Supporting Information

Metal-free photosensitized aminosulfonylation of alkenes: a practical approach to β-amido sulfones

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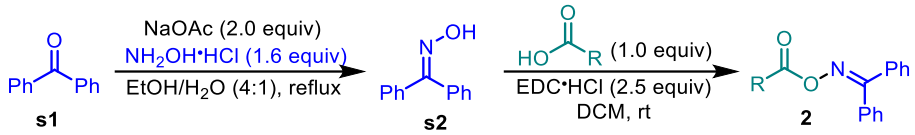
Supplementary Methods

General information

All glassware was thoroughly oven-dried. Chemicals and solvents were either purchased from commercial suppliers or purified by standard techniques. Thin-layer chromatography plates were visualized by exposure to ultraviolet light and/or staining with phosphomolybdic acid followed by heating on a hot plate. Flash chromatography was carried out using silica gel (200−300 mesh). ^{1}H NMR and ^{13}C NMR spectra were recorded on a Bruker AM-400 (400 MHz). The spectra were recorded in deuterochloroform ($CDCl_3$) as solvent at room temperature, ^{1}H and ^{13}C NMR chemical shifts are reported in ppm relative to the residual solvent peak. The residual solvent signals were used as references and the chemical shifts were converted to the TMS scale ($CDCl_3$: δ_H = 7.26 ppm, δ_C = 77.0 ppm). Data for ^{1}H NMR are reported as follows: chemical shift (δ ppm), multiplicity (s = singlet, d = doublet, t = triplet, m = multiplet, dd = doublet, br = broad), integration, coupling constant (Hz) and assignment. Data for ^{13}C NMR are reported as chemical shift. HRMS were performed on a Bruker Apex II mass instrument (ESI).

General experimental procedure for the preparation of alkyl oxime esters[1]

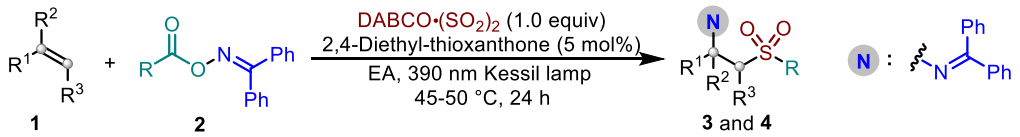


Step 1: In a 500 mL round bottom flask equipped with a condenser, aromatic ketones **s1** (100 mmol, 1.0 equiv) were dissolved in the mixture of EtOH/H_2O (v/v, 4:1, 250 mL). Then, hydroxylamine hydrochloride (160 mmol, 1.6 equiv) and NaOAc (200 mmol, 2.0 equiv) were added in one portion. The reaction mixture was refluxed overnight and the consumption of the starting material was observed by TLC. The reaction mixture was cooled down to room temperature, and then EtOH was removed under reduced pressure. The resulting mixture was extracted with EtOAc. The organic layer was then washed with brine and dried over Na_2SO_4. The solvent was removed under vacuum to give oxime **s2**, not further purified.

Step 2: An oven-dried 100-mL round-bottom flask equipped with a magnetic stir bar was charged with the oxime **s2** (5.0 mmol, 1.0 equiv), carboxylic acid (5.0 mmol, 1.0 equiv), DMAP (0.5 mmol, 0.1 equiv) and DCM (25 mL). To this solution was added EDC·HCl (12.5 mmol, 2.5 equiv) and the resulting mixture was stirred at rt. The progress of the reaction was monitored by TLC. Upon reaction completion, the mixture was diluted with distilled water (50 mL) and the DCM layer was separated, dried over anhydrous Na_2SO_4 and concentrated. The crude mass was treated with PE (10 mL) and sonicated for 30 minutes. The resultant solid was filtered and dried under vacuum to obtain the pure oxime esters.

General procedure for aminosulfonylation

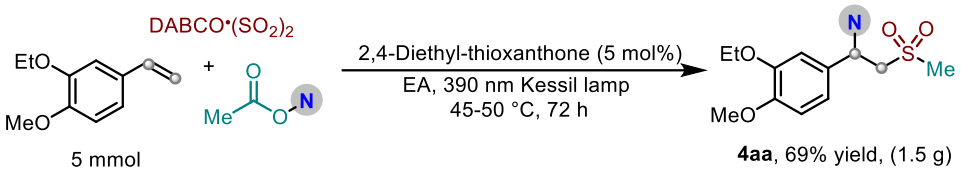
(a) General procedure for the aminosulfonylation of alkenes



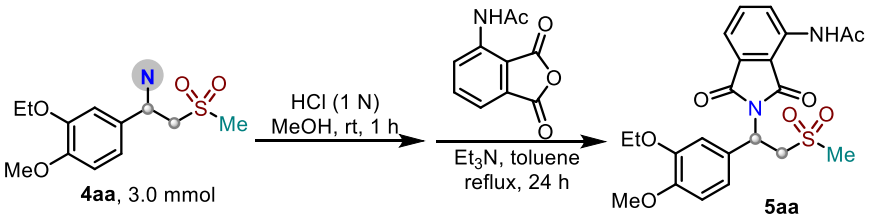
All optimization reactions were set up in a glove box under N_2 atmosphere. Alkene **1** (0.2 mmol), DABCO·$(SO_2)_2$ (0.2 mmol), and oxime ester **2** (0.3 mmol) were added

to a solution of 2,4-diethyl-thioxanthone (5 mol %) in dry EA (4.0 mL) at room temperature. The heterogenous mixture was placed in the irradiation apparatus equipped with 390 nm Kessil lamp. The resulting mixture was stirred for 24 h. Upon completion of the reaction, the resulting crude residue was concentrated in vacuum and purified by column chromatography to afford the desired β-amino sulfone.

(b) General procedure for the preparation of apremilast[2]



All optimization reactions were set up in a glove box under N_2 atmosphere. 2-ethoxy-1-methoxy-4-vinylbenzene **1** (5.0 mmol), DABCO·$(SO_2)_2$ (5.0 mmol) and cdiphenylmethanone O-acetyl oxime (15.0 mmol) were added to a solution of 2,4-diethyl-thioxanthone (5 mol %) in dry EA (100 mL) at room temperature. The heterogenous mixture was placed in the irradiation apparatus equipped with 390 nm Kessil lamp. The resulting mixture was stirred for 72 h. Upon completion of the reaction, the resulting crude residue was concentrated in vacuum and purified by column chromatography to afford the desired β-amino sulfone **4aa** (1.5 g, 69% yield).

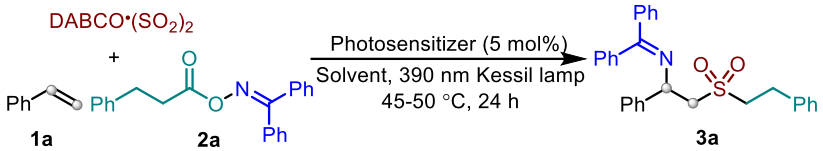


Step 1: A 100 mL vial was charged with **4aa** (51.3 mg, 3.0 mmol), MeOH (30 mL), and 1 N HCl (10 mL). The resulting solution was stirred at room temperature for 1 h. After the reaction was completed (monitored by TLC), the solution was poured into water (30 mL) and extracted with Et_2O (50 mL x 3). The water layer was poured into aq. $NaHCO_3$ (100 mL), and extracted with Et_2O (50 mL x 3). The combined organic layers were washed with brine, dried over sodium sulfate and filtrated. Et_2O was removed in vacuo, and the crude product obtained was directly used in the next step.

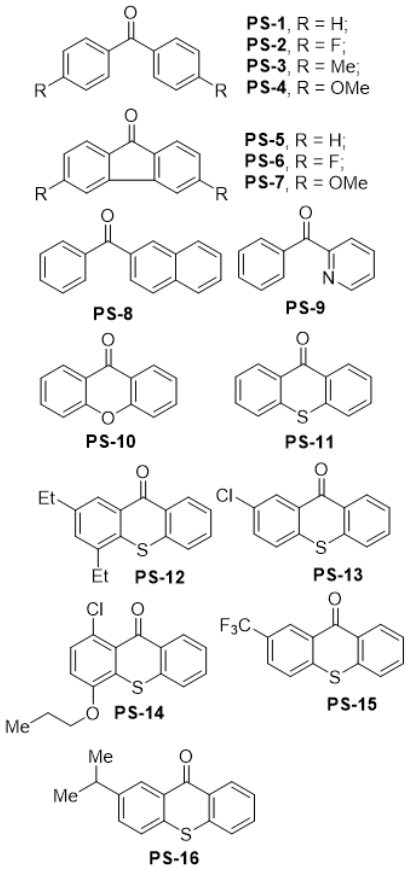
Step 2: A 100 mL vial was charged with crude product, *N*-(1,3-dioxo-1,3-dihydroisobenzofuran-5-yl)-cetamide (4.5 mmol, 1.5 equiv.), and toluene (30 mL). Then, triethylamine (4.5 mmol, 1.5 equiv.) was added. The mixture was stirred at 110 ºC for 24 h. After the reaction was completed, the residue was purified by flash silica column chromatography to afford the product **5aa** (0.93 g, 67% yield).

Initial studies and the reaction optimization

Supplementary Table 1 Optimization of reaction conditions[a,b]

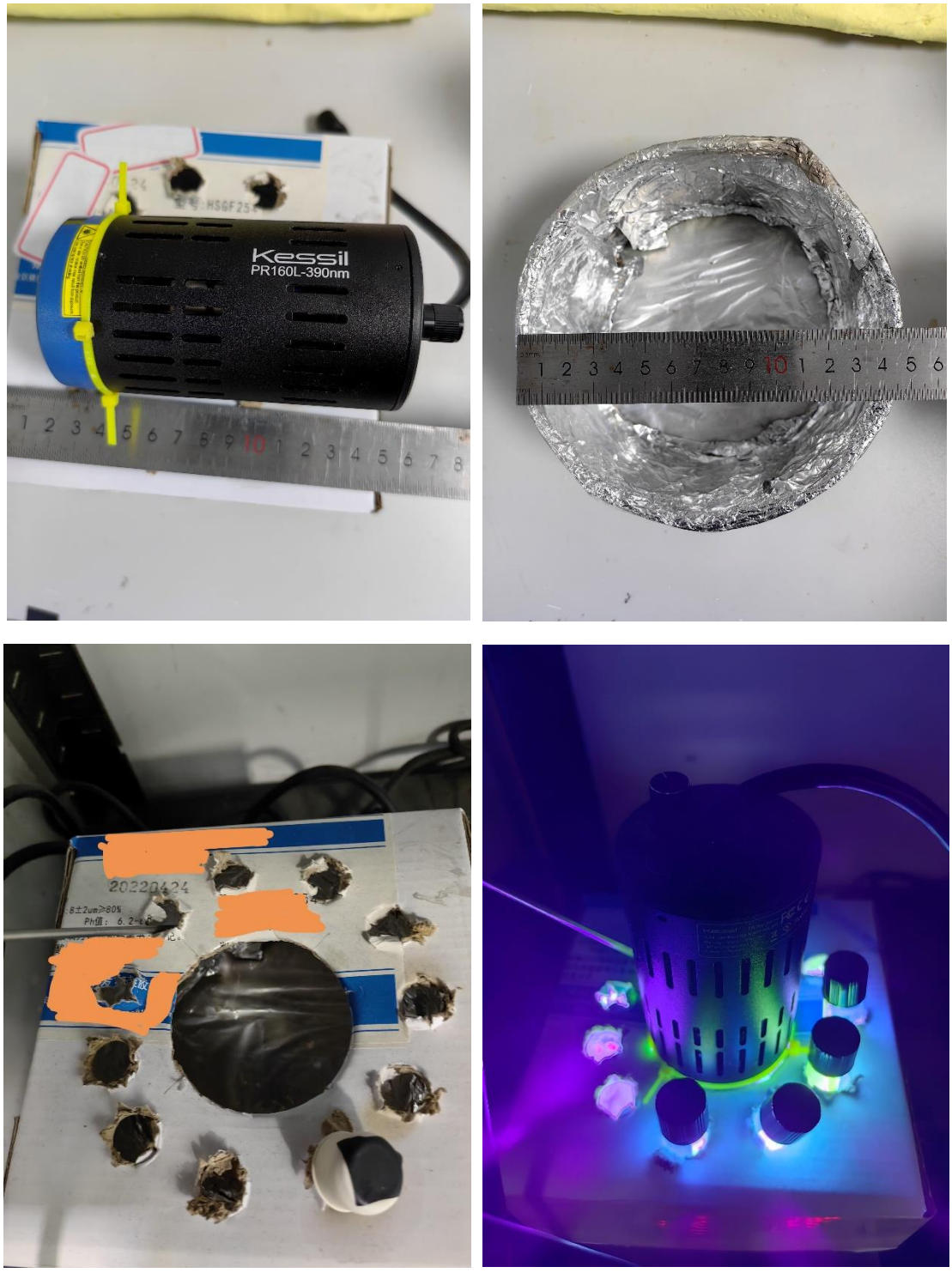


Entry	Photosensitizer	Solvent	Yield (%)
1	**PS-1** (Benzophenone)	EA	33
2	**PS-2**	EA	29
3	**PS-3**	EA	32
4	**PS-4**	EA	33
5	**PS-5**	EA	13
6	**PS-6**	EA	24
7	**PS-7**	EA	12
8	**PS-8**	EA	11
9	**PS-9**	EA	35
10	**PS-10** (Xanthone)	EA	30
11	**PS-11** (Thioxanthone)	EA	68
12	**PS-12** (2,4-Diethyl-thioxanthone)	EA	79
13	**PS-13**	EA	63
14	**PS-14**	EA	49
15	**PS-15**	EA	61
16	**PS-16**	EA	59
17	**PS-12** (2,4-Diethyl-thioxanthone)	Acetone	53
18	**PS-12** (2,4-Diethyl-thioxanthone)	THF	58
19	**PS-12** (2,4-Diethyl-thioxanthone)	DCM	55
20	**PS-12** (2,4-Diethyl-thioxanthone)	MeCN	36
21	-	EA	29
22[c]	**PS-12** (2,4-Diethyl-thioxanthone)	EA	NR



[a]Reaction conditions: **1a** (0.2 mmol), **2a** (0.3 mmol), DABCO·$(SO_2)_2$ (0.2 mmol), photosensitizer (0.01 mmol), solvent (4 mL), 390 nm Kessil lamp, 45−50 °C, 24 h, under a N_2 atmosphere. [b] Yields were determined by ^{1}H NMR analysis using 1,3,5-trimethoxybenzene an internal standard. [c]In the dark.

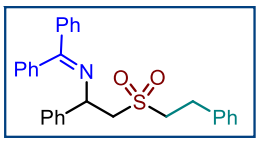
Devices for the photocatalytic reactions



Supplementary Figure 1 Devices for the photocatalytic reactions

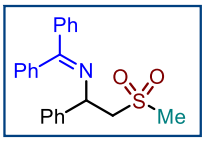
Characterization of products

N-(2-(phenethylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3a)



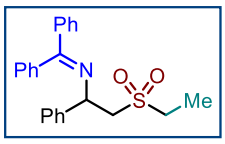
Purification by flash chromatography (PE/EA = 10/1) afforded **3a.** White solid; mp 134−136 ℃; 69.8 mg, 77% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.72 (d, *J* = 7.5 Hz, 2H), 7.48−7.40 (m, 4H), 7.37−7.24 (m, 8H), 7.15 (d, *J* = 6.5 Hz, 2H), 7.10−7.01 (m, 4H), 5.10 (dd, *J* = 10.1, 2.6 Hz, 1H), 3.93 (br, 1H), 3.42−3.10 (m, 5H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) = 170.4, 141.5, 138.8, 137.7, 135.8, 130.6, 128.7, 128.7, 128.6, 128.4, 128.3, 128.2, 127.7, 127.4, 126.9, 126.7, 61.5, 61.1, 56.2, 28.1; HRMS (ESI) for $C_{29}H_{28}NO_2S$ $[M+H]^+$ calcd. 454.1835, found 454.1846.

N-(2-(methylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3b)



Purification by flash chromatography (PE/EA = 10/1) afforded **3b.** White solid; mp 157−159 ℃; 67.7 mg, 93% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.73 (d, *J* = 7.4 Hz, 2H), 7.48−7.35 (m, 6H), 7.31−7.24 (m, 3H), 7.17 (d, *J* = 6.8 Hz, 2H), 7.03 (d, *J* = 6.2 Hz, 2H), 5.08 (dd, *J* = 10.0, 2.8 Hz, 1H), 3.96 (br, 1H), 3.32 (dd, *J* = 14.7, 1.9 Hz, 1H), 2.93 (s, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 170.5, 141.4, 138.6, 135.7, 130.8, 128.8, 128.7, 128.6, 128.3, 128.2, 127.7, 127.4, 126.9, 63.0, 61.5, 43.1; HRMS (ESI) for $C_{22}H_{22}NO_2S$ $[M+H]^+$ calcd. 364.1366, found 364.1375.

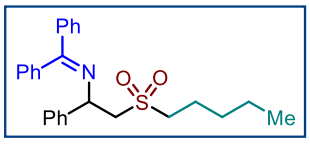
N-(2-(ethylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3c)



Purification by flash chromatography (PE/EA = 10/1) afforded **3c.** White solid; mp 154−156 ℃; 54.3 mg, 72% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.69 (d, *J* = 7.3 Hz, 2H), 7.45−7.32 (m, 6H), 7.29−7.20 (m, 3H), 7.14 (dd, *J* = 7.6, 1.3 Hz, 2H), 6.99 (dd, *J* = 7.4, 1.4 Hz, 2H), 5.04 (dd, *J* = 9.9, 2.8 Hz, 1H), 3.92 (t, *J* = 12.0 Hz, 1H), 3.21 (dd, *J* = 14.7, 2.2 Hz, 1H), 3.08−2.98 (m, 1H), 2.96−2.86 (m, 1H), 1.40 (t, *J* = 7.4 Hz, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 170.2, 141.8, 138.8, 135.9, 130.6, 128.7, 128.7, 128.5, 128.3, 128.2,

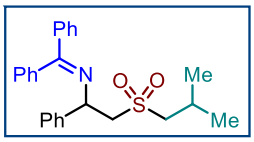
127.7, 127.4, 126.9, 61.4, 60.0, 49.1, 6.8; HRMS (ESI) for $C_{23}H_{24}NO_2S$ $[M+H]^+$ calcd. 378.1522, found 378.1536.

N-(2-(pentylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3d)



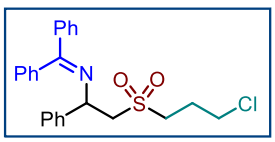
Purification by flash chromatography (PE/EA = 10/1) afforded **3d.** White solid; mp 82−84 °C; 59.5 mg, 71% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.68 (dd, *J* = 7.2, 1.4 Hz, 2H), 7.43−7.32 (m, 6H), 7.29−7.20 (m, 3H), 7.13 (dd, *J* = 7.9, 1.8 Hz, 2H), 7.03−6.97 (m, 2H), 5.04 (dd, *J* = 10.0, 2.9 Hz, 1H), 3.89 (dd, *J* = 14.6, 10.0 Hz, 1H), 3.21 (dd, *J* = 14.6, 2.4 Hz, 1H), 3.03−2.85 (m, 2H), 1.95−1.74 (m, 2H), 1.32−1.24 (m, 4H), 0.86 (t, *J* = 6.9 Hz, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 170.1, 141.7, 138.8, 135.8, 130.6, 128.7, 128.7, 128.5, 128.3, 128.1, 127.6, 127.4, 126.9, 61.4, 60.8, 54.8, 30.5, 22.0, 21.7, 13.7; HRMS (ESI) for $C_{26}H_{30}NO_2S$ $[M+H]^+$ calcd. 420.1992, found 420.2005.

N-(2-(isobutylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3e)



Purification by flash chromatography (PE/EA = 10/1) afforded **3e.** Yellow oil; 59.0 mg, 73% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.70 (d, *J* = 7.4 Hz, 2H), 7.44−7.32 (m, 6H), 7.29−7.20 (m, 3H), 7.16 (d, *J* = 6.8 Hz, 2H), 7.01 (d, *J* = 6.1 Hz, 2H), 5.05 (dd, *J* = 9.8, 2.4 Hz, 1H), 3.91 (br, 1H), 3.23 (dd, *J* = 14.6, 2.9 Hz, 1H), 2.98−2.85 (m, 2H), 2.42−2.28 (m, 1H), 1.06 (d, *J* = 6.7 Hz, 3H), 0.97 (d, *J* = 6.7 Hz, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 170.1, 141.6, 138.7, 135.8, 130.7, 130.0, 128.7, 128.6, 128.3, 128.1, 127.6, 127.4, 126.9, 62.3, 61.5, 23.4, 22.9, 22.5; HRMS (ESI) for $C_{25}H_{28}NO_2S$ $[M+H]^+$ calcd. 406.1835, found 406.1842.

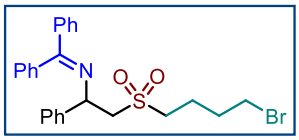
N-(2-((3-chloropropyl)sulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3f)



Purification by flash chromatography (PE/EA = 10/1) afforded **3f**. Yellow oil; 46.0 mg, 54% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.73−7.65 (m, 2H), 7.44−7.31 (m, 6H),

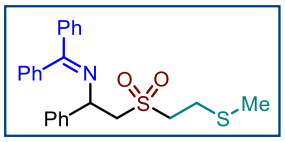
7.29−7.19 (m, 3H), 7.15−7.09 (m, 2H), 7.02−6.94 (m, 2H), 5.05 (dd, *J* = 10.0, 2.8 Hz, 1H), 3.92 (t, *J* = 11.8 Hz, 1H), 3.57 (t, *J* = 6.2 Hz, 2H), 3.28−3.16 (m, 3H), 2.40−2.23 (m, 2H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 170.5, 141.5, 138.7, 135.8, 130.8, 128.8, 128.7, 128.6, 128.3, 128.2, 127.7, 127.4, 126.8, 61.5, 61.4, 52.2, 42.9, 25.1; HRMS (ESI) for $C_{24}H_{25}ClNO_2S$ $[M+H]^+$ calcd. 426.1289, found 426.1291.

N-(2-((4-bromobutyl)sulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3g)



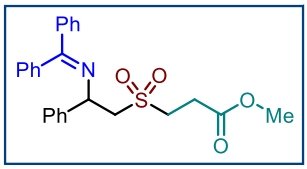
Purification by flash chromatography (PE/EA = 10/1) afforded **3g**. Yellow oil; 40.6 mg, 42% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.70 (d, *J* = 7.2 Hz, 2H), 7.45−7.34 (m, 6H), 7.29−7.20 (m, 3H), 7.14 (dd, *J* = 7.8, 1.6 Hz, 2H), 7.00 (dd, *J* = 6.8, 1.6 Hz, 2H), 5.05 (dd, *J* = 10.0, 2.8 Hz, 1H), 3.92 (t, *J* = 12.2 Hz, 1H), 3.53−3.28 (m, 2H), 3.23 (dd, *J* = 14.8, 2.4 Hz, 1H), 3.07−2.90 (m, 2H), 2.14−2.02 (m, 1H), 2.00−1.78 (m, 3H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 170.4, 141.5, 138.7, 135.7, 130.8, 128.8, 128.5, 128.4, 128.3, 127.7, 127.4, 126.9, 61.4, 60.9, 53.8, 32.2, 31.1, 20.9; HRMS (ESI) for $C_{25}H_{27}BrNO_2S$ $[M+H]^+$ calcd. 484.0940, found 484.0947.

N-(2-((2-(methylthio)ethyl)sulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3h)



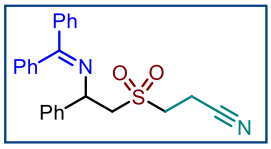
Purification by flash chromatography (PE/EA = 10/1) afforded **3h**. Yellow oil; 36.1 mg, 43% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.70 (d, *J* = 7.2 Hz, 2H), 7.45−7.32 (m, 6H), 7.29−7.21 (m, 3H), 7.13 (dd, *J* = 6.9, 1.7 Hz, 2H), 6.99 (dd, *J* = 6.8, 1.6 Hz, 2H), 5.05 (dd, *J* = 10.0, 2.8 Hz, 1H), 3.96 (dd, *J* = 14.3, 10.7 Hz, 1H), 3.35−3.18 (m, 3H), 3.01−2.93 (m, 1H), 2.90−2.81 (m, 1H), 1.97 (s, 3H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 170.3, 141.1, 138.4, 135.5, 130.4, 128.4, 128.4, 128.3, 128.0, 127.9, 127.4, 127.0, 126.5, 61.2, 61.1, 54.4, 25.6, 14.9; HRMS (ESI) for $C_{24}H_{26}NO_2S_2$ $[M+H]^+$ calcd. 424.1399, found 424.1410.

methyl 3-((2-((diphenylmethylene)amino)-2-phenylethyl)sulfonyl)propanoate (3i)



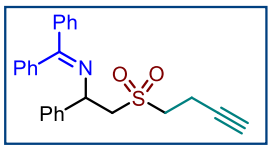
Purification by flash chromatography (PE/EA = 6/1) afforded **3i**. Yellow solid; mp 85−87 °C; 43.5 mg, 50% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.71 (d, *J* = 6.8 Hz, 2H), 7.46−7.33 (m, 6H), 7.29−7.21 (m, 3H), 7.20−7.07 (m, 2H), 7.00 (d, *J* = 6.6 Hz, 2H), 5.07 (d, *J* = 9.3 Hz, 1H), 3.99 (br, 1H), 3.65 (s, 3H), 3.47−3.23 (m, 3H), 2.97−2.78 (m, 2H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 170.6, 141.4, 135.7, 130.8, 128.8, 128.4, 128.2, 127.8, 127.4, 126.9, 61.3, 52.2, 50.2, 26.9; HRMS (ESI) for $C_{25}H_{26}NO_4S$ $[M+H]^+$ calcd. 436.1577, found 436.1584.

3-((2-((diphenylmethylene)amino)-2-phenylethyl)sulfonyl)propanenitrile (3j)



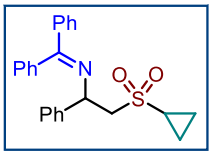
Purification by flash chromatography (PE/EA = 6/1) afforded **3j**. Yellow oil; 43.1 mg, 53% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.71 (d, *J* = 7.2 Hz, 2H), 7.47−7.36 (m, 6H), 7.29−7.21 (m, 3H), 7.14 (dd, *J* = 7.6, 2.3 Hz, 2H), 6.97 (d, *J* = 6.5 Hz, 2H), 5.05 (dd, *J* = 10.3, 2.7 Hz, 1H), 4.01 (t, *J* = 11.9 Hz, 1H), 3.50−3.42 (m, 1H), 3.33−3.22 (m, 2H), 2.99−2.80 (m, 2H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 171.3, 140.9, 138.4, 135.6, 131.1, 128.8, 128.8, 128.5, 128.4, 127.9, 127.2, 126.9, 116.4, 61.5, 61.3, 49.9, 11.4; HRMS (ESI) for $C_{24}H_{23}N_2O_2S$ $[M+H]^+$ calcd. 403.1475, found 403.1483.

N-(2-(but-3-yn-1-ylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3k)



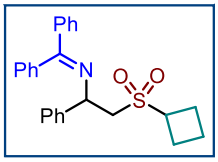
Purification by flash chromatography (PE/EA = 10/1) afforded **3k**. White solid; mp 116−118 °C; 37.7 mg, 47% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.73 (d, *J* = 7.5 Hz, 2H), 7.45−7.34 (m, 6H), 7.29−7.21 (m, 3H), 7.14 (d, *J* = 6.3 Hz, 2H), 6.99 (d, *J* = 6.6 Hz, 2H), 5.04 (d, *J* = 8.1 Hz, 1H), 4.06 (br, 1H), 3.40−3.32 (m, 1H), 3.26 (dd, *J* = 14.7, 1.6 Hz, 1H), 3.15−3.07 (m, 1H), 2.87−2.68 (m, 2H), 2.08 (t, *J* = 2.6 Hz, 1H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 170.8, 141.5, 138.5, 135.7, 130.9, 128.8, 128.4, 128.3, 127.8, 127.4, 126.9, 79.8, 70.8, 61.3, 61.1, 53.1, 12.9; HRMS (ESI) for $C_{25}H_{24}NO_2S$ $[M+H]^+$ calcd. 402.1522, found 402.1530.

N-(2-(cyclopropylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3l)



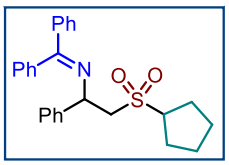
Purification by flash chromatography (PE/EA = 10/1) afforded **3l**. White solid; mp 134−136 ℃; 51.3 mg, 66% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.70 (d, *J* = 7.2 Hz, 2H), 7.43−7.37 (m, 4H), 7.36−7.30 (m, 2H), 7.30−7.19 (m, 5H), 7.03 (dd, *J* = 6.6, 1.7 Hz, 2H), 5.10 (dd, *J* = 9.6, 3.1 Hz, 1H), 3.95 (t, *J* = 11.6 Hz, 1H), 3.36 (dd, *J* = 14.4, 3.2 Hz, 1H), 2.34−2.27 (m, 1H), 1.30−1.23 (m, 1H), 1.18−1.10 (m, 1H), 1.01−0.93 (m, 1H), 0.91−0.83 (m, 1H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 169.7, 141.9, 139.1, 136.0, 130.5, 128.7, 128.6, 128.3, 128.1, 127.6, 127.6, 127.0, 62.3, 61.4, 31.3, 5.3, 4.8; HRMS (ESI) for $C_{24}H_{24}NO_2S$ $[M+H]^+$ calcd. 390.1522, found 390.1524.

N-(2-(cyclobutylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3m)



Purification by flash chromatography (PE/EA = 10/1) afforded **3m**. White solid; mp 115−117 ℃; 55.9 mg, 69% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.74 (d, *J* = 7.1 Hz, 2H), 7.48−7.36 (m, 6H), 7.32−7.23 (m, 3H), 7.18 (dd, *J* = 7.0, 1.4 Hz, 2H), 7.04 (dd, *J* = 6.7, 1.6 Hz, 2H), 5.06 (dd, *J* = 9.7, 2.9 Hz, 1H), 3.90−3.69 (m, 2H), 3.19 (dd, *J* = 14.5, 3.0 Hz, 1H), 2.67−2.50 (m, 2H), 2.40−2.30 (m, 1H), 2.18−2.09 (m, 1H), 2.05−1.93 (m, 2H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 169.9, 141.9, 139.0, 136.0, 130.5, 128.7, 128.6, 128.3, 128.2, 127.6, 127.5, 126.9, 61.0, 58.8, 55.3, 23.0, 21.3, 16.9; HRMS (ESI) for $C_{25}H_{26}NO_2S$ $[M+H]^+$ calcd. 404.1679, found 404.1687.

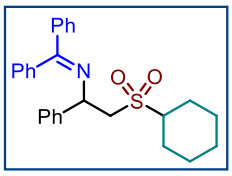
N-(2-(cyclopentylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3n)



Purification by flash chromatography (PE/EA = 10/1) afforded **3n**. Yellow oil; 53.5 mg, 64% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.69 (d, *J* = 7.2 Hz, 2H), 7.42−7.31 (m, 6H), 7.29−7.20 (m, 3H), 7.18 (d, *J* = 6.8 Hz, 2H), 7.01 (dd, *J* = 6.6, 1.8 Hz, 2H), 5.07 (dd, *J* = 9.7, 2.8 Hz, 1H), 3.91 (br, 1H), 3.38−3.29 (m, 1H), 3.22 (dd, *J* = 14.4, 3.0 Hz, 1H), 2.16−1.99 (m, 3H), 1.88−1.70 (m, 3H), 1.64−1.50 (m, 2H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 169.9, 142.0, 139.0, 135.9, 130.5, 128.7, 128.6, 128.3, 128.1, 127.6, 127.5, 126.9, 62.4,

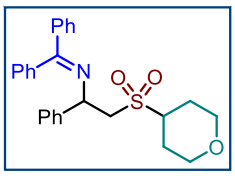
61.2, 59.9, 27.8, 26.0, 25.9, 25.4; HRMS (ESI) for $C_{26}H_{28}NO_2S$ $[M+H]^+$ calcd. 418.1835, found 418.1843.

N-(2-(cyclohexylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3o)



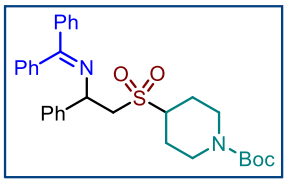
Purification by flash chromatography (PE/EA = 10/1) afforded **3o**. Yellow oil; 54.8 mg, 64% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.69 (dd, *J* = 7.8, 1.4 Hz, 2H), 7.44−7.32 (m, 6H), 7.29−7.21 (m, 3H), 7.17 (dd, *J* = 7.1, 1.7 Hz, 2H), 7.01 (dd, *J* = 5.4, 2.2 Hz, 2H), 5.04 (dd, *J* = 9.7, 2.9 Hz, 1H), 3.92 (dd, *J* = 9.7, 2.9 Hz, 1H), 3.15 (dd, *J* = 14.5, 3.0 Hz, 1H), 2.87−2.77 (m, 1H), 2.29 (d, *J* = 12.5 Hz, 1H), 2.07 (d, *J* = 12.7 Hz, 1H), 1.94−1.76 (m, 2H), 1.64−1.42 (m, 3H), 1.22−1.09 (m, 2H), 1.04−0.92 (m, 1H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 169.8, 141.8, 138.8, 135.8, 130.7, 128.7, 128.3, 128.1, 127.6, 127.5, 126.9, 61.8, 61.2, 57.8, 25.7, 25.0, 23.4; HRMS (ESI) for $C_{27}H_{30}NO_2S$ $[M+H]^+$ calcd. 432.1992, found 432.2000.

1,1-diphenyl-N-(1-phenyl-2-((tetrahydro-2H-pyran-4-yl)sulfonyl)ethyl)methanimine (3p)



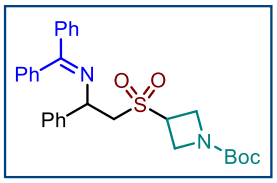
Purification by flash chromatography (PE/EA = 10/1) afforded **3p**. Yellow solid; mp 117−119 °C; 61.8 mg, 71% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.69 (d, *J* = 7.3 Hz, 2H), 7.45−7.34 (m, 6H), 7.29−7.20 (m, 3H), 7.14 (dd, *J* = 6.8, 1.8 Hz, 2H), 7.01 (dd, *J* = 6.7, 1.8 Hz, 2H), 5.07 (dd, *J* = 10.0, 2.8 Hz, 1H), 4.12−3.87 (m, 3H), 3.29−3.03 (m, 4H), 2.19−2.09 (m, 1H), 2.01−1.85 (m, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 170.2, 141.5, 138.7, 135.7, 130.8, 128.7, 128.5, 128.3, 128.2, 127.7, 127.4, 126.8, 66.6, 66.3, 61.2, 58.9, 57.8, 26.0, 23.3; HRMS (ESI) for $C_{26}H_{28}NO_3S$ $[M+H]^+$ calcd. 434.1784, found 434.1787.

tert-butyl 4-((2-((diphenylmethylene)amino)-2-phenylethyl)sulfonyl)piperidine-1-carboxylate (3q)



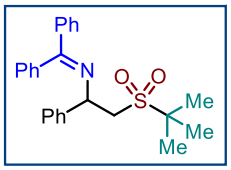
Purification by flash chromatography (PE/EA = 10/1) afforded **3q**. Yellow oil; 61.8 mg, 64% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.69 (d, *J* = 7.5 Hz, 2H), 7.46−7.33 (m, 6H), 7.29−7.20 (m, 3H), 7.15 (d, *J* = 6.0 Hz, 2H), 7.01 (d, *J* = 6.2 Hz, 2H), 5.07 (dd, *J* = 9.6, 2.0 Hz, 1H), 4.45−3.80 (m, 3H), 3.17 (dd, *J* = 14.6, 2.2 Hz, 1H), 3.01 (t, *J* = 11.2 Hz, 1H), 2.59 (br, 1H), 2.39 (br, 1H), 2.28−2.15 (m, 1H), 1.97 (d, *J* = 12.6 Hz, 1H), 1.83−1.64 (m, 2H), 1.44 (s, 9H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 170.4, 154.3, 141.5, 138.7, 135.7, 130.9, 128.8, 128.6, 128.5, 128.3, 127.8, 127.5, 126.9, 80.1, 61.3, 60.1, 58.1, 42.9, 28.4, 25.4, 22.9; HRMS (ESI) for $C_{31}H_{37}N_2O_4S$ $[M+H]^+$ calcd. 533.2469, found 533.2474.

tert-butyl 3-((2-((diphenylmethylene)amino)-2-phenylethyl)sulfonyl)azetidine-1-carboxylate (3r)



Purification by flash chromatography (PE/EA = 10/1) afforded **3r**. Yellow oil; 77.1 mg, 77% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.69 (d, *J* = 7.4 Hz, 2H), 7.48−7.33 (m, 6H), 7.29−7.20 (m, 3H), 7.09 (d, *J* = 5.2 Hz, 2H), 6.96 (d, *J* = 6.7 Hz, 2H), 5.05 (d, *J* = 7.7 Hz, 1H), 4.33−4.25 (m, 2H), 4.20−4.12 (m, 1H), 4.00−3.70 (m, 3H), 3.26 (dd, *J* = 14.7, 2.6 Hz, 1H), 1.41 (s, 9H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 171.0, 155.6, 141.2, 138.6, 135.6, 131.0, 128.8, 128.6, 128.4, 128.3, 127.9, 127.3, 126.8, 80.3, 60.9, 60.0, 49.8, 48.8, 28.2; HRMS (ESI) for $C_{29}H_{33}N_2O_4S$ $[M+H]^+$ calcd. 505.2156, found 505.2165.

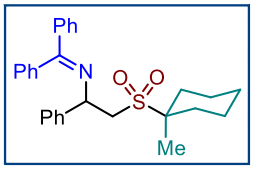
N-(2-(tert-butylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3s)



Purification by flash chromatography (PE/EA = 10/1) afforded **3s**. Yellow solid; 44.1 mg, 55% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.70 (d, *J* = 6.7 Hz, 2H), 7.44−7.23 (m, 11H), 7.08 (d, *J* = 5.3 Hz, 2H), 5.15 (d, *J* = 8.4 Hz, 1H), 3.87 (br, 1H), 3.24 (dd, *J* = 13.2, 2.3 Hz, 1H), 1.38 (s, 9H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 169.4, 142.7, 139.6, 136.4, 130.2, 128.9, 128.7, 128.6, 128.1, 128.0, 127.9, 127.5, 127.0, 60.0, 59.4, 54.2, 23.3; HRMS

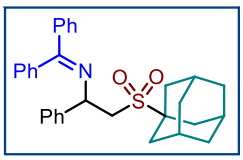
(ESI) for $C_{25}H_{28}NO_2S$ $[M+H]^+$ calcd. 406.1835, found 406.1848.

N-(2-((1-methylcyclohexyl)sulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3t)



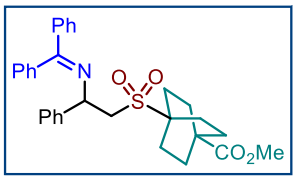
Purification by flash chromatography (PE/EA = 10/1) afforded **3t**. White solid; mp 129−131 °C; 54.3 mg, 61% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.73−7.63 (m, 2H), 7.41−7.22 (m, 11H), 7.12−7.00 (m, 2H), 5.13 (dd, *J* = 9.2, 2.6 Hz, 1H), 3.81 (dd, *J* = 13.2, 9.3 Hz, 1H), 3.21 (dd, *J* = 13.2, 2.7 Hz, 1H), 1.90−1.80 (m, 2H), 1.76−1.64 (m, 5H), 1.40 (s, 3H), 1.37−1.17 (m, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 169.1, 142.9, 139.8, 136.5, 130.0, 128.8, 128.7, 128.5, 128.1, 127.9, 127.8, 127.4, 127.0, 63.0, 59.9, 53.9, 29.2, 25.0, 21.3, 21.3, 17.0; HRMS (ESI) for $C_{28}H_{32}NO_2S$ $[M+H]^+$ calcd. 446.2148, found 446.2148.

N-(2-(((3s,5s,7s)-adamantan-1-yl)sulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3u)



Purification by flash chromatography (PE/EA = 15/1) afforded **3u**. White solid; mp 153−155 °C; 50.2 mg, 52% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.69 (d, *J* =7.2 Hz, 2H), 7.41−7.24 (m, 11H), 7.12−7.02 (m, 2H), 5.13 (dd, *J* = 9.0, 1.8 Hz, 1H), 3.78 (br, 1H), 3.18 (dd, *J* = 13.2, 2.6 Hz, 1H), 2.14 (br, 3H), 2.06−1.96 (m, 6H), 1.69 (q, *J* = 12.6 Hz, 6H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 169.1, 142.9, 139.8, 136.5, 130.0, 128.8, 128.7, 128.5, 128.1, 127.9, 127.9, 127.5, 60.9, 59.8, 53.2, 35.7, 34.6, 28.1; HRMS (ESI) for $C_{31}H_{34}NO_2S$ $[M+H]^+$ calcd. 484.2305, found 484.2315.

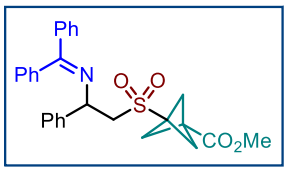
methyl 4-((2-((diphenylmethylene)amino)-2-phenylethyl)sulfonyl)bicyclo[2.2.2]octane-1-carboxylate (3v)



Purification by flash chromatography (PE/EA = 10/1) afforded **3v**. Yellow oil; 59.8 mg, 58% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.68 (d, *J* =7.3 Hz, 2H), 7.40−7.24 (m, 11H), 7.06 (d, *J* = 5.5 Hz, 2H), 5.12 (dd, *J* = 9.2, 2.0 Hz, 1H),

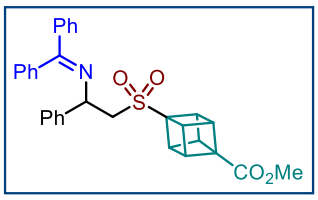
3.83 (br, 1H), 3.64 (s, 3H), 3.17 (dd, J = 13.3, 2.5 Hz, 1H), 2.02−1.91 (m, 6H), 1.89−1.84 (m, 6H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 176.7, 142.5, 139.5, 136.3, 130.2, 128.9, 128.7, 128.1, 128.0, 127.8, 127.6, 126.9, 59.8, 59.3, 54.9, 51.9, 38.4, 27.5, 24.0; HRMS (ESI) for $C_{31}H_{34}NO_4S$ $[M+H]^+$ calcd. 516.2203, found 516.2216.

methyl 3-((2-((diphenylmethylene)amino)-2-phenylethyl)sulfonyl)bicyclo[1.1.1]pentane-1-carboxylate (3w)



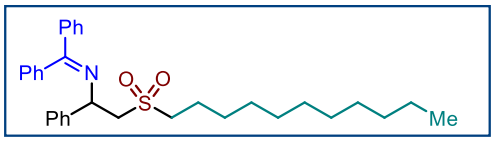
Purification by flash chromatography (PE/EA = 6/1) afforded **3w**. Yellow oil; 57.8 mg, 61% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.68 (d, J =7.3 Hz, 2H), 7.41−7.21 (m, 11H), 7.05 (d, J =5.4 Hz, 2H), 5.09 (dd, J = 9.4, 2.4 Hz, 1H), 3.90 (br, 1H), 3.67 (s, 3H), 3.28 (dd, J = 14.2, 2.8 Hz, 1H), 2.36 (q, J =9.2 Hz, 6H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 169.7, 168.2, 142.0, 139.4, 136.2, 130.3, 128.8, 128.7, 128.6, 128.2, 128.0, 127.7, 127.7, 126.9, 60.4, 58.8, 52.1, 52.0, 51.0, 36.2, 21.0, 14.1; HRMS (ESI) for $C_{28}H_{28}NO_4S$ $[M+H]^+$ calcd. 474.1734, found 474.1740.

methyl (2r,3R,4r,5S)-4-((2-((diphenylmethylene)amino)-2-phenylethyl)sulfonyl)cubane-1-carboxylate (3x)



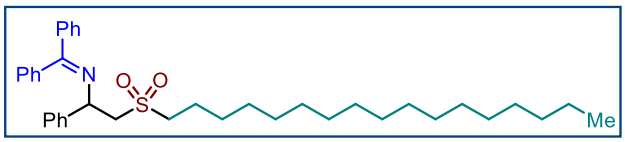
Purification by flash chromatography (PE/EA = 8/1) afforded **3x**. Yellow solid; mp 150−152 °C; 40.5 mg, 40% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.66 (d, J =7.1 Hz, 2H), 7.41−7.33 (m, 6H), 7.28−7.23 (m, 3H), 7.18 (dd, J = 7.1, 1.6 Hz, 2H), 7.04 (d, J =5.5 Hz, 2H), 5.13 (dd, J = 9.4, 2.8 Hz, 1H), 4.34 (t, J = 5.2 Hz, 3H), 4.15 (t, J = 5.2 Hz, 3H), 3.88 (dd, J = 14.2, 9.5 Hz, 1H), 3.68 (s, 3H), 3.26 (dd, J = 14.2, 2.9 Hz, 1H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 171.0, 170.8, 141.9, 139.2, 136.1, 130.7, 128.9, 128.4, 128.3, 128.1, 128.1, 127.8, 127.8, 127.0, 68.8, 60.4, 58.0, 55.9, 51.8, 46.9, 46.6; HRMS (ESI) for $C_{31}H_{28}NO_4S$ $[M+Na]^+$ calcd. 510.1734, found 510.1739.

1,1-diphenyl-N-(1-phenyl-2-(undecylsulfonyl)ethyl)methanimine (3y)



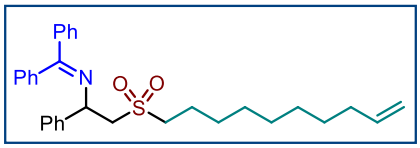
Purification by flash chromatography (PE/EA = 10/1) afforded **3y.** White solid; mp 61−63 ℃; 46.7 mg, 46% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.69 (d, *J* = 7.4 Hz, 2H), 7.43−7.32 (m, 6H), 7.29−7.20 (m, 3H), 7.15 (d, *J* = 6.8 Hz, 2H), 7.00 (d, *J* = 6.0 Hz, 2H), 5.04 (dd, *J* = 9.8, 2.5 Hz, 1H), 3.90 (br, 1H), 3.21 (dd, *J* = 14.7, 2.6 Hz, 1H), 3.03−2.85 (m, 2H), 1.95−1.73 (m, 2H), 1.33−1.20 (m, 16H), 0.89 (t, *J* = 6.8 Hz, 3H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 170.2, 141.7, 138.8, 135.8, 130.7, 130.0, 128.7, 128.5, 128.3, 128.1, 127.6, 127.4, 126.9, 61.4, 60.7, 54.9, 31.8, 29.5, 29.4, 29.3, 29.0, 28.4, 22.6, 22.0, 14.1; HRMS (ESI) for $C_{32}H_{42}NO_2S$ $[M+H]^+$ calcd. 504.2931, found 504.2946.

N-(2-(heptadecylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3z)



Purification by flash chromatography (PE/EA = 10/1) afforded **3z**. Yellow solid; mp 53−55 ℃; 63.3 mg, 54% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.69 (d, *J* = 7.3 Hz, 2H), 7.42−7.32 (m, 6H), 7.29−7.20 (m, 3H), 7.17−7.13 (m, 2H), 7.00 (dd, *J* = 6.7, 1.7 Hz, 2H), 5.04 (dd, *J* = 9.9, 2.8 Hz, 1H), 3.90 (dd, *J* = 14.2, 10.5 Hz, 1H), 3.21 (dd, *J* = 14.7, 2.6 Hz, 1H), 3.03−2.85 (m, 2H), 1.95−1.72 (m, 2H), 1.33−1.20 (m, 28H), 0.88 (t, *J* = 6.6 Hz, 3H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 170.1, 141.7, 138.8, 135.8, 130.6, 128.7, 128.7, 128.5, 128.3, 128.1, 127.6, 127.4, 126.9, 61.4, 60.8, 54.9, 31.9, 29.7, 29.6, 29.6, 29.6, 29.5, 29.3, 29.3, 29.0, 28.4, 22.6, 22.0, 14.1; HRMS (ESI) for $C_{38}H_{54}NO_2S$ $[M+H]^+$ calcd. 588.3870, found 588.3878.

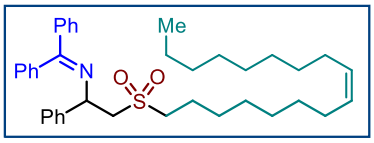
N-(2-(dec-9-en-1-ylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3aa)



Purification by flash chromatography (PE/EA = 10/1) afforded **3aa**. Yellow oil; 69.7 mg, 72% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.69 (d, *J* = 7.3 Hz, 2H), 7.45−7.32 (m, 6H), 7.29−7.20 (m, 3H), 7.14 (d, *J* = 6.5 Hz, 2H), 7.00 (dd, *J* = 6.7, 1.6 Hz, 2H), 5.86−5.75 (m, 1H), 5.07−4.92 (m, 3H), 3.90 (t, *J* = 11.3 Hz, 1H),

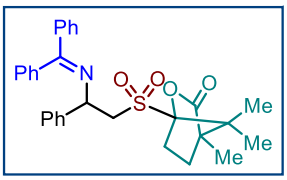
3.21 (dd, J = 14.7, 2.6 Hz, 1H), 3.03−2.85 (m, 2H), 2.04 (q, J = 7.2 Hz, 2H), 1.93−1.73 (m, 2H), 1.40−1.22 (m, 10H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 170.1, 141.7, 139.0, 138.8, 135.8, 130.7, 128.7, 128.5, 128.3, 128.2, 127.7, 127.4, 126.9, 114.2, 61.4, 60.8, 54.9, 33.7, 29.1, 28.9, 28.8, 28.4, 22.0; HRMS (ESI) for $C_{31}H_{38}NO_2S$ $[M+H]^+$ calcd. 488.2618, found 488.2625.

(Z)-N-(2-(heptadec-8-en-1-ylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3ab)



Purification by flash chromatography (PE/EA = 10/1) afforded **3ab**. Yellow oil; 103.0 mg, 88% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.69 (d, J = 7.2 Hz, 2H), 7.43−7.31 (m, 6H), 7.28−7.20 (m, 3H), 7.14 (dd, J = 7.8, 1.4 Hz, 2H), 7.00 (dd, J = 6.7, 1.8 Hz, 2H), 5.63−5.29 (m, 2H), 5.04 (dd, J = 9.9, 2.8 Hz, 1H), 3.89 (dd, J = 14.3, 10.3 Hz, 1H), 3.21 (dd, J = 14.7, 2.6 Hz, 1H), 3.02−2.94 (m, 1H), 2.93−2.84 (m, 1H), 2.03−1.73 (m, 6H), 1.38−1.21 (m, 20H), 0.88 (t, J = 6.8 Hz, 3H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 170.1, 141.7, 138.8, 135.8, 130.6, 130.5, 130.0, 128.7, 128.7, 128.5, 128.3, 128.1, 127.6, 127.4, 126.9, 61.4, 60.8, 54.9, 32.6, 32.5, 31.8, 29.6, 29.4, 29.4, 29.3, 29.1, 28.8, 28.7, 28.4, 22.6, 22.0, 14.1; HRMS (ESI) for $C_{38}H_{52}NO_2S$ $[M+H]^+$ calcd. 586.3713, found 586.3726.

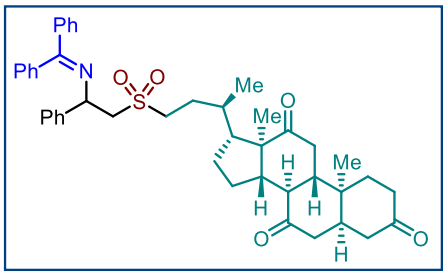
(4S)-1-((2-((diphenylmethylene)amino)-2-phenylethyl)sulfonyl)-4,7,7-trimethyl-2-oxabicyclo[2.2.1]heptan-3-one (3ac)



Purification by flash chromatography (PE/EA = 10/1) afforded **3ac**. Yellow oil; 80.0 mg, 80% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.74−7.65 (m, 2H), 7.41−7.22 (m, 11H), 7.05 (t, J =7.8 Hz, 2H), 5.20−5.11 (m, 1H), 3.98 (br, 1H), 3.51−3.43 (m, 1H), 2.68−2.46 (m, 1H), 2.13−2.01 (m, 1H), 1.99−1.87 (m, 1H), 1.74−1.62 (m, 1H), 1.21−1.16 (m, 6H), 1.09−1.05 (m, 3H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 176.5, 176.4, 169.6, 142.1, 139.6, 136.4, 130.3, 129.0, 128.9, 128.8, 128.3, 128.1, 128.0, 127.9, 127.8, 127.1, 127.0, 100.6, 99.9, 60.0, 59.8, 59.7, 59.4, 55.0, 54.9, 54.8, 54.7, 29.6, 28.8,

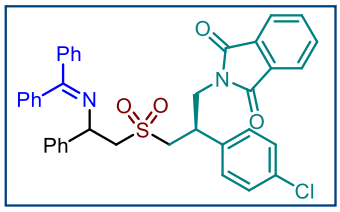
28.3, 28.1, 17.5, 17.4, 17.0, 16.9, 9.5, 9.4; HRMS (ESI) for $C_{30}H_{32}NO_4S$ $[M+H]^+$ calcd. 502.2047, found 502.2058.

(5S,8R,9S,10S,13R,14S,17R)-17-((2R)-4-((2-((diphenylmethylene)amino)-2-phenylethyl)sulfonyl)butan-2-yl)-10,13-dimethyldodecahydro-3H-cyclopenta[a]phenanthrene-3,7,12(2H,4H)-trione (3ad)



Purification by flash chromatography (PE/EA = 2/1) afforded **3ad**. Yellow solid; mp 110−112 °C; 95.9 mg, 68% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.71 (br, 2H), 7.42−7.33 (m, 6H), 7.30−7.21 (m, 3H), 7.15 (br, 2H), 7.02 (br, 2H), 5.05 (t, J = 8.2 Hz, 1H), 3.88 (br, 1H), 3.28−3.20 (m, 1H), 3.18−3.04 (m, 1H), 2.94−2.78 (m, 4H), 2.35−2.11 (m, 9H), 2.05−1.73 (m, 7H), 1.40−1.25 (m, 7H), 1.01 (d, J = 8.9 Hz, 3H), 0.76 (d, J = 6.6 Hz, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 211.7, 211.5, 209.0, 208.6, 208.4, 141.6, 130.6, 128.7, 128.3, 128.2, 128.1, 127.7, 127.4, 126.9, 126.9, 61.4, 56.7, 56.7, 52.7, 51.9, 51.6, 51.4, 48.8, 46.7, 46.7, 45.4, 45.3, 44.9, 44.7, 42.7, 38.5, 36.4, 35.9, 35.9, 35.4, 35.2, 34.7, 27.4, 27.3, 27.1, 26.3, 25.0, 24.9, 21.8, 18.6, 18.6, 11.7; HRMS (ESI) for $C_{44}H_{52}NO_5S$ $[M+H]^+$ calcd. 706.3561, found 706.3567.

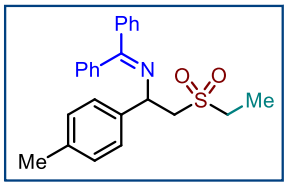
2-((2R)-2-(4-chlorophenyl)-3-((2-((diphenylmethylene)amino)-2-phenylethyl)sulfonyl)propyl)isoindoline-1,3-dione (3ae)



Purification by flash chromatography (PE/EA = 2/1) afforded **3ae**. White solid; mp 89−91 °C; 87.8 mg, 68% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.82−7.73 (m, 2H), 7.71−7.58 (m, 4H), 7.48−7.20 (m, 11H), 7.07−6.80 (m, 6H), 5.05−4.81 (m, 1H), 4.04−3.54 (m, 5H), 3.43−3.26 (m, 1H), 3.14−2.93 (m, 1H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 170.2, 168.0, 167.8, 141.1, 138.7, 137.8, 137.2, 135.6, 134.0, 134.0, 133.7, 133.1, 131.6, 131.5, 130.7, 129.6, 129.0, 128.9, 128.8, 128.7, 128.3, 128.3, 128.2, 127.7, 127.4, 127.3, 126.8, 126.8, 123.3, 123.3, 62.1, 61.3, 58.6, 58.2, 42.5, 42.1, 38.6, 37.3; HRMS (ESI) for $C_{38}H_{32}ClN_2O_4S$ $[M+H]^+$ calcd. 647.1766,

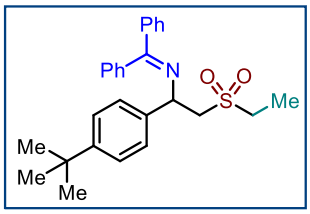
found 647.1771.

N-(2-(ethylsulfonyl)-1-(p-tolyl)ethyl)-1,1-diphenylmethanimine (4a)



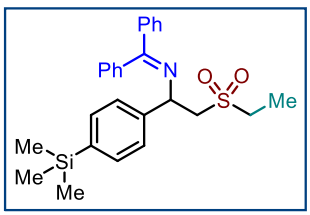
Purification by flash chromatography (PE/EA = 10/1) afforded **4a.** Yellow solid; mp 86−88 ℃; 54.8 mg, 70% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.69 (d, *J* = 7.4 Hz, 2H), 7.45−7.30 (m, 6H), 7.11−6.96 (m, 6H), 5.02 (dd, *J* = 11.2, 2.6 Hz, 1H), 3.96 (br, 1H), 3.19 (dd, *J* = 14.7, 2.4 Hz, 1H), 3.09−2.97 (m, 1H), 2.96−2.83 (m, 1H), 2.30 (s, 3H), 1.39 (t, *J* = 7.4 Hz, 3H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 170.3, 138.6, 137.4, 135.7, 130.7, 129.4, 128.8, 128.7, 128.3, 128.2, 127.5, 126.7, 61.0, 59.9, 49.1, 21.1, 6.7; HRMS (ESI) for $C_{24}H_{26}NO_2S$ $[M+H]^+$ calcd. 392.1679, found 392.1675.

N-(1-(4-(tert-butyl)phenyl)-2-(ethylsulfonyl)ethyl)-1,1-diphenylmethanimine (4b)



Purification by flash chromatography (PE/EA = 10/1) afforded **4b.** White solid; mp 102−104 ℃; 59.8 mg, 69% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.71 (d, *J* = 7.4 Hz, 2H), 7.45−7.27 (m, 8H), 7.18−6.97 (m, 4H), 5.06 (d, *J* = 9.0 Hz, 1H), 4.04 (br, 1H), 3.20 (dd, *J* = 14.6, 2.4 Hz, 1H), 3.10−2.98 (m, 1H), 2.98−2.85 (m, 1H), 1.39 (t, *J* = 7.4 Hz, 3H), 1.29 (s, 9H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 150.7, 138.3, 135.6, 130.9, 128.9, 128.8, 128.3, 128.2, 127.6, 126.6, 125.7, 60.9, 59.7, 49.1, 34.5, 31.3, 6.7; HRMS (ESI) for $C_{27}H_{32}NO_2S$ $[M+H]^+$ calcd. 434.2148, found 434.2154.

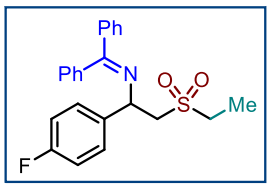
N-(2-(ethylsulfonyl)-1-(4-(trimethylsilyl)phenyl)ethyl)-1,1-diphenylmethanimine (4c)



Purification by flash chromatography (PE/EA = 10/1) afforded **4c.** Yellow oil; 59.3 mg, 66% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.71−7.65 (m, 2H), 7.43−7.31 (m, 8H), 7.14 (d, *J* = 7.9 Hz, 2H), 7.06−6.98 (m, 2H), 5.03 (dd, *J* = 10.0, 2.7 Hz, 1H), 3.91 (dd, *J* = 14.6, 10.1 Hz, 1H), 3.24−3.14 (m, 1H), 3.08−2.98

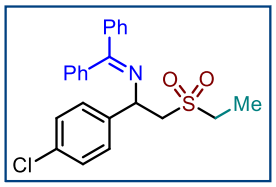
(m, 1H), 2.96−2.86 (m, 1H), 1.39 (t, J = 7.4 Hz, 3H), 0.24 (s, 9H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 170.0, 142.1, 139.9, 138.9, 135.9, 133.7, 130.5, 128.6, 128.5, 128.3, 128.2, 127.5, 126.2, 61.4, 59.9, 49.1, 6.8, -1.2; HRMS (ESI) for $C_{26}H_{32}NO_2SSi$ $[M+H]^+$ calcd. 450.1918, found 450.1913.

N-(2-(ethylsulfonyl)-1-(4-fluorophenyl)ethyl)-1,1-diphenylmethanimine (4d)



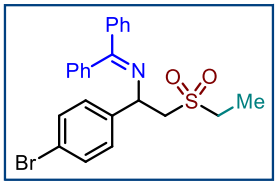
Purification by flash chromatography (PE/EA = 10/1) afforded **4d.** Yellow solid; mp 126−128 ℃; 45.2 mg, 57% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.68 (d, J = 7.5 Hz, 2H), 7.48−7.32 (m, 6H), 7.12 (dd, J = 7.9, 5.4 Hz, 2H), 7.03−6.90 (m, 4H), 5.04 (dd, J = 9.8, 2.4 Hz, 1H), 3.91 (br, 1H), 3.17 (dd, J = 14.6, 2.2 Hz, 1H), 3.08−2.98 (m, 1H), 2.97−2.86 (m, 1H), 1.40 (t, J = 7.4 Hz, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 170.6, 162.0 (d, J = 245.1 Hz), 138.6, 137.5, 135.7, 130.8, 128.8, 128.5, 128.5 (d, J = 8.1 Hz), 128.4, 128.2, 127.3, 115.6 (d, J = 21.3 Hz), 60.6, 60.0, 49.2, 6.7; HRMS (ESI) for $C_{23}H_{23}FNO_2S$ $[M+H]^+$ calcd. 396.1428, found 396.1427.

N-(1-(4-chlorophenyl)-2-(ethylsulfonyl)ethyl)-1,1-diphenylmethanimine (4e)



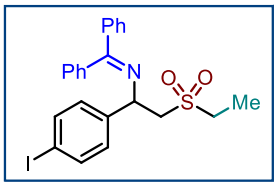
Purification by flash chromatography (PE/EA = 10/1) afforded **4e.** Yellow oil; 50.2 mg, 61% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.69−7.63 (m, 2H), 7.45−7.33 (m, 6H), 7.27−7.20 (m, 2H), 7.08 (d, J = 8.4 Hz, 2H), 7.02−6.92 (m, 2H), 5.03 (dd, J = 9.9, 2.8 Hz, 1H), 3.89 (dd, J = 13.9, 10.4 Hz, 1H), 3.15 (dd, J = 14.7, 2.1 Hz, 1H), 3.09−2.99 (m, 1H), 2.98−2.87 (m, 1H), 1.40 (t, J = 7.4 Hz, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 170.8, 140.2, 138.6, 135.7, 133.4, 130.8, 128.9, 128.8, 128.6, 128.4, 128.3, 128.2, 127.3, 60.6, 59.8, 49.2, 6.7; HRMS (ESI) for $C_{23}H_{23}ClNO_2S$ $[M+H]^+$ calcd. 412.1133, found 412.1136.

N-(1-(4-bromophenyl)-2-(ethylsulfonyl)ethyl)-1,1-diphenylmethanimine (4f)



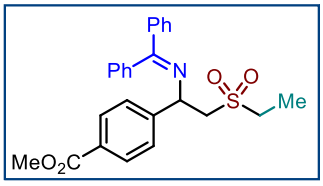
Purification by flash chromatography (PE/EA = 10/1) afforded **4f.** Yellow oil; 54.7 mg, 60% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.68 (d, *J* = 7.3 Hz, 2H), 7.46−7.32 (m, 8H), 7.08−6.93 (m, 4H), 5.01 (dd, *J* = 9.9, 2.7 Hz, 1H), 3.90 (t, *J* = 11.9 Hz, 1H), 3.15 (dd, *J* = 14.6, 2.2 Hz, 1H), 3.09−2.99 (m, 1H), 2.98−2.88 (m, 1H), 1.40 (t, *J* = 7.4 Hz, 3H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 170.9, 140.7, 138.5, 135.6, 131.9, 130.9, 128.9, 128.6, 128.6, 128.4, 128.3, 127.3, 121.6, 60.7, 59.7, 49.2, 6.7; HRMS (ESI) for $C_{23}H_{23}BrNO_2S$ $[M+H]^+$ calcd. 456.0627, found 456.0636.

N-(2-(ethylsulfonyl)-1-(4-iodophenyl)ethyl)-1,1-diphenylmethanimine (4g)



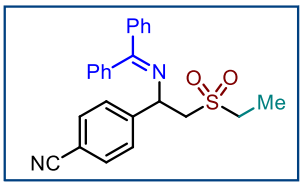
Purification by flash chromatography (PE/EA = 10/1) afforded **4g.** Colorless oil; 65.0 mg, 65% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.68 (d, *J* = 7.4 Hz, 2H), 7.60 (d, *J* = 8.3 Hz, 2H), 7.45−7.32 (m, 6H), 6.99 (d, *J* = 6.0 Hz, 2H), 6.91 (d, *J* = 8.2 Hz, 2H), 5.00 (dd, *J* = 9.9, 2.6 Hz, 1H), 3.90 (br, 1H), 3.15 (dd, *J* = 14.6, 2.1 Hz, 1H), 3.09−2.99 (m, 1H), 2.98−2.88 (m, 1H), 1.40 (t, *J* = 7.4 Hz, 3H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 170.9, 141.4, 138.5, 137.8, 135.6, 130.9, 128.9, 128.8, 128.6, 128.4, 128.3, 127.3, 93.2, 60.8, 59.7, 49.2, 6.7; HRMS (ESI) for $C_{23}H_{23}INO_2S$ $[M+H]^+$ calcd. 504.0489, found 504.0508.

methyl 4-(1-((diphenylmethylene)amino)-2-(ethylsulfonyl)ethyl)benzoate (4h)



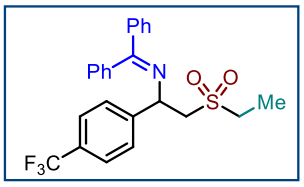
Purification by flash chromatography (PE/EA = 10/1) afforded **4h.** Colorless oil; 48.5 mg, 56% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.94 (d, *J* = 8.3 Hz, 2H), 7.69 (d, *J* = 7.3 Hz, 2H), 7.45−7.32 (m, 6H), 7.23 (d, *J* = 8.2 Hz, 2H), 6.96 (d, *J* = 6.6 Hz, 2H), 5.11 (dd, *J* = 10.0, 2.6 Hz, 1H), 4.02−3.88 (m, 4H), 3.18 (dd, *J* = 14.6, 2.0 Hz, 1H), 3.12−3.01 (m, 1H), 3.00−2.90 (m, 1H), 1.41 (t, *J* = 7.4 Hz, 3H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 171.2, 166.6, 146.7, 138.5, 135.7, 130.9, 130.0, 129.5, 128.9, 128.4, 128.3, 127.2, 126.9, 61.1, 59.7, 52.1, 49.3, 6.7; HRMS (ESI) for $C_{25}H_{26}NO_4S$ $[M+H]^+$ calcd. 436.1577, found 436.1586.

4-(1-((diphenylmethylene)amino)-2-(ethylsulfonyl)ethyl)benzonitrile (4i)



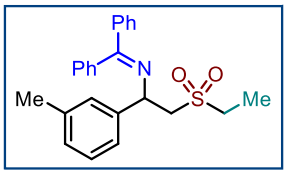
Purification by flash chromatography (PE/EA = 6/1) afforded **4i.** Yellow oil; 57.9 mg, 72% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.69 (d, *J* = 7.3 Hz, 2H), 7.57 (d, *J* = 8.3 Hz, 2H), 7.48−7.33 (m, 6H), 7.28 (d, *J* = 8.2 Hz, 2H), 6.96 (d, *J* = 6.6 Hz, 2H), 5.11 (dd, *J* = 9.9, 2.6 Hz, 1H), 3.91 (t, *J* = 11.7 Hz, 1H), 3.16 (dd, *J* = 14.6, 2.2 Hz, 1H), 3.12−3.02 (m, 1H), 3.02−2.92 (m, 1H), 1.41 (t, *J* = 7.4 Hz, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 171.7, 146.8, 138.3, 135.5, 132.6, 131.1, 129.0, 128.6, 128.5, 128.3, 127.7, 127.1, 118.4, 111.6, 60.8, 59.4, 49.3, 6.7; HRMS (ESI) for $C_{24}H_{23}N_2O_2S$ $[M+H]^+$ calcd. 403.1475, found 403.1480.

N-(2-(ethylsulfonyl)-1-(4-(trifluoromethyl)phenyl)ethyl)-1,1-diphenylmethanimine (4j)



Purification by flash chromatography (PE/EA = 10/1) afforded **4j.** Yellow oil; 62.4 mg, 70% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.69 (d, *J* = 7.2 Hz, 2H), 7.53 (d, *J* = 8.2 Hz, 2H), 7.46−7.33 (m, 6H), 7.29 (d, *J* = 8.1 Hz, 2H), 6.98 (d, *J* = 6.3 Hz, 2H), 5.12 (dd, *J* = 10.0, 2.6 Hz, 1H), 3.92 (dd, *J* = 14.4, 10.2 Hz, 1H), 3.17 (dd, *J* = 14.6, 2.1 Hz, 1H), 3.12−3.01 (m, 1H), 3.01−2.91 (m, 1H), 1.41 (t, *J* = 7.4 Hz, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 171.2, 145.7, 138.5, 135.7, 130.9, 129.9 (q, *J* = 32.2 Hz), 128.9, 128.6, 128.5, 128.3, 127.3, 127.2, 125.7 (q, *J* = 3.7 Hz), 123.7 (q, *J* = 270.5 Hz), 60.9, 59.7, 49.3, 6.7; HRMS (ESI) for $C_{24}H_{23}F_3NO_2S$ $[M+H]^+$ calcd. 446.1396, found 446.1393.

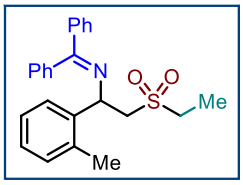
N-(2-(ethylsulfonyl)-1-(m-tolyl)ethyl)-1,1-diphenylmethanimine (4k)



Purification by flash chromatography (PE/EA = 10/1) afforded **4k.** White solid; mp 157−159 °C; 50.6 mg, 65% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.69 (d, *J* = 7.2 Hz, 2H), 7.46−7.30 (m, 6H), 7.14 (t, *J* = 7.5 Hz, 1H), 7.08−6.89 (m, 5H), 5.00 (dd, *J* = 10.0, 2.7 Hz, 1H), 3.92 (t, *J* = 11.8 Hz, 1H), 3.19 (dd, *J* = 14.7, 2.2 Hz, 1H), 3.09−2.97 (m, 1H),

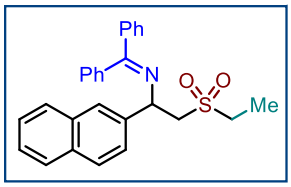
2.95−2.84 (m, 1H), 2.28 (s, 3H), 1.39 (t, J = 7.4 Hz, 3H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 170.2, 141.6, 138.9, 138.4, 135.9, 130.6, 128.7, 128.6, 128.4, 128.3, 128.2, 127.5, 127.5, 123.9, 61.3, 60.0, 49.1, 21.4, 6.8; HRMS (ESI) for $C_{24}H_{26}NO_2S$ $[M+H]^+$ calcd. 392.1679, found 392.1685.

N-(2-(ethylsulfonyl)-1-(o-tolyl)ethyl)-1,1-diphenylmethanimine (4l)



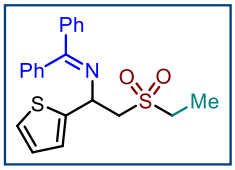
Purification by flash chromatography (PE/EA = 10/1) afforded **4l.** White solid; mp 157−159 °C; 36.9 mg, 47% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.69 (d, J = 7.5 Hz, 2H), 7.49−7.34 (m, 7H), 7.17−7.07 (m, 2H), 7.00 (d, J = 7.1 Hz, 1H), 6.91 (d, J = 6.5 Hz, 2H), 5.22 (d, J = 9.2 Hz, 1H), 3.93 (br, 1H), 3.18−2.90 (m, 3H), 1.77 (s, 3H), 1.44 (t, J = 7.4 Hz, 3H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 170.4, 140.8, 138.8, 136.4, 134.2, 130.6, 130.4, 130.0, 128.5, 128.4, 128.2, 127.3, 127.2, 127.1, 126.5, 59.1, 57.5, 49.1, 18.6, 6.8; HRMS (ESI) for $C_{24}H_{26}NO_2S$ $[M+H]^+$ calcd. 392.1679, found 392.1687.

N-(2-(ethylsulfonyl)-1-(naphthalen-2-yl)ethyl)-1,1-diphenylmethanimine (4m)



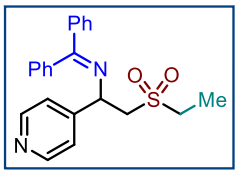
Purification by flash chromatography (PE/EA = 10/1) afforded **4p.** Yellow oil; 74.4 mg, 87% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.84−7.66 (m, 5H), 7.53 (s, 1H), 7.48−7.30 (m, 9H), 6.99 (d, J = 7.0 Hz, 2H), 5.21 (dd, J = 9.9, 2.7 Hz, 1H), 4.01 (t, J = 11.9 Hz, 1H), 3.28 (dd, J = 14.7, 2.1 Hz, 1H), 3.12−3.01 (m, 1H), 3.00−2.89 (m, 1H), 1.41 (t, J = 7.5 Hz, 3H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 170.7, 139.1, 138.8, 135.8, 133.3, 132.8, 130.7, 128.8, 128.6, 128.4, 128.2, 127.9, 127.6, 127.4, 126.2, 126.1, 125.8, 124.7, 61.5, 60.0, 49.2, 6.8; HRMS (ESI) for $C_{27}H_{26}NO_2S$ $[M+H]^+$ calcd. 428.1679, found 428.1681.

N-(2-(ethylsulfonyl)-1-(thiophen-2-yl)ethyl)-1,1-diphenylmethanimine (4n)



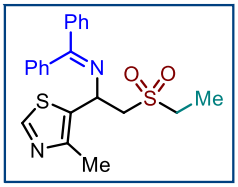
Purification by flash chromatography (PE/EA = 10/1) afforded **4n.** Yellow solid; mp 143−145 °C; 48.3 mg, 63% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.68 (d, *J* = 7.3 Hz, 2H), 7.47−7.31 (m, 6H), 7.21 (dd, *J* = 5.0, 0.5 Hz, 1H), 7.14−7.06 (m, 2H), 6.89 (dd, *J* = 5.0, 3.6 Hz, 1H), 6.70 (d, *J* = 3.2 Hz, 1H), 5.37 (dd, *J* = 9.7, 3.1 Hz, 1H), 3.90 (dd, *J* = 14.7, 9.8 Hz, 1H), 3.31 (dd, *J* = 14.7, 2.8 Hz, 1H), 3.06−2.96 (m, 1H), 2.95−2.84 (m, 1H), 1.38 (t, *J* = 7.5 Hz, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 170.9, 144.1, 138.7, 135.3, 130.8, 128.9, 128.7, 128.4, 128.2, 127.4, 126.5, 125.0, 123.9, 60.3, 57.4, 49.2, 6.7; HRMS (ESI) for $C_{21}H_{22}NO_2S_2$ $[M+H]^+$ calcd. 384.1086, found 384.1095.

N-(2-(ethylsulfonyl)-1-(pyridin-4-yl)ethyl)-1,1-diphenylmethanimine (4o)



Purification by flash chromatography (PE/EA = 6/1) afforded **4o.** White solid; mp 137−139 °C; 41.2 mg, 54% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 8.52 (d, *J* = 5.8 Hz, 2H), 7.69 (d, *J* = 7.2 Hz, 2H), 7.48−7.33 (m, 6H), 7.10 (d, *J* = 6.0 Hz, 2H), 6.97 (d, *J* = 6.4 Hz, 2H), 5.05 (dd, *J* = 10.1, 2.6 Hz, 1H), 3.89 (dd, *J* = 14.6, 10.1 Hz, 1H), 3.17 (dd, *J* = 14.6, 1.8 Hz, 1H), 3.13−3.03 (m, 1H), 3.02−2.91 (m, 1H), 1.42 (t, *J* = 7.5 Hz, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 171.8, 150.4, 150.2, 138.4, 135.5, 131.0, 128.9, 128.6, 128.5, 128.3, 127.1, 121.8, 60.4, 59.3, 49.4, 6.7; HRMS (ESI) for $C_{22}H_{23}N_2O_2S$ $[M+H]^+$ calcd. 379.1475, found 379.1487.

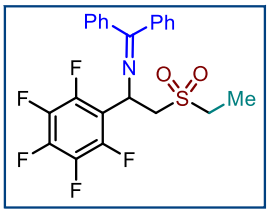
N-(2-(ethylsulfonyl)-1-(4-methylthiazol-5-yl)ethyl)-1,1-diphenylmethanimine (4p)



Purification by flash chromatography (PE/EA = 6/1) afforded **4p.** Yellow solid; mp 133−135 °C; 40.0 mg, 50% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 8.65 (s, 1H), 7.66 (dd, *J* = 7.2, 1.4 Hz, 2H), 7.48−7.40 (m, 4H), 7.36 (t, *J* = 7.5 Hz, 2H), 7.01 (t, *J* = 3.6 Hz, 2H), 5.40 (dd, *J* = 9.8, 3.0 Hz, 1H), 3.85 (dd, *J* = 14.6, 9.8 Hz, 1H), 3.14 (dd, *J* = 14.7, 2.5 Hz, 1H), 3.10−3.00 (m, 1H), 2.99−2.90 (m, 1H), 1.93 (s, 3H), 1.41 (t, *J* = 7.4 Hz, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 171.5, 151.8, 147.9, 138.3, 135.4, 131.6, 131.0, 128.9, 128.7, 128.6, 128.3, 127.0, 59.5, 54.7, 49.4, 14.8, 6.7; HRMS (ESI) for $C_{21}H_{22}N_2O_2S_2Na$ $[M+Na]^+$

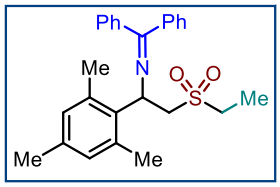
calcd. 421.1015, found 421.1028.

N-(2-(ethylsulfonyl)-1-(perfluorophenyl)ethyl)-1,1-diphenylmethanimine (4q)



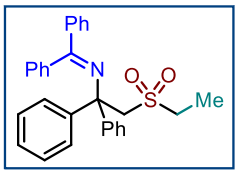
Purification by flash chromatography (PE/EA = 10/1) afforded **4q.** Yellow oil; 57.7 mg, 62% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.63 (d, *J* = 7.3 Hz, 2H), 7.50−7.40 (m, 4H), 7.34 (t, *J* = 7.6 Hz, 2H), 7.02 (d, *J* = 2.9 Hz, 2H), 5.56 (dd, *J* = 9.4, 4.2 Hz, 1H), 4.07 (dd, *J* = 14.5, 9.4 Hz, 1H), 3.24 (dd, *J* = 14.6, 3.8 Hz, 1H), 3.21−3.10 (m, 1H), 3.08−2.97 (m, 1H), 1.43 (t, *J* = 7.4 Hz, 3H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 172.9, 145.9, 143.4, 138.7, 138.5, 136.1 (t, *J* = 12.1 Hz), 135.3, 131.2, 129.2, 128.9, 128.6, 128.3, 126.7, 114.0 (t, *J* = 16.2 Hz), 55.9, 51.4, 49.5, 6.8; HRMS (ESI) for $C_{23}H_{18}F_5NO_2SNa$ $[M+Na]^+$ calcd. 490.0871, found 490.0874.

N-(2-(ethylsulfonyl)-1-mesitylethyl)-1,1-diphenylmethanimine (4r)



Purification by flash chromatography (PE/EA = 10/1) afforded **4r.** Yellow solid; mp 173−175 °C; 61.3 mg, 73% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.68 (d, *J* = 7.3 Hz, 2H), 7.42−7.31 (m, 6H), 6.86 (d, *J* = 4.2 Hz, 2H), 6.76 (s, 1H), 6.57 (s, 1H), 5.44 (dd, *J* = 10.6, 2.1 Hz, 1H), 4.19 (dd, *J* = 14.7, 10.8 Hz, 1H), 3.25−3.14 (m, 1H), 3.07−2.92 (m, 2H), 2.58 (s, 3H), 2.19 (s, 3H), 1.50−1.42 (m, 6H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 169.5, 138.7, 136.7, 136.6, 136.5, 135.8, 135.3, 130.8, 130.5, 128.7, 128.5, 128.3, 128.2, 127.1, 57.9, 56.4, 49.1, 22.4, 20.7, 19.5, 7.0; HRMS (ESI) for $C_{26}H_{30}NO_2S$ $[M+H]^+$ calcd. 420.1992, found 420.2001.

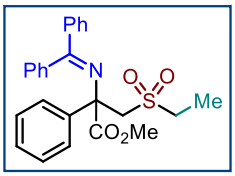
N-(2-(ethylsulfonyl)-1,1-diphenylethyl)-1,1-diphenylmethanimine (4s)



Purification by flash chromatography (PE/EA = 10/1) afforded **4s.** White solid; mp 156−158 °C; 54.3 mg, 60% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.71 (dd, *J* = 8.5, 1.5 Hz, 2H), 7.40−7.31 (m, 7H), 7.25−7.15 (m, 7H), 7.09 (t, *J* = 8.4 Hz, 2H), 6.62 (d, *J* = 7.2 Hz, 2H), 3.97 (s, 2H), 2.17 (q, *J* = 7.4 Hz, 2H), 0.99 (t, *J* = 7.4 Hz, 3H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ

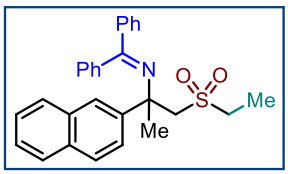
(ppm) 169.3, 147.5, 141.6, 138.1, 130.2, 128.6, 128.2, 128.0, 127.6, 127.5, 127.5, 126.9, 65.8, 61.6, 49.0, 6.1; HRMS (ESI) for $C_{29}H_{27}NO_2SNa$ $[M+Na]^+$ calcd. 476.1655, found 476.1662.

methyl 2-((diphenylmethylene)amino)-3-(ethylsulfonyl)-2-phenylpropanoate (4t)



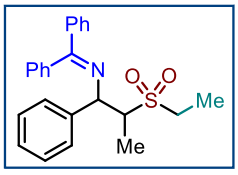
Purification by flash chromatography (PE/EA = 6/1) afforded **4t.** Yellow solid; mp 129−131 ℃; 30.5 mg, 35% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.67 (d, *J* = 7.2 Hz, 2H), 7.54−7.49 (m, 2H), 7.44−7.39 (m, 1H), 7.37−7.24 (m, 8H), 7.07 (d, *J* = 6.8 Hz, 2H), 4.00 (d, *J* = 11.8 Hz, 2H), 3.48 (s, 3H), 2.94−2.73 (m, 2H), 1.14 (t, *J* = 7.4 Hz, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 171.6, 171.5, 141.3, 140.6, 136.9, 130.7, 128.8, 128.6, 128.4, 128.0, 128.0, 127.8, 127.7, 126.4, 68.9, 61.7, 52.7, 49.6, 6.0; HRMS (ESI) for $C_{25}H_{26}NO_4S$ $[M+H]^+$ calcd. 436.1577, found 436.1577.

N-(1-(ethylsulfonyl)-2-(naphthalen-2-yl)propan-2-yl)-1,1-diphenylmethanimine (4u)



Purification by flash chromatography (PE/EA = 10/1) afforded **4u.** White solid; mp 117−119 ℃; 32.7 mg, 37% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.86−7.74 (m, 2H), 7.71−7.56 (m, 3H), 7.54−7.28 (m, 7H), 7.10 (t, *J* = 6.8 Hz, 1H), 6.93 (t, *J* = 7.3 Hz, 2H), 6.53 (d, *J* = 6.8 Hz, 2H), 4.07 (d, *J* = 14.6 Hz, 1H), 3.41 (d, *J* = 14.8 Hz, 1H), 3.18−3.04 (m, 1H), 3.03−2.87 (m, 1H), 1.78 (s, 3H), 1.39 (t, *J* = 7.5 Hz, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 168.7, 144.1, 140.8, 137.8, 132.9, 132.3, 130.3, 128.4, 128.3, 128.2, 128.1, 127.8, 127.5, 127.4, 127.3, 126.3, 126.2, 124.6, 124.5, 67.7, 63.4, 49.6, 24.1, 6.8; HRMS (ESI) for $C_{28}H_{28}NO_2S$ $[M+H]^+$ calcd. 442.1835, found 442.1838.

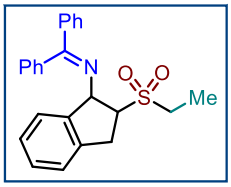
N-(2-(ethylsulfonyl)-1-phenylpropyl)-1,1-diphenylmethanimine (4v)



Purification by flash chromatography (PE/EA = 10/1) afforded **4v.** White solid; mp 91−93 ℃; 32.8 mg, 42% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.72 (d, *J* = 6.9 Hz, 2H), 7.44−7.30 (m, 6H), 7.29−7.16 (m, 5H), 6.91 (d, *J* = 6.8 Hz, 2H), 5.14 (d, *J* = 3.4 Hz, 1H), 3.33 (br,

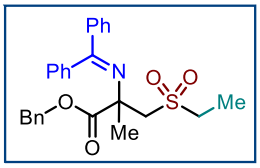
1H), 2.90−2.61 (m, 2H), 1.61 (d, *J* = 7.0 Hz,3H), 1.26 (t, *J* = 7.5 Hz, 3H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 170.1, 141.8, 139.2, 135.9, 130.6, 128.7, 128.5, 128.2, 127.4, 127.3, 65.2, 63.8, 45.3, 9.2, 5.5; HRMS (ESI) for $C_{24}H_{26}NO_2S$ $[M+H]^+$ calcd. 392.1679, found 392.1691.

N-(2-(ethylsulfonyl)-2,3-dihydro-1H-inden-1-yl)-1,1-diphenylmethanimine (4w)



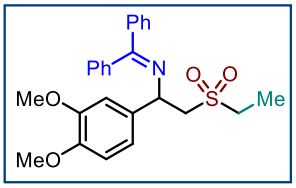
Purification by flash chromatography (PE/EA = 10/1) afforded **4w.** Yellow solid; mp 173−175 ℃; 33.0 mg, 42% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.68 (d, *J* = 7.2 Hz, 2H), 7.51−7.43 (m, 3H), 7.43−7.39 (m, 3H), 7.35 (t, *J* = 7.5 Hz, 2H), 7.26−7.20 (m, 3H), 7.06 (d, *J* = 6.9 Hz, 1H), 5.58 (d, *J* = 7.8 Hz, 1H), 4.32 (q, *J* = 8.1Hz, 1H), 3.44 (d, *J* = 9.3 Hz, 2H), 2.92 (q, *J* = 7.5 Hz, 2H), 1.41 (t, *J* = 7.5 Hz, 3H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 171.0, 141.3, 139.3, 138.6, 135.6, 130.7, 130.0, 129.1, 128.9, 128.7, 128.4, 128.2, 127.9, 127.4, 124.7, 124.0, 67.8, 67.0, 47.1, 31.7, 6.1; HRMS (ESI) for $C_{24}H_{24}NO_2S$ $[M+H]^+$ calcd. 390.1522, found 390.1532.

benzyl 2-((diphenylmethylene)amino)-3-(ethylsulfonyl)-2-methylpropanoate (4x)



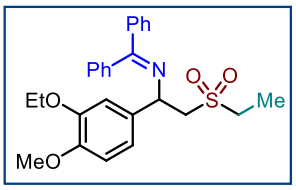
Purification by flash chromatography (PE/EA = 10/1) afforded **4x.** Colorless oil; 27.0 mg, 30% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.50 (d, *J* = 7.2 Hz, 2H), 7.41−7.28 (m, 10H), 7.25−7.22 (m, 1H), 7.18−7.12 (m, 2H), 4.84 (d, *J* = 12.3 Hz, 1H), 4.70 (d, *J* = 12.3 Hz, 1H), 3.74 (d, *J* = 14.4 Hz, 1H), 3.58 (d, *J* = 14.4 Hz, 1H), 3.16 (q, *J* = 7.4 Hz, 2H), 1.64 (s, 3H), 1.38(t, *J* = 7.4 Hz, 3H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 171.8, 169.0, 136.6, 135.1, 130.5, 130.0, 128.8, 128.5, 128.5, 128.4, 128.3, 128.2, 128.0, 128.0, 67.4, 65.4, 62.4, 50.2, 24.2, 6.6; HRMS (ESI) for $C_{26}H_{28}NO_4S$ $[M+H]^+$ calcd. 450.1734, found 457.1740.

N-(1-(3,4-dimethoxyphenyl)-2-(ethylsulfonyl)ethyl)-1,1-diphenylmethanimine (4y)



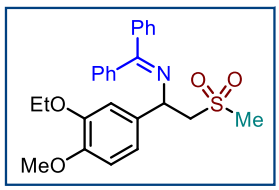
Purification by flash chromatography (PE/EA = 6/1) afforded **4y.** Yellow oil; 54.3 mg, 62% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.68 (d, *J* = 7.4 Hz, 2H), 7.46−7.33 (m, 6H), 7.01 (d, *J* = 5.4 Hz, 2H), 6.80−6.70 (m, 2H), 6.60 (br, 1H), 4.99 (dd, *J* = 9.6, 2.2 Hz, 1H), 4.01−3.81 (m, 4H), 3.79 (s, 3H), 3.26−3.16 (m, 1H), 3.08−2.97 (m, 1H), 2.96−2.85 (m, 1H), 1.40 (t, *J* = 7.4 Hz, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 170.1, 148.9, 148.3, 138.9, 135.9, 134.2, 130.6, 128.7, 128.5, 128.3, 128.2, 127.5, 119.0, 111.2, 110.0, 61.0, 60.1, 55.8, 55.8, 49.1, 6.7; HRMS (ESI) for $C_{25}H_{28}NO_4S$ $[M+H]^+$ calcd. 438.1734, found 438.1746.

N-(1-(3-ethoxy-4-methoxyphenyl)-2-(ethylsulfonyl)ethyl)-1,1-diphenylmethanimine (4z)



Purification by flash chromatography (PE/EA = 6/1) afforded **4z.** Yellow solid; mp 106−108 ℃; 72.5 mg, 80% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.70 (d, *J* = 4.6 Hz, 2H), 7.48−7.32 (m, 6H), 7.03 (d, *J* = 5.2 Hz, 2H), 6.86−6.44 (m, 3H), 4.99 (d, *J* = 7.1 Hz, 1H), 4.18−3.67 (m, 6H), 3.21 (dd, *J* = 14.7, 2.4 Hz, 1H), 3.10−2.82 (m, 2H), 1.48−1.35 (m, 6H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 148.6, 148.2, 135.8, 133.9, 130.8, 128.7, 128.3, 128.2, 127.5, 118.9, 111.4, 111.3, 64.2, 60.9, 59.9, 55.8, 14.7, 6.7; HRMS (ESI) for $C_{26}H_{30}NO_4S$ $[M+H]^+$ calcd. 452.1890, found 452.1894.

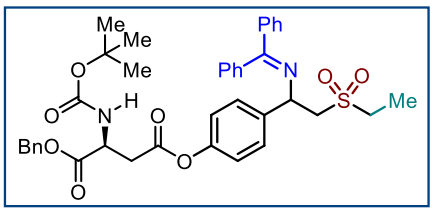
N-(1-(3-ethoxy-4-methoxyphenyl)-2-(methylsulfonyl)ethyl)-1,1-diphenylmethanimine (4aa)



Purification by flash chromatography (PE/EA = 6/1) afforded **4aa.** Yellow solid; mp 138−140 ℃; 70.0 mg, 80% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.68 (d, *J* = 7.2 Hz, 2H), 7.42−7.32 (m, 6H), 7.06−6.96 (m, 2H), 6.76 (d, *J* = 8.3 Hz, 1H), 6.70 (dd, *J* = 8.3, 1.8 Hz, 1H), 6.59 (s, 1H), 4.95 (dd, *J* = 9.9, 3.0 Hz, 1H),

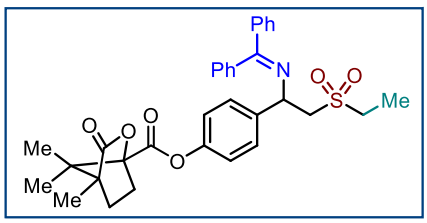
4.06−3.93 (m, 2H), 3.92−3.81 (m, 4H), 3.28 (dd, *J* = 14.6, 2.0 Hz, 1H), 2.89 (s, 3H), 1.43(t, *J* = 7.0 Hz, 3H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 170.1, 148.5, 148.1, 138.8, 135.9, 134.0, 130.6, 128.6, 128.4, 128.3, 128.2, 127.4, 118.9, 111.4, 111.2, 64.1, 63.2, 61.2, 55.8, 43.1, 14.7; HRMS (ESI) for $C_{25}H_{28}NO_4S$ $[M+H]^+$ calcd. 438.1734, found 438.1743.

1-benzyl 4-(4-(1-((diphenylmethylene)amino)-2-(ethylsulfonyl)ethyl)phenyl) (tert-butoxycarbonyl)-L-aspartate (4ab)



Purification by flash chromatography (PE/EA = 6/1) afforded **4ab.** Yellow oil; 62.2 mg, 45% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.67 (d, *J* = 7.3 Hz, 2H), 7.45−7.31 (m, 11H), 7.13 (d, *J* = 8.5 Hz, 2H), 6.99 (d, *J* = 6.5 Hz, 2H), 6.89 (d, *J* = 7.6 Hz, 2H), 5.54 (d, *J* = 8.2 Hz, 1H), 5.25−5.20 (m, 1H), 5.19−5.13 (m, 1H), 5.04 (dd, *J* = 10.0, 2.4 Hz, 1H), 4.79−4.68 (m, 1H), 3.87 (dd, *J* = 14.6, 10.0 Hz, 1H), 3.27−2.86 (m, 5H), 1.46−1.36 (m, 12H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 170.6, 170.5, 169.4, 155.3, 149.5, 139.5, 138.7, 135.8, 130.7, 128.7, 128.5, 128.5, 128.4, 128.4, 128.3, 128.2, 127.8, 127.3, 121.7, 80.3, 67.6, 60.7, 59.9, 50.1, 49.2, 37.0, 28.2, 6.7; HRMS (ESI) for $C_{39}H_{43}N_2O_8S$ $[M+H]^+$ calcd. 699.2735, found 699.2753.

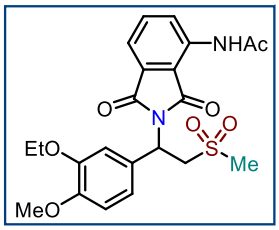
4-(1-((diphenylmethylene)amino)-2-(ethylsulfonyl)ethyl)phenyl (4R)-4,7,7-trimethyl-3-oxo-2-oxabicyclo[2.2.1]heptane-1-carboxylate (4ac)



Purification by flash chromatography (PE/EA = 6/1) afforded **4ac.** Yellow solid; mp 108−110 °C; 45.8 mg, 40% yield; **^{1}H NMR (400 MHz, CDCl$_3$)** δ (ppm) 7.67 (d, *J* = 7.3 Hz, 2H), 7.38−7.26 (m, 6H), 7.12 (d, *J* = 8.5 Hz, 2H), 7.01−6.86 (m, 4H), 4.99 (dd, *J* = 9.9, 2.4 Hz, 1H), 3.82 (dd, *J* = 14.6, 10.1 Hz, 1H), 3.11 (dd, *J* = 14.6, 2.0 Hz, 1H), 3.02−2.78 (m, 2H), 2.54−2.41 (m, 1H), 2.17−2.06 (m, 1H), 1.97−1.87 (m, 1H), 1.74−1.64 (m, 1H), 1.33 (t, *J* = 7.4 Hz, 3H), 1.12−0.95 (m, 9H); **^{13}C NMR (100 MHz, CDCl$_3$)** δ (ppm) 177.8, 170.7, 166.0,

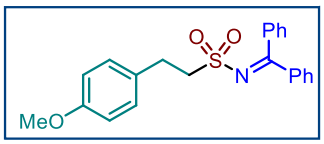
166.0, 149.2, 140.0, 138.7, 135.8, 130.8, 128.8, 128.5, 128.4, 128.2, 128.1, 127.3, 121.6, 90.7, 60.7, 59.9, 54.9, 54.7, 54.7, 49.2, 30.7, 28.9, 16.8, 16.8, 9.7, 6.7; HRMS (ESI) for $C_{33}H_{36}NO_6S$ $[M+H]^+$ calcd. 574.2258, found 574.2271.

N-(2-(1-(3-ethoxy-4-methoxyphenyl)-2-(methylsulfonyl)ethyl)-1,3-dioxoisoindolin-4-yl)acetamide (5aa)



Purification by flash chromatography (PE/EA = 1/1) afforded **5aa.** White solid; mp 112−114 ℃; 67% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 9.46 (s, 1H), 8.75 (d, *J* = 8.4 Hz, 1H), 7.65 (d, *J* = 7.9 Hz, 1H), 7.48 (d, *J* = 7.2 Hz, 1H), 7.13−7.06 (m, 2H), 6.84 (d, *J* = 8.9 Hz, 1H), 5.87 (dd, *J* = 10.5, 4.3 Hz, 1H), 4.55 (dd, *J* = 14.3, 10.6 Hz, 1H), 4.11 (q, *J* = 7.0 Hz, 2H), 3.85 (s, 3H), 3.73 (dd, *J* = 14.4, 4.4 Hz, 1H), 2.87 (s, 3H), 2.26 (s, 3H), 1.47 (t, *J* = 7.0 Hz, 3H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 169.5, 169.1, 167.4, 149.7, 148.6, 137.6, 136.1, 131.0, 129.2, 124.9, 120.3, 118.2, 115.1, 112.4, 111.4, 64.5, 55.9, 54.4, 48.5, 41.6, 24.9, 14.7; HRMS (ESI) for $C_{22}H_{24}N_2O_7SNa$ $[M+Na]^+$ calcd. 483.1196, found 483.1211.

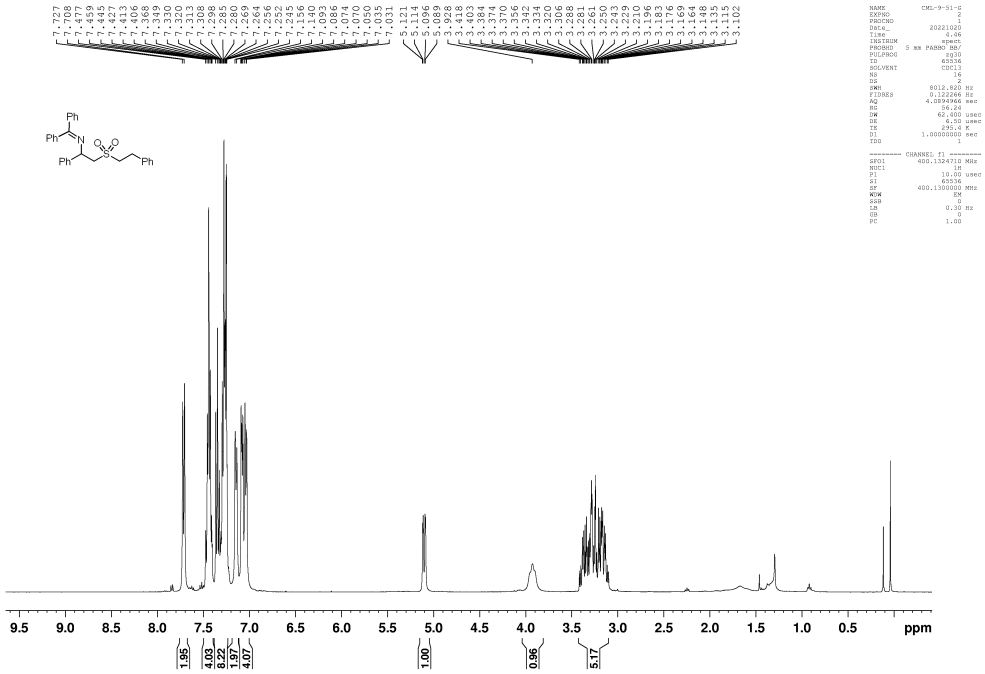
N-(diphenylmethylene)-2-(4-methoxyphenyl)ethane-1-sulfonamide (3ak')

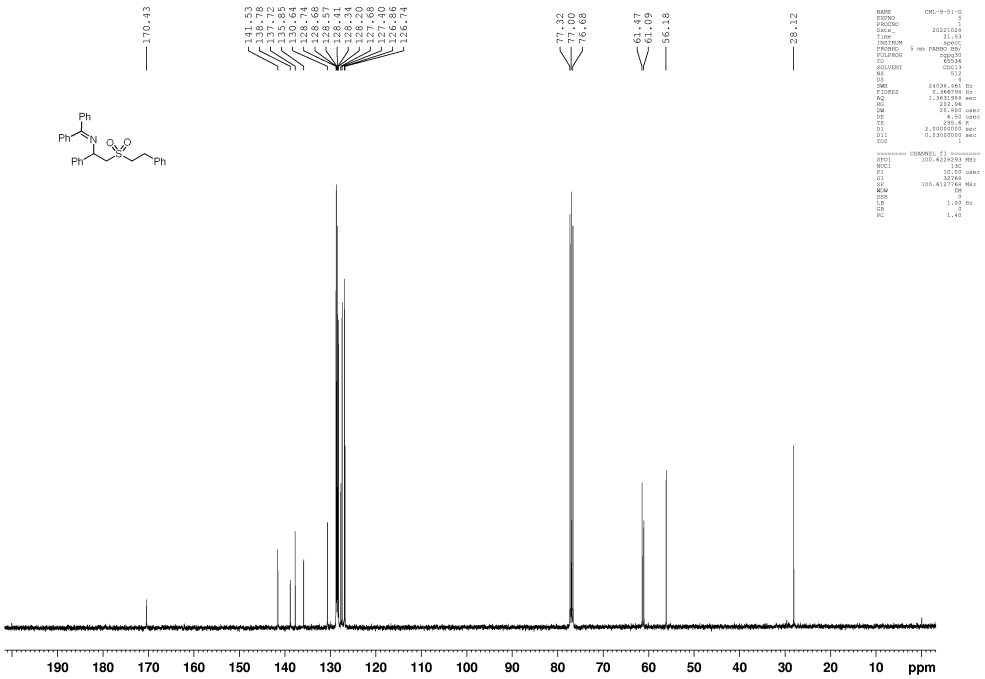


Purification by flash chromatography (PE/EA = 6/1) afforded **3ak'**. 50% yield; **^{1}H NMR (400 MHz, $CDCl_3$)** δ (ppm) 7.65−7.40 (m, 10H), 7.19 (d, *J* = 8.5 Hz, 2H), 6.87 (d, *J* = 8.5 Hz, 2H),3.79 (s, 3H), 3.58−3.47 (m, 2H), 3.29−3.17 (m, 2H); **^{13}C NMR (100 MHz, $CDCl_3$)** δ (ppm) 180.0, 158.4, 130.2, 129.5, 129.1, 129.0, 128.3, 128.2, 127.8, 114.2, 56.5, 55.3, 29.0; HRMS (ESI) for $C_{22}H_{21}NO_3SNa$ $[M+Na]^+$ calcd. 402.1134, found 402.1154.

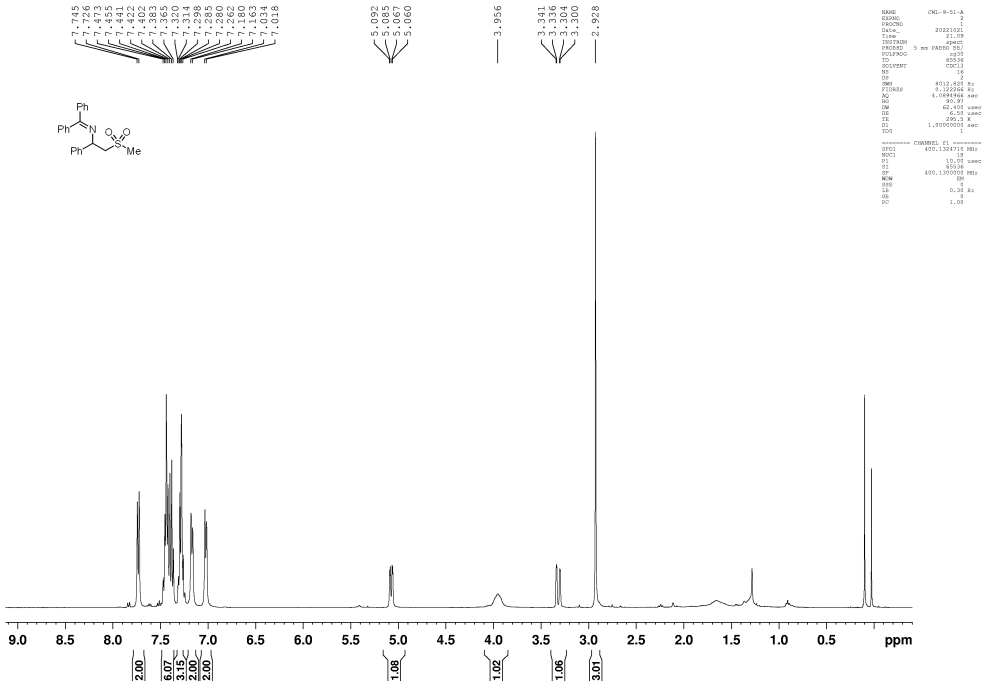
NMR spectra of compounds

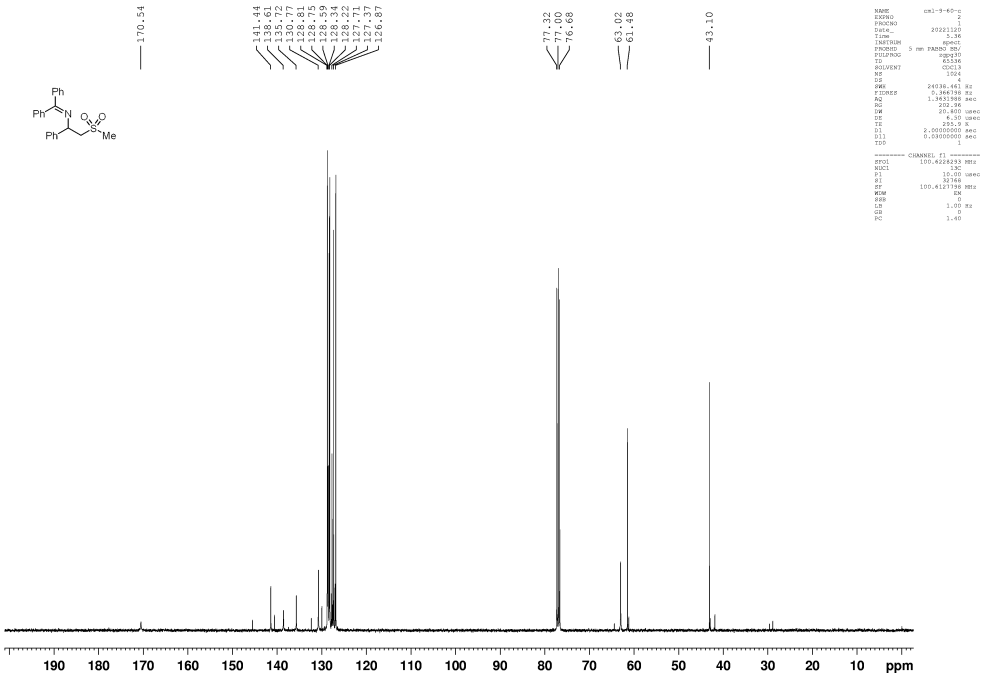
N-(2-(phenethylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3a)



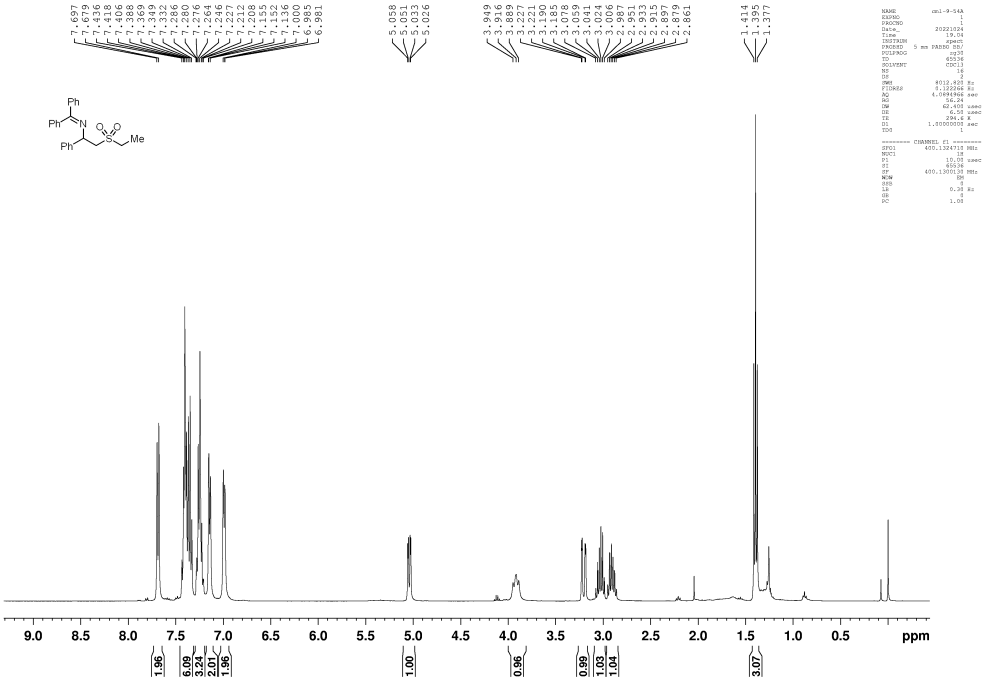


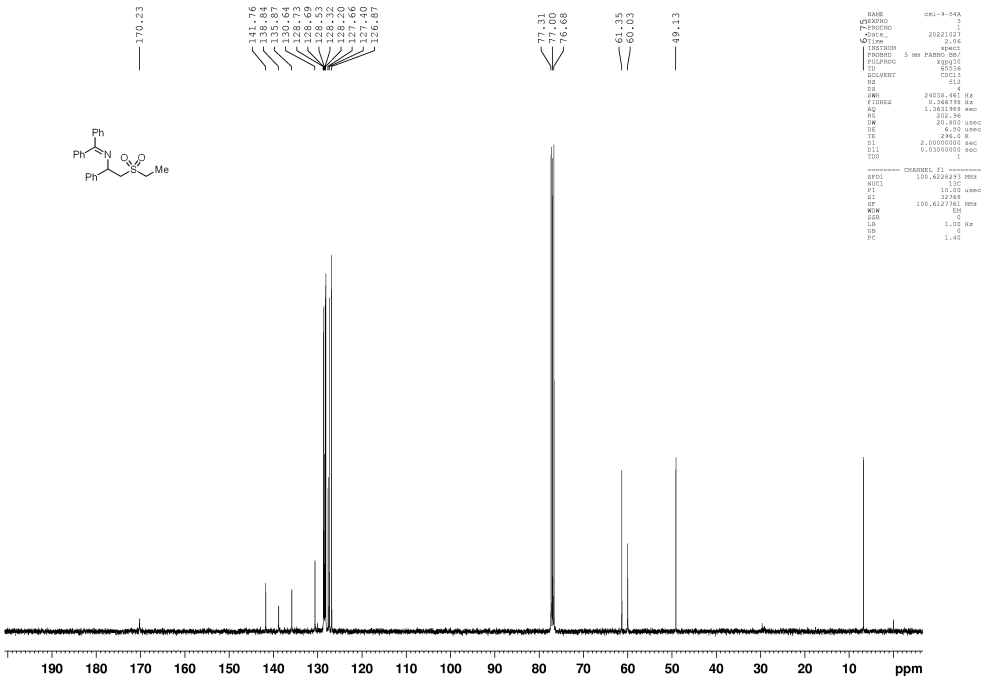
N-(2-(methylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3b)



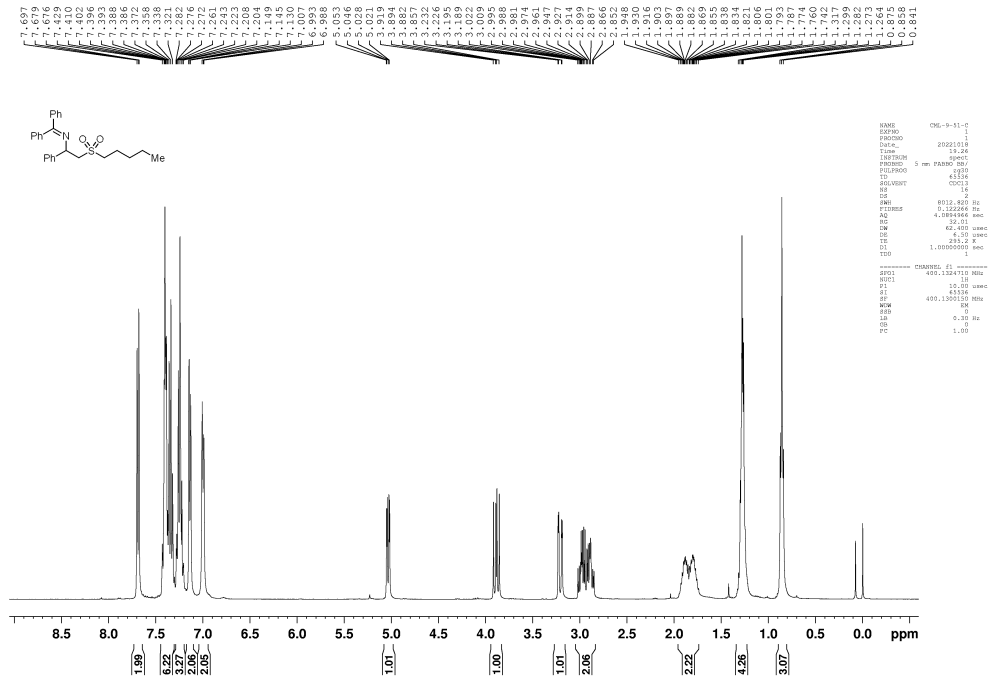


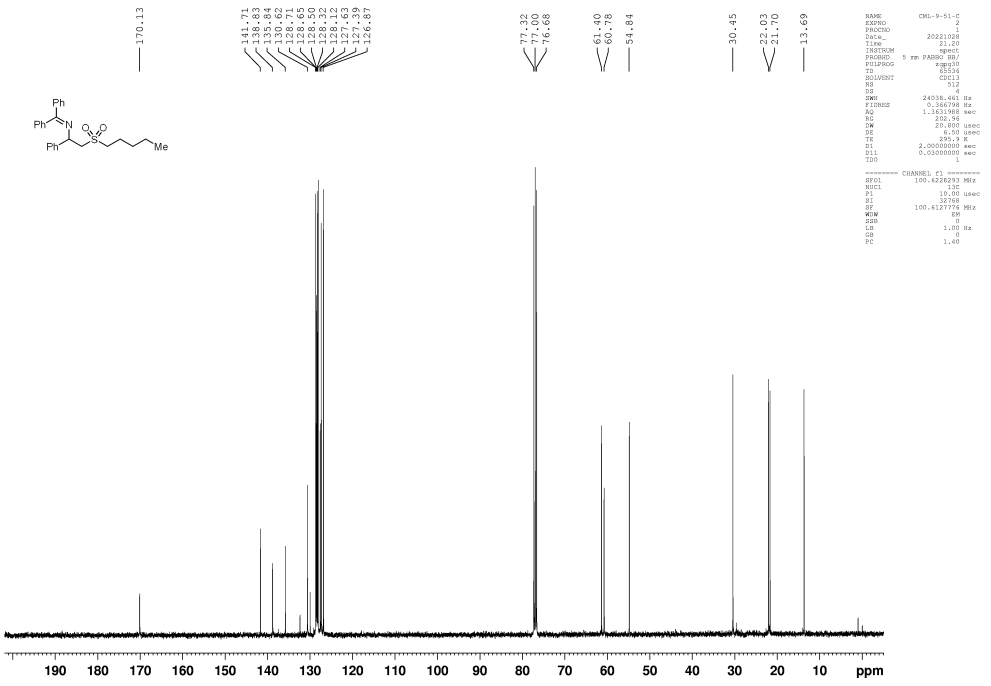
N-(2-(ethylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3c)



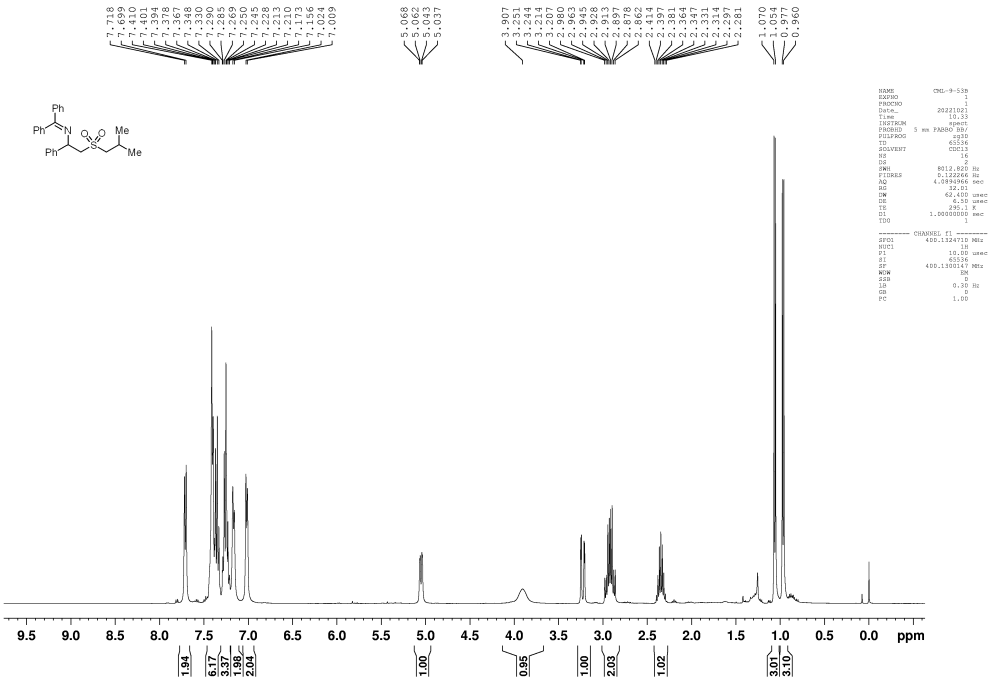


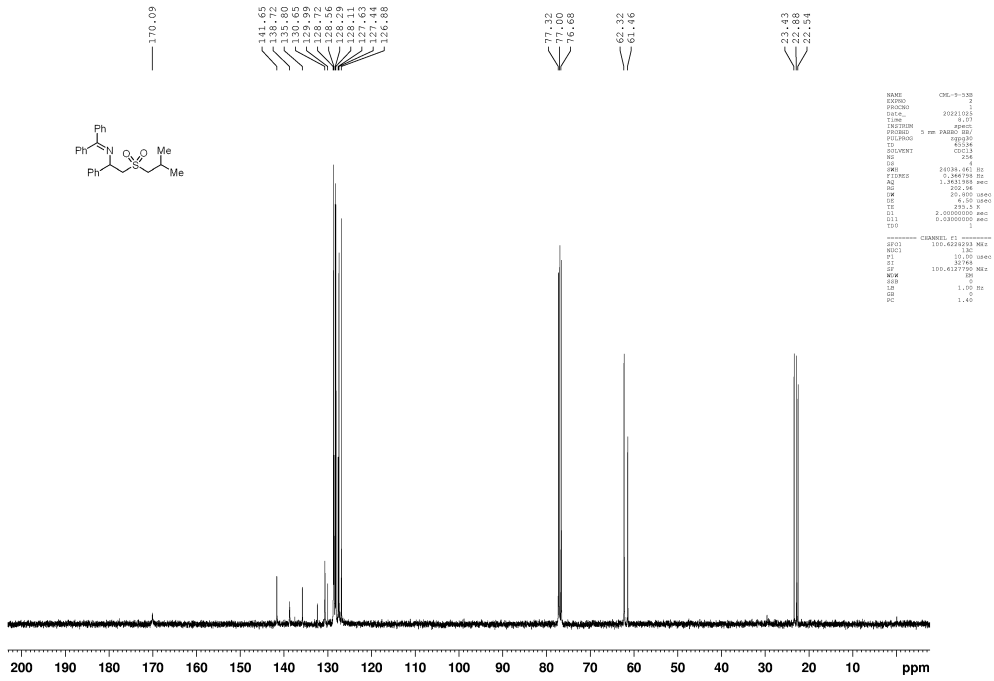
N-(2-(pentylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3d)



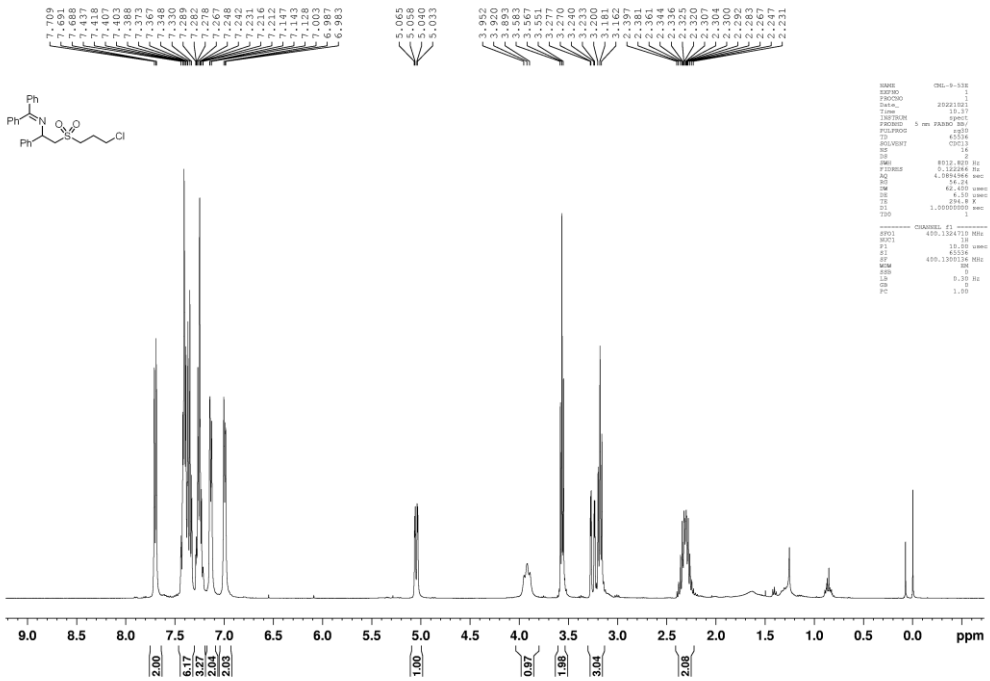


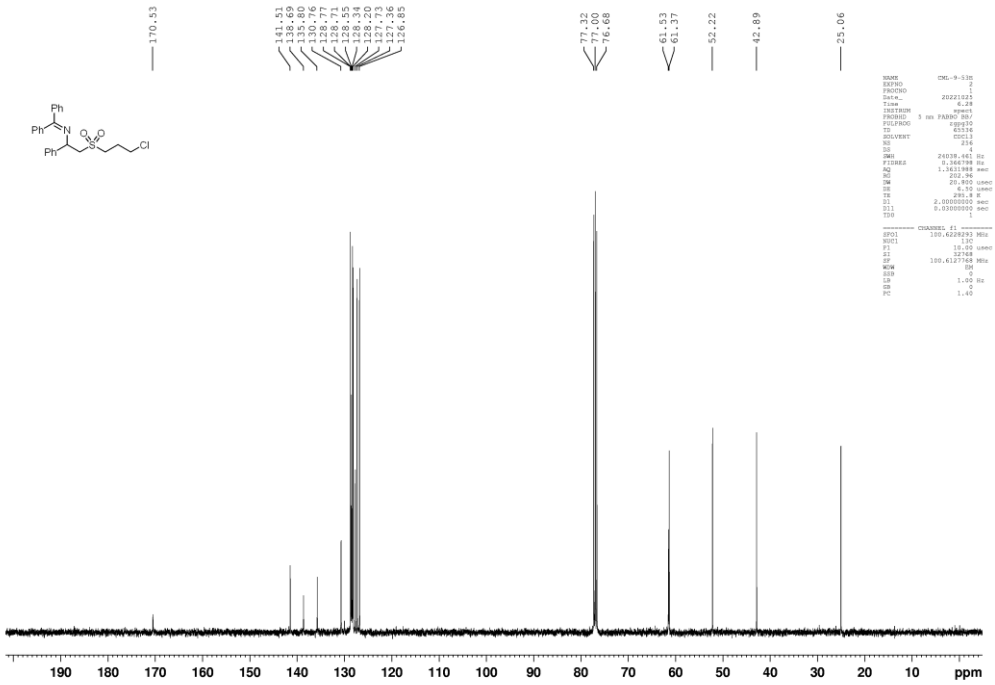
N-(2-(isobutylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3e)



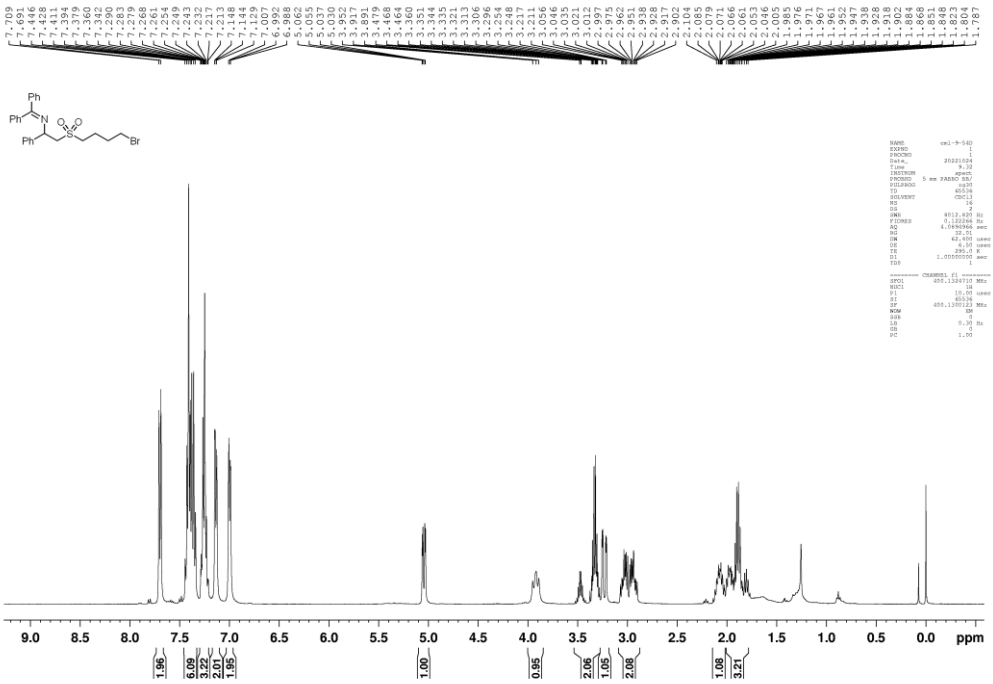


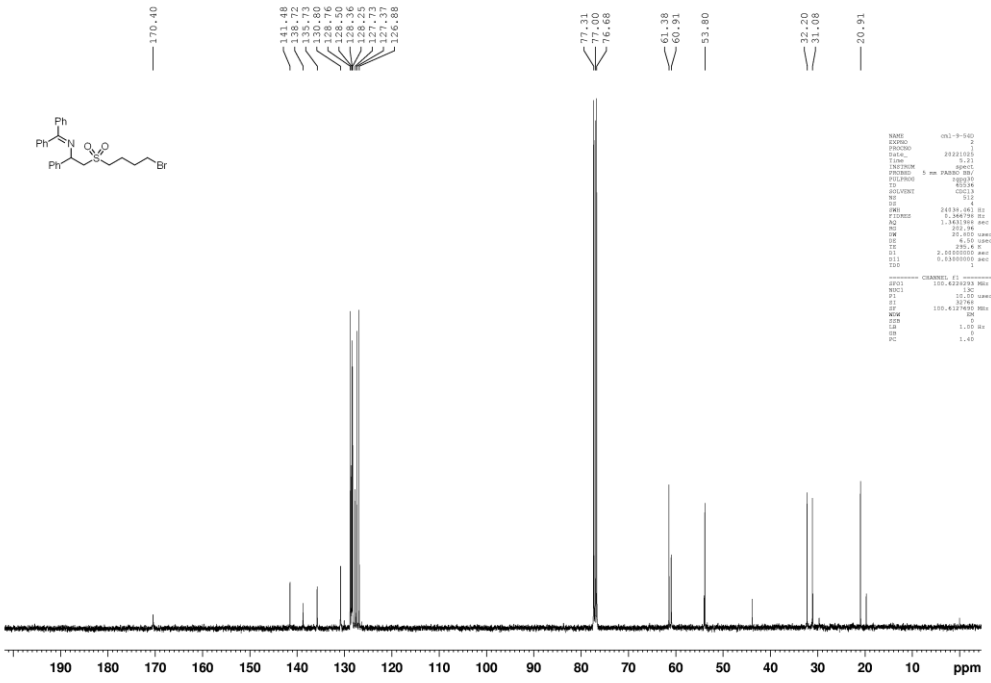
N-(2-((3-chloropropyl)sulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3f)



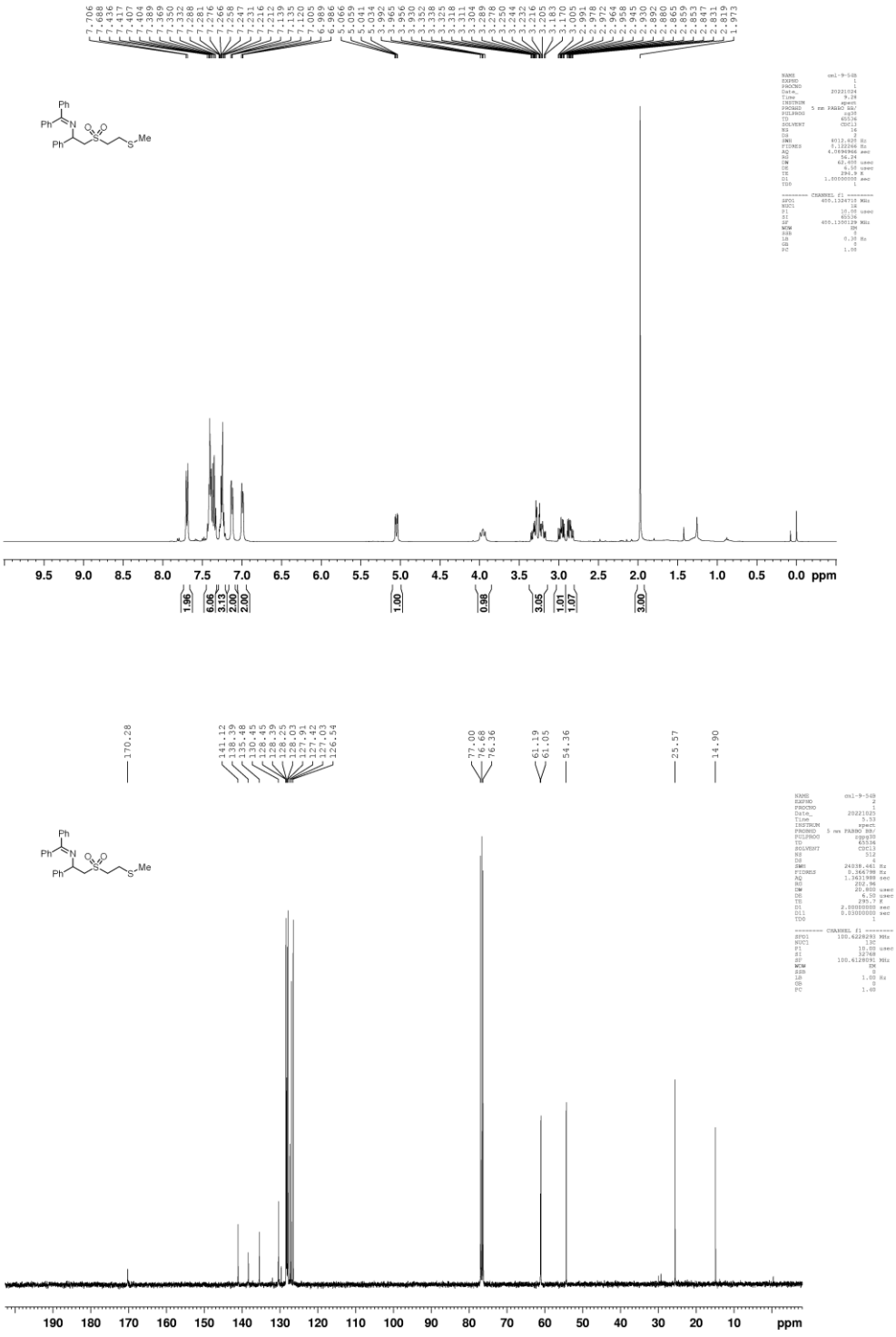


N-(2-((4-bromobutyl)sulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3g)

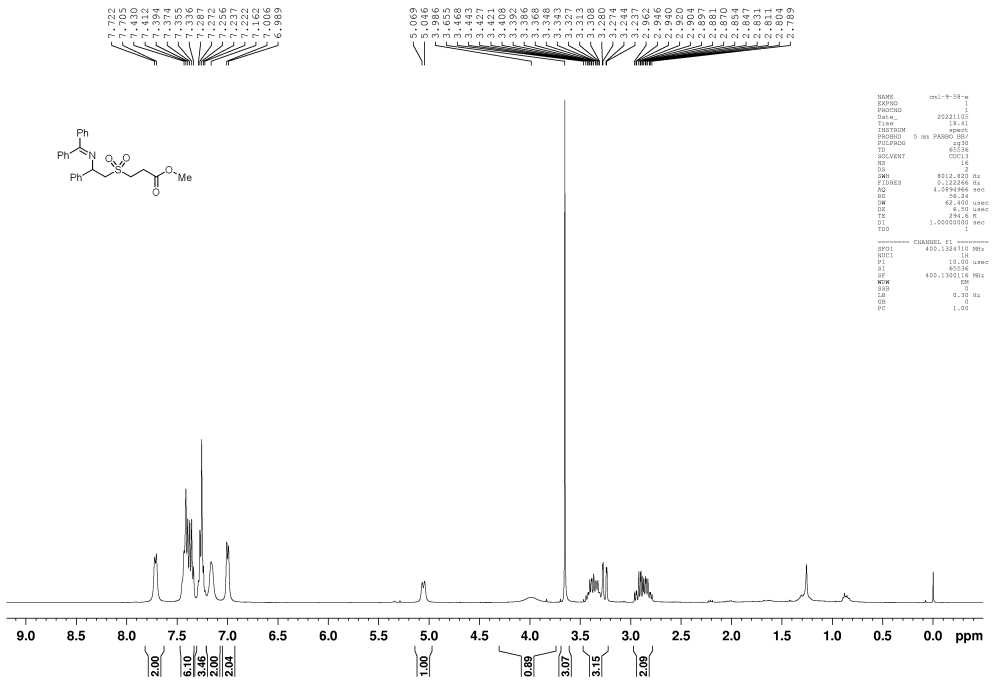


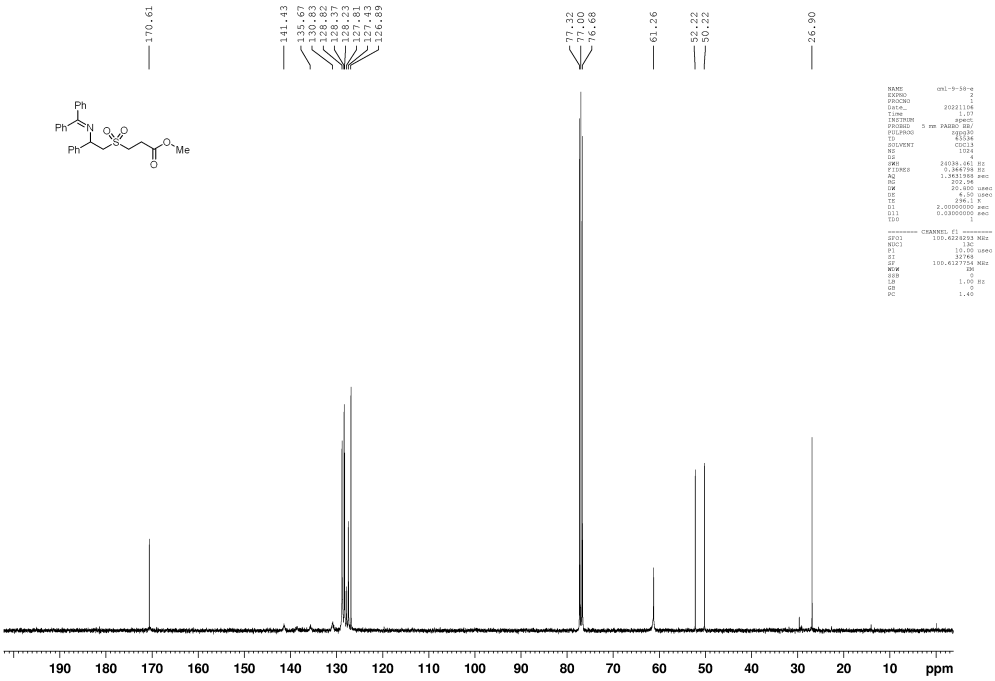


N-(2-((2-(methylthio)ethyl)sulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3h)

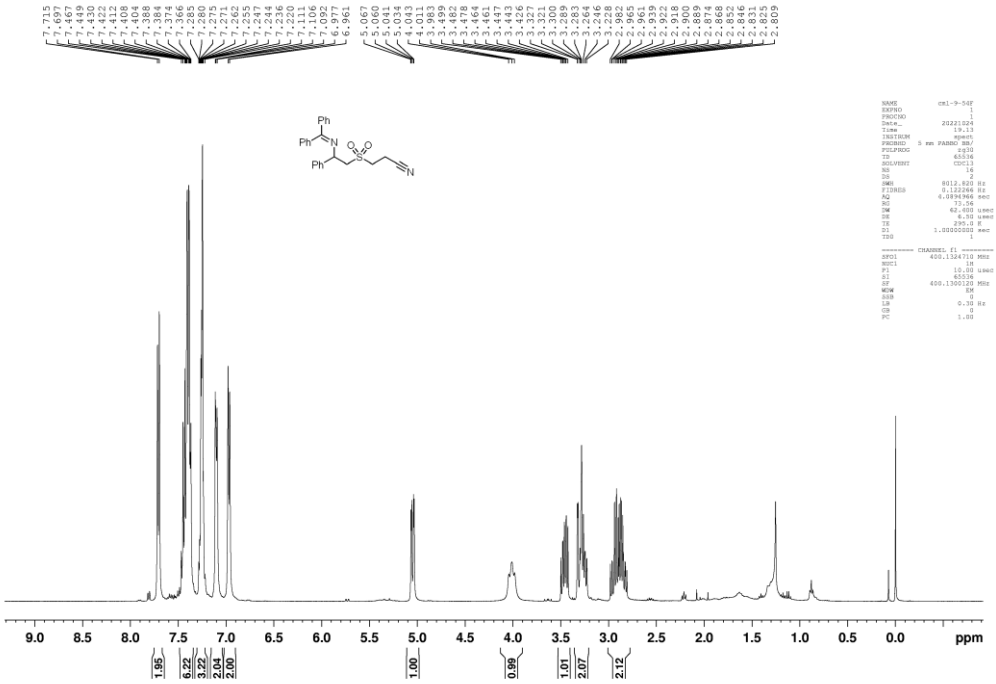


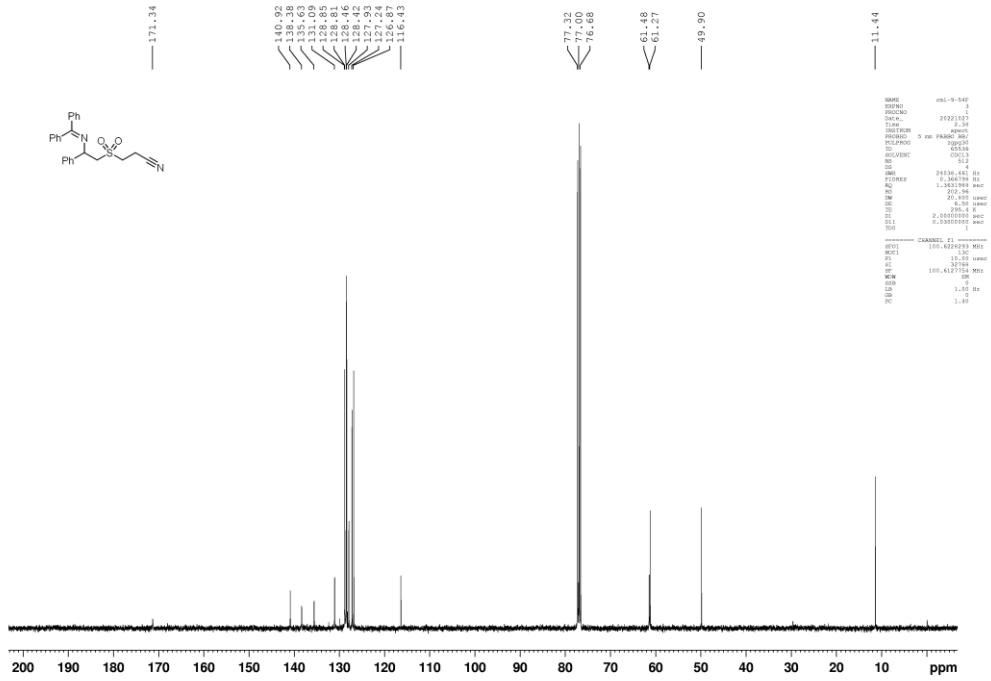
methyl 3-((2-((diphenylmethylene)amino)-2-phenylethyl)sulfonyl)propanoate (3i)



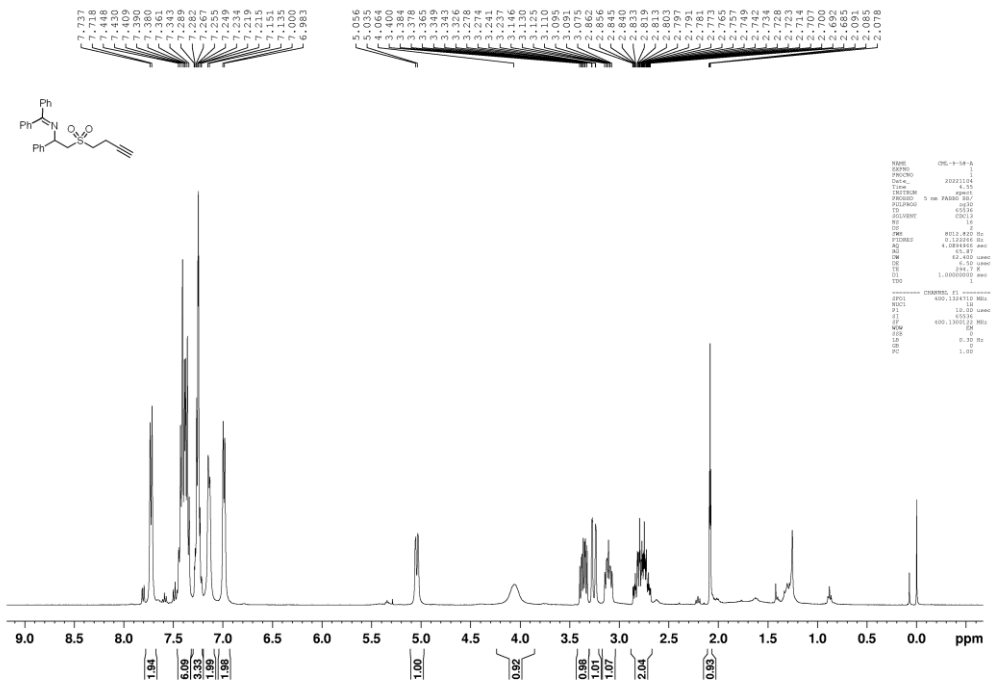


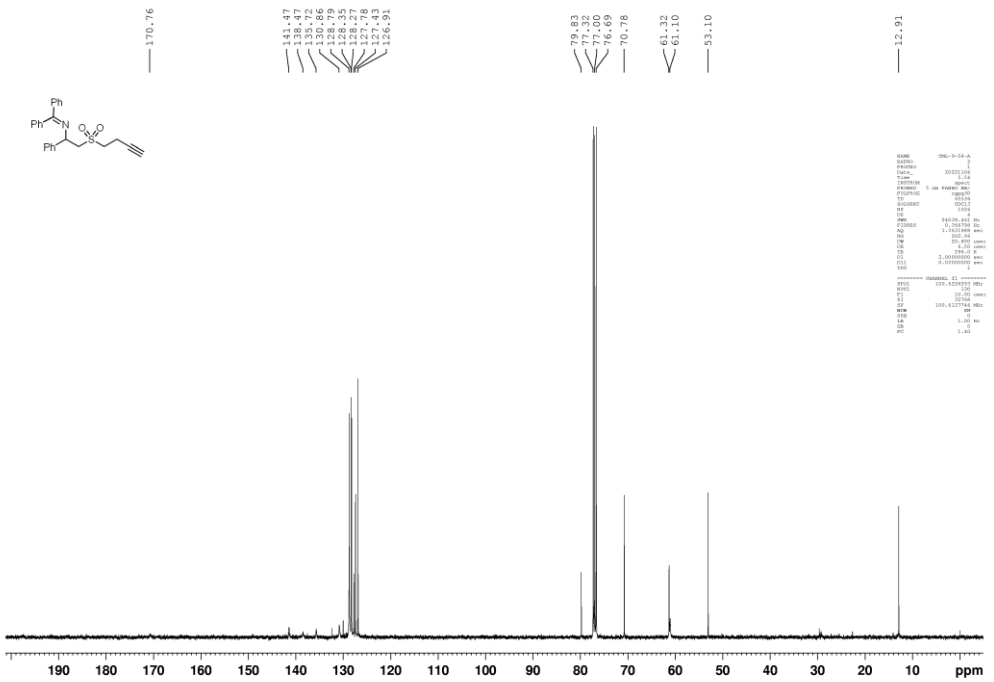
3-((2-((diphenylmethylene)amino)-2-phenylethyl)sulfonyl)propanenitrile (3j)



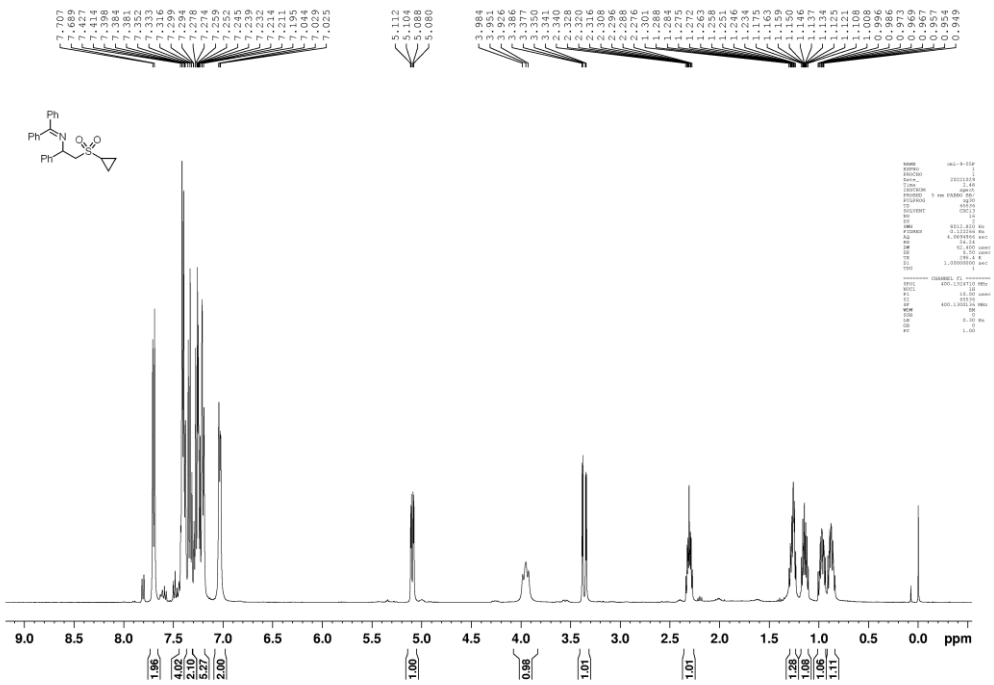


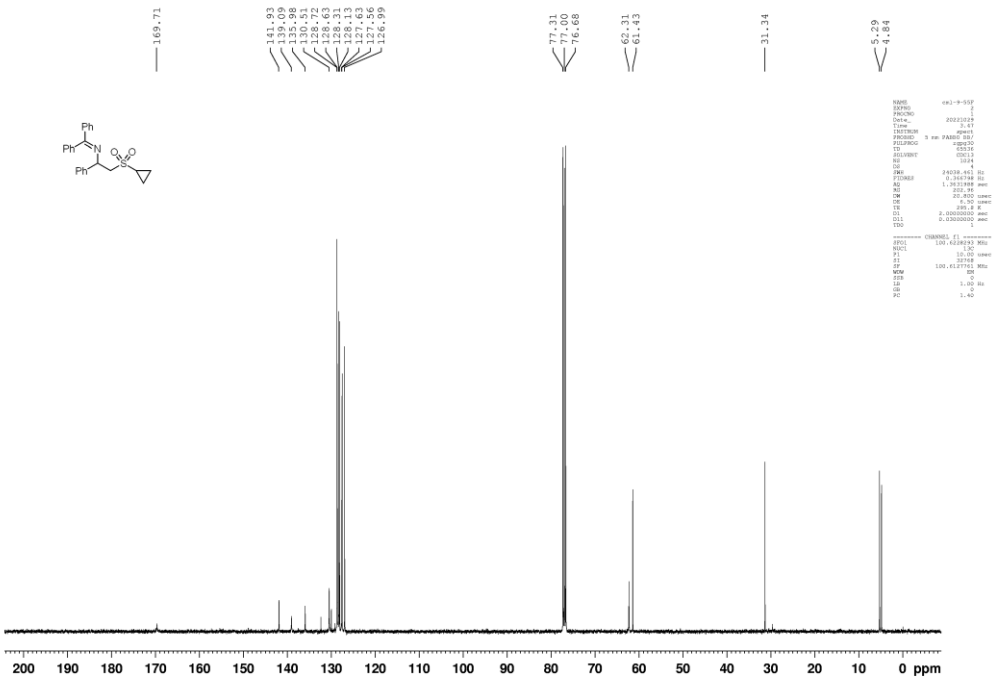
N-(2-(but-3-yn-1-ylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3k)



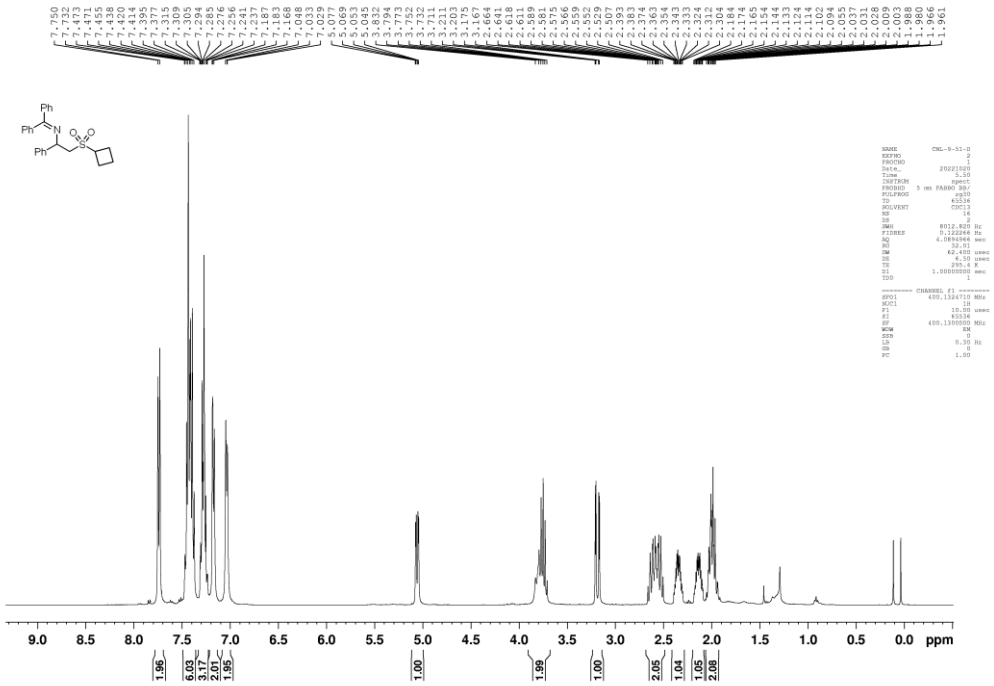


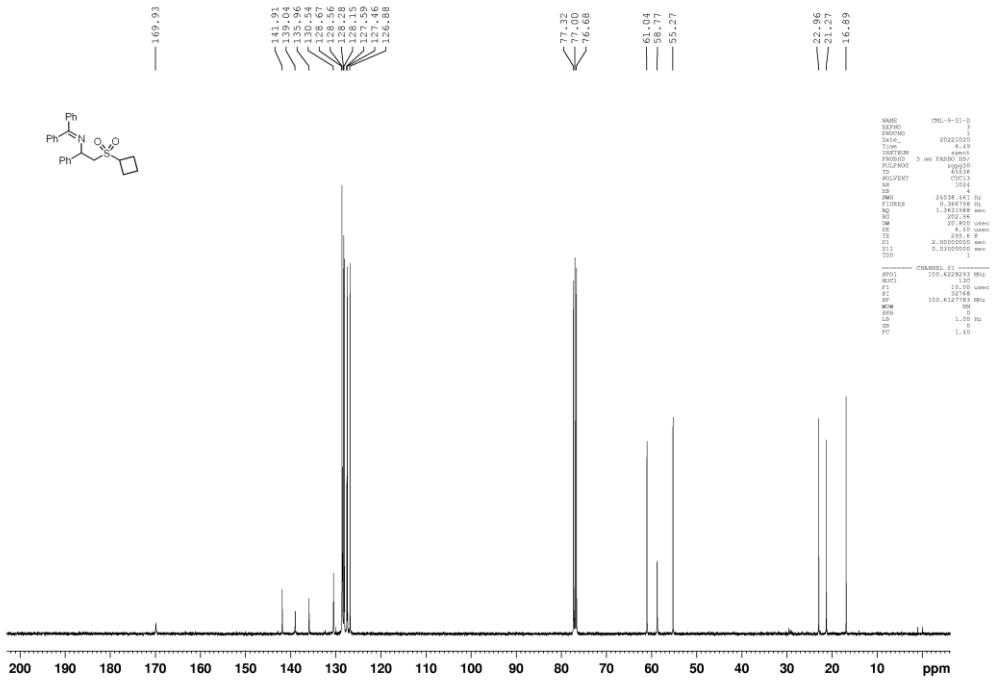
N-(2-(cyclopropylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3l)



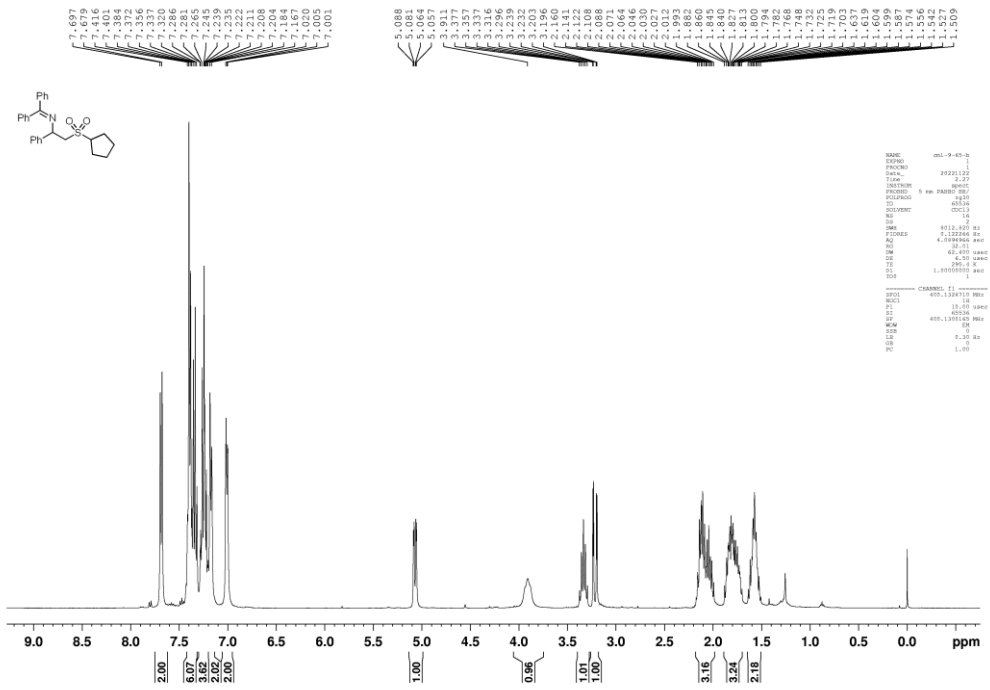


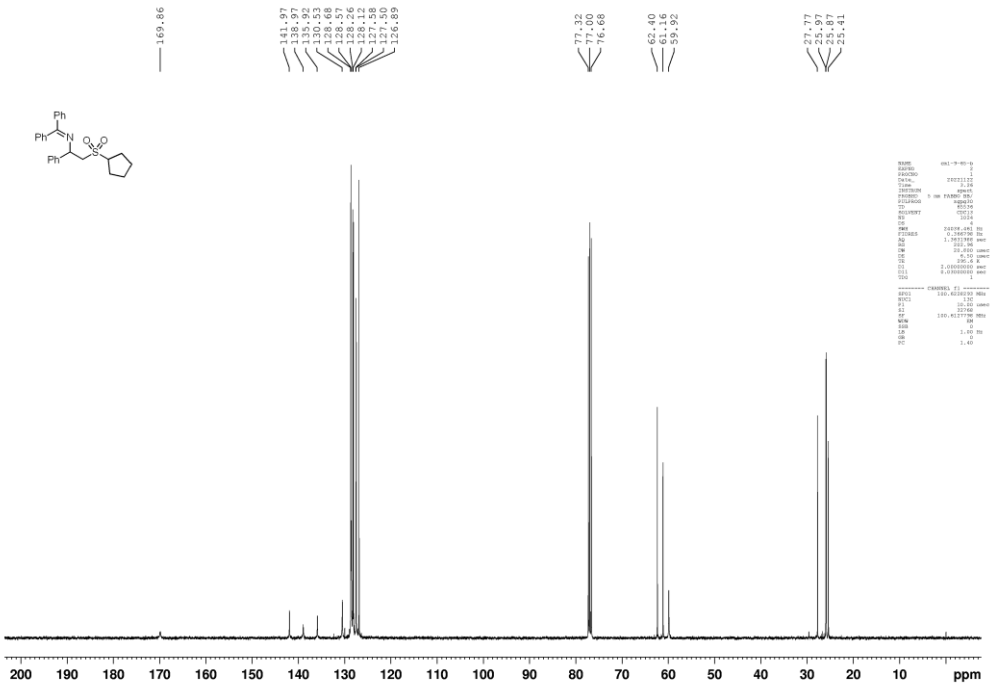
N-(2-(cyclobutylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3m)



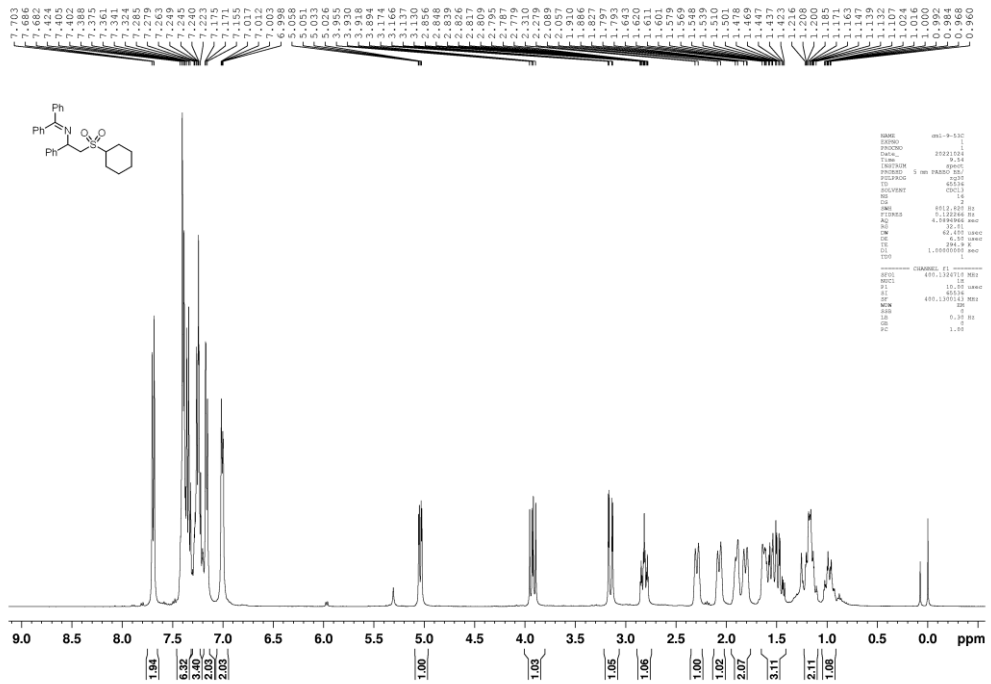


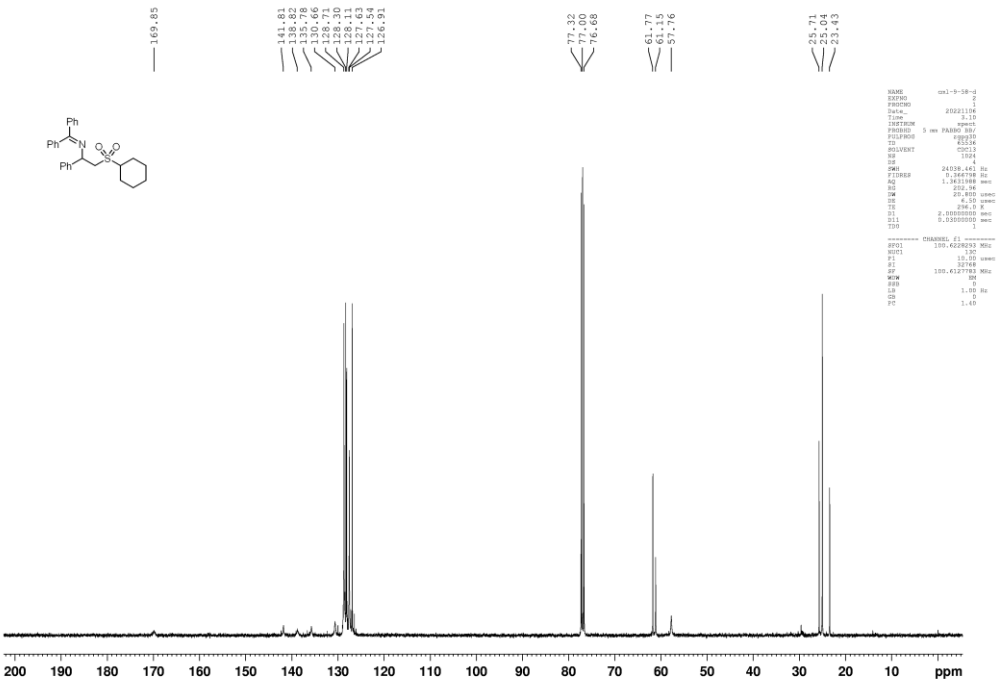
N-(2-(cyclopentylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3n)



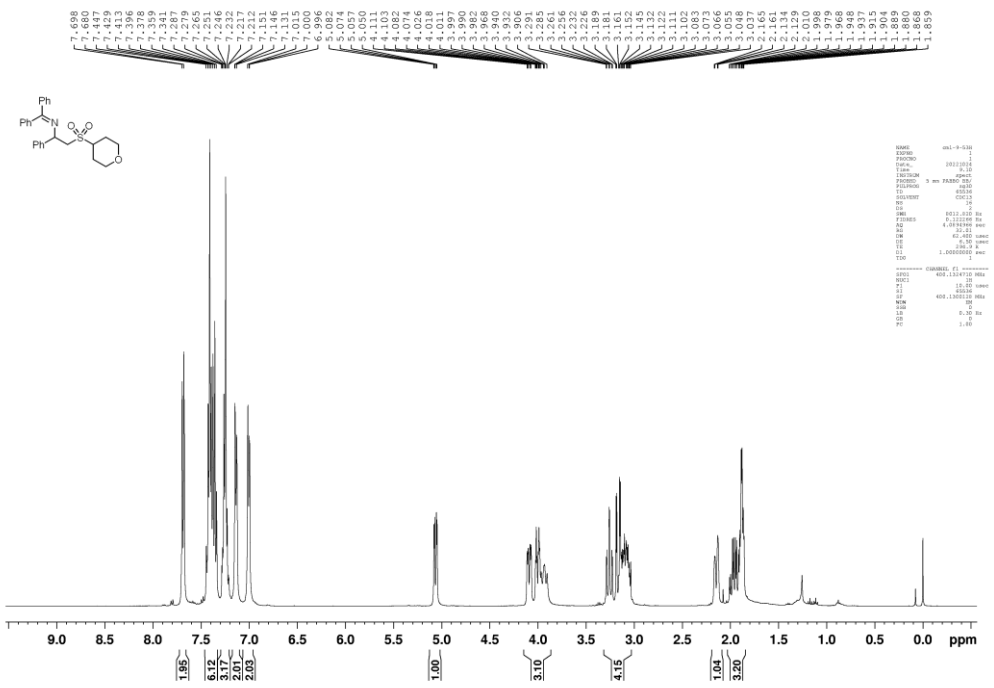


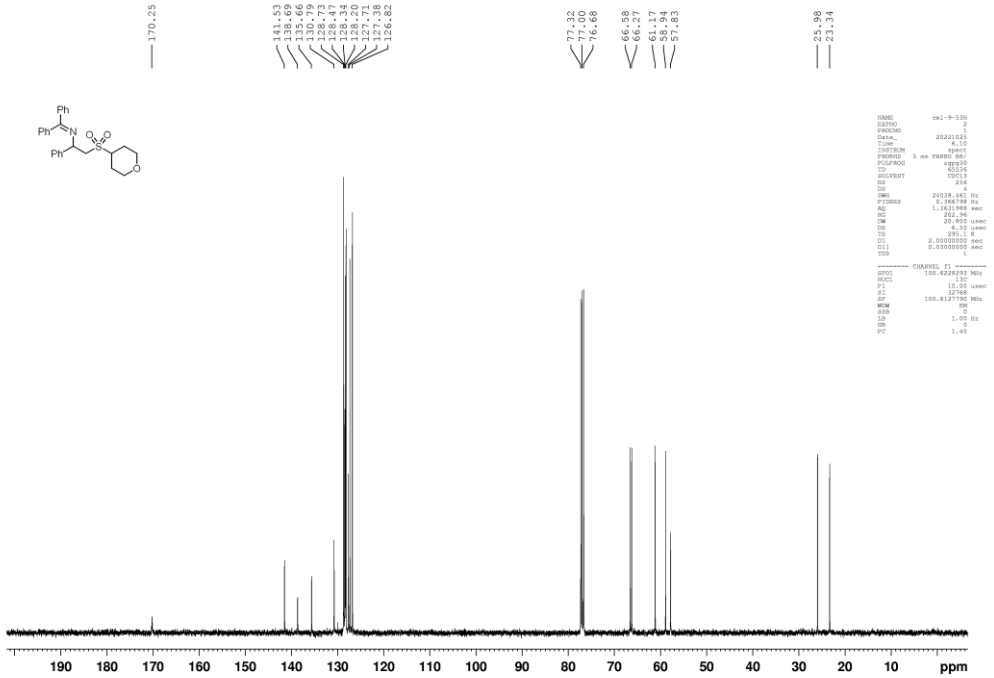
N-(2-(cyclohexylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3o)



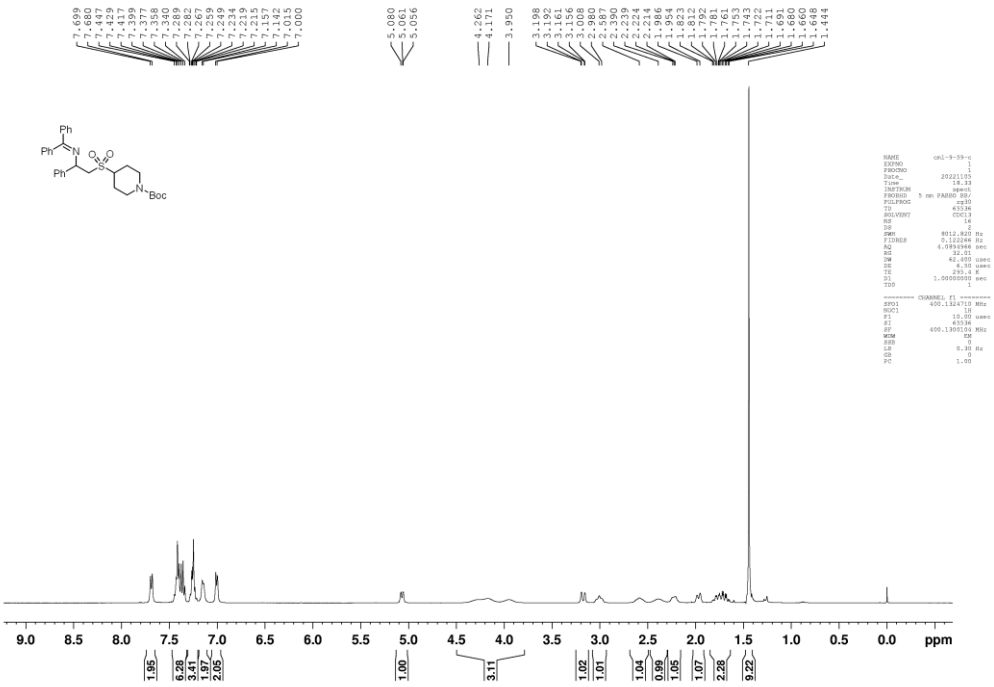


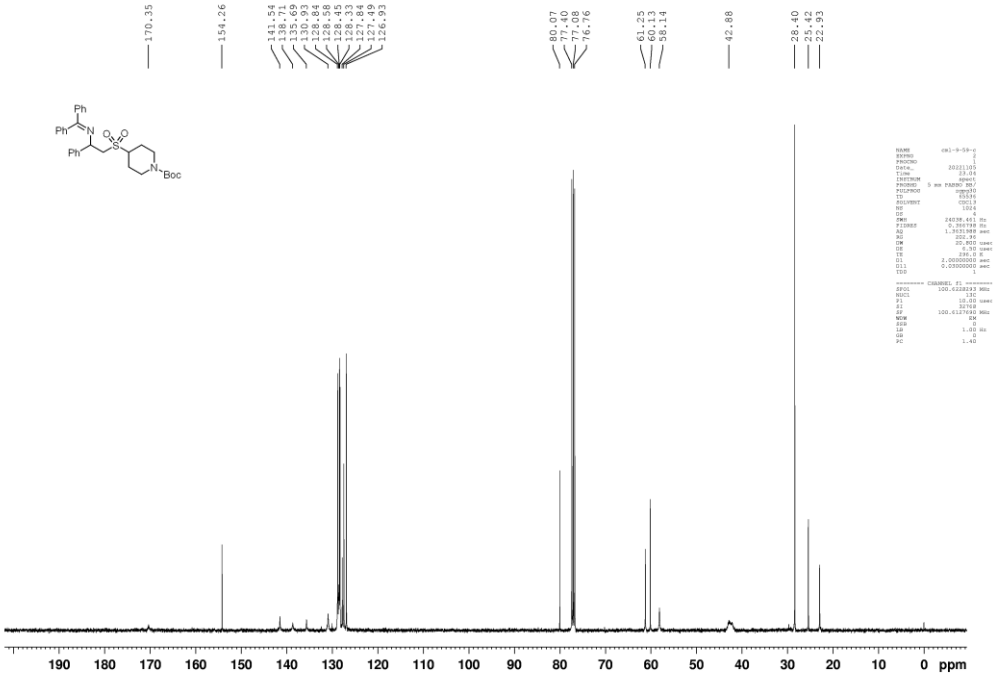
1,1-diphenyl-N-(1-phenyl-2-((tetrahydro-2H-pyran-4-yl)sulfonyl)ethyl)methanimine (3p)



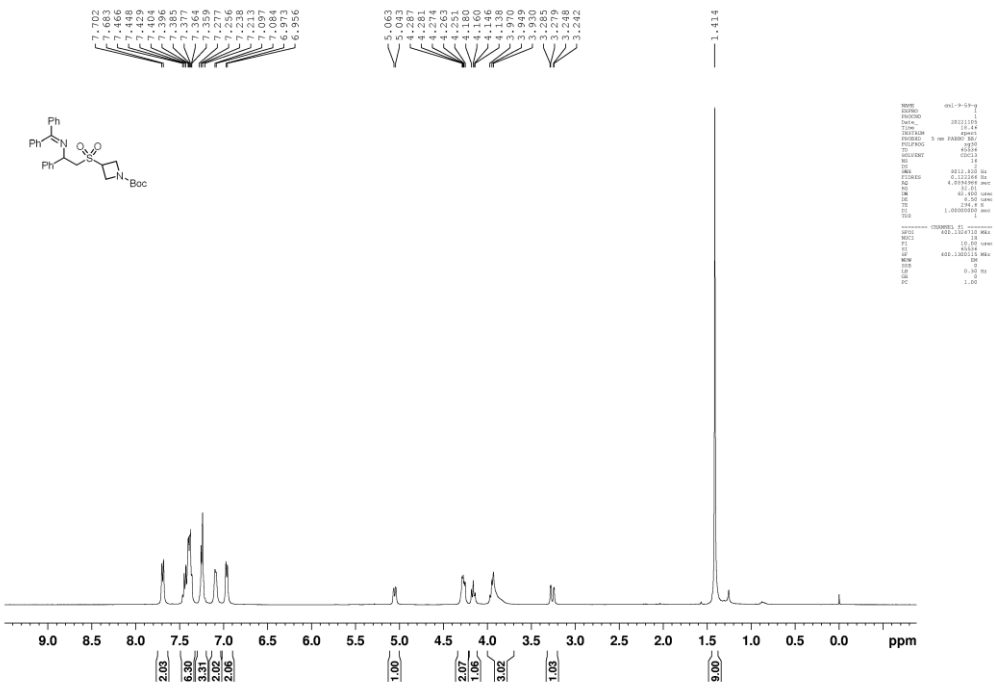


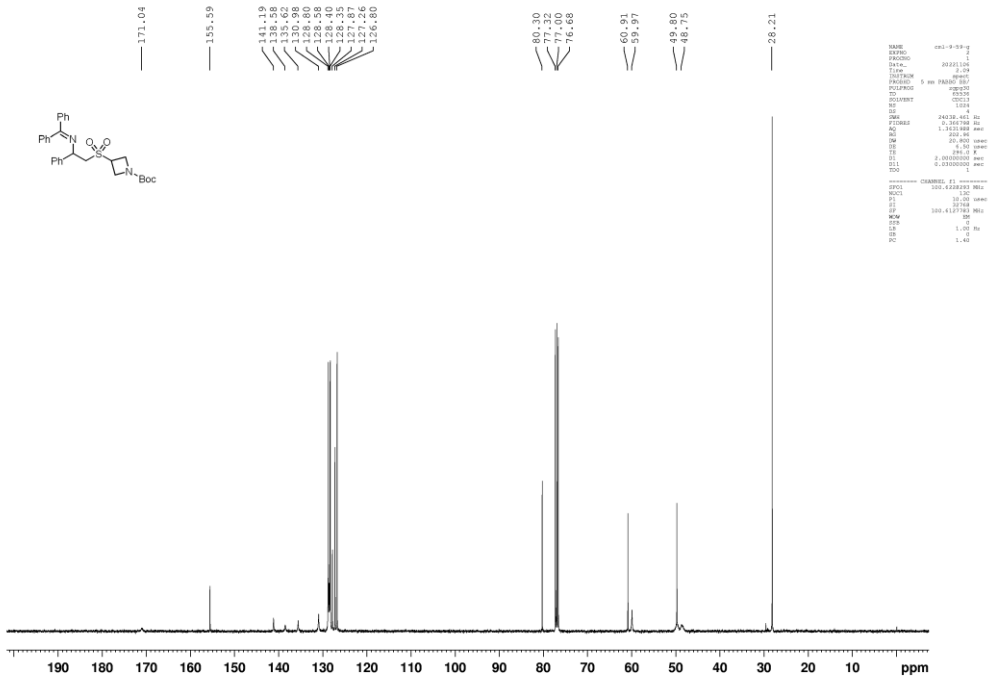
tert-butyl 4-((2-((diphenylmethylene)amino)-2-phenylethyl)sulfonyl)piperidine-1-carboxylate (3q)



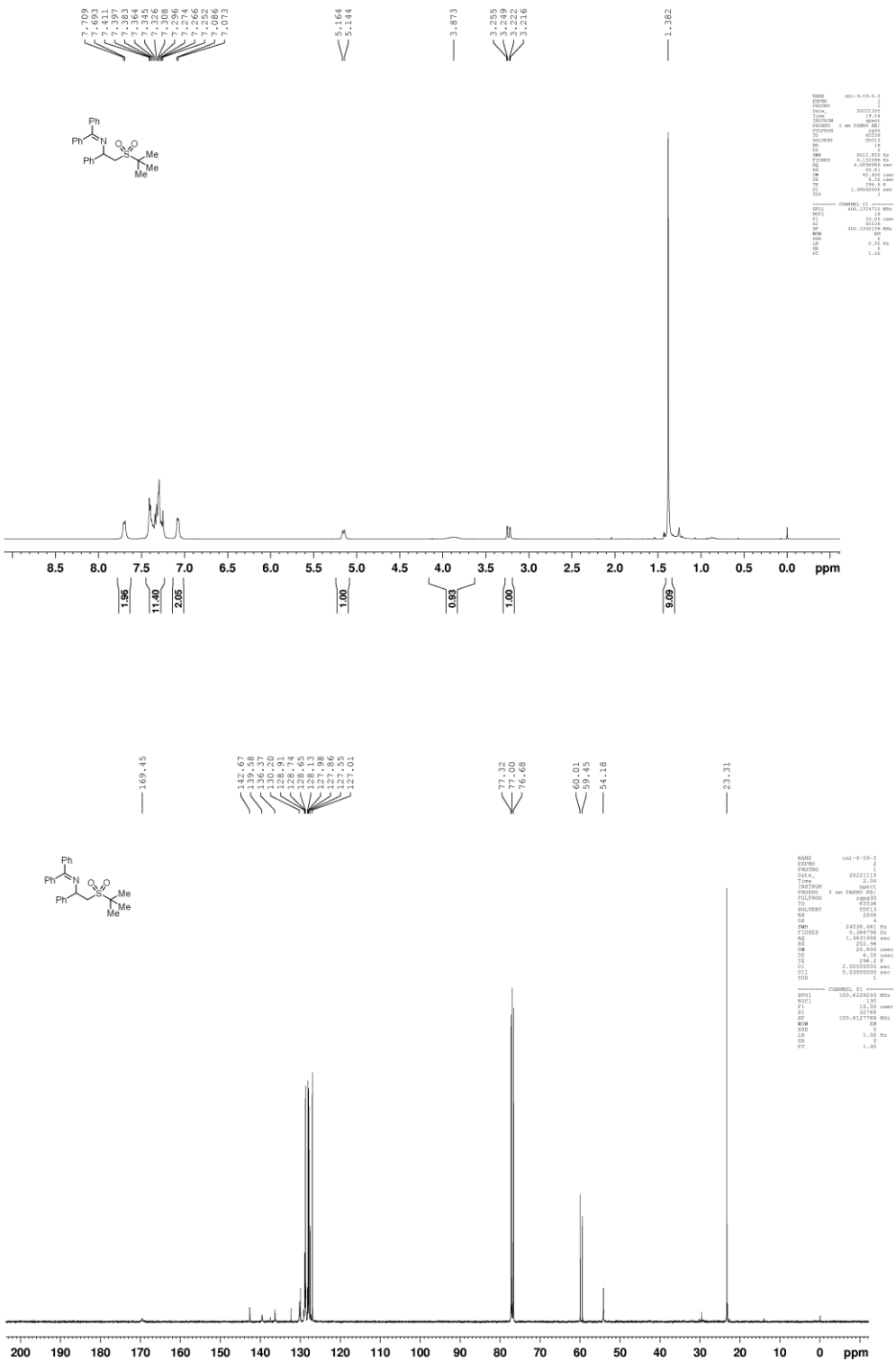


tert-butyl 3-((2-((diphenylmethylene)amino)-2-phenylethyl)sulfonyl)azetidine-1-carboxylate (3r)

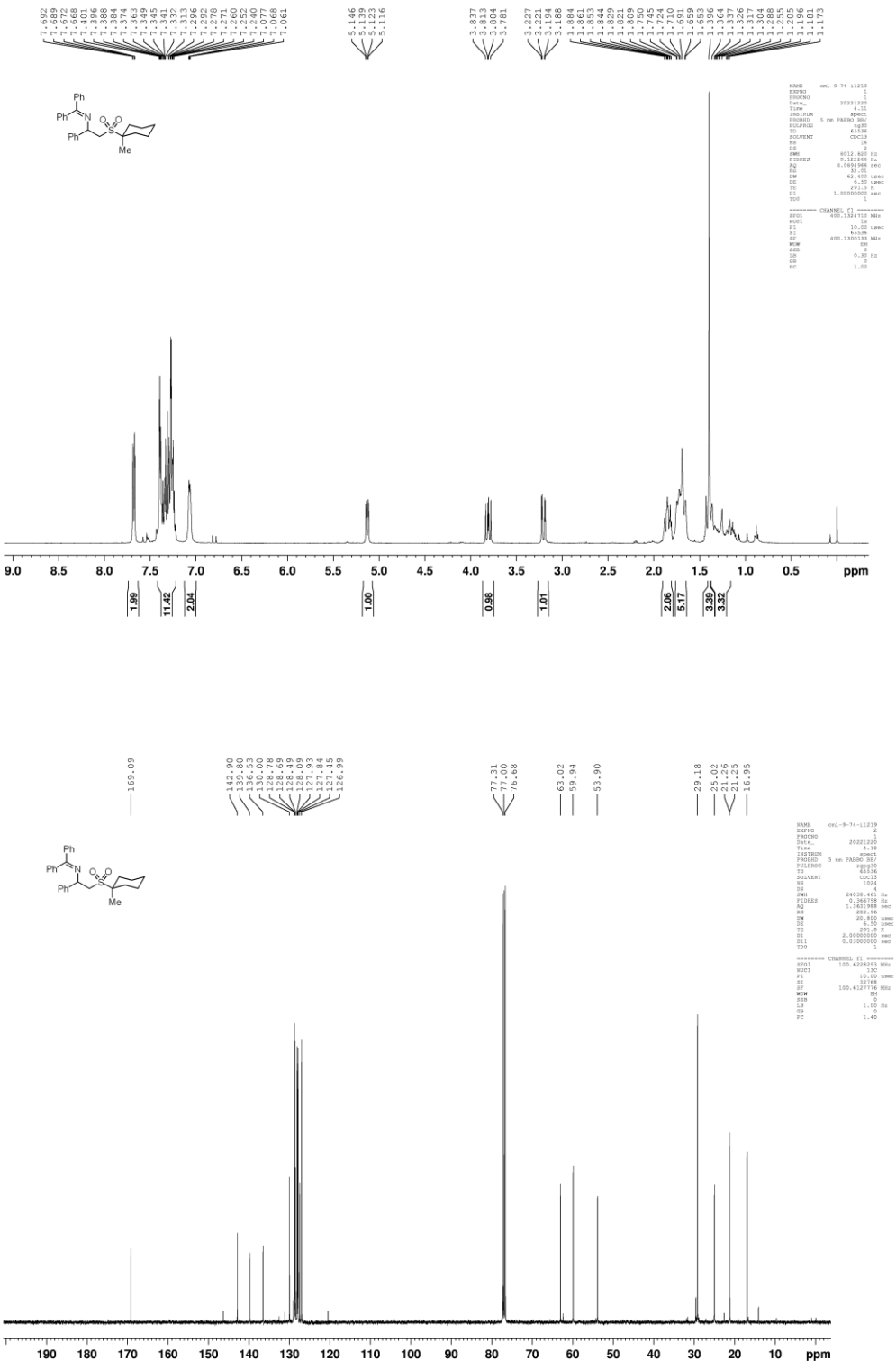




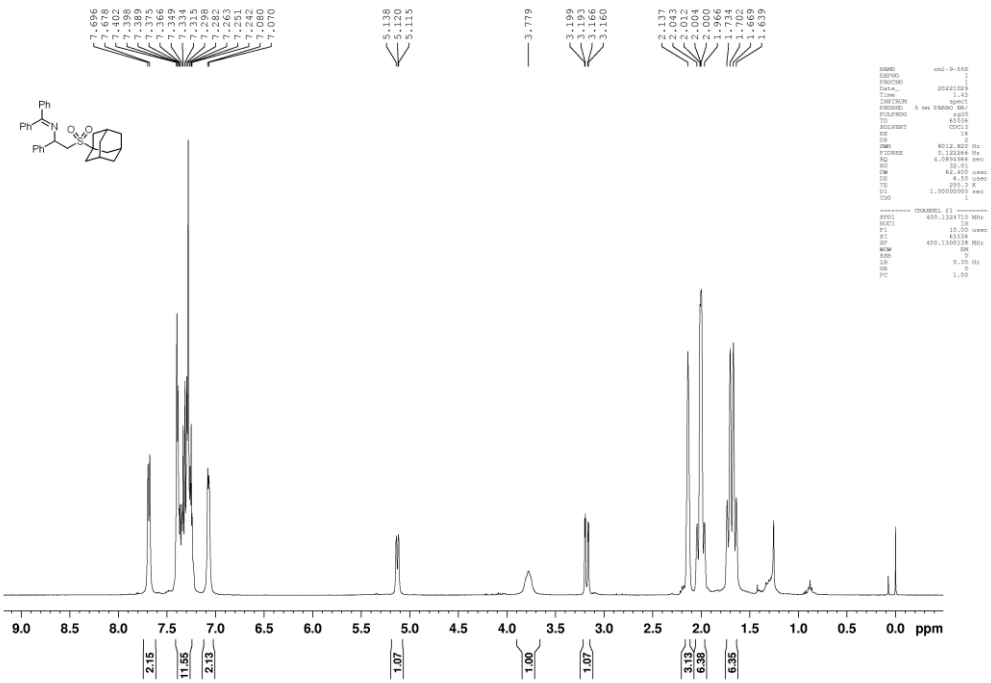
N-(2-(tert-butylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3s)

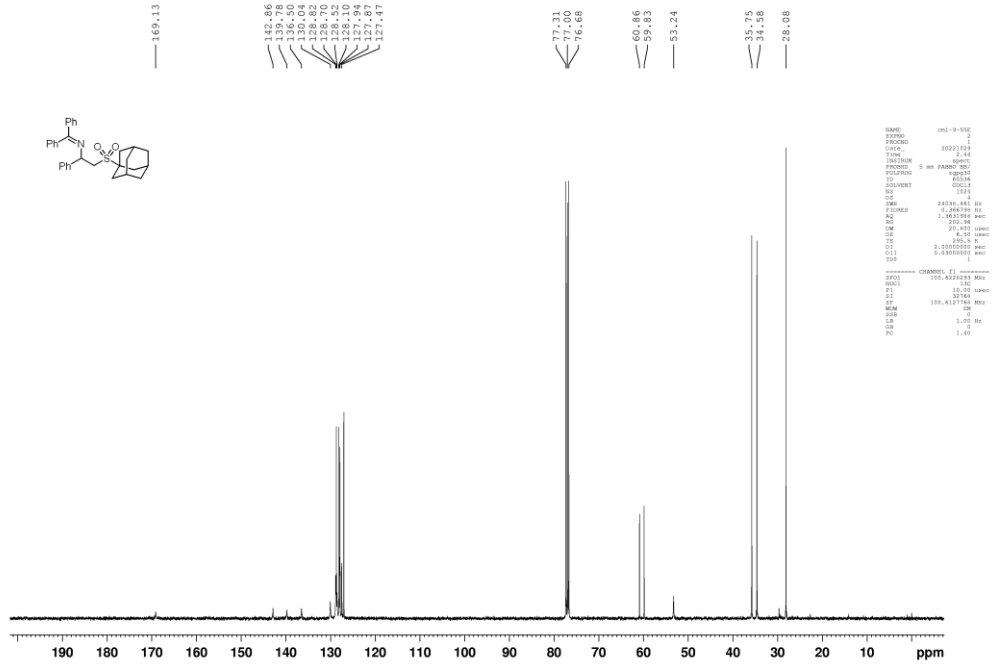


N-(2-((1-methylcyclohexyl)sulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3t)

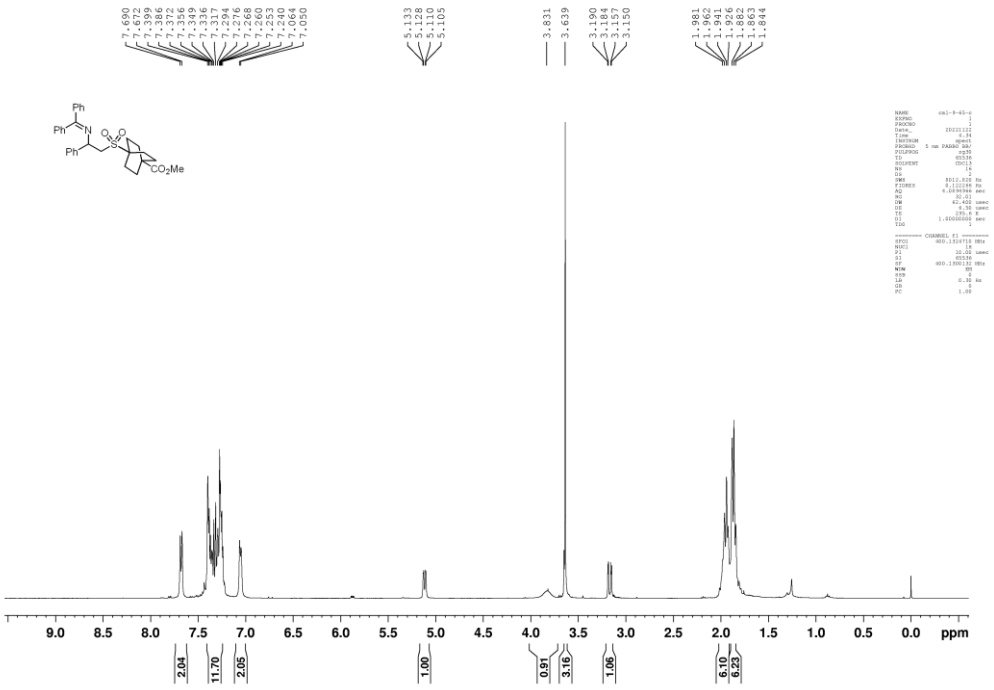


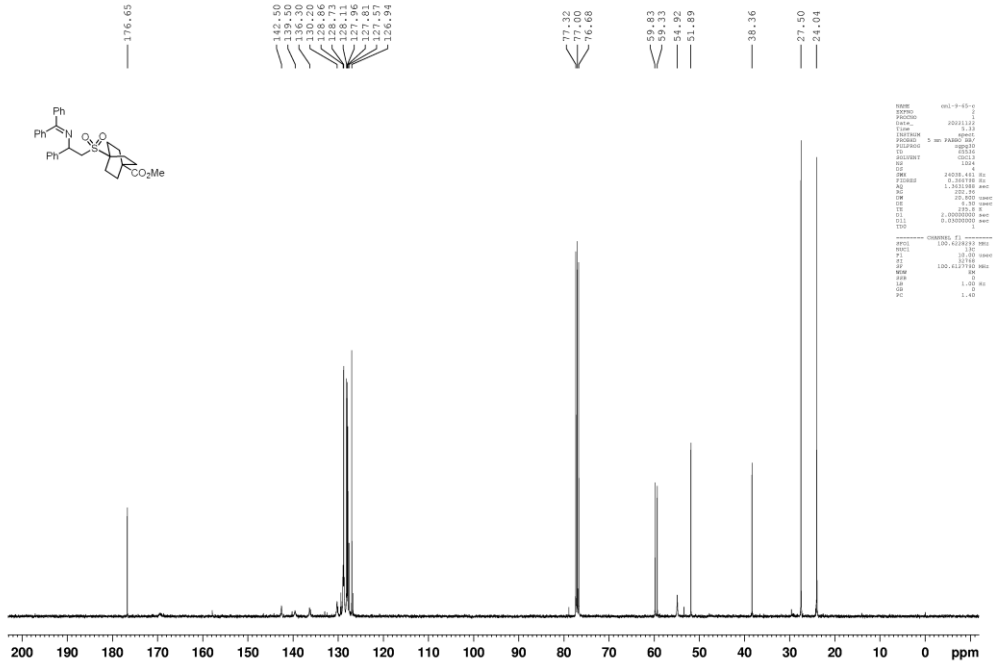
N-(2-(((3s,5s,7s)-adamantan-1-yl)sulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3u)



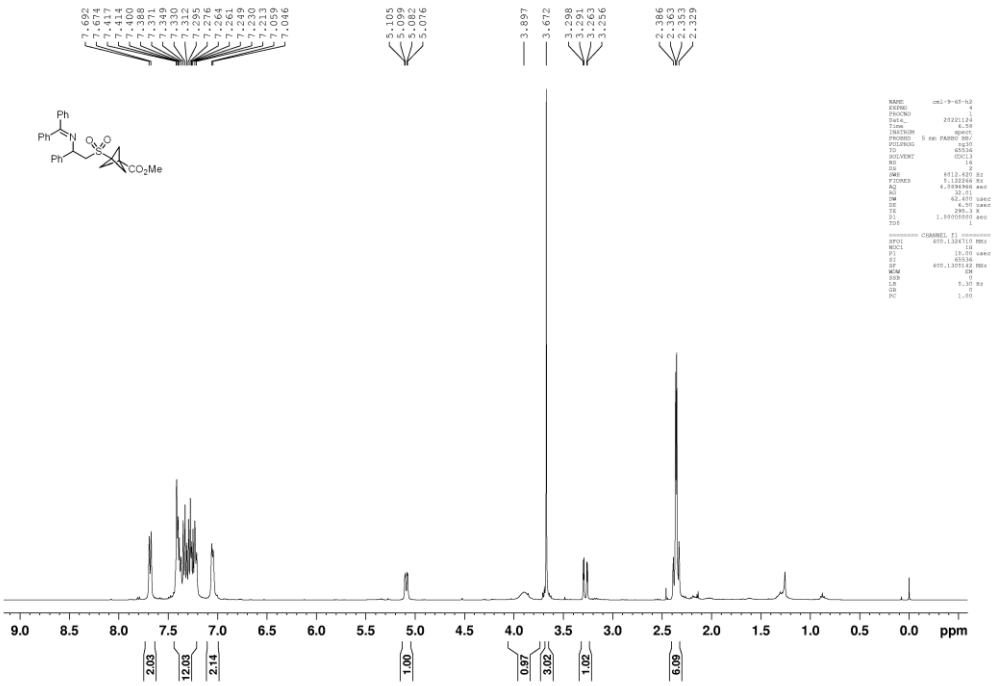


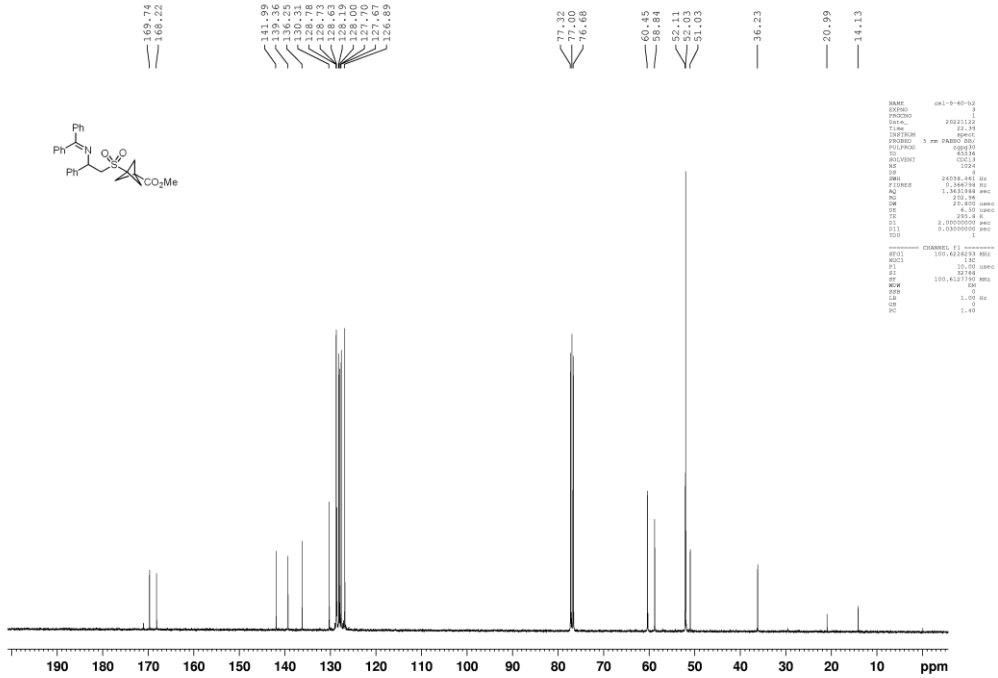
methyl 4-((2-((diphenylmethylene)amino)-2-phenylethyl)sulfonyl)bicyclo[2.2.2]octane-1-carboxylate (3v)



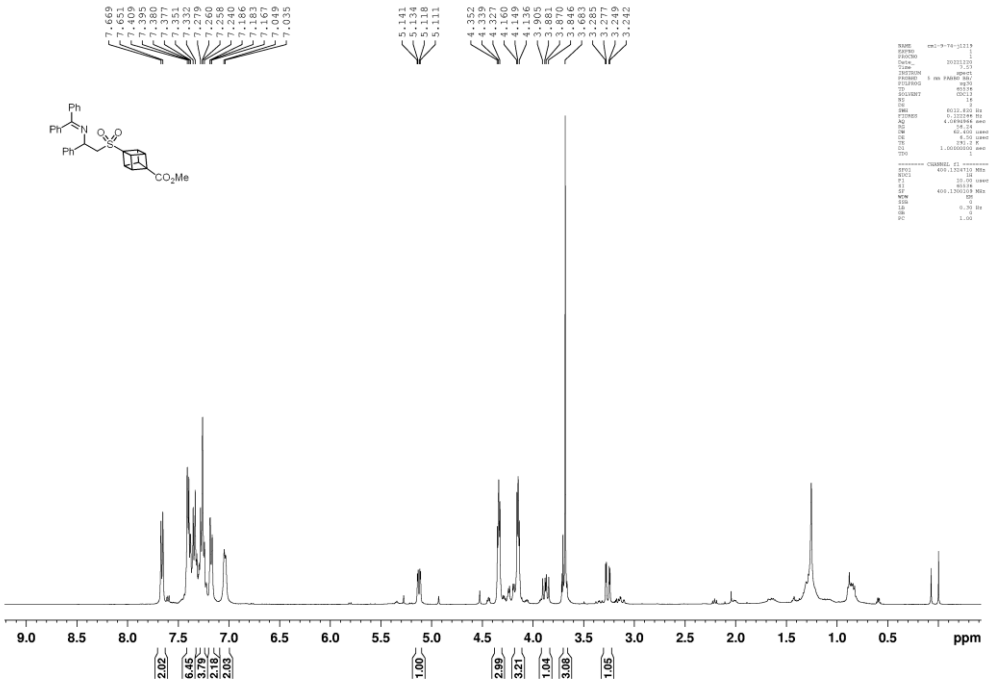


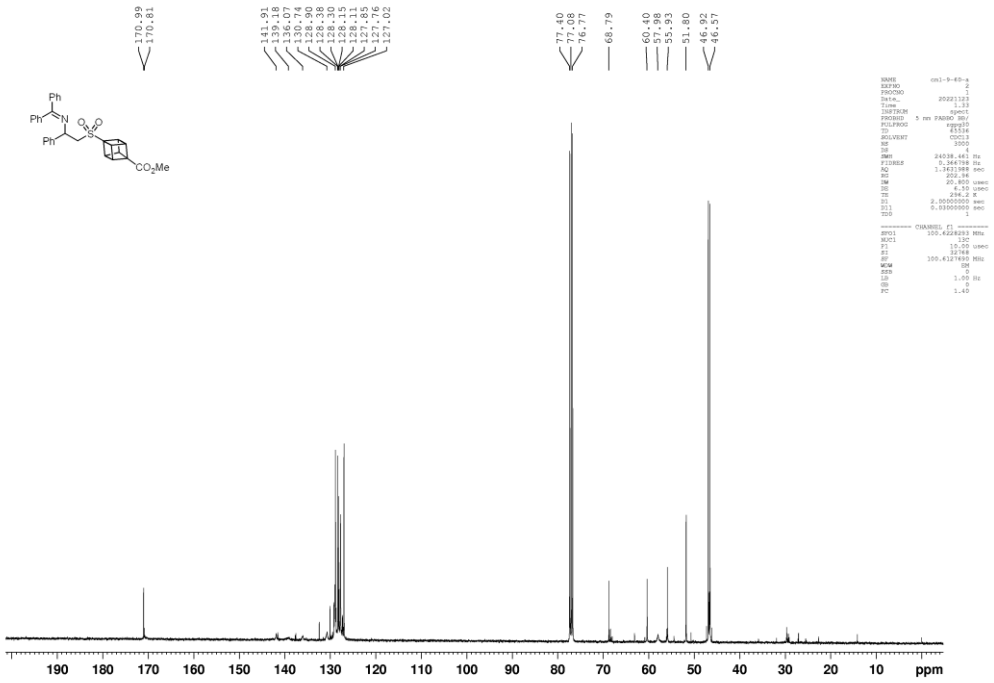
methyl 3-((2-((diphenylmethylene)amino)-2-phenylethyl)sulfonyl)bicyclo[1.1.1]pentane-1-carboxylate (3w)



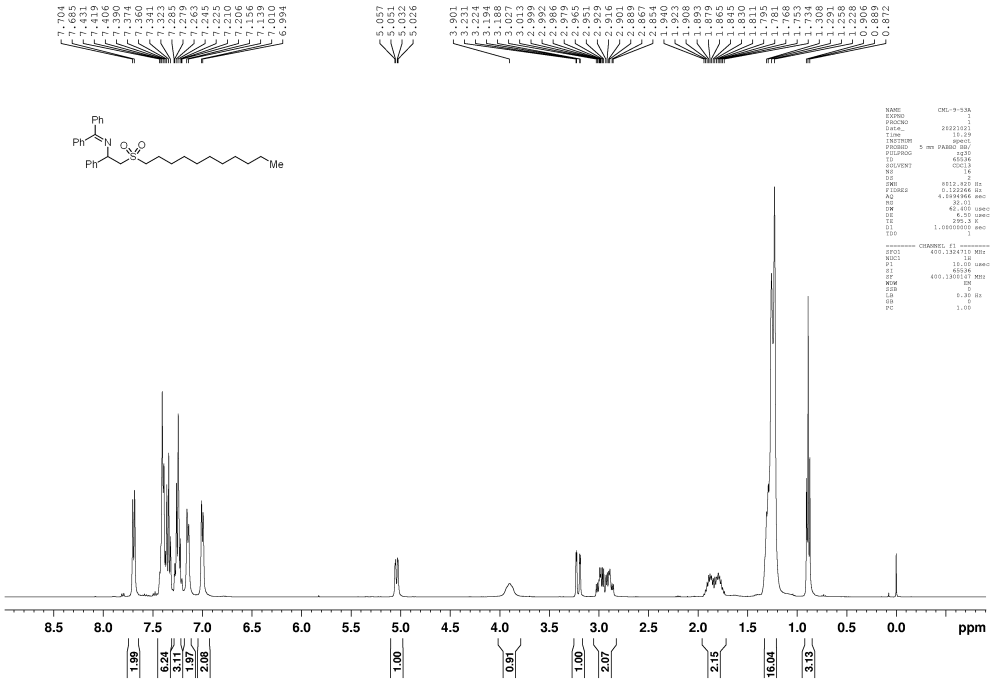


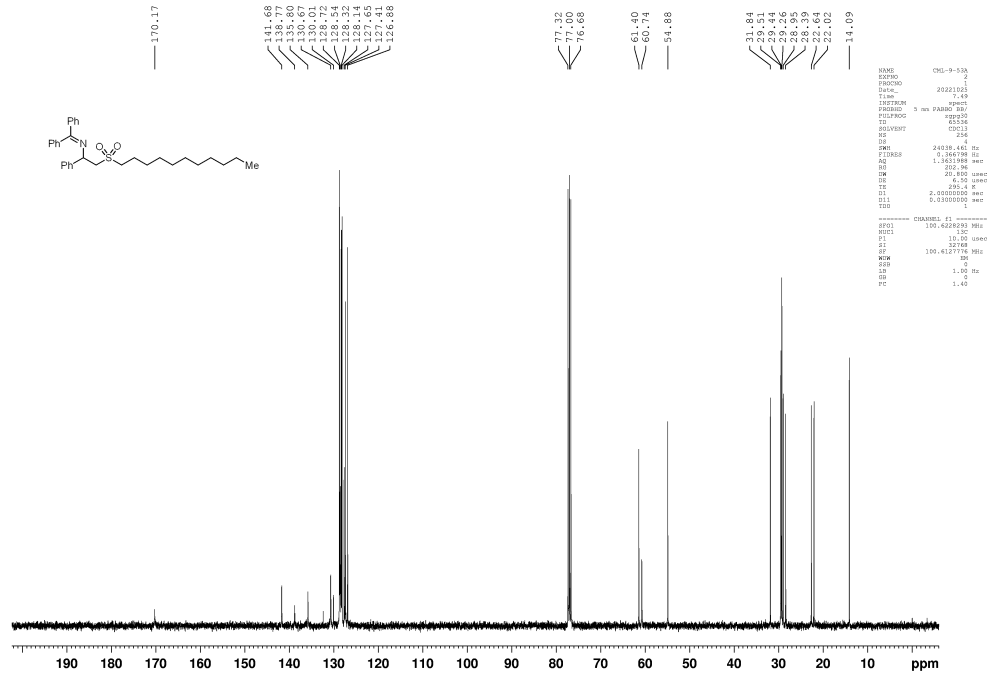
methyl (2r,3R,4r,5S)-4-((2-((diphenylmethylene)amino)-2-phenylethyl)sulfonyl)cubane-1-carboxylate (3x)



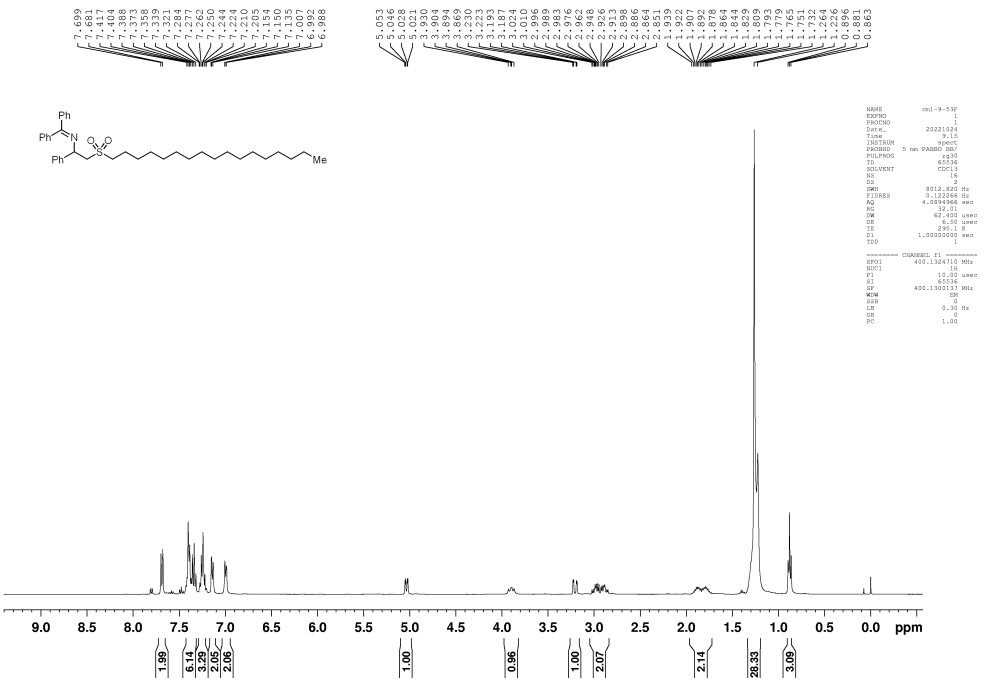


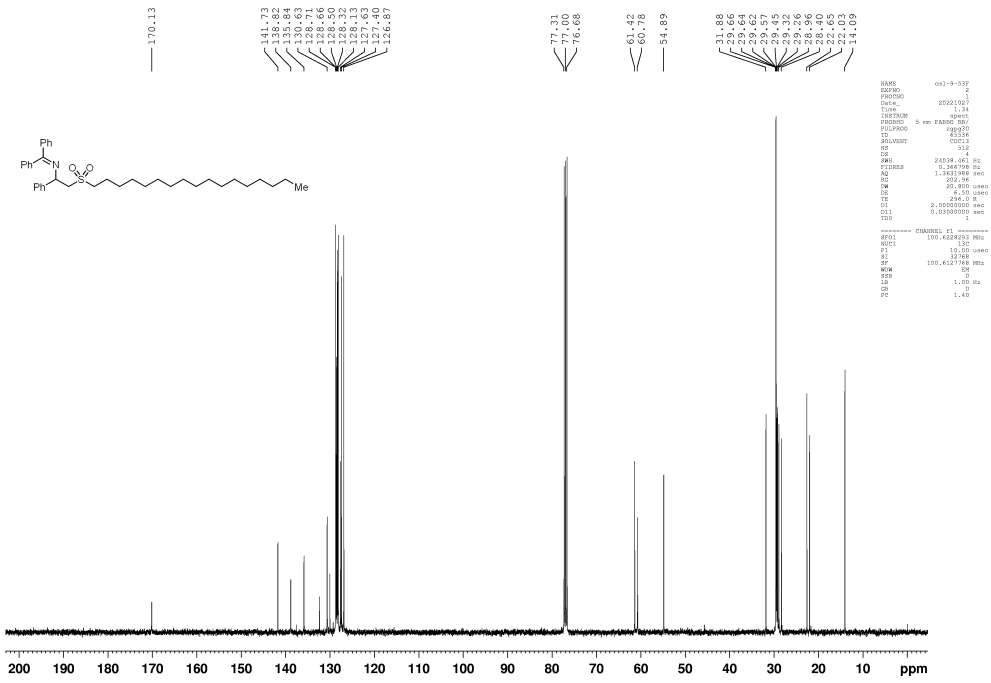
1,1-diphenyl-N-(1-phenyl-2-(undecylsulfonyl)ethyl)methanimine (3y)



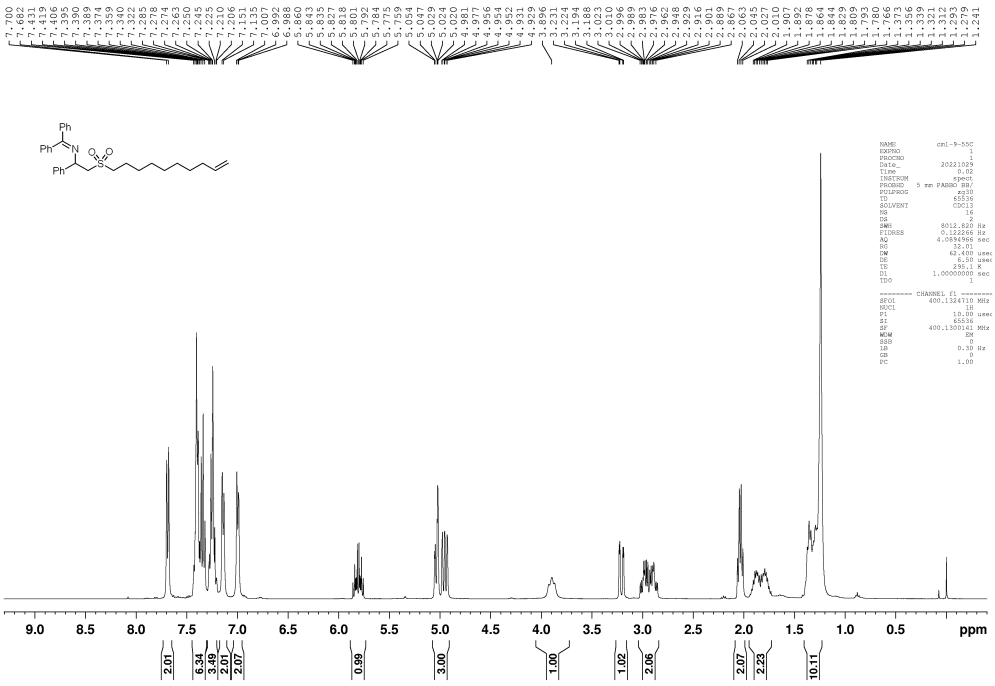


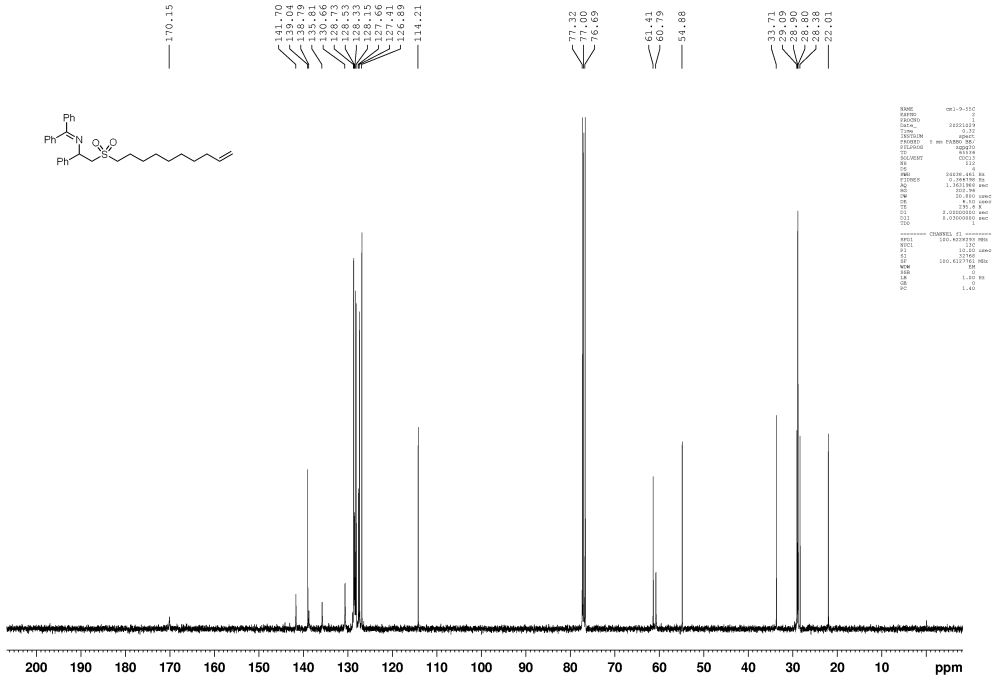
N-(2-(heptadecylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3z)



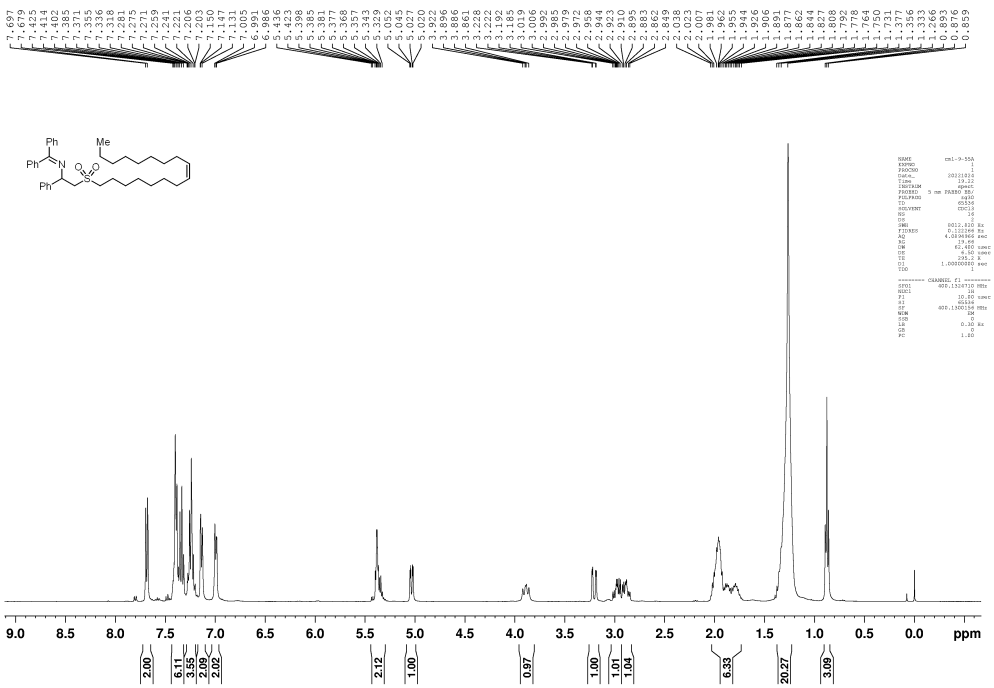


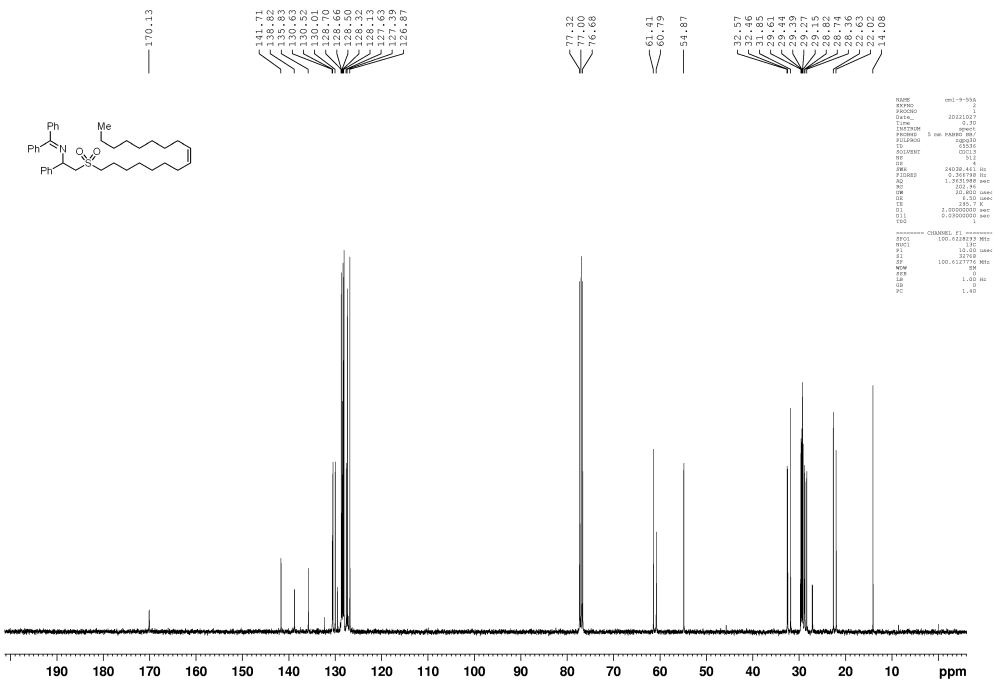
N-(2-(dec-9-en-1-ylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3aa)



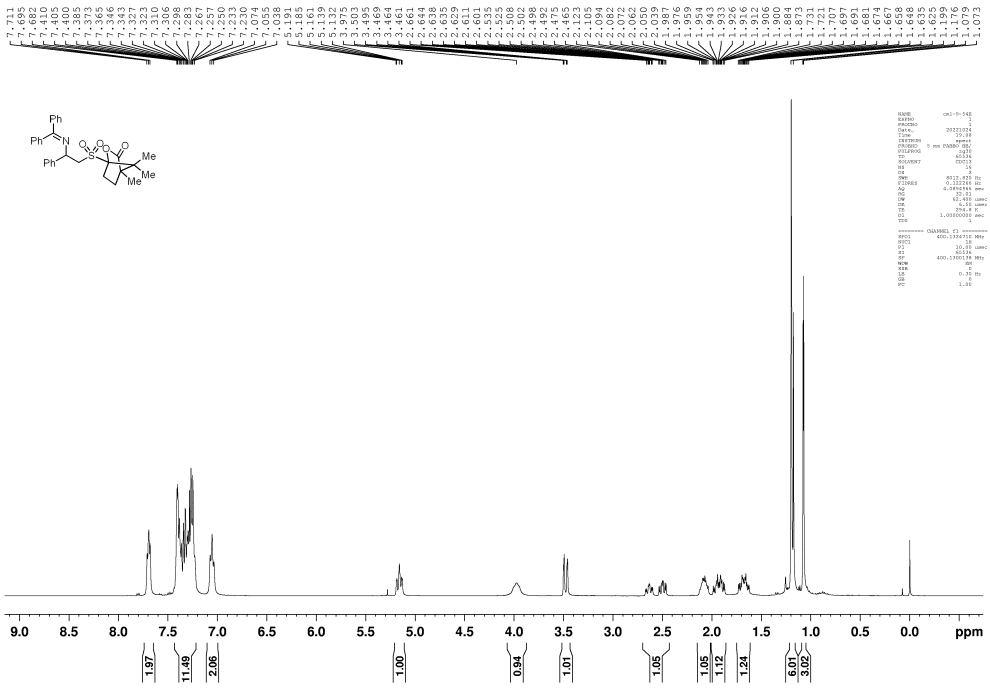


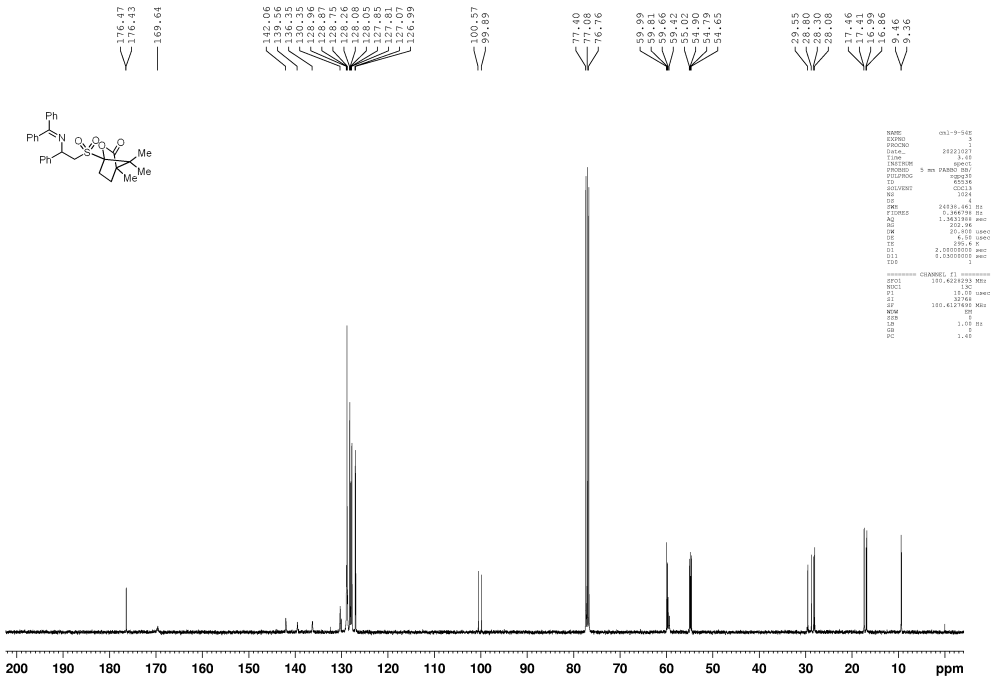
(Z)-N-(2-(heptadec-8-en-1-ylsulfonyl)-1-phenylethyl)-1,1-diphenylmethanimine (3ab)



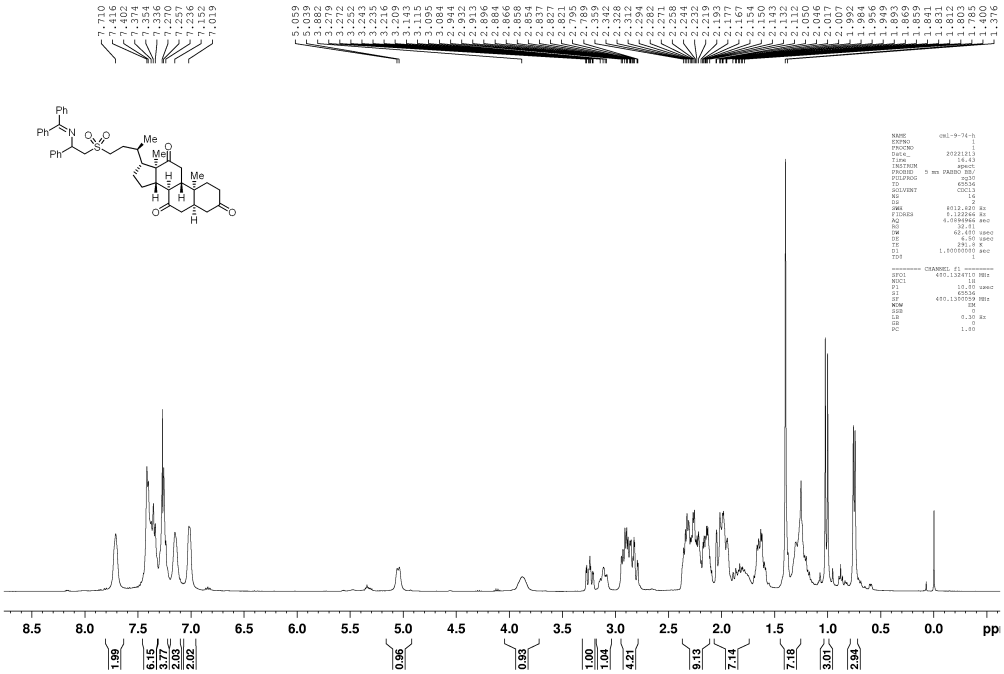


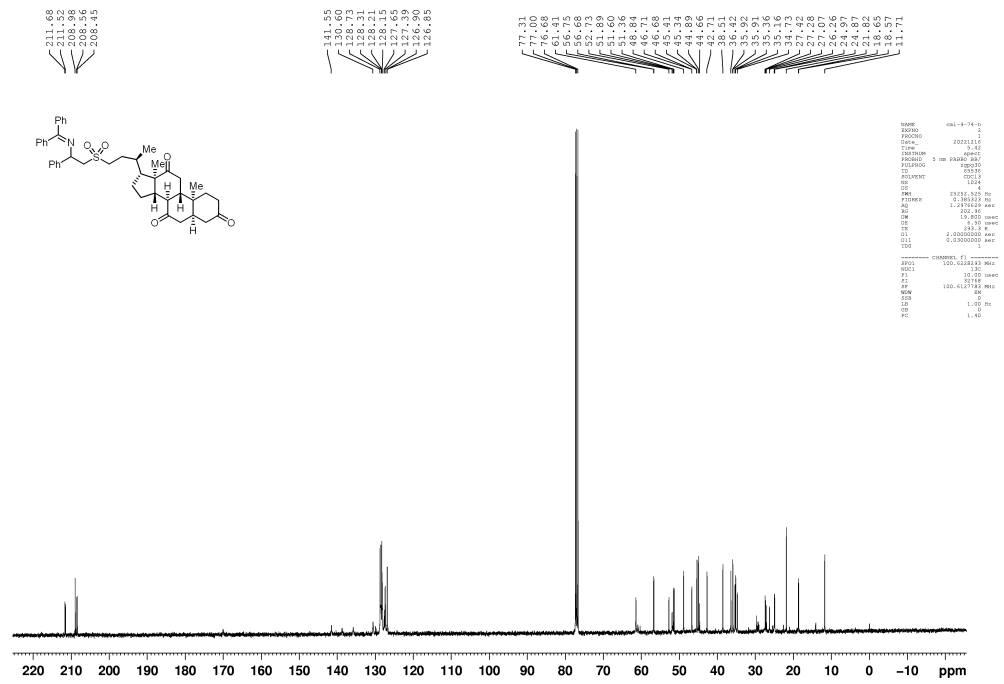
(4S)-1-((2-((diphenylmethylene)amino)-2-phenylethyl)sulfonyl)-4,7,7-trimethyl-2-oxabicyclo[2.2.1]heptan-3-one (3ac)



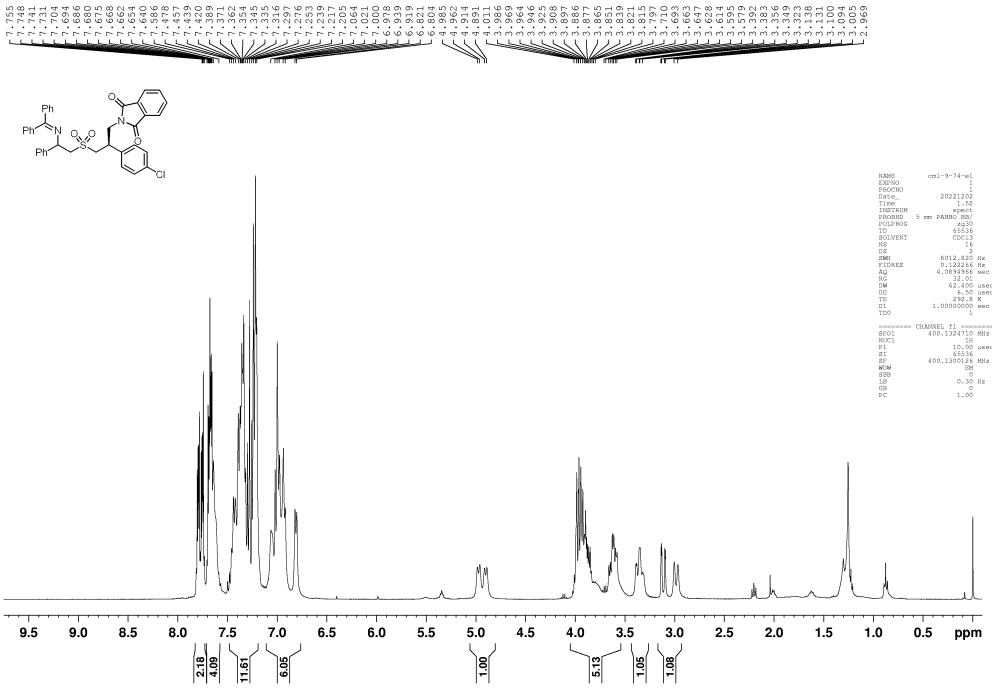


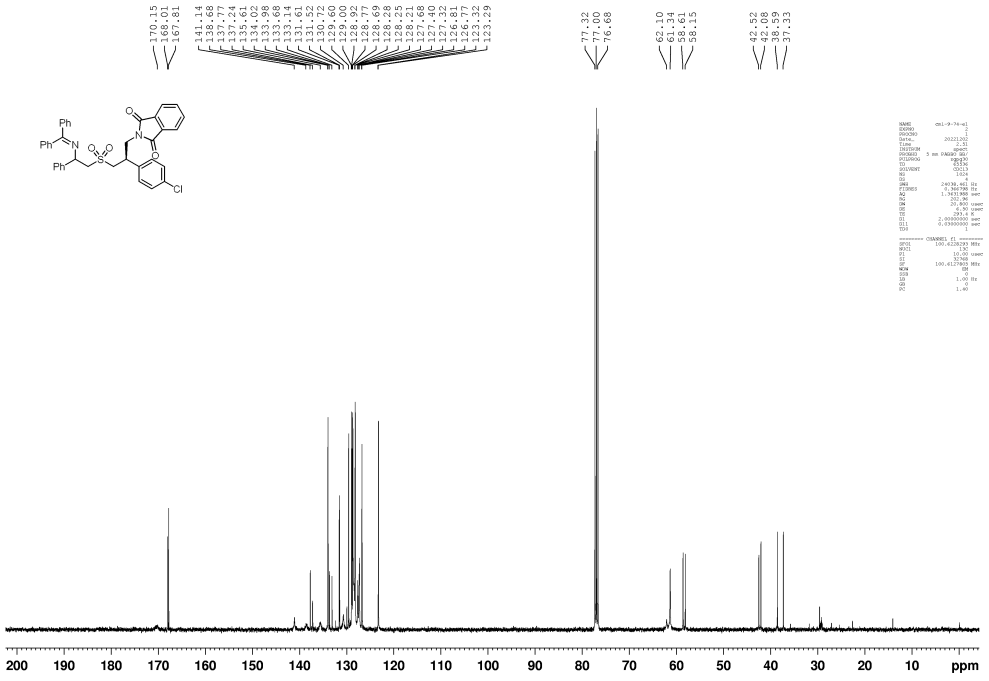
(5S,8R,9S,10S,13R,14S,17R)-17-((2R)-4-((2-((diphenylmethylene)amino)-2-phenylethyl)sulfonyl)butan-2-yl)-10,13-dimethyldodecahydro-3H-cyclopenta[a]phenanthrene-3,7,12(2H,4H)-trione (3ad)



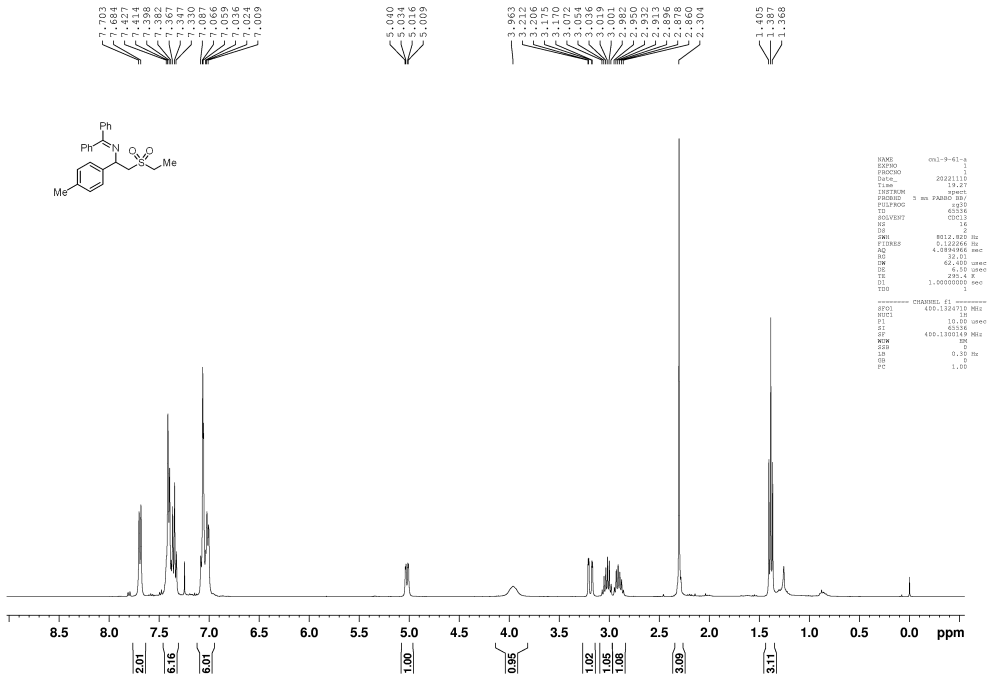


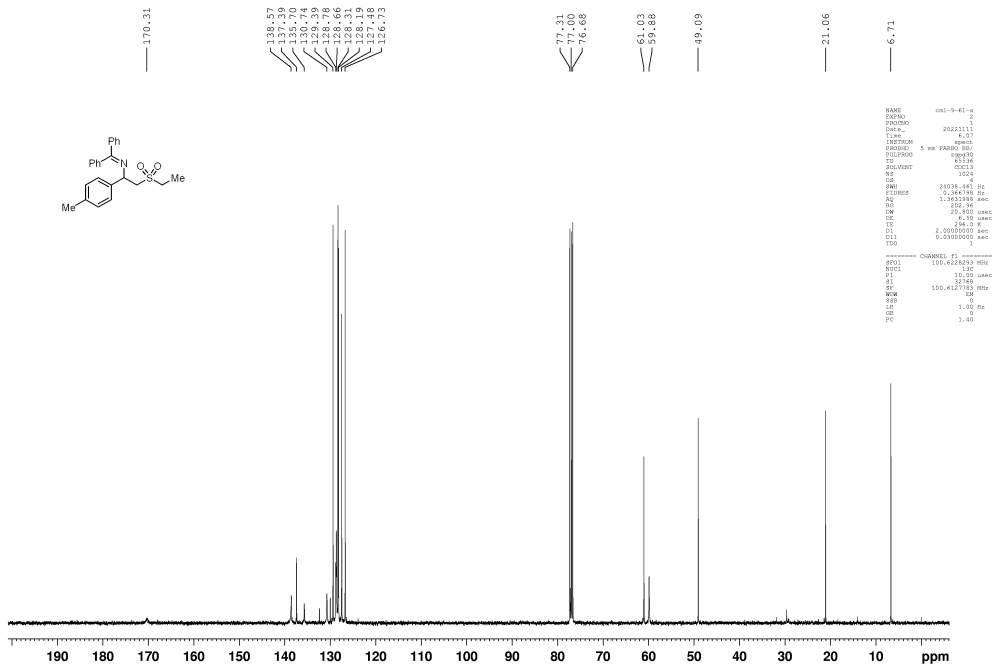
2-((2R)-2-(4-chlorophenyl)-3-((2-((diphenylmethylene)amino)-2-phenylethyl)sulfonyl)propyl)isoindoline-1,3-dione (3ae)



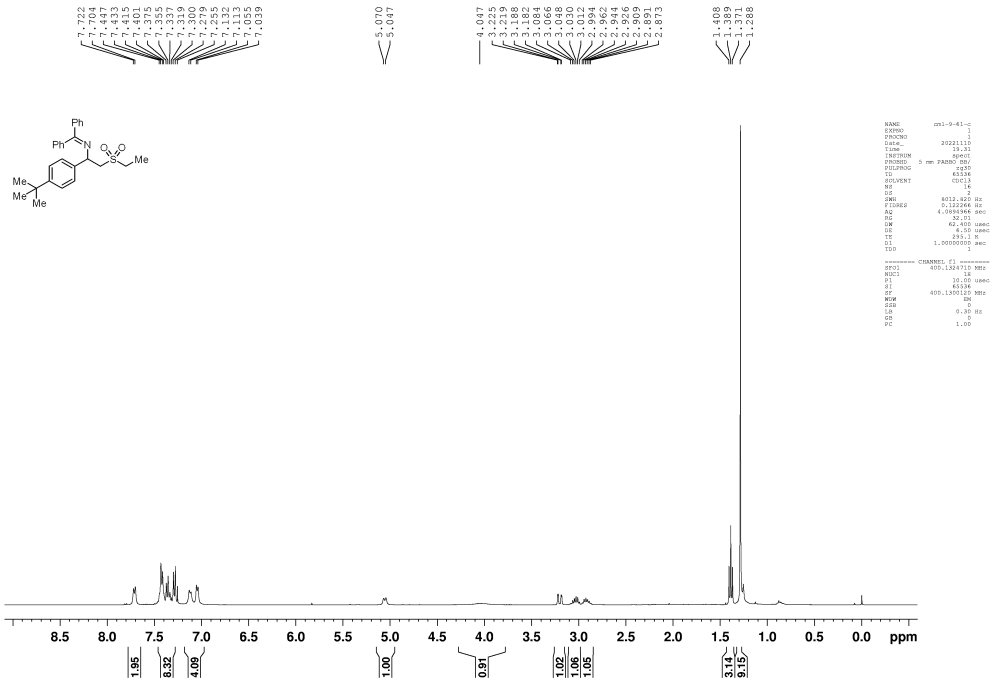


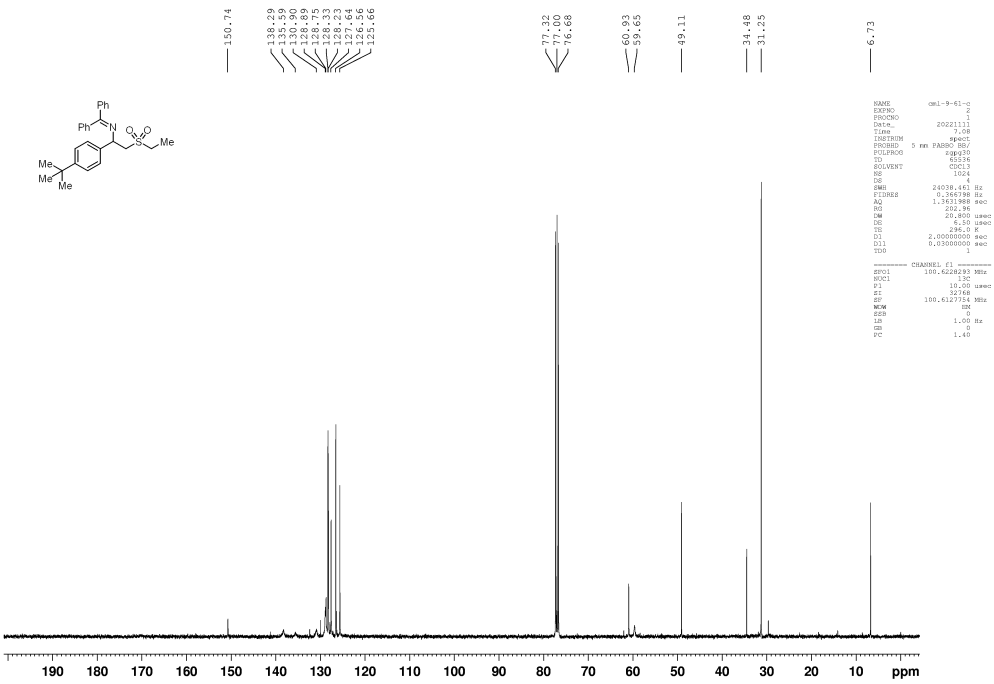
N-(2-(ethylsulfonyl)-1-(p-tolyl)ethyl)-1,1-diphenylmethanimine (4a)



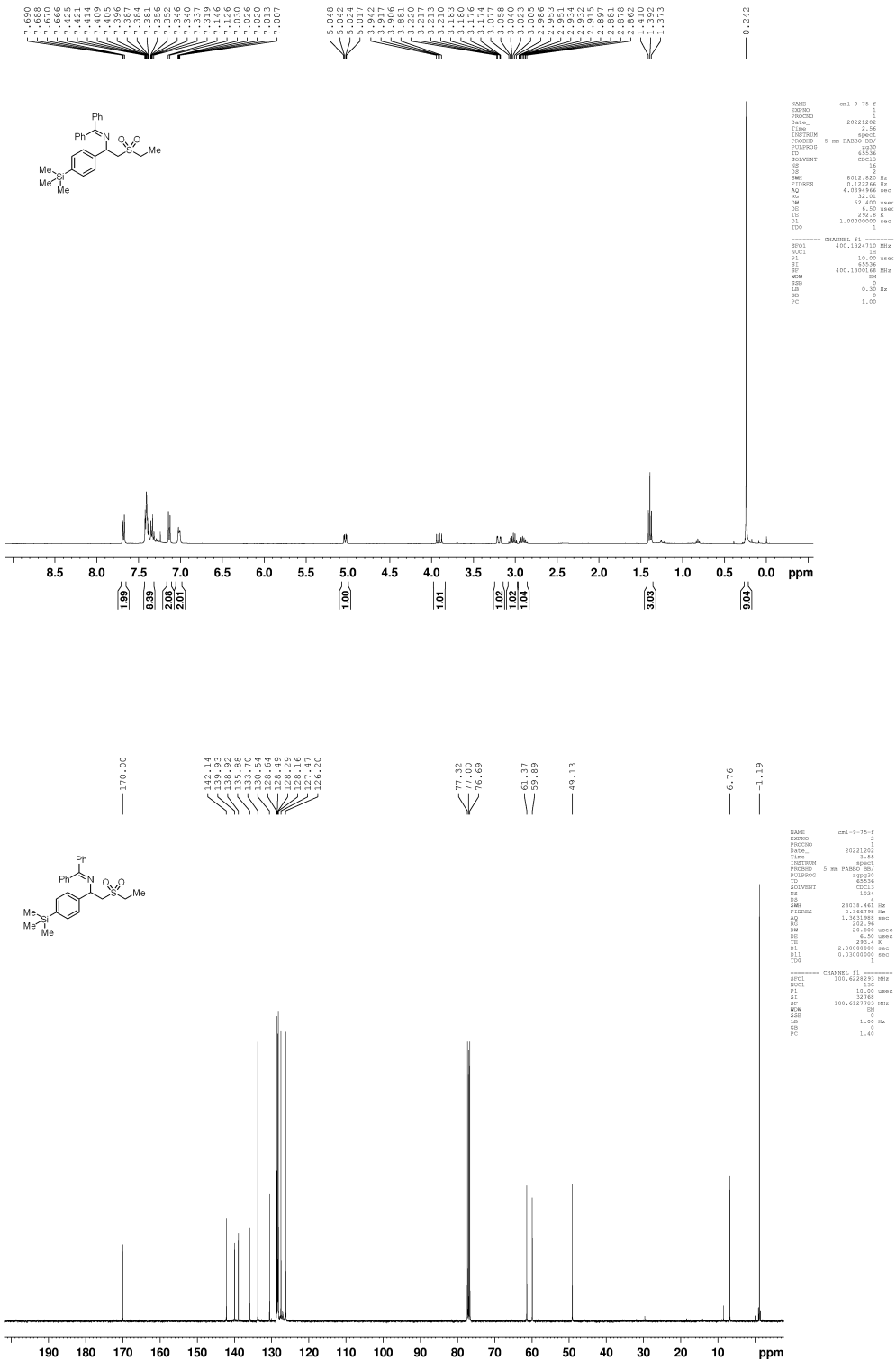


N-(1-(4-(tert-butyl)phenyl)-2-(ethylsulfonyl)ethyl)-1,1-diphenylmethanimine (4b)

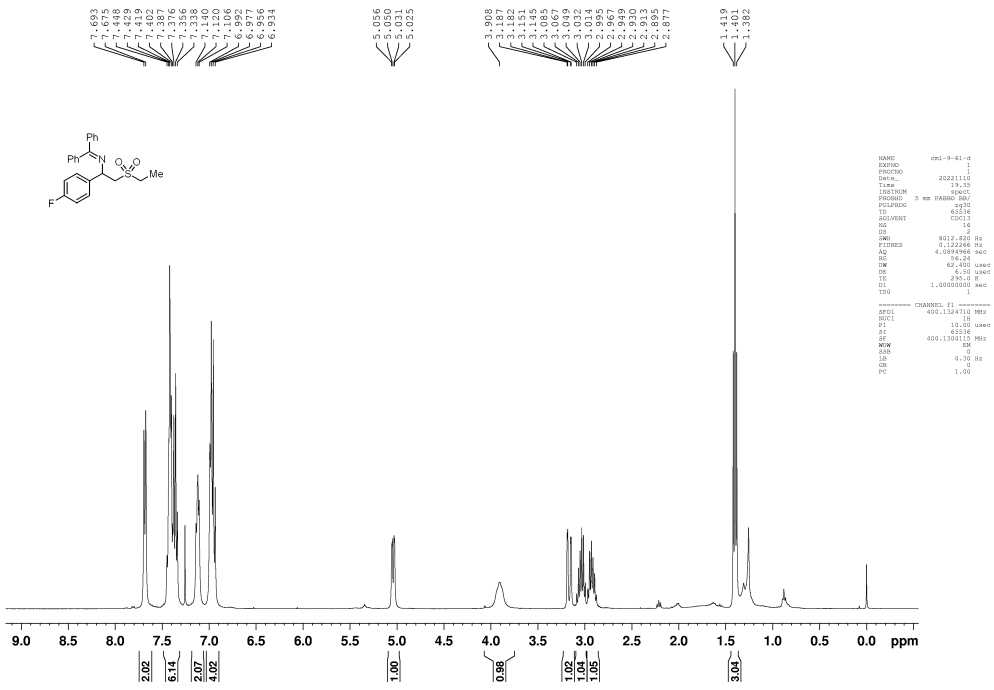


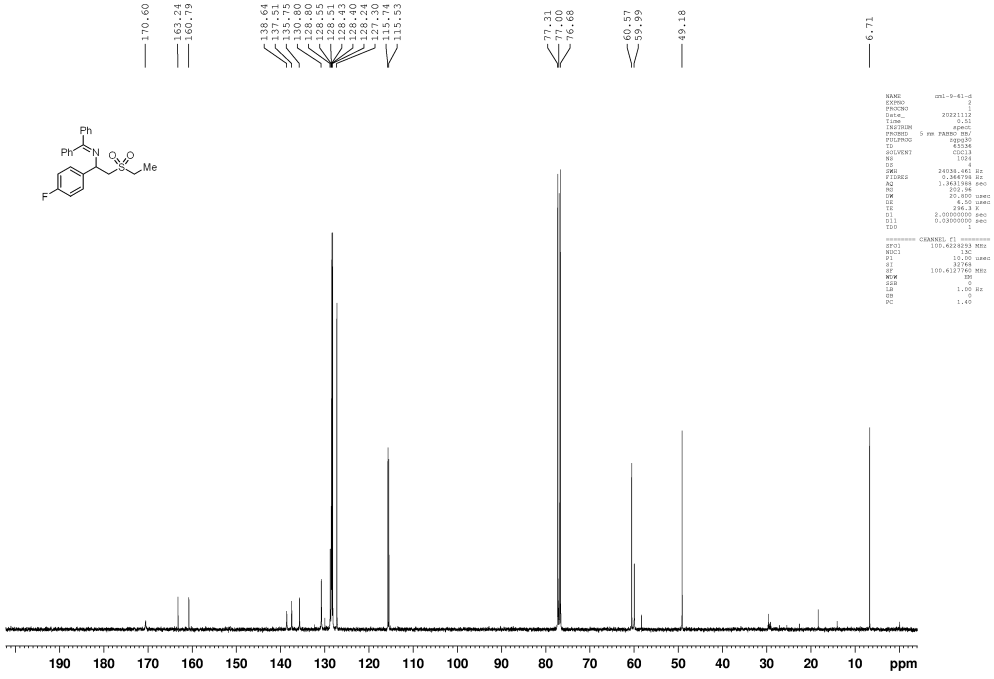


N-(2-(ethylsulfonyl)-1-(4-(trimethylsilyl)phenyl)ethyl)-1,1-diphenylmethanimine (4c)

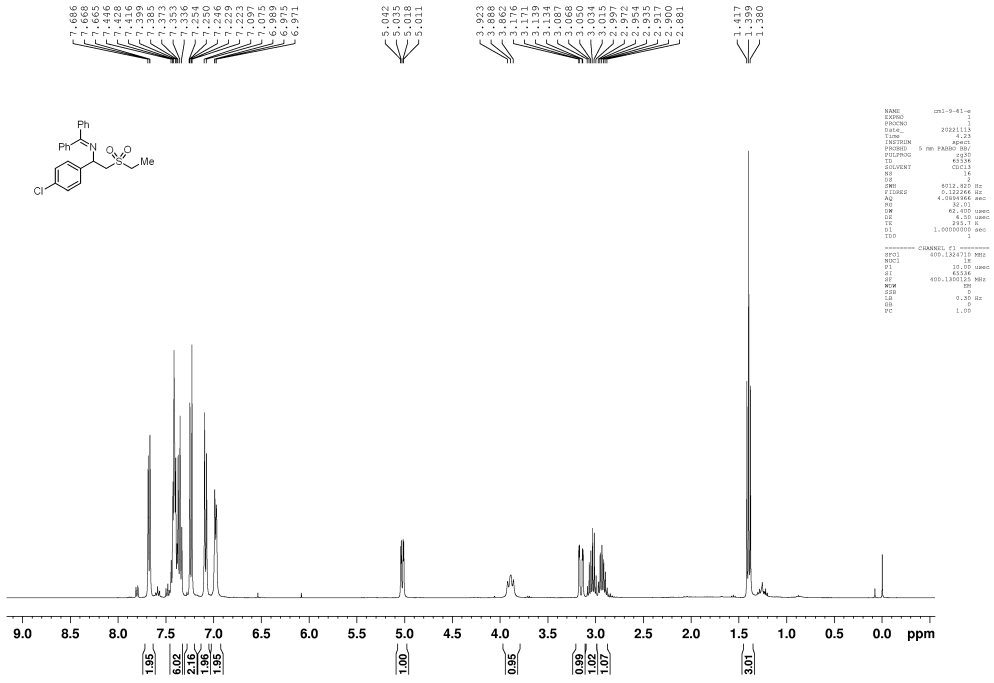


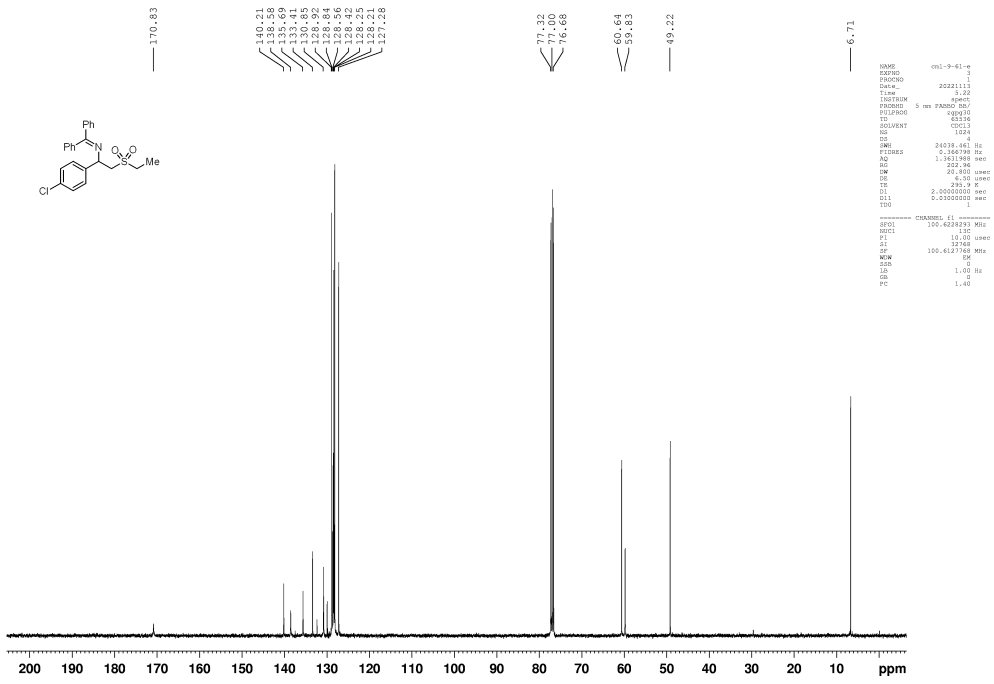
N-(2-(ethylsulfonyl)-1-(4-fluorophenyl)ethyl)-1,1-diphenylmethanimine (4d)



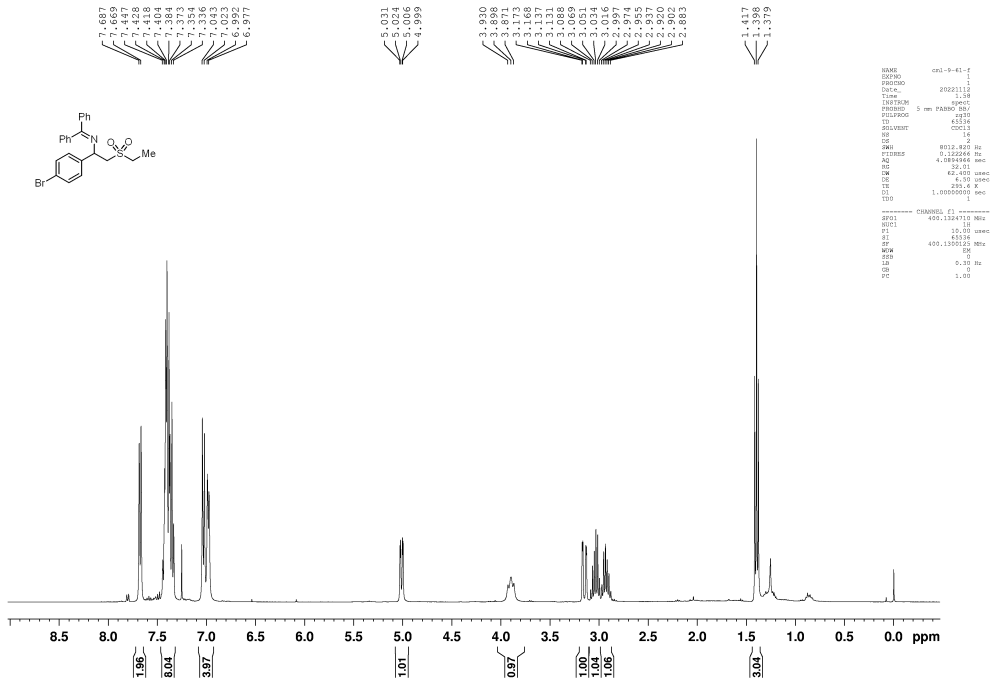


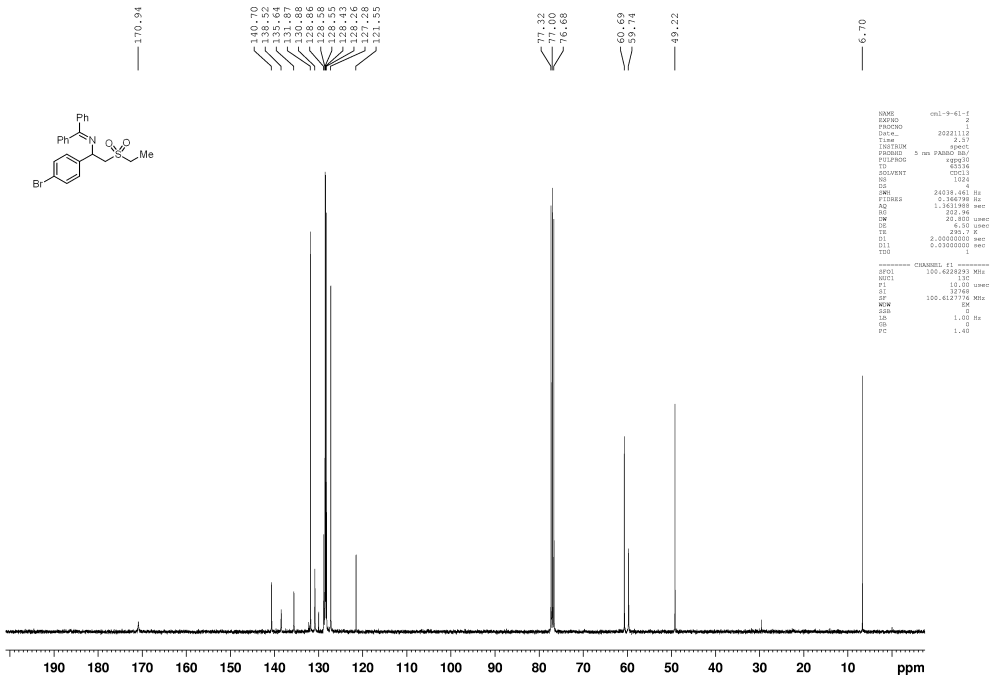
N-(1-(4-chlorophenyl)-2-(ethylsulfonyl)ethyl)-1,1-diphenylmethanimine (4e)



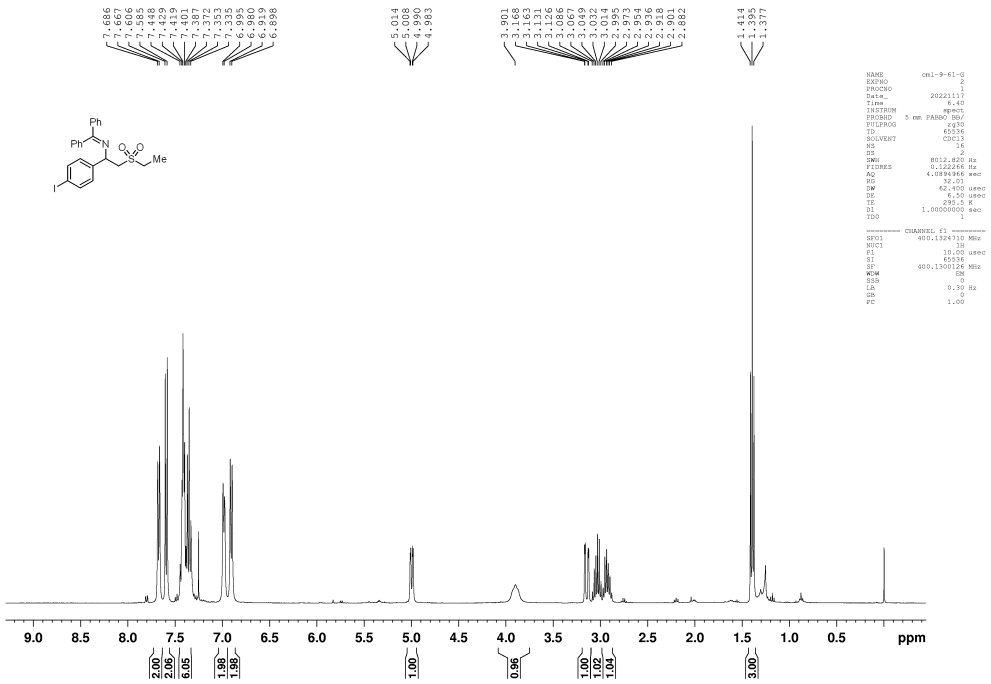


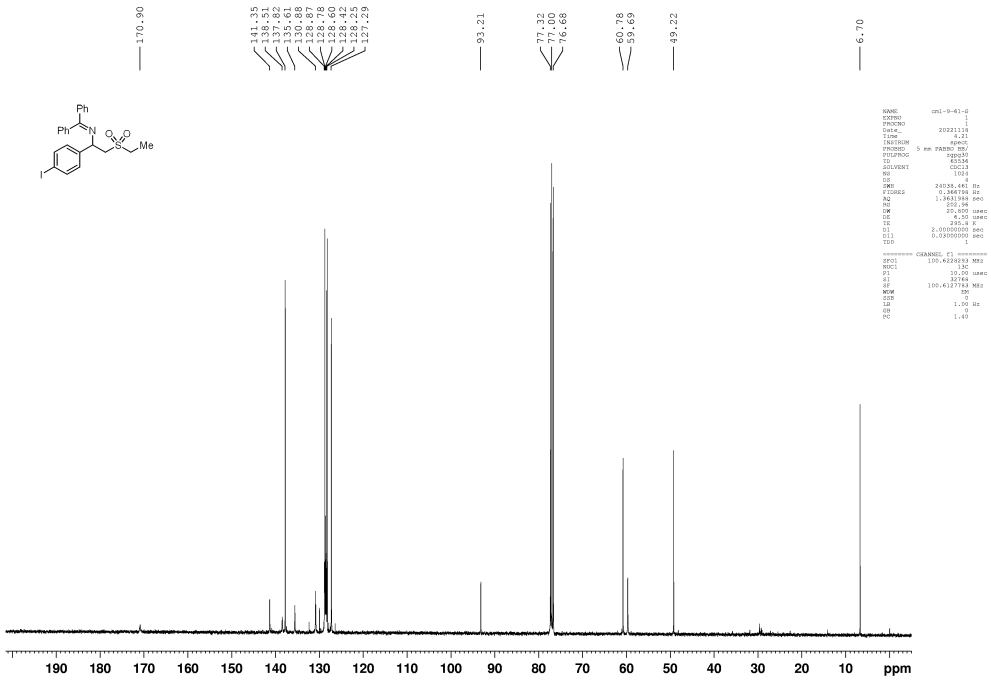
N-(1-(4-bromophenyl)-2-(ethylsulfonyl)ethyl)-1,1-diphenylmethanimine (4f)



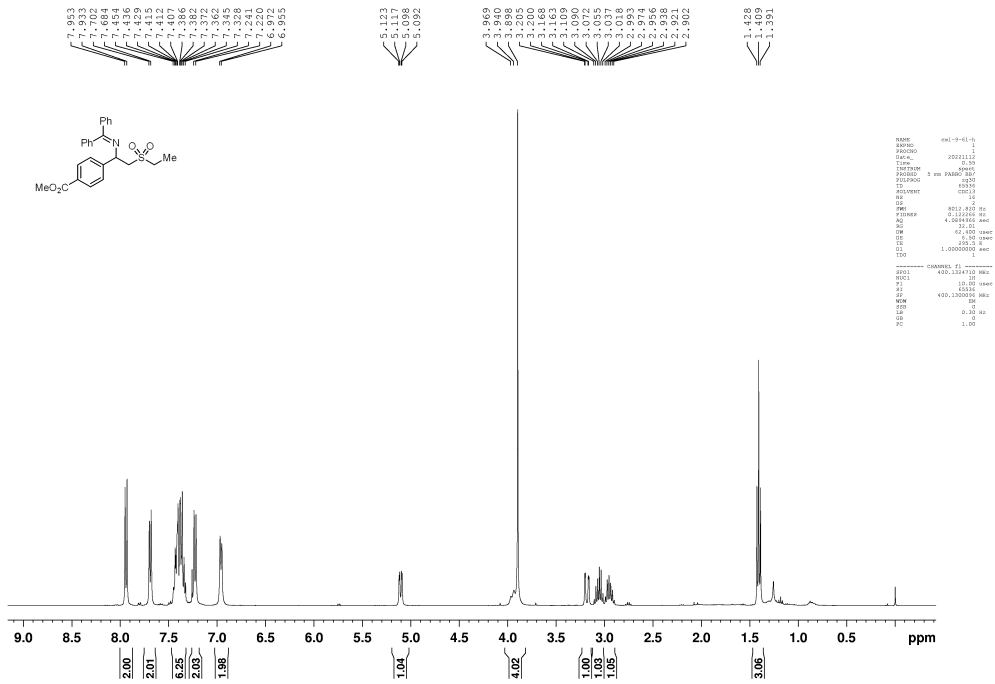


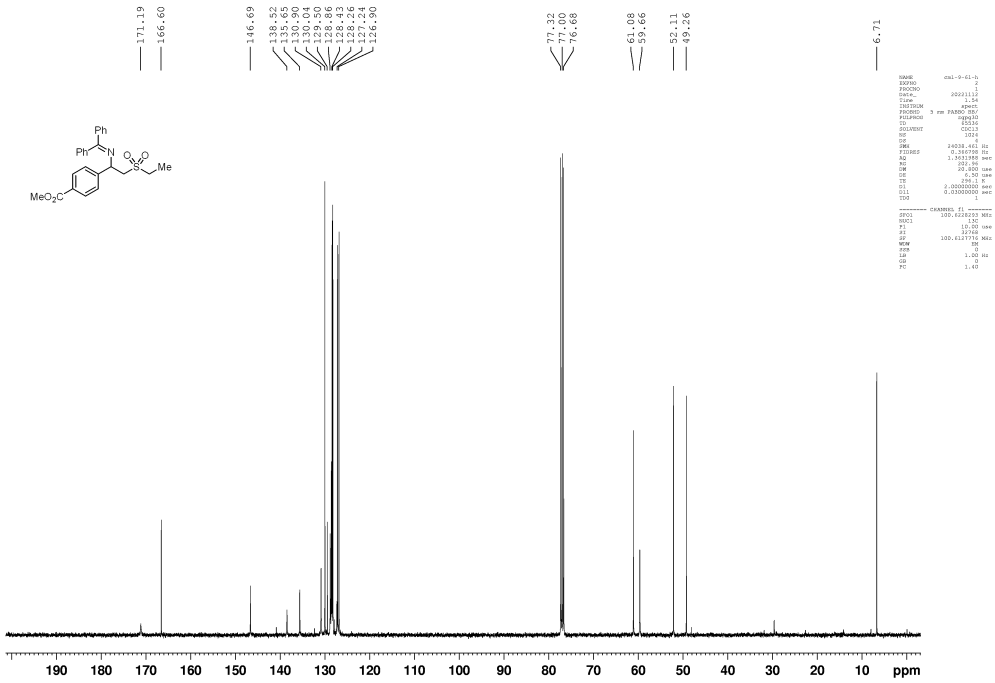
N-(2-(ethylsulfonyl)-1-(4-iodophenyl)ethyl)-1,1-diphenylmethanimine (4g)



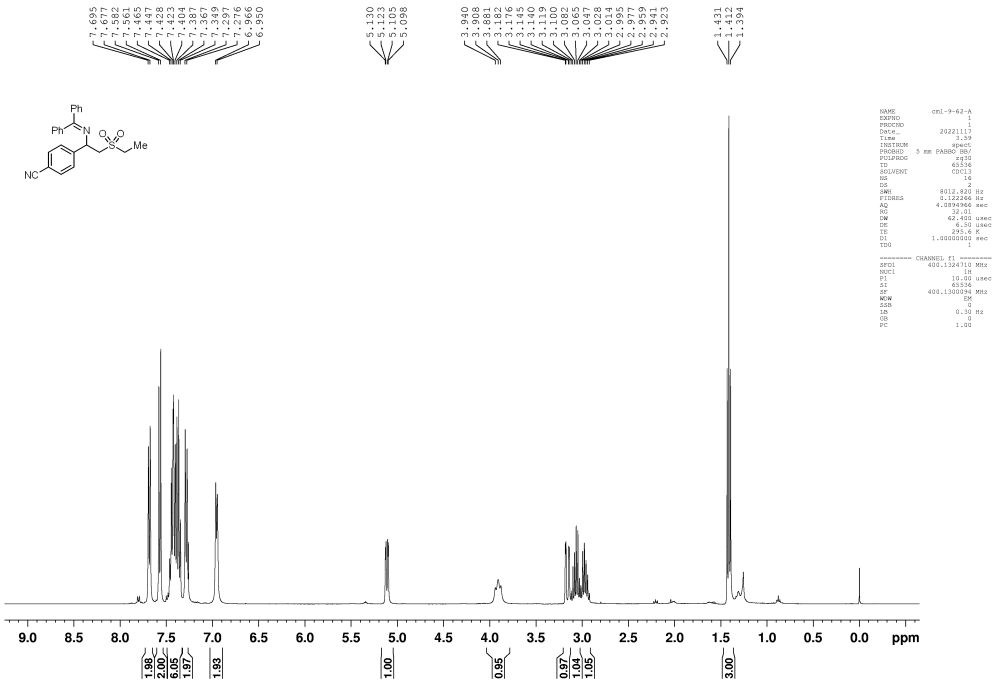


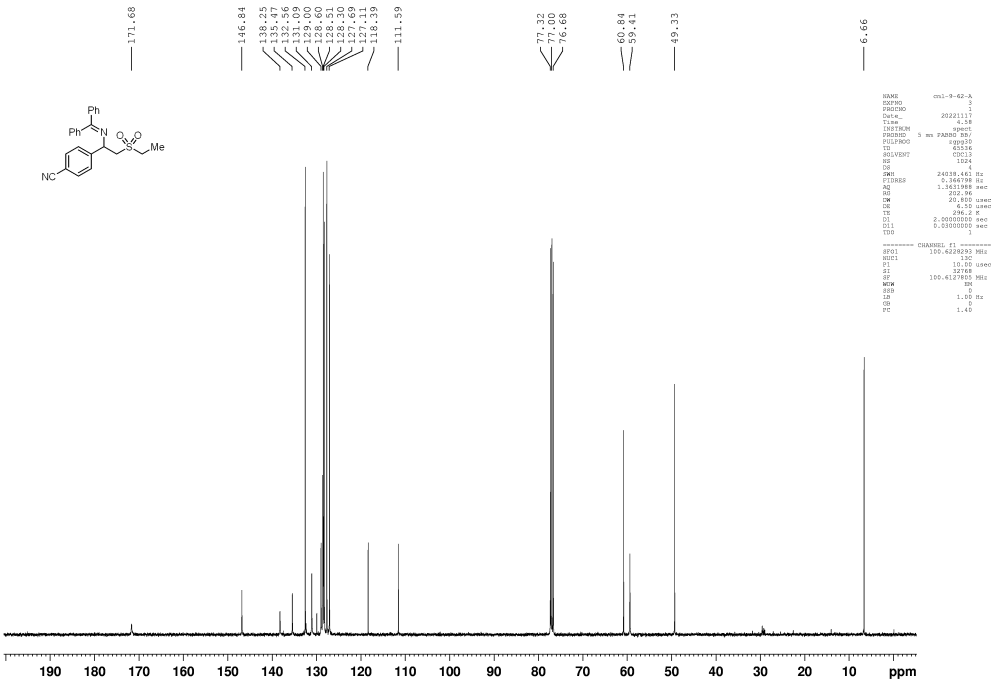
methyl 4-(1-((diphenylmethylene)amino)-2-(ethylsulfonyl)ethyl)benzoate (4h)



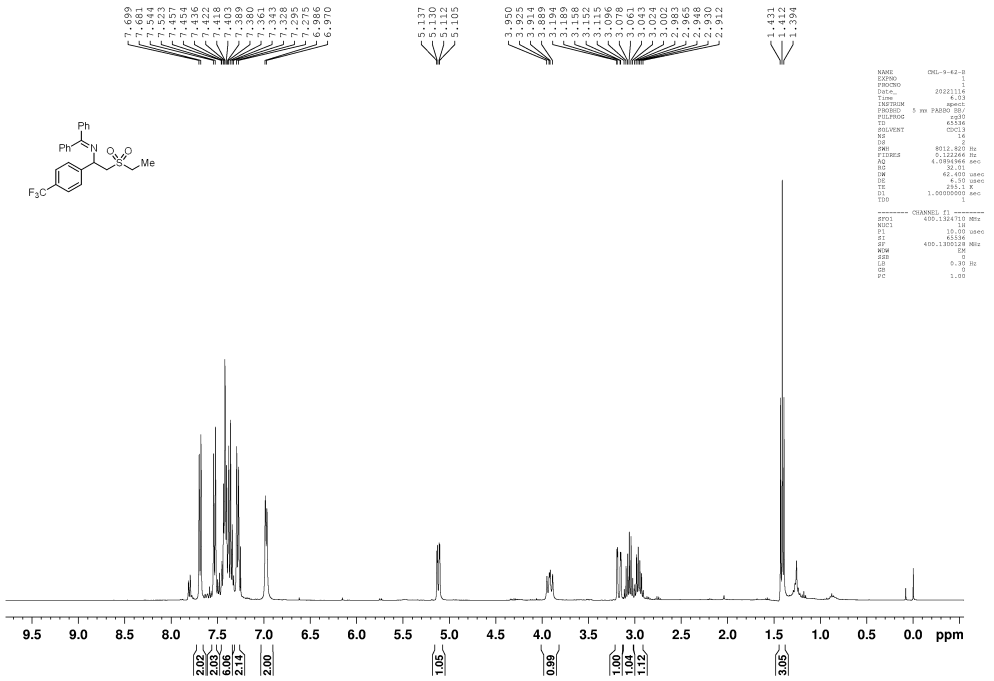


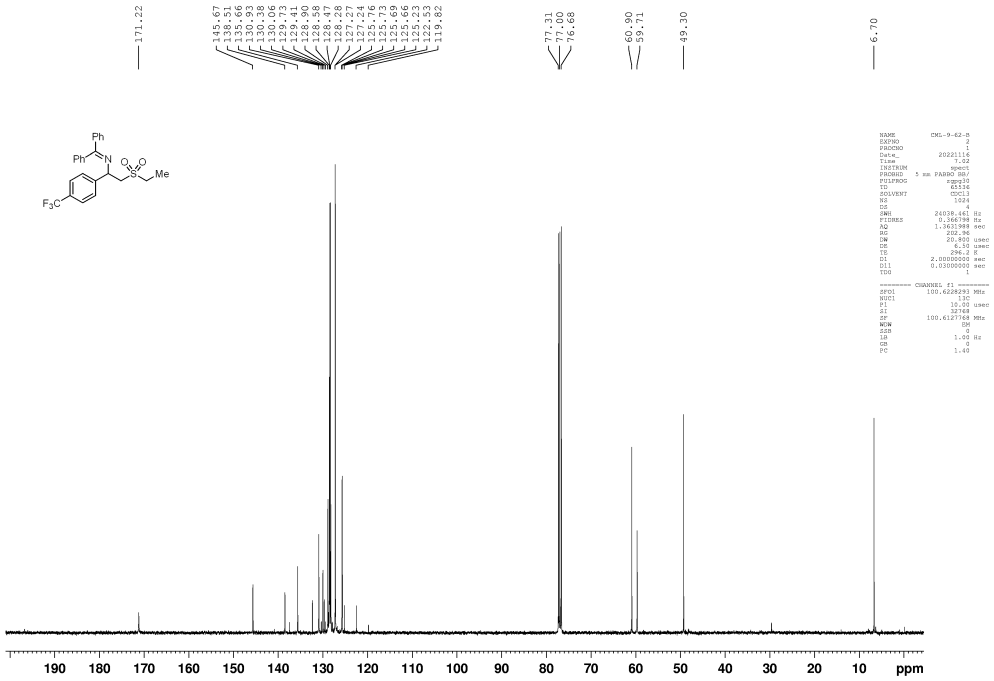
4-(1-((diphenylmethylene)amino)-2-(ethylsulfonyl)ethyl)benzonitrile (4i)



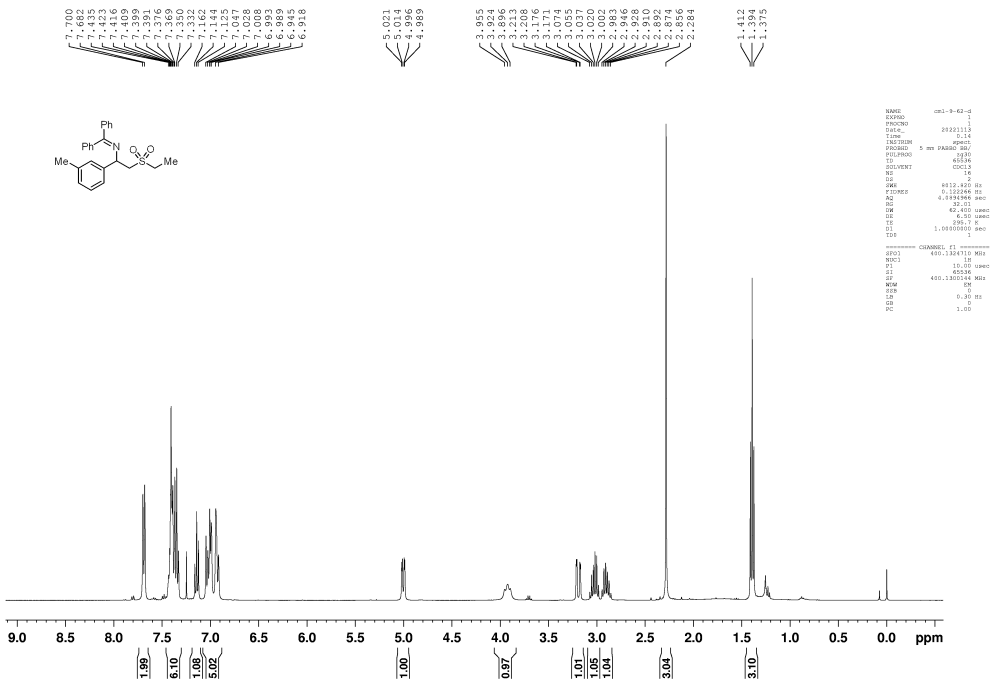


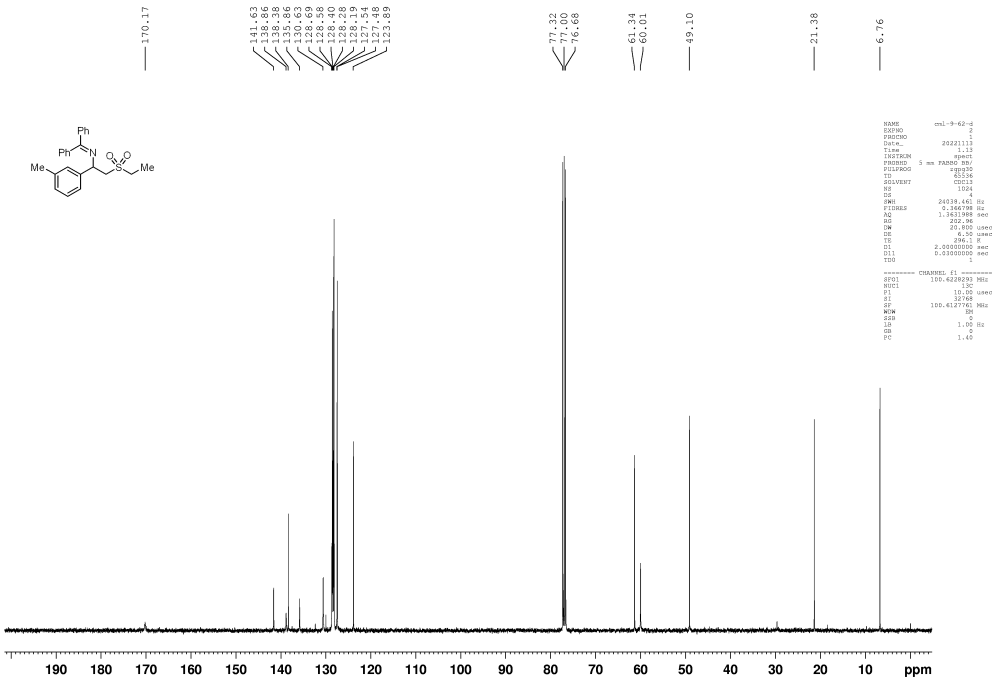
N-(2-(ethylsulfonyl)-1-(4-(trifluoromethyl)phenyl)ethyl)-1,1-diphenylmethanimine (4j)



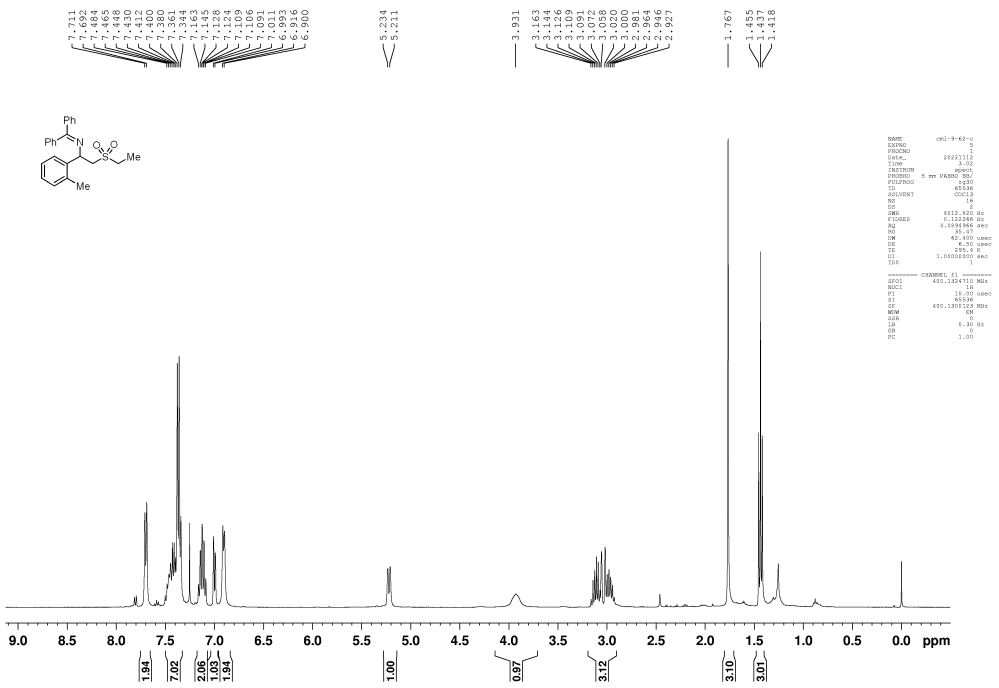


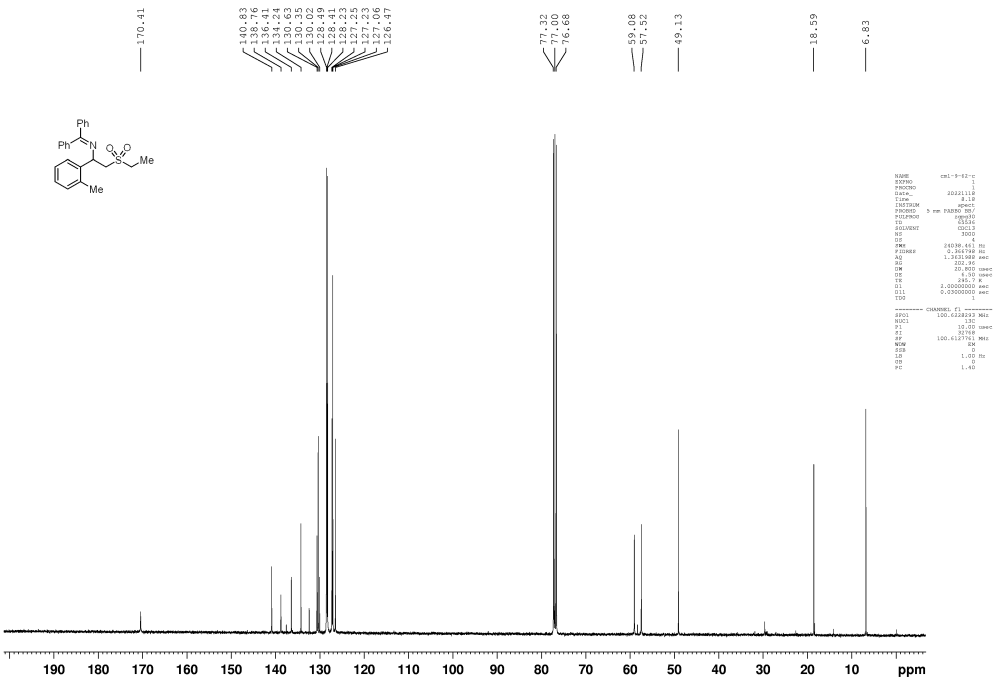
N-(2-(ethylsulfonyl)-1-(m-tolyl)ethyl)-1,1-diphenylmethanimine (4k)



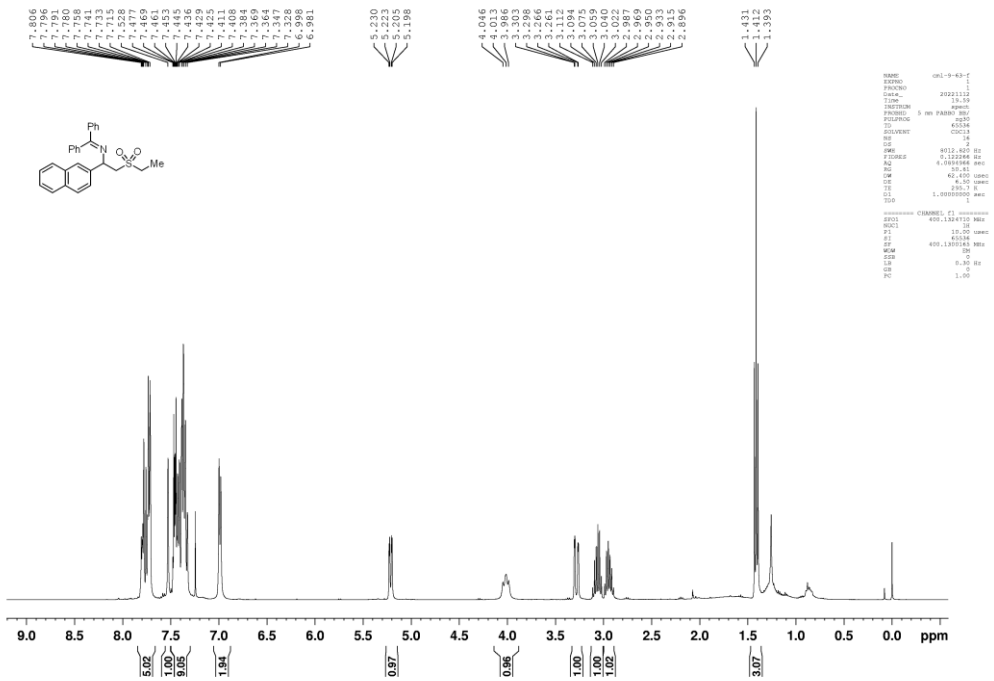


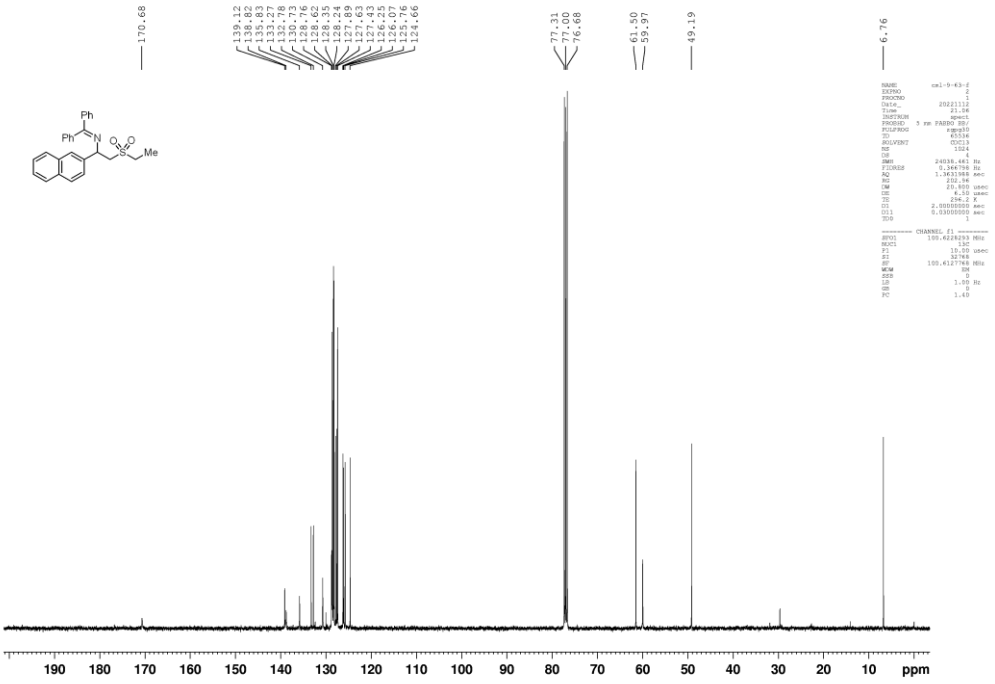
N-(2-(ethylsulfonyl)-1-(o-tolyl)ethyl)-1,1-diphenylmethanimine (4l)



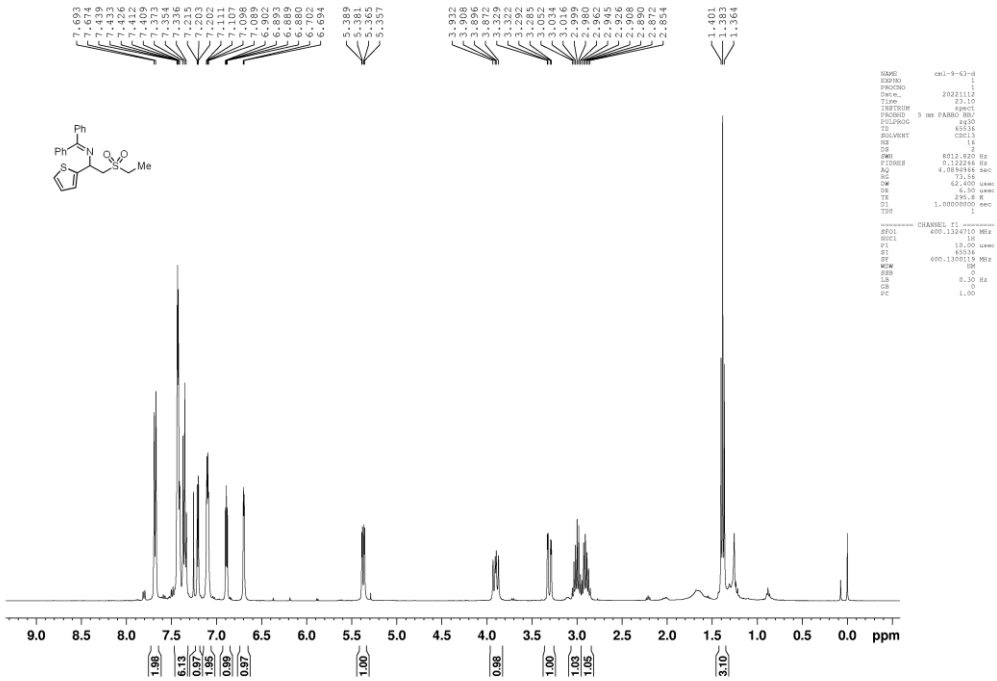


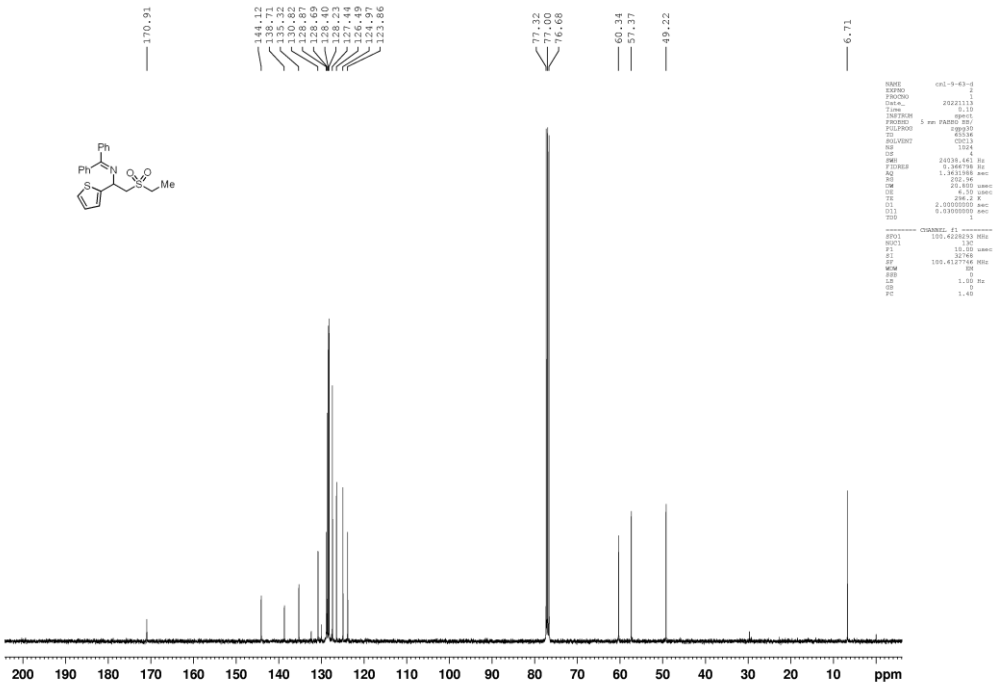
N-(2-(ethylsulfonyl)-1-(naphthalen-2-yl)ethyl)-1,1-diphenylmethanimine (4m)



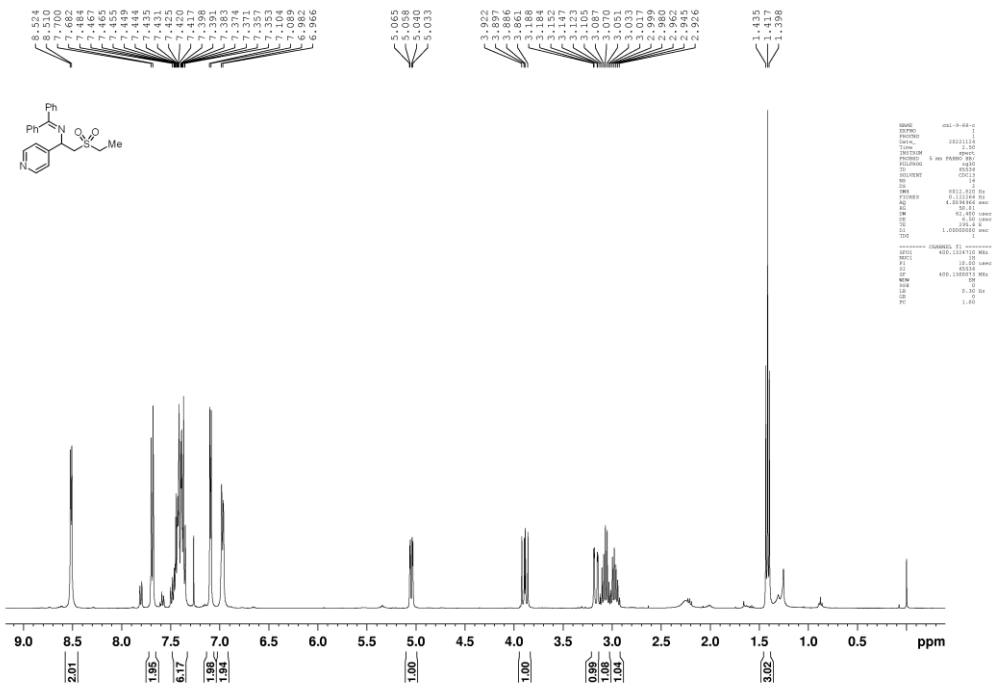


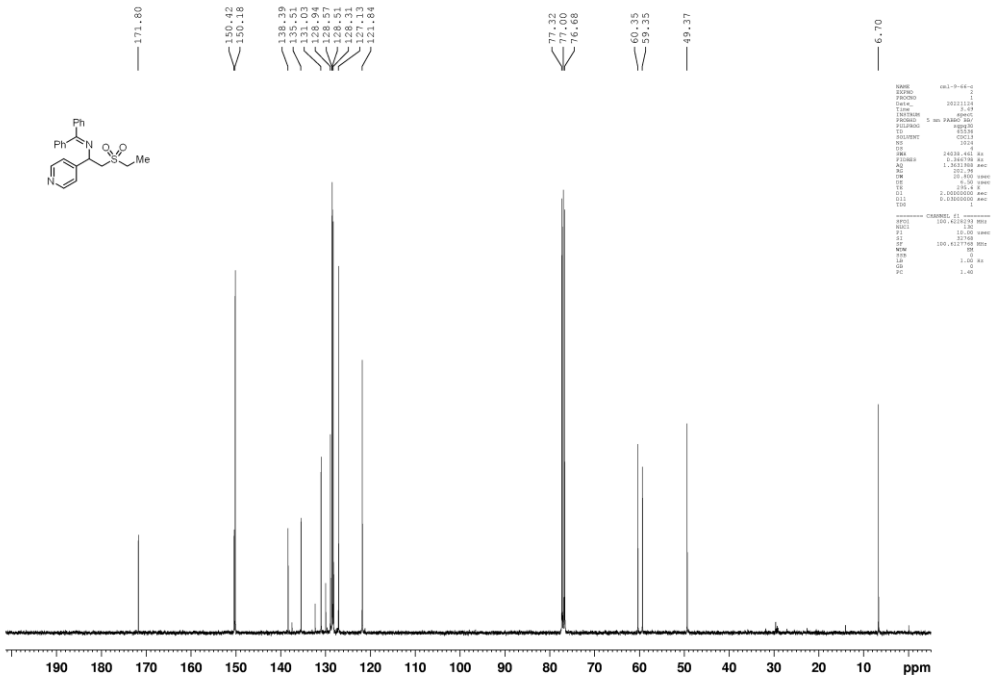
N-(2-(ethylsulfonyl)-1-(thiophen-2-yl)ethyl)-1,1-diphenylmethanimine (4n)



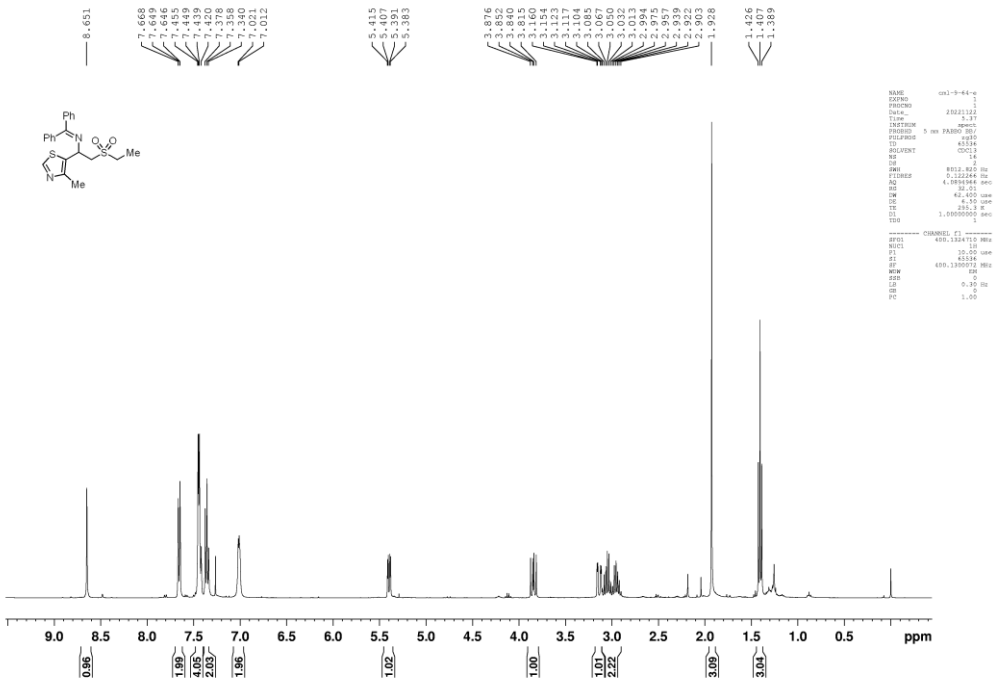


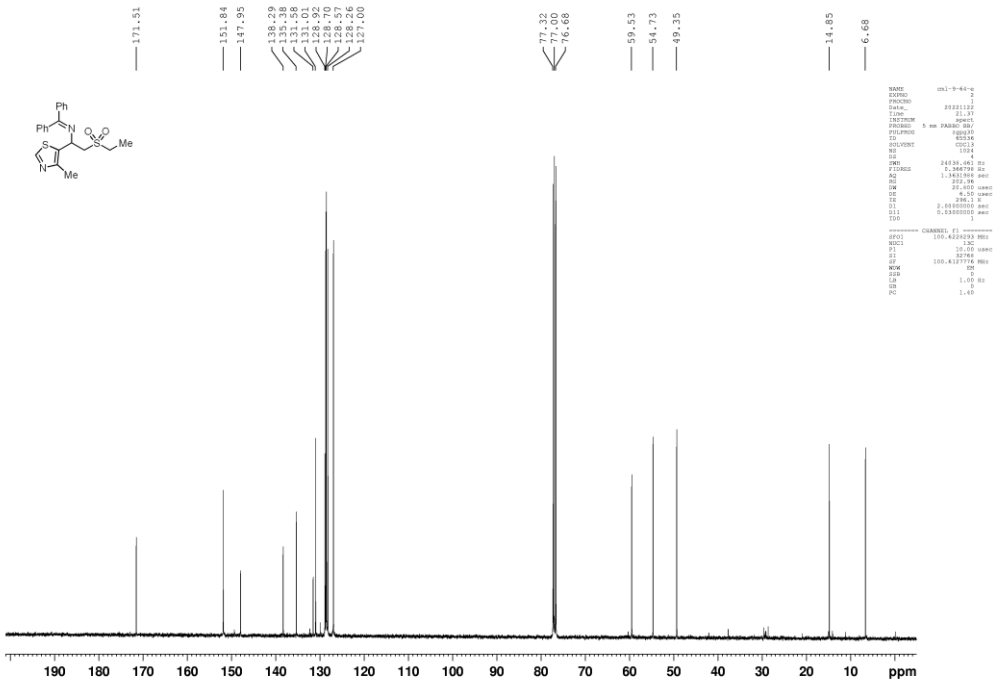
N-(2-(ethylsulfonyl)-1-(pyridin-4-yl)ethyl)-1,1-diphenylmethanimine (4o)



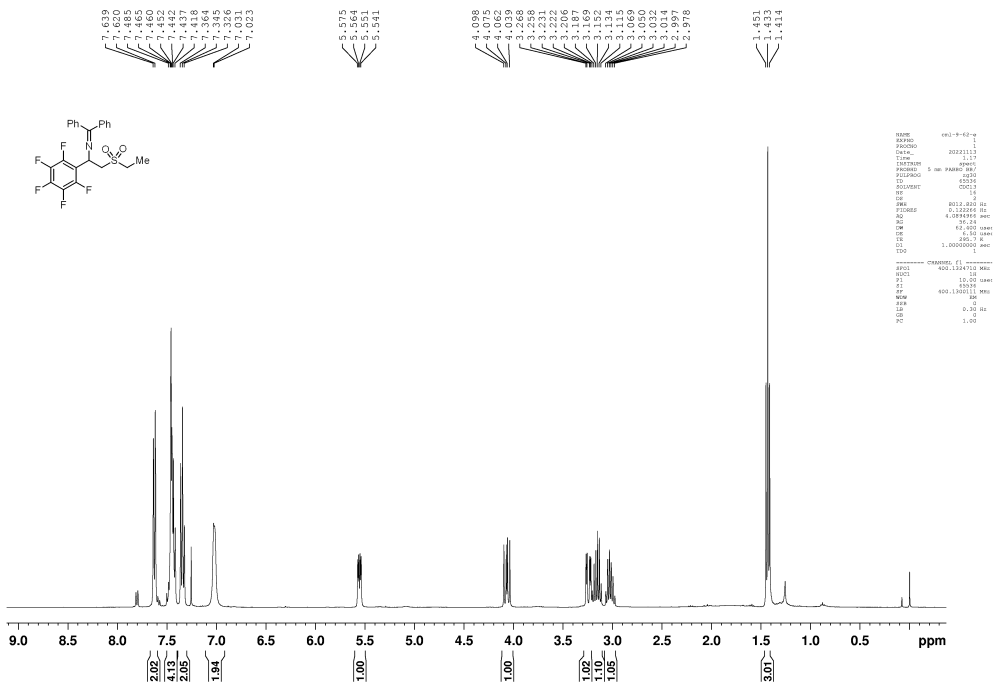


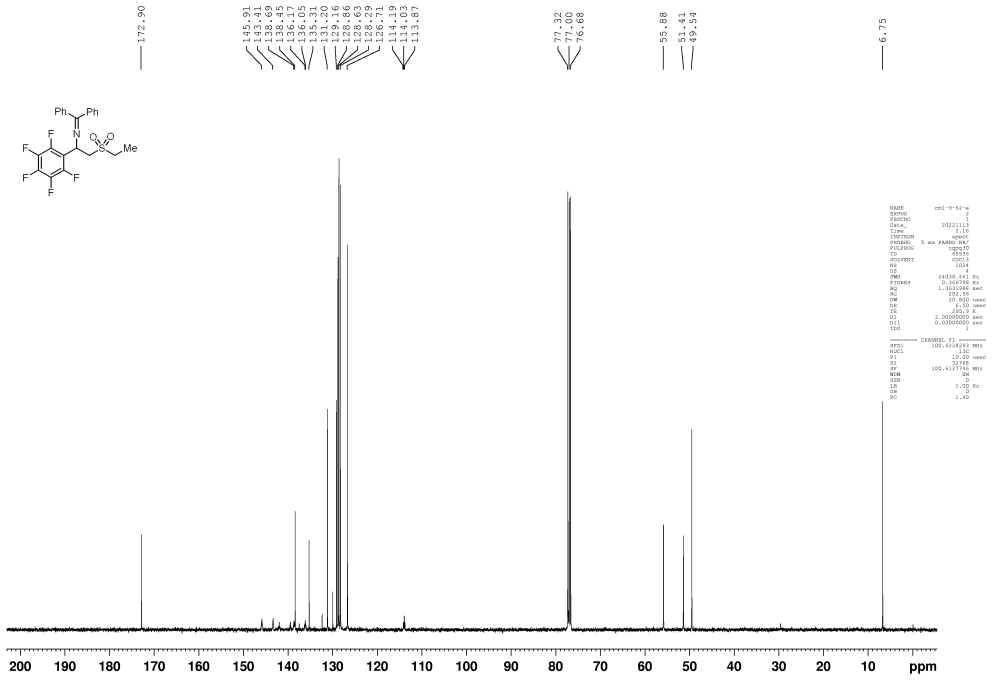
N-(2-(ethylsulfonyl)-1-(4-methylthiazol-5-yl)ethyl)-1,1-diphenylmethanimine (4p)



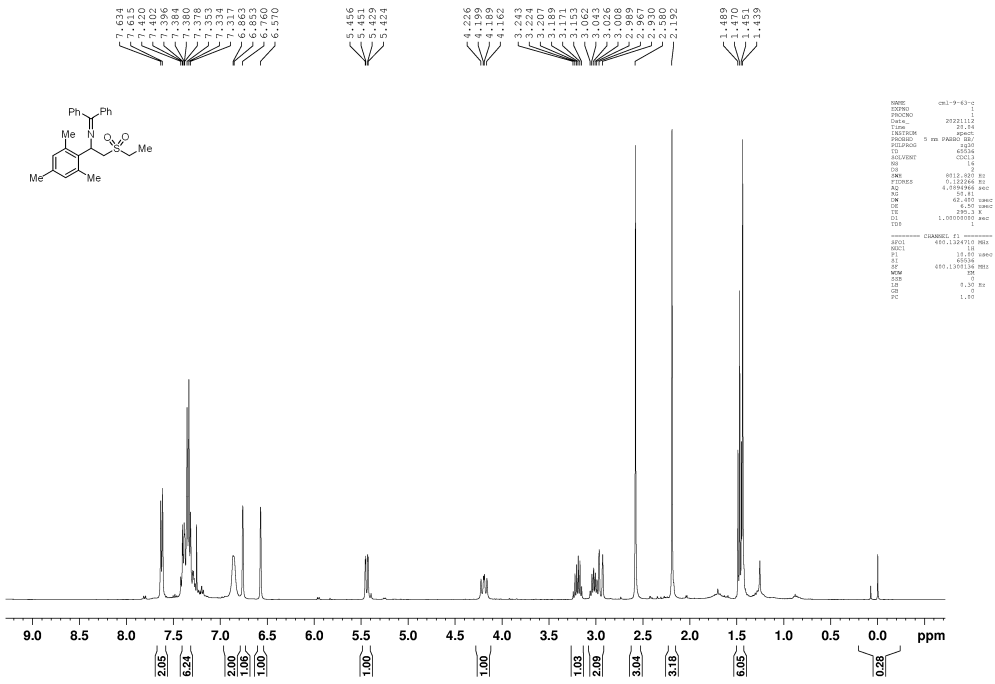


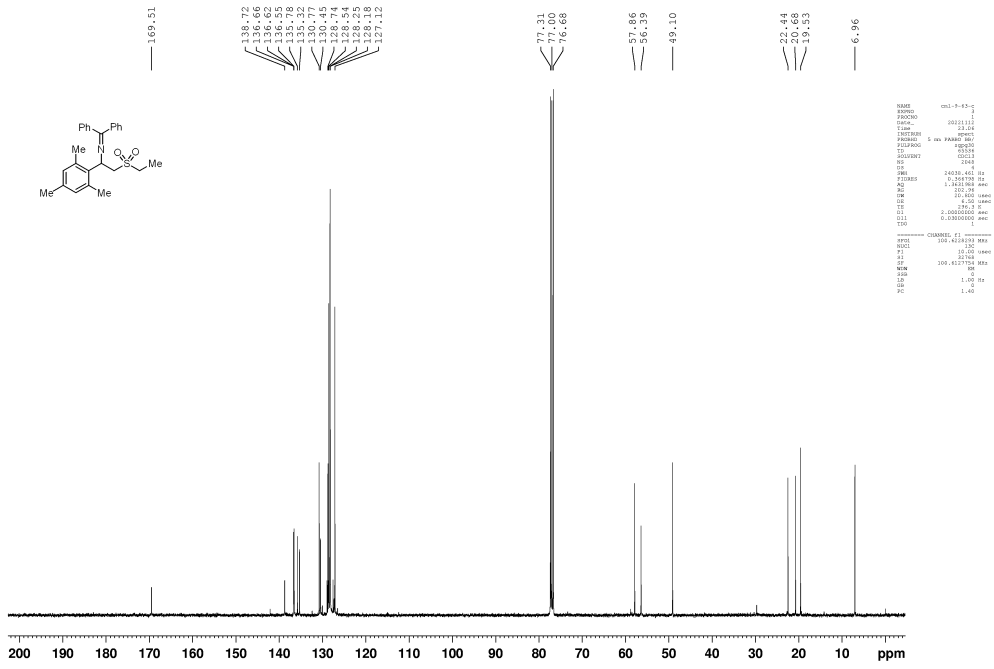
N-(2-(ethylsulfonyl)-1-(perfluorophenyl)ethyl)-1,1-diphenylmethanimine (4q)



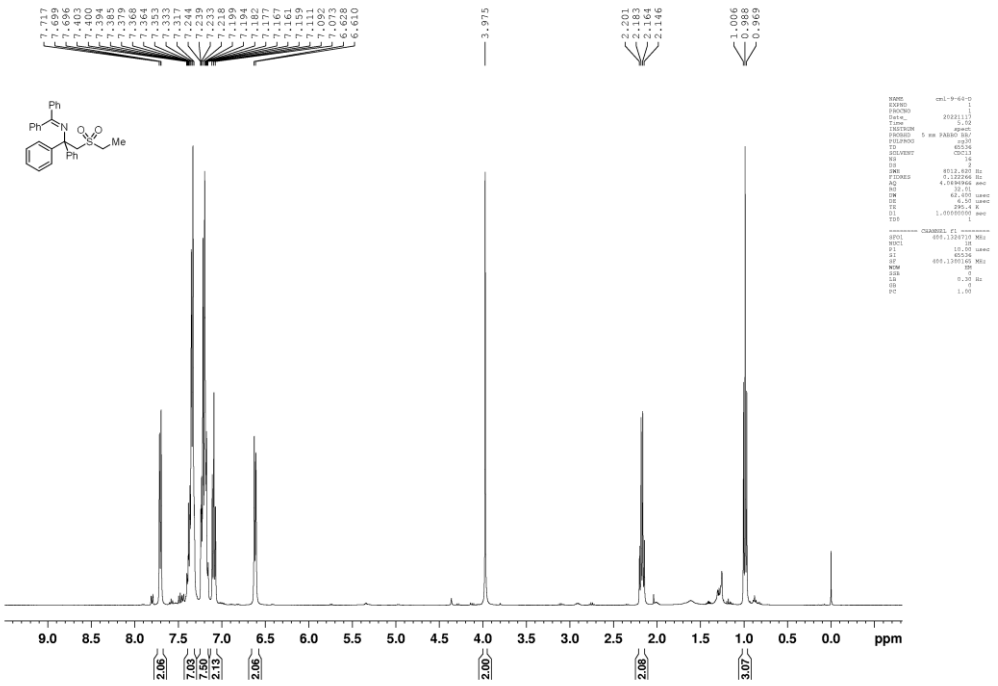


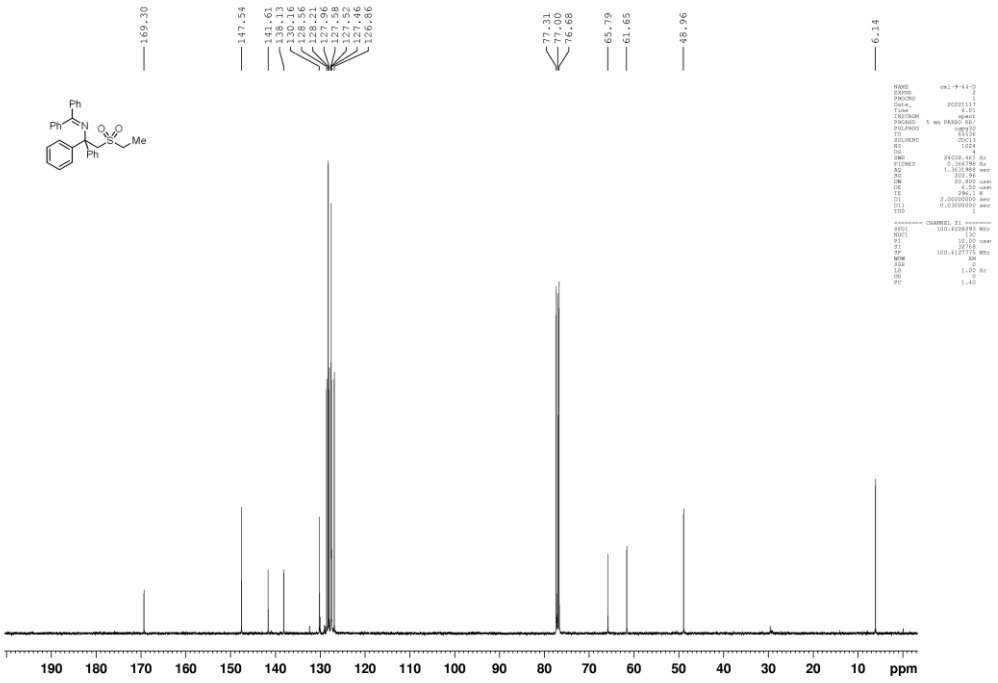
N-(2-(ethylsulfonyl)-1-mesitylethyl)-1,1-diphenylmethanimine (4r)



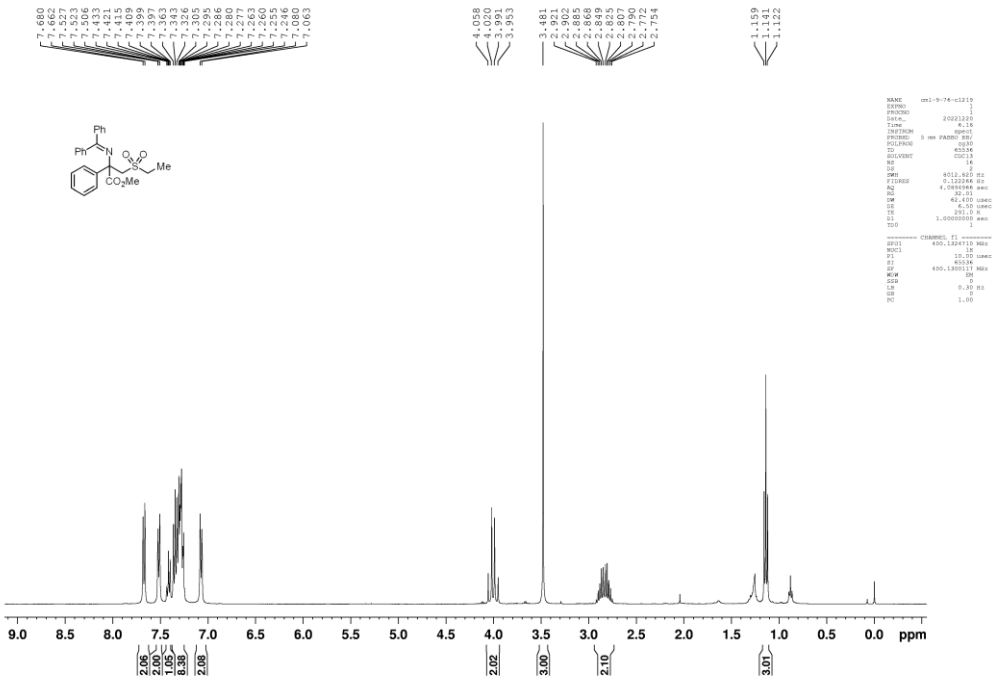


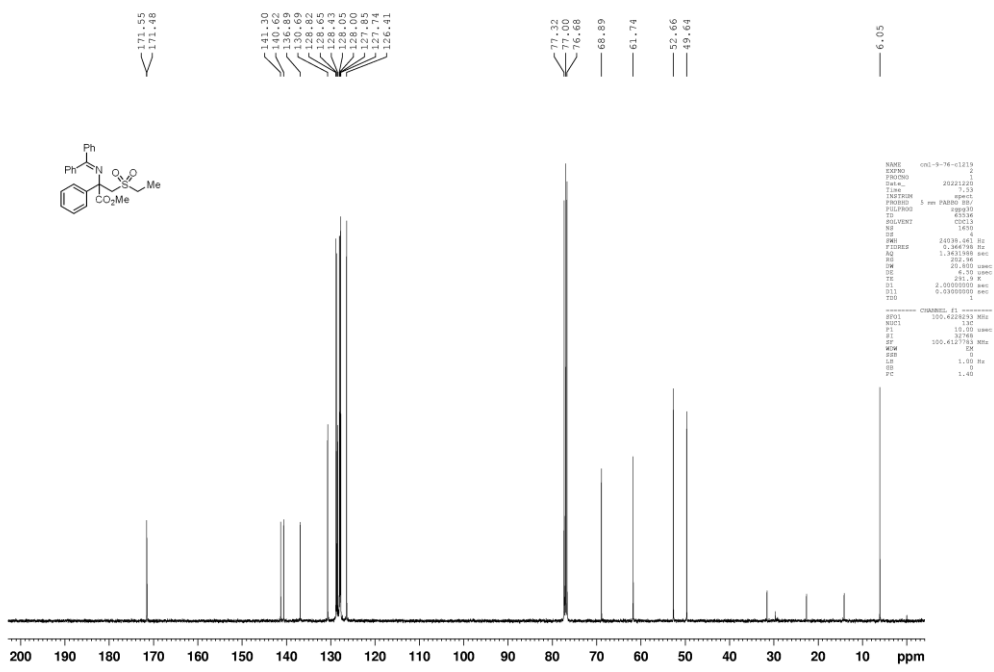
N-(2-(ethylsulfonyl)-1,1-diphenylethyl)-1,1-diphenylmethanimine (4s)



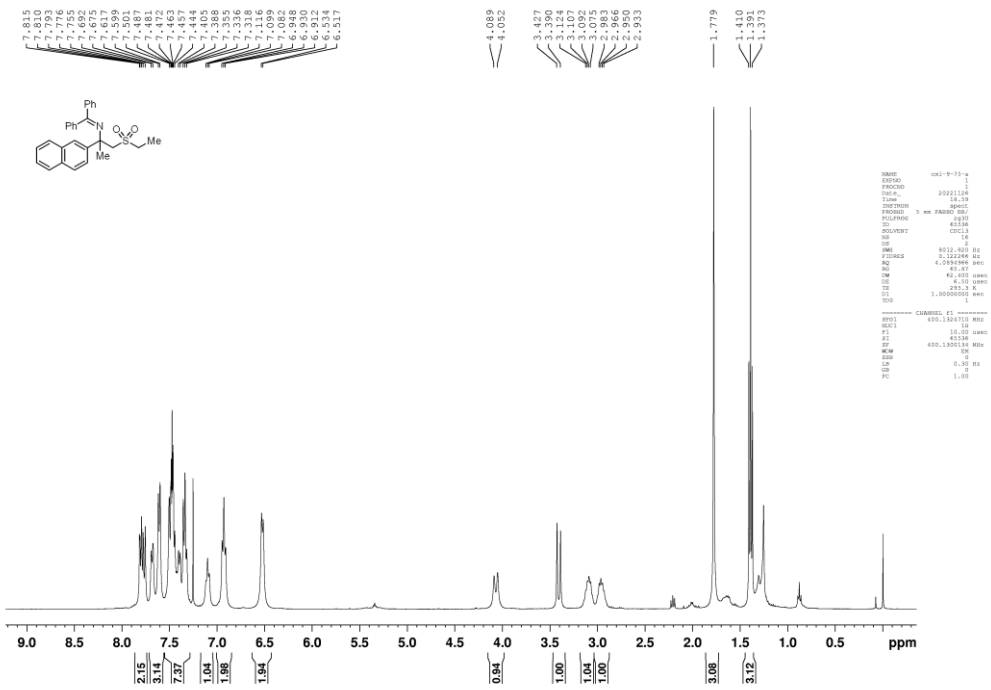


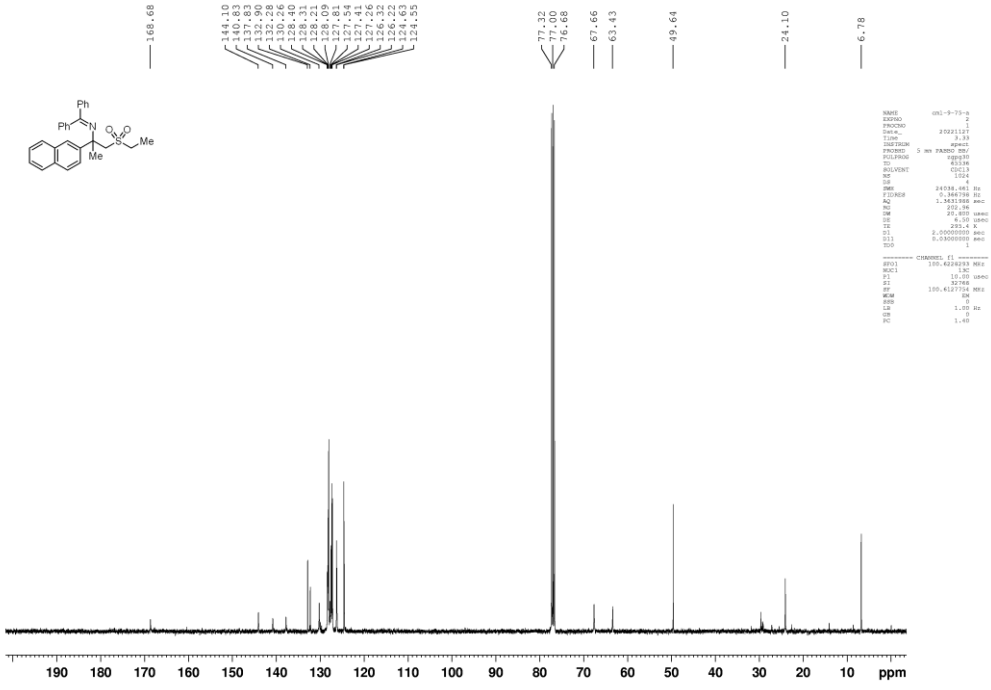
methyl 2-((diphenylmethylene)amino)-3-(ethylsulfonyl)-2-phenylpropanoate (4t)



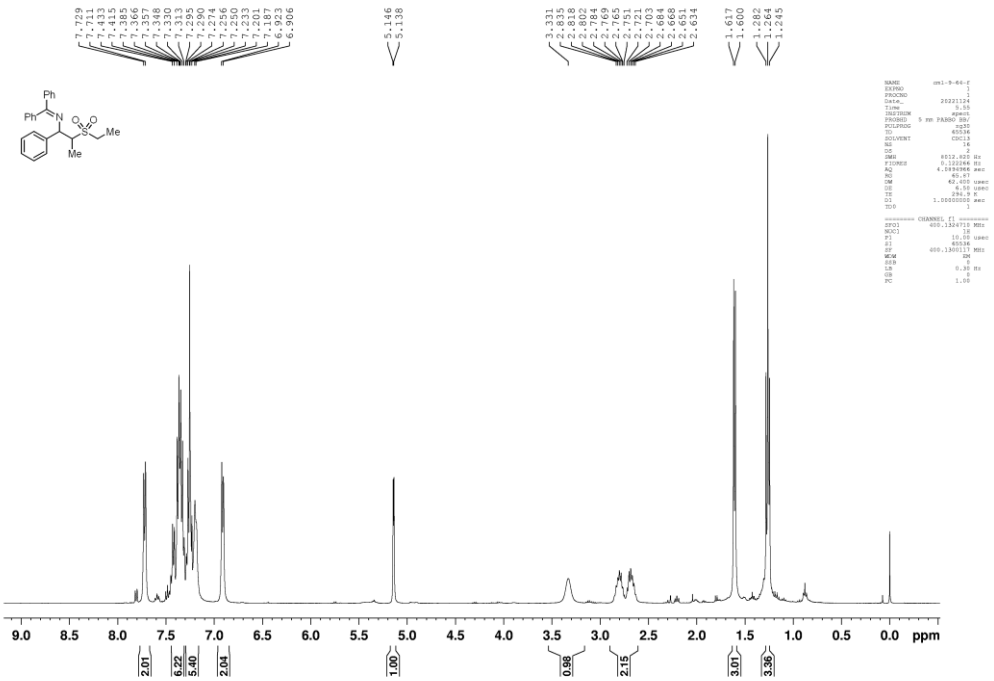


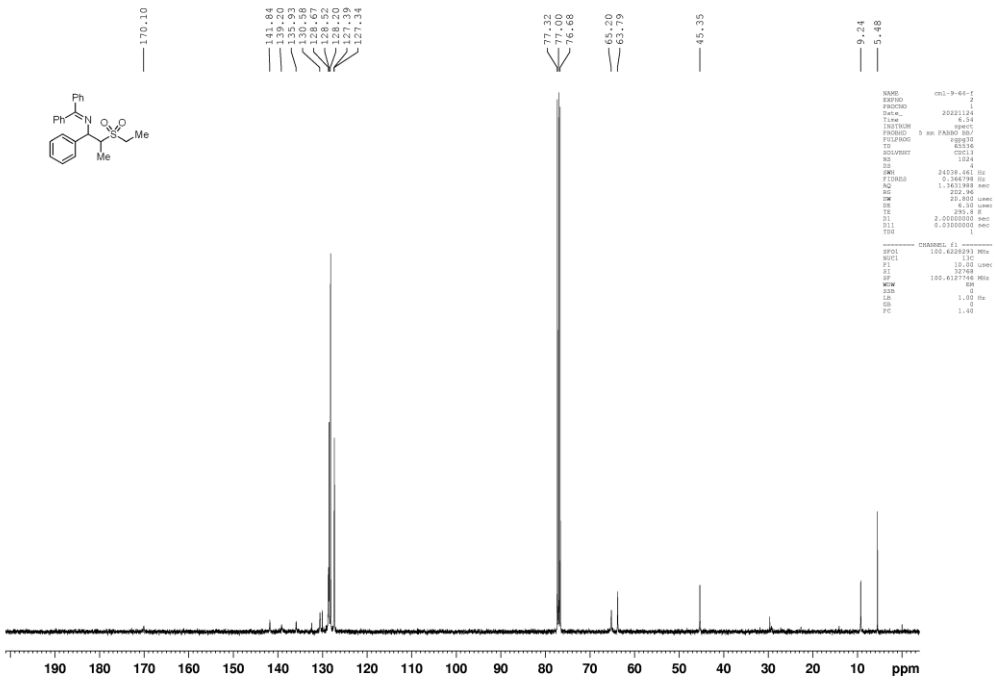
N-(1-(ethylsulfonyl)-2-(naphthalen-2-yl)propan-2-yl)-1,1-diphenylmethanimine (4u)



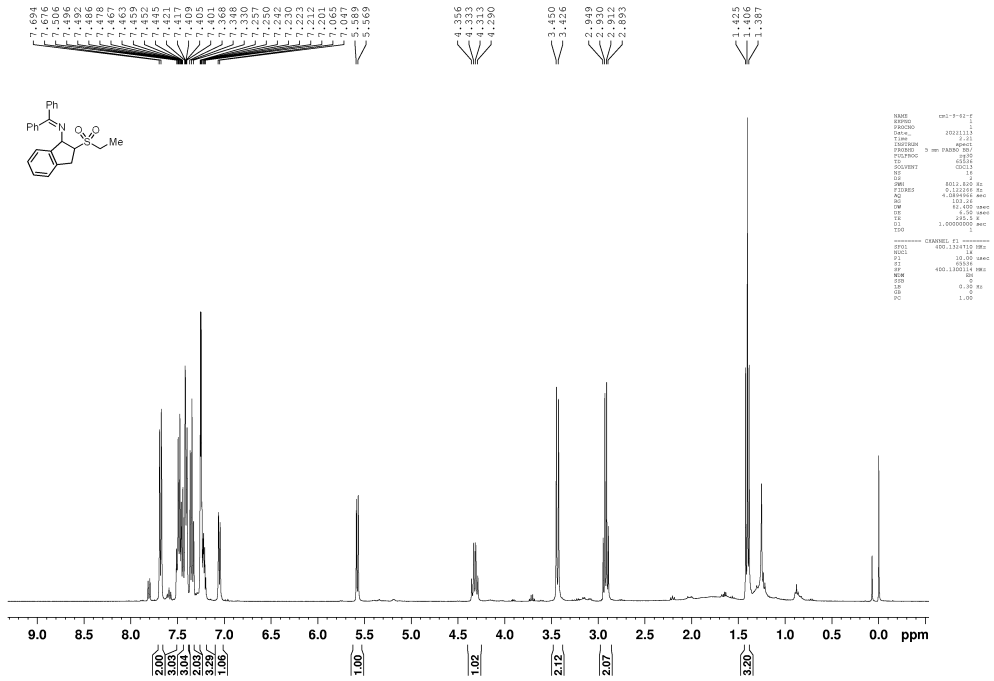


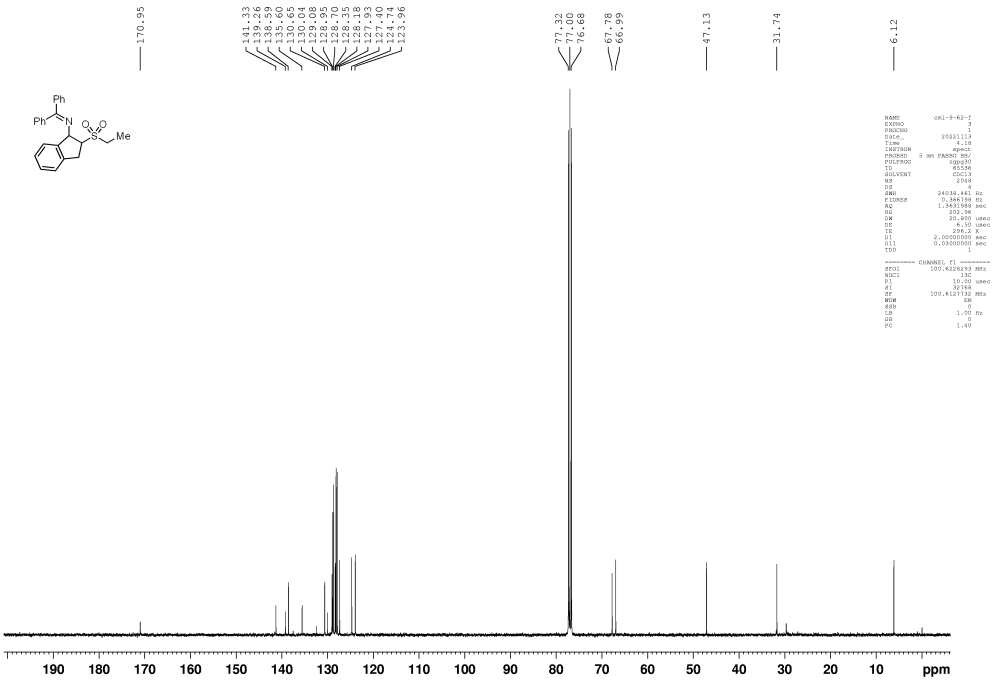
N-(2-(ethylsulfonyl)-1-phenylpropyl)-1,1-diphenylmethanimine (4v)



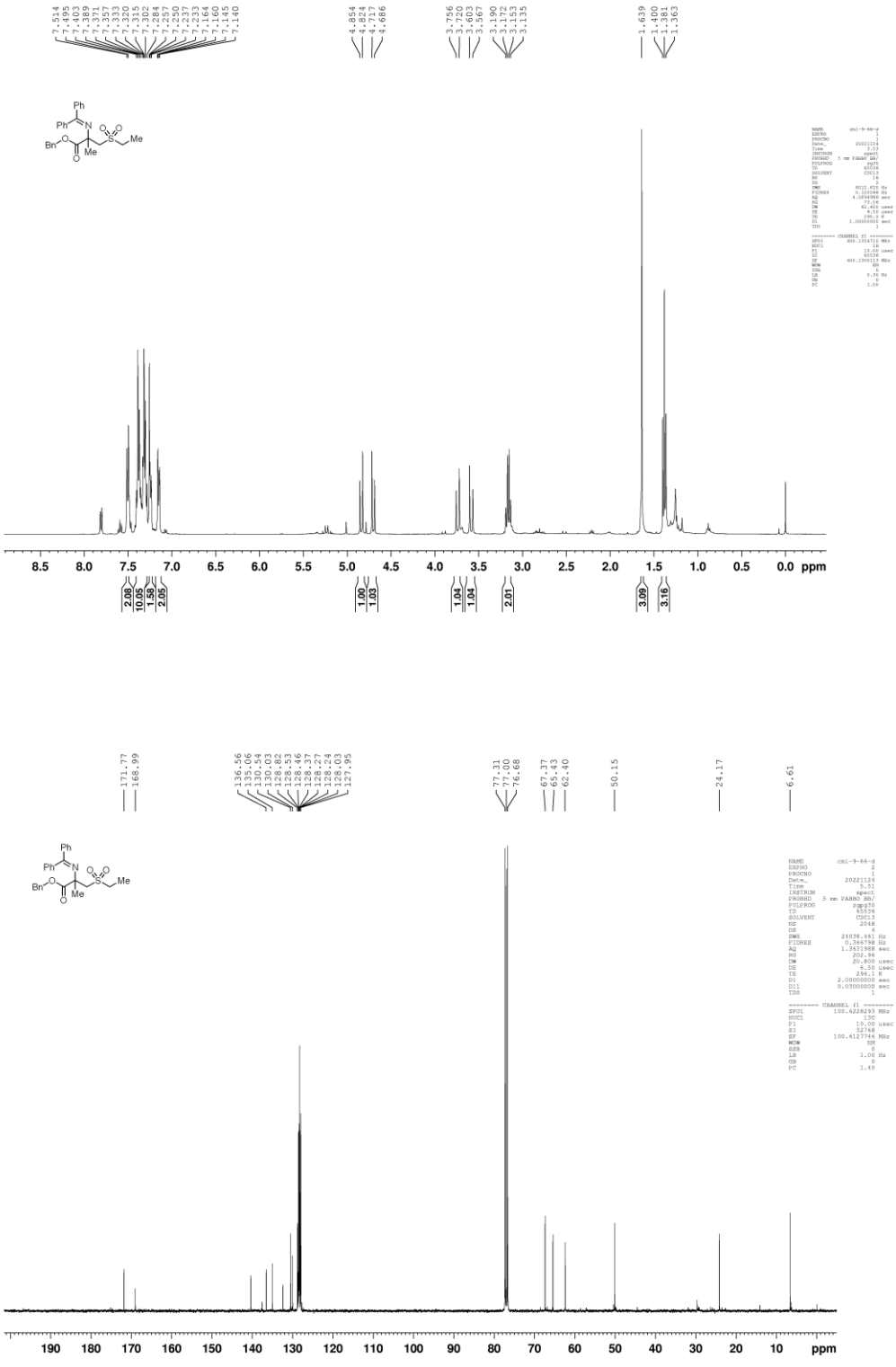


N-(2-(ethylsulfonyl)-2,3-dihydro-1H-inden-1-yl)-1,1-diphenylmethanimine (4w)

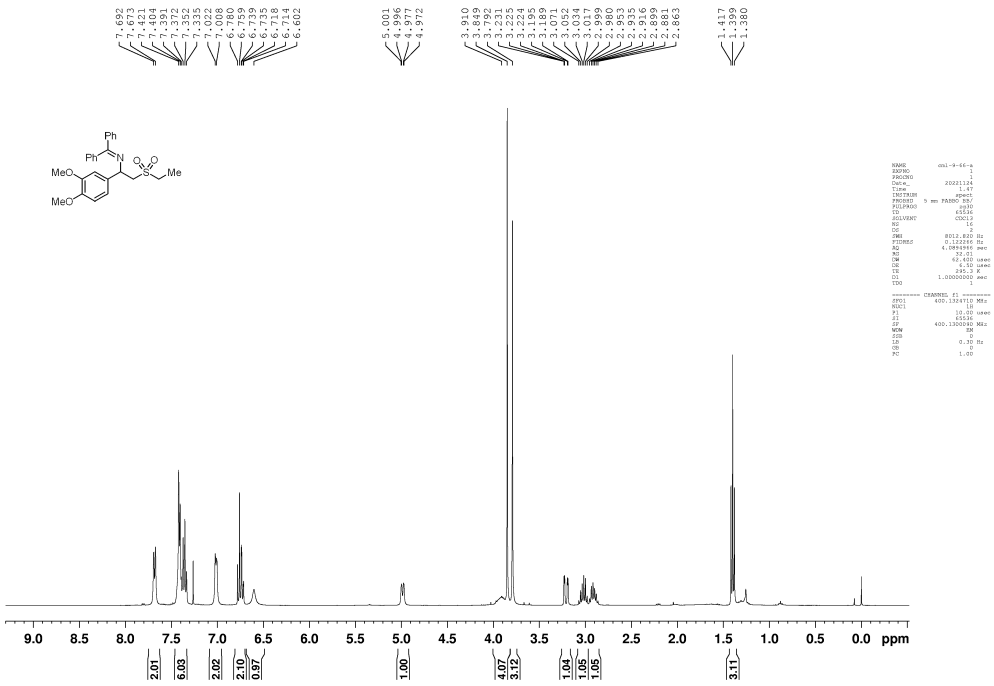


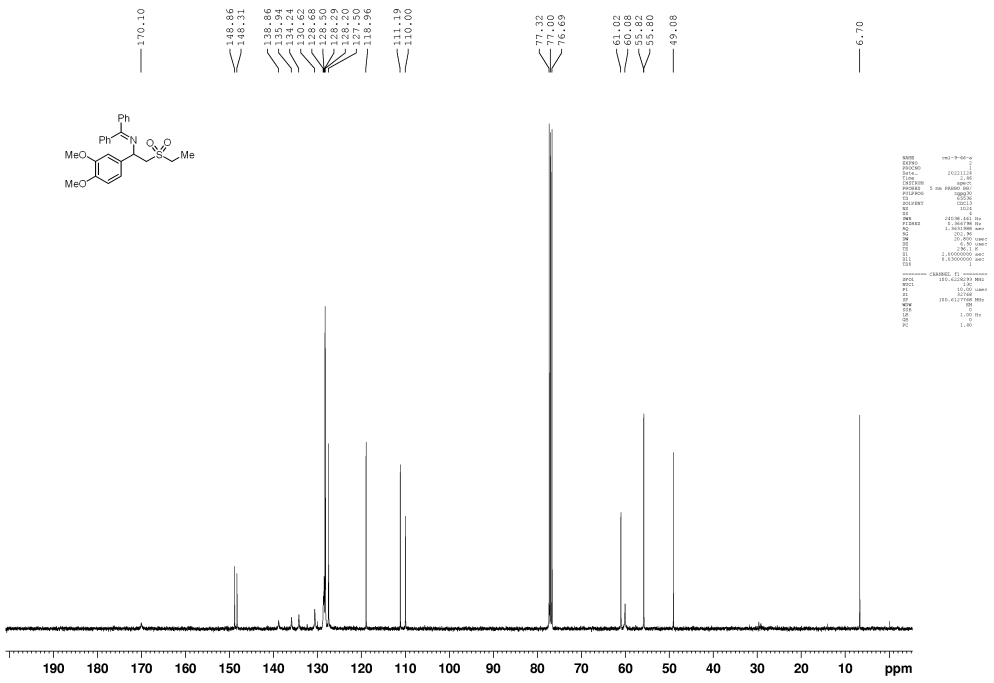


benzyl 2-((diphenylmethylene)amino)-3-(ethylsulfonyl)-2-methylpropanoate (4x)

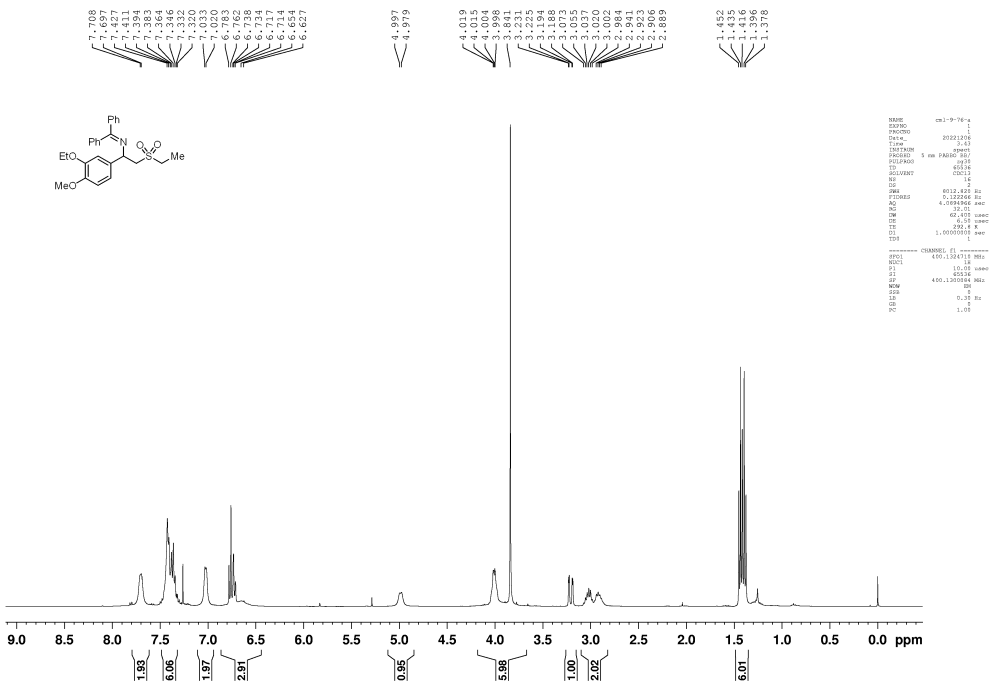


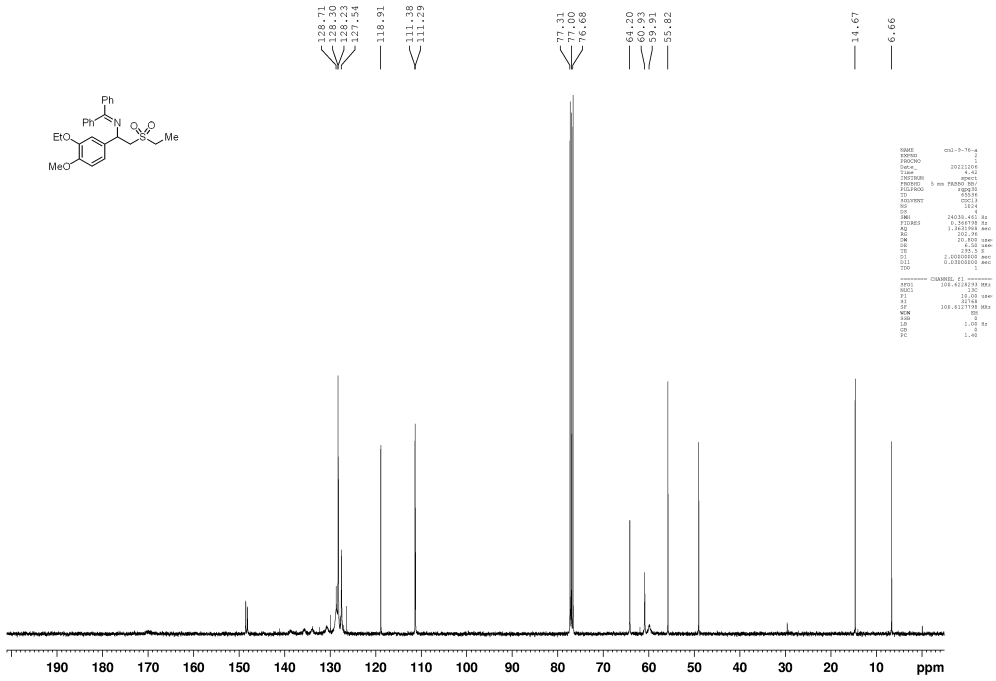
N-(1-(3,4-dimethoxyphenyl)-2-(ethylsulfonyl)ethyl)-1,1-diphenylmethanimine (4y)



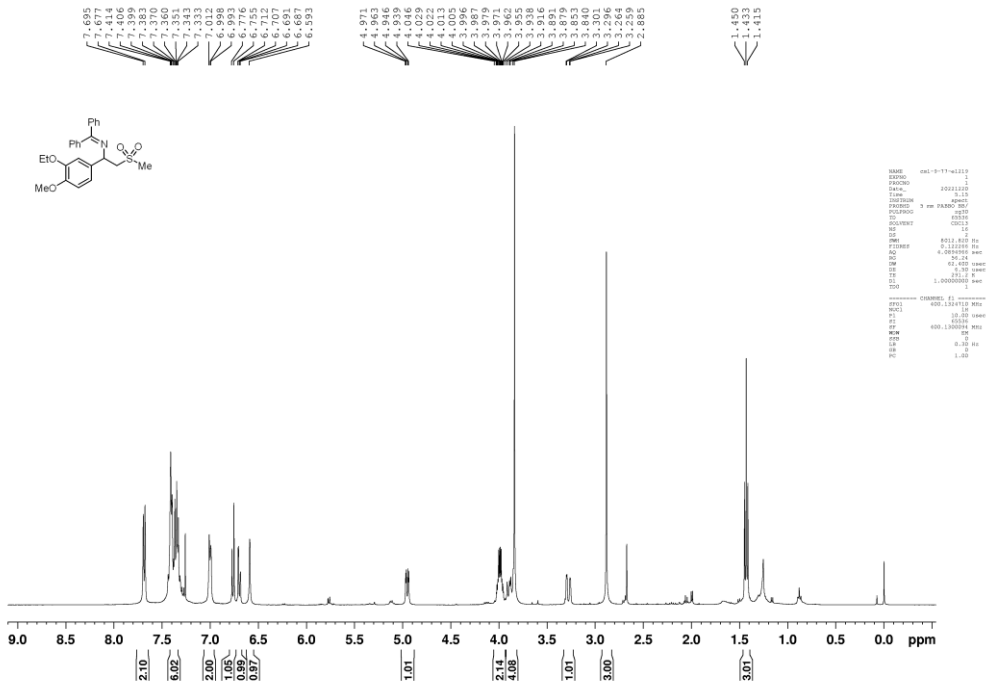


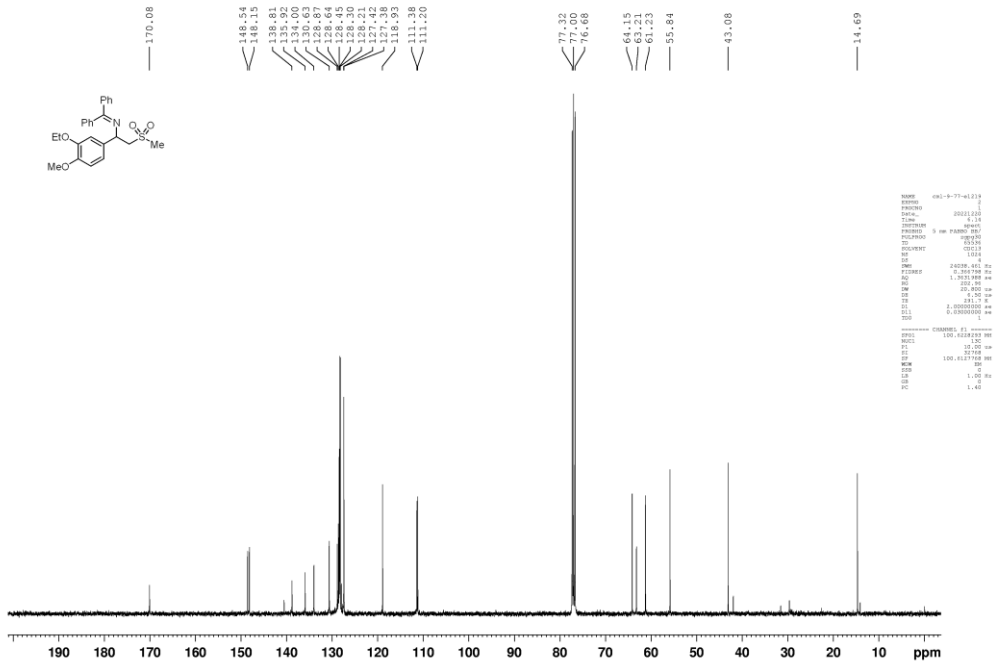
N-(1-(3-ethoxy-4-methoxyphenyl)-2-(ethylsulfonyl)ethyl)-1,1-diphenylmethanimine (4z)



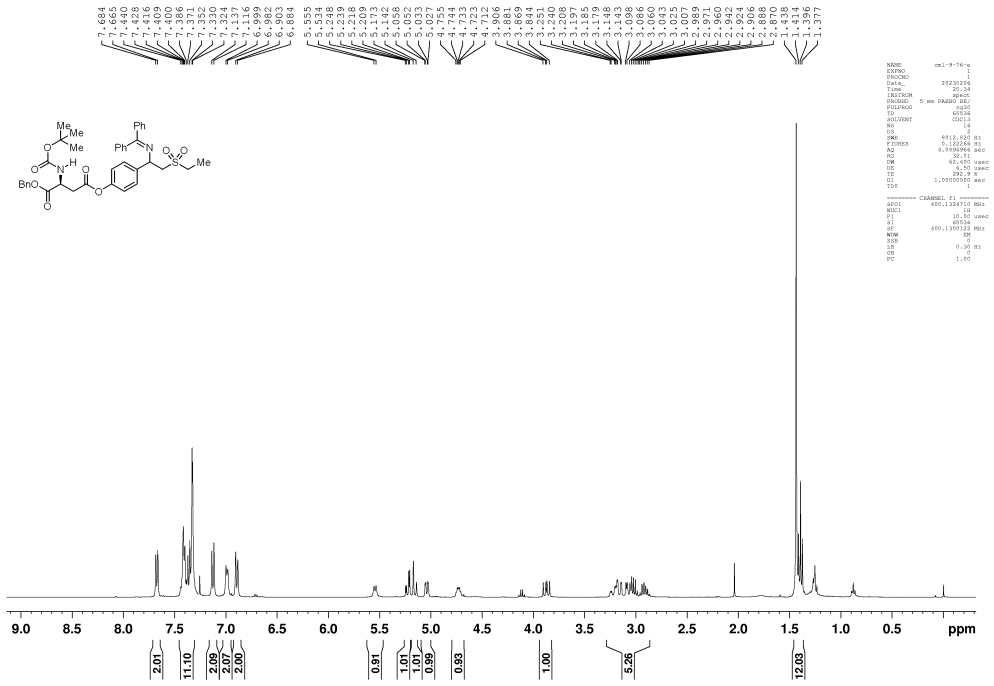


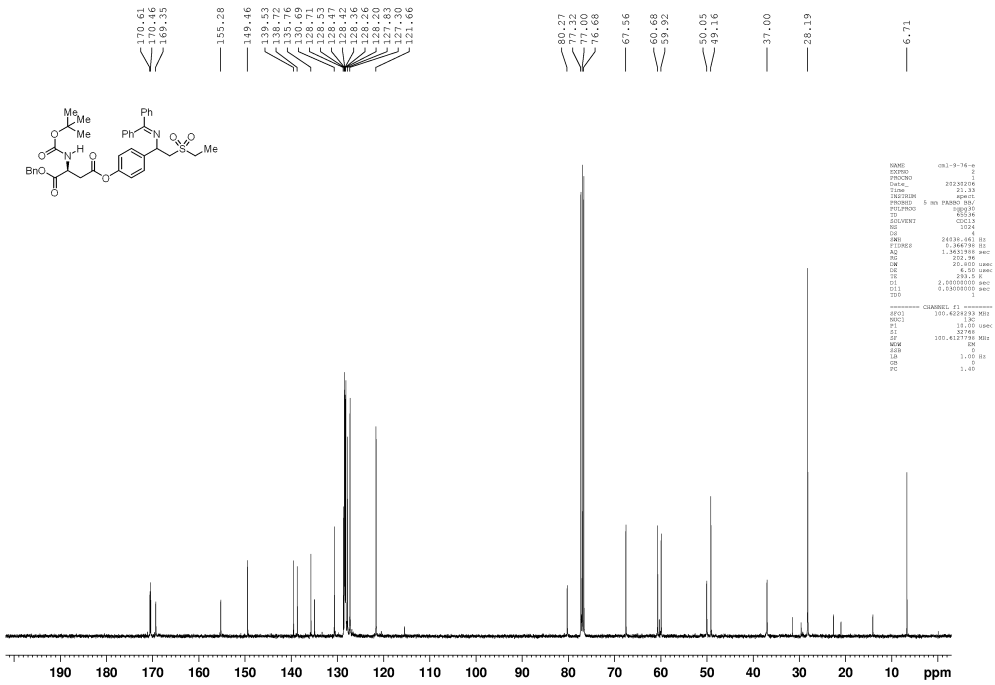
N-(1-(3-ethoxy-4-methoxyphenyl)-2-(methylsulfonyl)ethyl)-1,1-diphenylmethanimine (4aa)



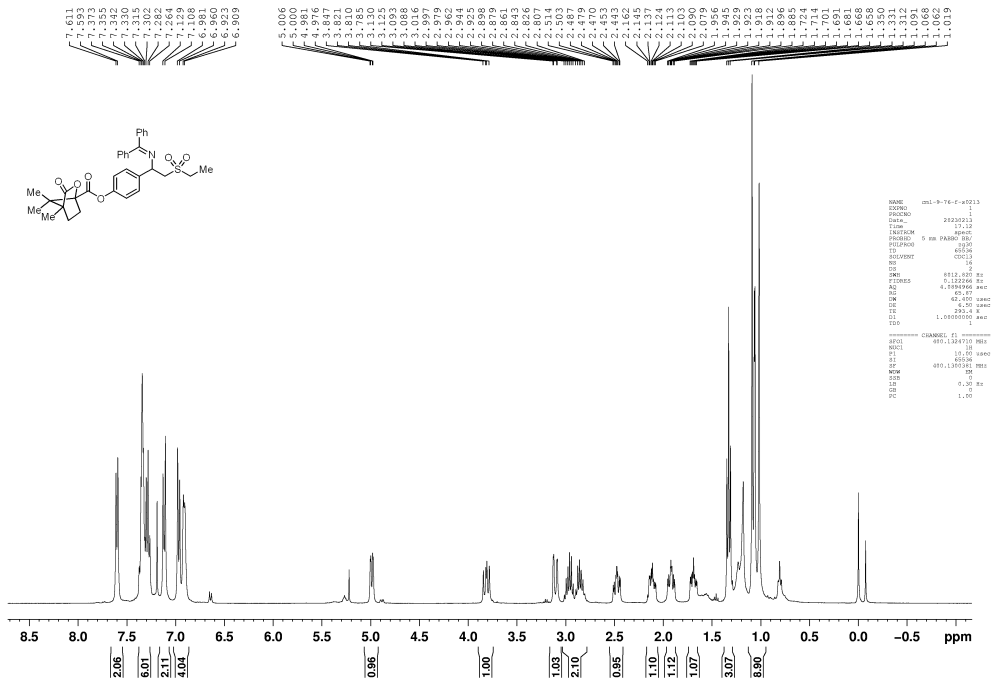


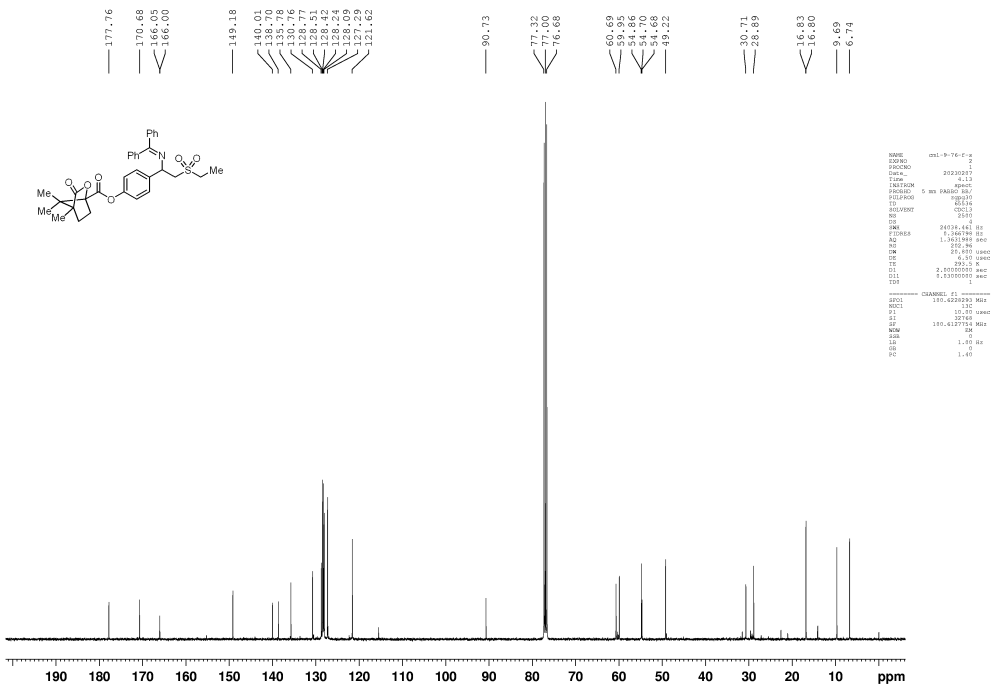
1-benzyl 4-(4-(1-((diphenylmethylene)amino)-2-(ethylsulfonyl)ethyl)phenyl) (tert-butoxycarbonyl)-L-aspartate (4ab)



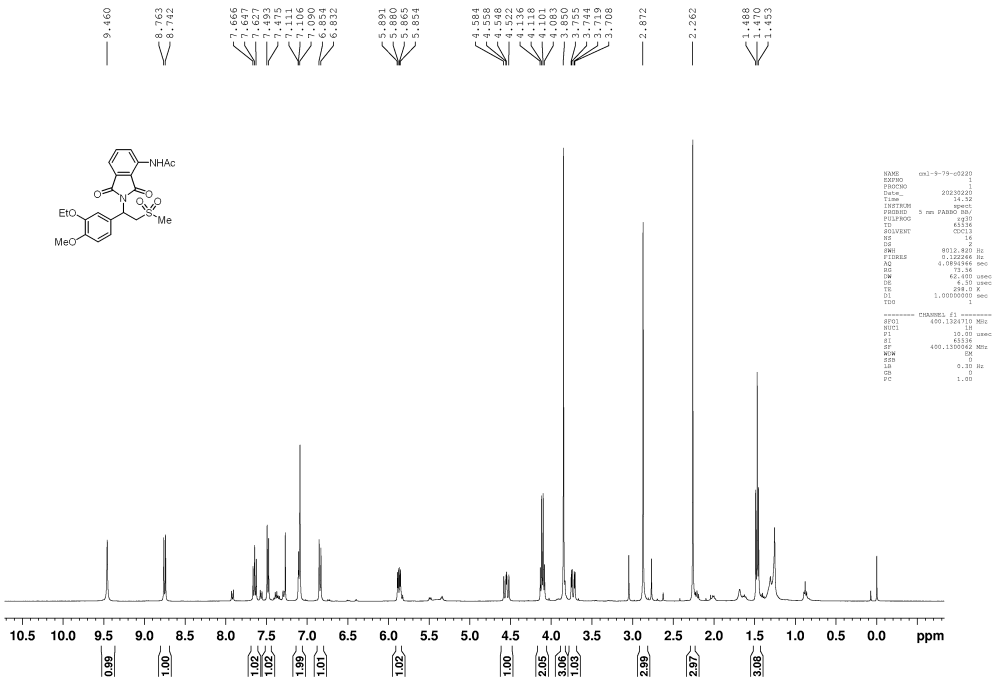


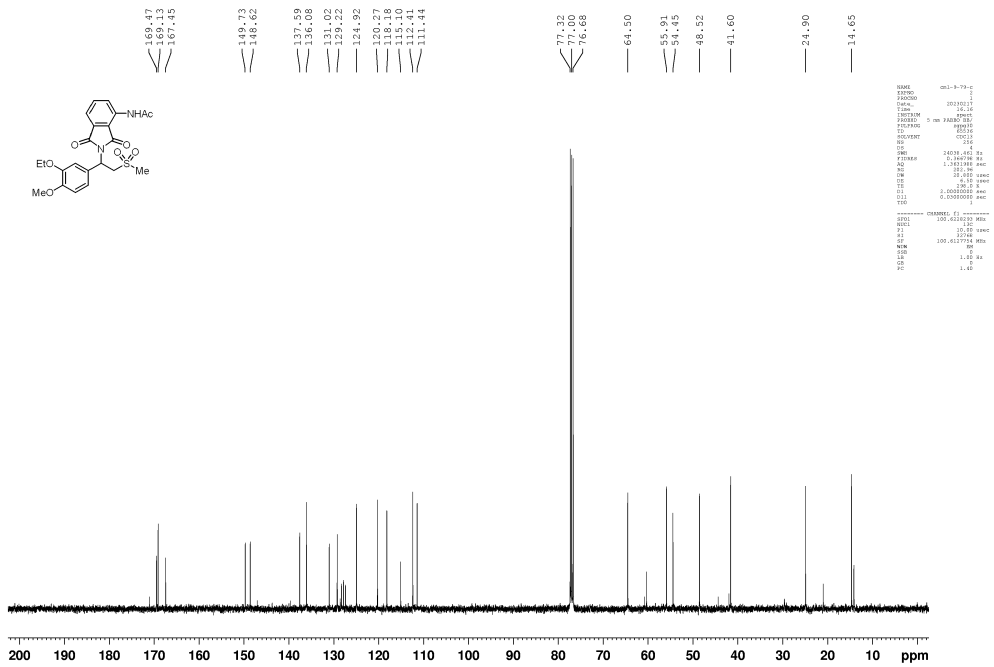
4-(1-((diphenylmethylene)amino)-2-(ethylsulfonyl)ethyl)phenyl (4R)-4,7,7-trimethyl-3-oxo-2-oxabicyclo[2.2.1]heptane-1-carboxylate (4ac)



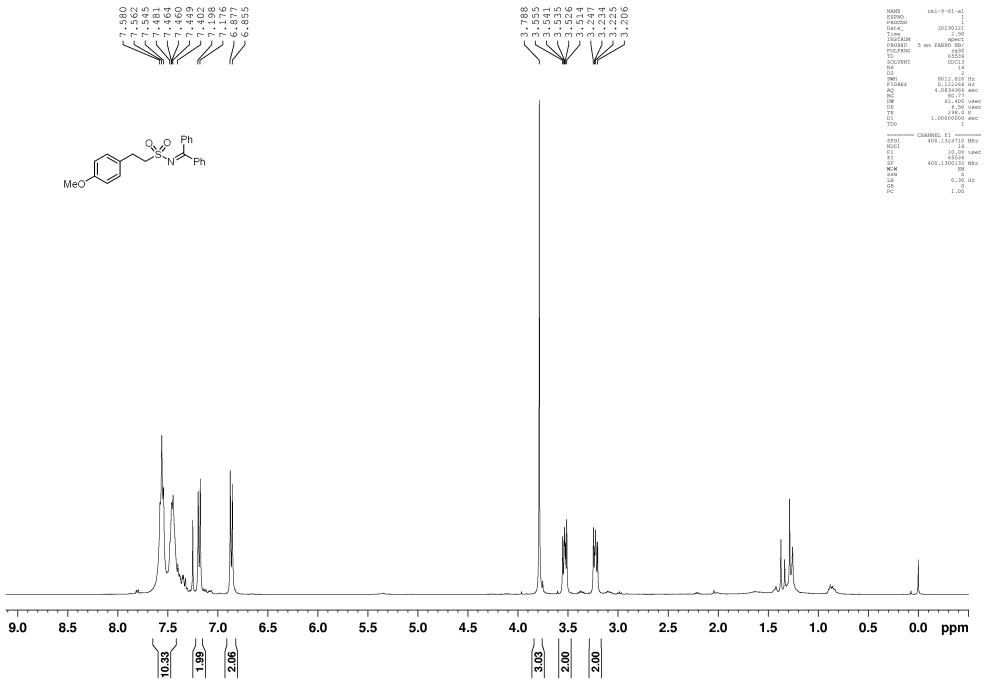


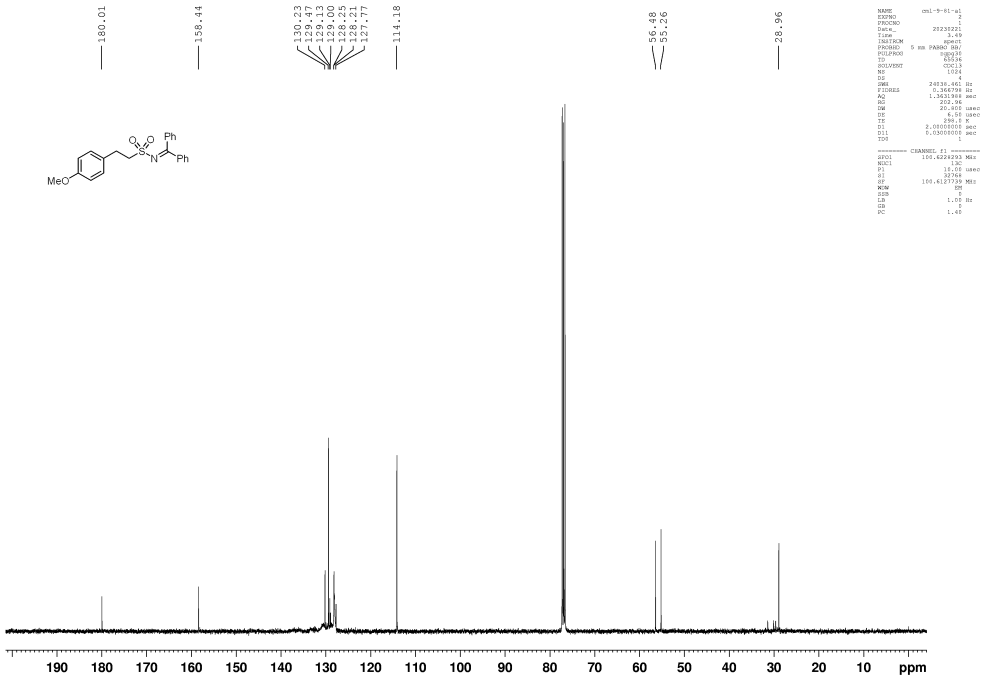
N-(2-(1-(3-ethoxy-4-methoxyphenyl)-2-(methylsulfonyl)ethyl)-1,3-dioxoisoindolin-4-yl)acetamide (5aa)





N-(diphenylmethylene)-2-(4-methoxyphenyl)ethane-1-sulfonamide (3ak')





Supplementary References

1. V. K. Soni, S. Lee, J. Kang, Y. K. Moon and H. S. Hwang, *ACS Catal.,* 2019, **9**, 10454−10463.
2. (a) M. Yang, W. Wang, Y. Liu, L. Feng and X. Ju, *Chin. J. Chem.,* 2014, **32**, 833−837; (b) H.-W. Man, P. Schafer, L. M. Wong, R. T. Patterson, L. G. Corral, H. Raymon, K. Blease, J. Leisten, M. A. Shirley, Y. Tang, D. M. Babusis, R. Chen, D. Stirling and G. W. Mulle, *J. Med. Chem.*, 2009, 52, 1522–1524.