Supporting Information

One-Pot Approach to Chiral Chromenes *via* Enantioselective Organocatalytic Domino Oxa-Michael-Aldol Reaction

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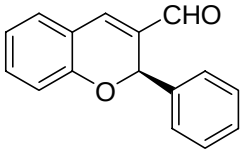
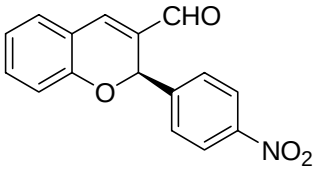
General Information: Commercial reagents were used as received, unless otherwise stated. Merck 60 silica gel was used for chromatography, and Whatman silica gel plates with fluorescence F_{254} were used for thin-layer chromatography (TLC) analysis. ^{1}H and ^{13}C NMR spectra were recorded on Broker Avance 500, and tetramethylsilane (TMS) was used as a reference. Data for ^{1}H are reported as follows: chemical shift (ppm), and multiplicity (s = singlet, d = doublet, t = triplet, q = quartet, m = multiplet). Data for ^{13}C NMR are reported as ppm.

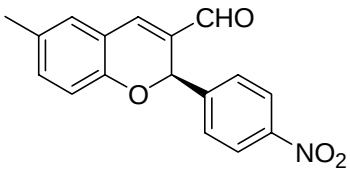
General Procedure for addition of 2-Hydroxy-benzaldehydes to unsaturated aldehydes (Table 2): To a solution of a *trans*-cinnamaldehyde (**1a**) (0.1 mmol) in the presence of catalyst **III (**30 mol %), benzoic acid (0.03 mmol) and 4Å MS (50 mg) in 1, 2-dichloroethane (0.5 mL) was added a 2-salicylaldehyde (**2a**) (1.0 mmol) and the resulting solution was stirred at specified temperature for a specified time. The reaction mixture was directly purified by silica gel chromatography and fractions were collected and concentrated *in vacuo* to give a pure product.



2-Phenyl-*2H*-chromene-3-carbaldehyde (Table 2, entry 1): The title compound was prepared according the typical procedure, as described above in 87% yield. ^{1}H NMR (500 MHz, $CDCl_3$, TMS): δ 9.64 (s, 1H; CHO), 7.40 (s, 1H; CH), 7.34-7.36 (m, 2H; Ar), 7.24-7.30 (m, 5H; Ar), 6.94 (t, ^{2}J (H,H) = 7.5 Hz, 1H; Ar), 6.87 (d, ^{2}J (H,H) = 8.0 Hz, 1H; Ar), 6.34 (s, 1H; OCH); ^{13}C NMR (125 MHz, $CDCl_3$, TMS): δ 190.0, 154.8, 140.8, 139.0, 133.7, 129.3, 128.6, 128.5, 126.7, 121.7, 119.9, 117.1, 74.2; $[\alpha]_D^{23}$ = -39.2 (*c* = 1.0, MeOH); HPLC (Daicel CHIRALPAK AS-H, Hexane/*i*-PrOH = 90:10, flow rate 0.5 mL/min, λ = 254 nm): t_{major} = 25.54 min, t_{minor} =35.53 min, ee = 88%.

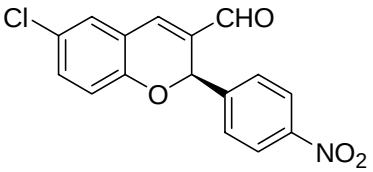


2-(4-Nitro-phenyl)-*2H*-chromene-3-carbaldehyde (Table 2, entry 2): The title compound was prepared according the typical procedure, as described above in 96% yield. ^{1}H NMR (500 MHz, $CDCl_3$, TMS): δ 9.68 (s, 1H; CHO), 8.11 (d, ^{2}J (H,H) = 8.5 Hz, 2H; Ar), 7.52 (d, ^{2}J (H,H) = 8.5 Hz, 2H; Ar), 7.47 (s, 1H; CH), 7.35 (t, ^{2}J (H,H) = 8.5 Hz, 1H; Ar), 7.27 (d, ^{2}J (H,H) = 6.5 Hz, 1H; Ar), 7.00 (t, ^{2}J (H,H) = 7.5 Hz, 1H; Ar), 6.93 (d, ^{2}J (H,H) = 8.0 Hz, 1H; Ar), 6.41 (s, 1H; OCH); ^{13}C NMR (125 MHz, $CDCl_3$, TMS): δ 189.8, 154.3, 147.8, 146.1, 141.4, 134.2, 132.6, 129.7, 127.5, 123.7, 122.4, 119.5, 117.0, 72.9; $[\alpha]_D^{23}$ = -61.0 (*c* = 1.0, MeOH); HPLC (Daicel CHIRALPAK AS-H, Hexane/*i*-PrOH = 60:40, flow rate 0.6 mL/min, λ = 254 nm): t_{major} = 37.40 min, t_{minor} = 53.40 min, ee = 95%.

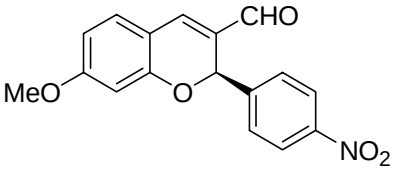


6-Methyl-2-(4-nitro-phenyl)-*2H*-chromene-3-carbaldehyde (Table 2, entry 3): The title compound was prepared according the typical procedure, as described above in 98% yield. ^{1}H NMR (500 MHz, $CDCl_3$, TMS): δ 9.67 (s, 1H), 8.10 (d, ^{2}J (H,H) = 9.0 Hz, 2H; Ar), 7.51 (d, ^{2}J (H,H) = 8.5 Hz, 2H; Ar), 7.42 (s, 1H; CH), 7.15 (dd, ^{2}J (H,H) = 8.5 Hz, ^{3}J (H,H) = 1.5 Hz, 1H; Ar), 7.07, (s, 1H; Ar), 6.83 (d, ^{2}J (H,H) = 8.5 Hz, 1H; Ar), 6.38 (s, 1H; OCH), 2.28 (s, 3H; CH_3); ^{13}C NMR (125 MHz, $CDCl_3$, TMS): δ

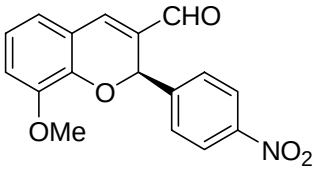
189.9, 152.2, 147.7, 146.3, 141.7, 134.9, 132.7, 131.8, 129.8, 127.4, 123.6, 119.4, 116.8, 72.7, 20.3; $[\alpha]_D^{23}$ = -63.7 (*c* = 1.0, EtOAc); HPLC (Daicel CHIRALPAK AS-H, Hexane/*i*-PrOH = 60:40, flow rate 0.6 mL/min, λ = 254 nm): t_{major} = 25.39 min, t_{minor} = 37.72 min, ee = 96%.



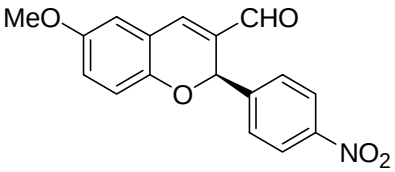
6-Chloro-2-(4-nitro-phenyl)-*2H*-chromene-3-carbaldehyde (Table 2, entry 4): The title compound was prepared according the typical procedure, as described above in 96% yield. ^{1}H NMR (500 MHz, $CDCl_3$, TMS): δ 9.69 (s, 1H; CHO), 8.12 (d, ^2J (H,H) = 9.0 Hz, 2H; Ar), 7.49 (d, ^2J (H,H) = 8.5 Hz, 2H; Ar), 7.42 (s, 1H; CH), 7.26-7.29 (m, 2H; Ar), 6.87 (d, ^2J (H,H) = 8.5 Hz, 1H; Ar), 6.40 (s, 1H; OCH); ^{13}C NMR (125 MHz, $CDCl_3$, TMS): δ 189.6, 152.7, 147.9, 145.4, 139.8, 133.6, 133.5, 128.7, 127.5, 127.2, 123.8, 120.7, 118.4, 73.1; $[\alpha]_D^{23}$ = -23.8 (*c* = 1.0, MeOH); HPLC (Daicel CHIRALPAK AS-H, Hexane/EtOH = 60:40, flow rate 0.5 mL/min, λ = 254 nm): t_{major} = 23.38 min, t_{minor} = 42.53 min. ee = 91%.



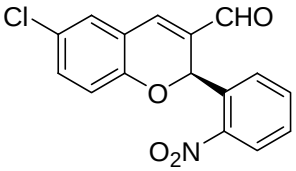
7-Methoxy-2-(4-nitro-phenyl)-*2H*-chromene-3-carbaldehyde (Table 2, entry 5): The title compound was prepared according the typical procedure, as described above in 64% yield. ^{1}H NMR (500 MHz, $CDCl_3$, TMS): δ 9.61 (s, 1H; CHO), 8.13 (d, ^2J (H,H) = 9.0 Hz, 2H; Ar), 7.53 (d, ^2J (H,H) = 9.0 Hz, 2H; Ar), 7.42 (s, 1H; CH), 7.19 (d, ^2J (H,H) = 8.5 Hz, 1H; Ar), 6.55 (dd, ^2J (H,H) = 8.5 Hz, ^3J (H,H) = 2.0 Hz, 1H; Ar), 6.47 (d, ^3J (H,H) = 2.0 Hz, 1H; Ar), 6.41 (s, 1H; OCH), 3.82 (s, 3H; OCH_3); ^{13}C NMR (125 MHz, $CDCl_3$, TMS): δ 189.5, 164.9, 156.3, 147.8, 146.4, 141.6, 131.0, 130.0, 127.5, 123.8, 112.9, 109.4, 102.0, 73.2, 55.6; $[\alpha]_D^{23}$ = - 194.6 (*c* = 1.0, MeOH); HPLC (Daicel CHIRALPAK AS-H, Hexane/EtOH = 60:40, flow rate 0.6 mL/min, λ = 254 nm): t_{major} = 21.75 min, t_{minor} = 25.74 min. ee = 86%.



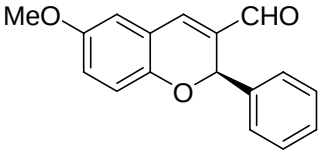
8-Methoxy-2-(4-nitro-phenyl)-*2H*-chromene-3-carbaldehyde (Table 2, entry 6): The title compound was prepared according the typical procedure, as described above in 98% yield. ^{1}H NMR (500 MHz, $CDCl_3$, TMS): δ 9.69 (s, 1H; CHO), 8.08 (d, ^2J (H,H) = 9.0 Hz, 2H; Ar), 7.51 (d, ^2J (H,H) = 8.5 Hz, 2H; Ar), 7.45 (s, 1H; CH), 6.93-6.99 (m, 2H; Ar), 6.87 (dd, ^2J (H,H) = 7.5 Hz, ^3J (H,H) = 1.5 Hz, 1H; Ar), 6.48 (s, 1H; OCH), 3.88 (s, 3H; OCH_3); ^{13}C NMR (125 MHz, $CDCl_3$, TMS): δ 190.0, 148.3, 147.7, 146.1, 143.3, 141.5, 133.0, 127.1, 123.6, 122.2, 121.3, 120.3, 116.2, 72.8, 56.2; $[\alpha]_D^{23}$ = -105.9 (*c* = 2.0, MeOH); HPLC (Daicel CHIRALPAK AS-H, Hexane/EtOH = 60:40, flow rate 0.6 mL/min, λ = 254 nm): t_{major} = 16.84 min, t_{minor} = 25.07 min. ee = 90%.



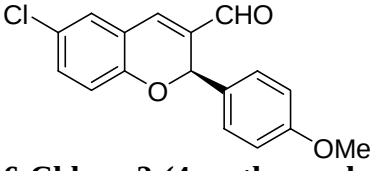
6-Methoxy-2-(4-nitro-phenyl)-*2H*-chromene-3-carbaldehyde (Table 2, entry 7): The title compound was prepared according the typical procedure, as described above in 95% yield. ^{1}H NMR (500 MHz, $CDCl_3$, TMS): δ 9.69 (s, 1H, CHO), 8.10 (d, ^{2}J (H,H) = 8.5 Hz, 2H; Ar), 7.50 (d, ^{2}J (H,H) = 8.5 Hz, 2H; Ar), 7.44 (s, 1H; CH), 6.91 (dd, ^{2}J (H,H) = 9.0 Hz, ^{3}J (H,H) = 3.0 Hz, 1H; Ar), 6.87 (d, ^{2}J (H,H) = 9.0 Hz, 1H; Ar), 6.78 (d, ^{3}J (H,H) = 3.0 Hz, 1H; Ar), 6.36 (s, 1H; OCH), 3.78 (s, 3H; OCH_3); ^{13}C NMR (125 MHz, $CDCl_3$, TMS): δ 189.9, 154.6, 148.2, 147.7, 146.1, 141.6, 133.3, 127.5, 123.6, 120.3, 120.0, 117.9, 113.1, 72.5, 55.7; $[\alpha]_D^{23}$ = -11.0 (*c* = 1.0, EtOAc); HPLC (Daicel CHIRALCEL OD-H, Hexane/EtOH = 60:40, flow rate 0.6 mL/min, λ = 254 nm): t_{major} = 12.88 min, t_{minor} = 14.31 min. ee = 94%.



6-Chloro-2-(2-nitro-phenyl)-*2H*-chromene-3-carbaldehyde (Table 2, entry 8): The title compound was prepared according the typical procedure, as described above in 82% yield. ^{1}H NMR (500 MHz, DMSO-d^6): δ 9.71 (s, 1H; CHO), 7.98 (s, 1H; CH), 7.94-7.96 (m, 1H; Ar), 7.58-7.61 (m, 3H; Ar), 7.32-7.35 (m, 2H; Ar), 6.80 (s, 1H; OCH), 6.74 (d, ^{2}J (H,H) = 8.5 Hz, 1H; Ar); ^{13}C NMR (125 MHz, DMSO-d^6): δ 200.9, 161.7, 158.7, 150.8, 143.1, 143.1, 142.1, 140.7, 140.3, 138.9, 138.7, 136.1, 134.8, 131.5, 128.4, 78.6; $[\alpha]_D^{23}$ = +176.7 (*c* = 1.0, EtOAc); HPLC (Daicel CHIRALCEL OD-H, Hexane/EtOH = 60:40, flow rate 0.6 mL/min, λ = 254 nm): t_{major} = 13.88 min, t_{major} = 24.77 min, ee = >99%.

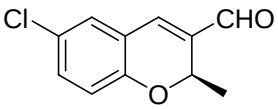


6-Methoxy-2-phenyl-*2H*-chromene-3-carbaldehyde (Table 2, entry 9): The title compound was prepared according the typical procedure, as described above in 97% yield. ^{1}H NMR (500 MHz, $CDCl_3$, TMS): δ 9.65 (s, 1H; CHO), 7.36 (s, 1H; CH), 7.33 (m, 2H; Ar), 7.25 (m, 3H; Ar), 6.86 (d, ^{2}J (H,H) = 8.5 Hz, 1H; Ar), 6.80 (d, ^{2}J (H,H) = 8.5 Hz, 1H; Ar), 6.76 (s, 1H; Ar), 6.29 (s, 1H; OCH), 3.76 (s, 3H; OCH_3); ^{13}C NMR (125 MHz, $CDCl_3$, TMS): δ 190.0, 154.2, 148.7, 140.9, 138.8, 134.3, 128.5, 128.4, 126.7, 120.3, 119.8, 117.9, 112.9, 73.8, 55.7; $[\alpha]_D^{23}$ = + 17.0 (*c* = 1.0, $CHCl_3$); HPLC (Daicel CHIRALCEL OD-H, Hexane/*i*-PrOH = 60:40, flow rate 0.5 mL/min, λ = 254 nm): t_{major} = 13.32 min, t_{minor} = 17.34 min, ee = 87%.

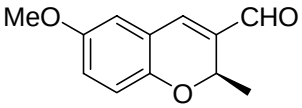


6-Chloro-2-(4-methoxy-phenyl)-*2H*-chromene-3-carbaldehyde (Table 2, entry 10): The title compound was prepared according the typical procedure, as described above in 53% yield. ^{1}H NMR (500 MHz, $CDCl_3$, TMS): δ 9.63 (s, 1H; CHO), 7.33 (s, 1H; CH), 7.19-7.25 (m, 3H; Ar), 6.76-6.81 (m,

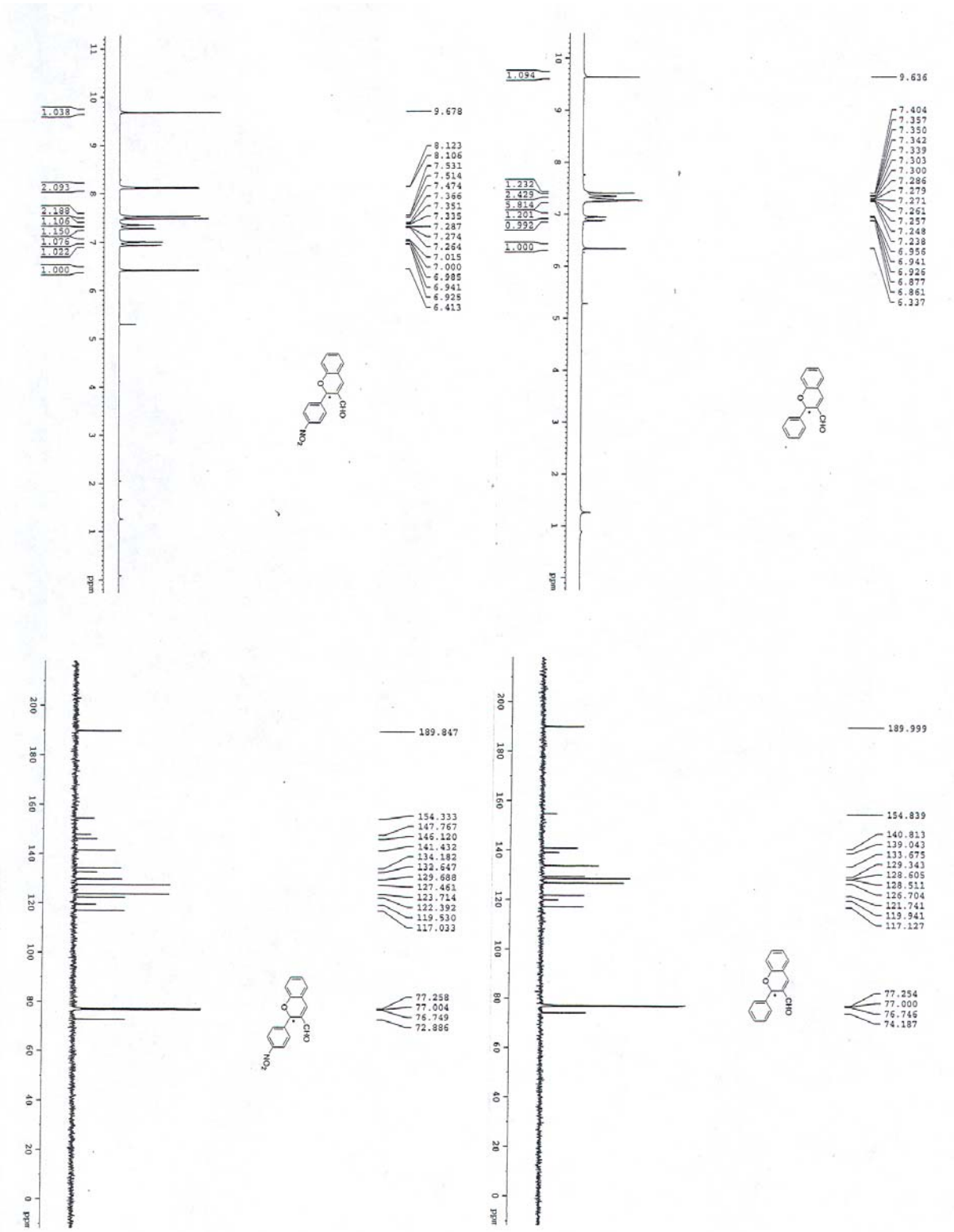
3H; Ar), 6.26 (s, 1H; OCH), 3.74 (s, 3H; OCH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 189.7, 160.0, 153.1, 139.0, 134.6, 133.0, 130.5, 128.3, 126.4, 121.2, 118.6, 114.0, 74.2, 55.2; $[\alpha]_D^{23}$ = + 27.7 (*c* = 1.0, MeOH); HPLC (Daicel CHIRALPAK AS-H, Hexane/EtOH = 60:40, flow rate 0.5 mL/min, λ = 254 nm): t_{major} = 18.58 min, t_{minor} = 24.78 min, ee = 75%.



6-Chloro-2-methyl-*2H*-chromene-3-carbaldehyde (Table 2, entry 11): The title compound was prepared according the typical procedure, as described above in 67% yield. ^1H NMR (500 MHz, $CDCl_3$, TMS): δ 9.56 (s, 1H; CHO), 7.25 (dd, ^2J (H,H) = 8.5 Hz, ^3J (H,H) = 2.5 Hz, 1H; Ar), 7.20 (d, ^3J (H,H) = 2.5 Hz, 1H; Ar), 7.12 (s, 1H; CH), 6.82 (d, ^2J (H,H) = 8.5 Hz, 1H; Ar), 5.41 (q, ^2J (H,H) = 6.5 Hz, 1H; OCH), 1.35 (d, ^2J (H,H) = 6.5 Hz, 3H; CH_3); ^{13}C NMR (125 MHz, $CDCl_3$, TMS): δ 189.8, 152.8, 138.6, 137.0, 132.8, 128.3, 126.4, 121.0, 118.7, 70.0, 19.8; $[\alpha]_D^{23}$ = - 27.4 (*c* = 1.0, MeOH); HPLC (Daicel CHIRALPAK AS-H, Hexane/*i*-PrOH = 90:10, flow rate 0.5 mL/min, λ = 254 nm): t_{major} = 12.31 min, t_{minor} = 16.47 min, ee = 82%.



6-Methoxy-2-methyl-*2H*-chromene-3-carbaldehyde (Table 2, entry 12): The title compound was prepared according the typical procedure, as described above in 84% yield. ^1H NMR (500 MHz, $CDCl_3$, TMS): δ 9.54 (s, 1H; CHO), 7.26 (s, 1H; CH), 6.88 (dd, ^2J (H,H) = 9.0 Hz, ^3J (H,H) = 3.0 Hz, 1H; Ar), 6.81 (d, ^2J (H,H) = 8.5 Hz, 1H; Ar), 6.73 (d, ^3J (H,H) = 3.0 Hz, 1H; Ar), 5.36 (q, ^2J (H,H) = 6.5 Hz, 1H; OCH), 3.78 (s, 3H; OCH_3), 1.32 (d, ^2J (H,H) = 6.5 Hz, 3H; CH_3); ^{13}C NMR (125 MHz, $CDCl_3$, TMS): δ 189.9, 154.1, 148.2, 140.1, 136.8, 120.2, 119.5, 118.0, 112.8, 69.5, 55.8, 19.4; $[\alpha]_D^{23}$ = + 10.7 (*c* = 1.0, $CHCl_3$); HPLC (Daicel CHIRALPAK AS-H, Hexane/*i*-PrOH = 70:30, flow rate 0.5 mL/min, λ = 254 nm): t_{major} = 16.26 min, t_{minor} = 17.61 min, ee = 85%.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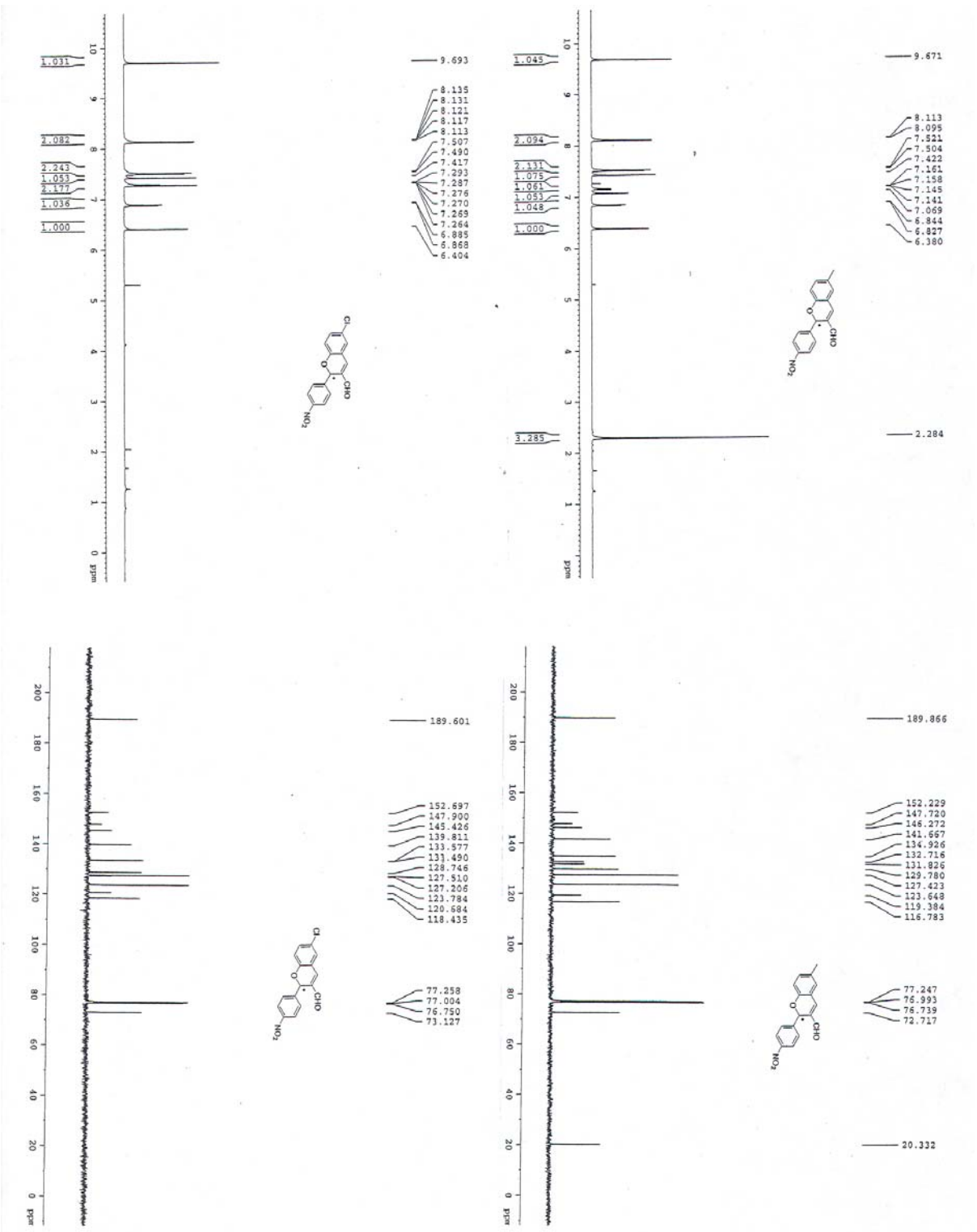
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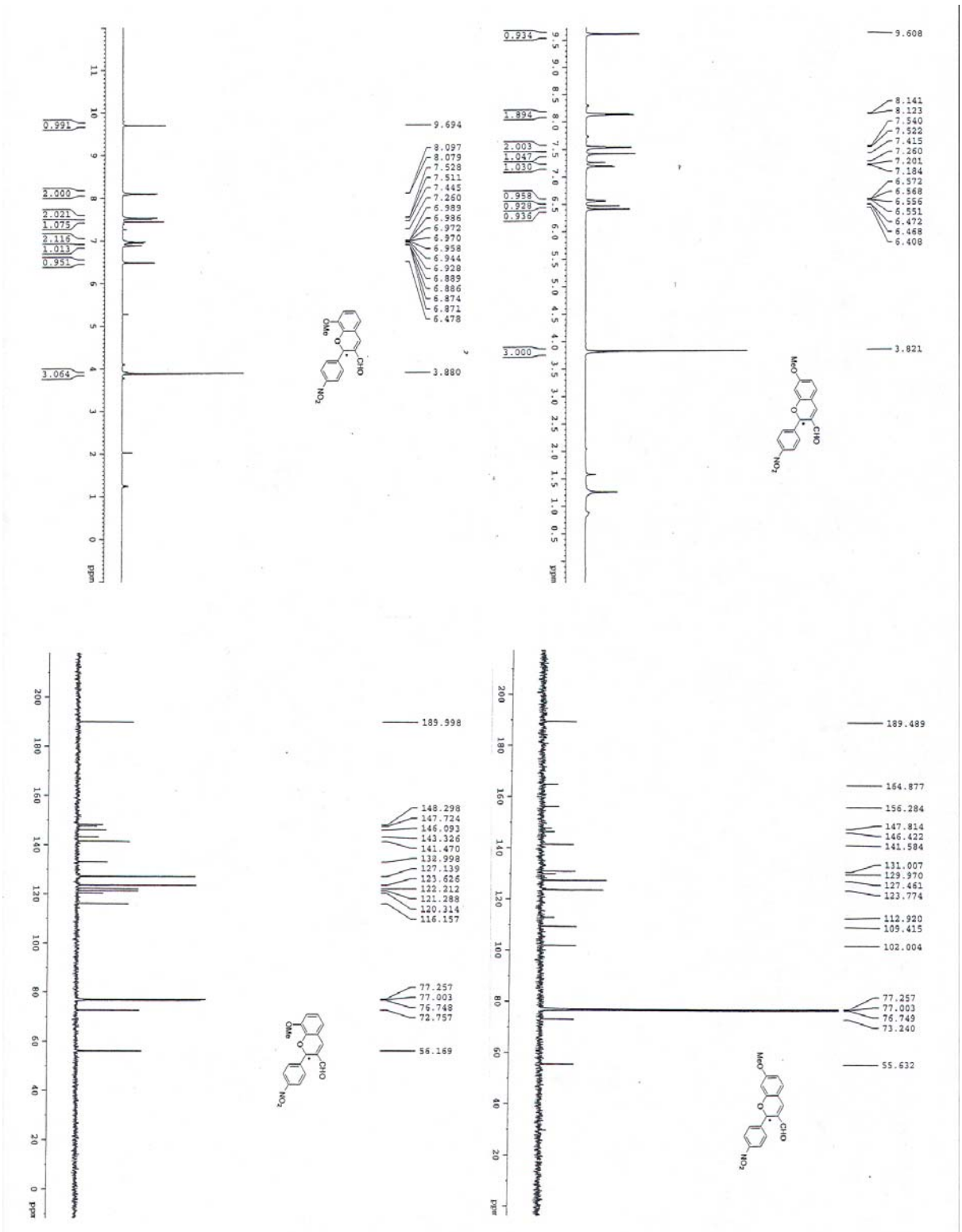
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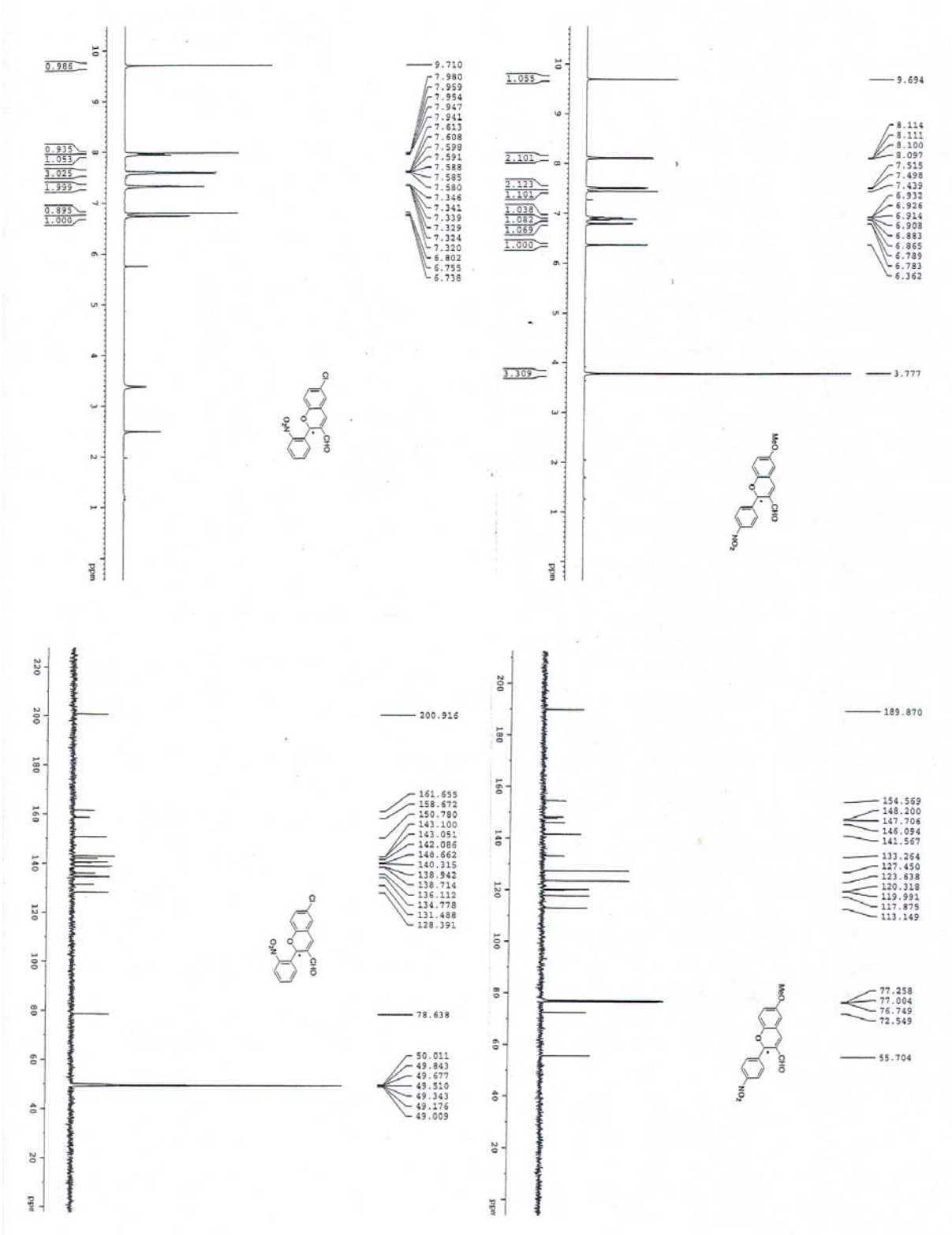
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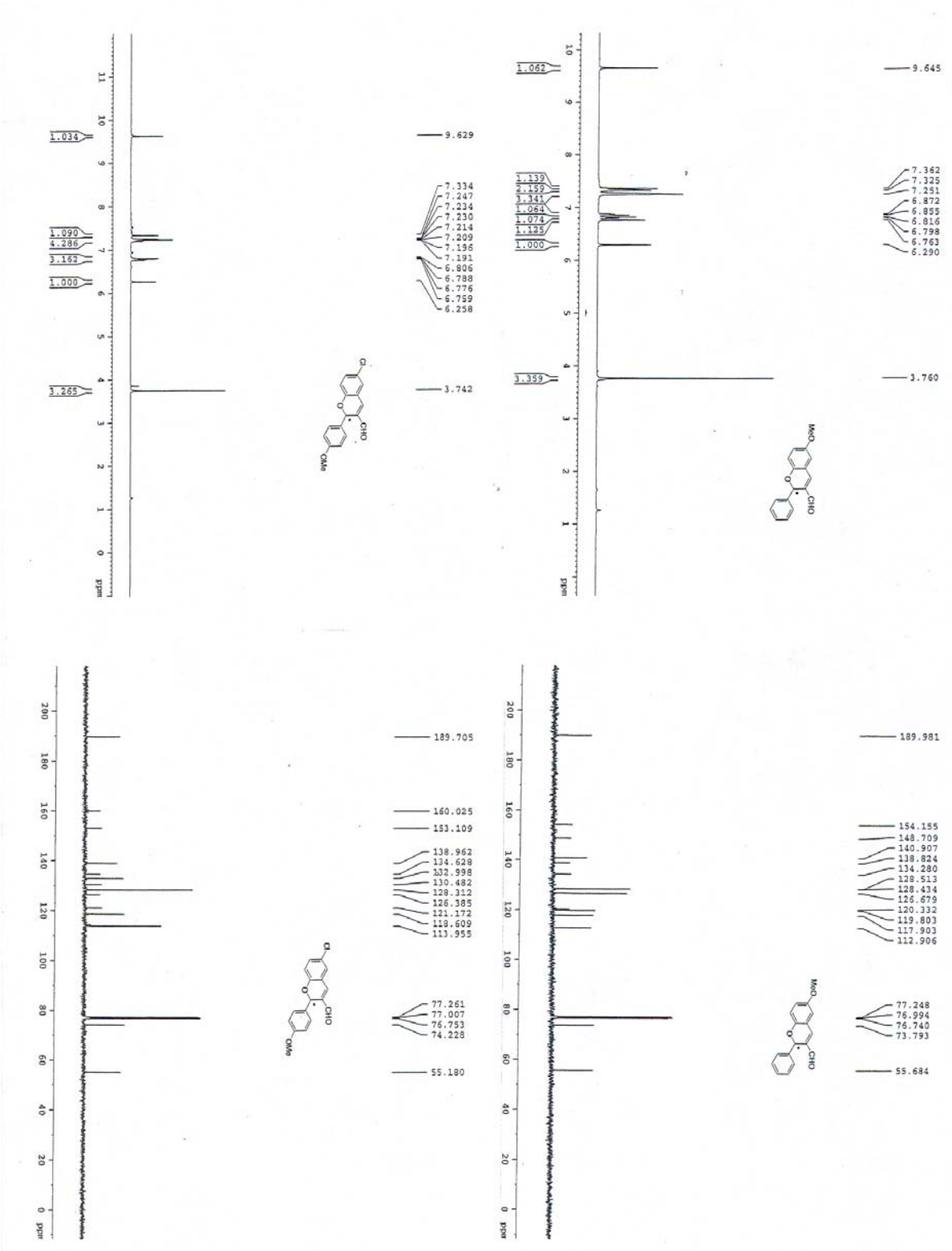
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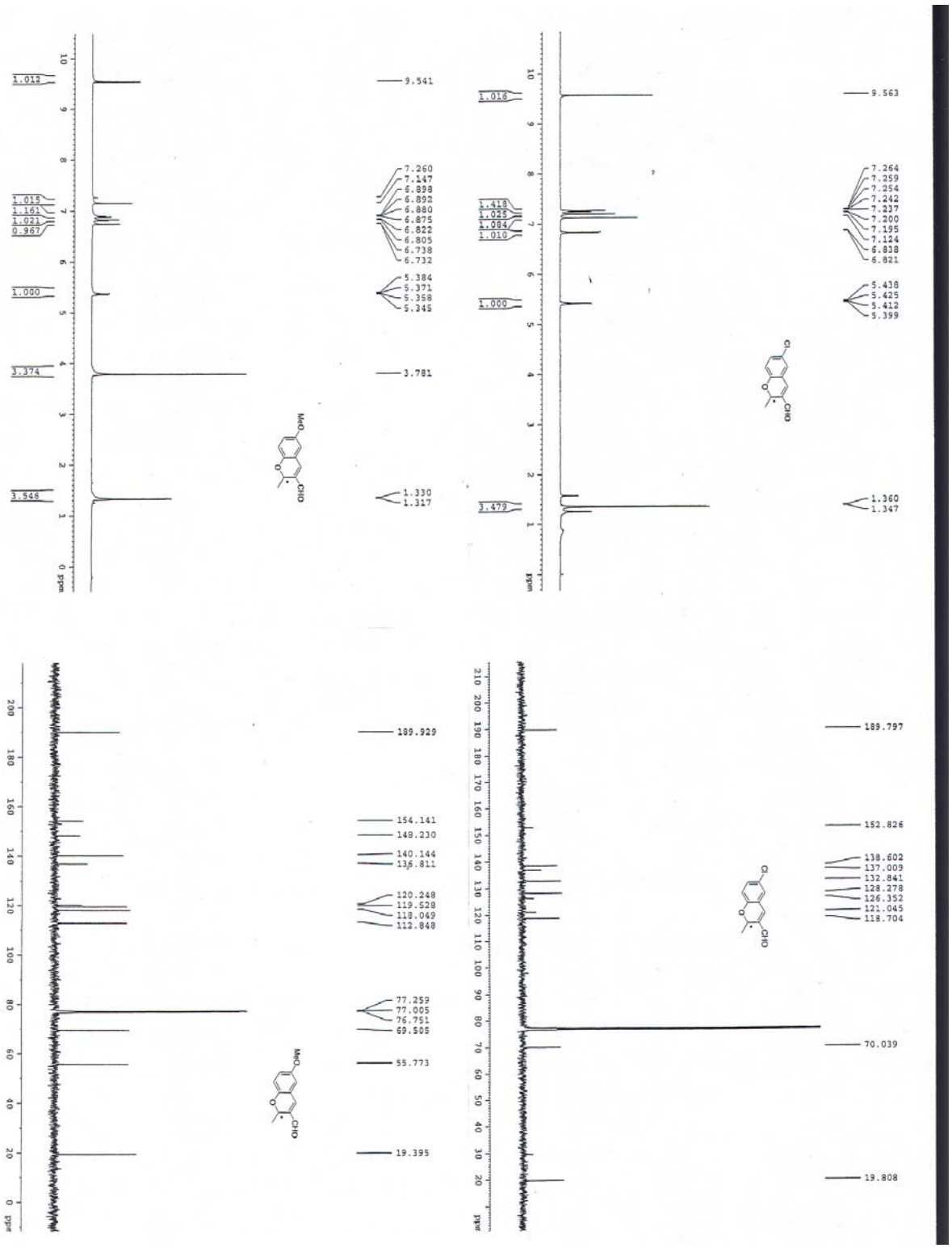
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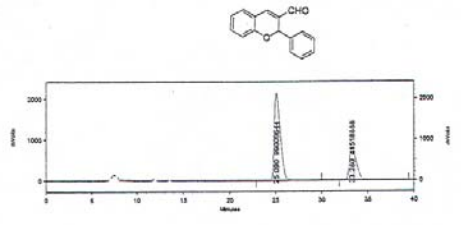
Method Name: C:\EZStart\Projects\Default\Method\HaoLi04.met
Data File: C:\EZStart\Projects\WeiWang\hl193d1.dat
Date Acquired: 3/15/2006 10:35:19 AM Date Printed: 05/03/2006 09:51:21 AM
Sample ID: hl193d



SPD-10Avp
Ch1-254nm Results

Pk #	RT	Area	Area %
1	25.090	99009644	70.455
2	33.280	41518888	29.545
Totals		140528532	100.000

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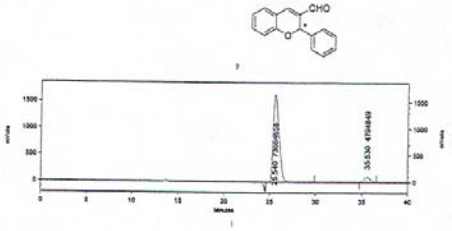
Method Name: C:\EZStart\Projects\Default\Method\zls0357.met
Data File: C:\EZStart\Projects\WeiWang\hlal5d4.dat
Date Acquired: 3/21/2006 10:46:01 PM Date Printed: 05/03/2006 09:52:32 AM
Sample ID: hlal5d



SPD-10Avp
Ch1-254nm Results

Pk #	RT	Area	Area %
1	25.540	73664658	93.889
2	35.530	4794849	6.111
Totals		78459507	100.000

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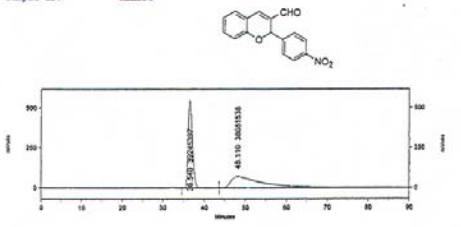
Method Name: C:\EZStart\Projects\Default\Method\HaoLi1.met
Data File: C:\EZStart\Projects\WeiWang\hlm29e3.dat
Date Acquired: 3/27/2006 10:24:15 PM Date Printed: 05/03/2006 09:55:16 AM
Sample ID: hlm29e



SPD-10Avp
Ch1-254nm Results

Pk #	RT	Area	Area %
1	36.540	39245397	50.362
2	48.110	38681538	49.638
Totals		77926935	100.000

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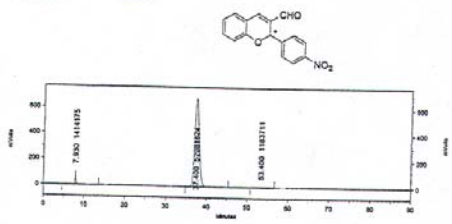
Method Name: C:\EZStart\Projects\Default\Method\HaoLi1.met
Data File: C:\EZStart\Projects\WeiWang\hlm38e1.dat
Date Acquired: 3/31/2006 11:12:10 AM Date Printed: 05/03/2006 09:56:45 AM
Sample ID: hlm38e



SPD-10Avp
Ch1-254nm Results

Pk #	RT	Area	Area %
2	37.400	52081824	95.269
3	53.400	1183711	2.165
Totals		53265535	97.414

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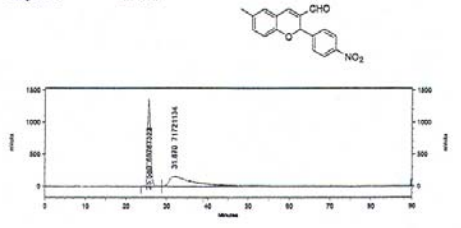
Method Name: C:\EZStart\Projects\Default\Method\HaoLi1.met
Data File: C:\EZStart\Projects\WeiWang\hlm40e1.dat
Date Acquired: 4/1/2006 4:58:36 PM Date Printed: 05/03/2006 09:57:31 AM
Sample ID: hlm40e



SPD-10Avp
Ch1-254nm Results

Pk #	RT	Area	Area %
1	25.580	69787322	49.317
2	31.870	71721134	50.683
Totals		141508456	100.000

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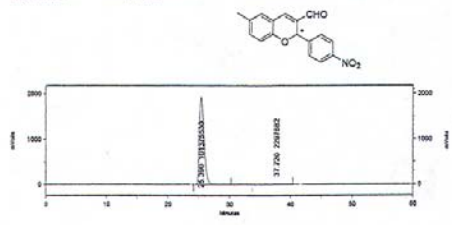
Method Name: C:\EZStart\Projects\Default\Method\HaoLi1.met
Data File: C:\EZStart\Projects\WeiWang\hlm47e1.dat
Date Acquired: 4/1/2006 6:35:30 PM Date Printed: 05/03/2006 10:01:18 AM
Sample ID: hlm47e



SPD-10Avp
Ch1-254nm Results

Pk #	RT	Area	Area %
1	25.390	101375530	97.784
2	37.720	2297682	2.216
Totals		103673212	100.000

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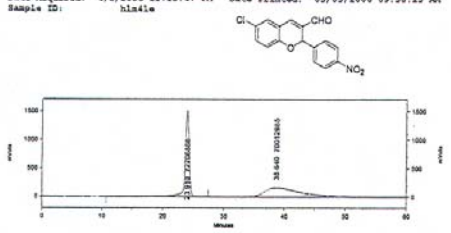
Method Name: C:\EZStart\Projects\Default\Method\HaoLi1.met
Data File: C:\EZStart\Projects\WeiWang\hlm41e3.dat
Date Acquired: 4/1/2006 11:19:47 PM Date Printed: 05/03/2006 09:58:25 AM
Sample ID: hlm41e



SPD-10Avp
Ch1-254nm Results

Pk #	RT	Area	Area %
1	23.910	72706868	50.944
2	38.640	70012985	49.056
Totals		142719853	100.000

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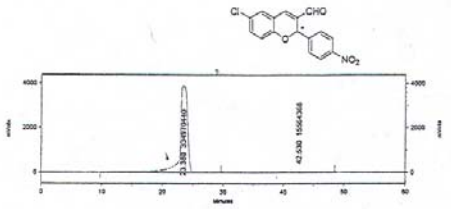
Method Name: C:\EZStart\Projects\Default\Method\HaoLi1.met
Data File: C:\EZStart\Projects\WeiWang\hlm48e1.dat
Date Acquired: 4/2/2006 10:55:03 AM Date Printed: 05/03/2006 10:02:03 AM
Sample ID: hlm48e



SPD-10Avp
Ch1-254nm Results

Pk #	RT	Area	Area %
1	23.380	334970440	95.560
2	42.530	15564368	4.440
Totals		350534808	100.000

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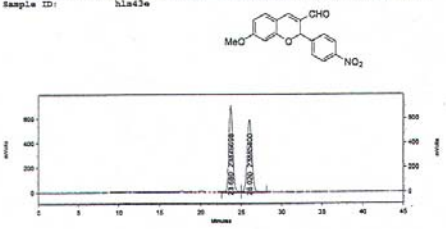
Method Name: C:\EZStart\Projects\Default\Method\HaoLi1.met
Data File: C:\EZStart\Projects\WeiWang\hlm43e1.dat
Date Acquired: 4/6/2006 1:12:46 PM Date Printed: 05/03/2006 09:59:43 AM
Sample ID: hlm43e



SPD-10Avp
Ch1-254nm Results

Pk #	RT	Area	Area %
1	23.680	23876698	49.991
2	26.020	23885400	50.009
Totals		47762098	100.000

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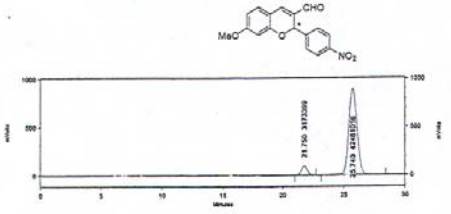
Method Name: C:\EZStart\Projects\Default\Method\HaoLi1.met
Data File: C:\EZStart\Projects\WeiWang\hlm50e1.dat
Date Acquired: 4/6/2006 3:26:54 PM Date Printed: 05/03/2006 10:02:42 AM
Sample ID: hlm50e



SPD-10Avp
Ch1-254nm Results

Pk #	RT	Area	Area %
1	21.750	3173399	6.951
2	25.740	42491016	93.049
Totals		45664415	100.000

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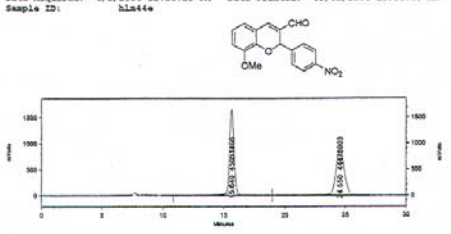
Method Name: C:\EZStart\Projects\Default\Method\HaoLi05.met
Data File: C:\EZStart\Projects\WeiWang\hlm44e2.dat
Date Acquired: 4/2/2006 12:58:25 PM Date Printed: 05/03/2006 10:00:40 AM
Sample ID: hlm44e



SPD-10Avp
Ch1-254nm Results

Pk #	RT	Area	Area %
1	15.640	45051466	50.321
2	24.550	44476903	49.679
Totals		89528369	100.000

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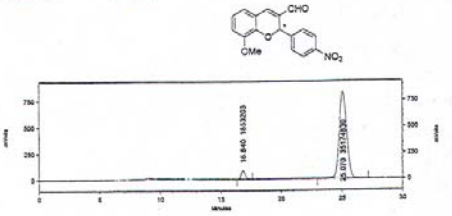
Method Name: C:\EZStart\Projects\Default\Method\HaoLi06.met
Data File: C:\EZStart\Projects\WeiWang\hlm51e1.dat
Date Acquired: 4/3/2006 11:16:22 AM Date Printed: 05/03/2006 10:03:15 AM
Sample ID: hlm51e



SPD-10Avp
Ch1-254nm Results

Pk #	RT	Area	Area %
1	16.840	1853203	5.005
2	25.070	35174830	94.995
Totals		37028033	100.000

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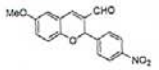
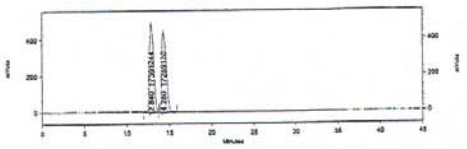
Method Name: C:\EZStart\Projects\Default\Method\HaoLi02.met
Data File: C:\EZStart\Projects\WeiWang\hla62e2.dat
Date Acquired: 4/9/2006 12:00:59 PM Date Printed: 05/03/2006 10:19:20 AM
Sample ID: hla62e





SPD-10Avp
Ch1-254nm Results

Pk #	RT	Area	Area %
1	12.840	17301244	50.018
2	14.280	17289120	49.982
Totals		34590364	100.000

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Method Name: C:\EZStart\Projects\Default\Method\HaoLi11.met
Data File: C:\EZStart\Projects\WeiWang\hla68e1.dat
Date Acquired: 4/12/2006 2:21:32 PM Date Printed: 05/03/2006 10:17:28 AM
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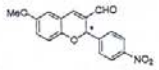

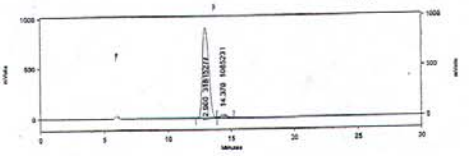

SPD-10Avp
Ch1-254nm Results

Pk #	RT	Area	Area %
1	12.960	31815277	96.701
2	14.370	1085231	3.299
Totals		32900508	100.000

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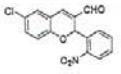
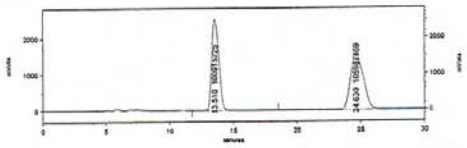
Method Name: C:\EZStart\Projects\Default\Method\HaoLi02.met
Data File: C:\EZStart\Projects\WeiWang\hla63e1.dat
Date Acquired: 4/9/2006 1:19:19 PM Date Printed: 05/03/2006 10:20:06 AM
Sample ID: hla63e





SPD-10Avp
Ch1-254nm Results

Pk #	RT	Area	Area %
1	13.510	100915725	48.774
2	24.630	105987869	51.226
Totals		206903594	100.000

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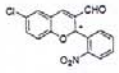
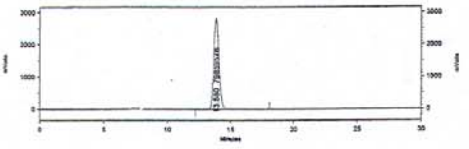
Method Name: C:\EZStart\Projects\Default\Method\HaoLi09.met
Data File: C:\EZStart\Projects\WeiWang\hla71e1.dat
Date Acquired: 4/19/2006 10:34:31 AM Date Printed: 05/03/2006 10:21:28 AM
Sample ID: hla71e





SPD-10Avp
Ch1-254nm Results

Pk #	RT	Area	Area %
1	13.880	79859578	100.000
Totals		79859578	100.000

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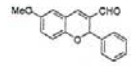
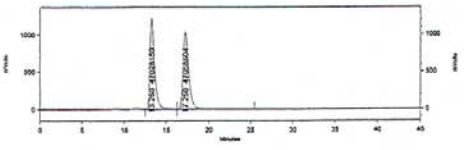
Method Name: C:\EZStart\Projects\Default\Method\HaoLi07.met
Data File: C:\EZStart\Projects\WeiWang\hla80e1.dat
Date Acquired: 4/14/2006 5:14:33 PM Date Printed: 05/03/2006 10:23:19 AM
Sample ID: hla80e





SPD-10Avp
Ch1-254nm Results

Pk #	RT	Area	Area %
1	13.260	47028110	49.984
2	17.250	47058604	50.016
Totals		94086754	100.000

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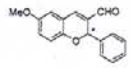
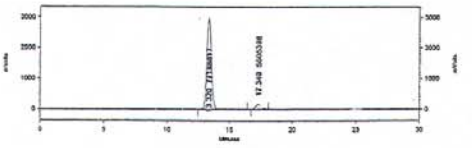
Method Name: C:\EZStart\Projects\Default\Method\HaoLi09.met
Data File: C:\EZStart\Projects\WeiWang\hla85e1.dat
Date Acquired: 4/19/2006 11:57:52 AM Date Printed: 05/03/2006 10:28:57 AM
Sample ID: hla85e





SPD-10Avp
Ch1-254nm Results

Pk #	RT	Area	Area %
1	13.320	77188817	93.230
2	17.340	5605398	6.770
Totals		82794215	100.000

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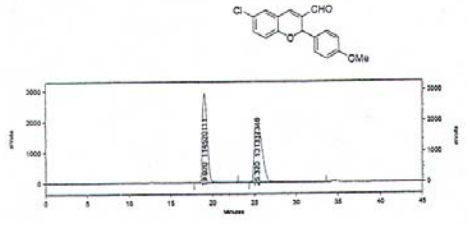
Method Name: C:\EZStart\Projects\Default\Method\HaoLi02.met
Data File: C:\EZStart\Projects\WeiWang\hlm57e1.dat
Date Acquired: 4/8/2006 2:58:40 PM Date Printed: 05/03/2006 10:05:16 AM
Sample ID: hlm57e



SPD-10Avp
Ch1-254nm Results

Pk #	RT	Area	Area %
1	19.020	114520111	46.580
2	25.320	131337346	53.420
Totals		245857457	100.000

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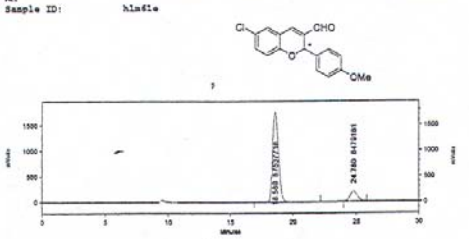
Method Name: C:\EZStart\Projects\Default\Method\HaoLi1.met
Data File: C:\EZStart\Projects\WeiWang\hlm61e1.dat
Date Acquired: 4/10/2006 11:32:27 AM Date Printed: 05/03/2006 10:14:25 AM
Sample ID: hlm61e



SPD-10Avp
Ch1-254nm Results

Pk #	RT	Area	Area %
1	18.580	57537718	87.156
2	24.780	8479181	12.844
Totals		66016899	100.000

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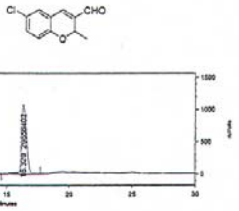
Method Name: C:\EZStart\Projects\Default\Method\HaoLi02.met
Data File: C:\EZStart\Projects\WeiWang\hlm52e2.dat
Date Acquired: 4/7/2006 11:59:08 AM Date Printed: 05/03/2006 10:07:06 AM
Sample ID: hlm52e



SPD-10Avp
Ch1-254nm Results

Pk #	RT	Area	Area %
1	12.320	27610314	48.214
2	16.320	29656402	51.786
Totals		57266716	100.000

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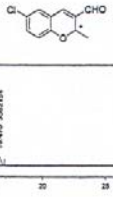
Method Name: C:\EZStart\Projects\Default\Method\HaoLi02.met
Data File: C:\EZStart\Projects\WeiWang\hlm59e1.dat
Date Acquired: 4/7/2006 11:27:51 AM Date Printed: 05/03/2006 10:07:43 AM
Sample ID: hlm59e



SPD-10Avp
Ch1-254nm Results

Pk #	RT	Area	Area %
1	12.210	36229268	91.048
2	16.470	3562154	8.952
Totals		39791422	100.000

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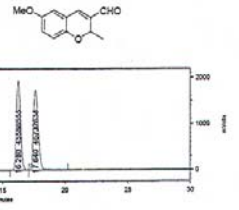
Method Name: C:\EZStart\Projects\Default\Method\HaoLi1.met
Data File: C:\EZStart\Projects\WeiWang\hlm62e1.dat
Date Acquired: 4/17/2006 2:20:48 PM Date Printed: 05/03/2006 10:25:36 AM
Sample ID: hlm62e



SPD-10Avp
Ch1-254nm Results

Pk #	RT	Area	Area %
1	16.280	45586555	49.379
2	17.640	46732638	50.621
Totals		92319193	100.000

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Method Name: C:\EZStart\Projects\Default\Method\HaoLi09.met
Data File: C:\EZStart\Projects\WeiWang\hlm86e1.dat
Date Acquired: 4/19/2006 12:48:47 PM Date Printed: 05/03/2006 10:29:41 AM
Sample ID: hlm86e

SPD-10Avp
Ch1-254nm Results

Pk #	RT	Area	Area %
1	16.260	67061190	92.334
2	17.610	5567476	7.666
Totals		72628666	100.000