Electronic Supplementary Material (ESI) for RSC Advances.

Multifunctional 3-schiff base-4-hydroxycoumarin derivatives with monoamine oxidase inhibition, anti-*β*-amyloid aggregation, metal chelation, antioxidant and neuroprotection properties against Alzheimer's disease

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Contents

Figure S1. Molecular modeling studies of **17** with hMAO-A and hMAO-B.

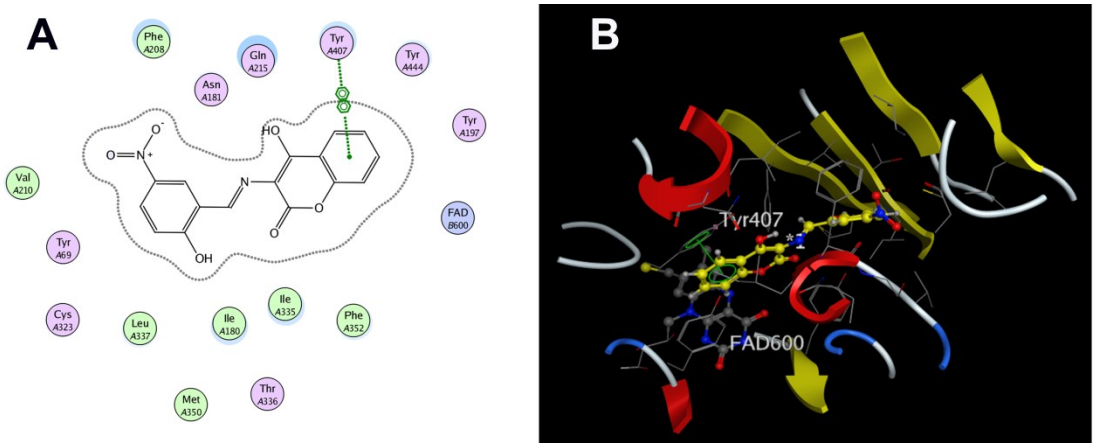


Figure S1.1. 17 with hMAO-A

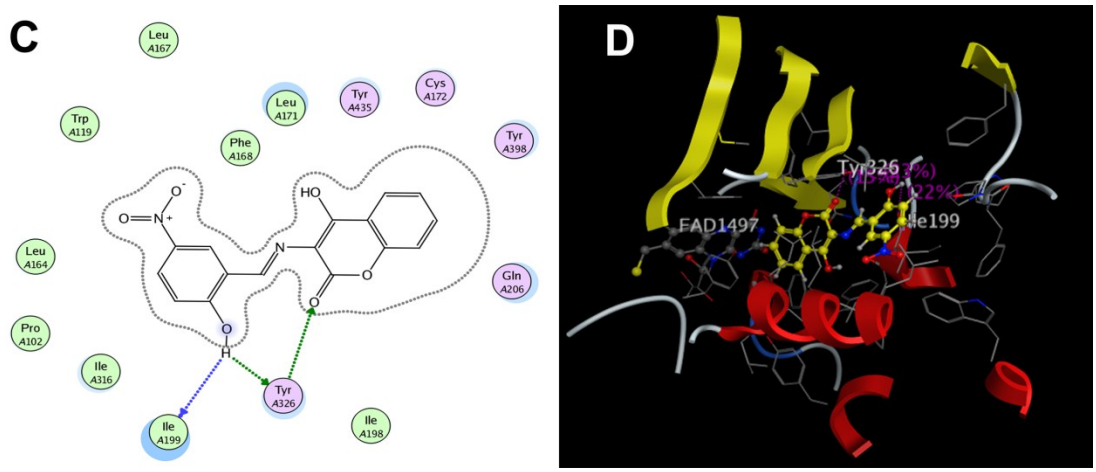


Figure S1.2. 17 with hMAO-B

Table S1. Prediction of BBB penetration and physical properties of compounds **1-20**.[a)]

Compounds	MW	Clog P	HBA	HBD	PSA	log BB
1	281.26	2.919	5	2	79.12	-0.588288
2	297.26	2.592	6	3	99.35	-0.937396
3	297.26	2.522	6	3	99.35	-0.948036
4	313.26	2.006	7	4	119.58	-1.325872
5	313.26	1.936	7	4	119.58	-1.336512
6	311.29	2.778	6	2	88.35	-0.746324
7	311.29	3.028	6	2	88.35	-0.708324
8	311.29	3.028	6	2	88.35	-0.708324
9	295.29	3.368	5	2	79.12	-0.52004
10	295.29	3.418	5	2	79.12	-0.51244
11	295.29	3.418	5	2	79.12	-0.51244
12	352.38	4.298	6	2	82.36	-0.426632
13	360.16	3.886	5	2	79.12	-0.441304
14	439.06	4.505	5	2	79.12	-0.347216
15	299.25	3.166	5	2	79.12	-0.550744
16	315.71	3.736	5	2	79.12	-0.464104
17	326.26	2.884	7	2	130.93	-1.360396
18	331.32	4.093	5	2	79.12	-0.40984
19	266.25	1.443	5	1	71.25	-0.696164
20	316.31	2.827	5	1	71.25	-0.485796
Rules	≤ 450	≤ 5.0	≤ 10	≤ 5	≤ 90	≥ -1.0

[a)] MW, molecular weight; clog P, calculated logarithm of the octanol-water partition coefficient; HBA, hydrogen bond acceptor atoms; HBD, hydrogen bond donor atoms; PSA, polar surface area; log BB = -0.0148 × PSA + 0.152 × clog P + 0.130.

Figure S2. Lineal correlation between experimental and reported permeability of 9 commercial drugs using the PAMPA-BBB assay. P_e (exp.) = 1.2084 P_e (bibl.) - 0.3055 (R^2 = 0.9427)

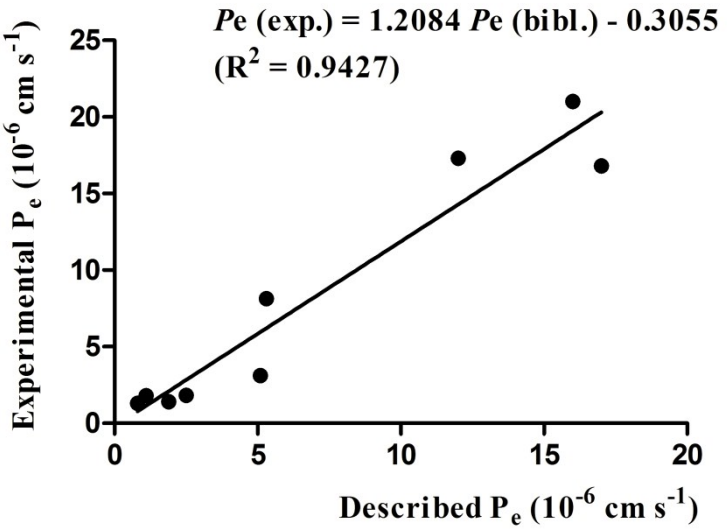
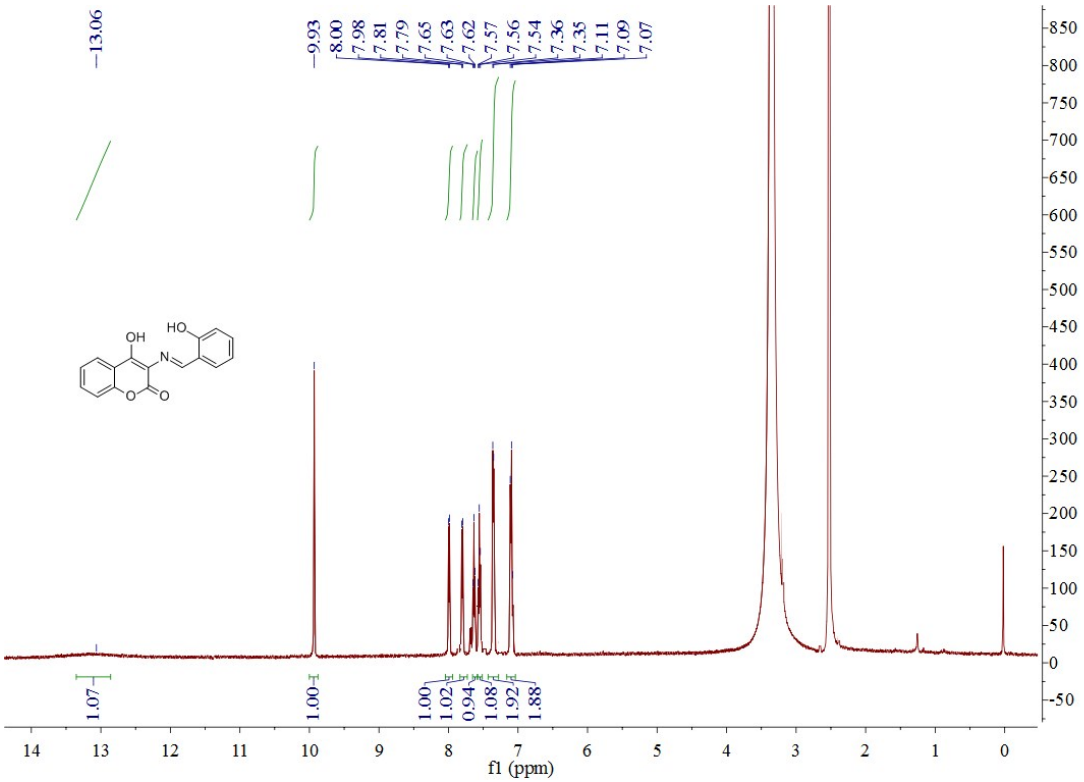
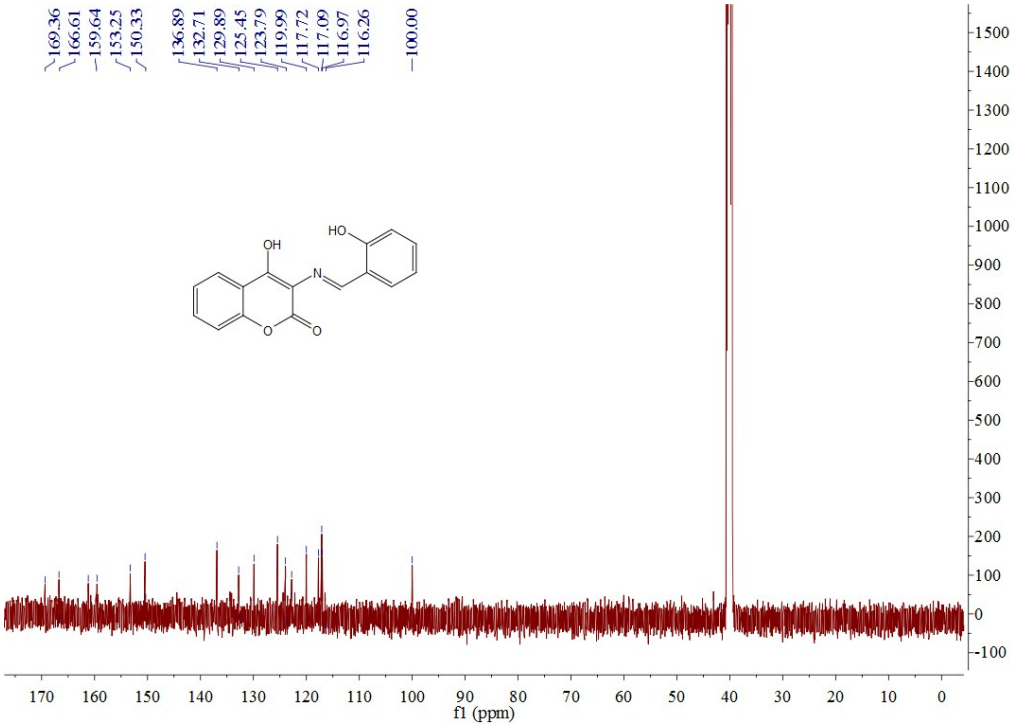


Figure S3. The ^{1}H NMR , ^{13}C NMR, IR and HRMS (ESI) spectrums of all the compounds (**1-20**).

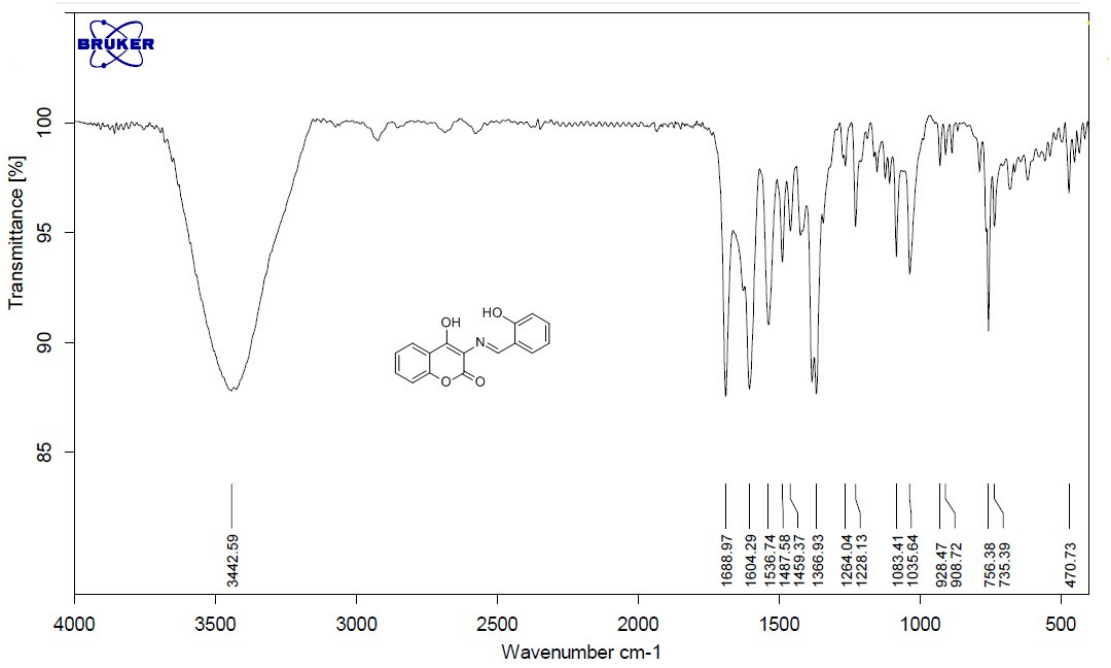
^{1}H NMR spectrum of compound 1 in DMSO



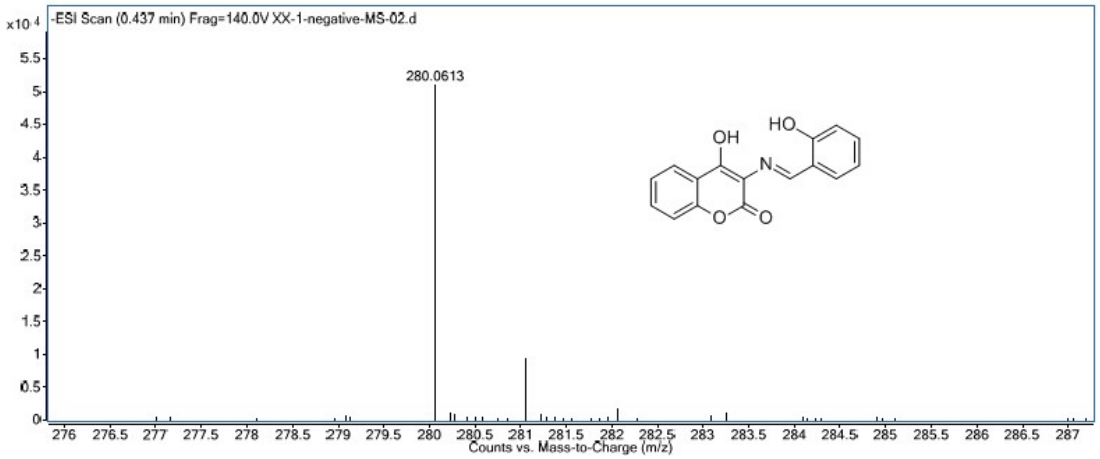
^{13}C NMR spectrum of compound 1 in DMSO



IR (KBr) spectrum of compound 1



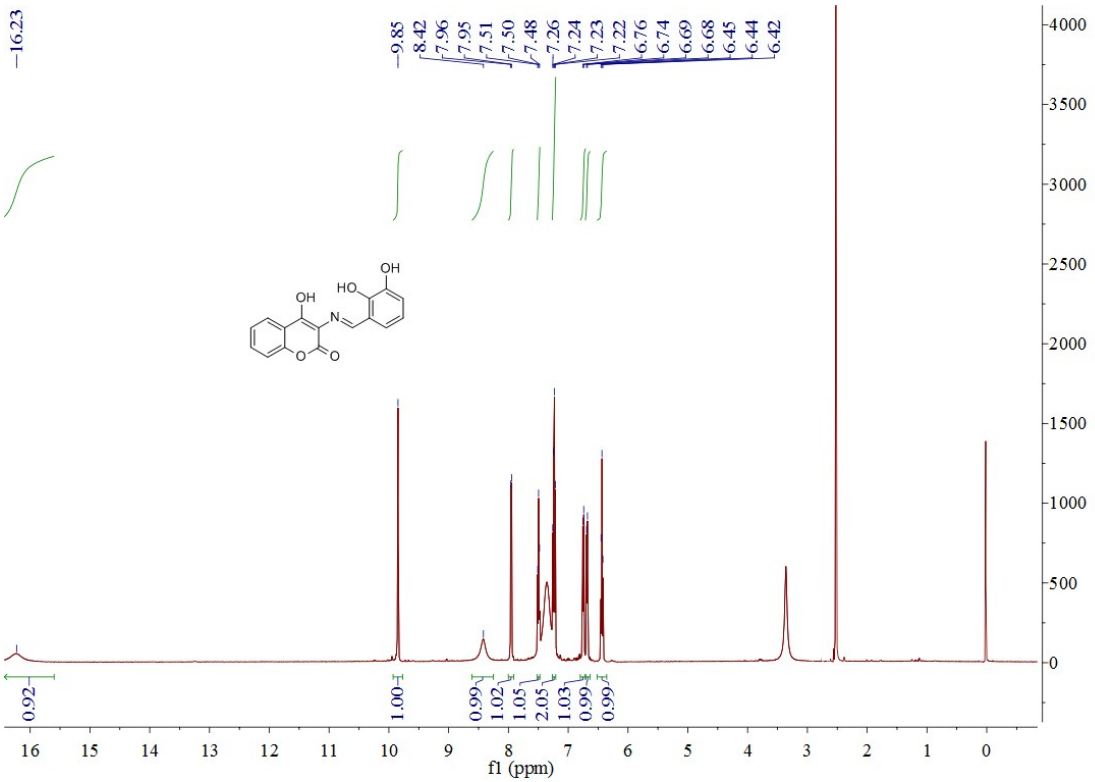
HRMS (ESI) spectrum of compound 1



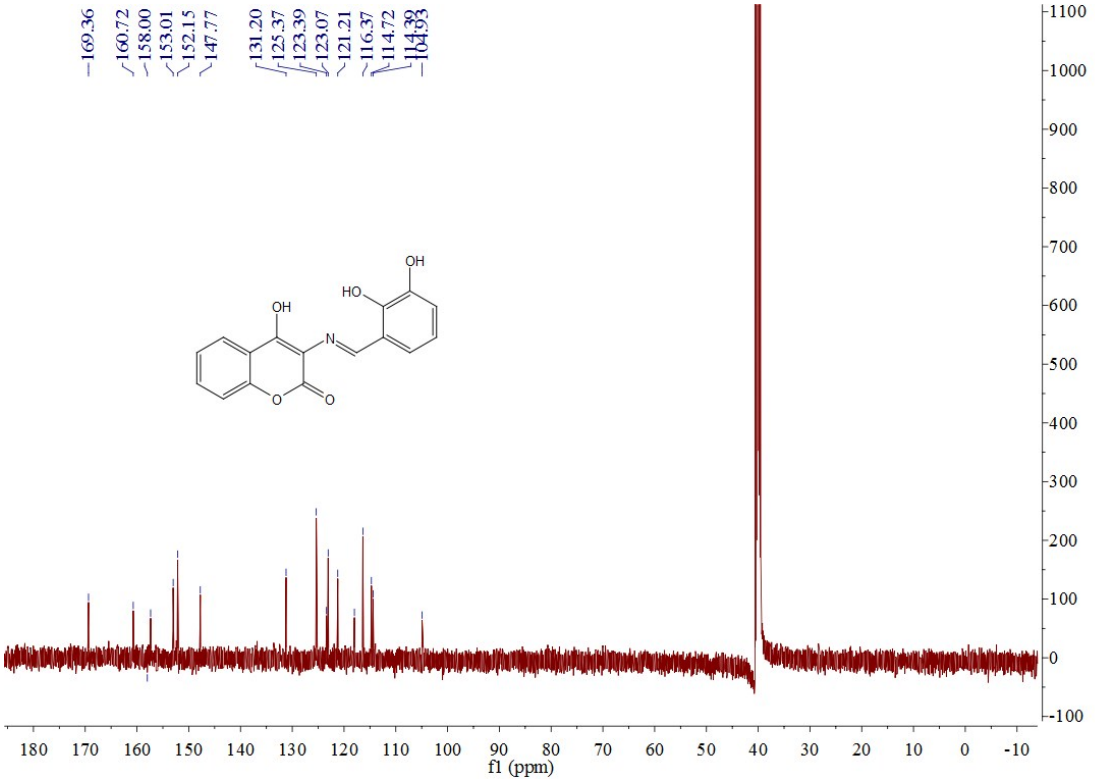
Elemental Composition Calculator

Target m/z:	280.0613	**Result type:**	Negative ions	**Species:**	$[M-H]^-$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10); Cl (0-5)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
C16H10NO4		280.0615		0.98	

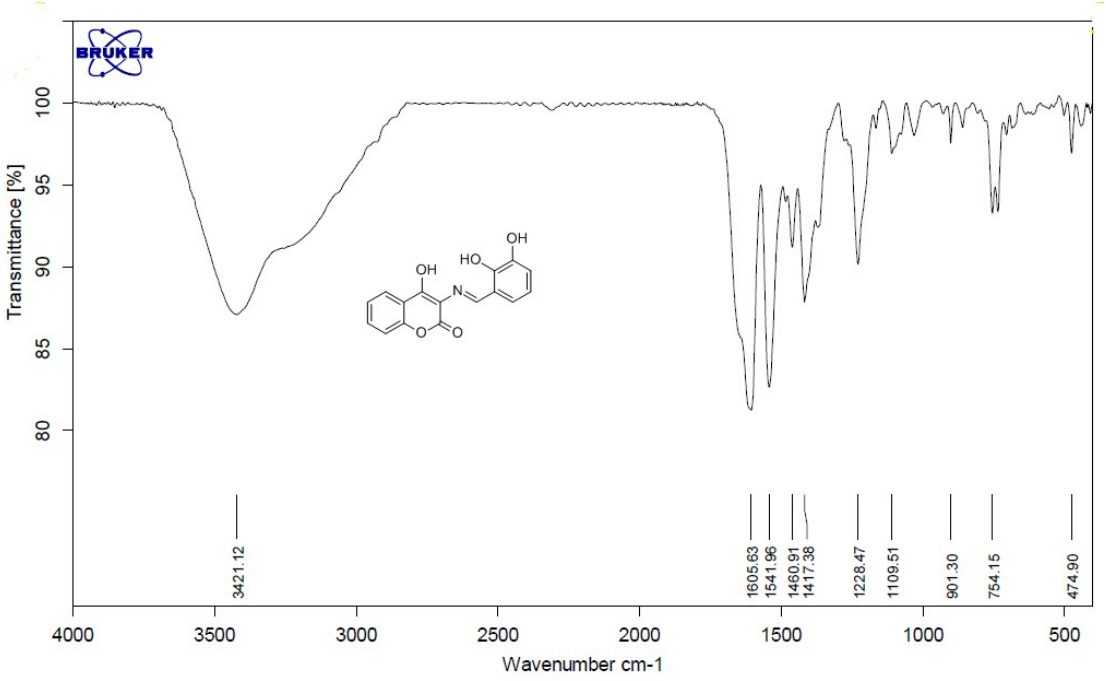
^{1}H NMR spectrum of compound 2 in DMSO



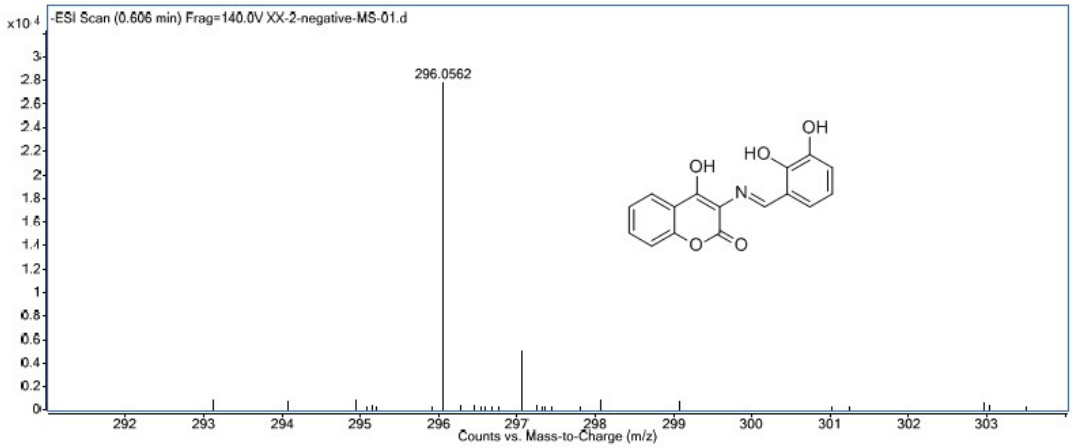
^{13}C NMR spectrum of compound 2 in DMSO



IR (KBr) spectrum of compound 2



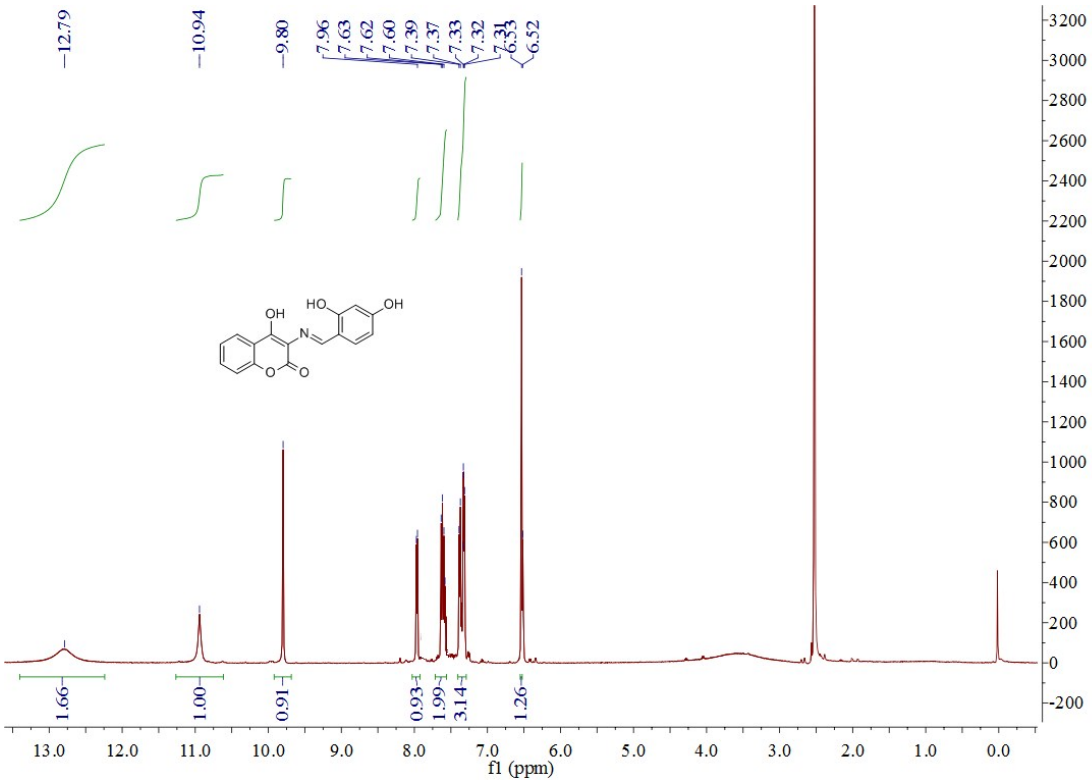
HRMS (ESI) spectrum of compound 2



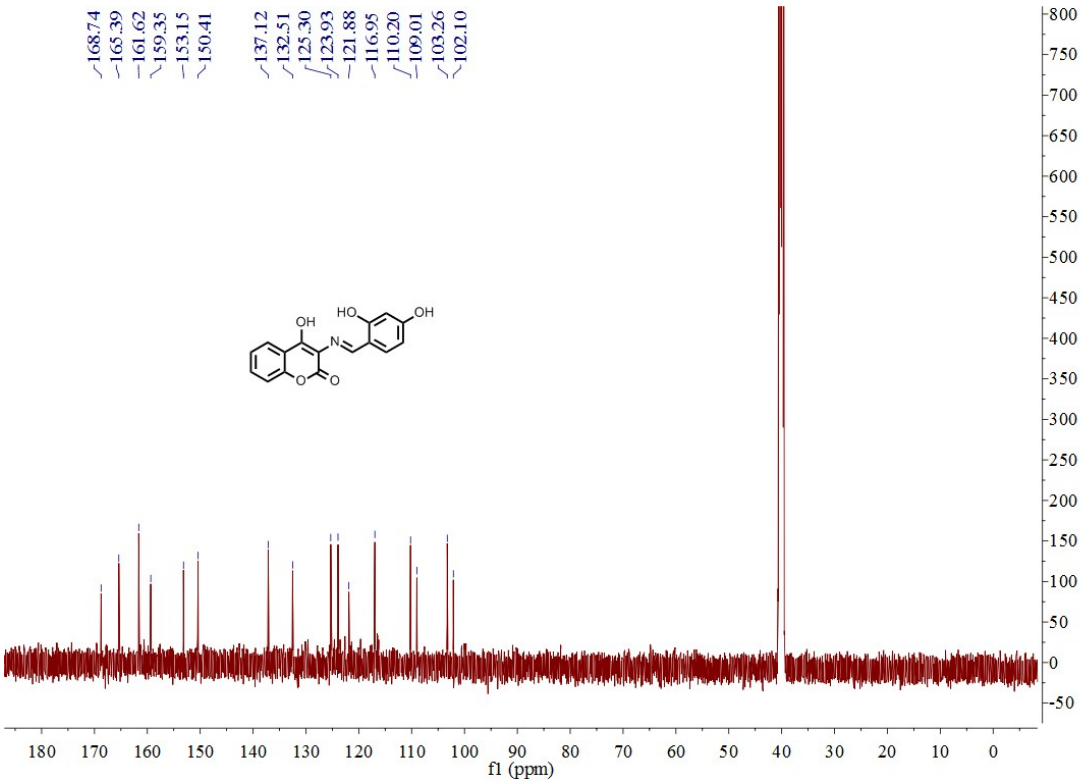
Elemental Composition Calculator

Target m/z:	296.0562	**Result type:**	Negative ions	**Species:**	$[M-H]^-$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10); Cl (0-5)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
C16H10NO5		296.0564		0.96	

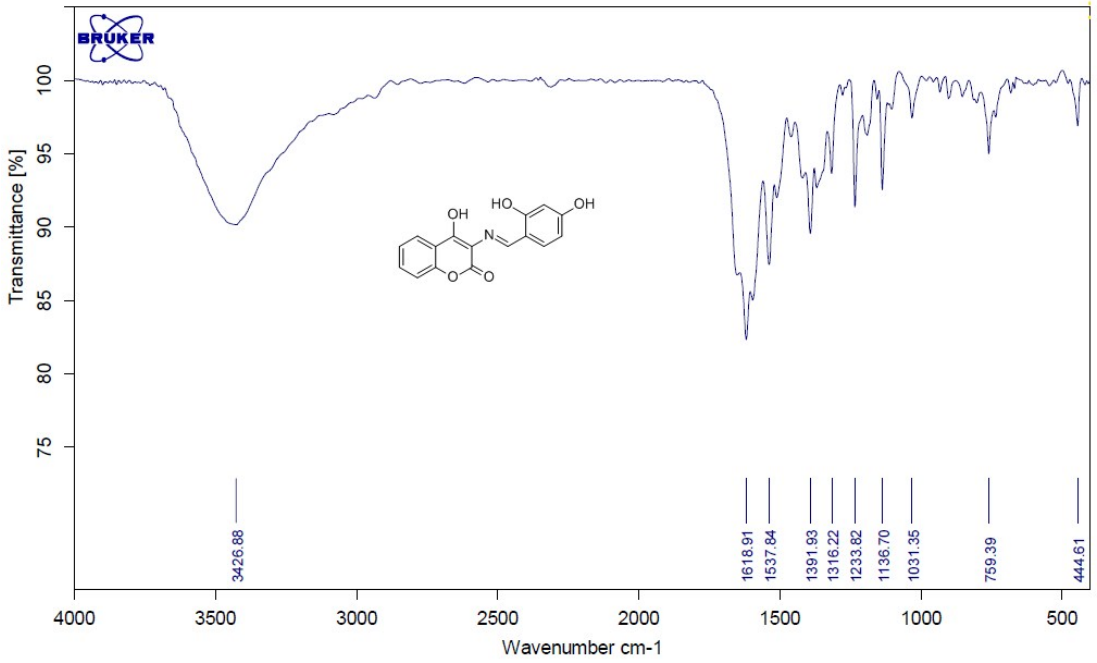
^{1}H NMR spectrum of compound 3 in DMSO



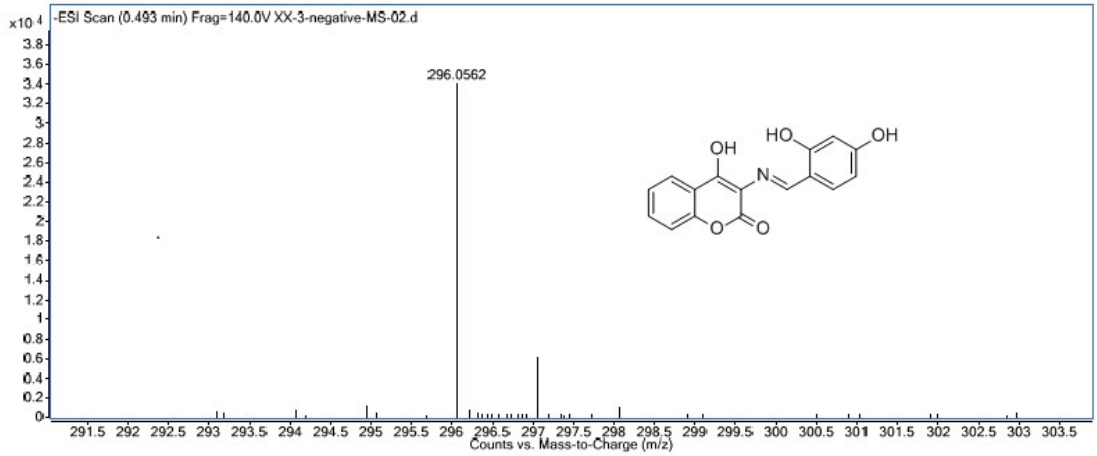
^{13}C NMR spectrum of compound 3 in DMSO



IR (KBr) spectrum of compound 3



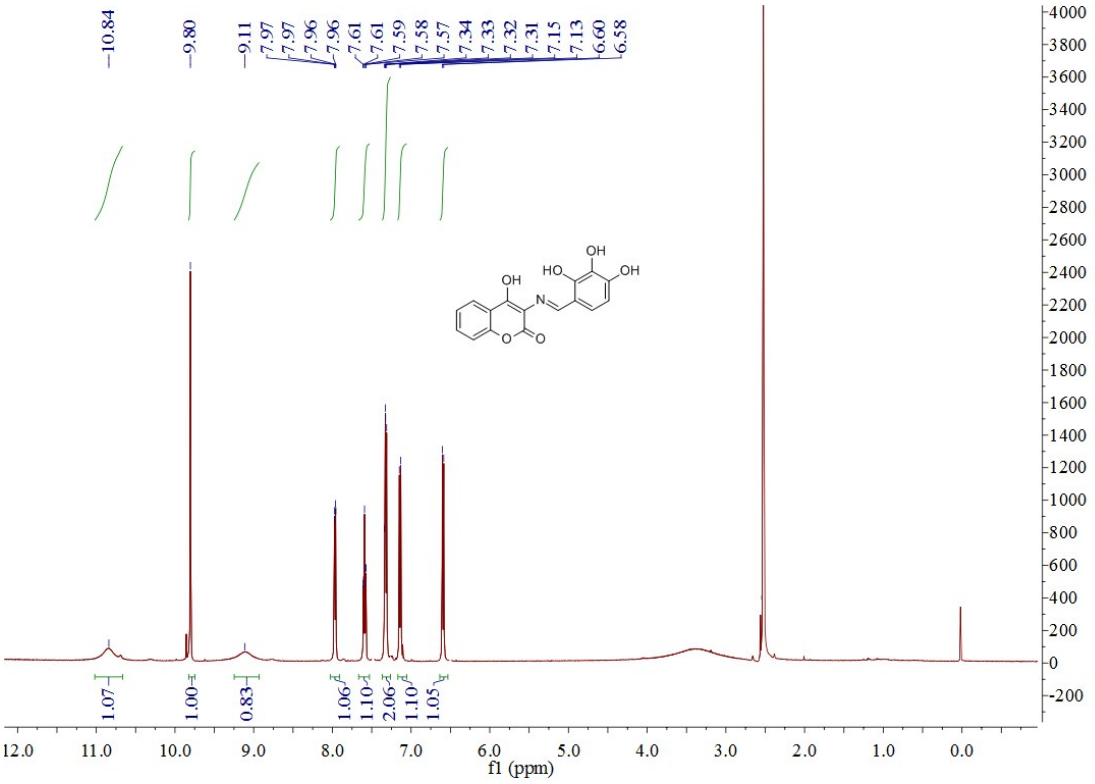
HRMS (ESI) spectrum of compound 3



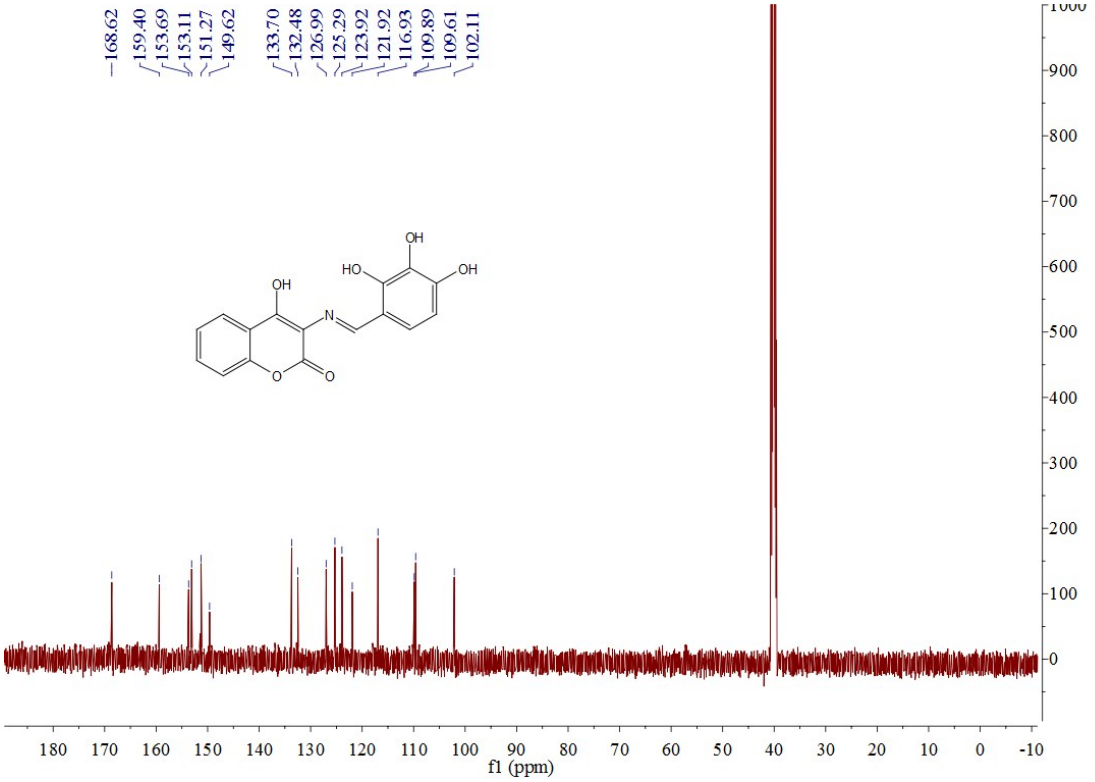
Elemental Composition Calculator

Target m/z:	296.0562	**Result type:**	Negative ions	**Species:**	$[M-H]^-$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10); Cl (0-5)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
C16H10NO5		296.0564		0.96	

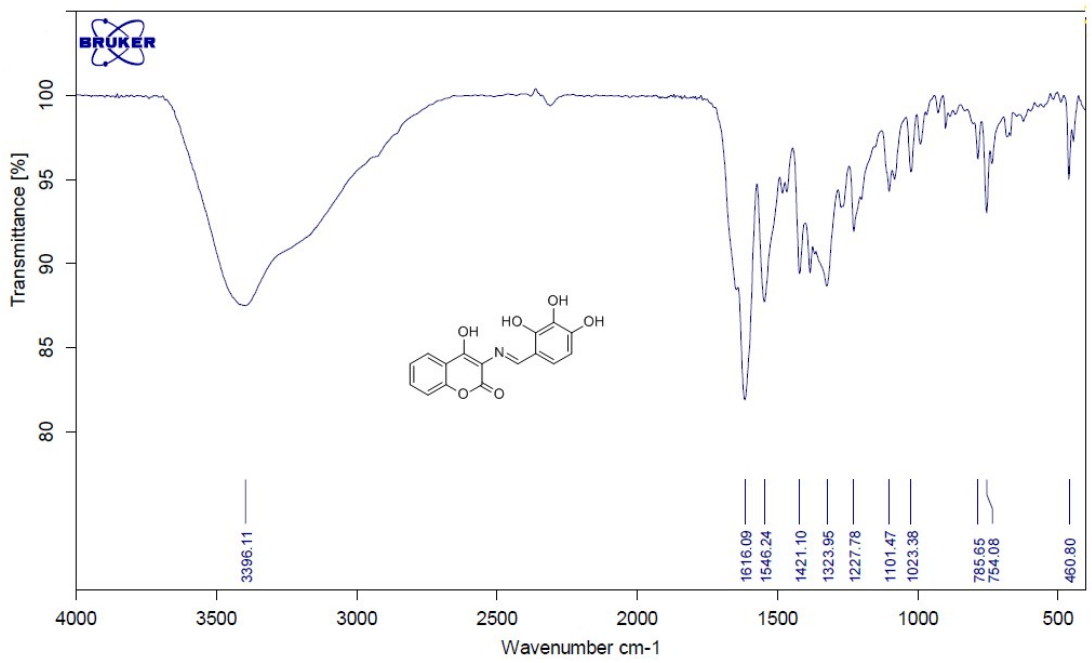
^{1}H NMR of compound 4 in DMSO



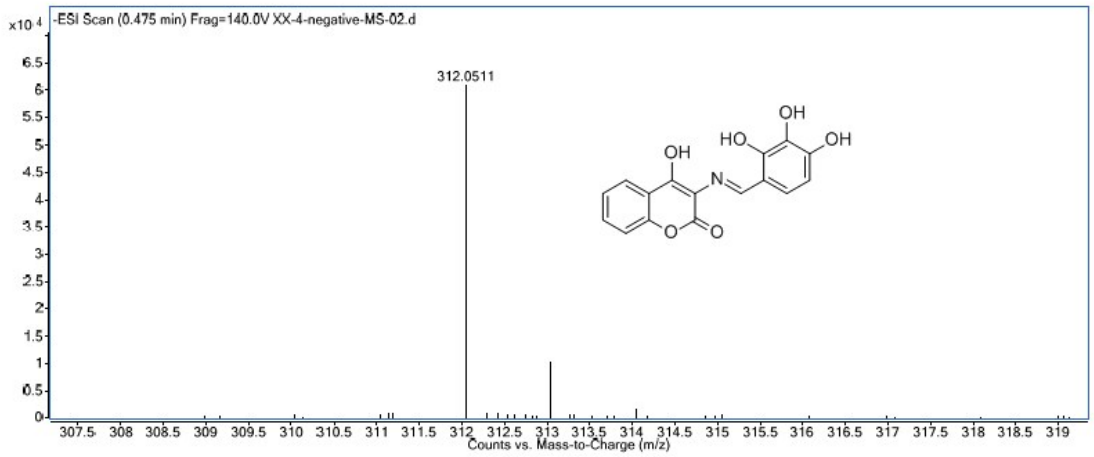
^{13}C NMR of compound 4 in DMSO



IR (KBr) spectrum of compound 4



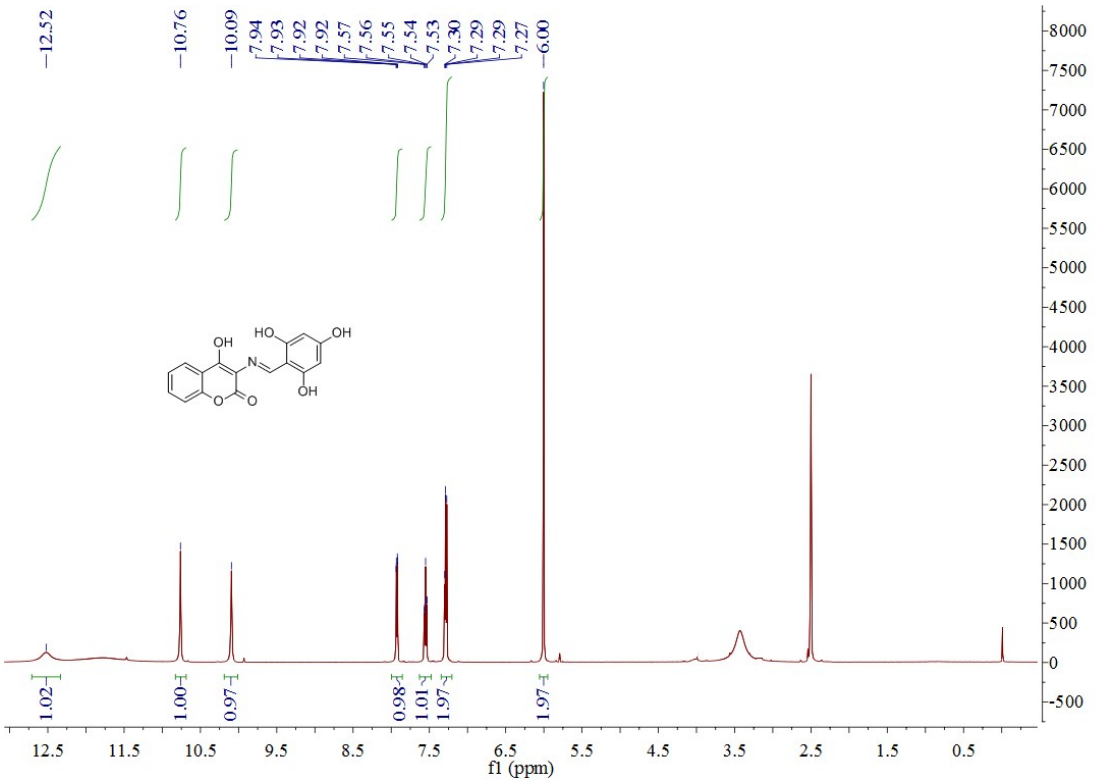
HRMS (ESI) spectrum of compound 4



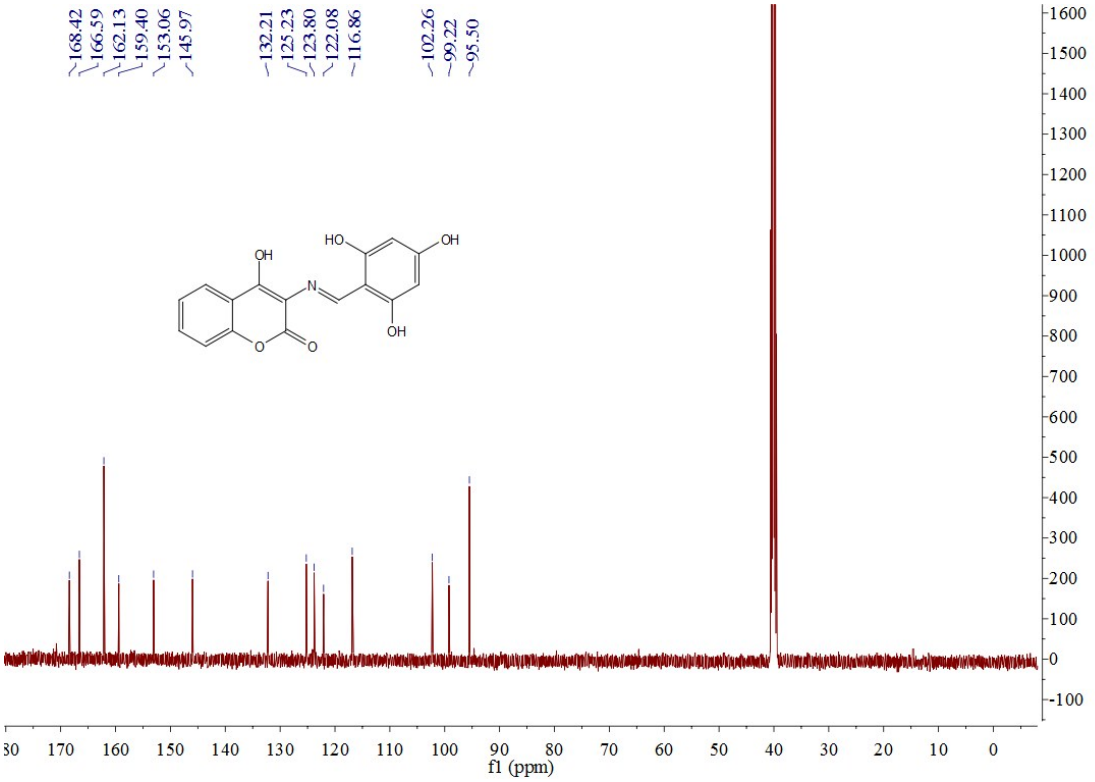
Elemental Composition Calculator

Target m/z:	312.0511	**Result type:**	Negative ions	**Species:**	$[M-H]^-$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10); Cl (0-5)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
$C_{16}H_{10}NO_6$		312.0514		0.85	

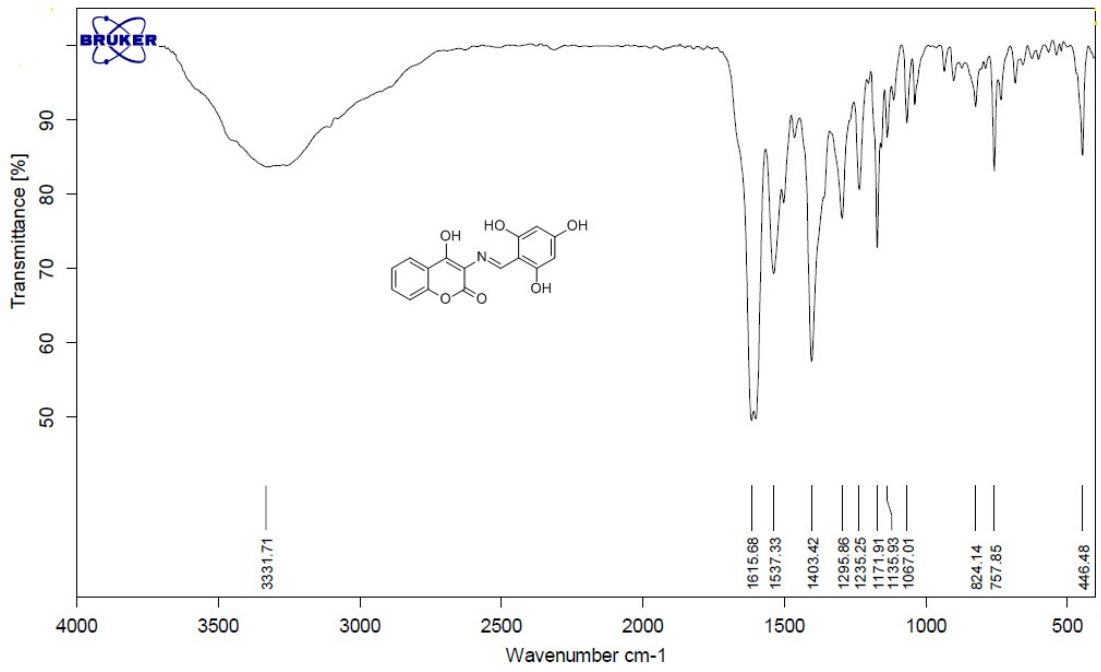
^{1}H NMR spectrum of compound 5 in DMSO



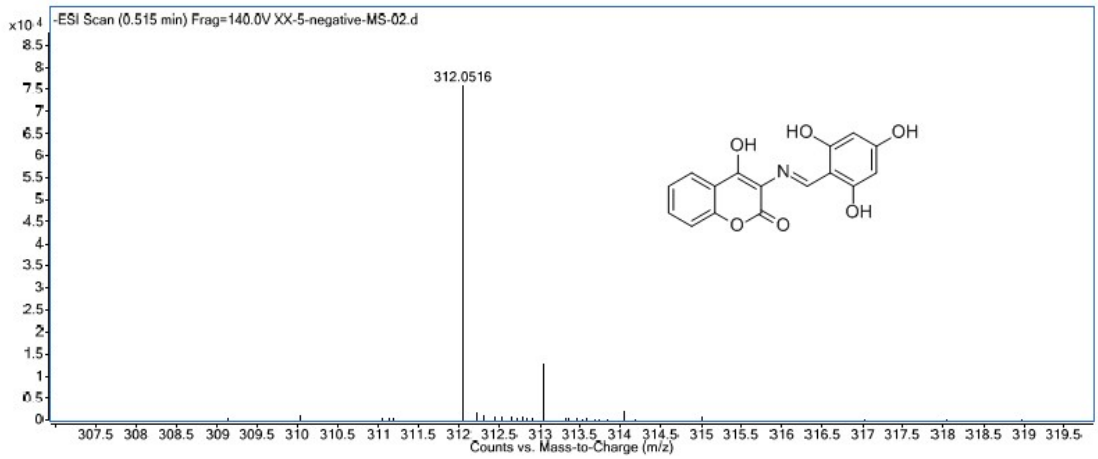
^{13}C NMR spectrum of compound 5 in DMSO



IR (KBr) spectrum of compound 5



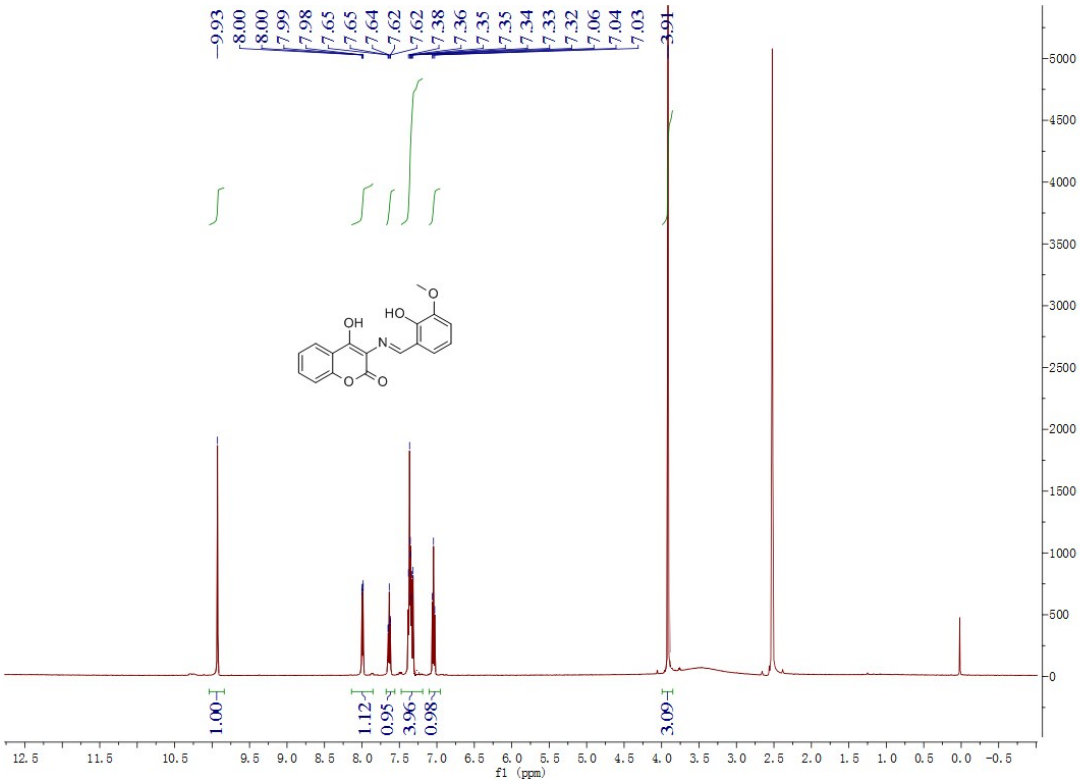
HRMS (ESI) spectrum of compound 5



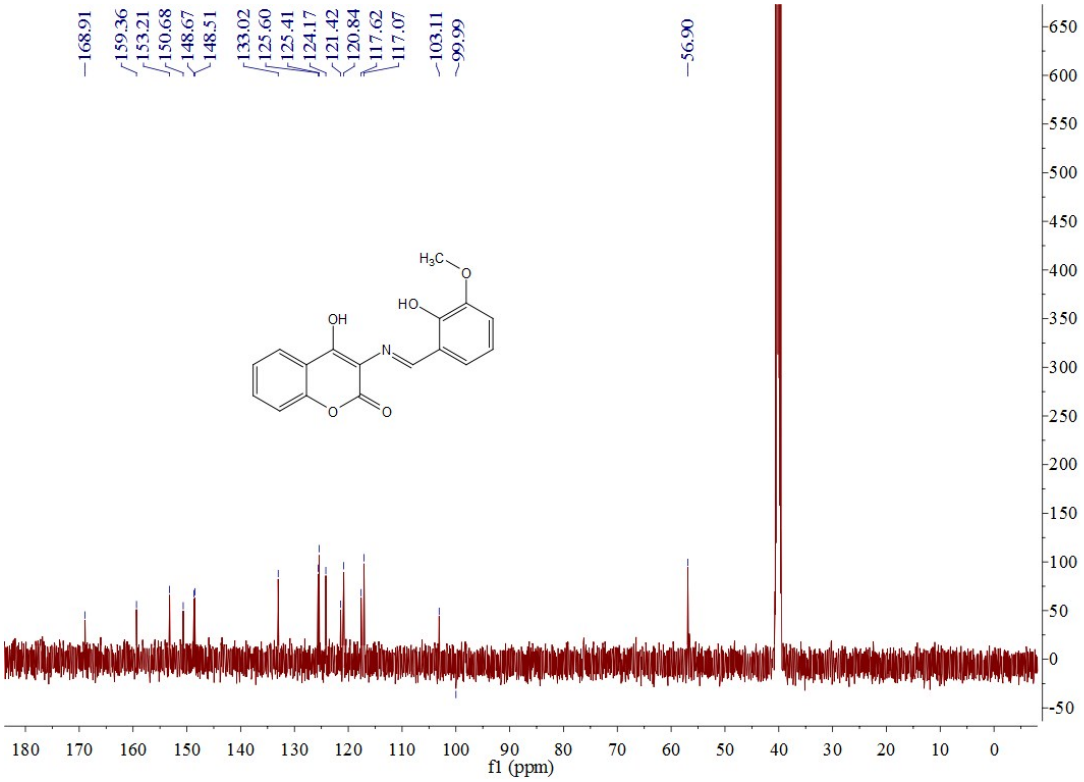
Elemental Composition Calculator

Target m/z:	312.0516	**Result type:**	Negative ions	**Species:**	$[M-H]^-$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10); Cl (0-5)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
$C_{16}H_{10}NO_6$		312.0514		-0.83	

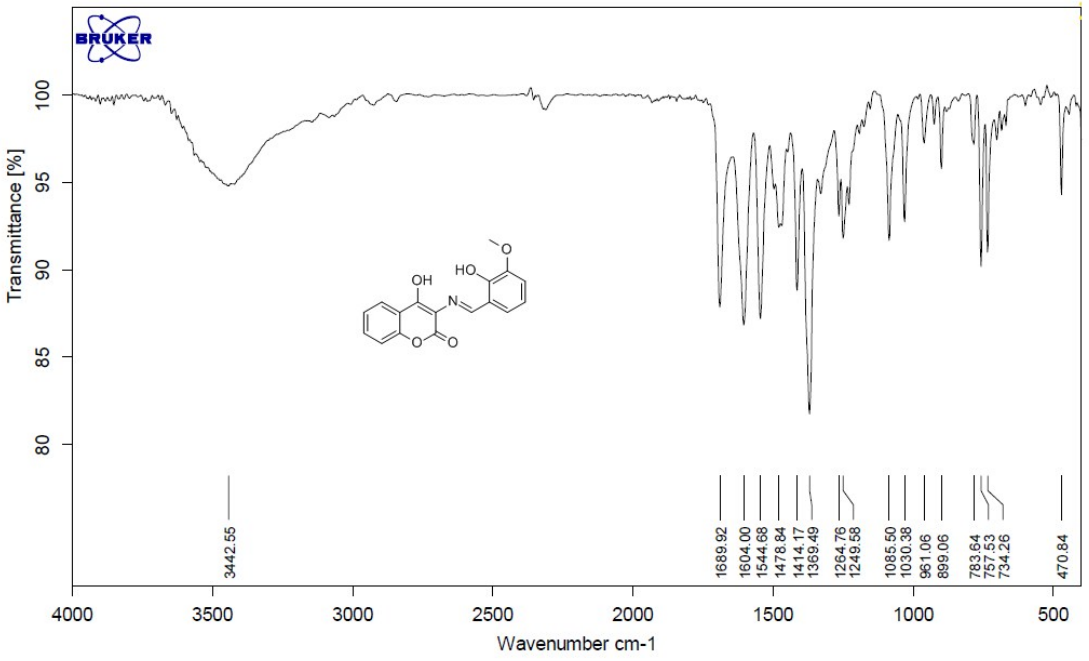
^{1}H NMR spectrum of compound 6 in DMSO



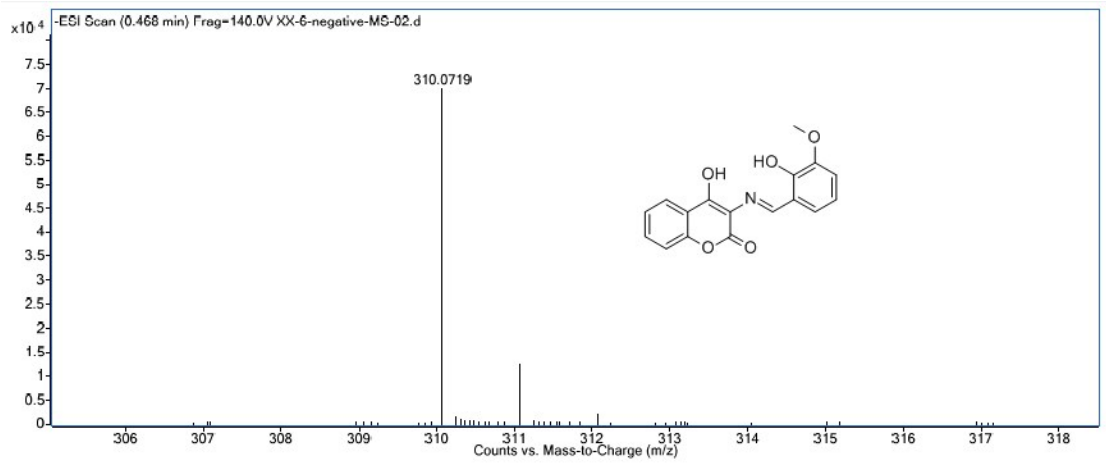
^{13}C NMR spectrum of compound 6 in DMSO



IR (KBr) spectrum of compound 6



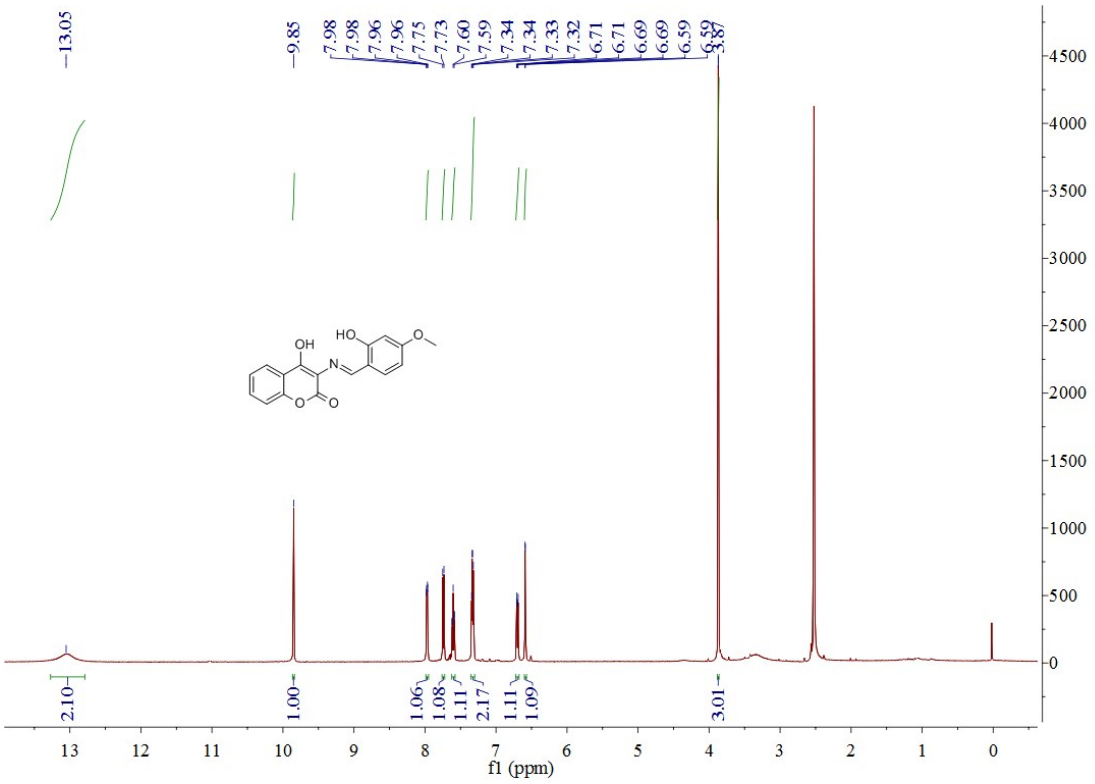
HRMS (ESI) spectrum of compound 6



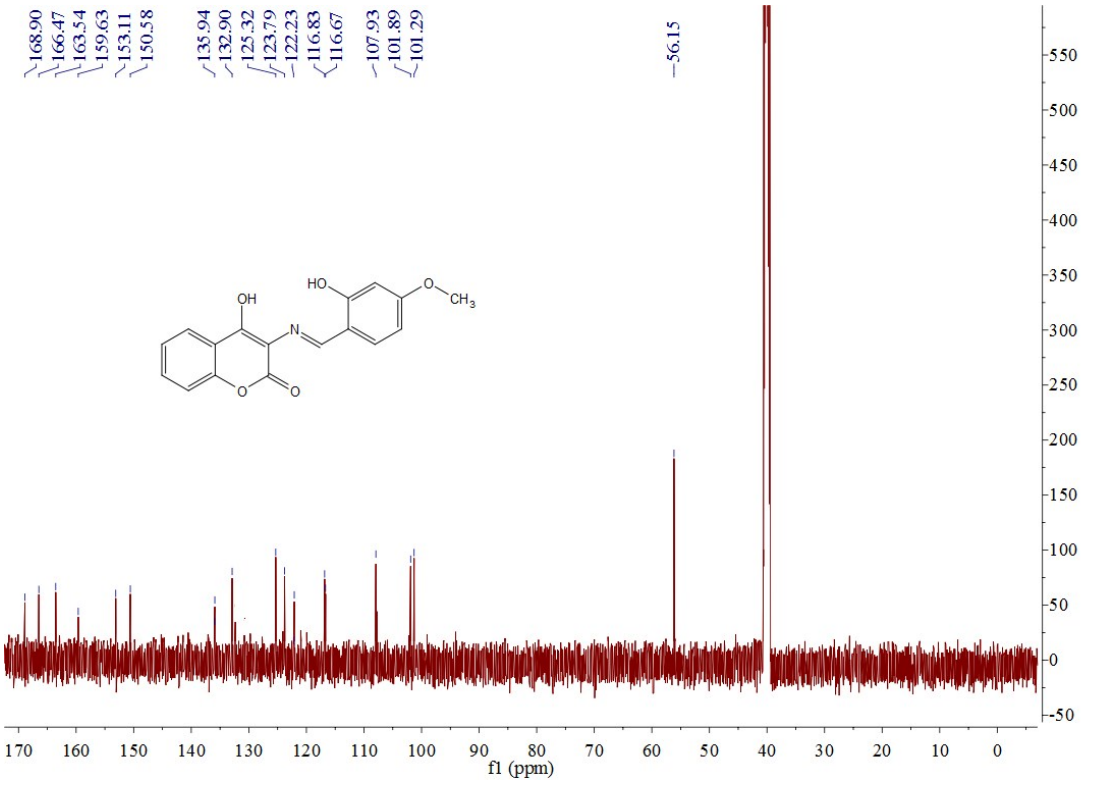
Elemental Composition Calculator

Target m/z:	310.0719	**Result type:**	Negative ions	**Species:**	$[M-H]^-$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10); Cl (0-5)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
C17H12NO5		310.0721		0.73	

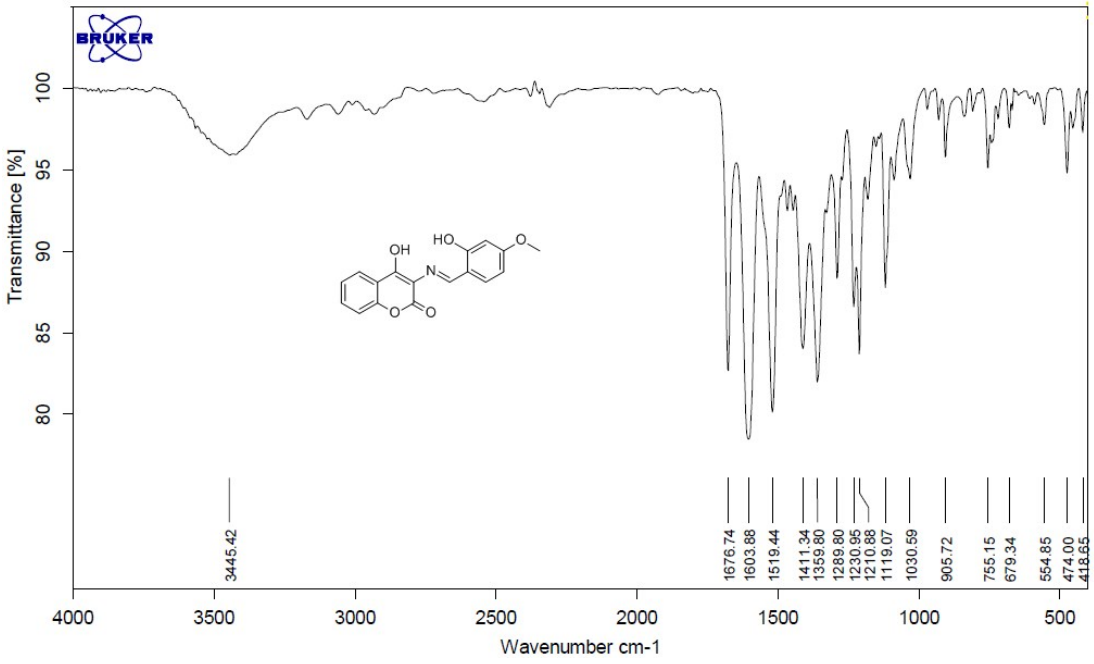
^{1}H NMR of compound 7 in DMSO



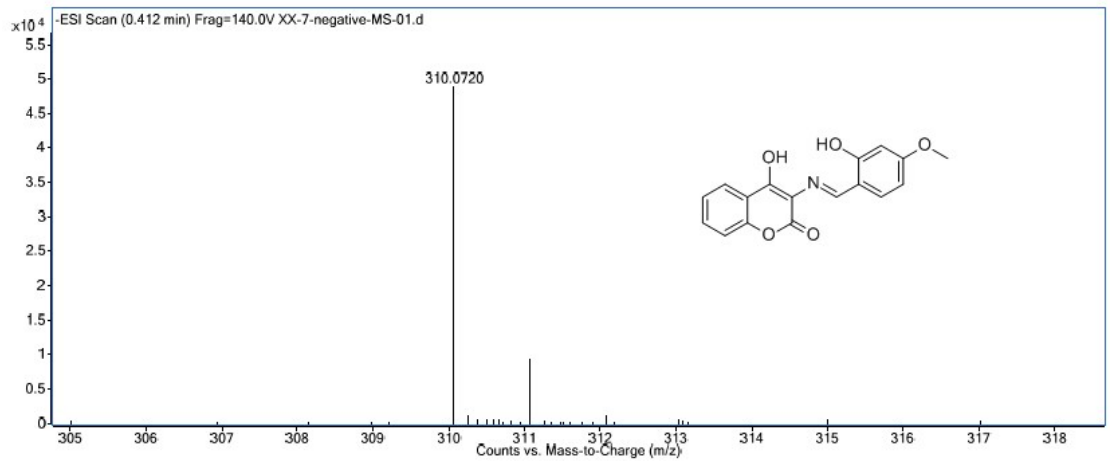
^{13}C NMR of compound 7 in DMSO



IR (KBr) spectrum of compound 7



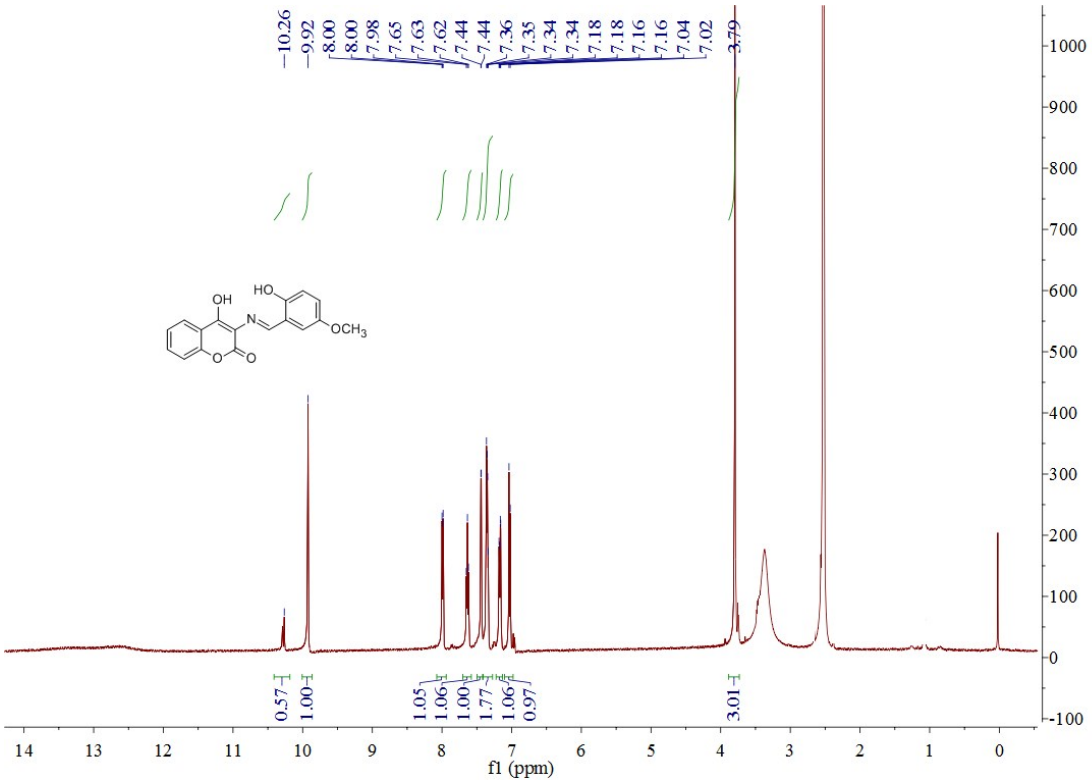
HRMS (ESI) spectrum of compound 7



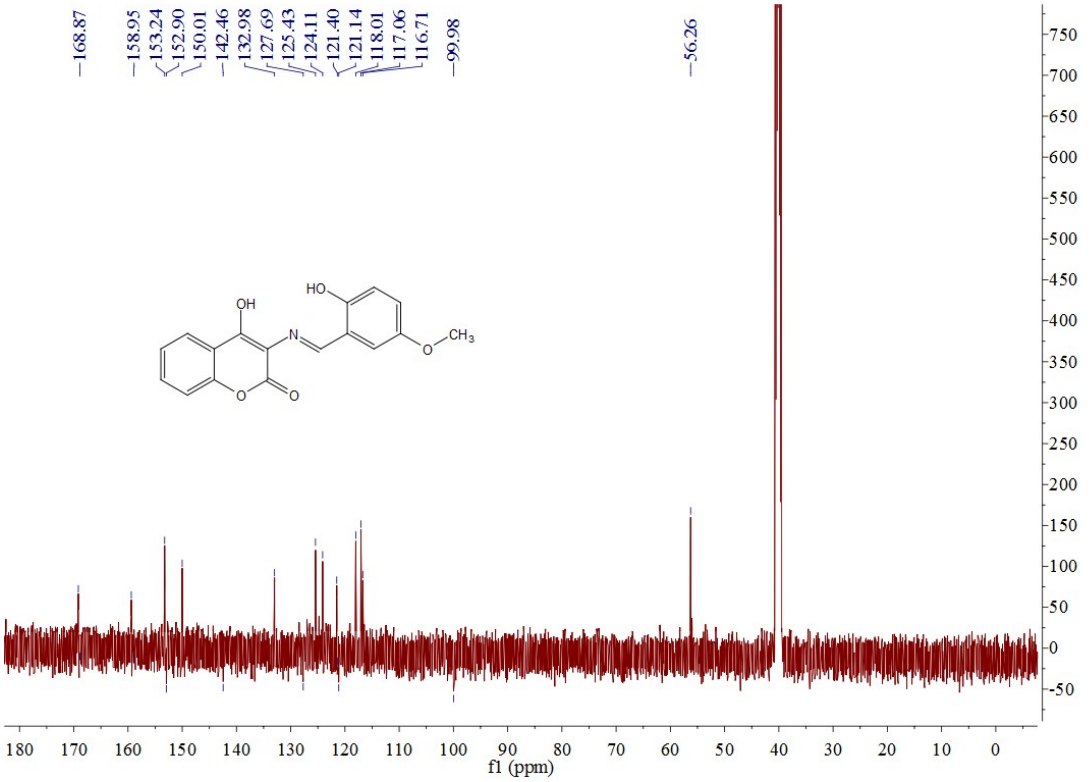
Elemental Composition Calculator

Target m/z:	310.072	**Result type:**	Negative ions	**Species:**	$[M-H]^-$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10); Cl (0-5)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
C17H12NO5		310.0721		0.43	

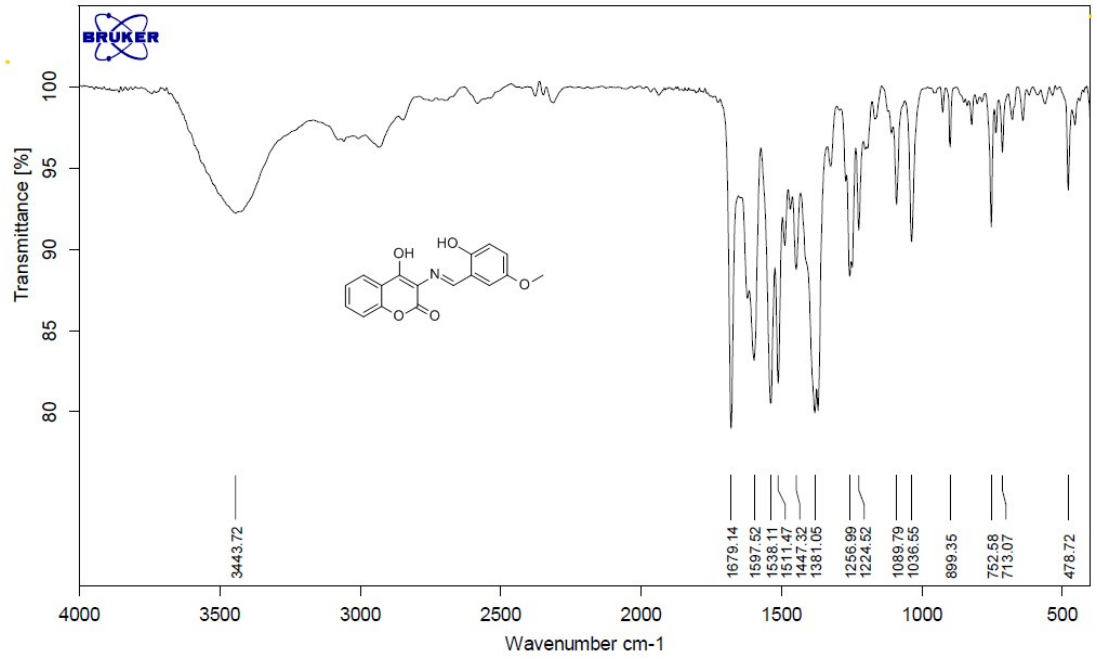
^{1}H NMR spectrum of compound 8 in DMSO



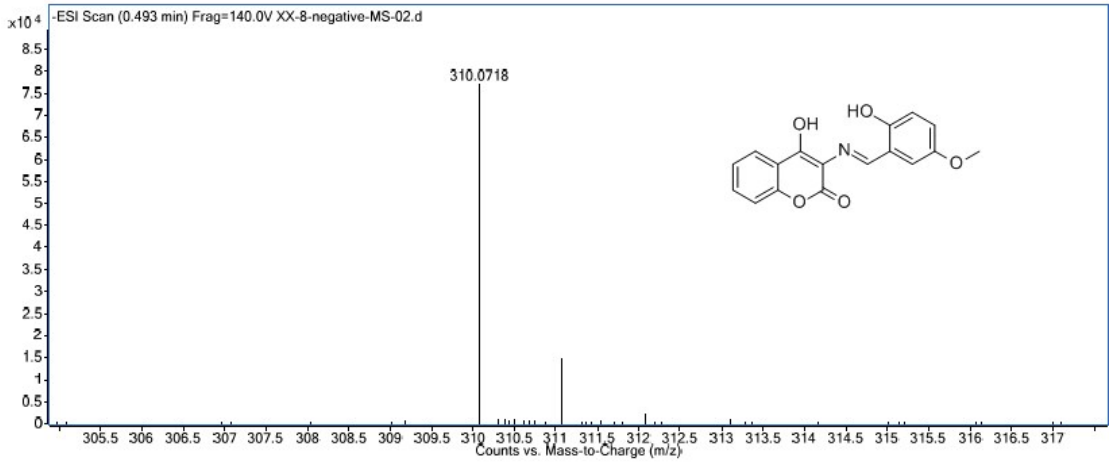
^{13}C NMR spectrum of compound 8 in DMSO



IR (KBr) spectrum of compound 8



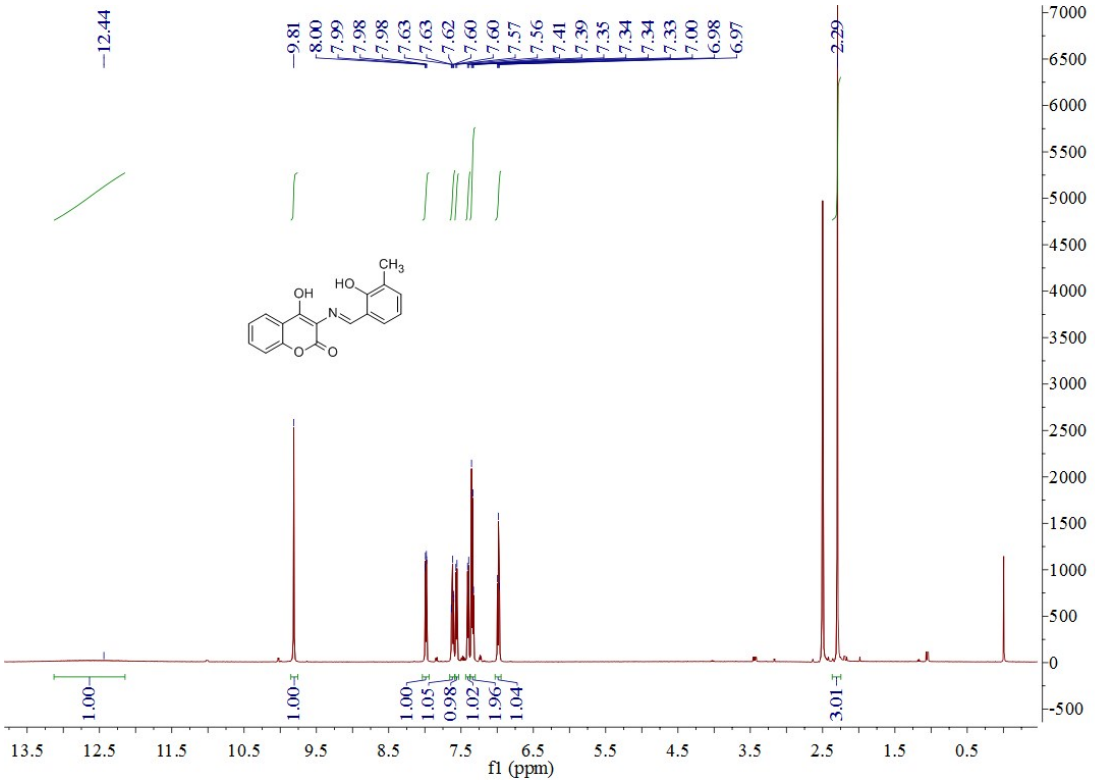
HRMS (ESI) spectrum of compound 8



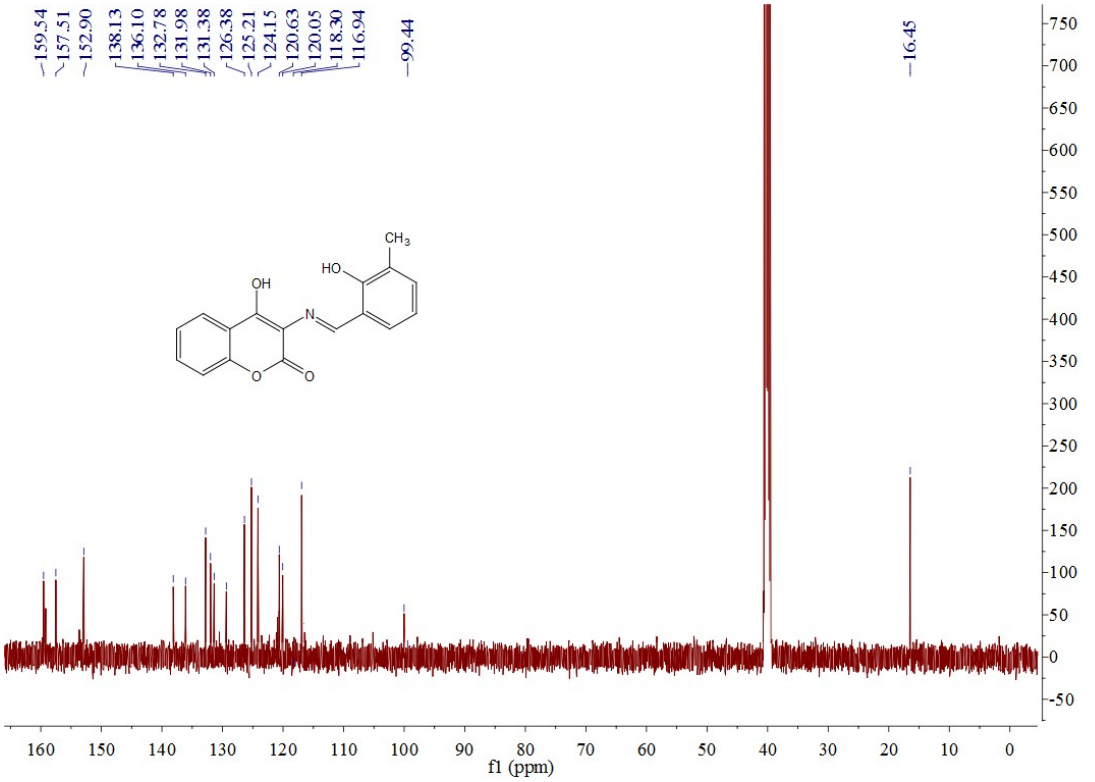
Elemental Composition Calculator

Target m/z:	310.0718	**Result type:**	Negative ions	**Species:**	$[M-H]^-$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10); Cl (0-5)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
C17H12NO5		310.0721		0.94	

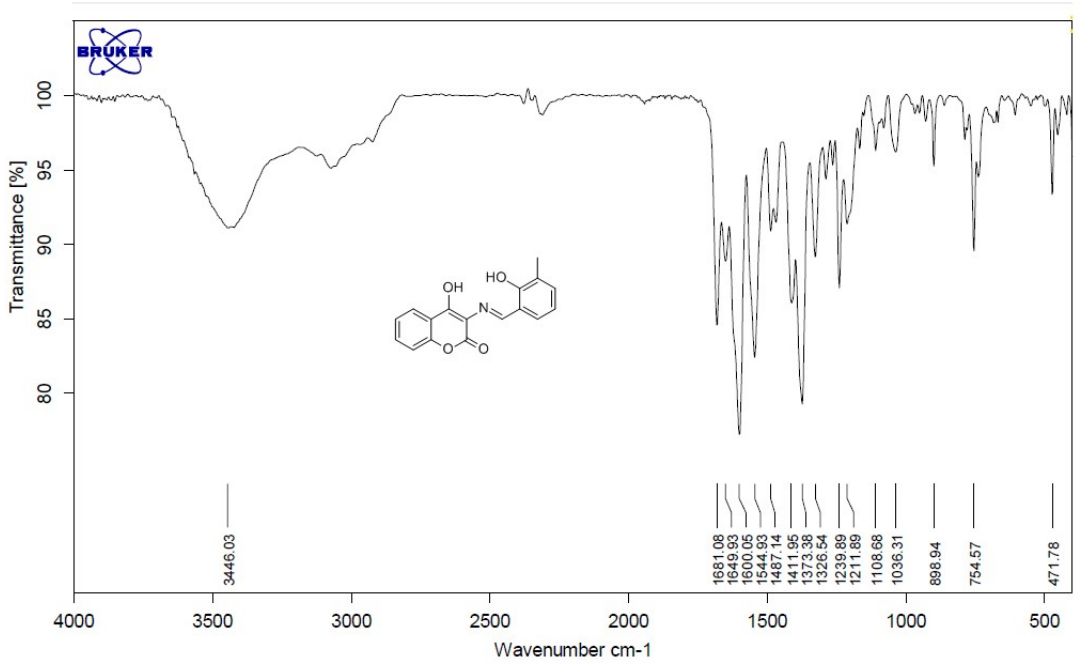
^{1}H NMR spectrum of compound 9 in DMSO



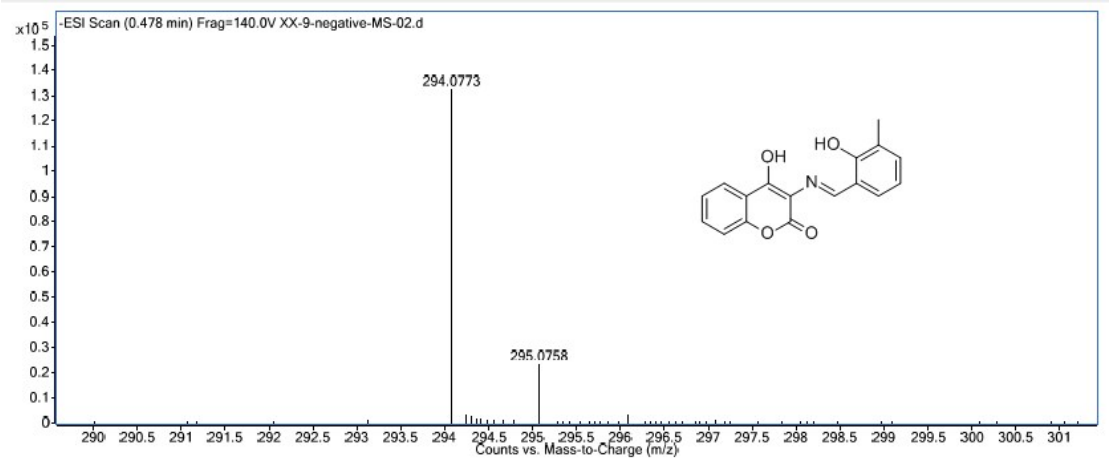
^{13}C NMR spectrum of compound 9 in DMSO



IR (KBr) spectrum of compound 9



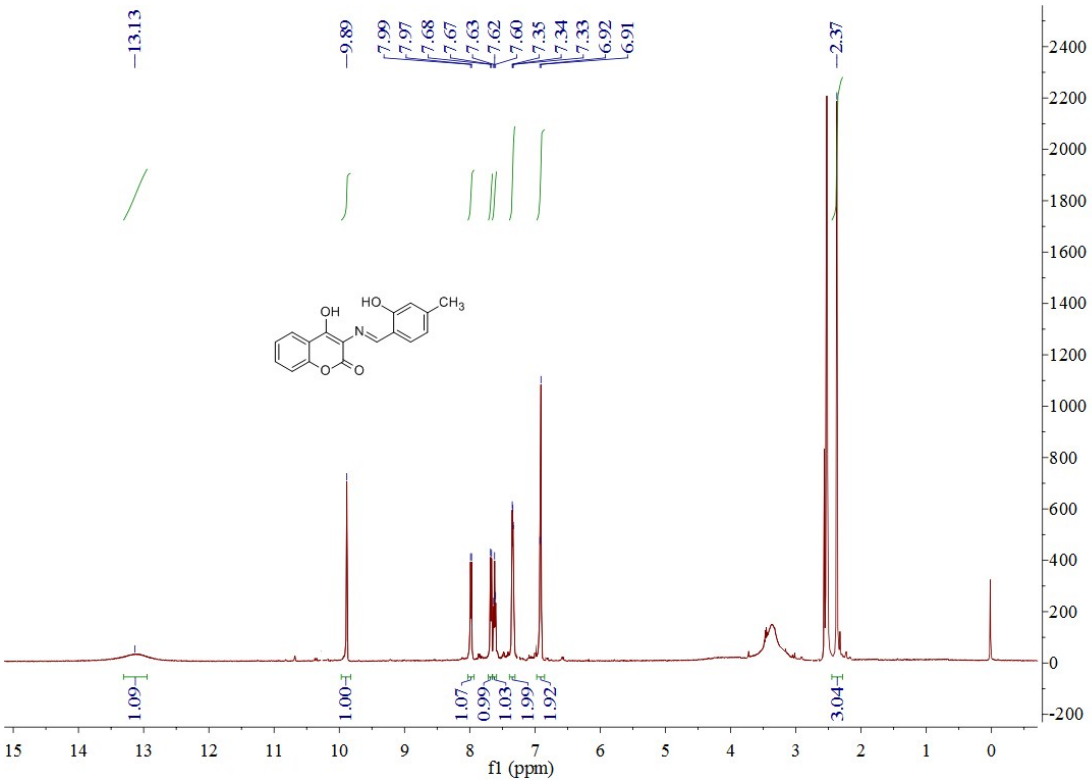
HRMS (ESI) spectrum of compound 9



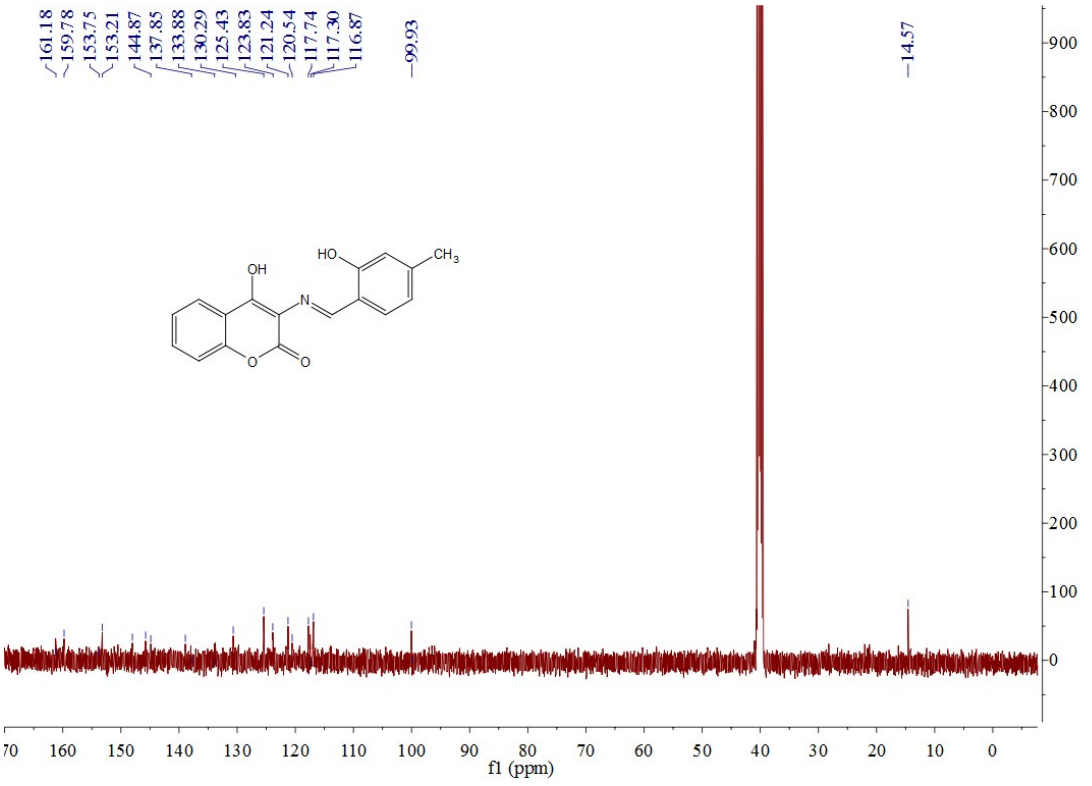
Elemental Composition Calculator

Target m/z:	294.0773	**Result type:**	Negative ions	**Species:**	$[M-H]^-$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10); Cl (0-5)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
$C_{17}H_{12}NO_4$		294.0772		-0.34	

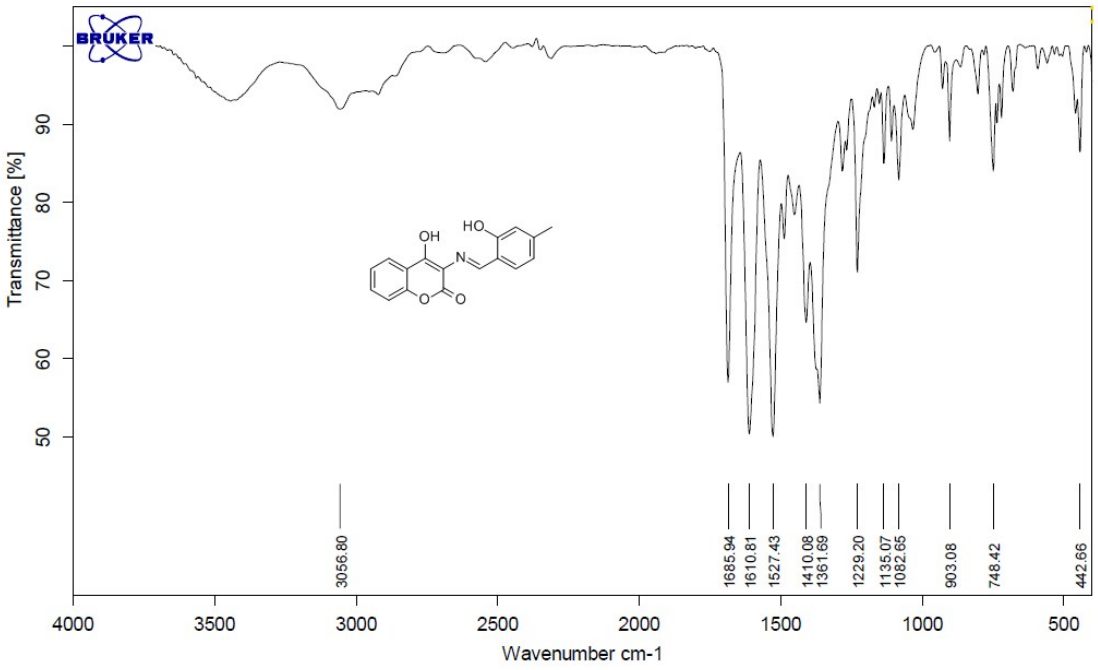
^{1}H NMR spectrum of compound 10 in DMSO



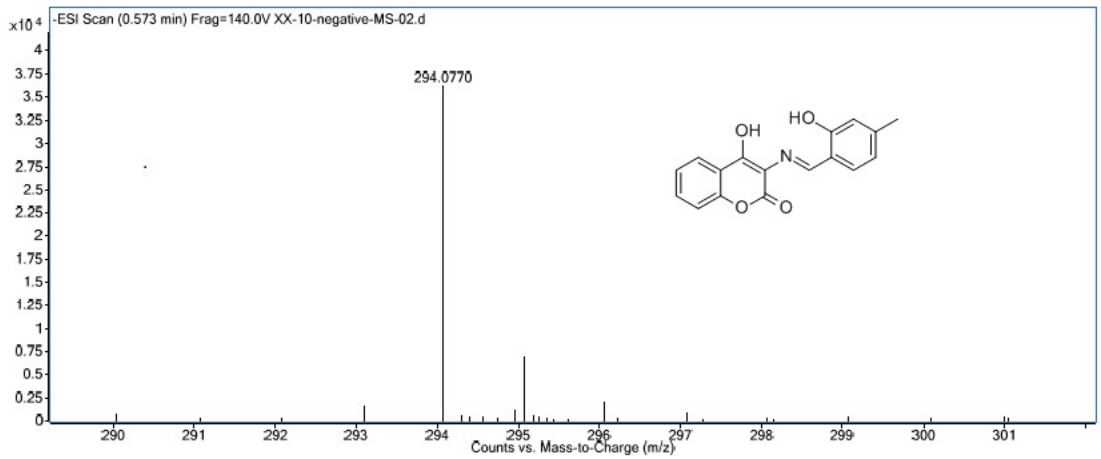
^{13}C NMR spectrum of compound 10 in DMSO



IR (KBr) spectrum of compound 10



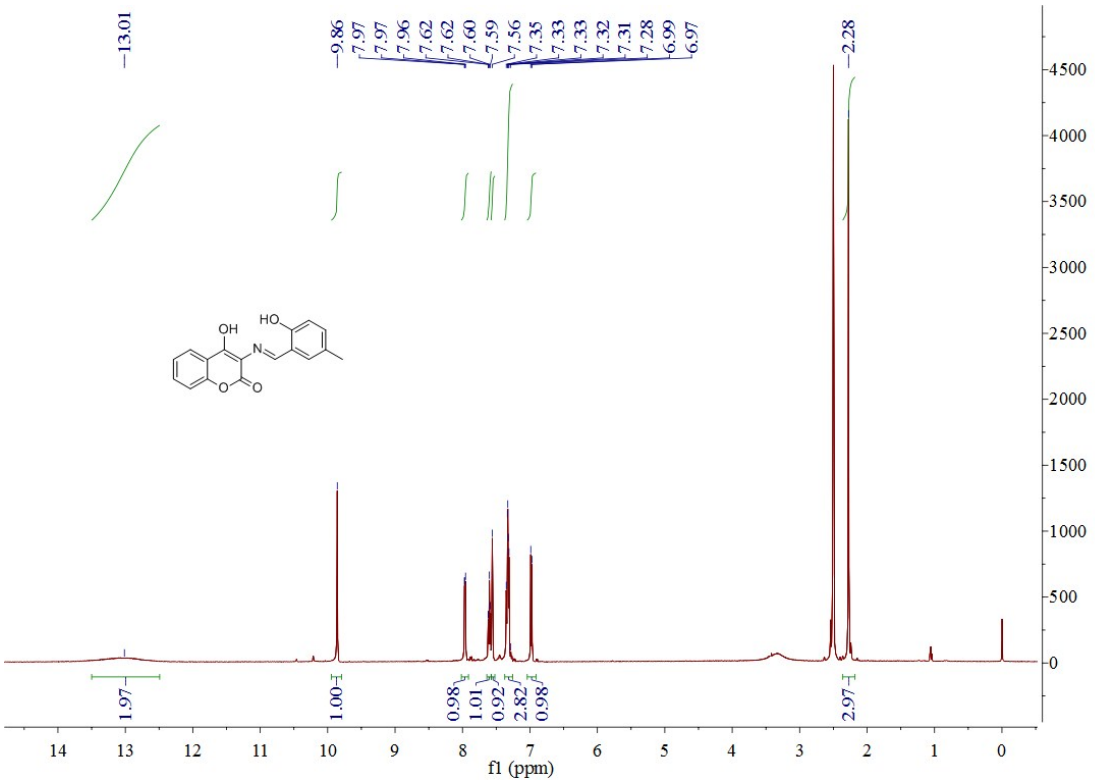
HRMS (ESI) spectrum of compound 10



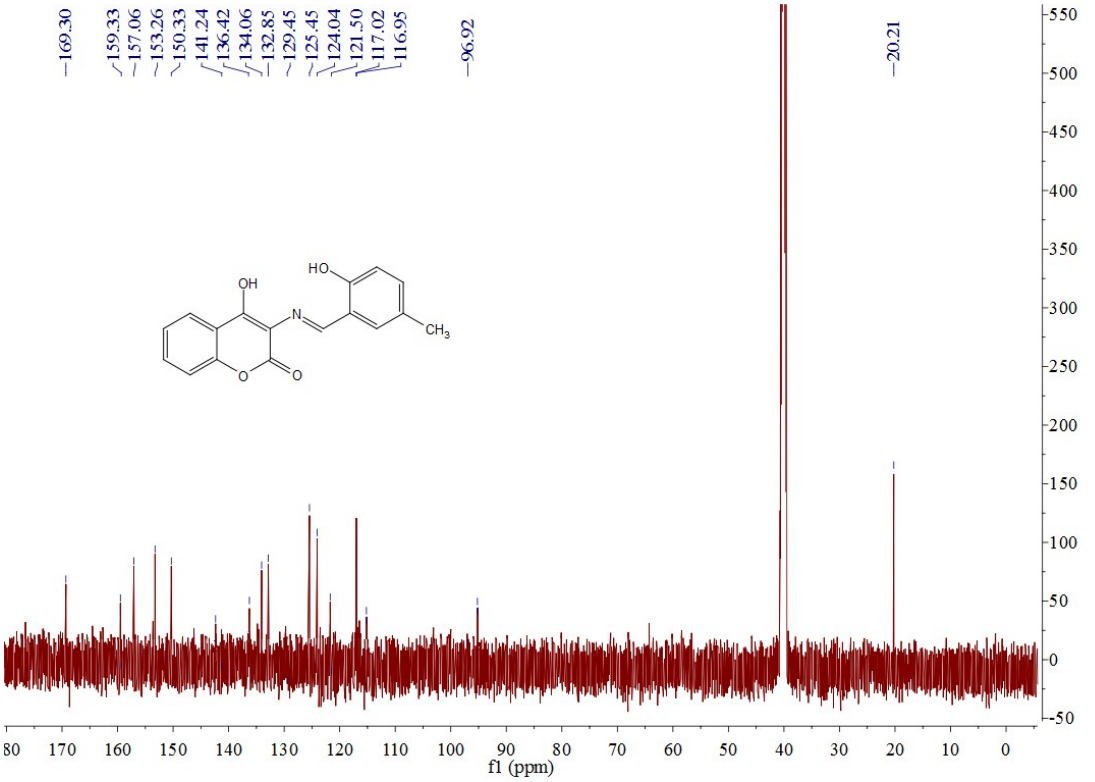
Elemental Composition Calculator

Target m/z:	294.077	**Result type:**	Negative ions	**Species:**	$[M-H]^-$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10); Cl (0-5)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
$C_{17}H_{12}NO_4$		294.0772		0.78	

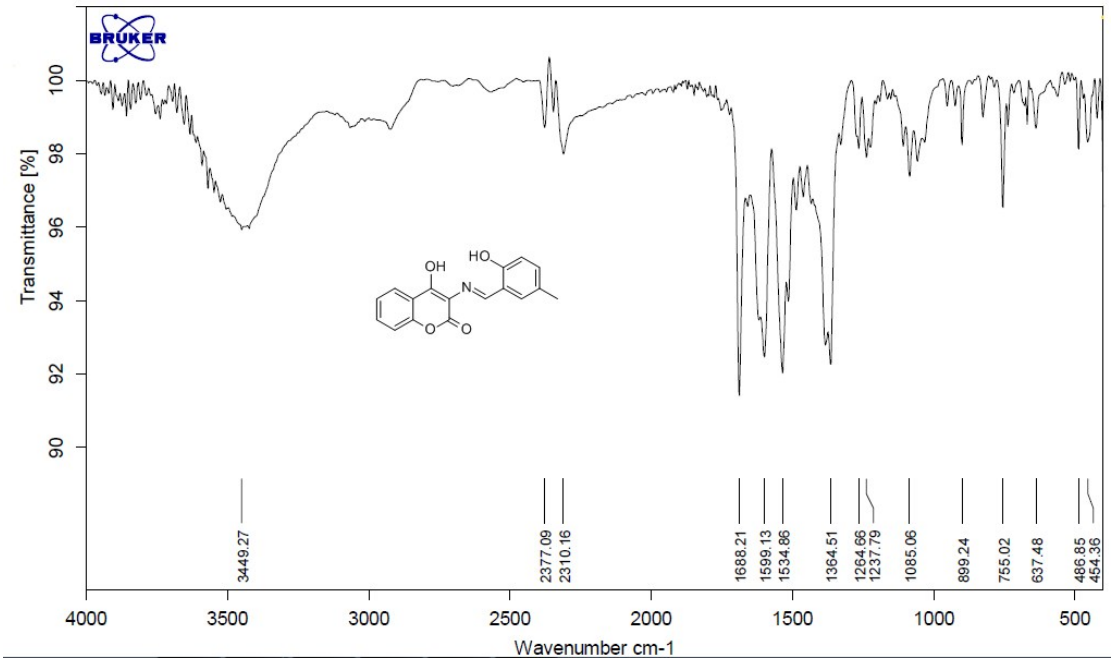
^{1}H NMR spectrum of compound 11 in DMSO



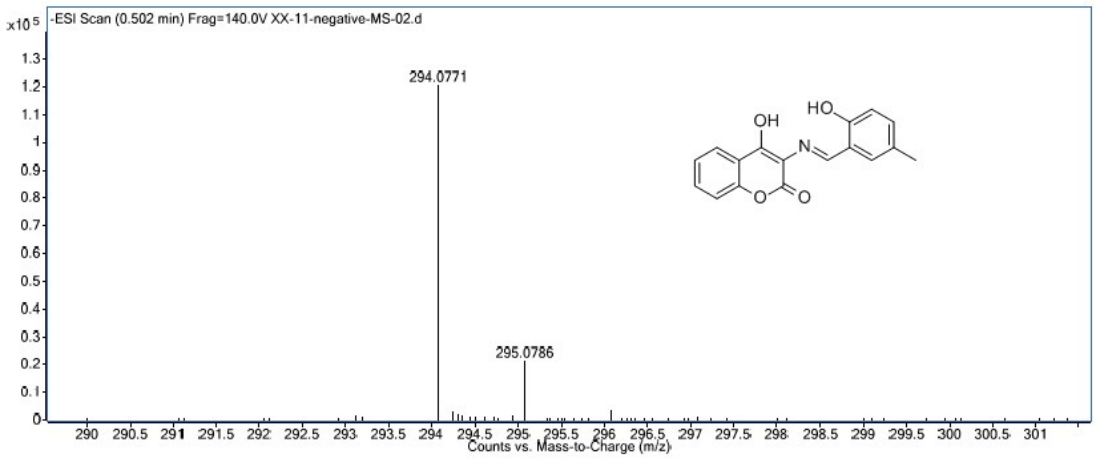
^{13}C NMR spectrum of compound 11 in DMSO



IR (KBr) spectrum of compound 11



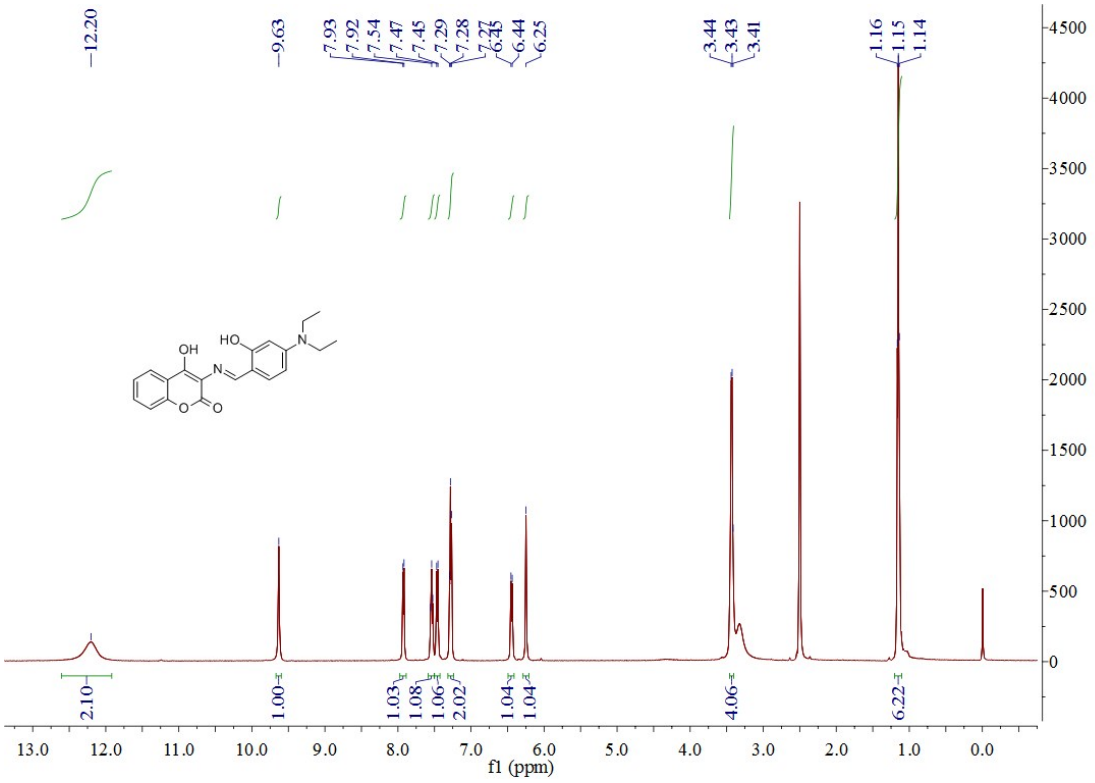
HRMS (ESI) spectrum of compound 11



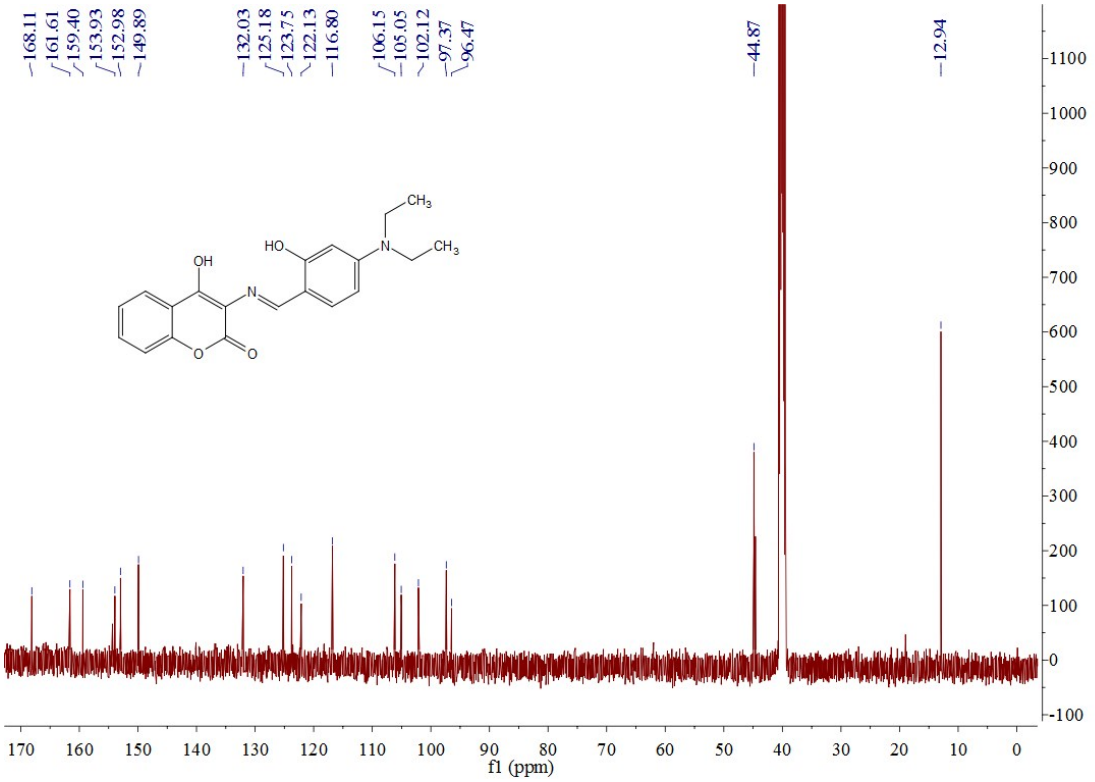
Elemental Composition Calculator

Target m/z:	294.0771	**Result type:**	Negative ions	**Species:**	$[M-H]^-$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10); Cl (0-5)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
C17H12NO4		294.0772		0.4	

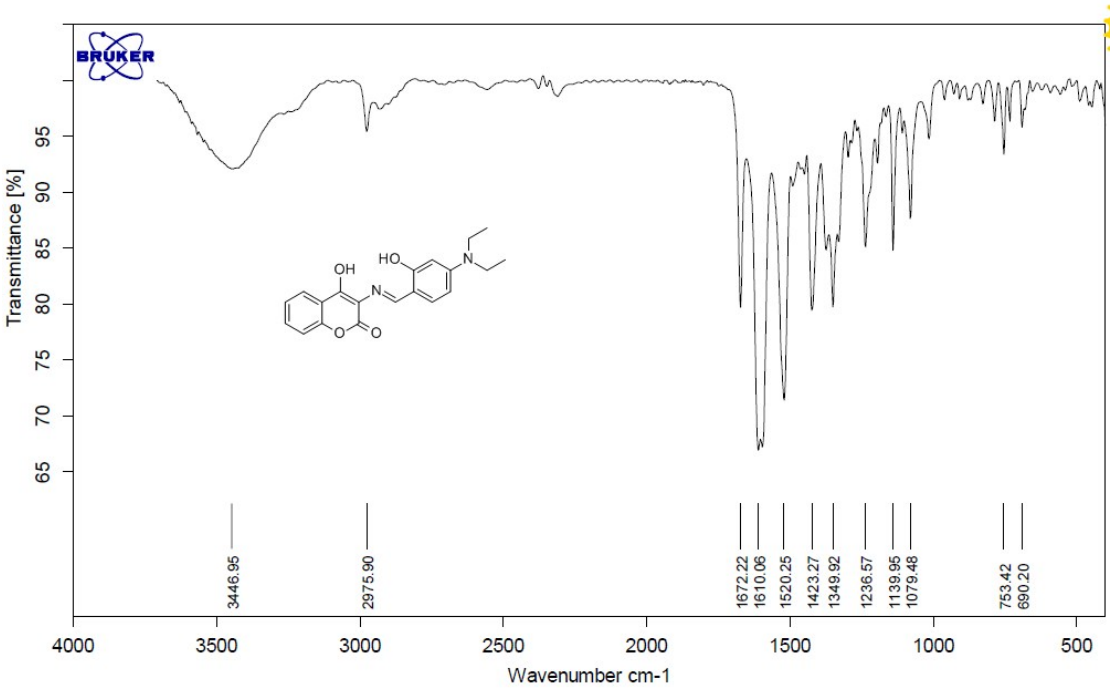
^{1}H NMR spectrum of compound 12 in DMSO



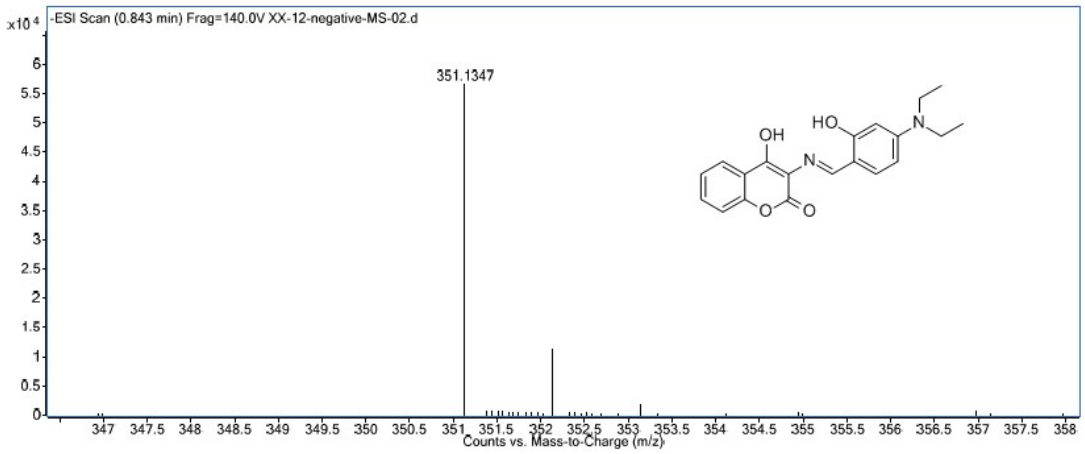
^{13}C NMR spectrum of compound 12 in DMSO



IR (KBr) spectrum of compound 12



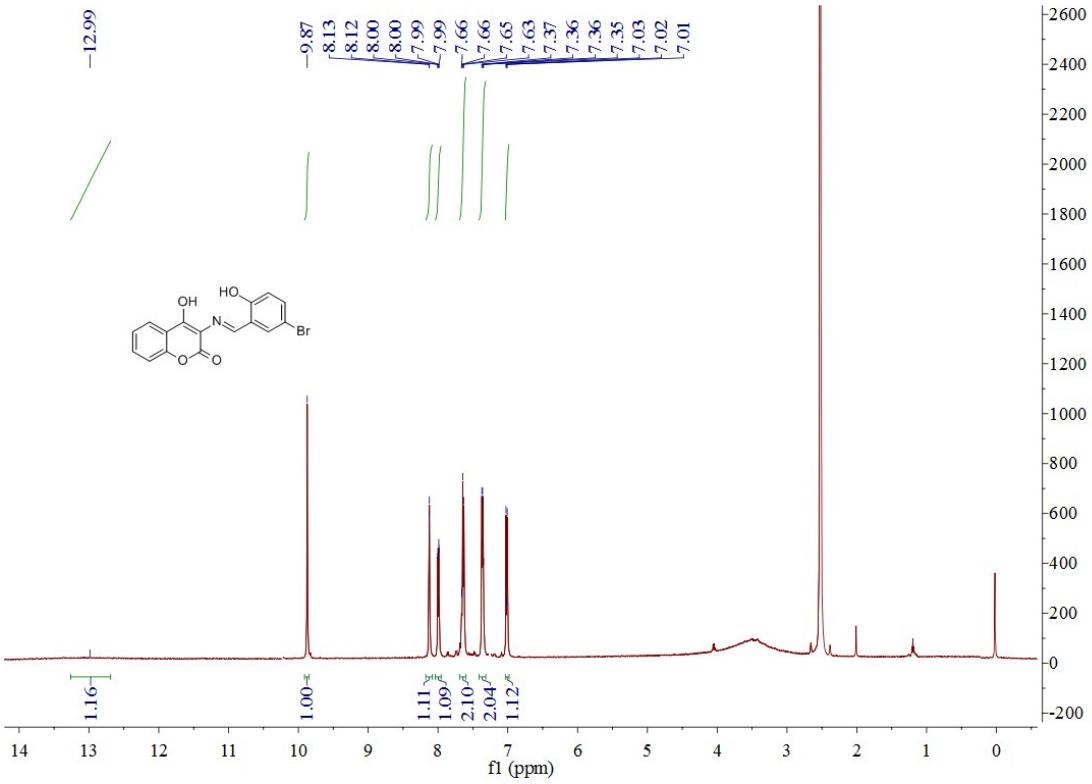
HRMS (ESI) spectrum of compound 12



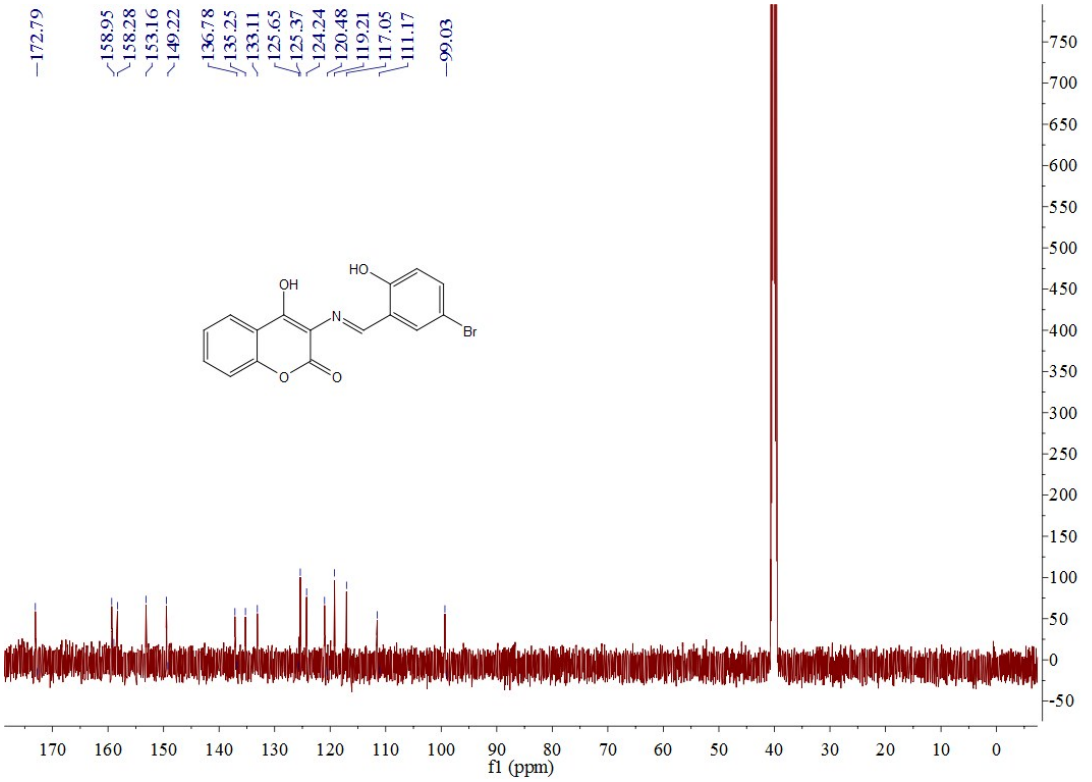
Elemental Composition Calculator

Target m/z:	351.1347	**Result type:**	Negative ions	**Species:**	$[M-H]^-$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10); Cl (0-5)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
$C_{20}H_{19}N_2O_4$		351.135		0.99	

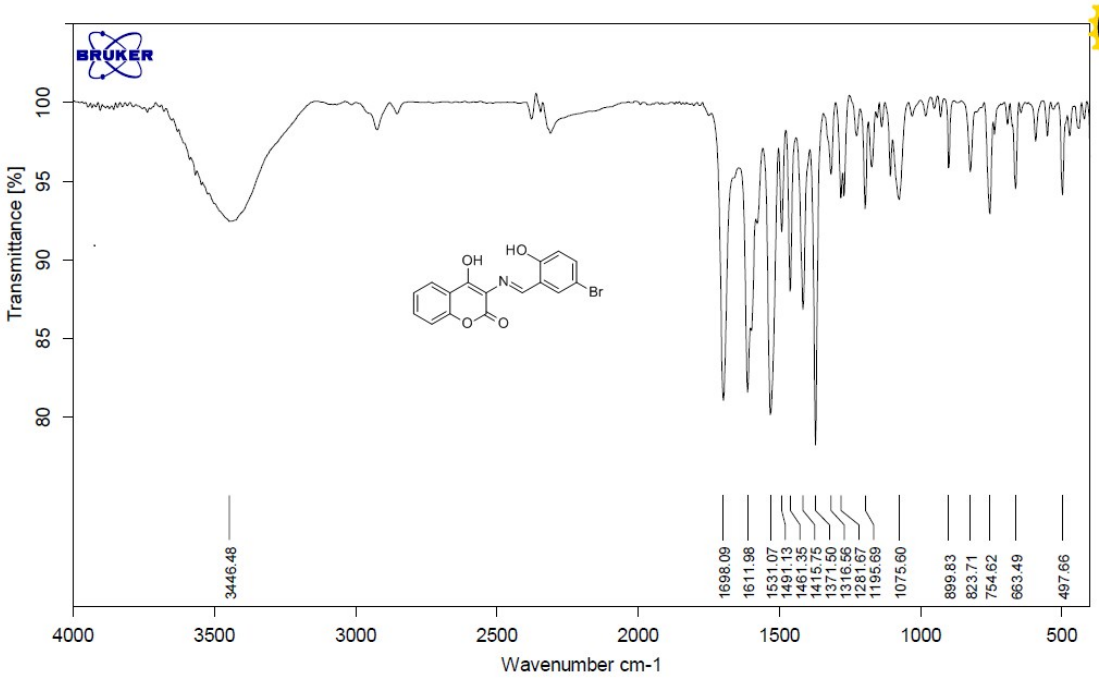
^{1}H NMR spectrum of compound 13 in DMSO



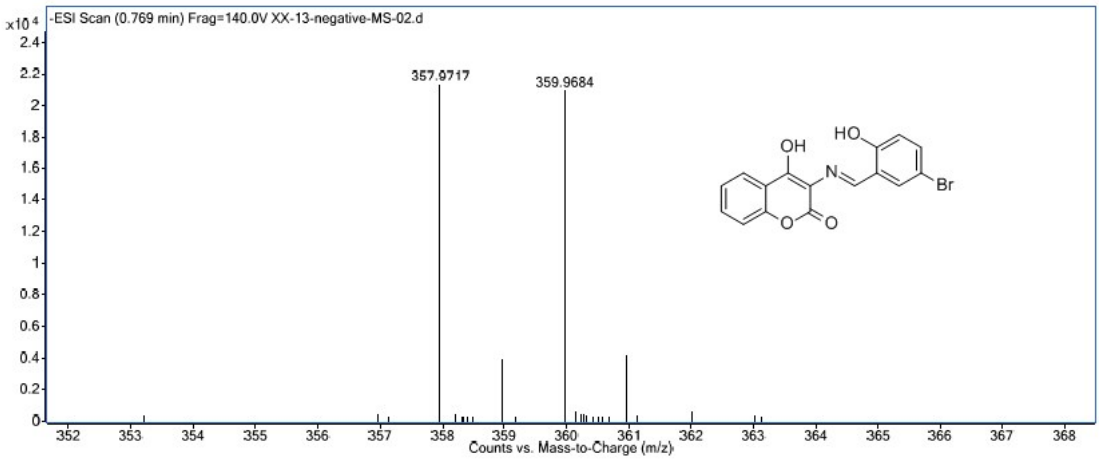
^{13}C NMR spectrum of compound 13 in DMSO



IR (KBr) spectrum of compound 13



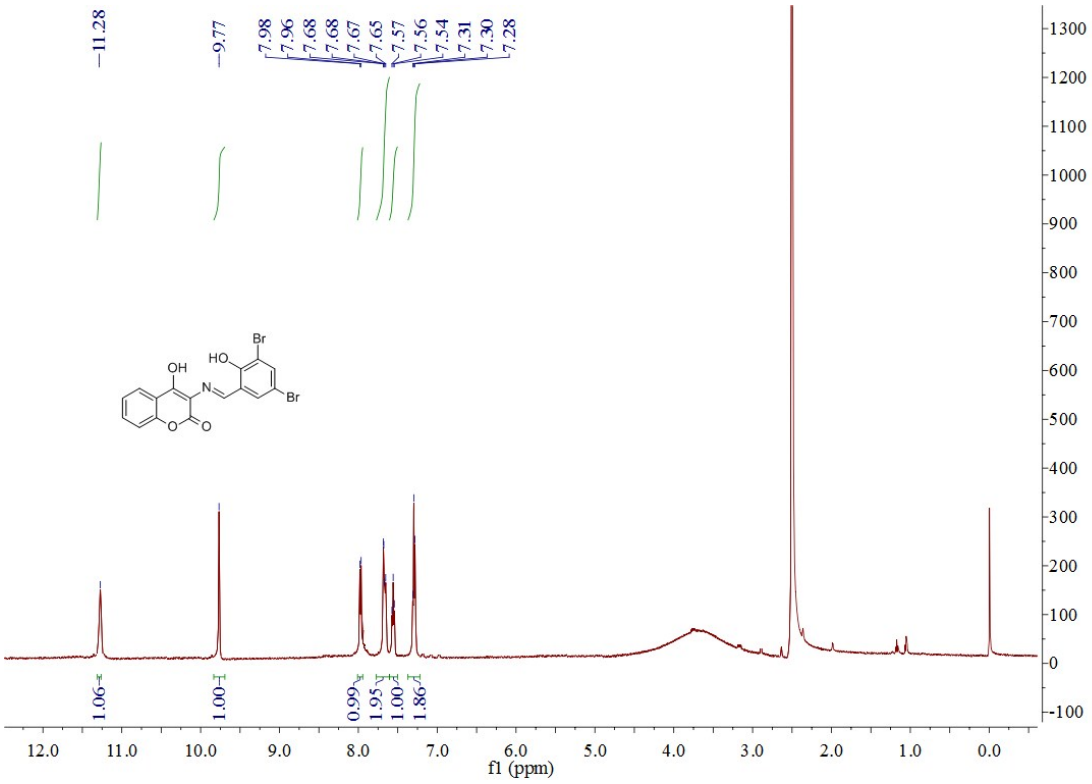
HRMS (ESI) spectrum of compound 13



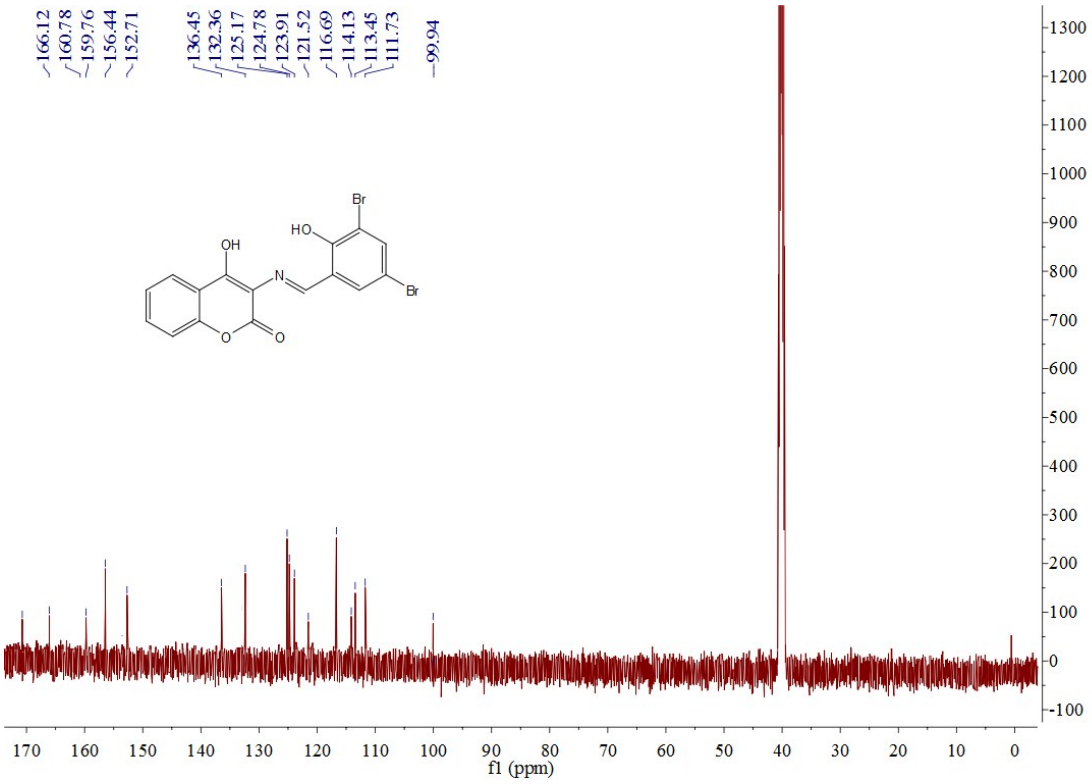
Elemental Composition Calculator

Target m/z:	357.9717	**Result type:**	Negative ions	**Species:**	$[M-H]^-$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10); Br (0-5)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
C16H9BrNO4		357.972		0.89	

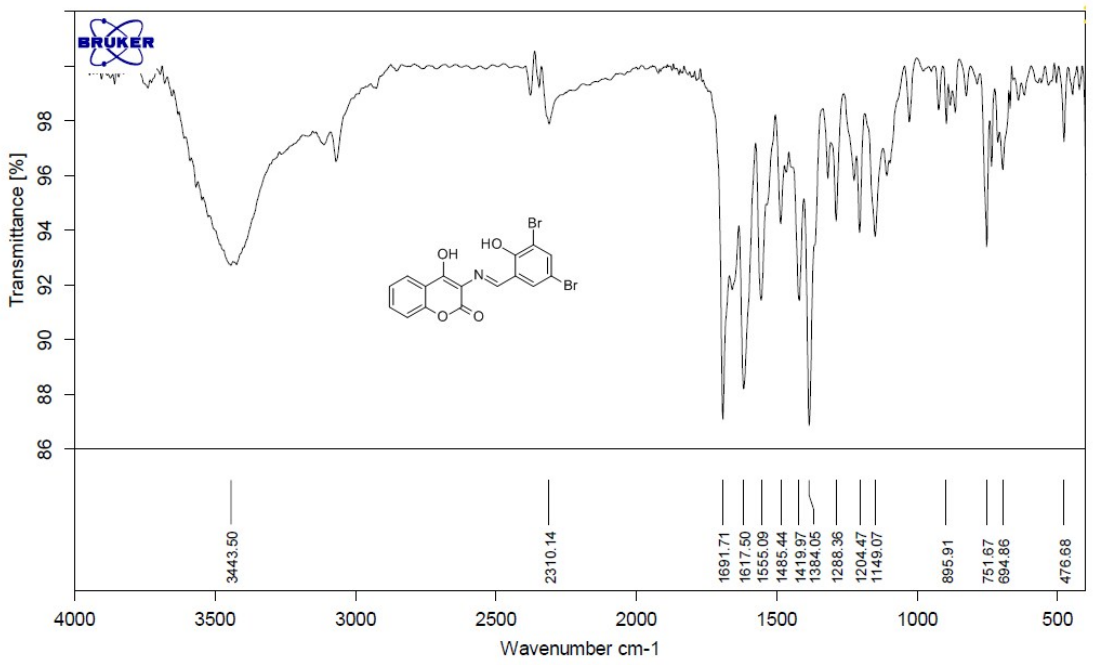
^{1}H NMR spectrum of compound 14 in DMSO



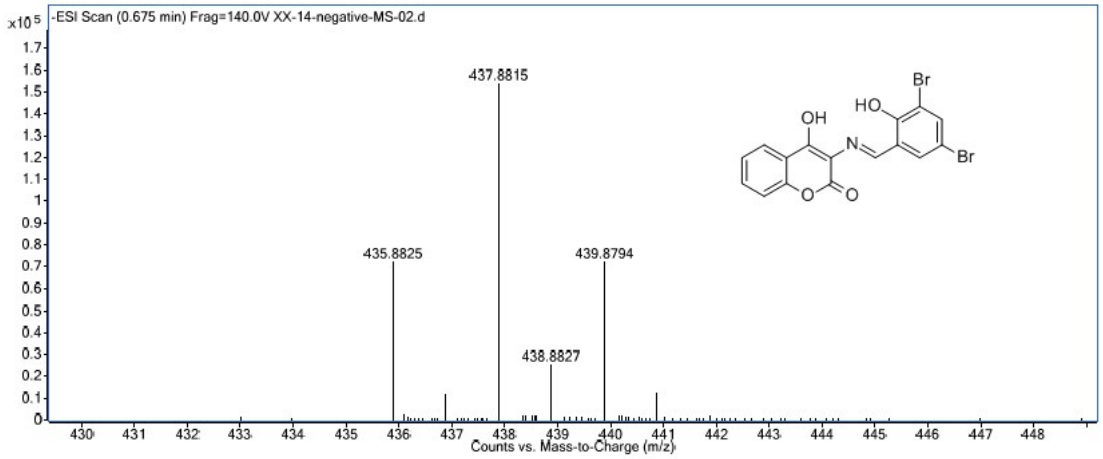
^{13}C NMR spectrum of compound 14 in DMSO



IR (KBr) spectrum of compound 14



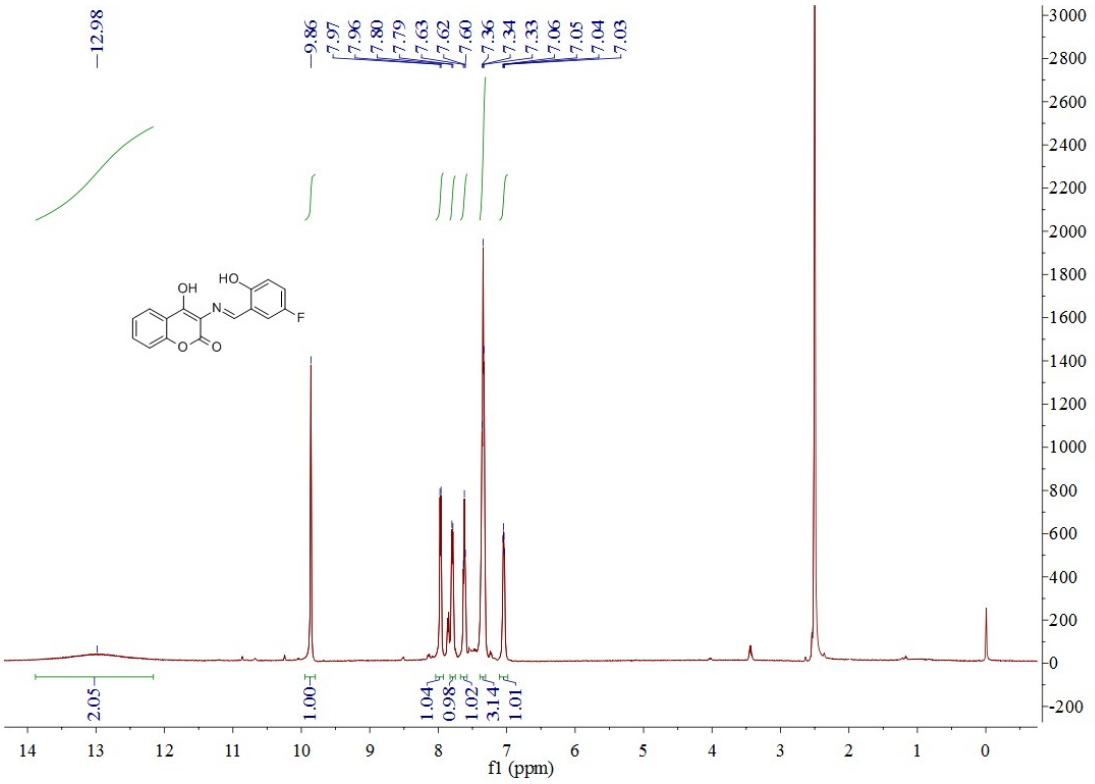
HRMS (ESI) spectrum of compound 14



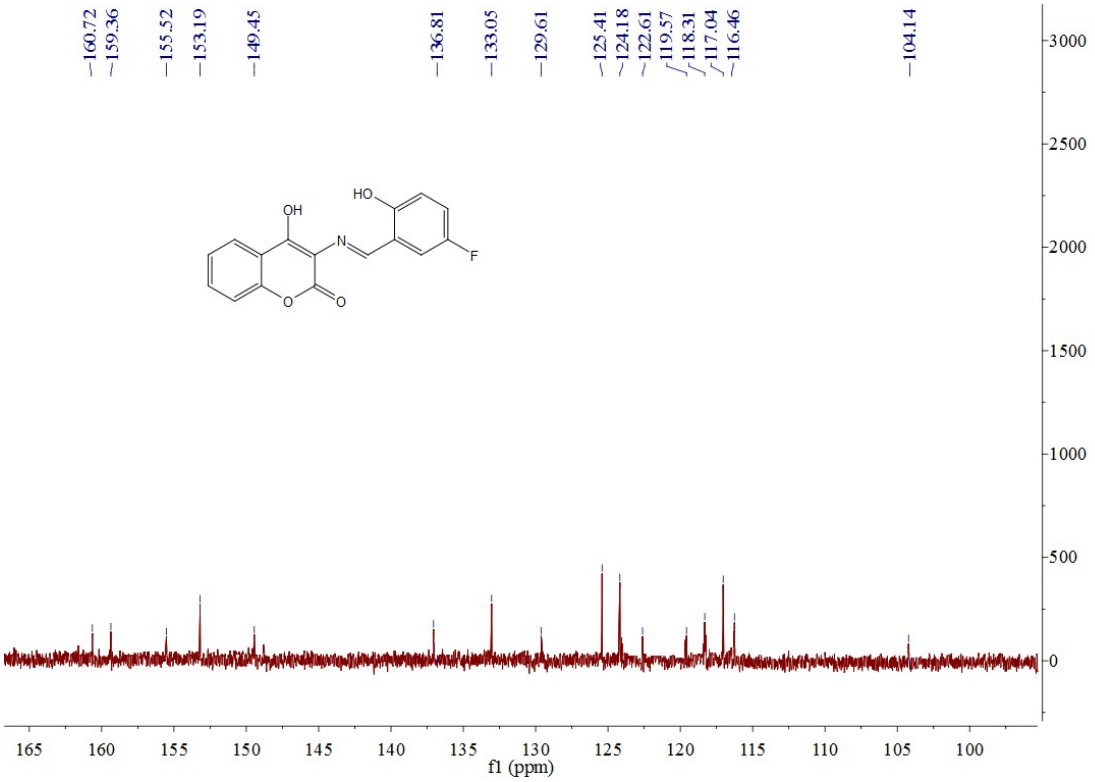
Elemental Composition Calculator

Target m/z:	435.8825	**Result type:**	Negative ions	**Species:**	$[M-H]^-$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10); Br (0-5)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
C16H8Br2NO4		435.8826		0.22	

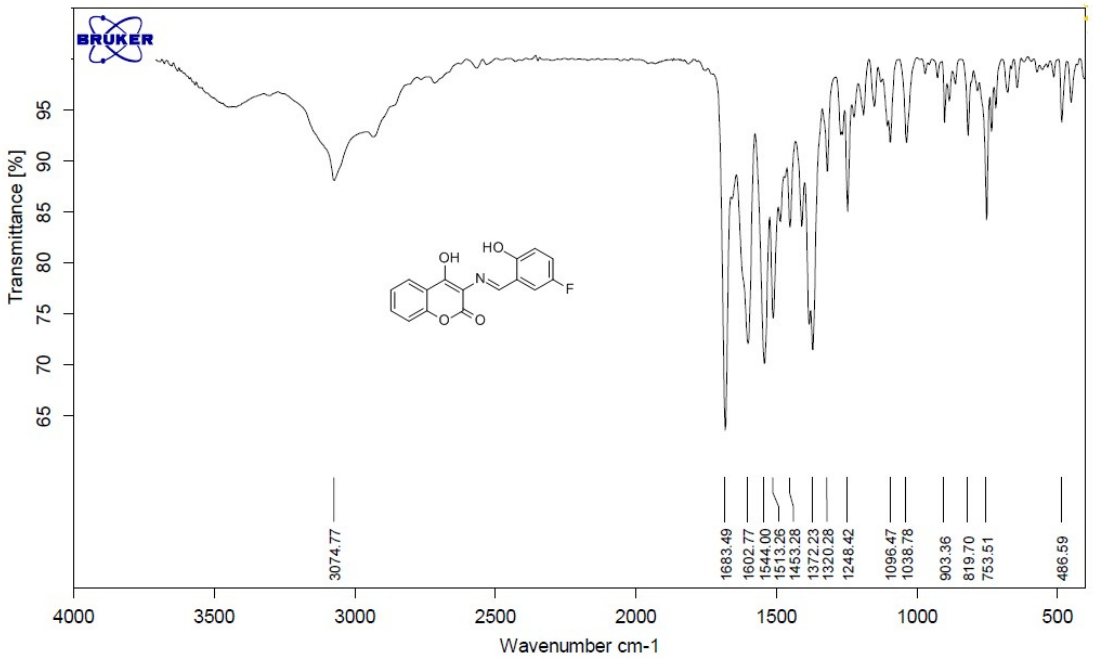
^{1}H NMR spectrum of compound 15 in DMSO



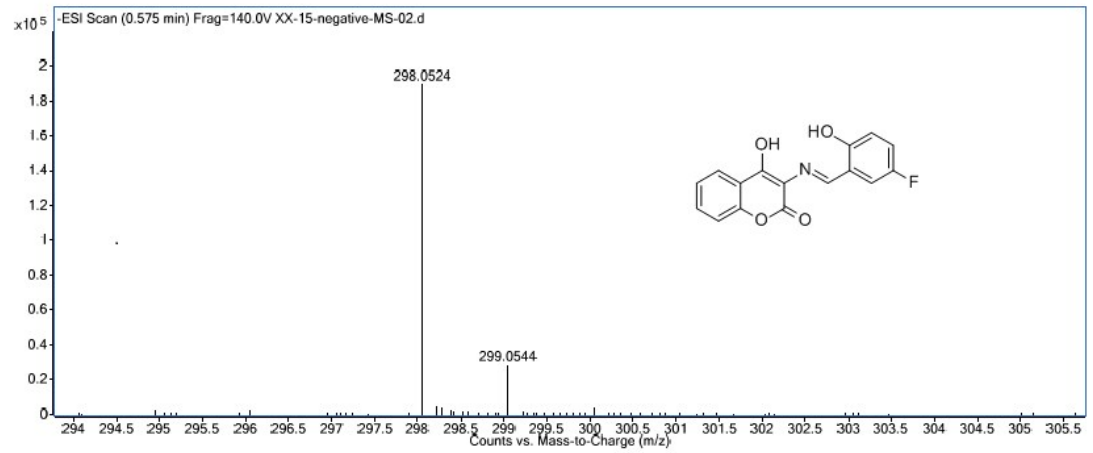
^{13}C NMR spectrum of compound 15 in DMSO



IR (KBr) spectrum of compound 15



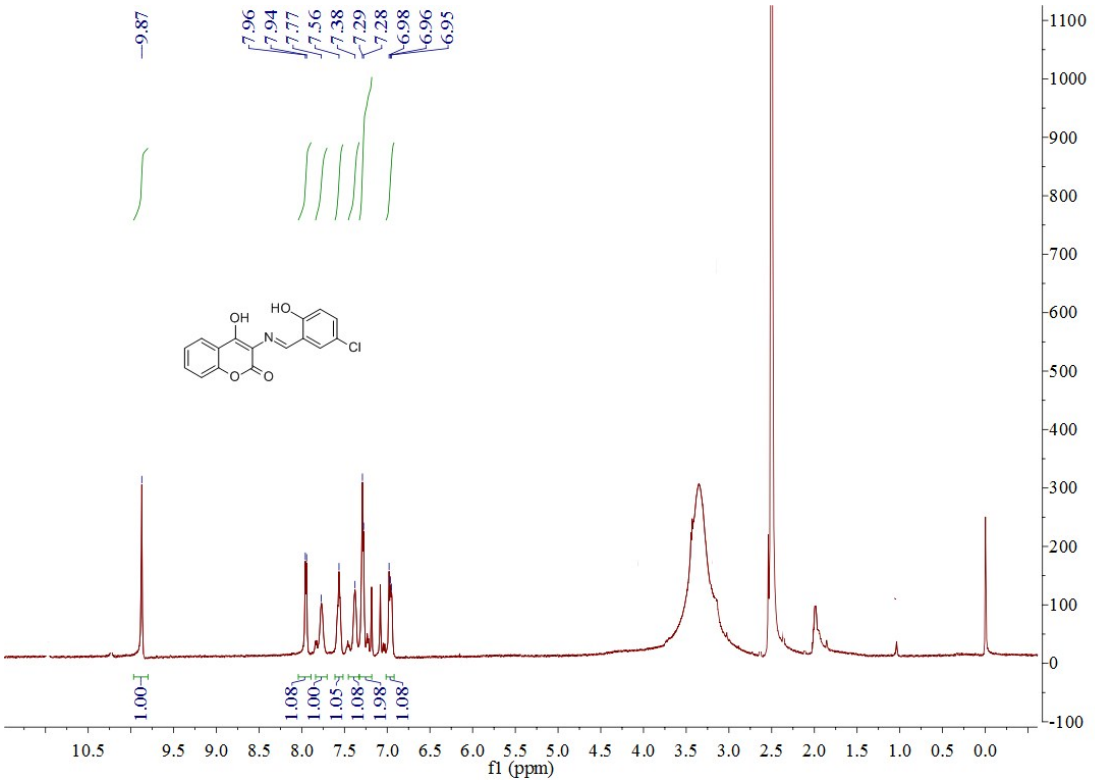
HRMS (ESI) spectrum of compound 15



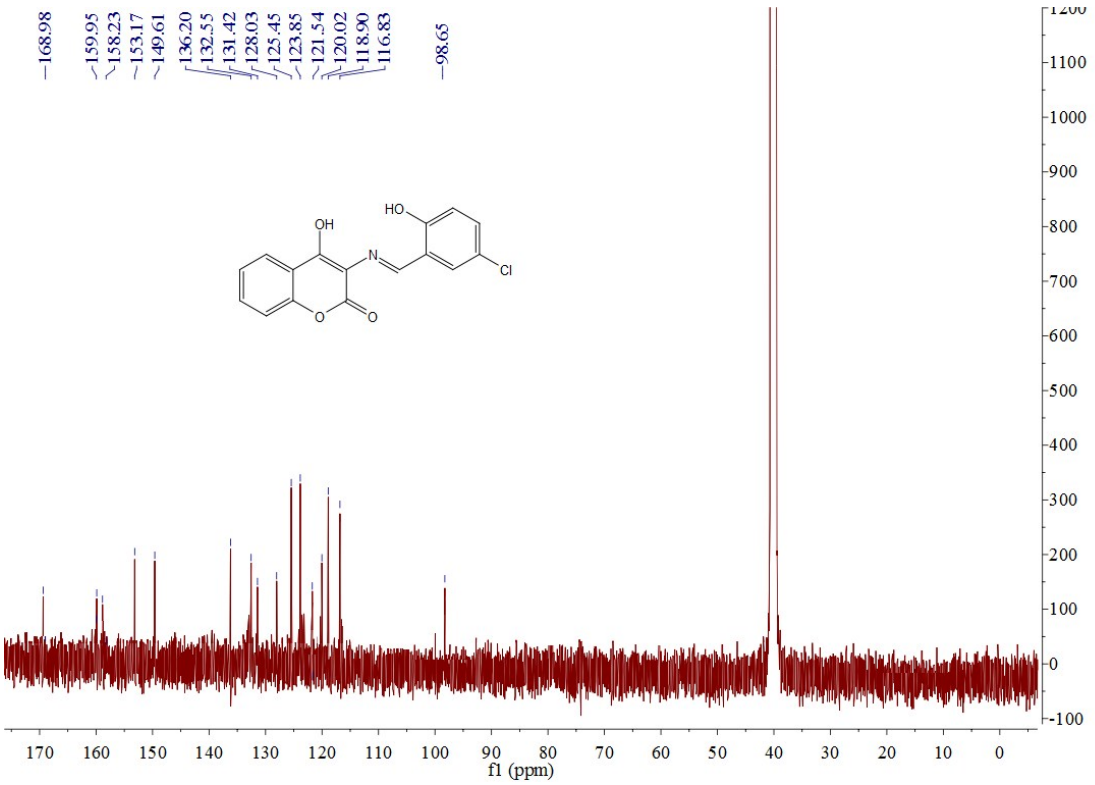
Elemental Composition Calculator

Target m/z:	298.0524	**Result type:**	Negative ions	**Species:**	$[M-H]^-$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10); F (0-5)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
C16H9FNO4		298.0521		-0.83	

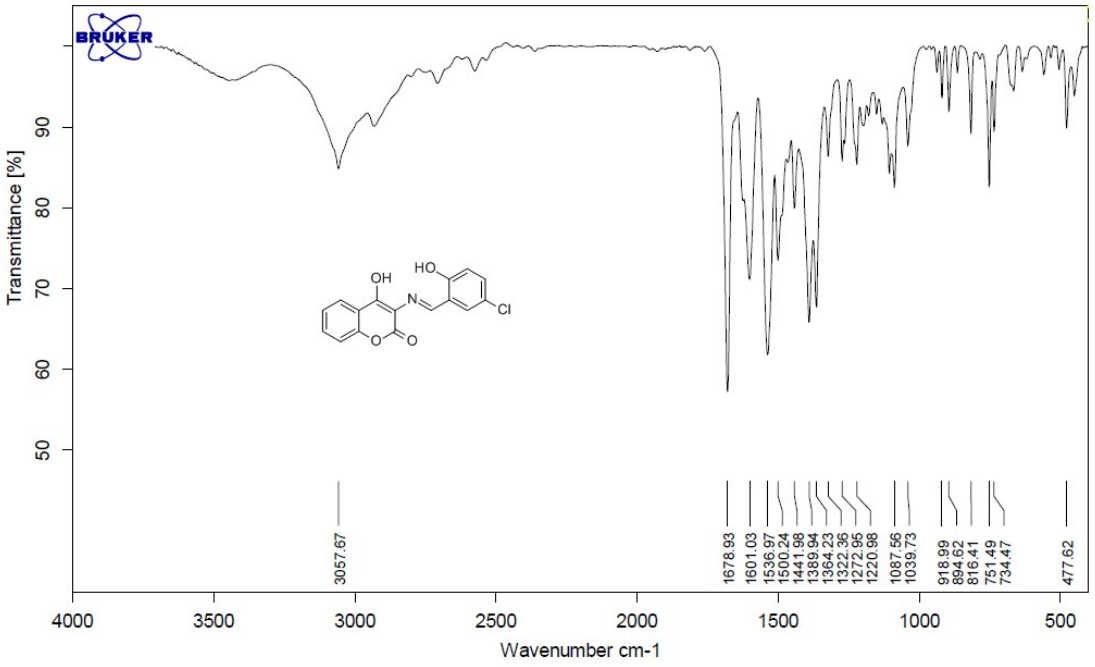
^{1}H NMR spectrum of compound 16 in DMSO



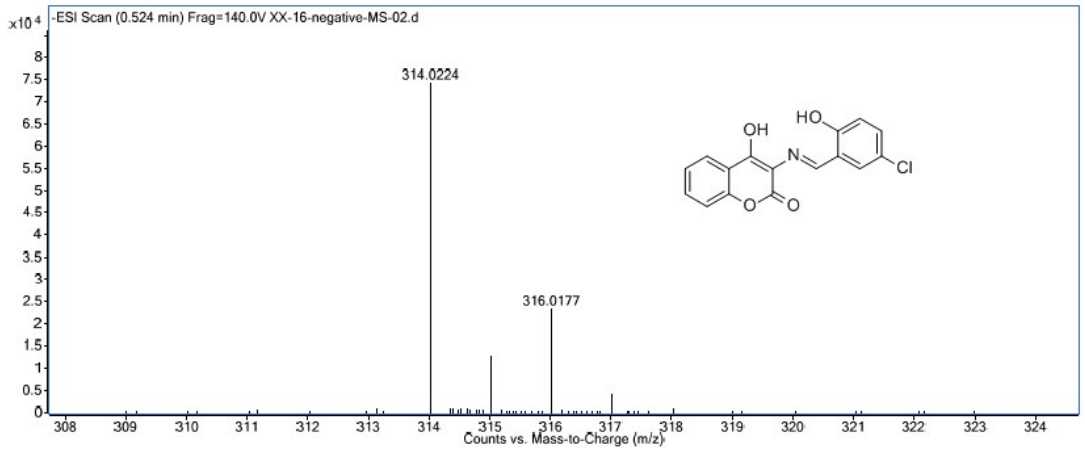
^{13}C NMR spectrum of compound 16 in DMSO



IR (KBr) spectrum of compound 16



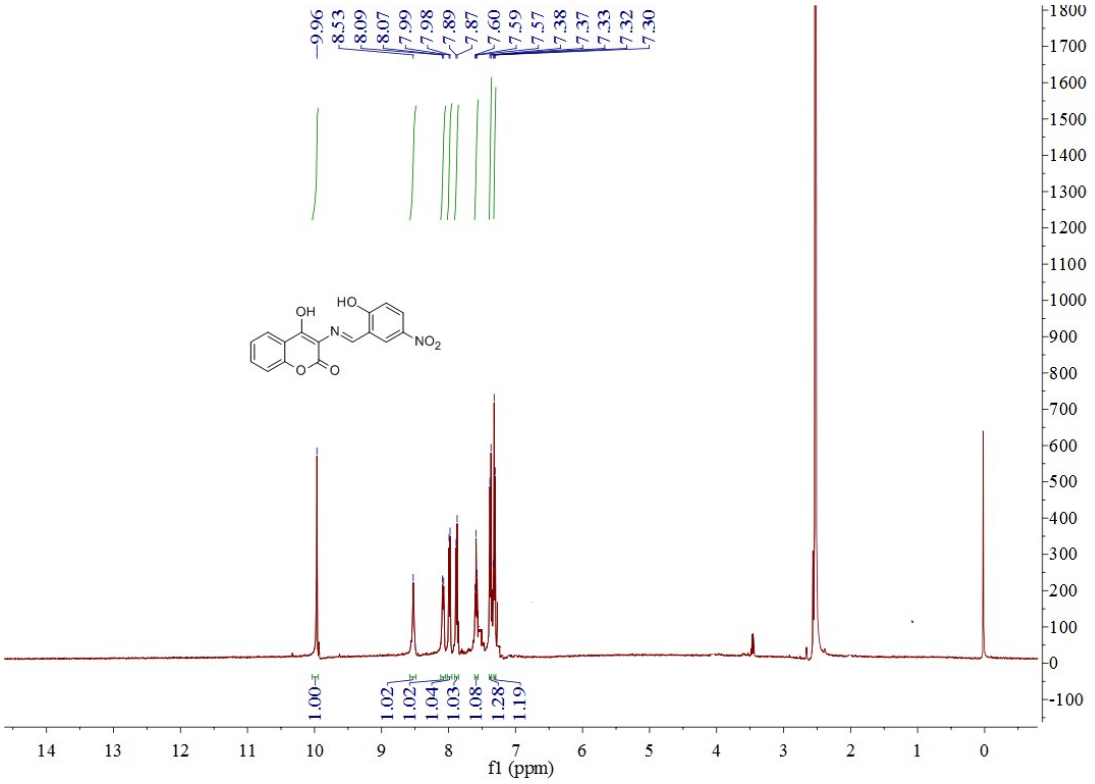
HRMS (ESI) spectrum of compound 16



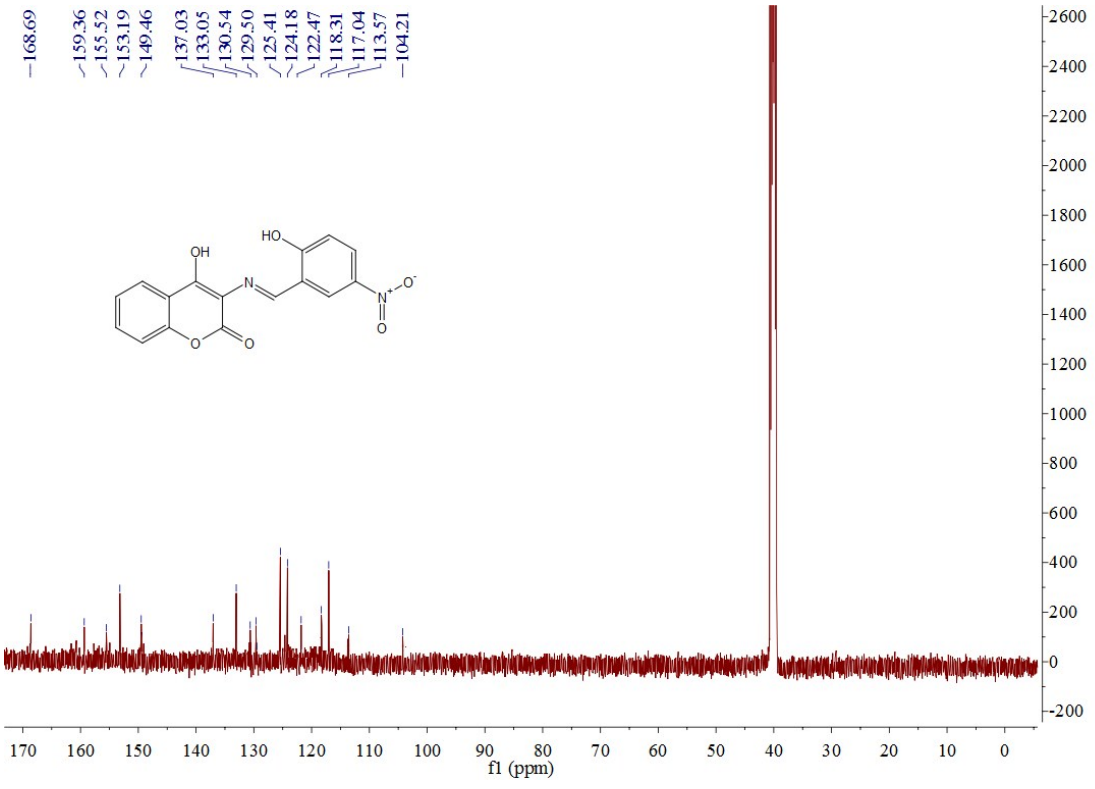
Elemental Composition Calculator

Target m/z:	314.0224	**Result type:**	Negative ions	**Species:**	$[M-H]^-$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10); Cl (0-5)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
$C_{16}H_9ClNO_4$		314.0226		0.58	

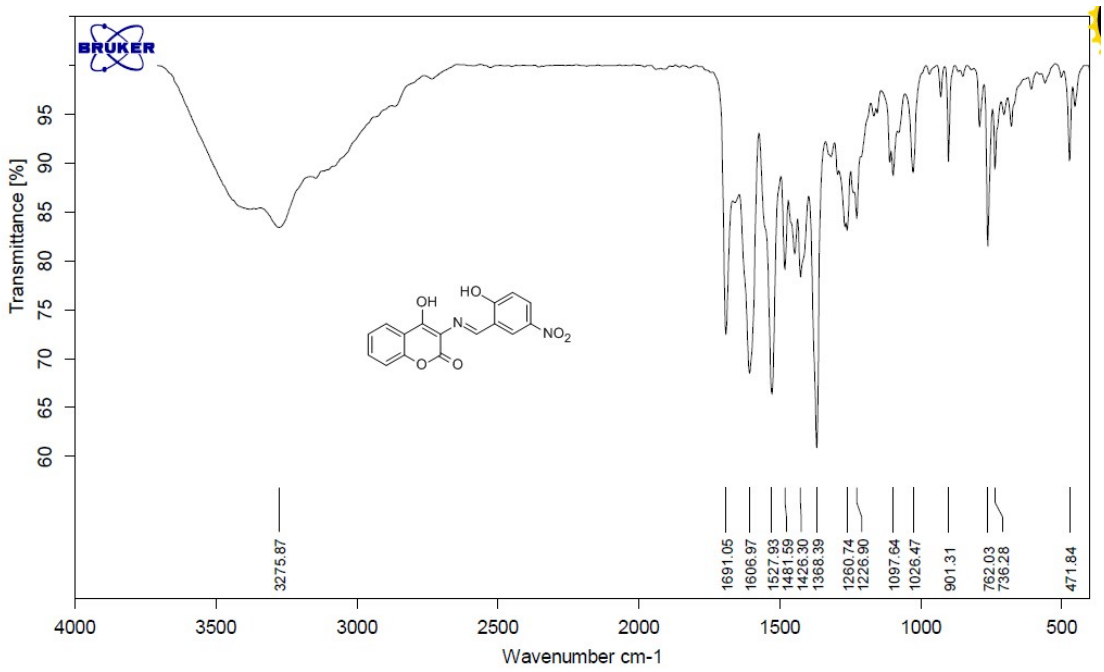
^{1}H NMR of compound 17 in DMSO



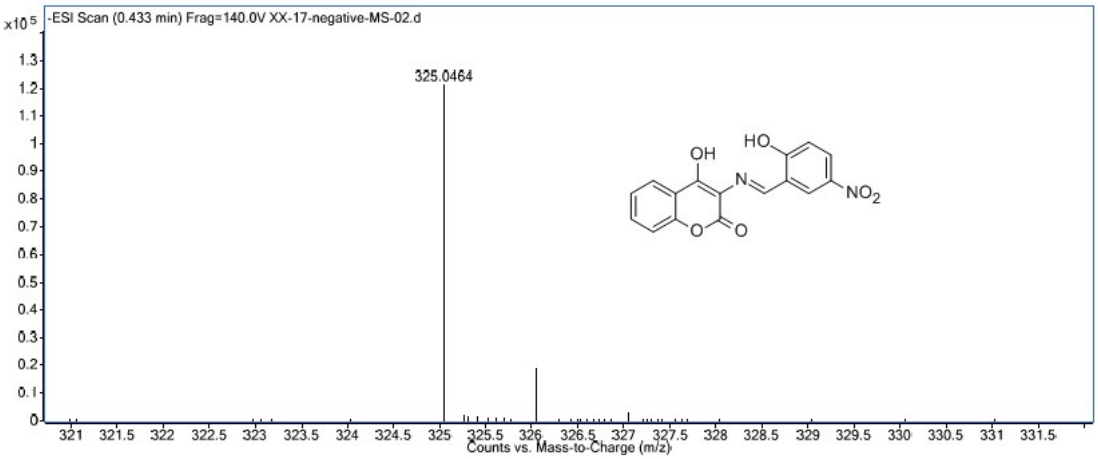
^{13}C NMR of compound 17 in DMSO



IR (KBr) spectrum of compound 17



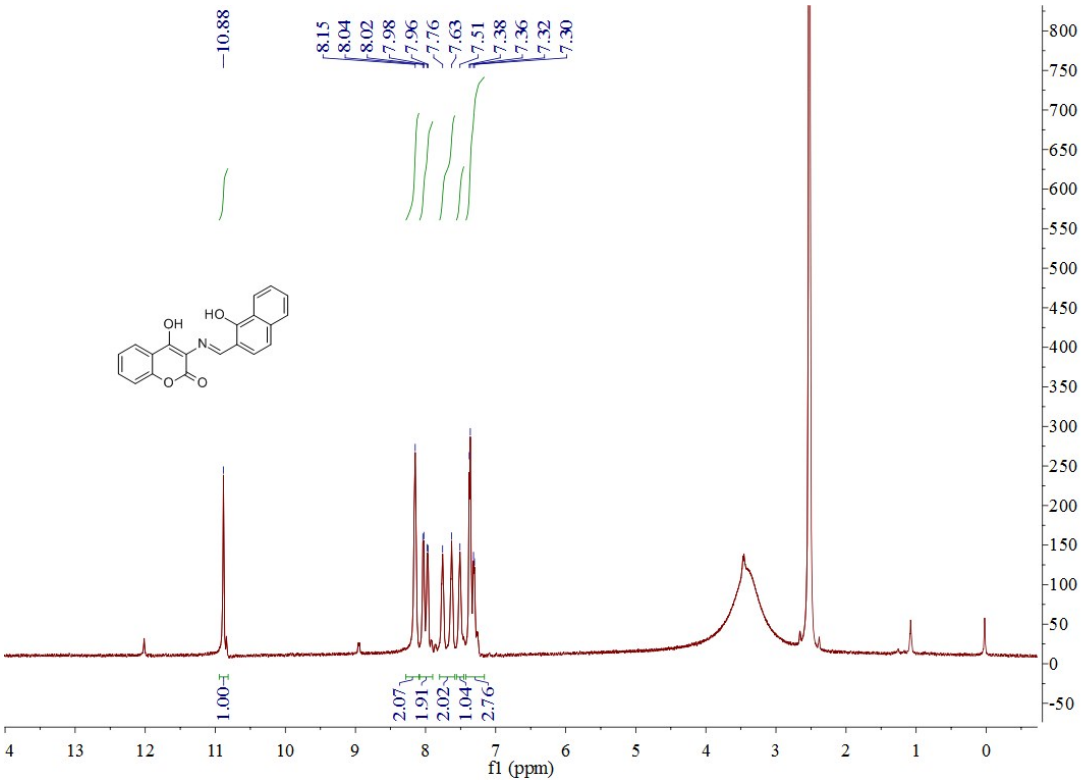
HRMS (ESI) spectrum of compound 17



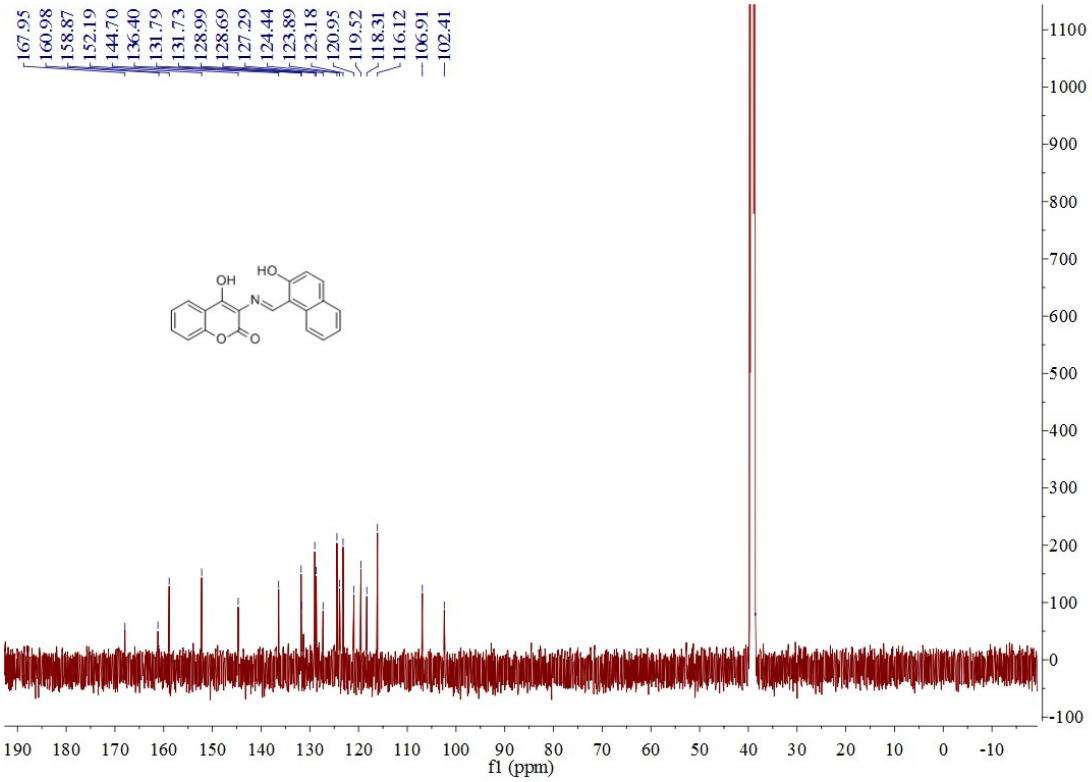
Elemental Composition Calculator

Target m/z:	325.0464	**Result type:**	Negative ions	**Species:**	$[M-H]^-$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10); Cl (0-5)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
C16H9N2O6		325.0466		0.75	

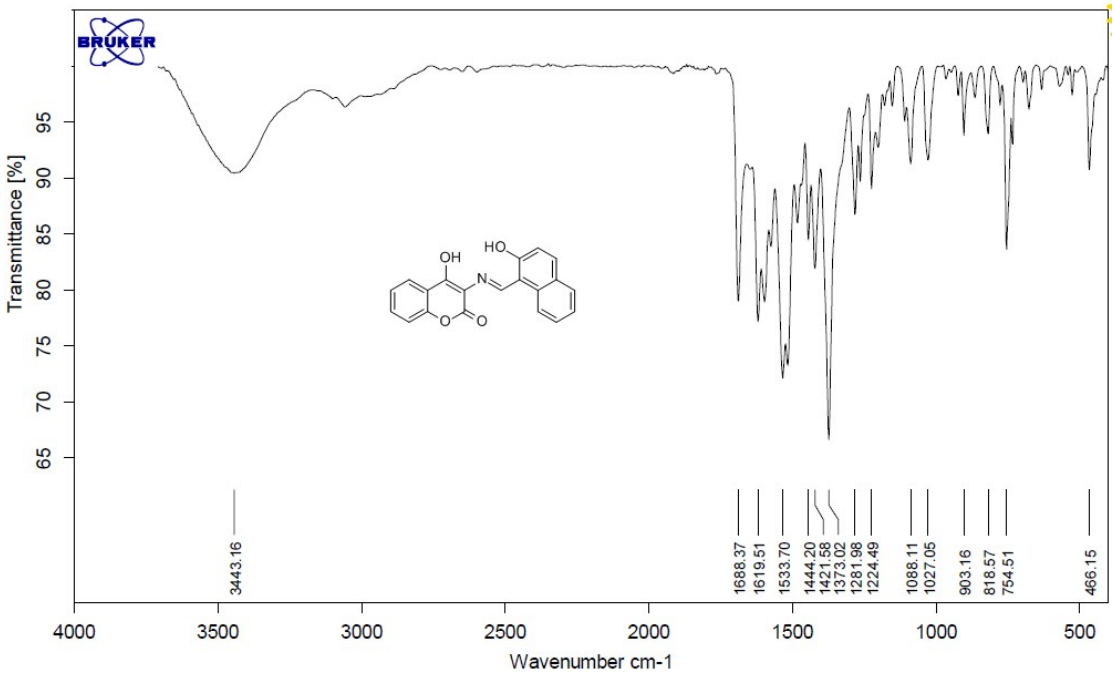
^{1}H NMR spectrum of compound 18 in DMSO



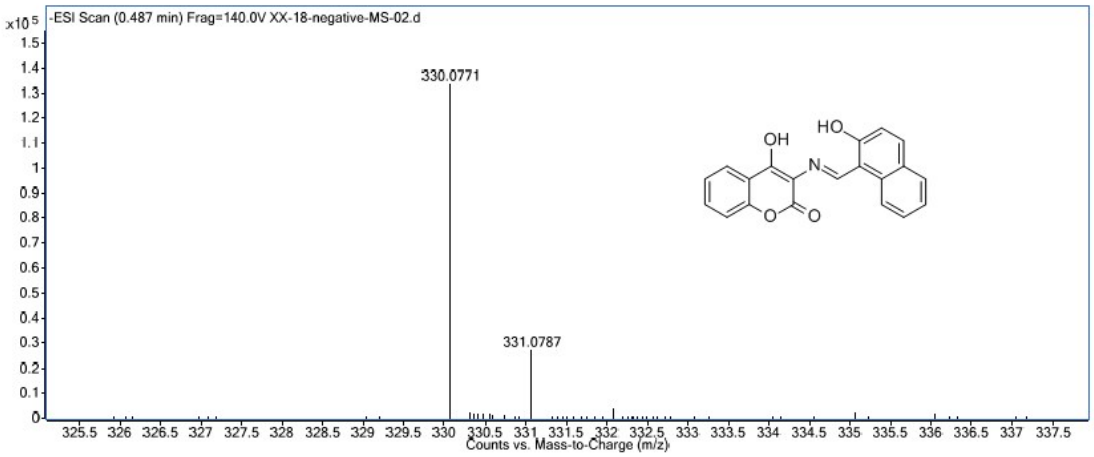
^{13}C NMR spectrum of compound 18 in DMSO



IR (KBr) spectrum of compound 18



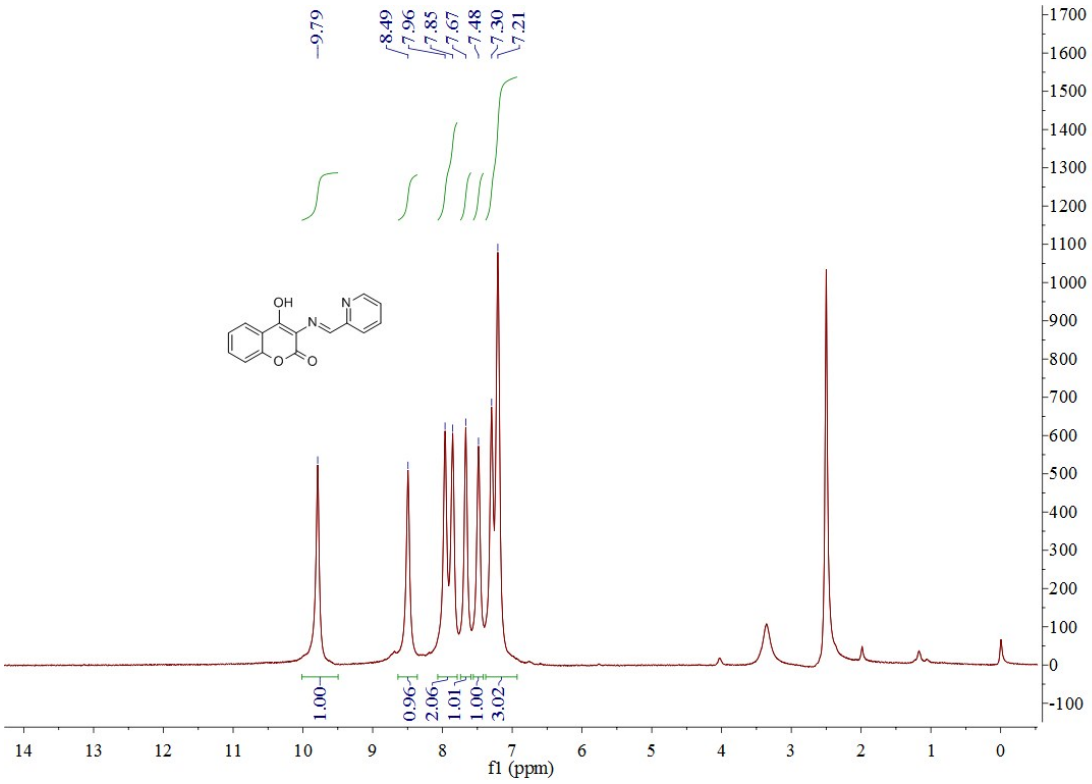
HRMS (ESI) spectrum of compound 18



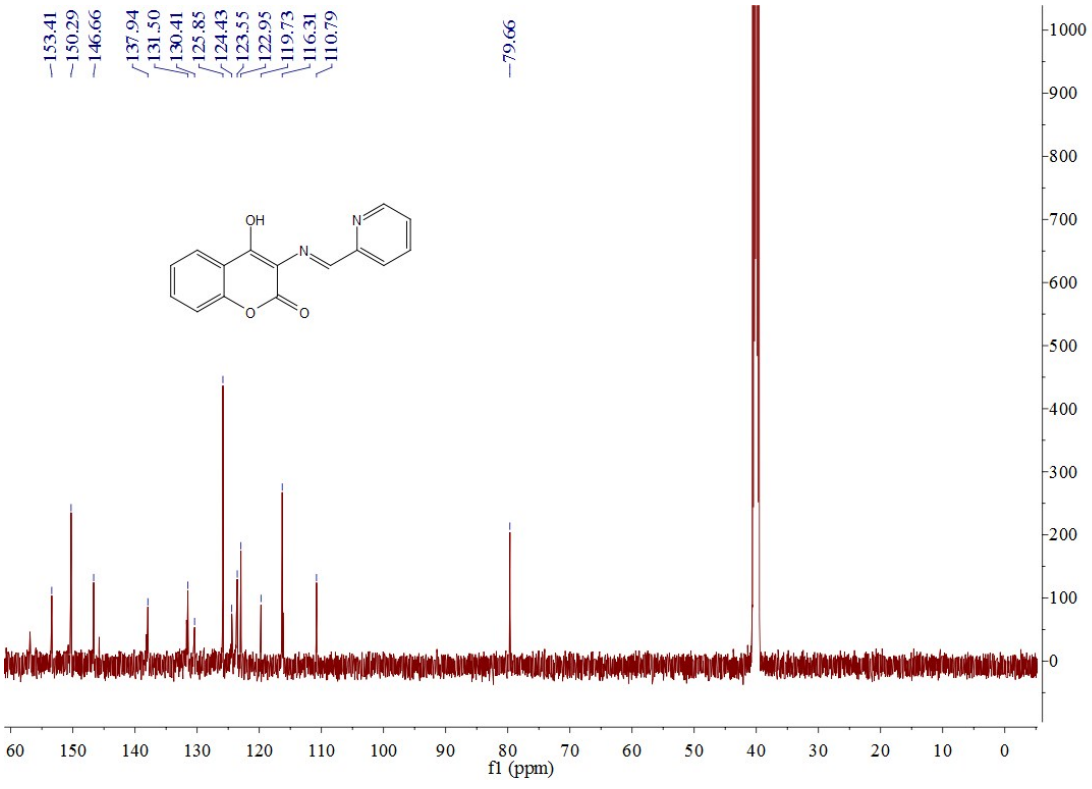
Elemental Composition Calculator

Target m/z:	330.0771	**Result type:**	Negative ions	**Species:**	$[M-H]^-$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10); Cl (0-5)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
$C_{20}H_{12}NO_4$		330.0772		0.24	

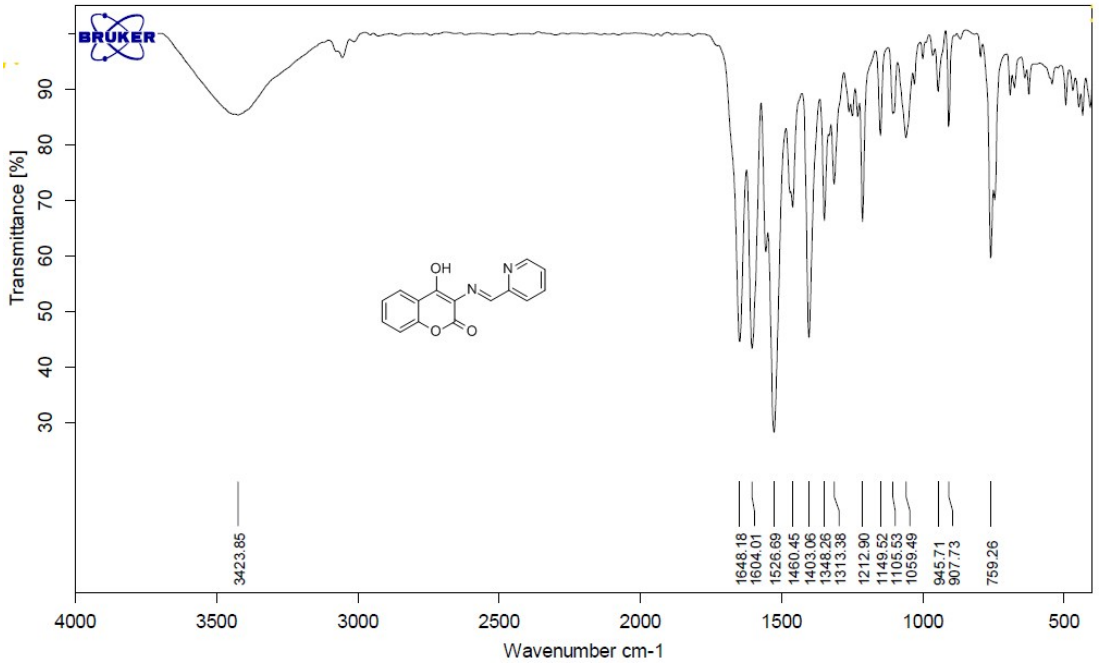
^{1}H NMR of compound 19 in DMSO



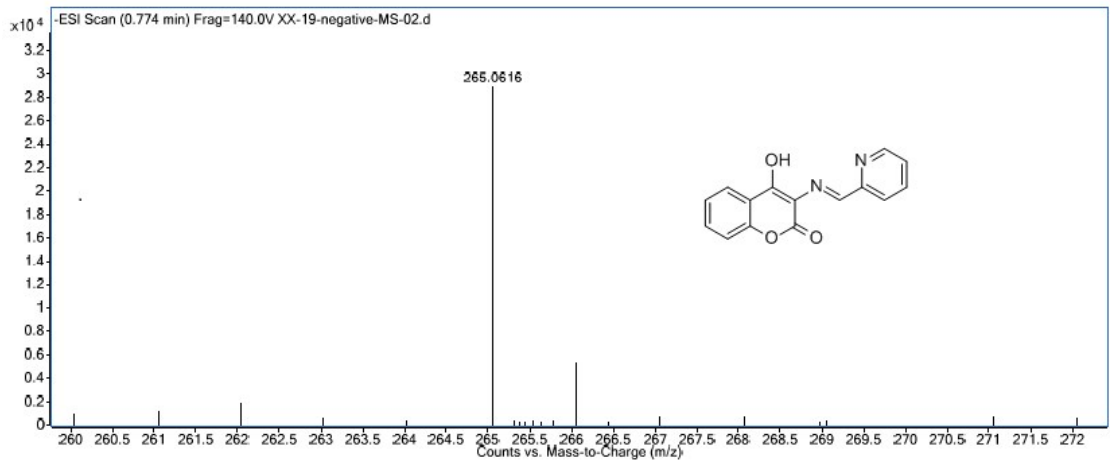
^{13}C NMR of compound 19 in DMSO



IR (KBr) spectrum of compound 19



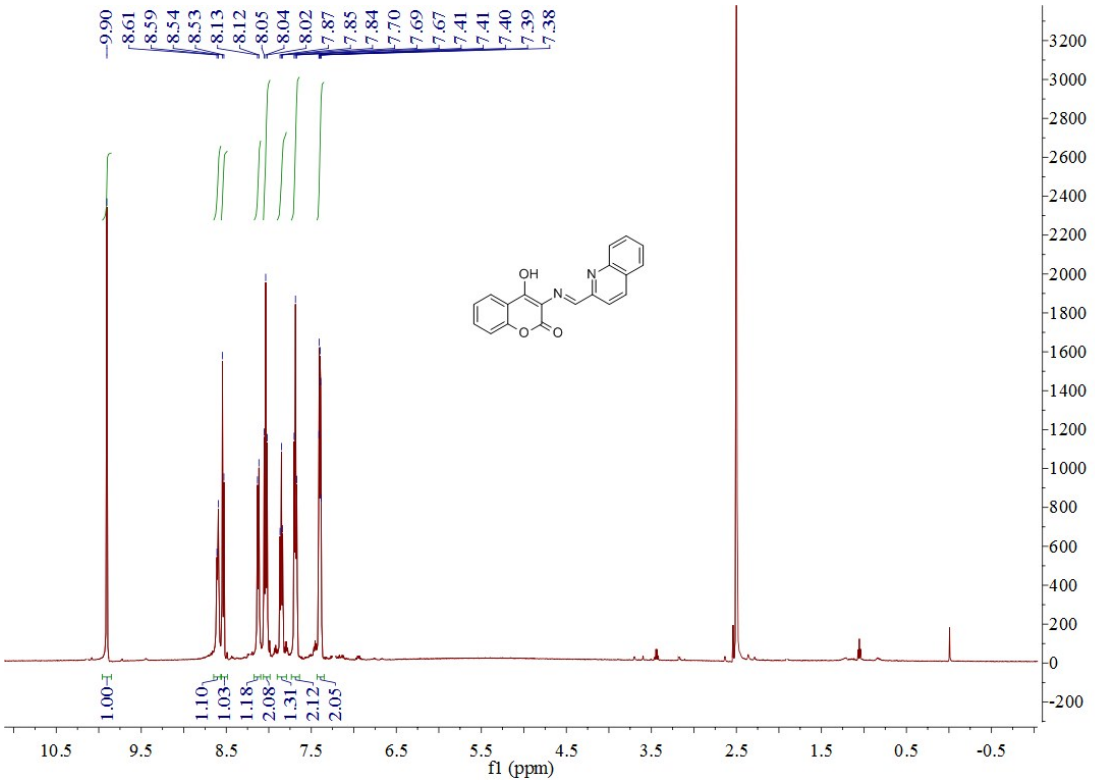
HRMS (ESI) spectrum of compound 19



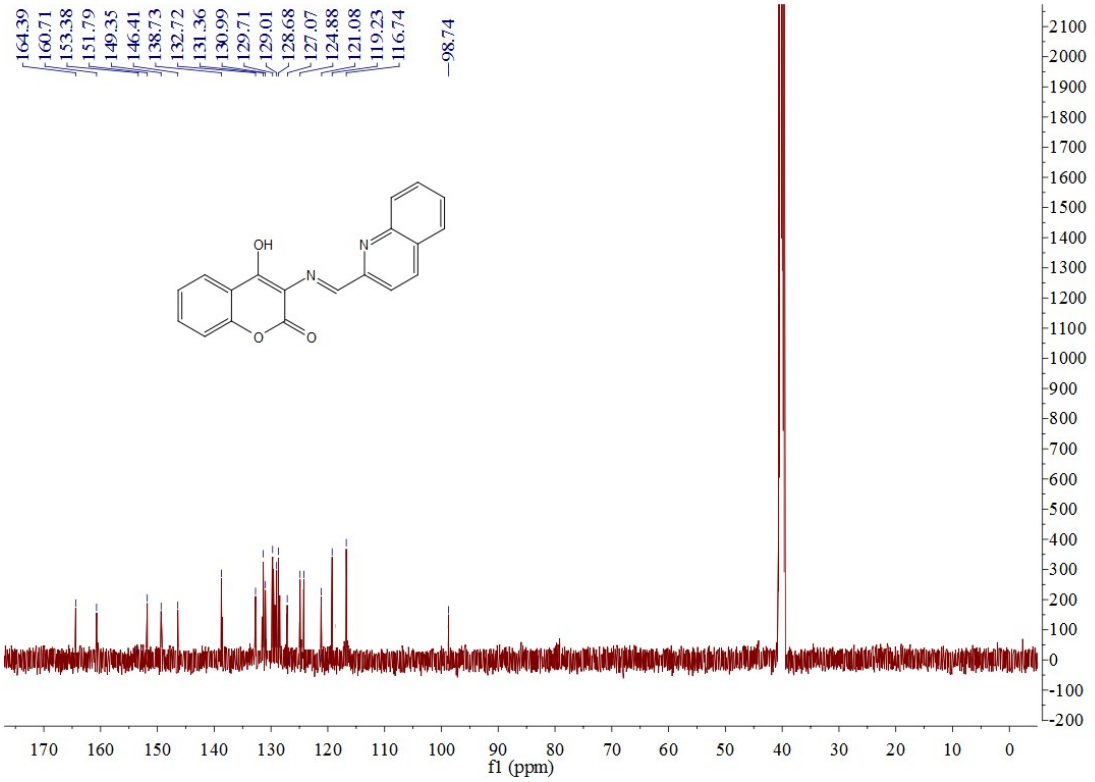
Elemental Composition Calculator

Target m/z:	265.0616	**Result type:**	Negative ions	**Species:**	$[M-H]^-$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10); Br (0-5)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
C15H9N2O3		265.0619		0.81	

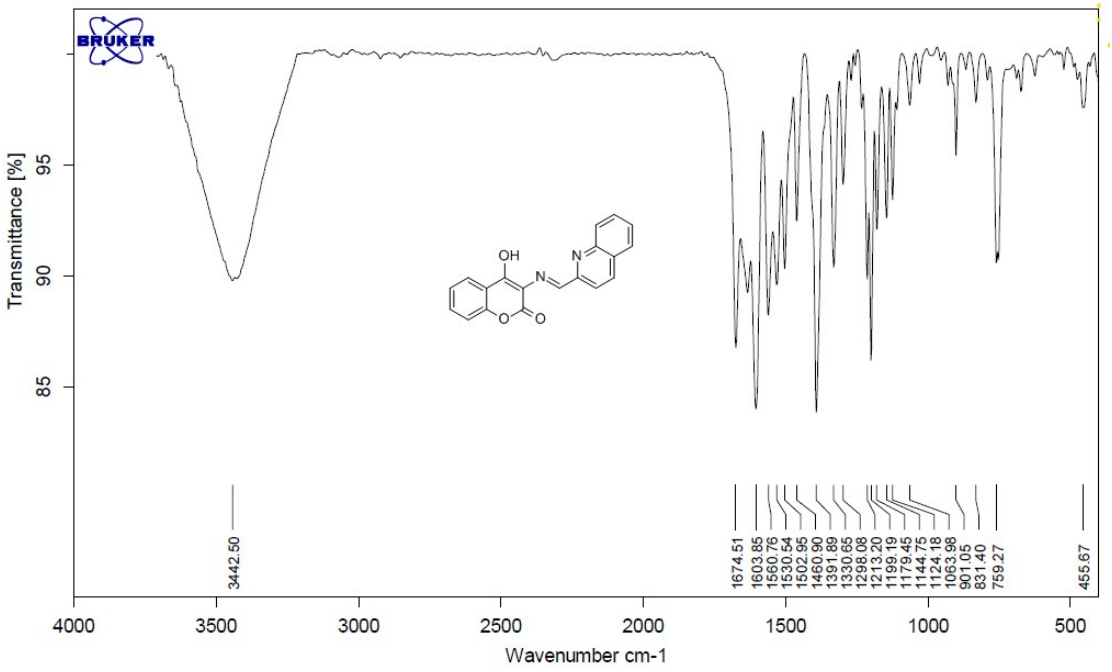
^{1}H NMR spectrum of compound 20 in DMSO



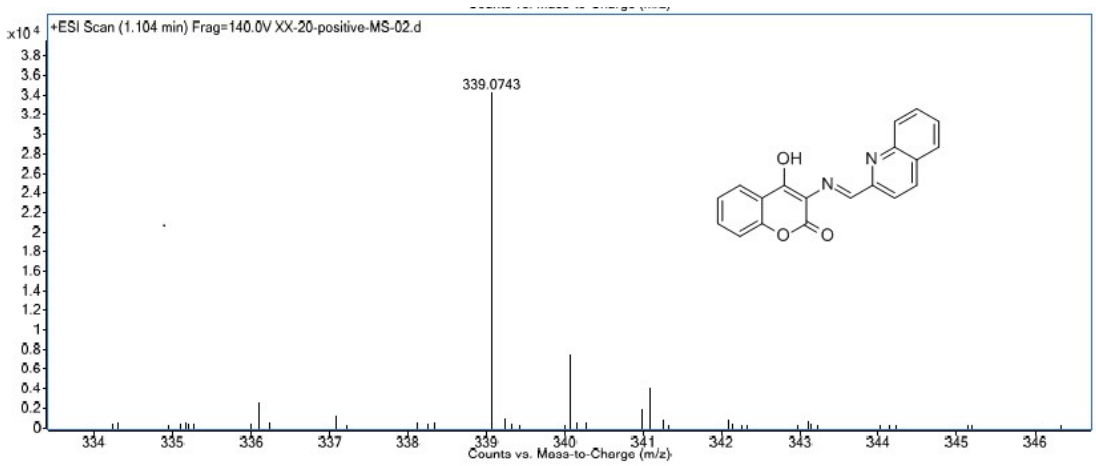
^{13}C NMR spectrum of compound 20 in DMSO



IR (KBr) spectrum of compound 20



HRMS (ESI) spectrum of compound 20



Elemental Composition Calculator

Target m/z:	339.0743	**Result type:**	Positive ions	**Species:**	$[M+Na]^+$
Elements:		C (0-80); H (0-120); O (0-30); N(0-10); Na (0-5)			
Ion Formula		**Calcalated m/z**		**PPM Error**	
C19H12N2NaO3		339.074		-0.9	