

# Highly Efficient General Enantioselective Synthesis of Naturally Occurring Isoquinoline Alkaloids

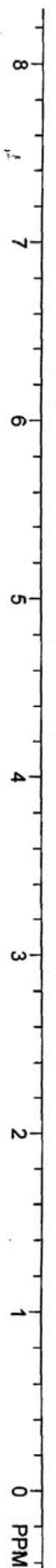
Weilong Lin,<sup>a</sup> and Shengming Ma<sup>\*a,b</sup>

<sup>a</sup> State Key Laboratory of Organometallic Chemistry, Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences, 345 Lingling Lu, Shanghai 200032, P. R. China

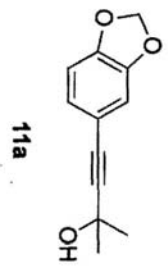
<sup>b</sup> Shanghai Key Laboratory of Green Chemistry and Chemical Process, Department of Chemistry, East China Normal University, 3663 North Zhongshan Road, Shanghai 200062, P. R. China

Email: [masm@sioc.ac.cn](mailto:masm@sioc.ac.cn)

Supporting Information



HW-3-118H-400M  
Jan 14 2014  
SOLVENT: CDCl3  
NA = 8



- 6.936
- 6.932
- 6.916
- 6.912
- 6.854
- 6.851
- 6.733
- 6.712

5.947

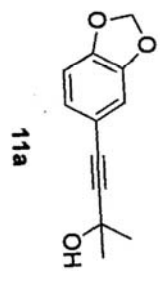
2.529

1.596

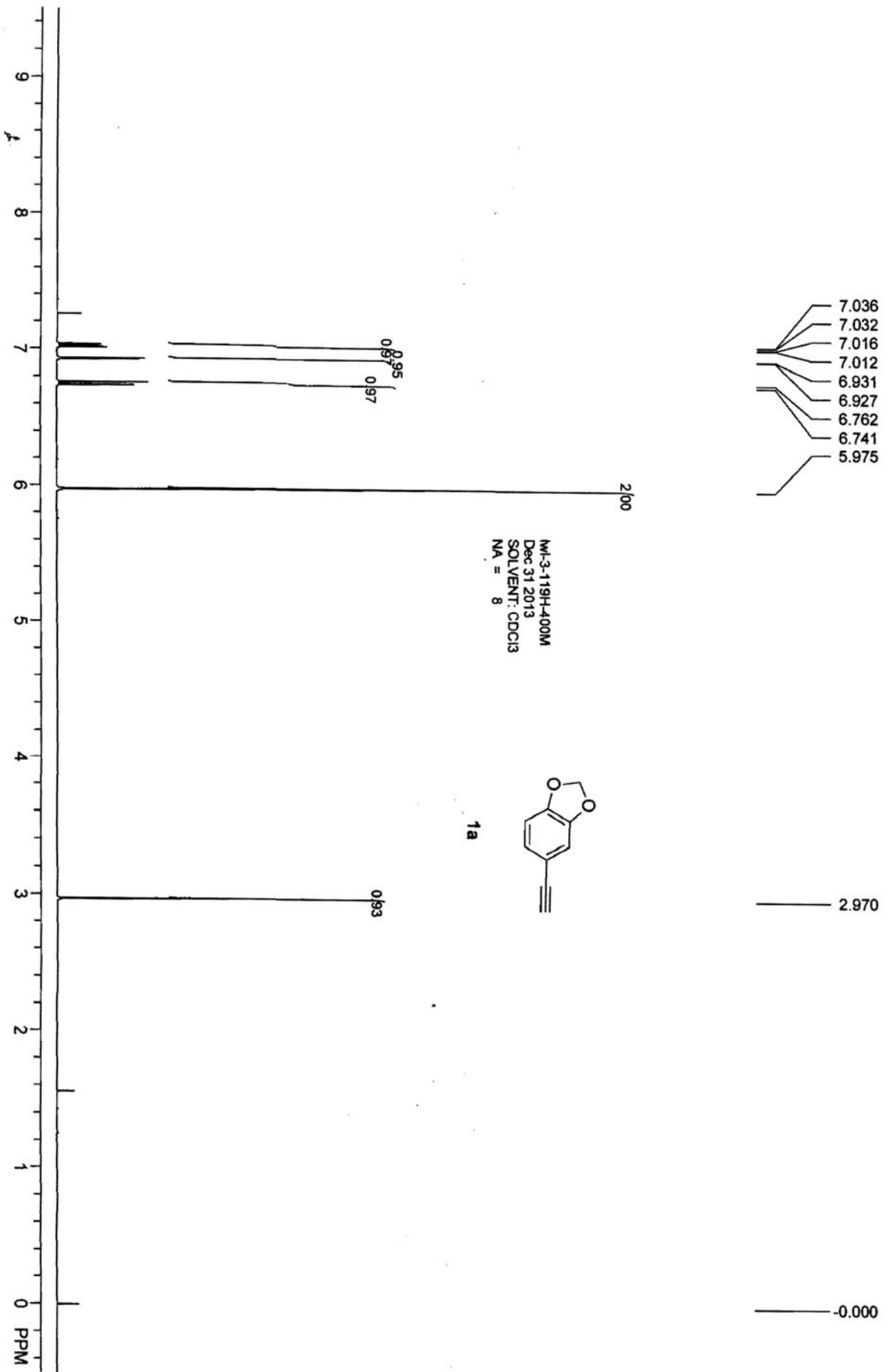
-0.000

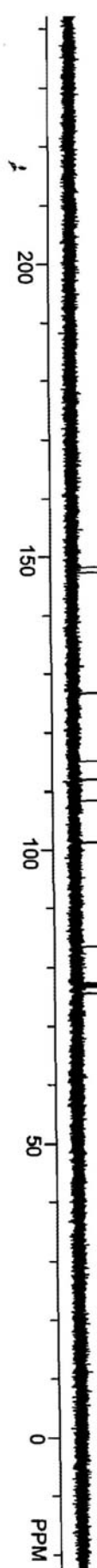


MI-3-118C-400M  
Jan 14 2014  
SOLVENT: cdcl3  
NA = 24



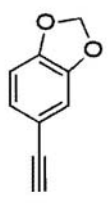
- 147.661
- 147.197
- 126.113
- 115.861
- 111.536
- 108.256
- 101.159
- 92.093
- 81.813
- 77.319
- 77.000
- 76.681
- 65.453
- 31.401





HWI-3-119C-400M  
Jan 14 2014  
SOLVENT: cdcl3  
NA = 40

1a



148.202  
147.290

126.807

115.183

111.947

108.353

101.300

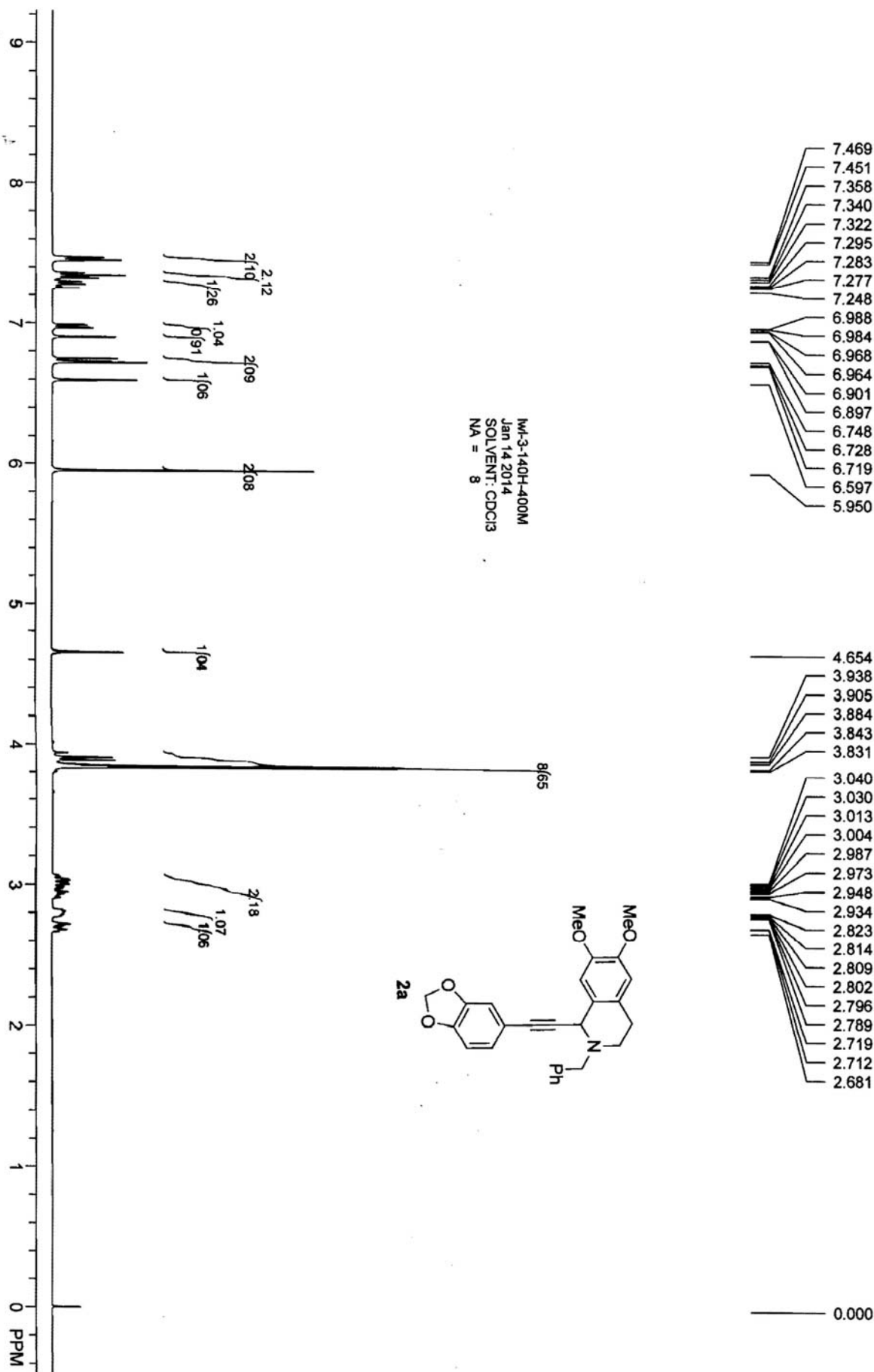
83.488

77.319

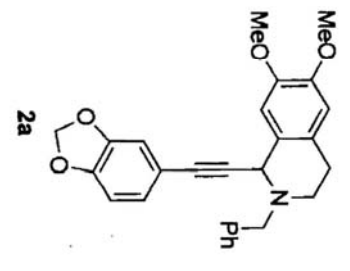
77.000

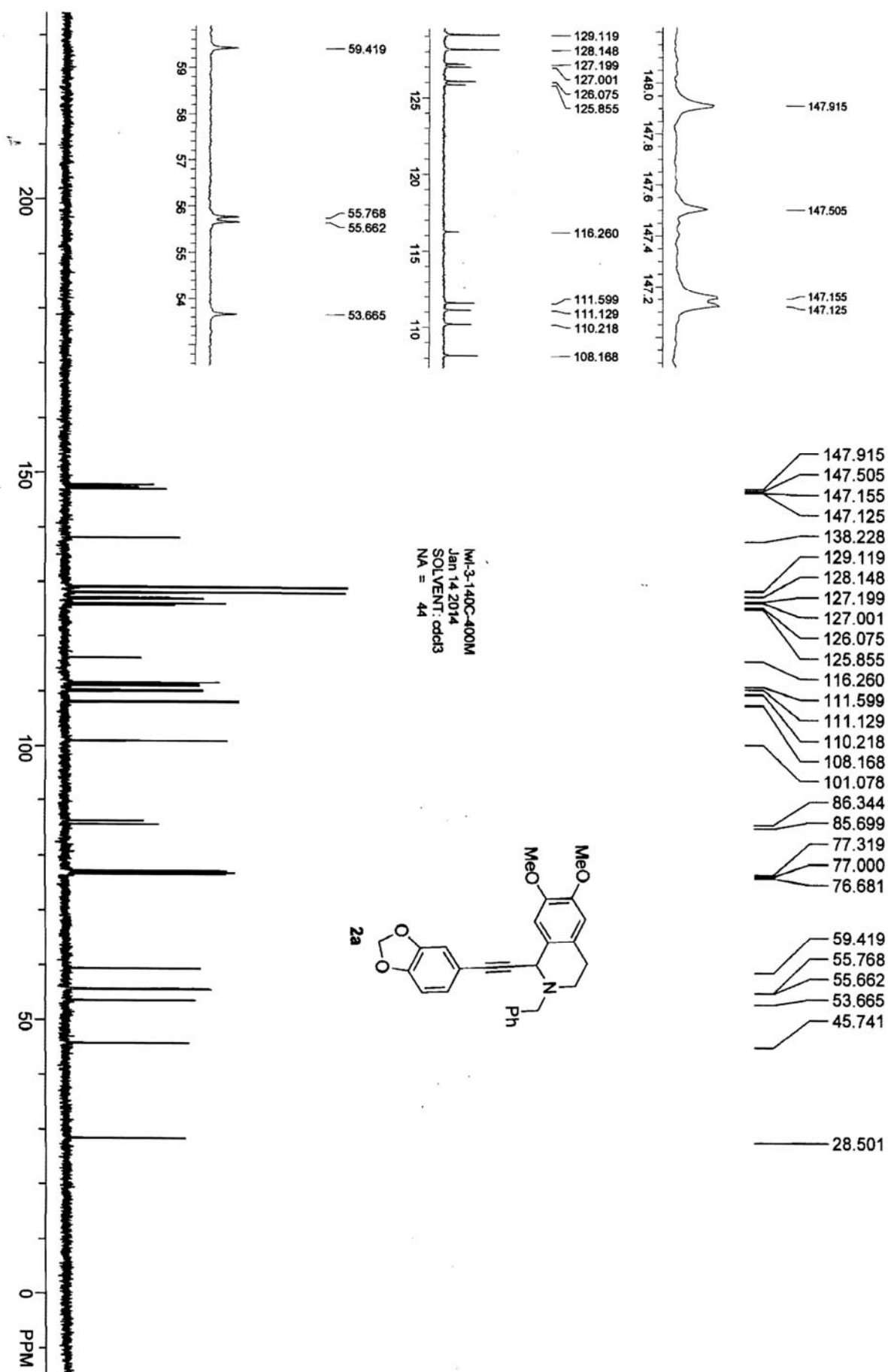
76.685

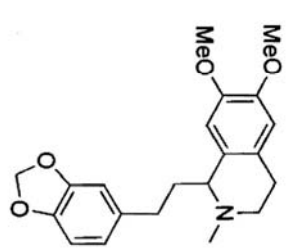
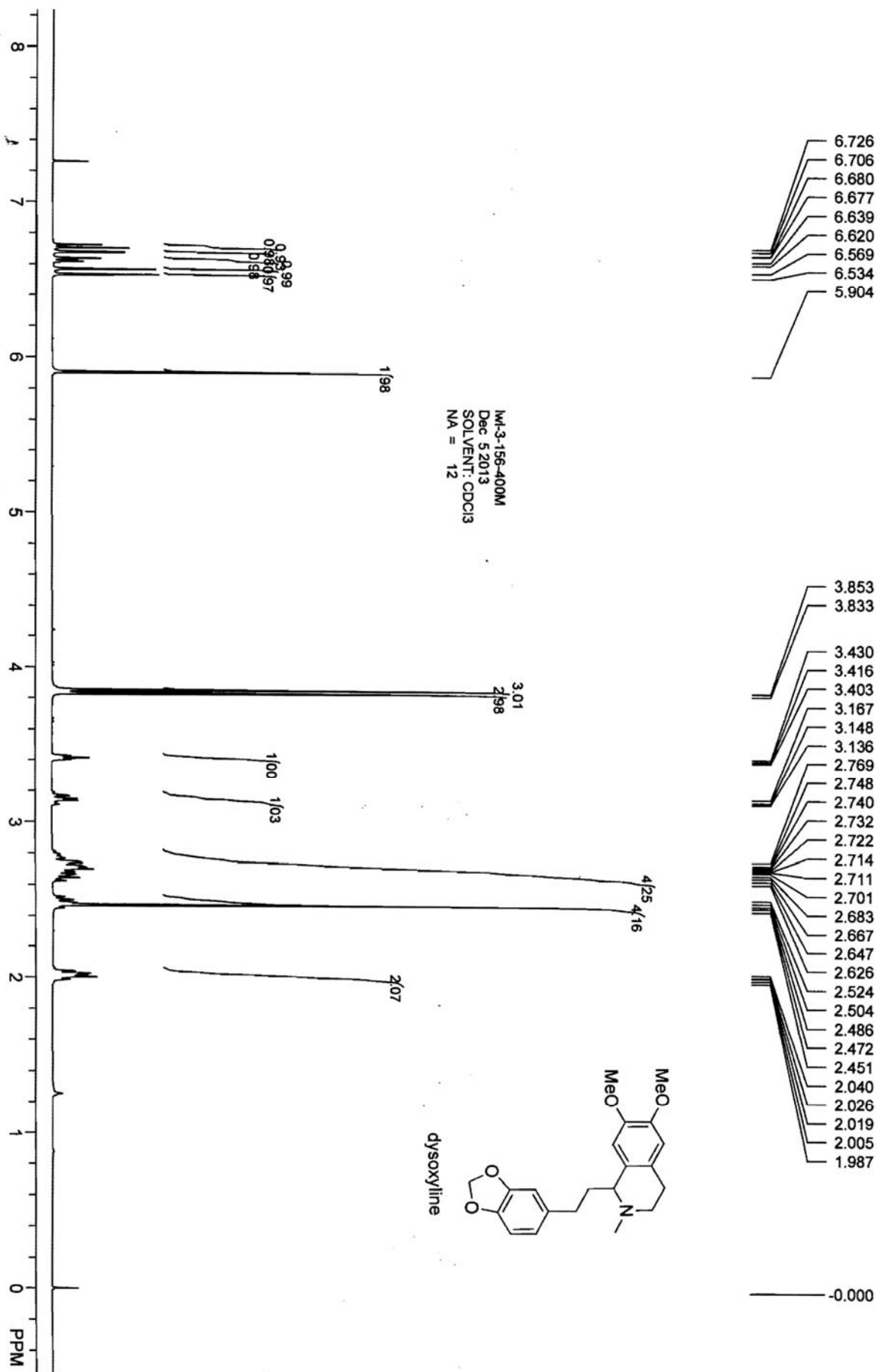
75.552



IM-3-140H-400M  
 Jan 14 2014  
 SOLVENT: CDCl3  
 NA = 8

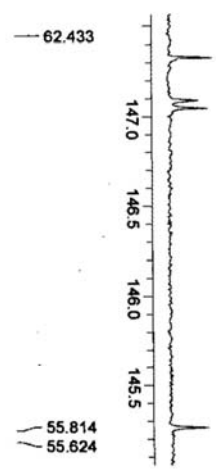
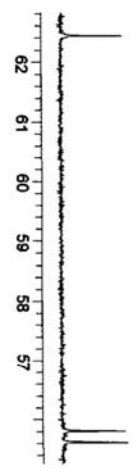
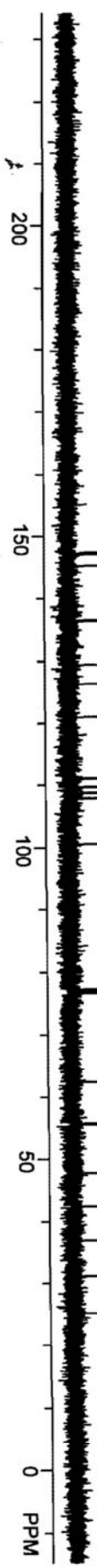






dysoxylone





147.330  
147.095  
147.049

145.265

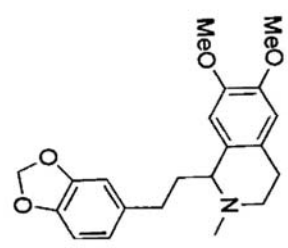
NI-3-156C-100M  
Jan. 13 2014  
SOLVENT: cdcl3  
NA = 48

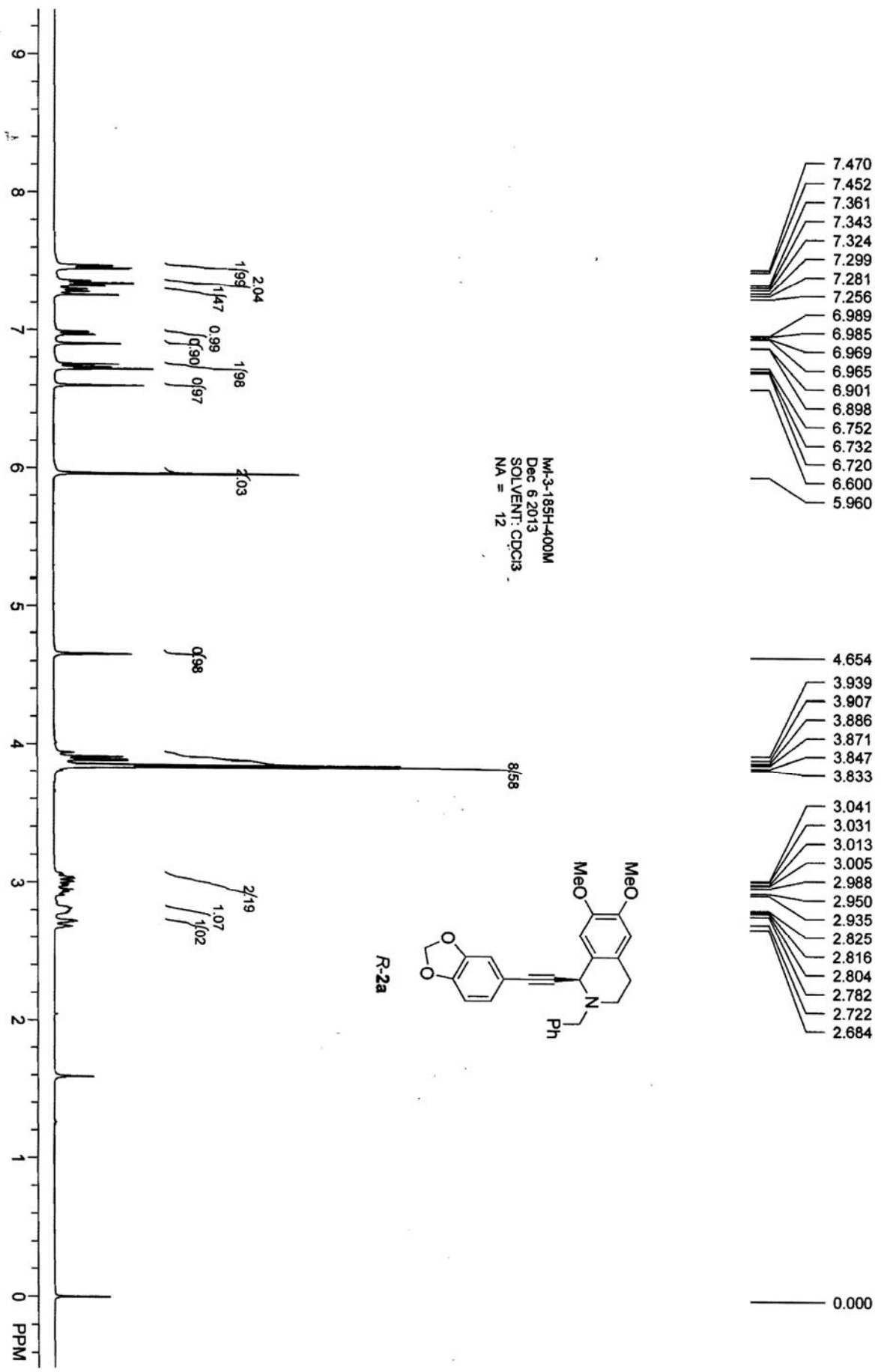
- 147.330
- 147.095
- 147.049
- 145.265
- 136.536
- 129.362
- 126.371
- 120.929
- 111.023
- 109.687
- 108.791
- 107.963
- 100.562

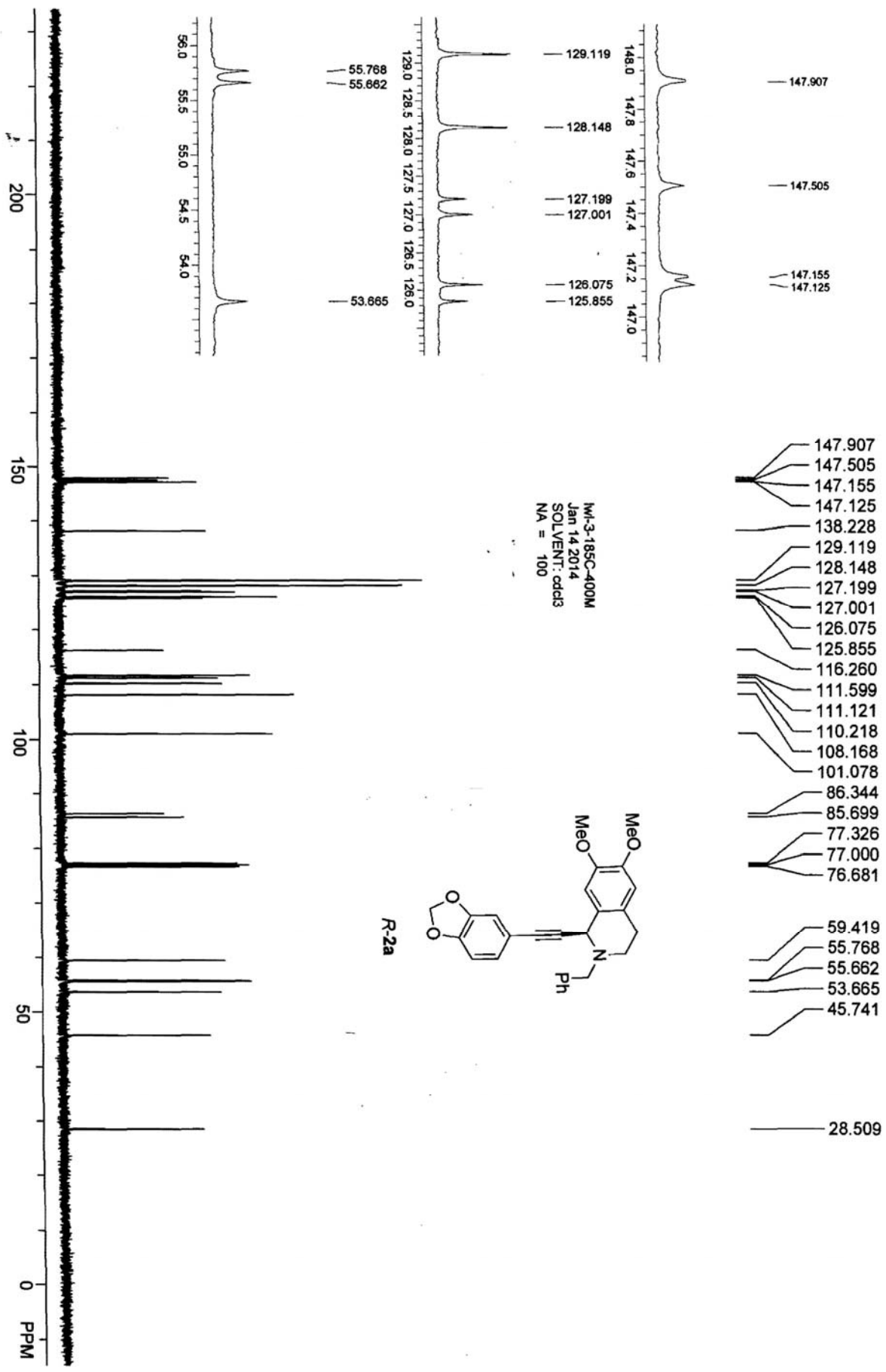
- 77.319
- 77.000
- 76.681

- 62.433
- 55.814
- 55.624
- 47.866
- 42.469
- 36.981
- 31.174
- 25.161

dysoxylone







中国科学院上海有机化学研究所

Project Name: defaults for copy

Reported by User: Breeze user (Breeze)



### SAMPLE INFORMATION

Sample Name: lw-3-185-odh-95-5-1-214

Acquired By: Breeze

Sample Type: 未知

Date Acquired: 2013/12/6 16:33:32 CST

Vial: 1

Acq Method: zg95

Injection #: 71

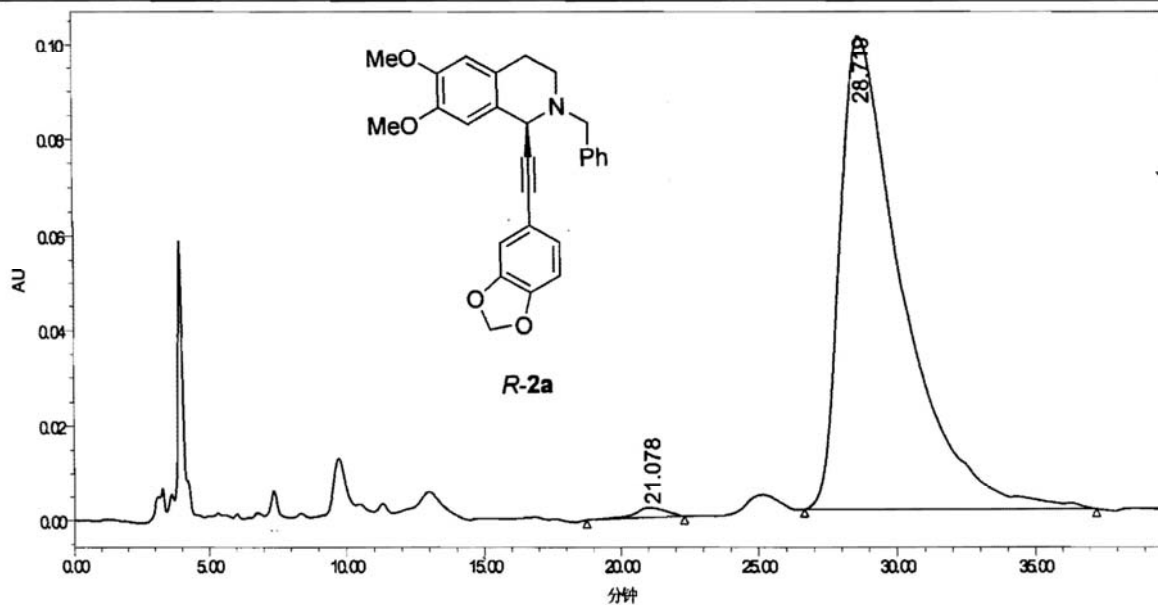
Date Processed: 2013/12/6 17:49:55 CST

Injection Volume: 10.00  $\mu$ l

Channel Name: V0489 ChA

Run Time: 60.00 Minutes

Sample Set Name:



	RT (min)	Area (峰面积)	%Area	Height (峰高)	% Height
1	21.078	172051	1.10	2095	2.08
2	28.719	15531511	98.90	99447	97.94

Report Method: 无标题

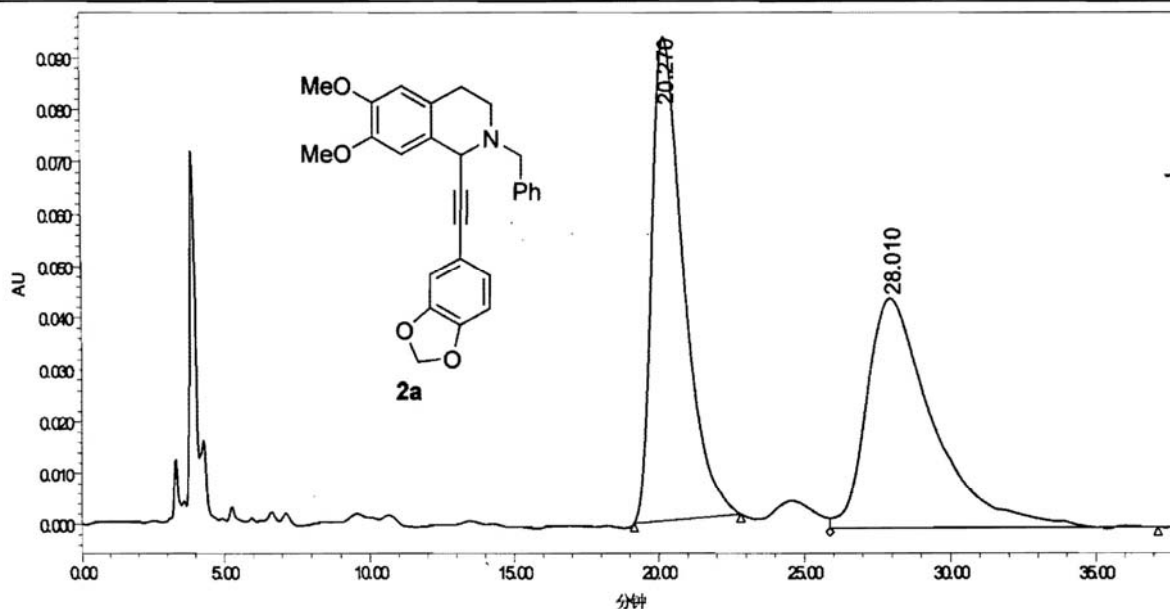
Page: 1 (共 1)

Printed: 2013/12/6

16:55:11 FFC

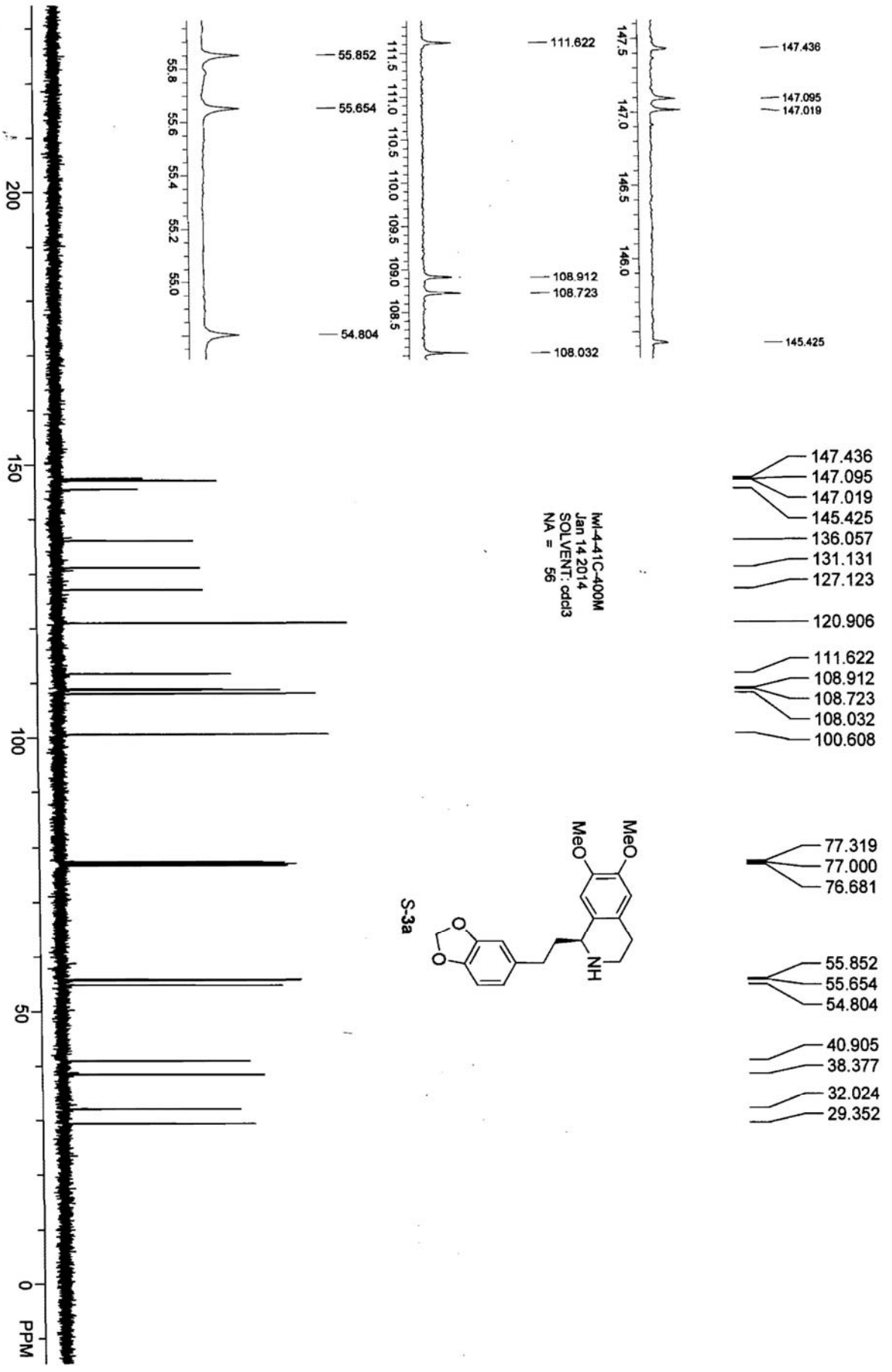
**SAMPLE INFORMATION**

Sample Name:	lw-3-165-cd-h-95-5-1-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2013/12/16 17:15:12 CST
Vial:	1	Acq. Method:	zg95
Injection #:	72	Date Processed:	2013/12/16 17:53:49 CST
Injection Volume:	10.00 ul	Channel Name:	V2489 ChA
Run Time:	60.00 Minutes	Sample Set Name:	



	RT (min)	Area (峰sec)	%Area	Height (峰)	% Height
1	20.270	7136475	50.44	93479	67.79
2	28.010	7011183	49.56	44421	32.21









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Project Name: defaults for copy

Reported by User: Breeze user (Breeze)



### SAMPLE INFORMATION

Sample Name: lw-4-41-cd-h-60-40-1-214

Sample Type: 未知

Vial: 1

Injection #: 48

Injection Volume: 10.00  $\mu$ l

Run Time: 60.00 Minutes

Acquired By: Breeze

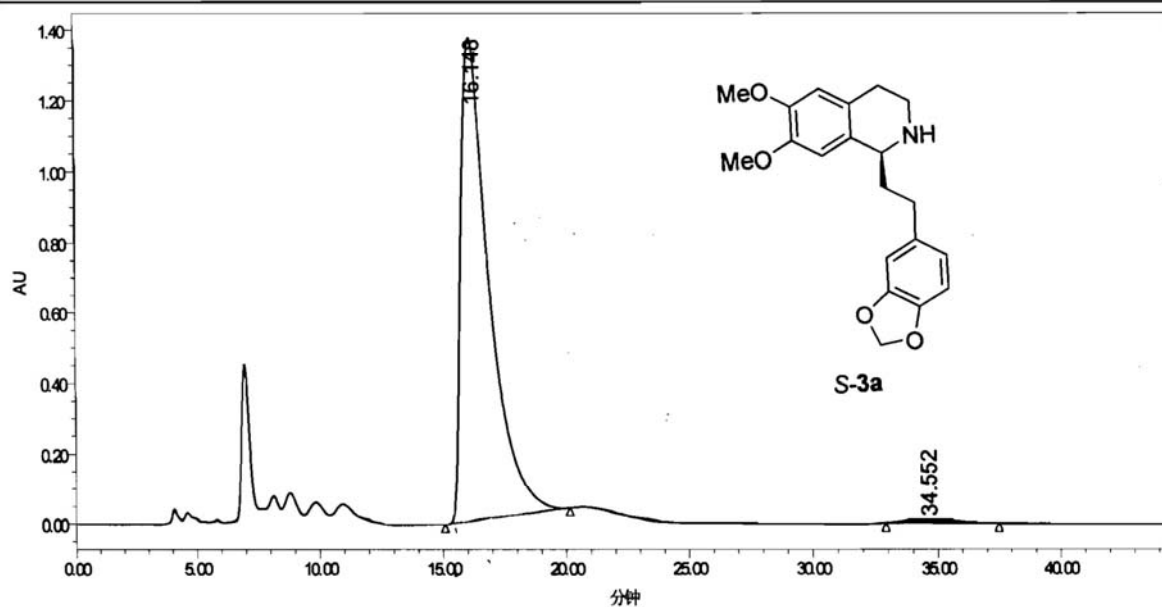
Date Acquired: 2014/1/10 12:05:01 CST

Acq. Method: zg60

Date Processed: 2014/1/10 16:24:51 CST

Channel Name: V2489 CHA

Sample Set Name:



	RT (min)	Area (峰sec)	%Area	Height (峰)	% Height
1	16.148	109031594	98.82	1370045	99.37
2	34.552	1302977	1.18	8673	0.63

Report Method: 无标题

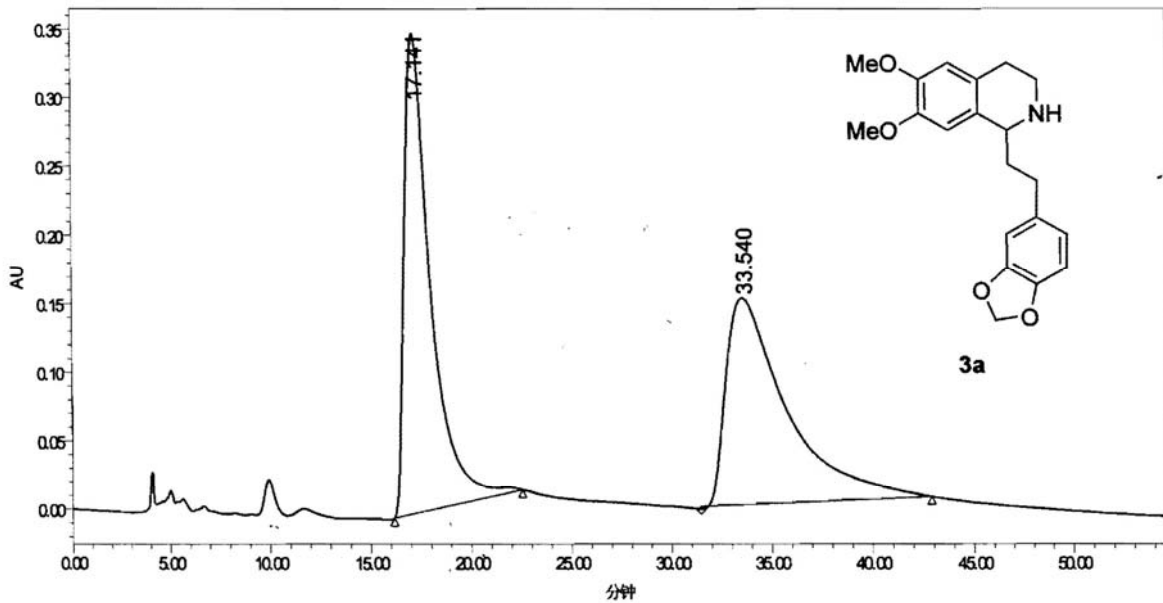
Page: 1 (共计 1)

Printed: 2014/1/10

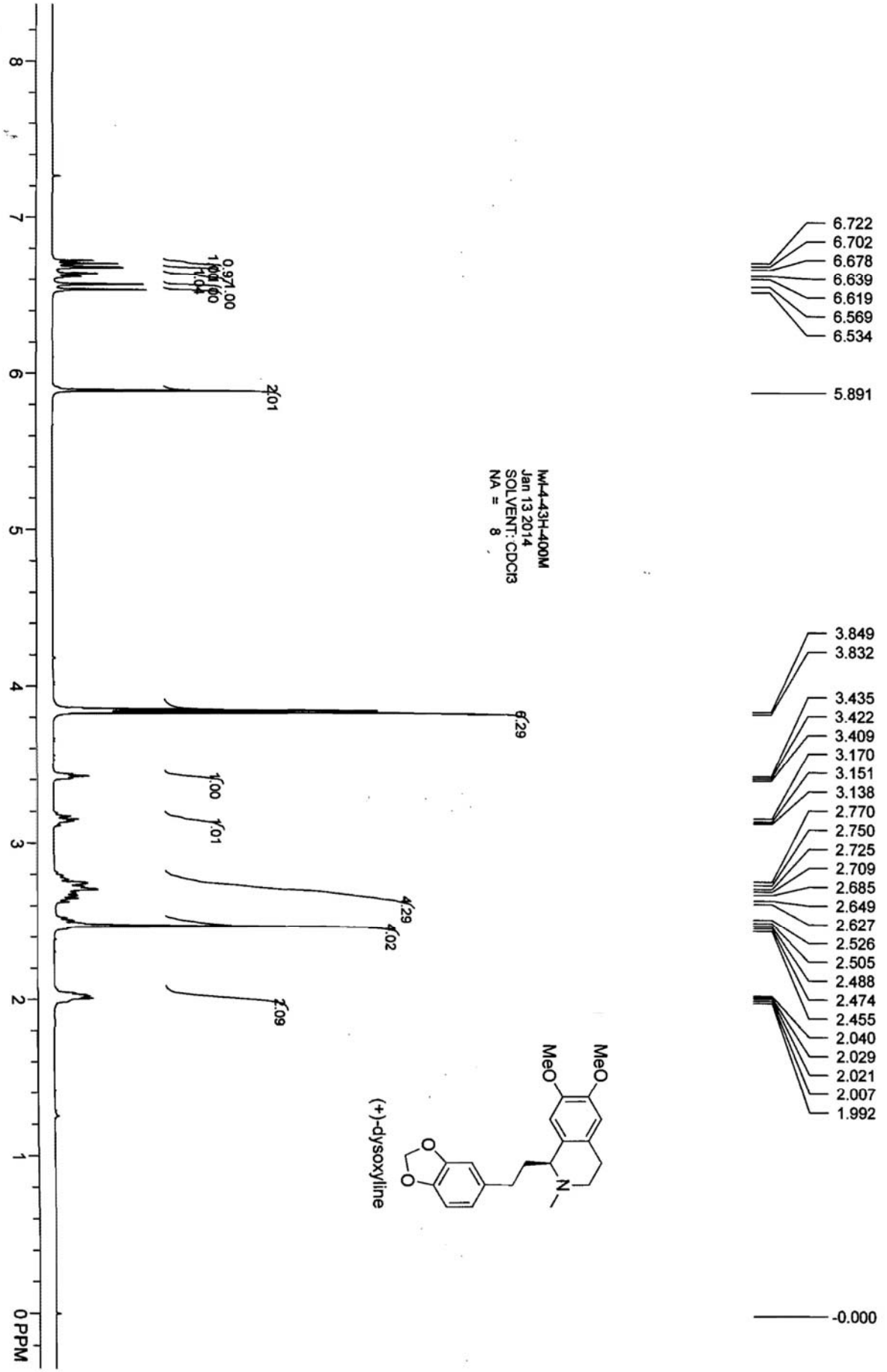
16:25:04.FFC

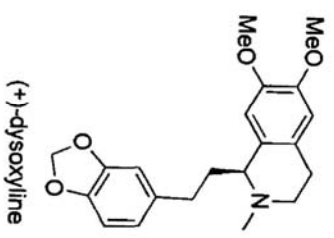
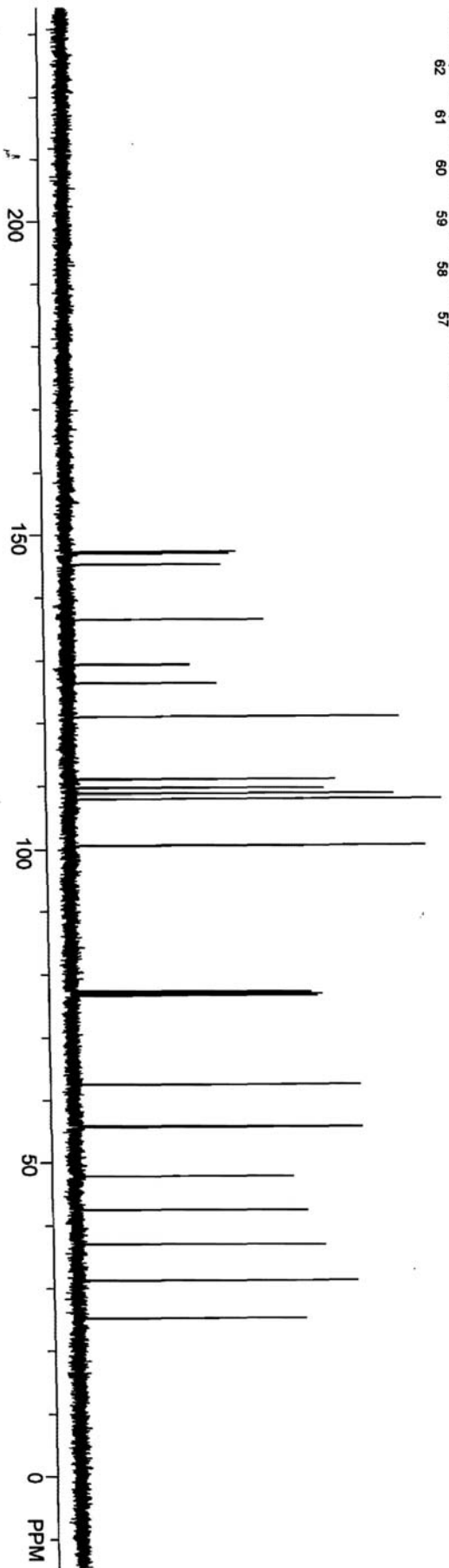
**SAMPLE INFORMATION**

Sample Name:	W1-3-168-cd-h-60-40-1-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2014/1/10 11:00:19 CST
Val:	1	Acq. Method:	zj60
Injection #:	47	Date Processed:	2014/1/10 16:22:24 CST
Injection Volume:	10.00 u	Channel Name:	V2489 CHA
Run Time:	60.00 Minutes	Sample Set Name:	

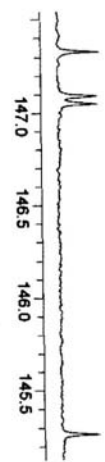
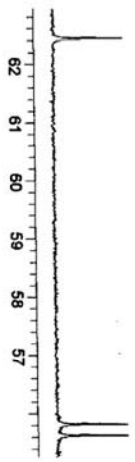


	RT (min)	Area (峰面积)	%Area	Height (峰高)	% Height
1	17.141	31820424	50.03	360397	69.92
2	33.540	31779801	49.97	150750	30.08





MW-4-43C-400M  
 Jan 13 2014  
 SOLVENT: cdcl3  
 NA = 80



- 147.330
- 147.095
- 147.049
- 145.265
- 136.536
- 129.362
- 126.371
- 120.929
- 111.023
- 109.687
- 108.791
- 107.963
- 100.562
- 77.319
- 77.000
- 76.681
- 62.433
- 55.814
- 55.624
- 47.866
- 42.469
- 36.981
- 31.174
- 25.161

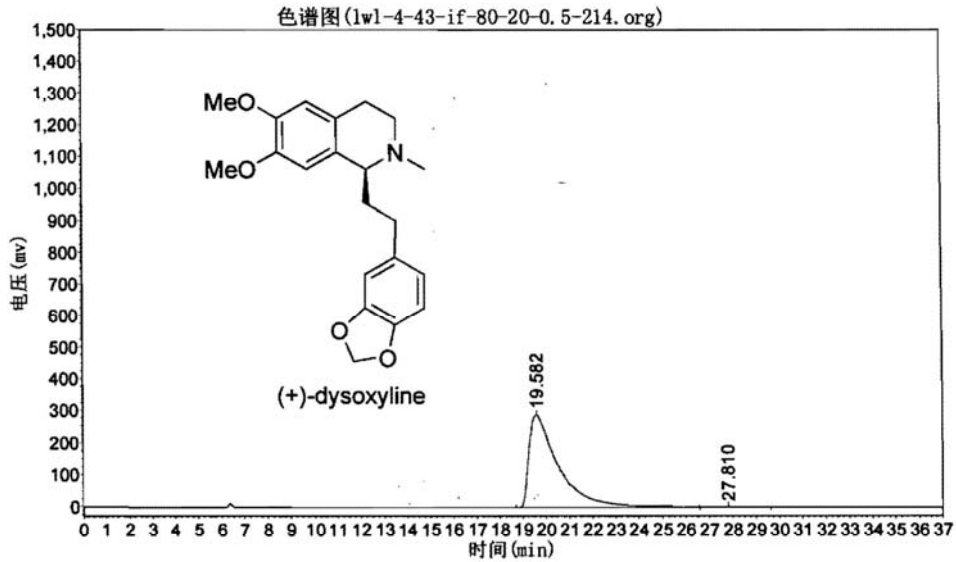
# lw1-4-43-if-80-20-0.5-214

实验时间: 2014-01-14, 13:35:31

报告时间: 2014-01-14, 15:08:05

谱图文件: D:\zhuguangjiong\lw1\20140113\lw1-4-43-if-80-20-0.5-214.org

实验内容简介:



分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		19.582	290361.156	25956498.000	98.7724
2		27.810	3050.142	322599.563	1.2276
总计			293411.299	26279097.563	100.0000

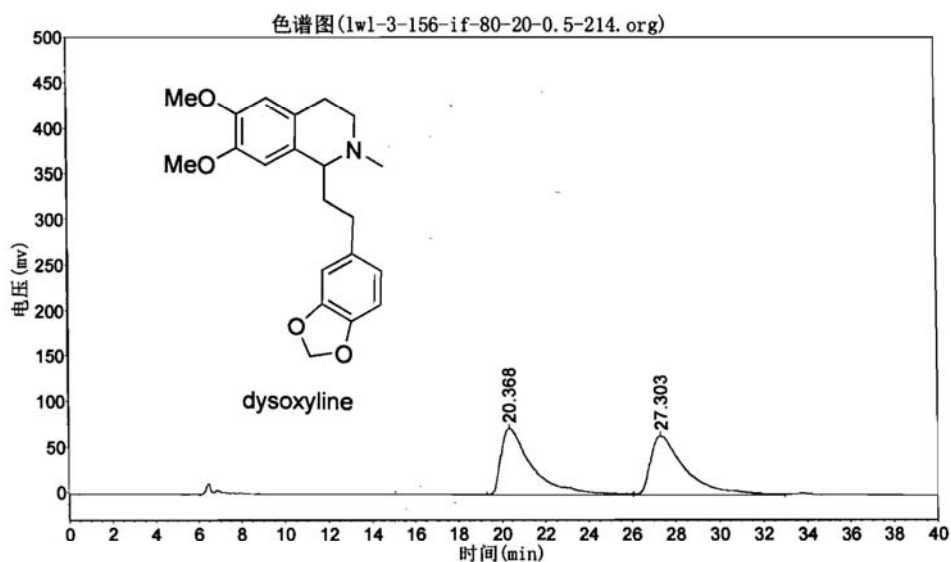
# lw1-3-156-if-80-20-0.5-214

实验时间: 2014-01-14, 14:17:31

报告时间: 2014-01-14, 15:09:06

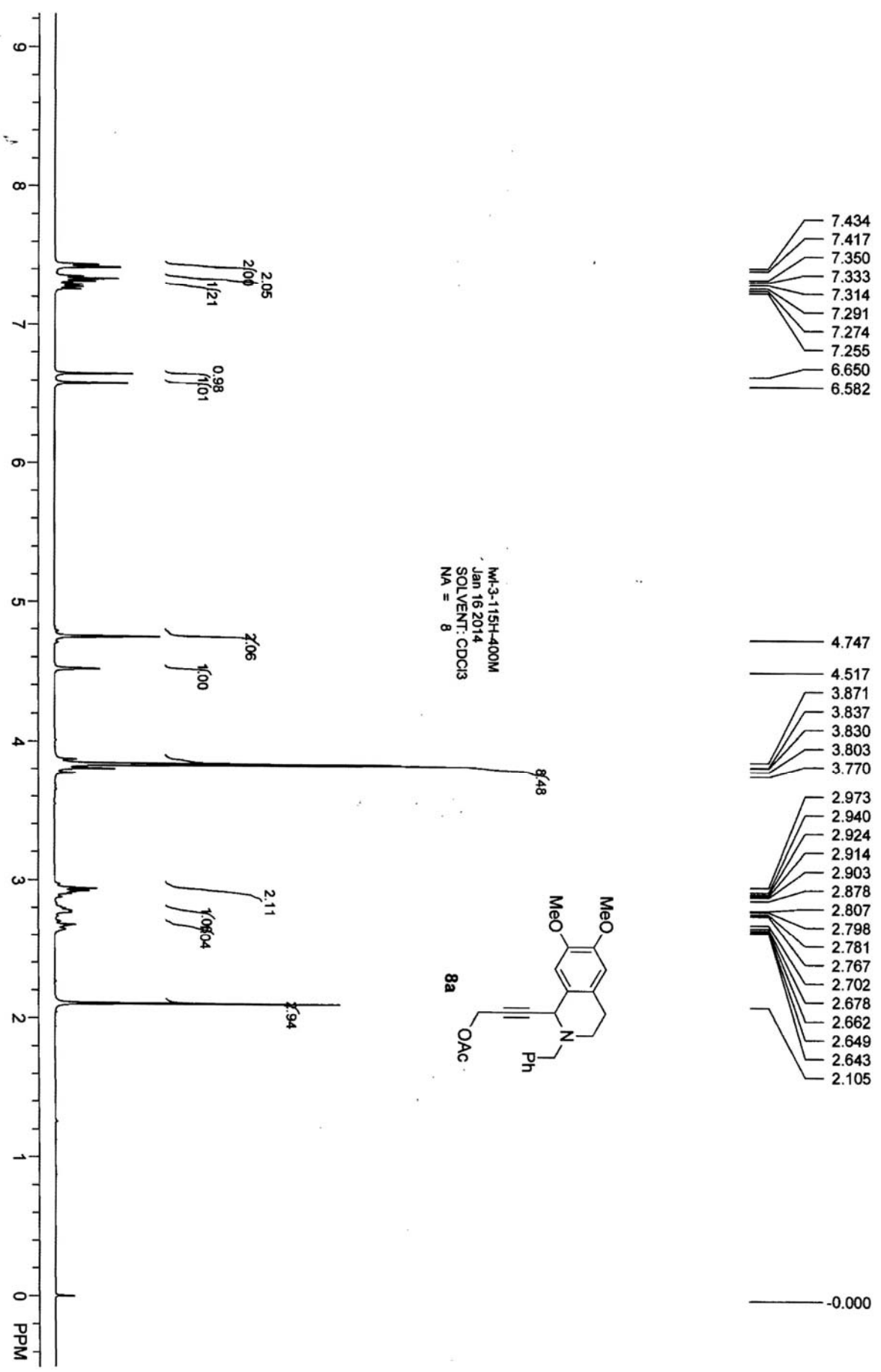
谱图文件: D:\zhuguangji\lw1\20140113\lw1-3-156-if-80-20-0.5-214.org

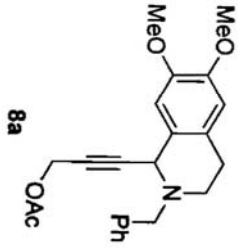
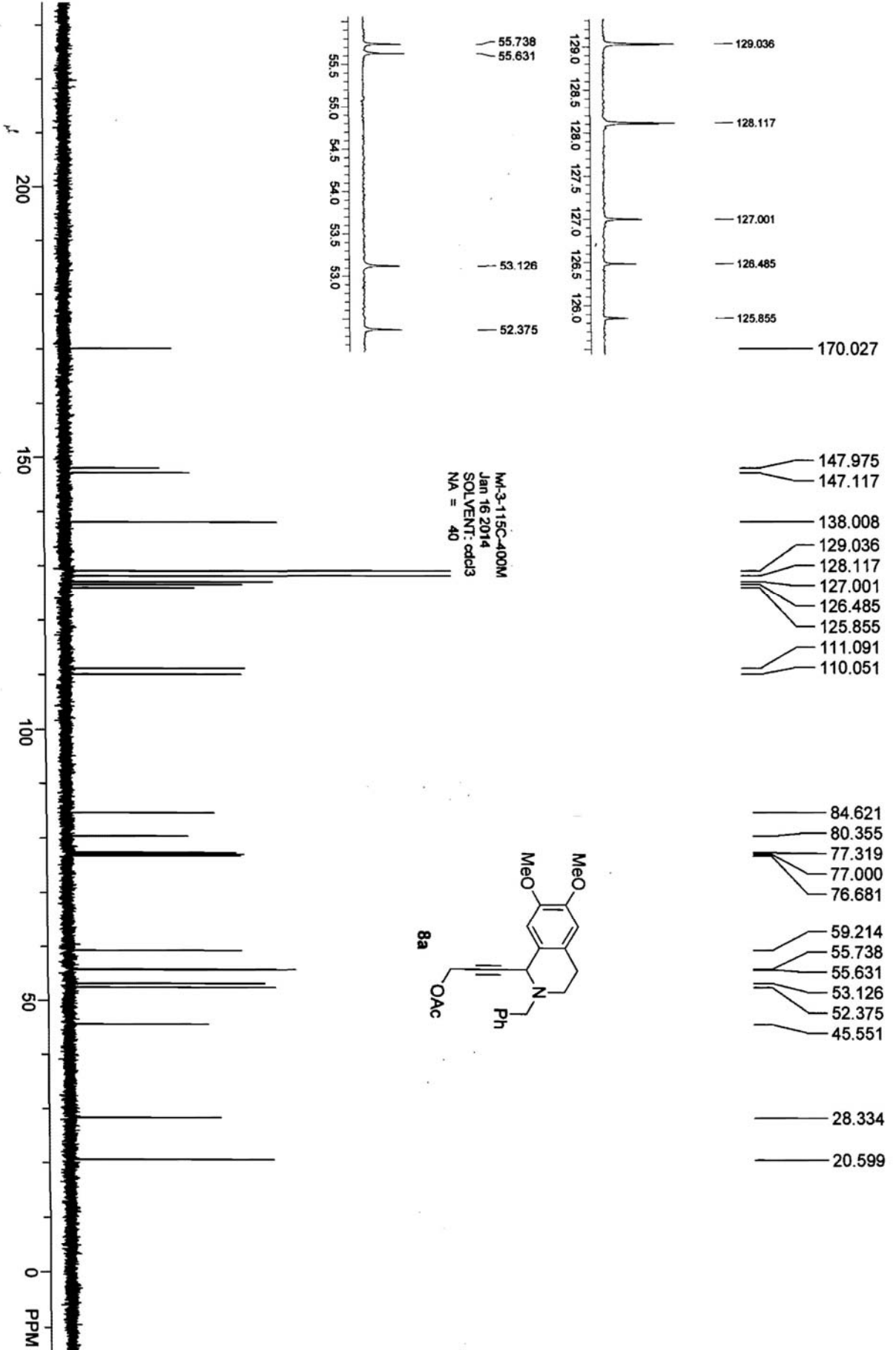
实验内容简介:



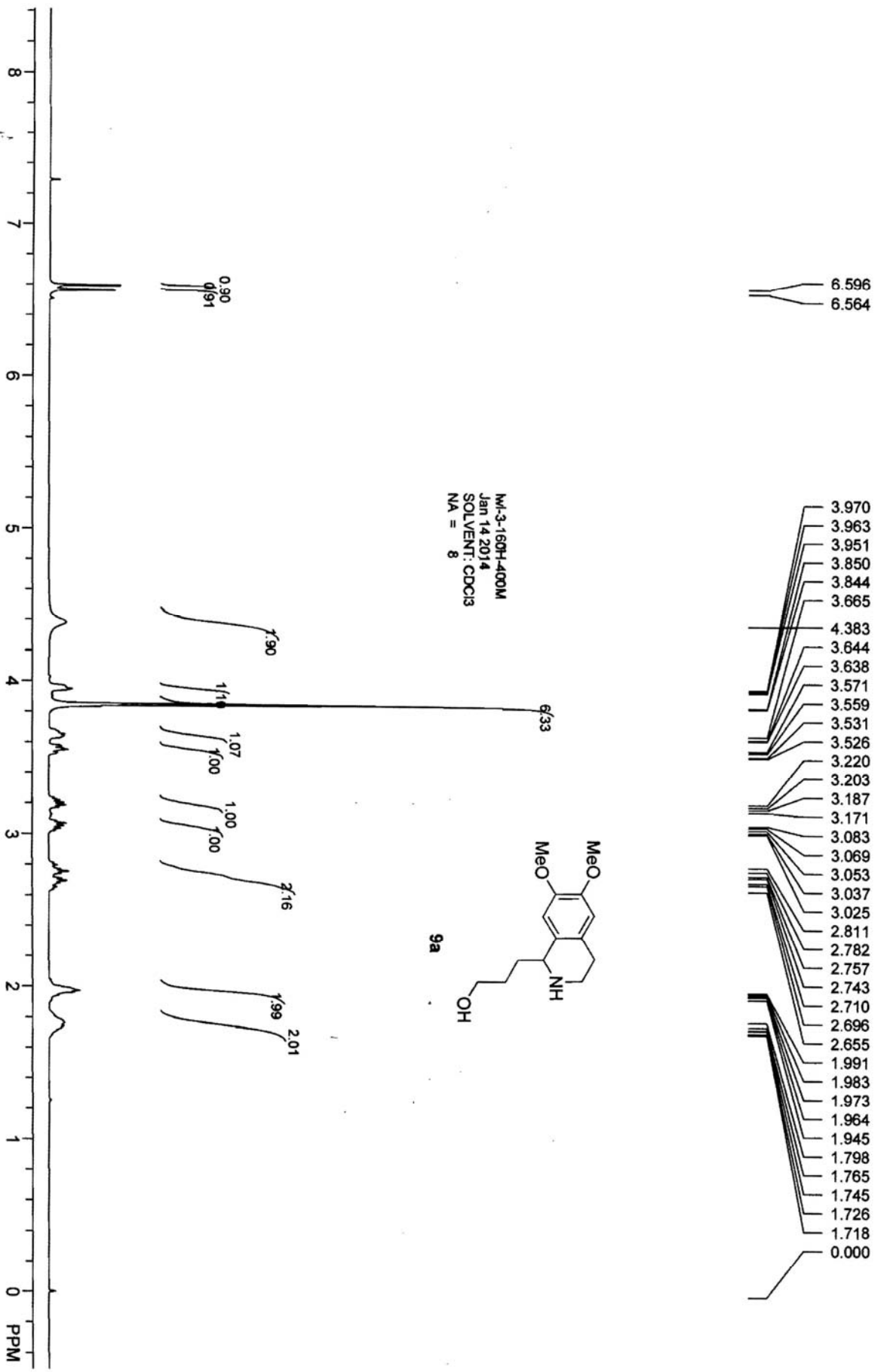
分析结果表

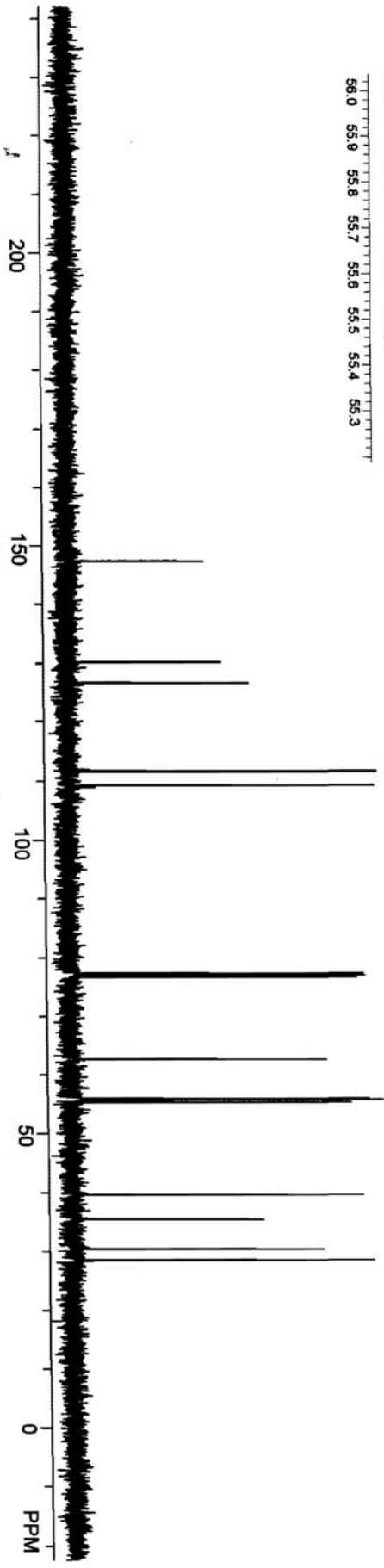
峰号	峰名	保留时间	峰高	峰面积	含量
1		20.368	72201.688	7172550.500	50.4382
2		27.303	63927.234	7047931.000	49.5618
总计			136128.922	14220481.500	100.0000











56.0 55.8 55.8 55.7 55.6 55.5 55.4 55.3

147.6 147.5 147.4 147.3 147.2 147.1  
 55.899 55.710 55.294

147.387  
 147.270

147.387  
 147.270

130.103  
 126.508

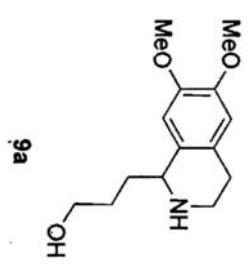
111.524  
 109.212

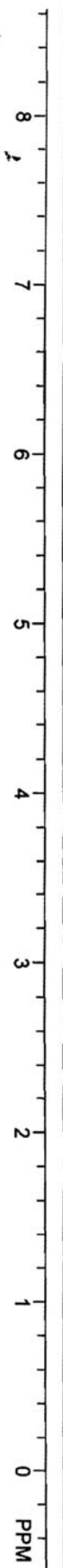
77.319  
 77.000  
 76.681

62.685  
 55.899  
 55.710  
 55.294

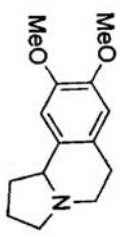
39.596  
 35.440  
 30.474  
 28.541

Mt-3-160C-400M  
 Jan 14 2014  
 SOLVENT: cdcl3  
 NA = 64





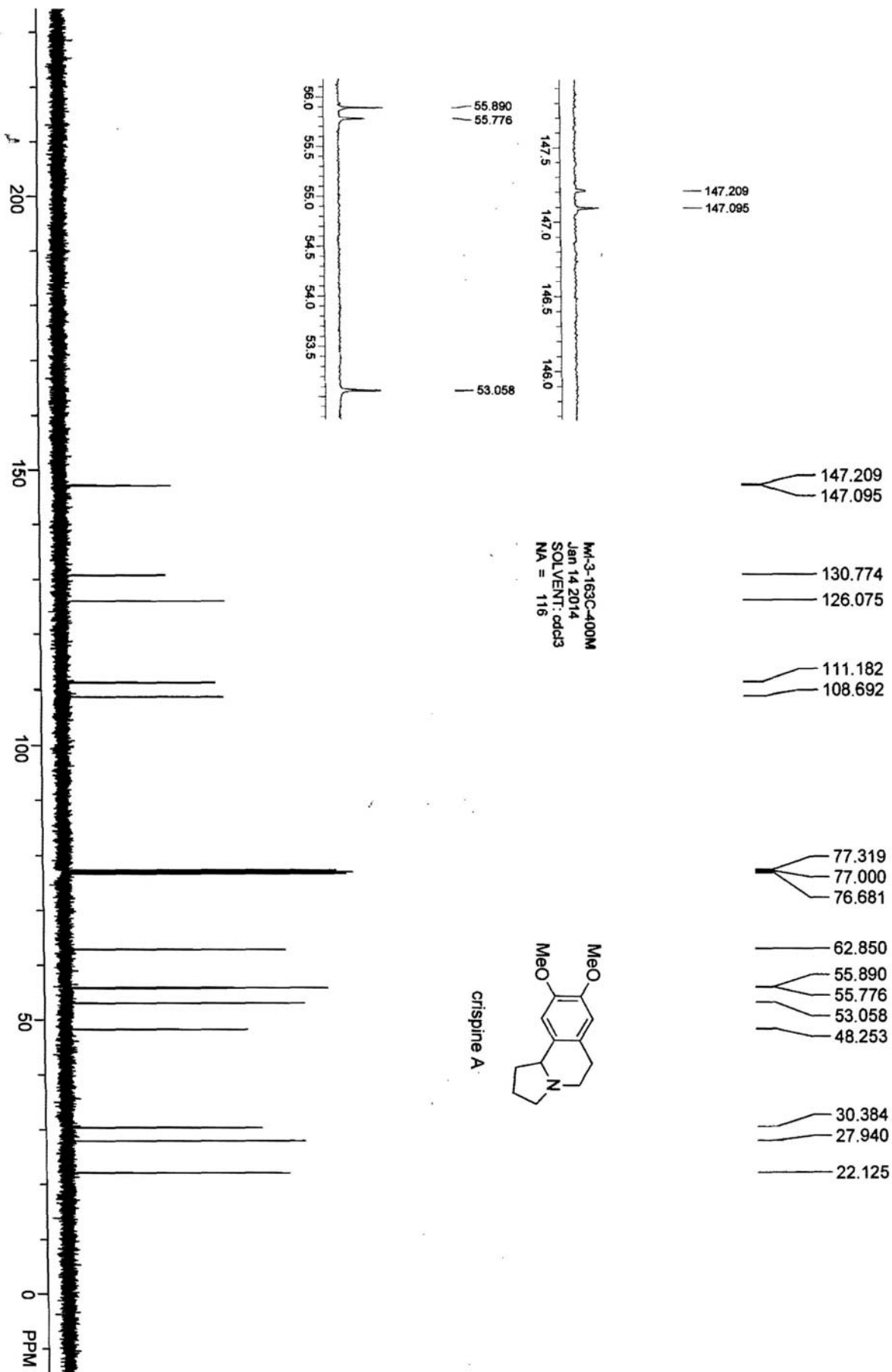
MW-3-163H-400M.  
 Jan 15 2014  
 SOLVENT: CDCl3  
 NA = 8

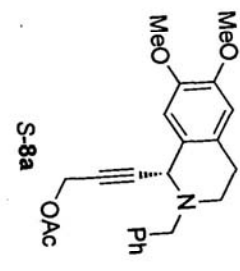
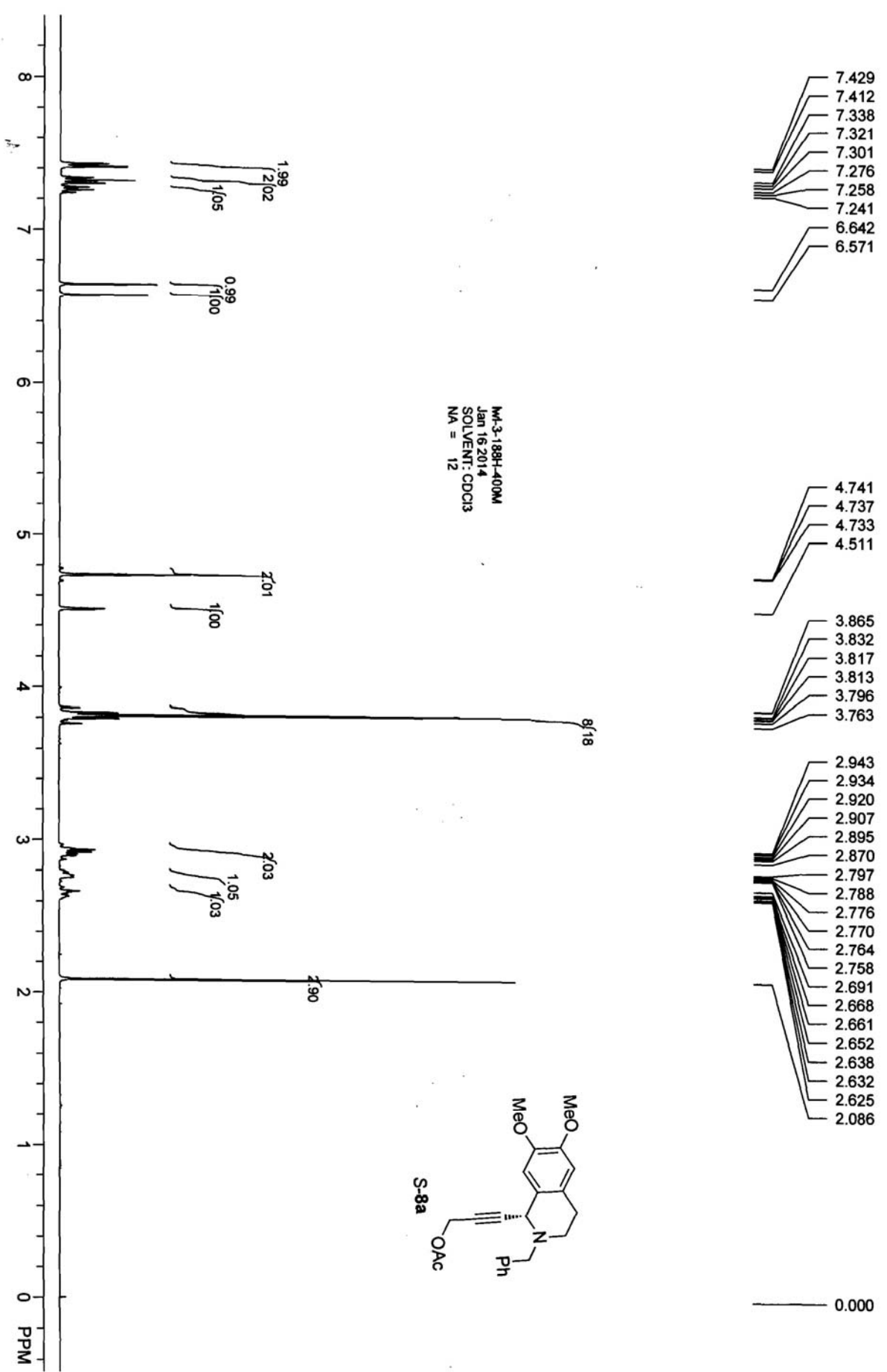


0.98  
 0.91  
 6.26  
 2.06  
 2.06  
 2.17  
 1.05  
 1.05  
 0.98  
 1.09

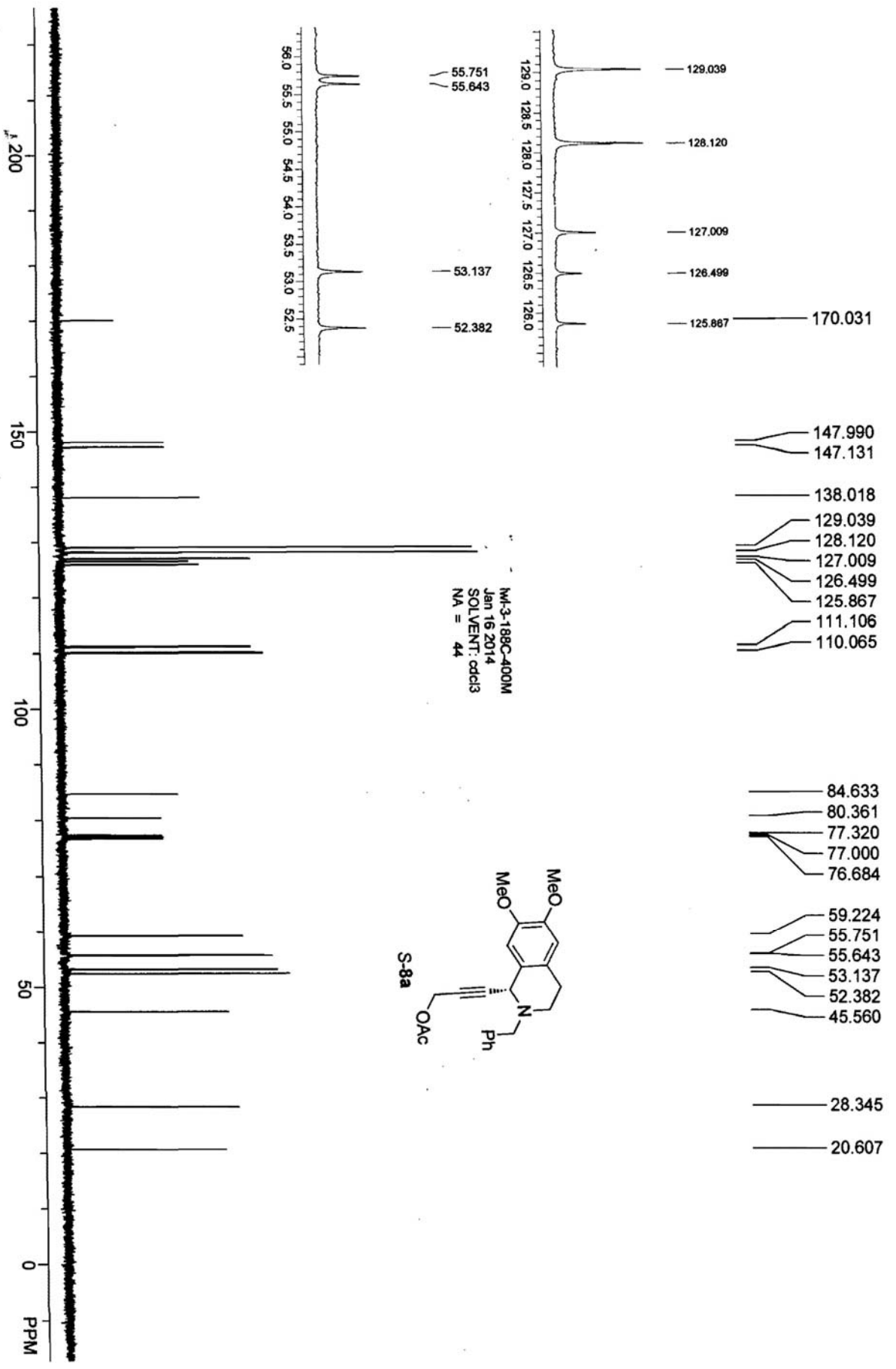
6.611  
6.569

3.850  
 3.845  
 3.451  
 3.431  
 3.411  
 3.207  
 3.192  
 3.180  
 3.157  
 3.106  
 3.084  
 3.063  
 3.024  
 2.983  
 2.757  
 2.749  
 2.726  
 2.716  
 2.709  
 2.667  
 2.653  
 2.602  
 2.580  
 2.560  
 2.359  
 2.338  
 2.307  
 2.298  
 1.948  
 1.931  
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 1.884  
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 1.745  
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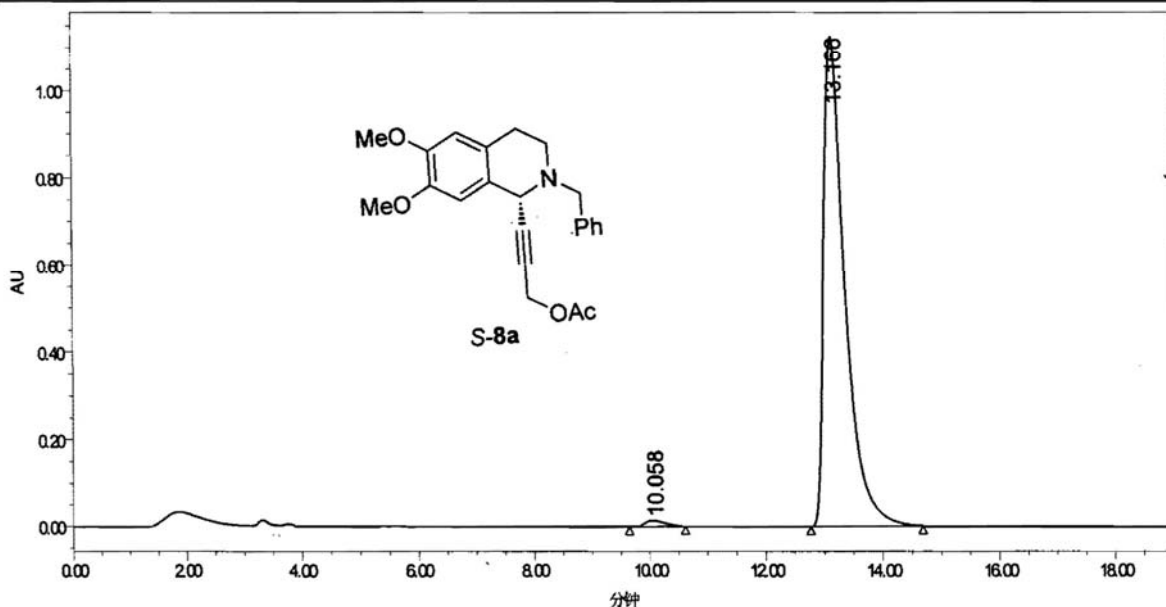


M4-3-189H-400M  
 Jan 16 2014  
 SOLVENT: CDCl3  
 NA = 12



**SAMPLE INFORMATION**

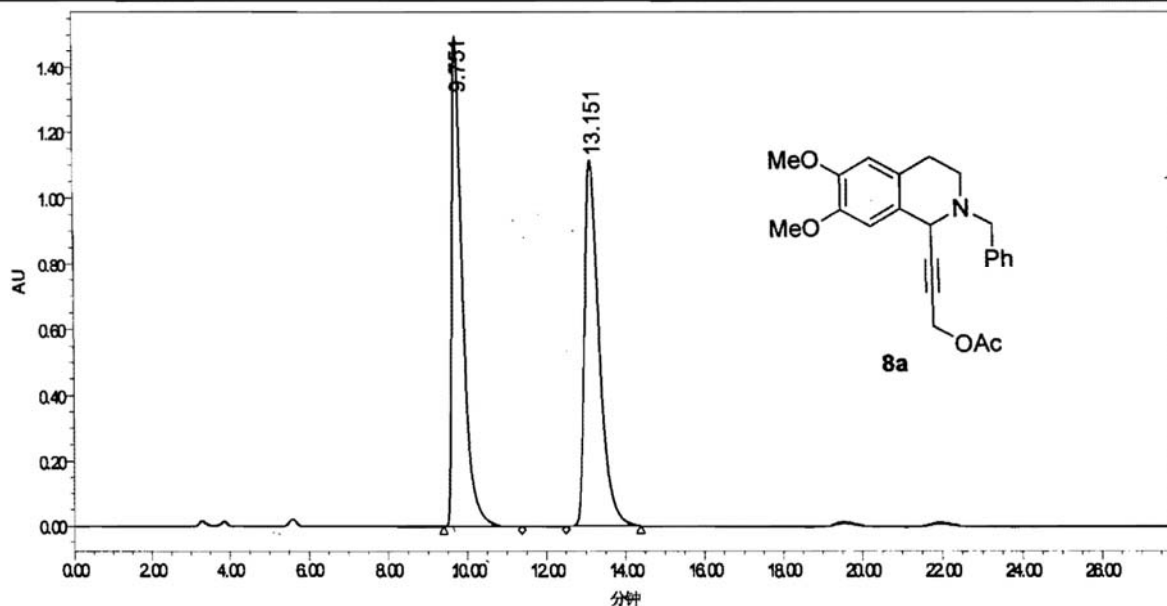
Sample Name:	MW-3-188-ad-h-85-15-1-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2013/12/9 16:38:17 CST
Val:	1	Acq. Method:	zqj85
Injection #:	10	Date Processed:	2013/12/9 16:57:51 CST
Injection Volume:	10.00 uL	Channel Name:	V2489 CHA
Run Time:	40.00 Minutes	Sample Set Name:	



	RT (min)	Area (峰面积)	%Area	Height (峰高)	% Height
1	10.058	336896	1.17	13636	1.21
2	13.166	28425840	98.83	1125114	98.79

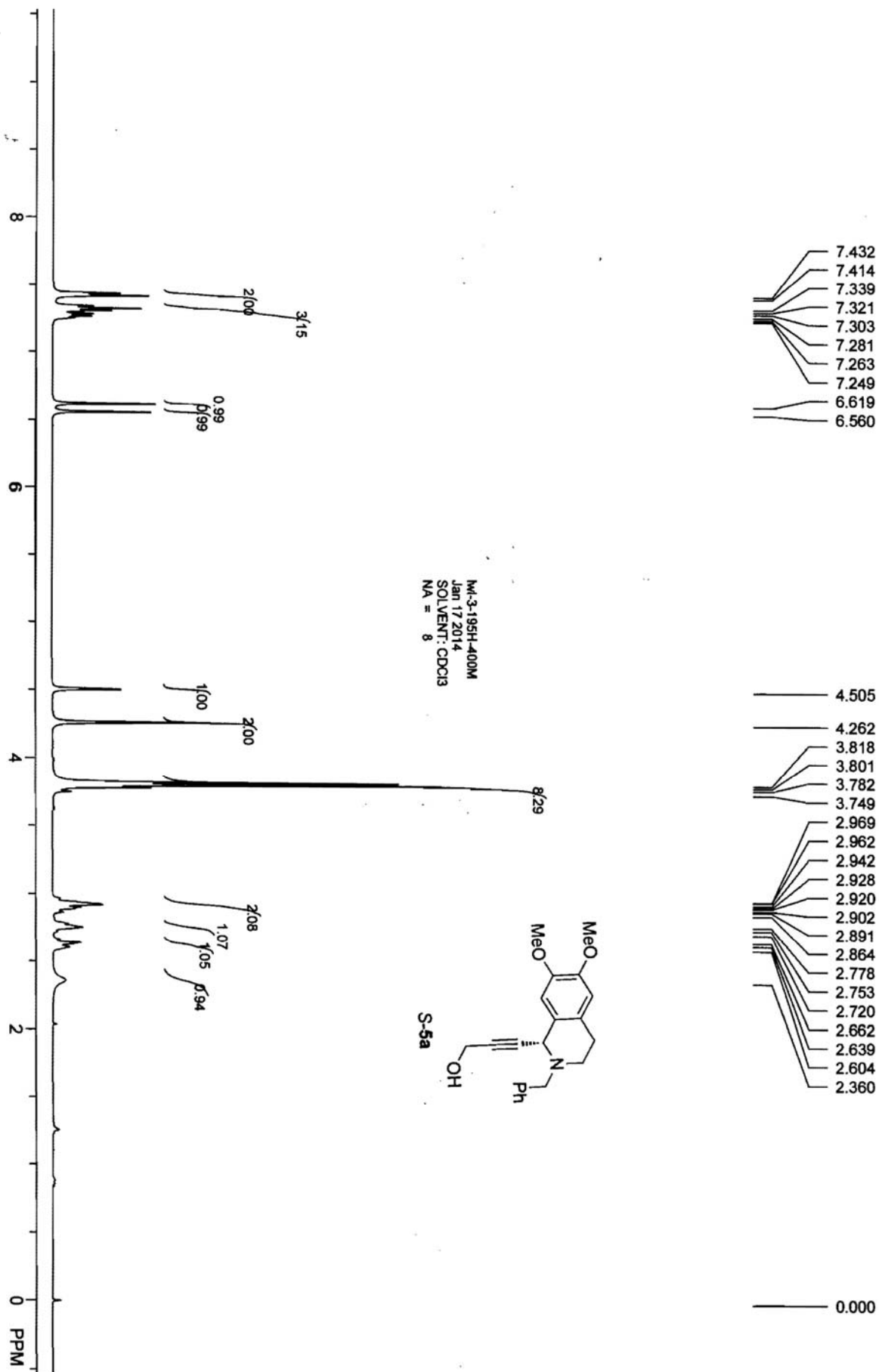
**SAMPLE INFORMATION**

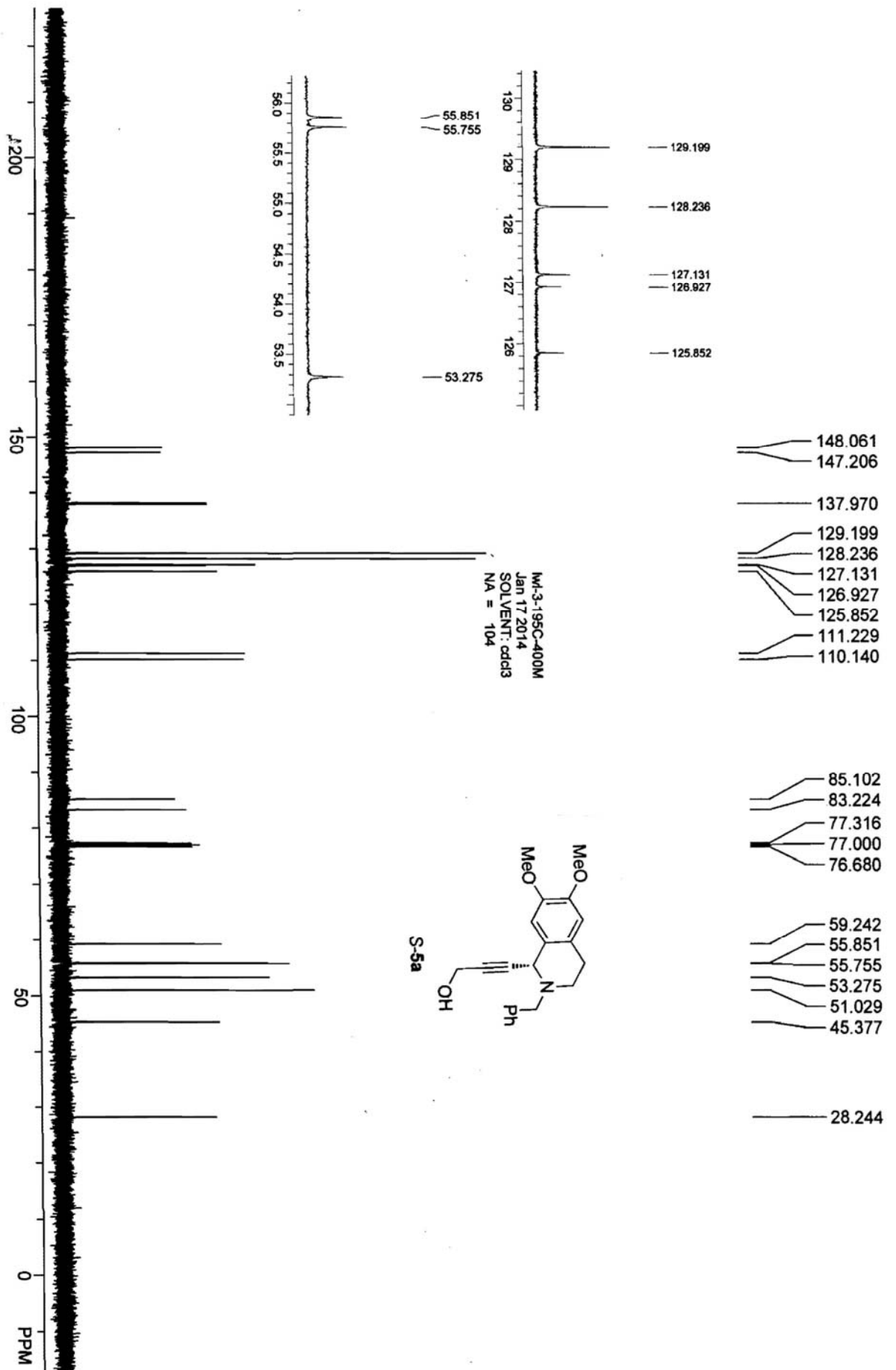
Sample Name:	lw-3-161-adh-85-15-1-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2013/12/9 15:49:02 CST
Vial:	1	Acq. Method:	zg85
Injection #:	8	Date Processed:	2013/12/9 16:20:39 CST
Injection Volume:	10.00 ul	Channel Name:	V2489 ChA
Run Time:	40.00 Minutes	Sample Set Name:	



	RT (min)	Area (峰面积)	%Area	Height (峰高)	% Height
1	9.751	27840116	49.50	1497470	57.33
2	13.151	28399882	50.50	1114660	42.67







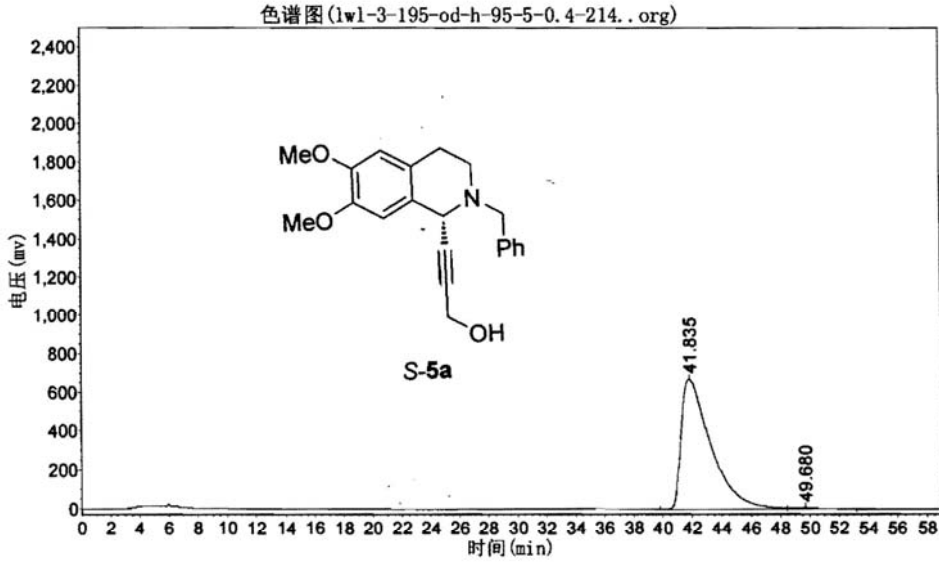
# 1w1-3-195-od-h-95-5-0.4-214

实验时间: 2014-01-17, 13:54:58

报告时间: 2014-01-17, 15:17:14

谱图文件: D:\zhuguangjiong\lwl\20140117\1w1-3-195-od-h-95-5-0.4-214.org

实验内容简介:



分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		41.835	670775.000	94157256.000	98.8589
2		49.680	7047.879	1086818.625	1.1411
总计			677822.879	95244074.625	100.0000

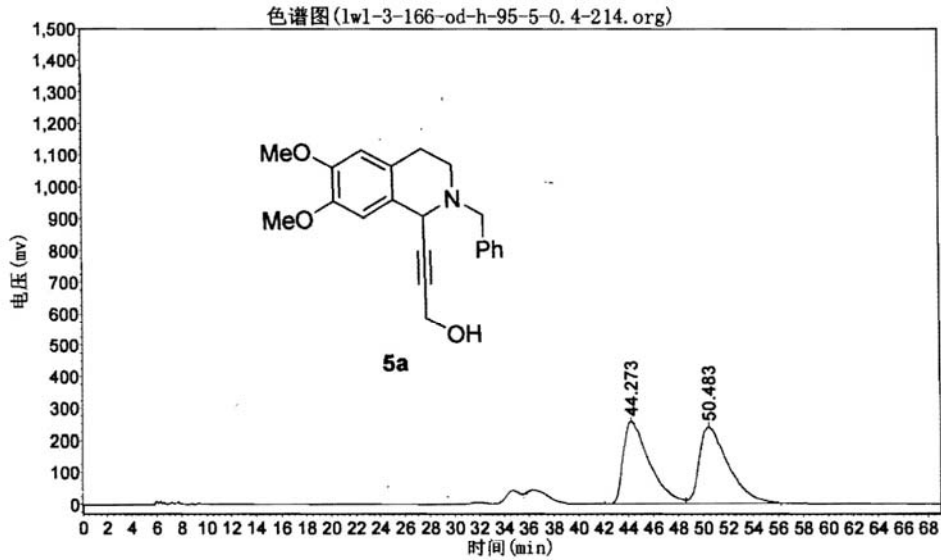
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实验时间: 2014-01-17, 11:42:57

报告时间: 2014-01-17, 15:15:37

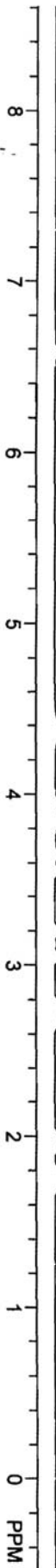
谱图文件: D:\zhuguangjiong\lw1\20140117\lw1-3-166-od-h-95-5-0.4-214.org

实验内容简介:



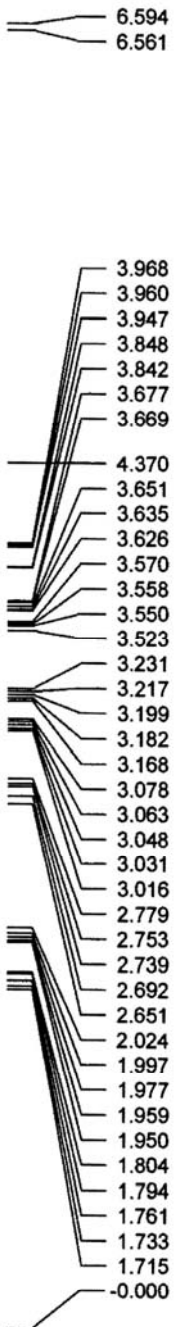
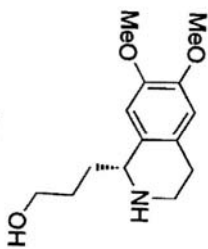
分析结果表

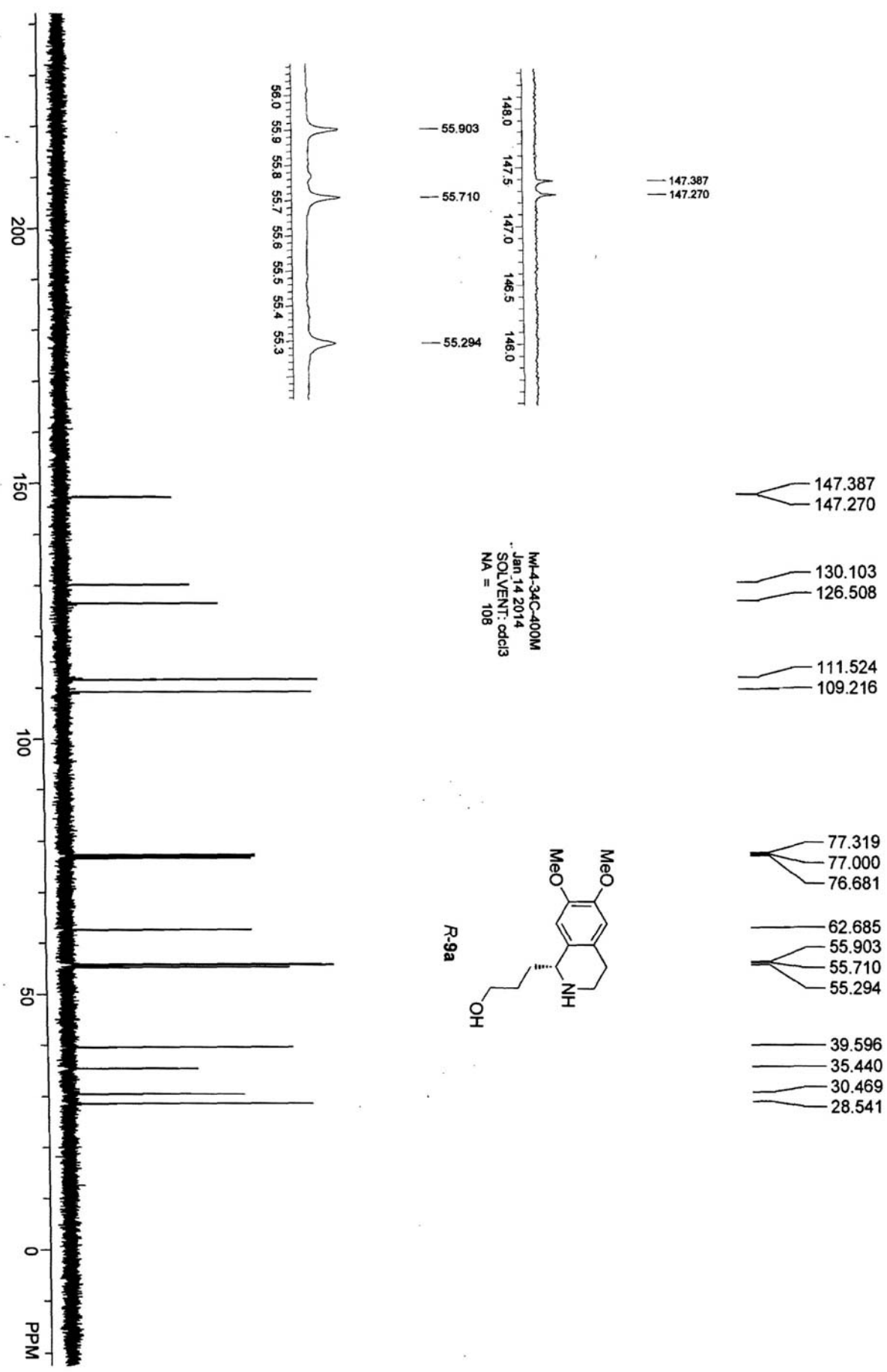
峰号	峰名	保留时间	峰高	峰面积	含量
1		44.273	256186.859	37735828.000	49.6446
2		50.483	237579.047	38276112.000	50.3554
总计			493765.906	76011940.000	100.0000

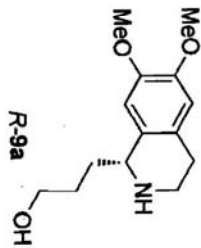


HW-4-34H-400M  
 Jan 16 2014  
 SOLVENT: CDCl3  
 NA = 12

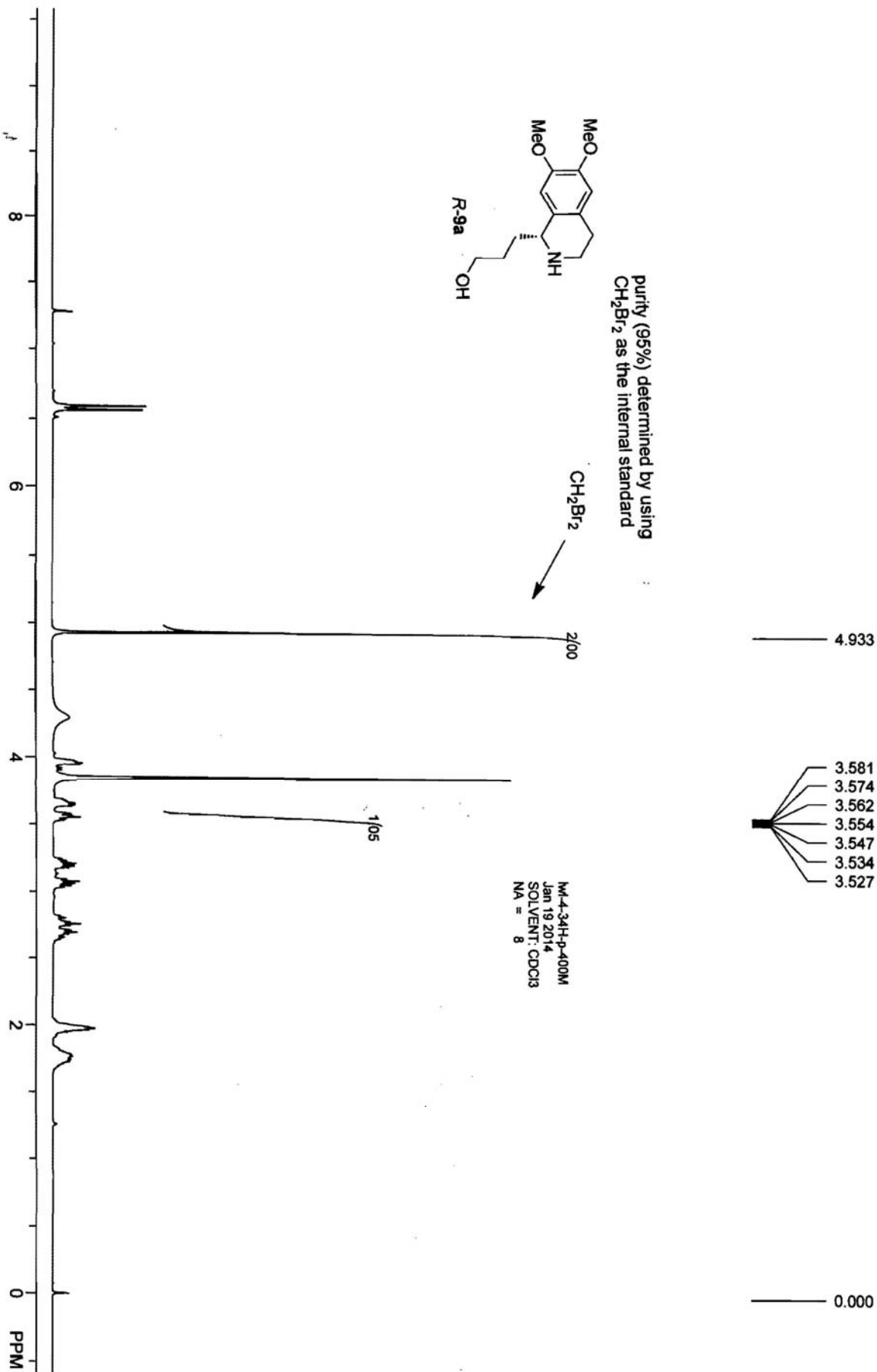
R-9a







purity (95%) determined by using  
CH<sub>2</sub>Br<sub>2</sub> as the internal standard



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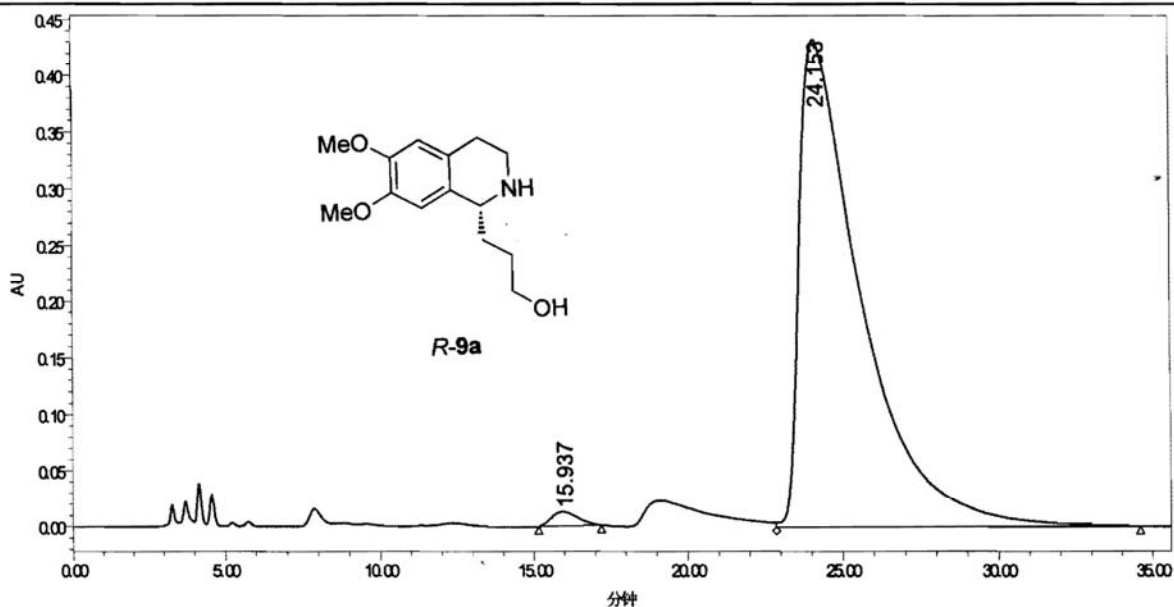
Project Name: defaults for copy

Reported by User: Breeze user (Breeze)

**Breeze 2**  
HPLC System

### SAMPLE INFORMATION

Sample Name:	W4-34-cd-h-80-20-0.1TEA-1-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2014/1/3 16:39:12 CST
Vial:	1	Acq. Method:	zq80
Injection #:	25	Date Processed:	2014/1/17 16:30:19 CST
Injection Volume:	10.00 $\mu$ l	Channel Name:	V2489 CHA
Run Time:	100.00 Minutes	Sample Set Name:	



	RT (min)	Area (峰面积)	%Area	Height (峰高)	% Height
1	15.937	752792	1.24	12664	2.65
2	24.153	59820704	98.76	432105	97.15

Report Method: 无标题

Page: 1 (共计 1)

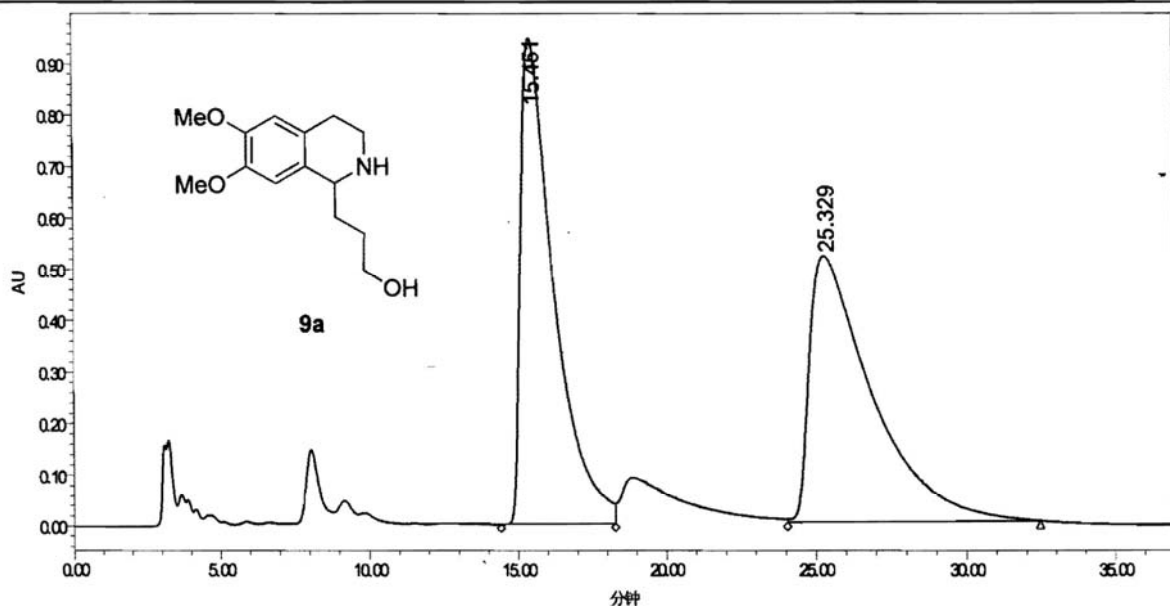
Printed: 2014/1/17

16:30:44 FRC

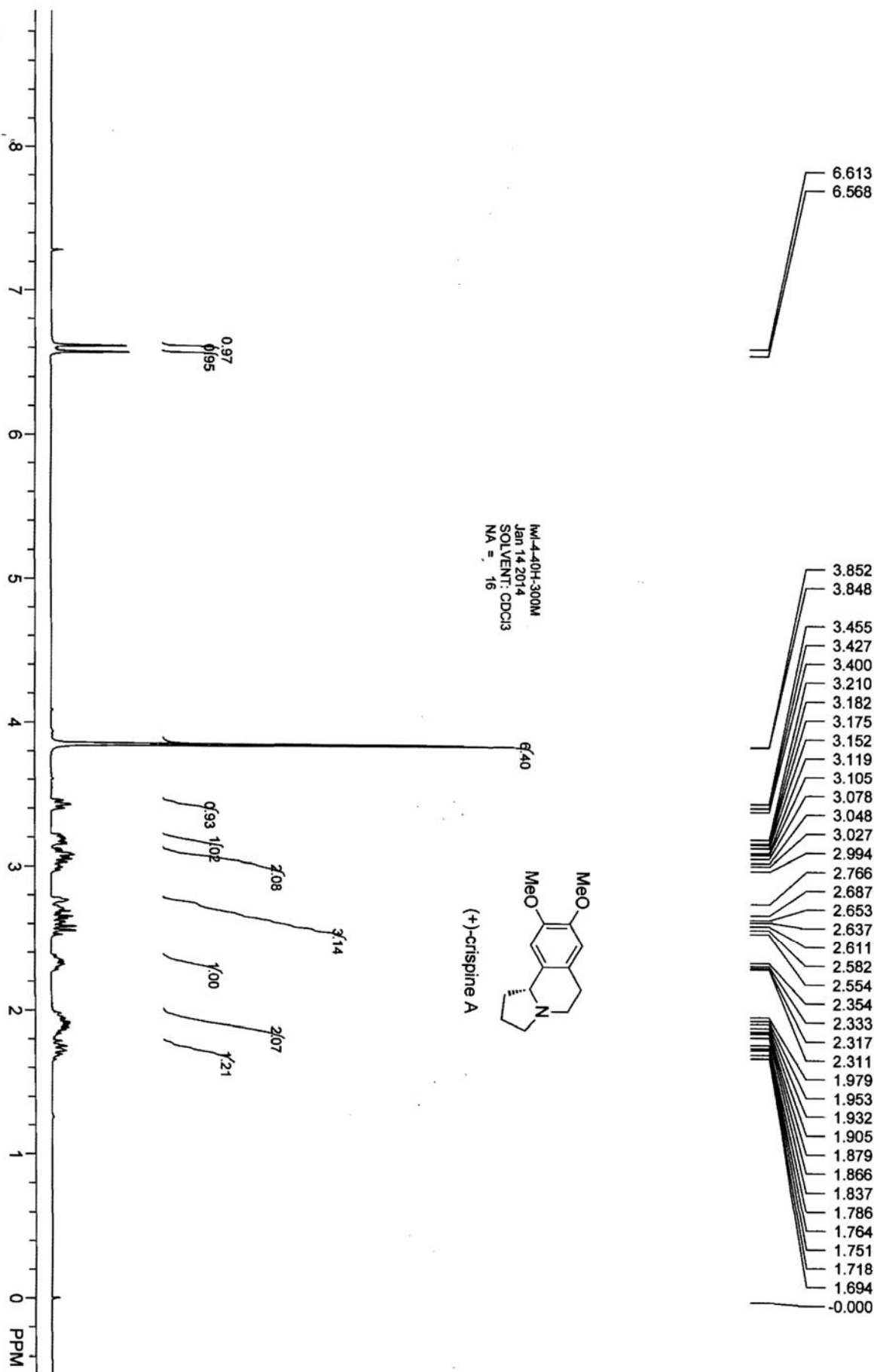


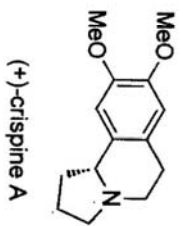
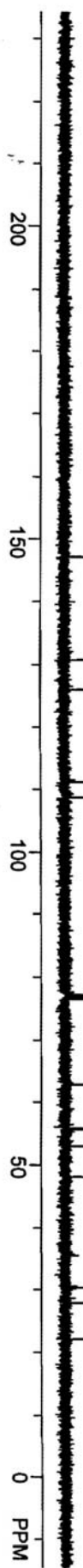
**SAMPLE INFORMATION**

Sample Name:	lw-3-160-od-h-80-20-0.1TEA1-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2014/1/3 17:15:46 CST
Vial:	1	Acq. Method:	zqj80
Injection #:	26	Date Processed:	2014/1/3 17:53:53 CST
Injection Volume:	10.00 uL	Channel Name:	V2489 CHA
Run Time:	100.00 Minutes	Sample Set Name:	

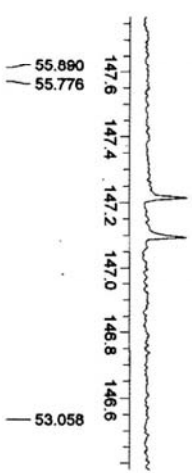
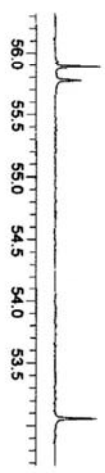


	RT (min)	Area (峰面积)	%Area	Height (峰高)	% Height
1	15.451	73733014	49.53	947917	64.64
2	25.329	75139975	50.47	518692	35.36





WI-4-40C-400M  
 Jan 14 2014  
 SOLVENT: cdcl3  
 NA = 184



— 147.216  
 — 147.095

147.216  
 147.095

130.774  
 126.075

111.190  
 108.692

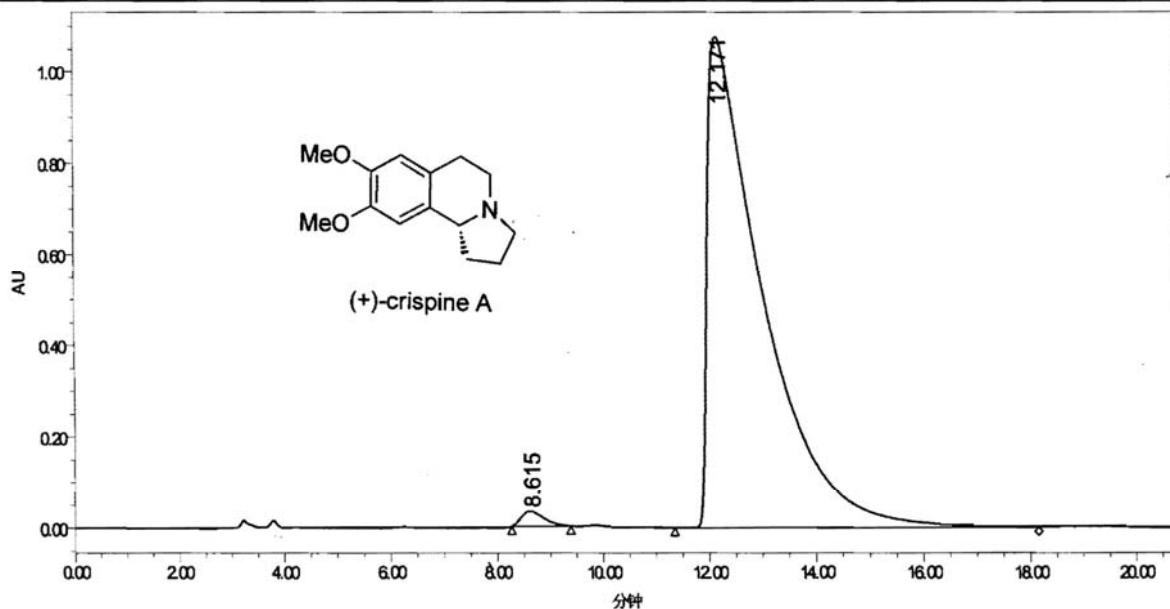
77.319  
 77.000  
 76.681

62.850  
 55.890  
 55.776  
 53.058  
 48.253

30.384  
 27.940  
 22.125

**SAMPLE INFORMATION**

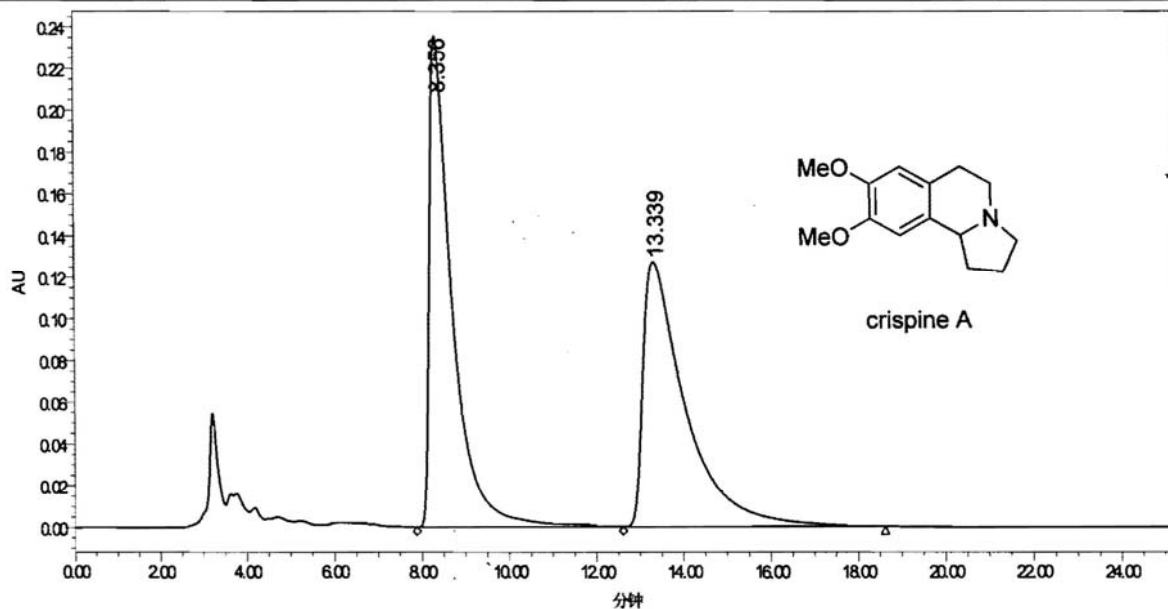
Sample Name:	lw-4-40-cd-h-80-20-1-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2014/1/10 15:50:17 CST
Vial:	1	Acq. Method:	zq80
Injection #:	52	Date Processed:	2014/1/10 16:18:07 CST
Injection Volume:	10.00 ul	Channel Name:	V2489 ChA
Run Time:	60.00 Minutes	Sample Set Name:	



	RT (min)	Area (峰sec)	%Area	Height (峰)	% Height
1	8.615	971727	1.24	32966	2.97
2	12.171	77683130	98.76	1076236	97.03

**SAMPLE INFORMATION**

Sample Name:	hw-3-163-cd-h-80-20-1-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2014/1/10 15:23:35 CST
Vial:	1	Acq. Method:	zgj80
Injection #:	51	Date Processed:	2014/1/10 16:18:18 CST
Injection Volume:	10.00 ul	Channel Name:	V2189 ChA
Run Time:	60.00 Minutes	Sample Set Name:	



	RT (min)	Area (峰面积)	%Area	Height (峰高)	% Height
1	8.366	8575062	50.03	235531	64.93
2	13.339	8563113	49.97	127261	35.07