

# Organocatalytic Enantioselective Indole Alkylations of $\alpha,\beta$ -Unsaturated Ketones

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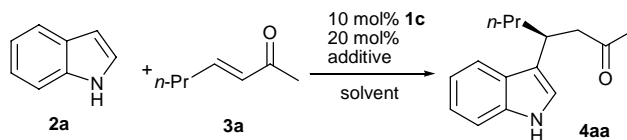
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**Supplementary Information**

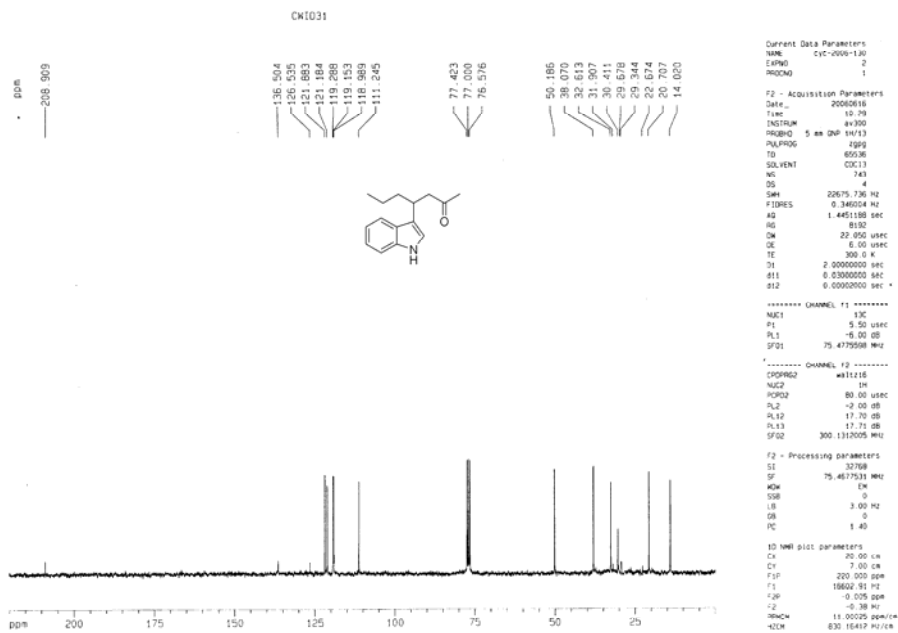
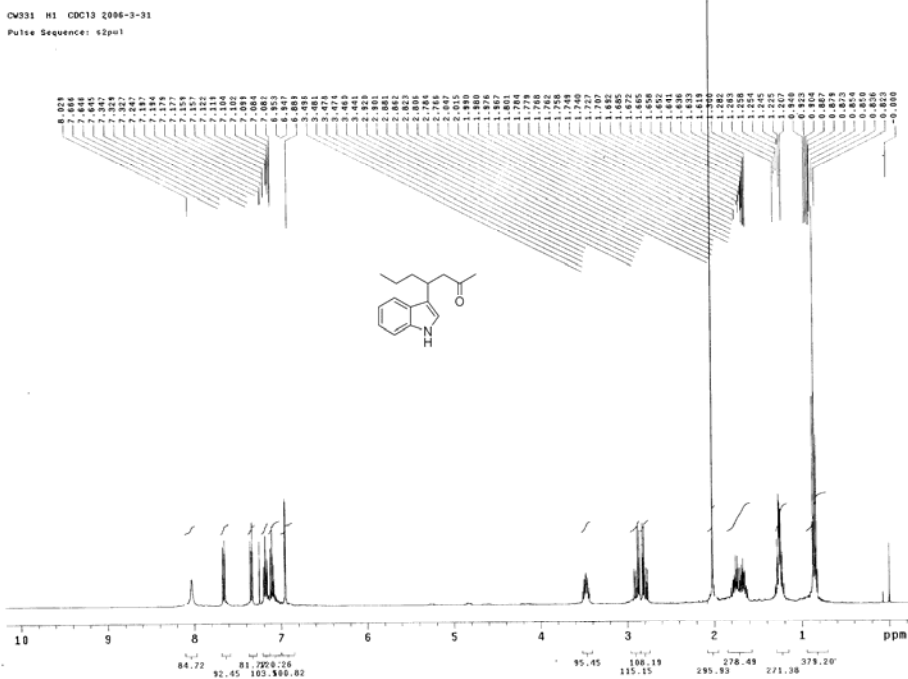
More screening studies of the asymmetric Friedel-Crafts reaction of indole **2a** and  $\alpha,\beta$ -unsaturated ketone **3a**<sup>a</sup>



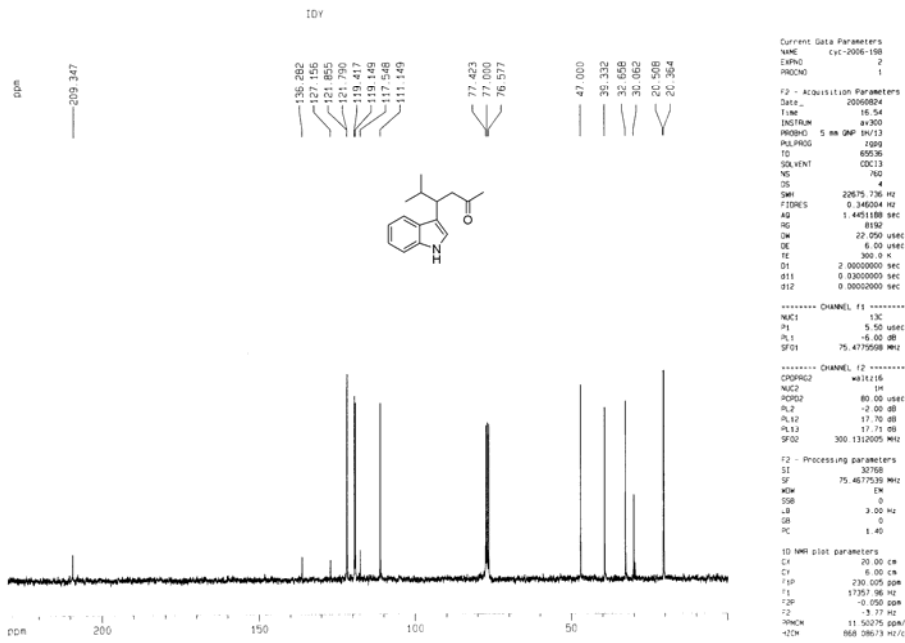
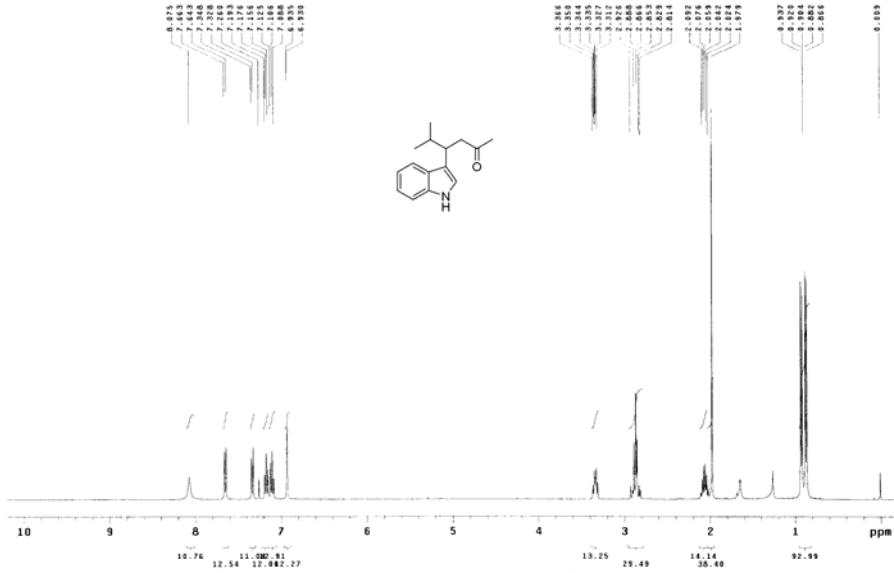
Entry	Catalyst	Solvent	T (°C)	t	Yield <sup>b</sup> (%)	Ee <sup>c</sup> (%)
1	1c	DCM	r.t.	18h	13	51
2	1c	CH <sub>3</sub> CN	r.t.	18h	13	6
3	1c	<i>i</i> -PrOH	r.t.	12h	44	47
4	1c	DCM: <i>i</i> -PrOH:H <sub>2</sub> O=85:15:0.6	r.t.	12h	50	42
5	1c	CH <sub>3</sub> NO <sub>2</sub> : <i>i</i> -PrOH=85:15	r.t.	12h	39	16
6	1c	THF: <i>i</i> -PrOH=85:15	r.t.	15h	44	36
7	1c	DCM:MeOH=95:5	r.t.	24h	39	46
8	1c	DCM: <i>i</i> -PrOH=95:5	r.t.	12h	39	55
9	1c	DCM: <i>i</i> -PrOH=90:10	r.t.	12h	37	60
10	1c	DCM: <i>i</i> -PrOH=85:15	r.t.	12h	44	58
11	1c	DCM: <i>i</i> -PrOH=80:20	r.t.	12h	46	34
12	1c	DCM: <i>i</i> -PrOH=85:15 0.01M	r.t.	3d	18	53
13	1c	DCM: <i>i</i> -PrOH=85:15 0.03M	r.t.	3d	52	54
14	1c	DCM: <i>i</i> -PrOH=85:15 0.3M	r.t.	12h	63	50
15	1c	DCM: <i>i</i> -PrOH=85:15 0.5M	r.t.	12h	57	48
16	1c	DCM: <i>i</i> -PrOH=85:15 0.05M	-10	6d	17	73
17	1c	DCM: <i>i</i> -PrOH=85:15 0.1M	-10	6d	52	65
18	1c	DCM: <i>i</i> -PrOH=85:15 0.2M	-10	6d	61	63
19	1c	DCM: <i>i</i> -PrOH=85:15 0.03M	0	40h	44	55
20	1c	DCM: <i>i</i> -PrOH=85:15 0.05M	0	36h	39	57
21	1c	DCM: <i>i</i> -PrOH=85:15 0.07M	0	36h	44	57

<sup>a</sup> Reaction was conducted with **2a** (0.1 mmol), **3a** (0.2 mmol), catalyst **1c** (0.01 mmol) and CF<sub>3</sub>SO<sub>3</sub>H (0.02 mmol) at room temperature. <sup>b</sup> Isolated yield. <sup>c</sup> Determined by chiral HPLC analysis.

# NMR Spectra



CVIDY-CDCL3-H1-2006-6-23  
Pulse Sequence: szpu1



Current Data Parameters  
NAME cxc-2006-198  
EXPNO 2  
PROCNO 1

F2 - Acquisition Parameters  
Date\_ 20060604  
Time 16.54  
INSTRUM spect  
PROBHD 5 mm QNP 1H/1  
PULPROG zgpg30  
TD 65536  
SOLVENT CDCl3  
NS 760  
DS 4  
SWH 22675.736 MHz  
FIDRES 0.346004 MHz  
AQ 1.445188 sec  
RG 8192  
DW 22.050 usec  
DE 6.00 usec  
TE 300.0 K  
D1 2.0000000 sec  
d11 0.3000000 sec  
d12 0.0000000 sec

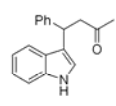
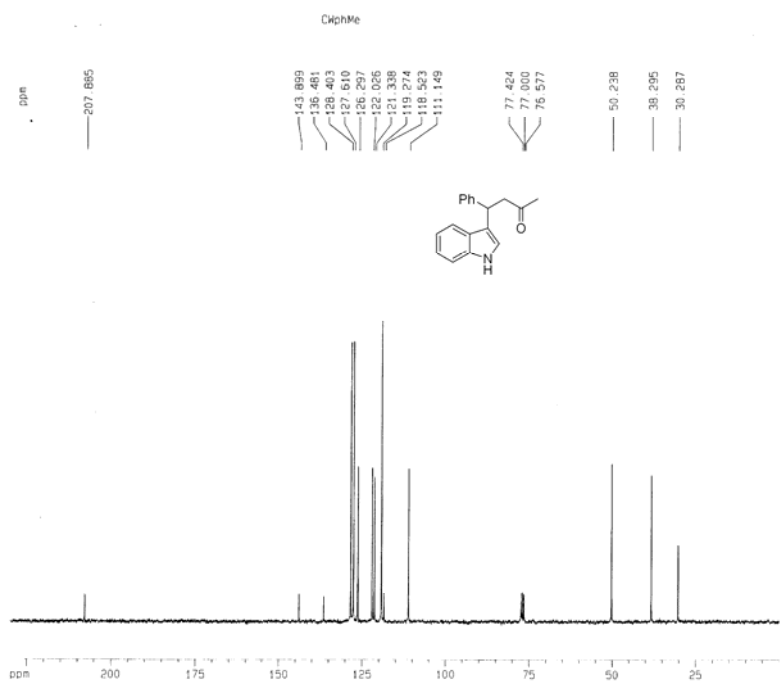
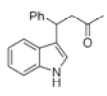
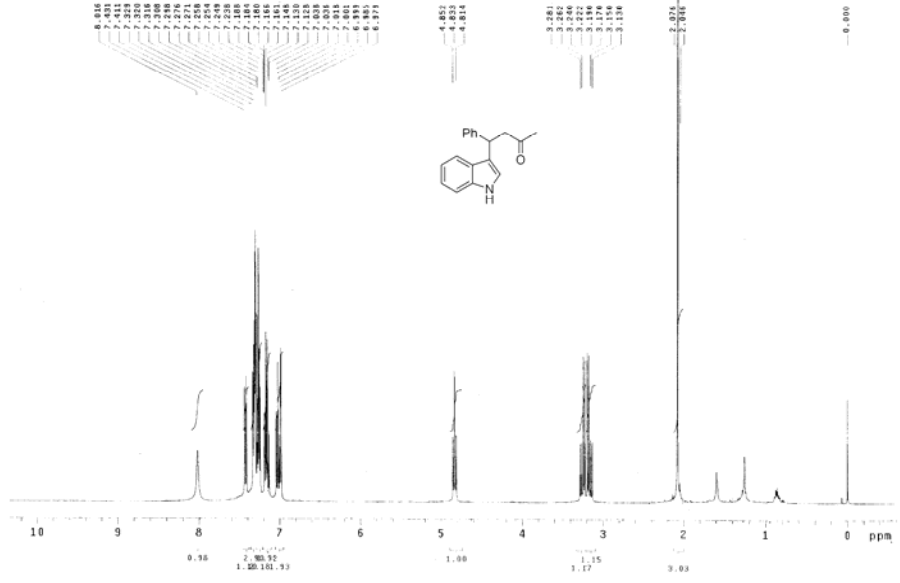
\*\*\*\*\* CHANNEL f1 \*\*\*\*\*  
NUC1 13C  
P1 5.50 usec  
PL1 -6.00 dB  
SFO1 75.477598 MHz

\*\*\*\*\* CHANNEL f2 \*\*\*\*\*  
CPDPRG2 waltz16  
NUC2 1H  
PCPD2 80.00 usec  
PL2 -2.00 dB  
PL12 17.70 dB  
PL13 17.70 dB  
SFO2 300.1312000 MHz

F2 - Processing parameters  
SI 32768  
SF 75.4677539 MHz  
WDW EM  
SSB 0  
LB 3.00 MHz  
GB 0  
RC 1.40

1D NMR plot parameters  
CX 20.00 cm  
CY 6.00 cm  
FID 230.000 ppm  
F1 17357.96 MHz  
F2 -0.050 ppm  
F2 -3.77 MHz  
FREQH 11.50275 ppm/c  
<Dh 868.08673 Hz/c

ChphMe M1 CDC13 2006-4-28  
Pulse Sequence: s2pu1



Current Data Parameters  
NAME: cyc-2006-127  
EXPNO: 2  
PROCNO: 1

F2 - Acquisition Parameters  
Date\_ : 20060615  
Time : 8.57  
INSTRUM : spect  
PROBHD : 5 mm QNP 1H/13  
PULPROG : zgpg  
TD : 65536  
SOLVENT : CDCl3  
NS : 128  
DS : 4  
SWH : 22675.736 Hz  
FIDRES : 0.346004 Hz  
AQ : 1.445188 sec  
RG : 6192  
DM : 22.050 usec  
DE : 6.00 usec  
TE : 300.2 K  
D1 : 2.0000000 sec  
d11 : 0.0300000 sec  
d12 : 0.0500000 sec

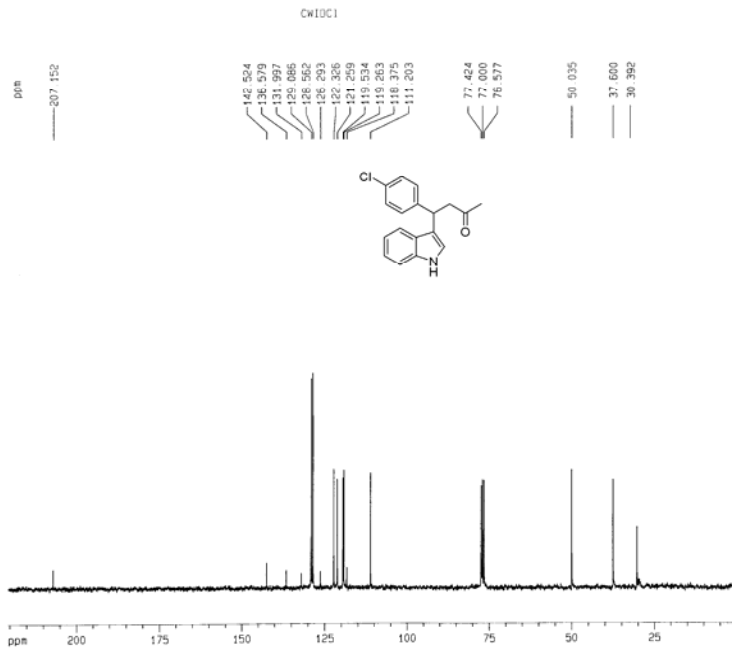
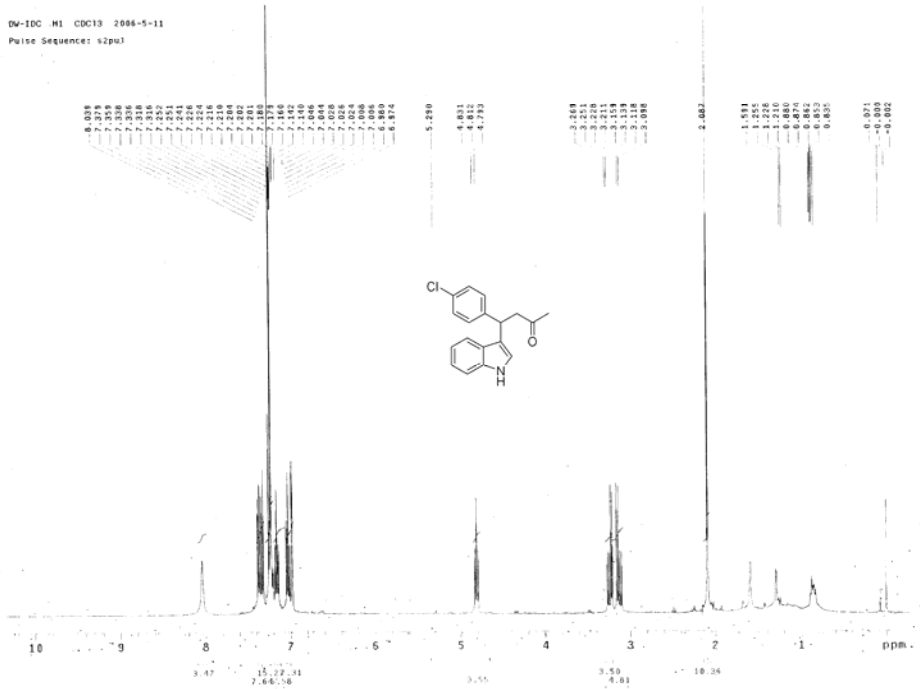
\*\*\*\*\* CHANNEL f1 \*\*\*\*\*  
NUC1 : 13C  
P1 : 5.50 usec  
PL1 : -8.00 dB  
SFO1 : 75.475558 MHz

\*\*\*\*\* CHANNEL f2 \*\*\*\*\*  
CPDPRG2 : waltz16  
NUC2 : 1H  
PCPD2 : 80.00 usec  
PL2 : -2.00 dB  
PL12 : 17.70 dB  
PL13 : 17.71 dB  
SFO2 : 300.1312005 MHz

F2 - Processing parameters  
SI : 32768  
SF : 75.4679527 MHz  
WDW : EM  
SSB : 0  
LB : 3.00 Hz  
GB : 0  
PC : 1.40

ID NMR plot parameters  
CX : 20.00 cm  
CY : 6.00 cm  
ZPX : 230.005 ppm  
F1 : 17357.96 Hz  
F2 : -0.005 ppm  
F3 : -0.38 Hz  
FREQH : 31.50050 ppm/cm  
C2H : 867.91705 Hz/cm

DW-1DC M1 CDC13 2006-5-11  
Pulse Sequence: s2pu1



Current Data Parameters  
NAME cxi-2006-231  
PROCNO 2  
PULPROG zgpg  
TD 65536  
SOLVENT CDCl3  
NS 604  
DS 4  
SWH 20675.736 Hz  
FIDRES 0.346004 Hz  
AQ 1.4451188 sec  
RG 8192  
DM 22.050 usec  
DE 6.00 usec  
TE 300.0 K  
D1 2.00000000 sec  
d11 0.03000000 sec  
d12 0.00020000 sec

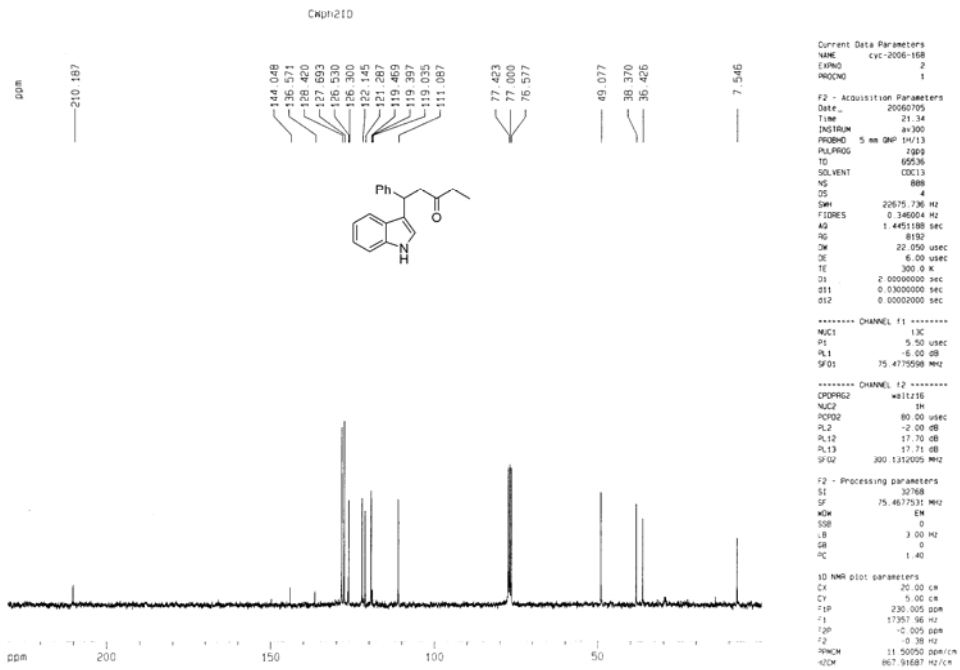
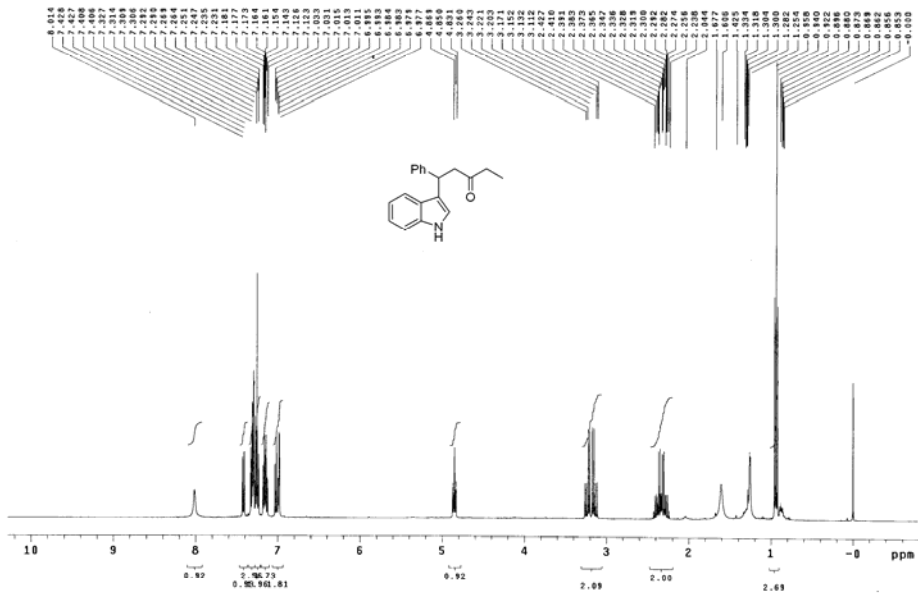
\*\*\*\*\* CHANNEL f1 \*\*\*\*\*  
NUC1 13C  
P1 5.50 usec  
PL1 -6.00 dB  
SFO1 75.475988 MHz

\*\*\*\*\* CHANNEL f2 \*\*\*\*\*  
CPDPRG2 waltz16  
NUC2 1H  
PCPD2 80.00 usec  
PL2 -2.00 dB  
PL3 17.70 dB  
PL13 17.71 dB  
SFO2 300.1312005 MHz

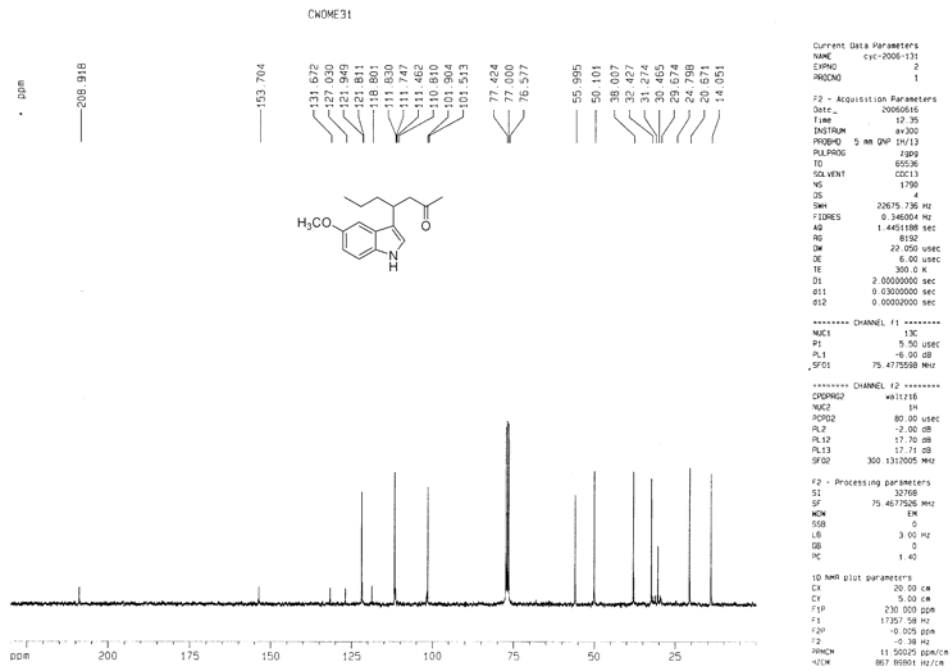
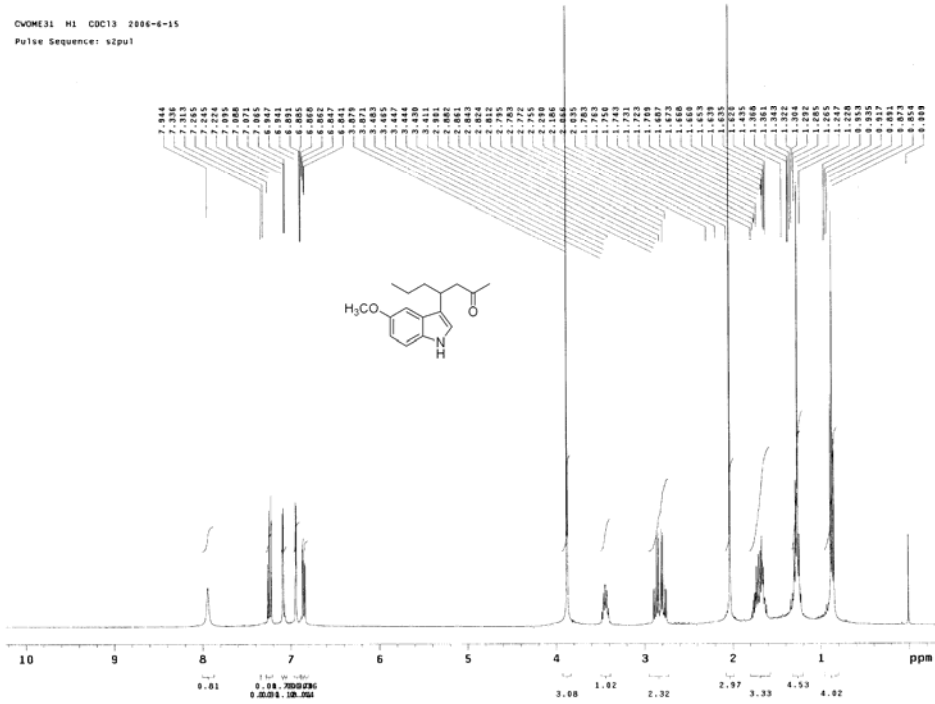
F2 - Processing parameters  
SI 32768  
SF 75.467979 MHz  
MCM EM  
SSB 0  
LB 3.00 Hz  
GB 0  
PC 1.49

10 NMR plot parameters  
CX 20.00 cm  
CY 6.00 cm  
F1P 220.500 ppm  
F1 16540.64 Hz  
F2P -0.300 ppm  
F2 -37.73 Hz  
PRMCM 11.05000 ppm/cm  
HZCM 813.91864 Hz/cm

CWgh210 H1 CDC13 2006-7-3  
Pulse Sequence: s2pul

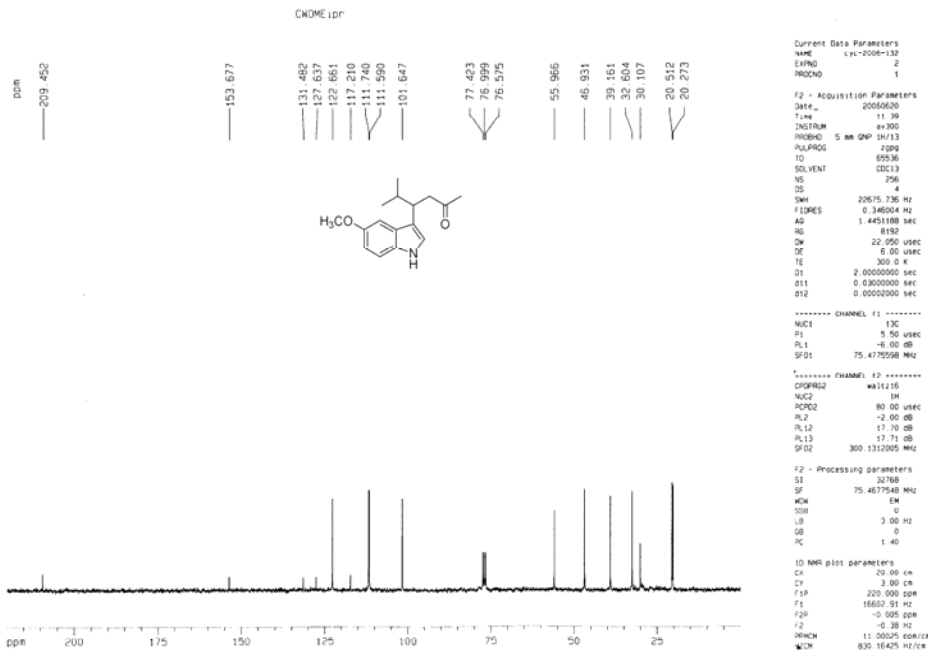
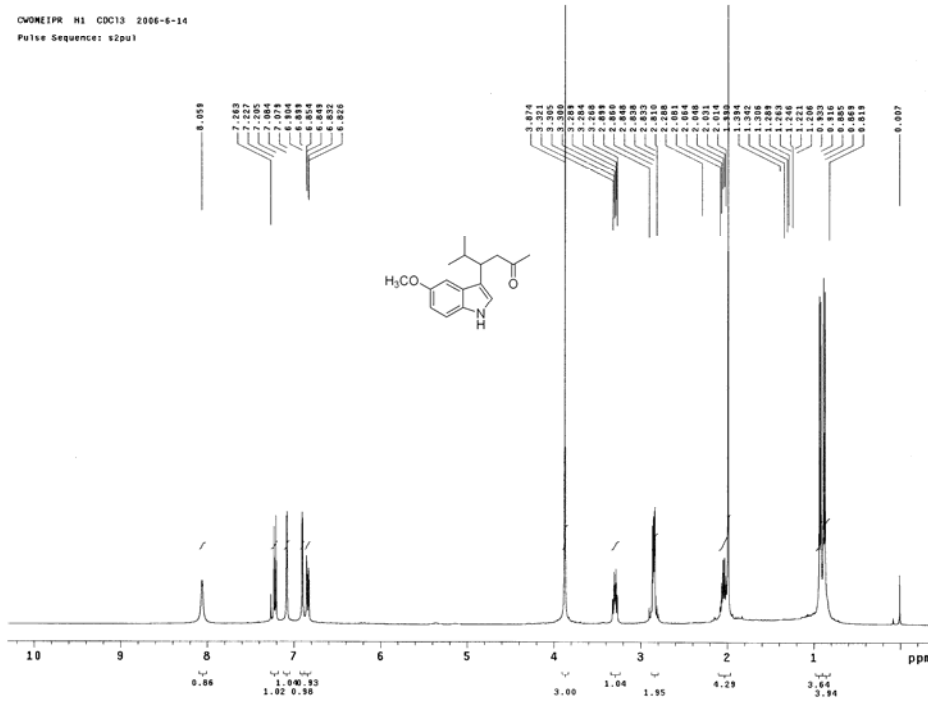


CVOME31 H1 CDCl3 2886-6-15  
Pulse Sequence: szpu1





CN0ME1PR M1 CDC13 2006-6-14  
Pulse Sequence: s2pu1



Current Data Parameters  
NAME: cn-2006-132  
EXPNO: 2  
PROCNO: 1

F2 - Acquisition Parameters  
Date\_: 20060620  
Time: 11:39  
INSTRUM: av300  
PROBHD: 5 mm QNP 1H/13  
PULPROG: zgpg30  
TD: 65536  
SOLVENT: CDC13  
NS: 256  
DS: 4  
SWH: 20675.736 Hz  
FIDRES: 0.346004 Hz  
AQ: 1.4421888 sec  
RG: 8192  
DQ: 22.050 uSec  
TE: 6.00 uSec  
IE: 300.0 K  
D1: 2.0000000 sec  
d11: 0.0300000 sec  
d12: 0.0000200 sec

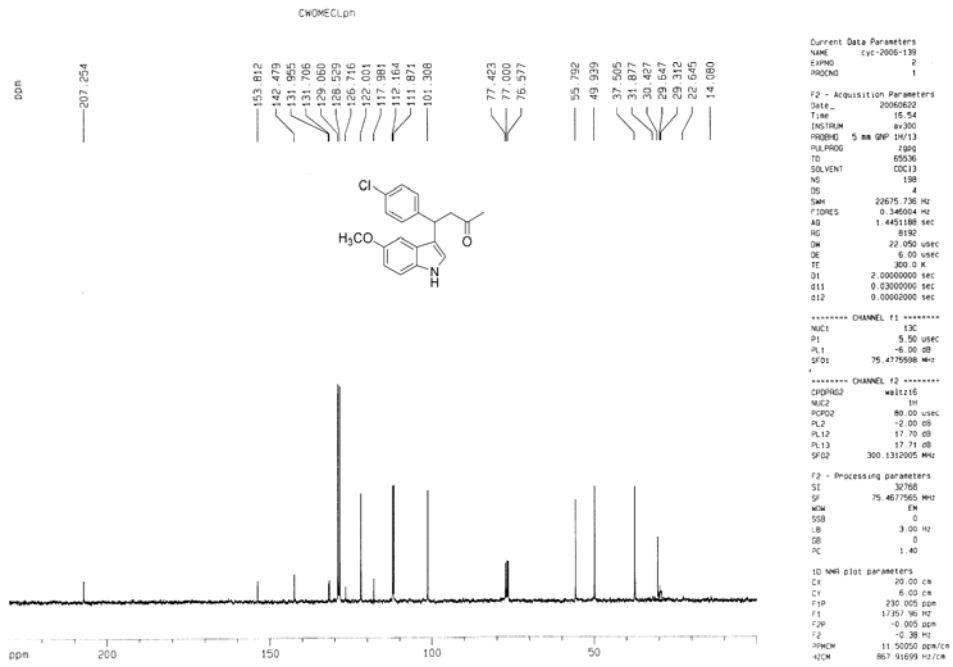
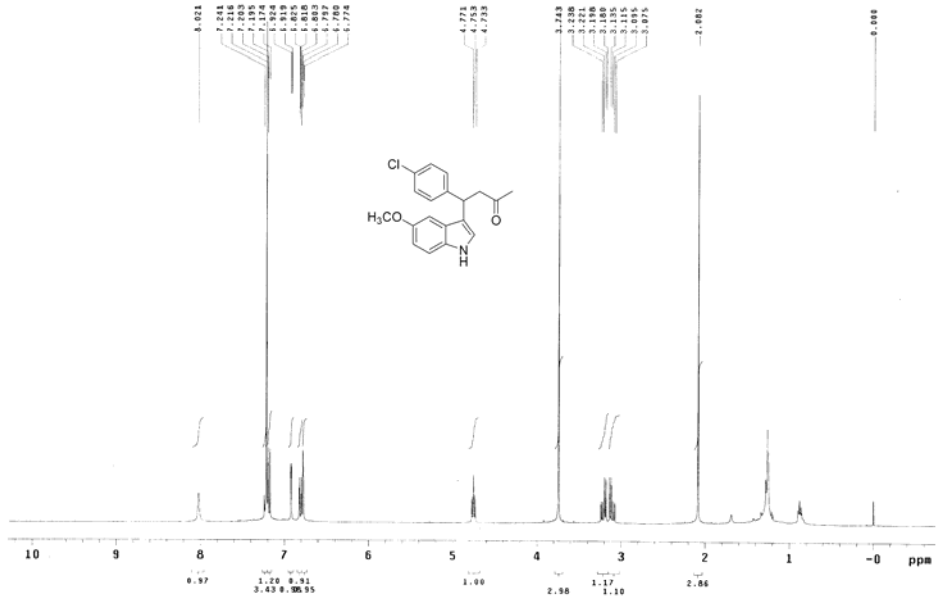
\*\*\*\*\* CHANNEL f1 \*\*\*\*\*  
NUC1: 13C  
P1: 5.50 uSec  
PL1: -6.00 dB  
SFO1: 75.477598 MHz

\*\*\*\*\* CHANNEL f2 \*\*\*\*\*  
CPDPRG2: waltz16  
NUC2: 1H  
PCPD2: 80.00 uSec  
PL2: -2.00 dB  
PL12: 17.70 dB  
PL13: 17.71 dB  
SFO2: 300.1312005 MHz

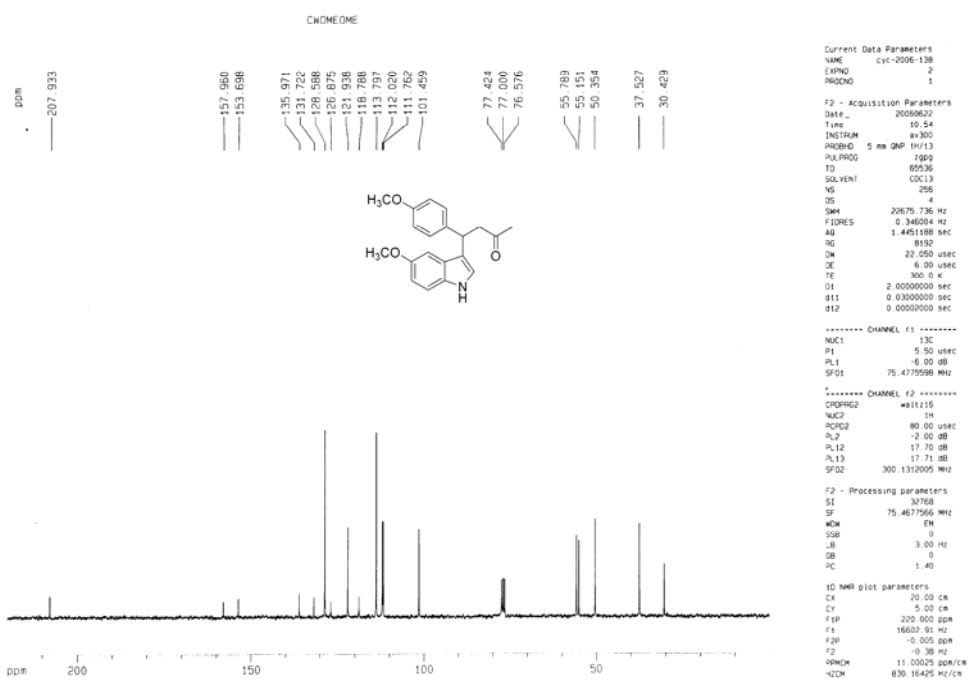
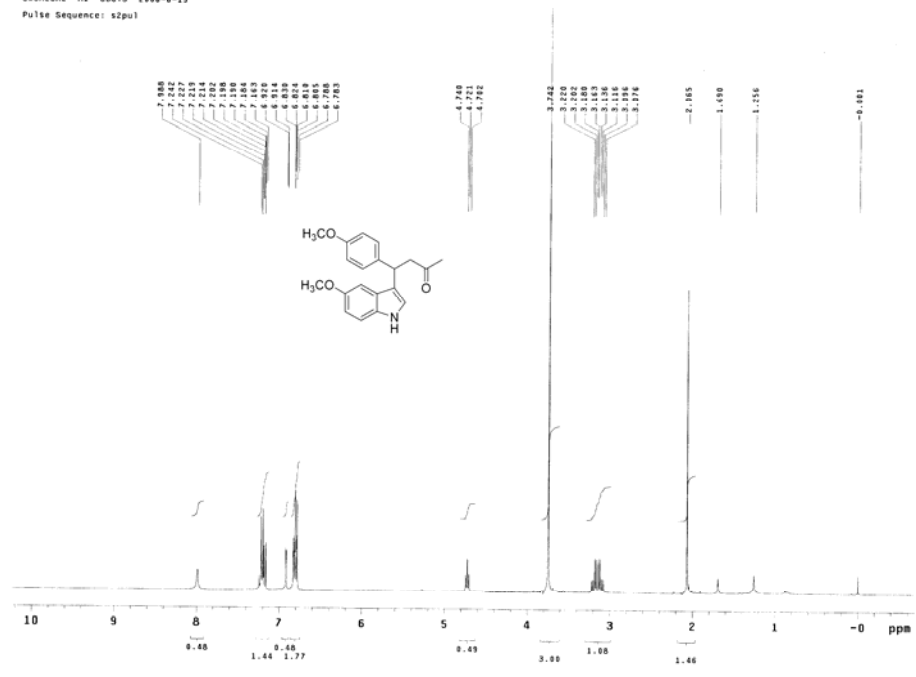
F2 - Processing parameters  
SI: 32768  
SF: 75.4677548 MHz  
MCH: EM  
SFO: 0  
LB: 3.00 Hz  
GB: 0  
PC: 1.40

1D NMR plot parameters  
C4: 30.00 cm  
C1: 3.00 cm  
F10: 200.0000 ppm  
F1: 16662.91 Hz  
F20: -0.005 ppm  
F2: -0.38 Hz  
HNCH: 11.00205 cm/c  
MCH: 830.16425 Hz/cm

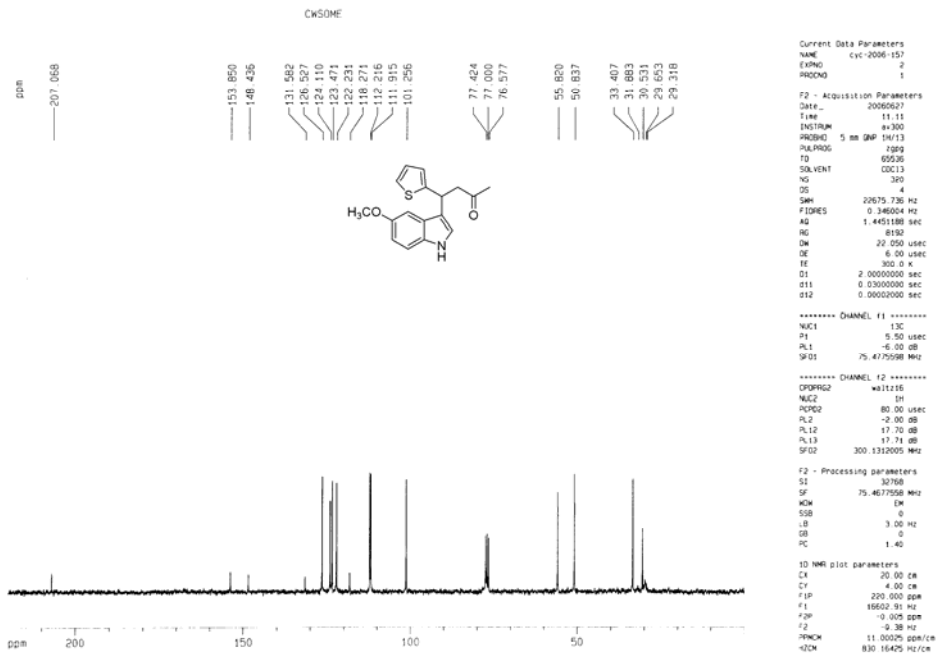
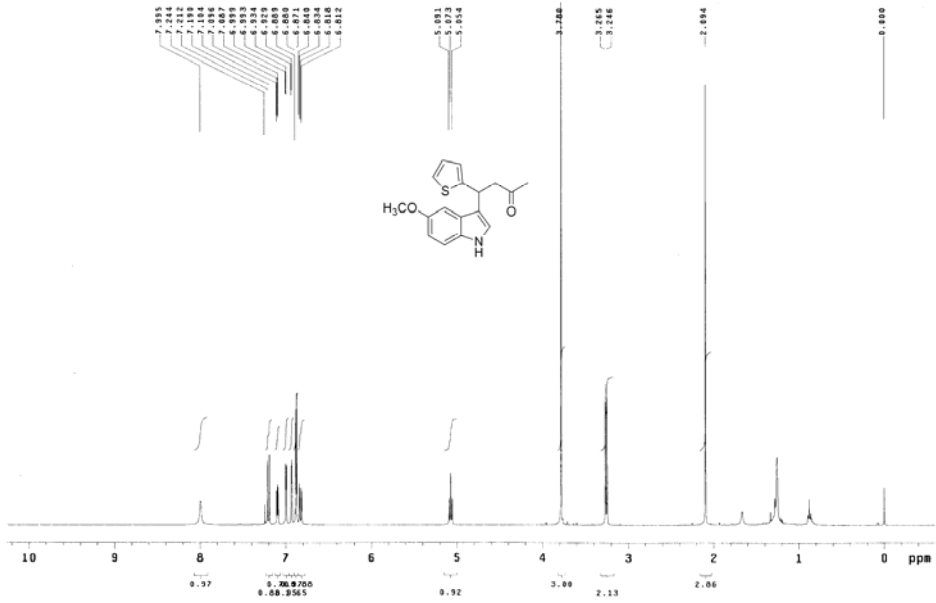
QVOMECLPH H1 CDC13 2496-6-19  
Pulse Sequence: szpul



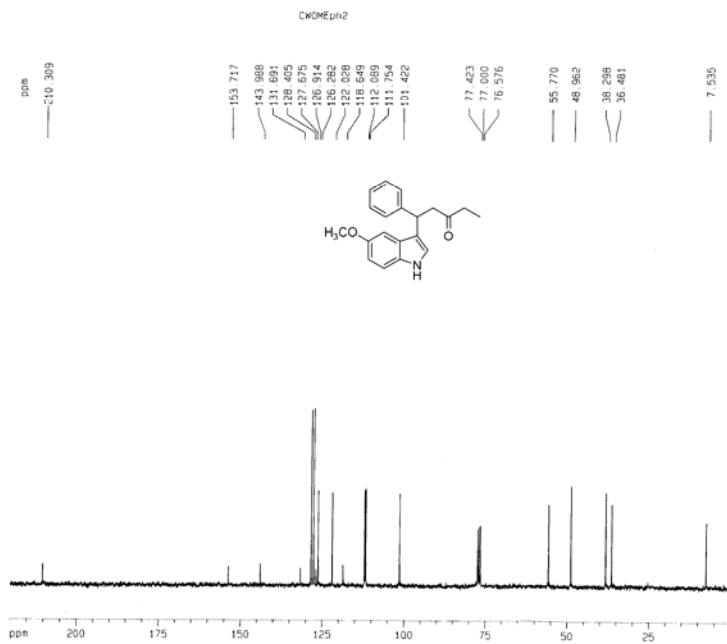
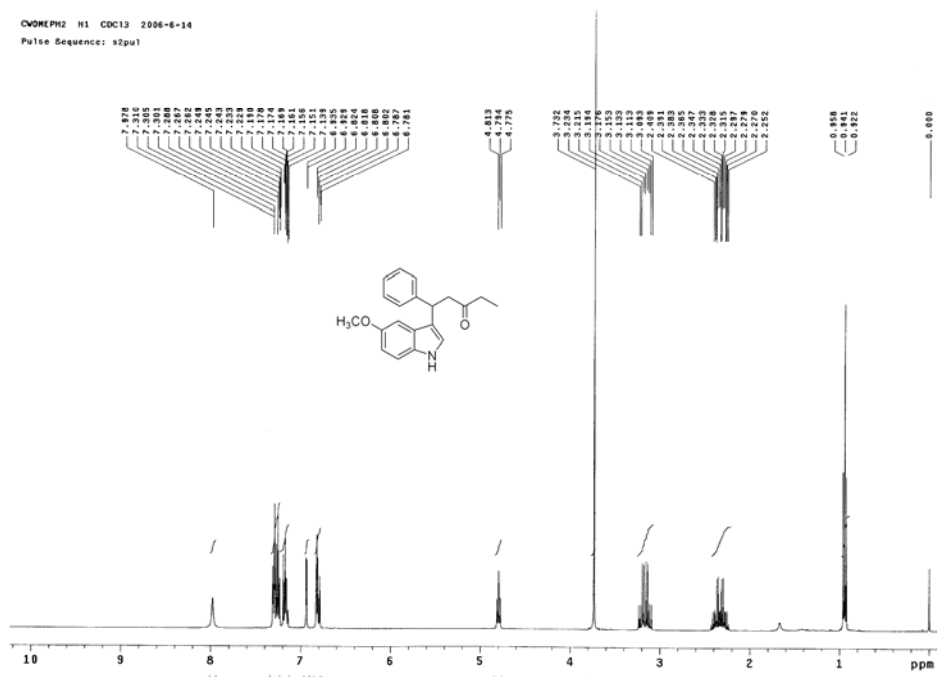
CUMEDONE HI C0C13 2006-6-19  
 Pulse Sequence: szpul



CVSOME H1 CDC13 2005-6-23  
Pulse Sequence: s2pul



CWMEPH2 H1 CDC13 2006-6-14  
Pulse Sequence: s2pu1



Current Data Parameters  
NAME: cyc-2006-133  
EXPNO: 2  
PROCNO: 1

F2 - Acquisition Parameters  
Date\_: 20060620  
Time: 12.03  
INSTRUM: av300  
PROBHD: 5 mm QNP 1H/13  
PULPROG: zgpg30  
TD: 65536  
SOLVENT: CDCl3  
NS: 164  
DS: 4  
SWH: 22675.736 Hz  
FIDRES: 0.346034 Hz  
AQ: 1.4451188 sec  
RG: 8192  
DW: 22.050 usec  
DE: 6.00 usec  
TE: 300.0 K  
SI: 2.0000000 sec  
Sf1: 0.0300000 sec  
Sf2: 0.0002000 sec

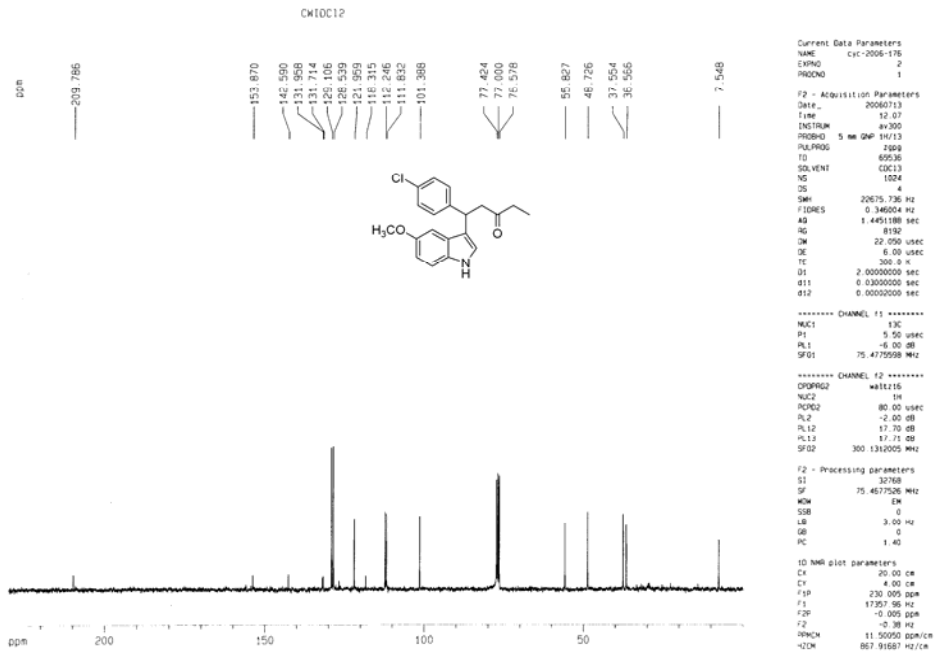
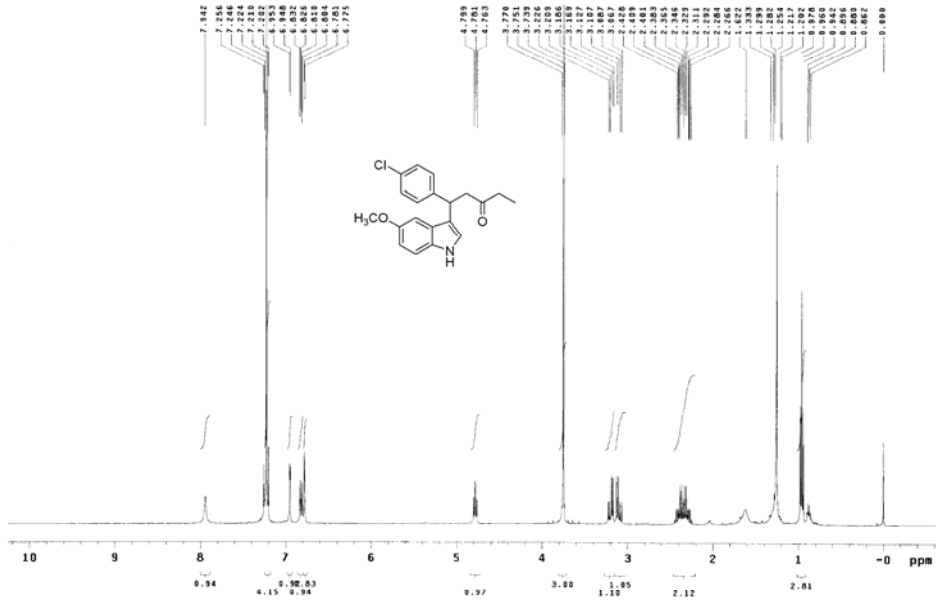
\*\*\*\*\* CHANNEL f1 \*\*\*\*\*  
NUC1: 13C  
P1: 9.50 usec  
PL1: -6.00 dB  
SFO1: 75.477598 MHz

\*\*\*\*\* CHANNEL f2 \*\*\*\*\*  
CPDPRG2: waltz16  
NUC2: 1H  
PCPD2: 80.00 usec  
PL2: -2.00 dB  
PL12: 17.70 dB  
PL13: 17.71 dB  
SFO2: 300.131000 MHz

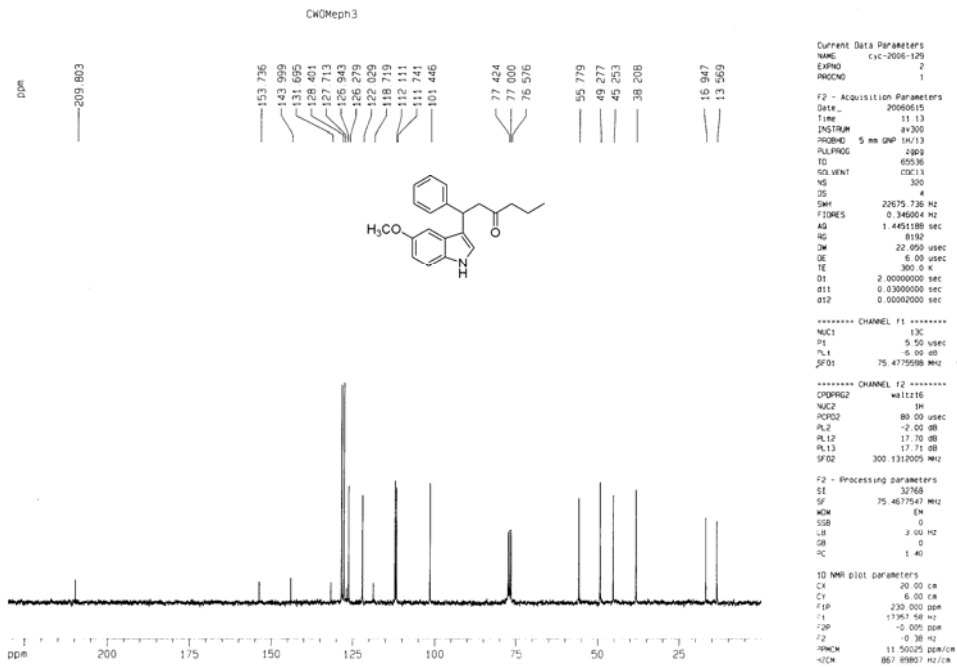
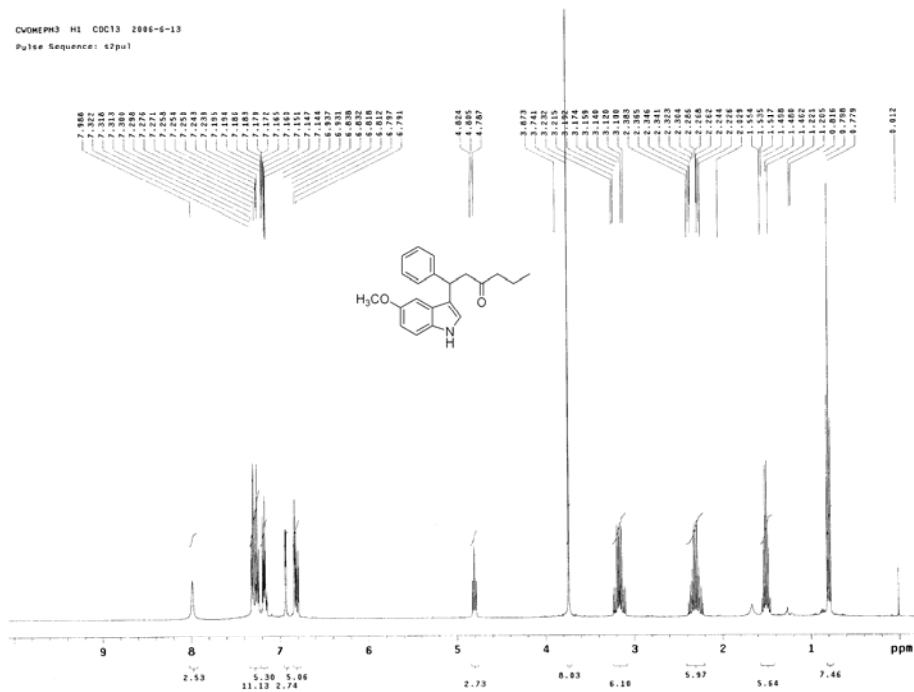
F2 - Processing parameters  
SI: 32768  
SF: 75.4677957 MHz  
WDW: EM  
SSB: 0  
LB: 3.00 Hz  
GB: 0  
PC: 1.40

SD MMR plot parameters  
CX: 20.00 ca  
CY: 5.00 ca  
F1P: 220.400 ppm  
F1: 16600.91 Hz  
CPO: -0.000 ppm  
F2: -0.38 Hz  
FREQ: 11.00275 ppm/ca  
CPC: 830.16425 Hz/ca

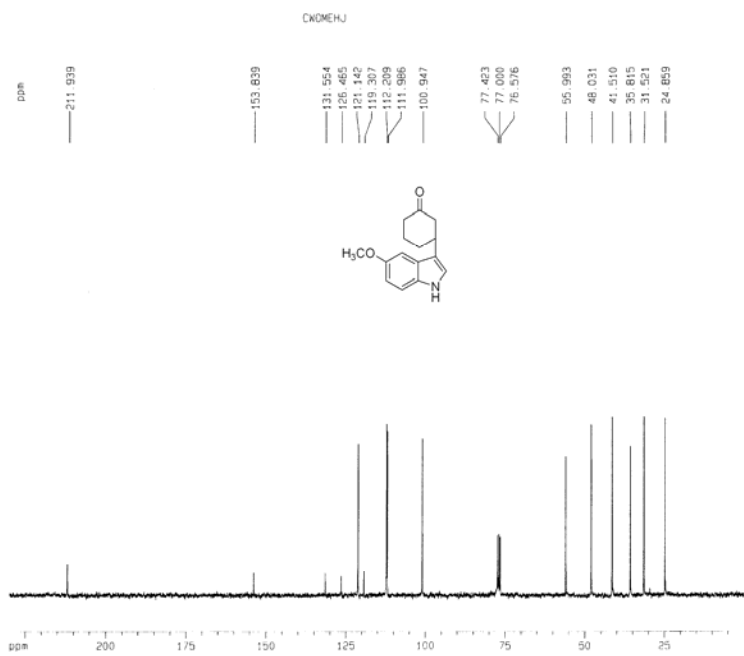
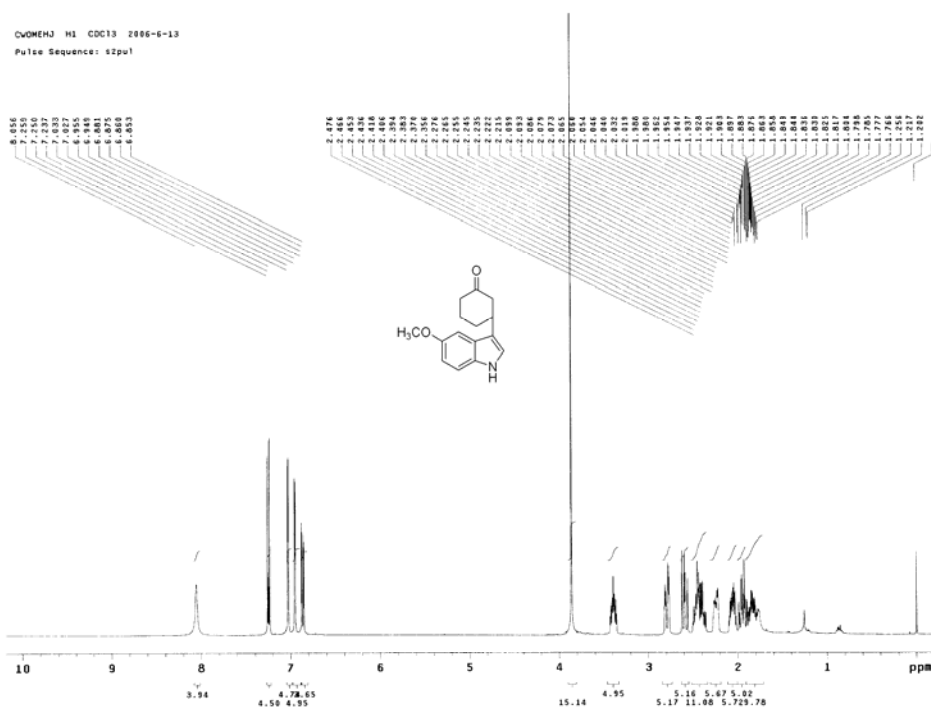
CW10C12 H1 C0C13 2066-7-6  
Pulse Sequence: s2pul



CWOMPH3 H1 CDC13 2006-6-13  
 Pulse Sequence: e2pul



CXDMHJ H1 CDC13 2006-6-13  
Pulse Sequence: s2pu1



Current Data Parameters  
NAME: cxc-2006-120  
EXPNO: 2  
PROCNO: 1

F2 - Acquisition Parameters  
DATE\_: 20060615  
TIME: 10.50  
INSTRUM: av300  
PROBHD: 5 mm QNP 1H/13  
PULPROG: zgpg30  
TD: 65536  
SOLVENT: CDCl3  
NS: 320  
DS: 4  
SWH: 22675.730 Hz  
FIDRES: 0.346004 Hz  
AQ: 1.445188 sec  
RG: 8192  
DQW: 22.050 usec  
DE: 6.00 usec  
TE: 300.0 K  
D1: 2.0000000 sec  
d15: 0.0300000 sec  
d12: 0.0000000 sec

\*\*\*\*\* CHANNEL f1 \*\*\*\*\*  
NUC1: 13C  
P1: 5.50 usec  
PL1: -6.00 dB  
SFO1: 75.4779980 MHz

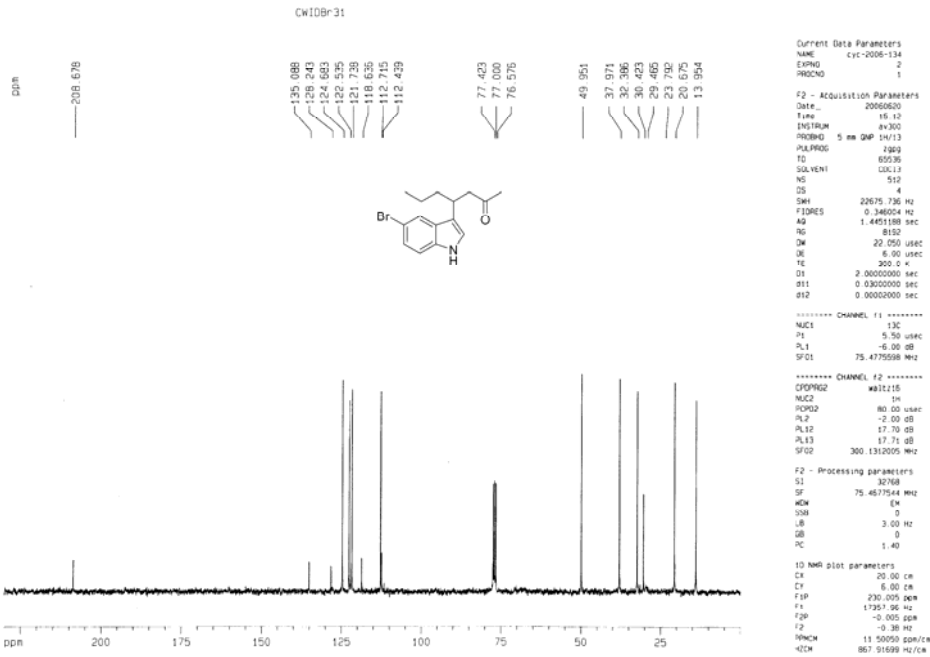
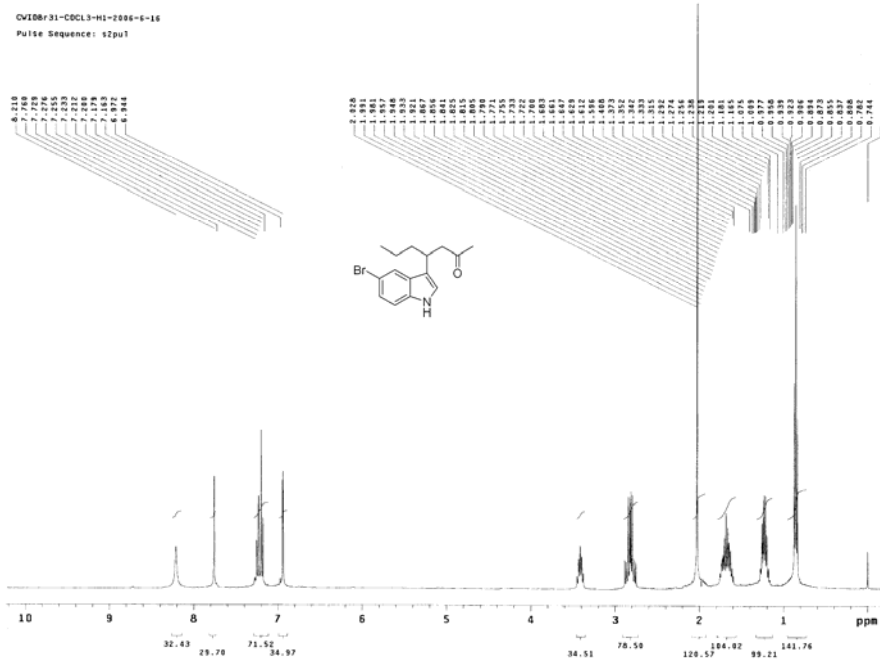
\*\*\*\*\* CHANNEL f2 \*\*\*\*\*  
CROSSP2: \*n1z1z  
NUC2: 1H  
P2PROG: 80.00 usec  
PL2: -2.00 dB  
PL12: 17.70 dB  
PL13: 17.71 dB  
SFO2: 300.1312005 MHz

F2 - Processing parameters  
SI: 32768  
SF: 75.4677964 MHz  
WDW: EM  
SSB: 0  
LB: 3.00 Hz  
GB: 0  
PC: 1.40

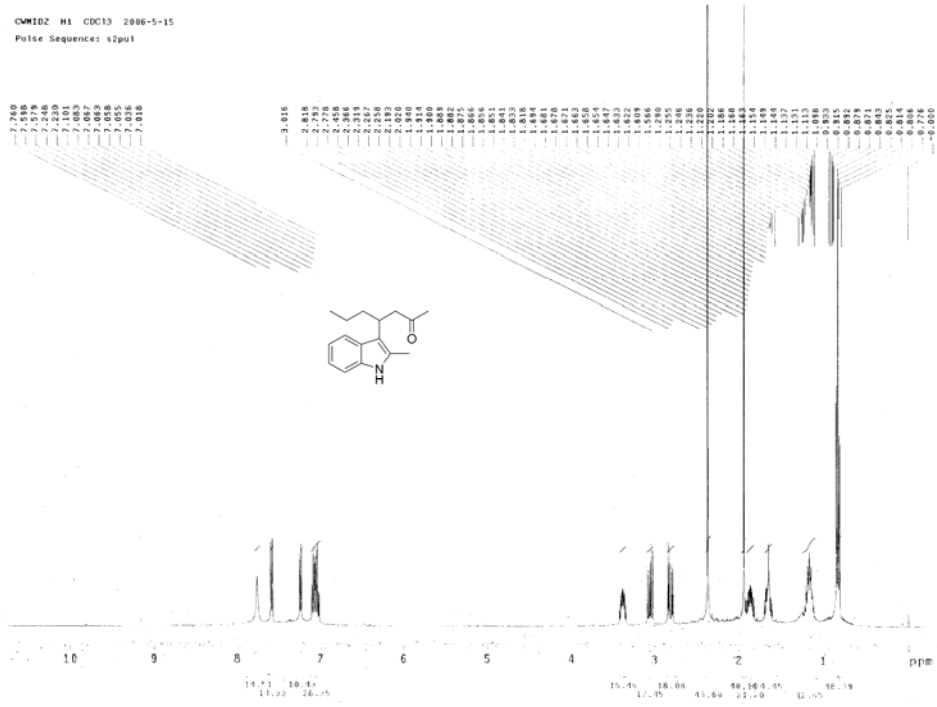
10 NMR plot parameters  
CX: 20.00 cm  
CY: 5.00 cm  
F1P: 230.000 dB  
F1: 17257.58 Hz  
F2P: -0.005 dB  
F2: -0.38 Hz  
FREQW: 11.50625 dB/cm  
ZCW: 867.89807 Hz/cm



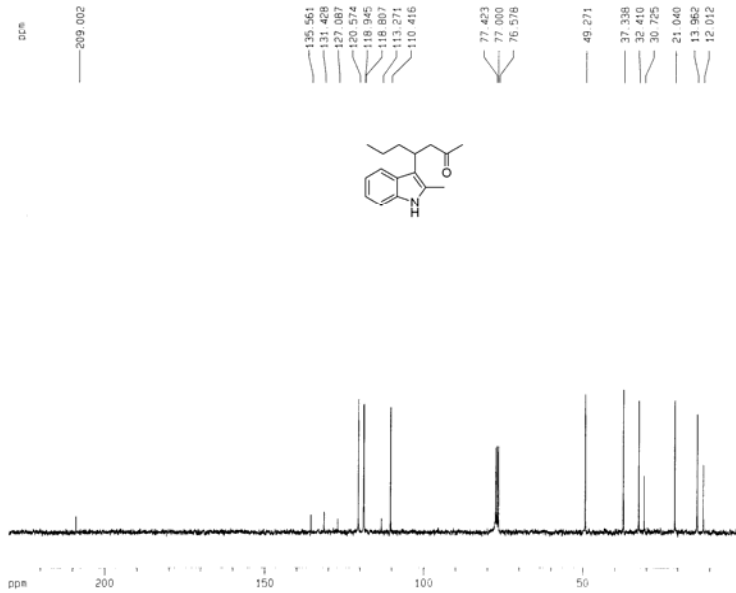
CVIDBr31-CDCl3-H1-2006-6-16  
Pulse Sequence: s2pu1



CM102 H1 CDC13 2006-5-15  
Pulse Sequence: s2pu1



CM1D31



Current Data Parameters  
 NAME cvc-2006-159  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20060630  
 Time 8.56  
 INSTRUM av300  
 PROBC 5 mm QNP 1H/13  
 PULPROG zgpg  
 TD 65536  
 SOLVENT CDC13  
 NS 516  
 DS 4  
 SWH 20675.736 Hz  
 FIDRES 0.348024 Hz  
 AQ 1.445188 sec  
 RG 8192  
 CW 22.950 usec  
 DE 6.00 usec  
 TE 300.0 K  
 D1 0.0000000 sec  
 d11 0.0000000 sec  
 d12 0.0000000 sec

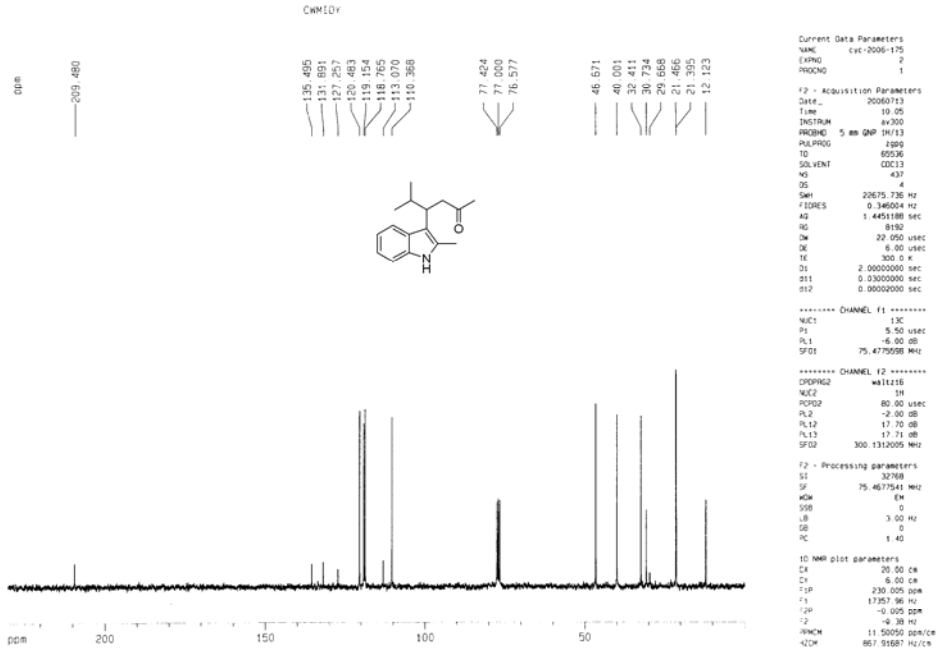
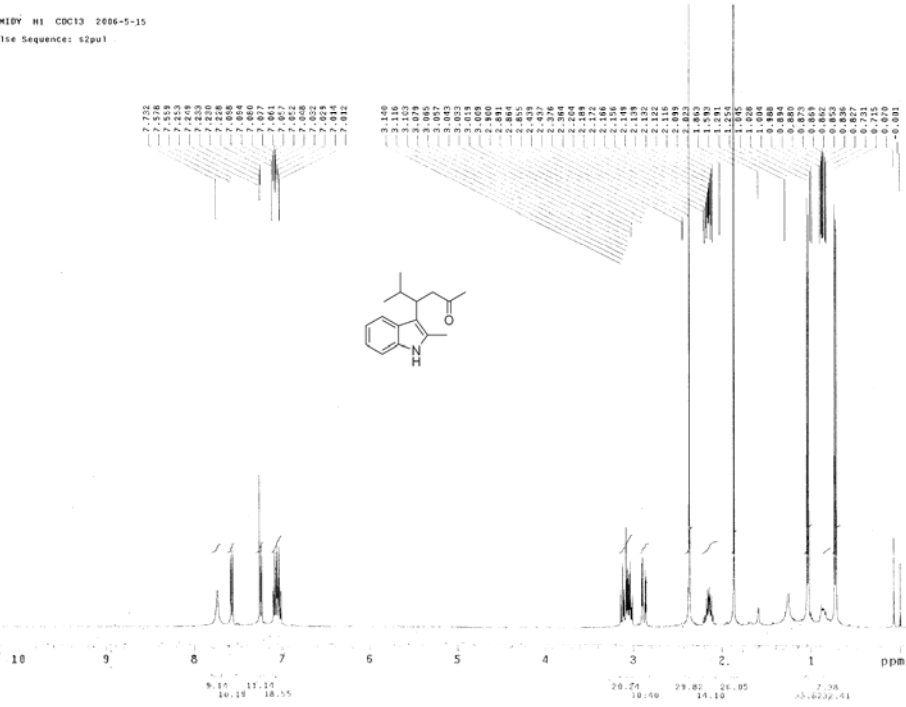
\*\*\*\*\* CHANNEL f1 \*\*\*\*\*  
 NUC1 13C  
 P1 5.50 usec  
 PL1 -6.00 dB  
 SF01 75.4775988 MHz

\*\*\*\*\* CHANNEL f2 \*\*\*\*\*  
 CPDPRG2 waltz16  
 NUC2 1H  
 PCPD2 80.00 usec  
 PL2 -2.00 dB  
 PL12 17.70 dB  
 PL13 17.71 dB  
 SF02 300.1312005 MHz

F2 - Processing parameters  
 SI 32768  
 SF 75.4677032 MHz  
 MDW EN  
 SSB 0  
 LB 3.00 Hz  
 GB 0  
 PC 1.40

1D NMR plot parameters  
 CX 20.00 cm  
 CY 4.00 cm  
 FID 230.005 ppm  
 F1 17357.96 Hz  
 F2P -0.005 ppm  
 F2 -0.38 Hz  
 FREQM 11.50050 ppm/cm  
 GCM 861.91687 Hz/cm

CNM1D1 H1 CDC13 2006-5-15  
Pulse Sequence: s2pu1



Current Data Parameters  
NAME cvc-2006-175  
EXPNO 2  
PROCNO 1

F2 - Acquisition Parameters  
DATE\_ 20060713  
TIME 19.05  
INSTRUM av300  
PROBHD 5 mm QNP 1H/13  
PULPROG zgpg30  
TD 65536  
SOLVENT CDC13  
NS 437  
DS 4  
SWH 20675.735 Hz  
FIDRES 0.346004 Hz  
AQ 1.445188 sec  
RG 8192  
DQ 22.050 usec  
DE 6.00 usec  
TE 300.0 K  
D1 2.0000000 sec  
d11 0.0300000 sec  
d12 0.0800000 sec

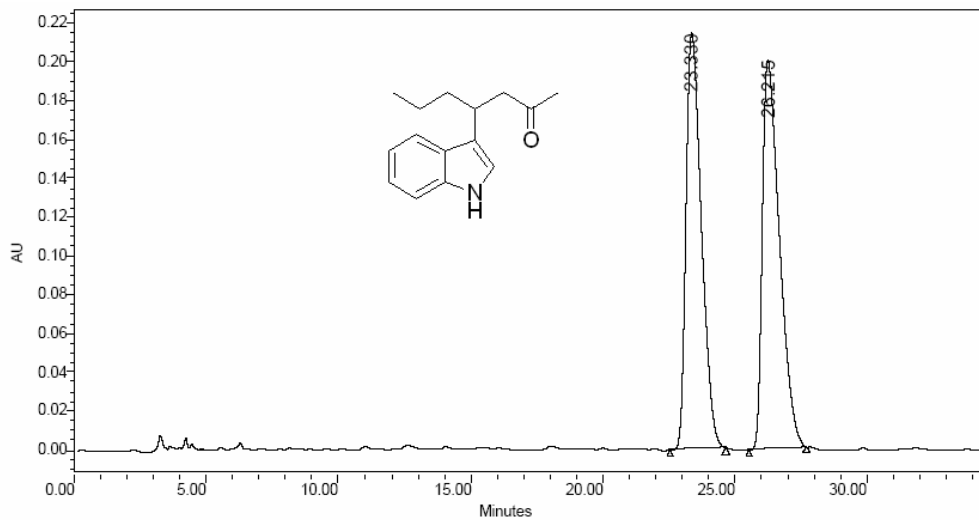
\*\*\*\*\* CHANNEL f1 \*\*\*\*\*  
NUC1 13C  
P1 5.50 usec  
PL1 -6.00 dB  
SFO1 75.4779508 MHz

\*\*\*\*\* CHANNEL f2 \*\*\*\*\*  
CPDPRG2 waltz16  
NUC2 1H  
PCPD2 80.00 usec  
PL2 -2.00 dB  
PL12 17.70 dB  
PL13 17.71 dB  
SFO2 300.1312005 MHz

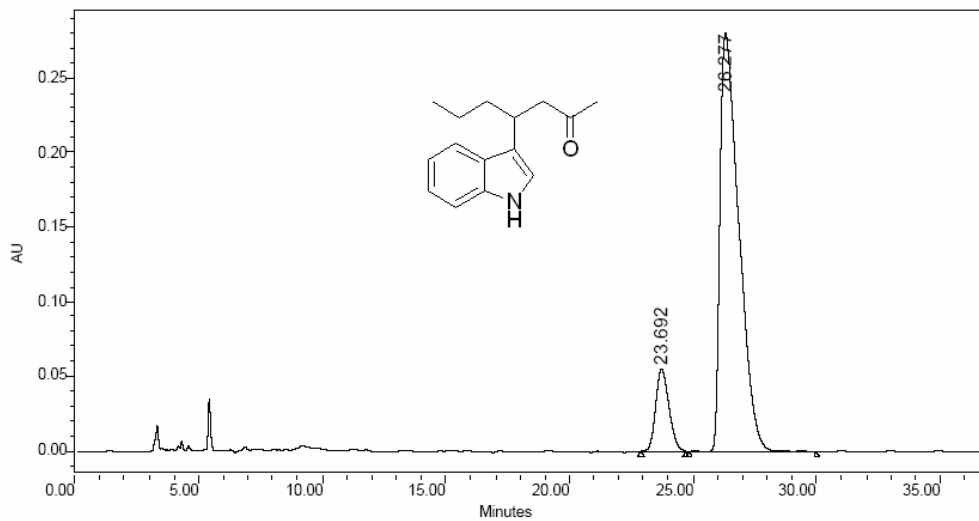
F2 - Processing parameters  
SI 32768  
SF 75.4677541 MHz  
WDW EM  
SSB 0  
LB 3.00 Hz  
GB 0  
PC 1.40

10 NMR plot parameters  
CX 20.00 cm  
CY 5.00 cm  
FID 230.005 dB  
F1 17357.96 Hz  
F2 -0.005 dB  
F3 -6.38 Hz  
F4CH 11.50050 dB/c  
GDC 867.91687 Hz/c

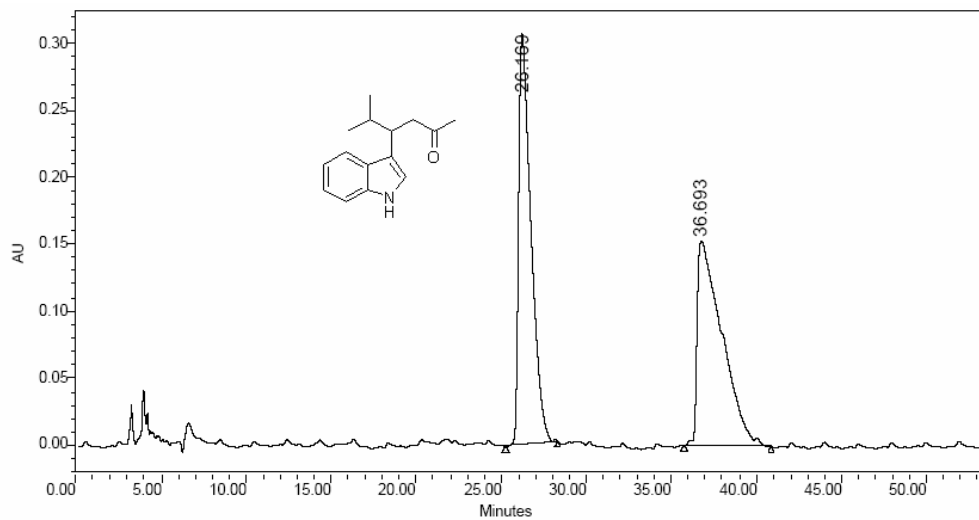
## HPLC chromatograms



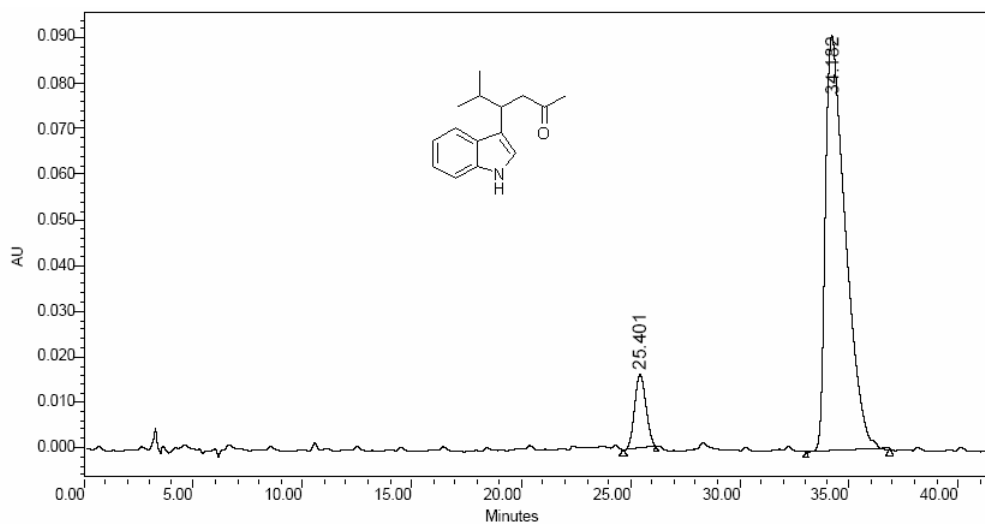
	RT (min)	Area (∇ *sec)	% Area	Height (∇)	% Height
1	23.330	8716689	49.05	214889	51.75
2	26.215	9055337	50.95	200362	48.25



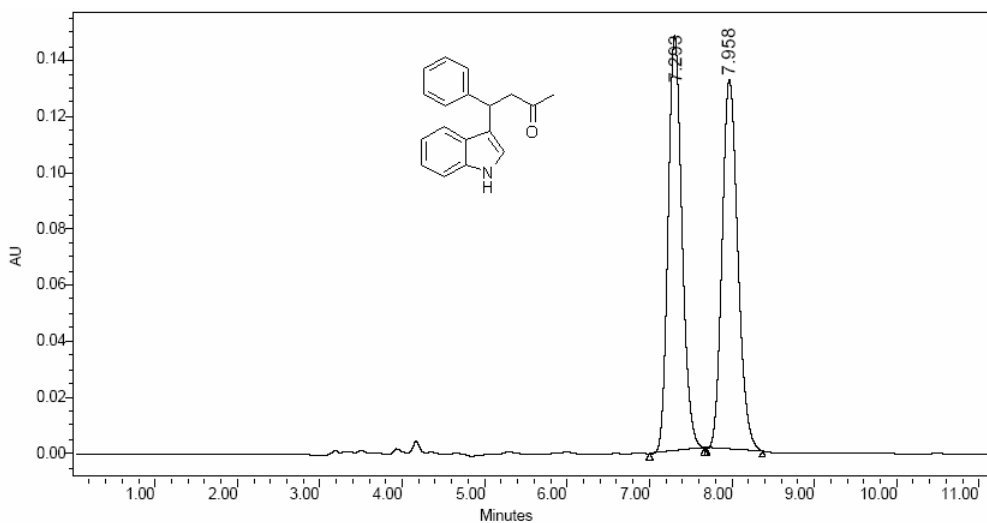
	RT (min)	Area (∇ *sec)	% Area	Height (∇)	% Height
1	23.692	2060454	12.12	55061	16.42
2	26.277	14934080	87.88	280322	83.58



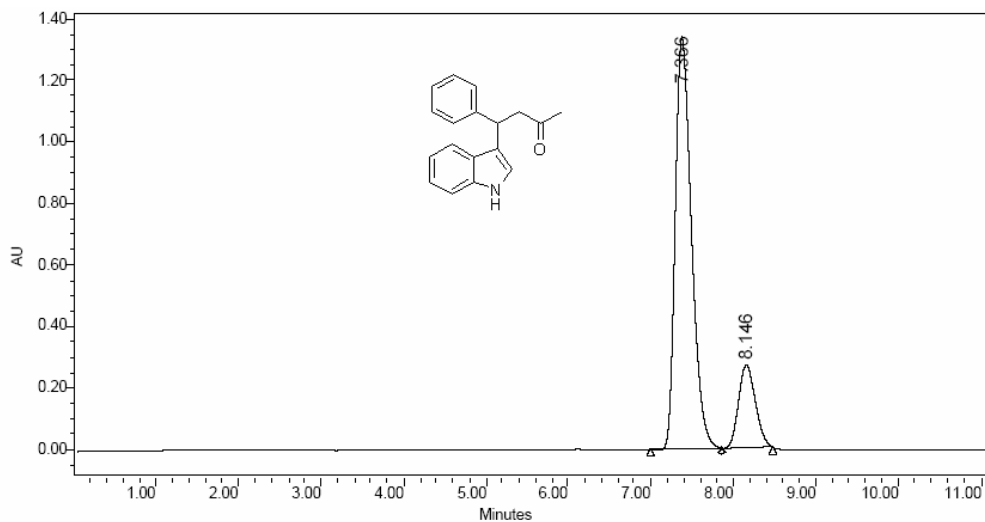
	RT (min)	Area (∇ *sec)	% Area	Height (∇)	% Height
1	26.169	15520777	50.01	307302	66.82
2	36.693	15517241	49.99	152562	33.18



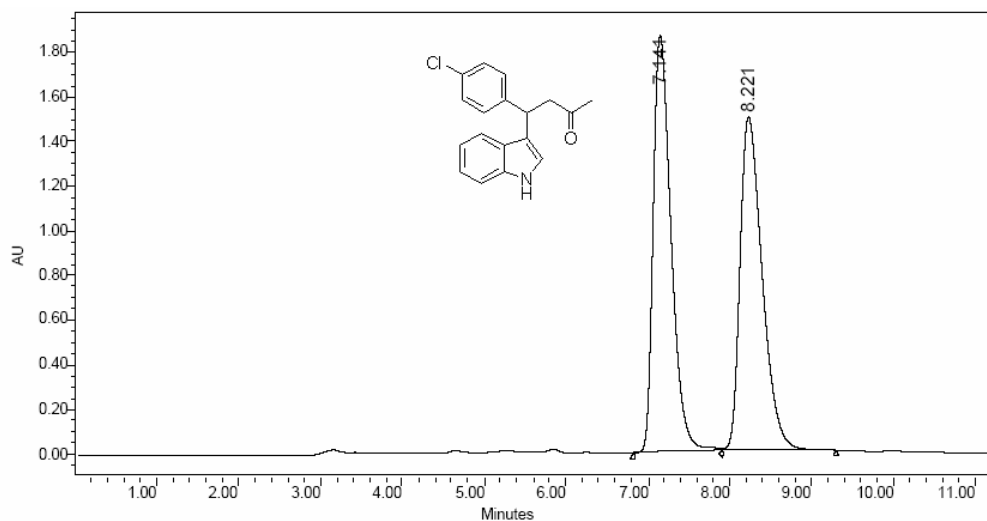
	RT (min)	Area (∇ *sec)	% Area	Height (∇)	% Height
1	25.401	583762	9.09	16155	15.06
2	34.182	5836234	90.91	91141	84.94



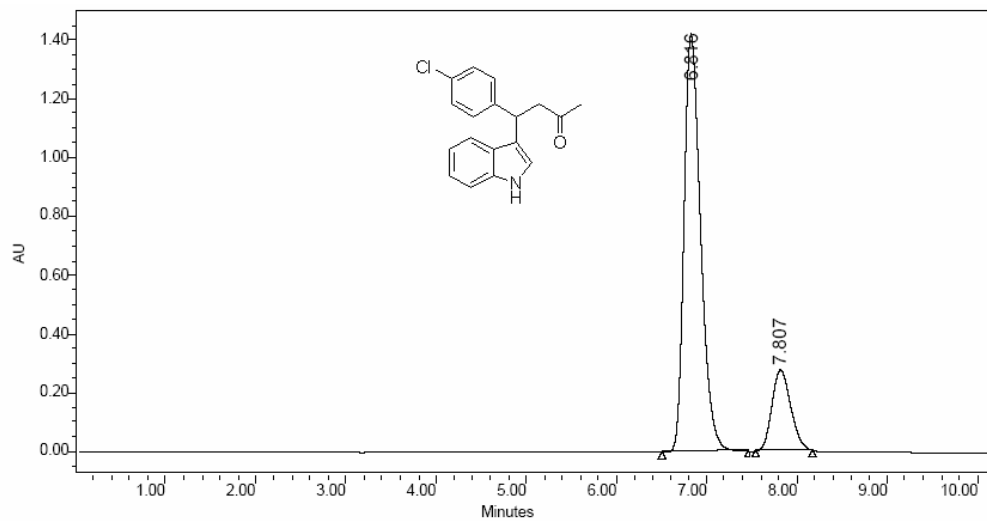
	RT (min)	Area (Δ *sec)	% Area	Height (Δ)	% Height
1	7.293	1742569	49.89	148606	52.90
2	7.958	1750523	50.11	132325	47.10



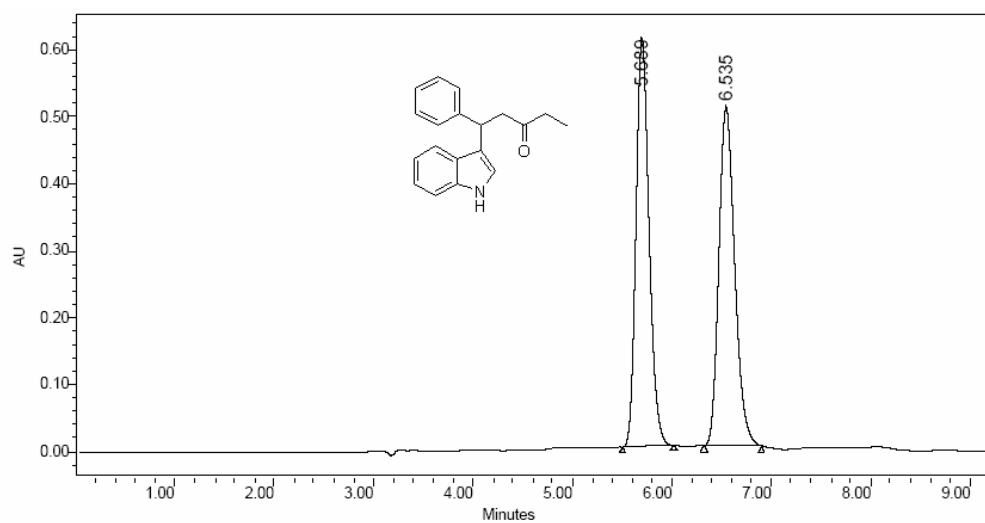
	RT (min)	Area (Δ *sec)	% Area	Height (Δ)	% Height
1	7.366	18346094	82.43	1342521	83.17
2	8.146	3911152	17.57	271752	16.83



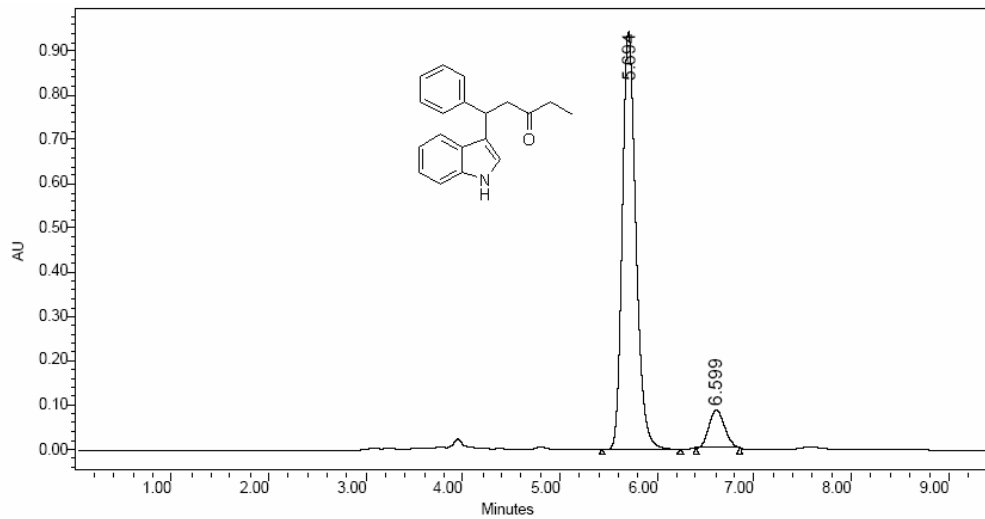
	RT (min)	Area (Δ *sec)	% Area	Height (Δ)	% Height
1	7.141	28465751	50.11	1873291	55.53
2	8.221	28343764	49.89	1500397	44.47



	RT (min)	Area (Δ *sec)	% Area	Height (Δ)	% Height
1	6.816	18213942	81.95	1423388	83.72
2	7.807	4011182	18.05	276779	16.28

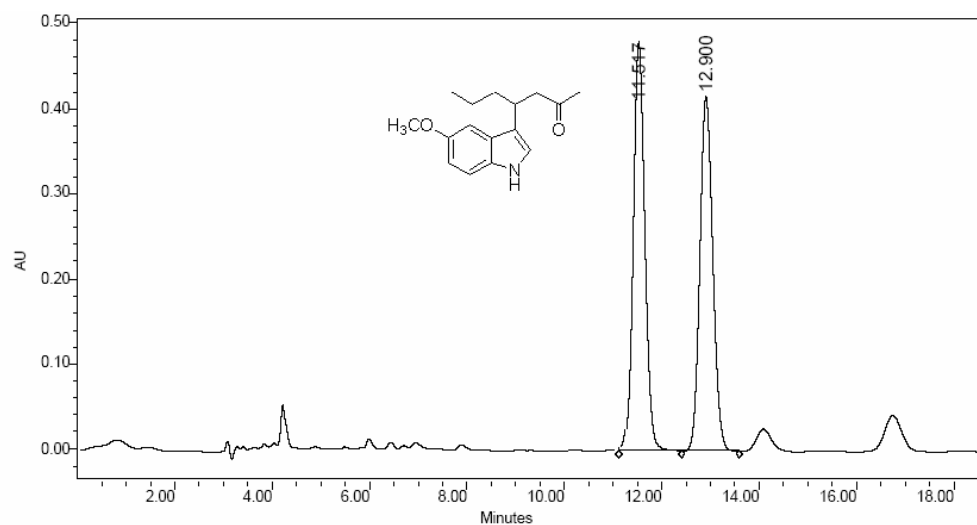


	RT (min)	Area ( $\Delta$ *sec)	% Area	Height ( $\Delta$ )	% Height
1	5.689	5570350	49.77	612664	54.67
2	6.535	5620876	50.23	507908	45.33

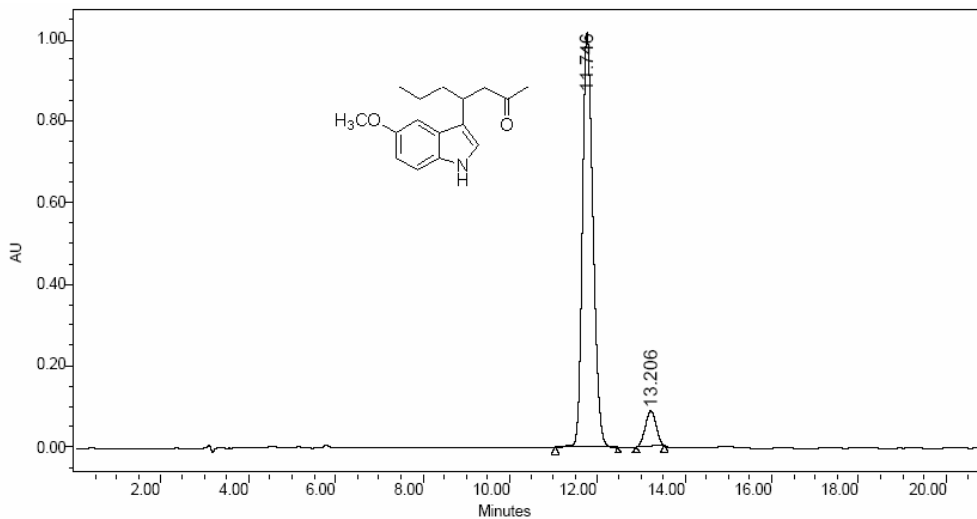


	RT (min)	Area ( $\Delta$ *sec)	% Area	Height ( $\Delta$ )	% Height
1	5.694	9221170	90.37	946957	91.56
2	6.599	982687	9.63	87294	8.44

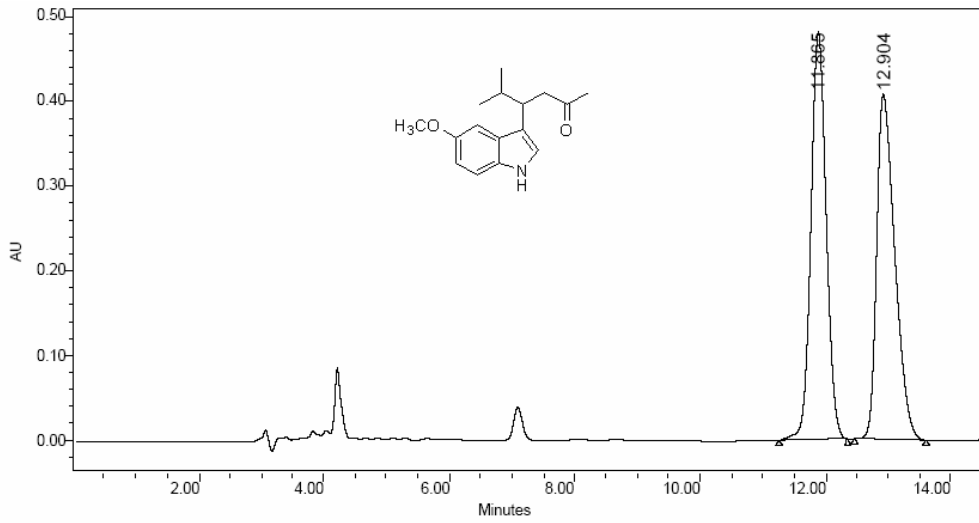




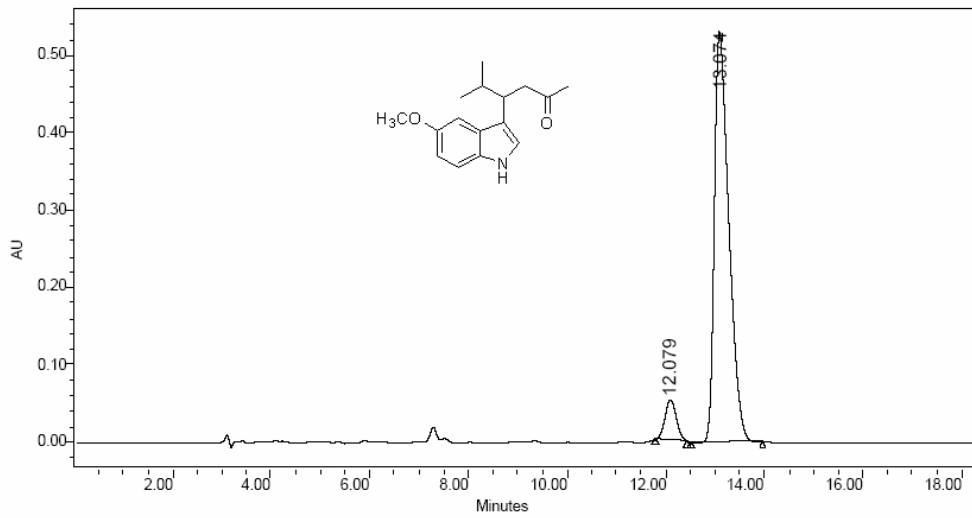
	RT (min)	Area (Δ *sec)	% Area	Height (Δ)	% Height
1	11.517	7581014	50.01	470605	53.20
2	12.900	7578364	49.99	413964	46.80



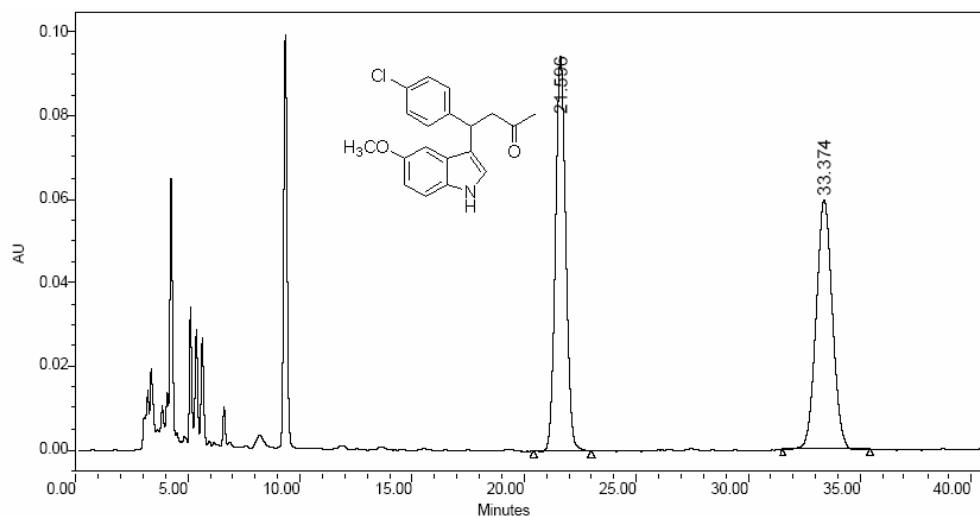
	RT (min)	Area (Δ *sec)	% Area	Height (Δ)	% Height
1	11.746	17237275	91.77	1017864	92.02
2	13.206	1545790	8.23	88230	7.98



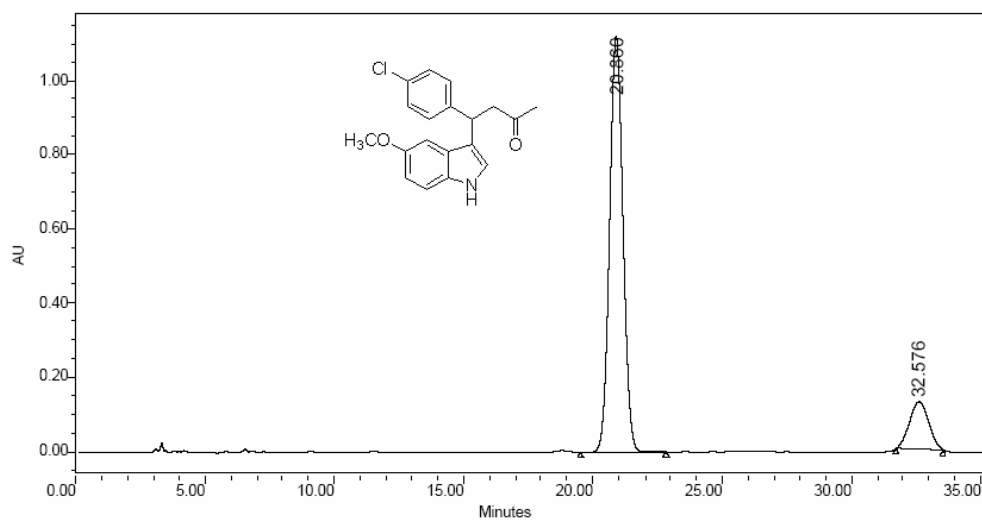
RT (min)	Area (∇ *sec)	% Area	Height (∇)	% Height
1 11.865	8138456	49.95	479714	54.10
2 12.904	8154215	50.05	406955	45.90



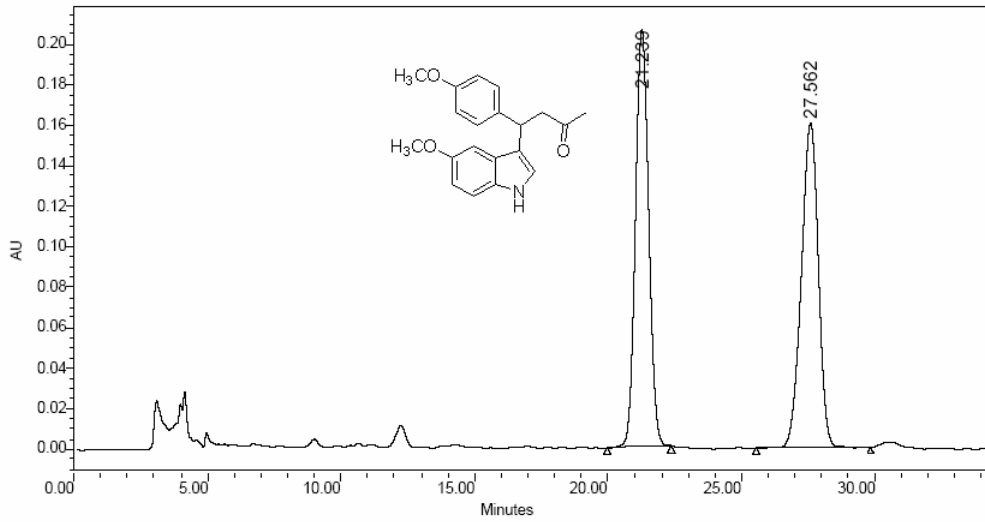
RT (min)	Area (∇ *sec)	% Area	Height (∇)	% Height
1 12.079	840285	7.22	52467	8.96
2 13.074	10801596	92.78	533137	91.04



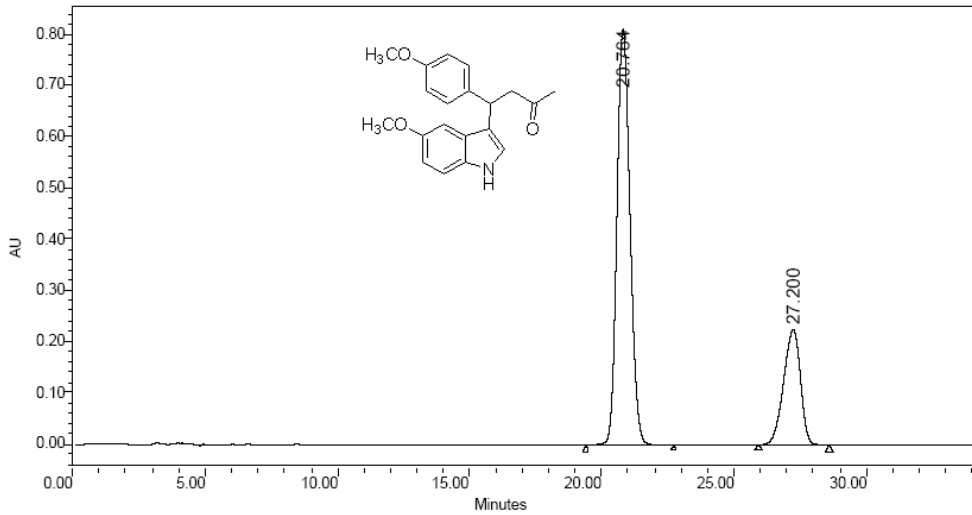
	RT (min)	Area (Δ *sec)	% Area	Height (Δ)	% Height
1	21.596	3016988	50.01	94592	61.24
2	33.374	3016344	49.99	59868	38.76



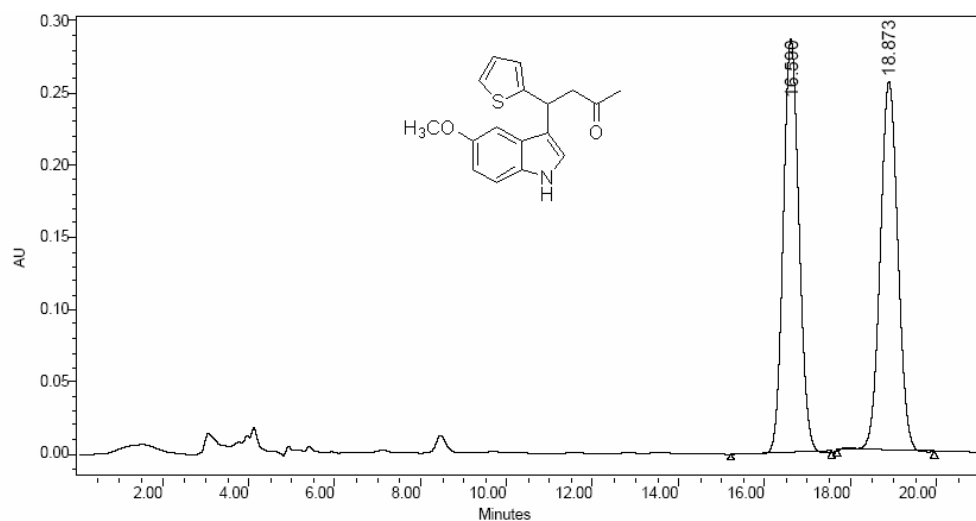
	RT (min)	Area (Δ *sec)	% Area	Height (Δ)	% Height
1	20.860	40337173	85.97	1120791	89.78
2	32.576	6585117	14.03	127636	10.22



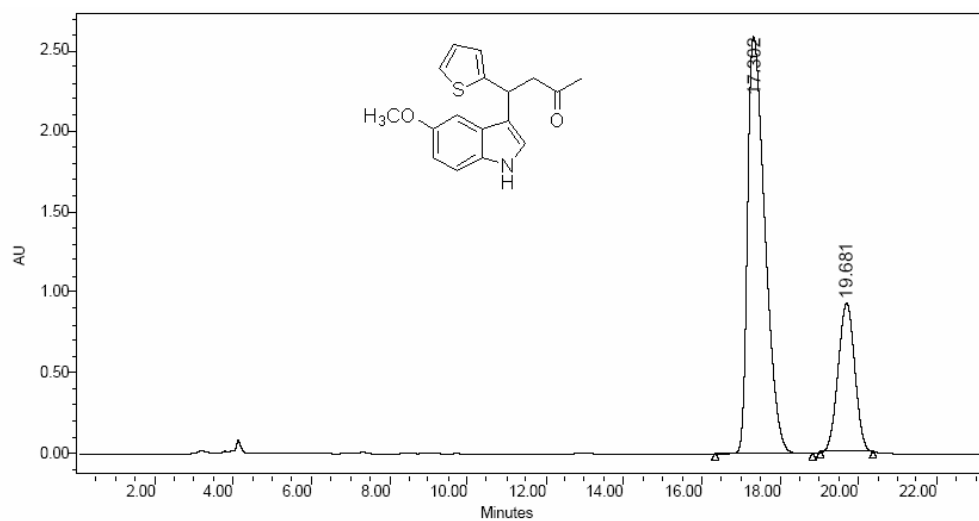
	RT (min)	Area (Δ *sec)	% Area	Height (Δ)	% Height
1	21.239	7160544	50.15	206413	56.27
2	27.562	7116625	49.85	160383	43.73



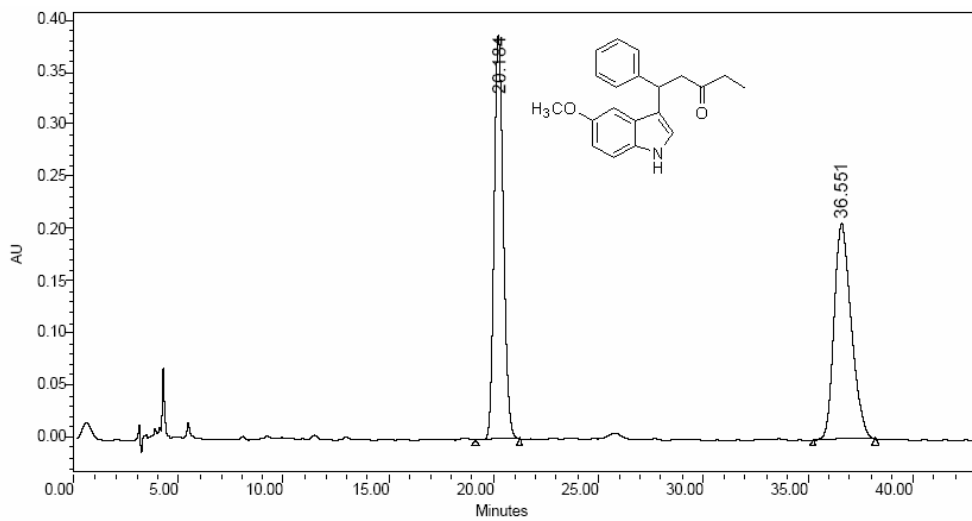
	RT (min)	Area (Δ *sec)	% Area	Height (Δ)	% Height
1	20.764	27906449	73.58	812635	78.32
2	27.200	10020192	26.42	224977	21.68



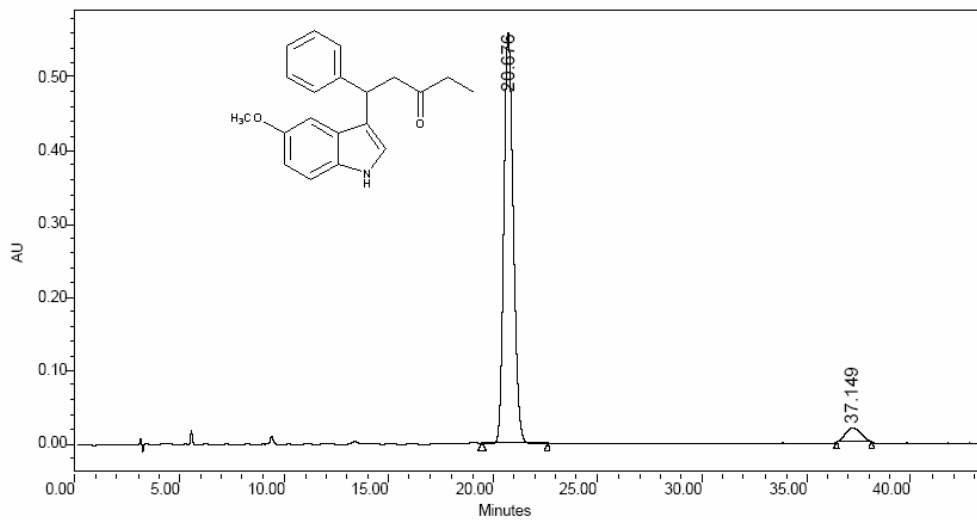
	RT (min)	Area (∇ *sec)	% Area	Height (∇)	% Height
1	16.590	7312859	49.97	286920	52.83
2	18.873	7322371	50.03	256148	47.17



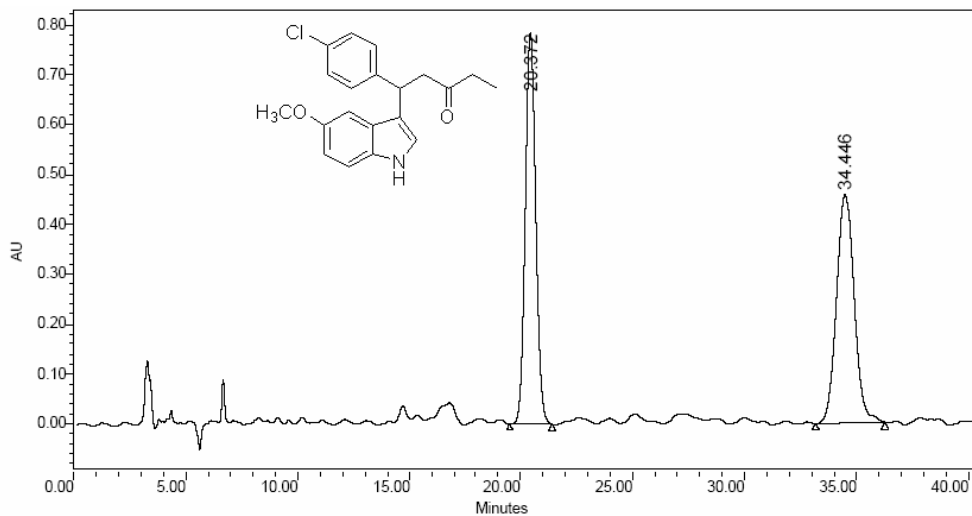
	RT (min)	Area (∇ *sec)	% Area	Height (∇)	% Height
1	17.302	80099833	74.36	2593950	73.63
2	19.681	27618121	25.64	928832	26.37



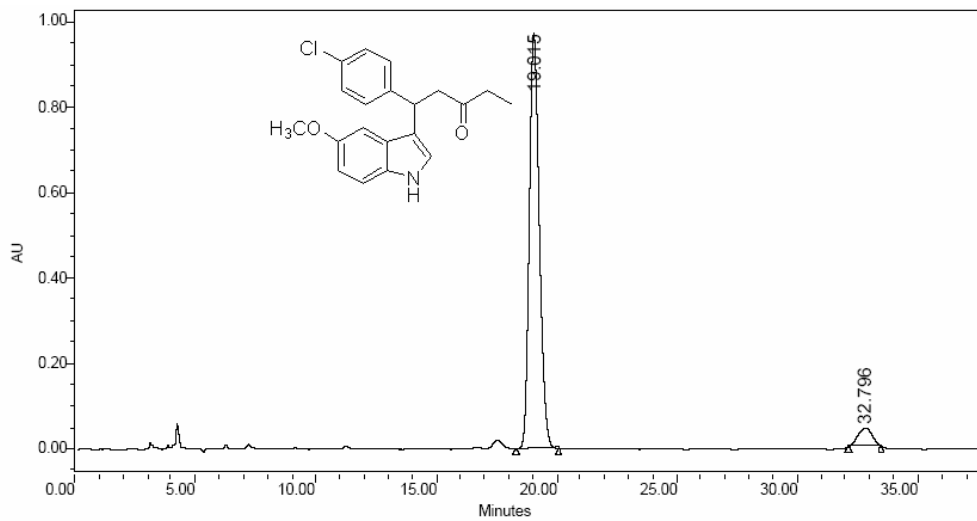
	RT (min)	Area (Δ *sec)	% Area	Height (Δ)	% Height
1	20.184	11829447	50.03	386662	65.09
2	36.551	11816028	49.97	207337	34.91



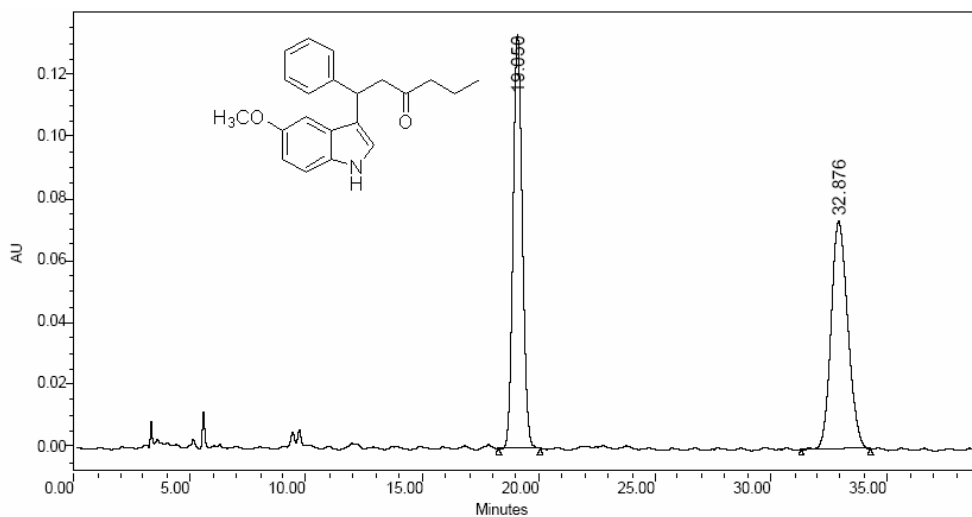
	RT (min)	Area (Δ *sec)	% Area	Height (Δ)	% Height
1	20.676	17649461	94.48	560490	96.61
2	37.149	1030701	5.52	19686	3.39



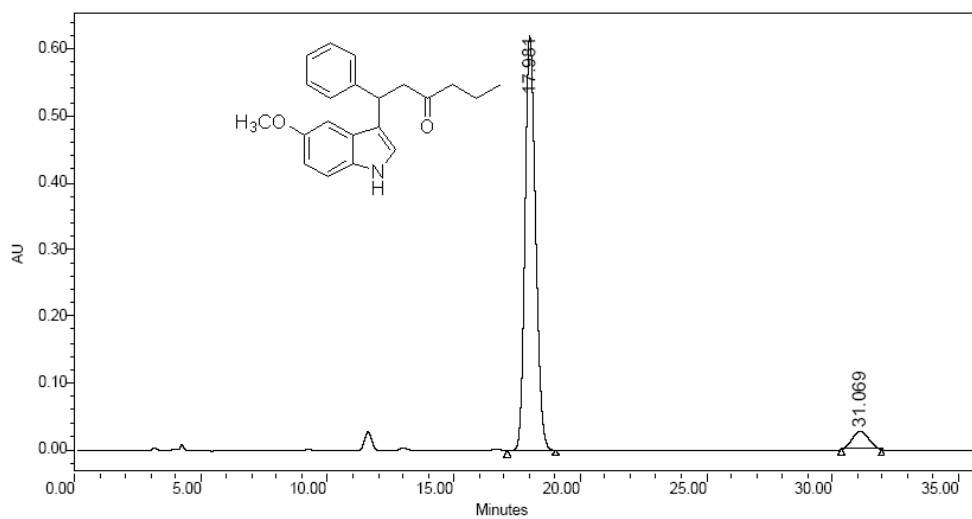
	RT (min)	Area (Δ *sec)	% Area	Height (Δ)	% Height
1	20.372	25562875	50.00	784589	63.01
2	34.446	25558697	50.00	460658	36.99



	RT (min)	Area (Δ *sec)	% Area	Height (Δ)	% Height
1	19.015	28100314	93.92	974105	95.70
2	32.796	1818321	6.08	43750	4.30

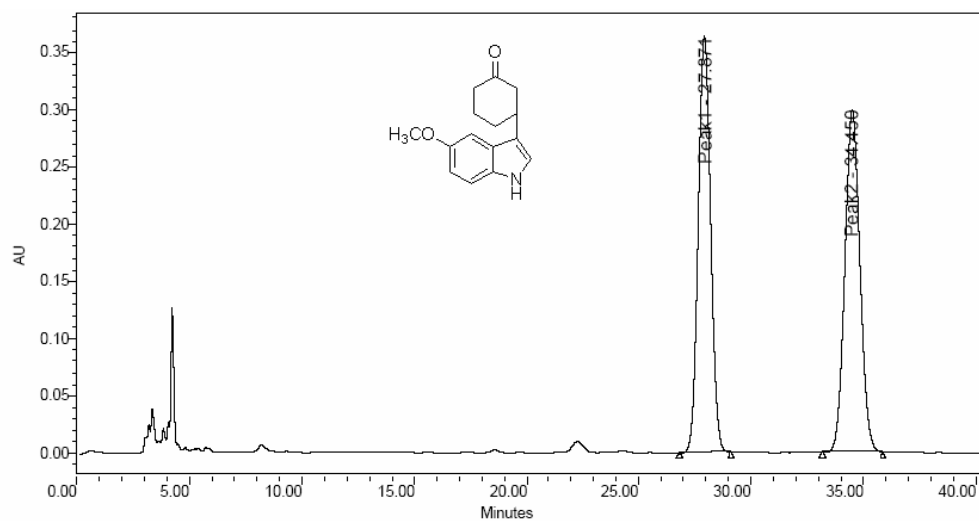


	RT (min)	Area (Δ <sup>2</sup> *sec)	% Area	Height (Δ)	% Height
1	19.050	3712366	50.00	133679	64.43
2	32.876	3712274	50.00	73810	35.57

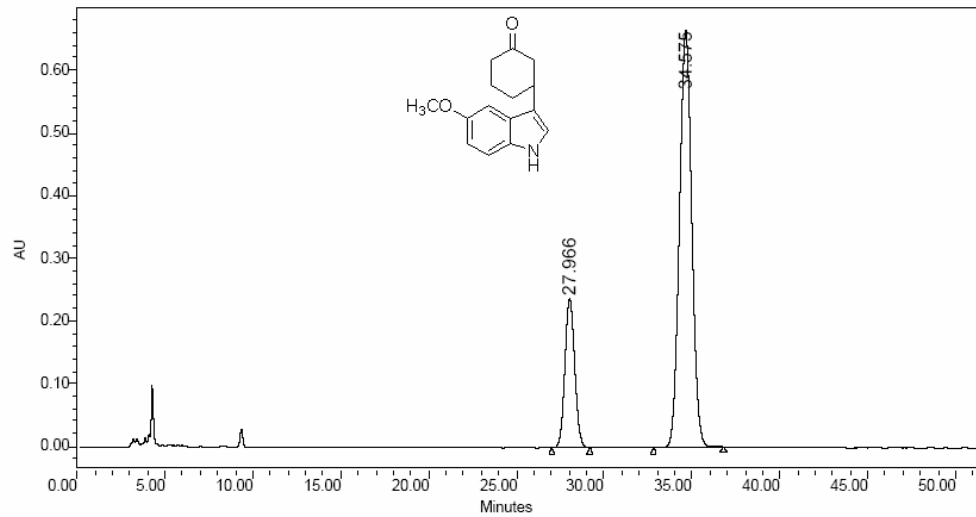


	RT (min)	Area (Δ <sup>2</sup> *sec)	% Area	Height (Δ)	% Height
1	17.981	18147842	93.42	620639	95.76
2	31.069	1279046	6.58	27497	4.24

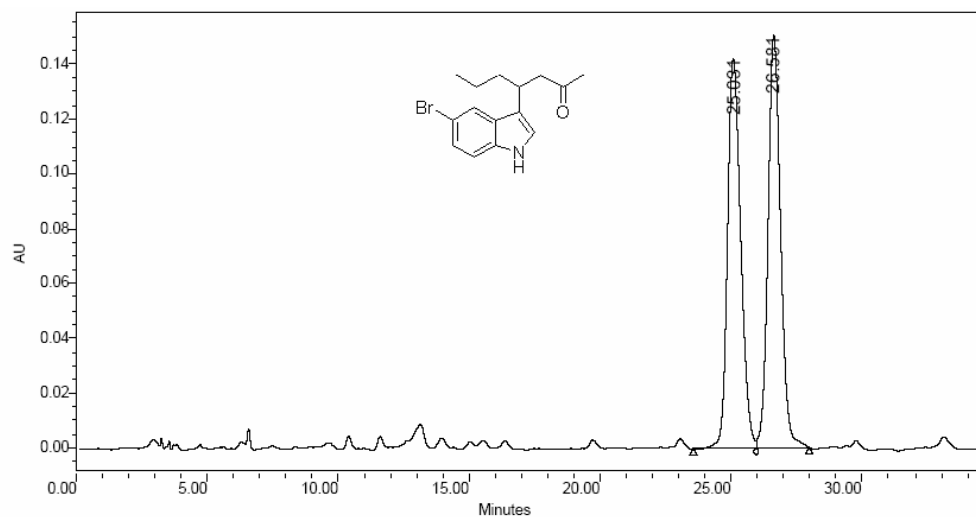




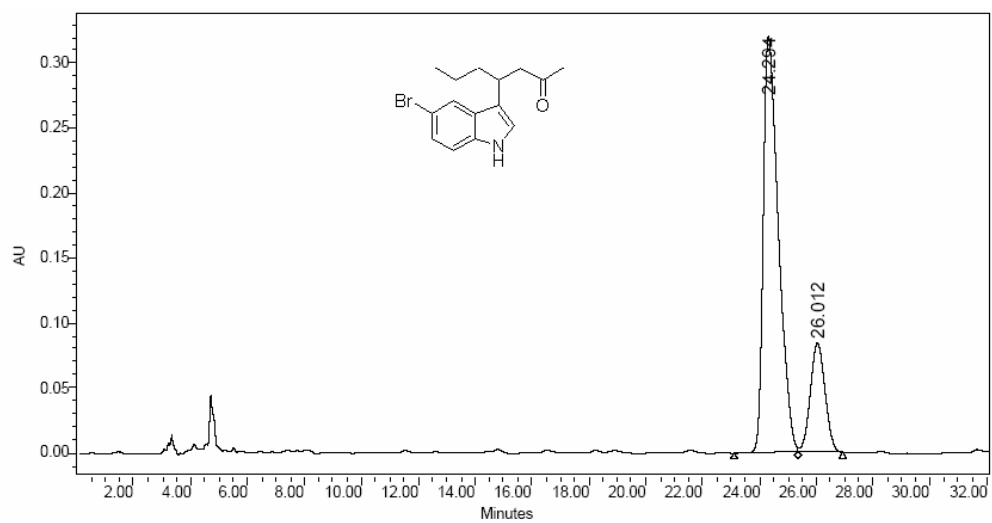
Peak Name	RT (min)	Area ( $\Delta$ *sec)	% Area	Height ( $\Delta$ )	% Height
1 Peak1	27.871	13977230	49.99	363765	54.85
2 Peak2	34.450	13981599	50.01	299449	45.15



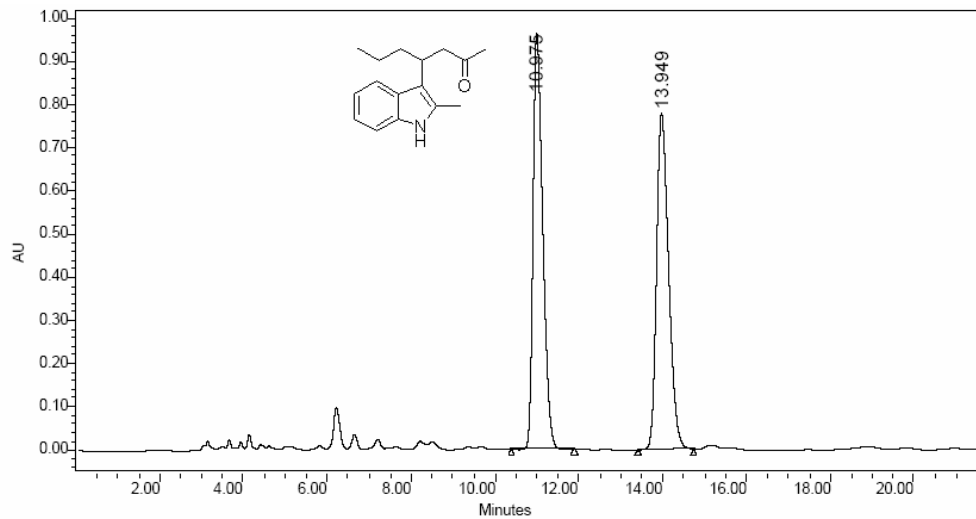
RT (min)	Area ( $\Delta$ *sec)	% Area	Height ( $\Delta$ )	% Height
1 27.966	9215085	22.11	238332	26.38
2 34.575	32462437	77.89	665157	73.62



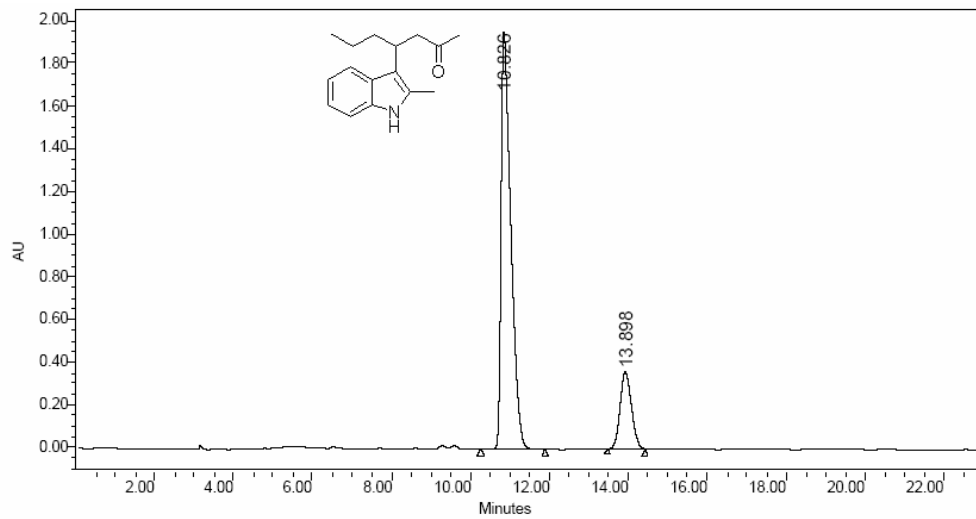
	RT (min)	Area (∇ *sec)	% Area	Height (∇)	% Height
1	25.031	5031744	49.92	142557	48.60
2	26.581	5048201	50.08	150758	51.40



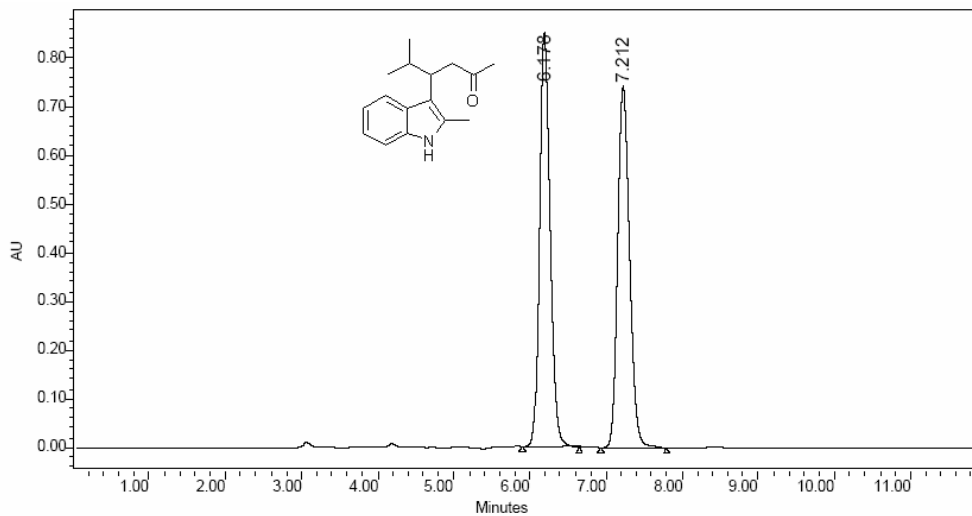
	RT (min)	Area (∇ *sec)	% Area	Height (∇)	% Height
1	24.294	11950266	79.50	321168	79.14
2	26.012	3081672	20.50	84660	20.86



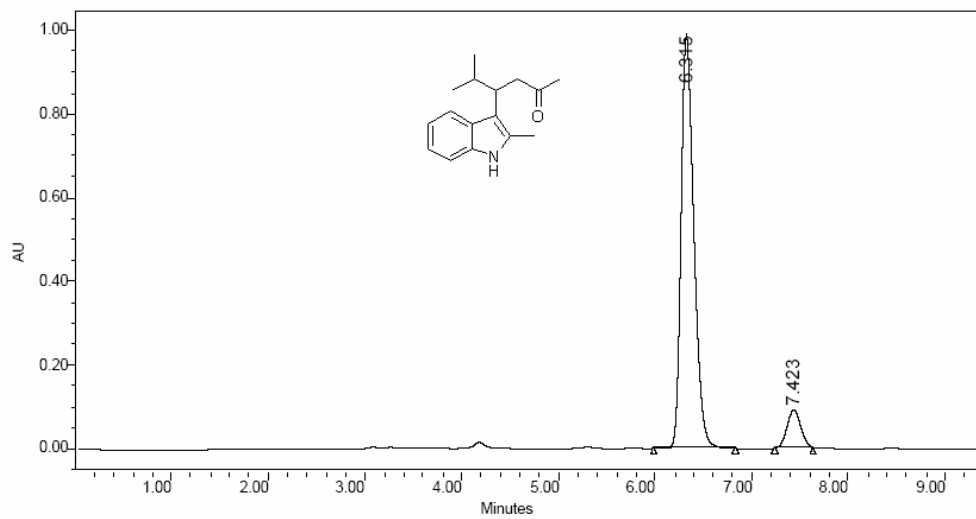
	RT (min)	Area (ΔV *sec)	% Area	Height (ΔV)	% Height
1	10.975	15499990	49.92	965460	55.33
2	13.949	15548610	50.08	779525	44.67



	RT (min)	Area (ΔV *sec)	% Area	Height (ΔV)	% Height
1	10.826	33413698	82.29	1964376	84.49
2	13.898	7191802	17.71	360657	15.51



	RT (min)	Area (Δ *sec)	% Area	Height (Δ)	% Height
1	6.178	8133583	50.17	854439	53.45
2	7.212	8079201	49.83	744127	46.55



	RT (min)	Area (Δ *sec)	% Area	Height (Δ)	% Height
1	6.315	9091609	91.00	989417	91.55
2	7.423	899392	9.00	91317	8.45