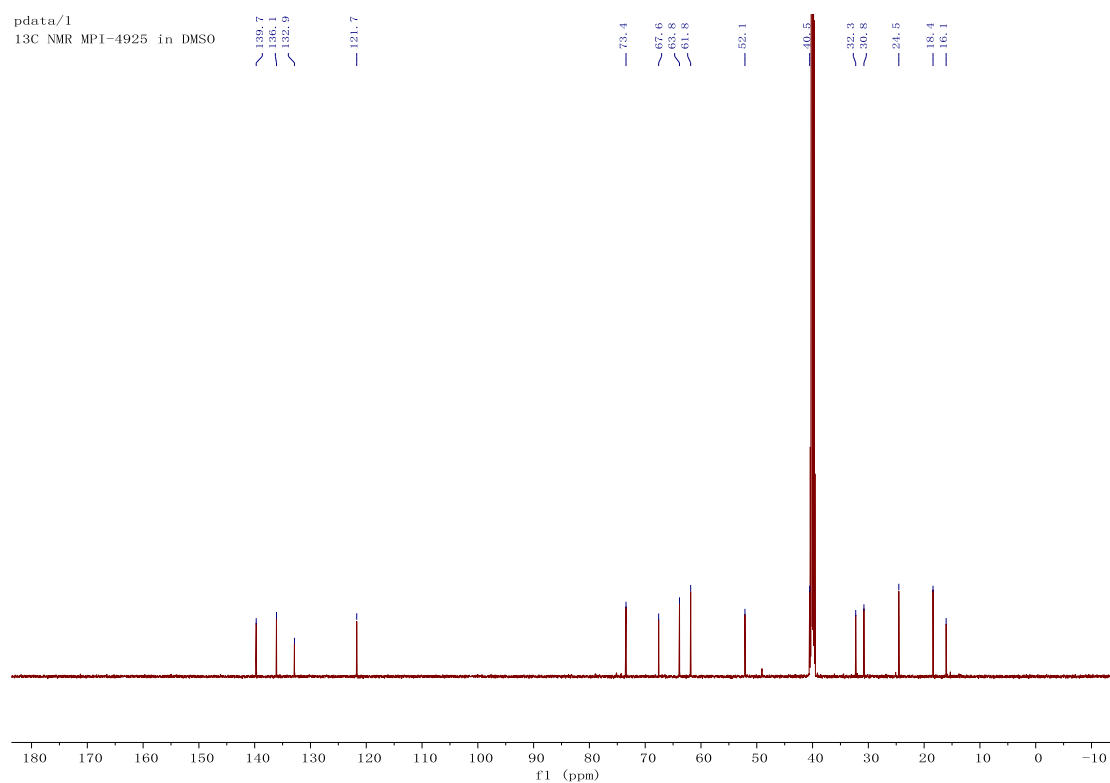


Figure S43. ¹³C NMR (150 MHz, DMSO-*d*₆) spectrum of the new compound **13**

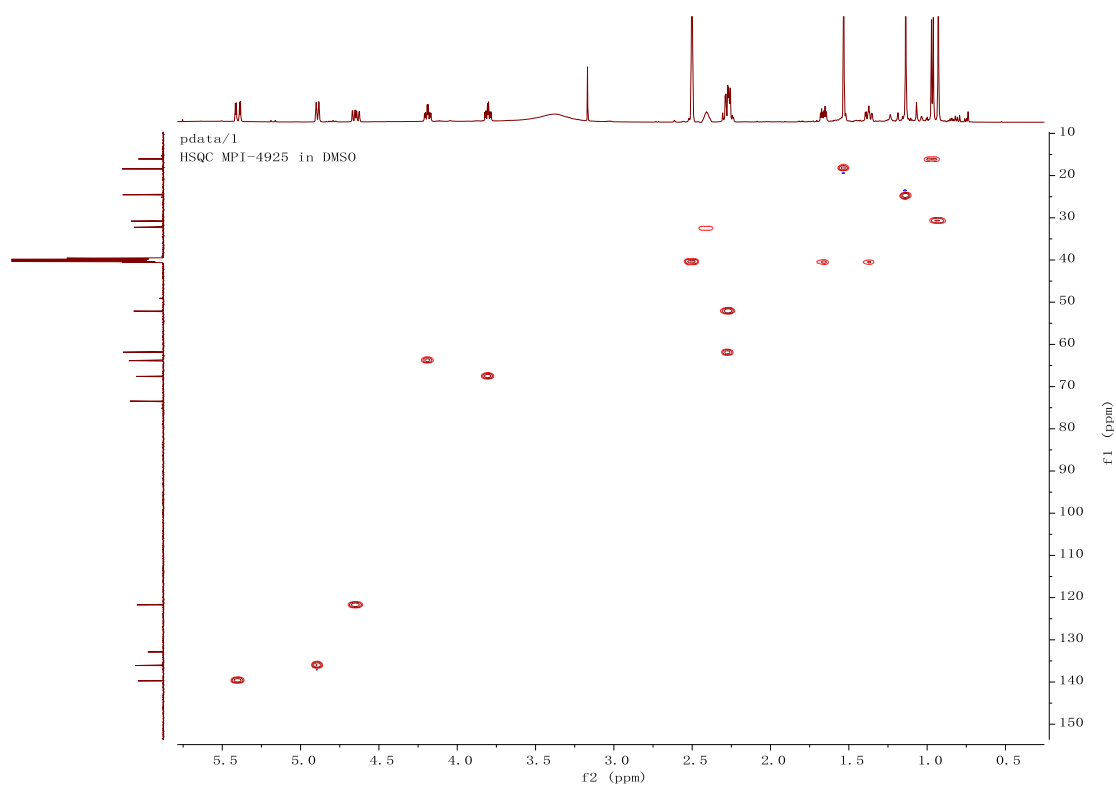


Figure S44. HSQC spectrum of the new compound **13**

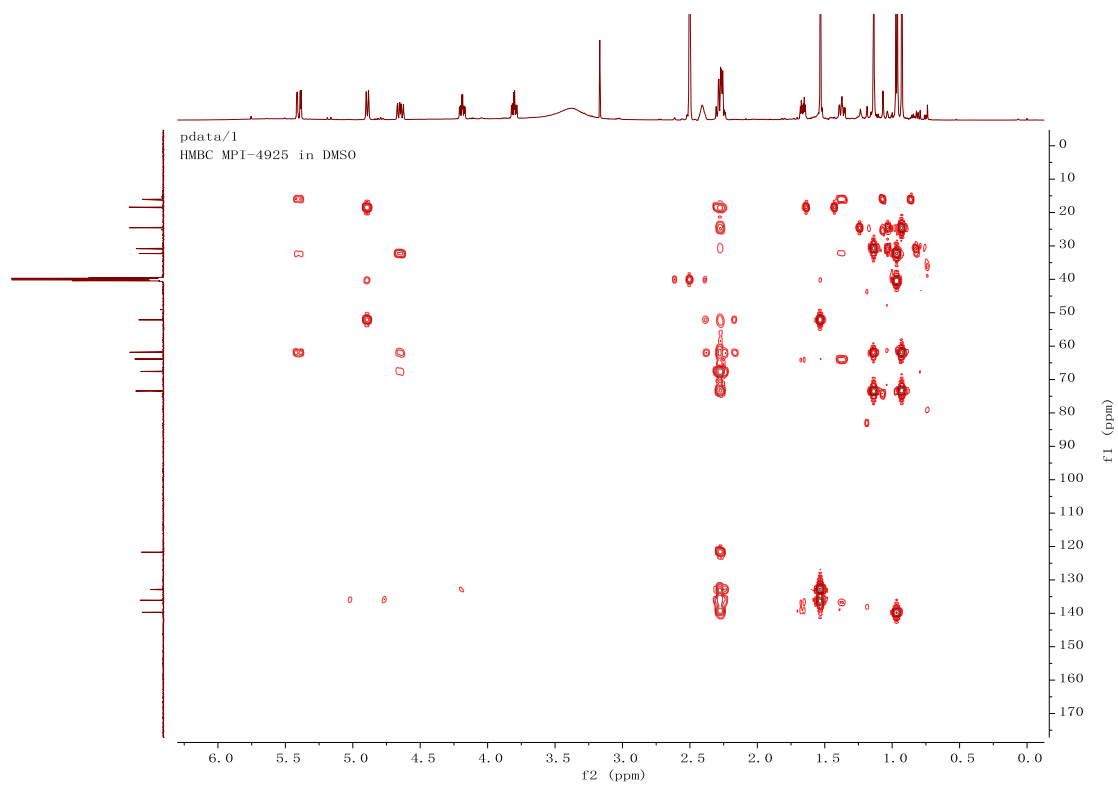


Figure S45. HMBC spectrum of the new compound **13**

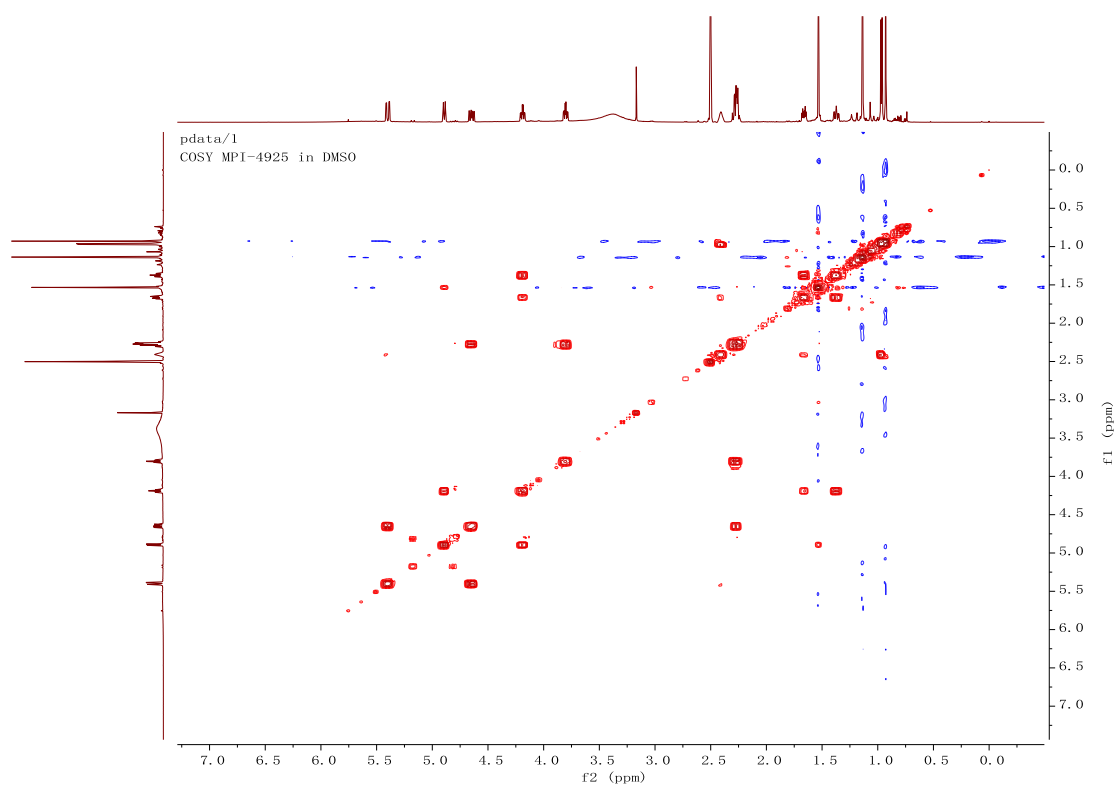


Figure S46. COSY spectrum of the new compound **13**

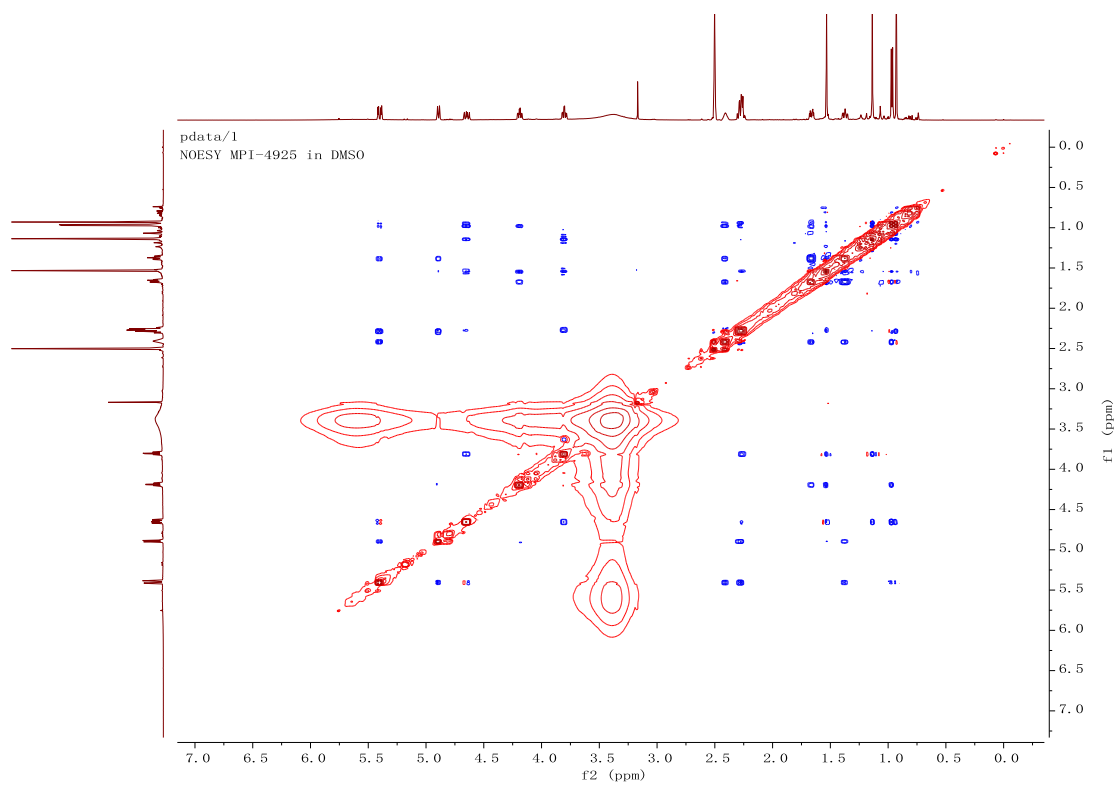


Figure S47. NOESY spectrum of the new compound **13**

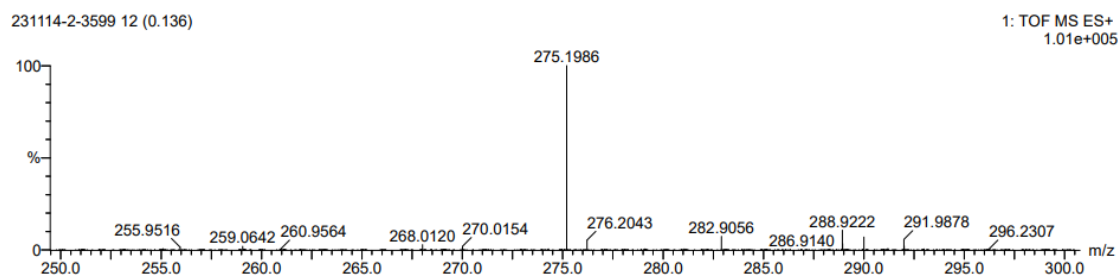


Figure S48. HRESI-MS spectrum of the new compound **14**

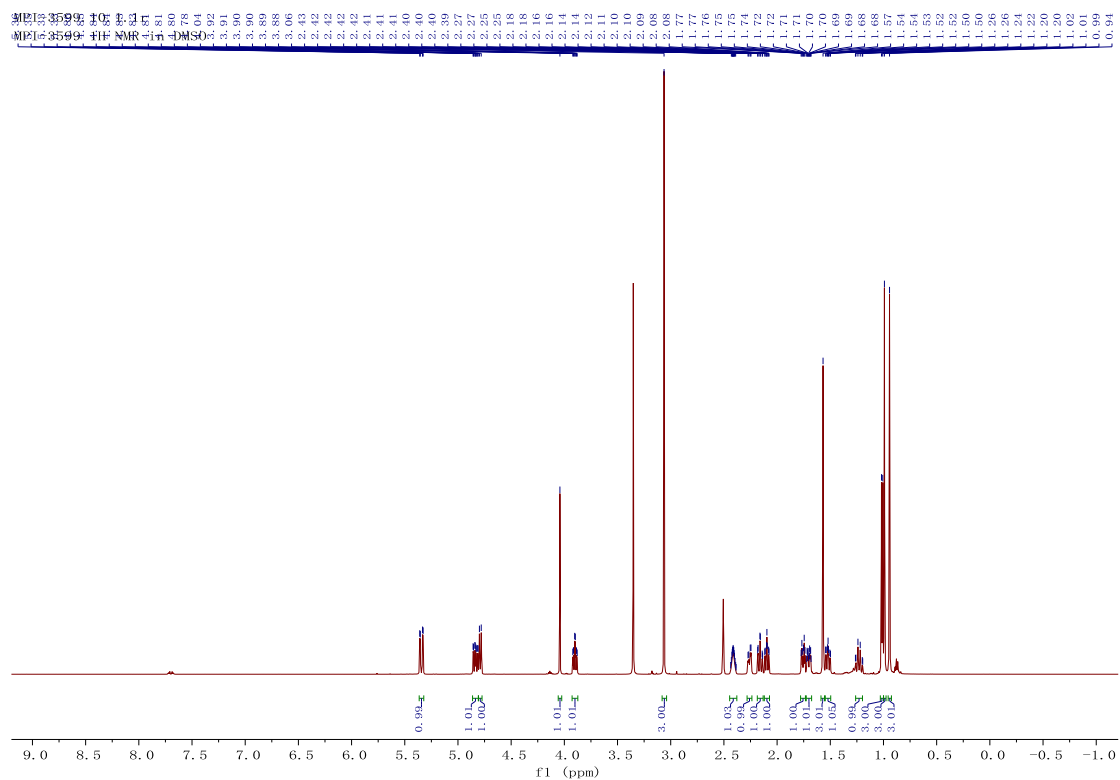


Figure S49. ^1H NMR (600 MHz, $\text{DMSO}-d_6$) spectrum of the new compound **14**

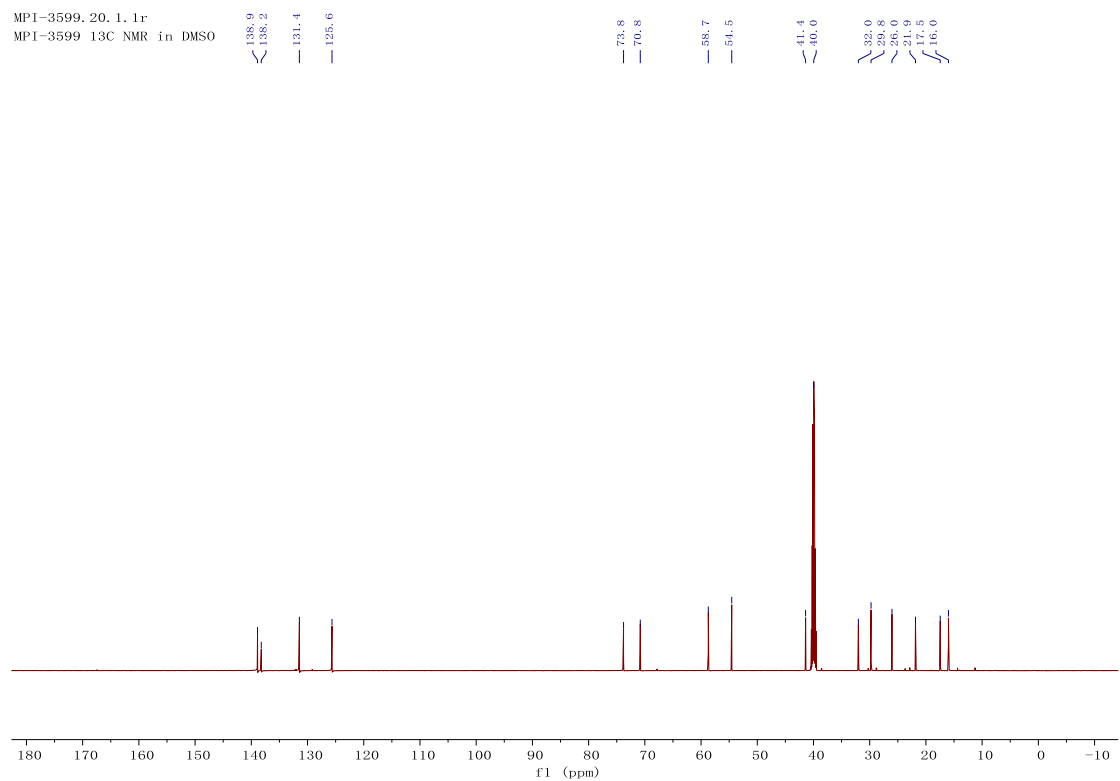


Figure S50. ^{13}C NMR (150 MHz, $\text{DMSO}-d_6$) spectrum of the new compound **14**

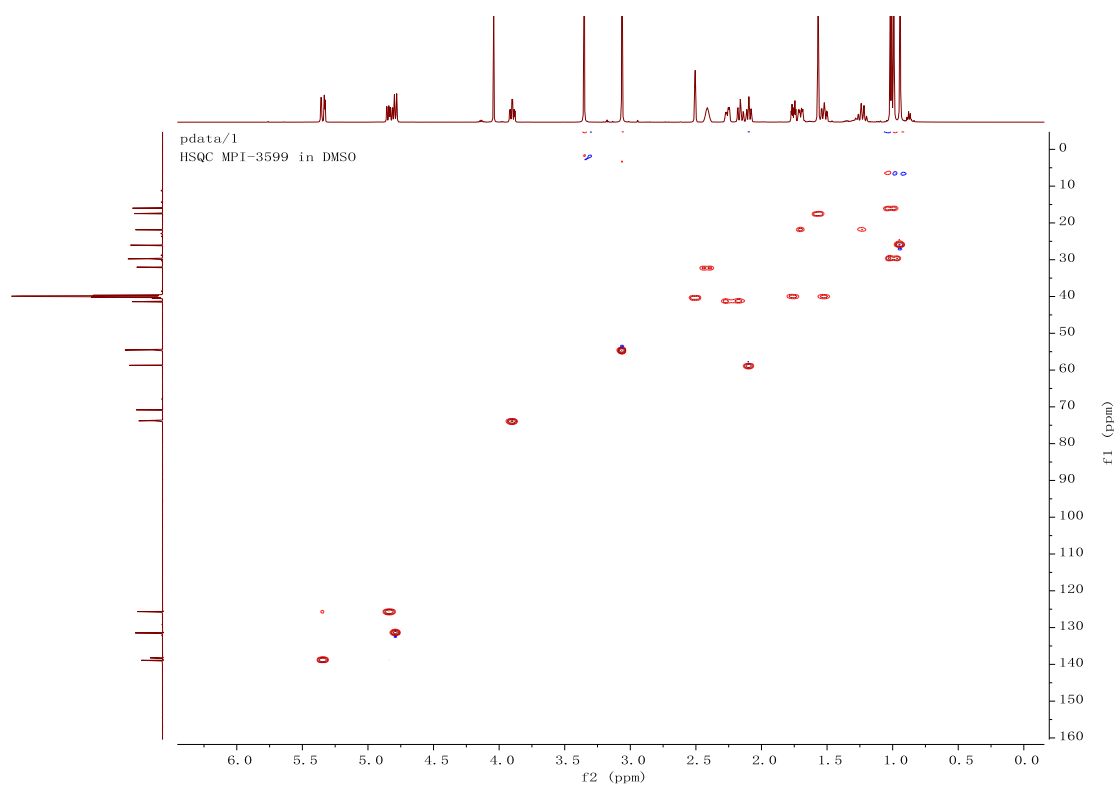


Figure S51. HSQC spectrum of the new compound **14**

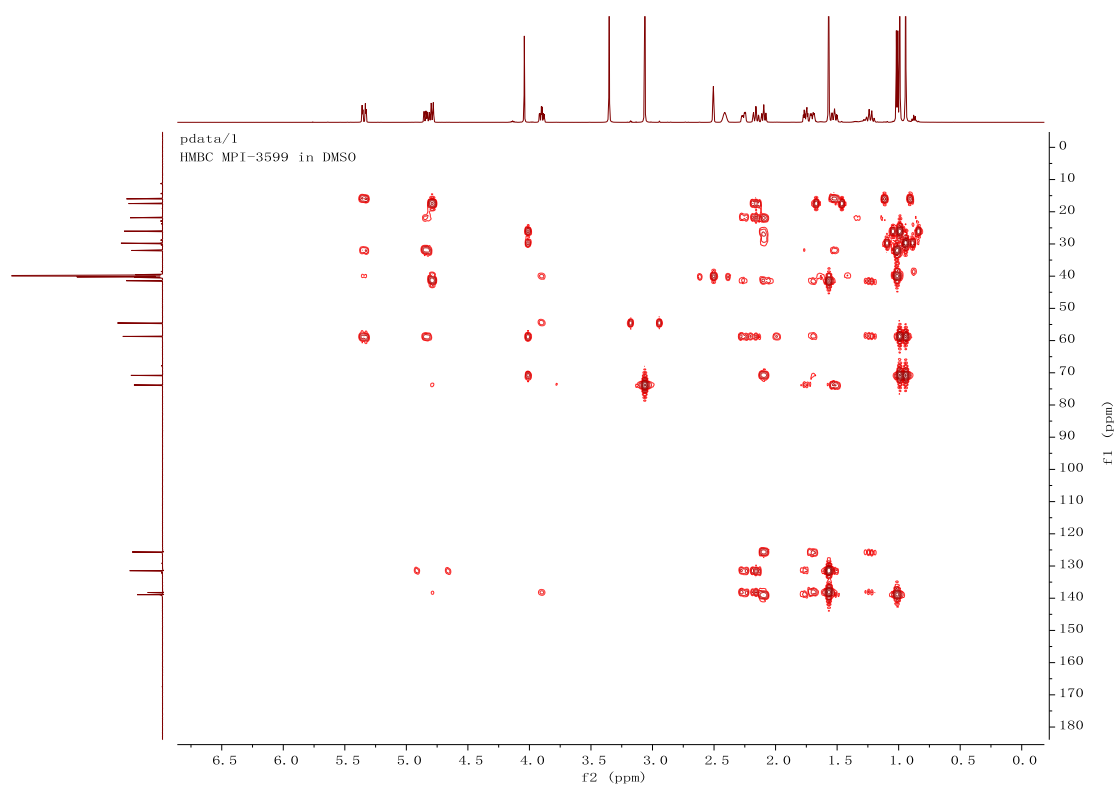


Figure S52. HMBC spectrum of the new compound **14**

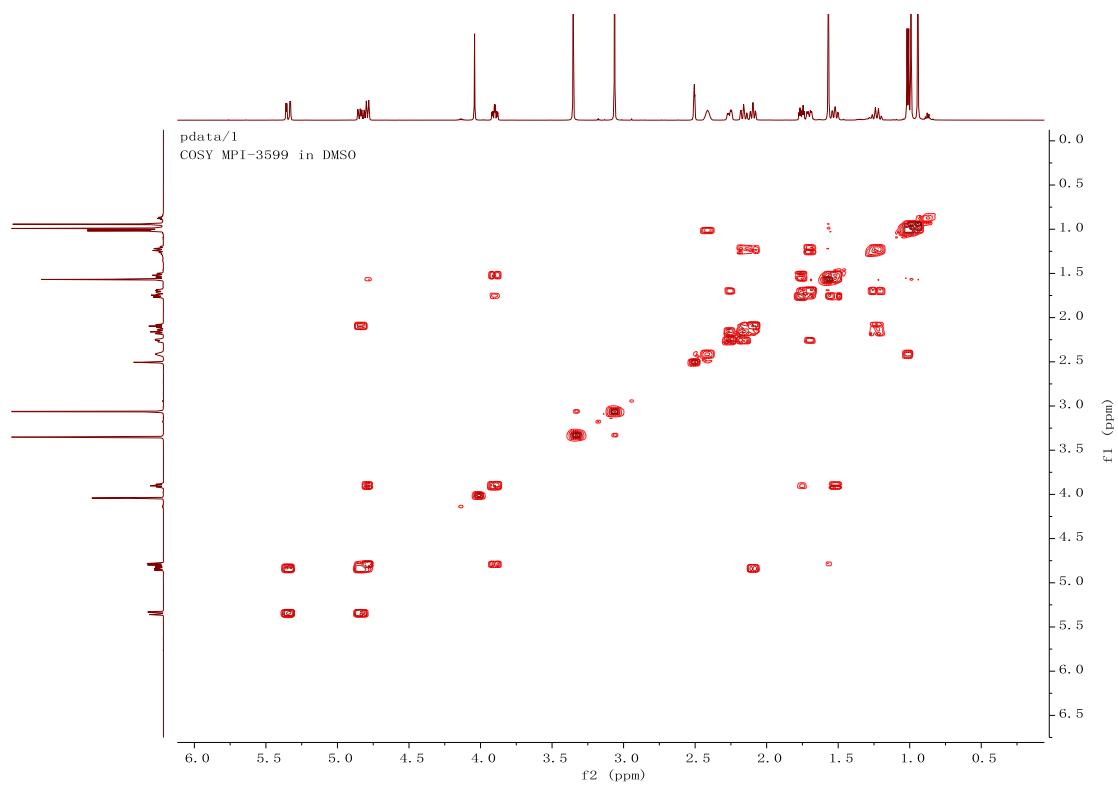


Figure S53. COSY spectrum of the new compound **14**

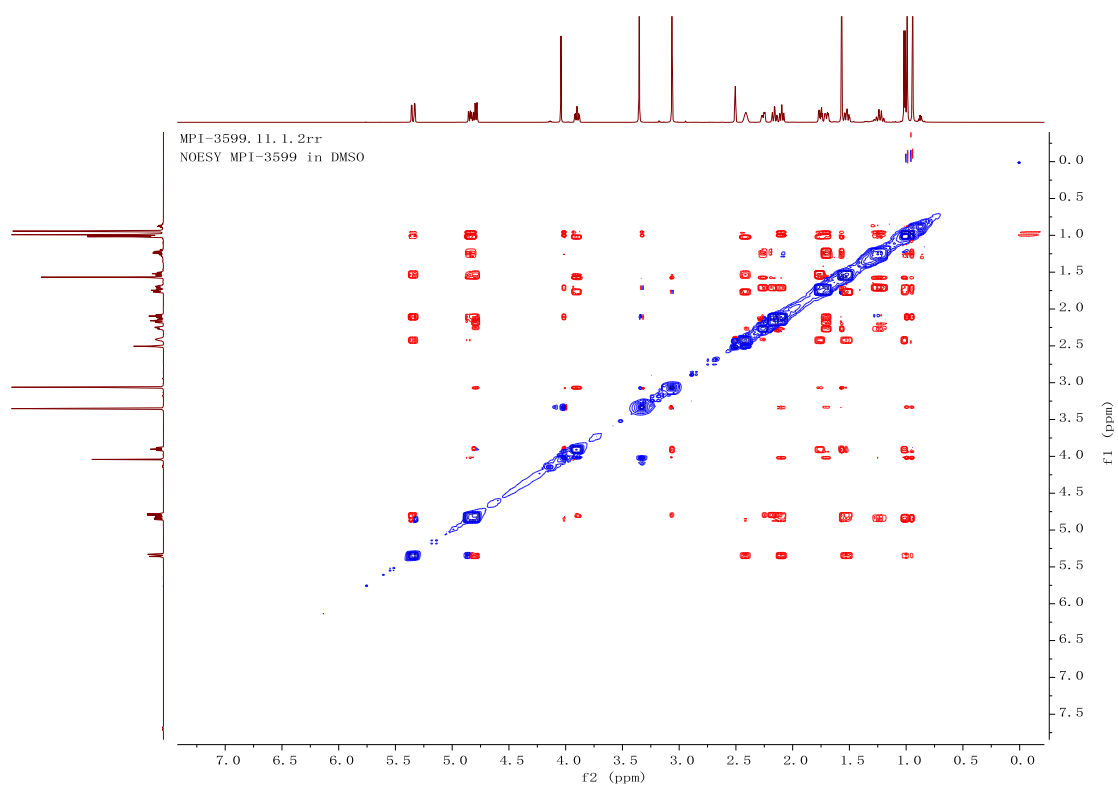


Figure S54. NOESY spectrum of the new compound **14**

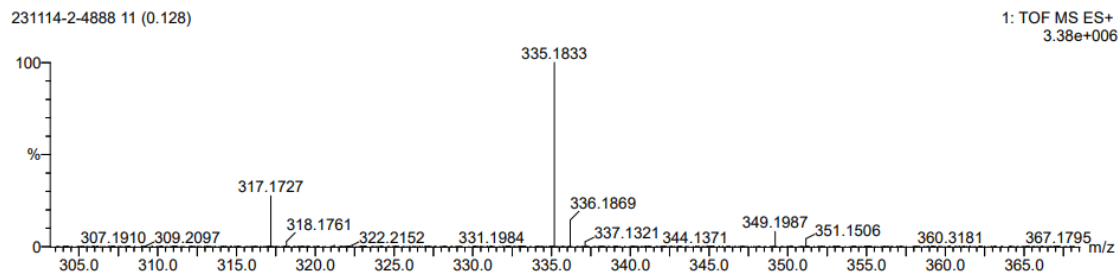


Figure S55. HRESI-MS spectrum of the new compound **15**

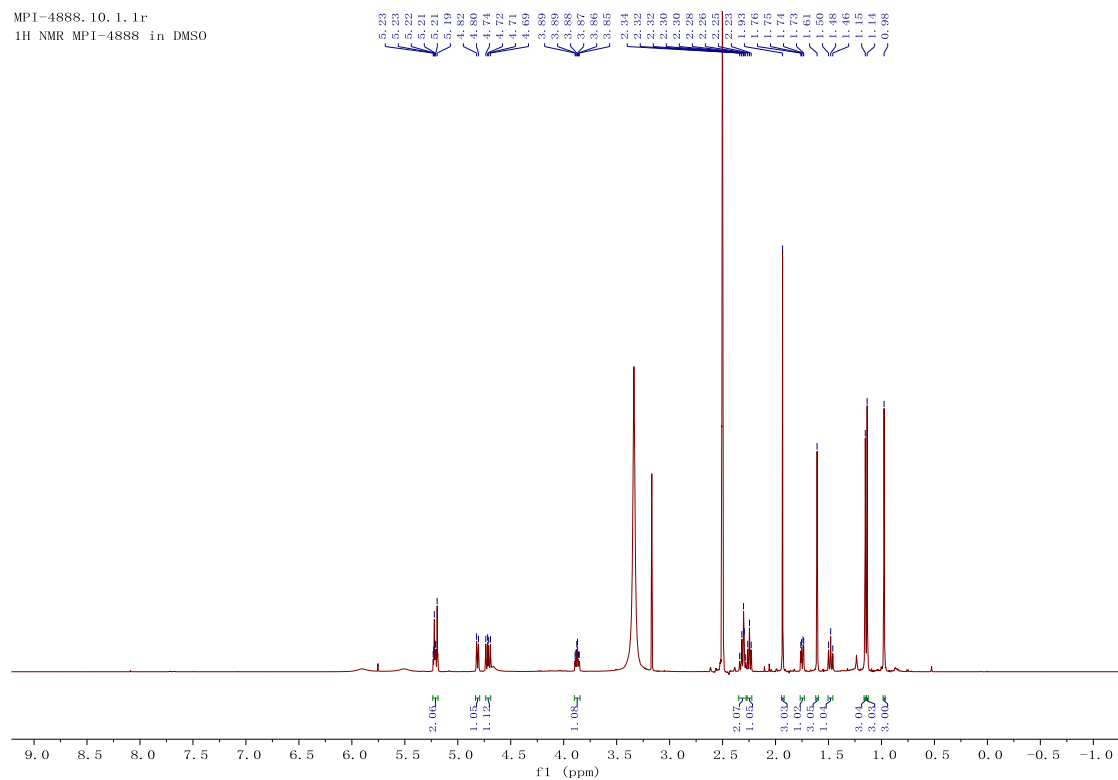


Figure S56. ^1H NMR (600 MHz, $\text{DMSO}-d_6$) spectrum of the new compound **15**

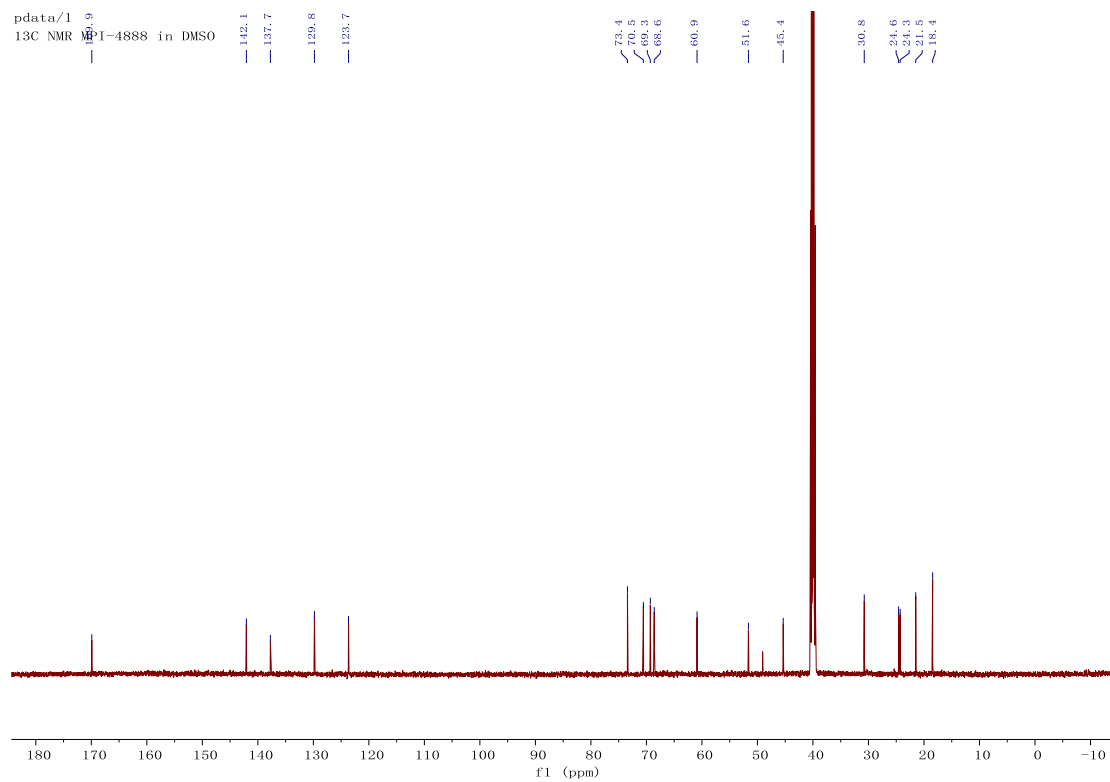


Figure S57. ^{13}C NMR (150 MHz, $\text{DMSO-}d_6$) spectrum of the new compound **15**

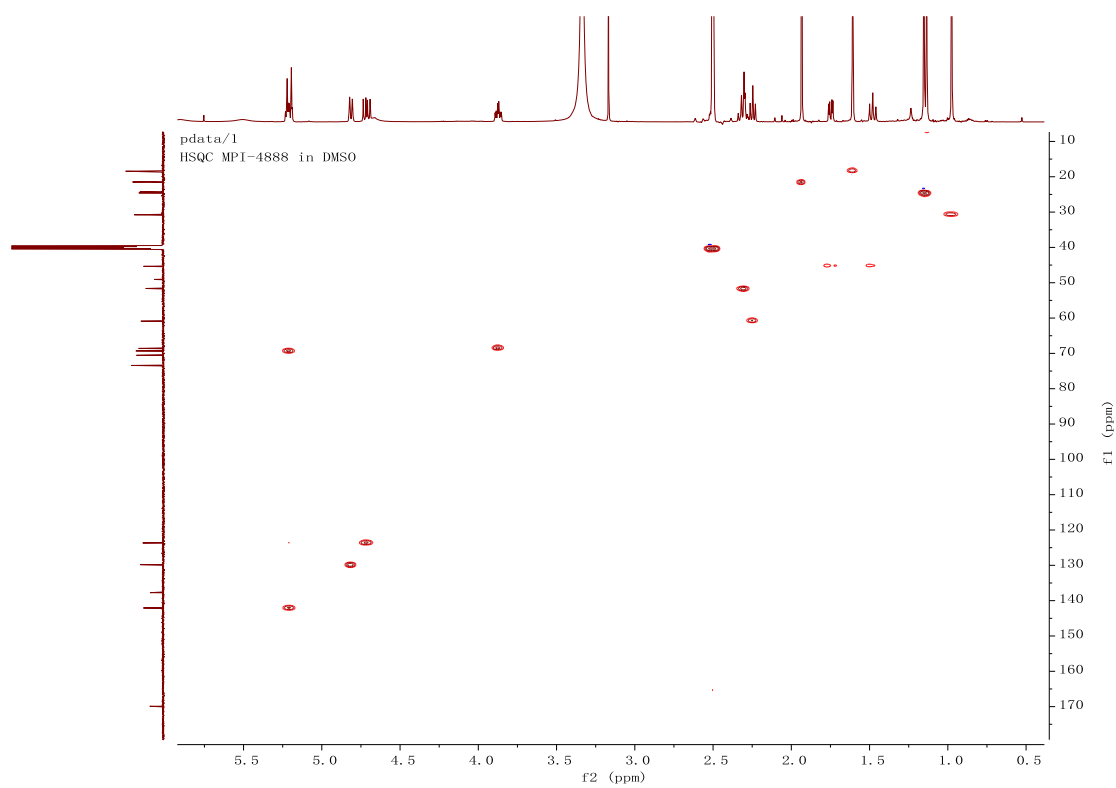


Figure S58. HSQC spectrum of the new compound **15**

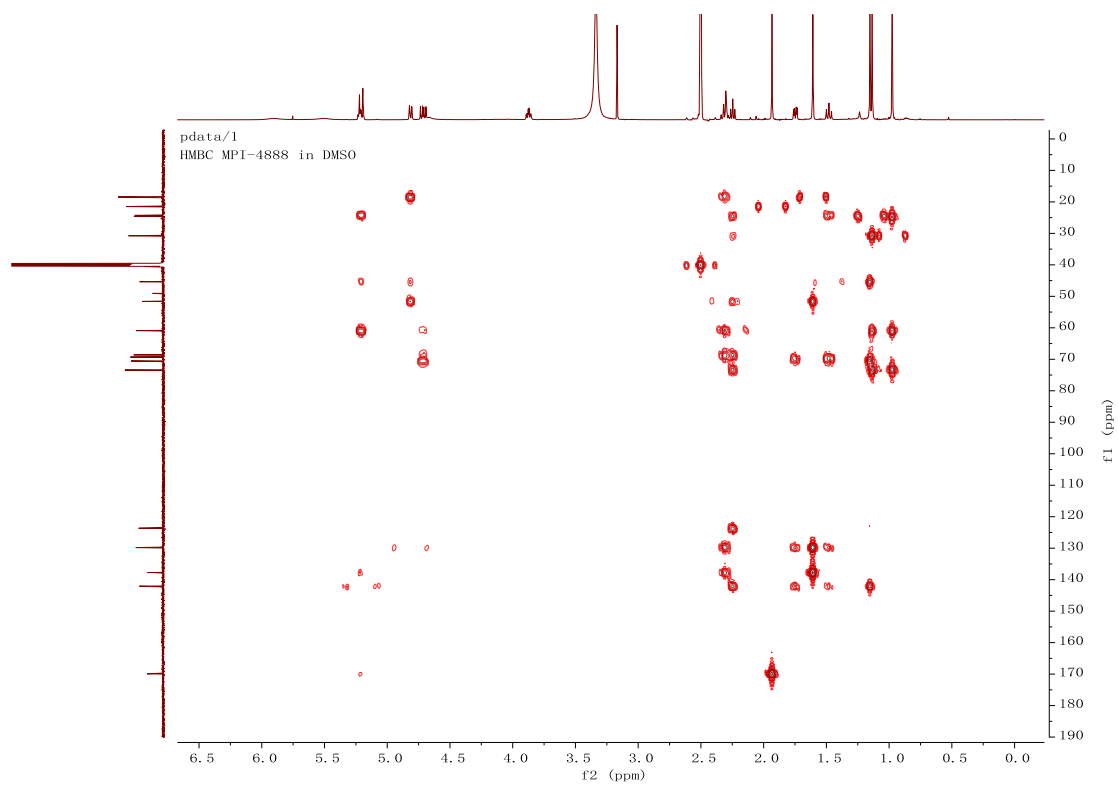


Figure S59. HMBC spectrum of the new compound **15**

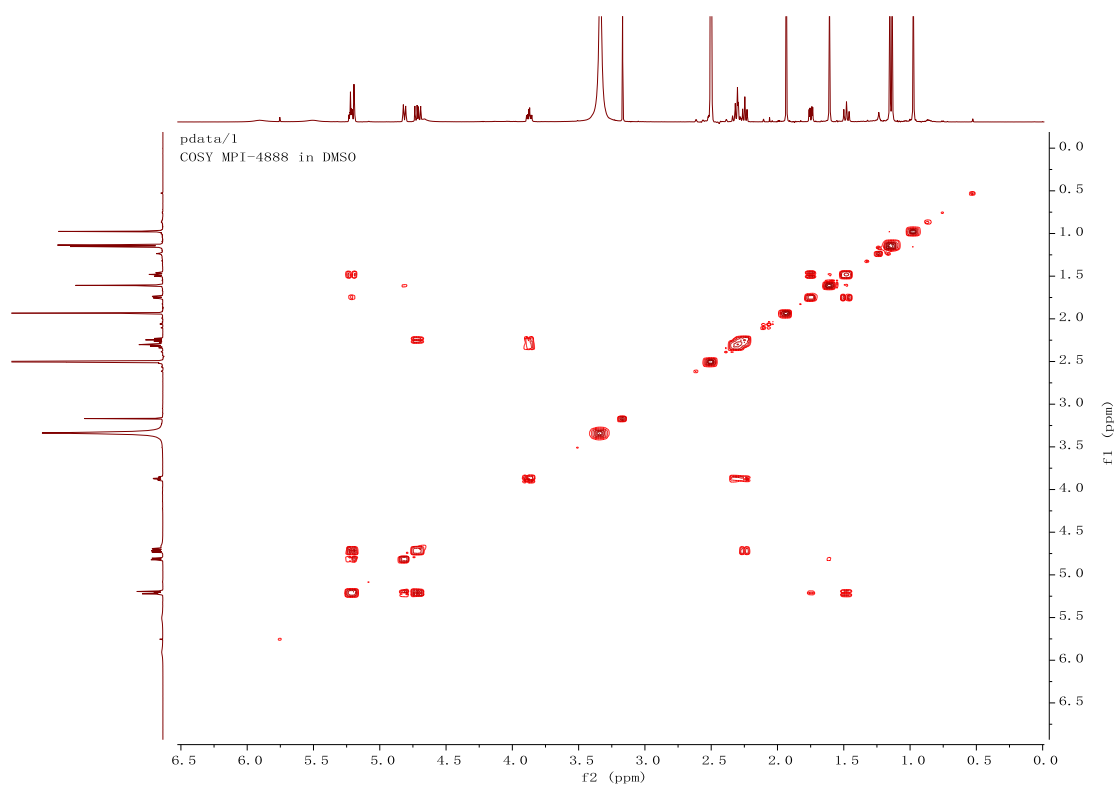


Figure S60. COSY spectrum of the new compound **15**

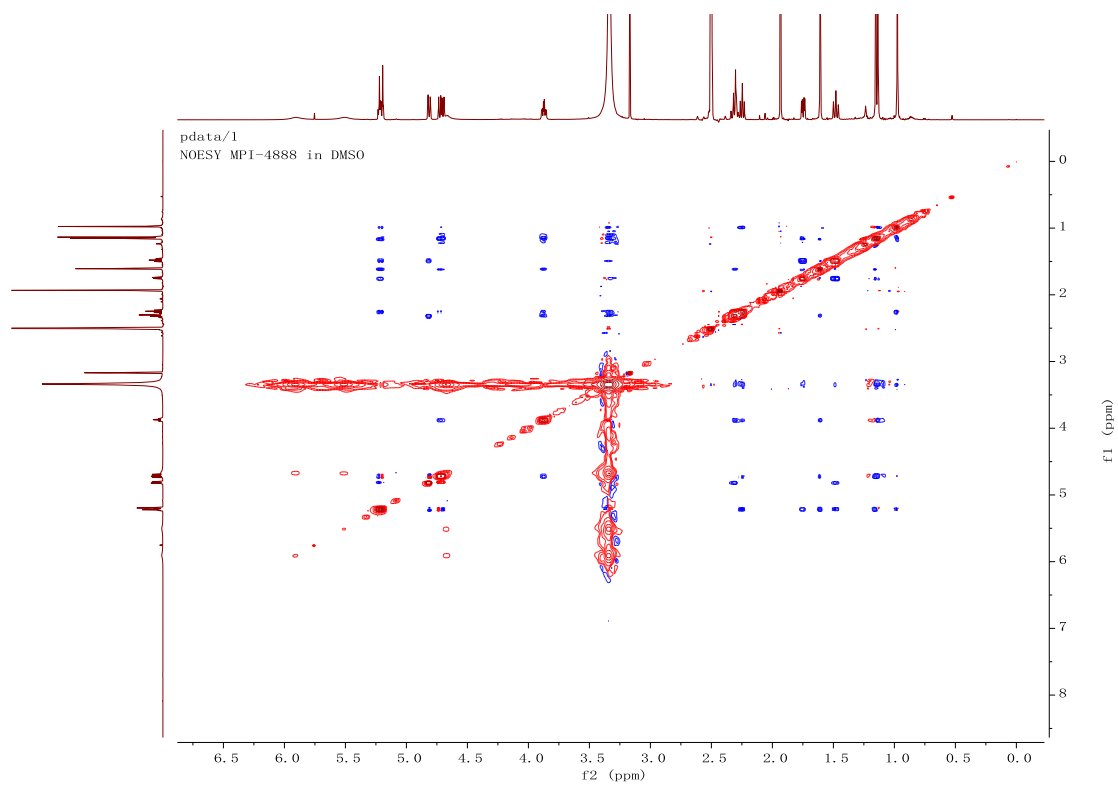


Figure S61. NOESY spectrum of the new compound **15**

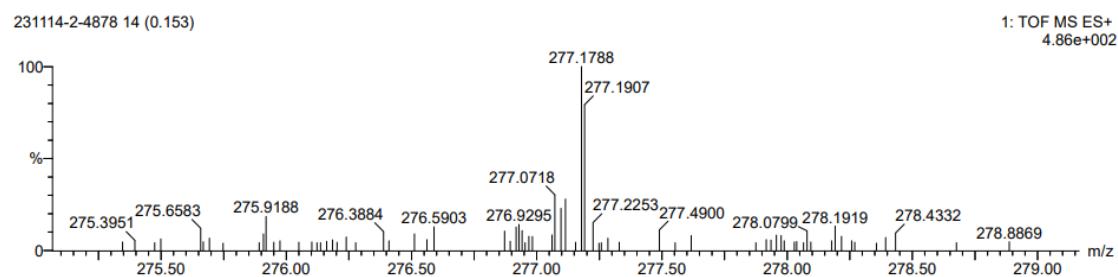


Figure S62. HRESI-MS spectrum of the new compound **17**

MPI-4878.10.1.1r
1H NMR MPI-4878 in DMSO

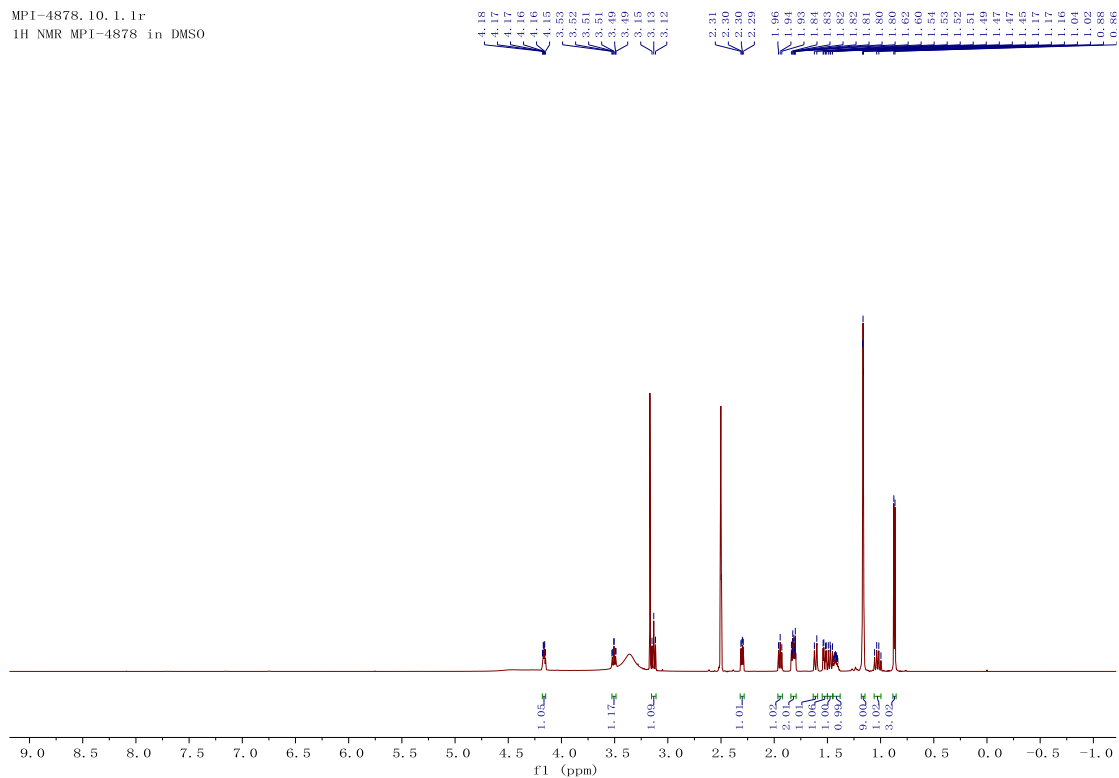


Figure S63. ^1H NMR (600 MHz, $\text{DMSO}-d_6$) spectrum of the new compound **17**

pdata/1
13C NMR MPI-4878 in DMSO

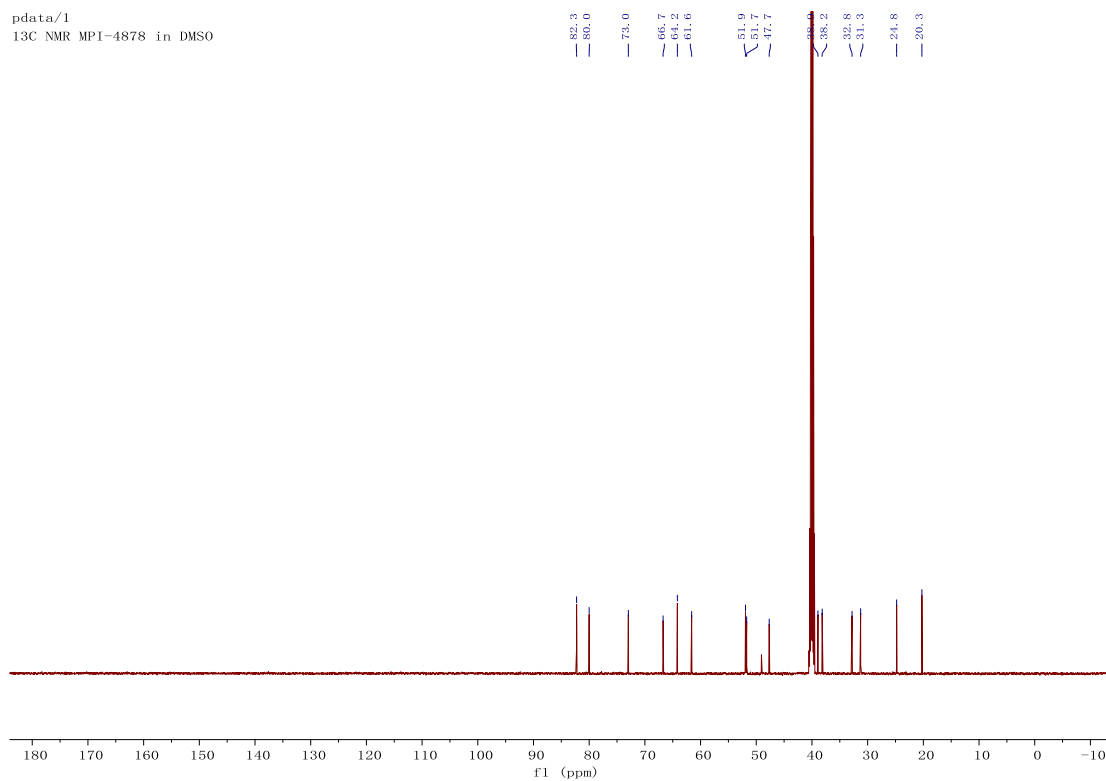


Figure S64. ^{13}C NMR (150 MHz, $\text{DMSO}-d_6$) spectrum of the new compound **17**

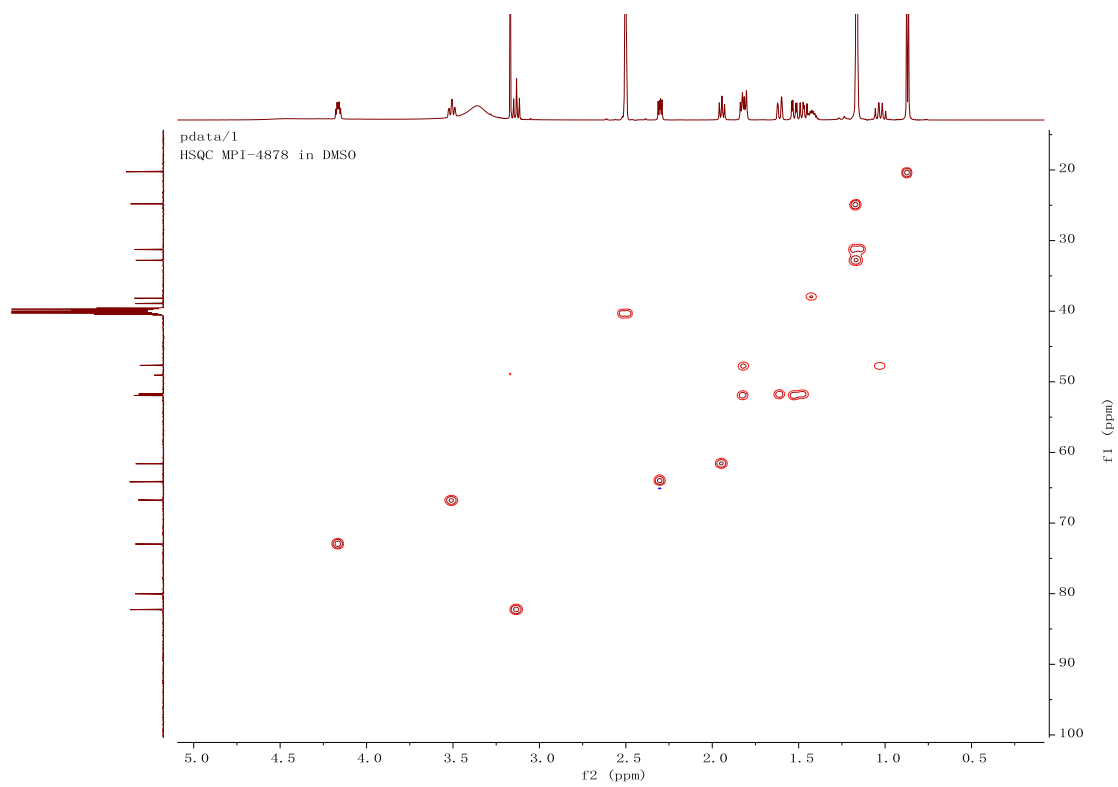


Figure S65. HSQC spectrum of the new compound **17**

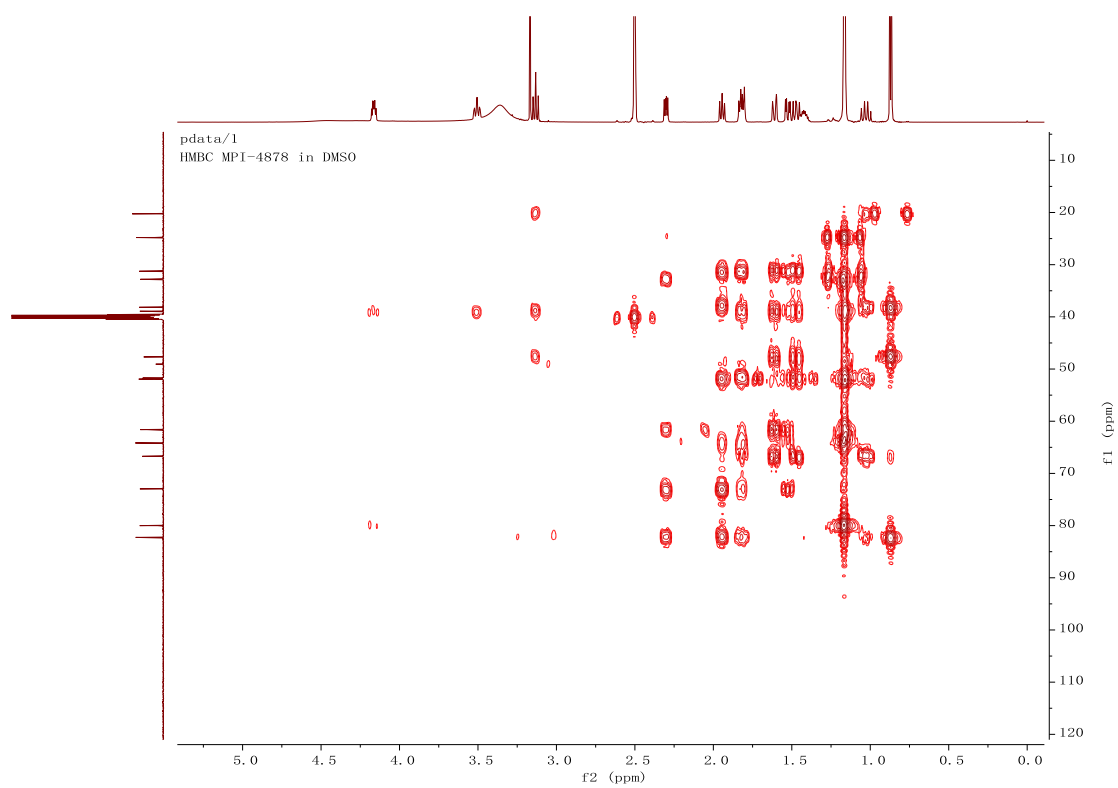


Figure S66. HMBC spectrum of the new compound **17**

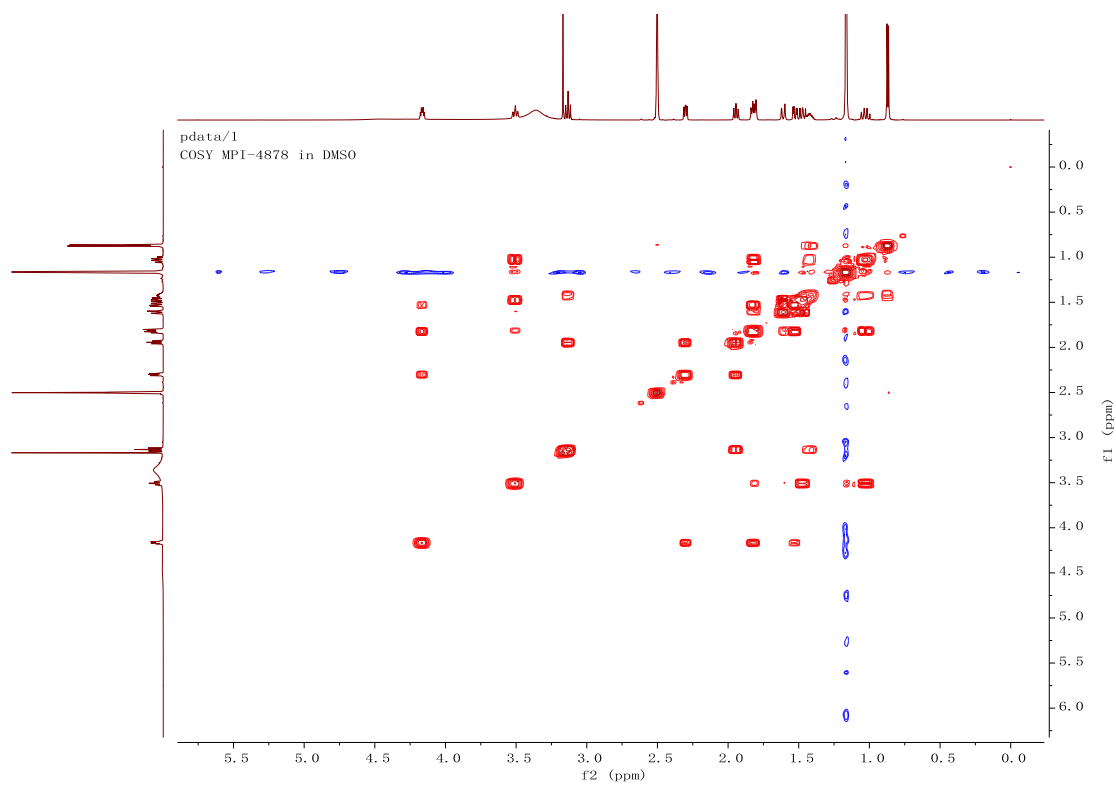


Figure S67. COSY spectrum of the new compound **17**

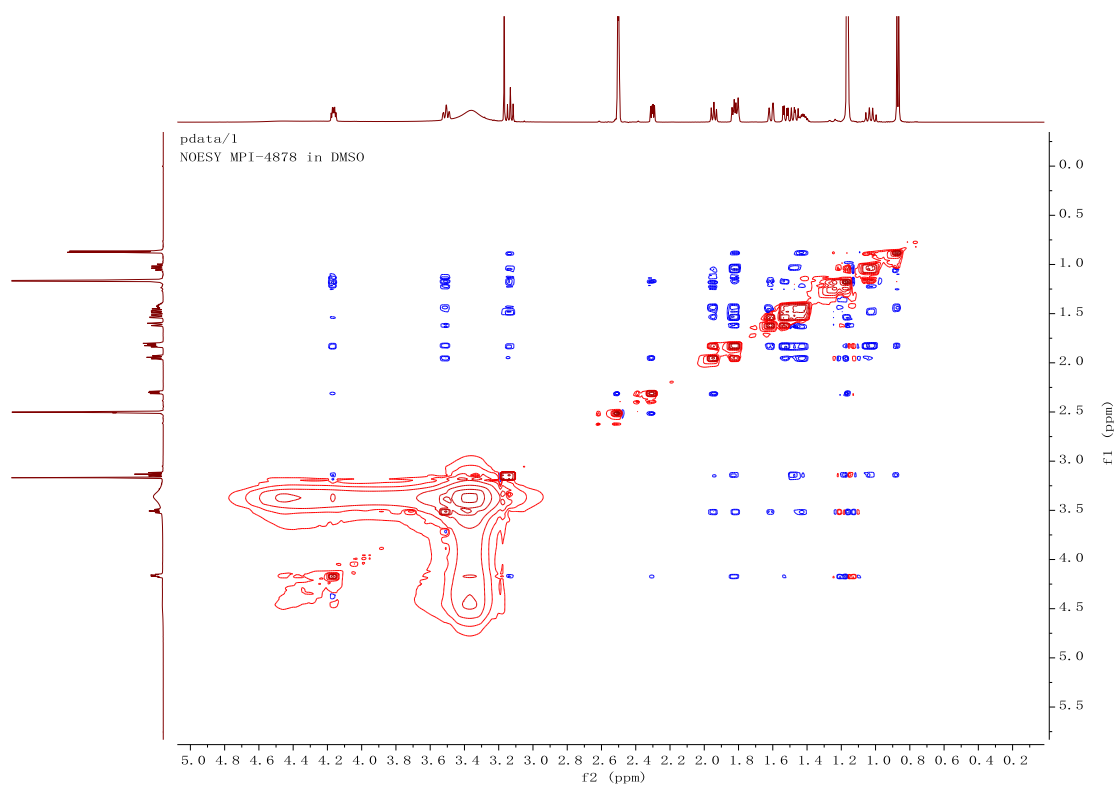


Figure S68. NOESY spectrum of the new compound **17**

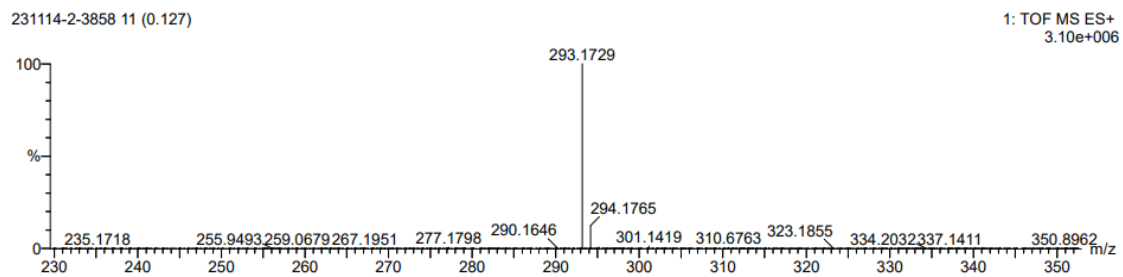


Figure S69. HRESI-MS spectrum of the new compound **18**

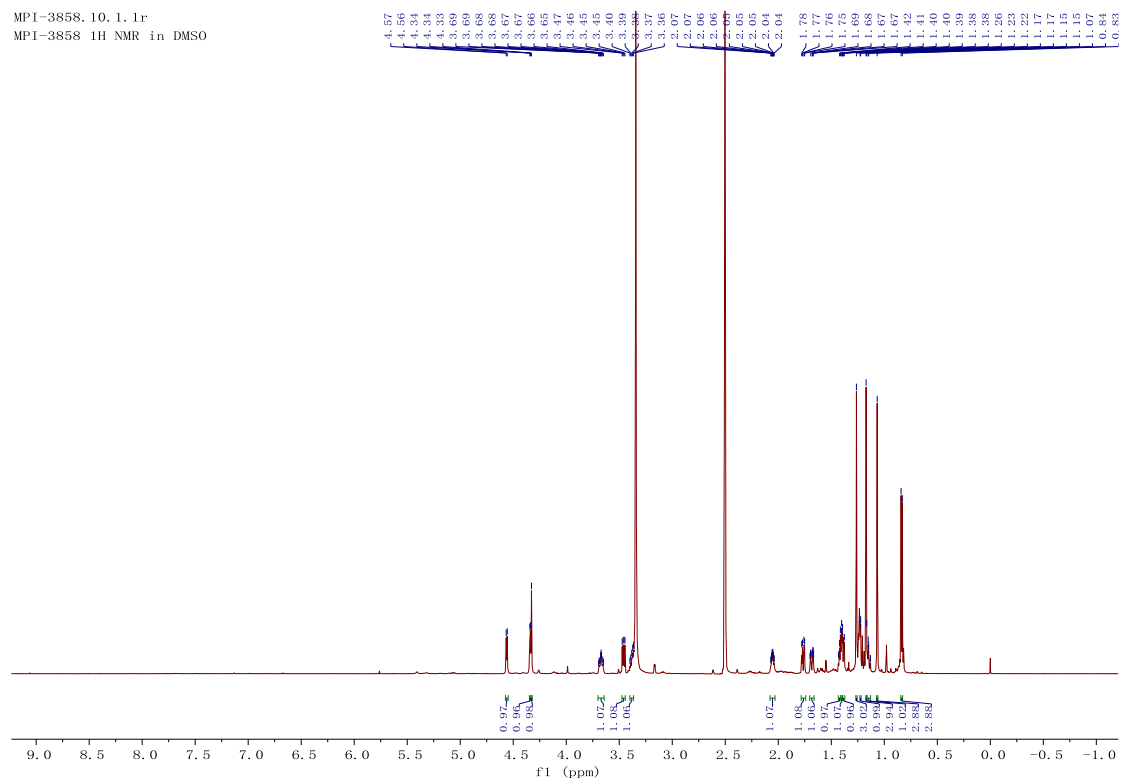


Figure S70. ¹H NMR (600 MHz, DMSO-*d*₆) spectrum of the new compound **18**

MPI-3858.20.1.1r
MPI-3858 ¹³C NMR in DMSO

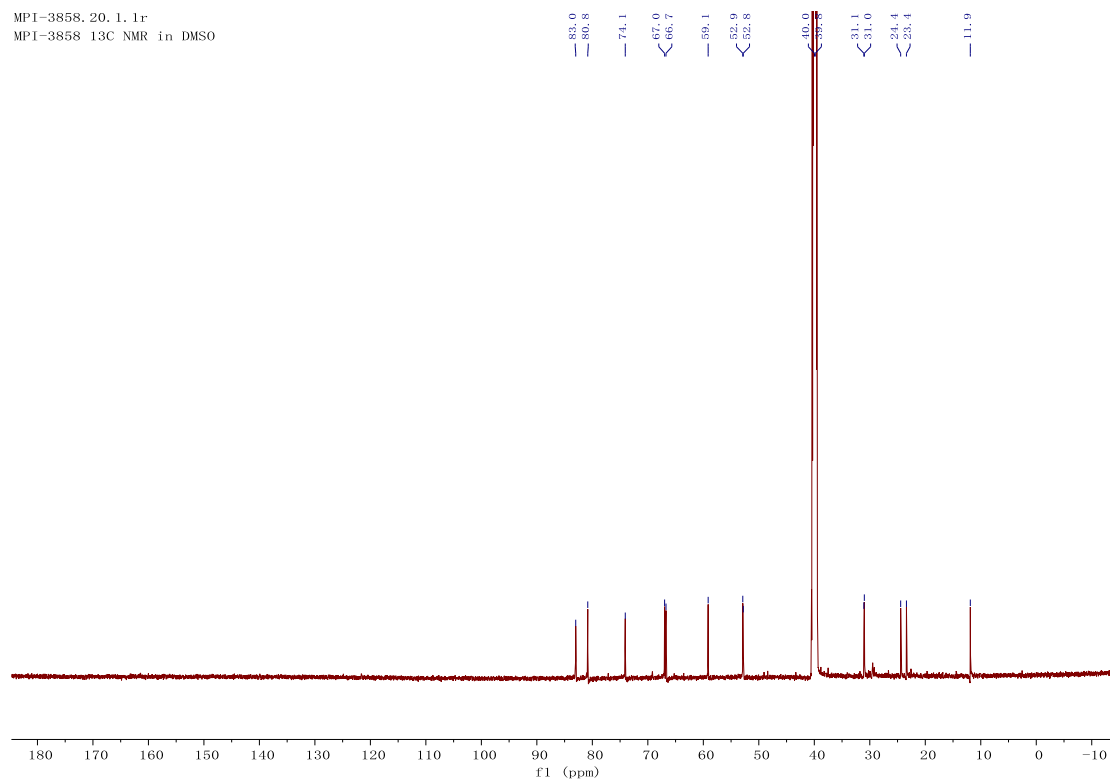


Figure S71. ¹³C NMR (150 MHz, DMSO-*d*₆) spectrum of the new compound **18**

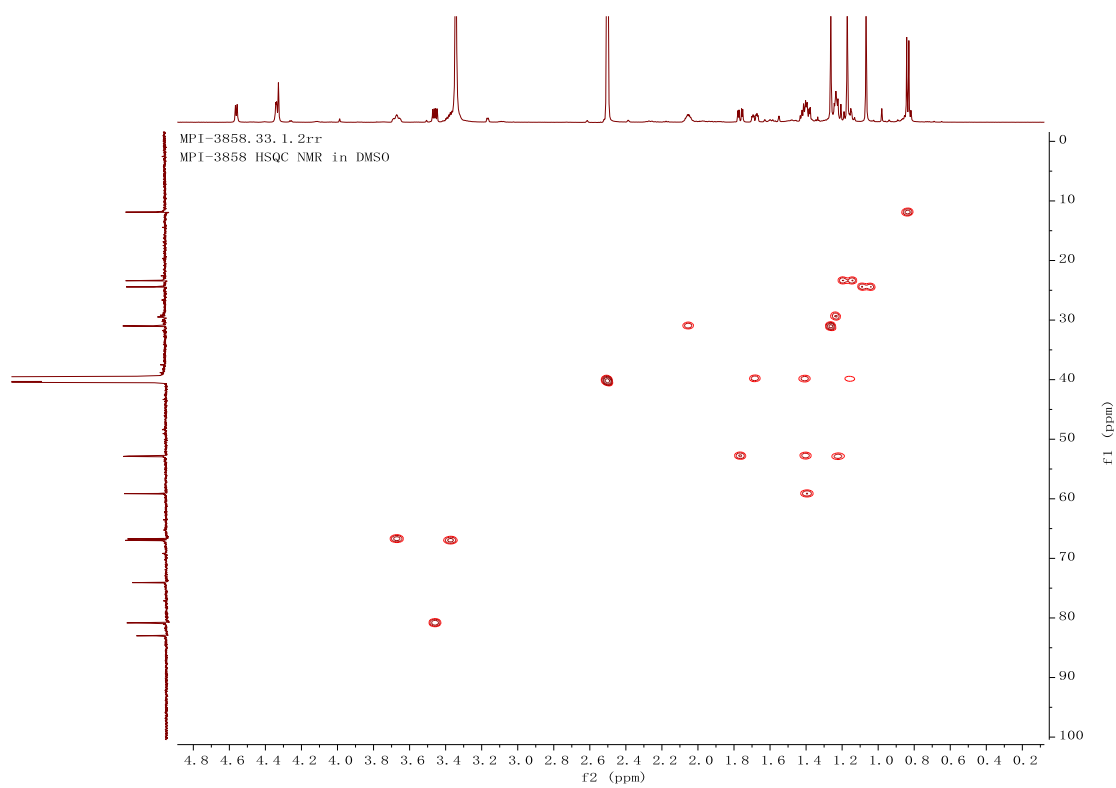


Figure S72. HSQC spectrum of the new compound **18**

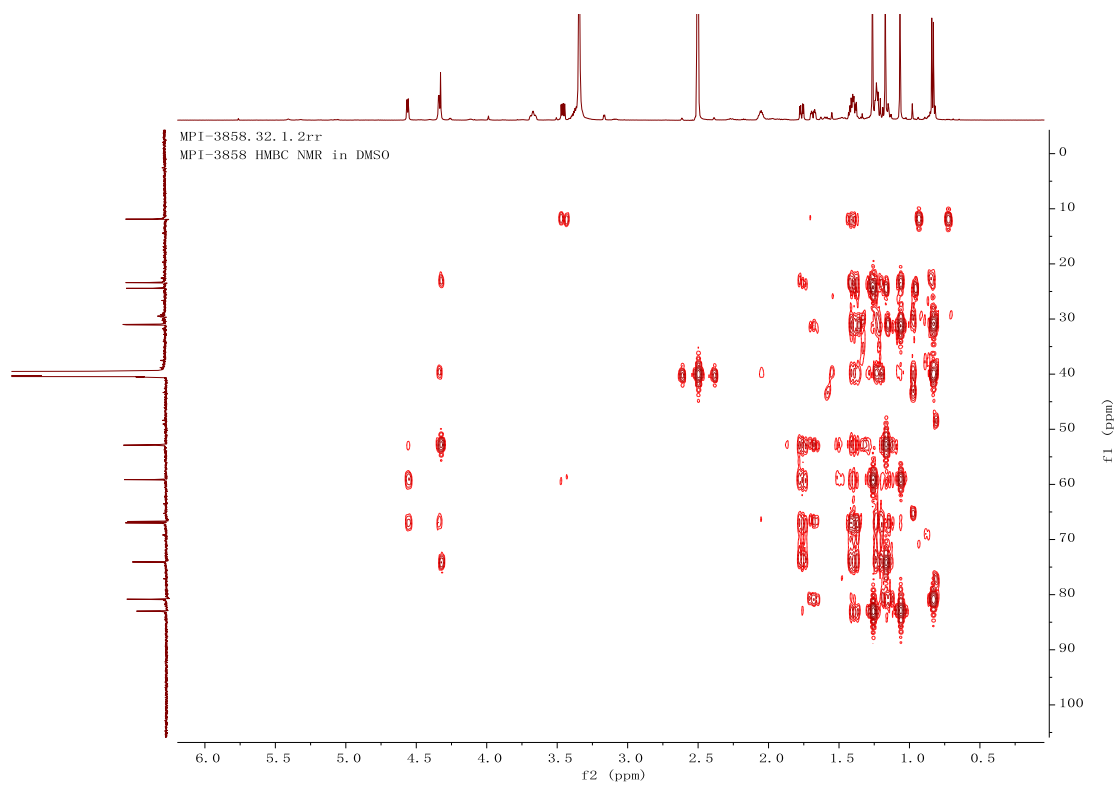


Figure S73. HMBC spectrum of the new compound **18**

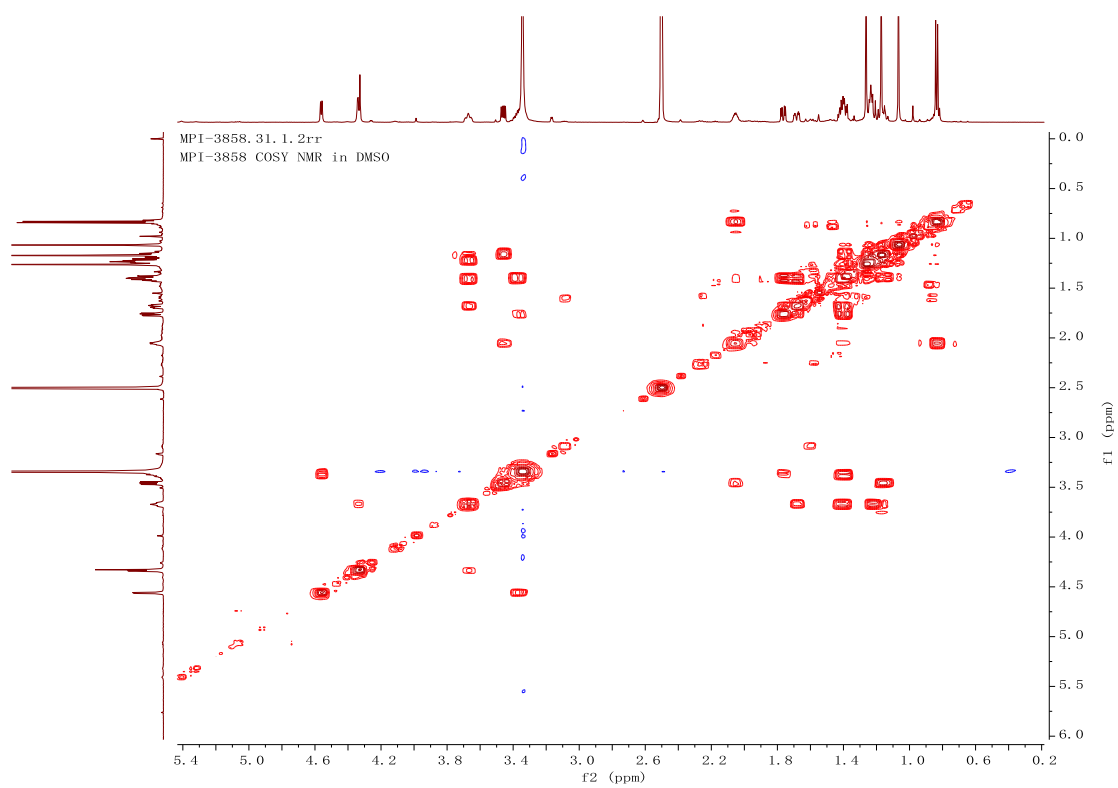


Figure S74. COSY spectrum of the new compound **18**

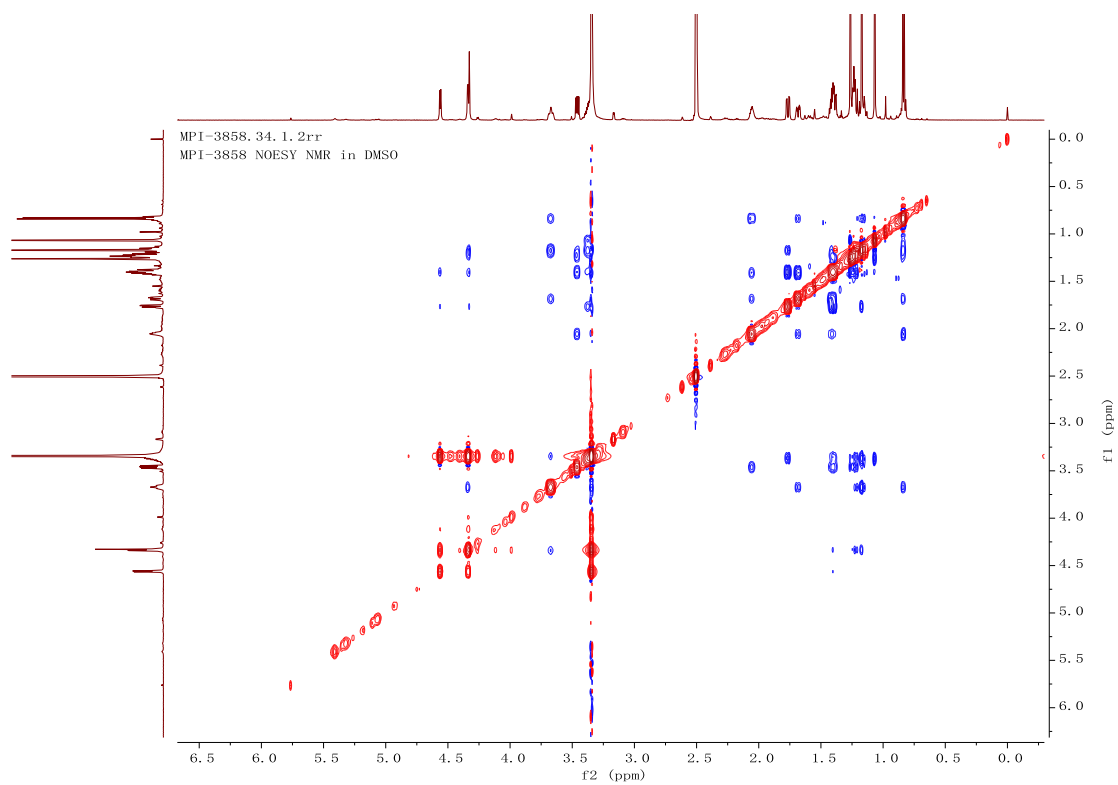


Figure S75. NOESY spectrum of the new compound **18**

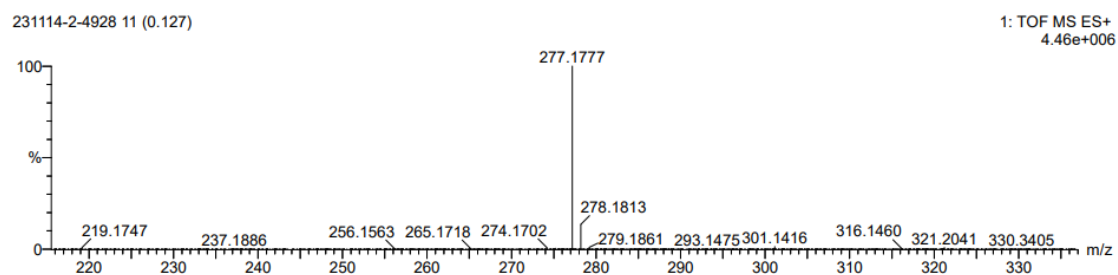


Figure S76. HRESI-MS spectrum of the new compound **22**

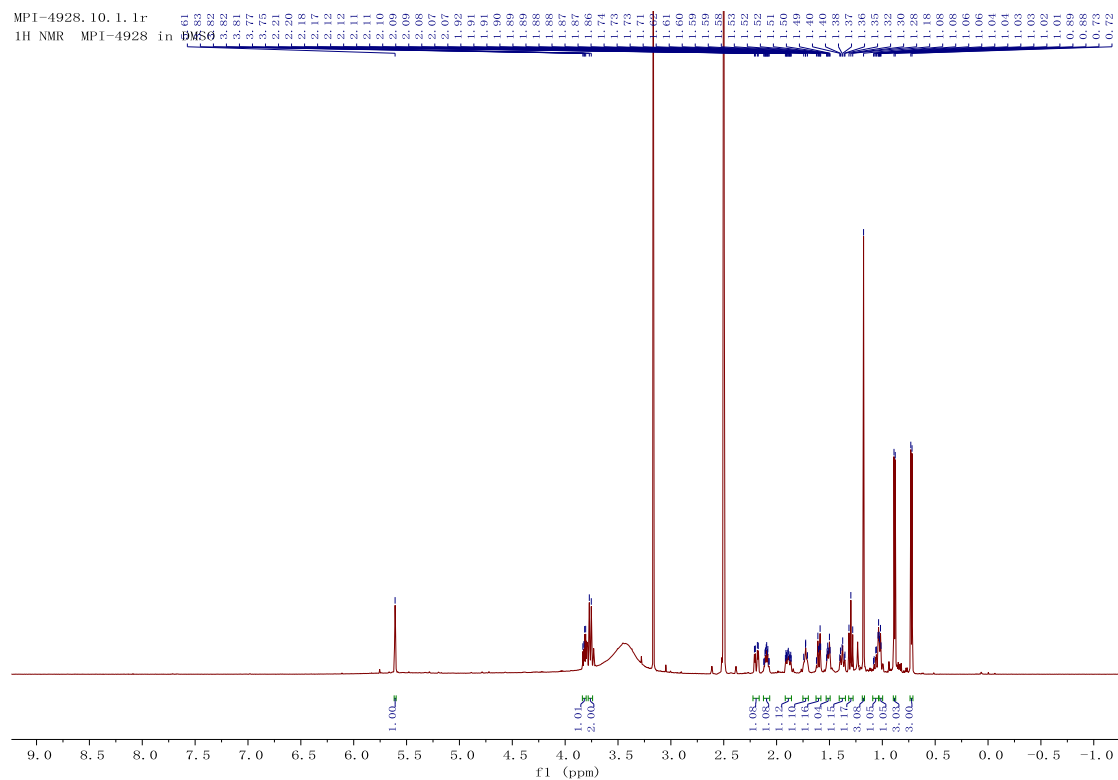


Figure S77. ^1H NMR (600 MHz, $\text{DMSO-}d_6$) spectrum of the new compound **22**

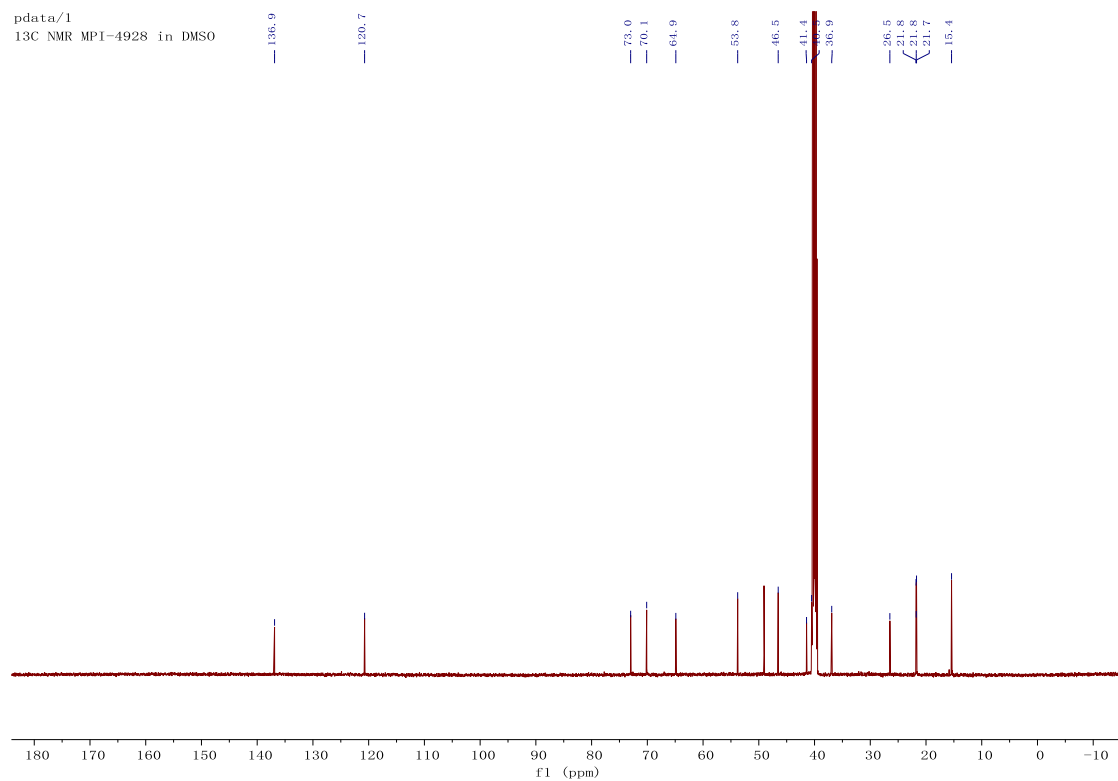


Figure S78. ^{13}C NMR (150 MHz, $\text{DMSO-}d_6$) spectrum of the new compound **22**

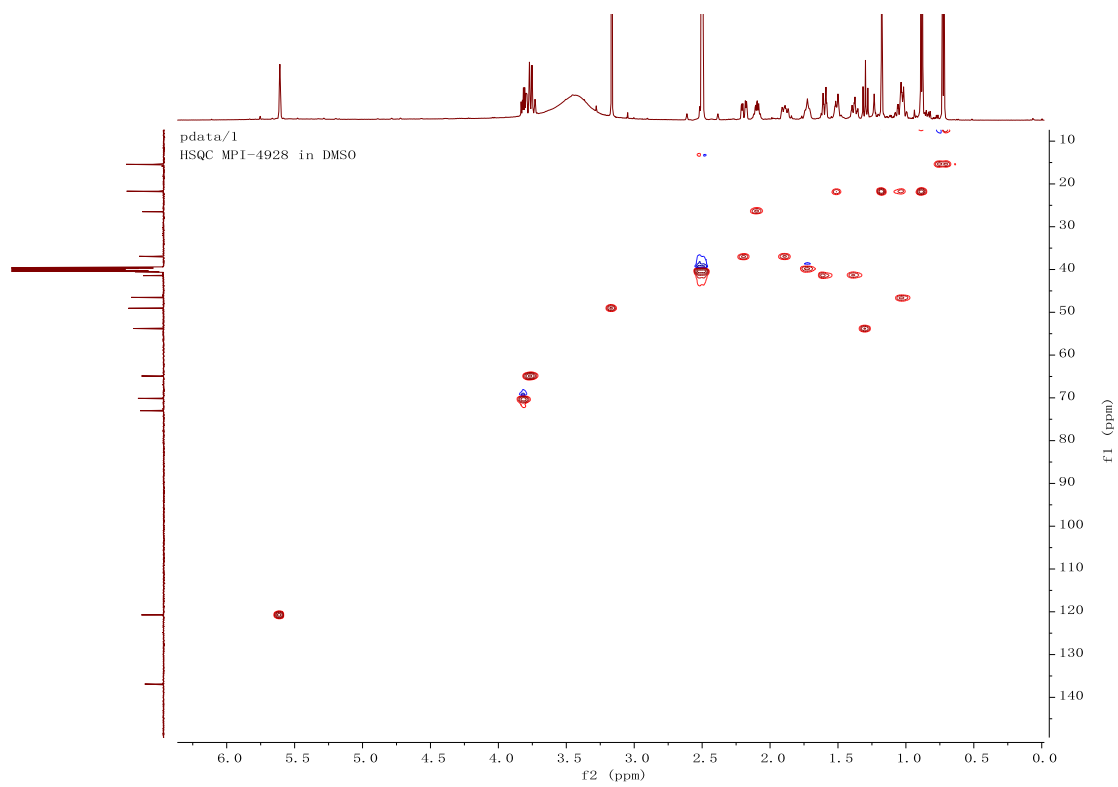


Figure S79. HSQC spectrum of the new compound **22**

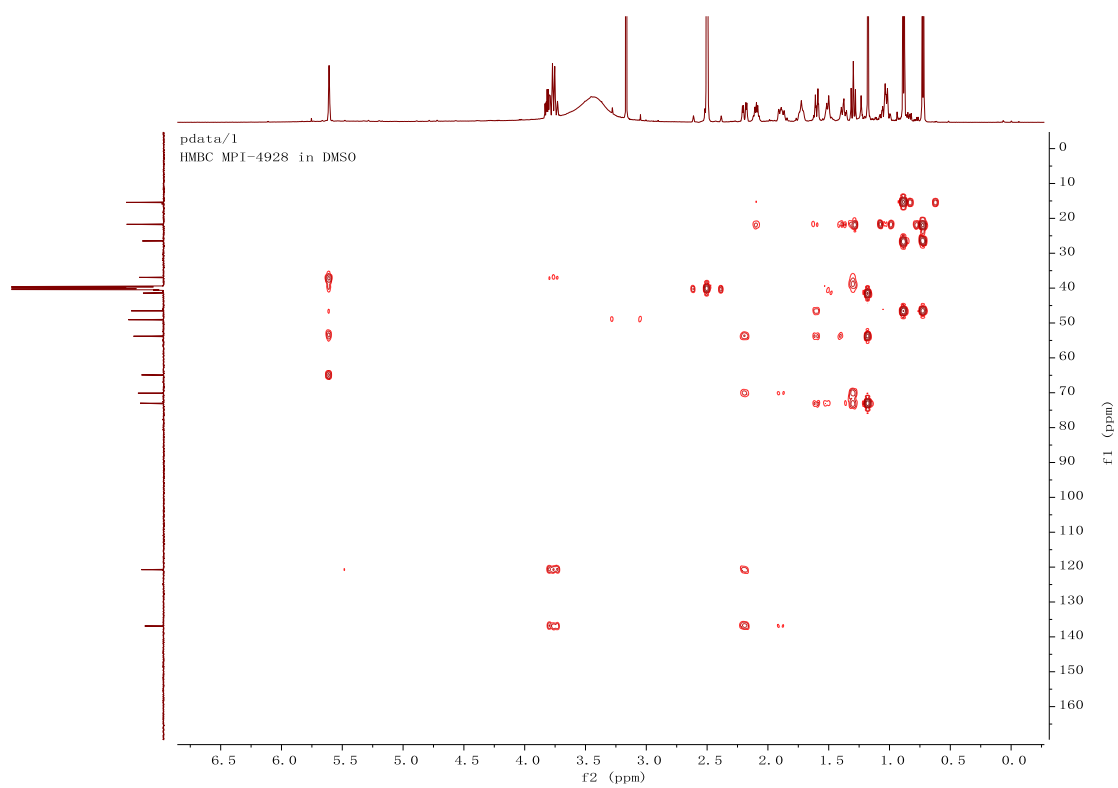


Figure S80. HMBC spectrum of the new compound **22**

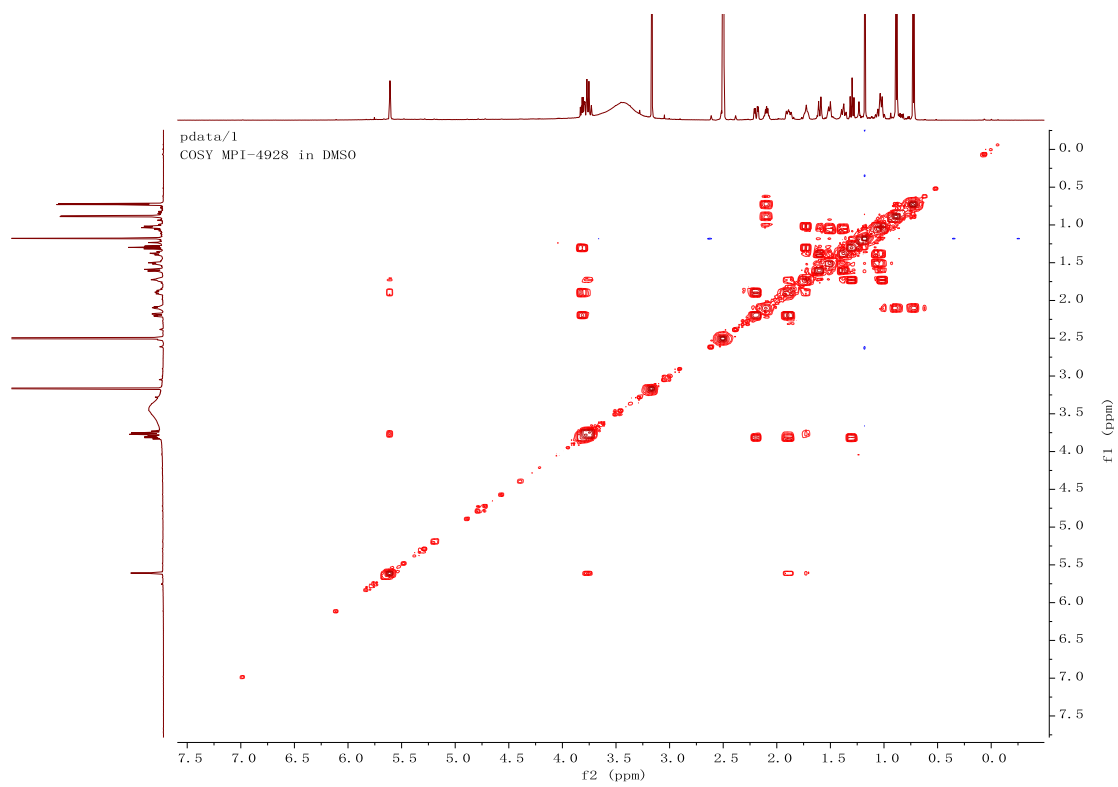


Figure S81. COSY spectrum of the new compound **22**

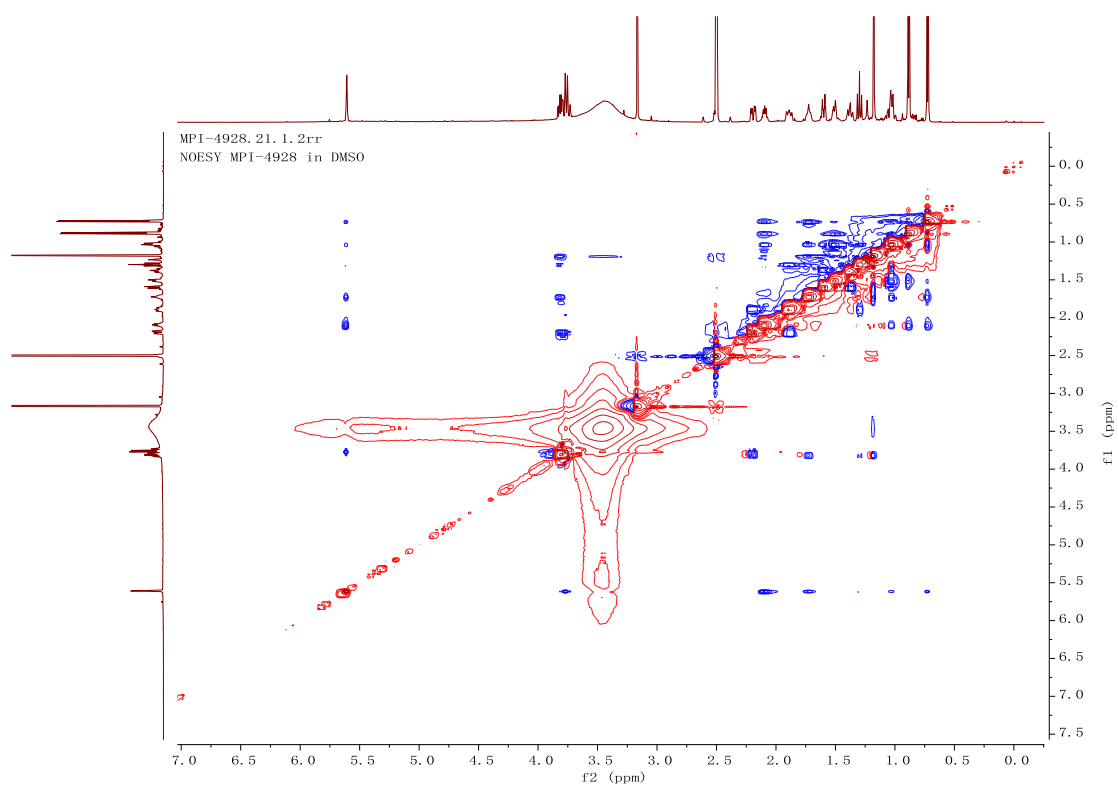


Figure S82. NOESY spectrum of the new compound **22**

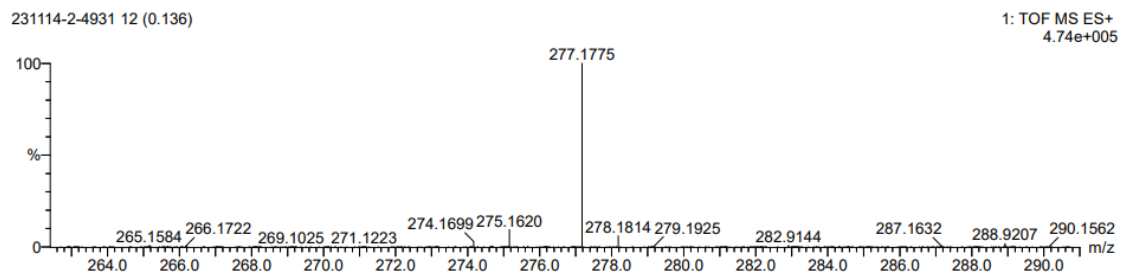


Figure S83. HRESI-MS spectrum of the new compound **23**

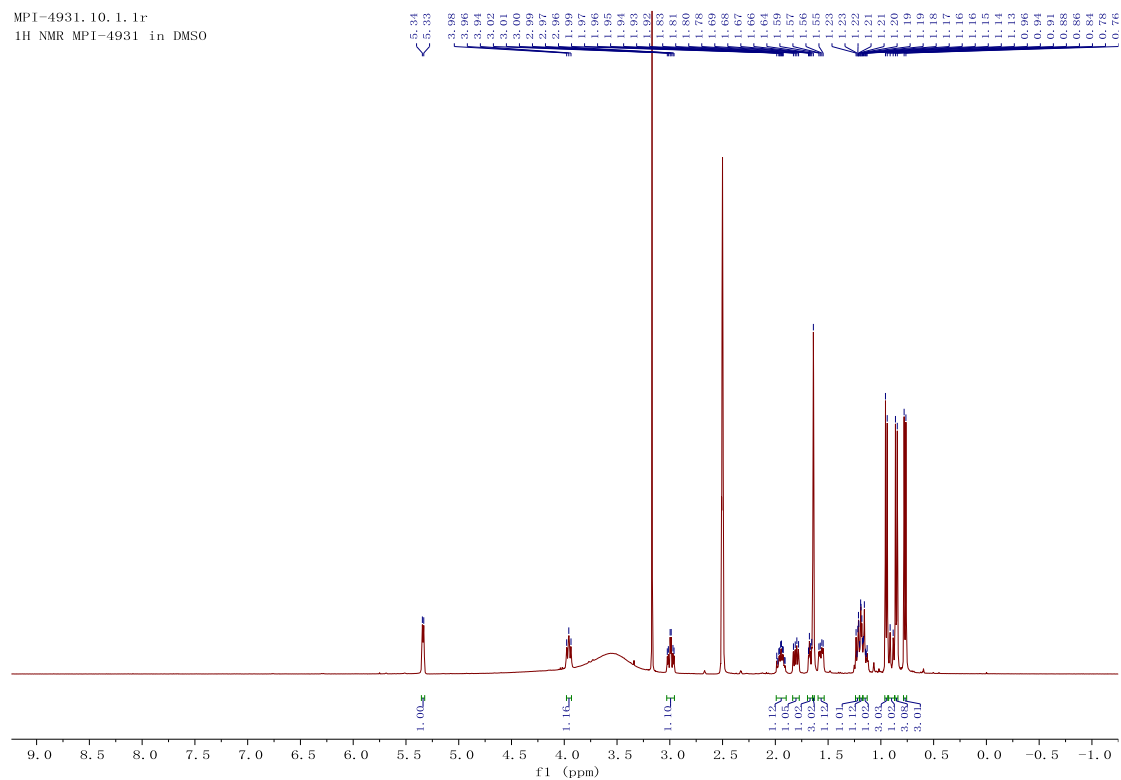


Figure S84. ^1H NMR (600 MHz, $\text{DMSO-}d_6$) spectrum of the new compound **23**

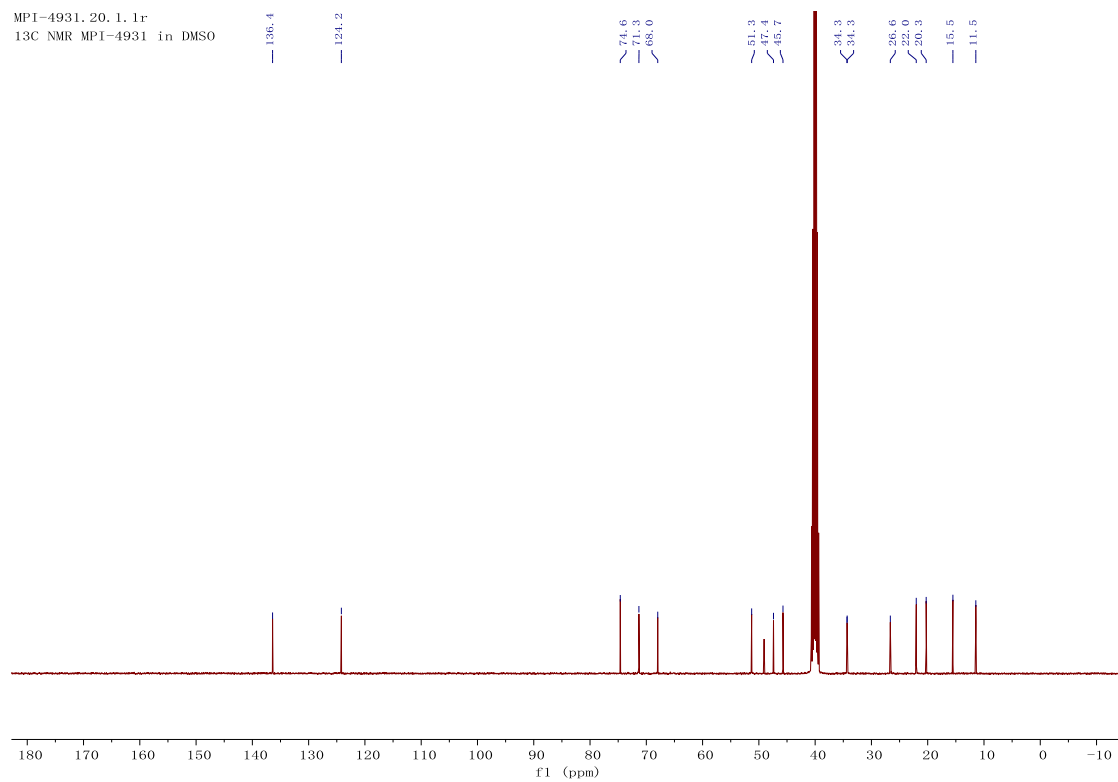


Figure S85. ¹³C NMR (150 MHz, DMSO-*d*₆) spectrum of the new compound **23**

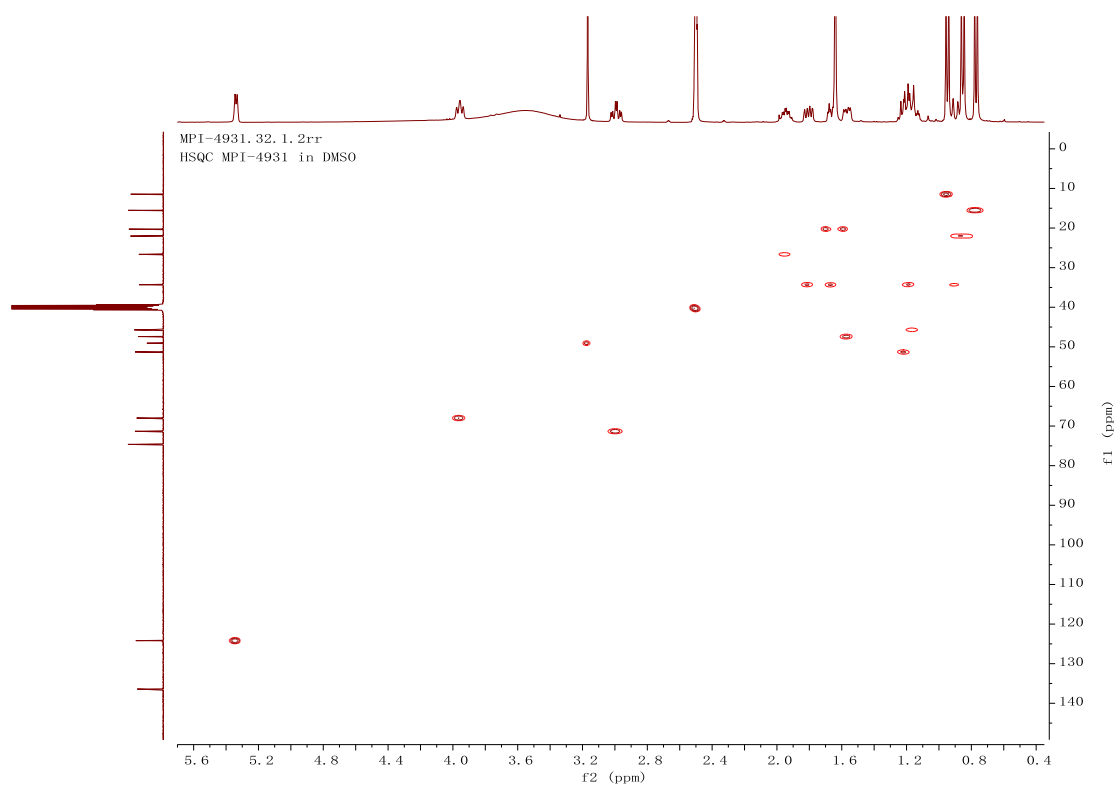


Figure S86. HSQC spectrum of the new compound **23**

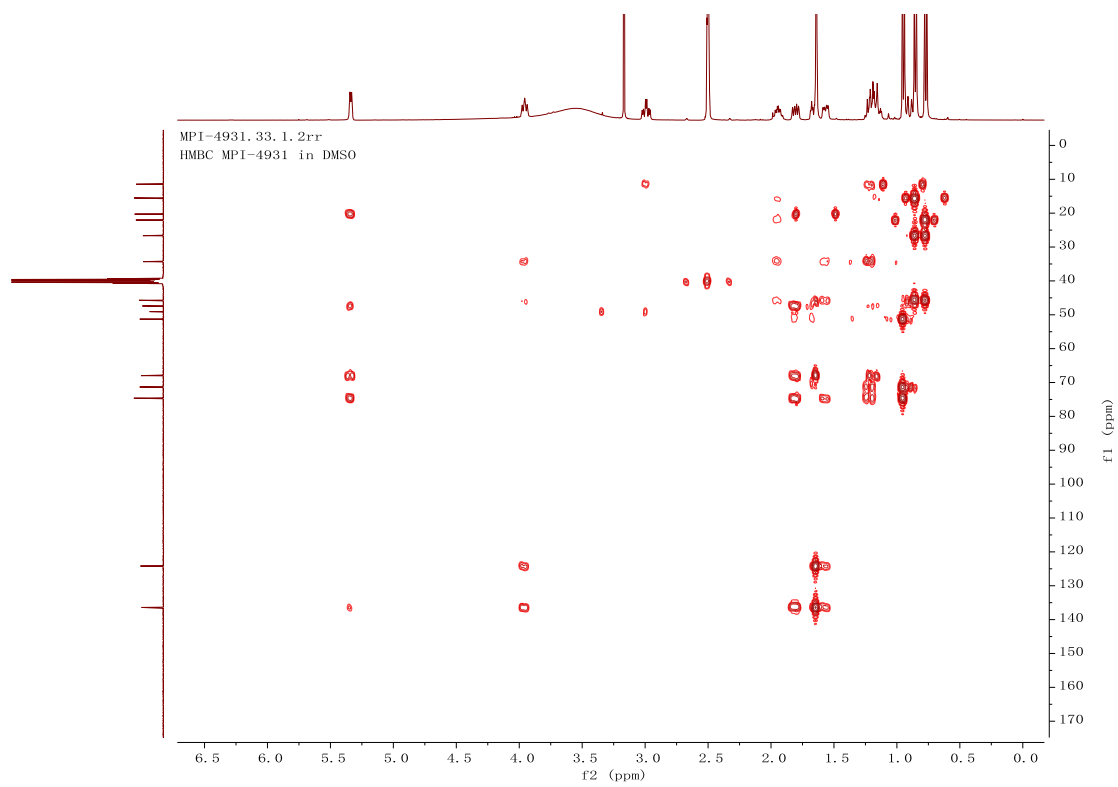


Figure S87. HMBC spectrum of the new compound **23**

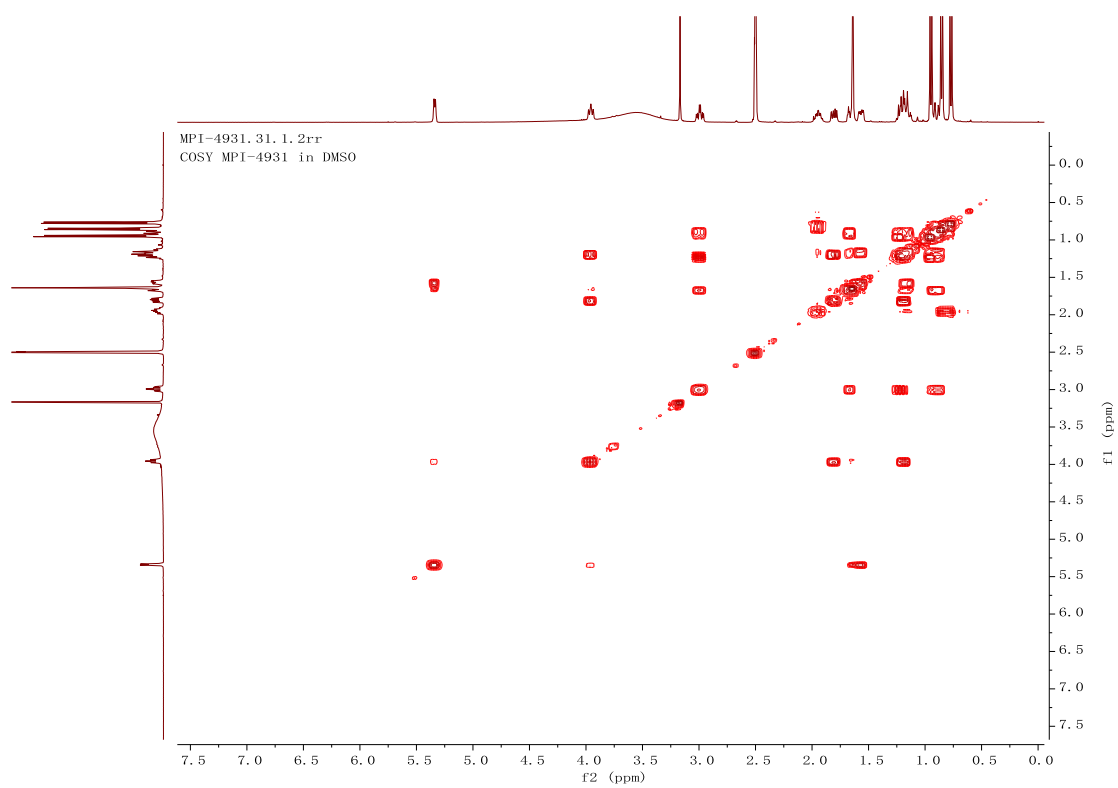


Figure S88. COSY spectrum of the new compound **23**

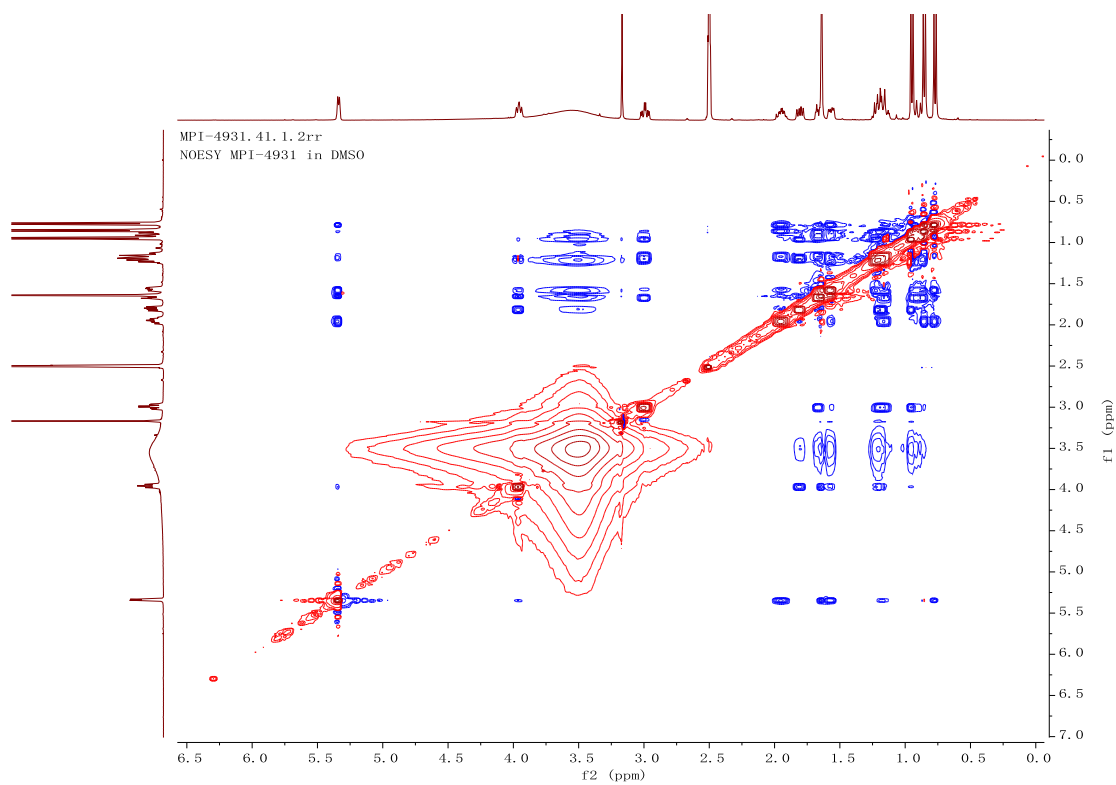


Figure S89. NOESY spectrum of the new compound **23**

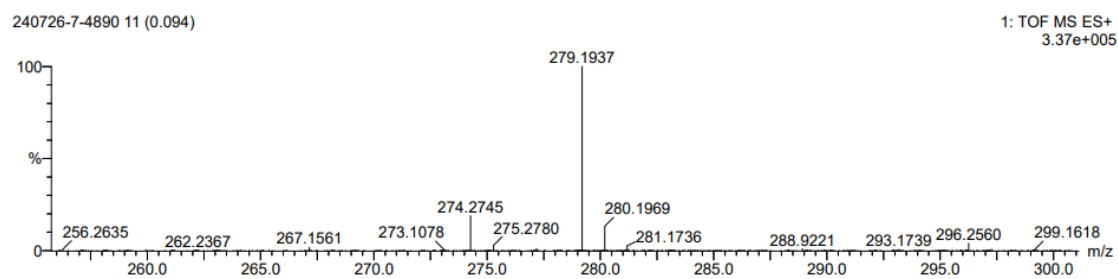


Figure S90. HRESI-MS spectrum of the new compound **25**

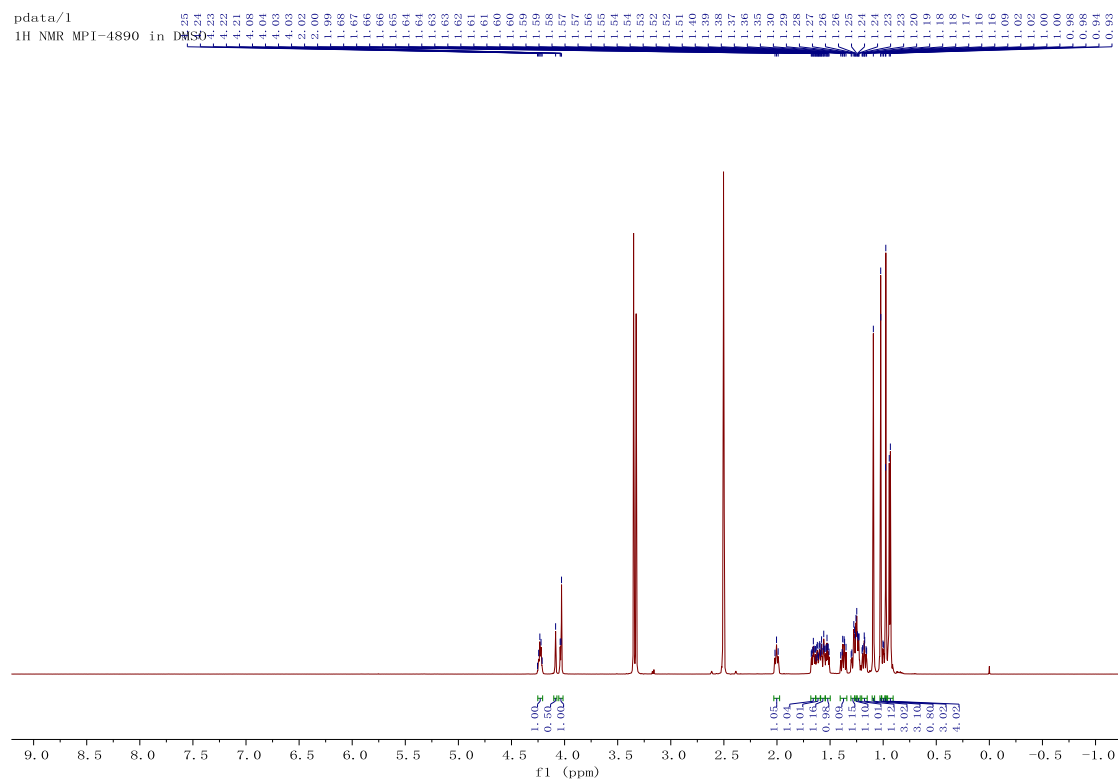


Figure S91. ¹H NMR (600 MHz, DMSO-*d*₆) spectrum of the new compound **25**

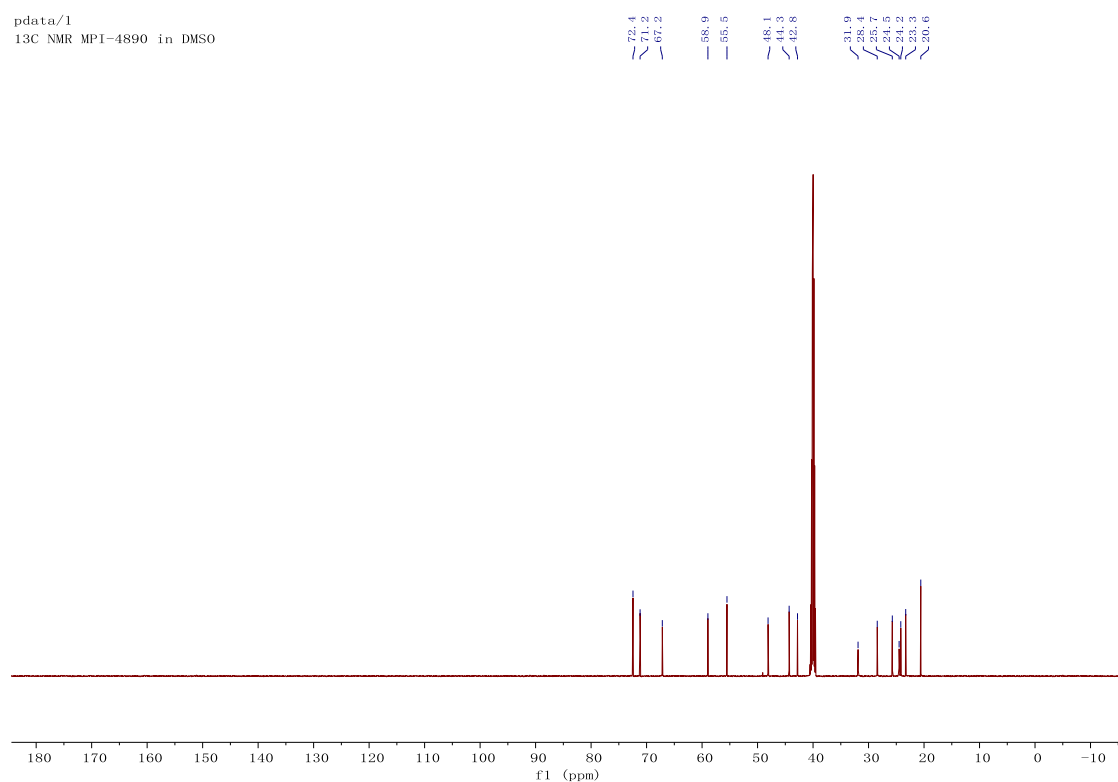


Figure S92. ¹³C NMR (150 MHz, DMSO-*d*₆) spectrum of the new compound **25**

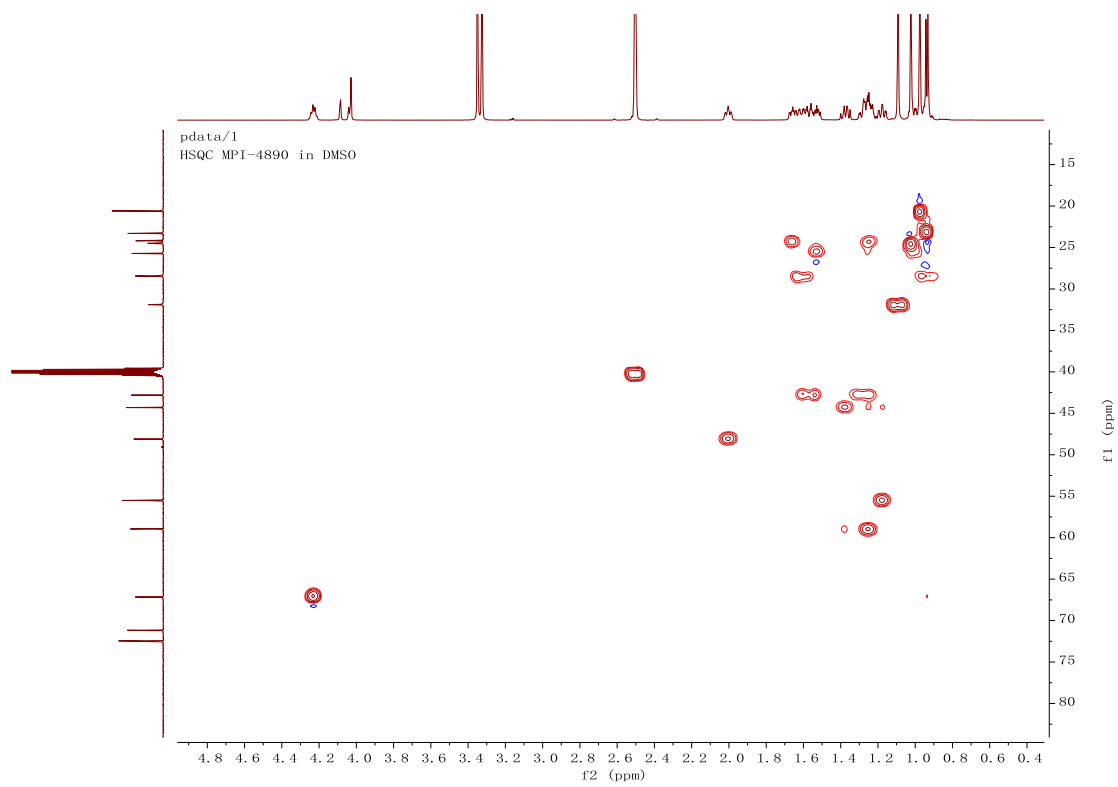


Figure S93. HSQC spectrum of the new compound **25**

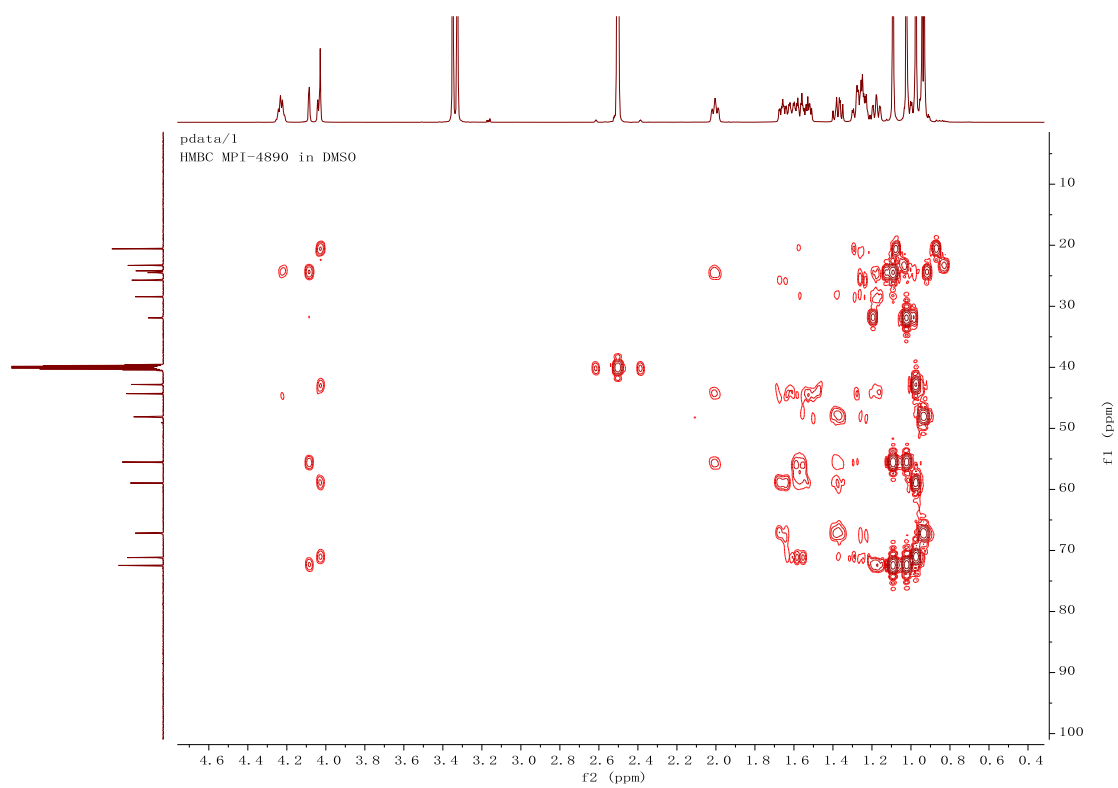


Figure S94. HMBC spectrum of the new compound **25**

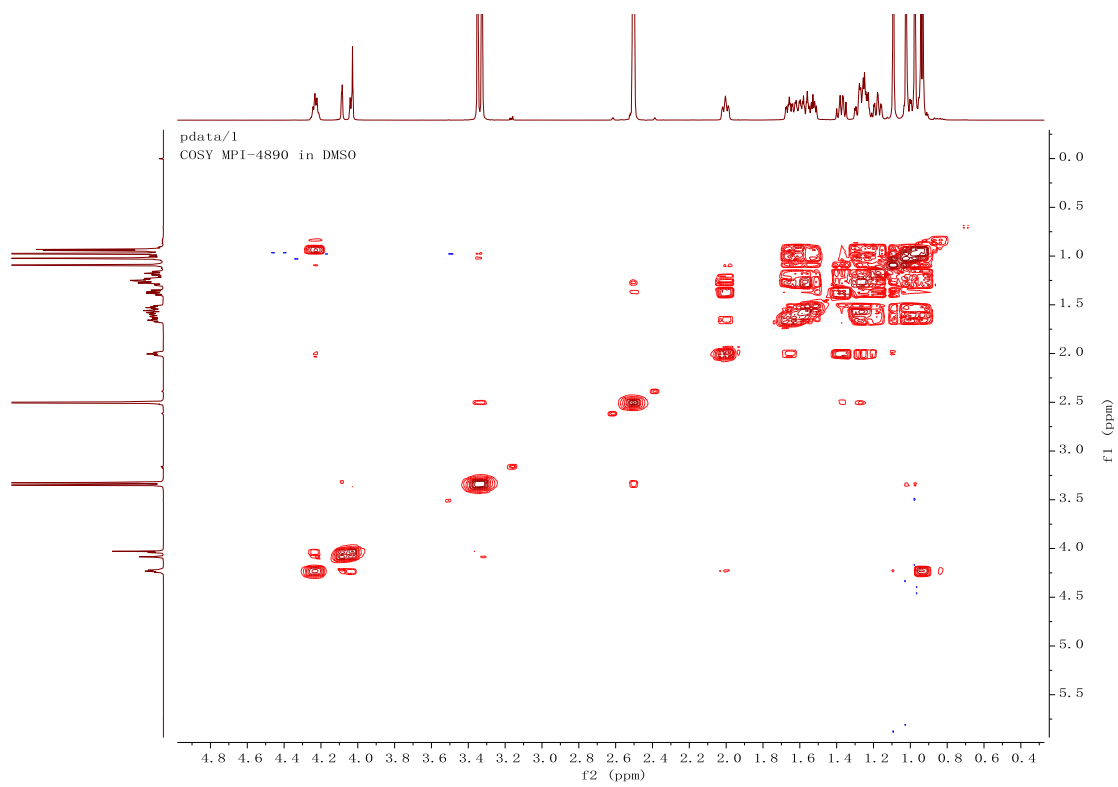


Figure S95. COSY spectrum of the new compound **25**

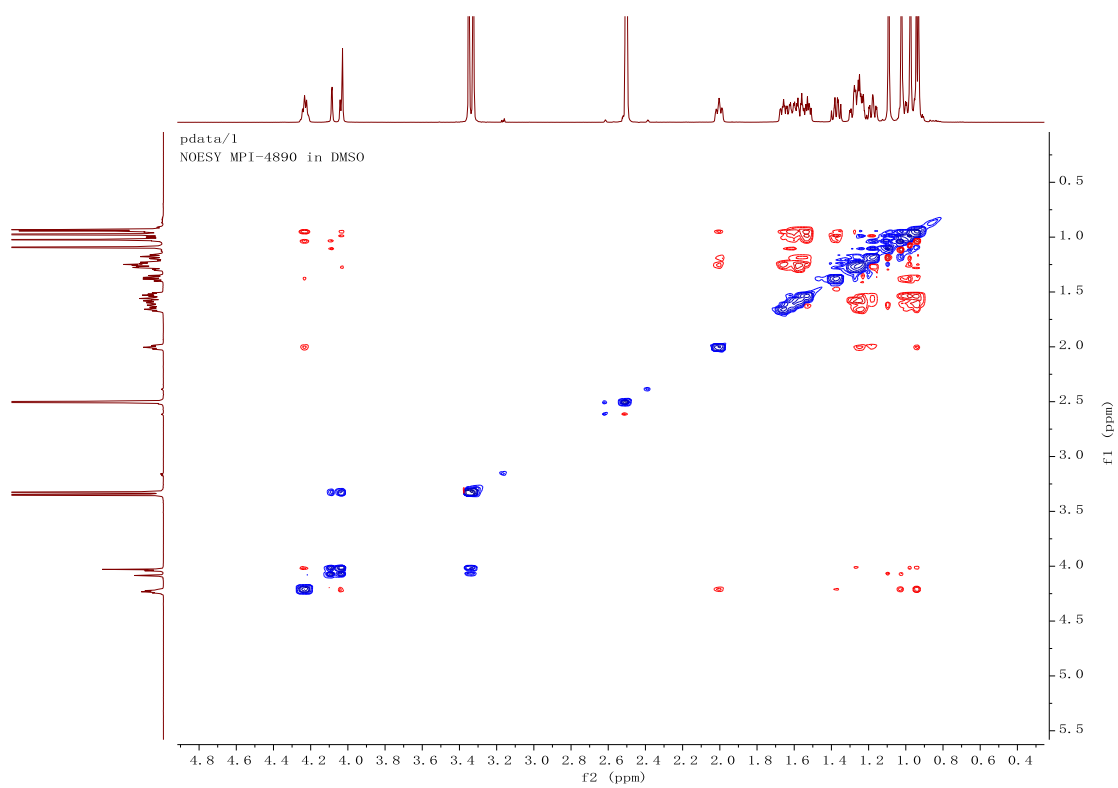


Figure S96. NOESY spectrum of the new compound **25**

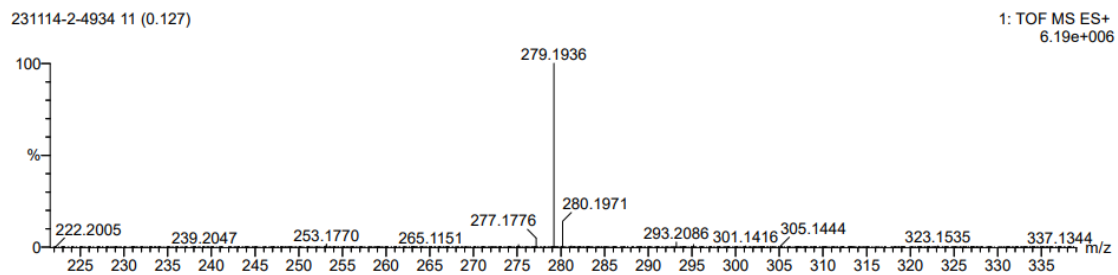


Figure S97. HRESI-MS spectrum of the new compound **26**

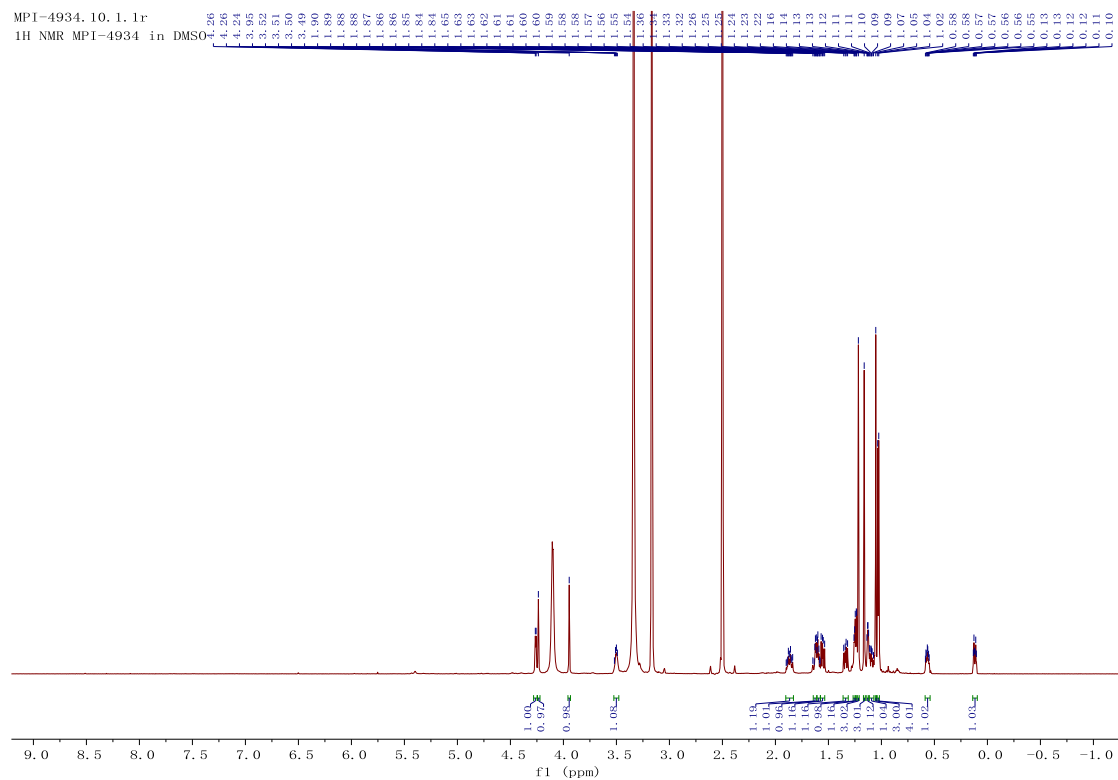


Figure S98. ^1H NMR (600 MHz, $\text{DMSO}-d_6$) spectrum of the new compound **26**

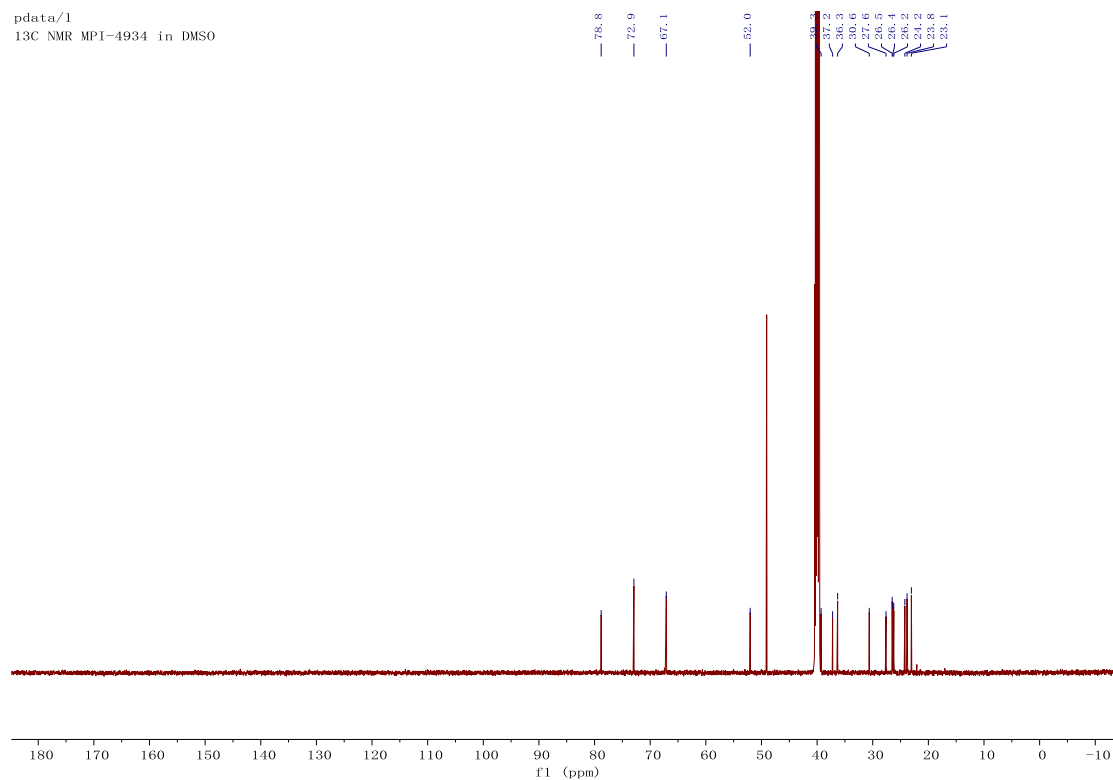


Figure S99. ¹³C NMR (150 MHz, DMSO-*d*₆) spectrum of the new compound **26**

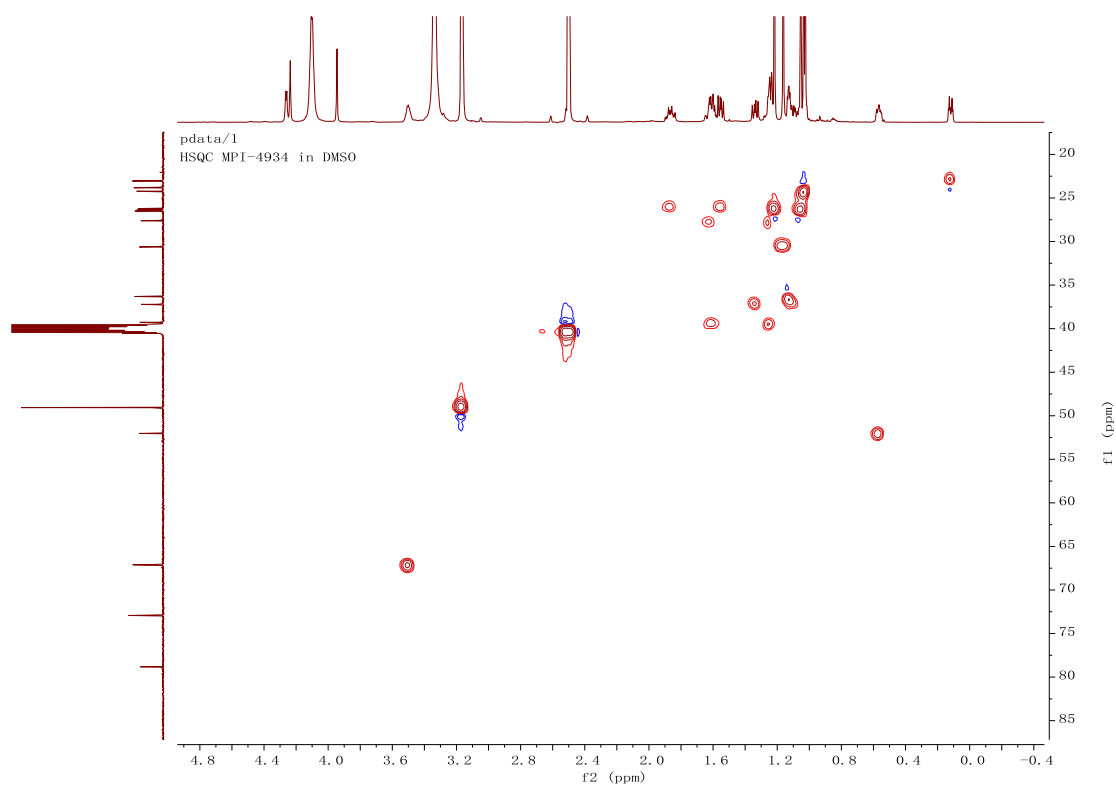


Figure S100. HSQC spectrum of the new compound **26**

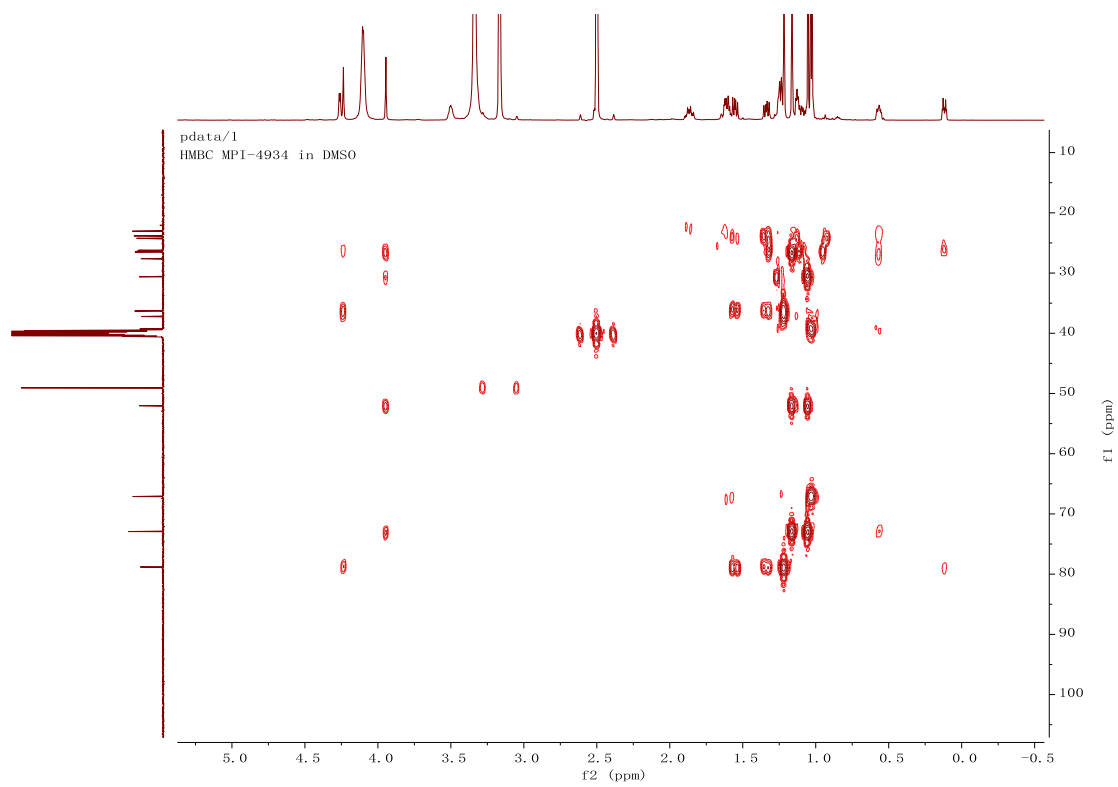


Figure S101. HMBC spectrum of the new compound **26**

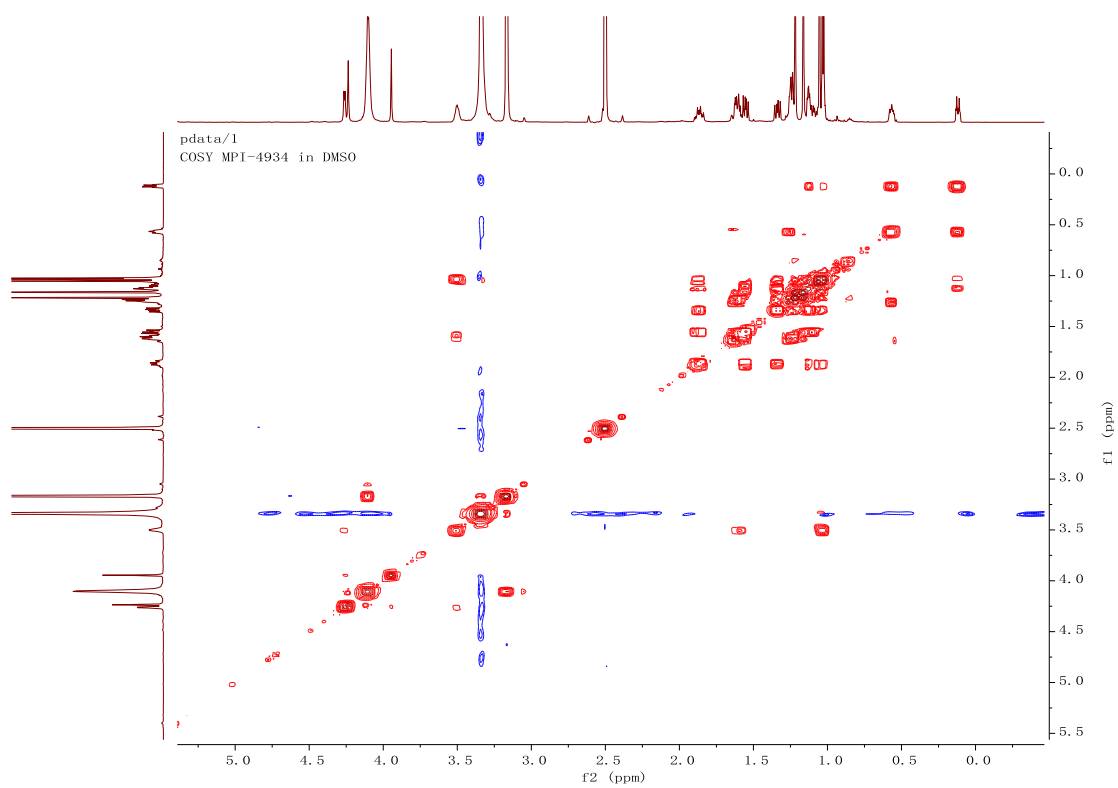


Figure S102. COSY spectrum of the new compound **26**

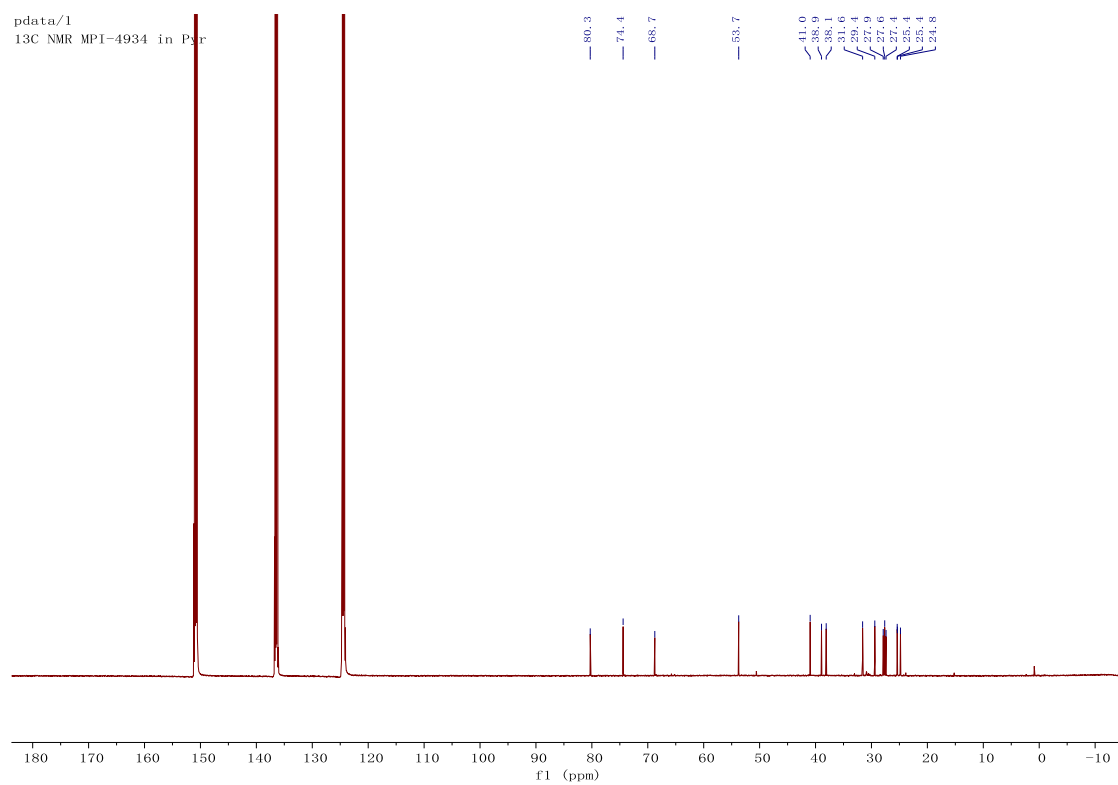


Figure S105. ^{13}C NMR (150 MHz, in pyridine- d_5) spectrum of the new compound **26**

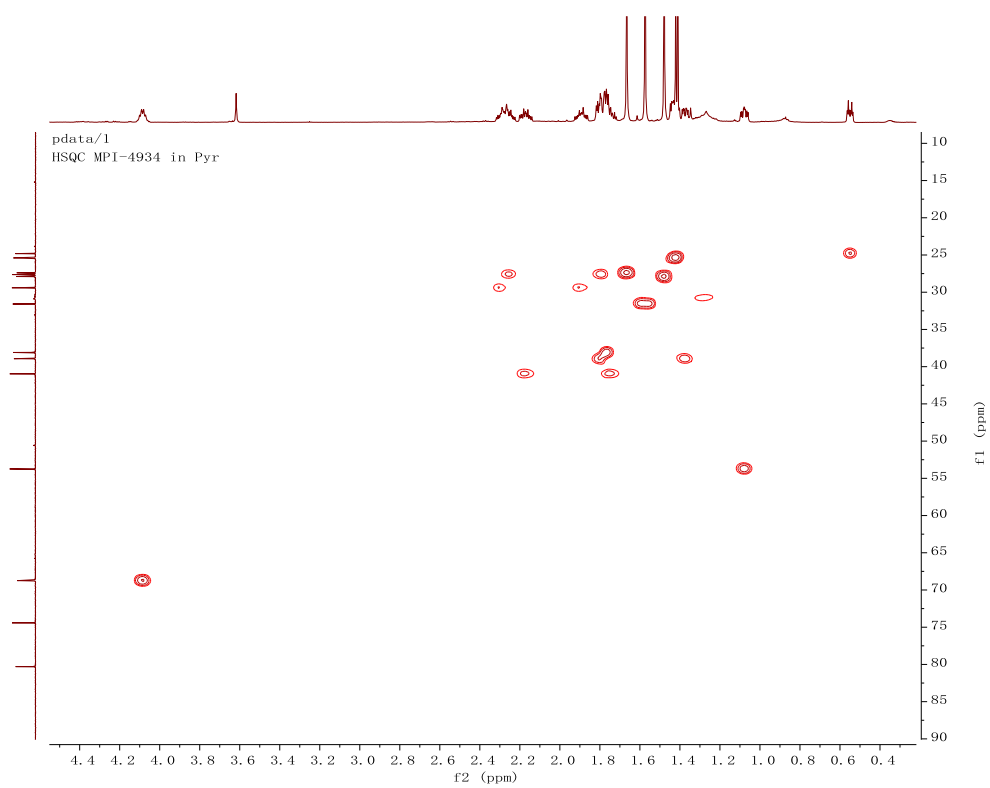


Figure S106. HSQC spectrum of the new compound **26** in pyridine- d_5

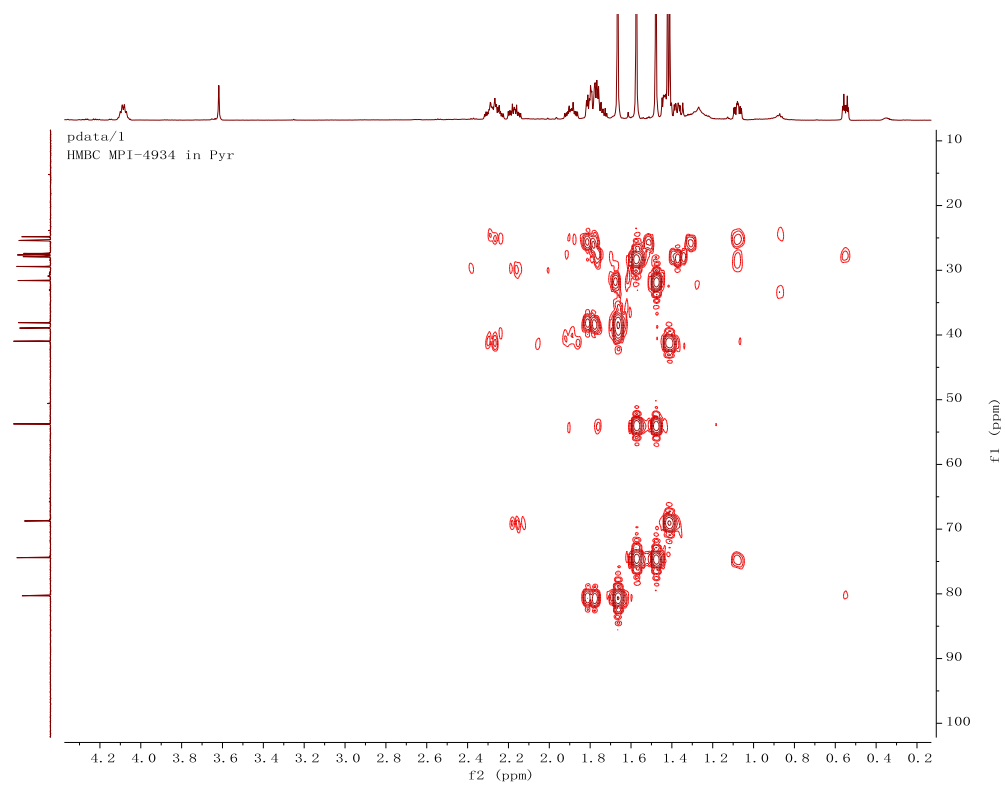


Figure S107. HMBC spectrum of the new compound **26** in pyridine-*d*₅

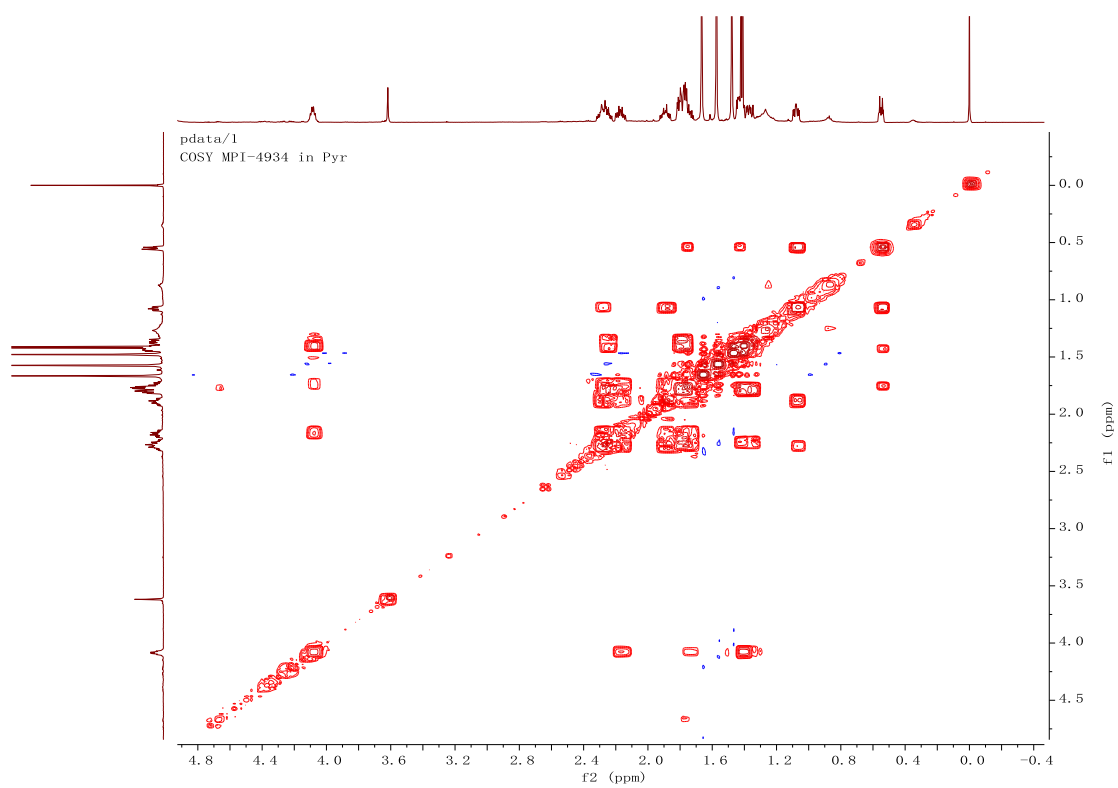


Figure S108. COSY spectrum of the new compound **26** in pyridine-*d*₅

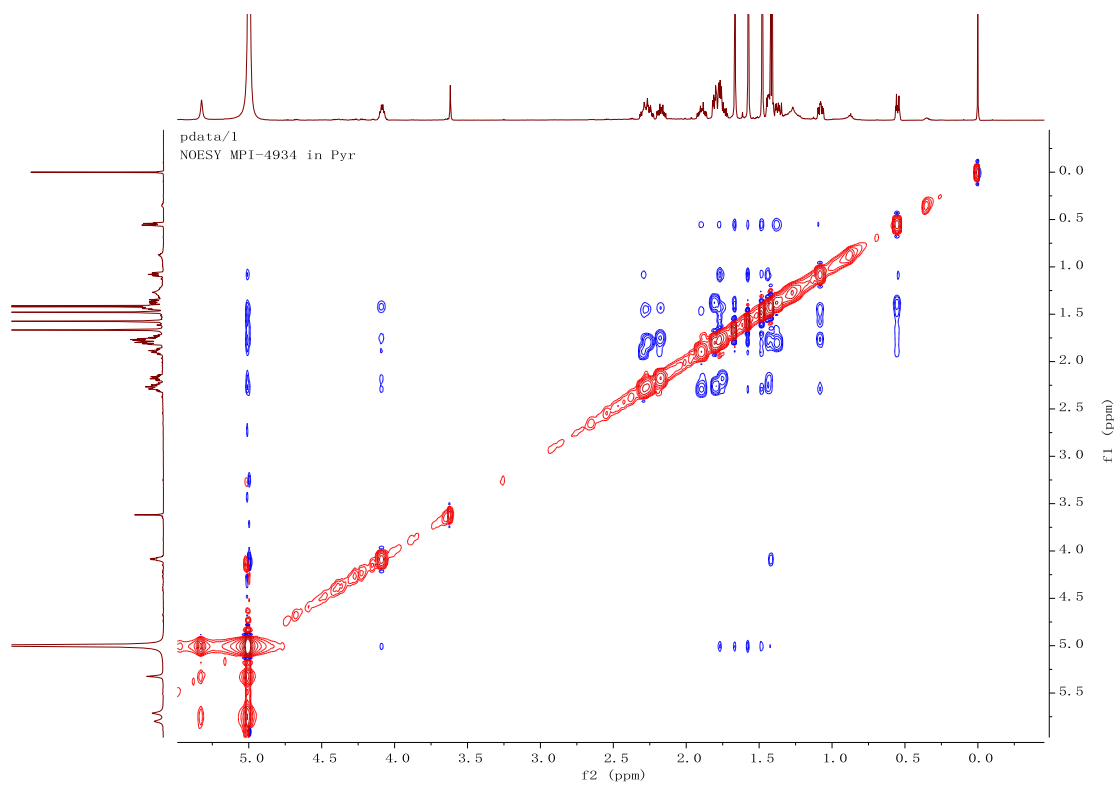


Figure S109. NOESY spectrum of the new compound **26** in pyridine-*d*₅

User Spectra

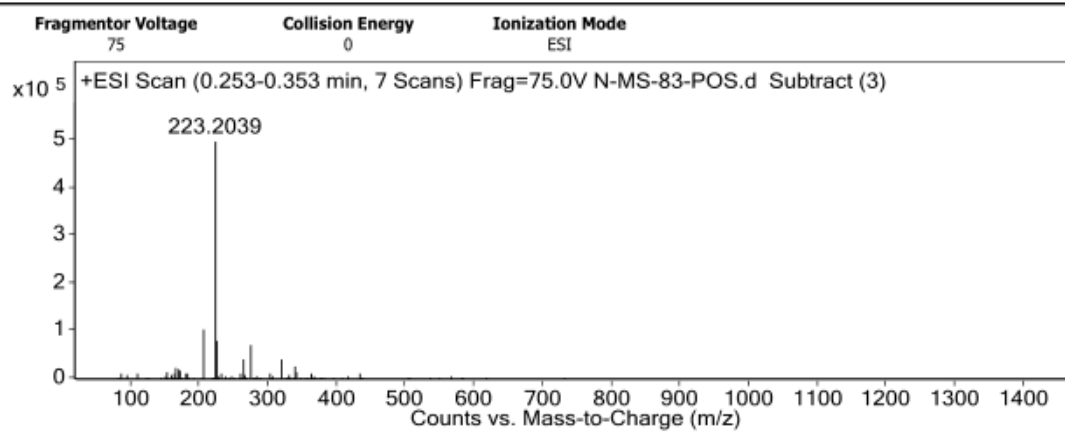


Figure S110. HRESI-MS spectrum of the new compound **27**

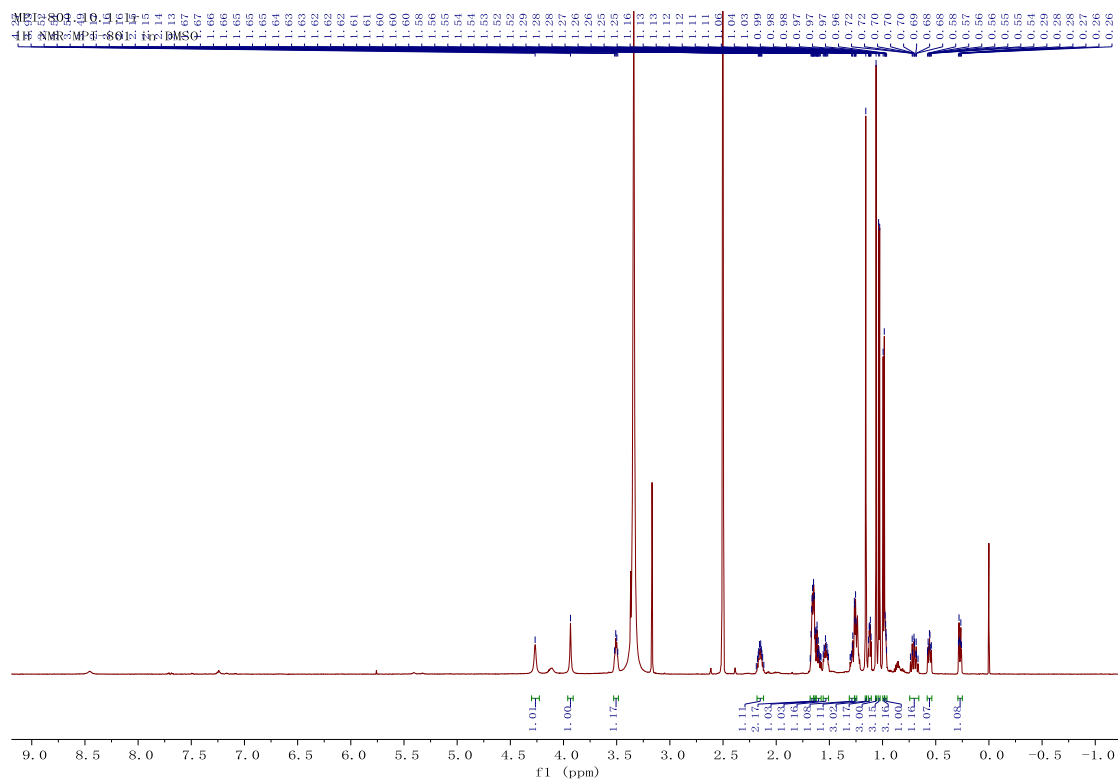


Figure S111. ^1H NMR (600 MHz, $\text{DMSO-}d_6$) spectrum of the new compound **27**

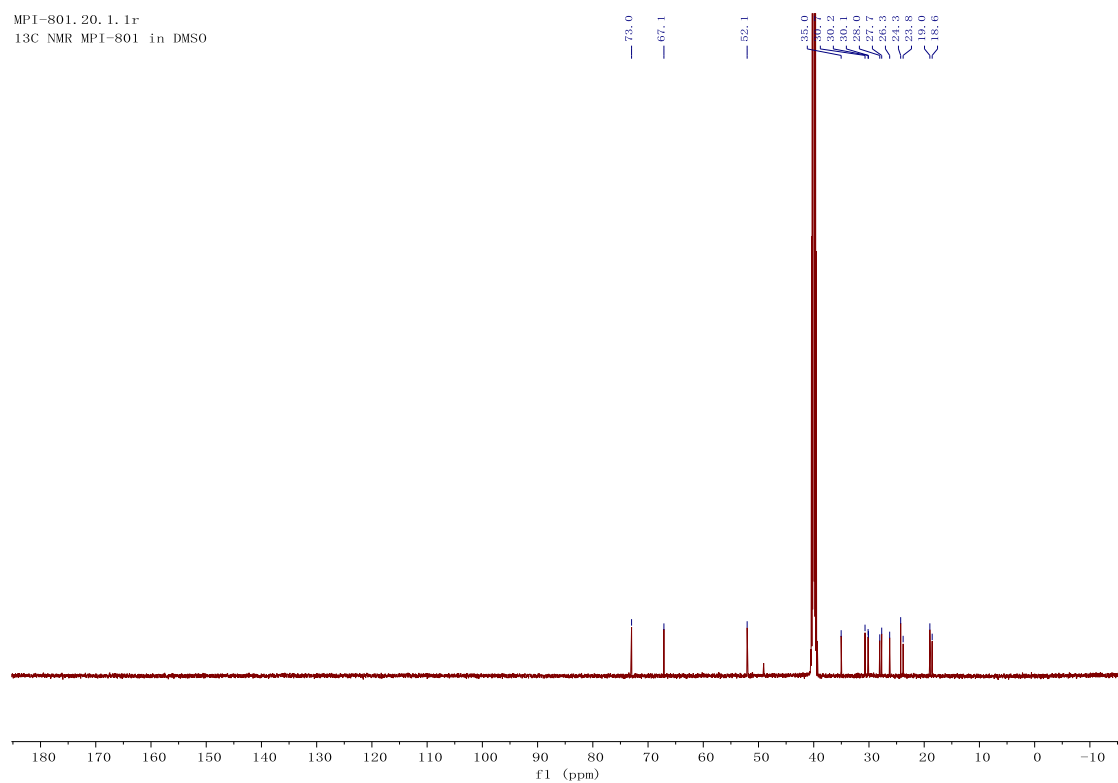


Figure S112. ^{13}C NMR (150 MHz, $\text{DMSO-}d_6$) spectrum of the new compound **27**

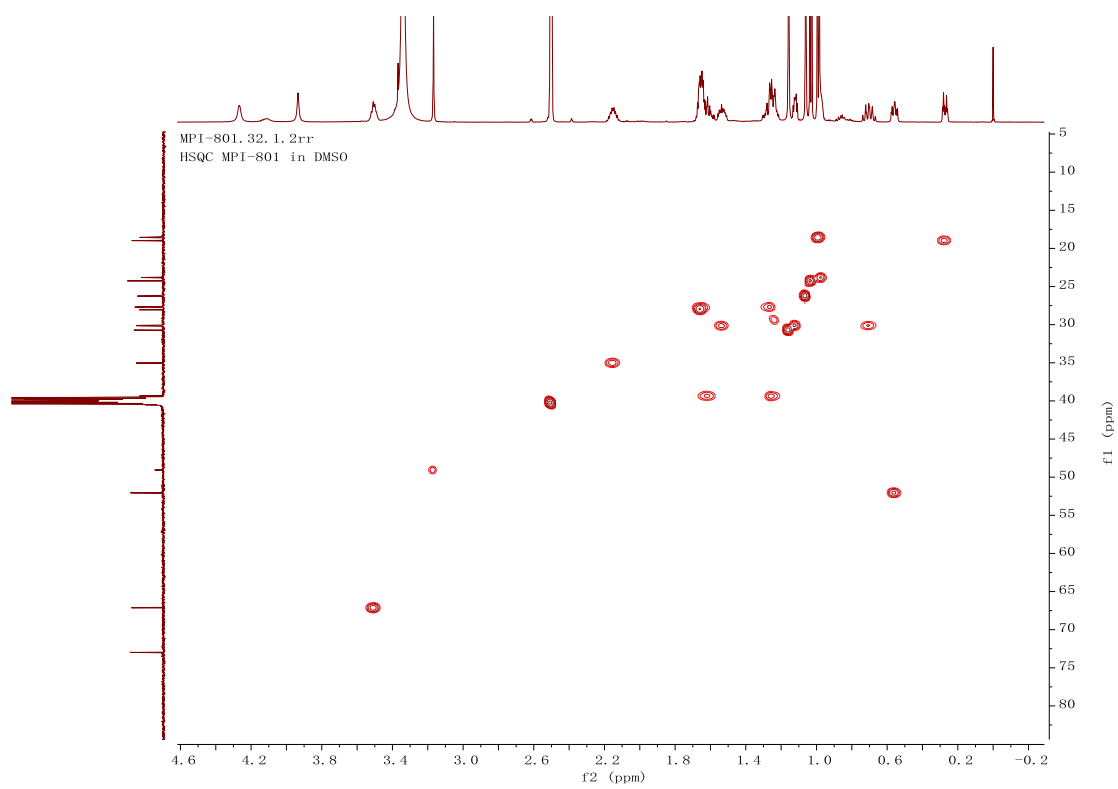


Figure S113. HSQC spectrum of the new compound **27**

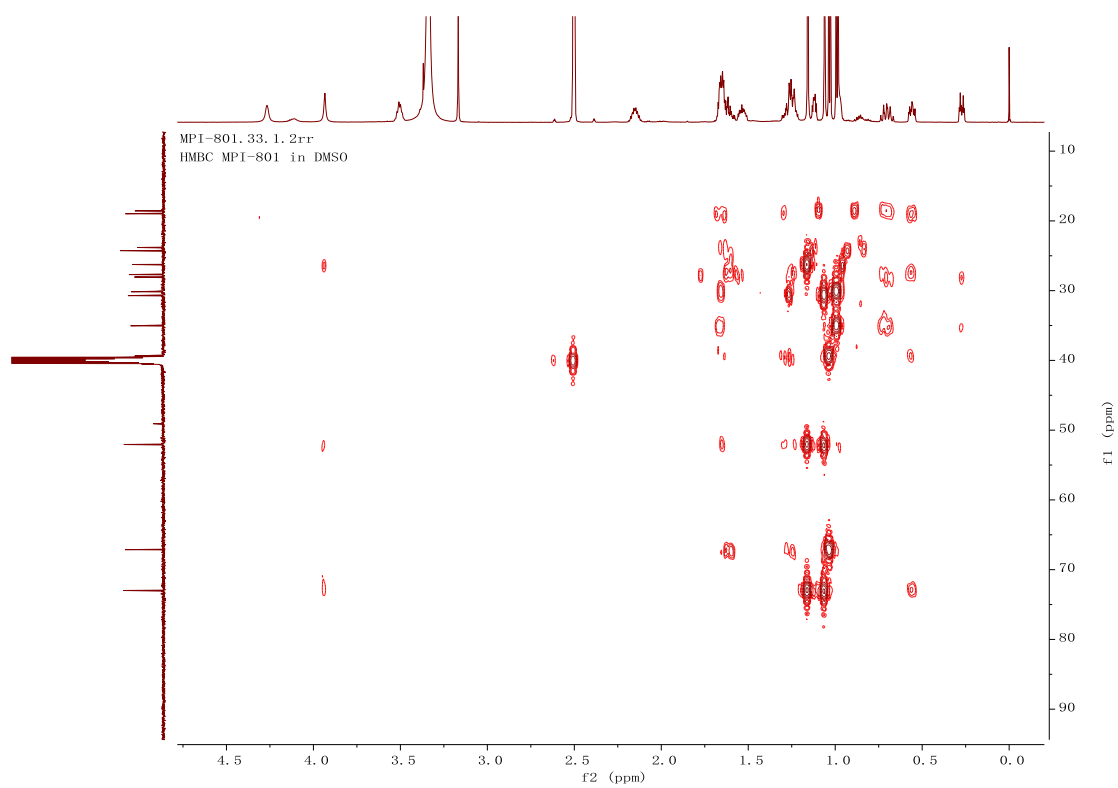


Figure S114. HMBC spectrum of the new compound **27**

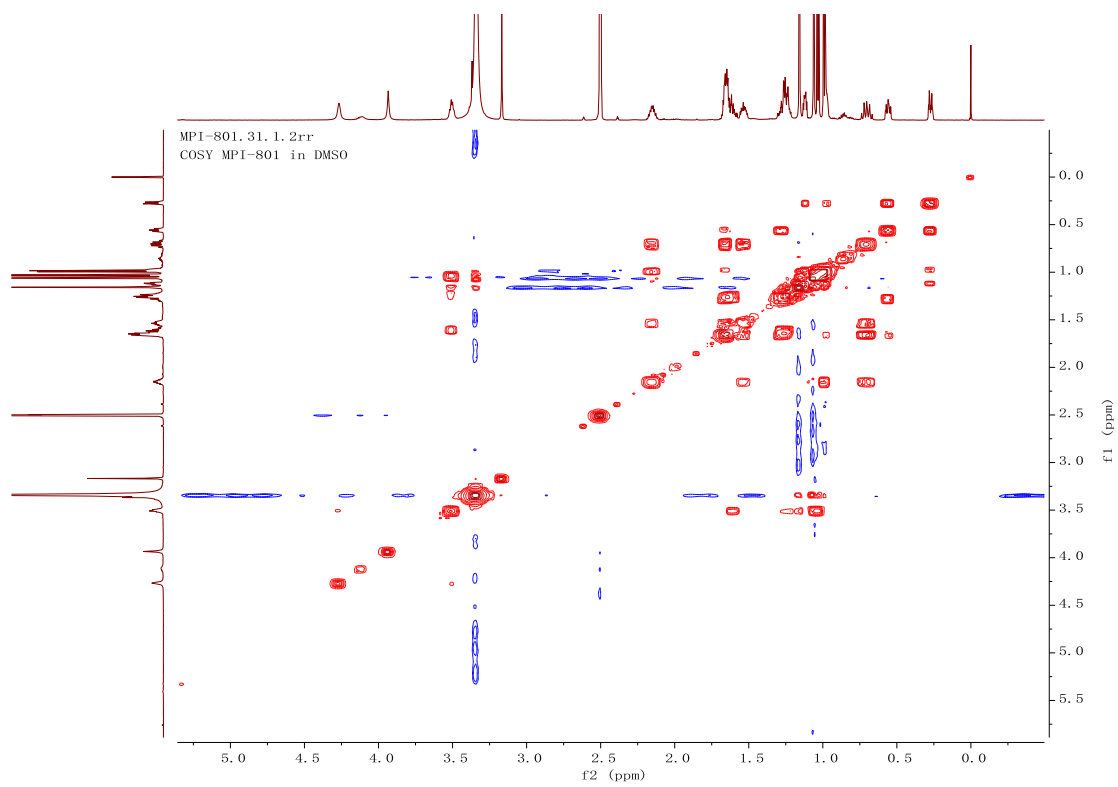


Figure S115. COSY spectrum of the new compound **27**

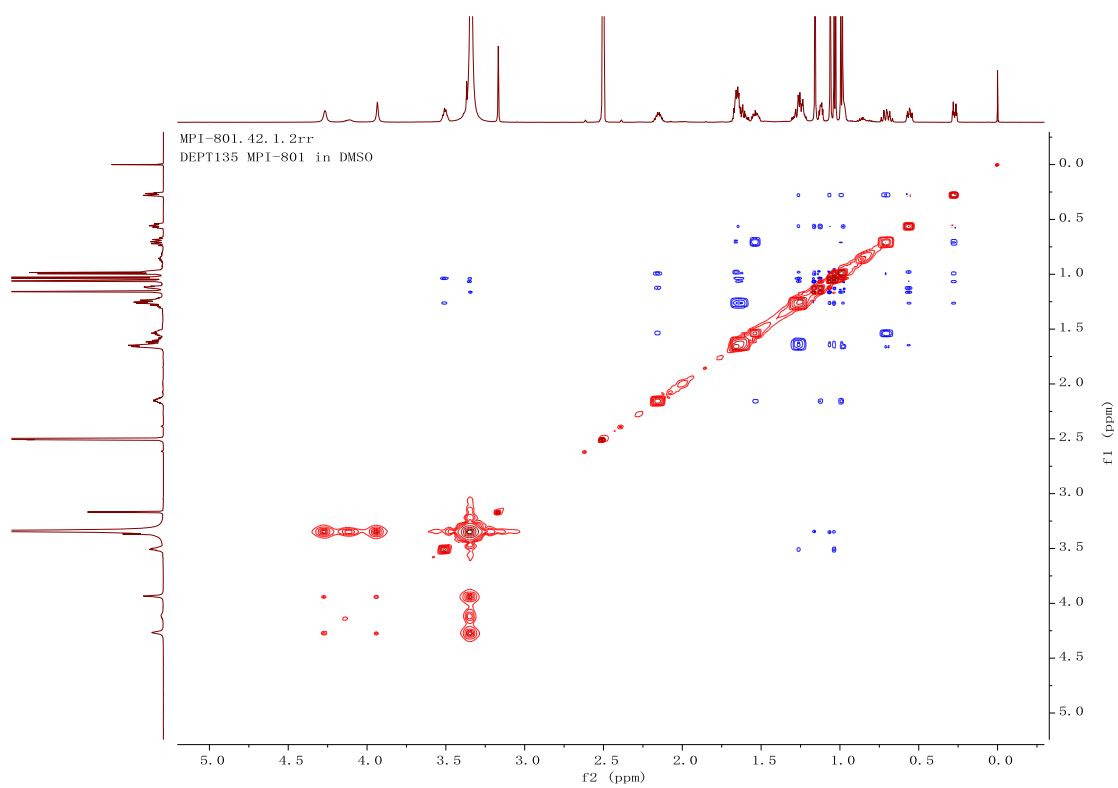


Figure S116. NOESY spectrum of the new compound **27**

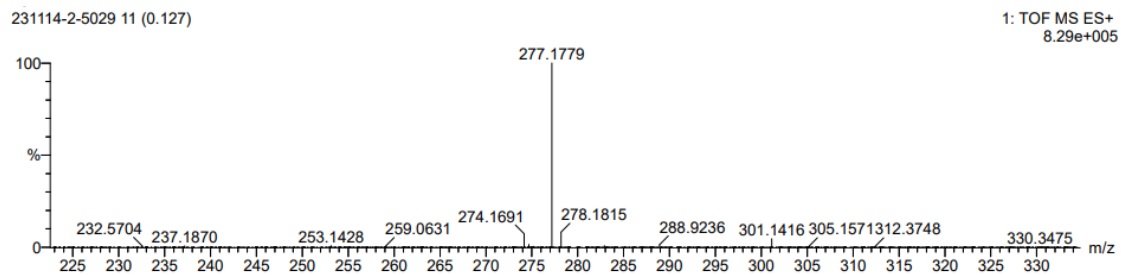


Figure S117. HRESI-MS spectrum of the new compound **28**

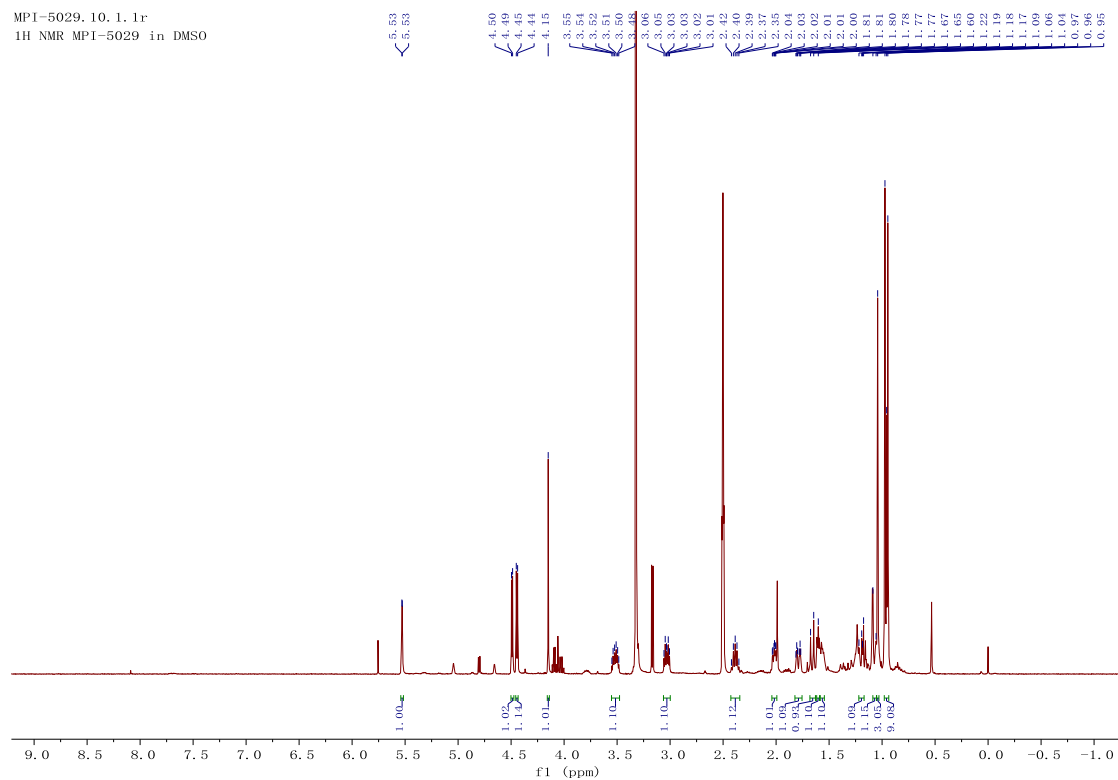


Figure S118. ^1H NMR (600 MHz, $\text{DMSO-}d_6$) spectrum of the new compound **28**

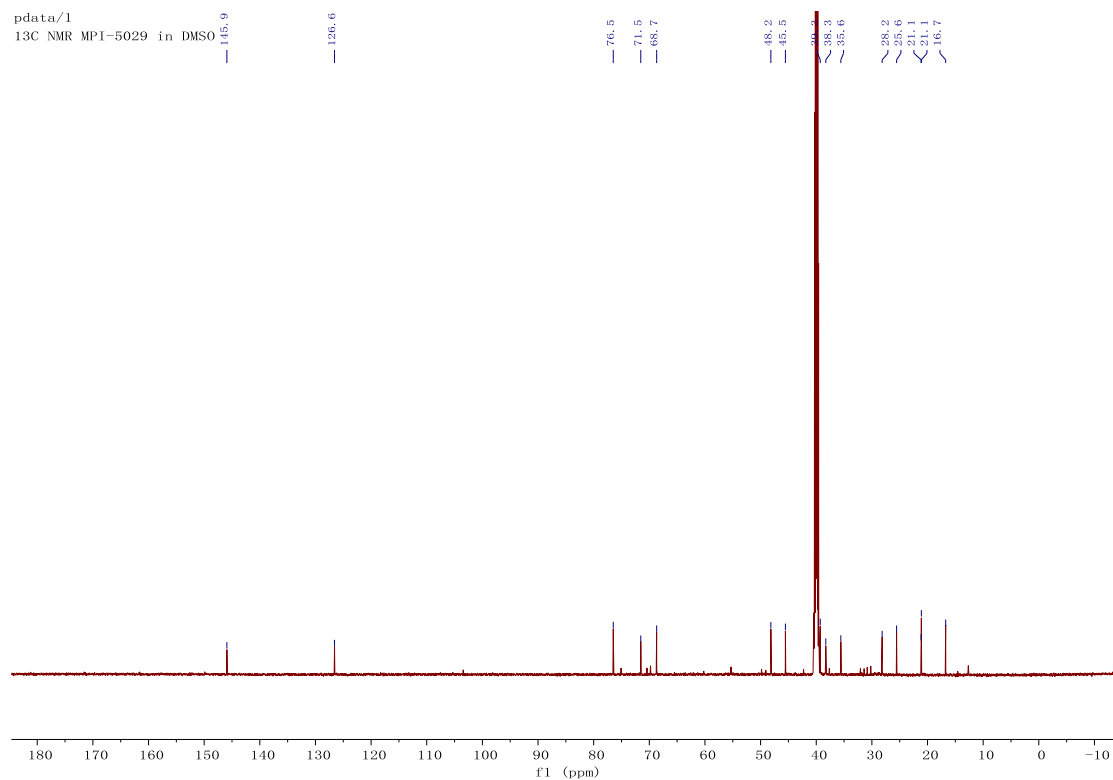


Figure S119. ¹³C NMR (150 MHz, DMSO-*d*₆) spectrum of the new compound **28**

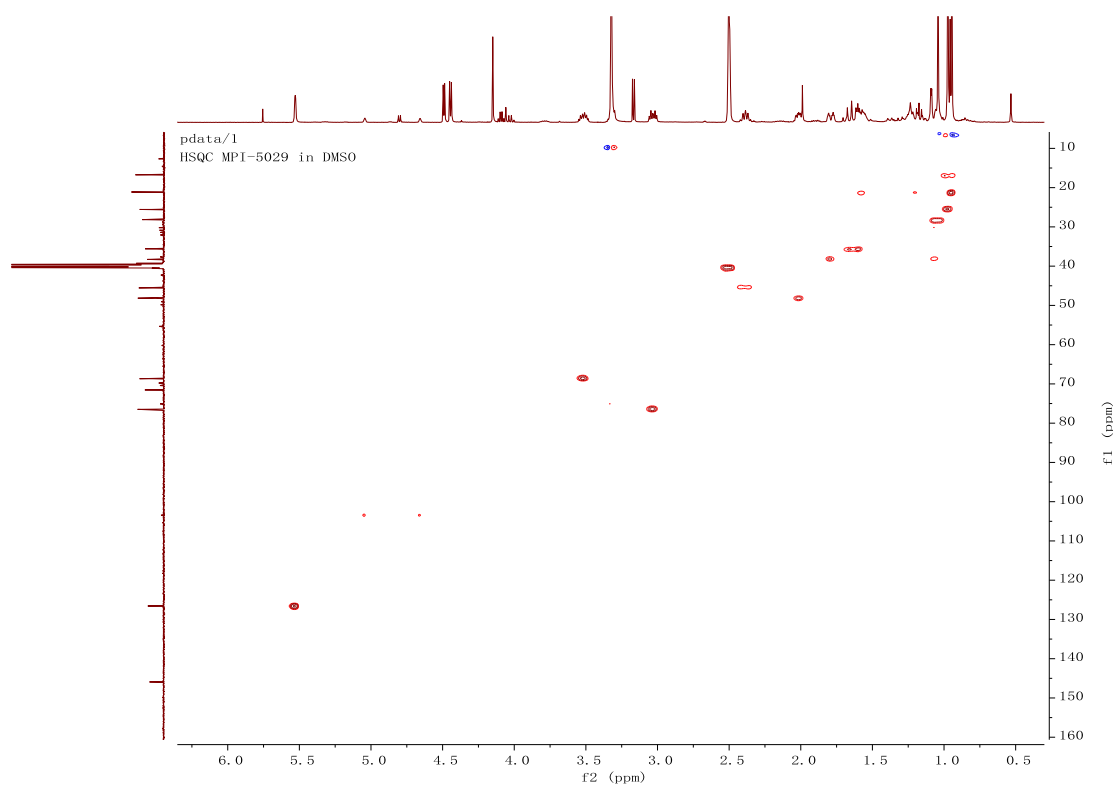


Figure S120. HSQC spectrum of the new compound **28**

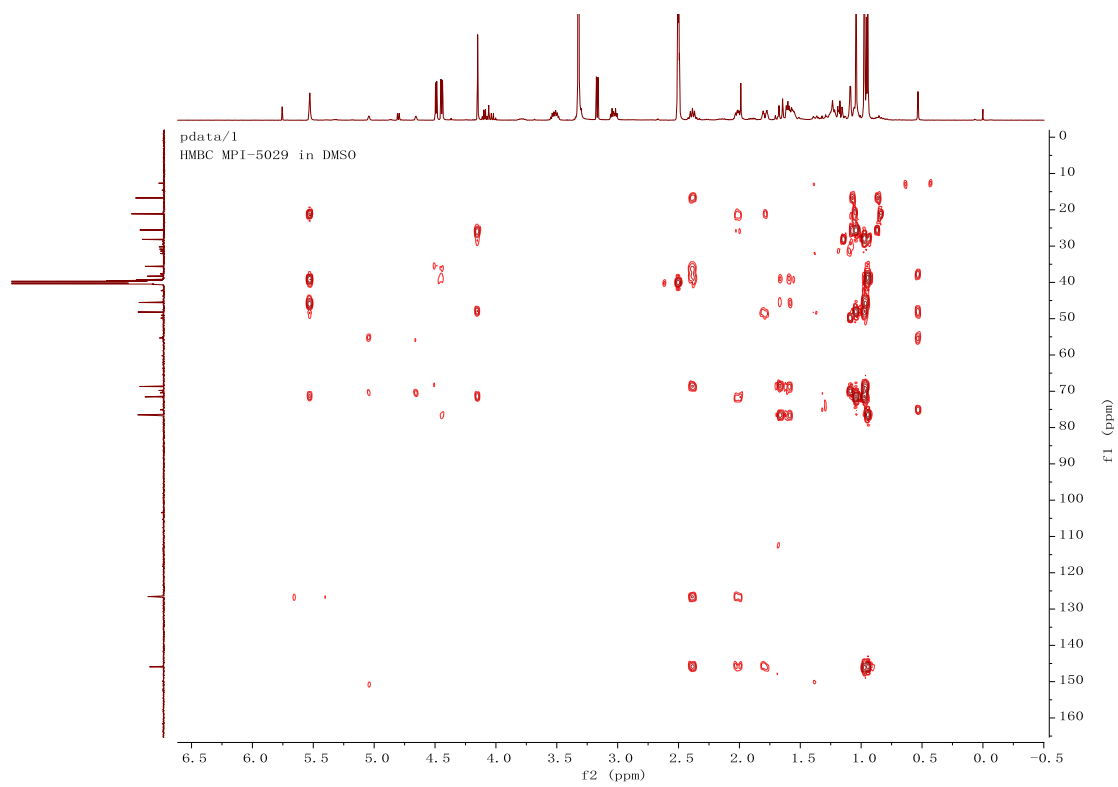


Figure S121. HMBC spectrum of the new compound **28**

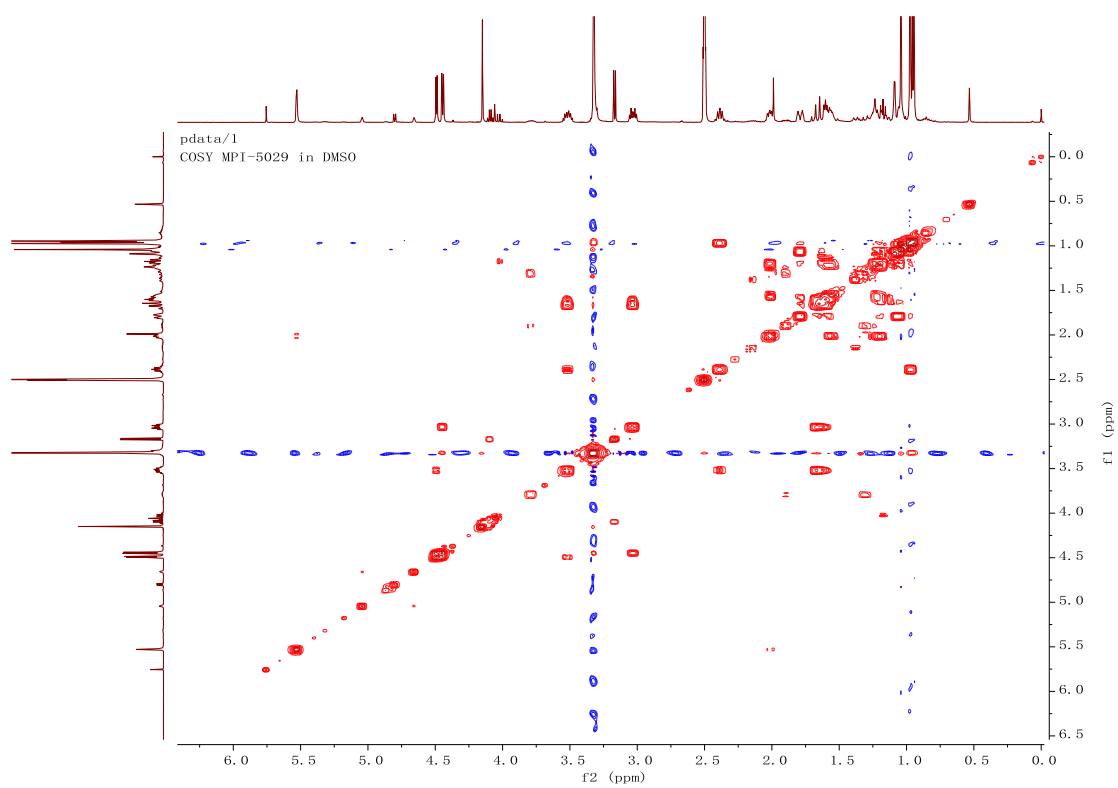


Figure S122. COSY spectrum of the new compound **28**

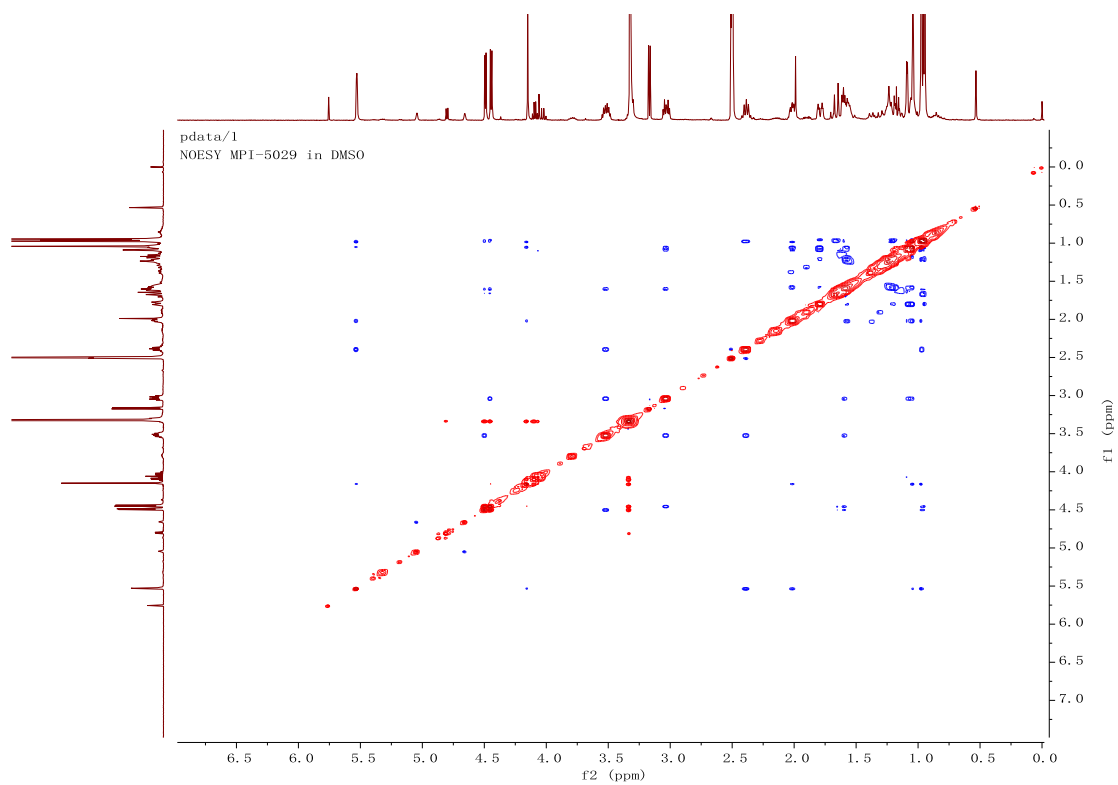


Figure S123. NOESY spectrum of the new compound **28**

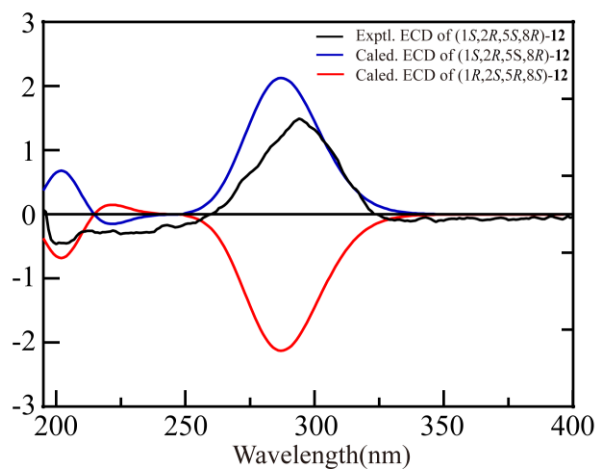


Figure S124. Experimental ECD spectra and calculated ECD spectra of compound **12**