One-pot Synthesis of 2,4-Disubstituted Indoles from *N*-Tosyl-2,3-dichloroaniline Using Palladium-Dihydroxyterphenylphosphine Catalyst

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Supporting Information

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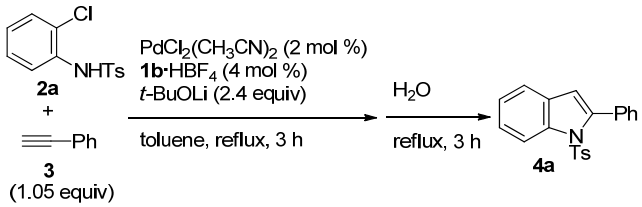
1. General method and materials

General. All reactions were performed under argon atmosphere. Reactions were monitored by TLC on Merck silica gel 60 F254 plates visualized by UV lump at 254 nm. Column chromatography was performed on Kanto Chemicals silica gel 60N (neutral, spherical) and preparative TLC was performed on Merck silica gel 60 F254 0.5 mm plates. NMR spectra were measured on a JEOL AL-400 NMR spectrometer at 400 MHz for ^{1}H spectra and 100 MHz for ^{13}C spectra, and for ^{1}H NMR, tetramethylsilane (TMS) (δ= 0) in $CDCl_3$ served as an internal standard. For ^{13}C NMR, $CDCl_3$ (δ= 77.0) served as an internal standard. Infrared spectra were measured on a SHIMADZU IR Prestige-21 spectrometer (ATR). High-resolution mass spectra (HRMS) were measured on a Bruker MicrOTOF time-of-flight mass spectrometer (ESI) and a JEOL JMS-T100TD time-of-flight mass spectrometer (DART). Melting points were measured using Stanford Research Systems MPA 100 OptiMelt and uncorrected.

Materials. Ligands **1b**•HBF_4 and **1c** were prepared according to the reported procedure.[1] 2-Chloroaniline derivatives **2a**,[2] **2c**,[3] **2d**,[4] and **2f**[5] were prepared according to the reported procedure. **2e**[6] was prepared by using the preparation method of *N*-(4-chlorophenyl)-2-nitrobenzenesulfonamide.[7] Dichloroaniline derivatives **7**,[8] *N*-(2,4-dichlorophenyl)-4-methylbenzenesulfonamide **32**,[9] and *N*-(2,5-dichlorophenyl)-4-methylbenzenesulfonamide **33** were prepared by using the preparation method of **2a**.[2a] Other reagents and anhydrous solvents were purchased from commercial suppliers and used without further purification.

2. Optimization of reaction conditions for indole synthesis

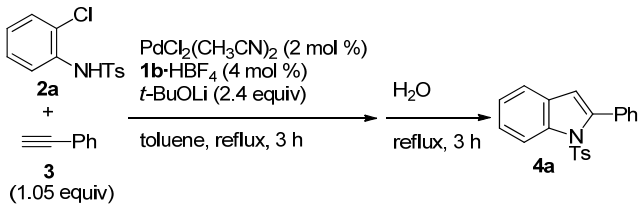
Table S1. Ligand Screening.



entry	ligand	time (h)	yield (%)[a]	
			4a	**5a**
1	**1b**·HBF_4	19	trace	38
2	**1a**·HBF_4	17	8	28
3	PCy_3	21	nd[b]	nd[b]
4	$P(t\text{-Bu})_3$·HBF_4	21	nd[b]	nd[b]
5	XPhos	19	nd[b]	nd[b]

[a]Isolated yield. [b]Not detected.

Table S2. Optimization of Reaction Conditions.



entry	solvent	base	yield (%)[a]
1	toluene	*t*-BuOLi	68
2	toluene	Li_3PO_4	<5[b]
3	toluene	LiOH	<5[b]
4	toluene	K_3PO_4	nd[c]
5	toluene	K_2CO_3	nd[c]
6	toluene	*t*-BuOK	nd[c]
7	DMF	*t*-BuOLi	nd[cd]
8[d]	xylene	*t*-BuOLi	74
9[d]	mesitylene	*t*-BuOLi	87

[a]Isolated yield. [b]NMR yield. [c]Not detected. [d]140 °C, 2 h and H_2O reflux 1 h.

3. Typical experimental procedure for the synthesis of *N*-tosylated chloroanilines[2a]

p-toluenesulfonyl chloride (4.56 g, 24 mmol) was added portionwise to 2-chloroanilines (20 mmol) and pyridine (10 mL, 120 mmol) dissolved in dichloromethane (66 mL). The reaction mixture was stirred at rt for 22 h. 1 M aqueous HCl (50 mL) was added and the organic phase was washed with aqueous HCl (50 mL × 3). Organic layer was dried over anhydrous Na_2SO_4 and evaporated in vacuo to afford the residue. The residue was purified by silica gel column chromatography or recrystallization to give the desired product.

4. Typical experimental procedure for the synthesis of 2-substituted indoles (Table 1, entry 1)

Toluene (2.0 mL) was added to $PdCl_2(CH_3CN)_2$ (2.6 mg, 0.01 mmol), **1b** •HBF_4 (10.9 mg, 0.02 mmol), *t*-BuOLi (96 mg, 1.2 mmol), and **2a** (140 mg, 0.50 mmol) in a two-neck flask under argon. The reaction mixture was stirred at rt for 40 min, and then ethylnylbenzene (112 μL, 1.0 mmol) was added. The reaction mixture was stirred at reflux for 3 h. Then, water (2 mL) was added, and the reaction mixture was stirred at reflux for 3 h. The resulting suspension was quenched with aq. NH_4Cl (5 mL) at rt and extracted with ethyl acetate (20 mL × 2). The combined organic layers were dried over anhydrous Na_2SO_4 and concentrated, and then the residue was purified by preparative TLC (hexanes/CH_2Cl_2 = 1/1) to give 2-phenyl-1-tosyl-1*H*-indole **4a** (118 mg, 68% yield) as a pale yellow solid.

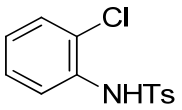
5. Typical experimental procedure for the Suzuki-Miyaura coupling of 4-chloroindole 9 (Scheme 2)

Toluene (1.0 mL) and water (1.0 mL) were added to $PdCl_2(CH_3CN)_2$ (1.3mg, 0.005 mmol), ligand (0.01 mmol), **9** (96 mg, 0.25 mmol), 4-methoxyphenylboronic acid **15** (57 mg, 0.375 mmol), and K_3PO_4 (106 mg, 0.5 mmol) in a two-neck flask under argon. The reaction mixture was stirred at reflux for 6 h. The resulting suspension was quenched with 1M aq. HCl (3 mL) at rt and filtered through the pad of Celite. The pad was washed with ethyl acetate (50 mL). The combined organic layers were dried over anhydrous Na_2SO_4, and concentrated. The residue was purified by column chromatography (SiO_2, hexanes/CH_2Cl_2 = 2/1) to give 4-(4-methoxyphenyl)-2-phenyl-1-tosyl-1*H*-indole **16** (135 mg, quant) as a pale yellow solid.

6. Typical experimental procedure for the synthesis of disubstituted indoles (Table 2, Entry 10)

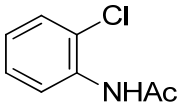
Toluene (2.0 mL) was added to $PdCl_2(CH_3CN)_2$ (2.6 mg, 0.01 mmol), **1b**•HBF_4 (10.9 mg, 0.02 mmol), *t*-BuOLi (96 mg, 1.20 mmol), and **7** (158 mg, 0.50 mmol) in a two-neck flask under argon. The reaction mixture was stirred at rt for 40 min, and then ethylnylbenzene (112 μL, 1.0 mmol) was added. The reaction mixture was stirred at reflux for 3 h. Then, water (2 mL) was added, and the reaction mixture was stirred at reflux for 3 h. After cooling down, 4-methoxyphenylboronic acid **15** (152 mg, 1.0 mmol), K_3PO_4 (318 mg, 1.5 mmol), and tetrabutylammonium chloride (69 mg, 0.25 mmol) were added, and the reaction mixture was stirred at reflux for 12 h. The resulting suspension was quenched with 1M aq. HCl (6 mL) at rt and filtered through the pad of Celite. The pad was washed with ethyl acetate (50 mL). The combined organic layers were dried over anhydrous Na_2SO_4 and concentrated, and then the residue was purified by column chromatography (SiO_2, hexanes/CH_2Cl_2 = 2/1) to give 4-(4-methoxyphenyl)-2-phenyl-1-tosyl-1*H*-indole **16** (157 mg, 69%) as a pale yellow solid.

7. Analytical data of the products



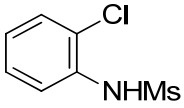
***N*-(2-Chlorophenyl)-4-methylbenzenesulfonamide (2a)[2]**

Prepared from 21.7 mmol of 2-chloroaniline following the typical procedure. Purification by silica gel column chromatography (hexane/ethyl acetate) afforded 4.99 g (82% yield) of **2a** as a colorless crystal. Spectral data matches that reported in the literature.



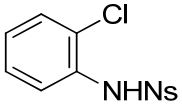
***N*-(2-Chlorophenyl)acetamide (2c)[3]**

Prepared from 10 mmol of 2-chloroaniline following the reported procedure.[3a] Recrystallization from ethanol afforded 1.01 g (60% yield) of **2c** as a colorless crystal. Spectral data matches that reported in the literature.



***N*-(2-Chlorophenyl)methanesulfonamide (2d)[4]**

Prepared from 10 mmol of 2-chloroaniline following the reported procedure.[4a] Recrystallization from ethanol afforded 1.25 g (61% yield) of **2d** as a colorless crystal. Spectral data matches that reported in the literature.



***N*-(2-Chlorophenyl)-2-nitrobenzenesulfonamide (2e)[6]**

Prepared from 12 mmol of 2-chloroaniline following the literature procedure.[7] Recrystallization from ethyl acetate/ hexane afforded 1.49 g (48% yield) of **2e** as a colorless crystal.

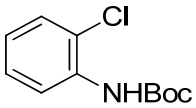
^{1}H NMR (400 MHz, $CDCl_3$) δ 7.89 (3H, ddd, *J* = 17.2, 7.9, 1.3 Hz), 7.75-7.71 (2H, m), 7.63 (1H, td, *J* = 7.7, 1.3 Hz), 7.29 (2H, dt, *J* = 13.8, 5.2 Hz), 7.13 (1H, td, *J* = 7.7, 1.8 Hz)

^{13}C NMR (100 MHz, $CDCl_3$) δ 134.1, 133.1, 132.9, 132.7, 131.0, 129.6, 127.9, 127.0, 126.6, 125.6, 124.9

HRMS (ESI) *m/z* calcd for $C_{12}H_9N_2O_4ClSNa$ ($[M+Na]^+$) : 334.9864, found : 334.9871

IR (ATR) 3291, 1539, 1474, 1366, 1331, 1177, 1126, 1057, 926 cm^{-1}

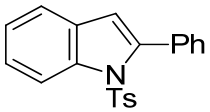
Mp. 147.0-148.0 °C



***tert*-Butyl (2-chlorophenyl)carbamate (2f)[5]**

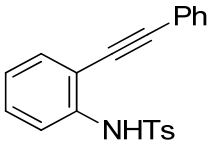
Prepared from 10 mmol of 2-chloroaniline following the reported procedure.[5a] Purification by silica gel column chromatography (hexane/ethyl acetate) afforded 0.31 g (14% yield) of **2f** as a colorless oil. Spectral data matches that reported in the literature.

^{13}C NMR (100 MHz, $CDCl_3$) δ 152.3, 135.1, 128.9, 127.6, 123.2, 121.8, 119.7, 81.0, 28.2



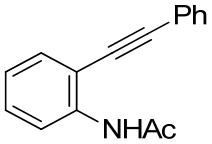
2-Phenyl-1-tosyl-1*H*-indole (4a)[10]

Prepared from **2a** and ethynylbenzene **3** following the typical procedure. The crude reaction mixture was purified by preparative TLC (hexanes/chloroform = 1/1) to yield 118 mg (68% yield) of **4a** as a pale yellow solid. Spectral data matches that reported in the literature.



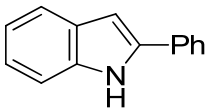
4-Methyl-*N*-(2-(phenylethynyl)phenyl)benzenesulfonamide (5a)[11]

Prepared from **2a** and ethynylbenzene **3** following the typical procedure. The crude reaction mixture was purified by preparative TLC (hexanes/chloroform = 1/2) to yield **5a** as a pale yellow solid. Spectral data matches that reported in the literature.



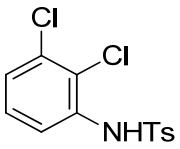
***N*-(2-(Phenylethynyl)phenyl)acetamide (5c)[12]**

Prepared from **2c** and ethynylbenzene **3** following the typical procedure. The crude reaction mixture was purified by column chromatography (SiO_2, hexanes/dichloromethane = 2/3) to yield **5c** as a pale yellow solid. Spectral data matches that reported in the literature.



2-Phenyl-1*H*-indole (6)[13]

Prepared from **2a** and ethynylbenzene **3** following the typical procedure. The crude reaction mixture was purified by column chlomatography (SiO_2, hexanes/dichloromethane = 2/1) to yield 12 mg (12% yield) of **6** as a pale yellow solid. Spectral data matches that reported in the literature.



***N*-(2,3-Dichlorophenyl)-4-methylbenzenesulfonamide (7)**[8]

Prepared from 2,3-dichloroaniline following the typical procedure. Recrystallization from ethanol afford 4.79 g (76% yield) of **7** as a colorless crystal.

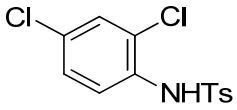
^{1}H NMR (400 MHz, $CDCl_3$) δ 7.67 (2H, d, *J* = 8.0 Hz), 7.58 (1H, d, *J* = 7.2 Hz), 7.26-7.23 (3H, m), 7.19-7.13 (1H, m), 7.10 (1H, s), 2.39 (3H, s)

^{13}C NMR (100 MHz, $CDCl_3$) δ 144.5, 135.3, 129.8, 127.8, 127.3, 126.3, 119.6, 21.6

HRMS (ESI) *m/z* calcd for $C_{13}H_{11}NO_2Cl_2SNa$ ($[M+Na]^+$) : 337.9780, found : 337.9738

IR (ATR) 3271, 1584, 1456, 1381, 1333, 1163, 1092, 937 cm^{-1}

Mp. 124.0-126.2 °C



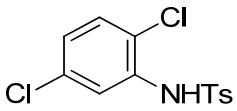
***N*-(2,4-Dichlorophenyl)-4-methylbenzenesulfonamide (32)**[9]

Prepared from 2,4-dichloroaniline following the typical procedure. Purification by silica gel column chromatography (hexane/chloroform = 2/1) afforded 4.11 g (65 % yield) of **32** as a colorless crystal. Spectral data matches that reported in the literature.

HRMS (ESI) *m/z* calcd for $C_{13}H_{11}NO_2Cl_2SNa$ ($[M+Na]^+$) : 337.9780, found : 337.9790

IR (ATR) 3258, 1474, 1410, 1375, 1335, 1167, 1090, 1053, 903 cm^{-1}

Mp. 126.8-127.7 °C



***N*-(2,5-Dichlorophenyl)-4-methylbenzenesulfonamide (33)**

Prepared from 2,5-dichloroaniline following the typical procedure. Recrystallization from ethanol afforded 3.81 g (60 % yield) of **33** as a colorless crystal.

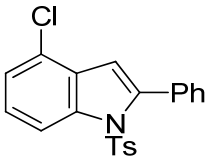
^{1}H NMR (400 MHz, $CDCl_3$) δ 7.69 (3H, t, *J* = 4.9 Hz), 7.26 (2H, t, *J* = 4.1 Hz), 7.18 (1H, d, *J* = 8.3 Hz), 7.00 (2H, dd, *J* = 8.8, 2.4 Hz), 2.39 (3H, s)

^{13}C NMR (100 MHz, $CDCl_3$) δ 144.6, 135.6, 134.5, 133.7, 130.1, 129.8, 127.3, 125.6, 122.7, 121.6, 21.6

HRMS (ESI) *m/z* calcd for $C_{13}H_{11}NO_2Cl_2SNa$ ($[M+Na]^+$) : 337.9780, found : 337.9793

IR (ATR) 3262, 1572, 1477, 1381, 1339, 1167, 1090, 1045, 924, 806 cm^{-1}

Mp. 144.9-145.9 °C



4-Chloro-2-phenyl-1-tosyl-1*H*-indole (9)

Prepared from **7** and ethynylbenzene **3** following the typical procedure. The crude reaction mixture was purified by preparative TLC (hexanes/dichloromethane = 3/1) to yield 169 mg (88% yield) of **9** as a pale yellow solid.

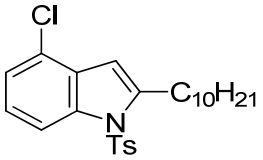
^{1}H NMR (400 MHz, $CDCl_3$) δ 8.22 (1H, d, *J* = 9.3 Hz), 7.51-7.39 (5H, m), 7.28-7.23 (4H, m), 7.04 (2H, d, *J* = 7.8 Hz), 6.66 (1H, s), 2.28 (3H, s)

^{13}C NMR (100 MHz, $CDCl_3$) δ 144.9, 142.7, 138.7, 134.5, 131.8, 130.4, 129.3, 129.2, 28.9, 127.5, 126.8, 125.8, 125.3, 124.0, 114.9, 111.1, 21.5

HRMS (ESI) *m/z* calcd for $C_{21}H_{17}NO_2ClS$ ($[M+H]^+$) : 382.0663, found : 382.0676

IR (ATR) 3059, 2924, 1595, 1491, 1464, 1423, 1369, 1163, 1051, 995 cm^{-1}

Mp. 156.5-157.3 °C



4-Chloro-2-decyl-1-tosyl-1*H*-indole (10)

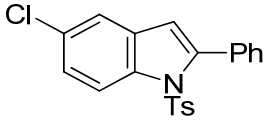
Prepared from **7** and 1-dodecyne **8** following the typical procedure. The crude reaction mixture was purified by preparative TLC (hexanes/dichloromethane = 3/1) to yield 186 mg (83% yield) of **10** as a pale yellow oil.

^{1}H NMR (400 MHz, $CDCl_3$) δ 8.08 (1H, d, *J* = 3.9 Hz), 7.61 (2H, dd, *J* = 6.1, 4.1 Hz), 7.25-7.14 (4H, m), 6.49 (1H, d, *J* = 1.0 Hz), 2.98 (2H, t, *J* = 7.3 Hz), 2.33 (3H, s), 1.75 (2H, t, *J* = 7.6 Hz), 1.43-1.27 (14H, m), 0.88 (3H, t, *J* = 6.8 Hz)

^{13}C NMR (100 MHz, $CDCl_3$) δ 144.9, 143.4, 137.7, 136.0, 129.9, 128.5, 126.3, 125.2, 124.3, 123.2, 113.2, 106.3, 31.9, 29.6, 29.5, 29.39, 29.36, 29.3, 29.0, 28.7, 22.7, 21.5, 14.1

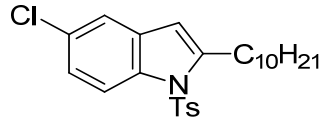
HRMS (ESI) *m/z* calcd for $C_{25}H_{33}NO_2ClS$ ($[M+H]^+$) : 446.1915, found : 446.1907

IR (ATR) 2922, 2853, 1597, 1560, 1425, 1371, 1171, 1092, 1049, 947 cm^{-1}



5-Chloro-2-phenyl-1-tosyl-1*H*-indole (11)[14]

Prepared from **32** and ethynylbenzene **3** following the typical procedure. The crude reaction mixture was purified by preparative TLC (hexanes/dichloromethane = 3/1) to yield 127 mg (67% yield) of **11** as a pale yellow solid. Spectral data matches that reported in the literature.



5-Chloro-2-decyl-1-tosyl-1*H*-indole (12)

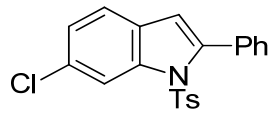
Prepared from **32** and 1-dodecyne **8** following the typical procedure. The crude reaction mixture was purified by preparative TLC (hexanes/dichloromethane = 3/1) to yield 186 mg (83% yield) of **12** as a pale yellow oil.

^{1}H NMR (400 MHz, $CDCl_3$) δ 8.09 (1H, d, J = 9.3 Hz), 7.58 (2H, d, J = 8.3 Hz), 7.34 (1H, d, J = 2.0 Hz), 7.18-7.16 (3H, m), 6.29 (1H, s), 2.95 (2H, t, J = 7.6 Hz), 2.30 (3H, s), 1.71 (2H, t, J = 7.3 Hz), 1.36-1.29 (14H, m), 0.88 (3H, t, J = 6.6 Hz)

^{13}C NMR (100 MHz, $CDCl_3$) δ 144.8, 144.1, 136.0, 135.5, 131.1, 129.8, 129.1, 126.2, 123.8, 19.6, 115.8, 107.5, 31.9, 29.6, 29.5, 29.4, 29.31, 29.28, 28.9, 28.7, 22.6, 21.5, 14.1

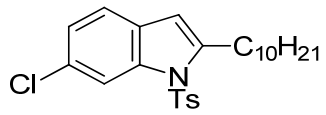
HRMS (ESI) *m/z* calcd for $C_{25}H_{33}NO_2ClS$ ($[M+H]^+$) : 446.1915, found : 446.1915

IR (ATR) 2922, 2853, 1597, 1445, 1369, 1219, 1173, 1072, 1049, 923 cm^{-1}



6-Chloro-2-phenyl-1-tosyl-1*H*-indole (13)[15]

Prepared from **33** and ethynylbenzene **3** following the typical procedure. The crude reaction mixture was purified by preparative TLC (hexanes/dichloromethane = 3/1) to yield 109 mg (57% yield) of **13** as a pale yellow solid. Spectral data matches that reported in the literature.



6-Chloro-2-decyl-1-tosyl-1*H*-indole (14)

Prepared from **33** and 1-dodecyne **8** following the typical procedure. The crude reaction mixture was purified by preparative TLC (hexanes/dichloromethane = 3/1) to yield 57 mg (30% yield) of **11** as a pale yellow solid.

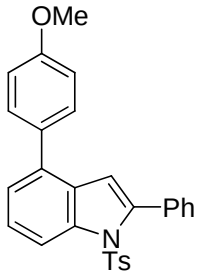
^{1}H NMR (400 MHz, $CDCl_3$) δ 8.21 (1H, s), 7.61 (2H, d, *J* = 8.3 Hz), 7.30 (1H, d, *J* = 8.3 Hz), 7.18 (3H, dt, *J* = 12.2, 5.2 Hz), 6.33 (1H, s), 2.93 (2H, t, *J* = 7.6 Hz), 2.34 (3H, s), 1.67-1.74 (2H, m), 1.37-1.25 (14H, m), 0.88 (3H, t, *J* = 6.8 Hz)

^{13}C NMR (100 MHz, $CDCl_3$) δ 144.9, 143.3, 137.5, 136.0, 129.9, 129.6, 128.3, 126.3. 124.0, 120.6, 115.0, 108.0, 31.9, 29.6, 29.5, 29.4, 29.33, 29.32, 28.9, 28.7, 22.7, 21.6, 14.1

HRMS (ESI) *m/z* calcd for $C_{25}H_{33}NO_2ClS$ ($[M+H]^+$) : 446.1915, found : 446.1906

IR (ATR) 2924, 2855, 1591, 1452, 1418, 1368, 1169, 1148, 1092, 1040, 932 cm^{-1}

Mp. 81.7-82.7 °C



4-(4-Methoxyphenyl)-2-phenyl-1-tosyl-1*H*-indole (16)

Prepared from **7**, ethynylbenzene **3**, and 4-methoxyphenylboronic acid **15** following the typical procedure. The crude reaction mixture was purified by column chromatography (hexanes/dichloromethane = 2/1) to yield 157 mg (69% yield) of **16** as a pale yellow solid.

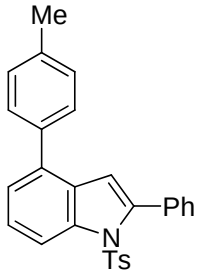
^{1}H NMR (400 MHz, $CDCl_3$) δ 8.28 (1H, d, *J* = 8.3 Hz), 7.48 (2H, td, *J* = 4.9, 1.6 Hz), 7.43-7.36 (6H, m), 7.31 (2H, d, *J* = 8.3 Hz), 7.26 (1H, t, *J* = 3.9 Hz), 7.02 (2H, d, *J* = 8.3 Hz), 6.93 (2H, dt, *J* = 9.3, 2.6 Hz), 6.71 (1H, s), 3.79 (3H, s), 2.25 (3H, s)

^{13}C NMR (100 MHz, $CDCl_3$) δ 159.0, 144.5, 142.0, 138.6, 134.8, 134.3, 132.5, 132.3, 130.3, 129.7, 129.2, 128.5, 127.4, 126.8, 125.0, 123.9, 114.9, 114.0, 112.9, 55.2, 21.4

HRMS (DART) *m/z* calcd for $C_{28}H_{24}NO_3S$ ($[M+H]^+$) : 454.1471, found : 454.1494

IR (ATR) 3065, 2994, 2930, 2832, 1609, 1595, 1516, 1474, 1429, 1366, 1298, 1238, 1163, 1109, 1090, 1057, 1026, 987 cm^{-1}

Mp. 159.4-159.9 °C



4-(4-Methylphenyl)-2-phenyl-1-tosyl-1*H*-indole (17)

Prepared from **7**, ethynylbenzene **3**, and 4-methylphenylboronic acid following the typical procedure. The crude reaction mixture was purified by column chromatography (hexanes/dichloromethane = 2/1) to yield 68 mg (38 % yield) of **17** as a pale yellow solid.

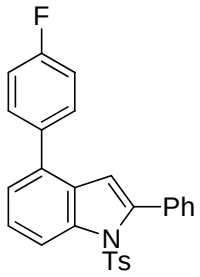
^{1}H NMR (400 MHz, $CDCl_3$) δ 8.29 (1H, d, *J* = 8.3 Hz), 7.48 (2H, t, *J* = 3.7 Hz), 7.41 (6H, t, *J* = 6.6 Hz), 7.31 (3H, q, *J* = 3.6 Hz), 7.24 (2H, t, *J* = 7.8 Hz), 7.05 (2H, d, *J* = 8.3 Hz), 6.72 (1H, s), 2.29 (3H, s), 2.38 (3H, s)

^{13}C NMR (100 MHz, $CDCl_3$) δ 144.5, 142.1, 138.6, 137.1, 137.0, 134.8, 134.6, 132.5, 130.3, 129.3, 129.2, 128.7, 128.6, 127.4, 126.9, 125.0, 124.1, 115.2, 113.0, 21.5, 21.1

HRMS (DART) *m/z* calcd for $C_{28}H_{24}NO_2S$ ($[M+H]^+$) : 438.1522, found : 438.1532

IR (ATR) 3028, 2918, 1595, 1474, 1423, 1366, 1238, 1167, 1109, 1057, 993 cm^{-1}

Mp. 148.7-149.7 °C



4-(4-Fluorophenyl)-2-phenyl-1-tosyl-1*H*-indole (18)

Prepared from **7**, ethynylbenzene **3**, and 4-fluorophenylboronic acid following the typical procedure. The crude reaction mixture was purified by column chromatography (hexanes/dichloromethane = 2/1) to yield 62 mg (28% yield) of **18** as a pale yellow solid.

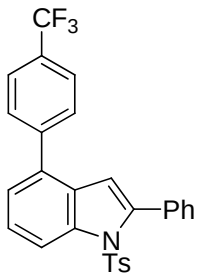
^{1}H NMR (400 MHz, $CDCl_3$) δ 8.32 (1H, d, *J* = 8.3 Hz), 7.67-7.37 (8H, m), 7.32 (2H, dt, *J* = 10.2, 3.2 Hz), 7.22 (1H, tt, *J* = 20.5, 6.7 Hz), 7.06 (4H, ddt, *J* = 24.2, 15.4, 7.4 Hz), 6.67 (1H, s), 2.28 (3H, s)

^{13}C NMR (100 MHz, $CDCl_3$) δ 163.5, 161.0, 144.6, 142.3, 138.5, 135.9,35.8、134.8、133.5、132.3、131.6、130.34, 130.28, 130.21, 129.3, 128.7, 128.5, 128.4, 127.5, 126.8, 125.0, 124.1, 115.6, 115.44, 115.37, 112.4, 21.5

HRMS (DART) *m/z* calcd for $C_{27}H_{21}NO_2SF$ ($[M+H]^+$) : 442.1272, found : 442.1285

IR (ATR) 3061, 2922, 1597, 1512, 1427, 1364, 1225, 1186, 1161, 1057, 986 cm^{-1}

Mp. 135.8-136.5 °C



4-(4-Trifluoromethylphenyl)-2-phenyl-1-tosyl-1*H*-indole (19)

Prepared from **7**, ethynylbenzene **3**, and 4-trifluoromethylphenylboronic acid following the typical procedure. The crude reaction mixture was purified by column chromatography (hexanes/dichloromethane = 2/1) to yield 103 mg (42% yield) of **19** as a pale yellow solid.

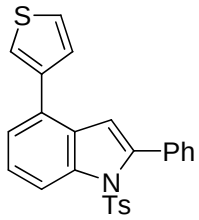
^{1}H NMR (400 MHz, $CDCl_3$) δ 8.38 (1H, d, *J* = 8.3 Hz), 7.64 (4H, dd, *J* = 22.9, 8.3 Hz), 7.49-7.38 (6H, m), 7.32 (3H, d, *J* = 8.3 Hz), 7.07 (2H, d, *J* = 7.8 Hz), 6.65 (1H, s), 2.30 (3H, s)

^{13}C NMR (100 MHz, $CDCl_3$) δ 144.7, 143.5, 142.7, 138.5, 134.8, 133.0, 132.2, 130.4, 129.6, 129.3, 129.2, 129.0, 128.8, 128.5, 127.5, 126.9, 125.53, 125.50, 125.45, 125.0, 124.2, 122.8, 116.2, 112.0, 21.5

HRMS (DART) *m/z* calcd for $C_{28}H_{21}NO_2SF_3$ ($[M+H]^+$) : 492.1240, found : 492.1237

IR (ATR) 3061, 1618, 1400, 1368, 1327, 1188, 1161, 1109, 1070, 989 cm^{-1}

Mp. 167.9-168.9 °C



4-(3-Thienyl)-2-phenyl-1-tosyl-1*H*-indole (20)

Prepared from **7**, ethynylbenzene **3**, and 3-thienylboronic acid following the typical procedure. The crude reaction mixture was purified by column chromatography (hexanes/dichloromethane = 2/1) to yield 67 mg (31% yield) of **20** as a pale yellow solid.

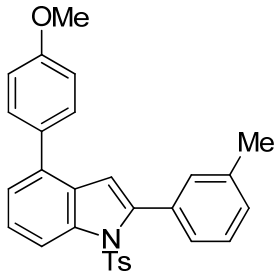
^{1}H NMR (400 MHz, $CDCl_3$) δ 8.29 (1H, dt, *J* = 6.8, 1.0 Hz), 7.49 (2H, td, *J* = 4.9, 1.8 Hz), 7.43-7.34 (7H, m), 7.32-7.29 (3H, m), 7.04 (2H, d, *J* = 7.8 Hz), 6.78 (1H, s), 2.27 (3H, s)

^{13}C NMR (100 MHz, $CDCl_3$) δ 144.6, 142.2, 140.6, 138.6, 134.7, 132.4, 130.3, 129.3, 128.7, 128.42, 128.36, 127.9, 127.5, 126.8, 125.9, 124.9, 123.7, 122.2, 115.4, 112.8, 21.5

HRMS (DART) *m/z* calcd for $C_{25}H_{20}NO_2S_2$ ($[M+H]^+$) : 430.0930, found : 430.0941

IR (ATR) 3059, 2924, 1595, 1489, 1464 1423, 1369, 1186, 1163, 1090, 1051, 995, 916 cm^{-1}

Mp. 155.9-157.7 °C



4-(4-Methoxyphenyl)-2-(3-methylphenyl)-1-tosyl-1*H*-indole (21)

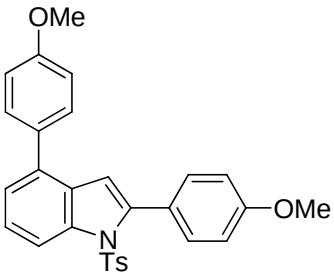
Prepared from **7**, 1-ethynyl-3-methylbenzene, and 4-methoxyphenylboronic acid **15** following the typical procedure. The crude reaction mixture was purified by column chromatography (hexanes/dichloromethane = 2/1) to yield 109 mg (47% yield) of **21** as a pale yellow solid.

^{1}H NMR (400 MHz, $CDCl_3$) δ 8.27 (1H, d, *J* = 8.3 Hz), 7.21-7.43 (10H, m), 7.03 (2H, d, *J* = 7.8 Hz), 6.93 (2H, d, *J* = 8.3 Hz), 6.70 (1H, s), 3.80 (3H, s), 2.38 (3H, s), 2.26 (3H, s)

^{13}C NMR (100 MHz, $CDCl_3$) δ 159.0, 144.5, 142.2, 128.5, 136.9, 134.8, 134.2, 132.35, 132.27, 130.9, 129.7, 129.3, 129.2, 128.7, 128.5, 127.4, 127.3, 126.8, 124.9, 123.8, 114.9, 114.0, 112.6, 55.2, 21.4, 21.3

HRMS (DART) *m/z* calcd for $C_{29}H_{26}NO_3S$ ($[M+H]^+$) : 468.1628, found : 468.1643

IR (ATR) 2955, 2922, 1609, 1597, 1516, 1369, 1246, 1167, 887 cm^{-1}



2,4-Di(4-methoxyphenyl)-1-tosyl-1*H*-indole (22)

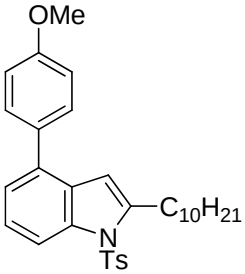
Prepared from **7**, 1-ethynyl-4-methoxybenzene, and 4-methoxyphenylboronic acid **15** following the typical procedure. The crude reaction mixture was purified by column chromatography (hexanes/dichloromethane = 2/1) to yield 118 mg (49% yield) of **22** as a pale brown solid.

^{1}H NMR (400 MHz, $CDCl_3$) δ 8.27 (1H, d, *J* = 8.3 Hz), 7.40 (5H, tt, J = 12.7, 4.9 Hz), 7.27 (3H, dt, *J* = 15.9, 7.6 Hz), 7.04 (2H, d, *J* = 8.3 Hz), 6.94 (4H, dt, *J* = 9.8, 3.4 Hz), 6.65 (1H, s), 3.85 (3H, s), 3.81 (3H, s), 2.27 (3H, s)

^{13}C NMR (100 MHz, $CDCl_3$) δ 159.9, 159.0, 144.5, 141.9, 138.4, 14.8, 134.1, 132.3, 131.6, 129.7, 129.2, 128.6, 126.8, 124.7, 123.9, 114.9, 114.0, 112.9, 112.2, 55.3, 55.2, 21.5

HRMS (DART) *m/z* calcd for $C_{29}H_{26}NO_4S$ ($[M+H]^+$) : 484.1577, found : 484.1564

IR (ATR) 2932, 2835, 1609, 1503, 1369, 1244, 1173, 1030, 829 cm^{-1}



2-Decyl-4-(4-methoxyphenyl)-1-tosyl-1*H*-indole (23)

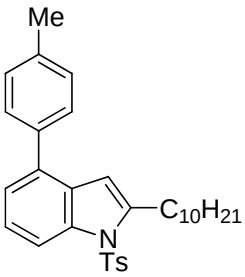
Prepared from **7**, 1-dodecyne **8**, and 4-methoxyphenylboronic acid **15** following the typical procedure. The crude reaction mixture was purified by column chromatography (hexanes/dichloromethane = 2/1) to yield 226 mg (87% yield) of **23** as a yellow oil.

^{1}H NMR (400 MHz, $CDCl_3$) δ 8.14 (1H, d, *J* = 8.3 Hz), 7.65 (2H, d, *J* = 8.3 Hz), 7.44 (2H, dt, *J* = 9.3, 2.3 Hz), 7.28 (1H, t, *J* = 7.8 Hz), 7.22-7.15 (3H, m), 6.99-6.96 (2H, m), 6.52 (1H, s), 3.83 (3H, d, *J* = 4.4 Hz), 2.99 (2H, t, *J* = 7.6 Hz), 2.30 (3H, s), 1.70 (2H, q, *J* = 7.5 Hz), 1.29-1.11 (14H, m), 0.87 (3H, t, *J* = 6.8 Hz).

^{13}C NMR (100 MHz, $CDCl_3$) δ 158.9, 114.5, 142.6, 137.5, 136.3, 133.6, 132.6, 129.7, 129.6, 127.8, 126.3, 123.9, 123.2, 114.0, 113.2, 107.7, 55.2, 31.9, 29.6, 29.5, 29.41, 29.38, 29.3, 29.1, 29.0, 22.6, 21.5, 14.1

HRMS (DART) *m/z* calcd for $C_{32}H_{40}NO_3S$ ($[M+H]^+$) : 518.2723, found : 518.2724

IR (ATR) 2922, 2853, 1609, 1516, 1477, 1368, 1244, 1173, 1146, 109, 1032, 833 cm^{-1}



2-Decyl-4-(4-methylphenyl)-1-tosyl-1*H*-indole (24)

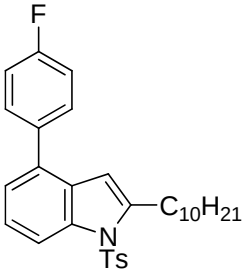
Prepared from **7**, 1-dodecyne **8**, and 4-methylphenylboronic acid following the typical procedure. The crude reaction mixture was purified by column chromatography (hexanes/dichloromethane = 2/1) to yield 138 mg (55% yield) of **24** as a pale yellow oil.

^{1}H NMR (400 MHz, $CDCl_3$) δ 8.15 (1H, d, *J* = 8.3 Hz), 7.65 (2H, dt, *J* = 8.8, 2.0 Hz), 7.41 (2H, dd, *J* = 6.3, 2.0 Hz), 7.25 (6H, m), 6.52 (1H, d, *J* = 1.0 Hz), 2.97 (2H, t, *J* = 7.6 Hz), 2.41 (3H, s), 2.33 (3H, s), 1.74-1.67 (2H, m), 1.40-1.12 (14H, m), 0.88 (3H, t, *J* = 6.8 Hz)

^{13}C NMR (100 MHz, $CDCl_3$) δ 144.5, 142.7, 137.5, 137.3, 136.9, 136.3, 133.9, 129.7, 129.2, 128.6, 127.9, 126.3, 123.9, 123.3, 113.5, 107.7, 31.9, 29.6, 29.5, 29.41, 29.38, 29.28, 29.1, 29.0, 22.6, 21.5, 21.1, 14.1

HRMS (DART) *m/z* calcd for $C_{32}H_{40}NO_2S$ ($[M+H]^+$) : 502.2774, found : 502.2785

IR (ATR) 2922, 2853, 1597, 1560, 1425, 1368, 1171, 1146, 1090, 1047, 823 cm^{-1}



2-Decyl-4-(4-fluorophenyl)-1-tosyl-1*H*-indole (25)

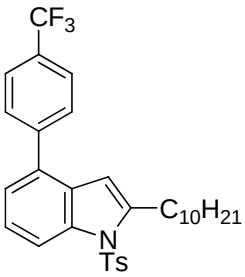
Prepared from **7**, 1-dodecyne **8**, and 4-fluorophenylboronic acid following the typical procedure. The crude reaction mixture was purified by column chromatography (hexanes/dichloromethane = 2/1) to yield 122 mg (48% yield) of **25** as a yellow oil.

^{1}H NMR (400 MHz, $CDCl_3$) δ 8.18 (1H, d, *J* = 8.3 Hz), 7.66 (2H, t, *J* = 4.1 Hz), 7.46 (2H, td, *J* = 6.0, 2.6 Hz), 7.29 (1H, t, *J* = 8.0 Hz), 7.19 (3H, d, *J* = 7.8 Hz), 7.15-7.10 (2H, m), 6.47 (1H, s), 2.99 (2H, t, *J* = 7.3 Hz), 2.32 (3H, s), 1.70 (2H, q, *J* = 7.6 Hz), 1.41-0.86 (14H, m), 0.87 (3H, t, *J* = 6.8 Hz)

^{13}C NMR (100 MHz, $CDCl_3$) δ 163.4, 161.0, 144.7, 143.0, 137.5, 136.3, 136.20, 136.17, 132.9, 130.3, 130.2, 129.8, 127.9, 126.3, 124.0, 123.4, 115.6, 115.3, 113.8, 107.3, 31.9, 29.59, 29.56, 29.43, 29.39, 29.30, 29.1, 29.0, 22.7, 21.5, 14.1

HRMS (DART) *m/z* calcd for $C_{31}H_{37}NO_2SF$ ($[M+H]^+$) : 506.2524, found : 506.2521

IR (ATR) 2922, 2853, 1597, 1514, 1368, 1223, 1188, 1148, 1090, 1047, 839 cm^{-1}



2-Decyl-4-(4-trifluoromethylphenyl)-1-tosyl-1*H*-indole (26)

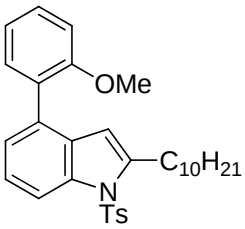
Prepared from **7**, 1-dodecyne **8**, and 4-trifluoromethylphenylboronic acid following the typical procedure. The crude reaction mixture was purified by column chromatography (hexanes/dichloromethane = 2/1) to yield 201 mg (72% yield) of **26** as a yellow oil.

^{1}H NMR (400 MHz, $CDCl_3$) δ 8.23 (1H, d, *J* = 8.8 Hz), 7.67 (6H, td, *J* = 16.5, 8.1 Hz), 7.34 (1H, t, *J* = 8.0 Hz), 7.26-7.21 (3H, m), 6.46 (1H, s), 2.99 (2H, t, *J* = 7.6 Hz), 2.34 (3H, d, *J* = 9.3 Hz), 1.75-1.67 (2H, m), 1.56 (2H, s), 1.37-1.29 (14H, m), 0.88 (3H, t, *J* = 6.8 Hz)

^{13}C NMR (100 MHz, $CDCl_3$) δ 144.8, 143.8, 143.4, 137.5, 136.2, 132.3, 129.8, 129.0, 127.8, 126.3, 125.6, 124.0, 123.5, 114.8, 106.9, 31.9, 29.6, 29.5, 29.42, 29.37, 29.29, 29.1, 29.0, 22.6, 21.5, 14.1

HRMS (DART) *m/z* calcd for $C_{32}H_{37}NO_2SF_3$ ($[M+H]^+$) : 556.2491, found : 556.2493

IR (ATR) 2924, 2853, 1616, 1597, 1560, 1369, 1323, 1167, 1123, 1067, 1016, 847 cm^{-1}



2-Decyl-4-(2-methoxyphenyl)-1-tosyl-1*H*-indole (27)

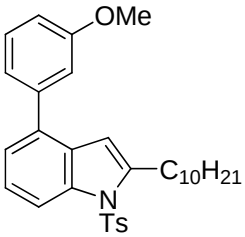
Prepared from **7**, 1-dodecyne **8**, and 4-methoxyphenylboronic acid **15** following the typical procedure. The crude reaction mixture was purified by column chromatography (hexanes/dichloromethane = 2/1) to yield 150 mg (87 % yield) of **27** as a pale yellow oil.

^{1}H NMR (400 MHz, $CDCl_3$) δ 8.15 (1H, d, *J* = 7.8 Hz), 7.66 (2H, t, *J* = 4.1 Hz), 7.36-7.16 (6H, m), 7.03-6.98 (2H, m), 6.21 (1H, s), 3.71 (3H, d, *J* = 1.5 Hz), 2.95 (2H, t, *J* = 7.6 Hz), 2.32 (3H, s), 1.66 (2H, q, *J* = 7.0 Hz), 1.38-1.17 (14H, m), 0.87 (3H, t, *J* = 5.9 Hz)

^{13}C NMR (100 MHz, $CDCl_3$) δ 156.6, 144.4, 142.0, 137.1, 136.5, 131.5, 130.6, 129.7, 129.0, 128.8, 126.4, 124.7, 123.4, 120.6, 113.6, 111.2, 108.5, 55.4, 31.86, 29.6, 29.5, 29.4, 29.35, 29.28, 29.0, 28.9, 22.6, 21.5, 14.1

HRMS (DART) *m/z* calcd for $C_{32}H_{40}NO_3S$ ($[M+H]^+$) : 518.2723, found : 518.2717

IR (ATR) 2922, 2853, 1462, 1420, 1368, 1240, 1188, 1169, 1146, 1105, 1026, 812 cm^{-1}



2-Decyl-4-(3-methoxyphenyl)-1-tosyl-1*H*-indole (28)

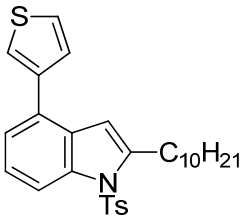
Prepared from **7**, 1-dodecyne **8**, and 4-methoxyphenylboronic acid **15** following the typical procedure. The crude reaction mixture was purified by column chromatography (hexanes/dichloromethane = 2/1) to yield 150 mg (58 % yield) of **28** as a pale yellow oil.

^{1}H NMR (400 MHz, $CDCl_3$) δ 8.18 (1H, d, *J* = 8.3 Hz), 7.65 (2H, d, *J* = 8.3 Hz), 7.36-7.21 (3H, m), 7.16 (2H, d, *J* = 8.3 Hz), 7.11-7.05 (2H, m), 6.90 (1H, dd, *J* = 8.3, 2.4 Hz), 6.55 (1H, s), 3.81 (3H, s), 2.99 (2H, t, *J* = 7.8 Hz), 2.30 (3H, s), 1.71 (2H, t, *J* = 7.6 Hz), 1.39-1.26 (14H, m), 0.87 (3H, t, J = 6.8 Hz)

^{13}C NMR (100 MHz, $CDCl_3$) δ 159.7, 144.6, 142.8, 141.6, 137.5, 136.3, 133.8, 129.7, 129.5, 127.9, 126.3, 123.9, 123.4, 121.2, 114.4, 113.8, 112.6, 107.6, 55.2, 31.8, 29.6, 29.5, 29.40, 29.37, 29.28, 29.1, 29.0, 22.6, 21.4, 14.0

HRMS (DART) *m/z* calcd for $C_{32}H_{40}NO_3S$ ($[M+H]^+$) : 518.2723, found : 518.2714

IR (ATR) 2922, 2853, 1597, 1562, 1474, 1410, 1368, 1229, 1169, 1090, 1042, 777 cm^{-1}



2-Decyl-4-(3-thienyl)-1-tosyl-1*H*-indole (29)

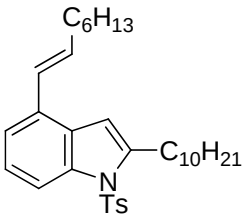
Prepared from **7**, 1-dodecyne **8**, and 3-thienylboronic acid following the typical procedure. The crude reaction mixture was purified by column chromatography (hexanes/dichloromethane = 2/1) to yield 158 mg (64% yield) of **29** as a yellow oil.

^{1}H NMR (400 MHz, $CDCl_3$) δ 8.15 (1H, dd, *J* = 7.1, 2.2 Hz), 7.63 (2H, t, *J* = 5.1 Hz), 7.38 (2H, q, *J* = 2.1 Hz), 7.31 (1H, q, *J* = 2.1 Hz), 7.27 (2H, dd, *J* = 7.3, 5.4 Hz), 7.15 (2H, d, *J* = 7.8 Hz), 6.60 (1H, s), 2.99 (2H, t, *J* = 7.6 Hz), 2.29 (3H, s), 1.72 (2H, q, *J* = 7.8 Hz), 1.42-1.26 (14H, m), 0.87 (3H, t, *J* = 6.8 Hz)

^{13}C NMR (100 MHz, $CDCl_3$) δ 144.6, 142.8, 140.9, 137.6, 136.2, 129.7, 128.5, 127.9, 127.7, 126.3, 125.7, 123.9, 123.0, 122.0, 113.7, 107.7, 31.9, 29.6, 29.5, 29.41, 29.38, 29.3, 29.1, 29.0, 22.6, 21.5, 14.1

HRMS (DART) *m/z* calcd for $C_{29}H_{36}NO_2S_2$ ($[M+H]^+$) : 494.2182, found : 494.2204

IR (ATR) 2922, 2851,1425, 1366, 1182, 1148, 1090, 1049, 772 cm^{-1}



2-Decyl 4-(1-*trans*-1-octen-1-yl)-1-tosyl-1*H*-indole (30)

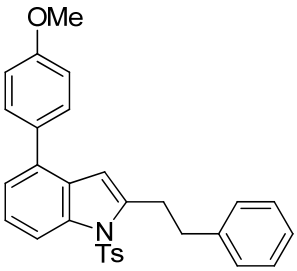
Prepared from **7**, 1-dodecyne **8**, and 1-*trans*-1-octen-1-ylboronic acid following the typical procedure. The crude reaction mixture was purified by column chromatography (hexanes/dichloromethane = 2/1) to yield 93 mg (36% yield) of **30** as a pale yellow oil.

^{1}H NMR (400 MHz, $CDCl_3$) δ 8.02 (1H, d, *J* = 8.3 Hz), 7.60 (2H, d, *J* = 8.3 Hz), 7.29 (1H, d, *J* = 7.8 Hz), 7.20-7.15 (3H, m), 6.62 (1H, d, *J* = 15.6 Hz), 6.54 (1H, s), 6.28 (1H, dt, *J* = 15.6, 7.1 Hz), 2.99 (2H, t, *J* = 7.6 Hz), 2.31 (3H, s), 2.24 (1H, q, *J* = 6.8 Hz), 1.79-1.72 (2H, m), 1.39-1.13 (14H, m), 0.89 (3H, t, *J* = 6.6 Hz)

^{13}C NMR (100 MHz, $CDCl_3$) δ 144.5, 142.3, 137.5, 136.3, 132.9, 129.7, 127.7, 126.4, 126.2, 123.9, 119.7, 113.2, 106.8, 33.4, 31.9, 31.7, 29.60, 29.57, 29.45, 29.42, 29.40, 29.32, 29.14, 28.99, 28.91, 22.7, 22.6, 21.5, 14.1

HRMS (DART) *m/z* calcd for $C_{33}H_{48}NO_2S$ ($[M+H]^+$) : 522.3400, found : 522.3410

IR (ATR) 2292, 2853, 1597, 1564, 1425, 1367, 1169, 1148, 1094, 964 cm^{-1}



4-(4-Methoxyphenyl)-2-phenethyl-1-tosyl-1*H*-indole (31)

Prepared from **7**, 4-phenyl-1-butyne, and 4-methoxyphenylboronic acid **15** following the typical procedure. The crude reaction mixture was purified by column chromatography (hexanes/dichloromethane = 2/1) to yield 135 mg (56% yield) of **31** as a yellow solid.

^{1}H NMR (400 MHz, $CDCl_3$) δ 8.15 (1H, d, *J* = 8.3 Hz), 7.64 (2H, d, *J* = 8.3 Hz), 7.39 (2H, d, *J* = 8.3 Hz), 7.31-7.14 (9H, m), 6.96 (2H, d, J = 8.8 Hz), 6.51 (1H, s), 3.82 (3H, s), 3.30 (2H, t, *J* = 7.8 Hz), 3.04 (2H, t, *J* = 8.0 Hz), 2.29 (3H, s)

^{13}C NMR (100 MHz, $CDCl_3$) δ 158.9, 144.7, 141.24, 141.17, 137.5, 136.1, 133.8, 132.4, 129.8, 129.7, 128.5, 128.4, 127.7, 126.3, 126.1, 124.2, 123.2, 114.0, 113.3, 108.7, 55.3, 35.7, 31.3, 21.5

HRMS (DART) *m/z* calcd for $C_{30}H_{28}NO_3S$ ($[M+H]^+$) : 482.1784, found : 482.1780

IR (ATR) 2951, 2916, 1597, 1560, 1516, 1464, 1364, 1288, 1240, 1169, 1028, 993 cm^{-1}

Mp. 84.7-85.4 °C

8. References

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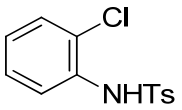
9. NMR spectra of the products



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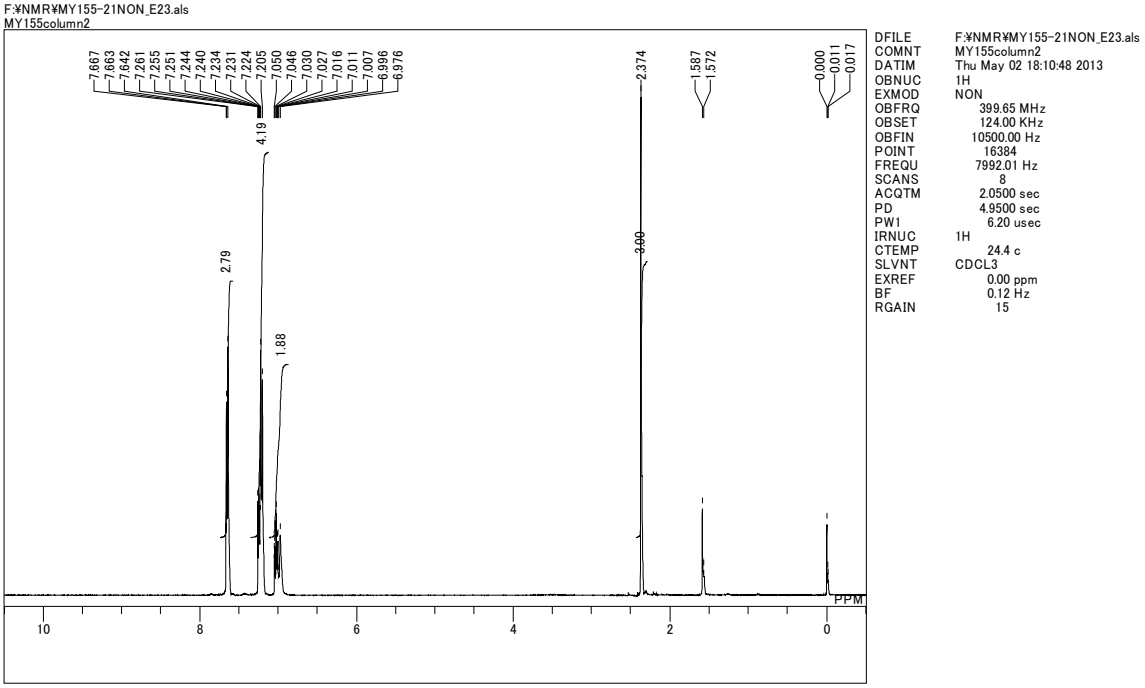

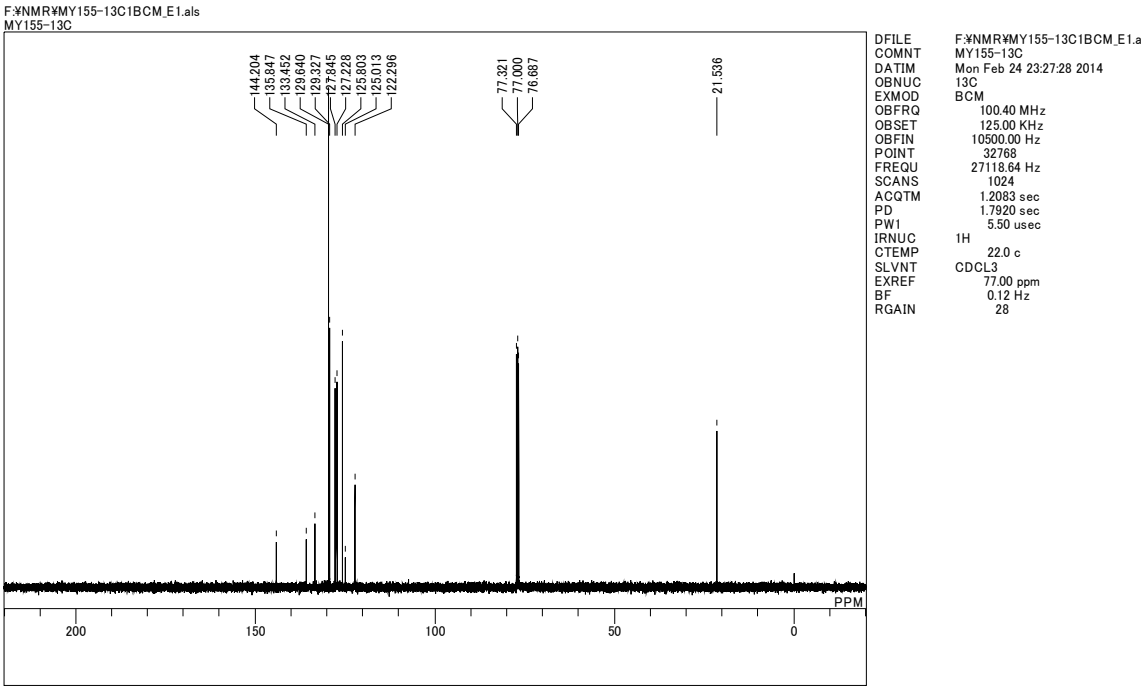

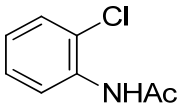

2c

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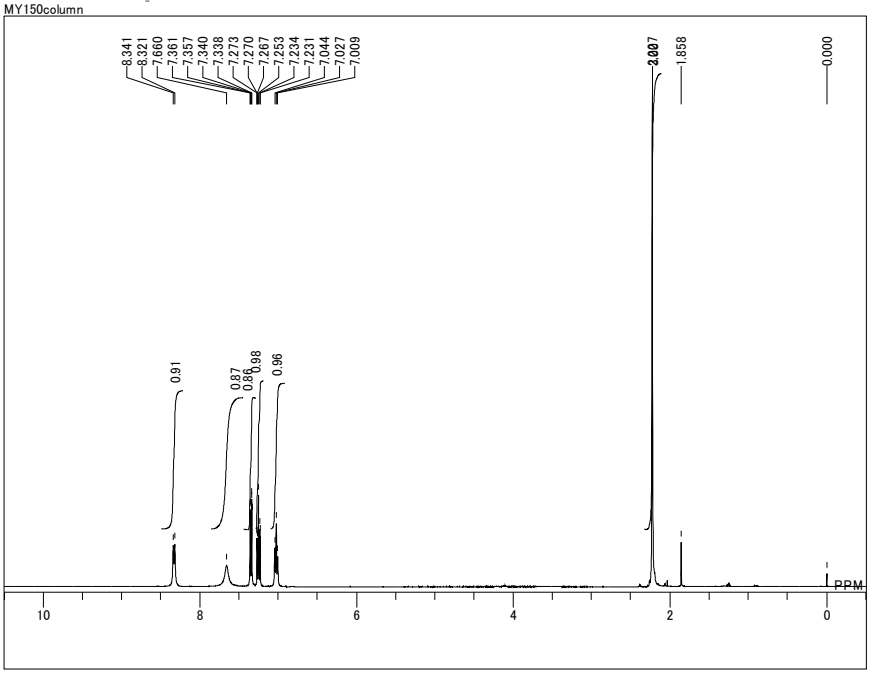

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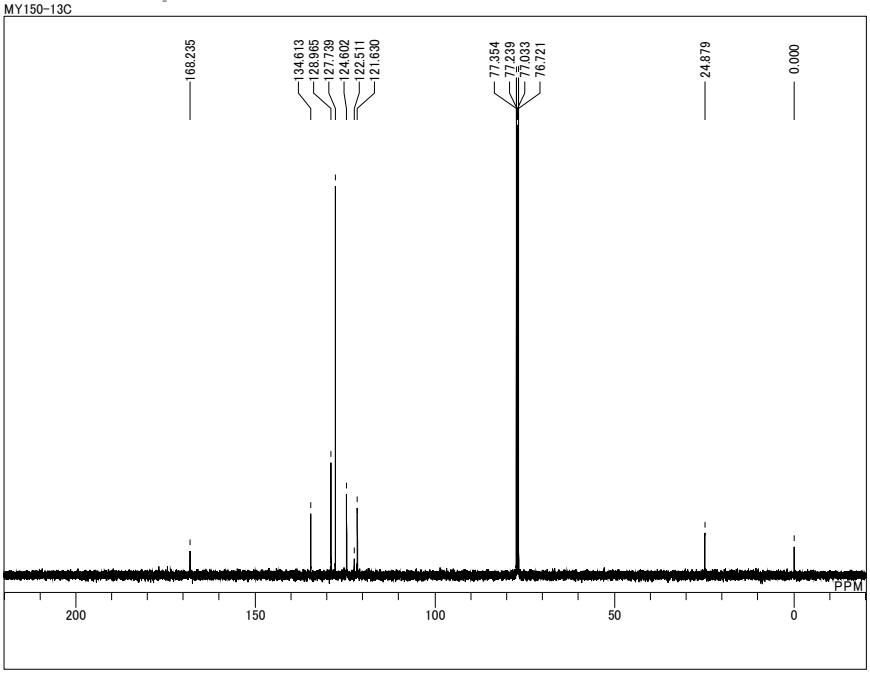

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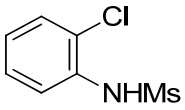
RGAIN	28



2d

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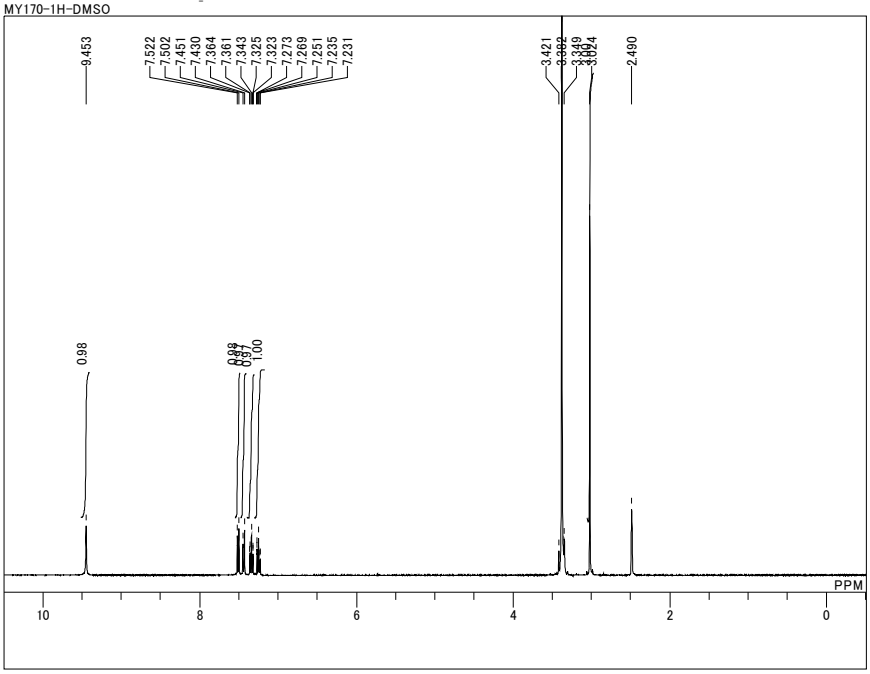

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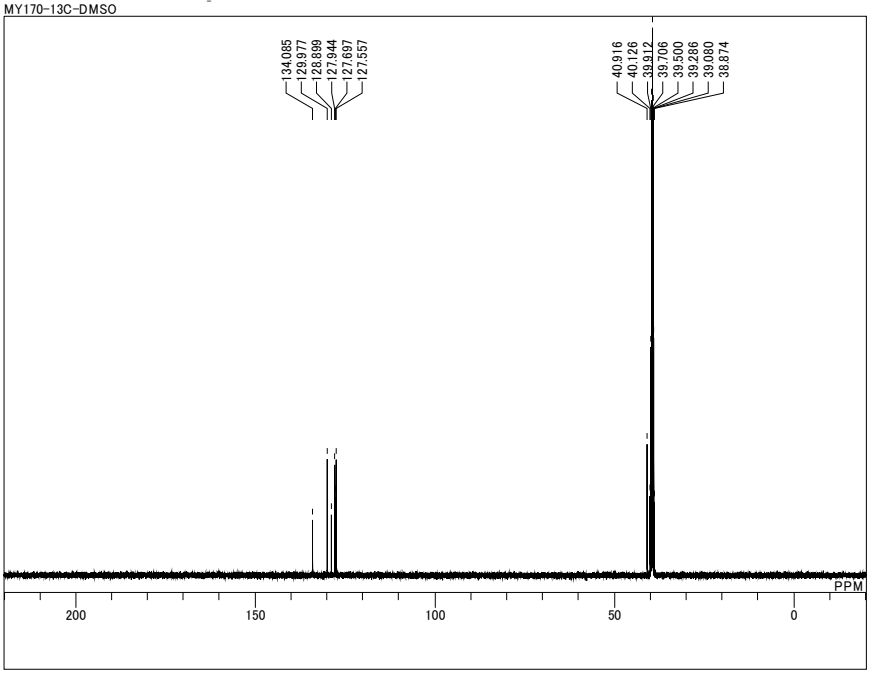

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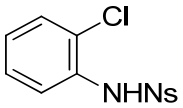
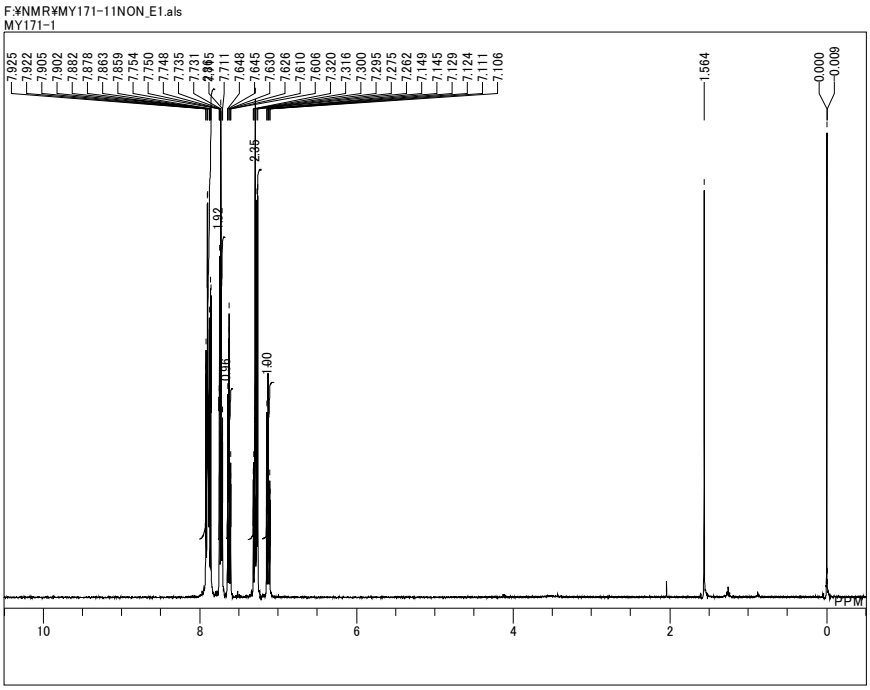


2e



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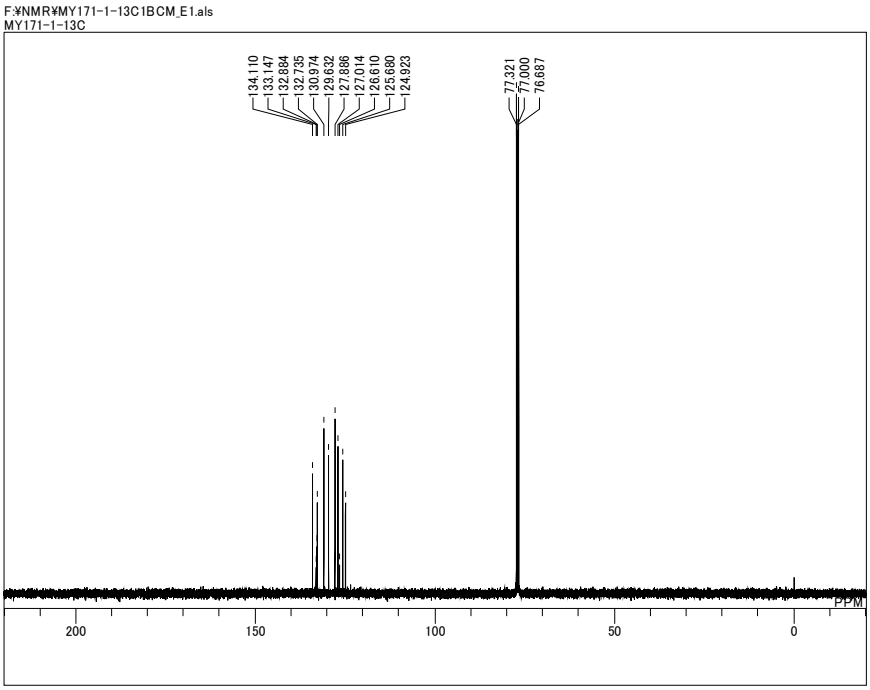
RGAIN 16



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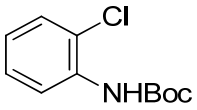

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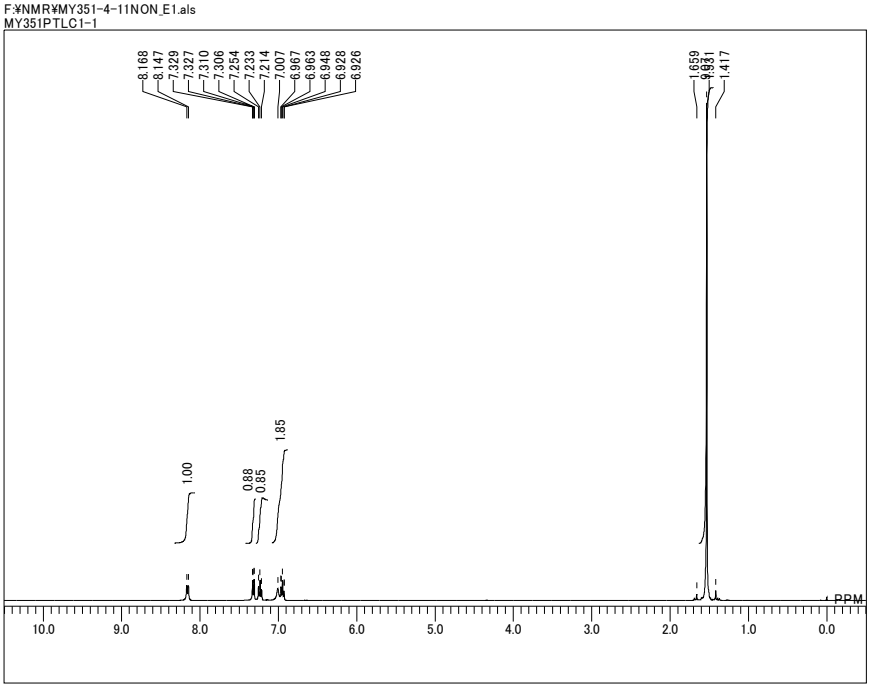

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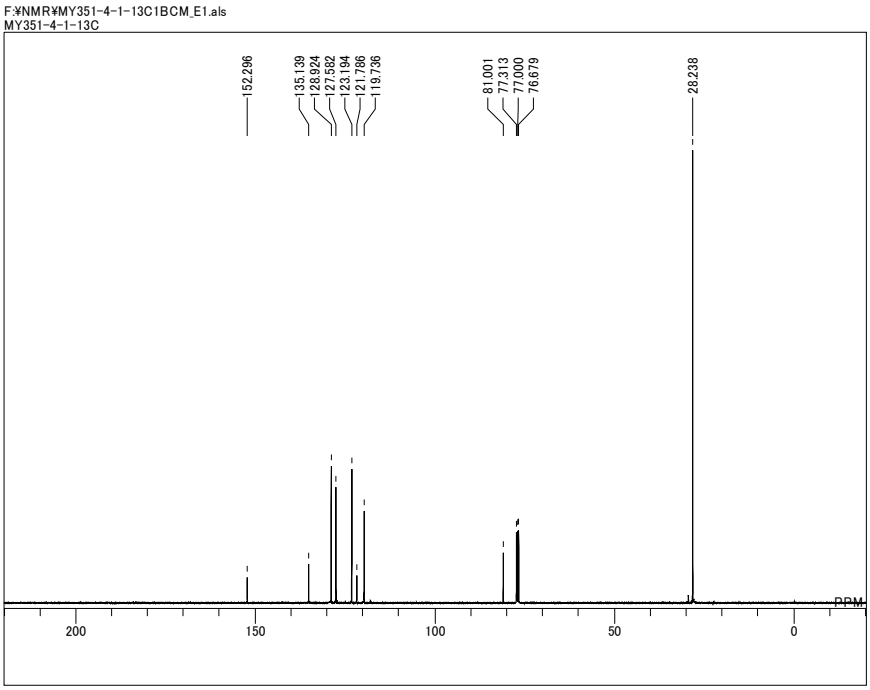

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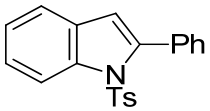
RGAIN 28



4a

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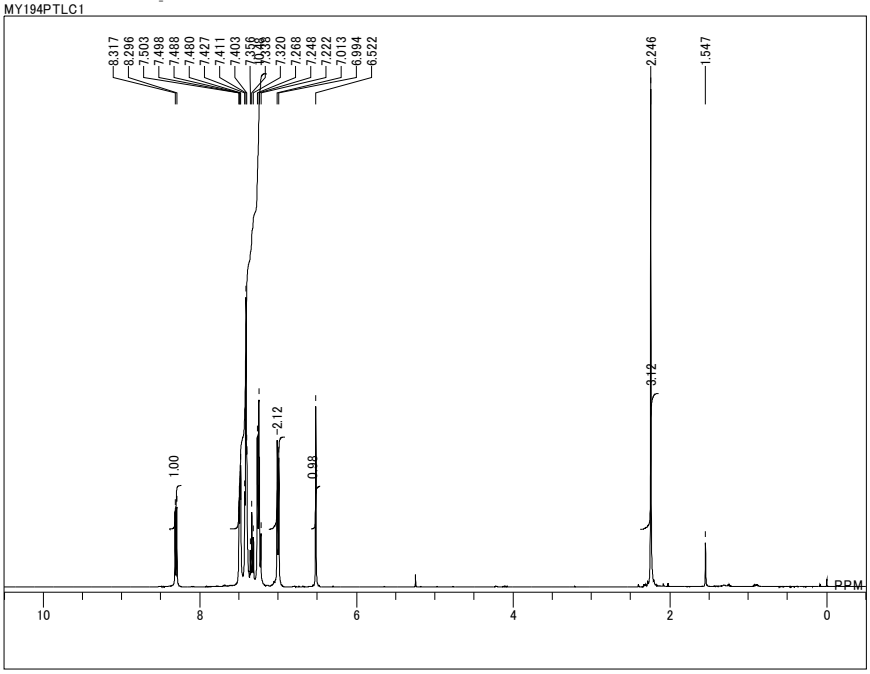

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SCANS	8
ACQTM	2.0500 sec
PD	4.9500 sec
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IRNUC	1H
CTEMP	23.7 c
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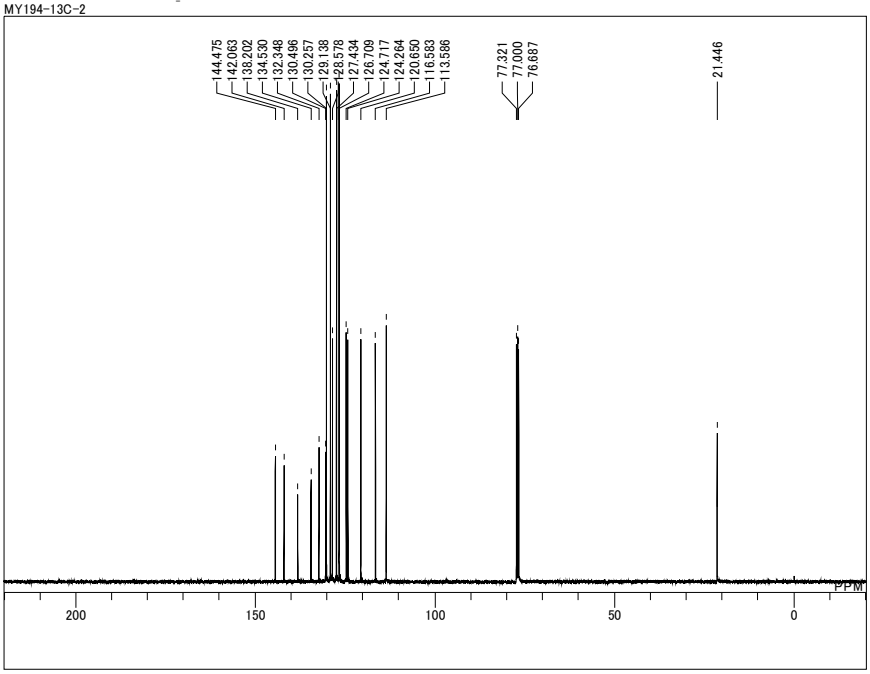

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PD	1.7920 sec
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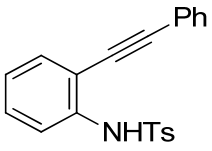
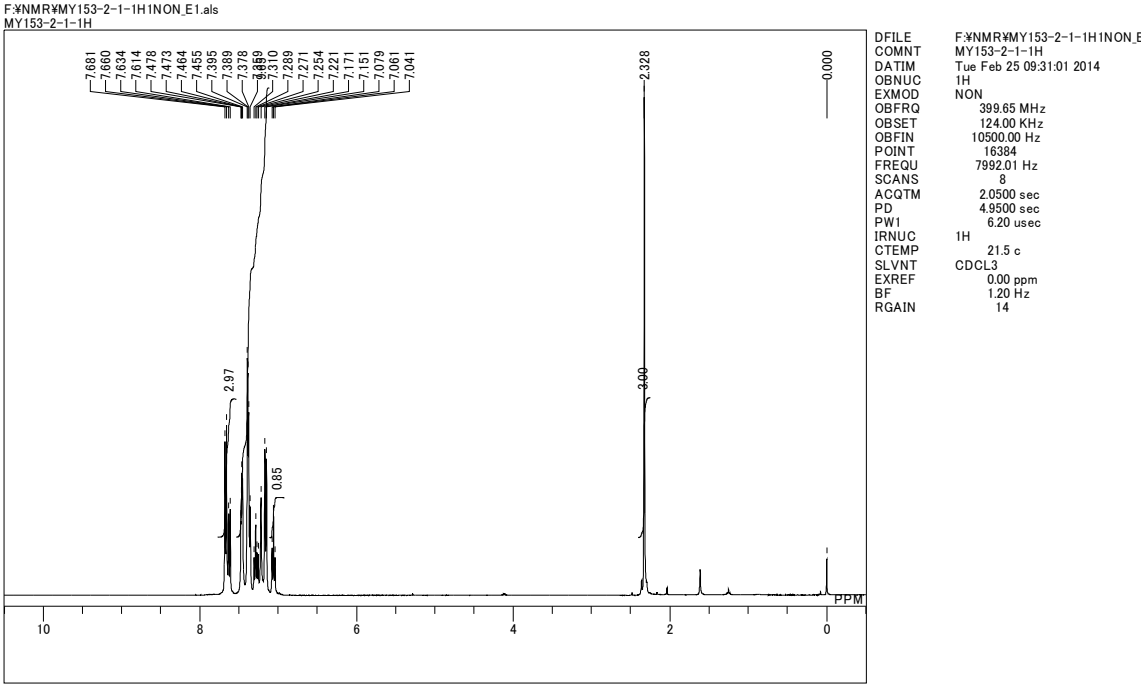
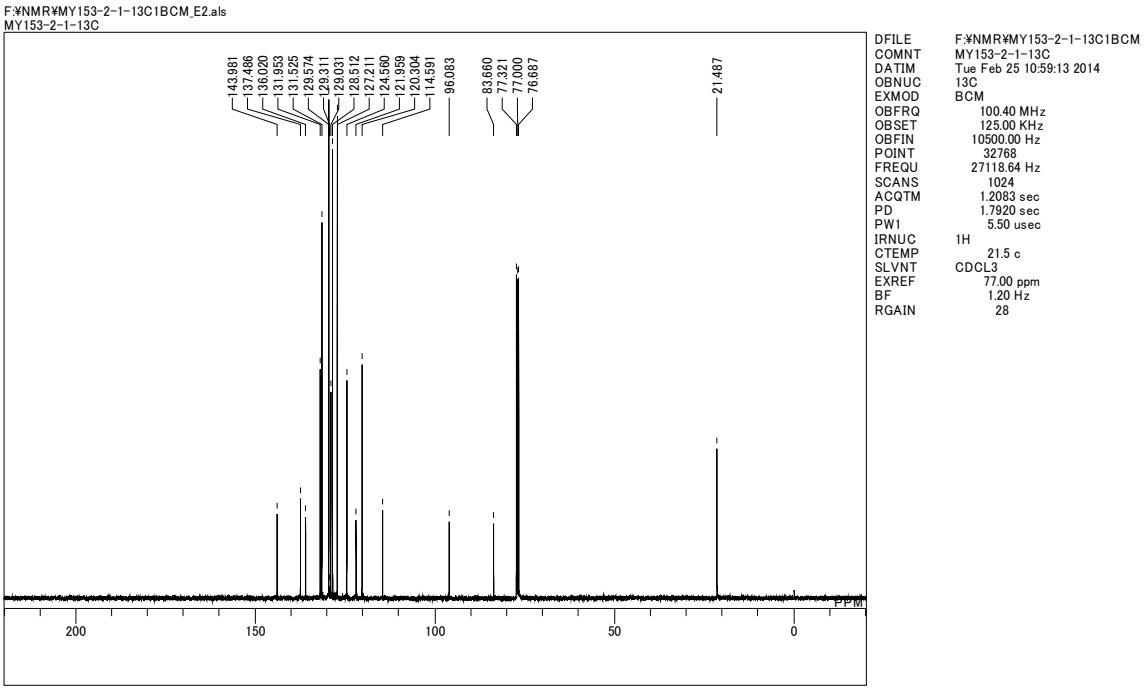
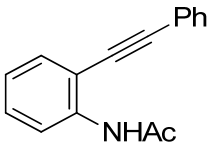
IRNUC	1H
CTEMP	21.0 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	1.20 Hz
RGAIN	26


Ph
NHTs

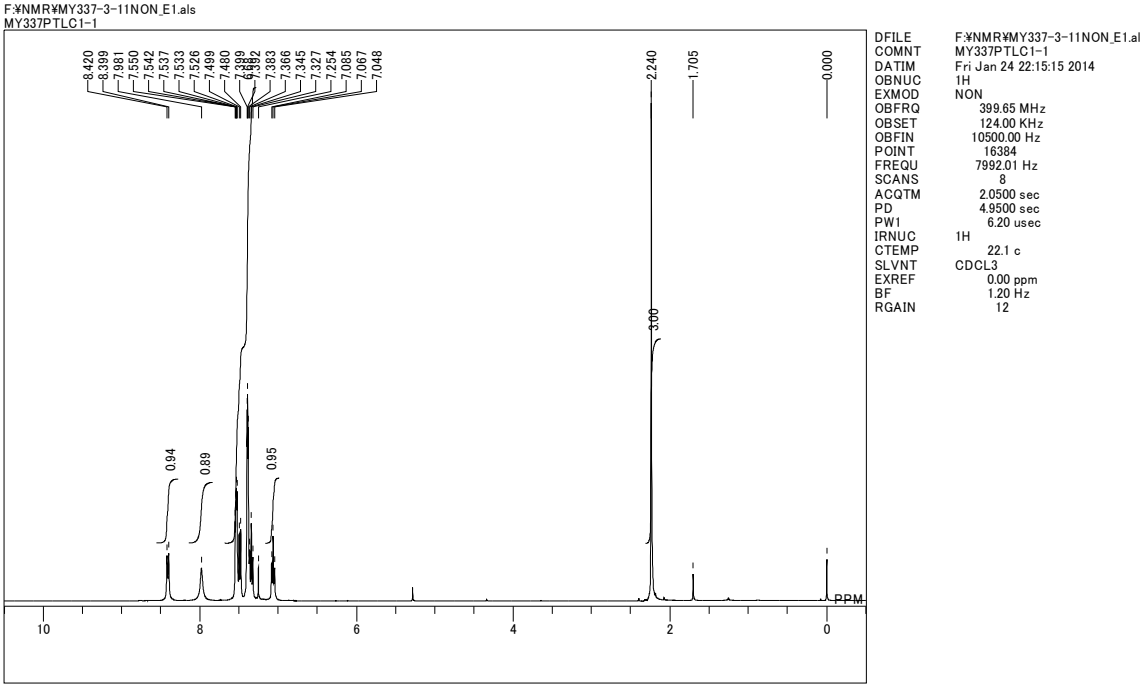
5a

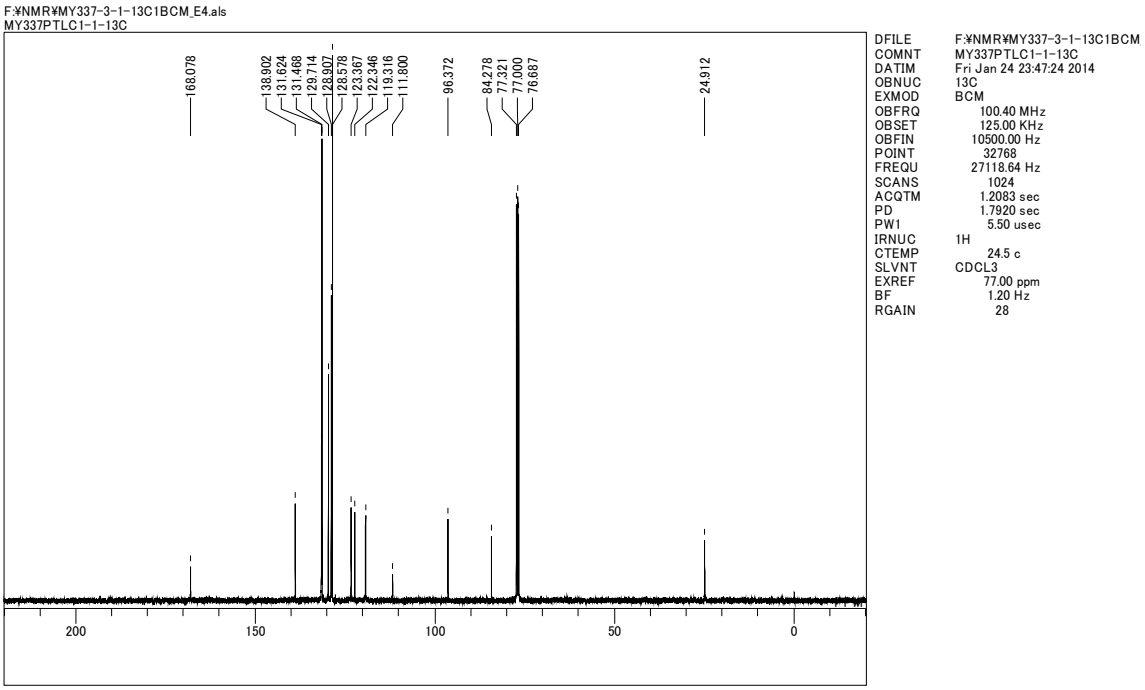

F:¥NMR¥MY153-2-1-1H1NON_E1.als
MY153-2-1-1H
7.681
7.660
7.634
7.614
7.478
7.473
7.464
7.455
7.395
7.389
7.378
7.310
7.289
7.271
7.254
7.221
7.171
7.151
7.079
7.061
7.041
2.328
0.000
2.97
3.00
0.85
PPM
10
8
6
4
2
0
DFILE F:¥NMR¥MY153-2-1-1H1NON_E
COMNT MY153-2-1-1H
DATIM Tue Feb 25 09:31:01 2014
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.00 Hz
POINT 16384
FREQU 7992.01 Hz
SCANS 8
ACQTM 2.0500 sec
PD 4.9500 sec
PW1 6.20 usec
IRNUC 1H
CTEMP 21.5 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 1.20 Hz
RGAIN 14

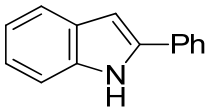

F:¥NMR¥MY153-2-1-13C1BCM_E2.als
MY153-2-1-13C
143.981
137.486
136.020
131.953
131.525
129.574
129.311
129.031
128.512
127.211
124.560
121.959
120.304
114.591
96.083
83.660
77.321
77.000
76.687
21.487
PPM
200
150
100
50
0
DFILE F:¥NMR¥MY153-2-1-13C1BCM
COMNT MY153-2-1-13C
DATIM Tue Feb 25 10:59:13 2014
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.00 Hz
POINT 32768
FREQU 27118.64 Hz
SCANS 1024
ACQTM 1.2083 sec
PD 1.7920 sec
PW1 5.50 usec
IRNUC 1H
CTEMP 21.5 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 28


Ph
NHAc

5c

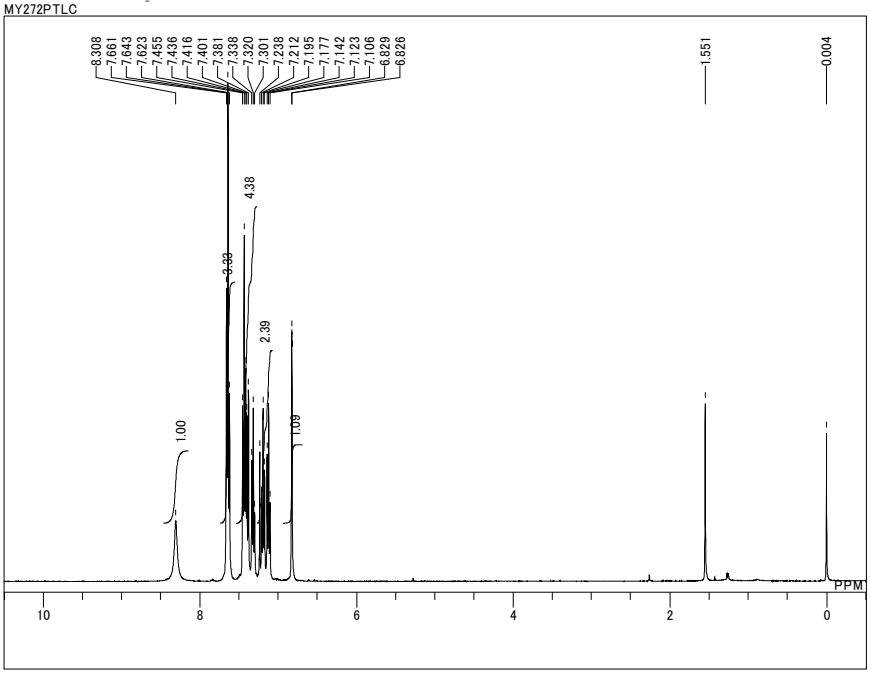

F:¥NMR¥MY337-3-11NON_E1.als
MY337PTLC1-1
8.420
8.399
7.981
7.550
7.542
7.537
7.533
7.526
7.499
7.480
7.392
7.383
7.366
7.345
7.327
7.254
7.085
7.067
7.048
2.240
1.705
0.000
3.00
0.94
0.89
0.95
PPM
10
8
6
4
2
0
DFILE F:¥NMR¥MY337-3-11NON_E1.al
COMNT MY337PTLC1-1
DATIM Fri Jan 24 22:15:15 2014
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.00 Hz
POINT 16384
FREQU 7992.01 Hz
SCANS 8
ACQTM 2.0500 sec
PD 4.9500 sec
PW1 6.20 usec
IRNUC 1H
CTEMP 22.1 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 1.20 Hz
RGAIN 12


F:¥NMR¥MY337-3-1-13C1BCM_E4.als
MY337PTLC1-1-13C
168.078
138.902
131.624
131.468
129.714
128.907
128.578
123.367
122.346
119.316
111.800
96.372
84.278
77.321
77.000
76.687
24.912
200
150
100
50
0
DFILE F:¥NMR¥MY337-3-1-13C1BCM
COMNT MY337PTLC1-1-13C
DATIM Fri Jan 24 23:47:24 2014
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.00 Hz
POINT 32768
FREQU 27118.64 Hz
SCANS 1024
ACQTM 1.2083 sec
PD 1.7920 sec
PW1 5.50 usec
IRNUC 1H
CTEMP 24.5 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 28



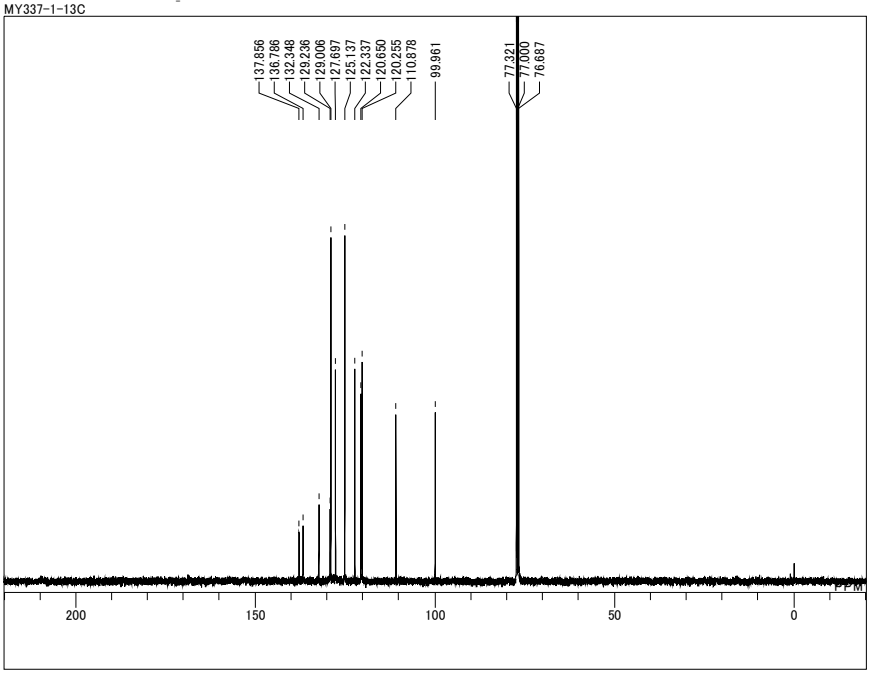
6

F:¥NMR¥MY272-21NON_E16.als
MY272PTLC

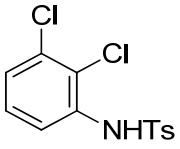


DFILE	F:¥NMR¥MY272-21NON_E16.als
COMNT	MY272PTLC
DATIM	Fri Sep 27 18:15:41 2013
OBNUC	1H
EXMOD	NON
OBFRQ	399.65 MHz
OBSET	124.00 KHz
OBFIN	10500.00 Hz
POINT	16384
FREQU	7992.01 Hz
SCANS	8
ACQTM	2.0500 sec
PD	4.9500 sec
PW1	6.20 usec
IRNUC	1H
CTEMP	21.5 c
SLVNT	CDCL3
EXREF	0.00 ppm
BF	1.20 Hz
RGAIN	15

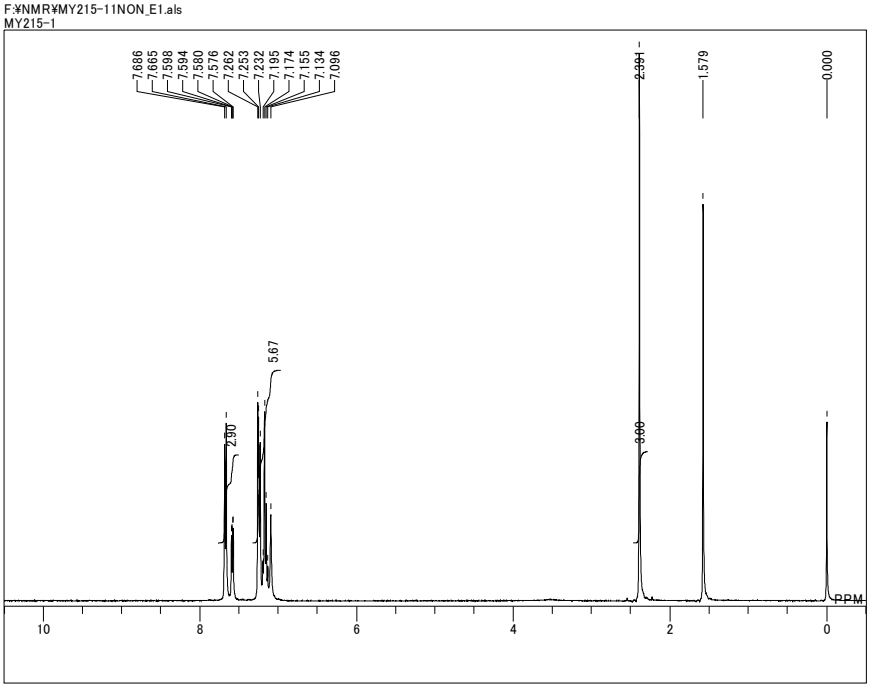
F:¥NMR¥MY337-1-13C1BCM_E6.als
MY337-1-13C



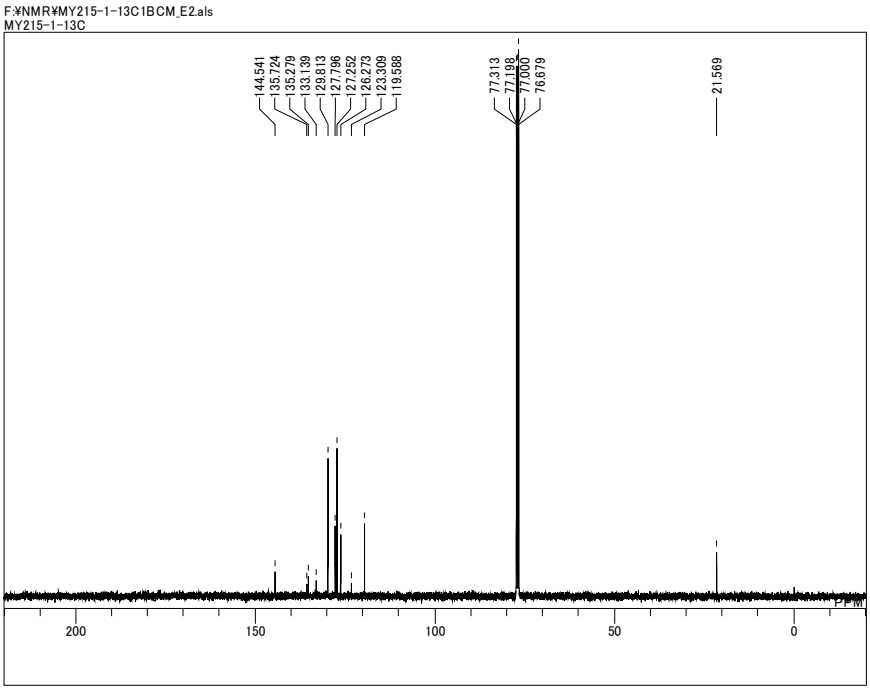
DFILE	F:¥NMR¥MY337-1-13C1BCM_E
COMNT	MY337-1-13C
DATIM	Wed Feb 26 03:24:15 2014
OBNUC	13C
EXMOD	BCM
OBFRQ	100.40 MHz
OBSET	125.00 KHz
OBFIN	10500.00 Hz
POINT	32768
FREQU	27118.64 Hz
SCANS	1024
ACQTM	1.2083 sec
PD	1.7920 sec
PW1	5.50 usec
IRNUC	1H
CTEMP	20.6 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	1.20 Hz
RGAIN	28



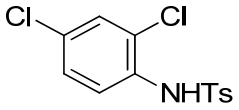
7



DFILE	F:¥NMR¥MY215-11NON_E1.als
COMNT	MY215-1
DATIM	Tue Jul 02 09:37:37 2013
OBNUC	1H
EXMOD	NON
OBFRQ	399.65 MHz
OBSET	124.00 KHz
OBFIN	10500.00 Hz
POINT	16384
FREQU	7992.01 Hz
SCANS	8
ACQTM	2.0500 sec
PD	4.9500 sec
PW1	6.20 usec
IRNUC	1H
CTEMP	22.1 c
SLVNT	CDCL3
EXREF	0.00 ppm
BF	1.20 Hz
RGAIN	18



DFILE	F:¥NMR¥MY215-1-13C1BCM_E:
COMNT	MY215-1-13C
DATIM	Tue Jul 02 23:17:05 2013
OBNUC	13C
EXMOD	BCM
OBFRQ	100.40 MHz
OBSET	125.00 KHz
OBFIN	10500.00 Hz
POINT	32768
FREQU	27118.64 Hz
SCANS	1024
ACQTM	1.2083 sec
PD	1.7920 sec
PW1	5.50 usec
IRNUC	1H
CTEMP	24.5 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	1.20 Hz
RGAIN	26



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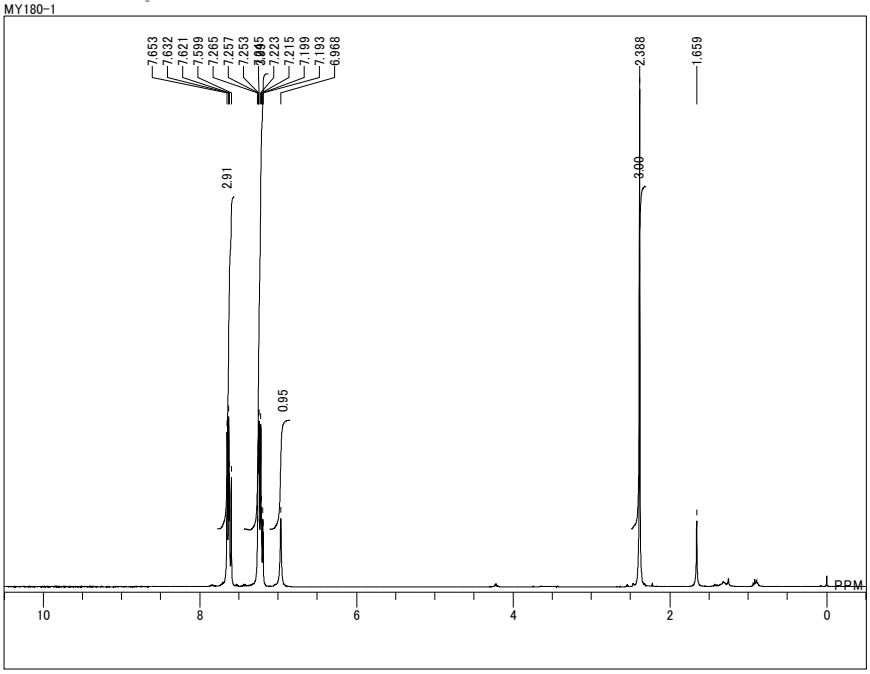
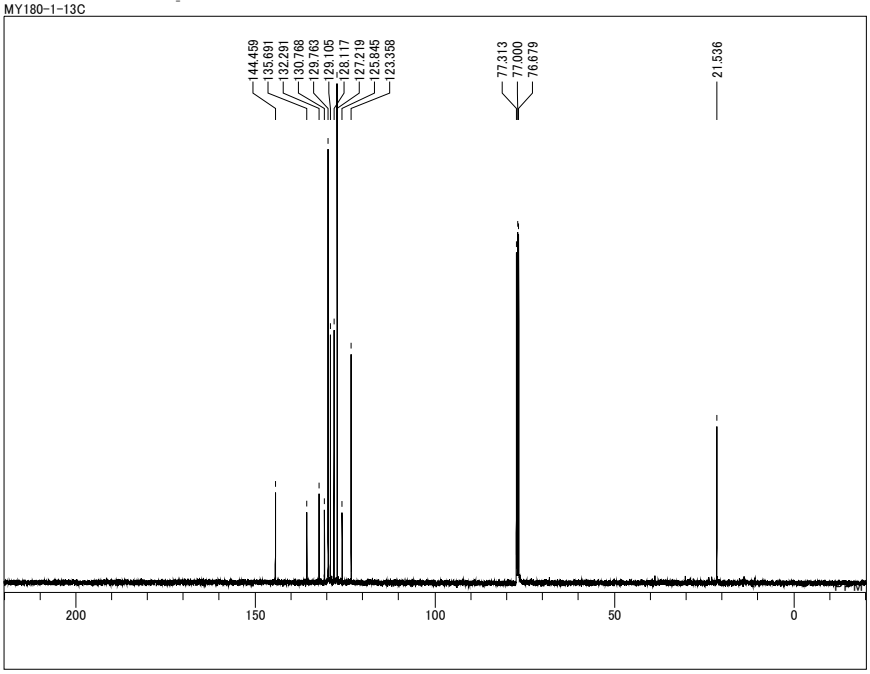
F:¥NMR¥MY180-11NON_E36.als
MY180-1

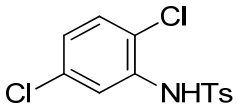


DFILE	F:¥NMR¥MY180-11NON_E36.als
COMNT	MY180-1
DATIM	Thu May 30 22:48:19 2013
OBNUC	1H
EXMOD	NON
OBFRQ	399.65 MHz
OBSET	124.00 KHz
OBFIN	10500.00 Hz
POINT	16384
FREQU	7992.01 Hz
SCANS	8
ACQTM	2.0500 sec
PD	4.9500 sec
PW1	6.20 usec
IRNUC	1H
CTEMP	23.0 c
SLVNT	CDCL3
EXREF	0.00 ppm
BF	1.20 Hz
RGAIN	13

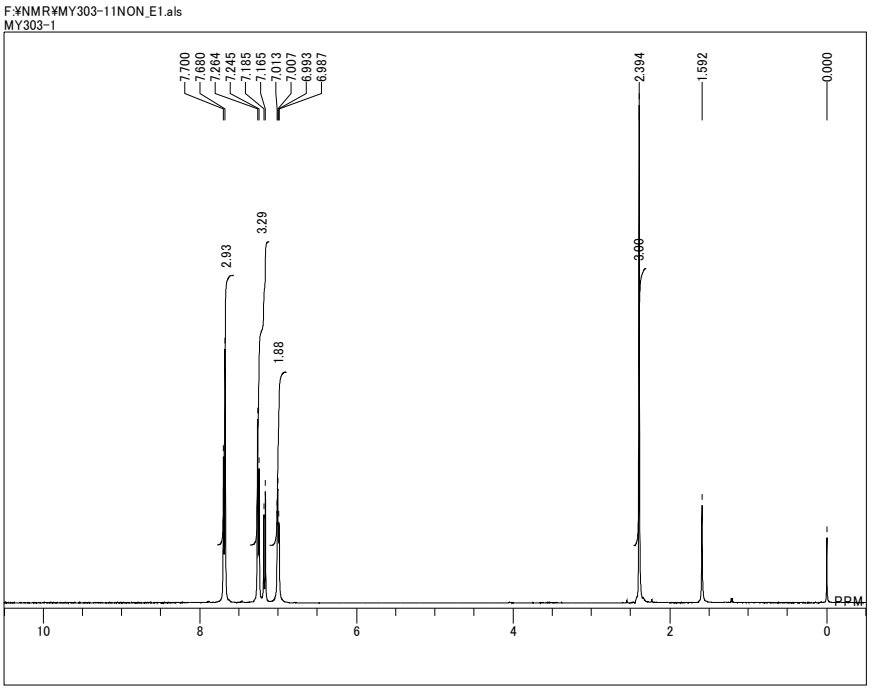
F:¥NMR¥MY180-1-13C1BCM_E4.als
MY180-1-13C



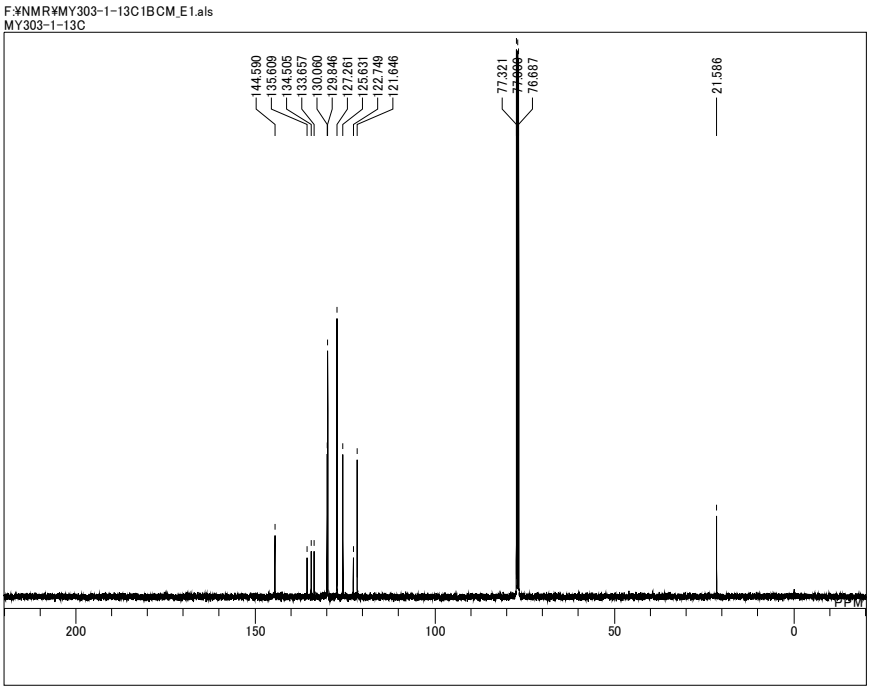
DFILE	F:¥NMR¥MY180-1-13C1BCM_E·
COMNT	MY180-1-13C
DATIM	Fri May 31 01:00:46 2013
OBNUC	13C
EXMOD	BCM
OBFRQ	100.40 MHz
OBSET	125.00 KHz
OBFIN	10500.00 Hz
POINT	32768
FREQU	27118.64 Hz
SCANS	1024
ACQTM	1.2083 sec
PD	1.7920 sec
PW1	5.50 usec
IRNUC	1H
CTEMP	25.5 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	1.20 Hz
RGAIN	28



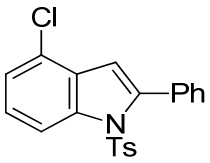
33



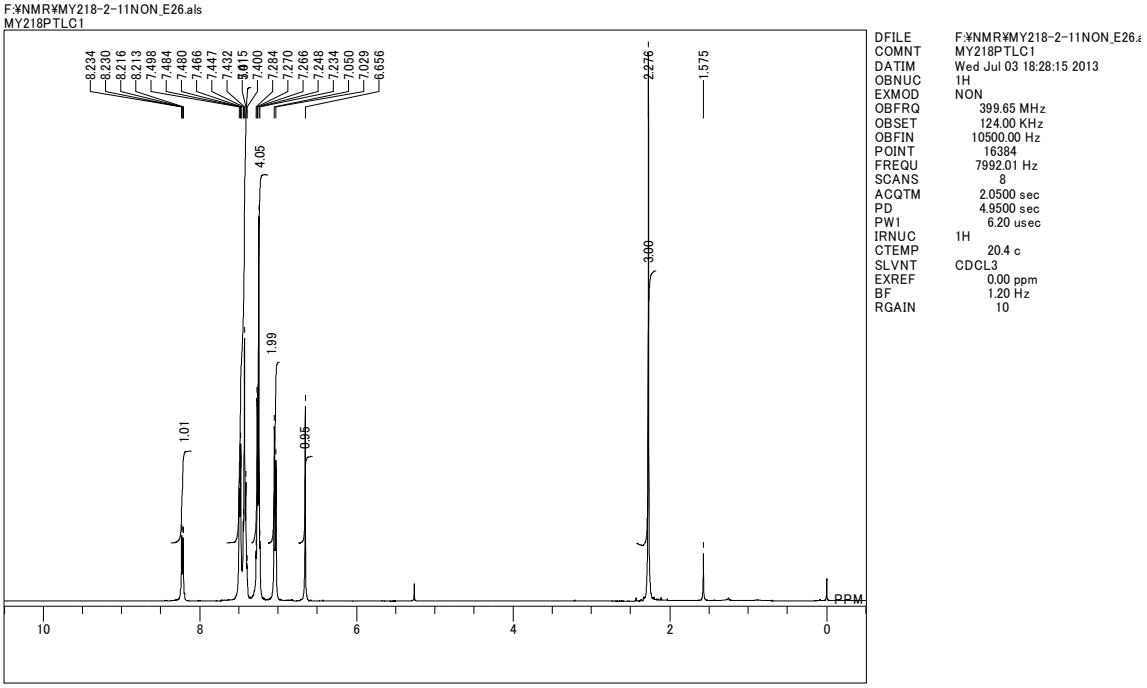
DFILE	F:¥NMR¥MY303-11NON_E1.als
COMNT	MY303-1
DATIM	Mon Nov 18 09:43:45 2013
OBNUC	1H
EXMOD	NON
OBFRQ	399.65 MHz
OBSET	124.00 KHz
OBFIN	10500.00 Hz
POINT	16384
FREQU	7992.01 Hz
SCANS	8
ACQTM	2.0500 sec
PD	4.9500 sec
PW1	6.20 usec
IRNUC	1H
CTEMP	22.5 c
SLVNT	CDCL3
EXREF	0.00 ppm
BF	1.20 Hz
RGAIN	18

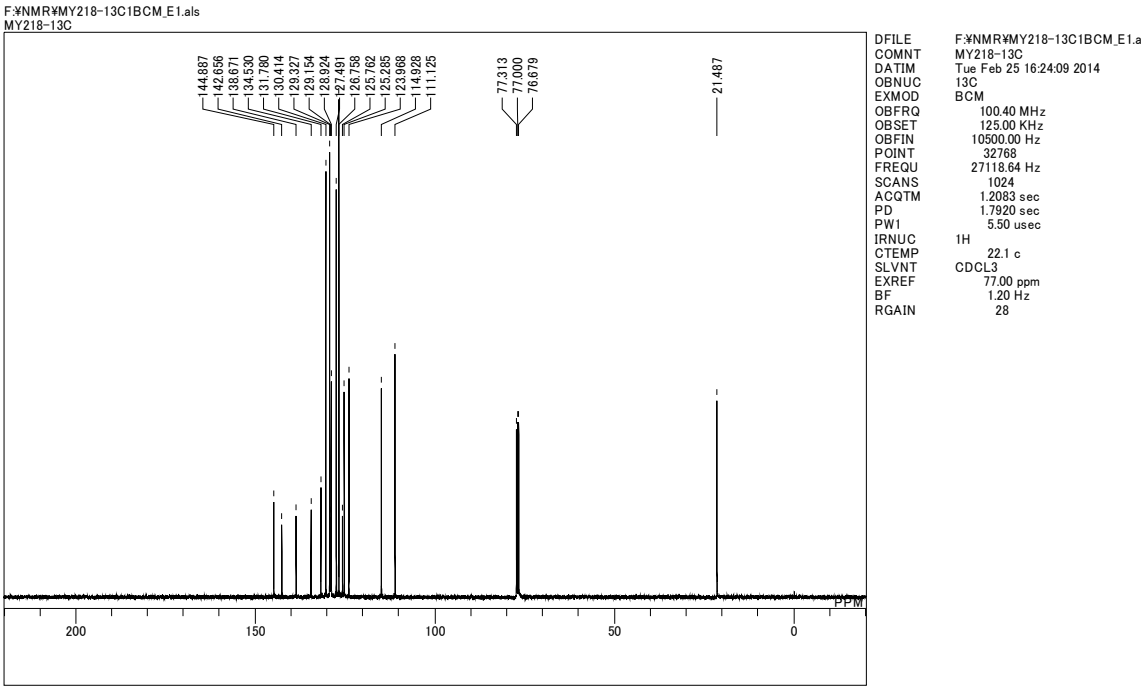


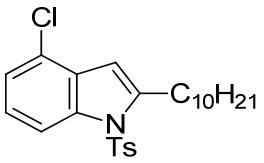
DFILE	F:¥NMR¥MY303-1-13C1BCM_E
COMNT	MY303-1-13C
DATIM	Mon Nov 18 20:05:02 2013
OBNUC	13C
EXMOD	BCM
OBFRQ	100.40 MHz
OBSET	125.00 KHz
OBFIN	10500.00 Hz
POINT	32768
FREQU	27118.64 Hz
SCANS	1024
ACQTM	1.2083 sec
PD	1.7920 sec
PW1	5.50 usec
IRNUC	1H
CTEMP	23.7 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	1.20 Hz
RGAIN	27


Cl
Ph
N
Ts

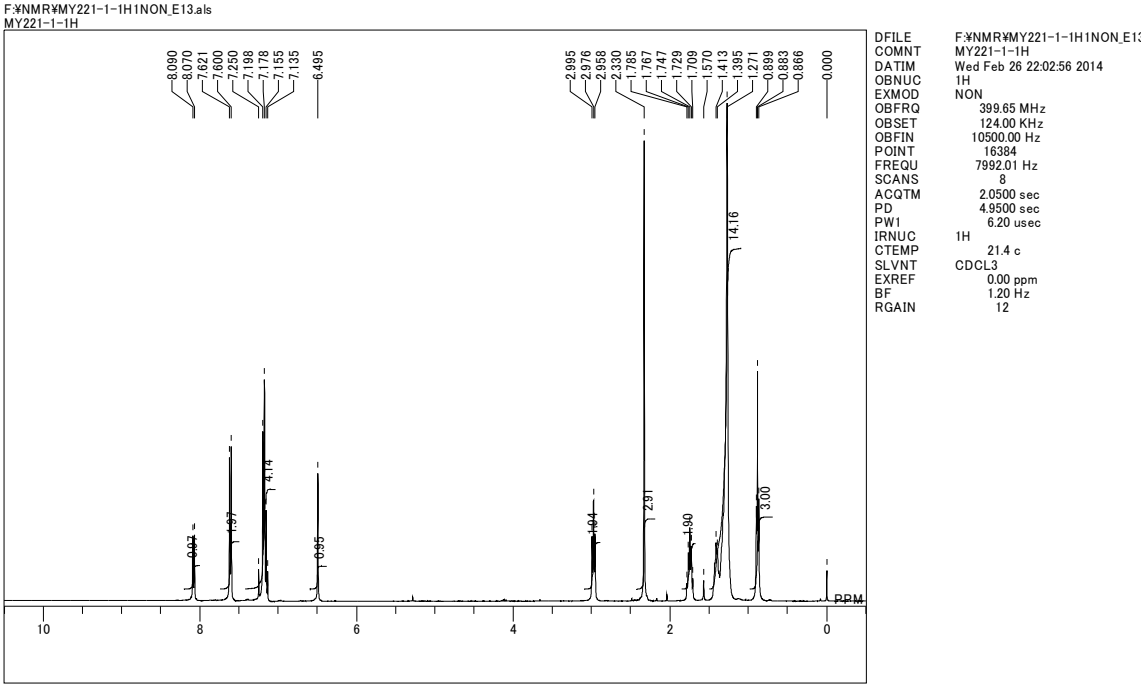
9

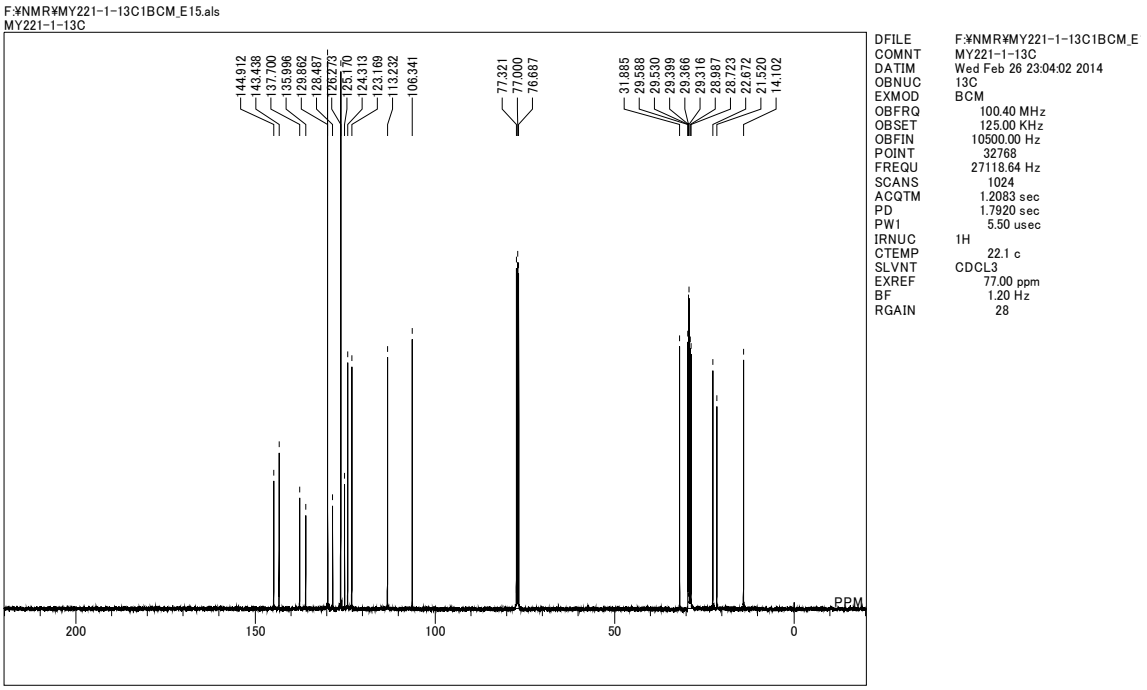

F:¥NMR¥MY218-2-11NON_E26.als
MY218PTLC1
8.234
8.230
8.216
8.213
7.498
7.484
7.480
7.466
7.447
7.432
7.400
7.284
7.270
7.266
7.248
7.234
7.050
7.029
6.656
2.276
1.575
4.05
3.00
1.99
1.01
0.95
PPM
10
8
6
4
2
0
DFILE F:¥NMR¥MY218-2-11NON_E26.a
COMNT MY218PTLC1
DATIM Wed Jul 03 18:28:15 2013
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.00 Hz
POINT 16384
FREQU 7992.01 Hz
SCANS 8
ACQTM 2.0500 sec
PD 4.9500 sec
PW1 6.20 usec
IRNUC 1H
CTEMP 20.4 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 1.20 Hz
RGAIN 10

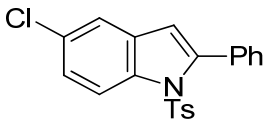

F:¥NMR¥MY218-13C1BCM_E1.als
MY218-13C
144.887
142.656
138.671
134.530
131.780
130.414
129.327
129.154
128.924
127.491
126.758
125.762
125.285
123.968
114.928
111.125
77.313
77.000
76.679
21.487
PPM
200
150
100
50
0
DFILE F:¥NMR¥MY218-13C1BCM_E1.a
COMNT MY218-13C
DATIM Tue Feb 25 16:24:09 2014
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.00 Hz
POINT 32768
FREQU 27118.64 Hz
SCANS 1024
ACQTM 1.2083 sec
PD 1.7920 sec
PW1 5.50 usec
IRNUC 1H
CTEMP 22.1 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 28


Cl
$C_{10}H_{21}$
N
Ts

10

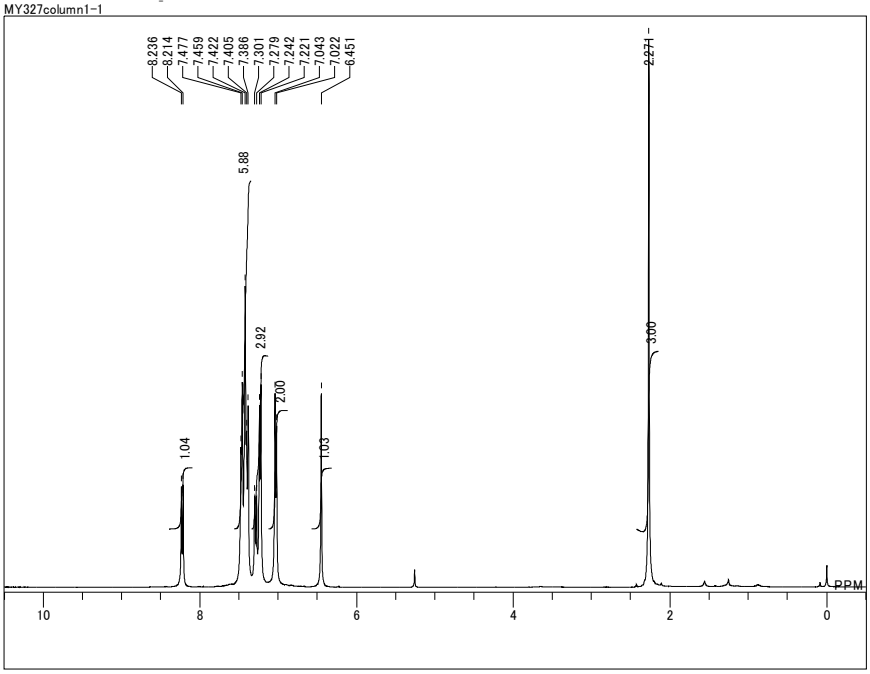

F:¥NMR¥MY221-1-1H1NON_E13.als
MY221-1-1H
8.090
8.070
7.621
7.600
7.250
7.198
7.178
7.155
7.135
6.495
2.995
2.976
2.958
2.330
1.785
1.767
1.747
1.729
1.709
1.570
1.413
1.395
1.271
0.899
0.883
0.866
0.000
14.16
4.14
2.91
3.00
1.97
1.84
1.90
0.97
0.95
PPM
10
8
6
4
2
0
DFILE F:¥NMR¥MY221-1-1H1NON_E1
COMNT MY221-1-1H
DATIM Wed Feb 26 22:02:56 2014
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.00 Hz
POINT 16384
FREQU 7992.01 Hz
SCANS 8
ACQTM 2.0500 sec
PD 4.9500 sec
PW1 6.20 usec
IRNUC 1H
CTEMP 21.4 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 1.20 Hz
RGAIN 12


F:¥NMR¥MY221-1-13C1BCM_E15.als
MY221-1-13C
144.912
143.438
137.700
135.996
129.862
128.487
126.273
125.170
124.313
123.169
113.232
106.341
77.321
77.000
76.687
31.885
29.588
29.530
29.399
29.366
29.316
28.987
28.723
22.672
21.520
14.102
PPM
200
150
100
50
0
DFILE F:¥NMR¥MY221-1-13C1BCM_E
COMNT MY221-1-13C
DATIM Wed Feb 26 23:04:02 2014
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.00 Hz
POINT 32768
FREQU 27118.64 Hz
SCANS 1024
ACQTM 1.2083 sec
PD 1.7920 sec
PW1 5.50 usec
IRNUC 1H
CTEMP 22.1 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 28



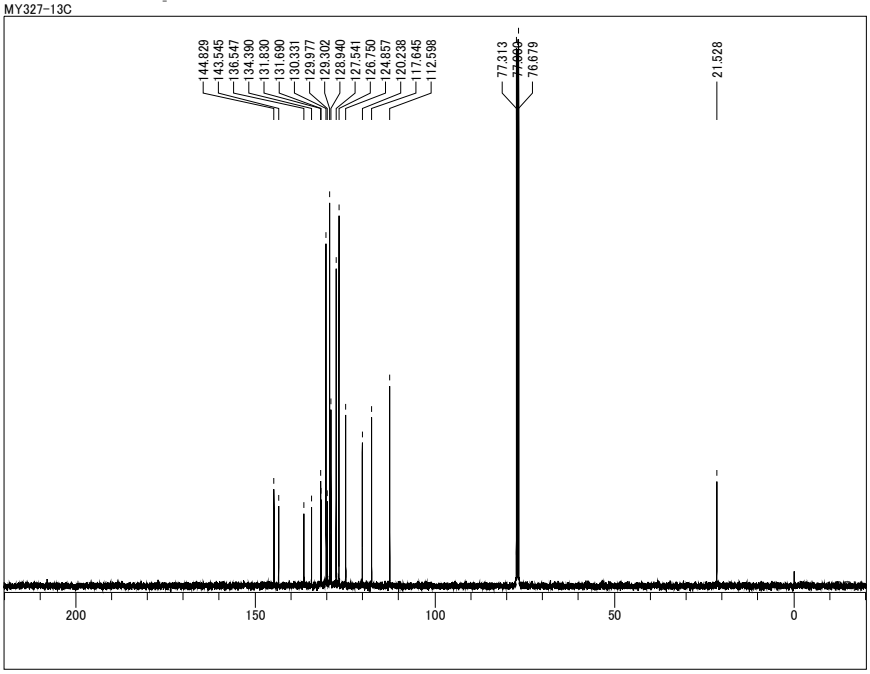
11

F:¥NMR¥MY327-2-11NON_E1.als
MY327column1-1

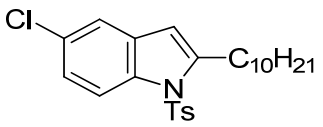


DFILE	F:¥NMR¥MY327-2-11NON_E1.al
COMNT	MY327column1-1
DATIM	Wed Jan 15 09:12:00 2014
OBNUC	1H
EXMOD	NON
OBFRQ	399.65 MHz
OBSET	124.00 KHz
OBFIN	10500.00 Hz
POINT	16384
FREQU	7992.01 Hz
SCANS	8
ACQTM	2.0500 sec
PD	4.9500 sec
PW1	6.20 usec
IRNUC	1H
CTEMP	21.7 c
SLVNT	CDCL3
EXREF	0.00 ppm
BF	1.20 Hz
RGAIN	10

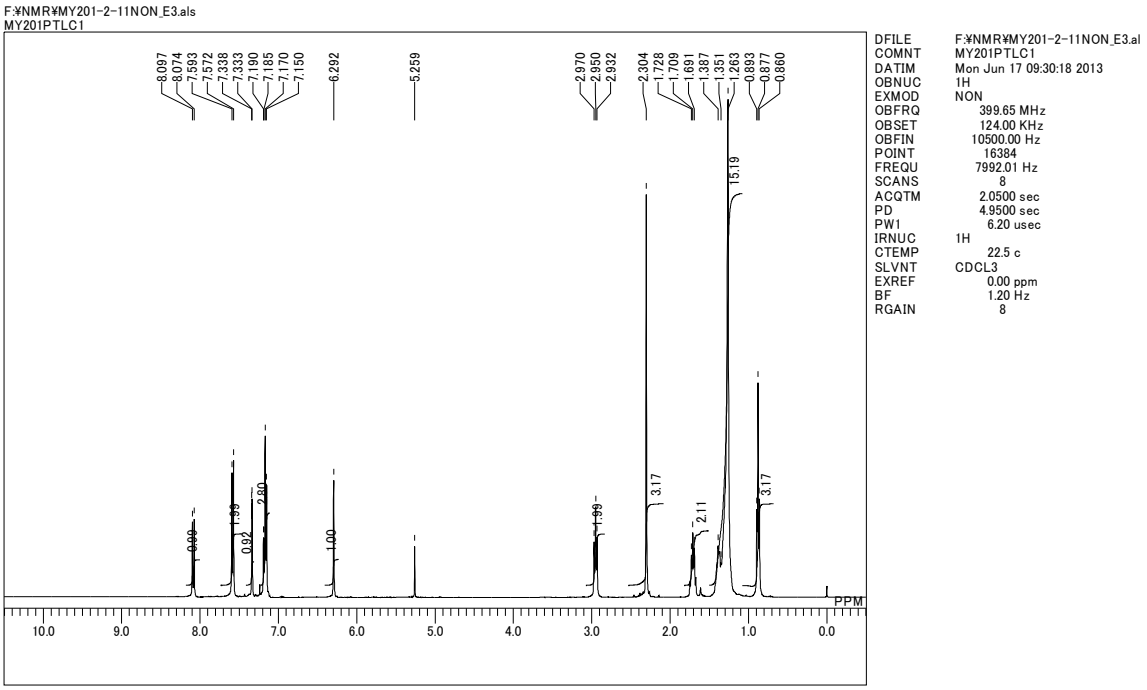
F:¥NMR¥MY327-13C1BCM_E3.als
MY327-13C

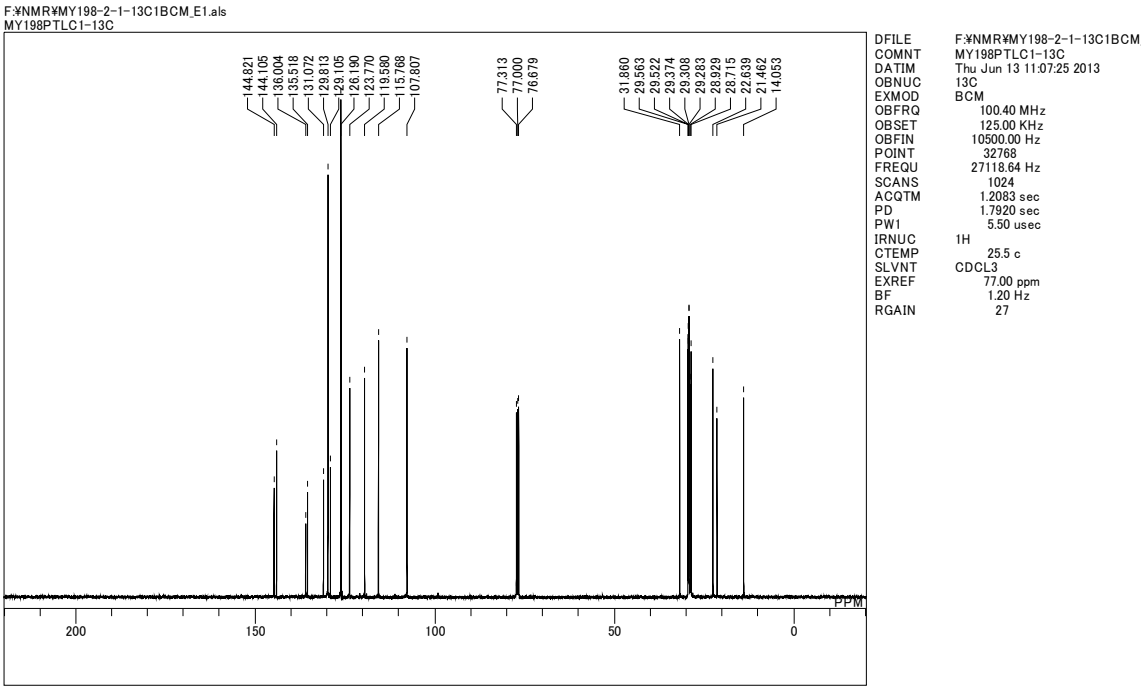


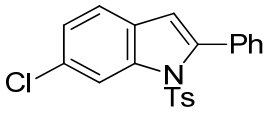
DFILE	F:¥NMR¥MY327-13C1BCM_E3.a
COMNT	MY327-13C
DATIM	Wed Feb 26 00:30:02 2014
OBNUC	13C
EXMOD	BCM
OBFRQ	100.40 MHz
OBSET	125.00 KHz
OBFIN	10500.00 Hz
POINT	32768
FREQU	27118.64 Hz
SCANS	1024
ACQTM	1.2083 sec
PD	1.7920 sec
PW1	5.50 usec
IRNUC	1H
CTEMP	21.2 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	1.20 Hz
RGAIN	28


Cl
$C_{10}H_{21}$
N
Ts

12

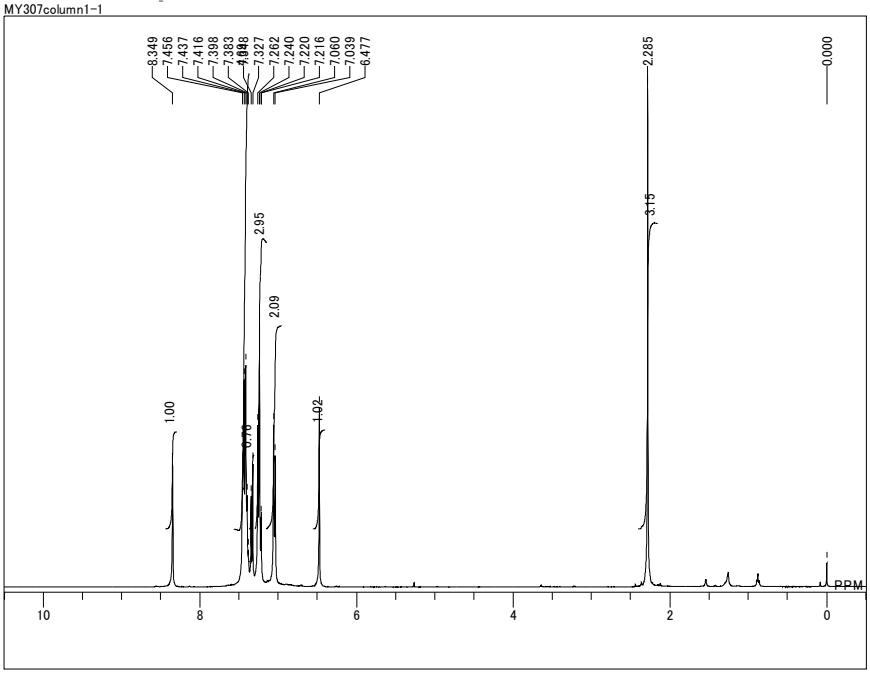

F:¥NMR¥MY201-2-11NON_E3.als
MY201PTLC1
8.097
8.074
7.593
7.572
7.338
7.333
7.190
7.185
7.170
7.150
6.292
5.259
2.970
2.950
2.932
2.304
1.728
1.709
1.691
1.387
1.351
1.263
0.893
0.877
0.860
15.19
3.17
3.17
2.11
2.00
1.99
1.00
0.92
2.80
1.99
0.00
PPM
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
DFILE F:¥NMR¥MY201-2-11NON_E3.al
COMNT MY201PTLC1
DATIM Mon Jun 17 09:30:18 2013
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.00 Hz
POINT 16384
FREQU 7992.01 Hz
SCANS 8
ACQTM 2.0500 sec
PD 4.9500 sec
PW1 6.20 usec
IRNUC 1H
CTEMP 22.5 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 1.20 Hz
RGAIN 8


F:¥NMR¥MY198-2-1-13C1BCM_E1.als
MY198PTLC1-13C
144.821
144.105
136.004
135.518
131.072
129.813
129.105
126.190
123.770
119.580
115.768
107.807
77.313
77.000
76.679
31.860
29.563
29.522
29.374
29.308
29.283
28.929
28.715
22.639
21.462
14.053
PPM
200
150
100
50
0
DFILE F:¥NMR¥MY198-2-1-13C1BCM
COMNT MY198PTLC1-13C
DATIM Thu Jun 13 11:07:25 2013
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.00 Hz
POINT 32768
FREQU 27118.64 Hz
SCANS 1024
ACQTM 1.2083 sec
PD 1.7920 sec
PW1 5.50 usec
IRNUC 1H
CTEMP 25.5 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 27



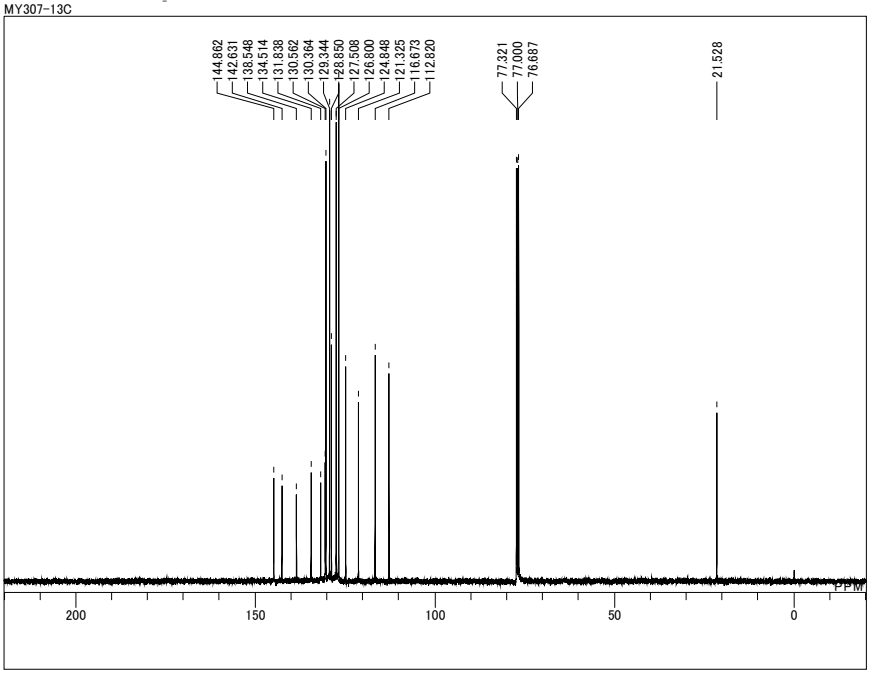
13

F:¥NMR¥MY307-2-11NON_E6.als
MY307column1-1

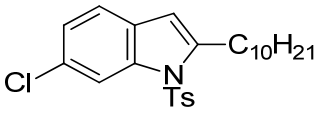


DFILE	F:¥NMR¥MY307-2-11NON_E6.al
COMNT	MY307column1-1
DATIM	Wed Nov 20 13:48:36 2013
OBNUC	1H
EXMOD	NON
OBFRQ	399.65 MHz
OBSET	124.00 KHz
OBFIN	10500.00 Hz
POINT	16384
FREQU	7992.01 Hz
SCANS	8
ACQTM	2.0500 sec
PD	4.9500 sec
PW1	6.20 usec
IRNUC	1H
CTEMP	22.4 c
SLVNT	CDCL3
EXREF	0.00 ppm
BF	1.20 Hz
RGAIN	14

F:¥NMR¥MY307-13C1BCM_E2.als
MY307-13C

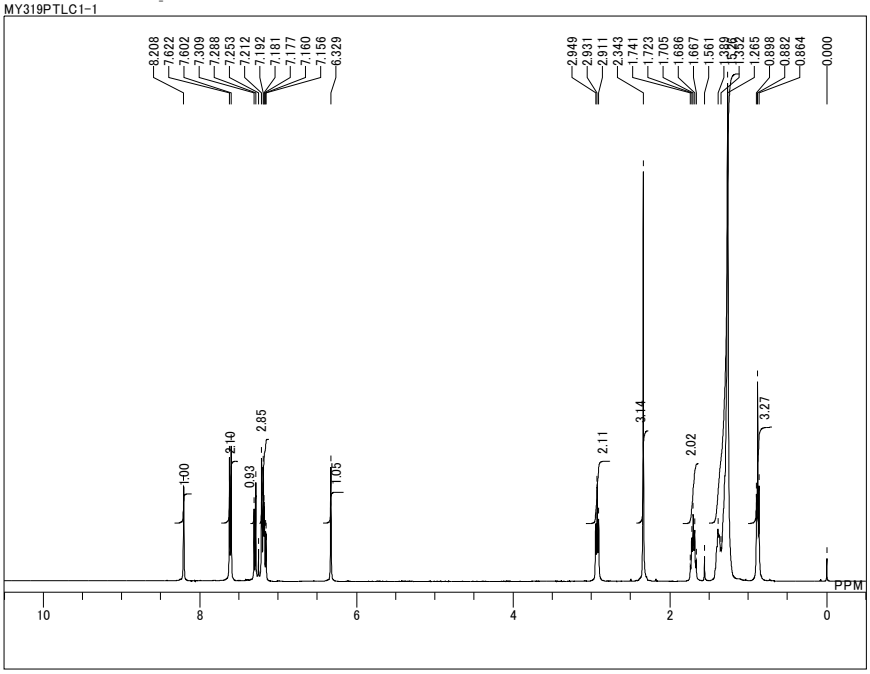


DFILE	F:¥NMR¥MY307-13C1BCM_E2.a
COMNT	MY307-13C
DATIM	Tue Feb 25 23:33:12 2014
OBNUC	13C
EXMOD	BCM
OBFRQ	100.40 MHz
OBSET	125.00 KHz
OBFIN	10500.00 Hz
POINT	32768
FREQU	27118.64 Hz
SCANS	1024
ACQTM	1.2083 sec
PD	1.7920 sec
PW1	5.50 usec
IRNUC	1H
CTEMP	21.4 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	1.20 Hz
RGAIN	28



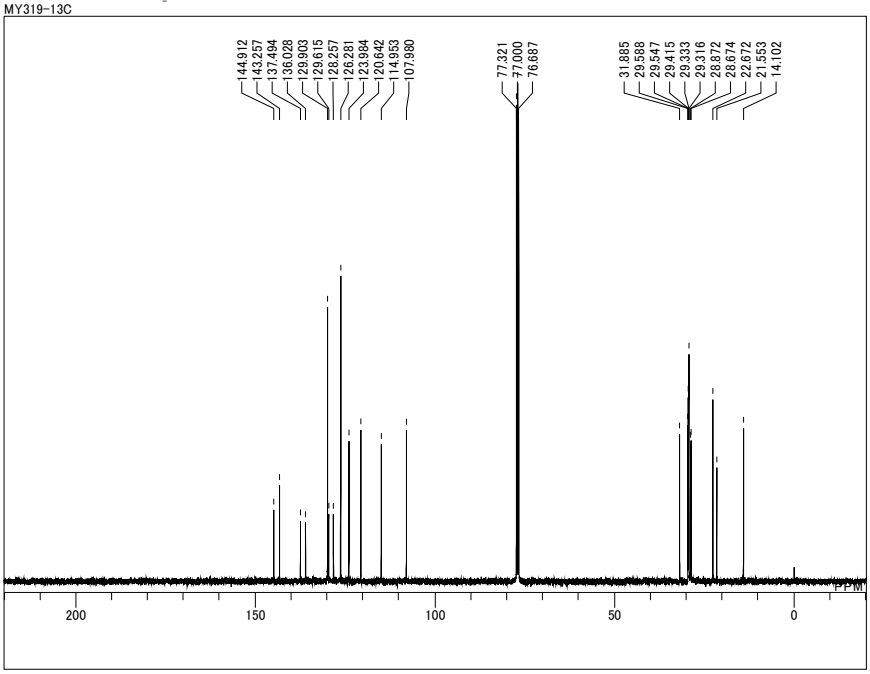
14

F:¥NMR¥MY319-3-11NON_E3.als
MY319PTLC1-1

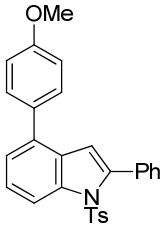


DFILE	F:¥NMR¥MY319-3-11NON_E3.al
COMNT	MY319PTLC1-1
DATIM	Sat Dec 21 14:19:34 2013
OBNUC	1H
EXMOD	NON
OBFRQ	399.65 MHz
OBSET	124.00 KHz
OBFIN	10500.00 Hz
POINT	16384
FREQU	7992.01 Hz
SCANS	8
ACQTM	2.0500 sec
PD	4.9500 sec
PW1	6.20 usec
IRNUC	1H
CTEMP	22.0 c
SLVNT	CDCL3
EXREF	0.00 ppm
BF	1.20 Hz
RGAIN	10

F:¥NMR¥MY319-13C1BCM_E1.als
MY319-13C



DFILE	F:¥NMR¥MY319-13C1BCM_E1.a
COMNT	MY319-13C
DATIM	Tue Feb 25 22:32:40 2014
OBNUC	13C
EXMOD	BCM
OBFRQ	100.40 MHz
OBSET	125.00 KHz
OBFIN	10500.00 Hz
POINT	32768
FREQU	27118.64 Hz
SCANS	1024
ACQTM	1.2083 sec
PD	1.7920 sec
PW1	5.50 usec
IRNUC	1H
CTEMP	21.5 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	1.20 Hz
RGAIN	28



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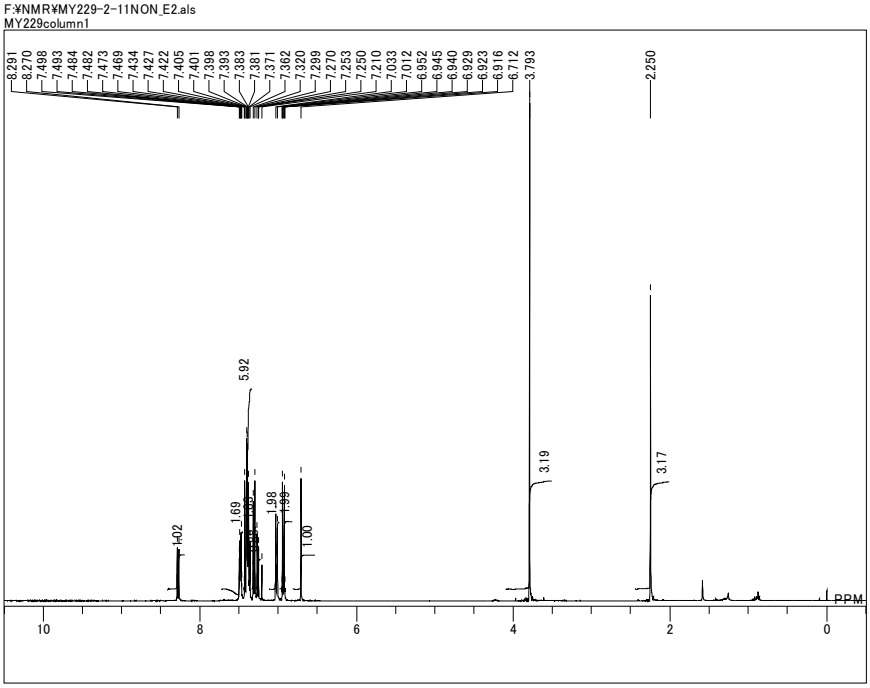
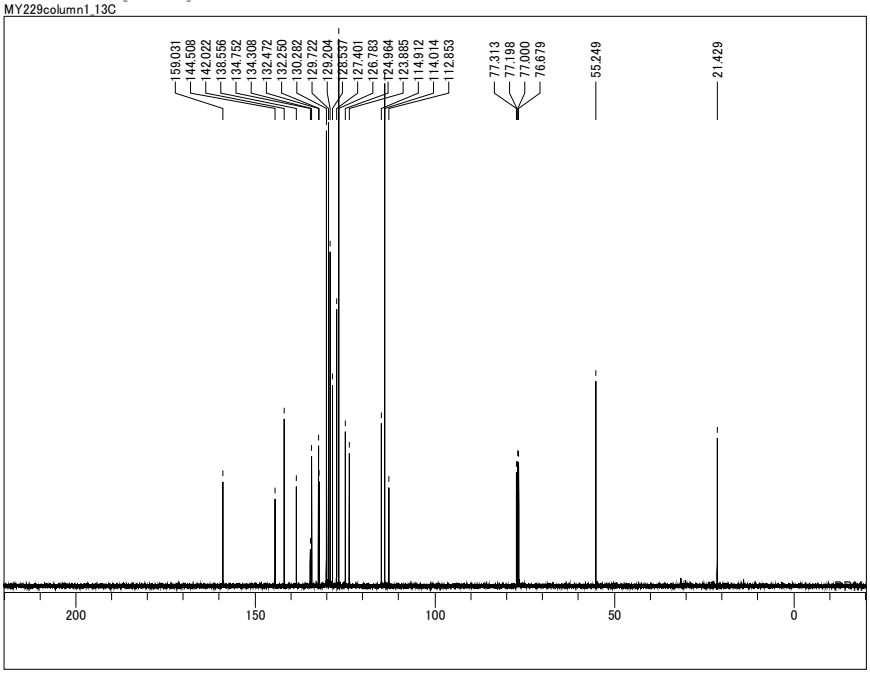
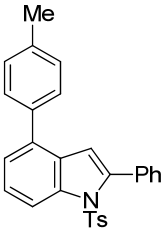


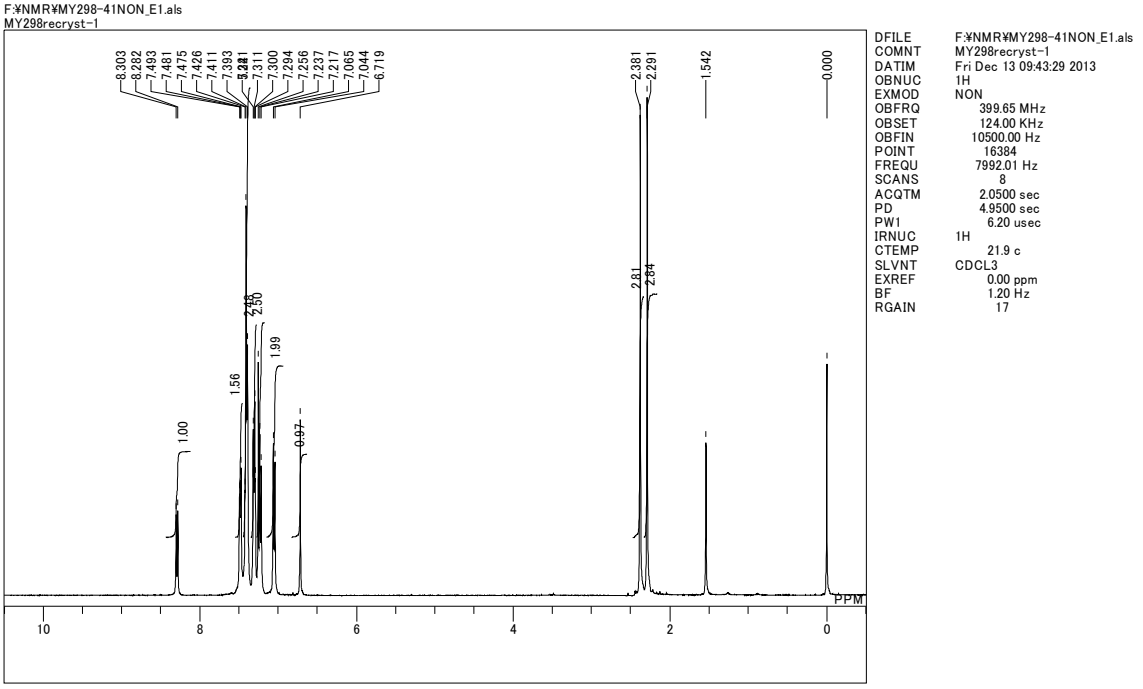
DFILE	F:¥NMR¥MY229-2-11NON_E2.al
COMNT	MY229column1
DATIM	Wed Jul 24 21:24:01 2013
OBNUC	1H
EXMOD	NON
OBFRQ	399.65 MHz
OBSET	124.00 KHz
OBFIN	10500.00 Hz
POINT	16384
FREQU	7992.01 Hz
SCANS	8
ACQTM	2.0500 sec
PD	4.9500 sec
PW1	6.20 usec
IRNUC	1H
CTEMP	21.9 c
SLVNT	CDCL3
EXREF	0.00 ppm
BF	0.12 Hz
RGAIN	9

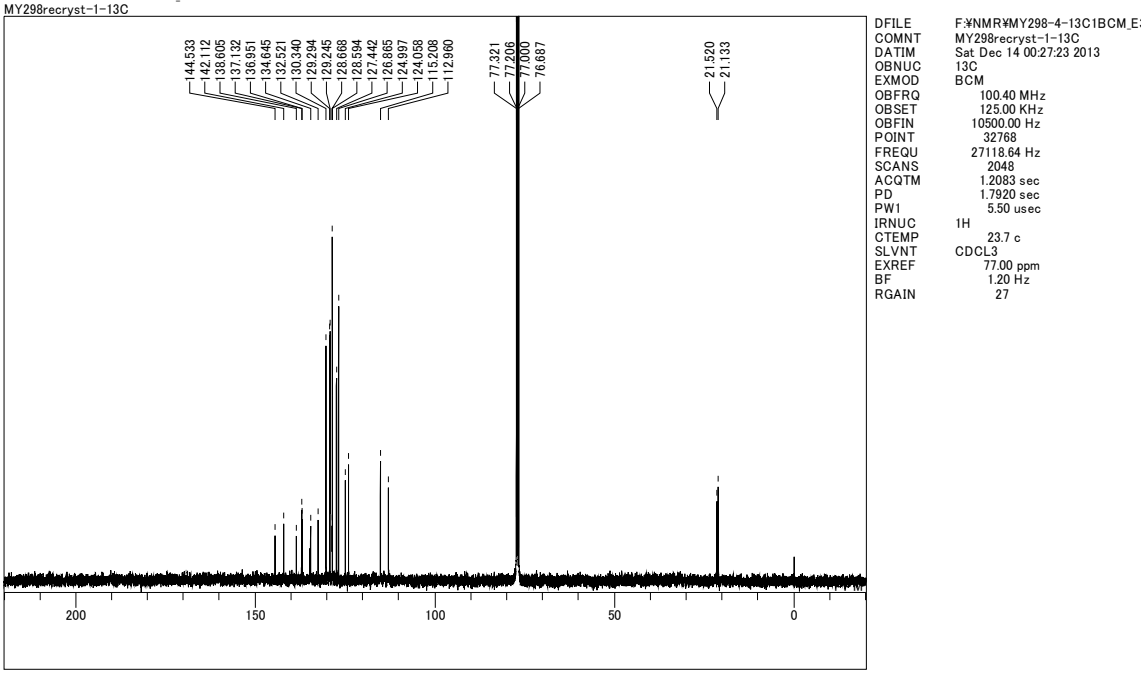


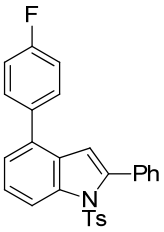
DFILE	F:¥NMR¥MY229-2-1_13C1BCM_
COMNT	MY229column1_13C
DATIM	Wed Jul 24 22:04:23 2013
OBNUC	13C
EXMOD	BCM
OBFRQ	100.40 MHz
OBSET	125.00 KHz
OBFIN	10500.00 Hz
POINT	32768
FREQU	27118.64 Hz
SCANS	512
ACQTM	1.2083 sec
PD	1.7920 sec
PW1	5.50 usec
IRNUC	1H
CTEMP	24.4 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	0.12 Hz
RGAIN	26


Me
Ph
N
Ts

17


F:¥NMR¥MY298-41NON_E1.als
MY298recryst-1
8.303
8.282
7.493
7.481
7.475
7.426
7.411
7.393
7.311
7.300
7.294
7.256
7.237
7.217
7.065
7.044
6.719
2.381
2.291
1.542
0.000
2.81
2.84
2.43
2.50
1.99
1.56
1.00
0.97
PPM
10
8
6
4
2
0
DFILE F:¥NMR¥MY298-41NON_E1.als
COMNT MY298recryst-1
DATIM Fri Dec 13 09:43:29 2013
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.00 Hz
POINT 16384
FREQU 7992.01 Hz
SCANS 8
ACQTM 2.0500 sec
PD 4.9500 sec
PW1 6.20 usec
IRNUC 1H
CTEMP 21.9 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 1.20 Hz
RGAIN 17


F:¥NMR¥MY298-4-13C1BCM_E3.als
MY298recryst-1-13C
144.533
142.112
138.605
137.132
136.951
134.645
132.521
130.340
129.294
129.245
128.668
128.594
127.442
126.865
124.997
124.058
115.208
112.980
77.321
77.206
77.000
76.687
21.520
21.133
200
150
100
50
0
DFILE F:¥NMR¥MY298-4-13C1BCM_E
COMNT MY298recryst-1-13C
DATIM Sat Dec 14 00:27:23 2013
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.00 Hz
POINT 32768
FREQU 27118.64 Hz
SCANS 2048
ACQTM 1.2083 sec
PD 1.7920 sec
PW1 5.50 usec
IRNUC 1H
CTEMP 23.7 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 27



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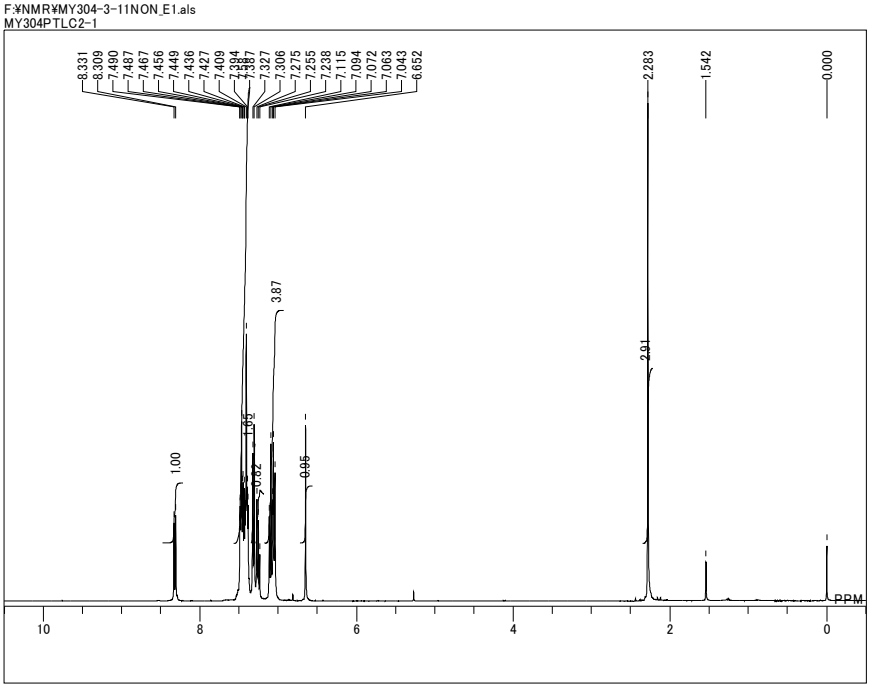
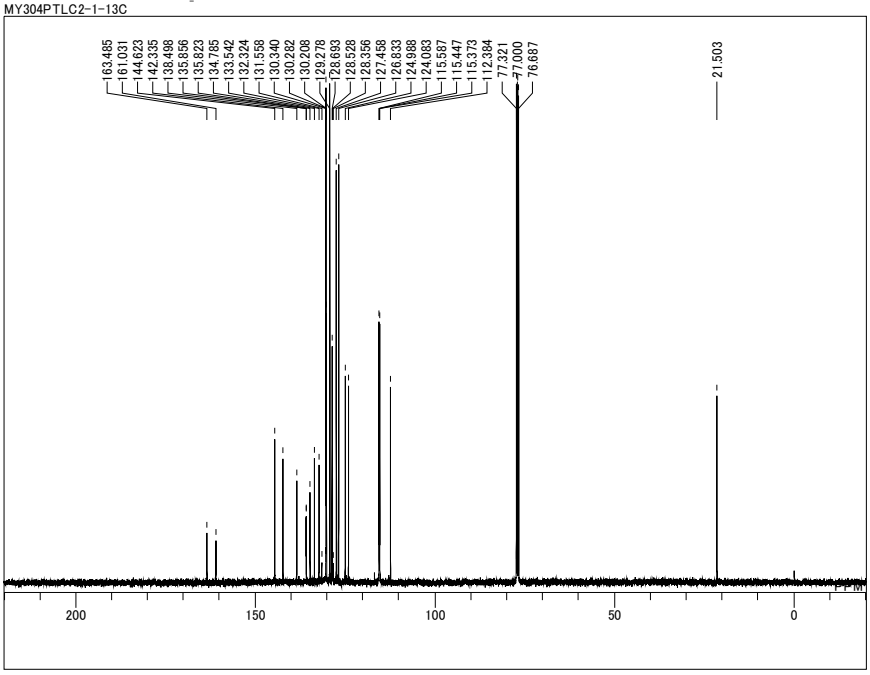
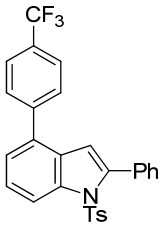


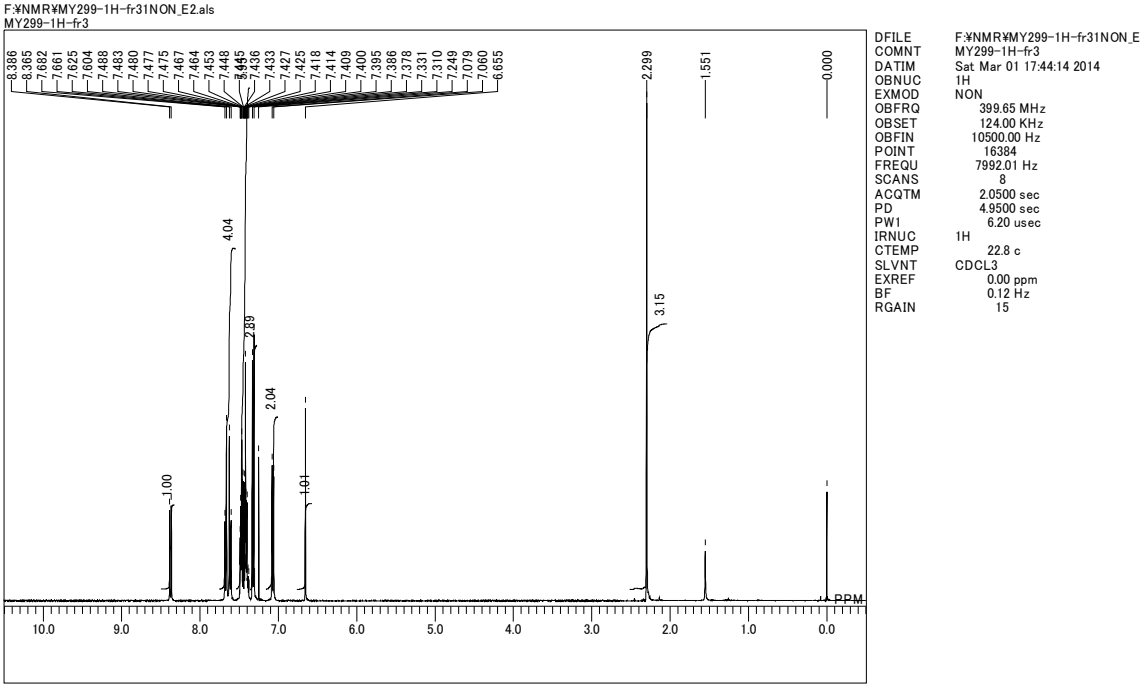
DFILE F:¥NMR¥MY304-3-11NON_E1.al
COMNT MY304PTLC2-1
DATIM Mon Nov 25 10:06:43 2013
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.00 Hz
POINT 16384
FREQU 7992.01 Hz
SCANS 8
ACQTM 2.0500 sec
PD 4.9500 sec
PW1 6.20 usec
IRNUC 1H
CTEMP 22.8 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 1.20 Hz
RGAIN 14

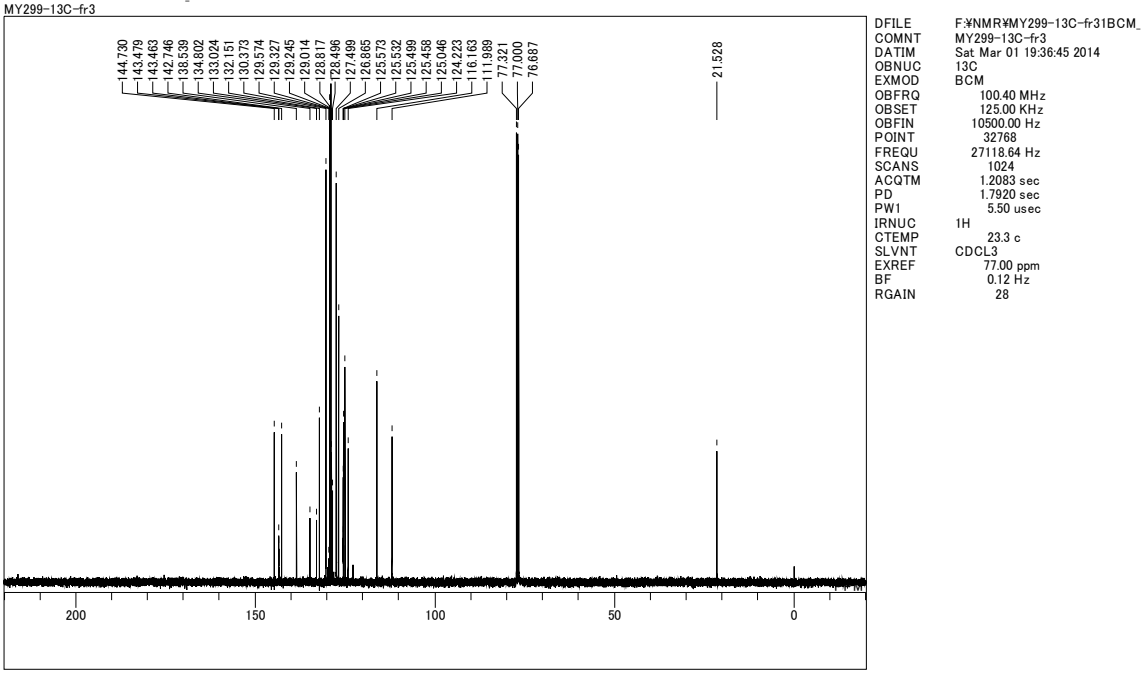


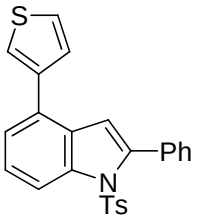
DFILE F:¥NMR¥MY304-3-1-13C1BCM
COMNT MY304PTLC2-1-13C
DATIM Tue Nov 26 00:34:43 2013
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.00 Hz
POINT 32768
FREQU 27118.64 Hz
SCANS 1024
ACQTM 1.2083 sec
PD 1.7920 sec
PW1 5.50 usec
IRNUC 1H
CTEMP 23.3 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 28


CF3
Ph
N
Ts

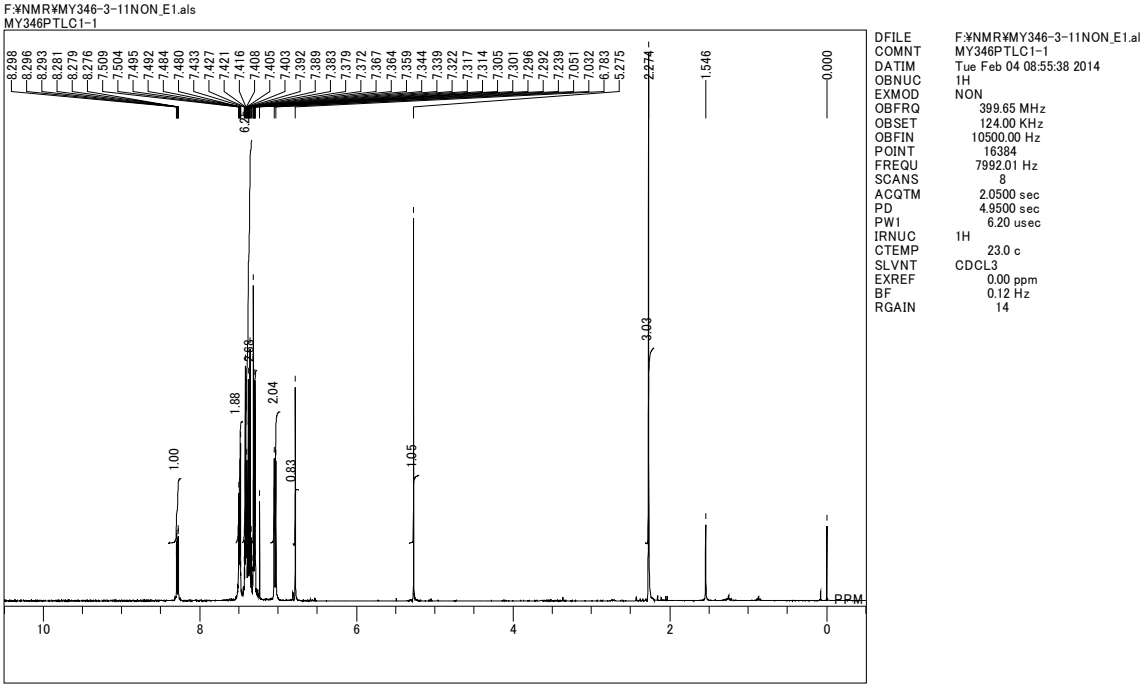
19

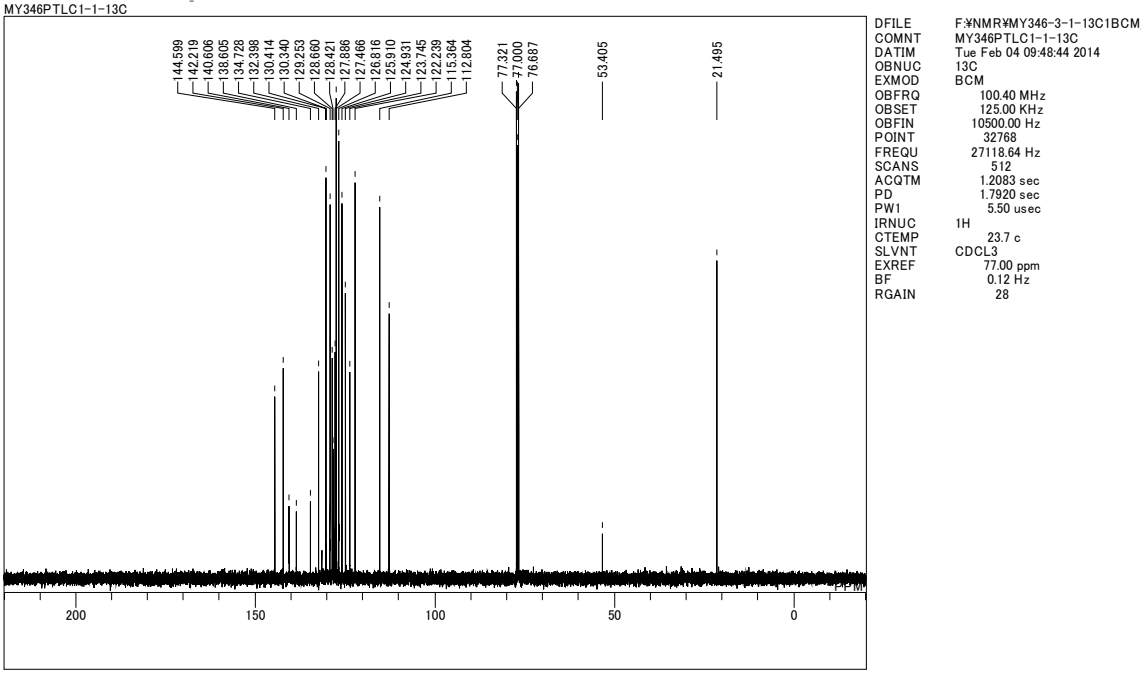

F:¥NMR¥MY299-1H-fr31NON_E2.als
MY299-1H-fr3
8.386
8.365
7.682
7.661
7.625
7.604
7.488
7.483
7.480
7.477
7.475
7.467
7.464
7.453
7.448
7.445
7.436
7.433
7.427
7.425
7.418
7.414
7.409
7.400
7.395
7.386
7.378
7.331
7.310
7.249
7.079
7.060
6.655
2.299
1.551
0.000
4.04
3.15
2.89
2.04
1.00
1.01
PPM
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
DFILE F:¥NMR¥MY299-1H-fr31NON_E
COMNT MY299-1H-fr3
DATIM Sat Mar 01 17:44:14 2014
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.00 Hz
POINT 16384
FREQU 7992.01 Hz
SCANS 8
ACQTM 2.0500 sec
PD 4.9500 sec
PW1 6.20 usec
IRNUC 1H
CTEMP 22.8 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 0.12 Hz
RGAIN 15

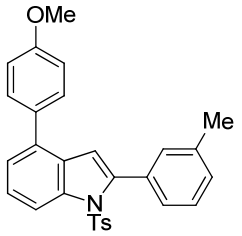

F:¥NMR¥MY299-13C-fr31BCM_E4.als
MY299-13C-fr3
144.730
143.479
143.463
142.746
138.539
134.802
133.024
132.151
130.373
129.574
129.327
129.245
129.014
128.817
128.496
127.499
126.865
125.573
125.532
125.499
125.458
125.046
124.223
116.163
111.989
77.321
77.000
76.687
21.528
200
150
100
50
0
DFILE F:¥NMR¥MY299-13C-fr31BCM_
COMNT MY299-13C-fr3
DATIM Sat Mar 01 19:36:45 2014
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.00 Hz
POINT 32768
FREQU 27118.64 Hz
SCANS 1024
ACQTM 1.2083 sec
PD 1.7920 sec
PW1 5.50 usec
IRNUC 1H
CTEMP 23.3 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 0.12 Hz
RGAIN 28


S
Ph
N
Ts

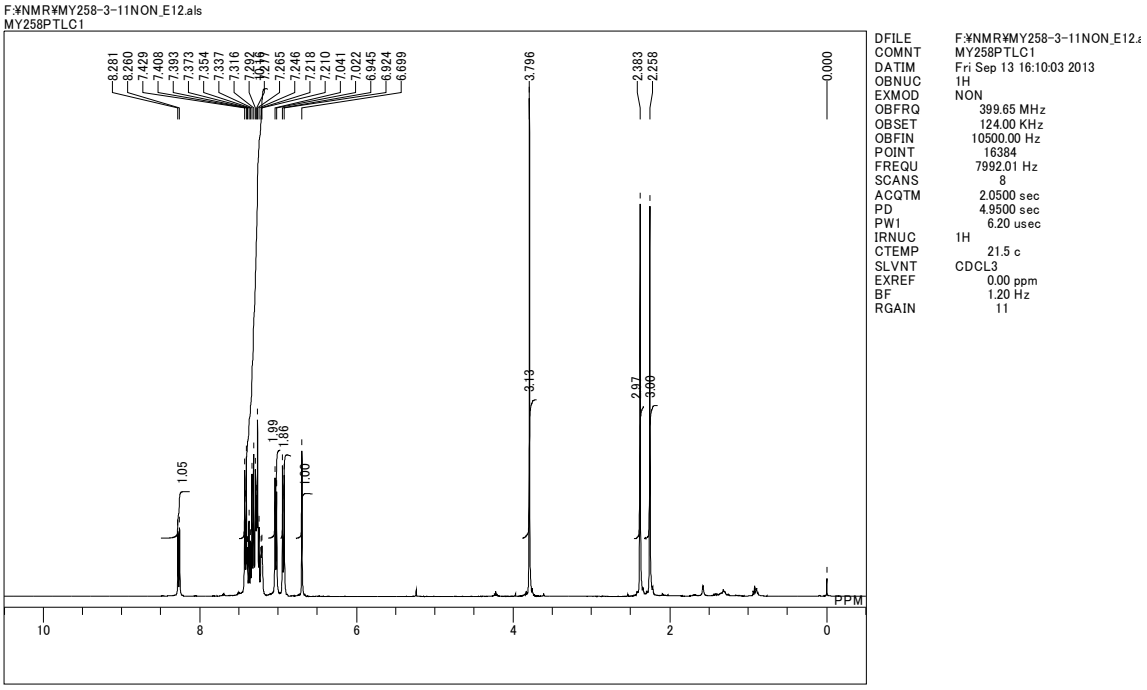
20

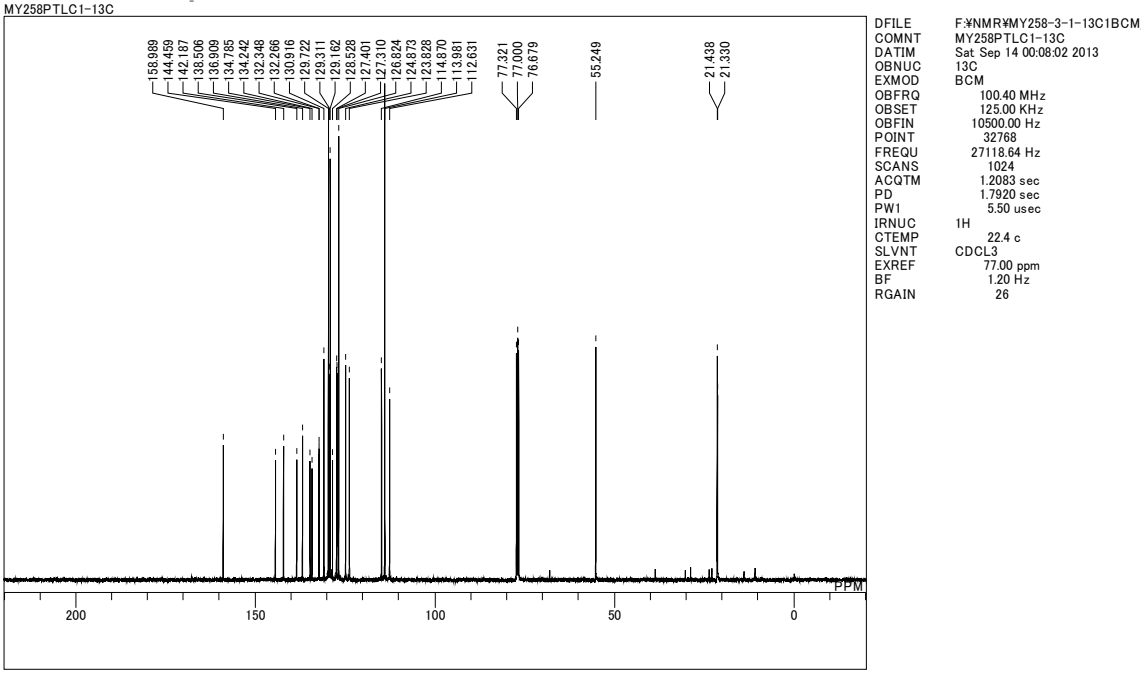

F:¥NMR¥MY346-3-11NON_E1.als
MY346PTLC1-1
8.298
8.296
8.293
8.281
8.279
8.276
7.509
7.504
7.495
7.492
7.484
7.480
7.433
7.427
7.421
7.416
7.408
7.405
7.403
7.392
7.389
7.383
7.379
7.372
7.367
7.364
7.359
7.344
7.339
7.322
7.317
7.314
7.305
7.301
7.296
7.292
7.239
7.051
7.032
6.783
5.275
2.274
1.546
0.000
1.00
1.88
2.04
0.83
1.05
3.03
PPM
10
8
6
4
2
0
DFILE F:¥NMR¥MY346-3-11NON_E1.al
COMNT MY346PTLC1-1
DATIM Tue Feb 04 08:55:38 2014
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.00 Hz
POINT 16384
FREQU 7992.01 Hz
SCANS 8
ACQTM 2.0500 sec
PD 4.9500 sec
PW1 6.20 usec
IRNUC 1H
CTEMP 23.0 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 0.12 Hz
RGAIN 14

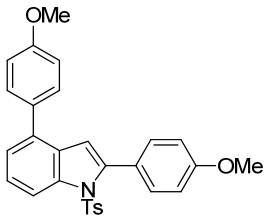

F:¥NMR¥MY346-3-1-13C1BCM_E5.als
MY346PTLC1-1-13C
144.599
142.219
140.606
138.605
134.728
132.398
130.414
130.340
129.253
128.660
128.421
127.886
127.466
126.816
125.910
124.931
123.745
122.239
115.364
112.804
77.321
77.000
76.687
53.405
21.495
PPM
200
150
100
50
0
DFILE F:¥NMR¥MY346-3-1-13C1BCM
COMNT MY346PTLC1-1-13C
DATIM Tue Feb 04 09:48:44 2014
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.00 Hz
POINT 32768
FREQU 27118.64 Hz
SCANS 512
ACQTM 1.2083 sec
PD 1.7920 sec
PW1 5.50 usec
IRNUC 1H
CTEMP 23.7 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 0.12 Hz
RGAIN 28


OMe
Me
N
Ts

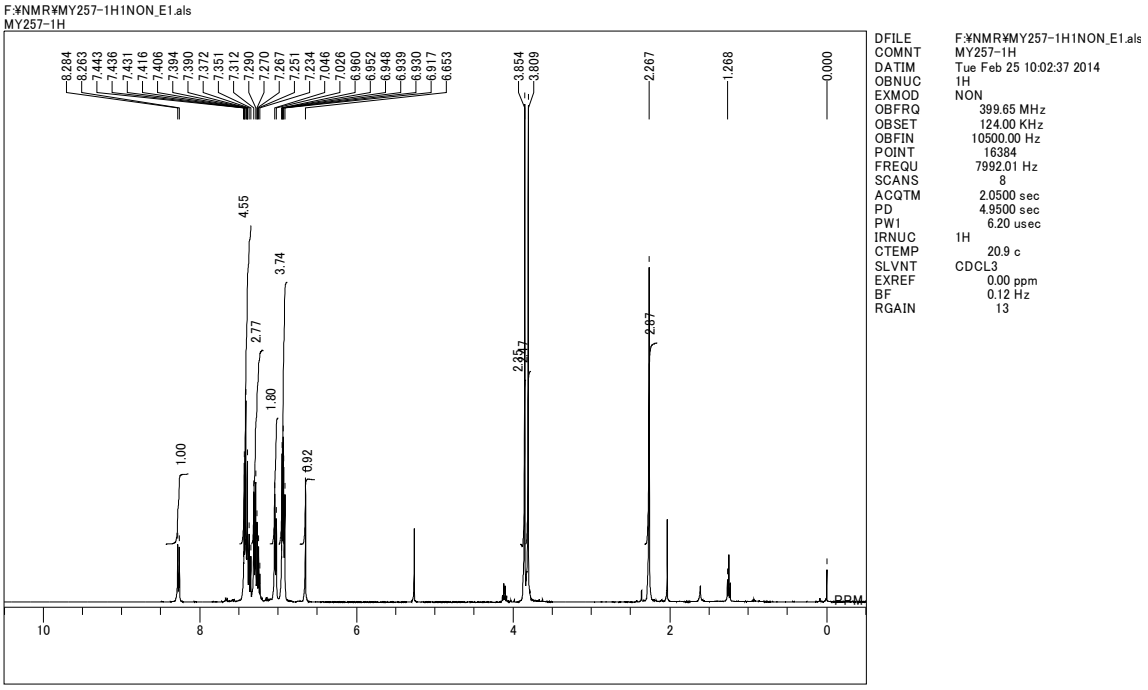
21

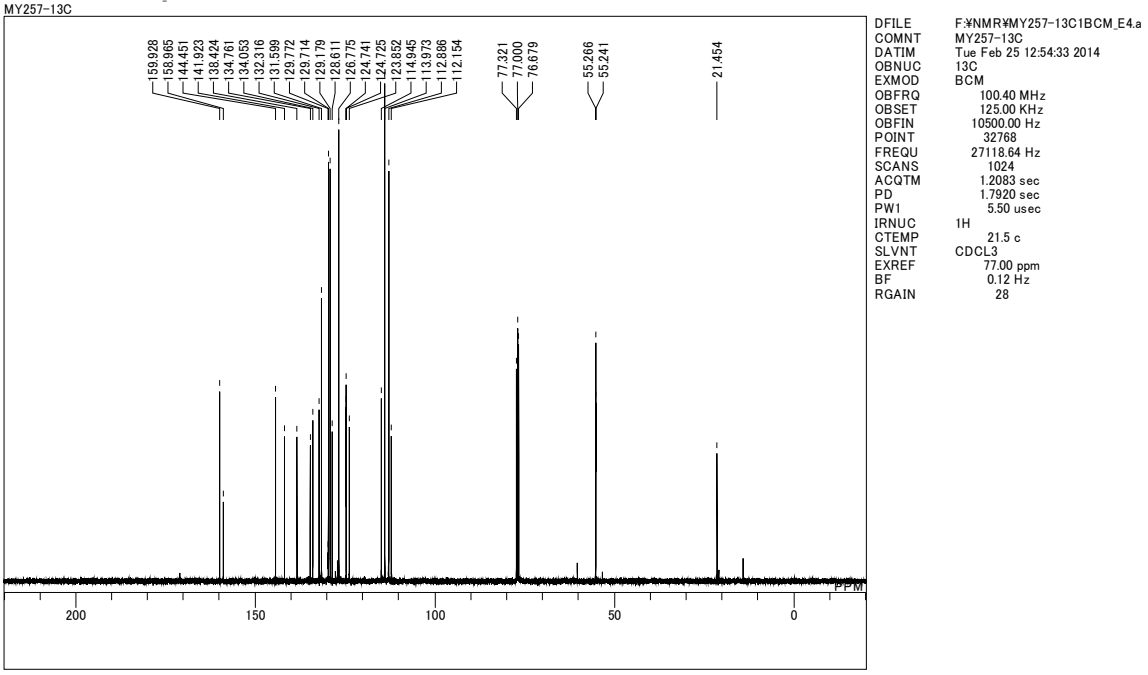

F:¥NMR¥MY258-3-11NON_E12.als
MY258PTLC1
8.281
8.260
7.429
7.408
7.393
7.373
7.354
7.337
7.316
7.292
7.265
7.246
7.218
7.210
7.041
7.022
6.945
6.924
6.699
3.796
2.383
2.258
0.000
8.13
2.97
3.00
1.99
1.86
1.05
1.00
PPM
10
8
6
4
2
0
DFILE F:¥NMR¥MY258-3-11NON_E12.a
COMNT MY258PTLC1
DATIM Fri Sep 13 16:10:03 2013
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.00 Hz
POINT 16384
FREQU 7992.01 Hz
SCANS 8
ACQTM 2.0500 sec
PD 4.9500 sec
PW1 6.20 usec
IRNUC 1H
CTEMP 21.5 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 1.20 Hz
RGAIN 11

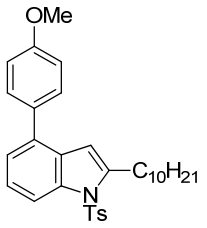

F:¥NMR¥MY258-3-1-13C1BCM_E2.als
MY258PTLC1-13C
158.989
144.459
142.187
138.506
136.909
134.785
134.242
132.348
132.266
130.916
129.722
129.311
129.162
128.528
127.401
127.310
126.824
124.873
123.828
114.870
113.981
112.631
77.321
77.000
76.679
55.249
21.438
21.330
PPM
200
150
100
50
0
DFILE F:¥NMR¥MY258-3-1-13C1BCM
COMNT MY258PTLC1-13C
DATIM Sat Sep 14 00:08:02 2013
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.00 Hz
POINT 32768
FREQU 27118.64 Hz
SCANS 1024
ACQTM 1.2083 sec
PD 1.7920 sec
PW1 5.50 usec
IRNUC 1H
CTEMP 22.4 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 26


OMe
OMe
N
Ts

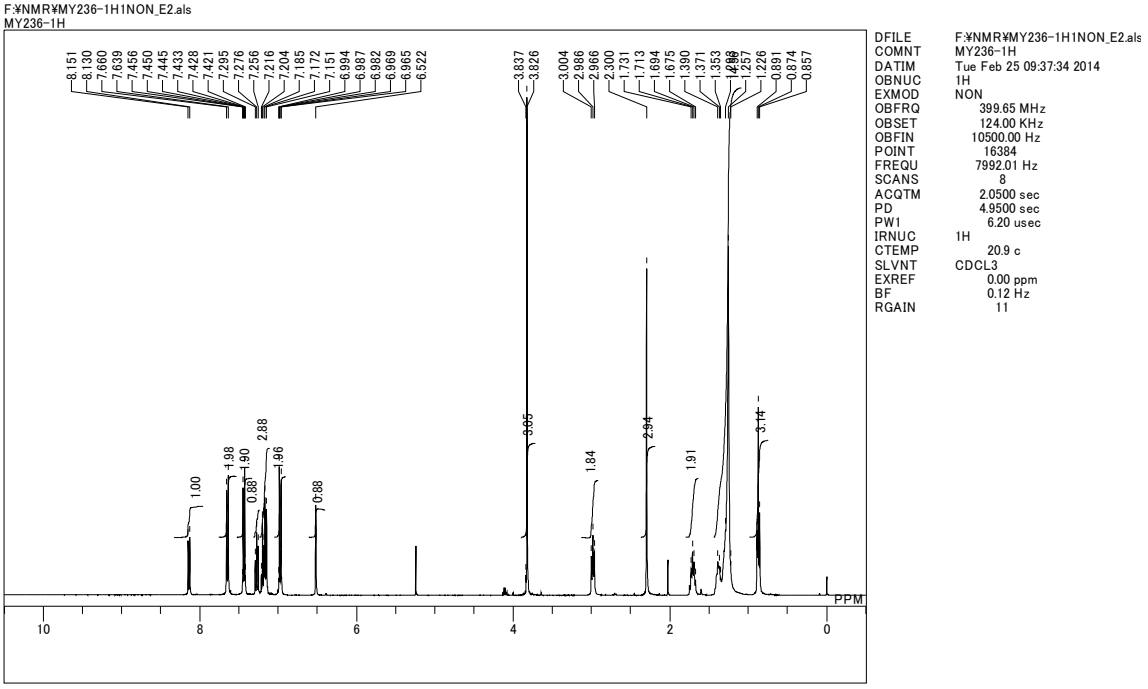
22

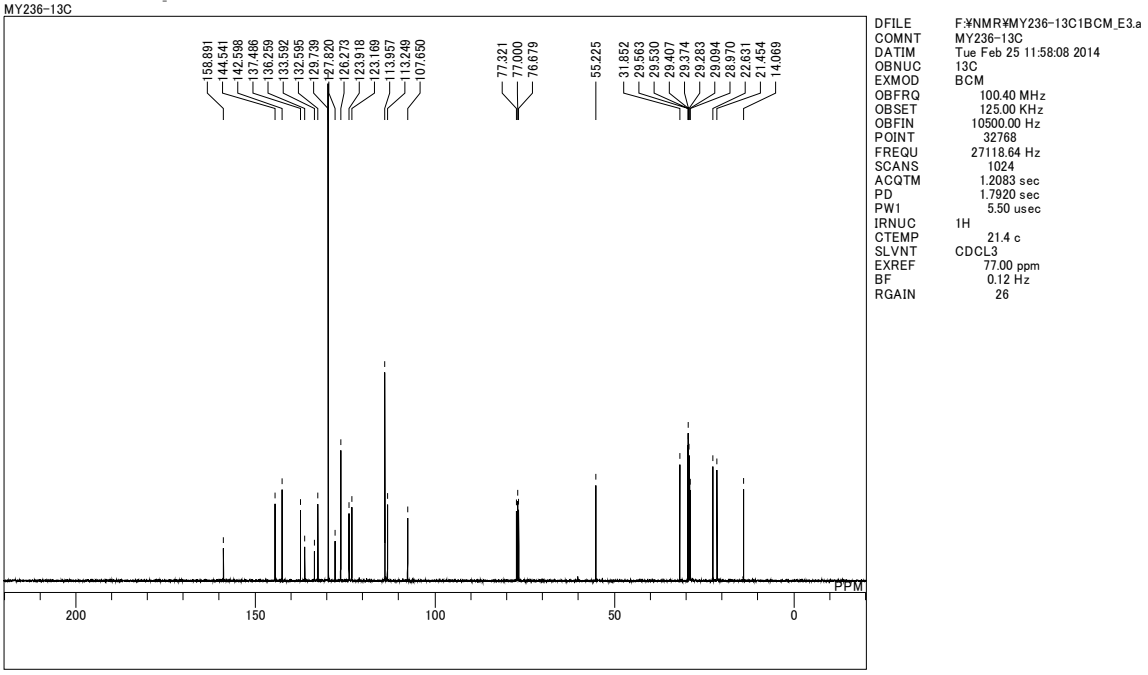

F:¥NMR¥MY257-1H1NON_E1.als
MY257-1H
8.284
8.263
7.443
7.436
7.431
7.416
7.406
7.394
7.390
7.372
7.351
7.312
7.290
7.270
7.267
7.251
7.234
7.046
7.026
6.960
6.952
6.948
6.939
6.930
6.917
6.653
3.854
3.809
2.267
1.268
0.000
4.55
3.74
2.77
1.80
1.00
0.92
2.35
2.31
2.87
PPM
10
8
6
4
2
0
DFILE F:¥NMR¥MY257-1H1NON_E1.als
COMNT MY257-1H
DATIM Tue Feb 25 10:02:37 2014
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.00 Hz
POINT 16384
FREQU 7992.01 Hz
SCANS 8
ACQTM 2.0500 sec
PD 4.9500 sec
PW1 6.20 usec
IRNUC 1H
CTEMP 20.9 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 0.12 Hz
RGAIN 13

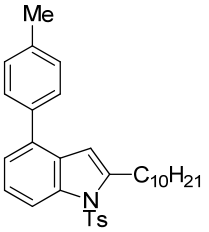

F:¥NMR¥MY257-13C1BCM_E4.als
MY257-13C
159.928
158.965
144.451
141.923
138.424
134.761
134.053
132.316
131.599
129.772
129.714
129.179
128.611
126.775
124.741
124.725
123.852
114.945
113.973
112.886
112.154
77.321
77.000
76.679
55.266
55.241
21.454
PPM
200
150
100
50
0
DFILE F:¥NMR¥MY257-13C1BCM_E4.a
COMNT MY257-13C
DATIM Tue Feb 25 12:54:33 2014
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.00 Hz
POINT 32768
FREQU 27118.64 Hz
SCANS 1024
ACQTM 1.2083 sec
PD 1.7920 sec
PW1 5.50 usec
IRNUC 1H
CTEMP 21.5 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 0.12 Hz
RGAIN 28


OMe
$C_{10}H_{21}$
N
Ts

23


F:¥NMR¥MY236-1H1NON_E2.als
MY236-1H
8.151
8.130
7.660
7.639
7.456
7.450
7.445
7.433
7.428
7.421
7.295
7.276
7.256
7.216
7.204
7.185
7.172
7.151
6.994
6.987
6.982
6.969
6.965
6.522
3.837
3.826
3.004
2.986
2.966
2.300
1.731
1.713
1.694
1.675
1.390
1.371
1.353
1.257
1.226
0.891
0.874
0.857
1.00
1.98
1.90
0.68
2.88
1.96
0.88
3.65
1.84
2.94
1.91
3.14
PPM
10
8
6
4
2
0
DFILE F:¥NMR¥MY236-1H1NON_E2.als
COMNT MY236-1H
DATIM Tue Feb 25 09:37:34 2014
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.00 Hz
POINT 16384
FREQU 7992.01 Hz
SCANS 8
ACQTM 2.0500 sec
PD 4.9500 sec
PW1 6.20 usec
IRNUC 1H
CTEMP 20.9 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 0.12 Hz
RGAIN 11


F:¥NMR¥MY236-13C1BCM_E3.als
MY236-13C
158.891
144.541
142.598
137.486
136.259
133.592
132.595
129.739
127.820
126.273
123.918
123.169
113.957
113.249
107.650
77.321
77.000
76.679
55.225
31.852
29.563
29.530
29.407
29.374
29.283
29.094
28.970
22.631
21.454
14.069
PPM
200
150
100
50
0
DFILE F:¥NMR¥MY236-13C1BCM_E3.a
COMNT MY236-13C
DATIM Tue Feb 25 11:58:08 2014
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.00 Hz
POINT 32768
FREQU 27118.64 Hz
SCANS 1024
ACQTM 1.2083 sec
PD 1.7920 sec
PW1 5.50 usec
IRNUC 1H
CTEMP 21.4 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 0.12 Hz
RGAIN 26



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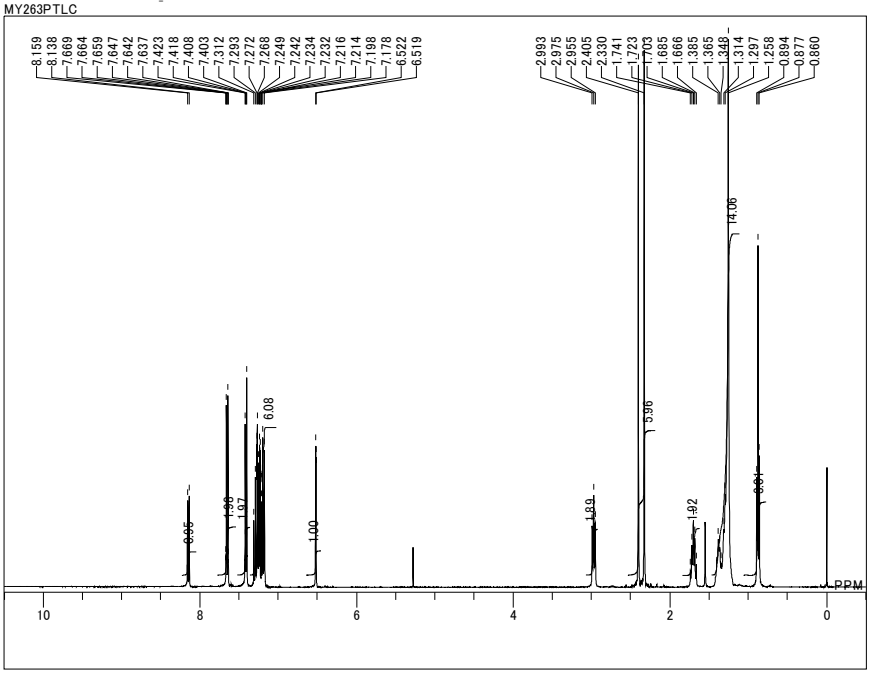
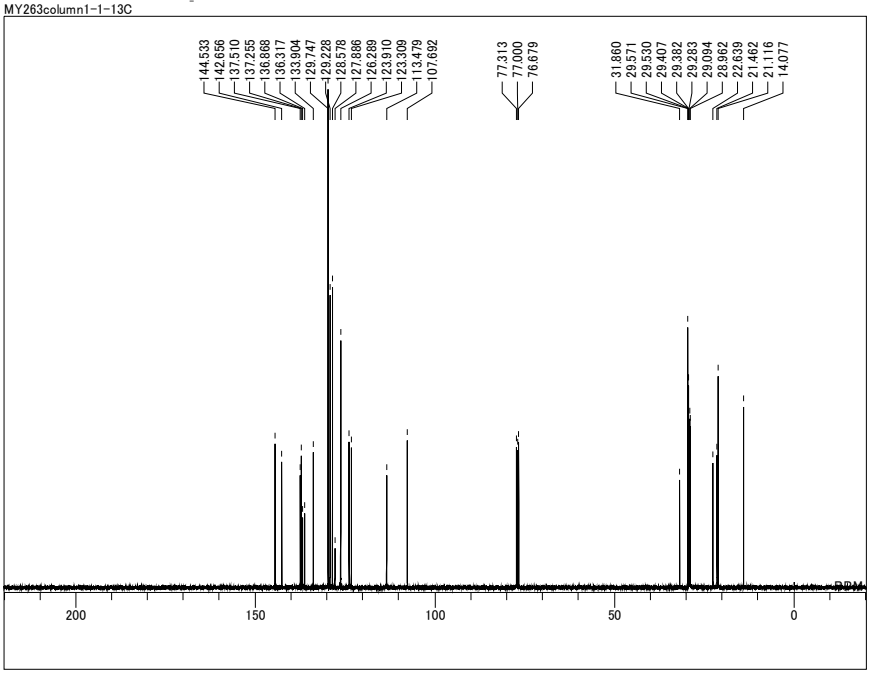
F:¥NMR¥MY263-3-11NON_E1.als
MY263PTLC

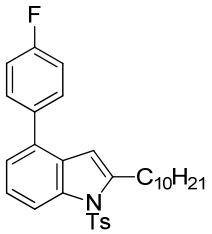


DFILE	F:¥NMR¥MY263-3-11NON_E1.al
COMNT	MY263PTLC
DATIM	Sat Sep 21 11:41:13 2013
OBNUC	1H
EXMOD	NON
OBFRQ	399.65 MHz
OBSET	124.00 KHz
OBFIN	10500.00 Hz
POINT	16384
FREQU	7992.01 Hz
SCANS	8
ACQTM	2.0500 sec
PD	4.9500 sec
PW1	6.20 usec
IRNUC	1H
CTEMP	22.1 c
SLVNT	CDCL3
EXREF	0.00 ppm
BF	0.12 Hz
RGAIN	12

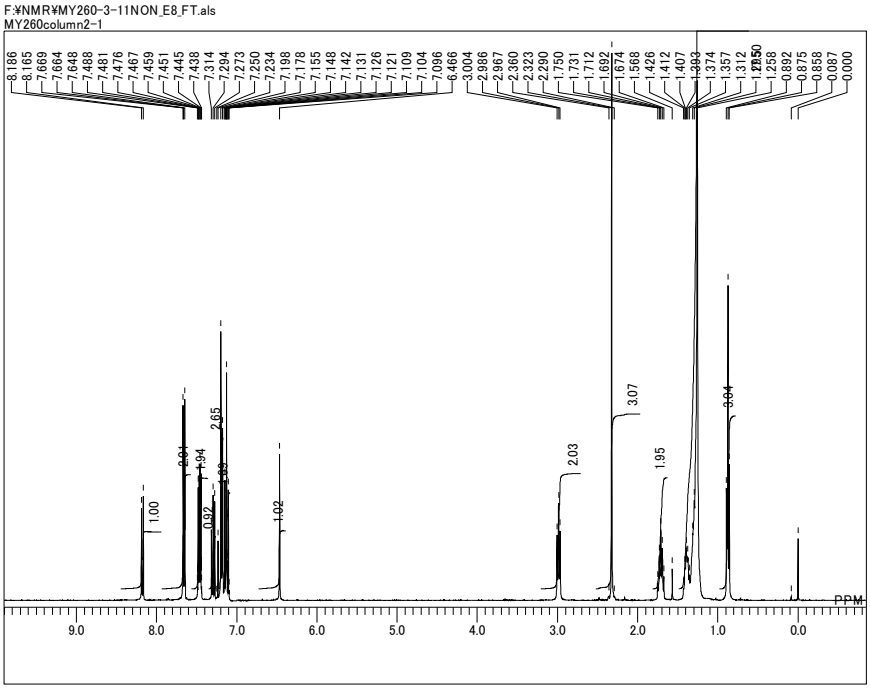
F:¥NMR¥MY263-2-1-13C1BCM_E1.als
MY263column1-1-13C

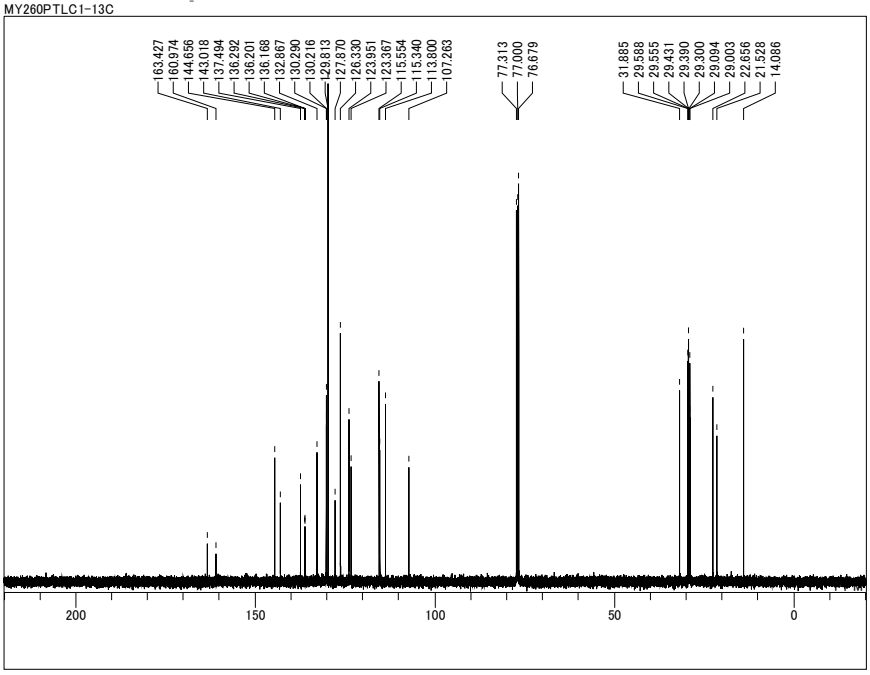


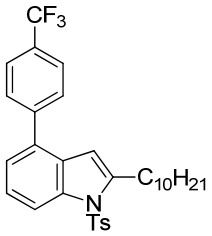
DFILE	F:¥NMR¥MY263-2-1-13C1BCM
COMNT	MY263column1-1-13C
DATIM	Fri Sep 20 10:56:06 2013
OBNUC	13C
EXMOD	BCM
OBFRQ	100.40 MHz
OBSET	125.00 KHz
OBFIN	10500.00 Hz
POINT	32768
FREQU	27118.64 Hz
SCANS	512
ACQTM	1.2083 sec
PD	1.7920 sec
PW1	5.50 usec
IRNUC	1H
CTEMP	23.7 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	0.12 Hz
RGAIN	26


F
$C_{10}H_{21}$
N
Ts

25


F:¥NMR¥MY260-3-11NON_E8_FT.als
MY260column2-1
8.186
8.165
7.669
7.664
7.648
7.488
7.481
7.476
7.467
7.459
7.451
7.445
7.438
7.314
7.294
7.273
7.250
7.234
7.198
7.178
7.155
7.148
7.142
7.131
7.126
7.121
7.109
7.104
7.096
6.466
3.004
2.986
2.967
2.360
2.323
2.290
1.750
1.731
1.712
1.692
1.674
1.568
1.426
1.412
1.407
1.383
1.374
1.357
1.312
1.258
0.892
0.875
0.858
0.087
0.000
1.00
2.01
1.94
2.65
0.92
0.89
1.02
2.03
3.07
1.95
3.04
PPM
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
DFILE F:¥NMR¥MY260-3-11NON_E8_F
COMNT MY260column2-1
DATIM Thu Sep 19 15:37:13 2013
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.00 Hz
POINT 16384
FREQU 7992.01 Hz
SCANS 8
ACQTM 2.0500 sec
PD 4.9500 sec
PW1 6.20 usec
IRNUC 1H
CTEMP 21.3 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 0.12 Hz
RGAIN 11


F:¥NMR¥MY260-4-1-13C1BCM_E4.als
MY260PTLC1-13C
163.427
160.974
144.656
143.018
137.494
136.292
136.201
136.168
132.867
130.290
130.216
129.813
127.870
126.330
123.951
123.367
115.554
115.340
113.800
107.263
77.313
77.000
76.679
31.885
29.588
29.555
29.431
29.390
29.300
29.094
29.003
22.656
21.528
14.086
200
150
100
50
0
DFILE F:¥NMR¥MY260-4-1-13C1BCM
COMNT MY260PTLC1-13C
DATIM Fri Sep 20 10:16:46 2013
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.00 Hz
POINT 32768
FREQU 27118.64 Hz
SCANS 512
ACQTM 1.2083 sec
PD 1.7920 sec
PW1 5.50 usec
IRNUC 1H
CTEMP 23.6 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 0.12 Hz
RGAIN 27



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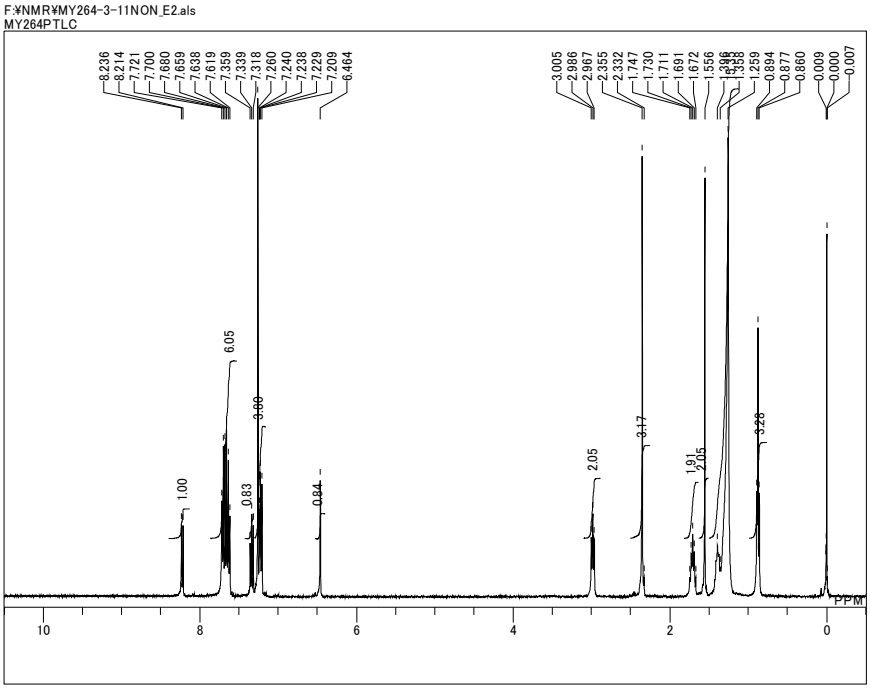
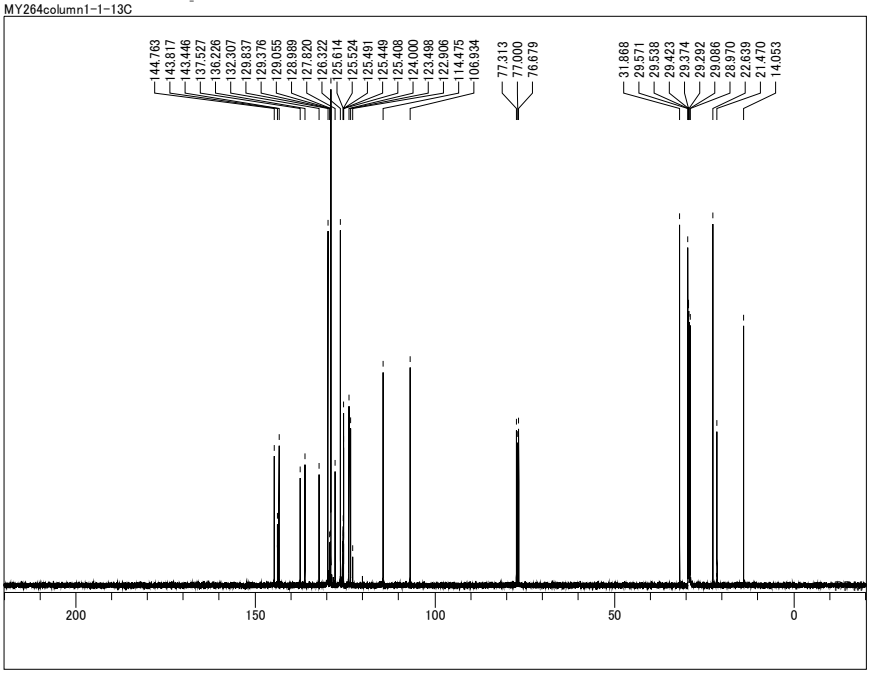
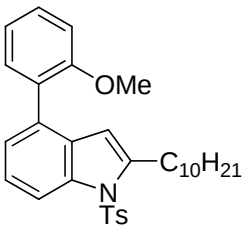


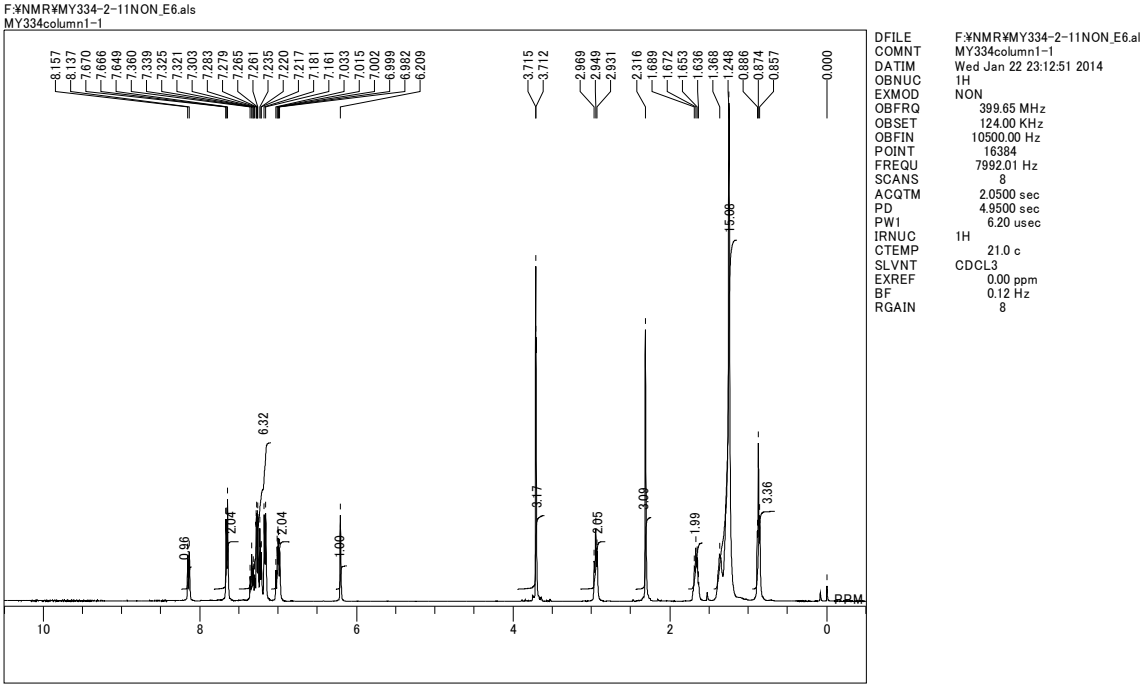
DFILE	F:¥NMR¥MY264-3-11NON_E2.al
COMNT	MY264PTLC
DATIM	Sat Sep 21 11:46:11 2013
OBNUC	1H
EXMOD	NON
OBFRQ	399.65 MHz
OBSET	124.00 KHz
OBFIN	10500.00 Hz
POINT	16384
FREQU	7992.01 Hz
SCANS	8
ACQTM	2.0500 sec
PD	4.9500 sec
PW1	6.20 usec
IRNUC	1H
CTEMP	22.0 c
SLVNT	CDCL3
EXREF	0.00 ppm
BF	0.12 Hz
RGAIN	17

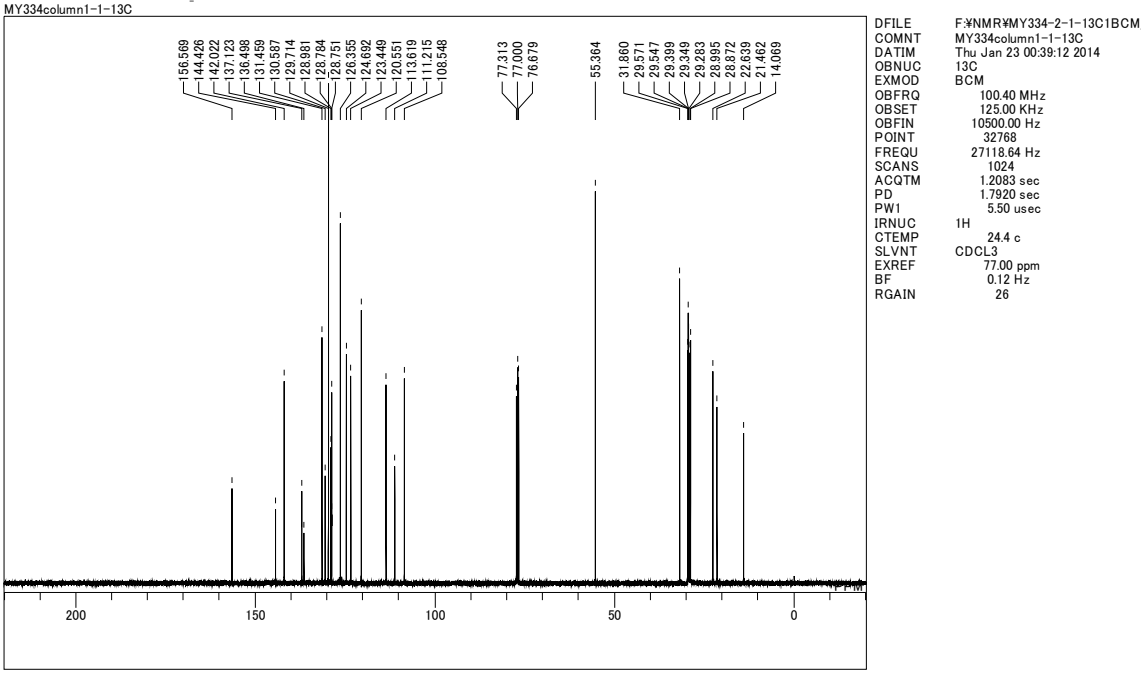


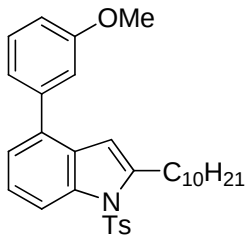
DFILE	F:¥NMR¥MY264-2-1-13C1BCM
COMNT	MY264column1-1-13C
DATIM	Fri Sep 20 12:54:28 2013
OBNUC	13C
EXMOD	BCM
OBFRQ	100.40 MHz
OBSET	125.00 KHz
OBFIN	10500.00 Hz
POINT	32768
FREQU	27118.64 Hz
SCANS	512
ACQTM	1.2083 sec
PD	1.7920 sec
PW1	5.50 usec
IRNUC	1H
CTEMP	23.6 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	0.12 Hz
RGAIN	27


OMe
$C_{10}H_{21}$
N
Ts

27


F:¥NMR¥MY334-2-11NON_E6.als
MY334column1-1
8.157
8.137
7.670
7.666
7.649
7.360
7.339
7.325
7.321
7.303
7.283
7.279
7.265
7.261
7.235
7.220
7.217
7.181
7.161
7.033
7.015
7.002
6.999
6.982
6.209
3.715
3.712
2.969
2.949
2.931
2.316
1.689
1.672
1.653
1.636
1.368
1.248
0.886
0.874
0.857
0.000
15.00
6.32
3.36
3.09
3.17
2.05
2.04
2.04
1.99
1.00
0.96
PPM
10
8
6
4
2
0
DFILE F:¥NMR¥MY334-2-11NON_E6.al
COMNT MY334column1-1
DATIM Wed Jan 22 23:12:51 2014
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.00 Hz
POINT 16384
FREQU 7992.01 Hz
SCANS 8
ACQTM 2.0500 sec
PD 4.9500 sec
PW1 6.20 usec
IRNUC 1H
CTEMP 21.0 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 0.12 Hz
RGAIN 8


F:¥NMR¥MY334-2-1-13C1BCM_E11.als
MY334column1-1-13C
156.569
144.426
142.022
137.123
136.498
131.459
130.587
129.714
128.981
128.784
128.751
126.355
124.692
123.449
120.551
113.619
111.215
108.548
77.313
77.000
76.679
55.364
31.860
29.571
29.547
29.399
29.349
29.283
28.995
28.872
22.639
21.462
14.069
PPM
200
150
100
50
0
DFILE F:¥NMR¥MY334-2-1-13C1BCM
COMNT MY334column1-1-13C
DATIM Thu Jan 23 00:39:12 2014
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.00 Hz
POINT 32768
FREQU 27118.64 Hz
SCANS 1024
ACQTM 1.2083 sec
PD 1.7920 sec
PW1 5.50 usec
IRNUC 1H
CTEMP 24.4 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 0.12 Hz
RGAIN 26


OMe
$C_{10}H_{21}$
N
Ts

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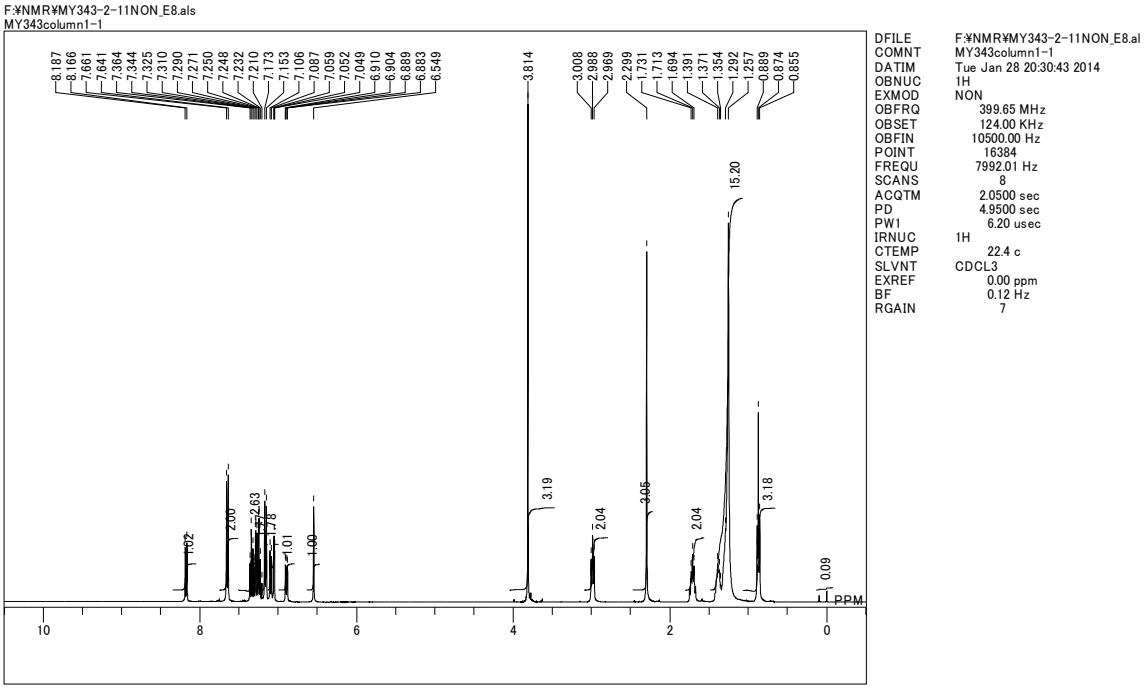
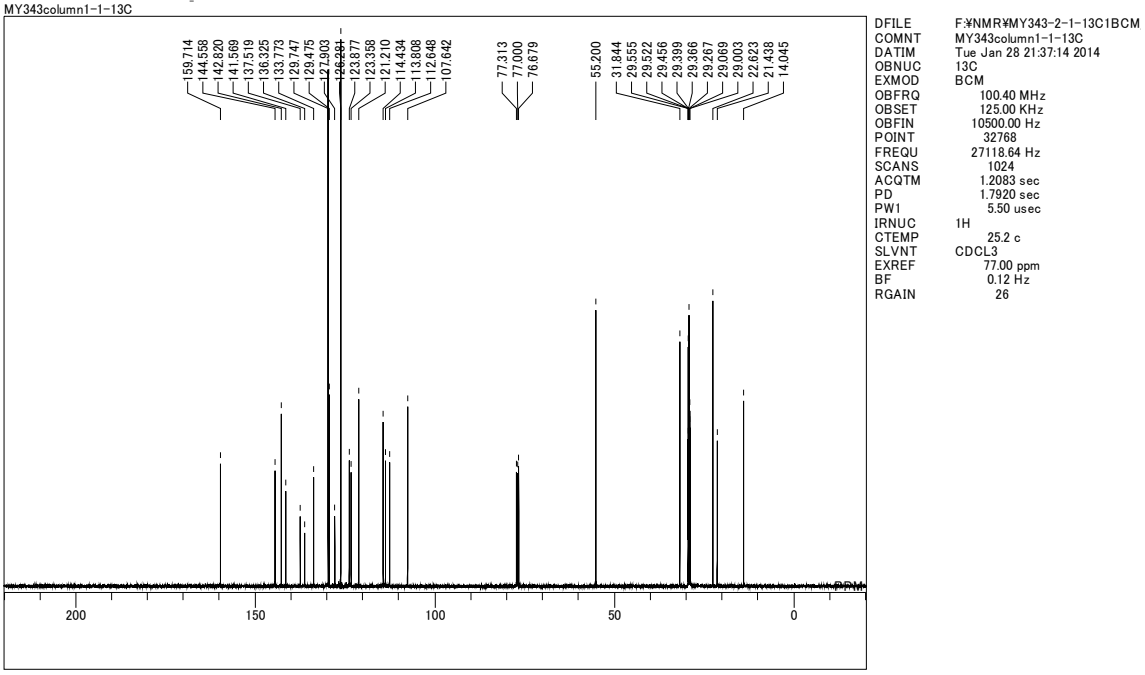
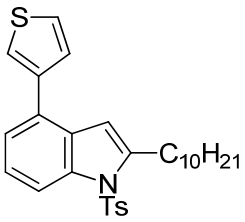

F:¥NMR¥MY343-2-11NON_E8.als
MY343column1-1
8.187
8.166
7.661
7.641
7.364
7.344
7.325
7.310
7.290
7.271
7.250
7.248
7.232
7.210
7.173
7.153
7.106
7.087
7.059
7.052
7.049
6.910
6.904
6.889
6.883
6.549
3.814
3.008
2.988
2.969
2.299
1.731
1.713
1.694
1.391
1.371
1.354
1.292
1.257
0.889
0.874
0.855
15.20
3.19
2.04
3.05
2.04
3.18
0.09
1.02
2.00
2.63
1.78
1.01
1.00
PPM
10
8
6
4
2
0
DFILE F:¥NMR¥MY343-2-11NON_E8.al
COMNT MY343column1-1
DATIM Tue Jan 28 20:30:43 2014
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.00 Hz
POINT 16384
FREQU 7992.01 Hz
SCANS 8
ACQTM 2.0500 sec
PD 4.9500 sec
PW1 6.20 usec
IRNUC 1H
CTEMP 22.4 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 0.12 Hz
RGAIN 7


F:¥NMR¥MY343-2-1-13C1BCM_E1.als
MY343column1-1-13C
159.714
144.558
142.820
141.569
137.519
136.325
133.773
129.747
129.475
127.903
126.281
123.877
123.358
121.210
114.434
113.808
112.648
107.642
77.313
77.000
76.679
55.200
31.844
29.555
29.522
29.456
29.399
29.366
29.267
29.069
29.003
22.623
21.438
14.045
PPM
200
150
100
50
0
DFILE F:¥NMR¥MY343-2-1-13C1BCM
COMNT MY343column1-1-13C
DATIM Tue Jan 28 21:37:14 2014
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.00 Hz
POINT 32768
FREQU 27118.64 Hz
SCANS 1024
ACQTM 1.2083 sec
PD 1.7920 sec
PW1 5.50 usec
IRNUC 1H
CTEMP 25.2 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 0.12 Hz
RGAIN 26



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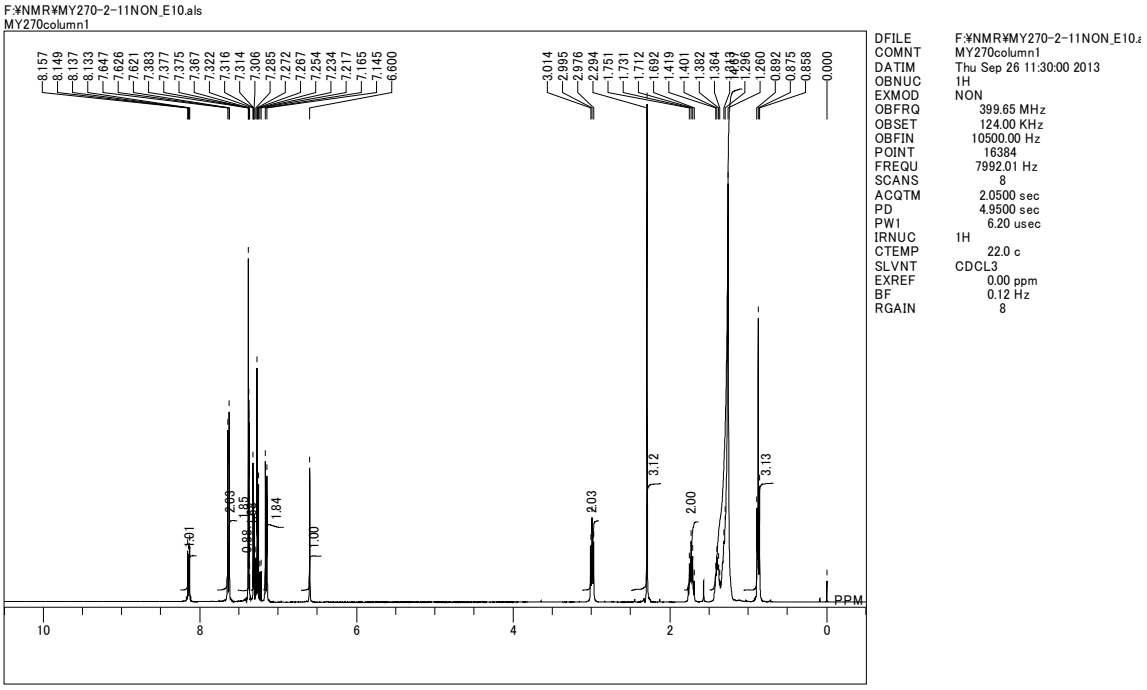
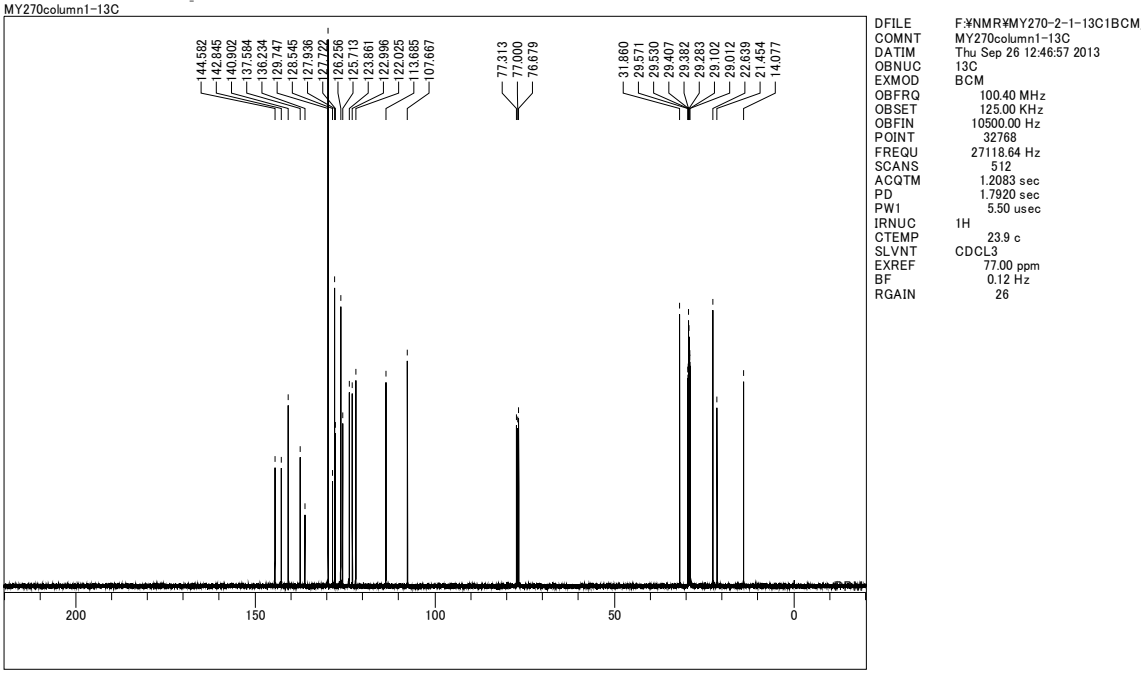
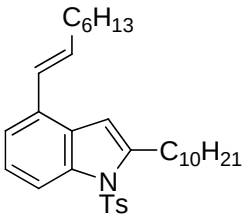


DFILE	F:¥NMR¥MY270-2-11NON_E10.a
COMNT	MY270column1
DATIM	Thu Sep 26 11:30:00 2013
OBNUC	1H
EXMOD	NON
OBFRQ	399.65 MHz
OBSET	124.00 KHz
OBFIN	10500.00 Hz
POINT	16384
FREQU	7992.01 Hz
SCANS	8
ACQTM	2.0500 sec
PD	4.9500 sec
PW1	6.20 usec
IRNUC	1H
CTEMP	22.0 c
SLVNT	CDCL3
EXREF	0.00 ppm
BF	0.12 Hz
RGAIN	8



DFILE	F:¥NMR¥MY270-2-1-13C1BCM
COMNT	MY270column1-13C
DATIM	Thu Sep 26 12:46:57 2013
OBNUC	13C
EXMOD	BCM
OBFRQ	100.40 MHz
OBSET	125.00 KHz
OBFIN	10500.00 Hz
POINT	32768
FREQU	27118.64 Hz
SCANS	512
ACQTM	1.2083 sec
PD	1.7920 sec
PW1	5.50 usec
IRNUC	1H
CTEMP	23.9 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	0.12 Hz
RGAIN	26


C6H13
C10H21
N
Ts

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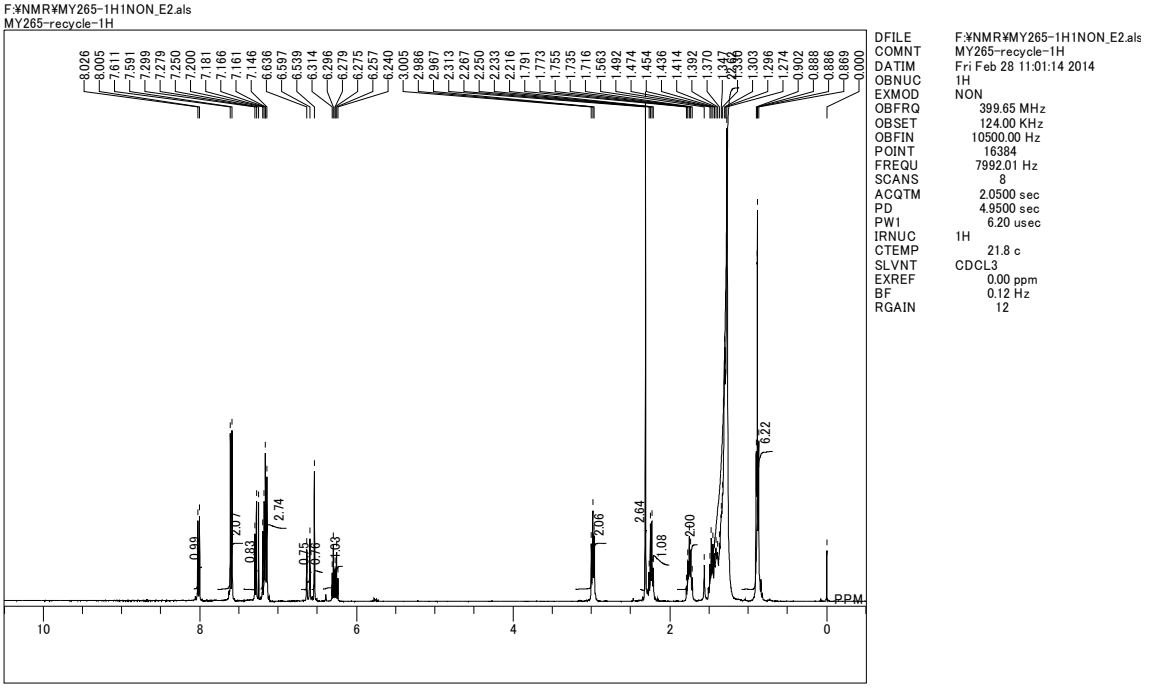
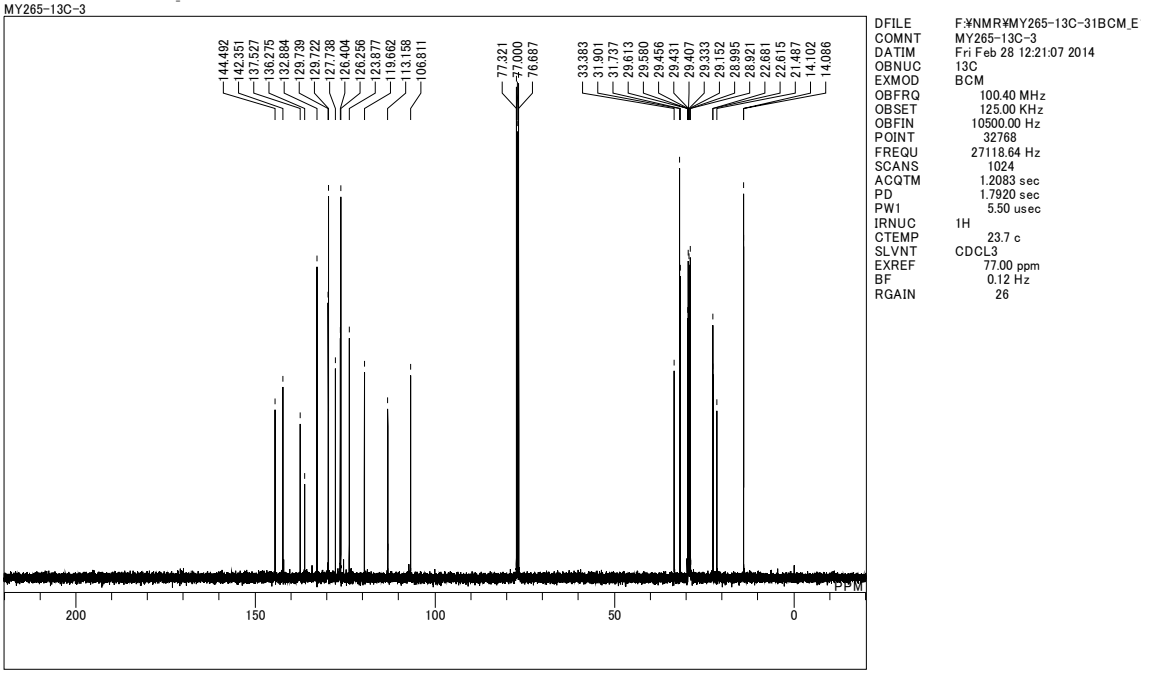
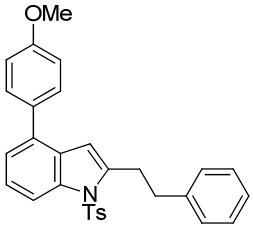

F:¥NMR¥MY265-1H1NON_E2.als
MY265-recycle-1H
8.026
8.005
7.611
7.591
7.299
7.279
7.250
7.200
7.181
7.166
7.161
7.146
6.636
6.597
6.539
6.314
6.296
6.279
6.275
6.257
6.240
3.005
2.986
2.967
2.313
2.267
2.250
2.233
2.216
1.791
1.773
1.755
1.735
1.716
1.563
1.492
1.474
1.454
1.436
1.414
1.392
1.370
1.347
1.303
1.296
1.274
0.902
0.888
0.886
0.869
0.000
0.99
2.17
0.83
2.74
0.75
0.78
1.83
2.06
2.64
1.08
2.00
6.22
PPM
10
8
6
4
2
0
DFILE F:¥NMR¥MY265-1H1NON_E2.als
COMNT MY265-recycle-1H
DATIM Fri Feb 28 11:01:14 2014
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.00 Hz
POINT 16384
FREQU 7992.01 Hz
SCANS 8
ACQTM 2.0500 sec
PD 4.9500 sec
PW1 6.20 usec
IRNUC 1H
CTEMP 21.8 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 0.12 Hz
RGAIN 12


F:¥NMR¥MY265-13C-31BCM_E1.als
MY265-13C-3
144.492
142.351
137.527
136.275
132.884
129.739
129.722
127.738
126.404
126.256
123.877
119.662
113.158
106.811
77.321
77.000
76.687
33.383
31.901
31.737
29.613
29.580
29.456
29.431
29.407
29.333
29.152
28.995
28.921
22.681
22.615
21.487
14.102
14.086
PPM
200
150
100
50
0
DFILE F:¥NMR¥MY265-13C-31BCM_E
COMNT MY265-13C-3
DATIM Fri Feb 28 12:21:07 2014
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.00 Hz
POINT 32768
FREQU 27118.64 Hz
SCANS 1024
ACQTM 1.2083 sec
PD 1.7920 sec
PW1 5.50 usec
IRNUC 1H
CTEMP 23.7 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 0.12 Hz
RGAIN 26


OMe
N
Ts

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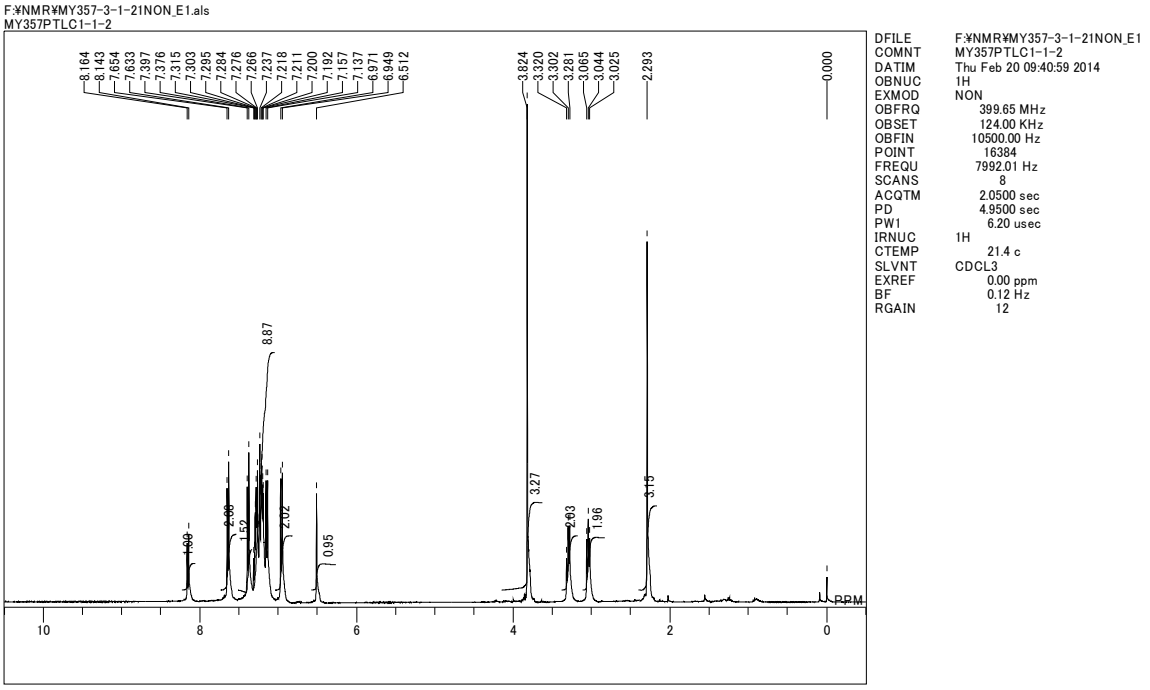
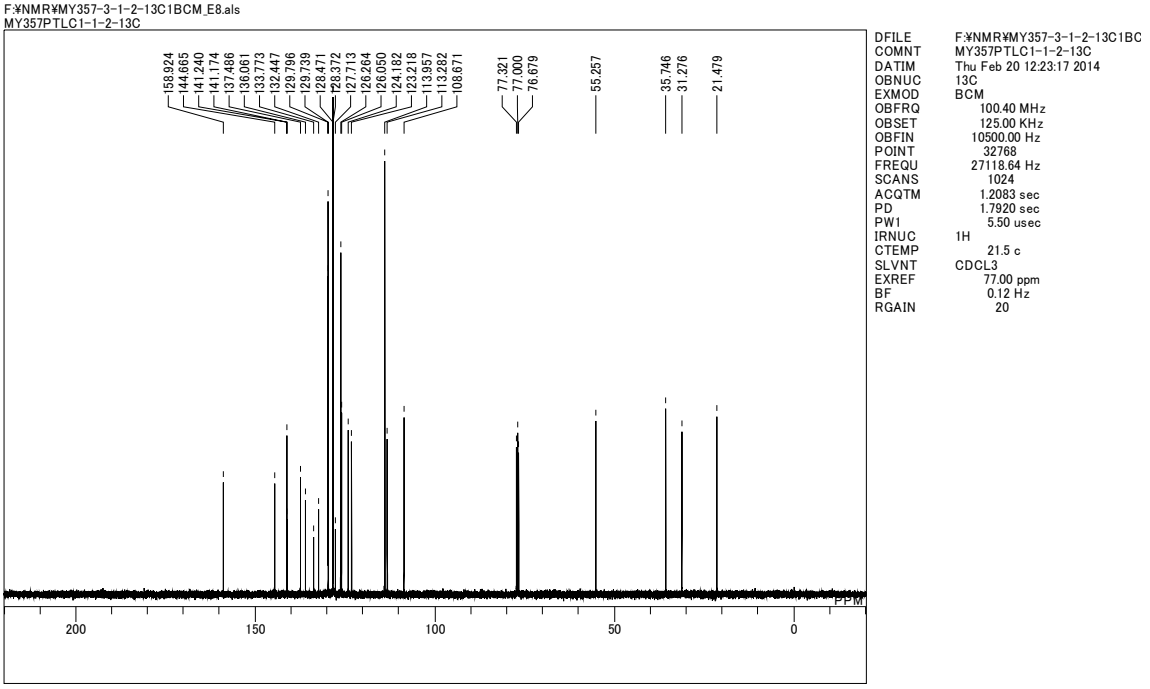

F:¥NMR¥MY357-3-1-21NON_E1.als
MY357PTLC1-1-2
8.164
8.143
7.654
7.633
7.397
7.376
7.315
7.303
7.295
7.284
7.276
7.266
7.237
7.218
7.211
7.200
7.192
7.157
7.137
6.971
6.949
6.512
3.824
3.320
3.302
3.281
3.065
3.044
3.025
2.293
0.000
8.87
3.27
3.15
2.03
2.00
2.02
1.96
1.52
0.95
1.00
PPM
10
8
6
4
2
0
DFILE F:¥NMR¥MY357-3-1-21NON_E1
COMNT MY357PTLC1-1-2
DATIM Thu Feb 20 09:40:59 2014
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.00 Hz
POINT 16384
FREQU 7992.01 Hz
SCANS 8
ACQTM 2.0500 sec
PD 4.9500 sec
PW1 6.20 usec
IRNUC 1H
CTEMP 21.4 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 0.12 Hz
RGAIN 12


F:¥NMR¥MY357-3-1-2-13C1BCM_E8.als
MY357PTLC1-1-2-13C
158.924
144.665
141.240
141.174
137.486
136.061
133.773
132.447
129.796
129.739
128.471
128.372
127.713
126.264
126.050
124.182
123.218
113.957
113.282
108.671
77.321
77.000
76.679
55.257
35.746
31.276
21.479
PPM
200
150
100
50
0
DFILE F:¥NMR¥MY357-3-1-2-13C1BC
COMNT MY357PTLC1-1-2-13C
DATIM Thu Feb 20 12:23:17 2014
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.00 Hz
POINT 32768
FREQU 27118.64 Hz
SCANS 1024
ACQTM 1.2083 sec
PD 1.7920 sec
PW1 5.50 usec
IRNUC 1H
CTEMP 21.5 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 0.12 Hz
RGAIN 20