Supplementary Information

Ent-abietane diterpenoids and their probable biogenetic precursors from the roots of *Euphorbia fischeriana*

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List of Supporting Information

Table 1. The 3D conformers of (5*R*,7*R*,9*S*,10*R*)-**1** with Boltzmann distribution over 1%.

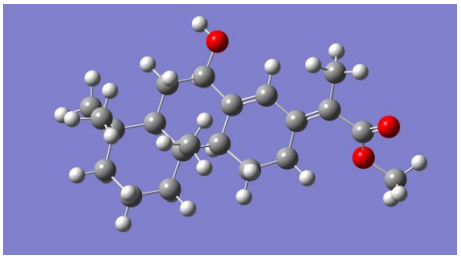
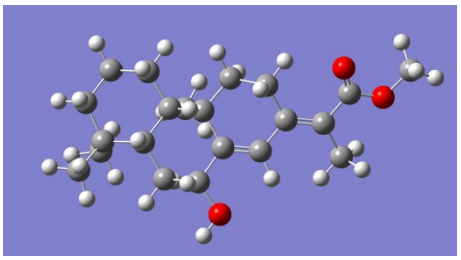
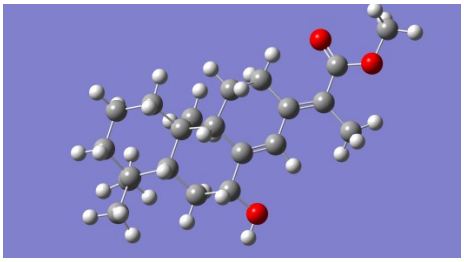
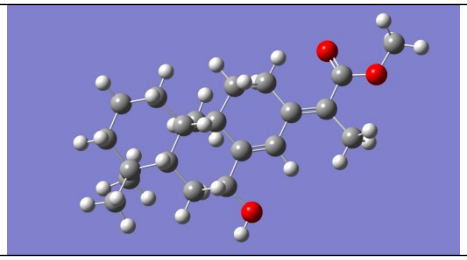
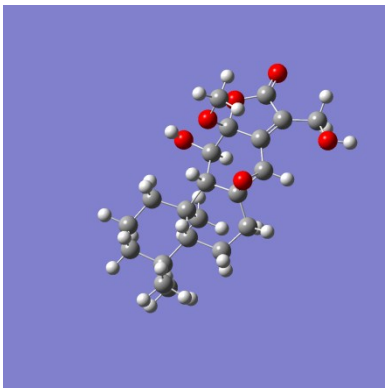
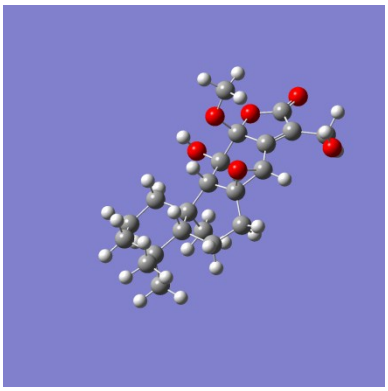
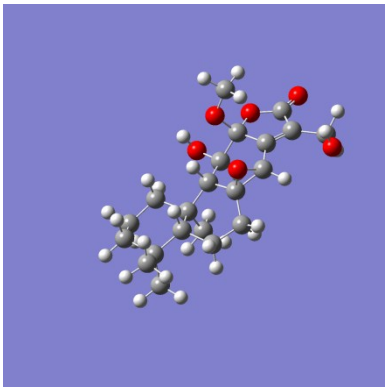
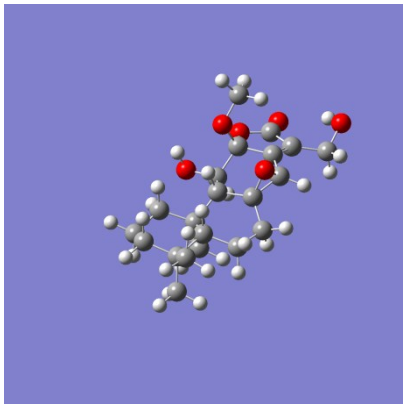
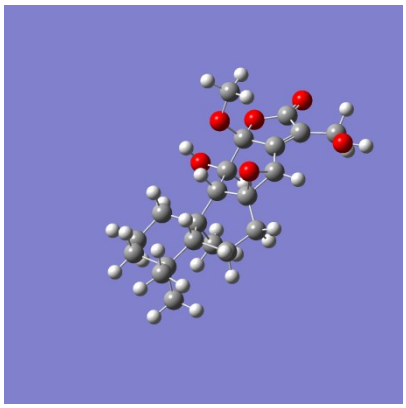
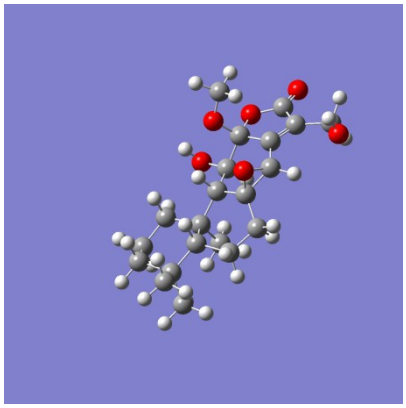
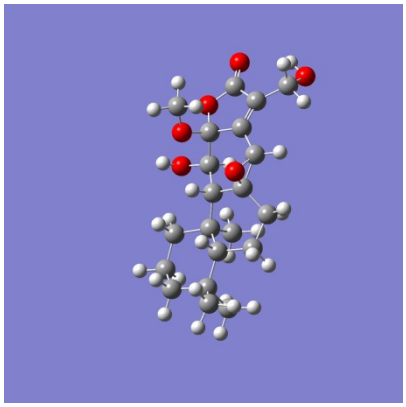
No.	Conformer	Population (%)
1		49.3
2		41.4
3		5.3
4		3.7

Table 2. The 3D conformers of (5*R*,8*S*,9*R*,12*R*,14*R*)-**5** with Boltzmann distribution over 1%.

No.	Conformer	Population (%)
1		10.63
3		9.58
4		18.98
5		21.23

6		10.62
8		9.59
9		18.99

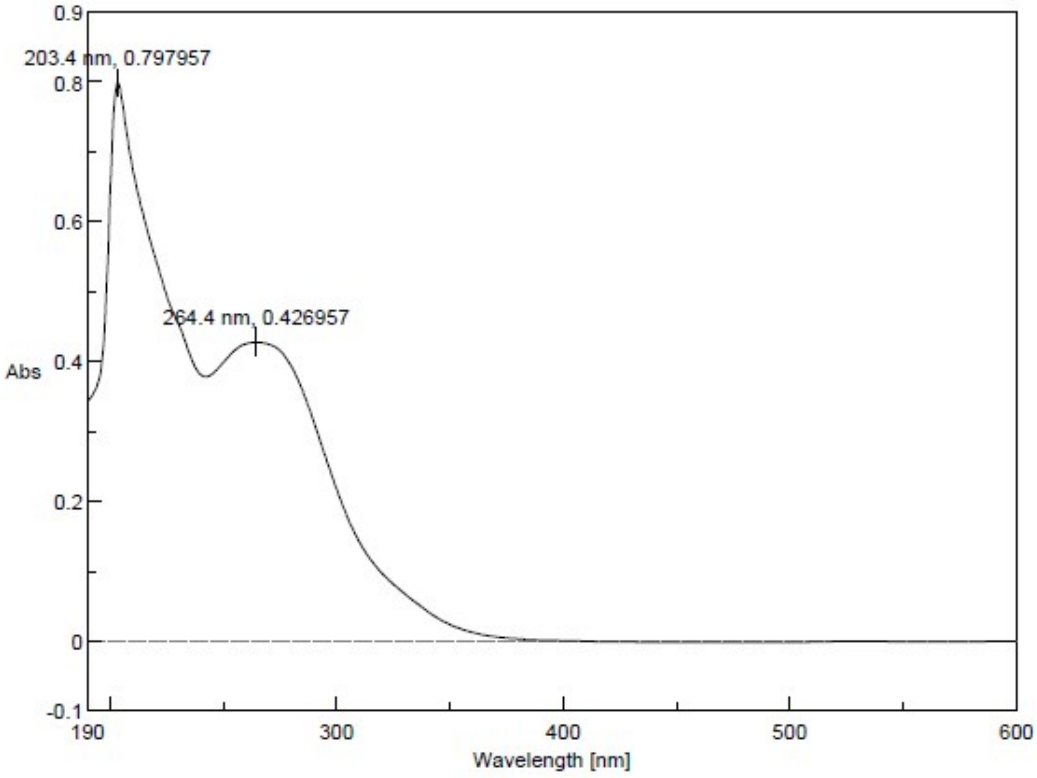


Figure S1. The UV spectrum of compound **1** in MeOH

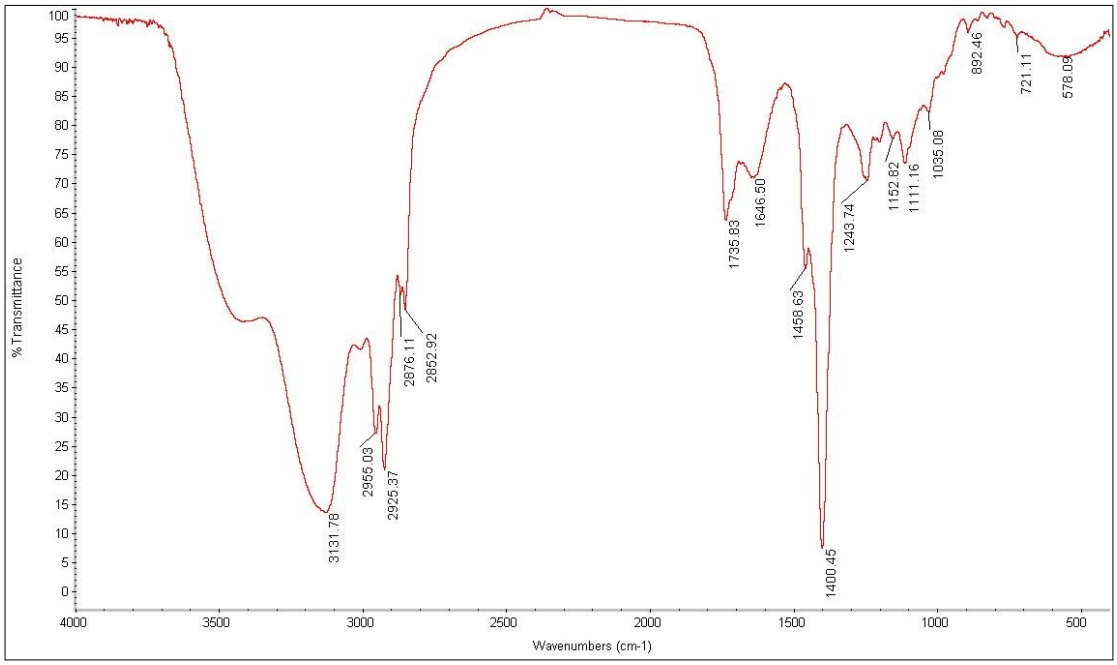
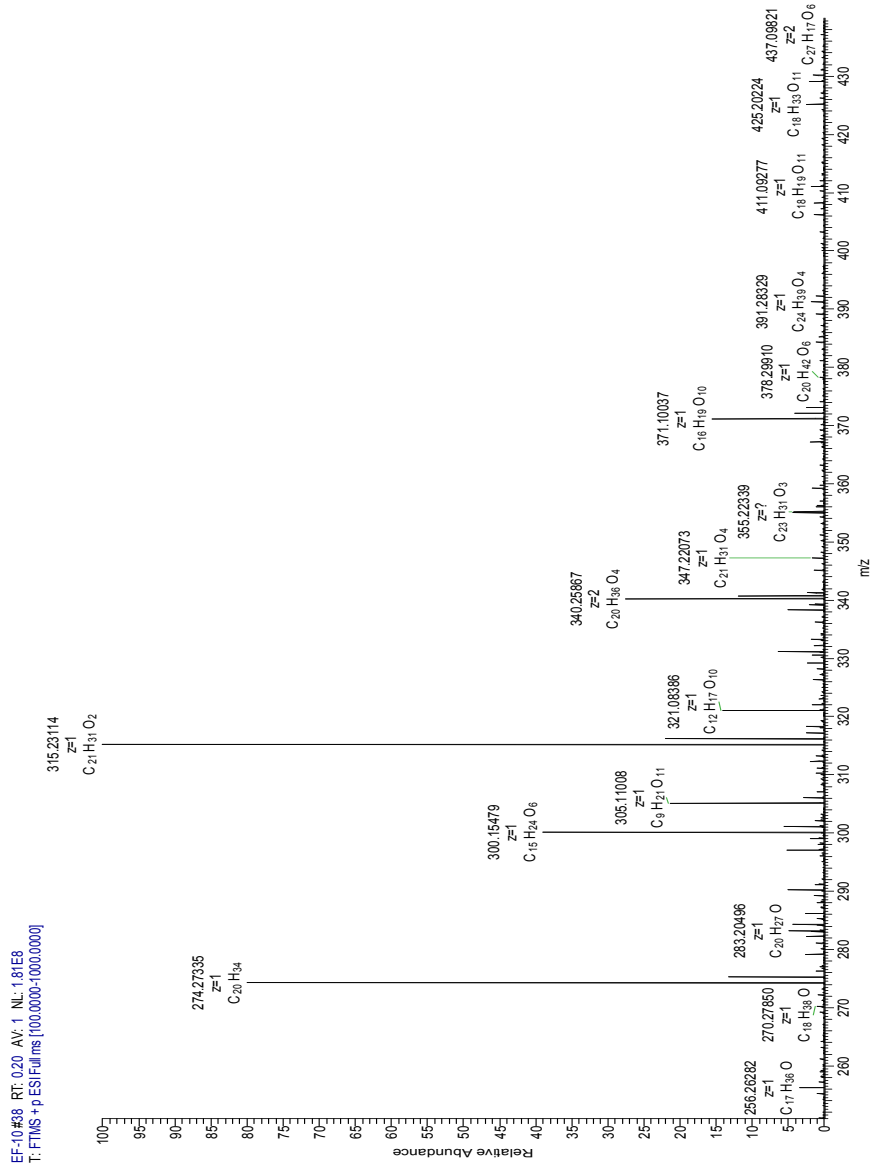


Figure S2. The IR spectrum of compound **1**



m/z	Theo. Mass	Delta (ppm)	RDB equiv.	Composition
315.23114	315.23186	-2.27	6.5	$C_{21}H_{31}O_2$
	315.21660	46.12	2.5	$C_{17}H_{31}O_5$
	315.21073	64.75	11.5	$C_{24}H_{27}$
	315.25299	-69.30	1.5	$C_{18}H_{35}O_4$
	315.19547	113.15	7.5	$C_{20}H_{27}O_3$
	315.26824	-117.70	5.5	$C_{22}H_{35}O$
	315.18022	161.55	3.5	$C_{16}H_{27}O_6$
	315.17434	180.18	12.5	$C_{23}H_{23}O$
	315.28937	-184.73	0.5	$C_{19}H_{39}O_3$
	315.16496	209.94	-0.5	$C_{12}H_{27}O_9$

Figure S3. The HRESIMS spectrum of compound **1**

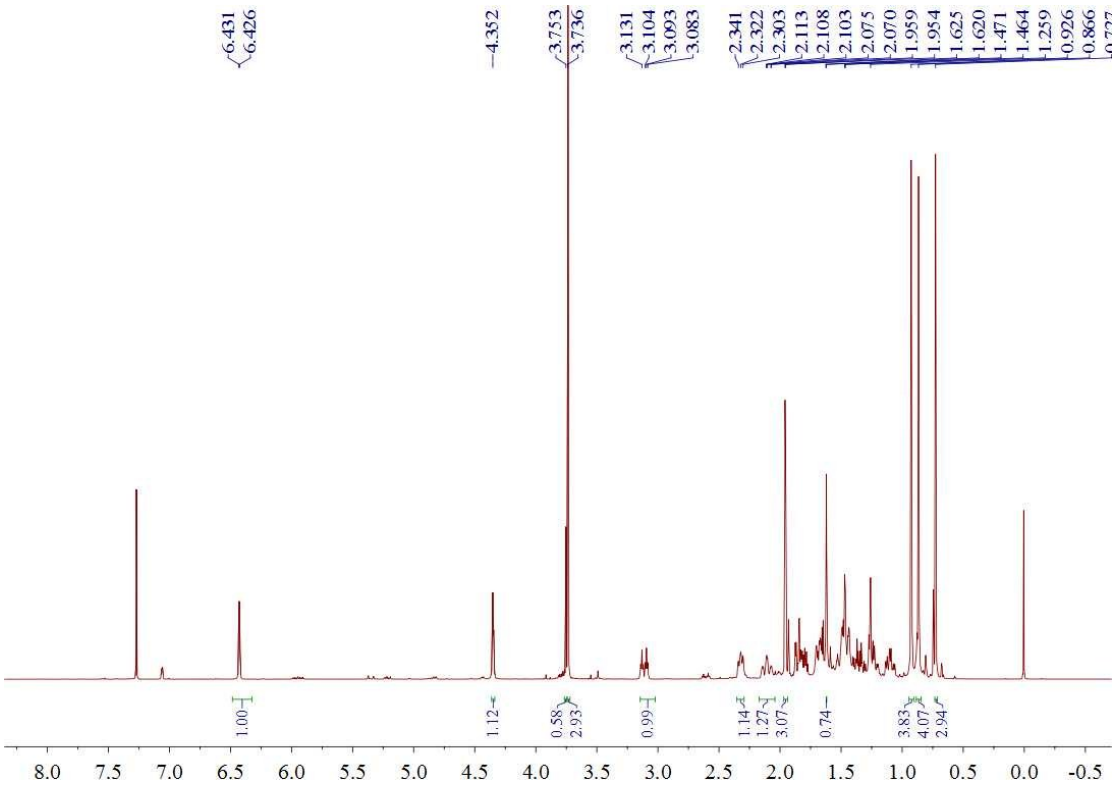


Figure S4. The ^{1}H NMR spectrum of compound **1** ($CDCl_3$, 400 MHz)

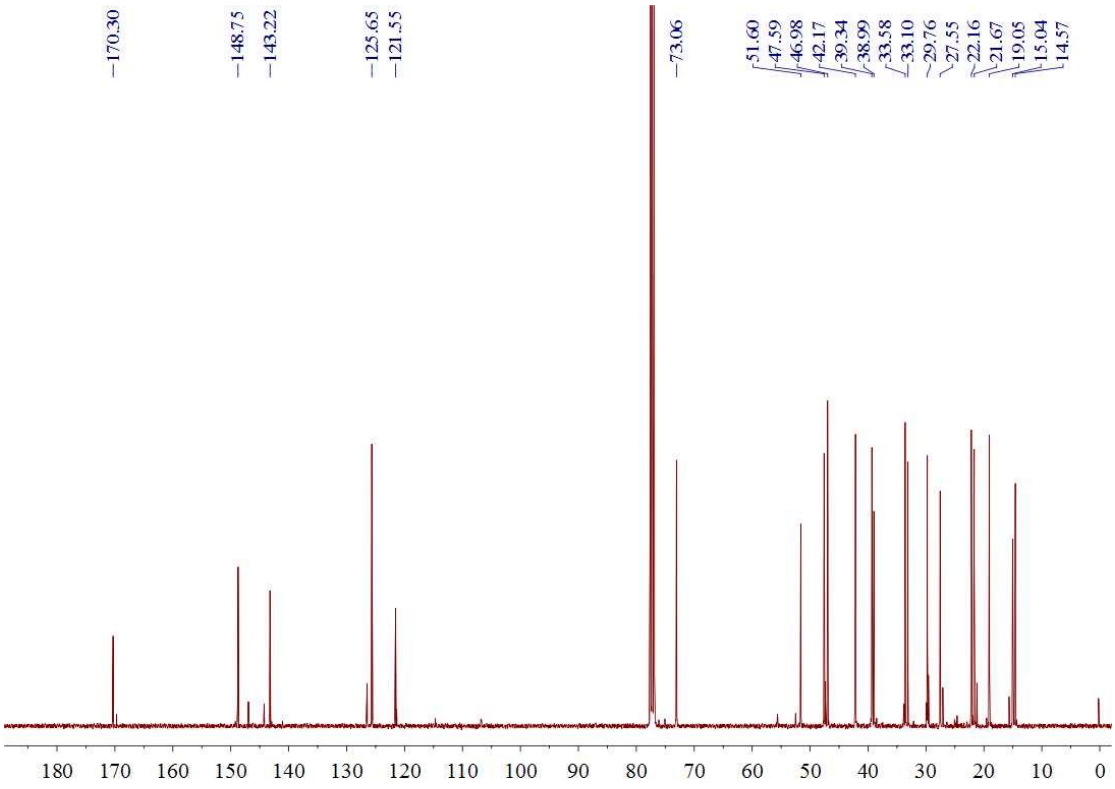


Figure S5. The ^{13}C NMR spectrum of compound **1** ($CDCl_3$, 100 MHz)

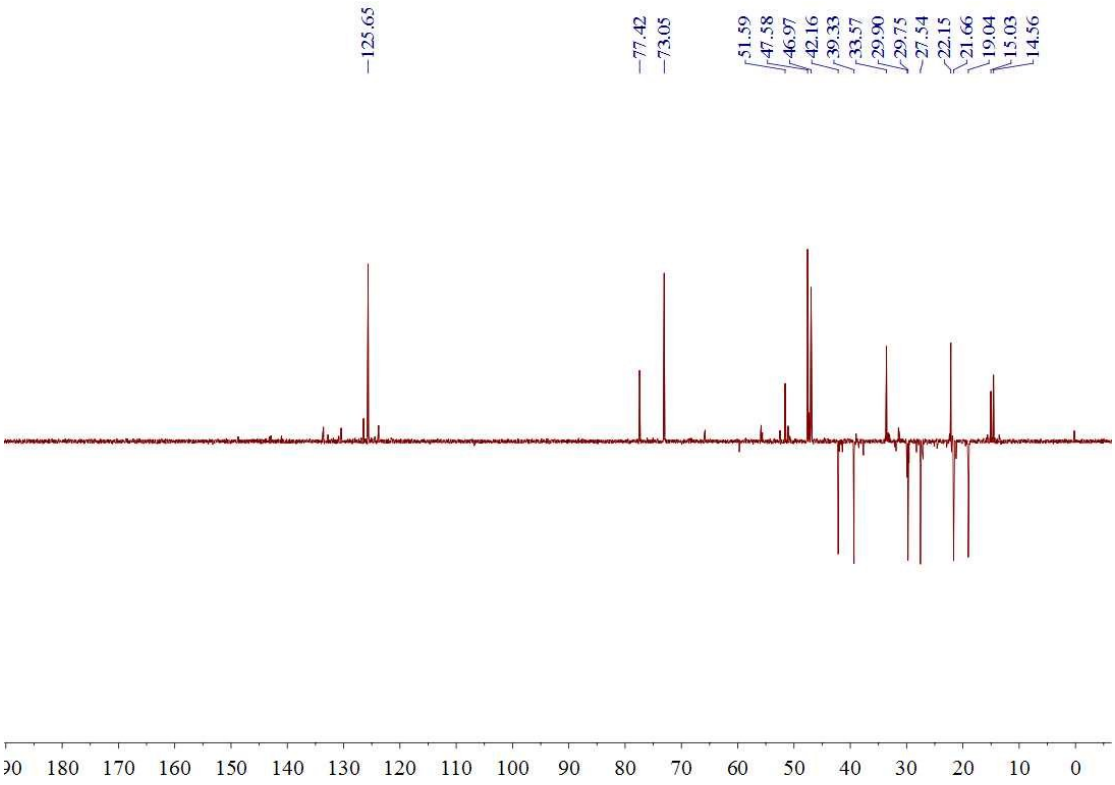


Figure S6. The DEPT-135 spectrum of compound **1** ($CDCl_3$, 100 MHz)

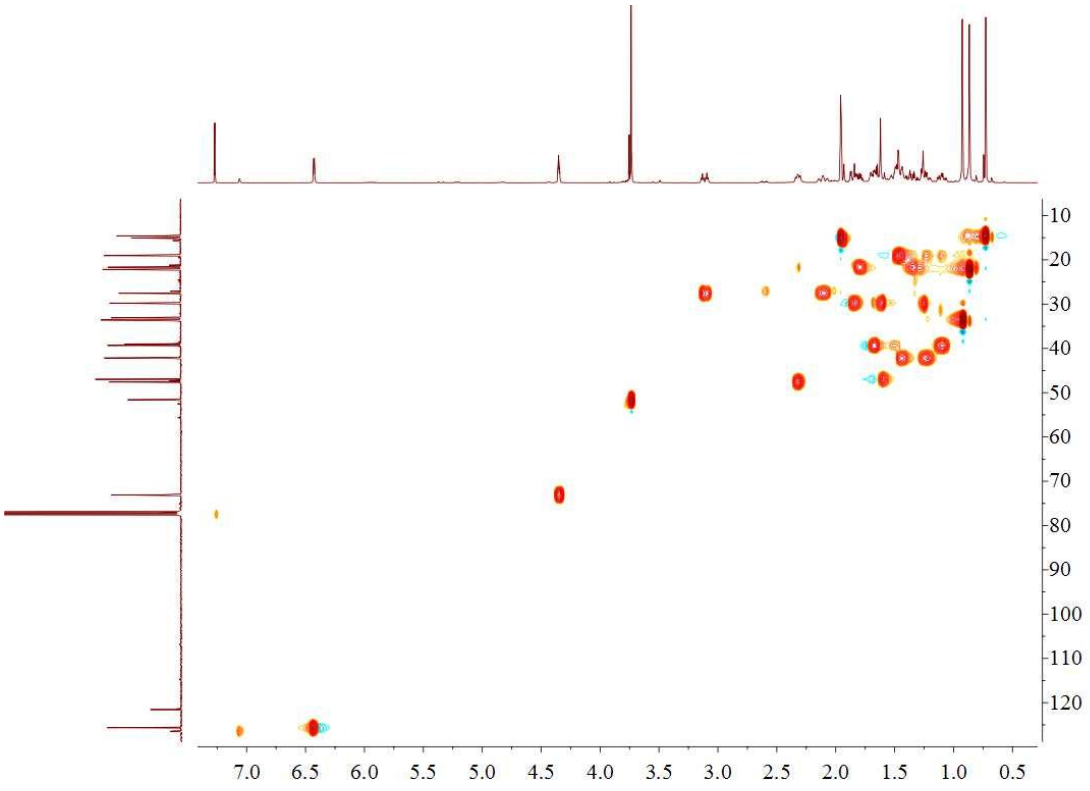


Figure S7. The HSQC spectrum of compound **1**

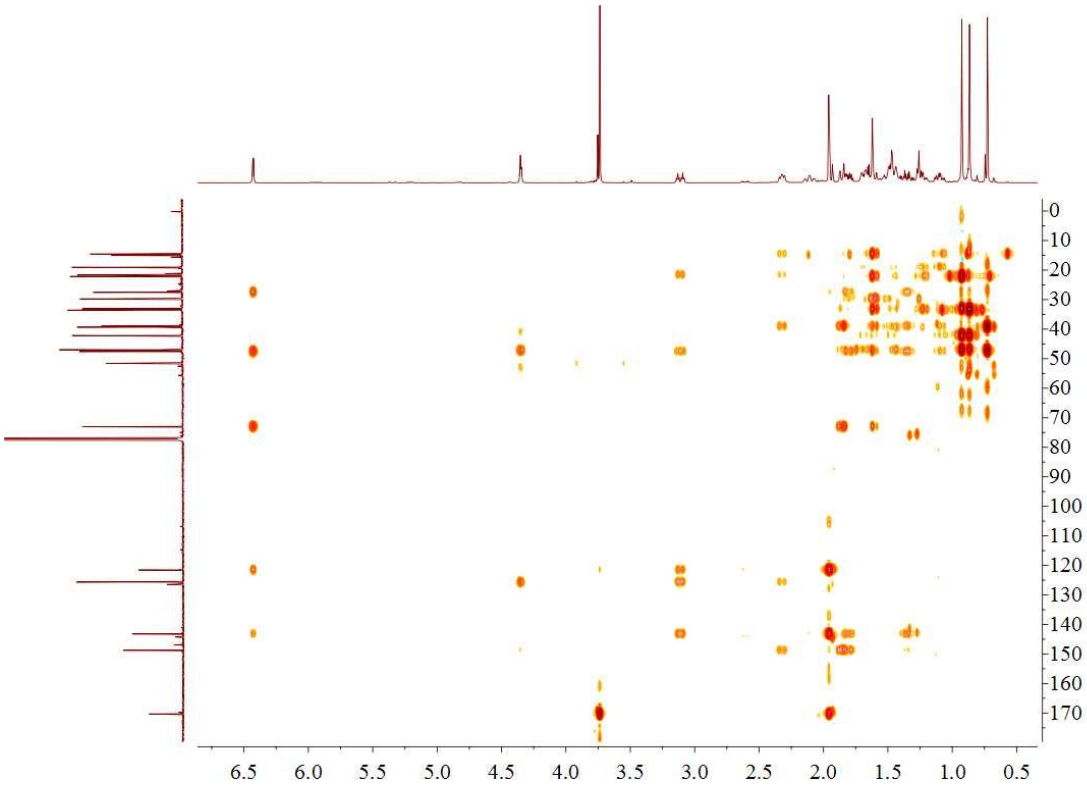


Figure S8. The HMBC spectrum of compound **1**

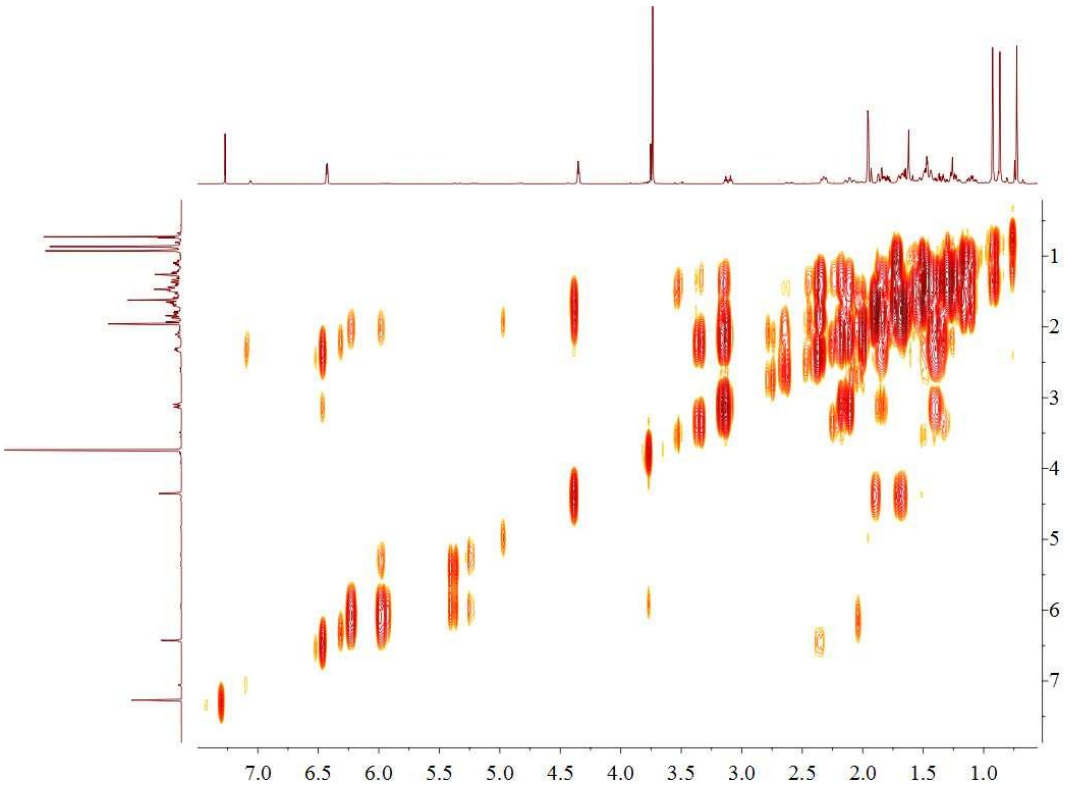


Figure S9. The COSY spectrum of compound **1** ($CDCl_3$, 400 MHz)

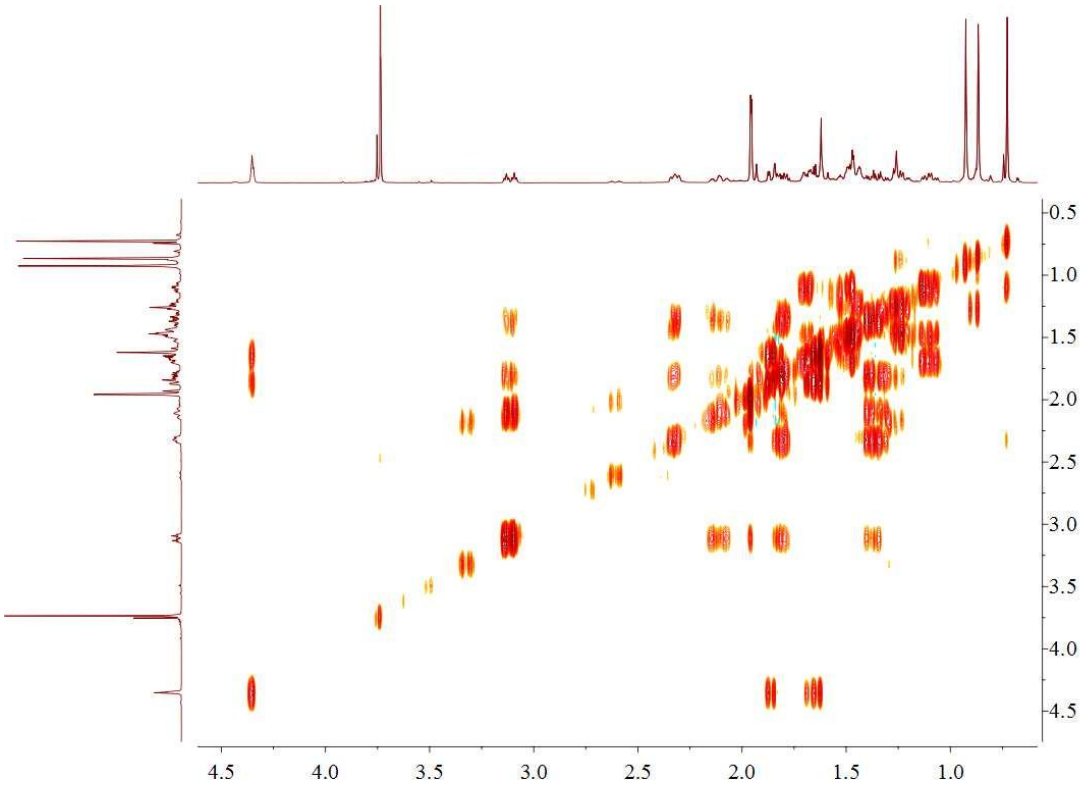


Figure S10. The expanded COSY spectrum of compound **1** ($CDCl_3$, 400 MHz)

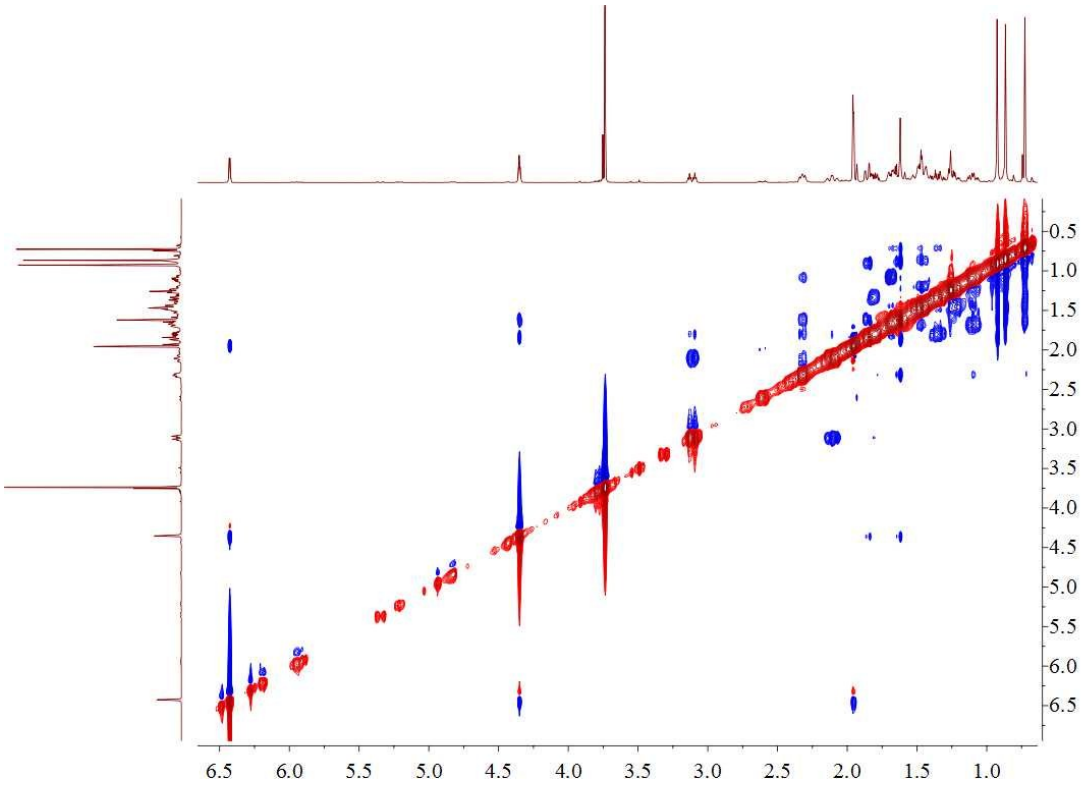


Figure S11. The NOESY spectrum of compound **1** ($CDCl_3$, 400 MHz)

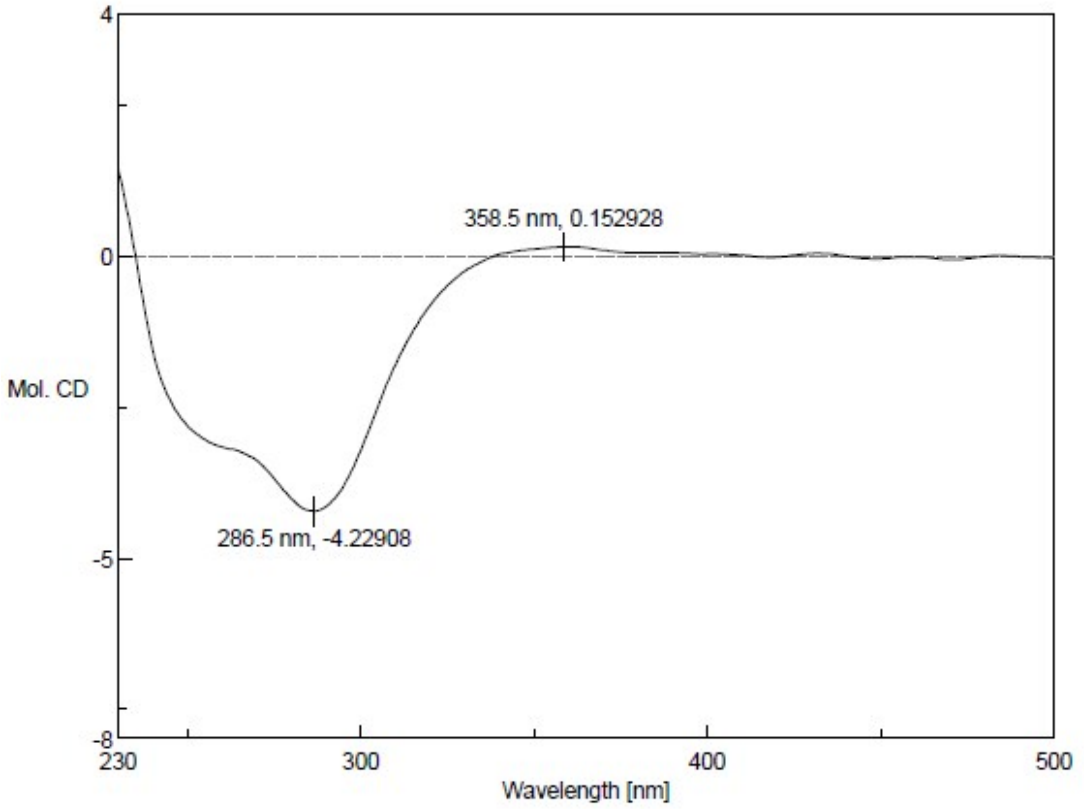


Figure S12. The ECD spectrum of compound **1** in MeOH

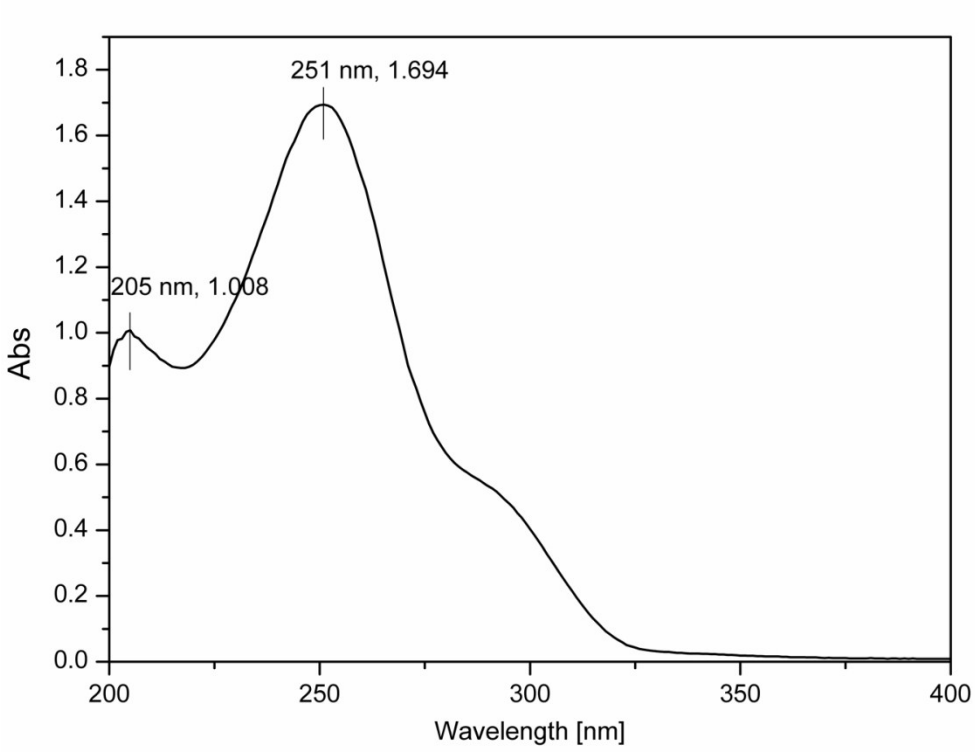


Figure S13. The UV spectrum of compound **2** in MeOH

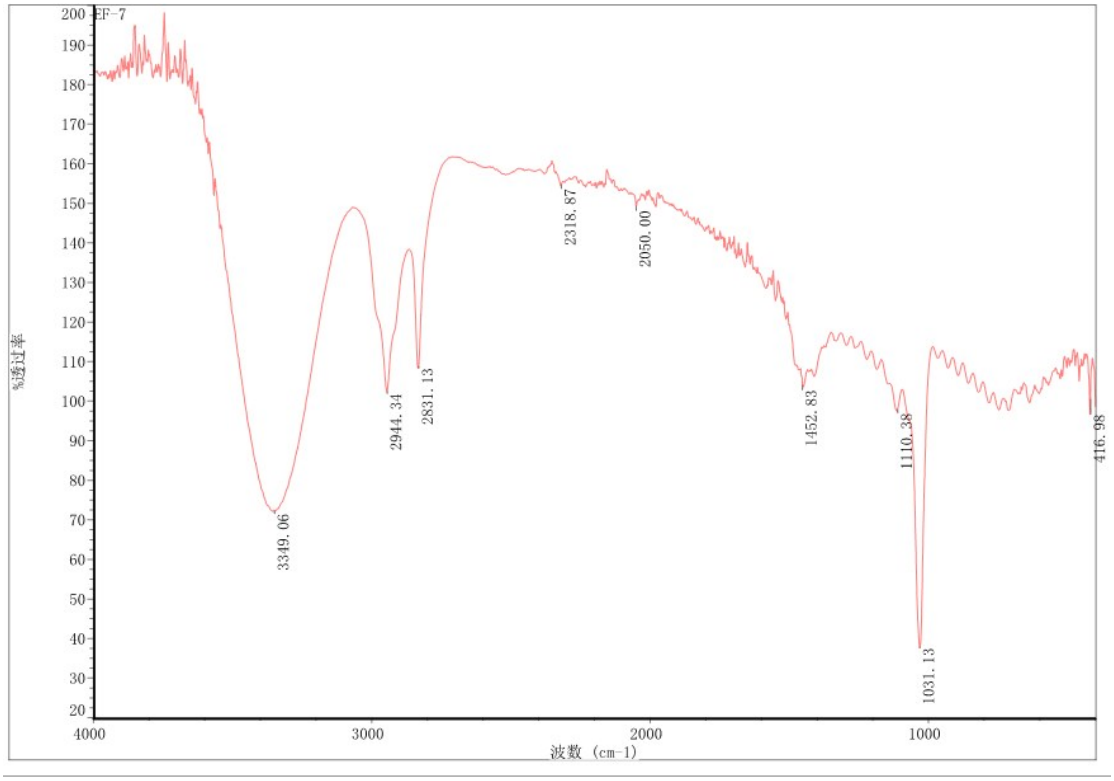
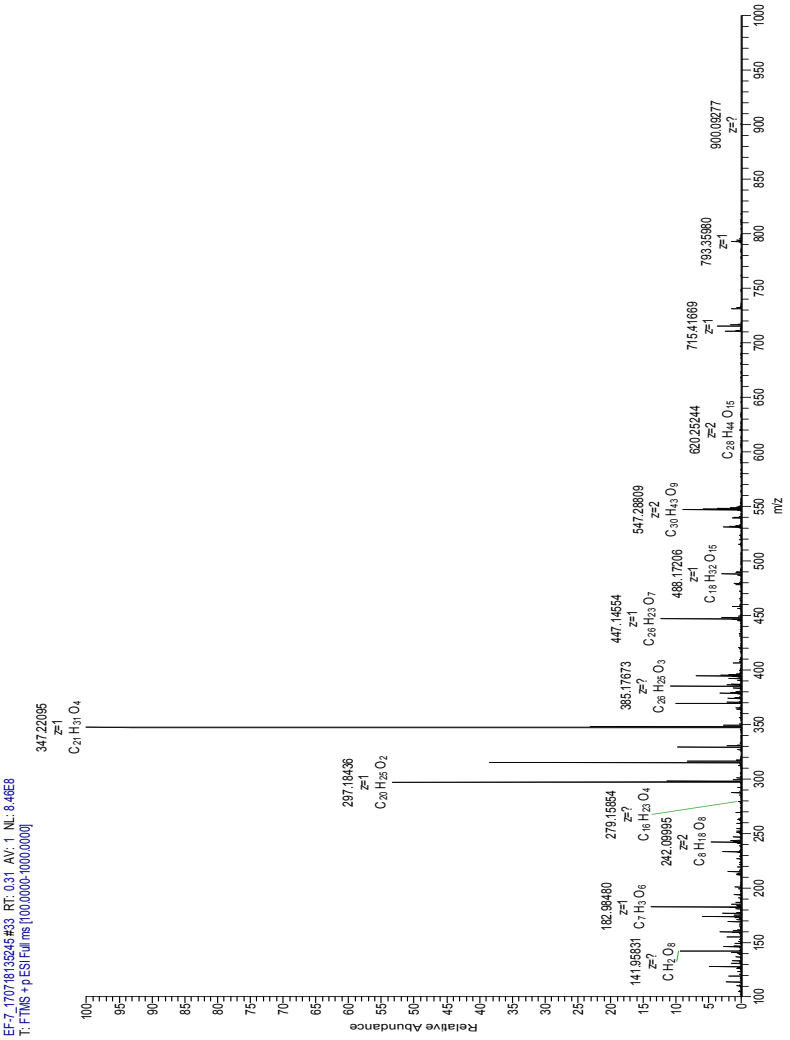


Figure S14. The IR spectrum of compound **2**



m/z	Theo. Mass	Delta (ppm)	RDB equiv.	Composition
347.22095	347.22169	-2.12	6.5	$C_{21}H_{31}O_4$
	347.20643	41.82	2.5	$C_{17}H_{31}O_7$
	347.23694	-46.06	10.5	$C_{25}H_{31}O$
	347.20056	58.73	11.5	$C_{24}H_{27}O_2$
	347.24282	-62.97	1.5	$C_{18}H_{35}O_6$
	347.18530	102.67	7.5	$C_{20}H_{27}O_5$
	347.25807	-106.91	5.5	$C_{22}H_{35}O_3$
	347.17943	119.59	16.5	$C_{27}H_{23}$
	347.17004	146.61	3.5	$C_{16}H_{27}O_8$
	347.27333	-150.85	9.5	$C_{26}H_{35}$

Figure S15. The HRESIMS spectrum of compound **2**

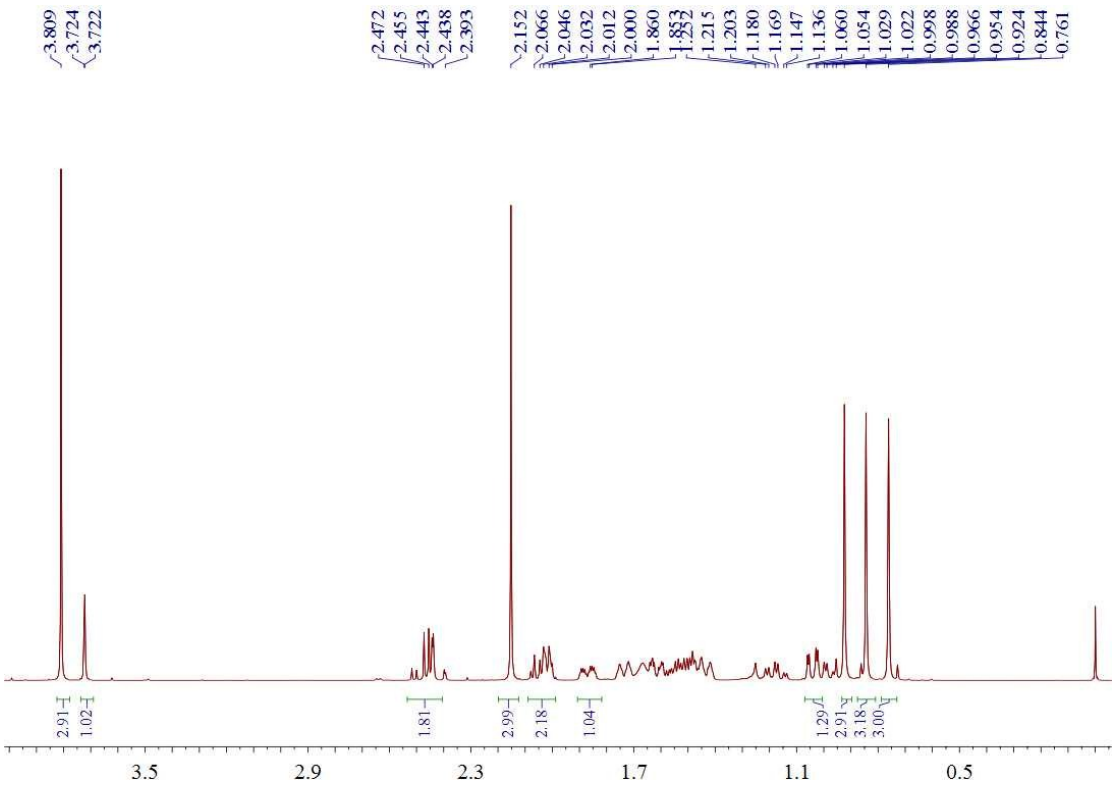


Figure S16. The ^{1}H NMR spectrum of compound **2** ($CDCl_3$, 400 MHz)

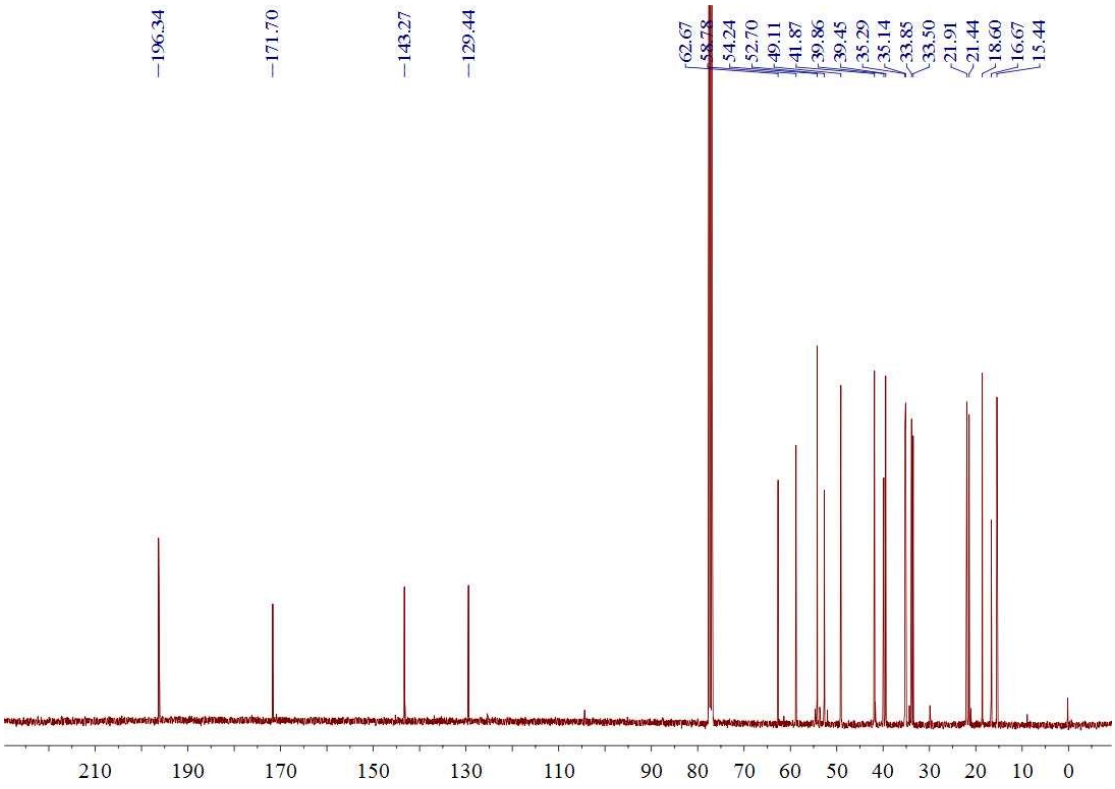


Figure S17. The ^{13}C NMR spectrum of compound **2** ($CDCl_3$, 100 MHz)

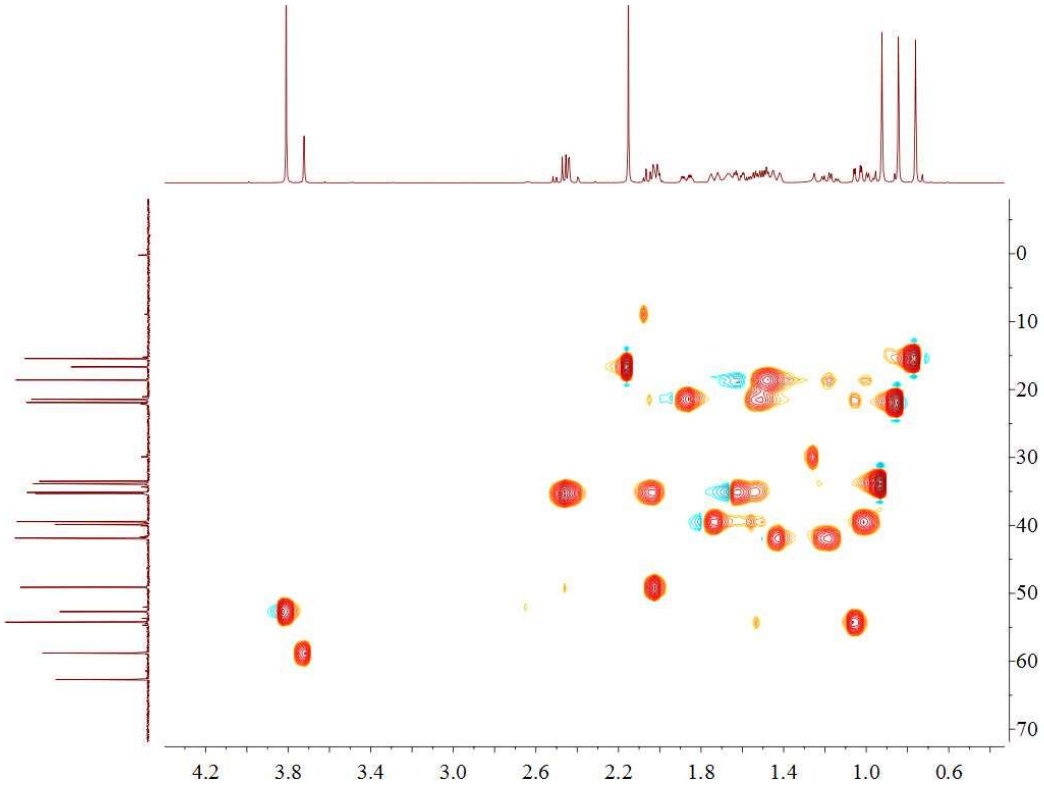


Figure S18. The HSQC spectrum of compound **2**

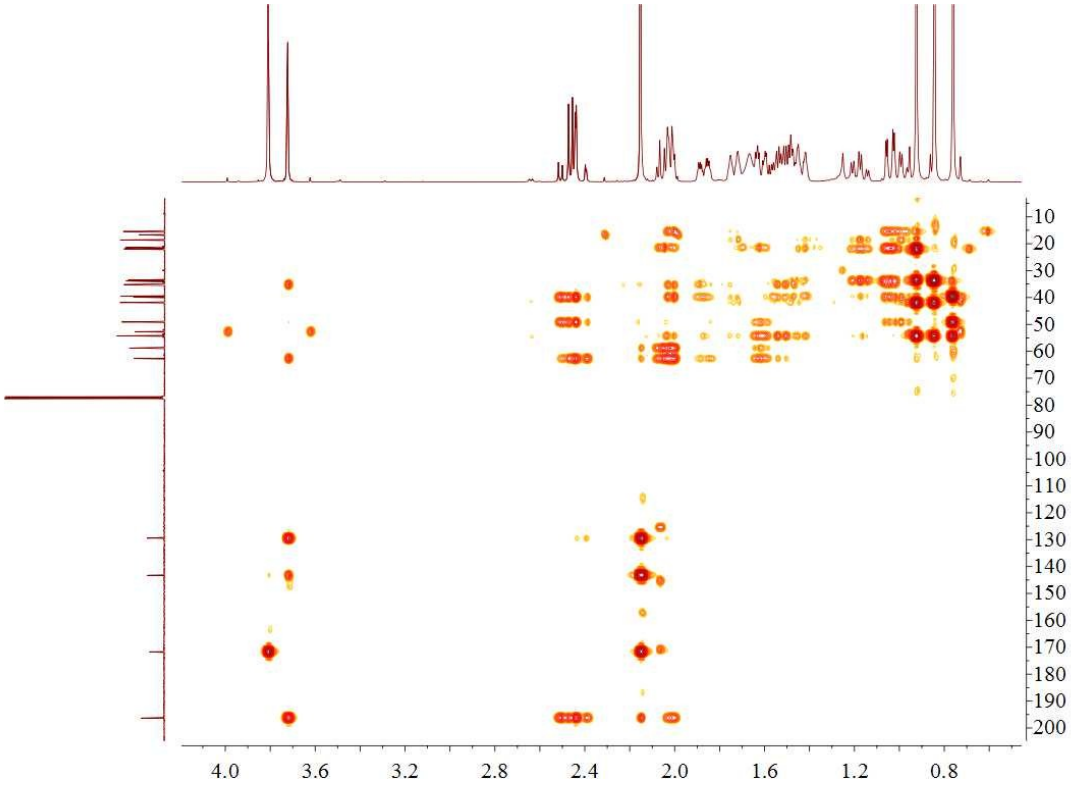


Figure S19. The HMBC spectrum of compound **2**

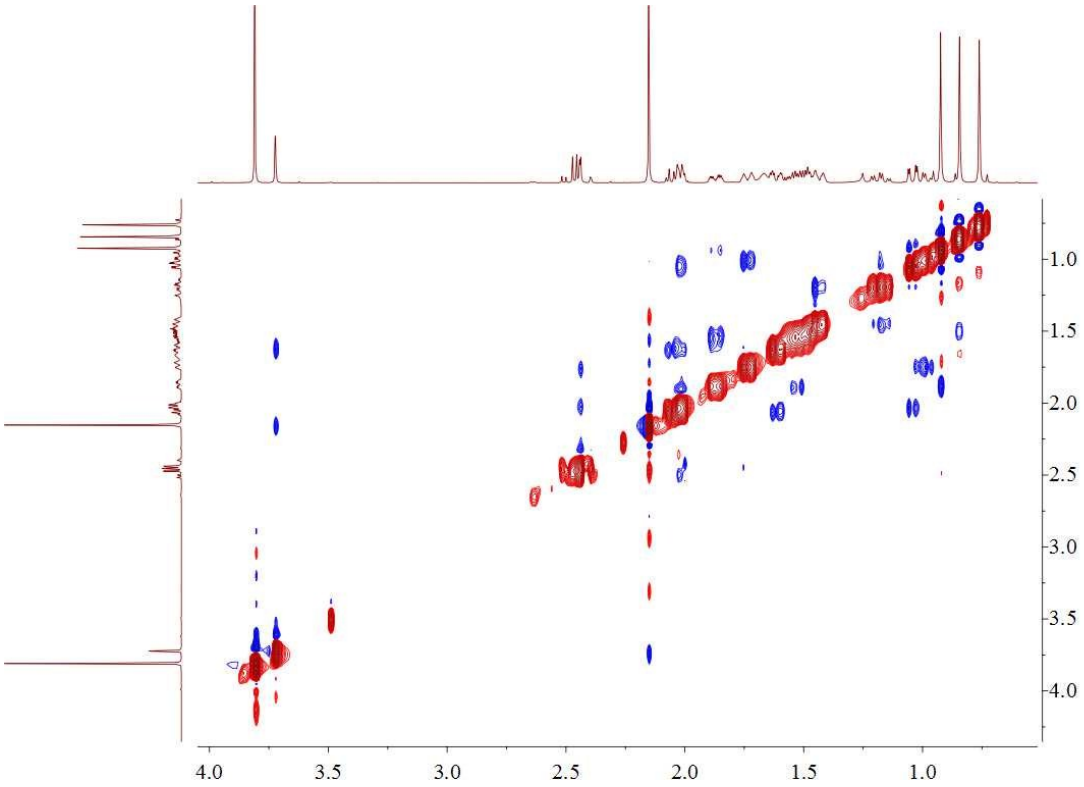


Figure S20. The NOESY spectrum of compound **2** ($CDCl_3$, 400 MHz)

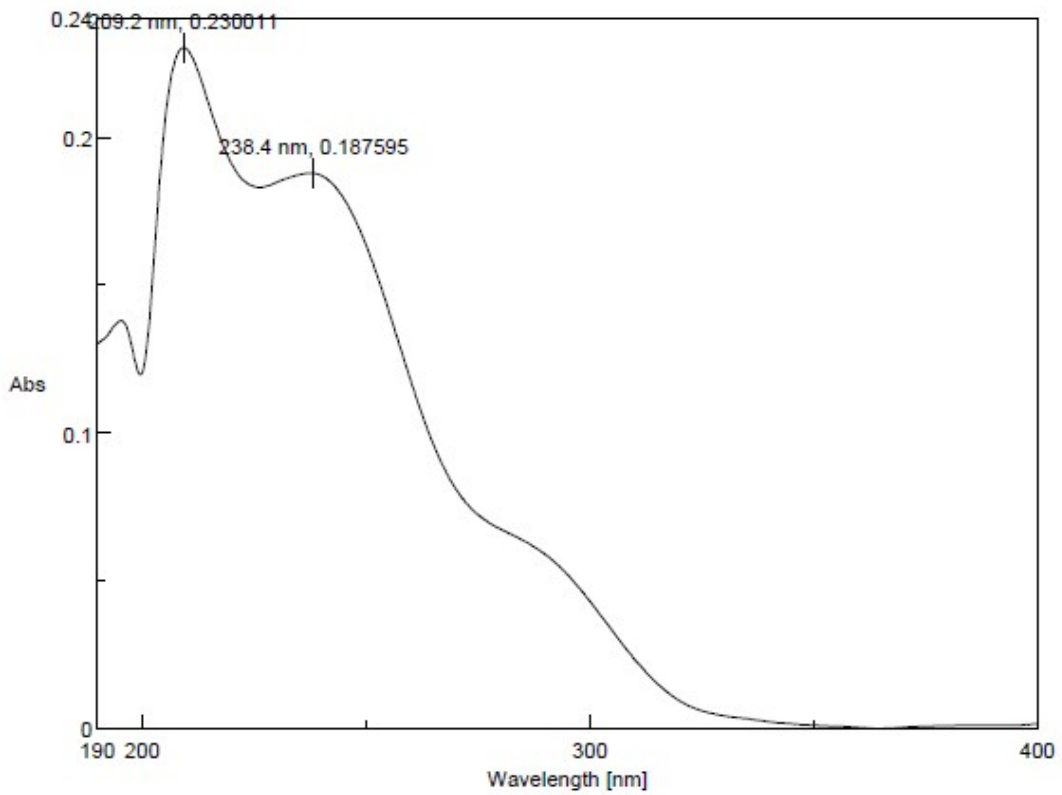


Figure S21. The UV spectrum of compound **3** in MeOH

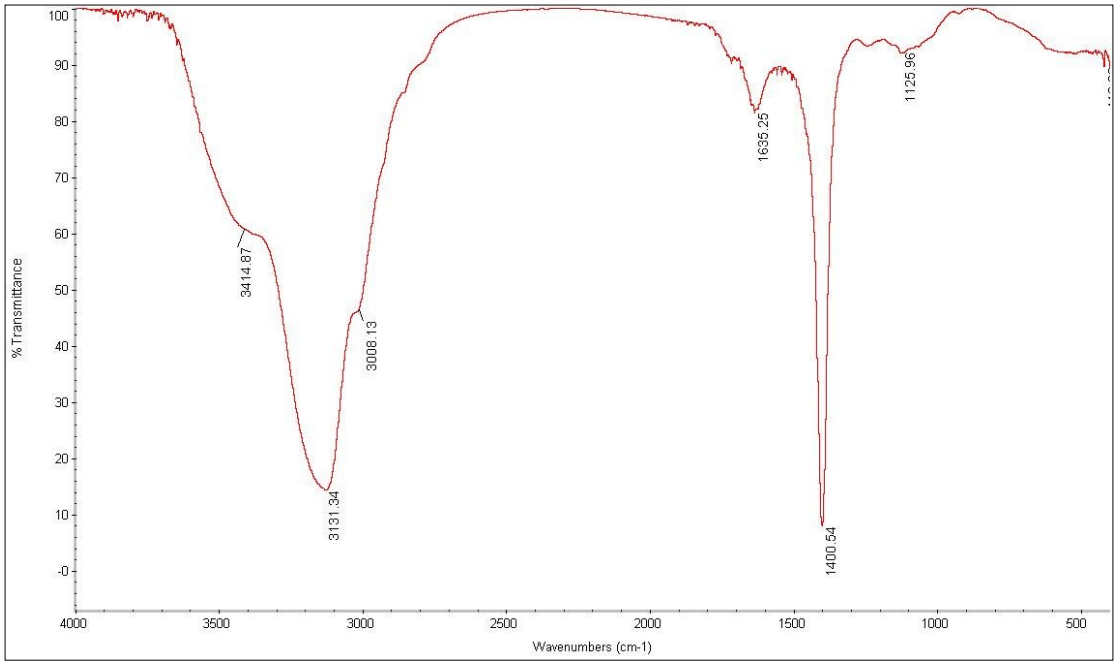
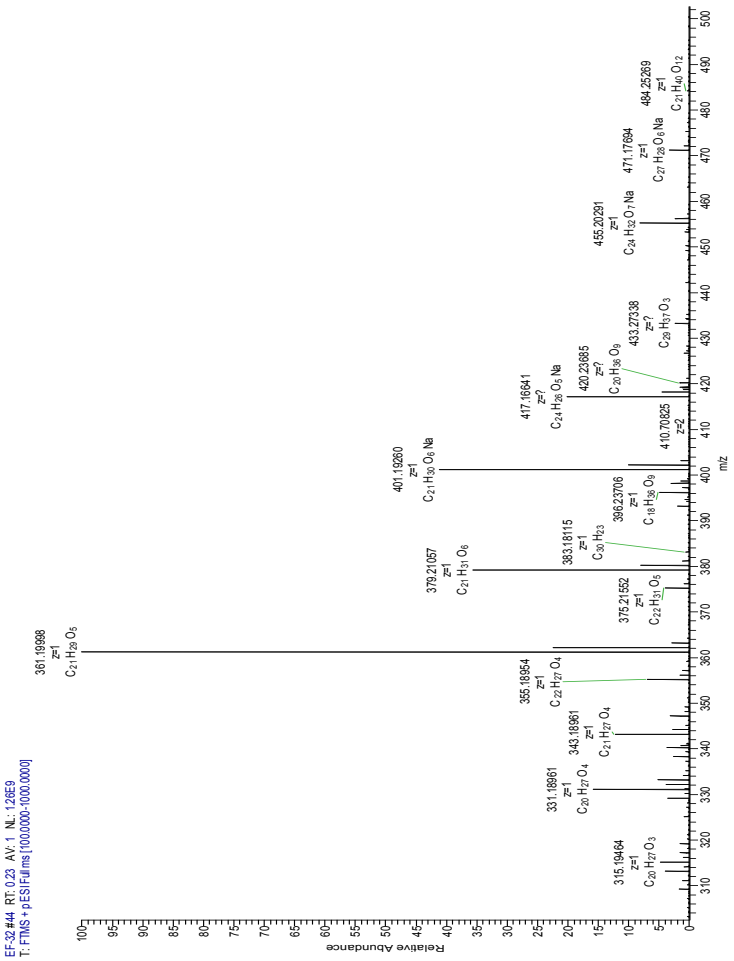


Figure S22. The IR spectrum of compound **3**



m/z	Theo. Mass	Delta (ppm)	RDB equiv.	Composition
379.21057	379.21152	-2.49	6.5	$C_{21}H_{31}O_6$
	379.20564	13.00	15.5	$C_{28}H_{27}O$
	379.19626	37.74	2.5	$C_{17}H_{31}O_9$
	379.22677	-42.72	10.5	$C_{25}H_{31}O_3$
	379.19039	53.23	11.5	$C_{24}H_{27}O_4$
	379.23264	-58.21	1.5	$C_{18}H_{35}O_8$
	379.24203	-82.96	14.5	$C_{29}H_{31}$
	379.17513	93.46	7.5	$C_{20}H_{27}O_7$
	379.24790	-98.44	5.5	$C_{22}H_{35}O_5$
	379.16926	108.95	16.5	$C_{27}H_{23}O_2$

Figure S23. The HRESIMS spectrum of compound **3**

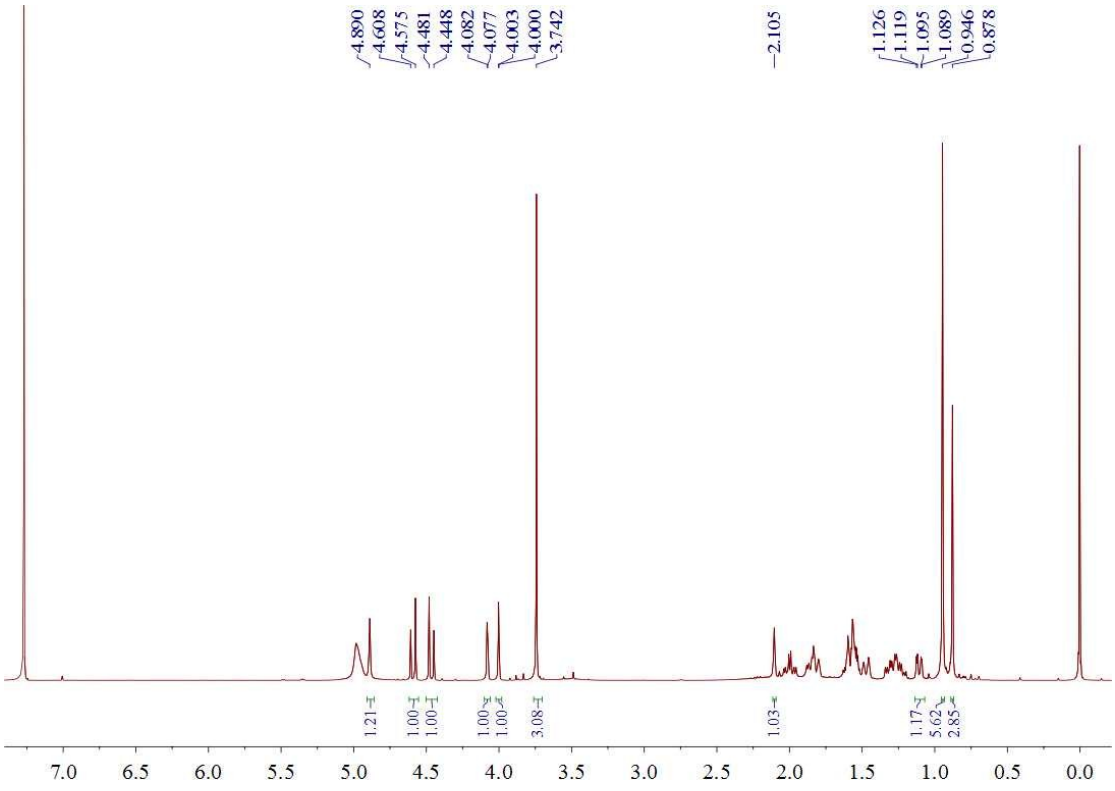


Figure S24. The ^{1}H NMR spectrum of compound **3** ($CDCl_3$, 400 MHz)

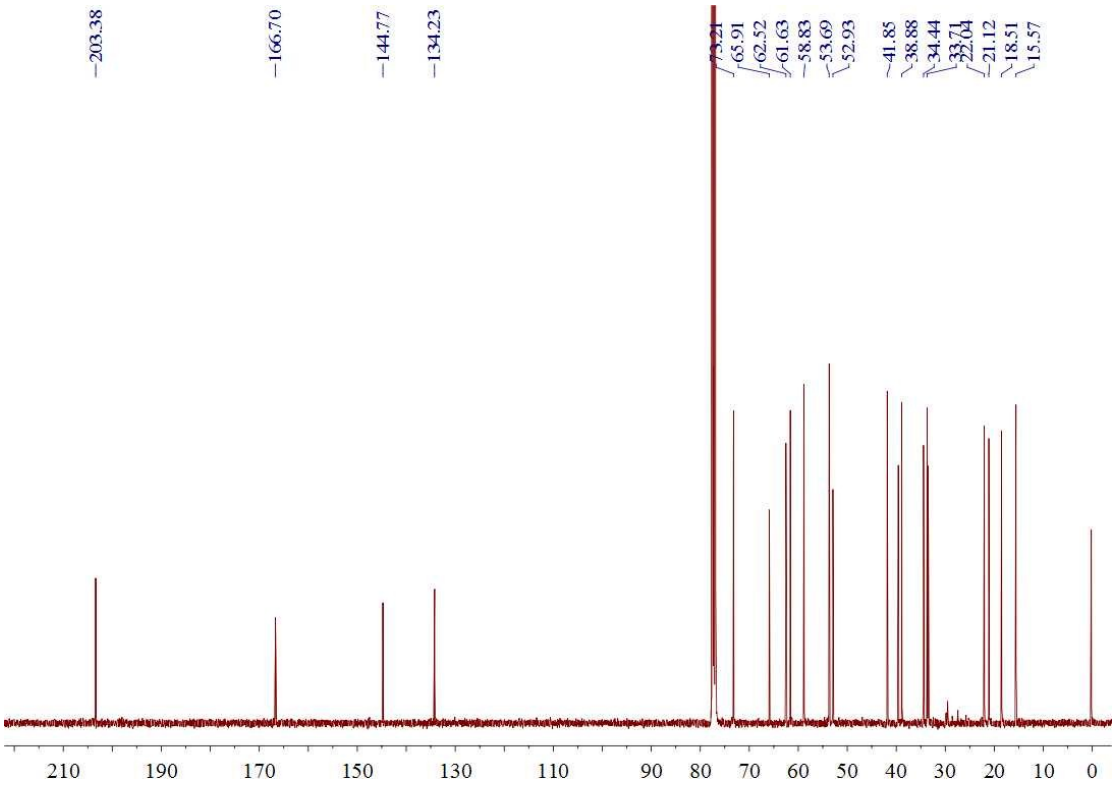


Figure S25. The ^{13}C NMR spectrum of compound **3** ($CDCl_3$, 100 MHz)

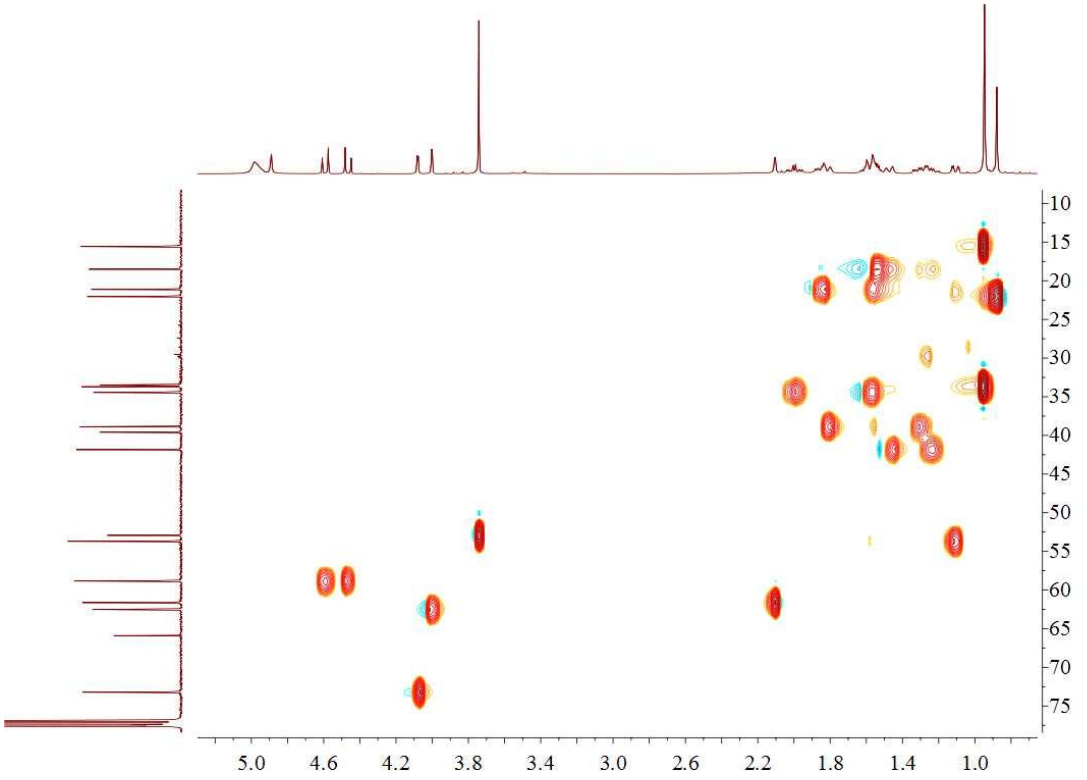


Figure S26. The HSQC spectrum of compound **3**

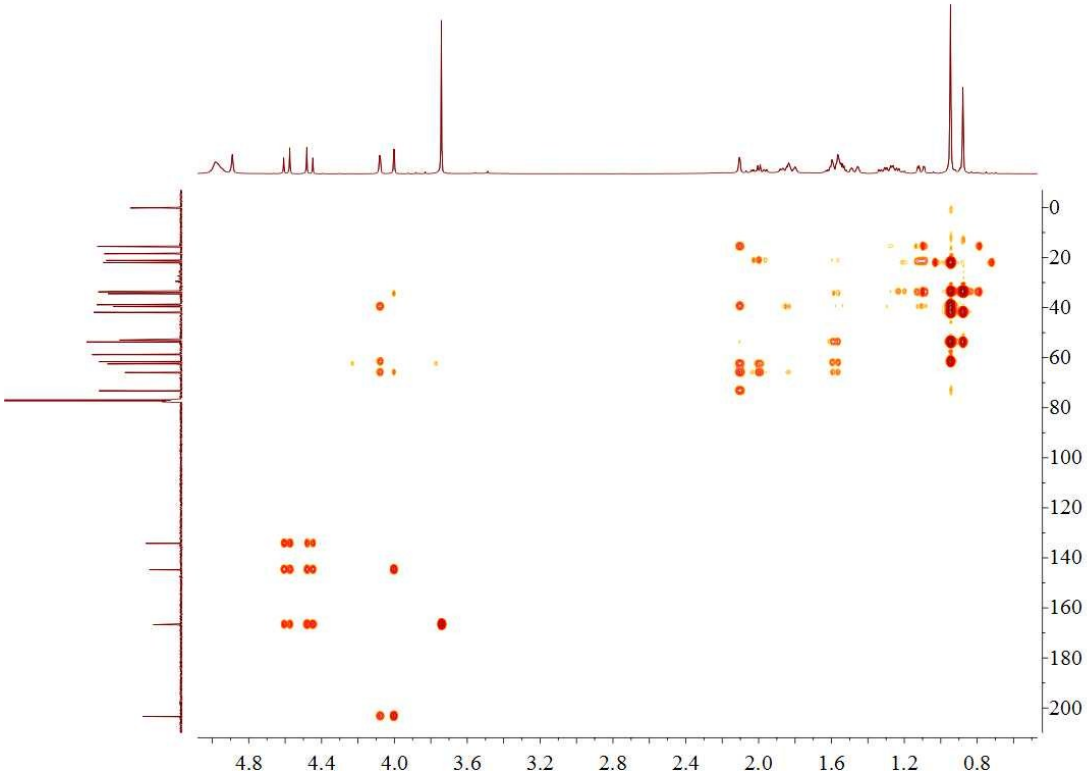


Figure S27. The HMBC spectrum of compound **3**

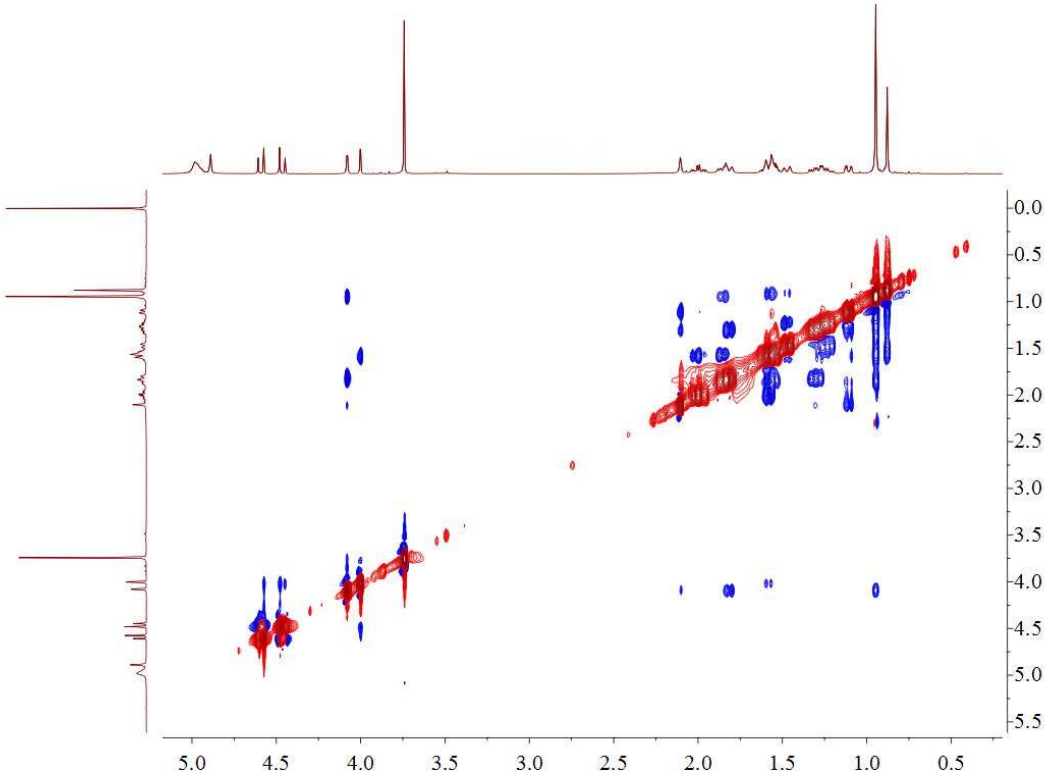


Figure S28. The NOESY spectrum of compound **3** ($CDCl_3$, 400 MHz)

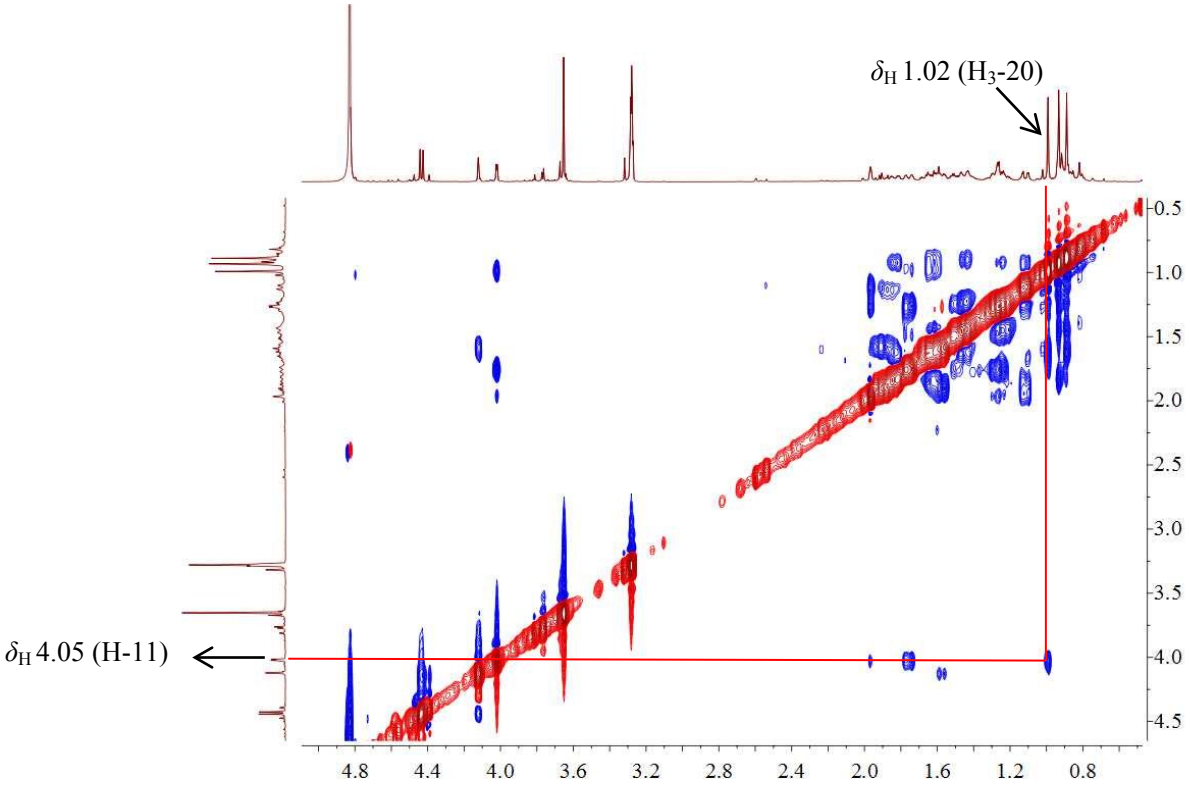


Figure S29. The NOESY spectrum of compound **3** (CD_3OD, 400 MHz)

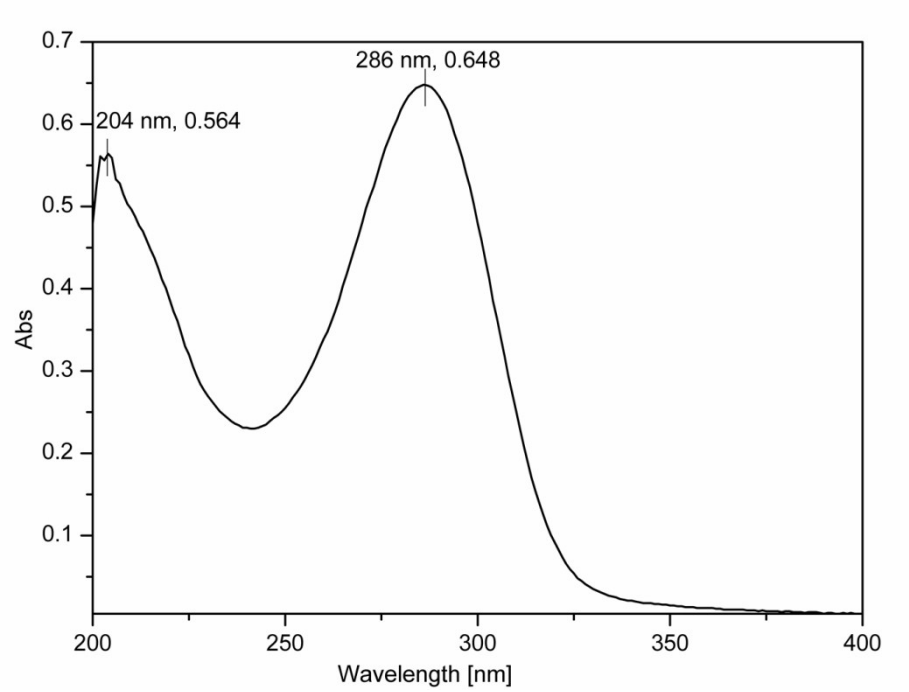


Figure S30. The UV spectrum of compound **4** in MeOH

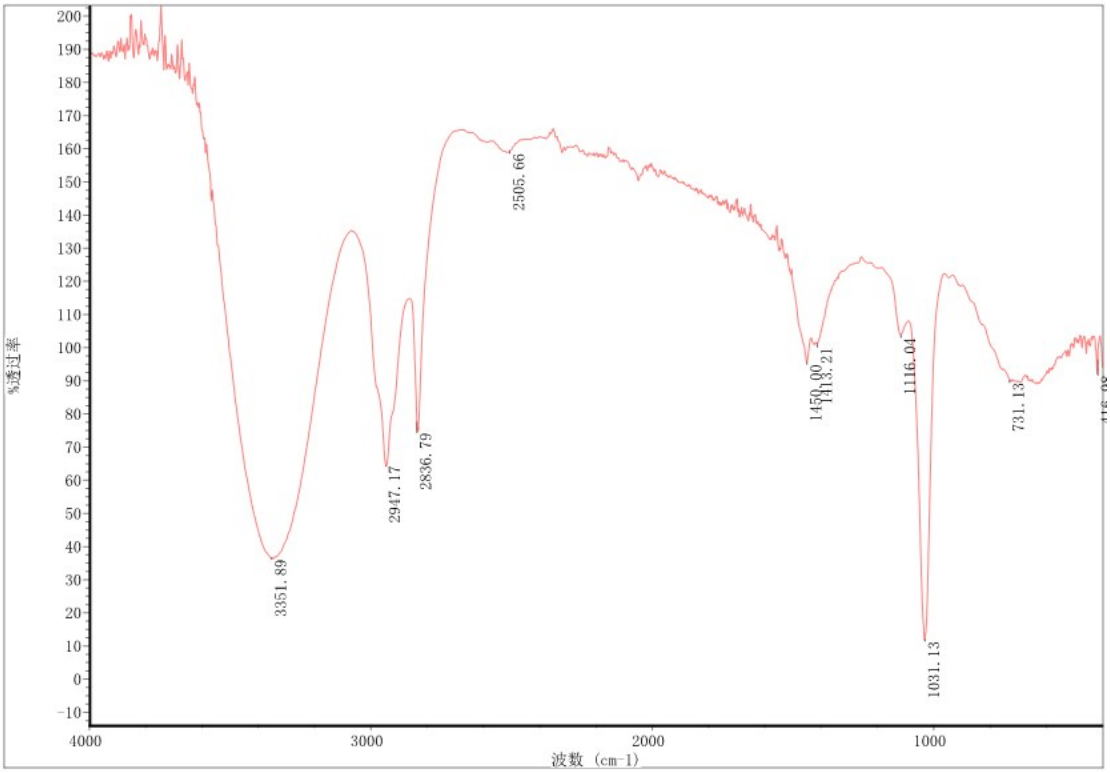
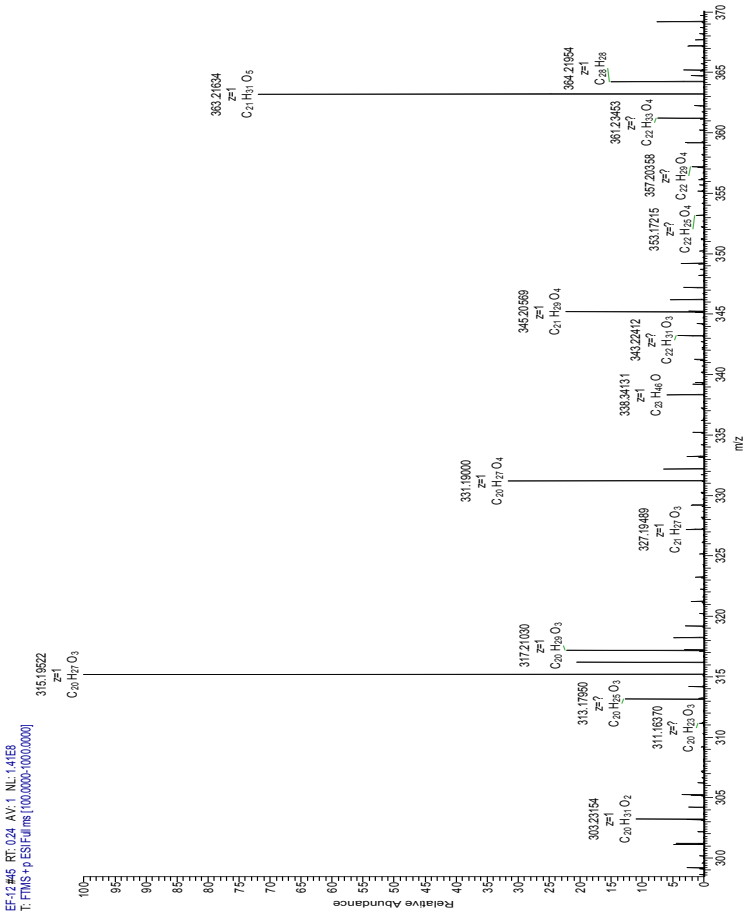


Figure S31. The IR spectrum of compound **4**



m/z	Theo. Mass	Delta (ppm)	RDB equiv.	Composition
331.19000	331.19039	-1.16	7.5	$C_{20}H_{27}O_4$
	331.17513	44.90	3.5	$C_{16}H_{27}O_7$
	331.20564	-47.23	11.5	$C_{24}H_{27}O$
	331.16926	62.63	12.5	$C_{23}H_{23}O_2$
	331.21152	-64.96	2.5	$C_{17}H_{31}O_6$
	331.15987	90.96	-0.5	$C_{12}H_{27}O_{10}$
	331.15400	108.70	8.5	$C_{19}H_{23}O_5$
	331.22677	-111.03	6.5	$C_{21}H_{31}O_3$
	331.14813	126.43	17.5	$C_{26}H_{19}$
	331.13874	154.76	4.5	$C_{15}H_{23}O_8$

Figure S32. The HRESIMS spectrum of compound **4**

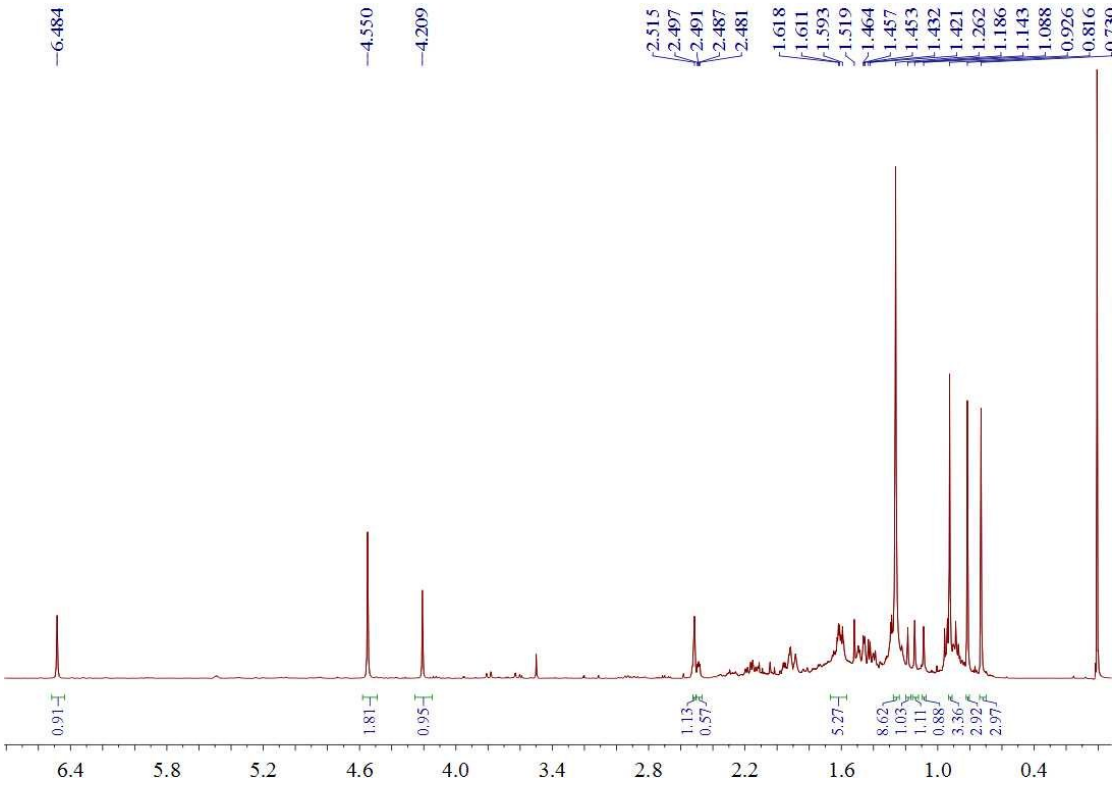


Figure S33. The ^{1}H NMR spectrum of compound **4** ($CDCl_3$, 400 MHz)

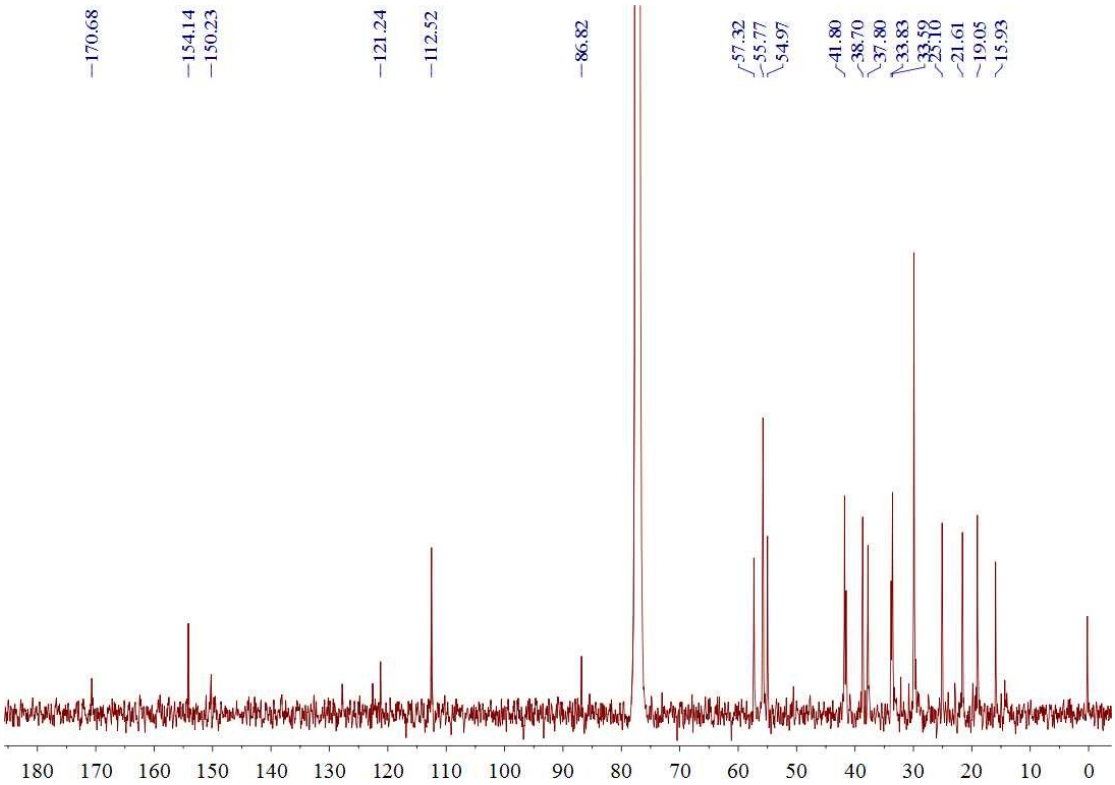


Figure S34. The ^{13}C NMR spectrum of compound **4** ($CDCl_3$, 100 MHz)

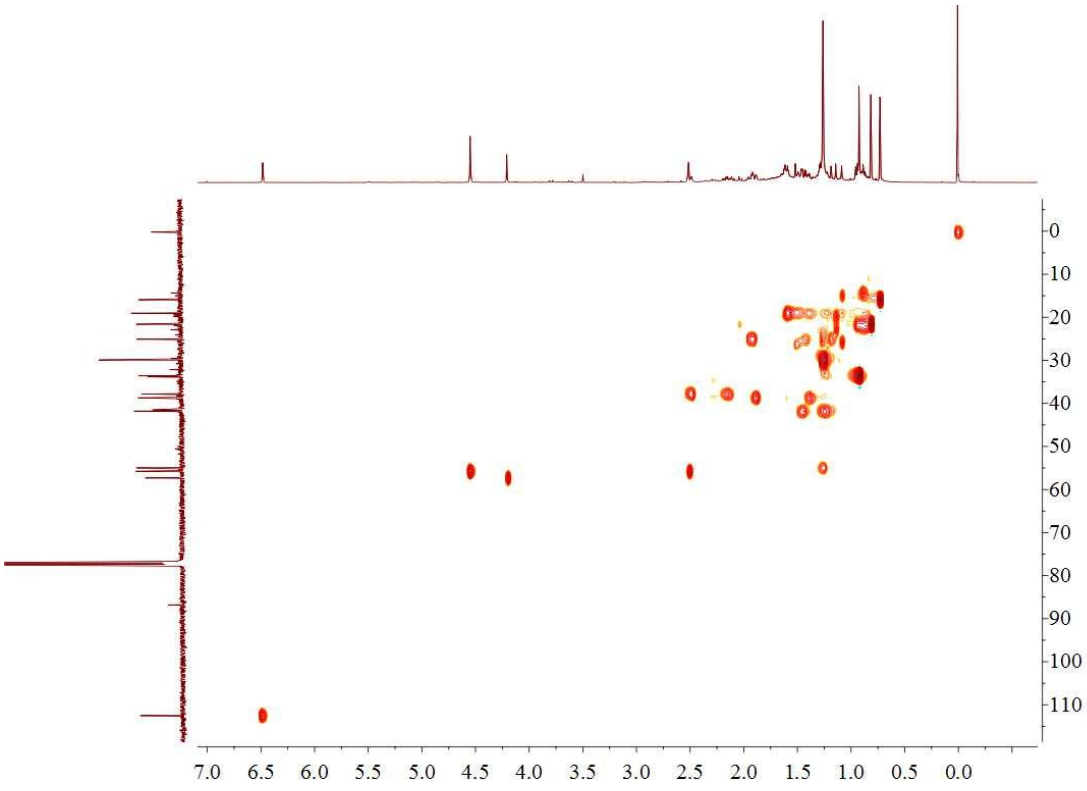


Figure S35. The HSQC spectrum of compound **4**

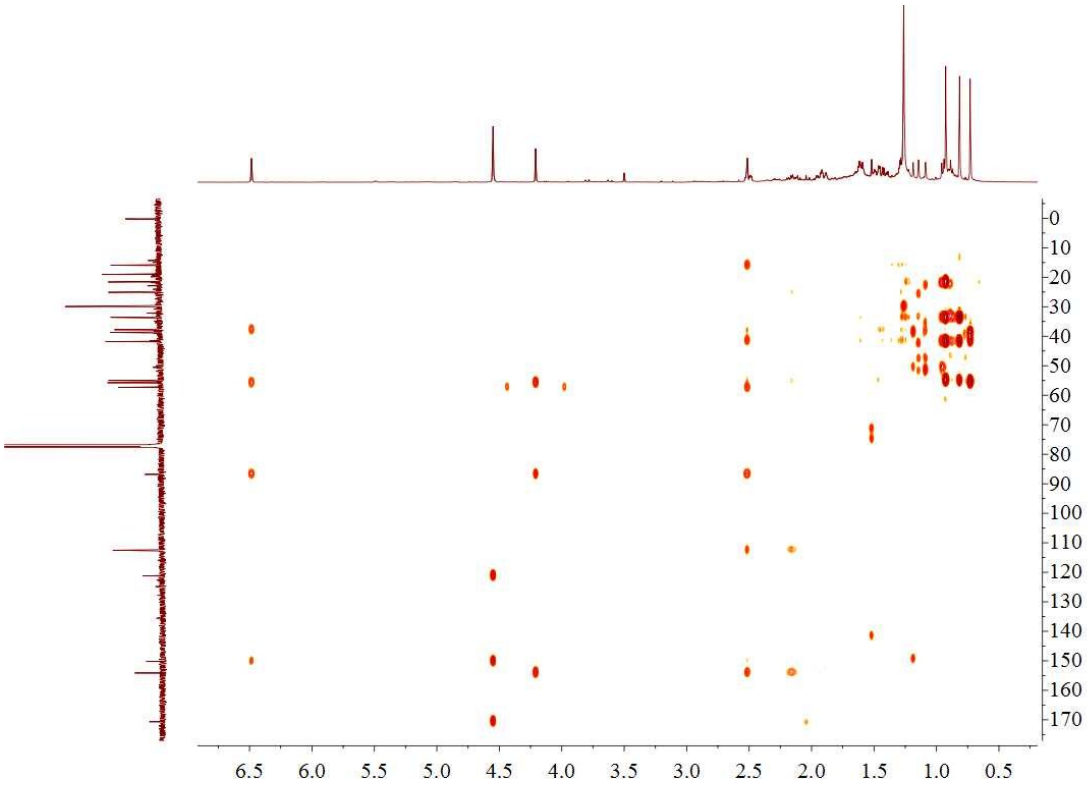


Figure S36. The HMBC spectrum of compound **4** ($CDCl_3$, 400 MHz)

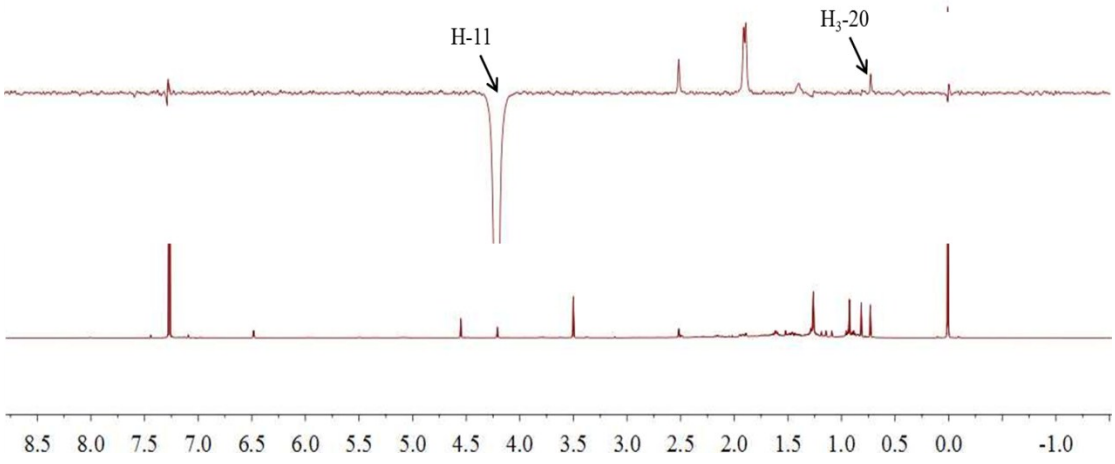


Figure S37. The NOE spectrum of compound **4** ($CDCl_3$, 600 MHz)

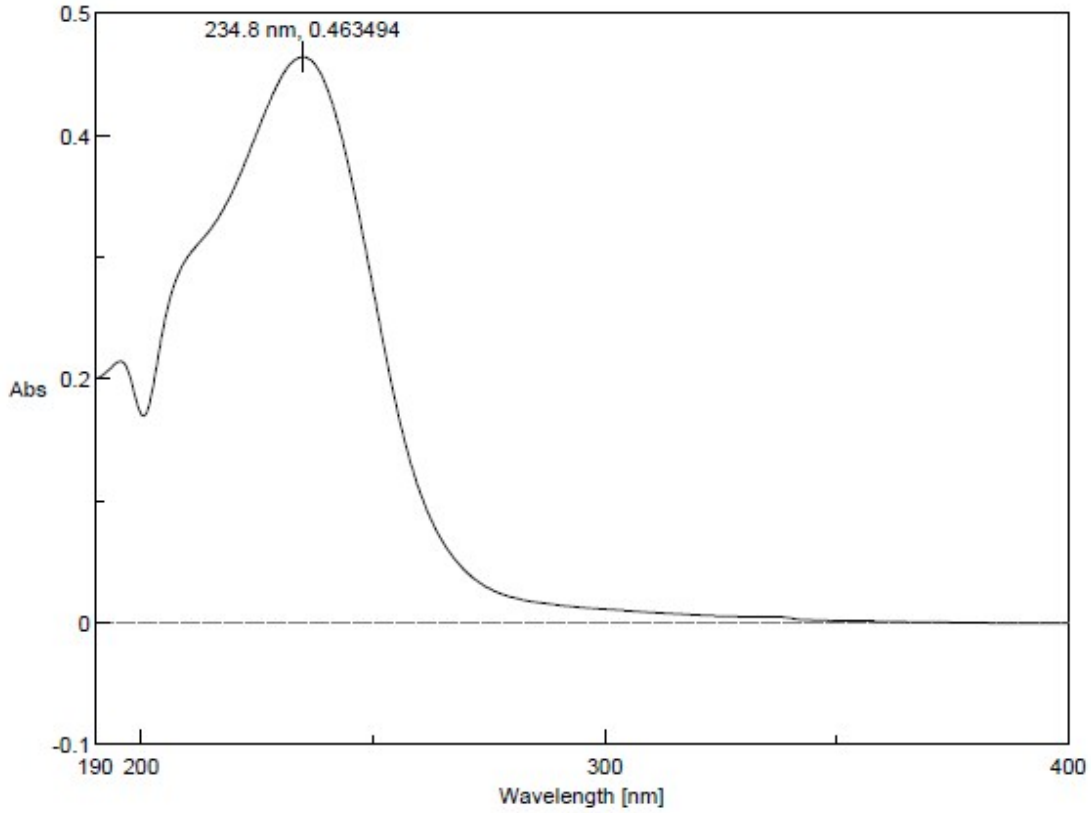


Figure S38. The UV spectrum of compound **5** in MeOH

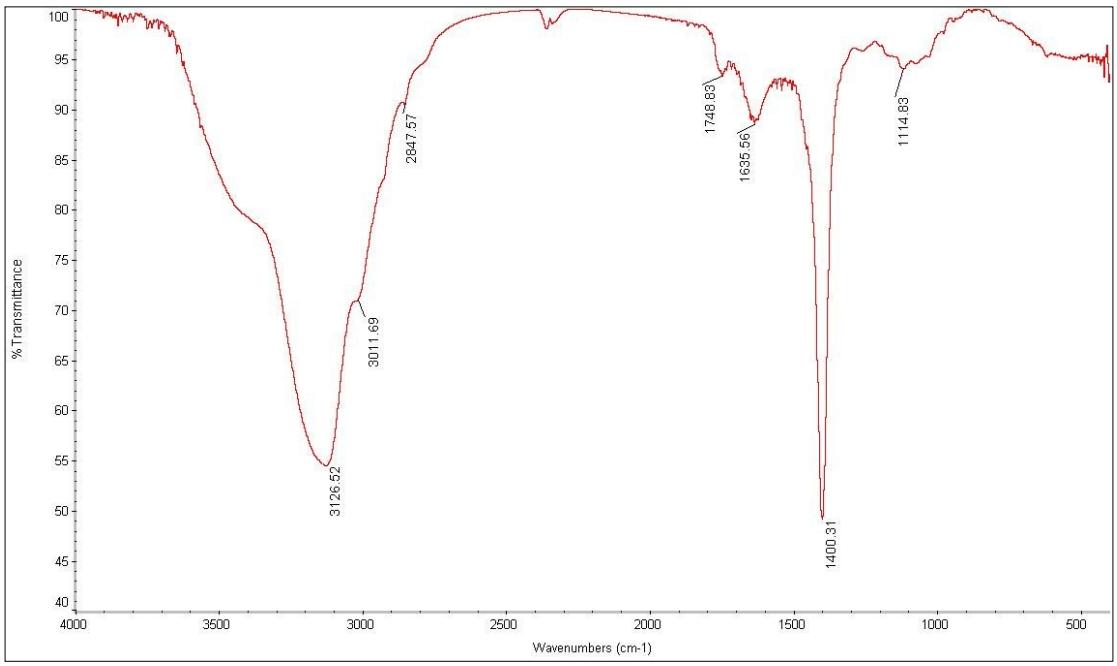
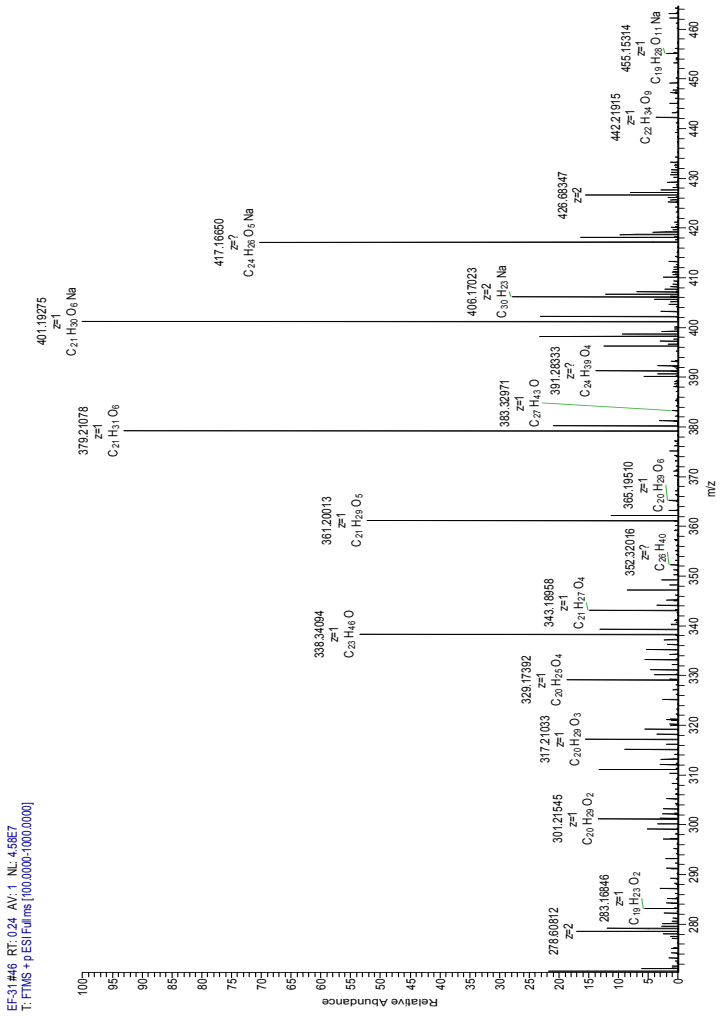


Figure S39. The IR spectrum of compound **5**



/z	Theo. Mass	Delta (ppm)	RDB equiv.	Composition
379.21078	379.21152	-1.94	6.5	$C_{21}H_{31}O_6$
	379.20564	13.55	15.5	$C_{28}H_{27}O$
	379.19626	38.29	2.5	$C_{17}H_{31}O_9$
	379.22677	-42.17	10.5	$C_{25}H_{31}O_3$
	379.19039	53.78	11.5	$C_{24}H_{27}O_4$
	379.23264	-57.66	1.5	$C_{18}H_{35}O_8$
	379.24203	-82.40	14.5	$C_{29}H_{31}$
	379.17513	94.01	7.5	$C_{20}H_{27}O_7$
	379.24790	-97.89	5.5	$C_{22}H_{35}O_5$
	379.16926	109.50	16.5	$C_{27}H_{23}O_2$

Figure S40. The HRESIMS spectrum of compound **5**

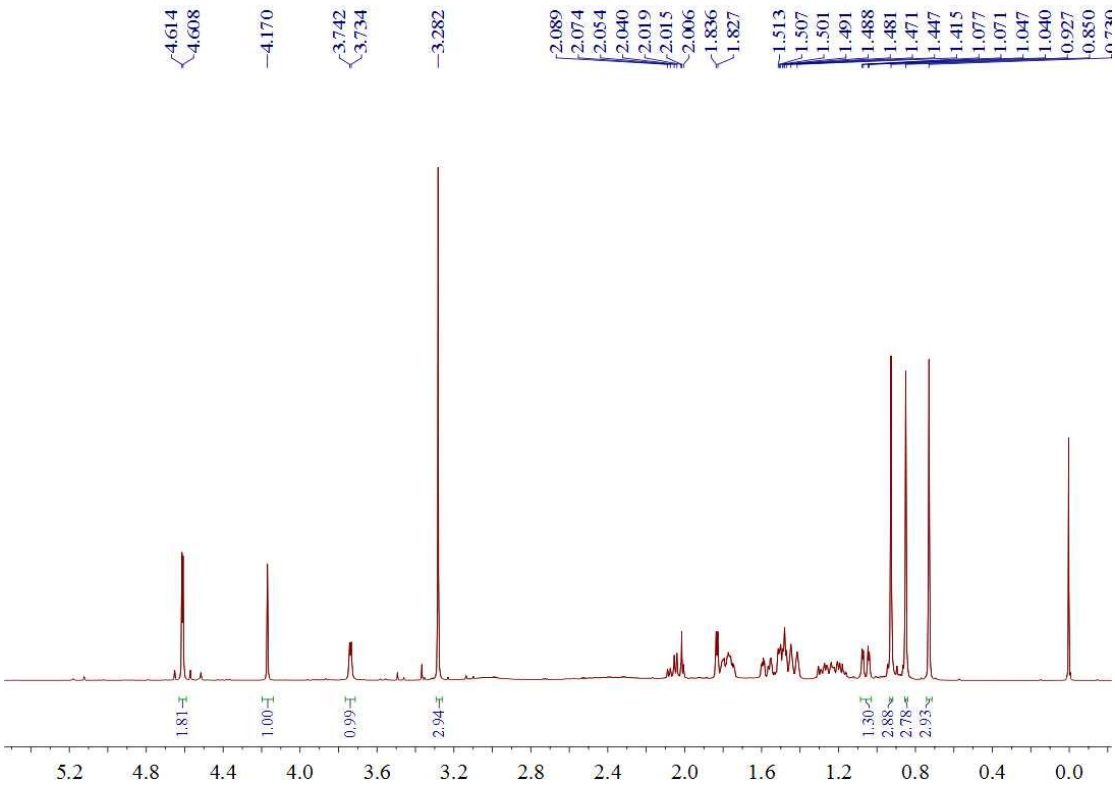


Figure S41. The ^{1}H NMR spectrum of compound **5** ($CDCl_3$, 400 MHz)

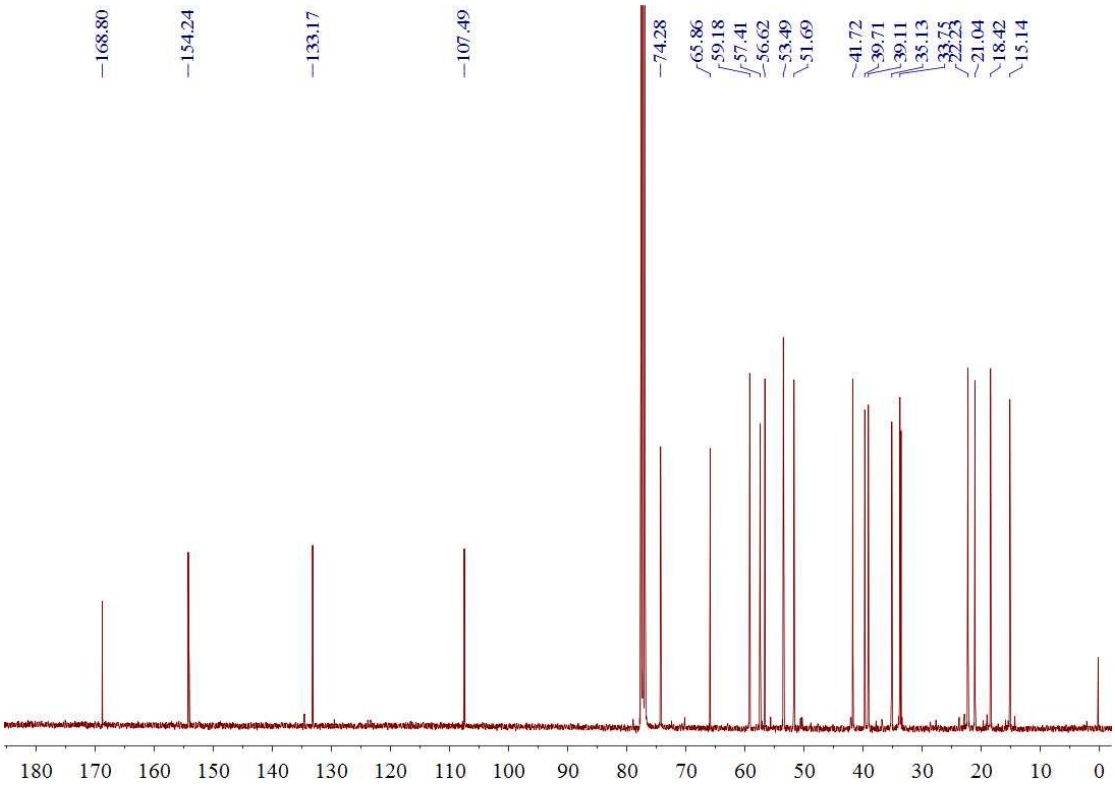


Figure S42. The ^{13}C NMR spectrum of compound **5** ($CDCl_3$, 100 MHz)

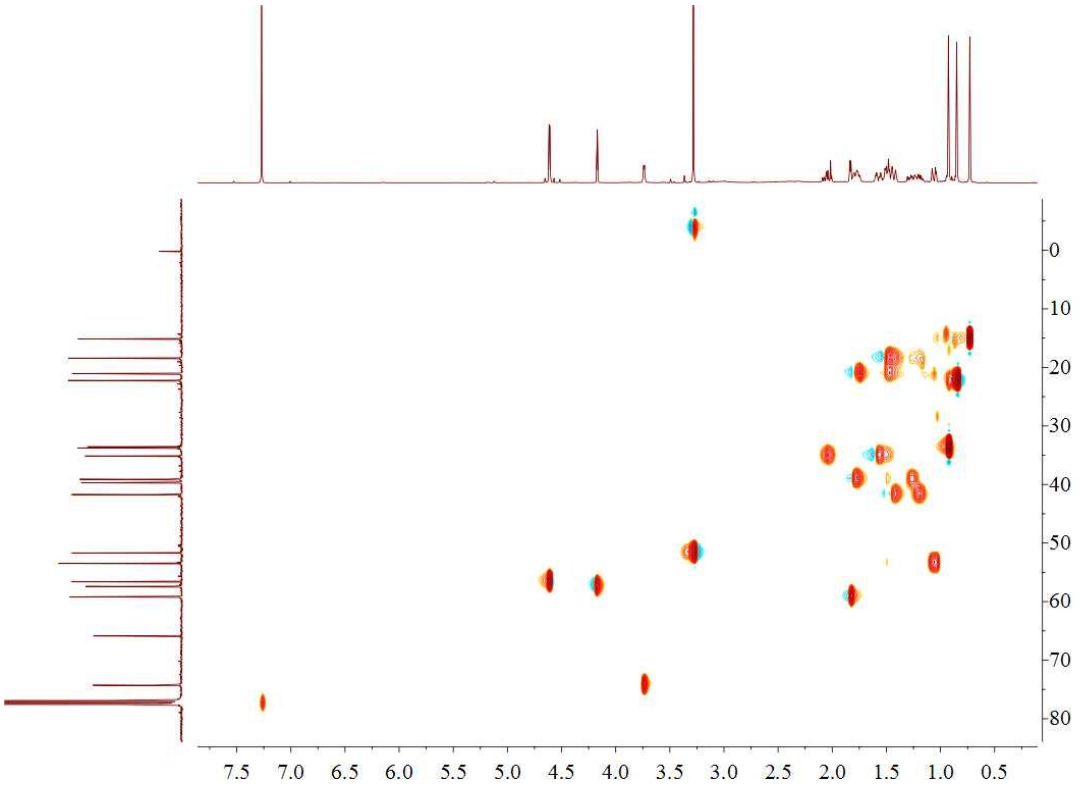


Figure S43. The HSQC spectrum of compound **5**

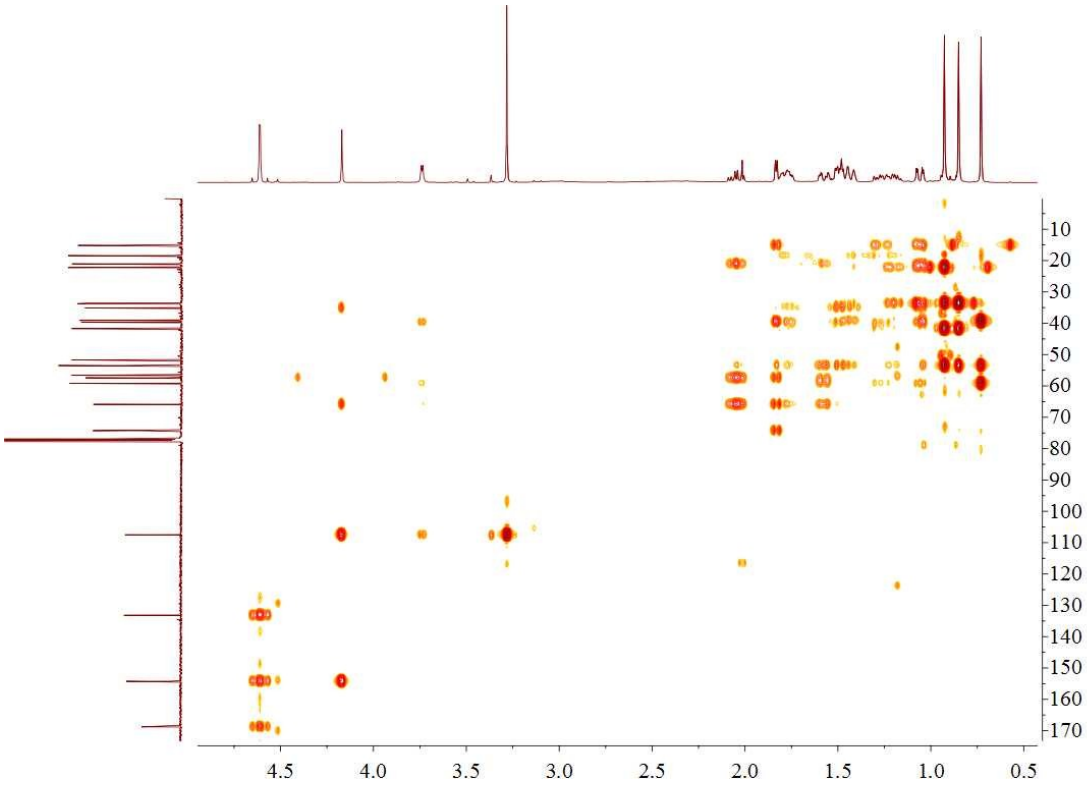


Figure S44. The HMBC spectrum of compound **5**

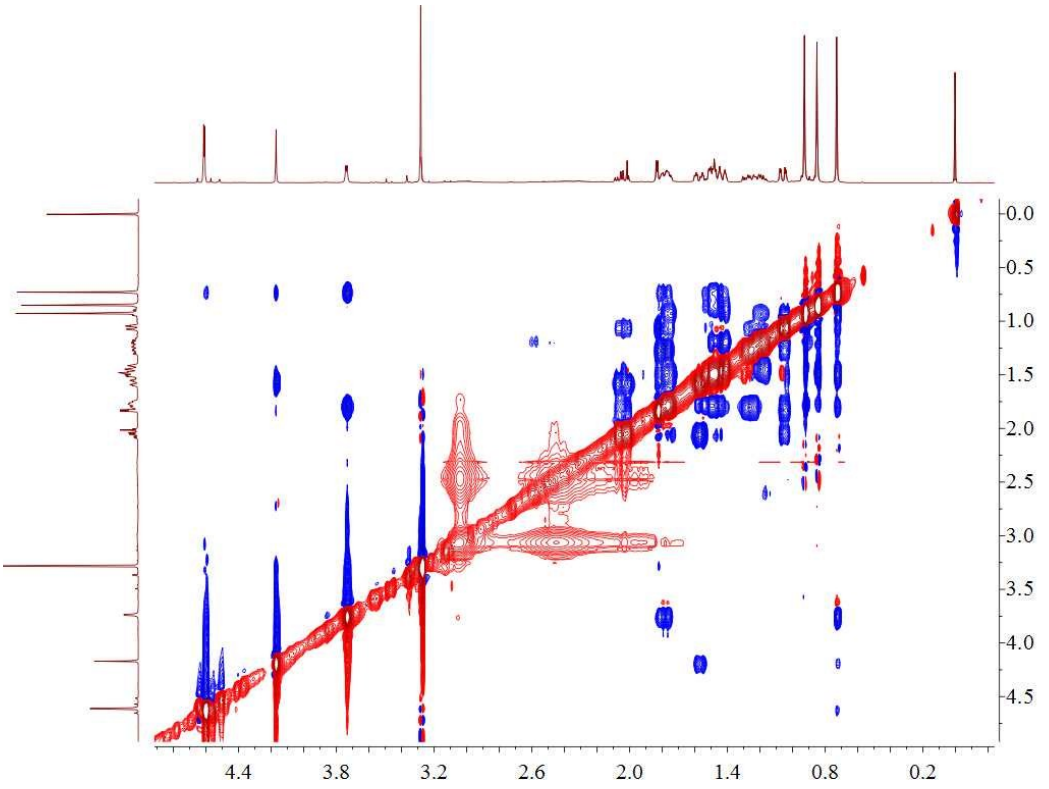


Figure S45. The NOESY spectrum of compound **5** ($CDCl_3$, 400 MHz)

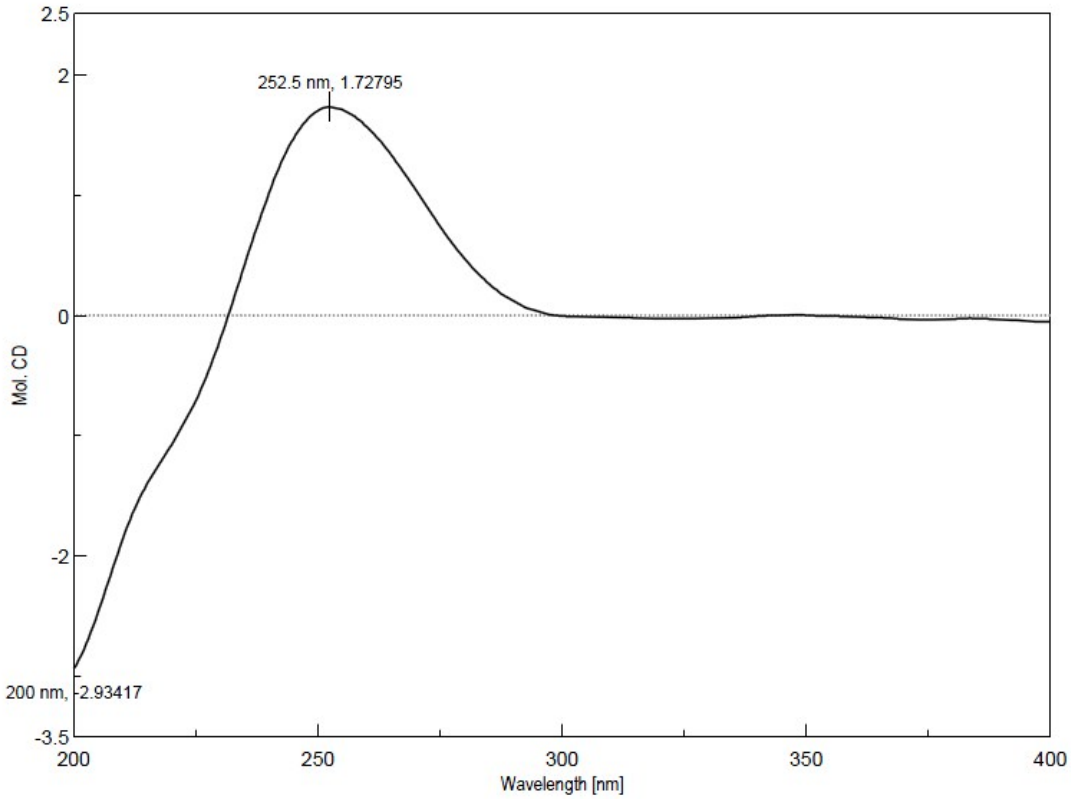


Figure S46. The ECD spectrum of compound **5** in MeOH