Electronic Supplementary Material (ESI) for Organic Chemistry Frontiers.

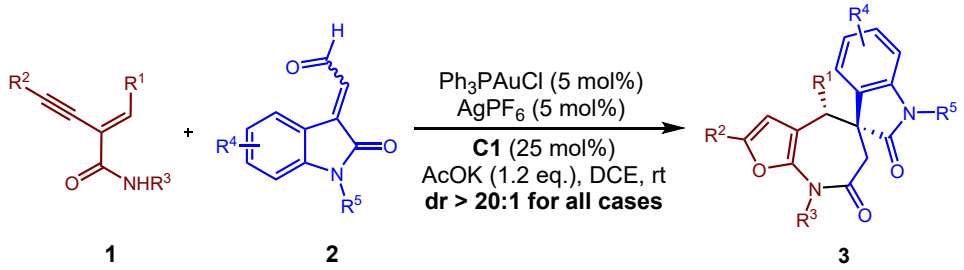
Supporting Information (SI)

Table of Contents

1. General Information.

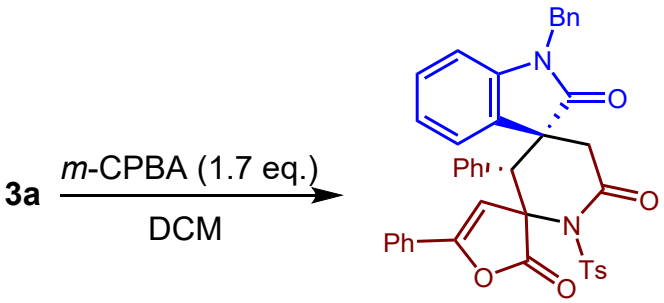
Unless otherwise specified, all one-pot reactions were carried out in an over-dried Schlenk tube equipped with a magnetic stir bar under nitrogen atmosphere. DCE and DCM was distilled from CaH_2; THF and 1,4-dioxane were distilled from sodium; *o*-Enyne-amides **1**[1] and isatin-derived enals **2**[2] were synthesized according to the known literatures. All other reagents were obtained from commercial sources and utilized without further purification, if not stated otherwise. All melting points are uncorrected. The NMR spectra were recorded in $CDCl_3$ on a 400 or 600 M Hz instrument with TMS as internal standard. Recorded shifts were reported in parts per million (δ) downfield from TMS. Data are represented as follows: chemical shift, multiplicity (s = singlet, d = doublet, t = triplet, q = quartet, m = multiplet, b = broad), coupling constant (*J*, Hz) and integration. TLC was carried out with 0.2 mm thick silica gel plates (GF254). Visualization was accomplished by UV light. The column chromatography was hand packed with silica gel 60 (160-200 mesh). The products were additionally confirmed by HRMS. Mass spectra were obtained using ESI ionization.

2. General Procedure for the One-Pot Synthesis of Products 3.



In a dried and nitrogen filled Schlenk flask, a mixture of PPh_3AuCl (2.5 mg, 0.005 mmol, 5.0 mol %), $AgPF_6$ (1.3 mg, 0.005mmol, 5.0 mol %) in DCE (1 mL) was stirred at room temperature under nitrogen for 15 mins to generate the gold catalyst. Immediately afterwards, ynamide (0.1 mmol, 1.0 eq.) was added to the above catalyst solution and stirred for 0.5 h to gain the intermediate. The chiral NHC (9.7 mg, 0.025 mmol, 25 mol%), AcOK (11.7 mg, 0.12 mmol, 1.2 eq.) and isatin-derived enal **2** (0.15 mmol, 1.5 eq.) were subsequently added to the mixture under nitrogen. After that the mixture was stirred at room temperature until the reaction was complete (12-24 h, monitored by TLC). The mixture was concentrated under reduced pressure, and the residue was purified by column chromatography on silica gel using (PE:EA:DCM = 40:1:20 to 60:1:20) as eluent to afford the desired product **3**.

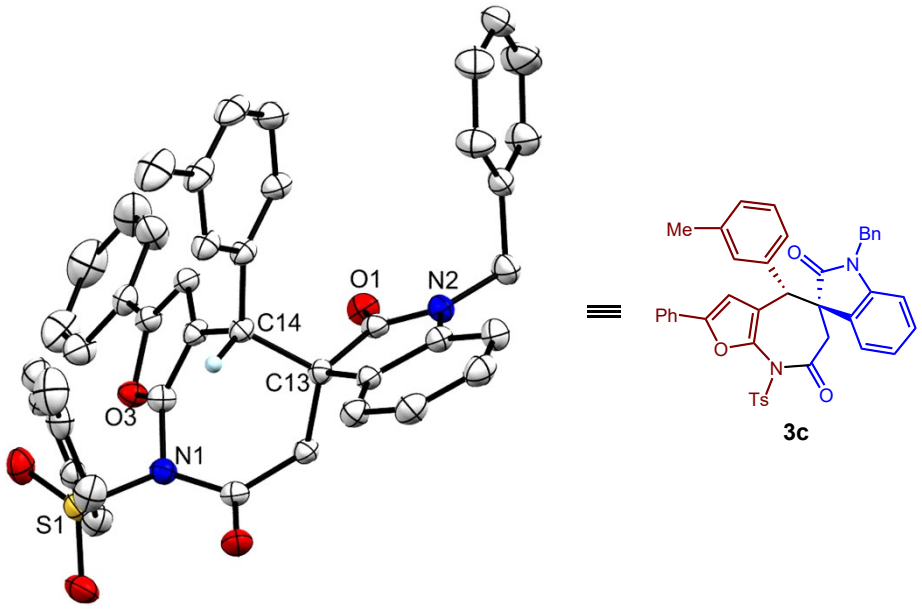
3. General procedure for the transformations of 3a



4a, 68%, dr > 20:1, 92% *ee*

To a solution of **3a** (33.2 mg, 0.05 mmol, 1.0 eq.) in DCM (1 mL) was added *m*-CPBA (15 mg, 0.085 mmol, 1.7 eq.) in portions. The reaction mixture was stirred at room temperature for 3 h until the reaction was complete (monitored by TLC). The mixture was concentrated under reduced pressure. The resulting crude residue was purified via column chromatography on silica gel (PE:EA = 5:1) to afford the desired spiroindolinone derivative **4a** with 68% (23.1 mg) yield.

4. **Crystal structure of 3c**



The single-crystal of **3c** was grown from the mixed solution of ethyl acetate and petrol ether (v:v = 1:4).

The X-ray source used for the single crystal X-ray diffraction analysis was GaKα (λ = 1.34139), and the thermal ellipsoid was drawn at the 50% probability level.

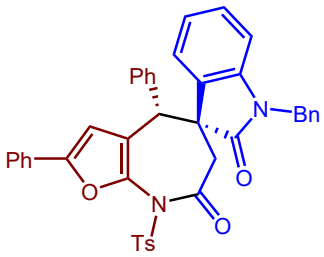
Important Structural Data:

CCDC Number	2232000
Identification code	**3c**
Empirical formula	$C_{42}H_{34}N_2O_5S$
Formula weight	678.77
Temperature/K	293(2)
Crystal system	orthorhombic
Space group	$P2_12_12_1$
a/Å	10.9916(5)
b/Å	13.2198(8)
c/Å	23.8003(10)
α/°	90

β/°	90
γ/°	90
Volume/Å^3	3458.3(3)
Z	4
ρ_{calc}g/cm^3	1.304
μ/mm^{-1}	0.143
F(000)	1424.0
Crystal size/mm^3	0.23 × 0.12 × 0.11
Radiation	MoKα (λ = 0.71073)
2Θ range for data collection/°	4.82 to 54.962
Index ranges	-14 ≤ h ≤ 14, -17 ≤ k ≤ 17, -30 ≤ l ≤ 30
Reflections collected	38329
Independent reflections	7903 [R_{int} = 0.0528, R_{sigma} = 0.0418]
Data/restraints/parameters	7903/0/454
Goodness-of-fit on F^2	1.062
Final R indexes [I>=2σ (I)]	R_1 = 0.0429, wR_2 = 0.0902
Final R indexes [all data]	R_1 = 0.0704, wR_2 = 0.1033
Largest diff. peak/hole / e Å^{-3}	0.13/-0.24
Flack parameter	-0.11(9)

5. Characterization Data of Compounds 3.

(4R,5R)-1'-Benzyl-2,4-diphenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3a)



^{1}H NMR (400 MHz, $CDCl_3$) δ 8.18 (d, *J* = 8.3 Hz, 2H), 7.80 – 7.69 (m, 2H), 7.51 (d, *J* = 8.1 Hz, 2H), 7.42 (t, *J* = 7.6 Hz, 2H), 7.34 – 7.29 (m, 1H), 7.23 – 7.09 (m, 6H), 7.07 – 6.98 (m, 3H), 6.95 – 6.88 (m, 2H), 6.76 – 6.67 (m, 2H), 6.54 (d, *J* = 7.0 Hz, 1H), 6.31 (d, *J* = 7.7 Hz, 1H), 4.67 (d, *J* = 15.9 Hz, 1H), 4.52 (d, *J* = 15.9 Hz, 1H), 4.02 (s, 1H), 3.24 (d, *J* = 12.6 Hz, 1H), 2.57 (s, 3H), 2.15 (d, *J* = 12.6 Hz, 1H).

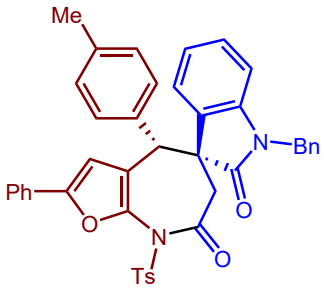
^{13}C NMR (101 MHz, $CDCl_3$) δ 175.38, 169.04, 152.84, 146.12, 141.69, 139.44, 135.68, 134.95, 134.64, 130.06, 130.01, 129.95, 129.87, 129.80, 128.85, 128.74, 128.52, 128.31, 127.89, 127.54, 126.98, 124.32, 123.65, 122.94, 121.22, 109.33, 106.63, 61.27, 47.30, 43.92, 43.85, 21.99.

HRMS (ESI) for $C_{41}H_{33}N_2O_5S^+$ $[M+H]^+$ m/z: calcd 665.2105, found 665.2096.

$[\alpha]^{25}_D$ = +27.25 (c = 0.25 in $CHCl_3$).

HPLC analysis: 96% e.e. (Chiralcel OD-H, 25:75 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 9.8 min, R_t (minor) =16.3 min.

(4R,5R)-1'-Benzyl-2-phenyl-4-(*p*-tolyl)-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3b)



^{1}H NMR (400 MHz, $CDCl_3$) δ 8.17 (d, *J* = 8.3 Hz, 2H), 7.77 – 7.70 (m, 2H), 7.51 (d, *J* = 8.1 Hz, 2H), 7.41 (t, *J* = 7.6 Hz, 2H), 7.31 (t, *J* = 7.4 Hz, 1H), 7.21 – 7.16 (m, 1H), 7.16 – 7.10 (m, 2H), 7.02 (td, *J* = 7.8, 1.1 Hz, 1H), 6.94 – 6.87 (m, 6H), 6.72 (d, *J* = 7.1 Hz, 2H), 6.51 (d, *J* = 7.1 Hz, 1H), 6.32 (d, *J* = 7.7

Hz, 1H), 4.74 (d, *J* = 16.0 Hz, 1H), 4.49 (d, *J* = 16.0 Hz, 1H), 3.97 (s, 1H), 3.23 (d, *J* = 12.6 Hz, 1H), 2.57 (s, 3H), 2.28 (s, 3H), 2.13 (d, *J* = 12.5 Hz, 1H).

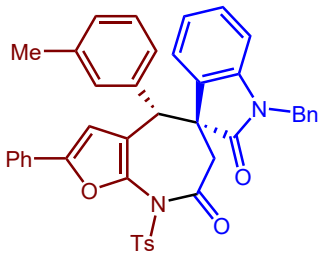
^{13}C NMR (151 MHz, $CDCl_3$) δ 175.43, 169.08, 152.76, 146.08, 141.71, 139.34, 137.48, 135.66, 134.98, 131.55, 130.11, 130.08, 129.84, 129.80, 129.78, 129.21, 128.82, 128.76, 128.61, 128.25, 127.49, 127.06, 124.28, 123.62, 122.86, 121.48, 109.33, 106.69, 61.26, 46.80, 43.96, 43.84, 21.98, 21.22.

HRMS (ESI) for $C_{42}H_{35}N_2O_5S^+$ $[M+H]^+$ m/z: calcd 679.2261, found 679.2259.

$[\alpha]^{25}_D$ = +17.25 (c = 0.25 in $CHCl_3$).

HPLC analysis: 87 % e.e. (Chiralcel OD-H, 25 :75 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 9.5 min, R_t (minor) = 13.5 min.

(4R,5R)-1'-Benzyl-2-phenyl-4-(m-tolyl)-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3c)



^{1}H NMR (600 MHz, $CDCl_3$) δ 8.17 (d, *J* = 8.3 Hz, 2H), 7.75 (d, *J* = 7.3 Hz, 2H), 7.51 (d, *J* = 8.1 Hz, 2H), 7.42 (t, *J* = 7.7 Hz, 2H), 7.31 (t, *J* = 7.4 Hz, 1H), 7.18 (t, *J* = 7.3 Hz, 1H), 7.13 (t, *J* = 7.4 Hz, 2H), 7.06 – 6.98 (m, 3H), 6.95 – 6.88 (m, 2H), 6.86 – 6.83 (m, 1H), 6.82 (s, 1H), 6.70 (d, *J* = 7.3 Hz, 2H), 6.54 (d, *J* = 7.4 Hz, 1H), 6.30 (d, *J* = 7.8 Hz, 1H), 4.71 (d, *J* = 16.1 Hz, 1H), 4.52 (d, *J* = 16.1 Hz, 1H), 3.94 (s, 1H), 3.23 (d, *J* = 12.6 Hz, 1H), 2.57 (s, 3H), 2.16 (s, 3H), 2.15 (d, *J* = 12.6 Hz, 1H).

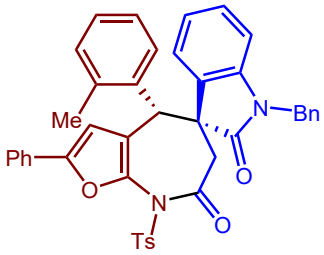
^{13}C NMR (151 MHz, $CDCl_3$) δ 175.39, 169.13, 152.79, 146.06, 141.71, 139.37, 138.10, 135.63, 134.99, 134.55, 130.74, 130.07, 130.01, 129.85, 129.80, 128.83, 128.79, 128.72, 128.64, 128.38, 128.28, 127.50, 126.93, 126.78, 124.31, 123.65, 122.86, 121.34, 109.34, 106.67, 61.25, 47.19, 43.96, 43.79, 21.99, 21.56.

HRMS (ESI) for $C_{42}H_{35}N_2O_5S^+$ $[M+H]^+$ m/z: calcd 679.2261, found 679.2260.

$[\alpha]^{25}_D$ = +25.25 (c = 0.25 in $CHCl_3$).

HPLC analysis: 79 % e.e. (Chiralcel IA, 20:80 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 12.4 min, R_t (minor) = 27.9 min.

(4R,5R)-1'-Benzyl-2-phenyl-4-(*o*-tolyl)-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3d)



^{1}H NMR (400 MHz, $CDCl_3$) δ 8.22 (d, *J* = 8.1 Hz, 2H), 7.76 (d, *J* = 6.3 Hz, 1H), 7.71 (d, *J* = 7.8 Hz, 2H), 7.47 (d, *J* = 8.0 Hz, 2H), 7.40 (t, *J* = 7.6 Hz, 2H), 7.30 (d, *J* = 7.3 Hz, 1H), 7.21 – 7.13 (m, 3H), 7.12 – 7.07 (m, 2H), 7.06 – 7.01 (m, 1H), 6.96 – 6.88 (m, 3H), 6.80 (d, *J* = 7.0 Hz, 2H), 6.74 (s, 1H), 6.37 (d, *J* = 7.7 Hz, 1H), 4.79 (d, *J* = 15.9 Hz, 1H), 4.70 (s, 1H), 4.57 (d, *J* = 15.9 Hz, 1H), 3.29 (d, *J* = 12.7 Hz, 1H), 2.53 (s, 3H), 2.14 (d, *J* = 12.6 Hz, 1H), 1.83 (s, 3H).

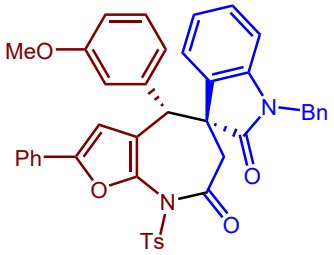
^{13}C NMR (101 MHz, $CDCl_3$) δ 176.04, 169.14, 152.57, 145.98, 141.74, 139.10, 136.77, 135.62, 135.02, 133.42, 130.87, 130.11, 130.09, 129.88, 129.82, 129.70, 129.04, 128.87, 128.82, 128.78, 128.23, 127.66, 127.57, 127.13, 126.29, 124.26, 122.75, 121.73, 109.33, 107.06, 61.48, 44.54, 44.02, 41.09, 21.96, 20.05.

HRMS (ESI) for $C_{42}H_{35}N_2O_5S^+$ $[M+H]^+$ m/z: calcd 679.2261, found 679.2270.

$[\alpha]^{25}_D$ = +20.25 (c = 0.25 in $CHCl_3$).

HPLC analysis: 85% e.e. (Chiralcel IA, 20:80 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 12.1 min, R_t (minor) = 22.7 min.

(4R,5R)-1'-Benzyl-4-(3-methoxyphenyl)-2-phenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3e)



^{1}H NMR (600 MHz, $CDCl_3$) δ 8.18 (d, *J* = 8.2 Hz, 2H), 7.75 (d, *J* = 7.4 Hz, 2H), 7.52 (d, *J* = 8.1 Hz, 2H), 7.42 (t, *J* = 7.7 Hz, 2H), 7.31 (t, *J* = 7.4 Hz, 1H), 7.20 – 7.13 (m, 3H), 7.07 – 7.01 (m, 2H), 6.93 (s, 1H), 6.91 (t, *J* = 7.6 Hz, 1H), 6.76 (dd, *J* = 8.3, 2.0 Hz, 1H), 6.73 (d, *J* = 7.3 Hz, 2H), 6.69 (d, *J* = 7.6 Hz,

1H), 6.54 – 6.49 (m, 2H), 6.34 (d, *J* = 7.8 Hz, 1H), 4.72 (d, *J* = 16.1 Hz, 1H), 4.53 (d, *J* = 16.1 Hz, 1H), 3.98 (s, 1H), 3.59 (s, 3H), 3.23 (d, *J* = 12.6 Hz, 1H), 2.56 (s, 3H), 2.15 (d, *J* = 12.6 Hz, 1H).

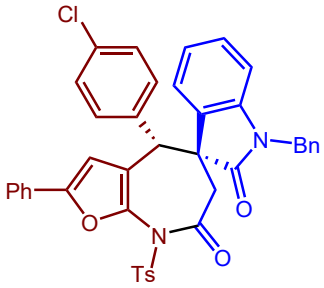
^{13}C NMR (101 MHz, $CDCl_3$) δ 175.40, 169.02, 159.39, 152.83, 146.13, 141.78, 139.41, 136.06, 135.65, 134.98, 130.02, 129.86, 129.80, 129.47, 128.87, 128.84, 128.74, 128.31, 127.52, 126.84, 124.31, 123.59, 122.88, 122.12, 121.18, 115.61, 113.66, 109.39, 106.64, 61.20, 55.18, 47.27, 43.98, 43.84, 21.95.

HRMS (ESI) for $C_{42}H_{35}N_2O_6S^+$ $[M+H]^+$ m/z: calcd 695.2210, found 695.2208.

$[\alpha]^{25}_D$ = +14.75 (c = 0.25 in $CHCl_3$).

HPLC analysis: 93 % e.e. (Chiralcel OD-H, 25 :75 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 13.7 min, R_t (minor) = 23.7 min.

(4R,5R)-1'-Benzyl-4-(4-chlorophenyl)-2-phenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3f)



^{1}H NMR (400 MHz, $CDCl_3$) δ 8.18 (d, *J* = 8.2 Hz, 2H), 7.74 (d, *J* = 7.5 Hz, 2H), 7.51 (d, *J* = 8.1 Hz, 2H), 7.42 (t, *J* = 7.6 Hz, 2H), 7.32 (t, *J* = 7.3 Hz, 1H), 7.25 – 7.17 (m, 3H), 7.10 – 7.03 (m, 3H), 7.00 – 6.91 (m, 3H), 6.85 (s, 1H), 6.76 – 6.69 (m, 2H), 6.60 (d, *J* = 7.4 Hz, 1H), 6.41 (d, *J* = 7.8 Hz, 1H), 4.77 (d, *J* = 15.9 Hz, 1H), 4.49 (d, *J* = 15.9 Hz, 1H), 4.05 (s, 1H), 3.22 (d, *J* = 12.6 Hz, 1H), 2.56 (s, 3H), 2.15 (d, *J* = 12.6 Hz, 1H).

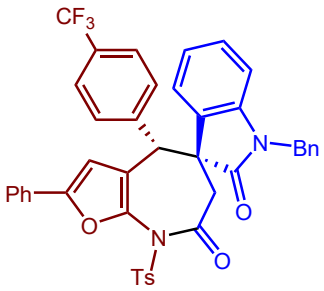
^{13}C NMR (101 MHz, $CDCl_3$) δ 175.12, 168.77, 152.91, 146.16, 141.69, 139.44, 135.61, 134.80, 133.95, 133.16, 131.26, 129.89, 129.81, 129.79, 129.75, 129.07, 128.87, 128.76, 128.71, 128.41, 127.71, 126.98, 124.28, 123.60, 123.08, 120.70, 109.44, 106.25, 61.00, 46.63, 43.87, 21.96.

HRMS (ESI) for $C_{41}H_{32}ClN_2O_5S^+$ $[M+H]^+$ m/z: calcd 699.1715, found 699.1711.

$[\alpha]^{25}_D$ = +41.00 (c = 0.25 in $CHCl_3$).

HPLC analysis: 89 % e.e. (Chiralcel OD-H, 25 :75 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 10.8 min, R_t (minor) = 17.4 min.

(4R,5R)-1'-Benzyl-2-phenyl-8-tosyl-4-(4-(trifluoromethyl)phenyl)-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3g)



^{1}H NMR (400 MHz, $CDCl_3$) δ 8.18 (d, *J* = 8.2 Hz, 2H), 7.74 (d, *J* = 7.4 Hz, 2H), 7.51 (d, *J* = 8.1 Hz, 2H), 7.42 (t, *J* = 7.6 Hz, 2H), 7.37 – 7.30 (m, 3H), 7.23 – 7.19 (m, 1H), 7.18 – 7.12 (m, 4H), 7.08 (t, *J* = 7.5 Hz, 1H), 6.96 (t, *J* = 7.5 Hz, 1H), 6.82 (s, 1H), 6.76 (d, *J* = 7.2 Hz, 2H), 6.64 (d, *J* = 7.4 Hz, 1H), 6.42 (d, *J* = 7.8 Hz, 1H), 4.75 (d, *J* = 15.8 Hz, 1H), 4.48 (d, *J* = 15.8 Hz, 1H), 4.12 (s, 1H), 3.23 (d, *J* = 12.6 Hz, 1H), 2.57 (s, 3H), 2.16 (d, *J* = 12.6 Hz, 1H).

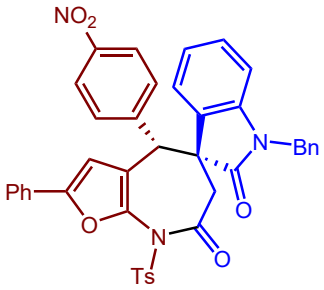
^{13}C NMR (101 MHz, $CDCl_3$) δ 175.10, 168.70, 153.08, 146.23, 141.61, 139.50, 138.78, 135.61, 134.83, 129.84, 129.83, 130.31, 129.98, 129.84, 129.83, 129.56, 129.22, 128.90, 128.79, 128.50, 127.84, 127.07, 125.40 (q, *J* = 3.6 Hz), 124.34, 123.61, 123.20, 120.43, 109.51, 106.14, 60.95, 47.07, 44.06, 44.03, 22.00.

HRMS (ESI) for $C_{42}H_{32}F_3N_2O_5S^+$ $[M+H]^+$ m/z: calcd 733.1979, found 733.1969.

$[\alpha]^{25}_D$ = +23.25 (c = 0.25 in $CHCl_3$).

HPLC analysis: 86 % e.e. (Chiralcel IA, 25 :75 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 9.9 min, R_t (minor) = 28.7 min.

(4R,5R)-1'-Benzyl-4-(4-nitrophenyl)-2-phenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3h)



^{1}H NMR (600 MHz, $CDCl_3$) δ 8.19 (d, *J* = 7.8 Hz, 2H), 7.84 (d, *J* = 8.2 Hz, 2H), 7.74 (d, *J* = 7.7 Hz, 2H), 7.52 (d, *J* = 7.8 Hz, 2H), 7.43 (t, *J* = 7.4 Hz, 2H), 7.34 (t, *J* = 7.2 Hz, 1H), 7.24 – 7.20 (m, 1H), 7.19 – 7.11 (m, 5H), 7.00 (t, *J* = 7.5 Hz, 1H), 6.85 – 6.78 (m, 3H), 6.72 (d, *J* = 7.3 Hz, 1H), 6.52 (d, *J* = 7.8

Hz, 1H), 4.67 (d, *J* = 15.7 Hz, 1H), 4.49 (d, *J* = 15.6 Hz, 1H), 4.21 (s, 1H), 3.22 (d, *J* = 12.7 Hz, 1H), 2.57 (s, 3H), 2.18 (d, *J* = 12.8 Hz, 1H).

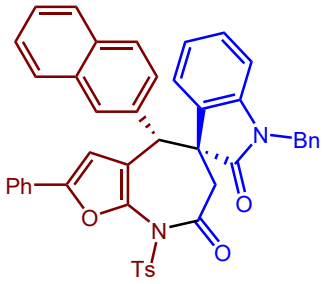
^{13}C NMR (151 MHz, $CDCl_3$) δ 174.78, 168.51, 153.17, 147.45, 146.31, 141.91, 141.58, 139.58, 135.53, 134.85, 130.81, 129.85, 129.81, 129.69, 129.46, 129.36, 128.94, 128.71, 128.62, 128.12, 127.42, 124.33, 123.71, 123.44, 123.40, 119.76, 109.39, 105.82, 60.74, 47.18, 44.00, 43.85, 22.02.

HRMS (ESI) for $C_{41}H_{32}N_3O_7S^+$ $[M+H]^+$ m/z: calcd 710.1955, found 710.1952.

$[\alpha]^{25}_D$ = +14.75 (c = 0.25 in $CHCl_3$).

HPLC analysis: 85 % e.e. (Chiralcel OD-H, 25 :75 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 22.7 min, R_t (minor) = 28.7 min.

(4R,5R)-1'-Benzyl-4-(naphthalen-2-yl)-2-phenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3i)



^{1}H NMR (400 MHz, $CDCl_3$) δ 8.22 (d, *J* = 8.3 Hz, 2H), 7.77 (dd, *J* = 9.0, 7.9 Hz, 3H), 7.67 (d, *J* = 7.9 Hz, 1H), 7.61 (d, *J* = 8.6 Hz, 1H), 7.57 – 7.39 (m, 7H), 7.31 (t, *J* = 7.4 Hz, 1H), 7.19 (dd, *J* = 8.5, 1.6 Hz, 1H), 7.05 – 6.91 (m, 4H), 6.77 (t, *J* = 7.7 Hz, 2H), 6.70 – 6.64 (m, 1H), 6.51 (d, *J* = 7.5 Hz, 2H), 6.26 – 6.19 (m, 1H), 4.71 (d, *J* = 16.0 Hz, 1H), 4.45 (d, *J* = 16.0 Hz, 1H), 4.22 (s, 1H), 3.30 (d, *J* = 12.6 Hz, 1H), 2.61 (s, 3H), 2.20 (d, *J* = 12.6 Hz, 1H).

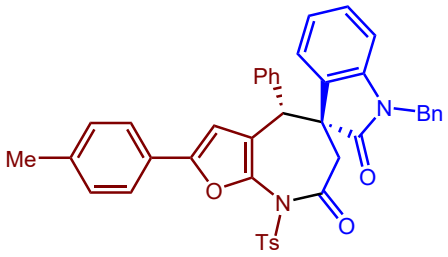
^{13}C NMR (151 MHz, $CDCl_3$) δ 175.41, 169.03, 152.85, 146.12, 141.64, 139.41, 135.66, 134.64, 133.17, 132.76, 132.26, 130.01, 129.97, 129.86, 129.85, 129.28, 128.90, 128.84, 128.48, 128.31, 128.19, 128.16, 127.65, 127.64, 127.35, 126.64, 126.44, 126.40, 124.30, 123.63, 122.97, 121.32, 109.45, 106.64, 61.27, 47.31, 44.14, 43.84, 22.04.

HRMS (ESI) for $C_{45}H_{35}N_2O_5S^+$ $[M+H]^+$ m/z: calcd 715.2261, found 715.2258.

$[\alpha]^{25}_D$ = +43.25 (c = 0.25 in $CHCl_3$).

HPLC analysis: 82 % e.e. (Chiralcel IA, 25 :75 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 13.1 min, R_t (minor) = 31.2 min.

(4R,5S)-1'-Benzyl-4-phenyl-2-(*p*-tolyl)-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3j)



^{1}H NMR (600 MHz, $CDCl_3$) δ 8.18 (d, *J* = 8.2 Hz, 2H), 7.64 (d, *J* = 8.0 Hz, 2H), 7.51 (d, *J* = 8.1 Hz, 2H), 7.23 – 7.16 (m, 4H), 7.15 – 7.09 (m, 4H), 7.05 – 6.99 (m, 3H), 6.90 (t, *J* = 7.5 Hz, 1H), 6.87 (s, 1H), 6.71 (d, *J* = 7.4 Hz, 2H), 6.51 (d, *J* = 7.4 Hz, 1H), 6.31 (d, *J* = 7.8 Hz, 1H), 4.67 (d, *J* = 16.0 Hz, 1H), 4.52 (d, *J* = 16.0 Hz, 1H), 4.00 (s, 1H), 3.24 (d, *J* = 12.6 Hz, 1H), 2.57 (s, 3H), 2.38 (s, 3H), 2.14 (d, *J* = 12.6 Hz, 1H).

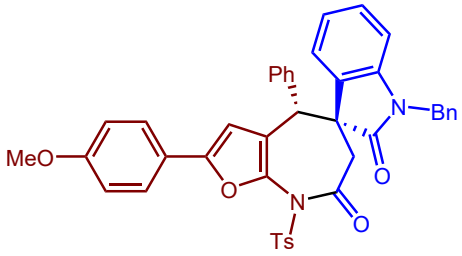
^{13}C NMR (151 MHz, $CDCl_3$) δ 175.36, 169.08, 153.11, 146.07, 141.66, 139.01, 138.24, 135.66, 134.93, 134.67, 130.01, 129.93, 129.85, 129.77, 129.52, 128.81, 128.72, 128.48, 127.84, 127.50, 127.36, 126.95, 124.26, 123.63, 122.89, 121.15, 109.30, 105.88, 61.29, 47.30, 43.90, 43.82, 21.98, 21.51.

HRMS (ESI) for $C_{42}H_{35}N_2O_5S^+$ $[M+H]^+$ m/z: calcd 679.2261, found 679.2261.

$[\alpha]^{25}_D$ = +22.75 (c = 0.25 in $CHCl_3$).

HPLC analysis: 93 % e.e. (Chiralcel OD-H, 25 :75 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 9.3 min, R_t (minor) = 16.4 min.

(4R,5S)-1'-Benzyl-2-(4-methoxyphenyl)-4-phenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3k)



^{1}H NMR (600 MHz, $CDCl_3$) δ 8.17 (d, *J* = 8.3 Hz, 2H), 7.71 – 7.66 (m, 2H), 7.51 (d, *J* = 8.1 Hz, 2H), 7.22 – 7.16 (m, 2H), 7.15 – 7.08 (m, 4H), 7.05 – 6.98 (m, 3H), 6.97 – 6.92 (m, 2H), 6.91 – 6.87 (m, 1H),

6.79 (s, 1H), 6.70 (d, *J* = 7.2 Hz, 2H), 6.48 (d, *J* = 7.3 Hz, 1H), 6.31 (d, *J* = 7.8 Hz, 1H), 4.67 (d, *J* = 16.0 Hz, 1H), 4.52 (d, *J* = 16.0 Hz, 1H), 3.98 (s, 1H), 3.85 (s, 3H), 3.24 (d, *J* = 12.6 Hz, 1H), 2.57 (s, 3H), 2.13 (d, *J* = 12.6 Hz, 1H).

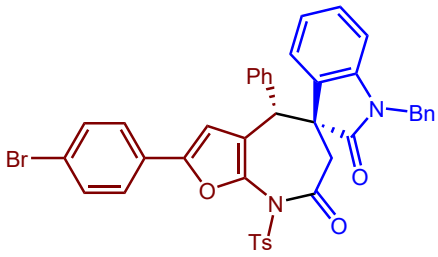
^{13}C NMR (151 MHz, $CDCl_3$) δ 175.37, 169.14, 159.77, 152.99, 146.07, 141.65, 138.70, 135.65, 134.93, 134.69, 130.00, 129.92, 129.85, 129.76, 128.80, 128.72, 128.47, 127.83, 127.51, 126.95, 125.83, 123.62, 123.07, 122.88, 121.21, 114.29, 109.30, 105.07, 61.35, 55.48, 47.29, 43.88, 43.82, 21.98.

HRMS (ESI) for $C_{42}H_{35}N_2O_6S^+$ $[M+H]^+$ m/z: calcd 695.2210, found 695.2213.

$[\alpha]^{25}_D$ = +27.25 (c = 0.25 in $CHCl_3$).

HPLC analysis: 81 % e.e. (Chiralcel OD-H, 25 :75 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 13.5 min, R_t (minor) = 24.8 min.

(4R,5S)-1'-Benzyl-2-(4-bromophenyl)-4-phenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3l)



^{1}H NMR (600 MHz, $CDCl_3$) δ 8.16 (d, *J* = 7.8 Hz, 2H), 7.74 (d, *J* = 7.9 Hz, 2H), 7.51 (d, *J* = 7.9 Hz, 2H), 7.42 (t, *J* = 7.6 Hz, 2H), 7.32 (t, *J* = 7.2 Hz, 1H), 7.25 – 7.12 (m, 6H), 7.07 – 6.99 (m, 3H), 6.90 (s, 1H), 6.70 (d, *J* = 7.3 Hz, 2H), 6.47 (s, 1H), 6.40 (d, *J* = 7.9 Hz, 1H), 4.64 (d, *J* = 16.0 Hz, 1H), 4.49 (d, *J* = 16.0 Hz, 1H), 3.95 (s, 1H), 3.22 (d, *J* = 12.6 Hz, 1H), 2.58 (s, 3H), 2.11 (d, *J* = 12.6 Hz, 1H).

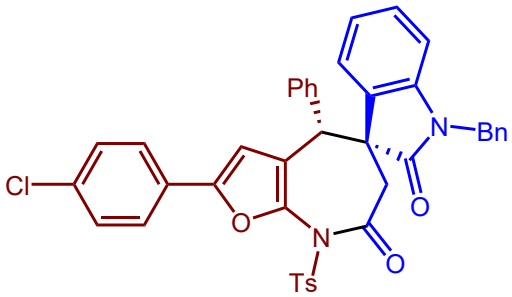
^{13}C NMR (151 MHz, $CDCl_3$) δ 175.34, 168.90, 151.76, 146.22, 141.65, 139.79, 135.57, 134.89, 134.47, 132.03, 129.87, 129.86, 129.82, 128.97, 128.89, 128.74, 128.55, 127.94, 127.56, 126.98, 125.77, 123.58, 122.94, 122.21, 121.34, 109.36, 107.17, 61.21, 47.21, 43.87, 43.85, 21.99.

HRMS (ESI) for $C_{41}H_{32}BrN_2O_5S^+$ $[M+H]^+$ m/z: calcd 743.1210, found 743.1205.

$[\alpha]^{25}_D$ = +20.50 (c = 0.25 in $CHCl_3$).

HPLC analysis: 83 % e.e. (Chiralcel OD-H, 25 :75 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 9.7 min, R_t (minor) = 29.0 min.

(4R,5S)-1'-Benzyl-2-(4-chlorophenyl)-4-phenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3m)



^{1}H NMR (400 MHz, $CDCl_3$) δ 8.17 (d, *J* = 7.8 Hz, 2H), 7.68 (d, *J* = 8.1 Hz, 2H), 7.52 (d, *J* = 7.7 Hz, 2H), 7.39 (d, *J* = 8.1 Hz, 2H), 7.24 – 7.08 (m, 6H), 7.07 – 6.97 (m, 3H), 6.95 – 6.86 (m, 2H), 6.72 (d, *J* = 6.7 Hz, 2H), 6.50 (d, *J* = 7.2 Hz, 1H), 6.32 (d, *J* = 7.7 Hz, 1H), 4.66 (d, *J* = 15.9 Hz, 1H), 4.53 (d, *J* = 15.9 Hz, 1H), 3.99 (s, 1H), 3.24 (d, *J* = 12.5 Hz, 1H), 2.58 (s, 3H), 2.15 (d, *J* = 12.5 Hz, 1H).

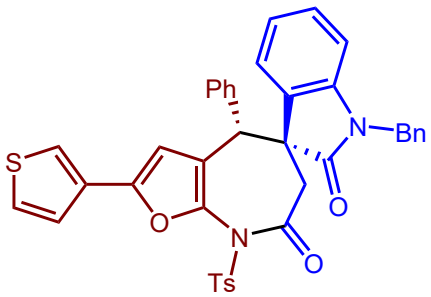
^{13}C NMR (101 MHz, $CDCl_3$) δ 175.34, 168.92, 151.75, 146.22, 141.65, 139.74, 135.58, 134.90, 134.49, 134.03, 129.99, 129.88, 129.82, 129.11, 128.89, 128.74, 128.64, 128.55, 127.94, 127.75, 127.56, 126.98, 125.54, 123.58, 122.94, 121.33, 109.36, 107.07, 61.22, 47.21, 43.86, 43.86, 21.99.

HRMS (ESI) for $C_{41}H_{32}ClN_2O_5S^+$ $[M+H]^+$ m/z: calcd 699.1715, found 699.1710.

$[\alpha]^{25}_D$ = +48.50 (c = 0.25 in $CHCl_3$).

HPLC analysis: 87 % e.e. (Chiralcel OD-H, 25 :75 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 10.6 min, R_t (minor) = 31.4 min.

(4S,5R)-1'-benzyl-4-phenyl-2-(thiophen-3-yl)-8-tosyl-4,8-dihydrospiro[furo[2,3-b]azepine-5,3'-indoline]-2',7(6H)-dione (3n)



^{1}H NMR (400 MHz, $CDCl_3$) δ 8.18 (d, *J* = 8.3 Hz, 2H), 7.51 (d, *J* = 8.2 Hz, 2H), 7.38 (dd, *J* = 3.6, 0.9 Hz, 1H), 7.29 (dd, *J* = 5.0, 0.9 Hz, 1H), 7.24 – 7.09 (m, 6H), 7.07 (dd, *J* = 5.0, 3.7 Hz, 1H), 7.04-7.00

(m, 3H), 6.91 (t, *J* = 7.5 Hz, 1H), 6.76 (s, 1H), 6.70 (d, *J* = 6.9 Hz, 2H), 6.55 (d, *J* = 7.3 Hz, 1H), 6.31 (d, *J* = 7.8 Hz, 1H), 4.67 (d, *J* = 16.0 Hz, 1H), 4.52 (d, *J* = 16.0 Hz, 1H), 4.02 (s, 1H), 3.23 (d, *J* = 12.6 Hz, 1H), 2.57 (s, 3H), 2.15 (d, *J* = 12.6 Hz, 1H).

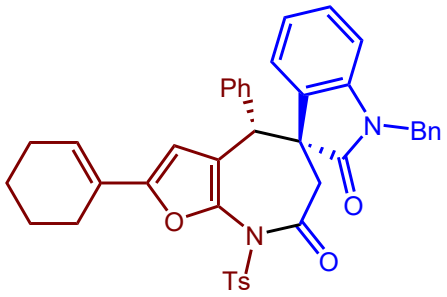
^{13}C NMR (101 MHz, $CDCl_3$) δ 175.21, 168.82, 148.34, 146.05, 141.55, 138.76, 135.46, 134.78, 134.39, 132.68, 129.84, 129.81, 129.74, 129.70, 128.77, 128.62, 128.43, 127.81, 127.78, 127.42, 126.83, 125.21, 124.03, 123.50, 122.85, 121.17, 109.24, 106.40, 61.05, 47.11, 43.78, 43.72, 21.89.

HRMS (ESI) for $C_{39}H_{31}N_2O_5S_2^+$ $[M+H]^+$ m/z: calcd 671.1669, found 671.1661.

$[\alpha]^{25}_D$ = +9.0, (c = 0.2 in $CHCl_3$).

HPLC analysis: 80 % e.e. (Chiralcel OD-H, 25 :75 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 11.8 min, R_t (minor) = 17.3 min.

(4S,5R)-1'-benzyl-2-(cyclohex-1-en-1-yl)-4-phenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-b]azepine-5,3'-indoline]-2',7(6H)-dione (3o)



^{1}H NMR (400 MHz, $CDCl_3$) δ 8.14 (d, *J* = 8.3 Hz, 2H), 7.49 (d, *J* = 8.2 Hz, 2H), 7.23 – 7.05 (m, 6H), 7.02-6.98 (m, 3H), 6.89 (t, *J* = 7.5 Hz, 1H), 6.69 (d, *J* = 7.0 Hz, 2H), 6.50-6.48 (m, 2H), 6.41 (s, 1H), 6.29 (d, *J* = 7.8 Hz, 1H), 4.66 (d, *J* = 16.0 Hz, 1H), 4.51 (d, *J* = 16.0 Hz, 1H), 3.95 (s, 1H), 3.18 (d, *J* = 12.5 Hz, 1H), 2.56 (s, 3H), 2.44-2.37 (m, 1H), 2.29-2.21 (m, 3H), 2.10 (d, *J* = 12.5 Hz, 1H), 1.80 – 1.62 (m, 4H).

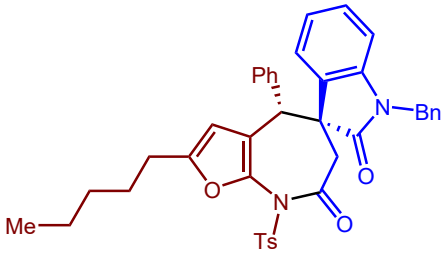
^{13}C NMR (101 MHz, $CDCl_3$) δ 175.24, 169.01, 154.25, 145.87, 141.50, 138.14, 135.53, 134.81, 134.63, 129.91, 129.79, 129.69, 129.61, 128.64, 128.58, 128.30, 127.63, 127.36, 126.80, 126.62, 124.77, 123.49, 122.75, 120.33, 109.14, 104.89, 61.24, 47.14, 43.71, 43.66, 25.28, 24.56, 22.23, 22.10, 21.86.

HRMS (ESI) for $C_{41}H_{37}N_2O_5S^+$ $[M+H]^+$ m/z: calcd 669.2418, found 669.2413.

$[\alpha]^{25}_D$ = +49, (c = 0.2 in $CHCl_3$).

HPLC analysis: 82 % e.e. (Chiralcel OD-H, 25 :75 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 7.9 min, R_t (minor) = 14.9 min.

(4R,5R)-1'-Benzyl-2-pentyl-4-phenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3p)



^{1}H NMR (600 MHz, $CDCl_3$) δ 8.13 (d, *J* = 8.2 Hz, 2H), 7.49 (d, *J* = 8.1 Hz, 2H), 7.20 – 7.06 (m, 6H), 7.02 – 6.95 (m, 3H), 6.88 (t, *J* = 7.5 Hz, 1H), 6.69 (d, *J* = 7.3 Hz, 2H), 6.48 (d, *J* = 7.4 Hz, 1H), 6.32 (s, 1H), 6.29 (d, *J* = 7.8 Hz, 1H), 4.64 (d, *J* = 16.0 Hz, 1H), 4.51 (d, *J* = 16.0 Hz, 1H), 3.94 (s, 1H), 3.13 (d, *J* = 12.5 Hz, 1H), 2.71 (t, *J* = 7.7 Hz, 2H), 2.56 (s, 3H), 2.08 (d, *J* = 12.5 Hz, 1H), 1.77 – 1.67 (m, 2H), 1.42 – 1.34 (m, 4H), 0.92 (t, *J* = 7.0 Hz, 3H).

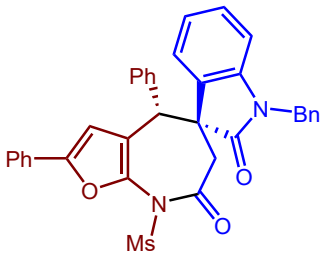
^{13}C NMR (151 MHz, $CDCl_3$) δ 175.45, 169.24, 156.15, 145.91, 141.66, 138.08, 135.76, 135.00, 134.91, 130.12, 129.94, 129.85, 129.70, 128.72, 128.36, 127.72, 127.50, 126.95, 123.70, 122.87, 119.85, 109.23, 106.98, 61.57, 47.35, 43.86, 43.81, 31.52, 28.58, 27.57, 22.53, 21.98, 14.15.

HRMS (ESI) for $C_{40}H_{39}N_2O_5S^+$ $[M+H]^+$ m/z: calcd 659.2574, found 659.2564.

$[\alpha]^{25}_D$ = +14.5 (c = 0.2 in $CHCl_3$).

HPLC analysis: 81 % e.e. (Chiralcel OD-H, 25 :75 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 6.3 min, R_t (minor) = 9.8 min.

(4R,5S)-1'-Benzyl-8-(methylsulfonyl)-2,4-diphenyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3q)



^{1}H NMR (600 MHz, $CDCl_3$) δ 7.69 (d, *J* = 7.5 Hz, 2H), 7.47 (d, *J* = 7.2 Hz, 1H), 7.38 (t, *J* = 7.7 Hz, 2H), 7.29 (t, *J* = 7.4 Hz, 1H), 7.25 – 7.22 (m, 1H), 7.21 – 7.10 (m, 9H), 6.83 (s, 1H), 6.66 (d, *J* = 7.3 Hz, 2H), 6.40 (d, *J* = 7.4 Hz, 1H), 4.78 (d, *J* = 16.0 Hz, 1H), 4.58 (s, 1H), 4.49 (d, *J* = 16.0 Hz, 1H), 3.74 (s, 3H), 3.24 (d, *J* = 13.0 Hz, 1H), 2.58 (d, *J* = 11.9 Hz, 1H).

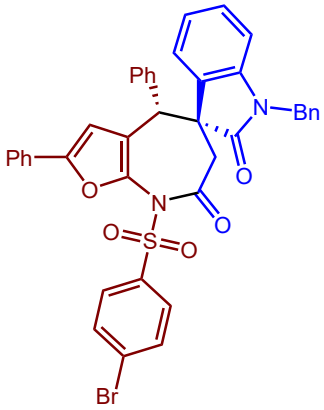
^{13}C NMR (101 MHz, $CDCl_3$) δ 175.39, 170.49, 152.51, 141.79, 138.28, 134.96, 134.89, 130.84, 130.09, 129.87, 129.15, 128.83, 128.78, 128.50, 128.30, 127.93, 127.52, 126.89, 124.23, 123.74, 123.51, 121.01, 109.52, 106.97, 59.62, 48.10, 44.39, 43.89, 43.30.

HRMS (ESI) for $C_{35}H_{29}N_2O_5S^+$ $[M+H]^+$ m/z: calcd 589.1792, found 589.1792.

$[\alpha]^{25}_D$ = +58.75 (c = 0.25 in $CHCl_3$).

HPLC analysis: 89 % ee. (Chiralcel OD-H, 25 :75 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 11.5 min, R_t (minor) = 28.5 min.

(4R,5S)-1'-Benzyl-8-((4-bromophenyl)sulfonyl)-2,4-diphenyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3r)



^{1}H NMR (400 MHz, $CDCl_3$) δ 8.16 (d, *J* = 8.3 Hz, 2H), 7.86 (d, *J* = 8.3 Hz, 2H), 7.74 (d, *J* = 7.7 Hz, 2H), 7.42 (t, *J* = 7.5 Hz, 2H), 7.32 (t, *J* = 7.3 Hz, 1H), 7.21 (dd, *J* = 14.5, 7.4 Hz, 2H), 7.17 – 7.12 (m, 4H), 7.08 – 7.02 (m, 3H), 7.00 (t, *J* = 7.4 Hz, 1H), 6.92 (s, 1H), 6.71 (d, *J* = 7.2 Hz, 2H), 6.65 (d, *J* = 7.2 Hz, 1H), 6.34 (d, *J* = 7.6 Hz, 1H), 4.68 (d, *J* = 15.9 Hz, 1H), 4.53 (d, *J* = 15.9 Hz, 1H), 4.04 (s, 1H), 3.24 (d, *J* = 12.6 Hz, 1H), 2.20 (d, *J* = 12.7 Hz, 1H).

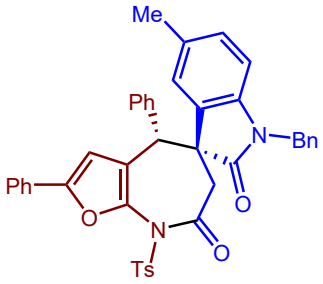
^{13}C NMR (101 MHz, $CDCl_3$) δ 175.25, 169.13, 152.98, 147.09, 141.69, 138.89, 137.43, 134.89, 134.42, 132.54, 131.25, 130.32, 129.98, 129.93, 129.01, 128.89, 128.75, 128.60, 128.44, 127.98, 127.56, 126.98, 124.31, 123.48, 123.18, 121.45, 109.45, 106.72, 61.13, 47.50, 43.89, 43.88.

HRMS (ESI) for $C_{40}H_{30}BrN_2O_5S^+$ $[M+H]^+$ m/z: calcd 729.1503, found 729.1504.

$[\alpha]^{25}_{D}$ = +24.00 (c = 0.25 in $CHCl_3$).

HPLC analysis: 86 % ee. (Chiralcel IA, 25 :75 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 16.1 min, R_t (minor) = 23.6 min.

(4R,5S)-1'-Benzyl-5'-methyl-2,4-diphenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3s)



^{1}H NMR (600 MHz, $CDCl_3$) δ 8.18 (d, *J* = 8.1 Hz, 2H), 7.75 (d, *J* = 7.7 Hz, 2H), 7.53 (d, *J* = 8.1 Hz, 2H), 7.41 (t, *J* = 7.6 Hz, 2H), 7.31 (t, *J* = 7.3 Hz, 1H), 7.22 (t, *J* = 7.3 Hz, 1H), 7.19 – 7.15 (m, 1H), 7.12 (d, *J* = 7.6 Hz, 4H), 7.01 (d, J = 7.6 Hz, 2H), 6.93 (s, 1H), 6.79 (d, *J* = 8.0 Hz, 1H), 6.70 (d, *J* = 7.4 Hz, 2H), 6.19 (d, *J* = 7.6 Hz, 2H), 4.66 (d, *J* = 16.0 Hz, 1H), 4.51 (d, *J* = 16.0 Hz, 1H), 3.89 (s, 1H), 3.24 (d, *J* = 12.5 Hz, 1H), 2.58 (s, 3H), 2.22 (s, 3H), 2.13 (d, *J* = 12.5 Hz, 1H).

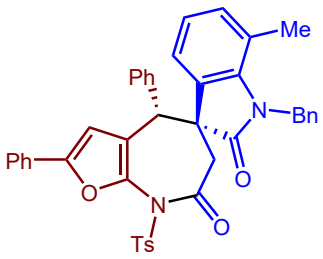
^{13}C NMR (101 MHz, $CDCl_3$) δ 175.25, 169.02, 152.89, 146.02, 139.47, 139.23, 135.81, 135.04, 134.72, 132.27, 130.03, 129.93, 129.89, 129.82, 129.13, 128.82, 128.67, 128.51, 128.28, 127.81, 127.46, 126.96, 124.30, 124.22, 121.16, 109.03, 106.61, 61.35, 47.16, 43.88, 43.81, 22.02, 21.18.

HRMS (ESI) for $C_{42}H_{35}N_2O_5S^+$ $[M+H]^+$ m/z: calcd 679.2261, found 679.2253.

$[\alpha]^{25}_{D}$ = +24.75 (c = 0.25 in $CHCl_3$).

HPLC analysis: 91 % e.e. (Chiralcel IA, 20 :80 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 16.5 min, R_t (minor) = 23.7 min.

(4R,5S)-1'-Benzyl-7'-methyl-2,4-diphenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3t)



^{1}H NMR (400 MHz, $CDCl_3$) δ 8.19 (d, *J* = 8.2 Hz, 2H), 7.73 (d, *J* = 7.5 Hz, 2H), 7.52 (d, *J* = 8.1 Hz, 2H), 7.40 (t, *J* = 7.6 Hz, 2H), 7.32 – 7.27 (m, 1H), 7.26 – 7.23 (m, 1H), 7.32 – 7.10 (m, 5H), 7.07 (d, *J* = 7.5 Hz, 2H), 6.92 (s, 1H), 6.87 – 6.78 (m, 2H), 6.55 (d, *J* = 6.9 Hz, 2H), 6.39 (dd, *J* = 6.4, 1.8 Hz, 1H), 4.93 (d, *J* = 17.1 Hz, 1H), 4.82 (d, *J* = 17.1 Hz, 1H), 4.05 (s, 1H), 3.23 (d, *J* = 12.6 Hz, 1H), 2.58 (s, 3H), 2.14 (d, *J* = 12.6 Hz, 1H), 1.94 (s, 3H).

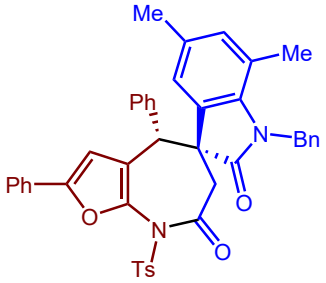
^{13}C NMR (151 MHz, $CDCl_3$) δ 176.27, 168.84, 152.72, 146.10, 139.83, 139.38, 137.03, 135.66, 134.83, 132.88, 130.60, 130.10, 130.04, 129.86, 129.78, 128.81, 128.61, 128.24, 127.88, 127.07, 125.41, 124.25, 122.93, 121.61, 121.34, 119.80, 106.68, 60.72, 47.20, 44.99, 44.61, 21.99, 18.43.

HRMS (ESI) for $C_{42}H_{35}N_2O_5S^+$ $[M+H]^+$ m/z: calcd 679.2261, found 679.2257.

$[\alpha]^{25}_D$ = +26.00 (c = 0.25 in $CHCl_3$).

HPLC analysis: 96 % e.e. (Chiralcel IA, 25 :75 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 15.3 min, R_t (minor) = 25.1 min.

(4R,5S)-1'-Benzyl-5',7'-dimethyl-2,4-diphenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3u)



^{1}H NMR (400 MHz, $CDCl_3$) δ 8.18 (d, *J* = 7.0 Hz, 2H), 7.73 (d, *J* = 6.8 Hz, 2H), 7.53 (d, *J* = 7.1 Hz, 2H), 7.44 – 7.37 (m, 2H), 7.34 – 7.27 (m, 2H), 7.21 – 7.09 (m, 5H), 7.05 (d, *J* = 6.6 Hz, 2H), 6.90 (s, 1H), 6.60 (s, 1H), 6.56 (d, *J* = 5.6 Hz, 2H), 6.08 (s, 1H), 4.91 (d, *J* = 17.2 Hz, 1H), 4.80 (d, *J* = 16.9 Hz, 1H), 3.93 (s, 1H), 3.22 (d, *J* = 12.3 Hz, 1H), 2.58 (s, 3H), 2.19 (s, 3H), 2.12 (d, *J* = 11.8 Hz, 1H), 1.88 (s, 3H).

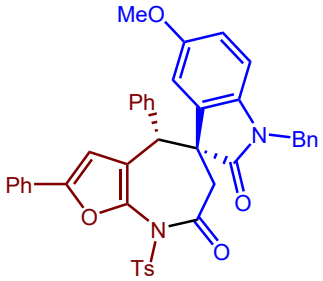
^{13}C NMR (101 MHz, $CDCl_3$) δ 176.21, 168.85, 152.82, 145.98, 139.43, 137.36, 137.12, 135.88, 134.98, 133.37, 132.20, 130.61, 130.08, 129.95, 129.85, 128.81, 128.78, 128.64, 128.24, 127.82, 127.05, 125.47, 124.29, 122.18, 121.31, 119.43, 106.70, 60.88, 47.12, 44.94, 44.61, 22.04, 20.88, 18.27.

HRMS (ESI) for $C_{43}H_{37}N_2O_5S^+$ $[M+H]^+$ m/z: calcd 693.2418, found 693.2415.

$[\alpha]^{25}_D$ = +18.50 (c = 0.25 in $CHCl_3$).

HPLC analysis: 76 % e.e. (Chiralcel OD-H, 25 :75 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 7.1 min, R_t (minor) = 13.1 min.

(4R,5S)-1'-Benzyl-5'-methoxy-2,4-diphenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3v)



^{1}H NMR (600 MHz, $CDCl_3$) δ 8.16 (d, *J* = 8.2 Hz, 2H), 7.75 (d, *J* = 7.5 Hz, 2H), 7.50 (d, *J* = 8.1 Hz, 2H), 7.41 (t, *J* = 7.7 Hz, 2H), 7.31 (t, *J* = 7.4 Hz, 1H), 7.23 (t, *J* = 7.4 Hz, 1H), 7.20 – 7.10 (m, 5H), 7.07 (d, *J* = 7.5 Hz, 2H), 6.92 (s, 1H), 6.70 (d, *J* = 7.3 Hz, 2H), 6.51 (dd, *J* = 8.5, 2.4 Hz, 1H), 6.20 (d, *J* = 8.5 Hz, 1H), 6.11 (d, *J* = 2.2 Hz, 1H), 4.66 (d, *J* = 16.0 Hz, 1H), 4.51 (d, *J* = 16.0 Hz, 1H), 3.94 (s, 1H), 3.70 (s, 3H), 3.25 (d, *J* = 12.6 Hz, 1H), 2.56 (s, 3H), 2.15 (d, *J* = 12.6 Hz, 1H).

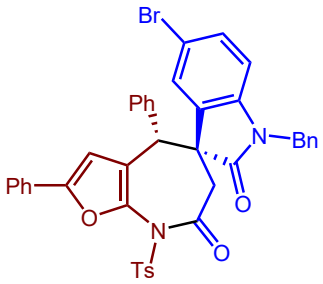
^{13}C NMR (151 MHz, $CDCl_3$) δ 175.05, 169.02, 156.15, 152.85, 146.30, 139.44, 135.61, 135.01, 134.93, 134.67, 131.21, 130.03, 129.92, 129.87, 129.75, 128.82, 128.69, 128.55, 128.27, 127.87, 127.48, 126.95, 124.30, 121.16, 112.97, 111.19, 109.67, 106.61, 61.66, 55.83, 47.30, 43.89, 43.87, 21.97.

HRMS (ESI) for $C_{42}H_{35}N_2O_6S^+$ $[M+H]^+$ m/z: calcd 695.2210, found 695.2210.

$[\alpha]^{25}_D$ = +26.50 (c = 0.25 in $CHCl_3$).

HPLC analysis: 81% e.e. (Chiralcel IA, 20 :80 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 22.3 min, R_t (minor) = 28.1 min.

(4R,5S)-1'-Benzyl-5'-bromo-2,4-diphenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3w)



^{1}H NMR (400 MHz, $CDCl_3$) δ 8.14 (d, *J* = 8.2 Hz, 2H), 7.76 (d, *J* = 7.5 Hz, 2H), 7.56 (d, *J* = 8.1 Hz, 2H), 7.42 (t, *J* = 7.6 Hz, 2H), 7.32 (t, *J* = 7.3 Hz, 1H), 7.25 – 7.09 (m, 7H), 6.96 (d, *J* = 7.5 Hz, 2H), 6.90 (s, 1H), 6.69 (d, *J* = 7.2 Hz, 2H), 6.37 (d, *J* = 1.1 Hz, 1H), 6.16 (d, *J* = 8.3 Hz, 1H), 4.62 (d, *J* = 16.0 Hz, 1H), 4.52 (d, *J* = 16.0 Hz, 1H), 3.67 (s, 1H), 3.24 (d, *J* = 12.5 Hz, 1H), 2.61 (s, 3H), 2.14 (d, *J* = 12.5 Hz, 1H).

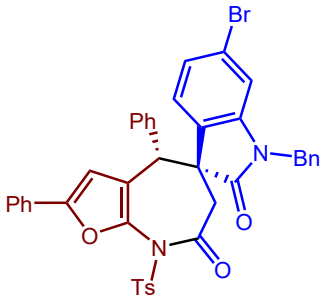
^{13}C NMR (101 MHz, $CDCl_3$) δ 174.73, 168.81, 153.17, 146.58, 140.67, 139.59, 135.31, 134.38, 134.20, 131.78, 130.18, 129.91, 129.78, 129.73, 128.86, 128.82, 128.70, 128.41, 128.07, 127.74, 126.91, 126.72, 124.35, 120.66, 115.63, 110.78, 106.46, 61.37, 47.14, 43.88, 43.51, 22.24.

HRMS (ESI) for $C_{41}H_{32}BrN_2O_5S^+$ $[M+H]^+$ m/z: calcd 743.1210, found 743.1198.

$[\alpha]^{25}_D$ = +16.00 (c = 0.25 in $CHCl_3$).

HPLC analysis: 76 % e.e. (Chiralcel IA, 20 :80 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 18.8 min, R_t (minor) = 22.1 min.

(4R,5S)-1'-Benzyl-6'-bromo-2,4-diphenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3x)



^{1}H NMR (400 MHz, $CDCl_3$) δ 8.16 (d, *J* = 8.0 Hz, 2H), 7.74 (d, *J* = 7.8 Hz, 2H), 7.51 (d, *J* = 8.0 Hz, 2H), 7.42 (t, *J* = 7.6 Hz, 2H), 7.32 (t, *J* = 7.3 Hz, 1H), 7.25 – 7.12 (m, 6H), 7.03 (t, *J* = 8.5 Hz, 3H), 6.90 (s, 1H), 6.70 (d, *J* = 7.3 Hz, 2H), 6.47 (s, 1H), 6.40 (d, *J* = 8.0 Hz, 1H), 4.64 (d, *J* = 16.0 Hz, 1H), 4.49 (d, *J* = 16.0 Hz, 1H), 3.95 (s, 1H), 3.22 (d, *J* = 12.6 Hz, 1H), 2.57 (s, 3H), 2.11 (d, *J* = 12.6 Hz, 1H).

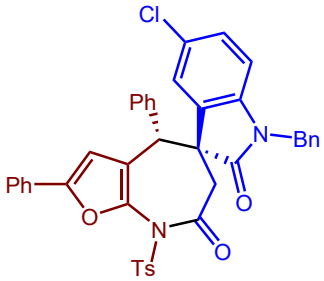
^{13}C NMR (101 MHz, $CDCl_3$) δ 175.23, 168.81, 152.97, 146.24, 143.05, 139.37, 135.56, 134.32, 134.27, 129.94, 129.88, 129.85, 129.81, 128.98, 128.90, 128.87, 128.72, 128.39, 128.11, 127.78, 126.90, 125.84, 124.94, 124.31, 122.59, 121.01, 112.63, 106.53, 61.01, 47.12, 43.93, 43.82, 22.02.

HRMS (ESI) for $C_{41}H_{32}BrN_2O_5S^+$ $[M+H]^+$ m/z: calcd 743.1210, found 743.1204.

$[\alpha]^{25}_D$ = +37.25 (c = 0.25 in $CHCl_3$).

HPLC analysis: 90 % e.e. (Chiralcel OD-H, 25 :75 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 8.5 min, R_t (minor) = 17.2 min.

(4R,5S)-1'-Benzyl-5'-chloro-2,4-diphenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3y)



^{1}H NMR (600 MHz, $CDCl_3$) δ 8.15 (d, *J* = 8.3 Hz, 2H), 7.80 – 7.73 (m, 2H), 7.55 (d, *J* = 8.1 Hz, 2H), 7.42 (t, *J* = 7.8 Hz, 2H), 7.32 (t, *J* = 7.4 Hz, 1H), 7.23 (t, *J* = 7.4 Hz, 1H), 7.21 – 7.10 (m, 5H), 7.01 – 6.94 (m, 3H), 6.90 (s, 1H), 6.68 (d, *J* = 7.2 Hz, 2H), 6.19 (dd, *J* = 6.8, 5.2 Hz, 2H), 4.62 (d, *J* = 16.1 Hz, 1H), 4.52 (d, *J* = 16.1 Hz, 1H), 3.73 (s, 1H), 3.25 (d, *J* = 12.6 Hz, 1H), 2.60 (s, 3H), 2.14 (d, *J* = 12.6 Hz, 1H).

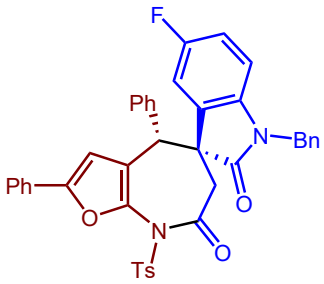
^{13}C NMR (151 MHz, $CDCl_3$) δ 174.85, 168.77, 153.17, 146.64, 140.21, 139.65, 135.42, 134.44, 134.27, 131.50, 130.11, 129.94, 129.83, 129.82, 128.87, 128.83, 128.70, 128.41, 128.33, 128.07, 127.73, 126.91, 124.37, 124.04, 120.70, 110.29, 106.45, 61.42, 47.17, 43.93, 43.55, 22.14.

HRMS (ESI) for $C_{41}H_{32}ClN_2O_5S^+$ $[M+H]^+$ m/z: calcd 699.1715, found 699.1714.

$[\alpha]^{25}_D$ = +24.25 (c = 0.25 in $CHCl_3$).

HPLC analysis: 82 % e.e. (Chiralcel OD-H, 25 :75 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 9.8 min, R_t (minor) = 22.8 min.

(4R,5S)-1'-Benzyl-5'-fluoro-2,4-diphenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3z)



^{1}H NMR (400 MHz, $CDCl_3$) δ 8.17 (d, *J* = 8.0 Hz, 2H), 7.76 (d, *J* = 7.5 Hz, 2H), 7.54 (d, *J* = 8.0 Hz, 2H), 7.42 (t, *J* = 7.5 Hz, 2H), 7.35 – 7.29 (m, 1H), 7.23 (d, *J* = 7.3 Hz, 1H), 7.21 – 7.09 (m, 5H), 7.03 (d, *J* = 7.4 Hz, 2H), 6.91 (s, 1H), 6.80 – 6.60 (m, 3H), 6.19 (dd, *J* = 8.4, 3.9 Hz, 1H), 5.95 (d, *J* = 7.7 Hz, 1H), 4.64 (d, *J* = 16.0 Hz, 1H), 4.51 (d, *J* = 16.0 Hz, 1H), 3.85 (s, 1H), 3.26 (d, *J* = 12.6 Hz, 1H), 2.58 (s, 3H), 2.14 (d, *J* = 12.6 Hz, 1H).

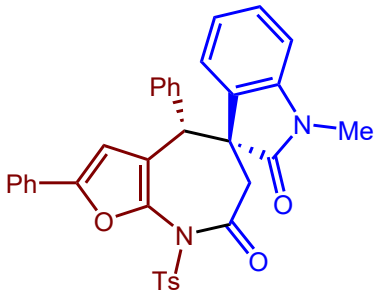
^{13}C NMR (101 MHz, $CDCl_3$) δ 175.04, 168.85, 153.12, 146.73, 139.63, 137.58, 135.49, 134.59, 134.35, 131.63 – 131.42 (m), 129.96, 129.87, 128.87, 128.81, 128.68, 128.41, 128.08, 127.67, 126.90, 124.36, 120.86, 115.35, 115.12, 111.90, 111.65, 110.01, 109.93, 106.46, 61.59, 47.25, 43.95, 43.60, 21.93.

HRMS (ESI) for $C_{41}H_{32}FN_2O_5S^+$ $[M+H]^+$ m/z: calcd 683.2010, found 683.2004.

$[\alpha]^{25}_D$ = +1.25 (c = 0.25 in $CHCl_3$).

HPLC analysis: 80% e.e. (Chiralcel OD-H, 25 :75 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 9.3 min, R_t (minor) = 20.0 min.

(4R,5S)-1'-Methyl-2,4-diphenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3aa)



^{1}H NMR (400 MHz, $CDCl_3$) δ 8.16 (d, *J* = 8.2 Hz, 2H), 7.75 (d, *J* = 7.4 Hz, 2H), 7.50 (d, *J* = 8.1 Hz, 2H), 7.41 (t, *J* = 7.6 Hz, 2H), 7.31 (t, *J* = 7.4 Hz, 1H), 7.16 – 7.07 (m, 4H), 6.92 (t, *J* = 7.3 Hz, 3H), 6.88 (s, 1H), 6.56 (d, *J* = 7.4 Hz, 1H), 6.42 (d, *J* = 7.8 Hz, 1H), 3.86 (s, 1H), 3.21 (d, *J* = 12.6 Hz, 1H), 2.82 (s, 3H), 2.57 (s, 3H), 2.15 (d, *J* = 12.6 Hz, 1H).

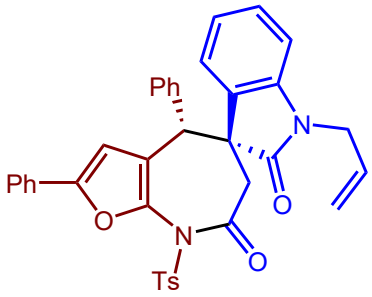
^{13}C NMR (151 MHz, $CDCl_3$) δ 175.13, 169.49, 152.82, 146.10, 142.30, 139.32, 135.55, 134.29, 130.07, 130.04, 129.80, 129.77, 129.48, 128.83, 128.27, 128.03, 127.91, 124.27, 123.50, 122.91, 120.94, 107.88, 106.51, 61.26, 48.07, 42.84, 25.99, 21.99.

HRMS (ESI) for $C_{35}H_{29}N_2O_5S^+$ $[M+H]^+$ m/z: calcd 589.1792, found 589.1794

$[\alpha]^{25}_D$ = +0.75 (c = 0.25 in $CHCl_3$).

HPLC analysis: 95 % e.e. (Chiralcel IA, 20:80 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 11.2 min, R_t (minor) = 17.9 min.

(4S,5R)-1'-allyl-2,4-diphenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-b]azepine-5,3'-indoline]-2',7(6H)-dione (3ab)



^{1}H NMR (400 MHz, $CDCl_3$) δ 8.17 (d, *J* = 8.1 Hz, 2H), 7.75 (d, *J* = 7.6 Hz, 2H), 7.51 (d, *J* = 8.0 Hz, 1H), 7.41 (t, *J* = 7.6 Hz, 1H), 7.31 (t, *J* = 7.3 Hz, 1H), 7.12 (dt, *J* = 15.1, 8.2 Hz, 2H), 6.99 (d, *J* = 7.0 Hz, 1H), 6.96 – 6.88 (m, 1H), 6.53 (d, *J* = 7.4 Hz, 1H), 6.46 (d, *J* = 7.8 Hz, 1H), 5.43 – 5.23 (m, 1H), 4.96 (d, *J* = 10.4 Hz, 1H), 4.65 (d, *J* = 17.2 Hz, 1H), 4.17 (dd, *J* = 16.4, 4.3 Hz, 1H), 3.94 (s, 1H), 3.86 (dd, *J* = 16.4, 5.2 Hz, 1H), 3.20 (d, *J* = 12.6 Hz, 1H), 2.57 (s, 1H), 2.13 (d, *J* = 12.6 Hz, 1H).

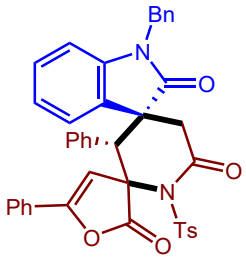
^{13}C NMR (101 MHz, $CDCl_3$) δ 174.79, 169.10, 152.69, 146.00, 141.56, 139.28, 135.51, 134.34, 130.47, 129.88, 129.73, 129.67, 128.72, 128.66, 128.20, 127.76, 124.17, 123.48, 122.74, 120.98, 117.68, 108.94, 106.46, 61.01, 47.48, 43.34, 42.25, 21.88.

HRMS (ESI) for $C_{37}H_{31}N_2O_5S^+$ $[M+H]^+$ m/z: calcd 615.1948, found 615.1949.

$[\alpha]^{25}_D$ = +15, (c = 0.1 in $CHCl_3$).

HPLC analysis: 81 % e.e. (Chiralcel OD-H, 25 :75 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 7.9 min, R_t (minor) = 13.4 min.

(3R,3'S)-1''-Benzyl-3',5-diphenyl-1'-tosyl-2H-dispiro[furan-3,2'-piperidine-4',3''-indoline]-2,2'',6'-trione (4a)



^{1}H NMR (600 MHz, $CDCl_3$) δ 8.05 (d, *J* = 8.0 Hz, 2H), 7.42 (d, *J* = 6.3 Hz, 2H), 7.37 – 7.28 (m, 10H), 7.07 (d, *J* = 7.4 Hz, 1H), 7.01 (t, *J* = 7.4 Hz, 2H), 6.94 (d, *J* = 6.4 Hz, 1H), 6.89 (dd, *J* = 14.5, 7.2 Hz, 2H), 6.84 (s, 1H), 6.76 (d, *J* = 7.2 Hz, 1H), 6.61 (d, *J* = 7.7 Hz, 1H), 6.55 (t, *J* = 7.0 Hz, 1H), 4.99 (d, *J* = 15.2 Hz, 1H), 4.84 (d, *J* = 15.3 Hz, 1H), 4.05 (s, 1H), 3.03 (d, *J* = 16.9 Hz, 1H), 2.71 (d, *J* = 17.0 Hz, 1H), 2.44 (s, 3H).

^{13}C NMR (151 MHz, $CDCl_3$) δ 176.97, 167.67, 154.27, 145.20, 142.09, 136.11, 135.16, 132.31, 131.03, 130.27, 129.86, 129.30, 129.11, 129.05, 128.99, 128.60, 128.51, 128.11, 127.92, 127.84, 127.69, 127.06, 125.49, 123.36, 122.97, 109.48, 103.34, 72.32, 57.17, 49.98, 44.28, 43.51, 21.88.

HRMS (ESI) for $C_{41}H_{33}N_2O_5S^+$ $[M+H]^+$ m/z: calcd 681.2054, found 681.2055.

$[\alpha]^{25}_D$ = +5.00 (c = 0.25 in $CHCl_3$).

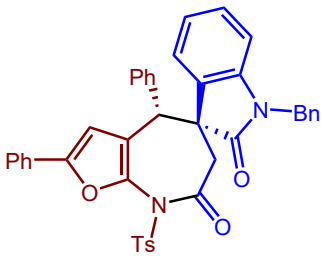
HPLC analysis: 92 % e.e. (Chiralcel OD-H, 25 :75 *i*PrOH/Hexane, 1.0 mL/min), R_t (major) = 22.3 min, R_t (minor) = 33.0 min.

6. References.

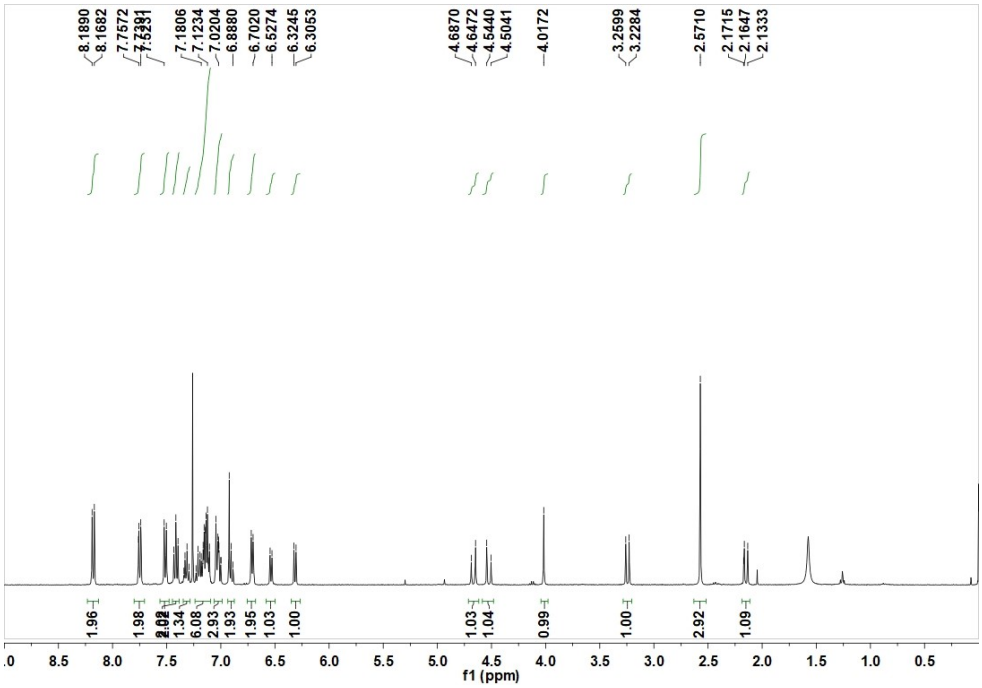
[1] (a) G. Q. Yang, Y.-M. Ke and Y. Zhao, *Angew. Chem., Int. Ed.* 2021, **60**, 12775–12780; (b) Y. Luo, K.-M. Qiu, X. Lu, K. Liu, J. Fu and H.-L. Zhu, *Bioorg. Med. Chem.* 2011, **19**, 4730–4738.

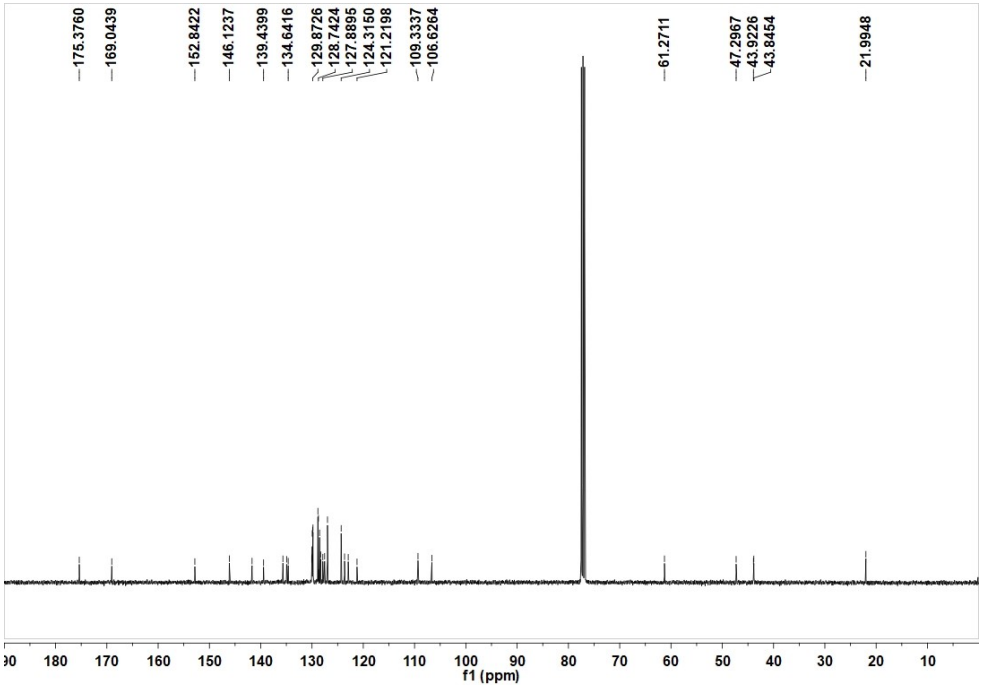
[2] T. Mukaiyama, K. Ogata, I. Sato and Y. Hayashi, *Chem. Eur. J.* 2014, **20**, 13583–13588.

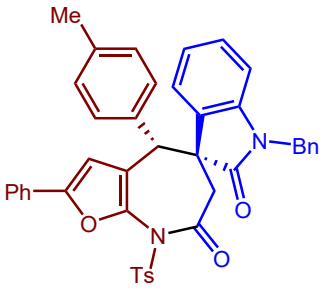
7. ^{1}H NMR, ^{13}C NMR and HPLC Spectra of the Compounds.



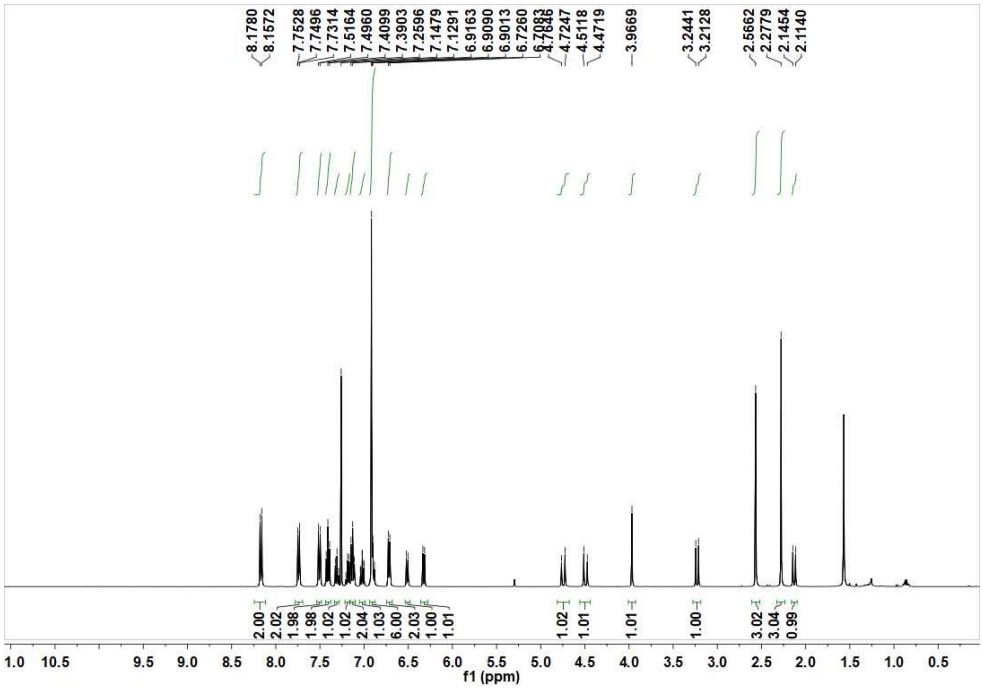
3a






Me
Ph
O
N
Ts
N
Bn
O
O

3b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7.7314
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7.3903
7.2696
7.1479
7.1291
6.9163
6.9090
6.9013
6.7260
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4.5118
4.4719
3.9669
3.2441
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2.5662
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2.02
1.98
1.02
1.02
1.02
2.04
1.03
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1.01
1.01
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3.02
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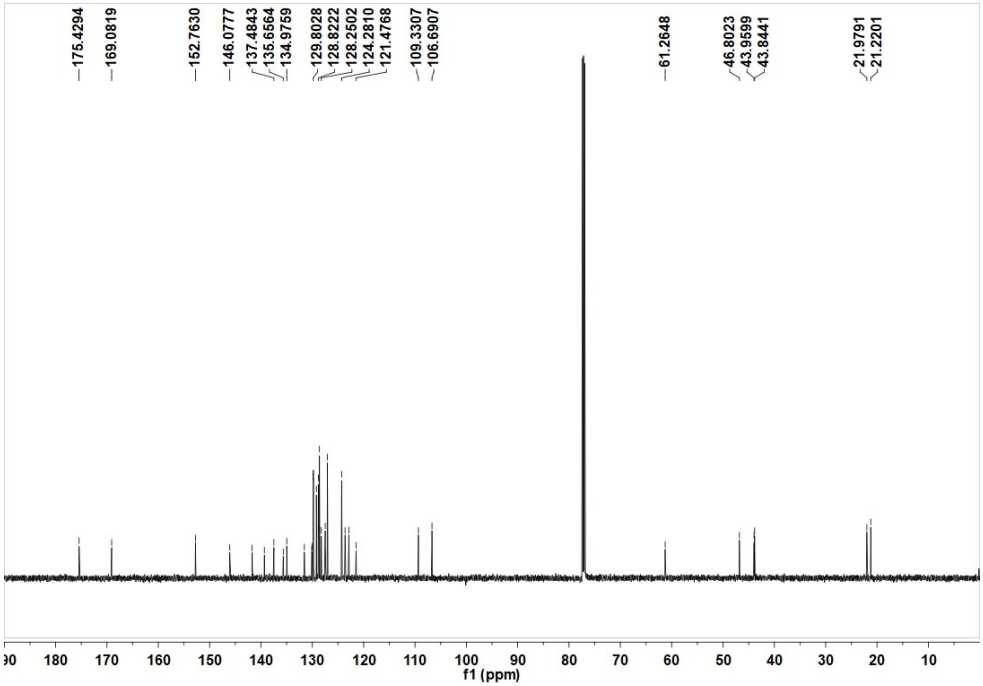
f1 (ppm)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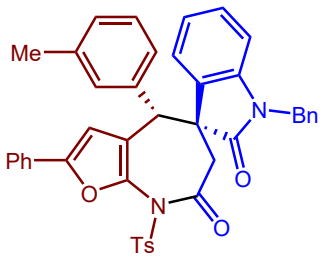
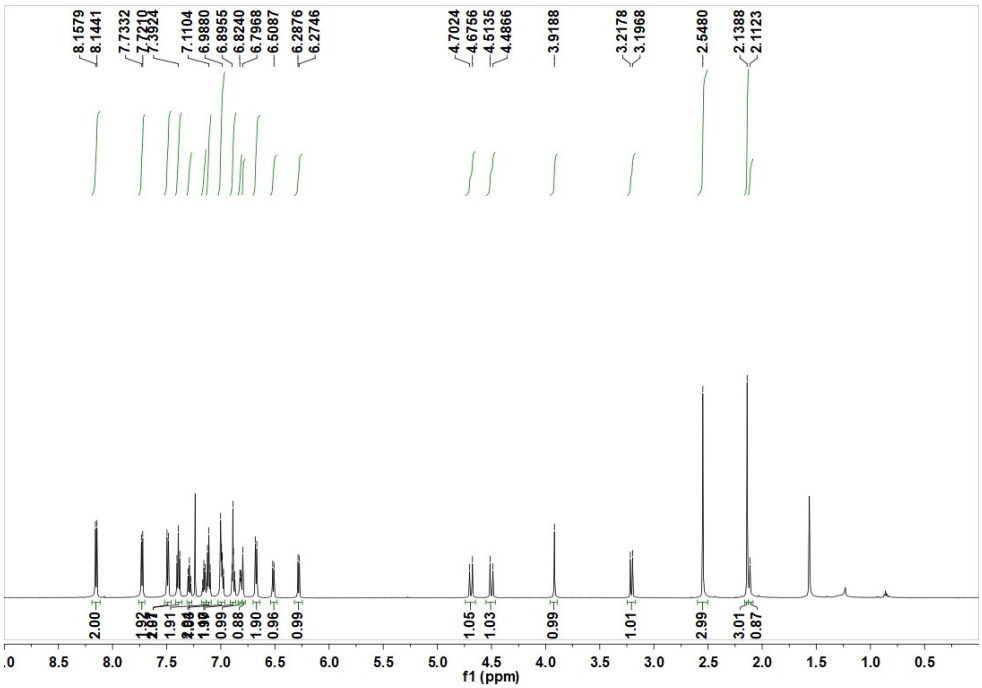
f1 (ppm)


Me
Ph
O
N
Ts
O
O
N
Bn

3c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7.7210
7.3824
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6.9880
6.8955
6.8240
6.7968
6.5087
6.2876
6.2746
4.7024
4.6756
4.5135
4.4866
3.9188
3.2178
3.1968
2.5480
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1.91
1.90
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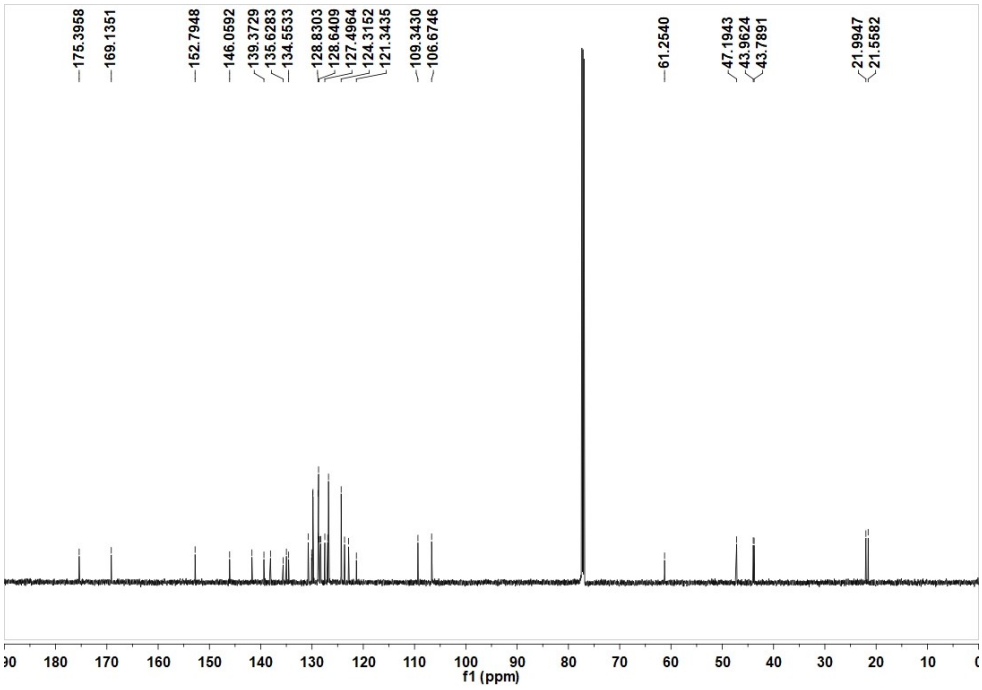
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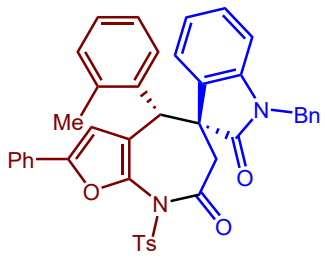
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Ph
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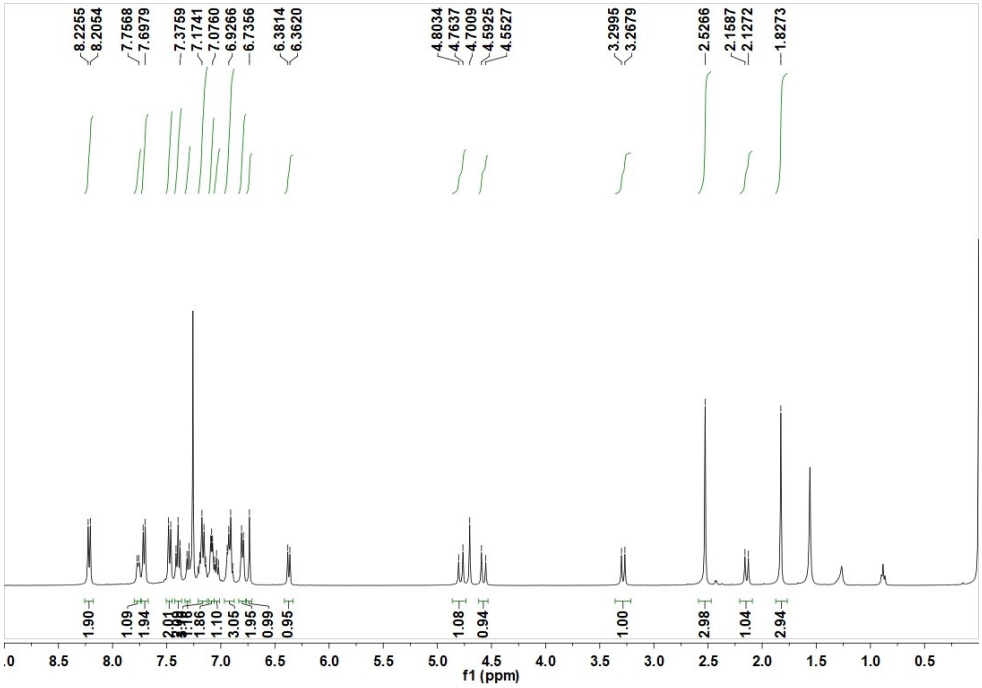
N
Ts
O
N
Bn
O

3d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7.3759
7.1741
7.0760
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6.7356
6.3814
6.3620
4.8034
4.7637
4.7009
4.5925
4.5527
3.2995
3.2679
2.5266
2.1587
2.1272
1.8273
1.90
1.09
1.94
1.10
3.05
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1.08
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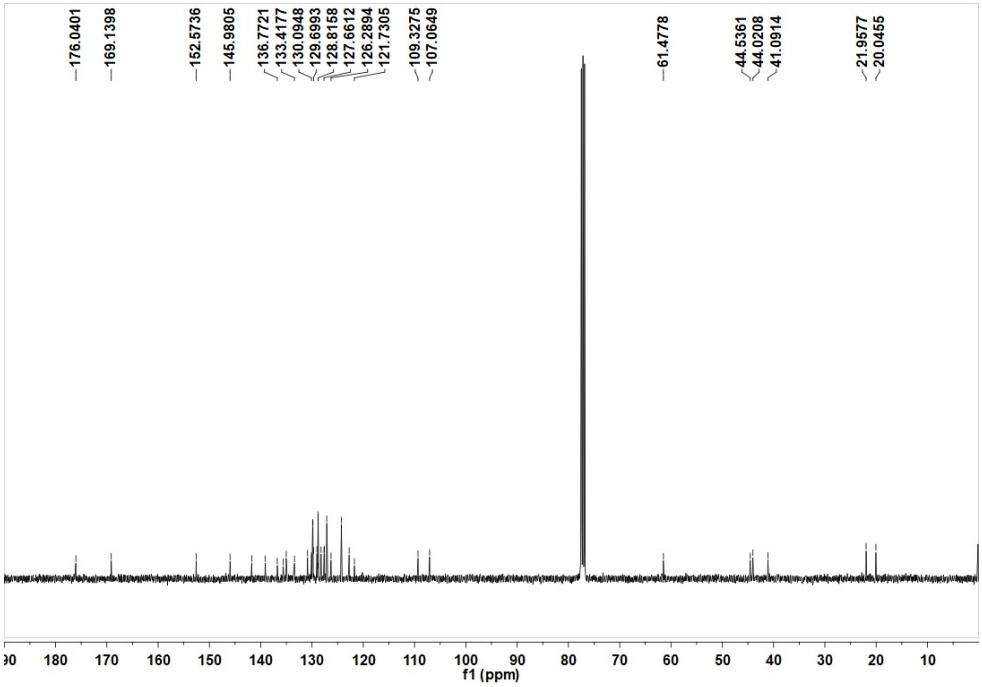
2.94
f1 (ppm)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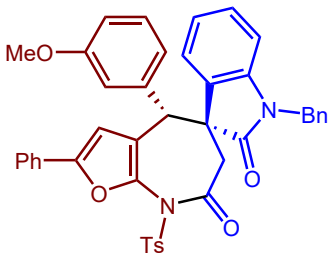
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Bn
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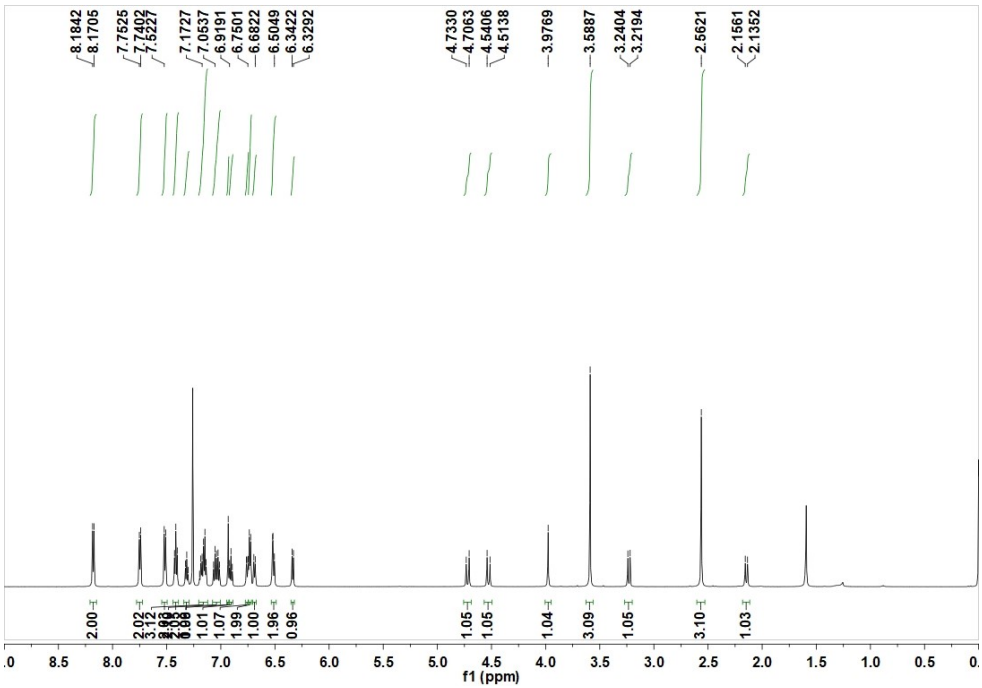
O
O
N
O
Ts

3e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6.3422
6.3292
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4.5138
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3.5887
3.2404
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2.02
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1.05
1.04
3.09
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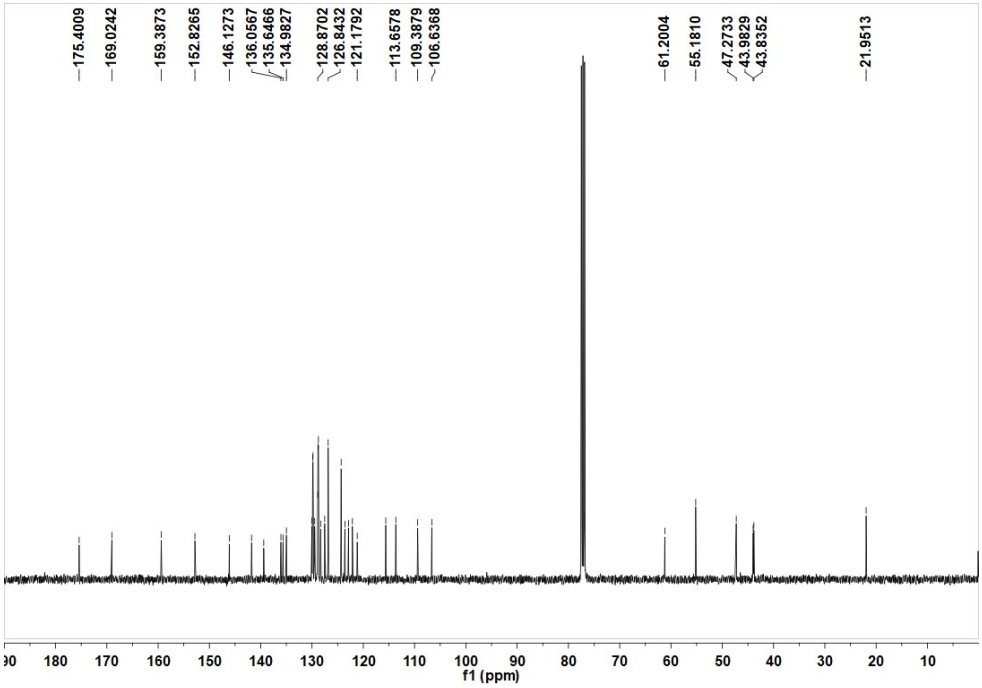
f1 (ppm)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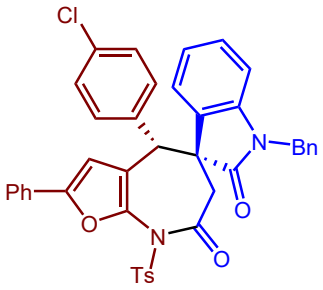
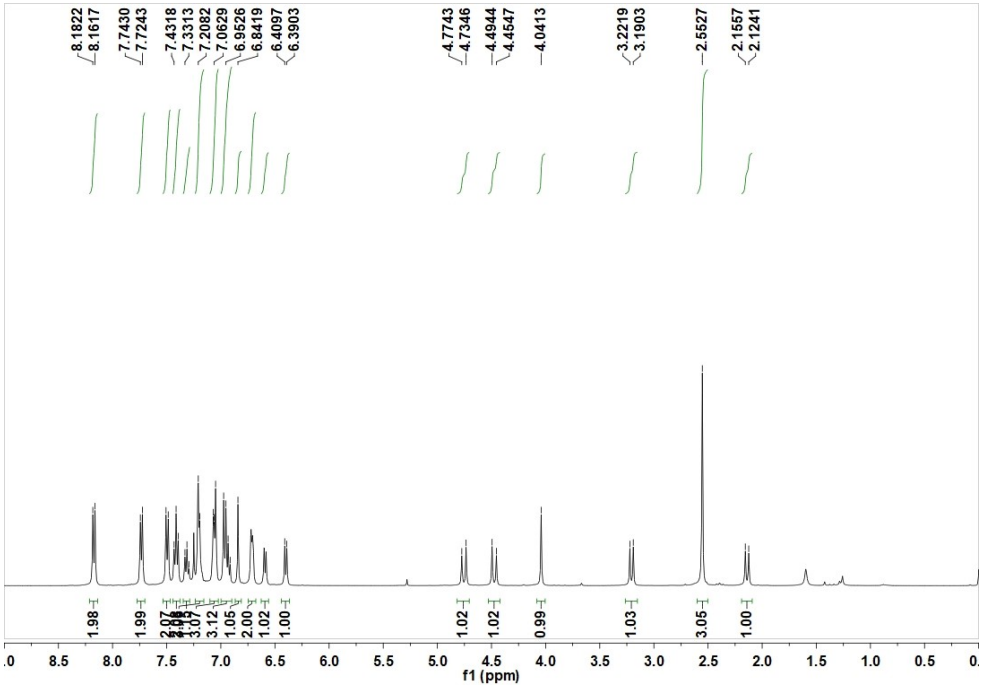
f1 (ppm)


Cl
N
Bn
Ph
O
O
N
O
Ts

3f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7.2082
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6.3903
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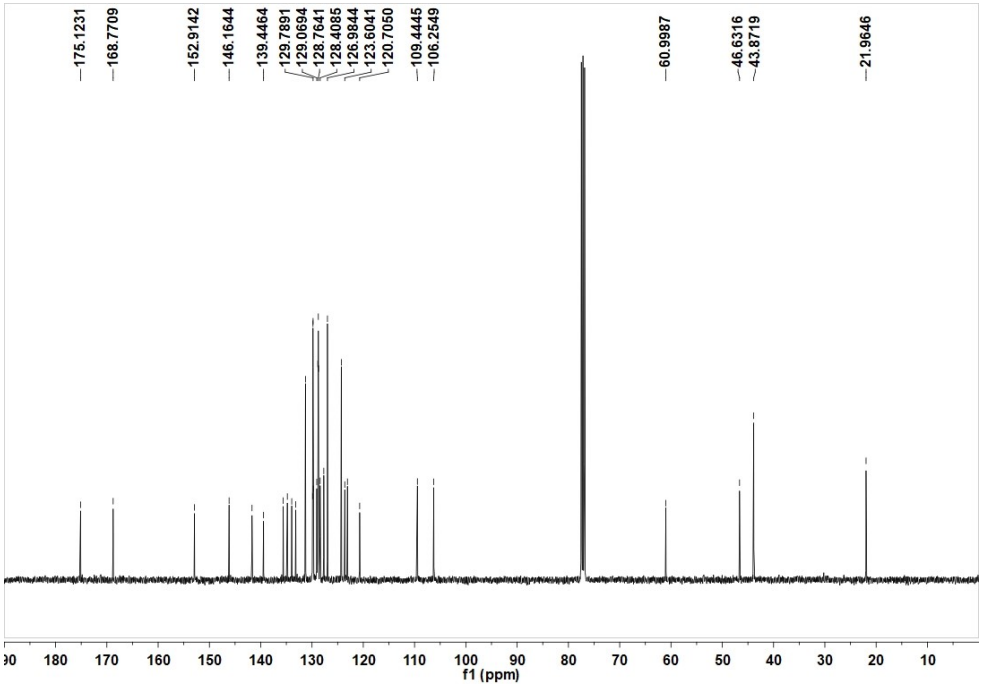
f1 (ppm)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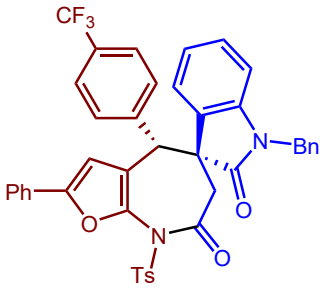
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Bn
Ph
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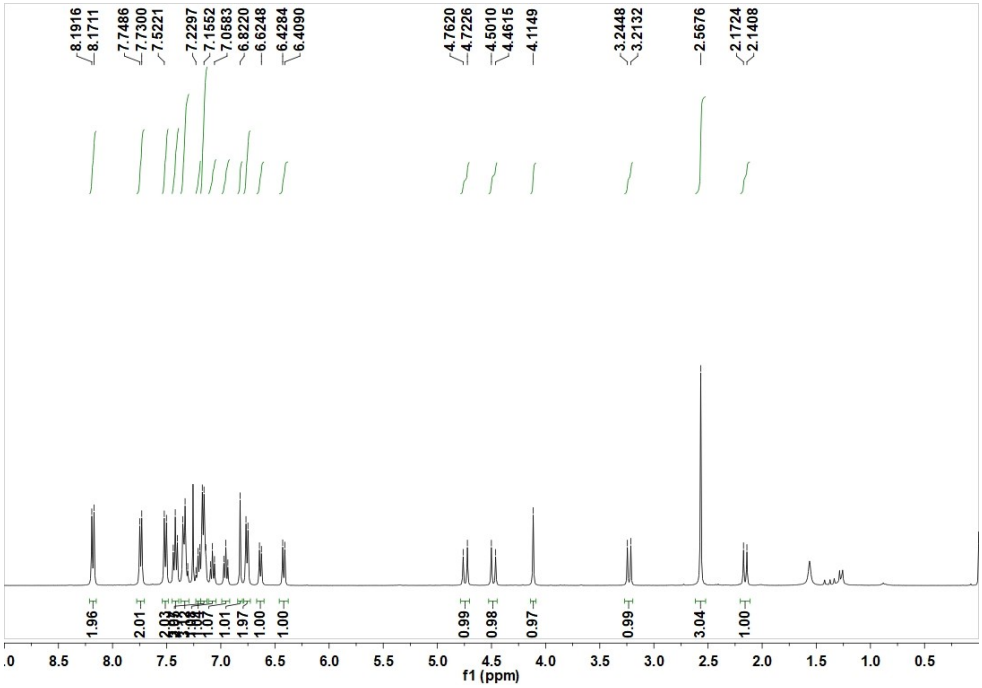
O
N
O
Ts

3g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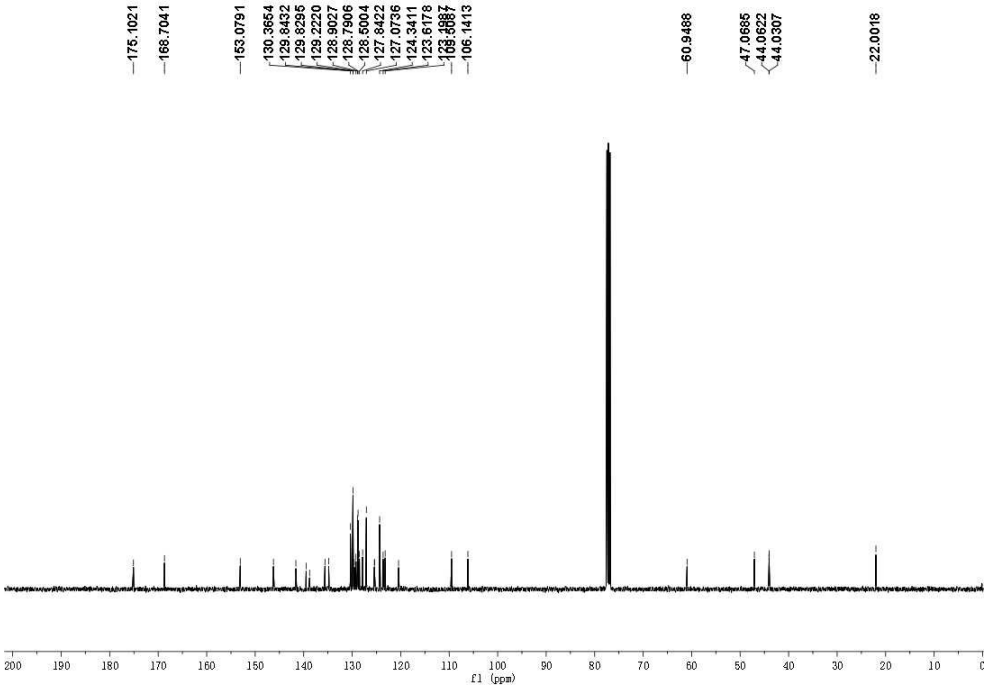
f1 (ppm)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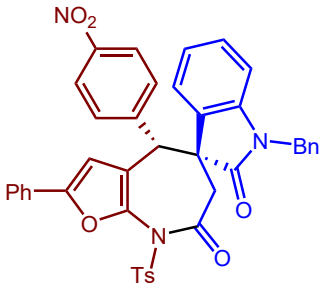
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Bn
Ph
O
O
N
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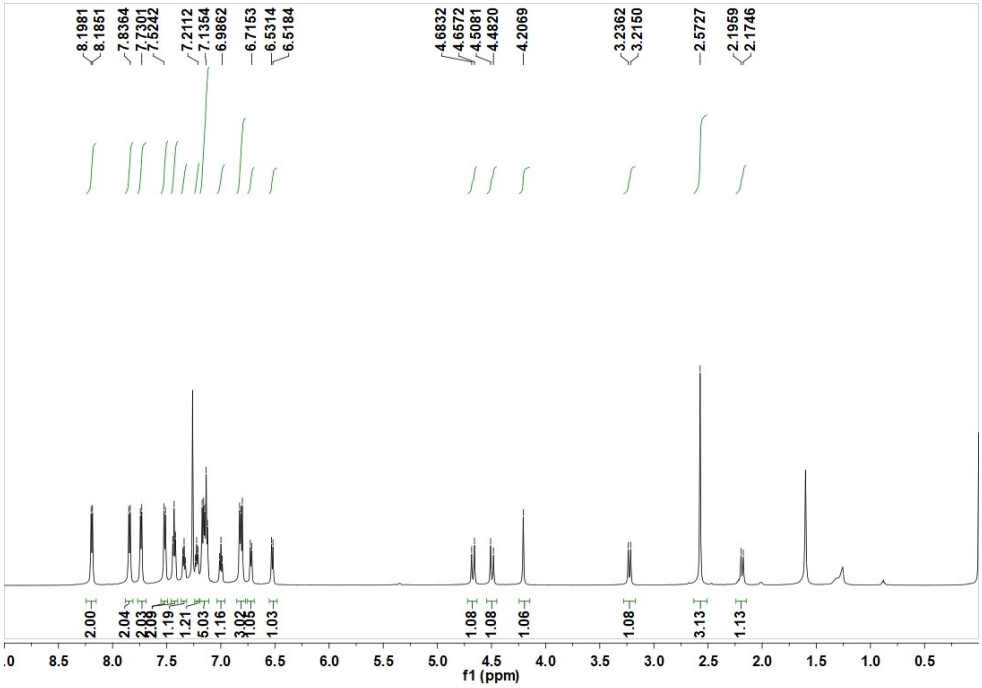
Ts

3h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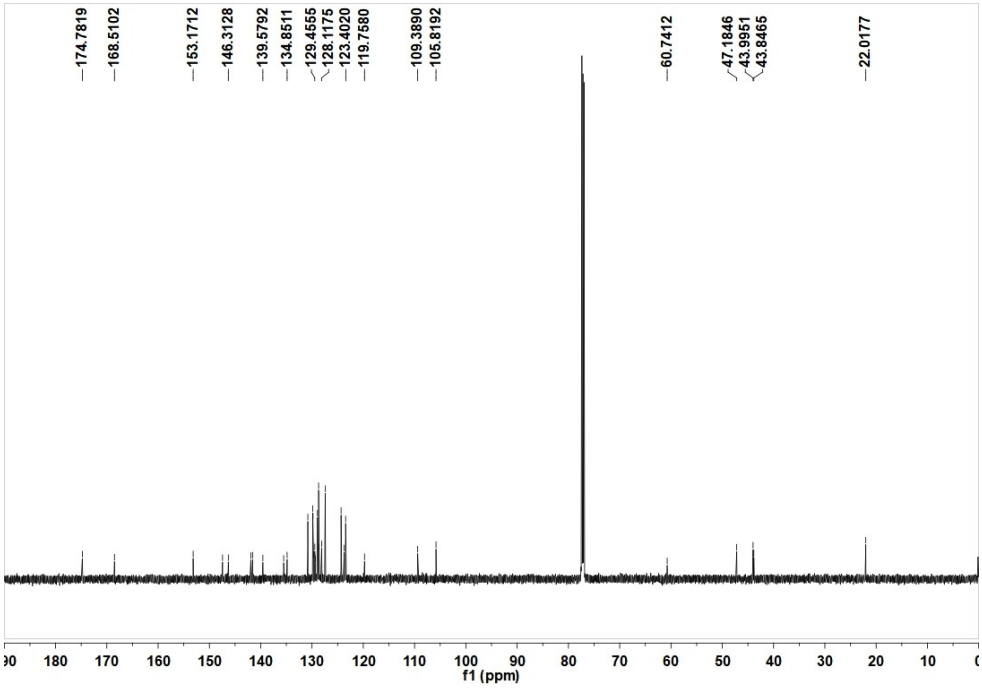
f1 (ppm)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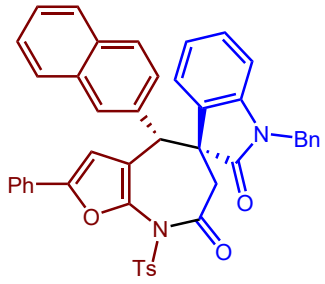
Ph
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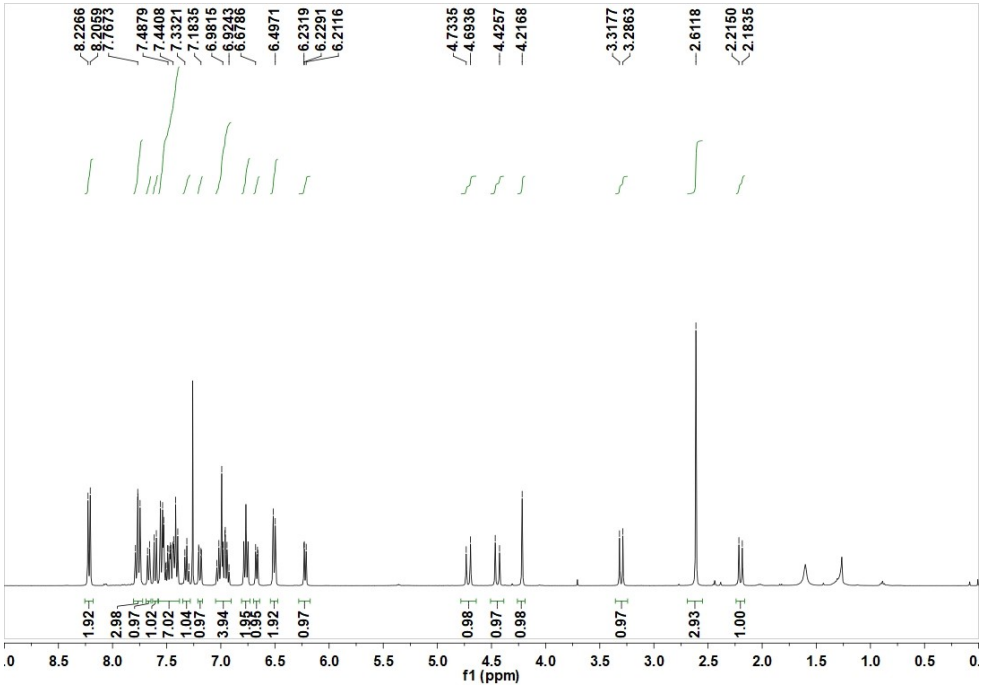
N
Ts
O
O
N
Bn

3i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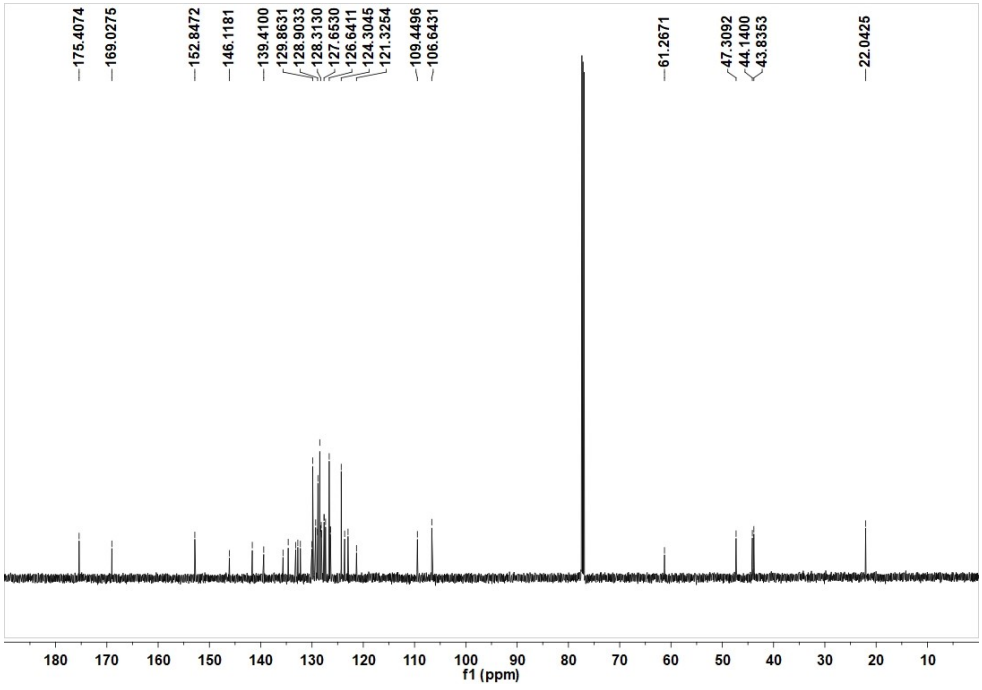
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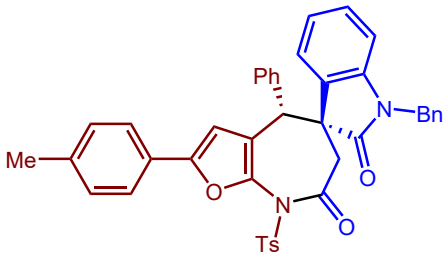
Ph
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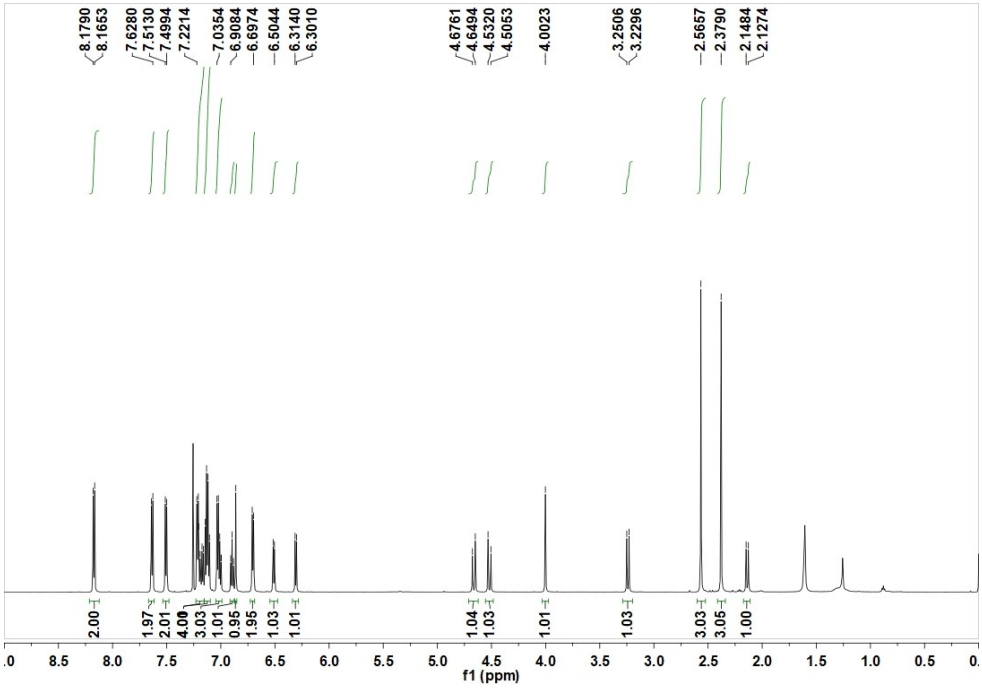
Bn
Me
O
O
N
O
Ts

3j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6.3010
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1.97
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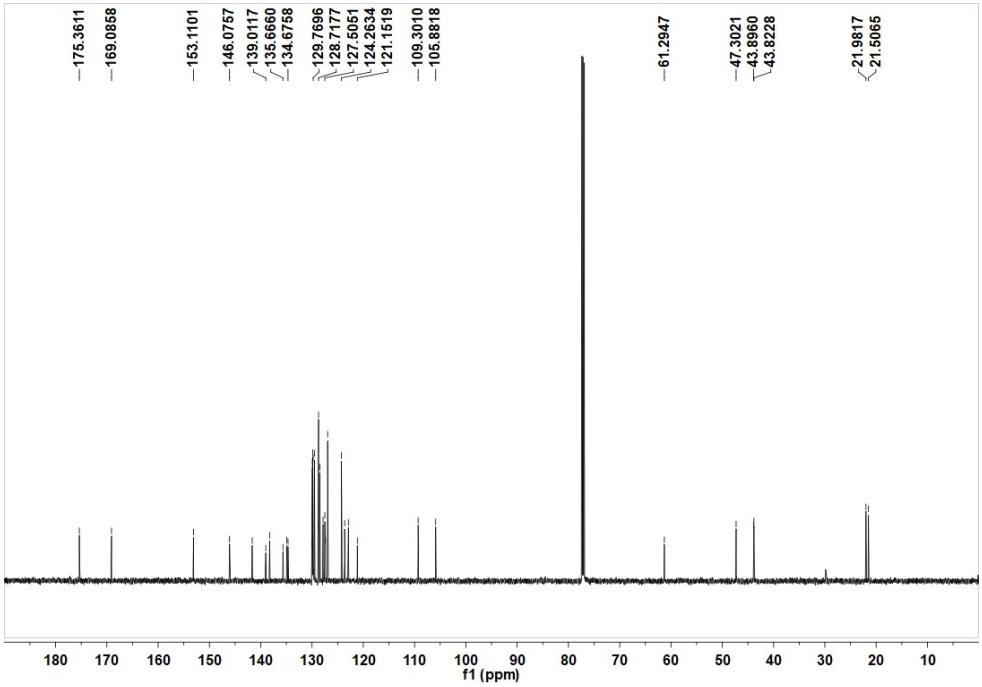
f1 (ppm)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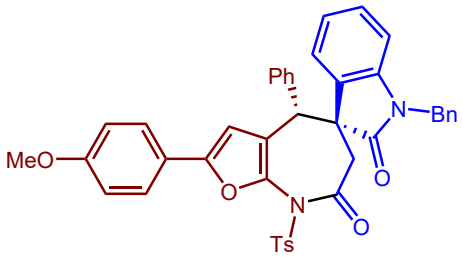
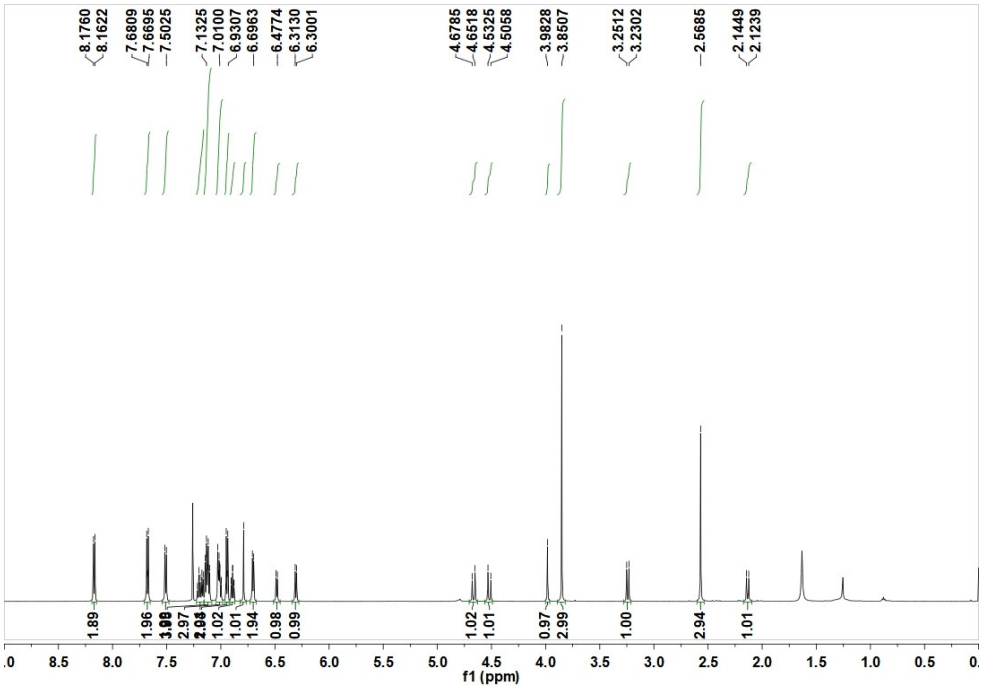
43.8228
21.9817
21.5065
f1 (ppm)


Ph
N
Bn
MeO
O
O
N
O
Ts

3k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7.5025
7.1325
7.0100
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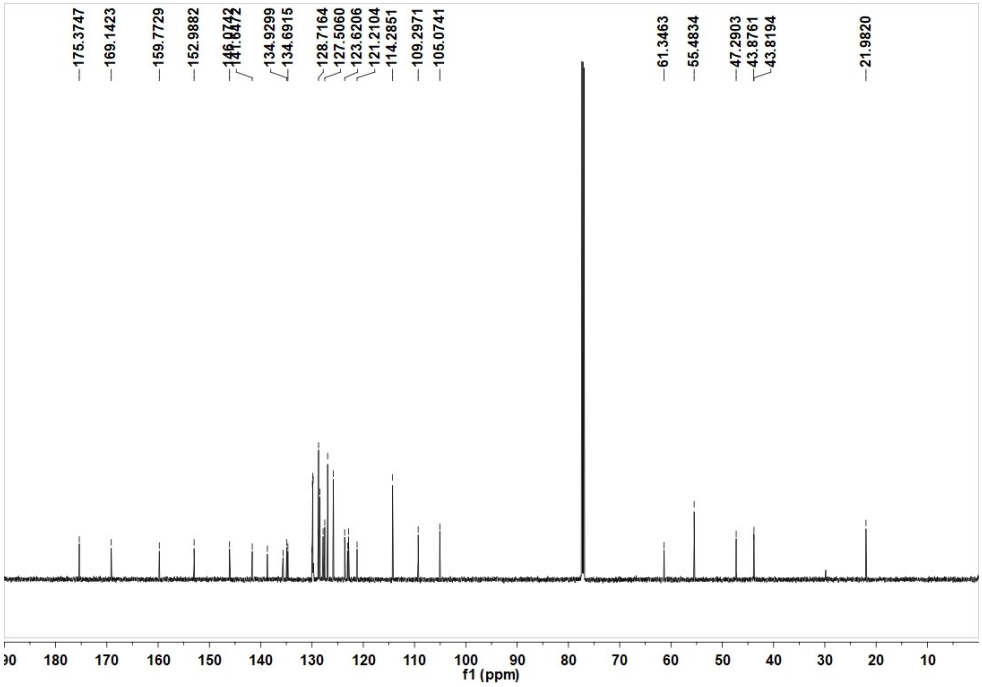
6.6963
6.4774
6.3130
6.3001
4.6785
4.6618
4.5325
4.5058
3.9828
3.8507
3.2512
3.2302
2.5685
2.1449
2.1239
1.89
1.96
2.97
1.02
1.01
1.94
0.98
0.99
1.02
1.01
0.97
2.99
1.00
2.94
1.01
f1 (ppm)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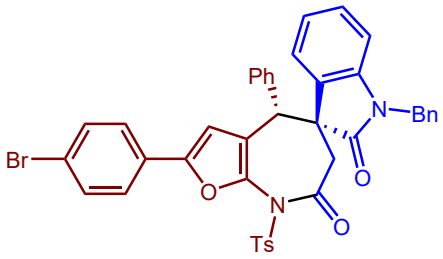
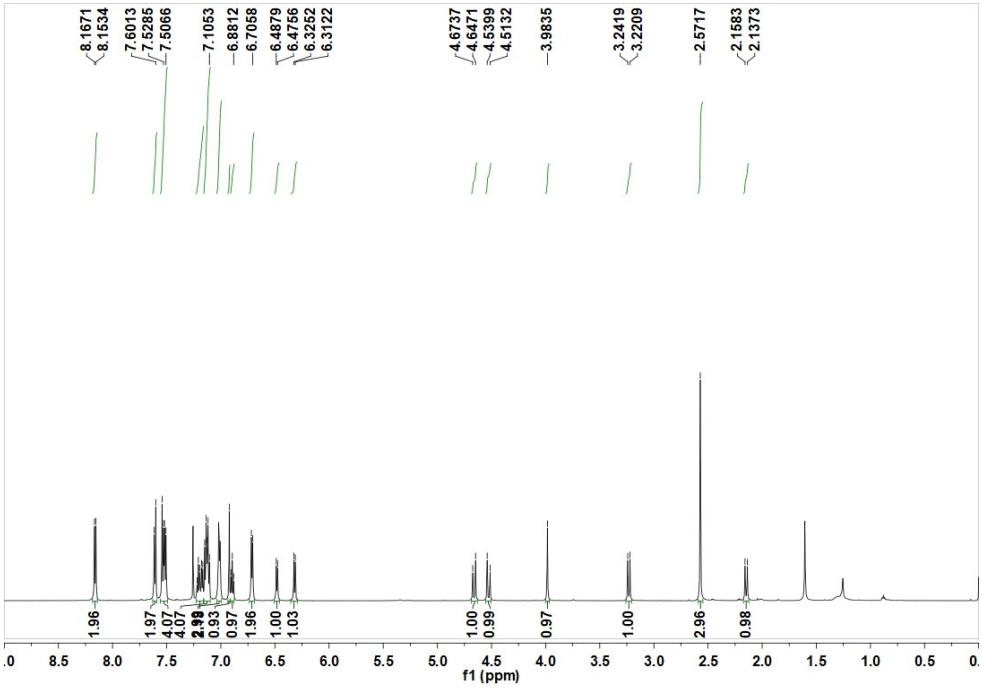
159.7729
152.9882
134.9299
134.6915
128.7164
127.5060
123.6206
121.2104
114.2851
109.2971
105.0741
61.3463
55.4834
47.2903
43.8761
43.8194
21.9820
f1 (ppm)


Ph
N
Bn
Br
O
O
N
O
Ts

3l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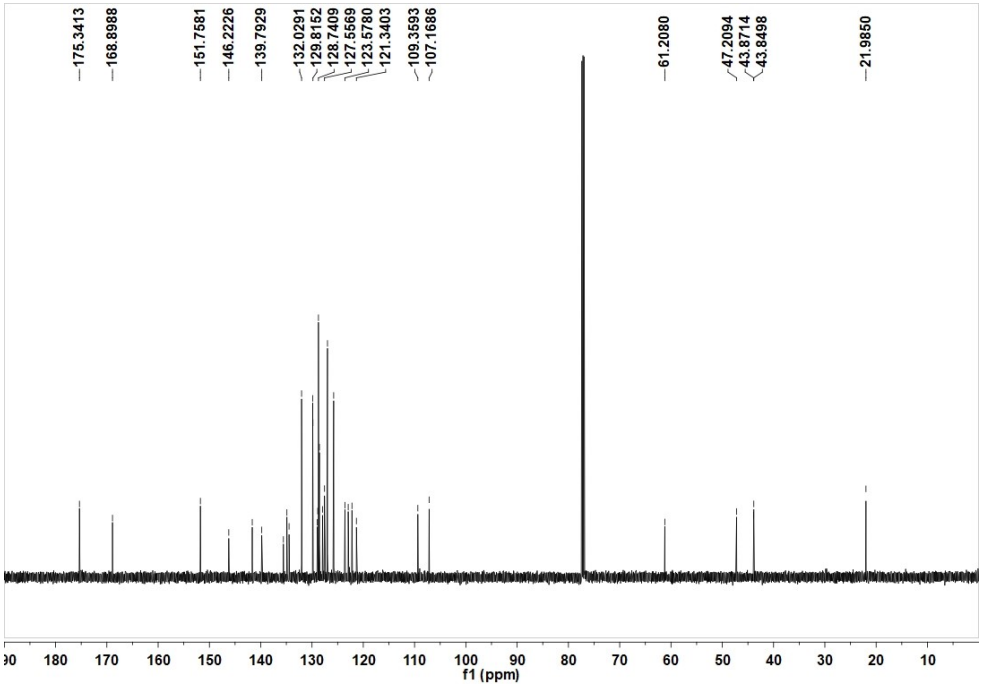
7.5285
7.5066
7.1053
6.8812
6.7058
6.4879
6.4756
6.3252
6.3122
4.6737
4.6471
4.5399
4.5132
3.9835
3.2419
3.2209
2.5717
2.1583
2.1373
1.96
1.97
4.07
4.07
0.93
0.97
1.96
1.00
1.03
1.00
0.99
0.97
1.00
2.96
0.98
f1 (ppm)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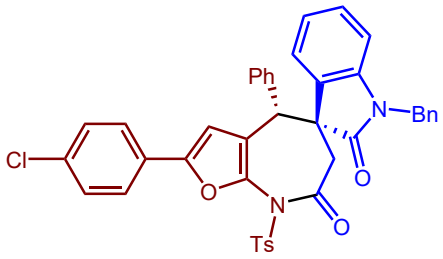
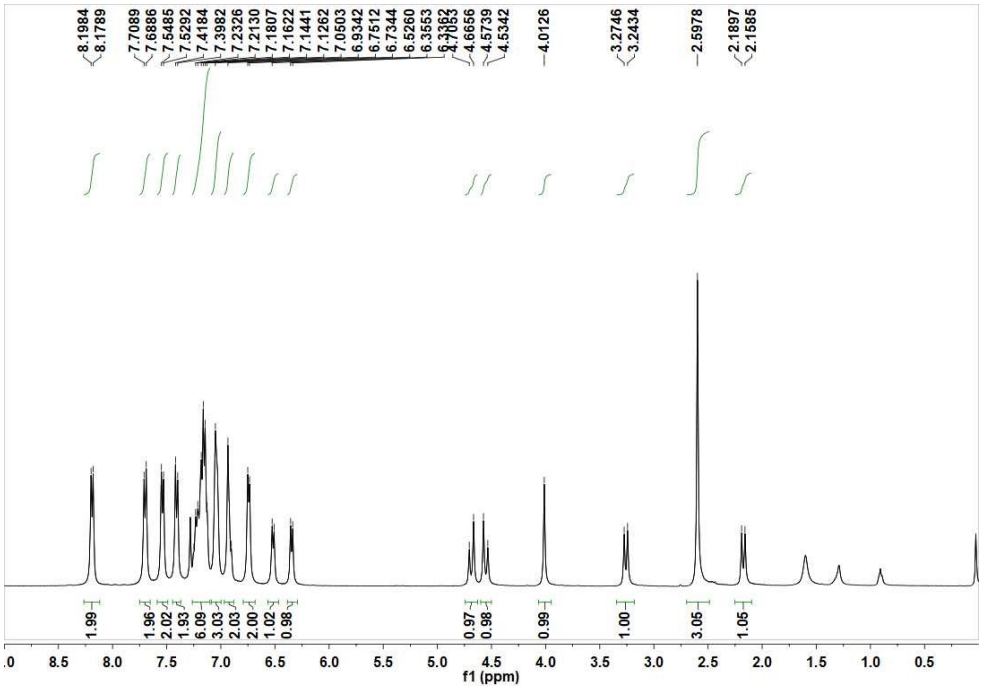
151.7581
146.2226
139.7929
132.0291
129.8152
128.7409
127.5569
123.5780
121.3403
109.3593
107.1686
61.2080
47.2094
43.8714
43.8498
21.9850
f1 (ppm)


Ph
N
Bn
Cl
O
O
N
O
Ts

3m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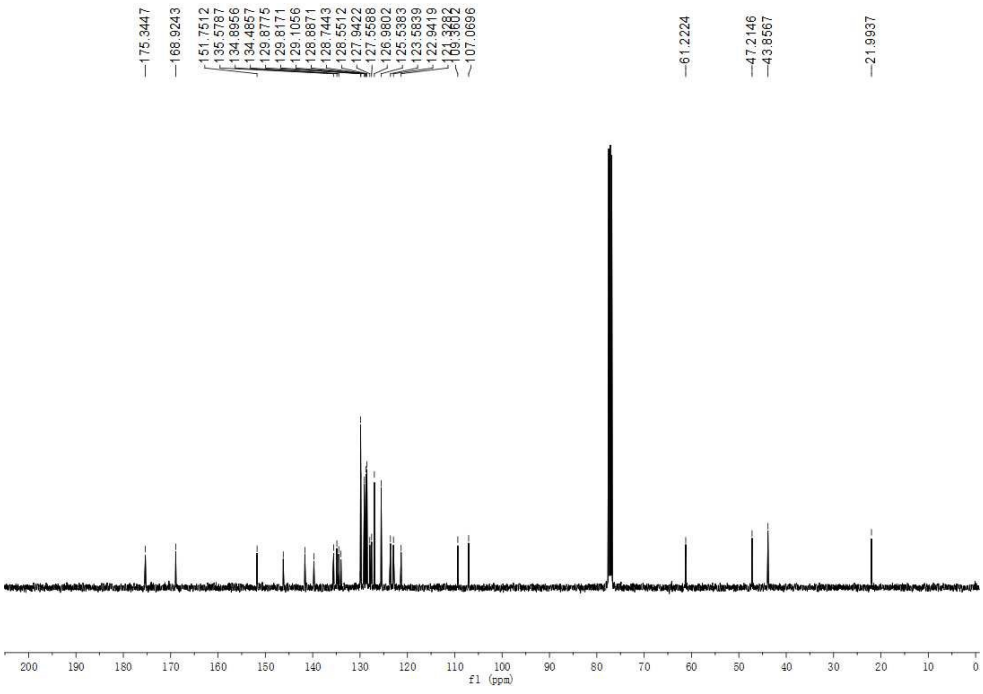
7.5292
7.4184
7.3982
7.2326
7.2130
7.1807
7.1622
7.1441
7.1262
7.0503
6.9342
6.7512
6.7344
6.5260
6.3553
4.6656
4.5739
4.5342
4.0126
3.2746
3.2434
2.5978
2.1897
2.1585
1.99
1.96
2.02
1.93
6.09
3.03
2.03
2.00
1.02
0.98
0.97
0.98
0.99
1.00
3.05
1.05
f1 (ppm)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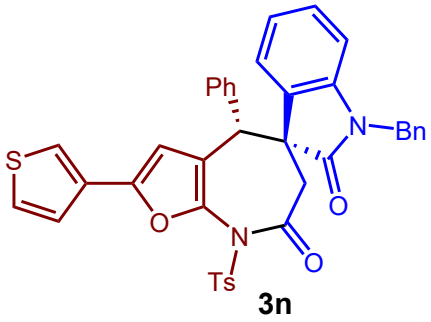
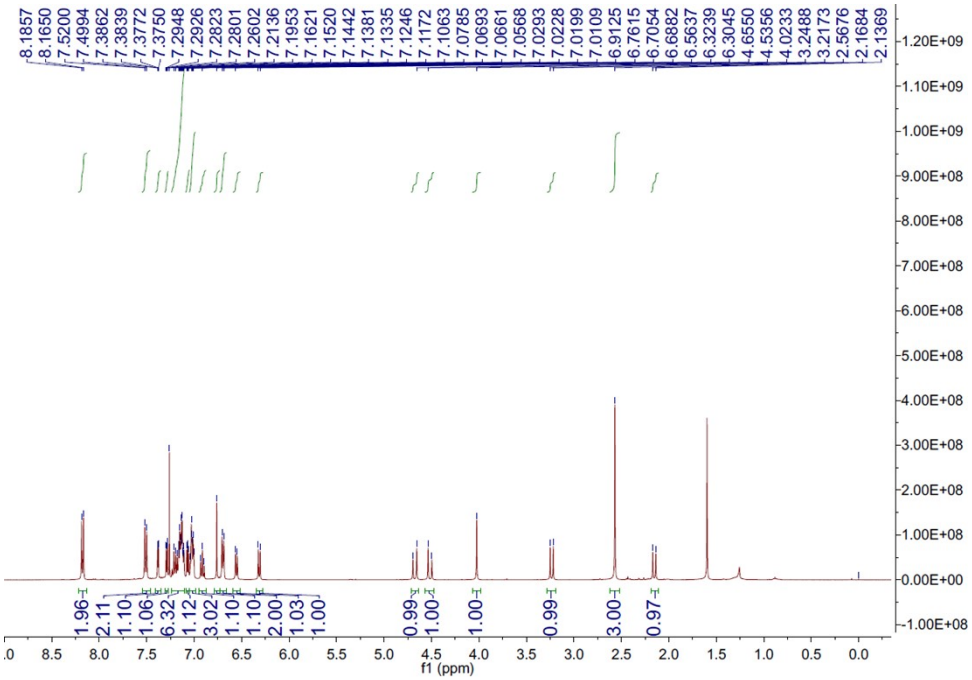
135.5787
134.8956
134.4857
129.8775
129.8171
129.1056
128.8871
128.7443
128.5512
127.9422
127.5588
126.9802
125.5383
123.5839
122.9419
121.3282
109.3602
107.0696
61.2224
47.2146
43.8567
21.9937
f1 (ppm)


Ph
N
Bn
S
O
O
N
O
Ts

3n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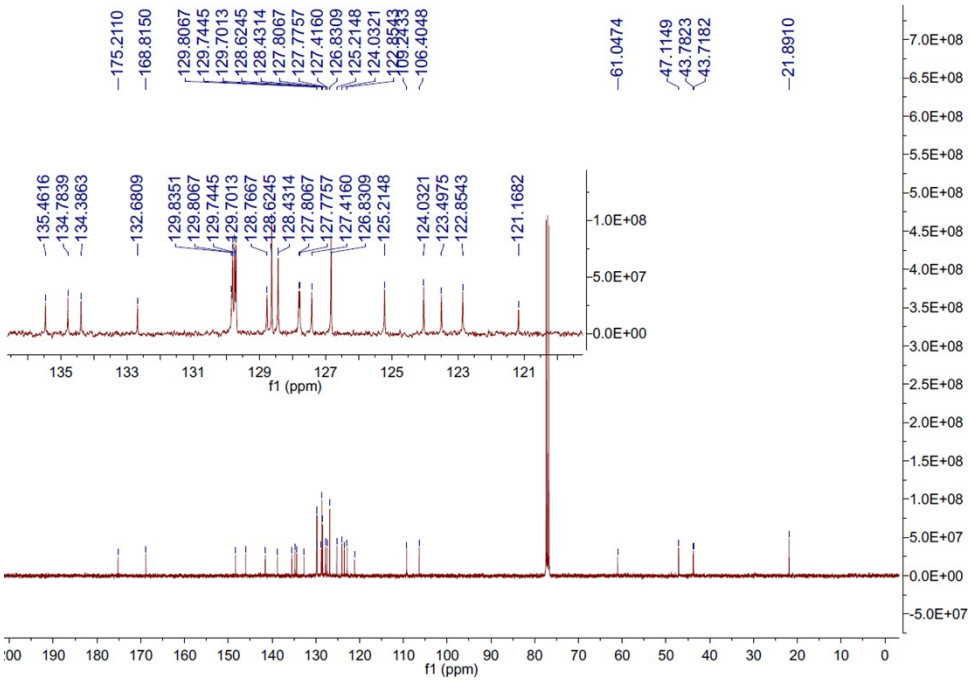
8.1650
7.5200
7.4994
7.3862
7.3839
7.3772
7.3750
7.2948
7.2926
7.2823
7.2801
7.2602
7.2136
7.1953
7.1621
7.1520
7.1442
7.1381
7.1335
7.1246
7.1172
7.1063
7.0785
7.0693
7.0661
7.0568
7.0293
7.0228
7.0199
7.0109
6.9125
6.7615
6.7054
6.6882
6.5637
6.3239
6.3045
4.6550
4.5356
4.0233
3.2488
3.2173
2.5676
2.1684
2.1369
1.96
2.11
1.10
1.06
6.32
1.12
3.02
1.10
1.10
2.00
1.03
1.00
0.99
1.00
1.00
0.99
3.00
0.97
f1 (ppm)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129.8067
129.7445
129.7013
128.6245
128.4314
127.8067
127.7757
127.4160
126.8309
125.2148
124.0321
106.4048
61.0474
47.1149
43.7823
43.7182
21.8910
135.4616
134.7839
134.3863
132.6809
129.8351
129.8067
129.7445
129.7013
128.7667
128.6245
128.4314
127.8067
127.7757
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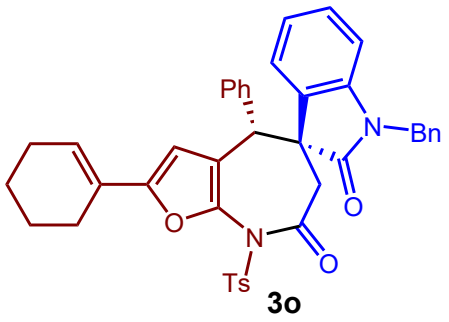
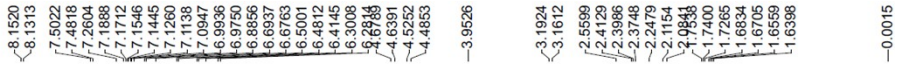
123.4975
122.8543
121.1682
f1 (ppm)


Ph
N
Bn
O
O
N
O
Ts

3o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7.2604
7.1888
7.1712
7.1546
7.1445
7.1260
7.1138
7.0947
6.9936
6.9750
6.8856
6.6937
6.6763
6.5001
6.4812
6.4145
6.3008
6.2834
4.6391
4.5252
4.4853
3.9526
3.1924
3.1612
2.5599
2.4129
2.3986
2.3748
2.2479
2.1154
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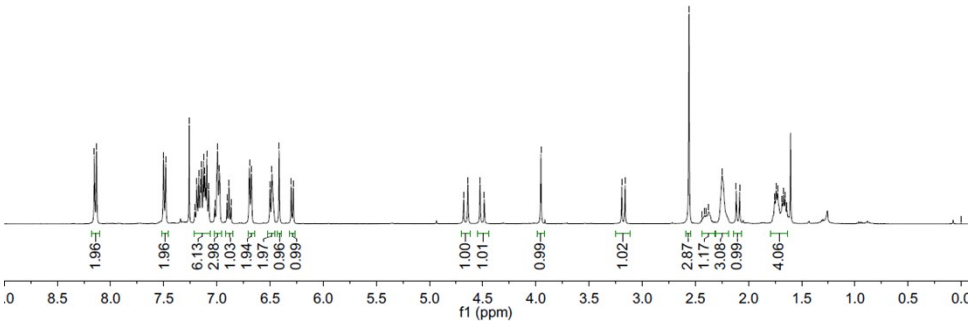
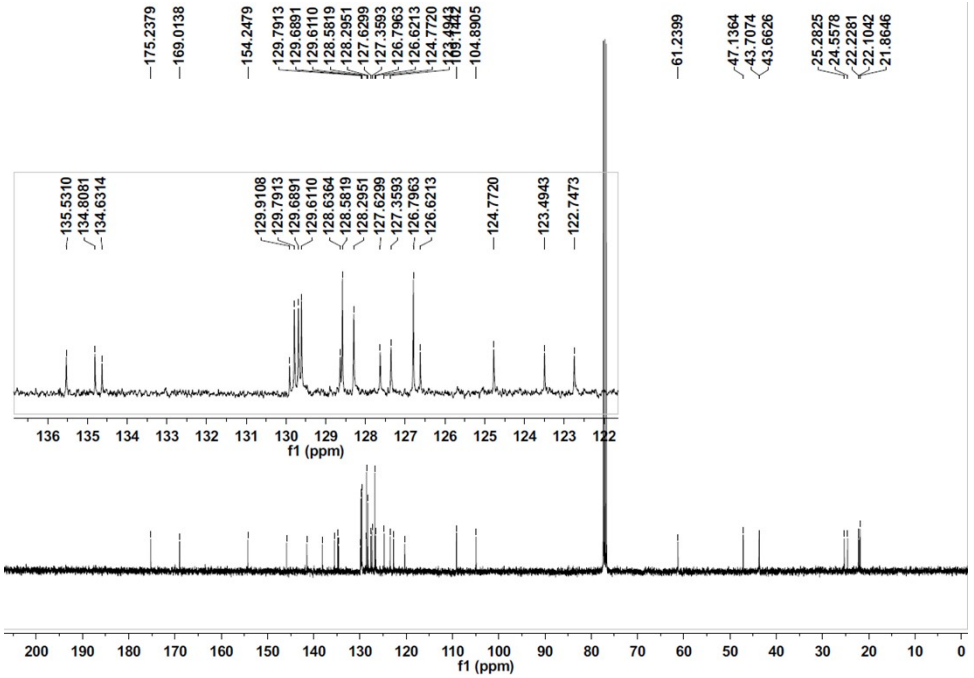
1.6834
1.6705
1.6559
1.6398
0.0015


1.96
1.96
6.13
2.98
1.03
1.94
1.97
0.96
0.99
1.00
1.01
0.99
1.02
2.87
1.17
3.08
0.99
4.06
f1 (ppm)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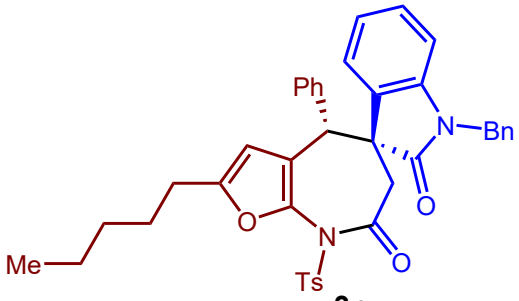
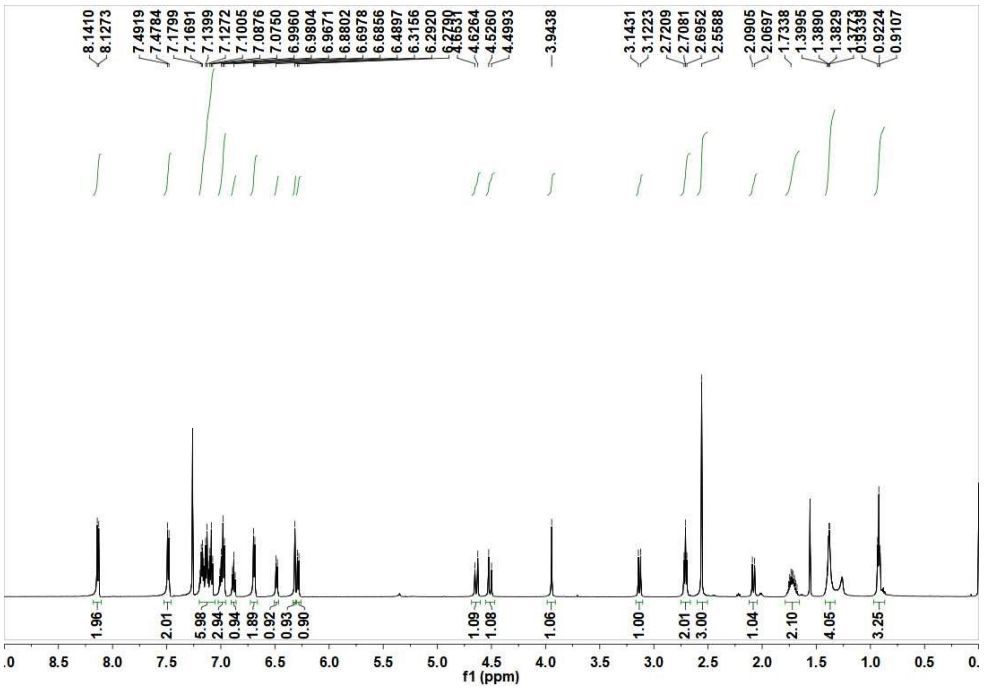
154.2479
129.7913
129.6891
129.6110
128.5819
128.2951
127.6299
127.3593
126.7963
126.6213
124.7720
123.4943
104.8905
61.2399
47.1364
43.7074
43.6626
25.2825
24.5578
22.2281
22.1042
21.8646
135.5310
134.8081
134.6314
129.9108
129.7913
129.6891
129.6110
128.6364
128.5819
128.2951
127.6299
127.3593
126.7963
126.6213
124.7720
123.4943
122.7473
f1 (ppm)
f1 (ppm)


Ph
N
Bn
O
O
N
Me
Ts
O

3p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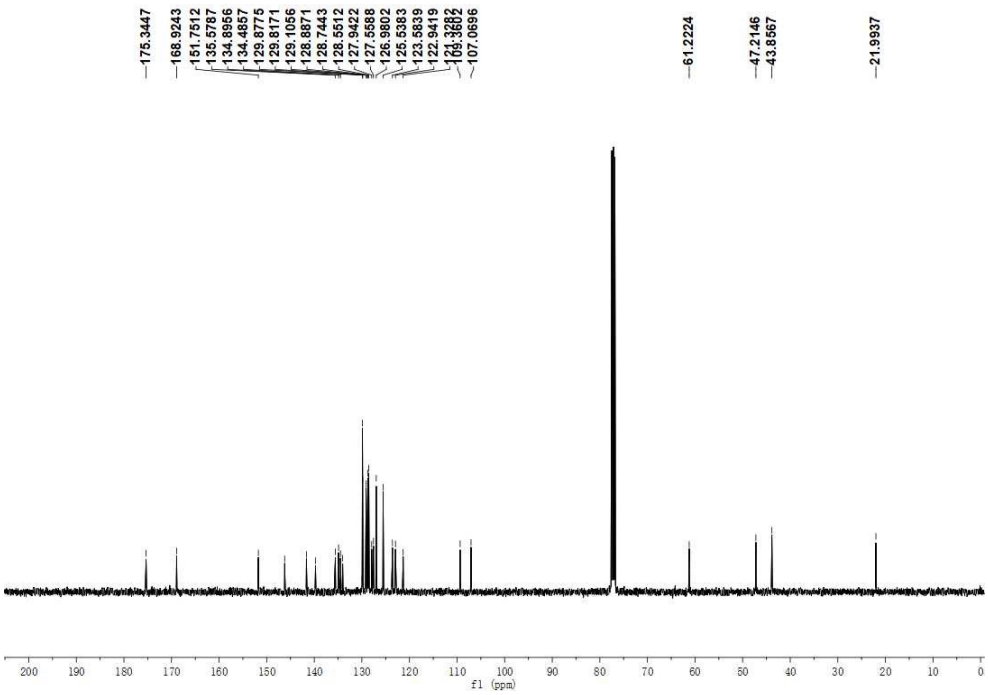
7.4784
7.1799
7.1691
7.1399
7.1272
7.1005
7.0876
7.0750
6.9960
6.9804
6.9671
6.8802
6.6978
6.6856
6.4897
6.3156
6.2920
6.2790
6.2631
4.6264
4.5260
4.4993
3.9438
3.1431
3.1223
2.7209
2.7081
2.6952
2.5588
2.0905
2.0697
1.7338
1.3995
1.3890
1.3829
1.3773
1.3338
0.9224
0.9107
1.96
2.01
5.98
2.94
0.94
1.89
0.92
0.93
0.90
1.09
1.08
1.06
1.00
2.01
3.00
1.04
2.10
4.05
3.25
f1 (ppm)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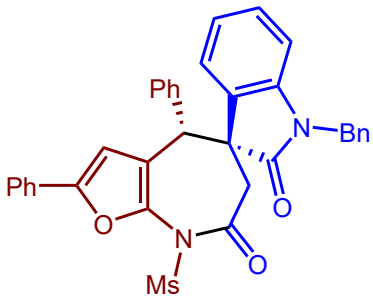
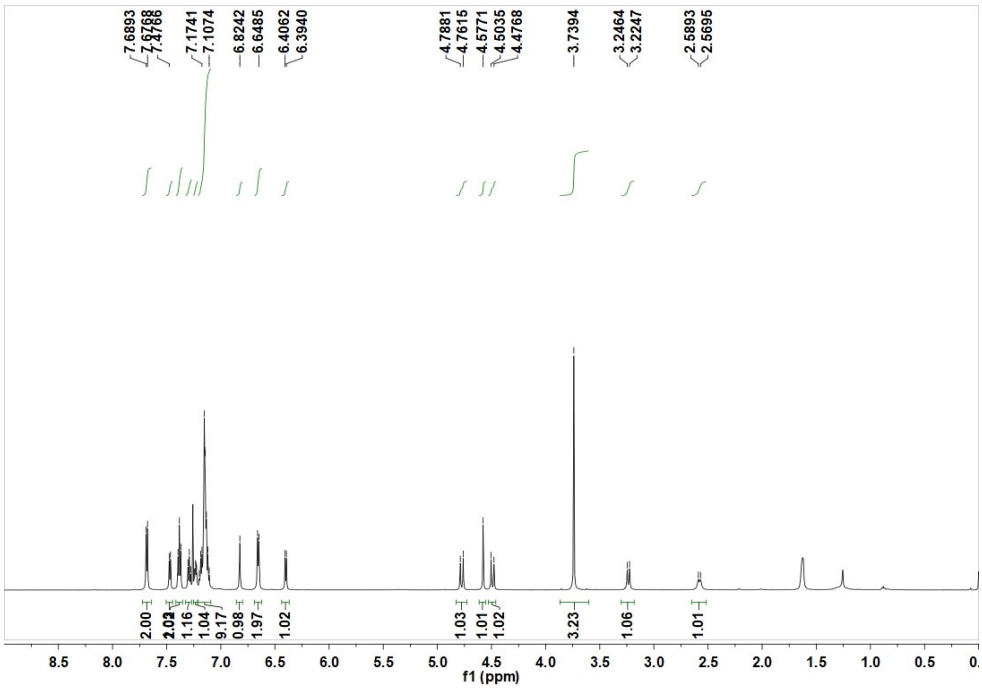
168.9243
151.7512
135.5787
134.8956
134.4857
129.8775
129.8171
129.1056
128.8871
128.7443
128.5512
127.9422
127.5588
126.9802
125.5383
123.5839
122.9419
121.3282
103.3682
107.0696
61.2224
47.2146
43.8567
21.9337
f1 (ppm)


Ph
N
Bn
Ph
O
O
N
O
Ms

3q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7.4766
7.1741
7.1074
6.8242
6.6485
6.4062
6.3940
4.7881
4.7615
4.5771
4.5035
4.4768
3.7394
3.2464
3.2247
2.5893
2.5695
2.00
2.03
1.16
1.04
9.17
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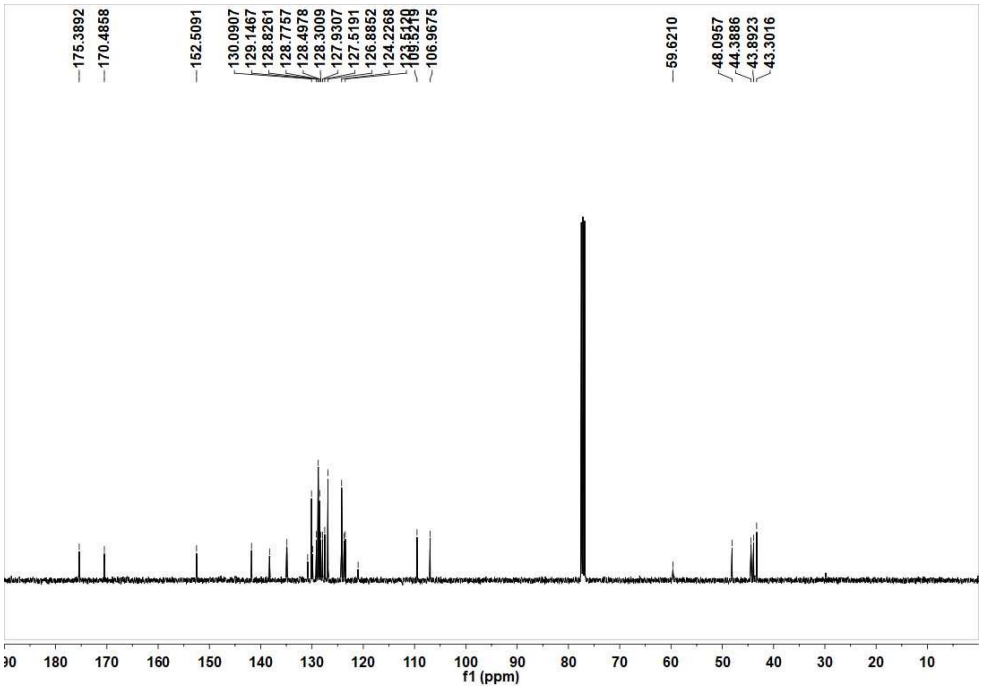
1.97
1.02
1.03
1.01
1.02
3.23
1.06
1.01
f1 (ppm)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128.8261
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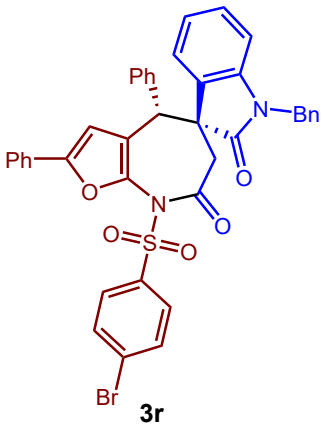
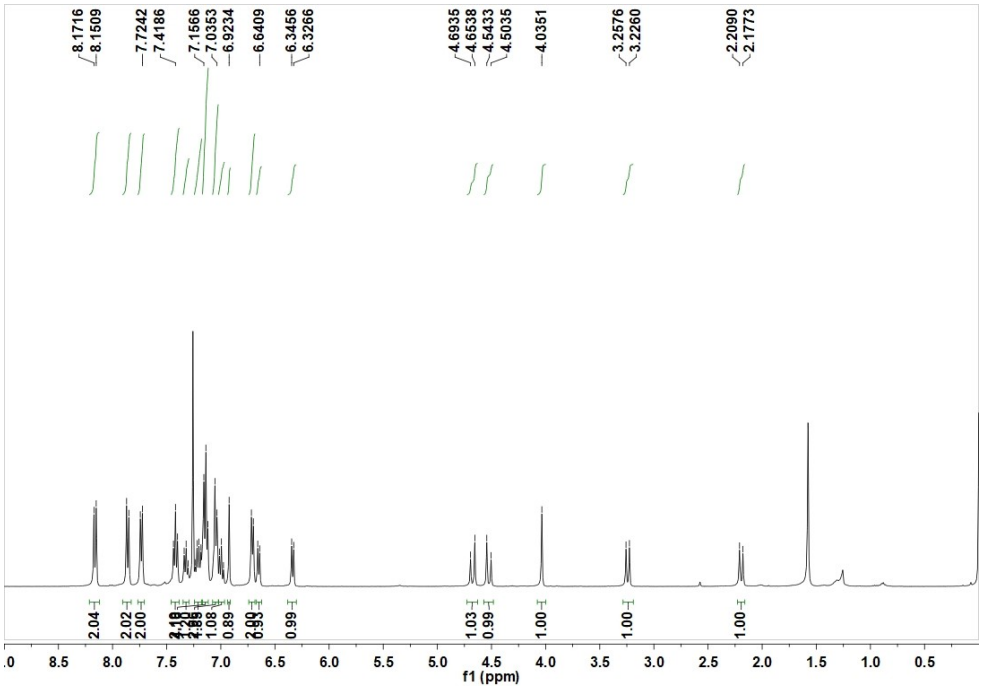
128.4978
128.3009
127.9307
127.5191
126.8852
124.2268
106.9675
59.6210
48.0957
44.3886
43.8923
43.3016
f1 (ppm)


Ph
N
Bn
Ph
O
O
N
O
O
O
S
O
Br

3r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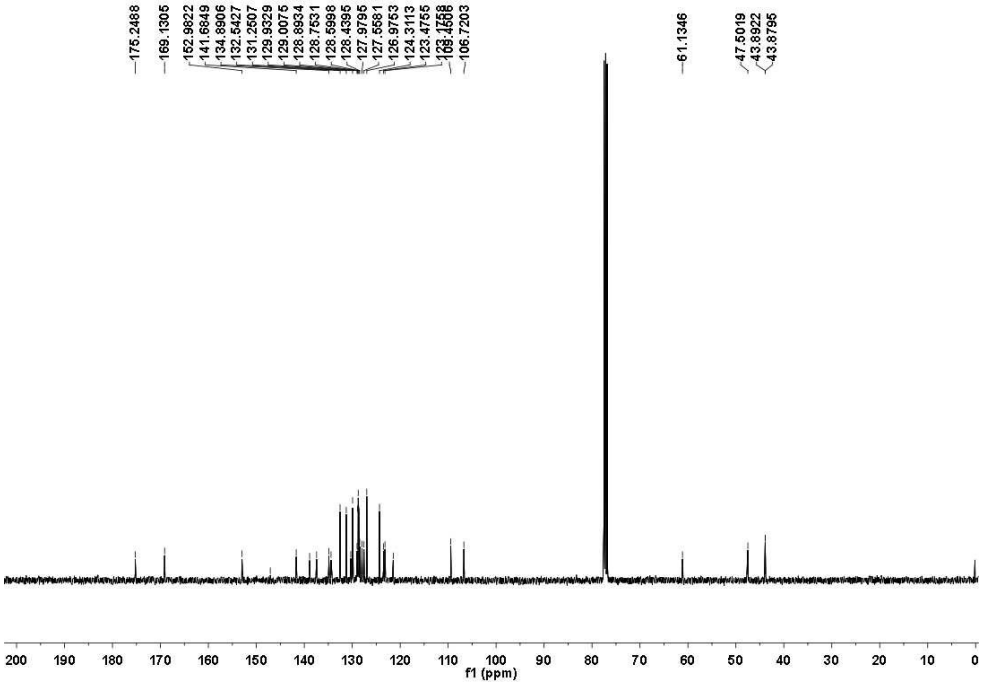
7.4186
7.1566
7.0353
6.9234
6.6409
6.3456
6.3266
4.6935
4.6538
4.5433
4.5035
4.0351
3.2576
3.2260
2.2090
2.1773
2.04
2.02
2.00
1.08
0.89
0.99
1.03
0.99
1.00
1.00
1.00
f1 (ppm)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141.6849
134.8906
132.5427
131.2507
129.9329
129.0075
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128.7531
128.5998
128.4395
127.9795
127.5581
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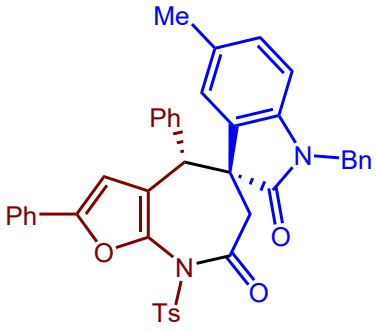
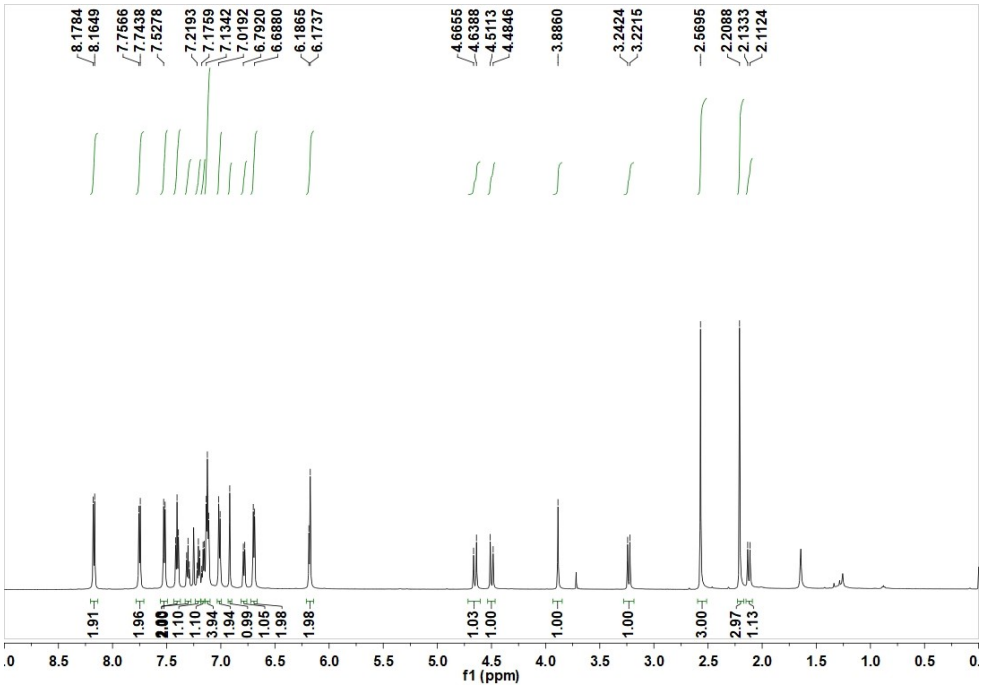
124.3113
123.4755
106.7203
61.1346
47.5019
43.8922
43.8795
f1 (ppm)


Me
Ph
N
Bn
Ph
O
O
N
O
Ts

3s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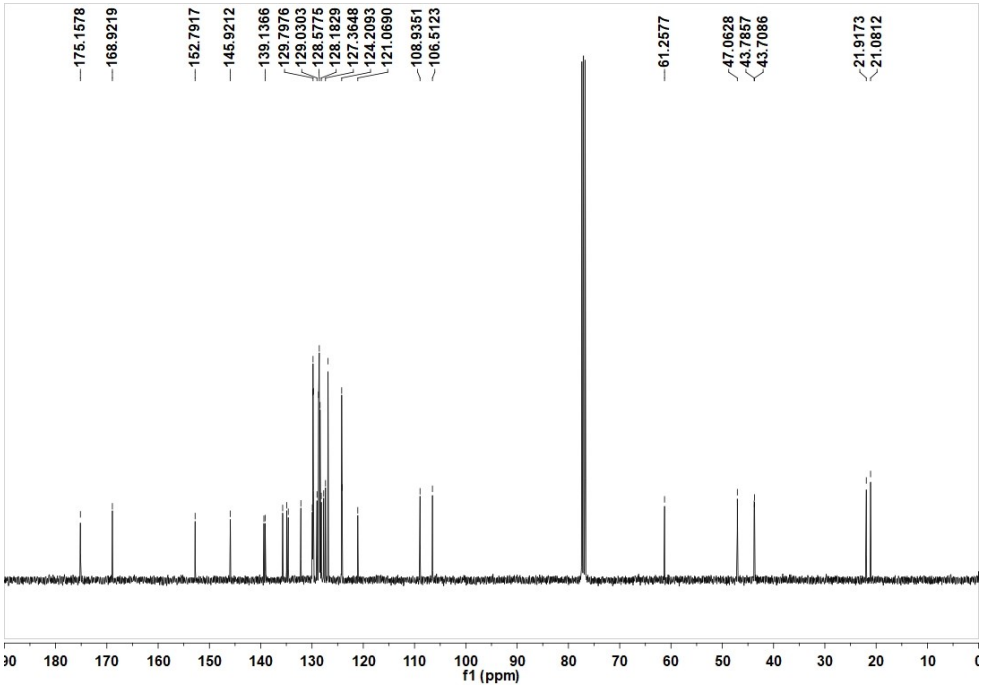
6.6880
6.1865
6.1737
4.6655
4.6388
4.5113
4.4846
3.8860
3.2424
3.2215
2.5695
2.2088
2.1333
2.1124
1.91
1.96
2.00
1.10
1.10
3.94
1.94
0.99
1.05
1.98
1.98
1.03
1.00
1.00
1.00
3.00
2.97
1.13
f1 (ppm)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152.7917
145.9212
139.1366
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129.0303
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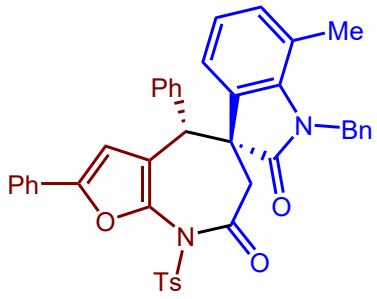
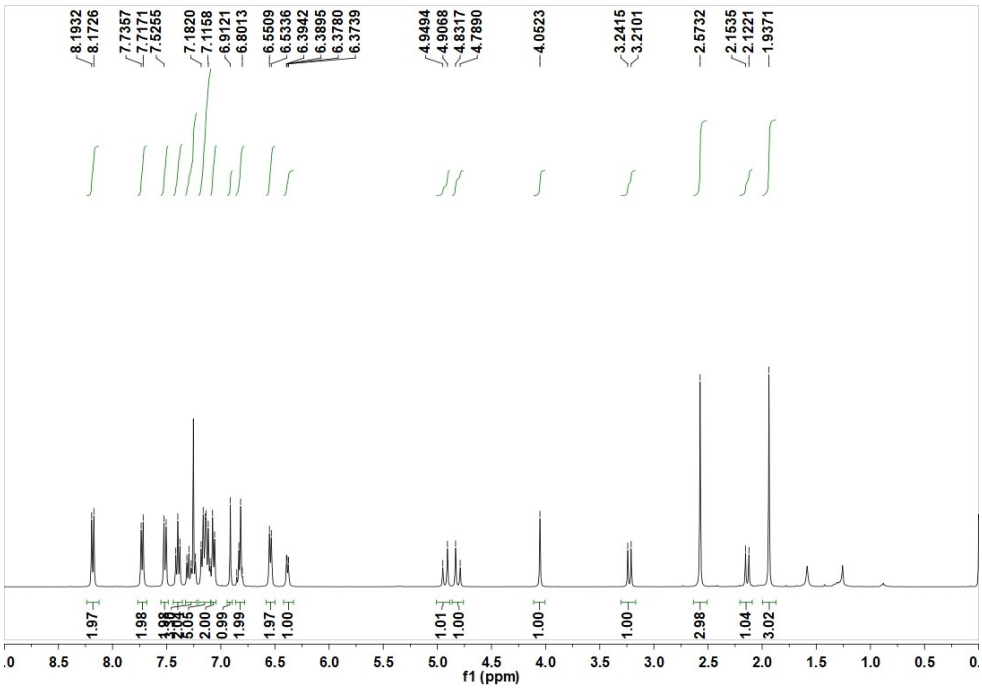
128.1829
127.3648
124.2093
121.0690
108.9351
106.5123
61.2577
47.0628
43.7857
43.7086
21.9173
21.0812
f1 (ppm)


Me
Ph
N
Bn
Ph
O
O
N
O
Ts

3t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7.5255
7.1820
7.1158
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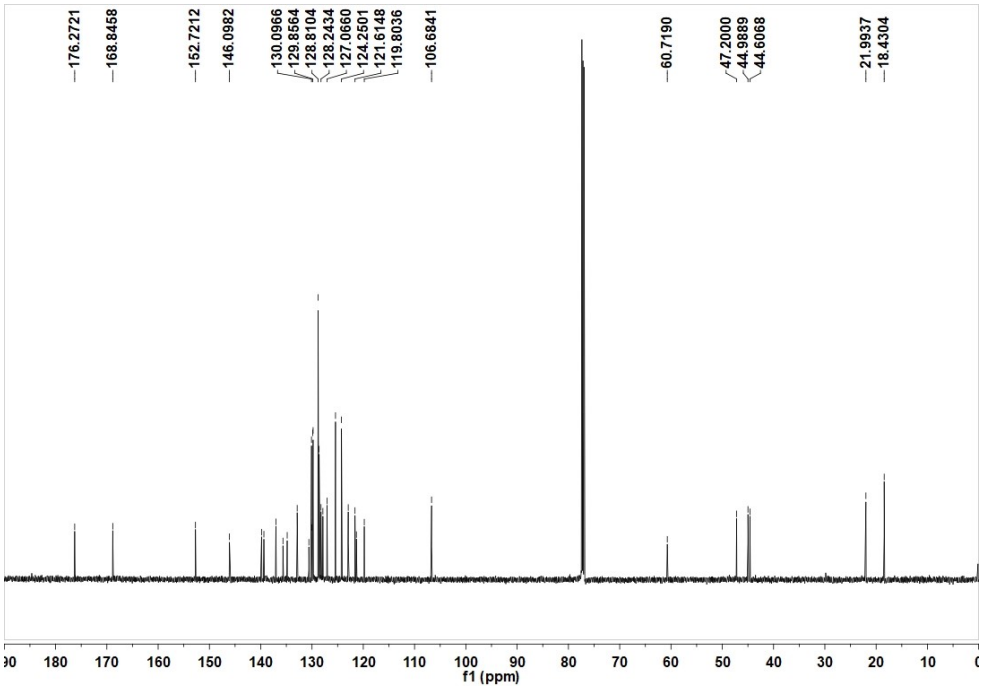
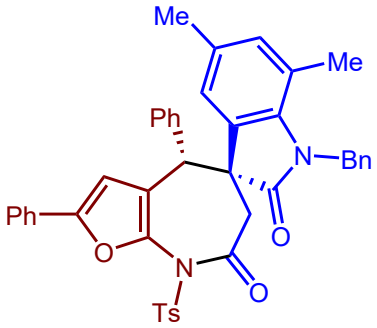
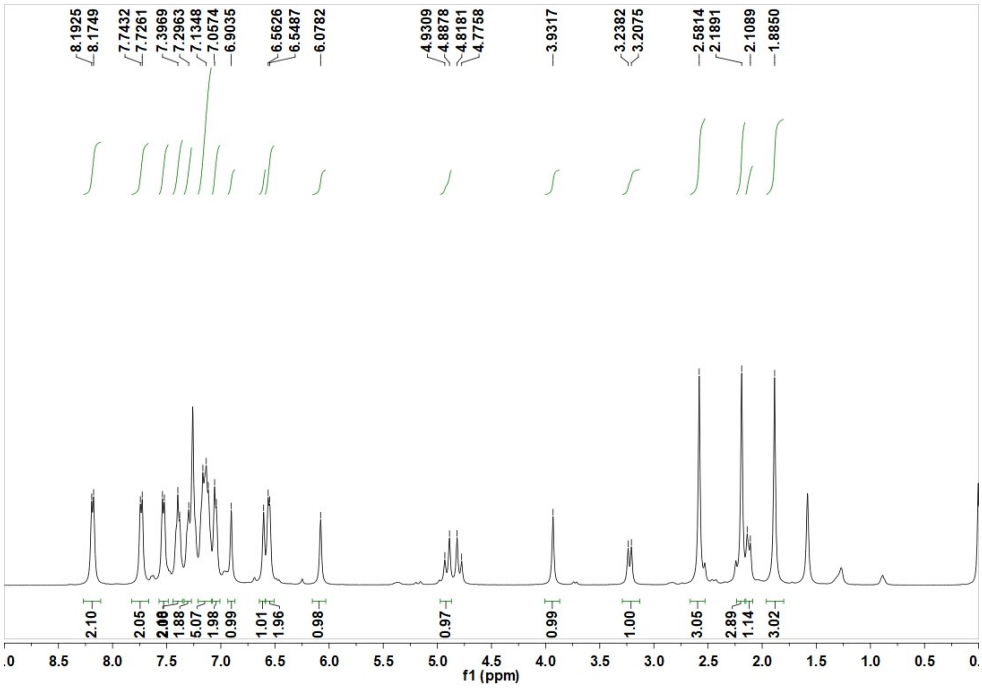
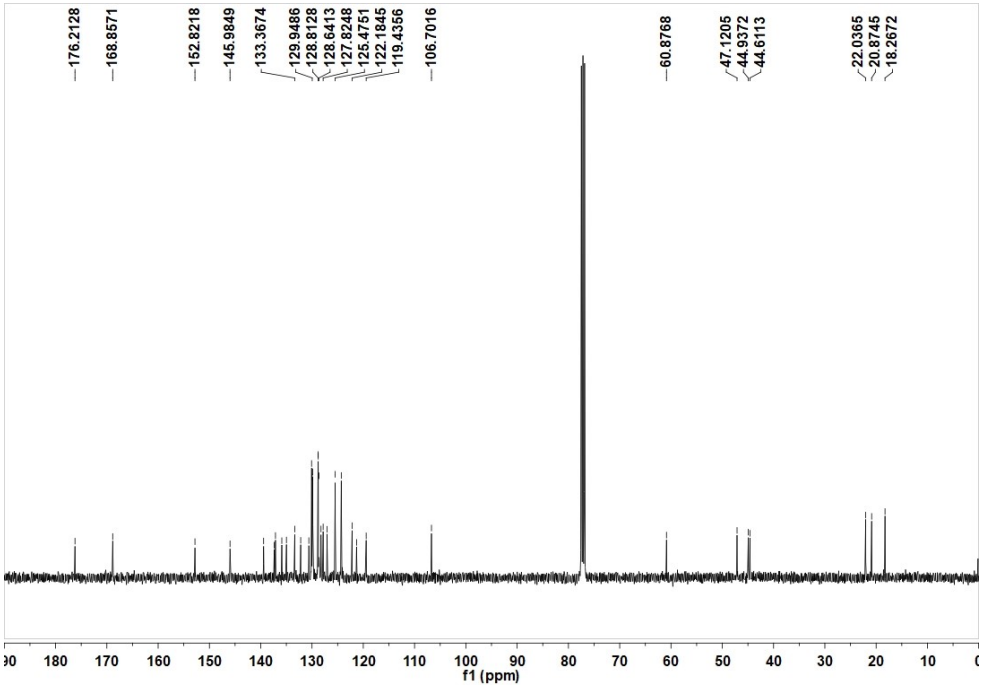
6.8013
6.5509
6.5336
6.3942
6.3895
6.3780
6.3739
4.9494
4.9068
4.8317
4.7890
4.0523
3.2415
3.2101
2.5732
2.1535
2.1221
1.9371
1.97
1.98
2.00
0.99
1.99
1.97
1.00
1.01
1.00
1.00
1.00
2.98
1.04
3.02
f1 (ppm)

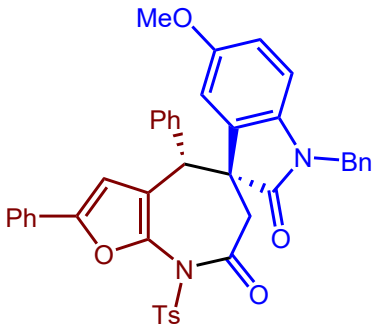

176.2721
168.8458
152.7212
146.0982
130.0966
129.8564
128.8104
128.2434
127.0660
124.2501
121.6148
119.8036
106.6841
60.7190
47.2000
44.9889
44.6068
21.9937
18.4304
f1 (ppm)


Me
Me
Ph
N
Bn
Ph
O
O
N
O
Ts

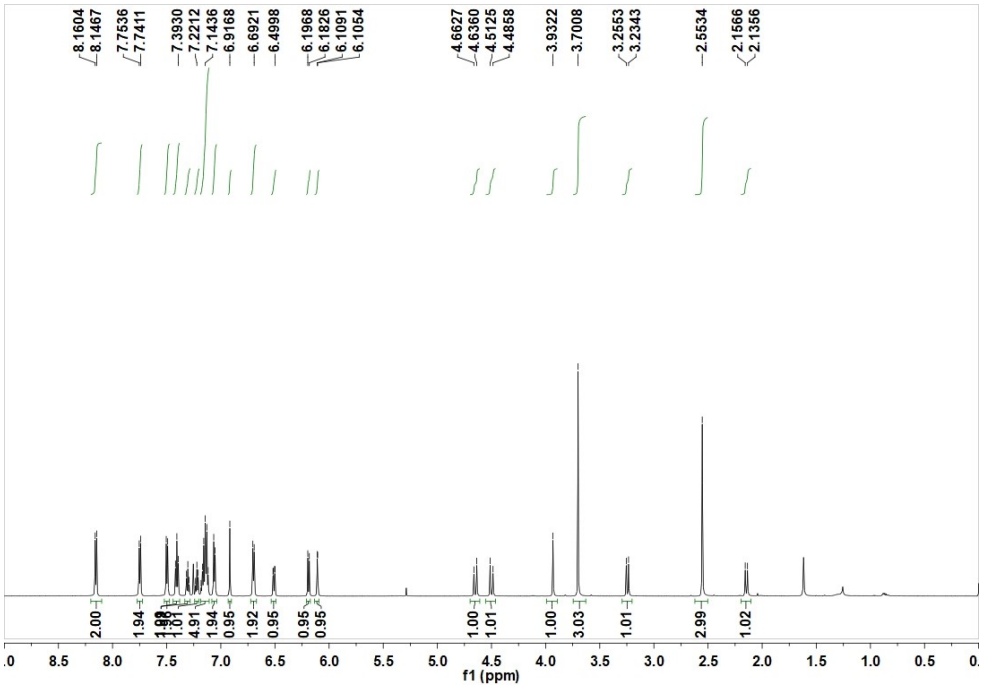
3u

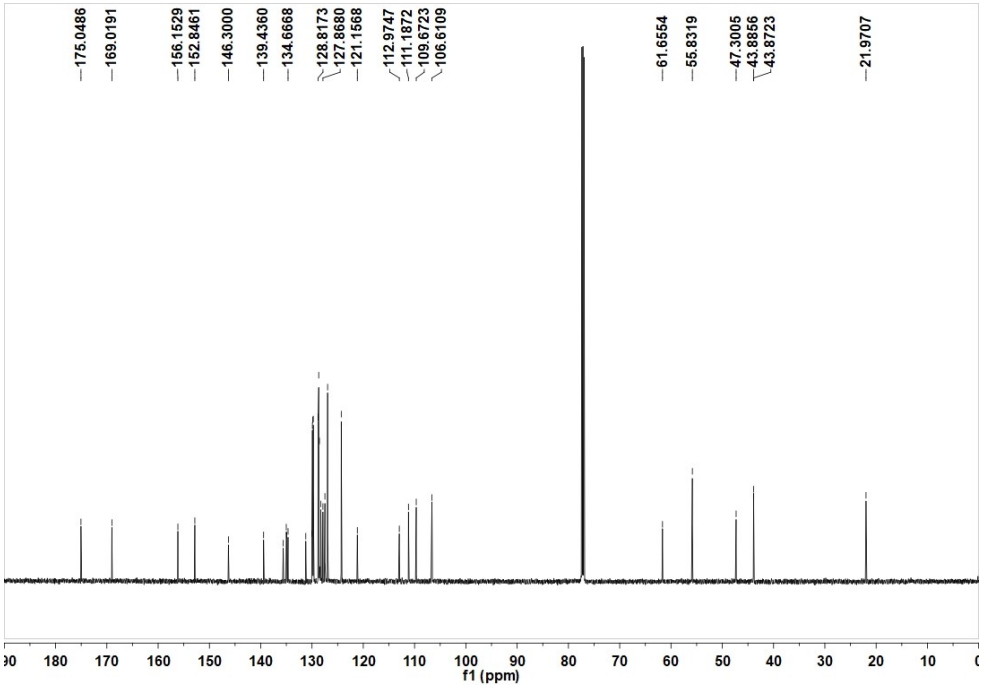

8.1925
8.1749
7.7432
7.7261
7.3969
7.2963
7.1348
7.0574
6.9035
6.5626
6.5487
6.0782
4.9309
4.8878
4.8181
4.7758
3.9317
3.2382
3.2075
2.5814
2.1891
2.1089
1.8850
2.10
2.05
2.08
1.88
5.07
1.98
0.99
1.01
1.96
0.98
0.97
0.99
1.00
3.05
2.89
1.14
3.02
f1 (ppm)

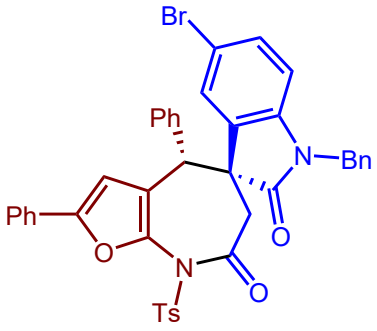

176.2128
168.8571
152.8218
145.9849
133.3674
129.9486
128.8128
128.6413
127.8248
125.4751
122.1845
119.4356
106.7016
60.8768
47.1205
44.9372
44.6113
22.0365
20.8745
18.2672
f1 (ppm)


MeO
Ph
N
Bn
Ph
O
O
N
O
Ts

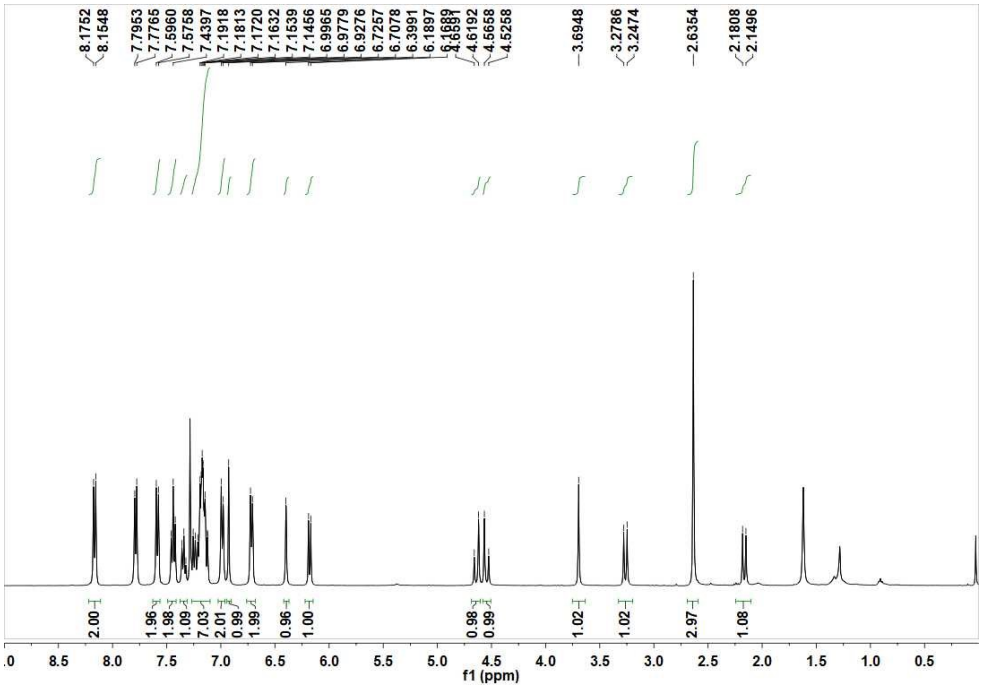
3v

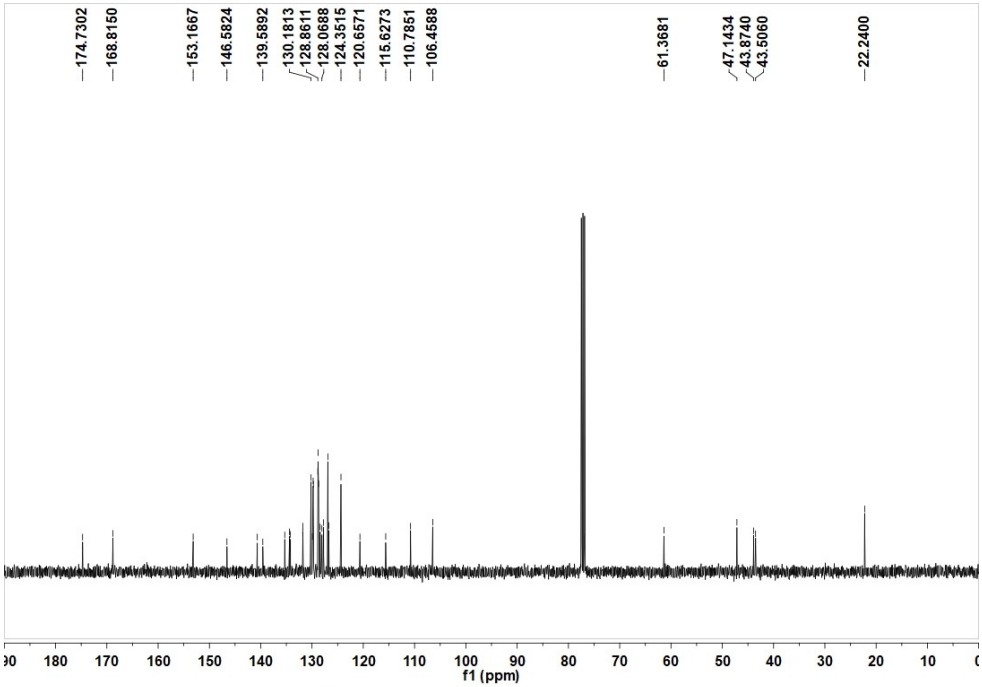

8.1604
8.1467
7.7536
7.7411
7.3930
7.2212
7.1436
6.9168
6.6921
6.4998
6.1968
6.1826
6.1091
6.1054
4.6627
4.6360
4.5125
4.4858
3.9322
3.7008
3.2553
3.2343
2.5534
2.1566
2.1356
2.00
1.94
1.98
1.01
4.91
1.94
0.95
1.92
0.95
0.95
0.95
1.00
1.01
1.00
3.03
1.01
2.99
1.02
f1 (ppm)

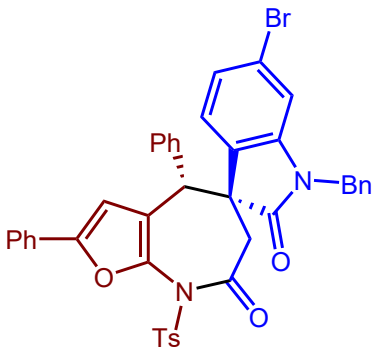

175.0486
169.0191
156.1529
152.8461
146.3000
139.4360
134.6668
128.8173
127.8680
121.1568
112.9747
111.1872
109.6723
106.6109
61.6554
55.8319
47.3005
43.8856
43.8723
21.9707
f1 (ppm)


Br
Ph
N
Bn
Ph
O
O
N
O
Ts

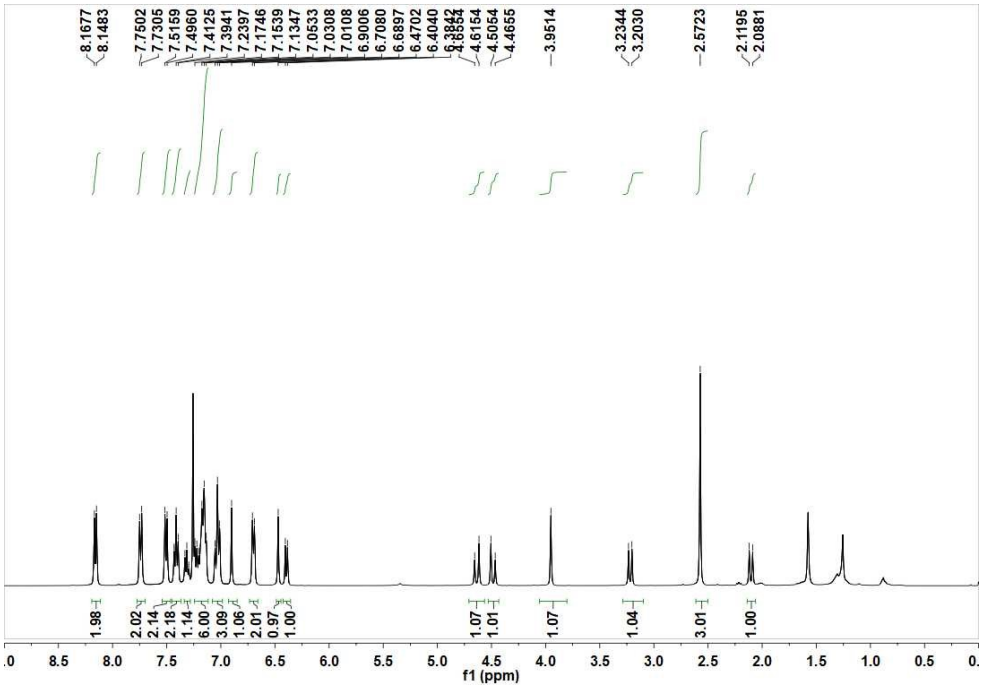
3w

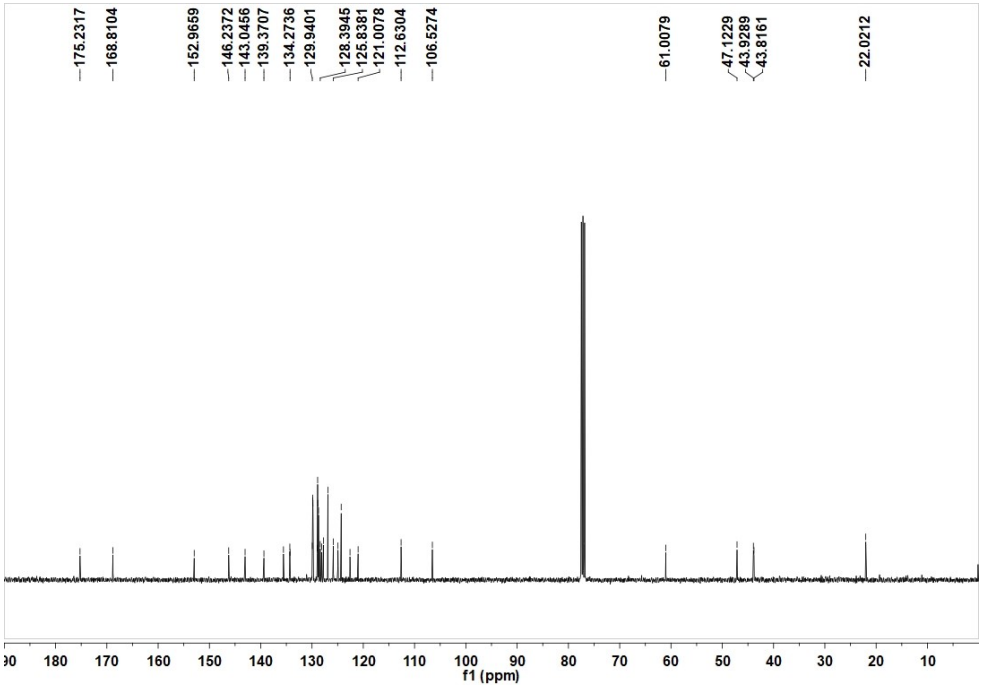

8.1752
8.1548
7.7953
7.7765
7.5960
7.5758
7.4397
7.1918
7.1813
7.1720
7.1632
7.1539
7.1456
6.9965
6.9779
6.9276
6.7257
6.7078
6.3991
6.1897
6.1689
6.1691
4.6192
4.5658
4.5258
3.6948
3.2786
3.2474
2.6354
2.1808
2.1496
2.00
1.96
1.98
1.09
7.03
2.01
0.99
1.99
0.96
1.00
0.98
0.99
1.02
1.02
2.97
1.08
f1 (ppm)

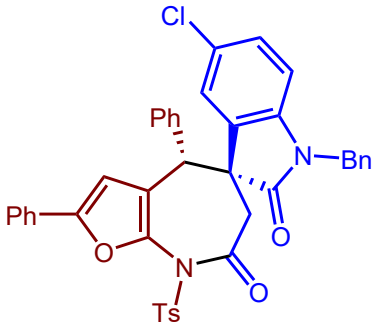

174.7302
168.8150
153.1667
146.5824
139.5892
130.1813
128.8611
128.0688
124.3515
120.6571
115.6273
110.7851
106.4588
61.3681
47.1434
43.8740
43.5060
22.2400
f1 (ppm)


Br
Ph
N
Bn
Ph
O
O
N
O
Ts

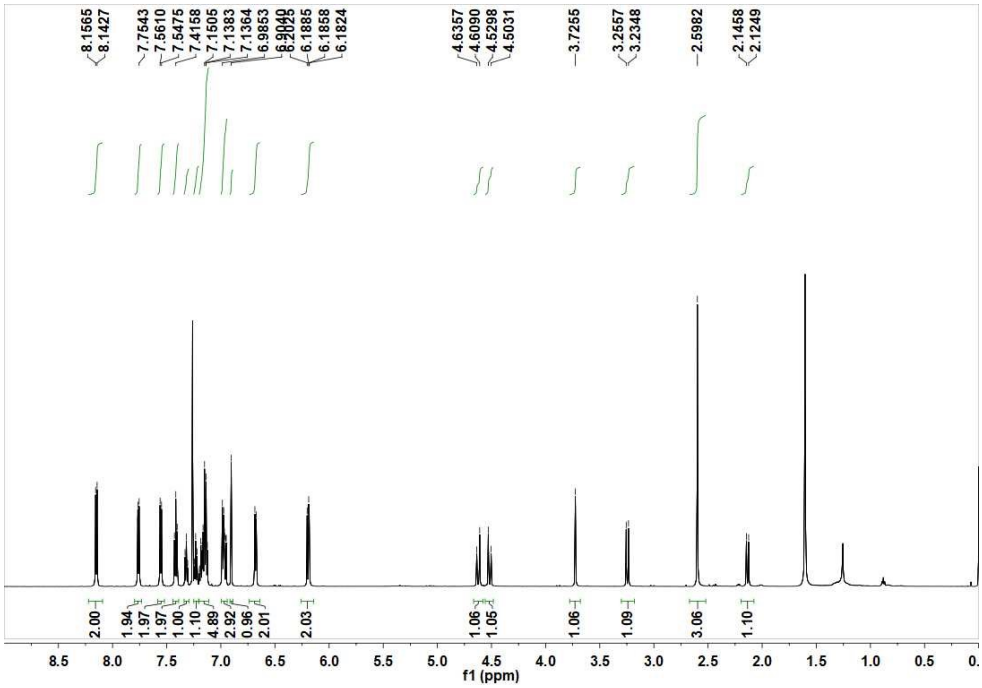
3x

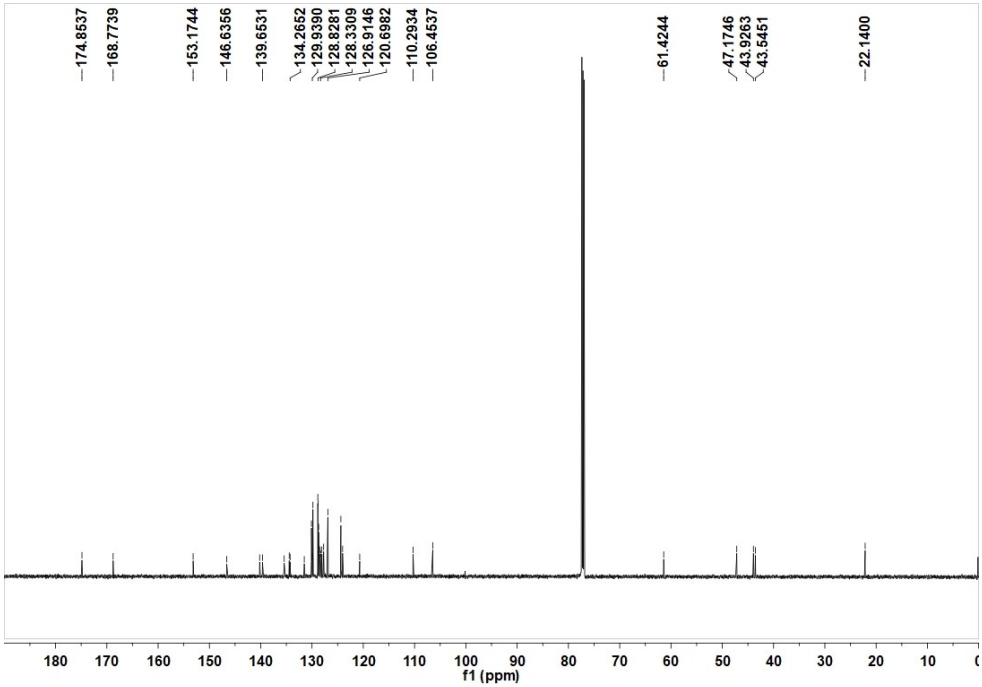

8.1677
8.1483
7.7502
7.7305
7.5159
7.4960
7.4125
7.3941
7.2397
7.1746
7.1539
7.1347
7.0533
7.0308
7.0108
6.9006
6.7080
6.6897
6.4702
6.4040
4.6154
4.5054
4.4655
3.9514
3.2344
3.2030
2.5723
2.1195
2.0881
1.98
2.02
2.14
2.18
1.14
6.00
3.09
1.06
2.01
0.97
1.00
1.07
1.01
1.07
1.04
3.01
1.00
f1 (ppm)

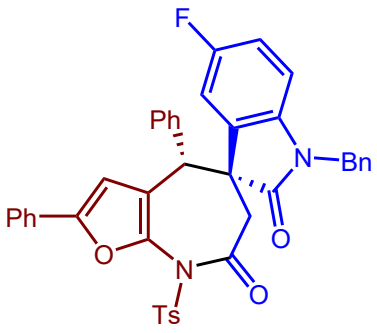

175.2317
168.8104
152.9659
146.2372
143.0456
139.3707
134.2736
129.9401
128.3945
125.8381
121.0078
112.6304
106.5274
61.0079
47.1229
43.9289
43.8161
22.0212
f1 (ppm)


Cl
Ph
N
Bn
Ph
O
O
N
O
Ts

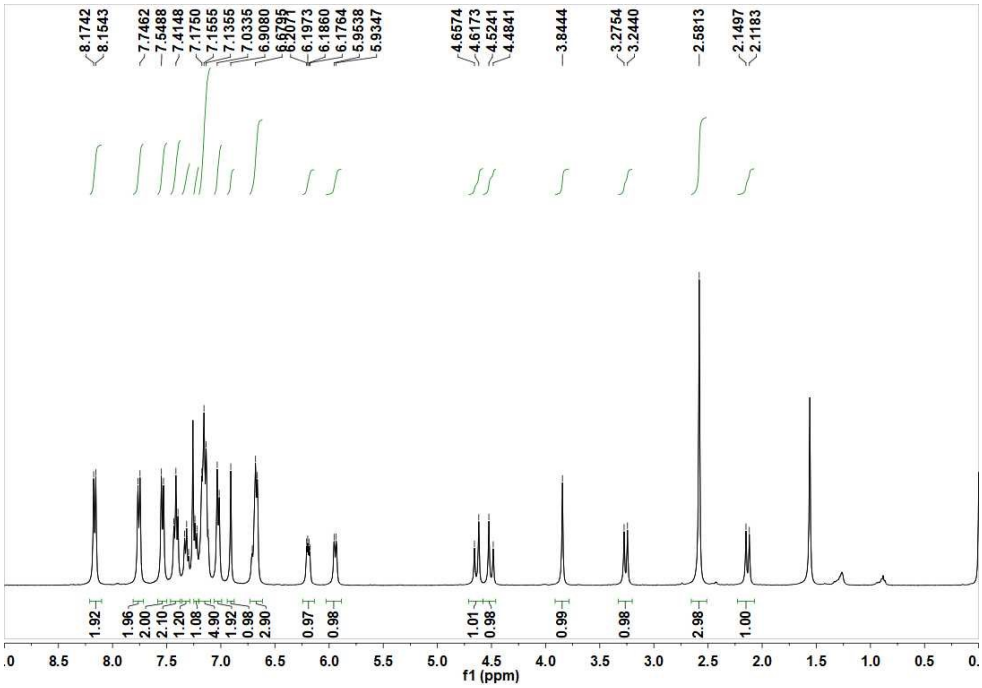
3y

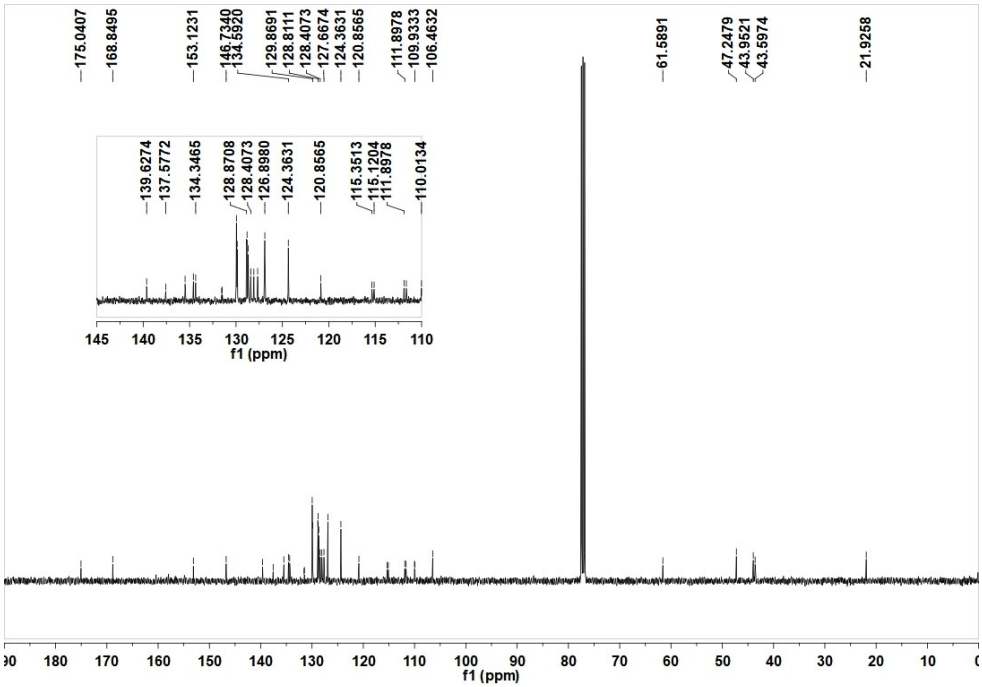

8.1565
8.1427
7.7543
7.5610
7.5475
7.4158
7.1505
7.1383
7.1364
6.9853
6.1885
6.1858
6.1824
4.6357
4.6090
4.5298
4.5031
3.7255
3.2557
3.2348
2.5982
2.1458
2.1249
2.00
1.94
1.97
1.97
1.00
1.10
4.89
2.92
0.96
2.01
2.03
1.06
1.05
1.06
1.09
3.06
1.10
f1 (ppm)

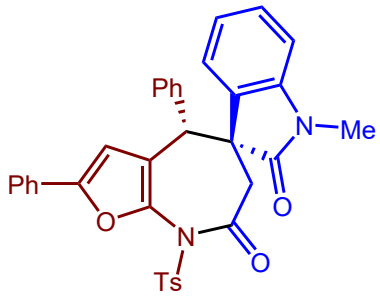

174.8537
168.7739
153.1744
146.6356
139.6531
134.2652
129.9390
128.8281
128.3309
126.9146
120.6982
110.2934
106.4537
61.4244
47.1746
43.9263
43.5451
22.1400
f1 (ppm)


F
Ph
N
Bn
Ph
O
O
N
O
Ts

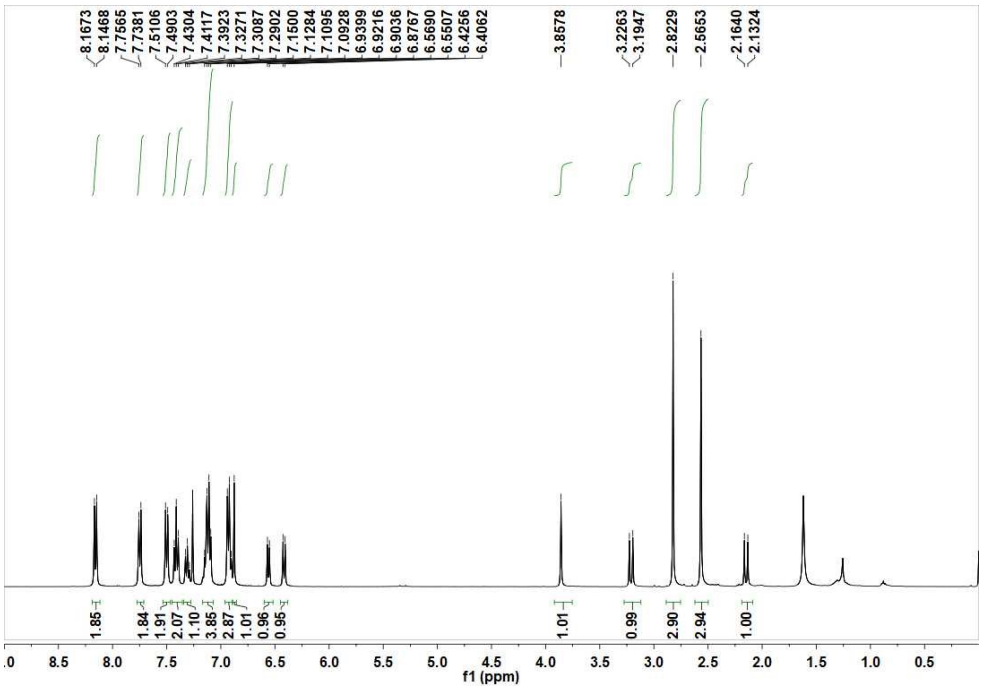
3z

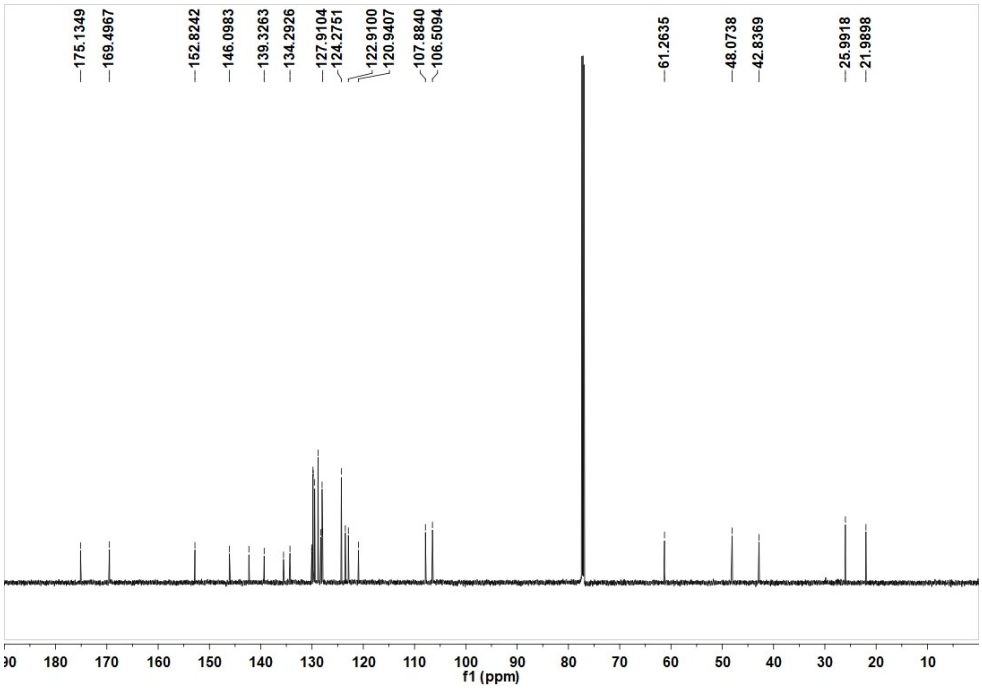

8.1742
8.1543
7.7462
7.5488
7.4148
7.1750
7.1555
7.1355
7.0335
6.9080
6.6795
6.2071
6.1973
6.1860
6.1764
5.9538
5.9347
4.6674
4.6173
4.5241
4.4841
3.8444
3.2754
3.2440
2.5813
2.1497
2.1183
1.92
1.96
2.00
2.10
1.20
1.08
4.90
1.92
0.98
2.90
0.97
0.98
1.01
0.98
0.99
0.98
2.98
1.00
f1 (ppm)


175.0407
168.8495
153.1231
146.7340
134.5920
129.8691
128.8111
128.4073
127.6674
124.3631
120.8565
111.8978
109.9333
106.4632
61.5891
47.2479
43.9521
43.5974
21.9258
139.6274
137.5772
134.3465
128.8708
128.4073
126.8980
124.3631
120.8565
115.3513
115.1204
111.8978
110.0134
145 140 135 130 125 120 115 110
f1 (ppm)
180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10
f1 (ppm)


Ph
N
Me
Ph
O
O
N
O
Ts

3aa


8.1673
8.1468
7.7565
7.7381
7.5106
7.4903
7.4304
7.4117
7.3923
7.3271
7.3087
7.2902
7.1500
7.1284
7.1095
7.0928
6.9399
6.9216
6.9036
6.8767
6.5690
6.5507
6.4256
6.4062
3.8578
3.2263
3.1947
2.8229
2.5653
2.1640
2.1324
1.85
1.84
1.91
2.07
1.10
3.85
2.87
1.01
0.96
0.95
1.01
0.99
2.90
2.94
1.00
f1 (ppm)


175.1349
169.4967
152.8242
146.0983
139.3263
134.2926
127.9104
124.2751
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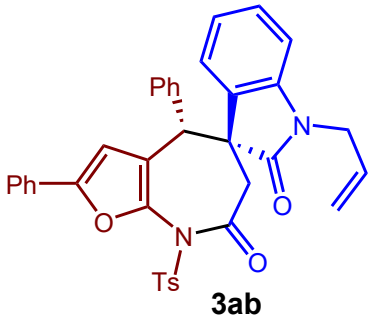
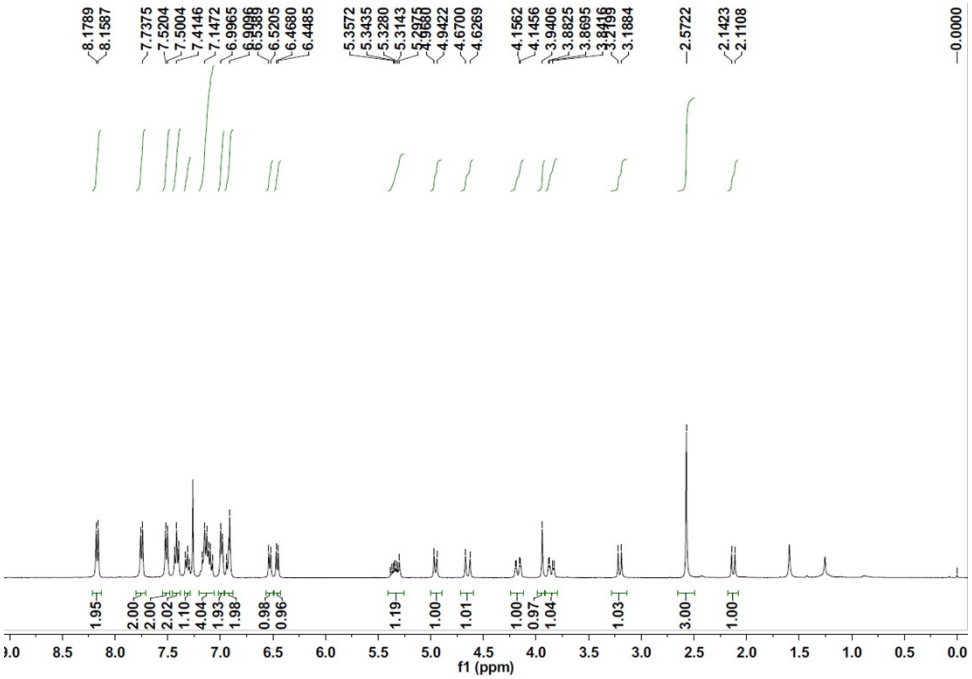
107.8840
106.5094
61.2635
48.0738
42.8369
25.9918
21.9898
f1 (ppm)


Ph
Ph
O
N
O
N
O
Ts

3ab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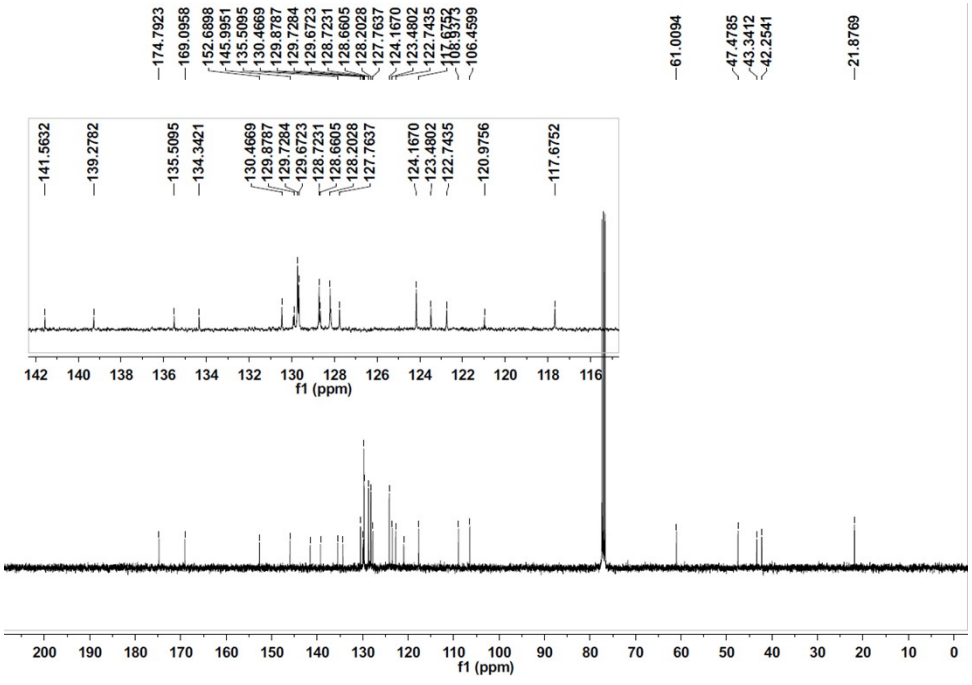
7.5204
7.5004
7.4146
7.1472
6.9965
6.5389
6.5205
6.4680
6.4485
5.3572
5.3435
5.3280
5.3143
4.9422
4.6700
4.6269
4.1562
4.1456
3.9406
3.8825
3.8695
3.1884
2.5722
2.1423
2.1108
0.0000
1.95
2.00
2.00
2.02
1.10
4.04
1.93
1.98
0.98
0.96
1.19
1.00
1.01
1.00
0.97
1.04
1.03
3.00
1.00
f1 (ppm)


174.7923
169.0958
152.6898
145.9951
135.5095
130.4669
129.8787
129.7284
129.6723
128.7231
128.6605
128.2028
127.7637
124.1670
123.4802
122.7435
117.6752
108.9373
106.4599
61.0094
47.4785
43.3412
42.2541
21.8769
141.5632
139.2782
135.5095
134.3421
130.4669
129.8787
129.7284
129.6723
128.7231
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128.2028
127.7637
124.1670
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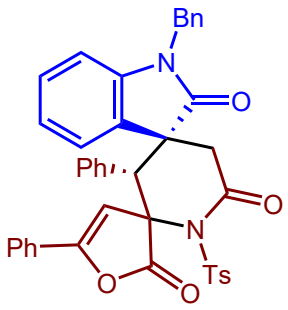
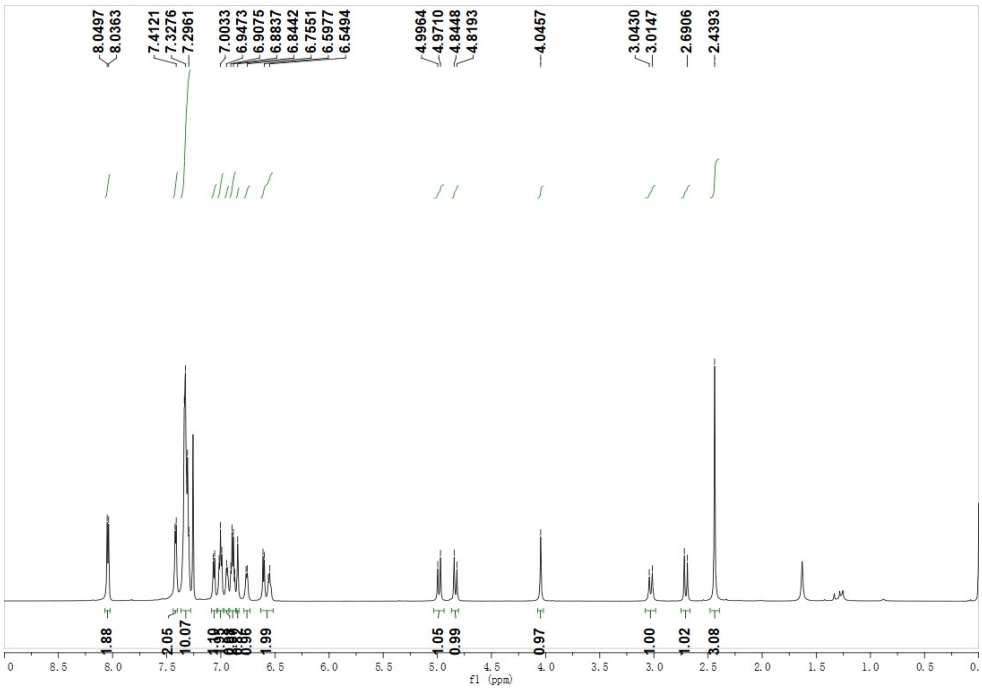
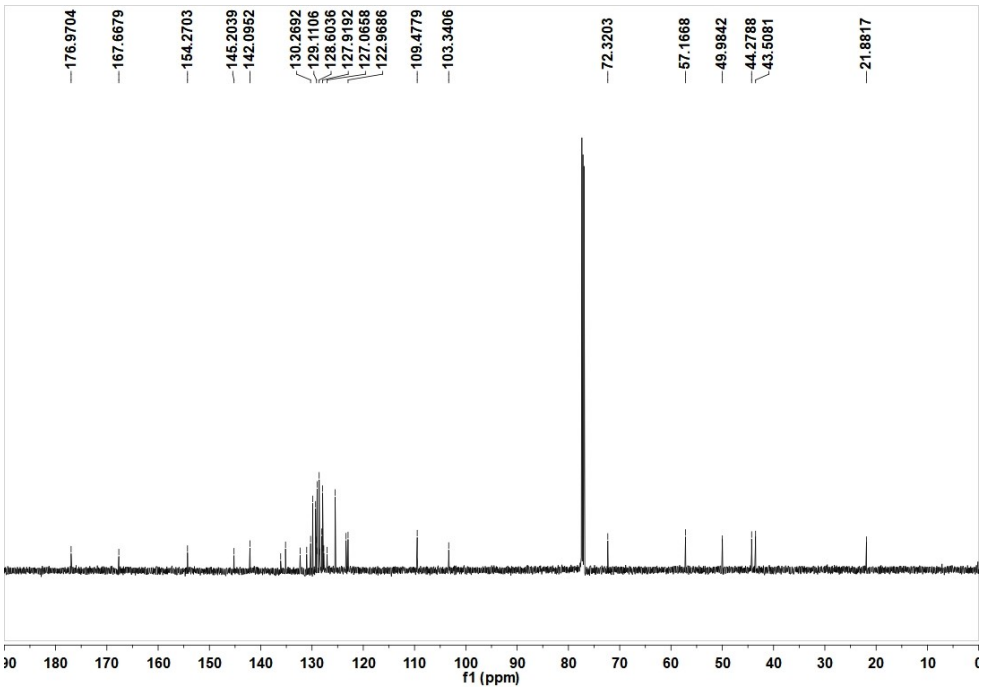
122.7435
120.9756
117.6752
f1 (ppm)

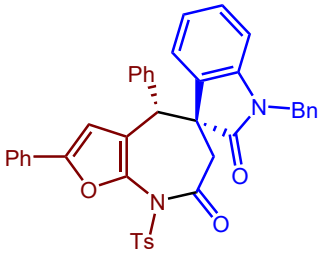

Bn
N
O
Ph
O
N
Ts
Ph
O
O

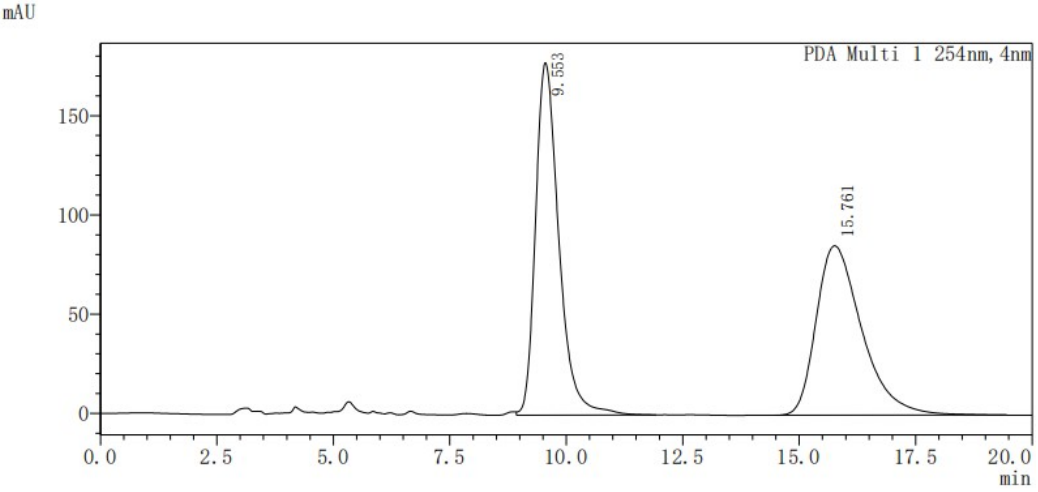
4a


8.0497
8.0363
7.4121
7.3276
7.2961
7.0033
6.9473
6.9075
6.8837
6.8442
6.7551
6.5977
6.5494
4.9964
4.9710
4.8448
4.8193
4.0457
3.0430
3.0147
2.6906
2.4393
1.88
2.05
10.07
1.99
1.05
0.99
0.97
1.00
1.02
3.08
f1 (ppm)


176.9704
167.6679
154.2703
146.2039
142.0952
130.2692
129.1106
128.6036
127.9192
127.0658
122.9686
109.4779
103.3406
72.3203
57.1668
49.9842
44.2788
43.5081
21.8817
f1 (ppm)

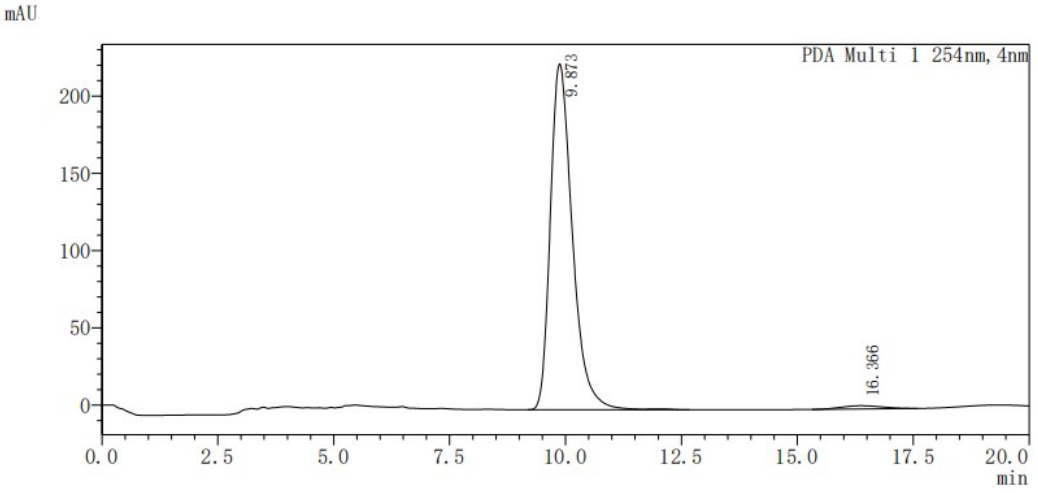
(4R,5R)-1'-Benzyl-2,4-diphenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3a)





PDA Ch1 254nm

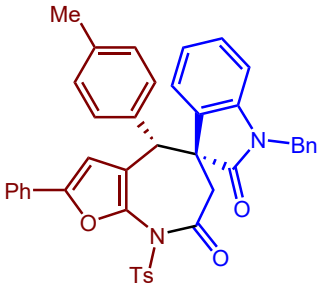
Peak#	Ret.Time	Area	Height	Area%	Height%
1	9.553	5933240	175662	50.796	67.355
2	15.761	5747282	85137	49.204	32.645
Total		11680522	260798	100.000	100.000

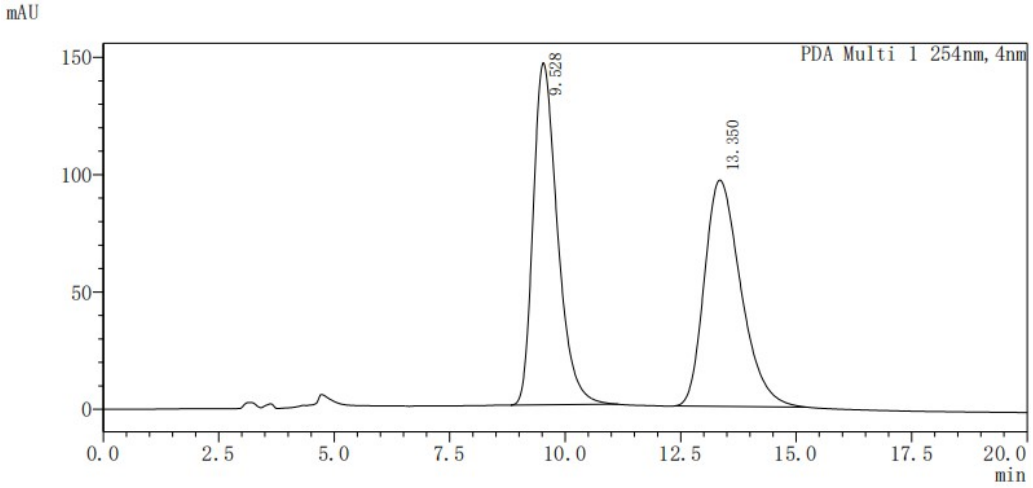


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	9.873	7354986	223637	98.261	99.068
2	16.366	130164	2105	1.739	0.932
Total		7485150	225742	100.000	100.000

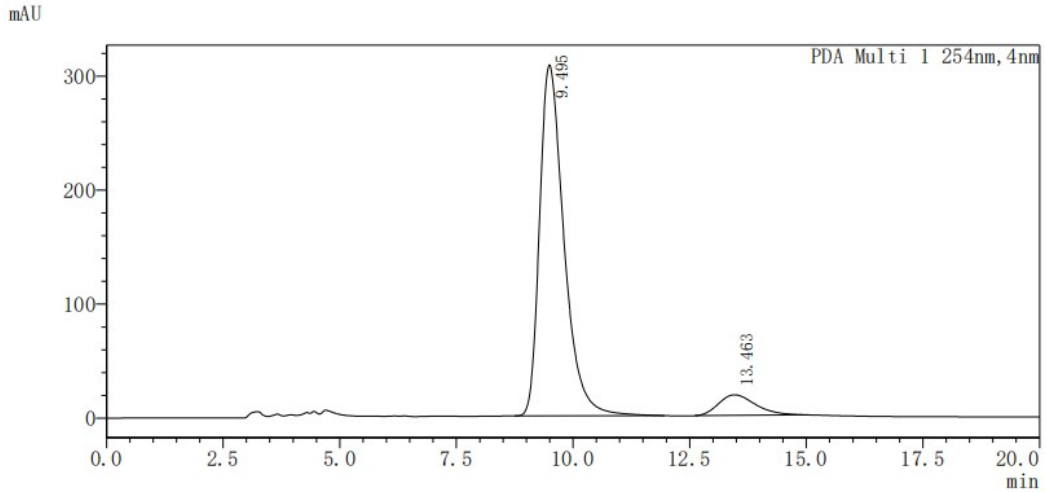
(4R,5R)-1'-Benzyl-2-phenyl-4-(p-tolyl)-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3b)





PDA Ch1 254nm

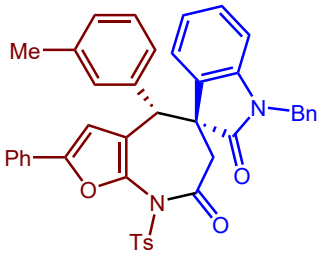
Peak#	Ret.Time	Area	Height	Area%	Height%
1	9.528	5404251	146005	50.019	60.130
2	13.350	5400061	96812	49.981	39.870
Total		10804312	242817	100.000	100.000

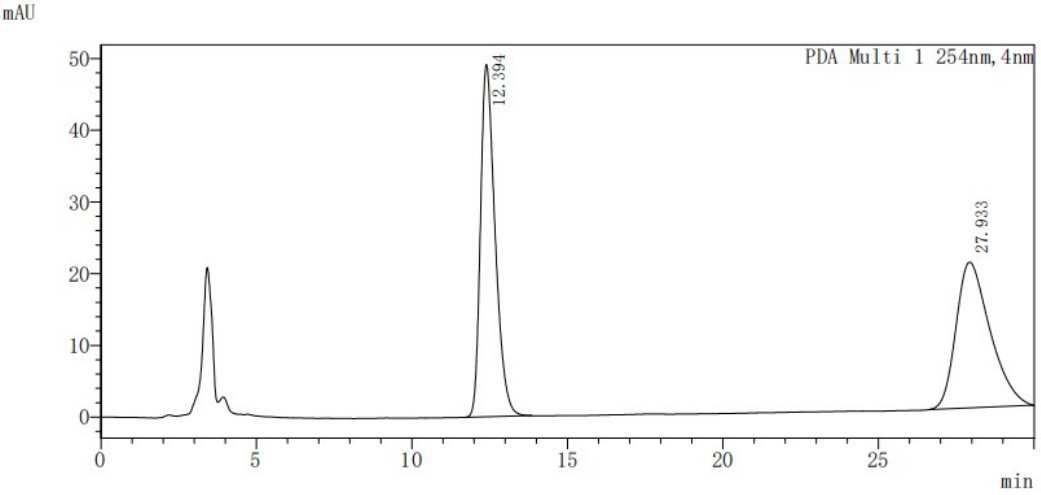


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	9.495	11041873	307387	93.121	94.961
2	13.463	815623	16310	6.879	5.039
Total		11857495	323697	100.000	100.000

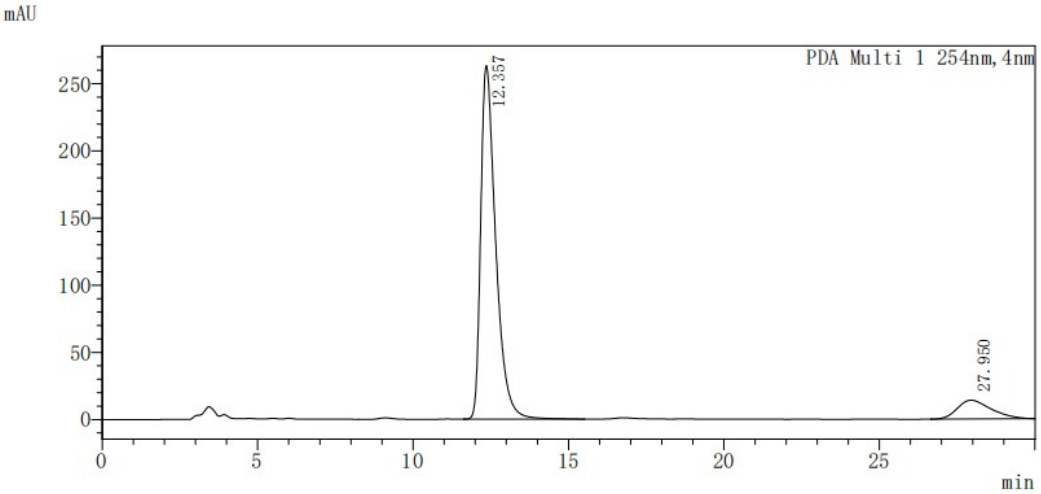
(4R,5R)-1'-Benzyl-2-phenyl-4-(m-tolyl)-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3c)





PDA Ch1 254nm

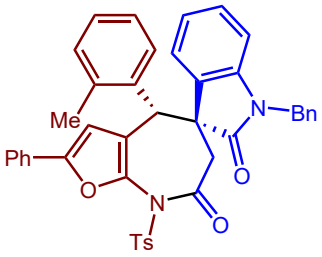
Peak#	Ret.Time	Area	Height	Area%	Height%
1	12.394	1605531	49110	51.010	70.728
2	27.933	1541937	20325	48.990	29.272
Total		3147468	69435	100.000	100.000

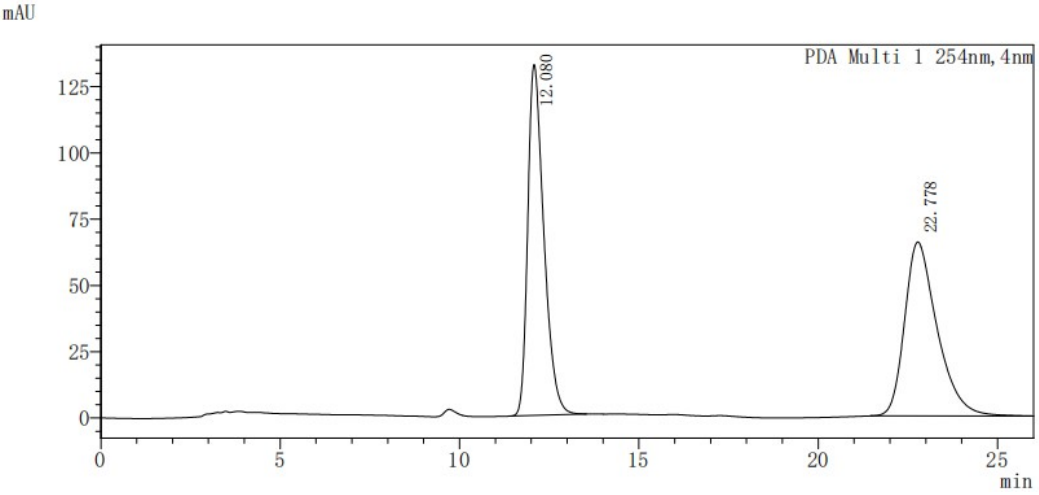


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	12.357	8816402	263172	89.228	94.941
2	27.950	1064310	14023	10.772	5.059
Total		9880711	277194	100.000	100.000

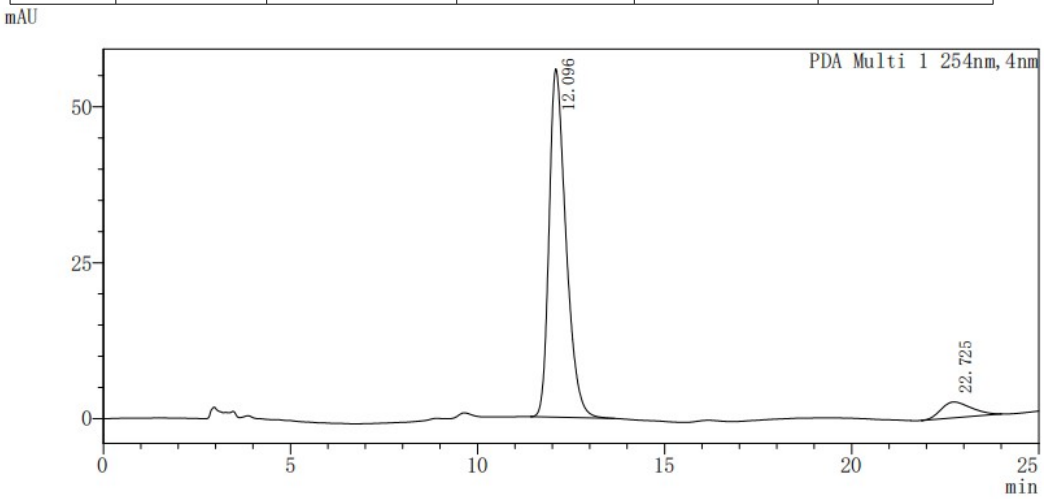
(4R,5R)-1'-Benzyl-2-phenyl-4-(o-tolyl)-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3d)





PDA Ch1 254nm

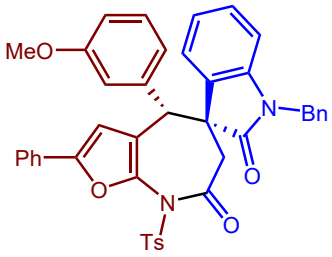
Peak#	Ret.Time	Area	Height	Area%	Height%
1	12.080	4126142	132331	49.975	66.856
2	22.778	4130264	65604	50.025	33.144
Total		8256406	197935	100.000	100.000

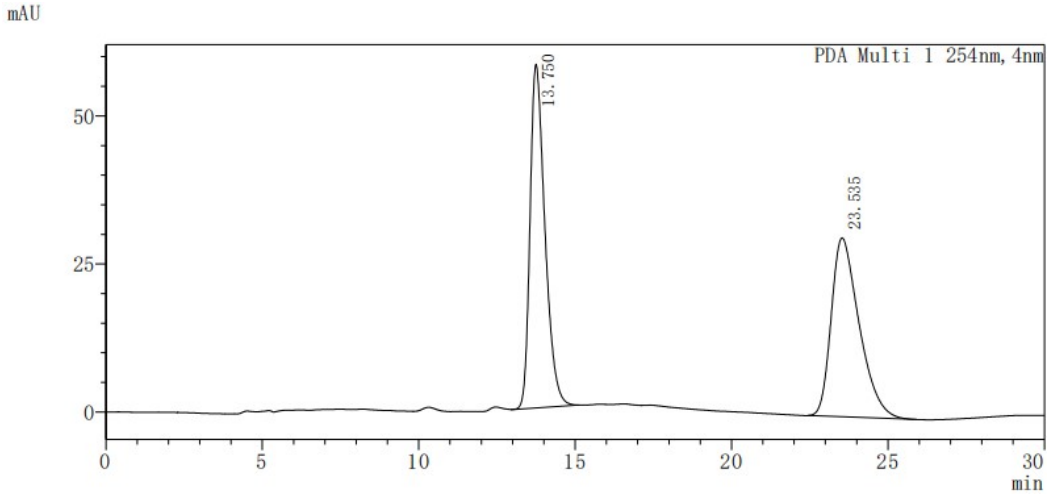


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	12.096	1750959	55857	92.476	95.642
2	22.725	142466	2545	7.524	4.358
Total		1893425	58403	100.000	100.000

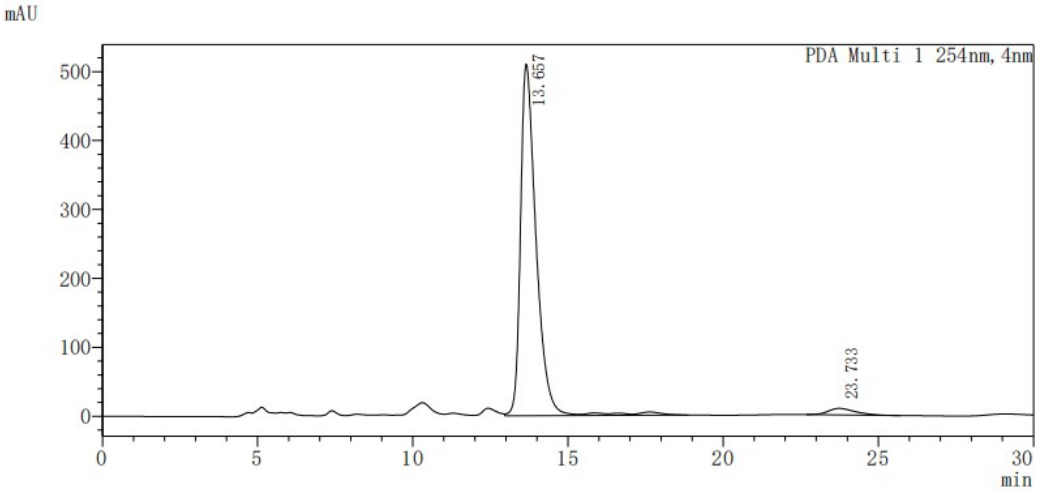
(4R,5R)-1'-Benzyl-4-(3-methoxyphenyl)-2-phenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3e)





PDA Ch1 254nm

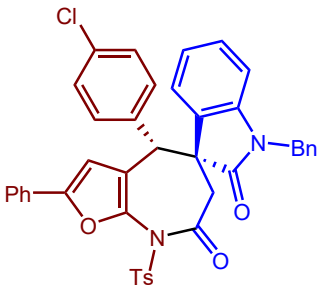
Peak#	Ret.Time	Area	Height	Area%	Height%
1	13.750	1918953	58002	50.577	65.746
2	23.535	1875200	30220	49.423	34.254
Total		3794153	88222	100.000	100.000

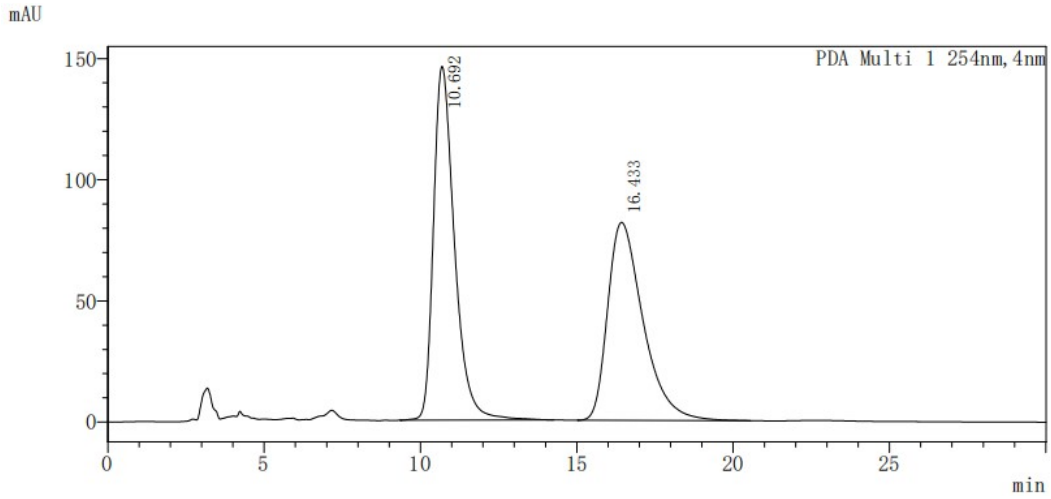


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	13.657	17259226	507326	96.784	98.192
2	23.733	573410	9344	3.216	1.808
Total		17832636	516670	100.000	100.000

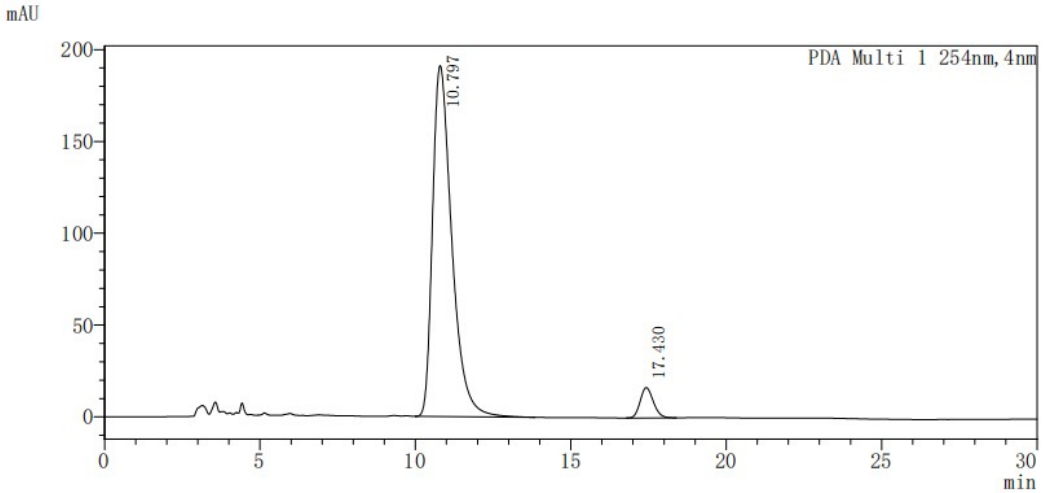
(4R,5R)-1'-Benzyl-4-(4-chlorophenyl)-2-phenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3f)





PDA Ch1 254nm

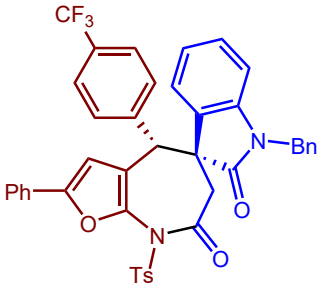
Peak#	Ret.Time	Area	Height	Area%	Height%
1	10.692	6831769	146001	51.537	64.122
2	16.433	6424240	81691	48.463	35.878
Total		13256009	227693	100.000	100.000

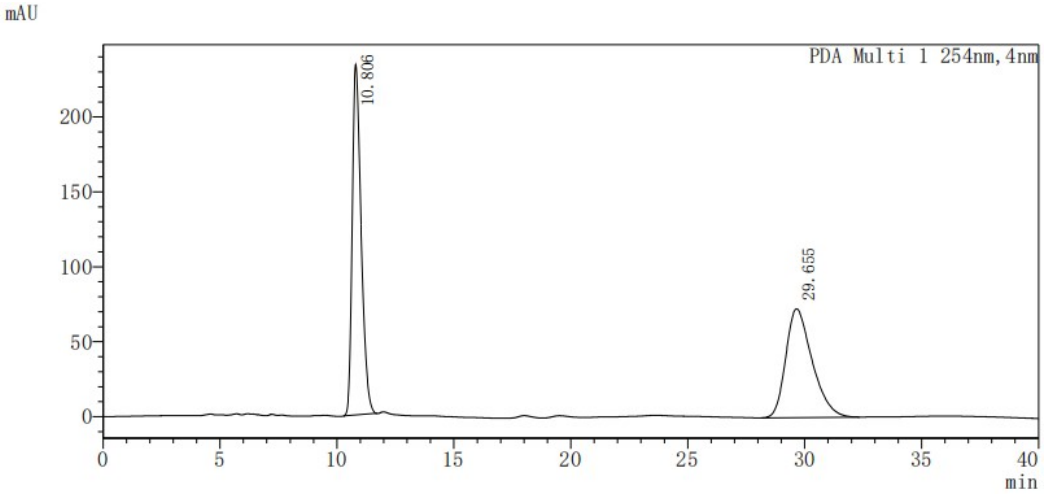


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	10.797	8226203	191090	94.421	92.036
2	17.430	486036	16535	5.579	7.964
Total		8712239	207625	100.000	100.000

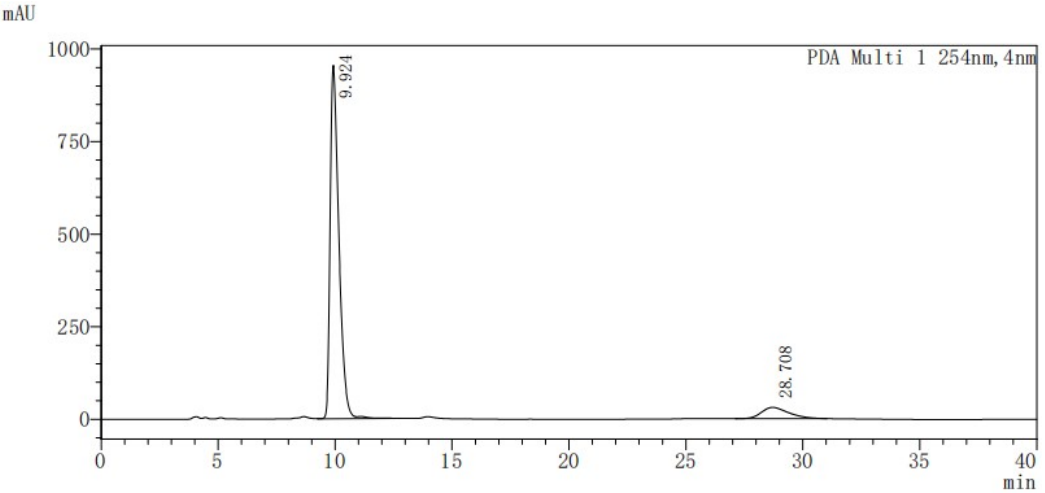
(4R,5R)-1'-Benzyl-2-phenyl-8-tosyl-4-(4-(trifluoromethyl)phenyl)-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3g)





PDA Ch1 254nm

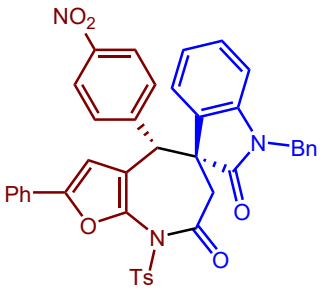
Peak#	Ret.Time	Area	Height	Area%	Height%
1	10.806	6063356	232297	51.584	76.191
2	29.655	5691010	72591	48.416	23.809
Total		11754366	304889	100.000	100.000

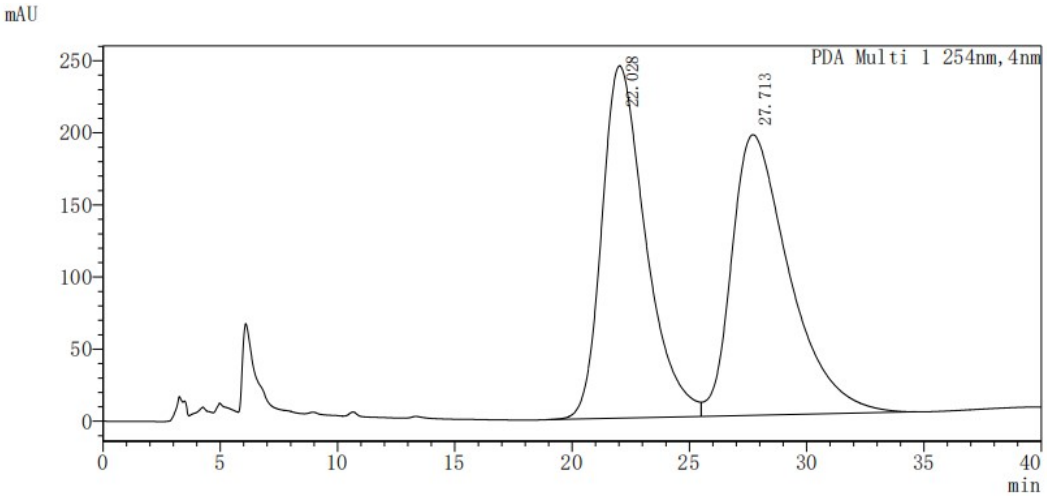


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	9.924	24820230	954144	92.924	97.231
2	28.708	1890064	27177	7.076	2.769
Total		26710295	981321	100.000	100.000

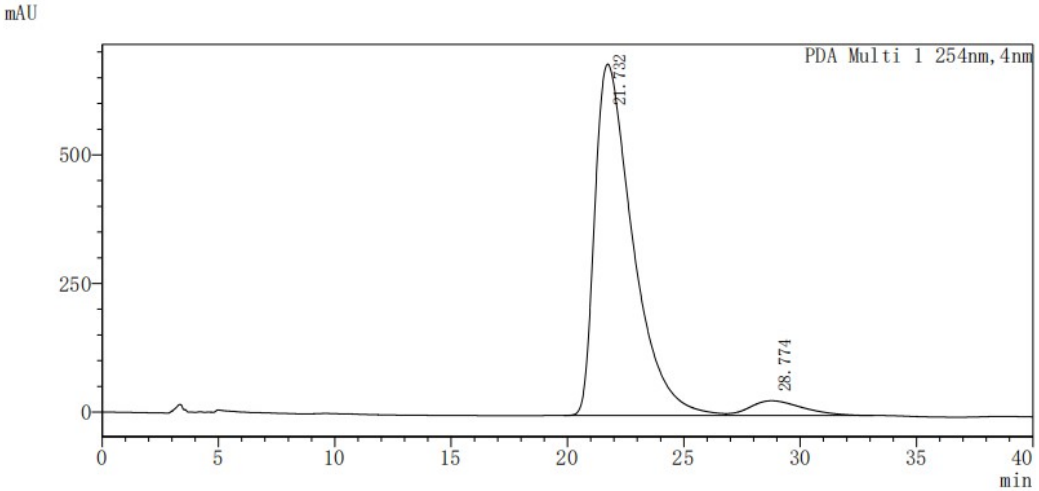
(4R,5R)-1'-Benzyl-4-(4-nitrophenyl)-2-phenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3h)





PDA Ch1 254nm

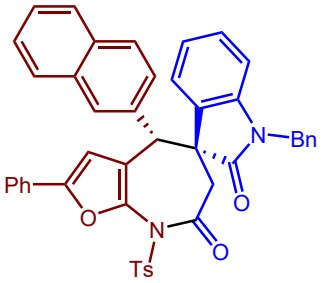
Peak#	Ret.Time	Area	Height	Area%	Height%
1	22.028	31726231	244309	48.780	55.674
2	27.713	33313453	194511	51.220	44.326
Total		65039684	438820	100.000	100.000

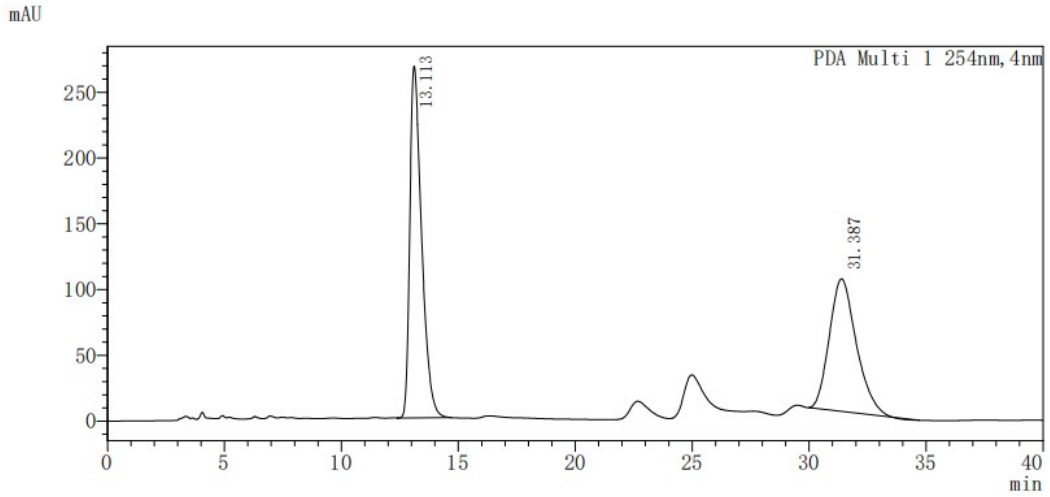


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	22.661	2776332	25671	92.442	92.902
2	28.730	227002	1961	7.558	7.098
Total		3003334	27633	100.000	100.000

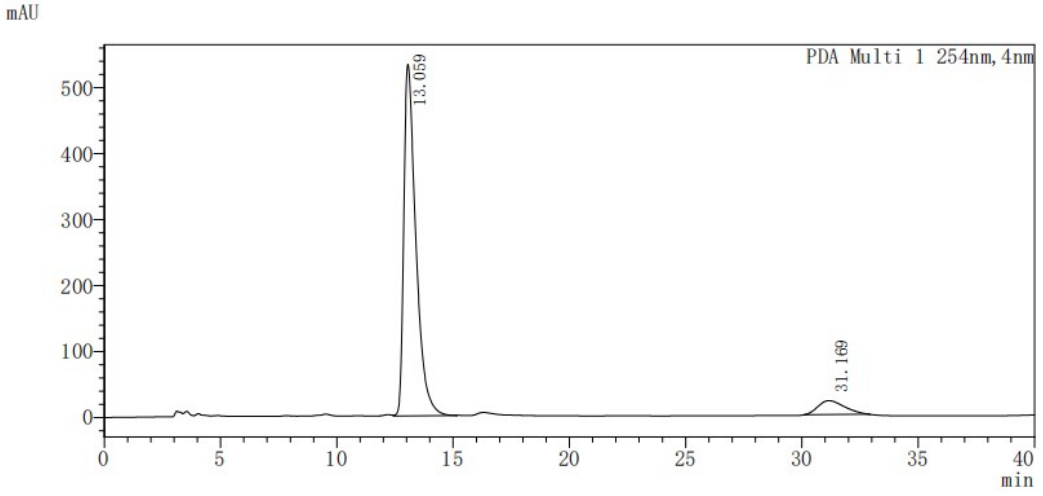
(4R,5R)-1'-Benzyl-4-(naphthalen-2-yl)-2-phenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3i)





PDA Ch1 254nm

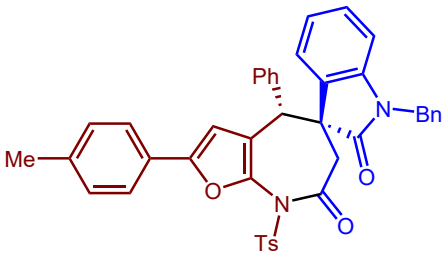
Peak#	Ret.Time	Area	Height	Area%	Height%
1	13.113	9391695	267582	49.756	71.315
2	31.387	9483937	107631	50.244	28.685
Total		18875632	375213	100.000	100.000

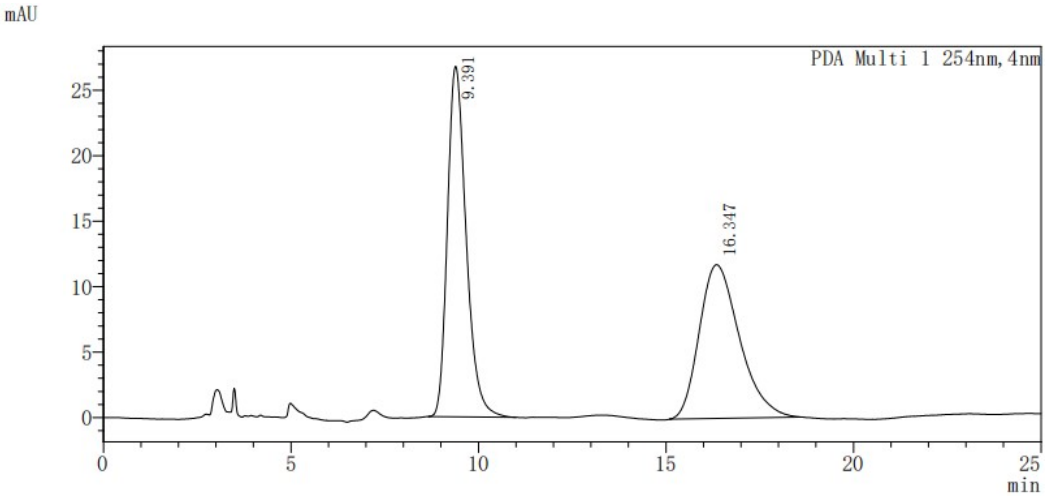


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	13.059	19212850	532654	91.592	96.098
2	31.169	1763722	21628	8.408	3.902
Total		20976572	554282	100.000	100.000

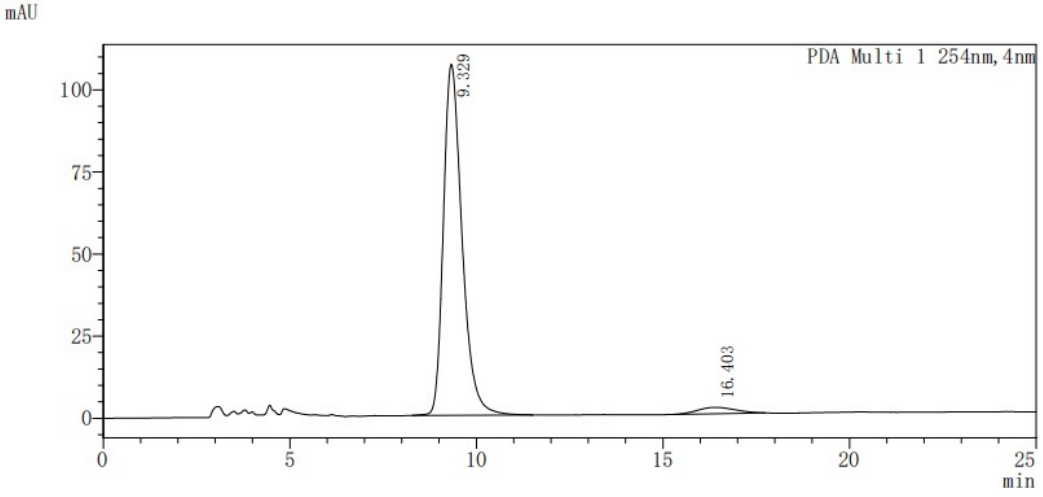
(4R,5S)-1'-Benzyl-4-phenyl-2-(p-tolyl)-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3j)





PDA Ch1 254nm

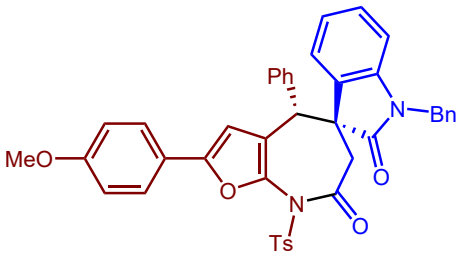
Peak#	Ret.Time	Area	Height	Area%	Height%
1	9.391	928820	26761	51.495	69.522
2	16.347	874889	11732	48.505	30.478
Total		1803708	38493	100.000	100.000

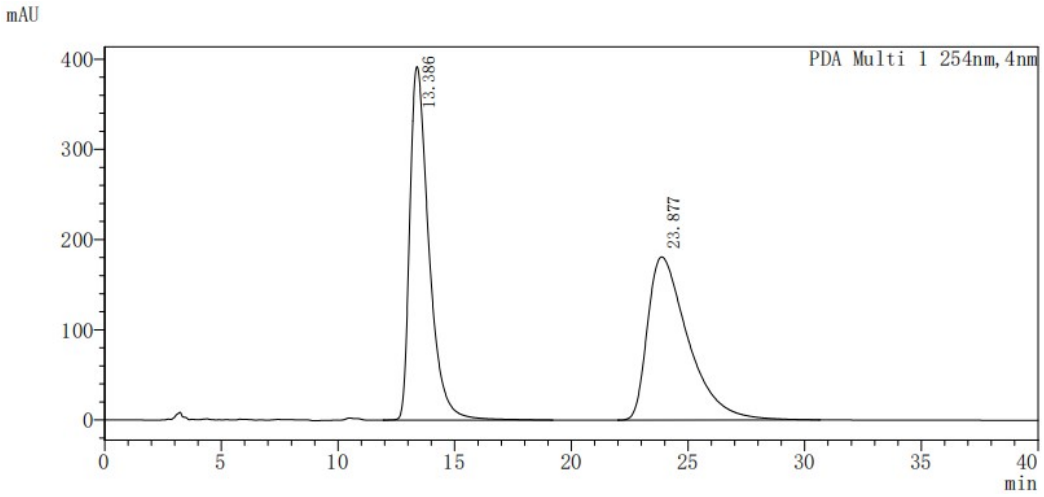


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	9.329	3709148	106860	96.526	98.234
2	16.403	133509	1921	3.474	1.766
Total		3842657	108782	100.000	100.000

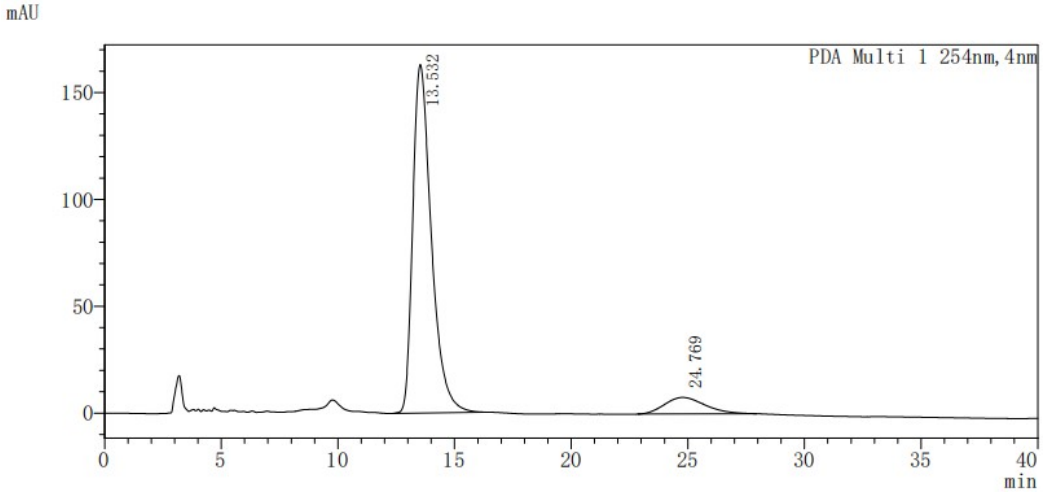
(4R,5S)-1'-Benzyl-2-(4-methoxyphenyl)-4-phenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3k)





PDA Ch1 254nm

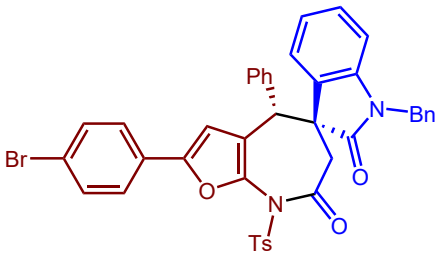
Peak#	Ret.Time	Area	Height	Area%	Height%
1	13.386	22303608	392024	50.488	68.423
2	23.877	21872849	180914	49.512	31.577
Total		44176457	572938	100.000	100.000

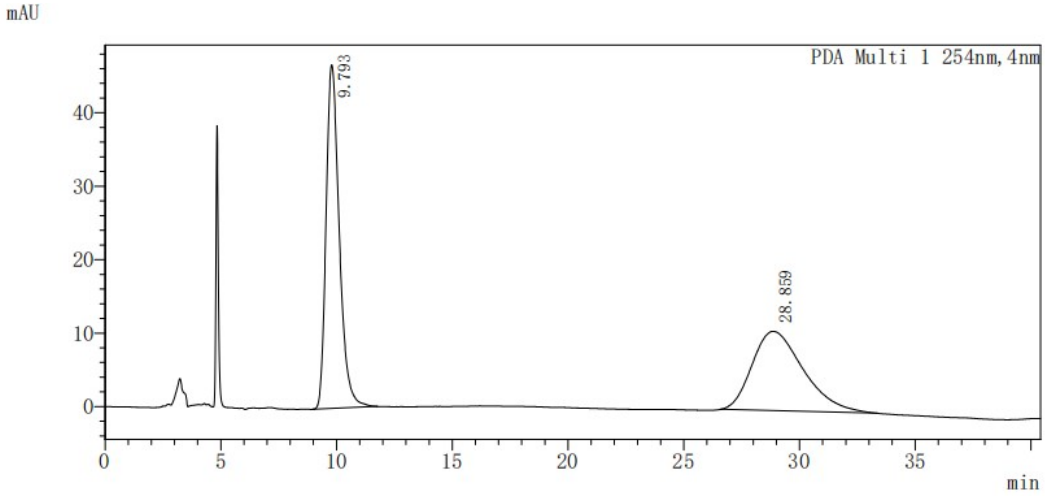


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	13.532	9030954	163064	90.638	95.482
2	24.769	932853	7717	9.362	4.518
Total		9963807	170781	100.000	100.000

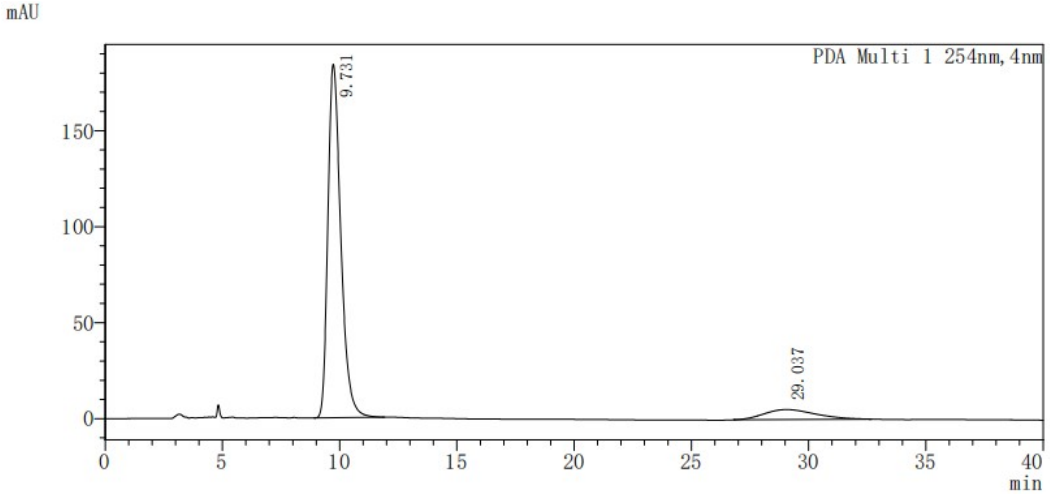
(4R,5S)-1'-Benzyl-2-(4-bromophenyl)-4-phenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3l)





PDA Ch1 254nm

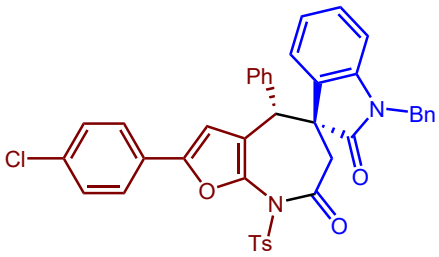
Peak#	Ret.Time	Area	Height	Area%	Height%
1	9.793	1803208	46520	51.038	80.935
2	28.859	1729861	10959	48.962	19.065
Total		3533069	57479	100.000	100.000

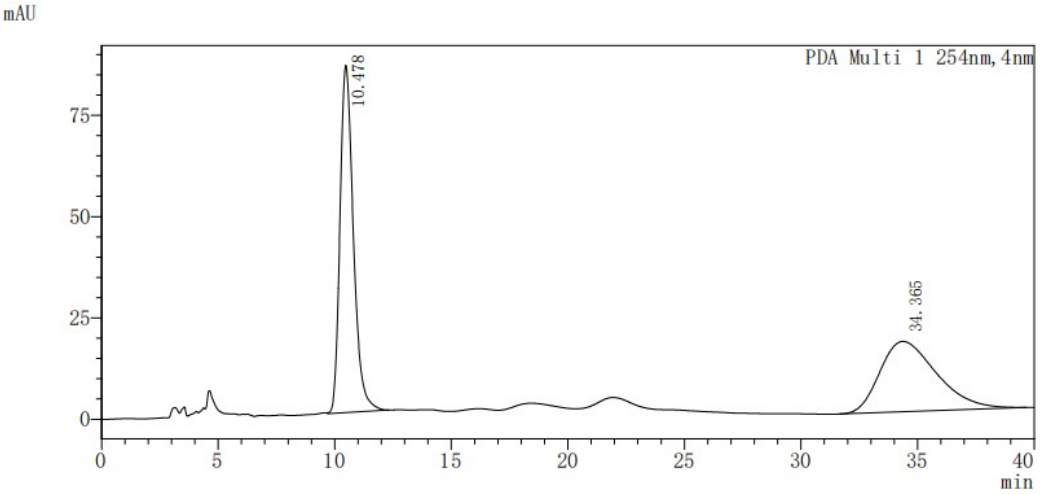


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	9.731	7108721	184176	91.433	97.475
2	29.037	666031	4772	8.567	2.525
Total		7774752	188948	100.000	100.000

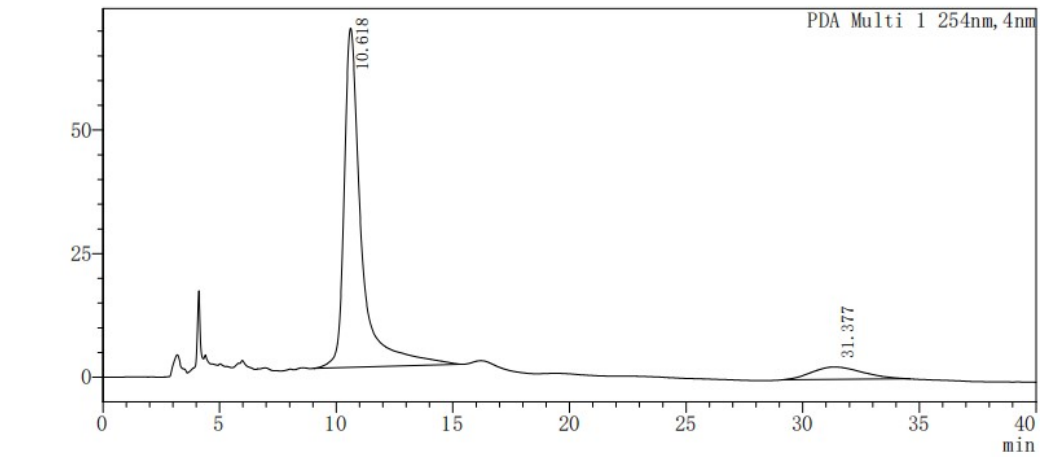
(4R,5S)-1'-Benzyl-2-(4-chlorophenyl)-4-phenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3m)





PDA Ch1 254nm

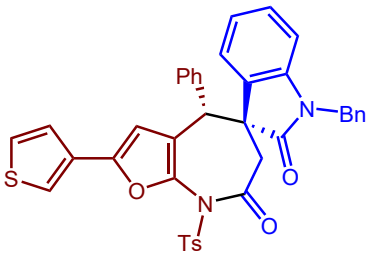
Peak#	Ret.Time	Area	Height	Area%	Height%
1	10.478	3413485	85673	53.750	83.144
2	34.365	2937215	17368	46.250	16.856
Total		6350700	103042	100.000	100.000

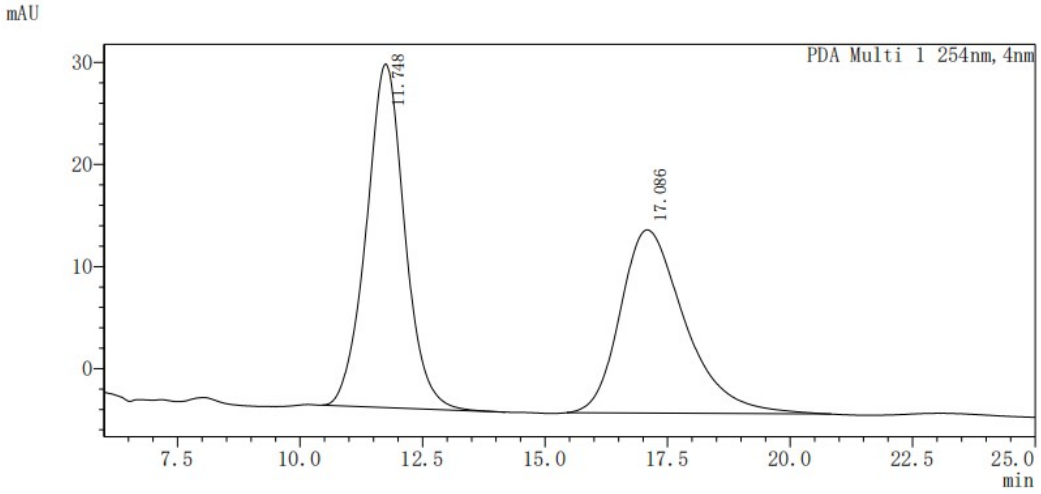


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	10.618	3543228	68589	93.133	97.082
2	31.377	261242	2062	6.867	2.918
Total		3804471	70650	100.000	100.000

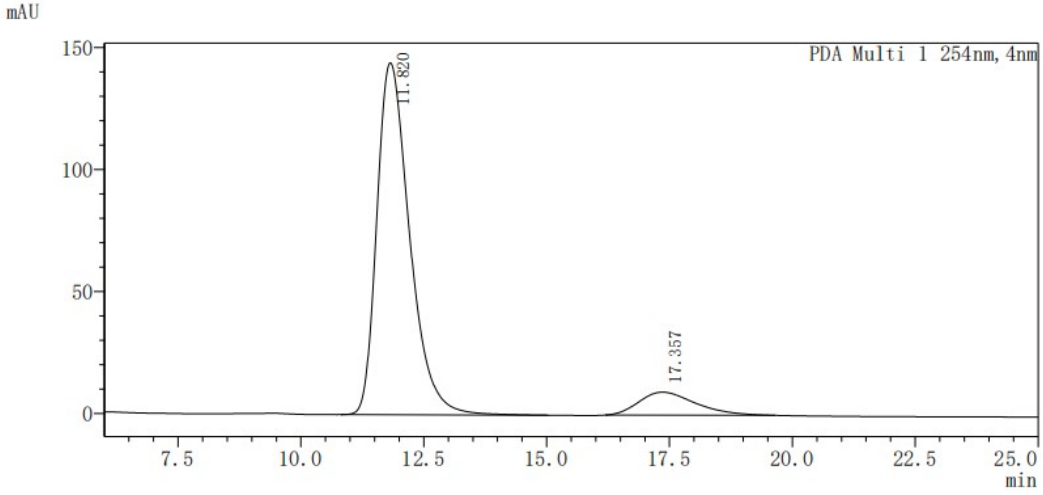
(4S,5R)-1'-benzyl-4-phenyl-2-(thiophen-3-yl)-8-tosyl-4,8-dihydrospiro[furo[2,3-b]azepine-5,3'-indoline]-2',7(6H)-dione (3n)





PDA Ch1 254nm

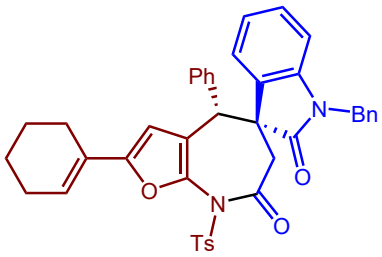
Peak#	Ret.Time	Area	Height	Area%	Height%
1	11.748	1836942	33655	52.682	65.216
2	17.086	1649895	17950	47.318	34.784
Total		3486837	51606	100.000	100.000

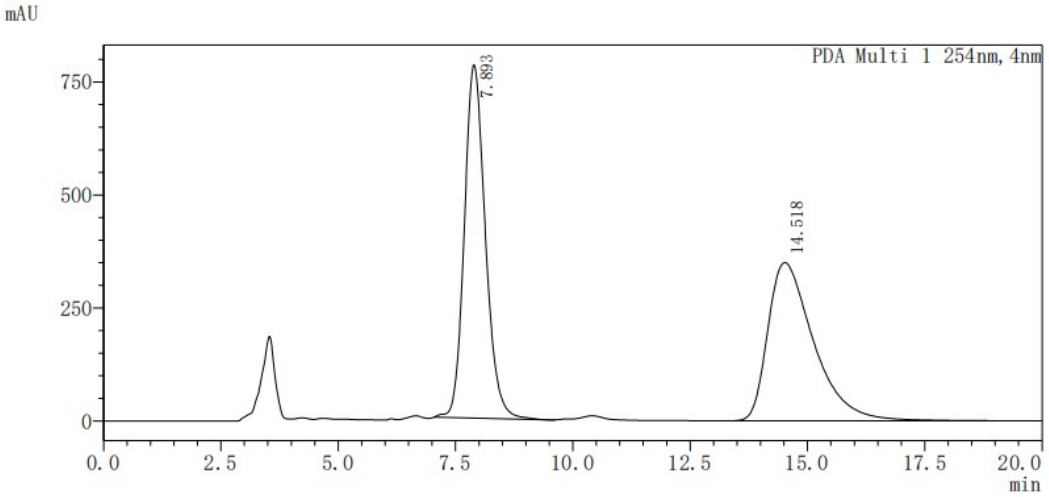


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	11.820	6686979	144208	89.841	93.863
2	17.357	756173	9429	10.159	6.137
Total		7443152	153637	100.000	100.000

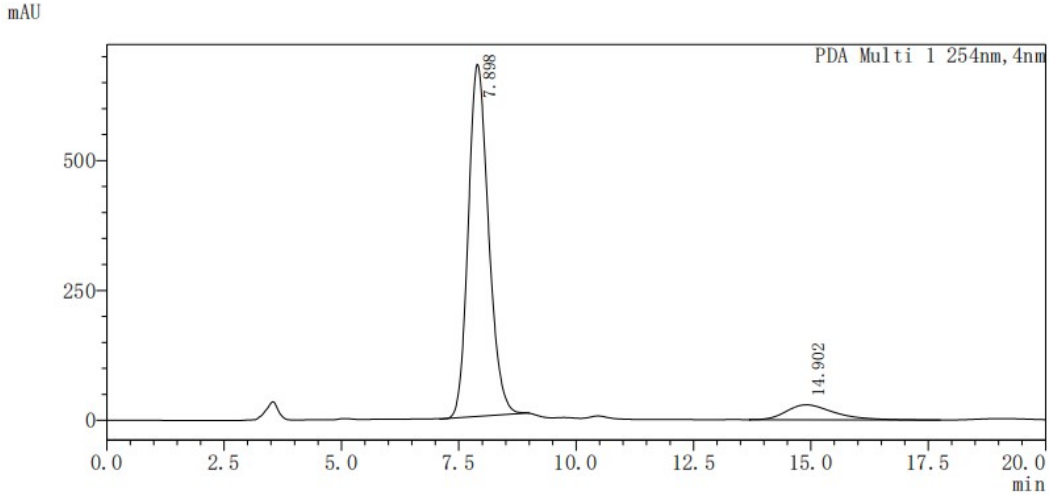
(4S,5R)-1'-benzyl-2-(cyclohex-1-en-1-yl)-4-phenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-b]azepine-5,3'-indoline]-2',7(6H)-dione (3o)





PDA Ch1 254nm

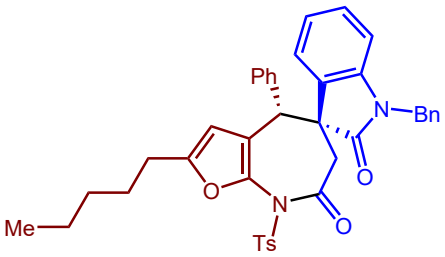
Peak#	Ret.Time	Area	Height	Area%	Height%
1	7.893	24408219	781629	50.661	69.063
2	14.518	23771590	350130	49.339	30.937
Total		48179809	1131759	100.000	100.000

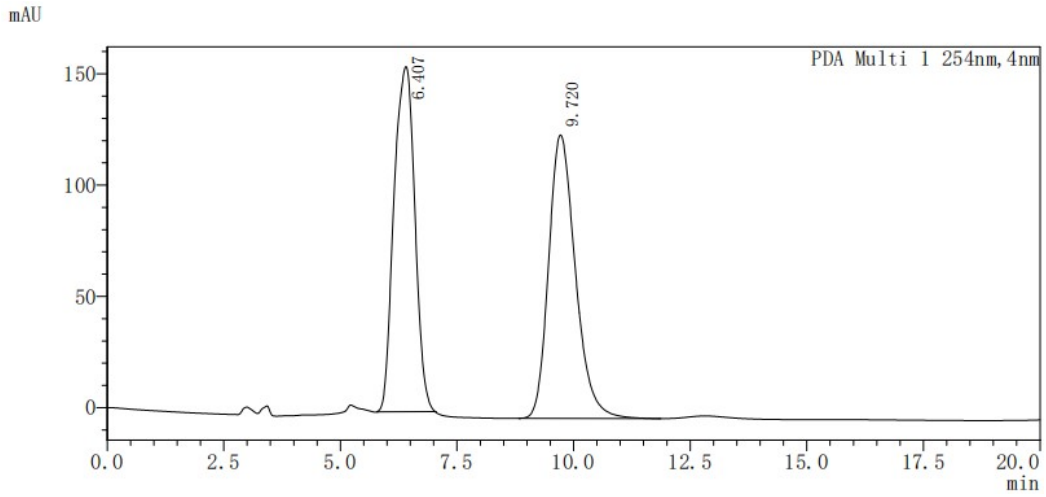


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	7.898	20377872	677616	90.959	95.936
2	14.902	2025399	28708	9.041	4.064
Total		22403271	706324	100.000	100.000

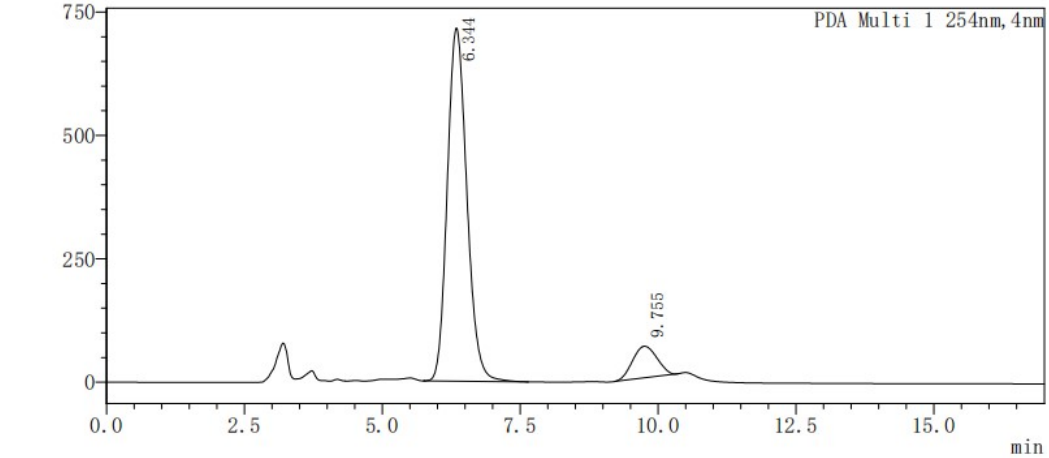
(4R,5R)-1'-Benzyl-2-pentyl-4-phenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3p)





PDA Ch1 254nm

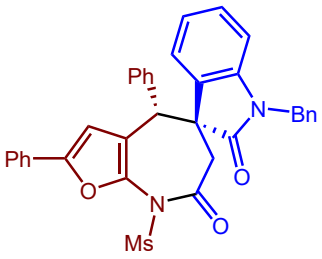
Peak#	Ret.Time	Area	Height	Area%	Height%
1	6.407	5060091	157600	49.888	55.310
2	9.720	5082889	127341	50.112	44.690
Total		10142979	284941	100.000	100.000

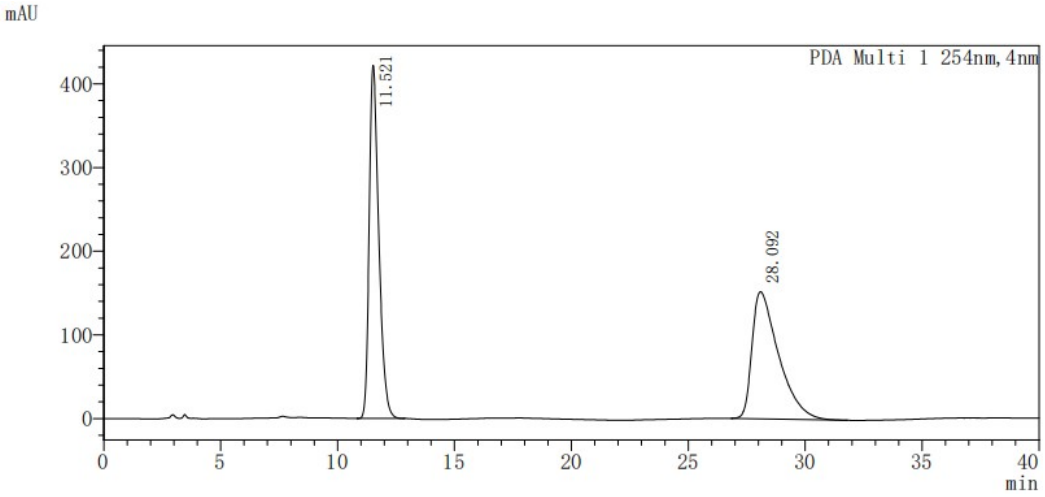


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	6.344	16554011	700602	89.814	91.815
2	9.755	1877420	62460	10.186	8.185
Total		18431430	763062	100.000	100.000

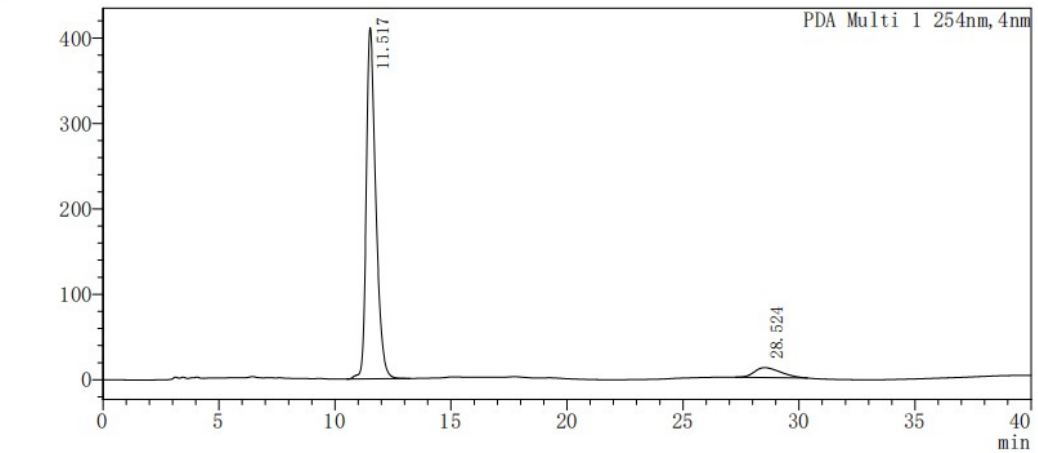
(4R,5S)-1'-Benzyl-8-(methylsulfonyl)-2,4-diphenyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3q)





PDA Ch1 254nm

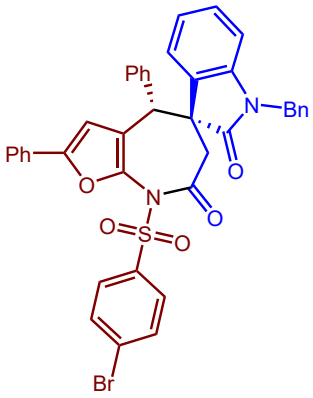
Peak#	Ret.Time	Area	Height	Area%	Height%
1	11.521	12023548	421835	50.023	73.521
2	28.092	12012595	151930	49.977	26.479
Total		24036144	573765	100.000	100.000

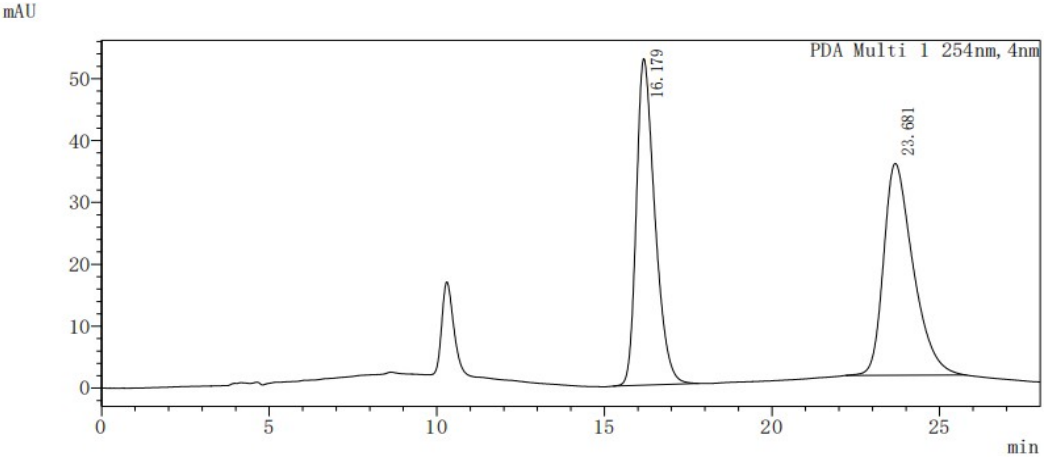


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	11.517	11697782	410816	94.657	97.760
2	28.524	660237	9414	5.343	2.240
Total		12358019	420230	100.000	100.000

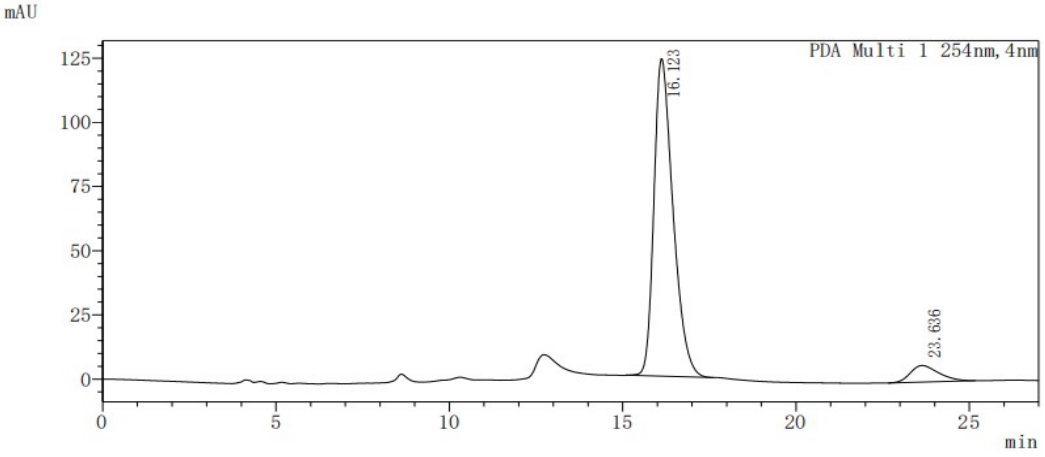
(4R,5S)-1'-Benzyl-8-((4-bromophenyl)sulfonyl)-2,4-diphenyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3r)





PDA Ch1 254nm

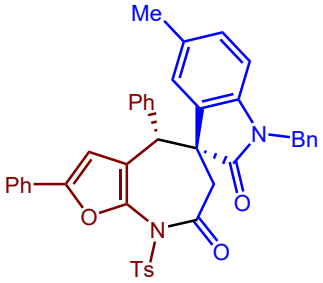
Peak#	Ret.Time	Area	Height	Area%	Height%
1	16.179	2028336	52727	49.596	60.784
2	23.681	2061353	34019	50.404	39.216
Total		4089689	86746	100.000	100.000

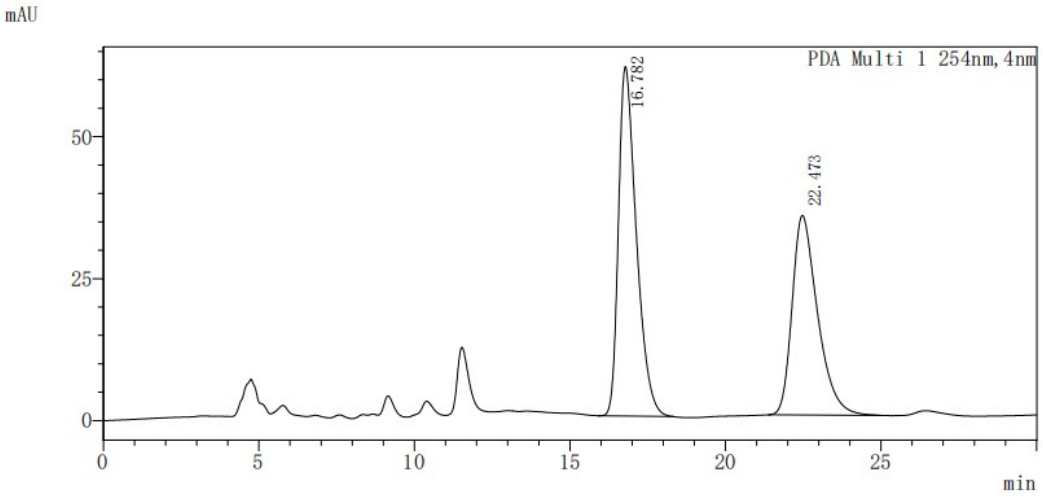


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	16.123	4741988	123625	92.819	95.036
2	23.636	366857	6458	7.181	4.964
Total		5108845	130083	100.000	100.000

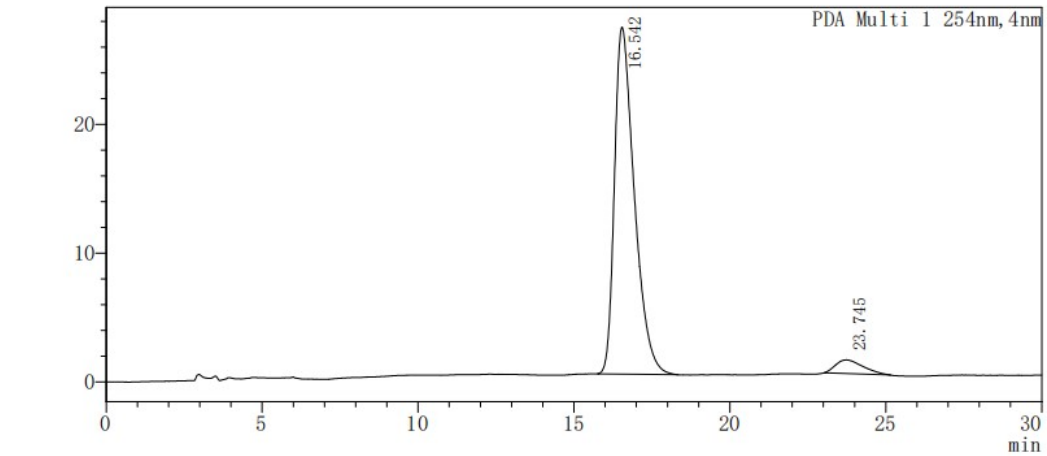
(4R,5S)-1'-Benzyl-5'-methyl-2,4-diphenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-b]azepine-5,3'-indoline]-2',7(6H)-dione (3s)





PDA Ch1 254nm

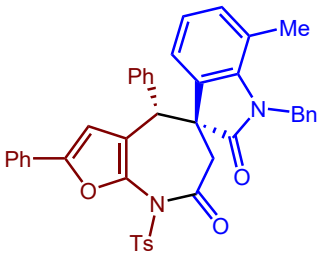
Peak#	Ret.Time	Area	Height	Area%	Height%
1	16.782	2340988	60650	53.725	63.253
2	22.473	2016361	35235	46.275	36.747
Total		4357349	95885	100.000	100.000

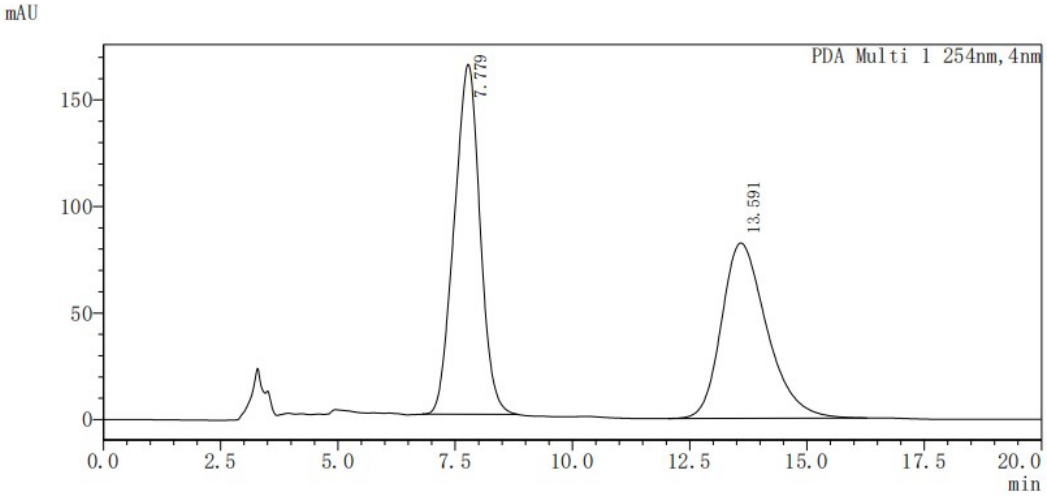


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	16.542	1180948	26880	95.679	96.527
2	23.745	53339	967	4.321	3.473
Total		1234287	27847	100.000	100.000

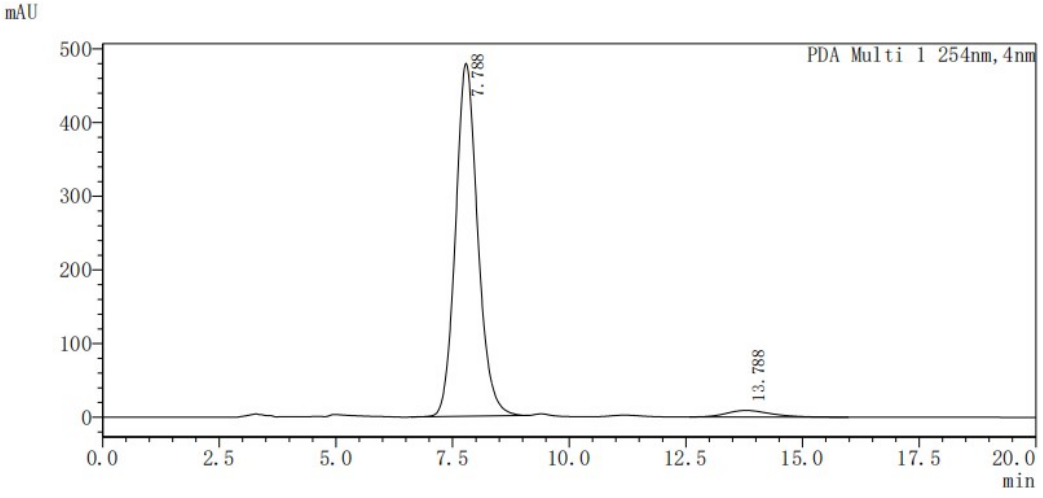
(4R,5S)-1'-Benzyl-7'-methyl-2,4-diphenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-b]azepine-5,3'-indoline]-2',7(6H)-dione (3t)





PDA Ch1 254nm

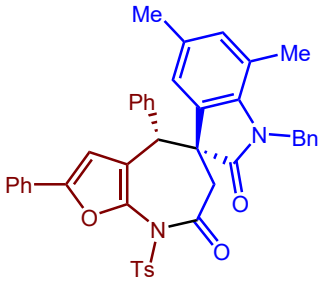
Peak#	Ret.Time	Area	Height	Area%	Height%
1	7.779	6285914	164150	53.249	66.624
2	13.591	5518815	82233	46.751	33.376
Total		11804730	246383	100.000	100.000

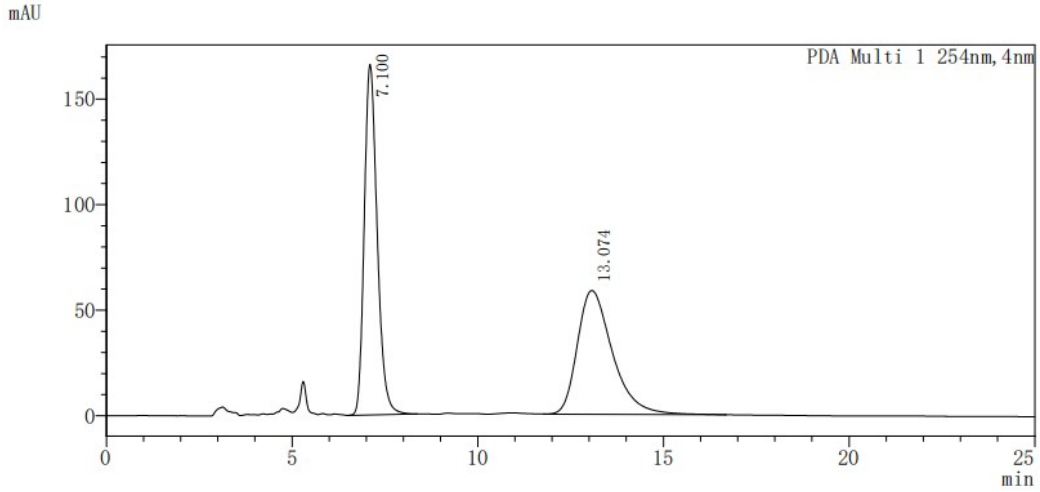


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	7.788	15867537	478941	96.432	98.173
2	13.788	587172	8915	3.568	1.827
Total		16454709	487857	100.000	100.000

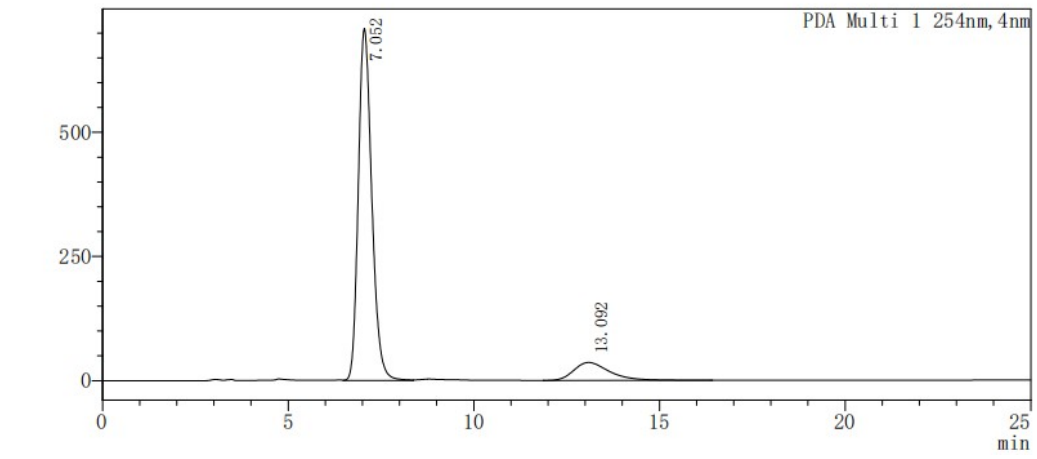
(4R,5S)-1'-Benzyl-5',7'-dimethyl-2,4-diphenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-b]azepine-5,3'-indoline]-2',7(6H)-dione (3u)





PDA Ch1 254nm

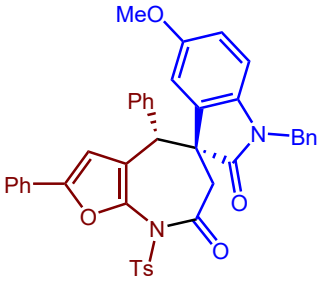
Peak#	Ret.Time	Area	Height	Area%	Height%
1	7.100	4016555	165985	50.953	73.876
2	13.074	3866361	58695	49.047	26.124
Total		7882916	224680	100.000	100.000

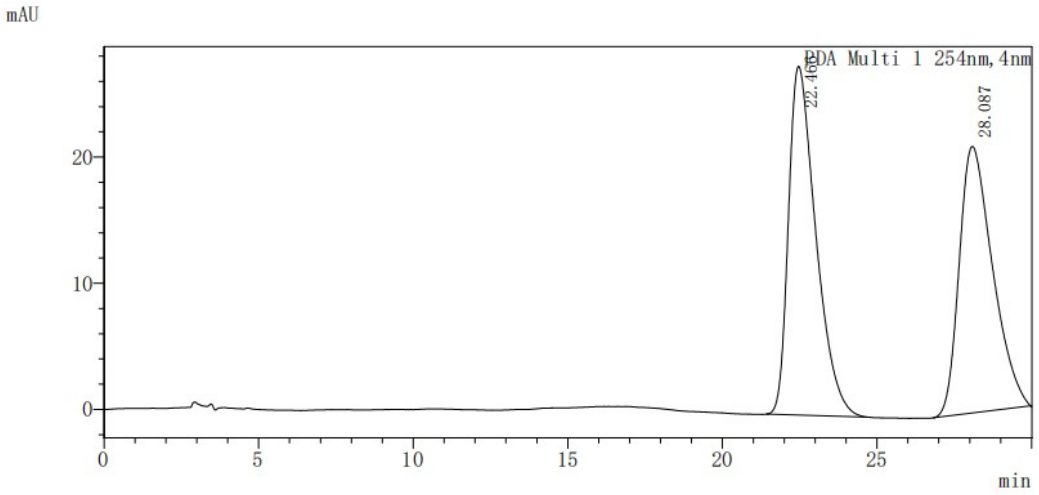


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	7.052	17854805	708614	88.014	95.149
2	13.092	2431593	36131	11.986	4.851
Total		20286398	744745	100.000	100.000

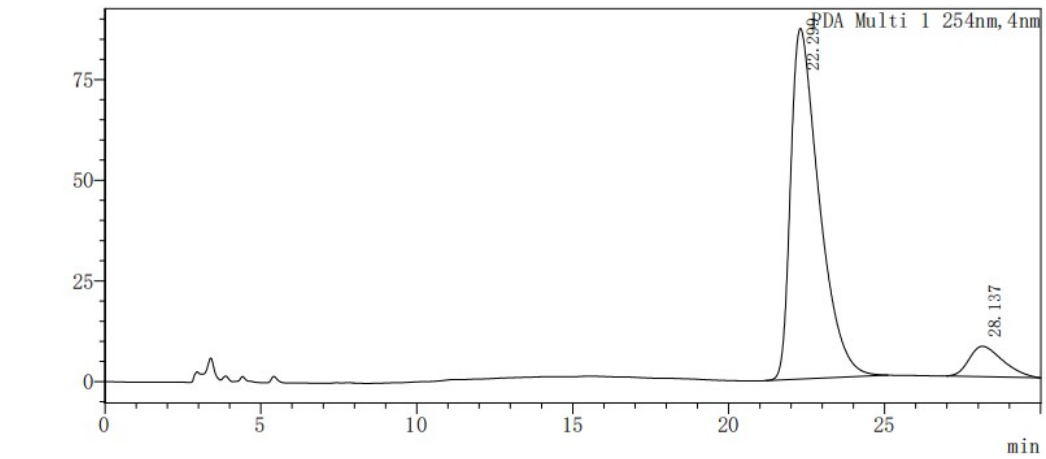
(4R,5S)-1'-Benzyl-5'-methoxy-2,4-diphenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3v)





PDA Ch1 254nm

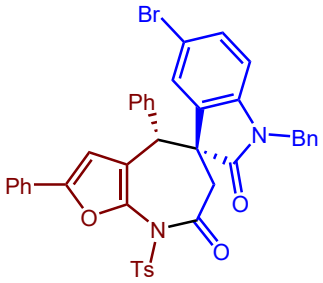
Peak#	Ret.Time	Area	Height	Area%	Height%
1	22.466	1702556	27648	51.796	56.677
2	28.087	1584455	21133	48.204	43.323
Total		3287011	48782	100.000	100.000

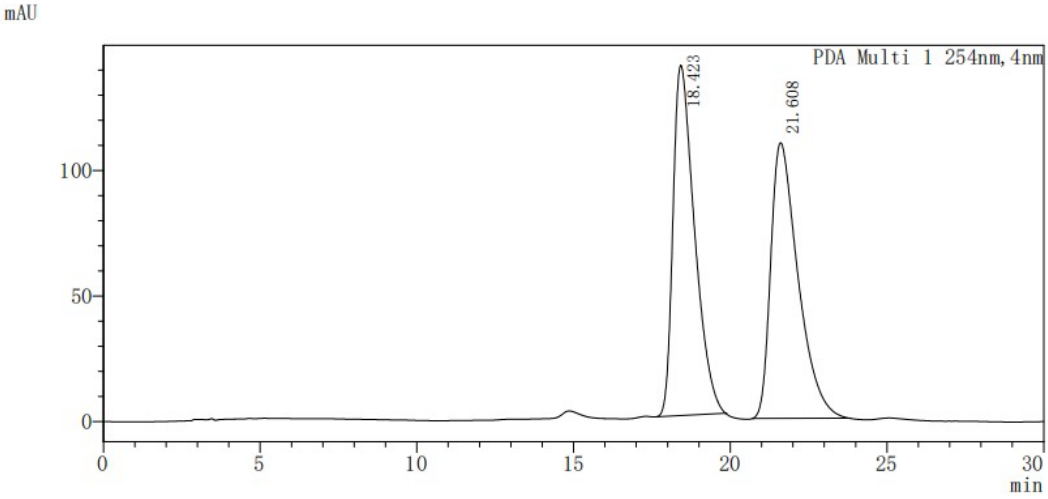


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	22.299	5538319	87042	90.691	92.025
2	28.137	568449	7543	9.309	7.975
Total		6106767	94585	100.000	100.000

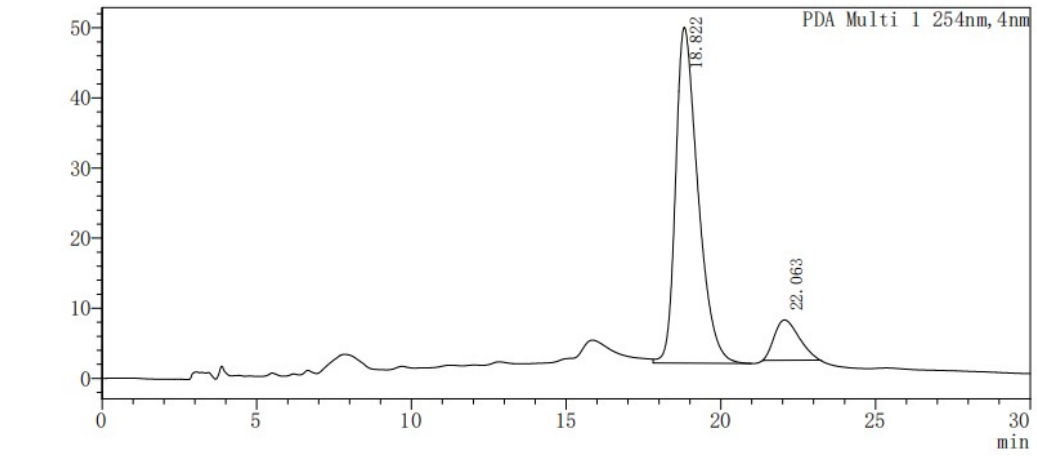
(4R,5S)-1'-Benzyl-5'-bromo-2,4-diphenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3w)





PDA Ch1 254nm

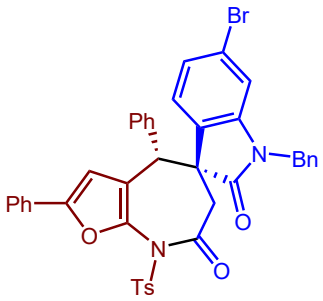
Peak#	Ret.Time	Area	Height	Area%	Height%
1	18.423	6914818	140880	50.595	56.113
2	21.608	6752257	110183	49.405	43.887
Total		13667075	251064	100.000	100.000

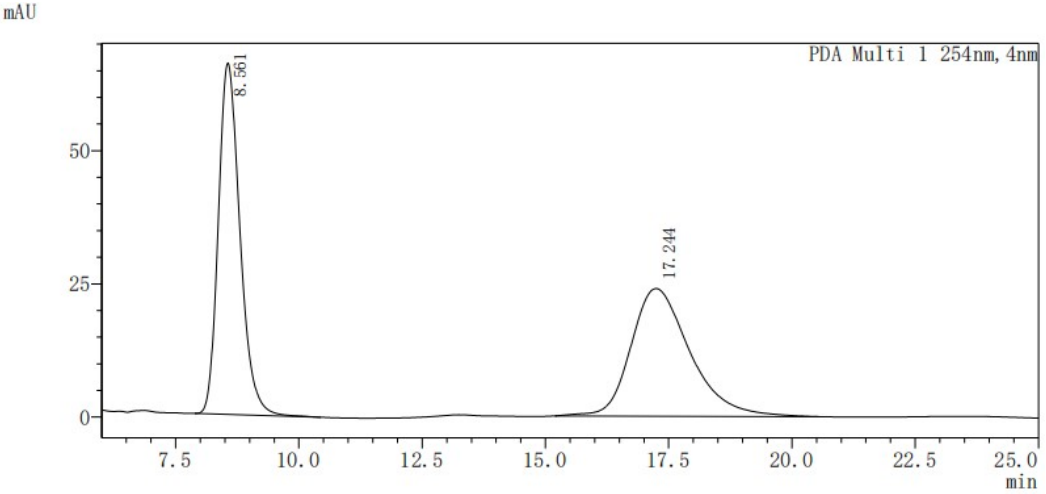


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	18.822	2410617	47919	88.020	89.182
2	22.063	328105	5813	11.980	10.818
Total		2738721	53732	100.000	100.000

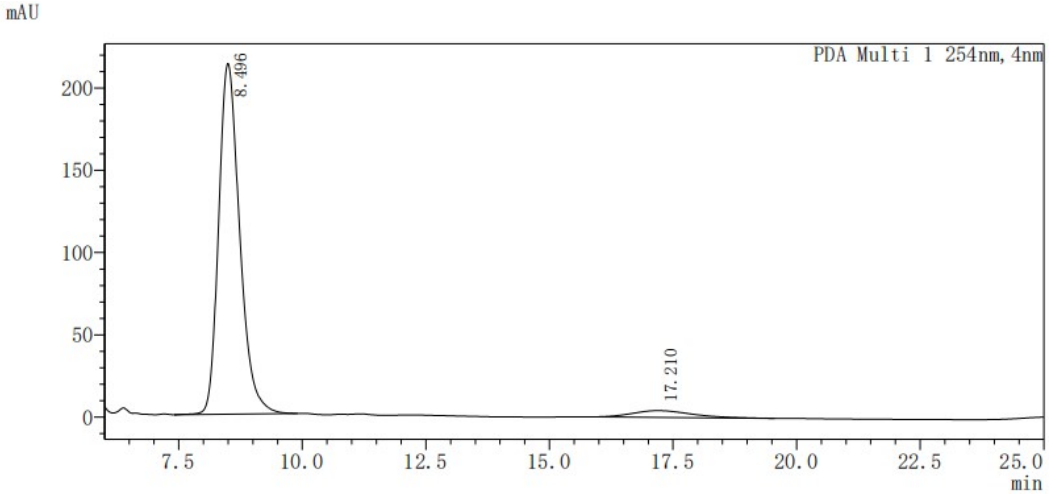
(4R,5S)-1'-Benzyl-6'-bromo-2,4-diphenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3x)





PDA Ch1 254nm

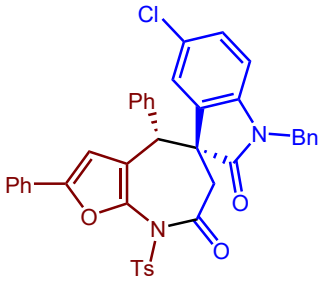
Peak#	Ret.Time	Area	Height	Area%	Height%
1	8.561	2014304	65930	50.248	73.349
2	17.244	1994405	23955	49.752	26.651
Total		4008708	89886	100.000	100.000

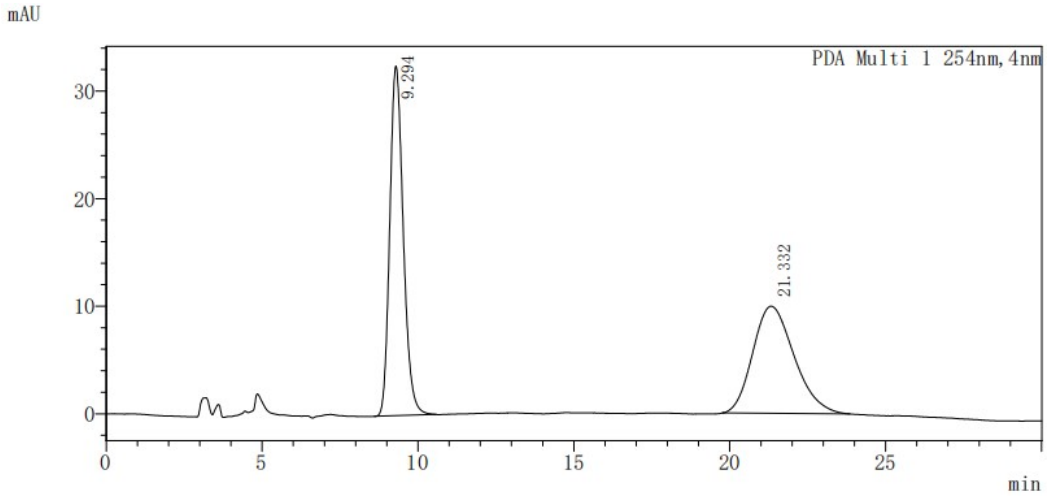


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	8.496	6294471	212856	95.073	98.141
2	17.210	326174	4031	4.927	1.859
Total		6620645	216887	100.000	100.000

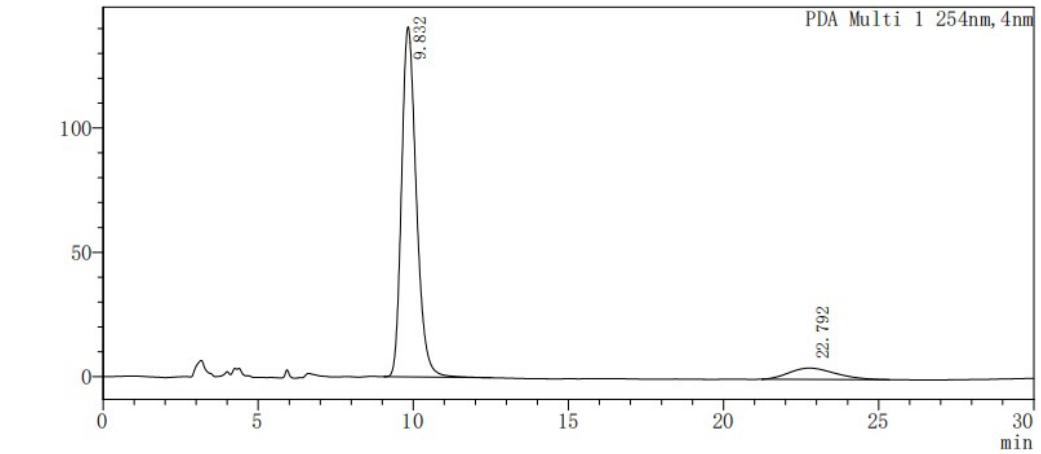
(4R,5S)-1'-Benzyl-5'-chloro-2,4-diphenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3y)





PDA Ch1 254nm

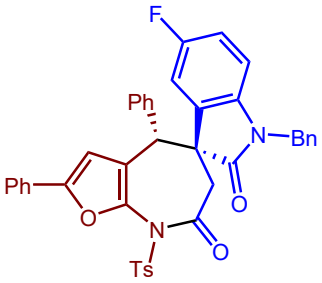
Peak#	Ret.Time	Area	Height	Area%	Height%
1	9.294	977540	32488	51.588	76.542
2	21.332	917362	9957	48.412	23.458
Total		1894902	42445	100.000	100.000

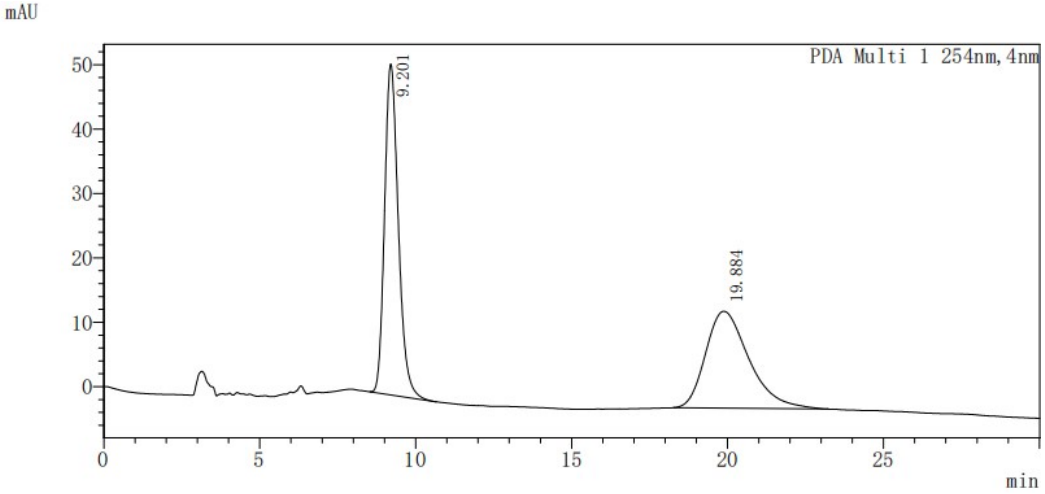


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	9.832	4670232	140784	90.958	96.894
2	22.792	464238	4513	9.042	3.106
Total		5134470	145297	100.000	100.000

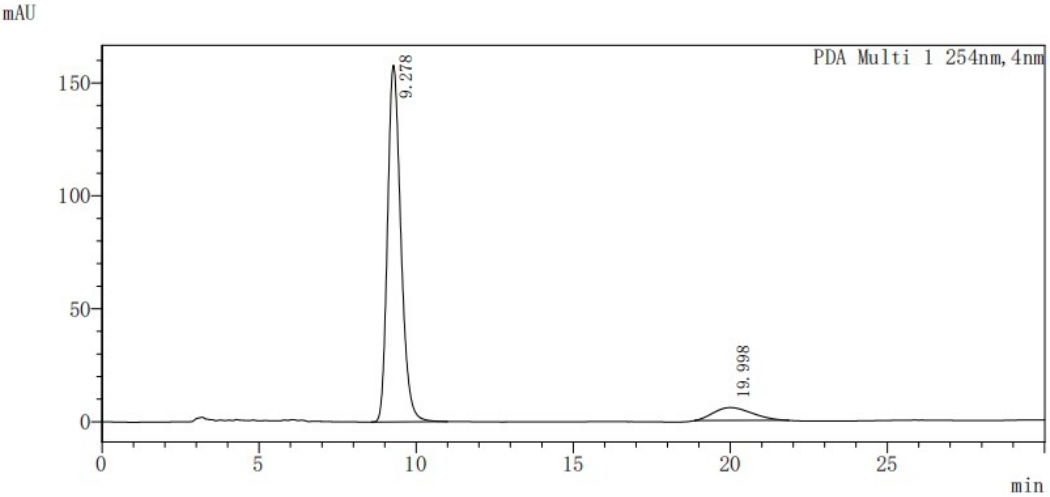
(4R,5S)-1'-Benzyl-5'-fluoro-2,4-diphenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3z)





PDA Ch1 254nm

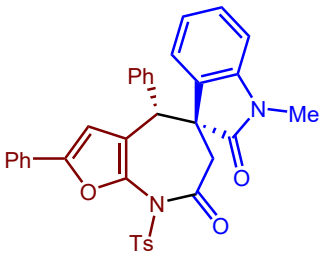
Peak#	Ret.Time	Area	Height	Area%	Height%
1	9.201	1491494	50571	50.596	77.073
2	19.884	1456377	15043	49.404	22.927
Total		2947871	65615	100.000	100.000

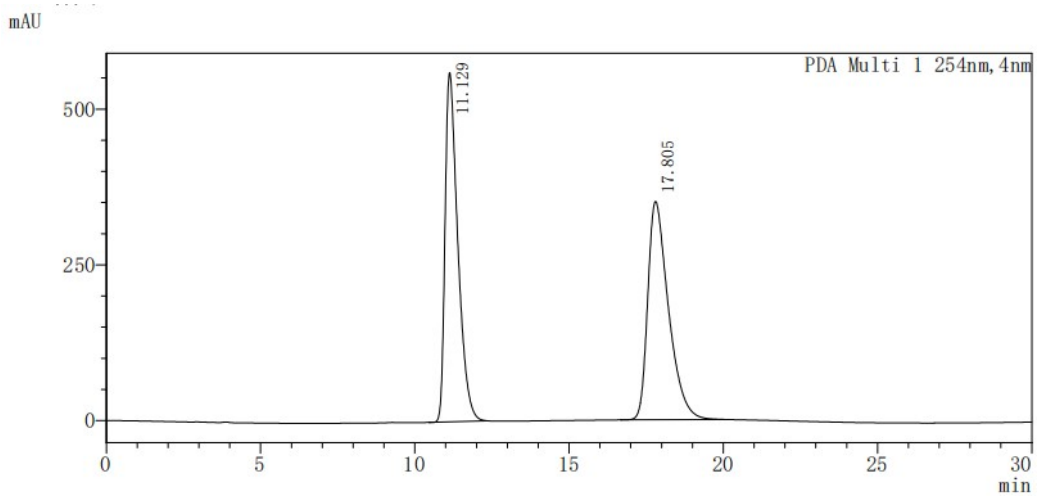


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	9.278	4657303	157903	89.970	96.380
2	19.998	519177	5931	10.030	3.620
Total		5176480	163834	100.000	100.000

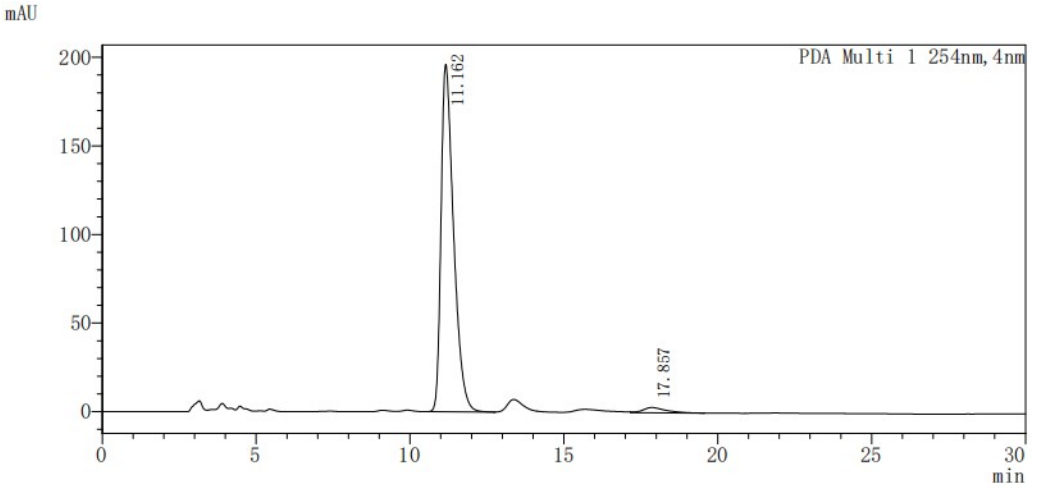
(4R,5S)-1'-Methyl-2,4-diphenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-*b*]azepine-5,3'-indoline]-2',7(6H)-dione (3aa)





PDA Ch1 254nm

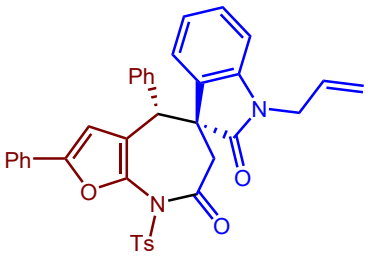
Peak#	Ret.Time	Area	Height	Area%	Height%
1	11.129	16140191	560660	49.848	61.564
2	17.805	16238325	350038	50.152	38.436
Total		32378516	910698	100.000	100.000

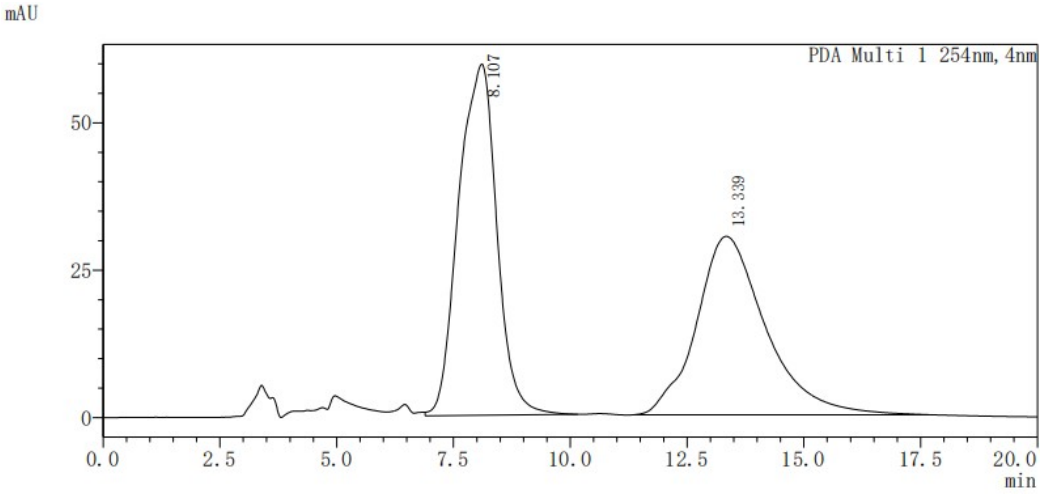


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	11.162	5560281	196003	97.304	98.507
2	17.857	154031	2971	2.696	1.493
Total		5714312	198974	100.000	100.000

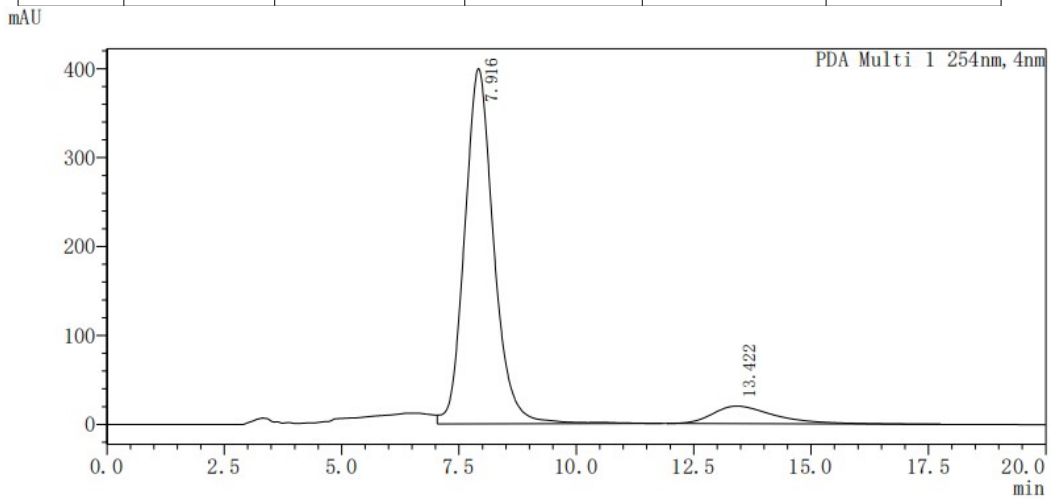
(4S,5R)-1'-allyl-2,4-diphenyl-8-tosyl-4,8-dihydrospiro[furo[2,3-b]azepine-5,3'-indoline]-2',7(6H)-dione (3ab)





PDA Ch1 254nm

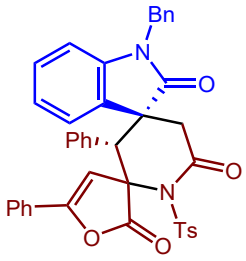
Peak#	Ret.Time	Area	Height	Area%	Height%
1	8.107	3386526	59571	51.977	66.301
2	13.339	3128889	30278	48.023	33.699
Total		6515415	89849	100.000	100.000

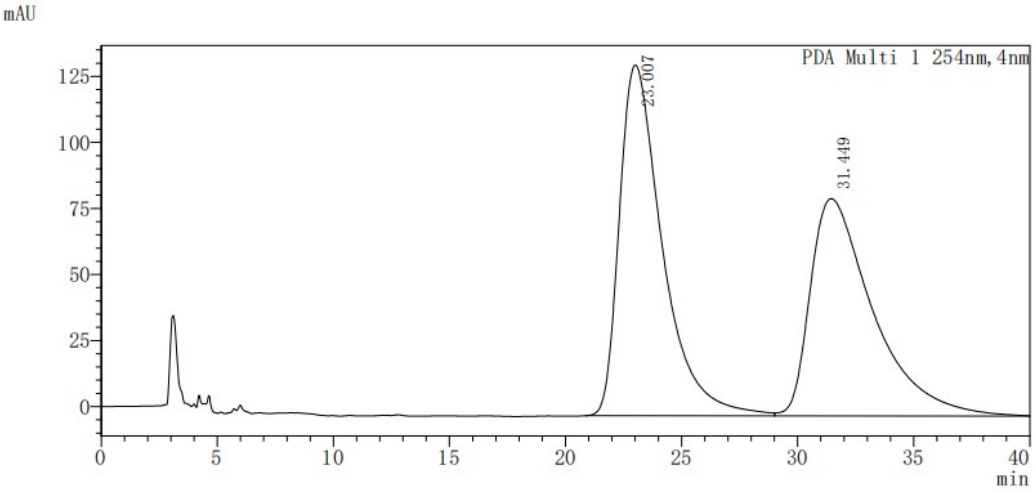


PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	7.916	17264998	399535	90.411	95.287
2	13.422	1831119	19763	9.589	4.713
Total		19096117	419299	100.000	100.000

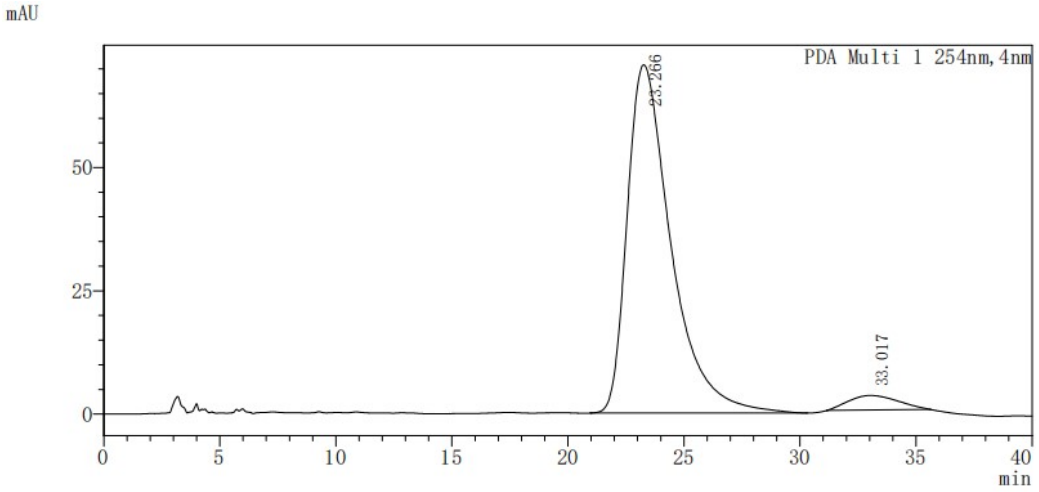
(3R,3'S)-1''-Benzyl-3',5-diphenyl-1'-tosyl-2H-dispiro[furan-3,2'-piperidine-4',3''-indoline]-2,2'',6'-trione (4a)





PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	23.007	17091847	132702	52.510	61.738
2	31.449	15458006	82242	47.490	38.262
Total		32549854	214944	100.000	100.000



PDA Ch1 254nm

Peak#	Ret.Time	Area	Height	Area%	Height%
1	23.266	9282406	70612	95.472	95.981
2	33.017	440240	2957	4.528	4.019
Total		9722647	73569	100.000	100.000