Supporting Information

Dolabellane Diterpenoids from the Xisha Soft Coral Clavularia viridis

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Figure S2. ¹³C NMR spectrum of 1 (125 MHz, CDCl₃).





Figure **S3**. ¹H-¹H COSY spectrum of **1** (500 MHz, CDCl₃).

Figure S4. HSQC spectrum of 1 (500 MHz, CDCl₃).



Figure S5. HMBC spectrum of 1 (500 MHz, CDCl₃).



Figure S6. NOESY spectrum of 1 (500 MHz, CDCl₃).







Figure **S8**. HREIMS spectrum of **1**

LIST: Samp: Comm:	h150 e2a5 Finn	519-c1 e5 igan/Mars	5/70eV/P	.10000		15-	Dec-15	Elapse: Start :	03:24.4 15:50:59	16 23
Mode:	EI +	VE +LMR	BSCAN (E	XP) UP	HR NRM	63		Study :	S/N: PT200	0712-01-01
Limt: (0) .	·	5/14.	F10012	05		Inter :		
: (381) C22.H1	.00.0							
Data:	CMAS	.00 mmu	R+D:	-2.0 >	60.0					
Data.	CPINS	5 : CONVE	srieu							
		3950)		(mmu)				
Mass	s Ir	ntensity	%RA	%RIC	Delta	R+D	Compos	sition		
130.1034	2 *	/326	2.64	0.04	1.2	3.0	C9.H14	.0		
143.0862	2 *	9334	3.36	0.04	-0.2	6.5	C11 H1	1		
144.0899	9 *	6026	2.17	0.04	0.1	0.5	G.L	-		
145.1019	* 6	24578	8.85	0.15	-0.2	5.5	C11.H1	.3		
146.1074	1 *	6321	2.28	0.04	2.2	5.0	C11.H1	.4		
147.0801	7 *	4549	7 70	0.03	0.9	5.5	C10.H1	1.0		
149.0230) *	28063	10.10	0.17	1./	4.5	CII.HI	.5		
149.0956	5 *	20028	7.21	0.12	1.0	4.5	C10.H1	3.0		
149.1318	3 *	19201	6.91	0.12	1.2	3.5	C11.H1	.7		
150.1035	*	24164	8.70	0.15	0.9	4.0	C10.H1	4.0		
151.1116	*	277802	100.00	1.70	0.7	3.5	C10.H1	5.0		
153.1272	*	31963	11 51	0.20	0.8	2 5	C10 H1	7.0		
157.1015	*	12466	4.49	0.08	0.2	6.5	C12.H1	3		
158.9886	5 *	4785	1.72	0.03				-		
159.1173	*	30308	10.91	0.18	0.0	5.5	C12.H1	5		
161.0970) *	4017	1.45	0.02	-0.3	5.5	C11.H1	3.0		
162 1401	*	19378	6.98	0.12	0.3	4.5	C12.H1	7	2.	
163.1117	*	13470	4.85	0.08	0.6	4.5	C11.H1	° 5.0		
163.1490) *	19792	7.12	0.12	-0.3	3.5	C12.H1	9		
164.1181	*	4962	1.79	0.03	2.0	4.0	C11.H1	6.0		
167.1066	*	4608	1.66	0.03						
173 1335	*	7326	2.64	0.04	-2.3	6.5	C13.H1	5		
175.1124	*	10575	3.81	0.06	-0.1	5.5	C12 H1	5 0		
175.1483	*	8862	3.19	0.05	0.4	4.5	C13.H1	9		
176.1191	*	4135	1.49	0.03	1.0	5.0	C12.H1	6.0		
176.1556	*	3958	1.42	0.02	0.9	4.0	C13.H2	0		
195 1313	*	15479	5.57	0.09	-1.1	4.5	C12.H1	7.0		
187.1479	*	13647	4.91	0.04	0.7	5.5	C14.H1	9		
188.1512	*	4135	1.49	0.03	0	5.5	C+41	-		
189.1268	*	5553	2.00	0.03	1.1	5.5	C13.H1	7.0		
189.1620	*	9157	3.30	0.06	2.4	4.5	C14.H2	1		
190.1691	*	10330	2.30	0.04	0.0	4 5	012 111	0.0		
199.1514	*	4076	1.47	0.02	-2.8	4.5	C15 H1	9.0		
201.1640	*	4431	1.60	0.03	0.4	5.5	C15.H2	1		
202.1702	*	6262	2.25	0.04	2.0	5.0	C15.H2	2		
203.1435	*	4017	1.45	0.02	0.0	5.5	C14.H1	9.0		
205.1588	*	14534	5.23	0.09	0.5	4.5	C14.H2	1.0		
218,1655	*	4608	2.30	0.04	1.4	4.0	C14.H2	2.0		
220.1830	*	4312	1.55	0.03	-0.2	4.0	C15.H2	4.0		
227.1798	*	31667	11.40	0.19	0.2	6.5	C17.H2	3		
228.1850	*	4194	1.51	0.03	2.8	6.0	C17.H2	4		
245.1/30	*	5140	1.85	0.03	1.8	6.5	C17.H2	3.0		
246.1942	*	8625	3.10	0.40	-0.0	5.5	C17.H2	5.0		
255.9880	*	5199	1.87	0.03						
270.2335	*	3958	1.42	0.02	1.3	6.0	C20.H3	D		
273.2218	*	4903	1.76	0.03	0.1	5.5	C19.H2	9.0		
288.2463	*	5671	2.04	0.03	-1 0	5.0	C20 112			
		2017	4.04	0.05	-1.0	5.0	C40.13.	4.0		

Figure **S9**. ¹H NMR spectrum of **2** (500MHz, CDCl₃).



Figure S10. ¹³C NMR spectrum of 2 (125 MHz, CDCl₃).







Figure **S12**. HSQC spectrum of **2** (500 MHz, CDCl₃).







Figure **S14**. NOESY spectrum of **2** (500 MHz, CDCl₃).







Figure **S16**. HREIMS spectrum of **2**.

LIST: h1 Samp: 21	L6376-c1 L-G2f3	DE /70-11/D	10000			Elapse: Start :	02:22	2.1 10 20
Mode: EI Oper: SI Limt: (INNIGAN/MAT I +VE +LMR IMM.CAS 0) .	BSCAN (E Client:	XP) UP S/N:	HR NRM PT0012	63	Study : Inlet :	S/N:	PT200712-01-01
:(4 Peak: 10 Data: CM	137) C24.H 000.00 mmu 1ASS : conve	L00.03 R+D: erted	-2.0 >	60.0				
	128	0		(mmu)			
Mass	Intensity	%RA	%RIC	Delta	R+D	Composition		
243.1746	* 52962	4.76	0.12	0.2	6.5	C17.H23.O		
243.2105	* 139486	1 25	0.27	0.8	5.5	C18.H2/		
244.2165	* 24268	2.18	0.05	2.6	5.0	C18.H28		
245.1475	* 1998	0.18	0.00					
245.1899	* 92576	8.31	0.21	0.6	5.5	C17.H25.O		
246.1956	* 21841	1.96	0.05	2.8	5.0	C17.H26.O		
247.1658	* 1356	0.12	0.00					
247.2413	* 2069	0.19	0.00	1.3	3.5	C18 H31		
251.1797	* 4782	0.43	0.01	0.3	8.5	C19.H23		
252.1920	* 1284	0.12	0.00					
253.1955	* 355174	31.90	0.80	0.1	7.5	C19.H25		
253.2859	* 1356	0.12	0.00					
254.1900	* 3211	0.29	0.15					
255.2082	* 12491	1.12	0.03					
256.1820	* 2926	0.26	0.01	0.7	7.0	C18.H24.O		
256.2149	* 2783	0.25	0.01					
257.1886	* 13561	1.22	0.03	1.9	6.5	C18.H25.O		
258 1979	* 108493	9 74	0.25	0.8	5.5	C19.H29 C18 H26 O		
258.2333	* 25910	2.33	0.06	1.4	5.0	C19.H30		
259.1937	* 7209	0.65	0.02		5.5	01311130		
259.2075	* 8351	0.75	0.02	-1.3	5.5	C18.H27.O		
259.2396	* 3711	0.33	0.01					
260.1859	* 5565	0.59	0.01					
261.9790	* 4068	0.37	0.01					
266.2043	* 8279	0.74	0.02	-0.8	8.0	C20.H26		
267.2118	* 5567	0.50	0.01	-0.6	7.5	C20.H27		
268.2192	* 501998	45.08	1.13	-0.1	7.0	C20.H28		
269.2236	* 134832	12.11	0.30					
270.2242	* 19628	1.76	0.01					
271.2067	* 531548	47.73	1.20	-0.5	6.5	C19.H27.O		
272.2103	* 87723	7.88	0.20					
273.2137	* 8351	0.75	0.02					
284.2188	* 3640	0.33	0.01					
285.2218	* 17915	1.61	0.01	0 1	6.5	C20 H29 0		
286.2309	* 514560	46.21	1.16	-1.2	6.0	C20.H30.O		
286.2676	* 3854	0.35	0.01	-1.6	5.0	C21.H34		
287.2351	* 100356	9.01	0.23	2.4	5.5	C20.H31.O		
288.2372	* 9778	0.88	0.02					
302 2900	* 1356	0.21	0.01					
308.9723	* 1998	0.18	0.00					
311.9729	* 2141	0.19	0.00					
313.2164	* 3497	0.31	0.01	0.3	7.5	C21.H29.O2		
316.3128	* 2569	0.23	0.01	0.2	4.0	C23.H40		
323.3671	* 1427	0.13	0.00	-1.9	0.5	C23.H41		
328.2391	* 13704	1.23	0.03	1.1	7.0	C22.H32.O2		13
329.2433	* 3925	0.35	0.01					
331.2298	* 1284	0.12	0.00	-2.5	6.5	C21.H31.O3		
340.2300	- 1284	0.12	0.00	0.2	6.0	C22.H34.03		

Figure S17. ¹H NMR spectrum of **3** (500MHz, CDCl₃).



Figure S18. ¹³C NMR spectrum of 3 (125 MHz, CDCl₃).







Figure **S20**. HSQC spectrum of **3** (500 MHz, CDCl₃).



Figure **S21**. HMBC spectrum of **3** (500 MHz, CDCl₃).



Figure S22. NOESY spectrum of 3 (500 MHz, CDCl₃).







Figure **S24**. HRESIMS spectrum of **3**.



Figure S25. ¹H NMR spectrum of 4 (500MHz, CDCl₃).



Figure **S26**. ¹³C NMR spectrum of **4** (125 MHz, CDCl₃).





Figure **S27**. ¹H-¹H COSY spectrum of **4** (500 MHz, CDCl₃).



Figure **S28**. HSQC spectrum of **4** (500 MHz, CDCl₃).



Figure **S29**. HMBC spectrum of **4** (500 MHz, CDCl₃).



Figure **S30**. NOESY spectrum of **4** (500 MHz, CDCl₃).





Figure **S32**. HREIMS spectrum of **4**.

LIST: h Samp: 5	16272 F3c2a	-c1 1a		ţ		13-J	ul-16 Elapse Start	:	06:42.3	32 40
Comm: F	innig	an/MAT9	5/70eV/R	:10000						
Mode: E	EI +VE	+LMR I	BSCAN (E	XP) UP	HR NRM		Study	:	S/N: PT2007	712-0
Oper: S	SIMM.C.	AS	Client:	S/N:	PT00126	3	Inlet	:		
Limt: (0)		·							
: (397)	C22.H10	00.02							
Peak: 1	1000.0	0 mmu	R+D:	-2.0 >	60.0					
Data: C	CMASS	: conve	rted							
		20200			(mmu)					
Mass	Inte	ensity	*RA	*RIC	Delta	R+D	Composition			
177.1274	* -	L90088	13.97	0.50	0.6	4.5	C12.H17.0			
1/8.1324		24213	1.78	0.06						
183.1120		82085	0.03	0.21	1.4	C E	014 117			
185.1310	· ·	21455	10.54	0.37	1.4	0.5	C14.H1/			
180.13/3	1	31456	2.31	0.00	1 1	6 5	C12 115 0			
107.1112	* .	12699	9.29	0.20	1 2	5 5	C14 H19			
100 1537	* .	76333	5 61	0.20	2 8	5.0	C14 H20			
189 1260	*	65895	4 84	0.17	1 9	5 5	C13 H17 0			
189 1628	* *	259107	19.04	0.68	1 5	4.5	C14.H21			
190,1672	*	55457	4.07	0.14	0.000		0.000			
191.1422	*	51693	3.80	0.14	1.4	4.5	C13.H19.O			
195.1167	*	20592	1.51	0.05	0.7	8.5	C15.H15			
197.1314	*	46368	3.41	0.12	1.6	7.5	C15.H17			
199.1469	*	82227	6.04	0.21	1.8	6.5	C15.H19			
200.1553	*	32805	2.41	0.09	1.2	6.0	C15.H20			
201.1279	*	82440	6.06	0.22	0.0	6.5	C14.H17.O			
201.1648	* :	107363	7.89	0.28	-0.5	5.5	C15.H21			
202.1344	*	35006	2.57	0.09	1.4	6.0	C14.H18.O			
202.1708	*	40332	2.96	0.11	1.4	5.0	C15.H22			
203.1429	* :	369382	27.14	0.96	0.6	5.5	C14.H19.O			
204.1488	: *	76262	5.60	0.20	2.6	5.0	C14.H20.O			
205.1578	*	42178	3.10	0.11	1.5	4.5	C14.H21.O			
211.1477	*	40403	2.97	0.11	1.0	1.5	C16.H19			
213.1624		51129	4.24	0.15	1.9	6.5	C15.H21			
215.142/	2	01208	4.50	0.10	0.9	6.5	C16 H22			
215.1/84	÷.	20450	1.50	0.05	1.5	5.5	C15 H20 0			
210.1507	*	13/772	9.00	0.17	0.5	5 5	C15 H21 0			
218 1652	*	72072	5 29	0 19	1 8	5.0	C15.H22.0			
219 1731	*	24994	1 84	0.07	1.8	4.5	C15.H23.0			
225 1620	*	36924	2.71	0.10	2.3	7.5	C17.H21			
226.1715	*	20450	1.50	0.05	0.7	7.0	C17.H22			
227.1789	*	81801	6.01	0.21	1.1	6.5	C17.H23			
228.1846	; *	31456	2.31	0.08						
229.1596	5 *	72072	5.29	0.19	-0.3	6.5	C16.H21.O			
230.1654	*	23290	1.71	0.06	1.7	6.0	C16.H22.O			
241.1935	; *	42817	3.15	0.11	2.1	6.5	C18.H25			
243.1739	*	40900	3.00	0.11	1.0	6.5	C17.H23.O			
243.2114	*	20379	1.50	0.05	-0.1	5.5	C18.H27			
244.1836	5 *	24355	1.79	0.06	-0.8	6.0	C17.H24.O			
245.1900) *	63907	4.70	0.17	0.6	5.5	C17.H25.0			
253.1954	. *	33444	2.46	0.09	0.3	7.5	C19.H25			
255.2108	3 *	23290	1.71	0.06	0.4	6.5	C19.H27			
257.2245	*	51125	3.76	0.13	2.4	5.5	C19.H29			
258.0646) * 	30959	> 2.27	0.08						
258.2314	*	20805	1.53	0.05	1 7	7 6	000 1100			
268.2174		38557	2.83	0.10	1.7	7.0	C10 H28			
269.1916) * :) *	23/592	17.40	0.62	-1.1	1.5	C19.H25.U			
209.2288	, ~ . *	59704 60285	4.92	0.10	-1.9	0.0	C20.829			
270.1954	*	101115	4.43	0.10	-0 1	6 5	C19 H27 0			
284 2141	*	58794	1.43	0.20	-0.1	7.0	C20 H28 0			
285 2191	*	22793	1.67	0.06	0.1	1.0	520.1100.0			
286.2286	*	59007	4.34	0.15	1.1	6.0	C20.H30.O			
287.2040) *	20308	1.49	0.05	-2.9	6.5	C19.H27.O2			+
302.2248	3 *	20237	1.49	0.05	-0.2	6.0	C20.H30.O2			**

31 40




Figure **S34**. ¹³C NMR spectrum of **5** (125 MHz, CDCl₃).





Figure **S35**. ¹H-¹H COSY spectrum of **5** (500 MHz, CDCl₃).



Figure **S36**. HSQC spectrum of **5** (500 MHz, CDCl₃).



Figure **S37**. HMBC spectrum of **5** (500 MHz, CDCl₃).



Figure **S38**. NOESY spectrum of **5** (500 MHz, CDCl₃).





Figure **S40**. HREIMS spectrum of **5**.

LIST: h150533-c1 Samp: c2g2			31-0	ec-15	Elapse: Start :	03:46.1	17 19
Comm: Finnigan/MAT Mode: EI +VE +LMR Oper: SIMM.CAS	95/70eV/R:100 BSCAN (EXP) U Client: S/I	00 UP HR NRM N: PT00126	• 53		Study : Inlet :	S/N: PT2007	12-01-
Limt: (0) . : (381) C22.H	100.0 DID: 2 (
Data: CMASS : conv	erted -2.0	0 - 00.0					
10292 Mass Intensity	0 9 PA 9 E	(mmu)) R+D	Compos	ition		
119.0862 * 874292	16.29 1.	23 -0.1	4.5	C9.H11	101011		
120.0929 * 371092	6.91 0.	52 1.0	4.0	C9.H12			
122.1086 * 2698324	50.26 3.	78 0.9	3.0	C9.H14			
123.0807 * 318214	5.93 0.	45 0.3	3.5	C8.H11	.0		
123.1168 * 5368527	100.00 7.	53 0.6	2.5	C9.H15			
124.1196 * 487720	9.08 0.	40 0.0	5 5	C10 H1	1		
132.0932 * 128443	2.39 0.	18 0.7	5.0	C10.H1	2		
133.1012 * 1014316	18.89 1.	42 0.5	4.5	C10.H1	3		
134.1082 * 476199	8.87 0.	67 1.4	4.0	C10.H1	4		
135.0806 * 153967	2.87 0.	22 0.4	4.5	C9.H11	.0		
136.1239 * 780943	14.55 1.	09 1.3	3.0	C10.H1	6		
137.0960 * 202414	3.77 0.	28 0.6	3.5	C9.H13	.0		
137.1311 * 241053	4.49 0.	34 1.9	2.5	C10.H1	7		
145 1013 * 171514	3.19 0. 6.31 0	24 -0.2	2.5	C9.H15	.0		
146.1082 * 119995	2.24 0.	17 1.3	5.0	C11.H1	4		
147.1163 * 567067	10.56 0.	79 1.1	4.5	C11.H1	5		
148.1233 * 146345	2.73 0.	21 1.9	4.0	C11.H1	6		
149.0955 * 778816	7 04 0	53 1.1	4.5	C10.H1	3.0		
150.1043 * 1364494	25.42 1.	91 0.2	4.0	C10.H1	4.0		
151.1113 * 4056379	75.56 5.	69 0.9	3.5	C10.H1	5.0		
152.1173 * 607597	11.32 0.	85 2.8	3.0	C10.H1	6.0		
159 1171 * 325363	5.68 0.	46 0 3	2.5	C10.H1	7.0		
161.1332 * 362762	6.76 0.	51 -0.2	4.5	C12.H1	7		
163.1118 * 176418	3.29 0.	25 0.5	4.5	C11.H1	5.0		
163.1482 * 133879	2.49 0.	19 0.5	3.5	C12.H1	9		
167.1070 * 251806	4.69 0.	35 1.0	4.0	CII.HI	6.0		
173.1327 * 184985	3.45 0.	26 0.4	5.5	C13.H1	7		
175.1481 * 604111	11.25 0.	85 0.6	4.5	C13.H1	9		
176.1544 * 157453	2.93 0.	22 2.1	4.0	C13.H2	0		
177.1633 * 147409	2.75 0.	21 1.1	3.5	C12.H1 C13.H2	1.0		
187.1491 * 232250	4.33 0.	33 -0.4	5.5	C14.H1	9		
189.1652 * 595190	11.09 0.	83 -0.9	4.5	C14.H2	1		
190.1715 * 247907	4.62 0.	35 0.6	4.0	C14.H2	2		
201.1639 * 178840	3.33 0.	25 0.5	5.5	C15.H2	1		
203.1440 * 182680	3.40 . 0.	26 -0.4	5.5	C14.H1	9.0		
205.1592 * 251865	4.69 0.	35 0.0	4.5	C14.H2	1.0		
217.1949 * 161411	3.01 0.	29 1.3	4.0	C14.H2	2.0		
218.1662 * 125726	2.34 0.	18 0.9	5.0	C15.H2	2.0		
220.1821 * 127203	2.37 0.	18 0.6	4.0	C15.H2	4.0		
227.1800 * 126198	2.35 0.	18 0.0	6.5	C17.H2	3		
270.2346 * 102920	1.92 0.	14 0.1	6.0	C20.H3	0		
271.2055 * 109537	2.04 0.	15 0.7	6.5	C19.H2	7.0		
273.2214 * 426216	7.94 0.	60 0.4	5.5	C19.H2	9.0		
288 2444 * 920789	2.44 0.	18 -0.2	6.0	C20.H3	2.0		
289.2456 * 217952	4.06 0.	31 0.9	5.0	C20.113.			

Figure S41. ¹H NMR spectrum of 6 (500MHz, CDCl₃).



Figure S42. ¹³C NMR spectrum of 6 (125 MHz, CDCl₃).





Figure **S43**. ¹H-¹H COSY spectrum of **6** (500 MHz, CDCl₃).



Figure **S44**. HSQC spectrum of **6** (500 MHz, CDCl₃).



Figure S45. HMBC spectrum of 6 (500 MHz, CDCl₃).



Figure **S46**. NOESY spectrum of **6** (500 MHz, CDCl₃).



Figure S47. IR spectrum of 6.

Figure **S48**. HREIMS spectrum of **6**.

LIST: h1623 Samp: SE353	38-c1 3d2		10000		03-J	un-16	Elapse: Start :	04:03.1 10:53:40	19 19
Comm: Finni Mode: EI +V Oper: SIMM.	Igan/MAT95 /E +LMR I .CAS	SCAN (E) Client:	(P) UP S/N:	HR NRM PT00126	53		Study : Inlet :	S/N: PT200	0712-01-01
Limt: (0)								
: (397 Peak: 1000) C22.H10	R+D.	-2 0 >	60 0					
Data: CMASS	5 : conve	rted	4.0 -	00.0					
	210	0.000	0.0.7.0	(mmu)		0			
227 1904 *	2485	5KA 1 1 8	6RIC	Delta	R+D	C17 H	sition 23		
228.1814 *	426	0.20	0.00	0.5	0.5	CI /			
229.1625 *	1775	0.84	0.01						
229.1943 *	1491	0.71	0.01	1.3	5.5	C17.H	25		
229.9998 *	568	0.27	0.00						
230.1668 *	1349	0.64	0.01	0.3	6.0	C16.H	22.0		
231.1710 *	568	0.27	0.00						
231.2005 *	426	0.20	0.00						
232.1423 *	497	0.24	0.00						
236 9893 *	3692	1.76	0.03						
239.1799 *	497	0.24	0.00	0.1	7.5	C18.H	23		
240.1800 *	923	0.44	0.01						
241.9993 *	284	0.14	0.00						
243.1754 *	1988	0.95	0.01	-0.5	6.5	C17.H	23.0		
243.2088 *	4473	2.13	0.03	2.4	5.5	C18.H	27		
244.1791 *	781	0.37	0.01						
249.9754 *	923	0.44	0.01						
249.9911 *	1207	0.57	0.01						
251-1760 *	300	2.26	0.00	0 1	7 5	C19 U	25		
253.1950 *	355	0.17	0.03	0.1	1.5	C19.n.	25		
254 1939 *	710	0.34	0.00						
255.2122 *	994	0.47	0.01	-0.9	6.5	C19.H	27		
256.1995 *	497	0.24	0.00						
256.9802 *	355	0.17	0.00						
257.1931 *	497	0.24	0.00	-2.5	6.5	C18.H	25.0		
257.2260 *	3124	1.49	0.02	0.9	5.5	С19.Н	29		
258.1975 *	852	0.41	0.01	0.9	6.0	C18.H	26.0		
258.2293 *	2130	1.01	0.01						
252 9858 *	2050	0.24	0.02						
267.1824 *	497	0.24	0.00						
268.2112 *	3195	1.52	0.02						
269.9925 *	1775	0.84	0.01						
270.1992 *	568	0.27	0.00	-0.8	7.0	C19.H	26.0		
270.9777 *	994	0.47	0.01						
271.2069 *	14059	6.69	0.10	-0.8	6.5	C19.H	27.0		
271.9814 *	1207	0.57	0.01						
272.2104 *	1362	0.74	0.01						
281 0457 *	852	0.41	0.00						
284.2111 *	2201	1.05	0.02	2.9	7.0	C20.H	28.0		
285.2180 *	3621	1.72	0.03						
286.2281 *	21089	10.03	0.15	1.6	6.0	C20.H	30.0		
287.2349 *	3195	1.52	0.02	2.6	5.5	C20.H	31.0		
288.2443 *	497	0.24	0.00	1.0	5.0	C20.H	32.0		
289.2097 *	426	0.20	0.00						
291.9907 *	923	0.44	0.01						
292.8933 *	284	0.20	0.00						
296.9730 *	1633	0.78	0.01						
298.9750 *	1420	0.68	0.01						
303.2220 *	497	0.24	0.00						
304.2420 *	497	0.24	0.00	-1.8	5.0	C20.H	32.02		
308.9769 *	3408	1.62	0.02						
309.9759 *	3905	1.86	0.03						

R 10

S52



S53

Figure **S50**. ¹³C NMR spectrum of **7** (125 MHz, CDCl₃).





Figure **S51**. ¹H-¹H COSY spectrum of **7** (500 MHz, CDCl₃).



Figure **S52**. HSQC spectrum of **7** (500 MHz, CDCl₃).



Figure **S53**. HMBC spectrum of 7 (500 MHz, CDCl₃).

Figure **S54**. NOESY spectrum of **7** (500 MHz, CDCl₃).







Figure **S56**. HREIMS spectrum of **7**.

LIST: h150531-c Samp: e2a5d1	21		31-De	ec-15	Elapse: Start :	07:58.7 15:10:13	38 46
Comm: Finnigan/ Mode: EI +VE +I Oper: SIMM.CAS	/MAT95/70eV/R: LMR BSCAN (EX Client:	10000 (P) UP HR NRM S/N: PT0012	53		Study : Inlet :	S/N: PT200	712-01-01
Limt: (0)							
: (381) C2 Peak: 1000.00 Data: CMASS : C	mmu R+D: converted	-2.0 > 60.0					
	4960	(mmu))				
Mass Intens	sity %RA	%RIC Delta	R+D	Compos	ition		
162.1388 * 6	3380 3.14	0.04 2.0	4.0	C12.H1	.8		
163.0749 * 7	739 3.81	0.05	1 5	C11 H1	5.0		
163.1115 * 34	102 4 97	0.06 0.1	3.5	C12.H1	9		
164.0835 * 5	2.88	0.03					
164.1193 * 8	3625 4.25	0.05 0.8	4.0	C11.H1	6.0		
165.0918 * 23	3278 11.46	0.14	2 5	C11 H1	7.0		
166 0990 * 48	3328 23 80	0.28	5.5	C11.111	1.0		
167.1053 * 30	0427 14.98	0.18					
169.1026 * 5	5849 2.88	0.03 -0.9	7.5	C13.H1	.3		
170.1086 * 5	5021 2.47	0.03 1.0	7.0	C13.H1	.4		
171.11/4 * 14	7030 3.46	0.09 = 0.1 0.04 = 0.4	6.5	C12.H1	3.0		
173.1325 * 29	9954 14.75	0.18 0.5	5.5	C13.H1	.7		
174.1379 * 7	7030 3.46	0.04 3.0	5.0	C13.H1	.8		
175.1118 * 14	1711 7.24	0.09 0.5	5.5	C12.H1	.5.0		
175.1482 * 31	1963 15.74	0.19 0.5	4.5	C12 H1	6.0		
176.1553 *	5676 3.29	0.04 1.2	4.0	C13.H2	0		
177.1253 * 14	1415 7.10	0.08 2.7	4.5	C12.H1	.7.0		
177.1611 * 7	7562 3.72	0.04					
179.1062 * 12	2820 6.31	0.08	7 5	C14 H1	5		
185.1321 * 12	2820 6.31	0.08 0.9	6.5	C14.H1	.7		
187.1117 * 11	1520 5.67	0.07 0.6	6.5	C13.H1	5.0		
187.1474 * 19	9378 9.54	0.11 1.3	5.5	C14.H1	.9		
188.1545 * 11	1284 5.56	0.07 2.0	5.0	C14.H2	7 0		
189.12/9 * 15	3750 11 70	0.14 -0.5	4.5	C14.H2	21		
190.1704 *	7562 3.72	0.04 1.8	4.0	C14.H2	22		
191.1436 * 15	5361 7.56	0.09 0.0	4.5	C13.H1	9.0		
191.1774 *	8980 4.42	0.05 2.6	3.5	C14.H2	23		
192.1495 * 5	5494 2.71	0.03 -1.4	4.0	C15.H1	7		
199.1102 *	5317 2.62	0.03 2.0	7.5	C14.H1	5.0		
199.1485 * 9	9748 4.80	0.06 0.1	6.5	C15.H1	19		
201.1266 *	5317 2.62	0.03 1.3	6.5	C14.H1	17.0		
201.1645 * 5	9216 4.54	0.05 -0.2	5.5	C14.H1	9.0		
204.1500 *	5967 2.94	0.04 1.4	5.0	C14.H2	20.0		
205.1236 *	5849 2.88	0.03					
205.1586 * 10	0221 5.03	0.06 0.6	4.5	C14.H2	21.0		
207.0294 * 6	6439 3.17 E010 2.00	0.04					
211 1474 *	7916 3.90	0.05 1.3	7.5	C16.H1	19		
215.1424 *	8448 4.16	0.05 1.2	6.5	C15.H1	19.0		
217.1583 *	7680 3.78	0.05 0.9	5.5	C15.H2	21.0		
227.1790 *	5140 2.53	0.03 0.9	6.5	C17 H	23		
233.1536 *	4962 2.44	0.03	5.5	Q17.m			
241.1581 *	5140 2.53	0.03 1.1	7.5	C17.H2	21.0		
243.1743 *	5376 2.65	0.03 0.6	6.5	C17.H	23.0		
245.1926 *	5317 2.62	0.03 -2.0	5.5	C17.H	25.0		
273.2210 *	5612 2.76	0.03 0.8	5.5	C19.H	29.0		
288.2443 *	6262 3.08	0.04 1.0	5.0	C20.H	32.0		

Figure S57. ¹H NMR spectrum of 8 (500MHz, CDCl₃).









Figure **S59**. ¹H-¹H COSY spectrum of **8** (500 MHz, CDCl₃).



Figure **S60**. HSQC spectrum of **8** (500 MHz, CDCl₃).



Figure S61. HMBC spectrum of 8 (500 MHz, CDCl₃).



Figure S62. NOESY spectrum of 8 (500 MHz, CDCl₃).





Figure **S64**. HREIMS spectrum of **8**.

LIST: Samp:	h162 SE2h	39-c1 3+4e6				03-J	un-16	Elapse: Start :	02:19.6 11:08:23	10 20
Comm: Mode:	Finn EI +	igan/MAT9 VE +LMR I	BSCAN (E	(10000 (XP) UP 1	HR NRM			Study :	S/N: PT200	712-01-01
Oper: Limt:	SIMM (0	.CAS	Client:	S/N:	PT0012	63		Inlet :		
:	(413) C22.H10	0.03							
Peak:	1000	.00 mmu	R+D:	-2.0 >	60.0					
Data:	CMAS	S : conve	rted							
		1560			(mmu)				
Mas	ss In	ntensity	8RA	%RIC	Delta	R+D	Compos	sition		
214.170	01 *	1562	0.61	0.01	2.0	6.0	C16.H	22		
215.142	29 *	7171	2.80	0.04	0.7	6.5	C15.H	19.0		
215.181	12 *	11148	4.35	0.07	-1.2	5.5	C16.H.	23		
210.148	58 -	34/9	1.30	0.02	2.0	6.0	C15.H.	20.0		
216.184	91 *	2343	0.91	0.01	0.4	E 5	CIE M	21.0		
217 100	50 *	13040	1 96	0.08	0.7	4.5	C16 W	21.0		
217.19.	51 *	10590	4 13	0.05	1.0	5 0	C15 W	22 0		
210.10	71 *	1633	0.64	0.01	1.0	5.0	C10.11			
219 983	28 *	2130	0.83	0.01						
219.99	50 *	2272	0.89	0.01	-0.1	18.0	C17.0			
221.15	50 *	14414	5.62	0.08	-0.9	4.5	C14.H	21.02		
222.160	05 *	11219	4.38	0.07	1.5	4.0	C14.H	22.02		
223.170	* 00	1633	0.64	0.01	-0.2	3.5	C14.H	23.02		
225.166	54 *	4331	1.69	0.03	-2.0	7.5	C17.H	21		
227.178	87 *	65256	25.45	0.38	1.3	6.5	C17.H	23		
228.184	41 *	20237	7.89	0.12						
229.158	85 *	5183	2.02	0.03	0.7	6.5	C16.H	21.0		
229.193	33 *	3195	1.25	0.02	2.3	5.5	C17.H	25		
230.170	08 *	6532	2.55	0.04			100220000			
231.175	54 *	15621	6.09	0.09	-0.5	5.5	C16.H	23.0		
232.183	39 *	1988	0.78	0.01	-1.1	5.0	C16.H	24.0		
233.152	29 *	1846	0.72	0.01	1.2	5.5	C15.H	21.02		
234.159	99 *	6319	2.46	0.04	2.1	5.0	C15.H	22.02		
235.165	51 *	7810	3.05	0.05						
235.18	13 *	2911	1.14	0.02	2.6	<i>c</i> =	010 U	0.6		
241.198	54 -	2059	0.80	0.01	-2.0	6.5	C10.1	22 0		
243.1/2	30 -	17206	6 79	0.14	1.5	5.5	C10 H	23.0		
243.21	11 *	7001	3 07	0.10	1.6	6.0	C17 H	24 0		
244.10	* 60	131648	51 34	0.77	0.7	5 5	C17 H	25.0		
246 193	* 95	31669	12 35	0 19	0.7	5.5	C1 /			
247.171	10 *	2201	0.86	0.01	-1.2	5.5	C16.H	23.02		
247.203	38 *	1775	0.69	0.01	2.4	4.5	C17.H	27.0		
249.000	01 *	1775	0.69	0.01	-2.4	18.5	C18.H	.02		
253.195	59 *	6958	2.71	0.04	-0.3	7.5	C19.H	25		
257.226	51 *	2911	1.14	0.02	0.8	5.5	C19.H	29		
258.232	27 *	3976	1.55	0.02	2.1	5.0	C19.H	30		
258.983	21 *	1633	0.64	0.01						
261.186	67 *	2698	1.05	0.02	-1.3	5.5	C17.H	25.02		
261.220	07 *	3976	1.55	0.02	1.1	4.5	C18.H	29.0		
262.215	53 *	1704	0.66	0.01						
263.200	03 *	20521	8.00	0.12	0.8	4.5	C17.H	27.02		
264.202	29 *	3337	1.30	0.02	2.2	12 12				
268.21	90 *	4544	1.77	0.03	0.1	7.0	C20.H	28		
269.22	51 *	1562	0.61	0.01	1.9	6.5.	C20.H	29		
271.200	07 +	41681	10.20	0.25	-0.7	0.5	C19.H.	27.0		
206 200	0/ *	9160	3.5/	0.05	0 7	6 0	020	30.0		
200.22	14 *	50557	19.12	0.30	0.7	0.0	C20.H	30.0		
201.43.	72 *	16260	6 34	0.07	-0.4	5 5	C10 1	29 02		
304 230		7668	2 99	0.05	0.5	5.0	C20 H	32 02		
305 24	19 *	1562	0.61	0.05	0.5	5.0	-20.n			
308.97	44 *	3053	1.19	0.02						
309.978	80 *	3408	1.33	0.02						
317.990	04 *	2201	0.86	0.01						
322.25	10 *	1562	0.61	0.01	-0.2	4.0	C20.H	34.03		

-

Figure S65. ¹H NMR spectrum of 9 (500MHz, CDCl₃).



Figure **S66**. ¹³C NMR spectrum of **9** (125 MHz, CDCl₃).





Figure **S67**. ¹H-¹H COSY spectrum of **9** (500 MHz, CDCl₃).

Figure **S68**. HSQC spectrum of **9** (500 MHz, CDCl₃).




Figure **S69**. HMBC spectrum of **9** (500 MHz, CDCl₃).

Figure **S70**. NOESY spectrum of **9** (500 MHz, CDCl₃).







Figure **S72**. HREIMS spectrum of **9**.

trom, http://ol				27-5	ac-16	Flance	01-33.7	6
Samp: 21-J3b3a	TOF /70-11/1	10000				Start :	14:17:28	11
Mode: EI +VE +LMR	BSCAN (E	XP) UP	HR NRM			Study :	S/N: PT2007	/12-01-01
Oper: SIMM.CAS Limt: (0) .	Client:	S/N:	PT00126	3		Inlet :		
: (397) C22.	H100.02	-2.0 >	60.0					
Data: CMASS : con	verted							
41	00		(mmu)	-				
Mass Intensit 148,1236 * 1253	6 7.49	%RIC 0.16	Delta 1.6	R+D 4.0	Compo C11.H	sition 16		
149.0236 * 448	7 2.68	0.06	-0.4	4.5	C10.H	13.0		
149.1332 * 1260	8 7.54	0.16	-0.2	3.5	C11.H	17		
150.1044 * 3696 151.1122 * 4516	9 22.09 1 26.99	0.48	0.0	3.5	C10.H	15.0		
152.1173 * 619	7 3.70	0.08	2.8	3.0	C10.H	16.0		
159.1174 * 3013	1 18.01	0.39	0.0	5.5	C12.H	15		
160.1241 * 961 161.0970 * 940	6 5.75 2 5.62	0.13	-0.4	5.0	C12.H	13.0		
161.1325 * 2179	7 13.03	0.28	0.5	4.5	C12.H	17		
163.1120 * 2243	8 13.41	0.29	0.3	4.5	C11.H	15.0		
163.1477 * 812 164.1189 * 455	0 4.85 8 2.72	0.11	1.2	4.0	C12.H C11.H	16.0		
165.0904 * 740	8 4.43	0.10	1.2	4.5	C10.H	13.02		
168.1115 * 947	3 5.66	0.12	0.0					
171.1163 * 918 173.1319 * 1616	8 5.49 9 9.66	0.12	1.0	5.5	C13.H	15		
174.1391 * 434	5 2.60	0.06	1.8	5.0	C13.H	18		
175.1490 * 2030	1 12.13	0.27	-0.3	4.5	C13.H	19		
176.1198 * 448 176.1526 * 505	7 2.68	0.06	0.4	5.0	C12.H	16.0		
177.1275 * 2592	8 15.50	0.34	0.4	4.5	C12.H	17.0		
185.1332 * 1681	0 10.05	0.22	-0.1	6.5	C14.H	17		
187.1483 * 2201 188.1561 * 598	0 13.15 3 3.58	0.29	0.3	5.5	C14.H	19		
189.1280 * 747	9 4.47	0.10	0.0	5.5	C13.H	17.0		
190.1708 * 847	6 5.07	0.11	1.3	4.0	C14.H	22		
199.1499 * 861 201.1649 * 847	9 5.15 6 5.07	0.11	-1.2	6.5	C15.H C15.H	19 21		
203.1457 * 3041	6 18.18	0.40	-2.1	5.5	C14.H	19.0		
205.1607 * 719	4 4.30	0.09	-1.5	4.5	C14.H	21.0		
213.1644 * 612 215.1804 * 448	5 3.66 7 2.68	0.08	-0.1	6.5	C16.H	21 23		
217.1591 * 1275	0 7.62	0.17	0.2	5.5	C15.H	21.0		
225.1644 * 413	1 2.47	0.05	0.0	7.5	C17.H	21		
227.1795 * 726 228.1864 * 598	5 4.34 3 3.58	0.09	0.5	6.5	C17.H	23		
231.1749 * 1417	5 8.47	0.19	0.0	5.5	C16.H	23.0		
243.2102 * 712	3 4.26	0.09	1.1	5.5	C18.H	27		
245.1911 * 1353 246.1990 * 655	4 8.09 3 3.92	0.18	-0.6	5.5	C17.H C17.H	25.0		
253.1963 * 690	9 4.13	0.09	-0.7	7.5	C19.H	25		
268.2196 * 655	3 3.92	0.09	-0.5	7.0	C20.H	28		
271.2070 • 1239 286.2309 • 1232	7.41 7.36	0.16	-0.9	6.5	C19.H C20.H	27.0		
304.2401 * 413	1 2.47	0.05	0.1	5.0	C20.H	32.02		



Figure **S73**. ¹H NMR spectrum of **10** (500MHz, CDCl₃).

Figure S74. ¹³C NMR spectrum of 10 (125 MHz, CDCl₃).





Figure S75. ¹H-¹H COSY spectrum of **10** (500 MHz, CDCl₃).



Figure S76. HSQC spectrum of 10 (500 MHz, CDCl₃).



Figure S77. HMBC spectrum of 10 (500 MHz, CDCl₃).



Figure **S78**. NOESY spectrum of **10** (500 MHz, CDCl₃).



Figure **S79**. IR spectrum of **10**.

Figure **S80**. HREIMS spectrum of **10**.

LIST: h150532-c1 Samp: c2g3			31-D	ec-15	Elapse: Start :	05:27.5 15:39:04	26 34
Comm: Finnigan/MAT Mode: EI +VE +LMR Oper: SIMM.CAS	95/70eV/R:10000 BSCAN (EXP) UP Client: S/N:	HR NRM PT00126	53		Study : Inlet :	S/N: PT20	0712-01-01
: (381) C22.H Peak: 1000.00 mmu	100.0 R+D: -2.0 >	60.0					
Data: CMASS : conv	erted						
1559	0	(mmu))				
Mass Intensity	%RA %RIC	Delta	R+D	Compos	sition		
149.0230 * 201/3	25 90 0.12	1 2	4 5	C10 H	13.0		
149 1316 * 85609	10.48 0.40	1.4	3.5	C11.H	17		
150.1035 * 211335	25.88 0.98	1.0	4.0	C10.H	14.0		
151.0755 * 18256	2.24 0.08						
151.1112 * 816687	100.00 3.78	1.1	3.5	C10.H	15.0		
152.1167 * 116568	14.27 0.54					3 I.	
153.0913 * 18315	2.24 0.08	1 5	0.5	010 11			
153.1265 * 41061	5.03 0.19	1.5	4.5	C10.H.	17.0		
150 1100 * 99700	10.97 0.41	-0.6	5.5	C12 H	15		
160 1226 * 24459	2.99 0.11	2.6	5.0	C12.H	16		
161.0959 * 41002	5.02 0.19	0.7	5.5	C11.H	13.0		
161.1326 * 119167	14.59 0.55	0.5	4.5	C12.H	17		
162.1387 * 30486	3.73 0.14	2.2	4.0	C12.H	18		
163.1120 * 60204	7.37 0.28	0.3	4.5	C11.H	15.0		
163.1477 * 26468	3.24 0.12	1.0	3.5	C12.H	19		
166 0000 * 45402	2.94 0.11	0.9	4.0	CII.H.	10.0		
165 1265 * 34326	4 20 0.21	1.4	3.5	C11.H	17.0		
166.0984 * 27354	3.35 0.13		5.5	ozz in			
167.1071 * 56954	6.97 0.26						
171.1182 * 31845	3.90 0.15	-0.8	6.5	C13.H	15		
173.1334 * 61445	7.52 0.28	-0.4	5.5	C13.H	17		
174.1390 * 25346	3.10 0.12	1.9	5.0	C13.H	18		
175.1117 * 34031	4.17 0.10	0.0	0.0	C12.H.	19.0		
176 1554 * 28477	3 49 0.13	1.1	4.0	C13.H	20		
177.1279 * 54709	6.70 0.25	0.1	4.5	C12.H	17.0		
177.1641 * 39230	4.80 0.18	0.2	3.5	C13.H	21		
178.1339 * 17074	2.09 0.08	1.9	4.0	C12.H	18.0		
179.1076 * 16897	2.07 0.08						
185.1318 * 25936	3.18 0.12	1.2	6.5	C14.H.	17		
100 1541 + 04570	2 01 0.20	2.4	5.5	C14.H.	20		
189 1275 * 31608	3 87 0.15	0.5	5.5	C13.H	17.0		
189.1635 * 72079	8.83 0.33	0.9	4.5	C14.H	21		
190.1690 * 24637	3.02 0.11						
191.1435 * 46851	5.74 0.22	0.1	4.5	C13.H	19.0		
191.1802 * 35744	4.38 0.17	-0.2	3.5	C14.H	23		
192.1487 * 16483	2.02 0.08	2.7	4.0	С13.Н.	20.0		
193.1222 * 1/606	2.16 0.08	0.4	6 5	C15 H	10	1.00	
201 1629 * 29422	3.60 0.14	1.4	5.5	C15.H	21		
203.1429 * 36158	4.43 0.17	0.7	5.5	C14.H	19.0		
203.1800 * 15597	1.91 0.07	0.0	4.5	C15.H	23		
205.1595 * 64340	7.88 0.30	-0.3	4.5	C14.H	21.0		
206.1658 * 33735	4.13 0.16	1.2	4.0	C14.H	22.0		
207.1398 * 24696	3.02 0.11	1.0		01E 11	21 0		
210 1756 * 20719	3.44 0.13	-0.7	2.5	C15 H	23.0		
221.1546 * 20737	2.54 0.10	-0.7	4.5	C1.J. H.			
235.1694 * 33912	4.15 0.16						
245.1906 * 19615	2.40 0.09	-0.1	5.5	C17.H	25.0		
271.2066 * 15597	1.91 0.07	-0.4	6.5	C19.H	27.0		
273.2207 * 22982	2.81 0.11	1.1	5.5	C19.H	29.0		
288.2459 * 48092	5.89 0.22	-0.6	5.0	C20.H	32.0		

Figure **S81**. ¹H NMR spectrum of **11** (500MHz, CDCl₃).



Figure S82. ¹³C NMR spectrum of 11 (125 MHz, CDCl₃).



Figure S83. ¹H-¹H COSY spectrum of 11 (500 MHz, CDCl₃).



Figure S84. HSQC spectrum of 11 (500 MHz, CDCl₃).



Figure **S85**. HMBC spectrum of **11** (500 MHz, CDCl₃).



Figure **S86**. NOESY spectrum of **11** (500 MHz, CDCl₃).



Figure **S87**. IR spectrum of **11**.



Figure **S88**. HREIMS spectrum of **11**.

LIST: h162 Samp: SF2d	70-c3 13c1				13-J	ul-16	Elapse: Start :	02:22.5 16:04:55	10 17
Comm: Finn Mode: EI + Oper: SIMM Limt: (0	VE +LMR LCAS	BSCAN (E Client:	:10000 XP) UP S/N:	HR NRM PT00126	53		Study : Inlet :	S/N: PT20	00712-01-01
: (397 Peak: 1000 Data: CMAS	7) C22.H1 0.00 mmu SS : conve	R+D: R+D:	-2.0 >	60.0					
	66020	`		(
Mass T	ntensity	%RA	%RTC	Delta	R+D	Compos	ition		
53.04097 *	150323	22.57	0.62	-1.8	2.5	C4.H5			
55.05658 *	600371	90.15	2.50	-1.8	1.5	C4.H7			
56.06364 *	143861	21.60	0.60	-1.0	1.0	C4.H8			
57.07217 *	665982	100.00	2.77	-1.7	0.5	C4.H9			
67 05803 *	271889	40 83	1 13						
68.06516 *	84925	12.75	0.35	-2.6	2.0	C5.H8		10 A	
69.07038 *	482995	72.52	2.01	0.0	1.5	C5.H9			
70.07796 *	149187	22.40	0.62	0.3	1.0	C5.H10			
71.08647 *	316979	47.60	1.32	-0.4	0.5	C5.H11			
77.04080 *	222893	33.47	0.93	-1.7	4.5	C6.H5			
81 07039 *	388412	45.50	1 61	0.0	2 5	C6 H9			
82.07724 *	132287	19.86	0.55	1.0	2.0	C6.H10			
83.08598 *	330115	49.57	1.37	0.1	1.5	C6.H11			
84.09268 *	79386	11.92	0.33	1.2	1.0	C6.H12			
85.10068 *	222467	33.40	0.92	1.0	0.5	C6.H13			
91.05489 *	368601	35.35	1.53	-0.1	4.5	C7 H9			
95.08622 *	316695	47.55	1.32	-0.1	2.5	C7.H11			
96.09376 *	109423	16.43	0.45	0.1	2.0	C7.H12			
97.10180 *	307322	46.15	1.28	-0.1	1.5	C7.H13			
99.11754 *	71220	10.69	0.30	-0.2	0.5	C7.H15			
105.0705 *	414685	13 06	0.36	2 1	4.5	C8 H10			
107.0861 *	286090	42.96	1.19	0.0	3.5	C8.H11			
109.0657 *	205567	30.87	0.85	-0.4	3.5	С7.Н9.	0		
109.1023 *	201236	30.22	0.84	-0.6	2.5	C8.H13			
111.1177 *	159128	23.89	0.66	-0.3	1.5	C8.H15		7	
110 0859 *	315061	47 31	1 31	0.1	3.5	C9 H11			
120.0924 *	106937	16.06	0.44	1.5	4.0	C9.H12			
121.1011 *	660302	99.15	2.75	0.6	3.5	C9.H13			
122.1074 *	167010	25.08	0.69	2.1	3.0	C9.H14			
123.1158 *	162394	24.38	0.68	1.6	2.5	C9.H15			
131 0857 *	95789	14 38	0.37	0.7	5.5	C10 H1	1		
133.1008 *	556062	83.50	2.31	1.0	4.5	C10.H1	3		
134.1084 *	131577	19.76	0.55	1.1	4.0	C10.H1	4		
135.1168 *	178158	26.75	0.74	0.6	3.5	C10.H1	.5		
136.1234 *	78818	11.83	0.33	1.8	3.0	C10.H1	.6	1	
145 1021 *	113825	17 09	0.28	-0.3	2.5	C10.H1	3		
147.0801 *	68238	10.25	0.28	0.9	5.5	C10.H1	1.0		
147.1165 *	105446	15.83	0.44	0.9	4.5	C11.H1	.5		
149.0232 *	454450	68.24	1.89						
149.0956 *	228077	34.25	0.95	1.0	4.5	C10.H1	3.0		
159,1173 *	74913	11.25	0.32	0.1	5.5	C12.H1	5		
173.1335 *	68309	10.26	0.28	-0.5	5.5	C13.H1	7		
175.1479 *	66605	10.00	0.28	0.7	4.5	C13.H1	9		
177.1277 *	177448	26.64	0.74	0.2	4.5	C12.H1	7.0		
189.1629 *	294469	44.22	1.22	1.5	4.5	C14.H2	1		
286.2300 *	119577	17.95	0.50	-0.3	6.0	C20.H3	0.0		

Figure S89. ¹H NMR spectrum of 12 (500MHz, CDCl₃).

1.00



Figure **S90**. ¹³C NMR spectrum of **12** (125 MHz, CDCl₃).



Figure **S91**. ¹H-¹H COSY spectrum of **12** (500 MHz, CDCl₃).



Figure S92. HSQC spectrum of 12 (500 MHz, CDCl₃).



Figure **S93**. HMBC spectrum of **12** (500 MHz, CDCl₃).



Figure **S94**. NOESY spectrum of **12** (500 MHz, CDCl₃).



Figure **S95**. IR spectrum of **12**.



Figure **S96**. HREIMS spectrum of **12**.

<pre>Comm: Finnigan/WAPS/70eV/R:1000 Mode: EI +VE +LMR BSCAN (EXP) UP HR NRM Oper: SIMM.CAS Client: S/N: PT001263 Inlet: Lint: (0)</pre>	LIST: h16452-c1 Samp: 21-H2b2a	11-Nov-16	Elapse: Start :	08:13.1 15:16:55	40 41
Mode: DIT +VE SCAN (EXP) UP HN NRM Study : S/N: PT200712-01- Limit: (0) Inlet: Inlet: Inlet: i: (413) C22.H100.03 Inlet: Inlet: Data: CONO mun R+D: -2.0 > 60.0 Composition S5.06495 * 199752 7.48 NC Delta R+D Composition S5.06495 * 199752 7.48 1.05 G7.05405 * 199463 7.30 1.33 0.7 2.5 C5.H7 G9.07026 * 60372 2.26 0.32 0.2 1.5 C6.H7 G1.0721 * 16911 6.36 0.23 5.5 C7.H7 G9.07026 * 505849 1.250 0.49 5.6 C7.H7 G0.060 * 505849 1.251 1.31 2.6 C.H7 G9.07026 * 51853 2.02 0.28 1.4 3.0 C6.H7 G0.0702 * 53853 2.02 0.28 1.4 3.0 C6.H7 G0.0569 * 5	Comm: Finnigan/MAT95/70eV/R:10000		bear o		
Line (4.13) C.2. HIOLOS (10.10010) Peak: 1000.00 mmu R+D: -2.0 > 60.0 Data: CMASS : converted 5.064095 + 199752 7.48 %RC Delta R+D Composition 5.064095 + 199752 7.48 %RC Delta R+D Composition 5.064095 + 199752 7.48 %RC Delta R+D Composition 5.064095 + 199752 7.48 %RC Delta R+D Composition 7.05185 + 3364713 11.66 1.92 2.9 3.5 C6.H5 7.05185 * 3364713 11.66 1.92 2.9 3.5 C6.H5 7.05185 * 3364713 11.66 1.92 2.9 3.5 C6.H5 7.05185 * 3364713 11.66 1.92 2.9 3.5 C6.H7 7.05723 + 166514 6.34 0.89 91.05430 * 413818 15.50 2.18 0.5 4.5 C7.H7 95.06495 * 132697 4.50 0.31 2.6 4.0 C7.H9 93.07026 * 16097 8.10 0.31 2.6 4.0 C7.H9 93.07026 * 13853 2.02 0.28 1.4 3.0 C6.H8.0 97.05630 * 97998 3.67 0.52 0.3 2.5 C6.H7.0 105.06622 * 233694 8.75 1.23 2.3 4.5 C6.H9.0 106.0749 * 56049 2.10 0.30 107.0836 * 336776 13.36 1.88 2.5 3.5 C8.H11 108.0890 * 54774 2.05 0.29 109.0628 * 56333 2.11 0.30 2.6 3.5 C7.H9.0 109.0929 7 00559 2.65 0.37 2.5 2.5 C8.H13 117.0701 * 62143 2.33 0.33 0.3 5.5 C9.H9 119.0664 * 195430 7.32 1.03 -0.4 4.5 C9.H11 121.1023 * 132932 4.98 0.70 -0.5 3.5 C9.H11 121.1023 * 132932 4.98 0.70 -0.5 3.5 C9.H11 121.1024 * 132497 1.89 0.70 -0.5 3.5 C9.H13 117.0701 * 62143 2.33 0.80 0.3 0.3 5.5 C9.H13 117.0701 * 62143 2.33 0.80 0.2 4.5 C7.H8.0 125.0955 * 108414 4.06 0.57 1.1 2.5 C8.H13.0 131.0806 75819 2.6 0.37 0.2 5.5 C1.H13 133.0008 * 121240 4.54 0.46 0.8 4.5 C10.H13 133.0008 * 121240 4.54 0.46 0.9 4.5 C10.H13 133.0008 * 714499 27.03 3.00 0.2 4.5 C10.H13 134.0055 * 74489 2.10 3.00 1.5 5.10.H11 135.0065 * 74489 2.10 3.00 1.5 5.10.H11.0 146.0965 * 74499 2.00 3.00 1.5 5.10.H11.0 147.0667 * 55270 2.07 0.29 1.2 5.0 C10.H13.0 159.1176 * B5102 3.19 0.45 -0.7 5.5 C11.H13.0 159.1176 * B5102 3.19 0.45 -0.2 5.5 C12.H15 161.0966 * 137041 5.13 0.72 0.0 5.5 C11.H13.0 177.0924 * 71137 6.42 0.90 -0.9 5.5 C11.H13.0 162.0676 * 5542 2.08 0.29 0.5 6.0 C10.H10.02 164.0614 * 614138 2.00 3.42 2.4 5.0 C10.H12.02 178.1172 * E191 2.44 0.40 4.5 0.5 C11.H13.0 162.0676 * 5542 2.08 0.42 0.5 0.2 0.5 C11.H13.0 177.0924 *	Mode: EI +VE +LMR BSCAN (EXP) UP HR NRM	3	Study : Inlet :	S/N: PT2007	L2-01-
: (413) C22.H100.03 Peak: 1000.00 mmu R+D; -2.0 > 60.0 Data: CMASS : converted 51000 (mmu) Mass Intensity %RA %RCD DeLta R+D Composition 55.08495 * 199752 7.48 1.05 65.03870 7 77590 2.91 0.41 0.4 3.5 C5.H5 67.05405 * 194863 7.30 1.03 0.7 2.5 C5.H7 79.05185 364713 13.66 1.92 2.9 3.5 C6.H7 81.06721 * 169141 6.34 0.89 91.05430 * 413818 15.50 2.18 0.5 4.5 C7.H7 92.05998 * 58175 2.18 0.31 2.6 4.0 C7.H8 93.07026 309564 11.60 1.63 0.2 3.5 C7.H9 95.06622 * 146914 1.6.34 0.89 95.06622 * 146915 5.50 0.77 -0.1 2.5 C7.H7 95.06622 * 146915 5.50 0.77 -0.1 2.5 C7.H7 95.06622 * 14691 5.50 0.77 -0.1 2.5 C7.H1 96.05609 * 53853 2.02 0.28 1.4 3.0 C6.H8.0 105.0662 * 33958 4 11.60 1.63 0.5 2.5 C6.H7 105.0662 * 33958 4 11.60 1.63 0.5 2.5 C6.H7 105.0662 * 33958 3.02 0.28 1.4 3.0 C6.H8.0 107.0836 * 33673 0.22 0.28 1.4 3.0 C6.H8.0 107.0836 * 33673 0.22 0.28 1.4 3.0 C6.H8.0 107.0836 * 33674 0.52 0.52 0.5 C6.H11 107.0836 * 35674 0.13 0.5 0.5 0.5 0.5 0.5 0.5 0.47 108.0644 * 1044 0.10 0.30 5.5 C8.H13 107.0836 * 35674 0.23 0.30 0.3 5.5 C8.H13 107.0836 * 56774 0.23 0.33 0.3 5.5 C8.H13 119.0664 * 195430 0.732 1.03 0.26 3.5 C7.H9.0 129.06622 * 70859 2.65 0.37 2.5 2.5 C8.H13 119.0664 * 195430 0.732 1.03 0.26 3.5 C7.H9.0 129.0692 * 70859 2.46 0.57 1.2 5 C8.H13 124.0516 * 317379 11.89 1.67 0.8 4.0 C7.H8.02 135.0172 * 019052 4.08 0.70 -5 3.5 C9.H13 124.0516 * 317379 11.89 1.67 0.8 4.0 C7.H8.02 135.0172 * 109052 4.08 0.57 0.2 3.5 C10.H11 135.1080 * 75119 2.84 0.64 0.15 5.5 C10.H11 135.1080 * 75119 2.84 0.64 0.57 3.5 C10.H11 135.1080 * 75119 2.84 0.64 0.15 5.5 C10.H11 135.1080 * 75119 2.84 0.64 0.15 5.5 C10.H11 135.1076 * 85172 3.19 0.45 -0.7 3.5 C11.H13 146.0874 * 55270 2.07 0.29 1.2 5.0 C10.H12.0 146.0814 * 614138 2.30 0.34 0.48 -0.7 5.5 C11.H13 135.1076 * 85172 3.19 0.45 -0.2 5.5 C12.H15 136.0859 * 74898 2.81 0.39 3.0 4.0 C9.H12.0 146.0814 * 614138 2.70 3.48 0.48 -0.7 5.5 C11.H13.0 147.0809 * 73139 2.75 0.39 0.1 5.5 C10.H11.0 148.0876 * 55270 2.07 0.29 1.5 5 C10.H11.0 148.0876 * 55270 2.07 0.29 1.5 5	Limt: (0)	5			
Peak: 1000.00 mmu R+D: -2.0 > 60.0 Data: CMASS: converted 51000 (mmu) Mass Intensity %RA %RIC Delta R+D Composition 55.06495 * 199752 7.48 %RIC Delta R+D Composition 65.06495 * 199752 7.48 %RIC Delta R+D Composition 77.05185 * 134654 7.30 1.03 0.7 2.5 C5.H7 69.07026 * 60372 2.26 0.32 0.2 1.5 C5.H7 79.05185 * 3364713 13.66 1.92 2.9 3.5 C6.H5 79.05185 * 3364713 13.66 1.92 2.9 3.5 C6.H7 81.06721 * 169141 6.34 0.89 91.05430 * 413818 15.50 2.18 0.5 4.5 C7.H7 95.04958 * 125917 4.72 0.66 0.1 3.5 C6.H7.0 95.04958 * 125917 4.72 0.66 0.1 3.5 C6.H7.0 95.04958 * 125917 4.72 0.66 0.1 3.5 C6.H7.0 95.06622 * 146891 5.50 0.77 -0.1 2.5 C7.H1 96.05609 * 53853 2.02 0.28 1.4 3.0 C6.H8.0 97.05603 * 97998 3.67 0.52 0.3 2.5 C6.H9.0 105.0682 * 233694 8.75 1.23 2.3 4.5 C8.H9 106.0749 * 56049 2.10 0.30 107.0836 * 336776 13.36 1.88 2.5 3.5 C8.H11 108.0890 * 54774 2.05 0.29 109.0624 * 56333 2.11 0.30 2.6 3.5 C7.H9.0 109.0922 * 70859 2.65 0.37 2.5 2.5 C8.H11 108.0890 * 53477 12.3 1.03 -0.4 4.5 C9.H9 119.0864 * 195430 7.32 1.03 -0.5 3.5 C9.H9 119.0864 * 195430 7.32 1.03 -0.5 3.5 C9.H9 119.0864 * 195430 7.32 1.03 -0.5 3.5 C9.H13 124.0516 * 317379 11.89 1.67 0.8 4.0 C7.H8.02 133.1008 * 721489 2.84 0.64 0.15 5.5 C10.H11 133.0008 * 721489 2.84 0.64 0.4 1.5 5. C10.H11 133.0008 * 721489 2.84 0.64 0.57 1.2.5 C8.H13 134.005 * 73149 2.84 0.64 0.57 5.5 C1.H13 135.008 * 721489 2.84 0.64 0.57 5.5 C10.H11 135.008 * 721489 2.84 0.64 0.57 5.5 C1.H13 136.008 * 721489 2.84 0.64 0.55 5.5 C10.H11 136.005 * 73149 2.84 0.64 0.55 5.5 C10.H11 136.005 * 73149 2.84 0.64 0.57 5.5 C1.H13 136.006 * 75139 2.75 0.39 3.0 4 5.5 C10.H11 136.007 * 415172 3.19 0.45 -0.1 3.5 C5.H13.0 144.0067 * 85172 3.19 0.45 -0.2 5.5 C12.H15 136.008 * 72148 2.81 0.39 3.0 4.5 5.5 C10.H11.0 136.005 * 72148 2.81 0.39 3.0 5.5 C10.H11.0 148.0076 * 85172 3.19 0.45 -0.2 5.5 C12.H15 136.0096 * 137041 5.13 0.29 0.5 6.0 C10.H12.02 148.1084 * 91692 3.00 3.42 4.5 C5.H13.00 149.0962 * 1001 1.400 3.29 0.5 6.0 C10.H13.02 149.0962 * 1001 2.60 3.29 0.5 6.0 C10.H	: (413) C22.H100.O3				
Data: CMASS : converted Silono (mmu) Mass Intensity %RA %RIC Delta R+D Composition 55.06495 * 199752 7.48 1.05 67.05405 * 194863 7.30 1.03 0.7 2.5 C5.H5 67.05405 * 194863 7.30 1.03 0.7 2.5 C5.H9 77.03723 * 196351 7.35 1.03 1.9 4.5 C6.H5 79.05185 * 364713 13.66 1.92 2.9 3.5 C6.H7 79.05185 * 364715 2.18 0.31 2.6 4.5 C7.H7 91.05430 * 413818 15.50 2.18 0.51 3.5 C7.H7 92.05998 * 58175 2.18 0.31 2.6 4.5 C7.H7 95.08622 * 146881 5.50 0.77 - 0.1 2.5 C7.H1 95.08622 * 146881 5.50 0.77 - 0.1 2.5 C7.H1 96.05609 * 53883 2.22 0.22 1.4 3.0 C6.H9.0 77.06509 * 53883 2.22 0.22 1.4 3.0 C6.H9.0 100.0682 * 56049 9.71 0.33 2.3 4.5 C8.H1 107.063 * 56774 13.36 1.88 2.5 3.5 C8.H1 107.063 * 56774 13.3 1.88 0.52 0.57 - 0.52 0.58 108.0682 * 5774 2.05 0.29 109.0628 * 56333 2.11 0.30 2.6 3.5 C7.H9.0 109.0628 * 56333 2.11 0.30 3.5 5.5 C9.H9 119.0864 * 195430 7.32 1.03 0.3 5.5 C9.H1 121.1023 * 132932 4.98 0.70 - 0.5 3.5 C9.H1 124.1023 * 132932 4.98 0.70 - 0.5 3.5 C9.H1 124.00316 * 317379 11.69 1.67 0.8 4.0 C7.H8.02 135.117.0701 * 62144 4.06 0.57 1.1 2.5 C8.H13 134.0860 * 75819 2.84 0.040 0.1 5.5 C10.H1 135.0808 * 721489 27.03 3.80 0.2 4.5 C9.H1 135.0808 * 721489 27.03 3.80 0.2 4.5 C9.H1 136.0859 * 74898 2.81 0.39 3.0 4.0 C9.H12.0 137.0967 * 85102 3.19 0.45 -0.1 3.5 C10.H11 136.0859 * 74898 2.81 0.39 3.0 4.0 C9.H12.0 144.0876 * 55270 2.07 0.23 1.5 C10.H13 135.1176 * 85102 3.19 0.45 -0.2 5.5 C10.H13 135.1176 * 85102 3.19 0.45 -0.2 5.5 C10.H13.0 145.024 * 91692 4.33 0.42 4.45 0.C10.H13.02 146.0874 * 71165 2.89 0.41 -0.3 6.0 C11.H13.02 147.0807 * 25570 2.00 0.427 0.0 5.5 C10.H11.02 148.0876 * 55270 2.07 0.29 1.2 5.0 C10.H13.02 176.0840 * 77145 2.89 0.41 -0.3 6.0 C11.H13.02 176.0840 * 77145 2.89 0.41 -0.3 6.0 C11.H13.02 176.0840 * 7145 2.89	Peak: 1000.00 mmu R+D: -2.0 > 60.0				
Mass Thremsity %RA %RIC Delta R+D Composition 55.06495 1.0575 7.484 1.05 1.05 1.05 1.05 1.05 1.05 1.05 1.05 1.05 1.05 1.05 1.04 0.41 </td <td>Data: CMASS : converted</td> <td></td> <td></td> <td></td> <td></td>	Data: CMASS : converted				
Side Threemicry RRA RITC pelta R+D Composition 55.06495 199752 7.48 1.05 RTC Composition 55.06495 194863 7.30 1.03 0.7 2.5 C5.H5 67.05405 194863 7.30 1.03 0.7 2.5 C5.H9 77.03723 196351 7.35 1.03 1.9 4.5 C6.H7 91.05430 4.13818 15.50 2.18 0.5 C.7.H7 92.05998 58175 2.18 0.31 2.6 4.0 C7.H9 95.08622 146891 5.50 0.77 -0.1 2.5 C7.H1 95.08622 146891 5.50 0.77 -0.1 2.5 C6.H9.O 97.06503 979983 6.7 1.23 2.3 4.5 C8.H9 106.0749 556042 2.10 0.30 C6 4.5 C9.H1 106.0749 556042 1.03 1.63 C6.H9.O					
Mass Intensity %RA %RIC Delta R+D Composition 65.08470 * 77590 2.91 0.41 0.4 3.5 C5.H5 67.05405 194867 7.30 1.03 0.7 2.5 C5.H7 69.07026 * 60372 2.26 0.32 0.2 1.5 C5.H7 70.07231 196351 7.35 1.03 1.9 4.5 C6.H7 81.06721 169141 6.34 0.89 4.5 C7.H7 92.05998 58175 2.18 0.31 2.6 C7.H8 93.07026 * 309584 11.60 1.63 0.2 C6.H7.O 95.04528 1245917 4.72 0.66 C7.H9 C6.H8.O 96.05609 53853 2.02 0.28 C6.H9.O C6.H8.O 97.06503 97998 3.67 0.52 3.5 C8.H11 106.0749 * 56049 2.10 0.30 2.6 <td>51000 (mmu)</td> <td></td> <td>5. E</td> <td></td> <td></td>	51000 (mmu)		5. E		
$\begin{array}{llllllllllllllllllllllllllllllllllll$	Mass Intensity %RA %RIC Delta	R+D Compos	sition		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	55.06495 * 199752 7.48 1.05				
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	65.03870 * 77590 2.91 0.41 0.4	3.5 C5.H5			
$\begin{array}{llllllllllllllllllllllllllllllllllll$	67.05405 * 194863 7.30 1.03 0.7	2.5 C5.H/			
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	69.07026 * 60372 2.26 0.32 0.2	1.5 C5.H9			
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	77.03723 * 196351 7.35 1.03 1.9	4.5 06.03		12	
$ \begin{array}{c} 81.00741 & 103441 & 0.34 & 0.35 & 0.65 & 4.5 & C7.H7 \\ 92.05998 & 58175 & 2.18 & 0.31 & 2.6 & 4.0 & C7.H8 \\ 93.07026 & 309584 & 11.60 & 1.63 & 0.2 & 3.5 & C7.H9 \\ 95.08622 & 146891 & 5.5 & 0.77 & -0.1 & 2.5 & C7.H11 \\ 96.05609 & 53853 & 2.02 & 0.28 & 1.4 & 3.0 & C6.H8.0 \\ 97.06503 & 97998 & 3.67 & 0.52 & 0.3 & 2.5 & C6.H9.0 \\ 105.0662 & 233694 & 8.75 & 1.23 & 2.3 & 4.5 & C8.H9 \\ 106.0749 & 556049 & 2.11 & 0.30 & 2.6 & 3.5 & C7.H9.0 \\ 107.0836 & 356776 & 13.36 & 1.88 & 2.5 & 3.5 & C8.H11 \\ 108.0890 & 54774 & 2.05 & 0.29 \\ 109.0628 & 56333 & 2.11 & 0.30 & 2.6 & 3.5 & C7.H9.0 \\ 109.0628 & 56333 & 2.11 & 0.30 & 2.6 & 3.5 & C7.H9.0 \\ 109.0628 & 56333 & 2.11 & 0.30 & 0.4 & 4.5 & C9.H9 \\ 119.0864 & 195430 & 7.32 & 1.03 & -0.4 & 4.5 & C9.H13 \\ 121.1023 & 113292 & 4.98 & 0.70 & -0.5 & 5.5 & C9.H13 \\ 124.0516 & 317379 & 11.89 & 1.67 & 0.8 & 4.0 & C7.H8.02 \\ 125.0995 & 100414 & 4.66 & 0.57 & 1.1 & 2.5 & C8.H13 \\ 135.0808 & 72819 & 2.84 & 0.40 & 0.1 & 5.5 & C10.H13 \\ 135.0808 & 72849 & 2.03 & 3.80 & 0.2 & 4.5 & C9.H13 \\ 135.0808 & 721489 & 2.703 & 3.80 & 0.2 & 4.5 & C9.H13 \\ 145.1024 & 91622 & 4.08 & 0.57 & 0.2 & 3.5 & C10.H13 \\ 135.0808 & 721489 & 2.703 & 3.80 & 0.2 & 4.5 & C9.H13 \\ 147.0809 & 73339 & 2.75 & 0.39 & 0.1 & 5.5 & C10.H13 \\ 147.0809 & 73339 & 2.75 & 0.39 & 0.1 & 5.5 & C10.H12 \\ 0.163.0757 & 85172 & 3.19 & 0.45 & -0.1 & 3.5 & C2.H15 \\ 161.0966 & 137041 & 5.13 & 0.72 & 0.0 & 5.5 & C11.H13 \\ 147.0809 & 73339 & 2.75 & 0.39 & 0.1 & 5.5 & C10.H11.0 \\ 162.0676 & 55482 & 2.08 & 0.29 & 0.2 & 5.5 & C12.H15 \\ 161.0966 & 137041 & 5.13 & 0.72 & 0.0 & 5.5 & C11.H13 \\ 0.76.0840 & 77165 & 2.89 & 0.41 & -0.3 & 5.0 & C10.H12.0 \\ 149.0962 & 71071 & 2.66 & 0.37 & 0.4 & 4.5 & C10.H13.0 \\ 162.0676 & 55482 & 2.08 & 0.29 & 0.2 & 5.5 & C12.H15 \\ 161.0966 & 137041 & 5.18 & 0.77 & 0.5 & C10.H11.02 \\ 164.0814 & 614138 & 23.00 & 3.24 & 2.4 & 5.0 & C10.H12.02 \\ 176.0840 & 77165 & 2.89 & 0.41 & -0.3 & 6.0 & C10.H10.02 \\ 176.0840 & 77165 & 2.89 & 0.41 & -0.3 & 6.0 & C10.H11.02 \\ 176.0840 & 77165 & 2.89 & 0.41 & -0.3 & 6.0 & C10.H13.$	79.05185 * 364/13 13.06 1.92 2.9	5.5 CO.M/			
91.05938 413616 10.30 2.13 2.64 0.7.148 93.07026 309584 11.60 1.63 0.2 3.5 C7.189 95.04958 125917 4.72 0.66 0.1 3.5 C7.189 95.04958 125917 4.72 0.66 0.1 3.5 C7.180 95.04958 125917 4.72 0.66 0.1 3.5 C7.181 96.05609 535853 2.02 0.28 1.4.3 0.65.862 23694 8.77 1.3 2.3 4.5 C6.H9.0 105.0662 23694 8.75 1.23 2.3 4.5 C6.H9 0.107.0836 356776 13.36 1.88 2.5 3.5 C6.H11 106.0830 54774 2.05 0.29 3.03 3.5 C9.H11 117.0701 62143 2.33 0.33 0.3 5.5 C9.H11 119.0864 195430 7.32 1.03 -0.4 4.5 C1.H11 121.023 132932 4.98 0.70 -0.5 S.5 C1.H11	81.00/21 - 109141 0.34 0.09 01.05420 + 412010 15 50 2.10 0.5	1 5 07 47			
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	91.05430 * 413616 15.30 2.16 0.3	4.0 07 49			
35.0/026 305384 11.00 1.02 0.2 5.1.5 0.111 95.0/0528 125917 4.72 0.66 0.1 1.5 CC.111 95.0/0528 146891 5.50 0.77 -0.1 2.5 CT.H11 96.05609 5.3533 2.02 0.28 1.4 3.0 C6.188.0 97.06503 97998 3.67 0.52 0.3 2.5 C6.189.0 105.0682 2.33694 8.75 1.23 2.3 4.5 C8.141 108.0890 54774 2.05 0.29 1.03 -0.6 3.5 C7.149.0 109.0628 56333 2.11 0.30 2.6 3.5 C7.149.0 119.0864 195430 7.32 1.03 -0.4 4.5 C9.141 121.1023 1324.0516 317379 1.189 1.67 0.8 4.0 C7.16.02 125.0955 108414 4.06 0.57 1.1 2.5 C8.113.0 131.0860 721489 2.70 3.5 C9.11.1 1.5 C1.0.111 </td <td>92.05998 - 58175 2.18 0.51 2.0</td> <td>3 5 07 19</td> <td></td> <td></td> <td></td>	92.05998 - 58175 2.18 0.51 2.0	3 5 07 19			
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	95.07026 * 309384 11.00 1.05 0.2	3 5 6 47	0		
95.08622 143631 3.02 0.12 1.4 3.0 C.Halo 97.06503 97998 3.67 0.52 0.3 2.5 C.Halo 105.0662 233694 8.75 1.23 2.3 4.5 C.Halo 106.0749 * 56049 2.10 0.30 107.0836 356776 1.336 1.88 2.5 3.5 C.B.H11 108.0890 * 54774 2.05 0.29	95.04958 - 125917 4.72 0.00 0.1	2 5 C7 H11			
30.0000 30000 21.2 0.12 2.5 0.13 2.5 0.145.06 105.0682 233694 8.75 1.23 2.3 4.5 C6.18.0 107.0836 356776 13.36 1.88 2.5 3.5 C6.H11 108.0890 54774 2.05 0.29 109.0628 56333 2.11 0.30 2.6 3.5 C9.H11 117.0701 62143 2.33 0.33 0.3 5.5 C9.H11 121.023 132932 4.98 0.70 -0.5 S.5 C9.H11 121.023 132932 4.86 0.70 -0.5 S.5 C1.H13.0 131.0860 75819 2.84 0.40 0.1 5.5 C1.H13 135.0808 721489 27.03 3.80 0.2 4.5 C1.H13 135.0808 71071 2.66 0.37 0.4 C9.H12.0 137.0967 135.1024 91962 3.04 0.2 9.5 <	06 05600 * 53853 2 02 0 28 1 4	3 0 C6 H8	0		
b):00502 * 51253 5.5 5.23 4.5 C8.H5 105.0622 * 53394 8.55 1.23 2.3 4.5 C8.H5 107.0836 * 356776 1.36 1.88 2.5 3.5 C8.H11 108.0890 * 54774 2.05 0.29 0.30 0.30 2.6 3.5 C7.H9.O 109.0628 * 56333 2.11 0.30 2.6 3.5 C7.H9.O 109.0628 * 70859 2.65 0.37 2.5 C8.H13 117.0701 * 62143 2.33 0.33 0.3 5.5 C9.H9 119.0864 * 195430 7.32 1.03 -0.4 4.5 C9.H13 124.0516 * 317379 1.89 1.67 0.8 4.0 C7.H8.O2 131.0860 * 7519 2.84 0.64 0.8 4.5 C10.H13 135.0808 * 721489 2.73 3.80 0.2 4.5 C9.H1.O 135.1172 * 109052 * 4.08 0.57 0.2 3.5 C9.H1.O 135.1172 *<	97.0503 * 97998 3.67 0.52 0.3	2 5 C6 H9	0		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	105 0682 * 233694 8 75 1.23 2.3	4.5 C8.H9			
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	106 0749 * 56049 2.10 0.30				
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	107.0836 * 356776 13.36 1.88 2.5	3.5 C8.H11			
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	108.0890 * 54774 2.05 0.29				
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	109.0628 * 56333 2.11 0.30 2.6	3.5 C7.H9.	.0		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	109.0992 * 70859 2.65 0.37 2.5	2.5 C8.H13	3		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	117.0701 * 62143 2.33 0.33 0.3	5.5 C9.H9			
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	119.0864 * 195430 7.32 1.03 -0.4	4.5 C9.H11	L		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	121.1023 * 132932 4.98 0.70 -0.5	3.5 C9.H13	3		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	124.0516 * 317379 11.89 1.67 0.8	4.0 C7.H8	.02		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	125.0955 * 108414 4.06 0.57 1.1	2.5 C8.H1	3.0		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	131.0860 * 75819 2.84 0.40 0.1	5.5 C10.H	[]		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	133.1009 * 121240 4.54 0.64 0.8	4.5 C10.H	13		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	135.0808 * 721489 27.03 3.80 0.2	4.5 C9.HI	1.0		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	135.1172 * 109052 4.08 0.57 0.2	3.5 CIU.H.	15		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	136.0859 * 74898 2.81 0.39 3.0	4.0 C9.H1	2.0		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	137.0967 * 85172 3.19 0.45 -0.1	5.5 (9.11	13		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	147.0000 * 72220 2.75 0.30 0.1	5.5 C10 H	11 0		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	148 0876 * 55270 2.07 0.29 1.2	5.0 C10.H	12.0		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	149 0962 * 71071 2.66 0.37 0.4	4.5 C10.H	13.0		
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	159 1176 * 85102 3.19 0.45 -0.2	5.5 C12.H	15		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	161.0966 * 137041 5.13 0.72 0.0	5.5 C11.H	13.0		
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	162.0676 * 55482 2.08 0.29 0.5	6.0 C10.H	10.02		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	163.0759 * 2669697 100.00 14.07 0.0	5.5 C10.H	11.02		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	164.0814 * 614138 23.00 3.24 2.4	5.0. C10.H	12.02		
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	165.0897 * 234331 8.78 1.24 1.8	4.5 C10.H	13.02		
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	176.0840 * 77165 2.89 0.41 -0.3	6.0 C11.H	12.02		
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	177.0924 * 171337 6.42 0.90 -0.9	5.5 C11.H	13.02		
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	178.0987 * 51656 1.93 0.27 0.7	5.0 C11.H	14.02		
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	179.1074 * 65119 2.44 0.34 -0.2	4.5 C11.H	15.02		
187.1112 * 61931 2.32 0.33 1.1 6.5 C13.H15.0 215.1432 * 53498 2.00 0.28 0.4 6.5 C15.H19.0 217.1228 * 82055 3.07 0.43 0.0 6.5 C14.H17.02 218.1288 * 57183 2.14 0.30 1.9 6.0 C14.H18.02 231.1745 * 55624 2.08 0.29 0.4 5.5 C16.H23.0 243.1395 * 60017 2.25 0.32 -1.0 7.5 C16.H19.02 259.1683 * 92471 3.46 0.49 1.5 6.5 C17.H23.02 316.2043 * 51089 1.91 0.27 -0.4 7.0 C20.H28.03	185.1328 * 55057 2.06 0.29 0.2	6.5 C14.H	17		
215.1432 53498 2.00 0.28 0.4 6.5 C15.H19.0 217.1228 * 82055 3.07 0.43 0.0 6.5 C14.H17.02 218.1288 * 57183 2.14 0.30 1.9 6.0 C14.H18.02 231.1745 * 55624 2.08 0.29 0.4 5.5 C16.H23.0 243.1395 * 60017 2.25 0.32 -1.0 7.5 C16.H19.02 259.1683 * 92471 3.46 0.49 1.5 6.5 C17.H23.02 316.2043 * 51089 1.91 0.27 -0.4 7.0 C20.H28.03	187.1112 * 61931 2.32 0.33 1.1	6.5 C13.H	15.0		
217.1228 52055 3.07 0.43 0.0 6.5 C14.117.02 218.1288 57183 2.14 0.30 1.9 6.0 C14.118.02 231.1745 * 55624 2.08 0.29 0.4 5.5 C16.143.0 243.1395 * 60017 2.25 0.32 -1.0 7.5 C16.1419.02 259.1683 * 92471 3.46 0.49 1.5 6.5 C17.123.02 316.2043 * 51089 1.91 0.27 -0.4 7.0 C20.1428.03	215.1432 * 53498 2.00 0.28 0.4	6.5 C15.H	17.02		
2131.1745 * 55624 2.08 0.29 0.4 5.5 C16.H23.0 243.1395 * 60017 2.25 0.32 -1.0 7.5 C16.H19.02 259.1683 * 92471 3.46 0.49 1.5 6.5 C17.H23.02 316.2043 * 51089 1.91 0.27 -0.4 7.0 C20.H28.03	217.1228 * 82055 3.07 0.43 0.0	6.5 C14.H.	19 02		
243.1395 * 6017 2.25 0.32 -1.0 7.5 C16.H19.02 259.1683 * 92471 3.46 0.49 1.5 6.5 C17.H23.02 316.2043 * 51089 1.91 0.27 -0.4 7.0 C20.H28.03	218.1288 * 5/183 2.14 0.30 1.9	5.5 C16 H	23.0		
259.1683 * 92471 3.46 0.49 1.5 6.5 C17.H23.02 316.2043 * 51089 1.91 0.27 -0.4 7.0 C20.H28.03	231.1743 20024 2.00 0.29 0.4	7 5. 016 4	19 02		
316.2043 * 51089 1.91 0.27 -0.4 7.0 C20.H28.03	259 1683 * 92471 3 46 0 49 1 5	6.5 C17 H	23.02		
	316.2043 * 51089 1.91 0.27 -0.4	7.0 C20.H	28.03		

Figure S97. ¹H NMR spectrum of (S)- and (R)-MTPA esters of 1 (400MHz, C_5D_5N).



Figure S98. ¹H NMR spectrum of (S)- and (R)-MTPA esters of 5 (400MHz, C_5D_5N).



NO.	1	2	3	4	5	6
1						
2a	1.31 m	1.29 m	1.36 m	1.31 m	1.38 m	1.37 m
2b	1.12 m	1.29 m	1.27 m	1.16 m	1.23 m	1.24 m
3a	2.06 m	2.10 m	2.09 m	2.06 m	2.07 m	2.08 m
3b	1.83 m	1.84 m	1.75 m	1.75 m	1.83 m	1.76 m
4						
5a	2.30 m	2.32 m	2.32 m	2.27 m	2.35 m	2.36 m
5b	1.98 m	2.00 m	1.95 m	1.93 m	2.11 m	2.10 m
6a	2.28 m	2.26 m	2.30 m	2.25 m	2.29 m	2.29 m
6b	1.97 m	1.98 m	1.96 m	1.95 m	2.10 m	2.10 m
7	5.33 m	5.39 m	5.37 m	5.35 dd (9.3 5.7)	5.36 dd (9.2 5.0)	5.37 t (7.0)
8						
9a	2.40 d (11.7)	2.22 m	2.21 m	2.27 m	2.31 m	2.40 m
9b	2.76 t (11.9)	3.41 t (11.8)	3.29 t (12.0)	3.39 t (12.1)	2.45 t (11.6)	2.43 m
10	4.16 dd (11.8 3.0)	5.43 dd (11.6 2.6)	5.35 dd (11.4 1.9)	4.17 d (9.9)	3.59 d (11.0)	3.73 d (8.3)
11					2.76 (s)	2.79 s
12						
13a	2.18 m	2.30 m	2.24 m	2.32 m	2.28 m	2.31 m
13b	2.18 m	2.21 m	2.40 m	2.23 m	2.28 m	2.31 m
14a	1.47 m	1.81 m	1.57 m	1.56 m	1.27 m	1.28 m

Table S1 ¹ H NMR spectroscopic data for compounds 1–6 in CDCl ₃ (δ in ppm, J in Hz
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14b	1.83 m	1.51 m	1.81 m	1.79 m	1.37 m	1.40 m
15	1.07 s	1.02 s	1.01 s	1.12 s	0.90 s	0.91 s
16a	4.64 s	4.74 s	4.67 s	4.65 s	4.68 s	4.67 s
16b	4.71 s	4.66 s	4.75 s	4.73 s	4.77 s	4.76 s
17	1.71 s	1.77 s	1.82 s	1.73 s	1.72 s	1.73 s
18	3.34 hept (6.8)					
19	1.09 d (6.9)	1.41 s	1.52 s	1.49 s	1.75 s	1.83 s
20	1.05 d(6.0)	1 40 a	1.59 a	1 52 c	1.76 a	3.76 d (11.7)
20	1.05 d (0.9)	1.40 \$	1.50 \$	1.55 \$	1.70 \$	4.17 d (11.4)
10-OAc		2.06 s	2.09 s	-	-	

Table S2 ¹H NMR spectroscopic data for compounds 7–12 in CDCl₃ (δ in ppm, J in Hz)

		1	I I	1		
NO.	7	8	9	10	11	12
1						
2a	1.47 m	1.07 m	1.33 m	1.31 m	1.30 m	1.81 m
2b	1.37 m	1.27 m	1.33 m	1.31 m	1.43 m	1.46 m
3a	1.95 m	2.21 m	2.09 m	2.07 m	2.08 m	2.06 m
3b	1.95 m	1.75 m	1.86 m	2.07 m	2.08 m	2.24 td (13.3 5.5)
4						
5a	2.23 m	2.37 m	2.28 m	2.37 m	2.38 m	2.44
5b	2.23 m	2.04 m	2.21 m	2.19 m	2.20 m	2.44 m
6a	2.20 m	2.27 m	2.24 m	2.18 m	2.19 m	2.04 m
6b	2.20 m	2.04 m	2.10 m	2.18 m	2.19 m	1.42 m

7	5.34 t (7.0)	5.35 dd (9.1 5.1)	5.32 m	5.40 d (7.2)	5.44 d (6.8)	2.91 m
8						
9a	2.24 m	2.56 t (11.8)	2.28 m	2.57 m	2.56 d (7.9)	1.55 dd (16.1 4.5)
9b	2.36 d (9.7)	2.20 m	2.42 t (12.0)	2.01 m	2.04 m	2.68 dd (16.0 2.5)
10	3.80 dd (11.9 3.3)	3.83 d (11.4)	3.76 dd (11.4 3.1)	3.91 m	4.00 m	4.30 ddd (12.5 4.5 2.6)
11	2.97 d (1.4)	2.20 m	2.24 m	2.11 m	3.10 m	2.91 d (9.7)
12				2.49 td (12.9 6.3)		
13a	5 44 4 (1 5)	1.50 m	1.52 m	1.48 m	5.18 br s	2.52 m
13b	5.44 d (1.5)	1.50 m	2.10 m	1.16 m		2.52 m
14a	1.89 m	1.60 m	1.72 m	1.62 m	1.94 d (12.8)	1.44 m
14b	2.10 m	1.60 m	1.20 m	2.15 m	2.70 d (15.1)	2.00 m
15	0.97 s	1.16 s	0.93 s	0.97 s	0.91 s	0.89 s
16a	4.70 s	4.66 s	4.67 s	4.63 s	4.63 s	4.78 s
16b	4.76 s	4.76 s	4.72 s	4.73 s	4.73 s	4.80 s
17	1.72 s	1.68 s	1.73 s	1.60 s	1.62 s	1.48 s
18	2.61 dt (13.2 6.6)					
19	1.12 d (6.8)	1.33 s	1.40 s	1.15 s	1.32 s	1.84 s
20	1.06 d (6.8)	1.41 s	1.42 s	1.26 s	1.31 s	
10-OAc		2.06 s	2.09 s			