

Table 1. NMR Data of Compounds 1–8 (400Hz, Chloroform-d, δ in ppm, Multi J in 400 Hz)

position	Compound 1		Compound 2		Compound 3		Compound 4	
	^{13}C	^1H	^{13}C	^1H	^{13}C	^1H	^{13}C	^1H
1	115.74	5.14(m, 2H)	115.89	5.14(m, 2H)	115.84	5.14 (d, $J = 6.2$ Hz, 1H) 5.11 (s, 1H)	174.59	
2	129.63	6.54 (dd, $J = 17.0, 10.9$ Hz, 1H)	129.71	6.55 (dd, $J = 16.9, 10.9$ Hz, 1H)	129.77	6.55 (dd, $J = 17.0, 10.9$ Hz, 1H)	119.35	
3	139.37		139.54		139.49		40.04	3.18 (t, $J = 3.3$ Hz, 1H) 3.40(m, 1H)
4	47.52	2.33 (m, 2H)	47.6	2.33 (d, $J = 2.1$ Hz, 2H)	47.62	2.31 (d, $J = 11.8$ Hz, 2H)	209.33	
5	36.36		36.5		36.53		46.31	3.11 overlap
6	29.63	1.10 (s, 3H)	47.29	2.24 (dd, $J = 19.4, 16.7$ Hz, 2H)	47.2	2.31 (d, $J = 11.8$ Hz, 1H) 2.22 (d, $J = 16.7$ Hz, 1H)	45.87	2.075 (dtd, $J = 11.1, 7.5, 3.9$ Hz, 1H)
7	29.69	1.10 (s, 3H)	133.97		134.09		39.48	3.11 overlap
8	47.17	2.26 (m, 2H)	29.8	1.10 (d, $J = 3.5$ Hz, 3H)	29.81	1.09 (s, 3H)	165.76	
9	133.78		29.8	1.10 (d, $J = 3.5$ Hz, 3H)	29.74	1.10 (s, 3H)	72.35	4.72(m, 2H)
10	40.42	3.67 (td, $J = 10.9, 8.2$ Hz, 1H)	40.6	3.66 (m, 1H)	40.59	3.67 (td, $J = 10.9, 8.2$ Hz, 1H)	15.44	1.04 (d, $J = 6.3$ Hz, 3H)
11	68.54	4.30 (t, $J = 8.5$ Hz, 1H) 4.01(m, 1H)	68.64	4.30(m, 1H) 4.00 (ddd, $J = 10.2, 8.9, 0.8$ Hz, 1H)	68.72	4.31 (m, 1H) 4.00 (m, 1H)	48.92	1.82 (ddd, $J = 12.4, 7.8, 2.0$ Hz, 1H) 1.27overlap
12	177.19		177.21		177.55		41.79	1.66 (ddd, $J = 13.1, 7.9, 2.0$ Hz, 1H) 1.27overlap
13	40.08	2.89 (ddd, $J = 11.5, 6.4, 5.0$ Hz, 1H) 2.66 (dd, $J = 16.8, 5.0$ Hz, 1H)	40.26	2.90 (ddd, $J = 11.7, 6.5, 5.1$ Hz, 1H)	40.21	2.90 (ddd, $J = 11.5, 6.5, 5.0$ Hz, 1H)	39.06	
14	32.71	2.55 (dd, $J = 16.8, 6.3$ Hz, 1H)	32.8	2.68 (ddd, $J = 16.6, 5.1, 0.9$ Hz, 1H) 2.55 (m, 1H)	32.73	2.66 (m, 1H) 2.54 (dd, $J = 16.7, 6.5$ Hz, 1H)	28.91	1.04 (d, $J = 6.3$ Hz, 3H)
15	170.87		171.34		171.09		26.81	0.99 (s, 3H)
16	64.94	4.07 (m, 2H)	52.13	3.66 (s, 3H)	61.14	4.12 (m, 2H)		
17	30.74	1.58 (dq, $J = 8.6, 6.8$ Hz, 2H)			14.24	1.23 (s, 3H)		
18	19.12	1.35 (m, 2H)						
19	13.72	0.91 (t, $J = 7.4$ Hz, 3H)						

Table 1 (continued)

position	Compound 5		Compound 6		Compound 7		Compound 8	
	¹³ C	¹ H	¹³ C	¹ H	¹³ C	¹ H	¹³ C	¹ H
1	21.04	2.09 (s, 3H)	20.98	2.05 (s, 3H)	21.14	2.06 (s, 3H)	21.13	2.00 (s, 3H)
2	171.45		169.99	2.03 (s, 3H)	171.49		171.46	
3	69.7	3.78 (m, 2H)	80.99	5.43 (d, <i>J</i> = 1.2 Hz, 1H)	72.533	4.00 (d, <i>J</i> = 10.6 Hz, 1H) 3.79 (d, <i>J</i> = 10.5 Hz, 1H)	72.88	3.82 (d, <i>J</i> = 2.9 Hz, 2H)
4	42.35		41.48		23.56	0.99 (s, 3H)	40.69	
5	23.92	1.16 (s, 3H)	25.56	0.87 (s, 3H)	47.5		26.59	1.05 (s, 3H)
6	41.92	1.93 (ddd, <i>J</i> = 16.3, 5.0, 2.8 Hz, 1H) 2.15 (m, 1H)	22.3	1.00 (s, 3H)	125.94	5.11 (t, <i>J</i> = 2.2 Hz, 1H)	41.8	1.79 (m, 1H) 1.62 (m, 1H)
7	39.78	1.78 (m, 1H), 1.45 (m, 1H)	44.62	1.81 (ddd, <i>J</i> = 12.8, 8.6, 1.2 Hz, 1H) 1.75 (s, 0H)	150.11		34.15	2.63 (m, 1H)
8	138.09		44.94	3.33 (q, <i>J</i> = 8.5 Hz, 1H)	45.35	2.55 (p, <i>J</i> = 10.4, 8.8 Hz, 1H)	43.24	2.13 (ddd, <i>J</i> = 14.1, 6.3, 3.1 Hz, 1H)
9	40.62	3.26 (m, 1H)	141.53	5.81(m, 1H)	43.73	1.60 (dd, <i>J</i> = 12.8, 8.1 Hz, 2H)	40.32	1.32overlap、1.64overlap
10	35.82	2.02 (ddd, <i>J</i> = 7.1, 4.2, 2.6 Hz, 1H)	114.42	5.00(m, 2H)	52.77	1.38 (m, 1H)	39.86	2.13 (ddd, <i>J</i> = 14.1, 6.3, 3.1 Hz, 1H)
11	125.95		148.11		27.08	1.93overlap 1.80 (dd, <i>J</i> = 11.5, 3.7 Hz, 1H)	11.38	0.98 (d, <i>J</i> = 7.3 Hz, 3H)
12	69.38	4.73 (m, 2H)	132.27		35.02	0.91 (dd, <i>J</i> = 11.5, 3.7 Hz, 1H)	71.88	3.85 (d, <i>J</i> = 5.8 Hz, 1H)
13	178.81		61.72	4.64 (d, <i>J</i> = 13.0 Hz, 1H) 4.94(m, 1H)	34.11	1.93overlap	26.4	2.75 (d, <i>J</i> = 1.7 Hz, 1H) 2.67 (dd, <i>J</i> = 15.3, 5.6 Hz, 1H)
14	38.24	3.53 (m, 1H)	170.34		18.72	1.06 (d, <i>J</i> = 6.5 Hz, 3H)	120.01	
15	27.55	1.85 (ddd, <i>J</i> = 14.6, 12.8, 1.9 Hz, 1H) 2.20 (m, 1H)	20.98	2.03 (s, 3H)	74.33		129.3	
16	74.37	5.13 (t, <i>J</i> = 4.1 Hz, 1H)	36.8	3.80 (m, 1H)	22.89	1.20(s, 3H)	137.98	7.18overlap
17	169.96		32.51	2.60 (dd, <i>J</i> = 17.7, 9.3 Hz, 1H) 2.45 (dd, <i>J</i> = 17.7, 8.6 Hz, 1H)	70.55	4.06 (s, 2H)	141.99	7.18overlap
18	21.53	2.14 (s, 3H)	176.75		171.31			
19	11.36	0.93 (d, <i>J</i> = 7.0 Hz, 3H)	70.6	4.39 (t, <i>J</i> = 8.7 Hz, 1H) 4.10 (dd, <i>J</i> = 9.2, 7.6 Hz, 1H)	21.14	2.11 (s, 3H)		