Supporting Information

Limonoids with diverse frameworks from stem barks of *Entandrophragma angolense* and their bioactivities

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Table of Contents:

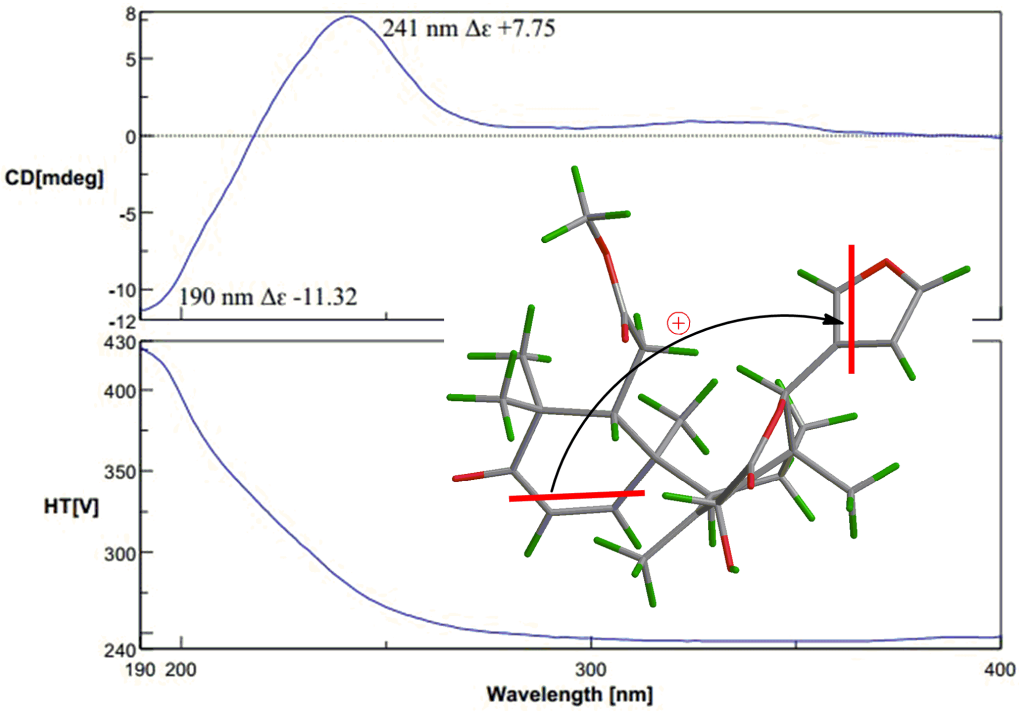


Figure S1. ECD and UV spectra of **2** (in MeCN).

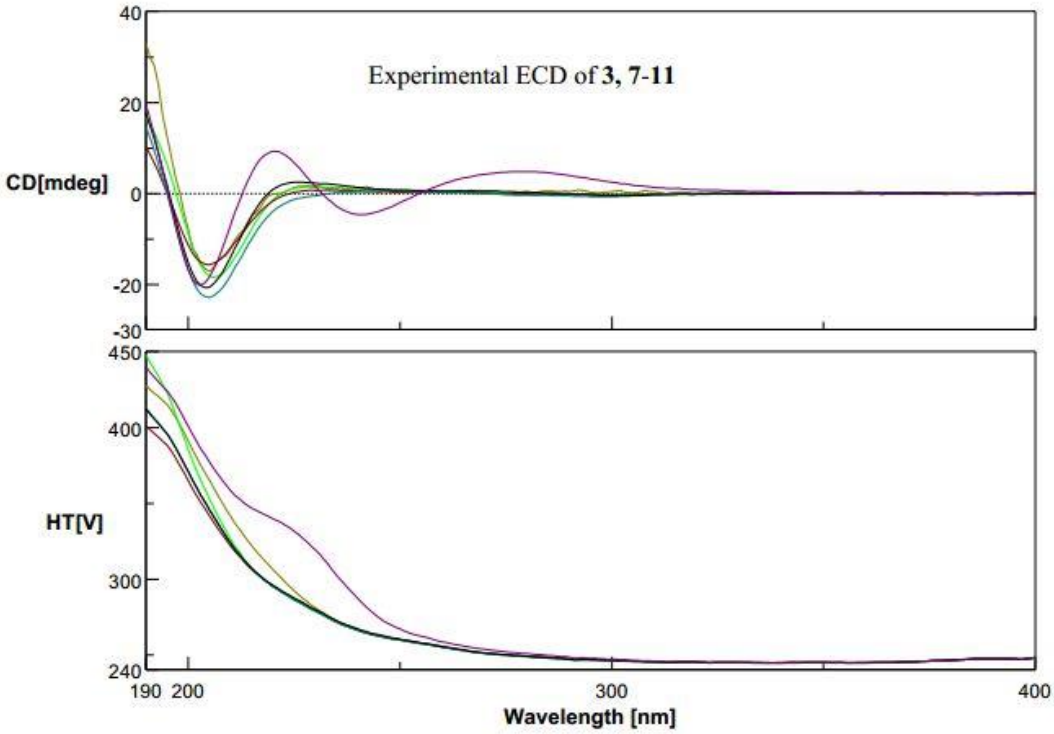


Figure S2. Experimental ECD of **3**, **7-11** (in MeCN).

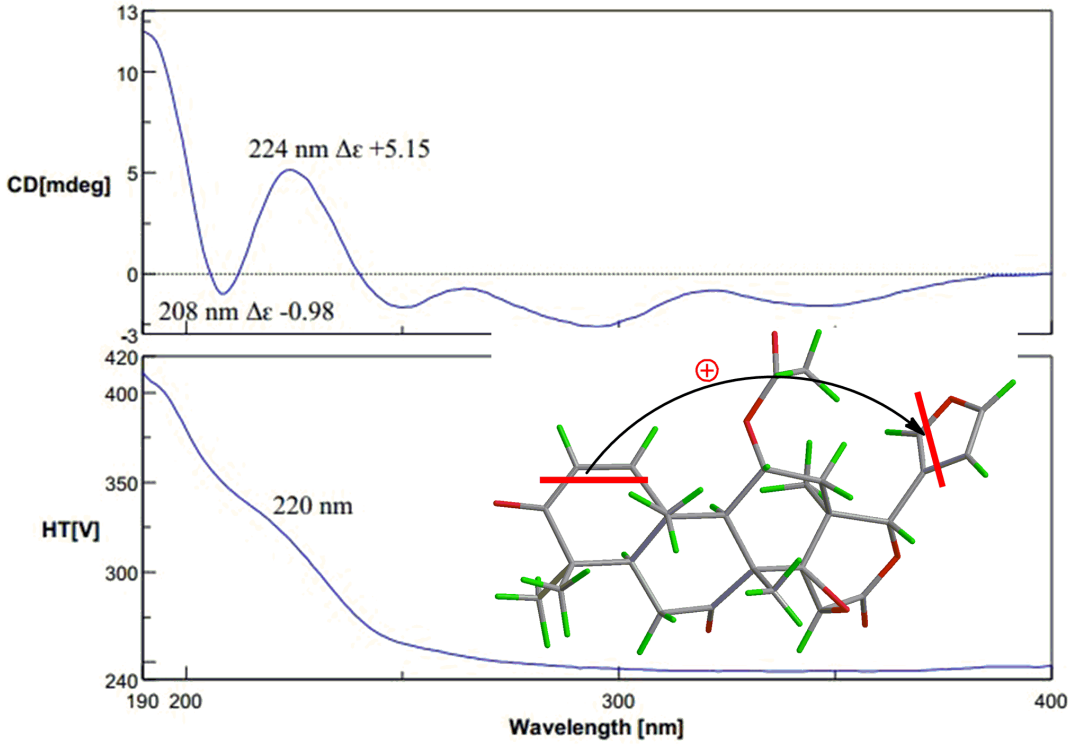


Figure S3. ECD and UV spectra of **12** (in MeCN).

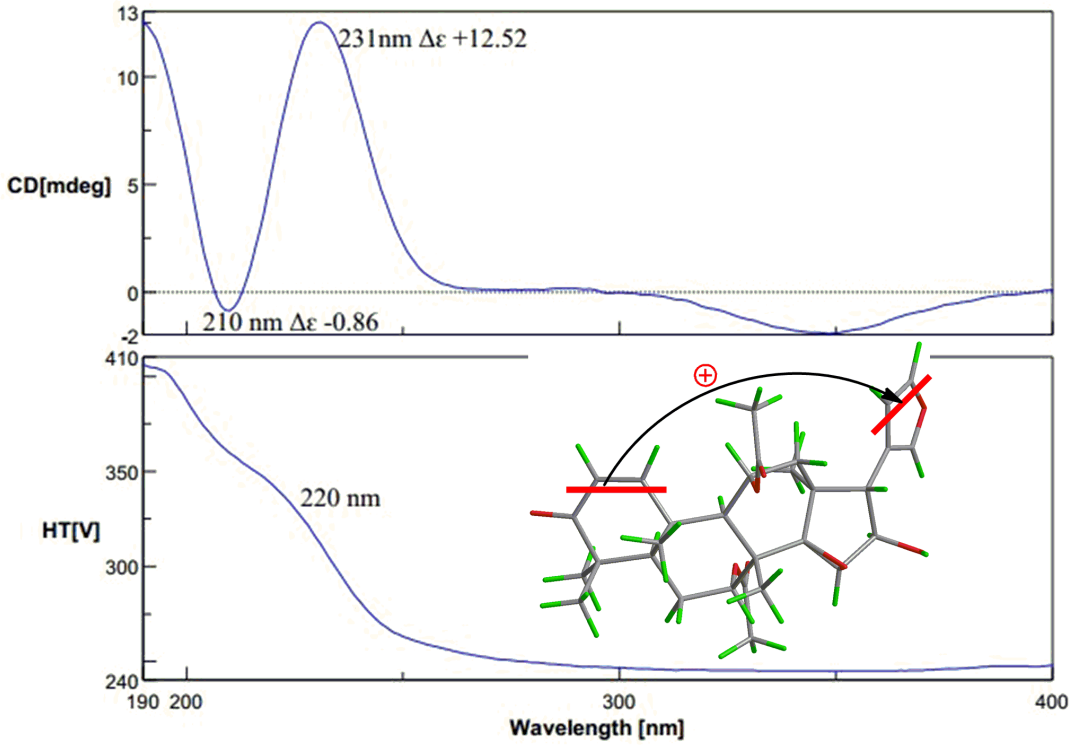
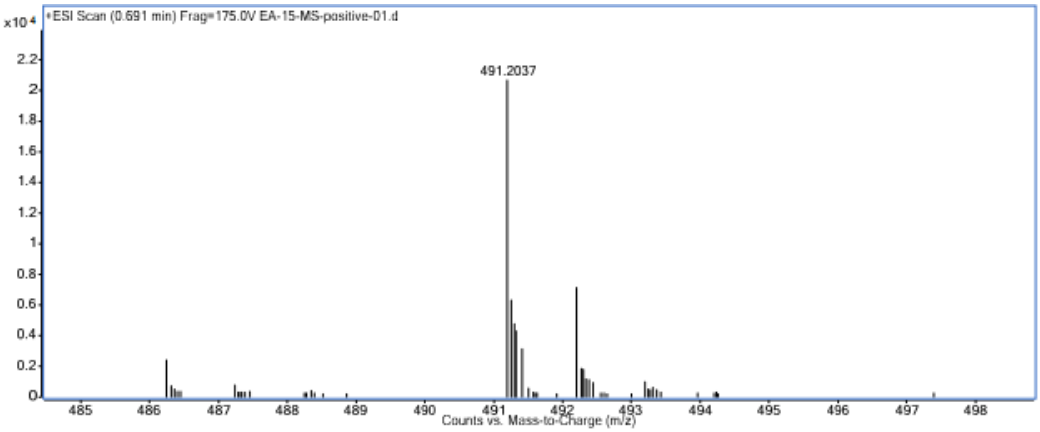


Figure S4. ECD and UV spectra of **15** (in MeCN).



Elemental Composition Calculator

Target m/z:	491.2037	**Result type:**	Positive ions	**Species:**	$[M+Na]^+$
Elements:		C (0-80); H (0-120); O (0-30); Na (0-5)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
C27H32NaO7		491.2040		0.65	

Figure S5. HRESIMS spectrum of **1**.

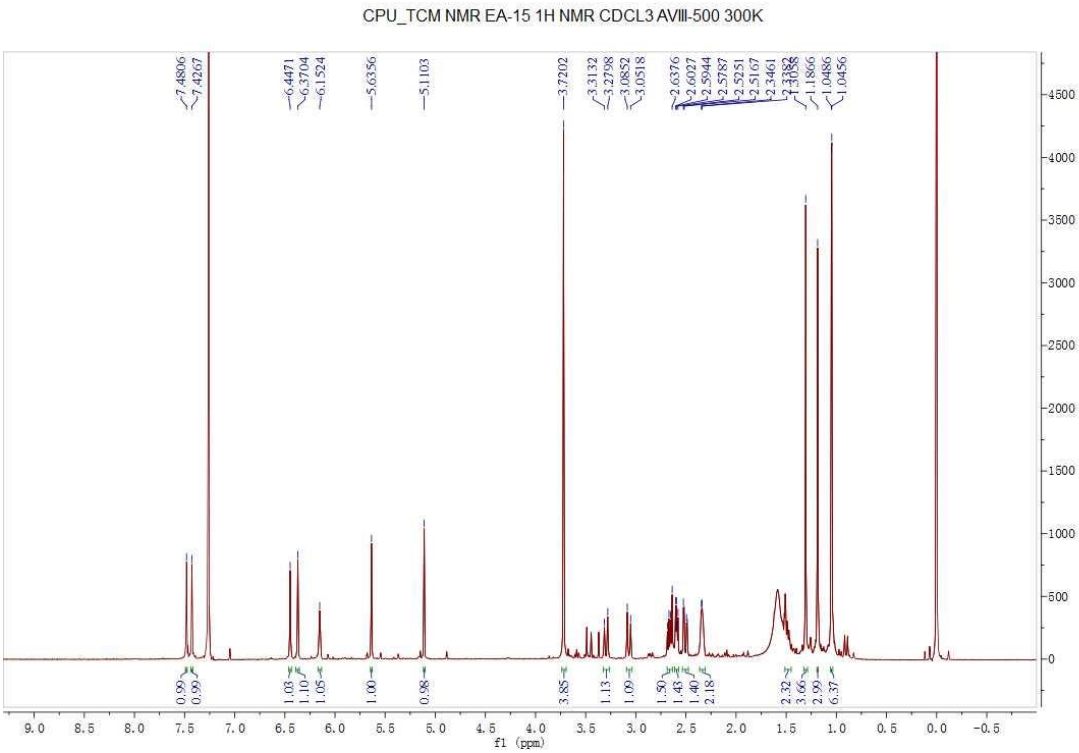


Figure S6. ^{1}H NMR spectrum of **1** in $CDCl_3$.

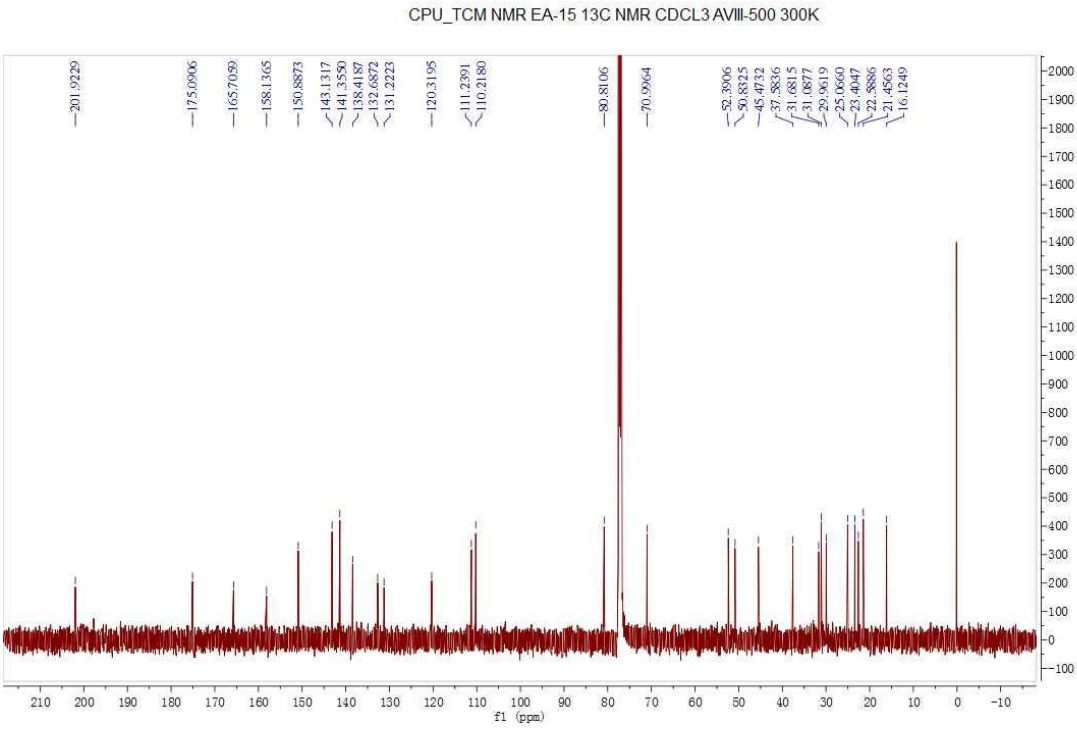


Figure S7. ^{13}C NMR spectrum of **1** in $CDCl_3$.

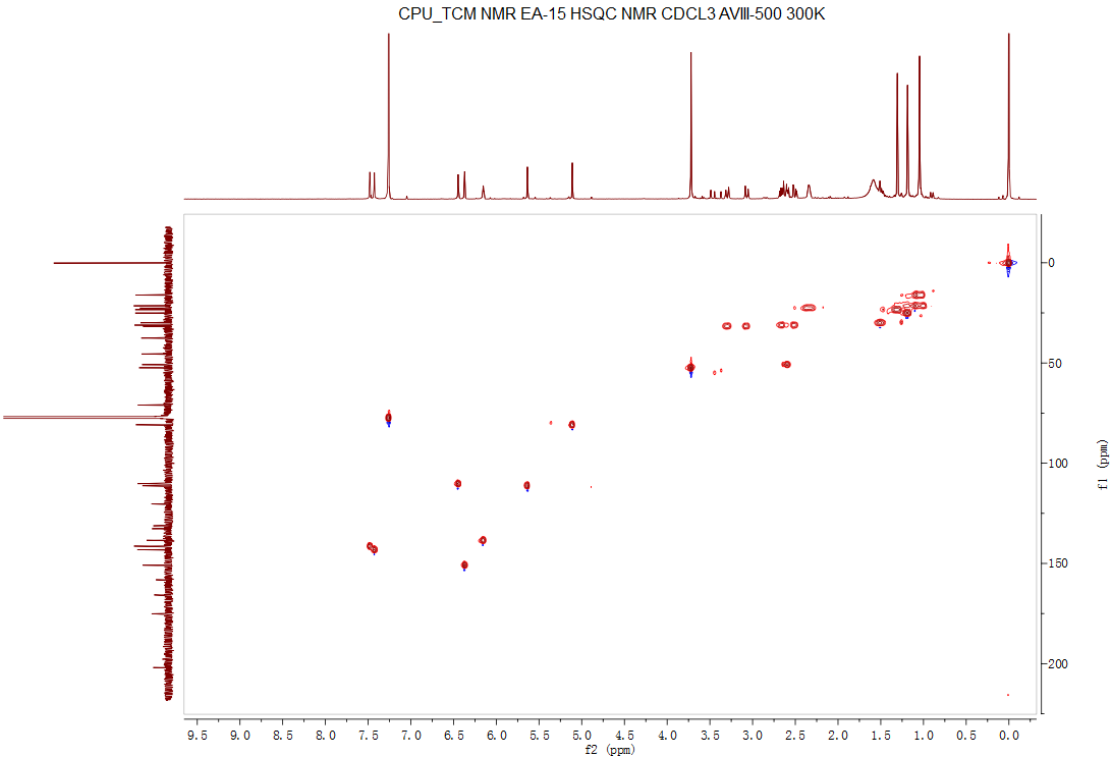


Figure S8. HSQC spectrum of **1** in $CDCl_3$.

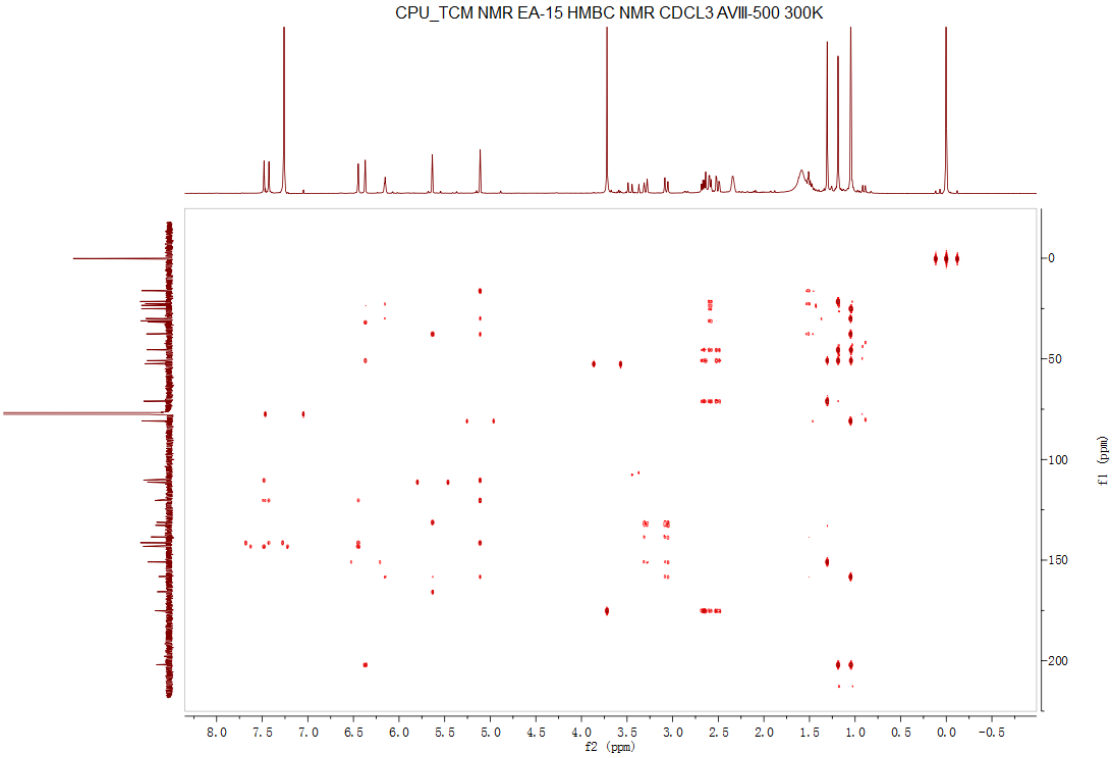


Figure S9. HMBC spectrum of **1** in $CDCl_3$.

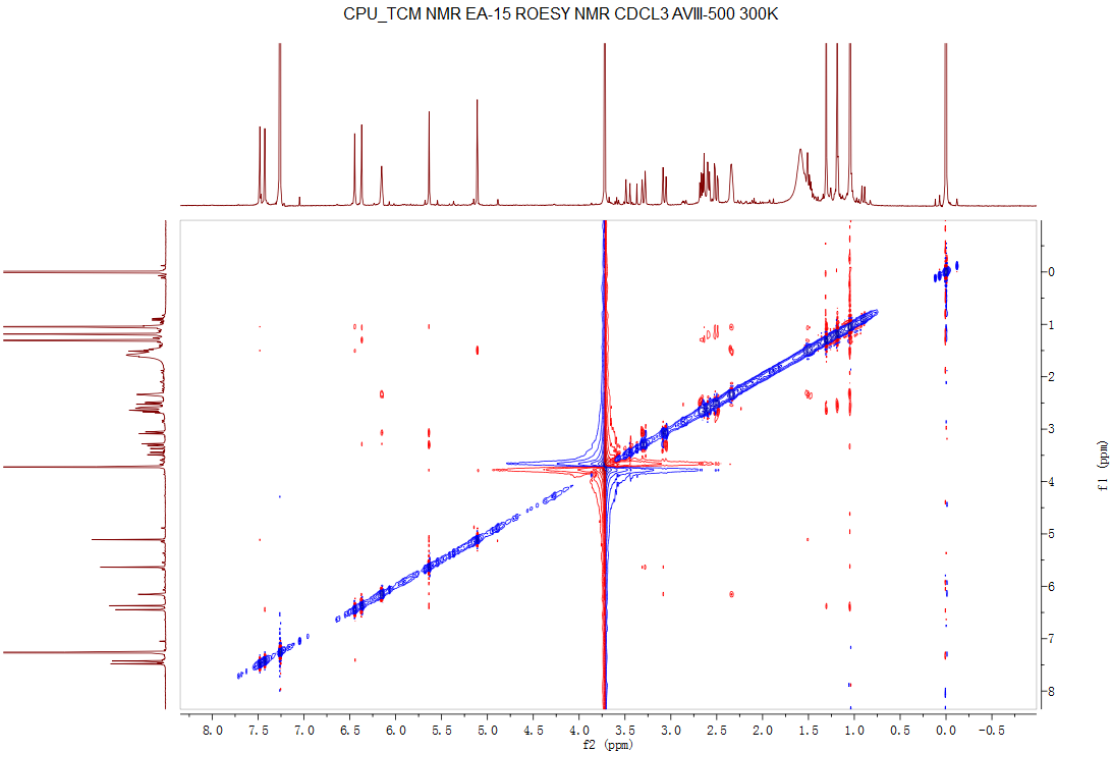
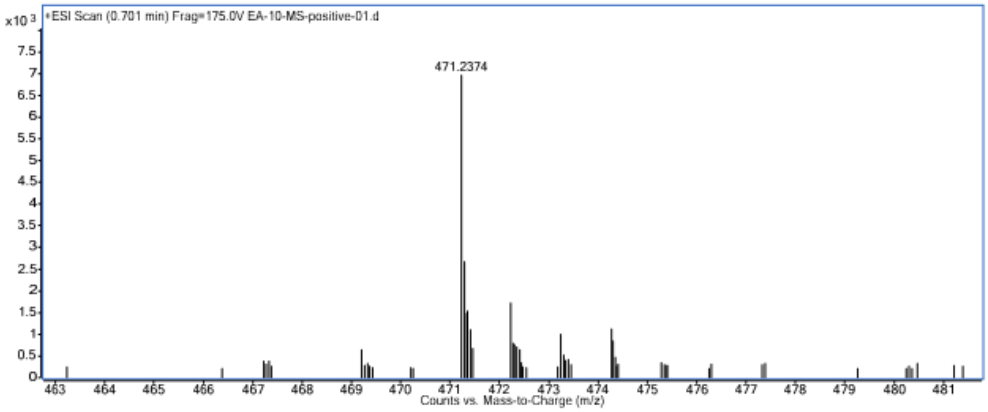


Figure S10. ROESY spectrum of **1** in $CDCl_3$



Elemental Composition Calculator

Target m/z:	471.2374	**Result type:**	Positive ions	**Species:**	$[M+H]^+$
Elements:		C (0-80); H (0-120); O (0-30)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
C27H35O7		471.2377		0.7	

Figure S11. HRESIMS spectrum of **2**.

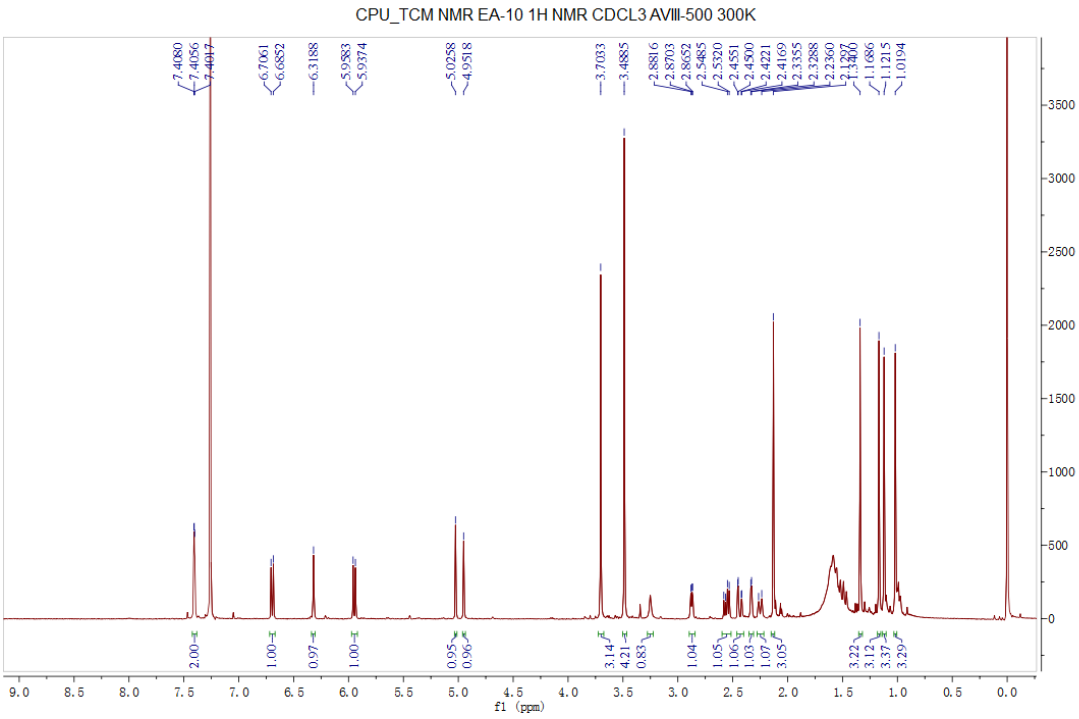


Figure S12. ^{1}H NMR spectrum of **2** in $CDCl_3$.

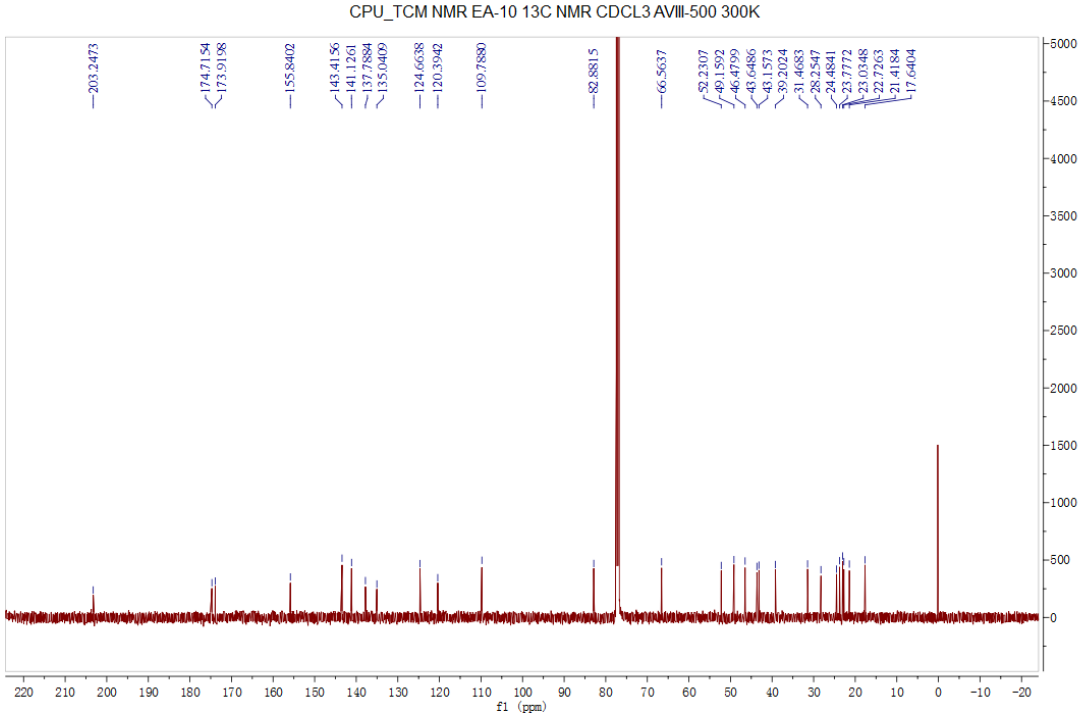


Figure S13. ^{13}C NMR spectrum of **2** in $CDCl_3$.

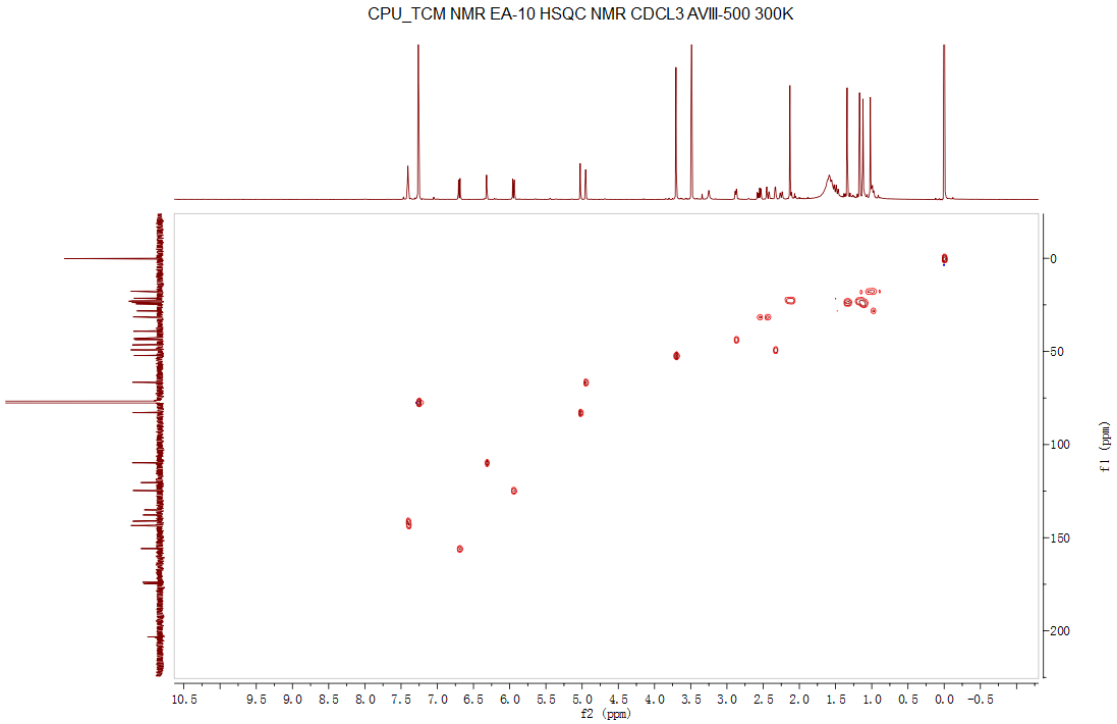


Figure S14. HSQC spectrum of **2** in $CDCl_3$.

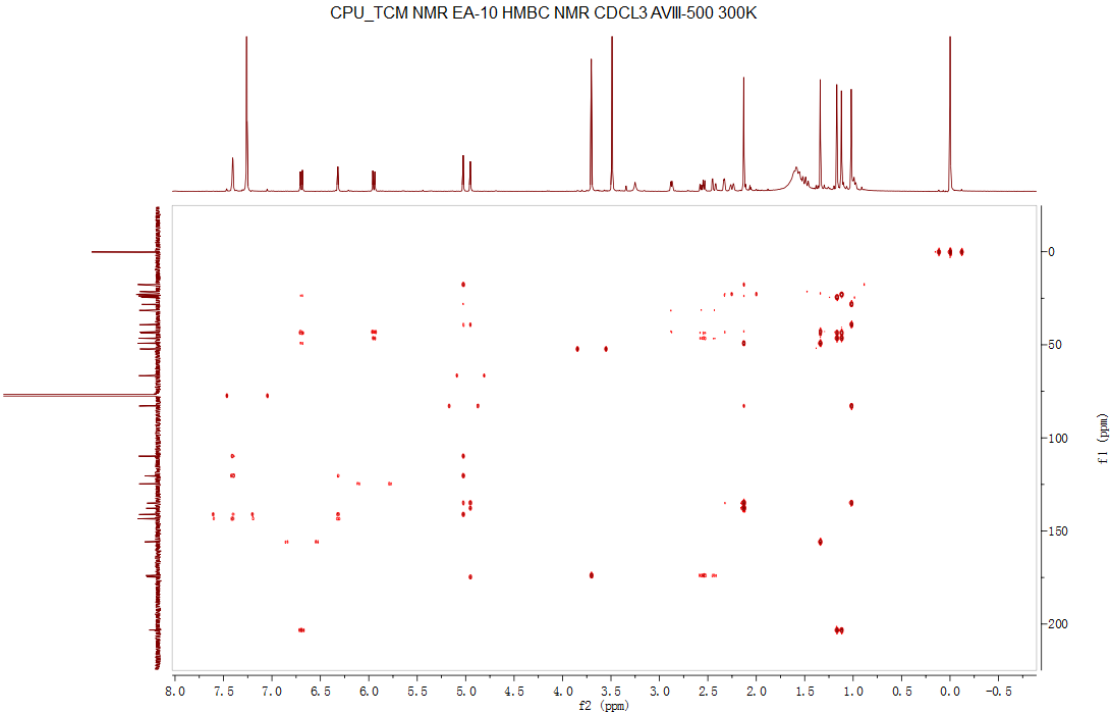


Figure S15. HMBC spectrum of **2** in $CDCl_3$.

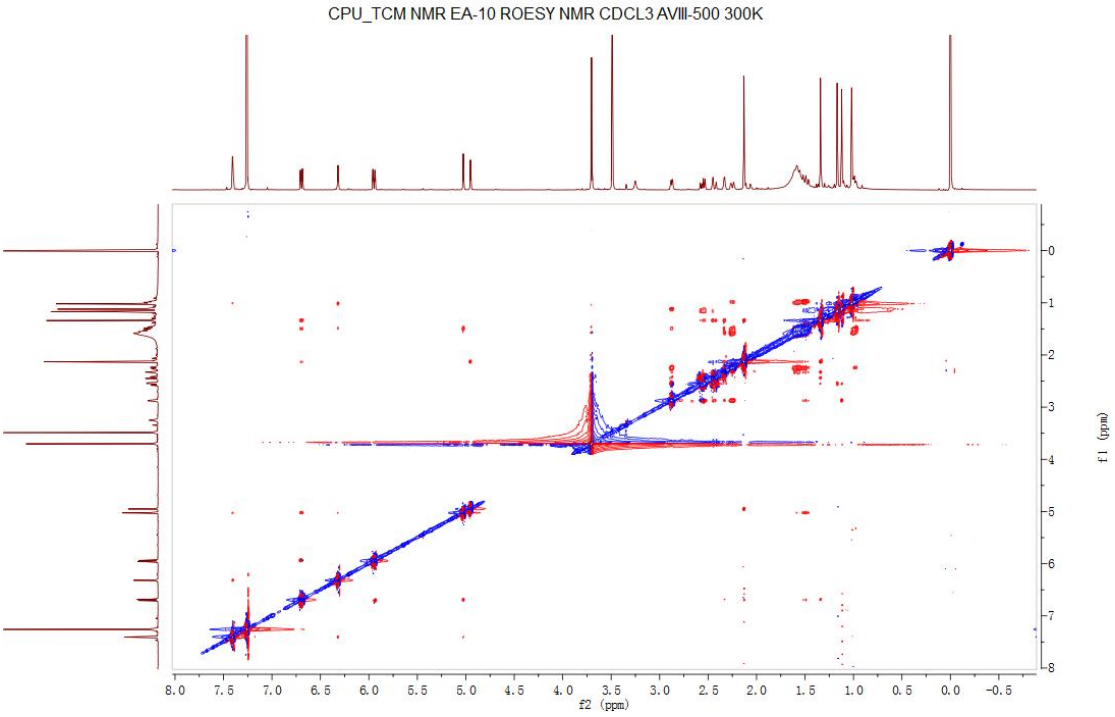
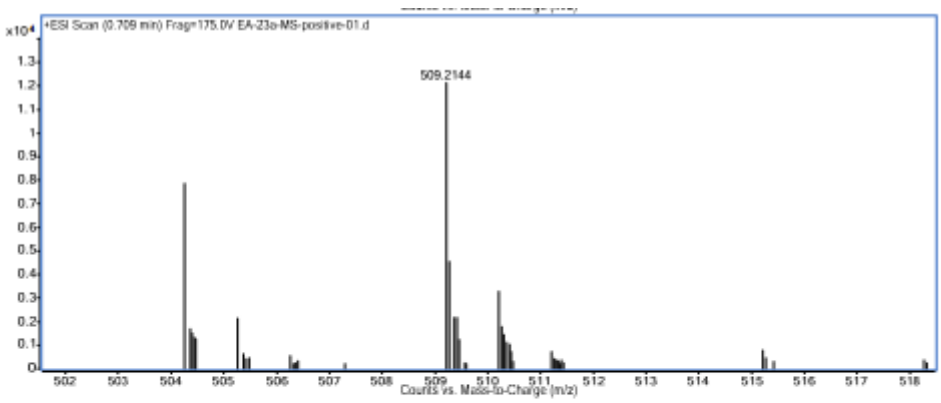


Figure S16. ROESY spectrum of **2** in $CDCl_3$.



Elemental Composition Calculator

Target m/z:	509.2144	**Result type:**	Positive ions	**Species:**	$[M+Na]^+$
Elements:		C (0-80); H (0-120); O (0-30); Na (0-5)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
C27H34NaO8		509.2146		0.29	

Figure S17. HRESIMS spectrum of **3**.

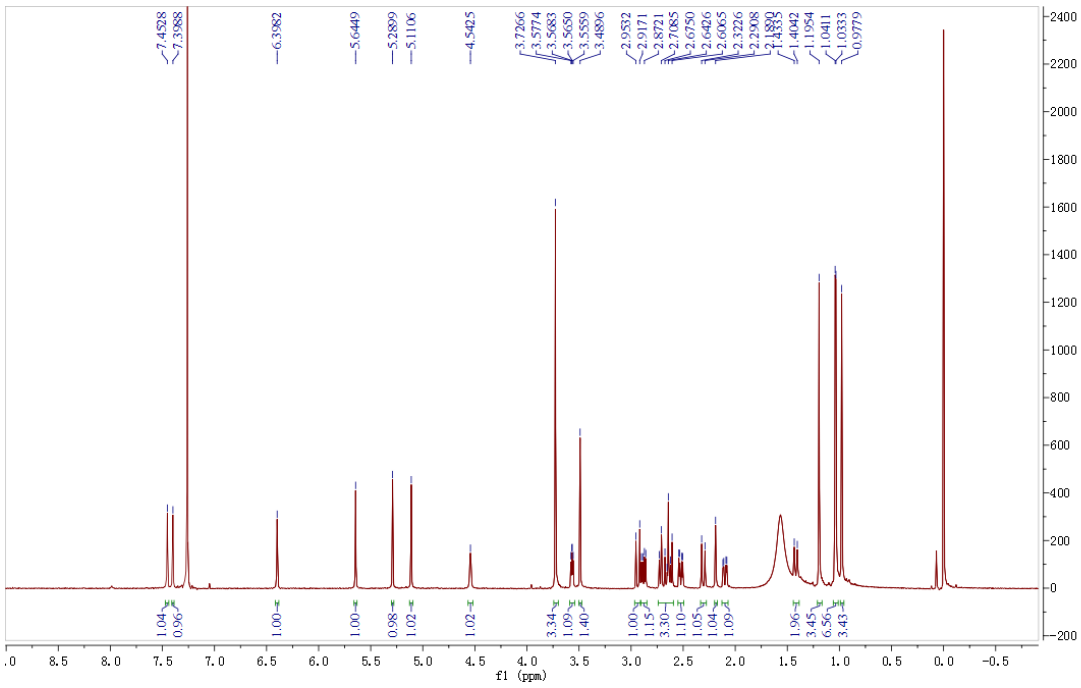


Figure S18. ^{1}H NMR spectrum of **3** in $CDCl_3$.

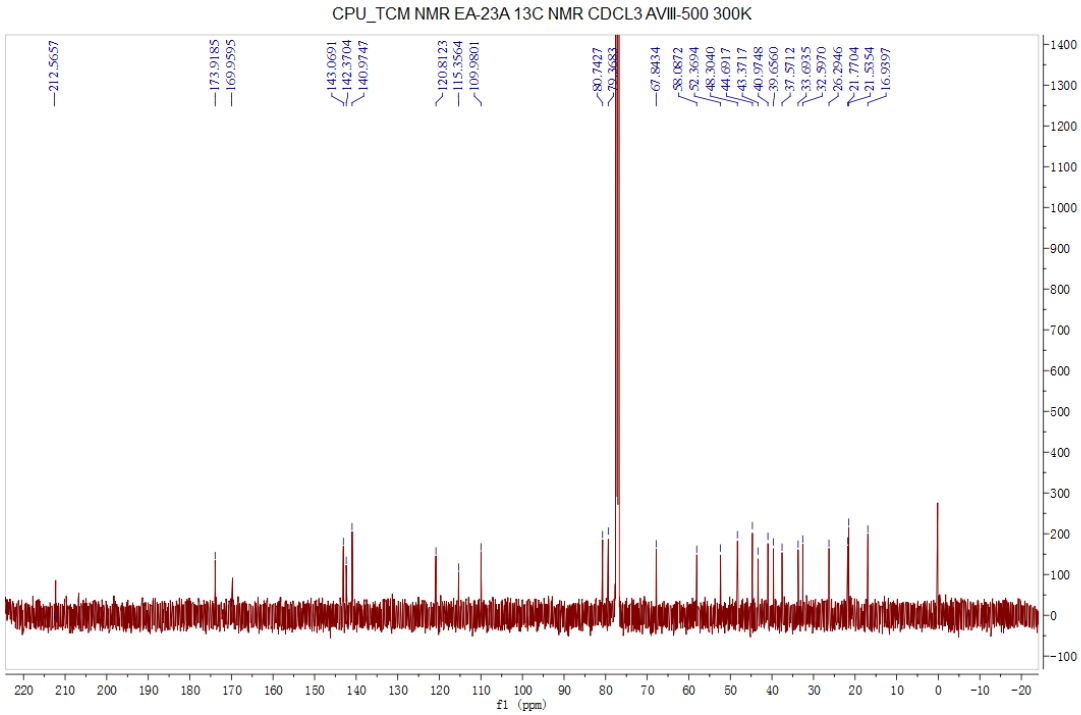


Figure S19. ^{13}C NMR spectrum of **3** in $CDCl_3$.

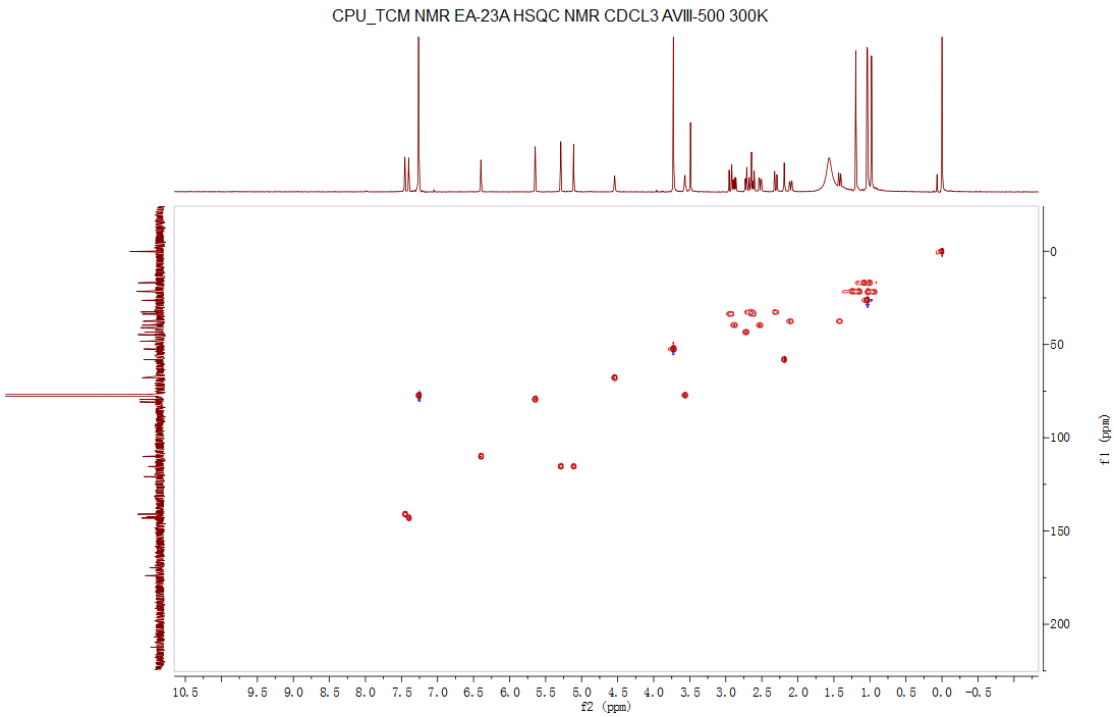


Figure S20. HSQC spectrum of **3** in $CDCl_3$.

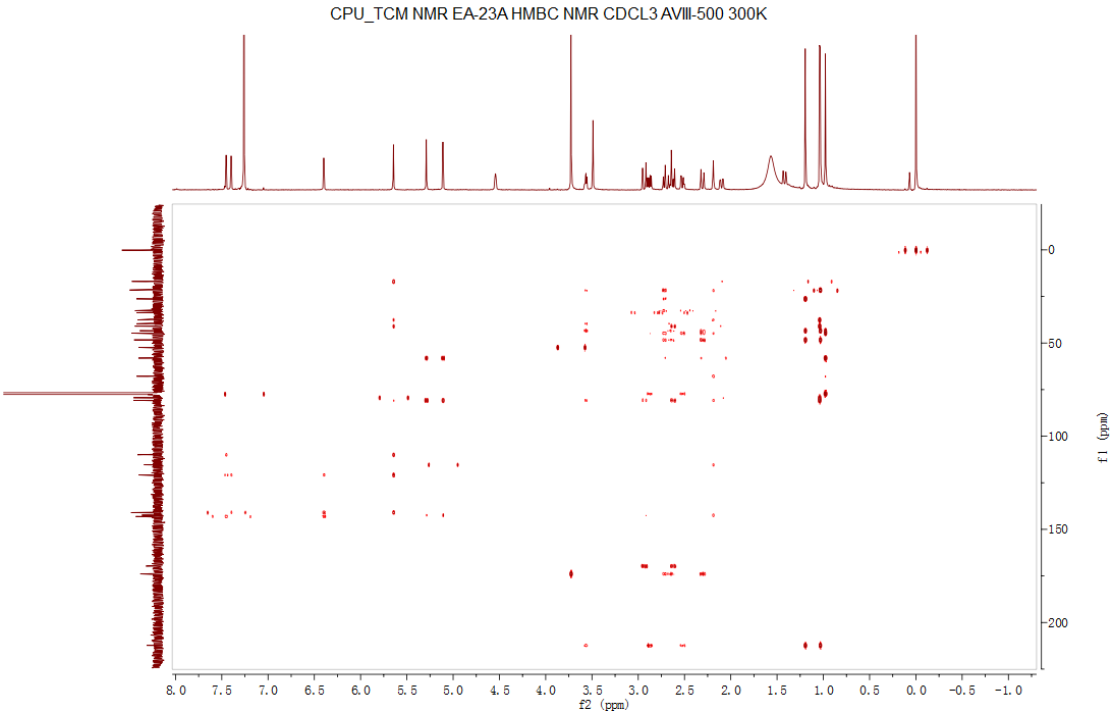


Figure S21. HMBC spectrum of **3** in $CDCl_3$.

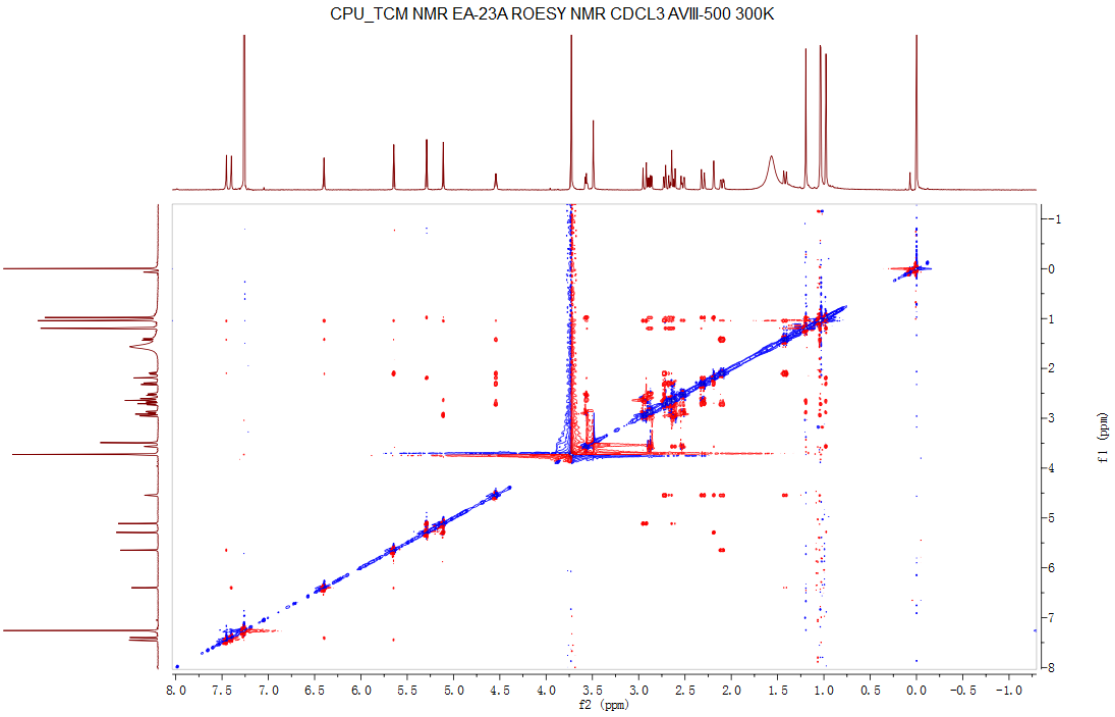
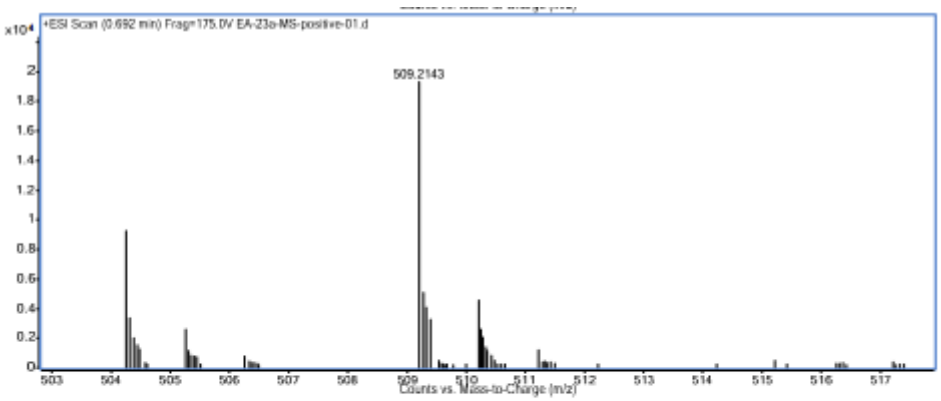


Figure S22. ROESY spectrum of **3** in $CDCl_3$.



Elemental Composition Calculator

Target m/z:	509.2143	**Result type:**	Positive ions	**Species:**	$[M+Na]^+$
Elements:		C (0-80); H (0-120); O (0-30); Na (0-5)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
C27H34NaO8		509.2146		0.57	

Figure S23. HRESIMS spectrum of **4**.

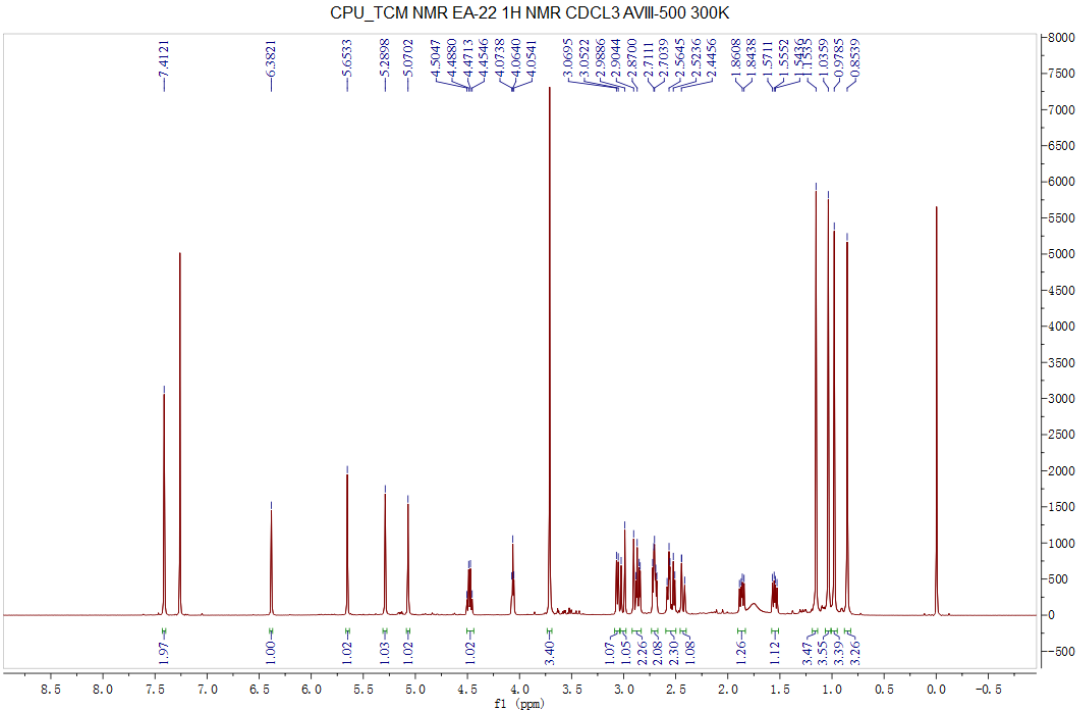


Figure S24. ^{1}H NMR spectrum of **4** in $CDCl_3$.

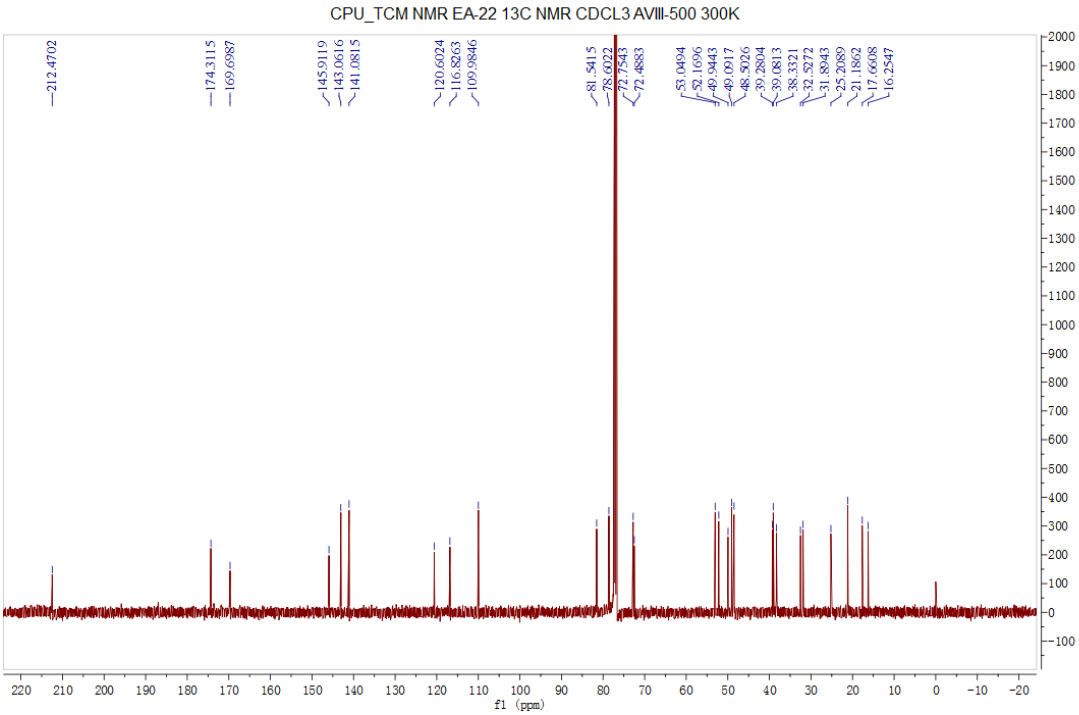


Figure S25. ^{13}C NMR spectrum of **4** in $CDCl_3$.

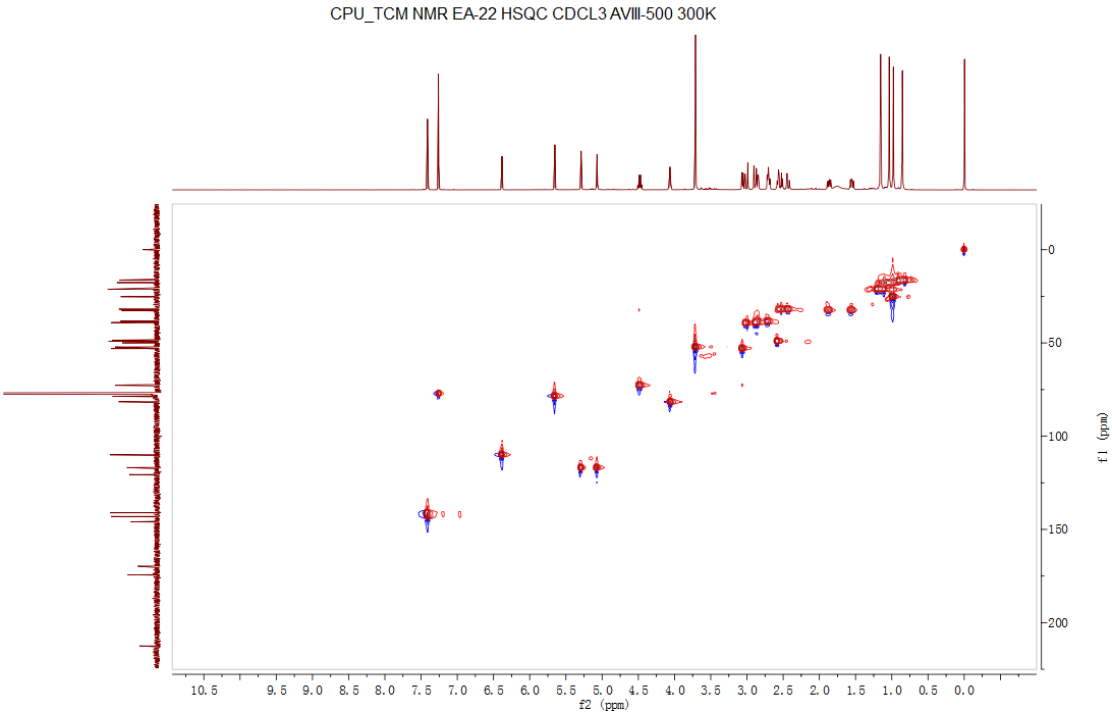


Figure S26. HSQC spectrum of **4** in $CDCl_3$.

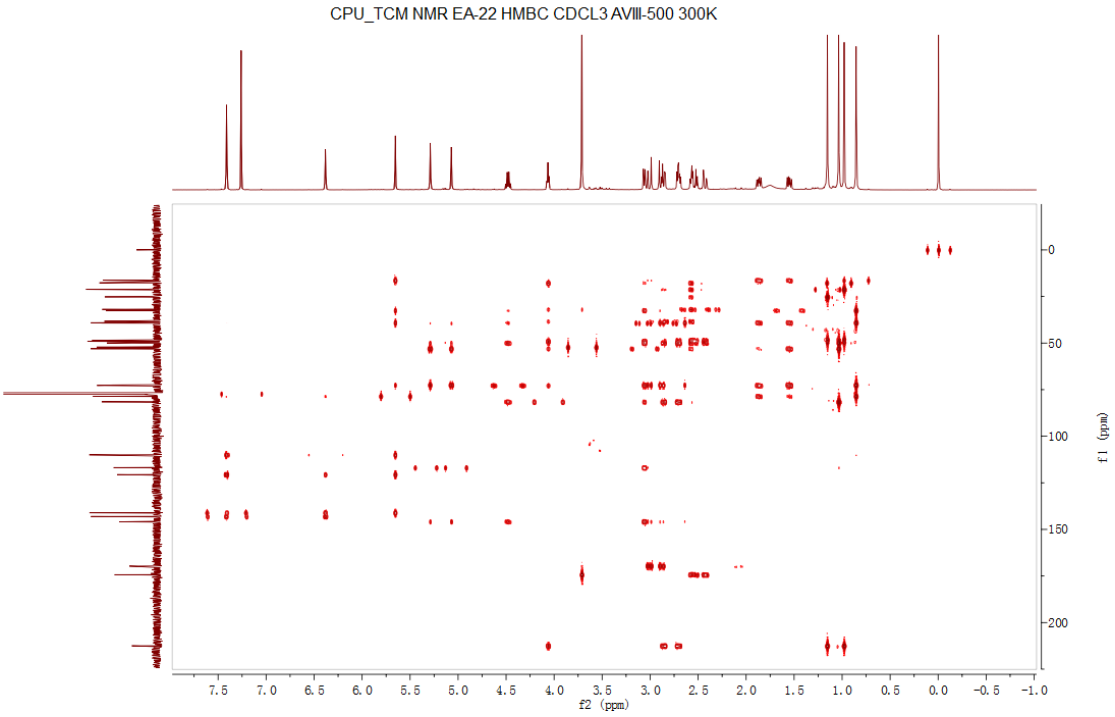


Figure S27. HMBC spectrum of **4** in $CDCl_3$.

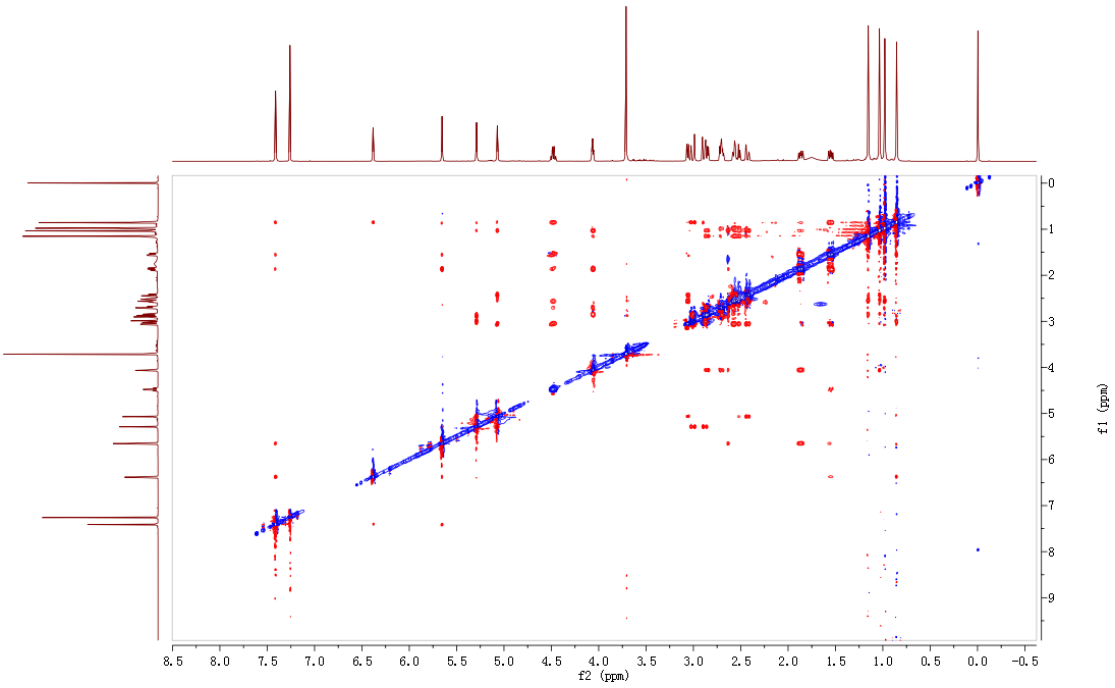
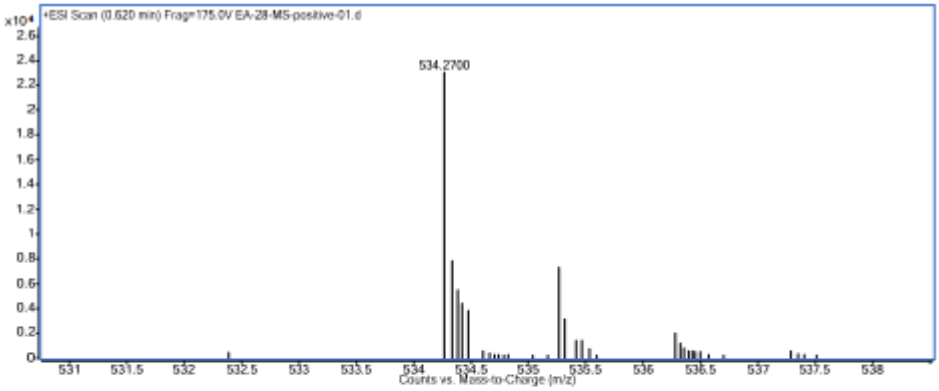


Figure S28. ROESY spectrum of **4** in $CDCl_3$.



Elemental Composition Calculator

Target m/z:	534.2700	**Result type:**	Positive ions	**Species:**	$[M+NH_4]^+$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
C28H40NO9		534.2698		-0.46	

Figure S29. HRESIMS spectrum of **5**.

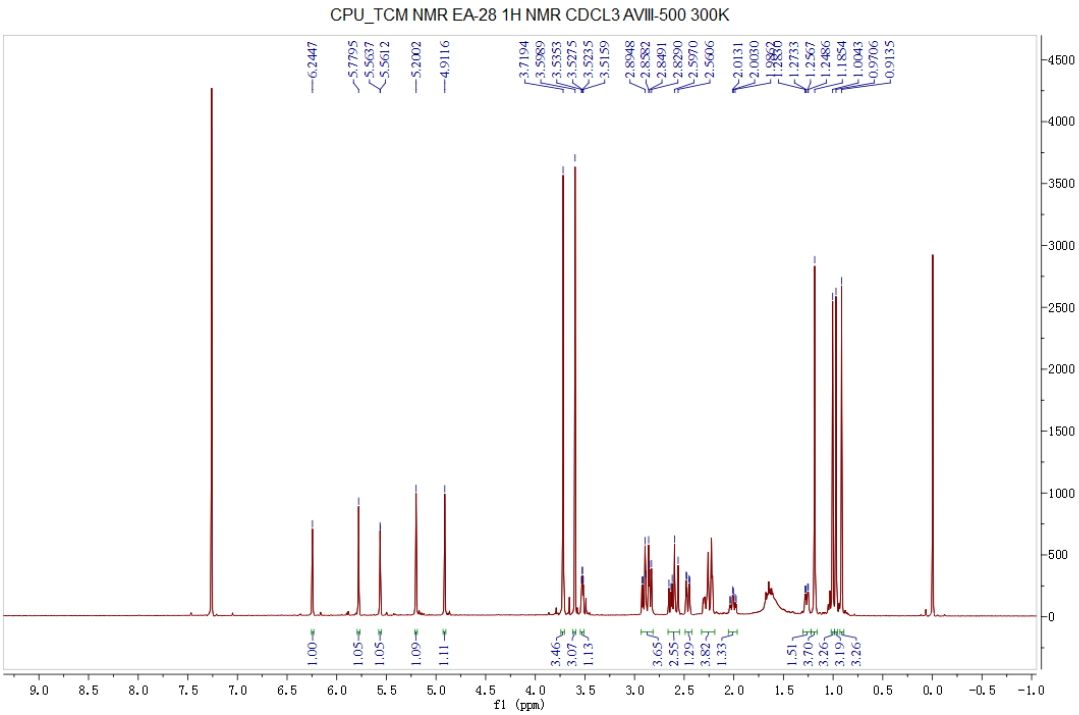


Figure S30. ^{1}H NMR spectrum of **5** in $CDCl_3$.

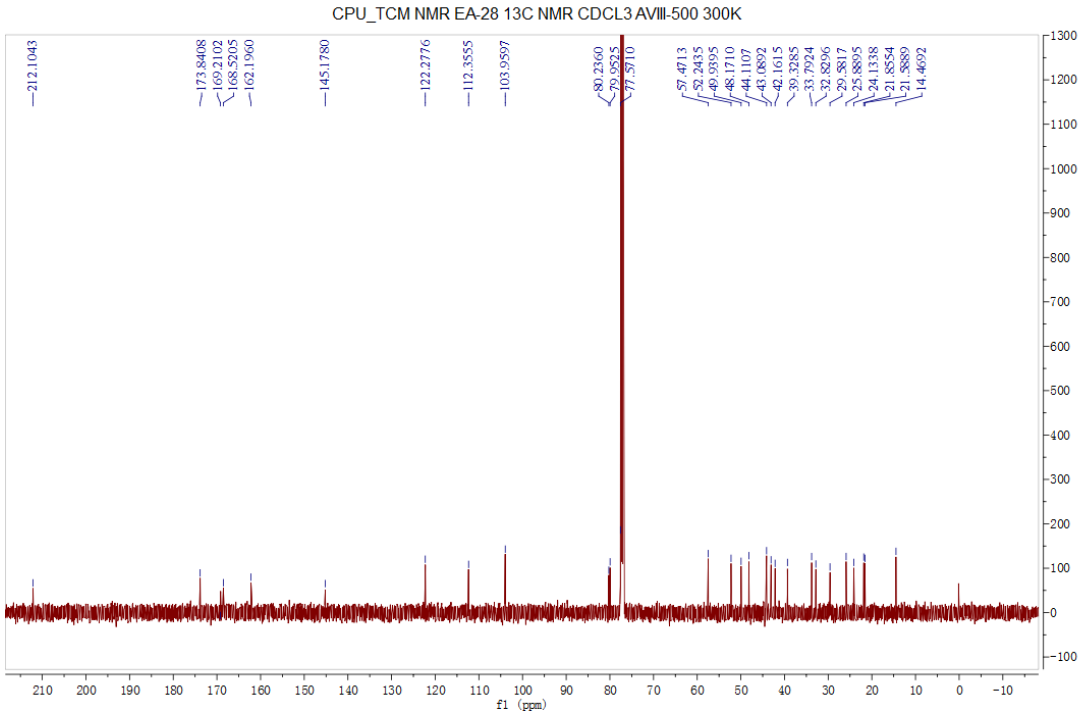


Figure S31. ^{13}C NMR spectrum of **5** in $CDCl_3$.

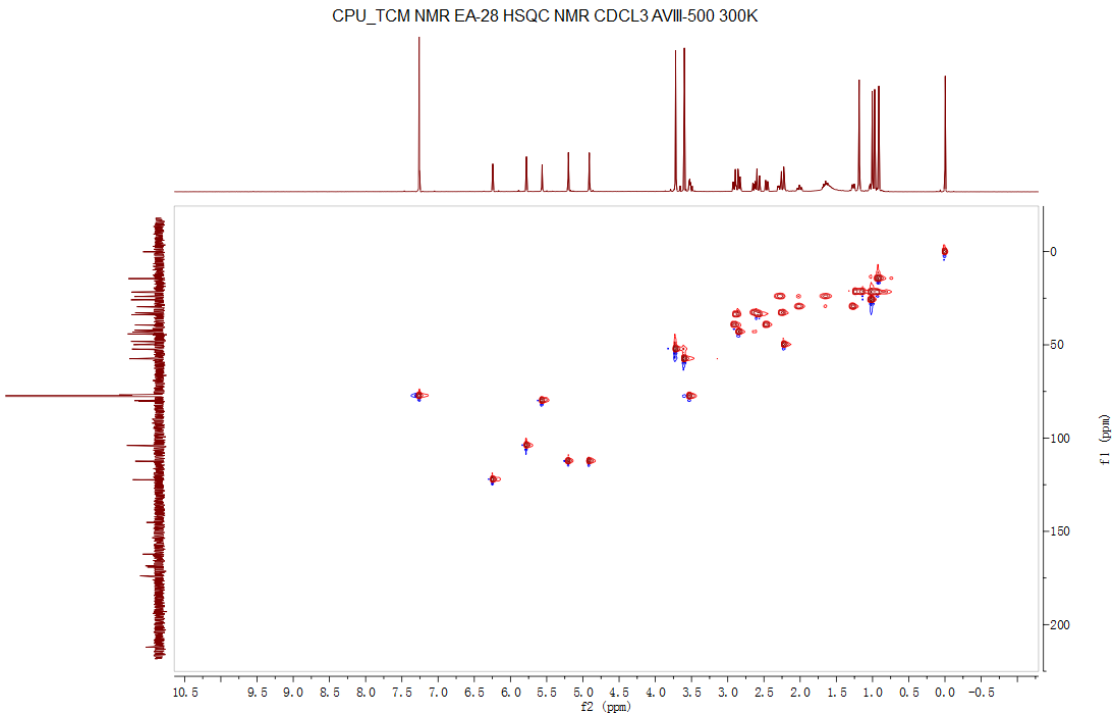


Figure S32. HSQC spectrum of **5** in $CDCl_3$.

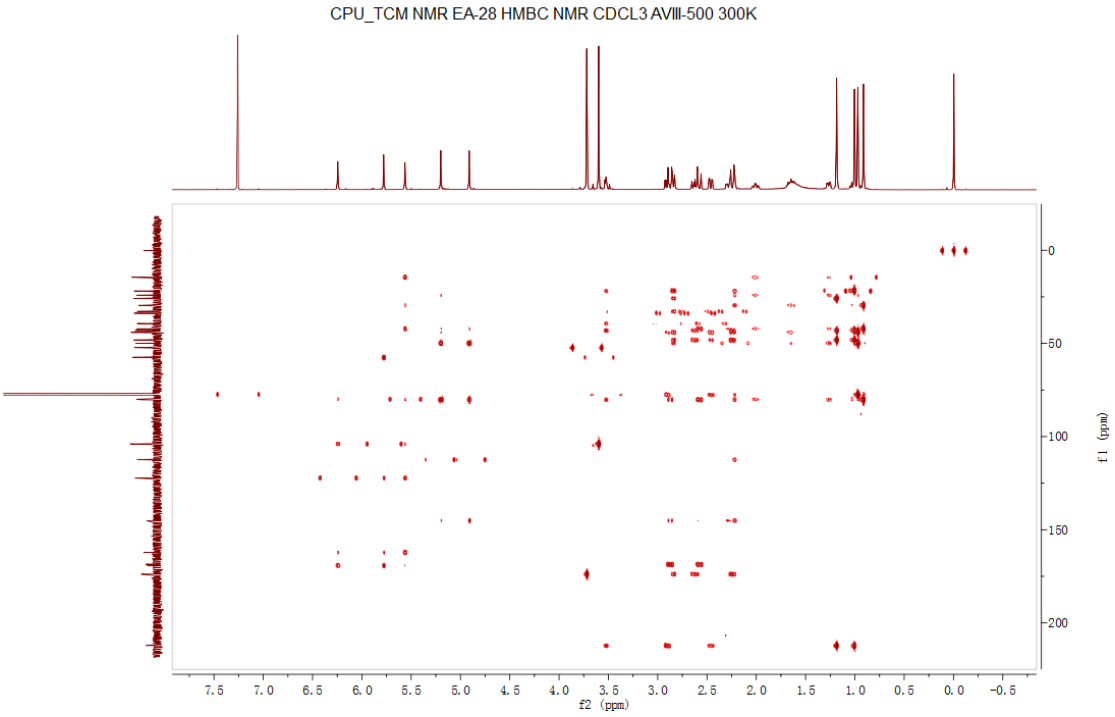


Figure S33. HMBC spectrum of **5** in $CDCl_3$.

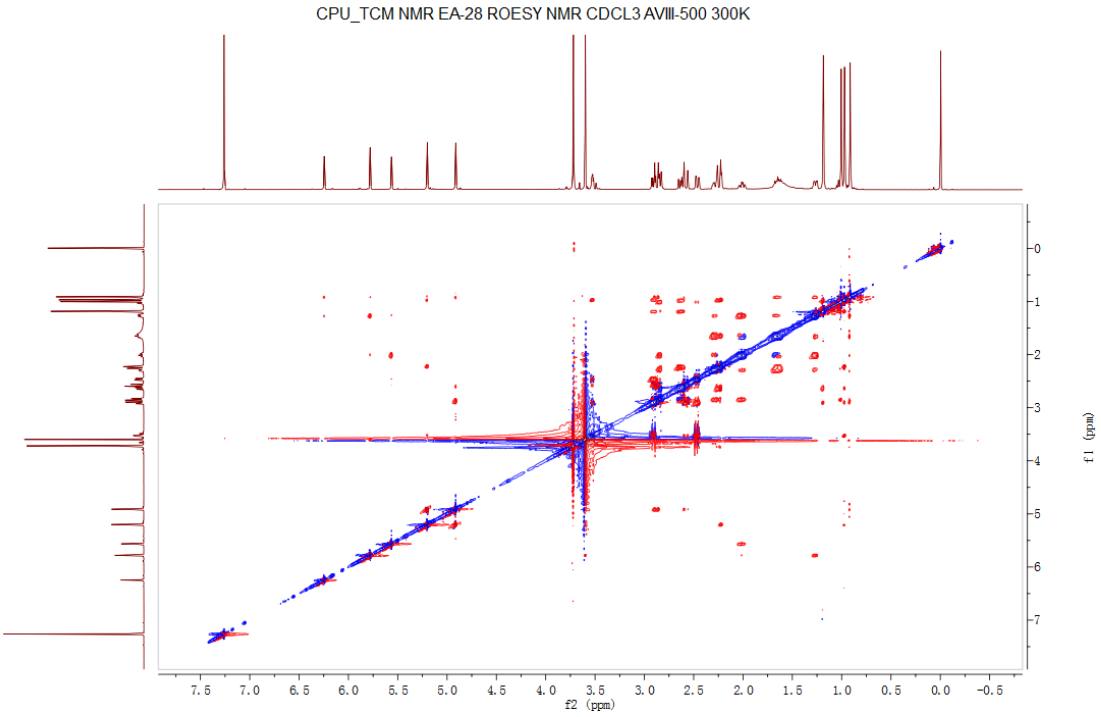
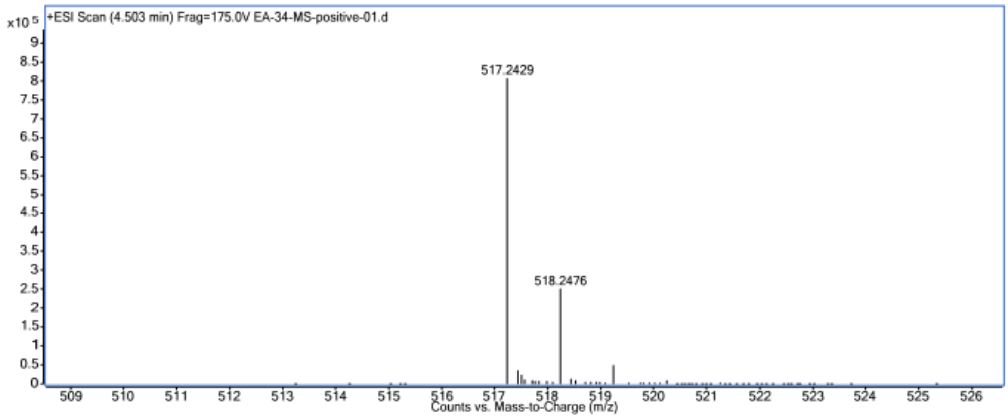


Figure S34. ROESY spectrum of **5** in $CDCl_3$.



Elemental Composition Calculator

Target m/z:	517.2429	**Result type:**	Positive ions	**Species:**	$[M+H]^+$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10)			
Ion Formula		**Calculated m/z**		**PPM Error**	
C28H37O9		517.2432		0.69	

Figure S35. HRESIMS spectrum of **6**.

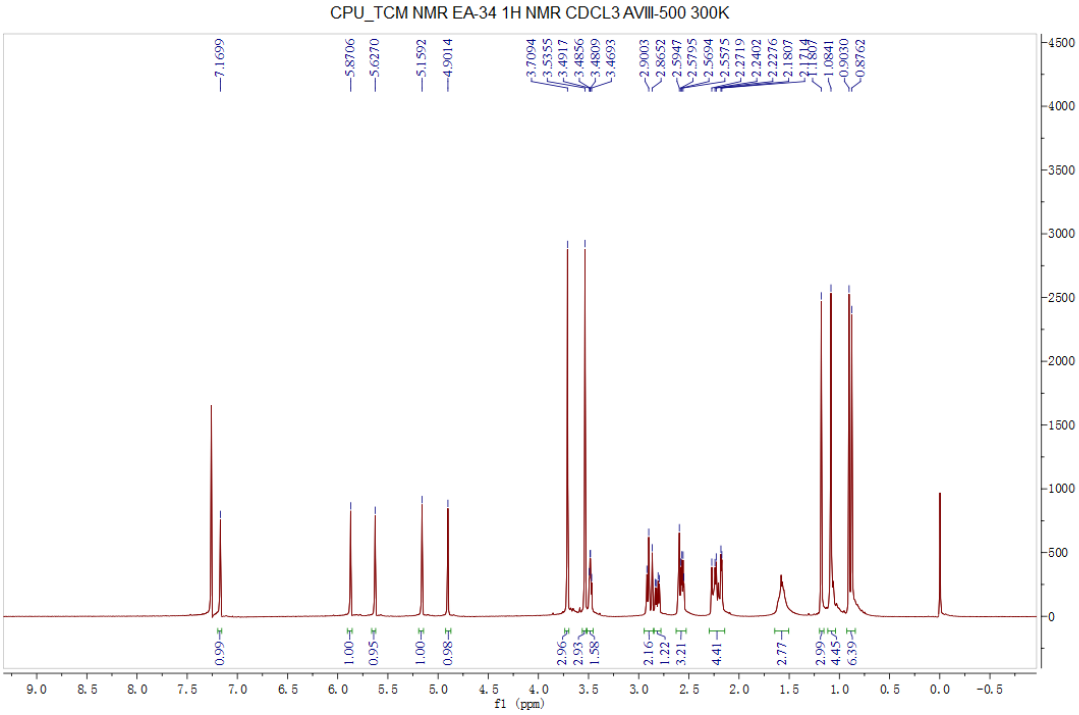


Figure S36. ^{1}H NMR spectrum of **6** in $CDCl_3$.

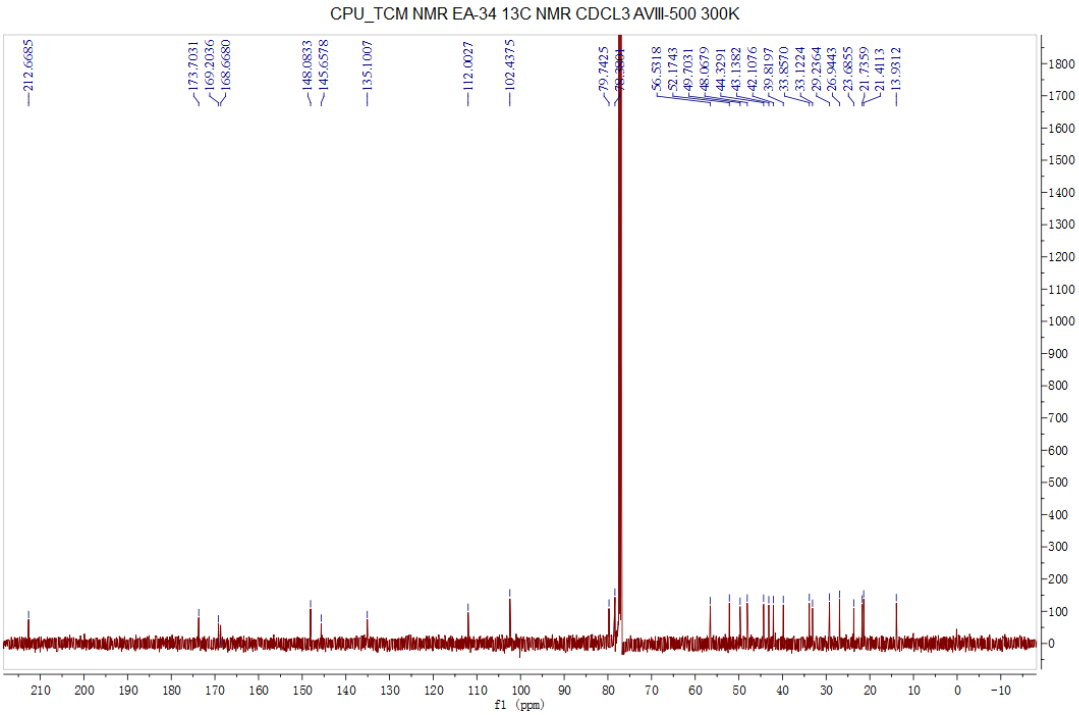


Figure S37. ^{13}C NMR spectrum of **6** in $CDCl_3$.

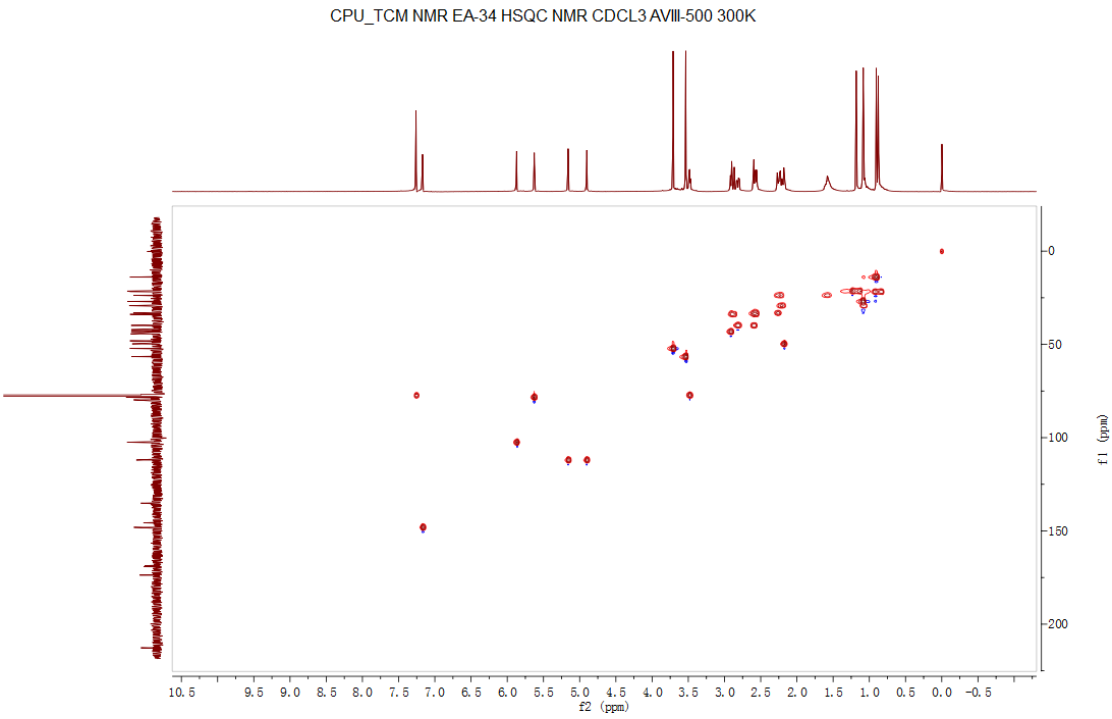


Figure S38. HSQC spectrum of **6** in $CDCl_3$.

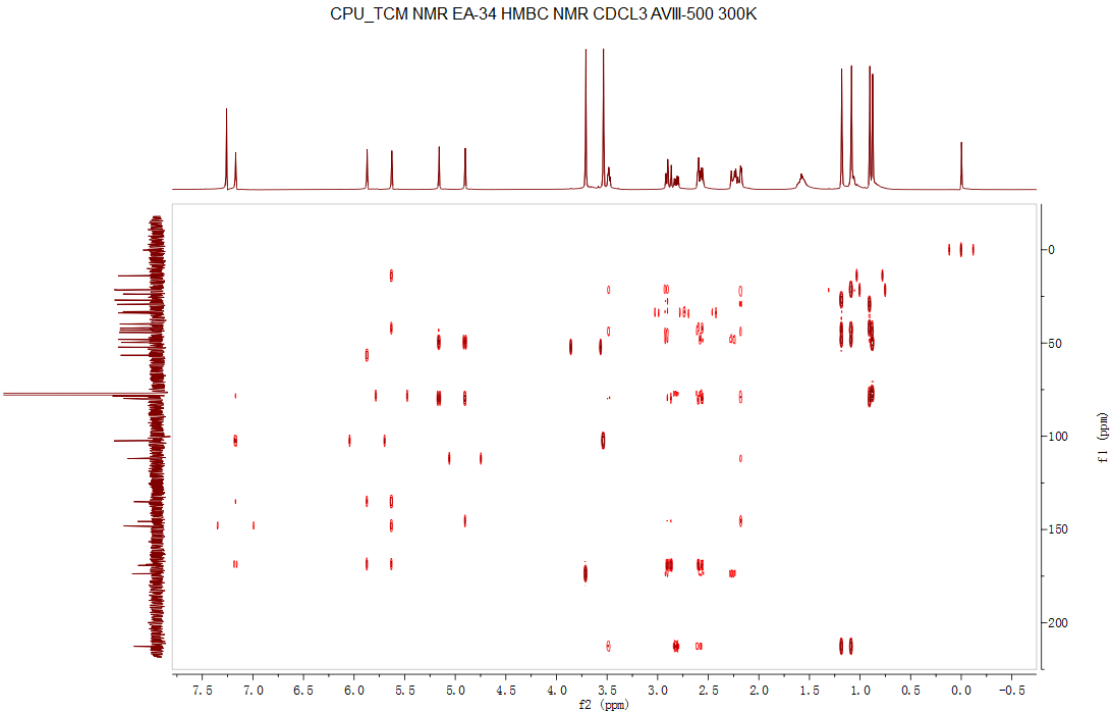


Figure S39. HMBC spectrum of **6** in $CDCl_3$.

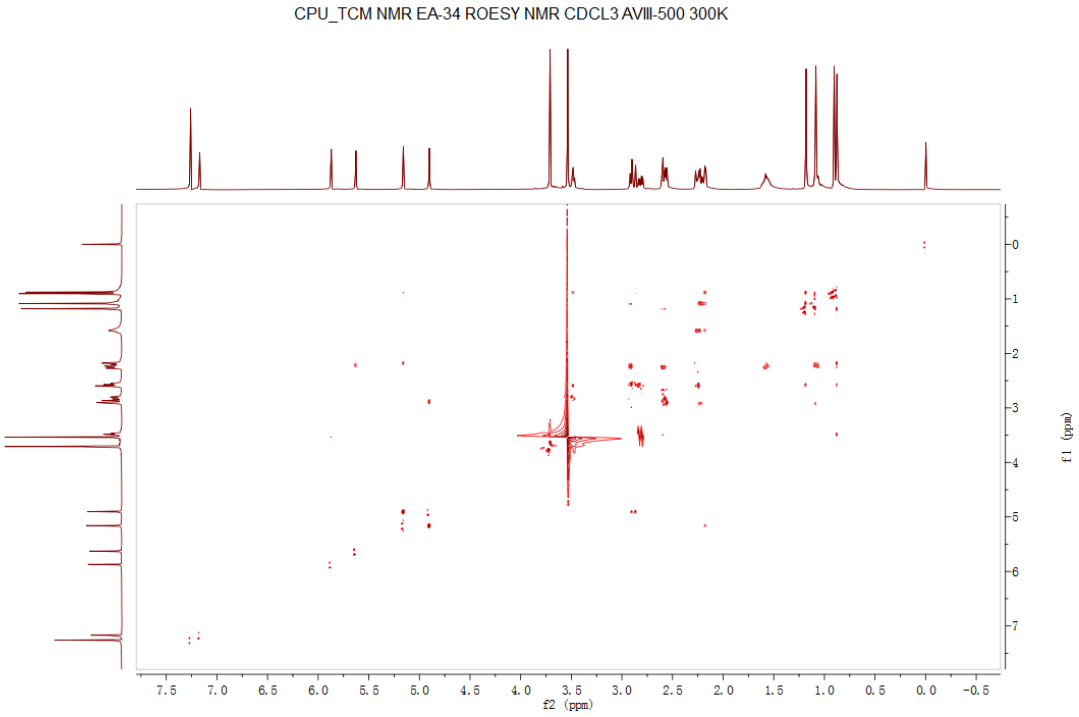
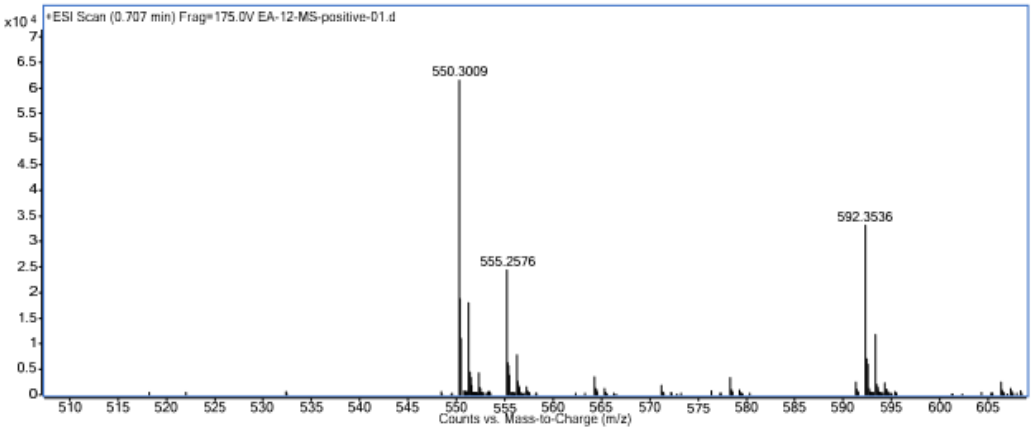


Figure S40. ROESY spectrum of **6** in $CDCl_3$.



Elemental Composition Calculator

Target m/z:	550.3009	**Result type:**	Positive ions	**Species:**	$[M+NH4]^+$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
C29H44NO9		550.3011		0.34	

Figure S41. HRESIMS spectrum of **7**.

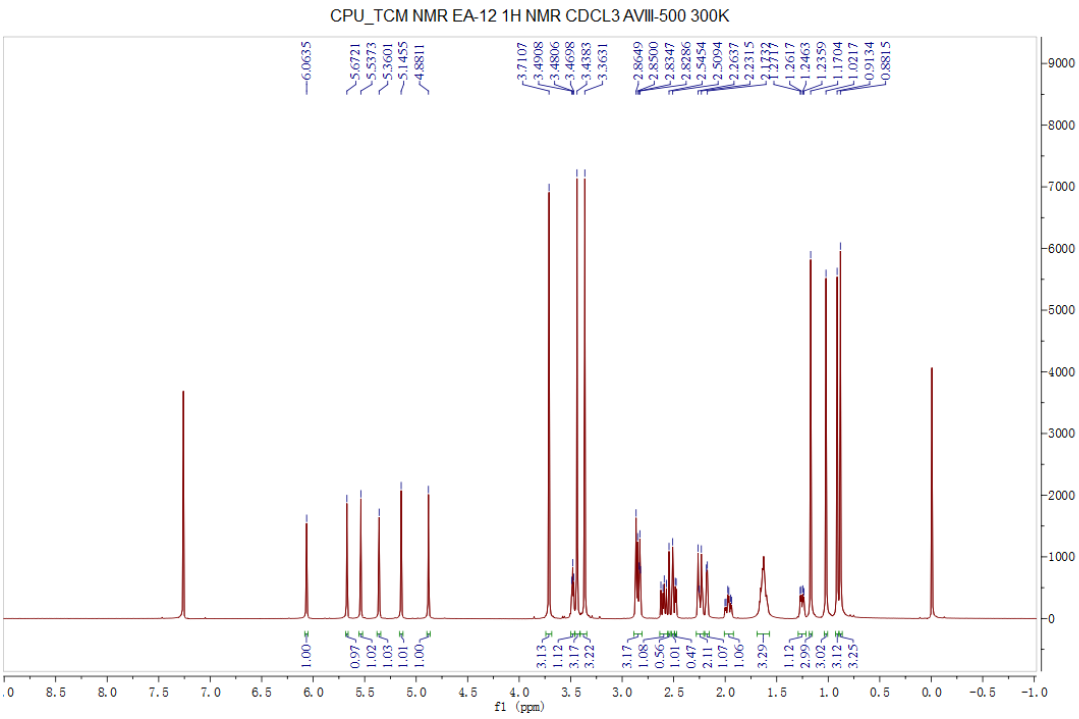


Figure S42. ^{1}H NMR spectrum of **7** in $CDCl_3$.

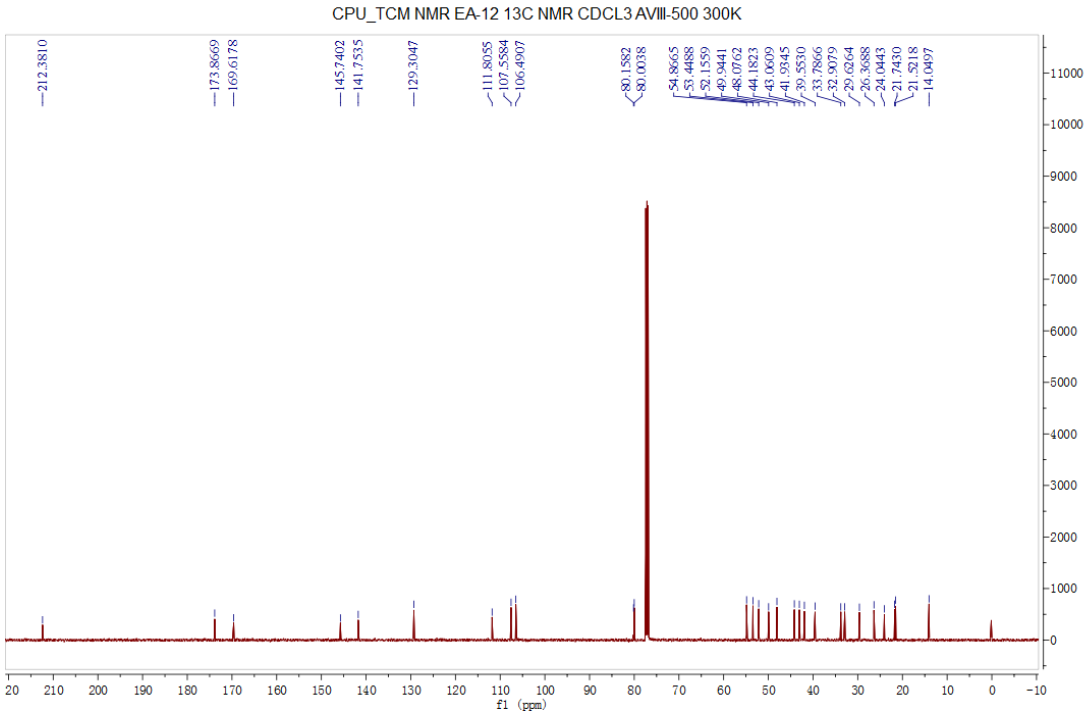


Figure S43. ^{13}C NMR spectrum of **7** in $CDCl_3$

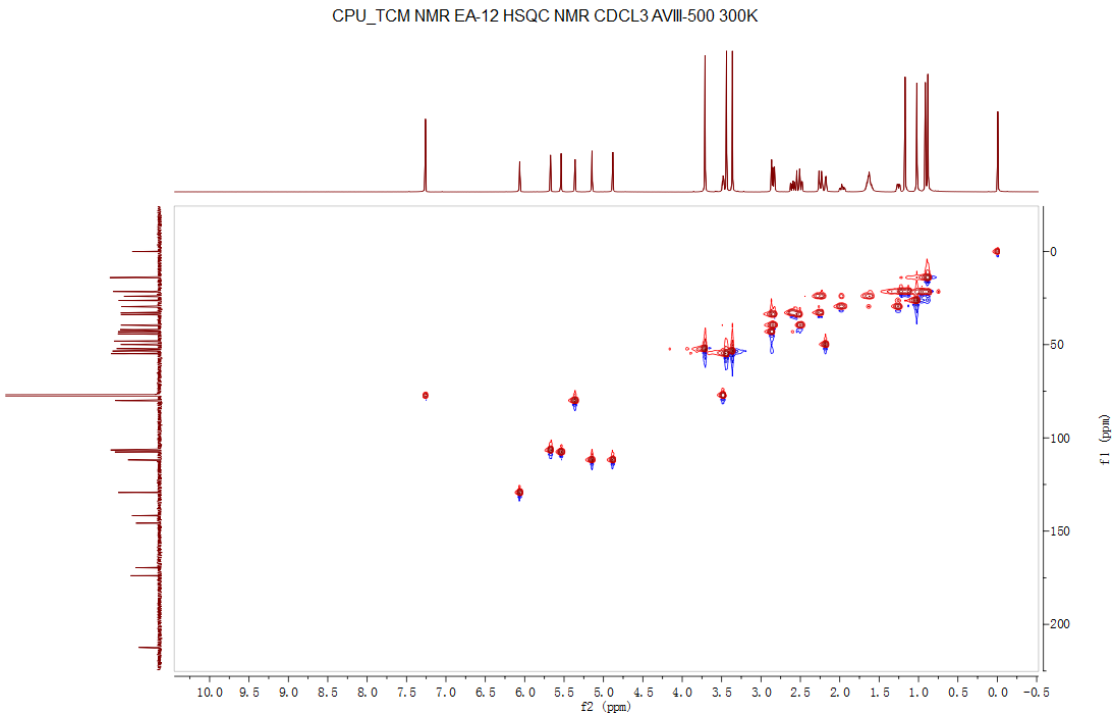


Figure S44. HSQC spectrum of **7** in $CDCl_3$.

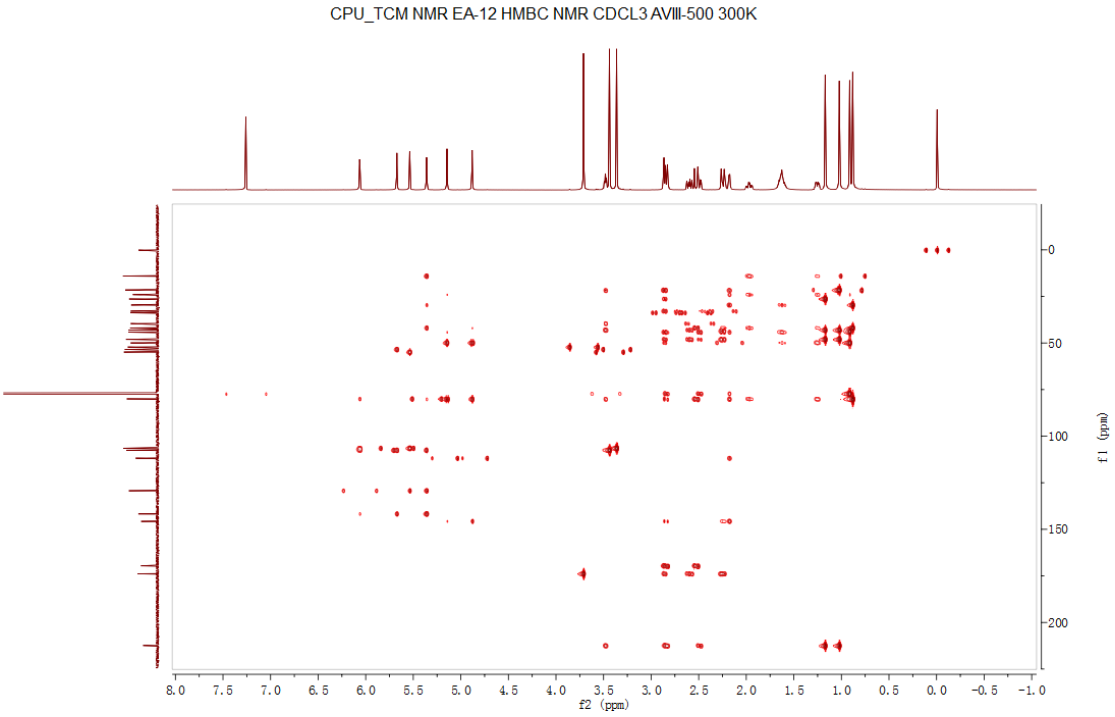


Figure S45. HMBC spectrum of **7** in $CDCl_3$.

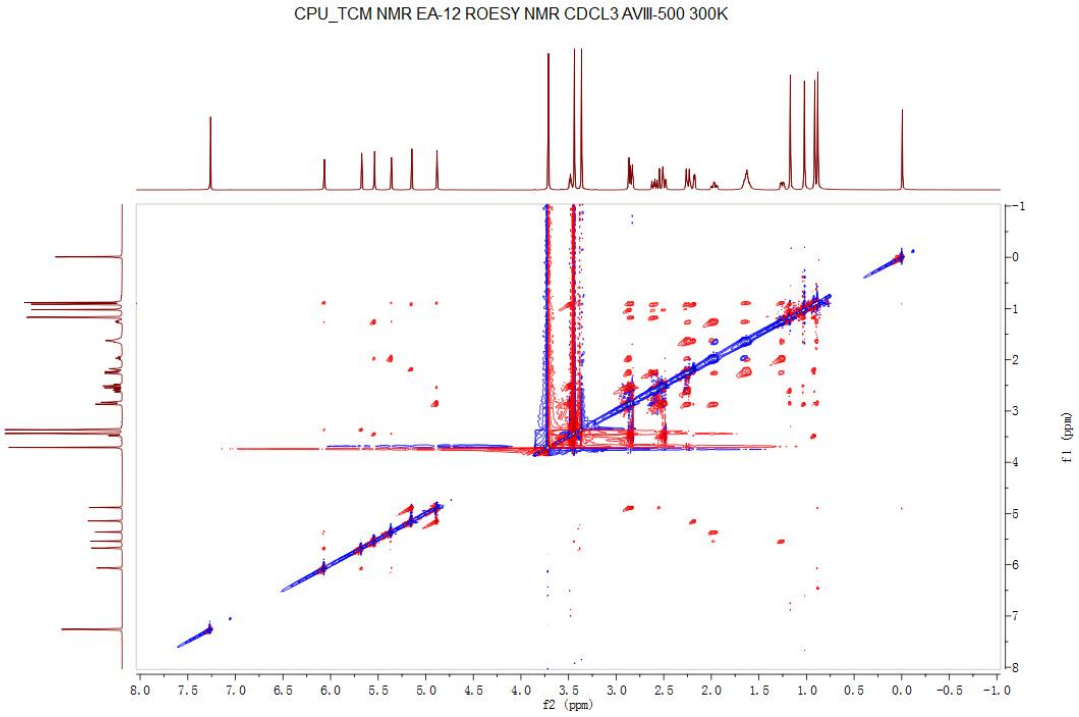
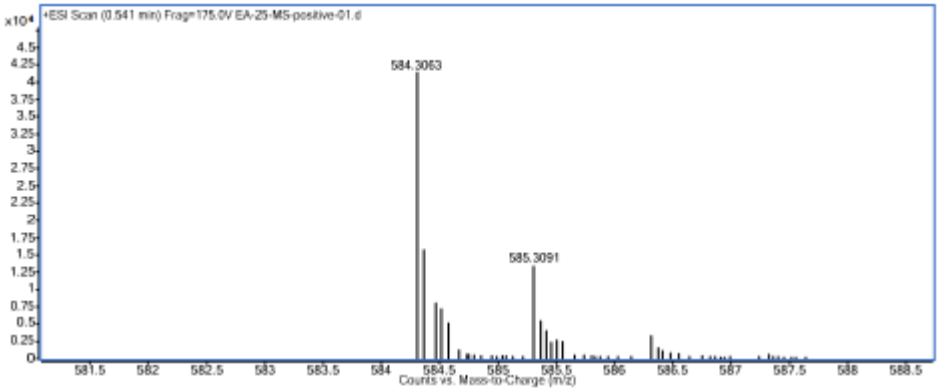


Figure S46. ROESY spectrum of **7** in $CDCl_3$.



Elemental Composition Calculator

Target m/z:	584.3063	**Result type:**	Positive ions	**Species:**	$[M+NH_4]^+$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
C29H46NO11		584.3065		0.33	

Figure S47. HRESIMS spectrum of **8**.

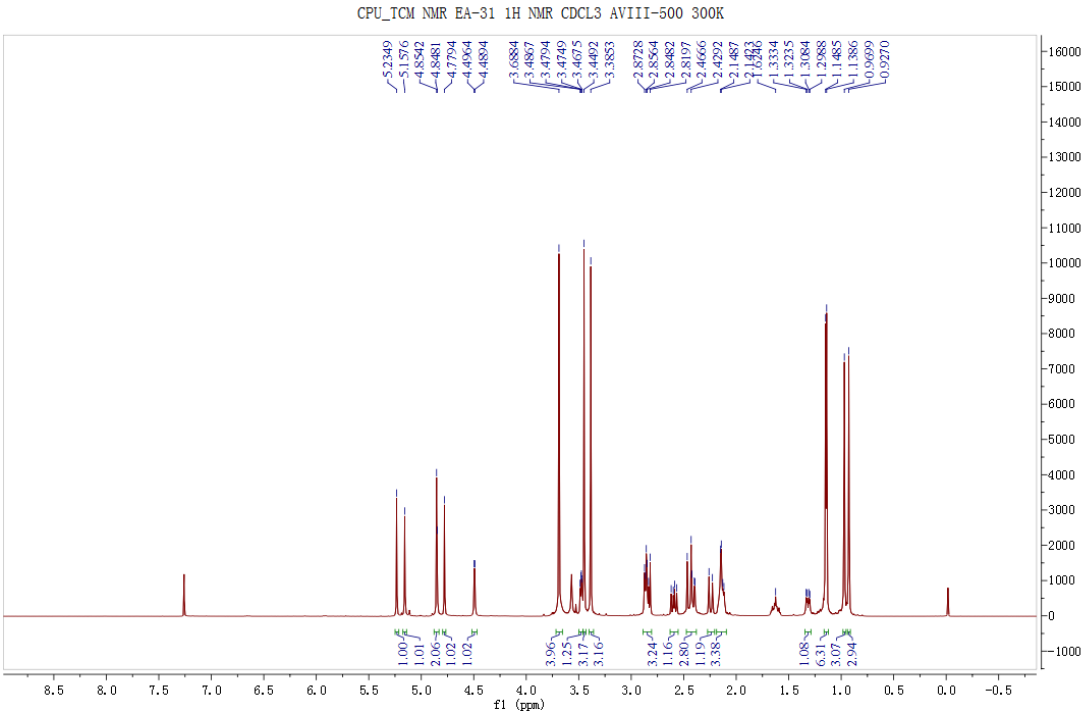


Figure S48. ^{1}H NMR spectrum of **8** in $CDCl_3$

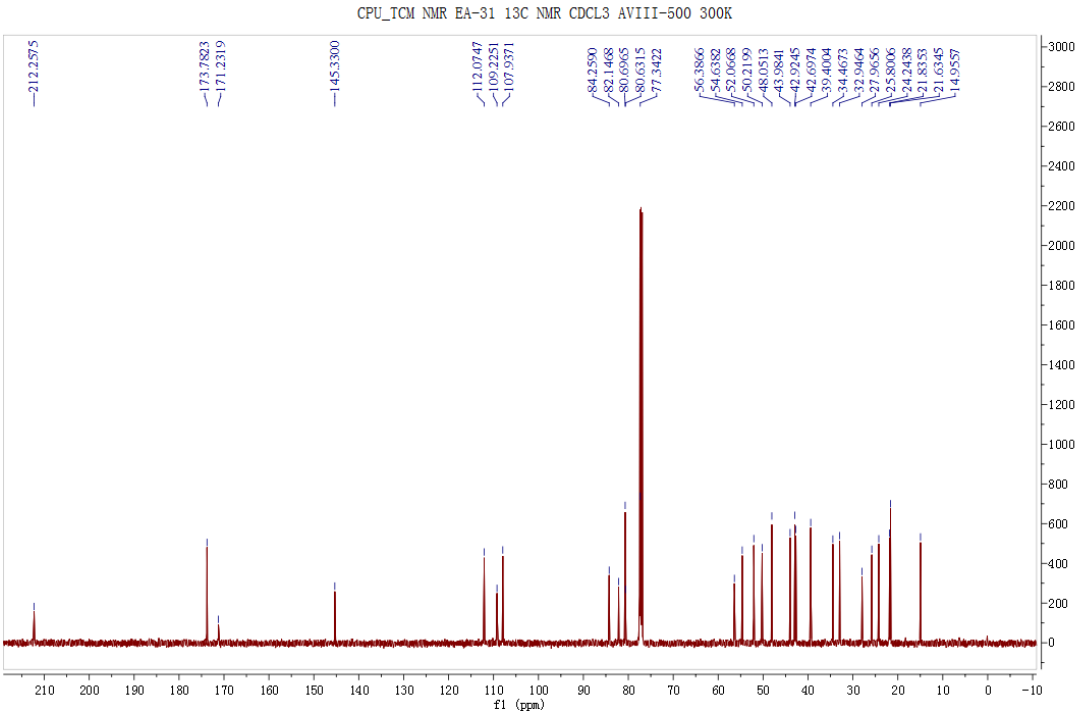


Figure S49. ^{13}C NMR spectrum of **8** in $CDCl_3$

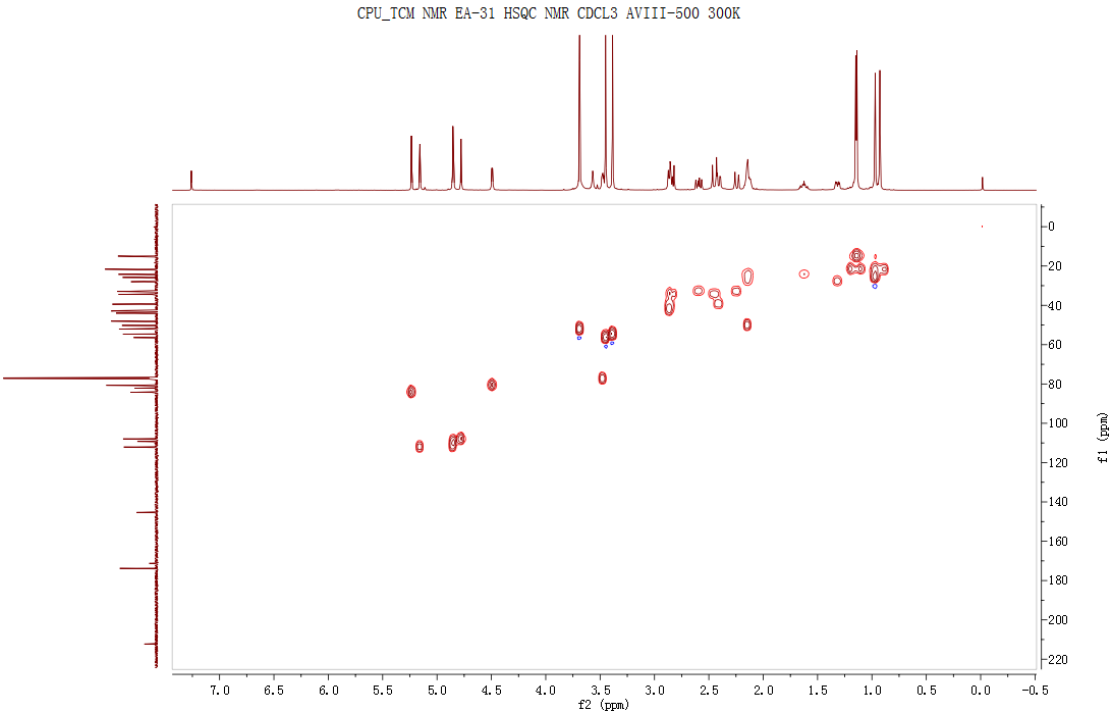


Figure S50. HSQC spectrum of **8** in $CDCl_3$

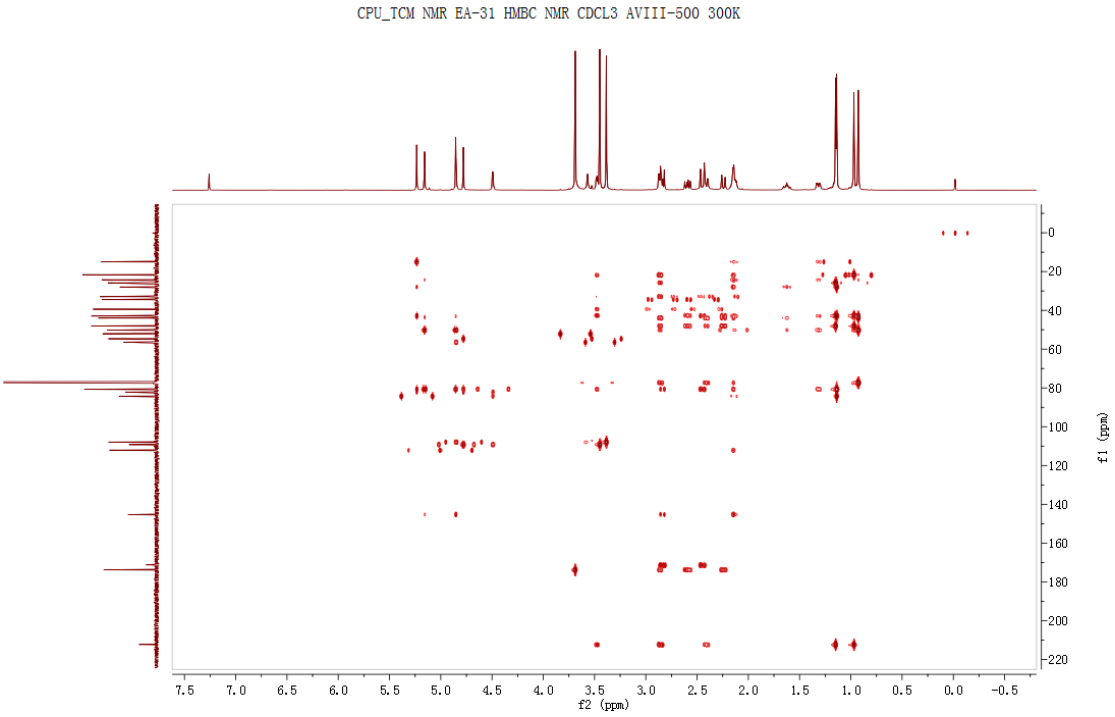


Figure S51. HMBC spectrum of **8** in $CDCl_3$.

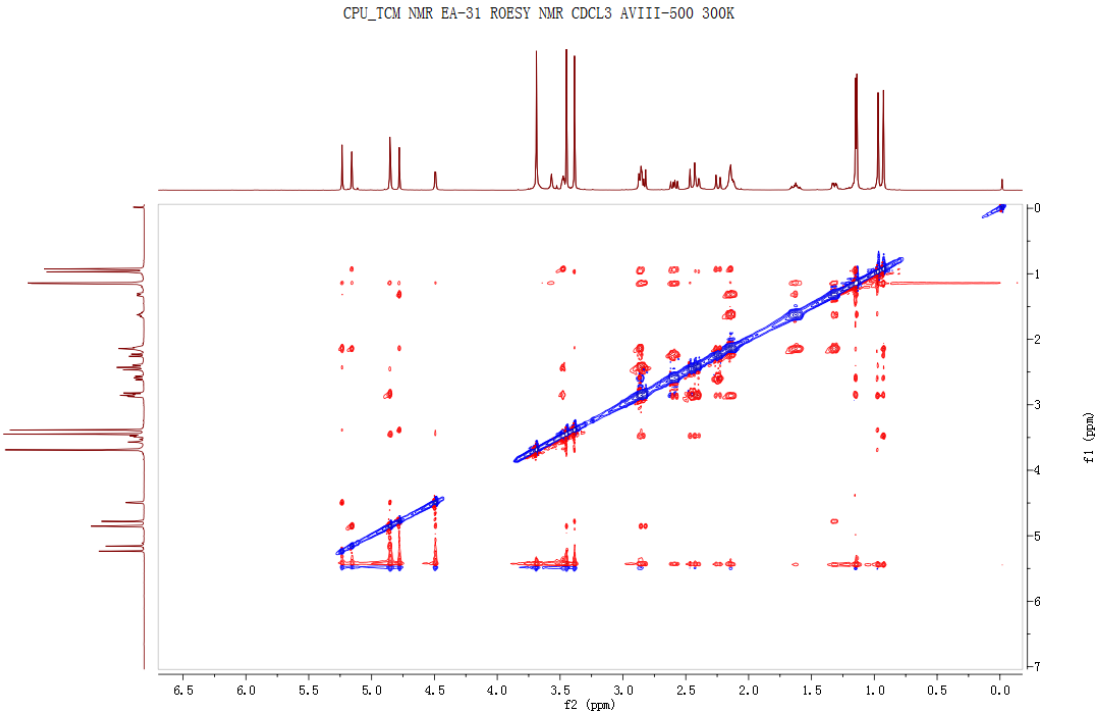
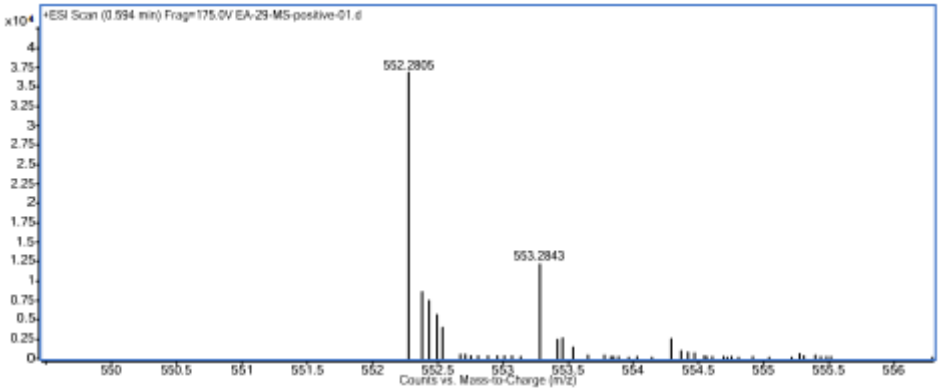


Figure S52. ROESY spectrum of **8** in $CDCl_3$.



Elemental Composition Calculator

Target m/z:	552.2805	Result type:	Positive ions	Species:	$[M+NH4]^+$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10)			
Ion Formula		Calcalated m/z		PPM Error	
C28H42NO10		552.2803		-0.34	

Figure S53. HRESIMS spectrum of **9**

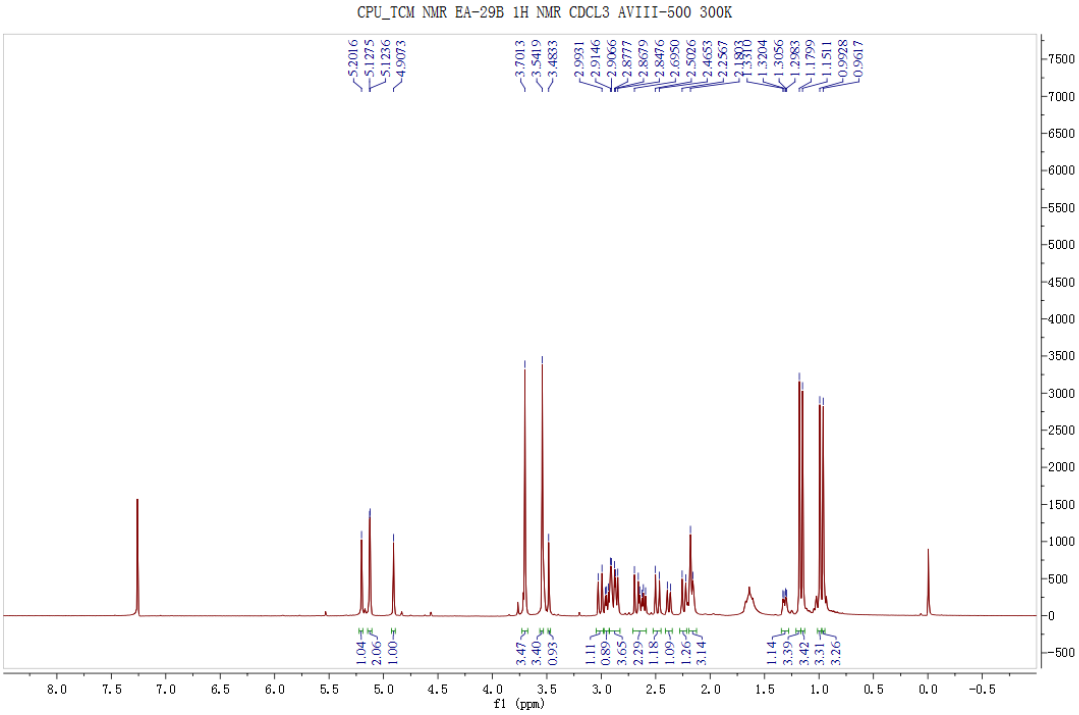


Figure S54. ^{1}H NMR spectrum of **9** in $CDCl_3$

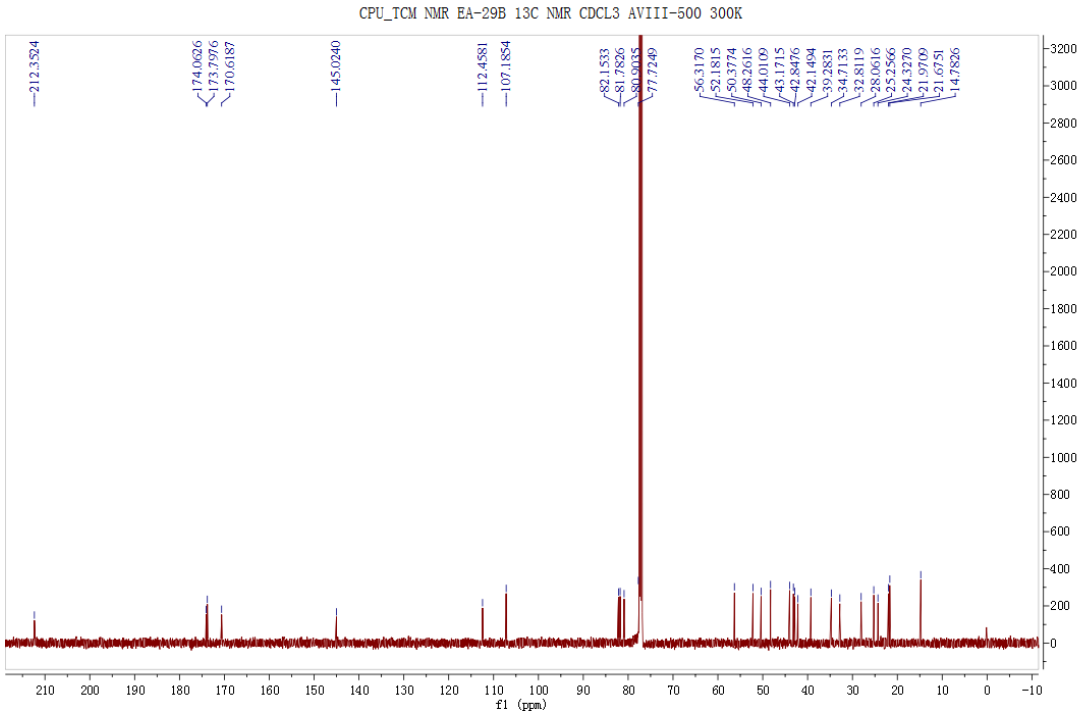


Figure S55. ^{13}C NMR spectrum of **9** in $CDCl_3$

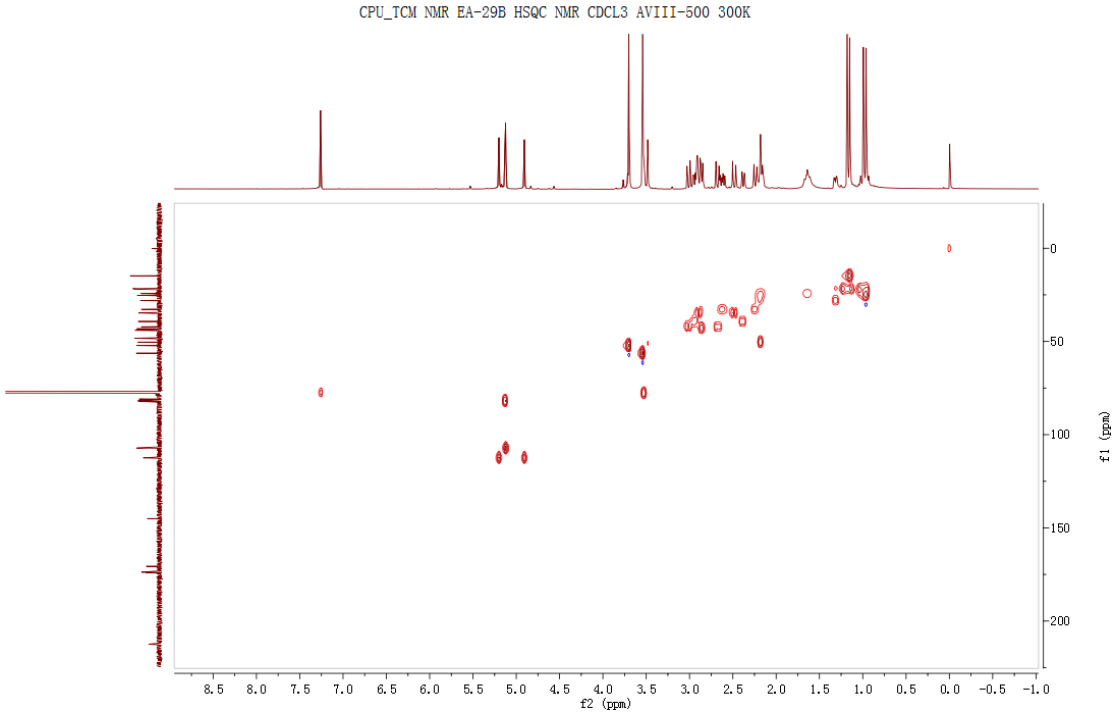


Figure S56. HSQC spectrum of **9** in $CDCl_3$.

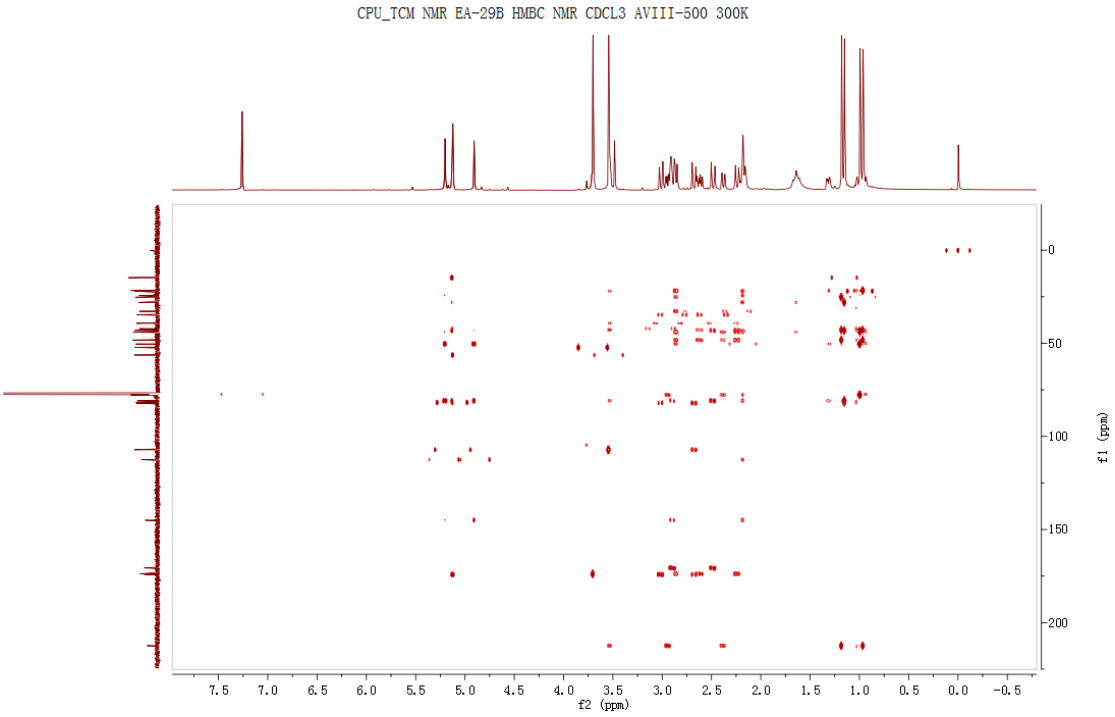


Figure S57. HMBC spectrum of **9** in $CDCl_3$.

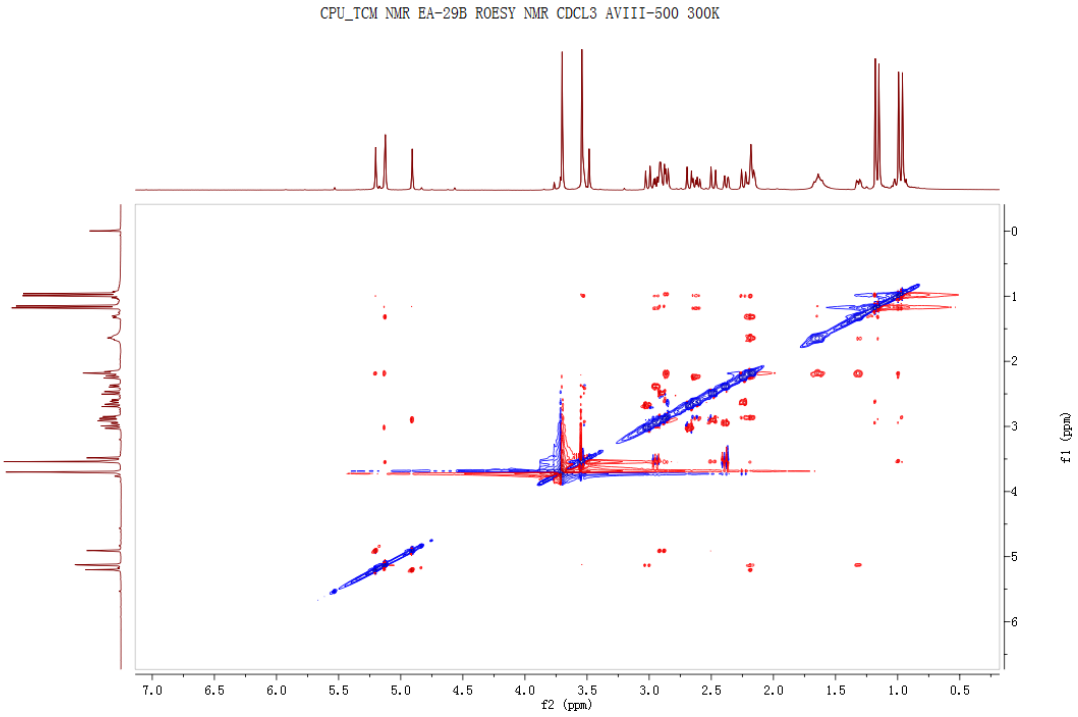
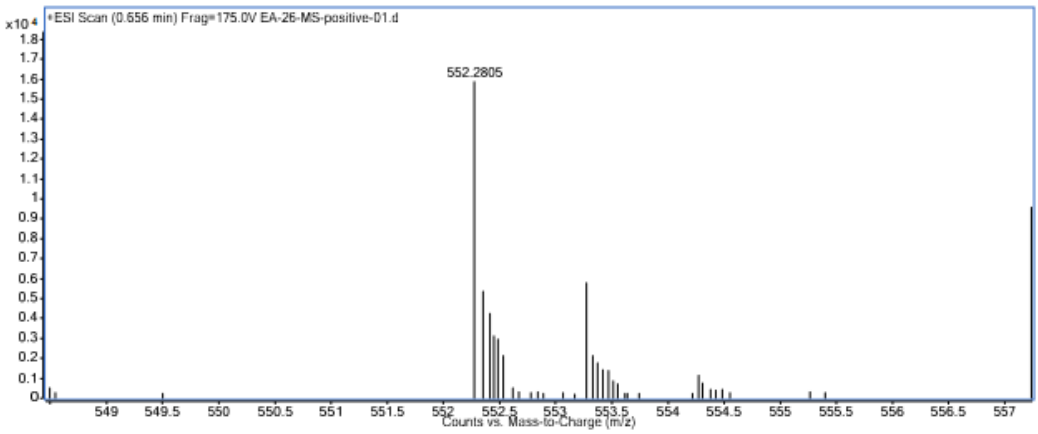


Figure S58. ROESY spectrum of **9** in $CDCl_3$.



Elemental Composition Calculator

Target m/z:	552.2805	**Result type:**	Positive ions	**Species:**	$[M+NH4]^+$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
C28H42NO10		552.2803		-0.26	

Figure S59. HRESIMS spectrum of **10**.

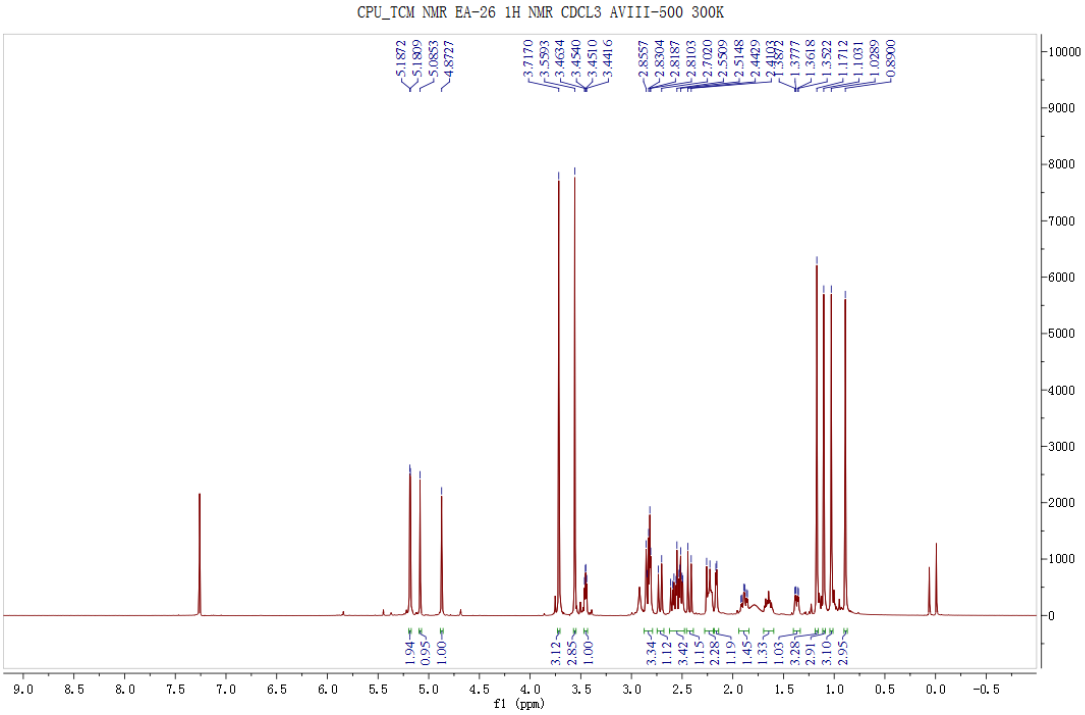


Figure S60. ^{1}H NMR spectrum of **10** in $CDCl_3$

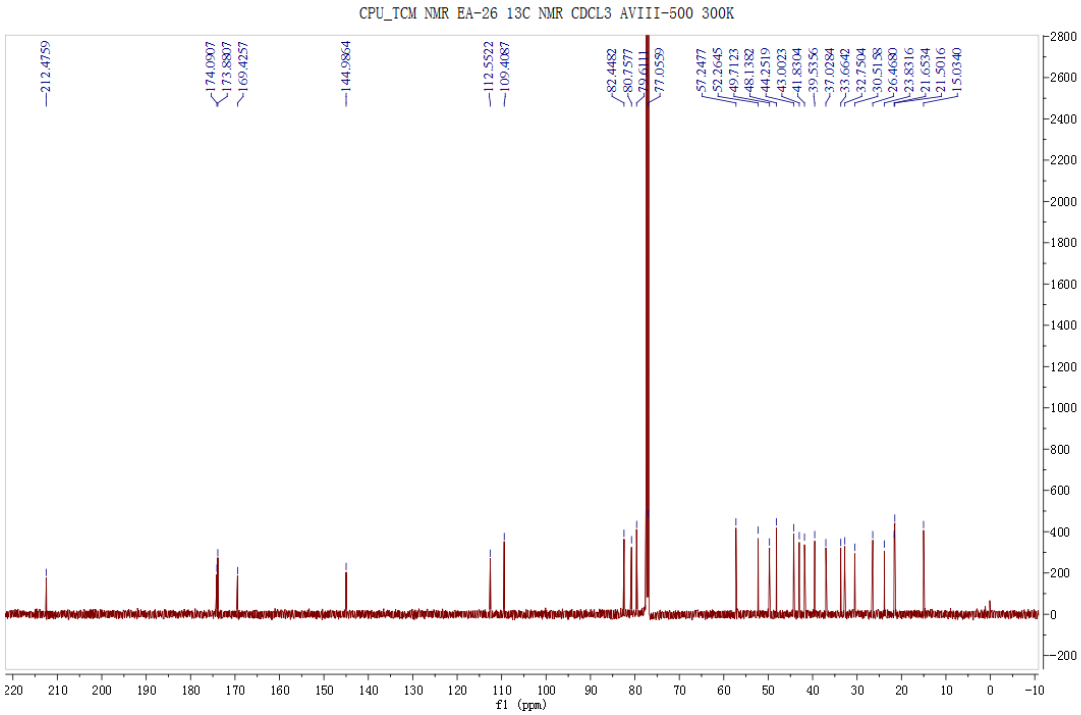


Figure S61. ^{13}C NMR spectrum of **10** in $CDCl_3$

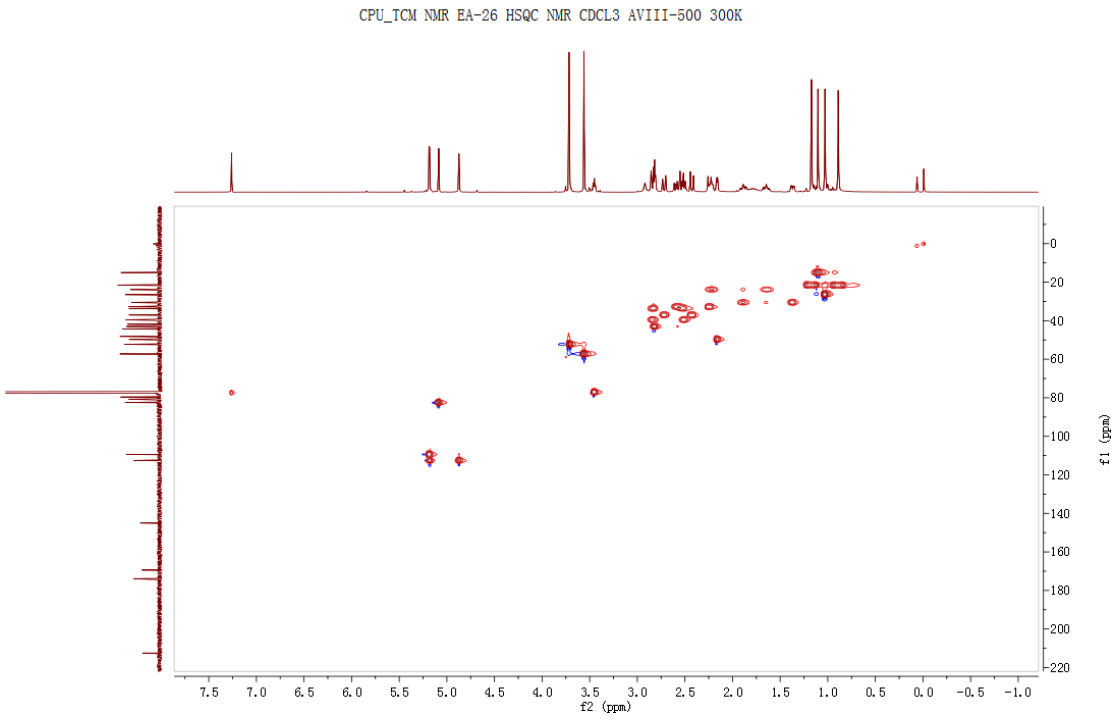


Figure S62. HSQC spectrum of **10** in $CDCl_3$

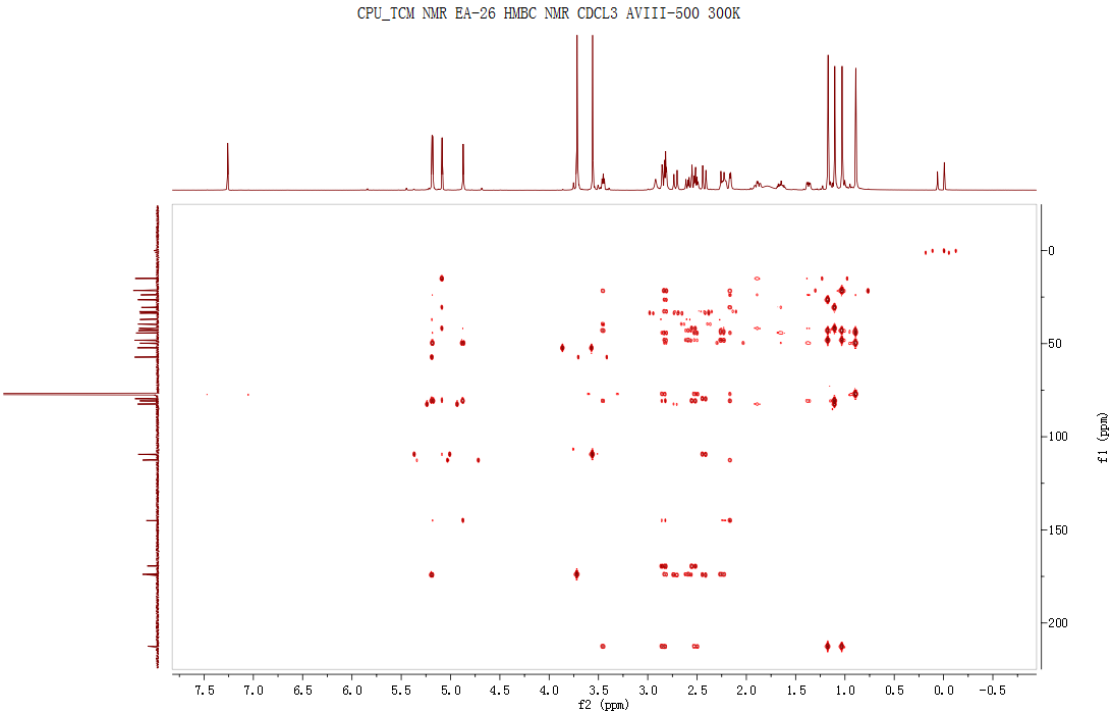


Figure S63. HMBC spectrum of **10** in $CDCl_3$

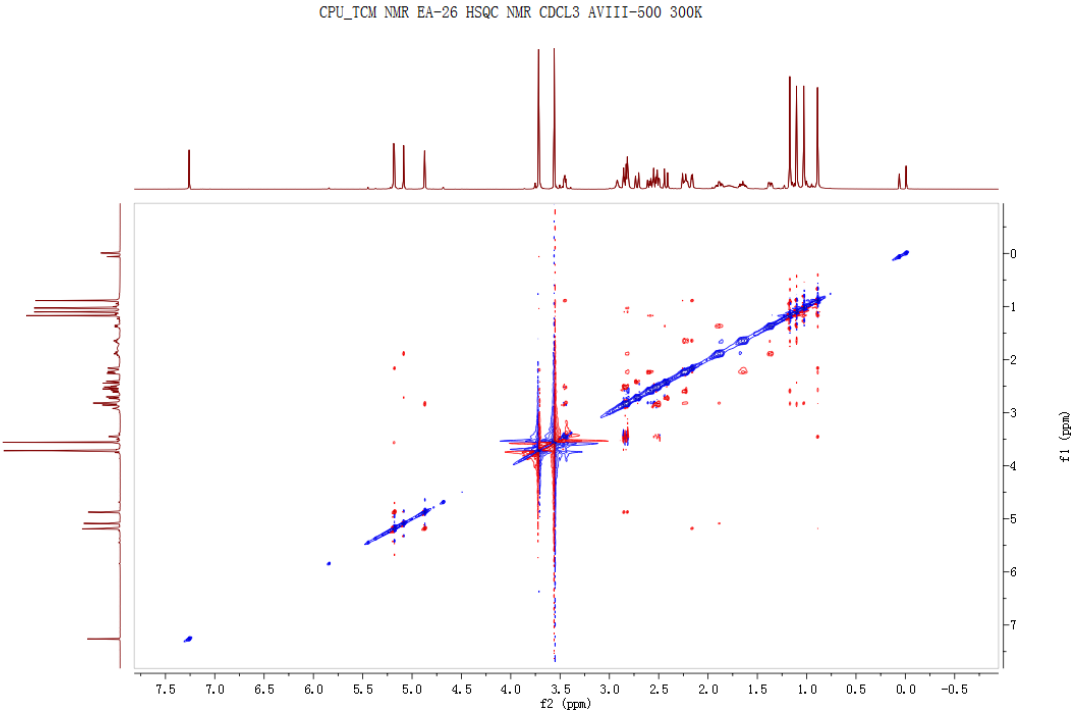
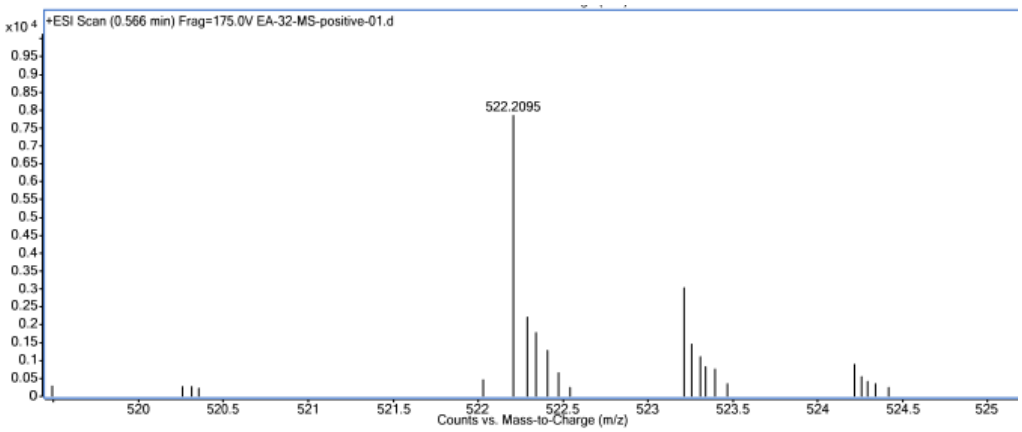


Figure S64. ROESY spectrum of **10** in $CDCl_3$



Elemental Composition Calculator

Target m/z:	522.2095	**Result type:**	Positive ions	**Species:**	$[M+Na]^+$
Elements:		C (0-80); H (0-120); O (0-30); N (0-10)Na (0-5)			
Ion Formula		**Calculated m/z**		**PPM Error**	
C27H33NNaO8		522.2098		0.70	

Figure S65. HRESIMS spectrum of **11**.

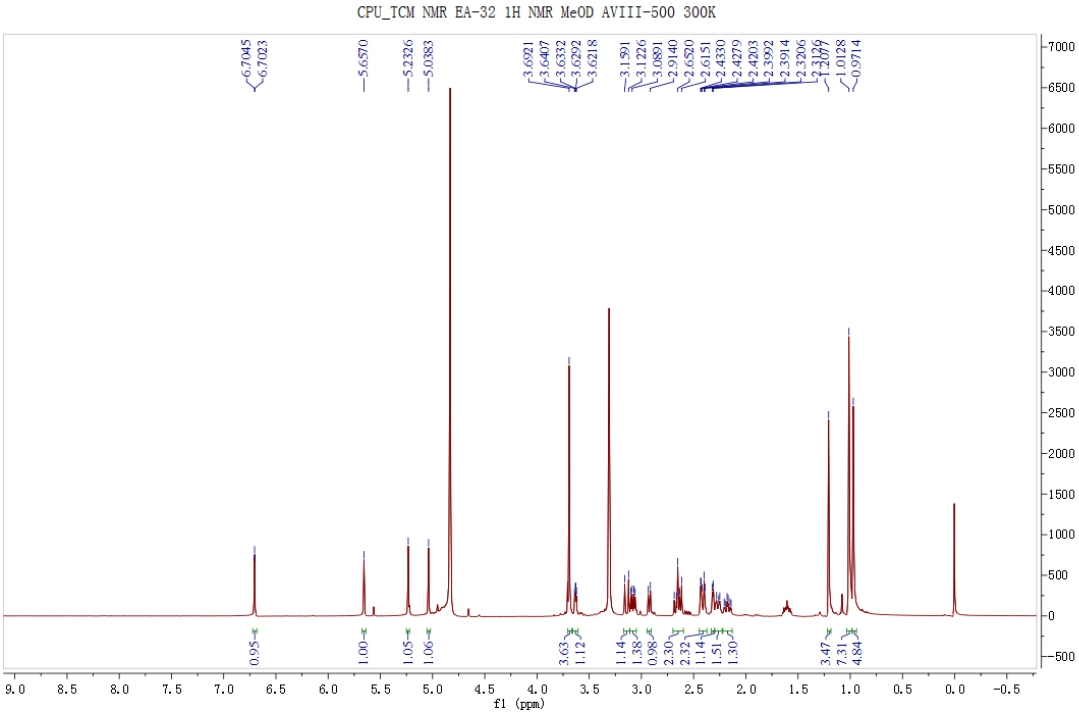


Figure S66. ^{1}H NMR spectrum of **11** in CD_3OD

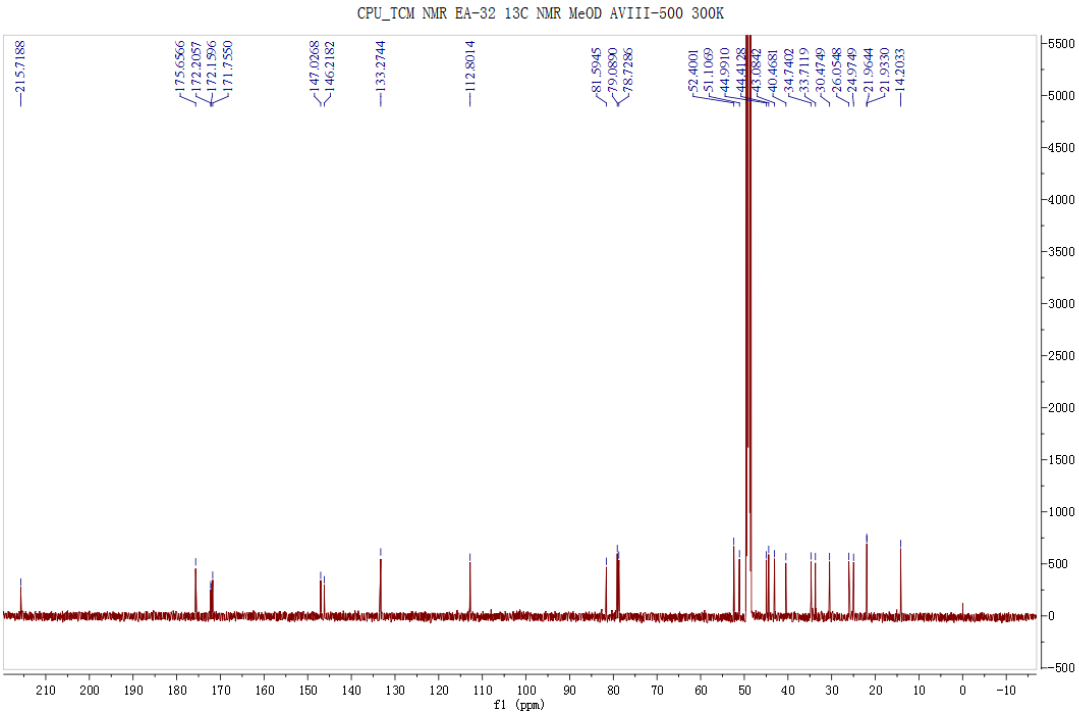


Figure S67. ^{13}C NMR spectrum of **11** in CD_3OD

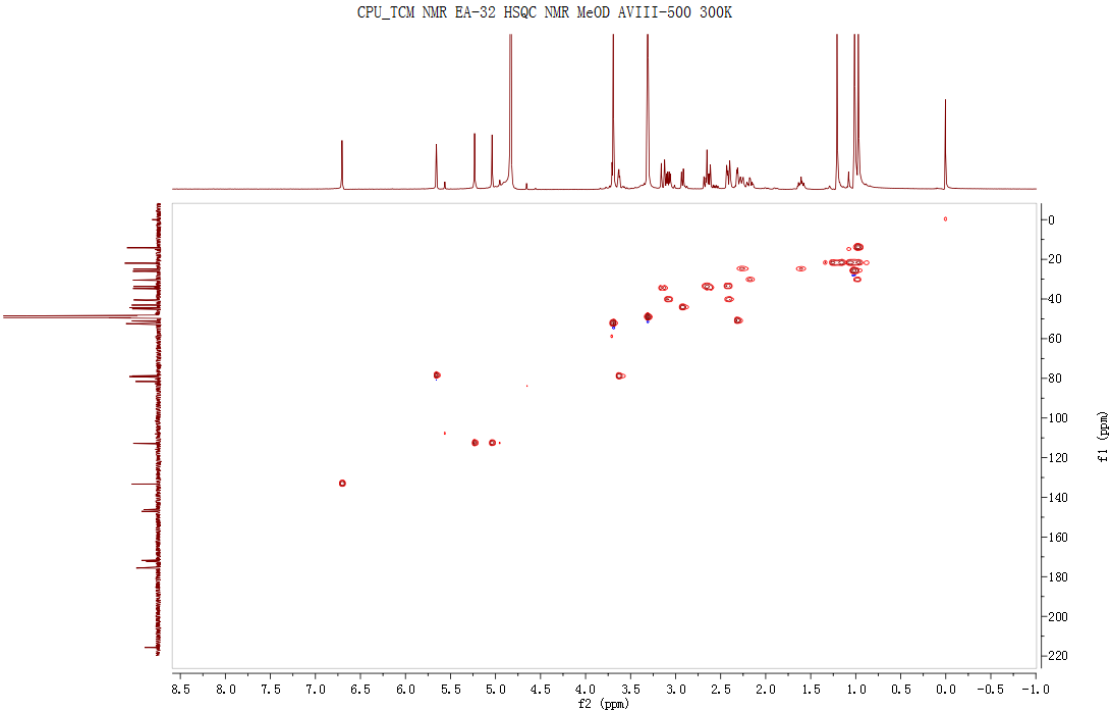


Figure S68. HSQC spectrum of **11** in CD_3OD

.

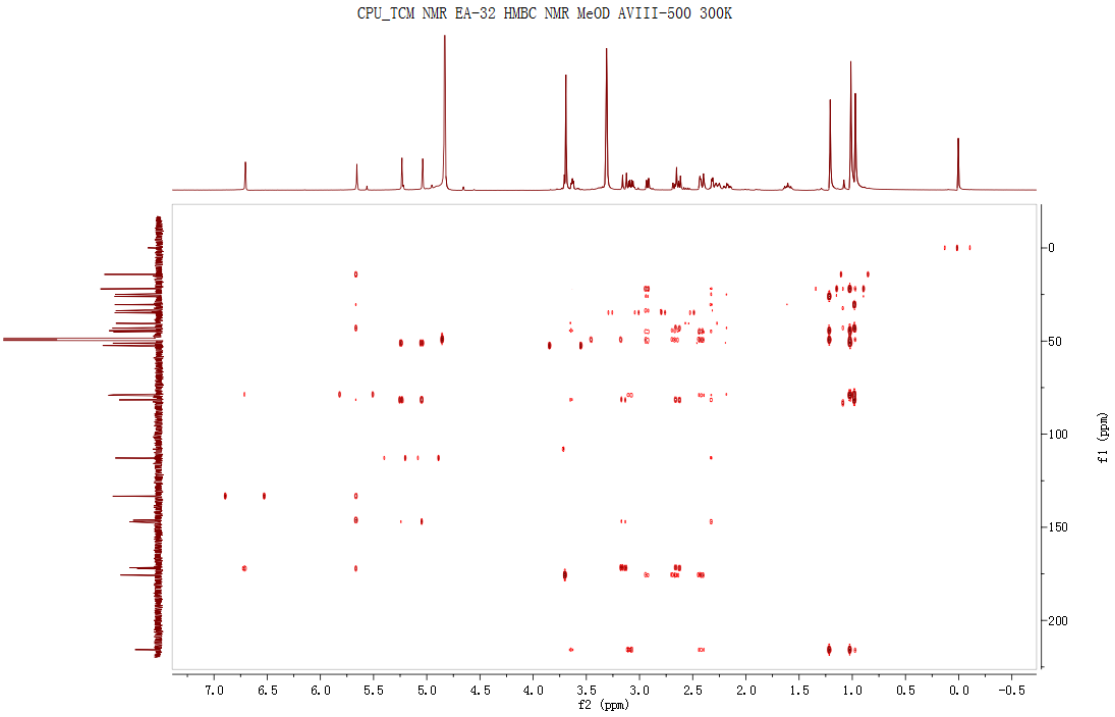


Figure S69. HMBC spectrum of **11** in CD_3OD

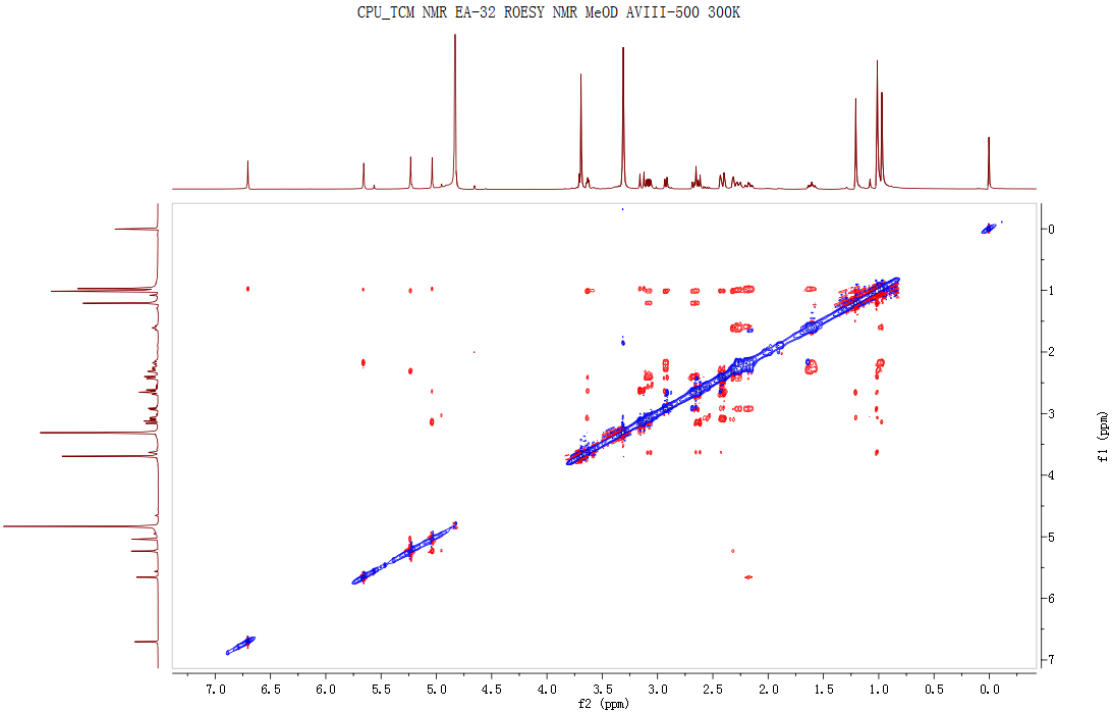
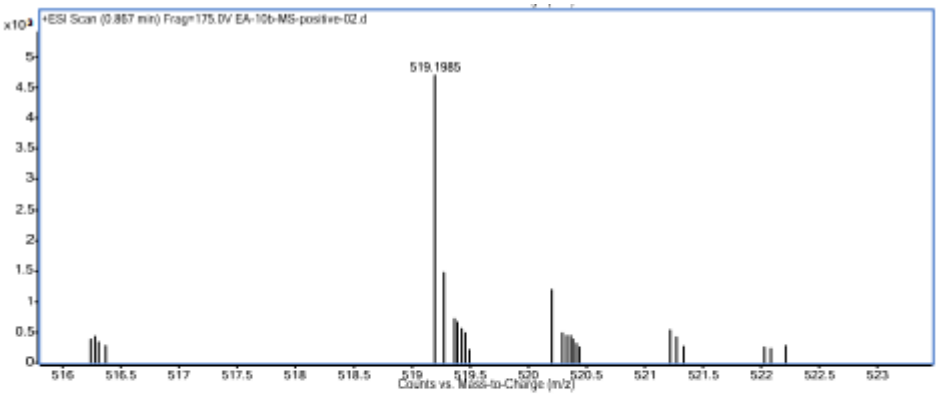


Figure S70. ROESY spectrum of **11** in CD_3OD



Elemental Composition Calculator

Target m/z:	519.1985	**Result type:**	Positive ions	**Species:**	$[M+Na]^+$
Elements:		C (0-80); H (0-120); O (0-30);Na (0-5)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
C28H32NaO8		519.1989		0.85	

Figure S71. HRESIMS spectrum of **12**

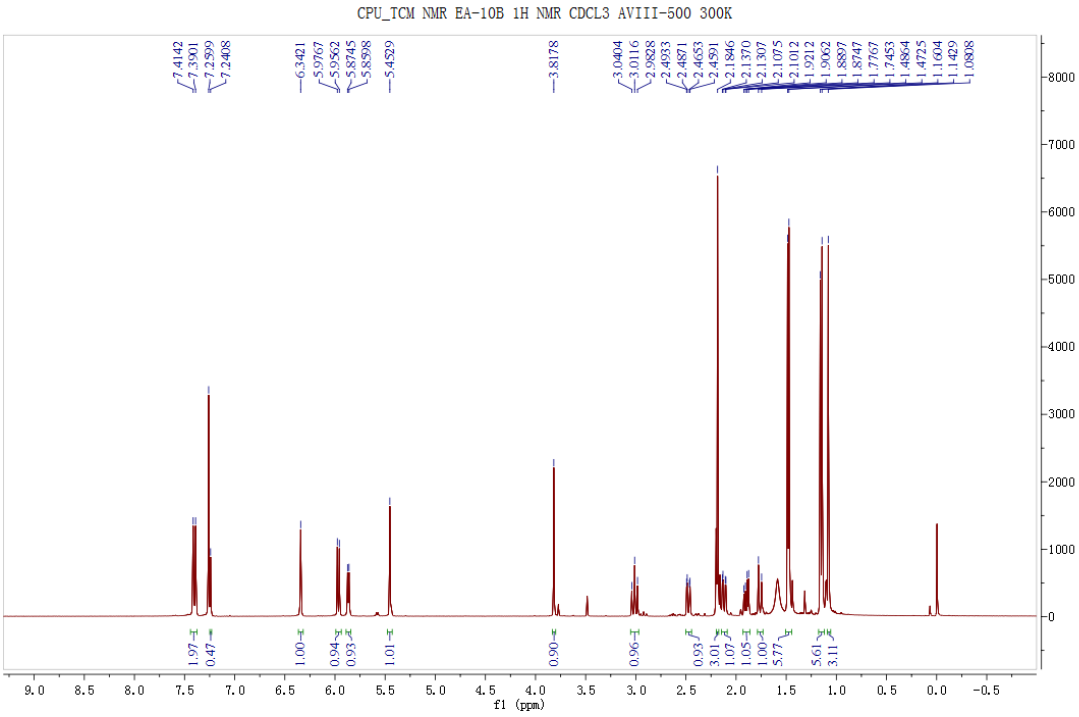


Figure S72. ^{1}H NMR spectrum of **12** in $CDCl_3$

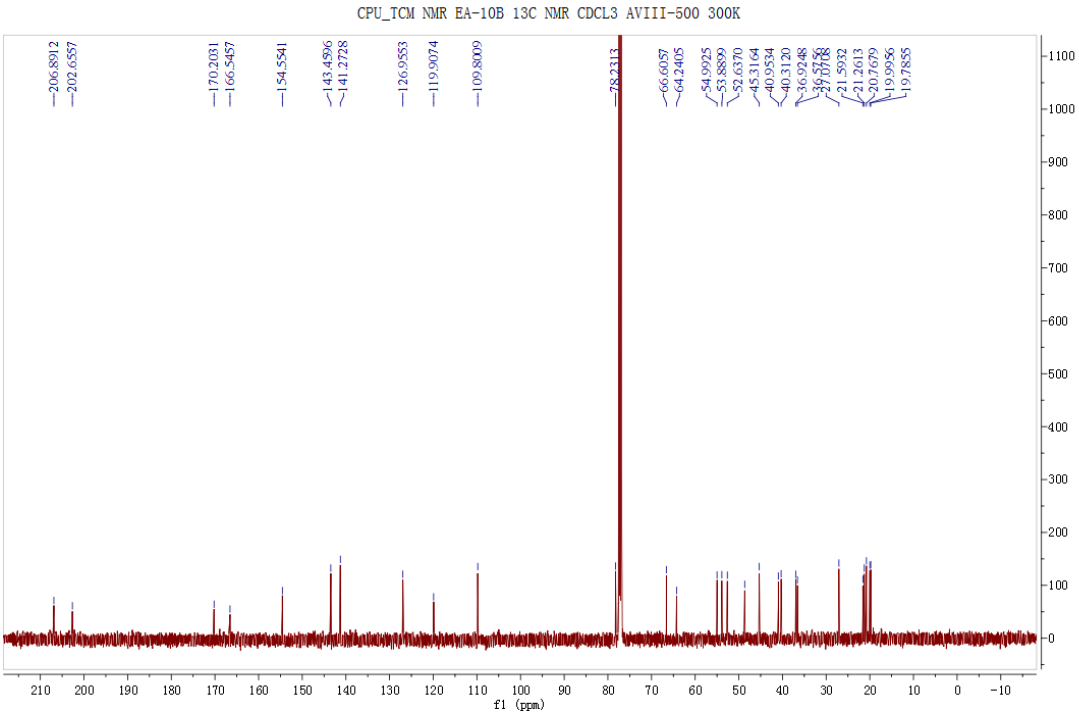


Figure S73. ^{13}C NMR spectrum of **12** in $CDCl_3$

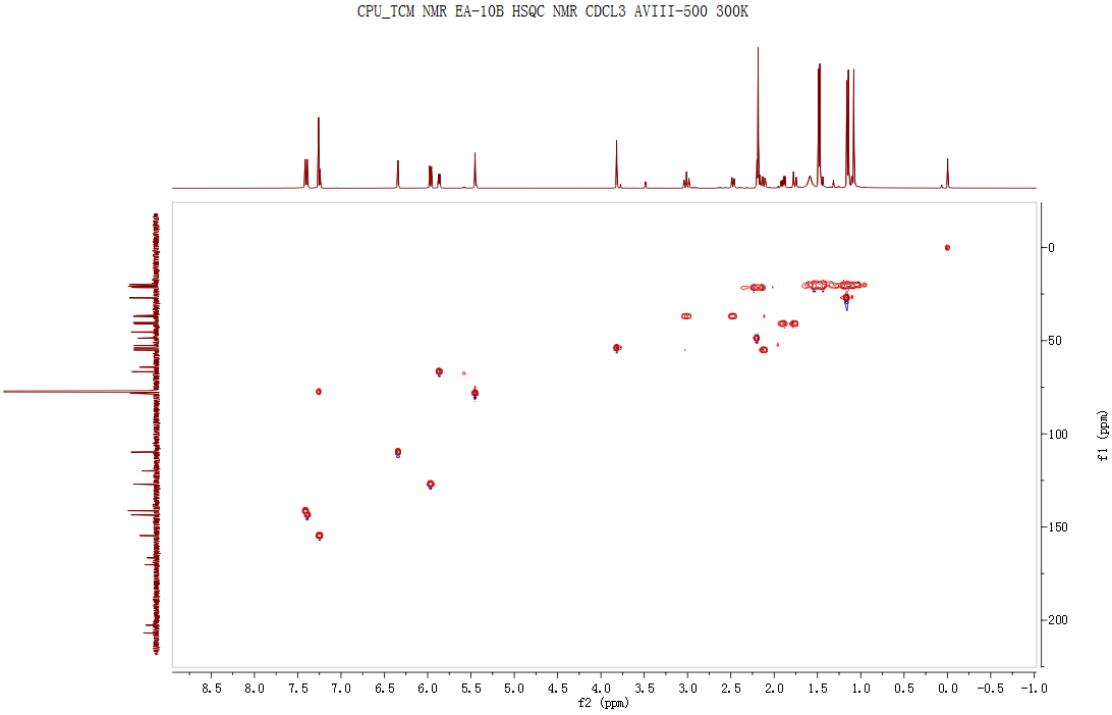


Figure S74. HSQC spectrum of **12** in $CDCl_3$

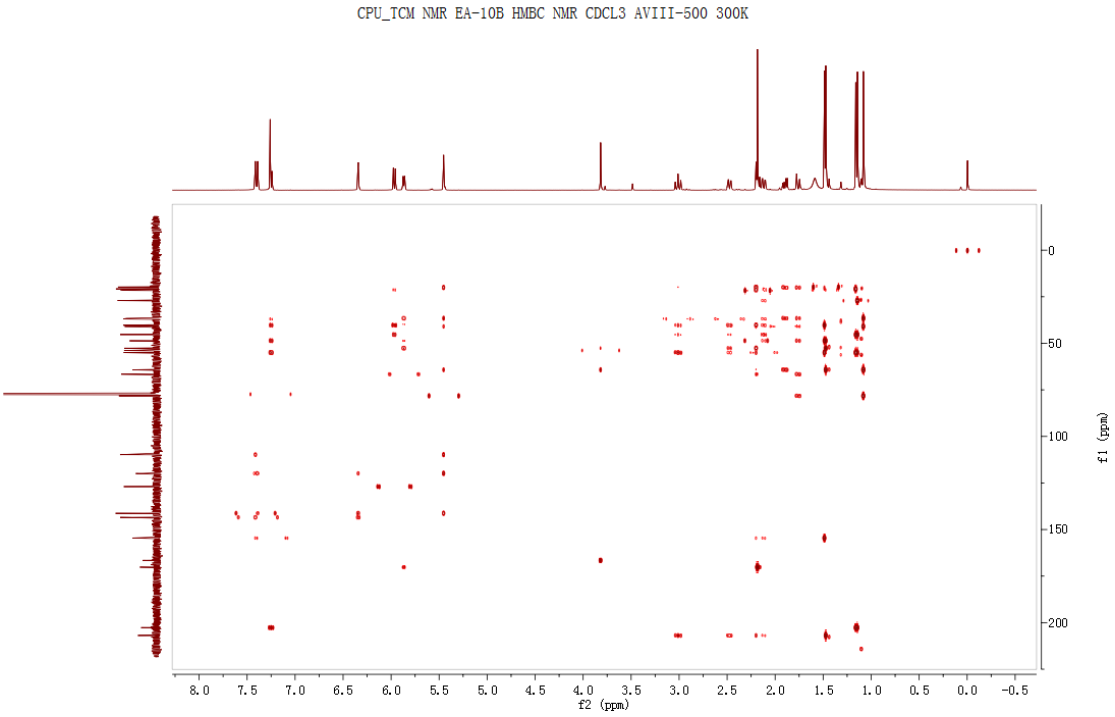


Figure S75. HMBC spectrum of **12** in $CDCl_3$.

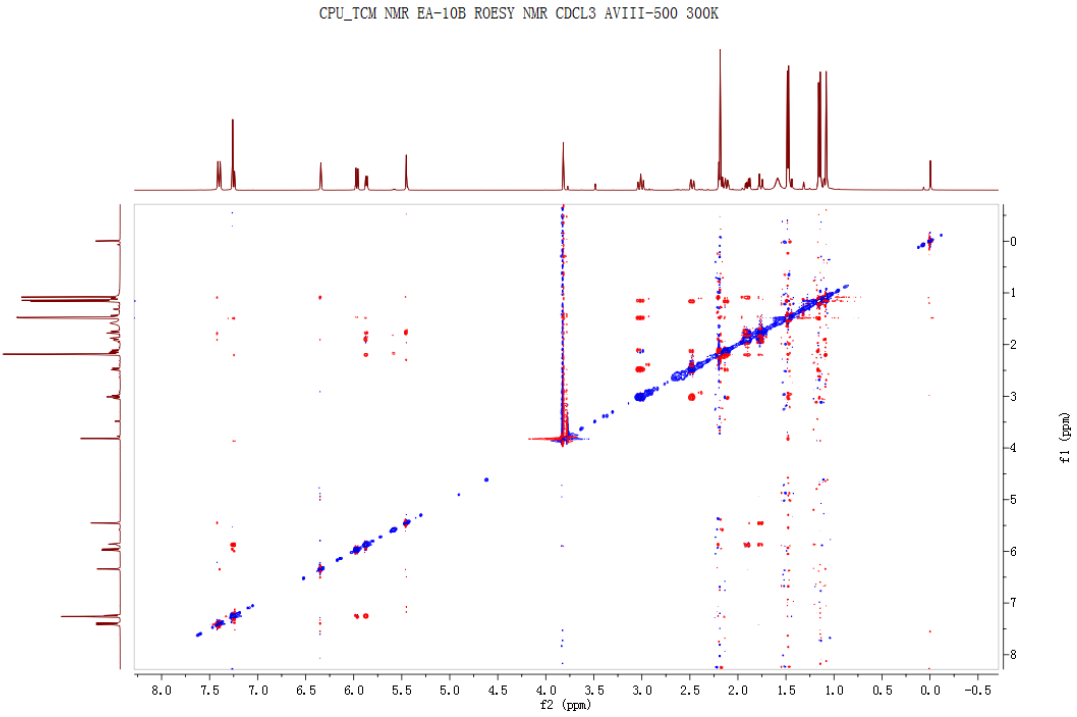
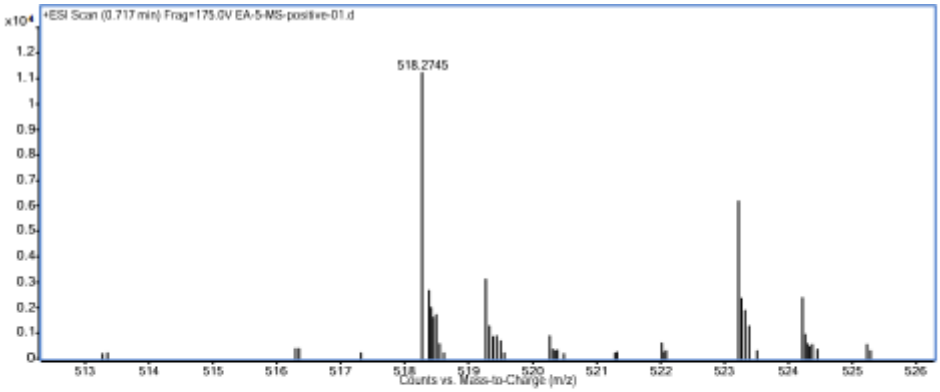


Figure S76. ROESY spectrum of **12** in $CDCl_3$.



Elemental Composition Calculator

Target m/z:	518.2745	Result type:	Positive ions	Species:	$[M+NH4]^+$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10)			
Ion Formula		Calcalated m/z		PPM Error	
C28H40NO8		518.2748		0.73	

Figure S77. HRESIMS spectrum of **13**

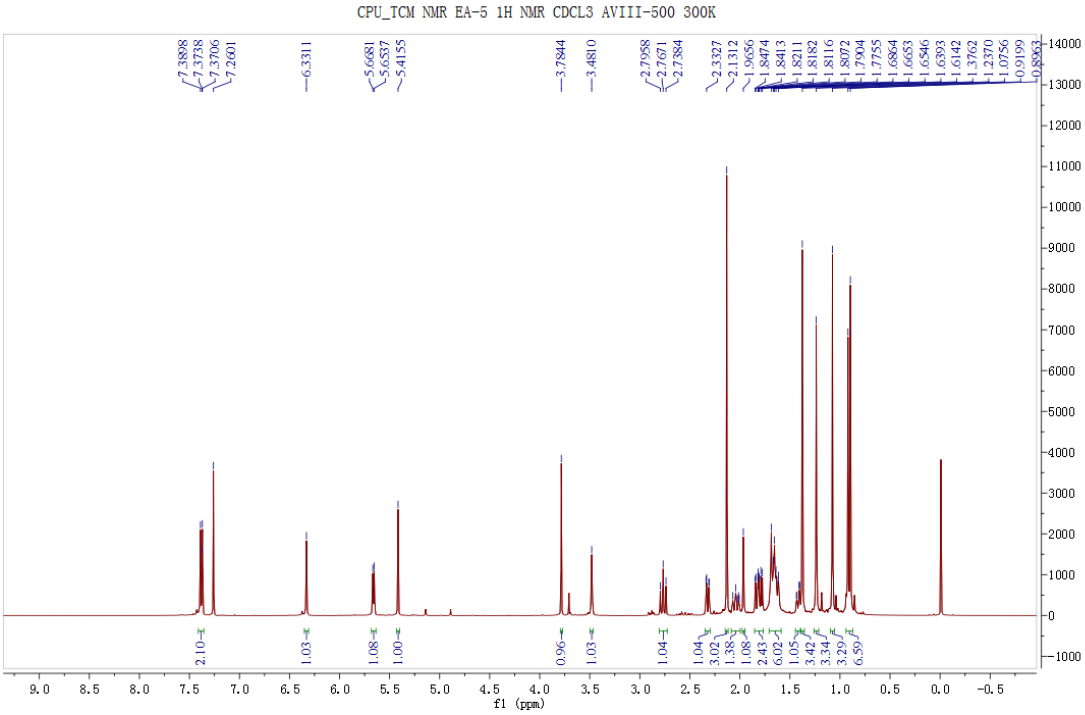


Figure S78. ^{1}H NMR spectrum of **13** in $CDCl_3$

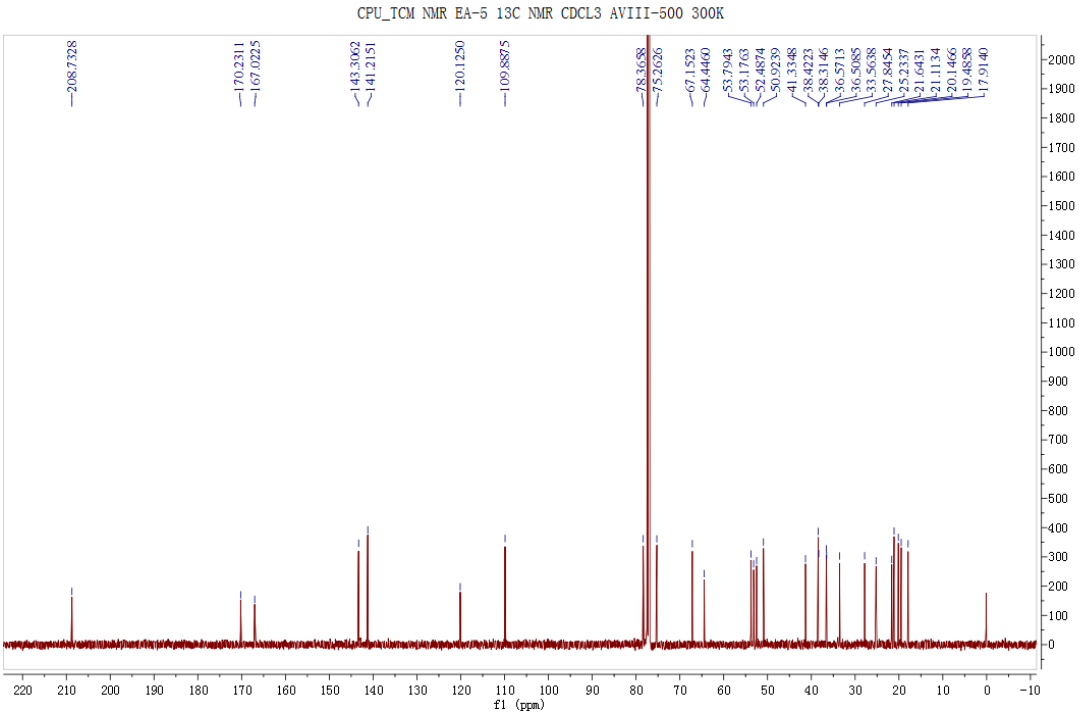


Figure S79. ^{13}C NMR spectrum of **13** in $CDCl_3$

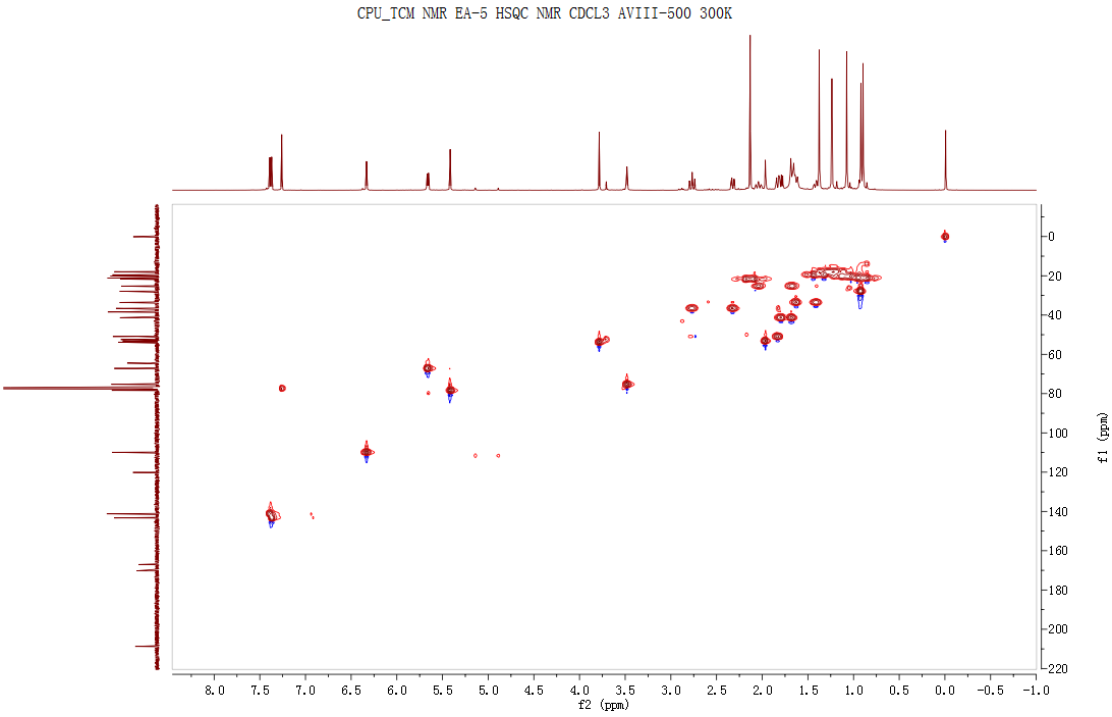


Figure S80. HSQC spectrum of **13** in $CDCl_3$

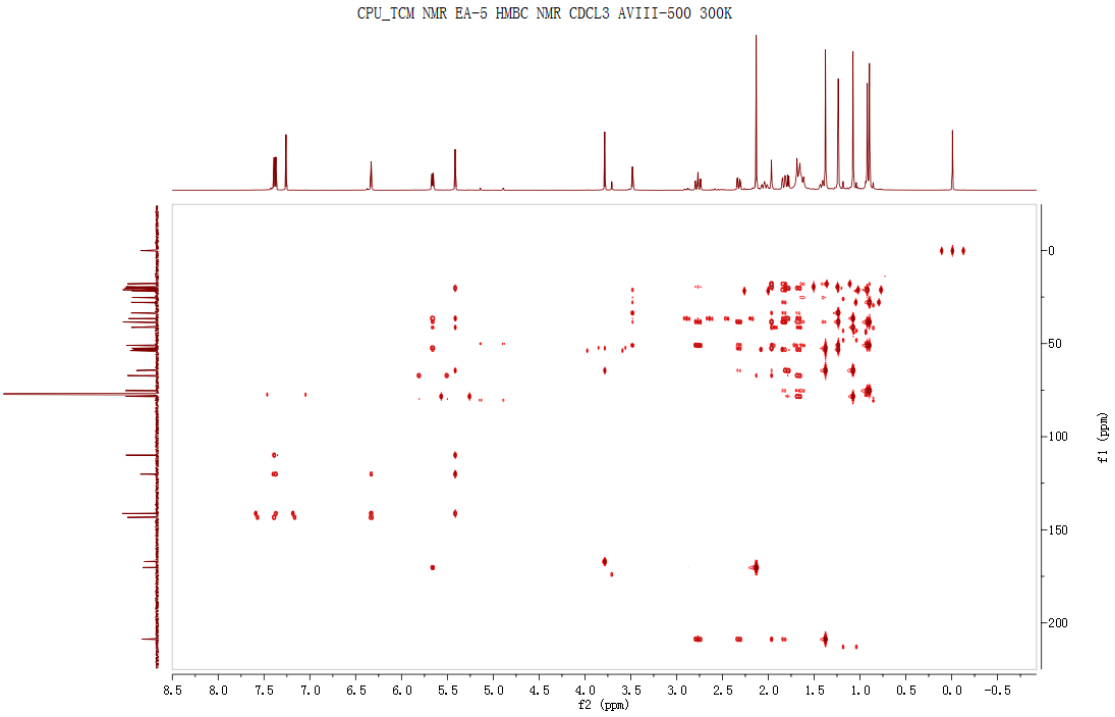


Figure S81. HMBC spectrum of **13** in $CDCl_3$

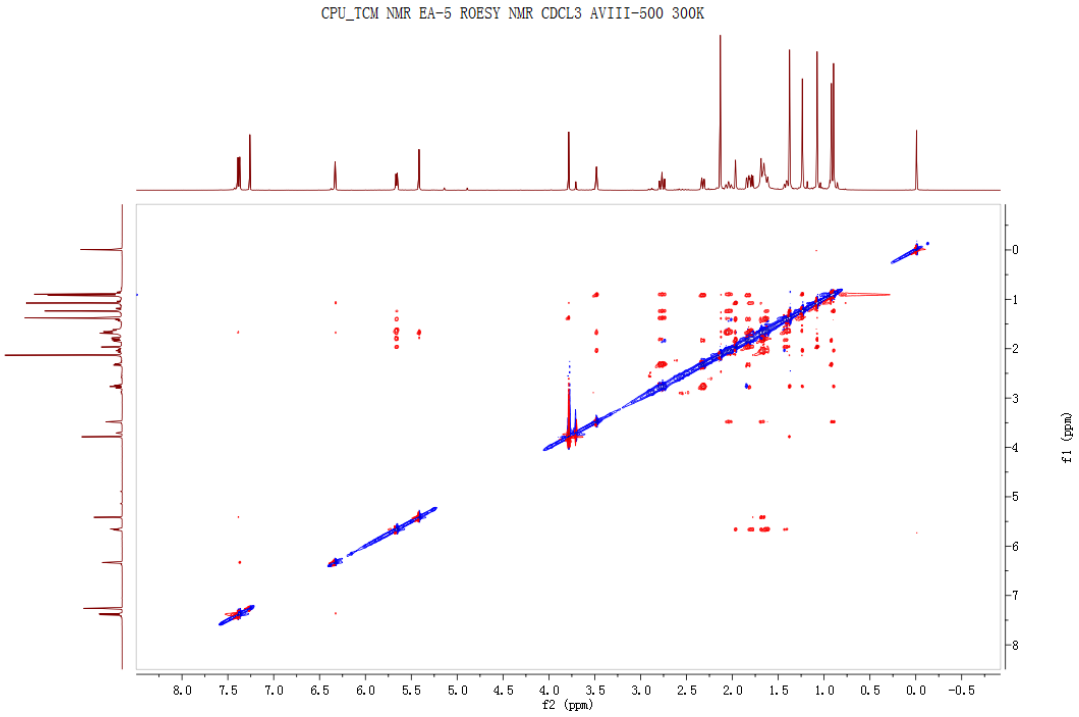
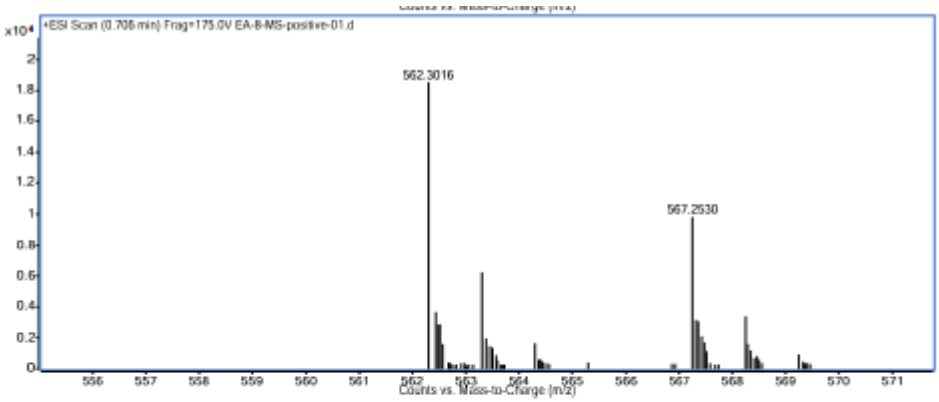


Figure S82. ROESY spectrum of **13** in $CDCl_3$



Elemental Composition Calculator

Target m/z:	562.3016	**Result type:**	Positive ions	**Species:**	$[M+NH_4]^+$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
C30H44NO9		562.3011		-0.95	

Figure S83. HRESIMS spectrum of **14**

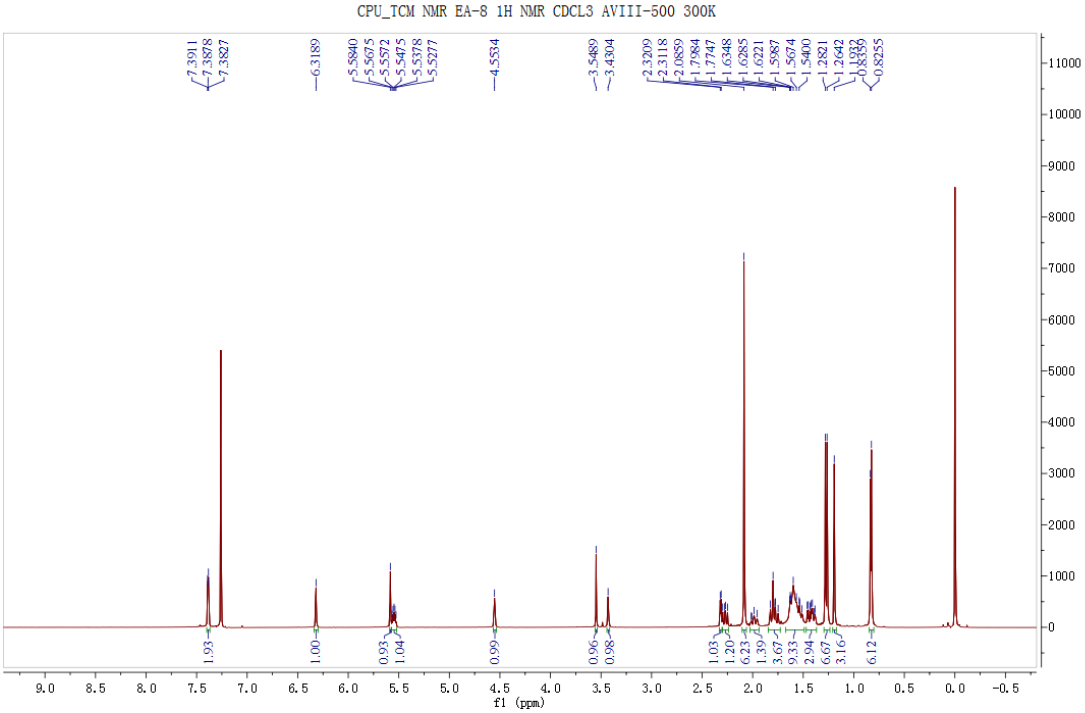


Figure S84. ^{1}H NMR spectrum of **14** in $CDCl_3$

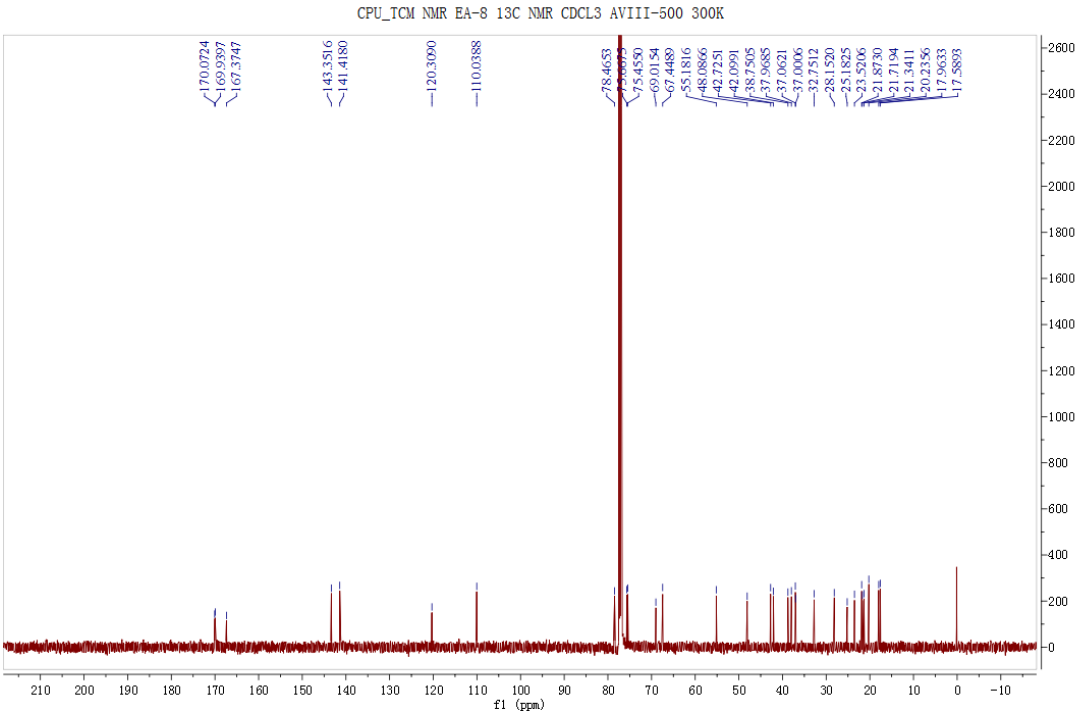


Figure S85. ^{13}C NMR spectrum of **14** in $CDCl_3$

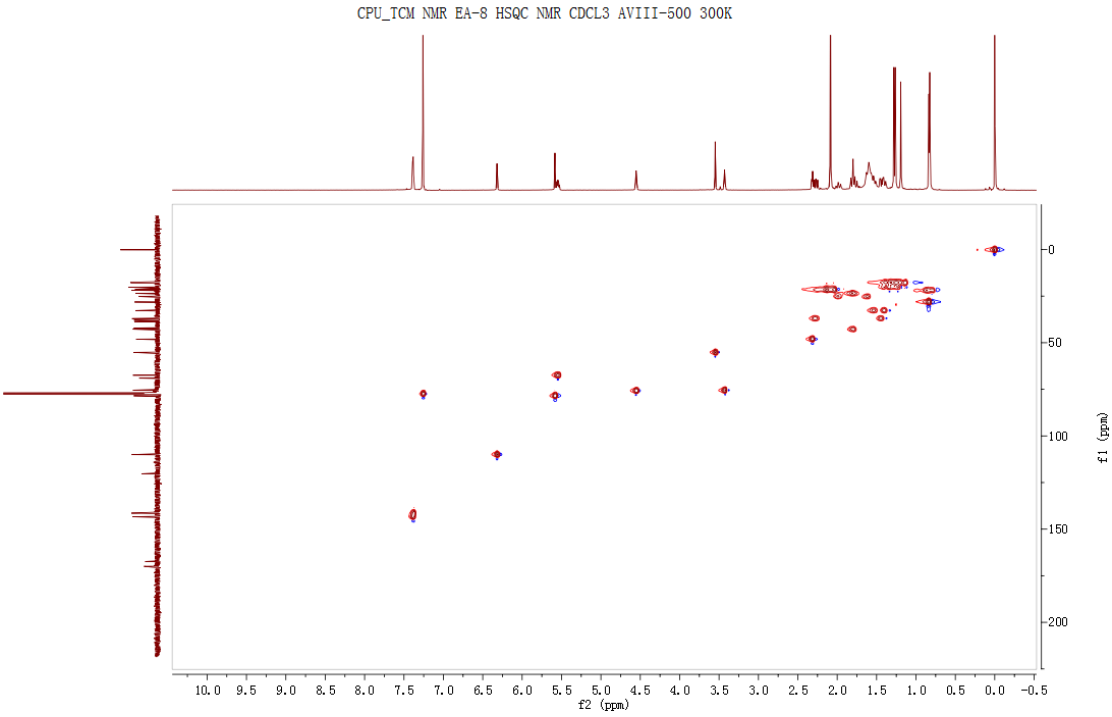


Figure S86. HSQC spectrum of **14** in $CDCl_3$

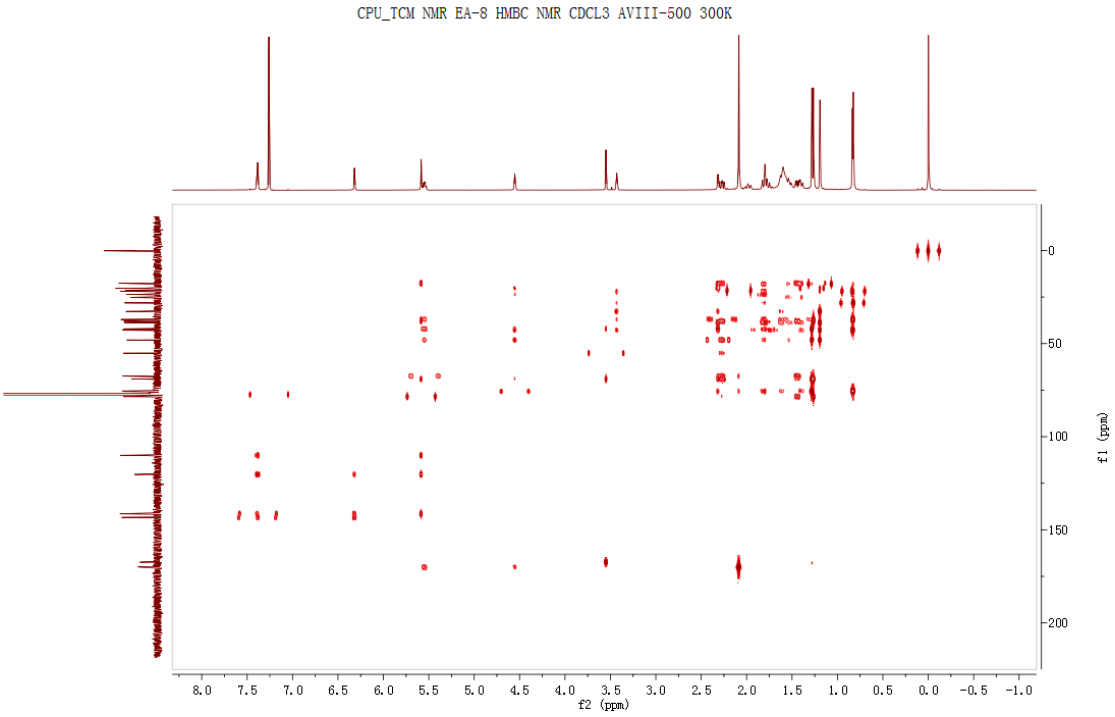


Figure S87. HMBC spectrum of **14** in $CDCl_3$.

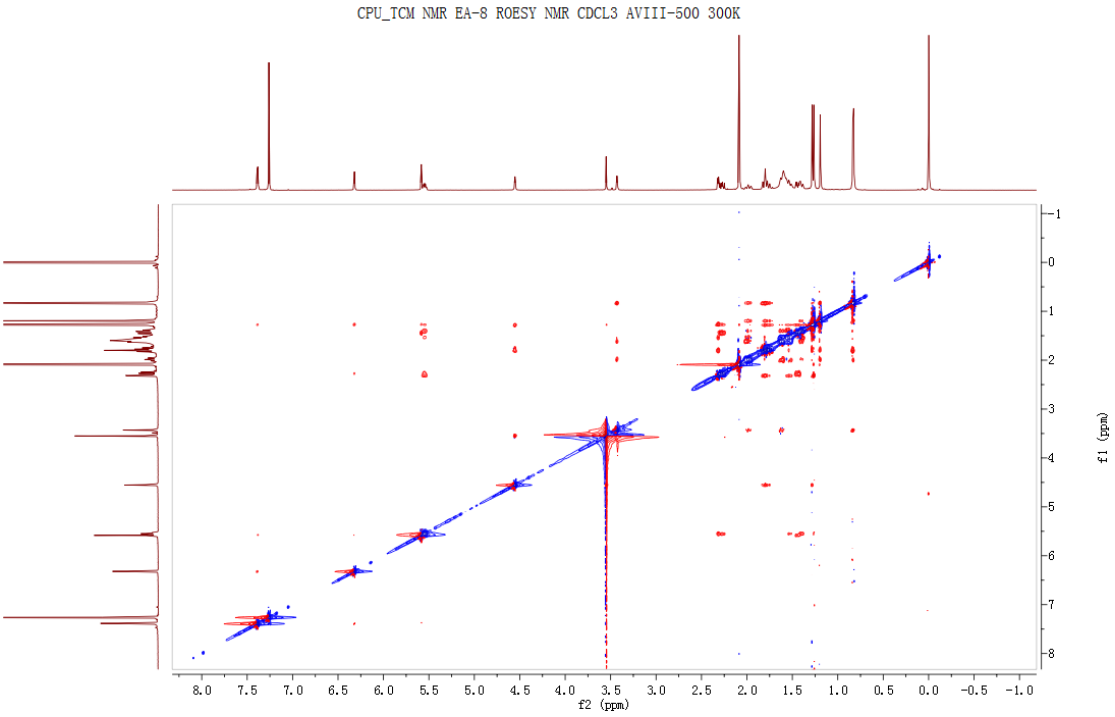
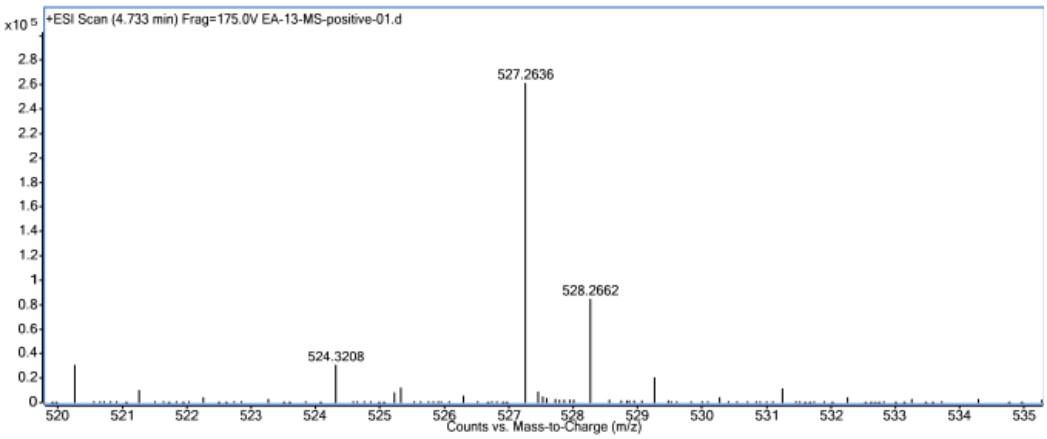


Figure S88. ROESY spectrum of **14** in $CDCl_3$



Elemental Composition Calculator

Target m/z:	527.2636	**Result type:**	Positive ions	**Species:**	$[M+H]^+$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10)			
Ion Formula		**Calculated m/z**		**PPM Error**	
C30H39O8		527.2639		0.63	

Figure S89. HRESIMS spectrum of **15**

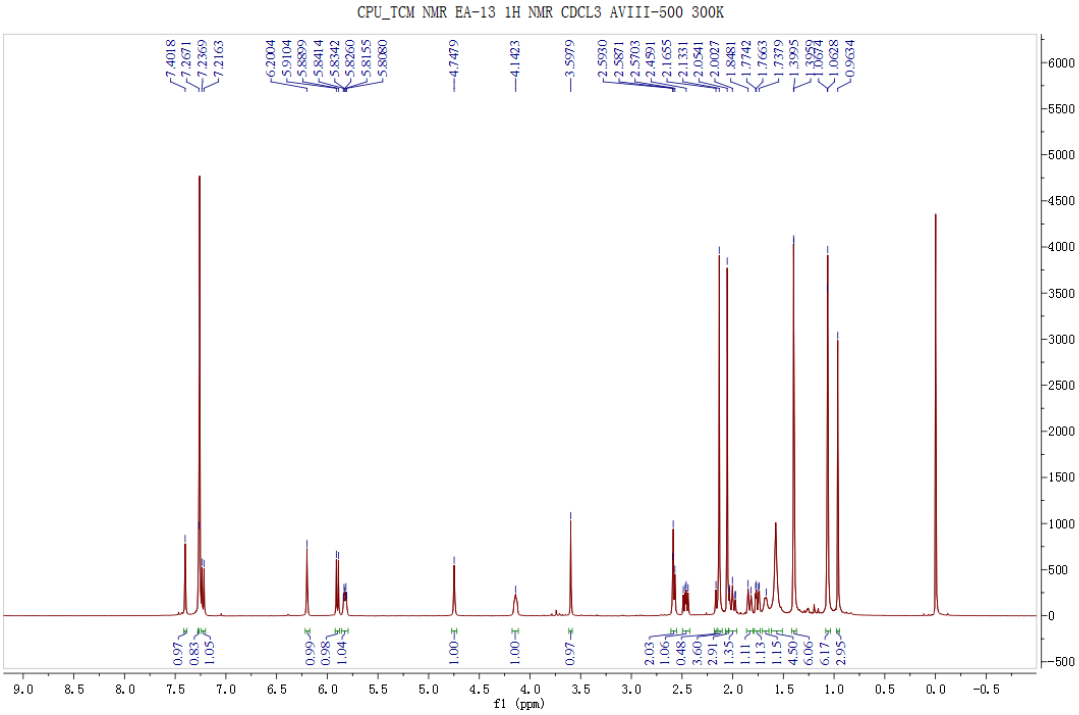


Figure S90. ^{1}H NMR spectrum of **15** in $CDCl_3$

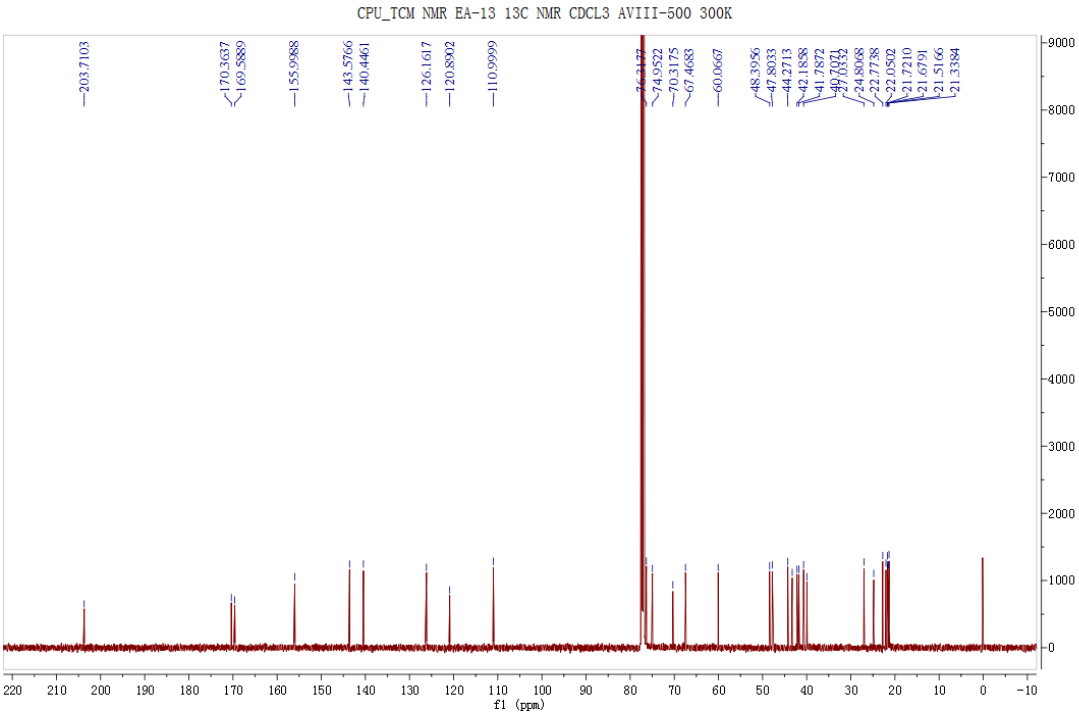


Figure S91. ^{13}C NMR spectrum of **15** in $CDCl_3$

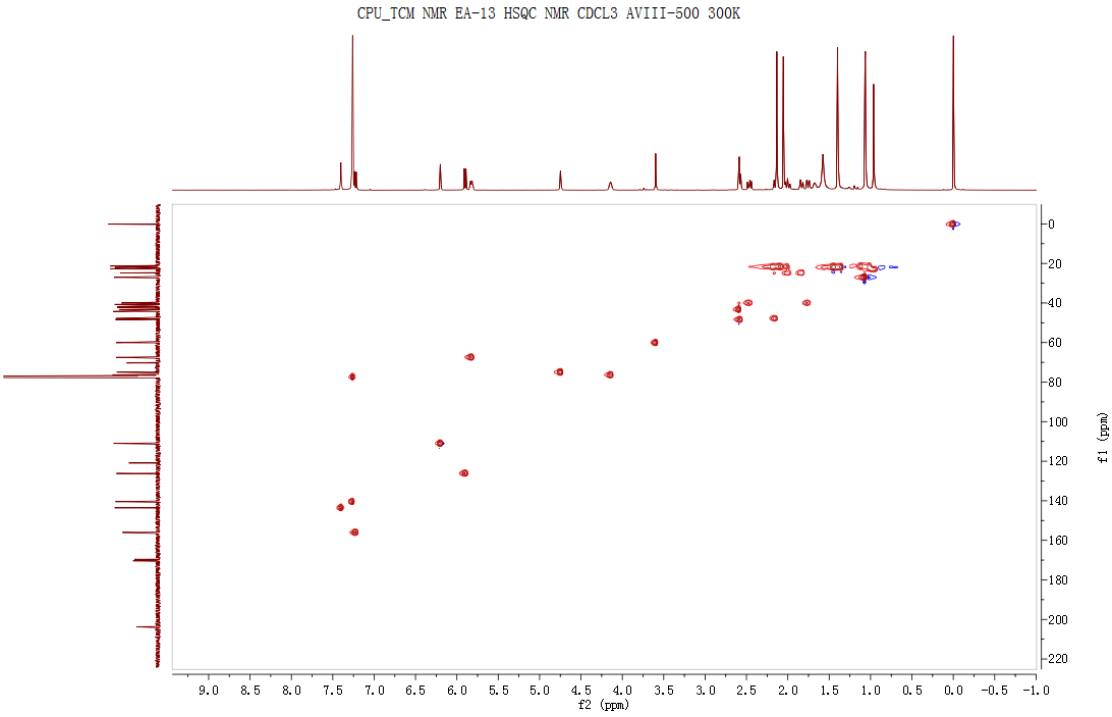


Figure S92. HSQC spectrum of **15** in $CDCl_3$

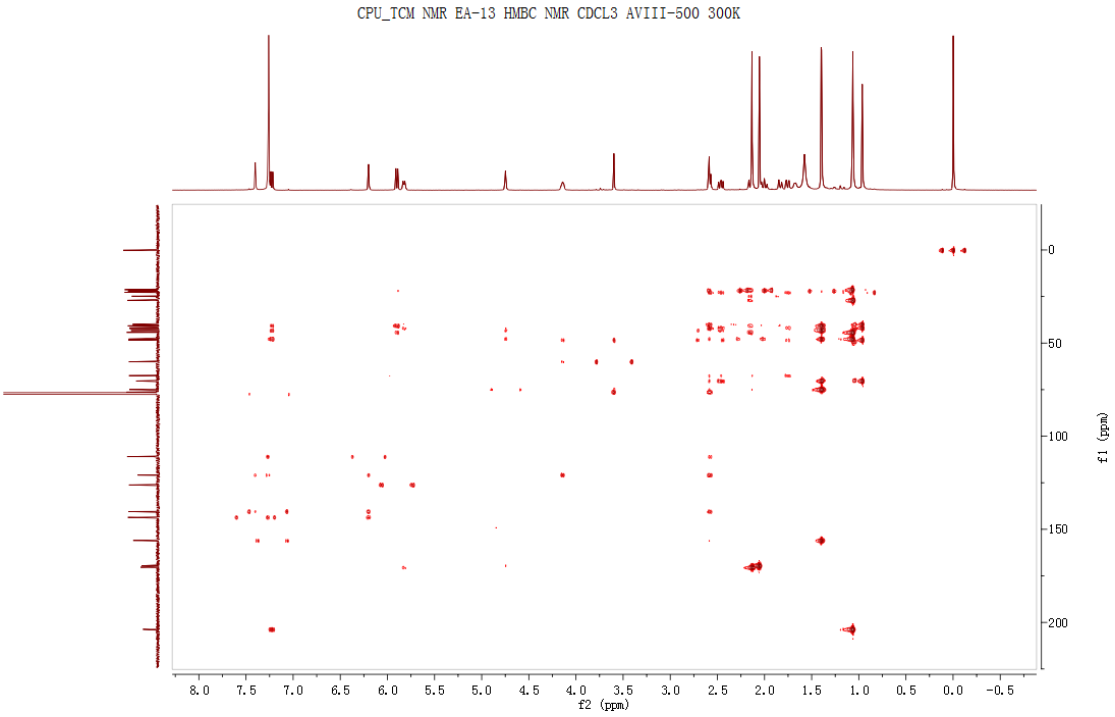


Figure S93. HMBC spectrum of **15** in $CDCl_3$

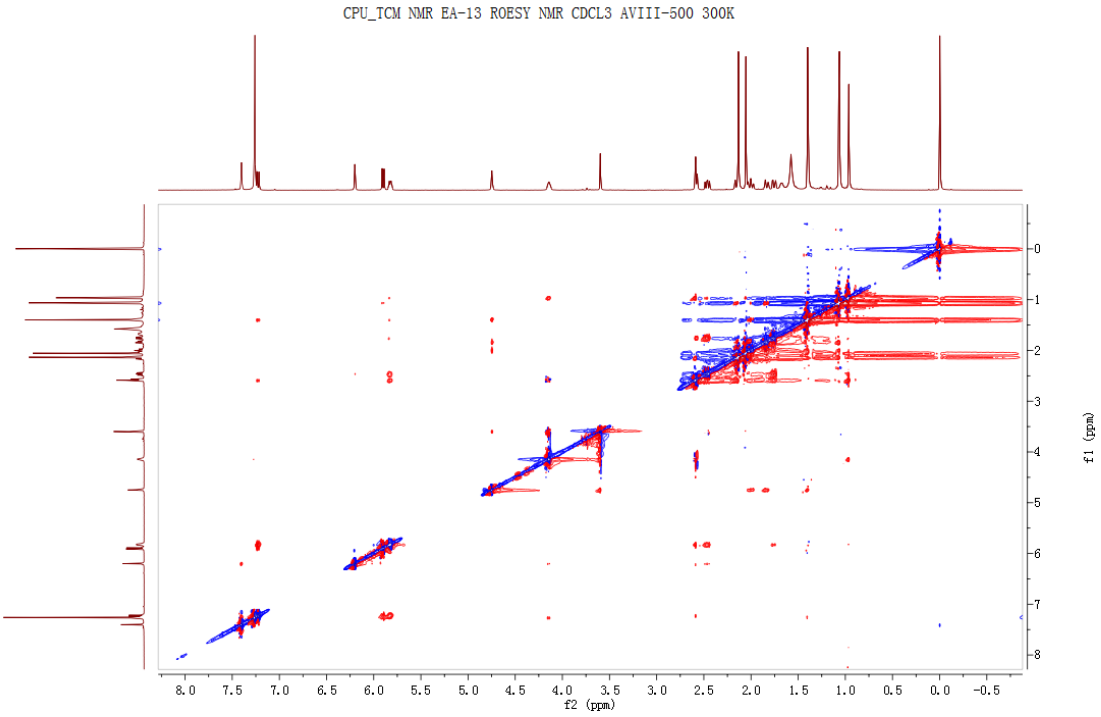
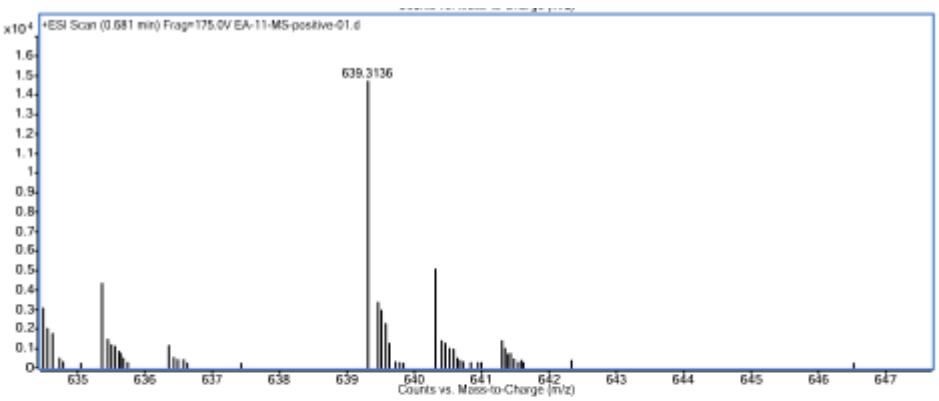


Figure S94. ROESY spectrum of **15** in $CDCl_3$



Elemental Composition Calculator

Target m/z:	639.3136	**Result type:**	Positive ions	**Species:**	$[M+Na]^+$
Elements:		C (0-80); H (0-120); O (0-30); Na (0-5)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
C34H48NaO10		639.3140		0.64	

Figure S95. HRESIMS spectrum of **16**

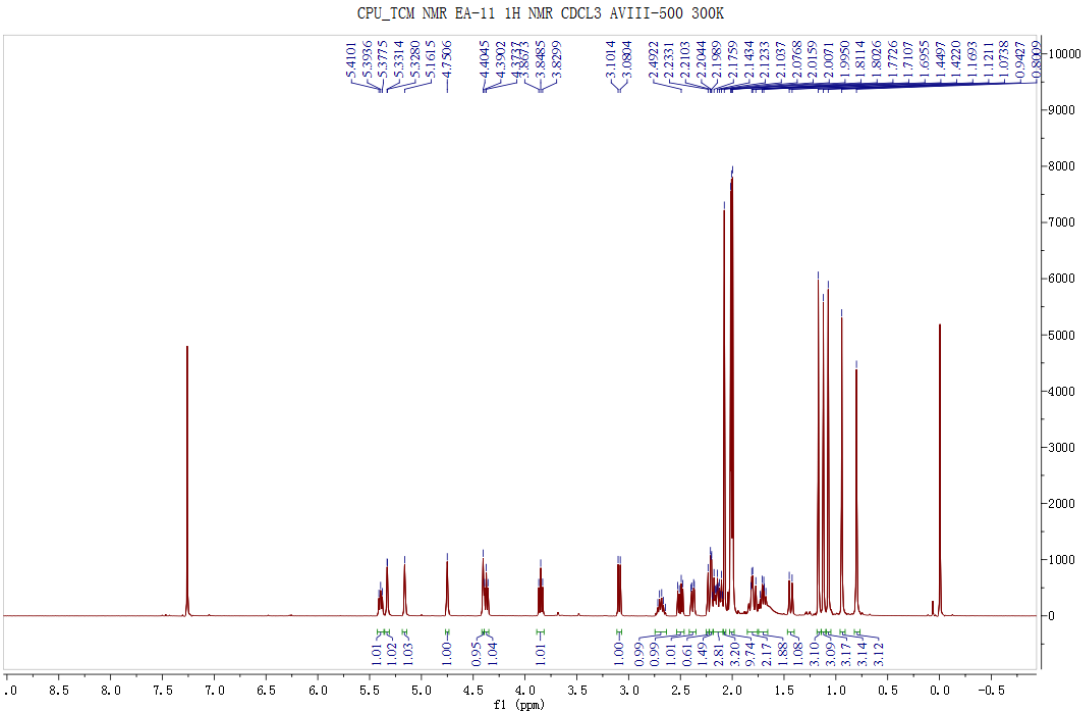


Figure S96. ^{1}H NMR spectrum of **16** in $CDCl_3$

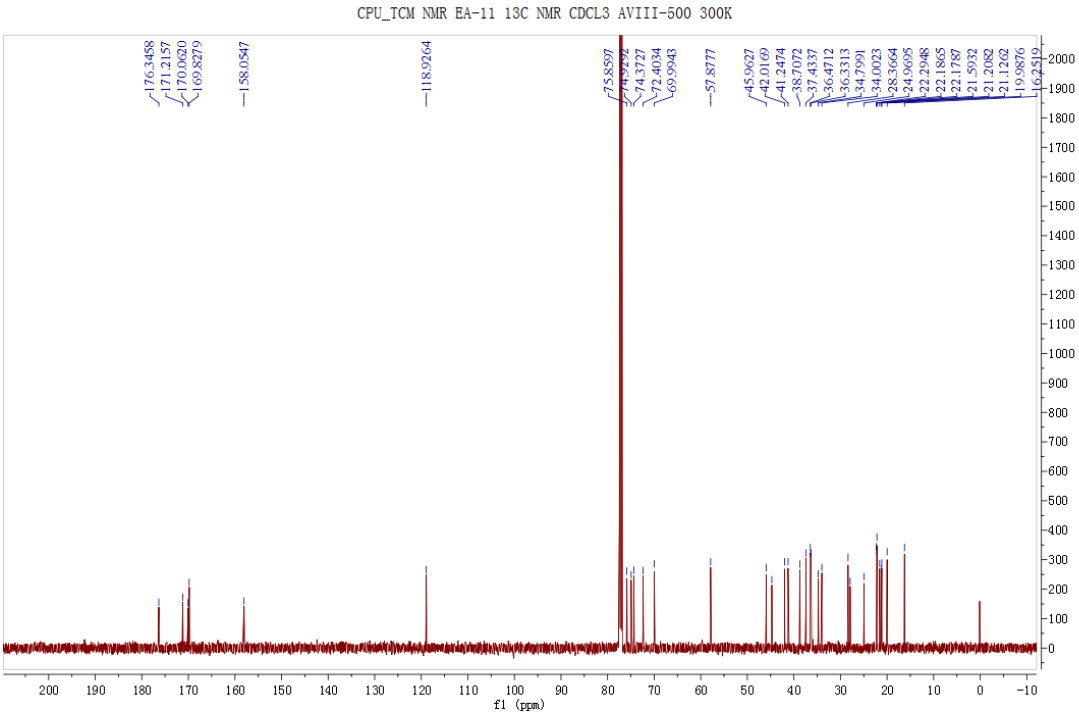


Figure S97. ^{13}C NMR spectrum of **16** in $CDCl_3$

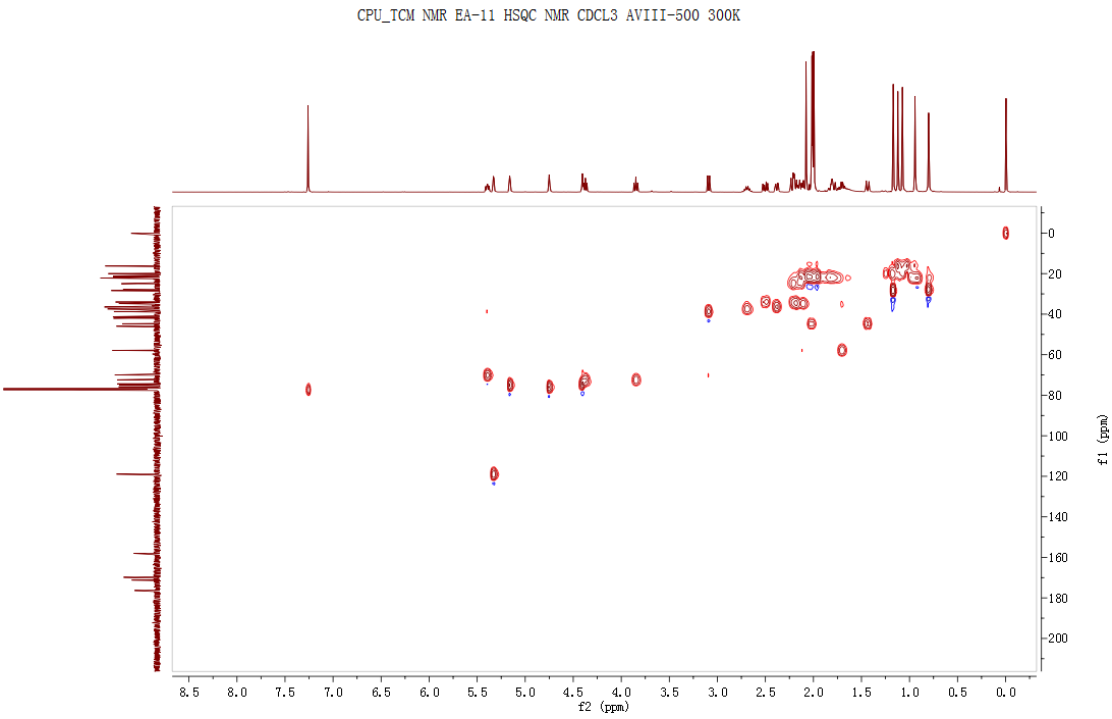


Figure S98. HSQC spectrum of **16** in $CDCl_3$

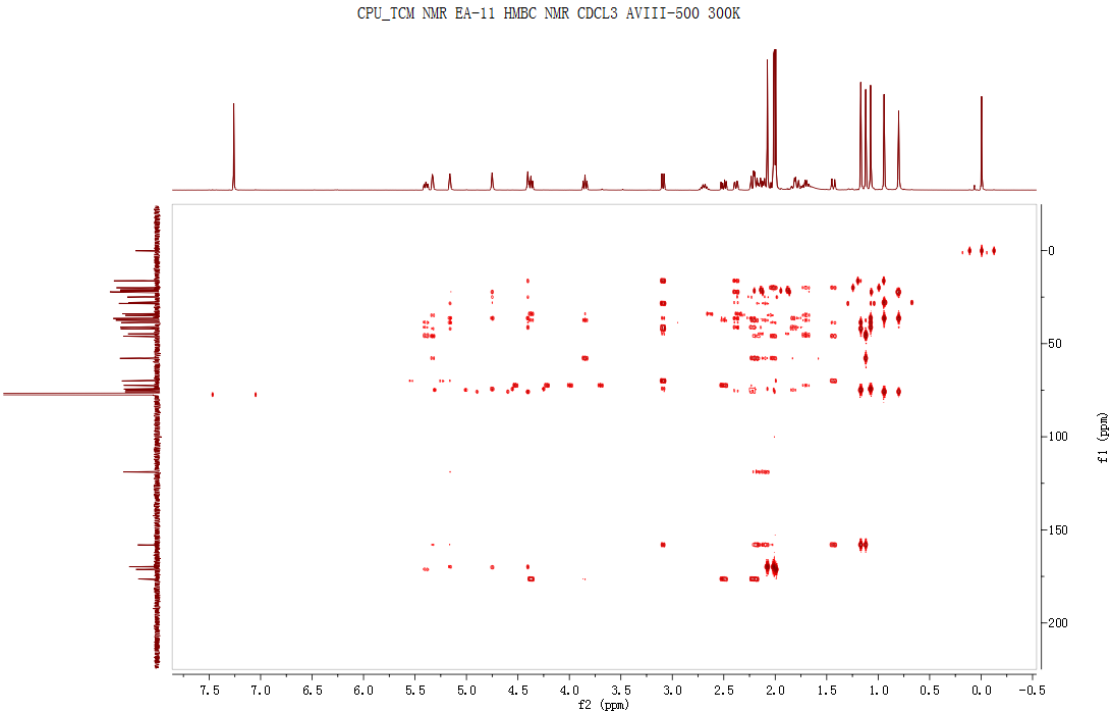


Figure S99. HMBC spectrum of **16** in $CDCl_3$

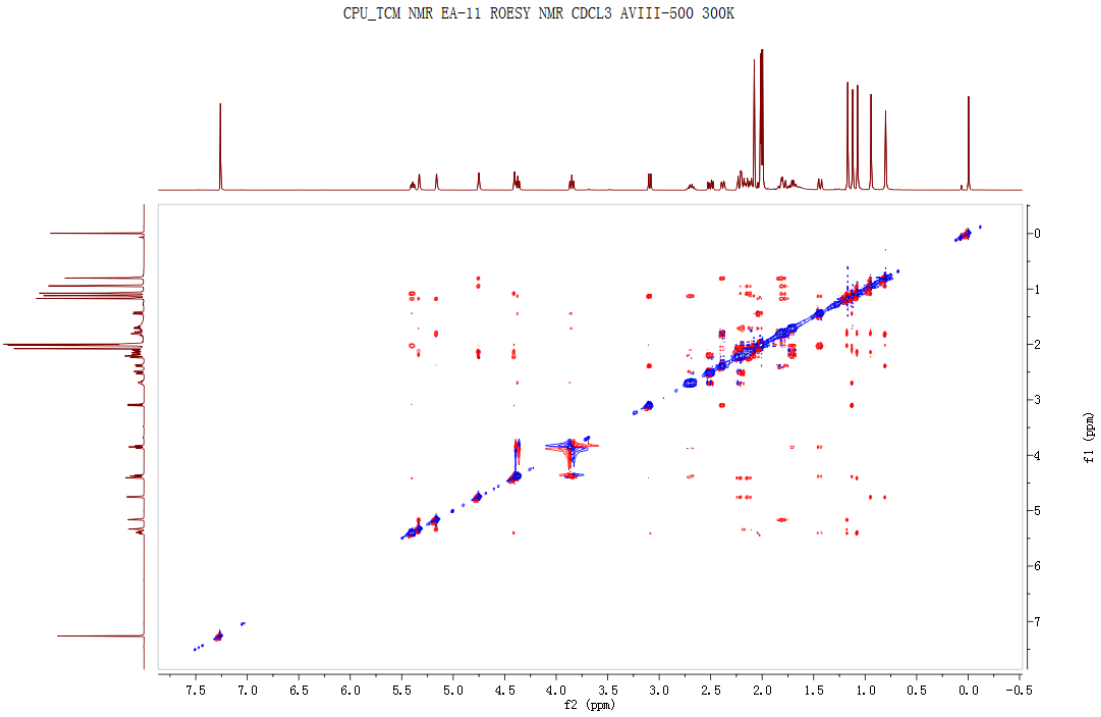


Figure S100. ROESY spectrum of **16** in $CDCl_3$