

NHC-Catalyzed [3+3] Annulation of Thioamides and Modified Enals for the Enantioselective Synthesis of Functionalized Thiazinones

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1. General Information

Unless otherwise specified, all reactions were carried out under an atmosphere of argon in flame-dried reaction vessels with Teflon screw caps. Mesitylene was purchased from commercial sources and stored under argon over 4 Å molecular sieves. The 2- bromoenals were synthesized from the corresponding α,β -unsaturated aldehydes following the literature procedure.¹ All the thioamide derivatives were prepared following the literature procedure.² The triazolium salt **C** was synthesized following the literature procedure.³ K_2CO_3 was purchased from SD-Fine.

Analytical thin layer chromatography was performed on TLC Silica gel 60 F254. Visualization was accomplished with short wave UV light or $KMnO_4$ staining solutions followed by heating. Flash chromatography was performed on silica gel (230-400 mesh) by standard techniques eluting with Pet. Ether-EtOAc solvent system.

All compounds were fully characterized. 1H and ^{13}C NMR spectra were recorded on Bruker AV 400 and Bruker Ultra shield spectrometer in solvents as indicated. Chemical shifts (δ) are given in ppm. The residual solvent signals were used as references and the chemical shifts converted to the TMS scale ($CDCl_3$: $\delta H = 7.26$ ppm, $\delta C = 77.16$ ppm). Infrared (FT-IR) spectra were recorded on a Perkin Elmer Spectrum BX spectrophotometer, ν -max in cm^{-1} . Optical rotations were measured on JASCO P-2000 polarimeter at room temperature using 50 mm cell of 1 mL capacity. HRMS (ESI) data were recorded on a Micromass Q-TOF Micro instrument. HPLC analysis was performed on Agilent Technologies 1260 Infinity II with UV detector.

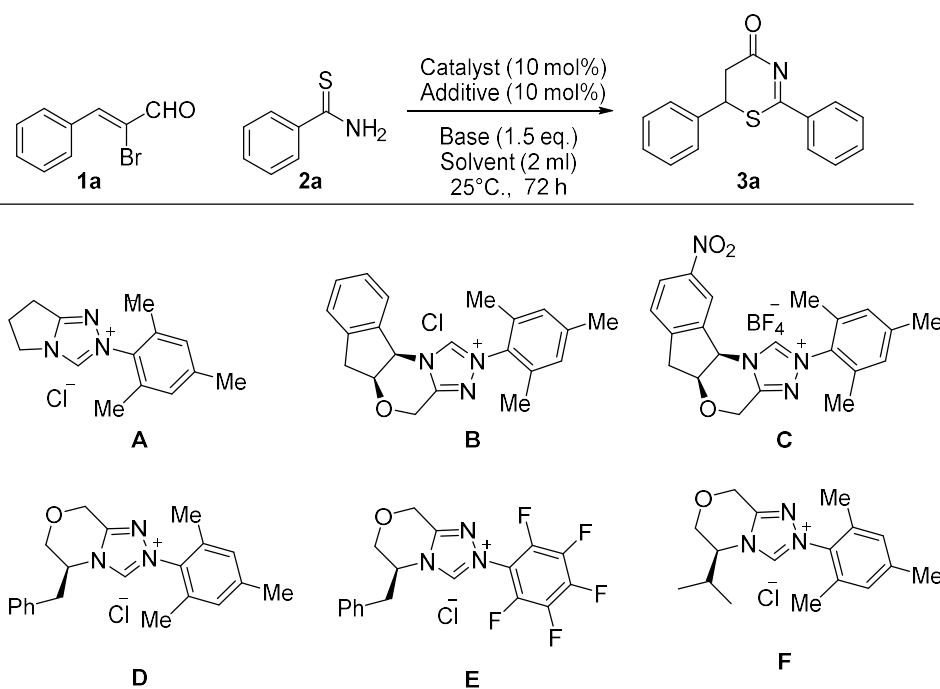
¹ (a) Allen, C. F. H.; Edens, Jr. C. O. *Org. Synth.* **1945**, 25, 92. (b) Li, W.; Li, Wan, Z.-K.; Wu, J.; Masefski, W. *Org. Lett.* **2007**, 9, 4607.

² Yan, Z.; Liu, A.; Huang, M.; Liu, M.; Pei, H.; Huang, L.; Yi, H.; Liu, W.; Hu, A. *Eur. J. Med. Chem.* **2018**, 149, 170.

³ Zhao, C.-G.; Li, F.-Y.; Wang, J. *Angew. Chem., Int. Ed.* **2016**, 55, 1820.

2. General Procedure for the Optimization of the Reaction Conditions

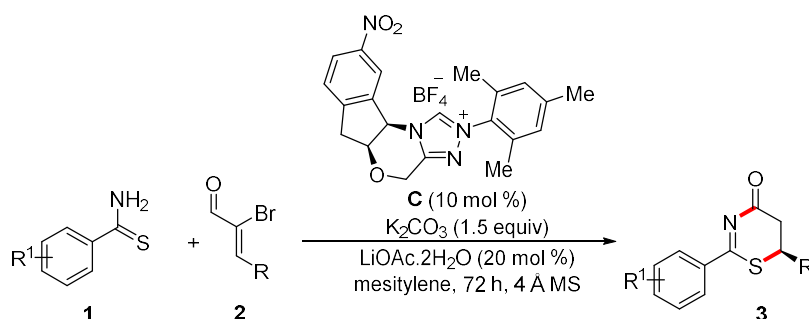
To an oven-dried Schlenk reaction vessel equipped with a magnetic stir bar was taken the (*Z*)-2-bromo-3-phenylacrylaldehyde **2a** (63.4 mg, 0.30 mmol, 1.2 equiv) and benzothioamide **1a** (34.3 mg, 0.25 mmol, 1.0 equiv) with triazolium salt (0.025 mmol, 10 mol %), additive (0.05 mmol, 20 mol %) and 4 Å MS (100 mg). The mixture was kept under argon atmosphere. To this mixture was added solvent (2.0 mL) under a positive pressure of argon and stirring the reaction mixture at 25 °C. To this stirring solution was added base (0.375 mmol, 1.5 equiv) and the resulting mixture was stirred at 25 °C for 72 h (*the reaction temperature was maintained at 25 °C using a chiller having MeOH bath maintained at 25 °C for 72 h*). Filtration and evaporation of the solvent to obtain the crude product, whose yield was determined by ¹H NMR analysis using CH₂Br₂ as the internal standard. The enantiomeric ratio was determined by HPLC analysis on a chiral column.



entry	catalyst	base	solvent	additive	yield (%) ^b	er ^c
1	A (10 mol %)	K ₂ CO ₃	toluene	LiOAc.2H ₂ O	28	nd
2	B (10 mol %)	K ₂ CO ₃	toluene	LiOAc.2H ₂ O	67	87:13
3	C (10 mol %)	K ₂ CO ₃	toluene	LiOAc.2H ₂ O	70	92:8
4	D (10 mol %)	K ₂ CO ₃	toluene	LiOAc.2H ₂ O	72	85:15
5	E (10 mol %)	K ₂ CO ₃	toluene	LiOAc.2H ₂ O	<5	nd
6	F (10 mol %)	K ₂ CO ₃	toluene	LiOAc.2H ₂ O	87	12:88
7	C (10 mol %)	K ₂ CO ₃	<i>o</i> - xylene	LiOAc.2H ₂ O	86	88:12
8	C (10 mol %)	K₂CO₃	mesitylene	LiOAc.2H₂O	67	92:8
9	C (10 mol %)	K ₂ CO ₃	mesitylene: hexane (1:1)	LiOAc.2H ₂ O	42	88:12
10	C (10 mol %)	K ₂ CO ₃	Ph-CF ₃	LiOAc.2H ₂ O	87	84:16
11	C (10 mol %)	K ₂ CO ₃	Ph-H	LiOAc.2H ₂ O	68	85:15
12	C (10 mol %)	K ₂ CO ₃	Ph-Cl	LiOAc.2H ₂ O	88	79:11
13	C (10 mol %)	K ₂ CO ₃	DME	LiOAc.2H ₂ O	<5	nd
14	C (10 mol %)	DBU	mesitylene	LiOAc.2H ₂ O	<5	nd
15	C (10 mol %)	Na ₂ CO ₃	mesitylene	LiOAc.2H ₂ O	76	91:9
16	C (10 mol %)	Li ₂ CO ₃	mesitylene	LiOAc.2H ₂ O	10	82:18
17	C (10 mol %)	Cs ₂ CO ₃	mesitylene	LiOAc.2H ₂ O	42	84:16
18	C (10 mol %)	(NH ₄) ₂ CO ₃	mesitylene	LiOAc.2H ₂ O	36	85:15
19	C (10 mol %)	K ₂ CO ₃	mesitylene	NaOAc	52	90:10
20	C (10 mol %)	K ₂ CO ₃	mesitylene	KOAc	45	88:12
21	C (10 mol %)	K ₂ CO ₃	mesitylene	LiCl	45	88:12
22	C (10 mol %)	K ₂ CO ₃	mesitylene	-	30	85:15
23	C (15 mol %)	K ₂ CO ₃	mesitylene	LiOAc.2H ₂ O	76	91:9
24 ^d	C (10 mol %)	K ₂ CO ₃	mesitylene	LiOAc.2H ₂ O	85	87:13
25 ^e	C (10 mol %)	K ₂ CO ₃	mesitylene	LiOAc.2H ₂ O	<5	nd

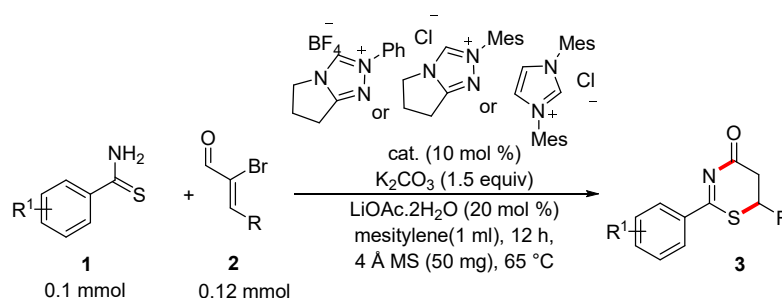
^a General reaction conditions: **1a** (0.25 mmol), **2a** (0.30 mmol), cat. (10 mol %), base (1.5 equiv), solvent (2.0 mL), 25 °C and 72 h. ^b The yields were determined by ¹H NMR analysis of crude product using CH₂Br₂ as the internal standard. ^c The er value was determined by HPLC analysis on a chiral column. ^d The reaction was performed at 30 °C. ^e The reaction was carried out 15 °C.

3. General Procedure for the Enantioselective Synthesis of Functionalized Thiazinones



To an oven dried Schlenk reaction vessel equipped with a magnetic stir bar was taken the (Z)-2-bromoaldehyde **2** (63.4 mg, 0.30 mmol, 1.2 equiv) and benzothioamide **1** (0.25 mmol, 1.0 equiv) with triazolium salt **C** (11.6 mg, 0.025 mmol, 10 mol %), lithium acetate dihydrate (5.1 mg, 0.05 mmol, 20 mol %) and 4 Å MS (100 mg). The mixture was kept under argon atmosphere. To this mixture was added mesitylene (2.0 mL) under a positive pressure of argon, and the mixture was stirred at 25 °C. To this stirring solution was added K_2CO_3 (52.0 mg, 0.375 mmol) and the resulting mixture was stirred at 25 °C for 72 h (*the reaction temperature was maintained at 25 °C using a chiller having MeOH bath maintained at 25 °C for 72 h*). The reaction mixture was purified through silica gel flash column chromatography afforded the thiazinone derivative **3**.

All racemic thiazinone derivatives were prepared using either *N*-phenyl triazolium-derived carbenes, *N*-mesityl triazolium-derived carbenes, or *N*-mesityl imidazolium-derived carbenes.



Procedure for the 1 mmol scale experiment

To an oven dried Schlenk reaction vessel equipped with a magnetic stir bar was taken the (Z)-2-bromo-3-phenylacrylaldehyde **2a** (253.3 mg, 1.2 mmol, 1.2 equiv) and benzothioamide **1a**

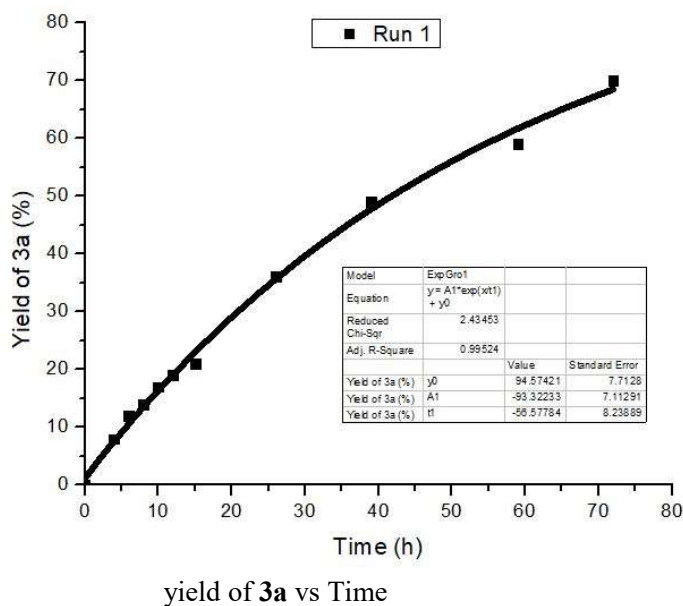
(137.2 mg, 1.0 mmol, 1.0 equiv) with triazolium salt **C** (46.4 mg, 0.10 mmol, 10 mol %), lithium acetate dihydrate (20.4 mg, 0.20 mmol, 20 mol %) and 4 Å MS (400 mg). The mixture was kept under argon atmosphere. To this mixture was added mesitylene (8.0 mL) under a positive pressure of argon, and the mixture was stirred at 25 °C. To this stirring solution was added K₂CO₃ (207.3 mg, 1.5 mmol, 1.5 equiv) and the resulting mixture was stirred at 25 °C for 72 h (*the reaction temperature was maintained at 25 °C using a chiller having MeOH bath maintained at 25 °C for 72 h*). The reaction mixture was purified through silica gel flash column chromatography afforded (*S*)-2,6-diphenyl-5,6-dihydro-4*H*-1,3-thiazin-4-one **3a** as a pale yellow solid (187 mg, 70% yield, 92:8 er).

4. Kinetic Studies for the Determination of Reaction Order⁴

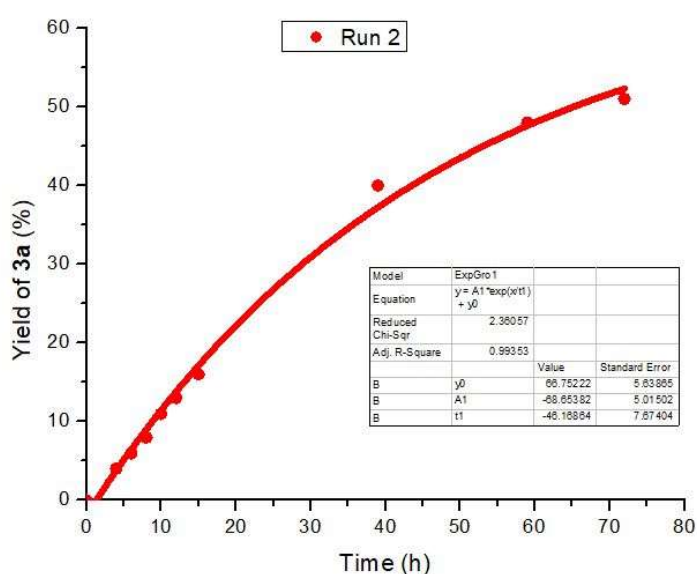
To an oven-dried Schlenk tube was charged with a magnetic stir-bar, (*Z*)-2-bromo-3-phenylacrylaldehyde **2a** and benzothioamide **1a** with triazolium salt **C**, lithium acetate dihydrate, 4Å MS (200 mg). Then mesitylene (4.0 mL) solvent, followed by K₂CO₃ was added and stirring the reaction mixture at 25 °C. After a defined time-interval, 100 µL of the reaction mixture was taken out from the mixture, filtered and concentrated to obtain crude residue, which was analysed using ¹H NMR using equivalent amount of 100 µL a standard solution of CH₂Br₂ as an external standard.

⁴ (a) Nguyen, X. B.; Nakano, Y.; Duggan, N. M.; Scott, L.; Breugst, M.; Lupton, D. W. *Angew. Chem., Int. Ed.* **2019**, *58*, 11483. (b) Bera, M.; Agasti, S.; Chowdhury, R.; Mondal, R.; Pal, D.; Maiti, D. *Angew. Chem. Int. Ed.* **2017**, *56*, 5272. ^c The yields were determined by using 0.125 M solution of CH₂Br₂ as the standard in CDCl₃. ^d The yields were determined by using 0.25 M solution of CH₂Br₂ as the standard in CDCl₃.

Run 1	
time (h)	yield of 3a (%) ^c
0	0
4	8
6	12
8	14
10	17
12	19
15	21
26	36
39	49
59	59
72	70

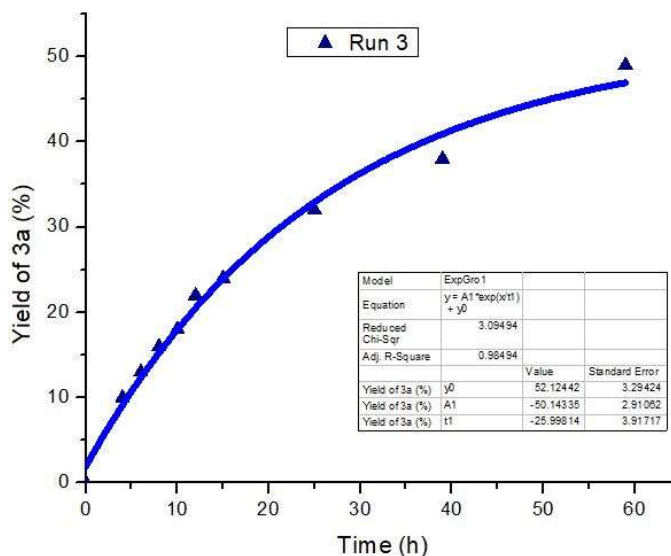


Run 2	
time (h)	yield of 3a (%) ^d
0	0
4	4
6	6
8	8
10	11
12	13
15	16
39	40
59	48
72	51



Run 1: **1a** (0.50 mmol), **2a** (0.60 mmol), **C** (0.05 mmol), LiOAc.2H₂O (0.10 mmol), K₂CO₃ (0.75 mmol); Run 2: **1a** (1.0 mmol), **2a** (0.60 mmol), **C** (0.05 mmol), LiOAc.2H₂O (0.10 mmol), K₂CO₃ (0.75 mmol); Run 3: **1a** (0.50 mmol), **2a** (1.20 mmol), **C** (0.05 mmol), LiOAc.2H₂O (0.10 mmol), K₂CO₃ (1.50 mmol).

Run 3	
time (h)	yield of 3a (%) ^c
0	0
4	10
6	13
8	16
10	18
12	22
15	24
25	32
39	38
59	49



yield of 3a vs Time

expt.	thioamide (1a)	bromoenal (2a)	carbene precursor (C)	LiOAc.2H ₂ O	K ₂ CO ₃
Run 1	0.50 mmol	0.60 mmol	0.05 mmol	0.10 mmol	0.75 mmol
Run 2	1.00 mmol	0.60 mmol	0.05 mmol	0.10 mmol	0.75 mmol
Run 3	0.50 mmol	1.20 mmol	0.05 mmol	0.10 mmol	1.50 mmol

Run 1:

$$\text{Rate}_{\text{Run1}} = dy / dx = (y_2 - y_1) / (x_2 - x_1) = 1.57857$$

$$\text{Rate}_{\text{Run1}} = 1.57857 = k [\text{Thioamide}]^m [\text{Bromoenal}]^n \quad \dots\dots\dots \text{(i)}$$

Run 2:

$$\text{Rate}_{\text{Run2}} = dy / dx = (y_2 - y_1) / (x_2 - x_1) = 1.09286$$

$$\text{Rate}_{\text{Run2}} = 1.09286 = k [\text{Thioamide}]^m [\text{Bromoenal}]^n \quad \dots\dots\dots \text{(ii)}$$

Run 3:

$$\text{Rate}_{\text{Run1}} = dy / dx = (y_2 - y_1) / (x_2 - x_1) = 1.75$$

$$\text{Rate}_{\text{Run1}} = 1.75 = k [\text{Thioamide}]^m [\text{Bromoenal}]^n \quad \dots\dots\dots \text{(iii)}$$

Hence from equation (i) and (ii)

$$\text{Rate}_{\text{Run2}} / \text{Rate}_{\text{Run1}} = k [1.00]^m / k [0.50]^m$$

$$(1.09286 / 1.57857) = 2^m$$

$$\log (1.09286 / 1.57857) = m \log 2$$

$$m = -0.53 \sim 0.5$$

Order with respect to substrate Thioamide (2a) is (-0.5)

From equation (i) and (iii)

$$\text{Rate}_{\text{Run3}} / \text{Rate}_{\text{Run1}} = k [1.00]^n / k [0.50]^n$$

$$(1.75 / 1.57857) = 2^n$$

$$\log (1.75 / 1.57857) = n \log 2$$

$$n = -0.14 \sim 0$$

Order with respect to substrate bromoenal (2a) is zero.

5. X-Ray Data of 3x

Single crystal of **3x** (recrystallized from $\text{CH}_2\text{Cl}_2/n$ -hexane at 25 °C) was mounted and the diffraction data was collected at 296 K on a Bruker APEX-II CCD diffractometer using SMART/SAINT software. Intensity data were collected using $\text{MoK}\alpha$ radiation ($\lambda=0.71073 \text{ \AA}$). The single crystal was affixed to a Hampton Research cryoloop using Paratone-N oil. Data collection and reduction was performed using Bruker APEX2 and Bruker SAINT, respectively. The structure was solved by direct methods using the SHELX-97 and refined by full-matrix least-squares on F2. Empirical absorption corrections were applied with SADABS. All Non-hydrogen atoms were refined anisotropically and hydrogen atoms were included in geometric positions. Structure was drawn using Olex-2 and Mercury-3. CCDC 1950784 (**3x**) contains the supplementary crystallographic data for this paper. These data can be obtained free of charge from Data Centre via www.ccdc.cam.ac.uk/data_request/cif. The crystallographic refinement parameters are given below:

Identification code	3x
Empirical formula	C ₁₆ H ₁₂ I N O S
Formula weight	393.23
Temperature/K	296(2)
Crystal system	Orthorhombic
Space group	P2 ₁ 2 ₁ 2 ₁
a/Å	9.568(3)
b/Å	16.041(6)
c/Å	19.325(7)
α /°	90
β /°	90
γ /°	90
Volume/Å ³	2966.1(18)
Z	8
ρ_{calc} g/cm ³	1.761
μ /mm ⁻¹	2.294
F(000)	1536.0
Crystal size/mm ³	0.25 × 0.20 × 0.12
Radiation	MoK α (λ = 0.71073)
2 θ range for data collection/°	2.9 to 61.1
Index ranges	-12 ≤ h ≤ 13, -22 ≤ k ≤ 14, -27 ≤ l ≤ 27
Reflections collected	43061
Independent reflections	5077 [R _{int} = 0.0549, R _{sigma} = 0.0370]
Data/restraints/parameters	8858/0/361
Goodness-of-fit on F ²	1.037
Final R indexes [$I \geq 2\sigma(I)$]	R ₁ = 0.0370, wR ₂ = 0.0808
Final R indexes [all data]	R ₁ = 0.0549, wR ₂ = 0.0872
Largest diff. peak/hole / e Å ⁻³	1.036/-0.928
Flack parameter	-0.015(8)
CCDC Number	CCDC 1950784

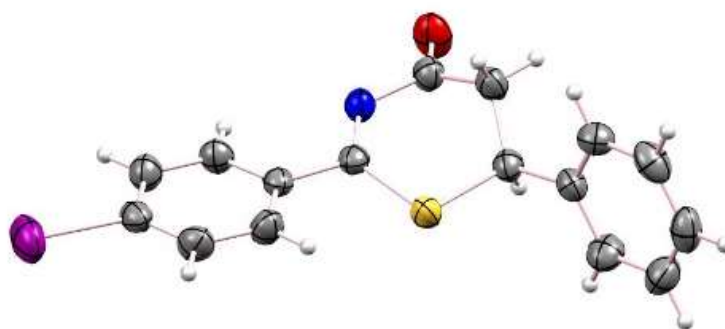
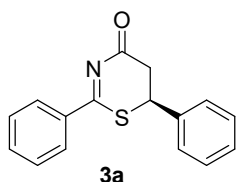


Figure S1. Crystal structure of **3x** (thermal ellipsoids are shown with 50% probability).

6. Synthesis and Characterization of Functionalized Thiazinones

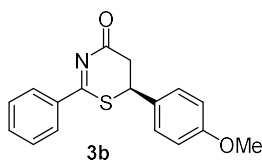
(S)-2,6-Diphenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3a)



Following the general procedure, treatment of (*Z*)-2-bromo-3-phenylacrylaldehyde **2a** (63.4 mg, 0.30 mmol) and benzothioamide **1a** (34.3 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 85:15) to afford (*S*)-2,6-diphenyl-5,6-dihydro-4H-1,3-thiazin-4-one **3a** as a pale yellow solid (45 mg, 67% yield).

R_f (Pet. ether /EtOAc = 60/30): 0.57; er = 92:8, [α]_D²⁵ = +136.9 (c 0.1, CHCl₃). **HPLC** (Chiralpak IF, 80:20 Hexane / *i*-PrOH, 1.0 mL/min, 254 nm) *Minor*: 18.4 min, *Major*: 21.7 min. **¹H NMR (400 MHz, CDCl₃)** δ 8.11-8.08 (m, 2H), 7.58-7.56 (m, 1H), 7.47-7.35 (m, 7H), 4.83 (dd, *J*₁ = 12.8 Hz, *J*₂ = 4.4 Hz, 1H), 3.06 (dd, *J*₁ = 14.2 Hz, *J*₂ = 4.0 Hz, 1H), 3.02 (dd, *J*₁ = 14.1 Hz, *J*₂ = 12.7 Hz, 1H). **¹³C NMR (100 MHz, CDCl₃)** δ 179.28, 179.26, 137.05, 136.43, 133.77, 129.46, 129.11, 128.84, 127.85, 127.62, 45.10, 37.03. **HRMS (ESI)** calculated [M+H] for C₁₆H₁₄NOS: 268.0796, found: 268.0795. **FTIR (cm⁻¹)** 3063, 3028, 2922, 2852, 1713, 1657, 1484, 1378, 1245, 1149, 1077, 905.

(S)-6-(4-Methoxyphenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3b)

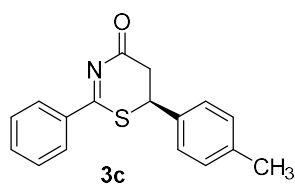


Following the general procedure, treatment of (*Z*)-2-bromo-3-(4-methoxyphenyl)acrylaldehyde **2b** (72.3 mg, 0.30 mmol) and benzothioamide **1a** (34.3 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 80:20) to afford (*S*)-6-(4-methoxyphenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one **3b** as a pale yellow solid (56 mg, 75% yield).

R_f (Pet. ether /EtOAc = 60/40): 0.51; er = 91:9, [α]_D²⁵ = -68.3 (c 0.1, CHCl₃). **HPLC** (Chiralpak IF, 75:25 Hexane / *i*-PrOH, 0.7 mL/min, 254 nm) *Minor*: 27.1 min, *Major*: 39.2 min. **¹H NMR (400 MHz, CDCl₃)** δ 8.09-8.07 (m, 2H), 7.58 (t, *J* = 7.4 Hz, 1H), 7.47-7.43 (m, 2H), 7.31-7.29 (m, 2H), 6.94-6.92 (m, 2H), 4.80 (dd, *J*₁ = 12.7 Hz, *J*₂ = 4.1 Hz, 1H), 3.82 (s, 3H), 3.06 (dd, *J*₁ =

14.2 Hz, $J_2 = 4.0$ Hz, 1H), 2.95 (dd, $J_1 = 14.1$ Hz, $J_2 = 12.9$ Hz, 1H). ^{13}C NMR (100 MHz, CDCl_3) δ 179.56, 179.54, 160.13, 136.51, 133.74, 128.85, 127.86, 114.82, 55.53, 44.70, 37.34. HRMS (ESI) calculated $[M+H]$ for $\text{C}_{17}\text{H}_{16}\text{NO}_2\text{S}$: 298.0902, found: 298.0902. FTIR (cm^{-1}) 2959, 2923, 2840, 1744, 1713, 1662, 1607, 1511, 1452, 1376, 1249, 1179, 1073.

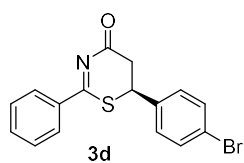
(S)-2-Phenyl-6-(p-tolyl)-5,6-dihydro-4H-1,3-thiazin-4-one (3c)



Following the general procedure, treatment of (*Z*)-2-bromo-3-(p-tolyl)acrylaldehyde **2c** (67.5 mg, 0.30 mmol) and benzothioamide **1a** (34.3 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K_2CO_3 (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 85:15) to afford (*S*)-2-phenyl-6-(p-tolyl)-5,6-dihydro-4H-1,3-thiazin-4-one **3c** as a yellow oil (46 mg, 64% yield).

R_f (Pet. ether /EtOAc = 70/30): 0.55; er = 87:13, $[\alpha]_D^{25} = -88.4$ (c 0.1, CHCl_3). HPLC (ChiralpakIF, 80:20 Hexane / *i*-PrOH, 0.7 mL/min, 254 nm) *Minor*: 24.9 min, *Major*: 31.2 min. ^1H NMR (400 MHz, CDCl_3) δ 8.10-8.07 (m, 2H), 7.60-7.56 (m, 1H), 7.47-7.43 (m, 2H), 7.28-7.21 (m, 4H), 4.81(dd, $J_1 = 12.7$ Hz, $J_2 = 4.1$ Hz, 1H), 3.04 (dd, $J_1 = 14.2$ Hz, $J_2 = 4.2$ Hz, 1H), 2.95 (dd, $J_1 = 14.2$ Hz, $J_2 = 12.6$ Hz, 1H), 2.37 (s, 3H). ^{13}C NMR (100 MHz, CDCl_3) δ 179.48, 139.11, 136.46, 133.97, 130.11, 128.83, 127.84, 127.49, 44.89, 37.13, 21.28. HRMS (ESI) calculated $[M+H]$ for $\text{C}_{17}\text{H}_{16}\text{NOS}$: 282.0953, found: 282.0953. FTIR (cm^{-1}) 2921, 1713, 1667, 1605, 1510, 1474, 1375, 1244, 1149, 904.

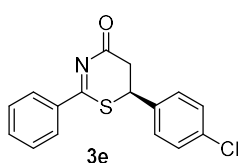
(S)-6-(4-Bromophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3d)



Following the general procedure, treatment of (*Z*)-2-bromo-3-(4-bromophenyl)acrylaldehyde **2d** (87 mg, 0.30 mmol) and benzothioamide **1a** (34.3 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K_2CO_3 (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 80:20) to afford (*S*)-6-(4-bromophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one **3d** as a pale yellow solid (72 mg, 83% yield).

R_f (Pet. ether /EtOAc = 70/30): 0.61; er = 94:6, $[\alpha]_D^{25} = -59.6$ (c 0.1, CHCl₃). **HPLC** (Chiralpak IF, 80:20 Hexane / *i*-PrOH, 0.7 mL/min, 254 nm) *Minor*: 26.9 min, *Major*: 51.1 min. **¹H NMR (400 MHz, CDCl₃)** δ 8.09-8.07 (m, 2H), 7.62-7.58 (m, 1H), 7.56-7.52 (m, 2H), 7.48-7.44 (m, 2H), 7.28-7.25 (m, 2H), 4.82 (dd, $J_1 = 12.3$ Hz, $J_2 = 4.2$ Hz, 1H), 3.04 (dd, $J_1 = 14.0$ Hz, $J_2 = 4.3$ Hz, 1H), 2.93 (dd, $J_1 = 14.0$ Hz, $J_2 = 12.2$ Hz, 1H). **¹³C NMR (100 MHz, CDCl₃)** δ 178.78, 178.69, 136.20, 136.16, 133.86, 132.58, 129.25, 128.84, 127.79, 123.06, 44.38, 36.76. **HRMS (ESI)** calculated [M+H] for C₁₆H₁₃NBrOS: 345.9901, found: 345.9904. **FTIR (cm⁻¹)** 2923, 2852, 1713, 1658, 1569, 1484, 1405, 1373, 1243, 1150, 1072, 1010, 903.

(S)-6-(4-Chlorophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3e)

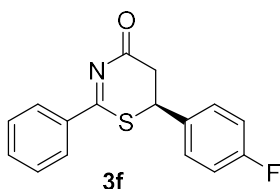


Following the general procedure, treatment of (*Z*)-2-bromo-3-(4-chlorophenyl)acrylaldehyde **2e** (72.3 mg, 0.30 mmol) and benzothioamide **1a** (34.3 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4

Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 80:20) to afford (*S*)-6-(4-chlorophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one **3e** as a pale yellow solid (56 mg, 74% yield).

R_f (Pet. ether /EtOAc = 80/20): 0.51; er = 93:7, $[\alpha]_D^{25} = -59.3$ (c 0.1, CHCl₃). **HPLC** (Chiralpak IF, 80:20 Hexane / *i*-PrOH, 0.7 mL/min, 254 nm) *Minor*: 26.3 min, *Major*: 45.0 min. **¹H NMR (400 MHz, CDCl₃)** δ 8.07-8.05 (m, 2H), 7.60-7.56 (m, 1H), 7.46-7.42 (m, 2H), 7.38-7.35 (m, 2H), 7.31-7.29 (m, 2H), 4.81 (dd, $J_1 = 12.3$ Hz, $J_2 = 4.1$ Hz, 1H), 3.0-3.06 (m, 1H), 2.95-2.88 (m, 1H). **¹³C NMR (100 MHz, CDCl₃)** δ 178.83, 178.75, 136.23, 135.64, 134.94, 133.91, 129.61, 128.97, 128.85, 127.80, 44.33, 36.85. **HRMS (ESI)** calculated [M+H] for C₁₇H₁₂ClNOS: 302.0406, found: 302.0403. **FTIR (cm⁻¹)** 3063, 2960, 2922, 2851, 1714, 1700, 1603, 1490, 1409, 1375, 1243, 1093.

(S)-6-(4-Fluorophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3f)

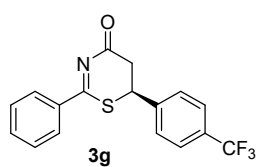


Following the general procedure, treatment (*Z*)-2-bromo-3-(4-fluorophenyl)acrylaldehyde **2f** (68.7 mg, 0.30 mmol) and benzothioamide **1a** (34.3 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the

reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 85:15) to afford (*S*)-6-(4-fluorophenyl)-2-phenyl-5,6-dihydro-4*H*-1,3-thiazin-4-one **3f** as a yellow oil (44 mg, 61% yield).

R_f (Pet. ether /EtOAc = 70/30): 0.56; er = 94:6, $[\alpha]_D^{25} = -84.3$ (c 0.1, CHCl₃). **HPLC** (Chiralpak IF, 80:20 Hexane / *i*-PrOH, 0.7 mL/min, 254 nm) *Minor*: 23.8 min, *Major*: 34.1 min. **¹H NMR** (400 MHz, CDCl₃) δ 8.08-8.07 (m, 2H), 7.58 (t, 1H), 7.45 (t, $J = 7.3$ Hz, 2H), 7.37-7.34 (m, 2H), 7.12-7.07 (m, 2H), 4.82 (dd, $J_1 = 12.4$ Hz, $J_2 = 4.1$ Hz, 1H), 3.04 (dd, $J_1 = 14.1$ Hz, $J_2 = 4.1$ Hz, 1H), 2.93 (dd, $J_1 = 14.0$ Hz, $J_2 = 12.4$ Hz, 1H). **¹³C NMR** (100 MHz, CDCl₃) δ 178.91, 162.95 ($J = 249$ Hz), 136.37, 133.85, 133.03, 129.43 ($J = 8.3$ Hz), 128.88, 127.86, 116.48 ($J = 21.8$ Hz), 44.40, 37.19. **HRMS (ESI)** calculated $[M+H]^+$ for C₁₆H₁₂FNOS: 286.0702, found: 286.0701. **FTIR** (cm⁻¹) 2960, 2923, 2852, 1714, 1655, 1603, 1509, 1475, 1227, 1157, 1099, 905.

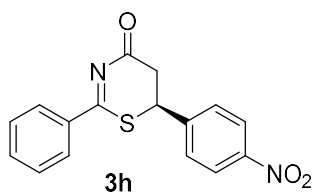
(*S*)-2-Phenyl-6-(4-(trifluoromethyl)phenyl)-5,6-dihydro-4*H*-1,3-thiazin-4-one (**3g**)



Following the general procedure, treatment of (*Z*)-2-bromo-3-(4-(trifluoromethyl)phenyl)acrylaldehyde **2g** (83.7 mg, 0.30 mmol) and benzothioamide **1a** (34.3 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 80:20) to afford (*S*)-2-phenyl-6-(4-(trifluoromethyl)phenyl)-5,6-dihydro-4*H*-1,3-thiazin-4-one **3g** as a pale yellow solid (52 mg, 58% yield).

R_f (Pet. ether /EtOAc = 80/20): 0.57; er = 92:8, $[\alpha]_D^{25} = +99.8$ (c 0.1, CHCl₃). **HPLC** (Chiralpak IF, 80:20 Hexane / *i*-PrOH, 0.7 mL/min, 254 nm) *Minor*: 17.8 min, *Major*: 26.4 min. **¹H NMR** (400 MHz, CDCl₃) δ 8.07 (d, $J = 7.6$ Hz, 2H), 7.66 (d, $J = 8.0$ Hz, 2H), 7.59 (t, $J = 7.4$ Hz, 1H), 7.52-7.43 (m, 4H), 4.91 (dd, $J_1 = 11.9$ Hz, $J_2 = 4.4$ Hz, 1H), 3.06 (dd, $J_1 = 14.0$ Hz, $J_2 = 4.3$ Hz, 1H), 2.95 (dd, $J_1 = 14.1$ Hz, $J_2 = 12.1$ Hz, 1H). **¹³C NMR** (100 MHz, CDCl₃) δ 178.53, 178.40, 141.26, 136.18, 134.05, 133.90, 131.22 (q, $J = 31.7$ Hz), 128.94, 128.90, 128.16, 128.06, 127.85, 127.62, 126.52, 126.33, 125.14, 122.44, 44.46, 36.63. **HRMS (ESI)** calculated $[M+H]^+$ for C₁₇H₁₃F₃NOS: 336.0670, found: 336.0667. **FTIR** (cm⁻¹) 2925, 1715, 1679, 1615, 1509, 1474, 1418, 1376, 1326, 1244, 1167, 1119, 1068.

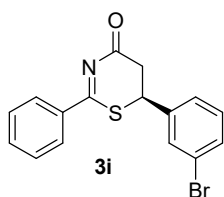
(S)-6-(4-Nitrophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3h)



Following the general procedure, treatment of (*Z*)-2-bromo-3-(4-nitrophenyl)acrylaldehyde **2h** (76.8 mg, 0.30 mmol) and benzothioamide **1a** (34.3 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 85:15) to afford (*S*)-6-(4-nitrophenyl)-2-phenyl-5,6-dihydro-4*H*-1,3-thiazin-4-one **3h** as a brown sticky liquid (41 mg, 52% yield).

R_f(Pet. ether /EtOAc = 70/30): 0.38; er = 92:8, [α]_D²⁰ = -88.0 (c 0.1, CHCl₃). **HPLC** (Chiralpak IA, 65:35 Hexane / *i*-PrOH, 0.7 mL/min, 254 nm) *Minor*: 25.7 min, *Major*: 35.8 min. **¹H NMR** (400 MHz, CDCl₃) δ 8.28-8.25 (m, 2H), 8.09-8.07 (m, 2H), 7.63-7.57 (m, 3H), 7.49-7.46 (m, 2H), 4.96 (dd, *J*₁ = 11.5 Hz, *J*₂ = 4.4 Hz, 1H), 3.09 (dd, *J*₁ = 14.1 Hz, *J*₂ = 4.4 Hz, 1H), 2.97 (dd, *J*₁ = 14.0 Hz, *J*₂ = 11.4 Hz, 1H). **¹³C NMR** (100 MHz, CDCl₃) δ 178.04, 177.88, 148.20, 144.45, 136.05, 134.19, 129.01, 128.77, 127.90, 124.70, 44.27, 36.47. **HRMS (ESI)** calculated [M+H] for C₁₆H₁₃N₂O₃S: 313.0647, found: 313.0645. **FTIR** (cm⁻¹) 2921, 2852, 1713, 1670, 1602, 1519, 1472, 1392, 1346, 1245, 1152, 904.

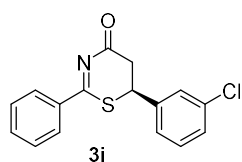
(S)-6-(3-Bromophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3i)



Following the general procedure, treatment of (*Z*)-2-bromo-3-(3-bromophenyl)acrylaldehyde **2i** (86.9 mg, 0.30 mmol) and benzothioamide **1a** (34.3 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 85:15) to afford (*S*)-6-(3-bromophenyl)-2-phenyl-5,6-dihydro-4*H*-1,3-thiazin-4-one **3i** as a yellow oil (64 mg, 74% yield). *R_f*(Pet. ether /EtOAc = 70/30): 0.58; er = 93:7, [α]_D²⁵ = -76.9 (c 0.1, CHCl₃). **HPLC** (Chiralpak IC, 70:30 Hexane / *i*-PrOH, 0.7 mL/min, 254 nm) *Minor*: 47.5 min, *Major*: 36.5 min. **¹H NMR** (400 MHz, CDCl₃) δ 8.09-8.07 (m, 2H), 7.61-7.44 (m, 5H), 7.33-7.28 (m, 2H), 4.80 (dd, *J*₁ = 12.4 Hz, *J*₂ = 4.1 Hz, 1H), 3.04 (dd, *J*₁ = 14.0 Hz, *J*₂ = 4.2 Hz, 1H), 2.92 (dd, *J*₁ = 14.1 Hz, *J*₂ = 12.5 Hz, 1H). **¹³C NMR** (100 MHz, CDCl₃) δ 178.58, 178.56, 139.39, 136.25, 133.92, 132.26, 130.97,

130.77, 130.65, 128.85, 127.83, 126.28, 123.30, 44.43, 36.77. **HRMS (ESI)** calculated [M+H] for C₁₆H₁₃BrNOS: 345.9901, found: 345.9911. **FTIR (cm⁻¹)** 2960, 2921, 1713, 1603, 1567, 1475, 1417, 1377, 1244, 1150, 1072, 904.

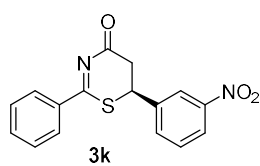
(S)-6-(3-Chlorophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3j)



Following the general procedure, treatment of (Z)-2-bromo-3-(3-chlorophenyl)acrylaldehyde **2j** (72.3 mg, 0.30 mmol) and benzothioamide **1a** (34.3 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 80:20) to afford (S)-6-(3-chlorophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one **3j** as a pale yellow solid (57 mg, 75% yield).

R_f (Pet. ether /EtOAc = 70/30): 0.62; er = 93:7, [α]_D²⁰ = -88.0 (c 0.1, CHCl₃). **HPLC** (Chiralpak IC, 70:30 Hexane / *i*-PrOH, 0.7 mL/min, 254 nm) *Minor*: 48.3 min, *Major*: 35.8 min. **¹H NMR (400 MHz, CDCl₃)** δ 8.11-8.09 (m, 2H), 7.64-7.60 (m, 1H), 7.50-7.46 (m, 2H), 7.40-7.34 (m, 3H), 7.31-7.27 (m, 1H), 4.83 (dd, *J*₁ = 12.5 Hz, *J*₂ = 4.2 Hz, 1H), 3.07 (dd, *J*₁ = 14.0 Hz, *J*₂ = 4.1 Hz, 1H), 2.95 (dd, *J*₁ = 14.0 Hz, *J*₂ = 12.5 Hz, 1H). **¹³C NMR (100 MHz, CDCl₃)** δ 178.73, 178.67, 139.13, 136.24, 135.25, 133.92, 130.75, 129.32, 128.89, 127.85, 125.85, 44.50, 36.78. **HRMS (ESI)** calculated [M+H] for C₁₆H₁₃ClNOS: 302.0406, found: 302.0405. **FTIR (cm⁻¹)** 3063, 2959, 2922, 1713, 1653, 1602, 1570, 1477, 1401, 1243, 1151, 1080, 904.

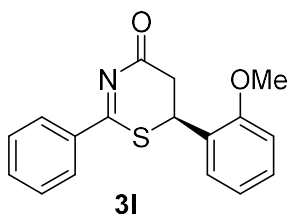
(S)-6-(3-Nitrophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3k)



Following the general procedure, treatment of (Z)-2-bromo-3-(3-nitrophenyl)acrylaldehyde **2k** (76.8 mg, 0.30 mmol) and benzothioamide **1a** (34.3 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 80:20) to afford (S)-6-(3-nitrophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one **3k** as a pale yellow solid (44 mg, 56% yield).

R_f (Pet. ether /EtOAc = 60/40): 0.57; er = 94:6, $[\alpha]_D^{20} = -122.0$ (c 0.1, CHCl₃). **HPLC** (Chiralpak IF, 70:30 Hexane / *i*-PrOH, 0.7 mL/min, 254 nm) *Minor*: 36.3 min, *Major*: 39.4 min. **¹H NMR (400 MHz, CDCl₃)** δ 8.28 (s, 1H), 8.24-8.22 (m, 1H), 8.07 (d, $J = 8.0$ Hz, 2H), 7.73 (d, $J = 7.9$ Hz, 1H), 7.63-7.58 (m, 2H), 7.47 (t, $J = 7.6$ Hz, 2H), 4.98 (dd, $J_1 = 11.7$ Hz, $J_2 = 4.3$ Hz, 1H), 3.10 (dd, $J_1 = 14.0$ Hz, $J_2 = 4.4$ Hz, 1H), 3.00 (dd, $J_1 = 13.9$ Hz, $J_2 = 11.8$ Hz, 1H). **¹³C NMR (100 MHz, CDCl₃)** δ 178.01, 177.96, 148.83, 139.58, 136.11, 134.09, 133.72, 130.65, 128.98, 127.89, 124.04, 122.81, 44.26, 36.65. **HRMS (ESI)** calculated $[M+H]$ for C₁₆H₁₃N₂O₃S: 313.0647, found: 313.0647. **FTIR (cm⁻¹)** 3067, 2923, 1724, 1713, 1655, 1605, 1569, 1528, 1479, 1406, 1350, 1245, 1153, 1097.

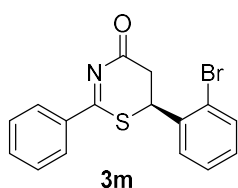
(S)-6-(2-Methoxyphenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (31)



Following the general procedure, treatment of (*Z*)-2-bromo-3-(2-methoxyphenyl)acrylaldehyde **21** (72.3 mg, 0.30mmole) and benzothioamide **1a** (34.3 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 85:15) to afford (*S*)-6-(2-methoxyphenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one **31** a pale yellow solid(50 mg, 67% yield).

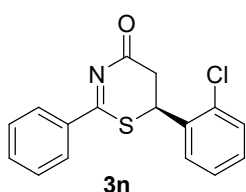
R_f (Pet. ether /EtOAc = 70/30): 0.41; er = 85:15, $[\alpha]_D^{25} = +11.0$ (c 0.1, CHCl₃). **HPLC** (Chiralpak IF, 70:30 Hexane / *i*-PrOH, 0.7 mL/min, 254 nm) *Minor*: 16.1 min, *Major*: 18.1 min. **¹H NMR (400 MHz, CDCl₃)** δ 8.08 (d, $J = 7.8$ Hz, 2H), 7.56 (t, $J = 7.2$ Hz, 1H), 7.43 (t, $J = 7.5$ Hz, 2H), 7.36-7.30(m, 2H), 6.98 (t, $J = 7.9$ Hz, 1H), 6.92 (d, $J = 8.2$ Hz, 1H), 5.31 (dd, $J_1 = 10.0$ Hz, $J_2 = 5.4$ Hz, 1H), 3.86 (s, 3H), 3.05-2.95 (m,2H). **¹³C NMR (100 MHz, CDCl₃)** δ 179.93, 179.42, 156.87, 136.80, 133.48, 129.99, 128.72, 127.81, 127.76, 125.29, 121.16, 111.04, 55.61, 38.54, 35.39. **HRMS (ESI)** calculated $[M+H]$ for C₁₇H₁₆NO₂S: 298.0902, found: 298.0901. **FTIR (cm⁻¹)** 2937, 2838, 1716, 1654, 1605, 1499, 1461, 1247, 1182, 1111, 1025, 905.

(S)-6-(2-Bromophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3m)



Following the general procedure, treatment of (*Z*)-2-bromo-3-phenylacrylaldehyde **2m** (86.9 mg, 0.30 mmol) and benzothioamide **1a** (34.3 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 85:15) to afford (*S*)-6-(2-bromophenyl)-2-phenyl-5,6-dihydro-4*H*-1,3-thiazin-4-one **3m** as a yellow oil (78 mg, 90% yield). *R_f*(Pet. ether /EtOAc = 70/30): 0.65; er = 91:9, [α]_D²⁵ = -13.3 (c 0.1, CHCl₃). **HPLC** (ChiralpakIF, 80:20 Hexane / *i*-PrOH, 0.7 mL/min, 254 nm) *Minor*: 25.4 min, *Major*: 28.7 min. **¹H NMR (400 MHz, CDCl₃)** δ 8.08-8.06 (m, 2H), 7.61-7.55 (m, 2H), 7.45-7.41 (m, 3H), 7.35-7.32 (m, 1H), 7.21-7.17 (m, 1H), 5.34 (dd, *J*₁ = 9.5 Hz, *J*₂ = 5.4 Hz, 1H), 3.05-2.94 (m, 2H). **¹³C NMR (100 MHz, CDCl₃)** δ 178.91, 178.37, 136.32, 133.74, 130.29, 128.79, 128.48, 127.76, 123.92, 43.74, 35.41. **HRMS (ESI)** calculated [M+H] for C₁₆H₁₃BrNOS: 345.9901, found: 345.9900. **FTIR (cm⁻¹)** 2922, 2851, 1713, 1606, 1509, 1472, 1376, 1308, 1243, 1194, 1024, 898.

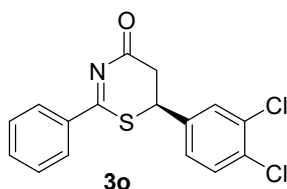
(S)-6-(2-Chlorophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3n)



Following the general procedure, treatment of (*Z*)-2-bromo-3-(2-chlorophenyl)acrylaldehyde **2n** (72.3 mg, 0.30 mmol) and benzothioamide **1a** (34.3 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 85:15) to afford (*S*)-6-(2-chlorophenyl)-2-phenyl-5,6-dihydro-4*H*-1,3-thiazin-4-one **3n** as a pale yellow sticky liquid (53 mg, 70% yield). *R_f*(Pet. ether /EtOAc = 70/30): 0.62; er = 92:8, [α]_D²⁵ = -73.6 (c 0.1, CHCl₃). **HPLC** (ChiralpakIC, 70:30 Hexane / *i*-PrOH, 1.0 mL/min, 254 nm) *Minor*: 23.2 min, *Major*: 21.8 min. **¹H NMR (400 MHz, CDCl₃)** δ 8.09 (d, *J* = 7.6 Hz, 2H), 7.59 (t, *J* = 7.2 Hz, 1H), 7.48-7.42 (m, 4H), 7.32-7.29 (m, 2H), 5.38 (dd, *J*₁ = 9.1 Hz, *J*₂ = 5.8 Hz, 1H), 3.06-2.97 (m, 2H). **¹³C NMR (100 MHz, CDCl₃)** δ 179.08, 178.50, 136.43, 134.81, 133.97, 133.60, 130.43, 130.09, 128.93, 128.81, 128.60, 128.07,

127.87, 127.65, 41.13, 35.36. **HRMS (ESI)** calculated [M+H] for C₁₆H₁₃Cl₂NOS: 302.0406, found: 302.0404. **FTIR (cm⁻¹)** 2959, 2923, 1714, 1677, 1573, 1509, 1474, 1375, 1243, 1153, 1035, 908.

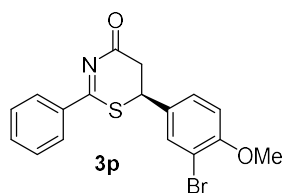
(S)-6-(3,4-Dichlorophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3o)



Following the general procedure, treatment of (*Z*)-2-bromo-3-(3,4-dichlorophenyl)acrylaldehyde **2o** (83.9 mg, 0.30 mmol) and benzothioamide **1a** (34.3 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 85:15) to afford (*S*)-6-(3,4-dichlorophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one **3o** as a pale yellow solid (30 mg, 36% yield).

R_f (Pet. ether /EtOAc = 70/30): 0.61. er = 92:8, [α]_D²⁵ = +50.2 (c 0.1, CHCl₃). **HPLC** (ChiralpakIF, 80:20 Hexane / *i*-PrOH, 0.7 mL/min, 254 nm) *Minor*: 24.9 min, *Major*: 26.5 min. **¹H NMR (400 MHz, CDCl₃)** δ 8.08 (d, *J* = 8.2 Hz, 2H), 7.61 (t, *J* = 7.3 Hz 1H), 7.50-7.45 (m, 4H), 7.24-7.21 (m, 1H), 4.80 (dd, *J*₁ = 12.2 Hz, *J*₂ = 4.1 Hz, 1H), 3.04 (dd, *J*₁ = 14.1 Hz, *J*₂ = 4.2 Hz, 1H), 2.95-2.88 (m, 1H). **¹³C NMR (100 MHz, CDCl₃)** δ 178.45, 178.37, 137.38, 136.15, 134.07, 133.65, 133.43, 131.47, 129.74, 128.97, 127.90, 126.96, 44.00, 36.75. **HRMS (ESI)** calculated [M+H] for C₁₆H₁₂Cl₂NOS: 336.0017, found: 336.0000. **FTIR (cm⁻¹)** 2959, 2922, 1682, 1519, 1472, 1399, 1374, 1243, 1213, 1131, 1030, 944.

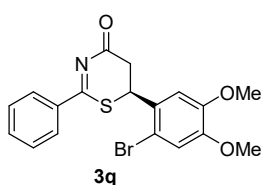
(S)-6-(3-Bromo-4-methoxyphenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3p)



Following the general procedure, treatment of (*Z*)-2-bromo-3-(3-bromo-4-methoxyphenyl)acrylaldehyde **2p** (96 mg, 0.30 mmol) and benzothioamide **1a** (34.3 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 85:15) to afford (*S*)-6-(3-Bromo-4-methoxyphenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one **3p** as a yellow solid (45 mg, 48% yield).

R_f (Pet. ether /EtOAc = 70/30): 0.56; er = 90:10, $[\alpha]_D^{20} = -82.0$ (c 0.05, CHCl₃). **HPLC** (Chiralpak IC, 70:30 Hexane / *i*-PrOH, 1.0 mL/min, 254 nm) *Minor*: 42.4 min, *Major*: 33.6 min. **¹H NMR (400 MHz, CDCl₃)** δ 8.08-8.07 (m, 2H), 7.59-7.57 (m, 2H), 7.46 (t, $J = 7.8$ Hz, 2H), 7.30-7.27 (m, 1H), 6.91 (d, $J = 8.6$ Hz, 1H), 4.76 (dd, $J_1 = 12.7$ Hz, $J_2 = 4.0$ Hz, 1H), 3.91 (s, 3H), 3.03 (dd, $J_1 = 14.0$ Hz, $J_2 = 4.0$ Hz, 1H), 2.92 (m, 1H). **¹³C NMR (100 MHz, CDCl₃)** δ 179.12, 179.10, 156.44, 136.31, 133.99, 132.60, 132.46, 130.35, 128.91, 127.91, 112.48, 112.34, 44.07, 37.16. **HRMS (ESI)** calculated $[M+H]$ for C₁₇H₁₅BrNO₂S: 376.0007, found: 376.0007. **FTIR (cm⁻¹)** 2962, 2925, 2842, 1714, 1663, 1601, 1498, 1370, 1255, 1054, 1018, 909.

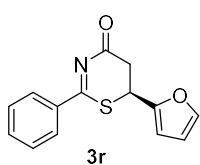
(S)-6-(2-Bromo-4,5-dimethoxyphenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3q)



Following the general procedure, treatment of (*Z*)-2-bromo-3-(2-bromo-4,5-dimethoxyphenyl)acrylaldehyde **2q** (81.3 mg, 0.30 mmol) and benzothioamide **1a** (34.3 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 80:20) to afford (*S*)-6-(2-bromo-4,5-dimethoxyphenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one **3q** as a pale yellow solid (48 mg, 47% yield).

R_f (Pet. ether /EtOAc = 70/30): 0.5; er = 82:18, $[\alpha]_D^{25} = -11.5$ (c 0.1, CHCl₃). **HPLC** (Chiralpak IF, 70:30 Hexane / *i*-PrOH, 0.7 mL/min, 254 nm) *Minor*: 25.3 min, *Major*: 51.1 min. **¹H NMR (400 MHz, CDCl₃)** δ 8.10-8.07 (m, 2H), 7.61-7.57 (m, 1H), 7.48-7.44 (m, 2H), 7.05 (s, 1H), 6.93 (s, 1H), 5.30 (dd, $J_1 = 9.8$ Hz, $J_2 = 5.2$ Hz, 1H), 3.88 (s, 3H), 3.84 (s, 3H), 3.05-2.94 (m, 2H), **¹³C NMR (100 MHz, CDCl₃)** δ 179.25, 178.82, 149.88, 149.16, 136.44, 133.90, 128.87, 128.10, 127.86, 115.93, 114.20, 110.68, 56.39, 56.35, 43.88, 35.83. **HRMS (ESI)** calculated $[M+H]$ for C₁₈H₁₈BrNO₃S: 406.0113, found: 406.0124. **FTIR (cm⁻¹)** 2962, 2925, 2845, 1737, 1714, 1660, 1600, 1506, 1465, 1439, 1381, 1261, 1162, 1026.

(S)-6-(Furan-2-yl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3r)

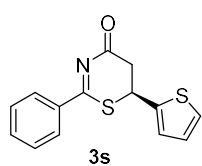


Following the general procedure, treatment of (*Z*)-2-bromo-3-(furan-2-yl)acrylaldehyde **2a** (60.3 mg, 0.30 mmol) and benzothioamide **1a** (34.3 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate

dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 85:15) to afford (*S*)-6-(Furan-2-yl)-2-phenyl-5,6-dihydro-4*H*-1,3-thiazin-4-one **3r** as a pale yellow solid (28 mg, 41% yield).

R_f (Pet. ether /EtOAc = 80/20): 0.48; er = 89:11, [α]_D²⁵ = -136.9 (c 0.1, CHCl₃). **HPLC** (Chiralpak IC, 70:30 Hexane / *i*-PrOH, 1.0 mL/min, 254 nm) *Minor*: 22.3 min, *Major*: 23.9 min. **¹H NMR (400 MHz, CDCl₃)** δ 8.07 (d, *J* = 7.9 Hz, 2H), 7.59 (t, *J* = 7.1 Hz, 1H), 7.47-7.43 (m, 3H), 6.36 (s, 2H), 4.95 (dd, *J*₁ = 9.0 Hz, *J*₂ = 5.3 Hz, 1H), 3.15-3.04 (m, 2H). **¹³C NMR (100 MHz, CDCl₃)** δ 178.59, 178.07, 150.02, 143.57, 136.54, 133.86, 132.08, 128.88, 128.59, 127.88, 127.06, 110.95, 108.53, 38.06, 34.00. **HRMS (ESI)** calculated [M+H] for C₁₄H₁₂NO₂S: 258.0589, found: 258.0591. **FTIR (cm⁻¹)** 2959, 2921, 1687, 1624, 1516, 1449, 1379, 1327, 1222, 1128.

(*S*)-2-Phenyl-6-(thiophen-2-yl)-5,6-dihydro-4*H*-1,3-thiazin-4-one (**3s**)

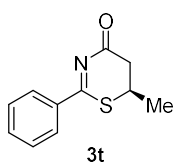


Following the general procedure, treatment of (*Z*)-2-bromo-3-(thiophen-2-yl)acrylaldehyde **2s** (65.1 mg, 0.30 mmol) and benzothioamide **1a** (34.3 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100

mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 85:15) to afford (*S*)-2-phenyl-6-(thiophen-2-yl)-5,6-dihydro-4*H*-1,3-thiazin-4-one **3s** as a brown oil (44 mg, 64% yield).

R_f (Pet. ether /EtOAc = 70/30): 0.5; er = 91:9, [α]_D²⁰ = -116.0 (c 0.1, CHCl₃). **HPLC** (Chiralpak IC, 70:30 Hexane / *i*-PrOH, 1.0 mL/min, 254 nm) *Minor*: 29.1 min, *Major*: 26.8 min. **¹H NMR (400 MHz, CDCl₃)** δ 8.09-8.06 (m, 2H), 7.61-7.57 (m, 1H), 7.48-7.44 (m, 2H), 7.43-7.32 (m, 1H), 7.10 (d, *J* = 3.5 Hz, 1H), 7.00 (dd, *J*₁ = 5.1 Hz, *J*₂ = 3.6 Hz, 1H), 5.13 (dd, *J*₁ = 11.9 Hz, *J*₂ = 4.0 Hz, 1H), 3.17 (dd, *J*₁ = 14.3 Hz, *J*₂ = 4.0 Hz, 1H), 3.01 (dd, *J*₁ = 14.3 Hz, *J*₂ = 11.9 Hz, 1H). **¹³C NMR (100 MHz, CDCl₃)** δ 178.77, 178.46, 140.44, 136.37, 133.89, 128.89, 127.93, 127.50, 126.57, 126.48, 40.51, 38.14. **HRMS (ESI)** calculated [M+H] for C₁₄H₁₂NOS₂: 274.0360, found: 274.0364. **FTIR (cm⁻¹)** 3064, 2960, 2923, 2852, 1714, 1678, 1605, 1508, 1475, 1373, 1245, 1105, 1025.

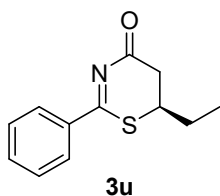
(*R*)-6-Methyl-2-phenyl-5,6-dihydro-4*H*-1,3-thiazin-4-one (**3t**)



Following the general procedure, treatment of (*Z*)-2-bromobut-2-enal **2t** (44.7 mg, 0.30 mmol) and benzothioamide **1a** (34.3 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 85:15) to afford (*R*)-6-methyl-2-phenyl-5,6-dihydro-4*H*-1,3-thiazin-4-one **3t** as a yellow oil (28 mg, 54 % yield).

R_f (Pet. ether /EtOAc = 80/20): 0.41; er = 88:12, [α]_D²⁵ = +13.0 (c 0.1, CHCl₃). **HPLC** (Chiralpak IF, 80:20 Hexane / *i*-PrOH, 0.7 mL/min, 254 nm) *Minor*: 18.9 min, *Major*: 20.5 min. **¹H NMR** (400 MHz, CDCl₃) δ 8.05-8.03 (m, 2H), 7.58-7.54 (m, 1H), 7.45-7.41 (m, 2H), 3.79-3.70 (m, 1H), 2.84 (dd, *J*₁ = 14.0 Hz, *J*₂ = 4.2 Hz, 1H), 2.51 (dd, *J*₁ = 14.2 Hz, *J*₂ = 10.4 Hz, 1H) 1.49 (d, *J* = 7.1 Hz, 3H). **¹³C NMR** (100 MHz, CDCl₃) δ 179.05, 178.95, 136.67, 133.55, 128.75, 127.75, 37.73, 36.08, 21.05. **HRMS (ESI)** calculated [M+H] for C₁₁H₁₂NOS: 206.0640, found: 206.0637. **FTIR** (cm⁻¹) 3063, 3028, 2922, 2852, 1713, 1657, 1484, 1378, 1245, 1149, 1077, 905.

(*R*)-6-Ethyl-2-phenyl-5,6-dihydro-4*H*-1,3-thiazin-4-one (**3u**)

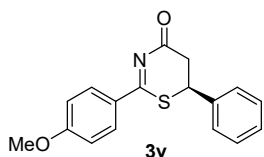


Following the general procedure, treatment of (*Z*)-2-bromopent-2-enal **2u** (48.9 mg, 0.30 mmol) and benzothioamide **1a** (34.3 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 85:15) to afford (*R*)-6-ethyl-2-phenyl-5,6-dihydro-4*H*-1,3-thiazin-4-one **3u** as a pale yellow liquid (41 mg, 75% yield).

R_f (Pet. ether /EtOAc = 70/30): 0.65; er = 89:11, [α]_D²⁰ = -50.0 (c 0.05, CHCl₃). **HPLC** (Chiralcel OJ-H, 85:15 Hexane / *i*-PrOH, 1.0 mL/min, 254 nm) *Minor*: 16.2 min, *Major*: 19.6 min. **¹H NMR** (400 MHz, CDCl₃) δ 8.06-8.04 (m, 2H), 7.57-7.53 (m, 1H), 7.45-7.41 (m, 2H), 3.74-3.55 (m, 1H), 2.84 (dd, *J*₁ = 14.0 Hz, *J*₂ = 4.4 Hz, 1H), 2.58 (dd, *J*₁ = 14.0 Hz, *J*₂ = 10.1 Hz, 1H), 1.95-1.72 (m, 2H), 1.08 (t, *J* = 7.3 Hz, 3H). **¹³C NMR** (100 MHz, CDCl₃) δ 179.18, 178.88, 136.78, 133.50, 128.73, 127.74, 42.90, 35.85, 28.46, 11.01. **HRMS (ESI)** calculated [M+H] for C₁₃H₁₄NOS:

220.0796, found: 220.0800. **FTIR (cm⁻¹)** 2967, 2927, 1712, 1679, 1574, 1511, 1475, 1378, 1240, 1155, 1073, 910.

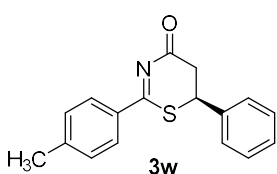
(S)-2-(4-Methoxyphenyl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3v)



Following the general procedure, treatment of (*Z*)-2-bromo-3-phenylacrylaldehyde **1a** (63.4 mg, 0.30 mmol) and 4-methoxybenzothioamide **2v** (41.8 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 80:20) to afford (*S*)-2-(4-methoxyphenyl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one **3v** as a pale yellow solid (41 mg, 55% yield).

R_f (Pet. ether /EtOAc = 70/30): 0.54; er = 92:8, [α]_D²² = -60.7 (c 0.1, CHCl₃). **HPLC** (Chiralpak IF, 75:25 Hexane / *i*-PrOH, 0.7 mL/min, 254 nm) *Minor*: 36.8 min, *Major*: 44.0 min. **¹H NMR (400 MHz, CDCl₃)** δ 8.11-8.09 (m, 2H), 7.43-7.35 (m, 5H), 6.95-6.93 (m, 2H), 4.80 (dd, *J*₁ = 12.6 Hz, *J*₂ = 3.9 Hz, 1H), 3.88 (s, 3H), 3.06 (dd, *J*₁ = 14.3 Hz, *J*₂ = 4.0 Hz, 1H), 2.95 (dd, *J*₁ = 14.4 Hz, *J*₂ = 12.8 Hz, 1H). **¹³C NMR (100 MHz, CDCl₃)** δ 179.38, 178.43, 164.49, 137.31, 130.09, 129.46, 129.07, 128.88, 127.67, 114.20, 55.73, 37.31. **HRMS (ESI)** calculated [M+H] for C₁₇H₁₆NO₂S: 298.0902, found: 298.0902. **FTIR (cm⁻¹)** 2962, 2843, 1711, 1673, 1603, 1488, 1377, 1312, 1251, 1175, 1025, 910, 844.

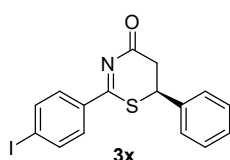
(S)-6-Phenyl-2-(p-tolyl)-5,6-dihydro-4H-1,3-thiazin-4-one (3w)



Following the general procedure, treatment of (*Z*)-2-bromo-3-phenylacrylaldehyde **2s** (63.4 mg, 0.30 mmol) and 4-methylbenzothioamide **1w** (37.8 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 85:15) to afford (*S*)-6-phenyl-2-(p-tolyl)-5,6-dihydro-4H-1,3-thiazin-4-one **3w** as a pale yellow solid (40 mg, 57% yield).

R_f (Pet. ether /EtOAc = 70/30): 0.64; er = 93:7, $[\alpha]_D^{25} = -73.8$ (c 0.1, CHCl₃). **HPLC** (Chiralpak IC, 70:30 Hexane / *i*-PrOH, 1.0 mL/min, 254 nm) *Minor*: 37.2 min, *Major*: 33.9 min. **¹H NMR (400 MHz, CDCl₃)** δ 7.99 (d, $J_1 = 8.2$ Hz, 2H), 7.42-7.38 (m, 5H), 7.27 (d, $J_1 = 7.9$ Hz, 2H), 4.82 (dd, $J_1 = 12.7$ Hz, $J_2 = 4.1$ Hz, 1H), 3.07 (dd, $J_1 = 14.2$ Hz, $J_2 = 4.2$ Hz, 1H), 3.01-2.94 (m, 1H), 2.43 (s, 3H). **¹³C NMR (100 MHz, CDCl₃)** δ 179.39, 179.20, 144.92, 137.18, 133.74, 129.58, 127.96, 127.67, 44.99, 37.14, 21.82. **HRMS (ESI)** calculated $[M+H]$ for C₁₇H₁₆NOS: 282.0953, found: 282.0954. **FTIR (cm⁻¹)** 2958, 2921, 2853, 1713, 1659, 1609, 1488, 1376, 1248, 1185, 1083, 910.

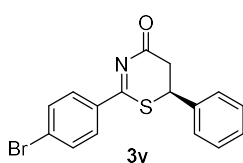
(S)-2-(4-Iodophenyl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3x)



Following the general procedure, treatment of (*Z*)-2-bromo-3-phenylacrylaldehyde **2a** (63.4 mg, 0.30 mmol) and 4-iodobenzothioamide **1x** (65.8 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 80:20) to afford (*S*)-2-(4-iodophenyl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one **3x** as a pale yellow solid (68 mg, 69% yield).

R_f (Pet. ether /EtOAc = 70/30): 0.56; er = 94:6, $[\alpha]_D^{25} = +191.24$ (c 0.1, CHCl₃). **HPLC** (Chiralpak IF, 80:20 Hexane / *i*-PrOH, 0.7 mL/min, 254 nm) *Minor*: 36.3 min, *Major*: 38.7 min. **¹H NMR (400 MHz, CDCl₃)** δ 7.81-7.76 (m, 4H), 7.43-7.34 (m, 5H), 4.84 (dd, $J_1 = 12.7$ Hz, $J_2 = 4.0$ Hz, 1H), 3.05 (dd, $J_1 = 14.3$ Hz, $J_2 = 4.1$ Hz, 1H), 2.95 (dd, $J_1 = 14.1$ Hz, $J_2 = 12.7$ Hz, 1H). **¹³C NMR (100 MHz, CDCl₃)** δ 179.03, 178.31, 138.06, 136.75, 135.76, 129.46, 129.17, 129.05, 127.57, 101.60, 45.12, 36.85. **HRMS (ESI)** calculated $[M+H]$ for C₁₆H₁₃INOS: 393.9763, found: 393.9760. **FTIR (cm⁻¹)** 2922, 2852, 1696, 1576, 1518, 1389, 1308, 1213, 1178, 1127, 1004, 963, 936.

(S)-2-(4-Bromophenyl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3y)

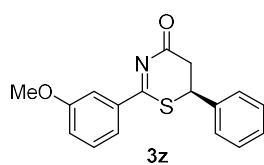


Following the general procedure, treatment of (*Z*)-2-bromo-3-phenylacrylaldehyde **2a** (63.4 mg, 0.30 mmol) and 4-bromobenzothioamide **1y** (54.0 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for

72 h followed by flash column chromatography (Pet. ether-EtOAc: 80:20) to afford (*S*)-2-(4-bromophenyl)-6-phenyl-5,6-dihydro-4*H*-1,3-thiazin-4-one **3y** as a pale yellow solid (60 mg, 69% yield).

R_f (Pet. ether /EtOAc = 80/20): 0.5; er = 92:8, $[\alpha]_D^{25} = -92.4$ (c 0.1, CHCl₃). **HPLC** (Chiralpak IC, 70:30 Hexane / *i*-PrOH, 0.7 mL/min, 254 nm) *Minor*: 40.0 min, *Major*: 36.0 min. **¹H NMR (400 MHz, CDCl₃)** δ 7.94 (d, $J = 8.3$ Hz, 2H), 7.58 (d, $J = 8.3$ Hz, 2H), 7.14-7.36 (m, 5H), 4.84 (dd, $J_1 = 12.9$ Hz, $J_2 = 4.0$ Hz, 1H), 3.05 (dd, $J_1 = 14.2$ Hz, $J_2 = 4.1$ Hz, 1H), 2.96 (t, $J = 13.2$ Hz, 1H). **¹³C NMR (100 MHz, CDCl₃)** δ 179.03, 178.04, 136.77, 135.21, 132.18, 132.05, 129.48, 129.21, 128.85, 127.58, 45.18, 36.87. **HRMS (ESI)** calculated [M+H] for C₁₆H₁₃BrNOS: 345.9901, found: 345.9902. **FTIR (cm⁻¹)** 3028, 2959, 2922, 2851, 1712, 1661, 1589, 1478, 1407, 1250, 1186, 1070, 1009, 907.

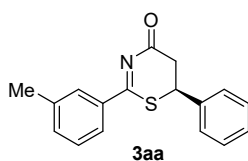
(*S*)-2-(3-Methoxyphenyl)-6-phenyl-5,6-dihydro-4*H*-1,3-thiazin-4-one (**3z**)



Following the general procedure, treatment of (*Z*)-2-bromo-3-phenylacrylaldehyde **2a** (63.4 mg, 0.30 mmol) and 3-methoxybenzothioamide **1z** (41.8 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 80:20) to afford (*S*)-2-(3-methoxyphenyl)-6-phenyl-5,6-dihydro-4*H*-1,3-thiazin-4-one **3z** as a yellow oil (53 mg, 72% yield).

R_f (Pet. ether /EtOAc = 60/40): 0.57; er = 92:8, $[\alpha]_D^{20} = -60.0$ (c 0.05, CHCl₃). **HPLC** (Chiralpak IF, 70:30 Hexane / *i*-PrOH, 0.7 mL/min, 254 nm) *Minor*: 26.1 min, *Major*: 27.4 min. **¹H NMR (400 MHz, CDCl₃)** δ 7.66-7.62 (m, 2H), 7.43-7.32 (m, 6H), 7.14-7.11 (m, 1H), 4.82 (dd, $J_1 = 12.6$ Hz, $J_2 = 4.1$ Hz, 1H), 3.85 (s, 3H), 3.06 (dd, $J_1 = 14.2$ Hz, $J_2 = 5.0$ Hz, 1H), 2.98 (dd, $J_1 = 14.0$ Hz, $J_2 = 12.6$ Hz, 1H). **¹³C NMR (100 MHz, CDCl₃)** δ 179.32, 179.20, 159.93, 137.78, 137.00, 129.77, 129.46, 129.11, 127.61, 120.58, 111.75, 55.64, 45.10, 37.03. **HRMS (ESI)** calculated [M+H] for C₁₇H₁₆NO₂S: 298.0902, found: 298.0902. **FTIR (cm⁻¹)** 2932, 2836, 1711, 1673, 1597, 1486, 1378, 1286, 1218, 1152, 1041.

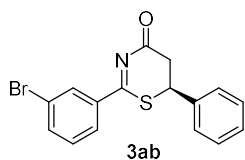
(S)-6-Phenyl-2-(m-tolyl)-5,6-dihydro-4H-1,3-thiazin-4-one (3aa)



Following the general procedure, treatment of (*Z*)-2-bromo-3-phenylacrylaldehyde **2a** (63.4 mg, 0.30 mmol) and 3-methylbenzothioamide **1aa** (37.8 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 80:20) to afford (*S*)-6-phenyl-2-(m-tolyl)-5,6-dihydro-4H-1,3-thiazin-4-one **3aa** as a yellow oil (36 mg, 51% yield).

R_f (Pet. ether /EtOAc = 80/20): 0.51; er = 92:8, [α]_D²⁵ = +62.6 (c 0.1, CHCl₃). **HPLC** (Chiralpak IC, 70:30 Hexane / *i*-PrOH, 0.7 mL/min, 254 nm) *Minor*: 43.3 min, *Major*: 39.3 min. **¹H NMR** (400 MHz, CDCl₃) δ 7.93-7.86 (m, 2H), 7.43-7.32 (m, 7H), 4.82 (dd, *J*₁ = 12.6 Hz, *J*₂ = 4.1 Hz, 1H), 3.06 (dd, *J*₁ = 14.3 Hz, *J*₂ = 4.0 Hz, 1H), 2.97 (dd, *J*₁ = 14.0 Hz, *J*₂ = 12.9 Hz, 1H), 2.40 (s, 3H). **¹³C NMR** (100 MHz, CDCl₃) δ 179.58, 179.33, 138.80, 137.09, 136.39, 134.65, 129.46, 129.10, 128.71, 127.62, 45.08, 37.05, 21.39. **HRMS (ESI)** calculated [M+H] for C₁₇H₁₇NOS: 282.0953, found: 282.0951. **FTIR** (cm⁻¹) 3029, 2959, 2922, 2854, 2363, 2329, 1713, 1659, 1606, 1498, 1376, 1266, 1193, 1148.

(S)-2-(3-Bromophenyl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3ab)

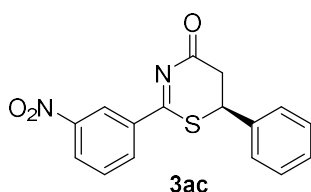


Following the general procedure, treatment of (*Z*)-2-bromo-3-phenylacrylaldehyde **2ab** (63.4 mg, 0.30 mmol) and 3-bromobenzothioamide **C** (54.0 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 80:20) to afford (*S*)-2-(3-bromophenyl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one **3ab** as a pale yellow solid (70 mg, 81% yield).

R_f (Pet. ether /EtOAc = 70/30): 0.58; er = 92:8, [α]_D²⁵ = -60.8 (c 0.1, CHCl₃). **HPLC** (Chiralpak IC, 70:30 Hexane / *i*-PrOH, 0.7 mL/min, 254 nm) *Minor*: 39.3 min, *Major*: 35.8 min. **¹H NMR** (400 MHz, CDCl₃) δ 8.24 (t, *J* = 1.4 Hz, 1H), 7.98-7.96 (m, 1H), 7.70-7.67 (m, 1H), 7.29-7.43 (m, 6H), 4.85 (dd, *J*₁ = 12.7 Hz, *J*₂ = 4.2 Hz, 1H), 3.06 (dd, *J*₁ = 14.2 Hz, *J*₂ = 4.1 Hz, 1H), 2.97 (dd, *J*₁ = 14.0 Hz, *J*₂ = 12.7 Hz, 1H). **¹³C NMR** (100 MHz, CDCl₃) δ 178.93, 177.68, 138.18, 136.66,

136.36, 130.60, 130.28, 129.51, 129.22, 127.58, 126.29, 123.07, 45.25, 36.82. **HRMS (ESI)** calculated [M+H] for C₁₆H₁₃BrNOS: 345.9901, found: 345.9904. **FTIR (cm⁻¹)** 3028, 2922, 1713, 1658, 1562, 1498, 1380, 1243, 1149, 1074, 748, 697.

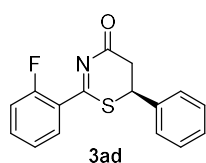
(S)-2-(3-Nitrophenyl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3ac)



Following the general procedure, treatment of (*Z*)-2-bromo-3-phenylacrylaldehyde **2a** (63.4 mg, 0.30 mmol) and 3-nitrobenzothioamide **1ac** (45.5 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 85:15) to afford (*S*)-2-(3-nitrophenyl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one **3ac** as a pale yellow solid (39 mg, 50% yield).

R_f (Pet. ether /EtOAc = 70/30): 0.53; er = 92:8, [α]_D²⁰ = -62.0 (c 0.05, CHCl₃). **HPLC** (ChiralpakIF, 70:30 Hexane / *i*-PrOH, 0.7 mL/min, 254 nm) *Minor*: 50.7 min, *Major*: 57.4 min. **¹H NMR (400 MHz, CDCl₃)** δ 8.32-8.23 (m, 4H), 7.44-7.38 (m, 5H), 4.92 (dd, *J*₁ = 12.6 Hz, *J*₂ = 4.1 Hz, 1H), 3.11 (dd, *J*₁ = 14.2 Hz, *J*₂ = 4.3 Hz, 1H), 3.05-2.98 (m, 1H). **¹³C NMR (100 MHz, CDCl₃)** 178.71, 176.81, 150.76, 141.71, 136.34, 129.67, 129.48, 128.85, 127.62, 124.00, 45.74, 36.67. **HRMS (ESI)** calculated [M+H] for C₁₆H₁₃N₂O₃S: 313.0647, found: 313.0647. **FTIR (cm⁻¹)** 2961, 2923, 2854, 1716, 1603, 1525, 1383, 1347, 1249, 1186, 1107, 916.

(S)-2-(2-Fluorophenyl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3ad)

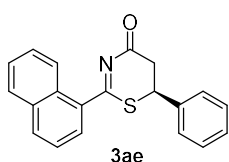


Following the general procedure, treatment of (*Z*)-2-bromo-3-phenylacrylaldehyde **2a** (63.4 mg, 0.30 mmol) and 2-fluorobenzothioamide **1ad** (38.8 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 85:15) to afford (*S*)-2-(2-fluorophenyl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (**3ad**) **3ad** as a pale yellow solid (46 mg, 65% yield).

R_f (Pet. ether /EtOAc = 80/20): 0.52; er = 90:10, [α]_D²⁵ = +136.9 (c 0.1, CHCl₃). **HPLC** (Chiralpak IA, 80:20 Hexane / *i*-PrOH, 0.7 mL/min, 254 nm) *Minor*: 15.9 min, *Major*: 14.2 min. **¹H NMR**

(400 MHz, CDCl₃) δ 7.98-7.94 (m, 1H), 7.54-7.49 (m, 1H), 7.41-7.37 (m, 5H), 7.26-7.22 (m, 1H), 7.18-7.14 (m, 1H), 4.86 (dd, $J_1 = 12.2$ Hz, $J_2 = 4.6$ Hz, 1H), 3.10-2.98 (m, 2H). ¹³C NMR (100 MHz, CDCl₃) δ 178.48, 176.17 (d, $J = 4.3$ Hz), 160.8 (d, $J = 257$ Hz), 136.72, 134.21 (d, $J = 9.2$ Hz), 130.68, 130.33, 129.49, 129.16, 127.65, 124.90, 124.55, 124.52, 116.96 (d, $J = 22.2$ Hz), 109.37, 77.48, 77.16, 76.84, 45.82 (d, $J = 3.5$ Hz). HRMS (ESI) calculated [M+H] for C₁₆H₁₃FNOS: 286.0702, found: 286.0702. FTIR (cm⁻¹) 2922, 2852, 1645, 1521, 1485, 1451, 1373, 1277, 1225, 1153, 1022.

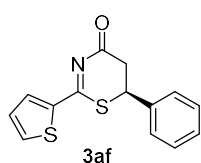
(S)-2-(Naphthalen-1-yl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3ae)



Following the general procedure, treatment of (Z)-2-bromo-3-phenylacrylaldehyde **1a** (63.4 mg, 0.30 mmol) and naphthalene-1-carbothioamide **2ae** (46.8 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 80:20) to afford (S)-2-(naphthalen-1-yl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one **3ae** as a pale yellow solid (50 mg, 63% yield).

R_f (Pet. ether /EtOAc = 70/30): 0.63; er = 91:9, [α]_D²⁵ = -54.4 (c 0.1, CHCl₃). HPLC (Chiralpak IC, 60:40 Hexane / *i*-PrOH, 0.7 mL/min, 254 nm) *Minor*: 39.2 min, *Major*: 34.5 min. ¹H NMR (400 MHz, CDCl₃) δ 8.54 (d, $J = 8.4$ Hz, 1H), 7.99 (d, $J = 8.1$ Hz, 1H), 7.89-7.82 (m, 2H), 7.62-7.54 (m, 2H), 7.52-7.47 (m, 1H), 7.42-7.37 (m, 5H), 4.91 (dd, $J_1 = 11.8$ Hz, $J_2 = 5.1$ Hz, 1H), 3.16-3.05 (m, 2H). ¹³C NMR (100 MHz, CDCl₃) δ 181.30, 178.66, 140.32, 136.85, 134.48, 133.90, 133.60, 132.62, 129.52, 129.09, 128.59, 127.58, 126.82, 125.18, 125.14, 124.66, 124.58, 45.88, 36.62. HRMS (ESI) calculated [M+H] for C₂₀H₁₆NOS: 318.0953, found: 318.0958. FTIR (cm⁻¹) 3057, 2922, 2852, 1709, 1649, 1507, 1453, 1413, 1374, 1247, 1194, 1149, 1029.

(S)-6-Phenyl-2-(thiophen-2-yl)-5,6-dihydro-4H-1,3-thiazin-4-one (3af)



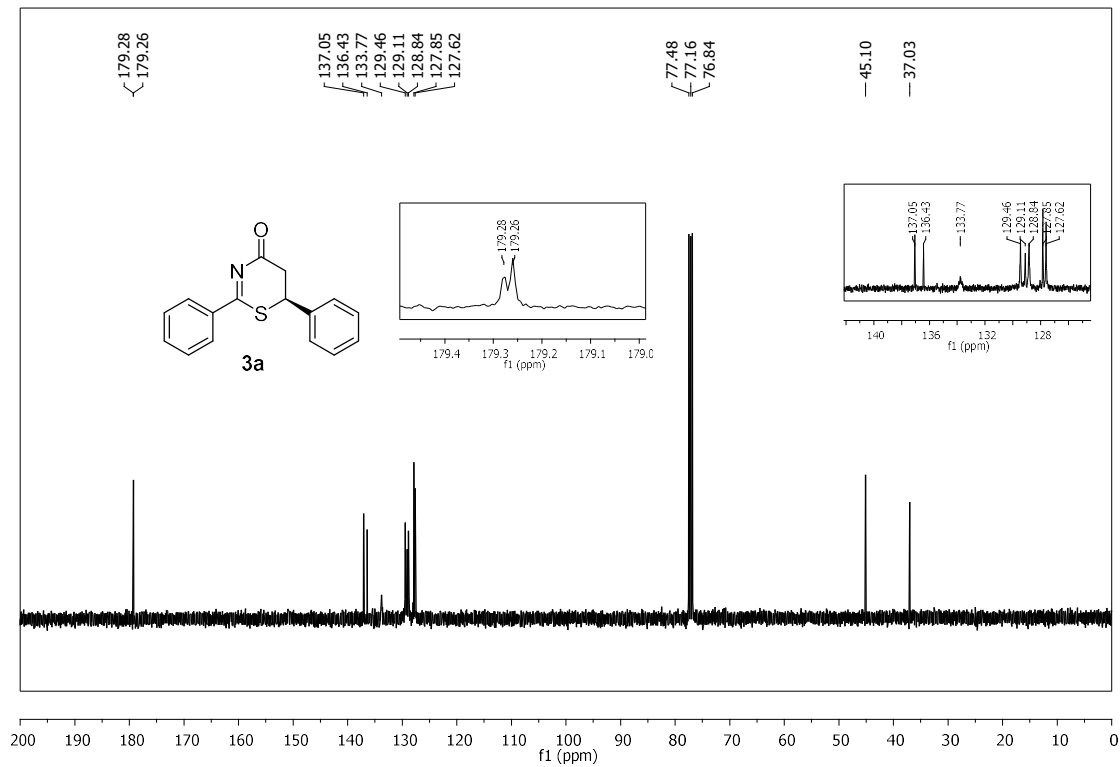
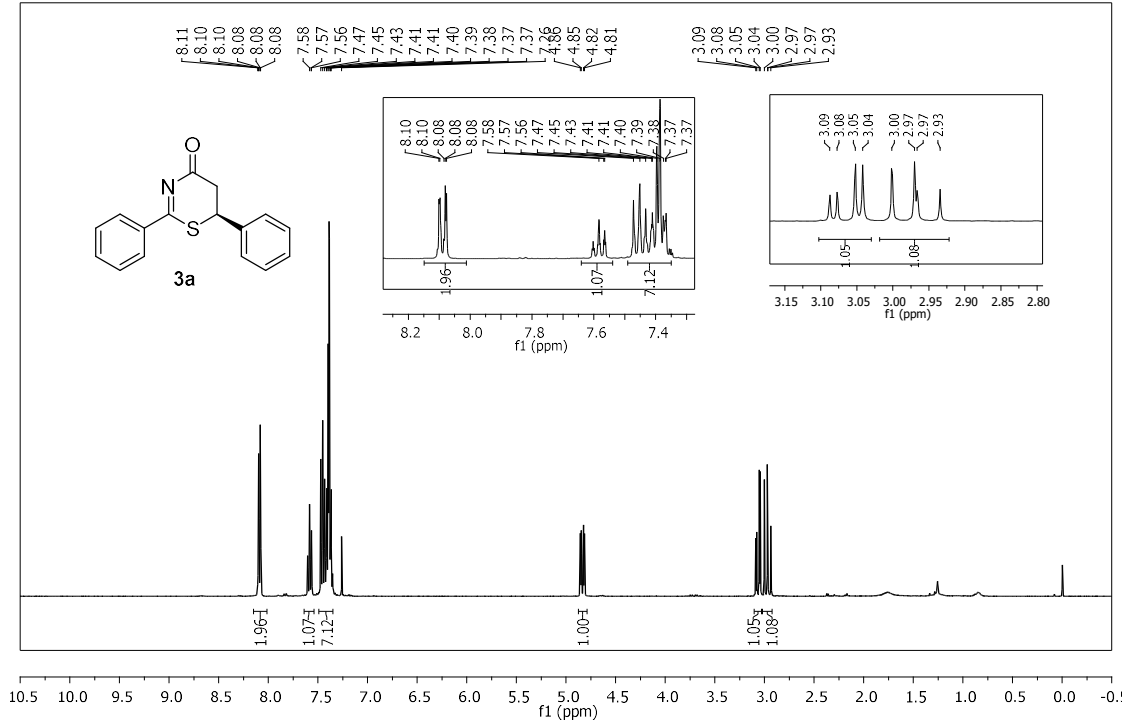
Following the general procedure, treatment of (Z)-2-bromo-3-phenylacrylaldehyde **2a** (63.4 mg, 0.30 mmol) and thiophene-2-carbothioamide **1af** (35.8 mg, 0.25 mmol) with triazolium salt **C** (11.6 mg, 0.025 mmol), lithium acetate dihydrate (5.1 mg, 0.05 mmol), K₂CO₃ (52.0 mg, 0.375 mmol) and 4 Å

MS (100 mg) in mesitylene (2.0 mL) and stirring the reaction mixture at 25 °C for 72 h followed by flash column chromatography (Pet. ether-EtOAc: 80:20) to afford (*S*)-6-phenyl-2-(thiophen-2-yl)-5,6-dihydro-4*H*-1,3-thiazin-4-one **3af** as a yellow oil (34 mg, 49 % yield).

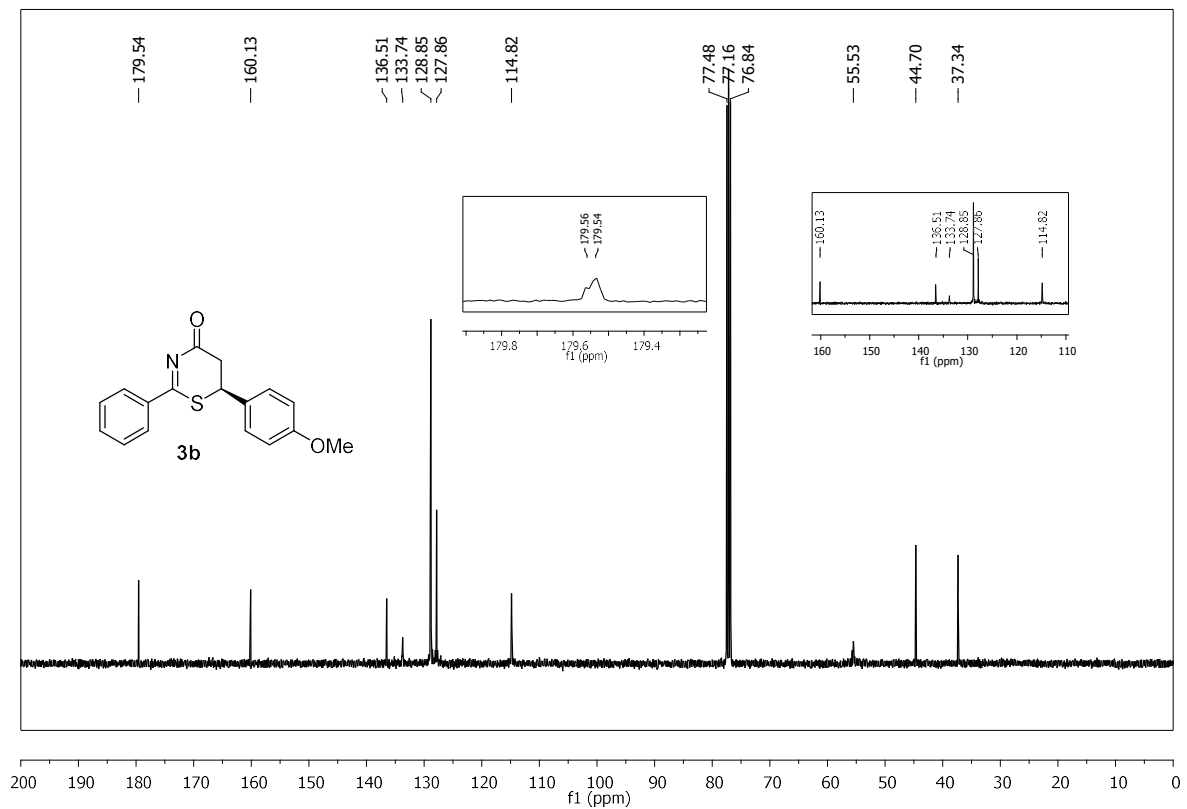
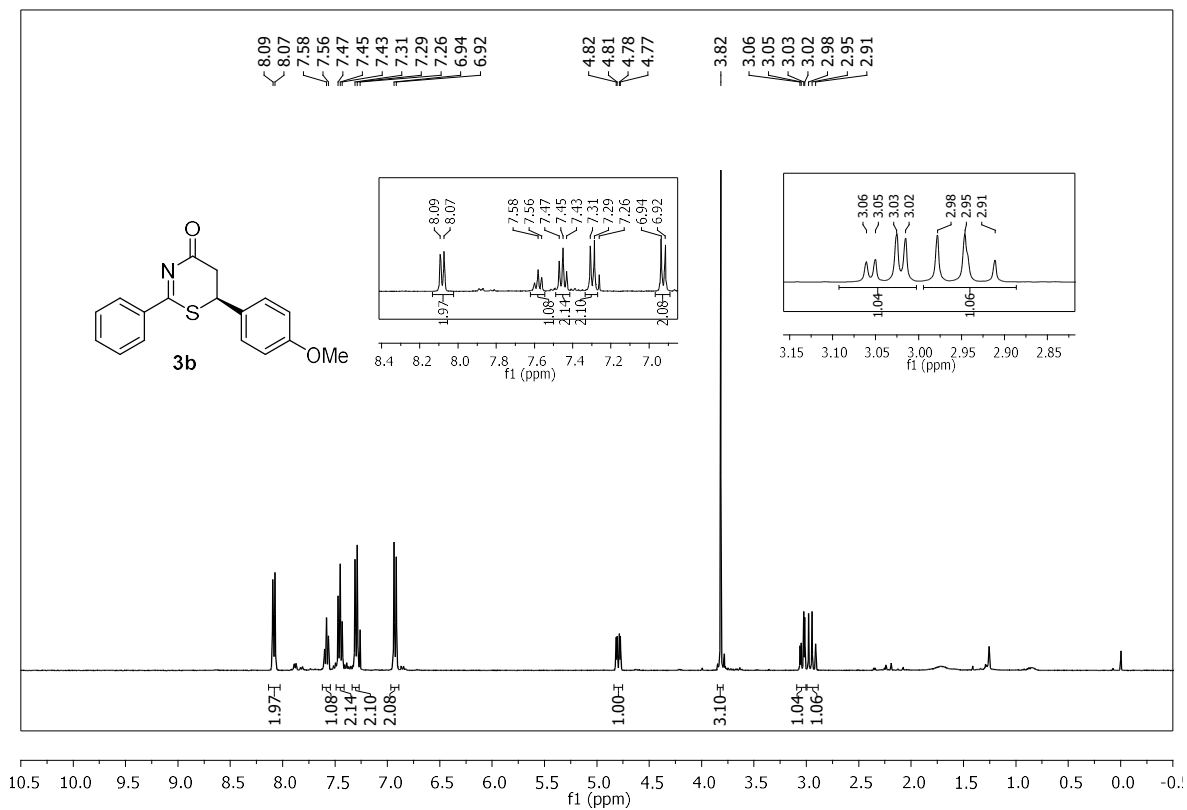
R_f (Pet. ether /EtOAc = 80/20): 0.41; er = 86:14, $[\alpha]_{\text{D}}^{25} = -42.6$ (c 0.1, CHCl₃). **HPLC** (Chiralpak IC, 70:30 Hexane / *i*-PrOH, 0.7 mL/min, 254 nm) *Minor*: 57.5 min, *Major*: 53.4 min. **¹H NMR (400 MHz, CDCl₃)** δ 7.86-7.85 (m, 1H), 7.69-7.67 (m, 1H), 7.43-7.35 (m, 5H), 7.15-7.13 (m, 1H), 4.84 (dd, *J*₁ = 12.5 Hz, *J*₂ = 4.0 Hz, 1H), 3.08 (dd, *J*₁ = 14.5 Hz, *J*₂ = 4.0 Hz, 1H), 2.98 (dd, *J*₁ = 14.7 Hz, *J*₂ = 12.5 Hz, 1H). **¹³C NMR (100 MHz, CDCl₃)** δ 178.77, 172.33, 141.51, 136.96, 131.81, 129.47, 129.15, 128.59, 128.54, 127.61, 45.23, 37.67. **HRMS (ESI)** calculated [M+H] for C₁₄H₁₂NO S₂: 274.0360, found: 274.0359. **FTIR (cm⁻¹)** 2960, 2923, 2852, 1711, 1651, 1523, 1489, 1419, 1260, 1149, 728, 697.

7. ^1H and ^{13}C NMR Spectra of Functionalized Thiazinones

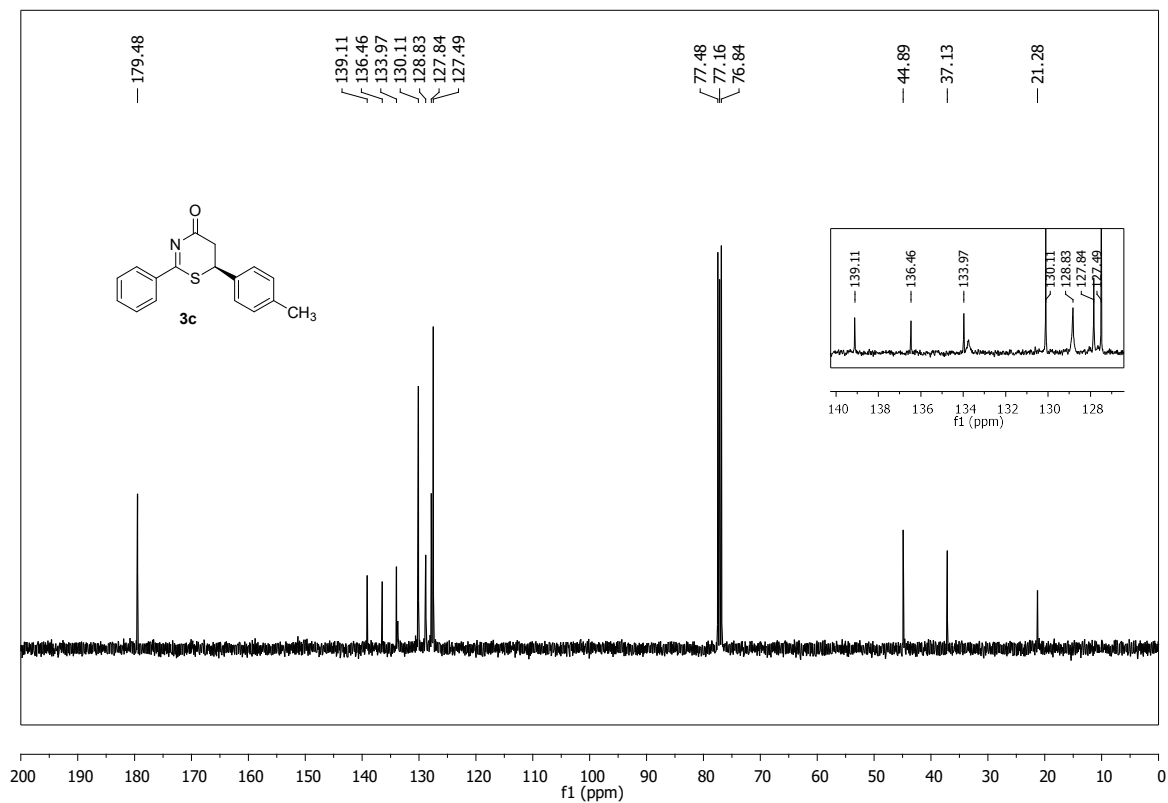
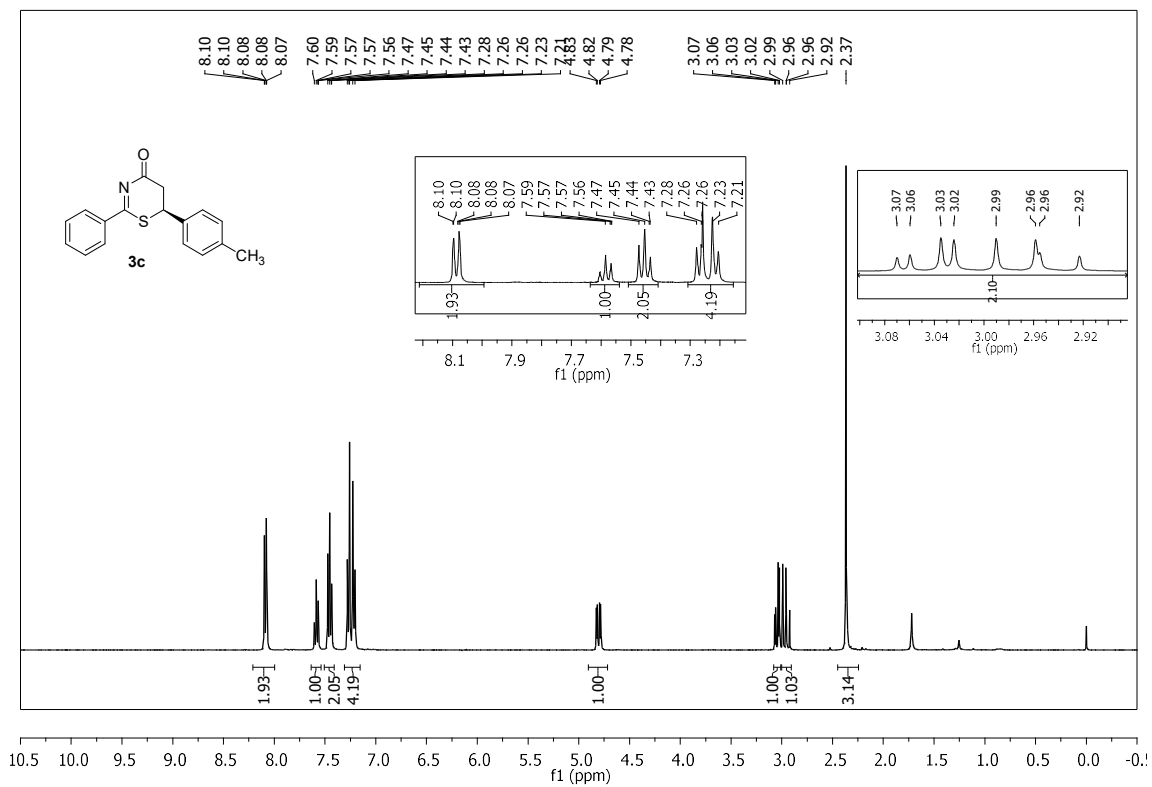
(*S*)-2,6-Diphenyl-5,6-dihydro-4*H*-1,3-thiazin-4-one (3a)



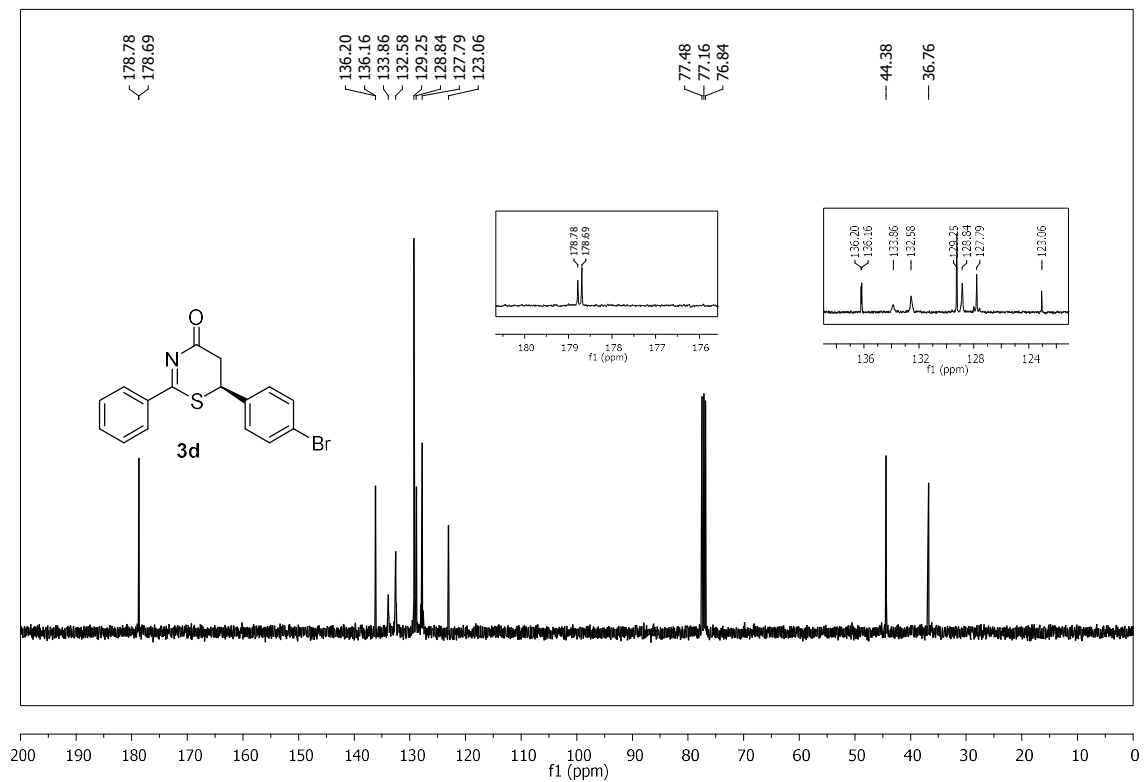
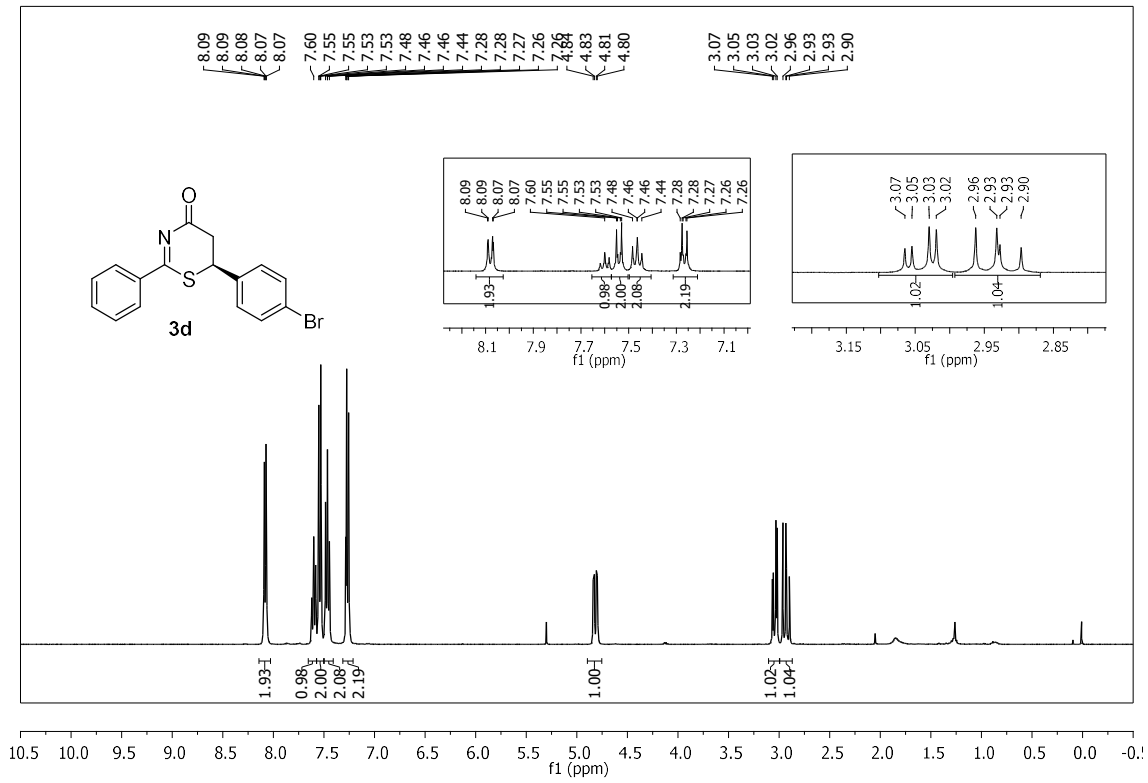
(S)-6-(4-Methoxyphenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3b)



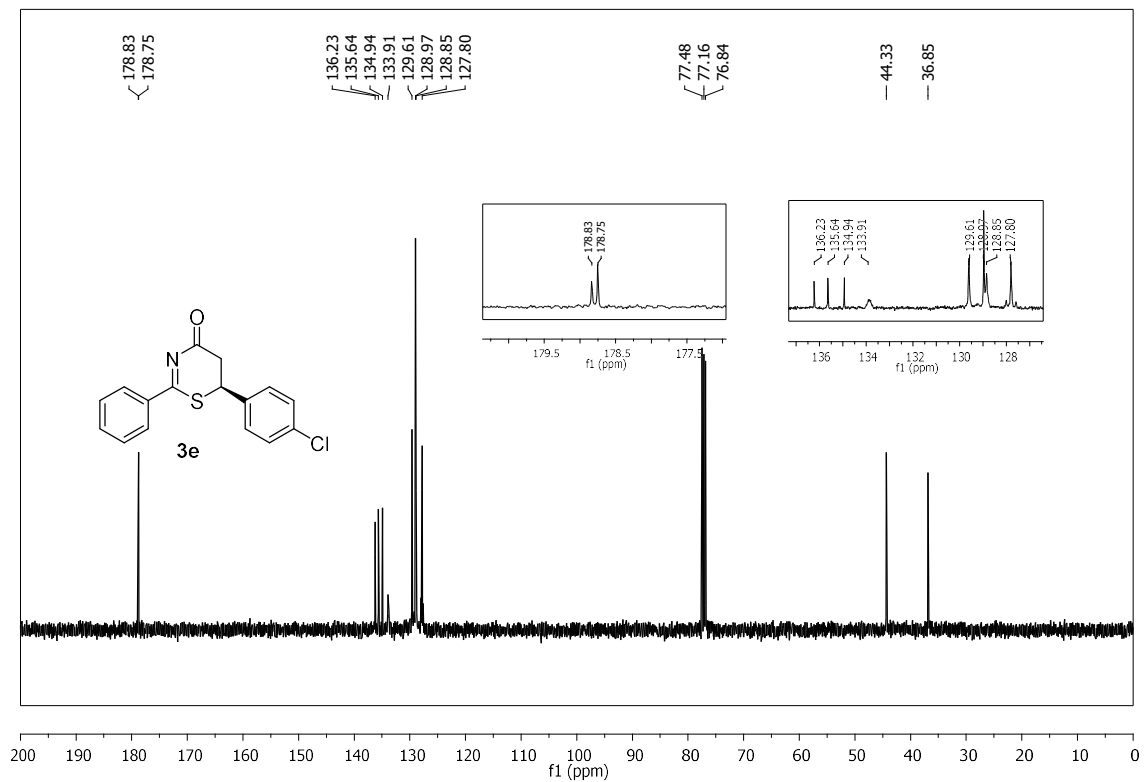
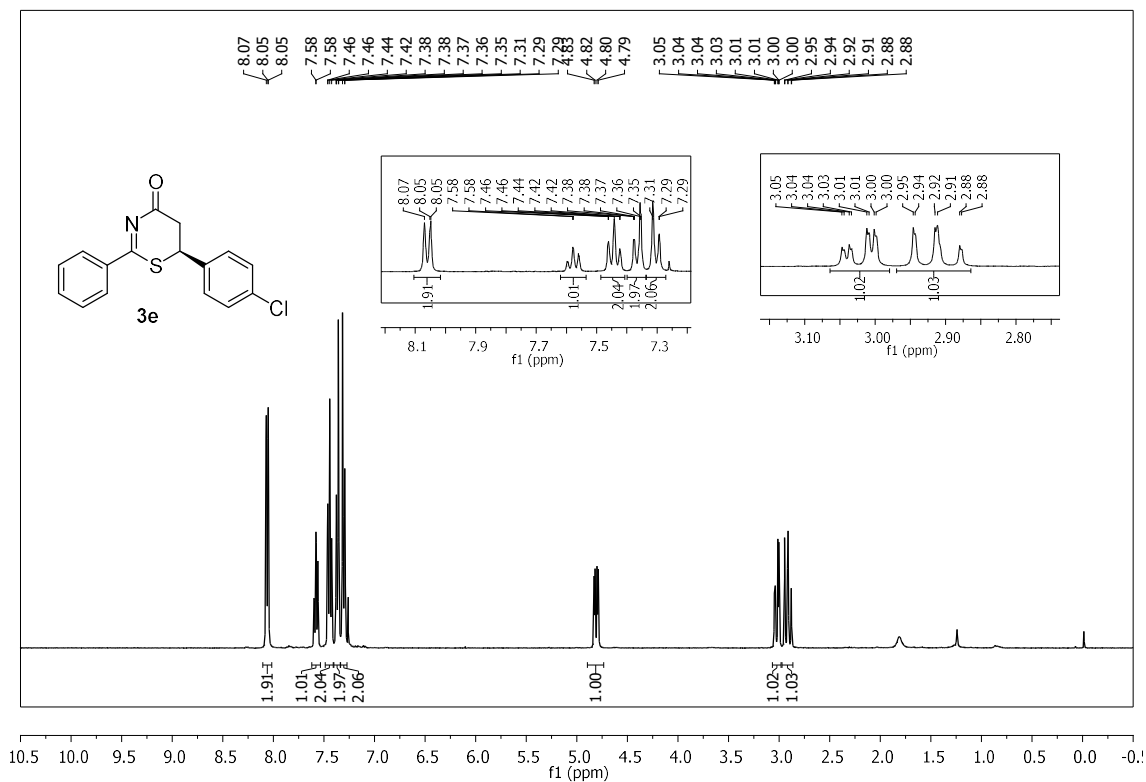
(S)-2-Phenyl-6-(p-tolyl)-5,6-dihydro-4H-1,3-thiazin-4-one (3c)



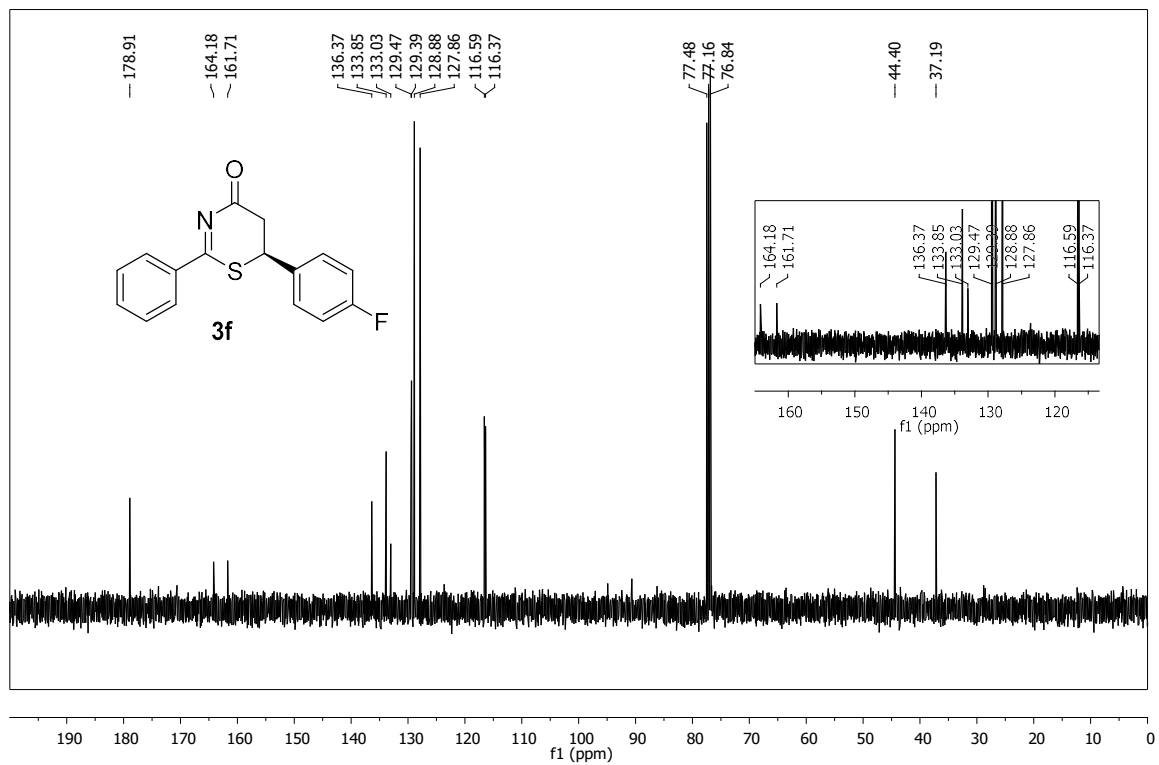
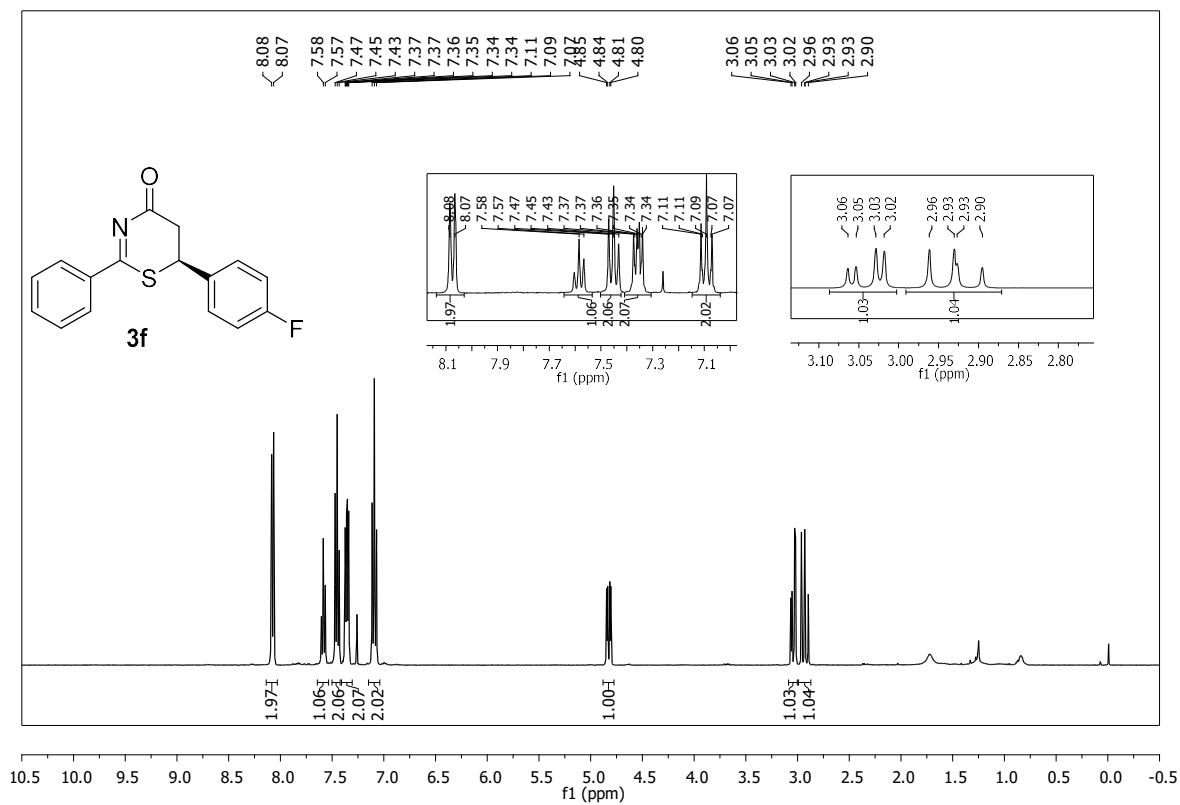
(S)-6-(4-Bromophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3d)



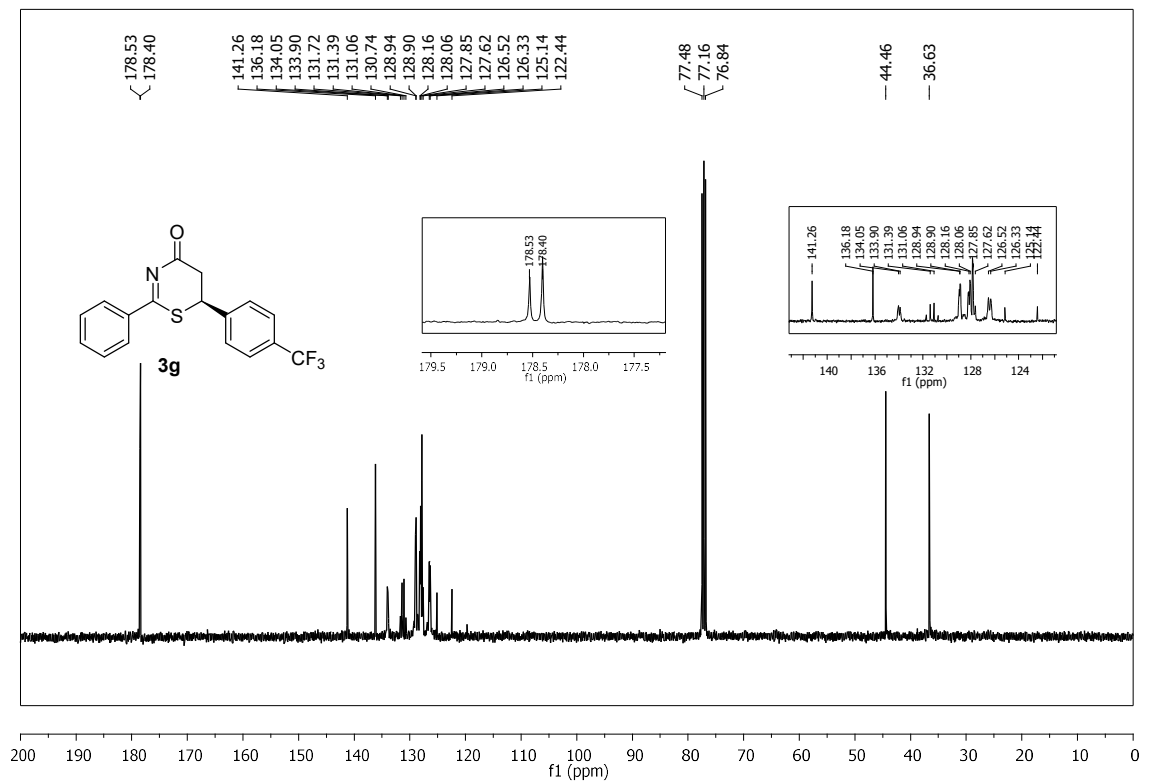
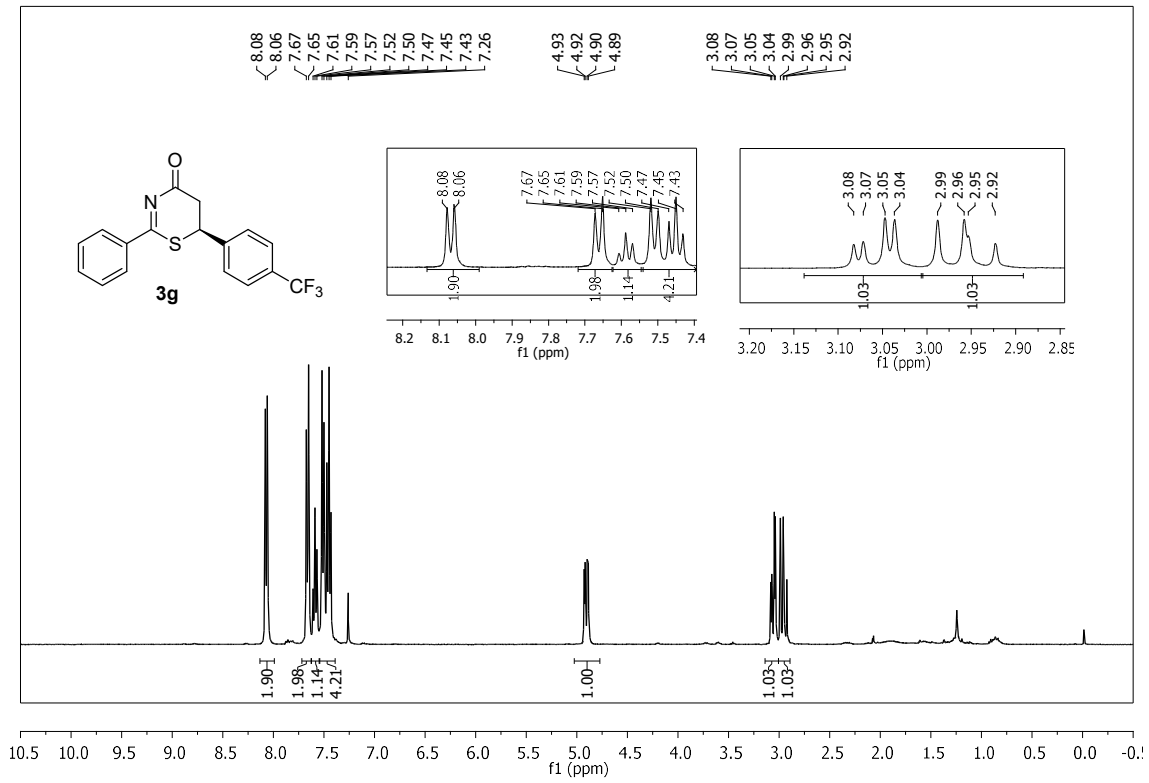
(S)-6-(4-Chlorophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3e)



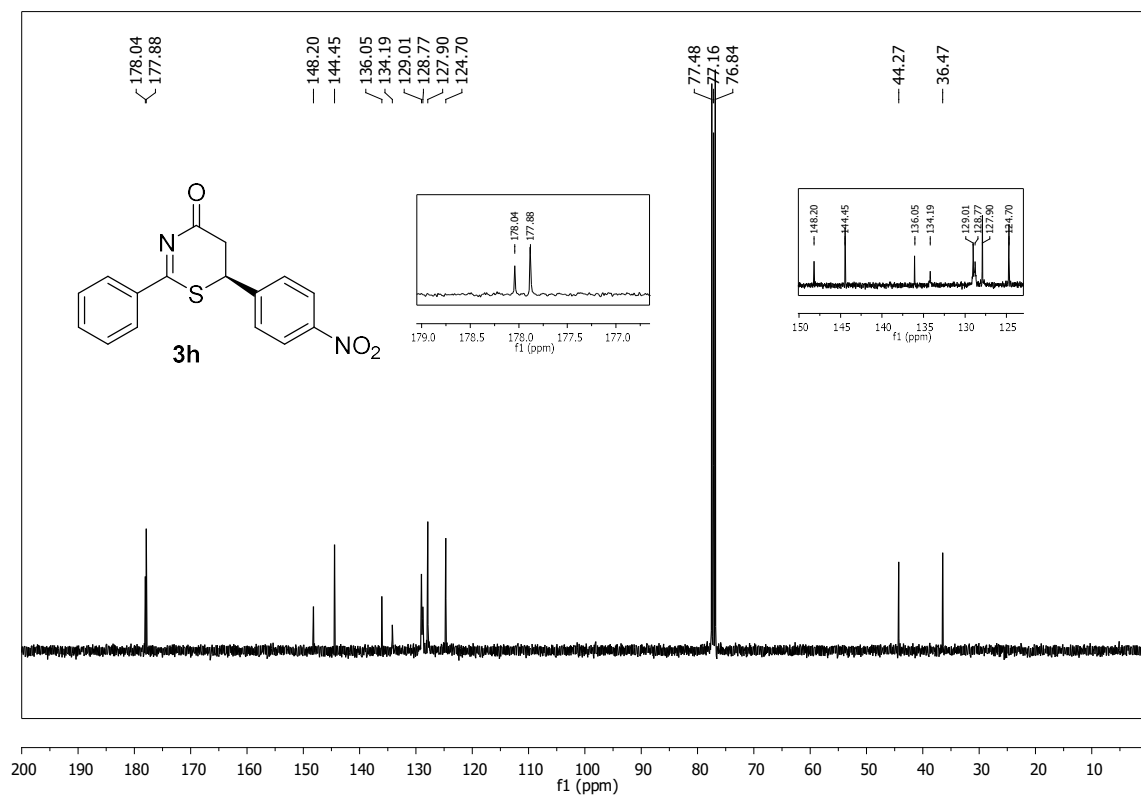
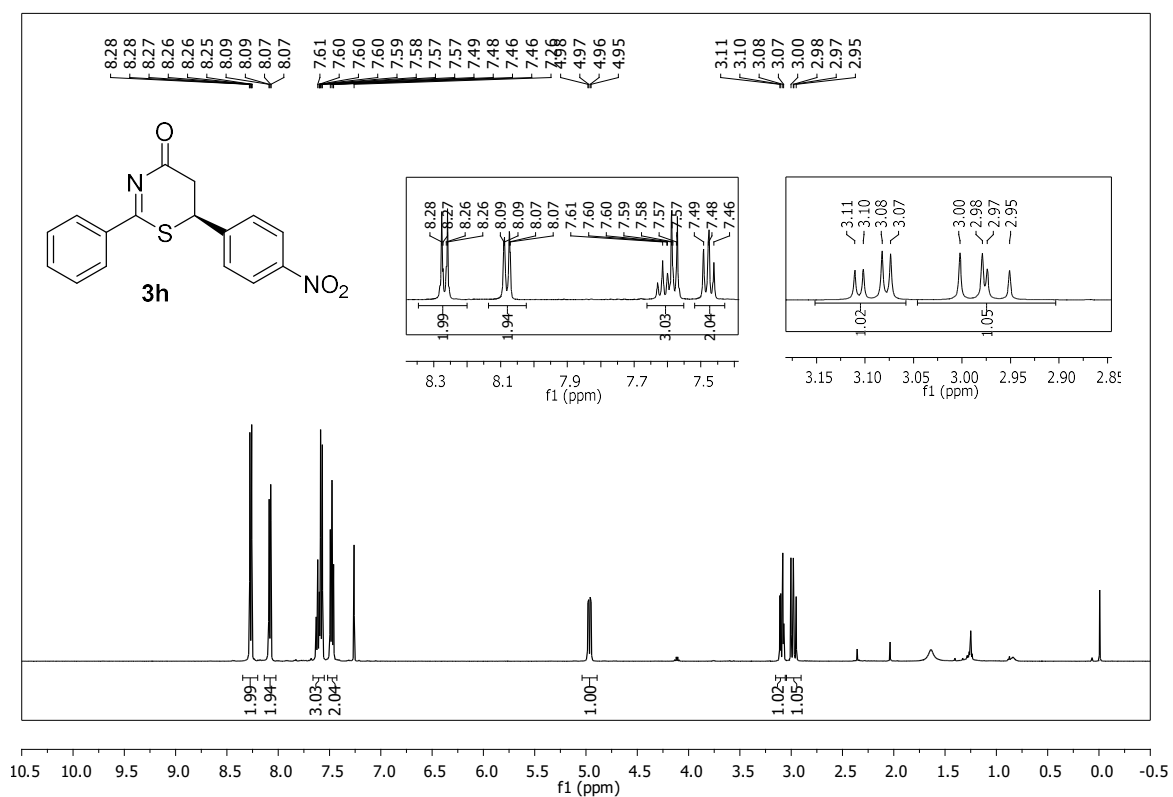
(S)-6-(4-Fluorophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3f)



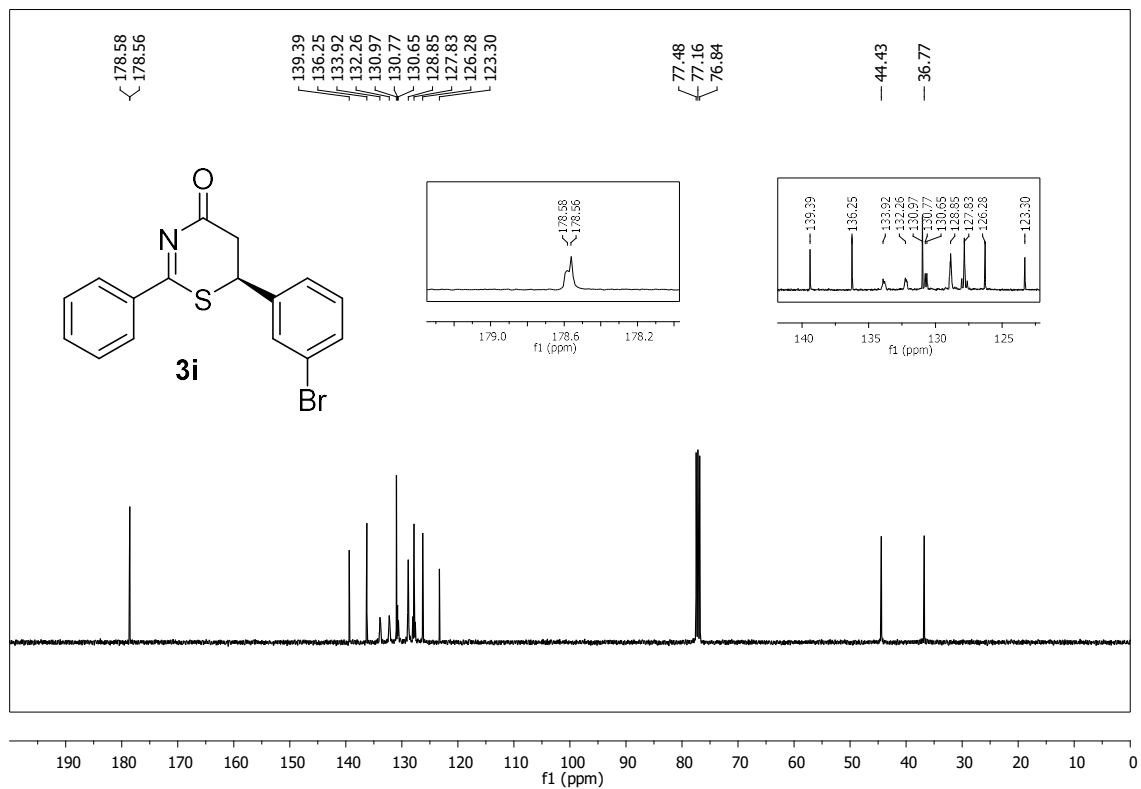
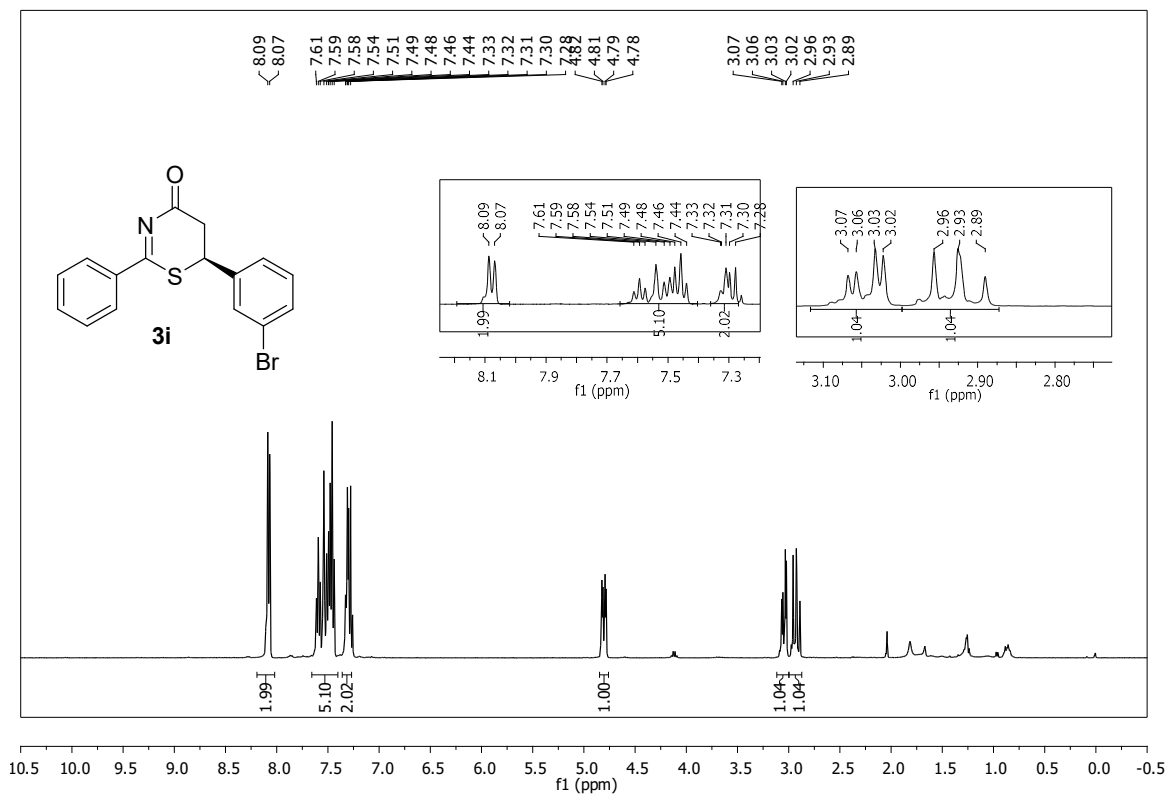
(S)-2-Phenyl-6-(4-(trifluoromethyl)phenyl)-5,6-dihydro-4H-1,3-thiazin-4-one (3g)



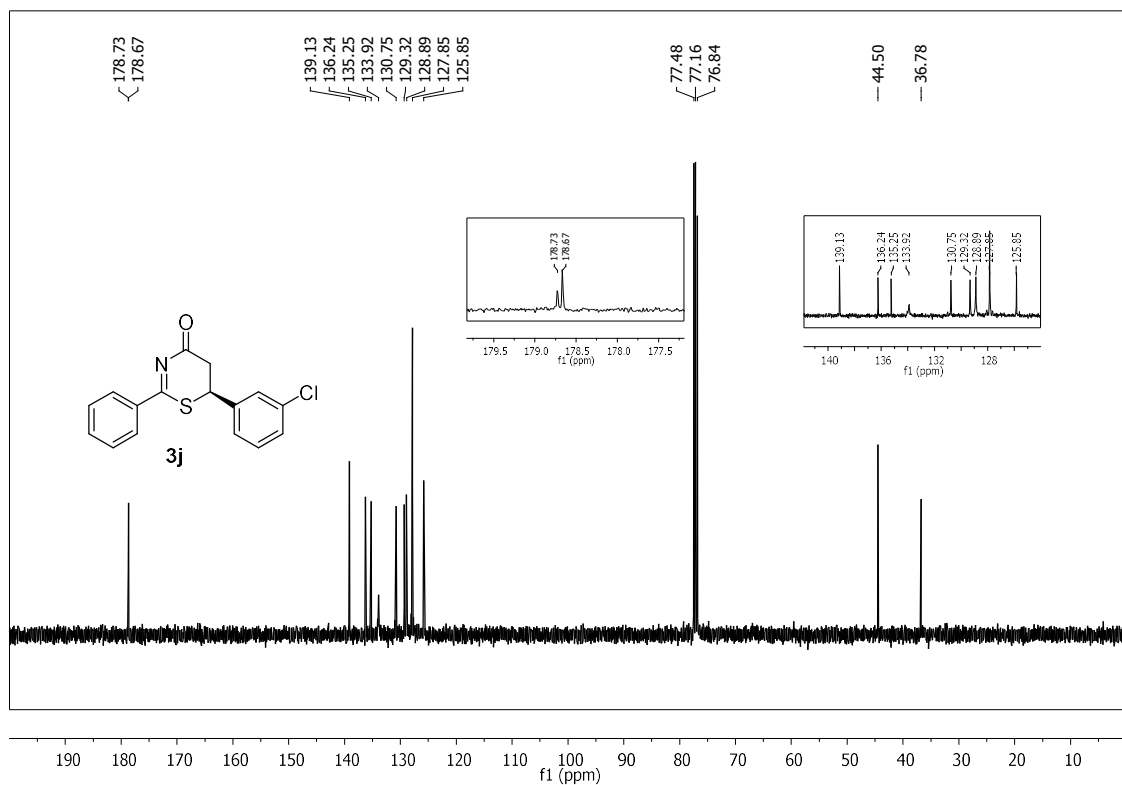
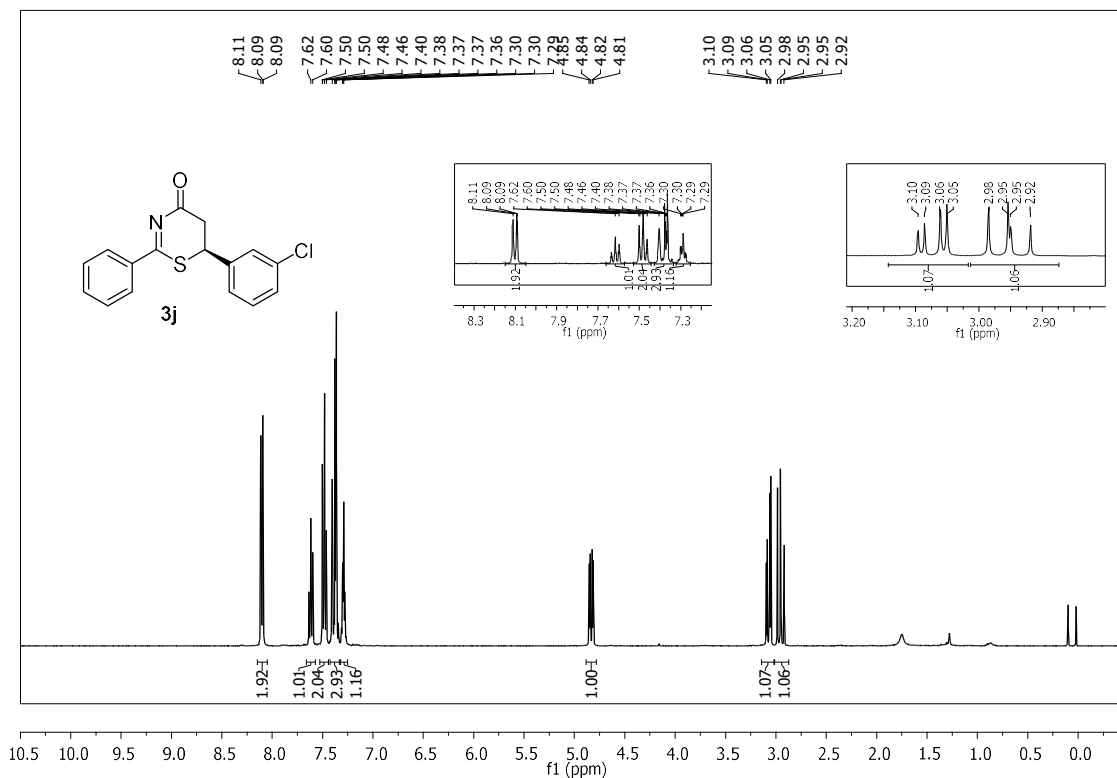
(S)-6-(4-Nitrophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3h)



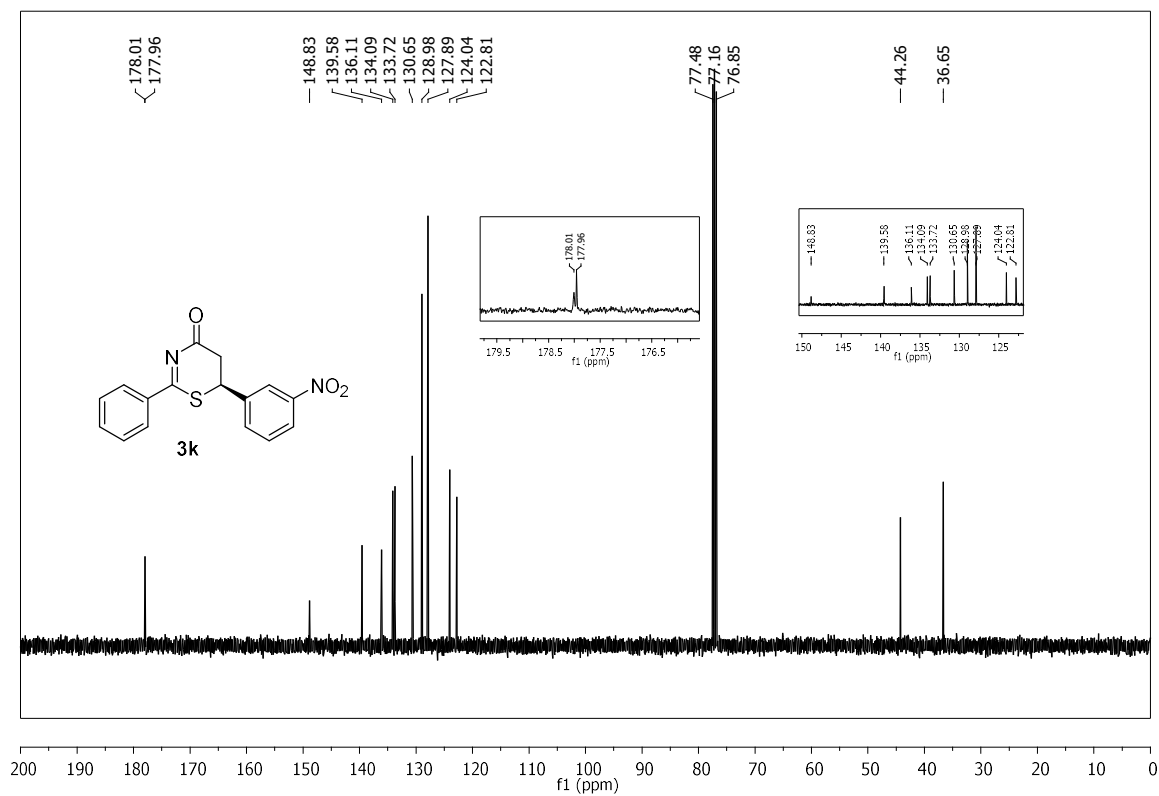
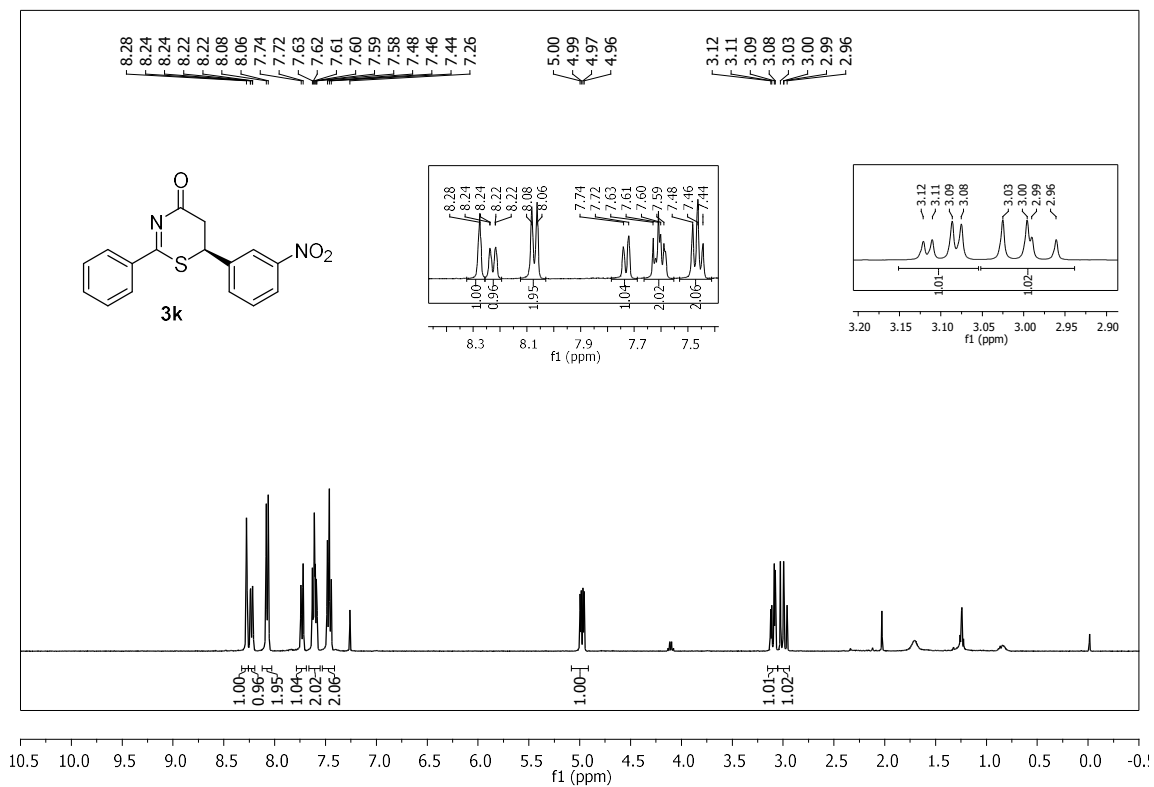
(S)-6-(3-Bromophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3i)



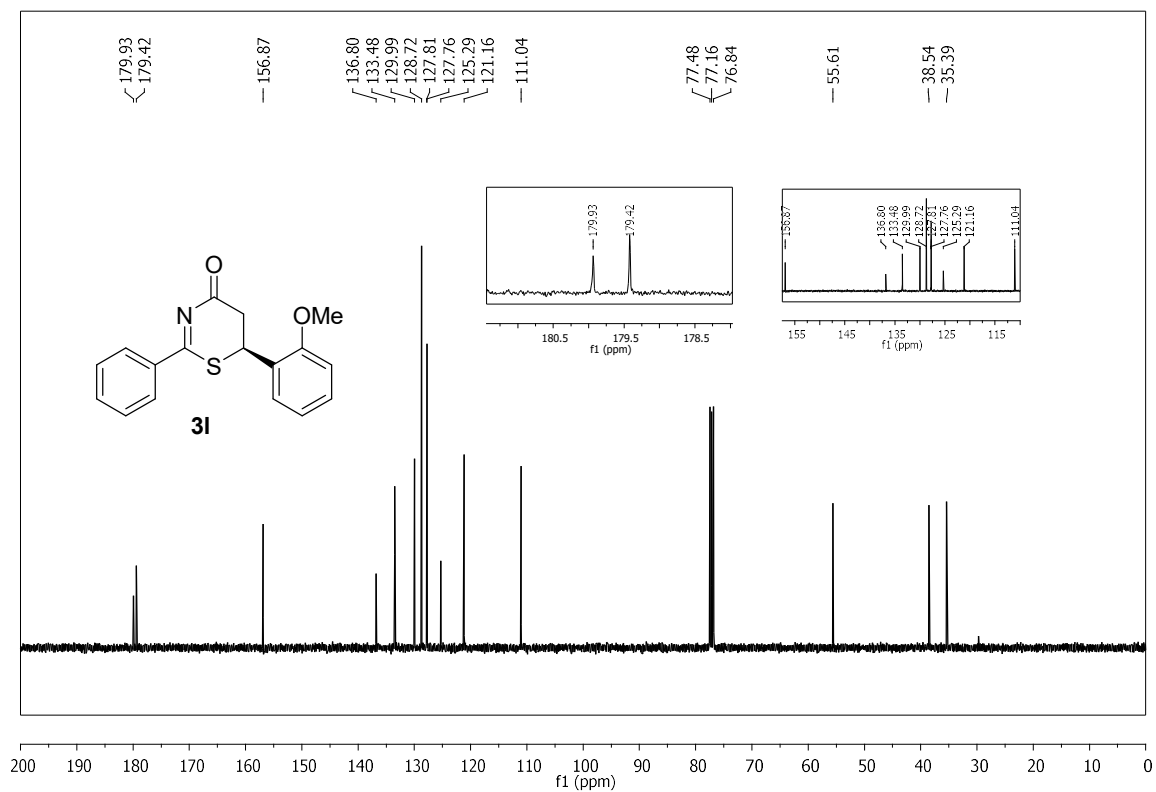
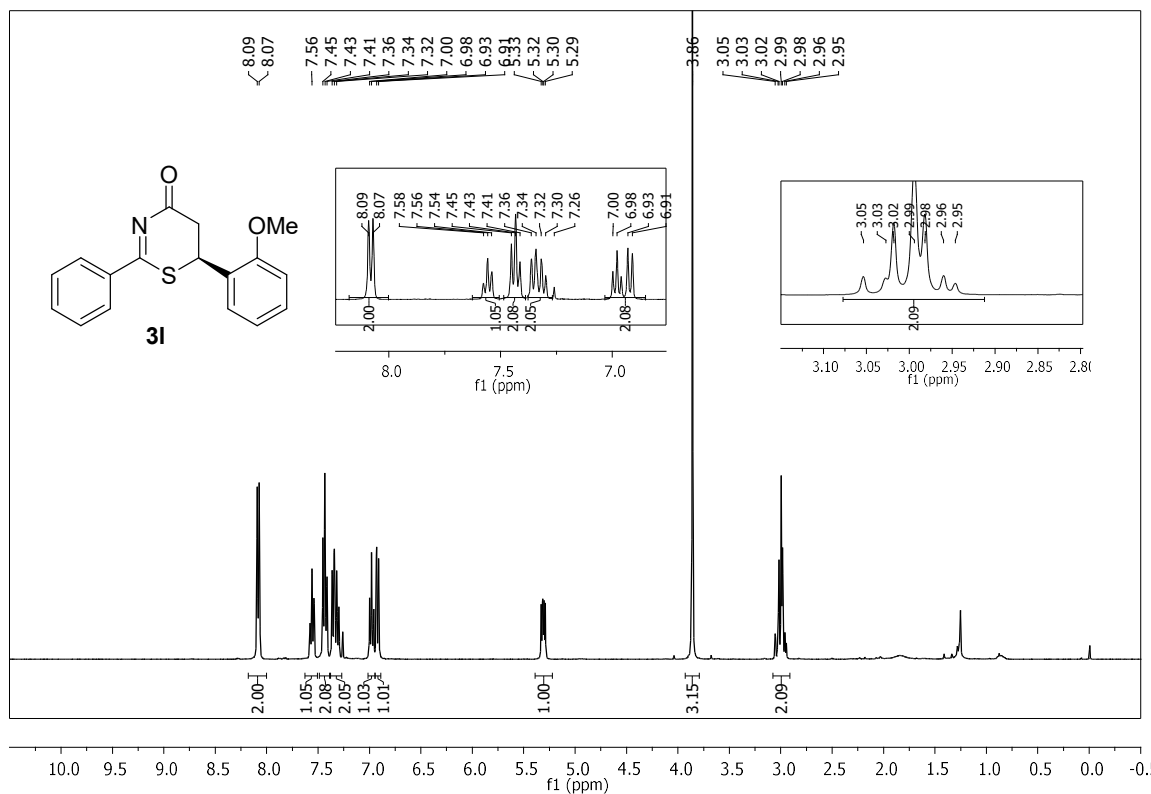
(S)-6-(3-Chlorophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3j)



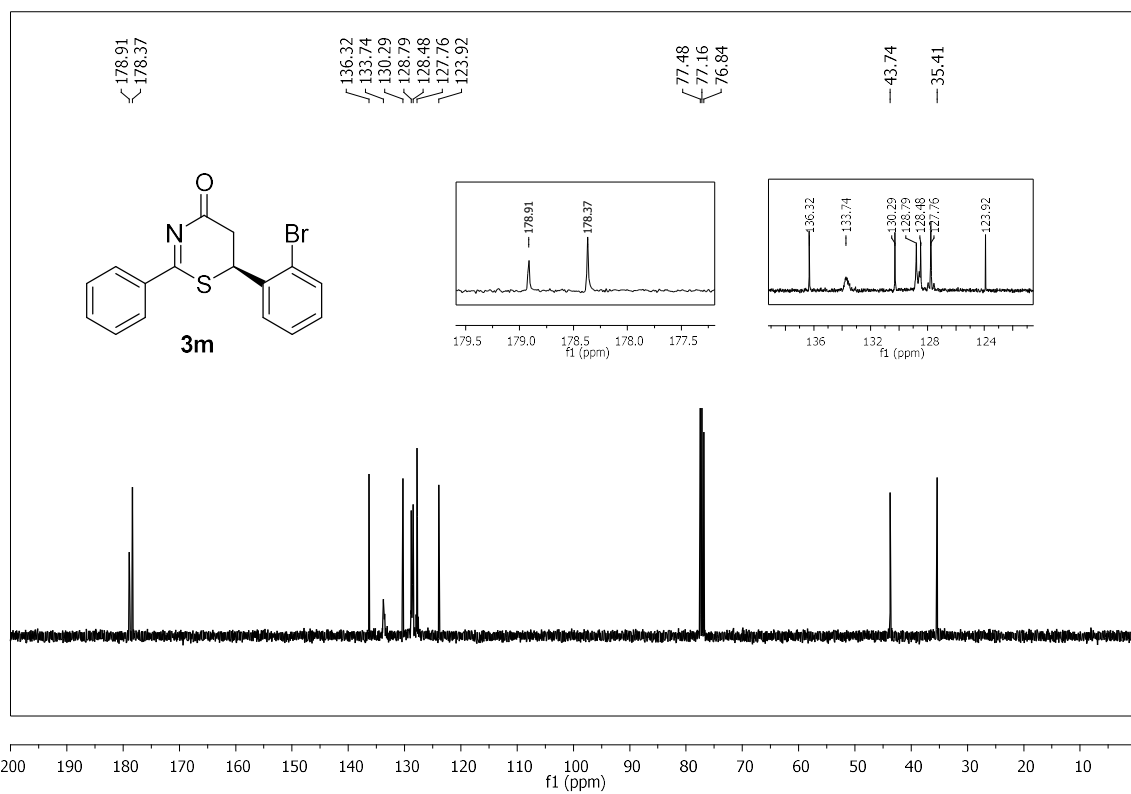
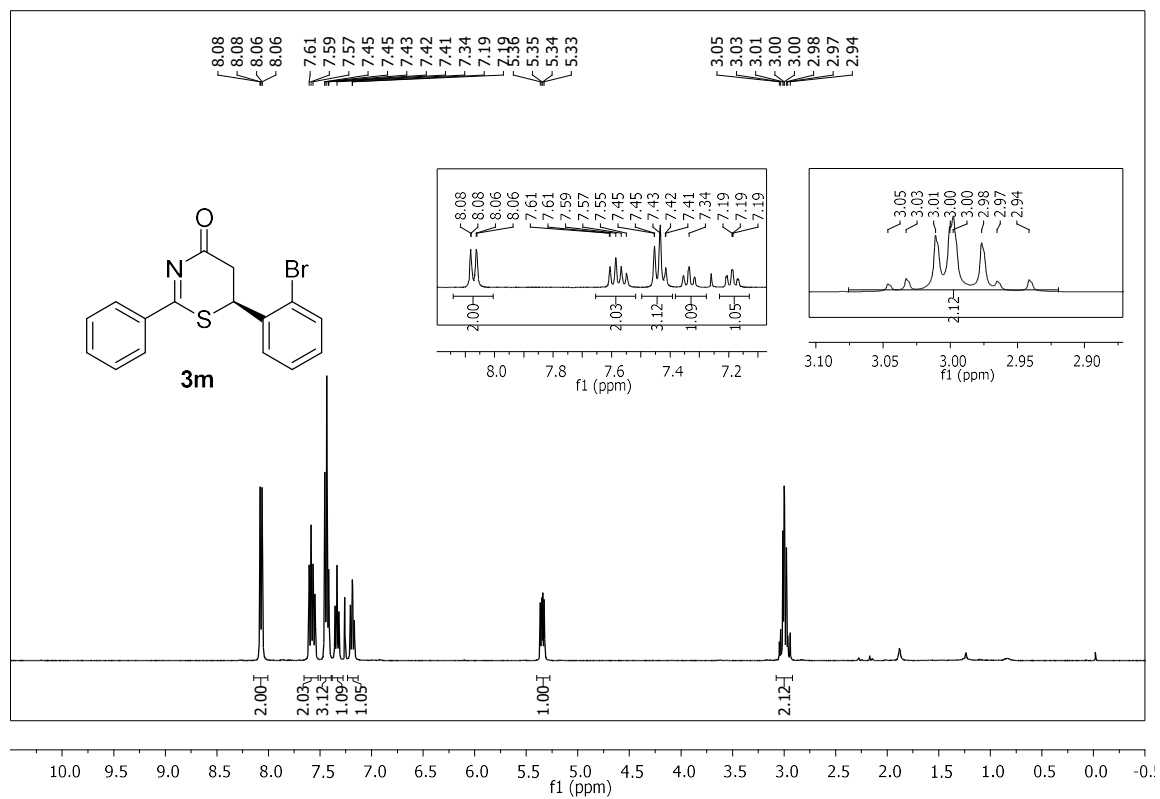
(S)-6-(3-Nitrophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3k)



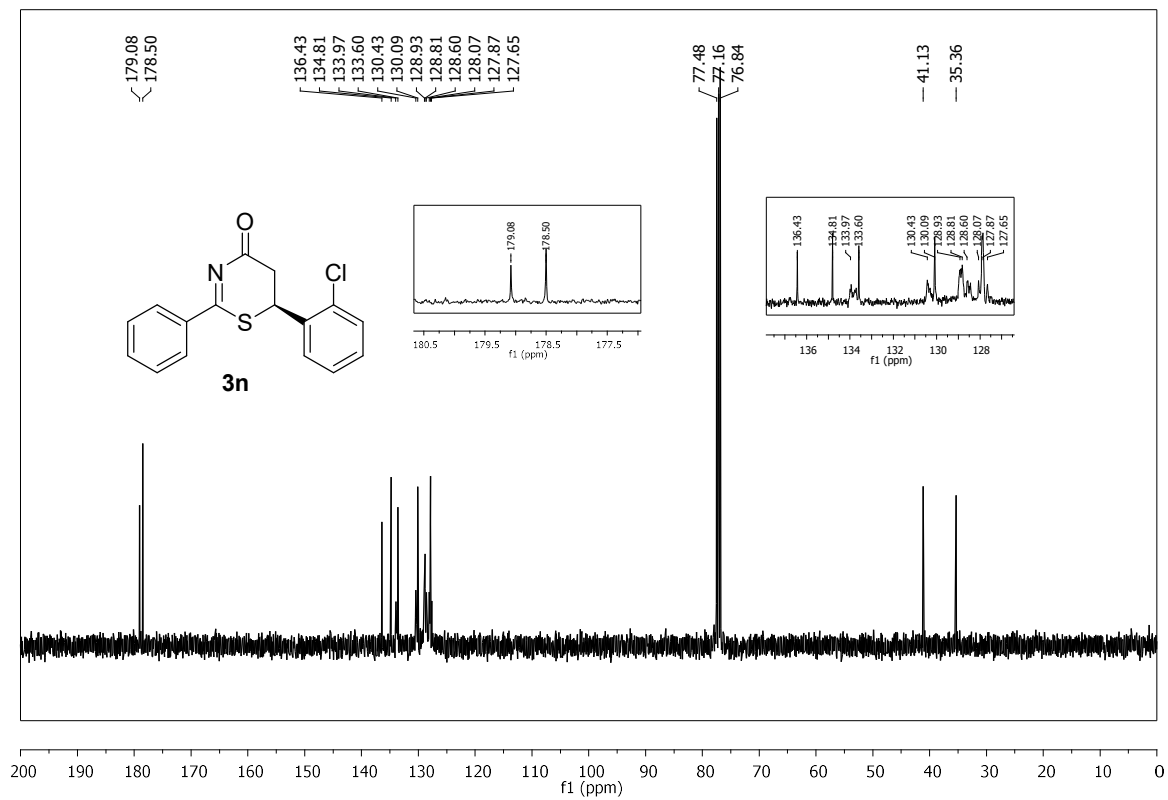
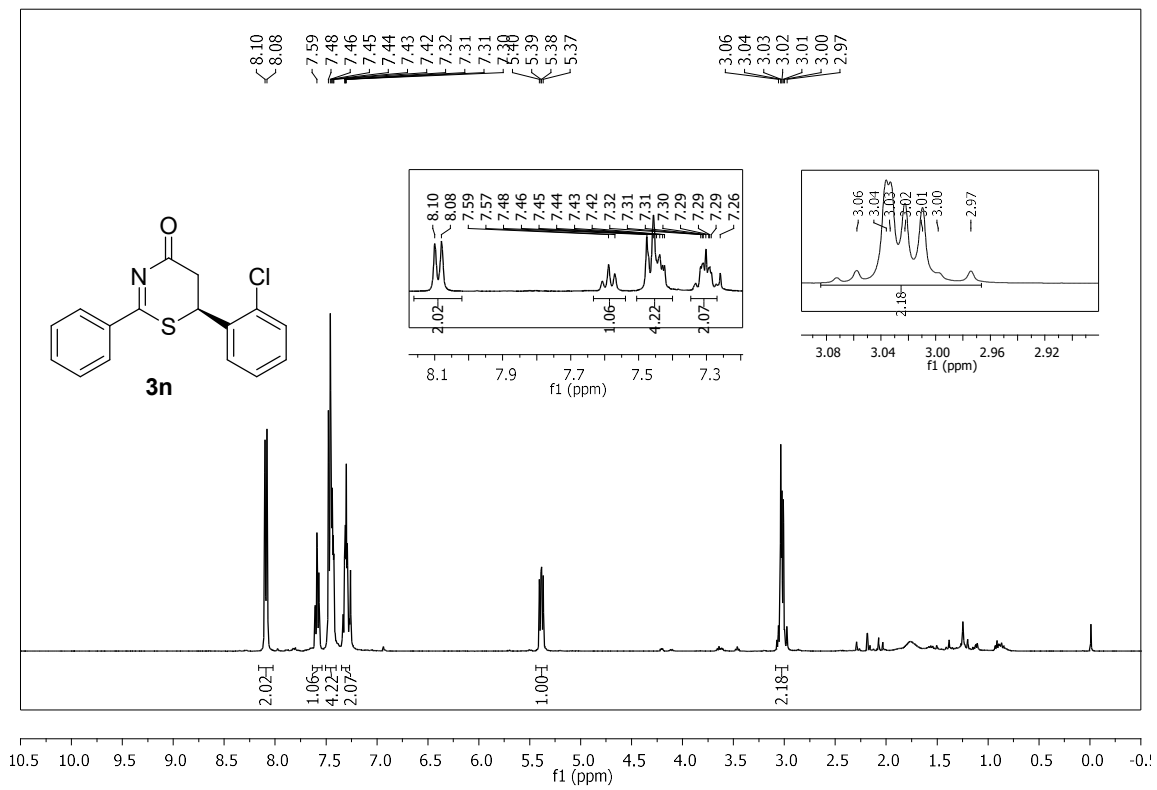
(S)-6-(2-Methoxyphenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3I)



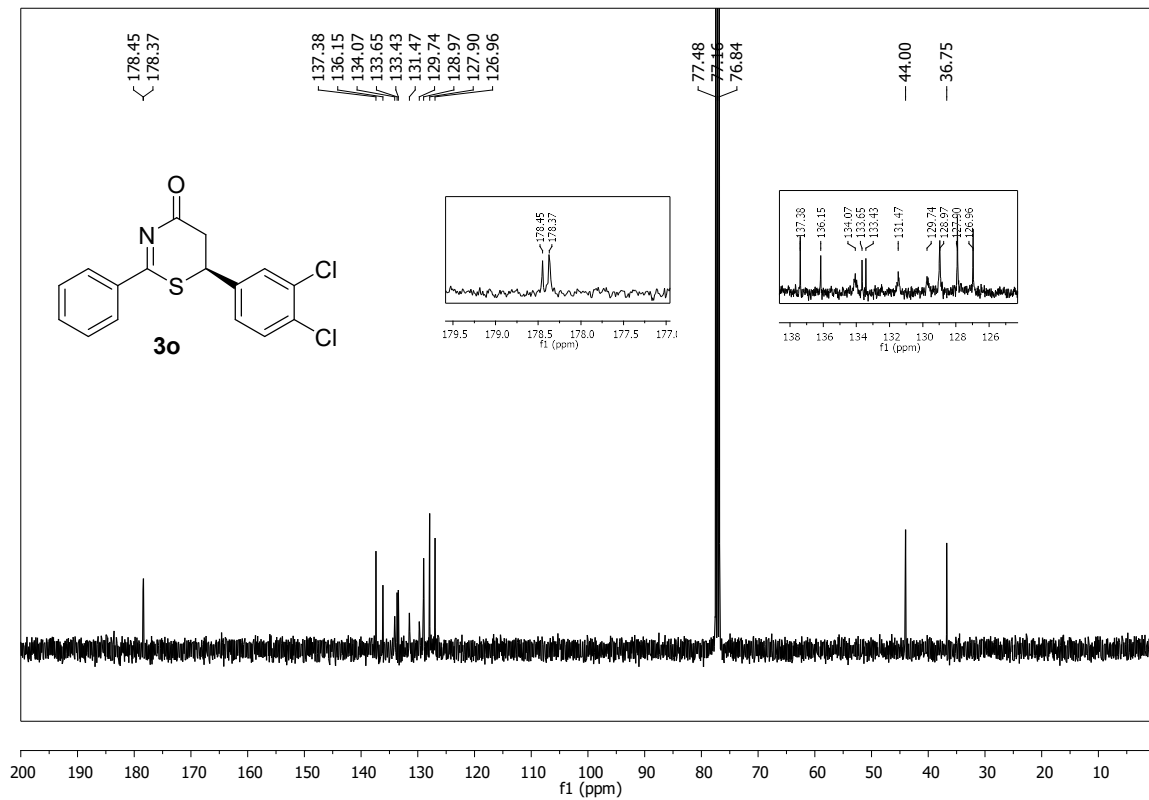
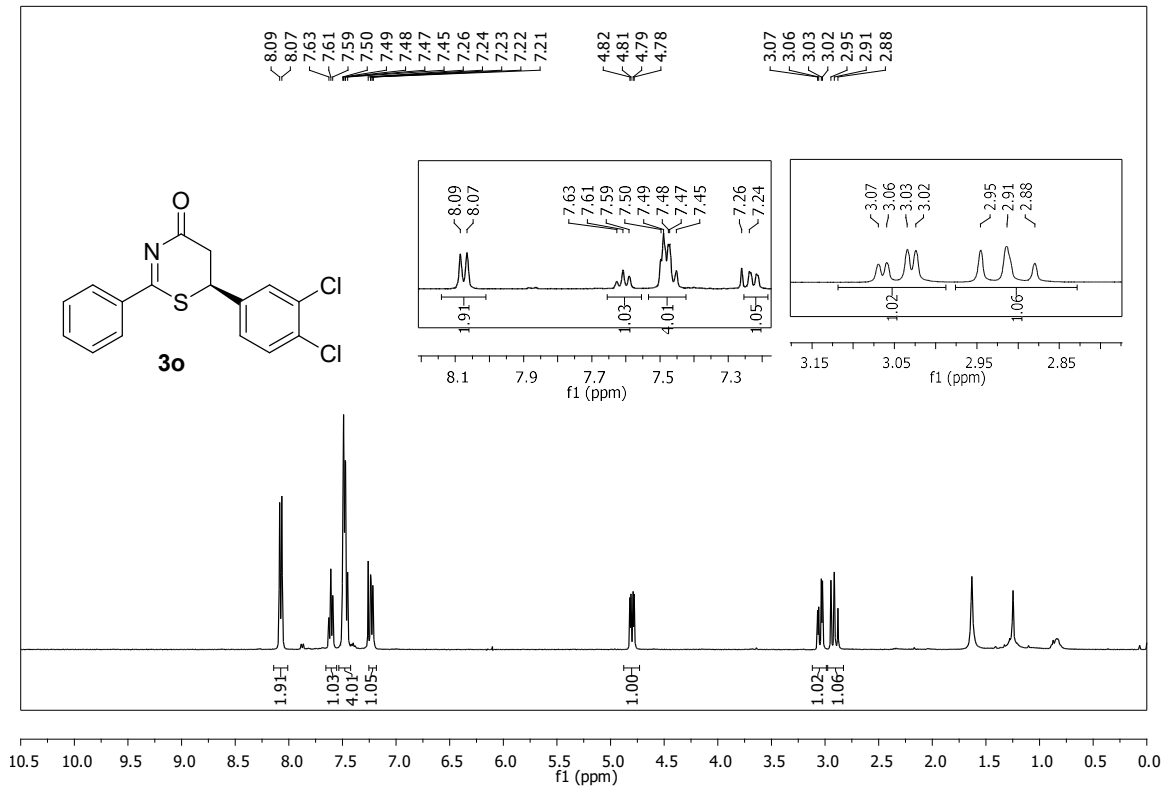
(S)-6-(2-Bromophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3m)



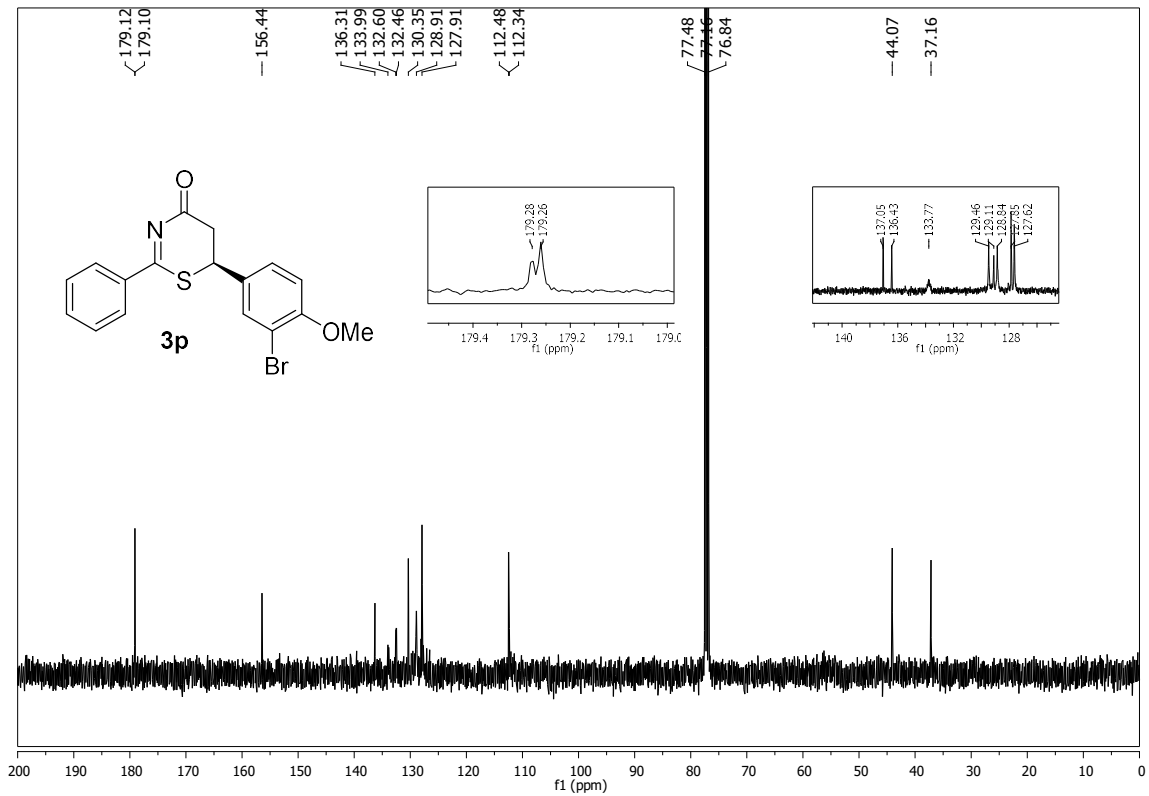
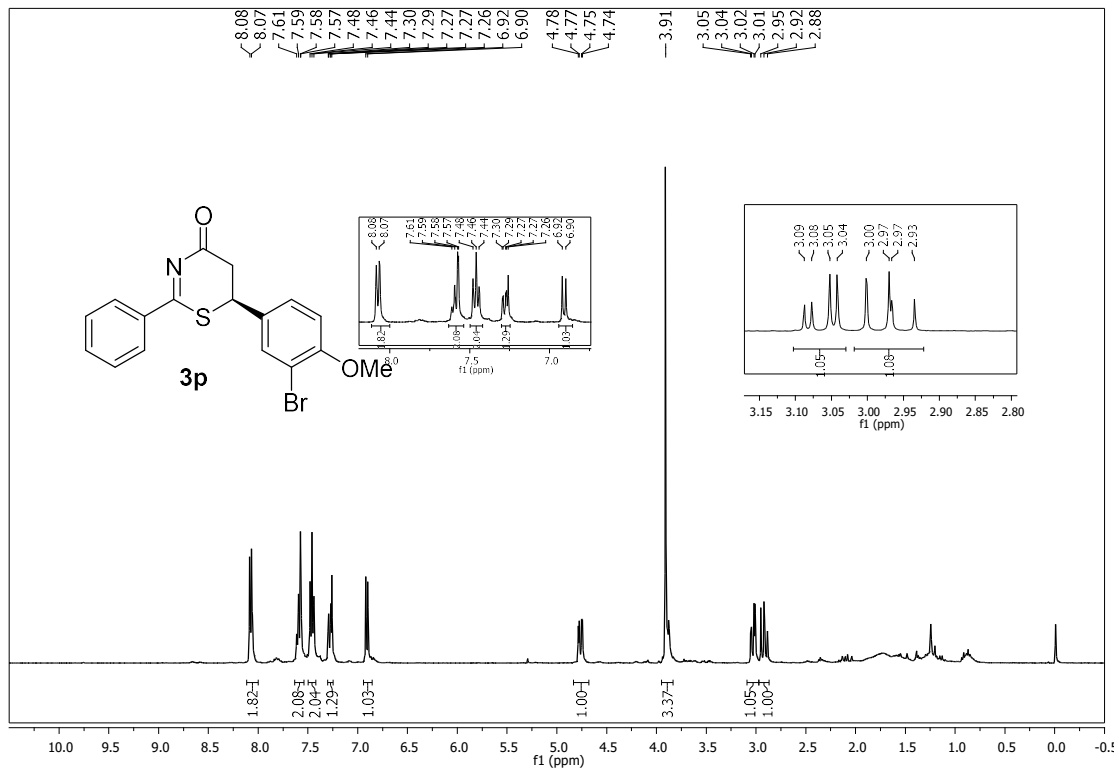
(S)-6-(2-Chlorophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3n)



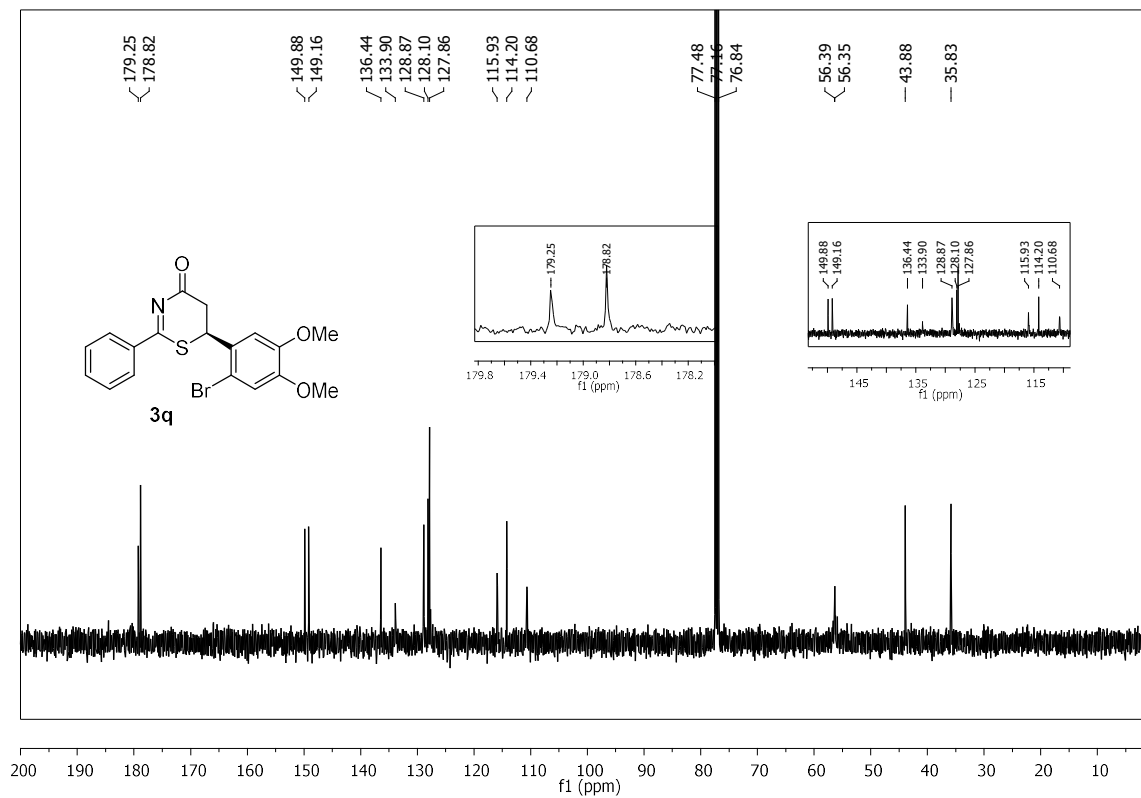
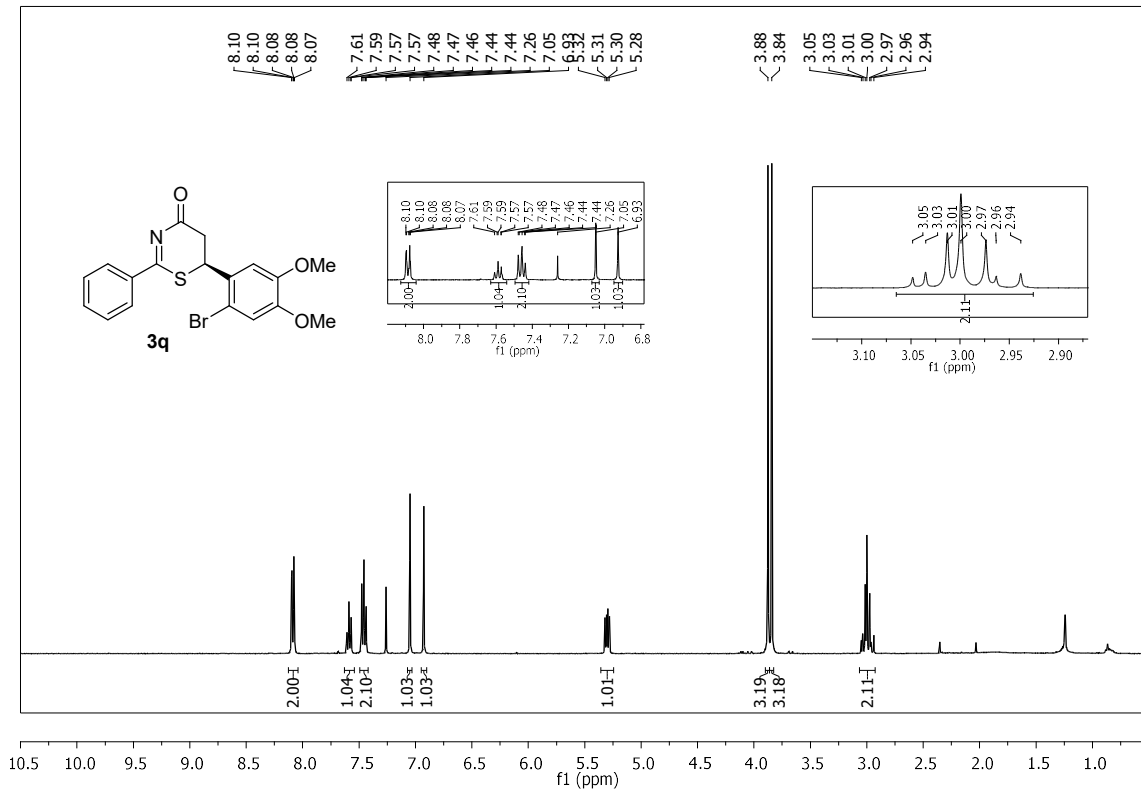
(S)-6-(3,4-Dichlorophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3o)



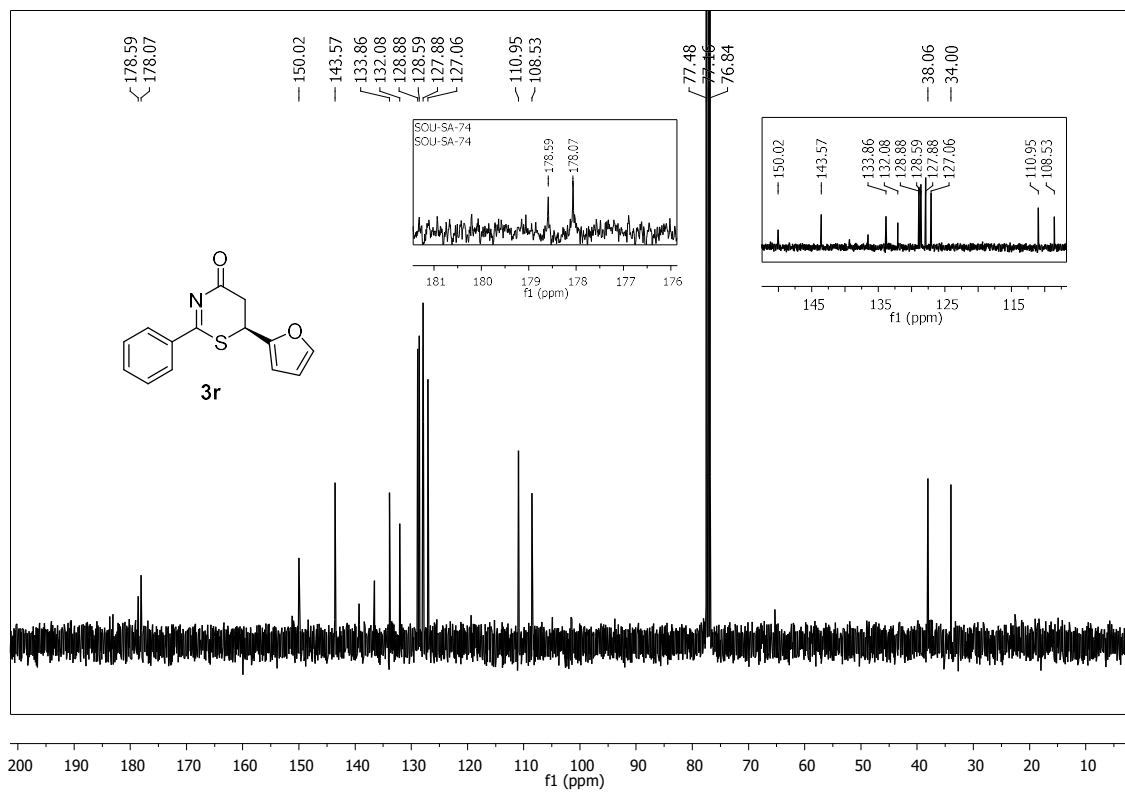
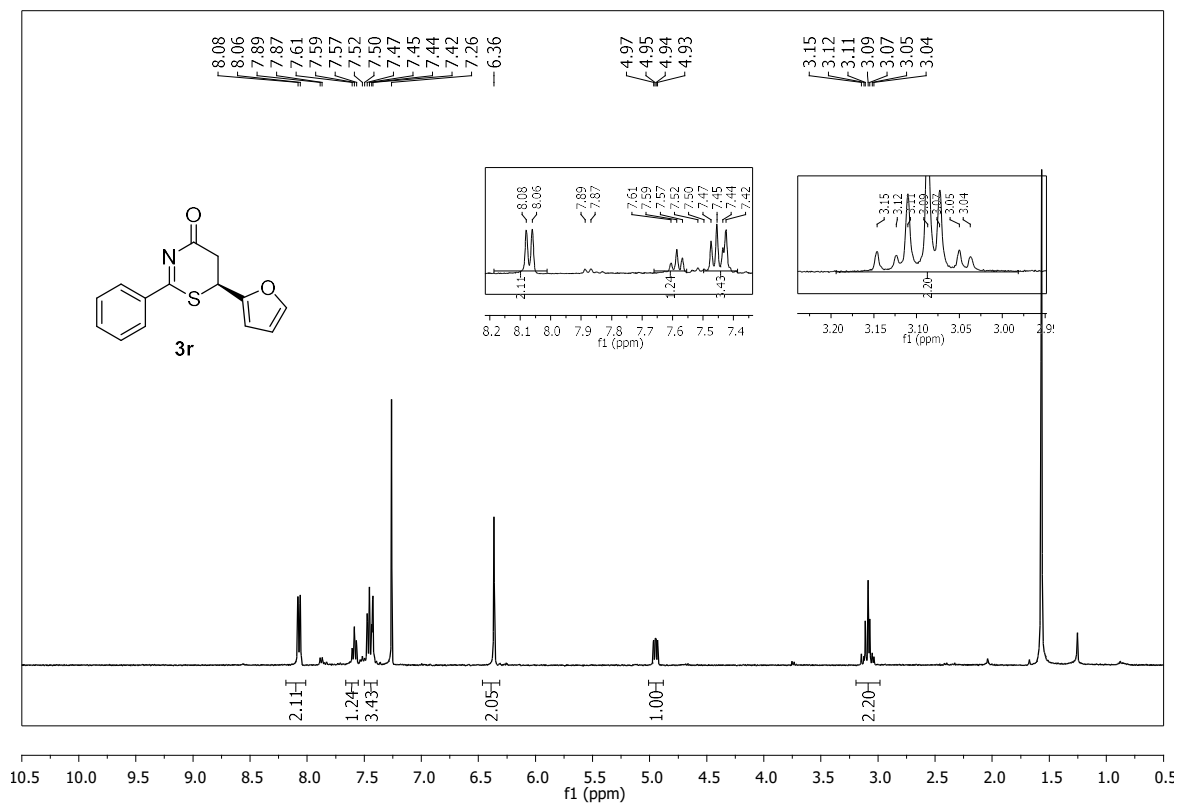
(S)-6-(3-Bromo-4-methoxyphenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3p)



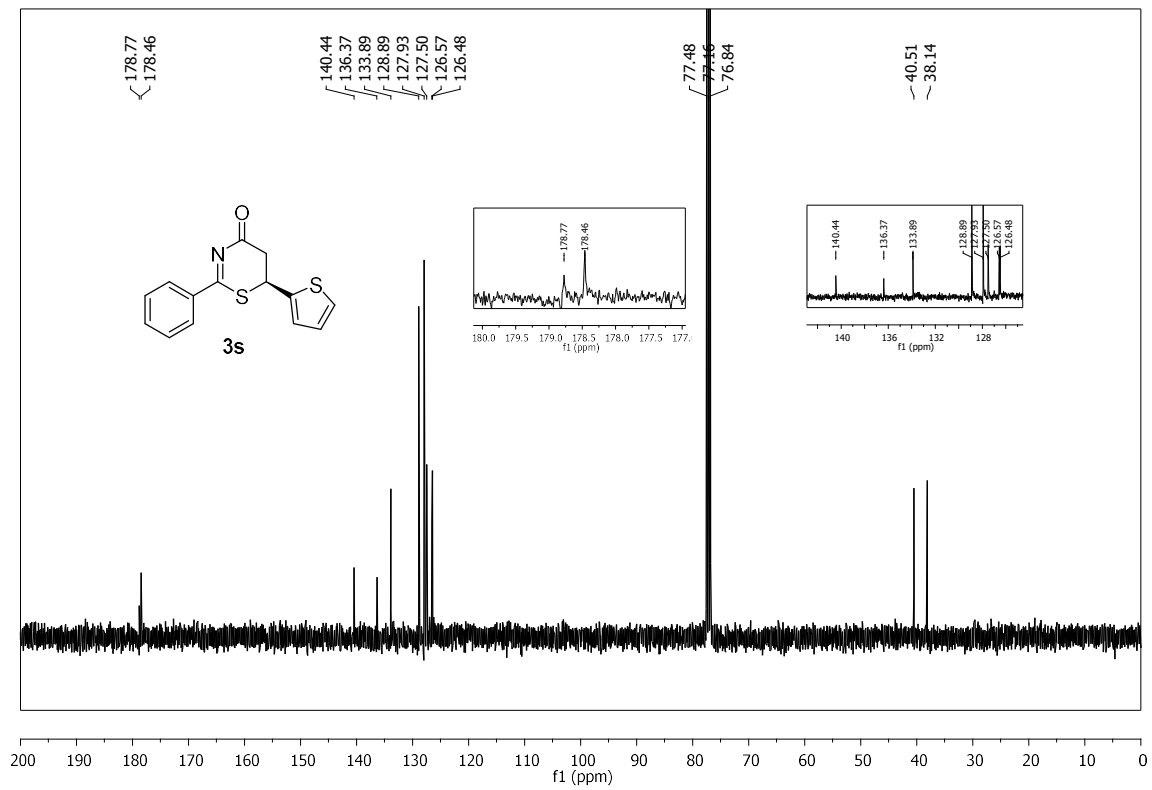
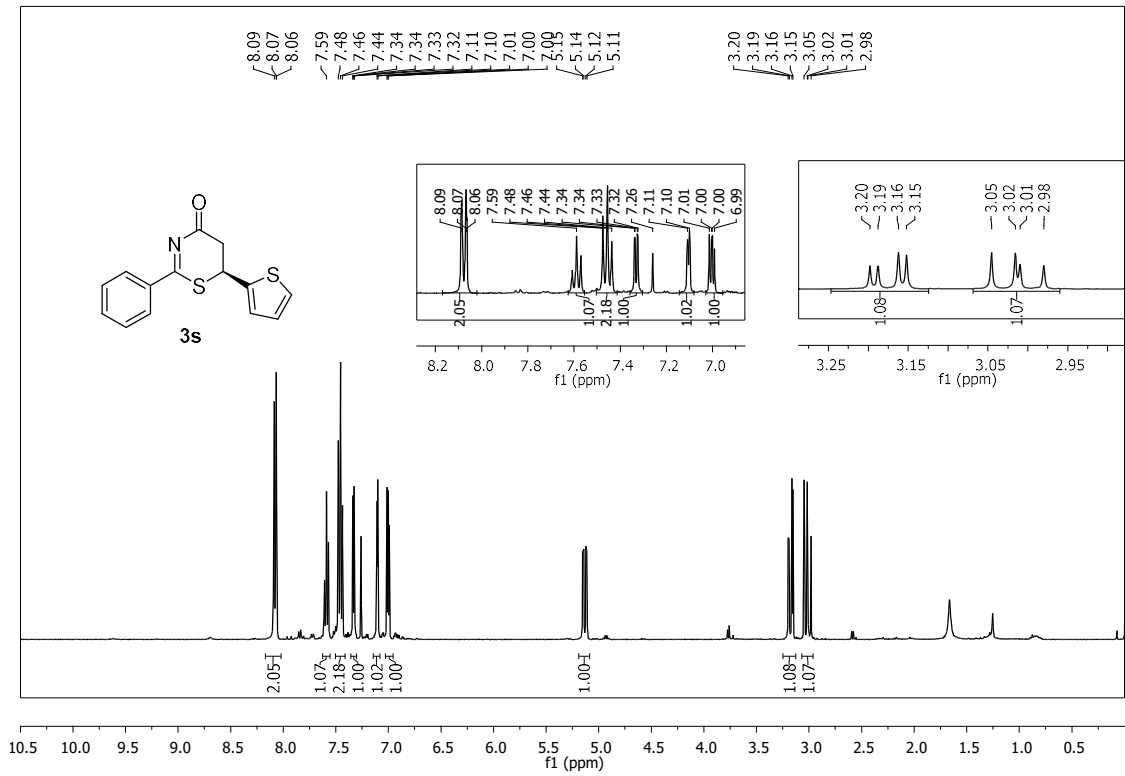
(S)-6-(2-Bromo-4,5-dimethoxyphenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3q)



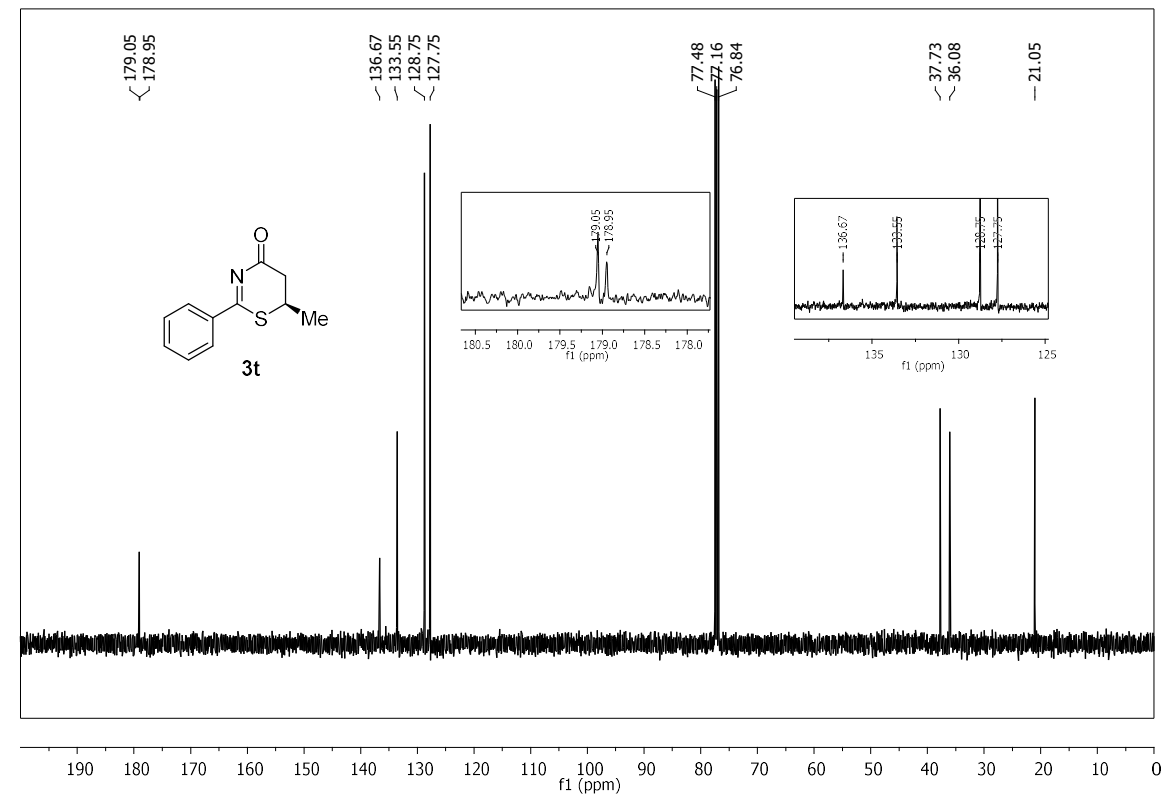
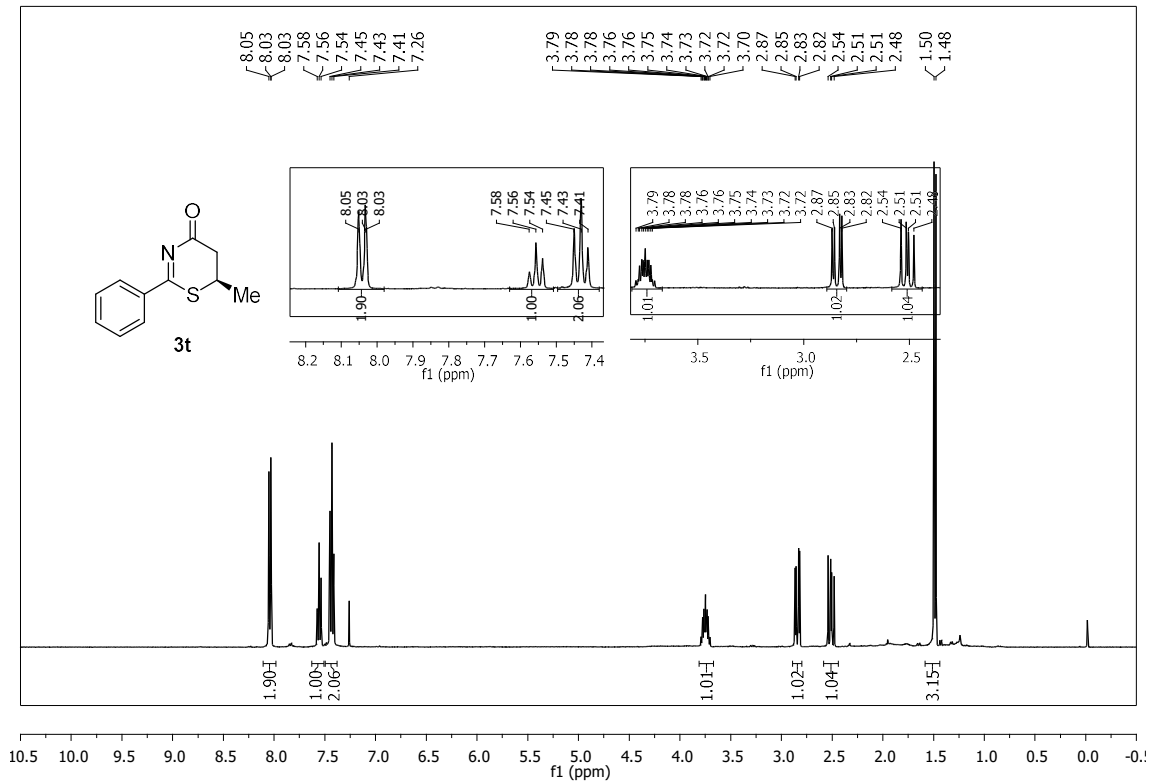
(S)-6-(Furan-2-yl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3r)



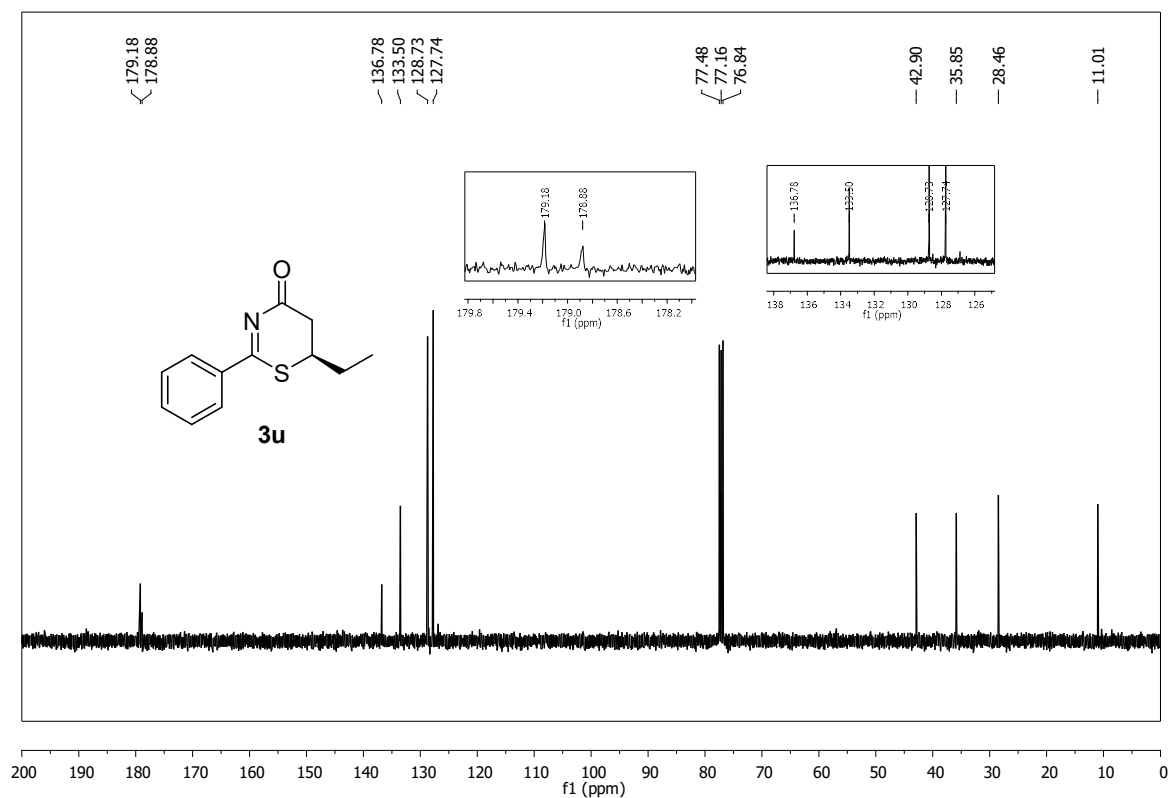
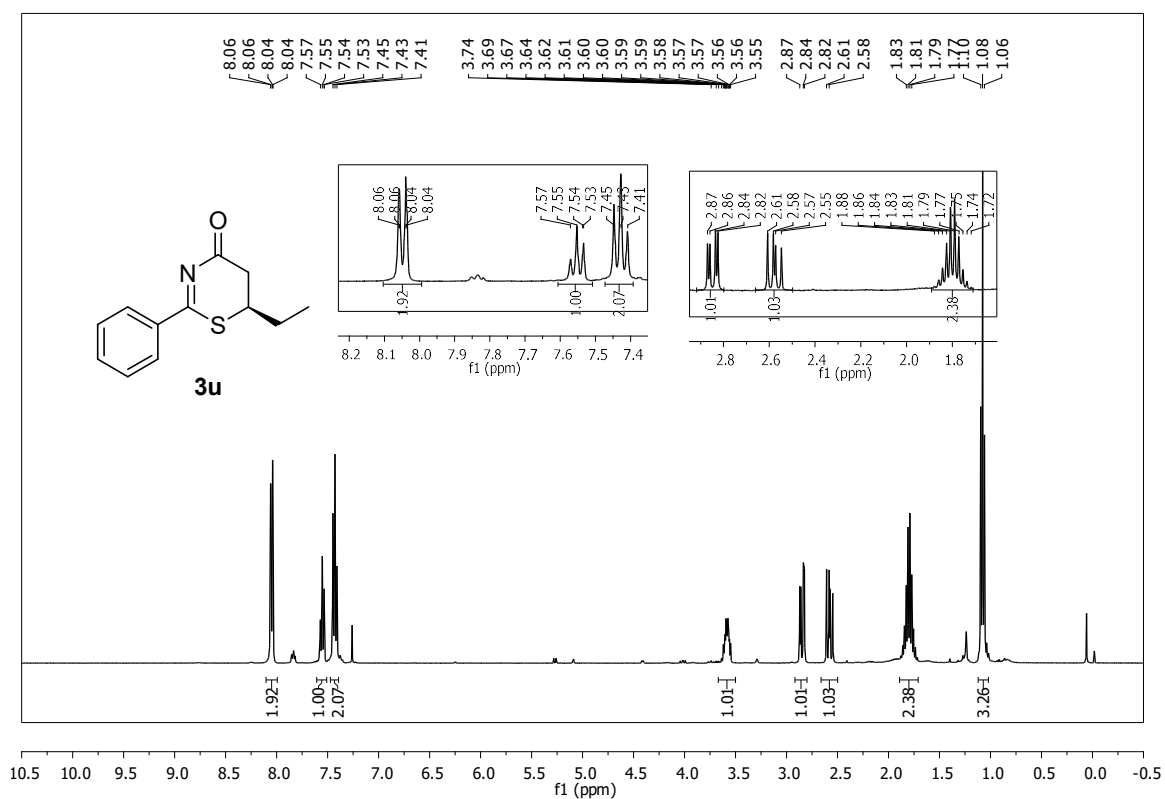
(S)-2-Phenyl-6-(thiophen-2-yl)-5,6-dihydro-4H-1,3-thiazin-4-one (3s)



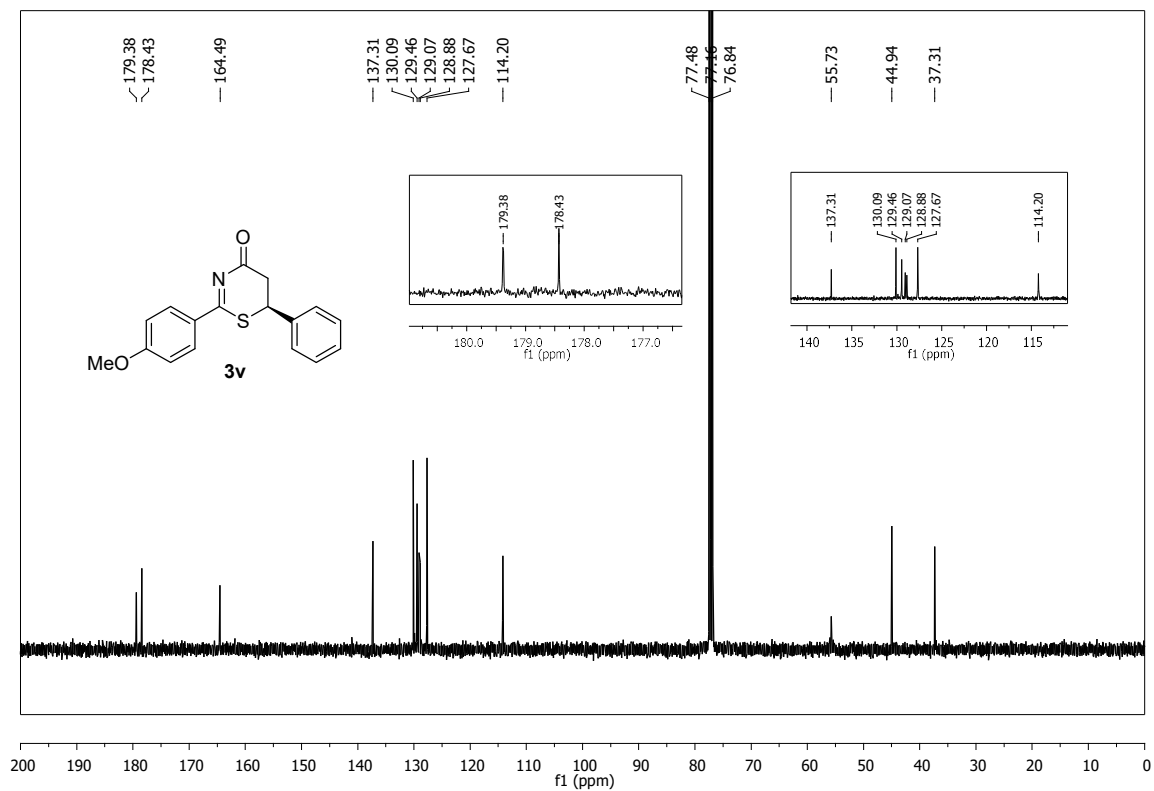
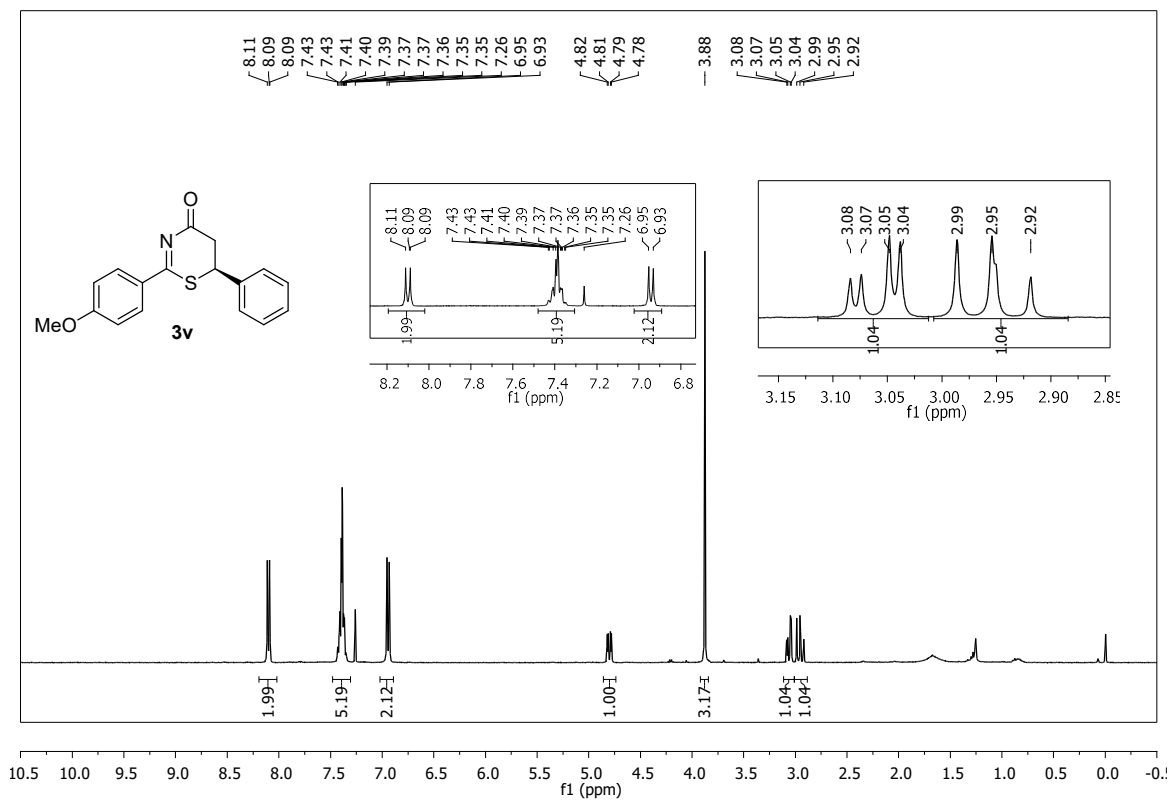
(R)-6-Methyl-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3t)



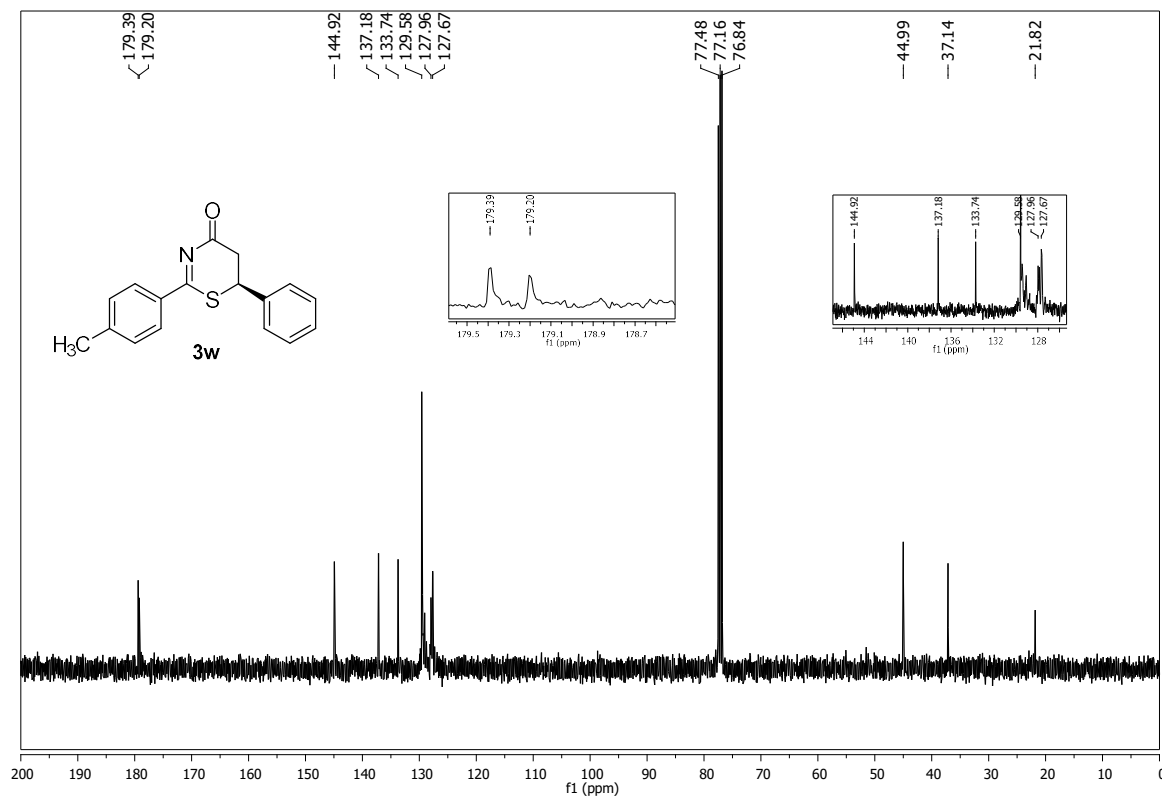
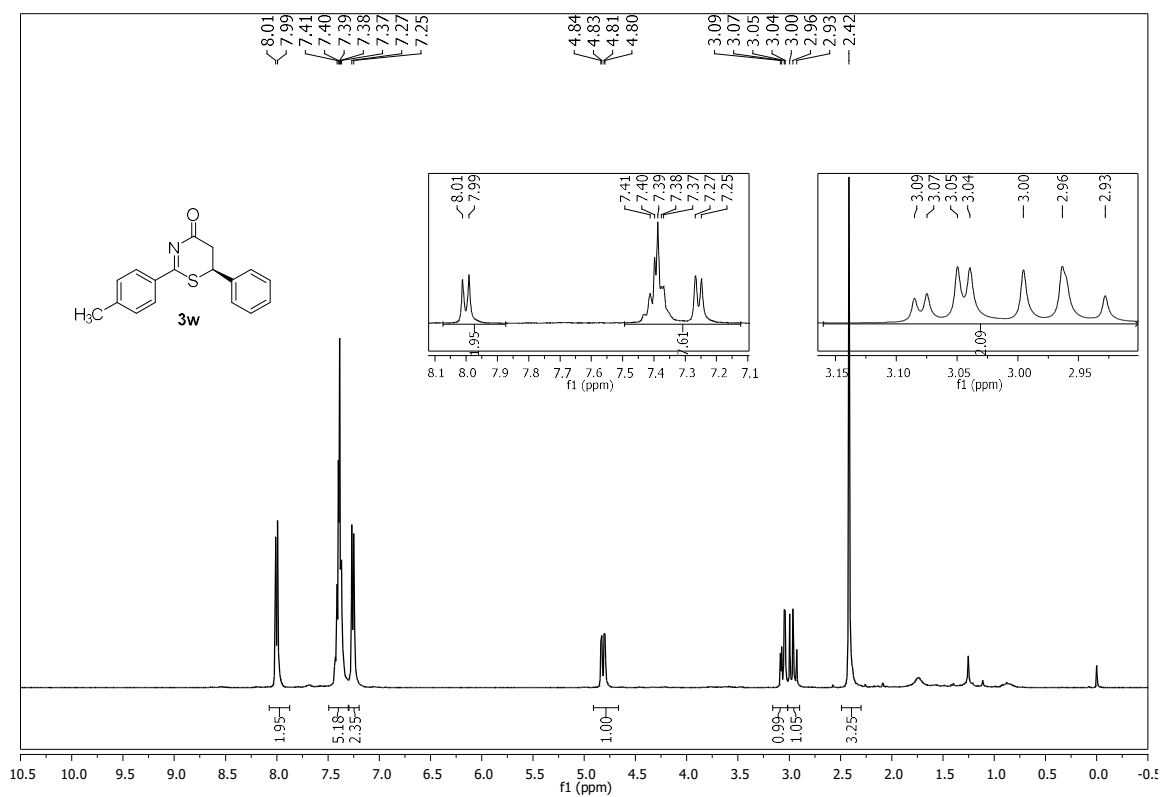
(R)-6-Ethyl-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one(3u)



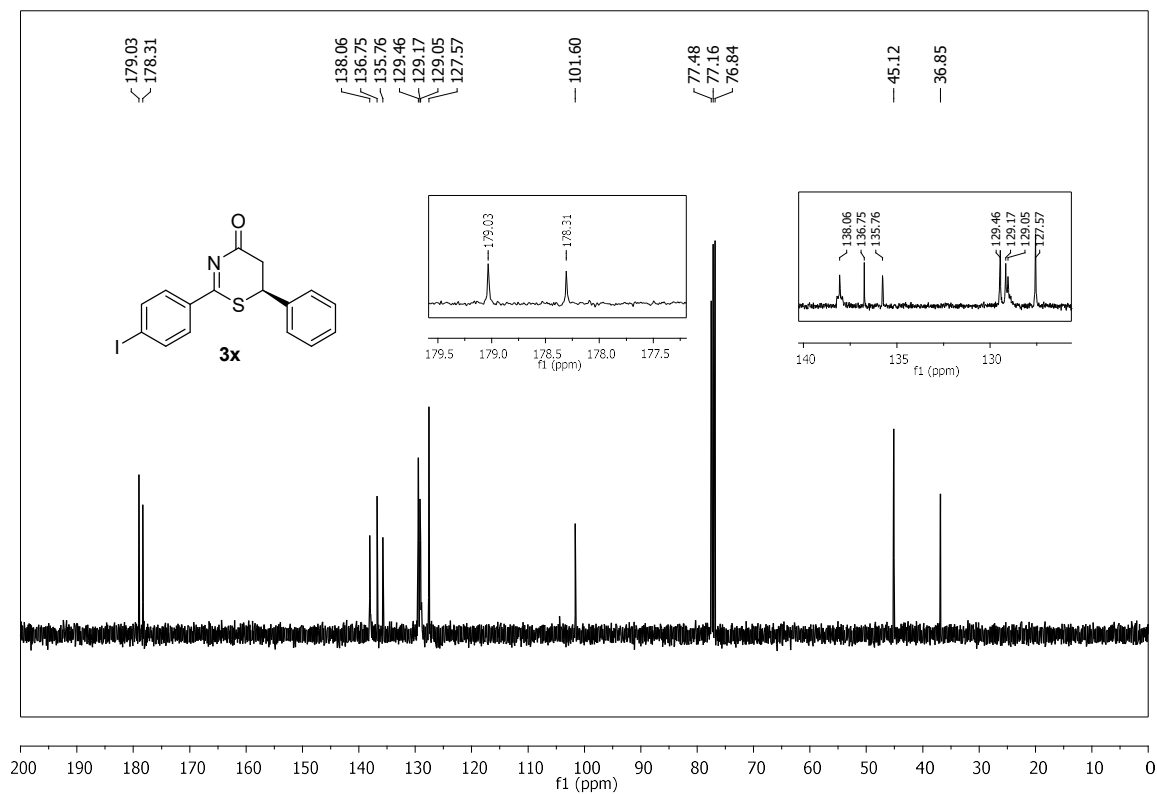
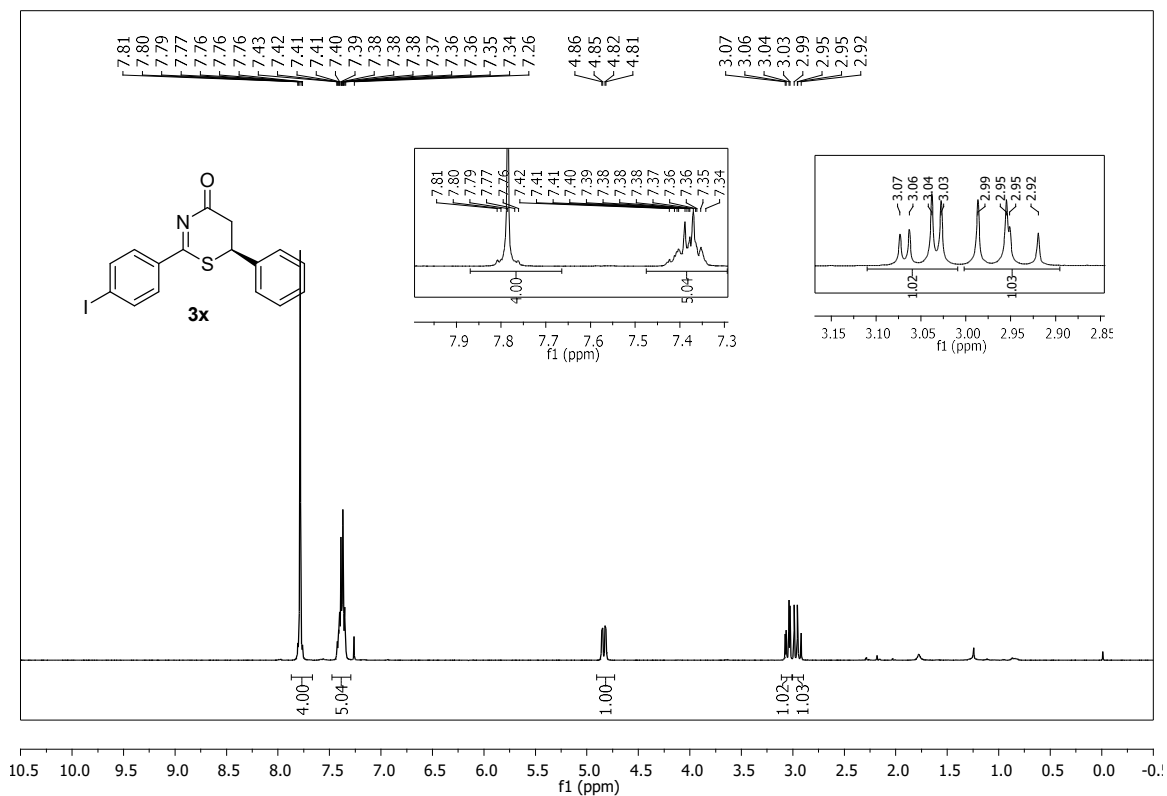
(S)-2-(4-Methoxyphenyl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3v)



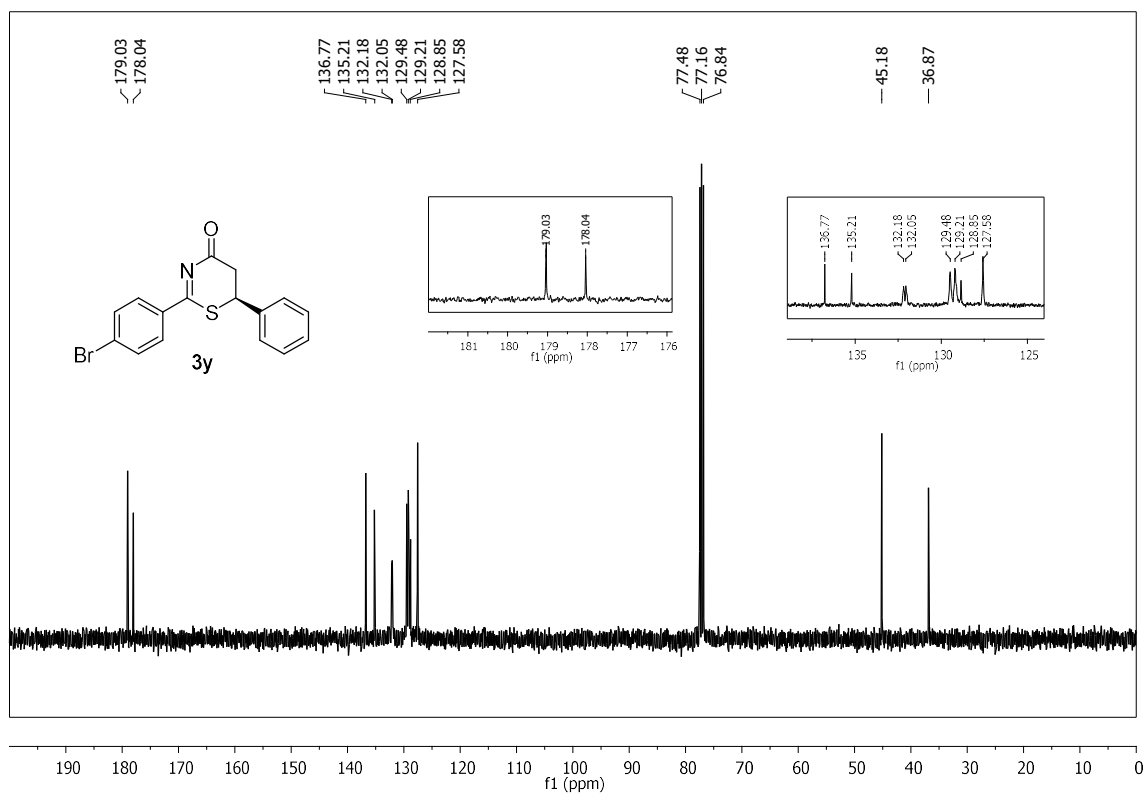
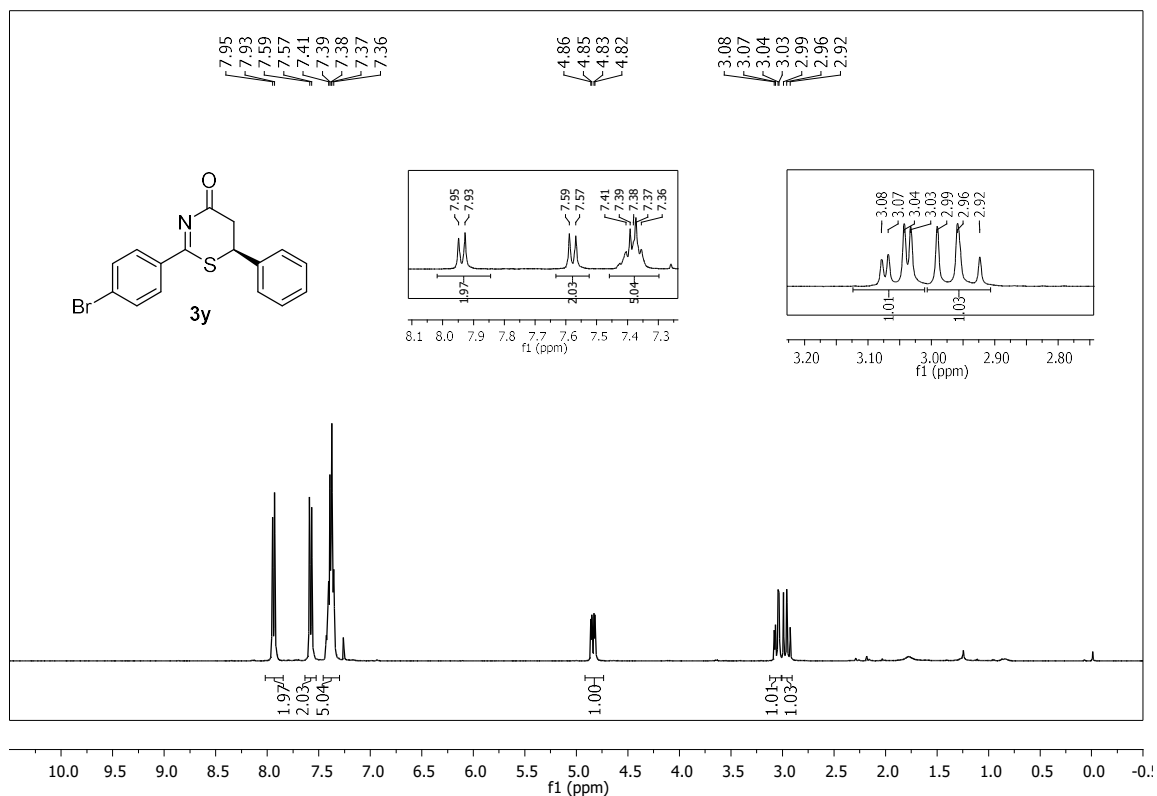
(S)-6-Phenyl-2-(p-tolyl)-5,6-dihydro-4H-1,3-thiazin-4-one (3w)



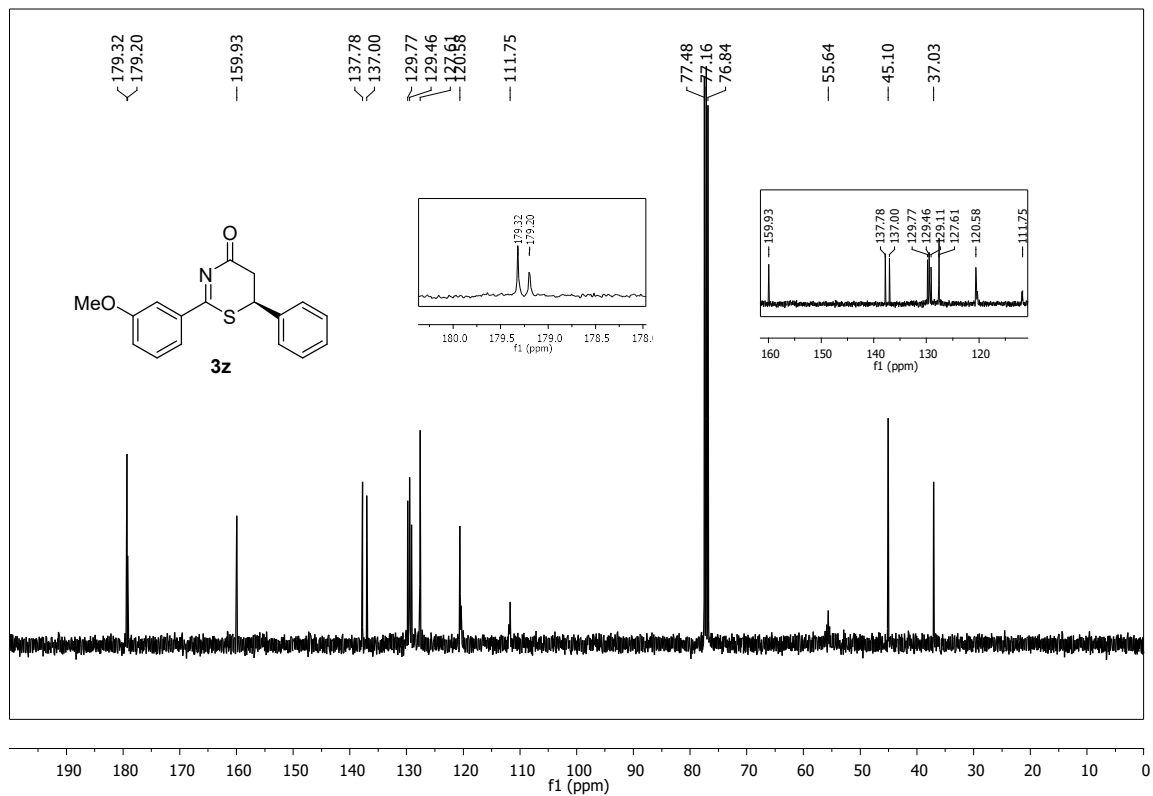
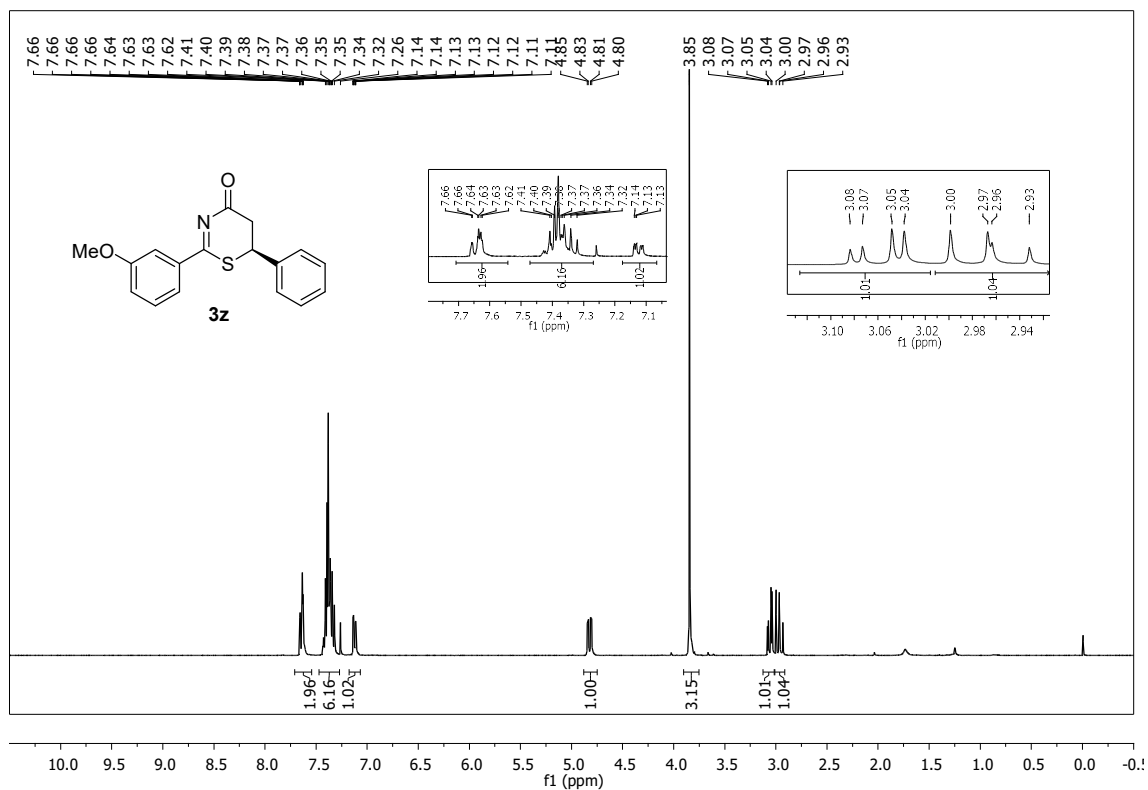
(S)-2-(4-Iodophenyl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3x)



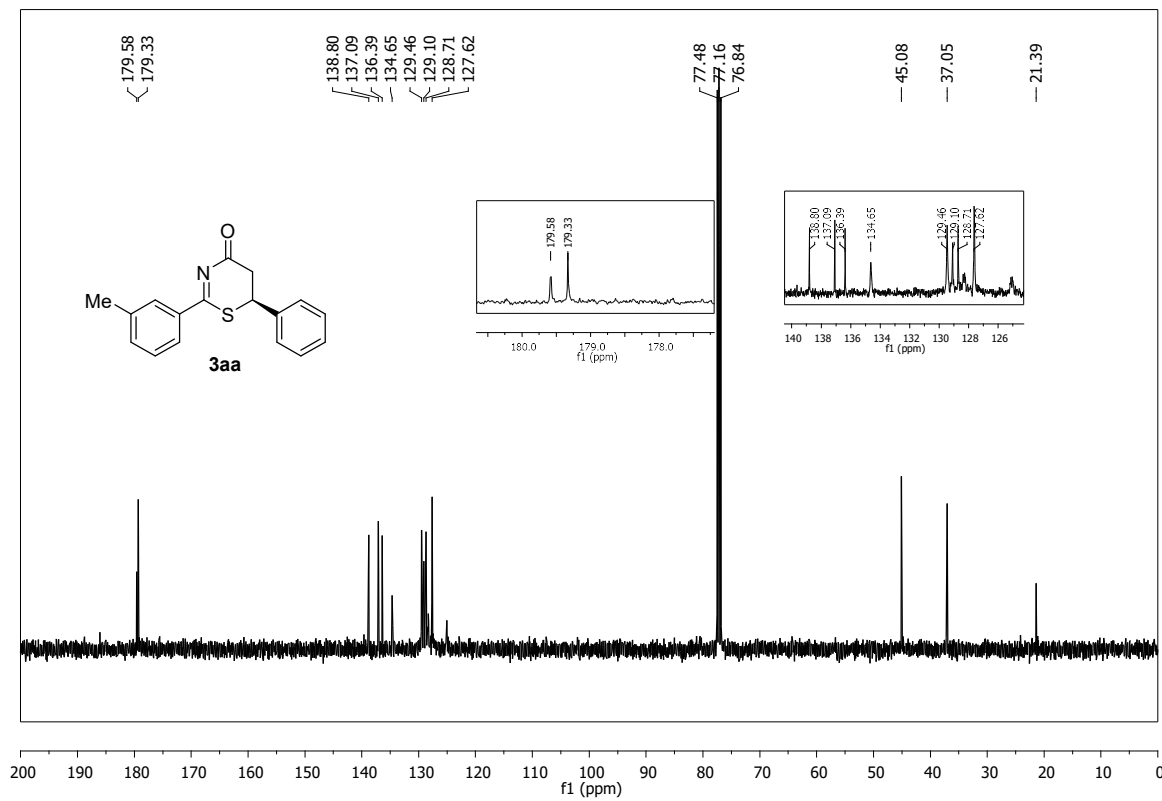
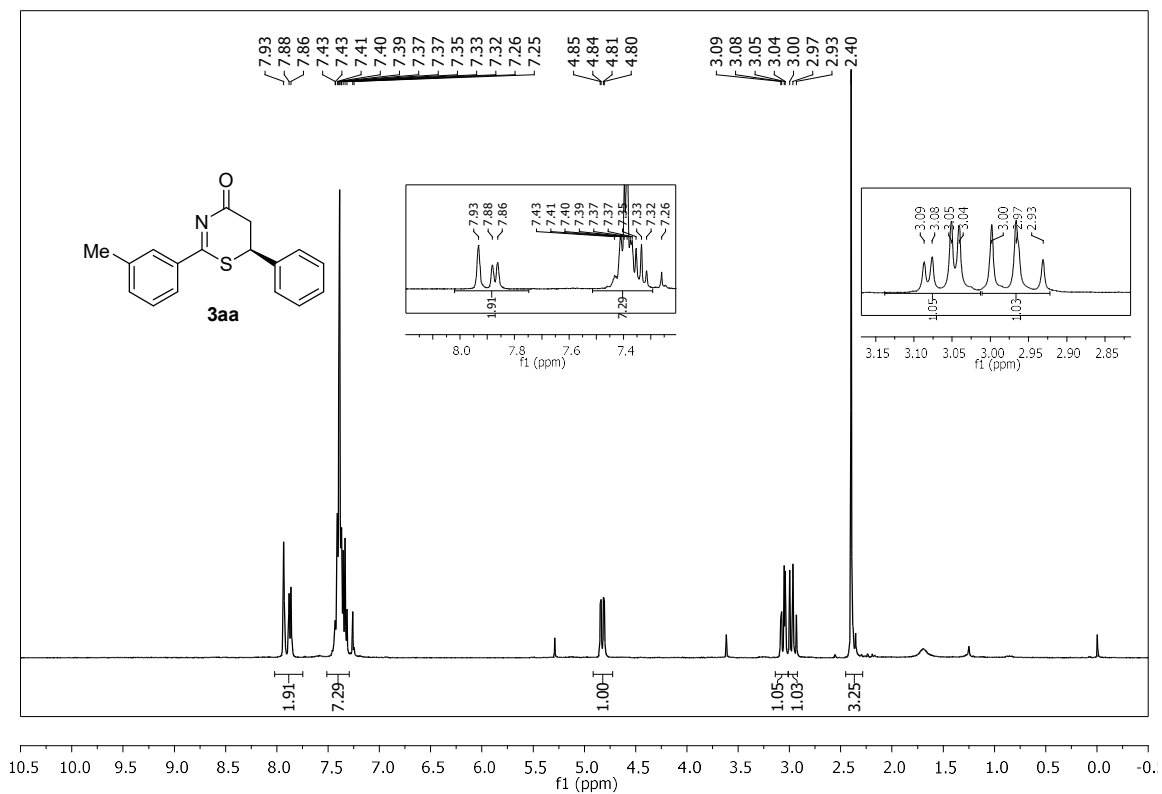
(S)-2-(4-Bromophenyl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3y)



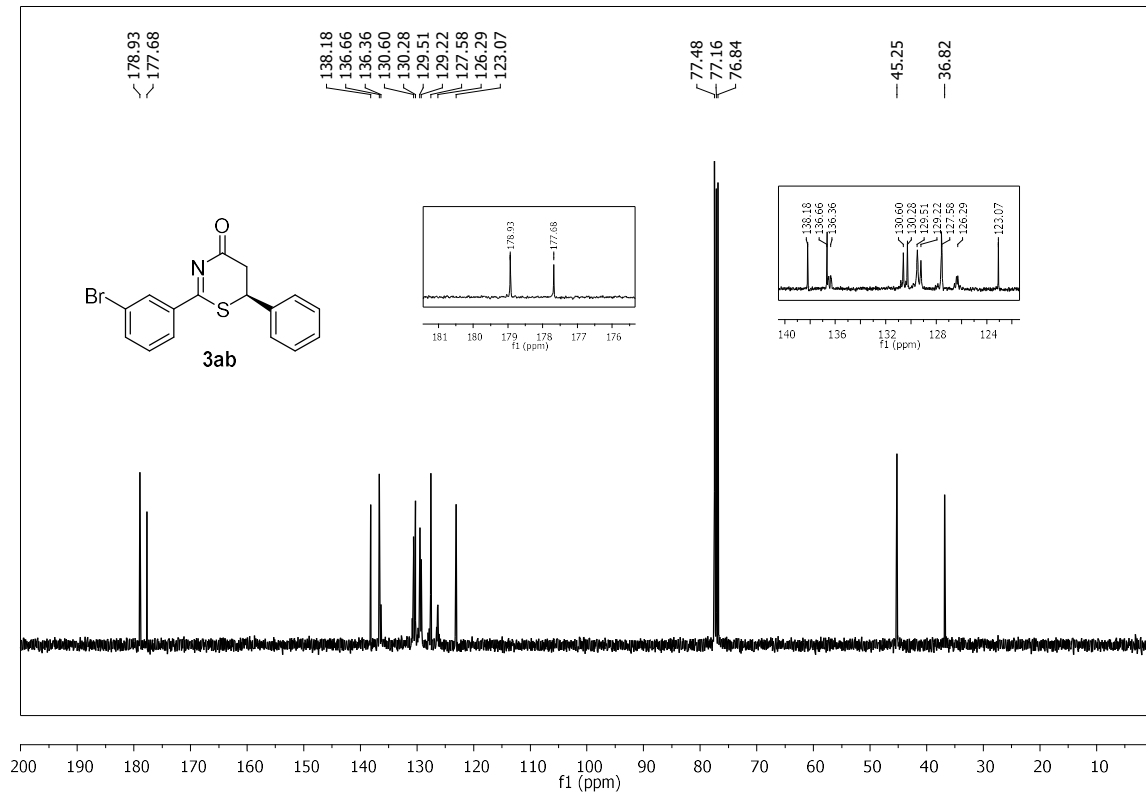
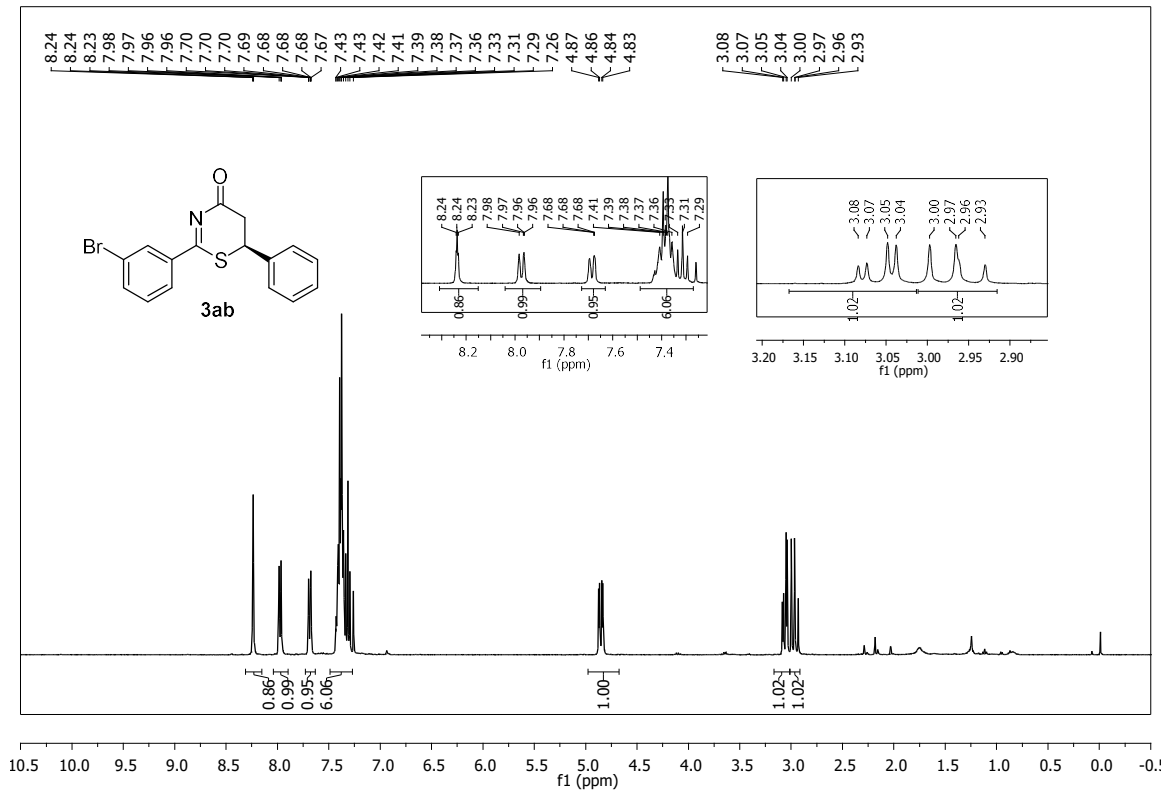
(S)-2-(3-Methoxyphenyl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3z)



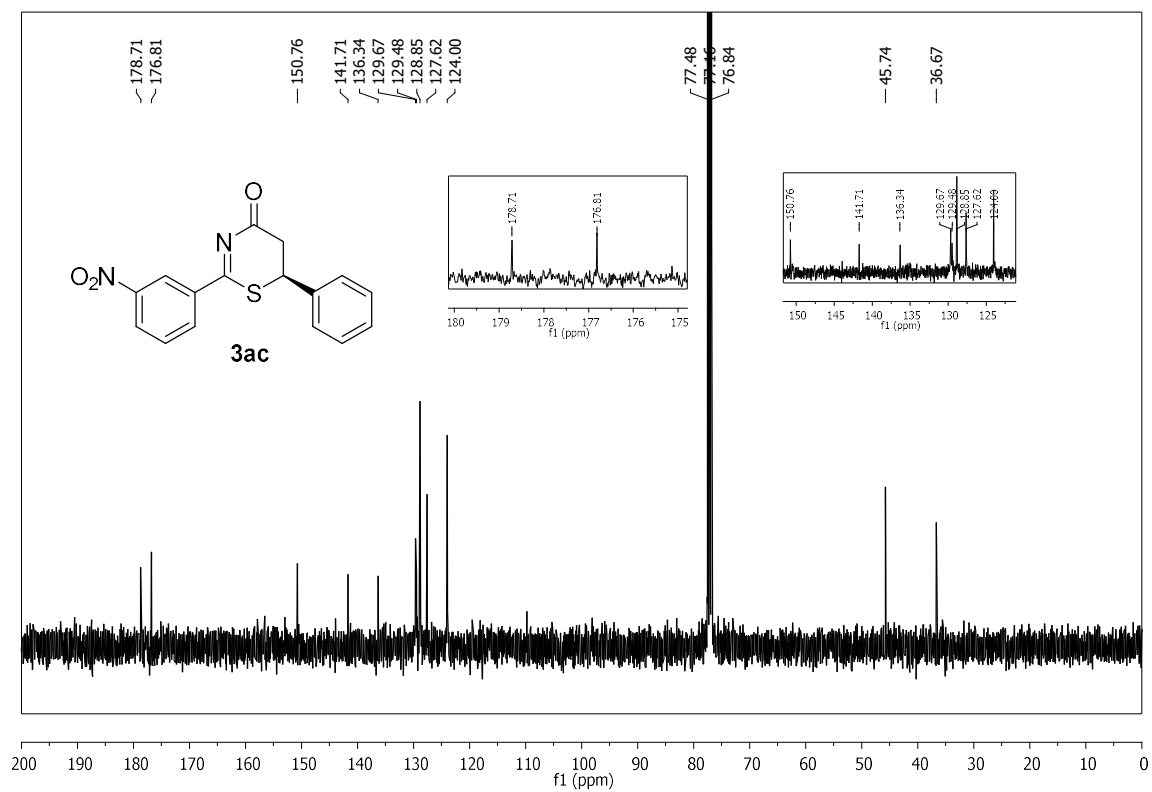
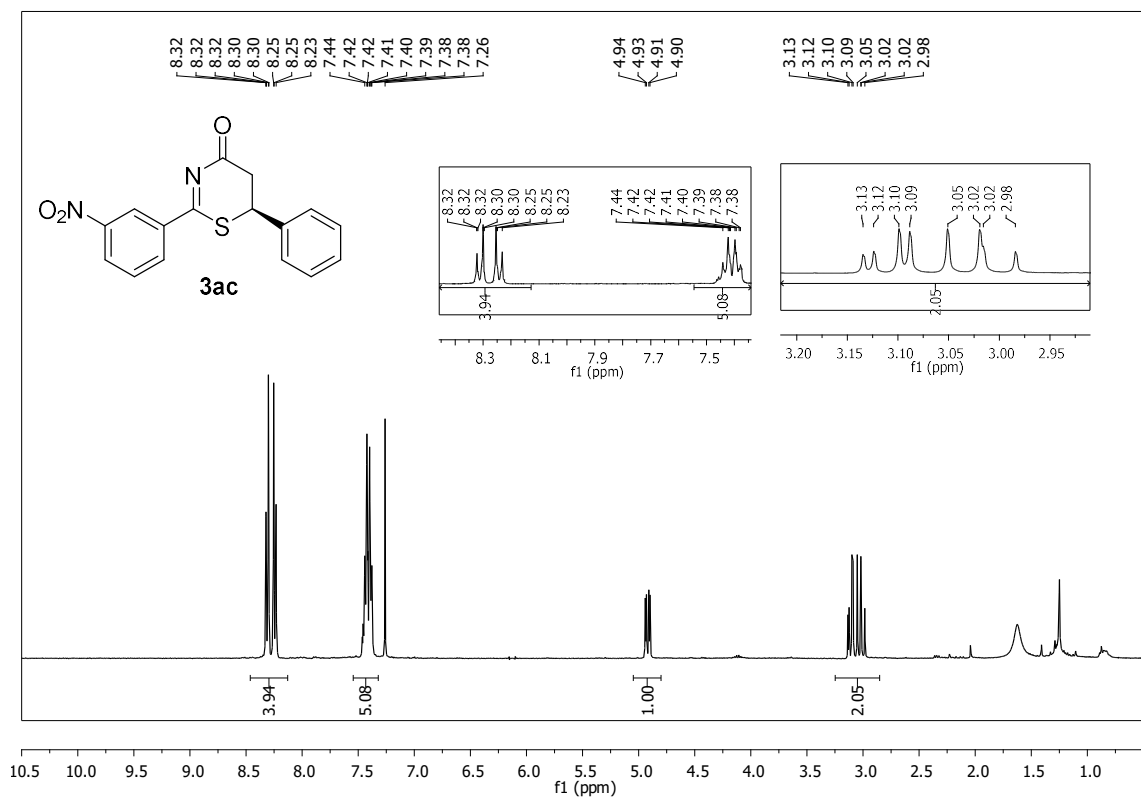
(S)-6-Phenyl-2-(m-tolyl)-5,6-dihydro-4H-1,3-thiazin-4-one (3aa)



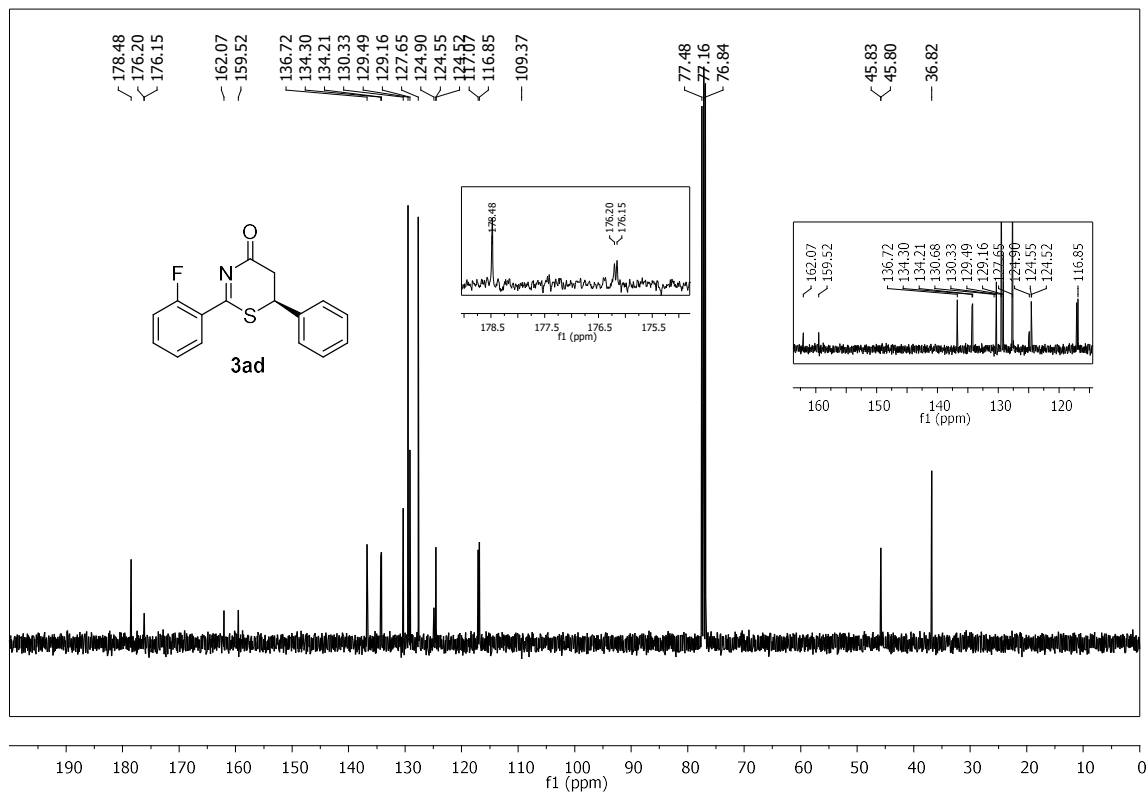
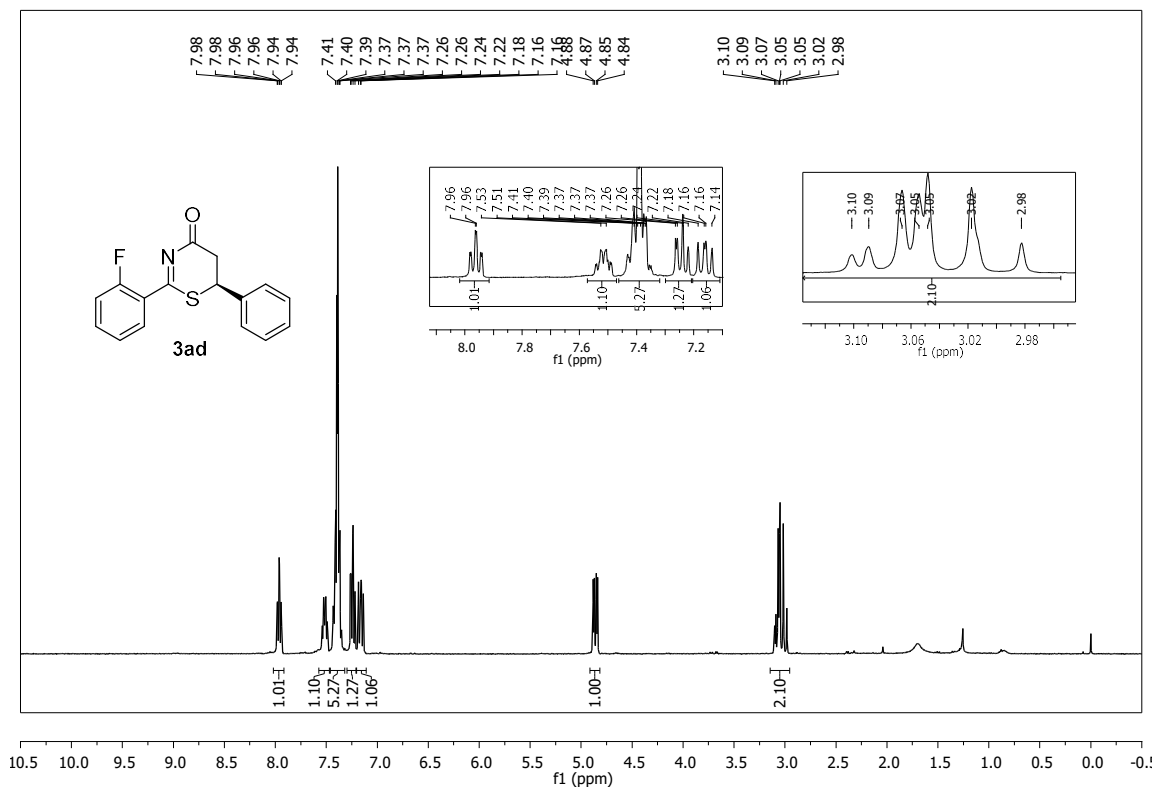
(S)-2-(3-Bromophenyl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3ab)



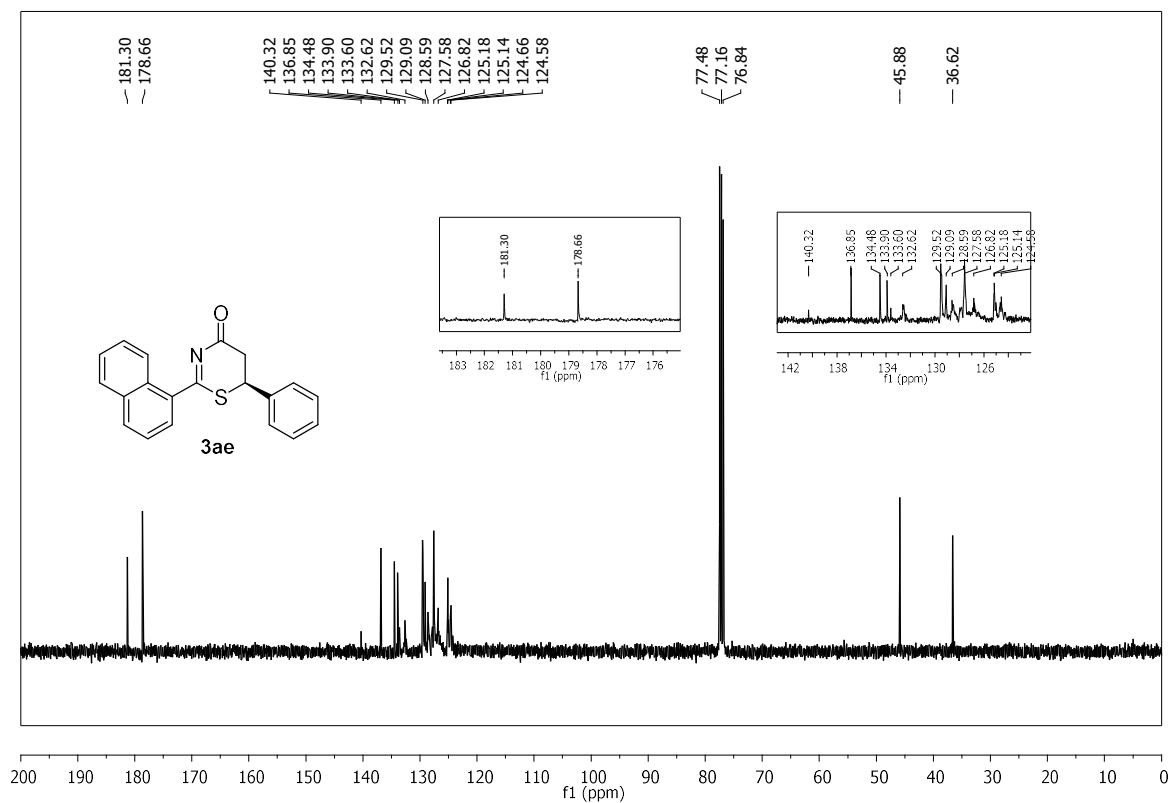
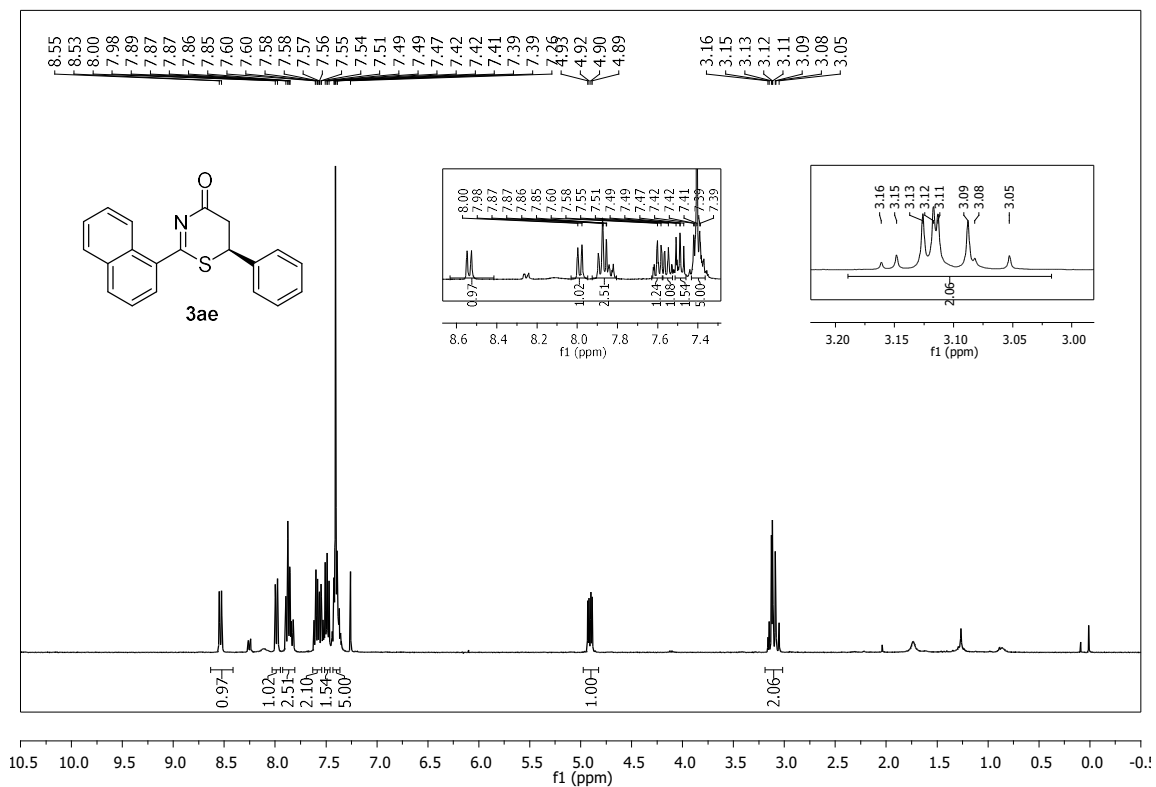
(S)-2-(3-Nitrophenyl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3ac)



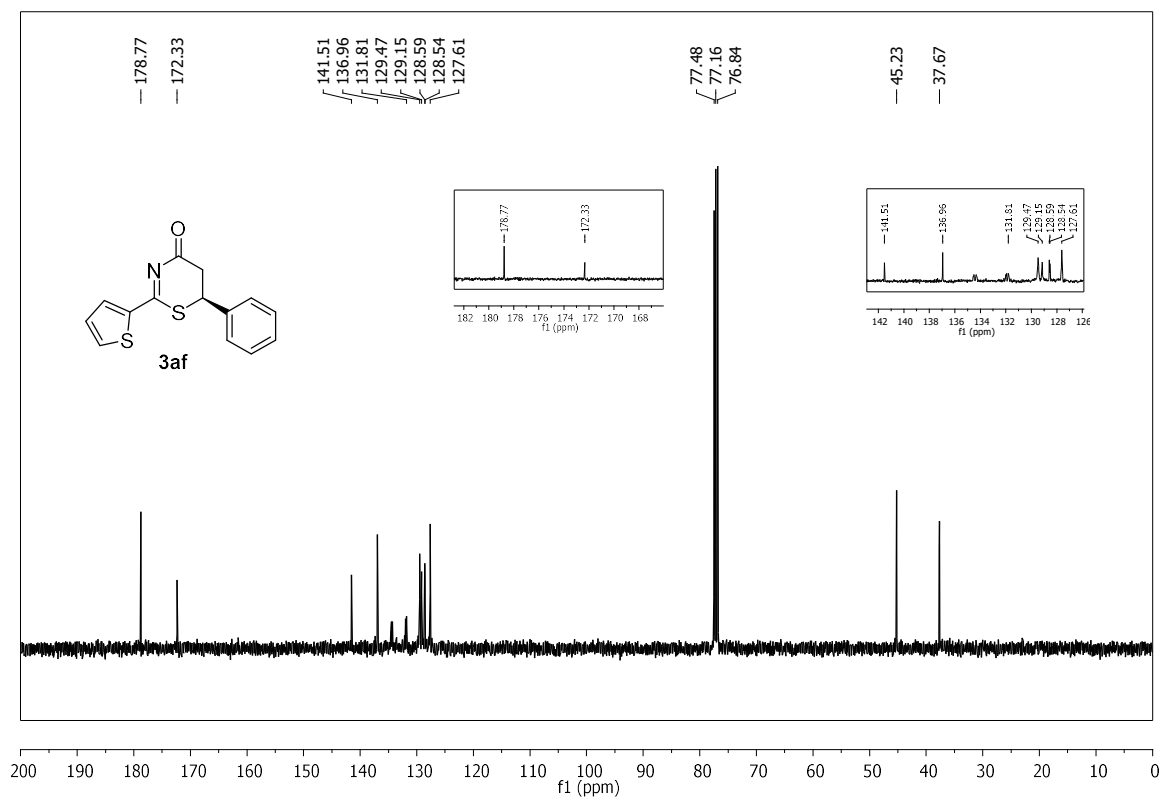
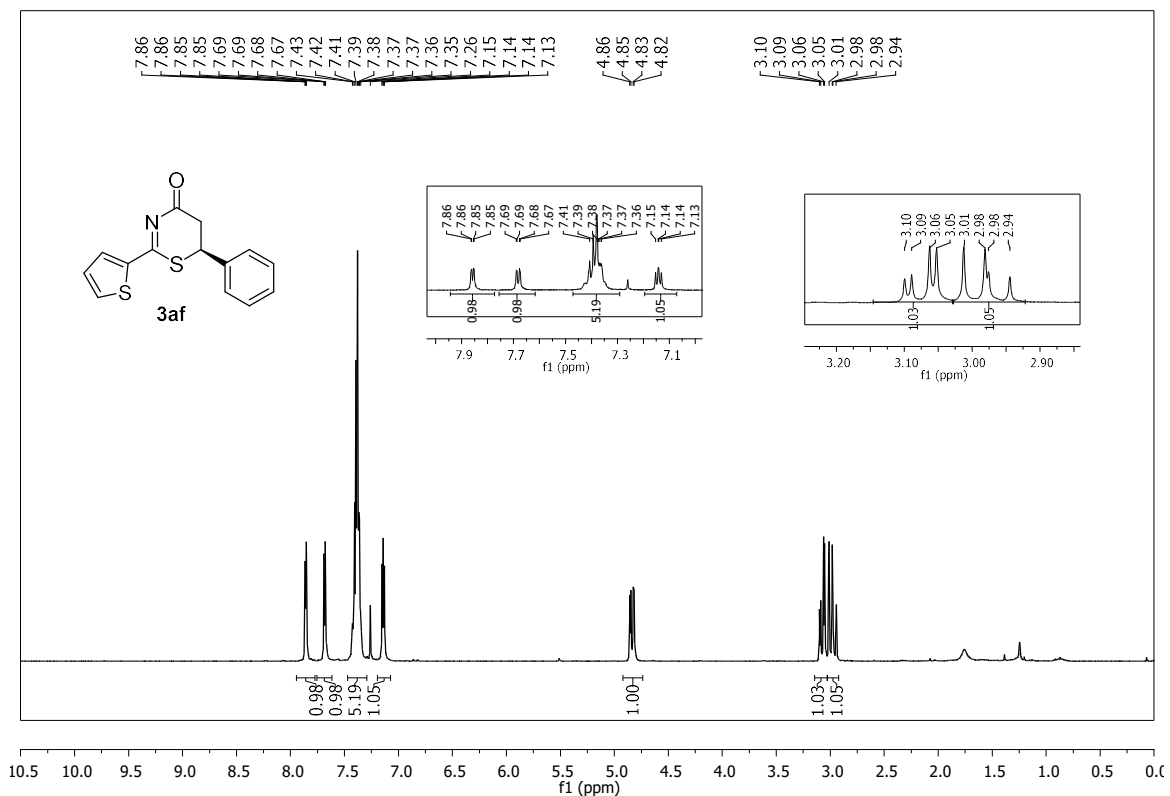
(S)-2-(2-Fluorophenyl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3ad)



(S)-2-(Naphthalen-1-yl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3ae)

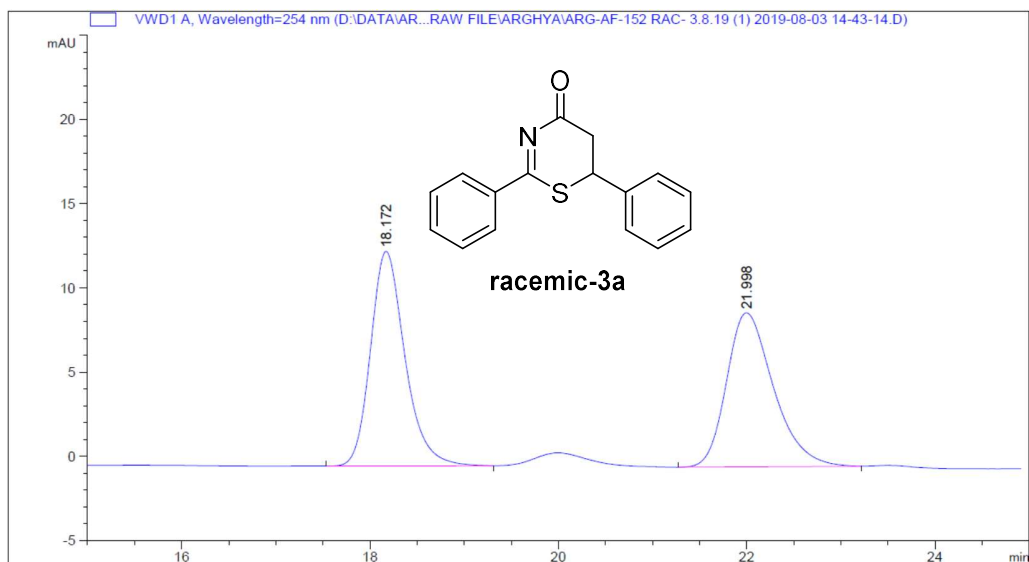


(S)-6-Phenyl-2-(thiophen-2-yl)-5,6-dihydro-4H-1,3-thiazin-4-one (3af)

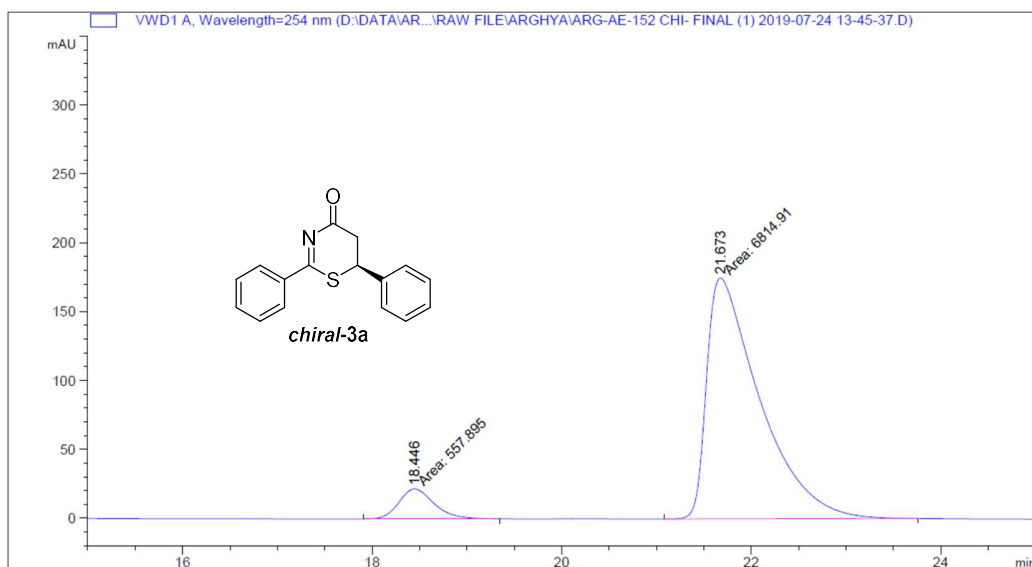


8. HPLC Data of Functionalized Thiazinones

(S)-2,6-Diphenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3a)



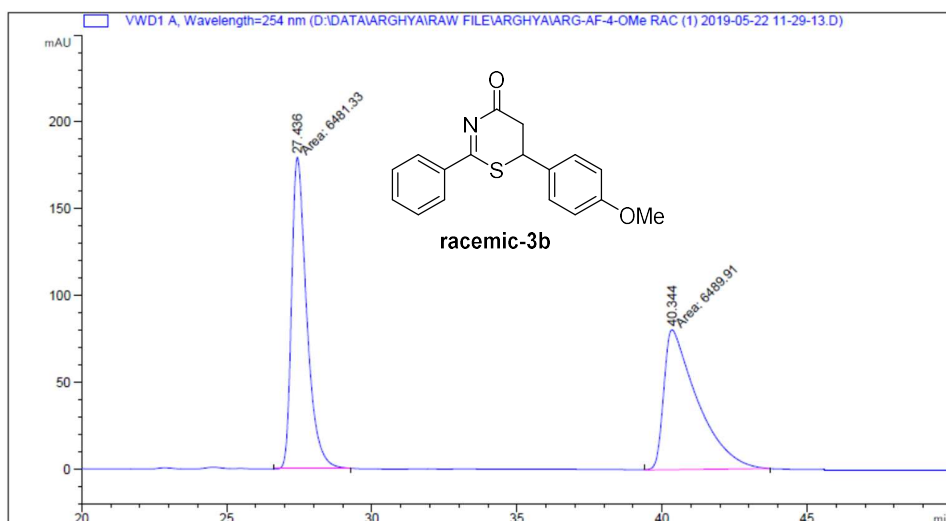
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	18.172	MM	0.4211	321.46527	12.72310	50.3859
2	21.998	BB	0.5229	316.54144	9.14263	49.6141



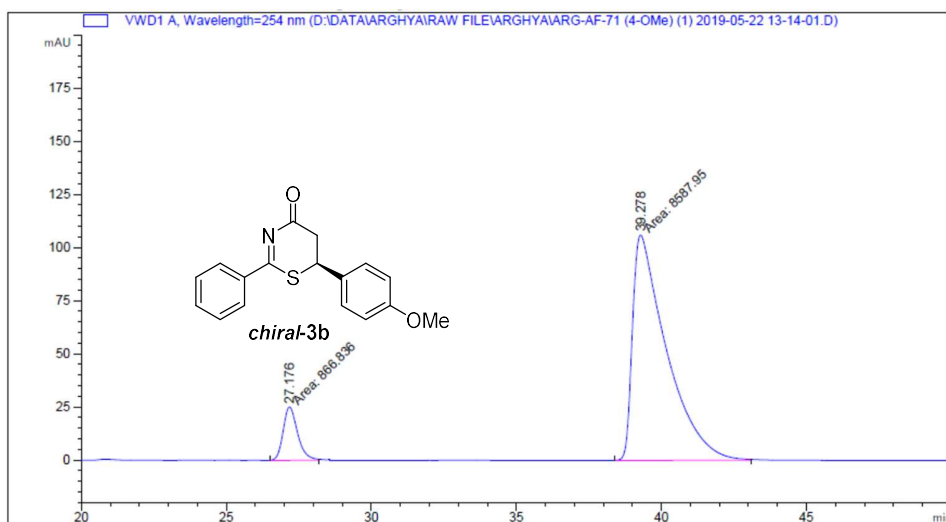
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	18.446	MM	0.4303	561.01117	21.73174	7.5955
2	21.673	MM	0.6502	6825.10742	174.93602	92.4045

Sample Info : CHIRALPAK IF, 20%IPA-Hexane, 1 mL/min, 254 nm

(S)-6-(4-Methoxyphenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3b)



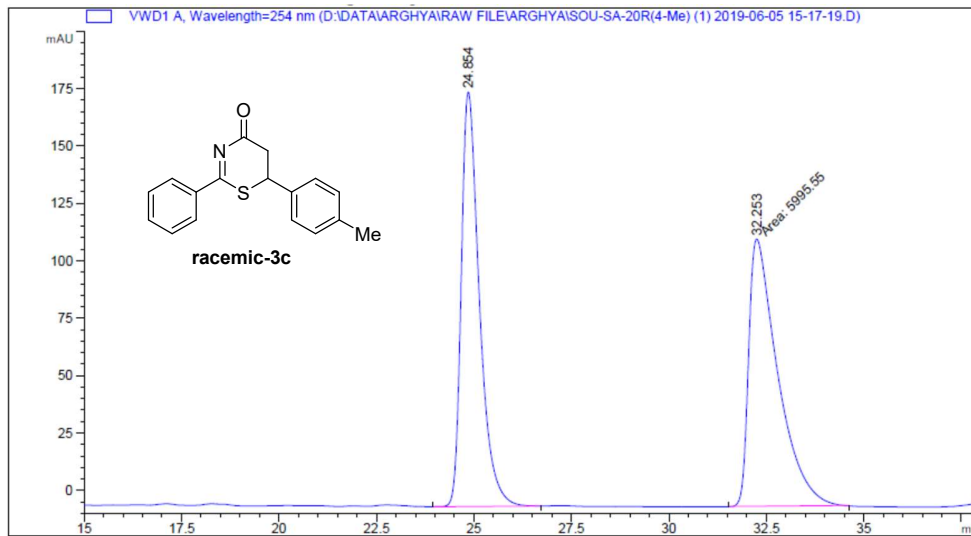
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	27.436	MM	0.6027	6481.32813	179.23349	49.9669
2	40.344	MM	1.3410	6489.90820	80.66045	50.0331



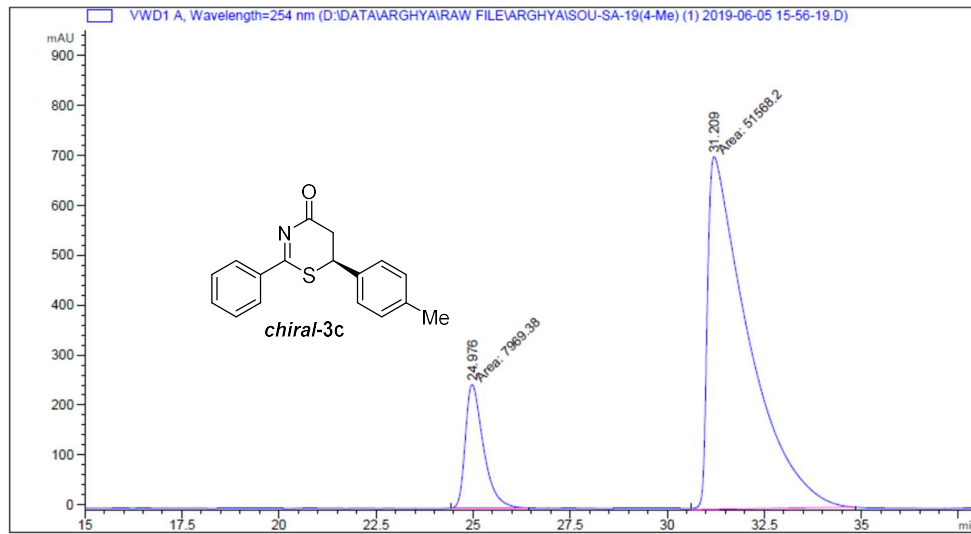
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	27.176	MM	0.5759	866.83557	25.08691	9.1682
2	39.278	MM	1.3497	8587.94922	106.04649	90.8318

Sample Info : CHIRALPAK IF,25%IPA-Hexane, .7 mL/min, 254 nm

(S)-2-Phenyl-6-(p-tolyl)-5,6-dihydro-4H-1,3-thiazin-4-one (3c)



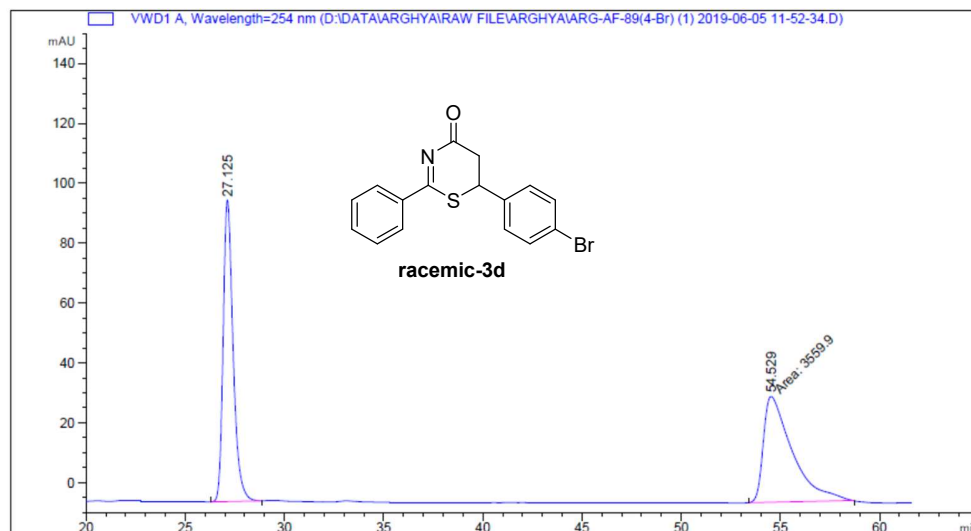
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	24.854	BB	0.4877	5827.69189	180.50215	49.2901
2	32.253	MM	0.8589	5995.54932	116.33555	50.7099



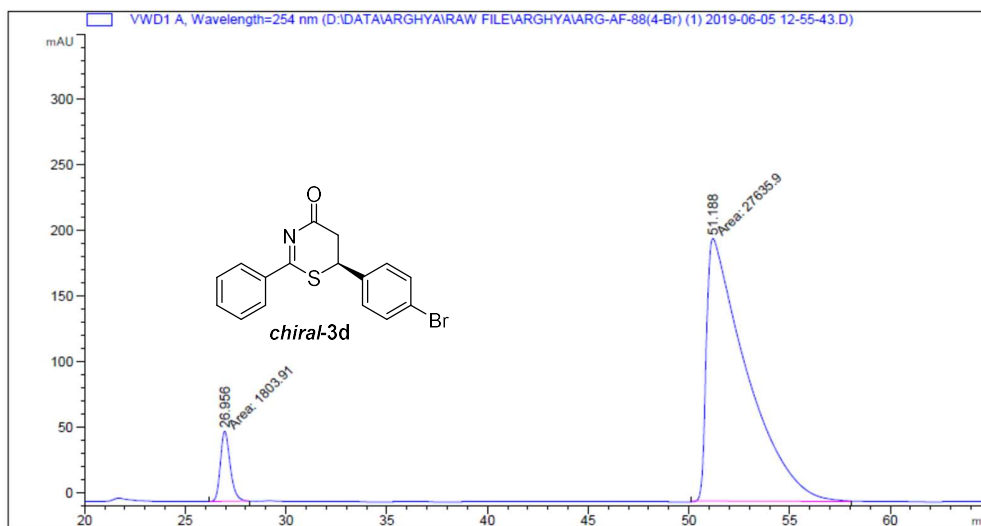
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	24.976	MM	0.5377	7969.38281	247.01347	13.3855
2	31.209	MM	1.2176	5.15682e4	705.84875	86.6145

Sample Info : CHIRALPAK IF, 20%IPA-Hexane, .7 mL/min, 254 nm

(S)-6-(4-Bromophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3d)



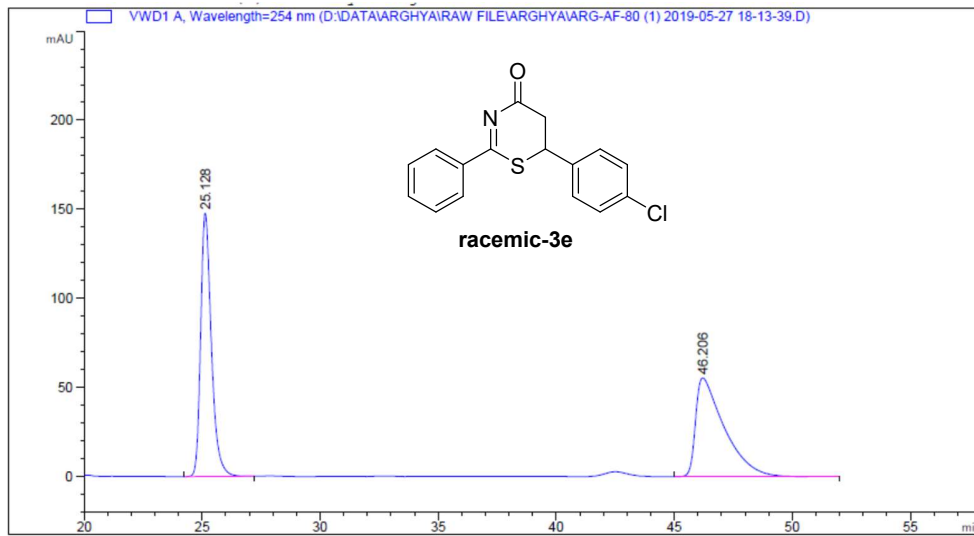
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	27.125	BB	0.5292	3497.82446	100.71378	49.5602
2	54.529	MM	1.6801	3559.89844	35.31382	50.4398



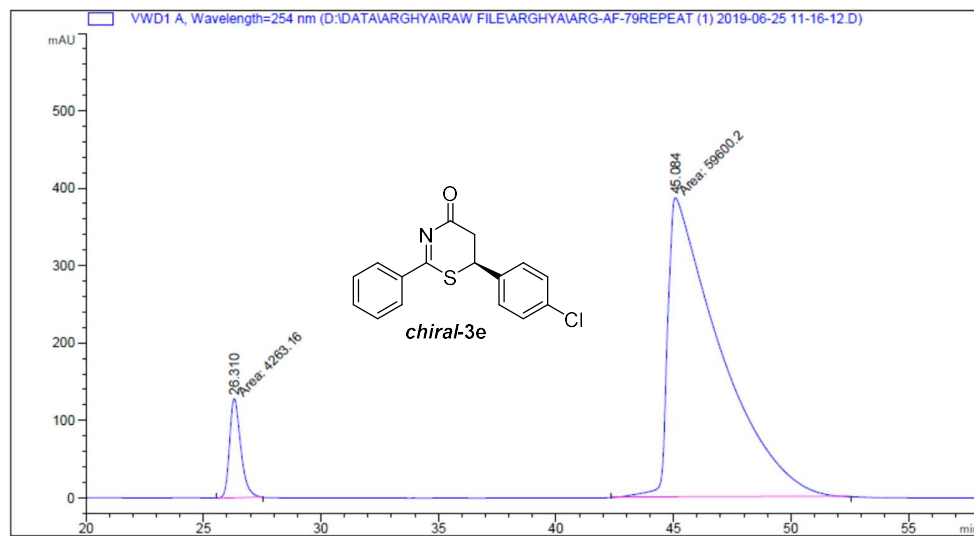
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	26.956	MM	0.5613	1803.91162	53.56414	6.1275
2	51.188	MM	2.2988	2.76359e4	200.36482	93.8725

Sample Info : CHIRALPAK IF,20%IPA-Hexane, .7 mL/min, 254 nm

(S)-6-(4-Chlorophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3e)



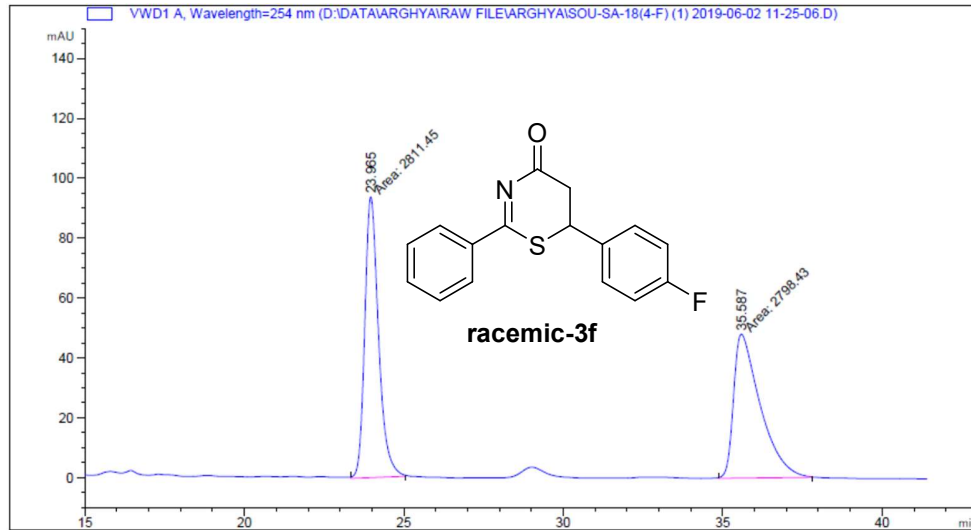
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	25.128	BB	0.4782	4653.45898	147.83717	49.7170
2	46.206	BBA	1.2022	4706.43799	55.56314	50.2830



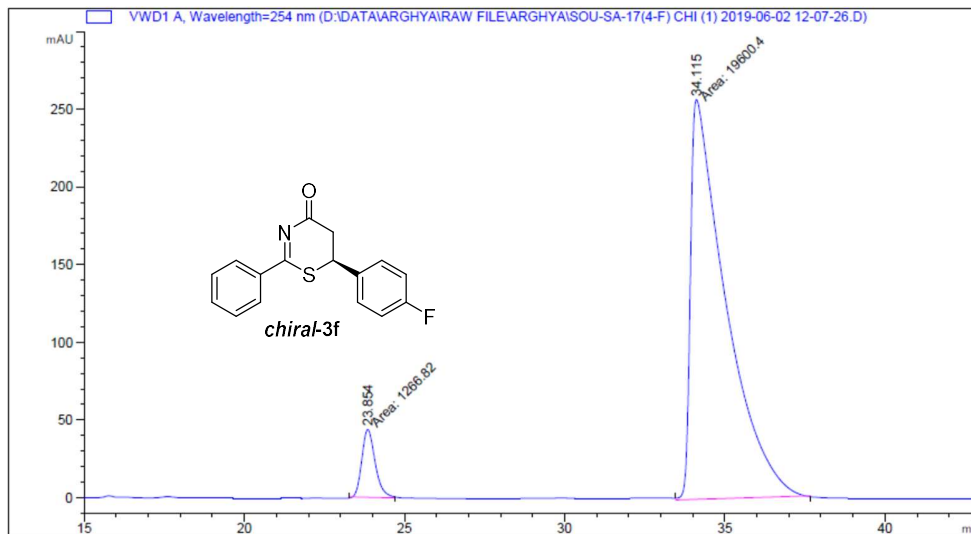
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	26.310	MM	0.5548	4263.15625	128.07262	6.6754
2	45.084	MM	2.5703	5.96002e4	386.46091	93.3246

Sample Info : CHIRALPAK IF, 20%IPA-Hexane, .70 mL/min, 254 nm

(S)-6-(4-Fluorophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3f)



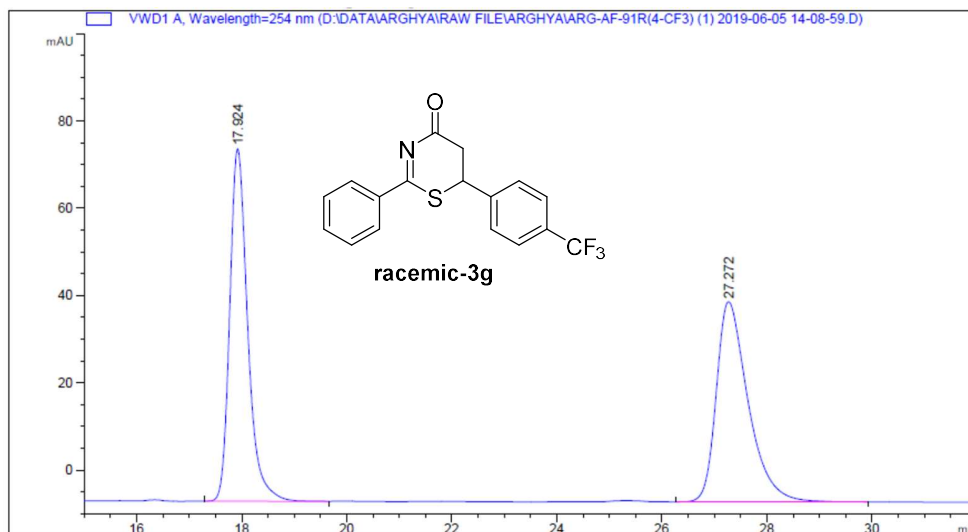
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	23.965	MM	0.5000	2811.45410	93.71530	50.1161
2	35.587	MM	0.9700	2798.43018	48.08184	49.8839



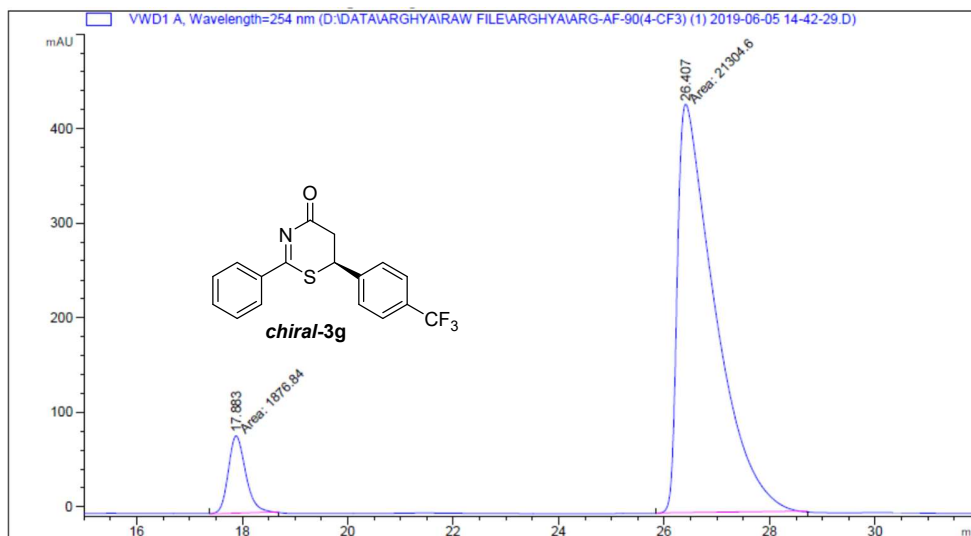
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	23.854	MM	0.4839	1266.81665	43.62823	6.0708
2	34.115	MM	1.2695	1.96004e4	257.32681	93.9292

Sample Info : CHIRALPAK IF,20%IPA-Hexane, .7 mL/min, 254 nm

(S)-2-Phenyl-6-(4-(trifluoromethyl)phenyl)-5,6-dihydro-4H-1,3-thiazin-4-one (3g)



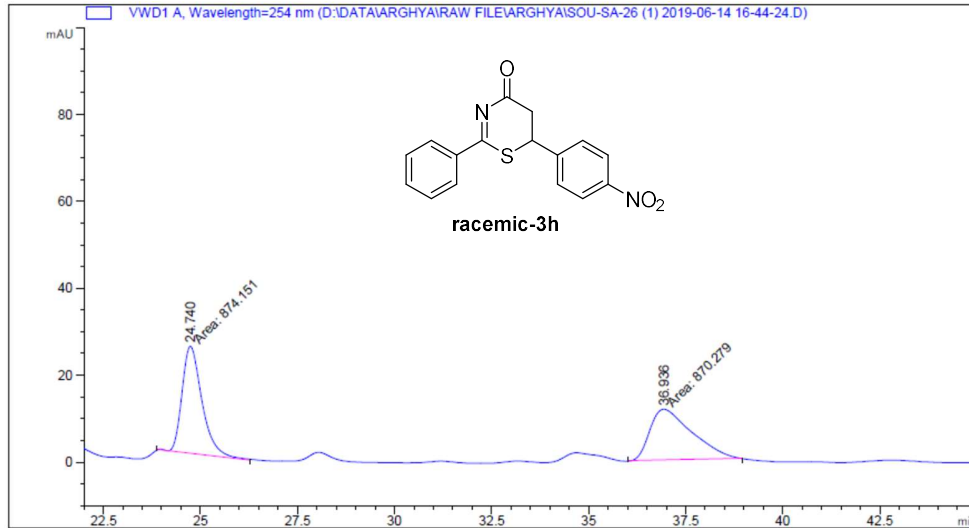
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	17.924	BB	0.3615	1913.22070	80.72743	49.8136
2	27.272	BB	0.6323	1927.53894	45.86814	50.1864



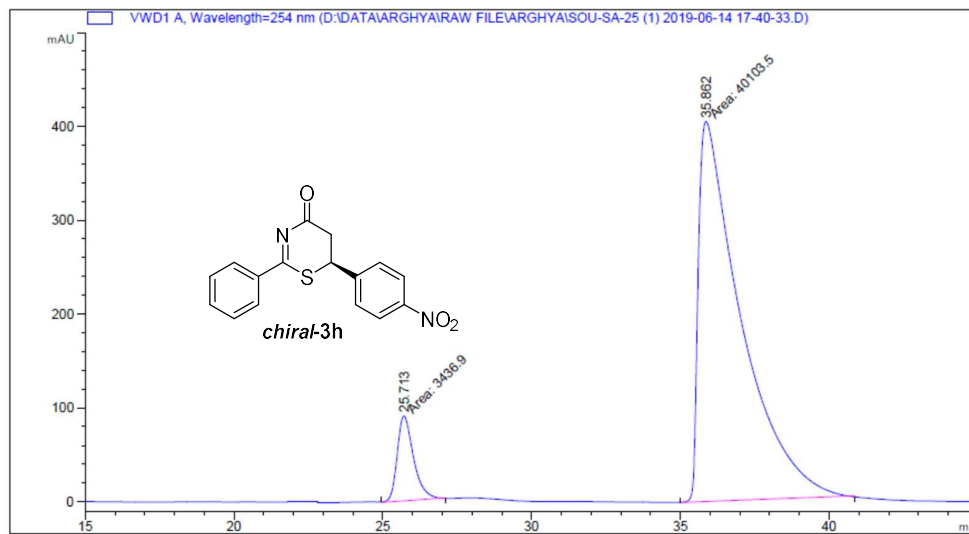
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	17.883	MM	0.3826	1876.83594	81.75480	8.0963
2	26.407	MM	0.8222	2.13046e4	431.87173	91.9037

Sample Info : CHIRALPAK IF,20%IPA-Hexane, .7 mL/min, 254 nm

(S)-6-(4-Nitrophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3h)



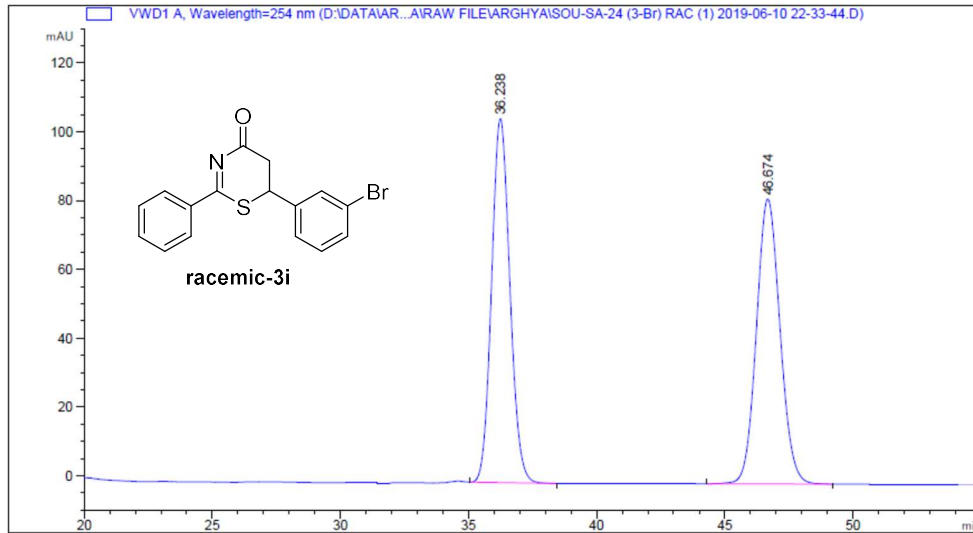
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	24.740	MM	0.5926	874.15057	24.58500	50.1110
2	36.936	MM	1.2463	870.27942	11.63839	49.8890



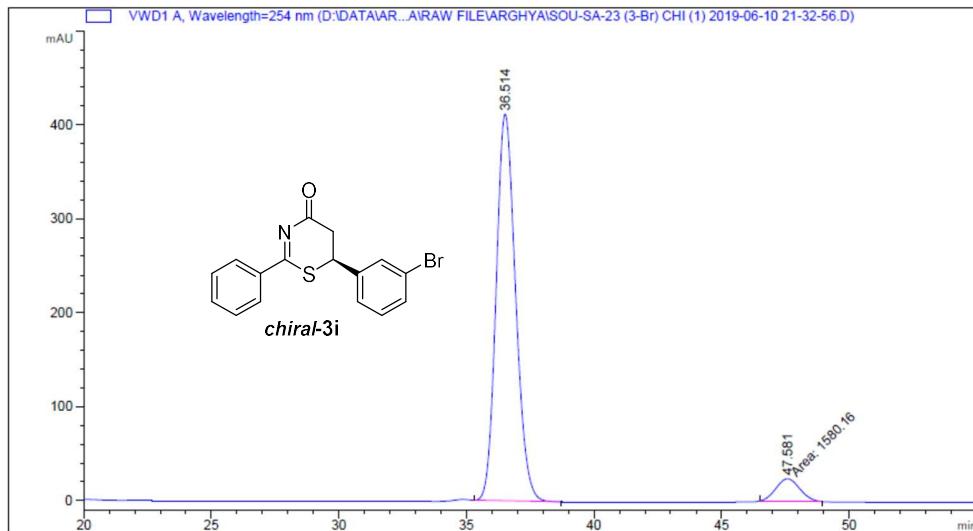
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	25.713	MM	0.6336	3436.89697	90.40067	7.8936
2	35.862	MM	1.6500	4.01035e4	405.07767	92.1064

Sample Info : CHIRALPAK IA, 35%IPA-Hexane, .7 mL/min, 254 nm

(S)-6-(3-Bromophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3i)



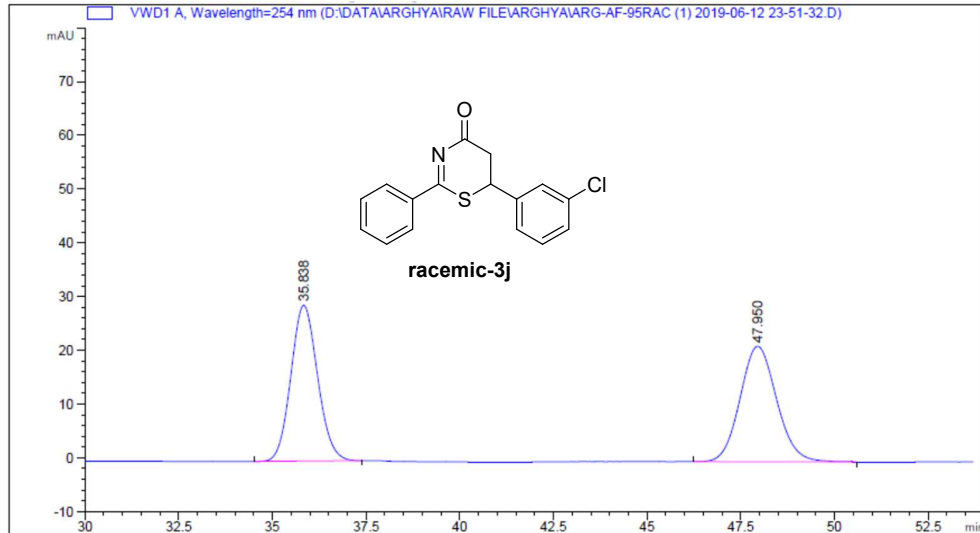
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	36.238	BB	0.7712	5255.15381	105.85538	49.8037
2	46.674	BB	0.9903	5296.57715	82.80404	50.1963



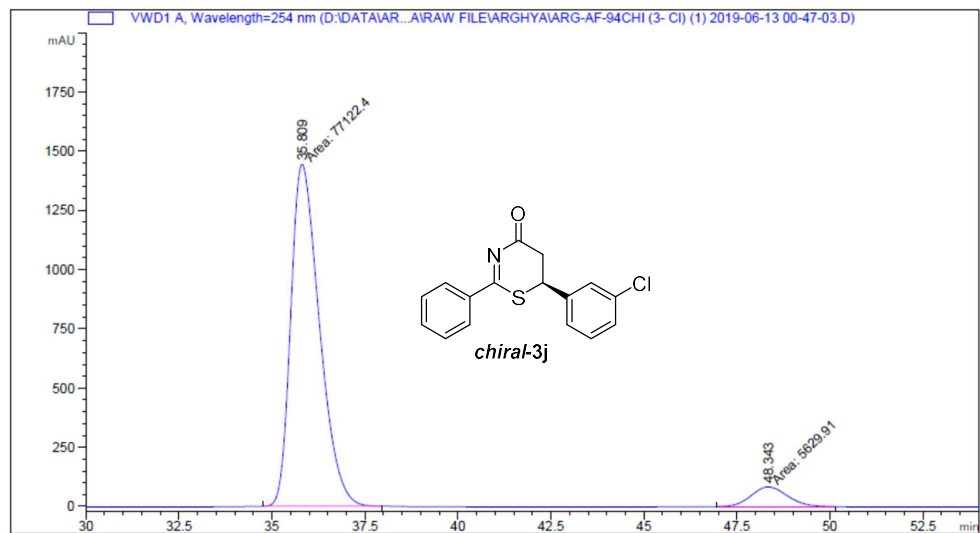
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	36.514	BB	0.8168	2.17527e4	411.44904	93.2277
2	47.581	MM	1.0883	1580.16467	24.19853	6.7723

Sample Info : CHIRALPAK IC, 30%IPA-Hexane, .7 mL/min, 254 nm

(S)-6-(3-Chlorophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3j)



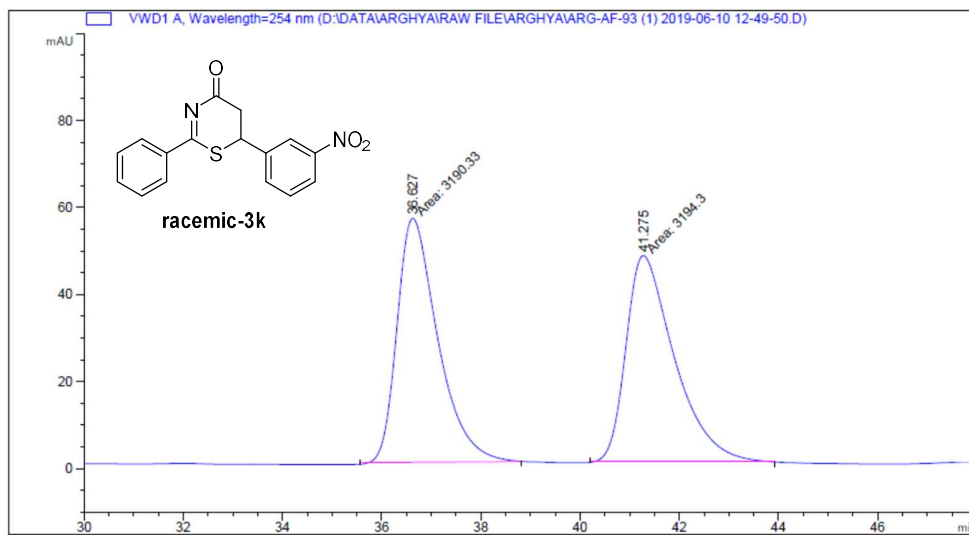
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	35.838	BB	0.7669	1438.13416	28.98344	49.6765
2	47.950	BB	1.0439	1456.86646	21.49087	50.3235



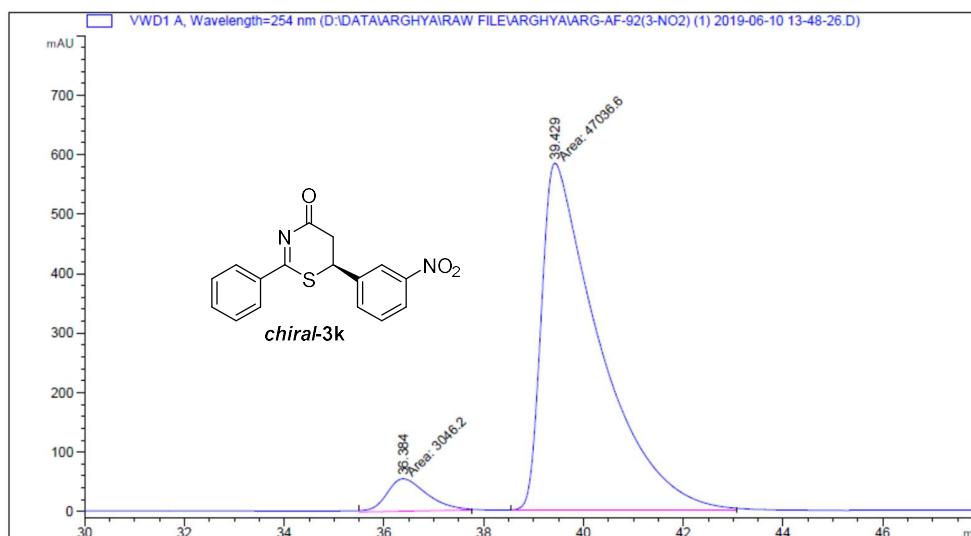
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	35.809	MM	0.8907	7.71224e4	1443.03662	93.1967
2	48.343	MM	1.1312	5629.91309	82.95084	6.8033

Sample Info : CHIRALPAK IC, 30%IPA-Hexane, .7 mL/min, 254 nm

(S)-6-(3-Nitrophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3k)



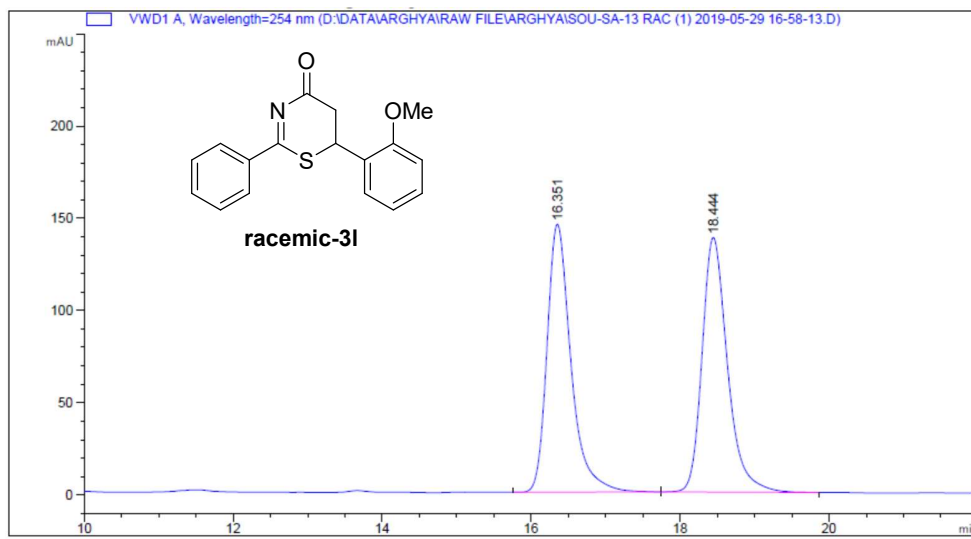
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	36.627	MM	0.9492	3190.32837	56.01939	49.9689
2	41.275	MM	1.1256	3194.30054	47.29879	50.0311



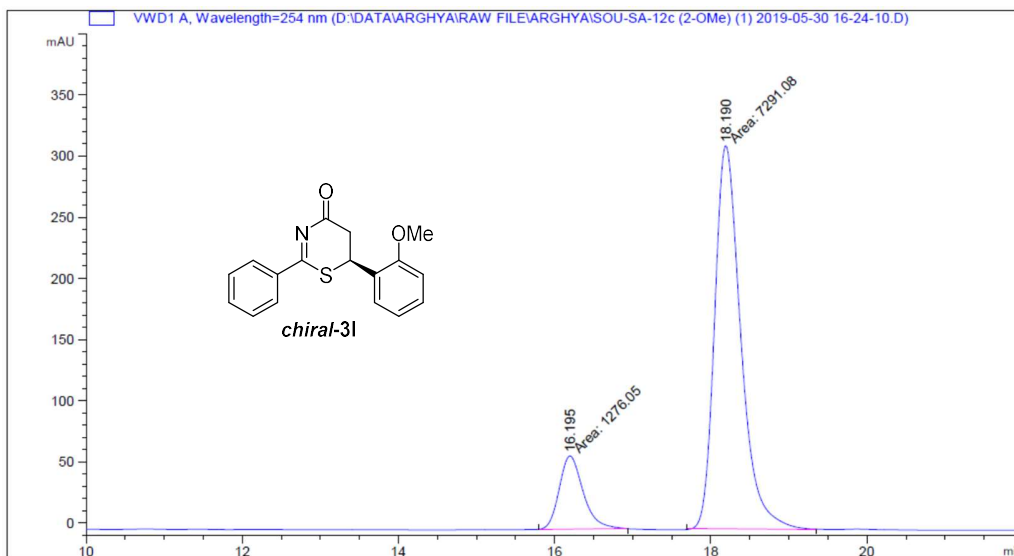
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	36.384	MM	0.9336	3046.20264	54.38330	6.0823
2	39.429	MM	1.3453	4.70366e4	582.71753	93.9177

Sample Info : CHIRALPAK IF,30%IPA-Hexane, .7 mL/min, 254 nm

(S)-6-(2-Methoxyphenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3l)



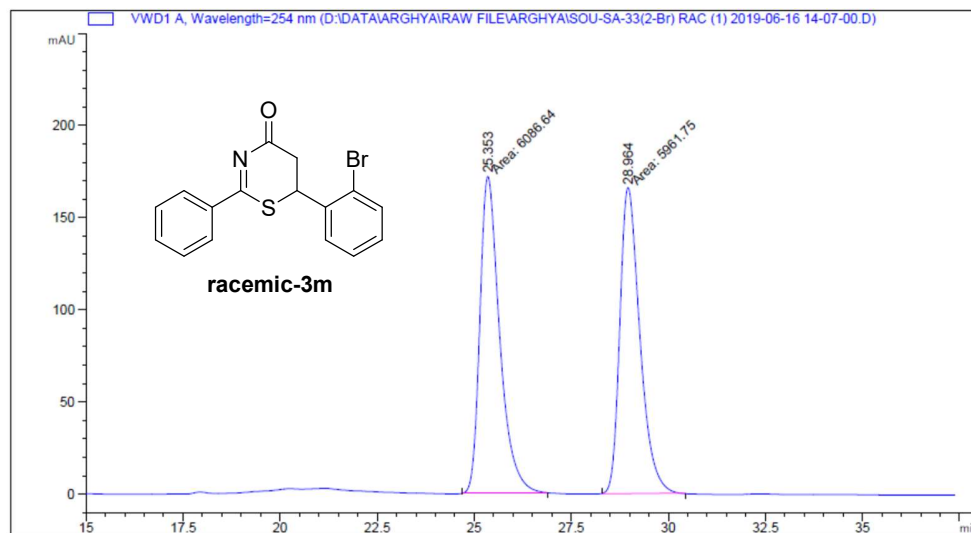
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.351	BB	0.3380	3237.87866	145.27248	49.8034
2	18.444	BB	0.3599	3263.44238	137.98129	50.1966



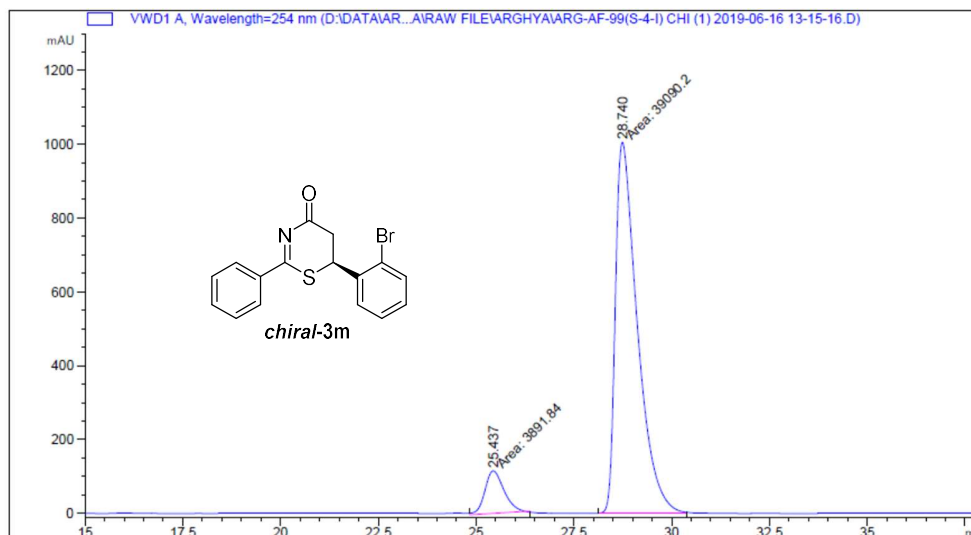
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.195	MM	0.3556	1276.05286	59.80689	14.8947
2	18.190	MM	0.3879	7291.07959	313.30234	85.1053

Sample Info : CHIRALPAK IF,30%IPA-Hexane, .7 mL/min, 254 nm

(S)-6-(2-Bromophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3m)



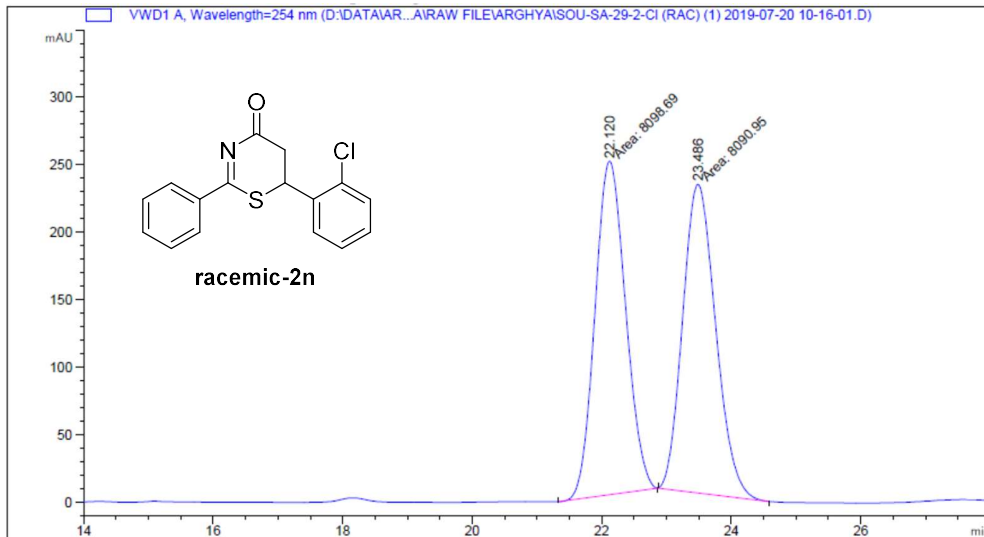
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	25.353	MM	0.5906	6086.64160	171.77419	50.5183
2	28.964	MM	0.5984	5961.74756	166.03732	49.4817



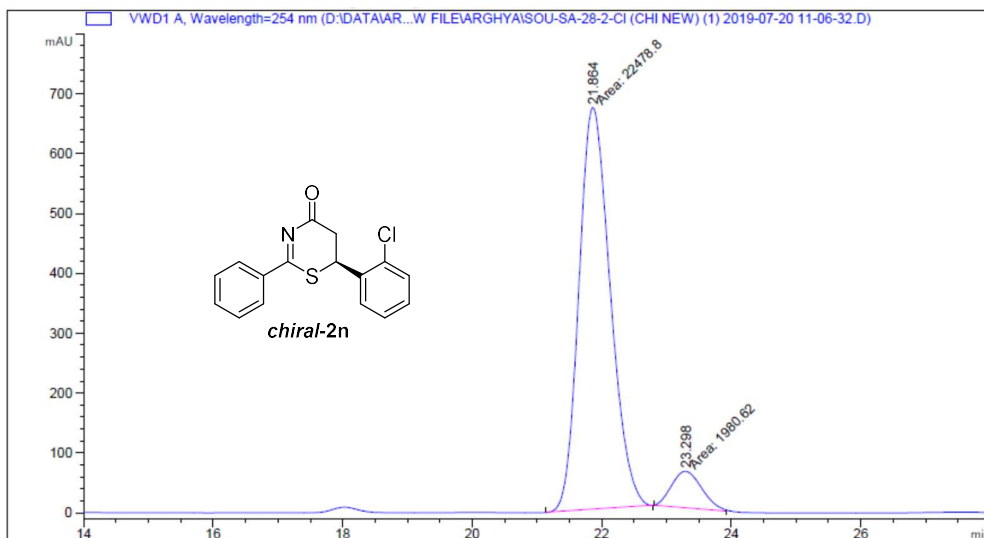
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	25.437	MM	0.5632	3891.83813	115.17988	9.0546
2	28.740	MM	0.6489	3.90902e4	1003.95044	90.9454

Sample Info : CHIRALPAK IF, 20%IPA-Hexane, .7 mL/min, 254 nm

(S)-6-(2-Chlorophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3n)



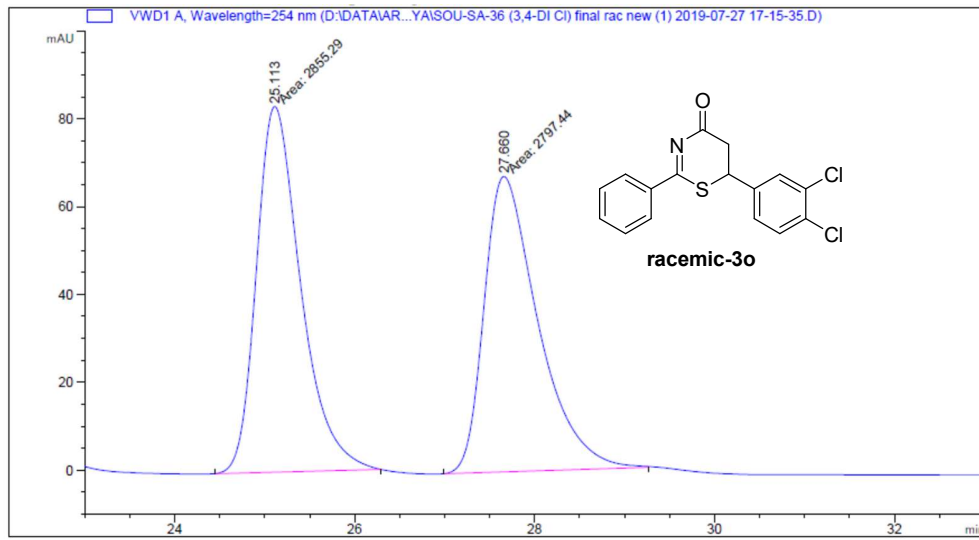
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	22.120	MM	0.5461	8098.68652	247.15506	50.0239
2	23.486	MM	0.5895	8090.95215	228.75598	49.9761



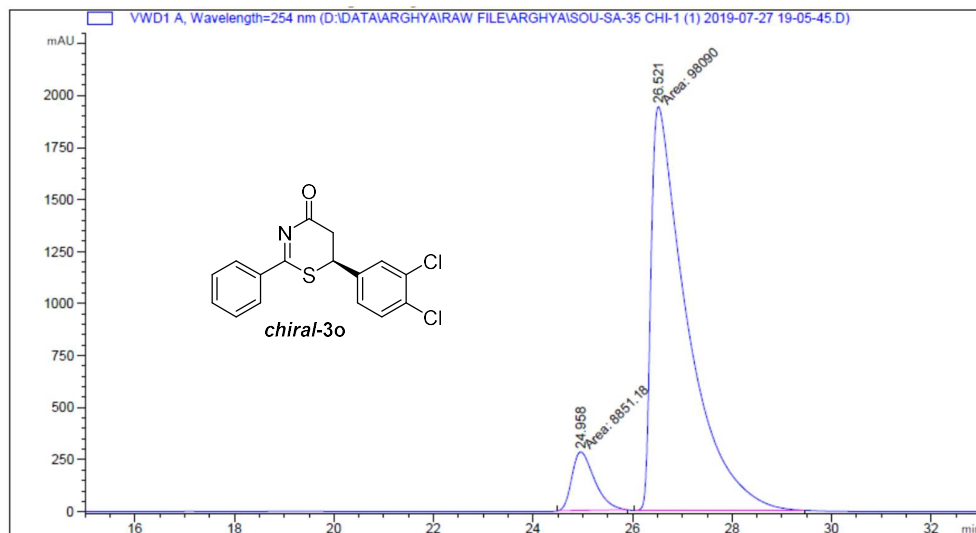
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	21.864	MM	0.5587	2.24788e4	670.57819	91.9024
2	23.298	MM	0.5410	1980.61902	61.02032	8.0976

Sample Info : CHIRALPAK IC, 30%IPA-Hexane, 1.0 mL/min, 254 nm

(S)-6-(3,4-Dichlorophenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3o)



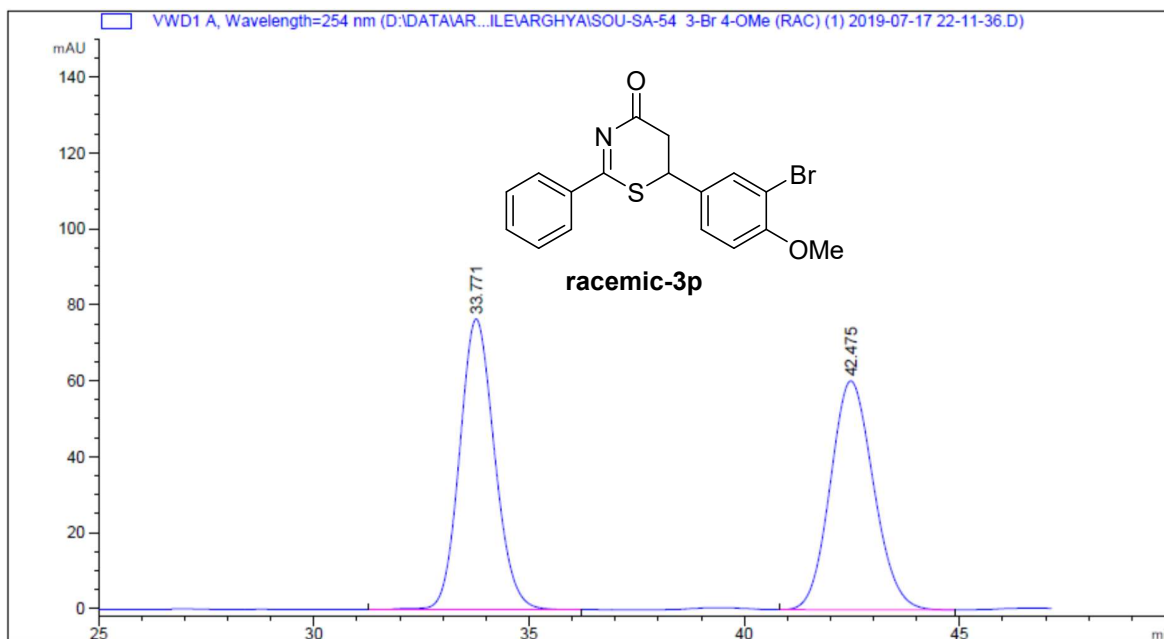
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	25.113	MM	0.5716	2855.29150	83.25730	50.5117
2	27.660	MM	0.6933	2797.43921	67.24760	49.4883



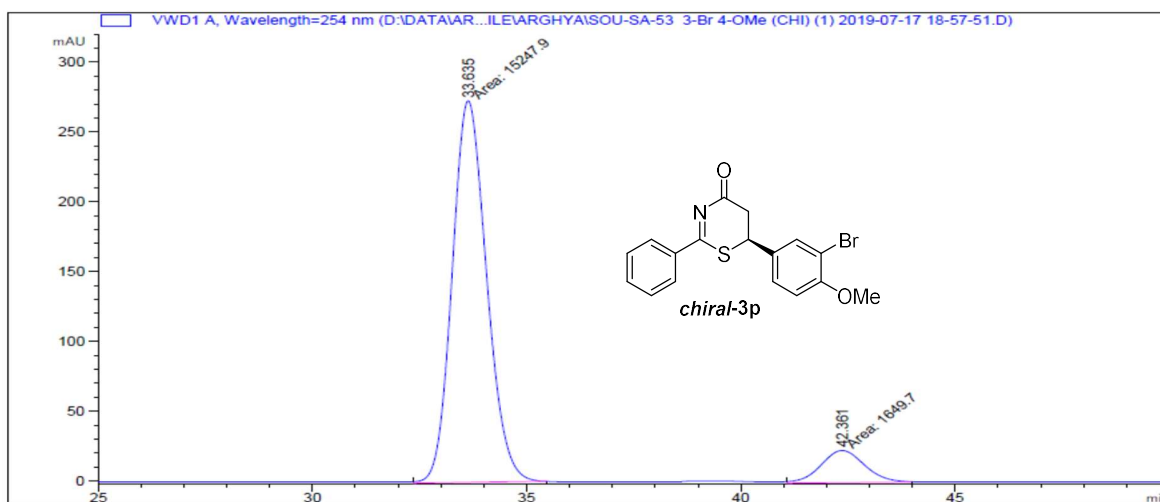
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	24.958	MM	0.5252	8851.18359	280.89914	8.2767
2	26.521	MM	0.8425	9.80900e4	1940.42114	91.7233

Sample Info : CHIRALPAK IF, 20%IPA-Hexane .7 mL/min, 254 nm

(S)-6-(3-Bromo-4-methoxyphenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3p)



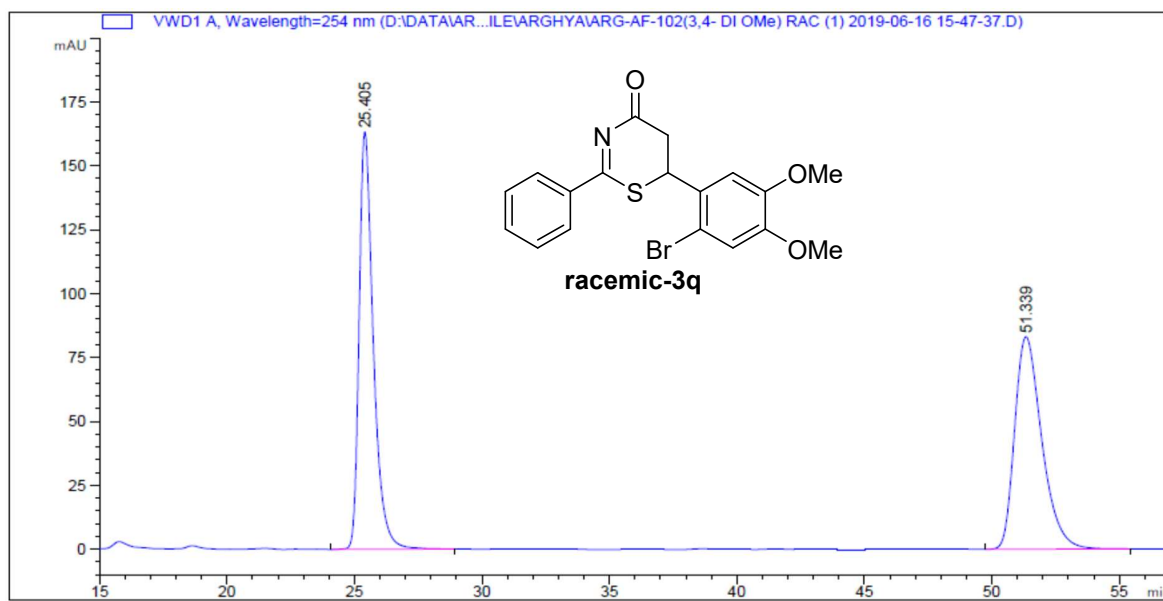
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	33.771	BB	0.8723	4312.16406	76.53898	50.5818
2	42.475	BB	1.0854	4212.97168	60.27555	49.4182



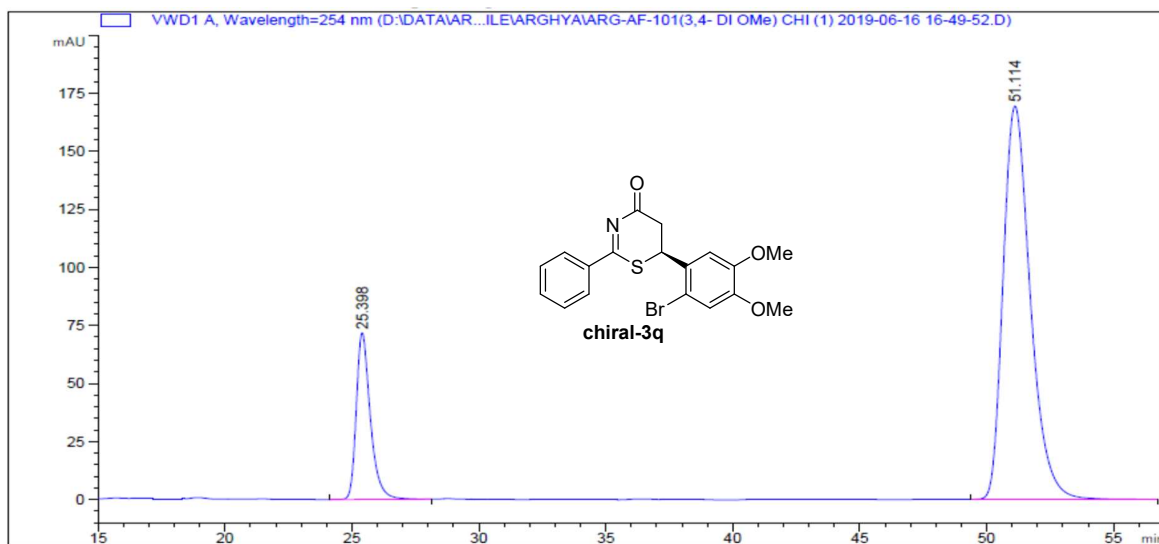
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	33.635	MM	0.9298	1.52479e4	273.30862	90.2371
2	42.361	MM	1.1916	1649.69641	23.07449	9.7629

Sample Info : CHIRALPAK IC, 30%IPA-Hexane, 1.0 mL/min, 254 nm

(S)-6-(2-Bromo-4,5-dimethoxyphenyl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3q)



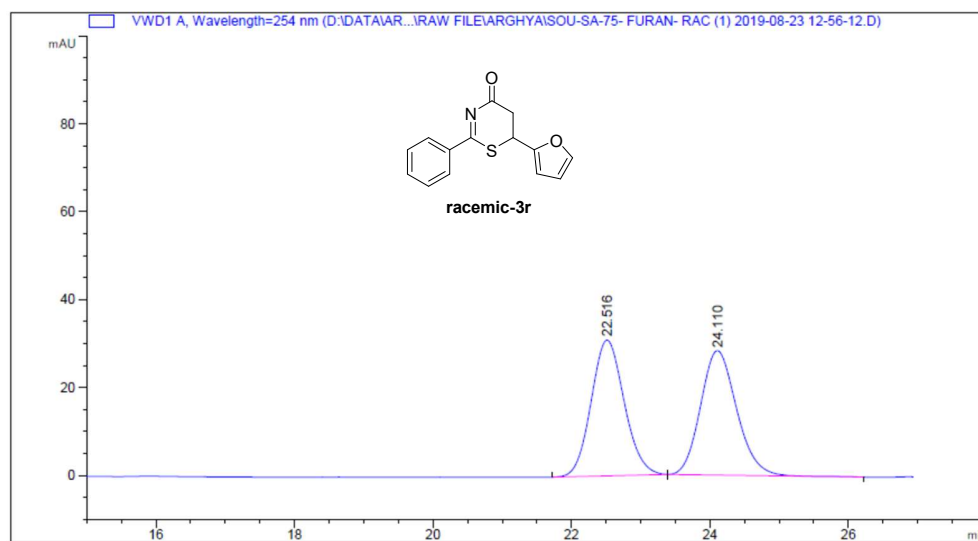
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	25.405	BB	0.5836	6333.69629	163.25160	50.7532
2	51.339	BB	1.1387	6145.71240	83.11047	49.2468



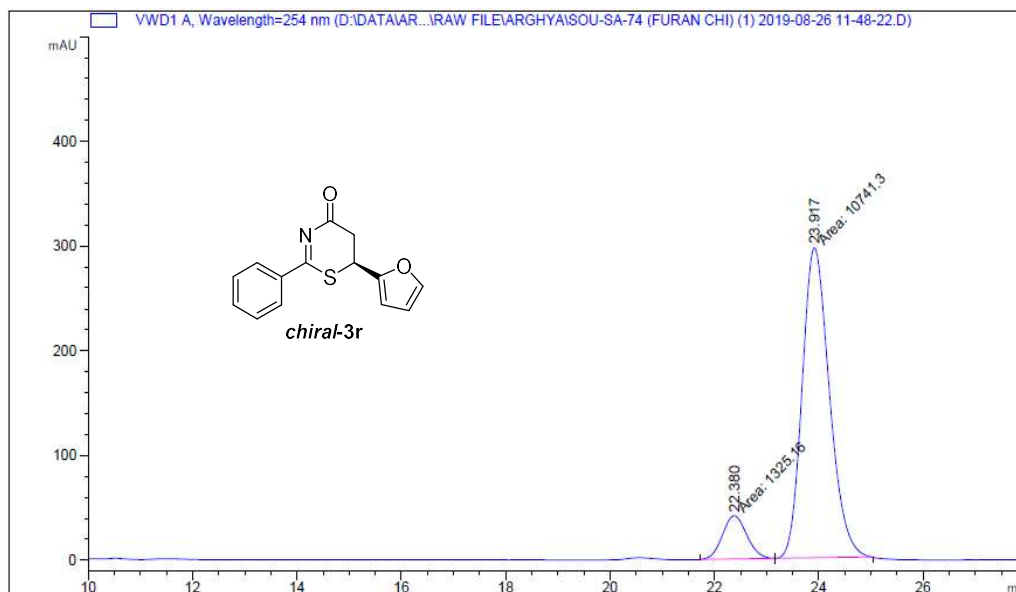
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	25.398	BB	0.5824	2764.01709	71.75471	17.9945
2	51.114	BBA	1.1488	1.25963e4	169.33673	82.0055

Sample Info : CHIRALPAK IF, 30%IPA-Hexane, .7 mL/min, 254 nm

(S)-6-(Furan-2-yl)-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3r)



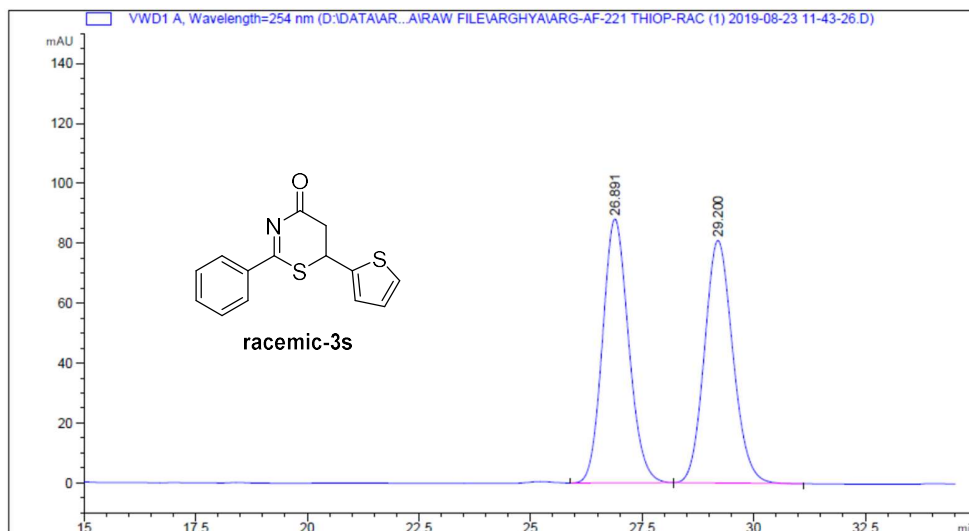
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
7	22.516	BB	0.5135	1022.64343	30.87194	42.2228
8	24.110	BB	0.5613	1024.64648	28.30993	42.3055



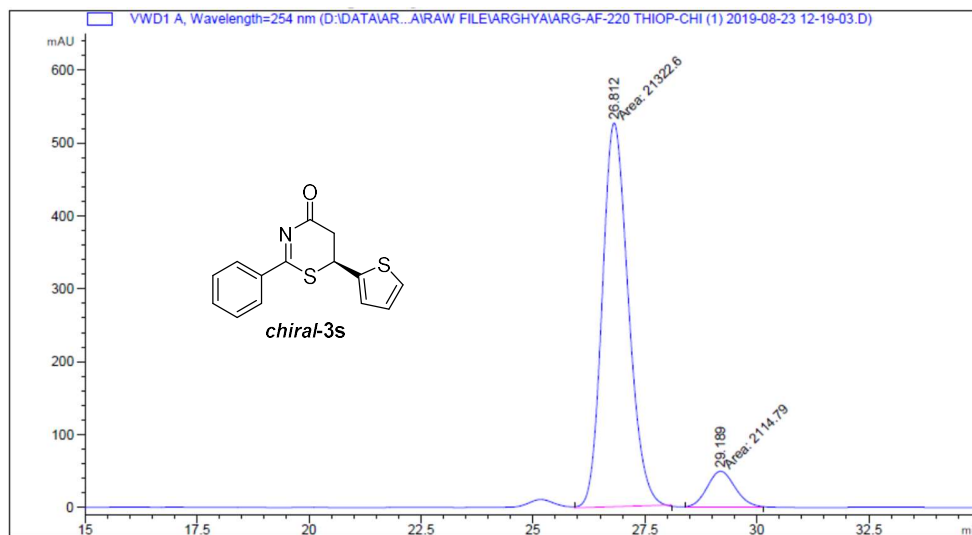
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	22.380	MM	0.5368	1325.15955	41.14085	10.9822
2	23.917	MM	0.6047	1.07413e4	296.04379	89.0178

Sample Info : CHIRALPAK IC, 30% IPA-HEXANE, 1 mL -min, 254 nm

(S)-2-Phenyl-6-(thiophen-2-yl)-5,6-dihydro-4H-1,3-thiazin-4-one (3s)



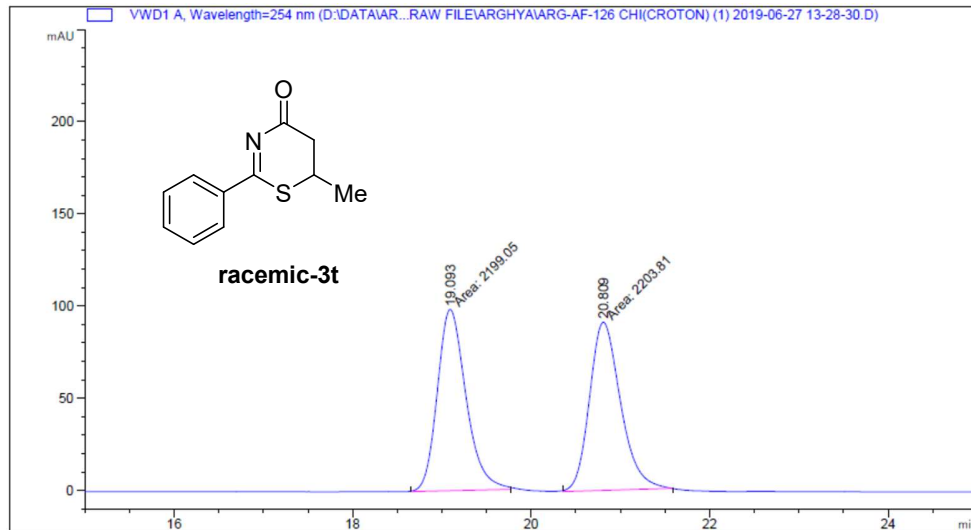
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	26.891	BB	0.6273	3572.09741	88.04857	49.9841
2	29.200	BB	0.6844	3574.37012	80.91721	50.0159



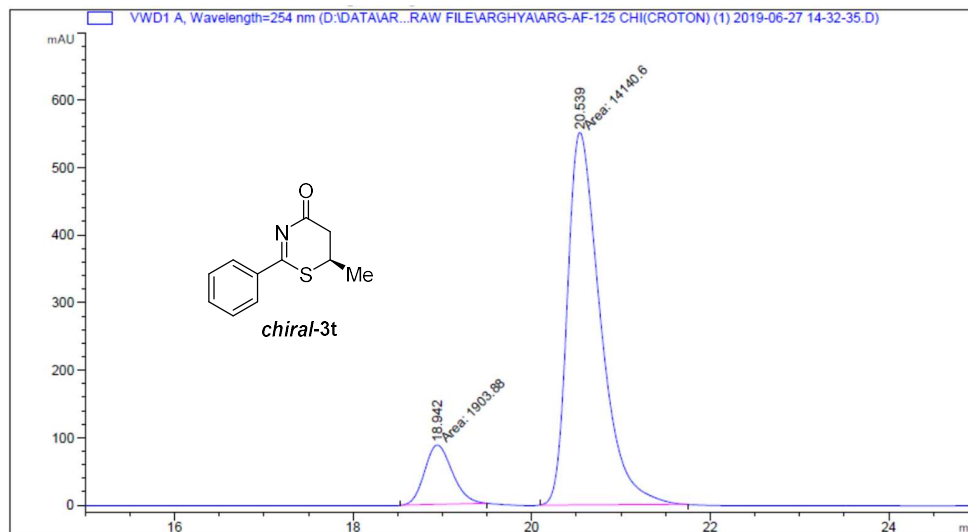
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	26.812	MM	0.6749	2.13226e4	526.57684	90.9768
2	29.189	MM	0.7197	2114.79199	48.97361	9.0232

Sample Info : CHIRALPAK IC, 30% IPA-HEXANE, 1 mL -min, 254 nm

(R)-6-Methyl-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3t)



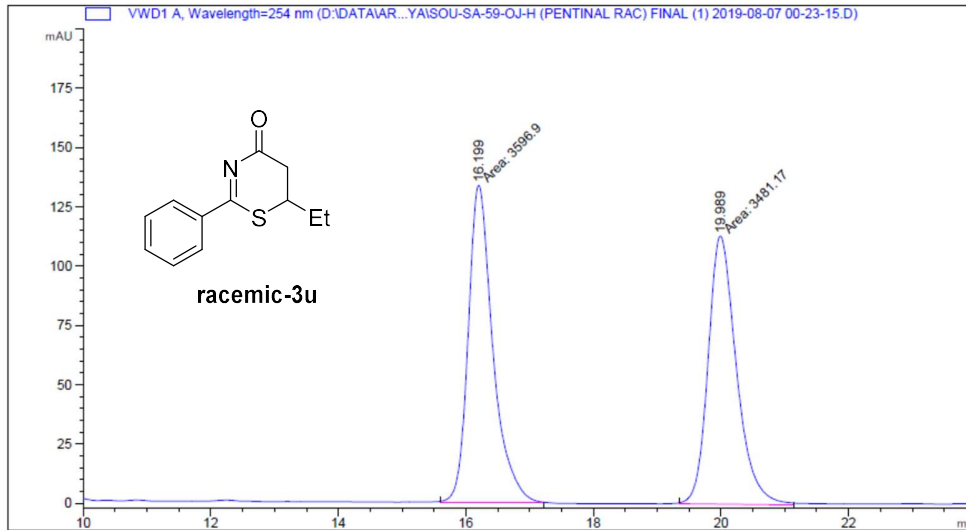
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	19.093	MM	0.3728	2199.05225	98.31226	49.9459
2	20.809	MM	0.4029	2203.81299	91.15805	50.0541



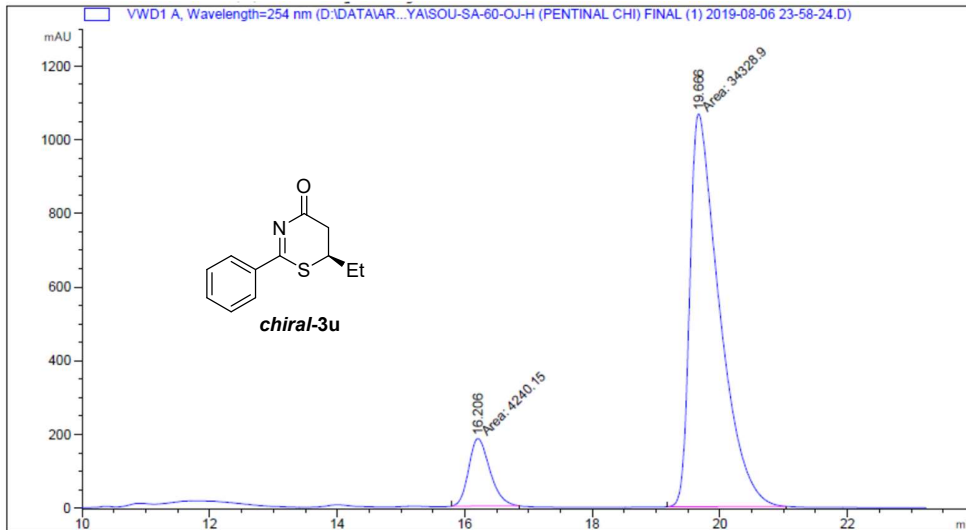
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	18.942	MM	0.3607	1903.88110	87.97055	11.8663
2	20.539	MM	0.4273	1.41406e4	551.54504	88.1337

Sample Info : CHIRALPAK IF, 20%IPA-Hexane, .7mL/min, 254 nm

(R)-6-Ethyl-2-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one(3u)



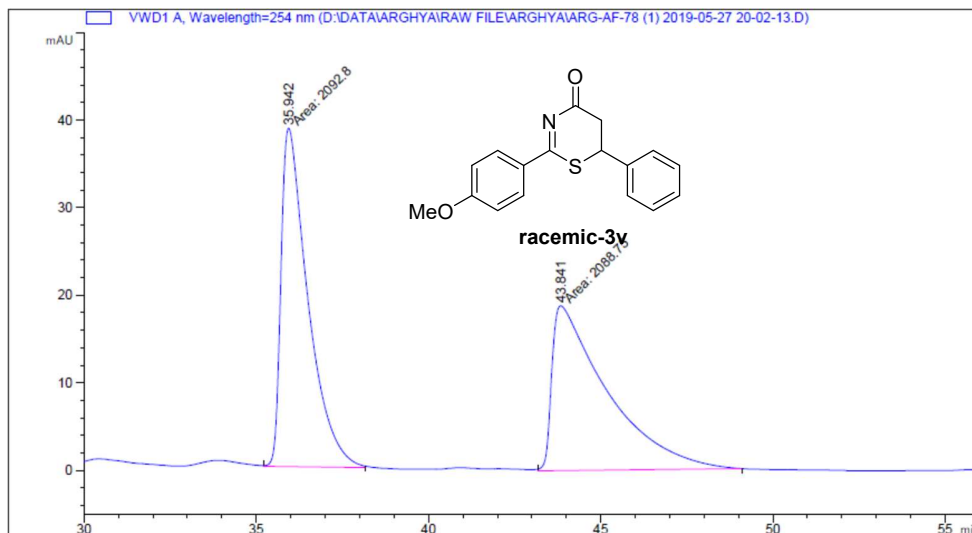
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.199	MM	0.4484	3596.89819	133.68478	50.8175
2	19.989	MM	0.5139	3481.16992	112.90457	49.1825



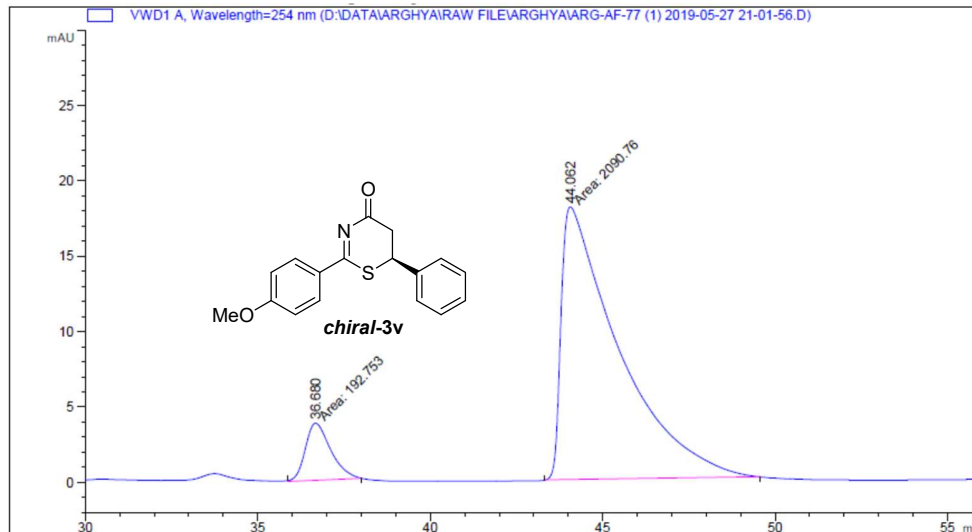
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.206	MM	0.3859	4240.14941	183.11447	10.9936
2	19.666	MM	0.5369	3.43289e4	1065.68323	89.0064

Sample Info : CHIRALCEL OJ-H, 15% IPA-HEXANE, 1 mL -min, 254 nm

(S)-2-(4-Methoxyphenyl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3v)



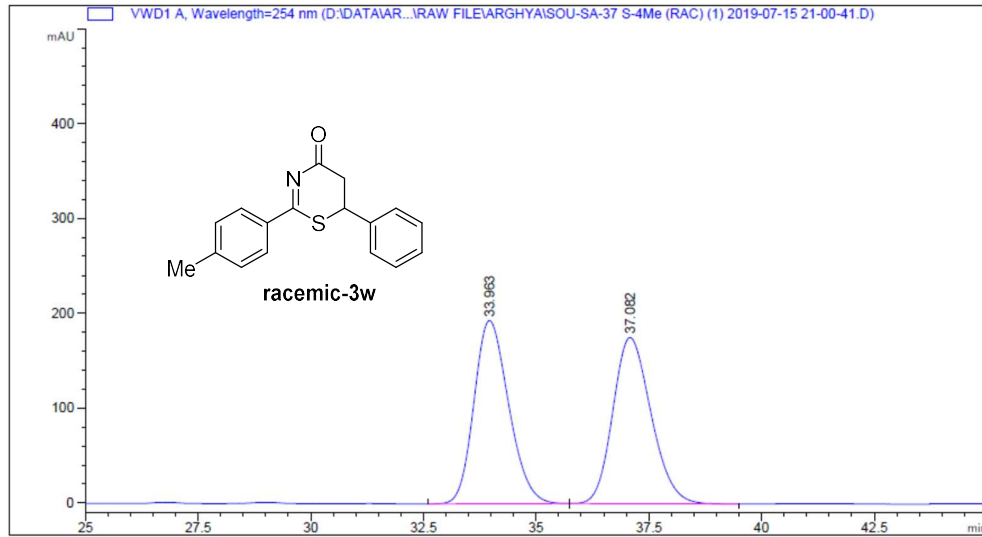
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	35.942	MM	0.9024	2092.80103	38.65309	50.0485
2	43.841	MM	1.8508	2088.74658	18.80948	49.9515



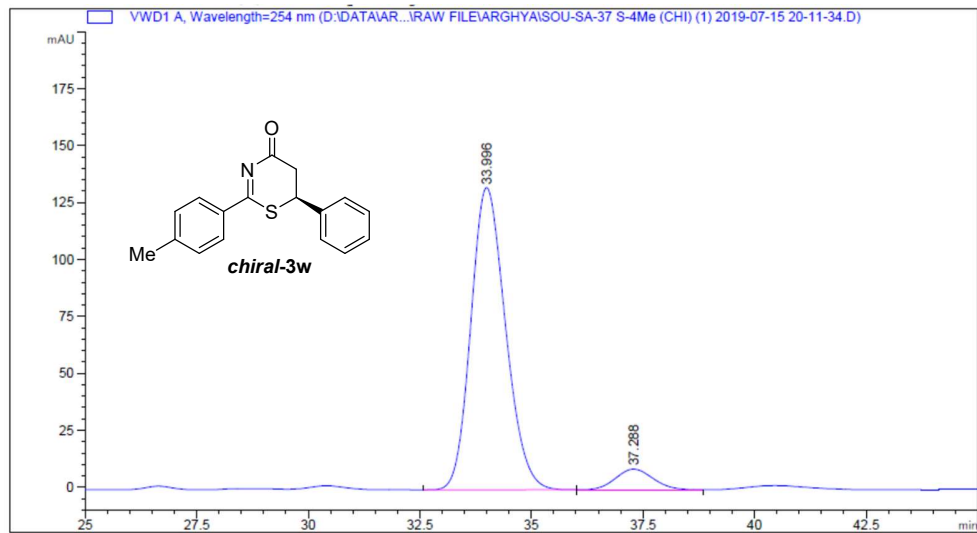
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	36.680	MM	0.8491	192.75259	3.78343	8.4411
2	44.062	MM	1.9275	2090.76172	18.07812	91.5589

Sample Info : CHIRALPAK IF, 25%IPA-Hexane, .7 mL/min, 254 nm

(S)-6-Phenyl-2-(p-tolyl)-5,6-dihydro-4H-1,3-thiazin-4-one (3w)



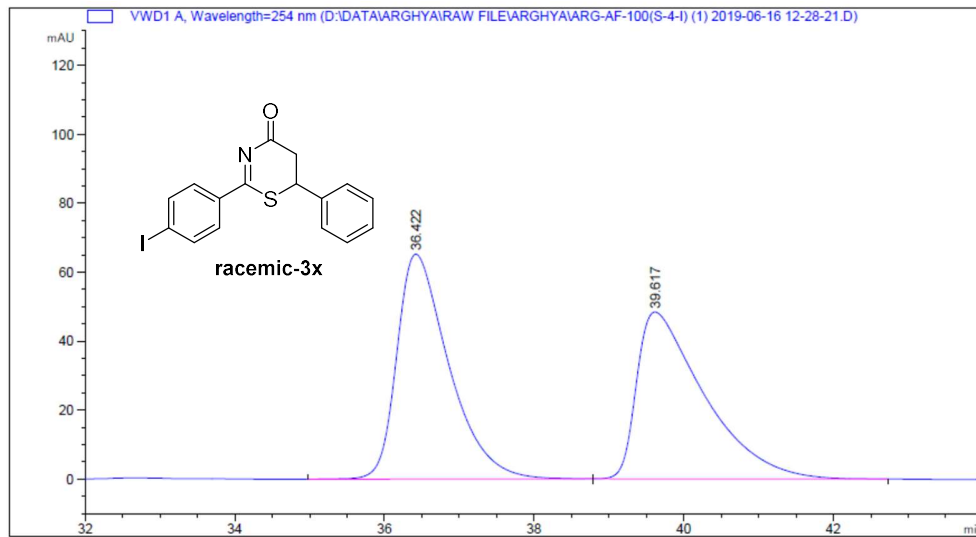
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	33.963	BB	0.8250	1.03289e4	193.10991	49.9838
2	37.082	BB	0.9125	1.03356e4	175.14085	50.0162



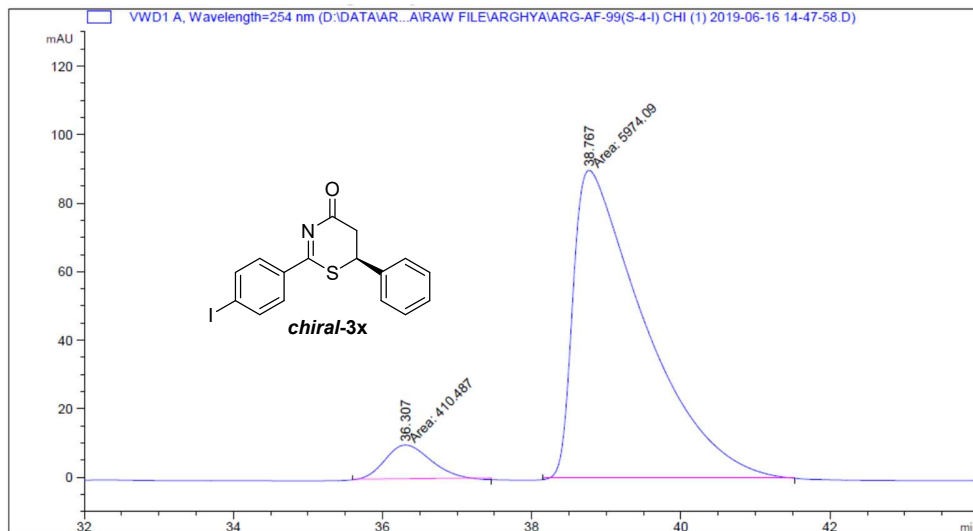
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	33.996	BB	0.8373	7167.71729	132.67072	93.1411
2	37.288	BB	0.8996	527.83197	9.04783	6.8589

Sample Info : CHIRALPAK IC, 30%IPA-Hexane, 1.0 mL/min, 254 nm

(S)-2-(4-Iodophenyl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3x)



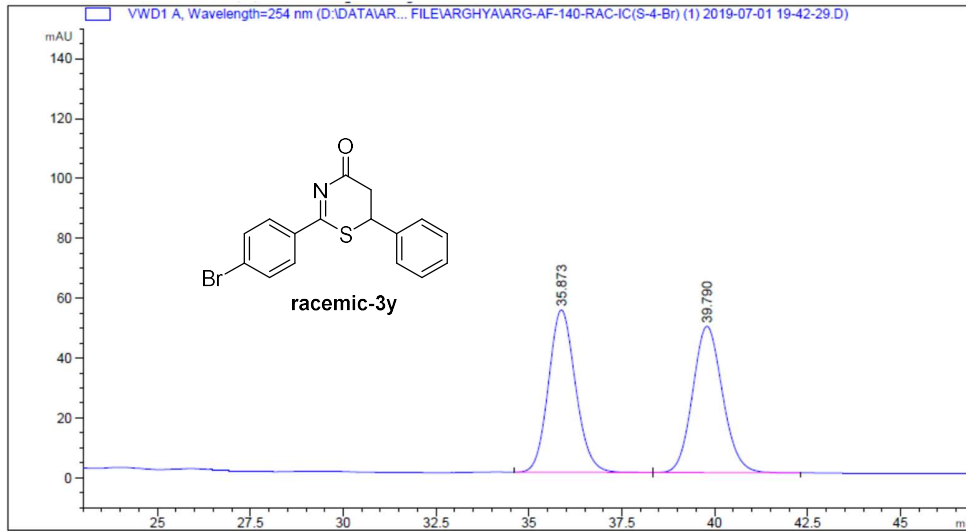
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	36.422	MM	0.7904	3070.11572	64.73603	50.3502
2	39.617	BB	0.9001	3027.41357	48.37505	49.6498



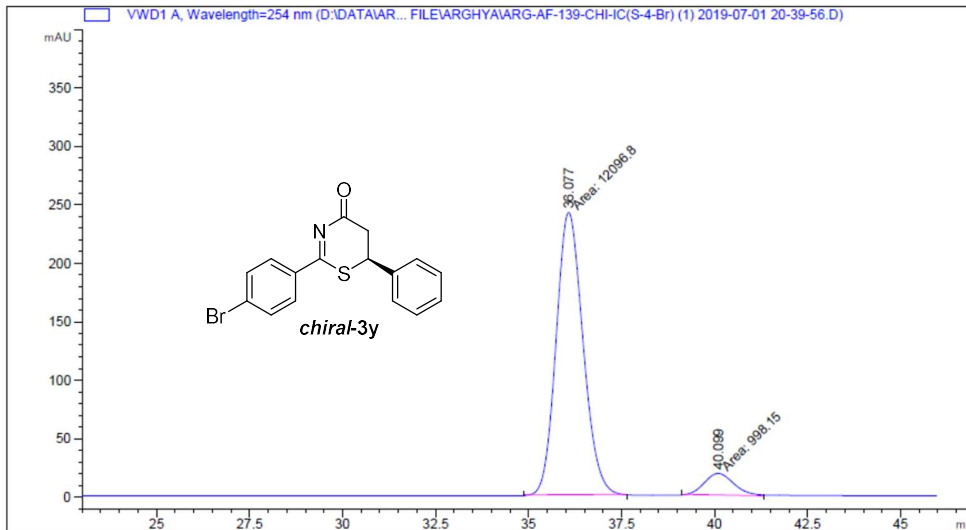
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	36.307	MM	0.6958	410.48712	9.83285	6.4294
2	38.767	MM	1.1093	5974.09326	89.75626	93.5706

Sample Info : CHIRALPAK IF, 20%IPA-Hexane, .7 mL/min, 254 nm

(S)-2-(4-Bromophenyl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3y)



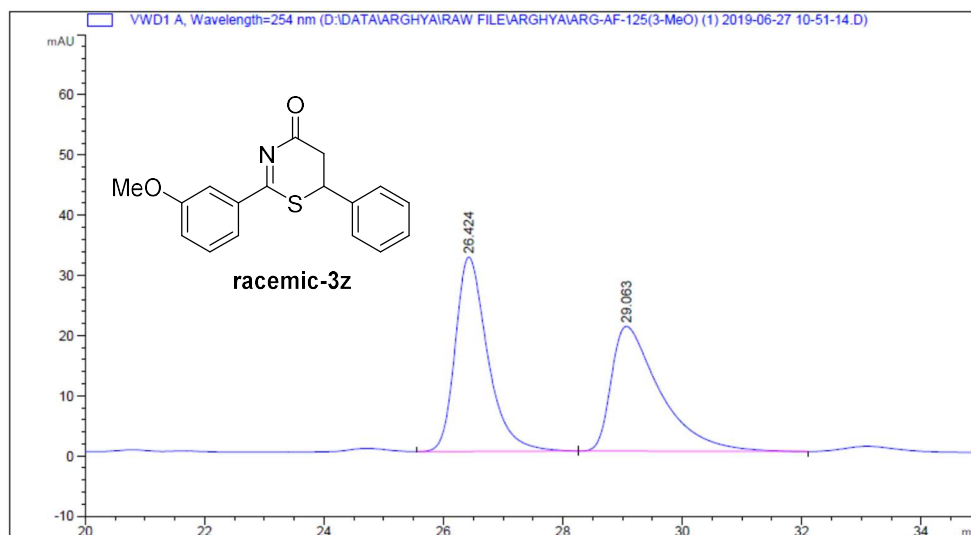
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	35.873	BB	0.7789	2740.54150	54.20215	49.9892
2	39.790	BB	0.8683	2741.72754	48.88553	50.0108



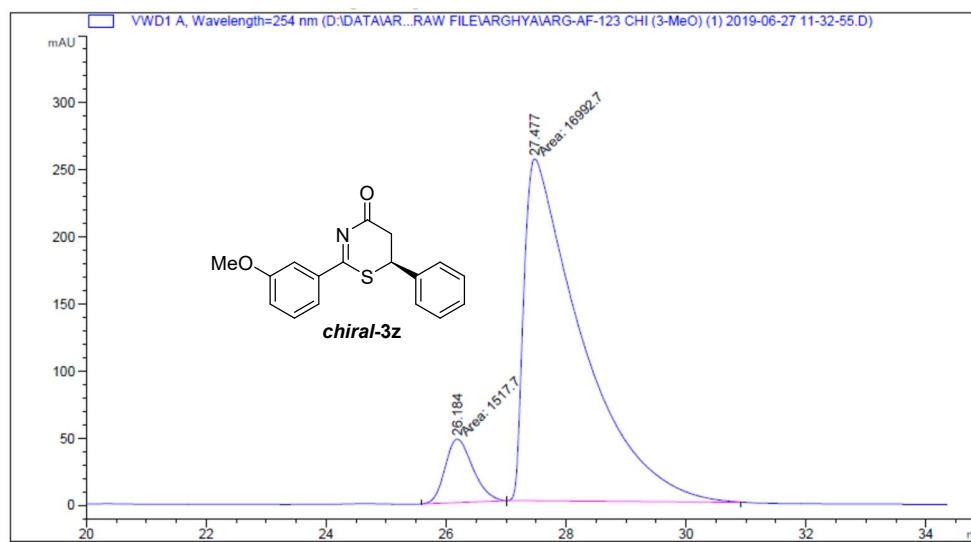
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	36.077	MM	0.8354	1.20968e4	241.32469	92.3776
2	40.099	MM	0.9060	998.15027	18.36099	7.6224

Sample Info : CHIRALPAK IC, 30%IPA-Hexane, .7mL/min, 254 nm

(S)-2-(3-Methoxyphenyl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3z)



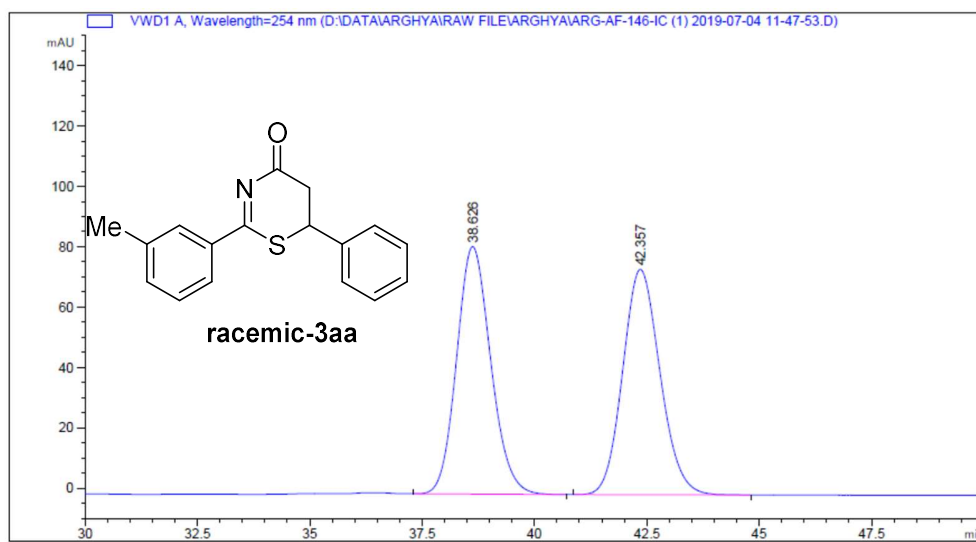
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	26.424	BB	0.5709	1217.37878	32.28959	50.8087
2	29.063	BB	0.8272	1178.62769	20.73383	49.1913



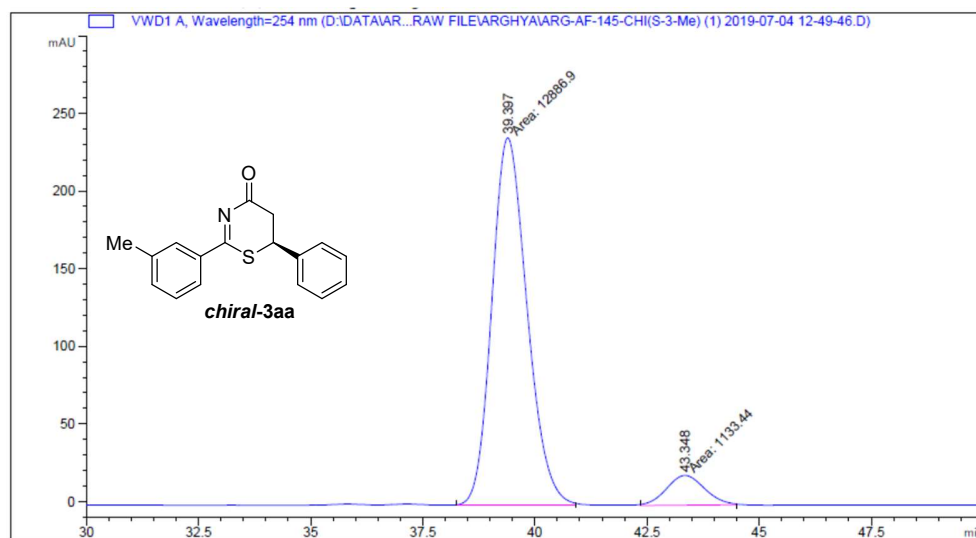
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	26.184	MM	0.5342	1517.69873	47.35447	8.1992
2	27.477	MM	1.1118	1.69927e4	254.73312	91.8008

Sample Info : CHIRALPAK IF, 30%IPA-Hexane, .7mL/min, 254 nm

(S)-6-Phenyl-2-(m-tolyl)-5,6-dihydro-4H-1,3-thiazin-4-one (3aa)



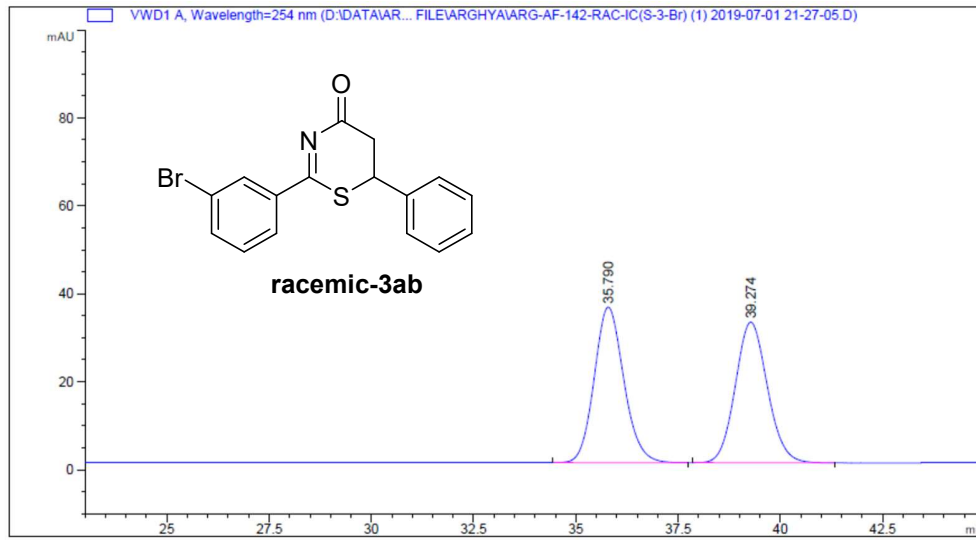
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	38.626	MM	0.8771	4310.63379	81.91376	49.8543
2	42.357	MM	0.9663	4335.83789	74.78542	50.1457



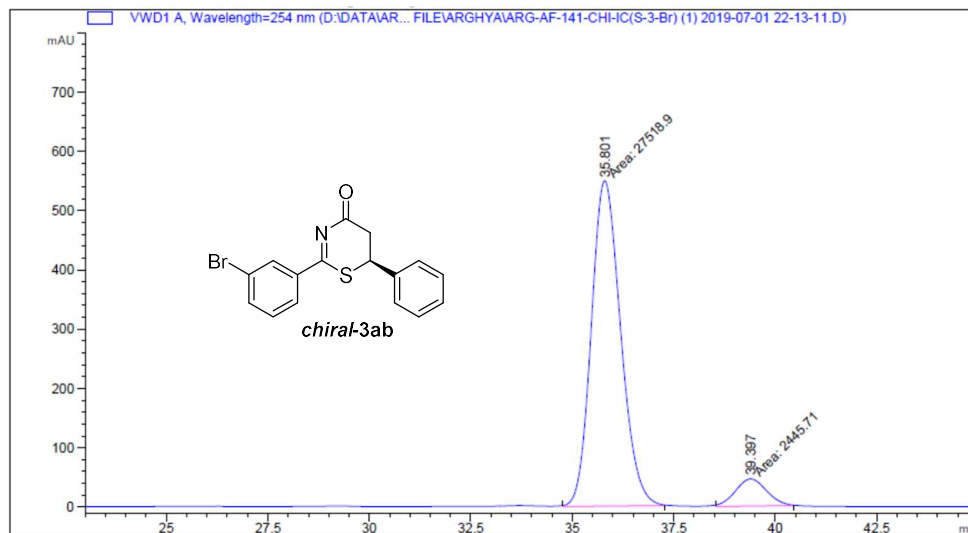
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	39.397	MM	0.9082	1.28869e4	236.49605	91.9157
2	43.348	MM	0.9861	1133.44165	19.15601	8.0843

Sample Info : CHIRALPAK IC, 30%IPA-Hexane, .7mL/min, 254 nm

(S)-2-(3-Bromophenyl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3ab)



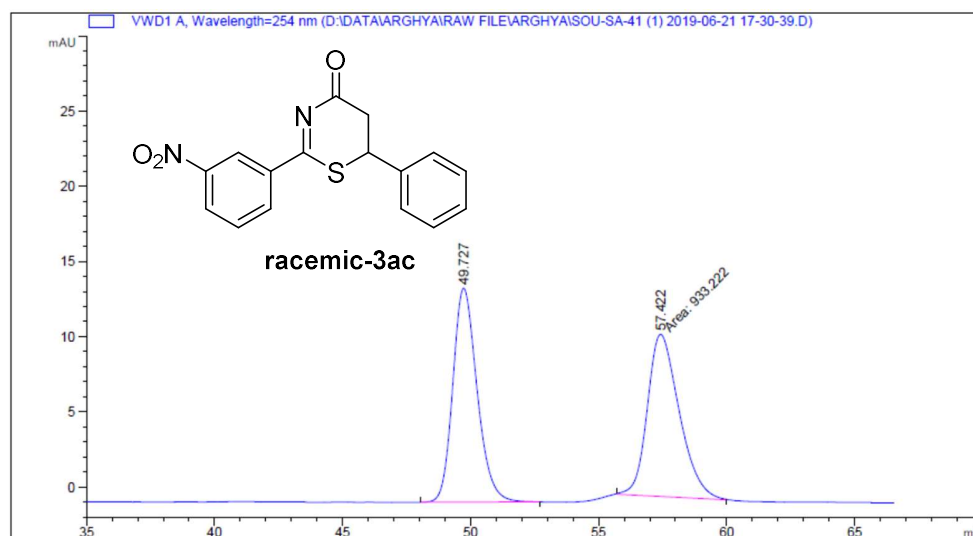
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	35.790	MM	0.8357	1769.66138	35.29260	50.5111
2	39.274	MM	0.9054	1733.84521	31.91601	49.4889



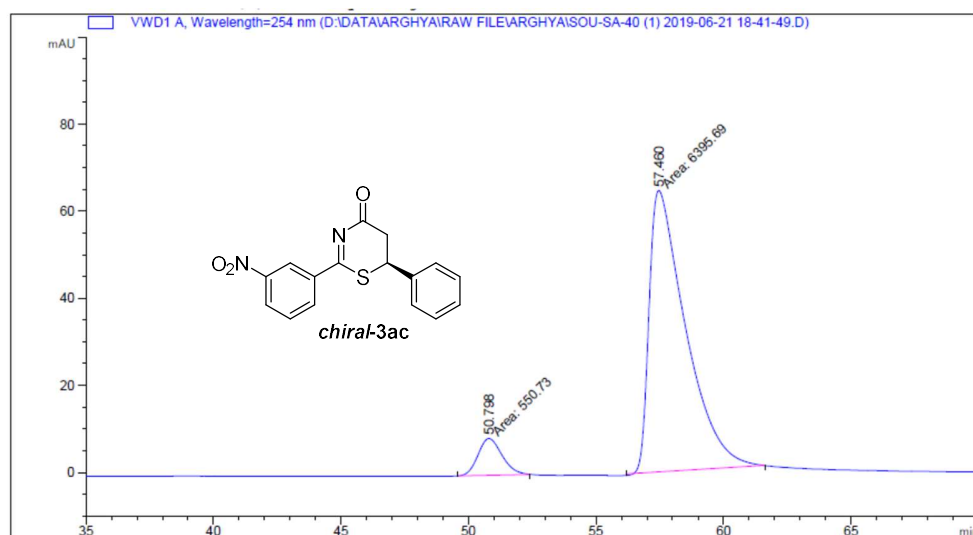
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	35.801	MM	0.8360	2.75189e4	548.63593	91.8380
2	39.387	MM	0.8917	2445.70630	45.71149	8.1620

Sample Info : CHIRALPAK IC, 30%IPA-Hexane, .7mL/min, 254 nm

(S)-2-(3-Nitrophenyl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3ac)



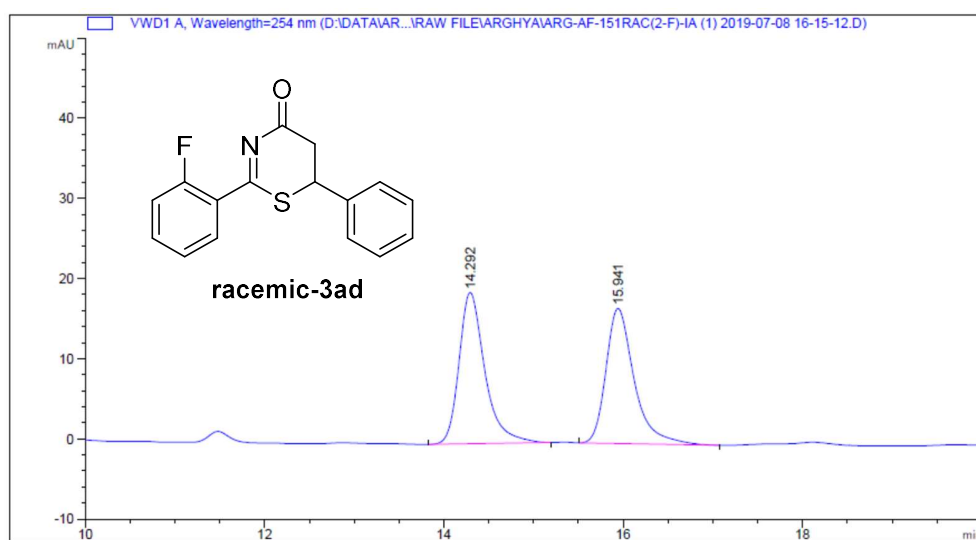
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	49.727	BB	1.0049	940.40686	14.23176	50.1917
2	57.422	MM	1.4432	933.22174	10.77695	49.8083



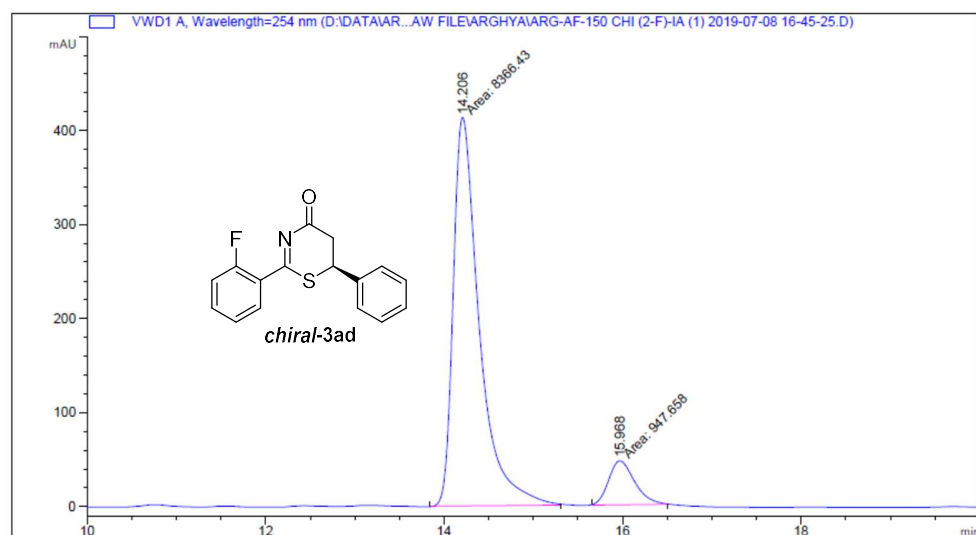
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	50.798	MM	1.0883	550.72992	8.43414	7.9283
2	57.460	MM	1.6505	6395.68506	64.58376	92.0717

Sample Info : CHIRALPAK IF, 30%IPA-Hexane, .7 mL/min, 254 nm

(S)-2-(2-Fluorophenyl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3ad)



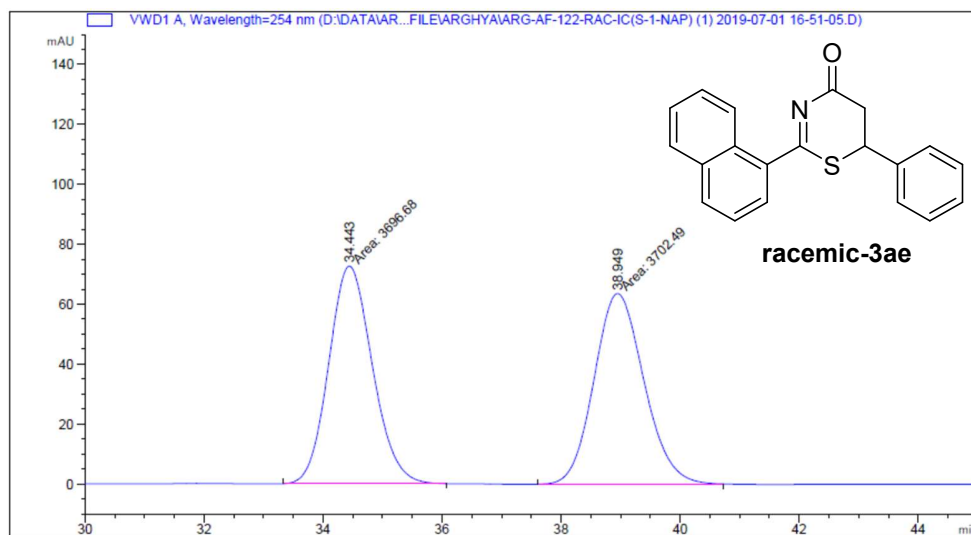
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	14.292	MM	0.3280	369.79791	18.78974	50.2468
2	15.941	MM	0.3629	366.16458	16.81887	49.7532



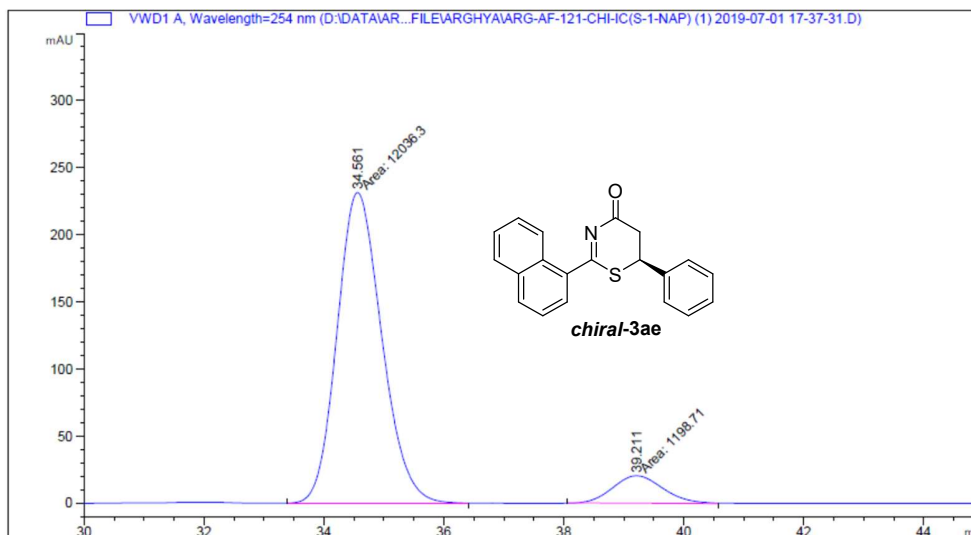
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	14.206	MM	0.3375	8366.42578	413.19446	89.8255
2	15.968	MM	0.3379	947.65753	46.74651	10.1745

Sample Info : CHIRALPAK IA, 20%IPA-Hexane, .7 mL/min, 254 nm

(S)-2-(Naphthalen-1-yl)-6-phenyl-5,6-dihydro-4H-1,3-thiazin-4-one (3ae)



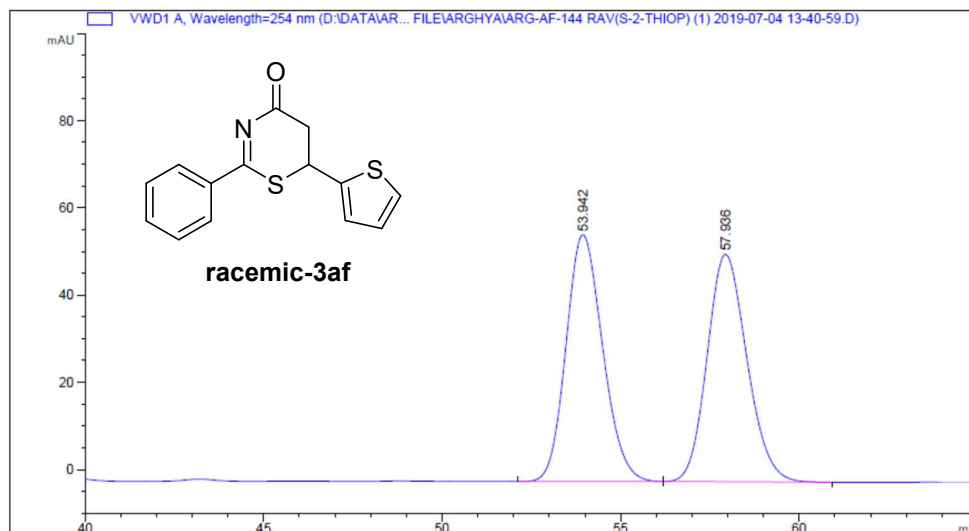
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	34.443	MM	0.8490	3696.67944	72.57103	49.9607
2	38.949	MM	0.9705	3702.48975	63.58062	50.0393



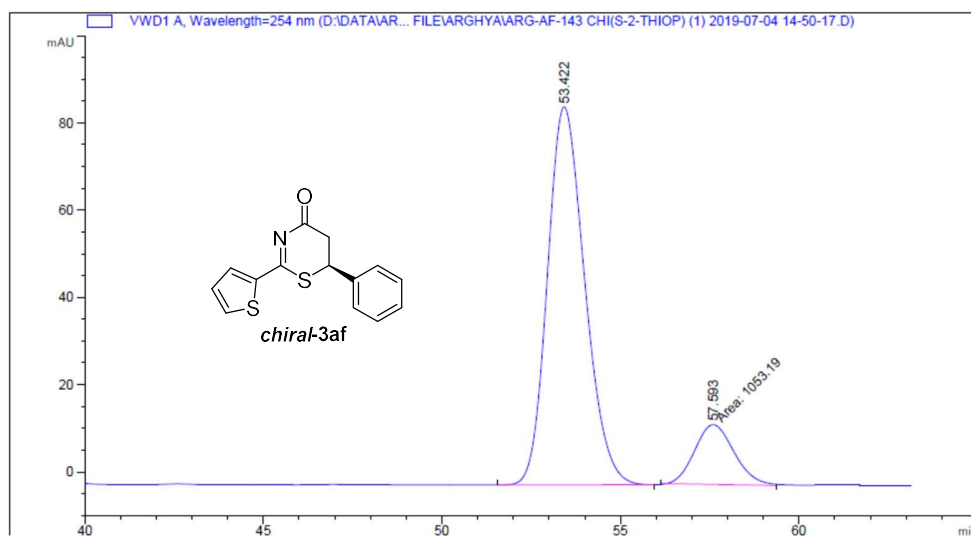
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	34.561	MM	0.8651	1.20363e4	231.87981	90.9428
2	39.211	MM	0.9743	1198.71143	20.50633	9.0572

Sample Info : CHIRALPAK IC, 40%IPA-Hexane, .7mL/min, 254 nm

(S)-6-Phenyl-2-(thiophen-2-yl)-5,6-dihydro-4H-1,3-thiazin-4-one (3af)



Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	53.942	BB	1.1077	4034.45703	56.59589	50.0037
2	57.936	BB	1.1929	4033.85815	52.12082	49.9963



Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	53.422	BB	1.1145	6288.43115	86.66669	85.6545
2	57.593	MM	1.2807	1053.18921	13.70635	14.3455

Sample Info : CHIRALPAK IC, 30%IPA-Hexane, .7mL/min, 254 nm