Supporting Information for *Synthesis of the Polycyclic Ring Systems of Artocarpol A and D*

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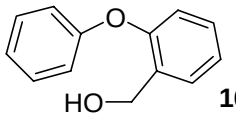
General Experimental Details

All non-aqueous reactions were performed under an atmosphere of dry nitrogen, in oven- or flame-dried glassware, unless otherwise indicated. Reaction temperatures stated were those of the external bath. Diethyl ether (ether) and tetrahydrofuran (THF) were dried over sodium/benzophenone ketyl and distilled under an atmosphere of dry nitrogen immediately prior to use. Benzene, dichloromethane, toluene and pyridine were dried over calcium hydride and distilled under an atmosphere of dry nitrogen immediately prior to use. Allyl amine, citral **5** and senecialdehyde **6** were purified by distillation at atmospheric pressure. All other solvents and reagents were purified by standard techniques or used as supplied.[1] Brine refers to a saturated aqueous solution of sodium chloride. Silica gel column chromatography ("flash chromatography") was carried out using Merck silica gel 60 (230 to 400 mesh).[2] Melting points were measured on a Gallenkamp capillary melting point apparatus and are uncorrected. All proton and carbon nuclear magnetic resonance (^{1}H NMR and ^{13}C NMR, respectively) spectra were recorded using a Bruker AMX 400 FT spectrometer (operating frequencies: ^{1}H, 400.13 MHz; ^{13}C, 100.61 MHz) at ambient temperature unless otherwise noted. Chemical shifts (δ) for all compounds are listed in parts per million downfield from tetramethylsilane using the NMR solvent as an internal reference. The reference values used for deuterated chloroform ($CDCl_3$) were 7.26 and 77.16 ppm for ^{1}H and ^{13}C NMR

(1) Armarego, W.; Perrin, D. *Purification of Laboratory Chemicals*, 4th ed.; Oxford: Butterworth-Heinemann, 1997.
(2) Still, W. C.; Kahn, M.; Mitra, A. *J. Org. Chem.* **1978**, *43*, 2923.

spectra, respectively. The reference values used for deuterated benzene (C_6D_6) were 7.15 and 128.02 ppm, respectively. Infrared spectra (IR) were recorded as either KBr discs (KBr) or evaporated films (ef) using a Perkin Elmer 599B IR spectrophotometer. Mass spectra (MS) were recorded on a Hewlett Packard 5985 GC-mass spectrometer. The modes of ionization used were electron impact (EI) or chemical ionization (CI) with isobutane. Microanalyses were performed on a Carlo Erba Model 1106 CHN analyzer.

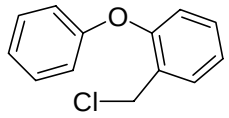
2-Phenoxybenzyl alcohol (16)



16

2-Phenoxybenzoic acid **7** (15.04 g, 70.00 mmol) was added over a period of 30 min. to a stirred suspension of lithium aluminum hydride (4.02 g, 110 mmol) in THF (50 mL) at 0 °C. The resultant mixture was allowed to warm to room temperature and was then heated at reflux for 4 h. The reaction mixture was cooled to 0 °C and water (10 mL) followed by an aqueous solution of sodium hydroxide (15% w/v, 5 mL) were added slowly. The resultant mixture was stirred for 2 h and then dried with anhydrous magnesium sulfate and filtered. The filter cake was washed with ether (50 mL) and the combined filtrates were concentrated *in vacuo* to afford the title compound **16** (12.72 g, 90%) as a pale yellow oil. **^{1}H NMR** ($CDCl_3$) δ 2.09 (broad s, 1H, O*H*), 4.75 (s, 2H, CH_2), 6.87-7.47 (m, 9H, Ar*H*). **^{13}C NMR** ($CDCl_3$) δ 61.34, 118.51, 118.74, 123.45, 123.91, 129.13, 129.35, 129.97, 132.05, 154.83, 157.26. **IR** (ef) 3416 (broad), 3038, 2870, 1580, 1493, 1162, 874, 806, 691 cm^{-1}. **MS** (CI) *m/z* (rel. intensity) 200 (M, 8), 199 (21), 183 (M - OH, 100).

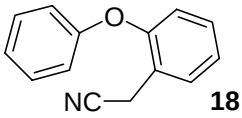
2-Phenoxybenzyl chloride (17)[3]



17

To a stirred solution of the alcohol **16** (12.72 g, 63.60 mmol) and pyridine (5.10 ml, 63.6 mmol) in benzene (200 mL) at 0 °C was added thionyl chloride (6.50 mL, 89.0 mmol). The reaction mixture was then heated at reflux for 24 h. The resultant mixture was allowed to cool to room and was then filtered. The filter cake was washed with benzene (50 mL) and the combined filtrates were concentrated *in vacuo* to afford the title compound **17** (13.65 g, 98%) as a yellow oil. **^{1}H NMR** ($CDCl_3$) δ 4.71 (s, 2H, C*H*$_2$), 6.87-7.50 (m, 9H, Ar*H*). **^{13}C NMR** ($CDCl_3$) δ 41.22, 118.89, 123.58, 123.82, 128.79, 129.94, 130.17, 131.06, 155.22, 157.26. **IR** (ef) 3038, 2968, 1583, 1455, 750, 691 cm^{-1}. **MS** (CI) *m/z* (rel. intensity) 220 (^{37}Cl-M, 3), 218 (^{35}Cl-M, 8), 183 (M - Cl, 100).

2-Phenoxybenzyl cyanide (18)[4]



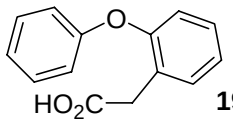
18

A solution of the chloride **17** (13.61 g, 62.20 mmol) in dimethyl sulfoxide (10 mL) was added to a stirred mixture of sodium cyanide (4.58 g, 93.4 mmol) and dimethyl sulfoxide (10 mL) at room temperature. The resultant mixture was stirred for 24 h, diluted with water (20 mL) and extracted with ether (2 x 30 mL). The combined organic extracts were washed with water (4 x 25 mL), dried over anhydrous sodium sulfate and concentrated *in vacuo* to afford the title compound **18** (11.71 g, 90%) as a green oil. **^{1}H NMR** ($CDCl_3$) δ 3.79 (s, 2H, C*H*$_2$), 6.85-7.51 (m, 9H, Ar*H*). **^{13}C NMR** ($CDCl_3$) δ 18.88, 117.75, 118.26, 118.94, 121.26, 123.91, 124.04, 129.80, 129.83, 130.13, 154.85,

(3) Atkinson, D. C.; Godfrey, K. E.; Meek, B.; Saville, J. F.; Stillings, M. R. *J. Med. Chem.* **1983**, *26*, 1353.
(4) Yoshioka, M.; Osawa, H.; Fukuzawa, S. *Bull. Chem. Soc. Jpn*. **1982**, *55*, 877.

156.40. **IR** (ef) 3043, 2928, 2251, 1585, 1455, 751 cm^{-1}. **MS** (CI) *m/z* (rel. intensity) 266 (M + *i*-Bu, 48), 210 (M + H, 100).

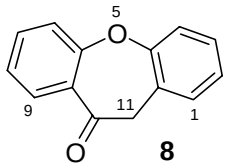
2-Phenoxyphenylacetic acid (19)[5]



19

A stirred solution of the cyanide **18** (5.62 g, 26.9 mmol) and potassium hydroxide (4.29 g, 76.7 mmol) in aqueous ethanol (80% v/v, 100 mL) was heated at reflux for 4 h. The reaction mixture was allowed to cool to room temperature and then was concentrated *in vacuo* to afford a solid residue. The residue was dissolved in water (50 mL) and extracted with ether (2 x 20 mL). The aqueous fraction was then acidified to pH 1 with concentrated hydrochloric acid. The precipitated solid was filtered, washed with water (2 x 20 mL) and air-dried. Recrystallization of the crude reaction product from hexanes:ether (5:1) afforded the title compound **19** (5.23 g, 85%) as a yellow solid. **M.p.** 85-88 °C, hexanes/ether (lit.[5] 89-91°C). **^{1}H NMR** ($CDCl_3$) δ 3.72 (s, 2H, CH_2), 6.85-7.32 (m, 9H, Ar*H*). **^{13}C NMR** ($CDCl_3$) δ 35.63, 118.71, 118.76, 123.43, 123.68, 125.16, 129.07, 129.87, 131.63, 155.49, 157.16, 177.13. **IR** (KBr) 2923, 2828 (broad), 2733, 1711, 1582, 1486, 1103, 753, 689 cm^{-1}. **MS** (CI) *m/z* (rel. intensity) 229 (M + H, 100), 183 (20). **Anal.** Calcd. for $C_{14}H_{12}O_3$: C, 73.67; H, 5.30; Found: C, 73.90; H, 5.26.

11*H*-Dibenzo[*b,f*]oxepin-10-one (8)

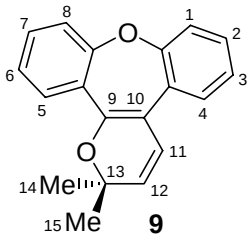


8

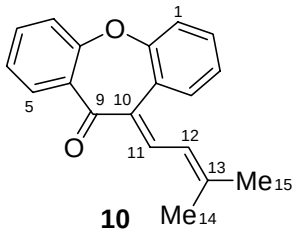
(5) Ong, H. H.; Profitt, J. A.; Anderson, V. B.; Spaulding, T. C.; Wilker, J. C.; Geyer III, H. M.; Kruse, H. *J. Med. Chem*. **1980**, *23*, 494.

The carboxylic acid **19** (4.21 g, 18.5 mmol) was added in small portions with stirring to polyphosphoric acid (95.1 g, 257 mmol) at ~100 °C. The reaction mixture was stirred for 4 h and then allowed to cool to room temperature. Ice-cold water (50 mL) was added slowly and the resultant mixture was extracted with ether (2 x 25 mL). The combined organic extracts were washed with a saturated aqueous solution of sodium carbonate (2 x 25 mL), dried over anhydrous sodium sulfate and concentrated *in vacuo*. Recrystallization of the resultant solid residue from hexanes afforded the title compound **8** (3.26 g, 84%) as yellow crystals. **M.p.** 48-50 °C, hexanes (lit.[6] 53-54 °C, hexanes). **^{1}H NMR** ($CDCl_3$) δ 4.10 (s, 2H, C*H*$_2$), 7.18-7.58 (m, 7H, Ar*H*), 8.06 (dd, *J* = 7.9, 1.8 Hz, 1H, Ar*H*-9). **^{13}C NMR** ($CDCl_3$) δ 48.35, 120.48, 121.66, 123.86, 126.38, 126.55, 128.58, 129.85, 130.63, 135.03, 157.03, 160.37, 190.43. **IR** (KBr) 3080, 2985, 1690, 1602, 1307, 947, 892, 786 cm^{-1}. **MS** (EI, 70 eV) *m/z* (rel. intensity) 210 (M, 100), 181 (91).

Artocarpol D analog (9) and unsaturated ketone (10)[7]



9



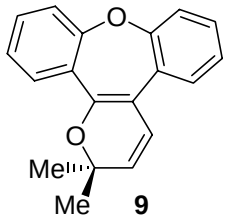
10

A stirred mixture of senecialdehyde **6** (0.4118 g, 4.902 mmol), allyl amine (400 μL, 5.34 mmol), oxepinone **8** (0.1712 g, 0.8152 mmol) and magnesium sulfate (1.0 g) in THF (20 mL) was heated at reflux for 8 h. The reaction mixture was allowed to cool to room temperature and was then filtered. The filter cake was washed with ether (10 mL) and the combined filtrates were concentrated *in vacuo*. The resultant oil was purified by flash chromatography using petroleum ether:dichloromethane (3:1) as the eluant to afford the artocarpol D analog **9** (0.0915 g, 40%) as a yellow oil and the unsaturated ketone **10** (0.0585 g, 26%) as a yellow oil. Artocarpol D analog **9**: **^{1}H NMR** (C_6D_6) δ

(6) Harris, T. W.; Smith, H. E.; Mobley, P. L.; Manier, D. H.; Sulser, F. *J. Med. Chem*. **1982**, *25*, 855.
(7) The numbering scheme is based on that used for artocarpol D **2**, see: Ko, H.-H.; Lin, C.-N.; Yang, S.-Z. *Helv. Chim. Acta* **2000**, *83*, 3000.

1.29 (s, 6H, *Me*-14, *Me*-15), 5.18 (d, *J* = 9.6 Hz, 1H, *H*-12), 6.10 (d, *J* = 9.6 Hz, 1H, *H*-11), 6.87-7.04 (m, 4H, Ar*H*), 7.10-7.14 (m, 3H, Ar*H*), 7.69 (dd, *J* = 7.7, 1.5 Hz, 1H, *H*-5). **^{13}C NMR** (C_6D_6) δ 27.08, 76.30, 112.61, 121.13, 121.36, 123.40, 124.85, 125.35, 126.71, 127.09, 128.33, 128.38, 128.97, 130.97, 131.12, 147.73, 157.42, 158.72. **IR** (ef) 3072, 2978, 1642, 1555, 1491, 1085, 884, 664 cm^{-1}. **MS** (CI) *m/z* (rel. intensity) 277 (M + H, 100). **Anal.** Calcd. for $C_{19}H_{16}O_2$: C, 82.58; H, 5.84; Found: C, 82.20; H, 5.91. Unsaturated ketone **10**: **^{1}H NMR** (C_6D_6) δ 1.38 (s, 3H, *Me*-14), 1.52 (s, 3H, *Me*-15), 6.18 (d, *J* = 12.1 Hz, 1*H*, *H*-12), 6.78-7.01 (m, 5H, Ar*H*), 7.16-7.20 (m, 2H, Ar*H*), 8.12 (d, *J* = 12.1 Hz, 1H, *H*-11), 8.31 (dd, *J* = 7.7, 1.5 Hz, 1H, *H*-5). **^{13}C NMR** (C_6D_6) δ 18.82, 26.74, 121.28, 121.35, 122.17, 125.00, 125.33, 129.27, 130.11, 132.32, 132.63, 134.32, 135.84, 136.86, 148.99, 157.94, 161.20, 187.80. **IR** (ef) 3073, 2907, 1649, 1610, 1550, 1102, 899, 635 cm^{-1}. **MS** (CI) m/z (rel. intensity) 277 (M + H, 100). **Anal.** Calcd. for $C_{19}H_{16}O_2$: C, 82.58; H, 5.84; Found: C, 82.43; H, 5.73.

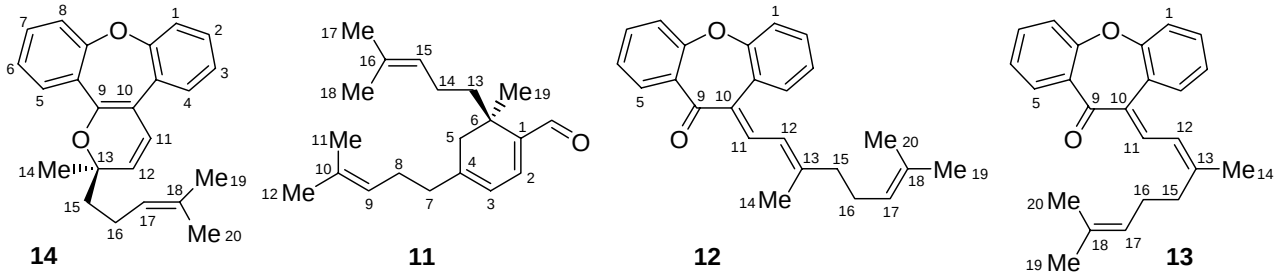
Artocarpol D analog (9) from unsaturated ketone (10)



9

A stirred mixture of the unsaturated ketone **10** (0.1304 g, 0.4724 mmol), allyl amine (100 μL, 1.34 mmol) and magnesium sulfate (0.30 g) in THF (10 mL) was heated at reflux for 8 h. The reaction mixture was allowed to cool to room temperature and was then filtered. The filter cake was washed with ether (10 mL) and the combined filtrates were concentrated *in vacuo*. The resultant oil was purified by flash chromatography using petroleum ether:dichloromethane (2:1) as the eluant to afford the artocarpol D analog **9** (0.1046 g, 80%) as a yellow oil.

2*H*-Pyran (14),[8] aldehyde (11), unsaturated ketone (12) and unsaturated ketone (13)



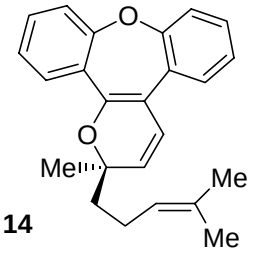
A stirred mixture of citral **5** (0.7962 g, 5.238 mmol), allyl amine (400 μL, 5.34 mmol), oxepinone **8** (0.1830 g, 0.8714 mmol) and magnesium sulfate (1.0 g) in THF (20 mL) was heated at reflux for 8 h. The reaction mixture was allowed to cool to room temperature and was then filtered. The filter cake was washed with ether (10 mL) and the combined filtrates were concentrated *in vacuo*. The resultant oil was purified by flash chromatography using petroleum ether:dichloromethane (3:1) as the eluant to afford the 2*H*-pyran **14** (0.1450 g, 50%) as a yellow oil, aldehyde **11** (0.1487 g, 20%) as an orange oil and a mixture (1:1.6) of the unsaturated ketones **12** and **13** (0.0821 g, 27%) as an orange oil. The unsaturated ketones **12** and **13** were then separated by repeated flash chromatography using chloroform as the eluant. 2*H*-pyran **14**: **^{1}H NMR** (C_6D_6) δ 1.28 (s, 3H, *Me*-14 or *Me*-19), 1.49 (s, 3H, *Me*-14 or *Me*-19), 1.67-1.84 (m, 2H, *H*-15), 1.68 (d, *J* = 1.3 Hz, 3H, *Me*-20), 2.14-2.32 (m, 2H, *H*-16), 5.12-5.17 (m, 1H, *H*-17), 5.19 (d, *J* = 9.9 Hz, 1H, *H*-12), 6.15 (d, *J* = 9.9 Hz, 1H, *H*-11), 6.87-7.01 (m, 4H, Ar*H*), 7.08-7.14 (m, 3H, Ar*H*), 7.72 (dd, *J* = 7.7, 1.7 Hz, 1H, *H*-5). **^{13}C NMR** (C_6D_6) δ 17.62, 23.23, 25.49, 25.78, 41.20, 78.86, 112.20, 121.14, 121.33, 123.81, 124.73, 124.85, 125.32, 125.54, 126.93, 129.01, 131.09, 131.51, 130.98, 147.90, 157.36, 158.74. **IR** (ef) 3073, 2852, 1727, 1644, 1557, 1013, 869, 752 cm^{-1}. **MS** (CI) *m*/*z* (rel. intensity) 345 (M + H, 100), 261 (8). **Anal.** Calcd. for $C_{24}H_{24}O_2$: C, 83.69; H, 7.02;

(8) The numbering scheme is based on that used for artocarpol A **1**, see: Chung, M.-I.; Ko, H.-H.; Yen, M.-H.; Lin, C.-N.; Yang, S.-Z.; Tsao, L.-T.; Wang, J.-P. *Helv. Chim. Acta* **2000**, *83*, 1200.

Found: C, 83.40; H, 7.07. Aldehyde **11**[9]: **^{1}H NMR** ($CDCl_3$) δ 1.19 (s, 3H, *Me*), 1.32-1.41 (m, 1H, 1 x *H*-13), 1.55 (s, 3H, *Me*), 1.62 (s, 3H, *Me*), 1.65 (s, 3H, *Me*), 1.69 (s, 3H, *Me*), 1.77-2.04 (m, 4H, 1 x *H*-5 + 1 x *H*-13 + 2 x *H*-14), 2.18-2.19 (m, 4H, 2 x *H*-7 + 2 x *H*-8), 2.33-2.38 (m, 1H, 1 x *H*-5), 5.03-5.10 (m, 2H, *H*-9 + *H*-15), 5.92 (d, *J* = 5.5 Hz, 1H, *H*-3), 6.67 (d, *J* = 5.5 Hz, 1H, *H*-2), 9.41 (s, 1H, C*H*O). **^{13}C NMR** ($CDCl_3$) δ 17.71, 17.89, 24.01, 25.36, 25.76, 36.38, 37.91, 38.52, 42.09, 118.09, 123.40, 124.89, 131.34, 132.54, 141.63, 146.01, 150.99, 193.47. **IR** (ef) 2963, 2711, 1680, 1560, 732 cm^{-1}. **MS** (CI) *m/z* (rel. intensity) 287 (M + H, 35), 229 (100). Unsaturated ketone **12** (minor isomer): **^{1}H NMR** (C_6D_6) δ 1.40 (s, 3H, *Me*-20), 1.59 (d, *J* = 0.9 Hz, 3H, *Me*-14 or *Me*-19), 1.61 (d, *J* = 1.2, 3H, *Me*-14 or *Me*-19), 1.83-1.92 (m, 4H, *H*-15, *H*-16), 4.96 (apparent t, *J* = 7.0 Hz, 1H, *H*-17), 6.28 (dd, *J* = 12.2, 1.2 Hz, 1H, *H*-12), 6.77-7.25 (m, 7H, Ar*H*), 8.18 (d, *J* = 12.2 Hz, 1H, *H*-11), 8.32 (dd, *J* = 7.6, 1.5 Hz, 1H, *H*-5). **^{13}C NMR** (C_6D_6) δ 17.41, 17.61, 25.72, 26.54, 40.89, 121.28, 121.41, 121.89, 123.99, 124.98, 125.25, 127.35, 129.29, 130.12, 131.79, 132.31, 132.69, 134.31, 136.11, 136.89, 152.47, 157.94, 161.18, 187.77. **IR** (ef) 2970, 2918, 1652, 1557, 1445, 1293, 1102, 890, 772 cm^{-1}. **MS** (CI) *m/z* (rel. intensity) 345 (M + H, 100), 251 (52), 127 (48). **Anal.** Calcd. for $C_{24}H_{24}O_2$: C, 83.69; H, 7.02; Found: C, 83.50; H, 7.08. Unsaturated ketone **13** (major isomer): **^{1}H NMR** (C_6D_6) δ 1.50 (d, *J* = 1.2 Hz, 3H, *Me*-14 or *Me*-19), 1.54 (s, 3H, *Me*-14 or *Me*-19), 1.63 (s, 3H, *Me*-20), 2.01-2.06 (m, 2H, *H*-16), 2.21-2.25 (m, 2H, *H*-15), 5.10 (apparent t, *J* = 7.3 Hz, 1H, *H*-17), 6.26 (apparent d, *J* = 12.2 Hz, 1H, *H*-12), 6.76-7.23 (m, 7H, Ar*H*), 8.22 (d, *J* = 12.2 Hz, 1H, *H*-11), 8.29 (dd, *J* = 7.9, 1.5 Hz, 1H, *H*-5). **^{13}C NMR** (C_6D_6) δ 17.70, 24.88, 25.77, 27.36, 33.27, 121.26, 121.37, 122.66, 123.82, 124.99, 125.30, 127.35, 129.28, 130.14, 132.31, 132.49, 132.69, 134.28, 135.86, 136.65, 152.72, 157.94, 161.18, 187.76. **IR** (ef) 2969, 2917, 1655, 1555, 1445, 1103, 895, 772 cm^{-1}. **MS** (CI) *m/z* (rel. intensity) 345 (M + H, 100). **Anal.** Calcd. for $C_{24}H_{24}O_2$: C, 83.69; H, 7.02; Found: C, 83.90; H, 7.09.

(9) Holst, P. B.; Anthoni, U.; Christophersen, C.; Nielsen, P. H.; Bock, K. *Acta Chem. Scand*. **1994**, *48*, 765 (all carbon signals in the ^{13}C NMR for aldehyde **11** were shifted by ~0.3 ppm from those reported).

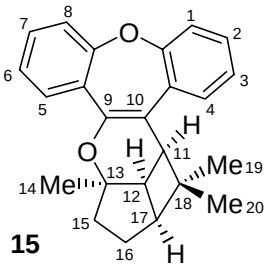
2*H*-Pyran (14) from unsaturated ketone (12) and unsaturated ketone (13)



14

A stirred mixture of the unsaturated ketones **12** and **13** (0.1365 g, 0.3968 mmol), allyl amine (90.0 μL, 1.20 mmol) and magnesium sulfate (0.30 g) in THF (10 mL) was heated at reflux for 8 h. The reaction mixture was allowed to cool to room temperature and was then filtered. The filter cake was washed with ether (10 mL) and the combined filtrates were concentrated *in vacuo*. The resultant oil was purified by flash chromatography using petroleum ether:dichloromethane (2:1) as the eluant to afford the 2*H*-pyran **14** (0.1092 g, 80%) as a yellow oil.

Artocarpol A analog (15)[10]

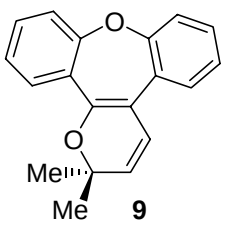


15

The reaction was performed in a quartz Schlenk flask: A solution of the 2*H*-pyran **14** (0.1454 g, 0.4226 mmol) and benzophenone (0.0744 g, 0.409 mmol) in benzene (80 mL) was deoxygenated by bubbling dry nitrogen through it for 2 h. The flask was then sealed and irradiated for 24 h using a Hanovia 450 W high-pressure mercury lamp. The reaction mixture was then concentrated *in vacuo* and the crude product was purified by flash chromatography using petroleum ether:dichloromethane (3:1) as the eluant. The

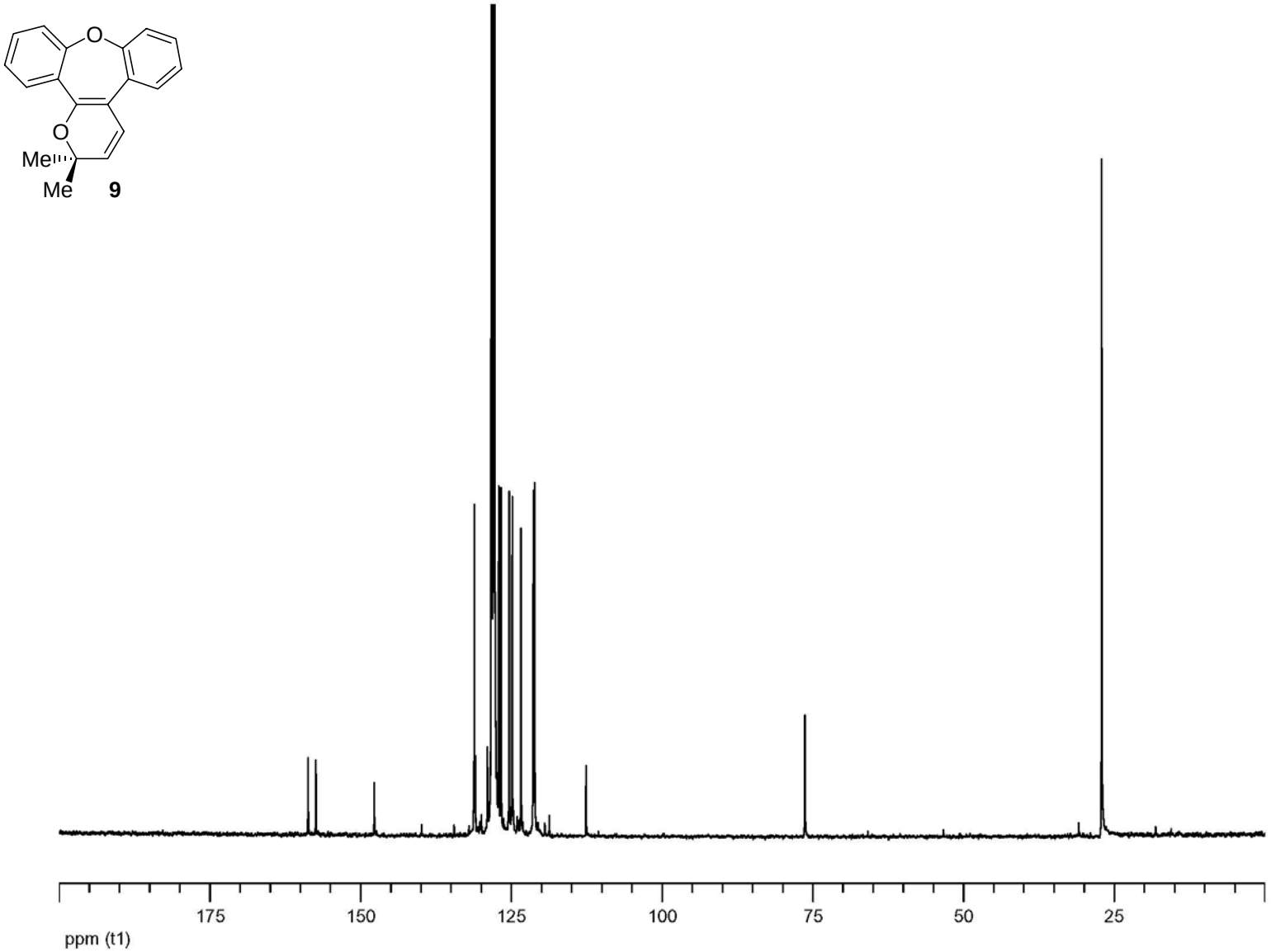
(10) Yamaguchi, S.; Shouji, N.; Kuroda, K. *Bull*. *Chem*. *Soc*. *Jpn*. **1995**, *68*, 305.

first fraction (0.0988 g) to elute contained a mixture (3:1) of the artocarpol A analog **15** and unreacted starting material **14**. The second fraction (0.0150 g, 10%) to elute contained a mixture (1:1) of the unsaturated ketones **12** and **13**. The first fraction was then purified by repetitive fractional recrystallization from hexanes to afford the artocarpol A analog **15** (0.0655 g, 45%) as white crystals and the starting material **14** (0.0220 g, 15%). **M.p.** 184-186 °C, hexanes. **^{1}H NMR** ($CDCl_3$) δ 0.61 (s, 3H, *Me*-20), 1.34 (s, 3H, *Me*-19), 1.44 (s, 3H, *Me*-14), 1.60-1.69 (m, 2H, *H*-15α, *H*-16α), 1.74-1.81 (m, 1H, *H*-15β), 2.32-2.42 (m, 2H, *H*-16β, *H*-17), 2.77 (apparent t, *J* = 9.4 Hz, 1H, *H*-12), 3.26 (d, *J* = 9.4 Hz, 1H, *H*-11), 7.06-7.31 (m, 7H, Ar*H*), 7.56 (dd, *J* = 8.0, 1.5 Hz, 1H, *H*-5). **^{13}C NMR** ($CDCl_3$) δ 18.61, 25.99, 27.01, 34.29, 38.58, 39.57, 39.81, 40.80, 46.84, 83.59, 114.11, 120.29, 121.04, 124.76, 126.48, 126.99, 127.49, 129.77, 130.30, 132.70, 147.80, 157.18, 158.40. **IR** (KBr) 3073, 2953, 2858, 1618, 1484, 1217, 1139, 1016, 909, 772 cm^{-1}. **MS** (CI) *m/z* (rel. intensity) 345 (M + H, 66), 249 (27), 97 (27), 81 (100). **Anal.** Calcd. for $C_{24}H_{24}O_2$: C, 83.69; H, 7.02; Found: C, 83.55; H, 7.03.

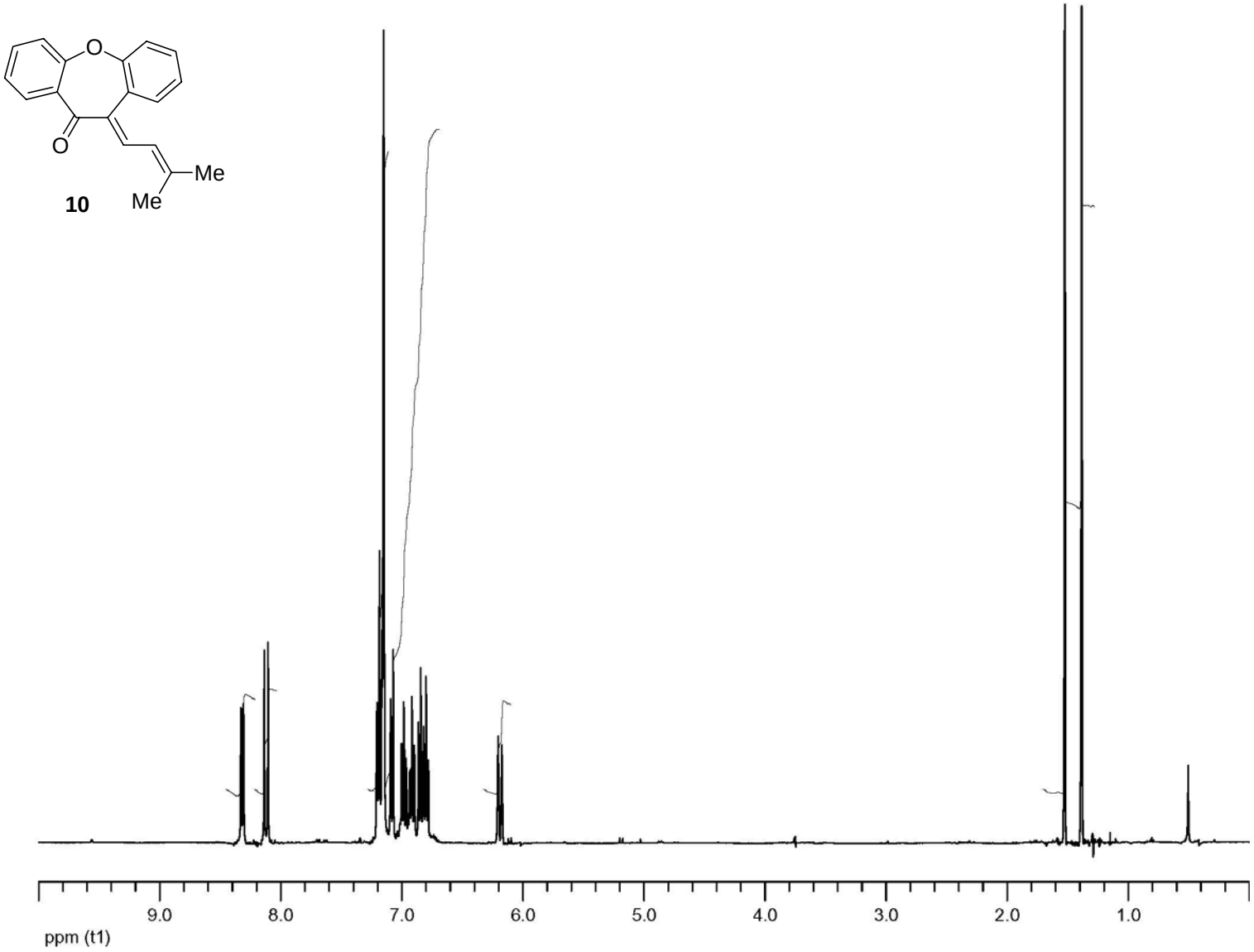


9

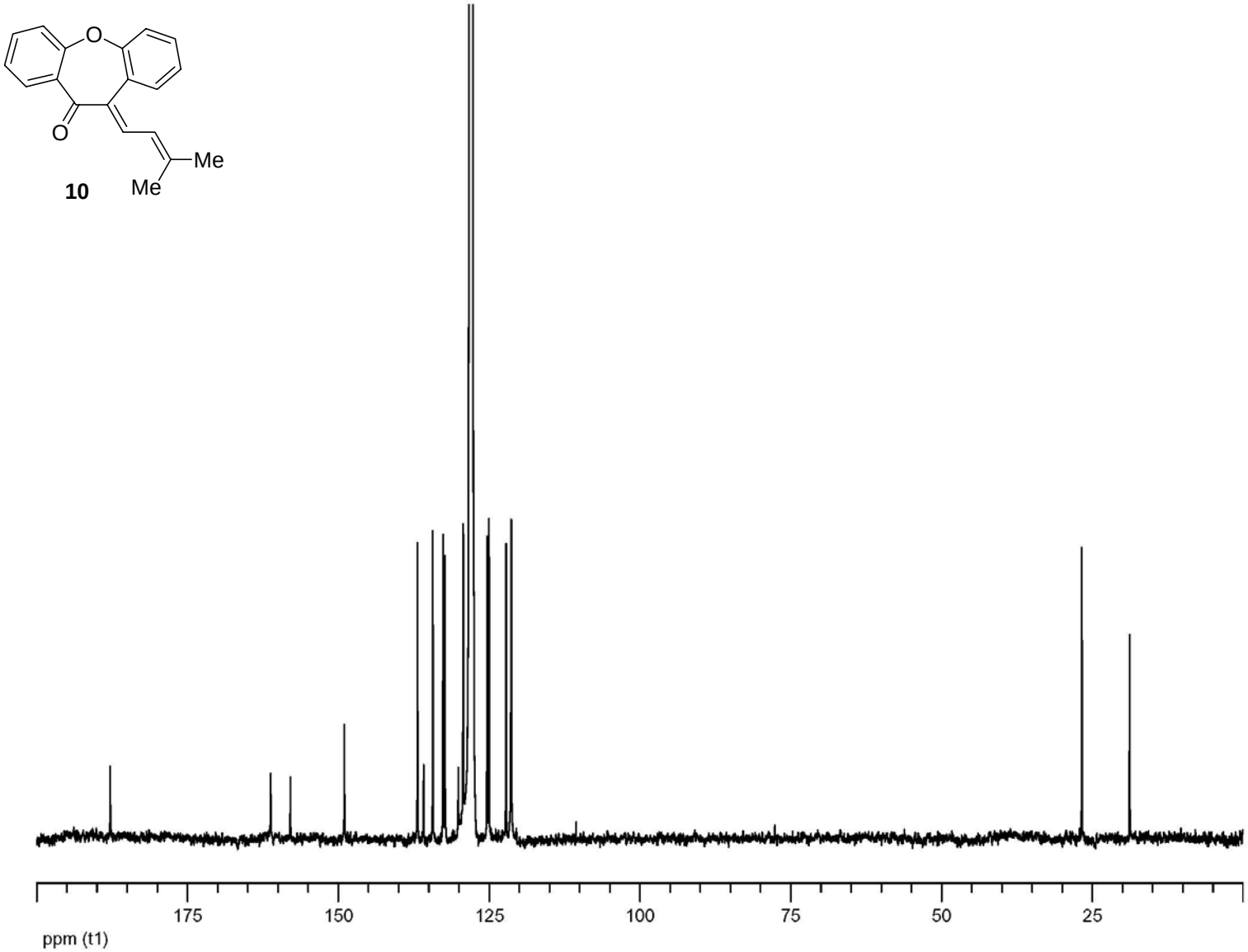
^{1}H NMR spectrum (C_6D_6) of artocarpol D analog **9**



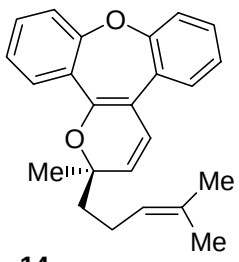
^{13}C NMR spectrum (C_6D_6) of artocarpol D analog **9**



^{1}H NMR spectrum (C_6D_6) of unsaturated ketone **10**

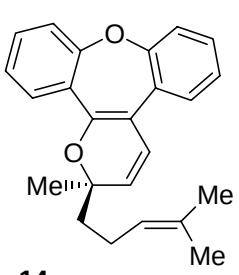


^{13}C NMR spectrum (C_6D_6) of unsaturated ketone **10**



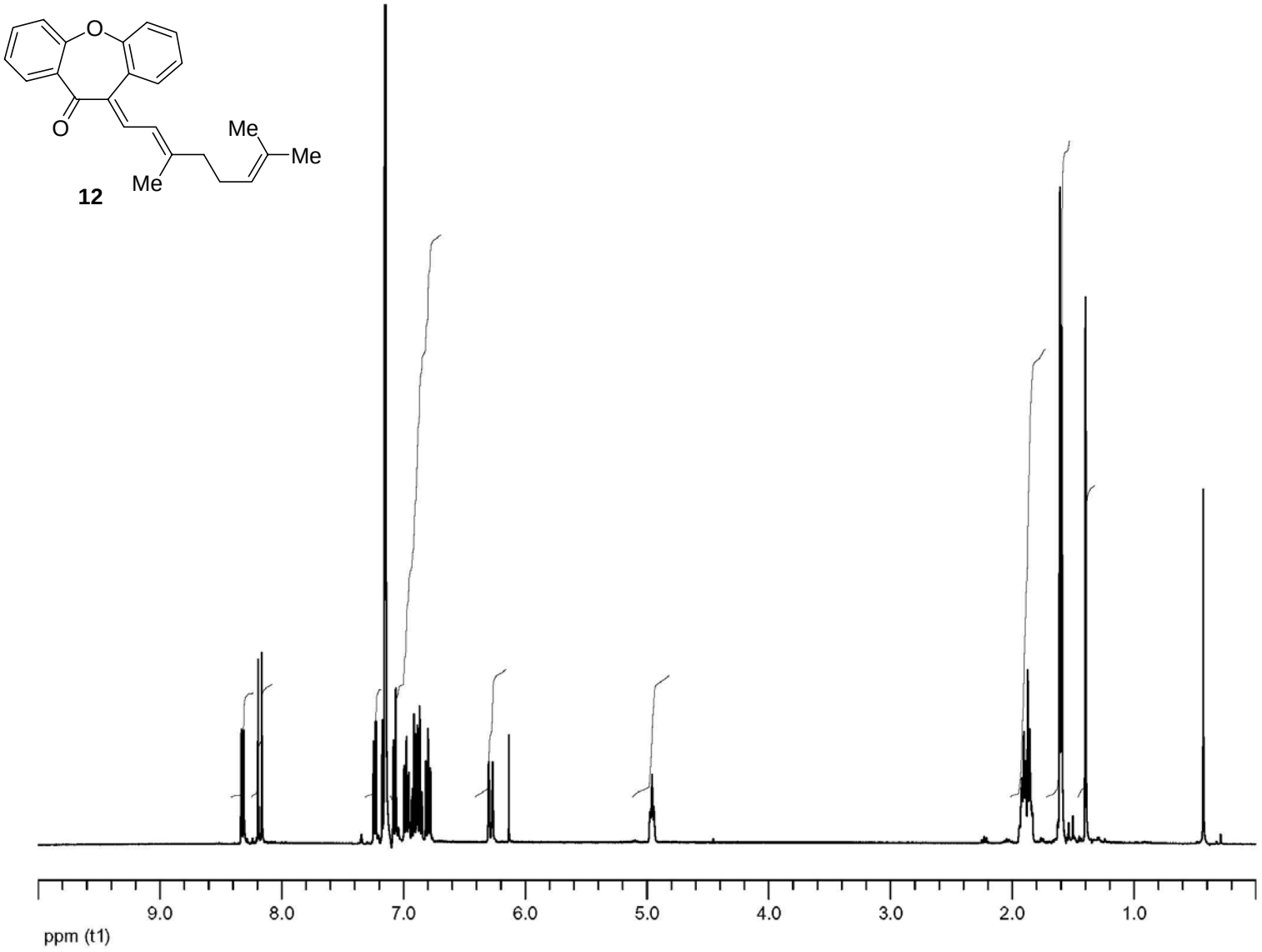
14

^{1}H NMR spectrum (C_6D_6) of 2*H*-pyran **14**

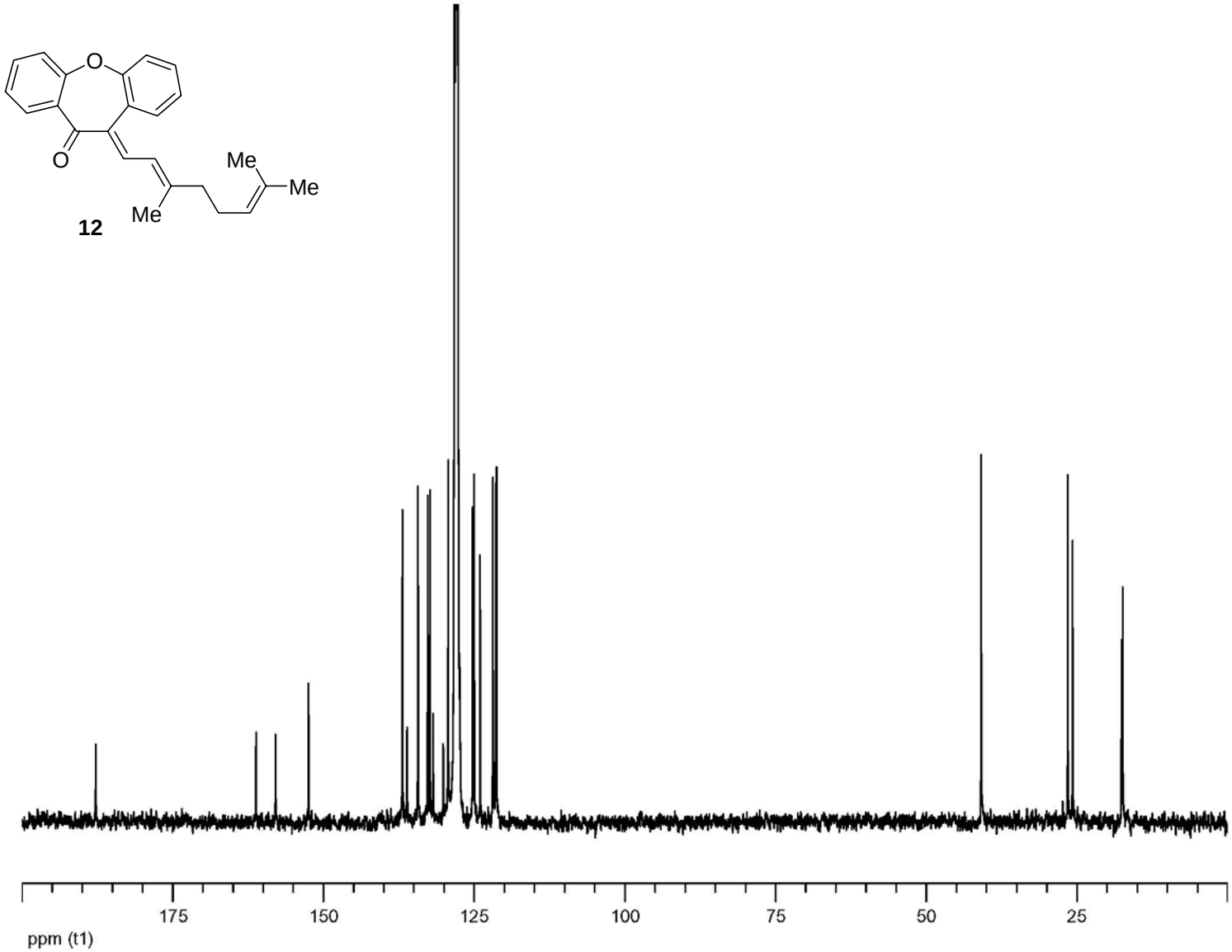


14

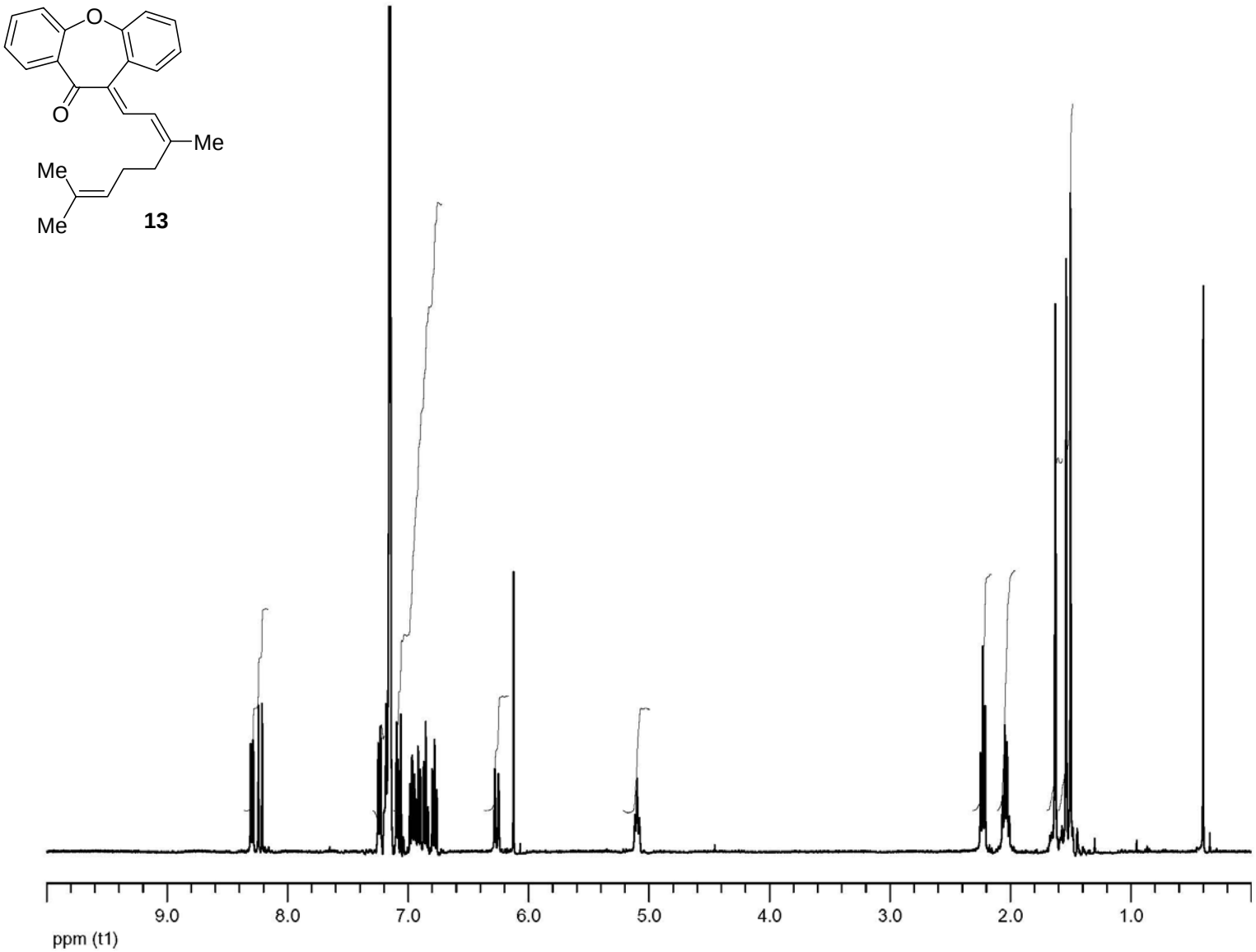
^{13}C NMR spectrum (C_6D_6) of 2*H*-pyran **14**



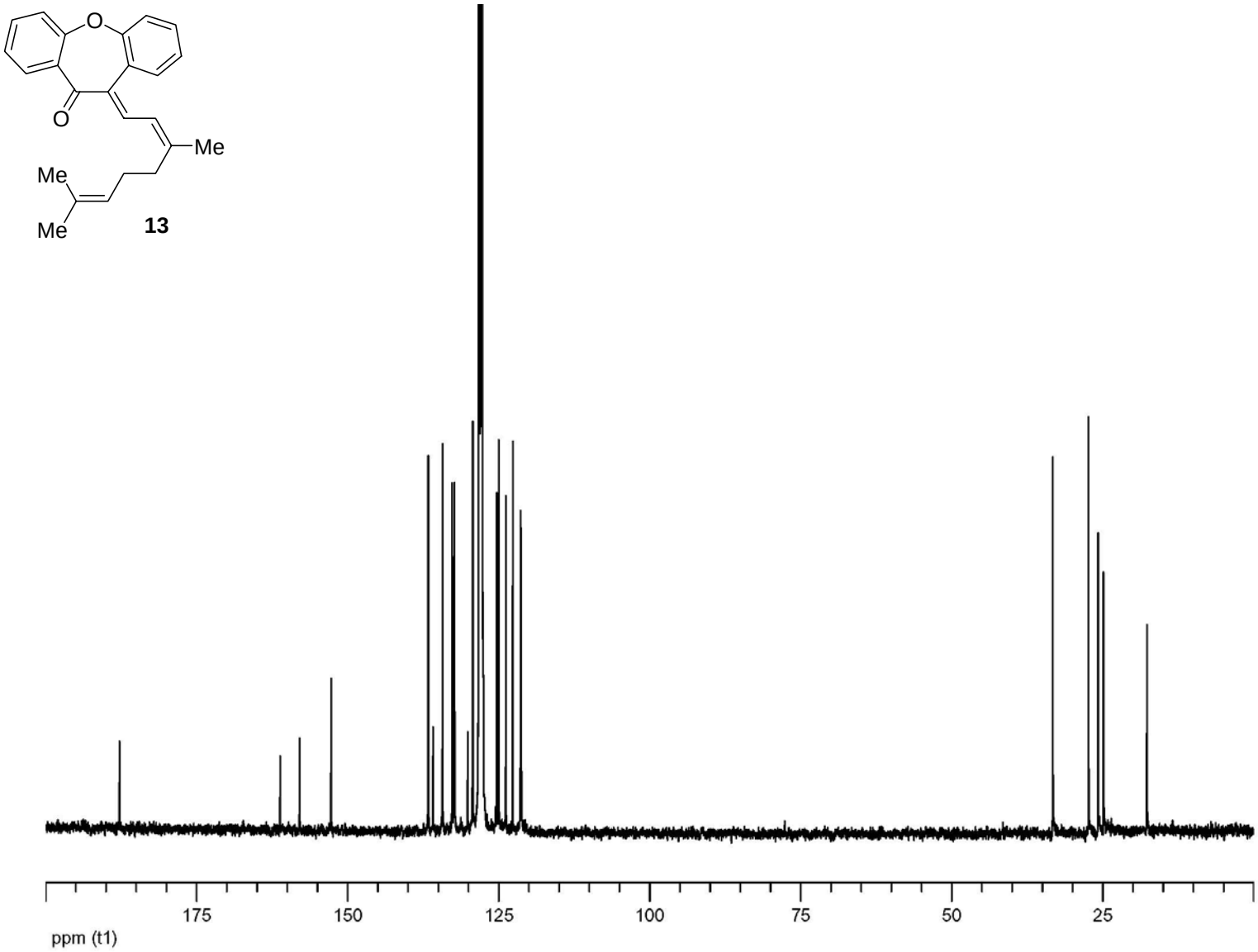
^{1}H NMR spectrum (C_6D_6) of unsaturated ketone **12** (minor isomer)



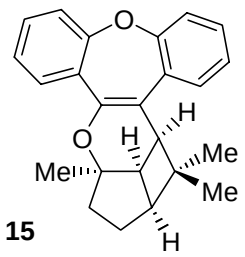
^{13}C NMR spectrum (C_6D_6) of unsaturated ketone **12** (minor isomer)



^{1}H NMR spectrum (C_6D_6) of unsaturated ketone **13** (major isomer)

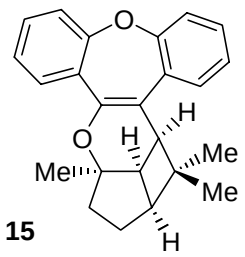


^{13}C NMR spectrum (C_6D_6) of unsaturated ketone **13** (major isomer)



15

^{1}H NMR spectrum ($CDCl_3$) of artocarpol A analog **15**



15

^{13}C NMR spectrum ($CDCl_3$) of artocarpol A analog **15**