Supporting Information

Dual Function of Carbon tetrachloride: Synthesis of Chlorinated Heterocycles

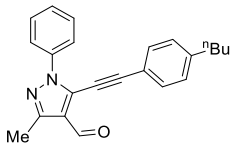
Shiv Kumar,[#] Rakesh K. Saunthwal, [#] Kapil Mohan Saini and Akhilesh K. Verma*

Synthetic Organic Chemistry Research Laboratory, Department of Chemistry, University of Delhi, Delhi- 110007, India

General Experimental

General Method. ^{1}H NMR (400 MHz) and ^{13}C NMR(100 MHz) spectra were recorded in $CDCl_3$. Chemical shifts for protons and carbons are reported in ppm from tetramethylsilane and are referenced to the carbon resonance of the solvent. Data arereported as follows: chemical shift, multiplicity (s = singlet, d = doublet, t = triplet, m = multiplet, coupling constants in Hertz and integration. High-resolution mass spectra were recorded on electrospray mass spectrometer. Crystal structure analysiswas accomplished on single needles X-ray diffractometer. TLC analysis was performed on commercially prepared 60 F_{254} silica gel plates andvisualized by either UV irradiation or by staining with I_2. All purchased chemicals were used as received. All melting points are uncorrected.

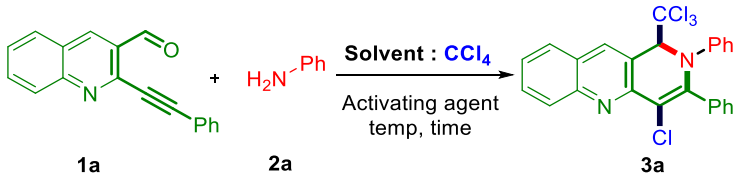
Starting Materials Synthesis: The starting materials **1** were prepared by Sonogashira coupling using the reported procedure. The structure and purity of known starting materials were confirmed by comparison of their physical and spectral data (^{1}H NMR and ^{13}C NMR) with those reported in literature[1]



5-((4-Butylphenyl)ethynyl)-3-methyl-1-phenyl-1*H*-pyrazole-4-carbaldehyde (1x). The product was obtained as a brown solid, mp: 98–100^{o}C (153.9 mg, 90%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 10.15 (s, 1H), 7.83–7.81 (m, 2H), 7.51–7.47 (m, 2H), 7.41–7.37 (m, 3H), 7.16 (d, J = 7.8 Hz, 2H), 2.60 (t, J = 7.8 Hz, 2H), 2.57 (s, 3H), 1.61–1.54 (m, 2H), 1.38–1.25 (m, 2H), 0.91 (t, J = 7.4 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 185.0, 150.9, 145.6, 138.9, 131.8, 131.0, 129.1, 128.9, 128.4, 123.5, 123.4, 118.1, 101.8, 75.5, 35.8, 33.4, 22.4, 14.0, 13.6; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{23}H_{22}N_2O]$ 343.1810, found 343.1813.

[1] (a) A. K. Verma, V. Rustagi, T. Aggarwal, A. P. Singh, *J. Org. Chem.* 2010, **75**, 7691–7703. (b) T. Aggarwal, M. Imam, N. K. Kaushik, V. S. Chauhan, A. K. Verma, *ACS Comb Sci.* 2011, **13**, 530–536. (c) V. Rustagi, R. K. Tiwari, A. K. Verma, *Eur. J. Org. Chem.* 2012, **24**, 4590–4602. (d) V. Rustagi, T. Aggarwal, A. K. Verma, *Green Chem.* 2011, **13**, 1640–1643. (e) S. P. Shukla, R. K. Tiwari, A. K. Verma, *Tetrahedron* 2012, **68**, 9035–9044. (f) A. K.Verma, D. Choudhary, R. K. Saunthwal, V. Rustagi, M. Patel, R. K. Tiwari, *J. Org. Chem.* 2013, **78**, 6657–6669. (g) R. R. Jha, R. K. Saunthwal, A. K.Verma, *Org. Biomol. Chem*. 2014, **12**, 552–556. (h) R. R. Jha, A. K. Danodia, S. Kumar, A. K. Verma, *Tetrahedron Lett.* 2014, **55**, 610–615. (i) S. Kumar, C. Cruz, S. Pal, R. K. Saunthwal, R. K. Tiwari, E. Juaristi, A. K. Verma, *J. Org. Chem.* 2015, **80**, 10548–10560. (j) P. K. Mishra, A. K. Verma, *Green Chem.* 2016, **18**, 6367–6372**.** (k) S. Pal, D. Choudhary, M. Jainth, S. Kumar, R. K. Tiwari, A. K. Verma, *J. Org. Chem.* 2016, **81**, 9356–9371.

Table 1. Optimising the tandem cyclization

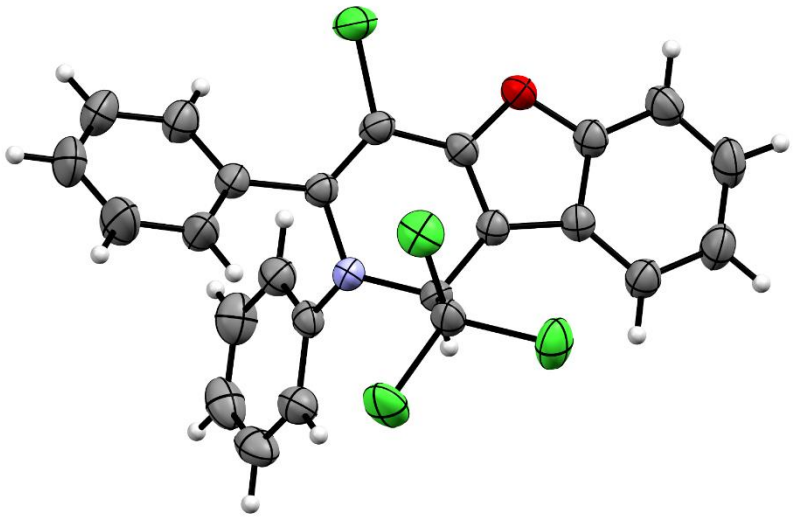


1a 2a 3a

Entry	Activating agent	Solvent	Temp (^oC)	Time (h)	Yield (%)[b] 3a
1	AgOTf	carbon tetrachloride	80	24	-
2	AgOTf	Dichloromethane	80	24	-
3	K_2CO_3	carbon tetrachloride	80	24	-
4	Et_3N	carbon tetrachloride	80	24	-
5	AgOTf	1,2-dichloroethane : carbon tetrachloride (9:1)	80	16	20
6	-	1,2-dichloroethane : carbon tetrachloride (9:1)	80	16	80
7	-	1,2-dichloroethane : carbon tetrachloride (9:1)	100	12	87
8	-	1,2-dichloroethane : carbon tetrachloride (9:1)	120	10	84
9	-	1,2-dichloroethane : carbon tetrachloride(9:1)	100	10	65[c]
10	-	tetrahydrofuran : carbon tetrachloride (9:1)	100	12	60
11	-	1,4-dioxane : carbon tetrachloride (9:1)	100	12	50
12	-	*N*,*N*-dimethylformaldehyde: carbon tetrachloride (9:1)	100	16	65
13	-	dimethyl sulfoxide : carbon tetrachloride (9:1)	100	16	40
14		*N*-Methyl-2-pyrrolidone : carbon tetrachloride (9:1)	100	16	45
15	-	1,2-dichloroethane : carbon tetrachloride (1:1)	100	16	50
16	-	carbon tetrachloride	100	10	25

[a]Reaction conditions: 2-(phenylethynyl)quinoline-3-carbaldehyde **1a** (0.50 mmol), aniline **2a** (0.51 mmol), solvent (2.0 mL), heated in a sealed tube. [b]Isolated yield. [c]30% SM was recovered.

Table 2. Crystal data and structure refinement for **5a**.



Identification code	shelx	
Empirical formula	C24 H15 Cl4 N O	
Formula weight	475.17	
Temperature	293(2) K	
Wavelength	0.71073 Å	
Crystal system	Monoclinic	
Space group	P 21/c	
Unit cell dimensions	a = 10.0953(5) Å	a= 90°.
	b = 26.4194(9) Å	b= 114.895(6)°.
	c = 8.7916(5) Å	g = 90°.
Volume	2126.9(2) $Å^3$	
Z	4	
Density (calculated)	1.484 Mg/m^3	
Absorption coefficient	0.573 mm^{-1}	
F(000)	968	
Crystal size	? x ? x ? mm^3	
Theta range for data collection	3.447 to 24.995°.	
Index ranges	-11<=h<=11, -31<=k<=31, -10<=l<=10	
Reflections collected	26358	
Independent reflections	3733 [R(int) = 0.0428]	
Completeness to theta = 24.995°	99.7 %	
Refinement method	Full-matrix least-squares on F^2	
Data / restraints / parameters	3733 / 0 / 275	
Goodness-of-fit on F^2	1.010	
Final R indices [I>2sigma(I)]	R1 = 0.0417, wR2 = 0.0946	

R indices (all data)	R1 = 0.0488, wR2 = 0.0985
Extinction coefficient	n/a
Largest diff. peak and hole	0.196 and -0.304 e.Å^{-3}

Table 3. Atomic coordinates (x 10^4) and equivalent isotropic displacement parameters (Å^{2}x 10^3)for **5a**. U(eq) is defined as one third of the trace of the orthogonalized U^{ij} tensor.

	x	y	z	U(eq)
Cl(1)	8354(1)	6643(1)	4314(1)	51(1)
Cl(2)	10948(1)	6511(1)	7366(1)	57(1)
Cl(4)	5170(1)	5399(1)	2498(1)	53(1)
Cl(3)	8806(1)	7249(1)	7202(1)	57(1)
O(1)	7910(2)	4983(1)	5229(2)	39(1)
N(1)	6711(2)	6324(1)	6505(2)	32(1)
C(19)	9723(2)	5331(1)	7565(3)	33(1)
C(8)	6084(2)	6361(1)	7696(3)	33(1)
C(7)	5757(2)	6114(1)	4928(3)	31(1)
C(16)	7535(2)	5466(1)	5453(3)	33(1)
C(14)	8290(2)	6229(1)	7176(3)	31(1)
C(17)	6157(2)	5683(1)	4413(3)	34(1)
C(15)	8572(2)	5699(1)	6793(3)	32(1)
C(1)	4427(2)	6417(1)	3978(3)	35(1)
C(20)	9271(3)	4906(1)	6532(3)	36(1)
C(24)	11049(3)	5312(1)	8979(3)	41(1)
C(9)	5008(3)	6022(1)	7620(3)	41(1)
C(13)	6530(3)	6735(1)	8926(3)	43(1)
C(21)	10067(3)	4468(1)	6790(4)	46(1)
C(2)	3060(3)	6198(1)	3143(3)	46(1)
C(23)	11849(3)	4866(1)	9286(4)	50(1)
C(18)	9051(3)	6636(1)	6535(3)	38(1)
C(10)	4377(3)	6063(1)	8726(4)	53(1)
C(12)	5883(3)	6766(1)	10031(3)	52(1)
C(22)	11381(3)	4457(1)	8204(4)	53(1)
C(6)	4560(3)	6936(1)	3873(4)	52(1)
C(11)	4802(3)	6435(1)	9925(4)	55(1)
C(3)	1869(3)	6496(1)	2207(4)	57(1)

C(4)	2020(3)	7008(1)	2074(4)	67(1)
C(5)	3365(3)	7226(1)	2909(4)	70(1)

Table 4. Bond lengths [Å] and angles [°] for **5a**.

Cl(1)-C(18)	1.775(3)
Cl(2)-C(18)	1.769(2)
Cl(4)-C(17)	1.726(2)
Cl(3)-C(18)	1.774(2)
O(1)-C(16)	1.370(3)
O(1)-C(20)	1.385(3)
N(1)-C(7)	1.426(3)
N(1)-C(8)	1.436(3)
N(1)-C(14)	1.470(3)
C(19)-C(24)	1.393(3)
C(19)-C(20)	1.394(3)
C(19)-C(15)	1.446(3)
C(8)-C(9)	1.387(3)
C(8)-C(13)	1.392(3)
C(7)-C(17)	1.347(3)
C(7)-C(1)	1.483(3)
C(16)-C(15)	1.350(3)
C(16)-C(17)	1.425(3)
C(14)-C(15)	1.496(3)
C(14)-C(18)	1.558(3)
C(14)-H(14)	0.96(2)
C(1)-C(6)	1.385(4)
C(1)-C(2)	1.387(3)
C(20)-C(21)	1.371(3)
C(24)-C(23)	1.389(4)
C(24)-H(24)	0.9300
C(9)-C(10)	1.372(4)
C(9)-H(9)	0.9300
C(13)-C(12)	1.383(4)
C(13)-H(13)	0.9300
C(21)-C(22)	1.385(4)
C(21)-H(21)	0.9300
C(2)-C(3)	1.382(4)
C(2)-H(2)	0.9300

C(23)-C(22)	1.385(4)
C(23)-H(23)	0.9300
C(10)-C(11)	1.373(4)
C(10)-H(10)	0.9300
C(12)-C(11)	1.370(4)
C(12)-H(12)	0.9300
C(22)-H(22)	0.9300
C(6)-C(5)	1.378(4)
C(6)-H(6)	0.9300
C(11)-H(11)	0.9300
C(3)-C(4)	1.370(4)
C(3)-H(3)	0.9300
C(4)-C(5)	1.370(4)
C(4)-H(4)	0.9300
C(5)-H(5)	0.9300

C(16)-O(1)-C(20)	104.80(17)
C(7)-N(1)-C(8)	114.28(17)
C(7)-N(1)-C(14)	119.83(18)
C(8)-N(1)-C(14)	117.09(18)
C(24)-C(19)-C(20)	118.7(2)
C(24)-C(19)-C(15)	136.3(2)
C(20)-C(19)-C(15)	105.0(2)
C(9)-C(8)-C(13)	119.1(2)
C(9)-C(8)-N(1)	119.8(2)
C(13)-C(8)-N(1)	121.1(2)
C(17)-C(7)-N(1)	118.8(2)
C(17)-C(7)-C(1)	126.5(2)
N(1)-C(7)-C(1)	114.69(19)
C(15)-C(16)-O(1)	112.9(2)
C(15)-C(16)-C(17)	124.5(2)
O(1)-C(16)-C(17)	122.5(2)
N(1)-C(14)-C(15)	110.27(18)
N(1)-C(14)-C(18)	110.74(18)
C(15)-C(14)-C(18)	113.31(19)
N(1)-C(14)-H(14)	108.6(14)
C(15)-C(14)-H(14)	110.3(14)
C(18)-C(14)-H(14)	103.3(14)

C(7)-C(17)-C(16)	118.3(2)
C(7)-C(17)-Cl(4)	124.34(18)
C(16)-C(17)-Cl(4)	117.23(17)
C(16)-C(15)-C(19)	106.2(2)
C(16)-C(15)-C(14)	118.1(2)
C(19)-C(15)-C(14)	135.7(2)
C(6)-C(1)-C(2)	118.7(2)
C(6)-C(1)-C(7)	118.8(2)
C(2)-C(1)-C(7)	122.4(2)
C(21)-C(20)-O(1)	124.6(2)
C(21)-C(20)-C(19)	124.3(2)
O(1)-C(20)-C(19)	111.08(19)
C(23)-C(24)-C(19)	117.7(2)
C(23)-C(24)-H(24)	121.1
C(19)-C(24)-H(24)	121.1
C(10)-C(9)-C(8)	120.2(2)
C(10)-C(9)-H(9)	119.9
C(8)-C(9)-H(9)	119.9
C(12)-C(13)-C(8)	119.6(3)
C(12)-C(13)-H(13)	120.2
C(8)-C(13)-H(13)	120.2
C(20)-C(21)-C(22)	116.1(2)
C(20)-C(21)-H(21)	121.9
C(22)-C(21)-H(21)	121.9
C(3)-C(2)-C(1)	120.0(3)
C(3)-C(2)-H(2)	120.0
C(1)-C(2)-H(2)	120.0
C(22)-C(23)-C(24)	121.8(2)
C(22)-C(23)-H(23)	119.1
C(24)-C(23)-H(23)	119.1
C(14)-C(18)-Cl(2)	109.54(16)
C(14)-C(18)-Cl(3)	110.59(17)
Cl(2)-C(18)-Cl(3)	108.15(13)
C(14)-C(18)-Cl(1)	112.15(16)
Cl(2)-C(18)-Cl(1)	108.34(14)
Cl(3)-C(18)-Cl(1)	107.95(13)
C(11)-C(10)-C(9)	120.8(3)
C(11)-C(10)-H(10)	119.6

C(9)-C(10)-H(10)	119.6
C(11)-C(12)-C(13)	120.9(3)
C(11)-C(12)-H(12)	119.6
C(13)-C(12)-H(12)	119.6
C(23)-C(22)-C(21)	121.3(2)
C(23)-C(22)-H(22)	119.3
C(21)-C(22)-H(22)	119.3
C(5)-C(6)-C(1)	120.5(3)
C(5)-C(6)-H(6)	119.8
C(1)-C(6)-H(6)	119.8
C(10)-C(11)-C(12)	119.4(3)
C(10)-C(11)-H(11)	120.3
C(12)-C(11)-H(11)	120.3
C(4)-C(3)-C(2)	120.8(3)
C(4)-C(3)-H(3)	119.6
C(2)-C(3)-H(3)	119.6
C(5)-C(4)-C(3)	119.4(3)
C(5)-C(4)-H(4)	120.3
C(3)-C(4)-H(4)	120.3
C(4)-C(5)-C(6)	120.6(3)
C(4)-C(5)-H(5)	119.7
C(6)-C(5)-H(5)	119.7

Symmetry transformations used to generate equivalent atoms:

Table 5. Anisotropic displacement parameters ($Å^2 x\ 10^3$) for **5a**. The anisotropic displacement factor exponent takes the form: $-2p^2[\ h^2 a^{*2} U^{11} + ... + 2\ h\ k\ a^*\ b^*\ U^{12}\ ]$

	U^{11}	U^{22}	U^{33}	U^{23}	U^{13}	U^{12}
Cl(1)	59(1)	48(1)	51(1)	8(1)	27(1)	-2(1)
Cl(2)	31(1)	50(1)	84(1)	5(1)	20(1)	-4(1)
Cl(4)	55(1)	45(1)	42(1)	-12(1)	2(1)	1(1)
Cl(3)	62(1)	29(1)	85(1)	-10(1)	36(1)	-6(1)
O(1)	40(1)	27(1)	43(1)	-3(1)	12(1)	2(1)
N(1)	26(1)	33(1)	33(1)	-3(1)	10(1)	1(1)
C(19)	31(1)	30(1)	39(1)	3(1)	16(1)	0(1)
C(8)	33(1)	32(1)	34(1)	4(1)	14(1)	7(1)
C(7)	29(1)	30(1)	33(1)	-1(1)	11(1)	-2(1)

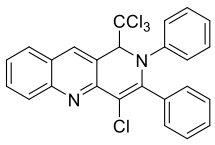
C(16)	36(1)	25(1)	37(1)	1(1)	14(1)	1(1)
C(14)	29(1)	30(1)	31(1)	-2(1)	9(1)	0(1)
C(17)	32(1)	32(1)	33(1)	-2(1)	8(1)	-4(1)
C(15)	30(1)	29(1)	35(1)	2(1)	13(1)	0(1)
C(1)	31(1)	39(1)	33(1)	-1(1)	11(1)	1(1)
C(20)	34(1)	29(1)	42(1)	4(1)	15(1)	1(1)
C(24)	34(1)	38(1)	47(2)	2(1)	12(1)	-1(1)
C(9)	42(1)	38(1)	42(1)	2(1)	16(1)	0(1)
C(13)	48(2)	39(1)	43(1)	-2(1)	20(1)	1(1)
C(21)	48(2)	33(1)	58(2)	-2(1)	23(1)	4(1)
C(2)	35(1)	48(2)	50(2)	3(1)	14(1)	-1(1)
C(23)	35(1)	47(2)	58(2)	7(1)	9(1)	6(1)
C(18)	33(1)	28(1)	50(2)	-3(1)	15(1)	0(1)
C(10)	48(2)	60(2)	58(2)	13(2)	30(1)	1(1)
C(12)	68(2)	50(2)	37(1)	-2(1)	22(1)	12(1)
C(22)	42(2)	40(2)	73(2)	10(1)	21(1)	13(1)
C(6)	40(1)	37(1)	61(2)	-7(1)	5(1)	3(1)
C(11)	63(2)	63(2)	51(2)	16(2)	36(2)	20(2)
C(3)	33(1)	69(2)	57(2)	-5(2)	7(1)	3(1)
C(4)	46(2)	64(2)	71(2)	0(2)	5(2)	23(2)
C(5)	58(2)	39(2)	90(2)	-3(2)	7(2)	13(1)

General Procedure for the Synthesis of Chlorinated Heterocycles.

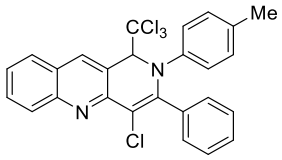
In an oven-dried sealed tube, a solution of *ortho*-alkynylaldehyde **1** (0.50 mmol), aniline **2** (0.51 mmol) were added in 2.0 mL of 1,2-ethylenedichloride : carbontetrachloride (9:1) . The resulting reaction mixture was heated at 100 °C for 12−16 h. Progression of the reaction was monitored by TLC analysis; after complete consumption of starting material, the reaction was cooled to room temperature. The reaction mixture was diluted with ethyl acetate (10 mL) and water (15 mL). The layers were separated, and the organic layer was washed with aqueous saturated brine solution and dried over Na_2SO_4. Organic layer was concentrated under reduced pressure. The crude material so obtained was purified by column chromatography on silica gel (100−200) (hexane:ethyl acetate). The structure and purity of known starting materials were confirmed by comparison of their physical and spectral data (^{1} H NMR, ^{13}C NMR, and HRMS).

Note: The Carbon tetrachloride is Carcinogen, Target Organ Effect, Toxic by inhalation. Toxic by ingestion, Toxic by skin absorption. Please, obtain special instructions before use. Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray. Wash skin thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. If inhaled: Remove person to fresh air and keep comfortable for breathing. call a poison center/doctor if you feel unwell. exposed or concerned: Get medical advice/ attention.

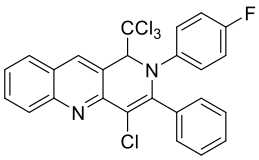
Analytical Data for the of Chlorinated Heterocycles



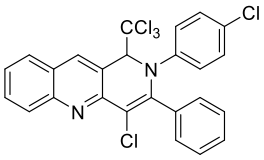
4-Chloro-2,3-diphenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3a). The product was obtained as a yellow solid, mp: 148–150^{o}C (211.5 mg, 87%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.28 (d, J = 8.5 Hz, 1H), 8.19 (s, 1H), 7.91–7.88 (m, 2H), 7.83 (d, J = 8.2 Hz, 1H), 7.81–7.77 (m, 1H), 7.56–7.52 (m, 1H), 7.35–7.31 (m, 2H), 7.29–7.23 (m, 3H), 7.14–7.09 (m, 2H), 6.96–6.93 (m, 1H), 5.57 (s, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 149.3, 148.8, 147.1, 144.0, 138.6, 135.0, 131.4, 131.0, 129.9, 129.5, 129.4, 128.2, 128.0, 127.4, 126.9, 125.2, 123.9, 120.6, 119.6, 102.4, 78.5; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{25}H_{16}Cl_4N_2]$ 485.0146, found 485.0153.



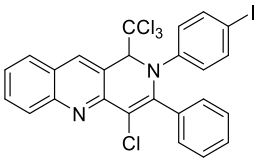
4-Chloro-3-phenyl-2-(*p*-tolyl)-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3b). The product was obtained as a yellow solid, mp: 218–220°C (225.3 mg, 90%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.28 (d, J = 8.5 Hz, 1H), 8.13 (s, 1H), 7.89–7.86 (m, 2H), 7.83 (d, J = 8.1 Hz, 1H), 7.80–7.76 (m, 1H), 7.55–7.51 (m, 1H), 7.35–7.31 (m, 2H), 7.29–7.25 (m, 1H), 7.11 (d, J = 8.5 Hz, 2H), 6.90 (d, J = 8.2 Hz, 2H), 5.50 (s, 1H), 2.15 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 149.2, 148.7, 144.6, 144.2, 138.4, 135.0, 134.9, 131.2, 130.8, 129.8, 129.7, 129.3, 128.0, 127.9, 127.2, 126.7, 123.9, 120.2, 118.9, 102.2, 78.4, 20.8; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{26}H_{18}Cl_4N_2]$ 499.0302, found 499.0286.



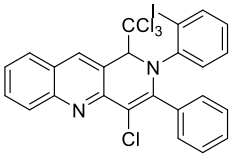
4-Chloro-2-(4-fluorophenyl)-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3c). The product was obtained as a yellow solid, mp:148–150°C (201.1 mg, 80%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.29 (d, J = 8.4 Hz, 1H), 8.22 (s, 1H), 7.87–7.85 (m, 3H), 7.83–7.78 (m, 1H), 7.58–7.54 (m, 1H), 7.37–7.33 (m, 2H), 7.31–7.27 (m, 1H), 7.24–7.21 (m, 2H), 6.84–6.78 (m, 2H), 5.48 (s, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 160.0 (d, $J_{C\text{-}F}$ = 245.6 Hz) 149.0, 148.7, 144.1, 143.1, 138.5, 134.7, 131.1, 131.0, 129.6 (d, $J_{C\text{-}F}$= 23.1 Hz), 128.1, 127.9, 127.3, 126.9, 125.9 (d,$J_{C\text{-}F}$= 7.7 Hz), 120.0, 119.2, 116.1 (d, $J_{C\text{-}F}$= 23.1 Hz), 102.1, 78.5; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{25}H_{15}Cl_4FN_2]$ 503.0052, found 503.0085.



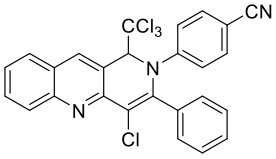
4-Chloro-2-(4-chlorophenyl)-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3d). The product was obtained as a yellow solid, mp:184–186°C (202.2 mg, 78%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.28 (d, J = 8.7 Hz, 1H), 8.20 (s, 1H), 7.89–7.84 (m, 3H), 7.82–7.78 (m, 1H), 7.557–7.53 (m, 1H), 7.37–7.28 (m, 3H), 7.20–7.17 (m, 2H), 7.09–7.06 (m, 2H), 5.50 (s, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 148.9, 148.7, 145.5, 143.3, 138.4, 134.5, 131.1, 131.0, 130.5, 129.7, 129.6, 129.3, 128.2, 127.9, 127.3, 127.0, 125.0, 120.2, 119.9, 101.9, 78.3; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{25}H_{15}Cl_5N_2]$ 518.9756, found 518.9751.



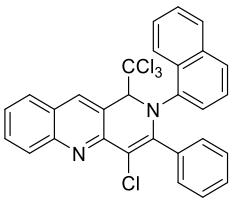
4-Chloro-2-(4-iodophenyl)-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3e). The product was obtained as a yellow solid, mp: 225–227°C (263.5 mg, 86%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.28 (d, J = 8.7 Hz, 1H), 8.22 (s, 1H), 7.89–7.87 (m, 2H), 7.85–7.79 (m, 2H), 7.58–7.54 (m, 1H), 7.43–7.40 (m, 2H), 7.38–7.29 (m, 3H), 7.02–7.00 (m, 2H), 5.52 (s, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 148.6, 148.4, 146.4, 142.7, 138.2, 137.9, 134.2, 130.8, 131.7, 129.5, 129.3, 127.9, 127.6, 127.0, 126.7, 125.2, 120.0, 119.9, 101.7, 88.8, 77.9; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{25}H_{15}Cl_4IN_2]$ 610.9112, found 610.9084.



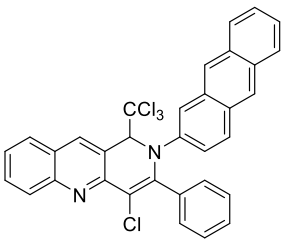
4-Chloro-2-(2-iodophenyl)-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3f). The product was obtained as a yellow solid, mp: 115–117°C (260.1 mg, 85%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.26–8.25 (m, 2H), 7.89 (d, J = 7.1 Hz, 1H), 7.80–7.75 (m, 1H), 7.72–7.66 (m, 2H), 7.55–7.49 (m, 3H), 7.30–7.25 (m, 3H), 7.10–7.06 (m, 1H), 6.81–6.77 (m, 1H), 5.49 (s, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 149.6, 148.9, 148.1, 145.6, 141.1, 138.9, 136.0, 135.2, 131.0, 130.0, 129.9, 129.7, 129.5, 128.4, 128.34, 128.3, 127.5, 126.5, 121.4, 114.9, 103.4, 99.3, 77.8; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{25}H_{15}Cl_4IN_2]$ 610.9112, found 610.9092.



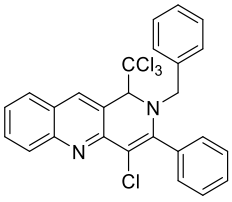
4-(4-Chloro-3-phenyl-1-(trichloromethyl)benzo[*b*][1,6]naphthyridin-2(1*H*)-yl)benzonitrile (3g). The product was obtained as a yellow solid, mp:187–189°C (153.8 mg, 60%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.27–8.25 (m, 2H), 7.90–7.88 (m, 2H), 7.85–7.78 (m, 2H), 7.58–7.54 (m, 1H), 7.39–7.36 (m, 3H), 7.34–7.29 (m, 4H), 5.65 (s, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 150.0, 148.6, 148.5, 141.4, 138.2, 134.0, 133.1, 131.1, 130.9, 129.7, 128.3, 127.8, 127.3, 122.6, 121.9, 120.5, 118.4, 107.3, 101.4, 77.3; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{26}H_{15}Cl_4N_3]$ 510.0098, found 510.0069.



4-Chloro-2-(naphthalen-1-yl)-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3h). The product was obtained as a light brown solid, mp: 219–221^{o}C (198.7 mg, 74%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.33 (d, J = 8.5 Hz, 1H), 8.23 (s, 1H), 7.88–7.81 (m, 3H), 7.74 (d, J = 8.2 Hz, 1H), 7.62 (d, J = 8.2 Hz, 1H), 7.58–7.53 (m, 1H), 7.35–7.22 (m, 4H), 7.20–7.08 (m, 5H), 5.53 (s, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 148.9, 148.8, 148.6, 142.1, 138.7, 135.1, 134.6, 132.5, 131.5, 130.9, 129.7, 129.7, 129.0, 128.9, 128.6, 128.1, 127.9, 127.3, 127.3, 126.3, 126.1, 124.9, 122.2, 119.4, 112.6, 103.10, 77.6; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{29}H_{18}Cl_4N_2]$ 535.0302, found 535.0312.

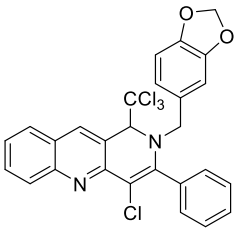


2-(Anthracen-2-yl)-4-chloro-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3i). The product was obtained as a brown semi solid, mp: 228–230^{o}C (175.9 mg, 60%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.31 (d, J = 8.5 Hz, 1H), 8.24–8.23 (m, 2H), 8.15 (s, 1H), 8.02–8.00 (m, 2H), 7.89–7.87 (m, 2H), 7.84–7.78 (m, 3H), 7.73–7.72 (m, 1H), 7.56–7.51 (m, 2H), 7.42–7.38 (m, 2H), 7.31 (t, J = 7.6 Hz, 2H), 7.24–7.20 (m, 1H), 5.76 (s, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 171.3, 149.2, 148.7, 143.7, 143.6, 138.5, 134.9, 132.2, 131.5, 131.4, 131.1, 130.9, 129.8, 129.7, 129.4, 129.2, 128.2, 128.1, 127.9, 127.8, 127.3, 126.8, 126.1, 125.9, 125.7, 125.4, 122.7, 121.1, 120.5, 119.8, 102.1, 78.0; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{33}H_{20}Cl_4N_2]$ 585.0459, found 585.047.

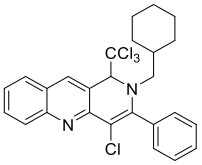


2-Benzyl-4-chloro-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3j). The product was obtained as a yellow solid, mp: 92–94^{o}C (185.9 mg, 75%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.22 (d, J = 8.5 Hz, 1H), 8.00 (s, 1H), 7.78–7.73 (m, 2H), 7.71–7.68 (m,

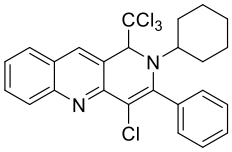
2H), 7.52–7.46 (m, 4H), 7.09–7.06 (m, 3H), 6.93–6.91 (m, 2H), 5.25 (s, 1H), 4.60–4.56 (m, 1H), 4.47–4.43 (m, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 149.3, 148.6, 148.2, 137.8, 137.6, 134.6, 130.7, 130.4, 129.7, 129.4, 128.8, 128.6, 127.8, 127.2, 127.0, 126.0, 119.4, 111.6, 103.6, 74.81, 59.7; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{26}H_{18}Cl_4N_2]$ 499.0302, found 499.0341.



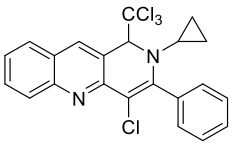
2-(Benzo[*d*][1,3]dioxol-5-ylmethyl)-4-chloro-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3k). The product was obtained as a yellow solid, mp:164–166^{o}C (217.4 mg, 80%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.22 (d, J = 8.7 Hz, 1H), 8.04 (s, 1H), 7.78 (d, J = 8.2 Hz, 1H), 7.79–768 (m, 3H), 7.51–7.40 (m, 4H), 6.52–6.50 (m, 1H), 6.40–6.38 (m, 2H), 5.78–5.75 (m, 2H), 5.25 (s, 1H), 4.45 (d, J = 15.6 Hz, 1H), 4.30 (d, J = 15.6 Hz, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 149.2, 148.4, 148.2, 148.0, 147.3, 138.0, 134.5, 131.1, 130.8, 130.4, 129.8, 129.2, 128.7, 127.9, 127.0, 126.1, 120.9, 119.4, 111.6, 108.4, 107.7, 103.6, 101.1, 74.4, 59.6; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{27}H_{18}Cl_4N_2O_2]$ 543.0201, found 543.0174.



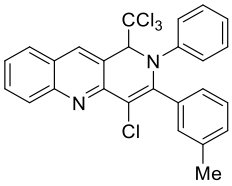
4-Chloro-2-(cyclohexylmethyl)-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3l). The product was obtained as a yellow solid, mp: 195–197^{o}C (177.8 mg, 70%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.23–8.21 (m, 2H), 7.87 (d, J = 8.0 Hz, 1H), 7.77–7.73 (m, 1H), 7.68–7.66 (m, 2H), 7.52–7.43 (m, 4H), 5.21 (s, 1H), 3.31–325 (m, 1H), 3.13–3.08 (m, 1H), 1.48–1.34 (m, 4H), 1.28–1.24 (m, 2H), 1.03–0.83 (m, 3H), 0.71–0.53 (m, 2H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 149.5, 148.7, 148.3, 137.9, 134.5, 130.7, 129.5, 129.4, 128.4, 127.9, 127.1, 125.9, 119.7, 110.6, 103.6, 75.9, 63.0, 39.0, 30.9, 30.5, 26.1, 25.8, 25.7; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{26}H_{24}Cl_4N_2]$ 505.0772, found 505.0747.



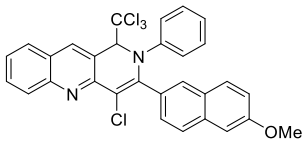
4-Chloro-2-cyclohexyl-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridin (3m). The product was obtained as a yellow solid, mp:169–171^{o}C (196.5 mg, 80%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.28 (s, 1H), 8.23 (d, J = 8.5 Hz, 1H), 7.89–7.83 (m, 3H), 7.78–7.73 (m, 1H), 7.54–7.45 (m, 4H), 5.19 (s, 1H), 3.01–2.94 (m, 1H), 2.17–2.14 (m, 1H), 1.86–1.73 (m, 1H), 1.61–1.55 (m, 1H), 1.48–1.40 (m, 2H), 1.30–1.23 (m, 1H), 1.02–0.85 (m, 4H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 149.9, 148.6, 147.8, 137.7, 135.9, 130.5, 130.45, 129.6, 128.3, 127.8, 127.4, 126.2, 122.0, 116.5, 102.8, 76.8, 69.7, 63.3, 32.1, 30.9, 25.9, 25.4; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{25}H_{22}Cl_4N_2]$ 491.0615, found 491.0638.



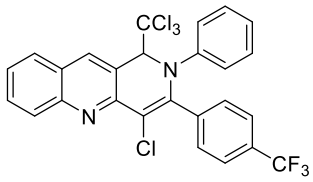
4-4-Chloro-2-cyclopropyl-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3n). The product was obtained as a brown solid, mp:109–111^{o}C (199.8 mg, 89%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.27 (d, J = 8.5 Hz, 1H), 8.24 (s, 1H), 7.87–7.84 (m, 1H), 7.77–7.72 (m, 3H), 7.53–7.47 (m, 3H), 7.45–7.41 (m, 1H), 5.39 (s, 1H), 3.17–3.12 (m, 1H), 0.71–0.66 (m, 1H), 0.53–0.47 (m, 2H), 0.35–0.28 (m, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 149.1, 148.5, 148.4, 138.1, 135.4, 131.1, 130.5, 129.5, 129.3, 128.4, 128.0, 127.1, 126.4, 120.2, 110.5, 103.8, 77.7, 39.7, 12.3, 9.5; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{22}H_{16}Cl_4N_2]$ 449.0146, found 449.0132.



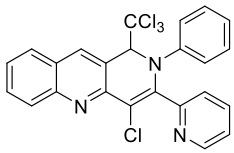
4-Chloro-2-phenyl-3-(*m*-tolyl)-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3o). The product was obtained as a yellow solid, mp 188–191^{o}C (219.6 mg, 88%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.29–8.26 (m, 1H), 8.21 (s, 1H), 7.84 (d, J = 8.2 Hz, 1H), 7.81–7.77 (m, 1H), 7.69 (d, J = 9.6 Hz, 2H), 7.56–7.52 (m, 1H), 7.27–7.20 (m, 4H), 7.14–7.08 (m, 2H), 6.98–6.94 (m, 1H), 5.57 (s, 1H), 2.34 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 149.2, 148.7, 146.9, 144.0, 138.3, 137.5, 134.7, 131.7, 130.8, 130.2, 129.7, 129.2, 128.4, 127.8, 127.2, 126.7, 125.0, 123.8, 120.4, 102.2, 78.3, 21.7; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{26}H_{18}Cl_4N_2]$ 499.0302, found 499.0298.



4-Chloro-3-(6-methoxynaphthalen-2-yl)-2-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3p). The product was obtained as a brown solid, mp: 218–221^{o}C (237.2 mg, 84%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.31–8.27 (m, 2H), 8.22 (s, 1H), 7.98–7.95 (m, 1H), 7.84 (d, J = 8.1 Hz, 1H), 7.81–7.77 (m, 1H), 7.73 (d, J = 8.9 Hz, 1H), 7.67 (d, J = 8.7 Hz, 1H), 7.56–7.52 (m, 1H), 7.29 (d, J = 8.2 Hz, 2H), 7.12–7.05 (m, 4H), 6.90–6.86 (m, 1H), 5.62 (s, 1H), 3.89 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 158.9, 149.6, 148.9, 147.3, 144.3, 138.7, 135.1, 131.5, 131.1, 130.6, 130.4, 129.9, 129.5, 128.9, 128.5, 128.1, 127.5, 127.0, 126.6, 125.2, 123.9, 120.7, 119.4, 105.9, 102.5, 78.7, 55.7; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{30}H_{20}Cl_4N_2O]$ 565.0408, found 565.0394.

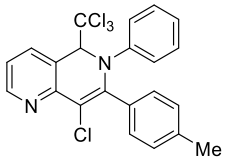


4-Chloro-2-phenyl-1-(trichloromethyl)-3-(4-(trifluoromethyl)phenyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3q). The product was obtained as a yellow solid, mp: 228–230^{o}C (193.8 mg, 70%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.28 (d, J = 8.5 Hz, 1H), 8.18 (s, 1H), 8.02 (d, J = 8.1 Hz, 2H), 7.85 (d, J = 8.1 Hz, 1H), 7.82–7.78 (m, 1H), 7.60–7.58 (m, 2H), 7.56–7.54 (m, 1H), 7.23 (d, J = 7.8 Hz, 2H), 7.16–7.12 (m, 2H), 7.00–6.96 (m, 1H), 5.56 (s, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 148.6, 146.4, 142.1, 138.4, 131.3, 130.9, 129.6, 129.4, 127.8, 127.3, 127.0, 125.3, 124.9 (d, $J_{C\text{-}F}$ = 2.9 Hz), 123.6, 120.7, 120.2, 101.9, 78.1; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{26}H_{15}Cl_4F_3N_2]$ 553.0020, found 553.0033.

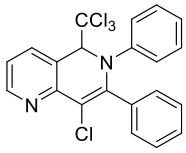


4-Chloro-2-phenyl-3-(pyridin-2-yl)-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3r). The product was obtained as a yellow solid, mp:148–150^{o}C (187.5 mg, 77%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.72–8.71 (m, 1H), 8.29 (d, J = 8.5 Hz, 1H), 8.24 (s, 1H), 7.86–7.77 (m, 3H), 7.66–7.62 (m, 1H), 7.57–7.53 (m, 1H), 7.37–7.34 (m, 2H), 7.20–7.11 (m, 3H), 6.98–6.93 (m, 1H), 5.65 (s, 1H); ^{13}C NMR (100 MHz,

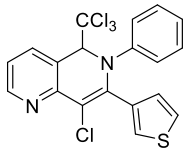
$CDCl_3$) δ 154.2, 149.1, 148.8, 148.7, 146.6, 142.0, 138.3, 136.5, 130.8, 129.9, 129.2, 129.1, 127.8, 127.3, 126.9, 125.2, 124.8, 123.4, 123.2, 121.4, 120.3, 120.1, 102.3, 78.1; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{24}H_{15}Cl_4N_3]$ 486.0098, found 486.0084.



8-Chloro-6-phenyl-7-(*p*-tolyl)-5-(trichloromethyl)-5,6-dihydro-1,6-naphthyridine(4a). The product was obtained as a brown solid, mp: 165–167°C (173.9 mg, 77%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.80–8.79 (m, 1H), 7.76 (d, J = 8.1 Hz, 2H), 7.73–7.71 (m, 1H), 7.30–7.23 (m, 3H), 7.15–7.10 (m, 4H), 6.97–6.93 (m, 1H), 5.43 (s, 1H), 2.28 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 150.5, 149.5, 146.6, 141.8, 139.1, 137.9, 131.5, 130.8, 128.9, 128.6, 124.6, 123.3, 122.0, 120.7, 118.2, 115.0, 101.7, 76.7, 21.1; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{22}H_{16}Cl_4N_2]$ 449.0146, found 449.0151.

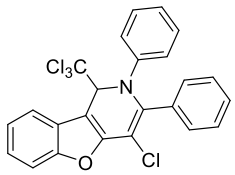


8-Chloro-6,7-diphenyl-5-(trichloromethyl)-5,6-dihydro-1,6-naphthyridine (4b). The product was obtained as a brown solid, mp:182–184°C (174.5 mg, 80%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.81–8.80 (m, 1H), 7.88–7.85 (m, 2H), 7.74–7.72 (m, 1H), 7.33–7.24 (m, 6H), 7.14–7.10 (m, 2H), 6.97–6.93 (m, 1H), 5.44 (s, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 150.8, 149.6, 146.7, 142.0, 138.2, 134.6, 131.1, 129.2, 129.1, 128.0, 125.0, 123.6, 122.3, 120.9, 118.8, 101.9, 77.9; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{21}H_{14}Cl_4N_2]$ 434.9989, found 434.9993.

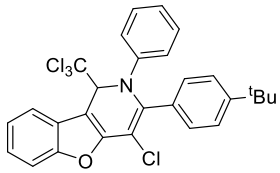


8-Chloro-6-phenyl-7-(thiophen-3-yl)-5-(trichloromethyl)-5,6-dihydro-1,6-naphthyridine (4c). The product was obtained as a brown solid, mp:192–194°C (163.5 mg, 74%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.80–8.79 (m, 1H), 7.87–7.86 (m, 1H), 7.73 (d, J = 7.8 Hz, 1H), 7.60 (d, J = 5.0 Hz, 1H), 7.30–7.26 (m, 1H), 7.22–7.20 (m, 3H), 7.15 (t, J = 8.0 Hz, 2H), 6.98 (t, J = 7.1 Hz, 1H), 5.44 (s, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 150.8, 149.6, 147.1, 138.0, 137.0,

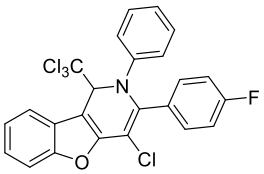
136.0, 129.7, 129.6, 129.2, 124.8, 124.6, 122.5, 122.3, 121.3, 118.6, 102.0, 76.8; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{19}H_{12}Cl_4N_2S]$ 440.9554, found 440.9550.



4-Chloro-2,3-diphenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[3,2-*c*]pyridine (5a). The product was obtained as a pale yellow solid, mp:174–176°C (208.0 mg, 88%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.83 (d, J = 8.2 Hz, 2H), 7.58–7.56 (m, 2H), 7.34–7.21 (m, 7H), 7.12 (t, J = 7.8 Hz, 2H), 6.96–6.93 (m, 1H), 5.71 (s, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 155.9, 151.6, 147.4, 140.6, 134.0, 130.9, 129.2, 128.1, 126.9, 125.1, 124.8, 123.9, 123.7, 120.5, 111.9, 108.2, 106.1, 103.2, 75.2; (ESI) $[M+H]^+$ Calcd for $[C_{24}H_{15}Cl_4NO]$ 473.9986, found 473.9975.

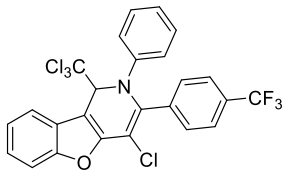


3-(4-(*tert*-Butyl)phenyl)-4-chloro-2-phenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[3,2-*c*]pyridine (5b). The product was obtained as a yellow solid, mp: 127–129°C (225.1 mg, 85%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.79–7.76 (m, 2H), 7.59–7.56 (m, 2H), 7.35–7.31 (m, 5H), 7.29–7.27 (m, 1H), 7.17–7.12 (m, 2H), 6.96 (t, J = 7.4 Hz, 1H), 5.70 (s, 1H), 1.26 (s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 155.8, 152.2, 151.7, 147.6, 140.4, 131.0, 130.5, 129.1, 126.9, 125.0, 124.7, 124.6, 123.7, 123.5, 120.4, 111.8, 108.0, 106.0, 103.0, 75.2, 34.81, 31.2; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{28}H_{23}Cl_4NO]$ 530.0612, found 530.0596.

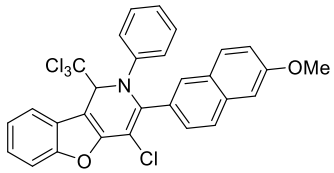


4-Chloro-3-(4-fluorophenyl)-2-phenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[3,2-*c*]pyridine (5c). The product was obtained as a yellow solid, mp:178–180°C (196.5 mg, 80%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.76–7.73 (m, 2H), 7.52 (d, J = 7.8 Hz, 2H), 7.26–7.21 (m, 3H), 7.19–7.18 (m, 2H), 7.08 (t, J = 7.3 Hz, 2H), 6.95-6.91 (m, 2H), 5.62 (s, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 155.9, 147.2, 139.6, 132.9 (d, J_{C-F} = 8.7 Hz), 129.2, 126.6, 124.8

(d, $J_{C\text{-}F}$ = 45.3 Hz), 123.9, 123.8, 120.5, 115.3 (d, $J_{C\text{-}F}$ = 21.2 Hz), 111.9, 106.2, 103.1, 75.2; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{24}H_{14}Cl_4FNO]$ 491.9892, found 491.9848.

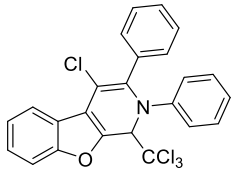


4-Chloro-2-phenyl-1-(trichloromethyl)-3-(4-(trifluoromethyl)phenyl)-1,2-dihydrobenzofuro[3,2-*c*]pyridine (5d). The product was obtained as a brown solid, mp:152–154^{o}C (210.5 mg, 78%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.96 (d, J = 7.8 Hz, 2H), 7.64–7.53 (m, 4H), 7.36–7.28 (m, 4H), 7.18–7.14 (m, 2H), 7.03–6.99 (m, 1H), 5.71 (s, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 155.9, 150.9, 146.8, 138.7, 137.4, 131.0, 129.3, 126.5, 125.3, 125.0, 124.9 (q, $J_{C\text{-}F}$ = 2.9 Hz) 123.8, 123.6, 120.5, 111.8, 106.7, 102.8, 75.0; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{25}H_{14}Cl_4F_3NO]$ 541.9860, found 541.9855.



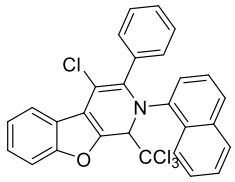
H

4-Chloro-3-(6-methoxynaphthalen-2-yl)-2-phenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[3,2-*c*]pyridine (5e). The product was obtained as a yellow solid, mp: 210–212^{o}C (240.3 mg, 87%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.25 (s, 1H), 7.93–7.90 (m, 1H), 7.73 (d, J = 9.1 Hz, 1H), 7.66–7.63 (m, 1H), 7.60–7.59 (m, 2H), 7.40–7.37 (m, 2H), 7.32–7.23 (m, 2H), 7.13–7.07 (m, 3H), 7.04 (d, J = 2.3 Hz, 1H), 6.92–6.88 (m, 1H), 5.75 (s, 1H), 3.87 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 158.7, 155.9, 151.8, 147.6, 140.8, 134.6, 131.0, 130.3, 129.4, 129.2, 128.4, 128.3, 127.0, 126.4, 125.1, 124.7, 123.8, 120.5, 119.2, 111.9, 105.7, 103.3, 75.3, 55.5; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{29}H_{19}Cl_4NO_2]$ 553.0170, found 554.0249.

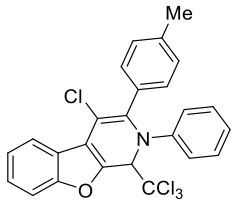


4-Chloro-2,3-diphenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[2,3-*c*]pyridine (6a). The product was obtained as a brown semi-solid (210.6 mg, 89%); ^{1}H NMR (400 MHz,

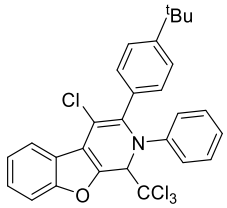
$CDCl_3$) δ 8.19–8.16 (m, 1H), 7.87–7.85 (m, 2H), 7.53–7.51 (m, 1H), 7.38–7.36 (m, 2H), 7.32–7.28 (m, 4H), 7.23–7.20 (m, 1H), 7.14–7.10 (m, 2H), 6.96–6.92 (m, 1H), 5.72 (s, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 156.2, 147.2, 142.8, 135.3, 134.2, 130.9, 129.2, 128.6, 128.0, 125.6, 124.9, 124.3, 123.7, 123.1, 121.7, 116.9, 112.4, 112.1, 100.8, 74.7;HRMS (ESI) $[M+H]^+$ Calcd for $[C_{24}H_{15}Cl_4NO]$ 473.9986, found 473.9981.



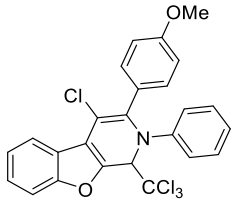
4-Chloro-2-(naphthalen-1-yl)-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[2,3-*c*]pyridine (6b). The product was obtained as a brown solid, mp: 190–192^{o}C (191.5 mg, 73%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.26–8.24 (m, 1H), 7.77 (d, J = 8.2 Hz, 1H), 7.72–7.70 (m, 1H), 7.61 (d, J = 8.7 Hz, 2H), 7.49–7.35 (m, 4H), 7.22–7.13 (m, 7H), 5.71 (s, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 156.2, 143.0, 141.1, 139.7, 134.7, 134.4, 132.2, 130.2, 128.9, 128.6, 128.5, 127.8, 127.6, 126.1, 125.7, 124.7, 124.3, 123.6, 122.0, 116.9, 114.1, 112.2, 102.3, 74.5; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{28}H_{17}Cl_4NO]$ 524.0143, found 524.0112.



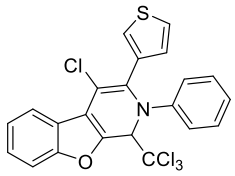
4-Chloro-2-phenyl-3-(*p*-tolyl)-1-(trichloromethyl)-1,2-dihydrobenzofuro[2,3-*c*]pyridine (6c). The product was obtained as a brown solid, mp:135–137^{o}C (209.2 mg, 86%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.18–8.16 (m, 1H), 7.74 (d, J = 7.8 Hz, 2H), 7.53–7.51 (m, 1H), 7.40–7.36 (m, 2H), 7.31 (d, J = 8.2 Hz, 2H), 7.15–7.11 (m, 4H), 6.96 (t, J = 8.0 Hz, 1H), 5.71 (s, 1H), 2.29 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 156.3, 147.5, 142.9, 138.7, 135.5, 131.3, 130.9, 129.3, 128.9, 125.7, 124.9, 124.5, 123.8, 123.2, 121.7, 112.2, 100.9, 74.9, 21.6; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{25}H_{17}Cl_4NO]$ 488.0143, found 488.0175.



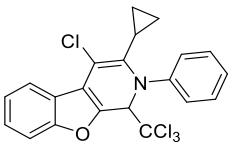
3-(4-(*tert*-Butyl)phenyl)-4-chloro-2-phenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[2,3-*c*]pyridine (6d). The product was obtained as a yellow solid, mp: 230–232°C (230.3 mg, 87%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.18–8.16 (m, 1H), 7.77 (d, J = 8.2 Hz, 2H), 7.52–7.50 (m, 1H), 7.36 (t, J = 4.1 Hz, 2H), 7.31 (d, J = 8.2 Hz, 4H), 7.15–7.11 (m, 2H), 6.94 (t, J = 7.3 Hz, 1H), 5.70 (s, 1H), 1.24 (s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 156.1, 151.5, 147.4, 142.8, 135.1, 131.0, 130.5, 129.1, 125.5, 124.9, 124.6, 124.3, 123.6, 122.8, 121.6, 117.0, 112.1, 100.8, 74.7, 34.7, 31.3; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{28}H_{23}Cl_4NO]$ 529.0534, found 530.0613.



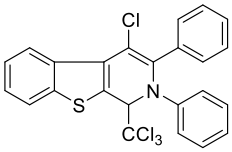
4-Chloro-3-(4-methoxyphenyl)-2-phenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[2,3-*c*]pyridine (6e). The product was obtained as a green solid, mp:182–184°C (214.4 mg, 85%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.10–8.07 (m, 1H), 7.71 (d, J = 8.2 Hz, 2H), 7.44–7.42 (m, 1H), 7.31–7.26 (m, 2H), 7.22 (d, J = 8.2 Hz, 2H), 7.04 (t, J = 7.6 Hz, 2H), 6.88–6.85 (m, 1H), 6.75 (d, J = 8.2 Hz, 2H), 5.62 (s, 1H), 3.66 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 159.2, 155.7, 147.0, 142.2, 134.7, 131.8, 128.7, 126.1, 125.1, 124.3, 123.9, 123.2, 122.6, 121.1, 116.6, 113.0, 111.7, 110.8, 100.4, 74.3, 55.8; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{25}H_{17}Cl_4NO_2]$ 504.0092, found 504.0106.



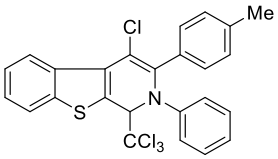
4-Chloro-2-phenyl-3-(thiophen-3-yl)-1-(trichloromethyl)-1,2-dihydrobenzofuro[2,3-*c*]pyridine (6f). The product was obtained as a brown solid, mp:184–186°C (208.5 mg, 90%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.19–8.15 (m, 1H), 7.78 –7.77 (m, 1H), 7.60–7.58 (m, 1H), 7.53–7.50 (m, 1H), 7.40–7.36 (m, 2H), 7.30–7.28 (m, 2H), 7.22–7.19 (m, 1H), 7.18–7.14 (m, 2H), 7.00 –7.96 (m, 1H), 5.70 (s, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 156.0, 147.4, 142.9, 135.6, 130.4, 129.2, 129.1, 127.7, 125.4, 124.6, 124.4, 124.1, 123.5, 121.9, 121.4, 116.7, 112.1, 111.9, 74.4; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{22}H_{13}Cl_4NOS]$ 479.9550, found 479.9526.



4-Chloro-3-cyclopropyl-2-phenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[2,3-*c*]pyridine (6g). The product was obtained as a brown solid, mp:178–180°C (175.5 mg, 80%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.21–8.17 (m, 1H), 7.55–7.50 (m, 1H), 7.40–7.32 (m, 6H), 7.17–7.14 (m, 1H), 5.58 (s, 1H), 2.10–2.03 (m, 1H), 1.00–0.96 (m, 1H), 0.94–0.86 (m, 1H), 0.75–0.79 (m, 1H), 0.60–0.53 (m, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 156.0, 147.8, 142.0, 135.7, 129.4, 125.4, 124.8, 123.9, 123.6, 121.9, 121.5, 116.5, 114.8, 112.1, 101.0, 74.9, 12.8, 8.0, 6.2; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{21}H_{15}Cl_4NO]$ 437.9986, found 437.9988.

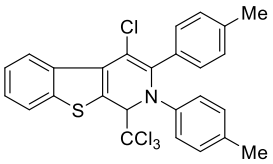


4-Chloro-2,3-diphenyl-1-(trichloromethyl)-1,2-dihydrobenzo[4,5]thieno[2,3-*c*]pyridine (7a). The product was obtained as a brown solid, mp:164–166°C (171.7 mg, 70%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.74 (d, J = 8.1 Hz, 1H), 7.89–7.87 (m, 2H), 7.80 (d, J = 8.0 Hz, 1H), 7.49–7.45 (m, 1H), 7.42–7.38 (m, 1H), 7.33–7.29 (m, 2H), 7.27–7.22 (m, 3H), 7.12–7.08 (m, 2H), 6.91 (t, J = 7.4 Hz, 1H), 5.66 (s, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 146.6, 140.8, 137.1, 134.8, 134.1, 131.1, 128.9, 128.6, 127.8, 125.8, 125.3, 124.7, 124.6, 124.5, 122.8, 122.4, 115.7, 101.4,75.9; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{24}H_{15}Cl_4NS]$ 489.9758, found 489.9721.

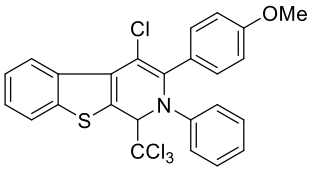


4-Chloro-2-phenyl-3-(*p*-tolyl)-1-(trichloromethyl)-1,2-dihydrobenzo[4,5]thieno[2,3-*c*]pyridine (7b). The product was obtained as a yellow solid, mp:156–158°C (171.5 mg, 68%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.73 (d, J = 8.1 Hz, 1H), 7.81–7.76 (m, 3H), 7.49–7.45 (m, 1H), 7.42–7.38 (m, 1H), 7.26–7.24 (m, 2H), 7.13–7.08 (m, 4H), 6.92 (t, J = 7.4 Hz, 1H), 5.65 (s, 1H), 2.28 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 146.9, 141.0, 138.8, 137.3, 135.1,

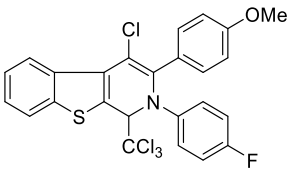
131.2, 129.1, 128.9, 125.8, 125.4, 124.8, 124.7, 124.6, 122.9, 122.6, 115.5, 101.6, 76.2, 21.6; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{25}H_{17}Cl_4NS]$ 503.9914, found 503.9901.



4-Chloro-2,3-di-p-tolyl-1-(trichloromethyl)-1,2-dihydrobenzo[4,5]thieno[2,3-*c*]pyridine (7c). The product was obtained as a yellowsolid, mp:160–162^{o}C (163.5 mg, 63%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.74 (d, J = 8.2 Hz, 1H), 7.80 (d, J = 8.1 Hz, 1H), 7.76 (d, J = 8.2 Hz, 2H), 7.49–7.45 (m, 1H), 7.42–7.38 (m, 1H), 7.15–7.11 (m, 4H), 6.90 (d, J = 8.2 Hz, 2H), 5.62 (s, 1H), 2.29 (s, 3H), 2.14 (s, 3H);^{13}C NMR (100 MHz, $CDCl_3$) δ 144.7, 141.2, 138.9, 137.7, 135.3, 134.5, 131.7, 131.3, 130.6, 129.8, 128.9, 125.7, 125.5, 125.0, 124.8, 123.2, 122.8, 115.1, 101.9, 76.5, 21.7, 21.0; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{26}H_{19}Cl_4NS]$ 518.0071, found 518.0052.

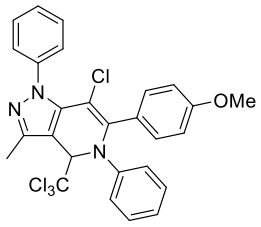


4-Chloro-3-(4-methoxyphenyl)-2-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[4,5]thieno[2,3-*c*]pyridine (7d). The product was obtained as a brown semisolid (166.5 mg, 64%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.73 (d, J = 8.2 Hz, 1H), 7.84–7.81 (m, 3H), 7.50–7.46 (m, 1H), 7.43–7.39 (m, 1H), 7.26–7.24 (m, 2H), 7.14–7.10 (m, 2H), 6.93 (t, J = 7.4 Hz, 1H), 6.86–6.83 (m, 2H), 5.65 (s, 1H), 3.76 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 159.5, 146.7, 140.7, 136.7, 134.8, 132.4, 130.3, 128.8, 126.4, 125.4, 125.2, 124.6, 124.5, 124.3, 122.7, 122.3, 114.6, 113.3, 101.4, 75.9, 55.0; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{25}H_{17}Cl_4NS]$ 519.9863, found 519.9842.

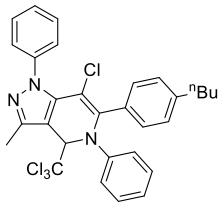


4-Chloro-2-(4-fluorophenyl)-3-(4-methoxyphenyl)-1-(trichloromethyl)-1,2-dihydrobenzo[4,5]thieno[2,3-*c*]pyridine (7e). The product was obtained as a brown solid,

mp:152–154^{o}C (161.9 mg, 60%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.73 (d, J = 8.0 Hz, 1H), 7.82 (d, J = 7.8 Hz, 1H), 7.78–7.74 (m, 2H), 7.50–7.46 (m, 1H), 7.44–7.40 (m, 1H), 7.22–7.18 (m, 2H), 6.86–6.77 (m, 4H), 5.53 (s, 1H), 3.77 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 159.9, 159.7 (d, J_{C-F} = 251.4 Hz), 159.7, 143.1, 141.0, 137.2, 135.0, 132.6, 130.5, 126.3, 125.5, 124.9 (d, J_{C-F} =7.7 Hz), 124.7 (d, J_{C-F} =9.6 Hz), 122.59, 115.8 (d, J_{C-F}=23.1 Hz), 114.2, 113.3, 101.4, 76.5, 55.3; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{25}H_{16}Cl_4FNOS]$ 537.9769, found 537.9741.

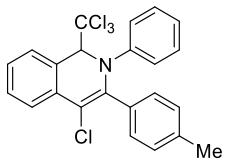


7-Chloro-6-(4-methoxyphenyl)-3-methyl-1,5-diphenyl-4-(trichloromethyl)-4,5-dihydro-1*H*-pyrazolo[4,3-*c*]pyridine (8a). The product was obtained as a yellow solid, mp: 91–93^{o}C (239.7 mg, 88%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.74 (d, J = 8.7 Hz, 2H), 7.57 (d, J = 8.2 Hz, 2H), 7.50 (t, J = 7.6 Hz, 2H), 7.45–7.41 (m, 1H), 7.29–7.25 (m, 2H), 7.19–7.15 (m, 2H), 7.00–696 (m, 1H), 6.80 (d, J = 8.7 Hz, 2H), 5.43 (s, 1H), 3.74 (s, 3H), 2.37 (s, 3H);^{13}C NMR (100 MHz, $CDCl_3$) δ 160.1, 147.0, 146.1, 140.6, 139.8, 137.7, 132.6, 129.1, 128.8, 128.3, 126.3, 126.1, 124.3, 122.5, 115.2, 113.5, 111.9, 106.8, 103.6, 74.1, 55.3, 13.5; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{27}H_{21}Cl_4N_3O]$ 544.0517, found 544.0522.

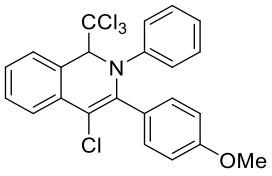


6-(4-Butylphenyl)-7-chloro-3-methyl-1,5-diphenyl-4-(trichloromethyl)-4,5-dihydro-1*H*-pyrazolo[4,3-*c*]pyridine (8b). The product was obtained as a redsemisolid(236.5 mg, 83%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.70 (d, J = 7.8 Hz, 2H), 7.57 (d, J = 7.8 Hz, 2H), 7.54–7.49 (m, 2H), 7.45–7.41 (m, 1H), 7.27 (t, J = 8.5 Hz, 2H), 7.17 (t, J = 7.8 Hz, 2H), 7.07 (d, J = 8.2 Hz, 2H), 6.98–6.94 (t, J = 7.3 Hz, 1H), 5.44 (s, 1H), 2.55–2.50 (m, 2H), 2.38 (s, 3H), 1.57–1.50 (m, 2H), 1.33–1.25 (m, 2H), 0.88 (t, J = 7.3 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 147.0, 146.0, 144.2, 140.8, 139.7, 137.6, 131.2, 131.0, 129.1, 128.8, 128.3, 128.0, 126.1,

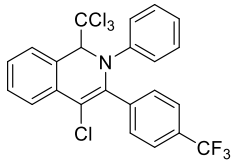
124.2, 122.4, 112.0, 107.5, 103.4, 74.1, 35.6, 33.2, 22.5, 14.0, 13.5; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{30}H_{27}Cl_4N_3]$ 570.1037, found 570.1046.



4-Chloro-2-phenyl-3-(*p*-tolyl)-1-(trichloromethyl)-1,2-dihydroisoquinoline (9a). The product was obtained as a colourless solid, mp:148–150°C (197.5 mg, 88%);^{1}H NMR (400 MHz, $CDCl_3$) δ 7.87 (d, J = 7.6 Hz, 1H), 7.77 (d, J = 8.2 Hz, 2H), 7.55–7.51 (m, 1H), 7.43–7.41 (m, 1H), 7.37–7.33 (m, 1H), 7.25–7.23 (m, 2H), 7.14–7.10 (m, 4H), 6.92 (t, J = 7.3 Hz, 1H), 5.45 (s, 1H), 2.29 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 147.1, 138.7, 137.4, 133.0, 132.2, 131.1, 130.3, 129.6, 129.0, 128.7, 127.5, 125.5, 124.3, 124.2, 123.1, 118.5, 102.6, 78.1, 21.5; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{23}H_{17}Cl_4N]$ 448.0193 found 448.0180.

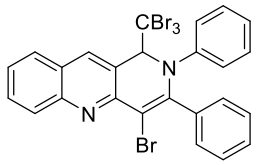


4-Chloro-3-(4-methoxyphenyl)-2-phenyl-1-(trichloromethyl)-1,2-dihydroisoquinoline (9b). The product was obtained as a green solid, mp:146–148°C (194.8 mg, 84%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.91–7.77 (m, 3H), 7.55–7.50 (m, 1H), 7.42–7.32 (m, 2H), 7.28–7.20 (m, 2H), 7.15–7.09 (m, 2H), 6.93–6.82 (m, 3H), 5.43 (s, 1H), 3.76 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 159.8, 147.3, 137.2, 133.2, 132.7, 130.4, 129.7, 129.1, 127.5, 125.7, 124.4, 124.2, 123.2, 118.2, 113.5, 102.8, 78.2, 55.4; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{23}H_{17}Cl_4NO]$ 464.0143, found 464.0142.



4-Chloro-2-phenyl-1-(trichloromethyl)-3-(4-(trifluoromethyl)phenyl)-1,2-dihydroisoquinoline (9c). The product was obtained as a brown solid, mp:129–131°C (200.6 mg, 80%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.99–7.96 (m, 2H), 7.89–7.86 (m, 1H), 7.57–7.52 (m, 3H), 7.44–7.36 (m, 2H), 7.23–7.20 (m, 2H), 7.14–7.09 (m, 2H), 6.96–6.92 (m, 1H), 5.43 (s, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 146.5, 138.7, 135.9, 132.4, 131.4, 130.4, 129.7,

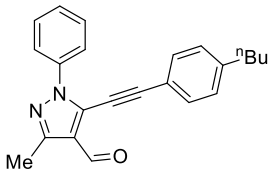
129.2, 128.2, 125.6, 124.9 (q, $J_{C\text{-}F}$ = 3.8 Hz),124.6, 124.5, 123.0, 120.3, 102.4, 77.9; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{23}H_{14}Cl_4F_3N]$ 501.9911, found 502.9928.



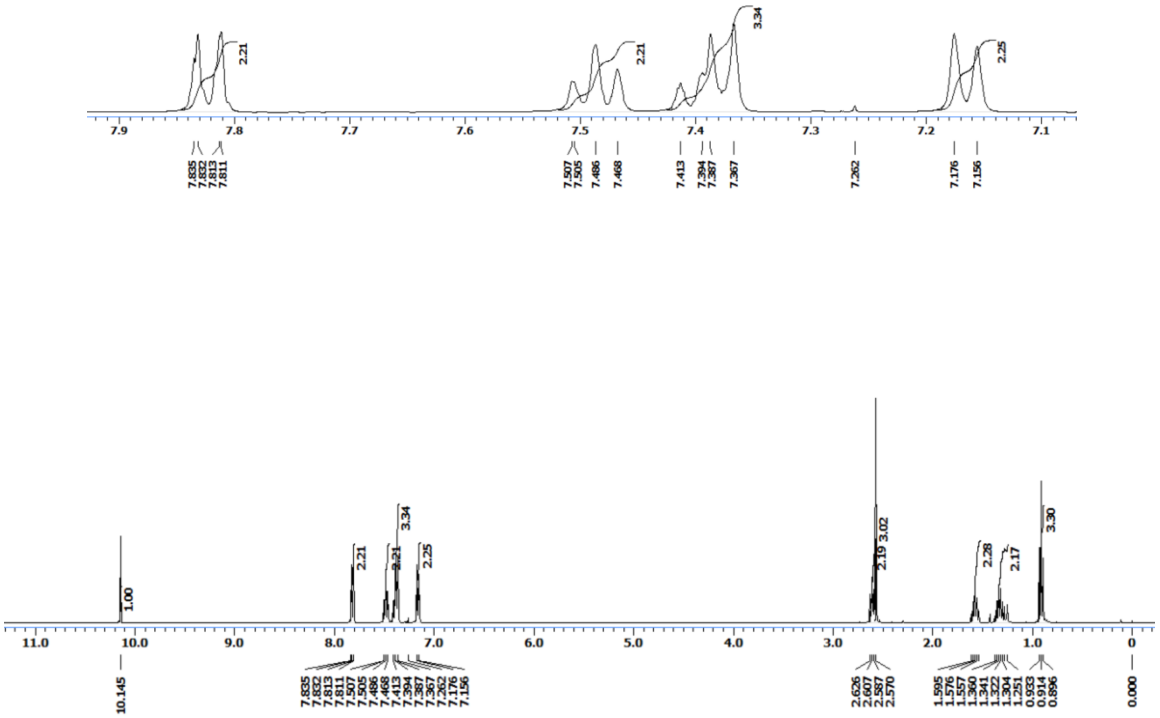
4-Bromo-2,3-diphenyl-1-(tribromomethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (10). The product was obtained as a brown solid, mp:120–122^{o}C (199.2 mg, 60%); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.37–8.35 (m, 2H), 7.96–7.94 (m, 2H), 7.88–7.85 (m,1H), 7.83–7.79 (m, 1H), 7.56–7.52 (m, 1H), 7.35–7.28 (m, 5H), 7.12–7.08 (m, 2H), 6.96 (t, J = 7.4 Hz, 1H), 5.65 (s, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 149.1, 147.9, 146.6, 139.2, 135.9, 131.3, 130.8, 129.3, 129.2, 128.9, 127.6, 127.5, 127.0, 126.7, 125.2, 124.1, 120.3, 79.2, 49.9; HRMS (ESI) $[M+H]^+$ Calcd for $[C_{25}H_{16}Br_4N_2]$ 660.8125, found 660.8135.

Copies of ^{1}H and ^{13}C NMR

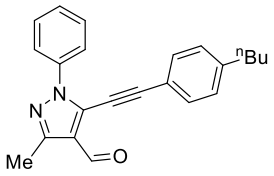
^{1}H NMR



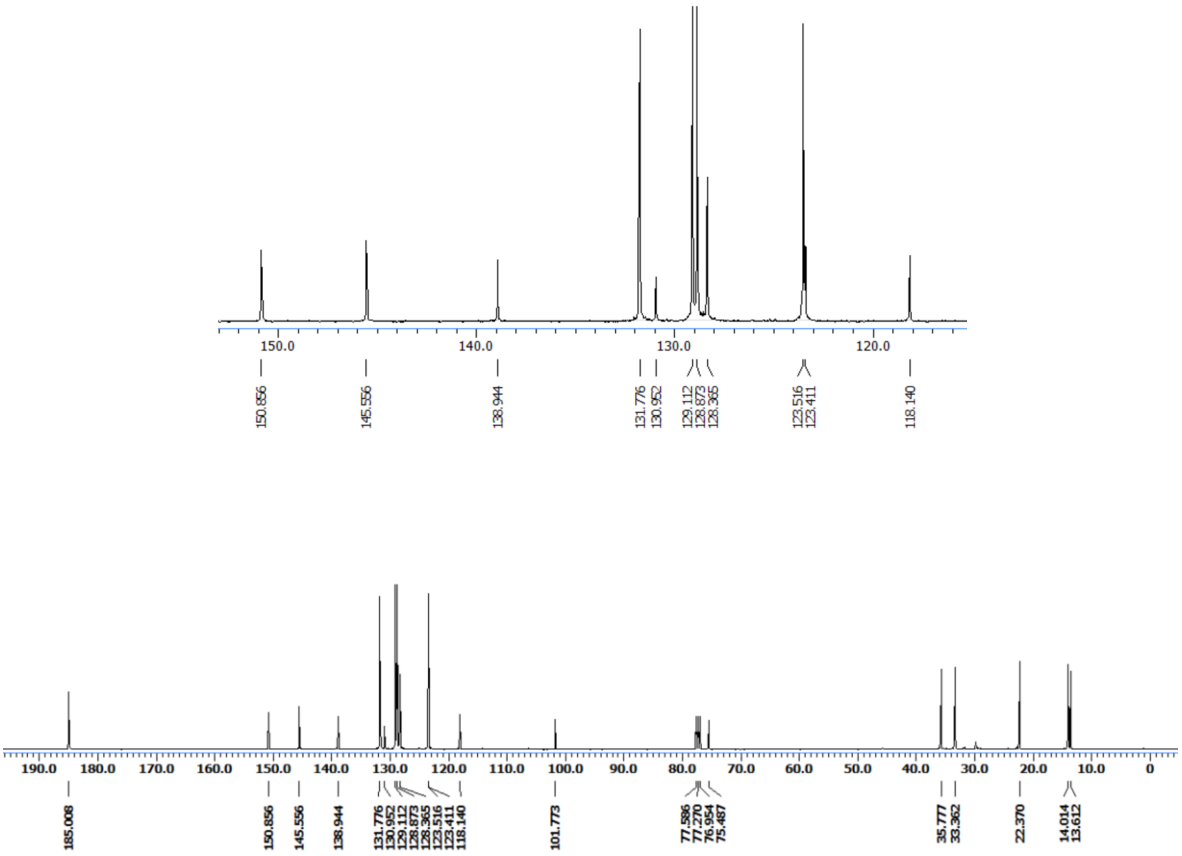
5-((4Butylphenyl)ethynyl)-3-methyl-1-phenyl-1*H*-pyrazole-4-carbaldehyde (1x)



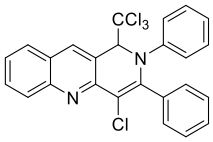
^{13}C NMR



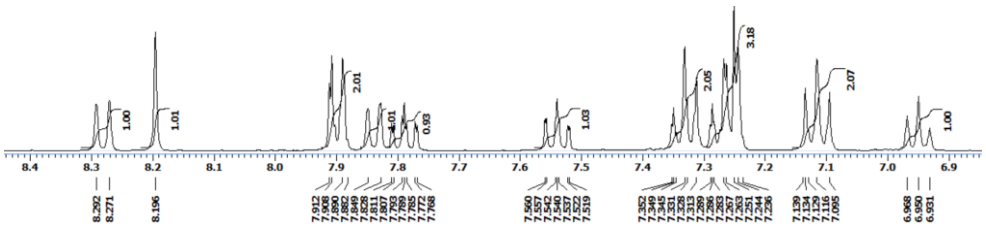
5-((4Butylphenyl)ethynyl)-3-methyl-1-phenyl-1*H*-pyrazole-4-carbaldehyde (1x)

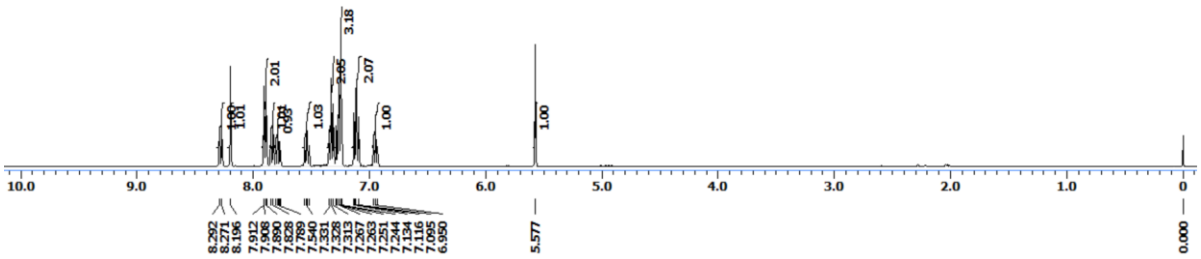


^{1}H NMR

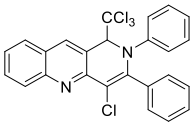


4-Chloro-2,3-diphenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3a)

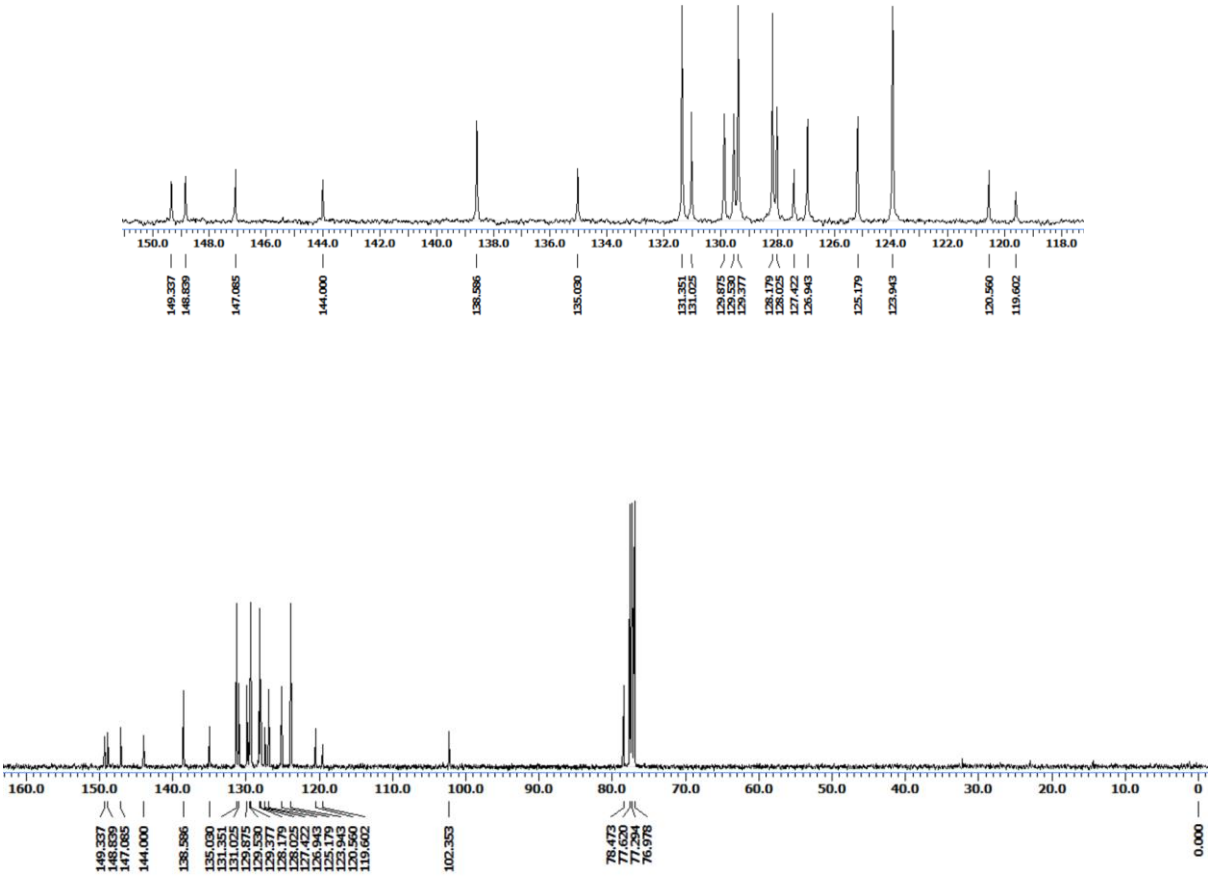




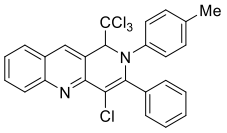
^{13}C NMR



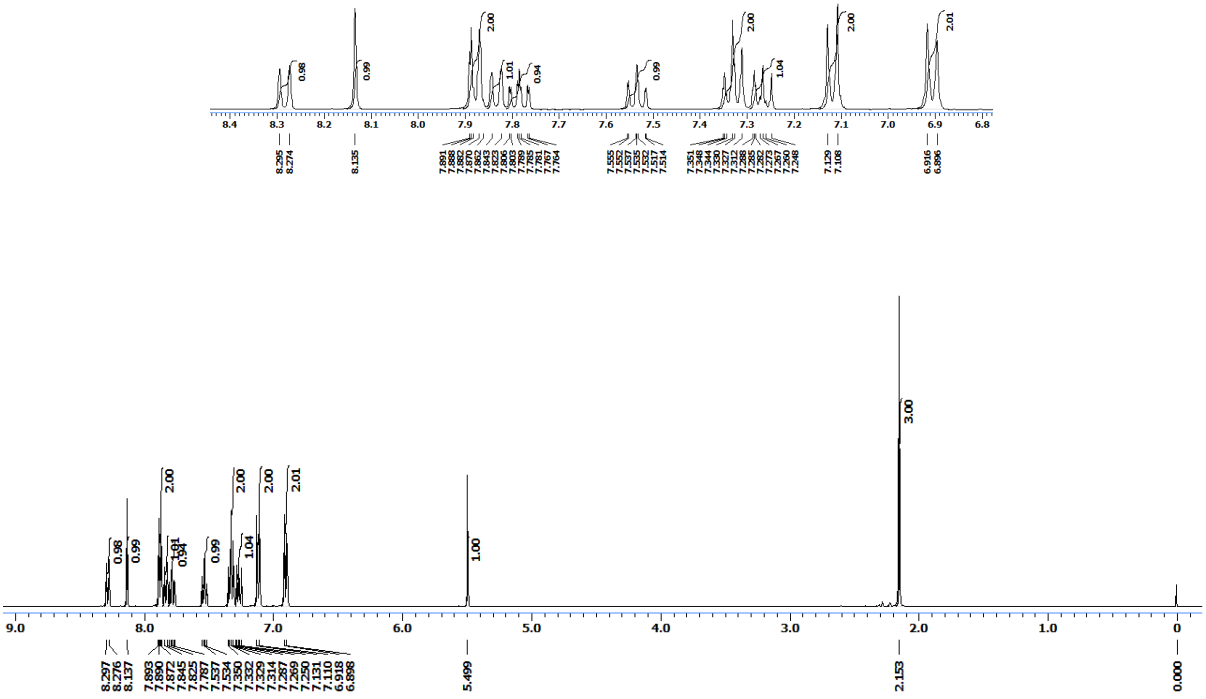
4-Chloro-2,3-diphenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3a)



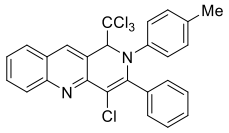
^{1}H NMR



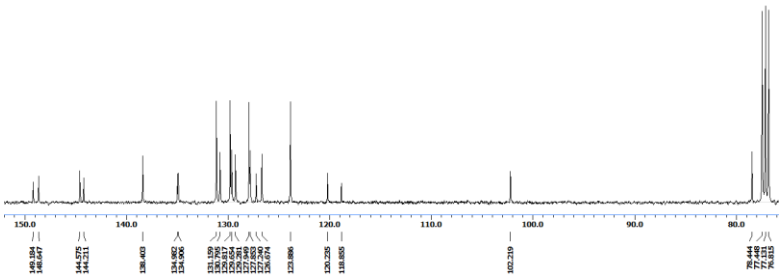
4-Chloro-3-phenyl-2-(*p*-tolyl)-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3b)

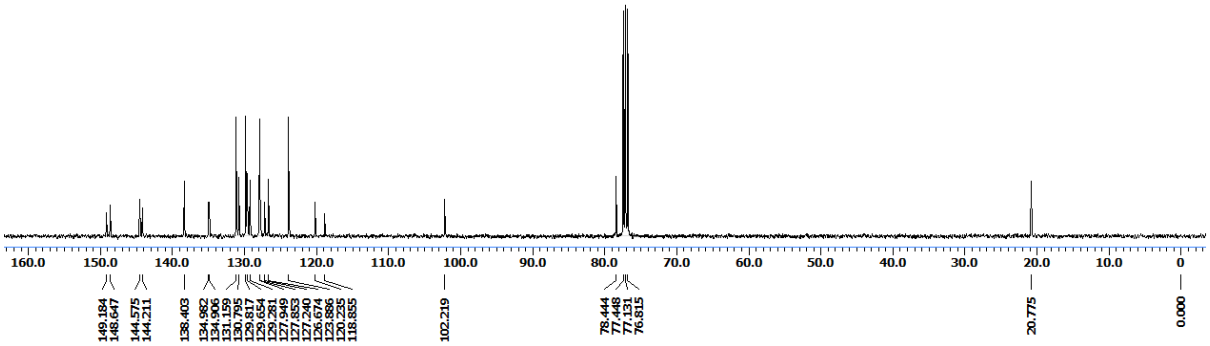


^{13}C NMR

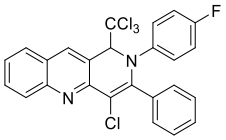


4-Chloro-3-phenyl-2-(*p*-tolyl)-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3b)

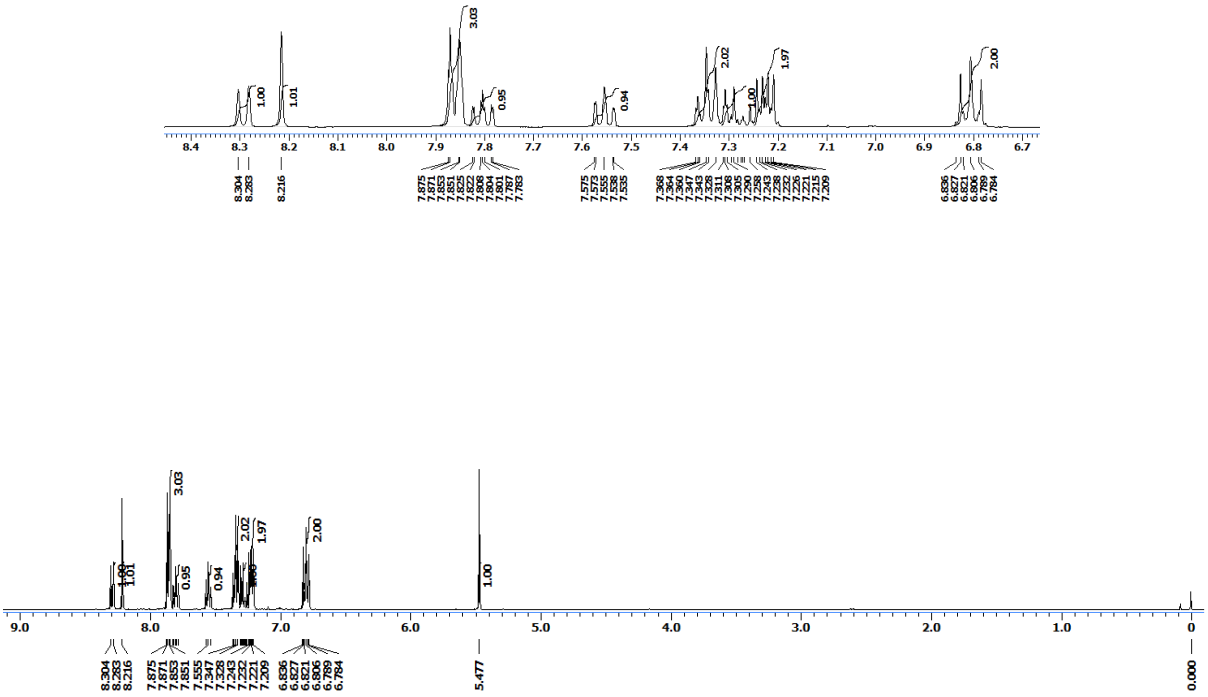




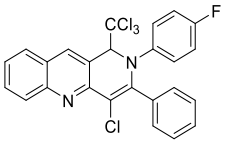
^{1}H NMR



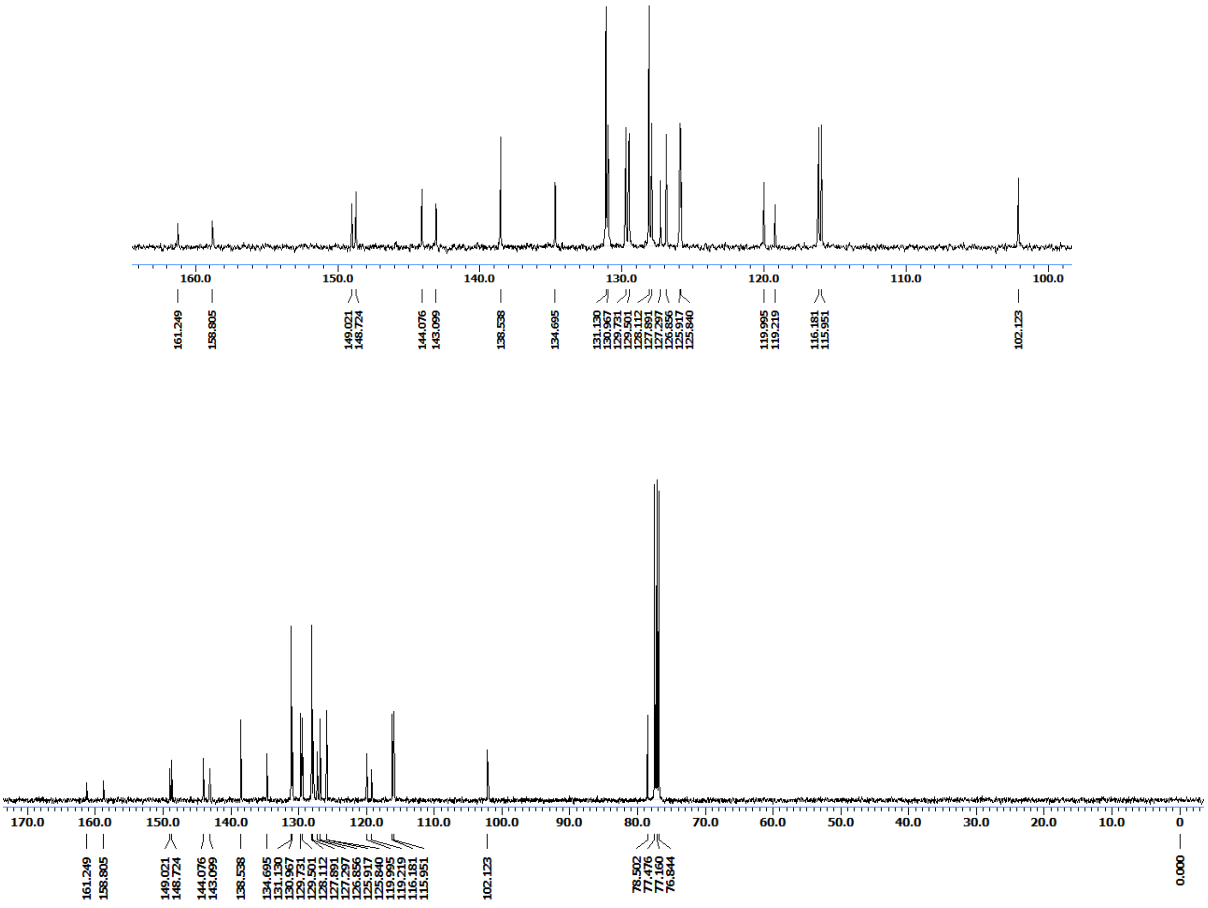
4-Chloro-2-(4-fluorophenyl)-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3c)



^{13}C NMR



4-Chloro-2-(4-fluorophenyl)-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3c)



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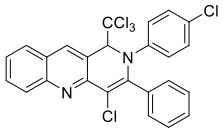
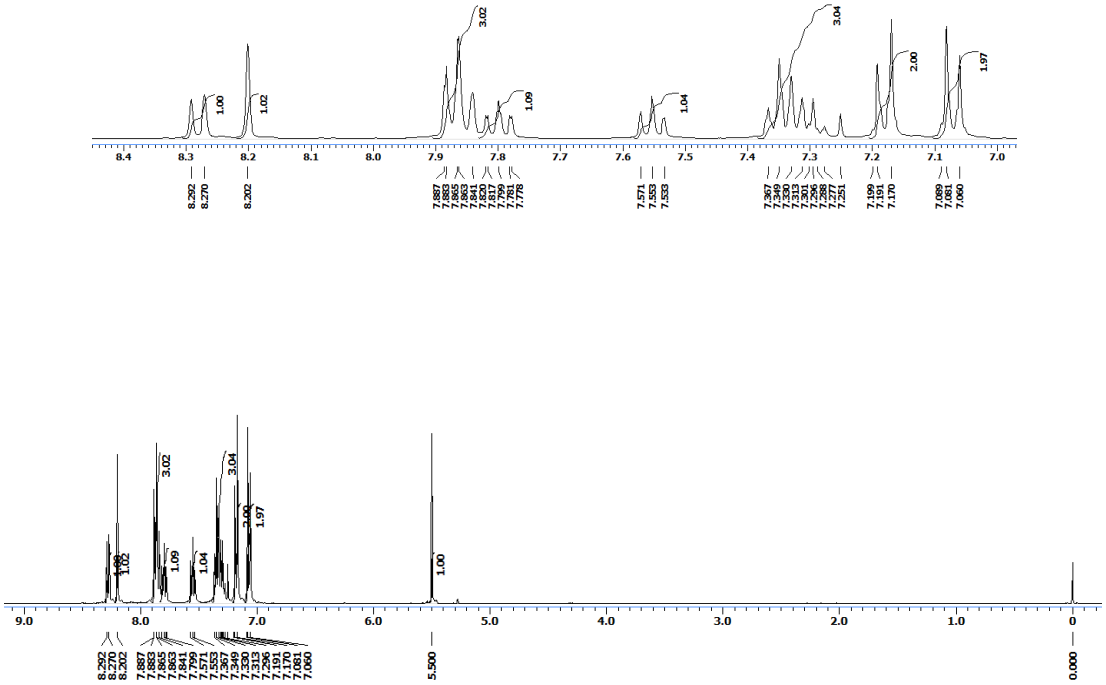
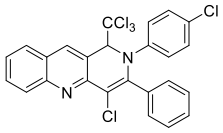


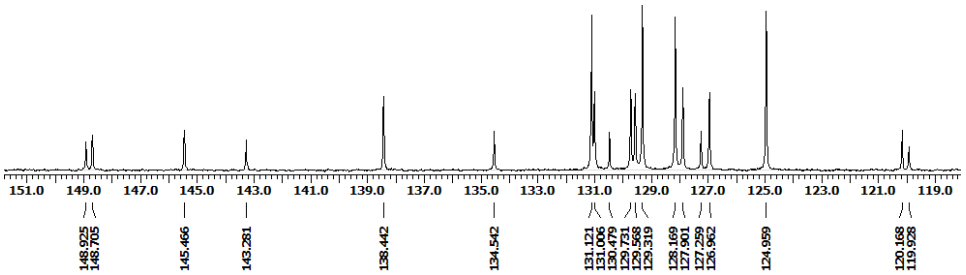
4-Chloro-2-(4-chlorophenyl)-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3d)

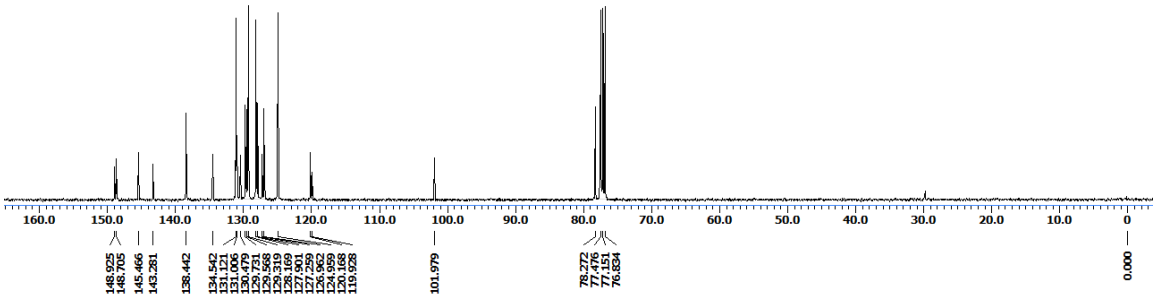


^{13}C NMR

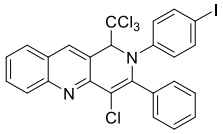


4-Chloro-2-(4-chlorophenyl)-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3d)

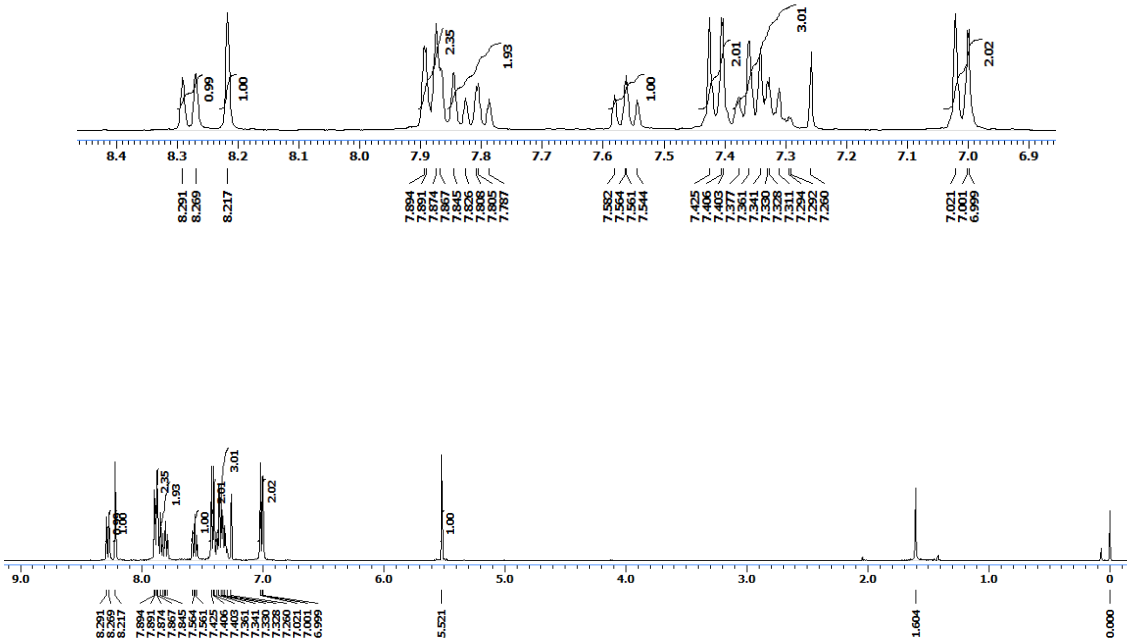




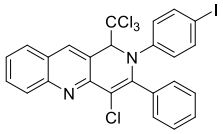
^{1}H NMR



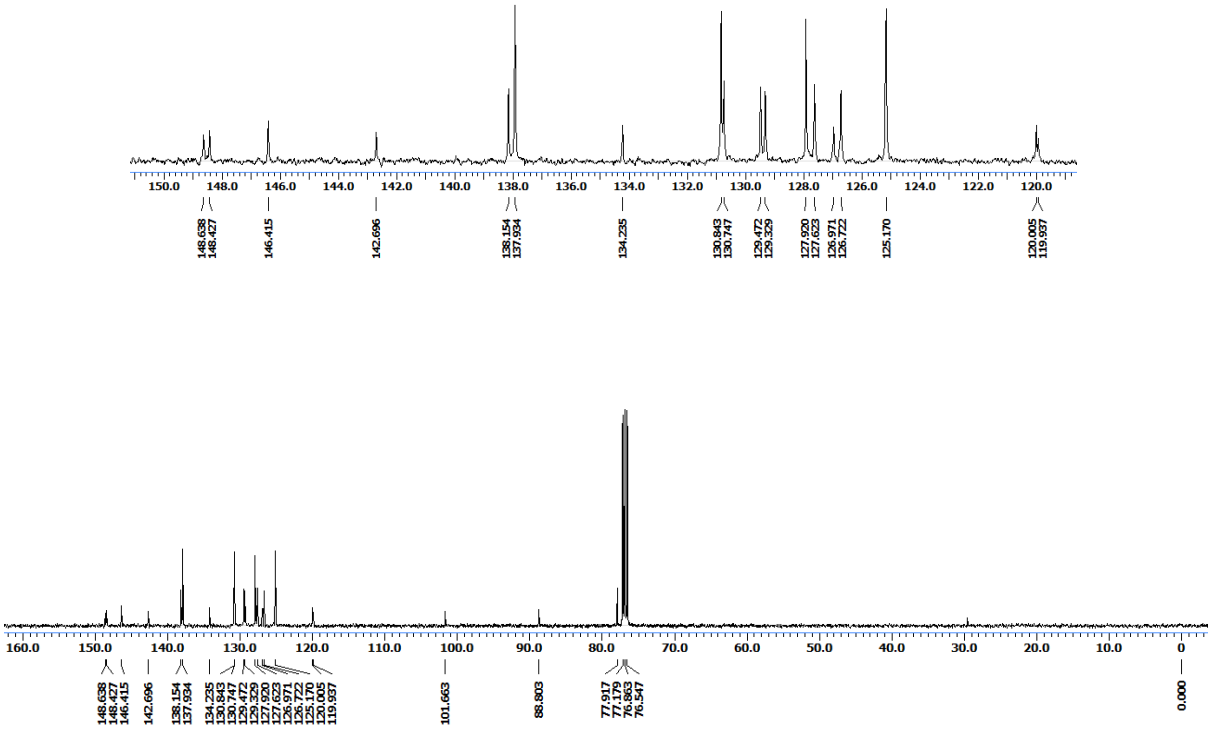
4-Chloro-2-(4-iodophenyl)-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3e)



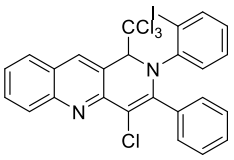
^{13}C NMR



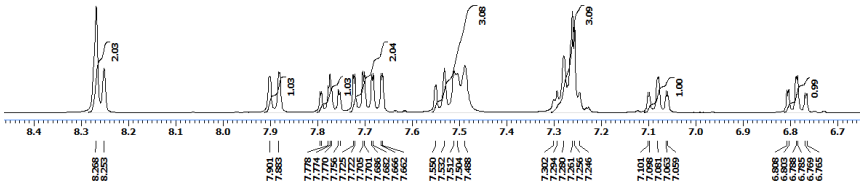
4-Chloro-2-(4-iodophenyl)-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3e)

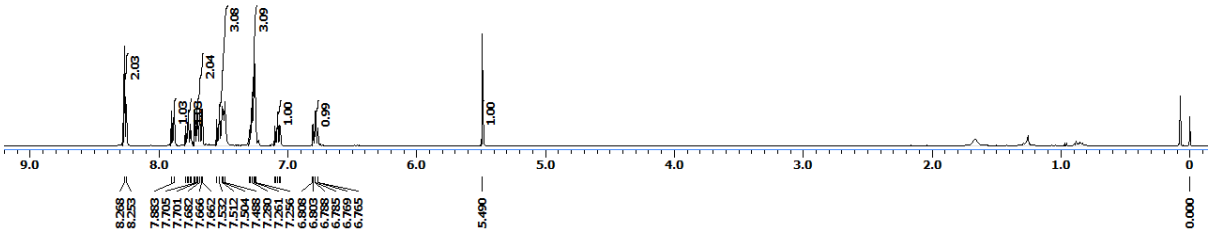


^{1}H NMR

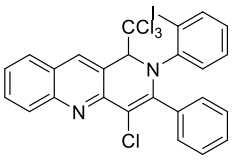


4-Chloro-2-(2-iodophenyl)-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3f)

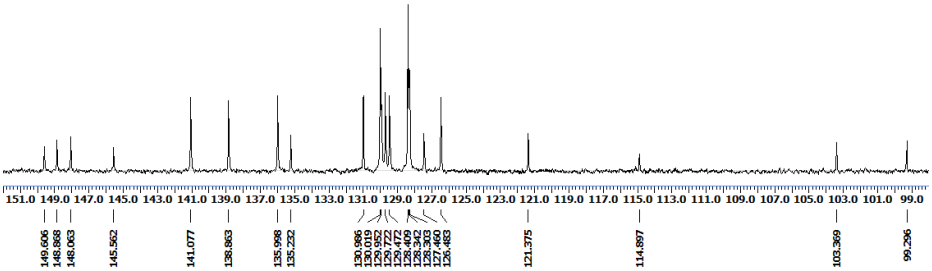


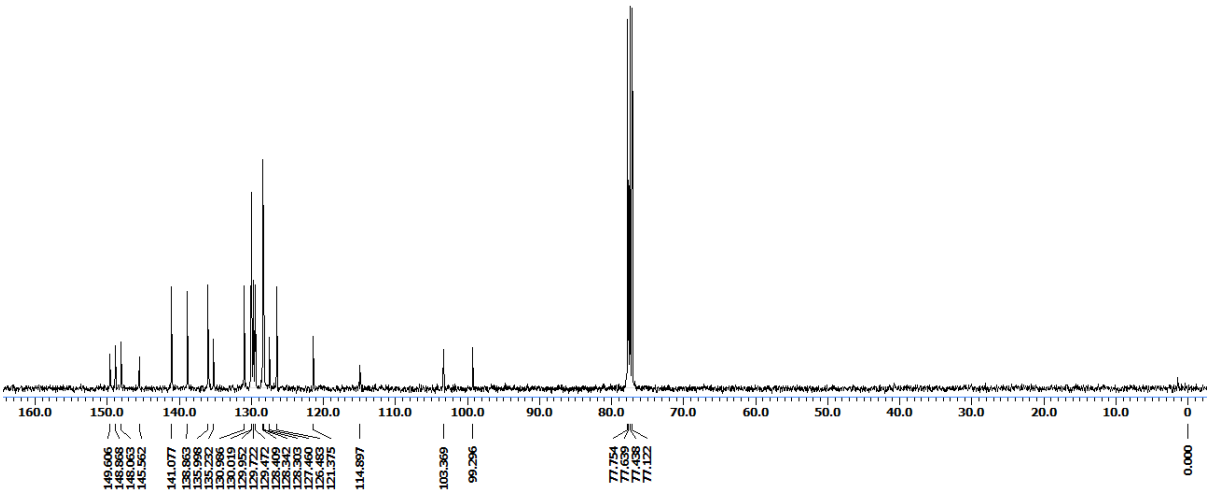


^{13}C NMR

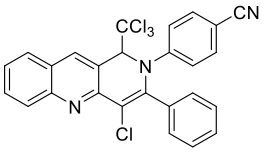


4-Chloro-2-(2-iodophenyl)-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3f)

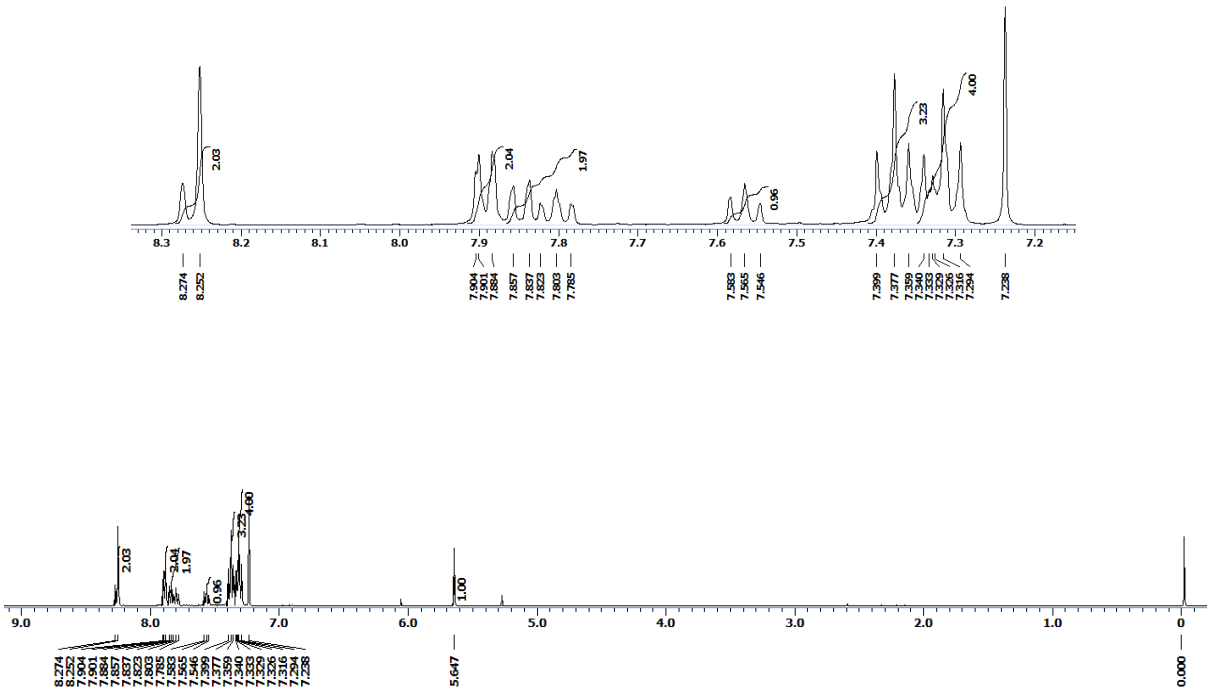




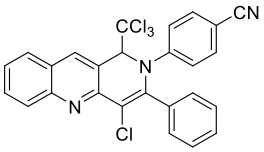
^{1}H NMR



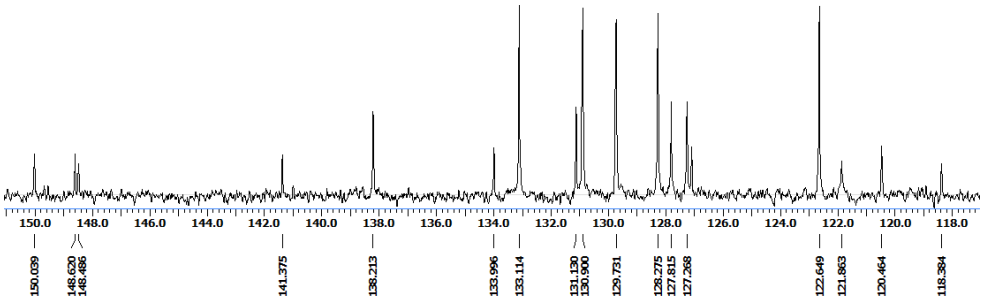
4-(4-chloro-3-phenyl-1-(trichloromethyl)benzo[*b*][1,6]naphthyridin-2(1*H*)-yl)benzonitrile (3g)

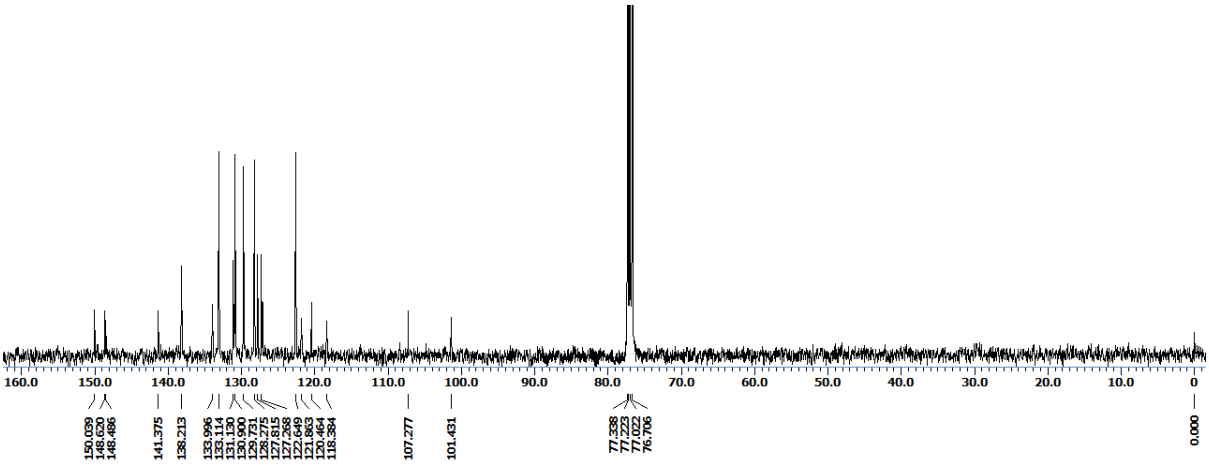


^{13}C NMR

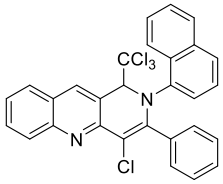


4-(4-chloro-3-phenyl-1-(trichloromethyl)benzo[*b*][1,6]naphthyridin-2(1*H*)-yl)benzonitrile (3g)

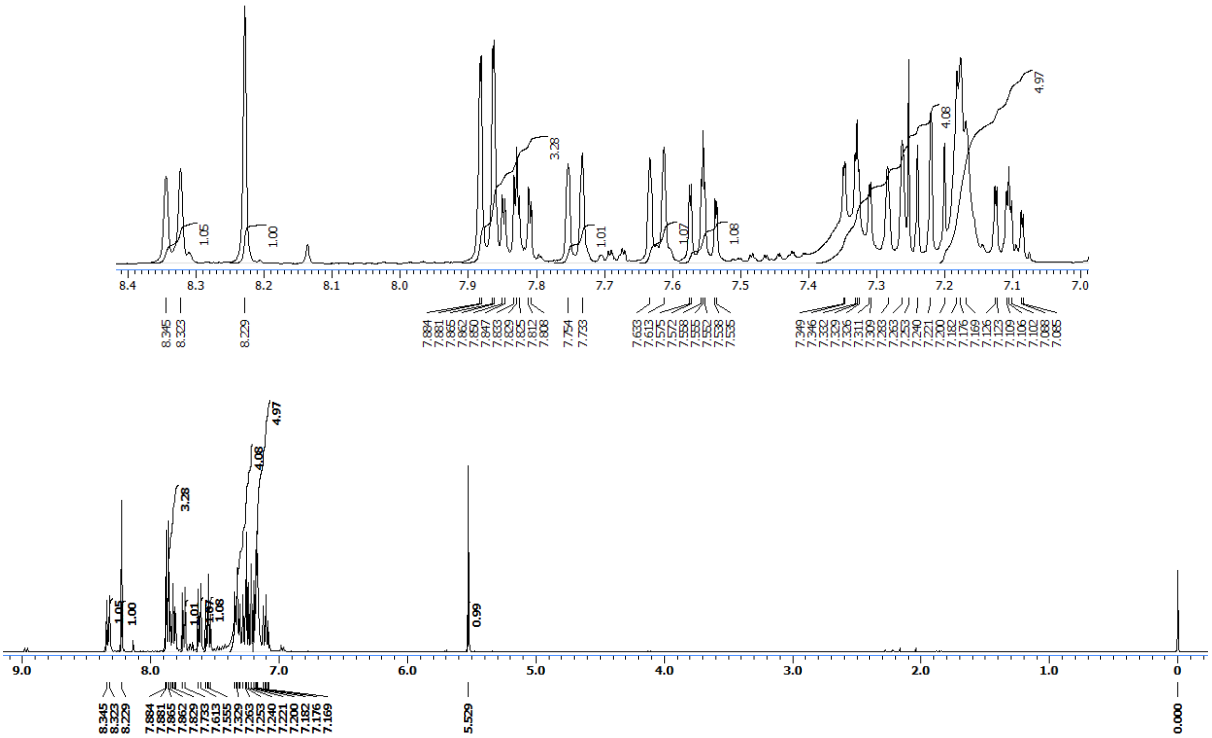




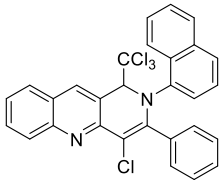
^{1}H NMR



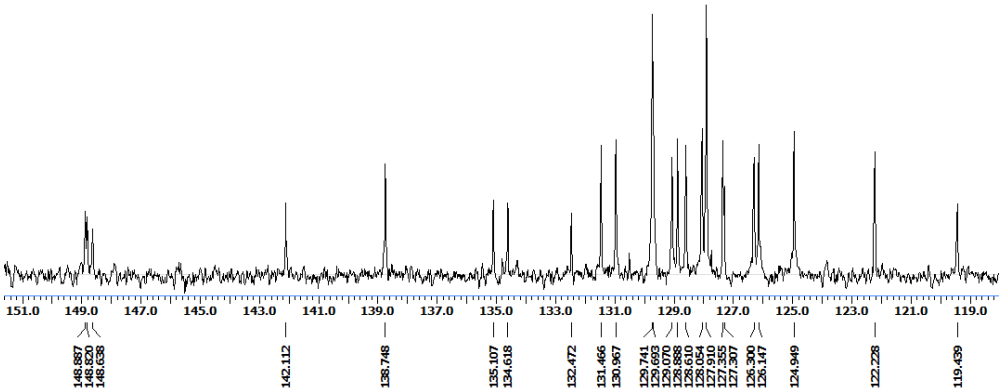
4-Chloro-2-(naphthalen-1-yl)-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3h)

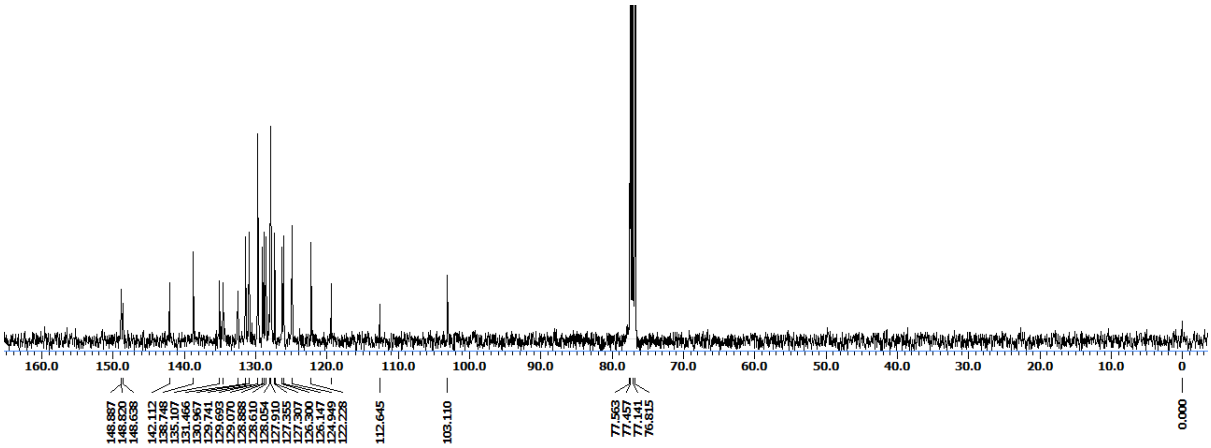


^{13}C NMR

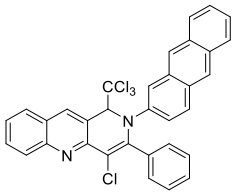


4-Chloro-2-(naphthalen-1-yl)-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3h)

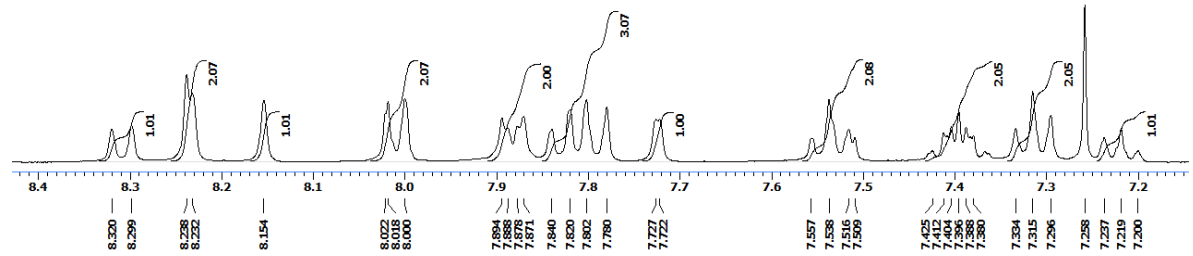


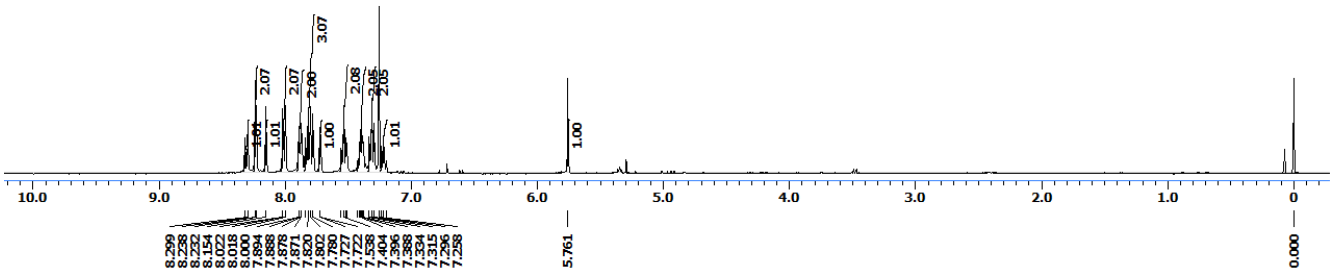


^{1}H NMR



2-(Anthracen-2-yl)-4-chloro-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3i)





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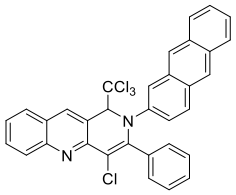
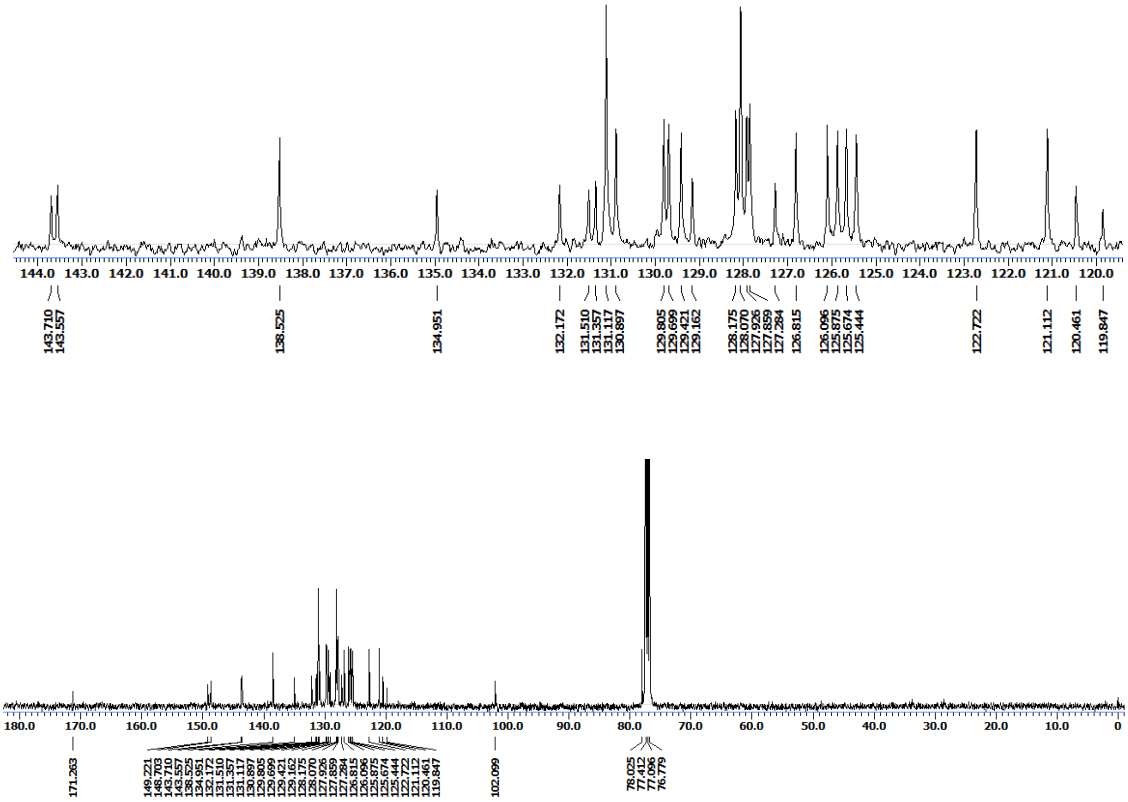
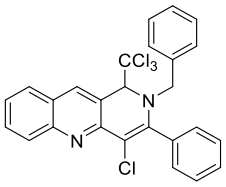


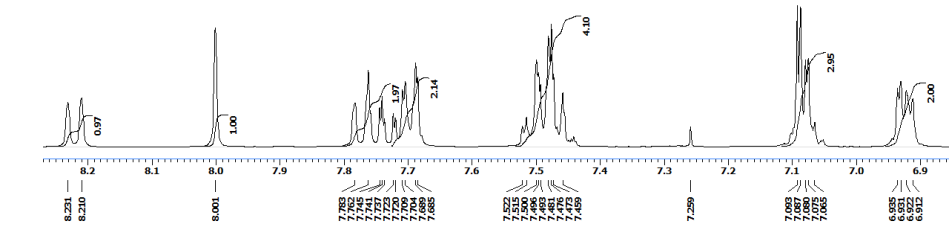
2-(Anthracen-2-yl)-4-chloro-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3i)

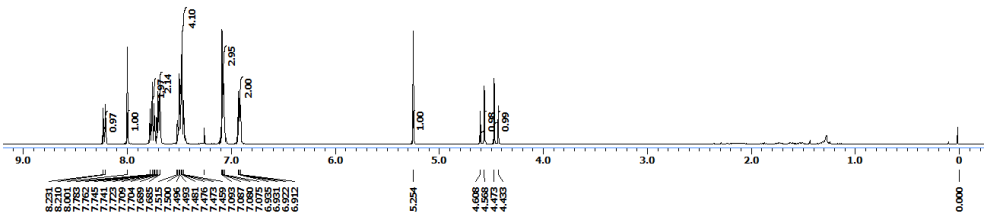


^{1}H NMR



2-Benzyl-4-chloro-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3j)





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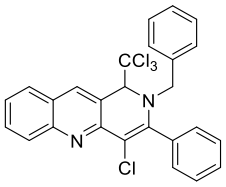
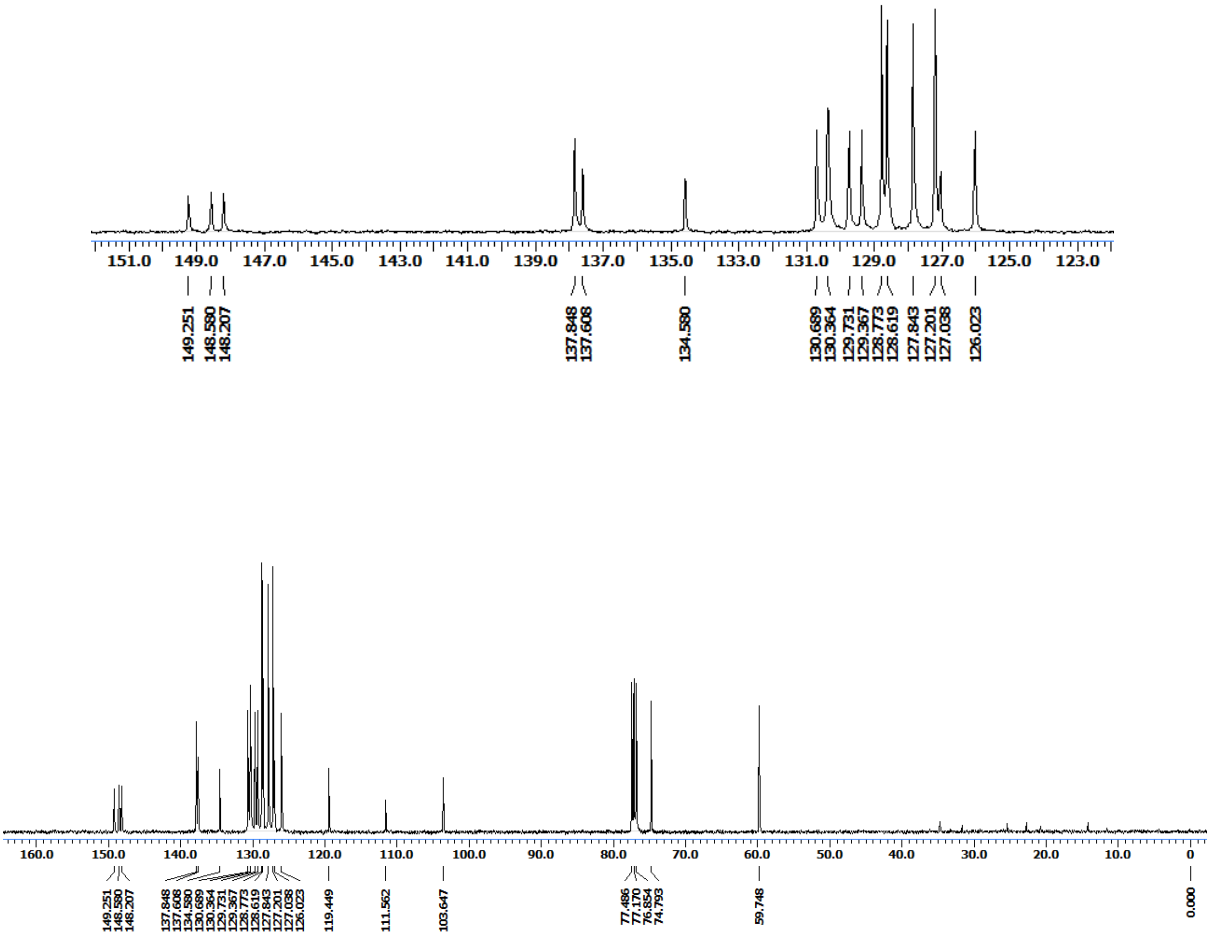
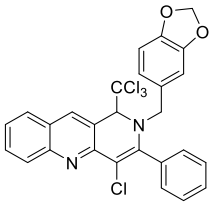


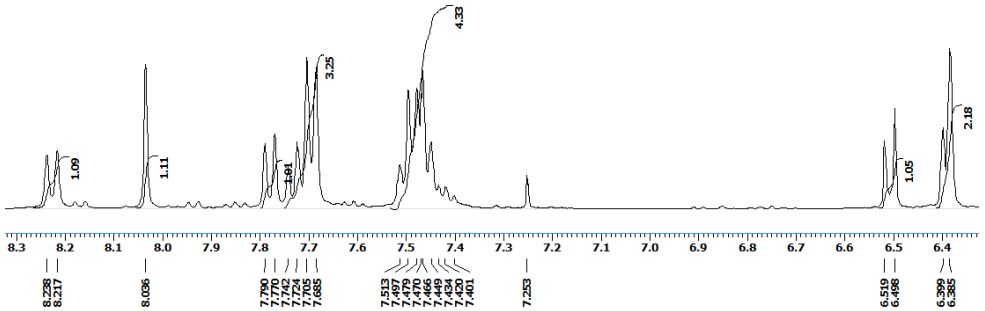
2-Benzyl-4-chloro-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3j)

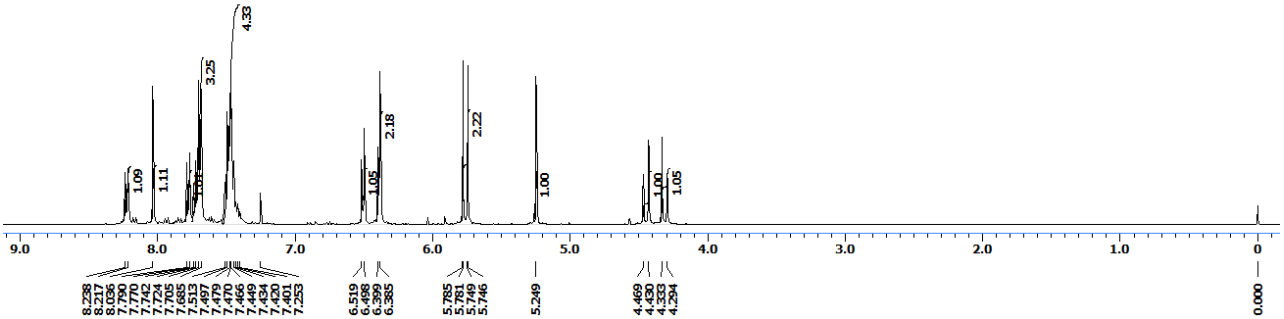


^{1}H NMR

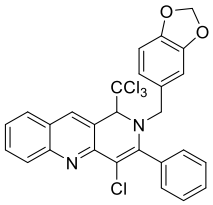


2-(Benzo[*d*][1,3]dioxol-5-ylmethyl)-4-chloro-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3k)

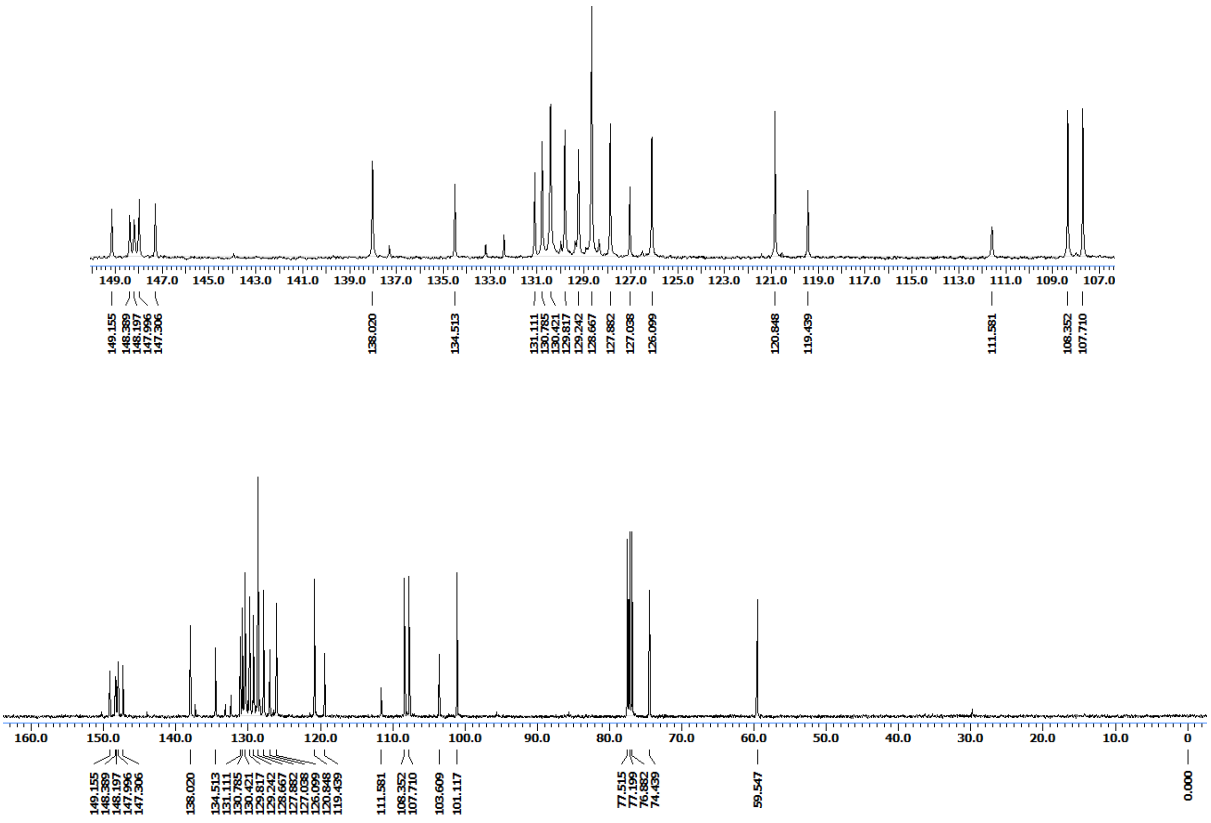




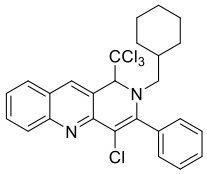
^{13}C NMR



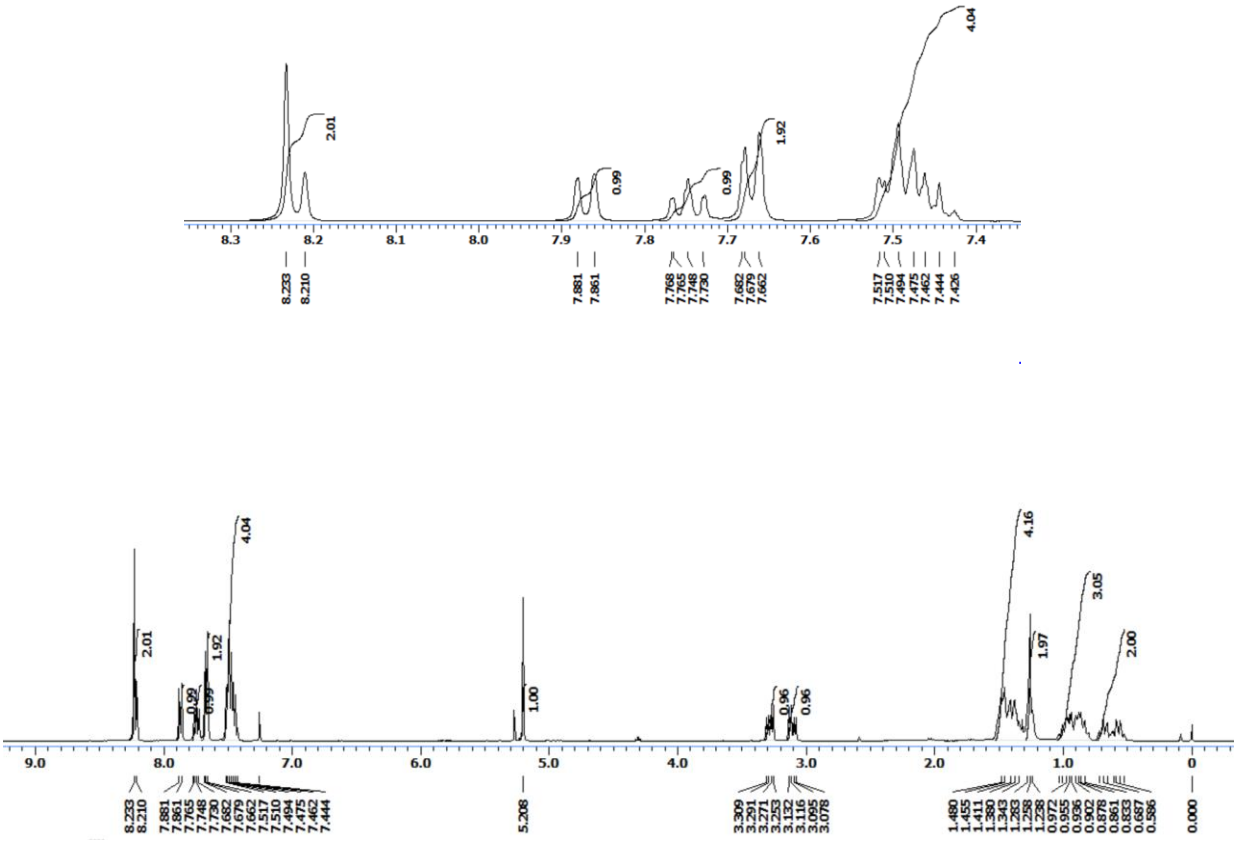
2-(Benzo[*d*][1,3]dioxol-5-ylmethyl)-4-chloro-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3k)



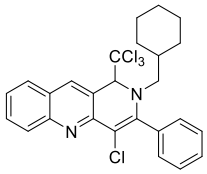
^{1}H NMR



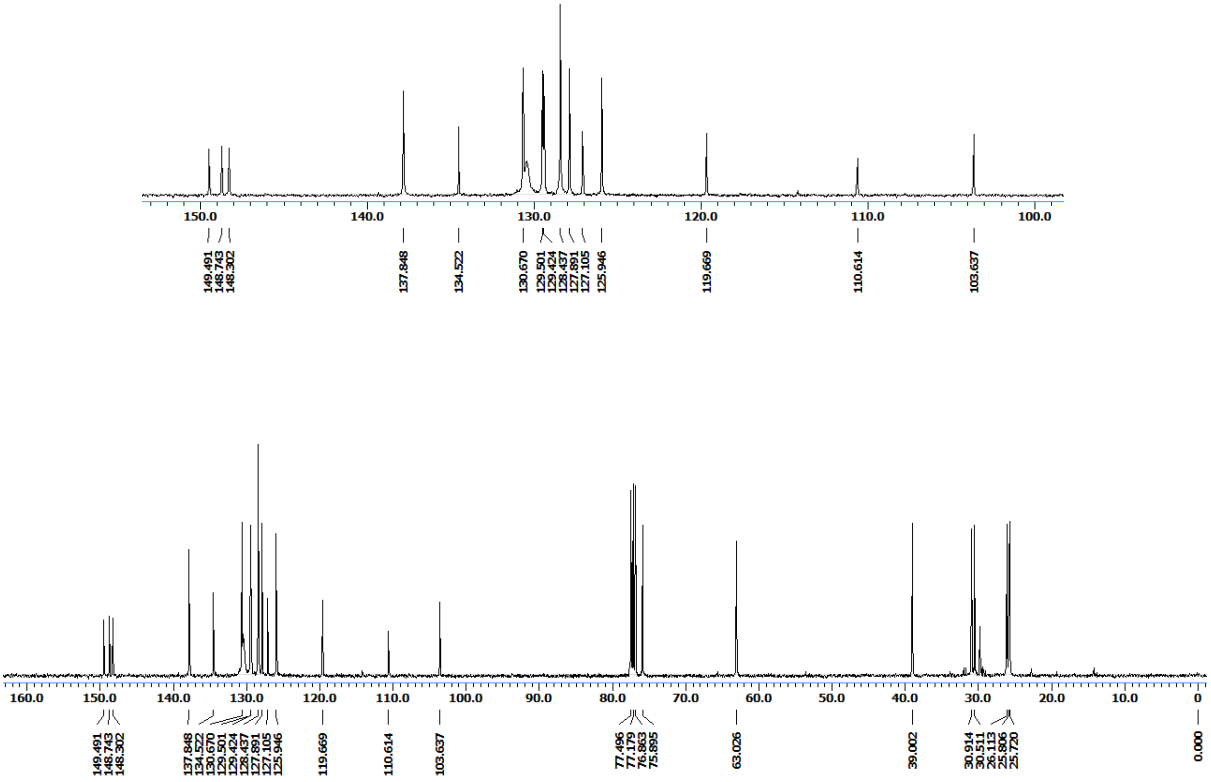
4-Chloro-2-(cyclohexylmethyl)-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3l)



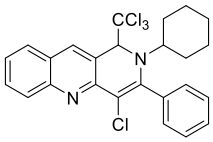
^{13}C NMR



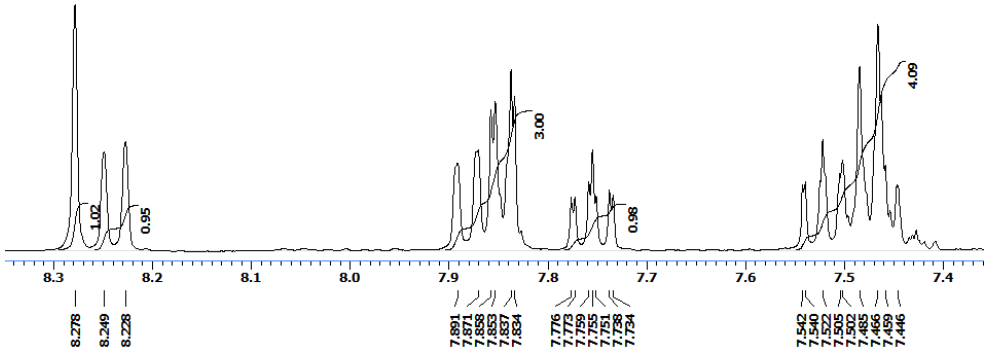
4-Chloro-2-(cyclohexylmethyl)-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3l)

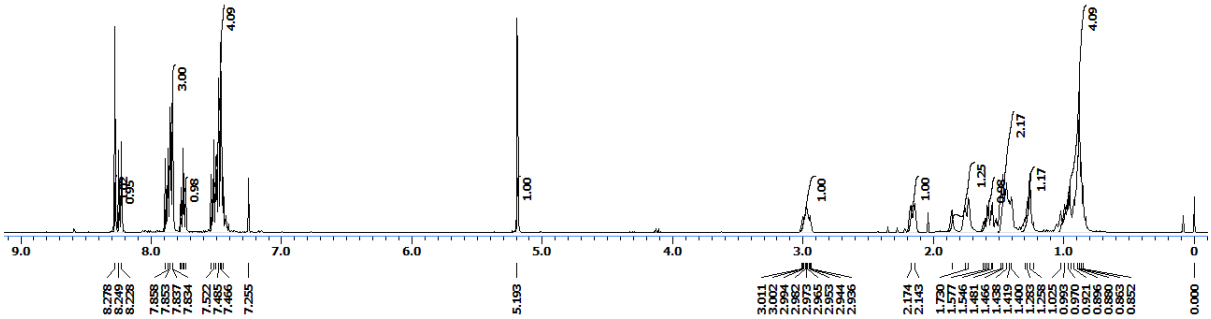


^{1}H NMR

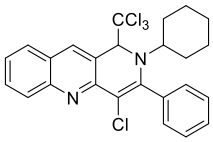


4-Chloro-2-cyclohexyl-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridin (3m)

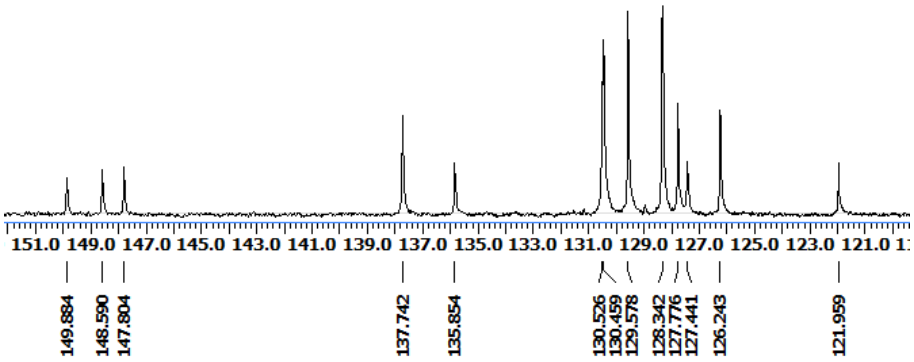


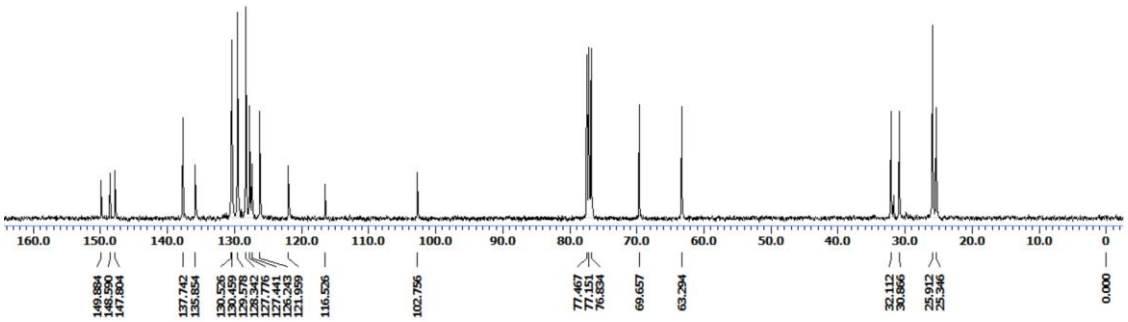


^{13}C NMR

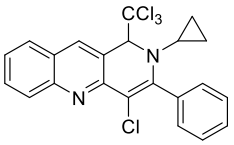


4-Chloro-2-cyclohexyl-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridin (3m)

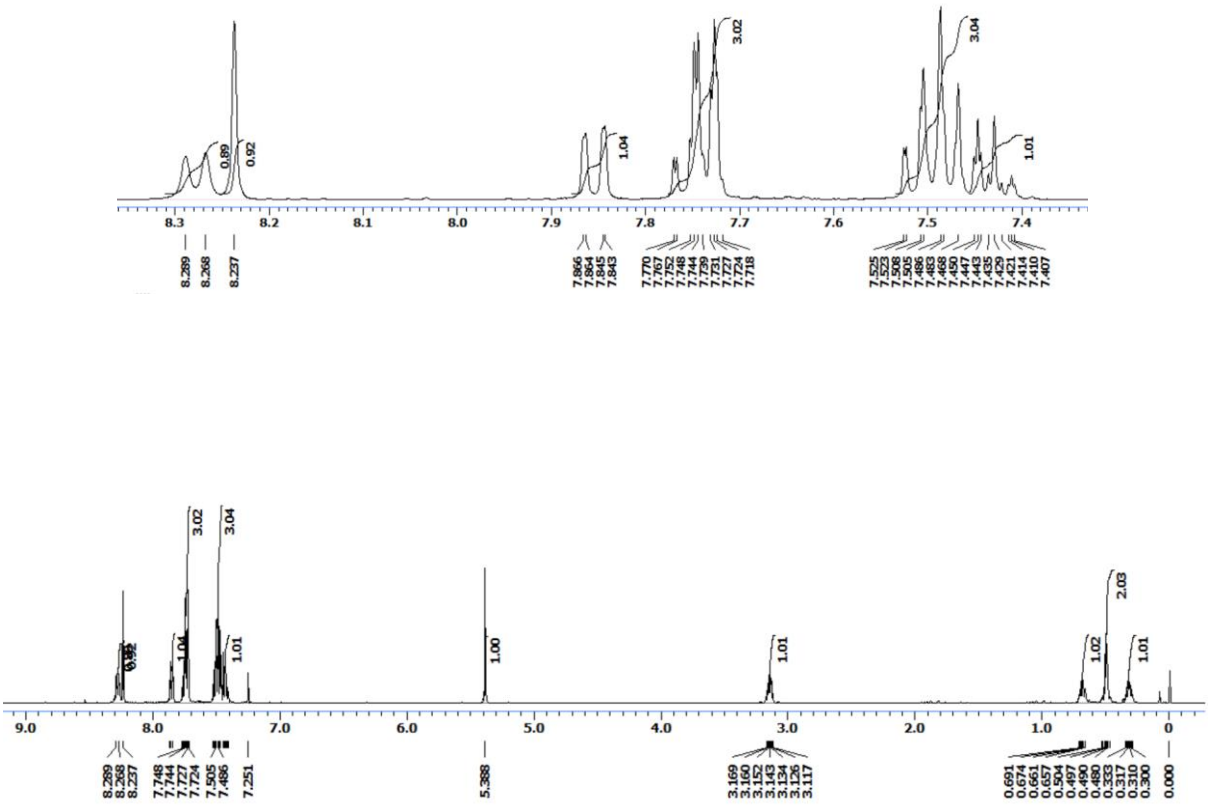




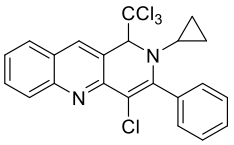
^{1}H NMR



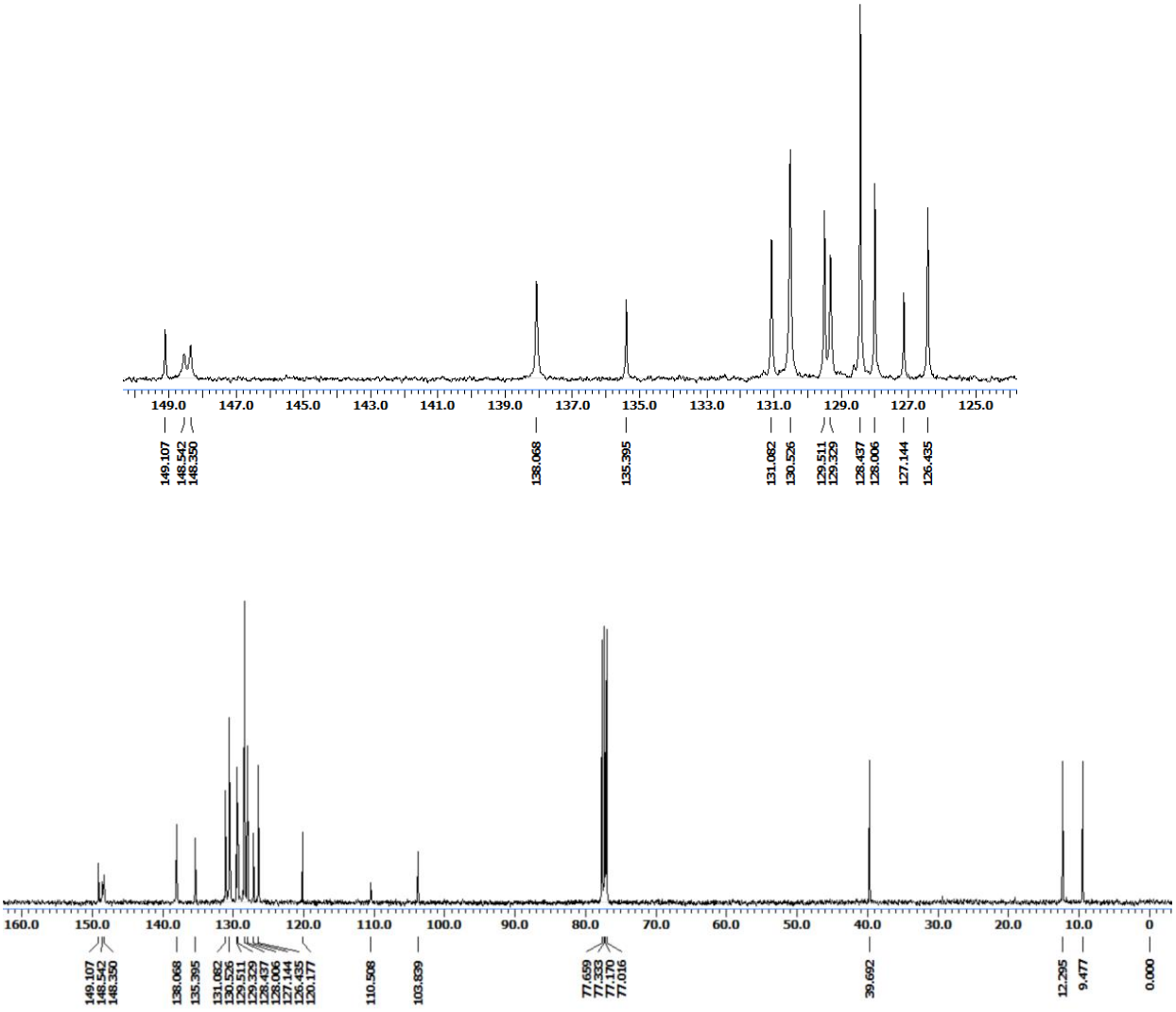
4-4-Chloro-2-cyclopropyl-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3n)



^{13}C NMR



4-4-Chloro-2-cyclopropyl-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3n)



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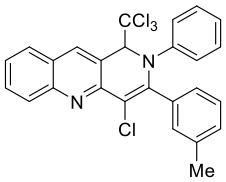
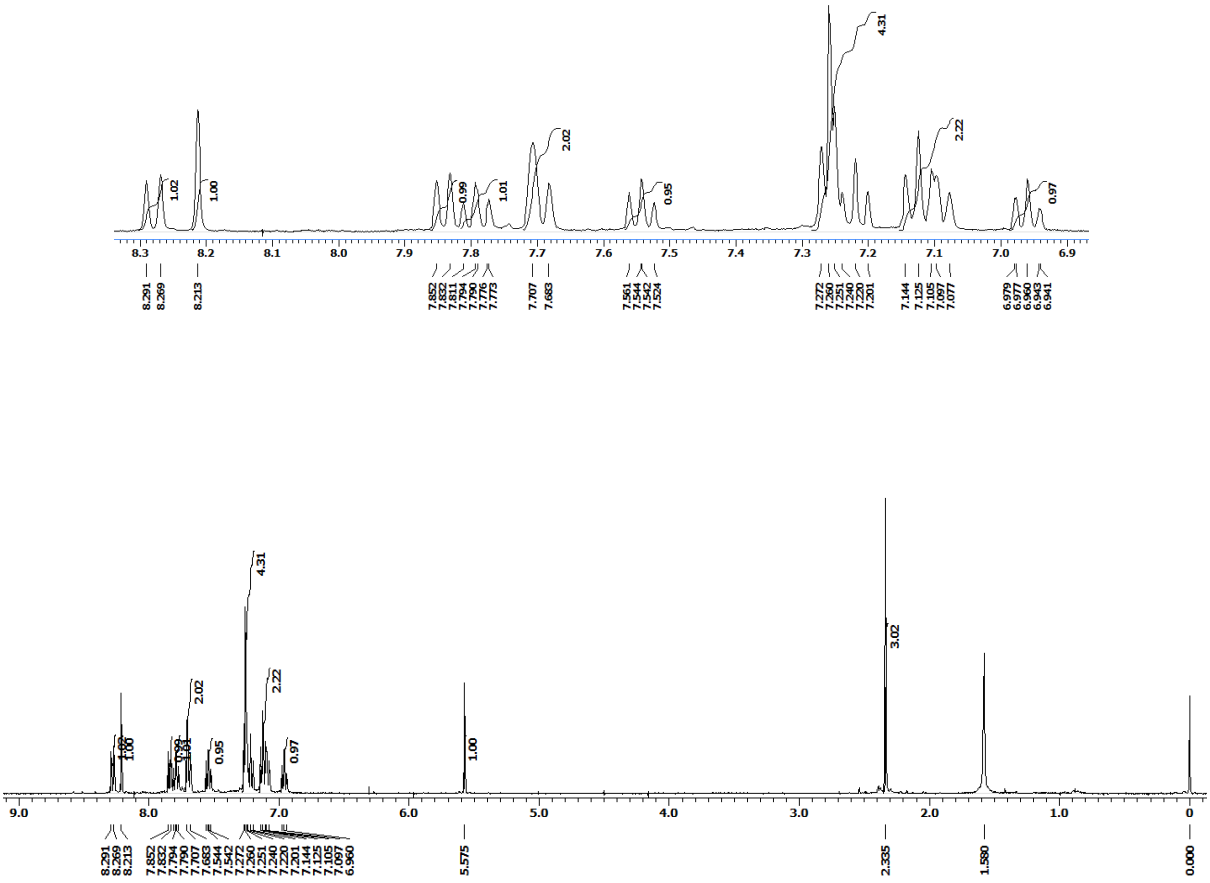
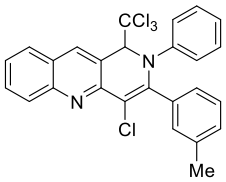


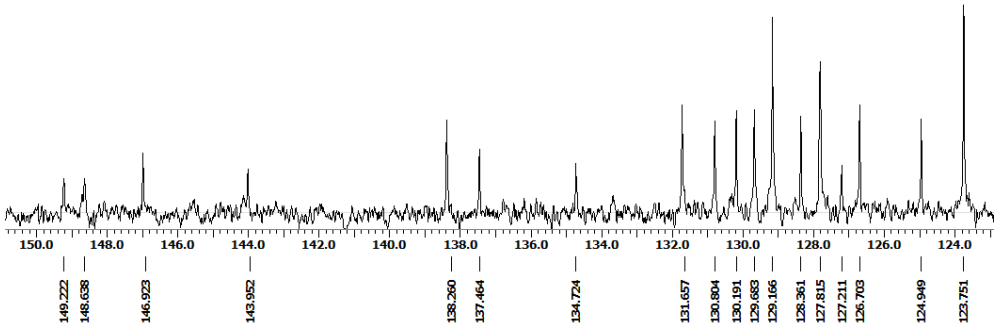
4-Chloro-2-phenyl-3-(m-tolyl)-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3o)

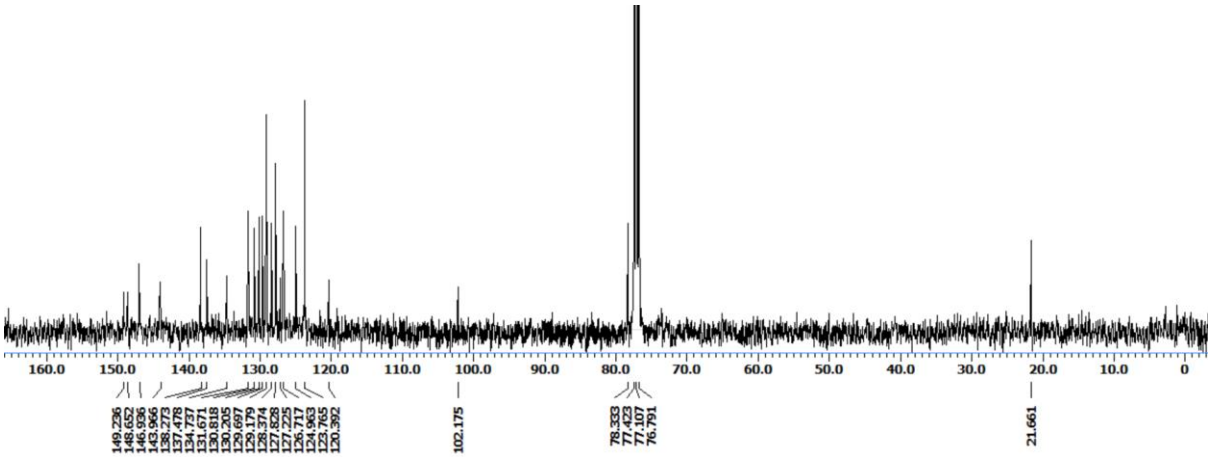


^{13}C NMR

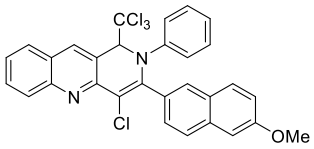


4-Chloro-2-phenyl-3-(m-tolyl)-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3o)

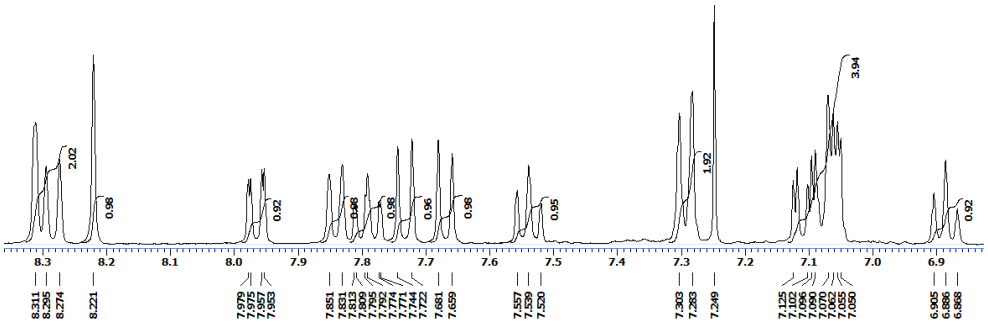


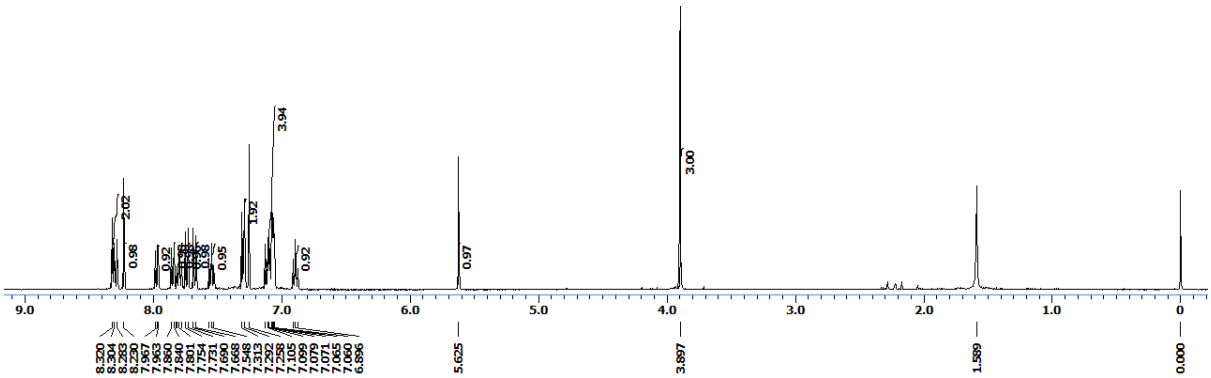


^{1}H NMR

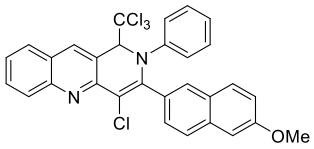


4-Chloro-3-(6-methoxynaphthalen-2-yl)-2-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3p)

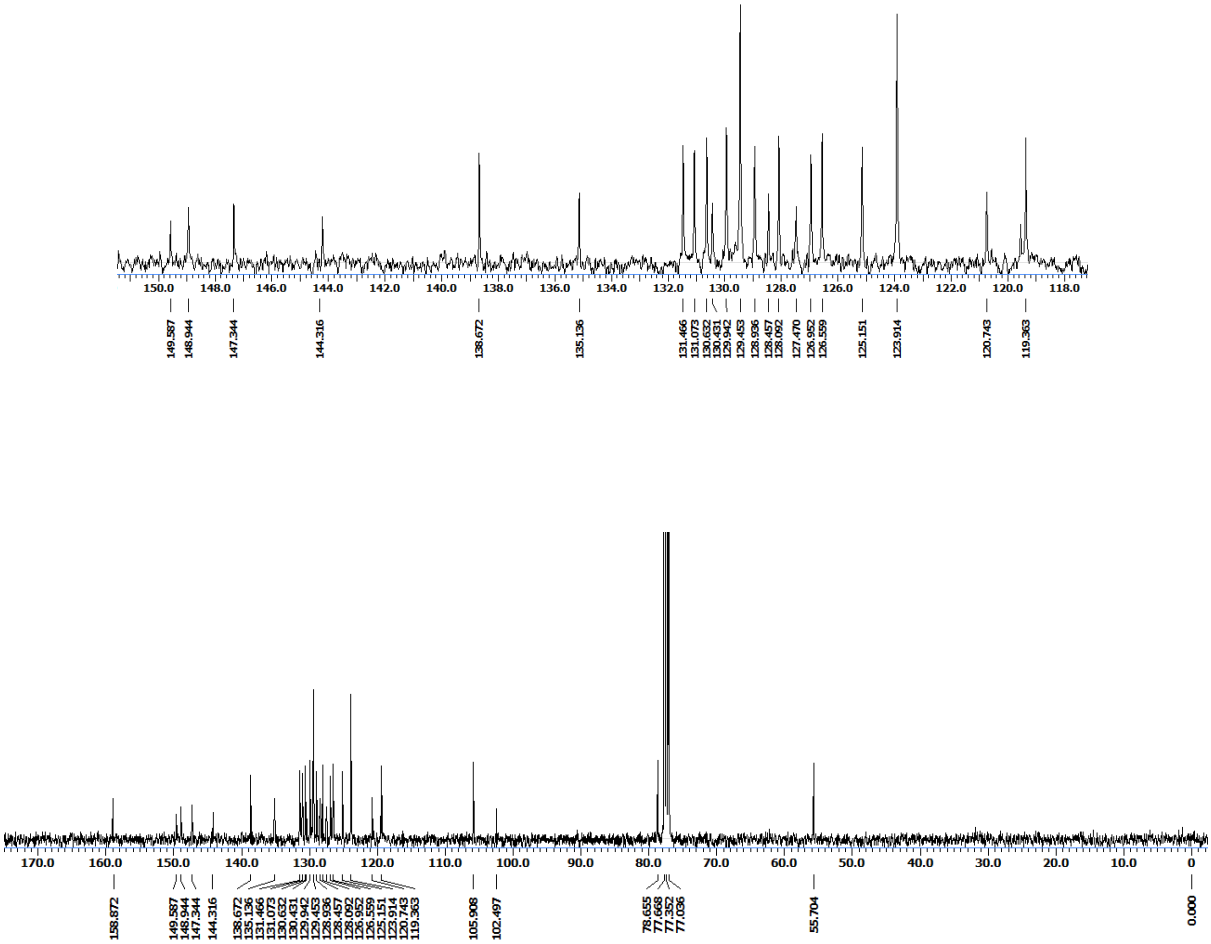




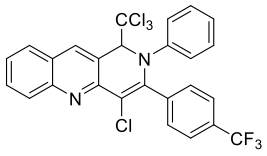
^{13}C NMR



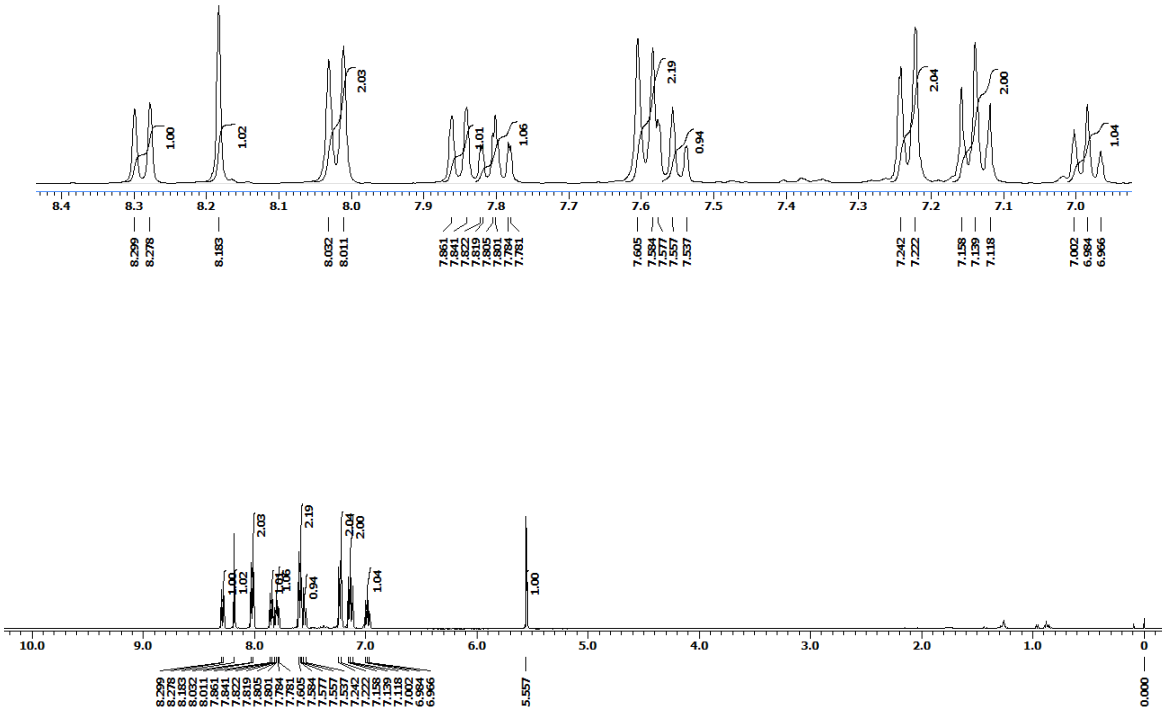
4-Chloro-3-(6-methoxynaphthalen-2-yl)-2-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3p)



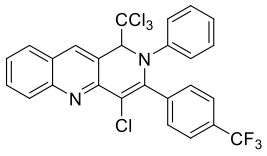
^{1}H NMR



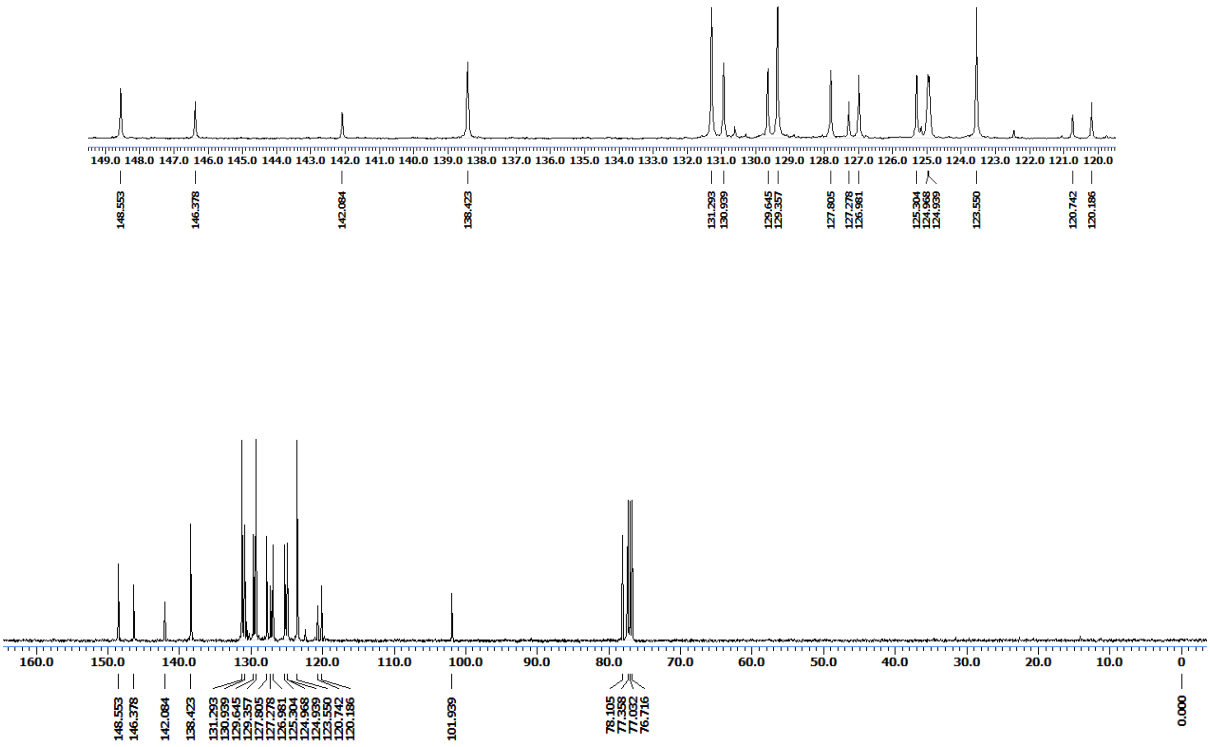
4-Chloro-2-phenyl-1-(trichloromethyl)-3-(4-(trifluoromethyl)phenyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3q)



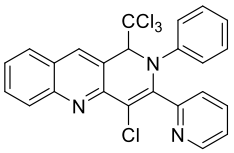
^{13}C NMR



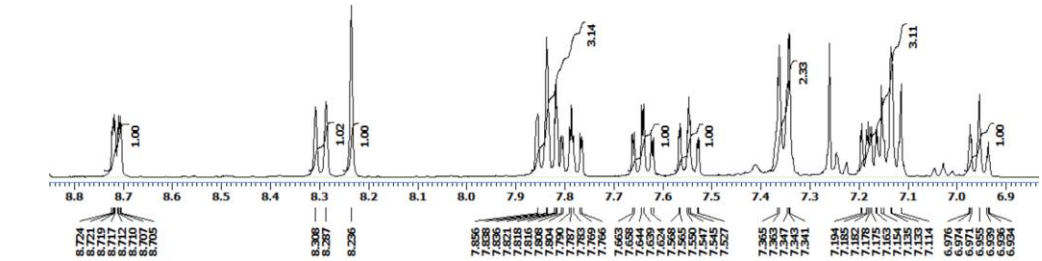
4-Chloro-2-phenyl-1-(trichloromethyl)-3-(4-(trifluoromethyl)phenyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3q)

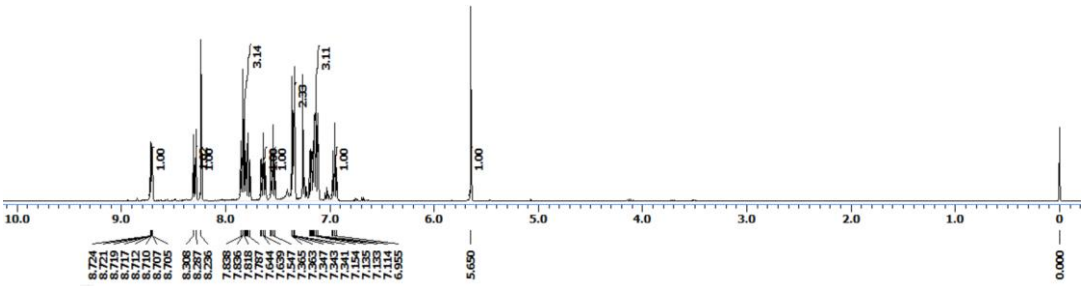


^{1}H NMR

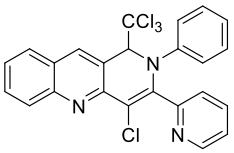


4-Chloro-2-phenyl-3-(pyridin-2-yl)-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3r)

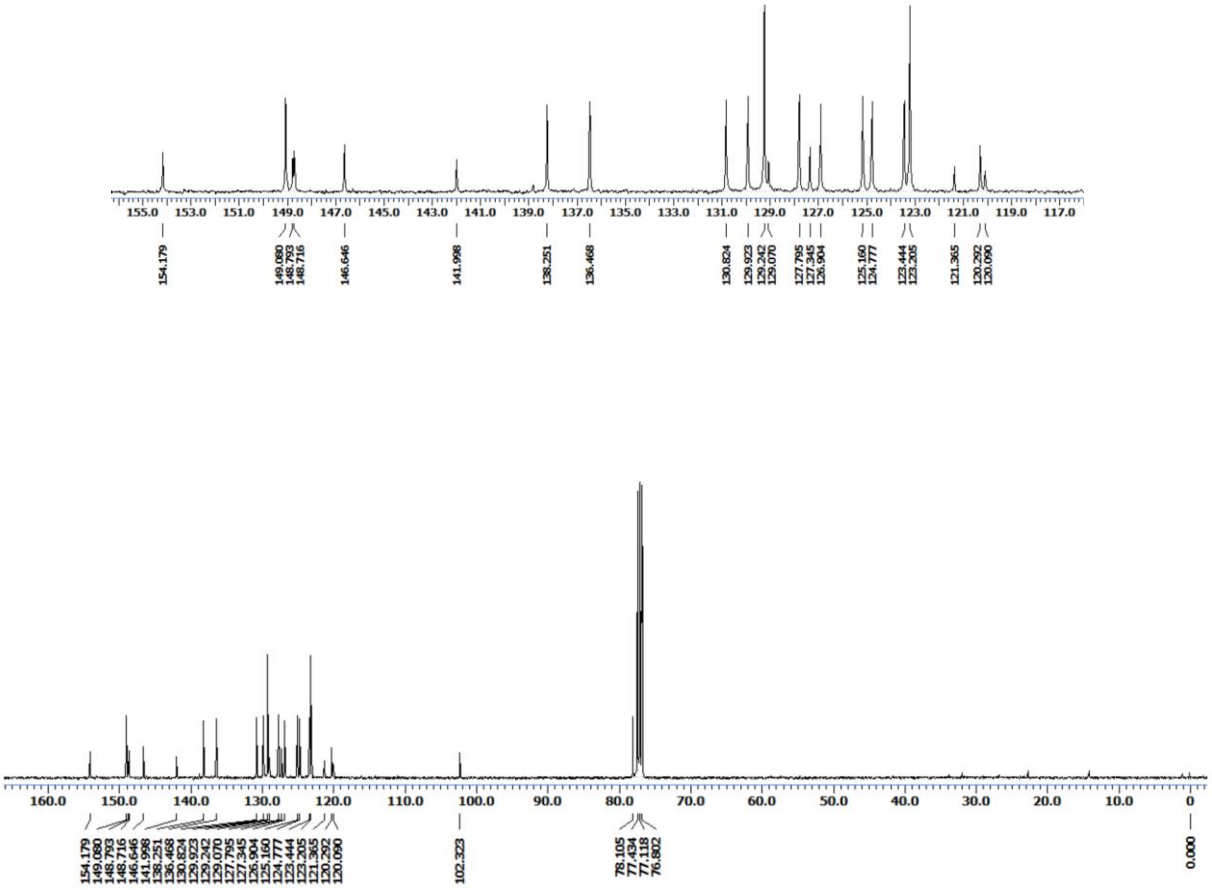




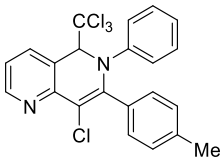
^{13}C NMR



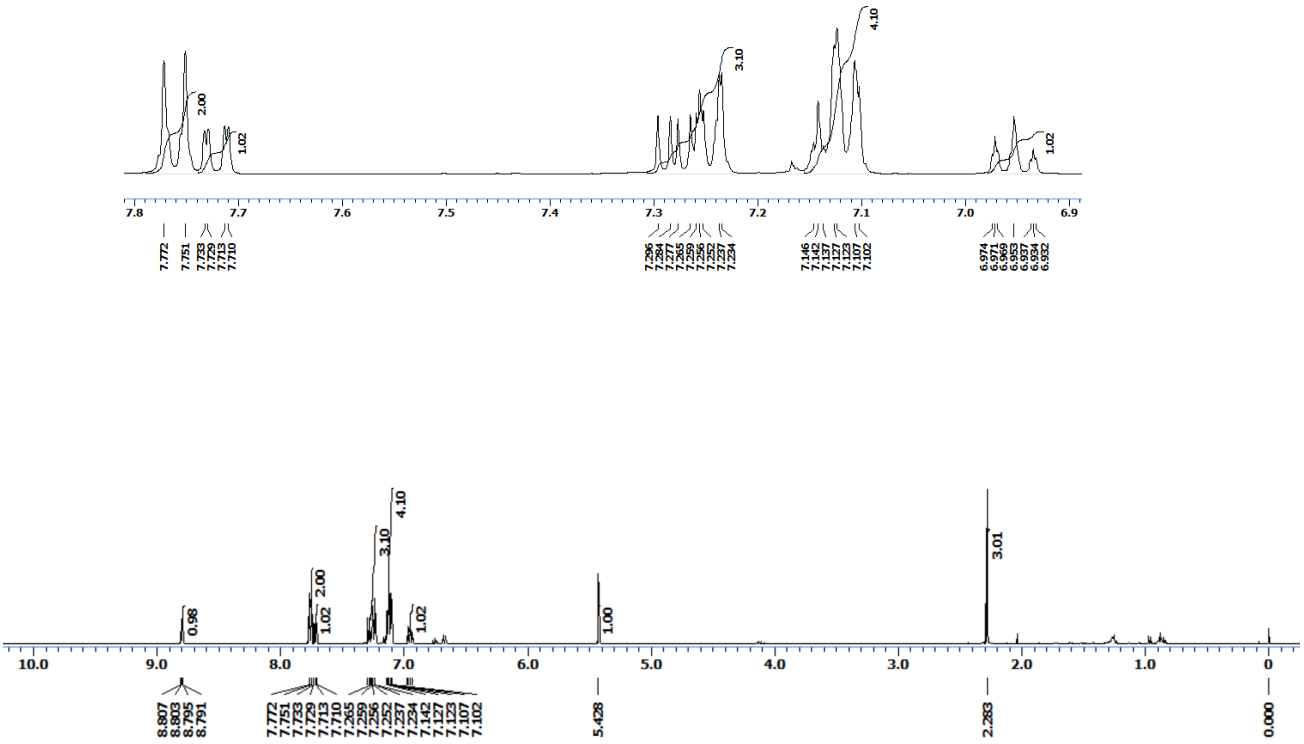
4-Chloro-2-phenyl-3-(pyridin-2-yl)-1-(trichloromethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (3r)



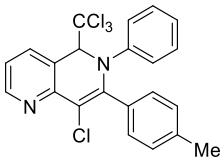
^{1}H NMR



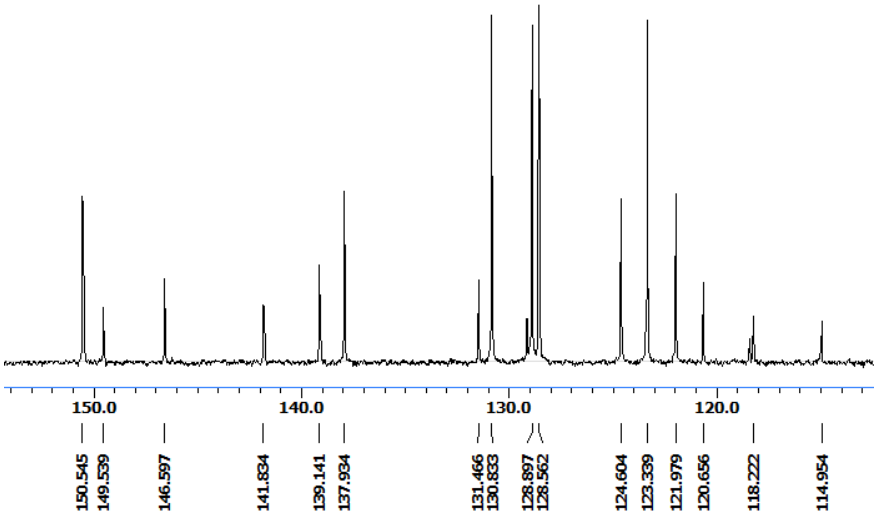
8-Chloro-6-phenyl-7-(*p*-tolyl)-5-(trichloromethyl)-5,6-dihydro-1,6-naphthyridine (4a)

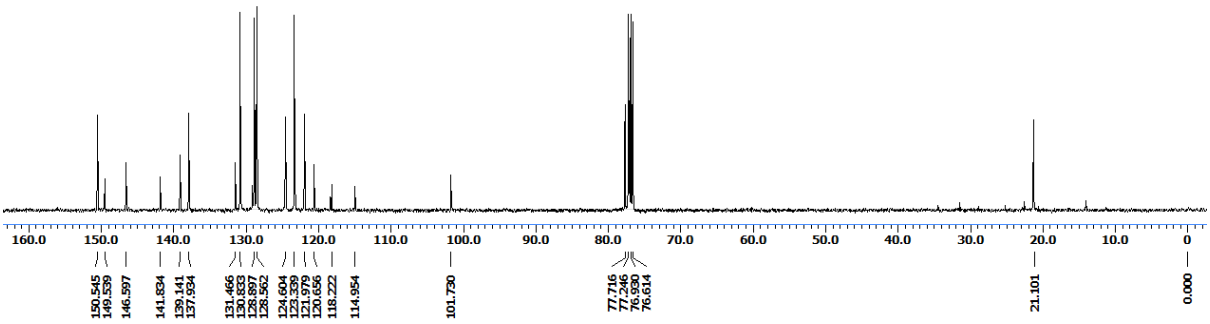


^{13}C NMR



8-Chloro-6-phenyl-7-(*p*-tolyl)-5-(trichloromethyl)-5,6-dihydro-1,6-naphthyridine (4a)





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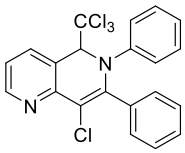
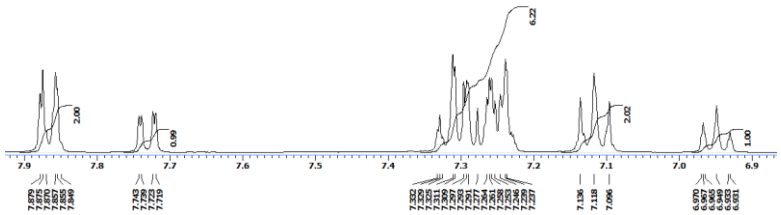
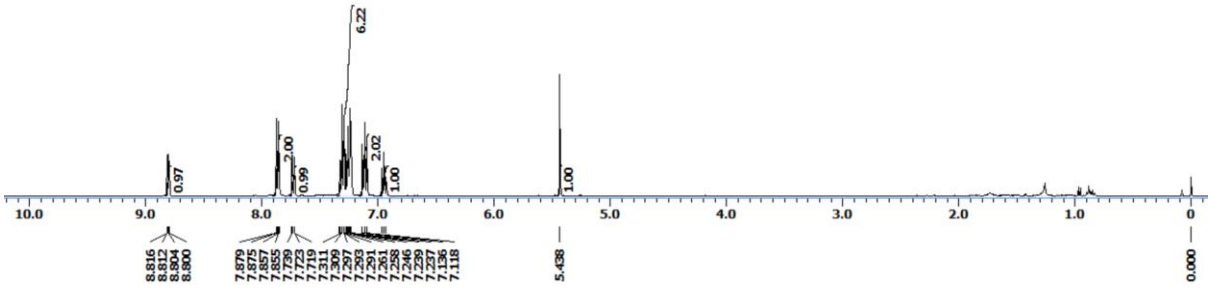


8-Chloro-6,7-diphenyl-5-(trichloromethyl)-5,6-dihydro-1,6-naphthyridine (4b)





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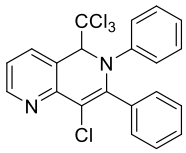
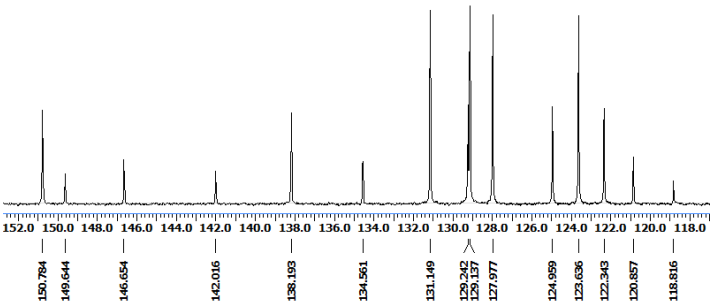
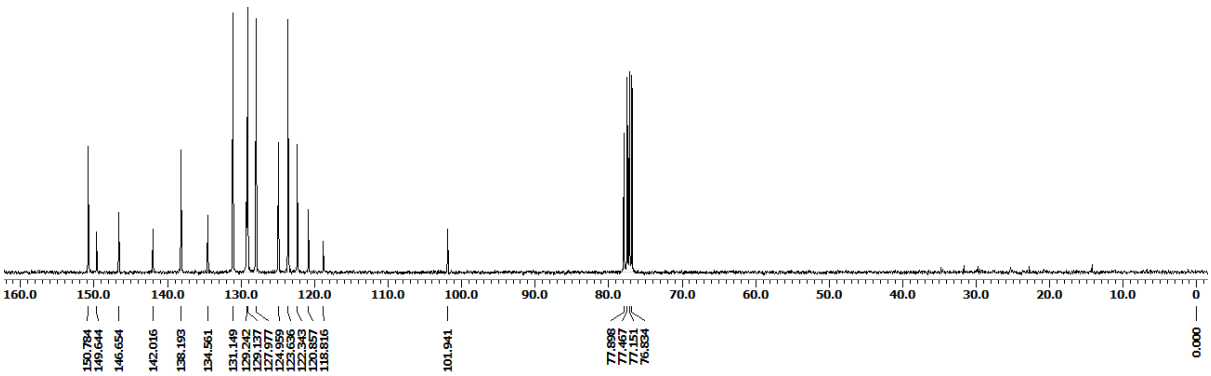
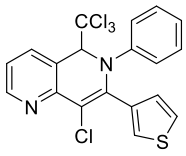


8-Chloro-6,7-diphenyl-5-(trichloromethyl)-5,6-dihydro-1,6-naphthyridine (4b)

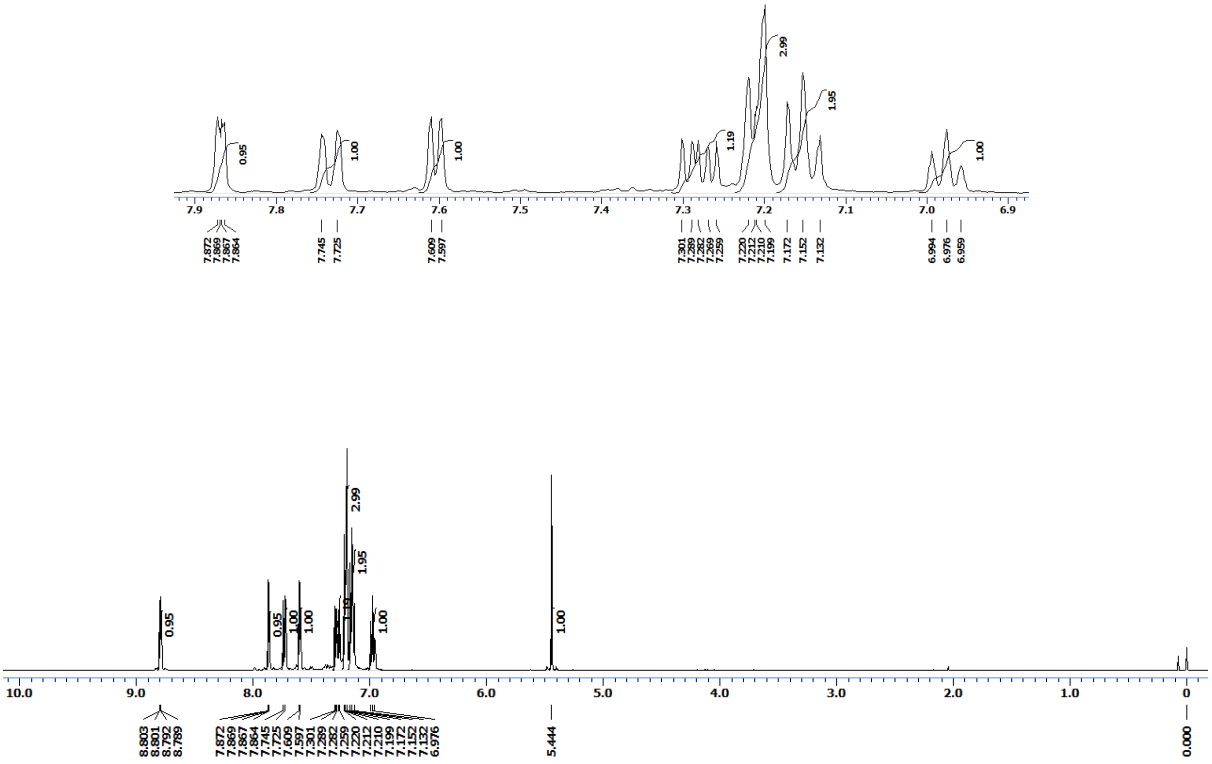




^{1}H NMR



8-Chloro-6-phenyl-7-(thiophen-3-yl)-5-(trichloromethyl)-5,6-dihydro-1,6-naphthyridine (4c)



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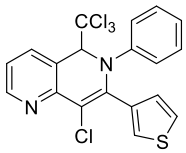
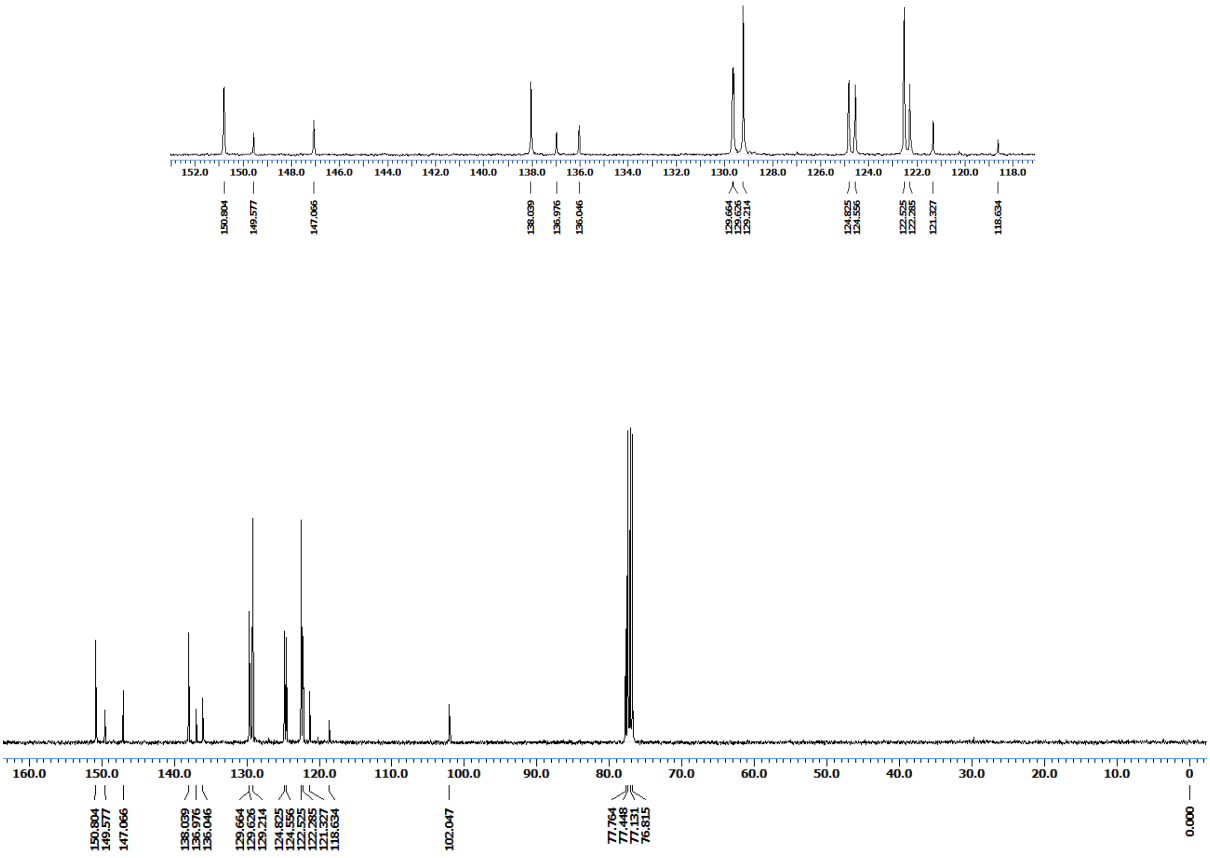


8-Chloro-6-phenyl-7-(thiophen-3-yl)-5-(trichloromethyl)-5,6-dihydro-1,6-naphthyridine (4c)



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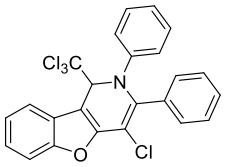
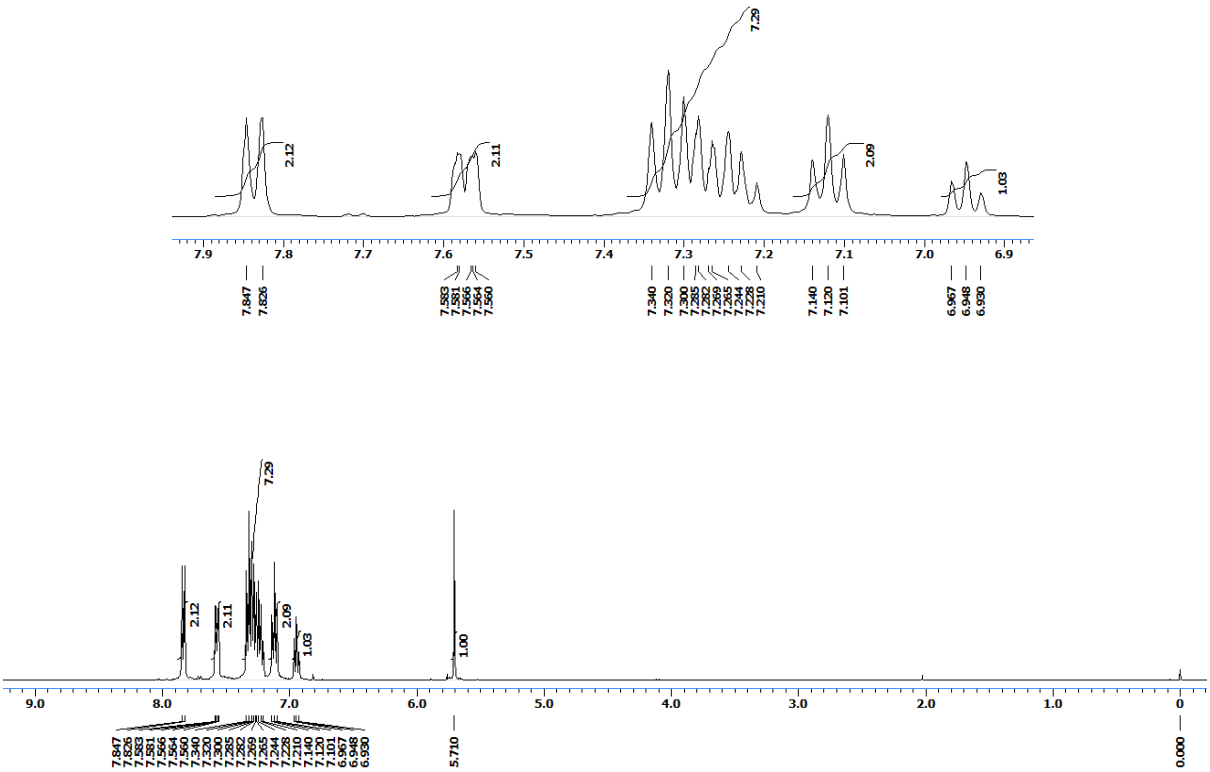
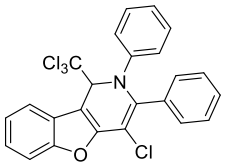


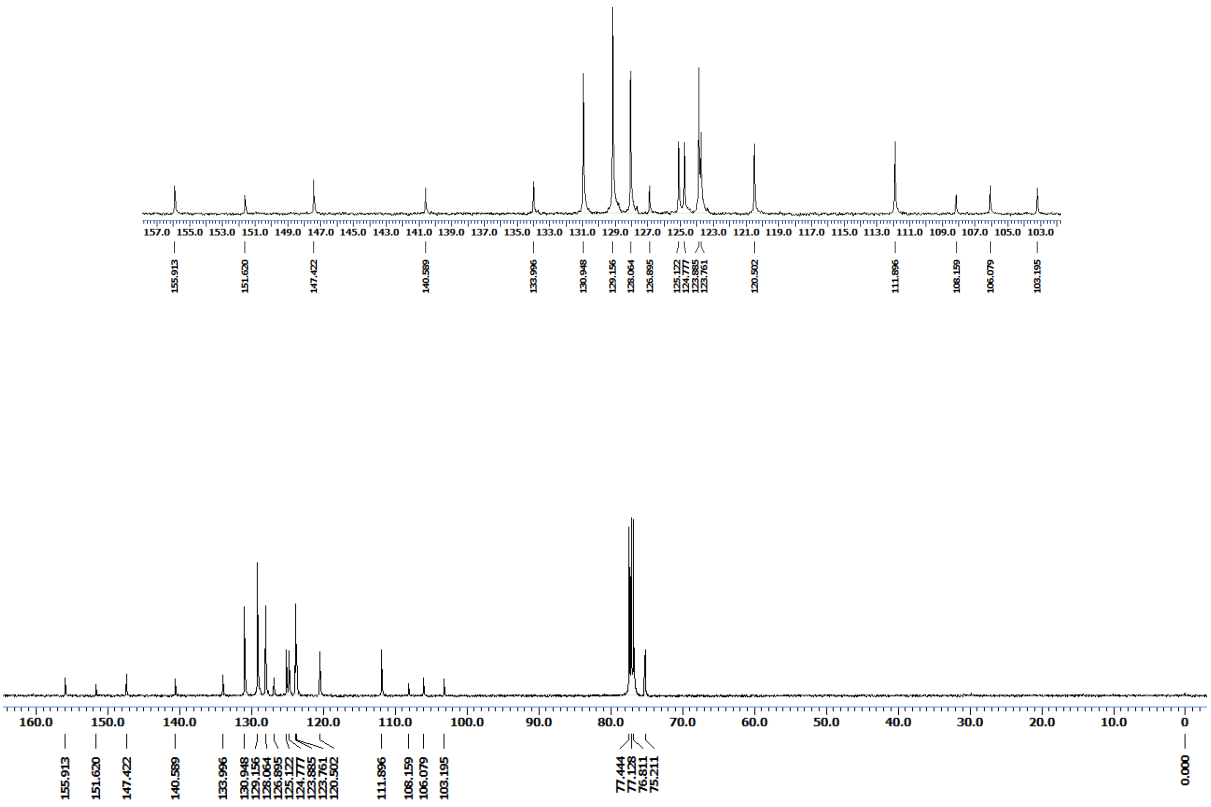
4-Chloro-2,3-diphenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[3,2-*c*]pyridine (5a)



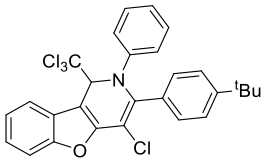
^{13}C NMR



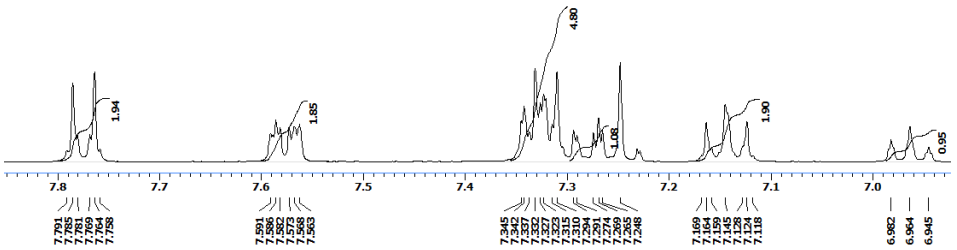
4-Chloro-2,3-diphenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[3,2-*c*]pyridine (5a)

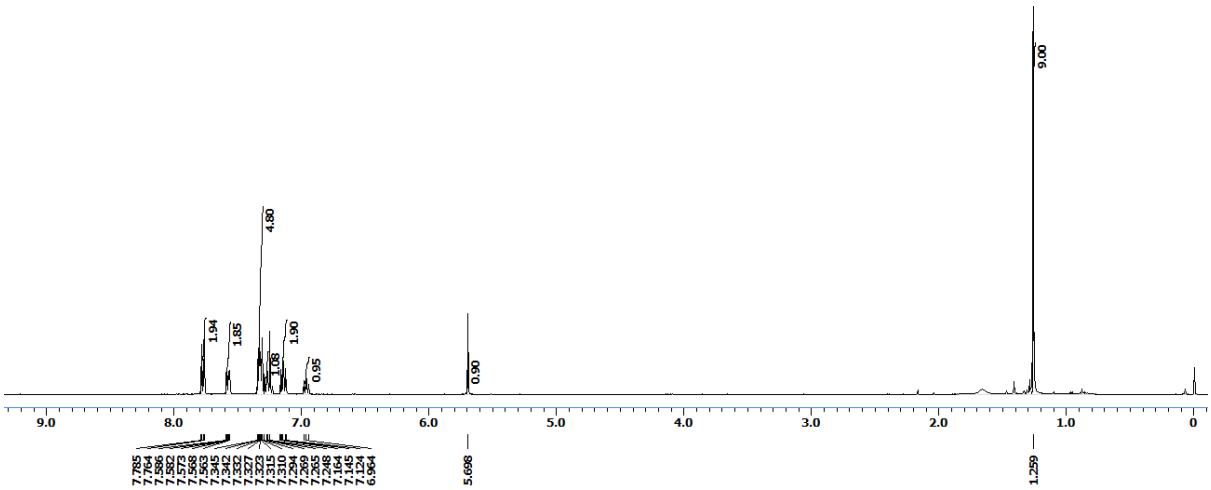


^{1}H NMR

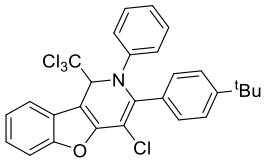


3-(4-(*Tert*-butyl)phenyl)-4-chloro-2-phenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[3,2-*c*]pyridine (5b)

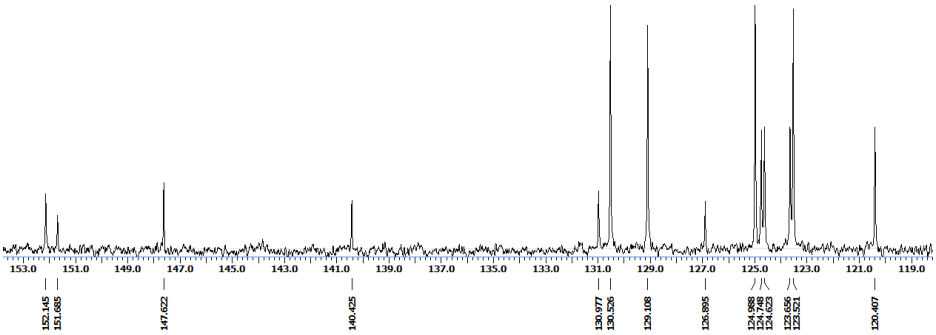


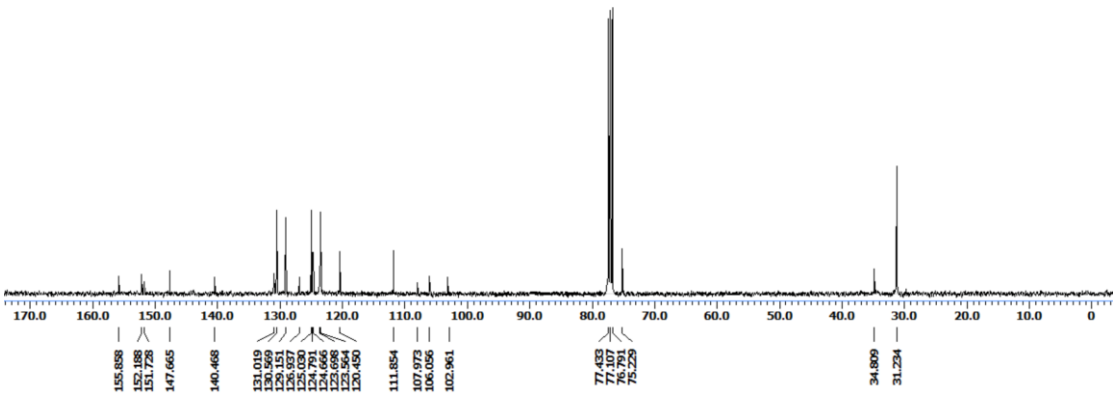


^{13}C NMR

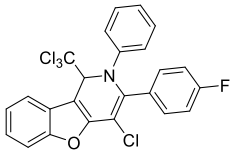


3-(4-(*Tert*-butyl)phenyl)-4-chloro-2-phenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[3,2-*c*]pyridine (5b)

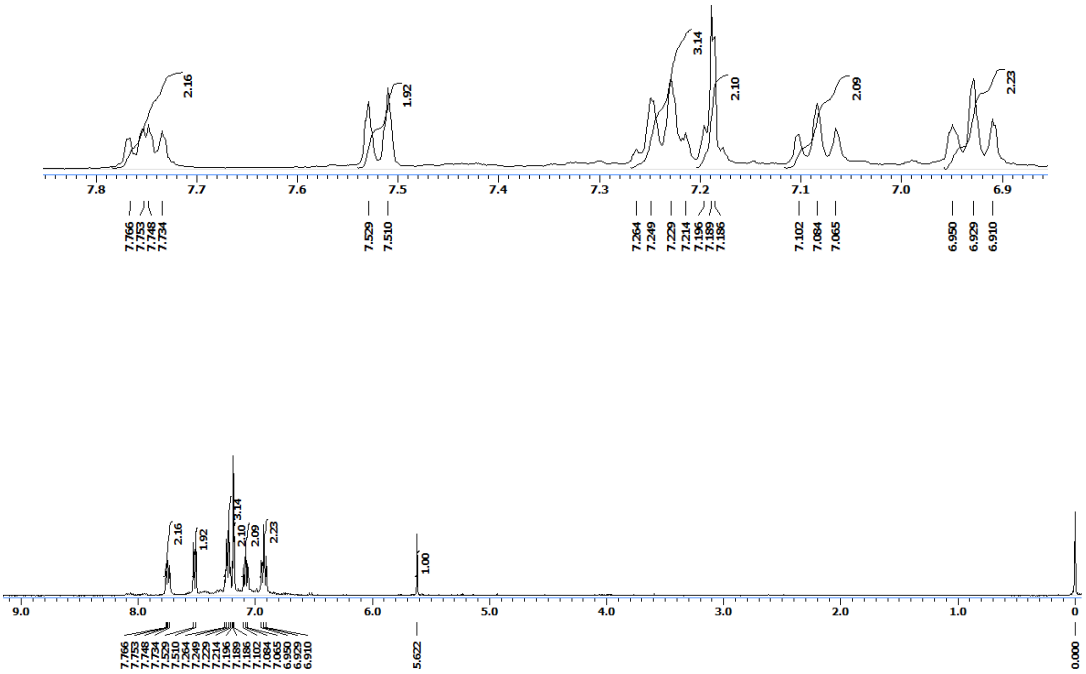




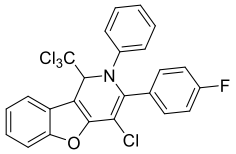
^{1}H NMR



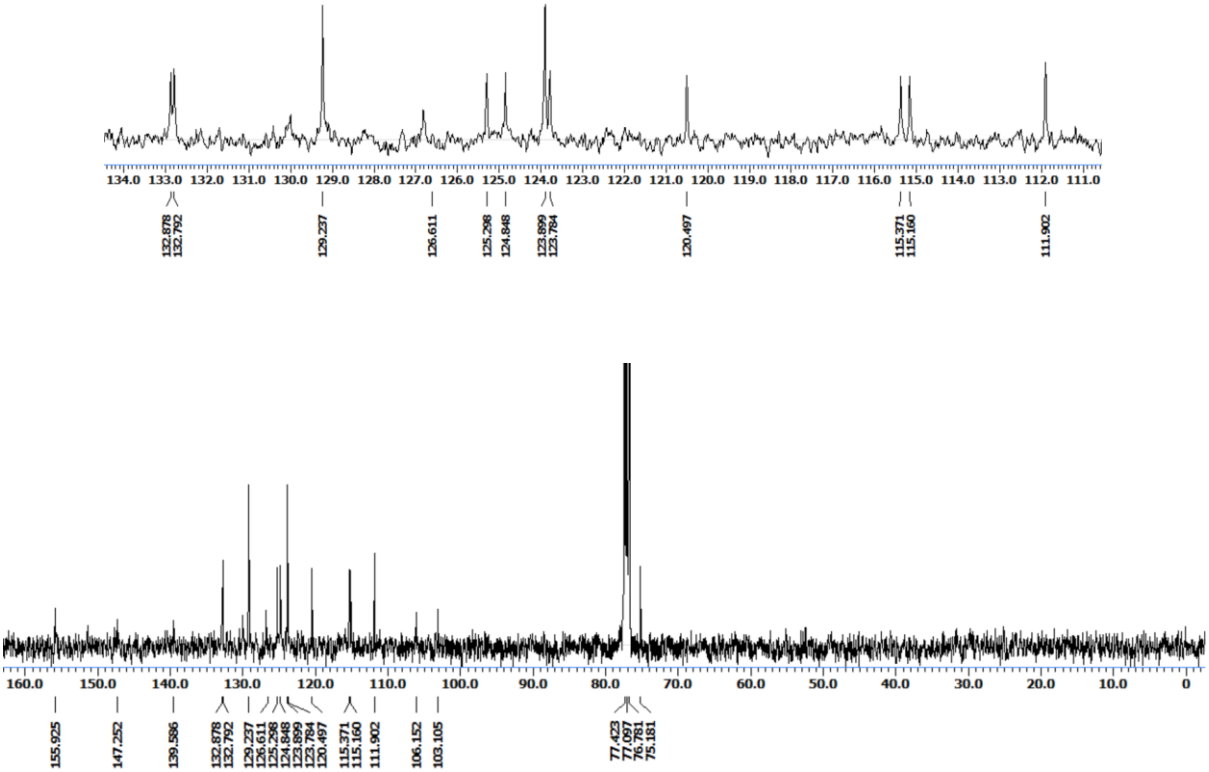
4-Chloro-3-(4-fluorophenyl)-2-phenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[3,2-*c*]pyridine (5c)



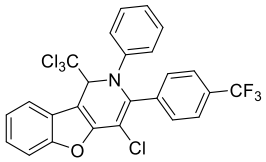
^{13}C NMR



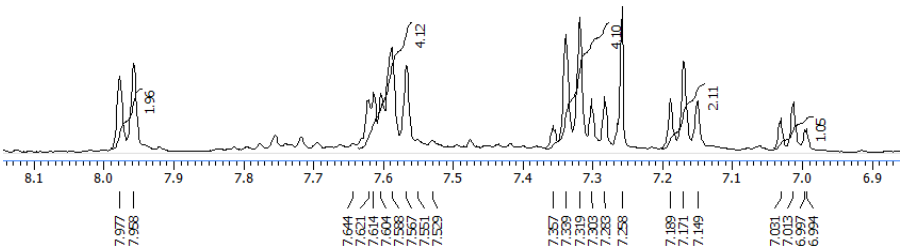
4-Chloro-3-(4-fluorophenyl)-2-phenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[3,2-*c*]pyridine (5c)

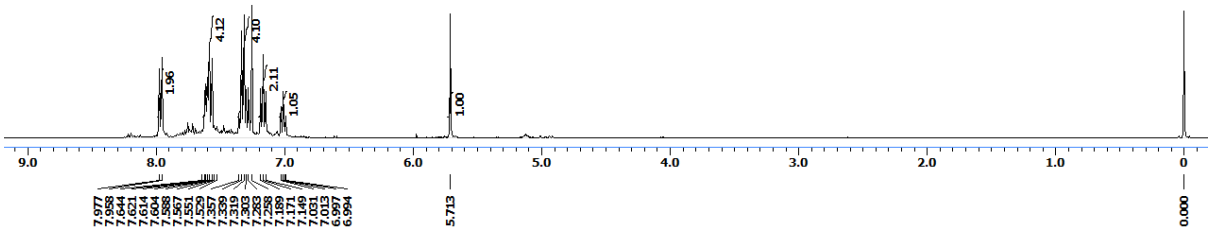


^{1}H NMR

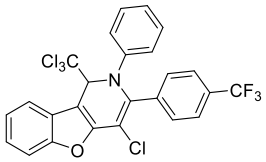


4-Chloro-2-phenyl-1-(trichloromethyl)-3-(4-(trifluoromethyl)phenyl)-1,2-dihydrobenzofuro[3,2-c]pyridine(5d)

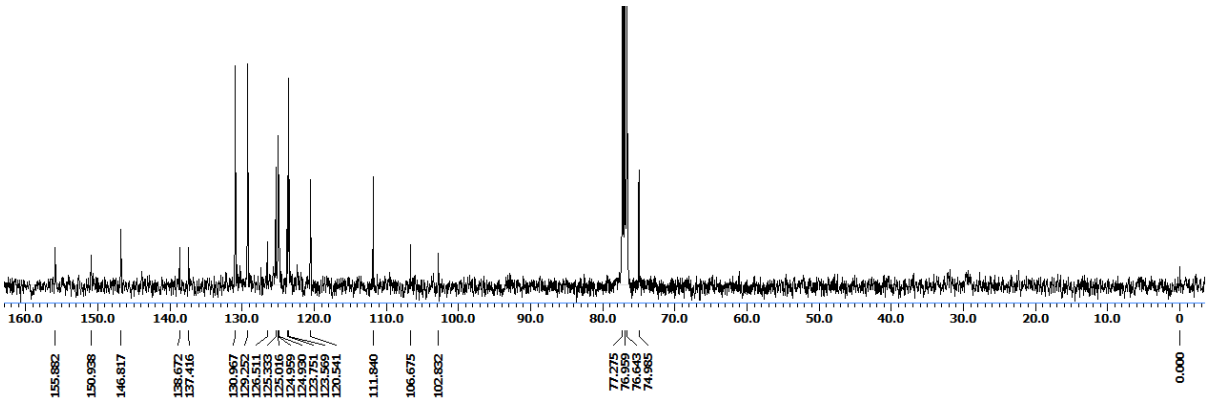




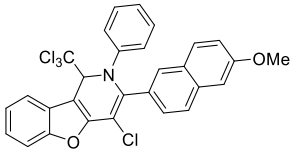
^{13}C NMR



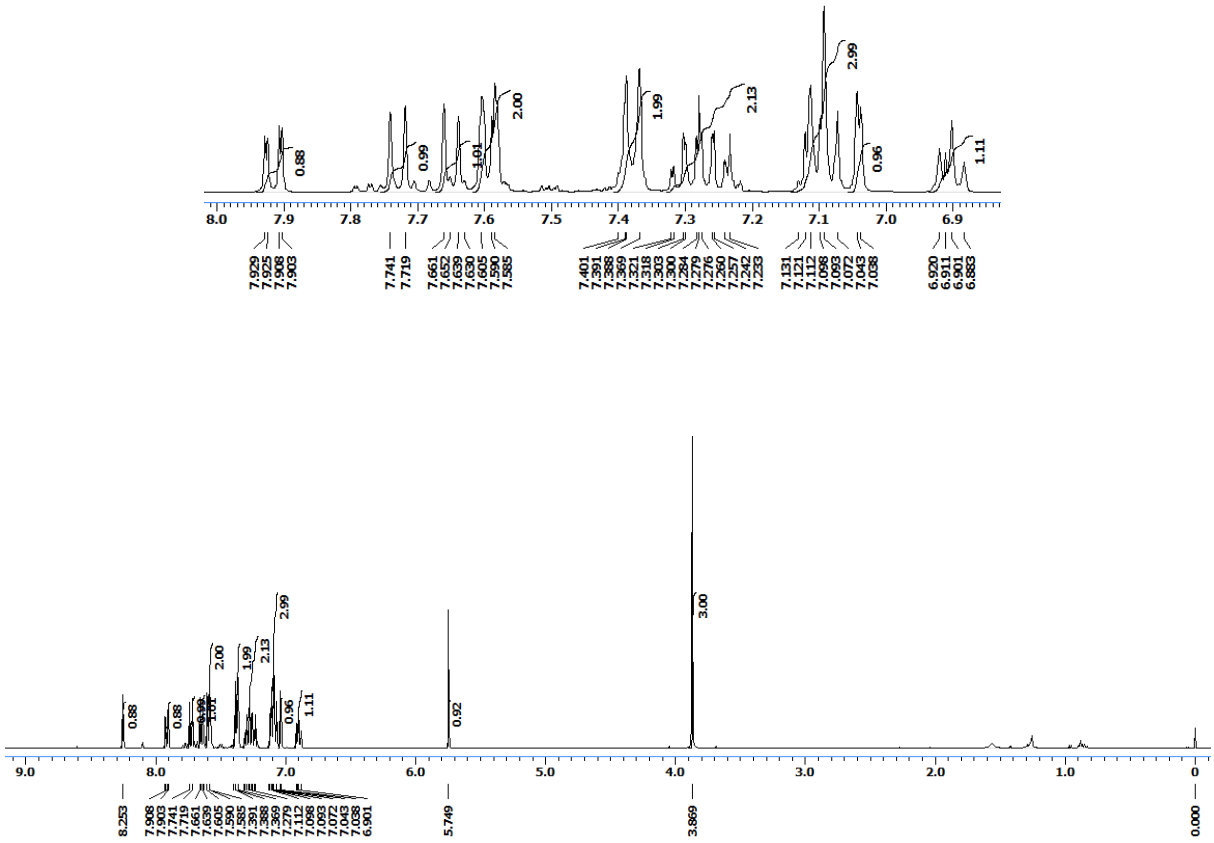
4-Chloro-2-phenyl-1-(trichloromethyl)-3-(4-(trifluoromethyl)phenyl)-1,2-dihydrobenzofuro[3,2-*c*]pyridine (5d)



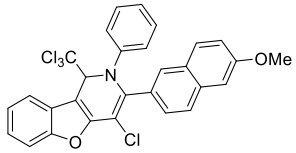
^{1}H NMR



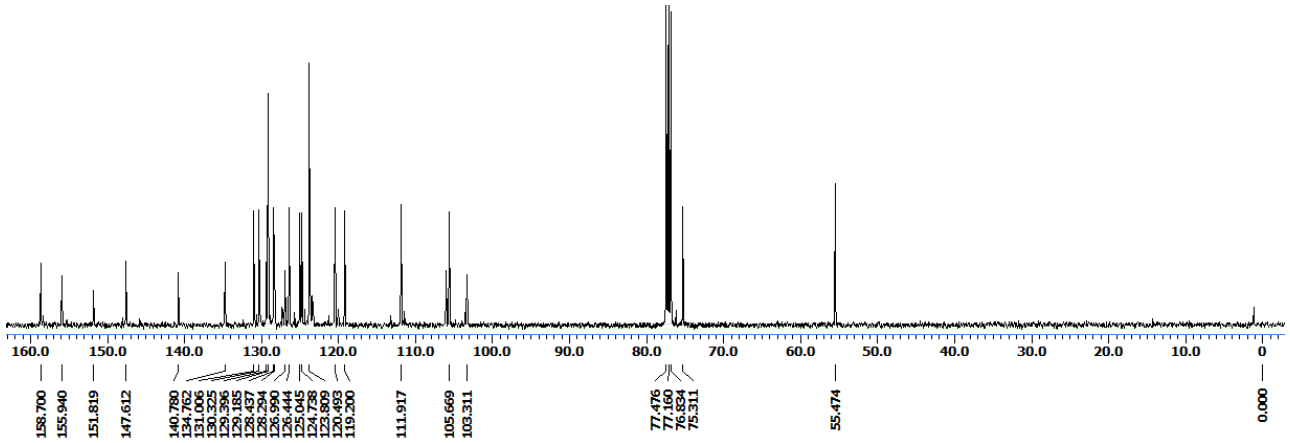
4-Chloro-3-(6-methoxynaphthalen-2-yl)-2-phenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[3,2-*c*]pyridine (5e)



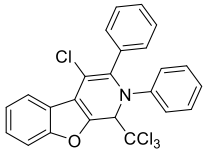
^{13}C NMR



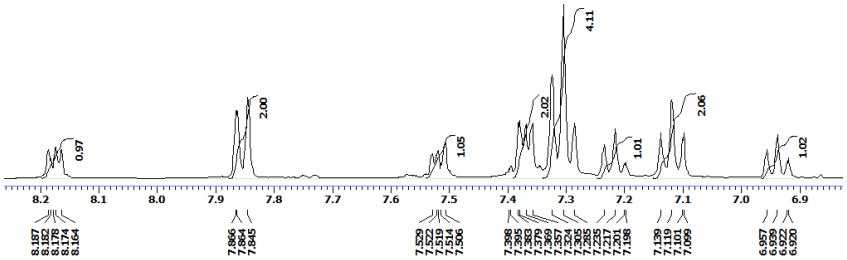
4-Chloro-3-(6-methoxynaphthalen-2-yl)-2-phenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[3,2-*c*]pyridine (5e)

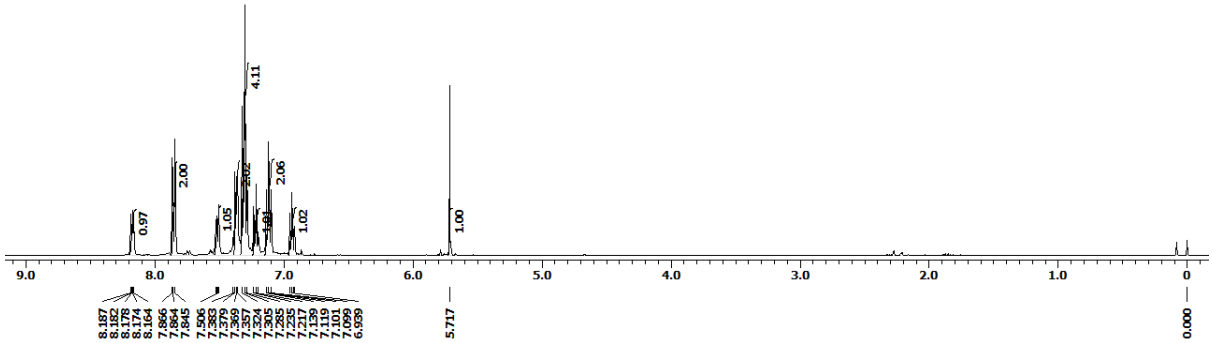


^{1}H NMR

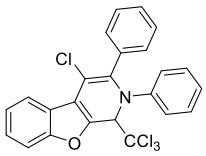


4-Chloro-2,3-diphenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[2,3-*c*]pyridine (6a)

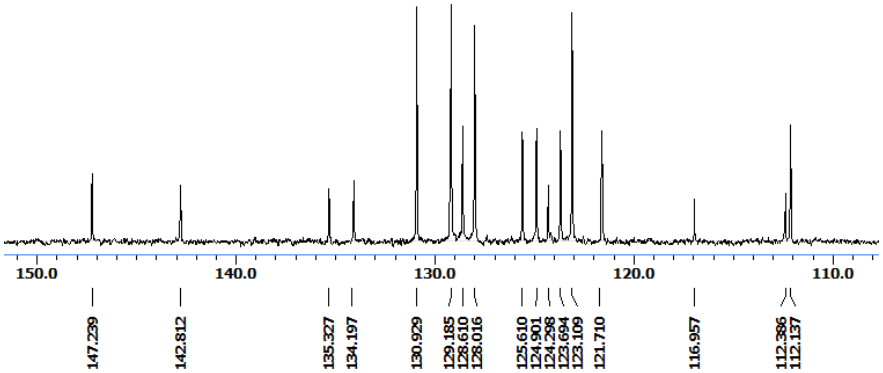


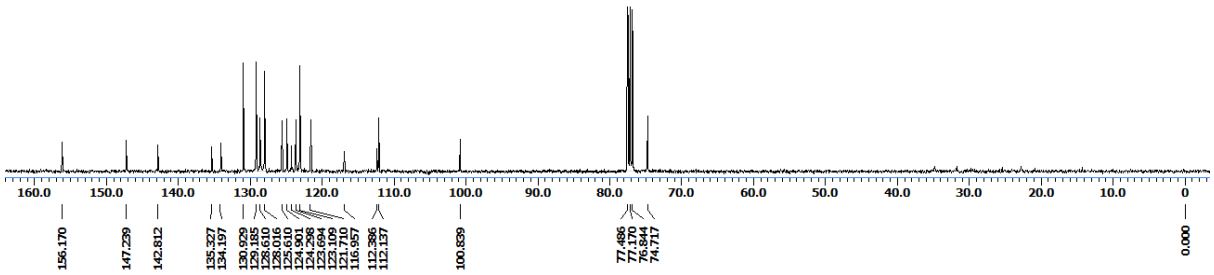


^{13}C NMR



4-Chloro-2,3-diphenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[2,3-*c*]pyridine (6a)





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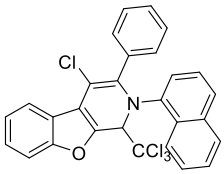
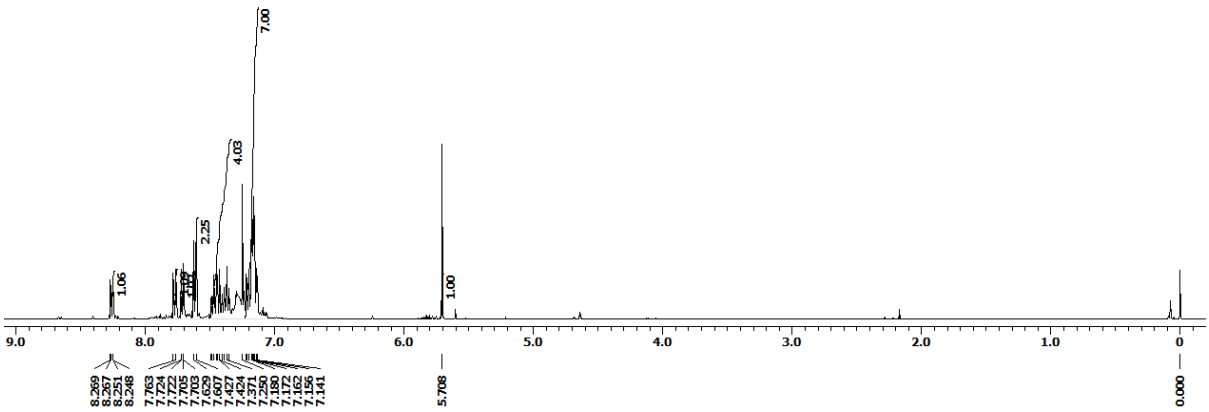
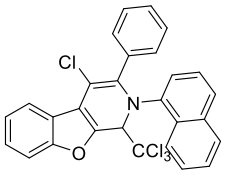


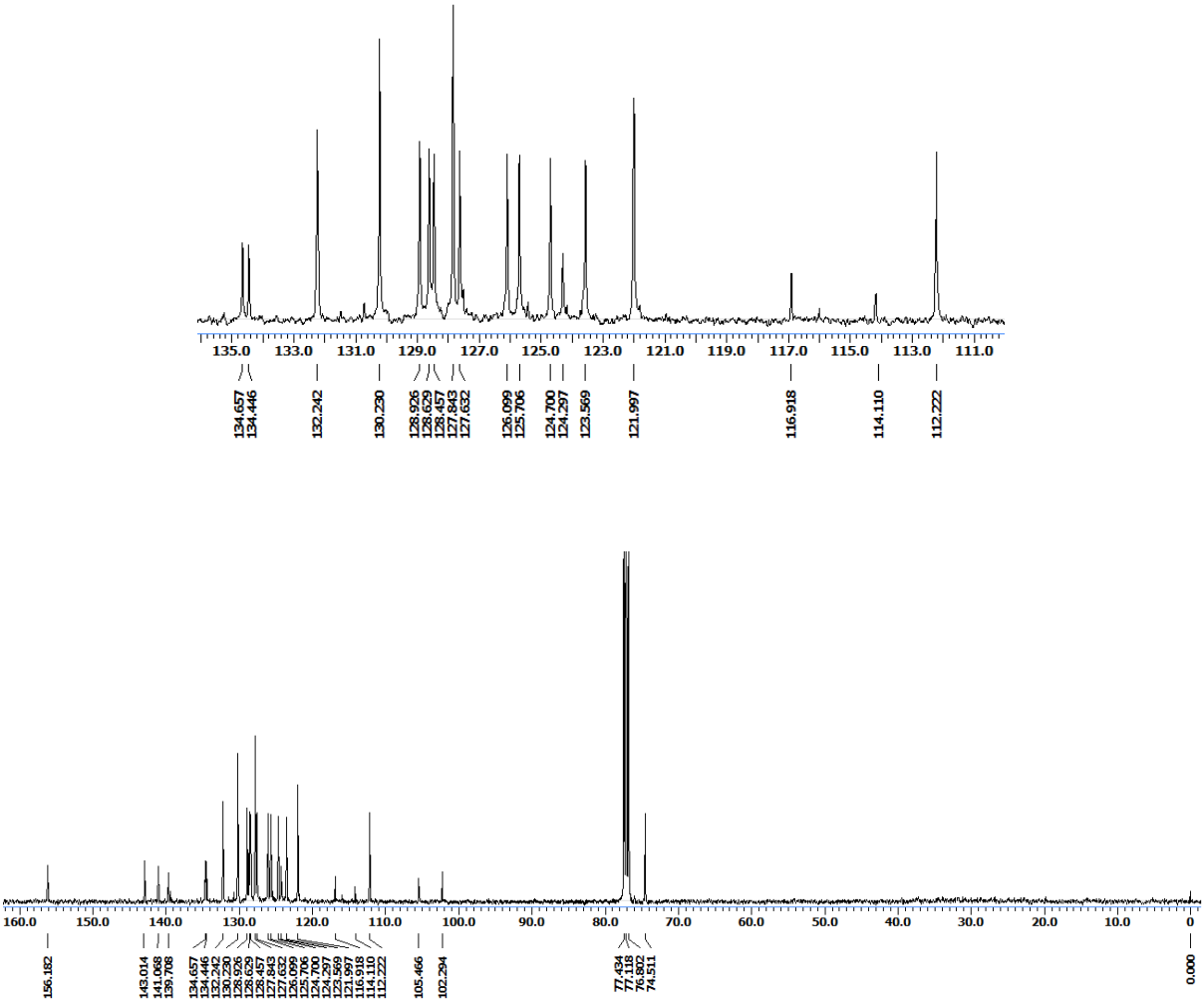
4-Chloro-2-(naphthalen-1-yl)-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[2,3-*c*]pyridine (6b)



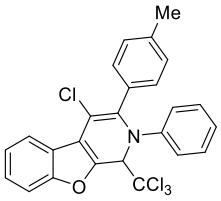
^{13}C NMR



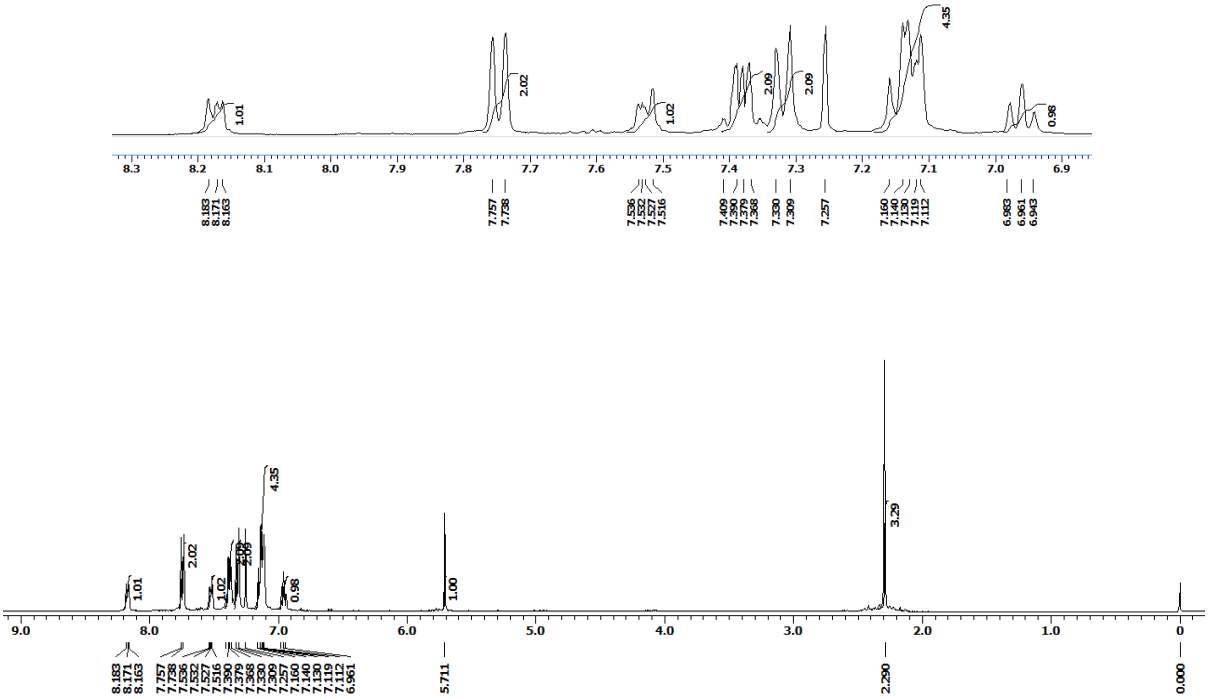
4-Chloro-2-(naphthalen-1-yl)-3-phenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[2,3-*c*]pyridine (6b)



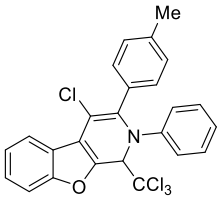
^{1}H NMR



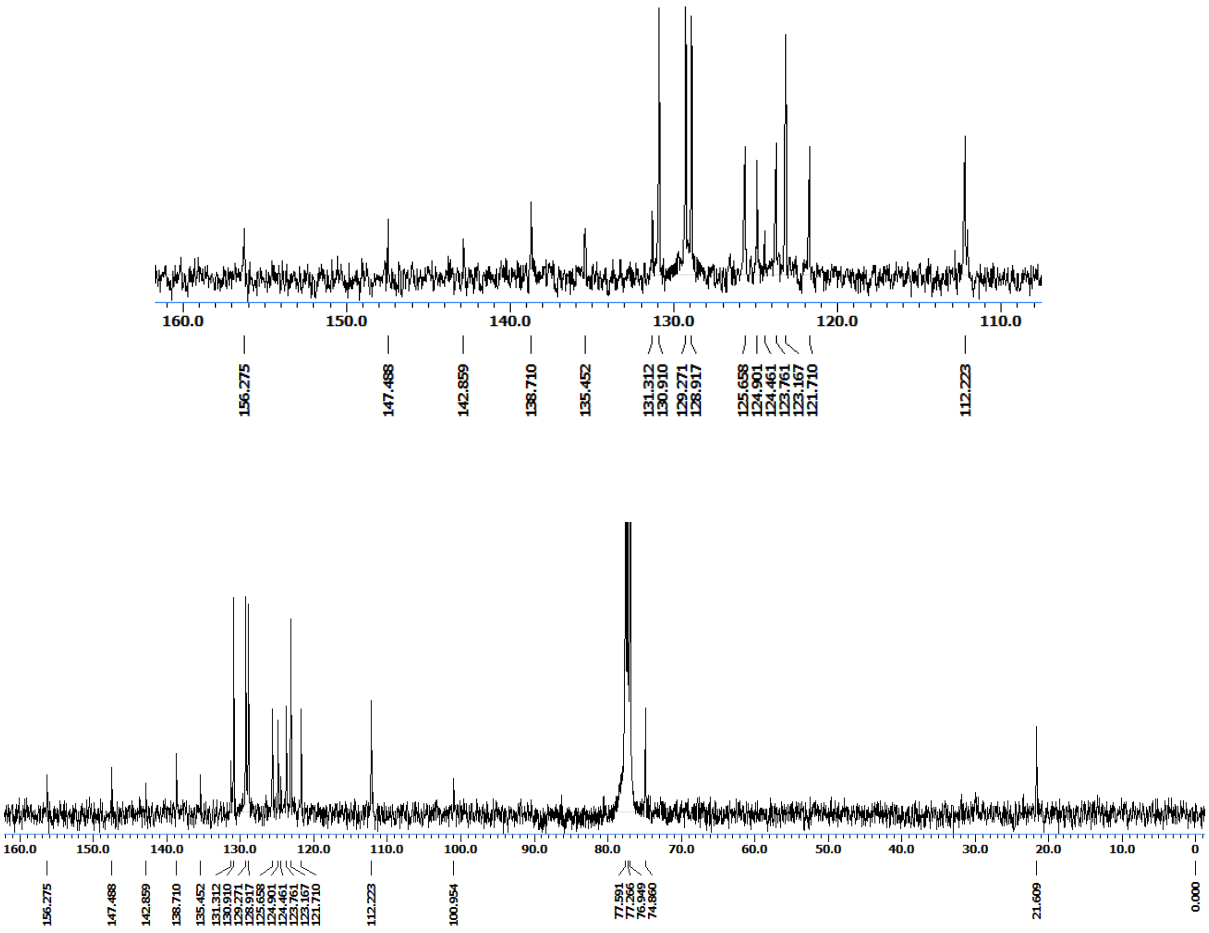
4-Chloro-2-phenyl-3-(*p*-tolyl)-1-(trichloromethyl)-1,2-dihydrobenzofuro[2,3-*c*]pyridine (6c)



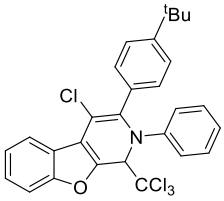
^{13}C NMR



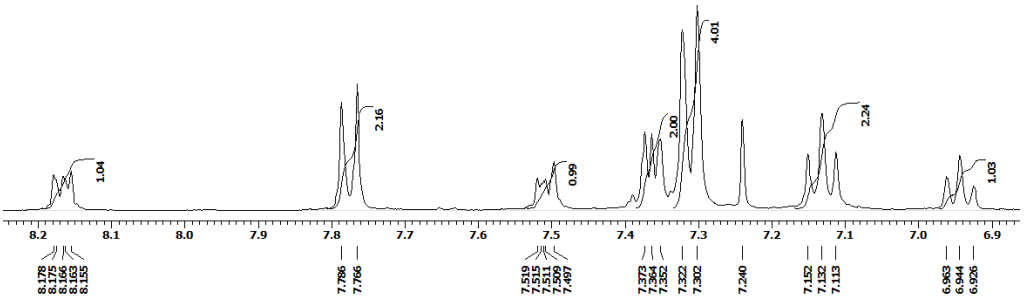
4-Chloro-2-phenyl-3-(*p*-tolyl)-1-(trichloromethyl)-1,2-dihydrobenzofuro[2,3-*c*]pyridine (6c)

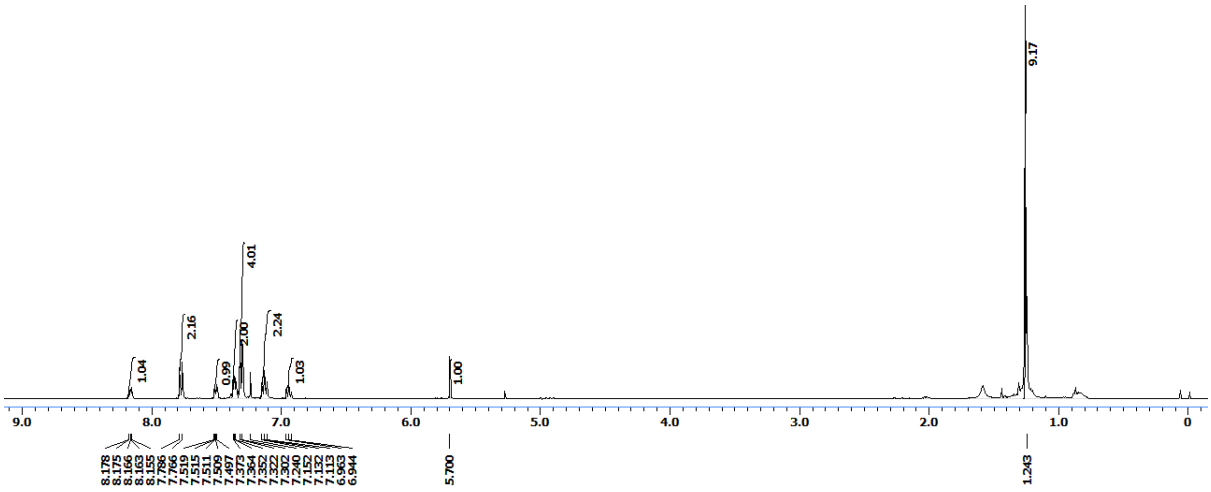


^{1}H NMR

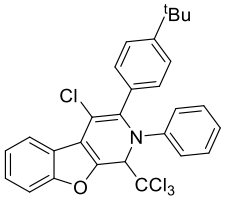


3-(4-(*Tert*-butyl)phenyl)-4-chloro-2-phenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[2,3-*c*]pyridine (6d)

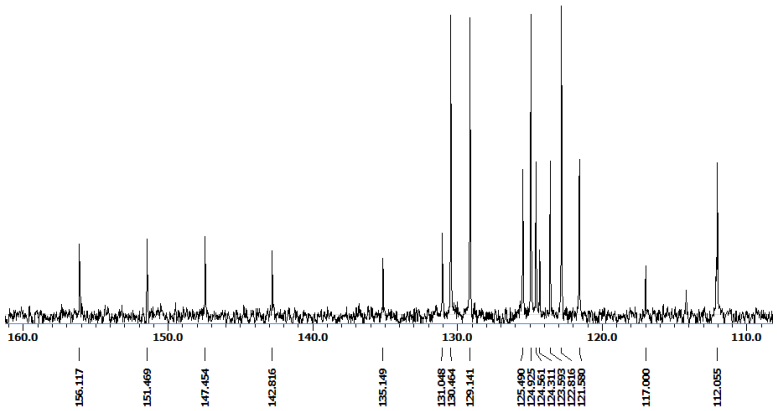


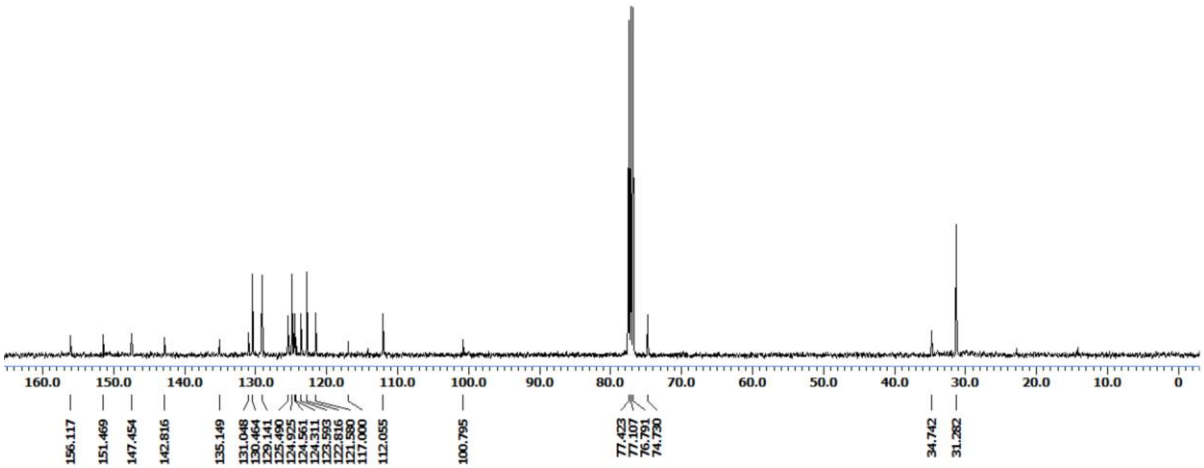


^{13}C NMR

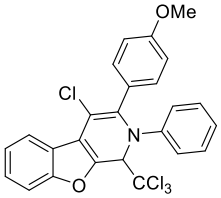


3-(4-(*Tert*-butyl)phenyl)-4-chloro-2-phenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[2,3-*c*]pyridine (6d)

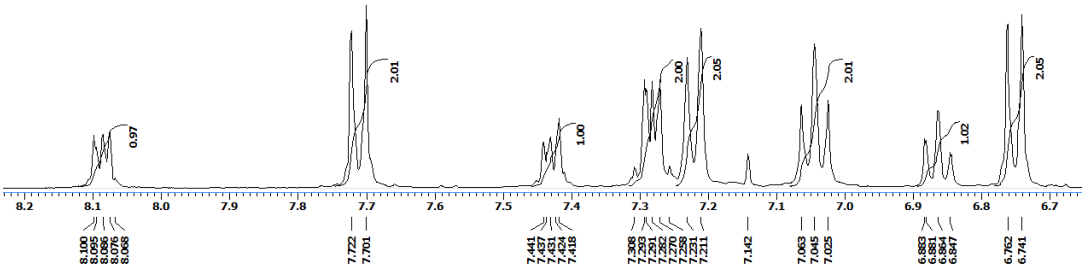


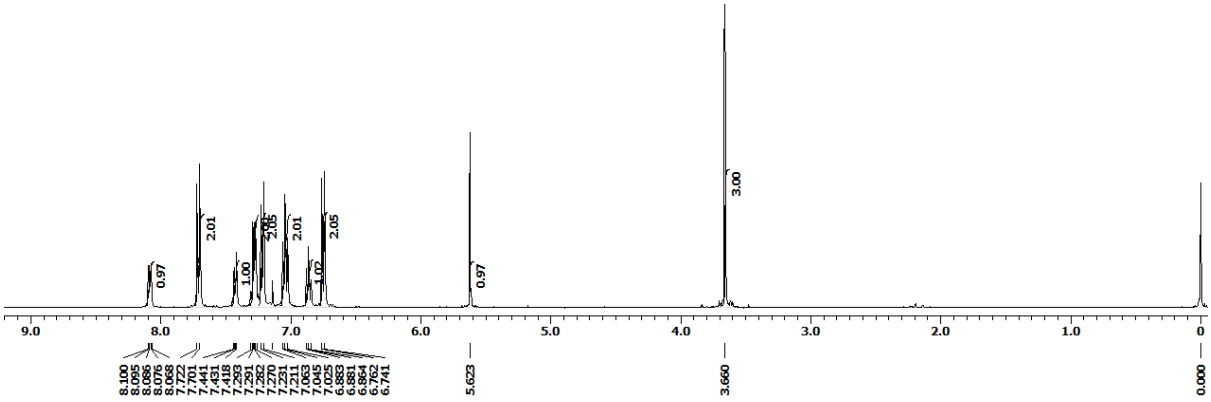


^{1}H NMR

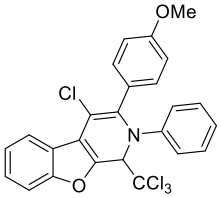


4-Chloro-3-(4-methoxyphenyl)-2-phenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[2,3-*c*]pyridine (6e)

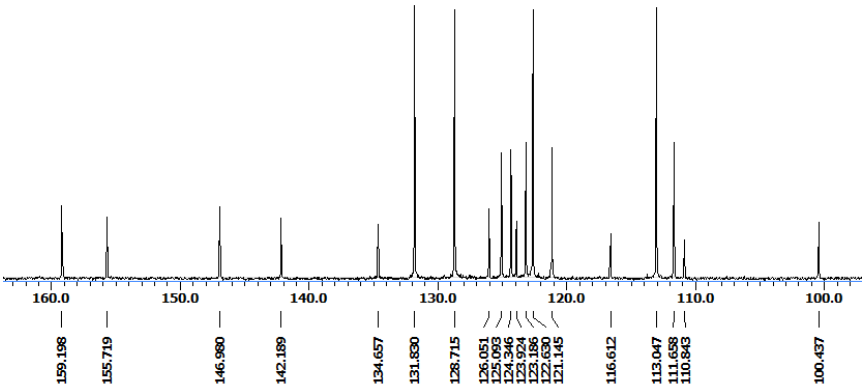


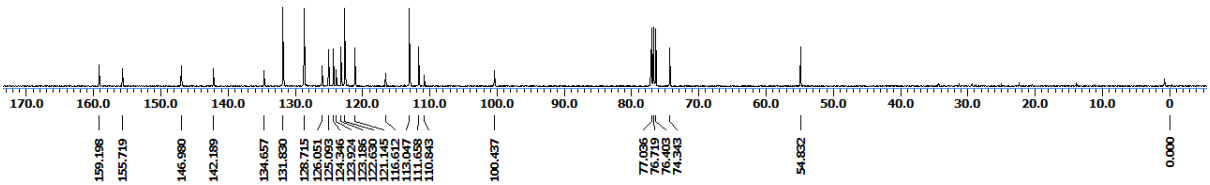


^{13}C NMR

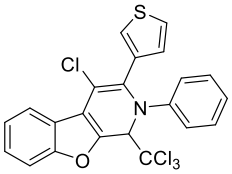


4-Chloro-3-(4-methoxyphenyl)-2-phenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[2,3-*c*]pyridine (6e)

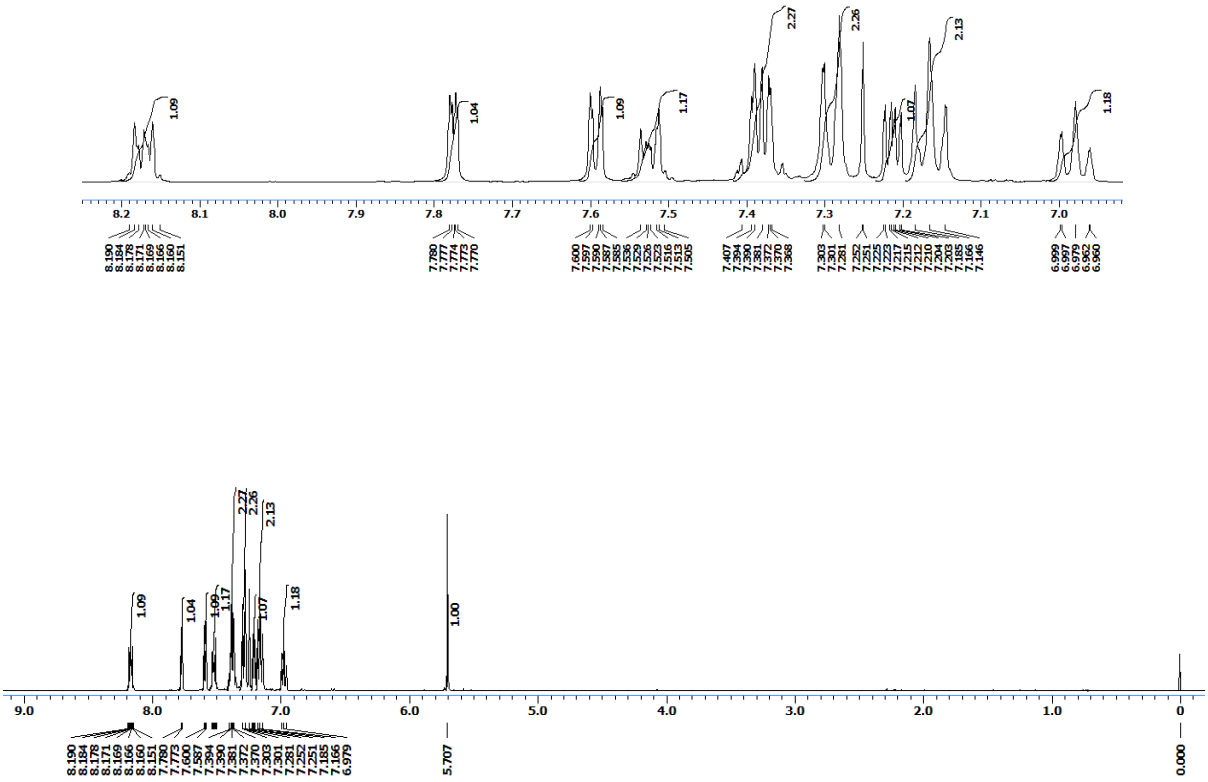




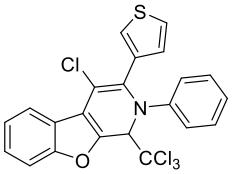
^{1}H NMR



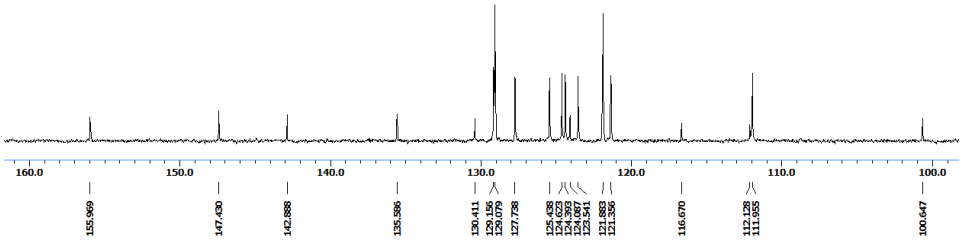
4-Chloro-2-phenyl-3-(thiophen-3-yl)-1-(trichloromethyl)-1,2-dihydrobenzofuro[2,3-*c*]pyridine (6f)

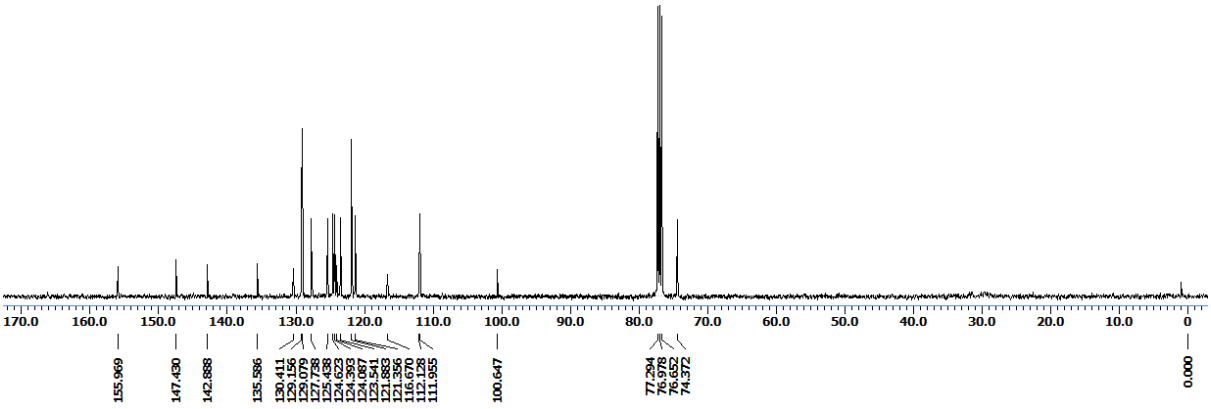


^{13}C NMR

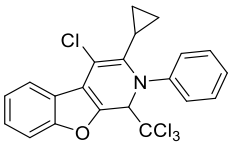


4-Chloro-2-phenyl-3-(thiophen-3-yl)-1-(trichloromethyl)-1,2-dihydrobenzofuro[2,3-*c*]pyridine (6f)

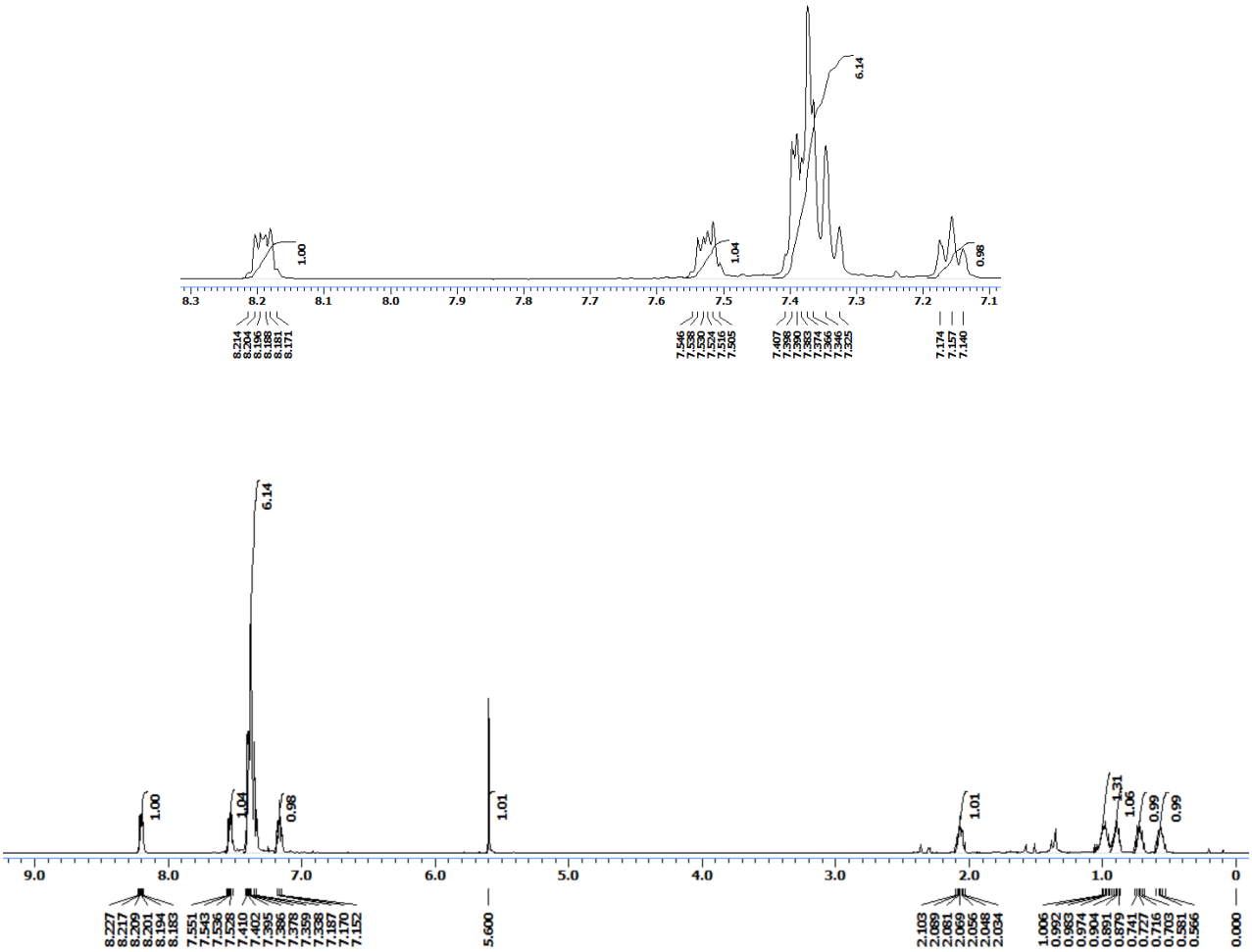




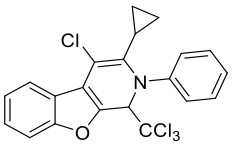
^{1}H NMR



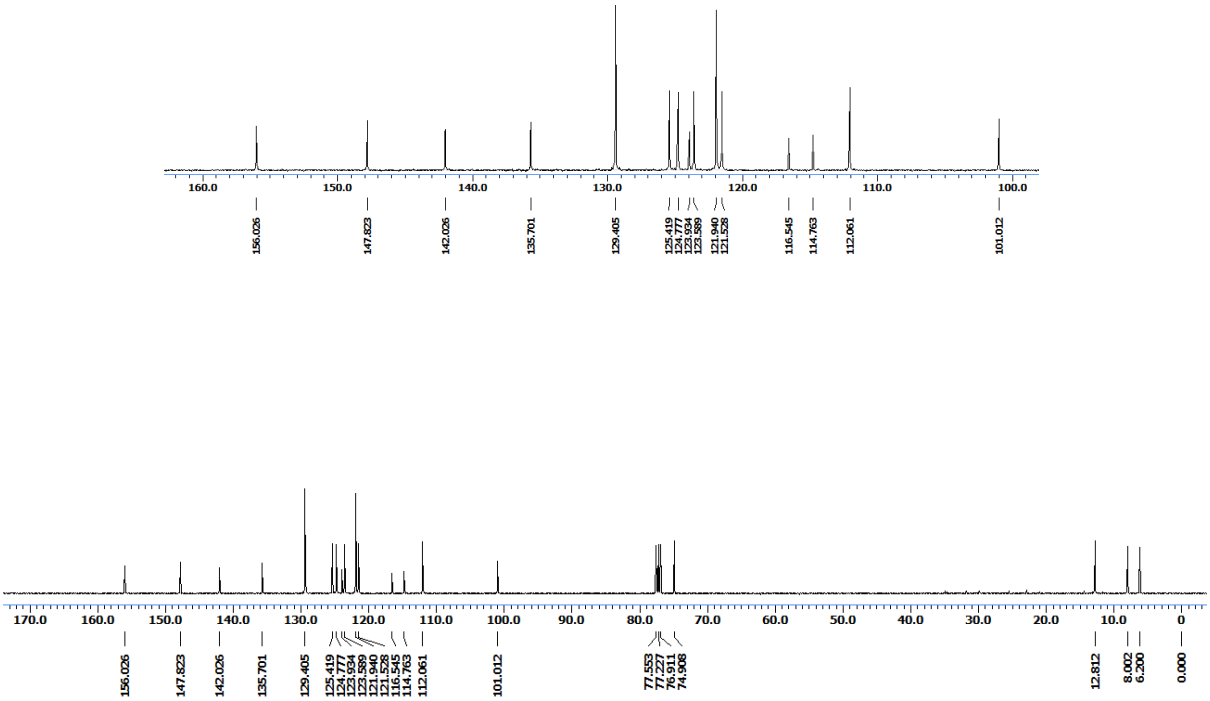
4-Chloro-3-cyclopropyl-2-phenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[2,3-*c*]pyridine (6g)



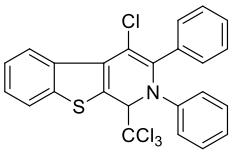
^{13}C NMR



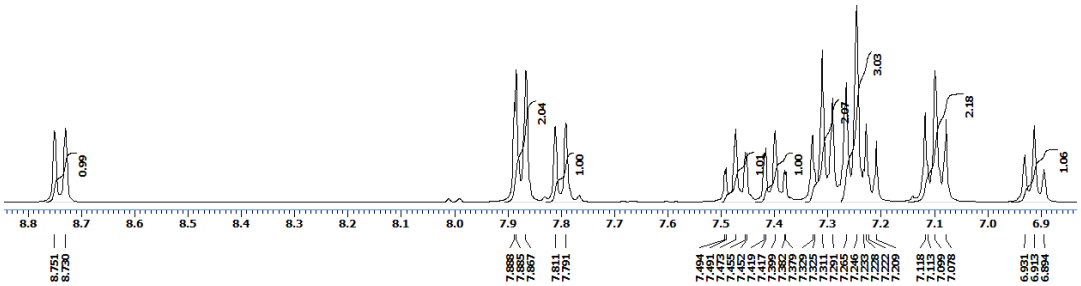
4-Chloro-3-cyclopropyl-2-phenyl-1-(trichloromethyl)-1,2-dihydrobenzofuro[2,3-*c*]pyridine (6g)

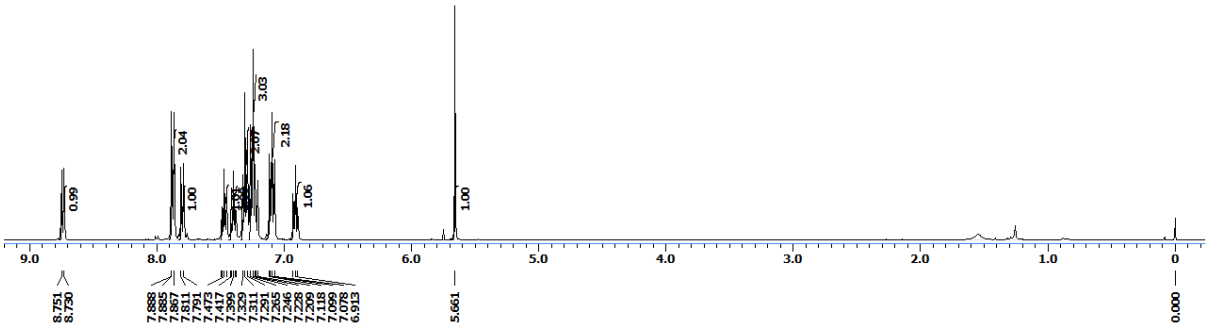


^{1}H NMR

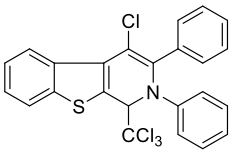


4-Chloro-2,3-diphenyl-1-(trichloromethyl)-1,2-dihydrobenzo[4,5]thieno[2,3-*c*]pyridine (7a)

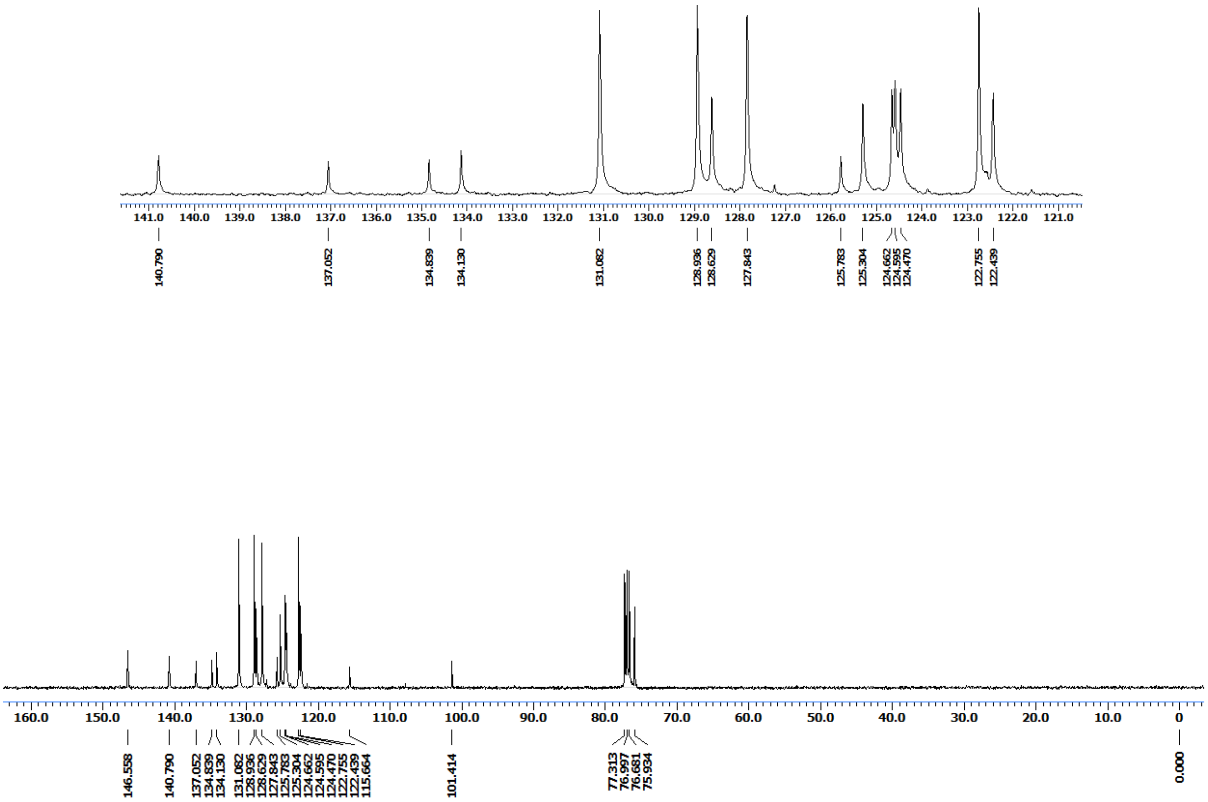




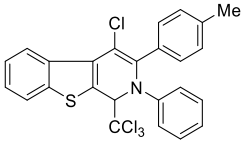
^{13}C NMR



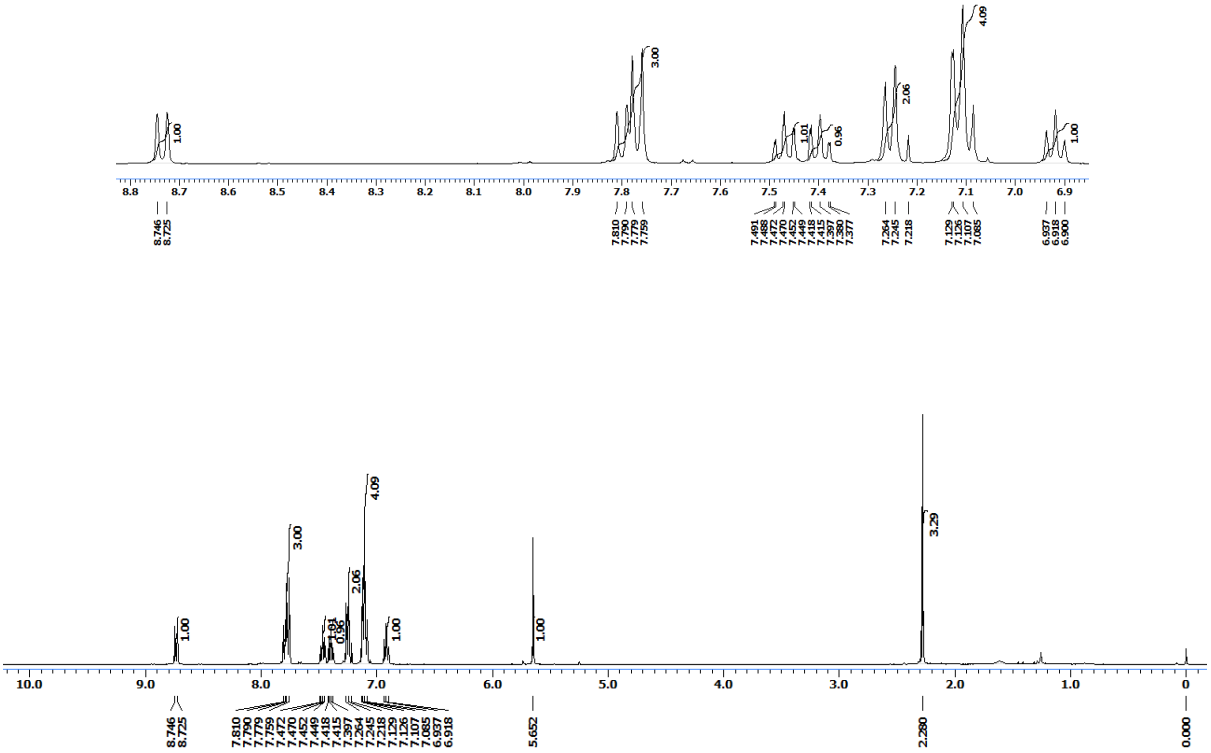
4-Chloro-2,3-diphenyl-1-(trichloromethyl)-1,2-dihydrobenzo[4,5]thieno[2,3-*c*]pyridine (7a)



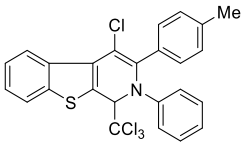
^{1}H NMR



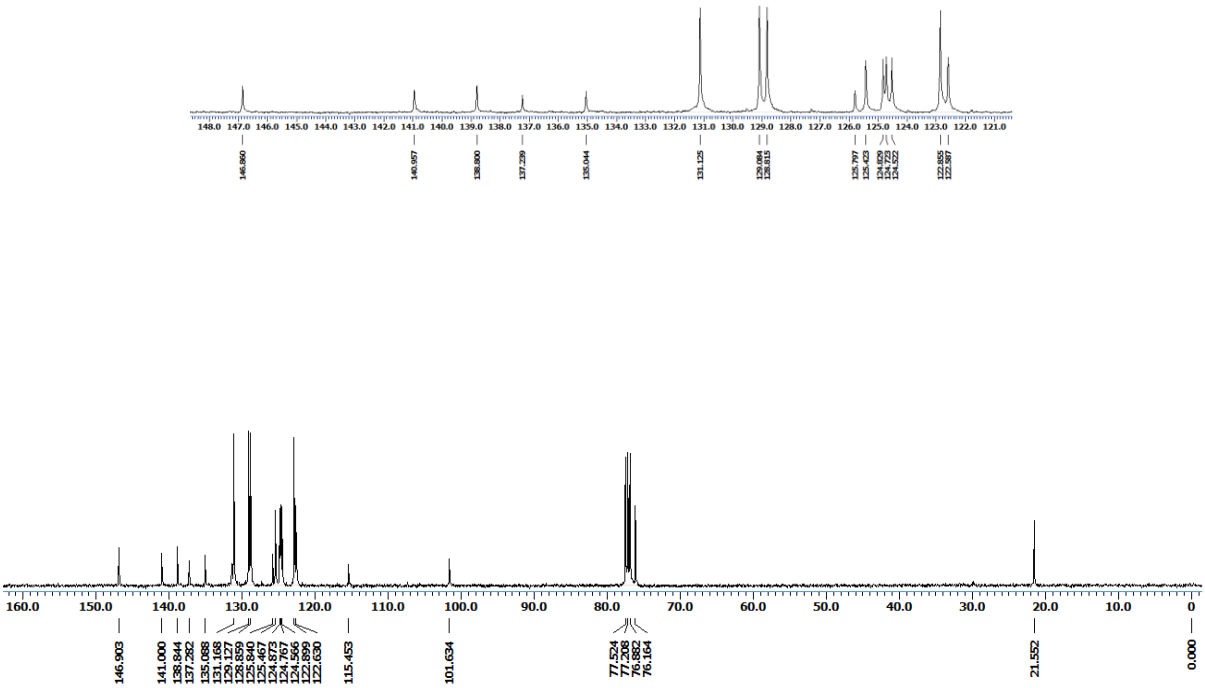
4-Chloro-2-phenyl-3-(p-tolyl)-1-(trichloromethyl)-1,2-dihydrobenzo[4,5]thieno[2,3-*c*]pyridine (7b)



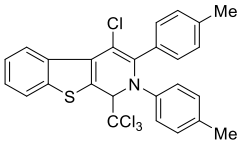
^{13}C NMR



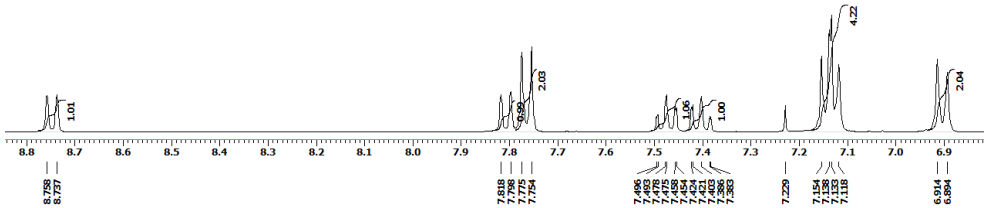
4-Chloro-2-phenyl-3-(p-tolyl)-1-(trichloromethyl)-1,2-dihydrobenzo[4,5]thieno[2,3-*c*]pyridine (7b)

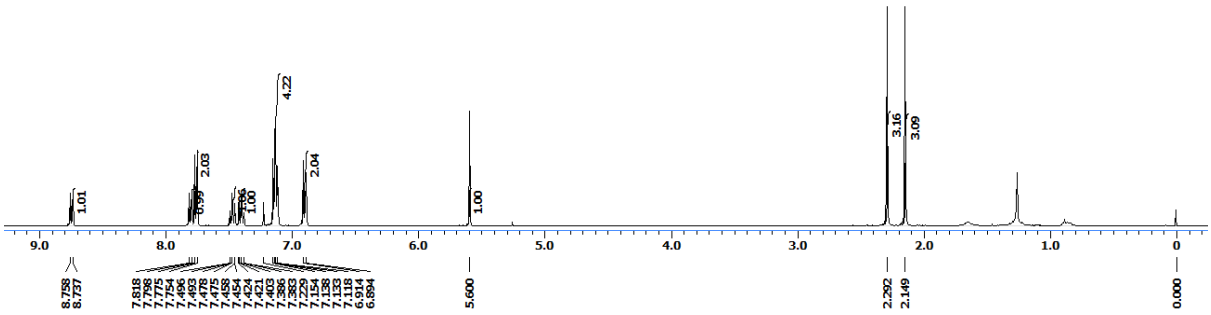


^{1}H NMR

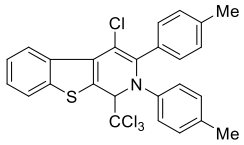


4-Chloro-2,3-di-p-tolyl-1-(trichloromethyl)-1,2-dihydrobenzo[4,5]thieno[2,3-*c*]pyridine (7c)

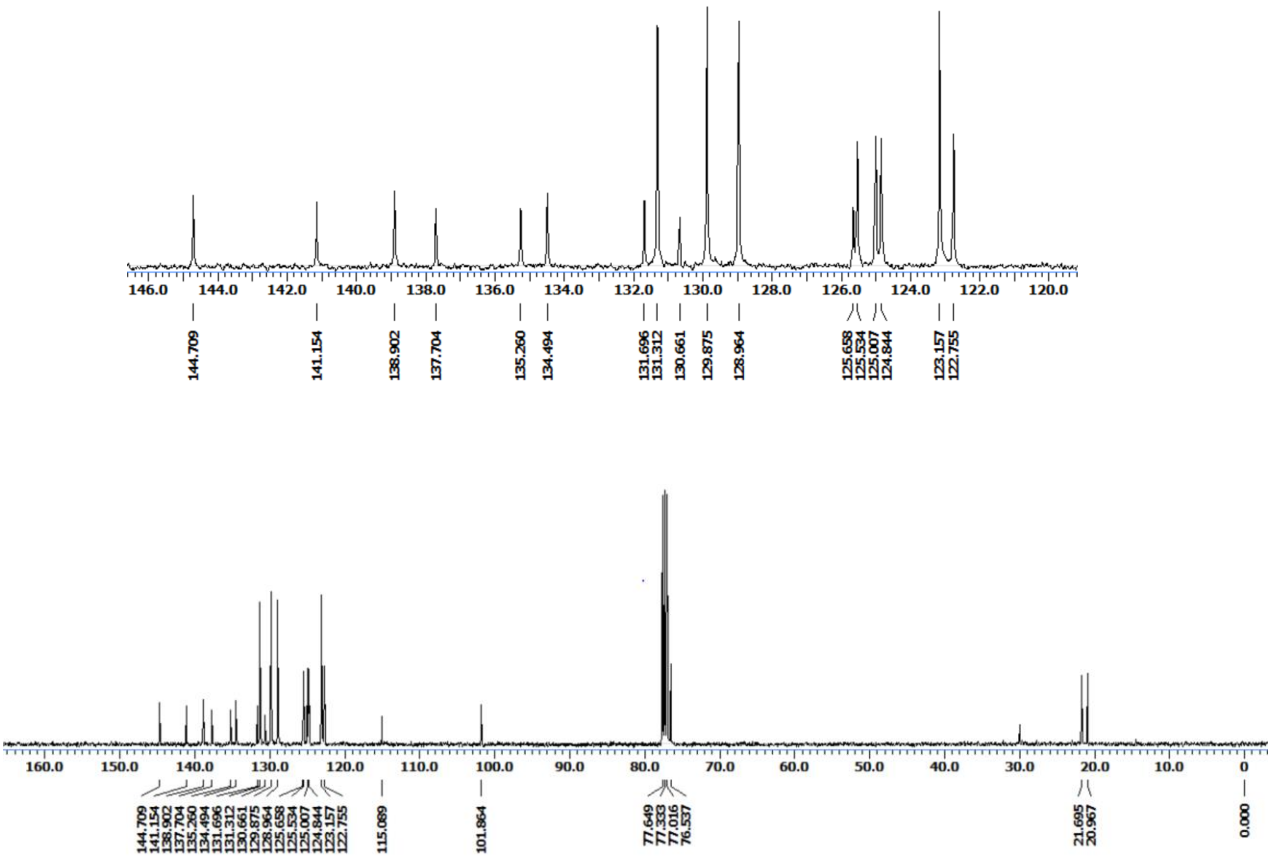




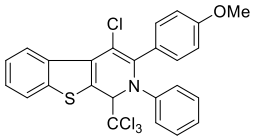
^{13}C NMR



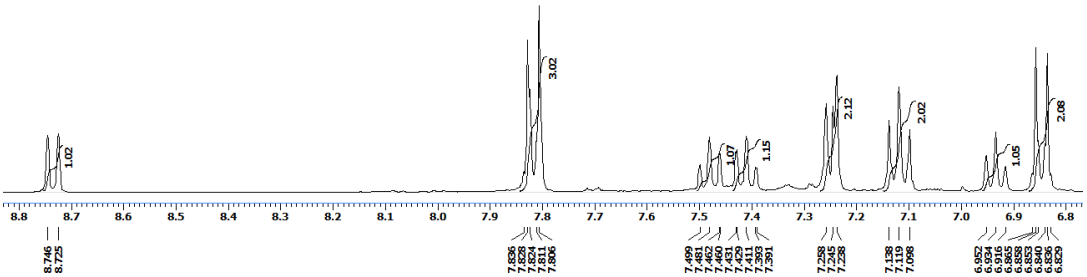
4-Chloro-2,3-di-p-tolyl-1-(trichloromethyl)-1,2-dihydrobenzo[4,5]thieno[2,3-*c*]pyridine (7c)

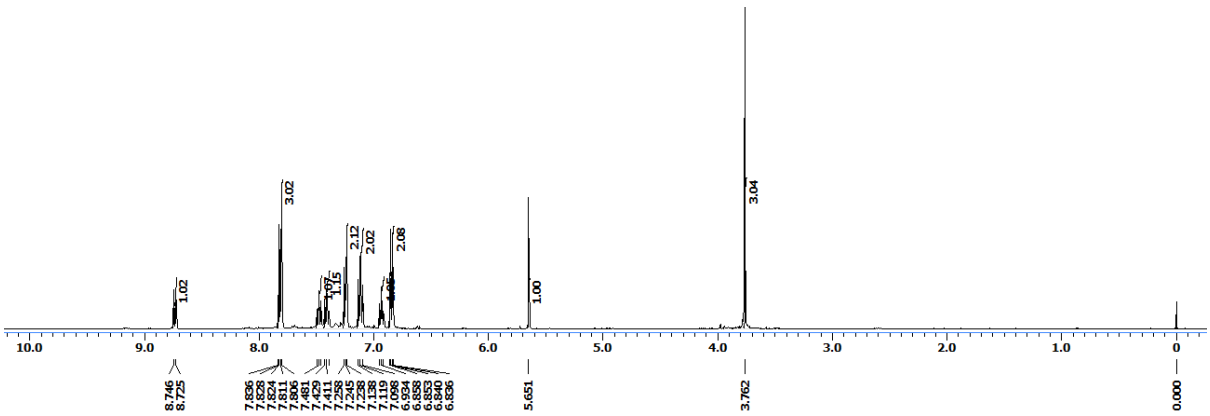


^{1}H NMR

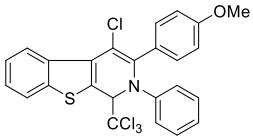


4-Chloro-3-(4-methoxyphenyl)-2-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[4,5]thieno[2,3-*c*]pyridine (7d)

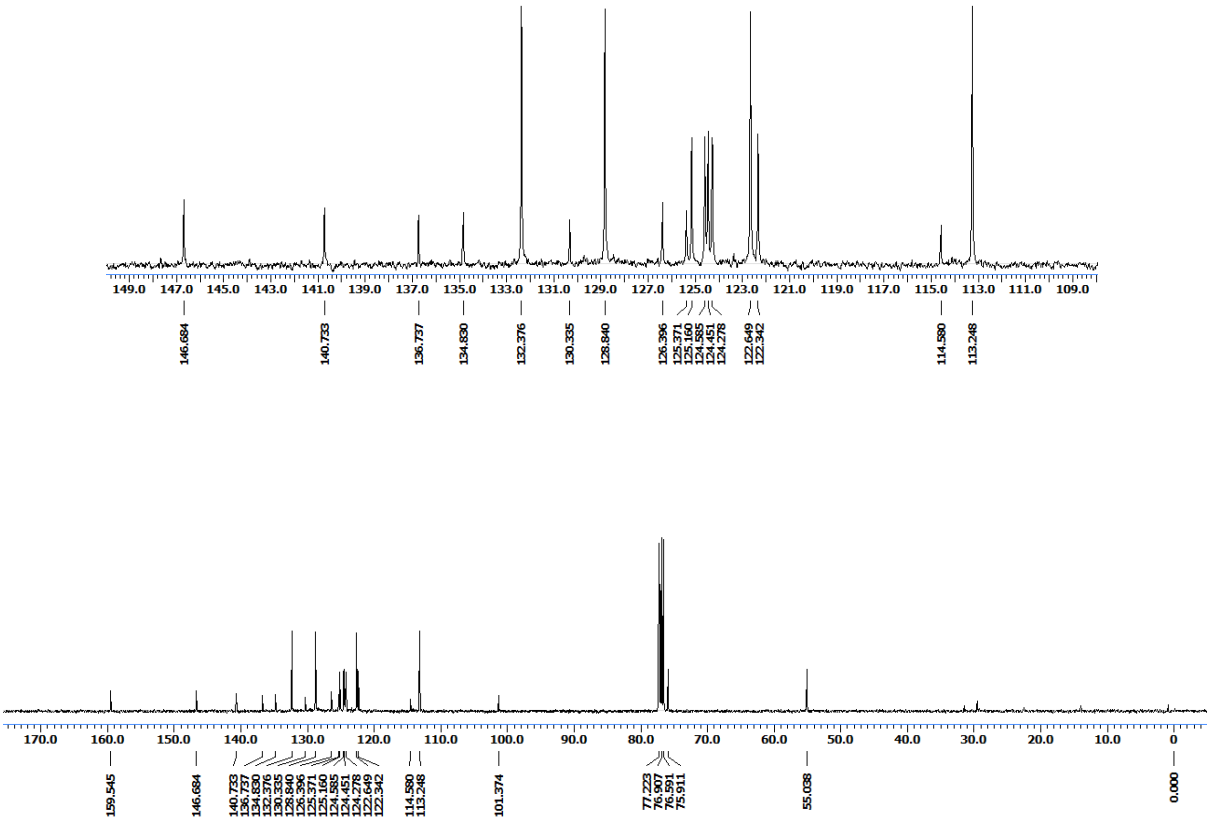




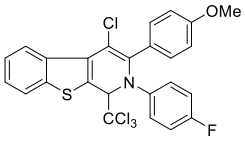
^{13}C NMR



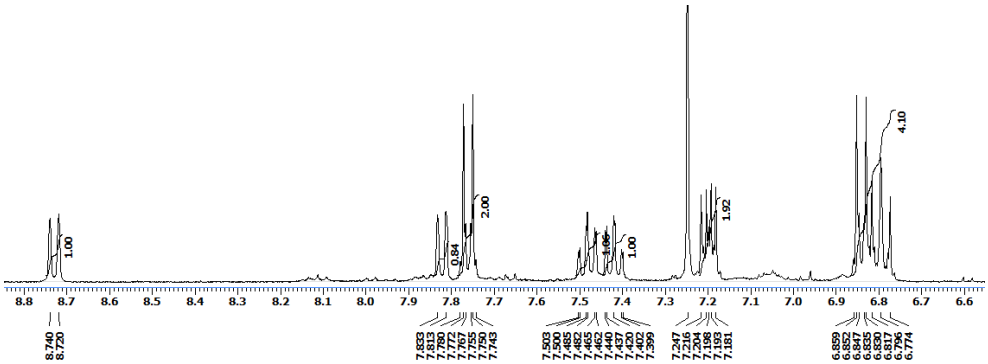
4-Chloro-3-(4-methoxyphenyl)-2-phenyl-1-(trichloromethyl)-1,2-dihydrobenzo[4,5]thieno[2,3-*c*]pyridine (7d)

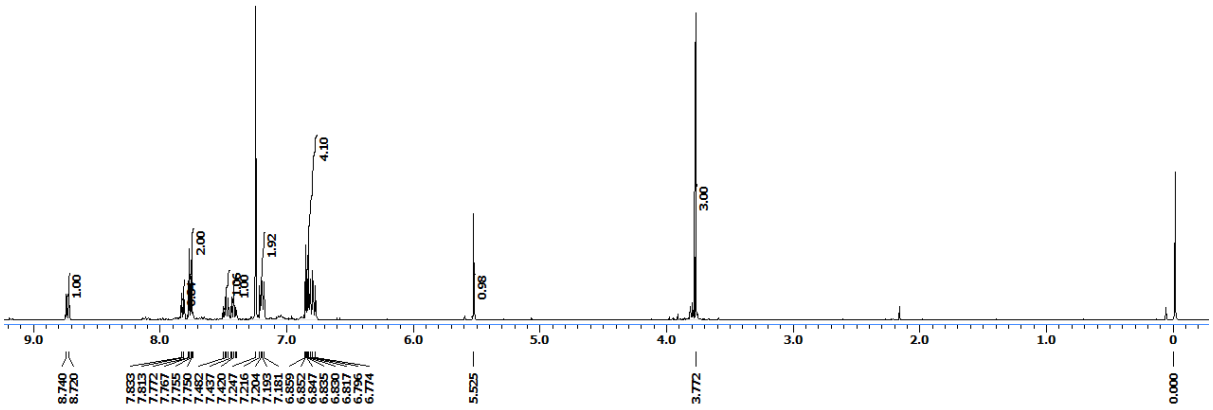


^{1}H NMR

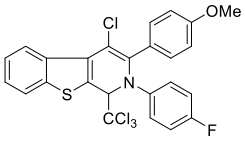


4-Chloro-2-(4-fluorophenyl)-3-(4-methoxyphenyl)-1-(trichloromethyl)-1,2-dihydrobenzo[4,5]thieno[2,3-*c*]pyridine (7e)

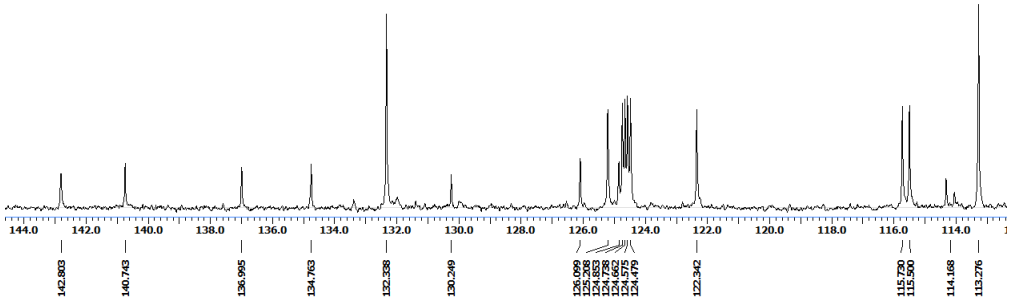


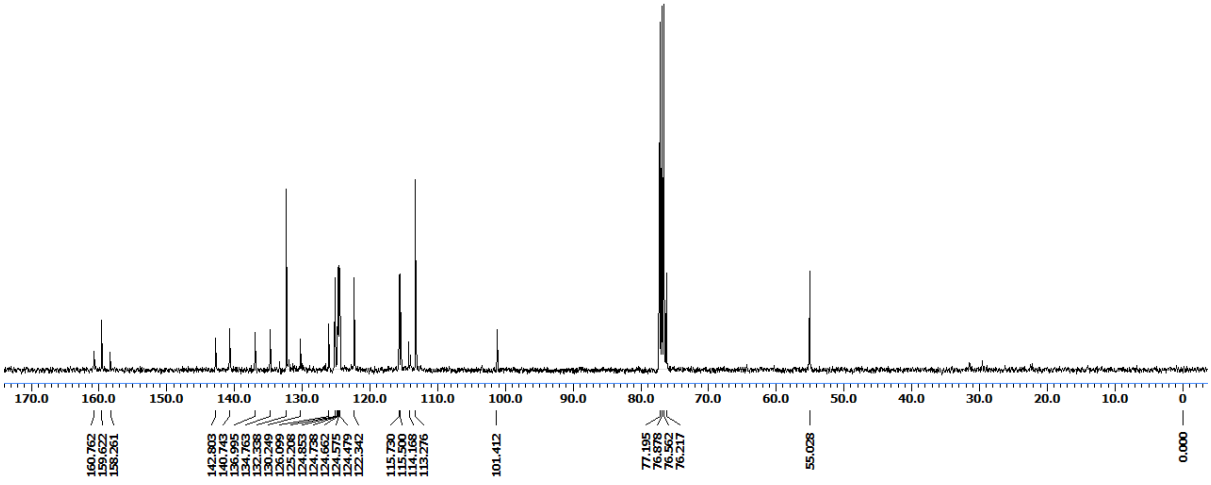


^{13}C NMR

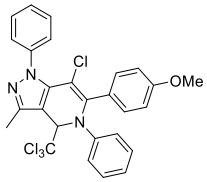


4-Chloro-2-(4-fluorophenyl)-3-(4-methoxyphenyl)-1-(trichloromethyl)-1,2-dihydrobenzo[4,5]thieno[2,3-*c*]pyridine (7e)

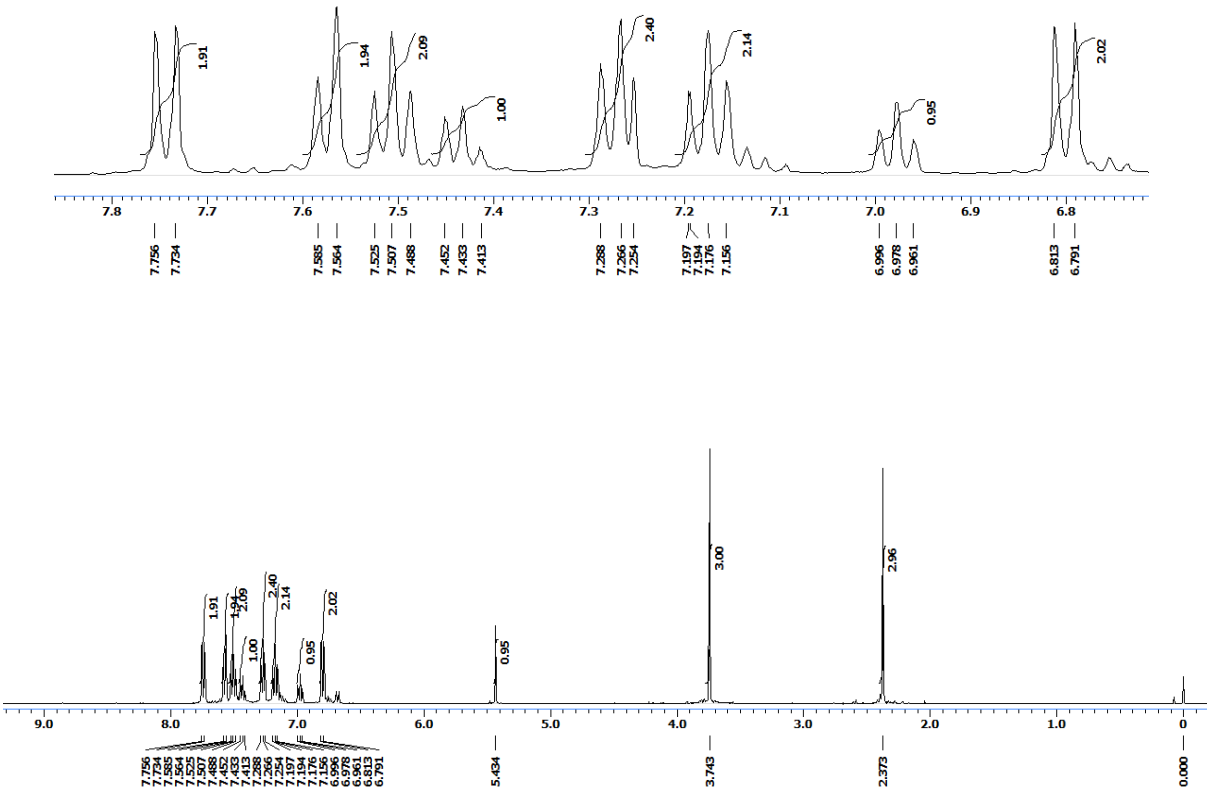




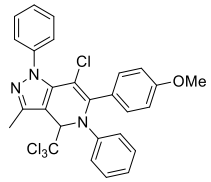
^{1}H NMR



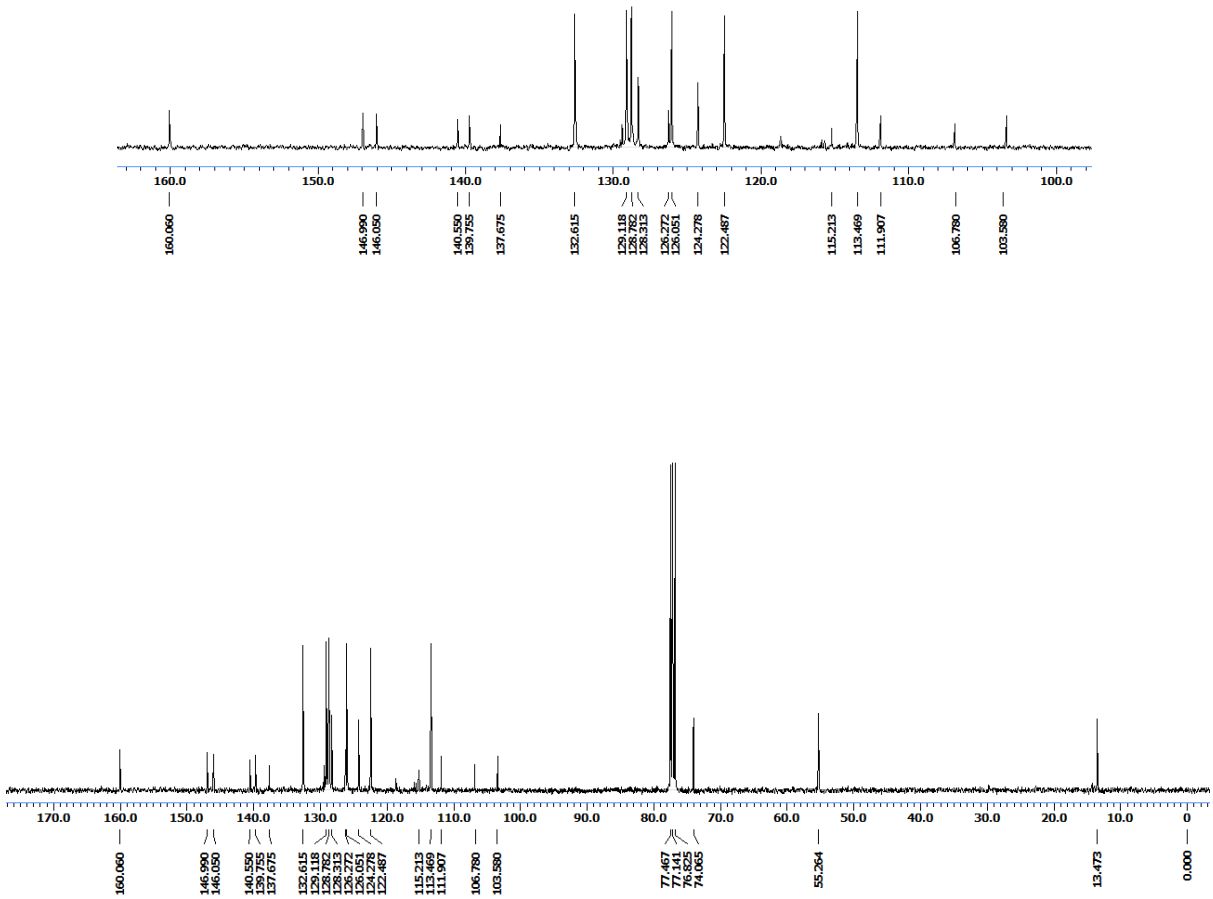
7-Chloro-6-(4-methoxyphenyl)-3-methyl-1,5-diphenyl-4-(trichloromethyl)-4,5-dihydro-1*H*-pyrazolo[4,3-*c*]pyridine (8a)



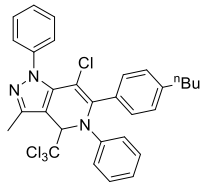
^{13}C NMR



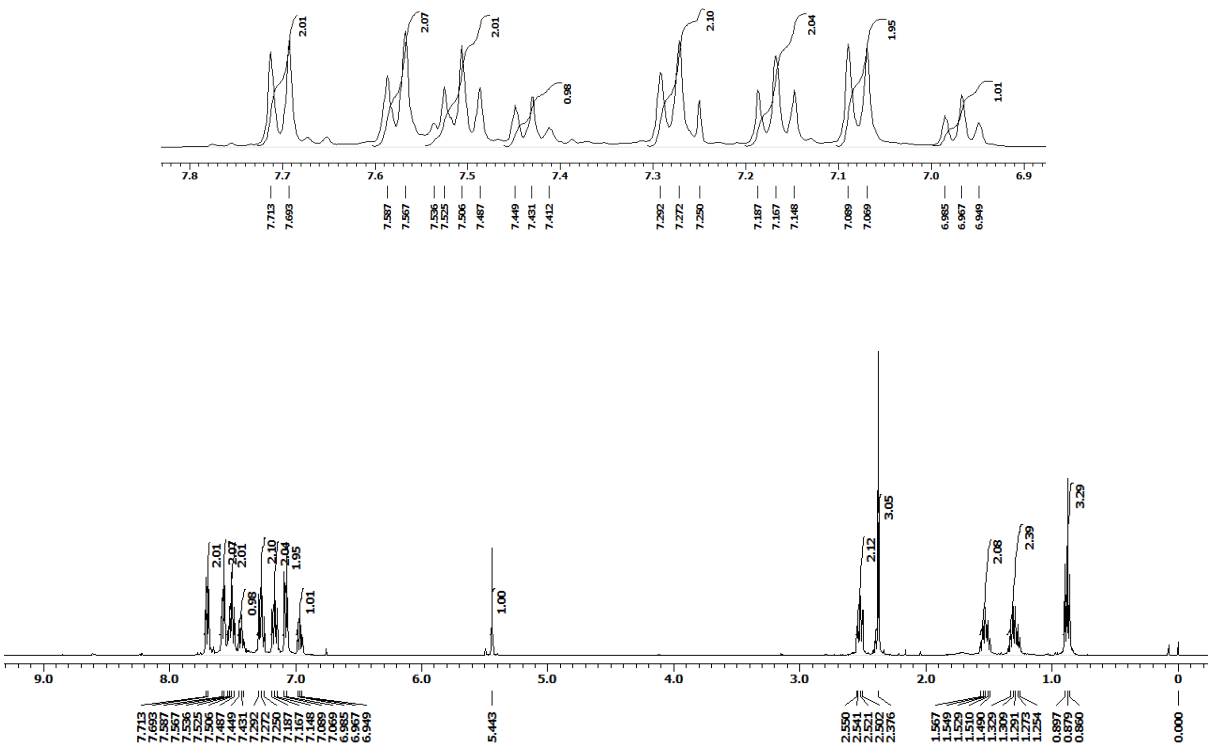
7-Chloro-6-(4-methoxyphenyl)-3-methyl-1,5-diphenyl-4-(trichloromethyl)-4,5-dihydro-1*H*-pyrazolo[4,3-*c*]pyridine (8a)



^{1}H NMR



6-(4-Butylphenyl)-7-chloro-3-methyl-1,5-diphenyl-4-(trichloromethyl)-4,5-dihydro-1*H*-pyrazolo[4,3-*c*]pyridine (8b)



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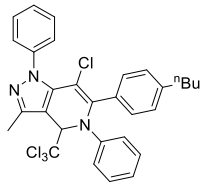
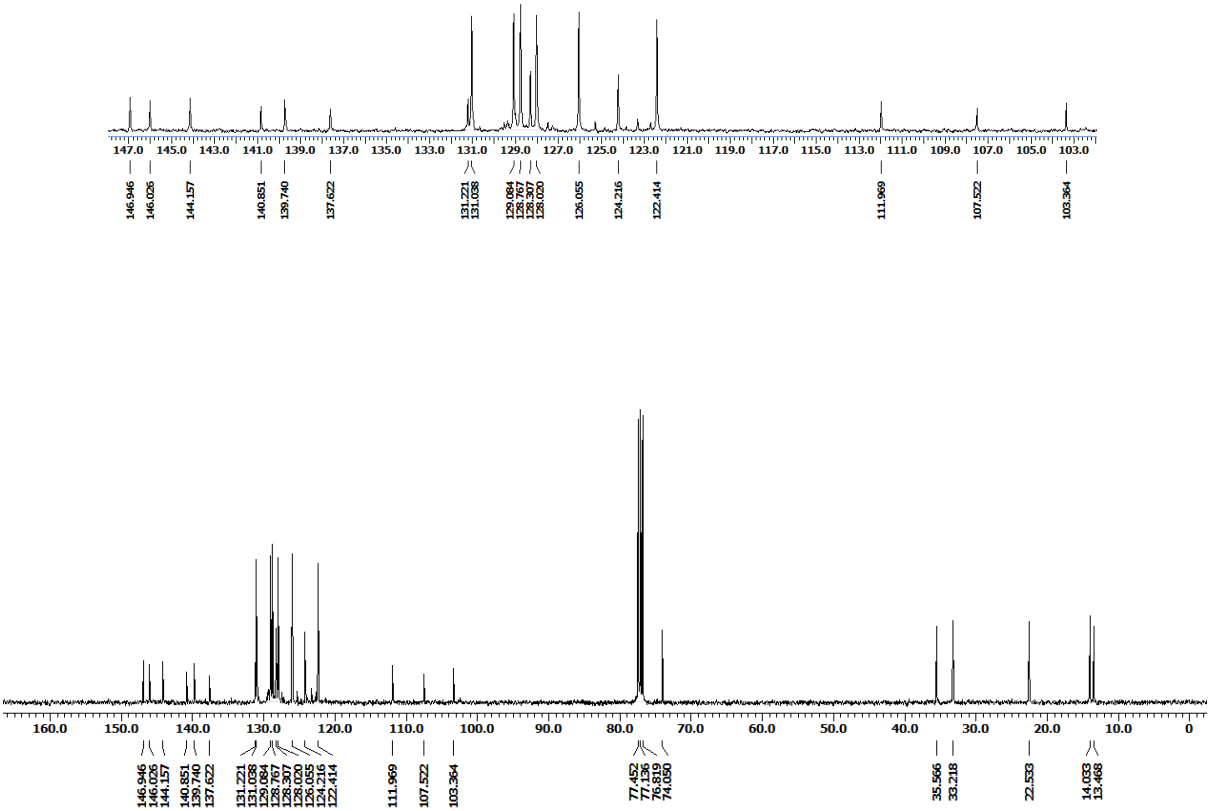


6-(4-Butylphenyl)-7-chloro-3-methyl-1,5-diphenyl-4-(trichloromethyl)-4,5-dihydro-1*H*-pyrazolo[4,3-*c*]pyridine (8b)



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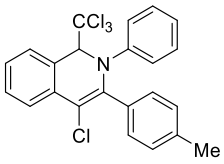
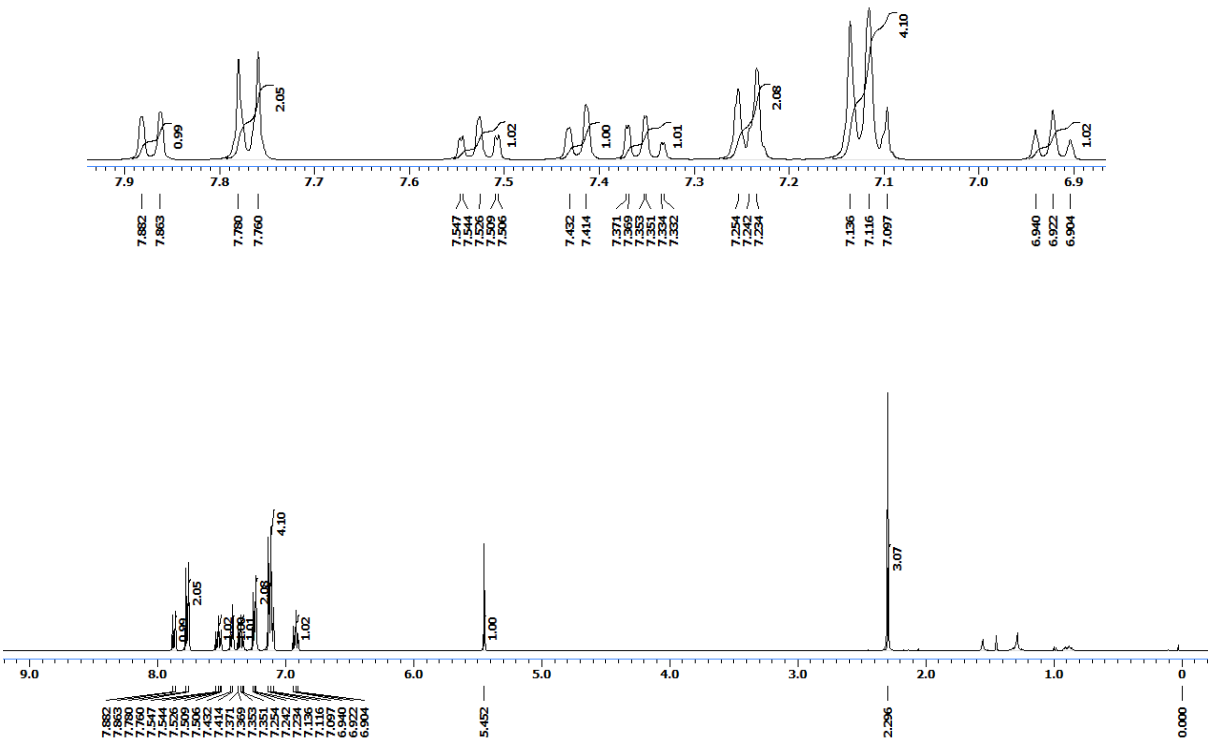


4-Chloro-2-phenyl-3-(*p*-tolyl)-1-(trichloromethyl)-1,2-dihydroisoquinoline (9a)



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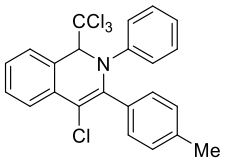
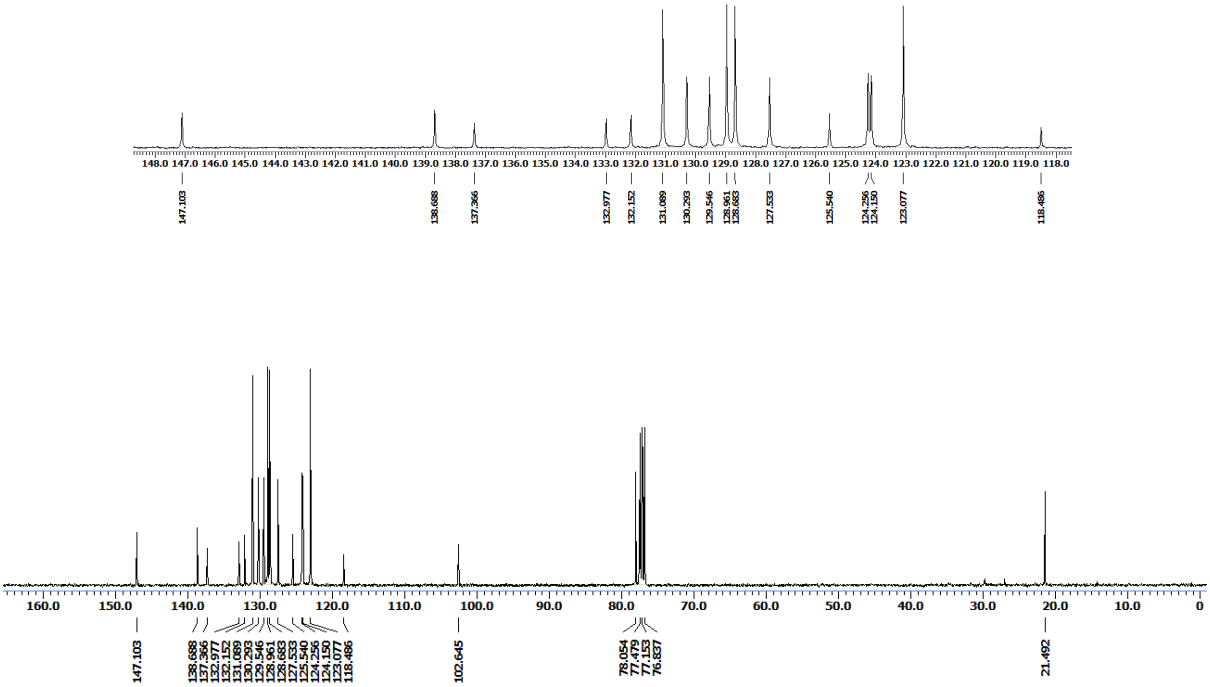
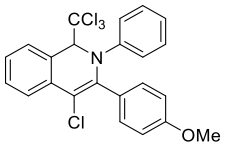


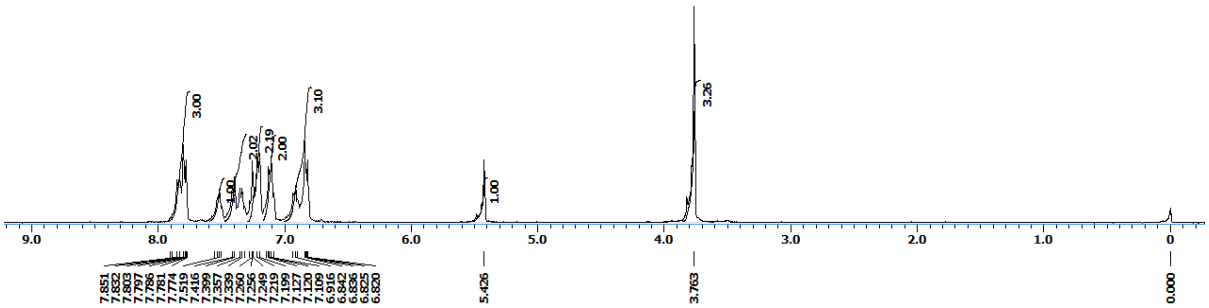
4-Chloro-2-phenyl-3-(*p*-tolyl)-1-(trichloromethyl)-1,2-dihydroisoquinoline (9a)



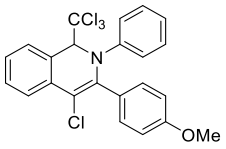
^{1}H NMR



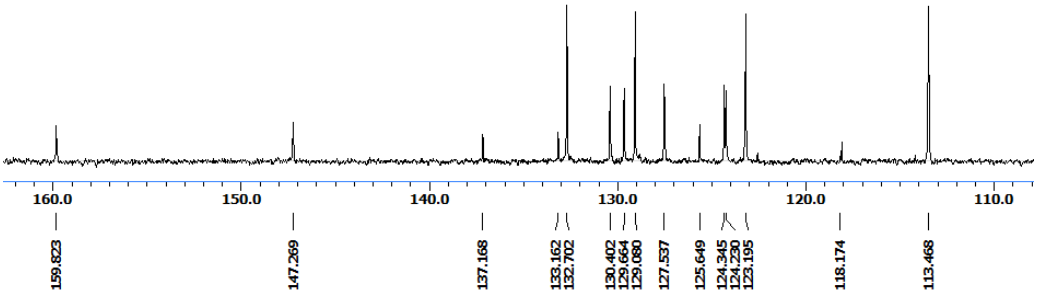
4-Chloro-3-(4-methoxyphenyl)-2-phenyl-1-(trichloromethyl)-1,2-dihydroisoquinoline (9b)

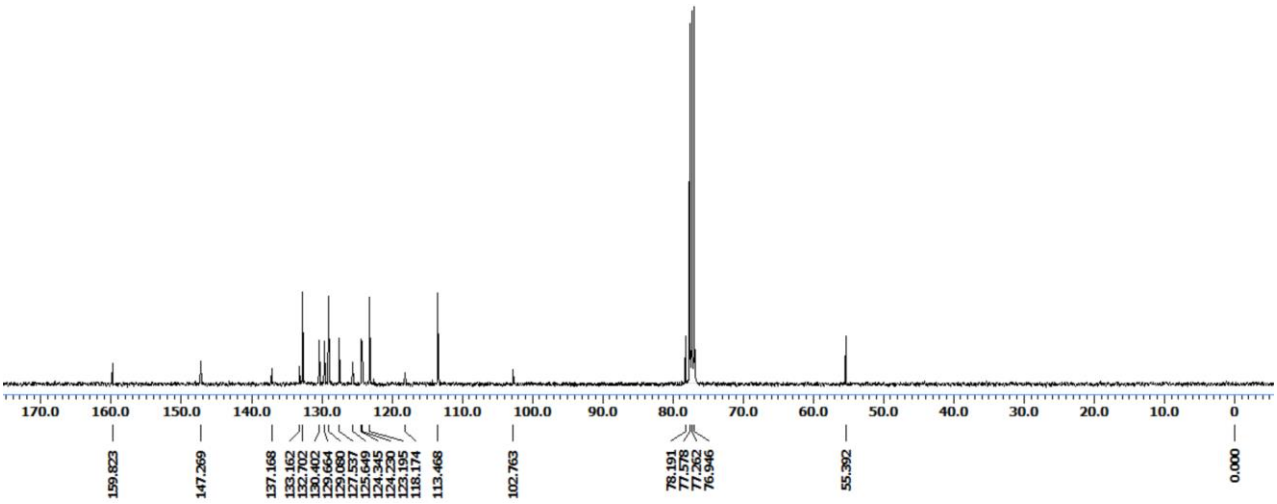


^{13}C NMR

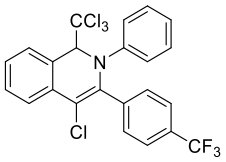


4-Chloro-3-(4-methoxyphenyl)-2-phenyl-1-(trichloromethyl)-1,2-dihydroisoquinoline (9b)

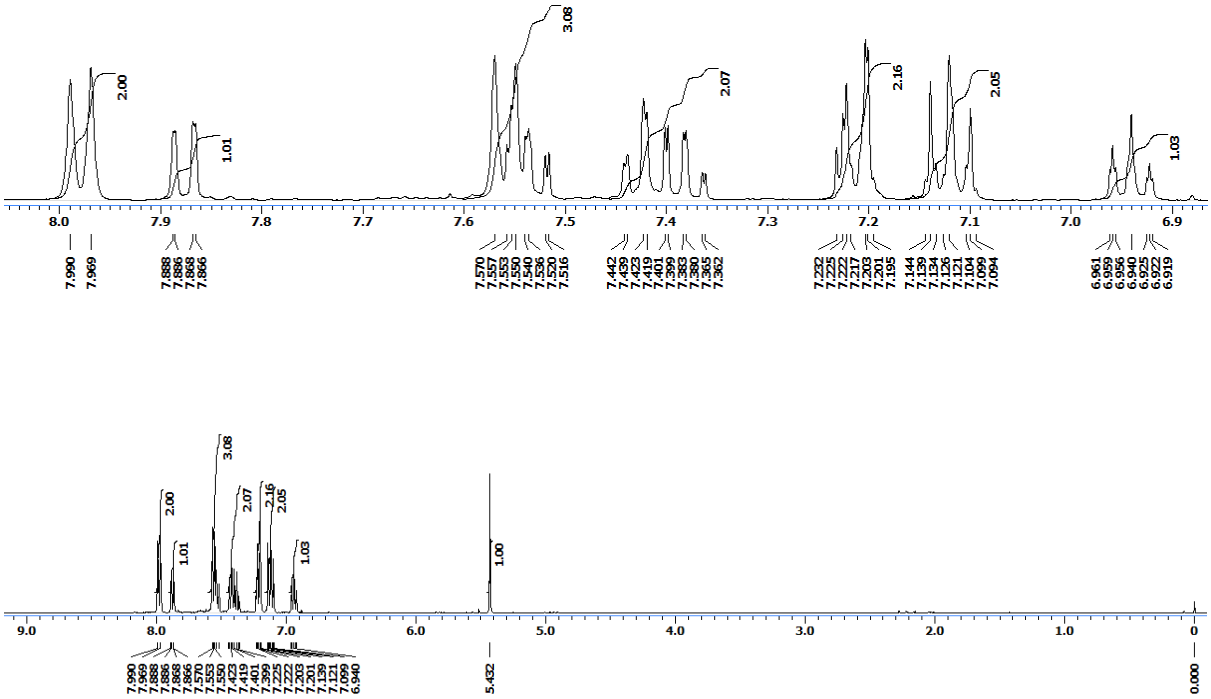




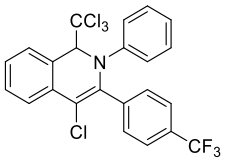
^{1}H NMR



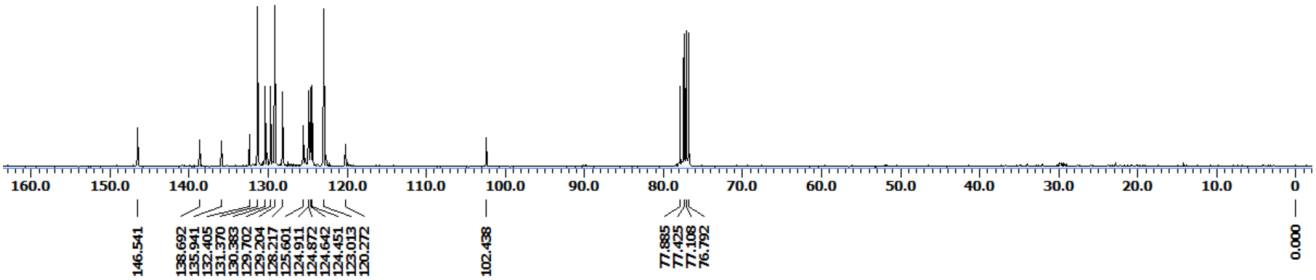
4-Chloro-2-phenyl-1-(trichloromethyl)-3-(4-(trifluoromethyl)phenyl)-1,2-dihydroisoquinoline (9c)



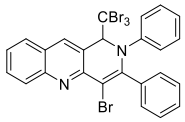
^{13}C NMR



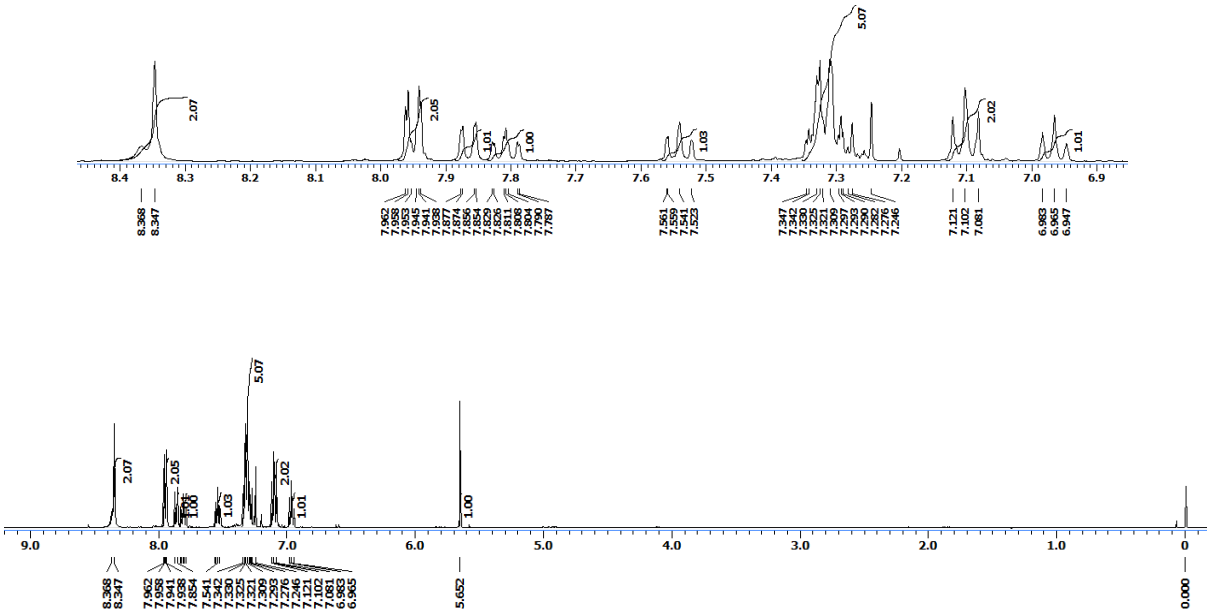
4-Chloro-2-phenyl-1-(trichloromethyl)-3-(4-(trifluoromethyl)phenyl)-1,2-dihydroisoquinoline (9c)



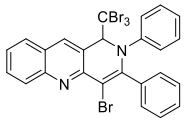
^{1}H NMR



4-Bromo-2,3-diphenyl-1-(tribromomethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (10)



^{13}C NMR



4-Bromo-2,3-diphenyl-1-(tribromomethyl)-1,2-dihydrobenzo[*b*][1,6]naphthyridine (10).