Supporting Information

Regioselective Synthesis of Novel and Diverse Naphtho[1,2-*b*]furan-3-carboxamides and Benzofuran-3-carboxamides by Cascade Formal [3 + 2] Cycloaddition

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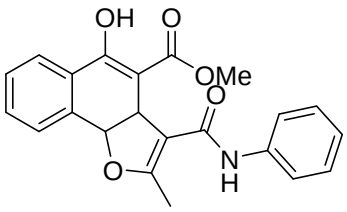
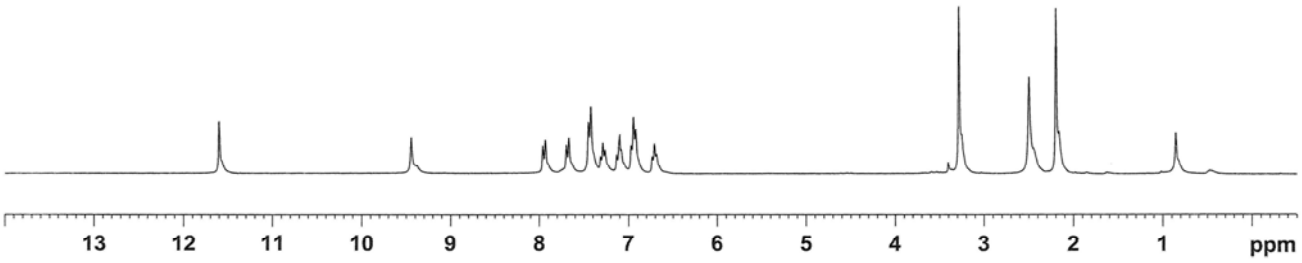
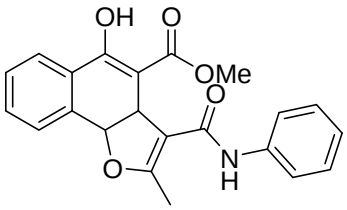
^{1}H NMR of Compound **7**



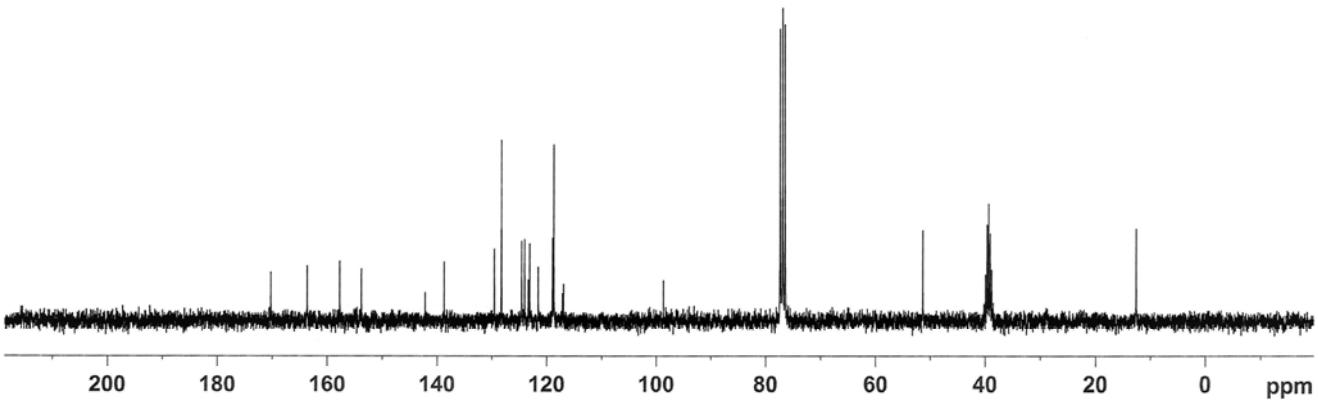
300 MHz, $CDCl_3$ + DMSO-d_6



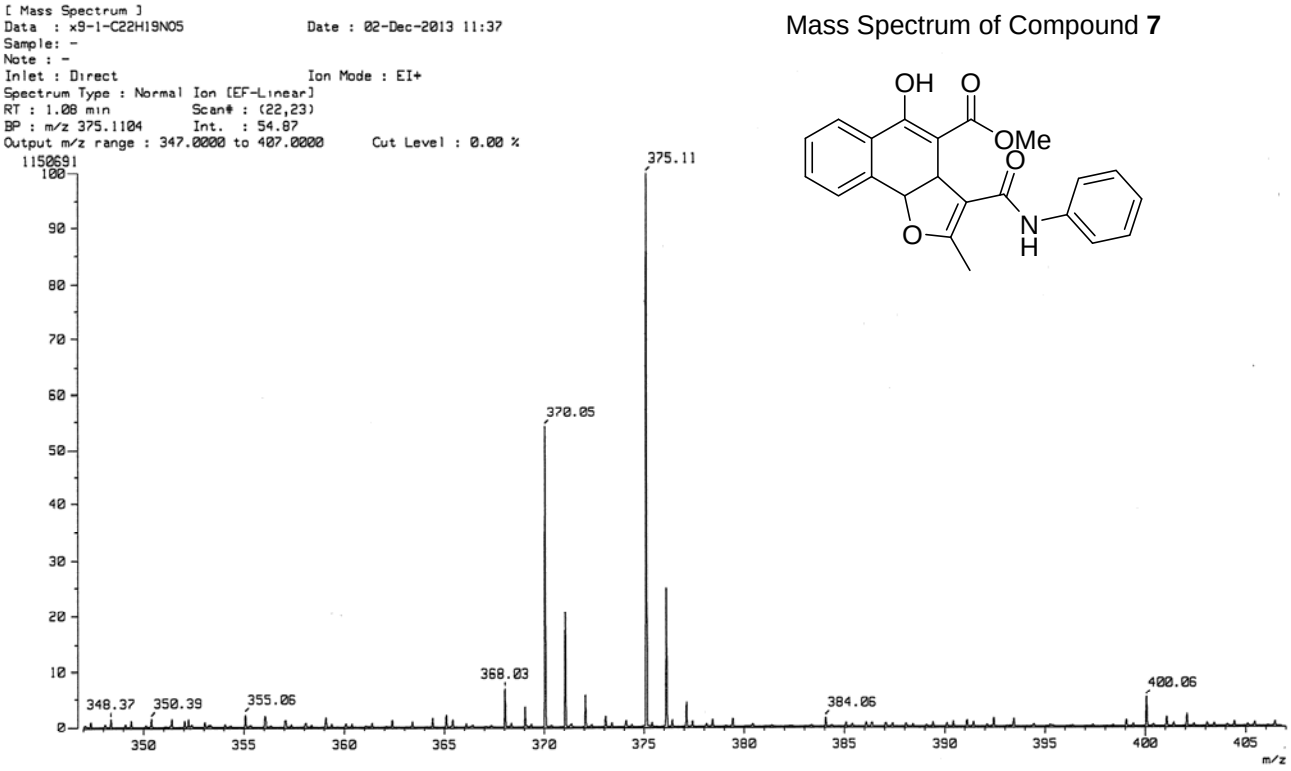
^{13}C NMR of Compound **7**



75 MHz, $CDCl_3$ + DMSO-d_6



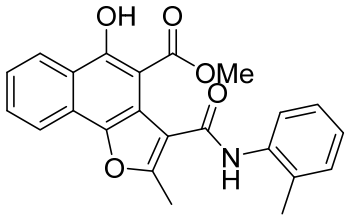
Mass Spectrum of Compound **7**



[Elemental Composition] Page: 1
Data : x9-1-C22H19NO5 Date : 02-Dec-2013 11:37
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 1.08 min Scan#: (22,23)
Elements : C 22/0, H 19/0, N 1/0, O 5/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 100.0

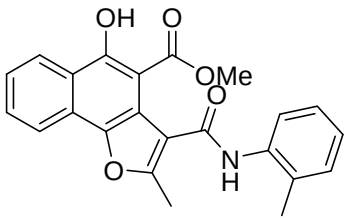
Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
370.0477	54.2			
371.0526	20.7			
375.1104	100.0	-0.7 / -0.3	15.0	C 22 H 17 N O 5
376.1136	25.0			

^{1}H NMR of Compound **8**



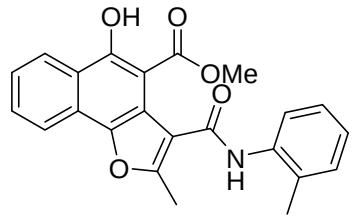
300 MHz, DMSO-d_6

^{13}C NMR of Compound **8**



75 MHz, DMSO-d_6

Mass Spectrum of Compound **8**



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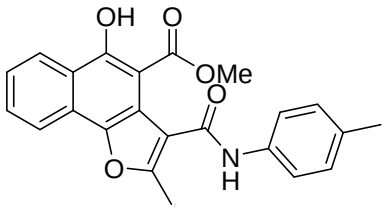
[Elemental Composition]
Data : x9-2-C23H21NO5 Date : 04-Nov-2013 13:41
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 0.88 min Scan#: (18,19)
Elements : C 23/0, H 21/0, N 1/0, O 5/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 100.0

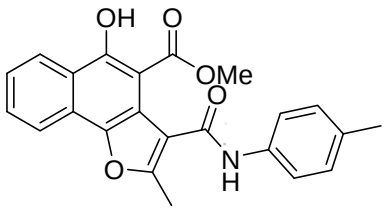
Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
389.1261	100.0	-0.6 / -0.2	15.0	C 23 H 19 N O 5
390.1309	25.8			

^{1}H NMR of Compound **9**



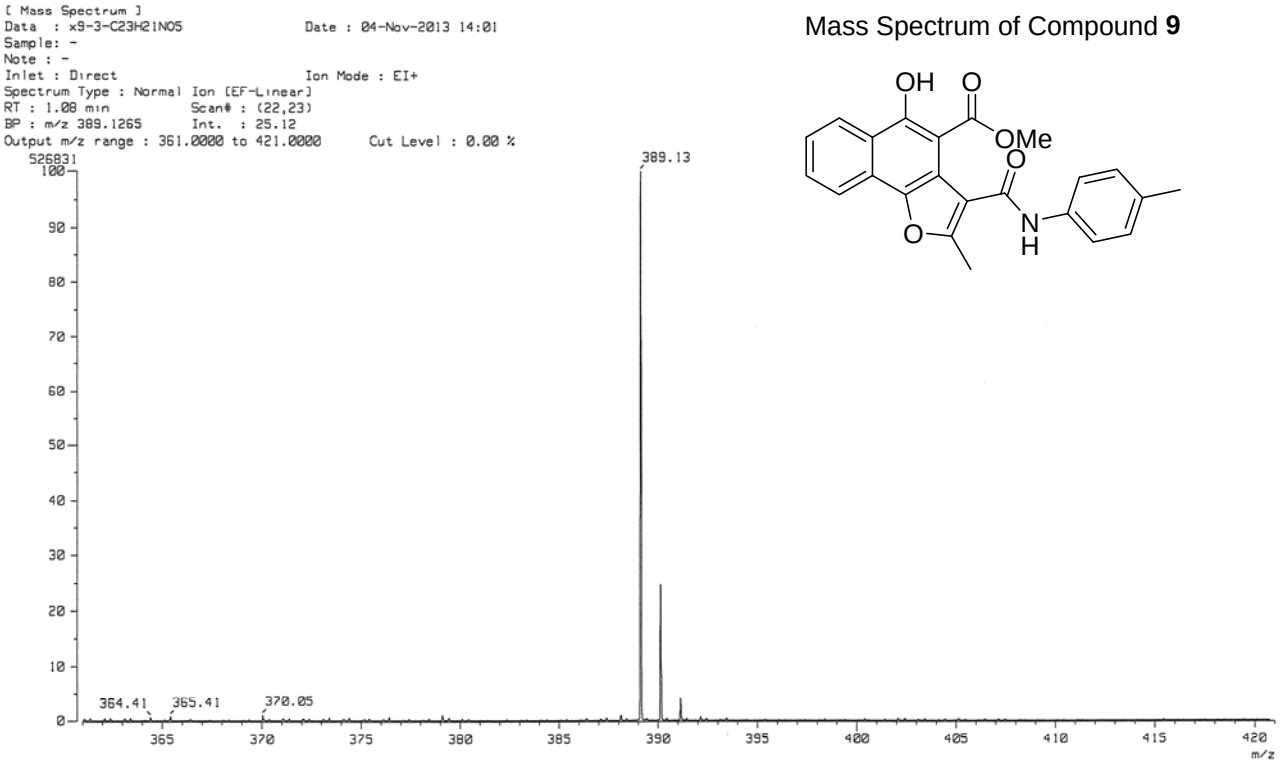
300 MHz, DMSO-d_6

^{13}C NMR of Compound **9**



75 MHz, DMSO-d_6

Mass Spectrum of Compound **9**



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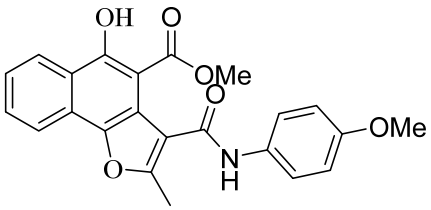
[Elemental Composition]
Data : x9-3-C23H21NO5 Date : 04-Nov-2013 14:01
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 1.08 min Scan#: (22,23)
Elements : C 23/0, H 21/0, N 1/0, O 5/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 2mmu if m/z > 2
Unsaturation (U.S.) : -0.5 - 100.0

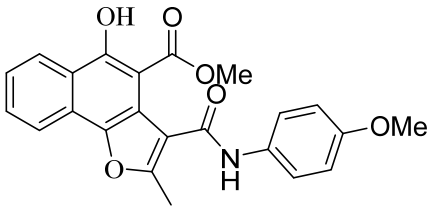
Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
389.1265	100.0	+0.4 / +0.2	15.0	C 23 H 19 N O 5
390.1313	24.8			

^{1}H NMR of Compound **10**



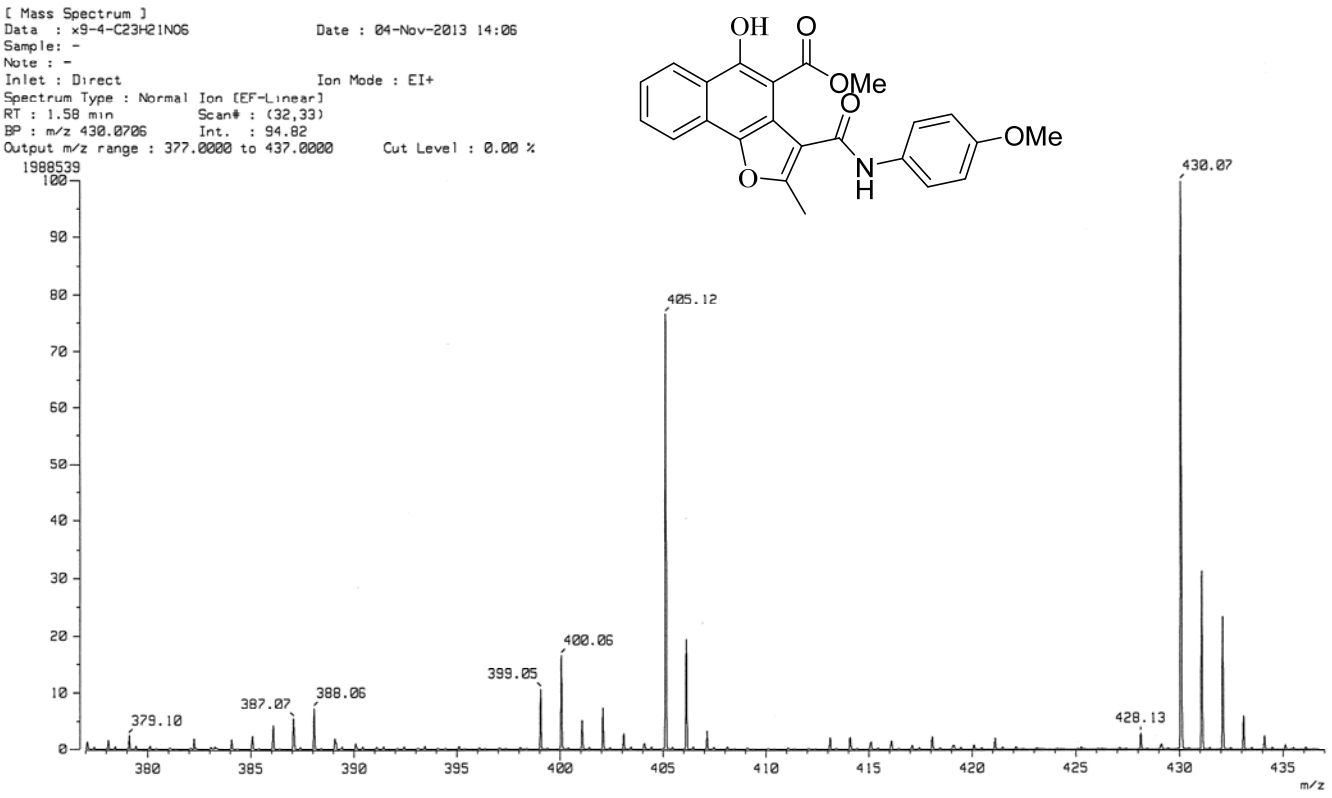
300 MHz, DMSO-d_6

^{13}C NMR of Compound **10**



75 MHz, DMSO-d_6

Mass Spectrum of Compound **10**

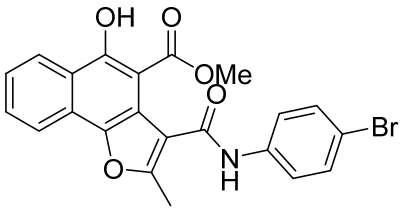


[Elemental Composition] Page: 1

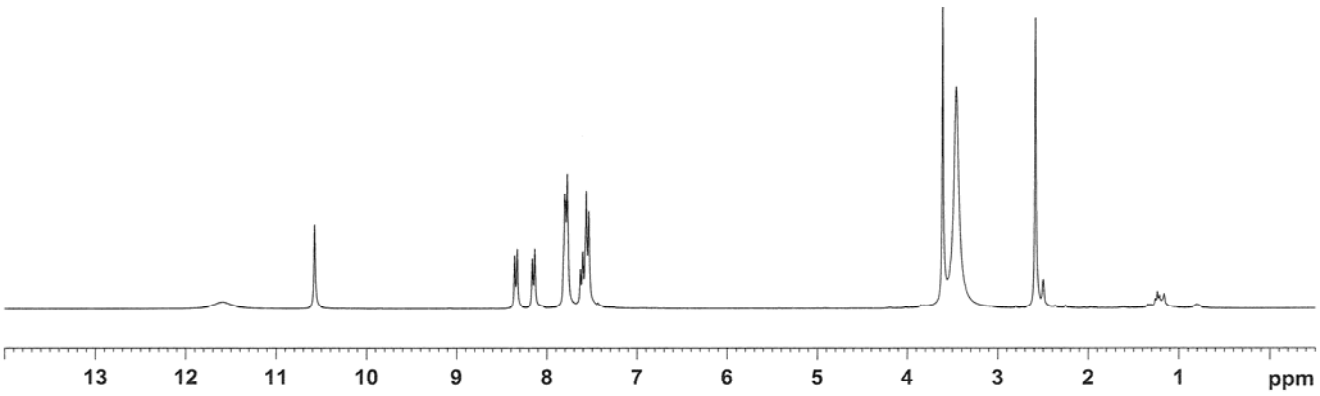
Data : x9-4-C23H21NO6 Date : 04-Nov-2013 14:06
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 1.58 min Scan#: (32,33)
Elements : C 23/0, H 21/0, N 1/0, O 6/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 100.0

Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
399.0516	10.7			
400.0596	16.6			
405.1215	76.6	+0.5 / +0.2	15.0	C 23 H 19 N O 6
406.1235	19.5			
430.0706	100.0			
431.0744	31.4			
432.0840	23.4			

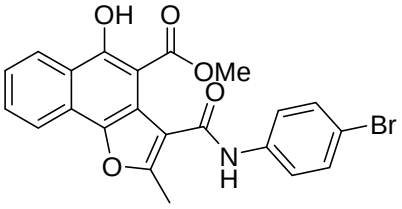
^{1}H NMR of Compound **11**



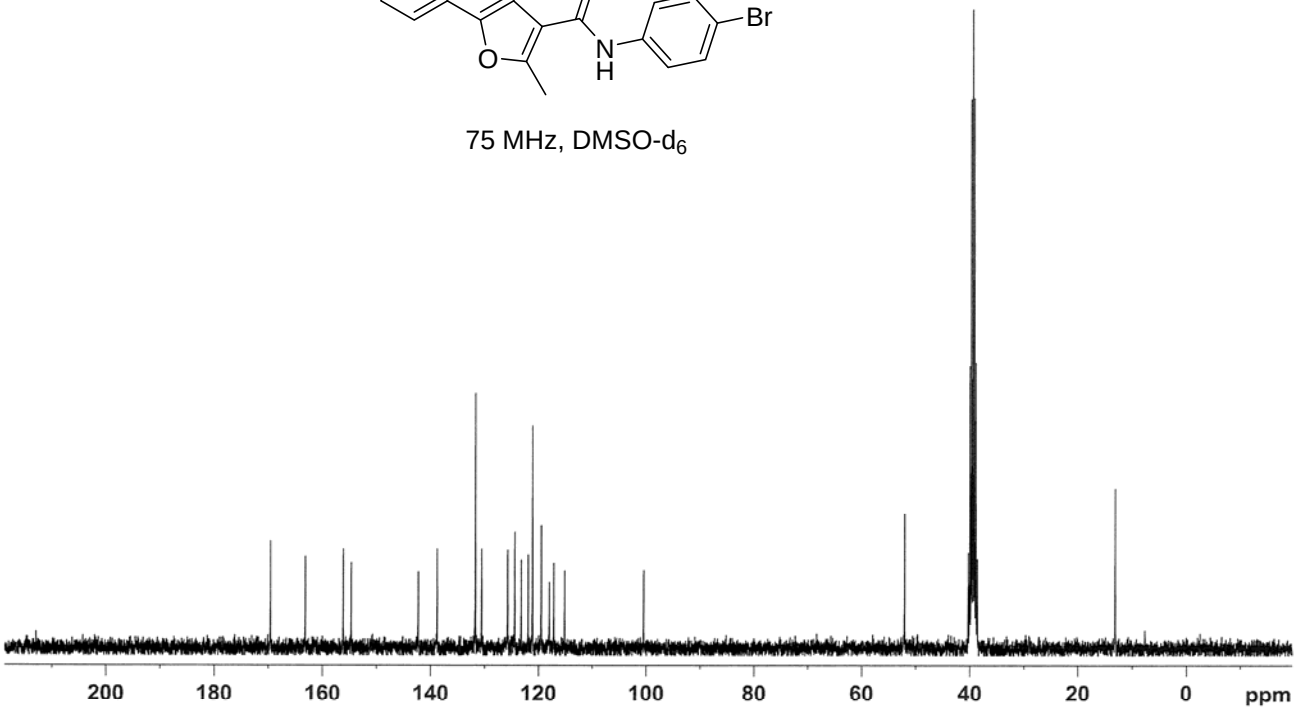
300 MHz, DMSO-d_6



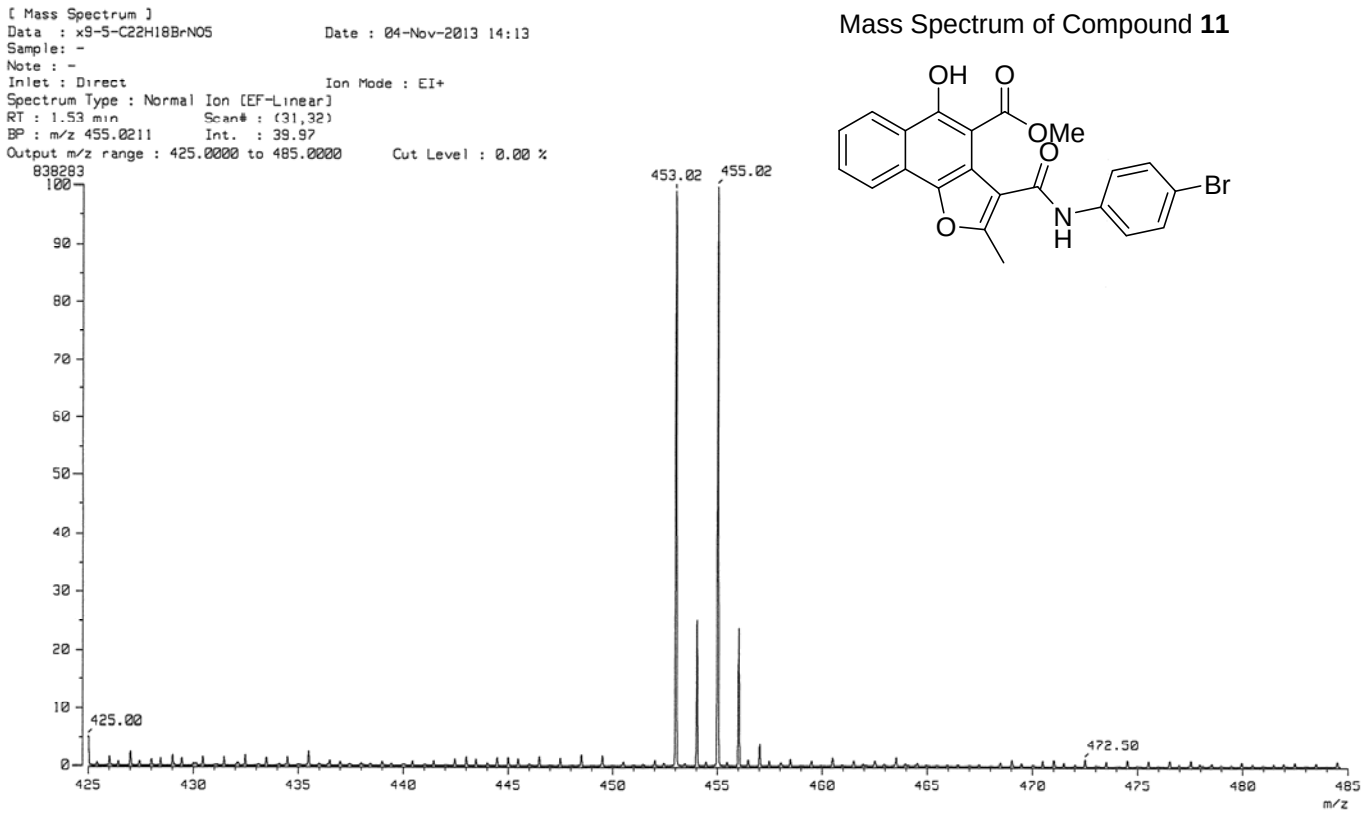
^{13}C NMR of Compound **11**



75 MHz, DMSO-d_6



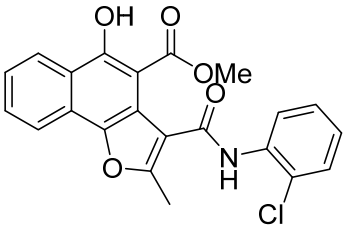
Mass Spectrum of Compound **11**



[Elemental Composition] Page: 1
Data : x9-5-C22H18BrNO5 Date : 04-Nov-2013 14:13
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 1.53 min Scan#: (31,32)
Elements : C 22/0, H 18/0, Br 1/0, N 1/0, O 5/0
Mass Tolerance : 1mmu
Unsaturation (U.S.) : -0.5 - 100.0

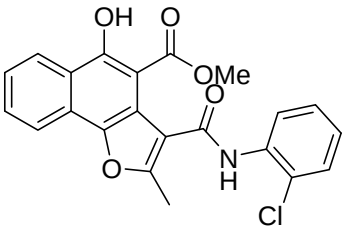
Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
453.0214	99.3	+0.4 / +0.2	15.0	C 22 H 16 Br N O 5
454.0277	25.2			
455.0211	100.0			
456.0230	23.9			

^{1}H NMR of Compound **12**



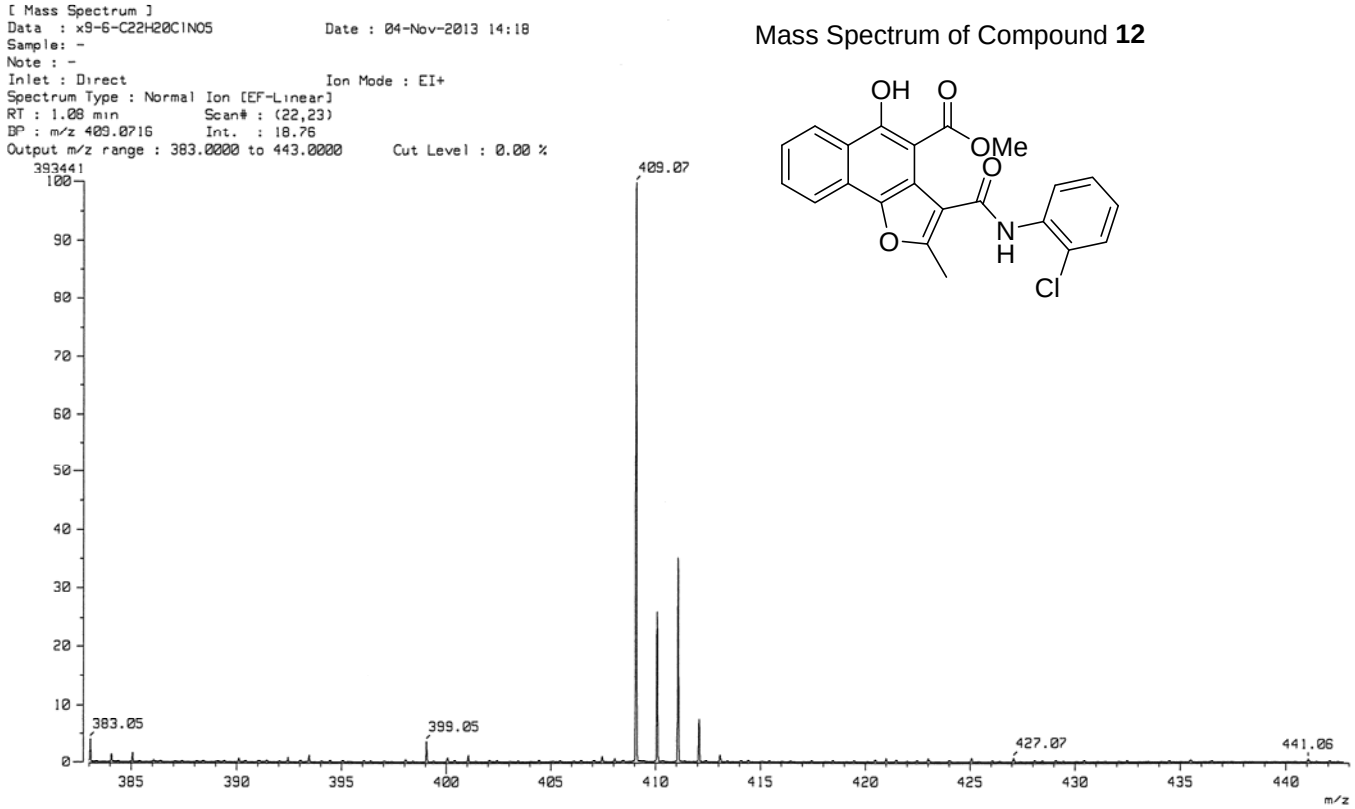
300 MHz, DMSO-d_6

^{13}C NMR of Compound **12**



75 MHz, DMSO-d_6

Mass Spectrum of Compound **12**

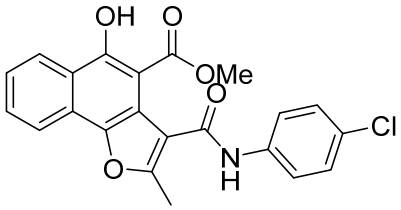


[Elemental Composition] Page: 1

Data : x9-6-C22H20ClNO5 Date : 04-Nov-2013 14:18
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 1.08 min Scan#: (22,23)
Elements : C 22/0, H 20/0, Cl 1/0, N 1/0, O 5/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 100.0

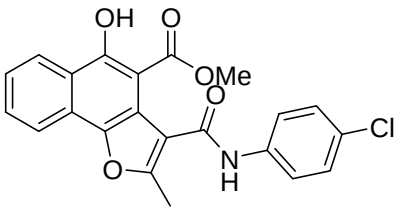
Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
409.0716	100.0	-0.3 / -0.1	15.0	C 22 H 16 Cl N O 5
410.0745	26.0			
411.0692	35.3			

^{1}H NMR of Compound **13**



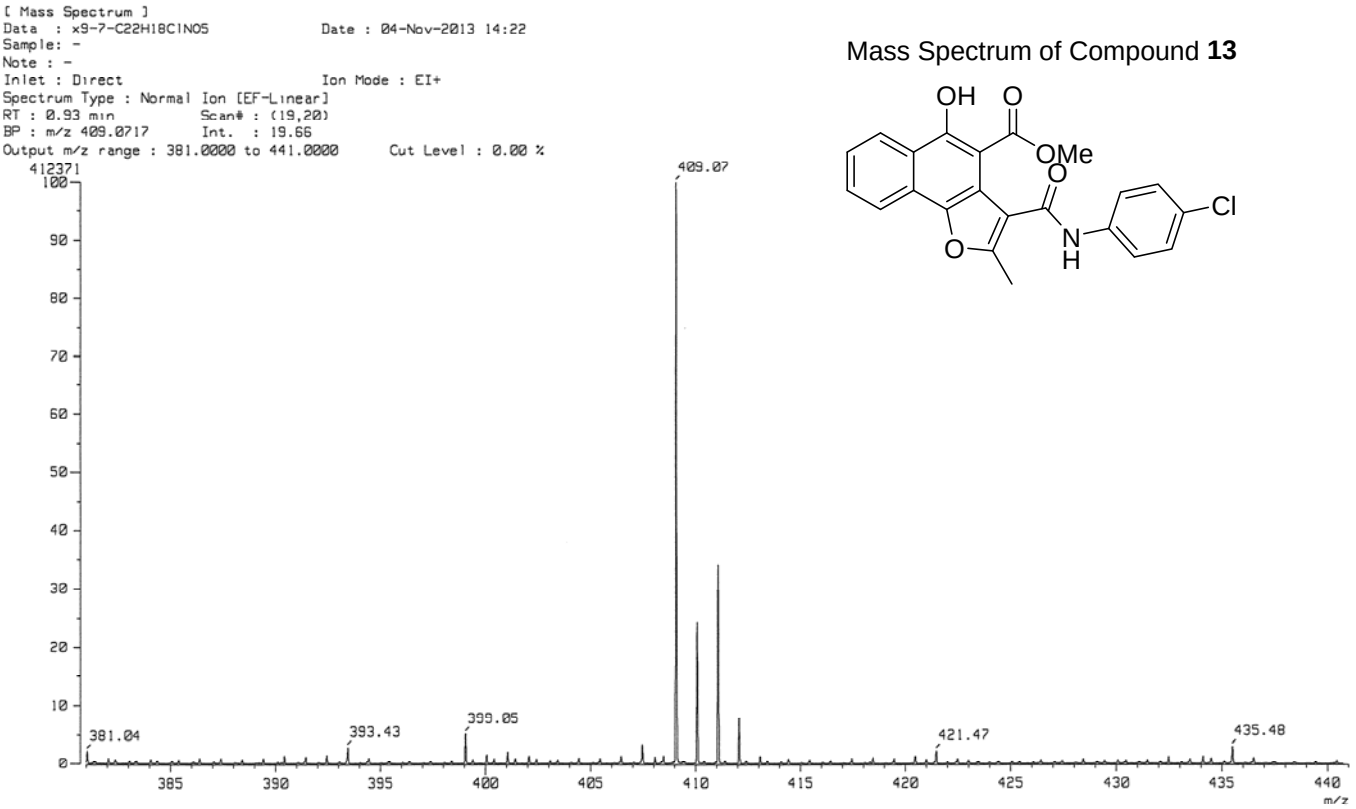
300 MHz, DMSO-d_6

^{13}C NMR of Compound **13**



75 MHz, DMSO-d_6

Mass Spectrum of Compound **13**



[Elemental Composition] Page: 1

Data : x9-7-C22H18ClNO5 Date : 04-Nov-2013 14:22

Sample: -

Note : -

Inlet : Direct Ion Mode : EI+

RT : 0.93 min Scan#: (19,20)

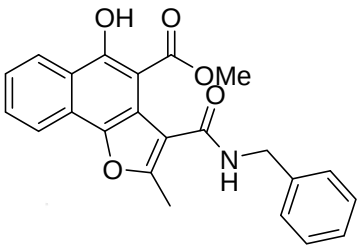
Elements : C 22/0, H 18/0, Cl 1/0, N 1/0, O 5/0

Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3

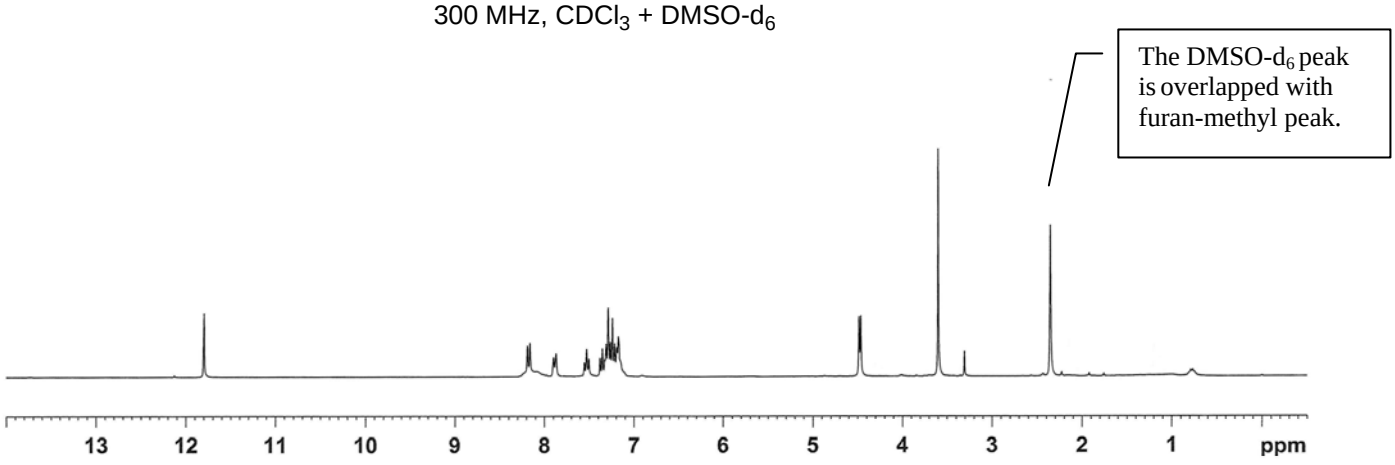
Unsaturation (U.S.) : -0.5 - 100.0

Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
409.0717	100.0	+0.0 / +0.0	15.0	C 22 H 16 Cl N O 5
410.0747	24.4			
411.0691	34.2			

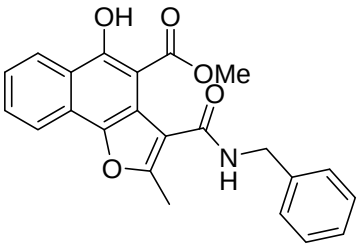
^{1}H NMR of Compound **14**



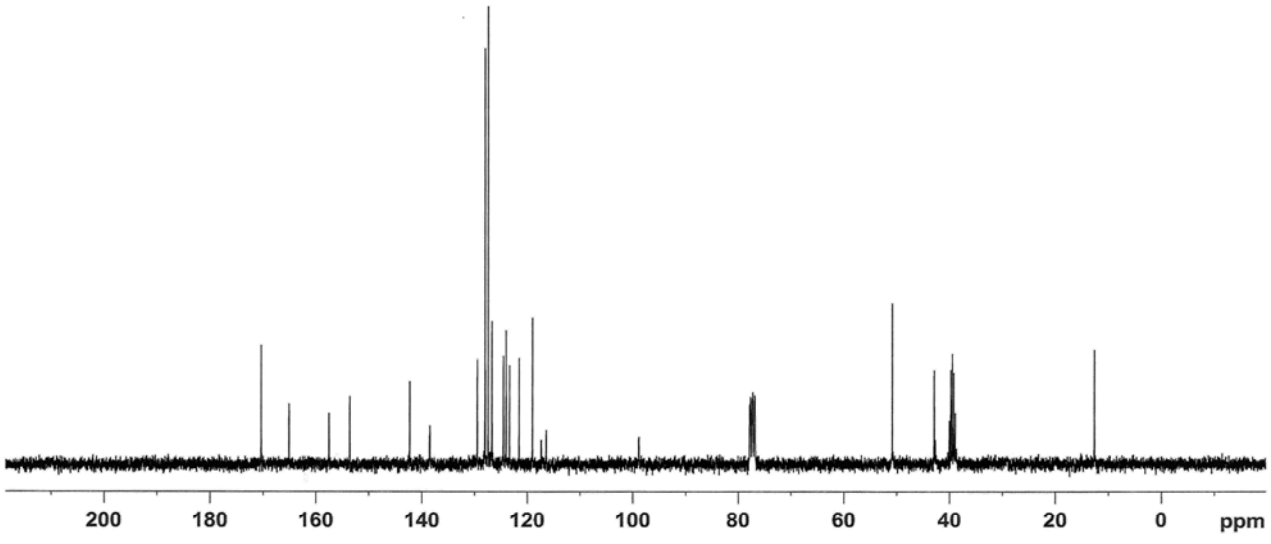
300 MHz, $CDCl_3$ + DMSO-d_6



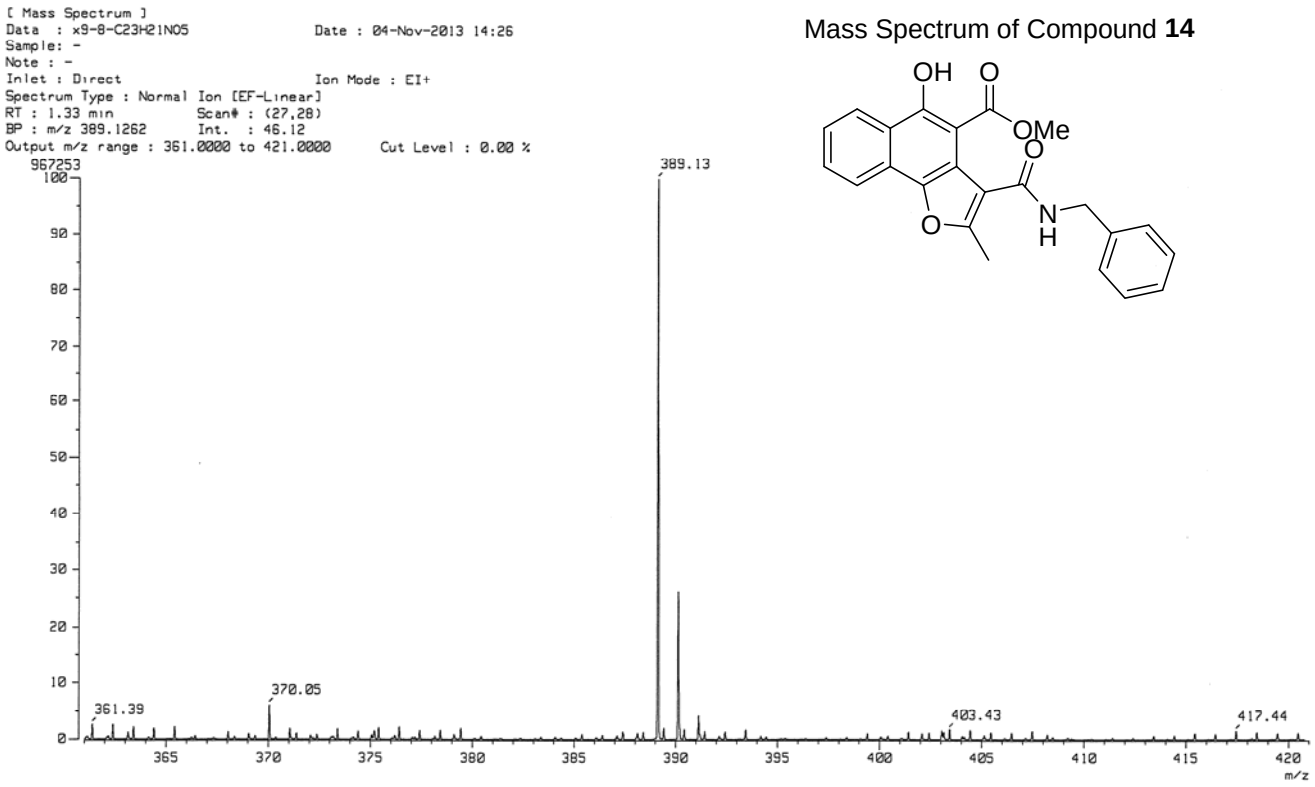
^{13}C NMR of Compound **14**



75 MHz, $CDCl_3$ + DMSO-d_6



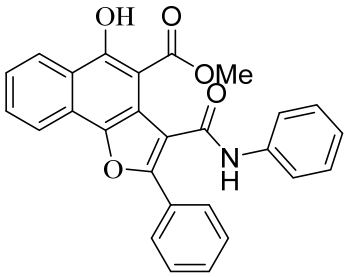
Mass Spectrum of Compound **14**



[Elemental Composition] Page: 1
Data : x9-8-C23H21NO5 Date : 04-Nov-2013 14:26
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 1.33 min Scan#: (27,28)
Elements : C 23/0, H 21/0, N 1/0, O 5/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 100.0

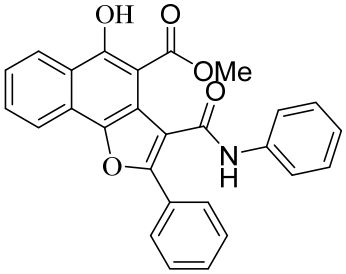
Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
389.1262	100.0	-0.4 / -0.2	15.0	C 23 H 19 N O 5
390.1306	26.3			

^{1}H NMR of Compound **15**



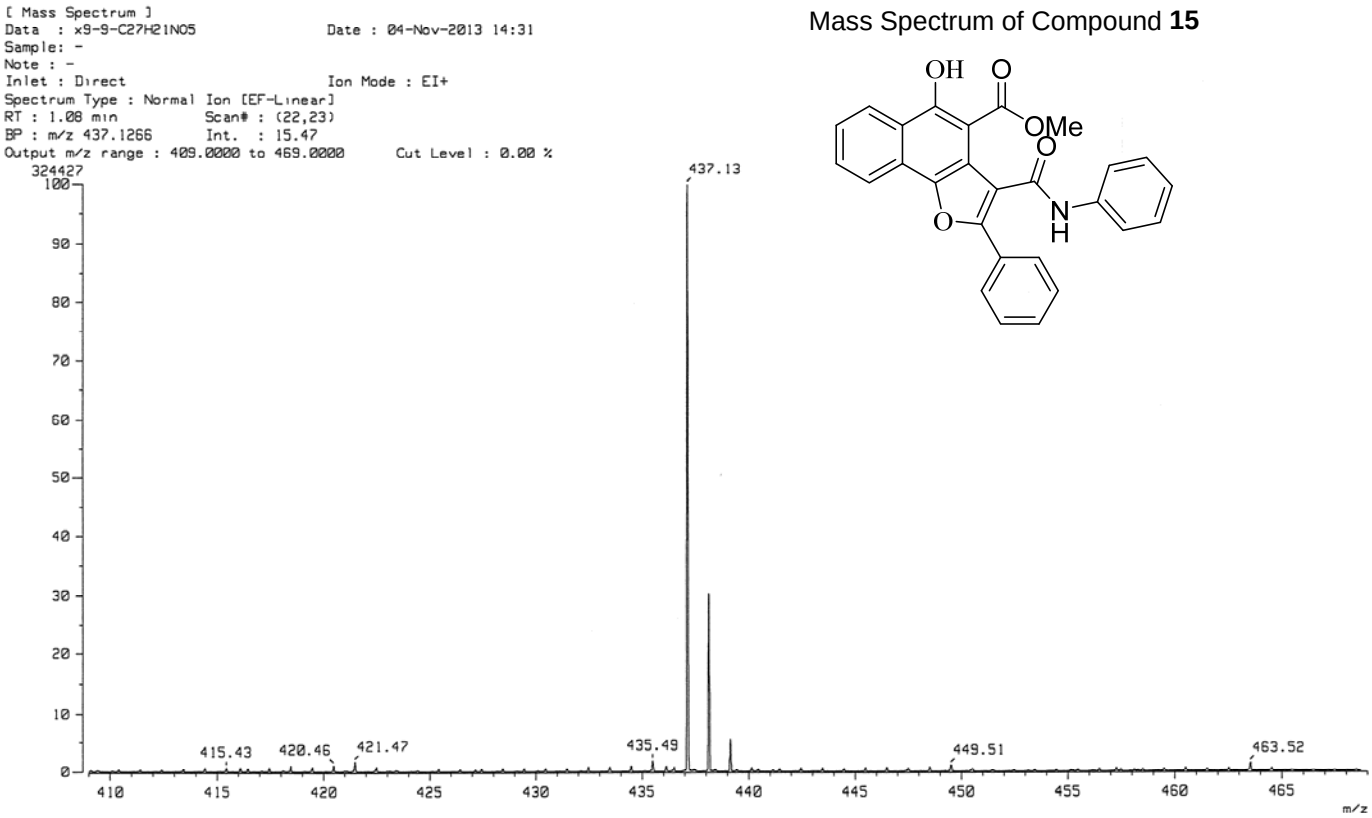
300 MHz, DMSO-d_6

^{13}C NMR of Compound **15**



75 MHz, DMSO-d_6

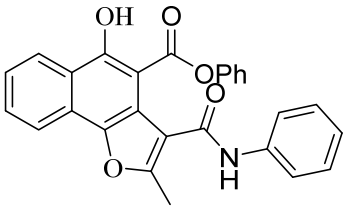
Mass Spectrum of Compound **15**



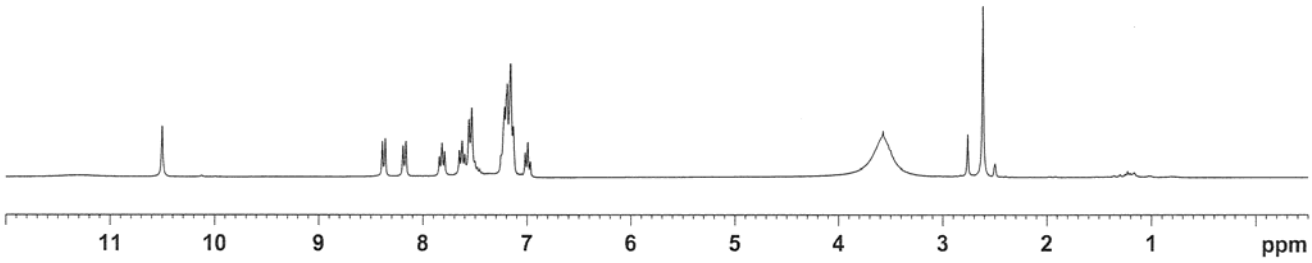
[Elemental Composition]
Data : x9-9-C27H21NO5 Date : 04-Nov-2013 14:31
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 1.08 min Scan#: (22,23)
Elements : C 27/0, H 21/0, N 1/0, O 5/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 2mmu if m/z > 2
Unsaturation (U.S.) : -0.5 - 100.0

Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
437.1266	100.0	+0.7 / +0.3	19.0	C 27 H 19 N O 5
438.1314	30.4			

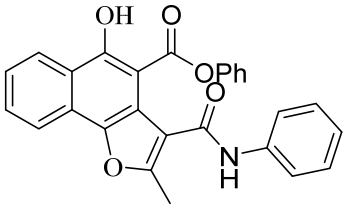
^{1}H NMR of Compound **16**



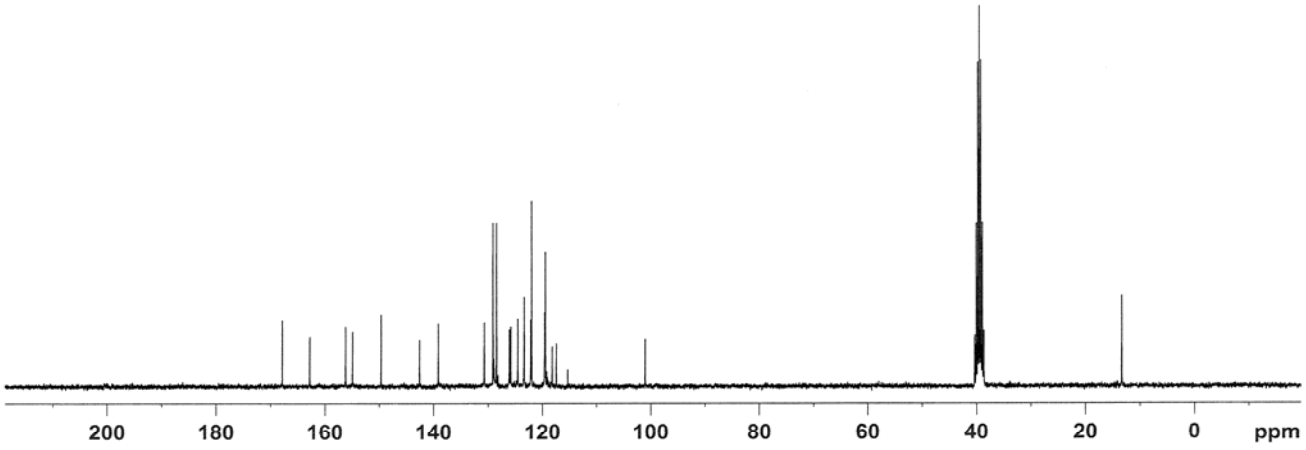
300 MHz, DMSO-d_6



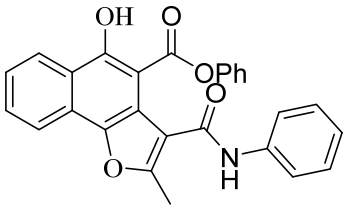
^{13}C NMR of Compound **16**



75 MHz, DMSO-d_6

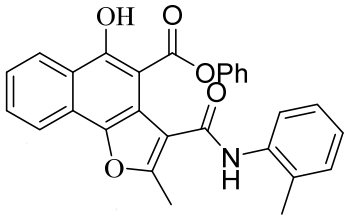


Mass Spectrum of Compound **16**

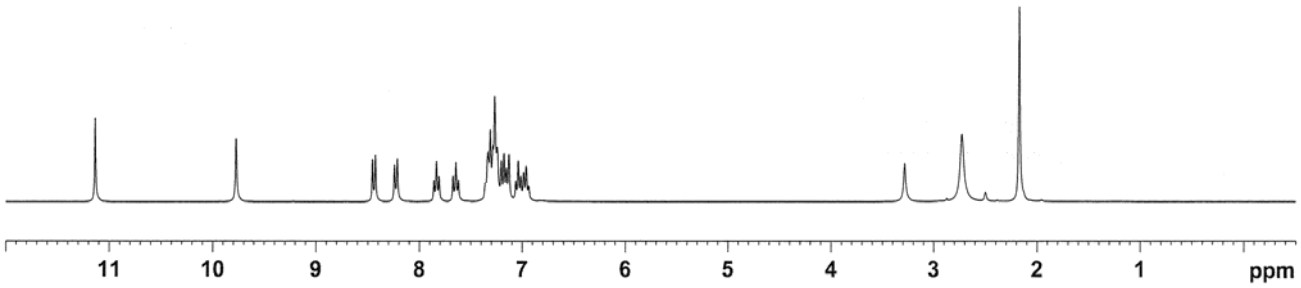



```
[ Elemental Composition ]                                    Page: 1
Data  : x9-10-C27H21NO5              Date : 04-Nov-2013 14:36
Sample: -
Note : -
Inlet : Direct                       Ion Mode : EI+
RT : 1.28 min                        Scan#: (26,27)
Elements : C 27/0, H 21/0, N 1/0, O 5/0
Mass Tolerance      : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 100.0

Observed m/z Int%   Err[ppm / mmu]    U.S.  Composition
  437.1261   100.0     -0.4 /  -0.2   19.0  C 27 H 19 N O 5

  438.1299    30.9
```

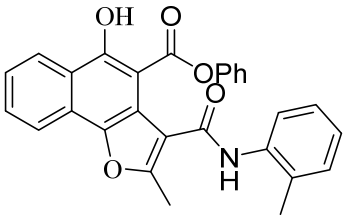
^{1}H NMR of Compound **17**



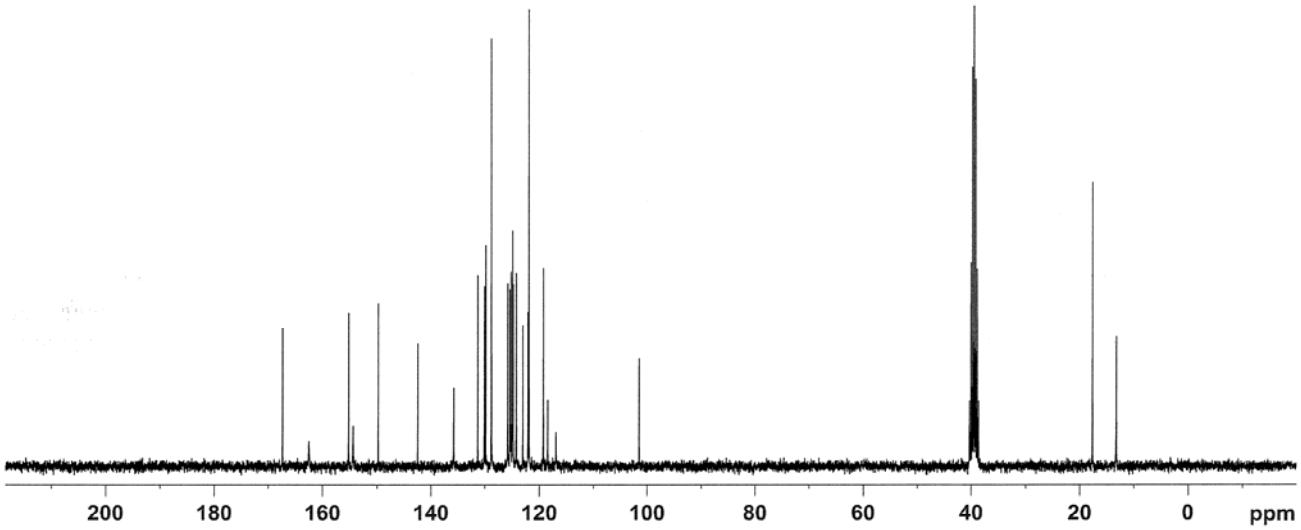
300 MHz, DMSO-d_6



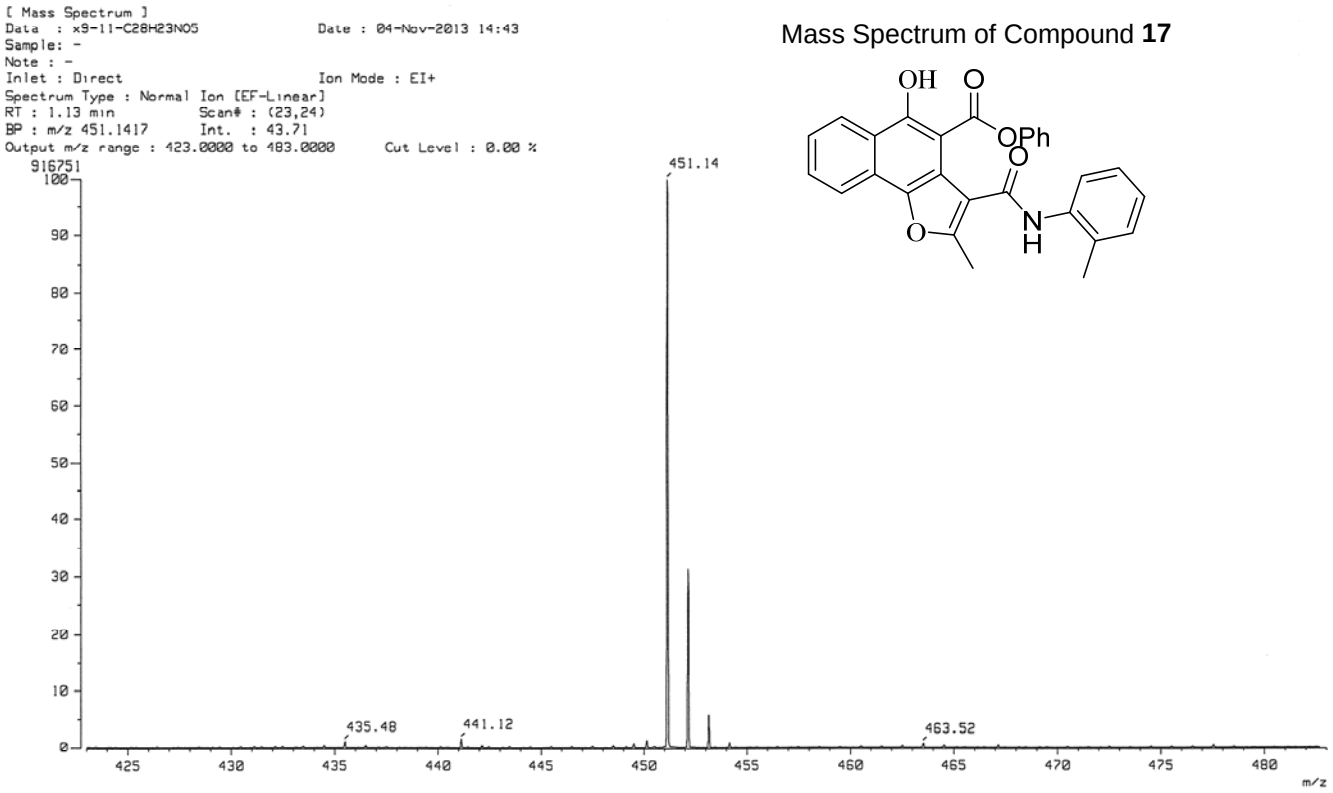
^{13}C NMR of Compound **17**



75 MHz, DMSO-d_6



Mass Spectrum of Compound **17**

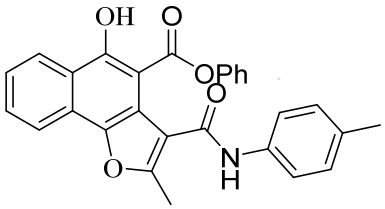


Page: 1

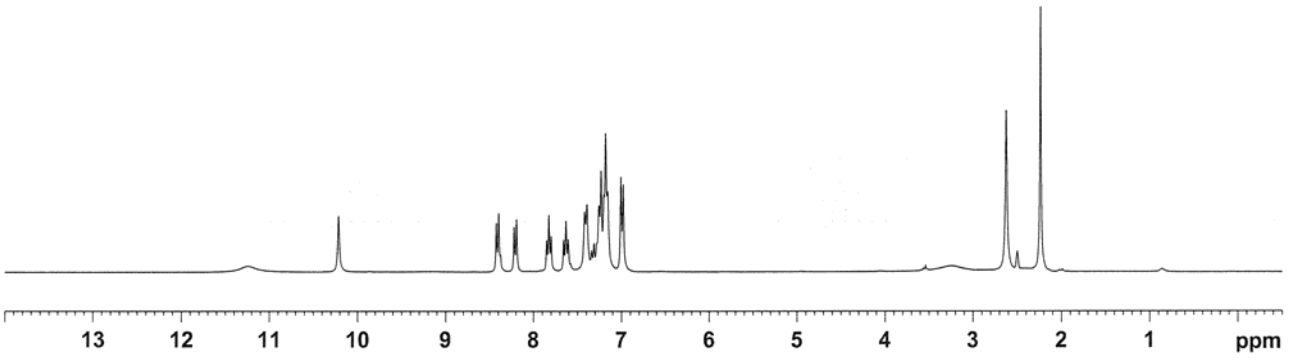
[Elemental Composition]
Data : x9-11-C28H23NO5 Date : 04-Nov-2013 14:43
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 1.13 min Scan#: (23,24)
Elements : C 28/0, H 23/0, N 1/0, O 5/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 100.0

Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
451.1417	100.0	-0.6 / -0.2	19.0	C 28 H 21 N O 5
452.1462	31.3			

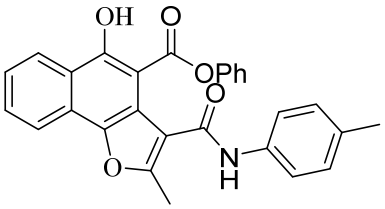
^{1}H NMR of Compound **18**



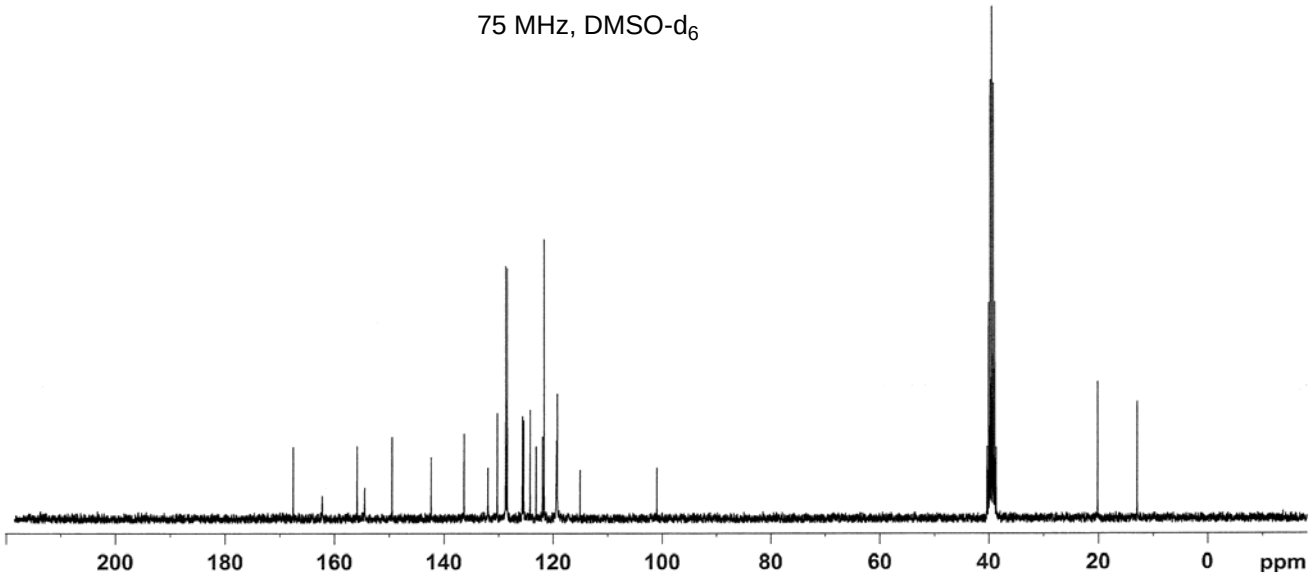
300 MHz, DMSO-d_6



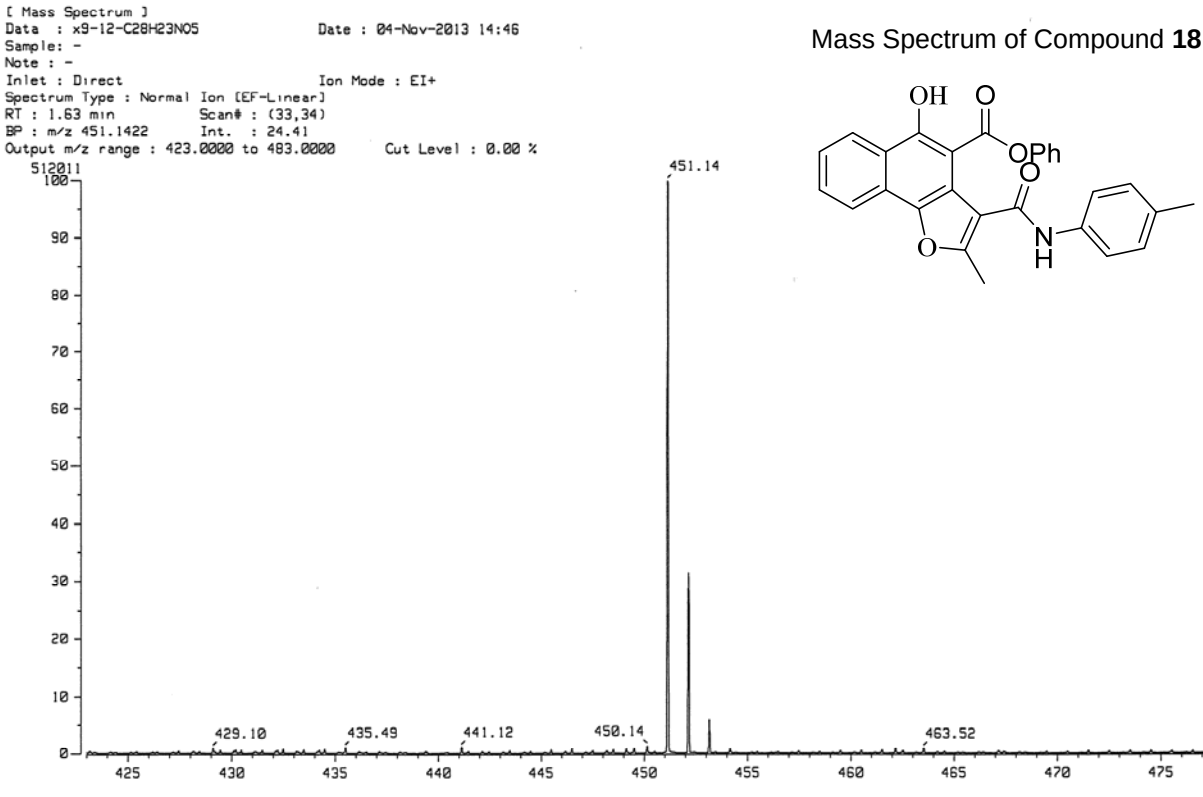
^{13}C NMR of Compound **18**



75 MHz, DMSO-d_6



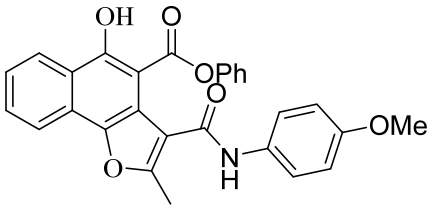
Mass Spectrum of Compound **18**



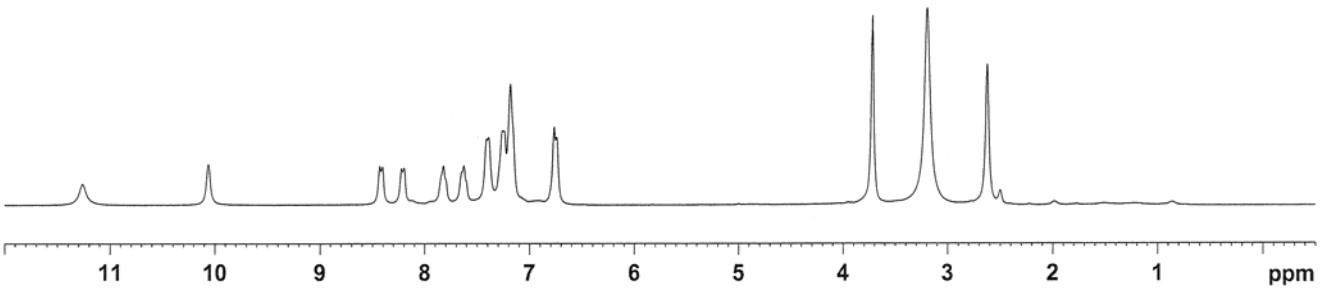
[Elemental Composition] Page: 1
Data : x9-12-C28H23NO5 Date : 04-Nov-2013 14:46
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 1.63 min Scan#: (33,34)
Elements : C 28/0, H 23/0, N 1/0, O 5/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 100.0

Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
451.1422	100.0	+0.5 / +0.2	19.0	C 28 H 21 N O 5
452.1457	31.5			

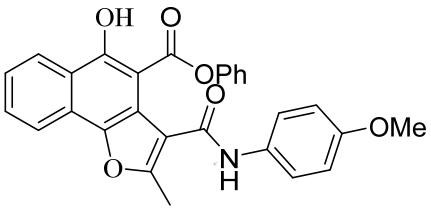
^{1}H NMR of Compound **19**



300 MHz, DMSO-d_6

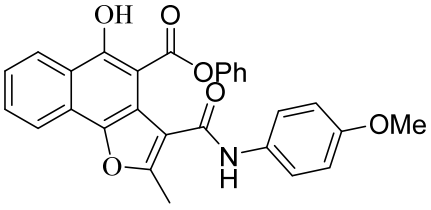


^{13}C NMR of Compound **19**



75 MHz, DMSO-d_6

Mass Spectrum of Compound **19**



[Elemental Composition] Page: 1

Data : x9-13-C28H23NO6 Date : 04-Nov-2013 14:51

Sample: -

Note : -

Inlet : Direct Ion Mode : EI+

RT : 1.38 min Scan#: (28,29)

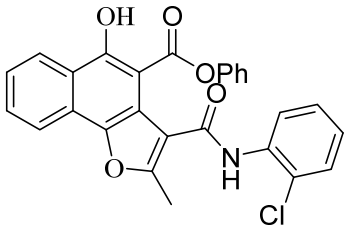
Elements : C 28/0, H 23/0, N 1/0, O 6/0

Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3

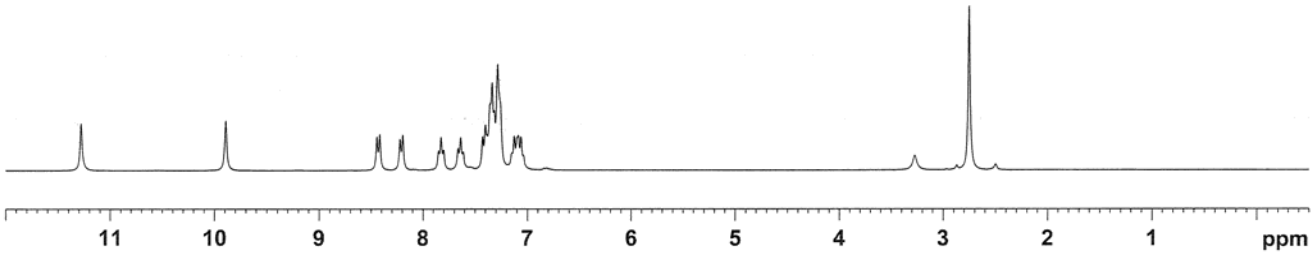
Unsaturation (U.S.) : -0.5 - 100.0

Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
457.1142	14.7			
463.0780	46.1			
464.0827	14.8			
467.1366	27.4	-0.6 / -0.3	19.0	C 28 H 21 N O 6
483.1311	100.0			
484.1335	31.0			

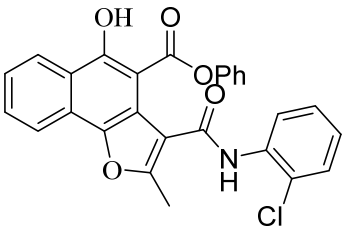
^{1}H NMR of Compound **20**



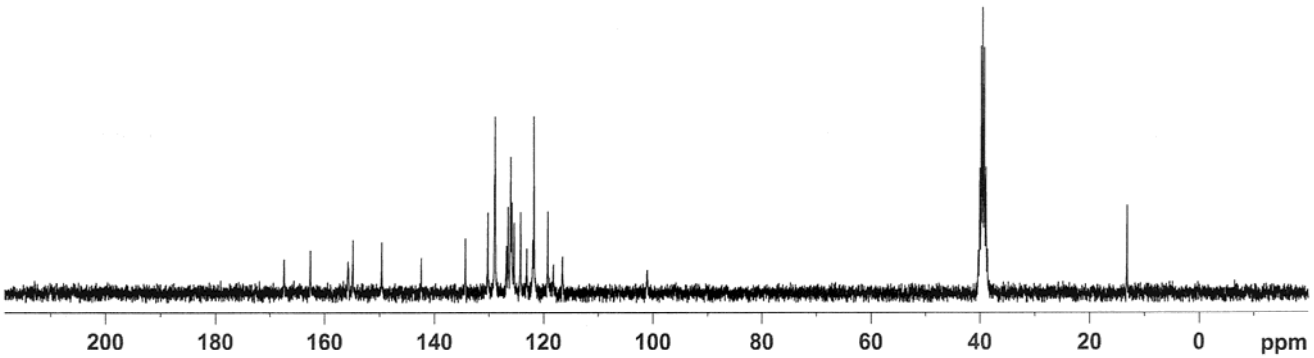
300 MHz, DMSO-d_6



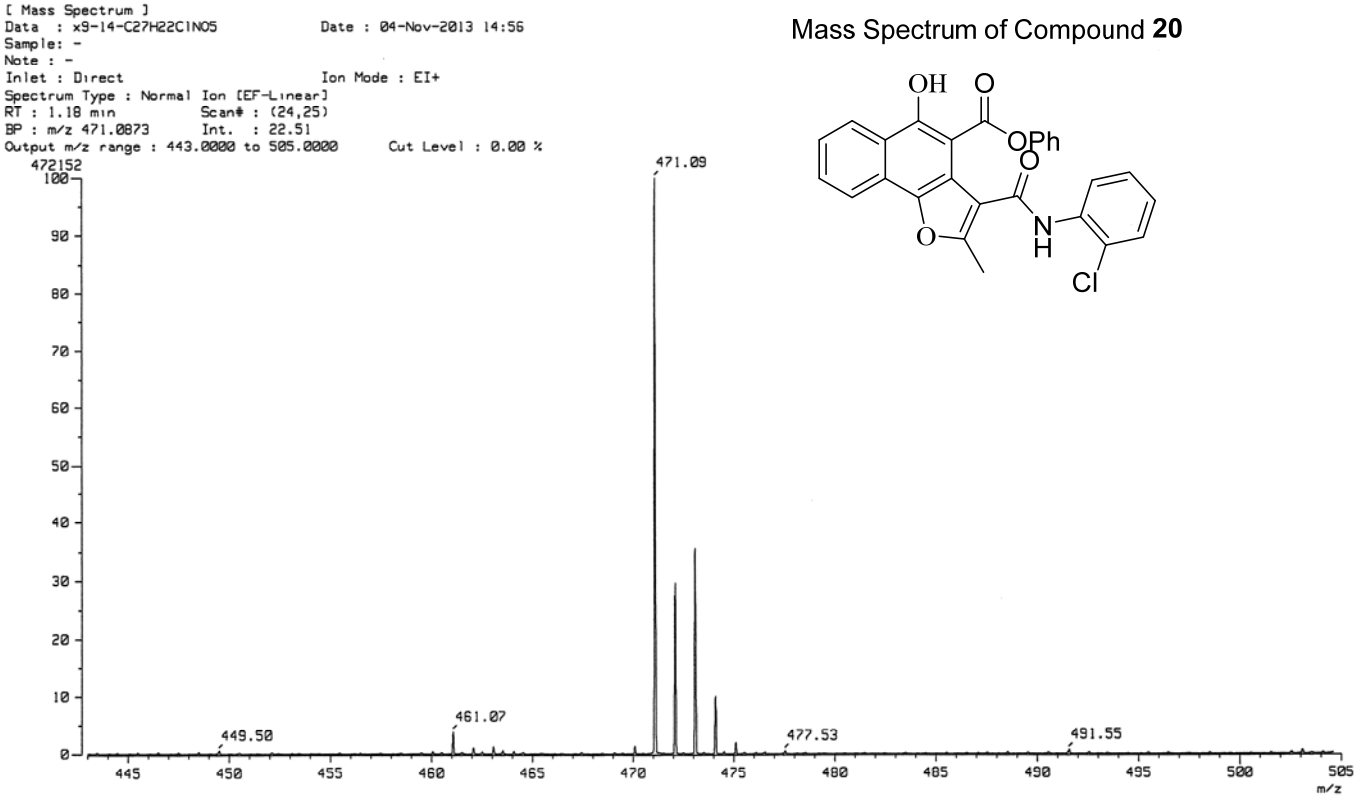
^{13}C NMR of Compound **20**



75 MHz, DMSO-d_6



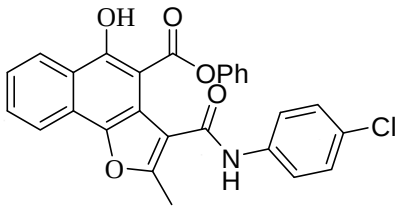
Mass Spectrum of Compound **20**



[Elemental Composition] Page: 1
Data : x9-14-C27H22ClNO5 Date : 04-Nov-2013 14:56
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 1.18 min Scan#: (24,25)
Elements : C 27/0, H 22/0, Cl 1/0, N 1/0, O 5/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 2mmu if m/z > 2
Unsaturation (U.S.) : -0.5 - 100.0

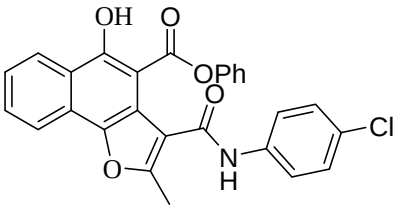
Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
471.0873	100.0	-0.1 / -0.1	19.0	C 27 H 18 Cl N O 5
472.0923	29.7			
473.0851	35.6			
474.0884	10.0			

^{1}H NMR of Compound **21**



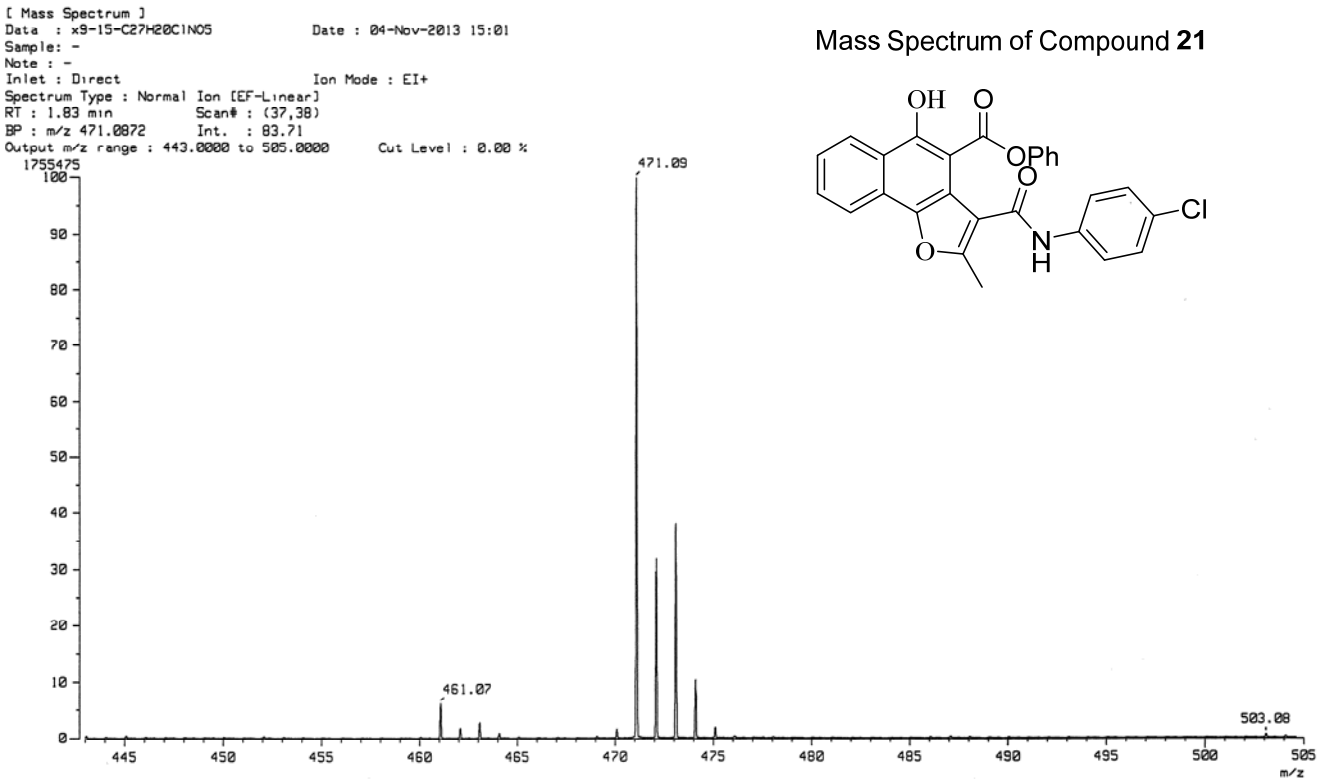
300 MHz, DMSO-d_6

^{13}C NMR of Compound **21**



75 MHz, DMSO-d_6

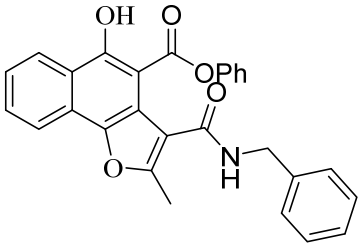
Mass Spectrum of Compound **21**



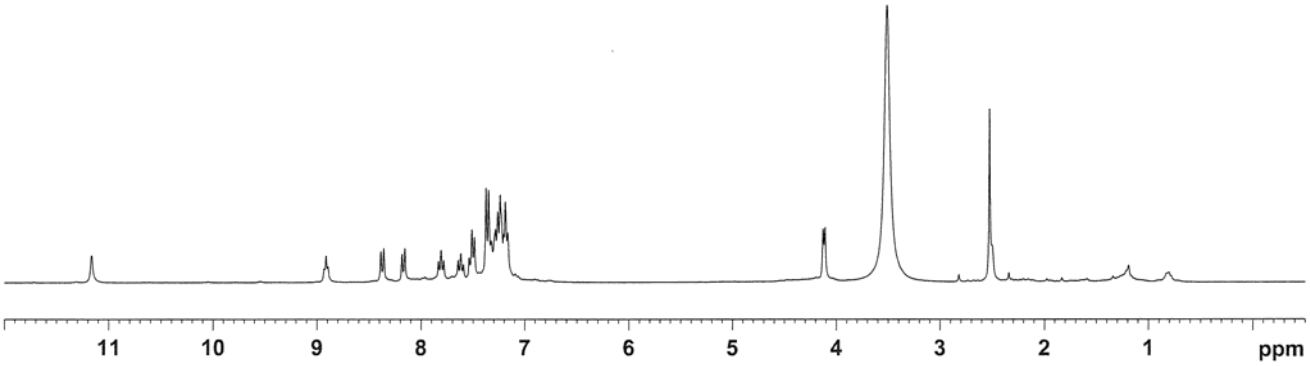
[Elemental Composition] Page: 1
Data : x9-15-C27H20ClNO5 Date : 04-Nov-2013 15:01
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 1.83 min Scan#: (37,38)
Elements : C 27/0, H 20/0, Cl 1/0, N 1/0, O 5/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 100.0

Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
471.0872	100.0	-0.3 / -0.1	19.0	C 27 H 18 Cl N O 5
472.0909	31.9			
473.0858	38.2			
474.0878	10.4			

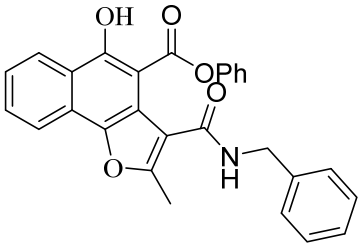
^{1}H NMR of Compound **22**



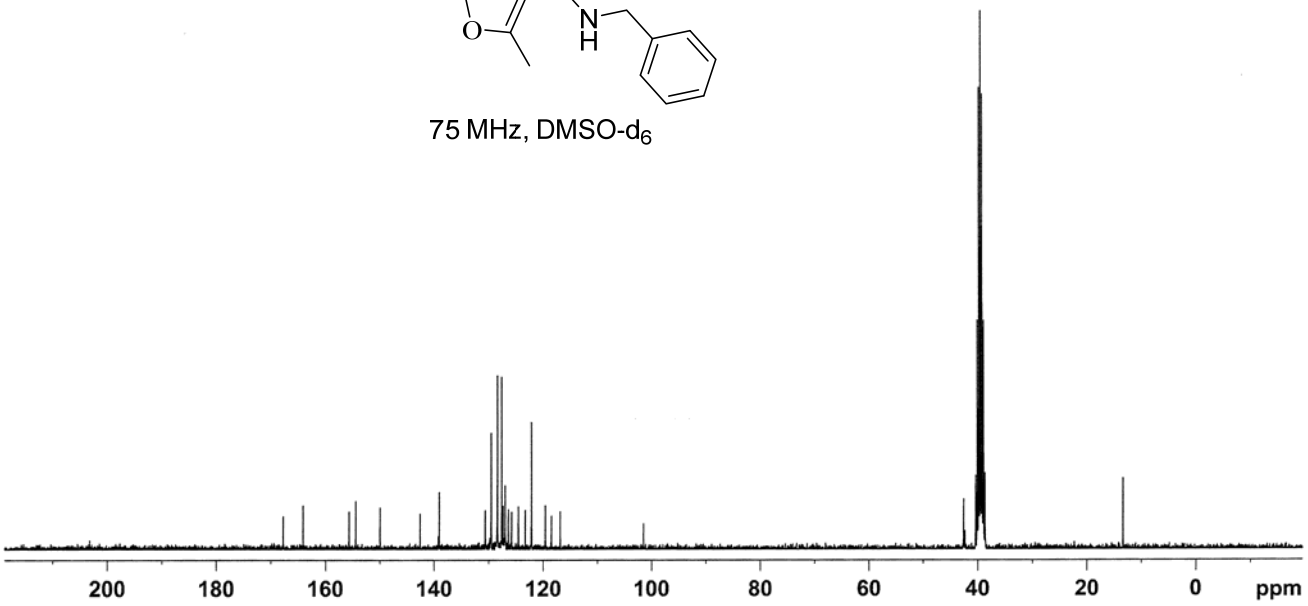
300 MHz, DMSO-d_6



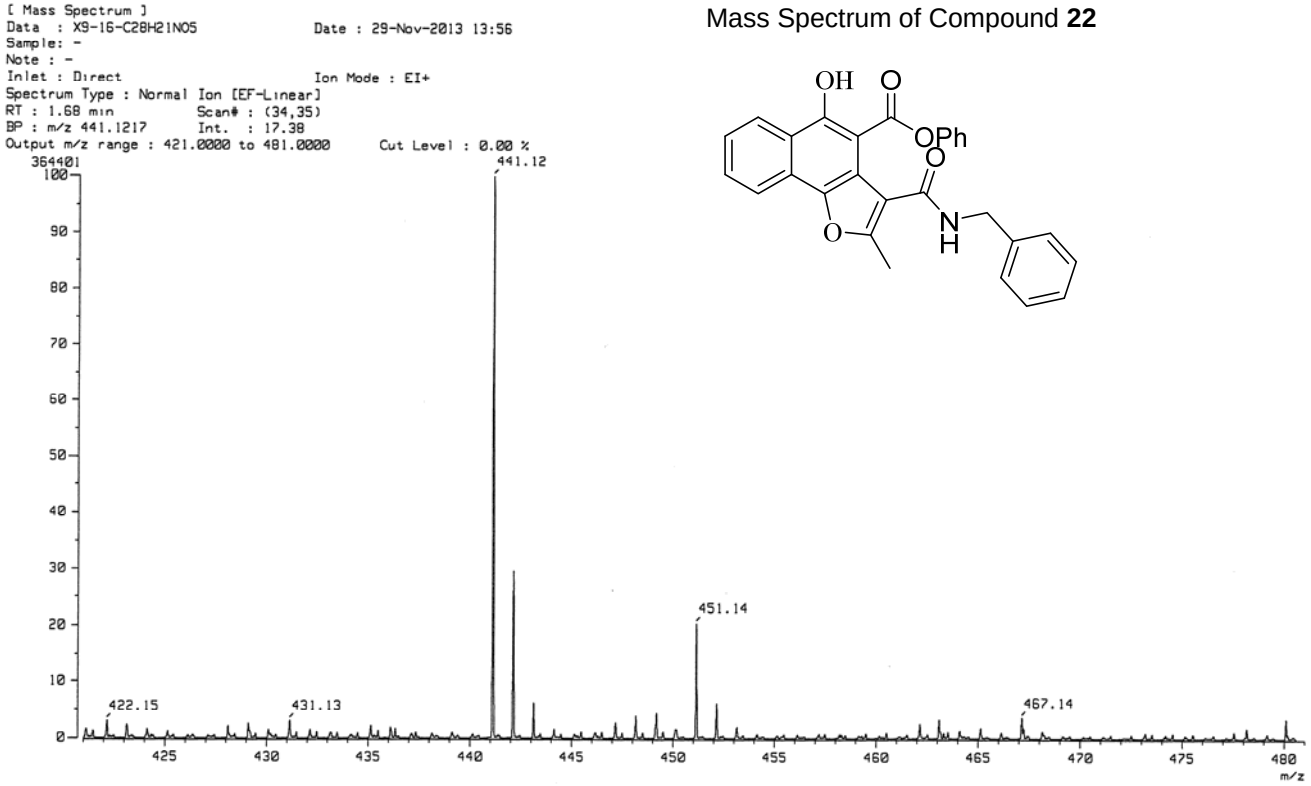
^{13}C NMR of Compound **22**



75 MHz, DMSO-d_6



Mass Spectrum of Compound **22**

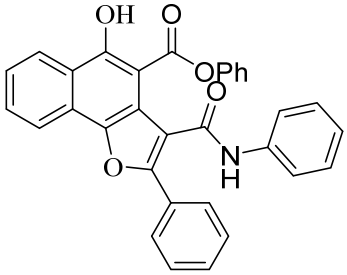


Page: 1

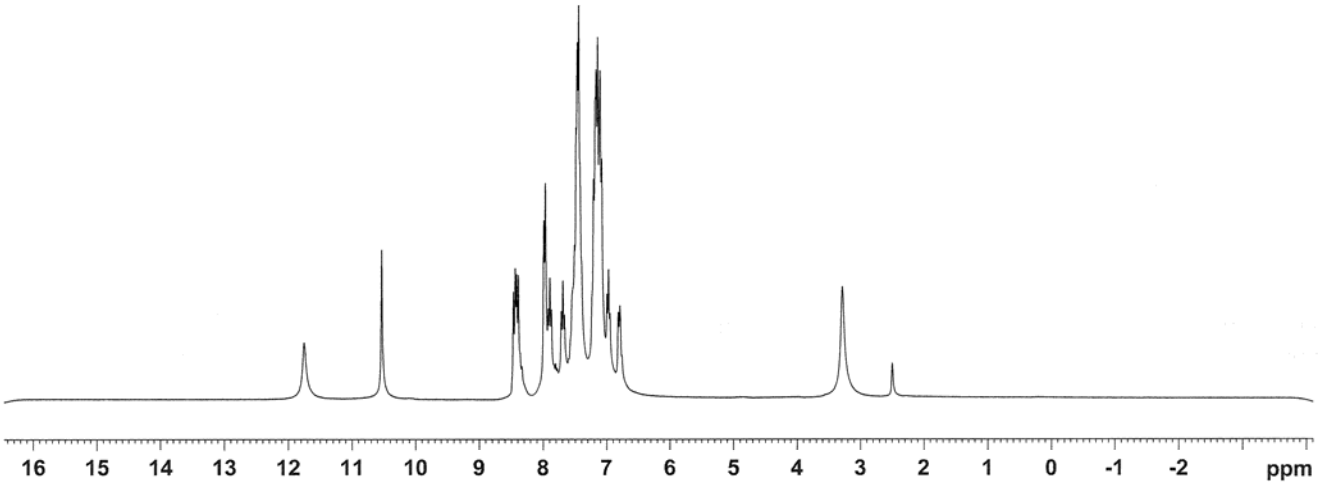
[Elemental Composition]
Data : X9-16-C28H21NO5 Date : 29-Nov-2013 13:56
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 1.68 min Scan#: (34,35)
Elements : C 28/0, H 21/0, N 1/0, O 5/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 100.0

Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
441.1217	100.0			
442.1251	29.7			
451.1419	20.5	-0.1 / -0.1	19.0	C 28 H 21 N O 5

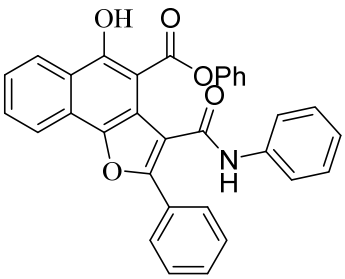
^{1}H NMR of Compound **23**



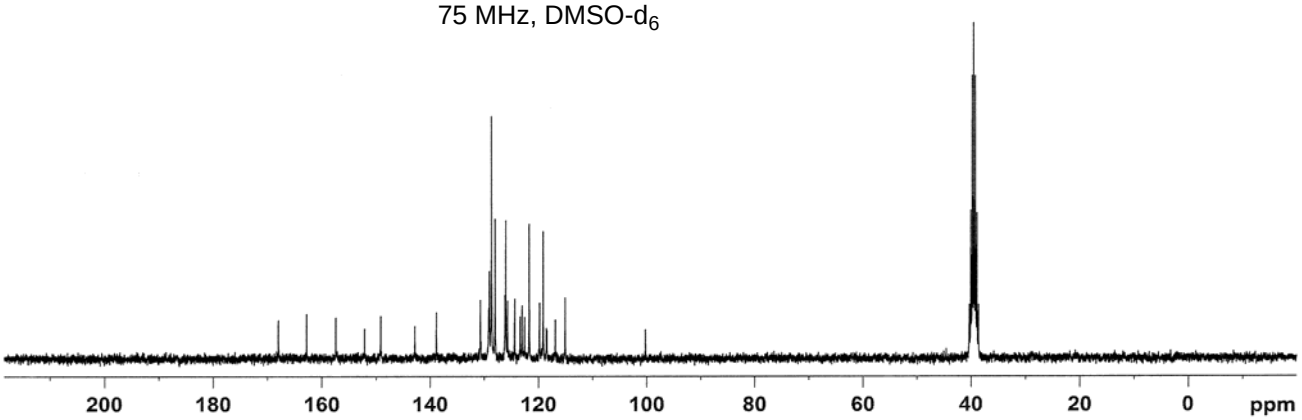
300 MHz, DMSO-d_6



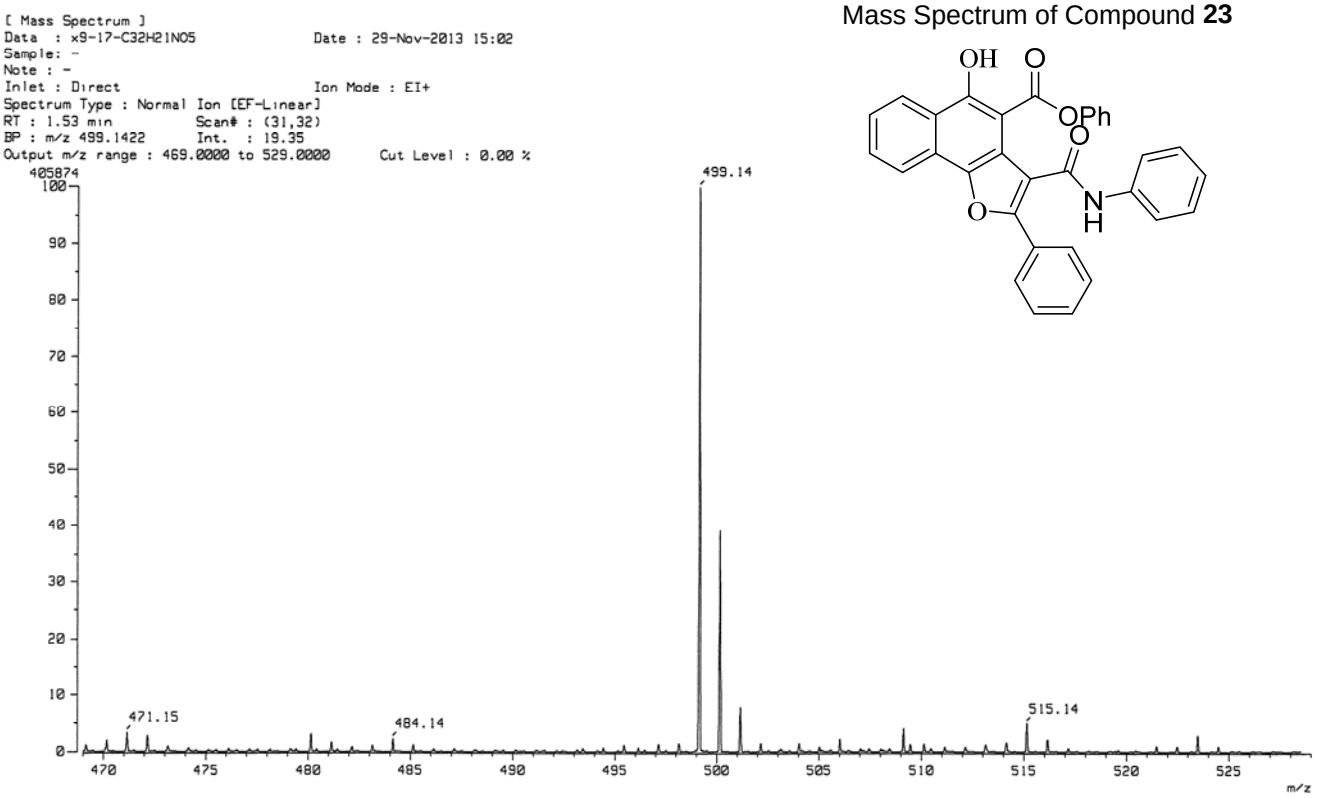
^{13}C NMR of Compound **23**



75 MHz, DMSO-d_6



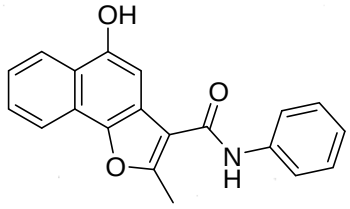
Mass Spectrum of Compound **23**



[Elemental Composition] Page: 1
Data : x9-17-C32H21NO5 Date : 29-Nov-2013 15:02
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 1.53 min Scan#: (31,32)
Elements : C 32/0, H 21/0, N 1/0, O 5/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 100.0

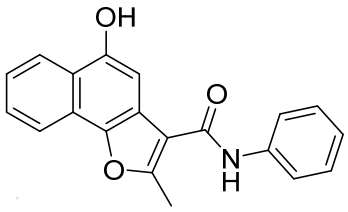
Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
499.1422	100.0	+0.5 / +0.3	23.0	C 32 H 21 N O 5
500.1451	39.2			

^{1}H NMR of Compound **26**



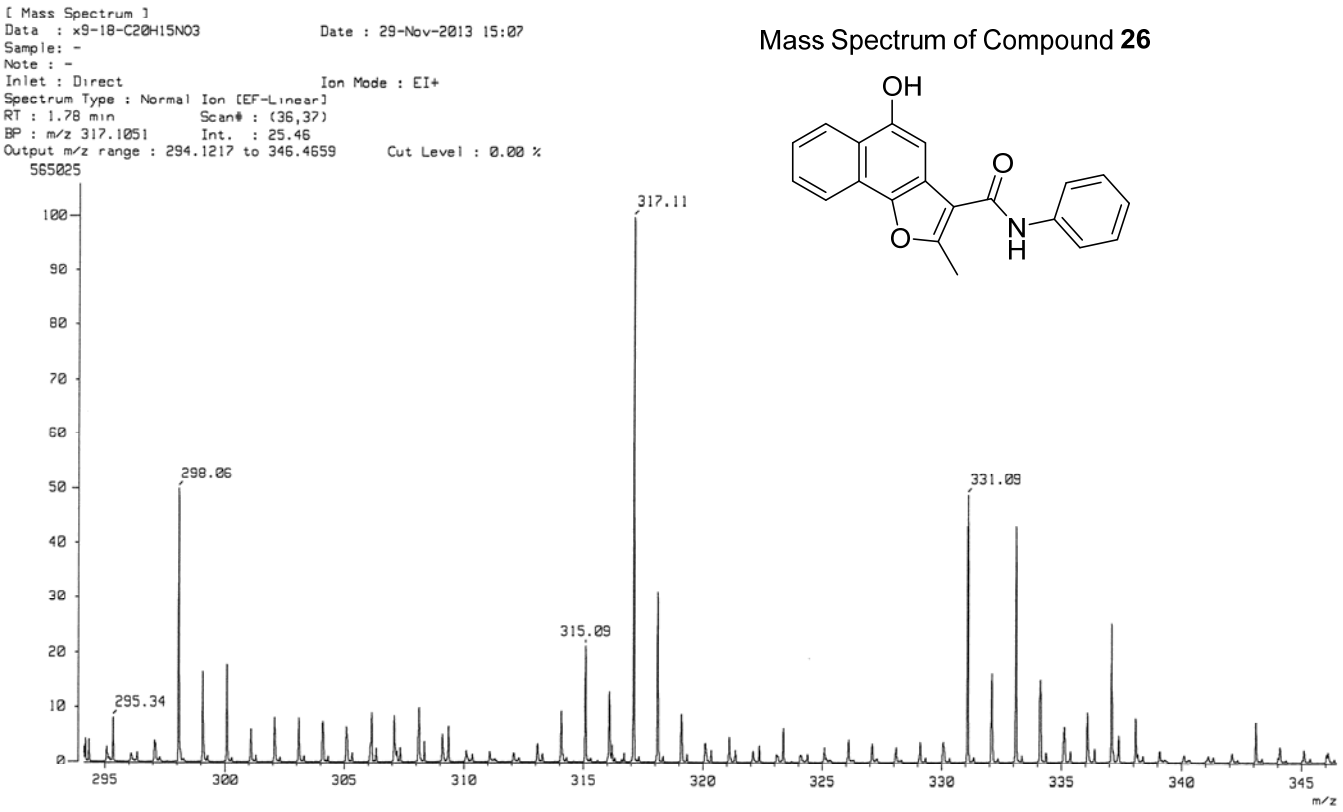
600 MHz, DMSO-d_6

^{13}C NMR of Compound **26**



75 MHz, DMSO-d_6

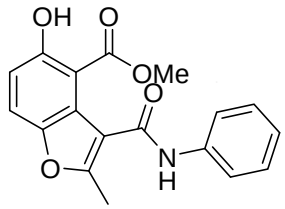
Mass Spectrum of Compound **26**



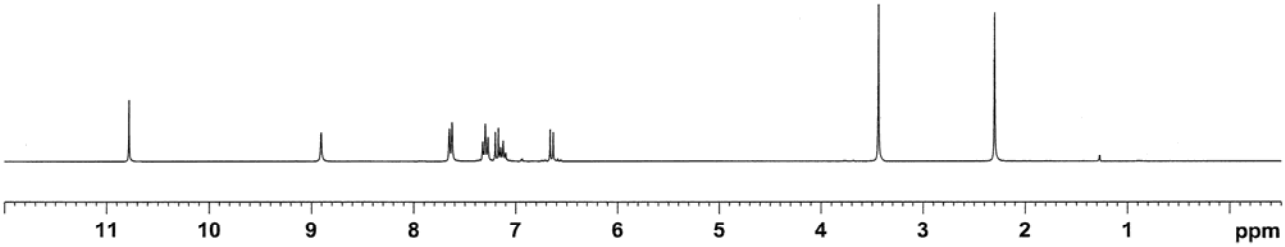
[Elemental Composition] Page: 1
Data : x9-18-C20H15NO3 Date : 29-Nov-2013 15:07
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 1.78 min Scan#: (36,37)
Elements : C 20/0, H 15/0, N 1/0, O 3/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 100.0

Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
298.0647	50.0	+5.6 / +1.7	16.0	C 20 H 10 O 3
299.0710	16.7	+0.7 / +0.2	15.5	C 20 H 11 O 3
300.0789	18.0	+0.9 / +0.3	15.0	C 20 H 12 O 3
315.0909	21.2	+4.1 / +1.3	15.0	C 20 H 13 N O 3
316.0889	12.8			
317.1051	100.0	-0.3 / -0.1	14.0	C 20 H 15 N O 3
318.1070	31.2			
331.0870	49.1			
332.0888	16.5			
333.1033	43.3			
334.1174	15.3			
337.0868	25.5			

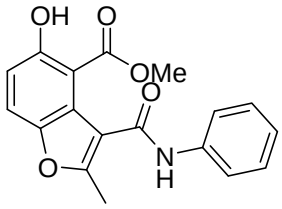
^{1}H NMR of Compound **27**



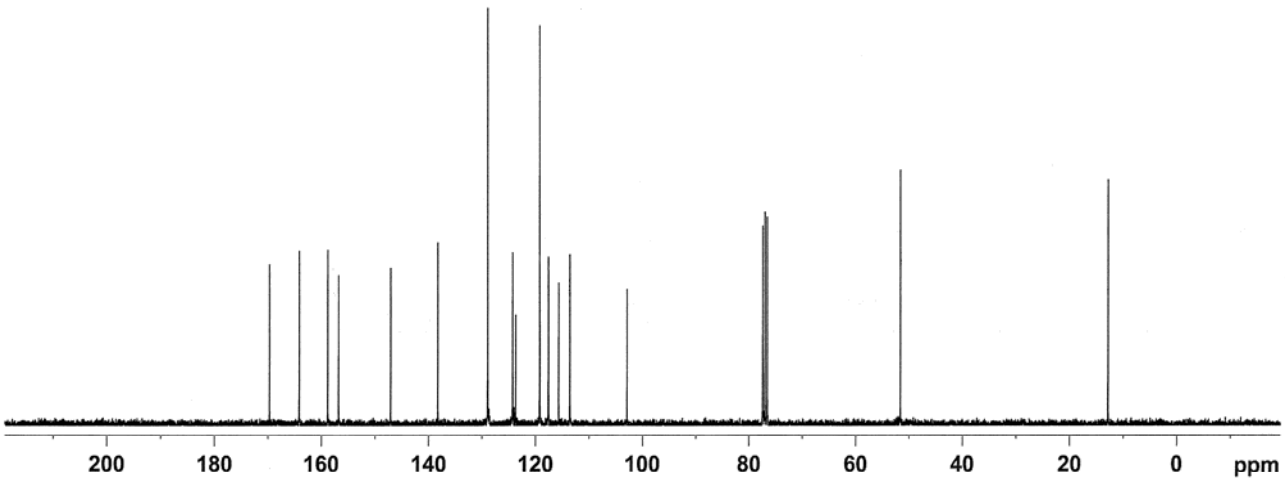
300 MHz, $CDCl_3$



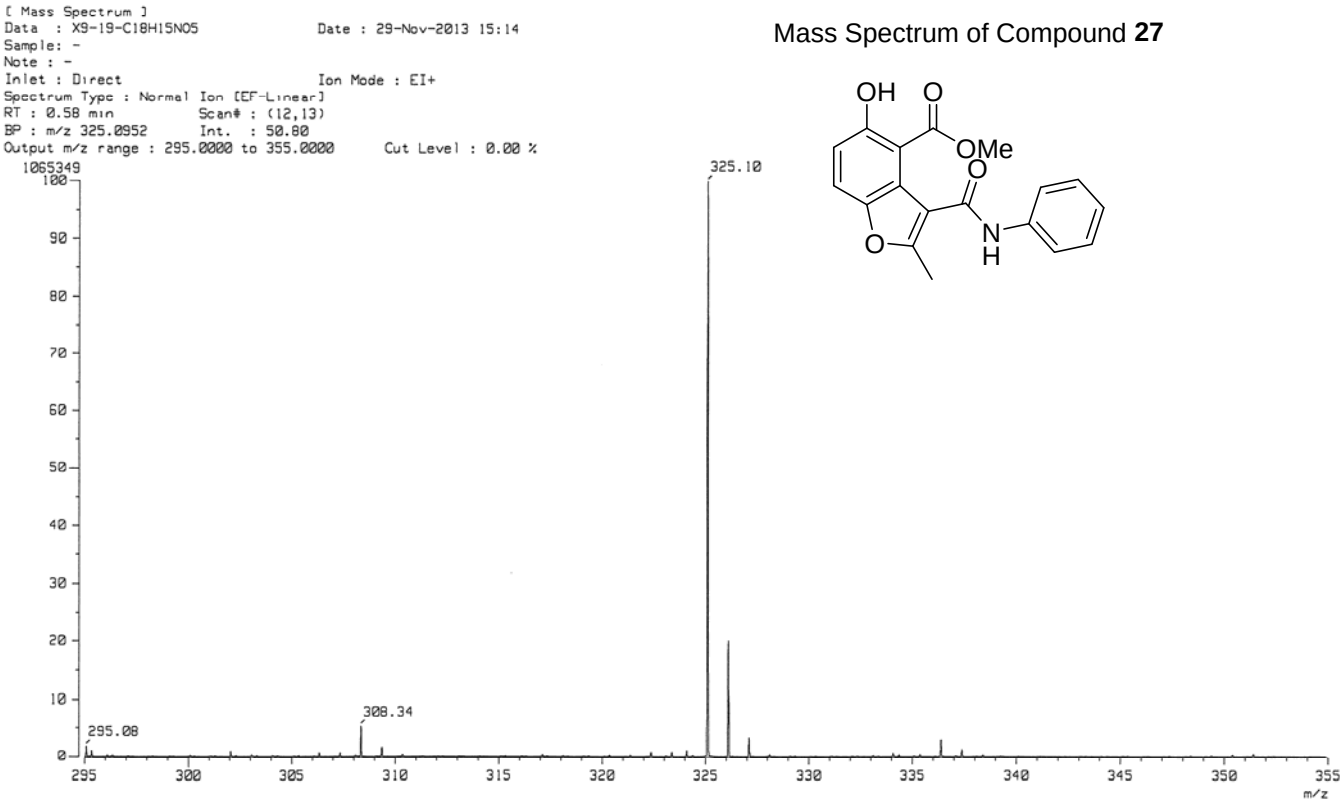
^{13}C NMR of Compound **27**



75 MHz, $CDCl_3$



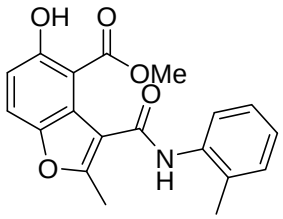
Mass Spectrum of Compound **27**



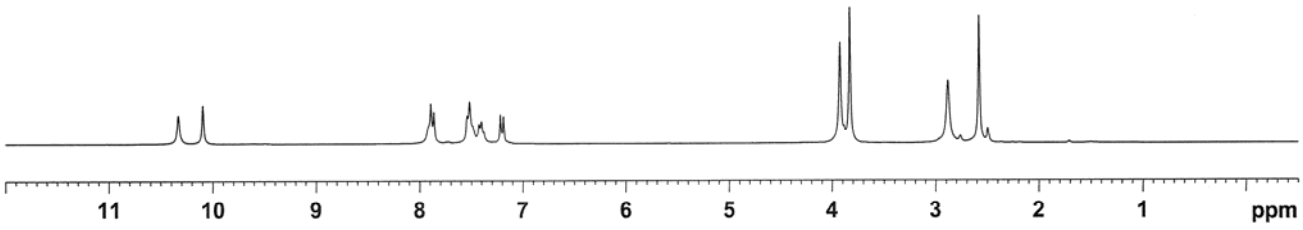
[Elemental Composition] Page: 1
Data : X9-19-C18H15NO5 Date : 29-Nov-2013 15:14
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 0.58 min Scan#: (12,13)
Elements : C 18/0, H 15/0, N 1/0, O 5/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 100.0

Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
325.0952	100.0	+0.4 / +0.1	12.0	C 18 H 15 N O 5
326.0996	20.2			

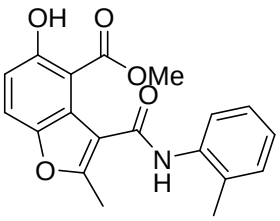
^{1}H NMR of Compound **28**



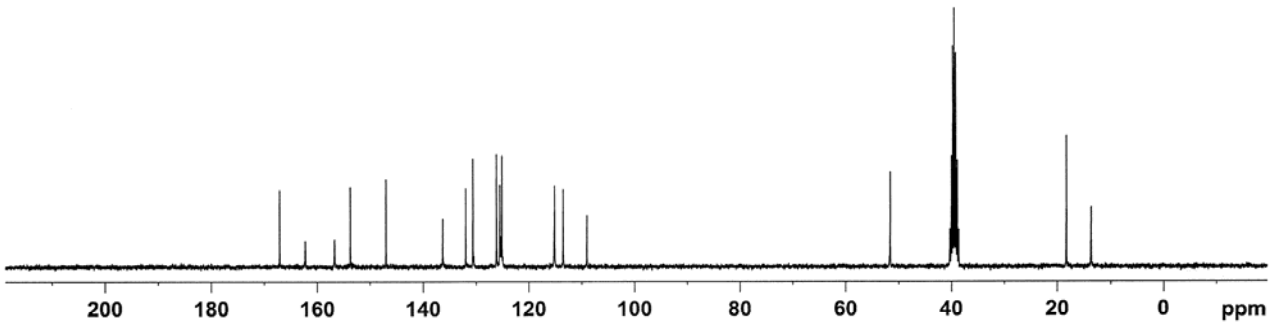
300 MHz, DMSO-d_6



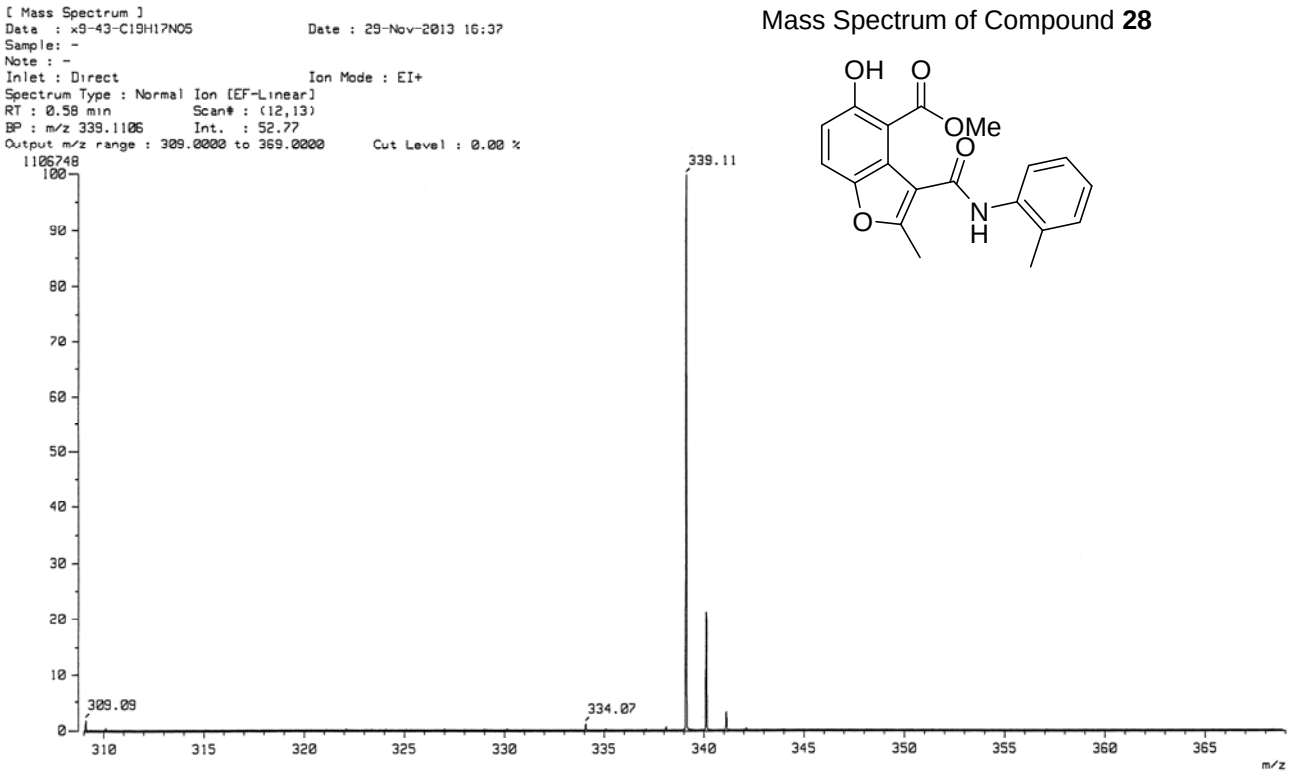
^{13}C NMR of Compound **28**



75 MHz, DMSO-d_6



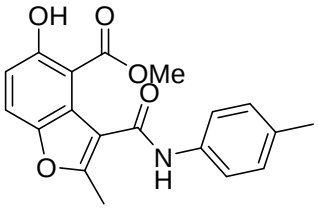
Mass Spectrum of Compound **28**



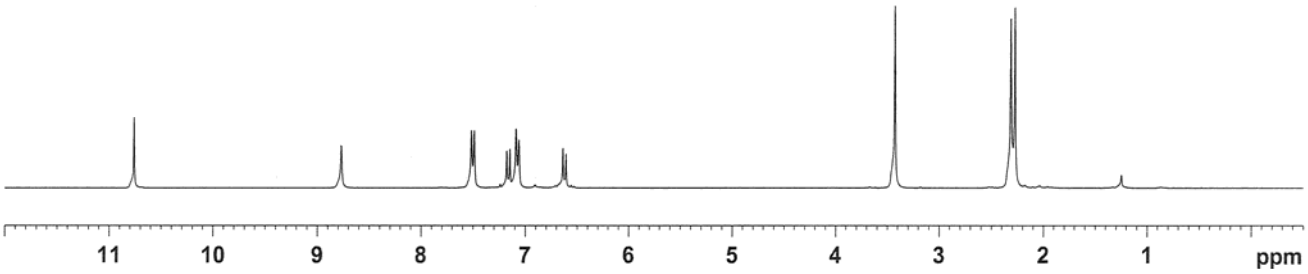
[Elemental Composition] Page: 1
Data : x9-43-C19H17NO5 Date : 29-Nov-2013 16:37
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 0.58 min Scan#: (12,13)
Elements : C 19/0, H 17/0, N 1/0, O 5/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 100.0

Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
339.1106	100.0	-0.3 / -0.1	12.0	C 19 H 17 N O 5
340.1144	21.4			

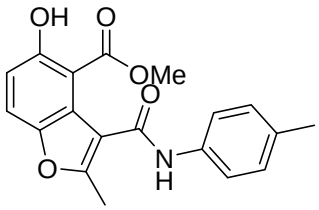
^{1}H NMR of Compound **29**



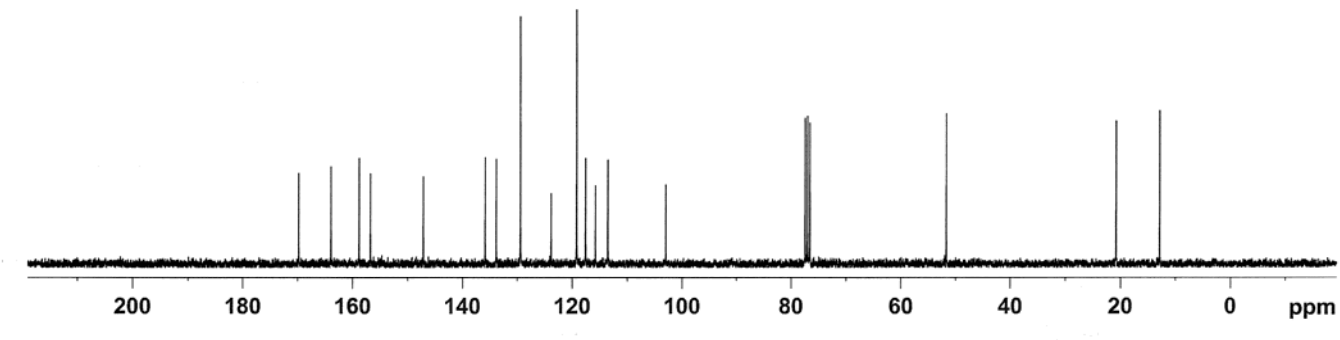
300 MHz, $CDCl_3$



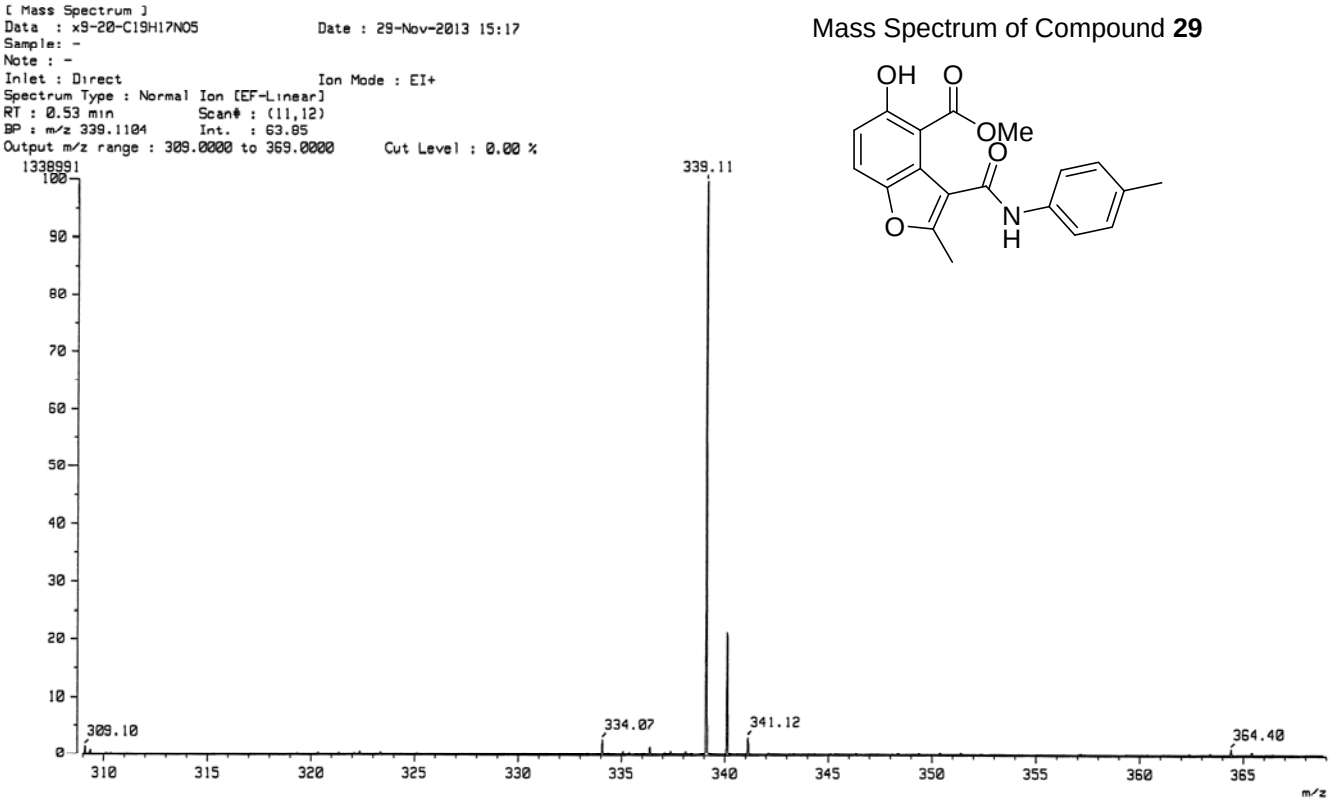
^{13}C NMR of Compound **29**



75 MHz, $CDCl_3$



Mass Spectrum of Compound **29**

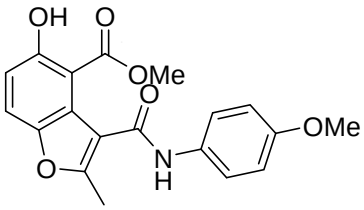


Page: 1

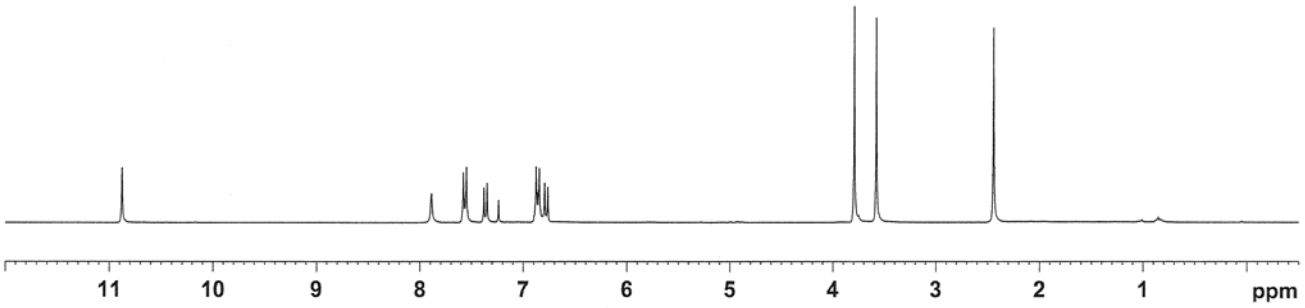
[Elemental Composition]
Data : x9-20-C19H17NO5 Date : 29-Nov-2013 15:17
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 0.53 min Scan#: (11,12)
Elements : C 19/0, H 17/0, N 1/0, O 5/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 100.0

Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
339.1104	100.0	-0.9 / -0.3	12.0	C 19 H 17 N O 5
340.1144	21.4			

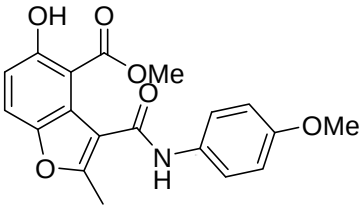
^{1}H NMR of Compound **30**



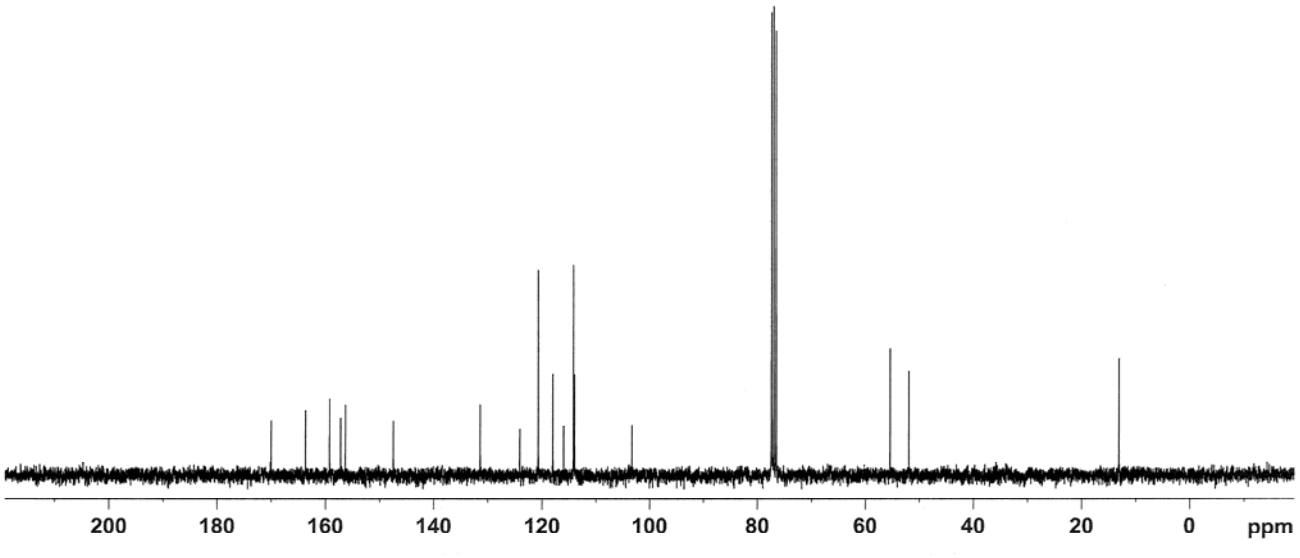
300 MHz, $CDCl_3$



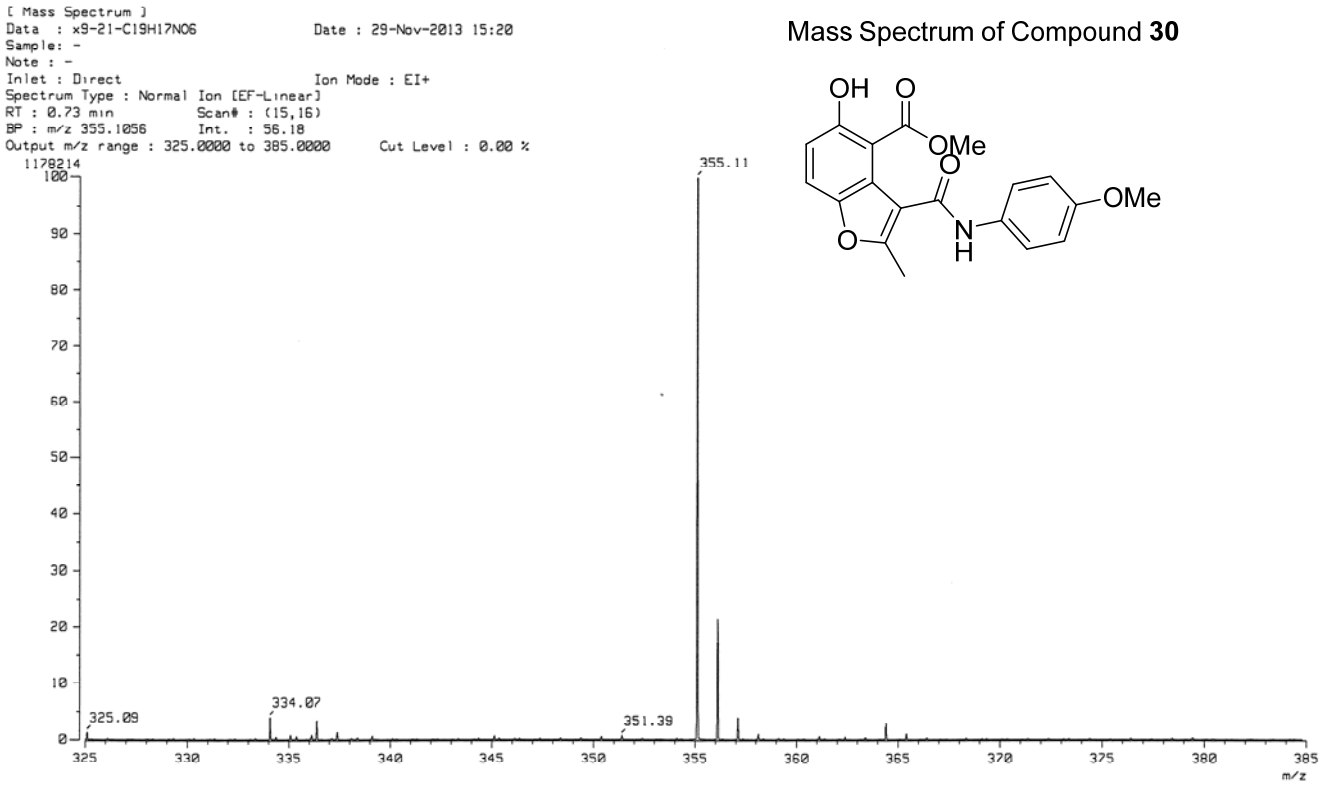
^{13}C NMR of Compound **30**



75 MHz, $CDCl_3$



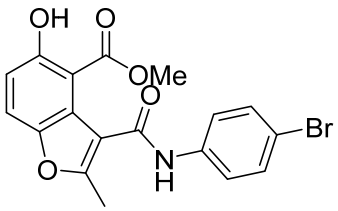
Mass Spectrum of Compound **30**



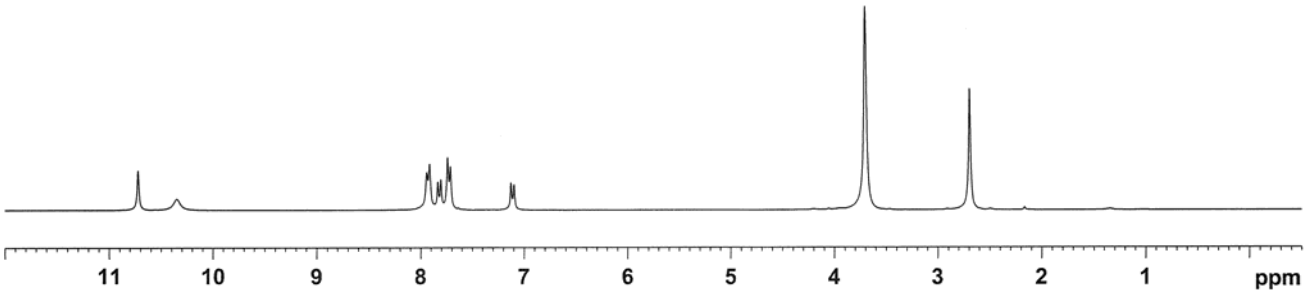
[Elemental Composition] Page: 1
Data : x9-21-C19H17NO6 Date : 29-Nov-2013 15:20
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 0.73 min Scan#: (15,16)
Elements : C 19/0, H 17/0, N 1/0, O 6/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 100.0

Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
355.1056	100.0	+0.1 / +0.0	12.0	C 19 H 17 N O 6
356.1096	21.5			

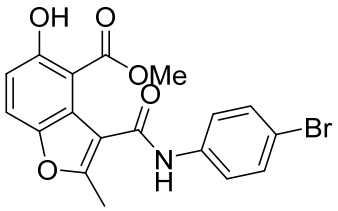
^{1}H NMR of Compound **31**



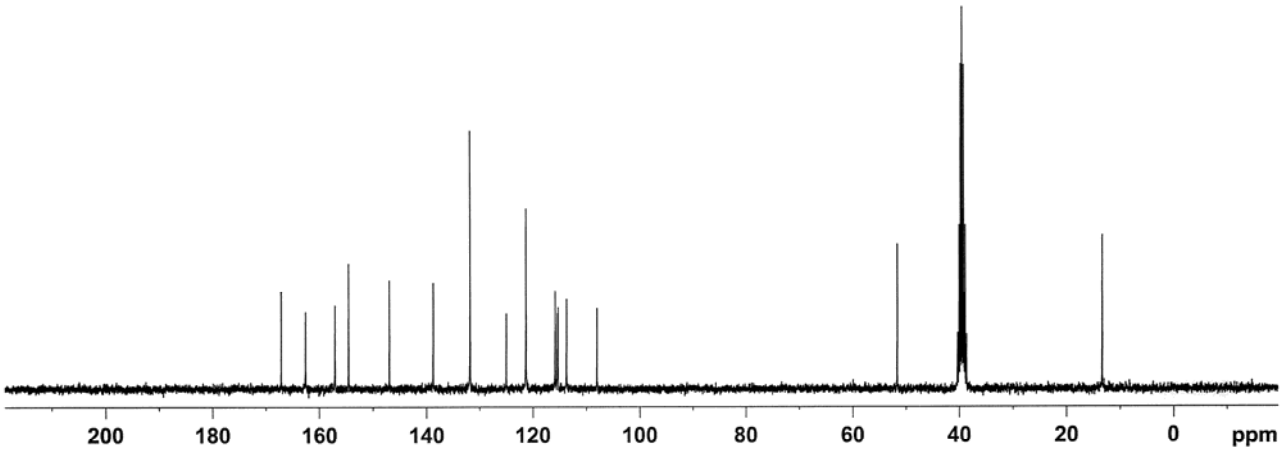
300 MHz, DMSO-d_6



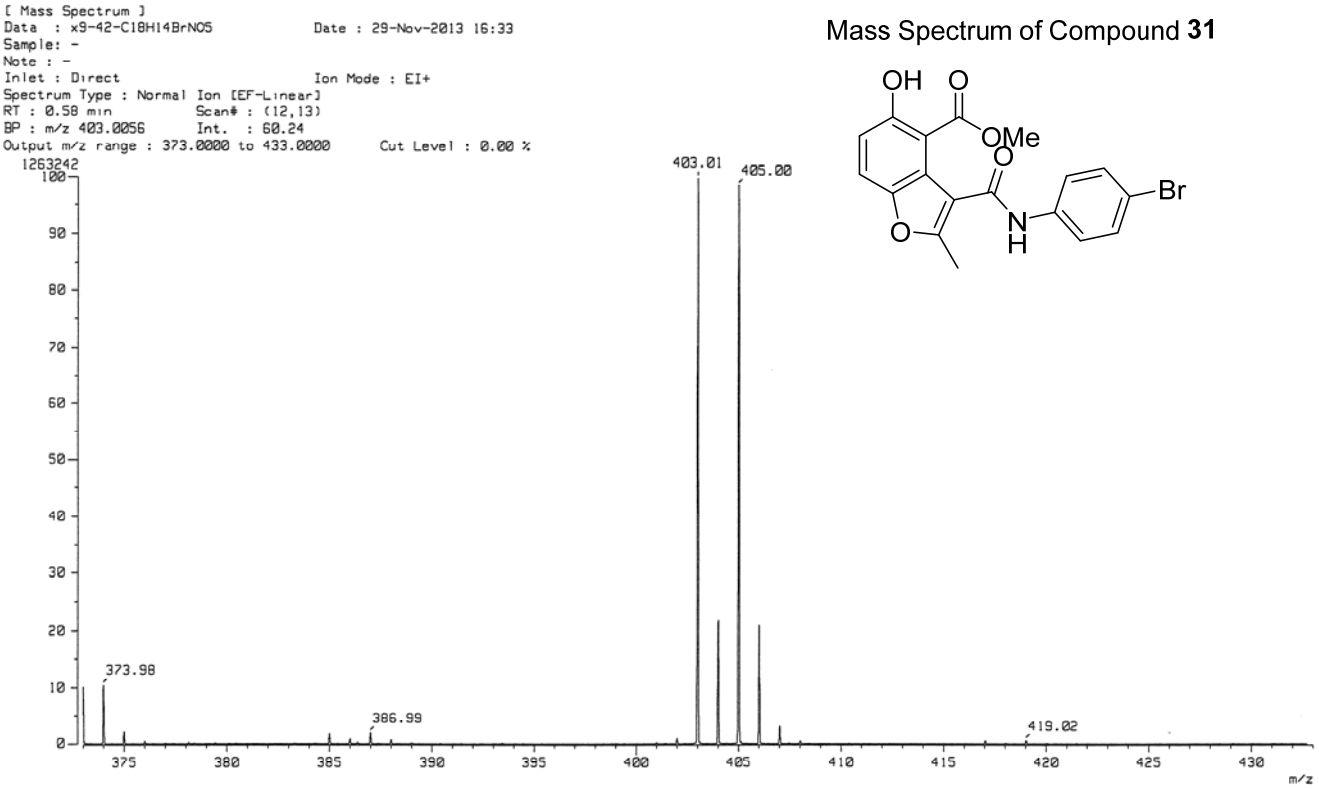
^{13}C NMR of Compound **31**



75 MHz, DMSO-d_6

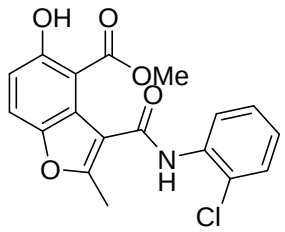


Mass Spectrum of Compound **31**

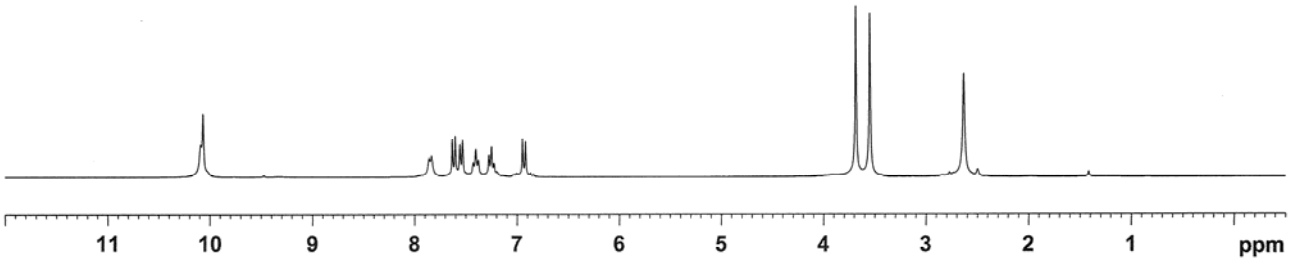



```
[ Elemental Composition ]                                    Page: 1
Data  : x9-42-C18H14BrNO5          Date : 29-Nov-2013 16:33
Sample: -
Note : -
Inlet : Direct                     Ion Mode : EI+
RT : 0.58 min                      Scan#: (12,13)
Elements : C 18/0, H 14/0, Br 1/0, N 1/0, O 5/0
Mass Tolerance      : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 100.0

Observed m/z Int%   Err[ppm / mmu]    U.S.  Composition
  373.9843    10.5

  403.0056   100.0     +0.1 /  +0.1   12.0  C 18 H 14 Br N O 5

  404.0078    22.0

  405.0044    98.7

  406.0074    21.1
```

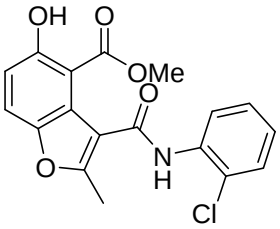
^{1}H NMR of Compound **32**



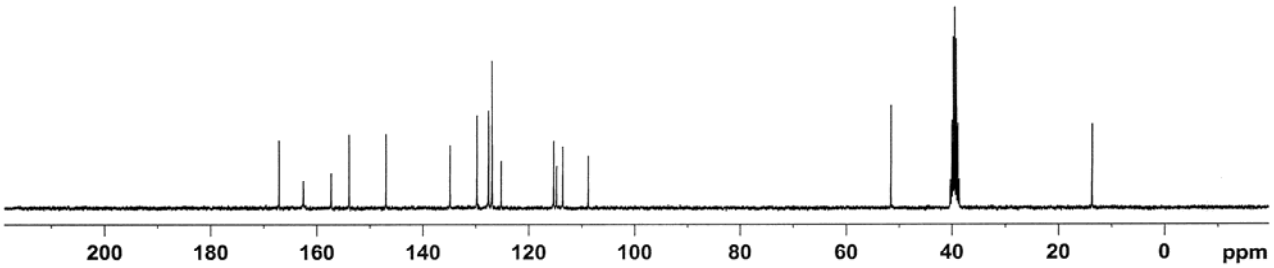
300 MHz, DMSO-d_6



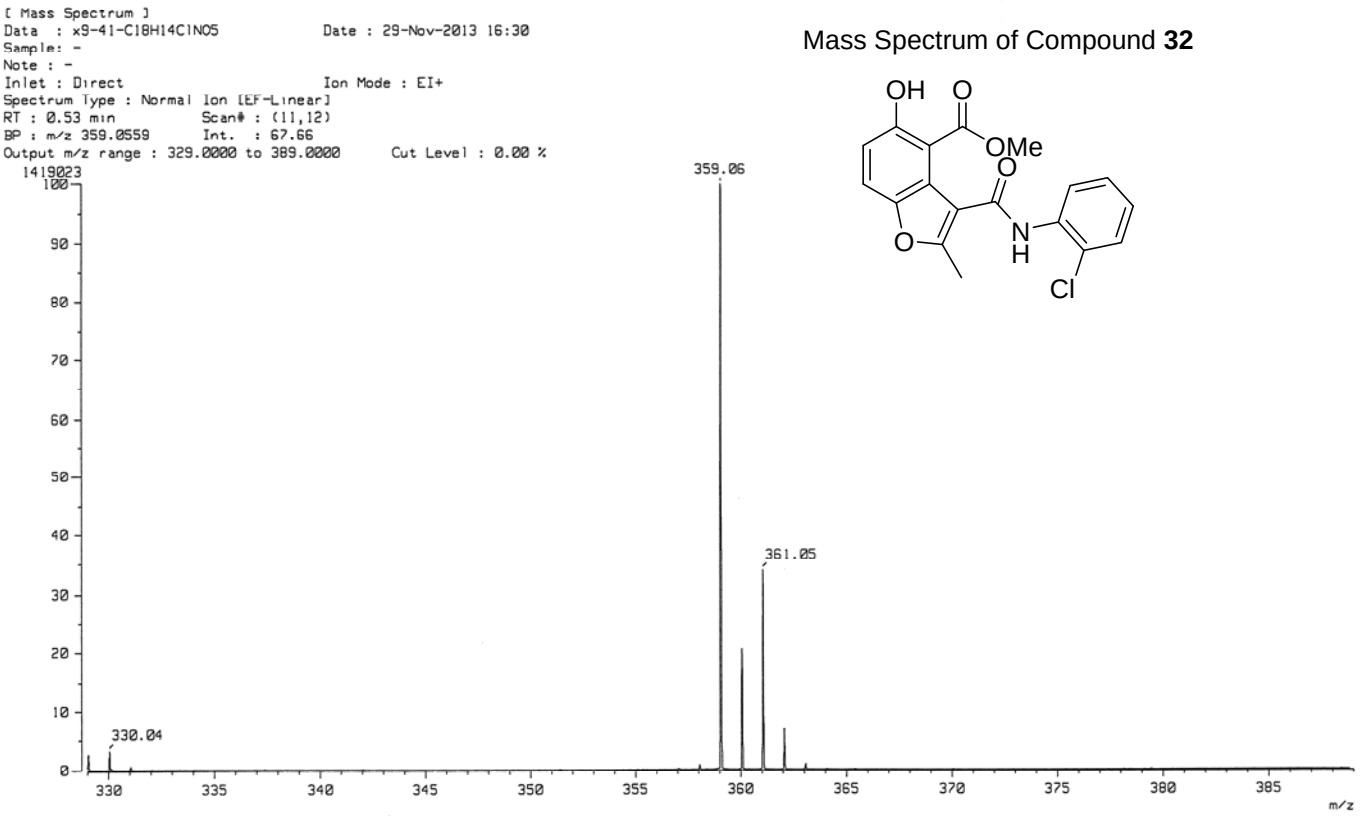
^{13}C NMR of Compound **32**



75 MHz, DMSO-d_6



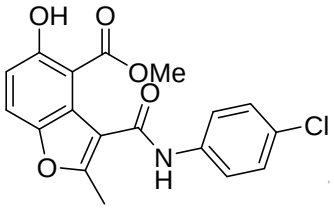
Mass Spectrum of Compound **32**



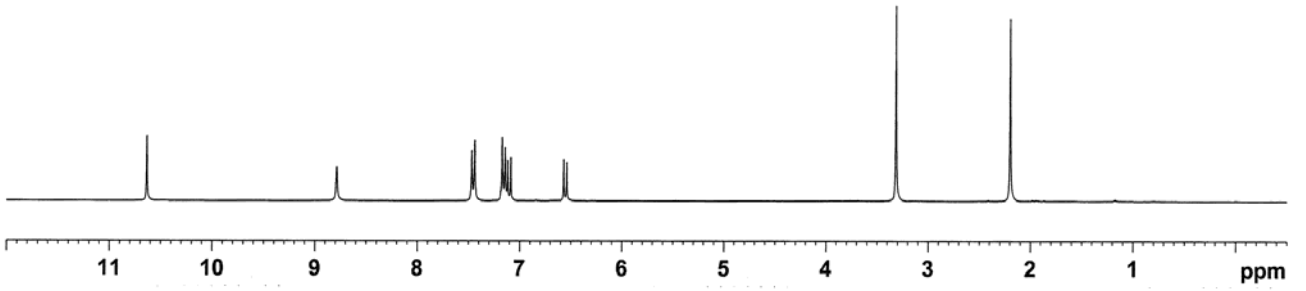
[Elemental Composition] Page: 1
Data : x9-41-C18H14ClNO5 Date : 29-Nov-2013 16:30
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 0.53 min Scan#: (11,12)
Elements : C 18/0, H 14/0, Cl 1/0, N 1/0, O 5/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 100.0

Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
359.0559	100.0	-0.3 / -0.1	12.0	C 18 H 14 Cl N O 5
360.0593	20.6			
361.0546	34.0			

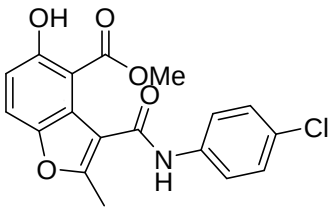
^{1}H NMR of Compound **33**



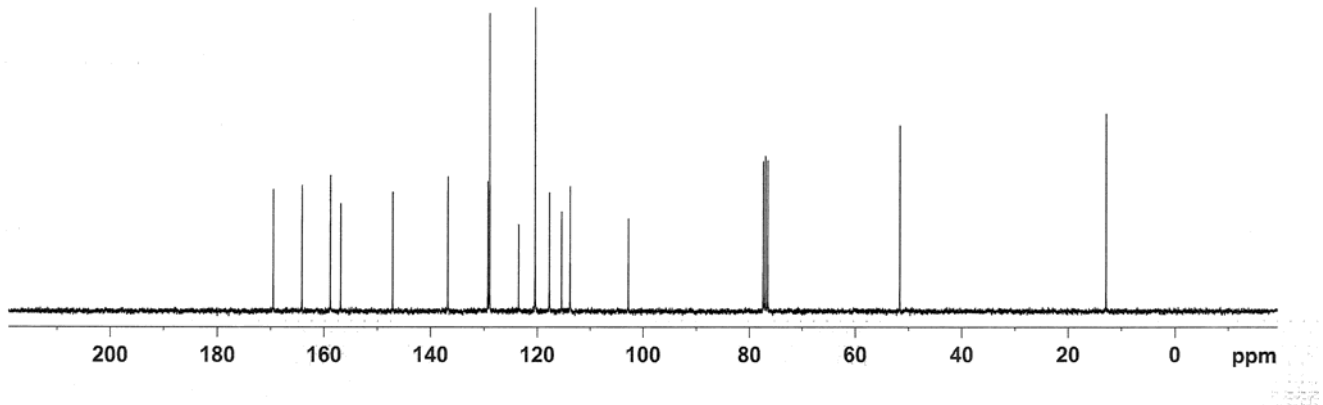
300 MHz, $CDCl_3$



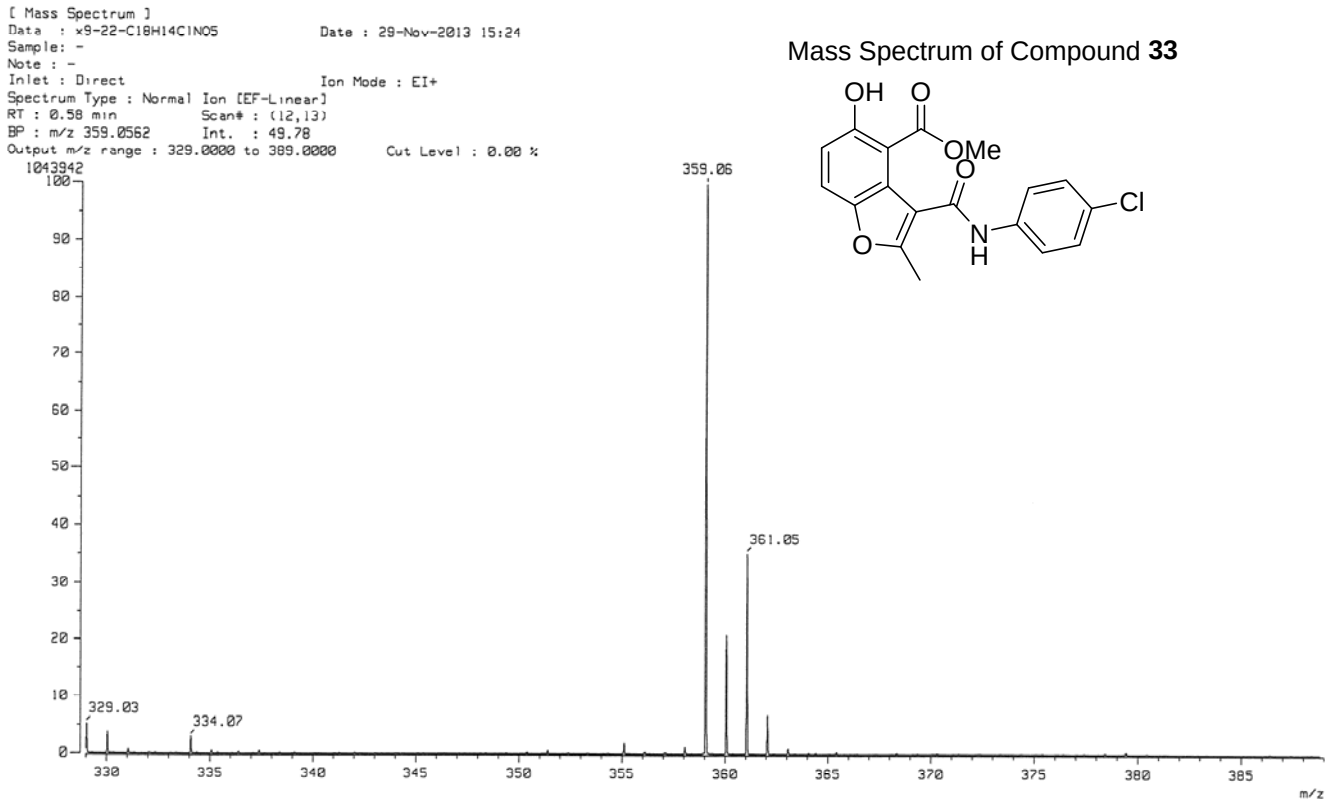
^{13}C NMR of Compound **33**



75 MHz, $CDCl_3$



Mass Spectrum of Compound **33**



[Elemental Composition] Page: 1

Data : x9-22-C18H14ClNO5 Date : 29-Nov-2013 15:24

Sample: -

Note : -

Inlet : Direct Ion Mode : EI+

RT : 0.58 min Scan#: (12,13)

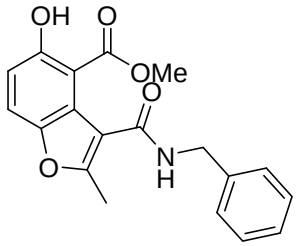
Elements : C 18/0, H 14/0, Cl 1/0, N 1/0, O 5/0

Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3

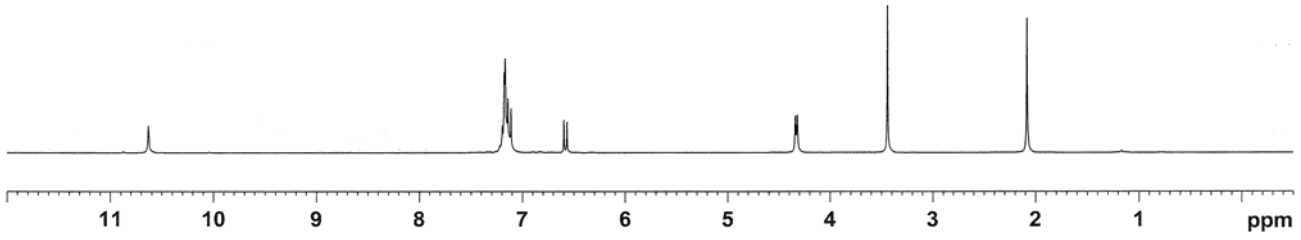
Unsaturation (U.S.) : -0.5 - 100.0

Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
359.0562	100.0	+0.5 / +0.2	12.0	C 18 H 14 Cl N O 5
360.0583	21.1			
361.0533	35.2			

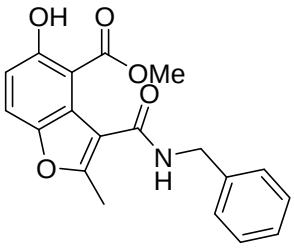
^{1}H NMR of Compound **34**



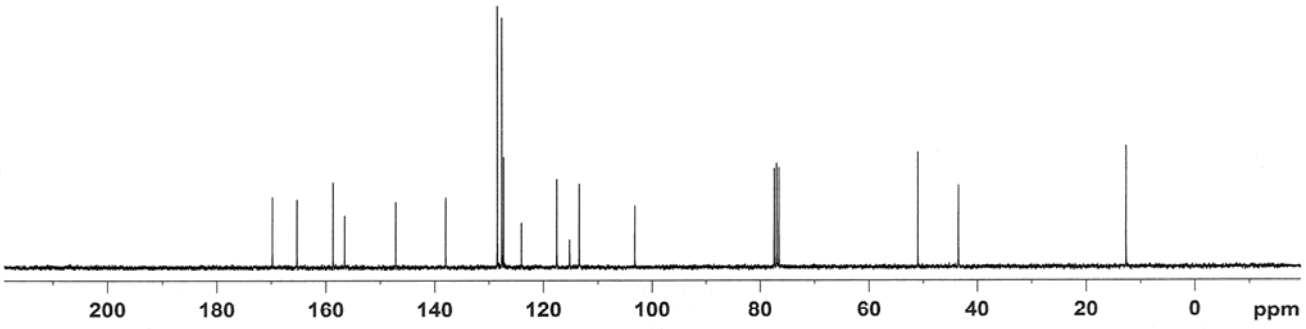
300 MHz, $CDCl_3$



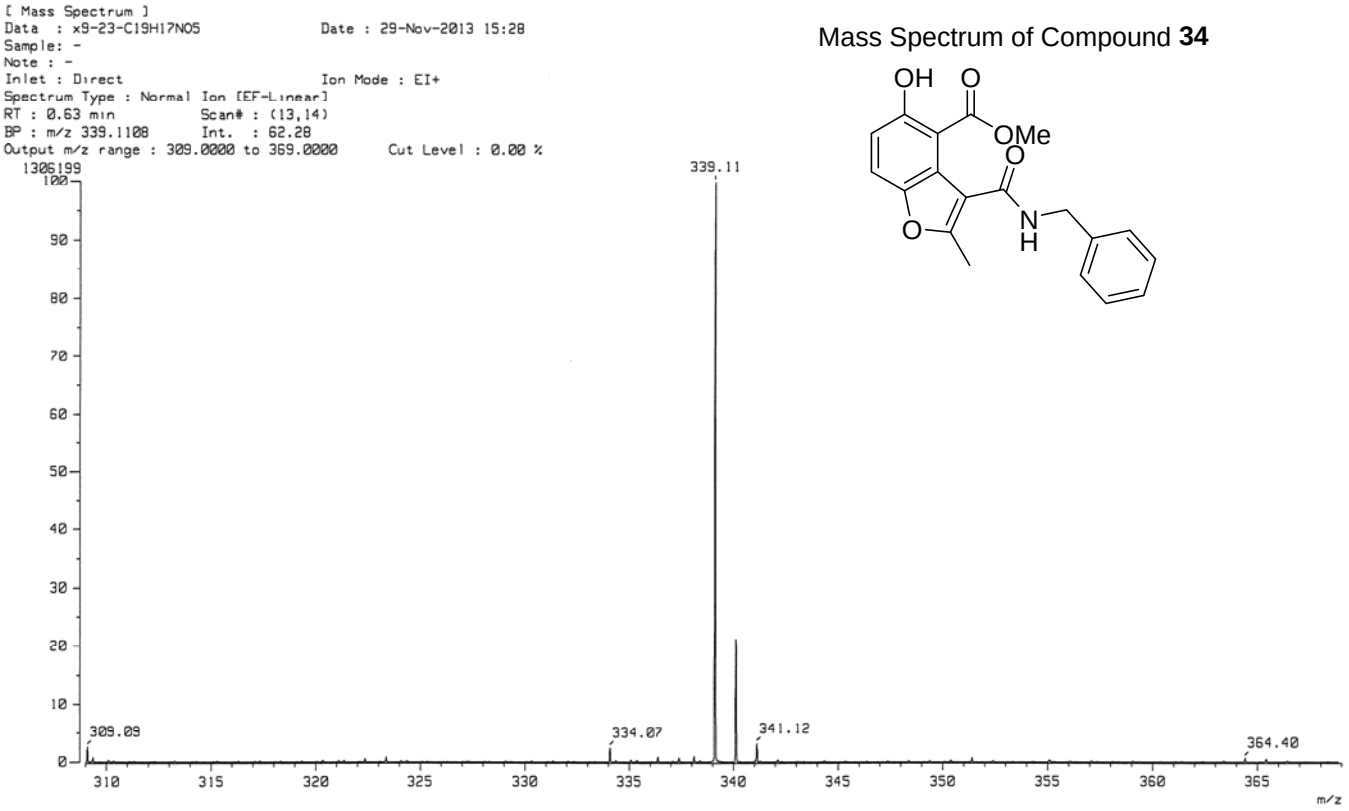
^{13}C NMR of Compound **34**



75 MHz, $CDCl_3$



Mass Spectrum of Compound **34**

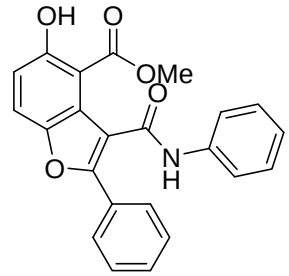


Page: 1

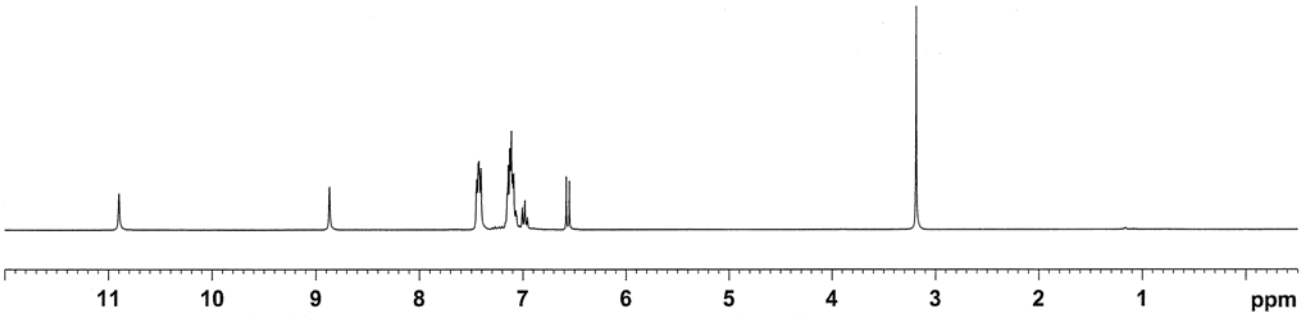
[Elemental Composition]
Data : x9-23-C19H17NO5 Date : 29-Nov-2013 15:28
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 0.63 min Scan#: (13,14)
Elements : C 19/0, H 17/0, N 1/0, O 5/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 100.0

Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
339.1108	100.0	+0.4 / +0.1	12.0	C 19 H 17 N O 5
340.1134	21.2			

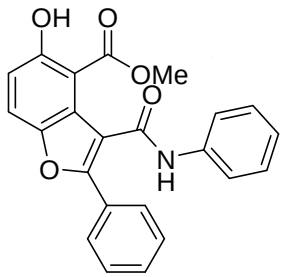
^{1}H NMR of Compound **35**



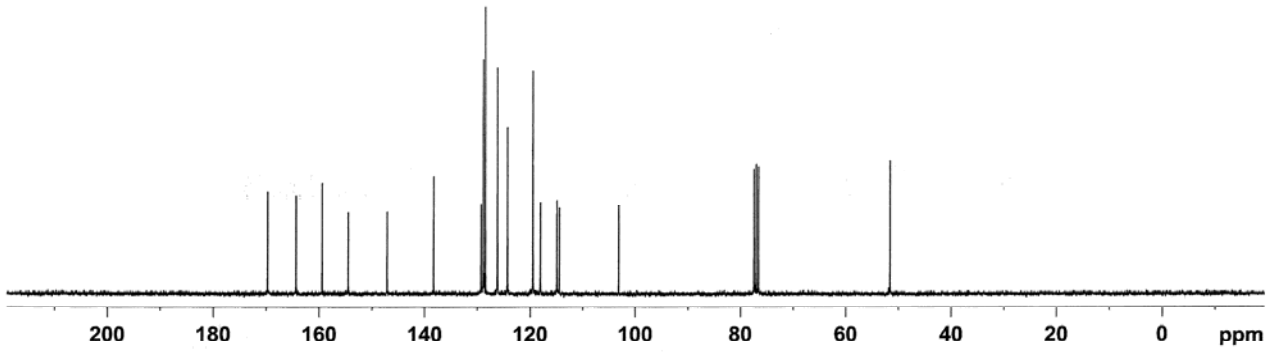
300 MHz, $CDCl_3$



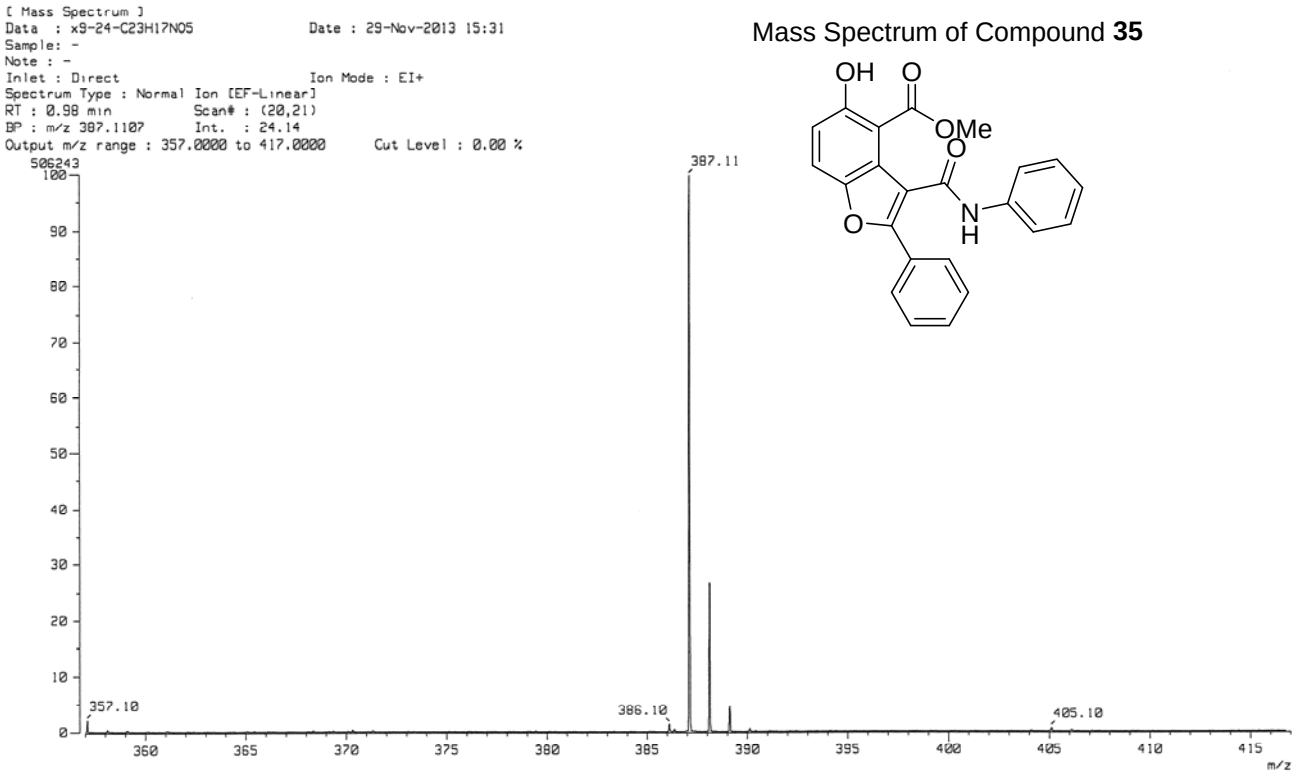
^{13}C NMR of Compound **35**



75 MHz, $CDCl_3$



Mass Spectrum of Compound **35**

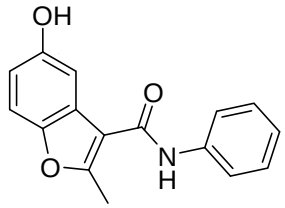


Page: 1

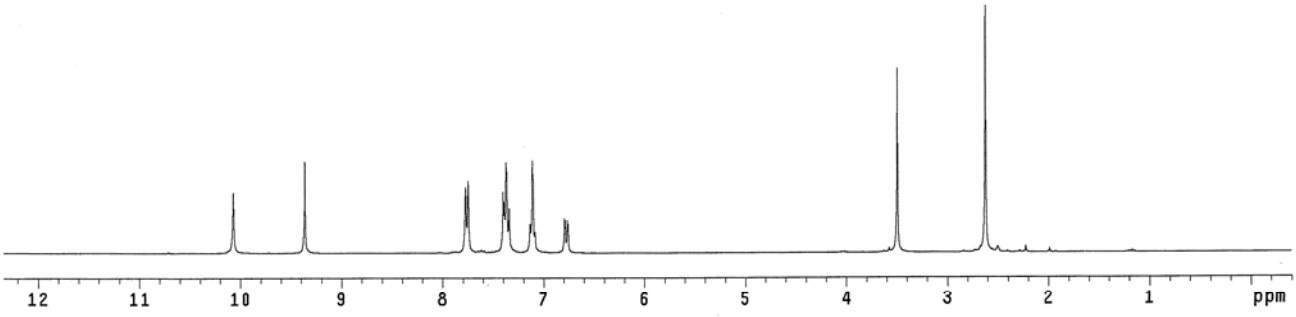
[Elemental Composition]
Data : x9-24-C23H17NO5 Date : 29-Nov-2013 15:31
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 0.98 min Scan#: (20,21)
Elements : C 23/0, H 17/0, N 1/0, O 5/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 100.0

Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
387.1107	100.0	+0.2 / +0.1	16.0	C 23 H 17 N O 5
388.1141	26.8			

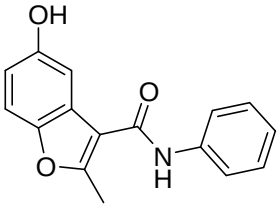
^{1}H NMR of Compound **36**



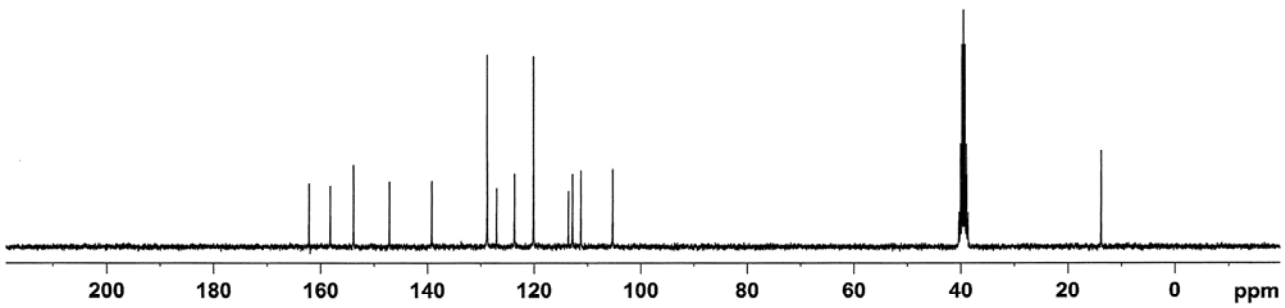
300 MHz, DMSO-d_6



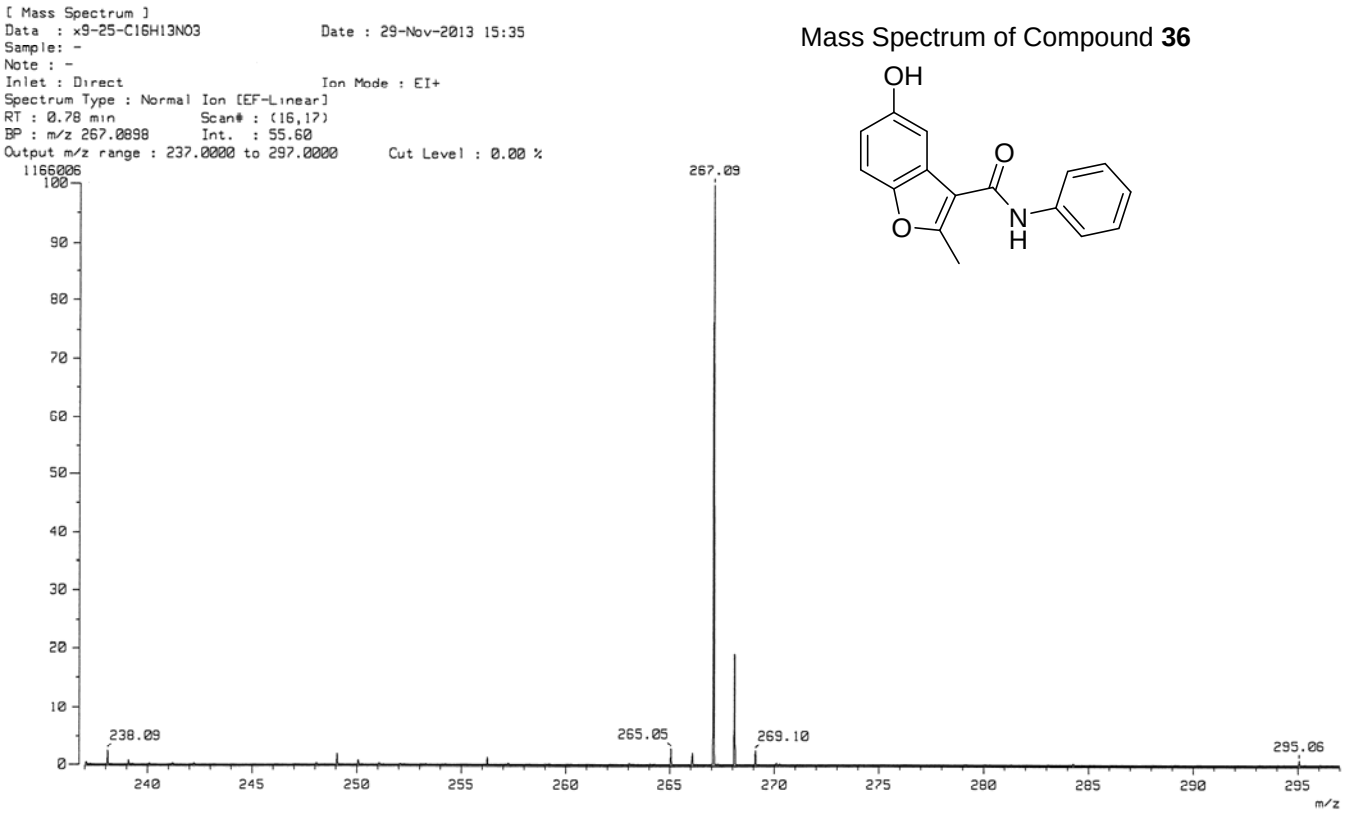
^{13}C NMR of Compound **36**



75 MHz, DMSO-d_6



Mass Spectrum of Compound **36**

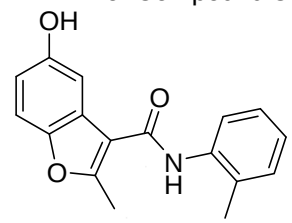


Page: 1

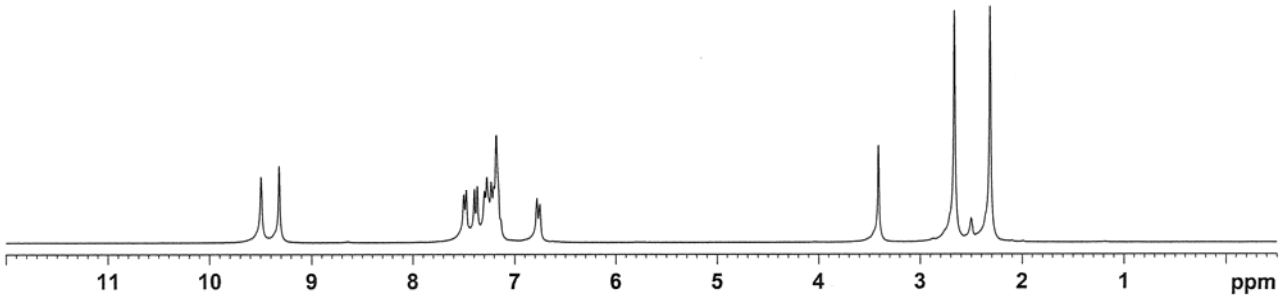
[Elemental Composition]
Data : x9-25-C16H13NO3 Date : 29-Nov-2013 15:35
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 0.78 min Scan#: (16,17)
Elements : C 16/0, H 13/0, N 1/0, O 3/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 100.0

Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
267.0898	100.0	+1.0 / +0.3	11.0	C 16 H 13 N O 3
268.0929	19.2			

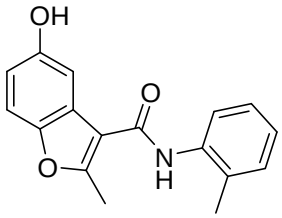
^{1}H NMR of Compound **37**



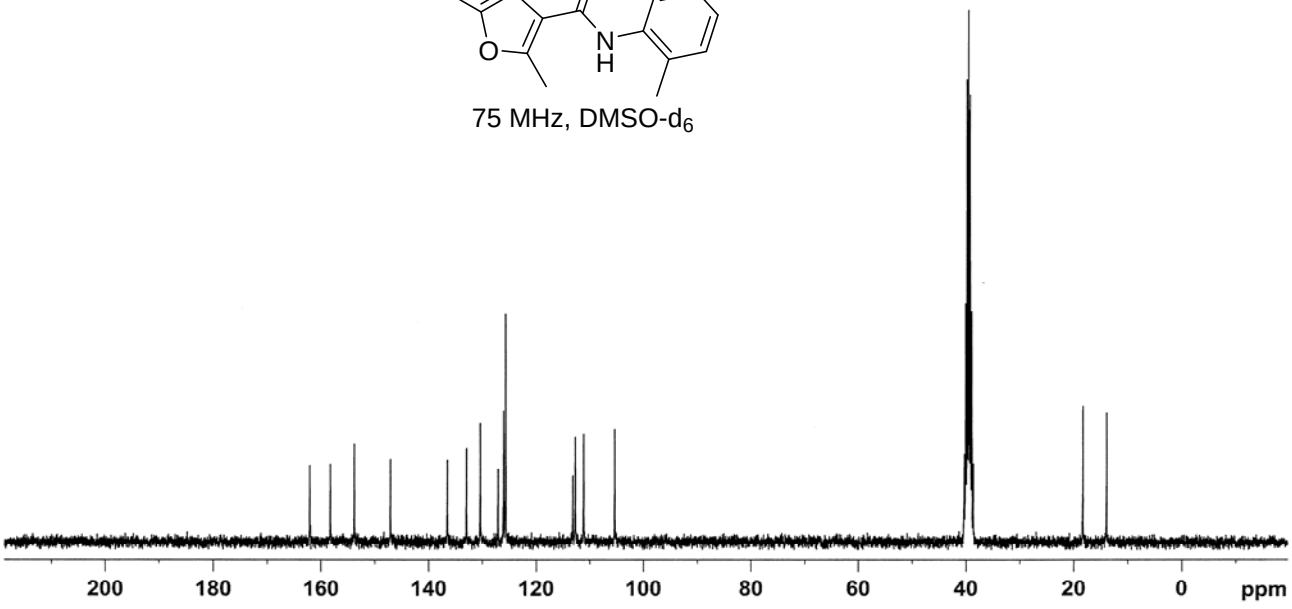
300 MHz, DMSO-d_6



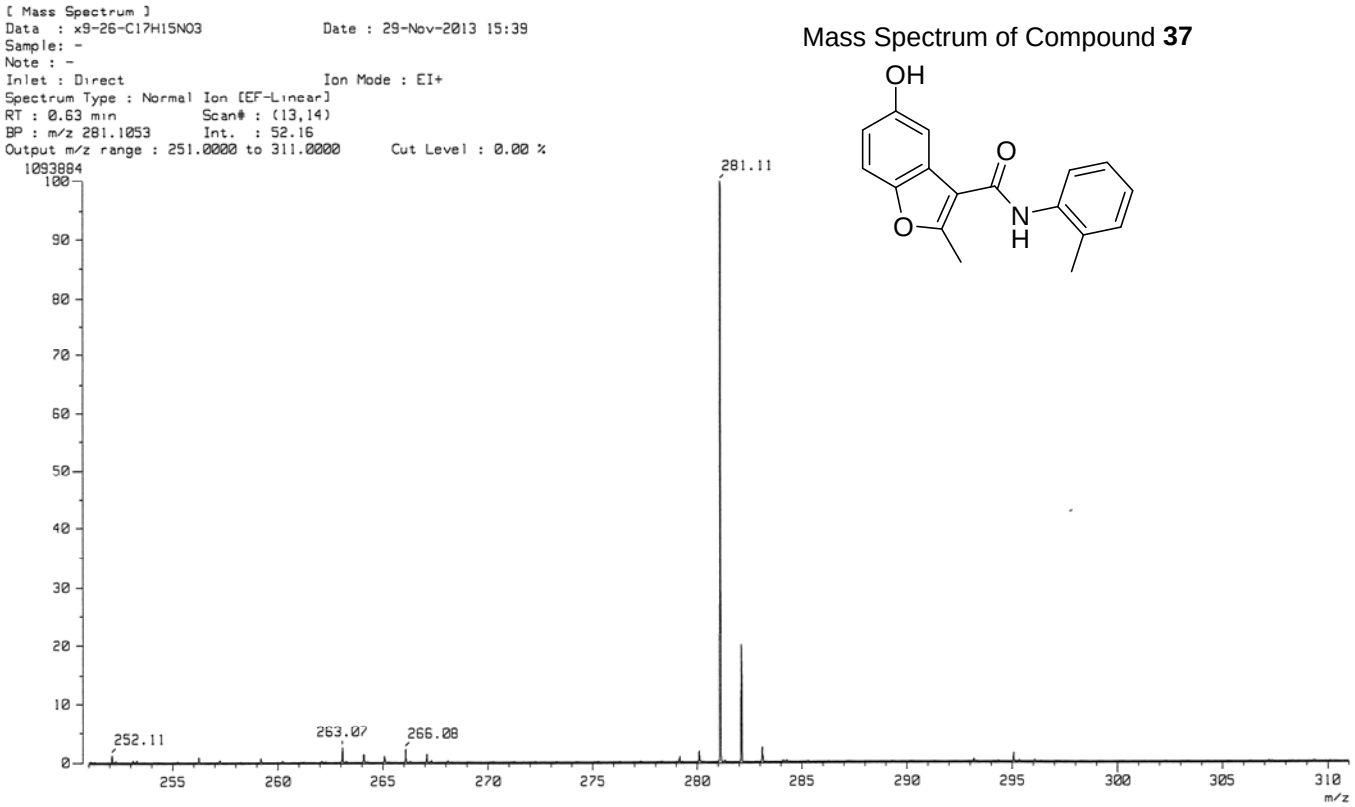
^{13}C NMR of Compound **37**



75 MHz, DMSO-d_6



Mass Spectrum of Compound **37**



[Elemental Composition] Page: 1

Data : x9-26-C17H15NO3 Date : 29-Nov-2013 15:39

Sample: -

Note : -

Inlet : Direct Ion Mode : EI+

RT : 0.63 min Scan#: (13,14)

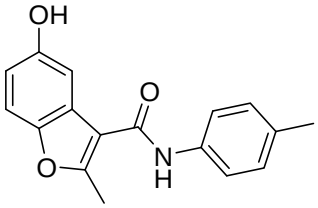
Elements : C 17/0, H 15/0, N 1/0, O 3/0

Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3

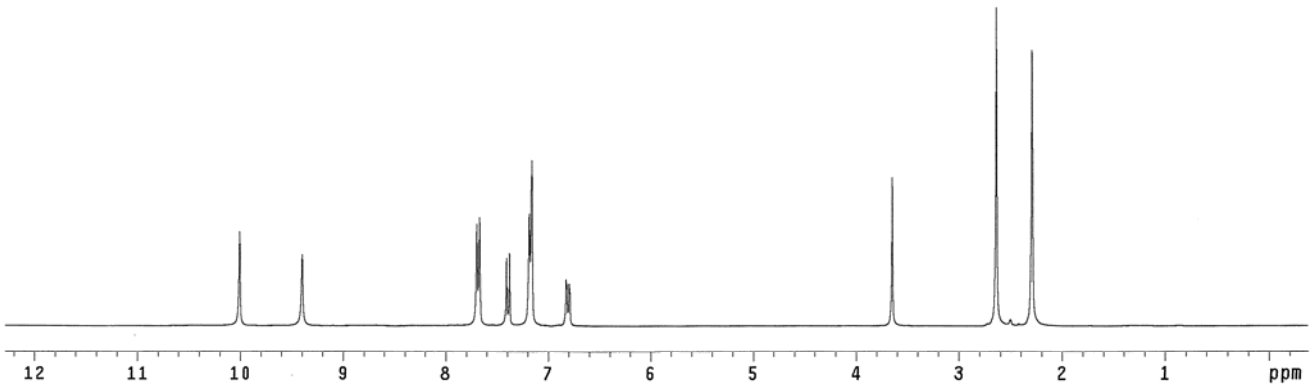
Unsaturation (U.S.) : -0.5 - 100.0

Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
281.1053	100.0	+0.5 / +0.2	11.0	C 17 H 15 N O 3
282.1097	20.1			

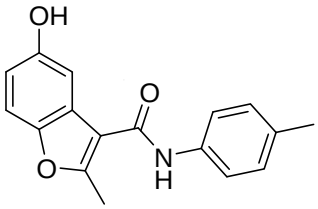
^{1}H NMR of Compound **38**



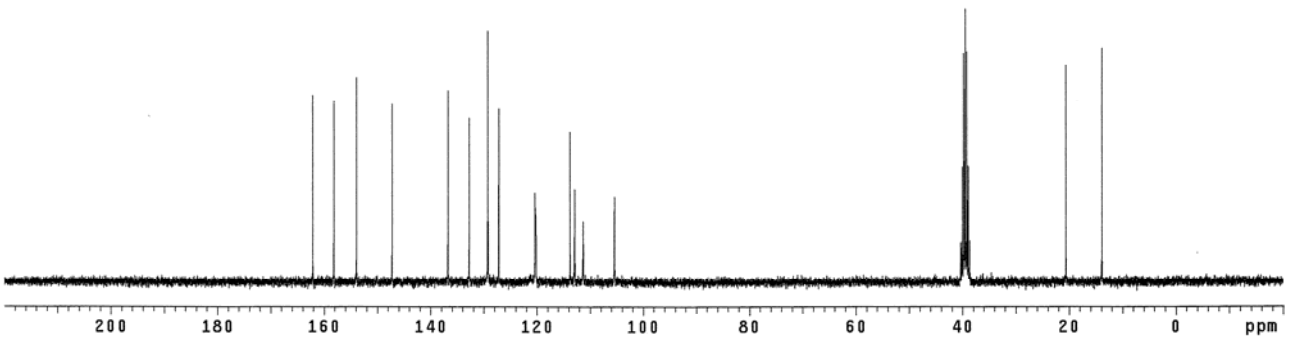
300 MHz, $CDCl_3$



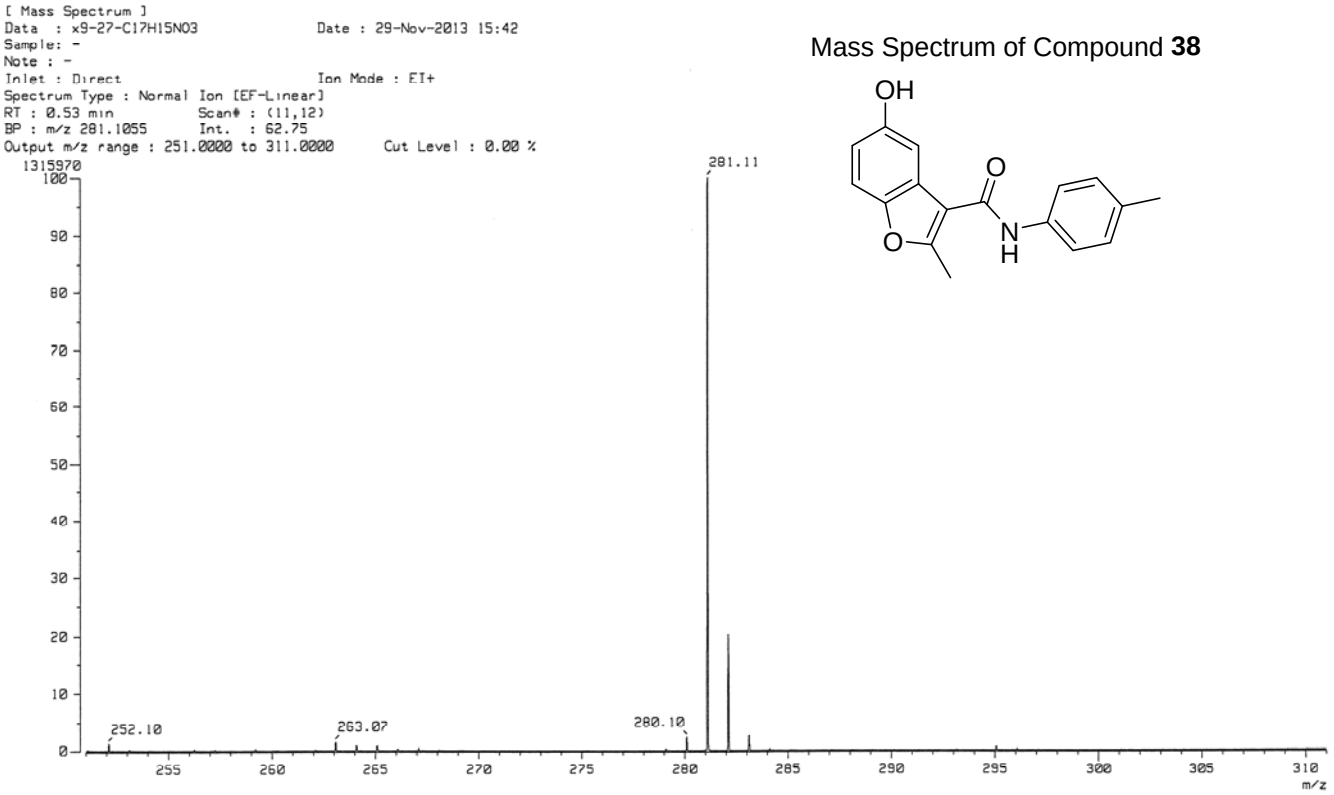
^{13}C NMR of Compound **38**



75 MHz, $CDCl_3$



Mass Spectrum of Compound **38**



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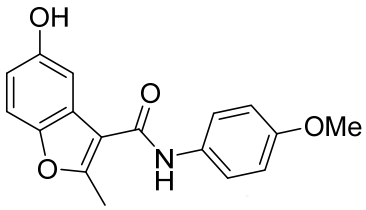
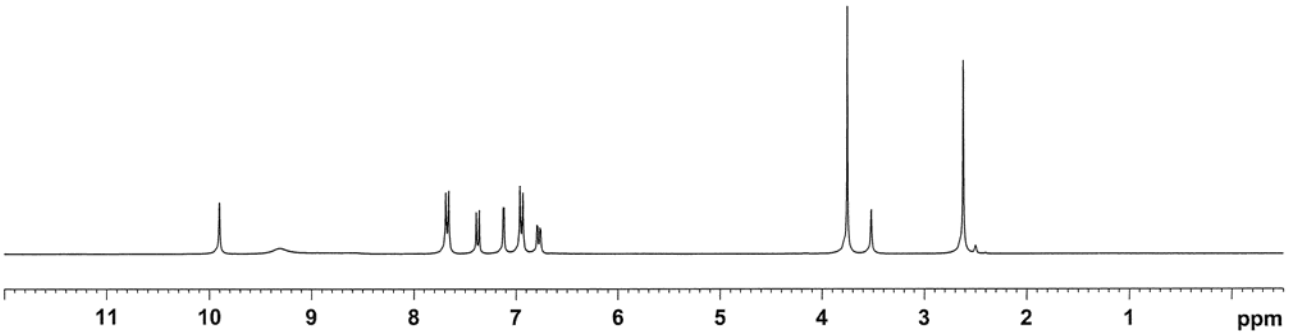
[Elemental Composition]
Data : x9-27-C17H15NO3
Date : 29-Nov-2013 15:42
Sample: -
Note : -
Inlet : Direct
Ion Mode : EI+
RT : 0.53 min
Scan#: (11,12)
Elements : C 17/0, H 15/0, N 1/0, O 3/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 100.0

Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
281.1055	100.0	+1.1 / +0.3	11.0	C 17 H 15 N O 3
282.1086	20.2			

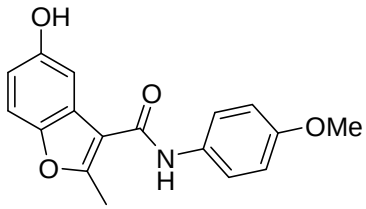
^{1}H NMR of Compound **39**



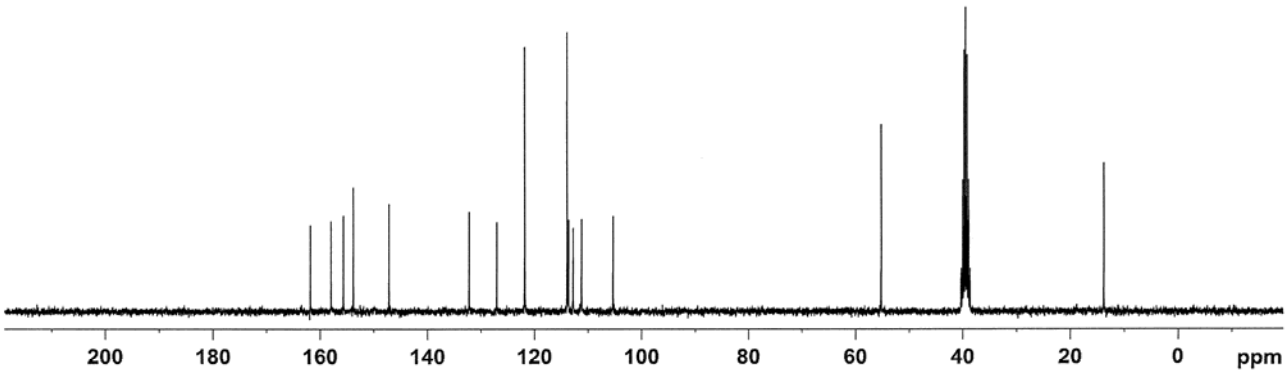
300 MHz, DMSO-d_6



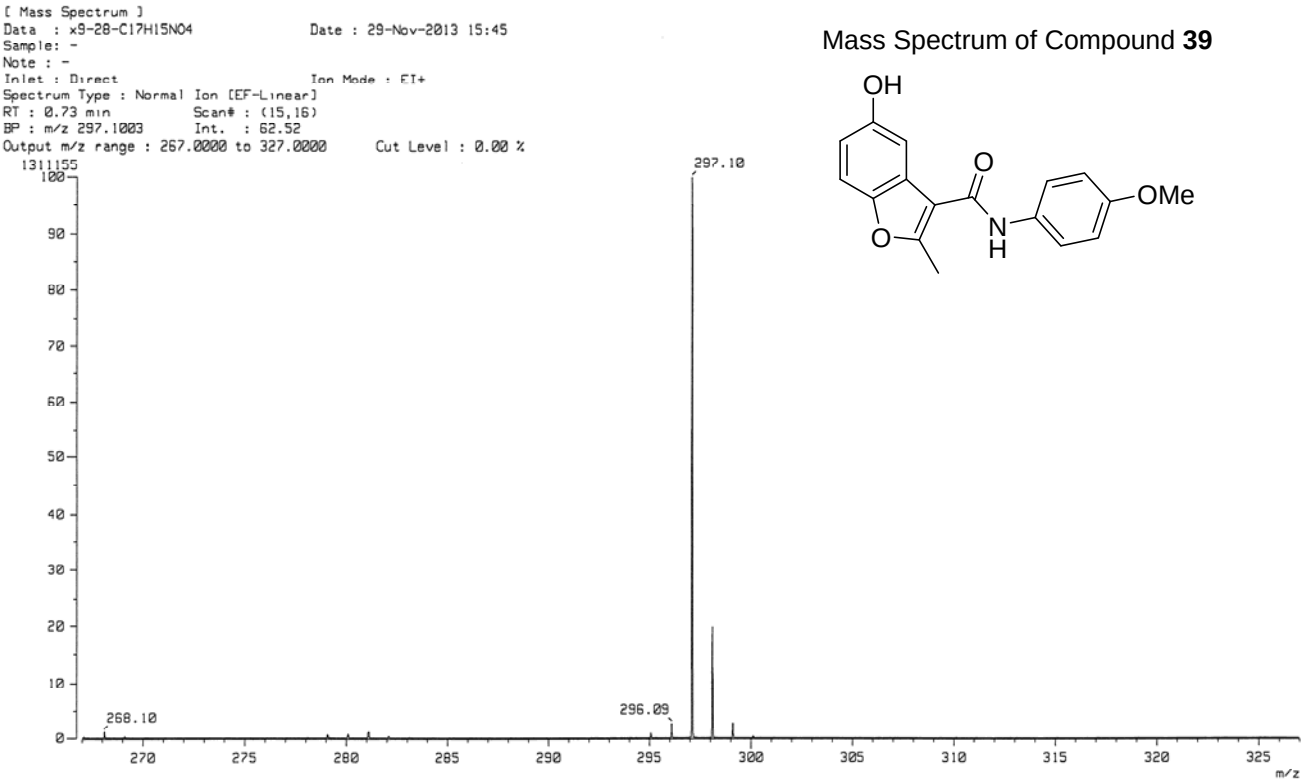
^{13}C NMR of Compound **39**



75 MHz, DMSO-d_6



Mass Spectrum of Compound **39**



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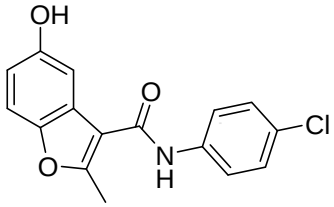
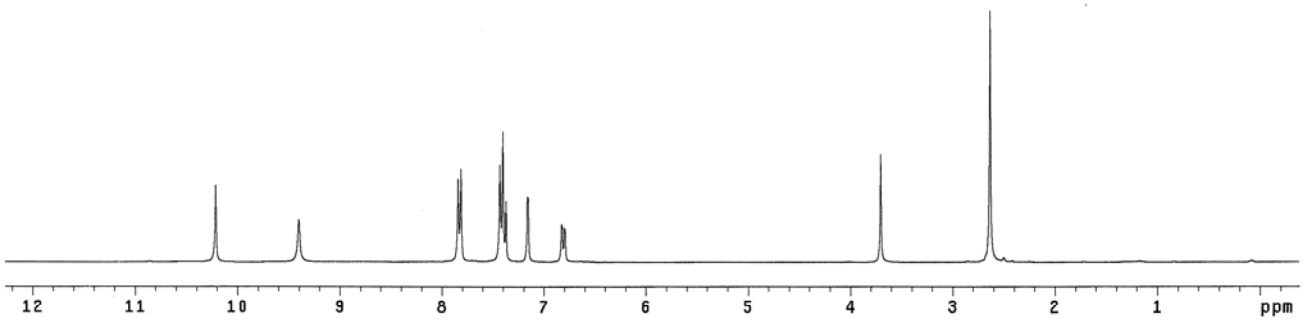
[Elemental Composition]
Data : x9-28-C17H15NO4 Date : 29-Nov-2013 15:45
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 0.73 min Scan#: (15,16)
Elements : C 17/0, H 15/0, N 1/0, O 4/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 100.0

Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
297.1003	100.0	+0.5 / +0.1	11.0	C 17 H 15 N O 4
298.1026	19.8			

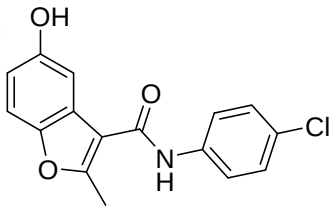
^{1}H NMR of Compound **40**



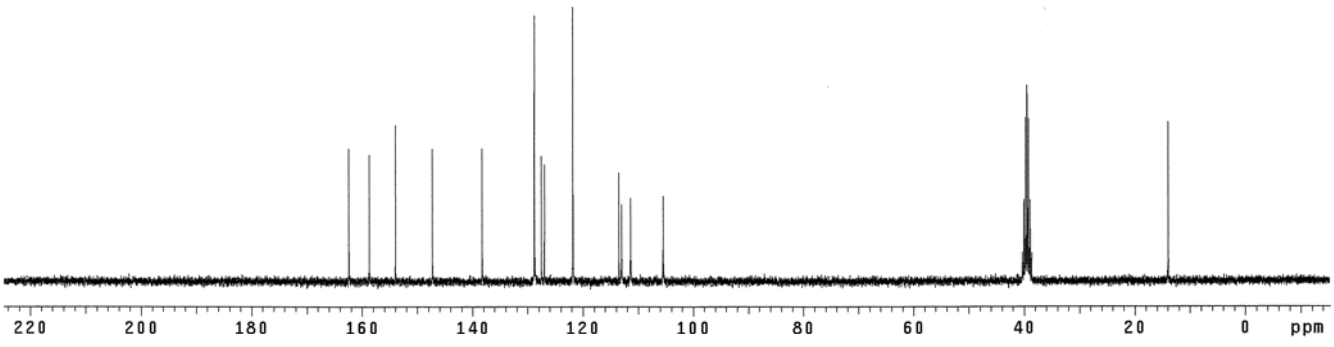
600 MHz, DMSO-d_6



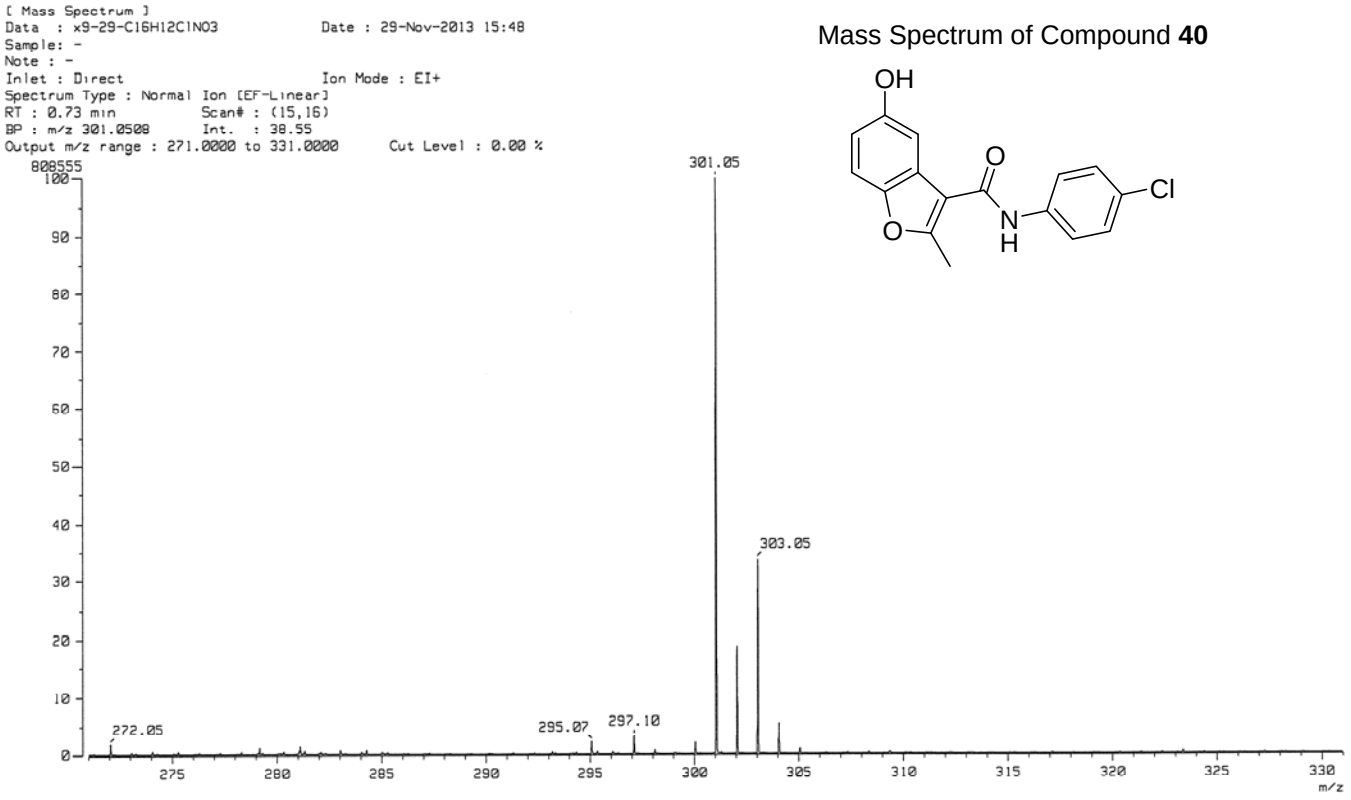
^{13}C NMR of Compound **40**



150 MHz, DMSO-d_6



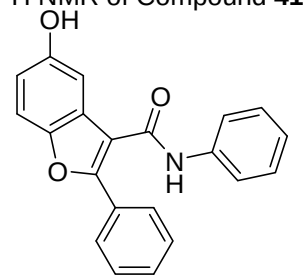
Mass Spectrum of Compound **40**



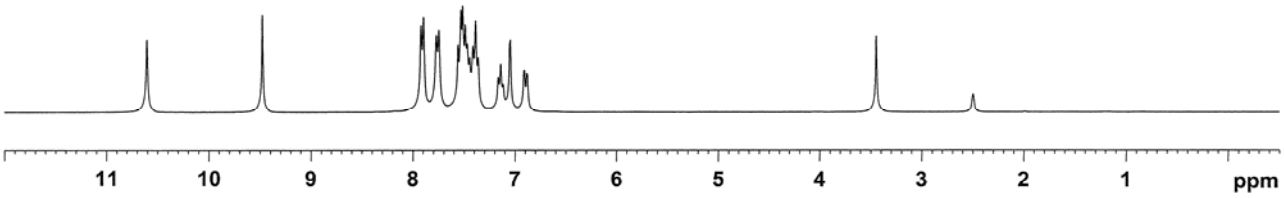
[Elemental Composition] Page: 1
Data : x9-29-C16H12ClNO3 Date : 29-Nov-2013 15:48
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 0.73 min Scan#: (15,16)
Elements : C 16/0, H 12/0, Cl 1/0, N 1/0, O 3/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 100.0

Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
301.0508	100.0	+0.7 / +0.2	11.0	C 16 H 12 Cl N O 3
302.0544	18.9			
303.0491	33.9			

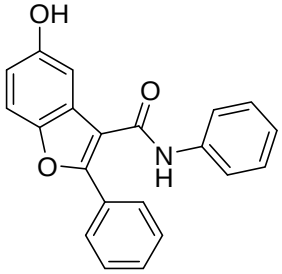
^{1}H NMR of Compound **41**



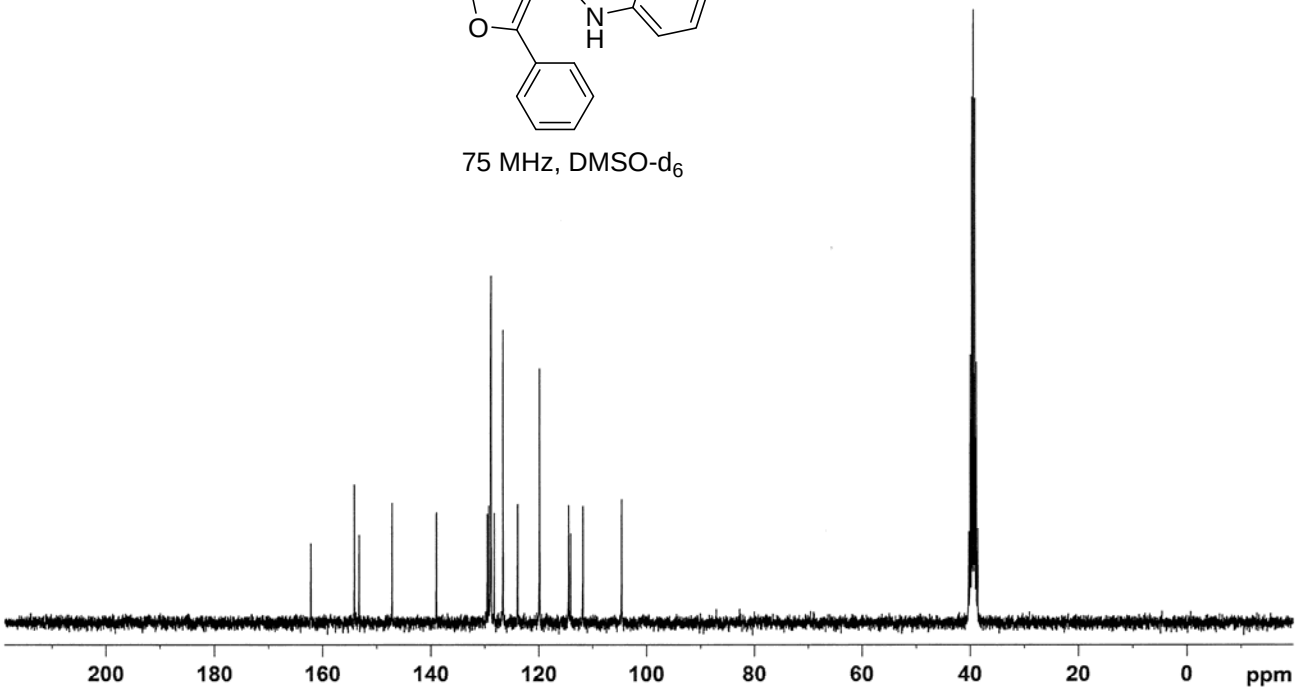
300 MHz, DMSO-d_6



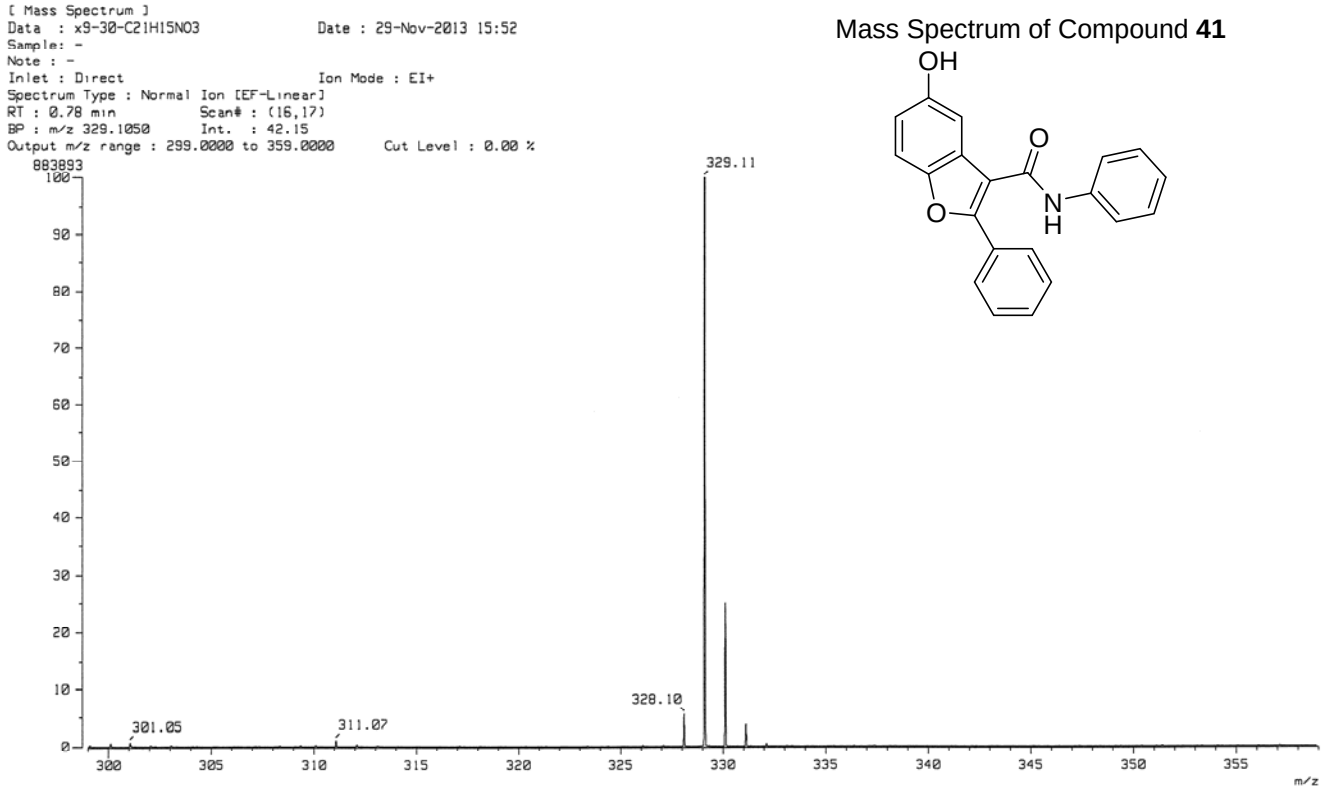
^{13}C NMR of Compound **41**



75 MHz, DMSO-d_6



Mass Spectrum of Compound **41**



[Elemental Composition] Page: 1

Data : x9-30-C21H15NO3 Date : 29-Nov-2013 15:52
Sample: -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 0.78 min Scan#: (16,17)
Elements : C 21/0, H 15/0, N 1/0, O 3/0
Mass Tolerance : 1000ppm, 1mmu if m/z < 1, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 100.0

Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
329.1050	100.0	-0.6 / -0.2	15.0	C 21 H 15 N O 3
330.1084	25.0			