



Supporting Information

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Cooperative Co-Existence: Effective Interplay of Two Brønsted Acids in the Asymmetric Synthesis of Isoquinuclidines

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General: Unless otherwise noted, all materials were obtained from commercial suppliers and were used without further purification. Solvents for extraction and chromatography were technical grade and distilled prior to use. Solvents used in reactions were reagent grade and distilled from the indicated drying agents: CH₂Cl₂ (CaH₂), CHCl₃ (CaH₂), mesitylene (P₂O₅), MeCN (CaH₂), benzene (Na), toluene (Na). For thin-layer chromatography (TLC), silica gel plates coated aluminium plates (Merck, silica gel 60 F₂₅₄) were used and chromatograms were visualised by irradiation with UV light at 254 nm. Column chromatography was performed using Merck silica gel 60 (particle size 0.040-0.063 mm). Solvent mixtures are understood as volume/volume.

¹H-NMR and ¹³C-NMR were recorded on a Bruker AM 250 spectrometer in CDCl₃. Data are reported in the following order: chemical shift (δ) in ppm; multiplicities are indicated (bs (broadened singlet), s (singlet), d (doublet), t (triplet), q (quartet), m (multiplet)); coupling constants (*J*) are in Hertz (Hz). Electron spray ionization (ESI) mass spectra were obtained with VG Platform II (Fisons Instruments) instrument. Matrix assisted laser desorption ionization (MALDI) mass spectra were obtained with VG ToFSpec (Fisons Instruments) instrument. IR spectra were recorded on a Jasco FT/IR-420 spectrometer and are reported in terms of frequency of absorption (cm⁻¹). The enantiomeric excesses were determined by HPLC analysis using a chiral stationary phase column (column, Daicel Co. CHIRALCEL OD-H and CHIRALPAK AD-H; eluent: hexane / 2-propanol). The chiral HPLC method were calibrated with the corresponding racemic mixtures. Optical rotations were measured on a Perkin Elmer 241 polarimeter.

Determination of the Absolute Configuration

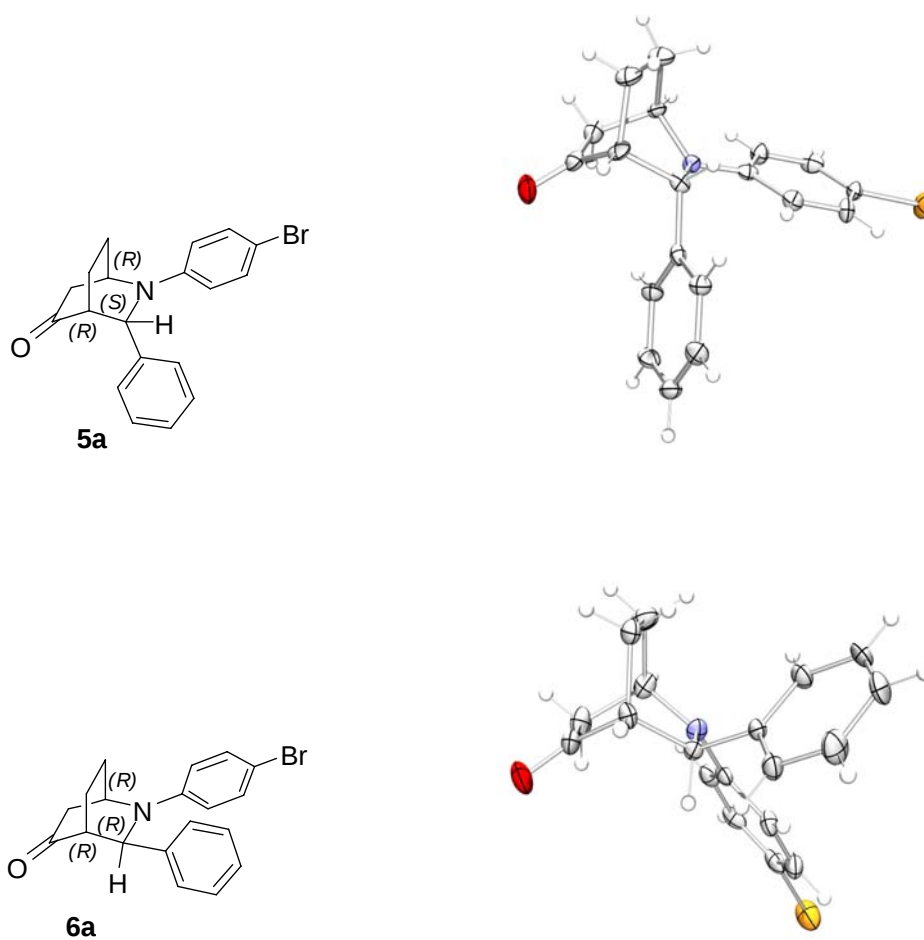


Figure 1: X-ray Crystal Structures of compound 5a and 6a.

General Procedure: In a typical experiment the imine (0.3 mmol), cyclohexenone (2.4 mmol) and 10 mol% of catalyst *BH **1** were dissolved in 1 ml toluene containing 20 mol% of acetic acid. The reaction mixture was allowed to stir at ambient temperature until completion was observed by TLC. The solvent was evaporated in vacuo, and the residue was purified by column chromatography on silica gel (ethyl acetate/hexane (1:4) as eluent) to afford the pure bicyclic products. The yields and enantiomeric excesses are given in table 2.

(1R,3S,4R)-2-(4-Bromo-phenyl)-3-phenyl-2-aza-bicyclo[2.2.2]octan-5-one (**5a**)

¹H-NMR (CDCl₃): δ = 7.32-7.11 (m, 7H), 6.45 (d, *J* = 9.0 Hz, 2H), 4.53 (d, *J* = 2.5 Hz, 1H), 4.47-4.37 (bs, 1H), 2.77-2.61 (m, 2H), 2.39 (dd, *J* = 18.9, 2.6 Hz, 1H), 2.26-1.89 (m, 3H), 1.78-1.58 (m, 1H); ¹³C-NMR (CDCl₃): δ = 211.1, 147.1, 141.1, 132.0, 129.1, 127.8, 125.5, 115.0, 109.8, 65.9, 52.1, 48.9, 45.8, 22.8, 22.6; MS (ESI): *m/z* = 356 ([M⁺], Br pattern); IR (KBr): 3059, 3025, 3007, 2963, 2949, 2932, 2911, 2869, 1725, 1586, 1492, 1364, 1211 cm⁻¹; yellowish solid, mp.: 120 °C; HPLC conditions: OD-H column, *n*-hexane/2-propanol = 90/10, flow rate = 0.6 mL min⁻¹, major enantiomer: *t_R* = 22,99 min; minor enantiomer: *t_R* = 26,15 min; [α]_D²⁵ = -58.1 (c = 1, CHCl₃).

(1R,3S,4R)-2-(4-Bromo-phenyl)-3-(4-trifluoromethyl-phenyl)-2-aza-bicyclo[2.2.2]octan-5-one (**5b**)

¹H-NMR (CDCl₃) δ = 7.51 (d, *J* = 8.2 Hz, 2H), 7.31 (d, *J* = 8.2 Hz, 2H), 7.22-7.15 (m, 2H), 6.42 (d, *J* = 9.1 Hz, 2H), 4.58 (d, *J* = 1.8 Hz, 1H), 4.48-4.39 (bs, 1H), 2.76-2.60 (m, 2H), 2.42 (dd, *J* = 19.0, 2.6 Hz, 1H), 2.26-1.92 (m, 3H), 1.79-1.62 (m, 1H); ¹³C-NMR (CDCl₃) δ = 210.4, 146.7, 145.2, 132.1, 126.2, 126.1, 126.0, 115.1, 110.4, 65.4, 51.9, 49.1, 45.8, 22.7, 22.5; MS (ESI): *m/z* = 424 ([M⁺] Br pattern); IR (KBr): 3100, 3072, 2964, 2917, 2873, 2846, 1741, 1590, 1496, 1325, 1125, 1066, 823 cm⁻¹; white solid, mp.: 187 °C; HPLC conditions: AD-H column, *n*-hexane/2-propanol = 80/20, flow rate = 1.0 mL min⁻¹, major enantiomer: *t_R* = 6,32 min; minor enantiomer: *t_R* = 8,07 min; [α]_D²⁵ = -35.2 (c = 1, CHCl₃).

(1*R*,3*S*,4*R*)-2-(4-Bromo-phenyl)-3-thiophen-2-yl-2-aza-bicyclo[2.2.2]octan-5-one (**5c**)

¹H-NMR (CDCl₃) δ = 7.20 (d, *J* = 9.1 Hz, 2H), 7.08 (dd, *J* = 4.2, 2.1 Hz, 1H), 6.90-6.83 (m, 2H), 6.57 (d, *J* = 9.1 Hz, 2H), 4.76 (d, *J* = 3.0 Hz, 1H), 4.37-4.28 (bs, 1H), 2.86-2.67 (m, 2H), 2.39 (dd, *J* = 18.9, 2.8 Hz, 1H), 2.21-1.86 (m, 3H), 1.72-1.53 (m, 1H); ¹³C-NMR (CDCl₃) δ = 210.9, 147.0, 146.9, 132.0, 127.5, 124.7, 123.4, 115.1, 110.3, 62.4, 52.7, 49.0, 45.8, 22.2, 22.1; IR (Film): 3088, 3011, 2952, 2931, 2868, 2839, 1730, 1587, 1492, 1322, 1277, 1222, 806, 728 cm⁻¹; MS (ESI): *m/z* = 362 ([M+H]⁺, Br pattern); yellow oil; HPLC conditions: OD-H column, *n*-hexane/2-propanol = 90/10, flow rate = 0.6 mL min⁻¹, major enantiomer: *t*_R = 29,49 min; minor enantiomer: *t*_R = 27,46 min; [α]_D²⁵ = -44.1 (*c* = 1, CHCl₃).

(1*R*,3*S*,4*R*)-2-(4-Bromo-phenyl)-3-(4-chloro-phenyl)-2-aza-bicyclo[2.2.2]octan-5-one (**5d**)

¹H-NMR (CDCl₃) δ = 7.33-7.03 (m, 6H), 6.42 (d, *J* = 8.9 Hz, 2H), 4.49 (d, *J* = 2.0 Hz, 1H), 4.44-4.33 (bs, 1H), 2.72-2.55 (m, 2H), 2.38 (dd, *J* = 18.9, 2.2 Hz, 1H), 2.23-1.86 (m, 3H), 1.77-1.59 (m, 1H); ¹³C-NMR (CDCl₃) δ = 210.7, 146.8, 139.7, 133.5, 132.0, 129.3, 127.0, 115.1, 110.2, 65.3, 52.0, 49.0, 45.8, 22.7, 22.4; MS (ESI): *m/z* = 390 ([M]⁺, Br and Cl pattern); IR (KBr): 2936, 2872, 1723, 1586, 1492, 1339, 1220, 812, 799 cm⁻¹; yellow solid, mp.: 168 °C; HPLC conditions: OD-H column, *n*-hexane/2-propanol = 90/10, flow rate = 0.6 mL min⁻¹, major enantiomer: *t*_R = 29,25 min; minor enantiomer: *t*_R = 32,42 min; [α]_D²⁵ = -65.8 (*c* = 1, CHCl₃).

(1*R*,3*S*,4*R*)-2-(4-Bromo-phenyl)-3-pyren-4-yl-2-aza-bicyclo[2.2.2]octan-5-one (**5e**)

¹H-NMR (CDCl₃) δ = 8.20-8.06 (m, 4H), 8.04-7.86 (m, 5H), 7.06 (d, *J* = 8.9 Hz, 2H), 6.44 (d, *J* = 8.9 Hz, 2H), 5.56 (d, *J* = 1.4 Hz, 1H), 4.65-4.56 (bs, 1H), 3.06-2.90 (m, 2H), 2.49 (dd, *J* = 19.0, 1.9 Hz, 1H), 2.39-2.20 (m, 2H), 2.15-1.99 (m, 1H), 1.90-1.74 (m, 1H); ¹³C-NMR (CDCl₃) δ = 210.8, 146.9, 133.8, 132.0, 131.4, 131.1, 130.6, 128.4, 127.6, 127.4, 126.7, 126.2, 125.7, 125.6, 125.5, 125.4, 125.0, 123.0, 121.1, 115.4, 110.1, 63.4, 51.2, 49.3, 45.4, 23.3, 22.7; IR (KBr): 3039, 2922, 2852, 1725, 1589, 1492, 1226, 1083, 849, 818 cm⁻¹; MS (MALDI): *m/z* = 480 ([M]⁺, Br pattern); brown solid mp: > 250 °C; HPLC conditions: OD-H column, *n*-hexane/2-propanol = 80/20, flow rate = 1.0 mL min⁻¹, major enantiomer: *t*_R = 16,38 min; minor enantiomer: *t*_R = 21,59 min; [α]_D²⁵ = +127.5 (*c* = 1, CHCl₃).

(1*R*,3*S*,4*R*)-2-(4-Bromo-phenyl)-3-(2,3-dimethoxy-phenyl)-2-aza-bicyclo[2.2.2]octan-5-one (5f)

¹H-NMR (CDCl₃) δ = 7.14 (d, *J* = 9.1 Hz, 2H), 6.89-6.68 (m, 3H), 6.43 (d, *J* = 9.0 Hz, 2H), 4.82 (d, *J* = 2.2 Hz, 1H), 4.42-4.34 (bs, 1H), 3.88 (s, 3H), 3.79 (s, 3H), 2.78-2.64 (m, 2H), 2.37 (dd, *J* = 18.9, 2.3 Hz, 1H), 2.20-1.83 (m, 3H), 1.75-1.59 (m, 1H); ¹³C-NMR (CDCl₃) δ = 211.7, 152.7, 147.1, 145.5, 134.4, 131.9, 124.2, 118.1, 115.0, 112.1, 109.7, 61.2, 60.6, 55.8, 50.2, 49.1, 45.6, 23.1, 22.5; IR (KBr): 2937, 2833, 1726, 1587, 1493, 1480, 1345, 1272, 1227, 1066, 998, 817, 761 cm⁻¹; MS (ESI): *m/z* = 416 ([M⁺], Br pattern); yellowish solid, mp.: 172 °C; HPLC conditions: AD-H column, *n*-hexane/2-propanol = 90/10, flow rate = 0.6 mL min⁻¹, major enantiomer: *t_R* = 14,88 min; minor enantiomer: *t_R* = 17,12 min; [α]_D²⁵ = +12.0 (*c* = 1, CHCl₃).

(1*R*,3*S*,4*R*)-3-Biphenyl-4-yl-2-(4-bromo-phenyl)-2-aza-bicyclo[2.2.2]octan-5-one (5g)

¹H-NMR (CDCl₃) δ = 7.59-7.40 (m, 4H), 7.38-7.10 (m, 7H), 6.46 (d, *J* = 9.0 Hz, 2H), 4.54 (d, *J* = 2.4 Hz, 1H), 4.46-4.34 (bs, 1H), 2.88-2.57 (m, 2H), 2.37 (dd, *J* = 18.9, 2.5 Hz, 1H), 2.24-1.84 (m, 3H), 1.75-1.52 (m, 1H); ¹³C-NMR (CDCl₃) δ = 211.2, 147.1, 140.6, 140.1, 132.0, 128.8, 127.8, 127.3, 127.1, 126.0, 115.1, 109.9, 65.7, 52.1, 48.9, 45.8, 22.8, 22.6; IR (KBr): 3026, 2944, 2868, 1731, 1588, 1492, 1371, 1337, 1277, 1227, 810, 765 cm⁻¹; MS (MALDI): *m/z* = 432 ([M⁺], Br pattern); white solid, mp.: 115 °C; HPLC conditions: OD-H column, *n*-hexane/2-propanol = 80/20, flow rate = 0.6 mL min⁻¹, major enantiomer: *t_R* = 22,50 min; minor enantiomer: *t_R* = 30,97 min; [α]_D²⁵ = -100.3 (*c* = 1, CHCl₃).

(1*R*,3*S*,4*R*)-2-(4-Bromo-phenyl)-3-(2-fluoro-phenyl)-2-aza-bicyclo[2.2.2]octan-5-one (5h)

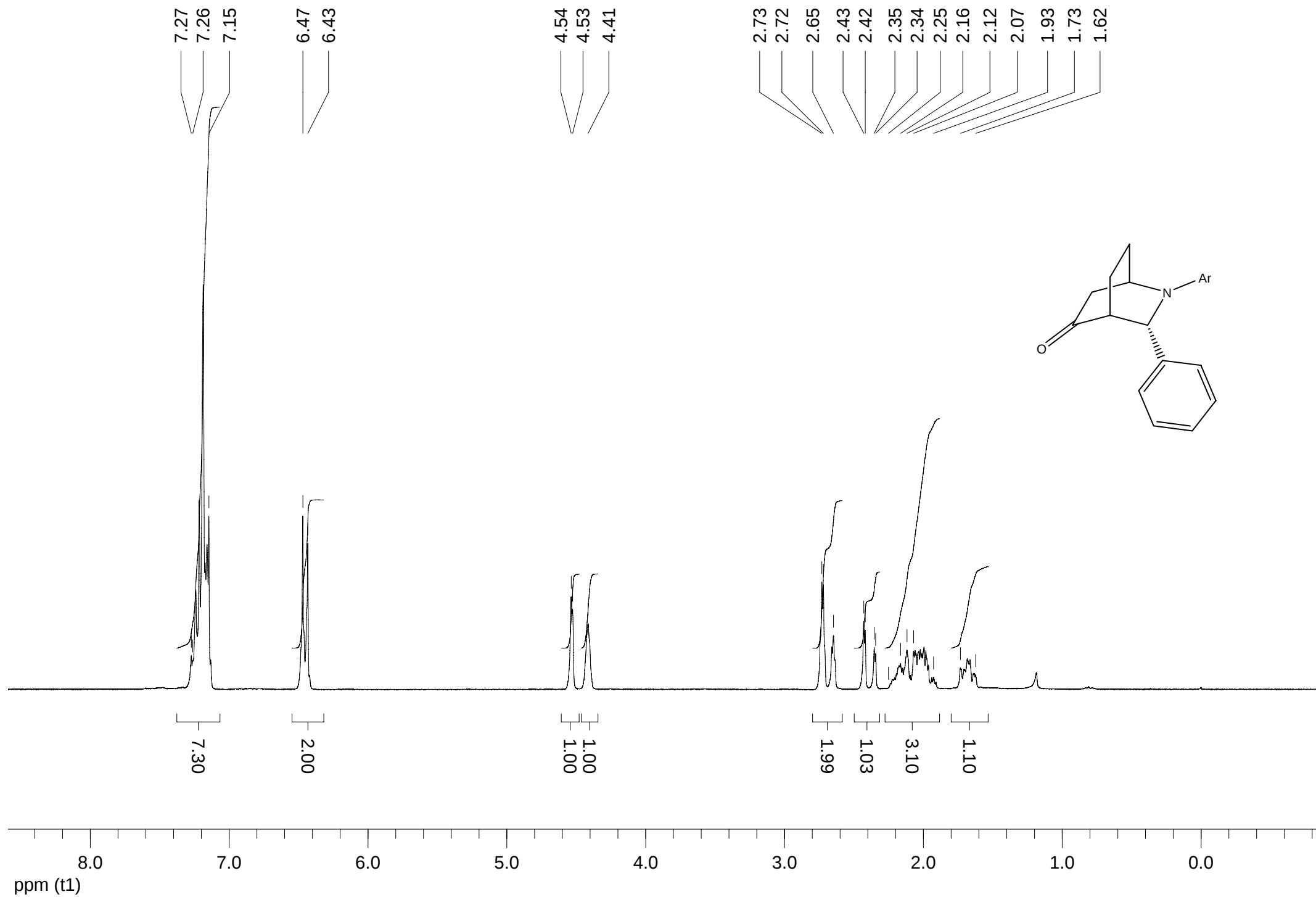
¹H-NMR (CDCl₃) δ = 7.22-7.09 (m, 4H), 7.04-6.89 (m, 2H), 6.43 (d, *J* = 9.1 Hz, 2H), 4.82 (d, *J* = 2.0 Hz, 1H), 4.45-4.37 (bs, 1H), 2.85-2.76 (m, 1H), 2.75-2.60 (m, 1H), 2.40 (dd, *J* = 18.9, 2.5 Hz, 1H), 2.24-1.86 (m, 3H), 1.76-1.58 (m, 1H); ¹³C-NMR (CDCl₃) δ = 211.0, 161.7, 157.8, 146.7, 132.0, 129.5, 129.4, 127.9, 127.7, 127.2, 127.1, 124.7, 124.6, 116.1, 115.8, 115.0, 110.1, 60.1, 49.8, 49.1, 45.6, 23.0, 22.3; IR (KBr): 2931, 2871, 1729, 1587, 1494, 1265, 1223, 805, 775 cm⁻¹; MS (ESI): *m/z* = 374 ([M⁺], Br pattern); yellow solid, mp.: 150 °C. HPLC conditions: OD-H column, *n*-hexane/2-propanol = 95/5, flow rate = 0.6 mL min⁻¹, major enantiomer: *t_R* = 21,85 min; minor enantiomer: *t_R* = 33,75 min; [α]_D²⁵ = -35.3 (*c* = 1, CHCl₃).

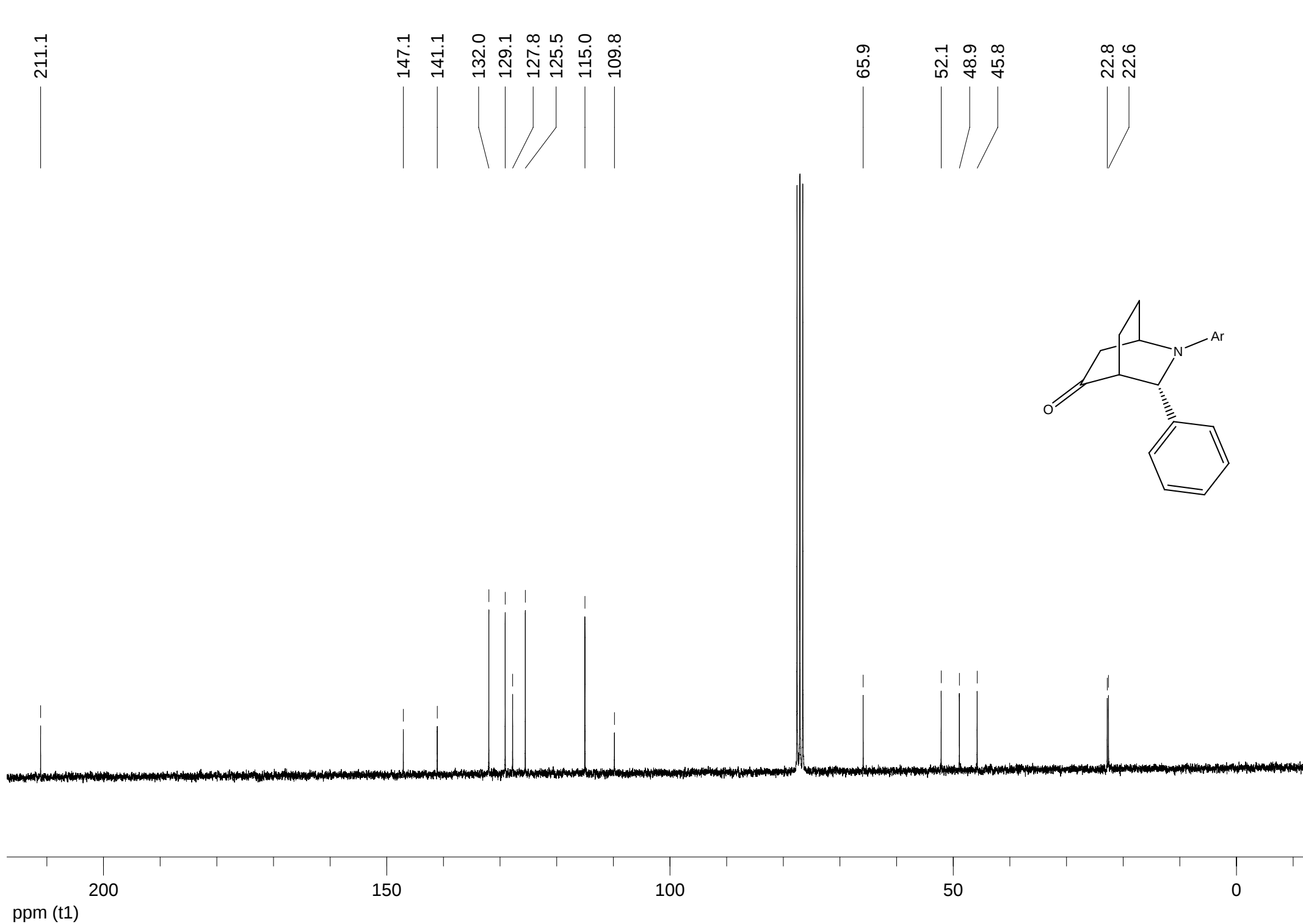
(1*R*,3*S*,4*R*)-2-(4-Bromo-phenyl)-3-(3-chloro-phenyl)-2-aza-bicyclo[2.2.2]octan-5-one (**5i**)

¹H-NMR (CDCl₃) δ = 7.28-7.01 (m, 6H), 6.43 (d, *J* = 9.0 Hz, 2H), 4.54-4.47 (bs, 1H), 4.45-4.34 (bs, 1H), 2.74-2.59 (m, 2H), 2.39 (dd, *J* = 19.0, 2.3 Hz, 1H), 2.22-1.88 (m, 3H), 1.78-1.57 (m, 1H); ¹³C-NMR (CDCl₃) δ = 210.6, 146.8, 143.4, 135.1, 132.1, 130.4, 128.1, 125.8, 123.7, 115.1, 110.3, 65.5, 51.9, 49.0, 45.8, 22.7, 22.5; MS (ESI): *m/z* = 390 ([M⁺] Br and Cl pattern); IR (KBr): 2958, 2911, 2873, 1722, 1587, 1493, 1221, 815, 794 cm⁻¹; white solid, mp.: 167 °C; HPLC conditions: OD-H column, *n*-hexane/2-propanol = 90/10, flow rate = 0.6 mL min⁻¹, major enantiomer: *t_R* = 24,42 min; minor enantiomer: *t_R* = 29,19 min; [α]_D²⁵ = -47.3 (c = 1, CHCl₃).

(1*R*,3*S*,4*R*)-2-(4-Bromo-phenyl)-3-(3,4,5-trimethoxy-phenyl)-2-aza-bicyclo[2.2.2]octan-5-one (**5j**)

¹H-NMR (CDCl₃) δ = 7.18 (d, *J* = 9.0 Hz, 2H), 6.47 (d, *J* = 9.0 Hz, 2H), 6.40 (bs, 2H), 4.45-4.36 (bs, 2H), 3.74 (s, 3H), 3.71 (s, 6H), 2.75-2.59 (m, 2H), 2.40 (dd, *J* = 18.8, 2.3 Hz, 1H), 2.24-1.86 (m, 3H), 1.74-1.55 (m, 1H); ¹³C-NMR (CDCl₃) δ = 211.1, 153.7, 147.2, 137.2, 137.0, 131.9, 115.2, 110.1, 102.3, 66.4, 60.8, 56.1, 52.1, 48.8, 45.7, 22.5, 22.4; IR (KBr): 2935, 2869, 2836, 1732, 1590, 1493, 1457, 1416, 1327, 1231, 1125, 809 cm⁻¹; MS (ESI): *m/z* = 446 ([M⁺], Br pattern); yellow solid, mp.: 69 °C; HPLC conditions: OD-H column, *n*-hexane/2-propanol = 80/20, flow rate = 0.6 mL min⁻¹, major enantiomer: *t_R* = 19,99 min; minor enantiomer: *t_R* = 28,75 min; [α]_D²⁵ = -32.7 (c = 1, CHCl₃).





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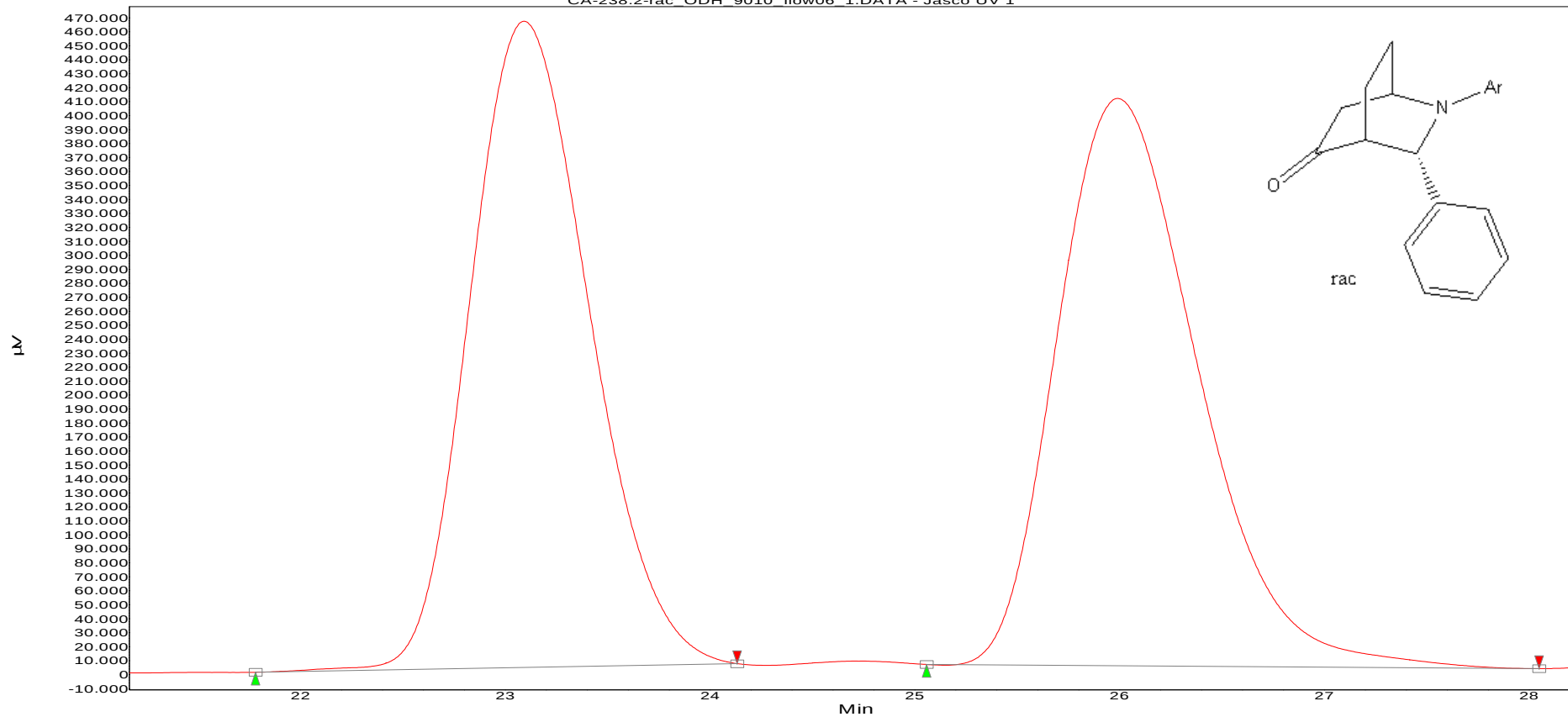
Date: 11.07.2006 15:00:18

Column: ODH

Flow: 0.6 mL/min

Run time: 34,90 min

CA-238.2-rac_ODH_9010_flow06_1.DATA - Jasco UV 1



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2	25,057	25,992	28,048	50,788
Total				100,000

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Method: ODH_9010_flow06_acq50

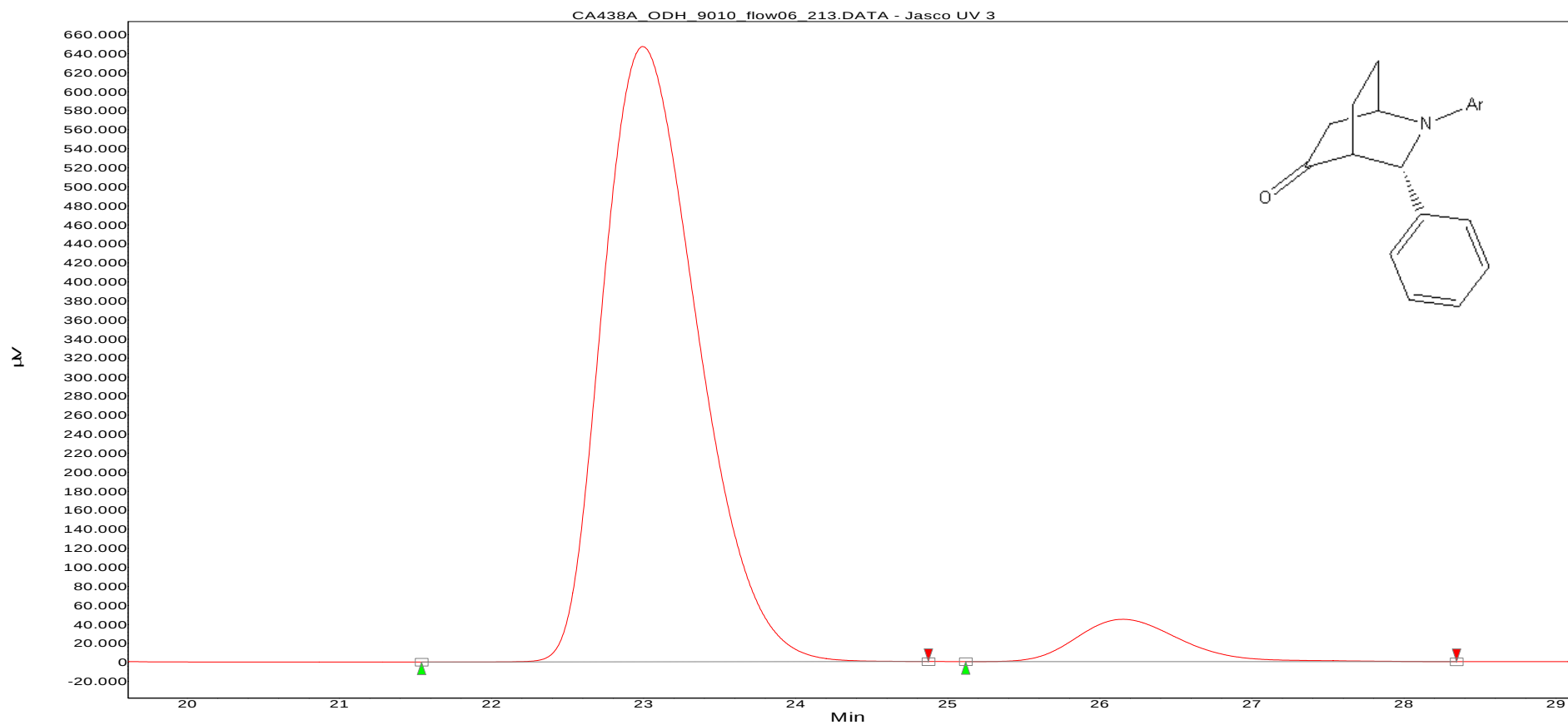
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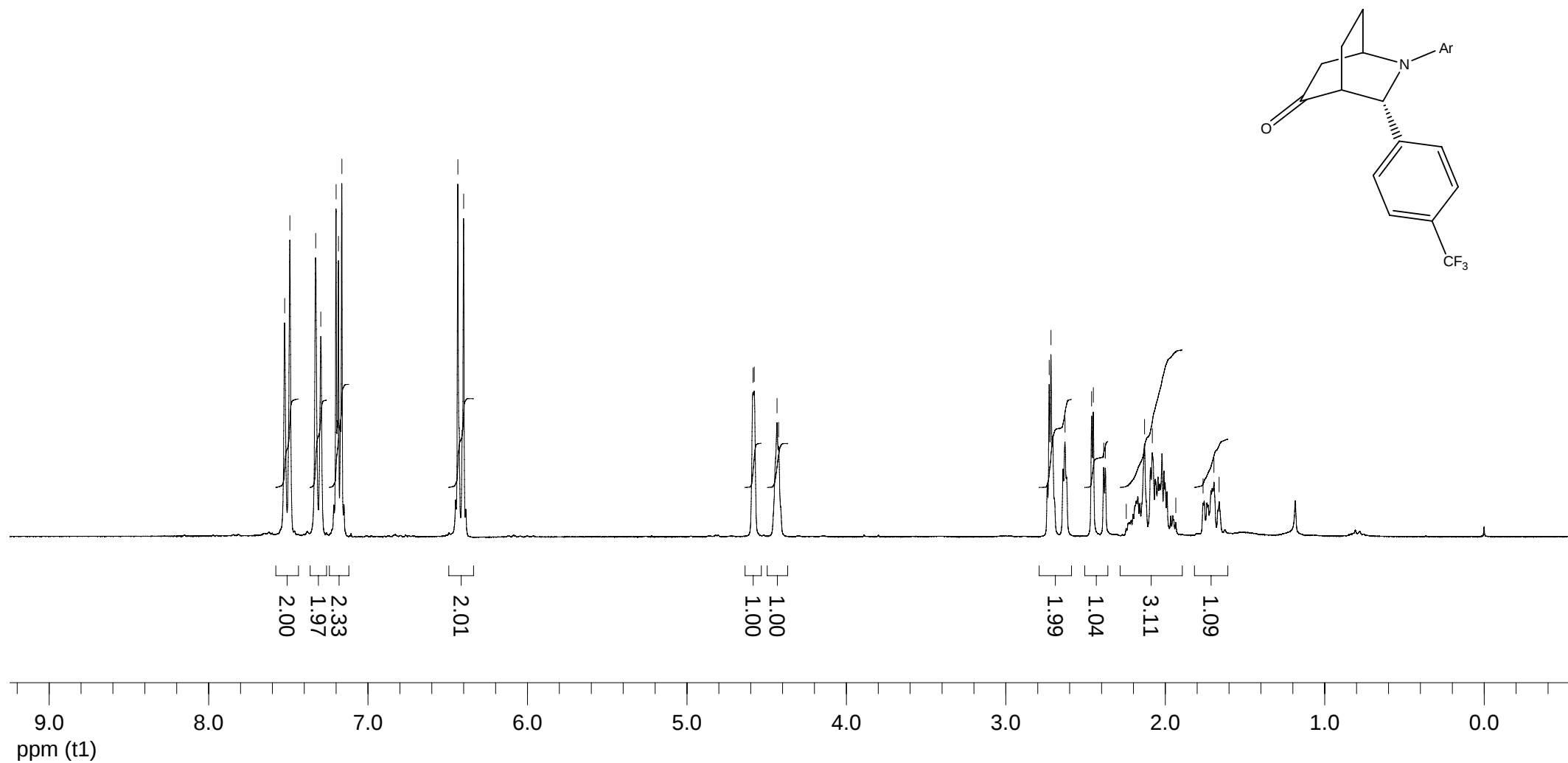
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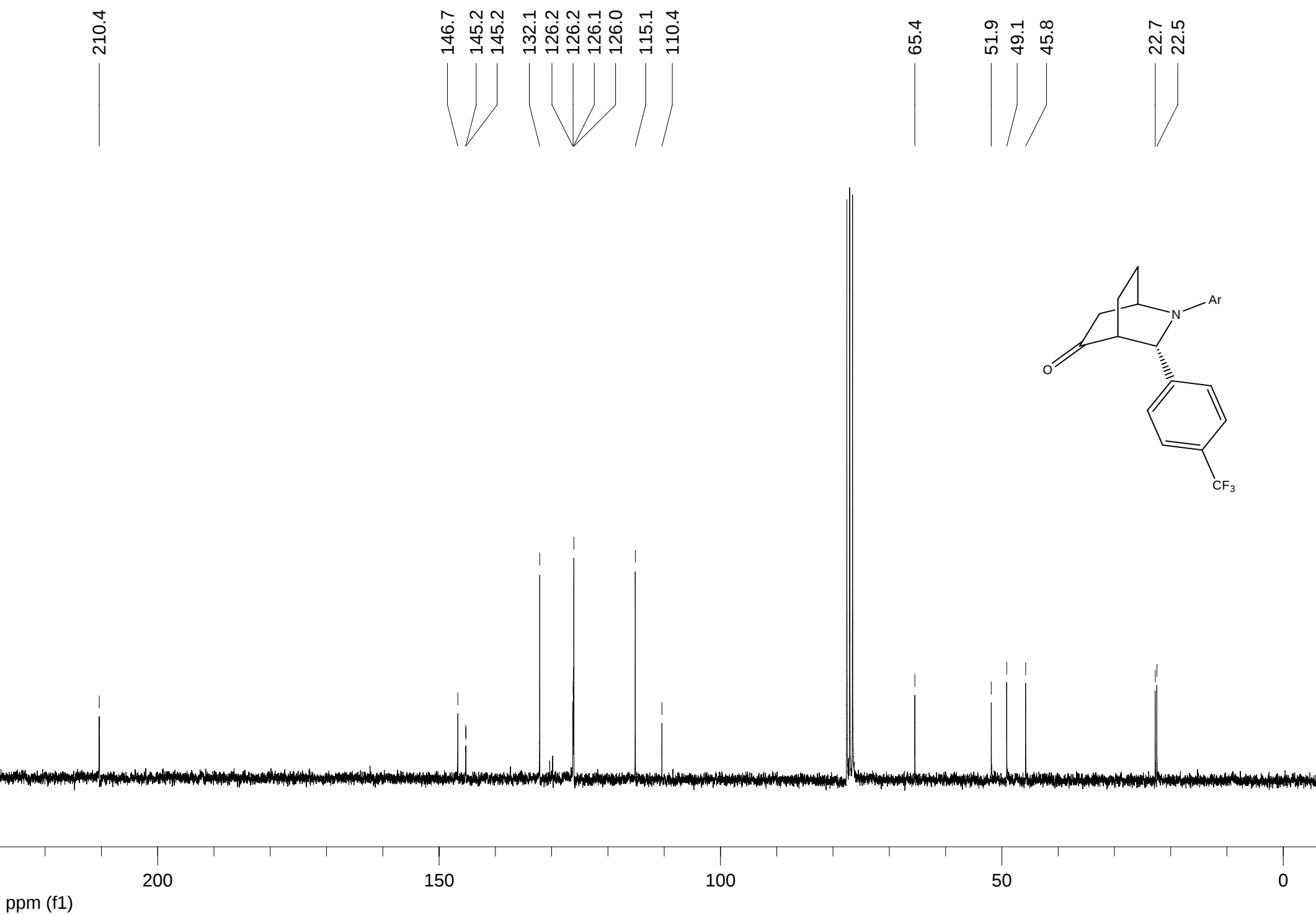
Flow: 0.6 mL/min

Run time: 33,96 min



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2	25,118	26,150	28,345	7,068
Total				100,000





Chromatogram : CA-246.2-rac_ADH_8020_flow1_5

Method: ADH_8020_flow1_acq60

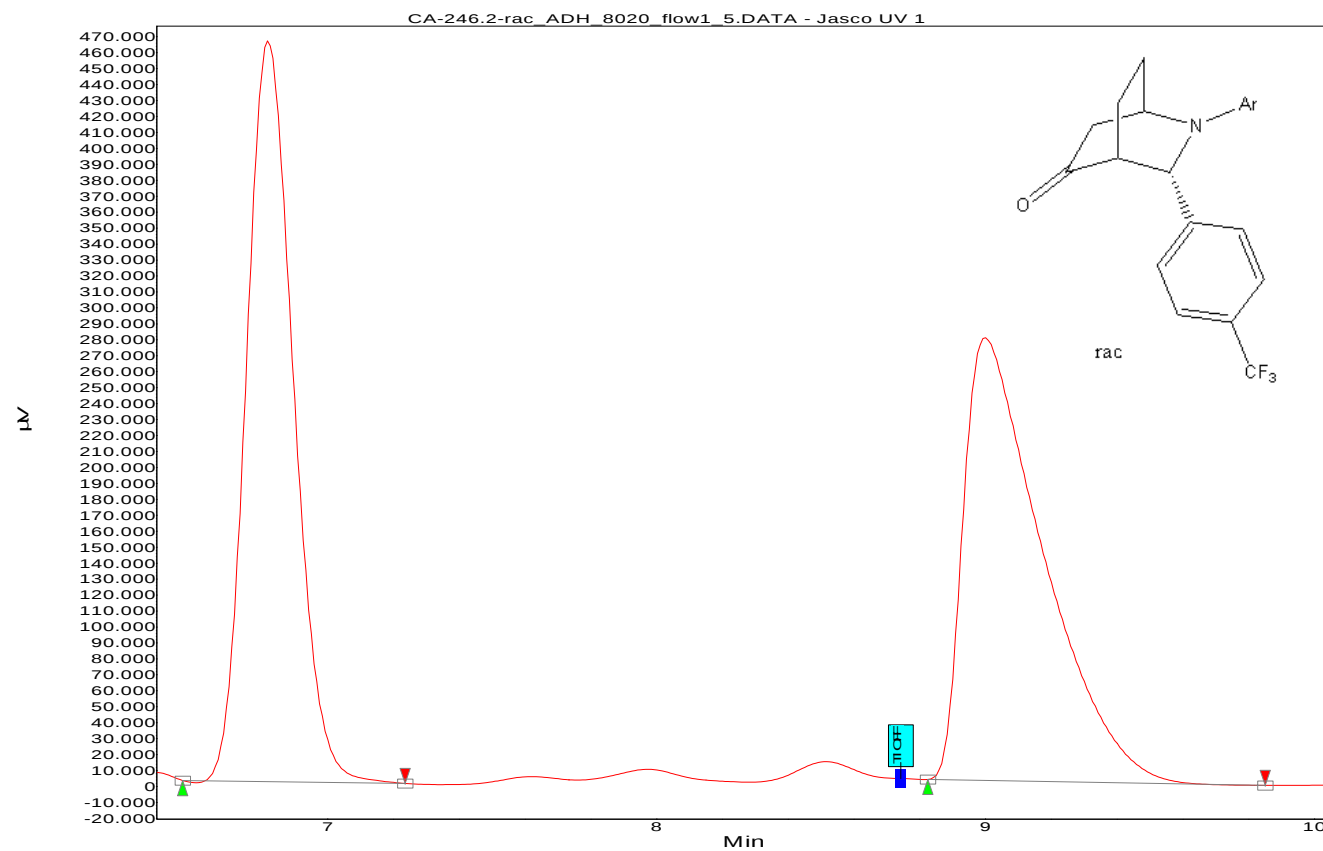
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Date: 18.05.2006 19:48:23

Column: ADH

Flow: 1.0 mL/min

Run time: 60,00



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1	6,559	6,817	7,235	49,808
2	8,824	9,000	9,850	50,192
Total				100,000

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Method: ADH_8020_flow1_acq60

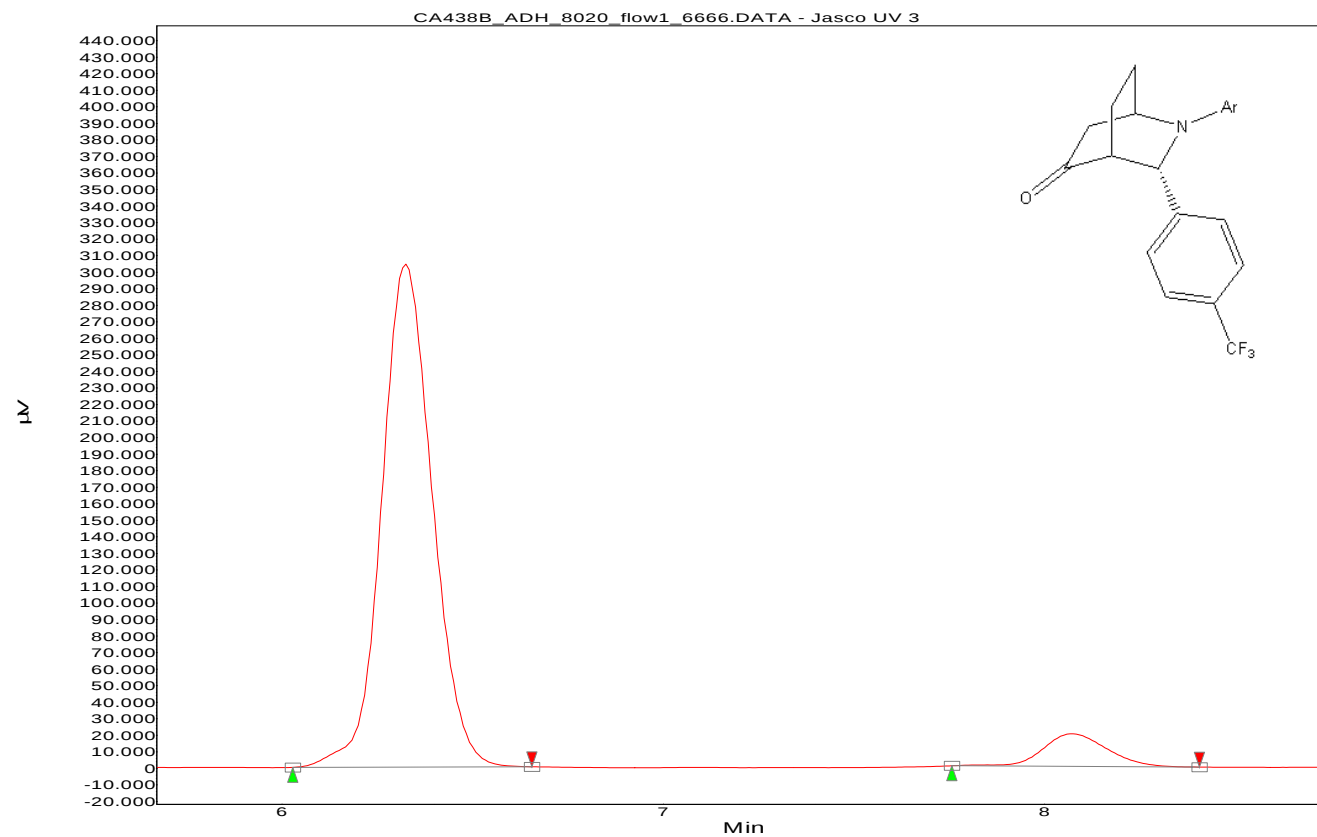
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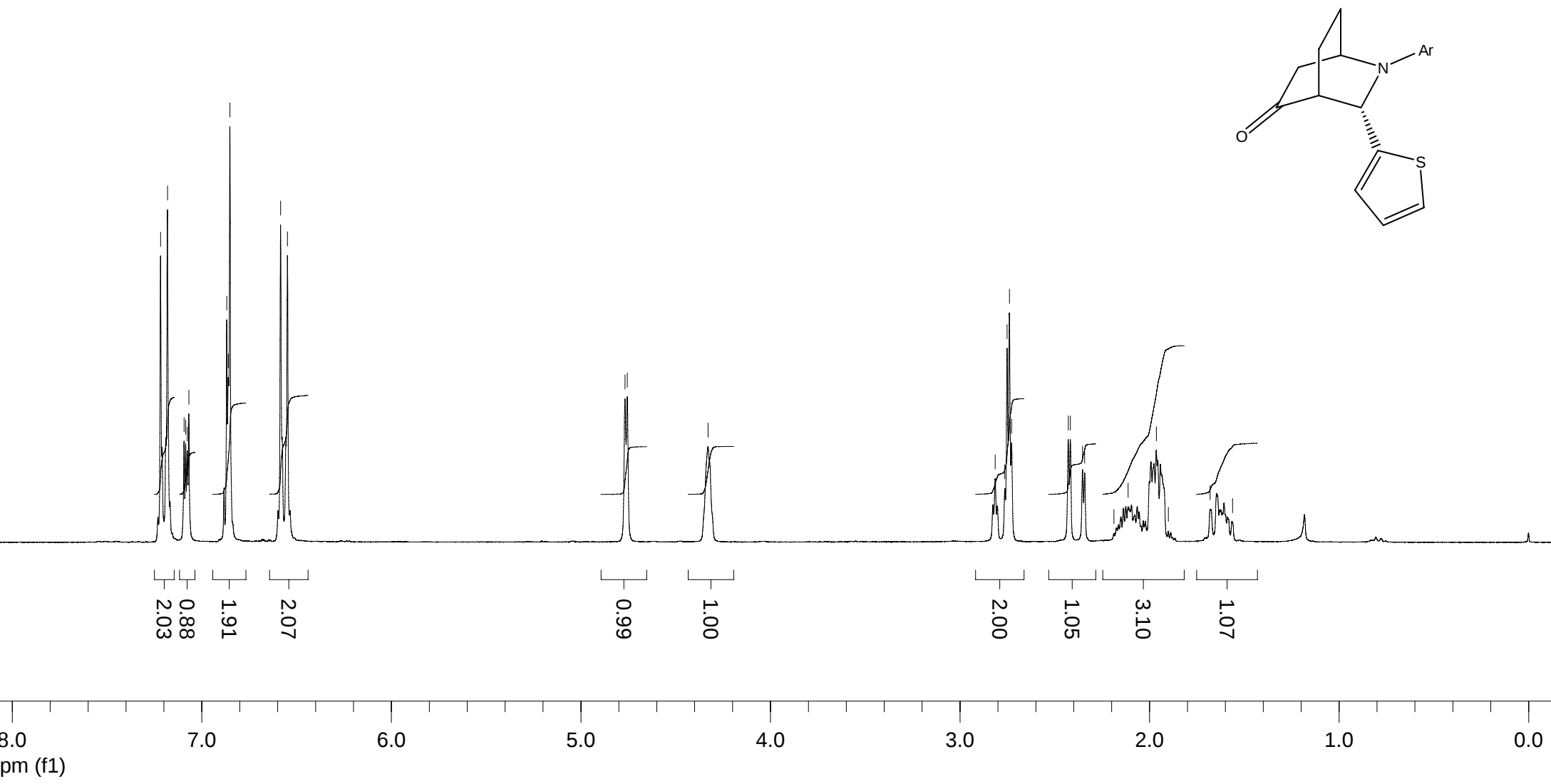
Column: ADH

Flow: 0.6 mL/min

Run time: 11,88



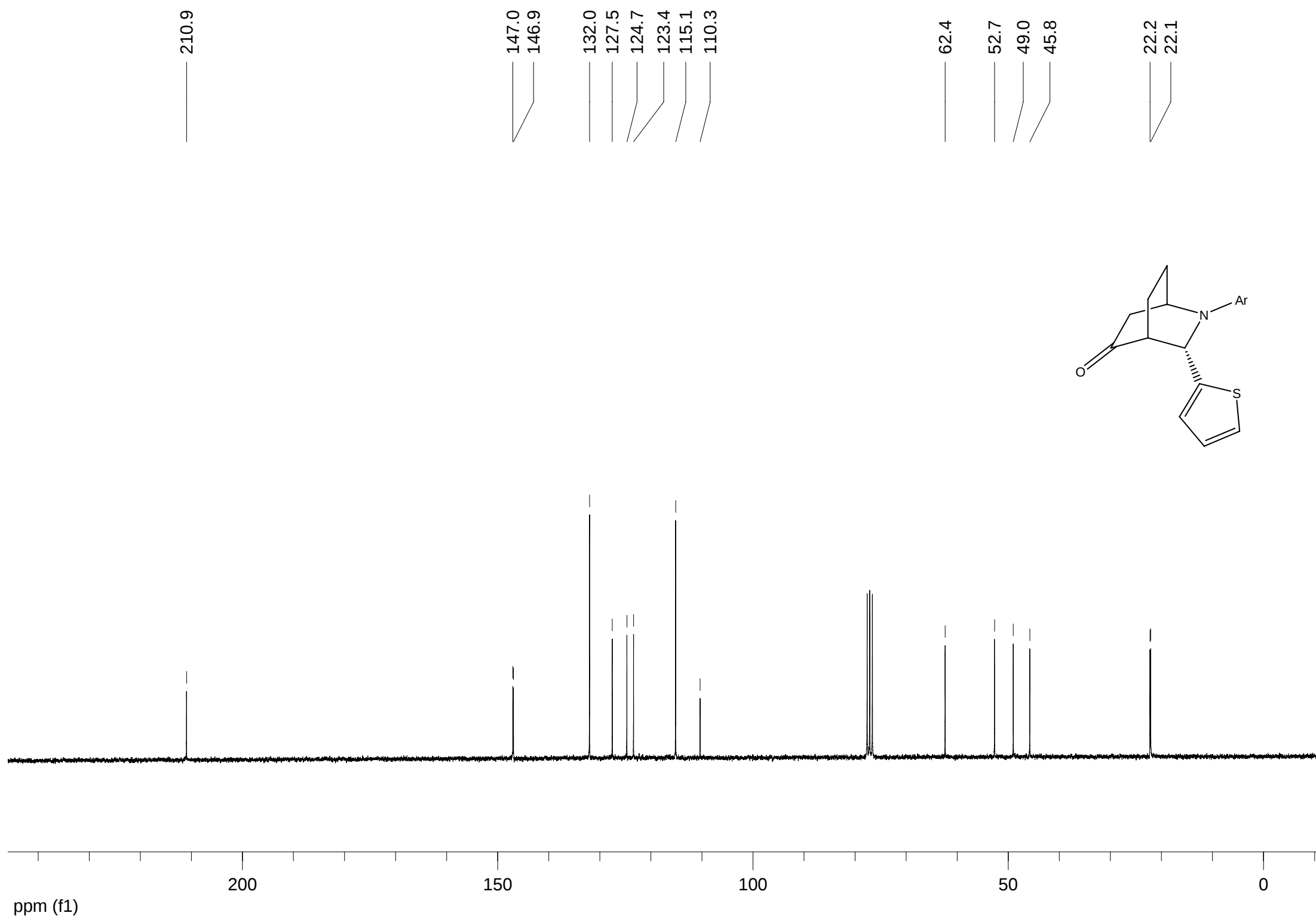
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2	7,757	8,075	8,406	7,559
Total				100,000



7.22
7.18
7.09
7.09
7.08
7.07
6.87
6.86
6.85
6.58
6.55

4.77
4.76
4.33

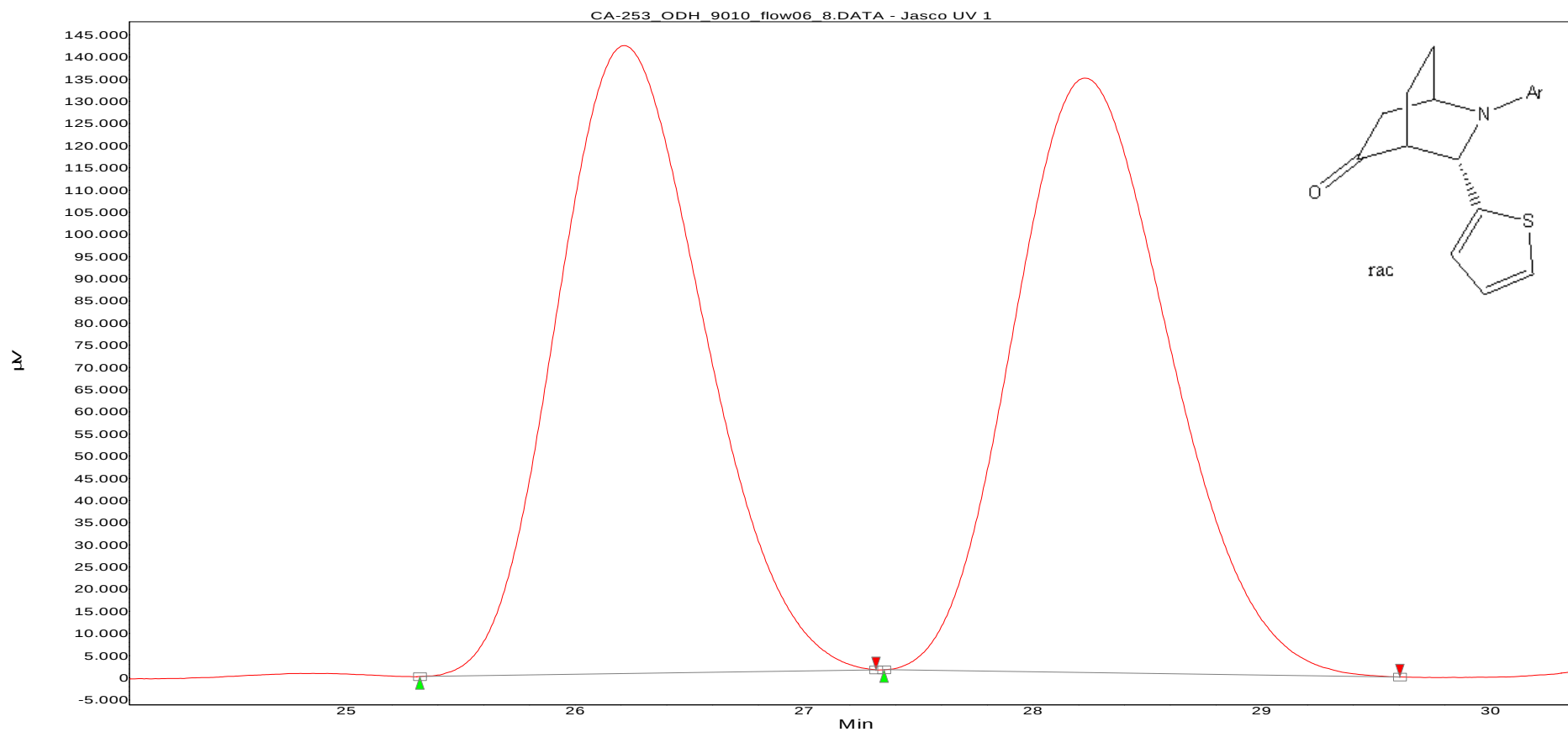
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2.73
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2.42
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2.34
2.19
2.11
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1.90
1.68
1.56



Chromatogram : CA-253_ODH_9010_flow06_8

Method: ODH_9010_flow06_acq50
Data file: CA-253_ODH_9010_flow06_8.DATA
Date: 12.07.2006 17:24:29

Column: ODH
Flow: 0.6 mL/min
Run time: 38,93 min

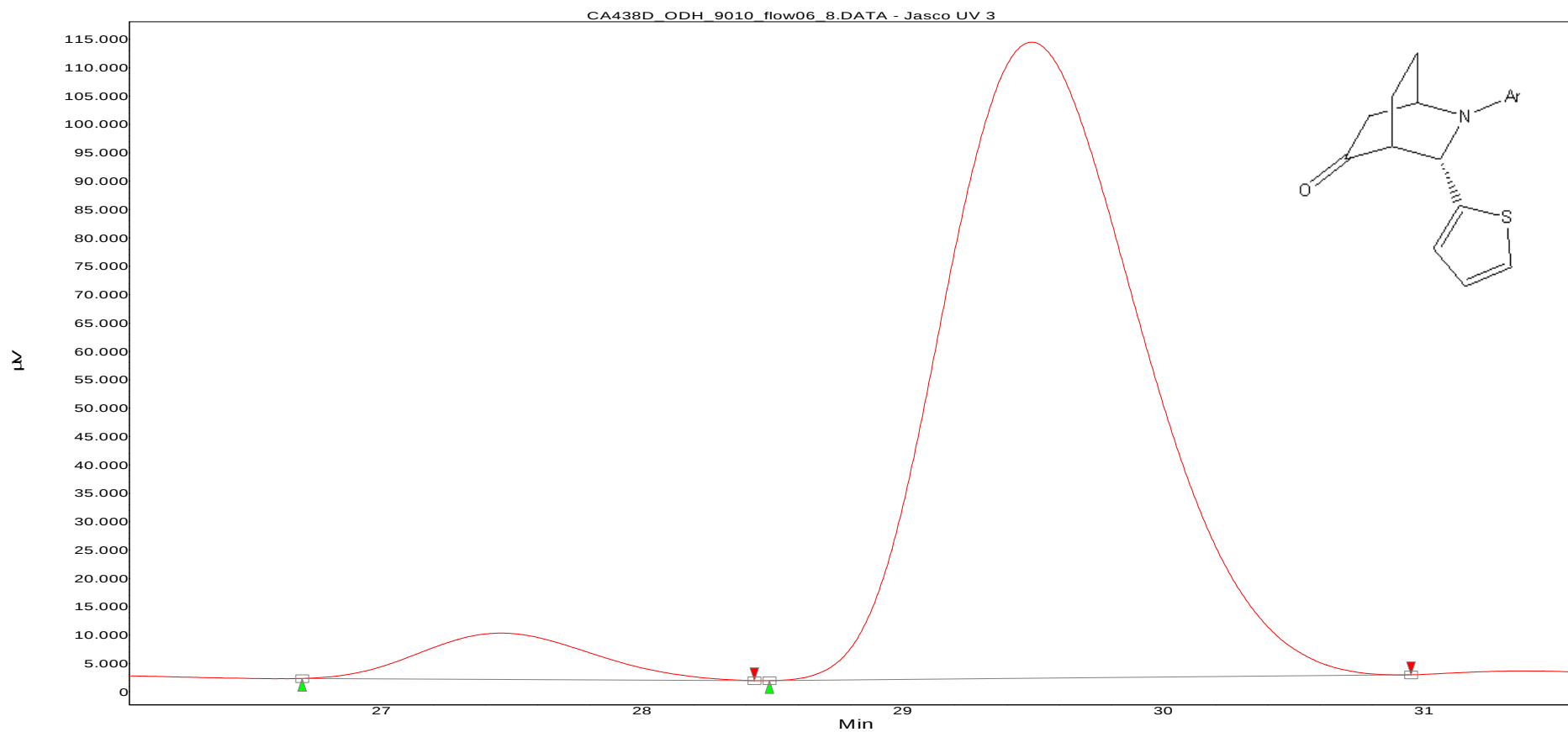


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2	27,350	28,225	29,603	50,173
Total				100,000

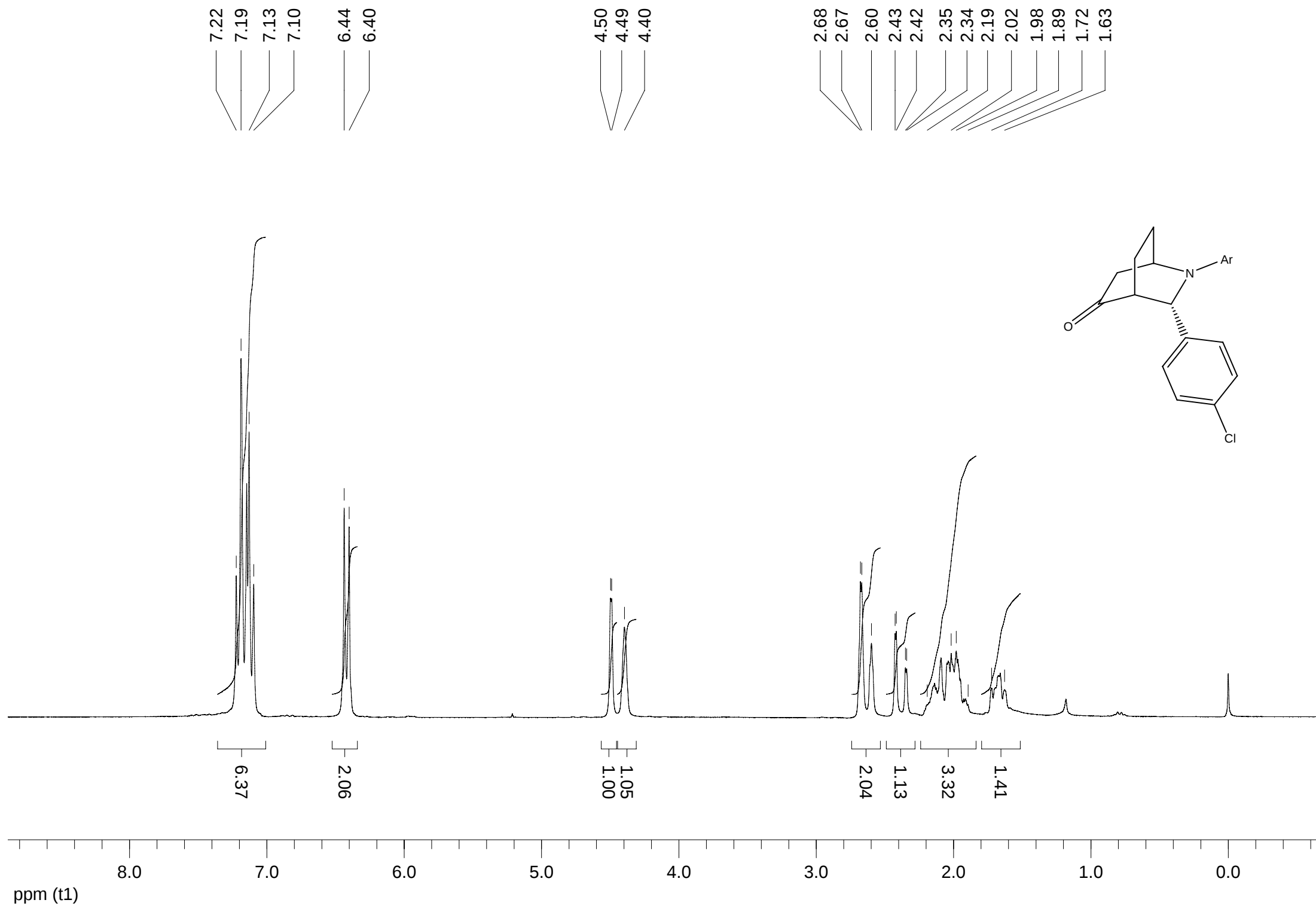
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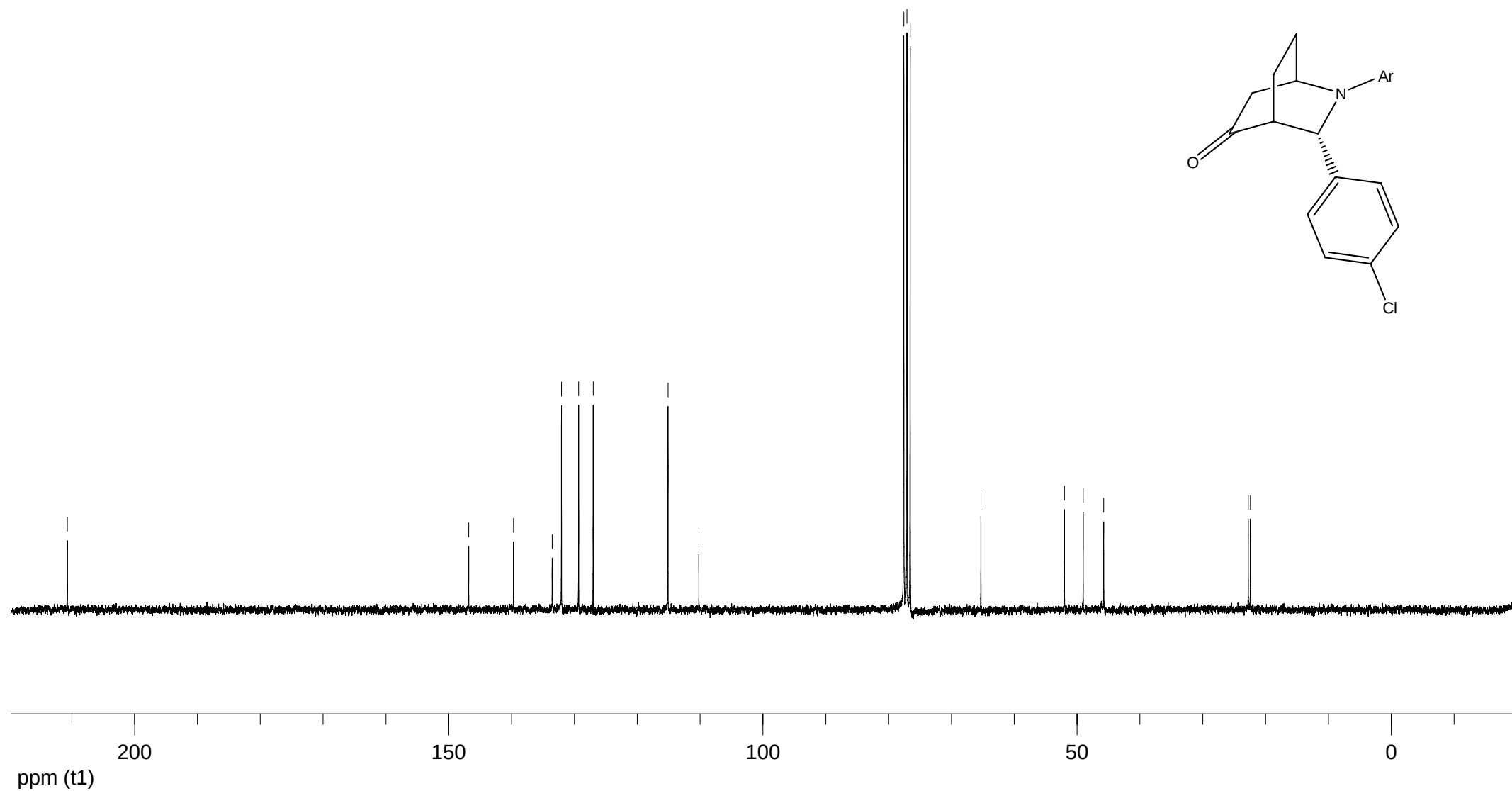
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Date: 11.07.2006 21:26:15

Column: ODH
Flow: 0.6 mL/min
Run time: 50,00 min



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	[Min]	[Min]	[Min]	[%]
1	26,696	27,467	28,430	5,955
2	28,488	29,492	30,949	94,045
Total				100,000





Chromatogram : CA-244.2-rac_ODH_9010_flow06_0

Method: ODH_9010_flow06_acq50

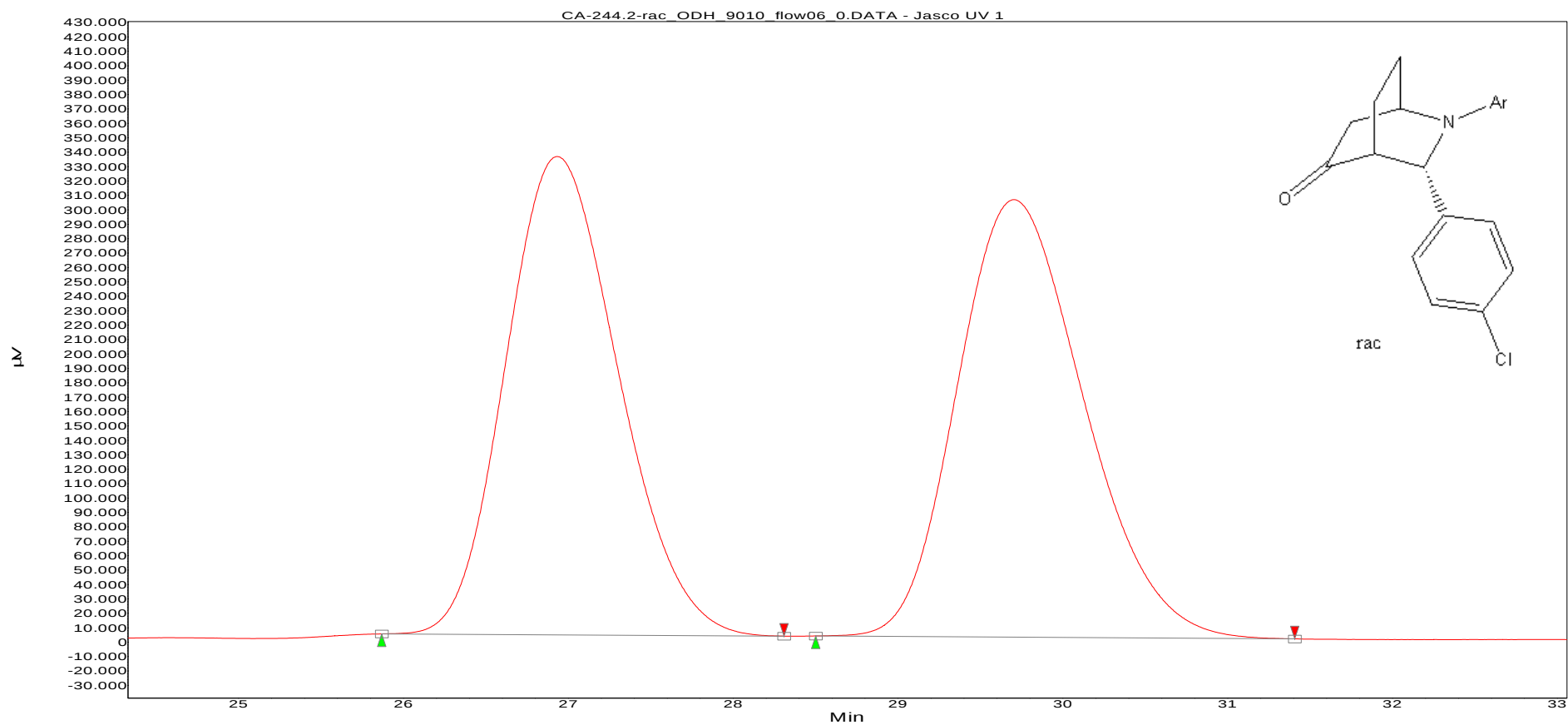
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Date: 12.07.2006 18:05:55

Column: ODH

Flow: 0.6 mL/min

Run time: 50,00 min



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1	25,867	26,933	28,309	49,363
2	28,501	29,700	31,406	50,637
Total				100,000

Chromatogram : CA439A_ODH_9010_flow06_57

Method: ODH_9010_flow06_acq50

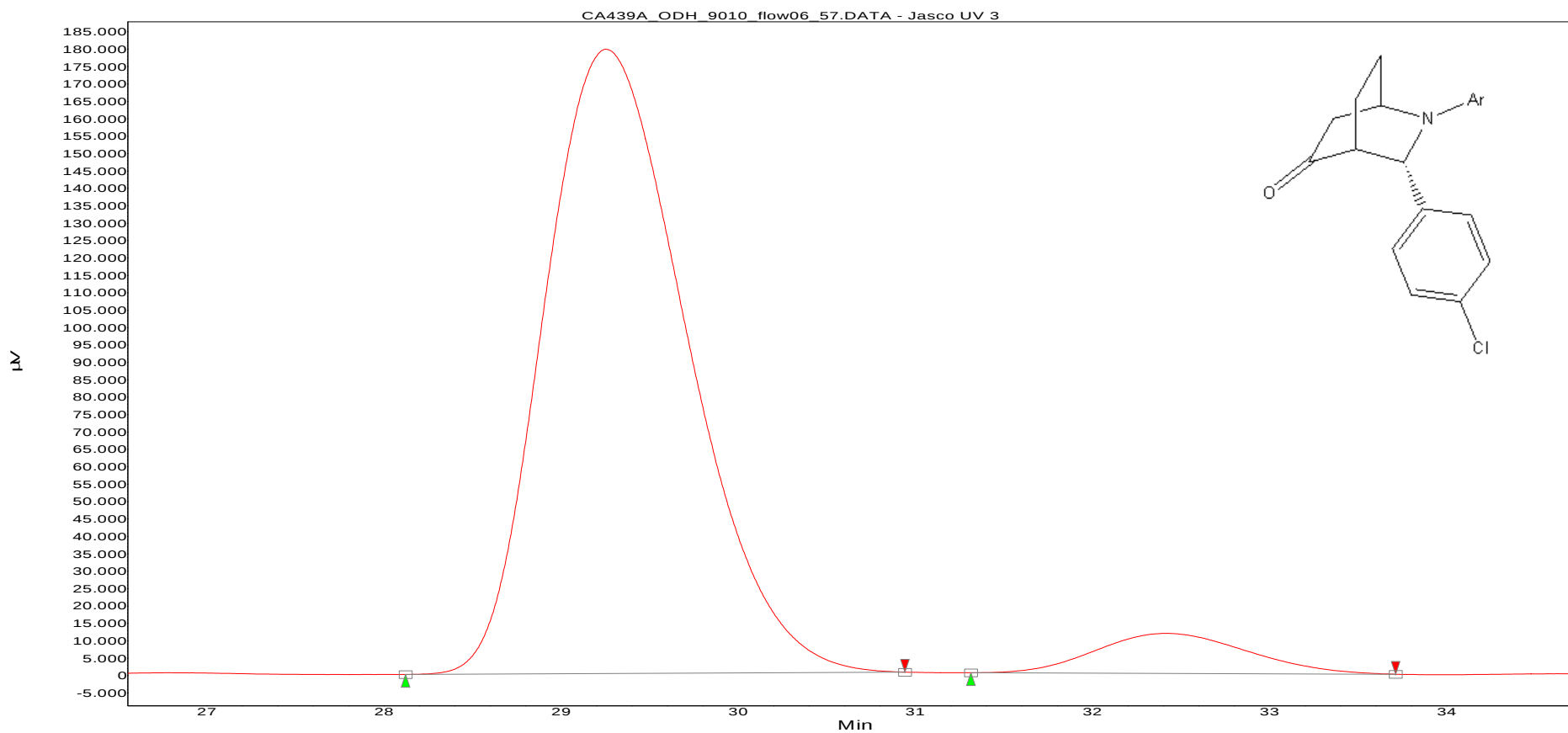
Data file: CA439A_ODH_9010_flow06_57.DATA

Date: 15.06.2006 13:36:03

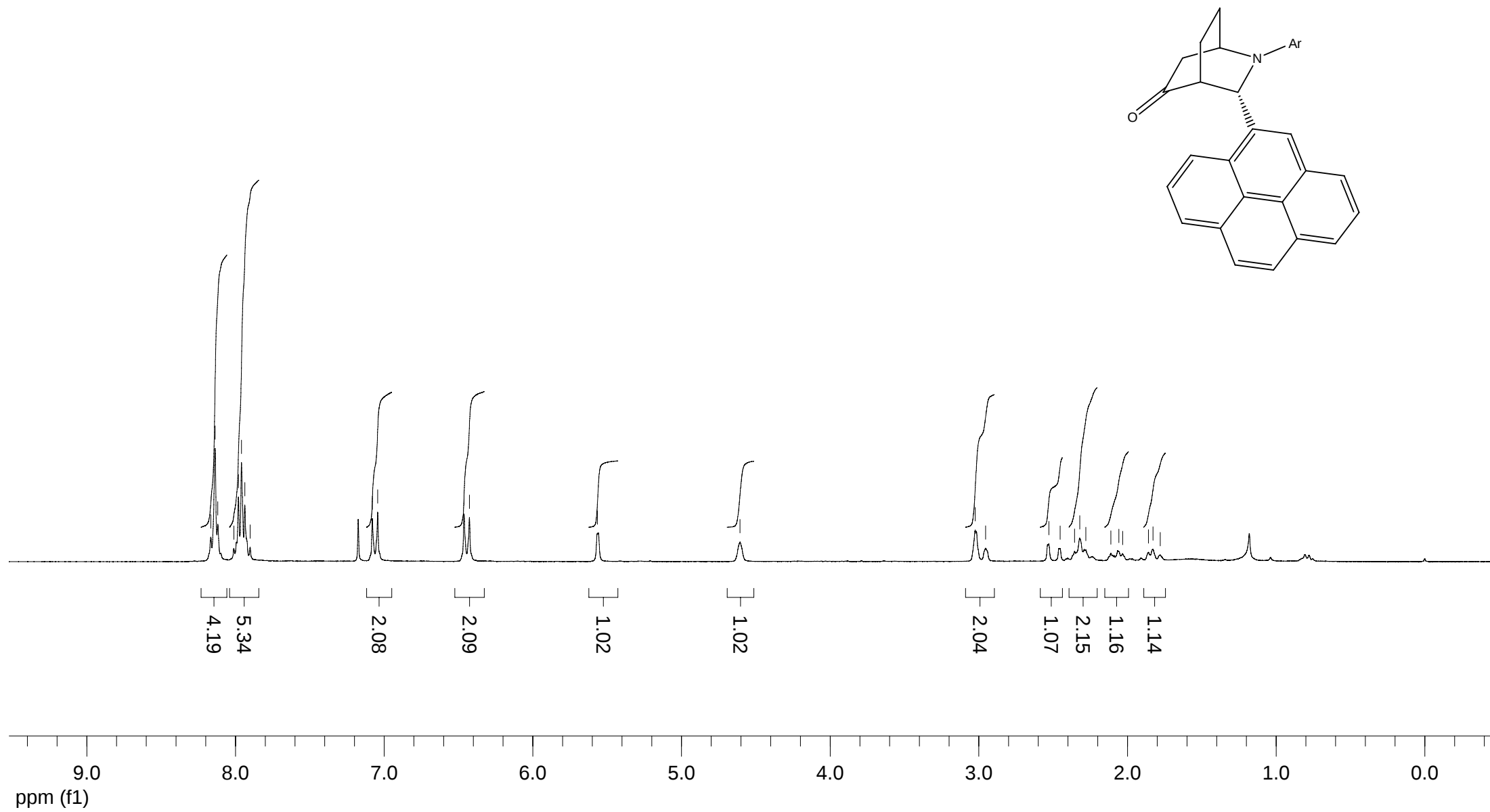
Column: ODH

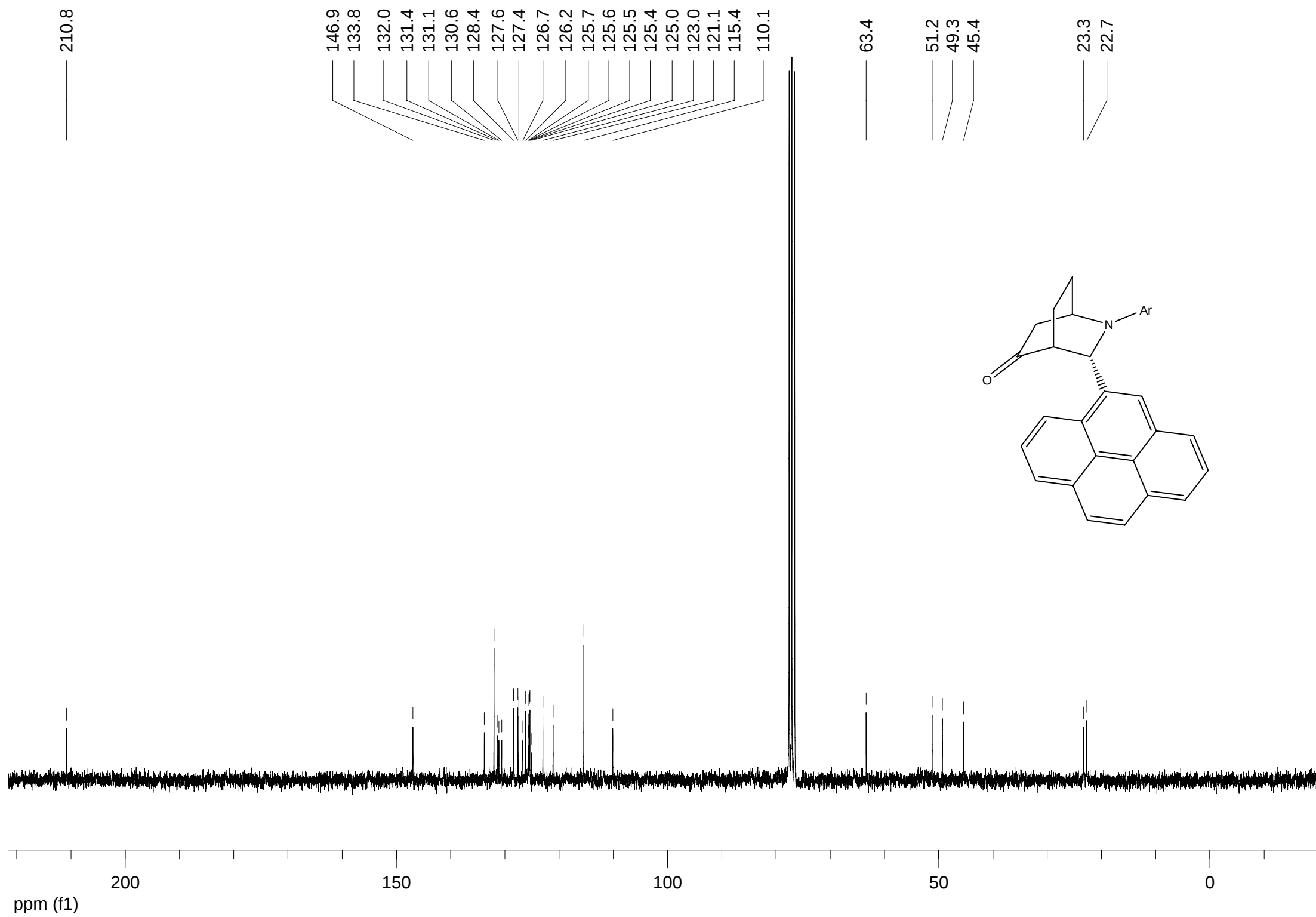
Flow: 0.6 mL/min

Run time: 36,67 min



Index	Start	Time	End	Area %
	[Min]	[Min]	[Min]	[%]
1	28,121	29,250	30,940	93,618
2	31,313	32,425	33,710	6,382
Total				100,000





Chromatogram : CA-251.2-rac_ODH_8020_flow1_10

Method: ODH_8020_flow1_acq50

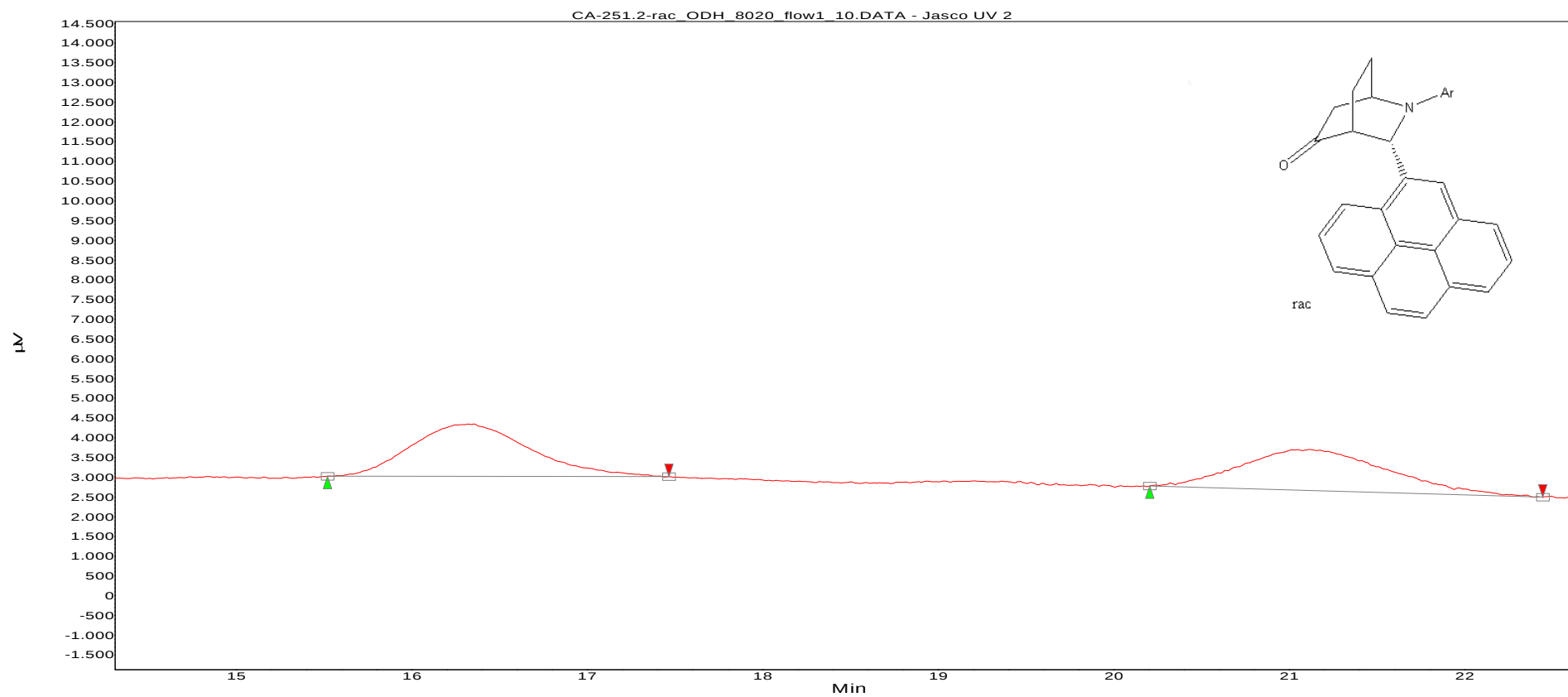
Data file: CA-251.2-rac_ODH_8020_flow1_10.DATA

Date: 11.07.2006 22:51:36

Column: ODH

Flow: 1.0 mL/min

Run time: 50,00

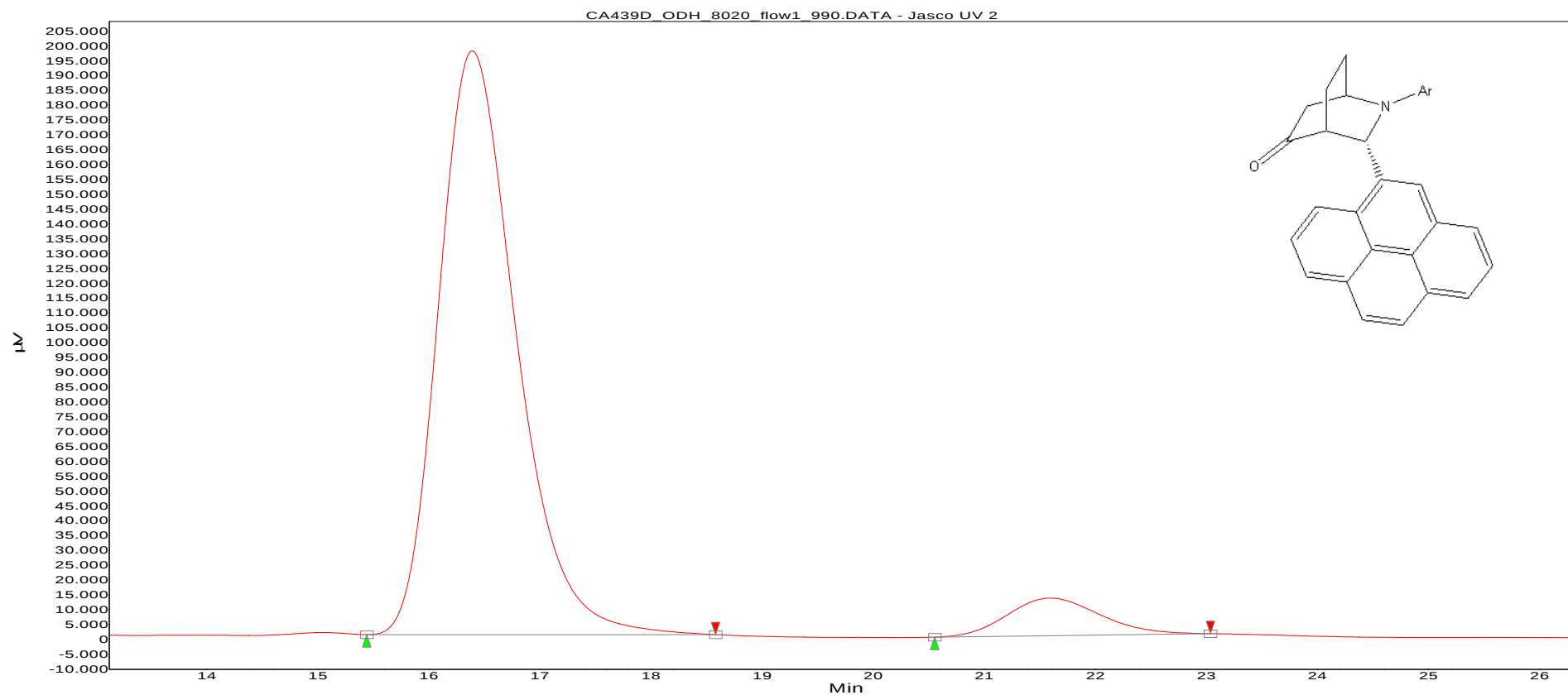


Index	Start	Time	End	Area %
	[Min]	[Min]	[Min]	[%]
2	15,518	16,317	17,463	50,660
1	20,203	21,108	22,442	49,340
Total				100,000

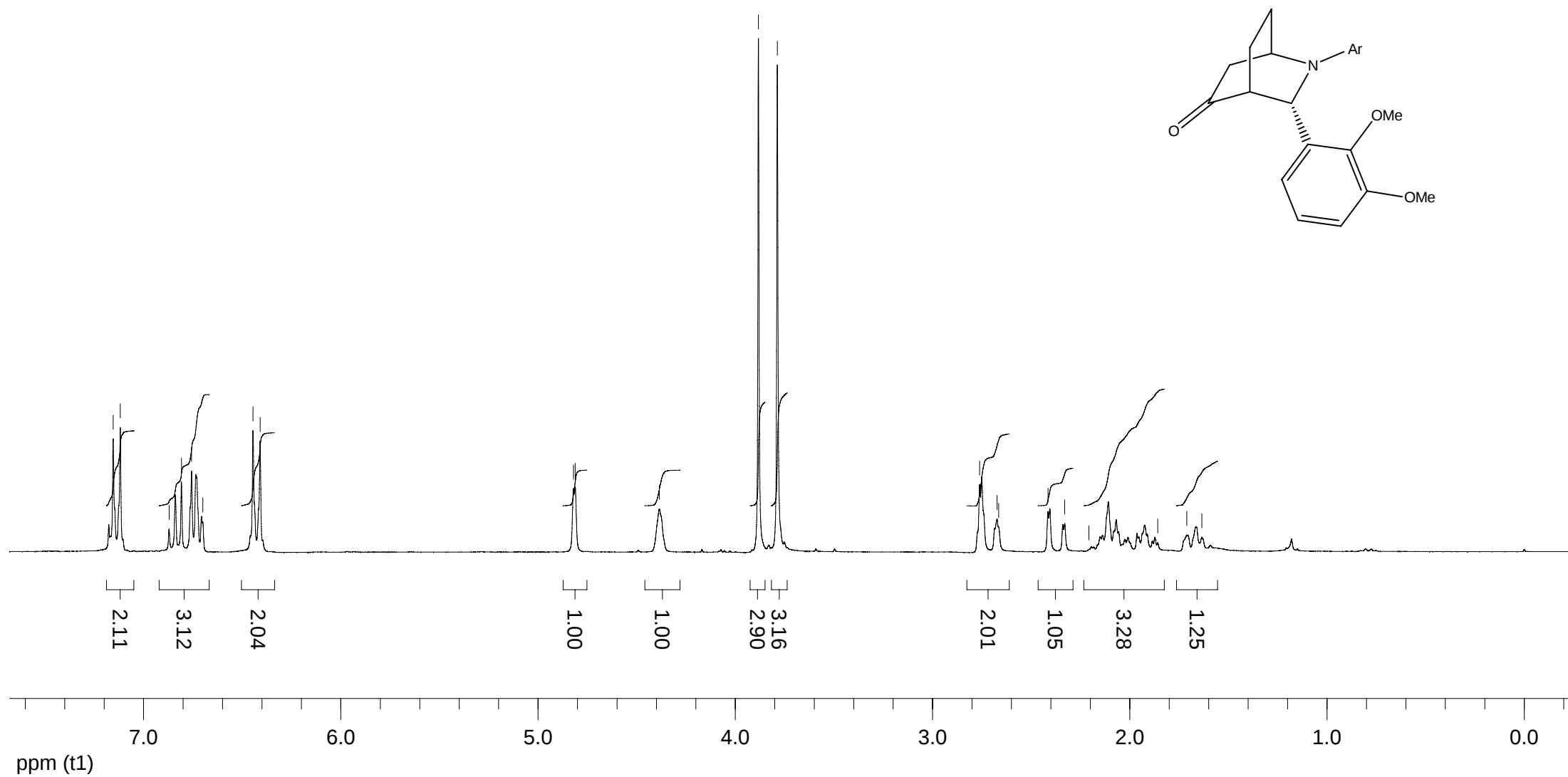
Chromatogram : CA439D_ODH_8020_flow1_990

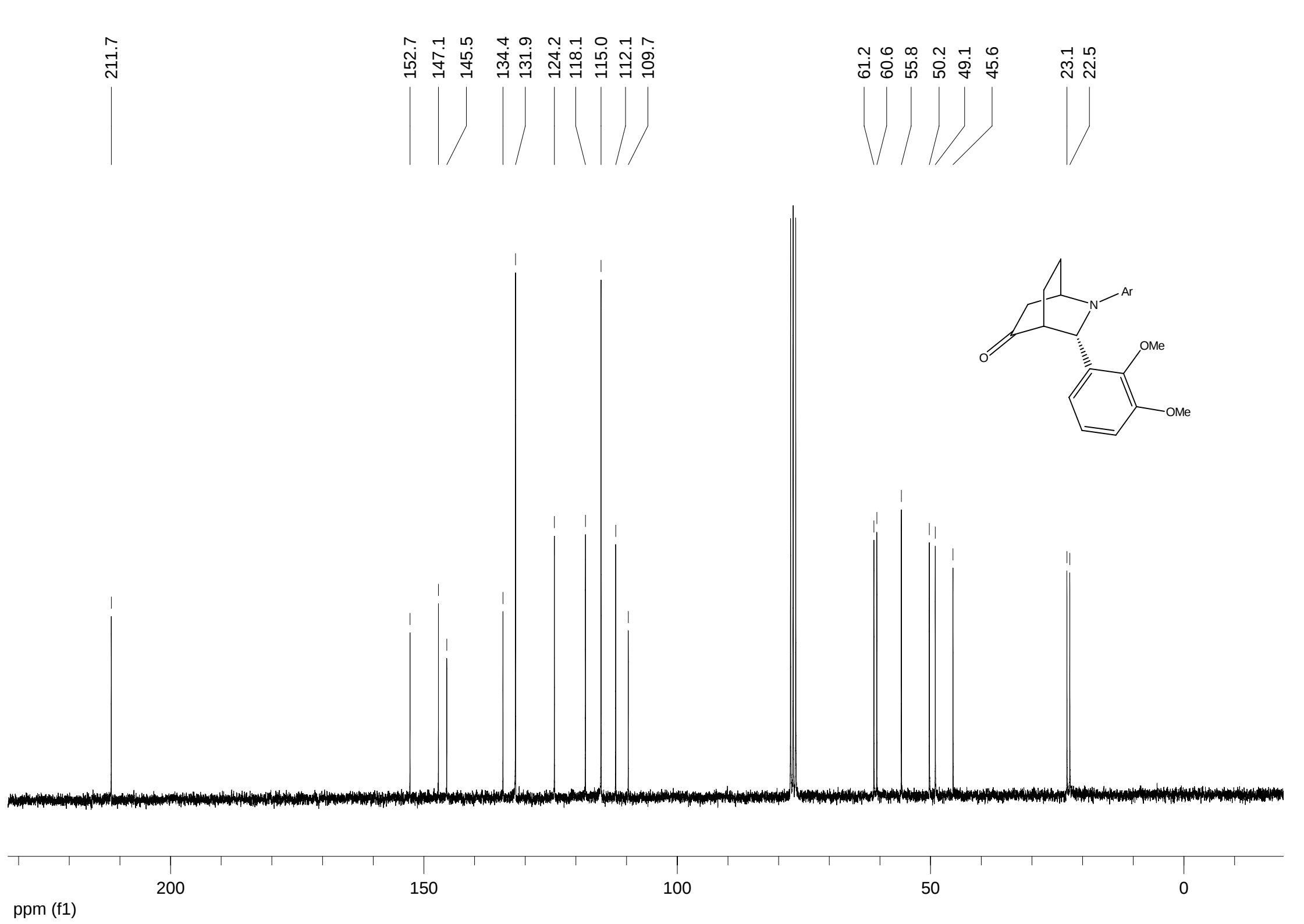
Method: ODH_8020_flow1_acq50
Data file: CA439D_ODH_8020_flow1_990.DATA
Date: 15.06.2006 16:10:29

Column: ODH
Flow: 1.0 mL/min
Run time: 50,00



Index	Start	Time	End	Area %
	[Min]	[Min]	[Min]	[%]
1	15,437	16,383	18,578	92,876
2	20,553	21,592	23,035	7,124
Total				100,000





Chromatogram : CA-252.2-rac_ADH_9010_flow06_66

Method: ADH_9010_flow06_acq60

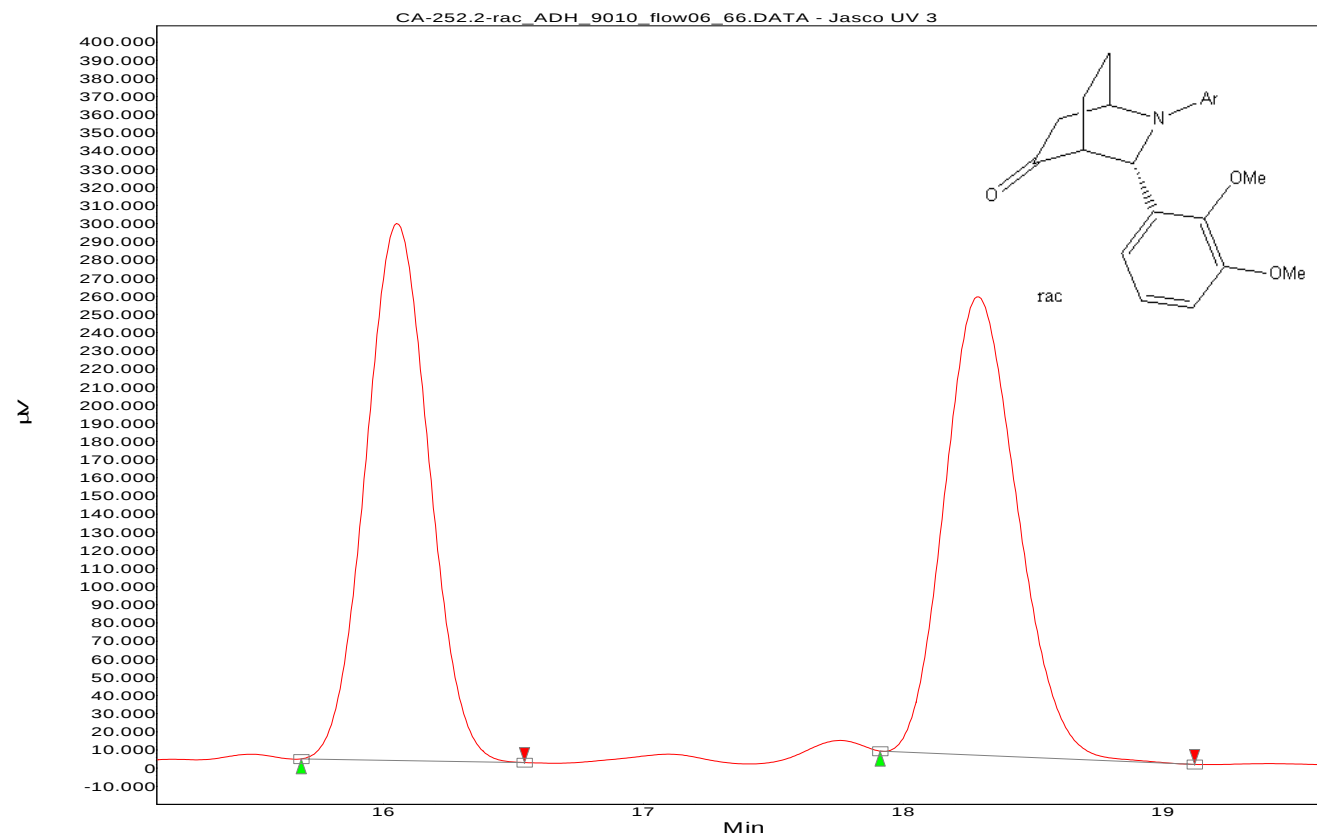
Column: ADH

Data file: CA-252.2-rac_ADH_9010_flow06_66.DATA

Flow: 0.6 mL/min

Date: 13.07.2006 16:51:55

Run time: 39,78



Index	Start	Time	End	Area %
	[Min]	[Min]	[Min]	[%]
1	15,683	16,050	16,543	50,500
2	17,911	18,292	19,121	49,500
Total				100,000

Chromatogram : CA454B_ADH_9010_flow06_55

Method: ADH_9010_flow06_acq60

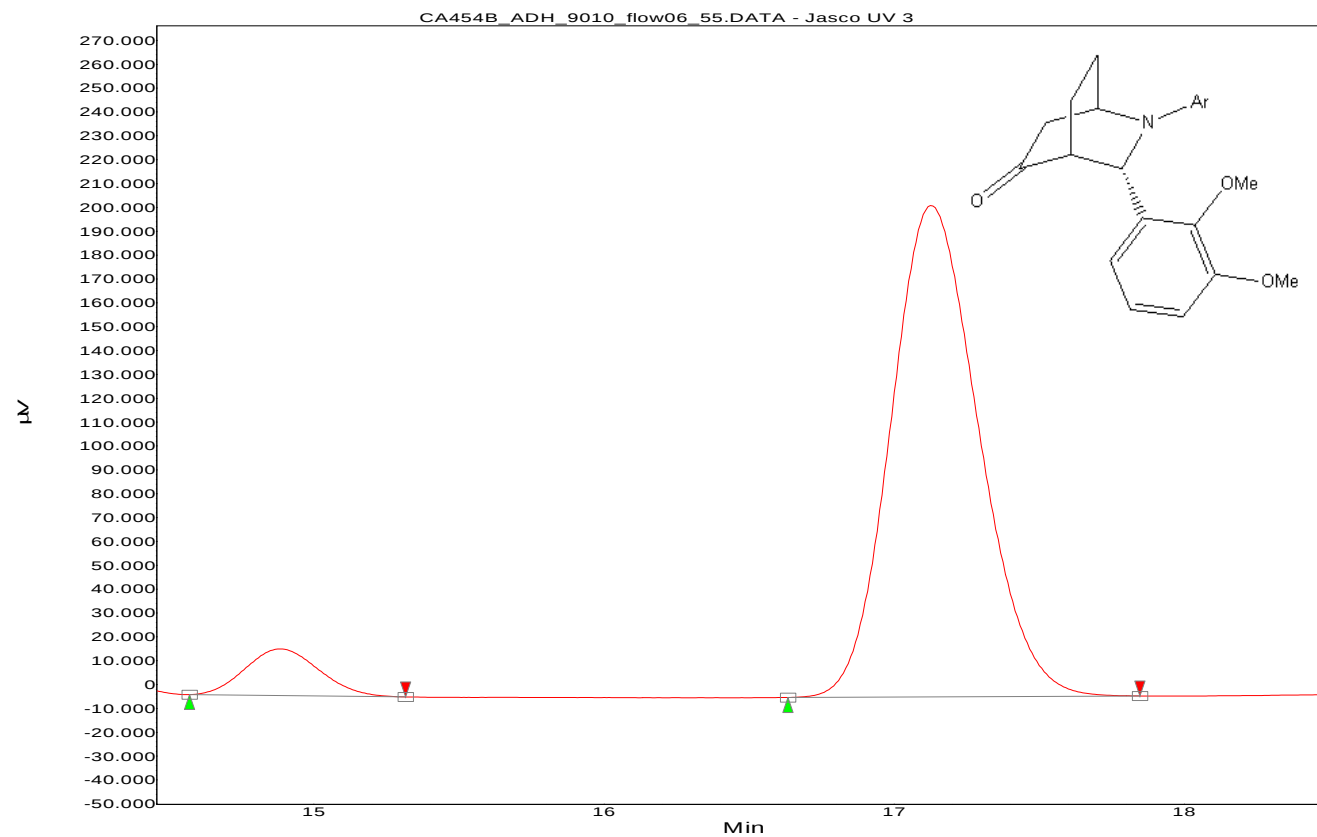
Data file: CA454B_ADH_9010_flow06_55.DATA

Date: 13.07.2006 17:34:15

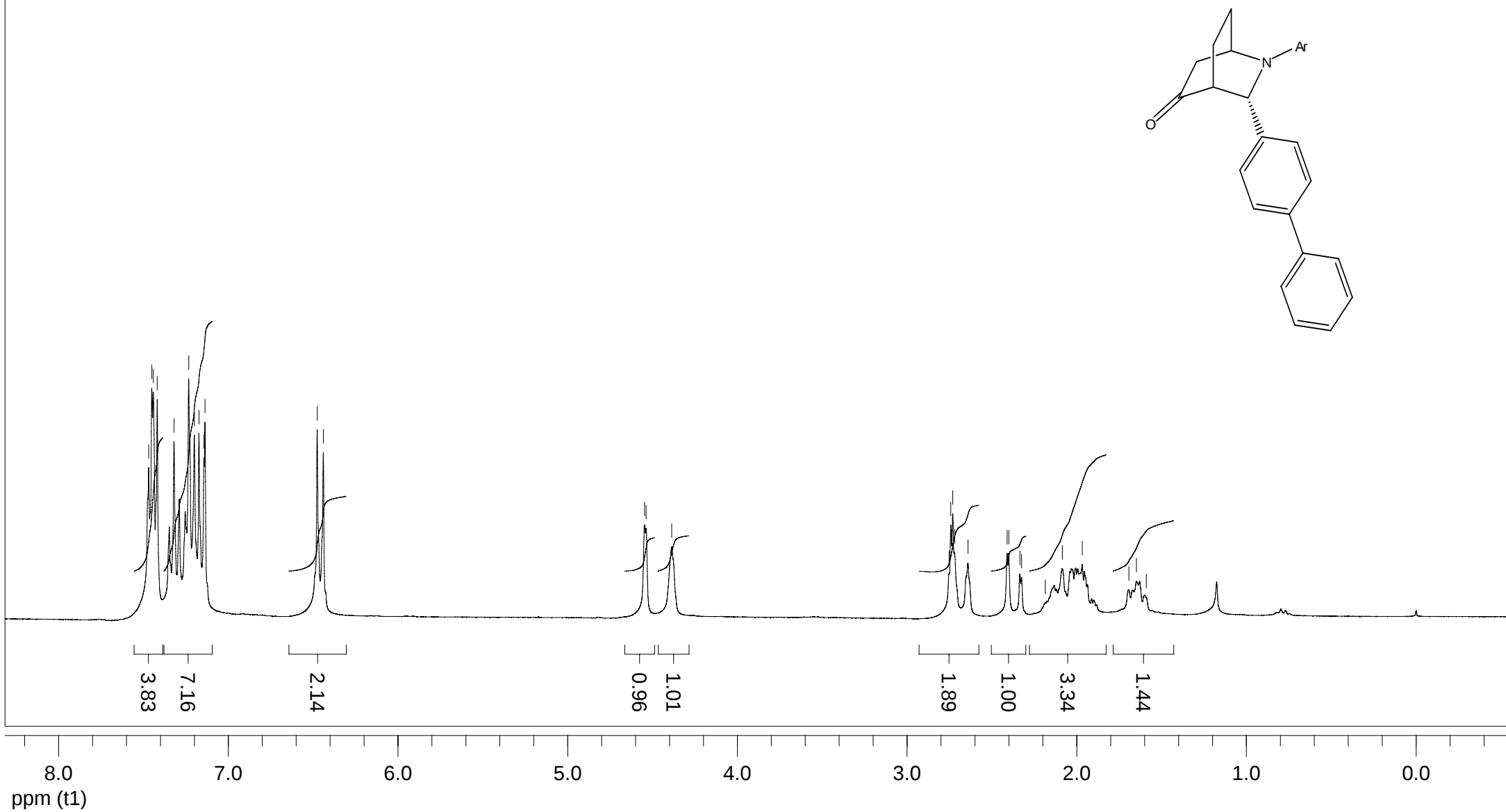
Column: ADH

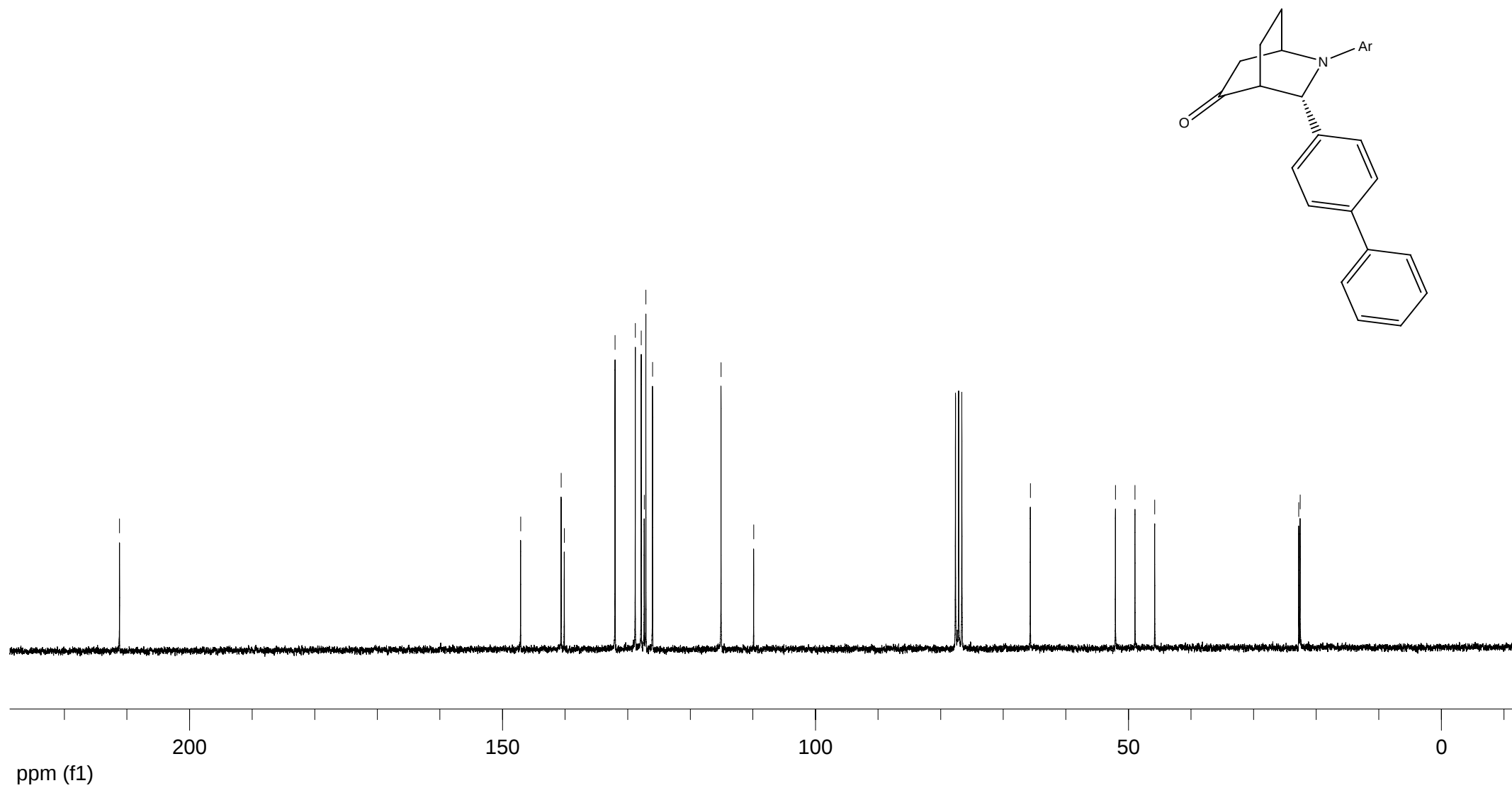
Flow: 0.6 mL/min

Run time: 30,63



Index	Start	Time	End	Area %
	[Min]	[Min]	[Min]	[%]
1	14,571	14,883	15,316	7,397
2	16,634	17,125	17,847	92,603
Total				100,000





Chromatogram : CA-255.2-rac_ODH_8020_flow06_23

Method: ODH_8020_flow06_acq50

Data file: CA-255.2-rac_ODH_8020_flow06_23.DATA

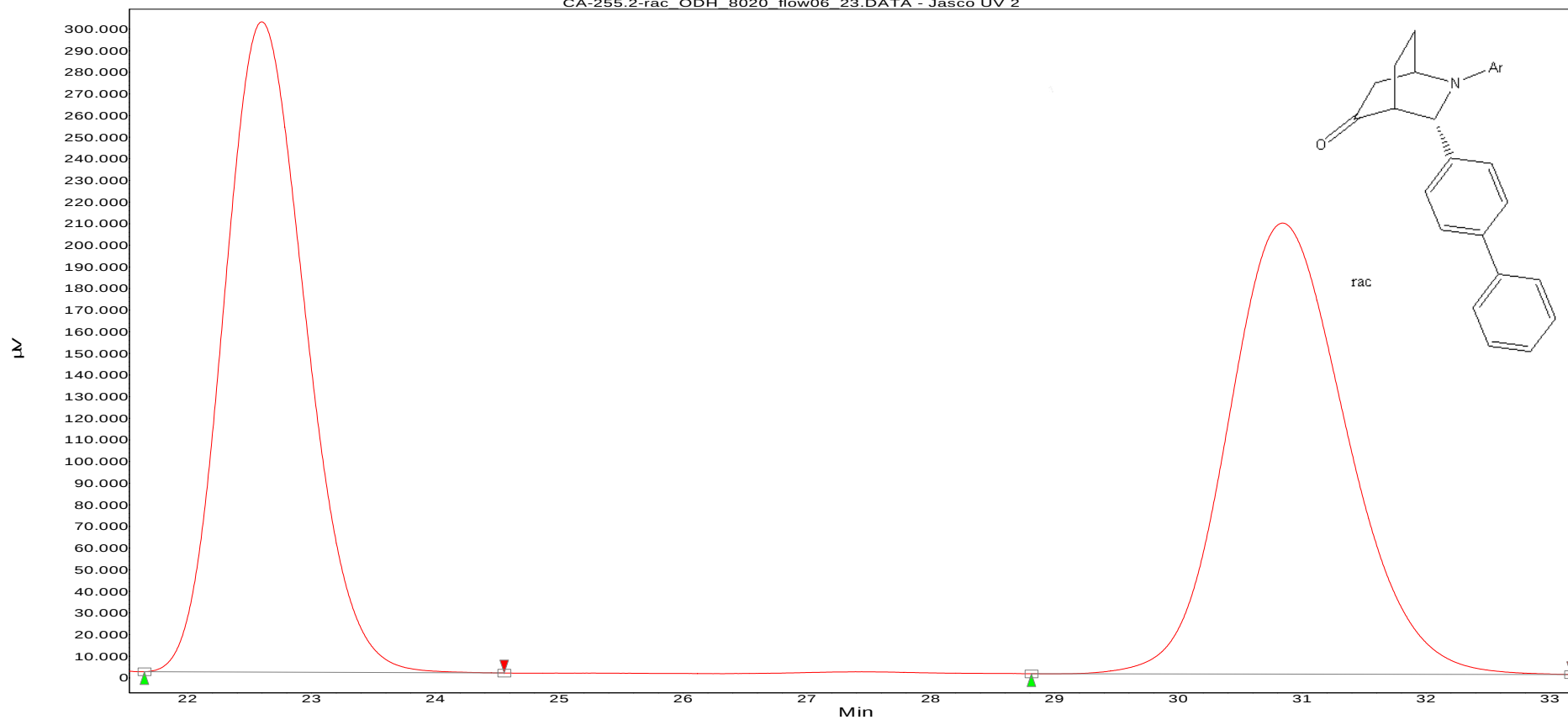
Date: 12.07.2006 02:22:25

Column: ODH

Flow: 0.6 mL/min

Run time: 50,00 min

CA-255.2-rac_ODH_8020_flow06_23.DATA - Jasco UV 2



Index	Start	Time	End	Area %
	[Min]	[Min]	[Min]	[%]
1	21,650	22,600	24,555	49,911
2	28,812	30,842	33,170	50,089
Total				100,000

Chromatogram : CA441C_ODH_8020_flow06_24

Method: ODH_8020_flow06_acq50

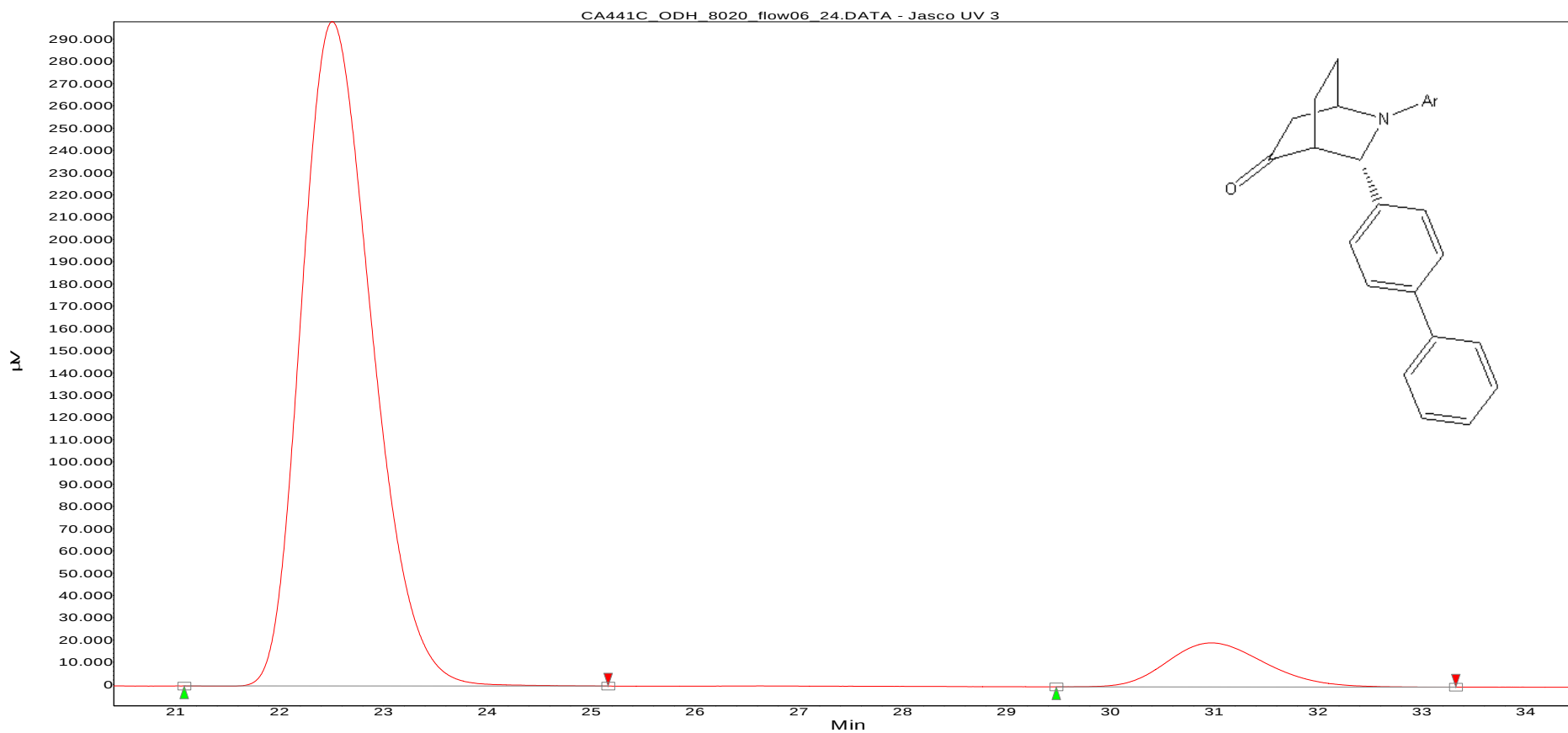
Data file: CA441C_ODH_8020_flow06_24.DATA

Date: 12.07.2006 03:15:05

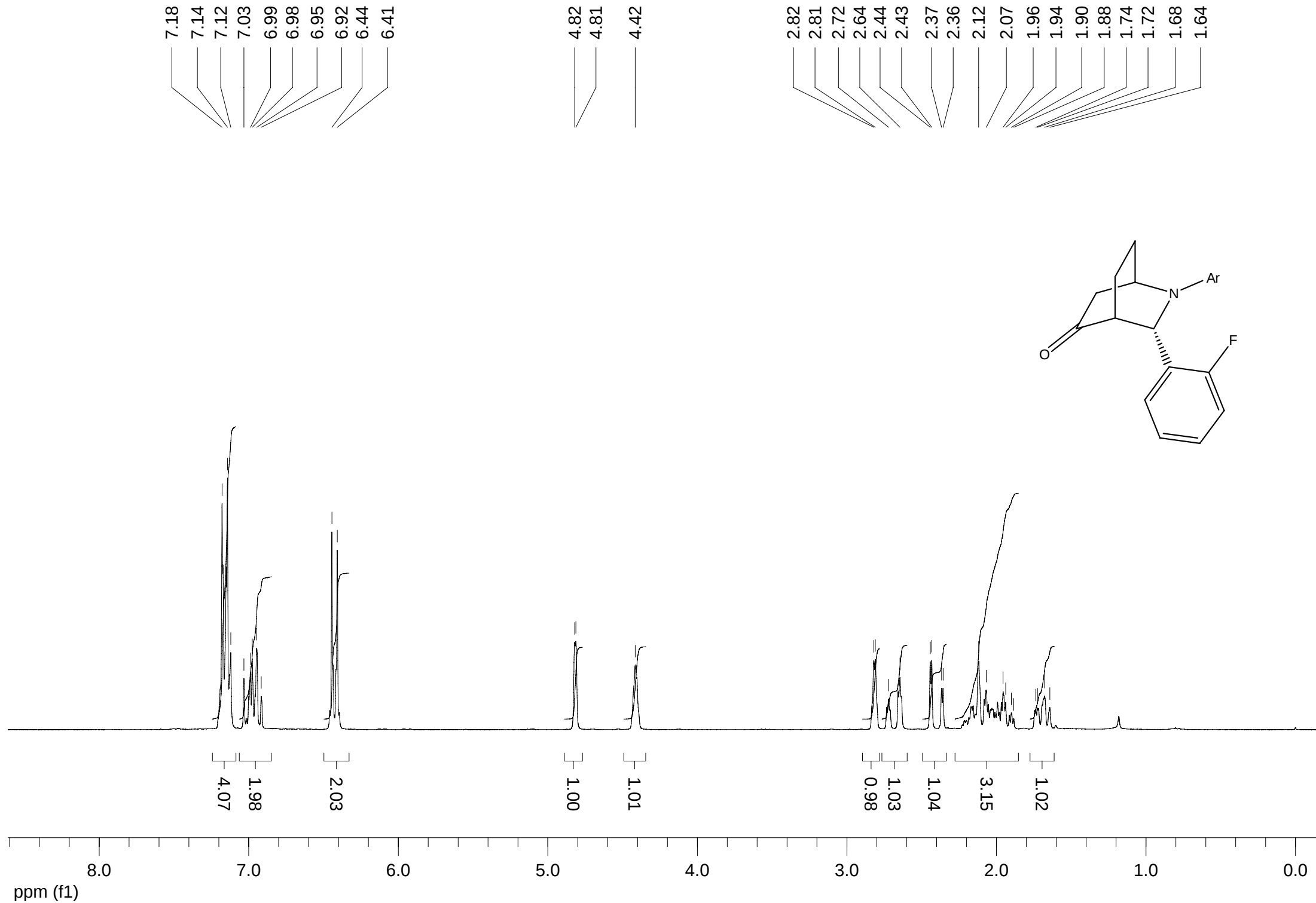
Column: ODH

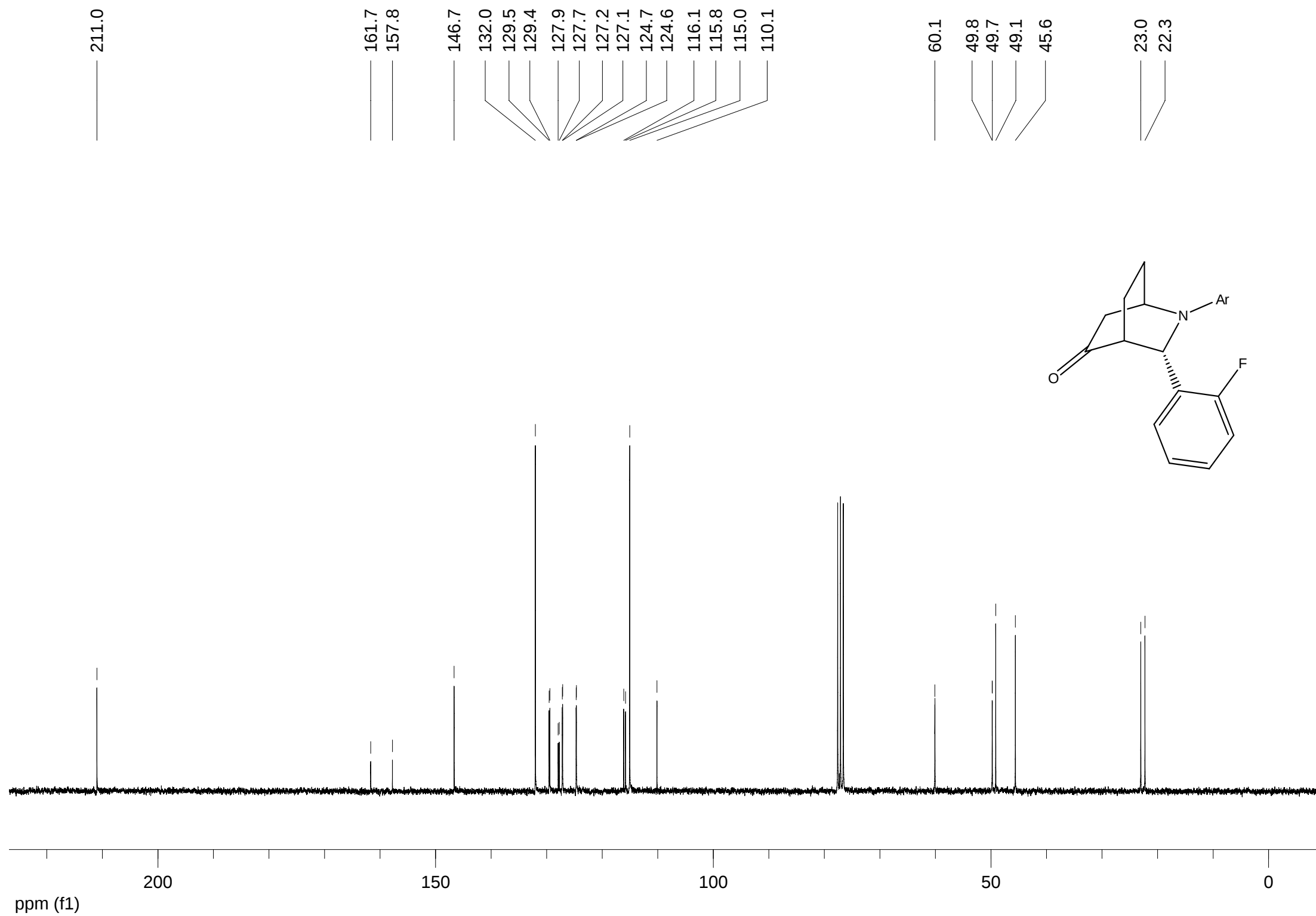
Flow: 0.6 mL/min

Run time: 50,00 min



Index	Start	Time	End	Area %
	[Min]	[Min]	[Min]	[%]
1	21,082	22,508	25,162	91,519
2	29,477	30,975	33,323	8,481
Total				100,000

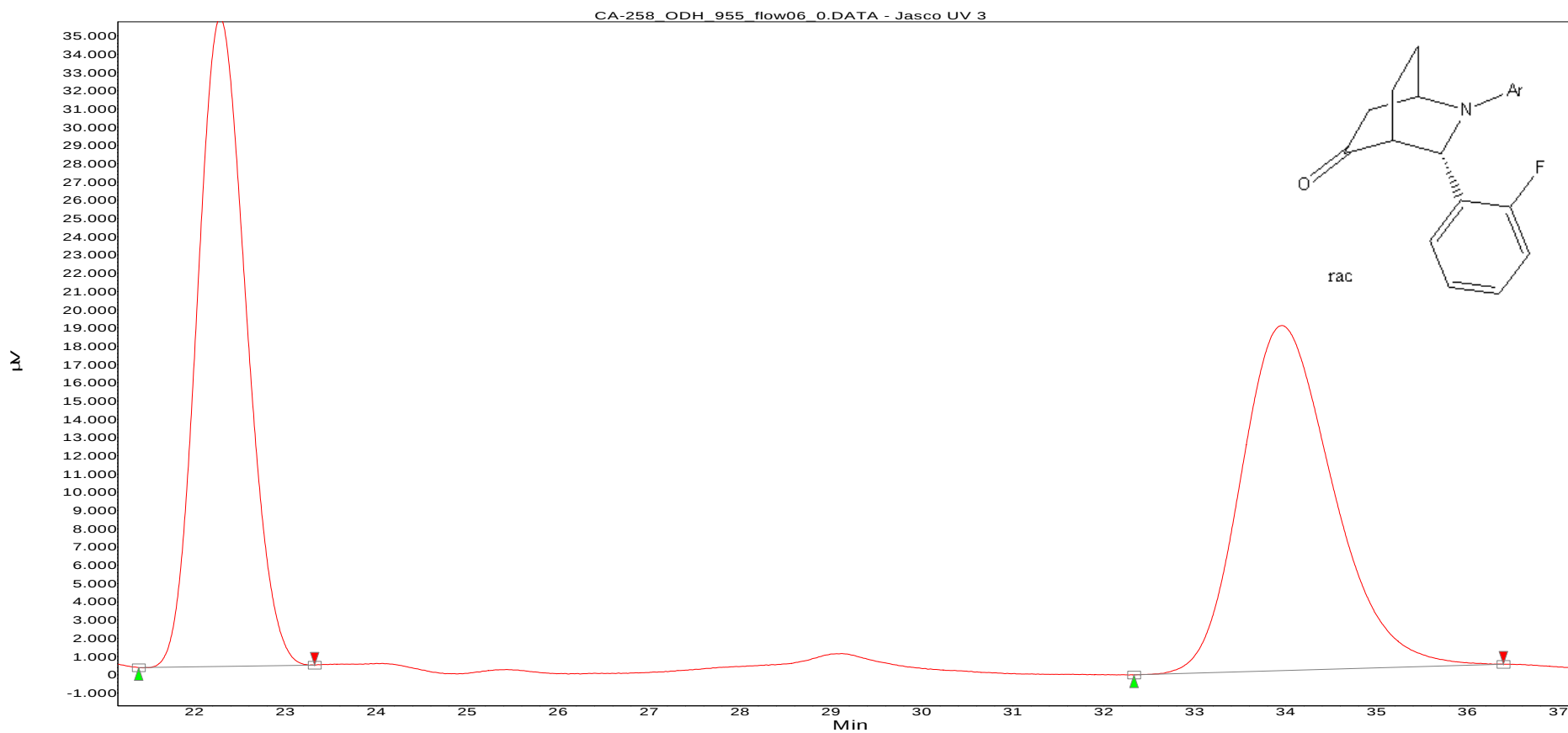




Chromatogram : CA-258_ODH_955_flow06_0

Method: ODH_955_flow06_acq50
Data file: CA-258_ODH_955_flow06_0.DATA
Date: 15.07.2006 00:47:57

Column: ODH
Flow: 0.6 mL/min
Run time: 50,00 min

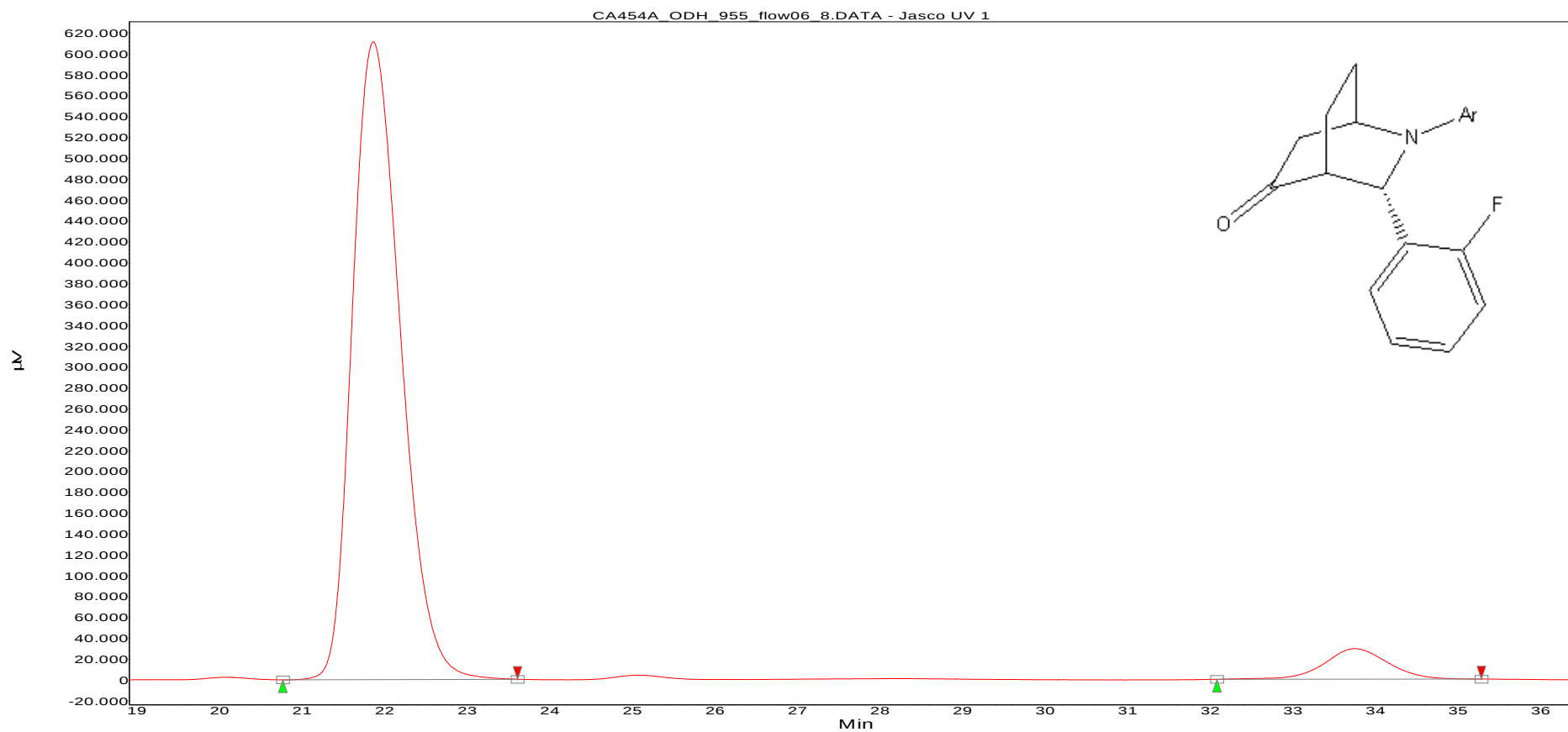


Index	Start	Time	End	Area %
	[Min]	[Min]	[Min]	[%]
1	21,387	22,283	23,321	49,861
2	32,330	33,958	36,392	50,139
Total				100,000

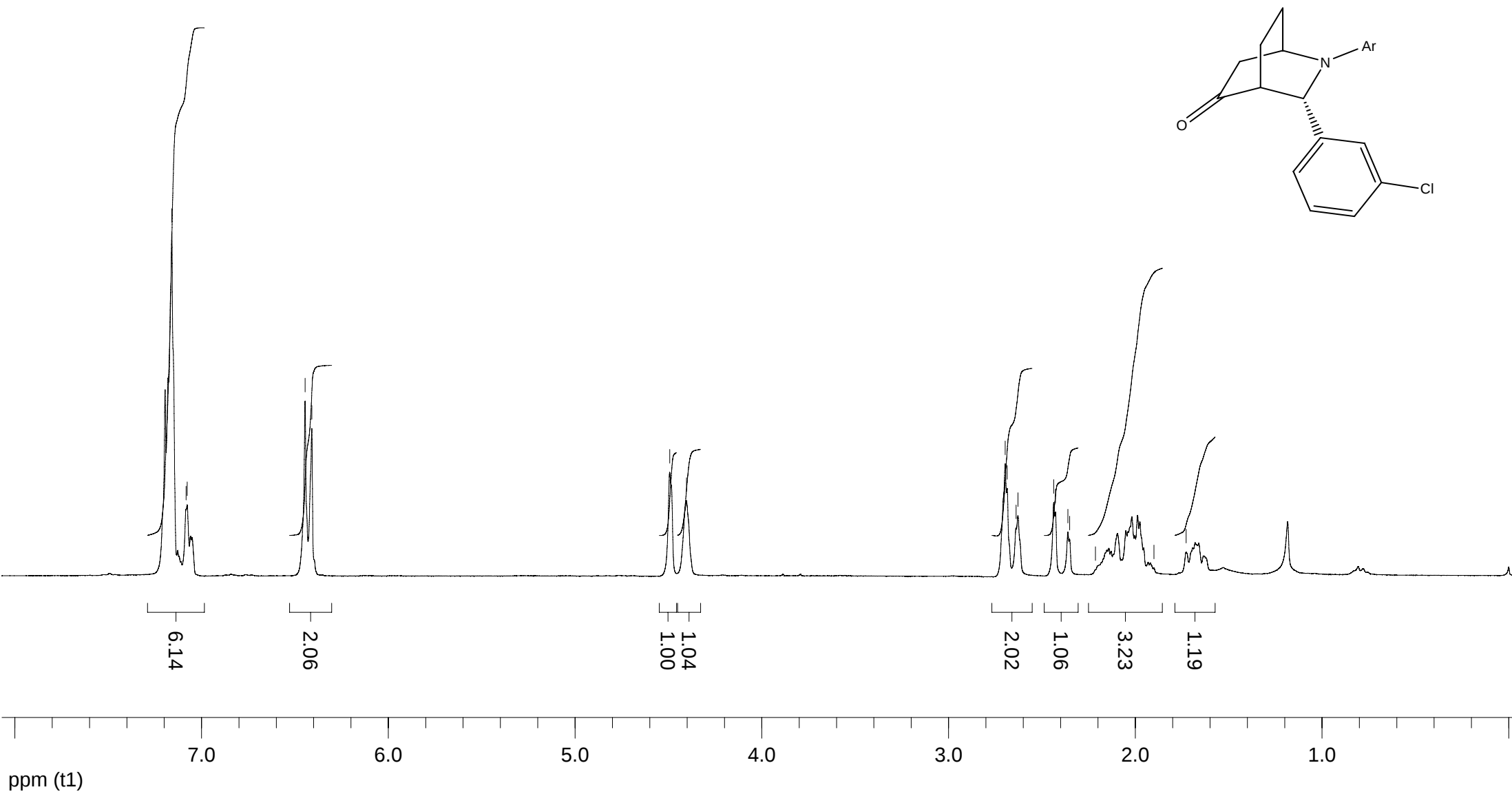
Chromatogram : CA454A_ODH_955_flow06_8

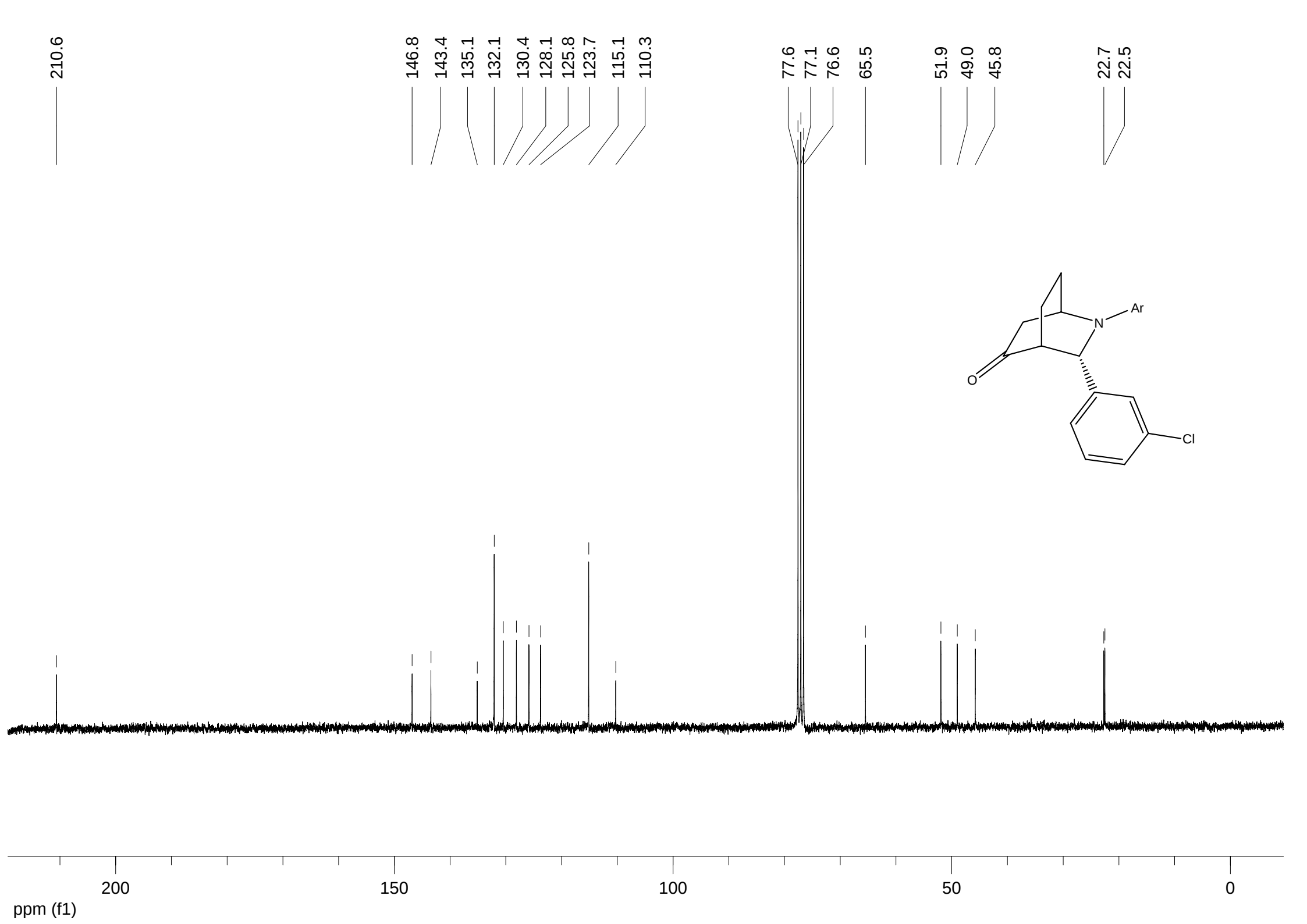
Method: ODH_955_flow06_acq50
Data file: CA454A_ODH_955_flow06_8.DATA
Date: 12.07.2006 21:16:43

Column: ODH
Flow: 0.6 mL/min
Run time: 50,00 min



Index	Start	Time	End	Area %
	[Min]	[Min]	[Min]	[%]
1	20,764	21,858	23,605	94,032
2	32,076	33,750	35,279	5,968
Total				100,000





Chromatogram : CA-247.2-rac_ODH_9010_flow06_0

Method: ODH_9010_flow06_acq50

Data file: CA-247.2-rac_ODH_9010_flow06_0.DATA

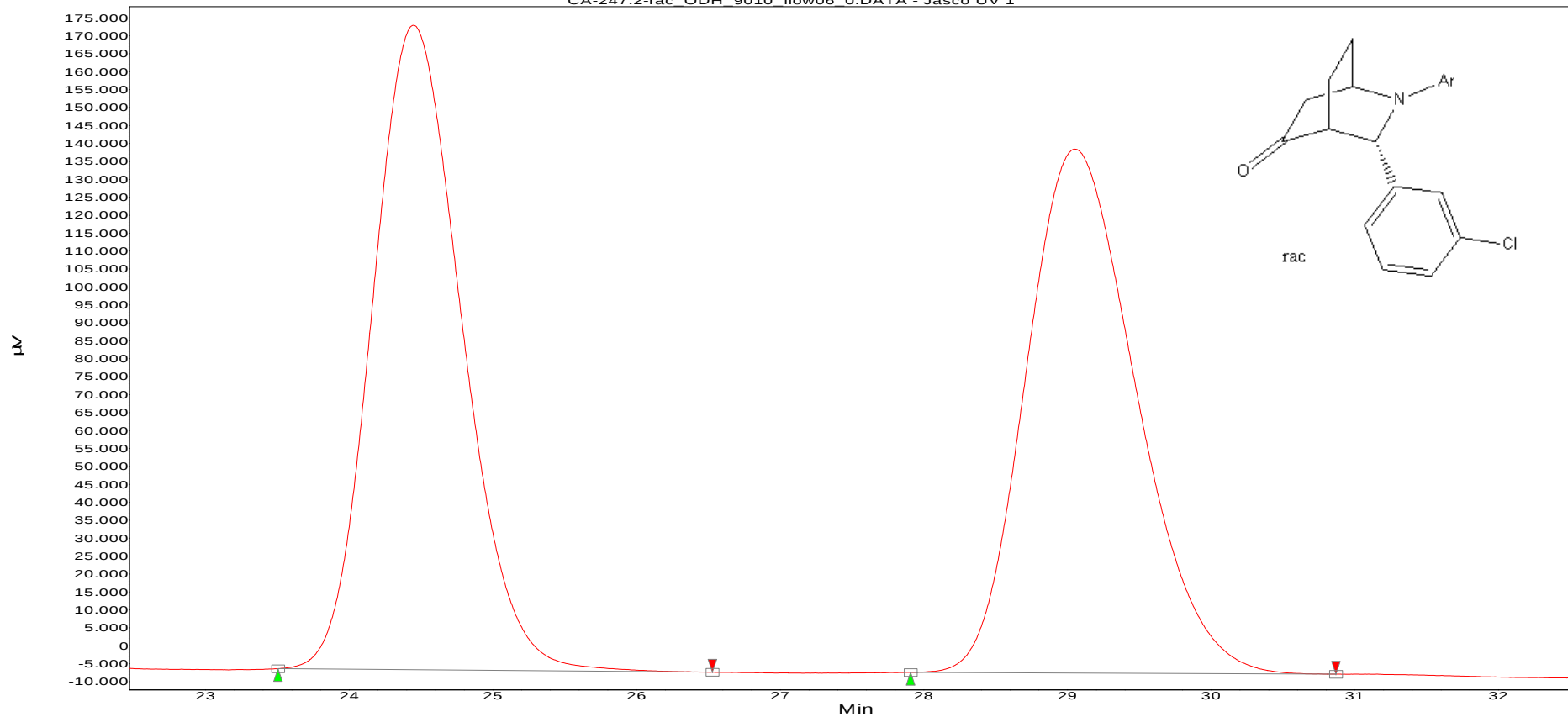
Date: 14.07.2006 20:44:27

Column: ODH

Flow: 0.6 mL/min

Run time: 50,00 min

CA-247.2-rac_ODH_9010_flow06_0.DATA - Jasco UV 1

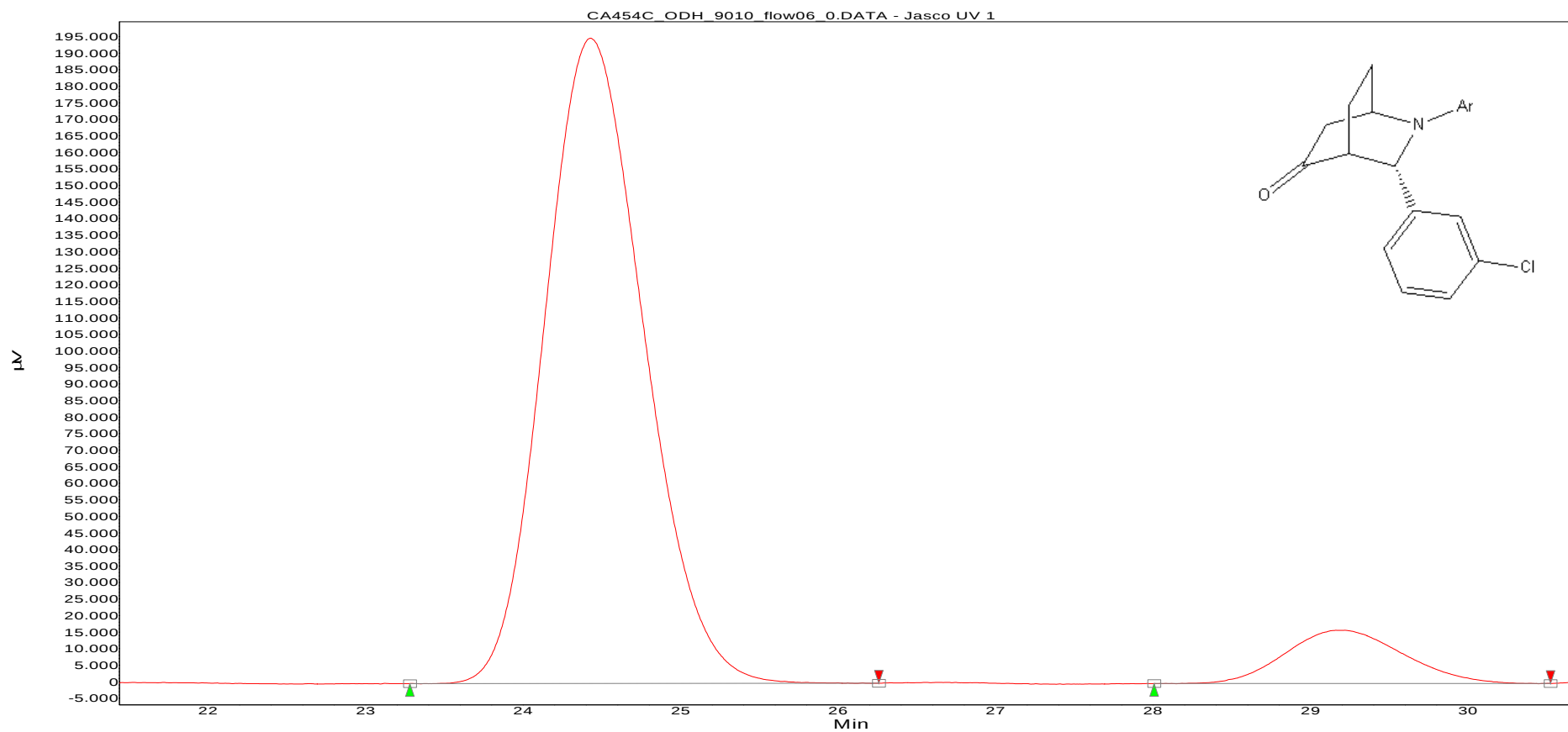


Index	Start	Time	End	Area %
	[Min]	[Min]	[Min]	[%]
1	23,504	24,442	26,527	50,049
2	27,908	29,050	30,867	49,951
Total				100,000

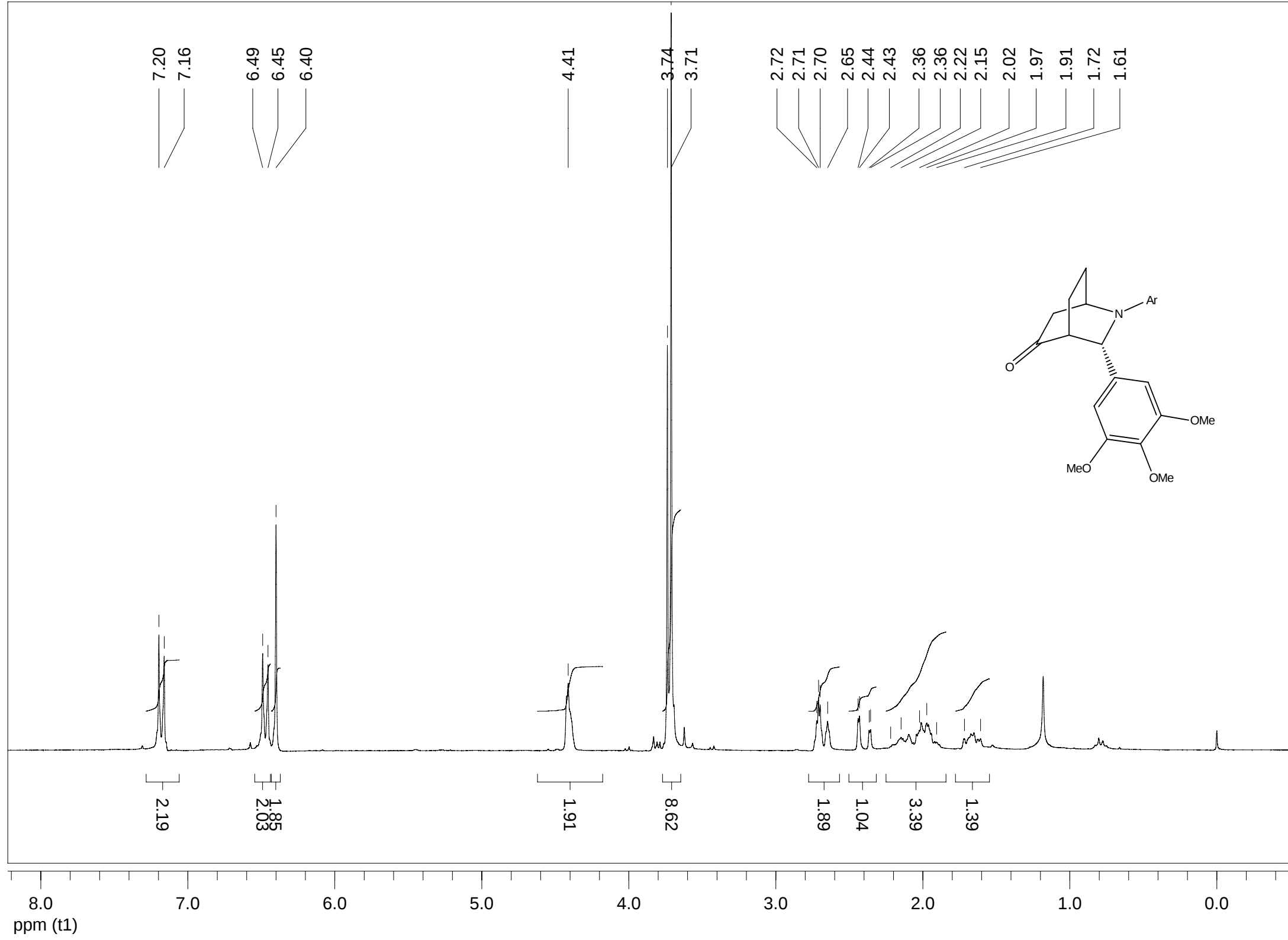
Chromatogram : CA454C_ODH_9010_flow06_0

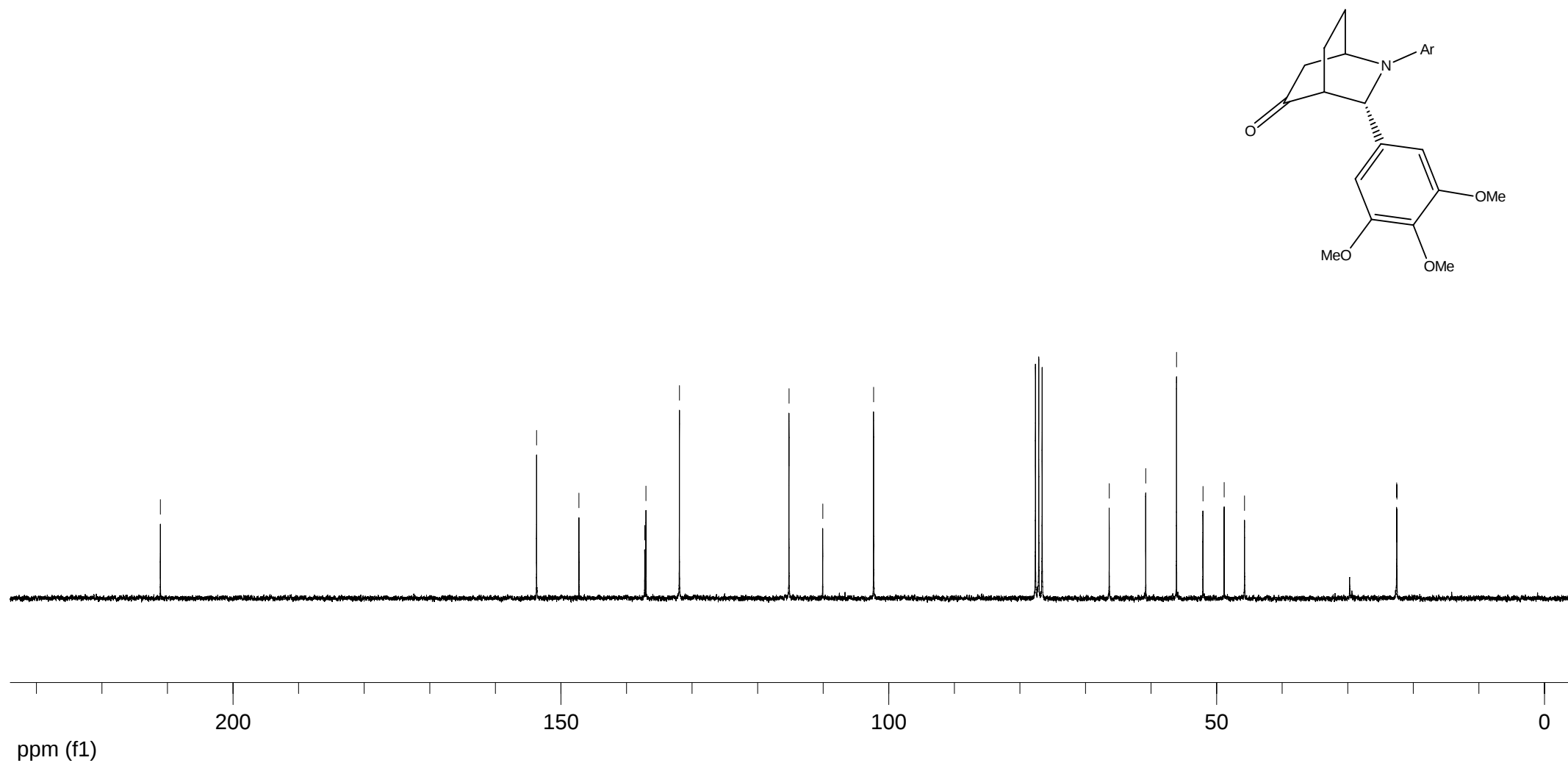
Method: ODH_9010_flow06_acq50
Data file: CA454C_ODH_9010_flow06_0.DATA
Date: 14.07.2006 21:37:08

Column: ODH
Flow: 0.6 mL/min
Run time: 50,00 min



Index	Start	Time	End	Area %
	[Min]	[Min]	[Min]	[%]
1	23,280	24,425	26,258	91,093
2	28,006	29,192	30,522	8,907
Total				100,000





211.1

153.7

147.2

137.2

137.0

131.9

115.2

110.1

102.3

66.4

60.8

56.1

52.1

48.8

45.7

22.5

22.5

Chromatogram : CA-254.2-rac_ODH_8020_flow06_21

Method: ODH_8020_flow06_acq50

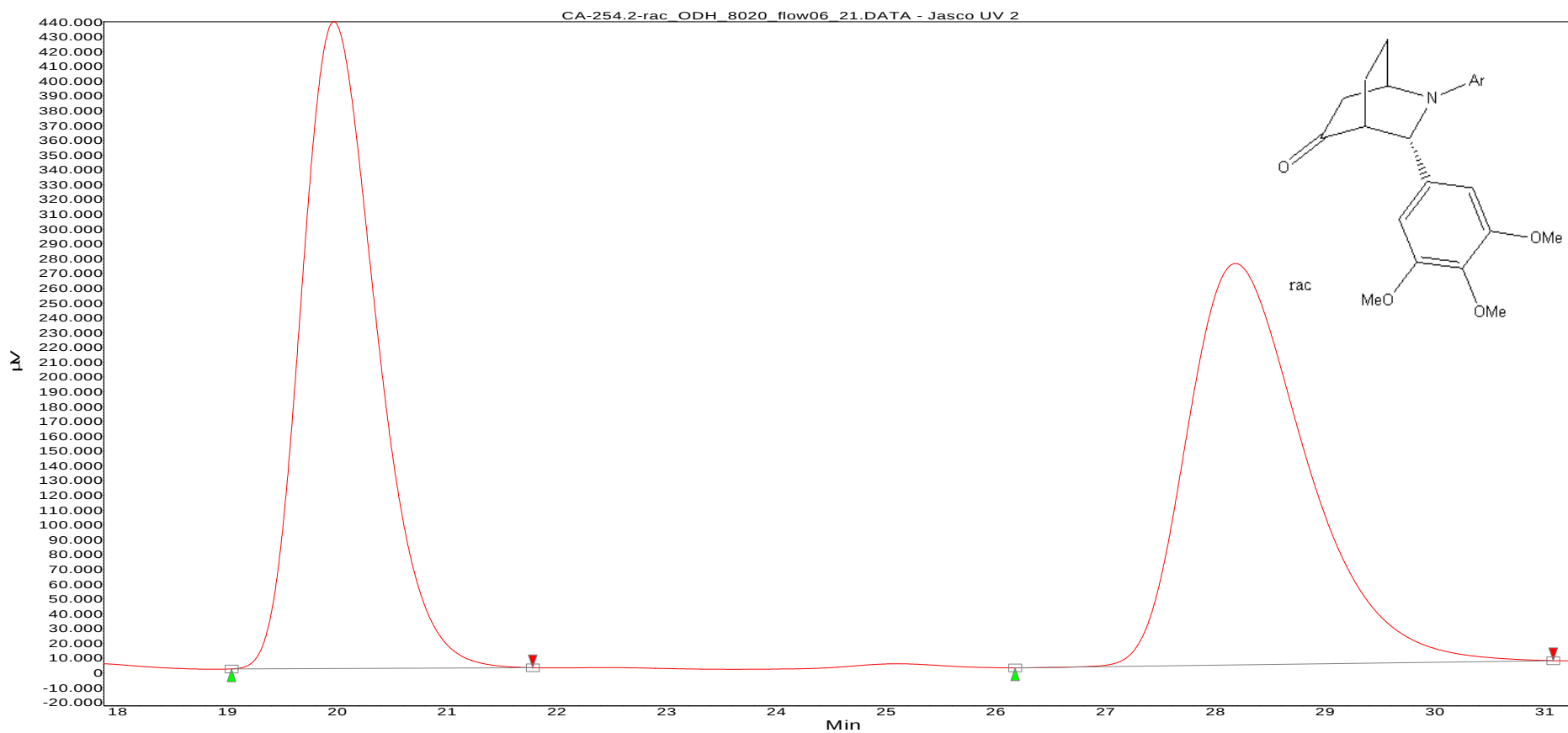
Data file: CA-254.2-rac_ODH_8020_flow06_21.DATA

Date: 12.07.2006 00:36:59

Column: ODH

Flow: 0.6 mL/min

Run time: 50,00 min

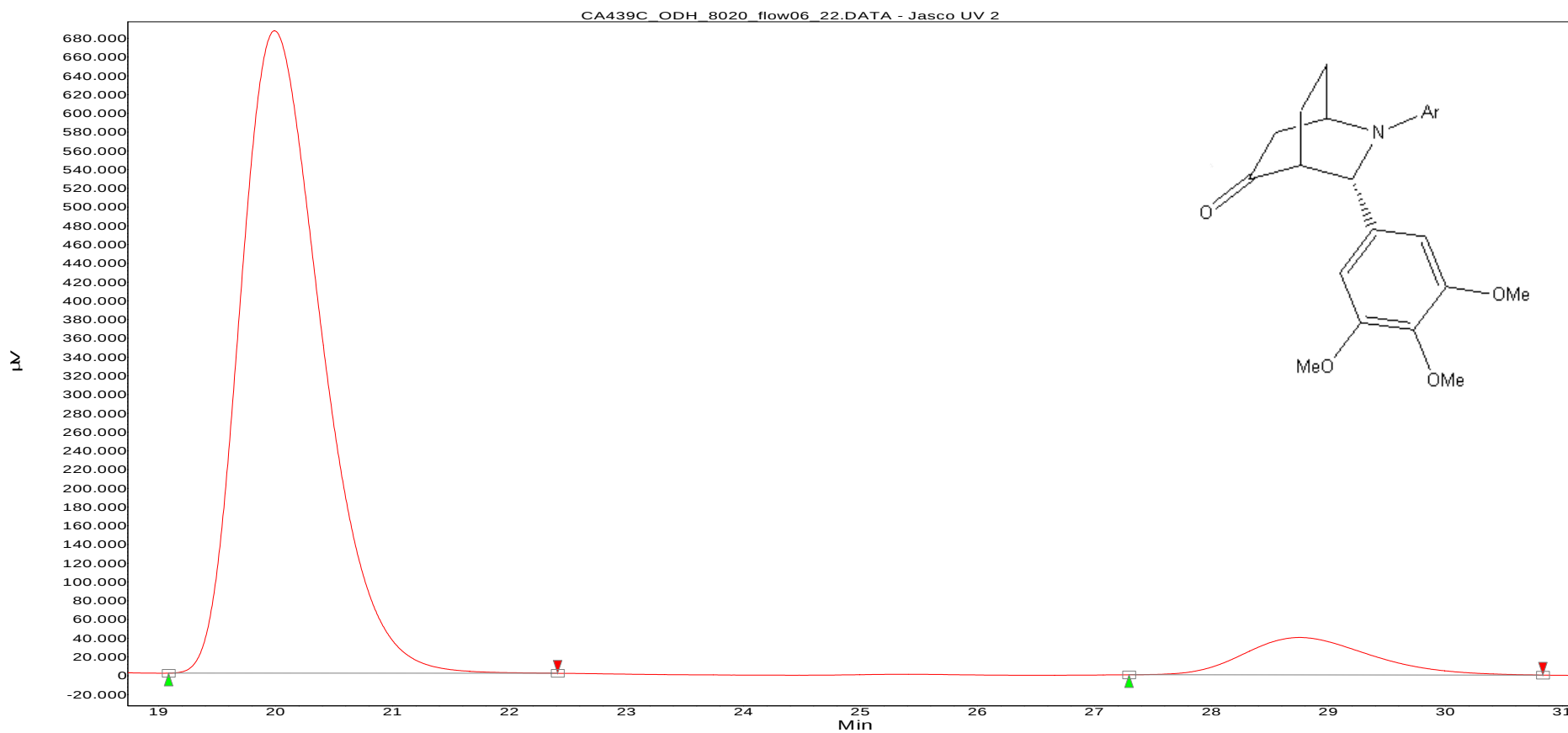


Index	Start	Time	End	Area %
	[Min]	[Min]	[Min]	[%]
1	19,035	19,967	21,779	50,571
2	26,172	28,183	31,075	49,429
Total				100,000

Chromatogram : CA439C_ODH_8020_flow06_22

Method: ODH_8020_flow06_acq50
Data file: CA439C_ODH_8020_flow06_22.DATA
Date: 12.07.2006 01:29:42

Column: ODH
Flow: 0.6 mL/min
Run time: 50,00 min



Index	Start	Time	End	Area %
	[Min]	[Min]	[Min]	[%]
1	19,085	19,992	22,411	91,763
2	27,295	28,750	30,831	8,237
Total				100,000