Supplementary Materials for

Palladium-catalyzed selective oxidative amination of olefins with Lewis basic amines

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1. Materials and Methods

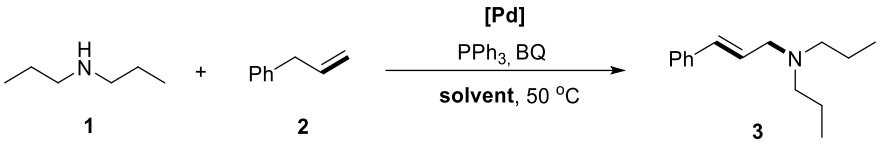
Materials. Toluene and tetrahydrofuran were distilled from sodium/benzophenone. Acetonitrile was distilled from phosphorus pentoxide. Other commercially available reagents were purchased and used without further purification. Analytical thin-layer chromatography was performed on 0.20 mm silica gel plates (GF_{254}) using UV light as a visualizing agent. Flash column chromatography was conducted using silica gel (200-300 mesh) with the indicated solvent system. All the reaction temperatures reported are oil bath temperatures.

Methods. NMR spectra were recorded with a Bruker AV 400 spectrometer at 400 MHz (^{1}H NMR), 100 MHz (^{13}C NMR) or a Bruker AV 500 spectrometer at 500 MHz (^{1}H NMR), 125 MHz (^{13}C NMR). Chemical shifts were reported in ppm from the solvent resonance as the internal reference ($CDCl_3$ δ_H = 7.26 ppm, downfield from TMS, δ_C = 77.0 ppm. Multiplicity was indicated as follows: s (singlet), d (doublet), t (triplet), q (quartet), m (multiplet). IR spectra were obtained as potassium bromide pellets between two potassium bromide pellets with a spectrometer. GC-MS was obtained using electron ionization. High Resolution Spectra (HRMS) were recorded on an IonSpec FTICR mass spectrometer with Electron Spray Ionization (ESI) resource.

2. Detailed Reaction Condition Optimization

2.1 Reaction condition optimization for amination of olefins with aliphatic amines

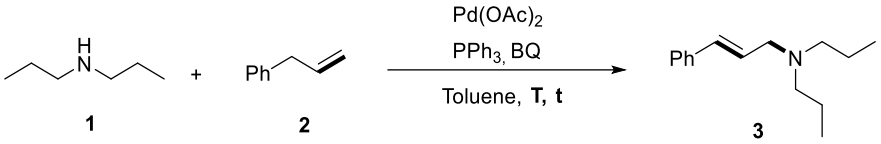
Table S1. Oxidative amination: optimization of palladium catalysts and solvents[a]



Entry	**[Pd]**	**solvent**	yield (%)
1	$PdCl_2$	DMSO	ND
2	$Pd(OAc)_2$	DMSO	43
3	$Pd(dba)_2$	DMSO	23
4	$Pd(MeCN)_2Cl_2$	DMSO	ND
5	$PdBr_2$	DMSO	Trace
6	$Pd(PPh_3)_4$	DMSO	30
7	$Pd(CF_3COO)_2$	DMSO	20
8	$Pd(OAc)_2$	DMF	ND
9	$Pd(OAc)_2$	Toluene	56
10	$Pd(OAc)_2$	THF	Trace
11	$Pd(OAc)_2$	MeCN	40
12	$Pd(OAc)_2$	DCE	Trace
13	$Pd(OAc)_2$	NMP	ND

[a.]Reaction conditions: allylbenzene (0.4 mmol), dipropylamine (0.2 mmol), [Pd] (15 mol %), PPh_3 (30 mol %), BQ (150 mol %), indicated solvent (2 mL), 24 h. The yields were determined by ^{1}H-NMR with CH_2Br_2 as an internal standard based on dipropylamine.

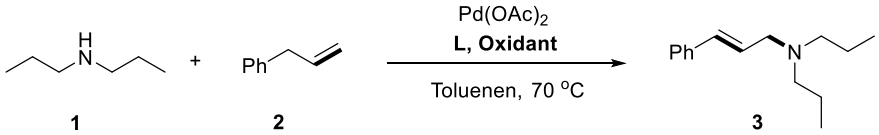
Table S2 | Oxidative amination: optimization of temperatures and time[a]

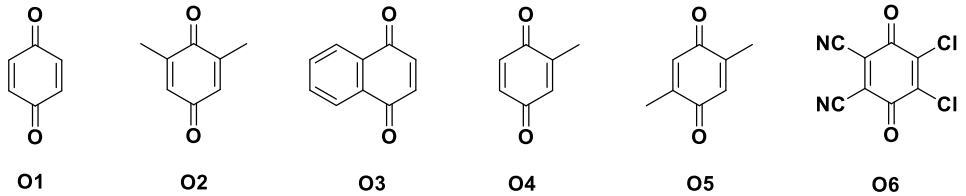


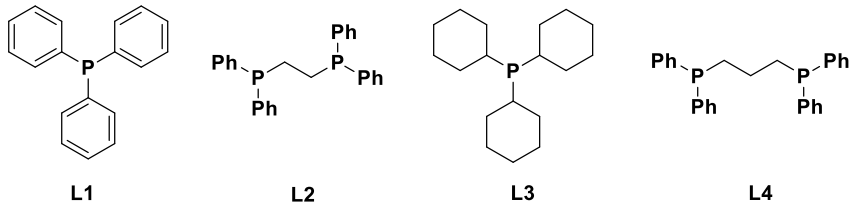
Entry	**T** (°C)	**time** (h)	yield (%)
1	30	24	22
2	40	24	43
3	50	24	55
4	60	24	58
5	70	24	60
6	80	24	59
7	70	18	50
8	70	15	49
9	70	10	30

[a.]Reaction conditions: allylbenzene (0.4 mmol), dipropylamine (0.2 mmol), $Pd(OAc)_2$ (15 mol %), PPh_3 (30 mol %), BQ (150 mol %), toluene (2 mL). The yields were determined by ^{1}H-NMR with CH_2Br_2 as an internal standard based on dipropylamine.

Table S3 | Oxidative amination: optimization of ligands and oxidants[a]



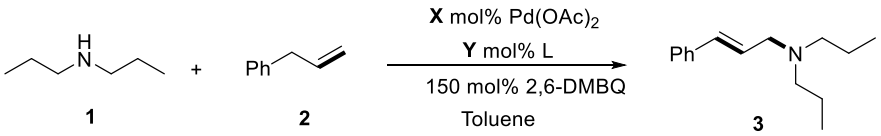




Yield (%) / [O] \ L	L1	L2	L3	L4
O1	60	12	20	45
O2	32	90	ND	82
O3	28	25	5	30
O4	58	22	ND	62
O5	38	80	8	82
O6	ND	ND	ND	ND

[a].Reaction conditions: allylbenzene (0.4 mmol), dipropylamine (0.2 mmol), $Pd(OAc)_2$ (15 mol %), L (30 mol %), oxidant (150 mol %), toluene (2 mL), 24 h. The yields were determined by ^{1}H-NMR with CH_2Br_2 as an internal standard based on dipropylamine.

Table S4 | Oxidative amination: optimization of atmosphere and the loading of $Pd(OAc)_2$ and ligand[a]

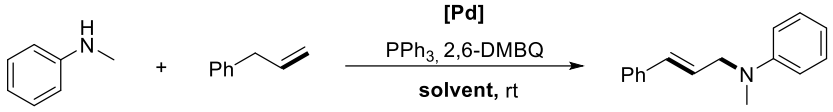


Entry	$Pd(OAc)_2$ (**X** mol%)	ligand (**Y** mol %)	atmosphere	yield (%)
1	15	L1 / 30	Air	90
2	10	L1 / 20	Air	69
3	5	L1 / 10	Air	20
4	5	L1 / 10	N_2	75
5	5	L2 / 10	Air	30
6	5	L2 / 10	N_2	98
7[b]	5	L2 / 10	N_2	97 (94)

[a.]Reaction conditions: allylbenzene (0.4 mmol), dipropylamine (0.2 mmol), $Pd(OAc)_2$ (X mol %), L (Y mol %), 2,6-DMBQ (150 mol %), toluene (2 mL), 70 °C, 24 h. The yields were determined by ^{1}H-NMR with CH_2Br_2 as an internal standard based on dipropylamine. [b.]allylbenzene (0.24 mmol). The isolated yield of **3** was given in parentheses. L1: 1,2-Bis(diphenylphosphino)ethane, L2: 1,3-Bis(diphenylphosphino)propane.

2.2 Reaction condition optimization for intermolecular amination of olefins with aromatic amines

Table S5 | Oxidative amination: optimization of palladium catalysts and solvents[a]

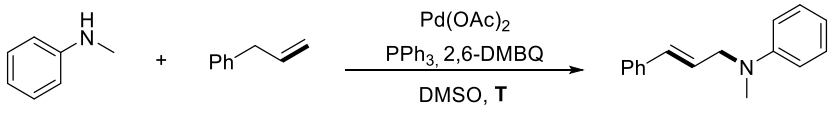


1 **2** **94**

Entry	**[Pd]**	**solvent**	yield (%)
1	$PdCl_2$	DMSO	ND
2	$Pd(OAc)_2$	DMSO	30
3	$Pd(dba)_2$	DMSO	25
4	$Pd(MeCN)_2Cl_2$	DMSO	Trace
5	$PdBr_2$	DMSO	ND
6	$Pd(PPh_3)_4$	DMSO	20
7	$Pd(CF_3COO)_2$	DMSO	12
8	$Pd(PPh_3)_2Cl_2$	DMSO	Trace
9	$Pd(MeCN)_2(BF_4)_2$	DMSO	Trace
10	$Pd(OAc)_2$	DMF	ND
11	$Pd(OAc)_2$	Toluene	16
12	$Pd(OAc)_2$	THF	Trace
13	$Pd(OAc)_2$	MeCN	Trace
14	$Pd(OAc)_2$	DCE	Trace
15	$Pd(OAc)_2$	NMP	ND

[a.]Reaction conditions: allylbenzene (0.4 mmol), *N*-methylaniline (0.2 mmol), [Pd] (10 mol %), PPh_3 (20 mol %), 2,6-DMBQ (20 mol %), indicated solvent (2 mL), 24 h. The yields were determined by ^{1}H-NMR with CH_2Br_2 as an internal standard based on *N*-methylaniline.

Table S6 | Oxidative amination: optimization of temperatures[a]



1 **2** **94**

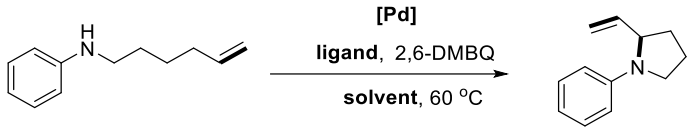
Entry	**T** (°C)	yield (%)
1	rt	30
2	40	68
3	45	75
4	50	78

5	55	92(90)
6	60	72
7	65	65
8	70	62
9	75	50

[a]·Reaction conditions: allylbenzene (0.4 mmol), *N*-methylaniline (0.2 mmol), $Pd(OAc)_2$ (10 mol %), PPh_3 (20 mol %), 2,6-DMBQ (20 mol %), DMSO (2 mL), 24 h. The yields were determined by ^{1}H-NMR with CH_2Br_2 as an internal standard based on *N*-methylaniline. The isolated yield of **94** was given in parentheses.

2.2 Reaction condition optimization for intramolecular amination

Table S7 | Oxidative amination: optimization of palladium catalysts, ligands and solvents[a]



118 119

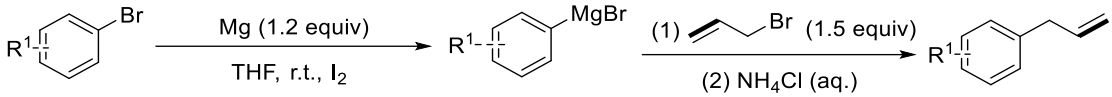
Entry	**[Pd]**	**ligand**	**solvent**	yield (%)
1	$Pd(OAc)_2$	DPPE	Toluene	35
2	$Pd(OAc)_2$	DPPE	DMSO	ND
3	$Pd(OAc)_2$	DPPE	DCM	15
4	$Pd(OAc)_2$	DPPE	THF	22
5	$Pd(OAc)_2$	DPPE	MTBE	40
6	$Pd(PPh_3)_4$	DPPE	MTBE	32
7	$Pd(CF_3COO)_2$	DPPE	MTBE	Trace
8	$Pd(PPh_3)_2Cl_2$	DPPE	MTBE	ND
9	$Pd(MeCN)_2(BF_4)_2$	DPPE	MTBE	Trace
10	$Pd(dba)_2$	DPPE	MTBE	59
11	$Pd(dba)_2$	DPPM	MTBE	15
12	$Pd(dba)_2$	DPPP	MTBE	62
13[b]	$Pd(dba)_2$	DPPP	MTBE	99(92)

[a]·Reaction conditions: amine (0.1 mmol), [Pd] (5 mol %), L (10 mol %), 2,6-DMBQ (150 mol %), indicated solvent (1 mL), 24 h. The yields were determined by ^{1}H-NMR with CH_2Br_2 as an internal standard based on amine. [b]·Under N_2 atmosphere. The isolated yield of **119** was given in parentheses. DPPM: 1,2-Bis(diphenylphosphino)mthane, DPPE: 1,2-Bis(diphenylphosphino)ethane, DPPP: 1,3-Bis(diphenylphosphino)propane.

3. Typical Procedures for the Synthesis of Olefines and *N*-Benzylamines

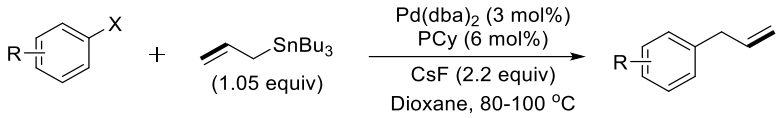
Olefines substrates **2a**, **2b**, **2d**, **2g**, **2h**, **2k**, **2n**, **2o**, **2p**, **2r**, **2v** were commercially available reagents. Olefines **2e**, **2f**, **2i**, **2j**, **2q** were synthesized through Grignard reaction. [S1] Olefines **2c**, **2l**, **2m** were synthesized through Stille reaction from aryl halide. [S2] Other olefin substrates **2s**, [S3] **2t**, [S4] **2u** [S5] were synthesized according to the reported literature procedure.

3.1.1 Grignard reaction for the synthesis of allylbenzenes



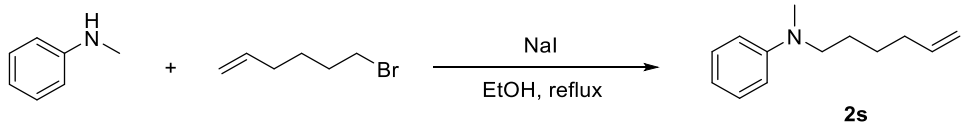
Aryl bromide (5 mmol) was reacted with magnesium (1.2 equiv) in 10 mL anhydrous THF using I_2 as initiator at room temperature. After the reaction was finished, the combined organics were added to the anhydrous THF solution of allyl bromide. After stirring for 1 h, NH_4Cl (aq.) was added to the reaction mixture, washing with water and then concentrated for further purification. Purification by column chromatography over silica gel (230-400 mesh) using petroleum ether as the eluent afforded pure allylarenes.

3.1.2 General procedure for the synthesis of allylbenzenes



In an oven-dried 10 mL Schlenk flask, $Pd(dba)_2$ (34.5 mg, 0.060 mmol, 0.03 equiv), PCy_3 (33.7 mg, 0.12 mmol, 0.06 equiv), CsF (668 mg, 4.40 mmol, 2.2 equiv) and aryl halide (2.00 mmol, 1 equiv) were dissolved in dioxane (2 mL) under argon atmosphere. Then allyltributyltin (644 μL, 2.10 mmol, 1.05 equiv) was added via syringe. The mixture was heated to 80-100 ℃ for 8-24 h. After complete consumption of aryl halide, the mixture was cooled to room temperature and diluted with saturated aqueous NH_4Cl solution (40 mL). The mixture was extracted with diethyl ether (2 x 40 mL). The combined organics were dried over $MgSO_4$, and the filtrate was concentrated under vacuum. The crude residue was purified by flash chromatography on silica gel to provide the pure products.

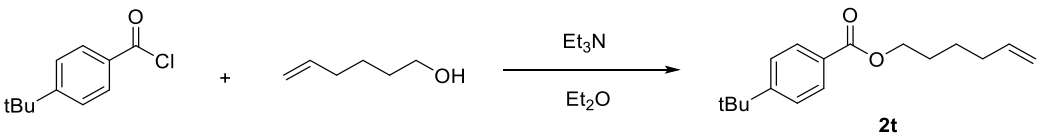
3.1.3 General procedure for the synthesis of alkene 2s



To a round bottle flask, *N*-methylaniline (5 mmol), 6-bromo-1-hexene (3 mmol) and NaI (0.1 mmol) were dissolved in ethanol (25 mL). The mixture was refluxed for 10 h and cooled to room temperature. Then, the mixture was diluted with water and extracted with ethyl acetate. The organic phase was dried over $MgSO_4$, filtered, and concentrated under vacuum. The crude residue was purified by flash column chromatography on silica gel to afford **2s** as yellow oil (0.28 g, 50% yield). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.36 – 7.15 (m, 2H), 6.81 – 6.67 (m, 3H), 5.97 – 5.74 (m, 1H), 5.16

– 4.92 (m, 2H), 3.47 – 3.29 (m, 2H), 2.97 (s, 3H), 2.14 (q, *J* = 7.2 Hz, 2H), 1.64 (p, *J* = 7.4 Hz, 2H), 1.48 (q, *J* = 7.8 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 149.3, 138.6, 129.1, 115.8, 114.6, 112.1, 52.6, 38.3, 33.6, 26.4, 26.1. HRMS: m/z (ESI) $[M+H]^+$ Calcd. for $C_{13}H_{20}N$, 190.1590; found, 190.1588.

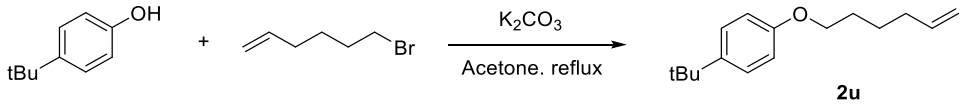
3.1.4 General procedure for the synthesis of alkene 2t



2t

Hex-5-en-1-ol (17 mmol, 1.0 equiv) and 4-*tert*-butylbenzoyl chloride (18 mmol, 1.1 equiv) were dissolved in diethyl ether (16 mL). NEt_3 (18 mmol, 1.1 equiv) was added slowly and the reaction mixture was stirred for 19 h. The reaction mixture was diluted with ethyl acetate and water, and the aqueous layer was extracted with ethyl acetate. The combined organic layers were washed with water and brine, dried over $MgSO_4$ and filtered. The solvent was removed in vacuo and the crude mixture was purified by column chromatography to afford **2t** as colorless oil (3.98 g, 90%). ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.00 (d, *J* = 8.6 Hz, 2H), 7.48 (d, *J* = 8.6 Hz, 2H), 5.85 (m, 1H), 5.09 – 4.97 (m, 2H), 4.34 (t, *J* = 6.6 Hz, 2H), 2.19 – 2.11 (m, 2H), 1.80 (m, 2H), 1.58 (tt, *J* = 10.0, 6.4 Hz, 2H), 1.36 (s, 9H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 166.7, 156.4, 138.4, 129.4, 127.7, 125.3, 114.8, 64.6, 35.0, 33.3, 31.1, 28.2, 25.3. HRMS: m/z (ESI) $[M+H]^+$ Calcd. for $C_{17}H_{25}O_2$, 261.1849; found, 261.1846.

3.1.5 Typical procedure for the synthesis of alkene 2u

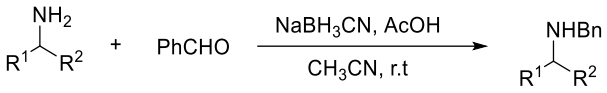


2u

To a round bottle flask, 4-*tert*-butylphenol (0.75 g, 5 mmol, 1 equiv), 6-bromo-1-hexene (0.98 g, 6 mmol, 1.2 equiv) and K_2CO_3 (1.38 g, 10 mmol, 2 equiv) were dissolved in acetone (50 mL). The mixture was refluxed for 14 h and cooled to room temperature. Then, the mixture was diluted with water and extracted with Et_2O. The organic phase was washed with brine, dried over $MgSO_4$, filtered, and concentrated under vacuum. The crude residue was purified by flash column chromatography on silica gel to afford **2u** as colorless oil (0.81 g, 70% yield). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.36 (d, *J* = 8.8 Hz, 2H), 6.91 (d, *J* = 8.8 Hz, 2H), 5.90 (m, 1H), 5.17 – 5.00 (m, 2H), 4.09 – 3.91 (m, 2H), 2.24 – 2.15 (m, 2H), 1.86 (dq, *J* = 8.4, 6.4 Hz, 2H), 1.64 (tt, *J* = 9.6, 6.4 Hz, 2H), 1.37 (s, 9H).

^{13}C NMR (100 MHz, $CDCl_3$) δ 156.8, 143.1, 138.5, 126.1, 114.7, 113.9, 67.6, 34.0, 33.4, 31.5, 28.8, 25.4. HRMS: m/z (ESI) $[M+H]^+$ Calcd. for $C_{16}H_{25}O$, 233.1900; found, 233.1898.

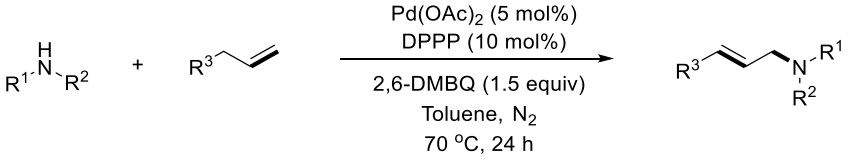
3.2 General procedure for the synthesis of *N*-benzylamines



N-benzylamines were prepared according to reported procedures. [S6] To a solution of benzaldehy (3 mmol) in 5 mL anhydrous CH_3CN, amine (9 mmol) was added and the resulting solution was stirred at room temperature under argon for 30 min. $NaBH_3CN$ (4.5 mmol) was then added followed 15 min later by acetic acid (2 mmol). The resulting turbid solution was then stirred at room temperature for 4 h. The reaction mixture was then diluted with dichloromethane (30 mL) and washed with 1M NaOH solution (2 × 25 mL). NaOH layer was extracted with dichloromethane (25 mL). Combined DCM layers were dried over anhydrous $MgSO_4$ and concentrated in vacuo to obtained crude product. Purification by flash chromatography over silica gel using EtOAc/Hexane (1:10) afforded the corresponding *N*-benzylamines.

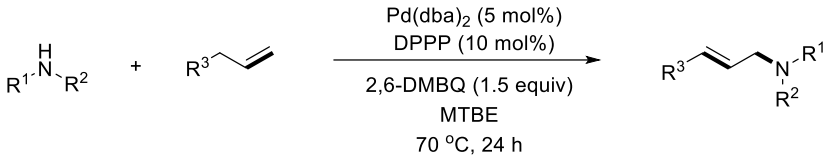
4. General Procedures for the Synthesis of Products

4.1 Procedure A for the synthesis of allylamines 3 to 59, 66 to 75.



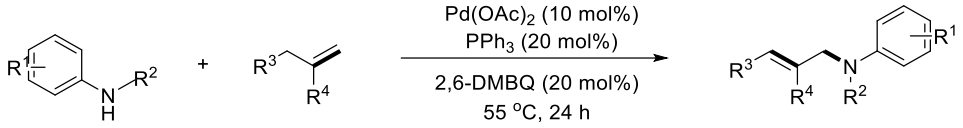
In a 25 mL sealed test tube charged with nitrogen, a mixture of olefins (0.24 mmol), amines (0.2 mmol), $Pd(OAc)_2$ (5 mol %), 2,6-DMBQ (1.5 equiv), DPPP (10 mol %) and 2 mL of toluene were vigorously stirred together at 70 °C for 24 h. After completion of the reaction and quenched by saturated brines, the mixture was extracted with ethyl acetate (3 × 10 mL). The combined ethyl acetate layer was then dried over anhydrous sodium sulfate and concentrated in vacuum. Further purification by flash column chromatography on silica gel (eluting with petroleum ether/ethyl acetate) afforded the pure products.

4.2 Procedure B for the synthesis of allylamines 60 to 65



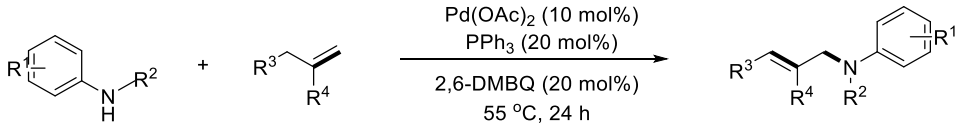
In a 25 mL sealed test tube charged with nitrogen, a mixture of olefin (0. 6 mmol), amine (0.2 mmol), $Pd(dba)_2$ (5 mol %), 2,6-DMBQ (1.5 equiv), DPPP (10 mol %) and 2 mL of MTBE were vigorously stirred together at 70 °C for 24 h. After completion of the reaction and quenched by saturated brines, the mixture was extracted with ethyl acetate (3 × 10 mL). The combined ethyl acetate layer was then dried over anhydrous sodium sulfate and concentrated in vacuum. Further purification by flash column chromatography on silica gel (eluting with petroleum ether/ethyl acetate) afforded the pure products.

4.3 Procedure C for the synthesis of allylamines 81 to 114



In a 25 mL sealed test tube charged with 1 atm O_2, a mixture of olefin (0.4 mmol), amine (0.2 mmol), $Pd(OAc)_2$ (10 mol %), 2,6-DMBQ (20 mol %), PPh_3 (20 mol %) and 2 mL of DMSO were vigorously stirred together at 55 °C for 24 h. After completion of the reaction and quenched by saturated brines, the mixture was extracted with ethyl acetate (3 × 10 mL). The combined ethyl acetate layer was then dried over anhydrous sodium sulfate and concentrated in vacuum. Further purification by flash column chromatography on silica gel (eluting with petroleum ether/ethyl acetate) afforded the pure products.

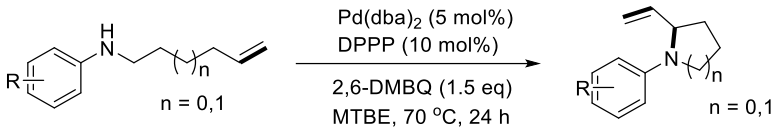
4.4 Procedure D for the synthesis of allylamines 115 to 117



In a 25 mL sealed test tube charged with 1 atm O_2, a mixture of olefin (0.4 mmol), amine (0.2 mmol), $Pd(OAc)_2$ (10 mol %), 2,6-DMBQ (20 mol %), PPh_3 (20 mol %) and 2 mL of anhydrous DMSO/DMA = 1 : 1 were vigorously stirred together at 55 °C for 24 h. After completion of the reaction and quenched by saturated brines, the mixture was extracted with ethyl acetate (3 ×10 mL). The combined ethyl acetate layer was then dried over anhydrous sodium sulfate and concentrated

in vacuum. Further purification by flash column chromatography on silica gel (eluting with petroleum ether/ethyl acetate) afforded the pure products.

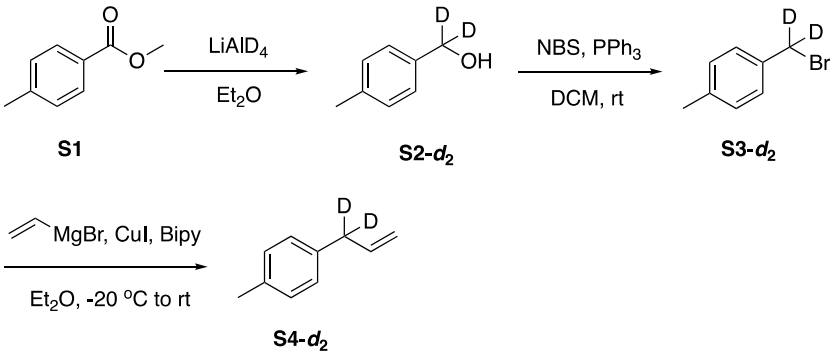
4.5 Procedure E for the synthesis of tetrahydropyrrole and piperidine derivatives 119 to 130



In a 25 mL sealed test tube charged with nitrogen, a mixture of amine (0.2 mmol), $Pd(dba)_2$ (5 mol %), 2,6-DMBQ (1.5 equiv), DPPP (10 mol %) and 2 mL of MTBE were vigorously stirred together at 70 °C for 24 h. After completion of the reaction and quenched by saturated brines, the mixture was extracted with ethyl acetate (3 × 10 mL). The combined ethyl acetate layer was then dried over anhydrous sodium sulfate and concentrated in vacuum. Further purification by flash column chromatography on silica gel (eluting with petroleum ether/ethyl acetate) afforded the pure products.

5. Kinetic Isotopic Effect Study

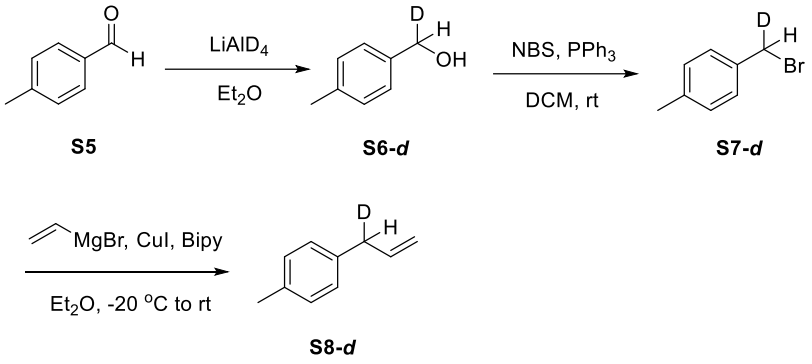
5.1 Synthesis of substrate S4-*d*$_2$ for isotopic effect study



According to the literature procedure [S7]: Under the N_2 atmosphere, the solution of **S1** (2.55 g, 17 mmol) in dry Et_2O (10 mL) was added to a suspension solution of $LiAlD_4$ (595 mg, 14 mmol) in dry Et_2O (20 mL). The mixture was stirred at room temperature for 4 h. After the reaction was completed, the wet THF was dropwise added to quench the reaction, followed by the addition of 1.4 mL 10% aqueous NaOH. The white solid was appeared, then filtered and dried by anhydrous $MgSO_4$. The solvent was removed by vacuum and the residue was purified by column chromatography to give **S2-*d*$_2$** (1.9 g, 91%).

To a solution of **S2-*d*$_2$** (1.86 g, 15 mmol), PPh_3 (4.9 g, 18 mmol) in 40 mL dry CH_2Cl_2, *N*-bromosuccinimide (NBS, 3.32 g, 18 mmol) was added with several potion at 0 ^oC. The mixture was stirred overnight at room temperature. After that, the petroleum ether (100 mL) was added to the mixed solution, and the solid was filtered through a short celite. The solvent was removed by vacuum, and the residue was purified by column chromatography to yield **S3-*d*$_2$** (2.0 g, 75% yield). To a solution of CuI (199 mg, 1 mmol), bipy (157 mg, 1 mmol) and **S3-*d*$_2$** (2.0 g, 11.2 mmol) in dry Et_2O (10 mL), the solution of vinylmagnesium bromide (7.5 mL 1.0 M in hexane) was slowly added at -10 ^oC under the N_2 atmosphere. The mixture was stirred at room temperature for 6 h. Then the reaction was quenched by the addition of water, and extracted by ether. The organic layer was dried by anhydrous $MgSO_4$ and filtered. After the solvent was removed, the residue was purified by column chromatography to give **S4-*d*$_2$** (98% D, 0.99 g, 66% yield); ^1H NMR (400 MHz, $CDCl_3$) δ 7.08 (s, 4H), 5.99 - 5.91 (m, 1H), 5.08 - 5.03 (m, 2H), 3.32 (s, 1H), 2.31 (s, 3H).

5.2 Synthesis of substrate S8-*d* for isotopic effect study



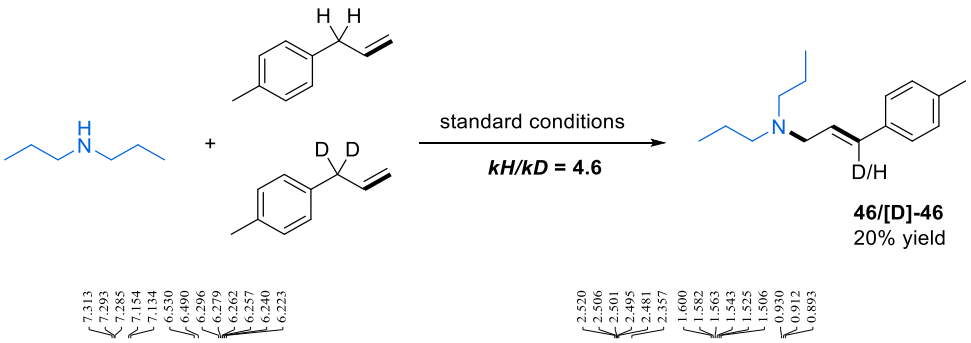
According to the literature procedure[S7]: Under the N_2 atmosphere, the solution of **S5** (2.04 g, 17 mmol) in dry Et_2O (10 mL) was added to a suspension solution of $LiAlD_4$ (595 mg, 14 mmol) in dry Et_2O (20 mL). The mixture was stirred at room temperature for 4 h. After the reaction was completed, the wet THF was dropwise added to quench the reaction, followed by the addition of 1.4 mL 10% NaOH aq. The white solid was appeared, then filtered and dried over anhydrous $MgSO_4$. The solvent was removed by vacuum and residue was purified by column chromatography to give **S6-*d*** (1.88 g 90%).

To a solution of **S6-*d*** (1.85 g, 15 mmol), PPh_3 (4.9 g, 18 mmol) in 40 mL dry CH_2Cl_2, *N*-bromosuccinimide (NBS, 3.32 g, 18 mmol) was added with several potion at 0 ^oC. The mixture was stirred overnight at room temperature. After that, the petroleum ether (100 mL) was added to the

mixture solution, and the solid was filtered through a short celite. The solvent was removed by vacuum, and the residue was purified by column chromatography to yield **S7-*d*** 2.0 g (75% yield). To a solution of CuI (199 mg, 1 mmol), bipy (157 mg, 1 mmol) and **S7-*d*** (2.0 g, 11.2 mmol) in dry Et_2O (10 mL), the solution of vinylmagnesium bromide (7.5 mL 1.0 M in hexane) was slowly added at -10 °C under the N_2 atmosphere. The mixture was stirred at room temperature for 6 h. Then the reaction was quenched by addition water, and extracted by ether. The organic layer was dried by anhydrous $MgSO_4$ and filtered. After removed solvent, the residue was purified by column chromatography to give **S8-*d*** (98% D, 0.98 g, 66% yield); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.08 (s, 4H), 5.98 - 5.91 (m, 1H), 5.09 - 5.03 (m, 2H), 2.31 (s, 3H).

5.3 Procedures of determination of isotopic effect

Intermolecular isotopic effect. Following the general procedures and reacting for 1 h. Starting from dipropylamine (20.2 mg, 0.2 mmol), **S4** (31.7 mg, 0.24 mmol) and **S4-*d*$_2$** (32.2 mg, 0.24 mmol) to afford **46** and **46-*d***. The products were isolated and applied to ^{1}H NMR spectrum. The kinetic isotopic effect (k_H/k_D) was determined to be KIE = 4.6.



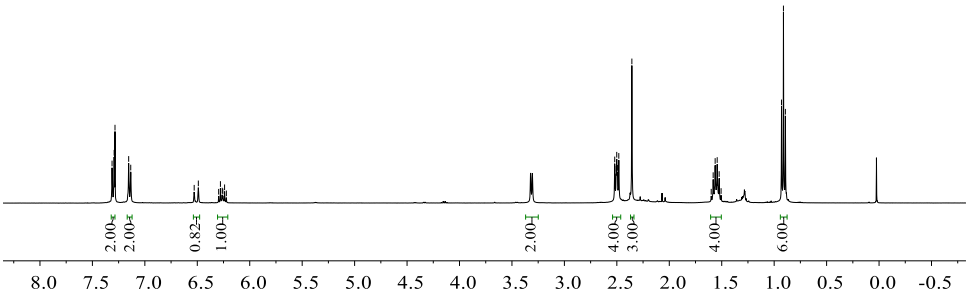


Fig S1. ^{1}H NMR spectrum of products **46** and **46-*d***.

Intramolecular isotopic effect. Following the general procedures and reacting for 20 h. Starting from dipropylamine (20.2 mg, 0.2 mmol) and **S8-*d*** (31.9 mg, 0.24 mmol) to afford **46** and **46-*d***. The products were isolated and applied to ^{1}H NMR spectrum. The kinetic isotopic effect (k_H/k_D) was determined to be KIE = 2.8.

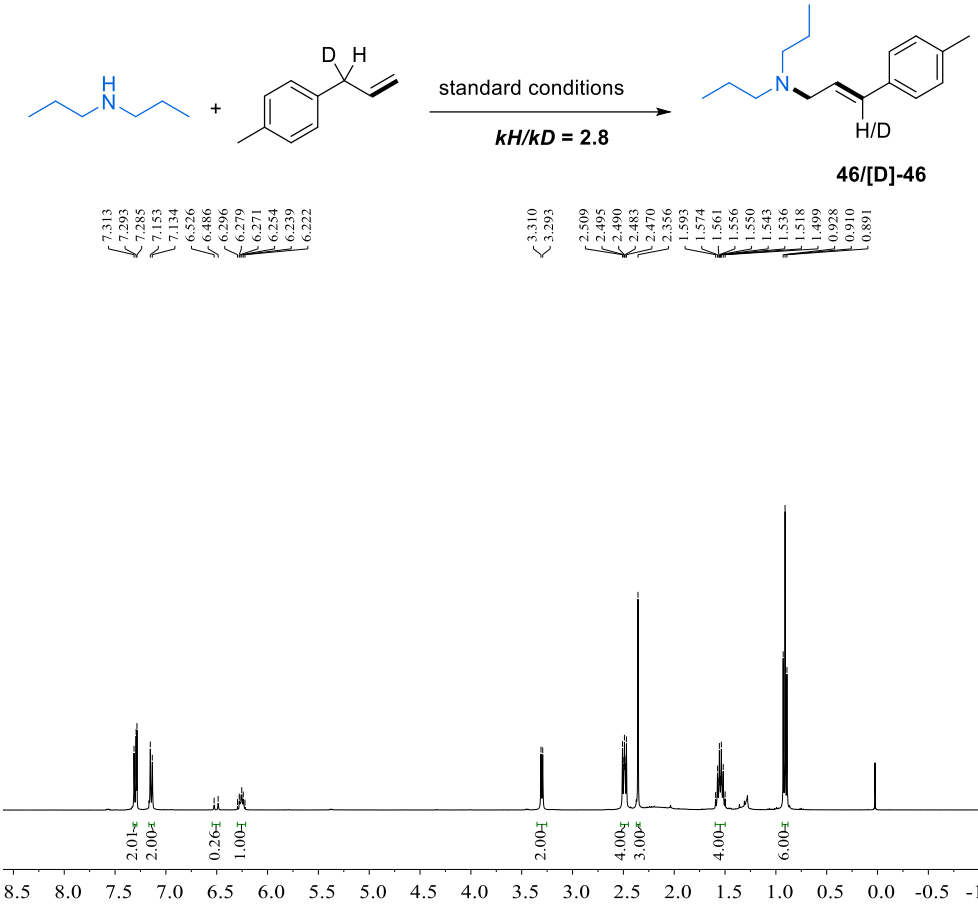


Fig S2. ^{1}H NMR spectrum of products **46** and **46-*d***.

6. Hammett Study

To better understand the reaction mechanism, a Hammett study was conducted. Initial rate kinetics were obtained for substrates **S9**–**S13**, and these rates were compared against one another.

$Pd(OAc)_2$ (0.06 mmol, 13.44 mg), 2,6-DMBQ (1.8 mmol, 244.8 mg) and DPPP (0.12 mmol, 47.8mg) were dissolved in 6 mL toluene. Subsequently, 1.0 mL of the solution was added to six test tubes charged with N_2 respectively. Then 1.0 mL of toluene, olefin (0.24 mmol) and dipropylamine (0.2 mmol) were added to each test tube. The reaction was heated and stirred at 70 ^{o}C for the appropriate

time. The yields were determined by ^{1}H-NMR with CH_2Br_2 as an internal standard based on dipropylamine.

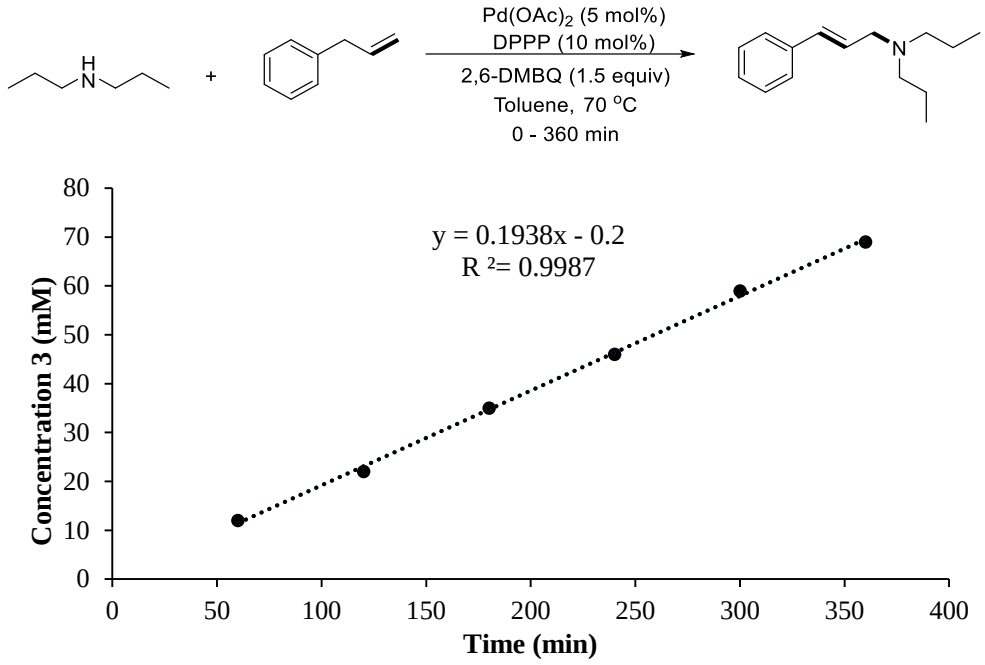


Fig S3. Initial rate for **S9.**

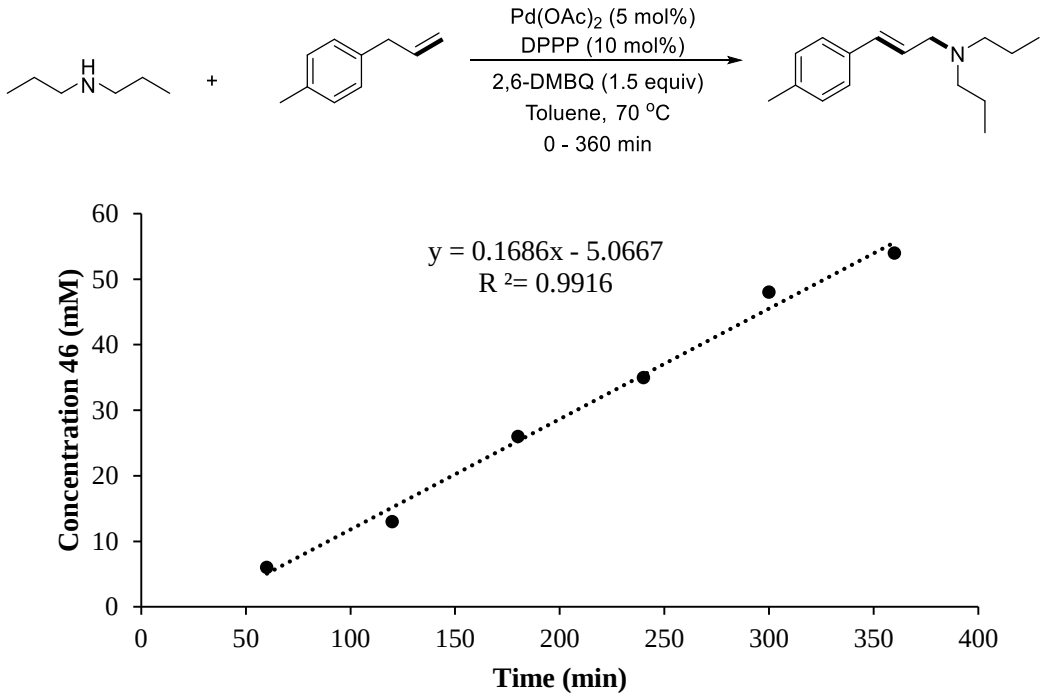


Fig S4. Initial rate for **S10.**

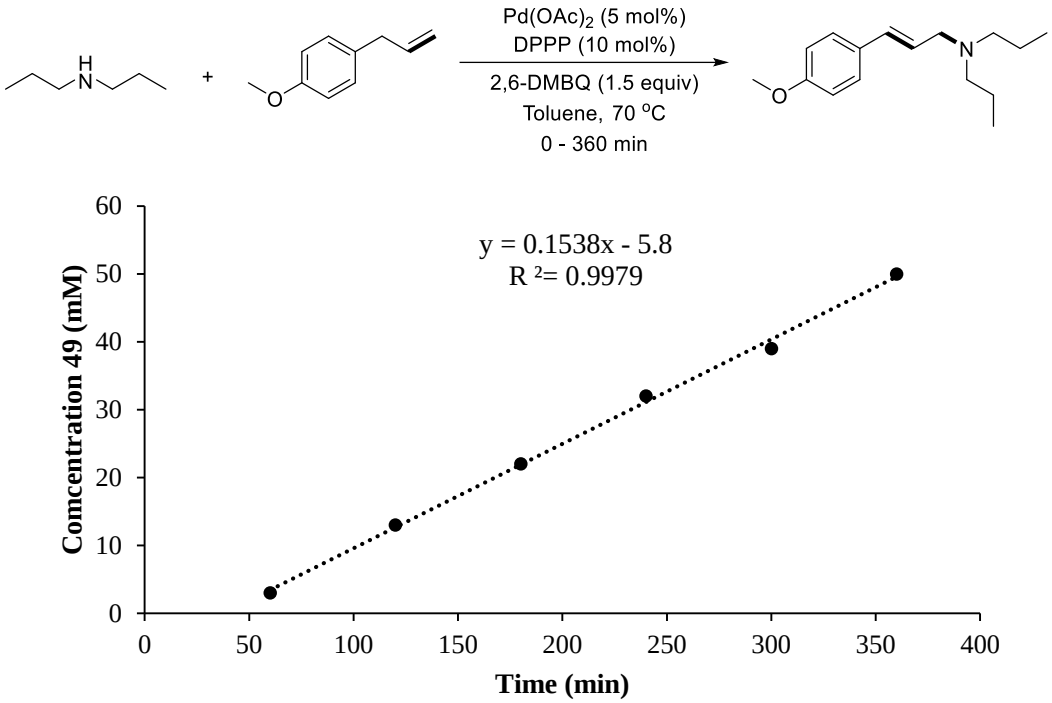


Fig S5. Initial rate for **S11.**

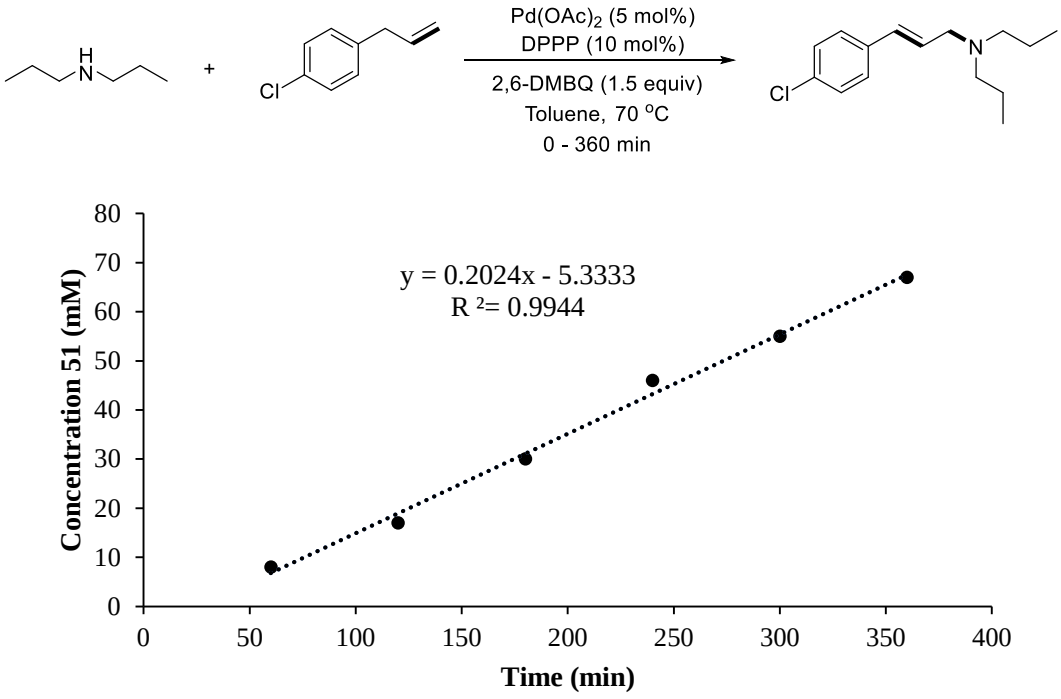


Fig S6. Initial rate for **S12.**

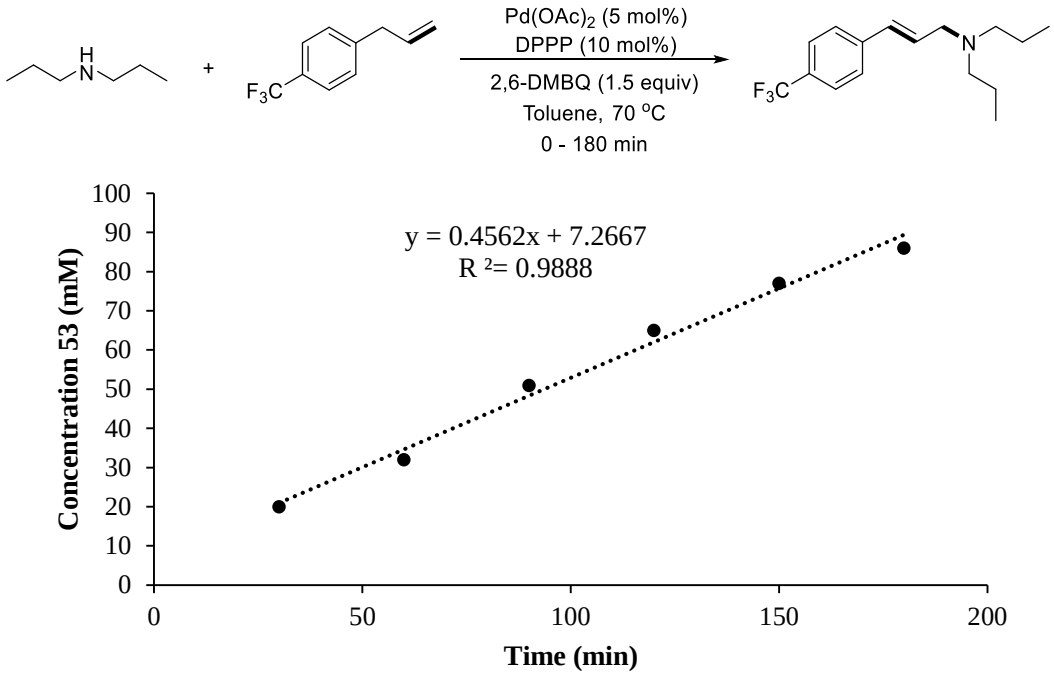


Fig S7. Initial rate for **S13.**

R	σ_R	$\log_{10}(k_R/k_H)$
H	**0.00**	**0.0000**
4-Me	**-0.17**	**-0.0604**
4-OMe	**-0.27**	**-0.1004**
4-Cl	**0.23**	**0.01886**
4-CF_3	**0.54**	**0.3718**

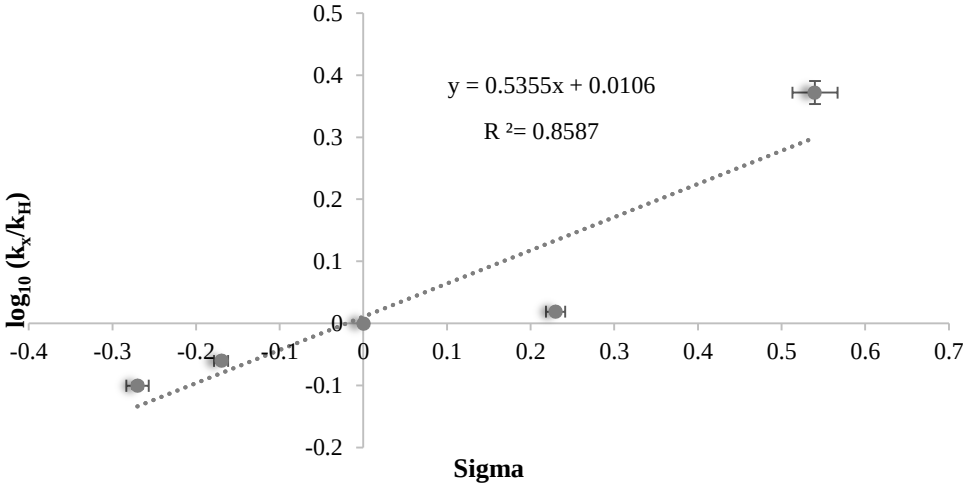
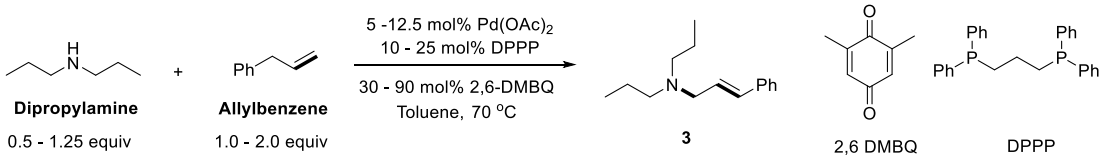


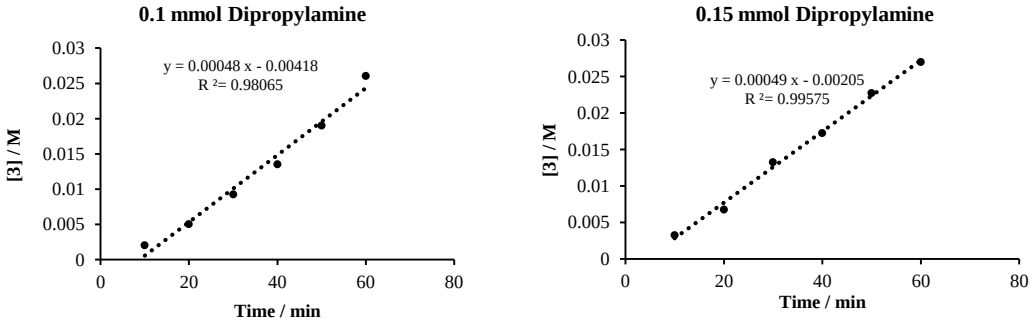
Fig S8. Hammett plot for series **S9-S13.**

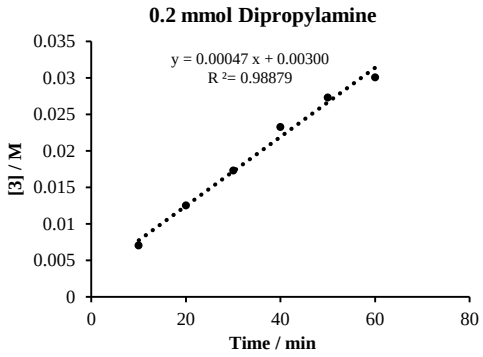
7. Reagent Order Determination

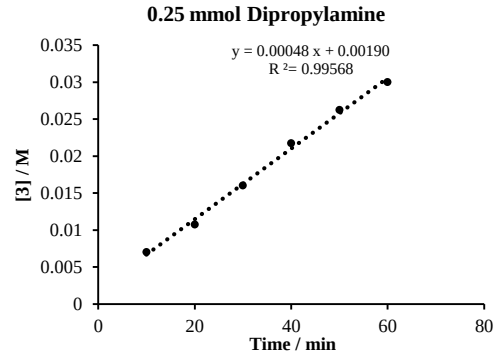


Order in Dipropylamine

The order in dipropylamine was determined using the generally amounts of allylbenzene (0.4 mmol, 53 μL) and dipropylamine (from 0.1 mmol to 0.25 mmol), and a stock solution was prepared of $Pd(OAc)_2$ (0.18 mmol, 40.3 mg), 2,6-DMBQ (1.8 mmol, 244.8 mg) and DPPP (0.36 mmol, 148.5 mg) in 6 mL toluene. Subsequently, 1.0 mL of the solutions were added to six test tubes respectively. Then 1.0 mL of toluene was added to each test tube and the reaction was heated and stirred at 70 °C for the appropriate time. The yields were determined by ^{1}H-NMR with CH_2Br_2 as an internal standard based on dipropylamine.







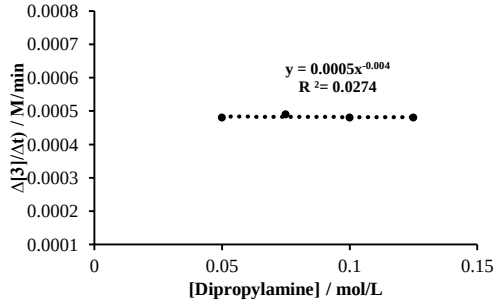


Fig S9. Dependence of the reaction rate on concentration of dipropylamine.

Order in Allylbenzene

The order in allylbenzene was determined using the generally amounts of allylbenzene (from 0.2 mmol to 0.4 mmol) and dipropylamine (0.2 mmol), and a stock solution was prepared of $Pd(OAc)_2$ (0.18 mmol, 40.3 mg), 2,6-DMBQ (1.8 mmol, 244.8 mg) and DPPP (0.36 mmol, 148.5 mg) in 6 mL toluene. Subsequently, 1.0 mL of the solutions were added to six test tubes respectively. Then 1.0 mL of toluene was added to each test tube and the reaction was heated and stirred at 70 °C for the appropriate time. The yields were determined by ^{1}H-NMR with CH_2Br_2 as an internal standard based on dipropylamine.

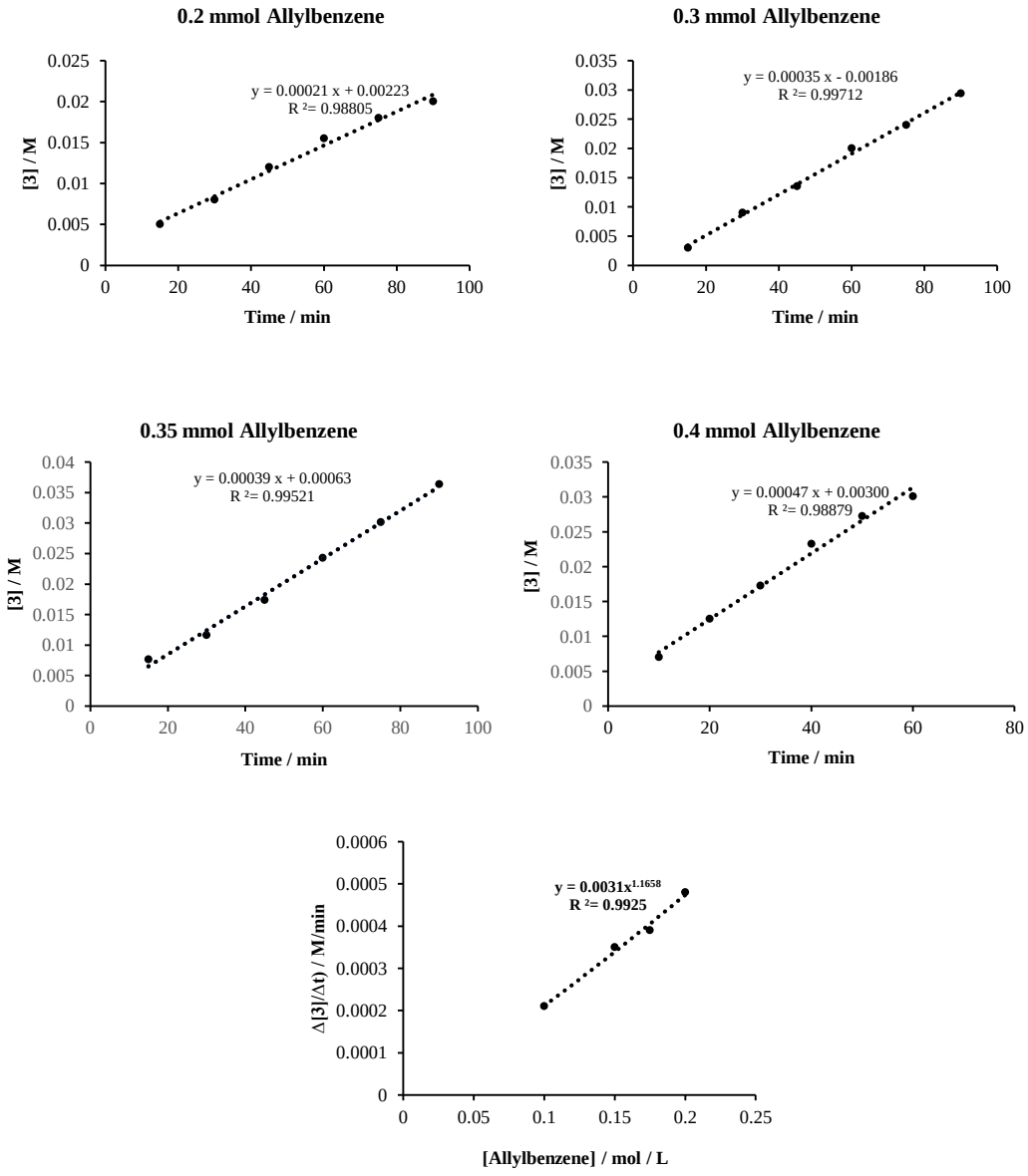


Fig S10. Dependence of the reaction rate on concentration of Allylbenzene.

Order in $Pd(OAc)_2$

The order in $Pd(OAc)_2$ was determined using the generally amounts of allylbenzene (0.4 mmol) and dipropylamine (0.2 mmol), and a stock solution was prepared of $Pd(OAc)_2$ (from 0.06 mmol to 0.15 mmol), 2,6-DMBQ (1.8 mmol, 244.8 mg) and DPPP (0.36 mmol, 148.5 mg) in 6 mL toluene. Subsequently, 1.0 mL of the solutions were added to six test tubes respectively. Then 1.0 mL of toluene was added to each test tube and the reaction was heated and stirred at 70 °C for the appropriate time. The yields were determined by ^{1}H-NMR with CH_2Br_2 as an internal standard based on dipropylamine.

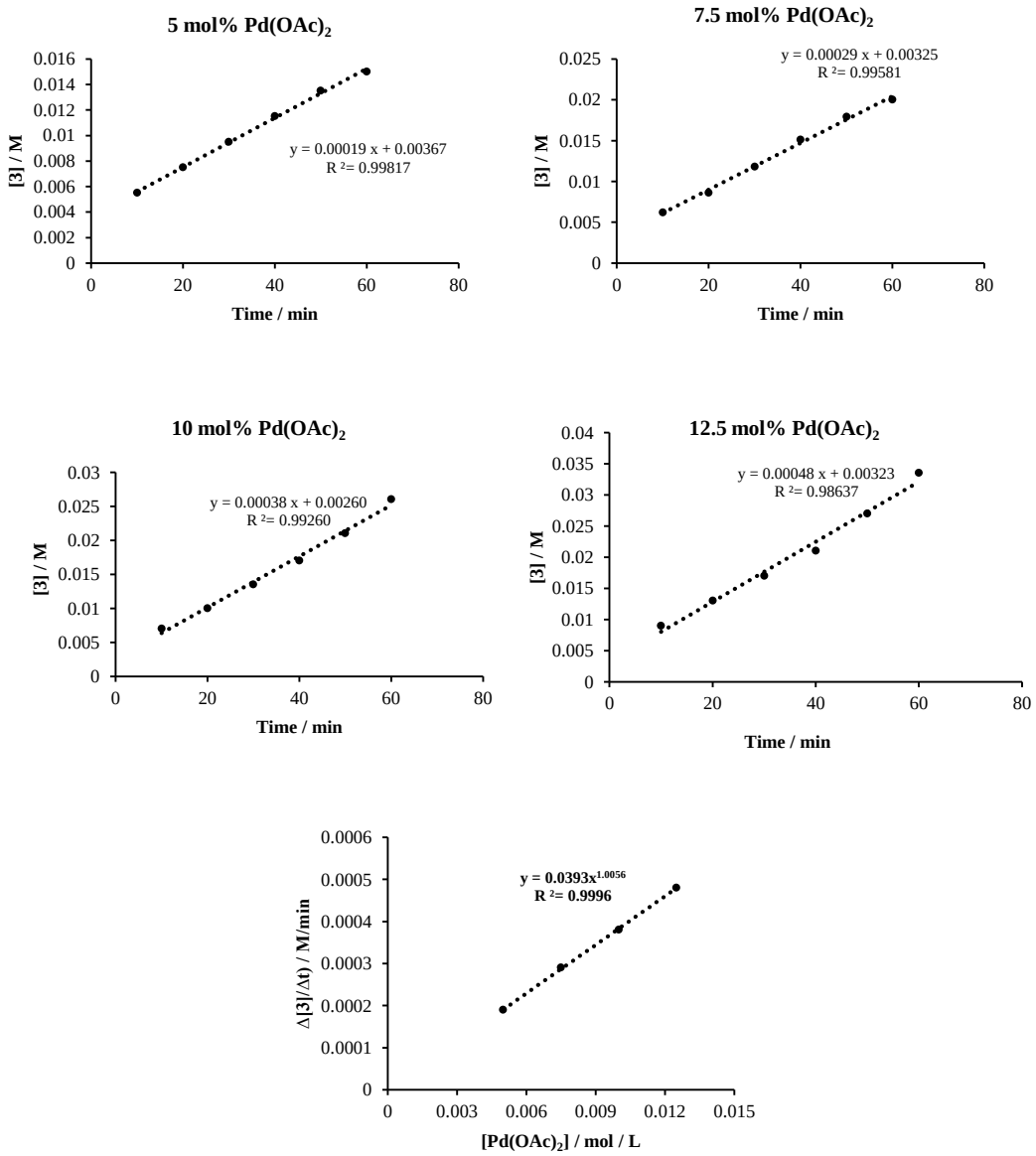


Fig S11. Dependence of the reaction rate on concentration of $Pd(OAc)_2$

Order in DPPE

The order in DPPE was determined using the generally amounts of allylbenzene (0.4 mmol) and dipropylamine (0.2 mmol), and a stock solution was prepared of $Pd(OAc)_2$ (0.18 mmol, 40.3 mg), 2,6-DMBQ (1.8 mmol, 244.8 mg) and DPPP (from 0.12 mmol to 0.3mmol) in 6 mL toluene. Subsequently, 1.0 mL of the solutions were added to six test tubes respectively. Then 1.0 mL of toluene was added to each test tube and the reaction was heated and stirred at 70 °C for the appropriate time. The yields were determined by ^{1}H-NMR with CH_2Br_2 as an internal standard based on dipropylamine.

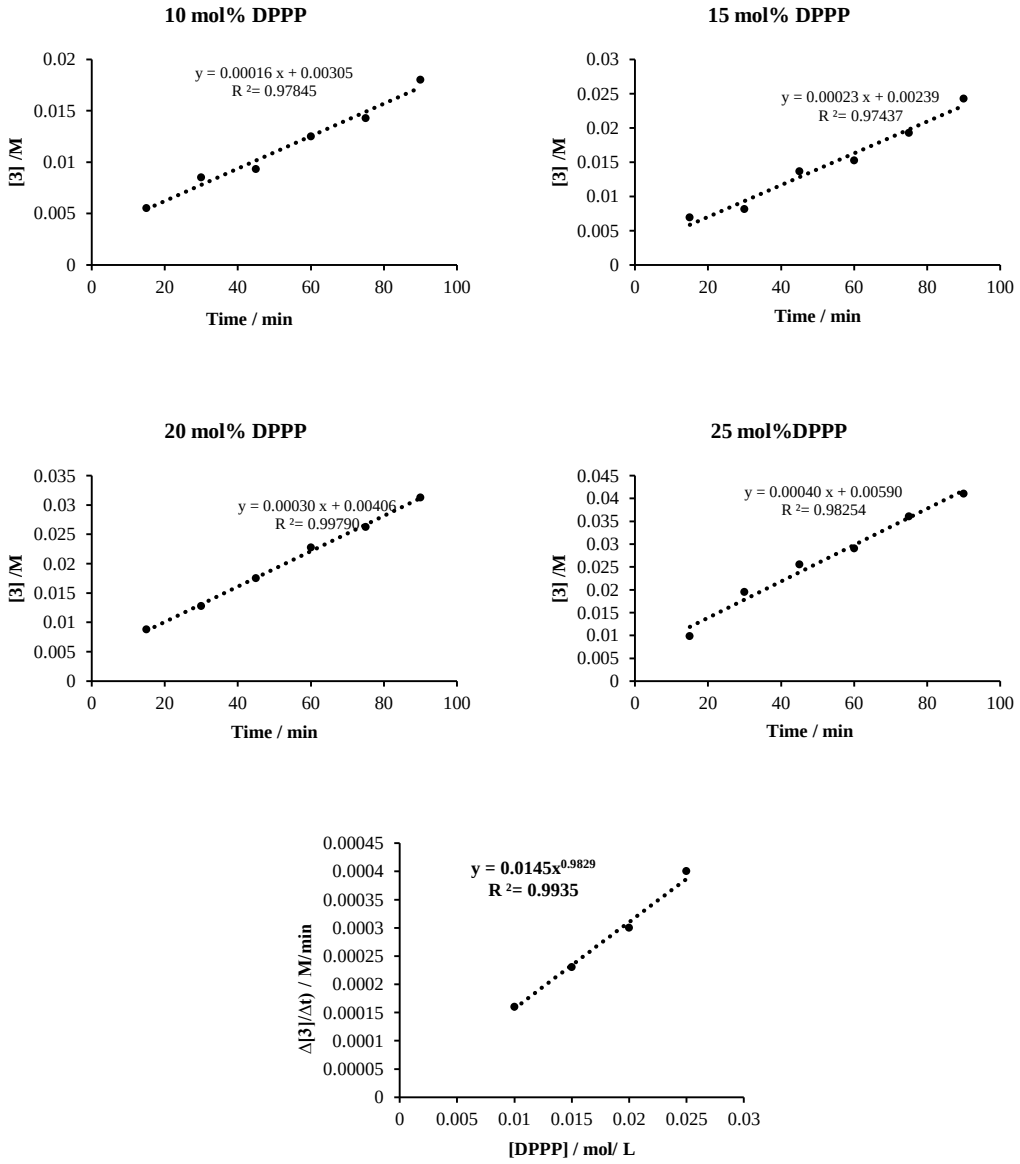


Fig S12. Dependence of the reaction rate on concentration of DPPP

Order in 2,6-DMBQ

The order in 2,6-DMBQ was determined using the generally amounts of allylbenzene (0.4 mmol) and dipropylamine (0.2 mmol), and a stock solution was prepared of $Pd(OAc)_2$ (0.18 mmol, 40.3 mg), 2,6-DMBQ (from 0.36 mmol to 1.08 mmol) and DPPP (0.36 mmol, 148.5 mg) in 6 mL toluene. Subsequently, 1.0 mL of the solutions were added to six test tubes respectively. Then 1.0 mL of toluene was added to each test tube and the reaction was heated and stirred at 70 °C for the appropriate time. The yields were determined by ^{1}H-NMR with CH_2Br_2 as an internal standard based on dipropylamine.

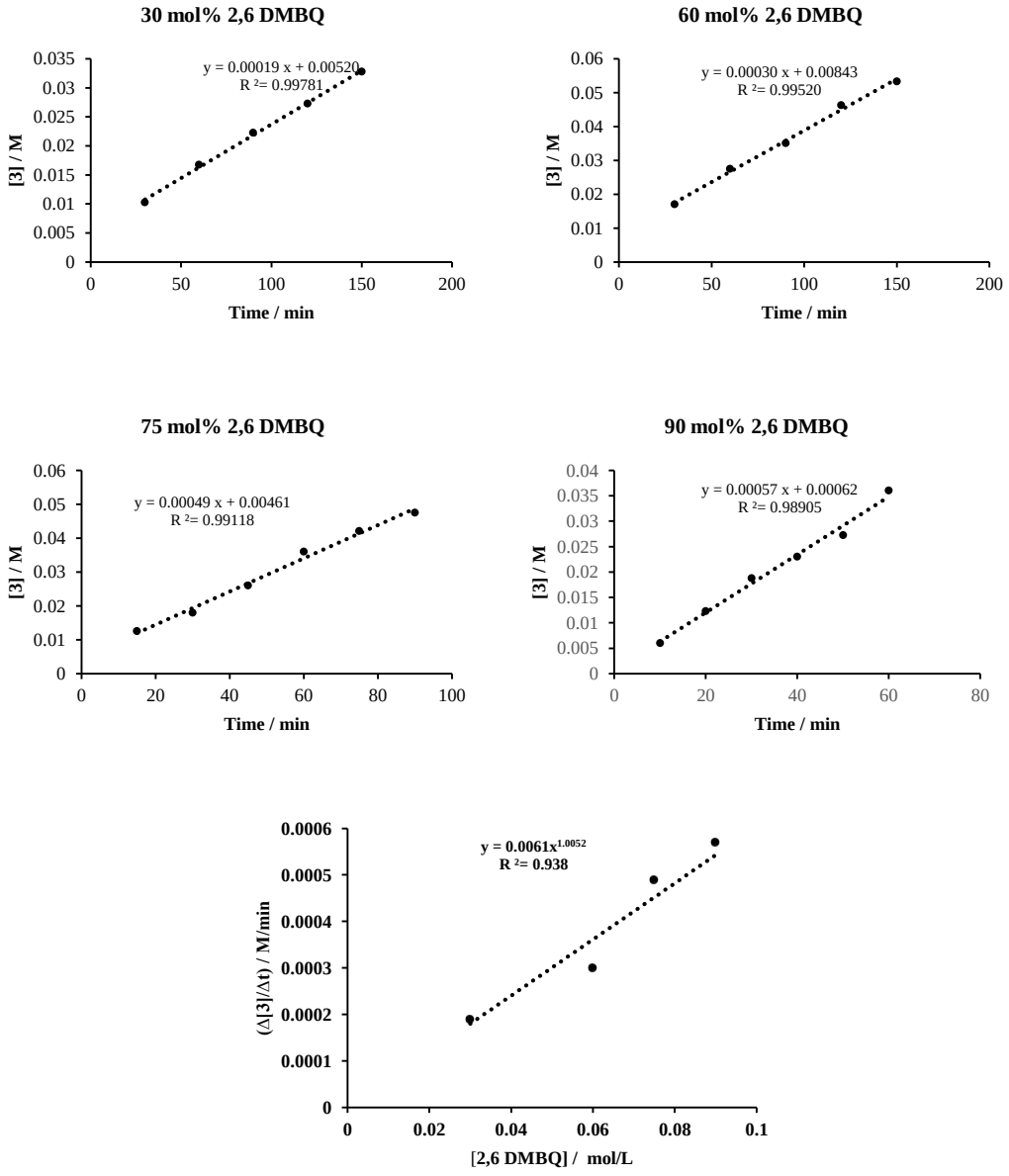
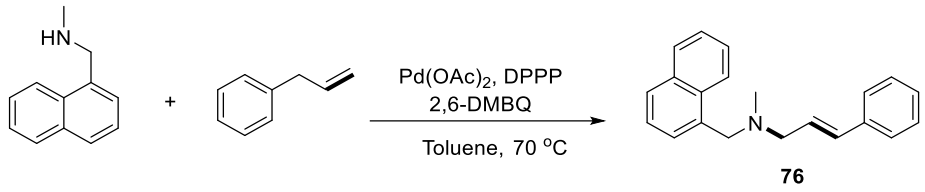


Fig S13. Dependence of the reaction rate on concentration of 2,6-DMBQ

8. Synthesis of Bioactive Drug Substances

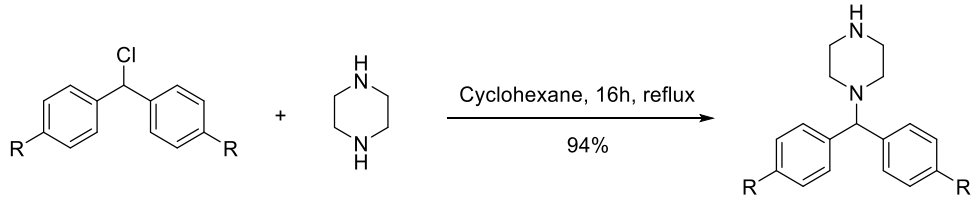
8.1 Synthesis of naftifine



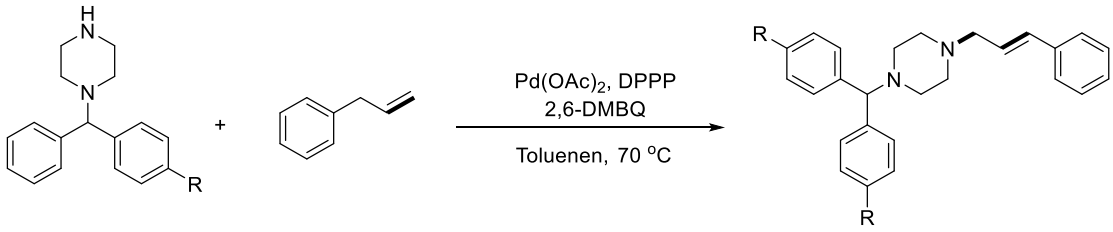
76

In a 25 mL sealed test tube charged with nitrogen,, a mixture of allylbenzene (0.24 mmol), *N*-methyl-1-(naphthalen-1-yl)methanamine (0.2 mmol), $Pd(OAc)_2$ (5 mol %), 2,6-DMBQ (1.5 equiv), DPPP (10 mol %) and 2 mL of toluene was vigorously stirred together at 70 °C for 24 h. After completion of the reaction and quenched by saturated brines, the mixture was extracted with ethyl acetate (3 × 10 mL). The combined ethyl acetate layer was then dried over anhydrous sodium sulfate and concentrated in vacuum. Further purification by flash column chromatography on silica gel (eluting with petroleum ether/ethyl acetate) afforded the pure product **76** in 85% yield.

8.2 Synthesis of Cinnarizine and Flunarizine



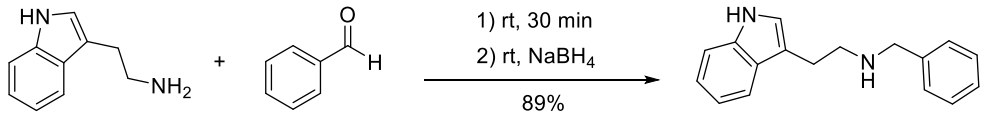
Piperazine (5 mmol, 1.0 equiv) and potassium carbonate (2.0 equiv) were suspended in cyclohexane (60 mL) and chlorobis(4-fluoromethylphenyl)methane (1.0 equiv) was added dropwise and the reaction was heated at reflux temperature for 16 h. Then the mixture was cooled to room temperature and diluted with ethyl acetate (150 mL) and washed with water (2 x 150 mL). The organic phase was dried over anhydrous $MgSO_4$ and concentrated under reduced pressure. Purification by flash chromatography on silica gel to yield the desired product in 94% yield.



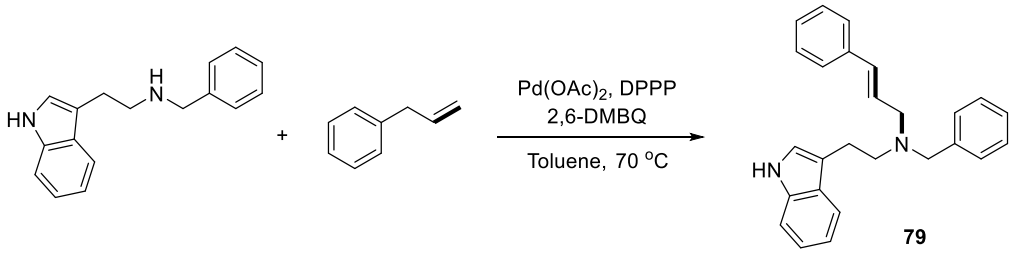
77, R=H, Cinnarizine, 92%
78, R=F, Flunarizine, 86%

In a 25 mL sealed test tube charged with nitrogen, a mixture of allylbenzene (0.24 mmol), amine (0.2 mmol), $Pd(OAc)_2$ (5 mol %), 2,6-DMBQ (1.5 equiv), DPPP (10 mol %) and 2 mL of toluene were vigorously stirred together at 70 °C for 24 h. After completion of the reaction and quenched by saturated brines, the mixture was extracted with ethyl acetate (3 × 10 mL). The combined ethyl acetate layer was then dried over anhydrous sodium sulfate and concentrated in vacuum. Further purification by flash column chromatography on silica gel (eluting with petroleum ether/ethyl acetate) afforded the pure product **77** cinnarizine and **78** flunarizine.

8.3 Synthesis of AC1 inhibitor

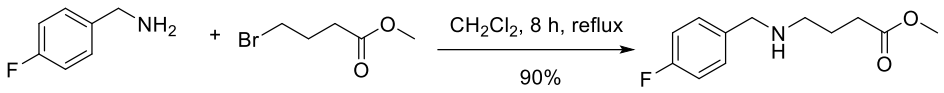


A solution of benzaldehyde (6 mmol, 610.7 μL) and tryptamine (5 mmol, 515.8 mg) in MeOH (10 mL) was stirred under room temperature for 30 min. Then $NaBH_4$ (9 mmol, 340 mg) was added portionwise to the stirred solution over a period of 0.5 h. After the full conversion of imine, 6 M HCl was then added to the reaction mixture to neutralize the excess of $NaBH_4$. The mixture was filtered and MeOH was removed under reduced pressure. The residue was extracted with ethyl acetate (3 x 10 mL) and the extract was concentrated. The crude product was purified by flash chromatography over silica gel using EtOAc/Hexane (1:1) to afford the corresponding *N*-benzyltryptamine in 89% yield.

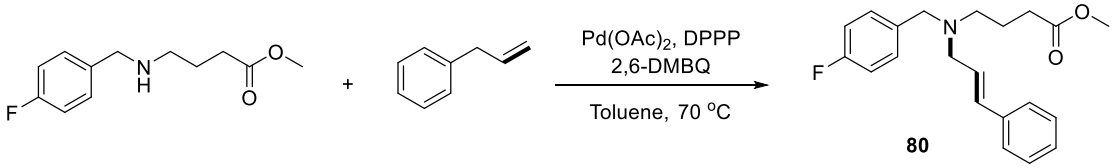


In a 25 mL sealed test tube charged with nitrogen, a mixture of allylbenzene (0.24 mmol), *N*-benzyltryptamine (0.2 mmol), $Pd(OAc)_2$ (5 mol %), 2,6-DMBQ (1.5 equiv), DPPP (10 mol %) and 2 mL of toluene was vigorously stirred together at 70 °C for 24 h. After completion of the reaction and quenched by saturated brine, the mixture was extracted with ethyl acetate (3 × 10 mL). The combined ethyl acetate layer was then dried over anhydrous sodium sulfate and concentrated in vacuum. Further purification by flash column chromatography on silica gel (eluting with petroleum ether/ethyl acetate) afforded the pure product **79** in 75% yield.

8.4 Synthesis of Abamine SG



Under the argon atmosphere, amine (5 mmol) and methyl 4-bromobutanoate (1 equiv) were added in CH_2Cl_2 (20 mL). The reaction was vigorously stirred together at reflux for 8 h. The process was monitored by TLC. Upon full conversion of the starting amine, CH_2Cl_2 (100 mL) and water were added to the reaction mixture. The organic layer was separated. The aqueous phase was further extracted with CH_2Cl_2 three times. The combined organic extracts were washed with saturated aqueous NaCl for three times and dried over Na_2SO_4 and concentrated in vacuo. The residue was purified by column chromatography with a mixture of Hexane and EtOAc as eluent to afford the desired product in 90% yield.



In a 25 mL sealed test tube charged with nitrogen, a mixture of allylbenzene (0.24 mmol), amine (0.2 mmol), $Pd(OAc)_2$ (5 mol %), 2,6-DMBQ (1.5 equiv), DPPP (10 mol %) and 2 mL of toluene were vigorously stirred together at 70 °C for 24 h. After completion of the reaction and quenched by saturated brines, the mixture was extracted with ethyl acetate (3 × 10 mL). The combined ethyl acetate layer was then dried over anhydrous sodium sulfate and concentrated in vacuum. Further purification by flash column chromatography on silica gel (eluting with petroleum ether/ethyl acetate) afforded the pure product **80** Abamine SG in 79% yield.

9. X-ray Crystallographic Analysis for Product 67

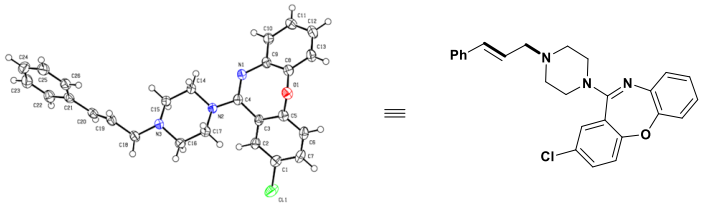
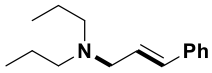


Table S8. Crystal data and structure refinement for **67**

Empirical formula	$C_{26}H_{24}ClN_3O$
Formula weight	429.93
Temperature	170.0 K
Wavelength	0.71073 Å
Crystal system	orthorhombic
Space group	Pbca
Unit cell dimensions	a = 20.5662(7) Å, α = 90.00°
	b = 8.1152(3) Å, β = 90.00°
	c = 25.8516(9) Å, γ = 90.00°
Density (calculated)	1.324
Absorption coefficient	0.201 mm^{-1}
F(000)	1808.0
Crystal size	0.19 × 0.15 × 0.12 mm^3
Theta range for data collection	5.062 to 52.746
Index ranges	$-19 \leq h \leq 25$, $-10 \leq k \leq 10$, $-32 \leq l \leq 30$
Reflections collected	21381
Independent reflections	4374 [R_{int} = 0.0542, R_{sigma} = 0.0431]
Completeness to theta = 25.242	99.9 %
Refinement method	Full-matrix least-squares on F^2
Data/restraints/parameters	4374/0/280
Goodness-of-fit on F^2	1.038
Final R indices [$I > 2sigma(I)$]	R_1 = 0.0421, wR_2 = 0.0882
Final R indexes [all data]	R_1 = 0.0699, wR_2 = 0.1027

10. Analysis Data for the Products



(*E*)-3-Phenyl-*N*, *N*-dipropylprop-2-en-1-amine (3)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **3** (40.8 mg, 94% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

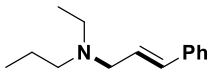
δ 7.37 (d, *J* = 8.0 Hz, 2H), 7.30 (t, *J* = 8.0 Hz, 2H), 7.21 (t, *J* = 8.0 Hz, 1H), 6.50 (d, *J* = 16.0 Hz, 1H), 6.28 (dt, *J* = 16.0, 6.8 Hz, 1H), 3.26 (d, *J* = 6.8 Hz, 2H), 2.46 - 2.42 (m, 4H), 1.55 - 1.46 (m, 4H), 0.88 (t, *J* = 8.0 Hz, 6H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 137.3, 132.0, 128.5, 127.8, 127.2, 126.2, 56.7, 55.9, 20.1, 11.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{15}H_{24}N$, 218.1903; found, 218.1900.



(*E*)-*N*-Ethyl-3-phenyl-*N*-propylprop-2-en-1-amine (4)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **4** (36.1 mg, 89% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

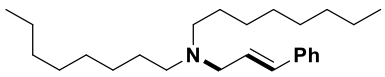
δ 7.37 (d, *J* = 8.0 Hz, 1H), 7.30 (t, *J* = 8.0 Hz, 2H), 7.21 (t, *J* = 8.0 Hz, 1H), 6.51 (d, *J*. = 16.0 Hz, 1H), 6.29 (dt, *J* = 16.0, 6.4 Hz, 1H), 3.26 (d, *J* = 6.8 Hz, 2H), 2.58 (q, *J* = 8.0 Hz, 2H), 2.44 (t, *J* = 8.0 Hz, 2H), 1.56 - 1.46 (m, 2H), 1.06 (t, *J* = 8.0 Hz, 3H), 0.89 (t, *J* = 8.0 Hz, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 137.2, 132.1, 128.5, 127.7, 127.3, 126.2, 56.1, 55.3, 47.3, 20.1, 12.0, 11.7.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{14}H_{22}N$, 204.1747; found, 204.1744.



***N*-Cinnamyl-*N*-octyloctan-1-amine (5)**

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **5** (57.1 mg, 80% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

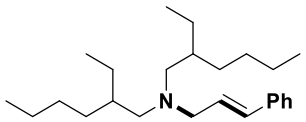
δ 7.37 (d, *J* = 8.0 Hz, 2H), 7.30 (t, *J* = 8.0 Hz, 2H), 7.21 (t, *J* = 8.0 Hz, 1H), 6.50 (d, *J*. = 16.0 Hz, 1H), 6.28 (dt, *J* = 16.0, 6.8 Hz, 1H), 3.25 (d, *J* = 6.8 Hz, 2H), 2.46 (t, *J* = 8.0 Hz, 4H), 1.47 (s, 4H), 1.27 (s, 20H), 0.87 (t, *J* = 8.0 Hz, 6H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 137.2, 132.1, 128.5, 127.7, 127.2, 126.2, 56.6, 53.9, 31.8, 29.5, 29.3, 27.6, 26.8, 22.6, 14.1.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{25}H_{44}N$, 358.3468; found, 358.3466.



***N*-Cinnamyl-2-ethyl-N-(2-ethylhexyl)hexan-1-amine (6)**

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **6** (60.6 mg, 85% yield) as yellow oil;

^{1}H NMR (500 MHz, $CDCl_3$)

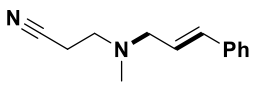
δ 7.36 (d, *J* = 8.0 Hz, 2H), 7.30 (t, *J* = 7.2 Hz, 2H), 7.20 (t, *J* = 7.2 Hz, 1H), 6.47 (d, *J*. = 16.0 Hz, 1H), 6.24 (dt, *J* = 16.0, 6.2 Hz, 1H), 3.14 (d, *J* = 6.0 Hz, 2H), 2.23 - 2.19 (m, 4H), 1.45 - 1.36 (m, 4H), 1.31 - 1.23 (m, 14H), 0.90 - 0.83 (m, 12H).

^{13}C NMR (125 MHz, $CDCl_3$)

δ 137.6, 131.5, 128.9, 128.5, 127.0, 126.2, 59.4, 57.3, 37.4, 31.3, 28.9, 24.5, 23.3, 14.1, 10.8.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{25}H_{44}N$, 358.3468, found, 358.3465.



2-(Cinnamyl(ethyl)amino)acetonitrile (7)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **7** (29.9 mg, 70% yield) as brown oil;

^{1}H NMR (400 MHz, $CDCl_3$)

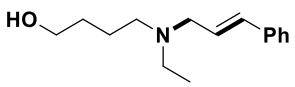
δ 7.38 (d, *J* = 8.0 Hz, 2H), 7.31 (t, *J* = 8.0 Hz, 2H), 7.24 (t, *J* = 8.0 Hz, 1H), 6.54 (d, *J*. = 16.0 Hz, 1H), 6.23 (dt, *J* = 16.0, 6.8 Hz, 1H), 3.23 (d, *J* = 6.8 Hz, 2H), 2.76 (t, *J* = 8.0 Hz, 2H), 2.51 (t, *J* = 8.0 Hz, 2H), 2.34 (s, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 136.7, 133.2, 128.6, 127.6, 126.3, 126.2, 118.7, 59.8, 52.0, 41.8, 16.2.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{13}H_{17}N_2$, 201.1386; found, 201.1383.



4-(Cinnamyl(ethyl)amino)butan-1-ol (8)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **8** (33.5 mg, 72% yield) as red oil;

^{1}H NMR (400 MHz, $CDCl_3$)

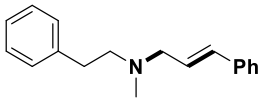
δ 7.42 - 7.40 (m, 2H), 7.34 - 7.31 (m, 2H), 7.27 - 7.23 (m, 1H), 6.54 (d, *J* = 16.0 Hz, 1H), 6.29 (dt, *J* = 16.0, 6.8 Hz, 1H), 4.96 (s, 1H), 3.62 - 3.60 (m, 2H), 3.32 (dd, *J* = 6.8, 1.2 Hz, 2H), 2.64 (q, *J* = 7.2 Hz, 2H), 2.53 (t, *J* = 5.4 Hz, 2H), 1.70 - 1.69 (m, 4H), 1.11 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 136.7, 133.4, 128.5, 127.5, 126.3, 125.6, 62.6, 55.3, 53.4, 46.9, 32.5, 26.1, 10.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{15}H_{24}NO$, 234.1852; found, 234.1850.



(*E*)-*N*-Methyl-*N*-phenethyl-3-phenylprop-2-en-1-amine (9)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **9** (40.2 mg, 80% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

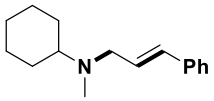
δ 7.43 - 7.41 (m, 2H), 7.37 - 7.31 (m, 4H), 7.29 - 7.24 (m, 4H), 6.56 (d, *J*. = 16.0 Hz, 1H), 6.33 (dt, *J* = 16.0, 6.8 Hz, 1H), 3.29 - 3.27 (m, 2H), 2.90 - 2.86 (m, 2H), 2.75 - 2.71 (m, 2H), 2.41 (s, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 140.3, 136.9, 132.7, 128.7, 128.5, 128.4, 127.4, 126.9, 126.3, 125.9, 60.1, 59.1, 42.0, 33.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{18}H_{22}N$, 252.1747, found, 252.1742.



***N*-Cinnamyl-*N*-methylcyclohexanamine (10)**

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **10** (41.6 mg, 91% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

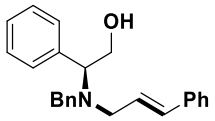
δ 7.39 - 7.37 (m, 2H), 7.30 (t, *J* = 8.0 Hz, 2H), 7.32 - 7.20 (m, 1H), 6.50 (d, *J* = 16.0 Hz, 1H), 6.27 (dt, *J* = 16.0, 6.8 Hz, 1H), 3.27 (d, *J* = 6.8 Hz, 2H), 2.49 - 2.43 (m, 1H), 2.27 (s, 3H), 1.86 (d, *J* = 8.0 Hz, 2H), 1.81 - 1.79 (m, 2H), 1.63 (d, *J* = 10.8 Hz, 1H), 1.28 - 1.22 (m, 4H), 1.12 - 1.07 (m, 1H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 137.1, 132.1, 128.5, 128.1, 127.3, 126.3, 62.1, 56.3, 37.3, 28.5, 26.3, 25.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{16}H_{24}N$, 230.1903, found, 230.1903.



(*S*)-2-(Benzyl(cinnamyl)amino)-2-phenylethan-1-ol (11)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **11** (40.4 mg, 59% yield) as white solid, m.p.: 110-111 ^oC;

^{1}H NMR (400 MHz, $CDCl_3$)

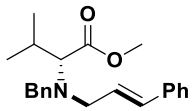
δ 7.42 - 7.35 (m, 9H), 7.30 - 7.22 (m, 6H), 6.51 (d, J = 16.0 Hz, 1H), 6.18 (dt, J = 16.0, 6.4 Hz, 1H), 4.13 - 4.05 (m, 2H), 3.99 (d, J = 12.0 Hz, 1H), 3.68 - 3.66 (m, 1H), 3.53 (d, J = 12.0 Hz, 1H), 3.20 (d, J = 12.0 Hz, 1H), 3.01 - 2.96 (m, 1H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 139.2, 136.8, 135.6, 132.9, 129.1, 128.8, 128.5, 128.4, 127.9, 127.7, 127.5, 127.2, 126.3, 63.9, 60.6, 53.7, 52.0.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{24}H_{26}NO$, 344.2009; found, 344.2006.



Methyl *N*-benzyl-*N*-cinnamyl-*D*-valinate (12)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **12** (47.2 mg, 70% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

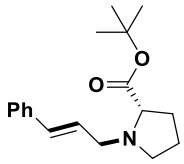
δ 7.38 - 7.35 (m, 4H), 7.33 - 7.28 (mz, 4H), 7.25 - 7.21 (m, 2H), 6.53 (d, J = 16.0 Hz, 1H), 6.19 (dt, J = 16.0, 6.4 Hz, 1H), 4.07 (d, J = 14.2 Hz, 1H), 3.74 (s, 3H), 3.54 (d, J = 12.4 Hz, 1H), 3.36 (d, J = 12.0 Hz, 1H), 3.08 - 2.97 (m, 2H), 2.14 - 2.09 (m, 1H), 1.04 (d, J = 6.4 Hz, 3H), 0.83 (d, J = 6.4 Hz, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 172.8, 139.8, 137.2, 132.3, 128.6, 128.5, 128.2, 127.3, 126.8, 126.3, 68.9, 54.5, 52.9, 50.7, 27.5, 19.9, 19.6.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{22}H_{28}NO_2$, 338.2115; found, 338.2110.



***tert*-Butyl cinnamyl-L-prolinate (13)**

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **13** (41.3 mg, 72% yield) as brown oil;

^{1}H NMR (400 MHz, $CDCl_3$)

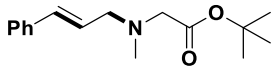
δ 7.38 (d, *J* = 7.6 Hz, 2H), 7.31 (t, *J* = 7.6 Hz, 2H), 7.23 (t, *J* = 7.2 Hz, 1H), 6.54 (d, *J*. = 16.0 Hz, 1H), 6.36 (dt, *J* = 16.0, 6.8 Hz, 1H), 3.56 - 3.51 (m, 1H), 3.33 - 3.28 (m, 1H), 3.22 - 3.12 (m, 2H), 2.47 (q, *J* = 8.0 Hz, 1H), 2.16 – 2.11 (m, 1H), 1.98 - 1.90 (m, 2H), 1.85 - 1.80 (m, 1H), 1.44 (s, 9H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 173.2, 137.0, 132.2, 128.4, 127.3, 127.24, 126.3, 80.6, 65.6, 56.7, 53.5, 29.4, 28.0, 22.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{18}H_{26}NO_2$, 288.1958; found, 288.1955.



***tert*-Butyl *N*-cinnamyl-*N*-methylglycinate (14)**

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **14** (35.0 mg, 67% yield) as brown oil;

^{1}H NMR (400 MHz, $CDCl_3$)

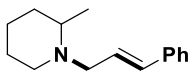
δ 7.40 (d, *J* = 7.6 Hz, 2H), 7.33 (t, *J* = 7.6 Hz, 2H), 7.24 (t, *J* = 7.2 Hz, 1H), 6.54 (d, *J*. = 16.0 Hz, 1H), 6.30 (dt, *J* = 16.0, 6.8 Hz, 1H), 3.33 (d, *J* = 6.8 Hz, 2H), 3.21 (s, 2H), 2.43 (s, 3H), 1.48 (s, 9H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 170.0, 136.8, 133.0, 128.5, 127.4, 126.7, 126.3, 80.9, 59.4, 58.3, 42.2, 28.1.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{16}H_{24}NO_2$, 262.1802; found, 262.1798.



1-Cinnamyl-2-methylpiperidine (**15**)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **15** (32.3 mg, 75% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

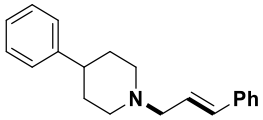
δ 7.37 (d, J = 8.0 Hz, 2H), 7.30 (t, J = 8.0 Hz, 2H), 7.21 (t, J = 8.0 Hz, 1H), 6.50 (d, J = 16.0 Hz, 1H), 6.31 (dt, J = 16.0, 6.4 Hz, 1H), 3.13 (d, = 8.0 Hz, 2H), 2.95 - 2.88 (m, 2H), 1.90 - 1.83 (m, 1H), 1.73 - 1.54 (m, 5H), 0.86 (d, J = 8.0 Hz, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 137.0, 132.7, 128.5, 127.4, 127.0, 126.3, 61.9, 61.6, 54.0, 32.9, 31.2, 25.5, 19.8.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{15}H_{22}N$, 216.1747; found, 216.1744.



1-Cinnamyl-4-phenylpiperidine (16)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **16** (40.4 mg, 73% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

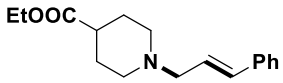
δ 7.45 - 7.43 (m, 2H), 7.37 - 7.32 (m, 4H), 7.29 - 7.21 (m, 4H), 6.59 (d, J = 16.0 Hz, 1H), 6.39 (dt, J = 16.0, 6.8 Hz, 1H), 3.27 - 3.25 (m, 2H), 3.18 (d, J = 12.0 Hz, 2H), 2.60 - 2.52 (m, 1H), 2.19 – 2.13 (m, 2H), 1.92 - 1.86 (m, 4H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 146.2, 136.9, 133.1, 128.5, 128.4, 127.5, 126.8, 126.7, 126.3, 126.1, 61.4, 54.3, 42.6, 33.4.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{20}H_{24}N$, 278.1903; found, 278.1899.



Ethyl-1-cinnamylpiperidine-4-carboxylate (17)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **17** (35.5 mg, 65% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

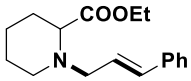
δ 7.37 (d, J = 8.0 Hz, 2H), 7.30 (t, J = 8.0 Hz, 2H), 7.22 (t, J = 8.0 Hz, 1H), 6.51 (d, J. = 16.0 Hz, 1H), 6.27 (dt, J = 16.0, 6.4 Hz, 1H), 4.13 (q, J = 7.2 Hz, 2H), 3.15 (d, J = 8.0 Hz, 2H), 2.96 (s, 1H), 2.93 (s, 1H), 2.33 - 2.26 (m, 1H), 2.08 (t, J = 8.0 Hz, 2H), 1.92 (d, J = 8.0 Hz, 2H), 1.85 - 1.75 (m, 2H), 1.24 (t, J = 7.2 Hz, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 175.0, 136.8, 133.0, 128.5, 127.5, 126.5, 126.3, 61.2, 60.3, 52.9, 41.0, 28.1, 14.2.

HRMS (ESI)

$[M+ H]^+$ Calcd. for $C_{17}H_{24}NO_2$, 274.1802; found, 274.1797.



Ethyl-1-cinnamylpiperidine-2-carboxylate (**18**)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **18** (38.7 mg, 71% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

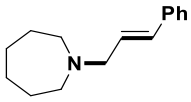
δ 7.36 (d, *J* = 8.0 Hz, 2H), 7.29 (t, *J* = 8.0 Hz, 2H), 7.21 (t, *J* = 8.0 Hz, 1H), 6.48 (d, *J*. = 16.0 Hz, 1H), 6.30 (dt, *J* = 16.0, 6.4 Hz, 1H), 4.18 (q, *J* = 7.2 Hz, 2H), 3.43 - 3.38 (m, 1H), 3.13 - 3.09 (m, 3H), 2.25 - 2.19 (m, 1H), 1.89 - 1.76 (m, 2H), 1.70 - 1.61 (m, 3H), 1.40 - 1.34 (m, 1H), 1.27 (t, *J* = 8.0 Hz, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 173.7, 136.9, 133.1, 128.5, 127.5, 126.4, 126.3, 65.0, 60.5, 59.0, 51.1, 29.8, 25.2, 22.7, 14.3.

HRMS (ESI)

$[M+ H]^+$ Calcd. for $C_{17}H_{24}NO_2$, 274.1802; found, 274.1797.



1-Cinnamylazepane (19)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **19** (30.5 mg, 71% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

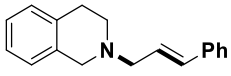
δ 7.37 (d, *J* = 8.0 Hz, 2H), 7.30 (t, *J* = 8.0 Hz, 2H), 7.22 (t, *J* = 8.0 Hz, 1H), 6.51 (d, *J*. = 16.0 Hz, 1H), 6.32 (dt, *J* = 16.0, 6.6 Hz, 1H), 3.31 (d, *J* = 6.6 Hz, 2H), 2.72 - 2.69 (m, 4H), 1.69 - 1.63 (m, 8H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 137.0, 132.6, 128.5, 127.4, 126.3, 61.0, 55.6, 27.7, 26.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{15}H_{22}N$, 216.1747, found, 216.1745.



2-Cinnamyl-1,2,3,4-tetrahydroisoquinoline (20)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **20** (34.8 mg, 70% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

δ 7.41 (d, *J* = 8.0 Hz, 2H), 7.32 (t, *J* = 8.0 Hz, 2H), 7.24 (d, J = 5.6 Hz, 1H), 7.12 - 7.09. (m, 3H), 7.01 (d, *J* = 8.0 Hz, 2H), 6.60 (d, *J* = 16.0 Hz, 1H), 6.37 (dt, *J* = 16.0, 6.8 Hz,

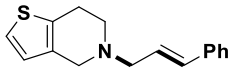
1H), 3.69 (s, 2H), 3.34 (d, *J* = 6.8 Hz, 2H), 2.94 (t, *J* = 6.0 Hz, 2H), 2.81 (t, *J* = 6.0 Hz, 2H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 136.9, 134.6, 134.1, 133.0, 128.7, 128.6, 127.5, 126.7, 126.6, 126.4, 126.2, 125.6, 60.7, 56.0, 50.7, 29.0.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{18}H_{20}N$, 250.1590, found, 250.1586.



5-Cinnamyl-4,5,6,7-tetrahydrothieno[3,2-c] pyridine (21)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **21** (42.3 mg, 83% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

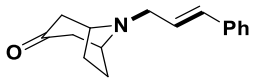
δ 7.44 (d, *J* = 8.0 Hz, 2H), 7.36 (t, *J* = 7.6 Hz, 2H), 7.30 - 7.27 (m, 1H), 7.11 (d, *J* = 8.0. Hz, 2H), 6.75 (d, *J* = 5.2 Hz, 1H), 6.63 (d, *J* = 16.0 Hz, 1H), 6.39 (dt, *J* = 16.0, 6.8 Hz, 1H), 3.66 (s, 2H), 3.42 - 3.40 (m, 2H), 2.96 (d, *J* = 5.2 Hz, 2H), 2.92 - 2.89 (m, 2H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 136.8, 133.6, 133.3, 133.1, 128.6, 127.6, 126.6, 126.3, 125.2, 122.7, 60.1, 53.0, 50.6, 25.3.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{16}H_{18}NS$, 256.1154, found, 256.1152.



(*1R, 5S*)-8-Cinnamyl-8-azabicyclo [3.2.1] octan-3-one (22)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **22** (28.4 mg, 59% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

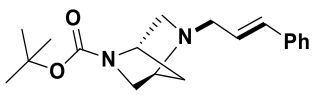
δ 7.43 - 7.41 (m, 2H), 7.36 - 7.32 (m, 2H), 7.29 - 7.24 (m, 1H), 6.59 (d, *J* = 16.0 Hz, 1H), 6.38 (dt, *J* = 16.0, 6.4 Hz, 1H), 3.61 (s, 2H), 3.40 (dd, *J* = 6.4, 1.6 Hz, 2H), 2.72 (dd, *J* = 16.0, 4.2 Hz, 2H), 2.27 - 2.22 (m, 2H), 2.13 - 2.09 (m, 2H), 1.68 - 1.63 (m, 2H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 209.9, 136.7, 132.4, 128.6, 127.6, 127.2, 126.3, 58.5, 53.4, 47.9, 27.7.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{16}H_{20}NO$, 242.1539, found, 242.1537.



***tert*-Butyl-5-cinnamyl-2,5-diazabicyclo [2.2.1] heptane-2-carboxylate (23)**

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **23** (55.8 mg, 89% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

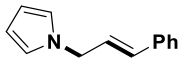
δ 7.39 (d, *J* = 8.0 Hz, 2H), 7.32 (t, *J* = 8.0 Hz, 2H), 7.24 (t, *J* = 8.0 Hz, 1H), 6.55 (d, *J*. = 16.0 Hz, 1H), 6.27 (dt, *J* = 16.0, 6.4 Hz, 1H), 4.40 - 4.26 (m, 1H), 3.62 - 3.49 (m, 2H), 3.37 (t, *J* = 6.4 Hz, 2H), 3.20 (d, *J* = 10.4 Hz, 1H), 2.99 - 2.53 (m, 3H), 1.87 (t, *J* = 8.0 Hz, 1H), 1.76 - 1.69 (m, 1H), 1.48 (s, 9H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 154.2 (d, *J* = 14.3 Hz), 136.8, 132.1 (d, *J* = 9.9 Hz), 128.5, 127.5, 127.3 (d, *J* = 5.8. Hz), 126.3, 79.3 (d, *J* = 10.6 Hz), 60.8, 60.4, 59.8, 57.8, 56.8, 56.1, 50.3, 48.9, 36.0, 34.9, 28.5.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{19}H_{27}N_2O_2$, 315.2067, found, 315.2066.



1-Cinnamyl-1*H*-pyrrole (24)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **24** (27.4 mg, 75% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

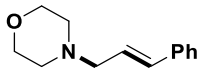
δ 7.36 (d, *J* = 8.0 Hz, 2H), 7.31 (t, *J* = 8.0 Hz, 2H), 7.25 (d, *J* = 8.0 Hz, 1H), 6.71 (s, 2H), 6.49 (d, *J* = 16.0 Hz, 1H), 6.33 (dt, *J* = 16.0, 6.8 Hz, 1H), 6.18 (s, 2H), 4.65 (d, *J* = 6.8 Hz, 2H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 136.3, 132.6, 128.6, 127.9, 126.5, 125.5, 120.6, 108.4, 51.6.

HRMS (ESI)

$[M+ H]^+$ Calcd. for $C_{13}H_{14}N$, 184.1121; found, 184.1118.



4-Cinnamylmorpholine (25)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **25** (17.5 mg, 43% yield) as yellow oil;

^{1}H NMR (500 MHz, $CDCl_3$)

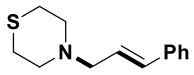
δ 7.37 (d, *J* = 7.4 Hz, 2H), 7.31 (t, *J* = 7.2 Hz, 2H), 7.23 (t, *J* = 6.8 Hz, 1H), 6.54 (d, *J*. = 16.0 Hz, 1H), 6.26 (dt, *J* = 16.0, 6.8 Hz, 1H), 3.75 (s, 4H), 3.18 (d, *J* = 6.8 Hz, 2H), 2.53 (s, 4H).

^{13}C NMR (125 MHz, $CDCl_3$)

δ 136.7, 133.6, 128.6, 127.6, 126.3, 125.7, 66.8, 61.4, 53.6.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{13}H_{18}NO$, 204.1383; found, 204.1380.



4-Cinnamylthiomorpholine (26)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **26** (28.4 mg, 65% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

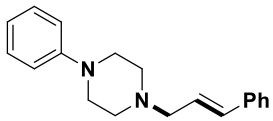
δ 7.37 (d, J = 8.0 Hz, 2H), 7.31 (t, J = 8.0 Hz, 2H), 7.23 (t, J = 8.0 Hz, 1H), 6.52 (d, J. = 16.0 Hz, 1H), 6.24 (dt, J = 16.0, 6.8 Hz, 1H), 3.19 (d, J = 6.8 Hz, 2H), 2.79 - 2.77 (m, 4H), 2.72 - 2.70 (m, 4H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 136.8, 133.4, 128.6, 127.6, 126.3, 126.1, 61.8, 54.9, 27.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{13}H_{18}NS$, 220.1154; found, 220.1152.



1-Cinnamyl-4-phenylpiperazine (27)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **27** (47.2 mg, 85% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

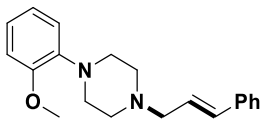
δ 7.44 (d, J = 8.0 Hz, 2H), 7.36 (t, J = 8.0 Hz, 2H), 7.34 - 7.26 (m, 3H), 6.98 (d, J = 8.0 Hz, 2H), 6.90 (t, J = 8.0 Hz, 1H), 6.61 (d, J = 16.0 Hz, 1H), 6.36 (dt, J = 16.0, 6.8 Hz, 1H), 3.29 - 3.27 (m, 6H), 2.74 - 2.72 (m, 4H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 151.2, 136.8, 133.4, 129.1, 128.6, 127.6, 126.3, 126.2, 119.7, 116.1, 61.0, 53.1, 49.1.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{19}H_{23}N_2$, 279.1856; found, 279.1855.



1-Cinnamyl-4-(2-methoxyphenyl) piperazine (28)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **28** (48.6 mg, 79% yield) as white solid, m.p.: 105-106 ^{o}C;

^{1}H NMR (400 MHz, $CDCl_3$)

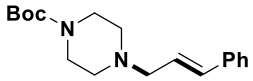
δ 7.43 (d, J = 8.0 Hz, 2H), 7.35 (t, J = 7.6 Hz, 2H), 7.29 - 7.24 (m, 1H), 7.05 - 6.93 (m, 3H), 6.89 (d, J = 8.0 Hz, 1H), 6.60 (d, J = 16.0 Hz, 1H), 6.37 (dt, J = 16.0, 6.8 Hz, 1H), 3.89 (s, 3H), 3.29 (d, J = 6.8 Hz, 2H), 3.17 (s, 4H), 2.78 (s, 4H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 152.2, 141.3, 136.9, 133.3, 128.5, 127.5 126.3, 122.9, 120.9, 118.2, 111.2, 61.1 (s, 2H), 55.3, 53.4, 50.5.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{20}H_{25}N_2O$, 309.1961; found, 309.1956.



***tert*-Butyl-4-cinnamylpiperazine-1-carboxylate (29)**

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **29** (30.2 mg, 50% yield) as white solid, m.p.: 65-66 ^{o}C;

^{1}H NMR (400 MHz, $CDCl_3$)

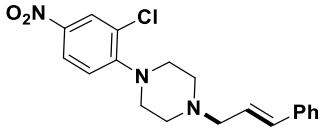
δ 7.37 (d, J = 8.0 Hz, 2H), 7.30 (t, J = 8.0 Hz, 2H), 7.23 (t, J = 8.0 Hz, 1H), 6.52 (d, J = 16.0 Hz, 1H), 6.26 (dt, J = 16.0, 6.4 Hz, 1H), 3.48 - 3.45 (m, 4H), 3.17 (d, J = 6.8 Hz, 2H), 2.47 - 2.44 (m, 4H), 1.46 (s, 9H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 154.8, 136.8, 133.5, 128.6, 127.6, 126.4, 126.0, 79.7, 61.1, 53.0, 28.4.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{18}H_{27}N_2O_2$, 303.2067; found, 303.2061.



1-(2-Chloro-4-nitrophenyl)-4-cinnamylpiperazine (30)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **30** (59.9 mg, 84% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

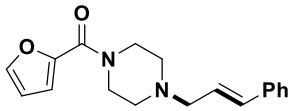
δ 8.26 (d, J = 4.0 Hz, 1H), 8.11 (dd, J = 8.0, 4.0 Hz, 1H), 7.42 (d, J = 8.0 Hz, 2H), 7.34. (t, J = 7.6 Hz, 2H), 7.28 (d, J = 8.0 Hz, 1H), 7.06 (d, J = 12.0 Hz, 1H), 6.60 (d, J = 16.0 Hz, 1H), 6.32 (dt, J = 16.0, 5.6 Hz, 1H), 3.31 - 3.28 (m, 6H), 2.77 - 2.74 (m, 4H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 154.7, 142.0, 136.7, 133.8, 128.6, 127.6, 127.4, 126.6, 126.3, 125.8, 123.4, 119.3, 60.9, 52.8, 50.5.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{19}H_{21}ClN_3O_2$, 358.1317; found, 358.1314.



(4-Cinnamylpiperazin-1-yl) (furan-2-yl) methanone (31)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **31** (39.6 mg, 67% yield) as yellow oil;

^{1}H NMR (500 MHz, $CDCl_3$)

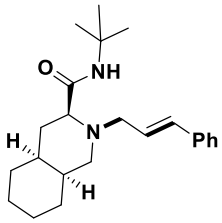
δ 7.47 (s, 1H), 7.38 (d, J = 7.8 Hz, 2H), 7.31 (t, J = 7.8 Hz, 2H), 7.24 (t, J = 7.2 Hz, 1H), 6.99(s, 1H), 6.54 (d, J = 16.0 Hz, 1H), 6.47 (s, 1H), 6.27 (dt, J = 16.0, 6.8 Hz, 1H), 3.84 (s, 4H), 3.20 (d, J = 6.8 Hz, 2H), 2.57 (s, 4H).

^{13}C NMR (125 MHz, $CDCl_3$)

δ 159.0, 147.9, 143.6, 136.6, 133.6, 128.5, 127.6, 126.3, 125.6, 116.3, 111.2, 60.8, 53.1.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{18}H_{21}N_2O_2$, 297.1598; found, 297.1593.



(3*S*, 4*aS*, 8*aS*)-*N*-(*tert*-Butyl)-2-cinnamyldecahydroisoquinoline-3-carboxamide (32)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **32** (60.8 mg, 86% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

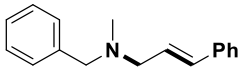
δ 7.39 (d, J = 8.0 Hz, 2H), 7.34 (t, J = 8.0 Hz, 2H), 7.29 - 7.24 (m, 1H), 6.62 - 6.56 (m, 2H), 6.17 (d, J = 16.0 Hz, 1H), 3.40 (d, J = 14.0 Hz, 1H), 2.94 (d, J = 11.2 Hz, 1H), 2.78 – 2.64 (m, 2H), 2.17 (d, J = 8.0 Hz, 1H), 1.81 (s, 4H), 1.64 (d, J = 8.8 Hz, 2H), 1.54 (s, 2H), 1.44 (s, 4H), 1.38 (s, 9H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 174.2, 136.9, 131.5, 128.5, 127.4, 126.9, 126.2, 69.2, 58.4, 57.9, 50.3, 35.9, 33.1, 30.8, 30.6, 28.7, 26.3, 25.6, 20.3.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{23}H_{35}N_2O$, 355.2744; found, 355.2739.



(*E*)-*N*-Benzyl-*N*-methyl-3-phenylprop-2-en-1-amine (33)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **33** (40.7 mg, 86% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

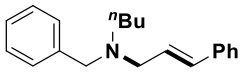
δ 7.38 (d, J = 8.0 Hz, 2H), 7.35 - 7.22 (m, 8H), 6.54 (d, J = 16.0 Hz, 1H), 6.31 (dt, J = 16.0, 6.4 Hz, 1H), 3.56 (s, 2H), 3.20 (d, J = 6.4 Hz, 2H), 2.25 (s, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 138.8, 137.1, 132.7, 129.1, 128.5, 128.2, 127.4, 127.4, 127.0, 126.3, 61.8, 59.8, 42.2.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{17}H_{20}N$, 238.1590, found, 238.1587.



***N*-Benzyl-*N*-cinnamylbutan-1-amine (34)**

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **34** (51.3 mg, 92% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

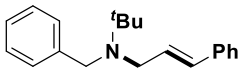
δ 7.29 - 7.20 (m, 8H), 7.15 (t, J = 8.0 Hz, 2H), 6.43 (d, J = 16.0 Hz, 1H), 6.20 (dt, J = 6.4 Hz, 1H), 3.54 (s, 2H), 3.15 (d, J = 6.4 Hz, 2H), 2.40 (t, J = 8.0 Hz, 2H), 1.46 -1.39 (m, 2H), 1.26 - 1.21 (m, 2H), 0.80 (t, J = 6.0 Hz, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 139.7, 137.3, 132.1, 128.9, 128.5, 128.1, 127.9, 127.2, 126.7, 126.2, 58.2, 56.2, 53.3, 29.3, 20.5, 14.1.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{20}H_{26}N$, 280.2060, found, 280.2056.



(*E*)-*N*-Benzyl-*N*-(*tert*-butyl)-3-phenylprop-2-en-1-amine (35)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **35** (45.7 mg, 82% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

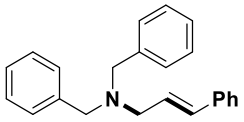
δ 7.38 (d, J = 8.0 Hz, 2H), 7.28 - 7.21 (m, 6H), 7.19 - 7.15 (m, 2H), 6.30 (d, J = 16.0. Hz, 1H), 6.15 (dt, J = 16.0, 6.4 Hz, 1H), 3.74 (s, 2H), 3.37 (d, J = 8.0 Hz, 2H), 1.19 (s, 9H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 142.7, 137.6, 130.6, 130.2, 128.4, 128.2, 128.0, 126.9, 126.2, 126.1, 55.0, 52.7, 51.8, 27.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{20}H_{26}N$, 280.2060, found, 280.2056.



(*E*)-*N*, *N*-Dibenzyl-3-phenylprop-2-en-1-amine (36)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **36** (51.3 mg, 82% yield) as yellow oil;

^{1}H NMR (500 MHz, $CDCl_3$)

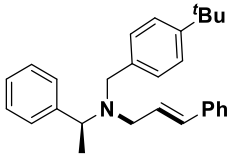
δ 7.39 (d, J = 7.2 Hz, 4H), 7.35 - 7.28 (m, 8H), 7.23 - 7.19 (m, 3H), 6.52 (d, J = 16.0. Hz, 1H), 6.29 (dt, J = 16.0, 6.4 Hz, 1H), 3.62 (s, 4H), 3.22 (d, J = 6.2 Hz, 2H).

^{13}C NMR (125 MHz, $CDCl_3$)

δ 139.5, 137.2, 132.5, 128.8, 128.5, 128.2, 127.7, 127.3, 126.8, 126.2, 57.9, 55.7.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{23}H_{24}N$, 314.1903; found, 314.1898.



(*S*, *E*)-*N*-(4-(*tert*-Butyl) benzyl)-3-phenyl-*N*-(1-phenylethyl) prop-2-en-1-amine (37)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **37** (64.3 mg, 84% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

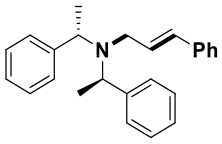
δ 7.61 (d, J = 8.0 Hz, 2H), 7.51 - 7.47 (m, 8H), 7.44 - 7.34 (m, 4H), 6.41 (dt, J = 16.0, 6.4 Hz, 1H), 4.18 (q, J = 6.8 Hz, 1H), 3.82 - 3.70 (m, 2H), 3.47 (dd, J = 14.4, 6.4 Hz, 1H), 3.35 (dd, J = 14.4, 6.4 Hz, 1H), 1.60 (d, J = 8.0 Hz, 3H), 1.48 (s, 9H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 149.4, 143.8, 137.4, 137.3, 131.8, 128.7, 128.4, 128.2, 128.0, 127.8, 127.1, 126.6, 126.2, 125.0, 57.9, 53.5, 51.9, 34.4, 31.4, 15.7.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{28}H_{34}N$, 384.2686, found, 384.2681.



(*E*)-3-Phenyl-*N*-((*R*)-1-phenylethyl)-*N*-((*S*)-1-phenylethyl) prop-2-en-1-amine (38)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **38** (54.5 mg, 80% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

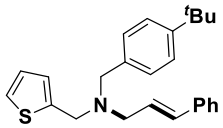
δ 7.38 (d, J = 8.0 Hz, 2H), 7.32 - 7.16 (m, 11H), 6.27 (d, J = 16.0 Hz, 1H), 5.99 (dt, J = 16.0, 6.4 Hz, 1H), 4.09 (q, J = 6.8 Hz, 2H), 3.40 (dd, J = 15.6, 6.8 Hz, 1H), 3.24 (dd, J = 15.6, 6.8 Hz, 1H), 1.43 (s, 3H), 1.41 (s, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 145.1, 137.6, 131.4, 130.0, 128.4, 128.0, 127.8, 126.9, 126.5, 126.1, 57.3, 48.6, 18.3.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{25}H_{28}N$, 342.2216, found, 342.2212.



(*E*)-*N*-(4-(*tert*-Butyl) benzyl)-3-phenyl-*N*-(thiophen-2-ylmethyl) prop-2-en-1-amine (39)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **39** (63.8 mg, 85% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

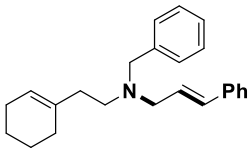
δ 7.26 - 7.25 (m, 6H), 7.18 (t, J = 8.0 Hz, 2H), 7.12 - 7.10 (m, 2H), 6.84 - 6.82 (m, 2H), 6.47 (d, J = 16.0 Hz, 1H), 6.18 (dt, J = 16.0, 6.4 Hz, 1H), 3.76 (s, 2H), 3.55 (s, 2H), 3.18 (d, J = 6.4 Hz, 2H), 1.22 (s, 9H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 149.7, 143.2, 137.1, 136.1, 132.5, 128.4, 128.4, 127.6, 127.2, 126.3, 126.2, 125.4, 125.1, 124.6, 57.2, 55.5, 52.2, 34.4, 31.4.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{25}H_{30}NS$, 376.2093, found, 376.2089.



(*E*)-*N*-Benzyl-*N*-(2-(cyclohex-1-en-1-yl)ethyl)-3-phenylprop-2-en-1-amine (40)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **40** (54.2 mg, 82% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

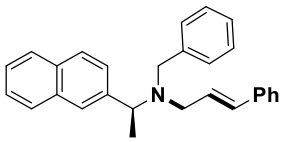
δ 7.36 (d, J = 8.0 Hz, 4H), 7.32 - 7.28 (m, 4H), 7.23 (t, J = 8.0 Hz, 2H), 6.52 (d, J =. 16.0 Hz, 1H), 6.28 (dt, J = 16.0, 6.4 Hz, 1H), 5.39 (s, 1H), 3.64 (s, 2H), 3.25 (d, J = 4.0 Hz, 2H), 2.59 (t, J = 8.0 Hz, 2H), 2.17 (t, J = 8.0 Hz, 2H), 1.96 (s, 2H), 1.88 (s, 2H), 1.58 - 1.52 (m, 4H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 137.2, 136.1, 132.3, 128.9, 128.5, 127.3, 127.3, 126.8, 126.2, 122.0, 122.0, 58.1, 56.1, 52.2, 35.5, 28.5, 25.3, 22.9, 22.4.

HRMS (ESI)

[M+H]$^+$ Calcd. for $C_{24}H_{30}N$, 332.2373, found, 332.2367.



(*S*, *E*)-*N*-Benzyl-*N*-(1-(naphthalen-2-yl)ethyl)-3-phenylprop-2-en-1-amine (41)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **41** (58.8 mg, 78% yield) as colorless oil.

^{1}H NMR (400 MHz, $CDCl_3$)

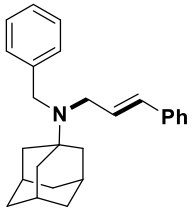
δ 7.82 - 7.77 (m, 4H), 7.67 (d, *J* = 8.0 Hz, 1H), 7.47 - 7.38 (m, 4H), 7.34 - 7.26 (m, 6H), 7.21 (d, *J* = 8.0 Hz, 2H), 6.49 (d, *J* = 16.0 Hz, 1H), 6.28 (dt, *J* = 16.0, 6.4 Hz, 1H), 4.16 (q, *J* = 6.2 Hz, 1H), 3.68 - 3.60 (m, 2H), 3.34 (dd, *J* = 14.4, 6.0 Hz, 1H), 3.22 (dd, *J* = 14.4, 6.0 Hz, 1H), 1.52 (d, *J* = 8.0 Hz, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 141.5, 140.5, 137.3, 133.3, 132.7, 132.1, 128.6, 128.5, 128.4, 128.2, 127.8, 127.7, 127.5, 127.2, 126.7, 126.2, 125.9, 125.8, 125.5, 58.0, 53.9, 51.9, 15.4.

HRMS (ESI)

[M+H]$^+$ Calcd. for $C_{28}H_{28}N$, 378.2216, found, 378.2208.



(*3s,5s,7s*)-*N*-Benzyl-*N*-cinnamyladamantan-1-amine (42)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **42** (49.2 mg, 69% yield) as white solid, m.p.: 99-100 ^{o}C

^{1}H NMR (400 MHz, $CDCl_3$)

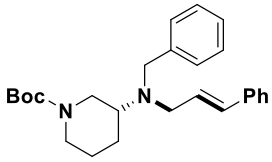
δ 7.47 (d, *J* = 8.0 Hz, 2H), 7.37 - 7.33 (m, 6H), 7.29 - 7.24 (m, 2H), 6.40 (d, *J* = 16.0. Hz, 1H), 6.28 (dt, *J* = 16.0, 6.4 Hz, 1H), 3.88 (s, 2H), 3.50 (d, *J* = 6.4 Hz, 2H), 2.17 (s, 3H), 1.90 (s, 6H), 1.76 - 1.68 (m, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 143.0, 137.6, 130.6, 130.2, 128.4, 128.2, 127.9, 126.9, 126.1 55.0, 50.4, 49.8, 40.7, 36.8, 29.8.

HRMS (ESI)

[M+ H]$^+$ Calcd. for $C_{26}H_{32}N$, 358.2529; found, 358.2525.



***tert*-Butyl-(*R*)-3-(benzyl(cinnamyl)amino) piperidine-1-carboxylate (43)**

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **43** (44.6 mg, 55% yield) as white solid, m.p.: 101-102 °C;

^{1}H NMR (400 MHz, $CDCl_3$)

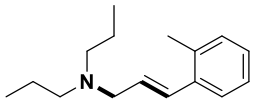
δ 7.31 - 7.26 (m, 8H), 7.21 (t, J = 8.0 Hz, 2H), 6.49 (d, J = 16.0 Hz, 1H), 6.19 (dt, J =. 16.0, 6.4 Hz, 1H), 4.22 - 3.99 (m, 2H), 3.79 - 3.68 (m, 2H), 3.39 - 3.29 (m, 2H), 2.69 - 2.54 (m, 3H), 2.03 (s, 1H), 1.97 (d, J = 12.0 Hz, 1H), 1.70 (d, J = 12.0 Hz, 1H), 1.54 – 1.45 (m, 1H), 1.43 (s, 9H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 154.8, 137.1, 131.8, 128.4, 128.4, 128.2, 127.2, 126.7, 126.2, 79.3, 60.3, 56.3, 54.0, 52.5, 28.4, 27.6, 24.9, 20.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{26}H_{35}N_2O_2$, 407.2693, found, 407.2689.



(*E*)-*N*,*N*-Dipropyl-3-(*o*-tolyl)prop-2-en-1-amine (44)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **44** (40.1 mg, 87% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

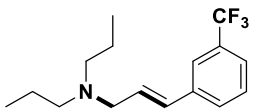
δ 7.47 (d, J = 8.0 Hz, 1H), 7.22 - 7.16 (m, 4H), 6.75 (d, J = 16.0 Hz, 1H), 6.18 (dt, J =. 16.0, 6.8 Hz, 1H), 3.32 (d, J = 6.0 Hz, 2H), 2.51 - 2.47 (m, 4H), 2.37 (s, 3H), 1.60 - 1.50 (m, 4H), 0.92 (t, J = 7.4 Hz, 6H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 136.4, 135.1, 130.2, 130.1, 128.9, 127.2, 126.1, 125.7, 56.8, 55.9, 20.1, 19.8, 11.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{16}H_{26}N$, 232.2060; found, 232.2057.



(*E*)-*N*,*N*-Dipropyl-3-(3-(trifluoromethyl)phenyl)prop-2-en-1-amine (45)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **45** (53.5 mg, 94% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

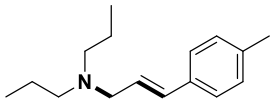
δ 7.60 (s, 1H), 7.54 (d, J = 8.0 Hz, 1H), 7.46 (d, J = 8.0 Hz, 1H), 7.40 (t, J = 7.8 Hz, 1H), 6.54 (d, J = 16.0 Hz, 1H), 6.36 (dt, J = 16.0, 6.4 Hz, 1H), 3.26 (dd, J = 6.4, 1.2 Hz, 2H), 2.45 - 2.42(m, 4H), 1.55 - 1.46 (m, 4H), 0.89 (t, J = 8.0 Hz, 6H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 138.1, 131.0 (q, J = 32.1 Hz), 130.5, 130.3, 129.3 (q, J = 1.0 Hz), 128.9, 124.2 (q, J. = 272.3 Hz), 123.7 (q, J = 3.8 Hz), 122.9 (q, J = 3.8 Hz), 56.5, 56.1, 20.2, 11.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{16}H_{23}F_3N$, 286.1777; found, 286.1772.



(*E*)-*N*,*N*-Dipropyl-3-(*p*-tolyl)prop-2-en-1-amine (46)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **46** (40.6 mg, 88% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

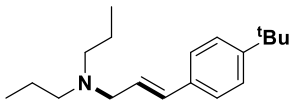
δ 7.31 (d, J = 8.0 Hz, 2H), 7.15 (d, J = 8.0 Hz, 2H), 6.51 (d, J = 16.0 Hz, 1H), 6.27 (dt, J = 16.0, 6.8 Hz, 1H), 3.29 (d, J = 7.6 Hz, 2H), 2.50 - 2.46 (m, 4H), 2.36 (s, 3H), 1.59 - 1.50 (m, 4H), 0.92 (t, J = 7.4 Hz, 6H).

^{13}C NMR (100 MHz, $CDCl_3$)、

δ 137.0, 134.4, 132.1, 129.2, 126.4, 126.1, 56.6, 55.8, 21.1, 19.9, 11.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{16}H_{26}N$, 232.2060; found, 232.2056.



(*E*)-3-(4-(*tert*-Butyl)phenyl)-*N*,*N*-dipropylprop-2-en-1-amine (47)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **47** (44.2 mg, 81% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

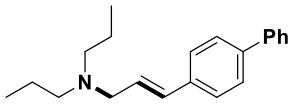
δ 7.39 - 7.34 (m, 4H), 6.52 (d, J = 16.0 Hz, 1H), 6.28 (dt, J = 16.0, 6.8 Hz, 1H), 3.29 (d, J = 6.8 Hz, 2H), 2.50 - 2.46 (m, 4H), 1.59 - 1.49 (m, 4H), 1.34 (s, 9H), 0.91 (t, J = 7.4 Hz, 6H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 150.4, 134.4, 132.1, 126.6, 126.0, 125.4, 56.7, 55.8, 34.5, 31.3, 20.0, 11.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{19}H_{32}N$, 274.2529; found, 274.2524.



(*E*)-3-([1,1'-Biphenyl]-4-yl)-*N*,*N*-dipropylprop-2-en-1-amine (48)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **48** (46.2 mg, 79% yield) as white solid, m.p.: 70-71 ºC;

^{1}H NMR (400 MHz, $CDCl_3$)

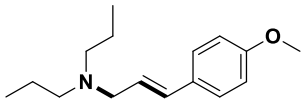
δ 7.64 - 7.58 (m, 4H), 7.50 - 7.45 (m, 4H), 7.39 - 7.35 (m, 1H), 6.59 (d, *J* = 16.0 Hz, 1H), 6.38 (dt, *J* = 16.0, 6.6 Hz, 1H), 3.33 (d, *J* = 5.6 Hz, 2H), 2.52 - 2.48 (m, 4H), 1.61 - 1.51 (m, 4H), 0.93 (t, *J* = 7.4 Hz, 6H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 140.7, 140.1, 136.2, 131.7, 128.7, 127.8, 127.2, 126.9, 126.7, 56.7, 55.9, 20.1, 11.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{21}H_{28}N$, 294.2216; found, 294.2214.



(*E*)-3-(4-Methoxyphenyl)-*N*,*N*-dipropylprop-2-en-1-amine (49)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **49** (41.4 mg, 84% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

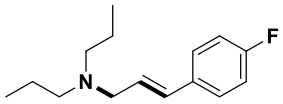
δ 7.32 (d, *J* = 8.6 Hz, 1H), 6.85 (d, *J* = 8.6 Hz, 1H), 6.43 (d, *J* = 16.0 Hz, 1H), 6.15 (dt, *J* = 16.0, 6.4 Hz, 1H), 3.81 (s, 3H), 3.25 (d, *J* = 8.0 Hz, 2H), 2.46 - 2.43 (m, 4H), 1.63 - 1.41 (m, 4H), 0.88 (t, *J* = 7.4 Hz, 6H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 159.0, 131.7, 130.0, 127.4, 125.2, 113.9, 56.7, 55.8, 55.3, 20.0, 11.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{16}H_{26}NO$, 248.2009; found, 248.2006.



(*E*)-3-(4-Fluorophenyl)-*N*,*N*-dipropylprop-2-en-1-amine (50)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **50** (40.4 mg, 86% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

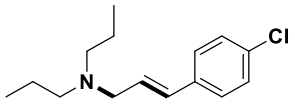
δ 7.37 - 7.34 (m, 2H), 7.02 (t, J = 8.8 Hz, 2H), 6.49 (d, J = 16.0 Hz, 1H), 6.22 (dt, J = 16.0, 6.8 Hz, 1H), 3.26 (d, J = 6.8 Hz, 2H), 2.48 - 2.44 (m, 4H), 1.57 - 1.48 (m, 3H), 0.91 (t, J = 7.6 Hz, 6H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 162.1 (d, J = 246.4 Hz), 133.4 (d, J = 3.3 Hz), 130.8, 127.7, 127.6, 127.5 (d, J = 1.9 Hz), 115.4 (d, J = 21.5 Hz), 56.6, 55.9, 20.1, 11.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{15}H_{23}FN$, 236.1809; found, 236.1806.



(*E*)-3-(4-Chlorophenyl)-*N*,*N*-dipropylprop-2-en-1-amine (51)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **51** (41.6 mg, 83% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

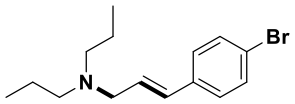
δ 7.31 - 7.25 (m, 4H), 6.46 (d, J = 16.0 Hz, 1H), 6.27 (dt, J = 16.0, 6.4 Hz, 1H), 3.24 (d, J = 6.6 Hz, 2H), 2.44 - 2.41 (m, 4H), 1.54 - 1.45 (m, 4H), 0.88 (t, J = 7.6 Hz, 6H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 135.7, 132.8, 130.7, 128.8, 128.6, 127.4, 56.6, 56.0, 20.2, 11.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{15}H_{23}ClN$, 252.1514; found, 252.1510.



(*E*)-3-(4-Bromophenyl)-*N*,*N*-dipropylprop-2-en-1-amine (52)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **52** (45.4 mg, 77% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

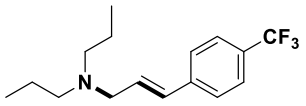
δ 7.45 (d, J = 8.4 Hz, 2H), 7.26 (d, J = 8.4 Hz, 2H), 6.47 (d, J = 16.0 Hz, 1H), 6.30 (dt, J = 16.0, 6.4 Hz, 1H), 3.25 (d, J = 6.4 Hz, 2H), 2.47 - 2.43 (m, 4H), 1.56 - 1.47 (m, 4H), 0.91 (t, J = 7.4 Hz, 6H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 136.2, 131.6, 130.7, 129.0, 127.8, 120.9, 56.6, 56.0, 20.2, 11.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{15}H_{23}BrN$, 296.1008; found, 296.1005.



(*E*)-*N*,*N*-Dipropyl-3-(4-(trifluoromethyl)phenyl)prop-2-en-1-amine (53)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **53** (54.1 mg, 95% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

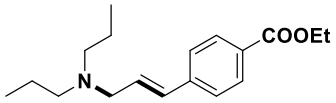
δ 7.58 (d, *J* = 8.0 Hz, 2H), 7.48 (d, *J* = 8.0 Hz, 2H), 6.57 (d, *J* = 16.0 Hz, 1H), 6.42 (dt, *J* = 16.0, 6.4 Hz, 1H), 3.29 (d, *J* = 6.4 Hz, 2H), 2.48 - 2.44 (m, 4H), 1.57 - 1.48 (m, 4H), 0.91 (t, *J* = 7.6 Hz, 6H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 140.7, 131.1, 130.5, 129.0 (q, *J* = 32.0 Hz) 126.3, 125.5 (q, *J* = 3.8 Hz), 124.2 (q, *J*. =270.0 Hz), 56.6, 56.0, 20.2, 11.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{16}H_{23}F_3N$, 286.1777; found, 286.1775.



Ethyl (*E*)-4-(3-(dipropylamino)prop-1-en-1-yl)benzoate (54)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **54** (50.8 mg, 88% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

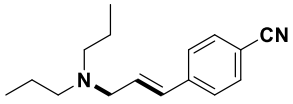
δ 7.98 (d, *J* = 8.0 Hz, 2H), 7.42 (d, *J* = 8.0 Hz, 2H), 6.55 (d, *J* = 16.0 Hz, 1H), 6.41 (dt, *J* = 16.0, 6.4 Hz, 1H), 4.37 (q, *J* = 7.2 Hz, 2H), 3.28 (d, *J* = 7.2 Hz, 2H), 2.47 - 2.43 (m, 4H), 1.56 - 1.46 (m, 4H), 1.39 (t, *J* = 7.2 Hz, 3H), 0.89 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 166.4, 141.6, 131.0, 130.9, 129.8, 129.0, 126.0, 60.8, 56.6, 56.0, 20.1, 14.3, 11.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{18}H_{28}NO_2$, 290.2115; found, 290.2110.



(*E*)-4-(3-(Dipropylamino)prop-1-en-1-yl)benzonitrile (55)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **55** (41.1 mg, 85% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

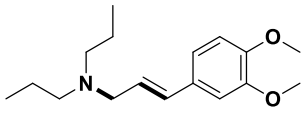
δ 7.58 (d, J = 8.4 Hz, 2H), 7.44 (d, J = 8.4 Hz, 2H), 6.53 (d, J = 16.0 Hz, 1H), 6.43 (dt, J = 16.0, 6.4 Hz, 1H), 3.29 (d, J = 5.4 Hz, 2H), 2.46 - 2.43 (m, 4H), 1.55 - 1.45 (m, 2H), 0.88 (t, J = 7.6 Hz, 6H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 141.6, 132.4, 132.2, 130.4, 126.7, 119.0, 110.5, 56.4, 55.9, 20.0, 11.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{16}H_{23}N_2$, 243.1856; found, 243.1853.



(*E*)-3-(3,4-Dimethoxyphenyl)-*N*,*N*-dipropylprop-2-en-1-amine (56)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **56** (42.6 mg, 77% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

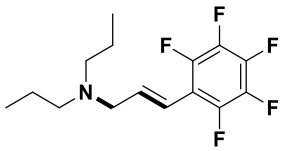
δ 6.96 (d, J = 2.0 Hz, 1H), 6.90 (dd, J = 8.2, 2.0 Hz, 1H), 6.81 (d, J = 8.0 Hz, 1H), 6.44 (d, J = 16.0 Hz, 1H), 6.15 (dt, J = 16.0, 6.8 Hz, 1H), 3.90 (s, 3H), 3.87 (s, 3H), 3.25 - 3.23 (m, 2H), 2.46 - 2.42 (m, 4H), 1.55 - 1.46 (m, 4H), 0.89 (t, J = 7.4 Hz, 6H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 149.0, 148.6, 131.7, 130.3, 125.8, 119.3, 111.1, 108.6, 56.7, 55.9, 55.8, 55.8, 20.0, 11.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{17}H_{28}NO_2$, 278.2115; found, 278.2111.



(*E*)-3-(Perfluorophenyl)-*N*,*N*-dipropylprop-2-en-1-amine (57)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **57** (56.4 mg, 92% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

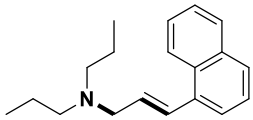
δ 6.62 (dt, J = 16.0, 6.4 Hz, 1H), 6.47 (d, J = 16.0 Hz, 1H), 3.30 (d, J = 6.4 Hz, 2H), 2.47 - 2.43 (m, 4H), 1.56 - 1.46 (m, 4H), 0.91 (t, J = 8.0 Hz, 6H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 144.7 (dm, J = 248.0 Hz), 140.8 (tt, J = 13.6, 5.2 Hz), 138.5 - 138.3 (m), 137.8 (dm, J. = 248.0 Hz), 115.6, 112.11 (td, J = 14.3, 4.2 Hz), 57.4, 56.1, 20.3, 11.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{15}H_{19}F_5N$, 308.1432; found, 308.1429.



(*E*)-3-(Naphthalen-1-yl)-*N*,*N*-dipropylprop-2-en-1-amine (58)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **58** (45.9 mg, 86% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

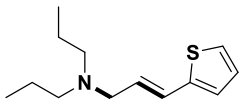
δ 8.11 (d, *J* = 8.0 Hz, 1H), 7.85 - 7.82 (m, 1H), 7.75 (d, *J* = 8.0 Hz, 1H), 7.59 (d, *J* = 8.0 Hz, 1H), 7.52 - 7.47 (m, 2H), 7.45 - 7.41 (m, 1H), 7.26 (d, *J* = 16.0 Hz, 1H), 6.31 (dt, *J* = 16.0, 6.6 Hz, 1H), 3.38 - 3.36 (m, 2H), 2.52 - 2.48 (m, 4H), 1.59 - 1.50 (m, 4H), 0.91 (t, *J* = 8.0 Hz, 6H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 135.1, 133.6, 131.1, 129.2, 128.5, 127.6, 125.9, 125.7, 125.7, 123.8, 123.8, 56.9, 56.0, 20.2, 12.0.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{19}H_{26}N$, 268.2060; found, 268.2056.



(*E*)-*N*,*N*-Dipropyl-3-(thiophen-2-yl)prop-2-en-1-amine (59)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **59** (37.0 mg, 83% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

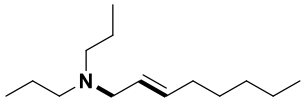
δ 7.15 (d, *J* = 4.0 Hz, 1H), 6.99 - 6.94 (m, 2H), 6.67 (d, *J* = 16.0 Hz, 1H), 6.13 (dt, *J* = 16.0, 6.8 Hz, 1H), 3.27 (d, *J* = 7.6 Hz, 2H), 2.49 - 2.45 (m, 4H), 1.58 - 1.48 (m, 4H), 0.91 (t, *J* = 7.4 Hz, 6H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 142.3, 127.3, 127.0, 125.5, 125.1, 123.9, 56.3, 55.8, 19.9, 11.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{13}H_{22}NS$, 224.1467; found, 224.1465.



(*E*)-*N*,*N*-Dipropyloct-2-en-1-amine (60)

This reaction was conducted on a 0.2 mmol scale with the general procedure B to give **60** (31.6 mg, 75% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

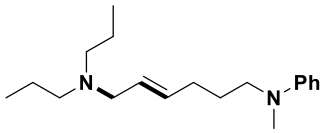
δ 5.60 - 5.53 (m, 1H), 5.51 - 5.44(m, 1H), 3.05 (d, *J* = 6.4 Hz, 2H), 2.41 - 2.37 (m, 4H), 2.06 - 1.98 (m, 2H), 1.52 - 1.42 (m, 4H), 1.39 - 1.29 (m, 6H), 0.90 - 0.85 (m, 9H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 134.2, 126.6, 56.2, 55.6, 32.3, 31.3, 28.9, 22.5, 19.9, 14.1, 11.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{14}H_{30}N$, 212.2373; found, 212.2371.



(*E*)-*N*^{6}-Methyl-*N*^{6}-phenyl-*N*^{1},*N*^{1}-dipropylhex-2-ene-1,6-diamine (61)

This reaction was conducted on a 0.2 mmol scale with the general procedure B to give **61** (29.4 mg, 51% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

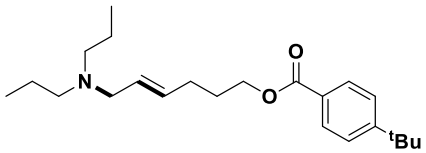
δ 7.27 - 7.21 (m, 2H), 6.76 - 6.65 (m, 3H), 5.66 - 5.49 (m, 2H), 3.37 - 3.30 (m, 2H), 3.10 (d, *J* = 5.8 Hz, 2H), 2.94 (s, 3H), 2.47 - 2.40 (m, 4H), 2.13 - 2.07 (m, 2H), 1.72 - 1.65 (m, 2H), 1.56 - 1.44 (m, 4H), 0.90 (t, *J* = 7.2 Hz, 6H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 149.3, 133.1, 129.1, 127.3, 115.9, 112.1, 56.1, 55.6, 52.2, 38.3, 29.9, 26.2, 19.9, 11.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{19}H_{33}N_2$, 289.2638; found, 289.2634.



(*E*)-6-(Dipropylamino)hex-4-en-1-yl 4-(*tert*-butyl)benzoate (62)

This reaction was conducted on a 0.2 mmol scale with the general procedure B to give **62** (33.0 mg, 46% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

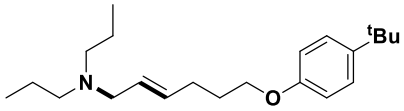
δ 7.97 (d, *J* = 8.6 Hz, 2H), 7.45 (d, *J* = 8.4 Hz, 2H), 5.67 - 5.44 (m, 2H), 4.31 (t, *J* = 6.8 Hz, 2H), 3.07 (d, *J* = 6.0 Hz, 2H), 2.43 - 2.32 (m, 4H), 2.20 - 2.17 (m, 2H), 1.88 - 1.80 (m, 2H), 1.51 - 1.42 (m, 4H), 1.33 (s, 9H), 0.86 (t, *J* = 7.2 Hz, 6H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 166.6, 156.5, 132.4, 129.4, 127.9, 127.6, 125.3, 64.1, 56.1, 55.6, 35.0, 31.1, 28.8, 28.4, 19.8, 11.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{23}H_{38}NO_2$, 360.2897; found, 360.2892.



(*E*)-6-(4-(*tert*-Butyl)phenoxy)-*N*,*N*-dipropylhex-2-en-1-amine (63)

This reaction was conducted on a 0.2 mmol scale with the general procedure B to give **63** (33.1 mg, 50% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

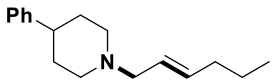
δ 7.28 (d, J = 8.8 Hz, 2H), 6.82 (d, J = 8.8 Hz, 2H), 5.66 - 5.49 (m, 2H), 3.94 (t, J = 6.4 Hz, 2H), 3.06 (d, J = 6.0 Hz, 2H), 2.40 - 2.36 (m, 4H), 2.26 - 2.17 (m, 2H), 1.85 (p, J = 6.7 Hz, 2H), 1.46 (dq, J = 14.9, 7.4 Hz, 4H), 1.29 (s, 9H), 0.86 (t, J = 7.4 Hz, 6H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 156.8, 143.2, 132.7, 127.6, 126.1, 113.9, 67.2, 56.1, 55.6, 34.0, 31.5, 28.9, 28.8, 19.9, 11.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{22}H_{38}NO$, 332.2948; found, 332.2943.



(*E*)-1-(Hex-2-en-1-yl)-4-phenylpiperidine (64)

This reaction was conducted on a 0.2 mmol scale with the general procedure B to give **64** (22.8 mg, 47% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

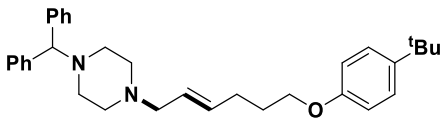
δ 7.32 (t, J = 7.6 Hz, 2H), 7.27 - 7.18 (m, 3H), 5.64 (dt, J = 15.2, 6.0 Hz, 1H), 5.61 - 5.53 (m, 1H), 3.12 (d, J = 11.6 Hz, 2H), 3.03 (d, J = 6.4 Hz, 2H), 2.59 - 2.41 (m, 1H), 2.07 (dq, J = 13.8, 6.8, 6.0 Hz, 4H), 1.87 (dt, J = 9.0, 4.4 Hz, 4H), 1.48 - 1.39 (m, 2H), 0.93 (t, J = 7.2 Hz, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 146.3, 134.8, 128.4, 126.9, 126.2, 126.1, 61.3, 54.1, 42.7, 34.5, 33.3, 22.4, 13.7.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{17}H_{26}N$, 244.2060; found, 244.2058.



(*E*)-1-Benzhydryl-4-(6-(4-(tert-butyl)phenoxy)hex-2-en-1-yl)piperazine (65)

This reaction was conducted on a 0.2 mmol scale with the general procedure B to give **65** (49.2 mg, 51% yield) as white solid, m.p.: 75-76 ^{o}C;

^{1}H NMR (400 MHz, $CDCl_3$)

δ 7.45 (d, J = 7.2 Hz, 4H), 7.30 (t, J = 8.0 Hz, 6H), 7.23 - 7.18 (m, 2H), 6.85 (d, J = 8.8 Hz, 2H), 5.67 (dt, J = 15.1, 6.3 Hz, 1H), 5.62 - 5.54 (m, 1H), 4.27 (s, 1H), 3.96 (t, J =

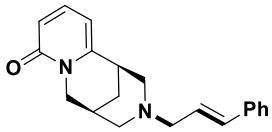
6.4 Hz, 2H), 3.01 (d, *J* = 6.3 Hz, 2H), 2.60 - 2.42 (m, 8H), 2.24 (q, *J* = 6.3, 5.5 Hz, 2H), 1.91 - 1.84 (m, 2H), 1.33 (s, 9H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 156.7, 143.1, 142.7, 133.6, 128.4, 127.9, 126.8, 126.1, 113.9, 76.2, 67.1, 60.7, 53.2, 51.7, 34.0, 31.5, 28.8, 28.8.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{33}H_{43}N_2O$, 483.3370; found, 483.3365.



(*1R*,*5S*)-3-Cinnamyl-1,2,3,4,5,6-hexahydro-8H-1,5-methanopyrido[1,2-a][1,5]diazocin-8-one (66)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **66** (46.5 mg, 76% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

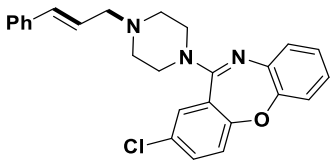
δ 7.30 (t, *J* = 6.4 Hz, 5H), 7.24 - 7.19 (m, 1H), 6.49 (d, *J* = 9.0 Hz, 1H), 6.35 (d, *J* = 16.0 Hz, 1H), 6.07 - 5.98 (m, 2H), 4.09 (d, *J* = 16.0 Hz, 1H), 3.91 (dd, *J* = 15.2, 6.8 Hz, 1H), 3.06 - 2.96(m, 5H), 2.45 (s, 1H), 2.34 (d, J = 12.0 Hz, 2H), 1.90 (d, *J* = 12.0 Hz, 1H), 1.79 (d, *J* = 12.0 Hz, 1H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 163.6, 151.4, 138.7, 136.8, 132.2, 128.4, 127.3, 126.3, 126.2, 116.5, 104.7, 60.2, 60.1, 59.9, 49.9, 35.4, 27.9, 25.8.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{20}H_{23}N_2O$, 307.1805; found, 307.1802.



2-Chloro-11-(4-cinnamylpiperazin-1-yl)dibenzo[*b*,*f*][1,4]oxazepane (67)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **67** (62.6 mg, 73% yield) as yellow oil;

^{1}H NMR (500 MHz, $CDCl_3$)

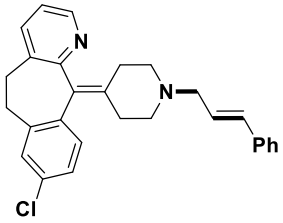
δ 7.37 (d, *J* = 7.5 Hz, 2H), 7.33 (dd, *J* = 8.5, 2.5 Hz, 1H), 7.29 (t, *J* = 7.5 Hz, 3H), 7.21 (t, *J* = 7.5 Hz, 1H), 7.17 - 7.13 (m, 2H), 7.09 - 7.05 (m, 2H), 6.96 (t, *J* = 7.5 Hz, 1H), 6.53 (d, *J* = 16.0 Hz, 1H), 6.28 (dt, *J* = 16.0, 5.4 Hz, 1H), 3.55 (s, 4H), 3.20 (d, *J* = 6.8 Hz, 1H), 2.60 (s, 4H).

^{13}C NMR (125 MHz, $CDCl_3$)

δ 159.2, 158.7, 151.7, 140.1, 136.6, 133.4, 132.4, 130.1, 128.9, 128.5, 127.5, 126.9, 126.3, 125.8, 125.7, 124.9, 124.4, 122.6, 122.0, 60.9, 52.8, 47.2.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{26}H_{25}ClN_3O$, 430.1681; found, 430.1679.



8-Chloro-11-(1-cinnamylpiperidin-4-ylidene)-6,11-dihydro-5*H*-benzo[5,6]cyclohepta[1,2-b]pyridine (68)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **68** (50.2 mg, 59% yield) as yellow oil;

^{1}H NMR (500 MHz, $CDCl_3$)

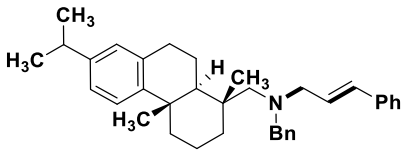
δ 8.39 (d, *J* = 5.0 Hz, 1H), 7.43 (d, *J* = 8.0 Hz, 1H), 7.36 (d, *J* = 7.5 Hz, 2H), 7.30 (t, *J*. = 7.5 Hz, 2H), 7.23 (t, *J* = 7.5 Hz, 1H), 7.14 (d, *J* = 15.0 Hz, 3H), 7.09 - 7.09 (m, 1H), 6.52 (d, *J* = 16.0 Hz, 1H), 6.33 (dt, *J* = 16.0, 5.4 Hz, 1H), 3.43 - 3.33 (m, 2H), 3.26 (d, *J* = 6.8 Hz, 2H), 2.91 - 2.76 (m, 4H), 2.64 - 2.40 (m, 6H).

^{13}C NMR (125 MHz, $CDCl_3$)

δ 157.3, 146.6, 139.5, 137.7, 137.4, 136.5, 133.4, 132.8, 130.6, 128.9, 128.6, 127.7, 126.4, 126.1, 122.2, 60.6, 54.5, 54.5, 31.7, 31.4, 30.4, 30.1.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{28}H_{28}ClN_2$, 427.1936; found, 427.1932.



(*E*)-*N*-Benzyl-*N*-(((1R,4aS,10aR)-7-isopropyl-1,4a-dimethyl-1,2,3,4,4a,9,10,10a-octahydrophenanthren-1-yl)methyl)-3-phenylprop-2-en-1-amine (69)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **69** (55.9 mg, 57% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

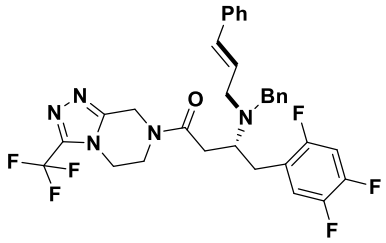
δ 7.34 (t, *J* = 7.6 Hz, 4H), 7.30 - 7.25 (m, 4H), 7.21 - 7.17 (m, 3H), 6.99 - 6.97 (m, 1H), 6.85 (s, 1H), 6.36 (d, *J* = 16.0 Hz, 1H), 6.27 (dt, *J* = 16.0, 6.2 Hz, 1H), 3.81 - 3.67 (m, 2H), 3.21 (qd, *J* = 14.8, 6.2 Hz, 2H), 2.84 - 2.78 (m, 3H), 2.61 (d, *J* = 14.4 Hz, 1H), 2.35 (d, *J* = 14.4 Hz, 1H), 2.28 (d, *J* = 12.4 Hz, 1H), 1.84 - 1.78 (m, 1H), 1.75 - 1.55 (m, 5H), 1.48 - 1.43 (m, 2H), 1.23 - 1.20 (m, 9H), 0.89 (s, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 147.8, 145.3, 140.0, 137.3, 134.8, 132.4, 128.8, 128.5, 128.2, 127.3, 127.2, 126.9, 126.7, 126.2, 124.1, 123.7, 65.3, 60.8, 57.4, 44.9, 39.5, 38.6, 37.6, 36.9, 33.4, 30.2, 25.8, 24.0, 24.0, 19.3, 19.0, 18.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{36}H_{46}N$, 492.3625; found, 492.3619.



(*R*)-3-(Benzyl(cinnamyl)amino)-1-(3-(trifluoromethyl)-5,6-dihydro-[1,2,4]triazolo[4,3-a]pyrazin-7(8H)-yl)-4-(2,4,5-trifluorophenyl)butan-1-one (70)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **70** (42.9 mg, 35% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

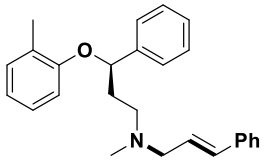
δ 7.34 - 7.28 (m, 4H), 7.23 - 7.20 (m, 2H), 7.11 (s, 3H), 6.98 - 6.97 (m, 1H), 6.87 (q, J = 9.6 Hz, 1H), 6.52 - 6.49 (m, 1H), 6.20 - 6.10 (m, 1H), 4.96 - 4.83 (m, 1H), 4.76 - 4.59 (m, 1H), 4.14 - 4.01 (m, 2H), 3.74 - 3.32 (m, 6H), 3.01 - 2.94 (m, 1H), 2.79 - 2.75 (m, 1H), 2.65 - 2.59 (m, 1H), 2.43 - 2.39 (m, 1H), 1.27 - 1.24 (m, 1H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 170.3, 157.2 (d, J = 8.0 Hz), 154.76 (d, J = 6.0 Hz), 152.9, 150.3 (d, J = 4.0 Hz), 147.8 (dd, J = 11.6, 2.7 Hz), 145.4 (dd, J = 12.7, 3.2 Hz), 139.4, 136.8 (d, J = 21.4 Hz), 132.6, 128.6, 128.4 (d, J = 8.3 Hz), 128.2, 127.6 (d, J = 11.9 Hz), 127.1, 126.3, 122.9 (dd, J = 16.3, 5.8 Hz), 119.0 (dd, J = 18.7, 6.2 Hz), 118.2 (q, J = 269.0 Hz), 105.3 (dd, J = 28.8, 21.0 Hz), 53.7, 52.2, 51.7, 43.2, 42.5, 41.8, 39.3, 38.0, 34.9, 34.4.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{32}H_{30}F_6N_5O$, 614.2349; found, 614.2341.



(*R*,*E*)-*N*-Methyl-3-phenyl-*N*-(3-phenyl-3-(*o*-tolyloxy)propyl)prop-2-en-1-amine (71)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **71** (58.6 mg, 79% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

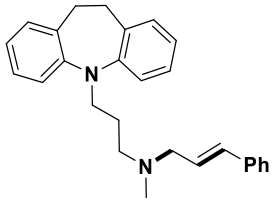
δ 7.40 (d, J = 7.2 Hz, 2H), 7.37 - 7.32 (m, 6H), 7.29 - 7.25 (m, 2H), 7.12 (d, J = 8.0 Hz, 1H), 7.00. (t, J = 8.0 Hz, 1H), 6.81 (t, J = 8.0 Hz, 1H), 6.67 (d, J = 8.0 Hz, 1H), 6.53 (d, J = 16.0 Hz, 1H), 6.26 (dt, J = 16.0, 6.8 Hz, 1H), 5.31 (dd, J = 8.4, 4.4 Hz, 1H), 3.27 - 3.18 (m, 2H), 2.74 - 2.61 (m, 2H), 2.34 (s, 3H), 2.30 (s, 3H), 2.28 - 2.23 (m, 1H), 2.14 - 2.06 (m, 1H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 156.1, 142.2, 136.9, 132.7, 130.6, 128.5, 128.5, 127.4, 127.4, 126.9, 126.9, 126.5, 126.3, 125.8, 120.1, 112.7, 77.8, 60.3, 53.4, 42.1, 36.6, 16.5.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{26}H_{30}NO$, 372.2322; found, 372.2320.



(*E*)-*N*-(3-(10,11-Dihydro-5*H*-dibenzo[b,f]azepin-5-yl)propyl)-*N*-methyl-3-phenylprop-2-en-1-amine (72)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **72** (58.8 mg, 77% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

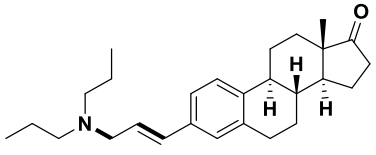
δ 7.33 - 7.28 (m, 4H), 7.23 (d, J = 8.0 Hz, 1H), 7.13 - 7.03 (m, 6H), 6.91 - 6.87 (m, 2H), 6.44 (d, J = 16.0 Hz, 1H), 6.17 (dt, J = 16.0, 6.8 Hz, 1H), 3.77 (t, J = 6.8 Hz, 2H), 3.10 - 3.07 (m, 6H), 2.47 - 2.43 (m, 2H), 2.18 (s, 3H), 1.80 - 1.73 (m, 2H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 148.2, 136.9, 134.2, 132.7, 129.8, 128.5, 127.4, 126.9, 126.3, 122.4, 119.9, 60.2, 54.8, 48.6, 42.2, 32.1, 25.6.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{27}H_{31}N_2$, 383.2482; found, 383.2481.



(8R,9S,13S,14S)-3-((*E*)-3-(Dipropylamino)prop-1-en-1-yl)-13-methyl-6,7,8,9,11,12,13,14,15,16-decahydro-17*H*-cyclopenta[a]phenanthren-17-one (73)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **73** (42.4 mg, 54% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

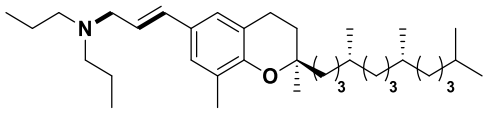
δ 7.26 - 7.24 (m, 1H), 7.18 (d, J = 8.0 Hz, 1H), 7.12 (s, 1H), 6.46 (d, J = 16.0 Hz, 1H), 6.24 (dt, J = 16.0, 6.8 Hz, 1H), 3.26 (d, J = 6.6 Hz, 2H), 2.93 - 2.89 (m, 2H), 2.47 - 2.40 (m, 5H), 2.33 - 2.27 (m, 1H), 2.10 - 1.94 (m, 4H), 1.63 - 1.44 (m, 10H), 0.91 - 0.86 (m, 9H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 220.8, 139.1, 136.6, 134.8, 132.1, 126.9, 125.6, 123.7, 56.6, 55.7, 50.5, 47.9, 44.4, 38.2, 35.8, 31.6, 29.4, 26.5, 25.7, 21.6, 19.9, 13.8, 11.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{27}H_{40}NO$, 394.3104; found, 394.3103.



(*E*)-3-((*R*)-2,8-Dimethyl-2-((4*R*,8*R*)-4,8,12-trimethyltridecyl)chroman-6-yl)-*N*,*N*-dipropylprop-2-en-1-amine (74)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **74** (60.9 mg, 58% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

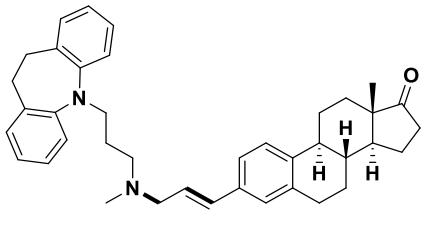
δ 7.04 (s, 1H), 6.95 (s, 1H), 6.40 (d, J = 16.0 Hz, 1H), 6.12 (dt, J = 16.0, 6.8 Hz, 1H), 3.26 (d, J = 6.8 Hz, 2H), 2.76 (t, J = 6.0 Hz, 2H), 2.49 - 2.45 (m, 4H), 2.18 (s, 3H), 1.88 - 1.74 (m, 3H), 1.62 - 1.51 (m, 8H), 1.45 - 1.29 (m, 10H), 1.19 – 1.01 (m, 8H), 0.93 - 0.86 (m, 19H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 151.8, 132.3, 127.9, 126.3, 126.3, 124.9, 123.8, 120.4, 76.2, 56.7, 55.7, 40.1, 39.4, 37.4, 37.4, 37.3, 32.8, 32.7, 31.2, 27.9, 24.8, 24.4, 24.3, 22.7, 22.6, 22.3, 20.9, 20.0, 19.7, 19.6, 16.1, 12.0.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{36}H_{64}NO$, 526.4982; found, 526.4982.



(8*R*,9*S*,13*S*,14*S*)-3-((*E*)-3-((3-(10,11-Dihydro-5*H*-dibenzo[*b*,*f*]azepin-5-yl)propyl)(methyl)amino)prop-1-en-1-yl)-13-methyl-6,7,8,9,11,12,13,14,15,16-decahydro-17*H*-cyclopenta[*a*]phenanthren-17-one (75)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **75** (60.2 mg, 54% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

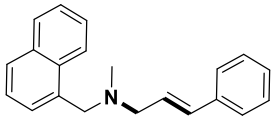
δ 7.30 - 7.28 (m, 1H), 7.20 - 7.14 (m, 3H), 7.13 - 7.10 (m, 5H), 6.97 - 6.93 (m, 2H), 6.45 (d, *J* = 16.0 Hz, 1H), 6.19 (dt, *J* = 16.0, 6.8 Hz, 1H), 3.82 (t, *J* = 6.8 Hz, 2H), 3.16 (s, 4H) 3.13 (d, *J* = 8.0 Hz, 2H), 2.95 (dd, *J* = 8.8, 4.0 Hz, 2H), 2.58 - 2.45 (m, 4H), 2.37 - 2.31 (m, 1H), 2.22 (s, 3H), 2.19 - 2.00 (m, 5H), 1.86 – 1.79 (m, 2H), 1.70 - 1.49 (m, 6H), 0.95 (s, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 220.9, 148.3, 139.2, 136.6, 134.7, 134.3, 132.5, 129.8, 127.0, 126.4, 126.3, 125.6, 123.8, 122.4, 120.0, 60.4, 60.3, 54.9, 50.5, 48.8, 48.0, 44.5, 42.2, 38.2, 35.9, 32.3, 31.6, 29.4, 26.6, 25.8, 25.7, 21.6, 21.1, 14.3, 13.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{39}H_{47}N_2O$, 559.3683; found, 559.3679.



(*E*)-*N*-Methyl-*N*-(naphthalen-1-ylmethyl)-3-phenylprop-2-en-1-amine (76)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **76** (48.7 mg, 85% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

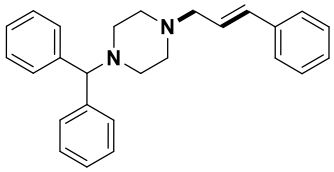
δ 8.29 (d, *J* = 8.0 Hz, 1H), 7.80 (d, *J* = 8.0 Hz, 1H), 7.73 (d, *J* = 8.0 Hz, 1H), 7.49 (t, *J* = 8.0 Hz, 1H), 7.45 - 7.41 (m, 2H), 7.39 - 7.34 (m, 3H), 7.27 (t, *J* = 8.0 Hz, 2H), 7.18 (t, *J* = 8.0 Hz, 1H), 6.54 (d, *J* = 16.0 Hz, 1H), 6.34 (dt, *J* = 16.0, 6.8 Hz, 1H), 3.91 (s, 2H), 3.24 (d, *J* = 6.8 Hz, 2H), 2.24 (s, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 137.1, 134.8, 133.8, 132.6, 132.4, 128.5, 128.4, 127.9, 127.5, 127.4, 127.3, 126.2, 125.8, 125.5, 125.0, 124.6, 60.3, 60.0, 42.4.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{21}H_{22}N$, 288.1747; found, 288.1742.



1-Benzhydryl-4-cinnamylpiperazine (77)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **77** (67.7 mg, 92% yield) as white solid, m.p.: 120-121 °C;

^{1}H NMR (400 MHz, $CDCl_3$)

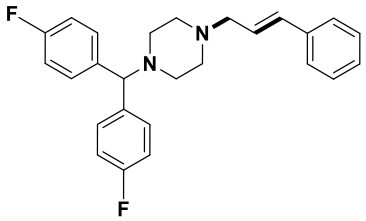
δ 7.39 (d, *J* = 8.0 Hz, 2H), 7.33 (d, *J* = 8.0 Hz, 2H), 7.28 - 7.20 (m, 7H), 7.14 (t, *J* = 7.2 Hz, 2H), 6.49 (d, *J* = 16.0 Hz, 1H), 6.25 (dt, *J* = 16.0, 6.8 Hz, 1H), 4.23 (s, 1H), 3.16 (d, *J* = 6.8 Hz, 2H), 2.55 (s, 4H), 2.45 (s, 4H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 142.6, 136.8, 133.2, 128.4, 128.4, 127.8, 127.4, 126.8, 126.2, 126.0, 76.0, 60.7, 53.2, 51.6.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{26}H_{29}N_2$, 369.2325; found, 369.2321.



1-(bis(4-Fluorophenyl)methyl)-4-cinnamylpiperazine (78)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **78** (69.4 mg, 86% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

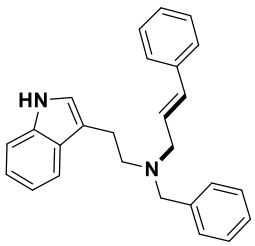
δ 7.34 - 7.21 (m, 10H), 6.96 (t, *J* = 8.4 Hz, 4H), 6.51 (d, *J* = 16.0 Hz, 1H), 6.26 (dt, *J* = 16.0, 6.8 Hz, 1H), 4.23 (s, 1H), 3.18 (d, *J* = 6.8 Hz, 2H), 2.55 (s, 4H), 2.43 (s, 4H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 161.8 (d, *J* = 245 Hz), 138.1 (d, *J* = 3.0 Hz), 136.8, 133.4, 129.2 (d, *J* = 8.0 Hz), 128.5, 127.5, 126.3, 126.0, 115.4 (d, *J* = 21.0 Hz), 74.4, 60.9, 53.3, 51.5.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{26}H_{27}F_2N_2$, 405.2137; found, 405.2128.



(*E*)-*N*-(2-(1*H*-Indol-3-yl)ethyl)-*N*-benzyl-3-phenylprop-2-en-1-amine (79)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **79** (54.9 mg, 75% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

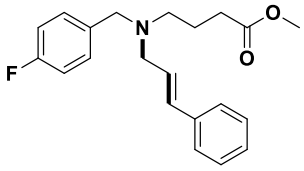
δ 7.88 (s, 1H), 7.48 (d, *J* = 8.0 Hz, 1H), 7.40 - 7.36 (m, 4H), 7.30 (t, *J* = 7.4 Hz, 3H), 7.24 (d, *J* = 7.2 Hz, 1H), 7.15 (d, *J* = 8.0 Hz, 3H), 7.02 (t, *J* = 8.0 Hz, 1H), 6.92 (s, 1H), 6.44 (d, *J* = 16.0 Hz, 1H), 6.25 (dt, *J* = 16.0, 6.8 Hz, 1H), 3.74 (s, 2H), 3.32 (d, *J* = 6.8 Hz, 2H), 2.99 - 2.96 (m, 2H), 2.88 - 2.84 (m, 2H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 139.5, 136.2, 136.1, 131.5, 131.0, 128., 128.8, 128.2, 127.8, 127.5, 126.9, 121.9, 121.5, 120.9, 119.1, 118.9, 114.5, 111.0, 58.4, 56.2, 54.2, 23.1.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{26}H_{27}N_2$, 367.2169; found, 367.2162.



Methyl 4-(cinnamyl(4-fluorobenzyl)amino)butanoate (80)

This reaction was conducted on a 0.2 mmol scale with the general procedure A to give **80** (53.8 mg, 79% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

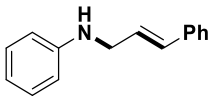
δ 7.35 (d, *J* = 8.0Hz, 2H), 7.31 - 7.28 (m, 4H), 7.21 (t, *J* = 7.2 Hz, 1H), 6.98 (t, *J* = 8.0 Hz, 2H), 6.49 (d, *J* = 16.0 Hz, 1H), 6.22 (dt, *J* = 16.0, 6.4 Hz, 1H), 3.60 (s, 3H), 3.55 (s, 2H), 3.19 (d, *J* = 6.8 Hz, 2H), 2.48 (t, *J* = 7.2 Hz, 2H), 2.33 (t, *J* = 7.2 Hz, 2H), 1.85 -1.78 (m, 2H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 174.0, 161.8 (d, *J* = 245.0 Hz), 137.0, 135.2 (d, *J* = 3.0 Hz), 132.4, 130.2 (d, *J* = 8.0 Hz), 128.5, 127.4, 127.3, 126.2, 114.9 (d, *J* = 21.0 Hz), 57.5, 55.8, 52.3, 51.4, 31.7, 22.4.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{21}H_{25}FNO_2$, 342.1864; found, 342.1860.



***N*-Cinnamylaniline (81)**

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **81** (29.2 mg, 70% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

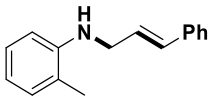
δ 7.35 (d, J = 8.0 Hz, 2H), 7.29 (t, J = 8.0 Hz, 2H), 7.23 - 7.16 (m, 3H), 6.72 (t, J = 8.0 Hz, 1H), 6.66 (d, J = 8.0 Hz, 2H), 6.61 (d, J = 16.0 Hz, 1H), 6.31 (d, J = 16.0 Hz, 1H), 3.91 (d, J = 4.0 Hz, 2H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 148.0, 136.8, 131.5, 129.2, 128.5, 127.5, 127.0, 126.3, 117.6, 113.1, 46.2.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{15}H_{16}N$, 210.1277; found, 210.1273.



***N*-Cinnamyl-2-methylaniline (82)**

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **82** (30.7 mg, 69% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

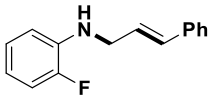
δ 7.38 (d, J = 8.0 Hz, 2H), 7.30 (t, J = 8.0 Hz, 2H), 7.24 - 7.22 (m, 1H), 7.13 (t, J = 8.0 Hz, 1H), 7.07 (d, J = 8.0 Hz, 1H), 6.70 - 6.67 (m, 2H), 6.63 (d, J = 16.0 Hz, 1H), 6.37 (dt, J = 16.0, 5.4 Hz, 1H), 3.98 (d, J = 4.0Hz, 2H), 2.17 (s, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 145.8, 136.8, 131.7, 130.1, 128.6, 127.5, 127.2, 127.0, 126.3, 122.2, 117.3, 110.2, 46.3, 17.5.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{16}H_{18}N$, 224.1434; found, 224.1428.



***N*-Cinnamyl-2-fluoroaniline (83)**

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **83** (27.2 mg, 60% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

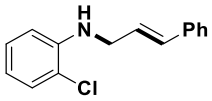
δ 7.28 (d, J = 8.0 Hz, 2H), 7.21 (t, J = 6.0 Hz, 2H), 7.16 - 7.12 (m, 1H), 6.92 - 6.87 (m, 2H), 6.66 (t, J = 8.0 Hz, 1H), 6.57 - 6.51 (m, 2H), 6.22 (dt, J = 16.0, 5.6 Hz, 1H), 3.86 (d, J = 5.6 Hz, 2H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 151.6 (d, J = 238 Hz), 136.7, 136.45 (d, J = 12 Hz), 131.7, 128.6, 127.6, 126.5, 126.3, 124.6 (d, J = 4 Hz), 116.8 (d, J = 7.0 Hz,), 114.4 (d, J = 19 Hz), 112.4 (d, J = 3 Hz), 45.7.

HRMS (ESI)

[M H]$^+$ Calcd. for $C_{15}H_{15}FN$, 228.1183; found, 228.1180.



2-Chloro-*N*-cinnamylaniline (84)

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **84** (30.6 mg, 63% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

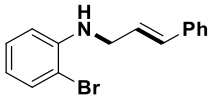
δ 7.36 (d, J = 7.2 Hz, 2H), 7.33 - 7.19 (m, 4H), 7.14 - 7.09 (m, 1H), 6.74 - 6.68 (m, 1H), 6.66 - 6.56 (m, 1H), 6.30 (dt, J = 16.0, 5.6 Hz, 1H), 3.97 (dd, J = 6.0, 1.2 Hz, 2H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 143.8, 136.7, 131.7, 129.1, 128.6, 127.8, 127.6, 126.4, 126.3, 119.2, 117.4, 111.6, 45.8.

HRMS (ESI)

[M+H]$^+$ Calcd. for $C_{15}H_{15}ClN$, 244.0888; found, 244.0883.



2-Bromo-*N*-cinnamylaniline (85)

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **85** (31.5 mg, 55% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

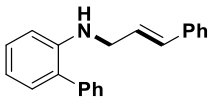
δ 7.43 (d, J = 8.0 Hz, 1H), 7.36 (d, J = 8.0 Hz, 2H), 7.30 (t, J = 8.0 Hz, 2H), 7.22 (t, J = 8.0 Hz, 1H), 7.16 (t, J = 8.0 Hz, 1H), 6.69 - 6.55 (m, 3H), 6.31 (dd, J = 16.0, 5.6 Hz, 1H), 4.53 (s, 1H), 3.97 (d, J = 5.6 Hz, 2H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 144.7, 136.7, 132.4, 131.7, 128.6, 128.5, 127.6, 126.4, 126.2, 117.9, 111.6, 109.8, 45.9.

HRMS (ESI)

[M+H]$^+$ Calcd. for $C_{15}H_{15}BrN$, 288.0382; found, 288.0375.



***N*-Cinnamyl-[1,1'-biphenyl]-2-amine (86)**

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **86** (30.2 mg, 53% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

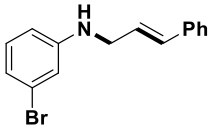
δ 7.46 - 7.40 (m, 4H), 7.34 - 7.30 (m, 3H), 7.28 - 7.16 (m, 4H), 7.11 - 7.09 (m, 1H), 6.79 - 6.74 (m, 2H), 6.53 (d, J = 16.0 Hz, 1H), 6.23 (dt, J = 16.0, 5.6 Hz, 1H), 3.88 (d, J = 5.6 Hz, 1H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 144.8, 139.4, 136.8, 131.2, 130.2, 129.4, 128.9, 128.7, 128.5, 127.8, 127.4, 127.2, 127.0, 126.3, 117.2, 110.8, 46.2.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{21}H_{20}N$, 286.1590; found, 286.1585.



3-Bromo-*N*-cinnamylaniline (87)

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **87** (29.8 mg, 52% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

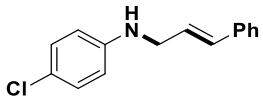
δ 7.36 (d, J = 8.0 Hz, 2H), 7.31 (t, J = 8.0 Hz, 2H), 7.25 - 7.23 (m, 1H), 7.00 (t, J = 8.0 Hz, 1H), 6.83 - 6.79 (m, 2H), 6.62 - 6.55 (m, 2H), 6.27 (dt, J = 16.0, 5.6 Hz, 1H), 3.90 (d, J = 5.6 Hz, 2H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 149.2, 136.7, 131.9, 130.5, 128.6, 127.7, 126.4, 126.2, 123.3, 120.4, 115.6, 111.7, 45.9.

HRMS (ESI)

$[M-H]^-$ Calcd. for $C_{15}H_{13}BrN$, 286.0237; found, 286.0237.



4-Chloro-*N*-cinnamylaniline (88)

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **88** (32.5 mg, 67% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

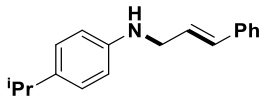
δ 7.40 (d, J = 7.2 Hz, 2H), 7.35 (t, J = 7.2 Hz, 2H), 7.31 – 7.27 (m, 1H), 7.17 (d, J = 8.8 Hz, 2H), 6.68 – 6.59 (m, 3H), 6.33 (dt, J = 16.0, 5.6 Hz, 1H), 3.94 (d, J = 4.8 Hz, 2H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 146.42, 136.6, 131.8, 129.1, 128.6, 127.6, 126.4, 126.3, 122.2, 114.2, 46.3.

HRMS (ESI)

$[M-H]^-$ Calcd. for $C_{15}H_{13}ClN$, 242.0742; found, 242.0739.



***N*-Cinnamyl-4-*iso*propylaniline (89)**

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **89** (32.6 mg, 65% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

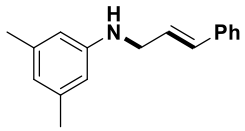
δ 7.36 (d, J = 8.0 Hz, 2H), 7.30 (t, J = 8.0 Hz, 2H), 7.23 (d, J = 8.0 Hz, 1H), 7.06 (d, J = 8.0 Hz, 2H), 6.64 - 6.60 (m, 3H), 6.33 (d, J = 16.0 Hz, 1H), 3.91 (d, J = 5.6 Hz, 2H), 2.81 (dt, J = 13.8, 6.8 Hz, 1H), 1.22 (s, 3H), 1.20 (s, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 145.9, 138.4, 136.9, 131.5, 128.5, 127.5, 127.2, 127.1, 126.3, 113.3, 46.7, 33.2, 24.2.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{18}H_{22}N$, 252.1747; found, 252.1745.



***N*-Cinnamyl-3,5-dimethylaniline (90)**

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **90** (29.8 mg, 63% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

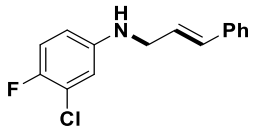
δ 7.36 (d, J = 8.0 Hz, 2H), 7.30 (t, J = 8.0 Hz, 2H), 7.23 (d, J = 8.0 Hz, 1H), 6.61 (d, J = 16.0 Hz, 1H), 6.40 (s, 1H), 6.36 - 6.29 (m, 3H), 3.91 (d, J = 5.6 Hz, 2H), 2.24 (s, 6H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 148.0, 138.9, 136.9, 131.5, 128.5, 127.5, 127.1, 126.3, 119.8, 111.2, 46.4, 21.5.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{17}H_{20}N$, 238.1590; found, 238.1588.



3-Chloro-*N*-cinnamyl-4-fluoroaniline (91)

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **91** (29.8 mg, 50% yield) as yellow oil;

^{1}H NMR (400 MHz, CDCl3)

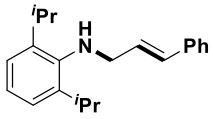
δ 7.36 (d, *J* = 8.0 Hz, 2H), 7.31 (t, *J* = 8.0 Hz, 2H), 7.24 (d, *J* = 8.0 Hz, 1H), 6.94 (t, *J* = 10.0 Hz, 1H), 6.64 (dd, *J* = 6.0, 2.8 Hz, 1H), 6.59 (d, *J* = 16.0 Hz, 1H), 6.46 (dt, *J* = 8.8, 3.2 Hz, 1H), 6.26 (dt, J = 16.0, 5.6 Hz, 1H), 3.86 (d, *J* = 5.6 Hz, 2H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 151.1 (d, *J* = 238 Hz), 144.8, 136.6, 132.0, 128.6, 127.7, 126.3,126.1, 121.1 (d, *J* = 18 Hz), 116.8 (d, *J* = 22 Hz), 114.0, 112.3 (d, *J* = 6 Hz), 46.5.

HRMS (ESI)

$[M-H]^-$ Calcd. for $C_{15}H_{12}ClFN$, 260.0648; found, 260.0647.



***N*-Cinnamyl-2,6-di-*iso*-propylaniline (92)**

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **92** (47.4 mg, 81% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

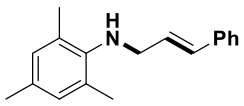
δ 7.32 (d, *J* = 8.0 Hz, 2H), 7.23 (t, *J* = 8.0 Hz, 2H), 7.14 (t, *J* = 8.0 Hz, 1H), 7.04 - 6.94 (m, 3H), 6.57 (d, *J* = 16.0 Hz, 1H), 6.35 (dt, *J* = 16.0, 6.0 Hz, 1H), 3.59 (d, *J* = 6.0 Hz, 2H), 3.24 (dt, *J* = 13.6, 6.8 Hz, 2H), 1.18 (s, 6H), 1.17 (s, 6H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 142.9, 142.5, 137.0, 131.2, 128.6, 128.0, 127.5, 126.3, 123.9, 123.6, 54.0, 27.8, 24.3.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{21}H_{28}N$, 294.2216; found, 294.2212.



***N*-Cinnamyl-2,4,6-trimethylaniline (93)**

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **93** (36.1 mg, 72% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

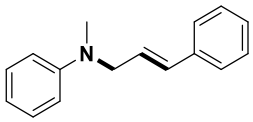
δ 7.37 (d, *J* = 8.0 Hz, 2H), 7.30 (t, *J* = 8.0 Hz, 2H), 7.22 (t, *J* = 8.0 Hz, 1H), 6.83 (s, 2H), 6.60 (d, *J* = 16.0 Hz, 1H), 6.36 (dt, *J* = 16.0, 6.4 Hz, 1H), 3.69 (d, *J* = 6.4 Hz, 2H), 2.70 (s, 1H), 2.28 (s, 6H), 2.23 (s, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 143.0, 137.0, 131.6, 131.2, 129.9, 129.4, 128.5, 128.1, 127.4, 126.3, 51.1, 20.6, 18.4.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{18}H_{22}N$, 252.1747; found, 252.1744.



***N*-Cinnamyl-*N*-methylaniline (94)**

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **94** (40.1 mg, 90% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

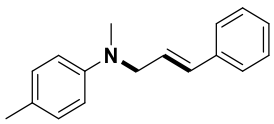
δ 7.33 (d, J = 8.0 Hz, 2H), 7.29 - 7.19 (m, 5H), 6.77 (d, J = 8.0 Hz, 2H), 6.71 (t, J = 8.0 Hz, 1H), 6.50 (d, J = 16.0 Hz, 1H), 6.22 (dt, J = 16.0, 6.0 Hz, 1H), 4.05 (d, J = 8.0 Hz, 1H), 2.95 (s, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 149.5, 136.9, 131.3, 129.1), 128.5, 127.4, 126.3, 125.7, 116.6, 112.6, 54.9, 37.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{16}H_{18}N$, 224.1434; found, 224.1429.



***N*-Cinnamyl-*N*,4-dimethylaniline (95)**

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **95** (40.1 mg, 82% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

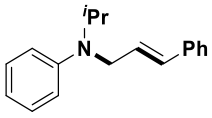
δ 7.40 (d, J = 8.0 Hz, 2H), 7.34 (t, J = 8.0 Hz, 2H), 7.29 – 7.25 (m, 1H), 7.11 (d, J = 8.0 Hz, 2H), 6.78 (d, J = 8.0 Hz, 2H), 6.58 (d, J = 16.0 Hz, 1H), 6.30 (dt, J = 16.0, 6.0 Hz, 1H), 4.09 (d, J = 5.5 Hz, 2H), 2.99 (s, 3H), 2.32 (s, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 147.6, 136.9, 131.3, 129.7, 128.5, 127.3, 126.3, 126.0, 113.1, 55.3, 38.2, 20.2.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{17}H_{20}N$, 238.1590; found, 238.1587.



***N*-Cinnamyl-*N*-*iso*propylaniline (96)**

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **96** (41.1 mg, 82% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

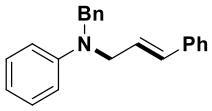
δ 7.33 (d, J = 8.0 Hz, 2H), 7.27 (t, J = 8.0 Hz, 2H), 7.22 - 7.17 (m, 3H), 6.79 (d, J = 8.0 Hz, 2H), 6.68 (t, J = 6.0 Hz, 1H), 6.54 (d, J = 16.0 Hz, 1H), 6.26 (dt, J = 16.0, 5.4 Hz, 1H), 4.16 (dt, J = 13.2, 6.6 Hz, 1H), 3.96 (d, J = 5.6 Hz, 2H), 1.22 (s, 3H), 1.21 (s, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 149.1, 137.2, 130.1, 129.1, 128.8, 128.5, 127.2, 126.2, 116.2, 113.0, 47.9, 46.5, 19.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{18}H_{22}N$, 252.1747; found, 252.1742.



***N*-Benzyl-*N*-cinnamylaniline (97)**

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **97** (47.2 mg, 79% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

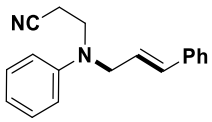
δ 7.23 - 7.16 (m, 12H), 6.76 (d, J = 8.0 Hz, 2H), 6.69 (t, J = 6.0 Hz, 1H), 6.49 (d, J = 16.0 Hz, 1H), 6.25 (dt, J = 16.0, 5.4 Hz, 1H), 4.57 (s, 2H), 4.14 (d, J = 5.4 Hz, 2H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 149.0, 138.8, 136.8, 131.4, 129.2, 128.6, 128.5, 127.4, 126.8, 126.6, 126.3, 125.5, 116.6, 112.5, 53.8, 52.5.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{22}H_{22}N$, 300.1747; found, 300.1742.



3-(Cinnamyl(phenyl)amino)propanenitrile (98)

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **98** (38.2 mg, 73% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

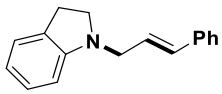
δ 7.35 (d, J = 8.0 Hz, 2H), 7.31 - 7.22 (m, 5H), 6.82 - 6.77 (m, 3H), 6.54 (d, J = 16.0 Hz, 1H), 6.23 (dt, J = 16.0, 5.6 Hz, 1H), 4.15 (d, J = 5.6 Hz, 2H), 3.73 (t, J = 8.0 Hz, 2H), 2.62 (t, J = 8.0 Hz, 2H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 146.7, 136.4, 132.1, 129.6, 128.6, 127.7, 126.4, 124.9, 118.3, 118.1, 113.0, 53.3, 46.7, 15.9.

HRMS (ESI)

$[M+ H]^+$ Calcd. for $C_{18}H_{19}N_2$, 263.1543; found, 263.1539.



1-Cinnamylindoline (99)

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **99** (38.1 mg, 81% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

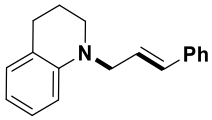
δ 7.36 (d, J = 8.0 Hz, 2H), 7.29 (t, J = 8.0 Hz, 2H), 7.21 (t, J = 6.0 Hz, 1H), 7.09 - 7.04 (m, 2H), 6.66 (t, J = 6.0 Hz, 1H), 6.61 (d, J = 16.0 Hz, 1H), 6.55 (d, J = 4.0 Hz, 1H), 6.29 (d, J = 16.0 Hz, 1H), 3.85 (d, J = 5.6 Hz, 2H), 3.36 (t, J = 8.0 Hz, 2H), 2.95 (t, J = 8.0 Hz, 2H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 152.1, 136.8, 132.3, 130.3, 128.5, 127.5, 127.3, 126.3, 125.9, 124.4, 117.8, 107.4, 53.3, 51.6, 28.5.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{17}H_{18}N$, 236.1434; found, 236.1429.



1-Cinnamyl-1,2,3,4-tetrahydroquinoline (100)

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **100** (41.3 mg, 83% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

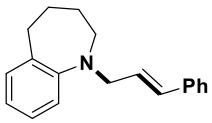
δ 7.34 (d, J = 8.0 Hz, 2H), 7.27 (t, J = 8.0 Hz, 2H), 7.19 (t, J = 8.0 Hz, 1H), 7.03 (t, J = 8.0 Hz, 1H), 6.95 (d, J = 8.0 Hz, 1H), 6.64 (d, J = 8.0 Hz, 1H), 6.58 (t, J = 8.0 Hz, 1H), 6.52 (d, J = 16.0 Hz, 1H), 6.24 (dt, J = 16.0, 5.4 Hz, 1H), 4.01 (d, J = 8.0 Hz, 2H), 3.30 (t, J = 6.0 Hz, 2H), 2.77 (t, J = 6.0 Hz, 2H), 1.97 (dt, J = 12.0, 6.2 Hz, 2H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 145.3, 136.9, 131.1, 129.0, 128.5, 127.3, 127.1, 126.3, 125.6, 122.6, 115.9, 111.1, 53.5 49.1, 28.1, 22.3.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{18}H_{20}N$, 250.1590; found, 250.1587.



1-Cinnamyl-2,3,4,5-tetrahydro-1*H*-benzo[*b*]azepine (101)

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **101** (42.1 mg, 80% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

δ 7.38 (d, J = 8.0 Hz, 2H), 7.29 (t, J = 8.0 Hz, 2H), 7.21 (d, J = 4.0 Hz, 1H), 7.13 – 7.08 (m, 2H), 6.95 (d, J = 8.0 Hz, 1H), 6.85 (t, J = 8.0 Hz, 1H), 6.59 (d, J = 16.0 Hz, 1H),

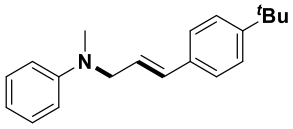
6.31 (dt, *J* = 16.0, 8.0 Hz, 1H), 3.91 (d, *J* = 4.0 Hz, 2H), 3.06 – 2.92 (m, 2H), 2.89 – 2.75 (m, 2H), 1.71 (s, 2H), 1.65 – 1.59 (m, 2H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 152.4, 137.2, 135.8, 131.8, 130.1, 128.5, 128.4, 127.3, 126.6, 126.3, 121.0, 117.5, 56.6, 53.1, 35.08, 3.26, 25.8.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{19}H_{22}N$, 264.1747; found, 264.1743.



(*E*)-*N*-(3-(4-(tert-Butyl)phenyl)allyl)-*N*-methylaniline (102)

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **102** (47.4 mg, 85% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

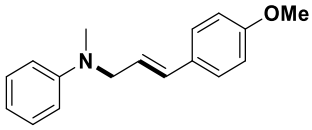
δ 7.30 (q, *J* = 8.0 Hz, 4H), 7.23 (t, *J* = 8.0 Hz, 2H), 6.78 (d, *J* = 8.0 Hz, 2H), 6.71 (t, *J* = 7.2 Hz, 1H), 6.49 (d, *J* = 16.0 Hz, 1H), 6.20 (dt, *J* = 16.0, 6.0 Hz, 1H), 4.06 (d, *J* = 4.0 Hz, 2H), 2.95 (s, 3H), 1.30 (s, 9H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 150.5, 149.6, 134.1, 131.2, 129.2, 126.0, 125.4, 124.8, 116.7, 112.8, 55.0, 37.9, 34.5, 31.3.

HRMS (ESI)

$[M+ H]^+$ Calcd. for $C_{20}H_{26}N$, 280.2060; found, 280.2057.



(*E*)-*N*-(3-(4-Methoxyphenyl)allyl)-*N*-methylaniline (103)

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **103** (42.5 mg, 84% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

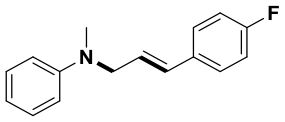
δ 7.28 - 7.21 (m, 4H), 6.83 - 6.77 (m, 4H), 6.71 (t, *J* = 8.0 Hz, 1H), 6.45 (d, *J* = 16.0 Hz, 1H), 6.08 (dt, *J* = 16.0, 5.6 Hz, 1H), 4.03 (d, *J* = 4.0 Hz, 2H), 3.77 (s, 3H), 2.95 (s, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 159.1, 149.6, 130.8, 129.7, 129.1, 127.4, 123.6, 116.6, 113.9, 112.7, 55.2, 54.9, 37.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{17}H_{20}NO$, 254.1539; found, 254.1535.



(*E*)-*N*-(3-(4-Fluorophenyl)allyl)-*N*-methylaniline (104)

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **104** (39.5 mg, 82% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

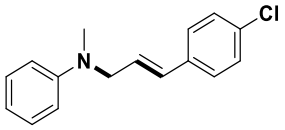
δ 7.31 - 7.22 (m, 4H), 6.96 (t, *J* = 8.0 Hz, 2H), 6.78 (d, *J* = 8.0 Hz, 2H), 6.72 (t, *J* = 8.0 Hz, 1H), 6.47 (d, *J* = 16.0 Hz, 1H), 6.15 (dt, *J* = 16.0, 6.0 Hz, 1H), 4.05 (d, *J* = 4.0 Hz, 2H), 2.96 (s, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 162.0 (d, *J* = 246.5 Hz), 149.4, 133.0 (d, *J* = 3.3 Hz), 130.1, 129.2, 127.8 (d, *J* = 8.0 Hz), 125.4, 116.7, 115.4 (d, *J* = 21.6 Hz), 112.7, 54.9, 38.1.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{16}H_{17}FN$, 242.1340; found, 242.1335.



(*E*)-*N*-(3-(4-Chlorophenyl)allyl)-*N*-methylaniline (105)

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **105** (41.1 mg, 80% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

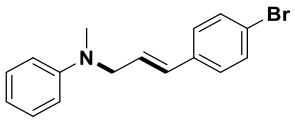
δ 7.25 - 7.22 (m, 6H), 6.78 - 6.71 (m, 3H), 6.46 (d, *J* = 16.0 Hz, 1H), 6.21 (dt, *J* = 16.0, 5.4 Hz, 1H), 4.06 (d, *J* = 4.0 Hz, 2H), 2.97 (s, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 149.4, 135.4, 132.9, 130.0, 129.2, 128.6, 127.5, 126.5, 116.8, 112.7, 54.9, 38.1.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{16}H_{17}ClN$, 258.1044; found, 258.1041.



(*E*)-*N*-(3-(4-Bromophenyl)allyl)-*N*-methylaniline (106)

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **106** (41.1 mg, 75% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

δ 7.31 (d, *J* = 8.0 Hz, 2H), 7.17 - 7.09 (m, 4H), 6.70 - 6.63 (m, 3H), 6.35 (d, *J* = 16.0

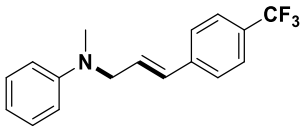
Hz, 1H), 6.14 (dt, *J* = 16.0, 5.4 Hz, 1H), 3.96 (d, *J* = 4.0 Hz, 2H), 2.88 (s, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 149.5, 135.9, 131.7, 130.1, 129.3, 127.9, 126.7, 121.2, 116.9, 112.7, 54.9, 38.2.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{16}H_{17}BrN$, 302.0539; found, 302.0535.



(*E*)-*N*-Methyl-*N*-(3-(4-(trifluoromethyl)phenyl)allyl)aniline (107)

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **107** (40.7 mg, 70% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

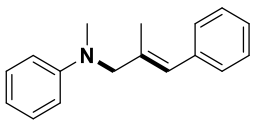
δ 7.52 (d, *J* = 8.0 Hz, 2H), 7.40 (d, *J* = 8.0 Hz, 2H), 7.24 (t, *J* = 8.0 Hz, 2H), 6.78 (d, *J* = 8.2 Hz, 2H), 6.74 (t, *J* = 8.0 Hz, 1H), 6.52 (d, *J* = 16.0 Hz, 1H), 6.33 (dt, *J* = 16.0, 5.4 Hz, 1H), 4.08 (d, *J* = 5.2 Hz, 2H), 2.98 (s, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 149.2, 140.3, 129.9, 129.2, 129.2 (q, *J* = 32.5 Hz),128.6, 126.4, 125.4 (q, *J* = 3.8 Hz), 124.2 (q, *J* = 271.0 Hz), 117.0, 112.7, 54.9, 38.2.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{17}H_{17}F_3N$, 292.1308; found, 292.1303.



(*E*)-*N*-Methyl-*N*-(2-methyl-3-phenylallyl)aniline (108)

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **108** (26.5 mg, 56% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

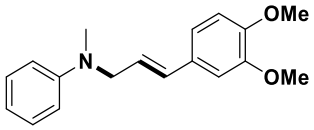
δ 7.30 (t, *J* = 8.0 Hz, 2H), 7.25 - 7.16 (m, 6H), 6.76 (d, *J* = 8.0 Hz, 2H), 6.70 (t, *J* = 7.2 Hz, 1H), 6.36 (s, 1H), 3.93 (s, 2H), 2.98 (s, 3H), 1.85 (s, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 149.8, 137.8, 134.7, 129.1, 128.9, 128.1, 126.2, 124.9, 116.4, 112.3, 61.0, 38.1, 15.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{17}H_{20}N$, 238.1590; found, 238.1586.



(*E*)-*N*-(3-(3,4-Dimethoxyphenyl)allyl)-*N*-methylaniline (109)

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **109** (41.8 mg, 74% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

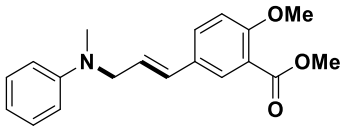
δ 7.24 (t, *J* = 8.0 Hz, 2H), 6.88 (d, *J* = 8.0 Hz, 2H), 6.79 - 6.77 (m, 3H), 6.71 (t, *J* = 6.0 Hz, 1H), 6.44 (d, *J* = 16.0 Hz, 1H), 6.10 (dt, *J* = 16.0, 5.6 Hz, 1H), 4.05 (d, *J* = 4.0 Hz, 2H), 3.86 (s, 3H), 3.84 (s, 3H), 2.96 (s, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 149.5, 148.9, 148.6, 130.9, 129.9, 129.1, 123.6, 119.3, 116.5, 112.5, 111.1, 108.8, 55.8, 55.8, 54.8, 37.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{18}H_{22}NO_2$, 284.1645; found, 284.1639.



Methyl (*E*)-2-methoxy-5-(3-(methyl(phenyl)amino)prop-1-en-1-yl)benzoate (110)

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **110** (44.8 mg, 72% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

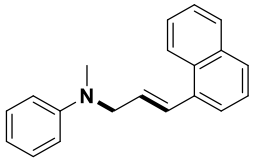
δ 7.24 (t, *J* = 8.0 Hz, 2H), 6.96 - 6.90 (m, 3H), 6.78 (d, *J* = 8.0 Hz, 2H), 6.73 (t, *J* = 8.0 Hz, 1H), 6.47 (d, *J* = 16.0 Hz, 1H), 6.18 (dt, *J* = 16.0, 5.4 Hz, 1H), 4.06 (d, *J* = 8.0 Hz, 2H), 3.81 (s, 3H), 2.97 (s, 3H), 2.29 (s, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 169.0, 151.0, 149.4, 139.1, 135.9, 130.8, 129.2, 126.0, 122.7, 118.9, 116.7, 112.6, 110.0, 55.8, 54.9, 38.0, 20.6.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{19}H_{22}NO_3$, 312.1594; found, 312.1588.



(*E*)-*N*-Methyl-*N*-(3-(naphthalen-1-yl)allyl)aniline (111)

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **111** (46.4

mg, 85% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

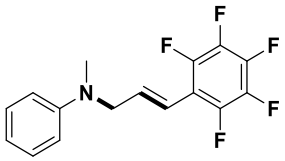
δ 7.98 (t, J = 4.0 Hz, 1H), 7.82 - 7.79 (m, 1H), 7.73 (d, J = 8.0 Hz, 1H), 7.54 (d, J = 4.0 Hz, 1H), 7.46 - 7.44 (m, 2H), 7.39 (t, J = 8.0 Hz, 1H), 7.28 - 7.22 (m, 3H), 6.84 (d, J = 8.0 Hz, 2H), 6.74 (t, J = 8.0 Hz, 1H), 6.23 (dt, J = 16.0, 5.4 Hz, 1H), 4.16 (d, J = 8.0 Hz, 2H), 3.03 (s, 3H);

^{13}C NMR (100 MHz, $CDCl_3$)

δ 149.6, 134.9, 133.7, 131.2, 129.3, 128.9, 128.8, 128.5, 127.8, 126.0, 125.8, 125.6, 123.9, 116.9, 112.9, 55.3, 38.3.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{20}H_{20}N$, 274.1590; found, 274.1586.



(*E*)-*N*-Methyl-*N*-(3-(perfluorophenyl)allyl)aniline (112)

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **112** (50.1 mg, 80% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

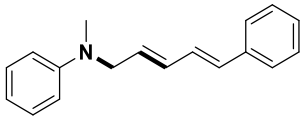
δ 7.17 - 7.13 (m, 2H), 6.68 - 6.63 (m, 3H), 6.48 (dt, J = 16.0, 5.0 Hz, 01H), 6.33 (d, J = 16.0 Hz, 1H), 4.02 (d, J = 4.8 Hz, 2H), 2.88 (s, 3H);

^{13}C NMR (100 MHz, $CDCl_3$)

δ 149.2, 144.6 (dm, J = 248 Hz), 137.6 (dm, J = 249 Hz), 139.7 (dm, J = 252 Hz), 135.78 (td, J = 7.2, 1.8 Hz), 129.2, 117.0, 115.0, 112.6, 111.8 (td, J = 14.2, 4.1 Hz)55.6, 38.2.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{16}H_{13}F_5N$, 314.0963; found, 314.0958.



***N*-Methyl-*N*-((2*E*,4*E*)-5-phenylpenta-2,4-dien-1-yl)aniline (113)**

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **113** (37.4 mg, 75% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

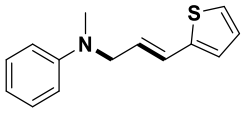
δ 7.27 (d, J = 8.0 Hz, 2H), 7.22 - 7.09 (m, 5H), 6.70 - 6.62 (m, 4H), 6.39 (d, J = 16.0 Hz, 1H), 6.26 - 6.20 (m, 1H), 5.74 (dt, J = 16.0, 5.4 Hz, 1H), 3.91 (d, J = 5.4 Hz, 2H), 2.85 (s, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 149.4, 137.2, 131.8, 131.7, 129.9, 129.1, 128.5, 128.3, 127.4, 126.2, 116.6, 112.6, 54.6, 38.1.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{18}H_{20}N$, 250.1590; found, 250.1586.



(*E*)-*N*-Methyl-*N*-(3-(thiophen-2-yl)allyl)aniline (114)

This reaction was conducted on a 0.2 mmol scale with the general procedure C to give **114** (37.4 mg, 83% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

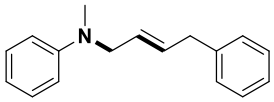
δ 7.22 (t, J = 8.0 Hz, 2H), 7.07 (d, J = 4.0 Hz, 1H), 6.91 - 6.86 (m, 2H), 6.75 - 6.69 (m, 3H), 6.60 (d, J = 16.0 Hz, 1H), 6.05 (dt, J = 16.0, 5.4 Hz, 1H), 3.99 (d, J = 4.0 Hz, 2H), 2.93 (s, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 149.4, 142.0, 129.1, 127.2, 125.5, 125.2, 124.3, 123.9, 116.6, 112.5, 54.6, 38.0.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{14}H_{16}NS$, 230.0998; found, 230.0995.



(*E*)-*N*-Methyl-*N*-(4-phenylbut-2-en-1-yl)aniline (115)

This reaction was conducted on a 0.2 mmol scale with the general procedure D to give **115** (24.6 mg, 52% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

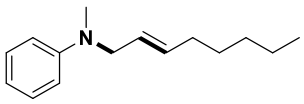
δ 7.21 - 7.10 (m, 5H), 7.07 (d, J = 8.0 Hz, 2H), 6.67 (d, J = 8.0 Hz, 2H), 6.62 (t, J = 7.2 Hz, 1H), 5.71 - 5.64 (m, 1H), 5.51 - 5.45 (m, 1H), 3.81 (d, J = 5.4 Hz, 2H), 3.28 (d, J = 5.4 Hz, 2H), 2.83 (s, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 149.6, 140.3, 131.4, 129.1, 128.5, 128.4, 126.9, 126.0, 116.5, 112.8, 54.5, 38.7, 37.9.

HRMS (ESI)

$[M+ H]^+$ Calcd. for $C_{17}H_{20}N$, 238.1590; found, 238.1588.



(*E*)-*N*-Methyl-*N*-(oct-2-en-1-yl)aniline (116)

This reaction was conducted on a 0.2 mmol scale with the general procedure D to give **116** (25.2

mg, 58% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

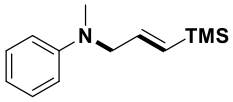
δ 7.23 - 7.19 (m, 2H), 6.74 (d, *J* = 8.0 Hz, 2H), 6.69 (t, *J* = 8.0 Hz, 1H), 5.62 - 5.55 (m, 1H), 5.47 - 5.41 (m, 1H), 3.84 (d, *J* = 5.4 Hz, 2H), 2.89 (s, 3H), 2.01 (q, *J* = 6.8 Hz, 2H), 1.36 - 1.22 (m, 7H), 0.87 (t, *J* = 8.0 Hz, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 149.5, 133.4, 129.1, 124.9, 116.5, 112.8, 54.8, 37.8, 32.2, 31.3, 28.9, 22.5, 14.0.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{15}H_{24}N$, 218.1903; found, 218.1901.



(*E*)-*N*-Methyl-*N*-(3-(trimethylsilyl)allyl)aniline (117)

This reaction was conducted on a 0.2 mmol scale with the general procedure D to give **117** (33.8 mg, 30% yield) as yellow oil;

^{1}H NMR (400 MHz, C_6D_6)

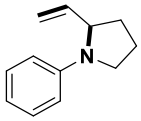
δ 7.18 (t, *J* = 7.6 Hz, 2H), 6.73 (t, *J* = 7.2 Hz, 1H), 6.62 (d, *J* = 8.4 Hz, 2H), 5.90 (dt, *J* = 18.8 Hz, 4.0 Hz, 1H), 5.75 (d, *J* = 18.8 Hz, 1H), 3.61 (d, *J* = 2.8 Hz, 2H), 2.58 (s, 3H), 0.00 (s, 9H).

^{13}C NMR (100 MHz, C_6D_6)

δ 142.2, 130.4, 129.1, 127.6, 116.60, 112.5, 57.4, 37.6, -1.5.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{13}H_{22}NSi$, 220.1516; found, 220.1512.



1-Phenyl-2-vinylpyrrolidine (119)

This reaction was conducted on a 0.2 mmol scale with the general procedure E to give **119** (31.8 mg, 92% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

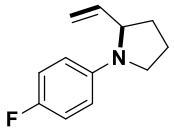
δ 7.29 - 7.22 (m, 2H), 6.71 (t, *J* = 7.2 Hz, 1H), 6.65 (d, *J* = 7.6 Hz, 2H), 5.95 - 5.78 (m, 1H), 5.23 - 5.08 (m, 2H), 4.21 (t, *J* = 5.6 Hz, 1H), 3.60 - 3.46 (m, 1H), 3.38 - 3.25 (m, 1H), 2.22 - 1.95 (m, 3H), 1.92 - 1.78 (m, 1H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 147.4, 139.2, 128.9, 115.5, 114.5, 112.1, 60.9, 48.5, 32.5, 23.1.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{12}H_{16}N$, 174.1277; found, 174.1275.



1-(4-Fluorophenyl)-2-vinylpyrrolidine (120)

This reaction was conducted on a 0.2 mmol scale with the general procedure E to give **120** (33.6 mg, 88% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

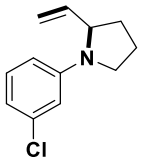
δ 7.00 - 6.79 (m, 2H), 6.61 - 6.45 (m, 2H), 5.89 - 5.73 (m, 1H), 5.22 -4.98 (m, 2H), 4.16 - 4.01 (m, 1H), 3.54 - 3.41 (m, 1H), 3.31 - 3.17 (m, 1H), 2.21 - 2.08 (m, 1H), 2.05 - 1.90 (m, 2H), 1.88 - 1.77 (m, 1H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 154.8 (d, J = 232.2 Hz), 144.1, 139.3, 115.2 (d, J = 21.8 Hz), 114.6, 112.4 (d, J = 7.1 Hz), 61.3, 49.0, 32.6, 23.2.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{12}H_{15}FN$, 192.1183; found, 192.1180.



1-(3-Chlorophenyl)-2-vinylpyrrolidine (121)

This reaction was conducted on a 0.2 mmol scale with the general procedure E to give **121** (38.9 mg, 94% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

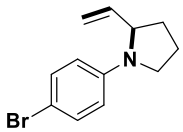
δ 7.07 (t, J = 8.0 Hz, 1H), 6.65 - 6.56 (m, 1H), 6.54 (t, J = 2.4 Hz, 1H), 6.48 - 6.34 (m, 1H), 5.86 - 5.63 (m, 1H), 5.24 - 4.91 (m, 2H), 4.23 - 4.05 (m, 1H), 3.51 - 3.35 (m, 1H), 3.31 - 3.13 (m, 3H), 2.21 - 2.04 (m, 1H), 2.00 - 1.90 (m, 2H), 1.86 - 1.76 (m, 1H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 148.3, 138.4, 134.7, 129.8, 115.4, 114.8, 111.9, 110.4, 60.9, 48.5, 32.4, 22.9.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{12}H_{15}ClN$, 208.0888; found, 208.0884.



1-(4-Bromophenyl)-2-vinylpyrrolidine (122)

This reaction was conducted on a 0.2 mmol scale with the general procedure E to give **122** (41.2 mg, 82% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

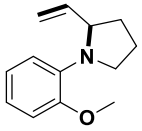
δ 7.24 (d, J = 9.0 Hz, 2H), 6.44 (d, J = 9.0 Hz, 2H), 5.92 - 5.61 (m, 1H), 5.25 - 4.84 (m, 2H), 4.29 - 3.92 (m, 1H), 3.61 - 3.34 (m, 1H), 3.28 - 3.07 (m, 1H), 2.31 - 2.05 (m, 1H), 2.03 - 1.89 (m, 2H), 1.88 - 1.68 (m, 1H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 146.2, 138.5, 131.5, 114.8, 113.7, 107.4, 60.9, 48.6, 32.4, 23.0.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{12}H_{15}BrN$, 252.0382; found, 252.0379.



1-(2-Methoxyphenyl)-2-vinylpyrrolidine (123)

This reaction was conducted on a 0.2 mmol scale with the general procedure E to give **123** (36.5 mg, 90% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

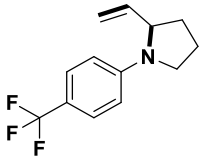
δ 6.92 - 6.73 (m, 4H), 5.75 - 5.55 (m, 1H), 5.19 - 5.07 (m, 1H), 5.04 - 4.88 (m,1H), 4.29 (q, J = 7.2 Hz, 1H), 3.97 - 3.71 (m, 4H), 3.13 - 2.90 (m, 1H), 2.33 - 2.09 (m, 1H), 2.05 - 1.91 (m, 1H), 1.91 - 1.60 (m, 2H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 150.9, 140.2, 138.6, 120.6, 120.1, 117.2, 115.1, 111.5, 62.2, 55.3, 51.6, 32.7, 23.6.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{13}H_{18}NO$, 204.1383; found, 204.1381.



1-(4-(Trifluoromethyl)phenyl)-2-vinylpyrrolidine (124)

This reaction was conducted on a 0.2 mmol scale with the general procedure E to give **124** (37.6 mg, 78% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

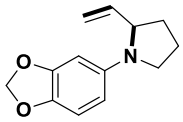
δ 7.45 (d, J = 8.4 Hz, 2H), 6.62 (d, J = 8.4 Hz, 2H), 5.92 - 5.69 (m, 1H), 5.28 - 4.96 (m, 2H), 4.25 (t, J = 6.6 Hz, 1H), 3.65 - 3.44 (m, 1H), 3.39 - 3.10 (m, 1H), 2.35 - 1.95 (m, 3H), 1.97 - 1.73 (m, 1H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 149.3, 138.0, 126.2 (q, J = 3.7 Hz), 125.3 (q, J = 268.3 Hz), 117.0 (q, J = 32.3 Hz), 115.0, 111.5, 60.8, 48.4, 32.3, 22.9.

HRMS (ESI)

[M+H]$^+$ Calcd. for $C_{13}H_{15}F_3N$, 242.1151; found, 242.1148.



1-(Benzo[d][1,3]dioxol-5-yl)-2-vinylpyrrolidine (125)

This reaction was conducted on a 0.2 mmol scale with the general procedure E to give **125** (42.5 mg, 98% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

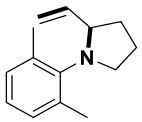
δ 6.71 (d, J = 8.8 Hz, 1H), 6.27 (s, 1H), 6.01 (d, J = 8.0 Hz, 1H), 5.90 - 5.73 (m, 3H), 5.23 - 5.00 (m, 2H), 4.14 - 3.99 (m, 1H), 3.51 - 3.38 (m, 1H), 3.20 (q, J = 8.4 Hz, 1H), 2.21 - 2.05 (m, 1H), 2.04 - 1.87 (m, 2H), 1.86 - 1.72 (m, 1H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 148.1, 143.8, 139.5, 138.0, 114.5, 108.4, 103.3, 100.3, 94.9, 61.6, 49.3, 32.5, 23.2.

HRMS (ESI)

[M+H]$^+$ Calcd. for $C_{13}H_{16}NO_2$, 218.1176; found, 218.1171.



1-(2,6-Dimethylphenyl)-2-vinylpyrrolidine (126)

This reaction was conducted on a 0.2 mmol scale with the general procedure E to give **126** (18.1 mg, 45% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

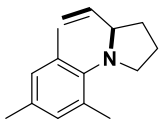
δ 7.07 - 6.89 (m, 3H), 5.76 - 5.59 (m, 1H), 4.96 - 4.84 (m, 1H), 4.82 - 4.65 (m, 1H), 4.01 (q, J = 7.2 Hz, 1H), 3.45 - 3.33 (m, 1H), 3.18 - 3.00 (m, 1H), 2.29 (s, 6H), 2.22 - 2.12 (m, 1H), 2.10 - 1.91 (m, 2H), 1.86 - 1.74 (m, 1H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 144.2, 141.9, 138.3, 128.5, 125.1, 114.0, 64.5, 51.0, 33.8, 25.0, 19.2.

HRMS (ESI)

[M+H]$^+$ Calcd. for $C_{14}H_{20}N$, 202.1590; found, 202.1588.



1-Mesityl-2-vinylpyrrolidine (127)

This reaction was conducted on a 0.2 mmol scale with the general procedure E to give **127** (15.1 mg, 35% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

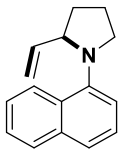
δ 6.84 (s, 2H), 5.79 - 5.58 (m, 1H), 4.90 (d, J = 16.8 Hz, 1H), 4.79 (d, J = 10.0 Hz, 1H), 3.99 (q, J = 7.2 Hz, 1H), 3.47 - 3.26 (m, 1H), 3.20 - 2.96 (m, 1H), 2.25 (d, J = 2.4 Hz, 9H), 2.18 - 2.09 (m, 1H), 2.06 - 1.86 (m, 2H), 1.85 - 1.65 (m, 1H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 142.0, 141.5, 138.1, 134.5, 129.2, 113.9, 64.6, 51.2, 33.8, 25.0, 20.8, 19.1.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{15}H_{22}N$, 216.1747; found, 216.1745.



1-(Naphthalen-1-yl)-2-vinylpyrrolidine (128)

This reaction was conducted on a 0.2 mmol scale with the general procedure E to give **128** (40.6 mg, 91% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

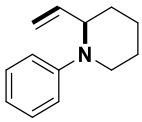
δ 7.81 - 7.66 (m, 3H), 7.43 (t, J = 7.6 Hz, 1H), 7.24 (t, J = 7.6 Hz, 1H), 7.12 - 7.04 (m, 1H), 6.88 (s, 1H), 6.05 - 5.77 (m, 1H), 5.33 - 5.09 (m, 2H), 4.46 - 4.31 (m, 1H), 3.78 - 3.59 (m, 1H), 3.52 - 3.39 (m, 1H), 2.37 - 2.03 (m, 3H), 1.99 - 1.86 (m, 1H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 145.2, 139.1, 135.1, 128.5, 127.5, 126.3, 126.0, 125.8, 121.2, 116.1, 114.7, 105.1, 60.8, 48.6, 32.4, 23.0.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{16}H_{18}N$, 224.1434; found, 224.1430.



1-Phenyl-2-vinylpiperidine (129)

This reaction was conducted on a 0.2 mmol scale with the general procedure E to give **129** (20.6 mg, 55% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

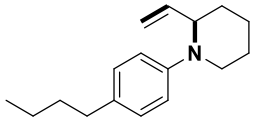
δ 7.32 - 7.14 (m, 2H), 6.96 (d, J = 8.4 Hz, 2H), 6.83 (t, J = 7.2 Hz, 1H), 6.01 - 5.76 (m, 1H), 5.28 - 4.98 (m, 2H), 4.31 (d, J = 5.2 Hz, 1H), 3.41 - 3.27 (m, 1H), 3.21 - 2.99 (m, 1H), 2.03 - 1.88 (m, 1H), 1.89 - 1.77 (m, 2H), 1.75 - 1.52 (m, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

δ 151.2, 137.6, 128.9, 119.0, 117.3, 116.2, 58.4, 46.0, 30.8, 25.8, 20.3.

HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{13}H_{18}N$, 188.1434; found, 188.1431.



1-(4-Butylphenyl)-2-vinylpiperidine (130)

This reaction was conducted on a 0.2 mmol scale with the general procedure E to give **130** (31.6 mg, 65% yield) as yellow oil;

^{1}H NMR (400 MHz, $CDCl_3$)

δ 7.05 (d, J = 8.4 Hz, 2H), 6.87 (d, J = 8.0 Hz, 2H), 5.94 - 5.73 (m, 1H), 5.17 - 4.94 (m, 2H), 4.16 (q, J = 5.2 Hz, 1H), 3.29 - 3.17 (m, 1H), 3.16 - 2.99 (m, 1H), 2.56 - 2.50 (m, 2H), 1.96 - 1.83 (m, 1H), 1.84 - 1.72 (m, 2H), 1.74 - 1.64 (m, 2H), 1.63 - 1.47 (m, 3H), 1.45 - 1.23 (m, 2H), 0.93 (t, J = 7.6 Hz, 3H).

^{13}C NMR (100 MHz, $CDCl_3$)

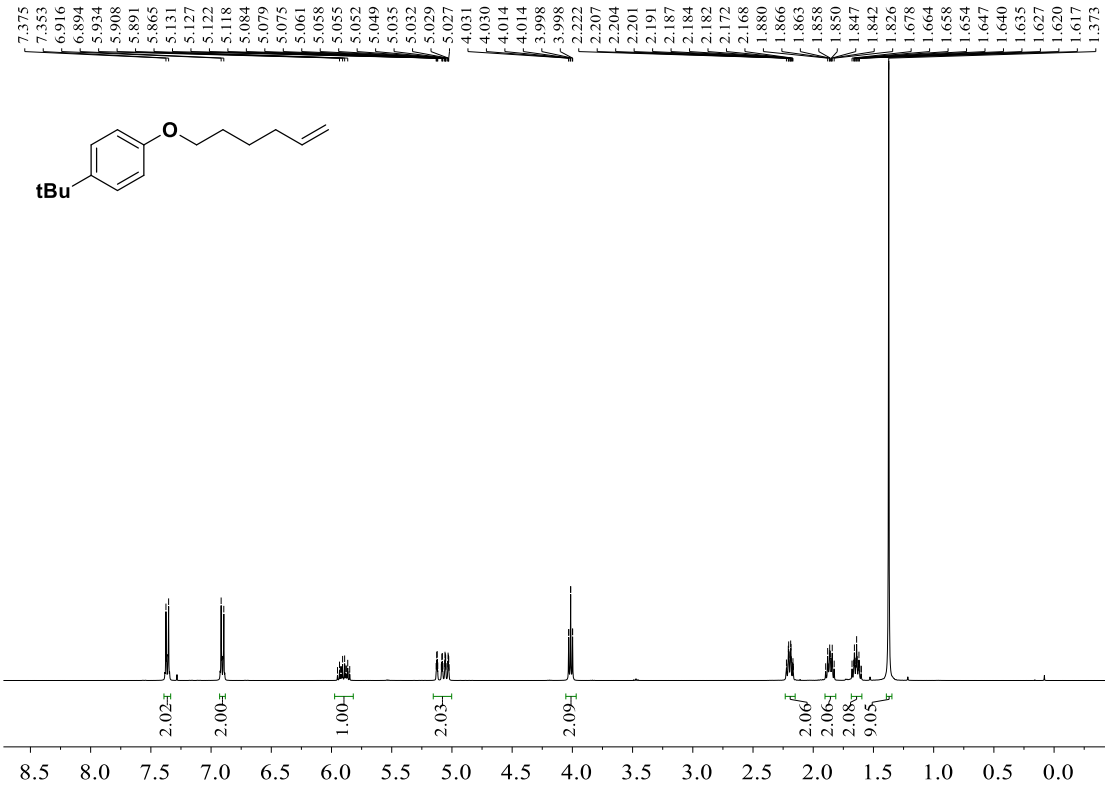
δ 149.2, 138.2, 133.9, 128.7, 118.0, 115.9, 59.1, 47.3, 34.7, 33.7, 31.2, 25.9, 22.4, 20.7, 14.0.

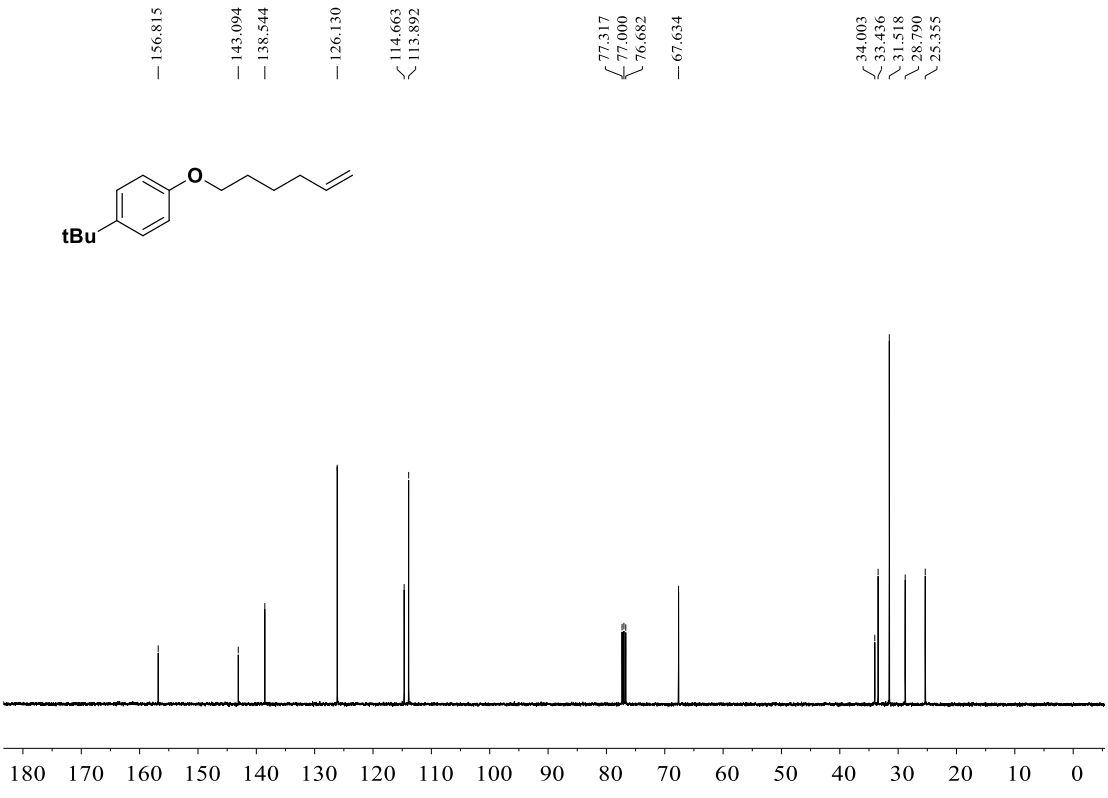
HRMS (ESI)

$[M+H]^+$ Calcd. for $C_{17}H_{26}N$, 244.2060; found, 244.2058.

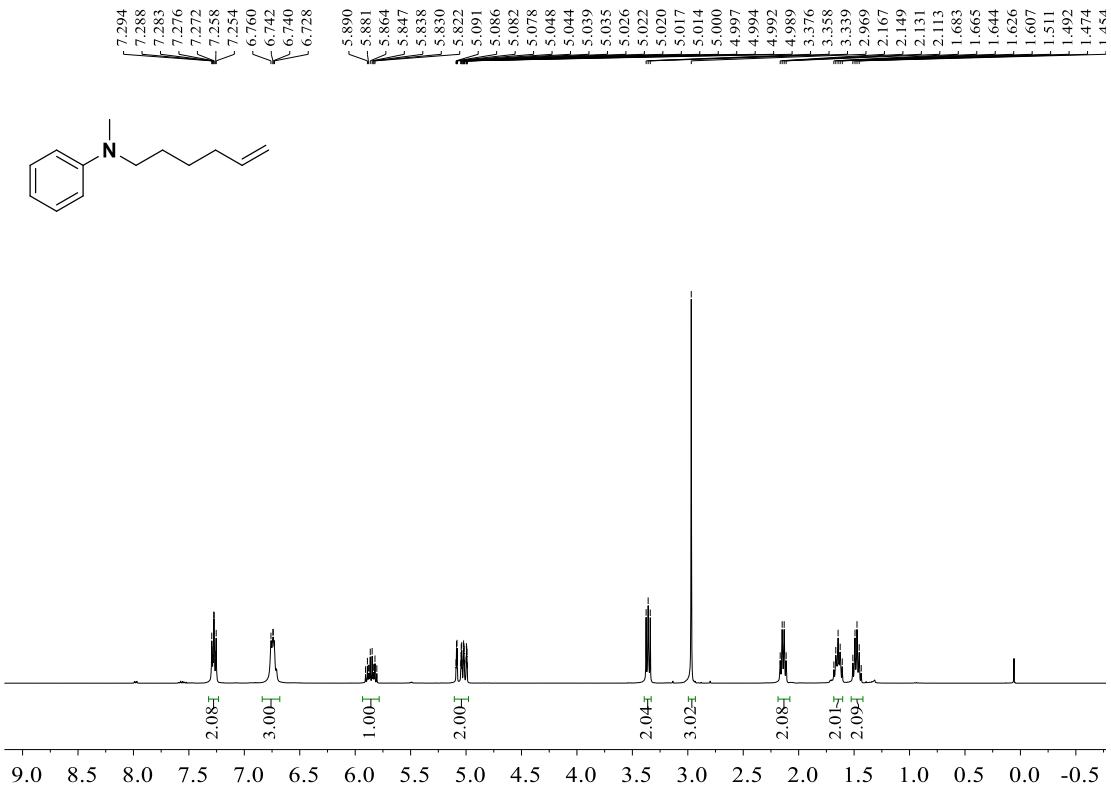
11. NMR Spectra for New Compounds

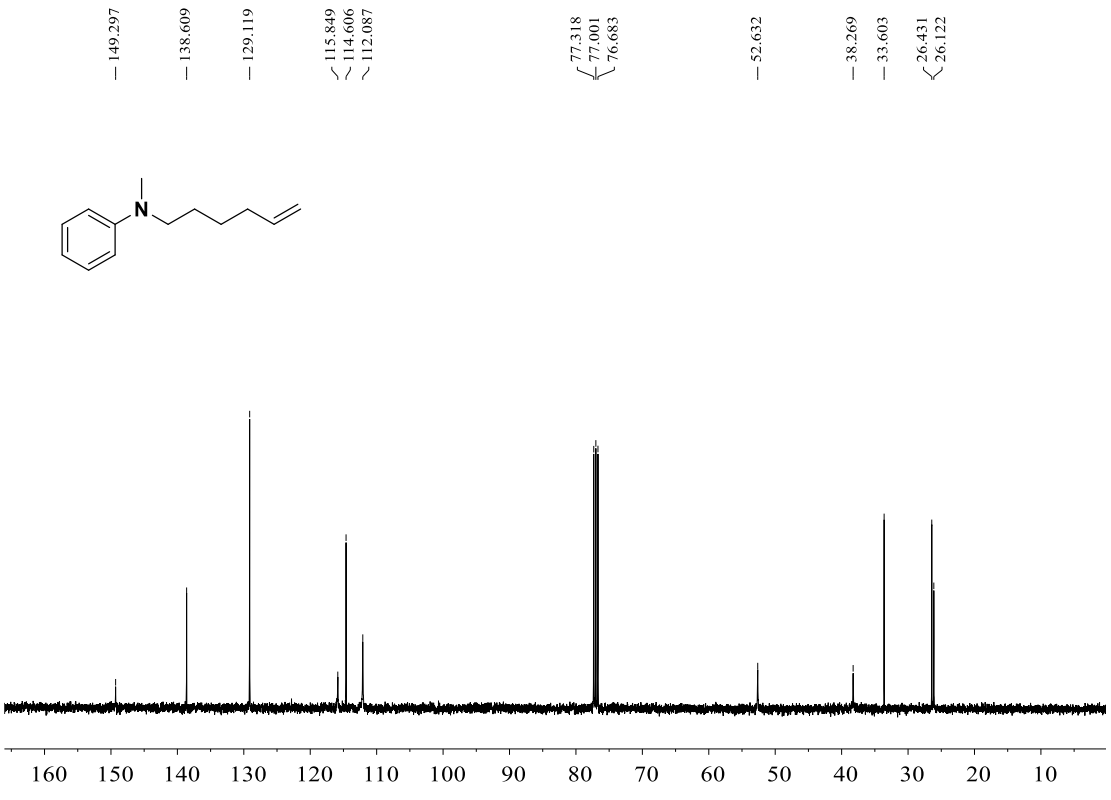
1-(*tert*-Butyl)-4-(hex-5-en-1-yloxy)benzene (2aa)



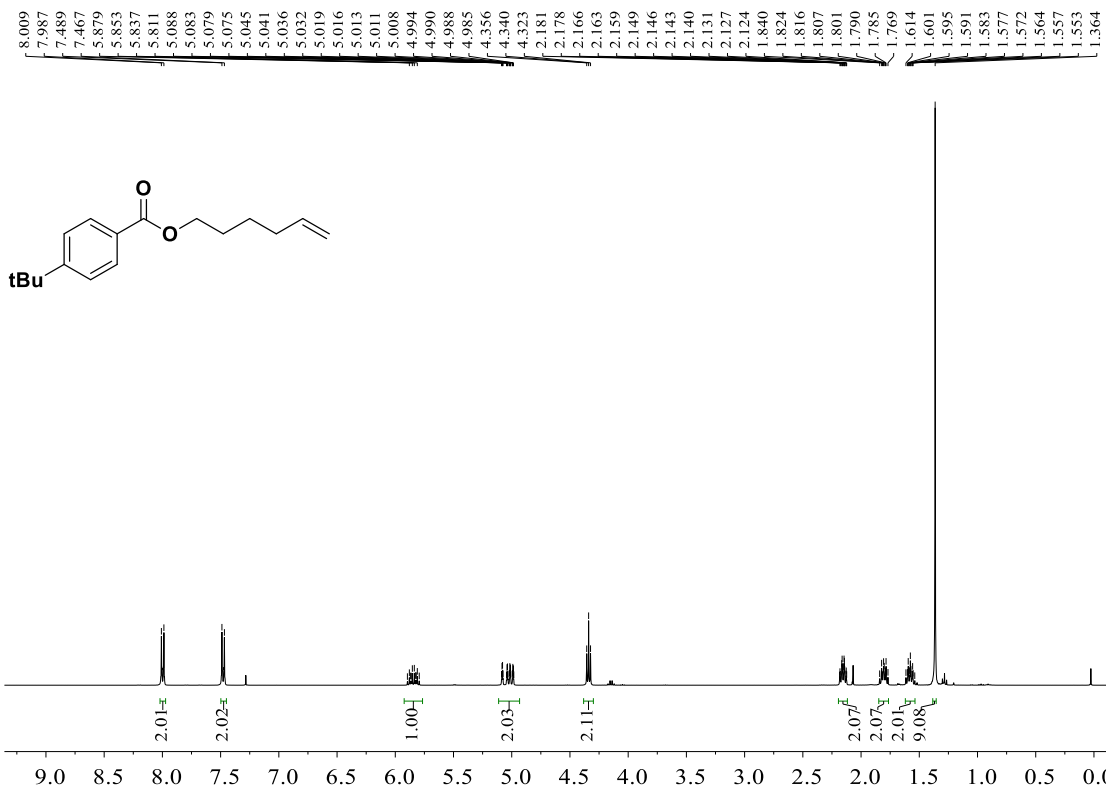


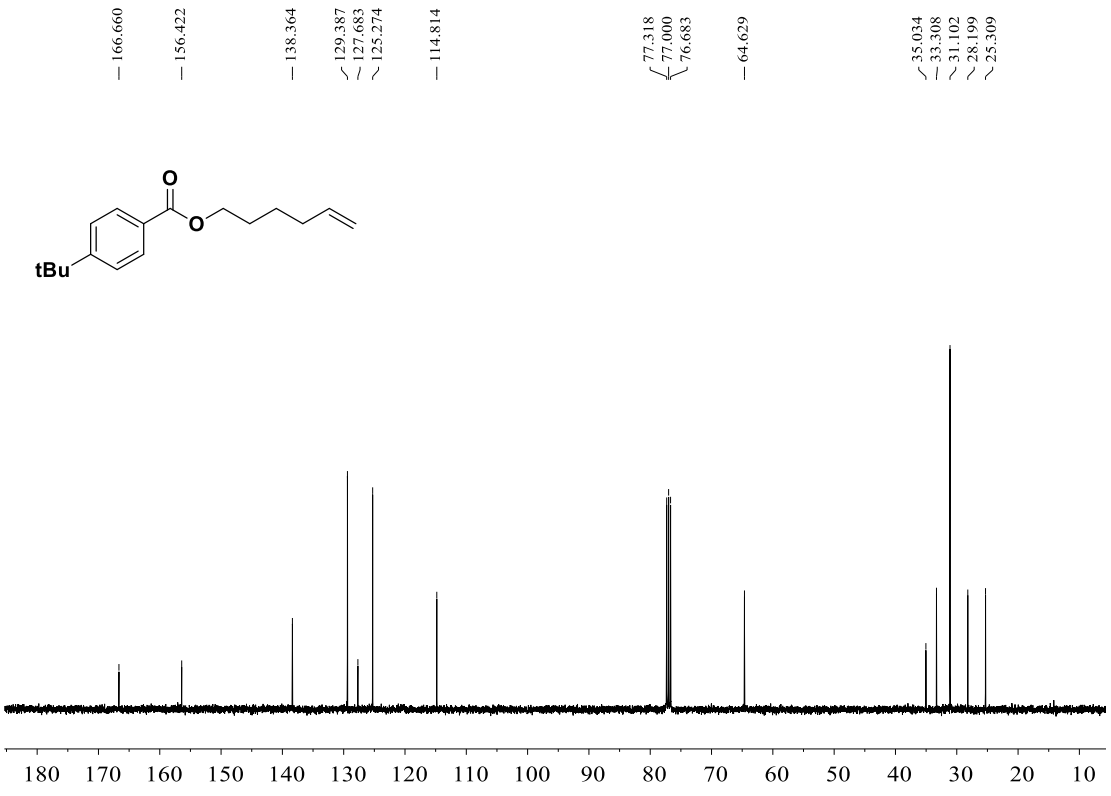
***N*-(Hex-5-en-1-yl)-*N*-methylaniline (2ab)**



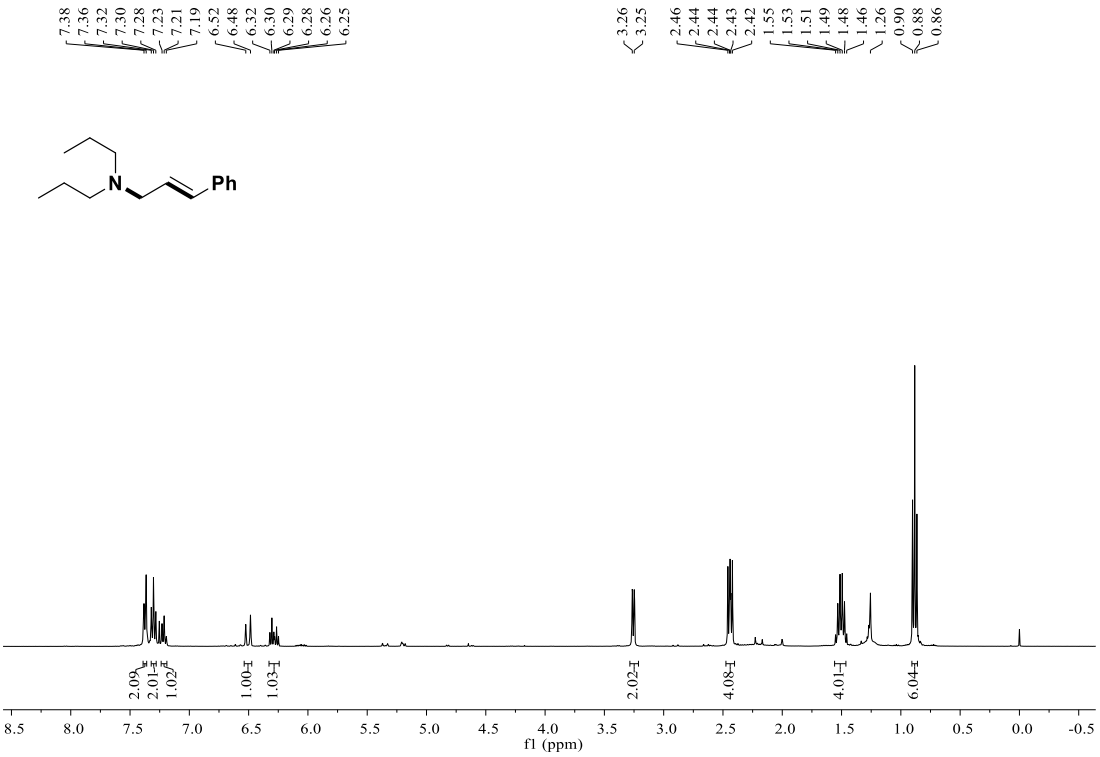


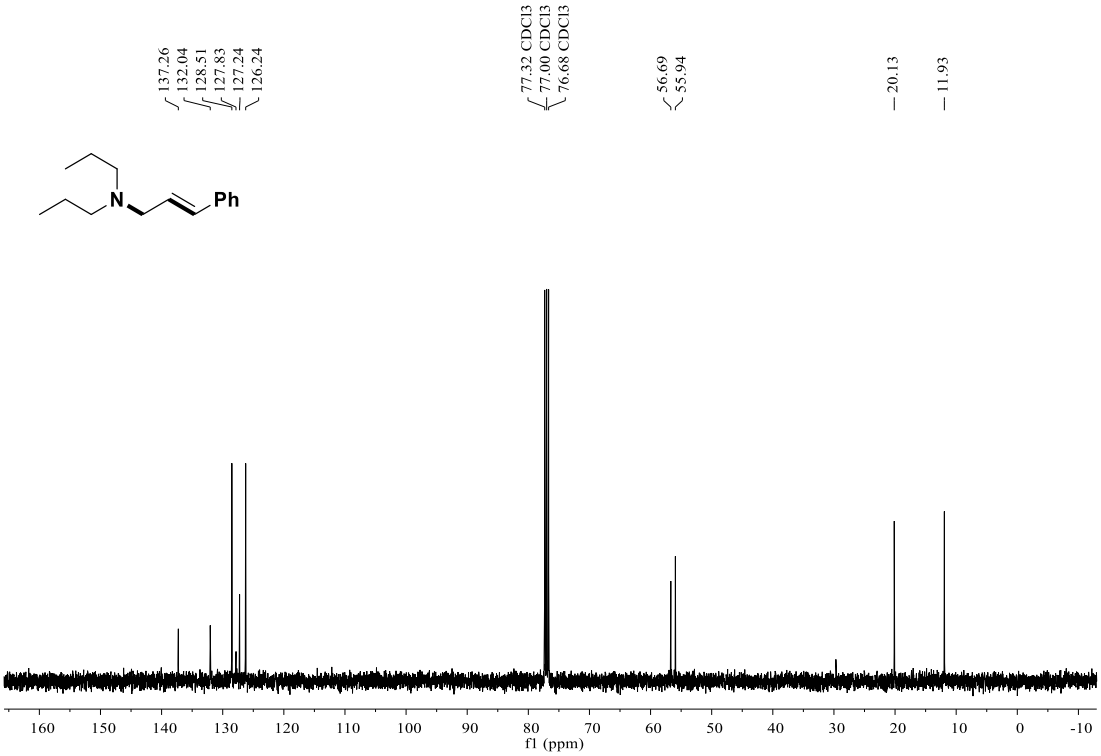
Hex-5-en-1-yl 4-(tert-butyl)benzoate (2ac)



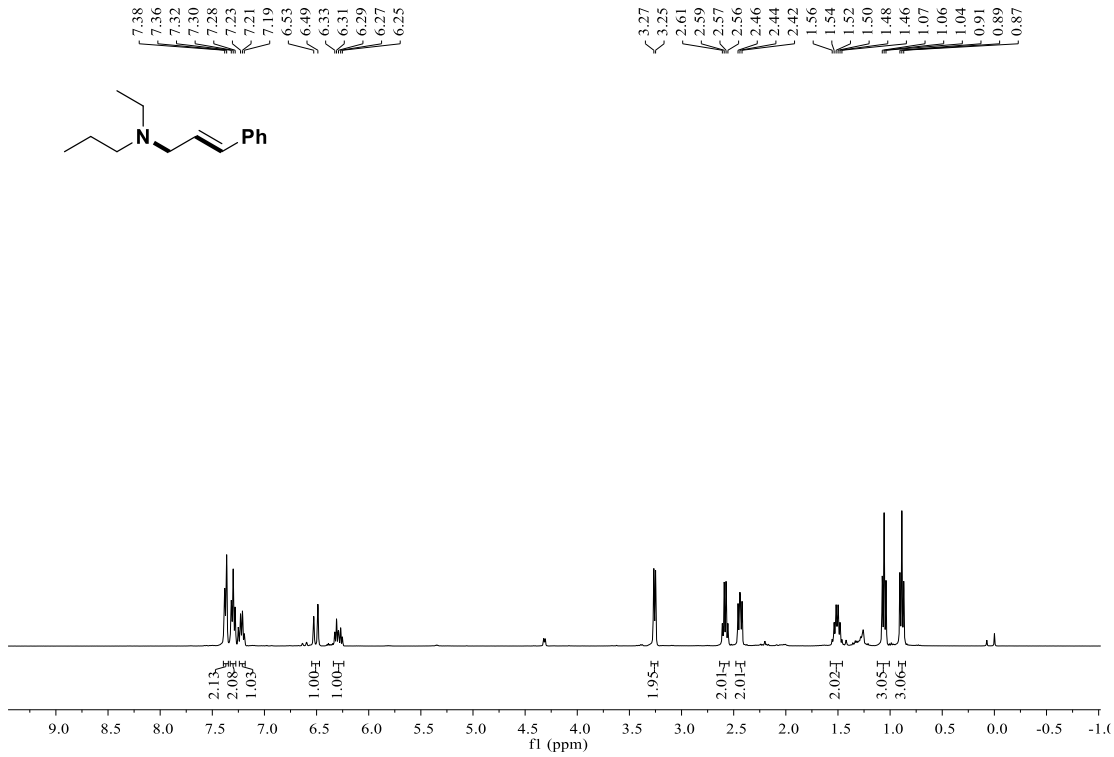


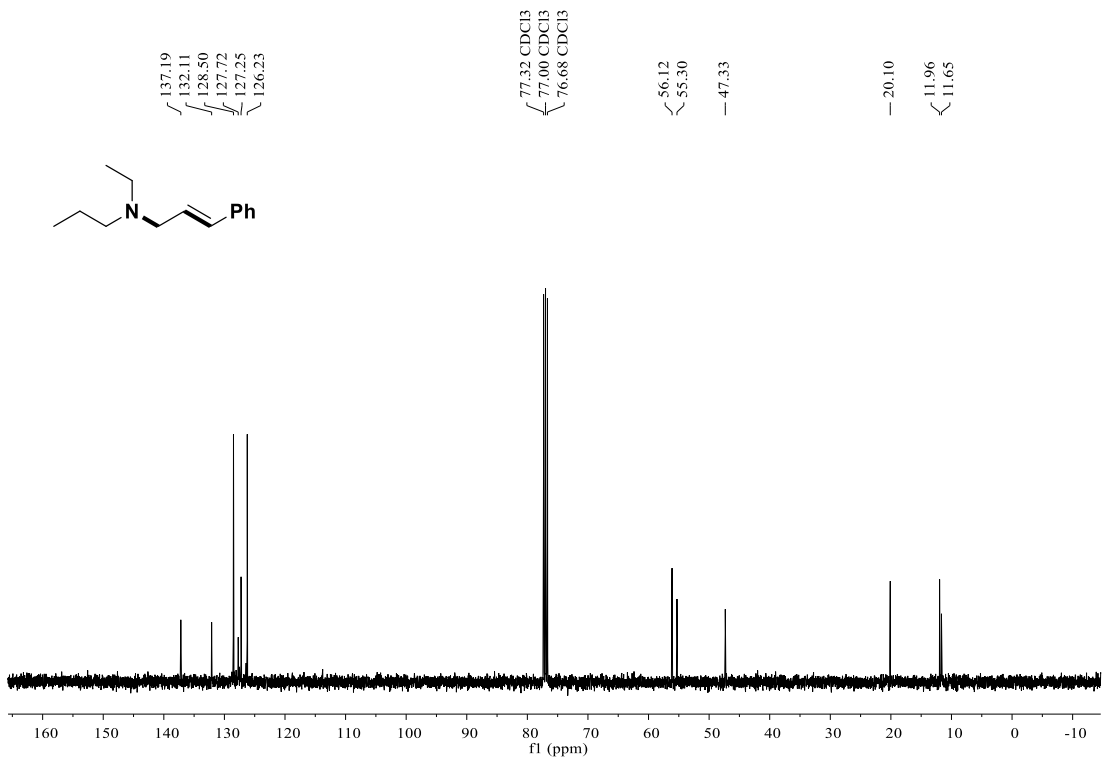
(*E*)-3-Phenyl-*N*, *N*-dipropylprop-2-en-1-amine (3)



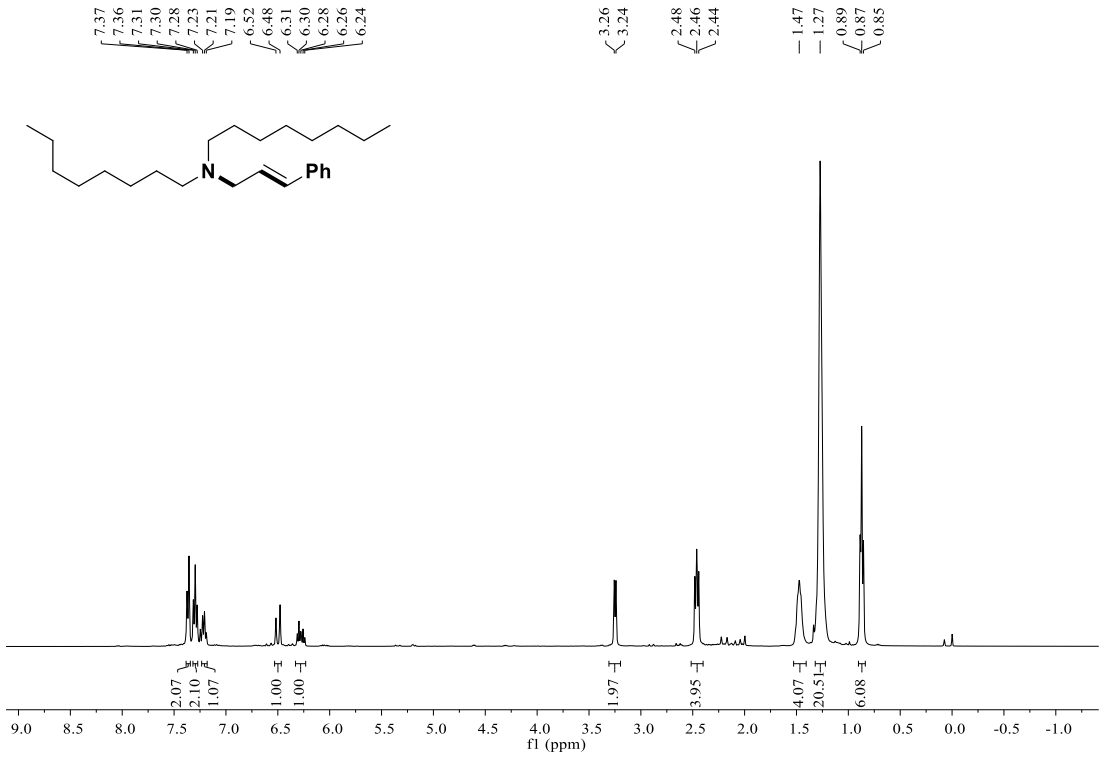


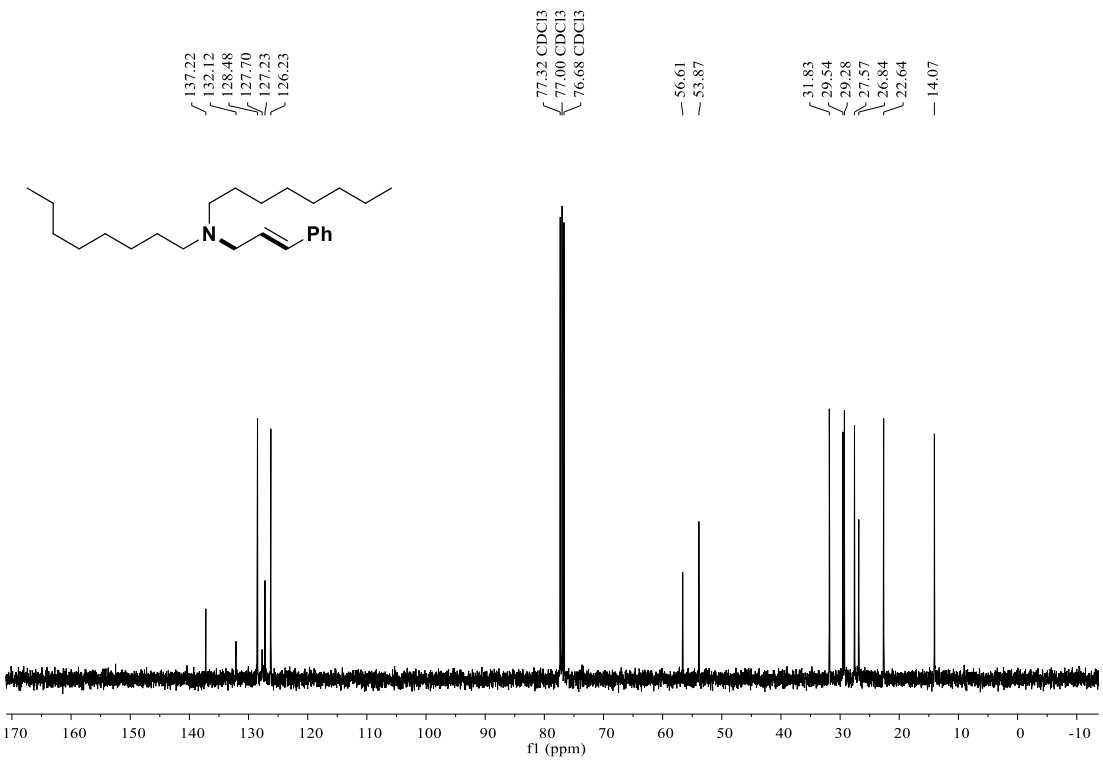
(*E*)-*N*-Ethyl-3-phenyl-*N*-propylprop-2-en-1-amine (4)



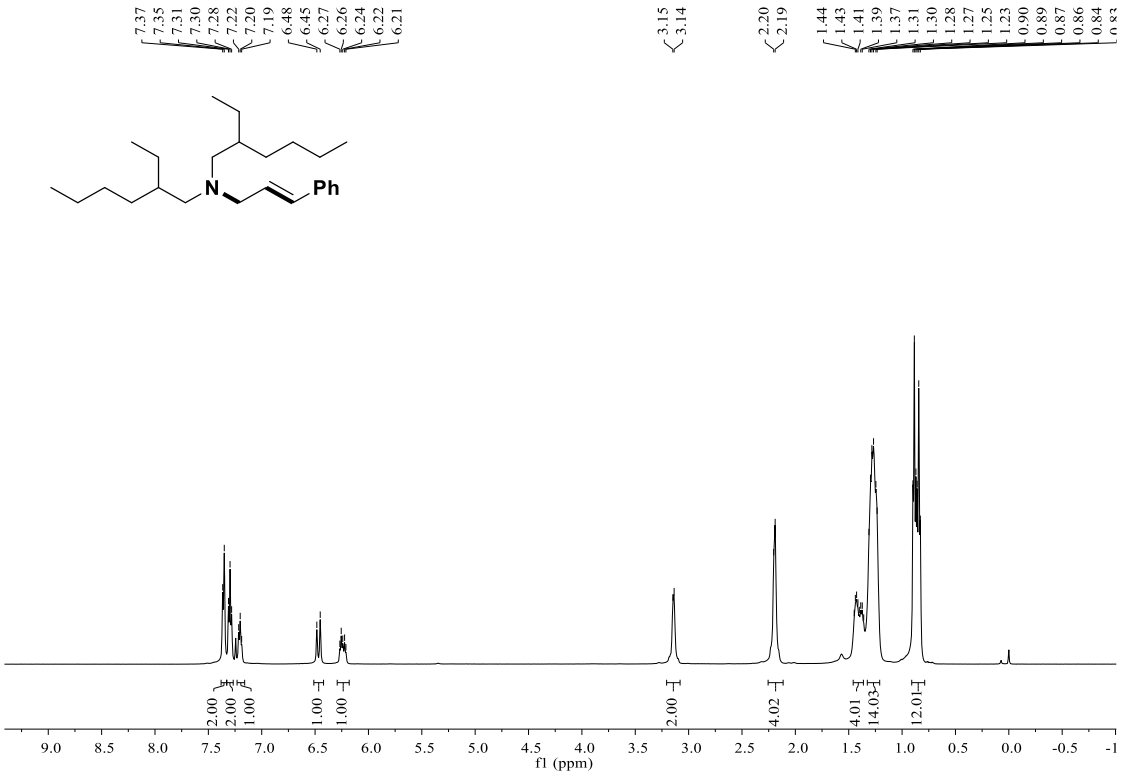


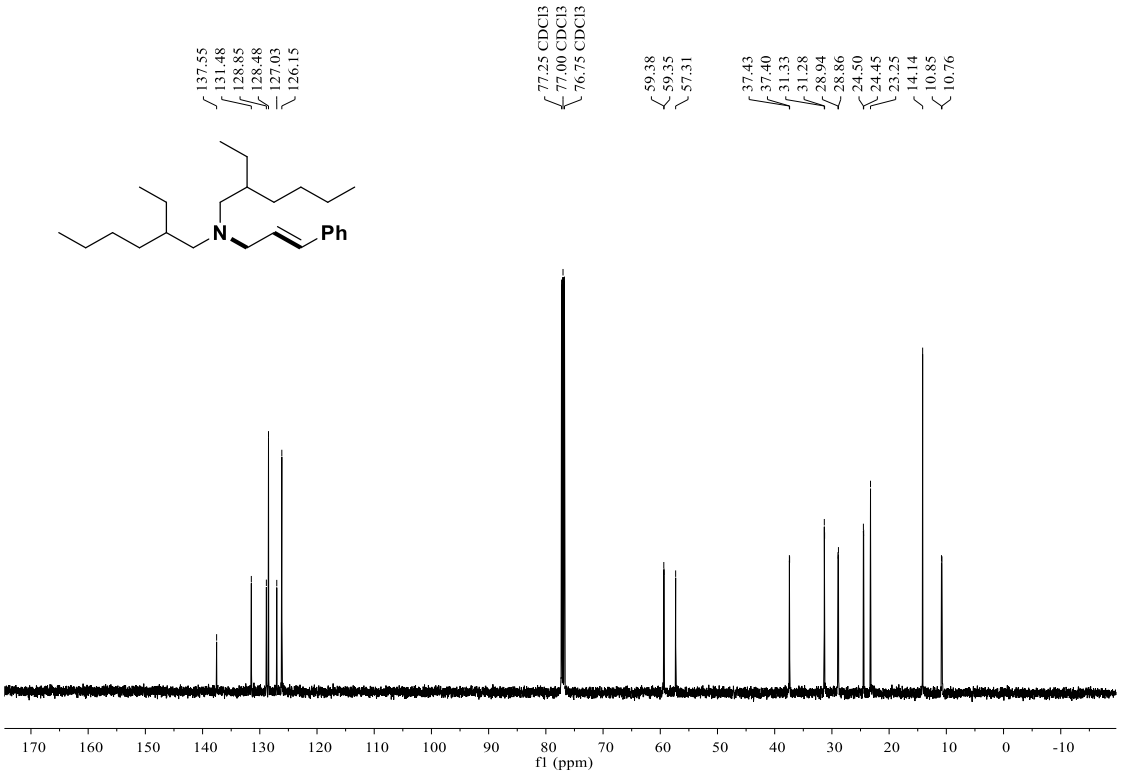
N-Cinnamyl-*N*-octyloctan-1-amine (5)



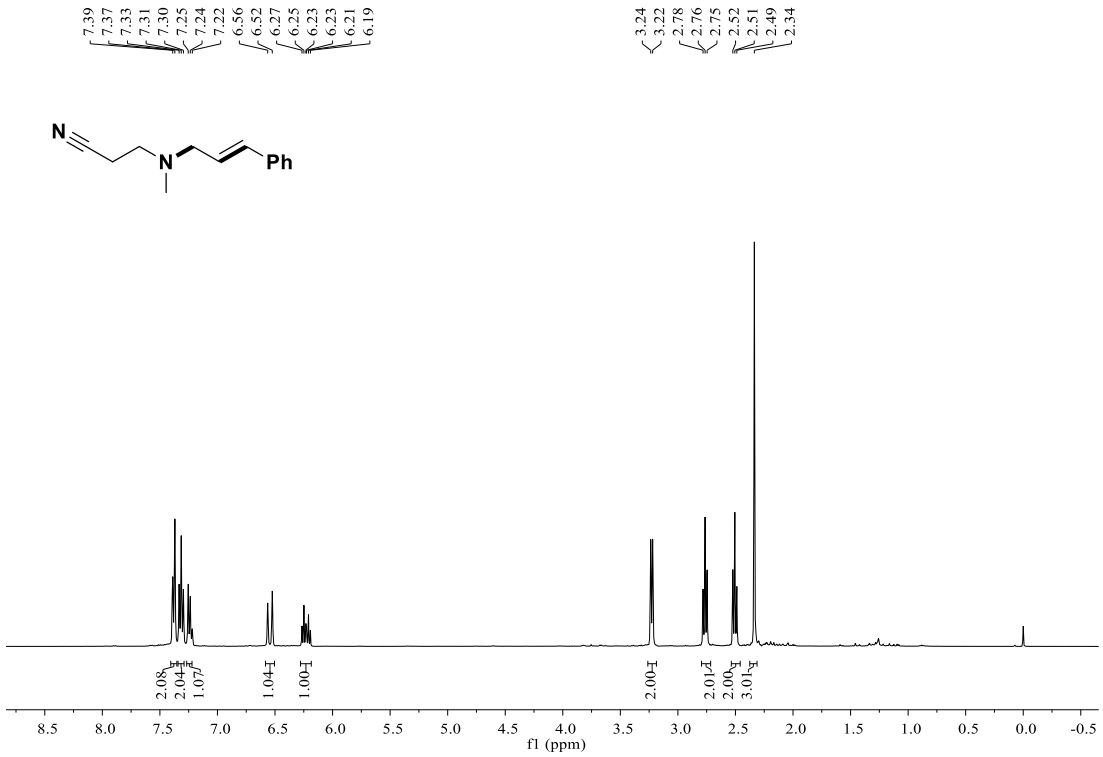


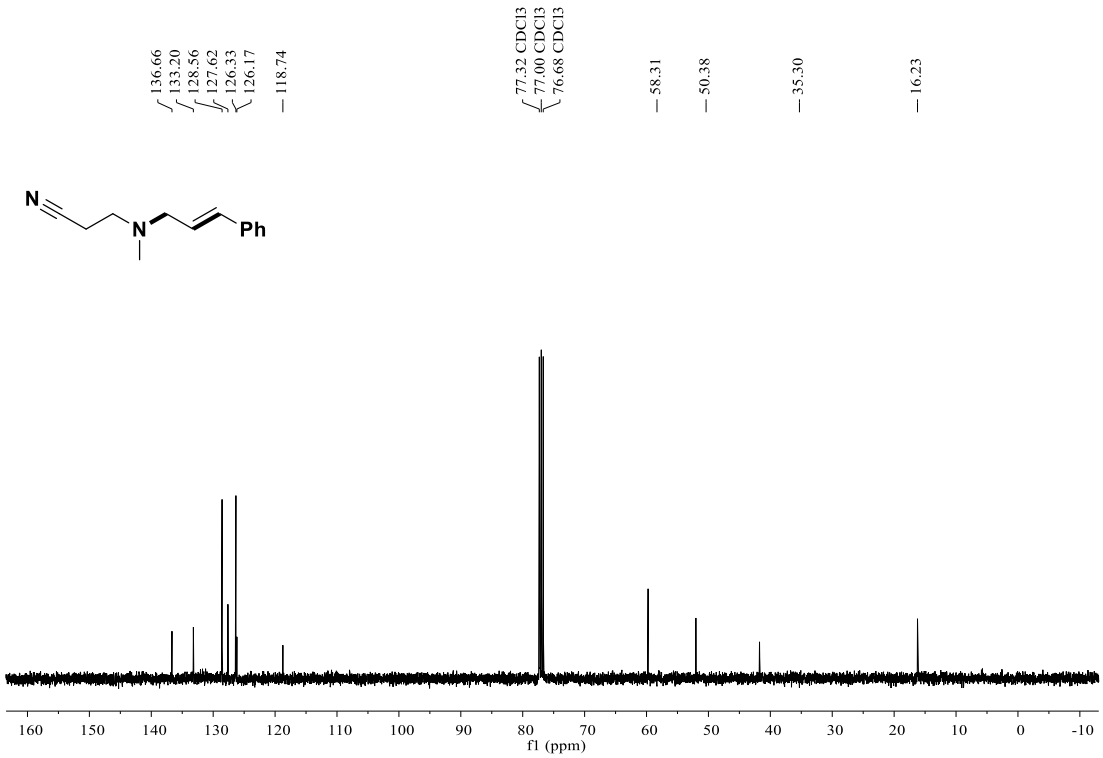
N-Cinnamyl-2-ethyl-*N*-(2-ethylhexyl)hexan-1-amine (6)



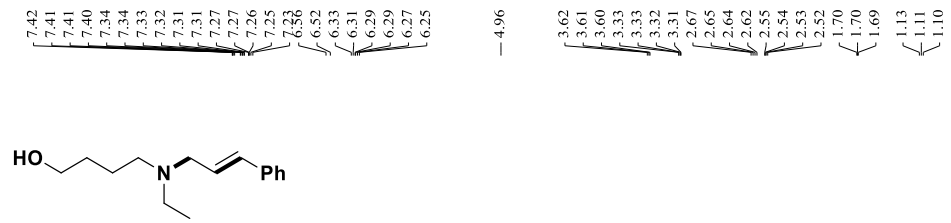


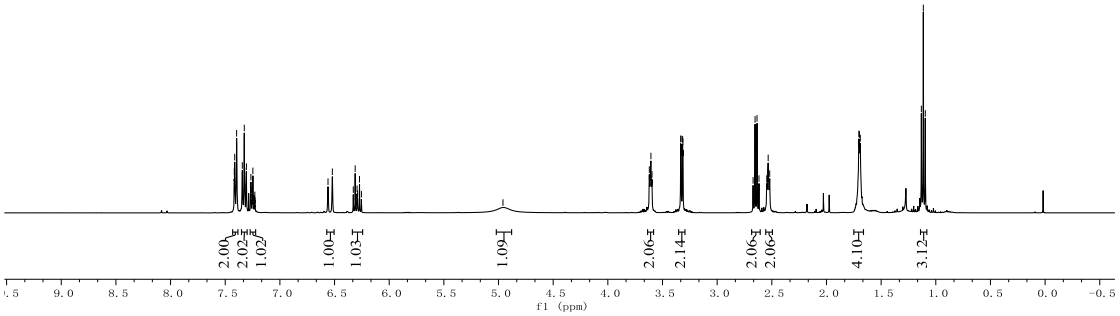
3-(Cinnamyl(methyl)amino) propanenitrile (7)

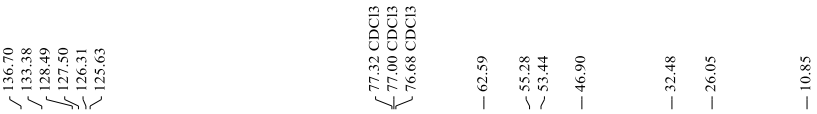


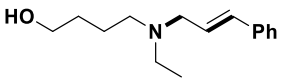


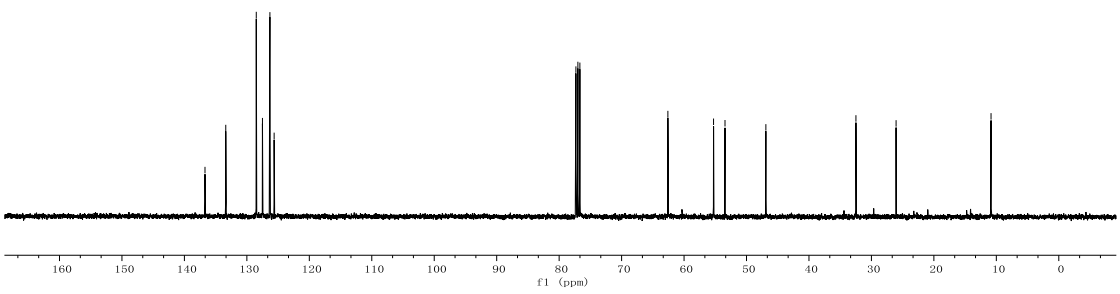
4-(Cinnamyl(ethyl)amino)butan-1-ol (8)



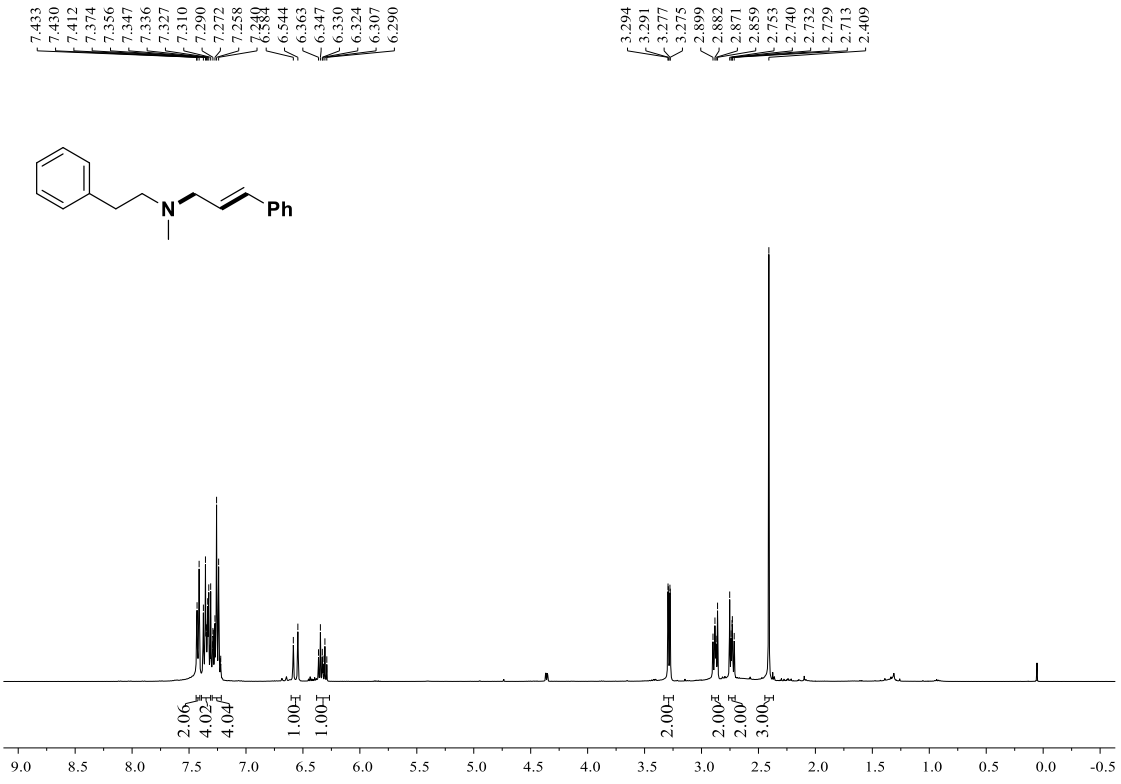


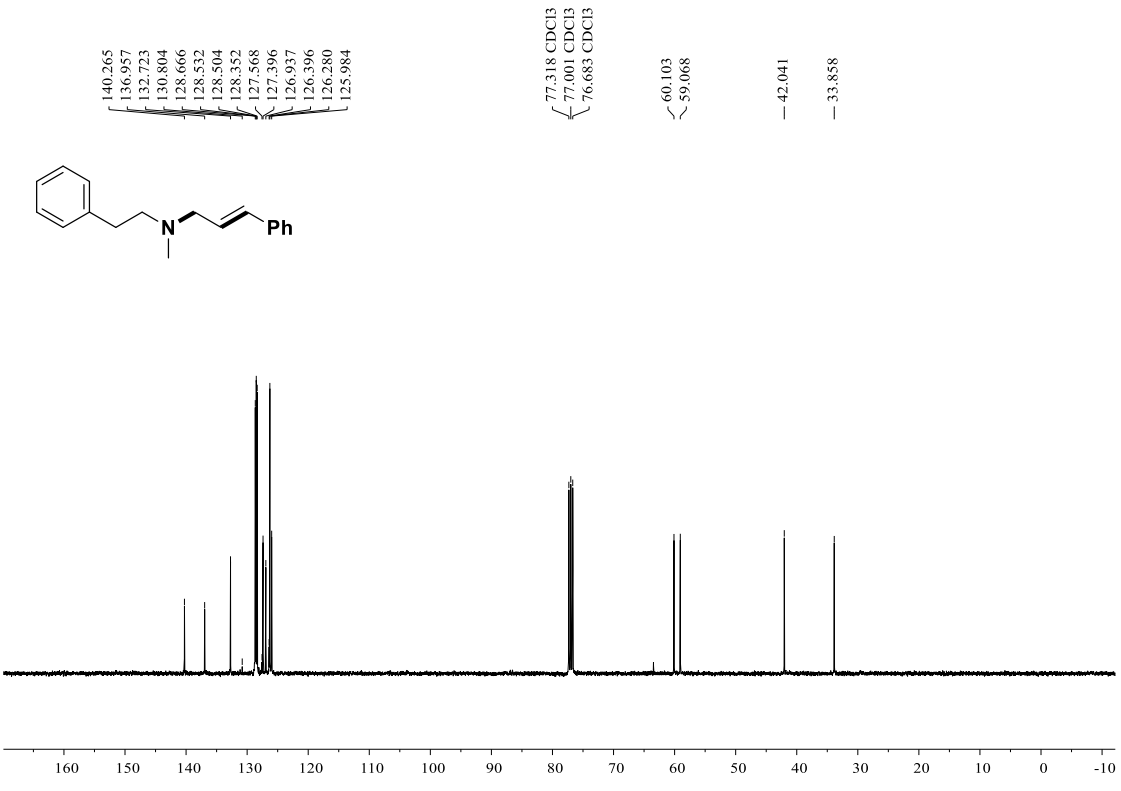




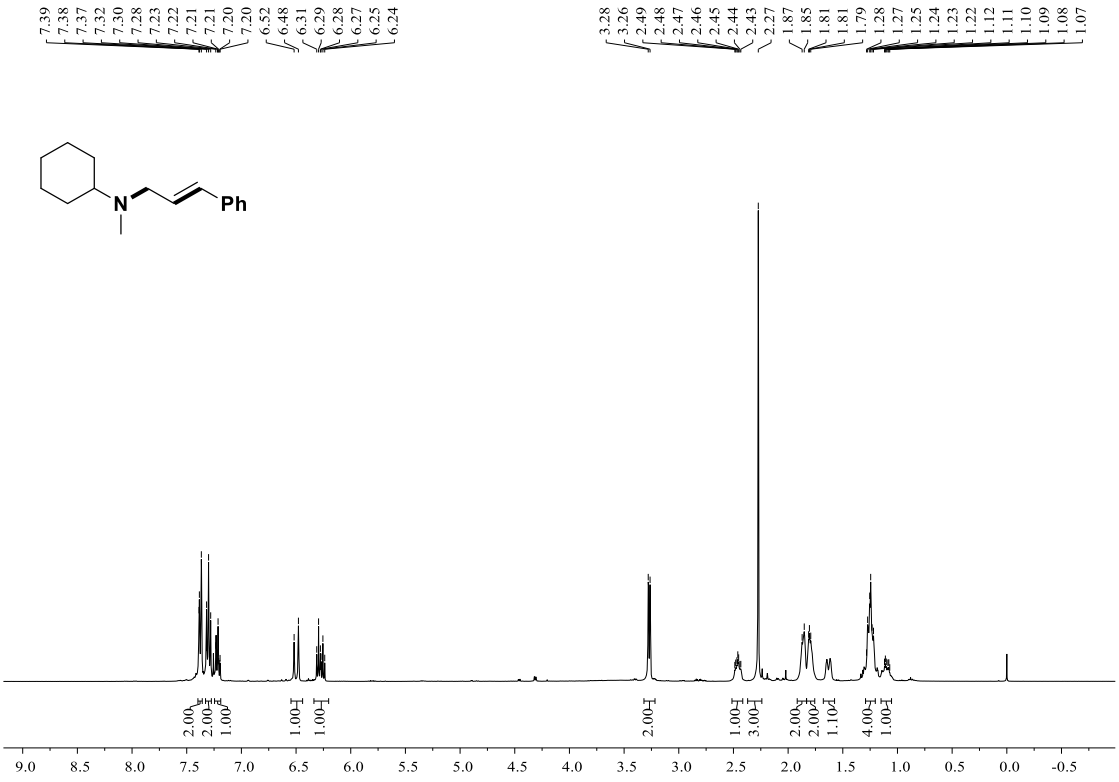


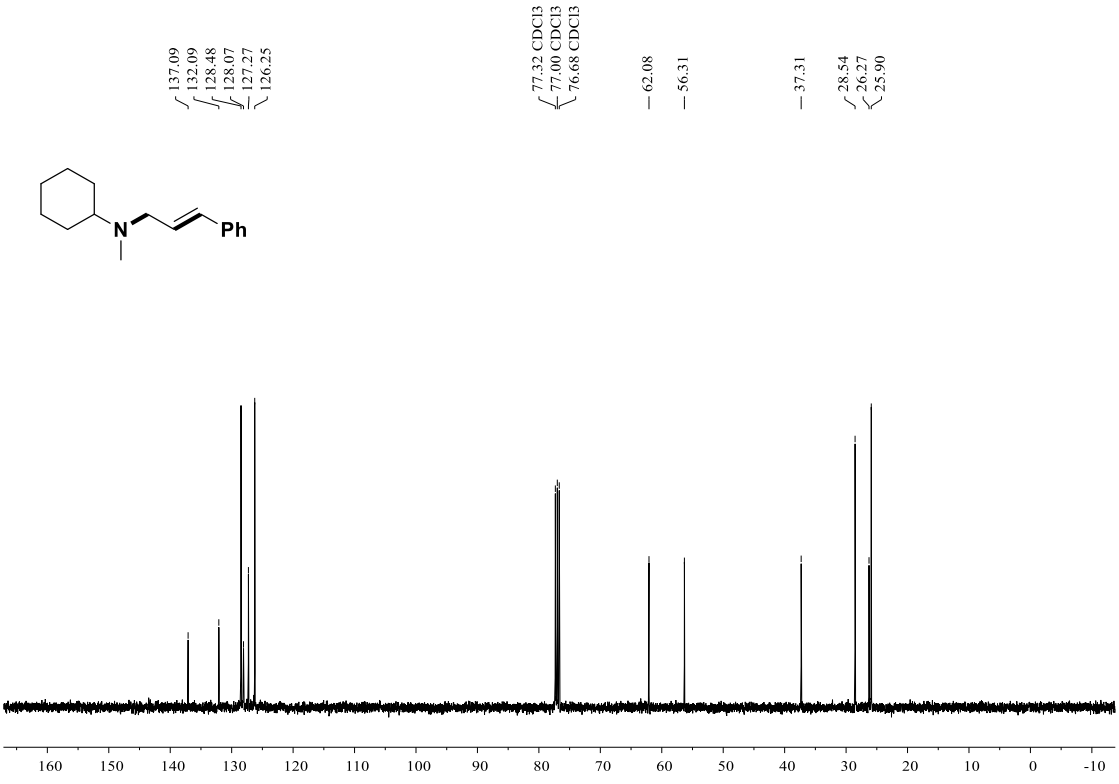
(*E*)-*N*-Methyl-*N*-phenethyl-3-phenylprop-2-en-1-amine (9)



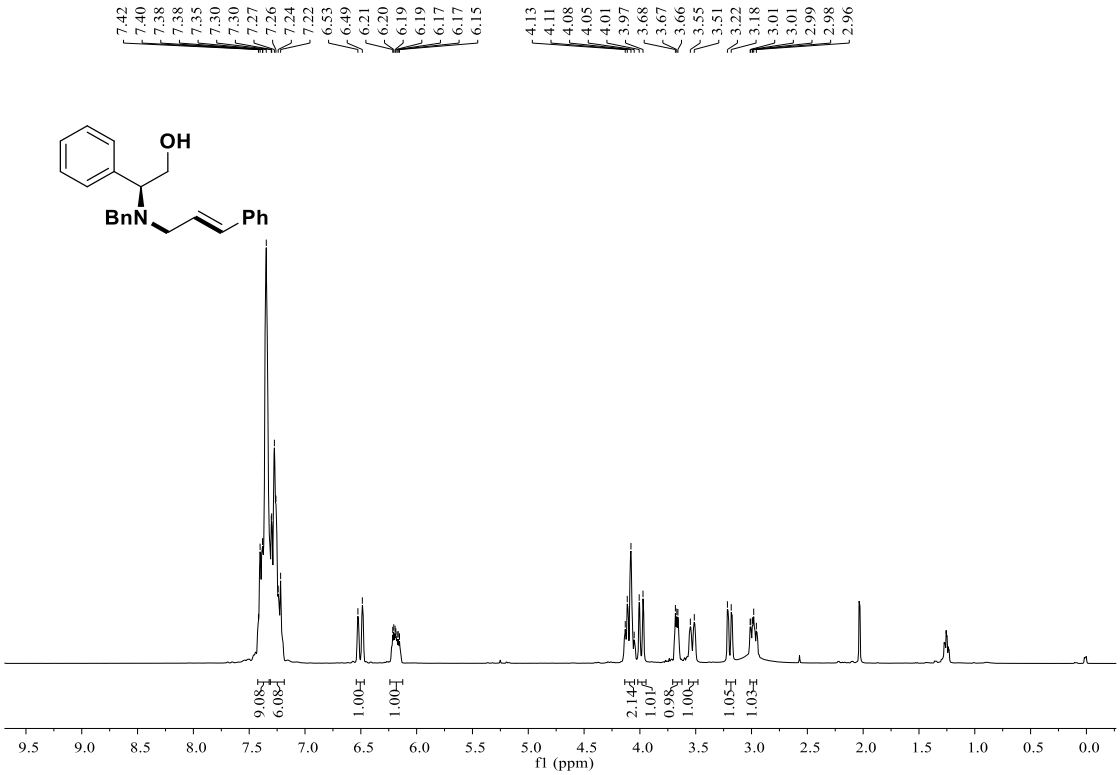


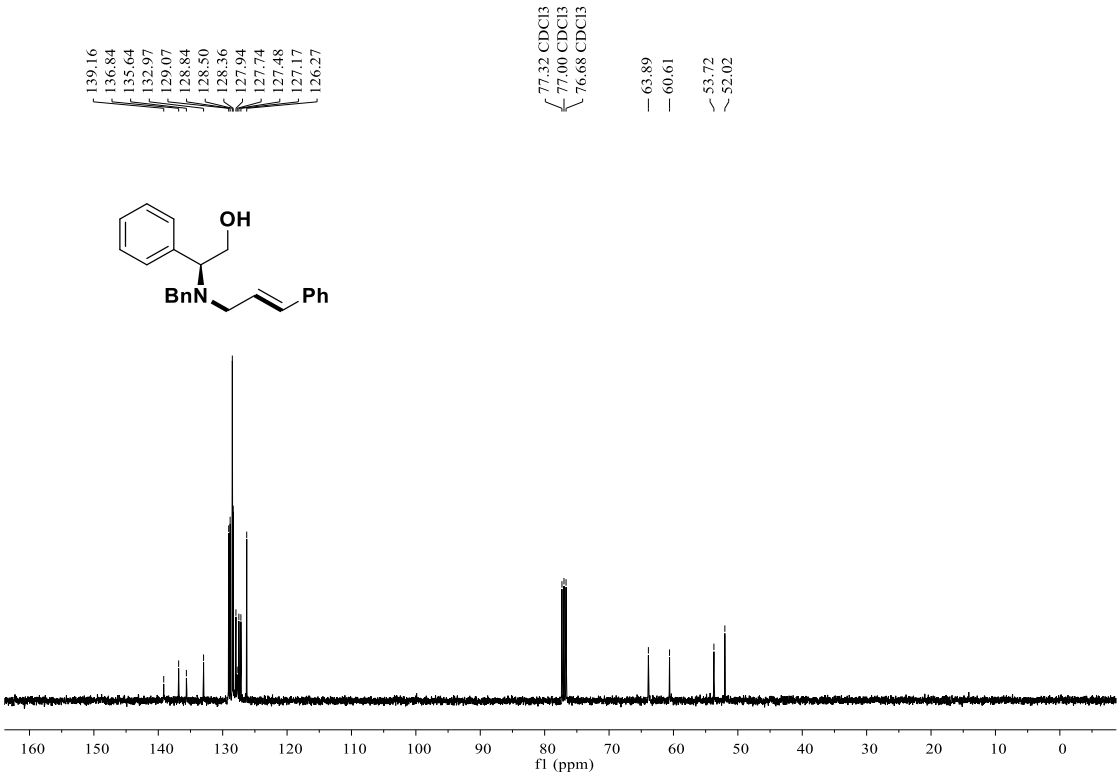
N-Cinnamyl-*N*-methylcyclohexanamine (10)



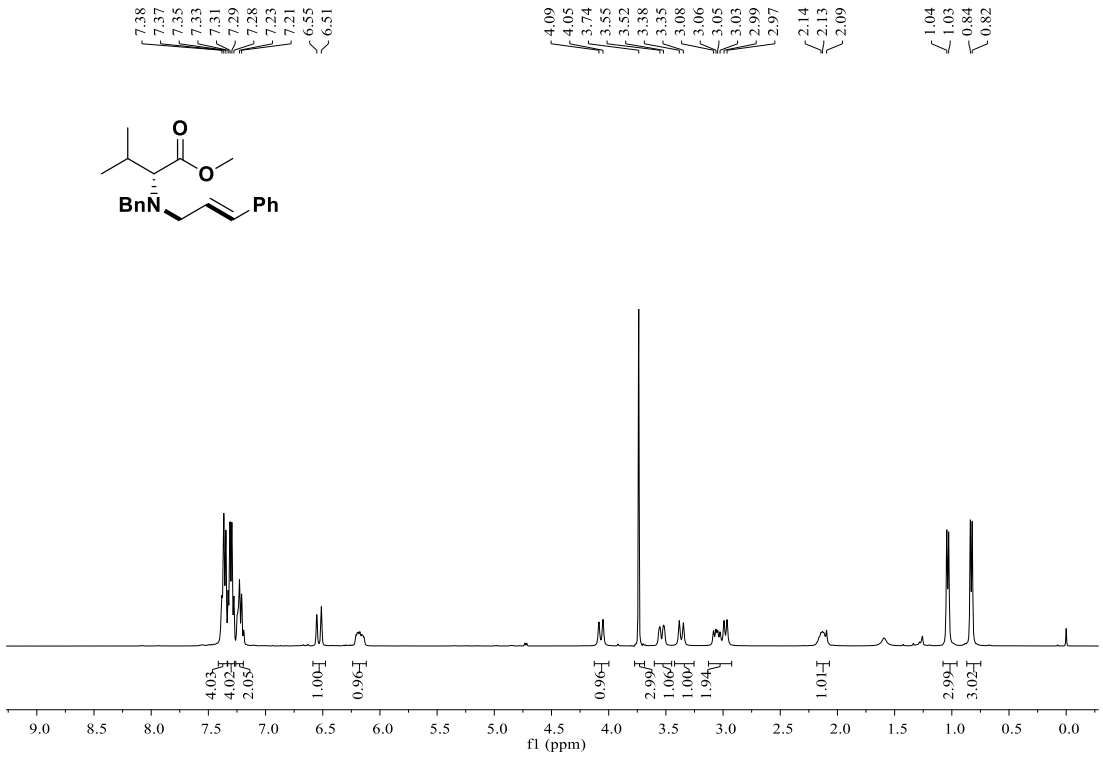


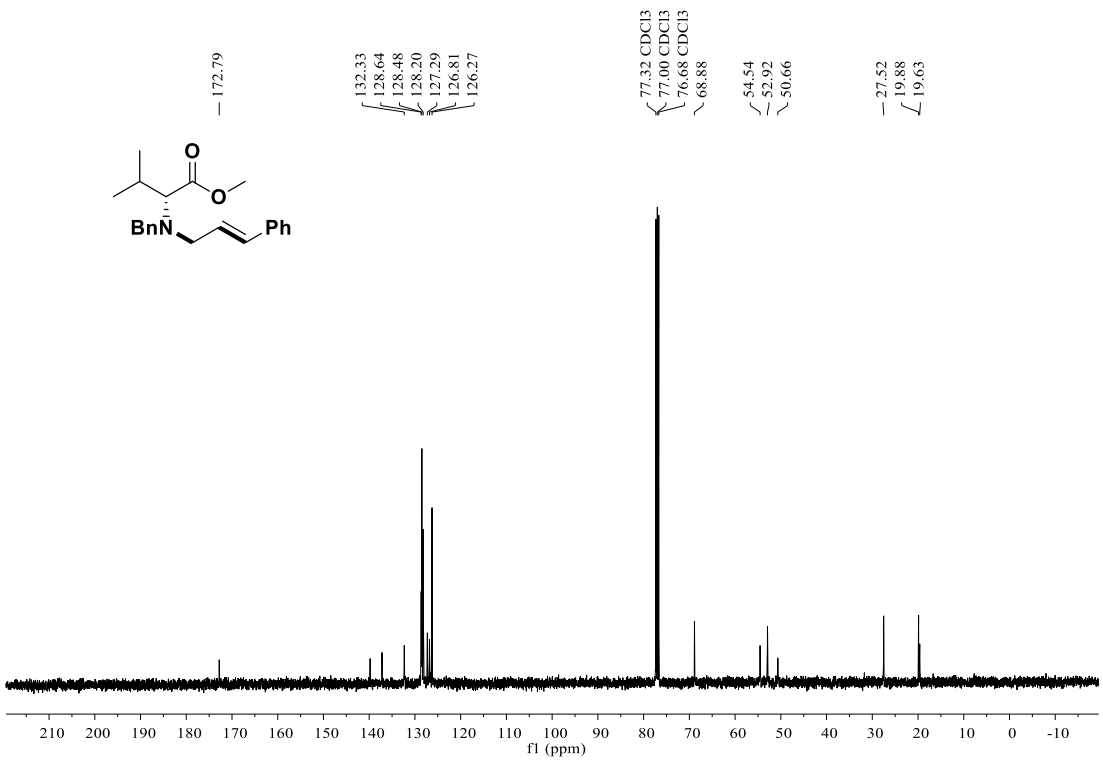
(*S*)-2-(Benzyl(cinnamyl)amino)-2-phenylethan-1-ol (11)



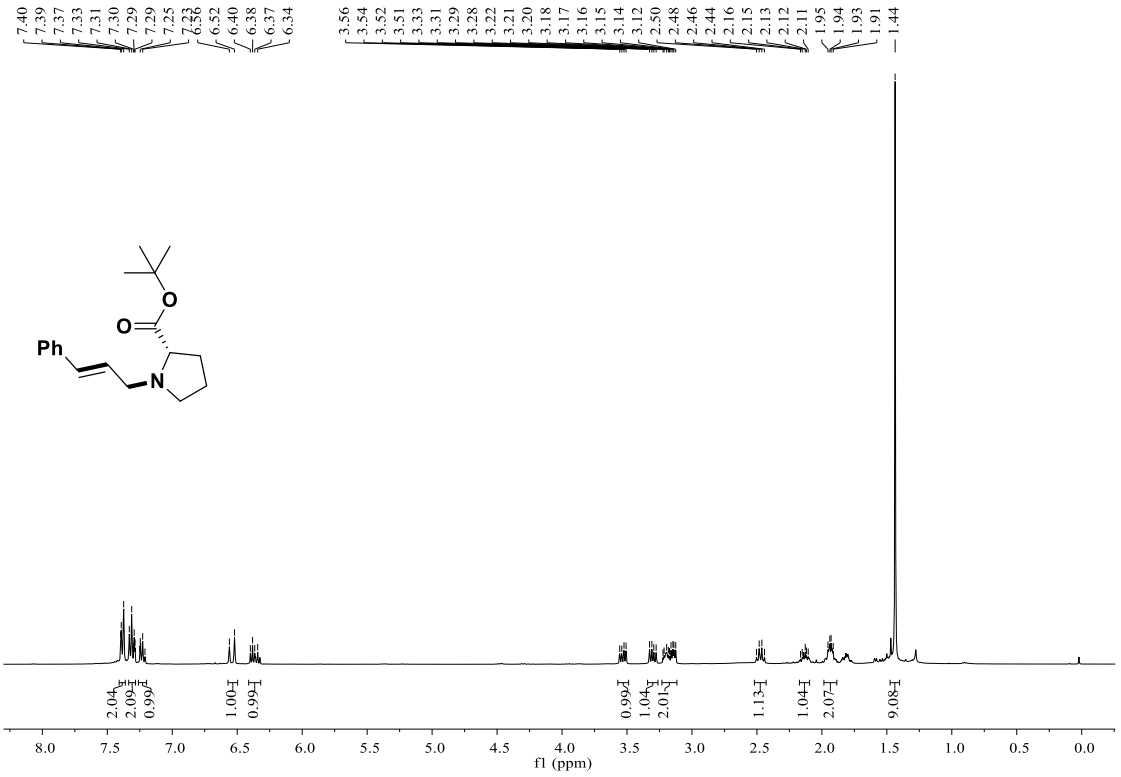


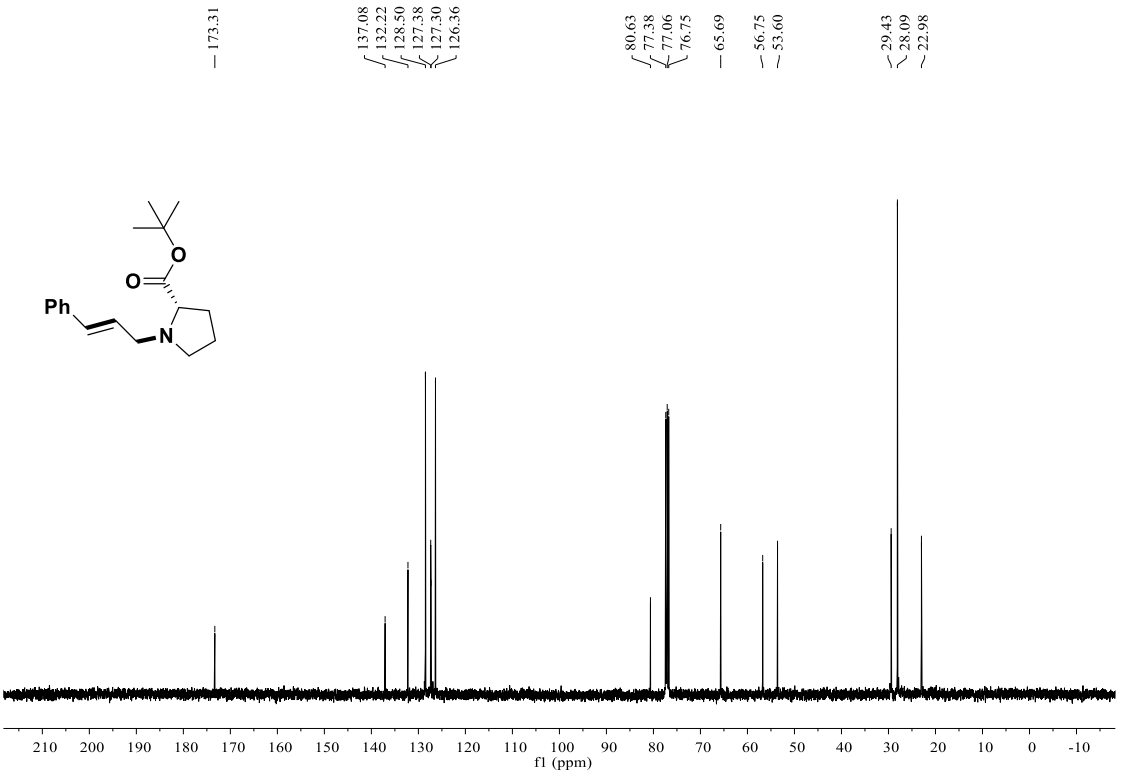
Methyl *N*-benzyl-*N*-cinnamyl-*D*-valinate (12)



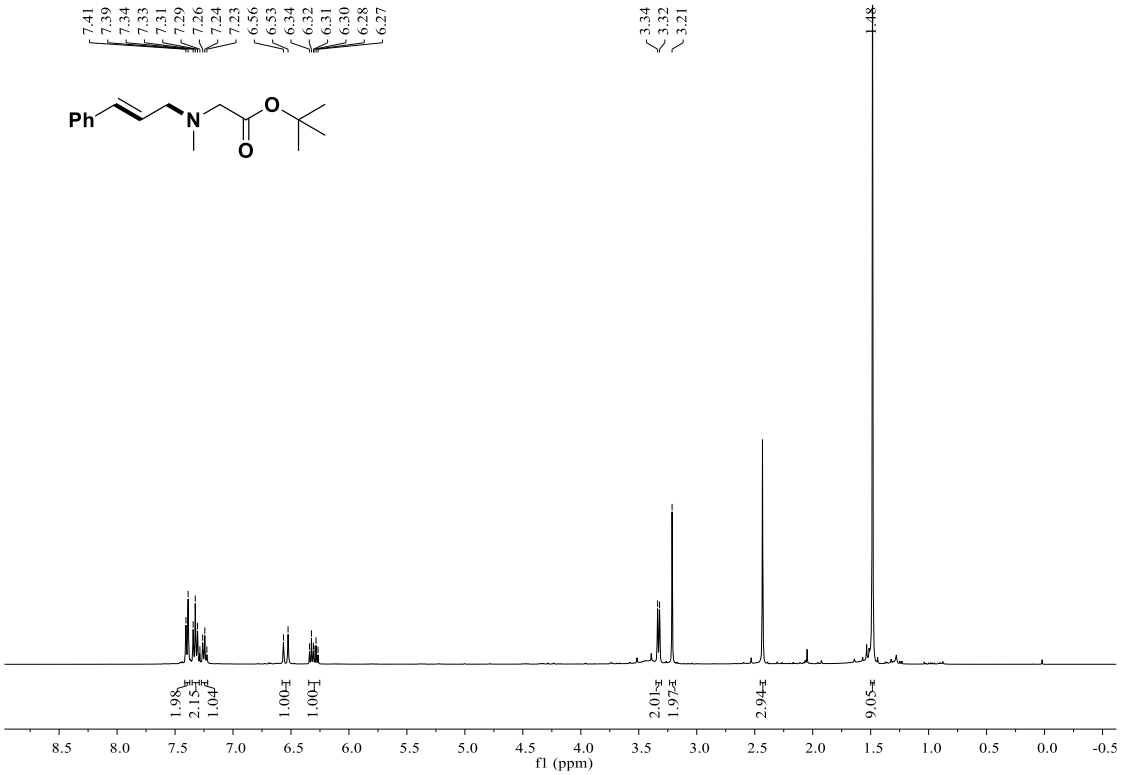


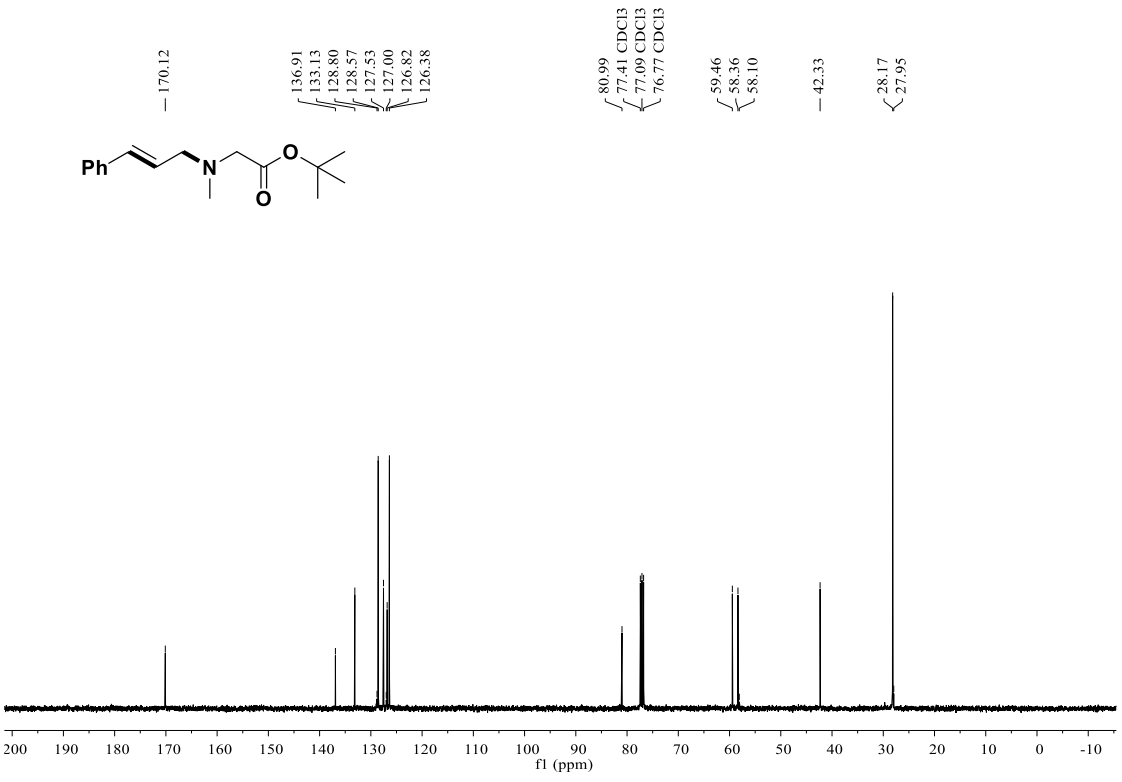
tert-Butyl cinnamyl-_L_-prolinate (13)



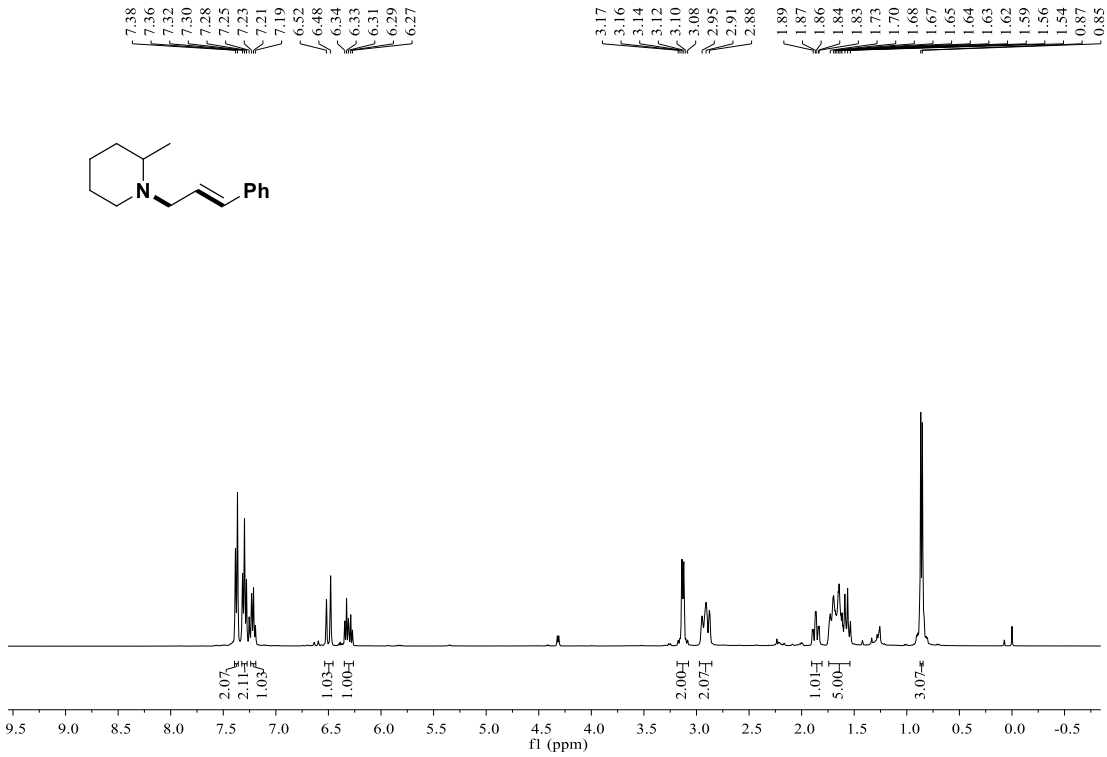


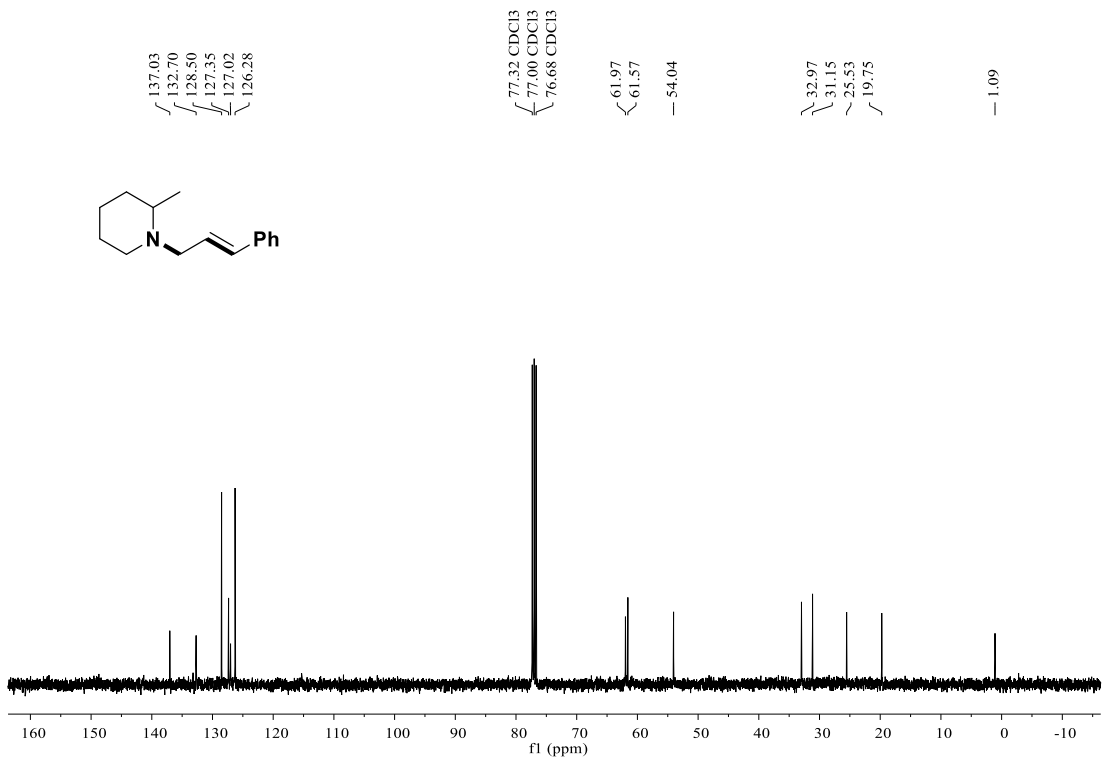
***tert*-Butyl *N*-cinnamyl-*N*-methylglycinate (14)**



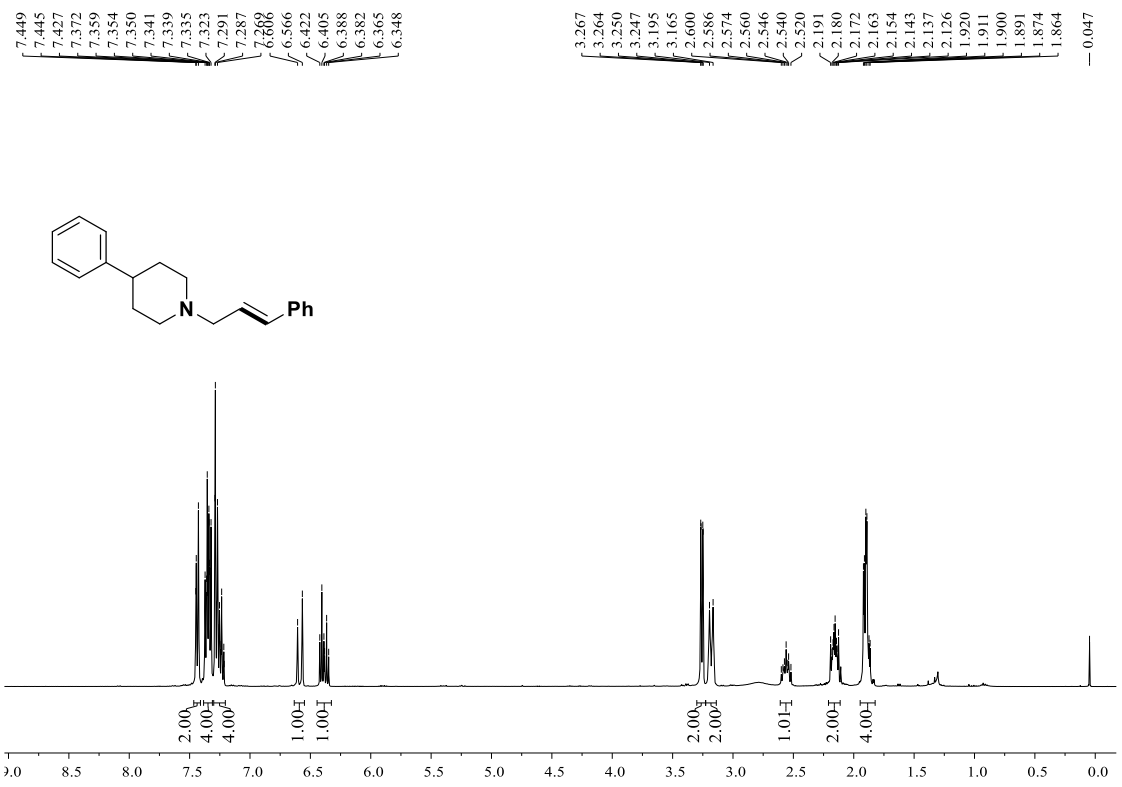


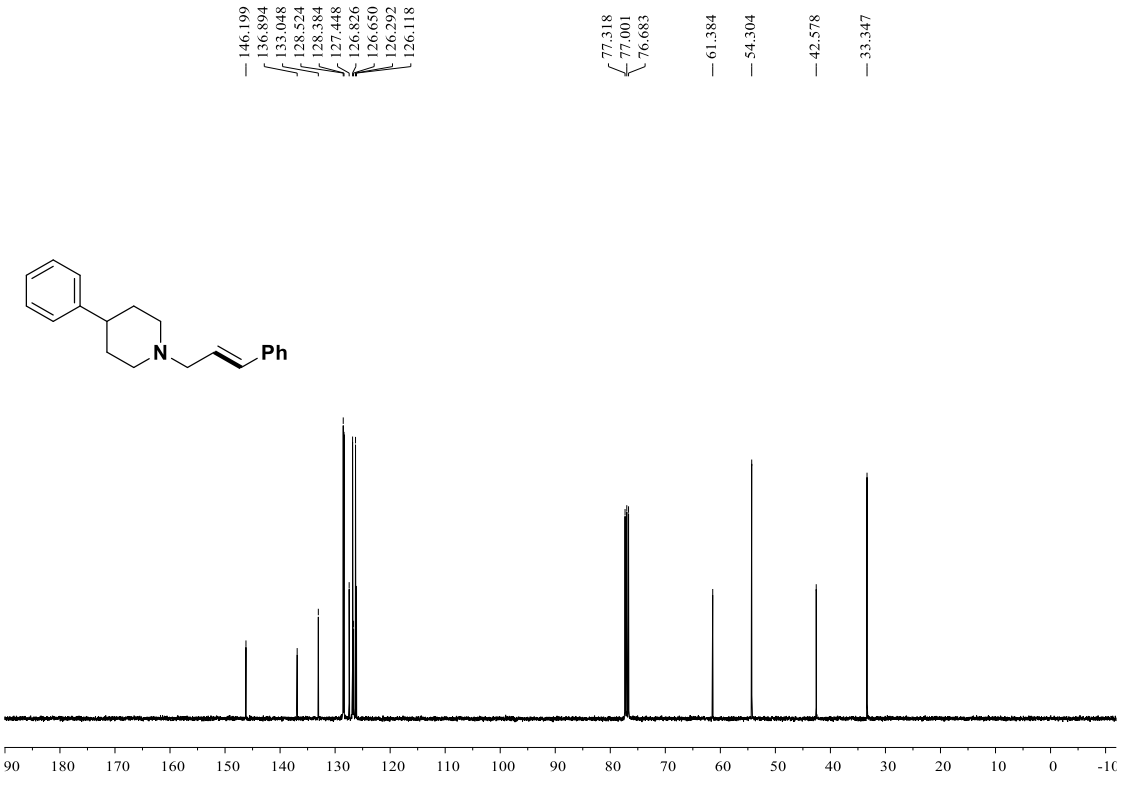
1-Cinnamyl-2-methylpiperidine (15)



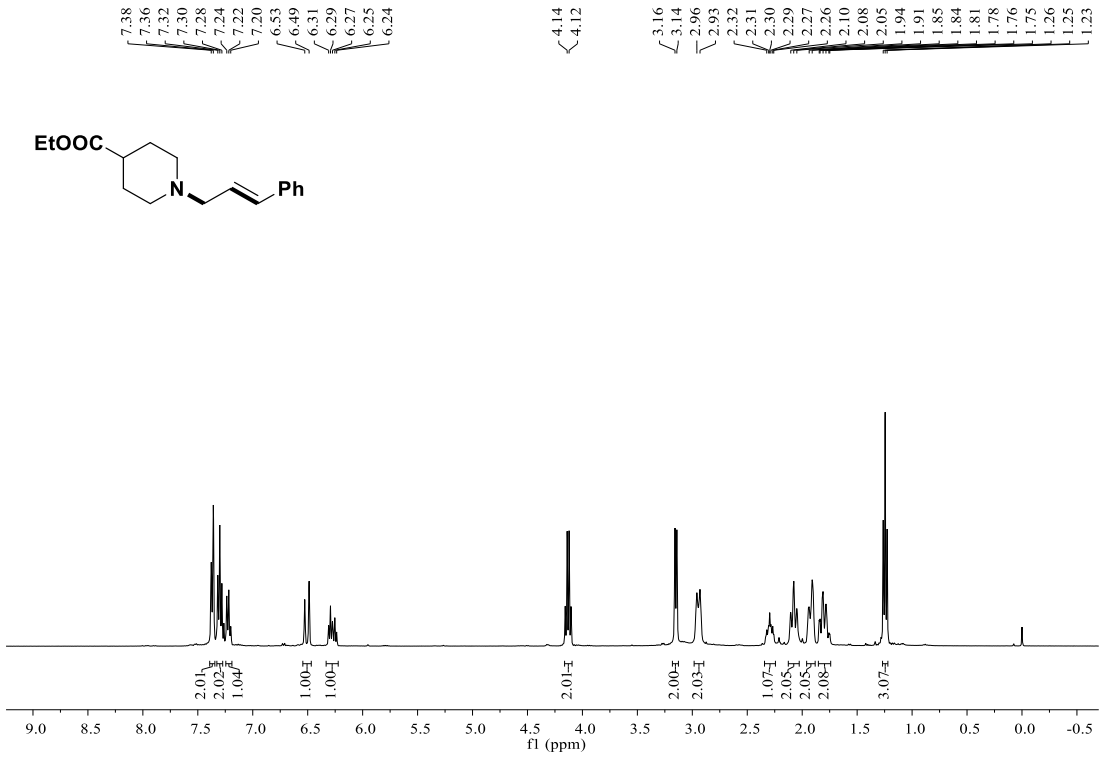


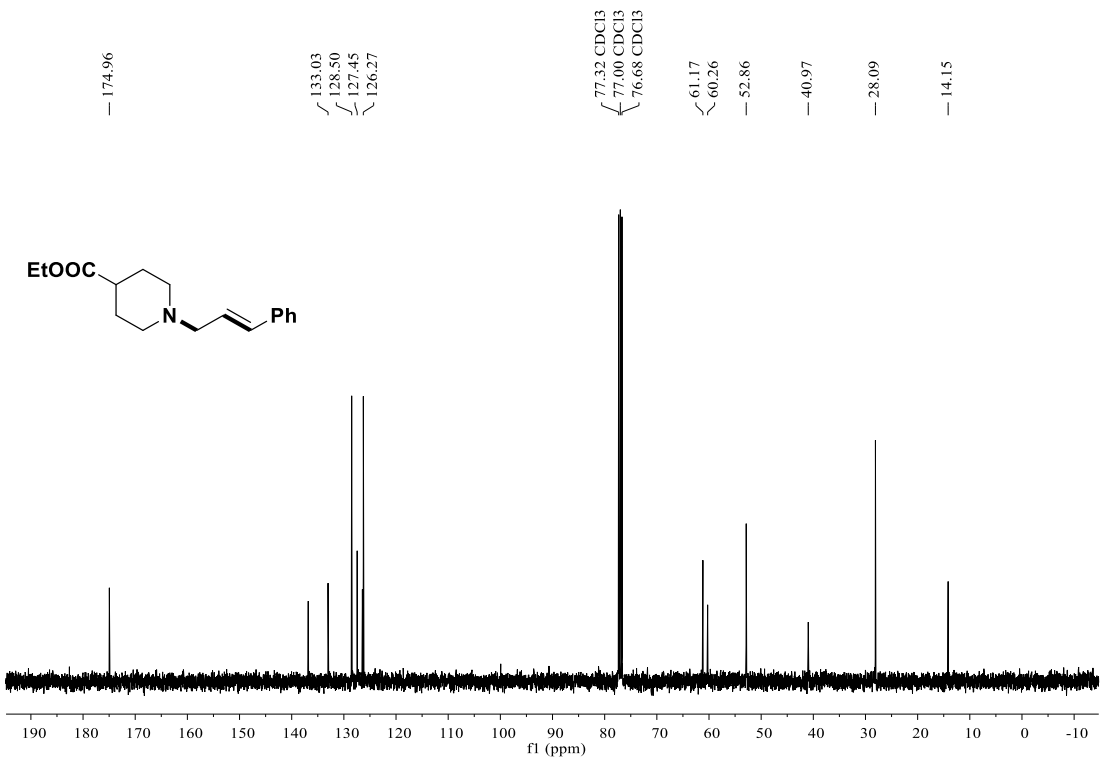
1-Cinnamyl-4-phenylpiperidine (16)



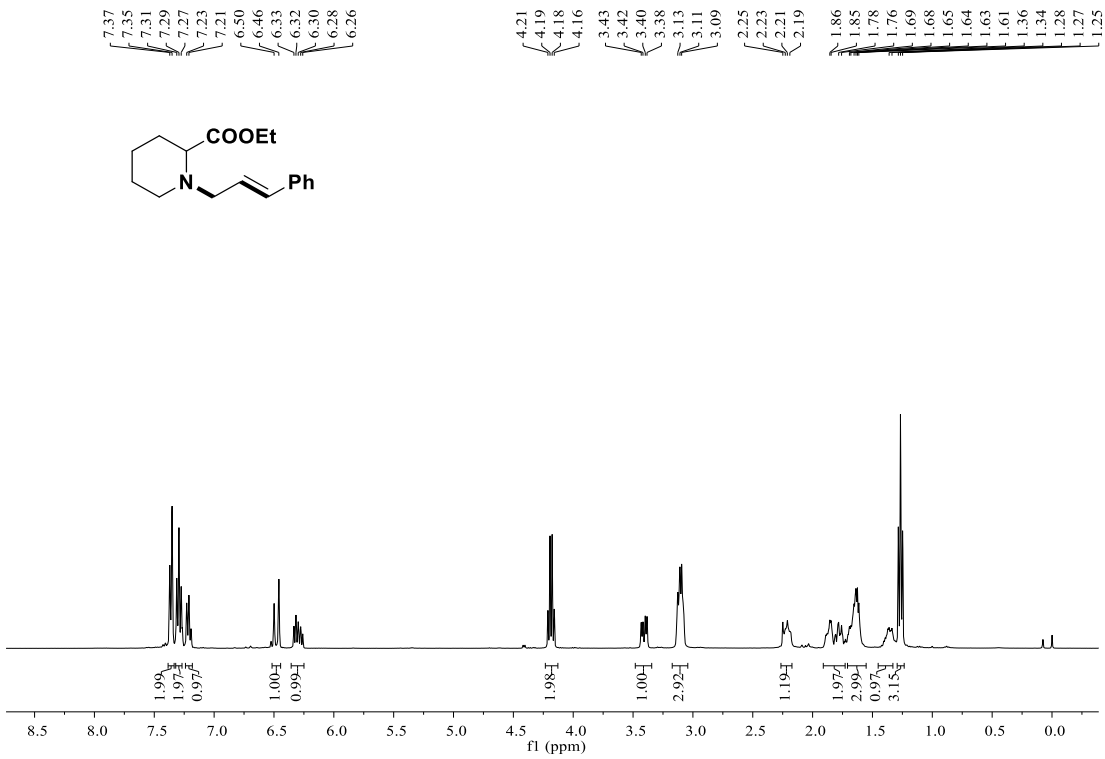


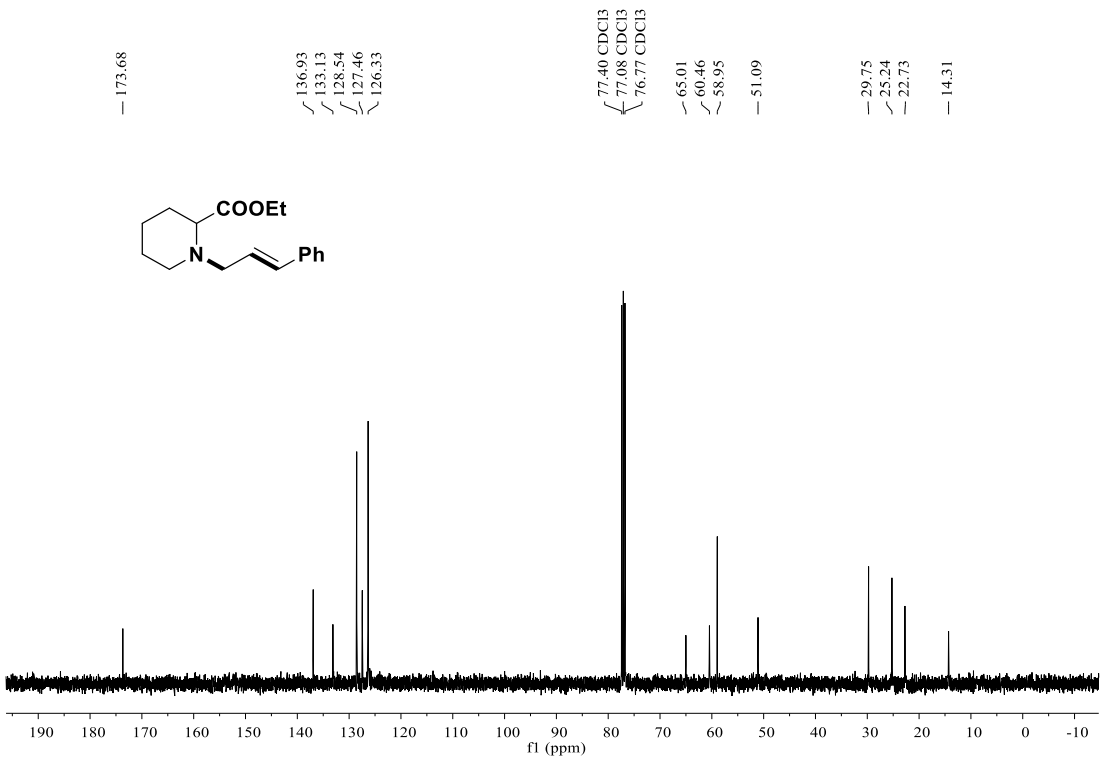
Ethyl-1-cinnamylpiperidine-4-carboxylate (17)



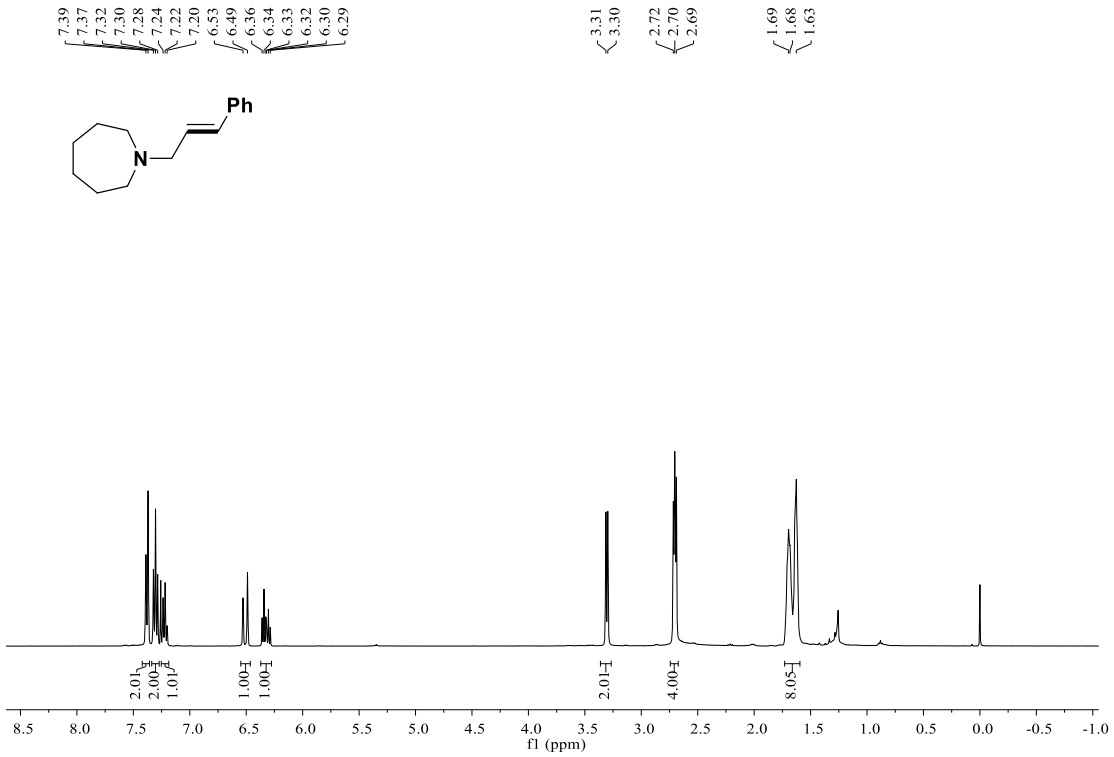


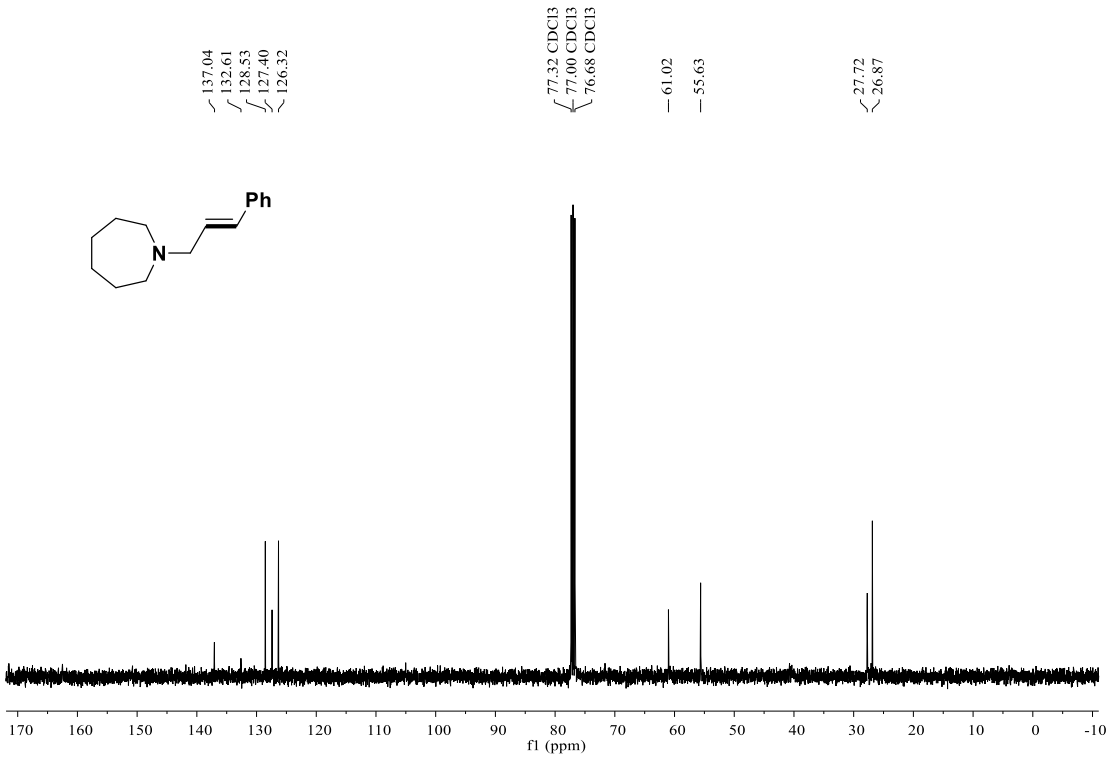
Ethyl-1-cinnamylpiperidine-2-carboxylate (18)



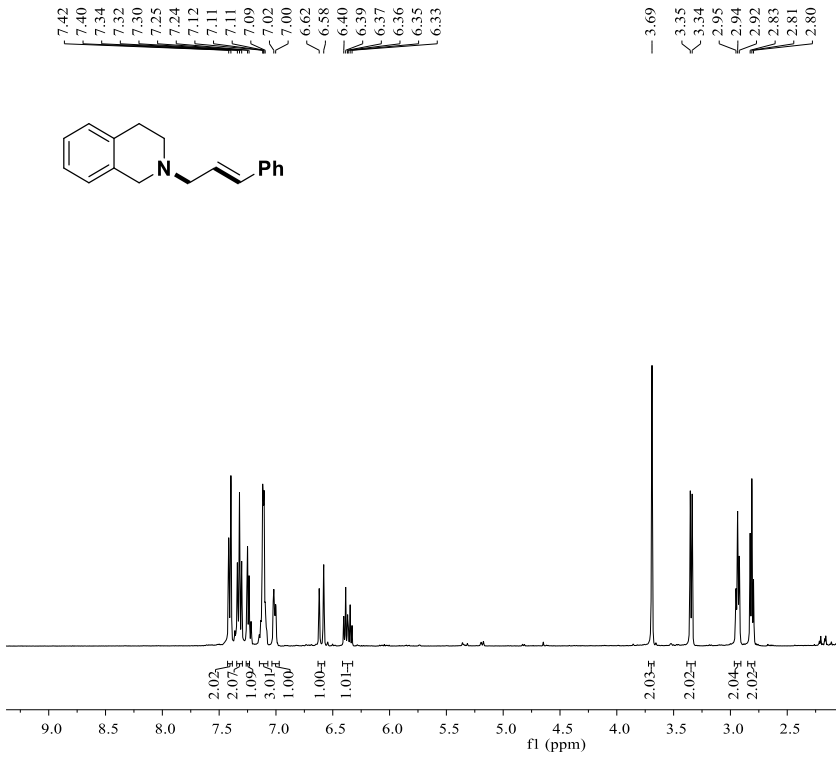


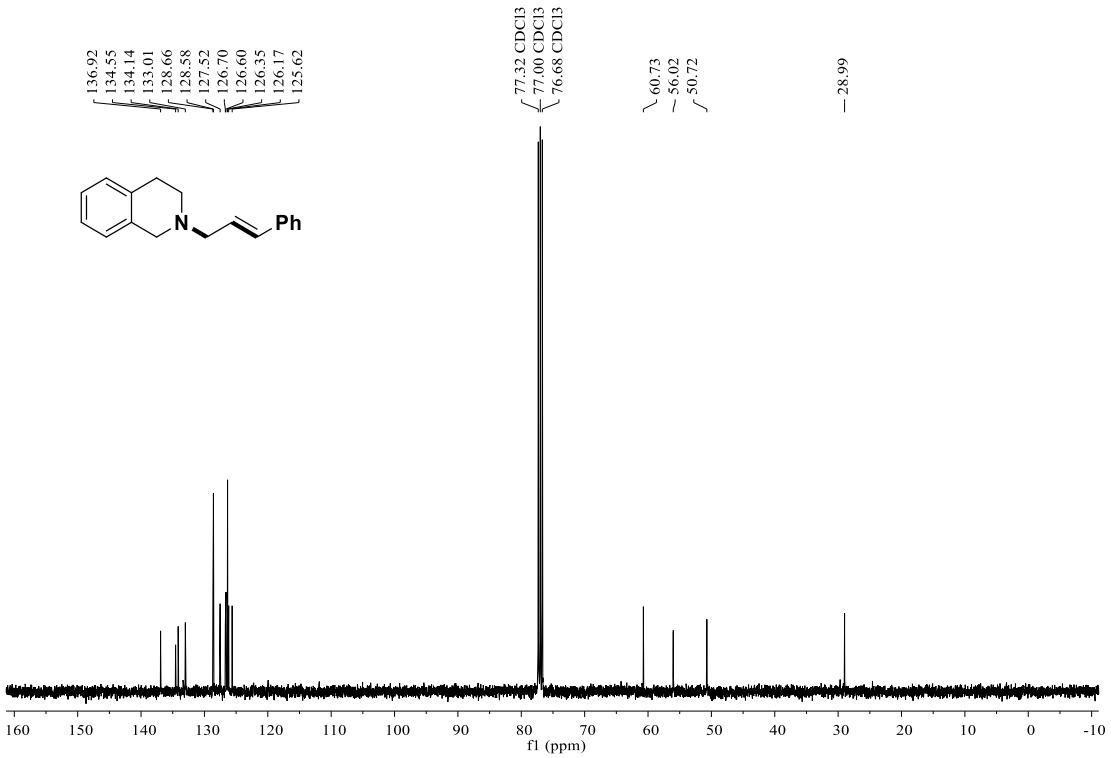
1-Cinnamylazepane (19)



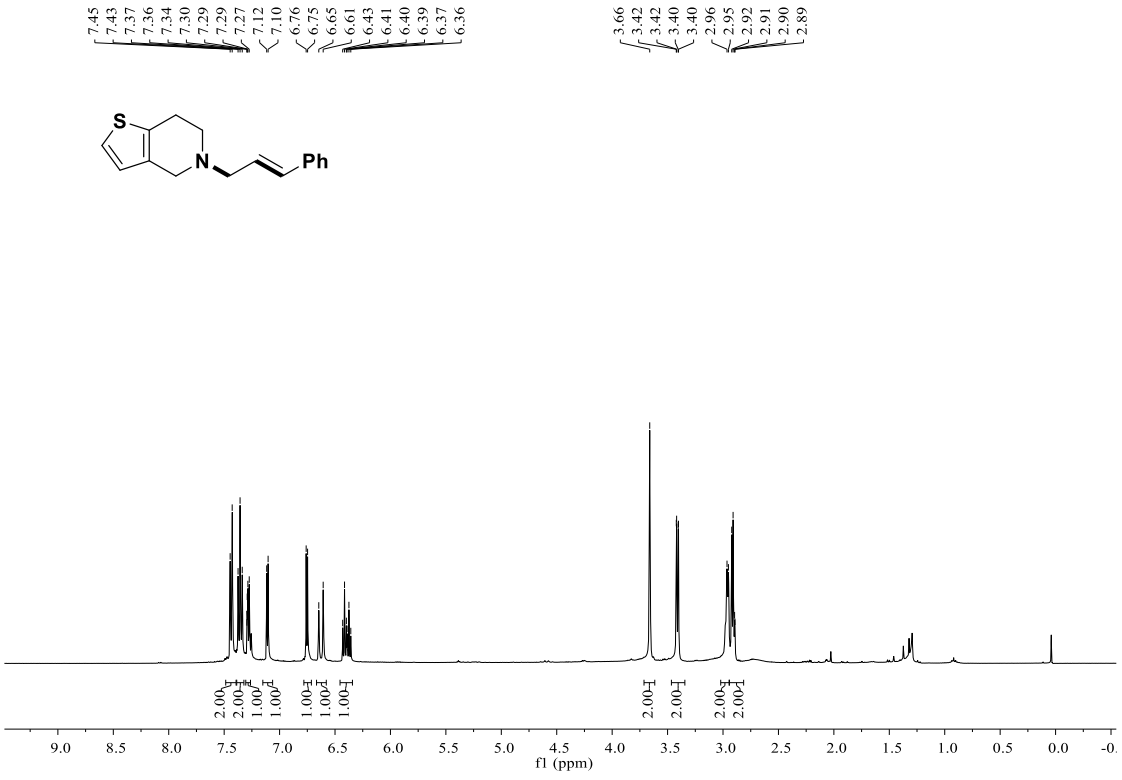


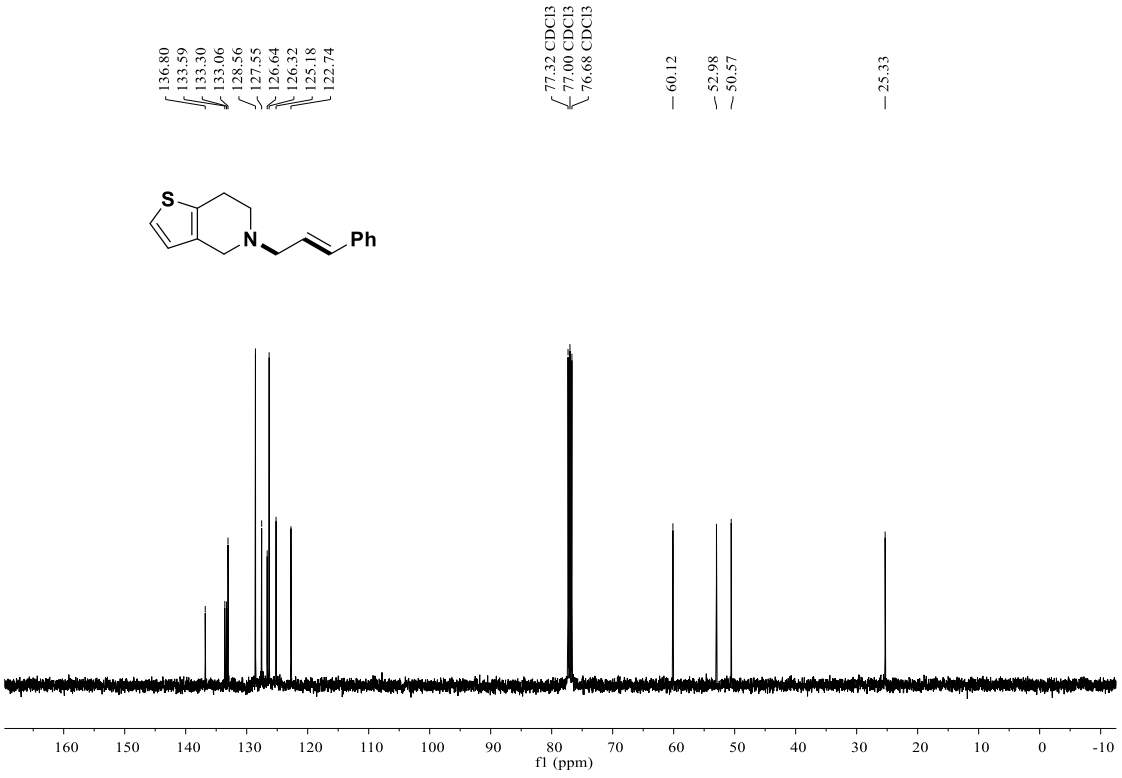
2-Cinnamyl-1,2,3,4-tetrahydroisoquinoline (20)



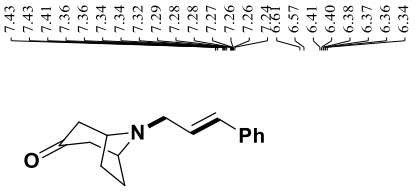


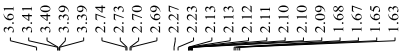
5-Cinnamyl-4,5,6,7-tetrahydrothieno[3,2-c] pyridine (21)

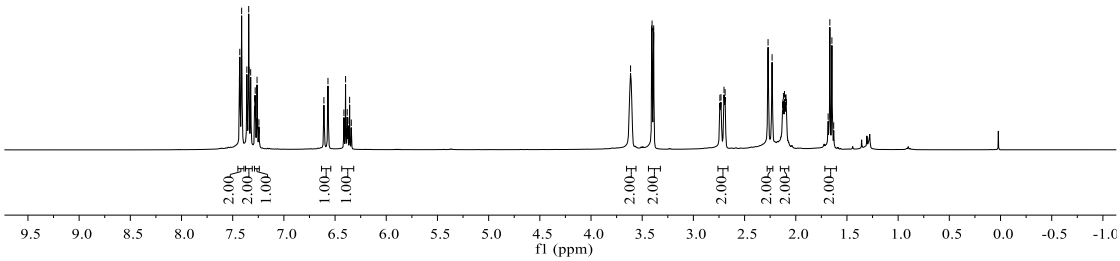


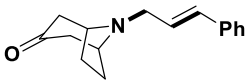


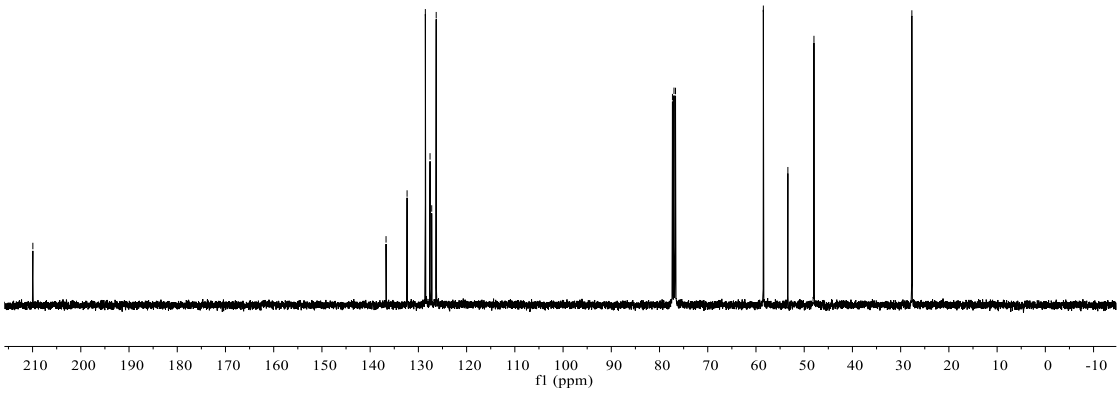
(*1R*, *5S*)-8-Cinnamyl-8-azabicyclo [3.2.1] octan-3-one (22)



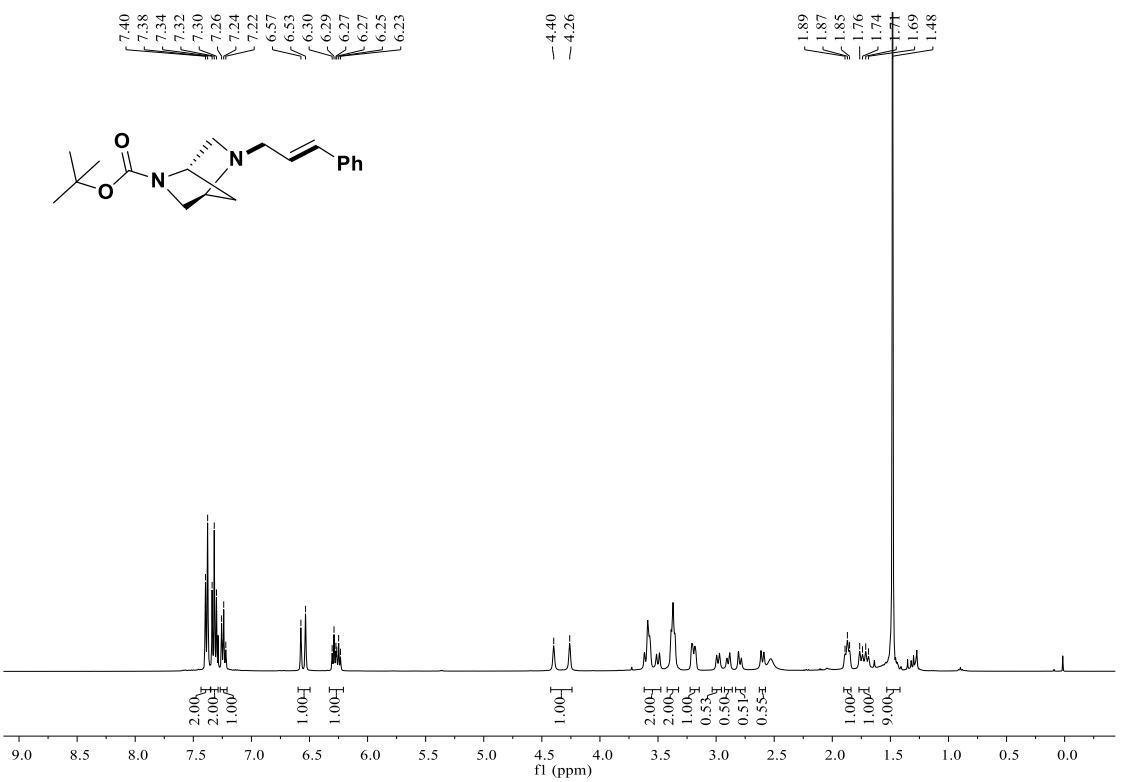


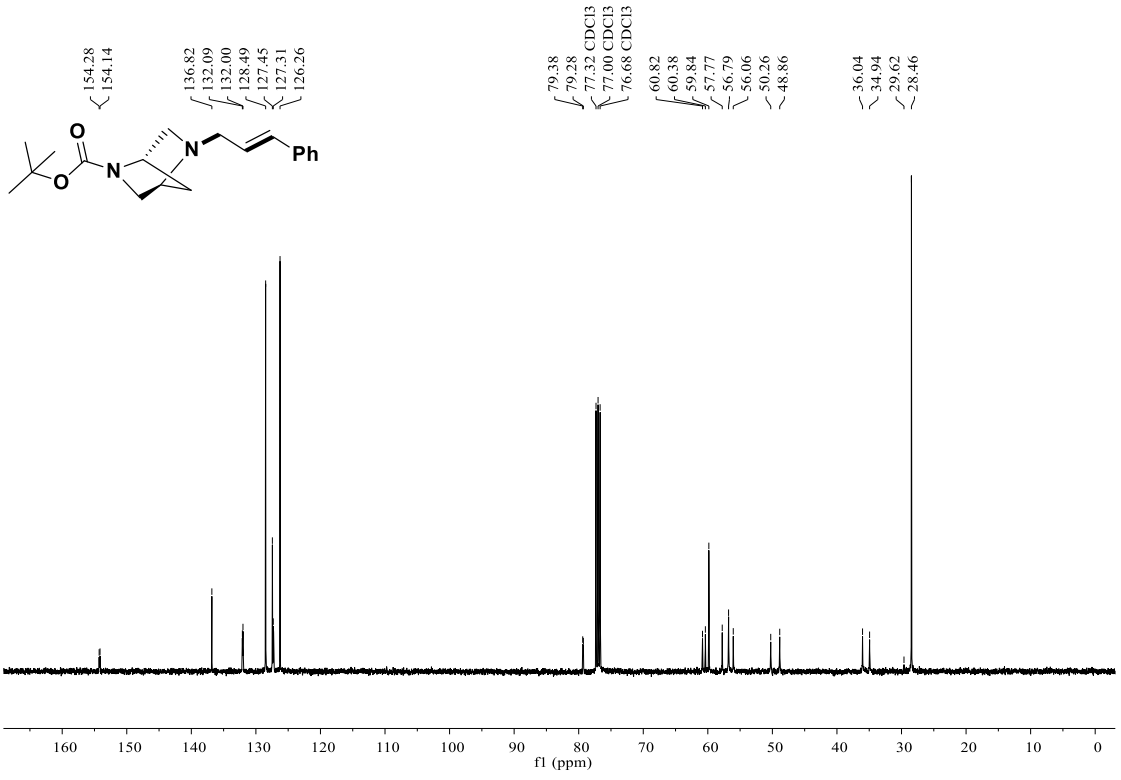




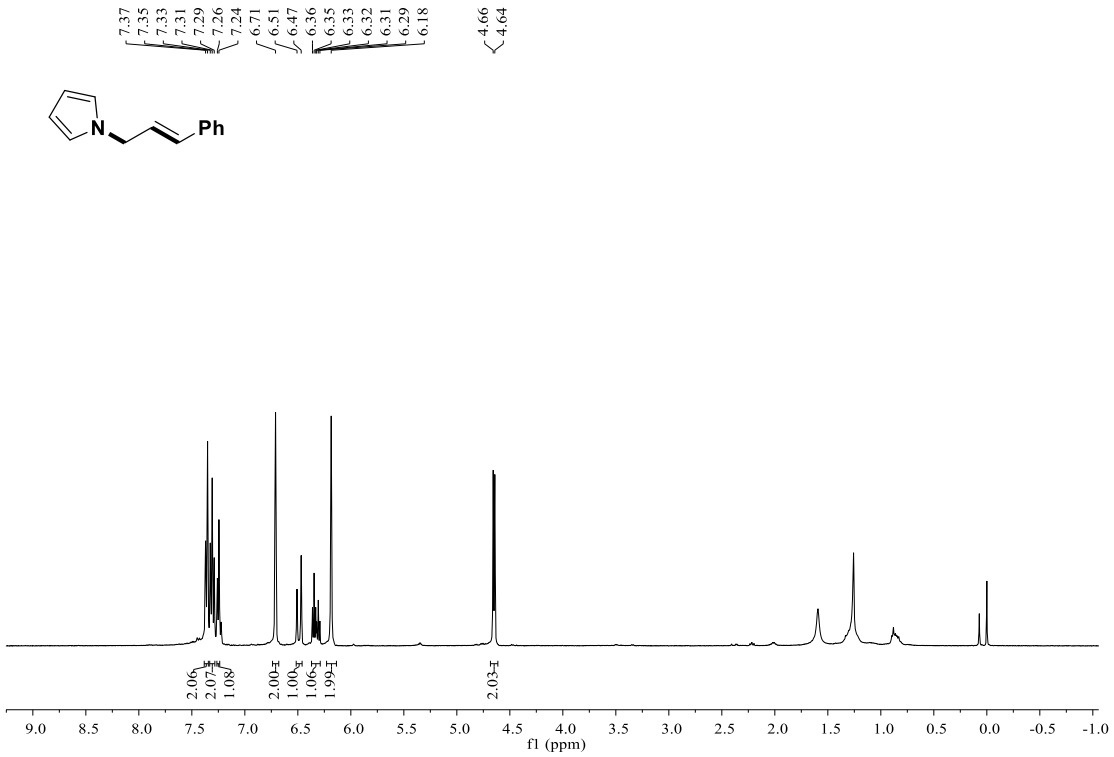


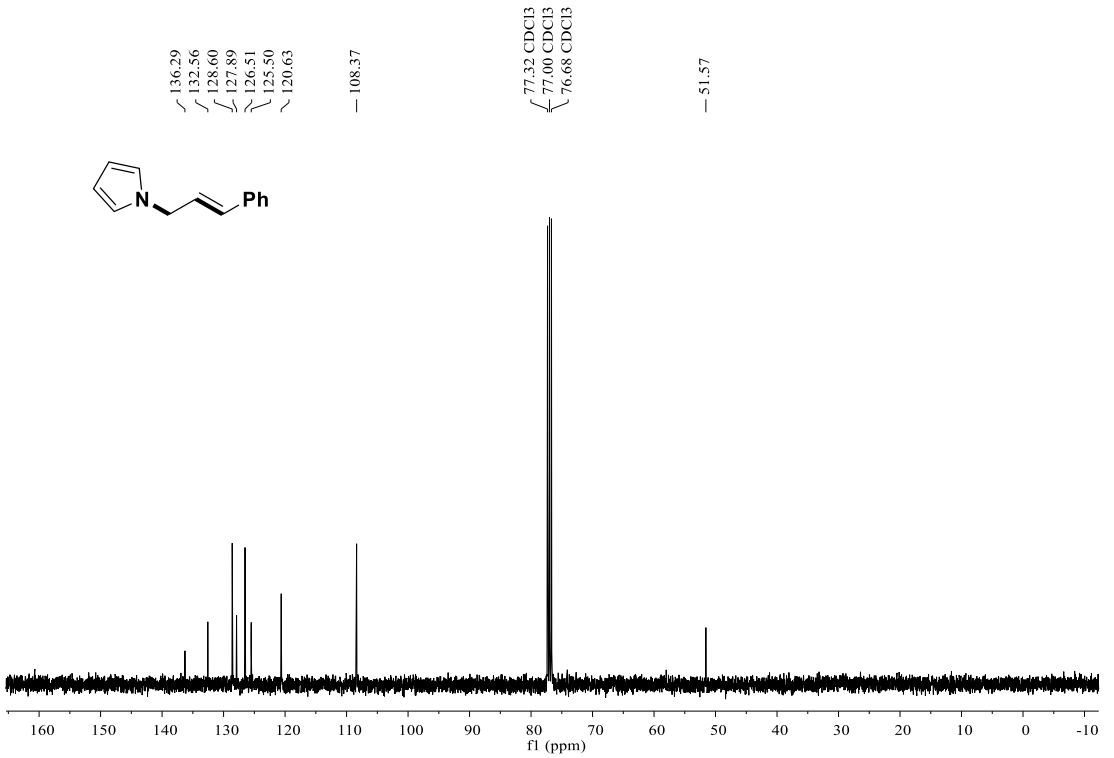
***tert*-Butyl-5-cinnamyl-2,5-diazabicyclo [2.2.1] heptane-2-carboxylate (23)**



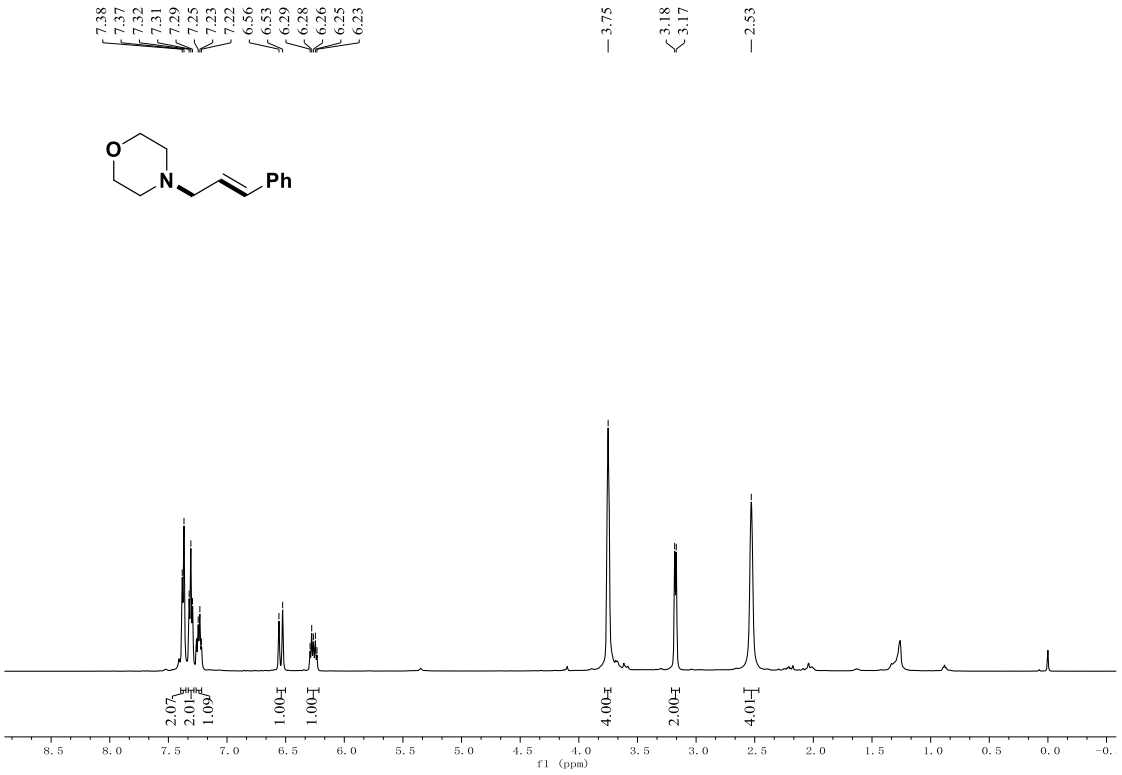


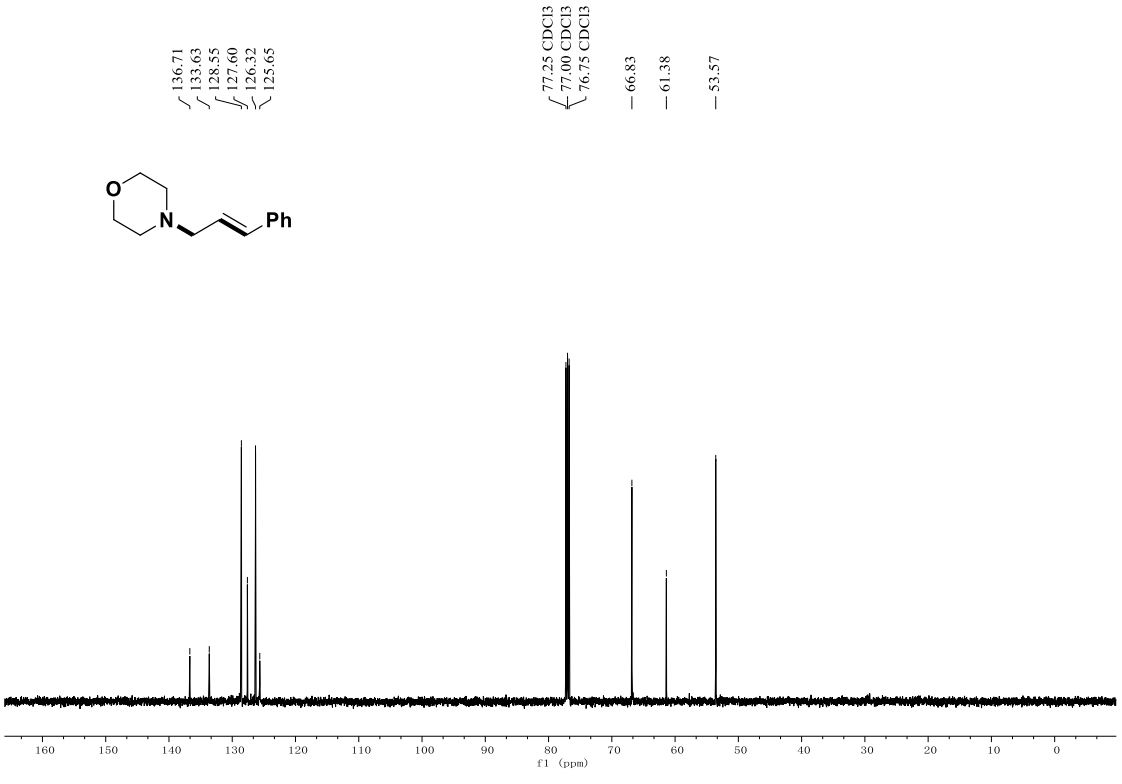
1-Cinnamyl-1*H*-pyrrole (24)



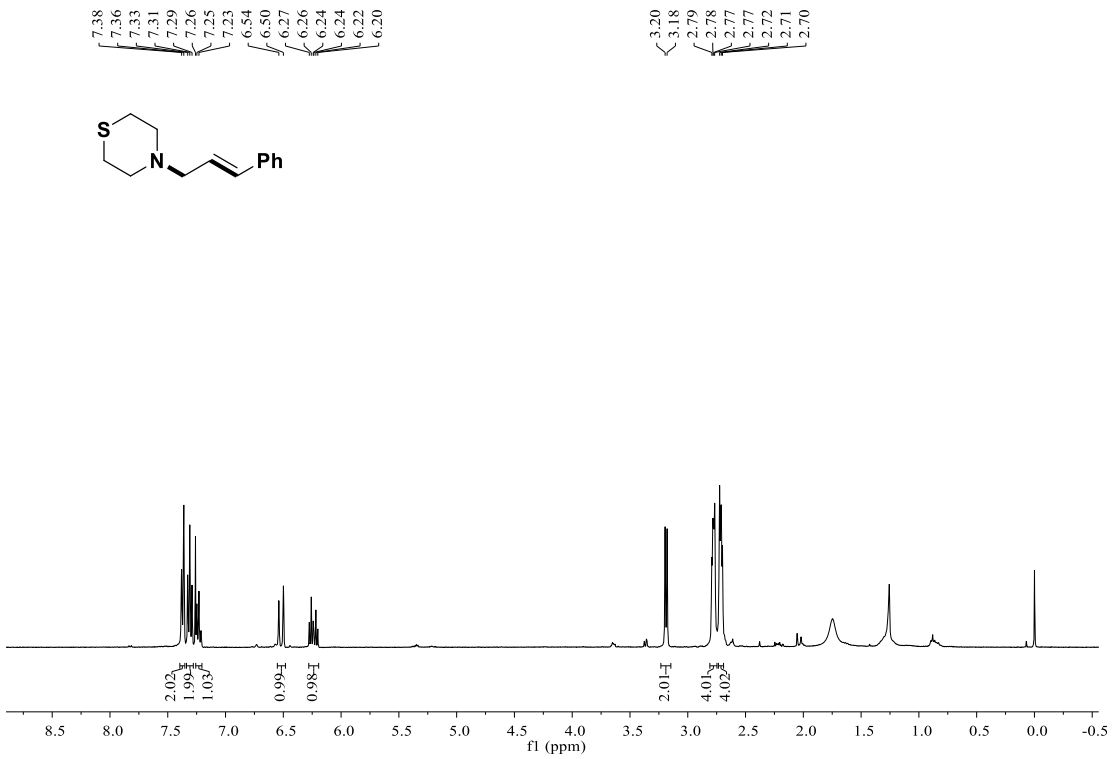


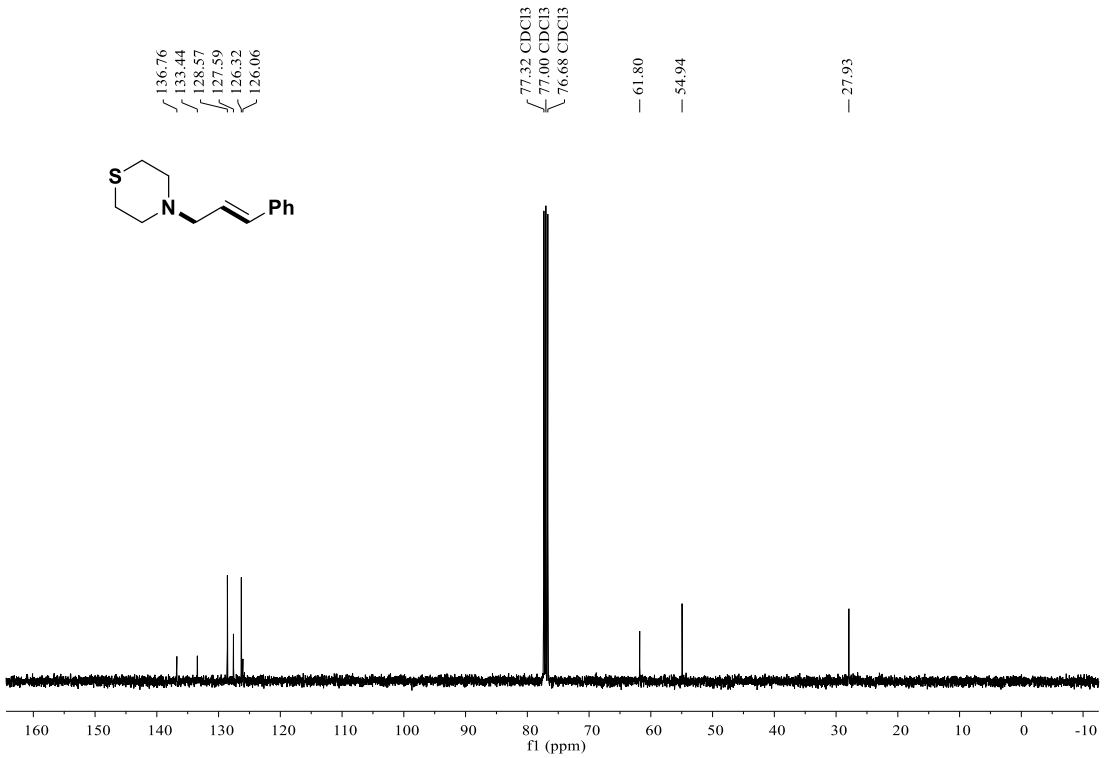
4-Cinnamylmorpholine (25)



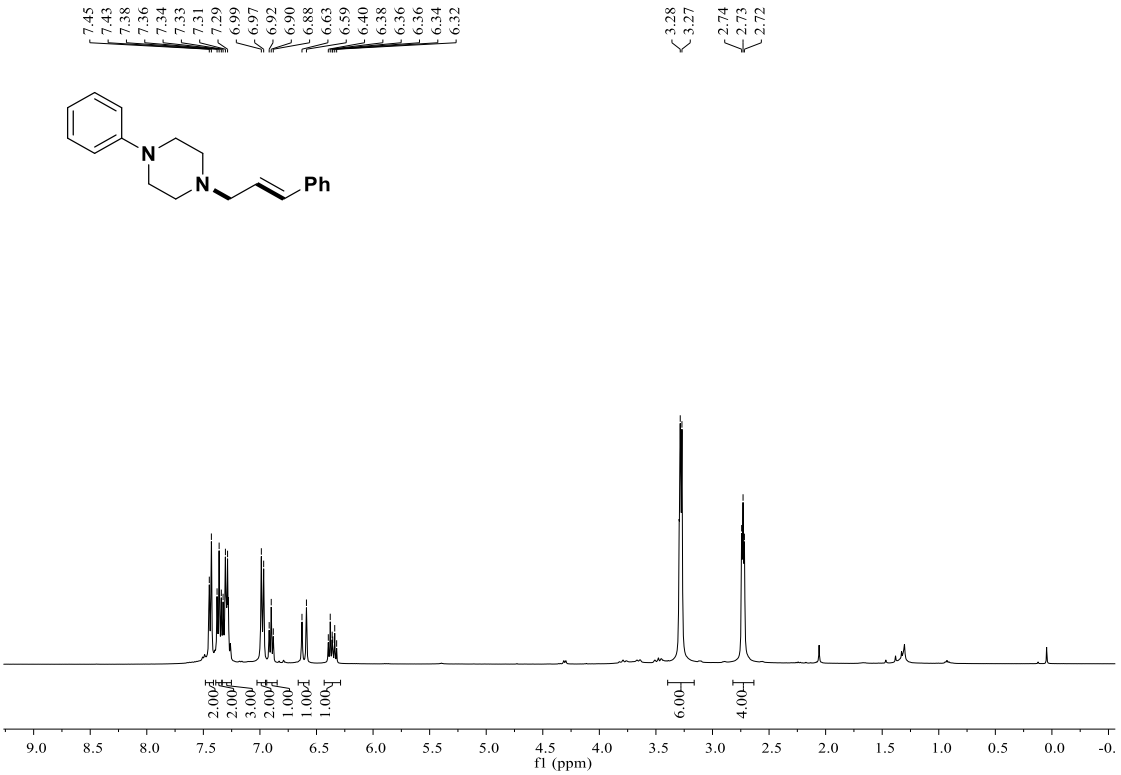


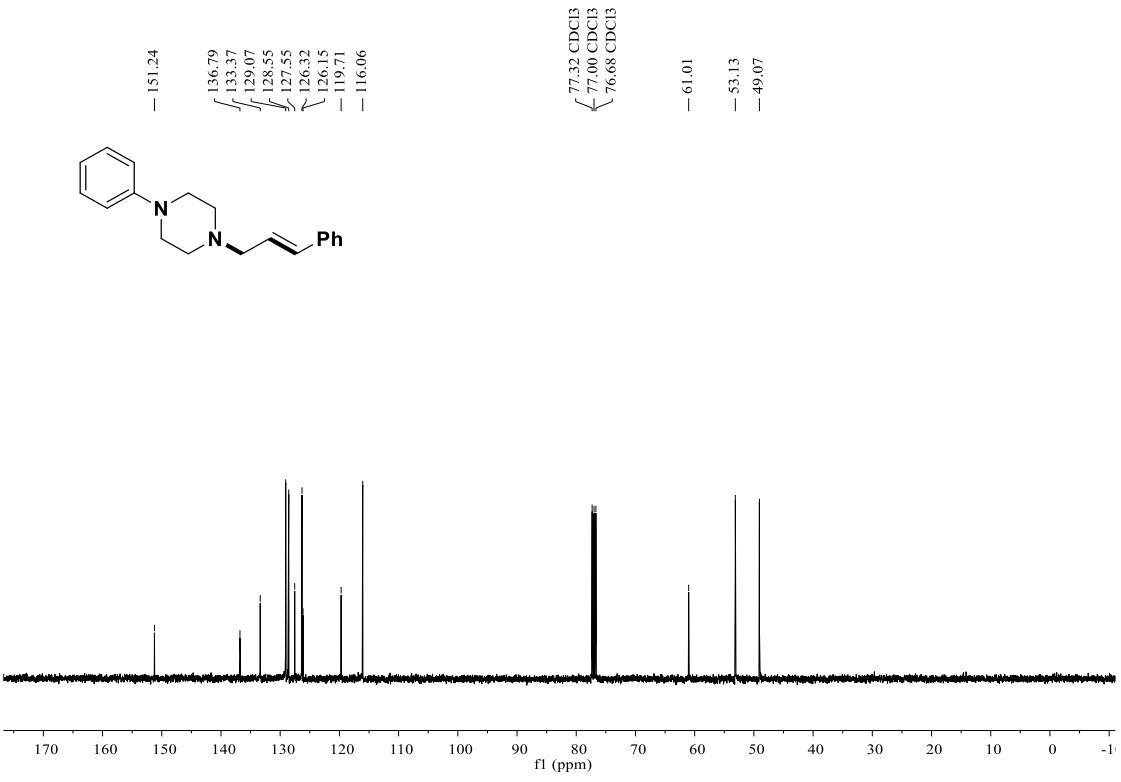
4-Cinnamylthiomorpholine (26)



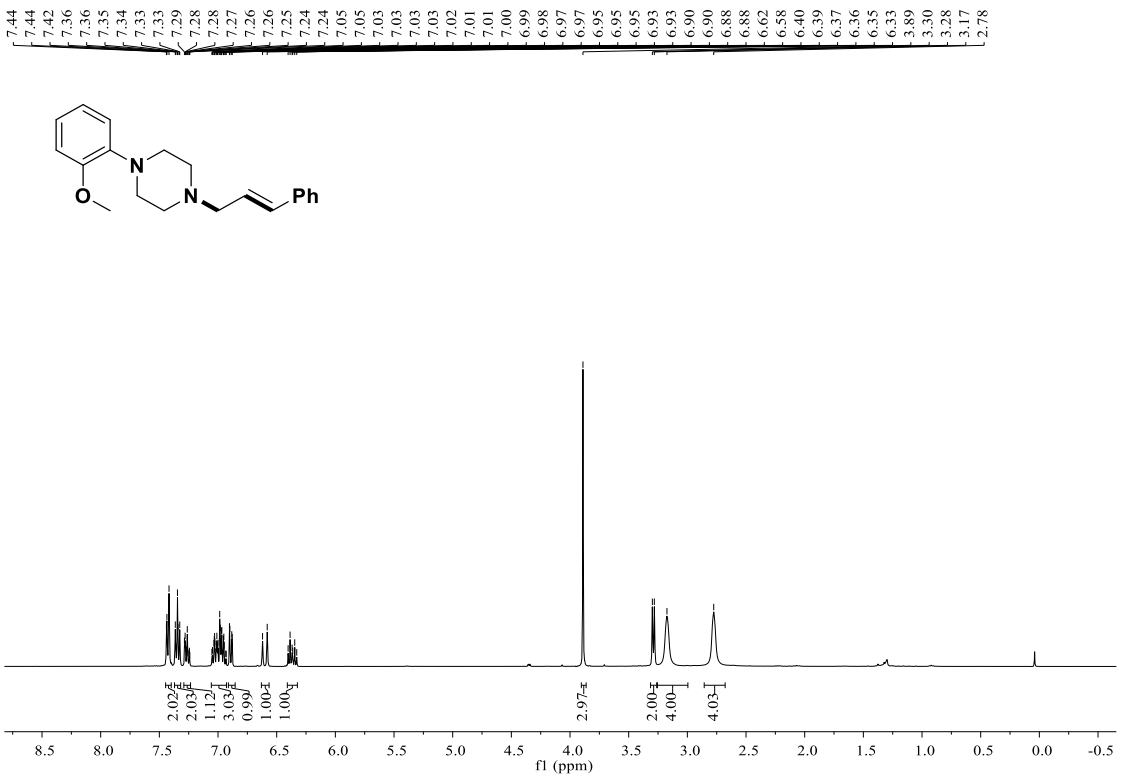


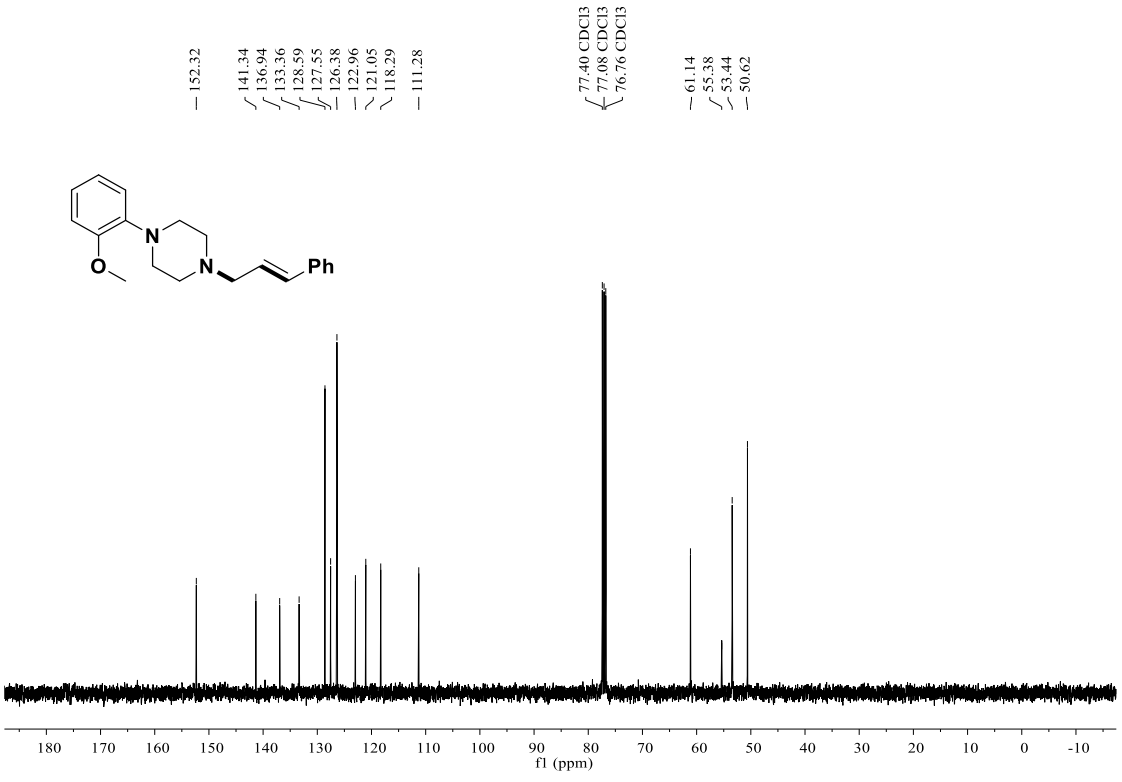
1-Cinnamyl-4-phenylpiperazine (27)



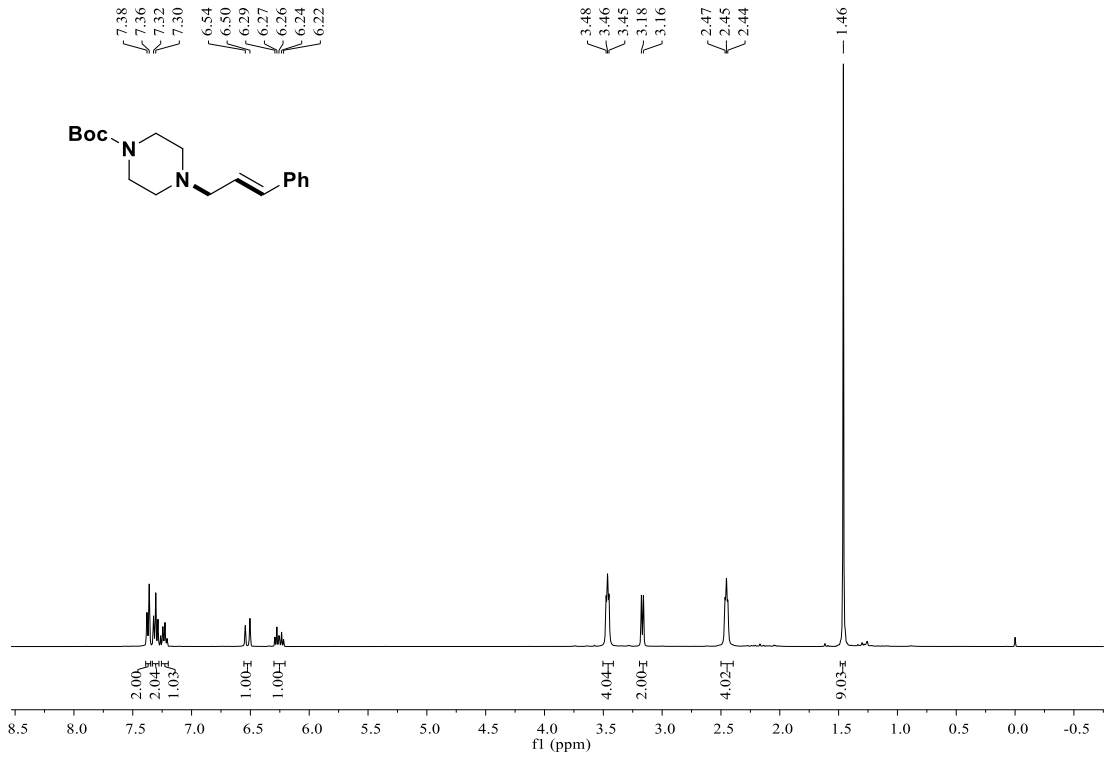


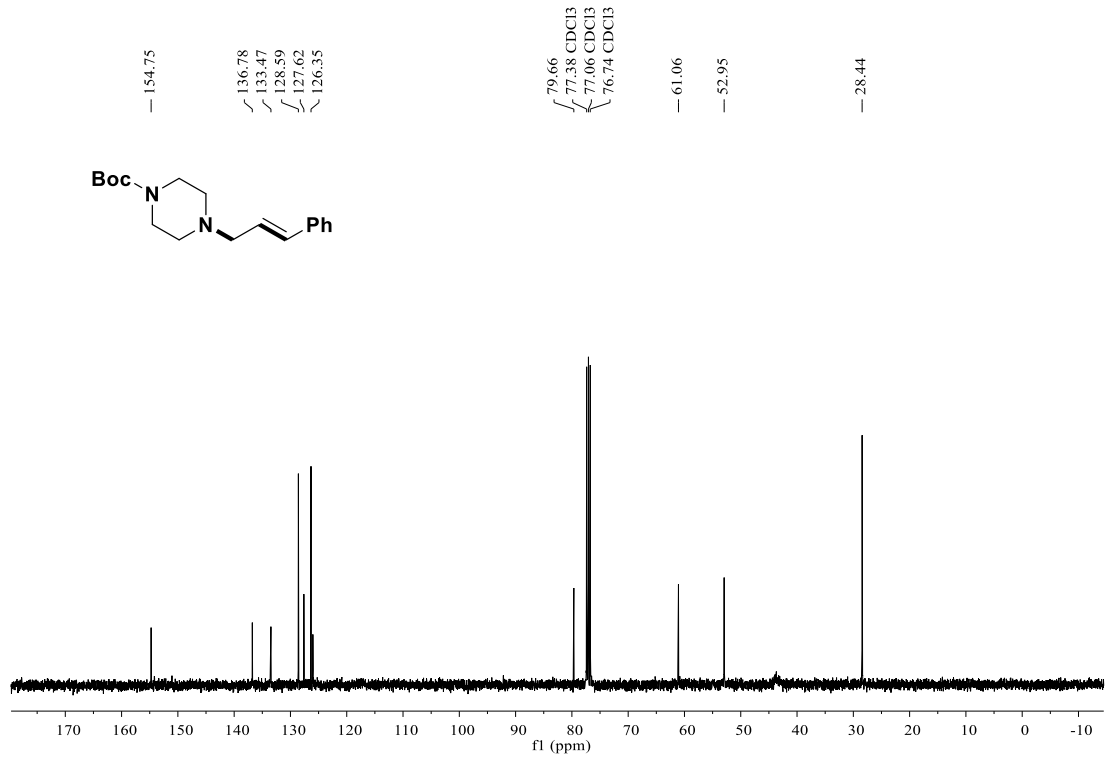
1-Cinnamyl-4-(2-methoxyphenyl) piperazine (28)



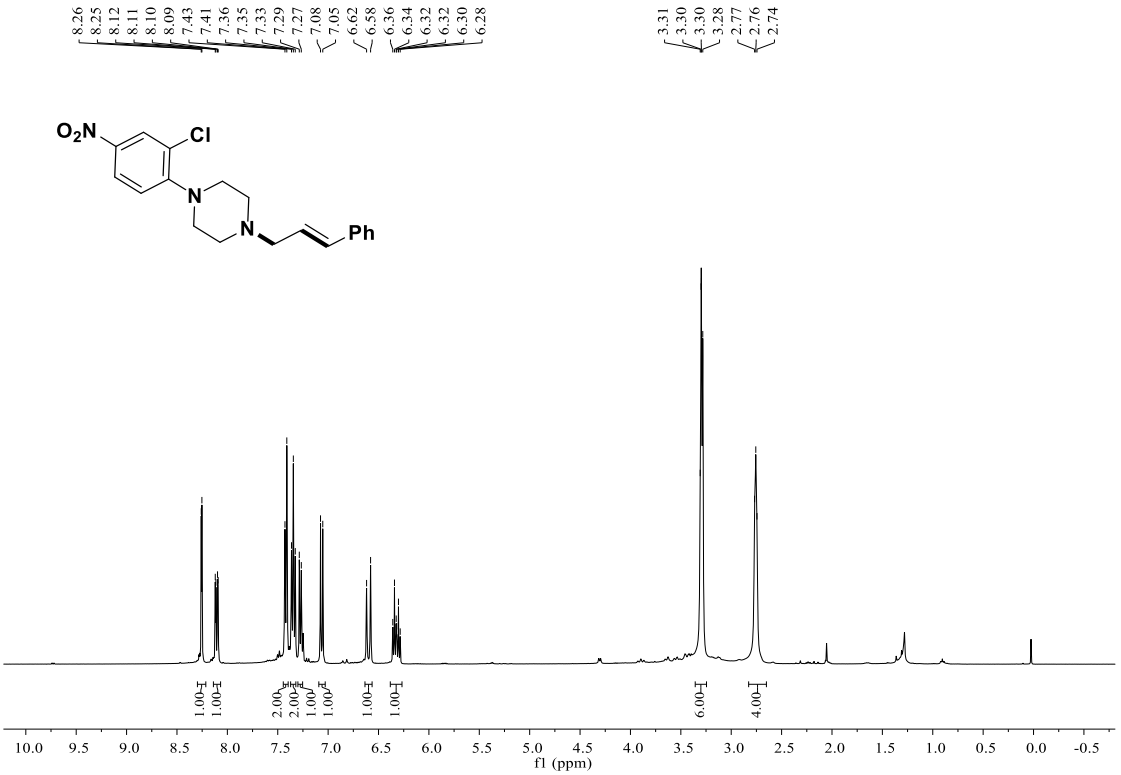


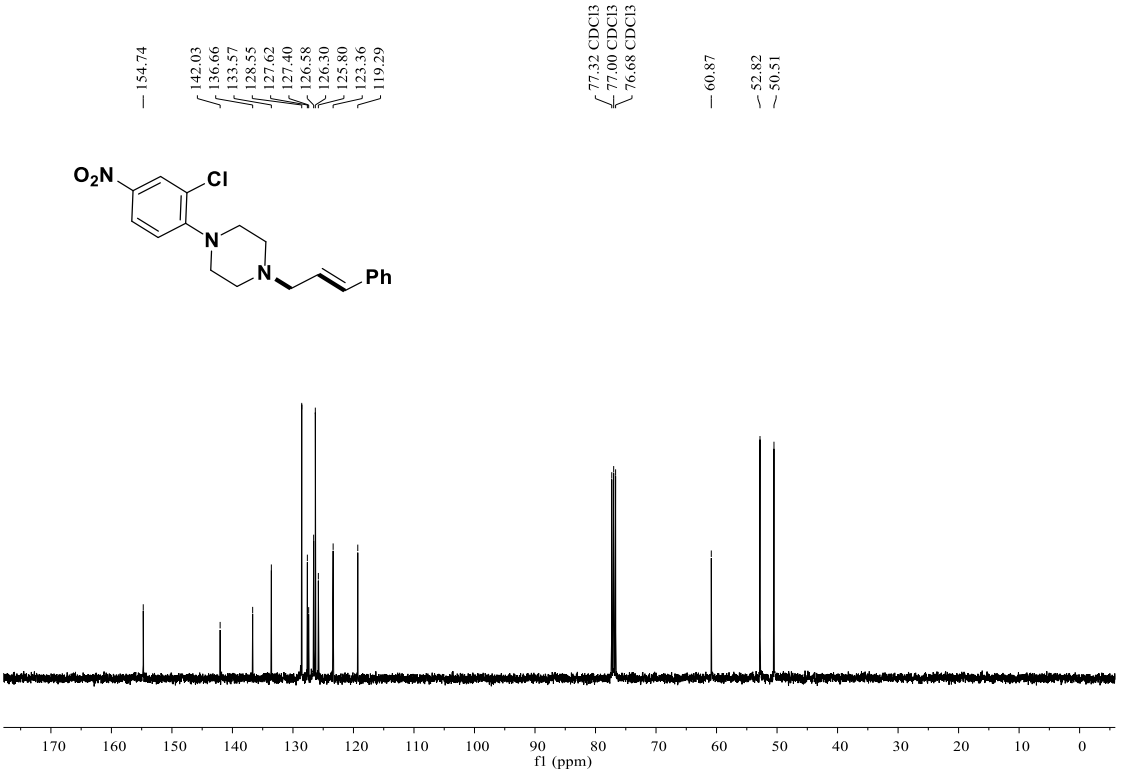
***tert*-Butyl-4-cinnamylpiperazine-1-carboxylate (29)**



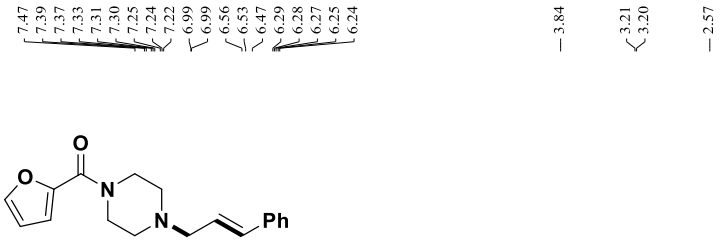


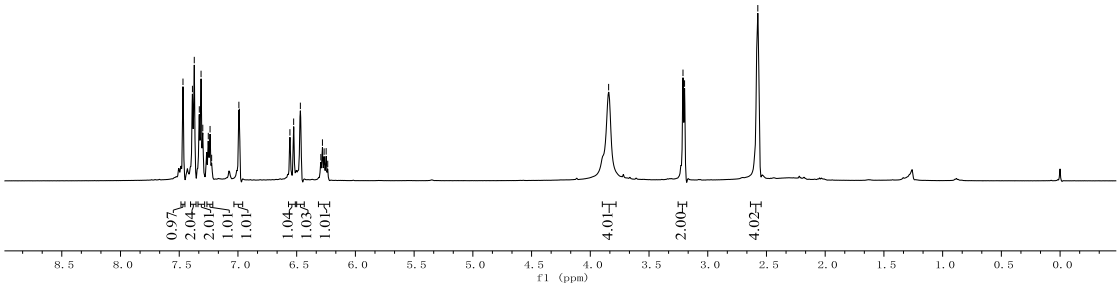
1-(2-Chloro-4-nitrophenyl)-4-cinnamylpiperazine (30)

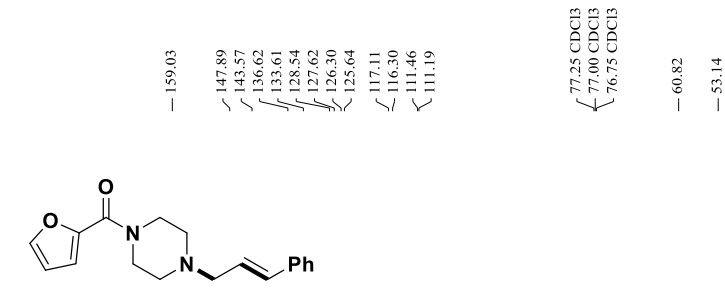


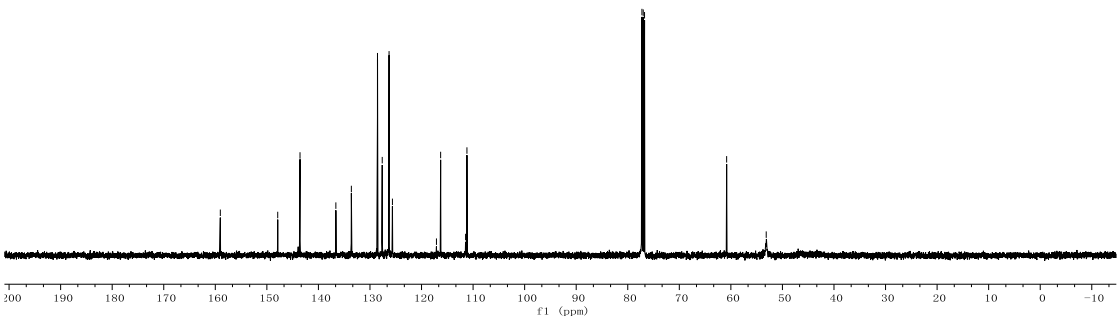


(4-Cinnamylpiperazin-1-yl) (furan-2-yl) methanone (31)

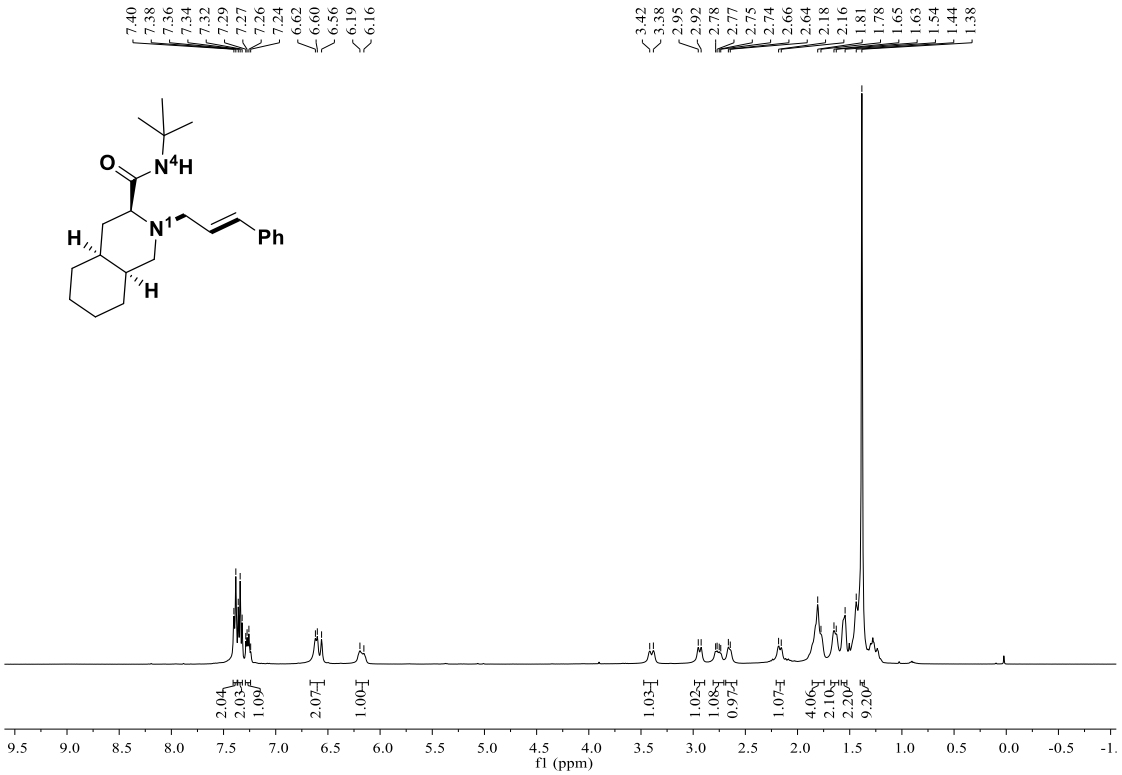


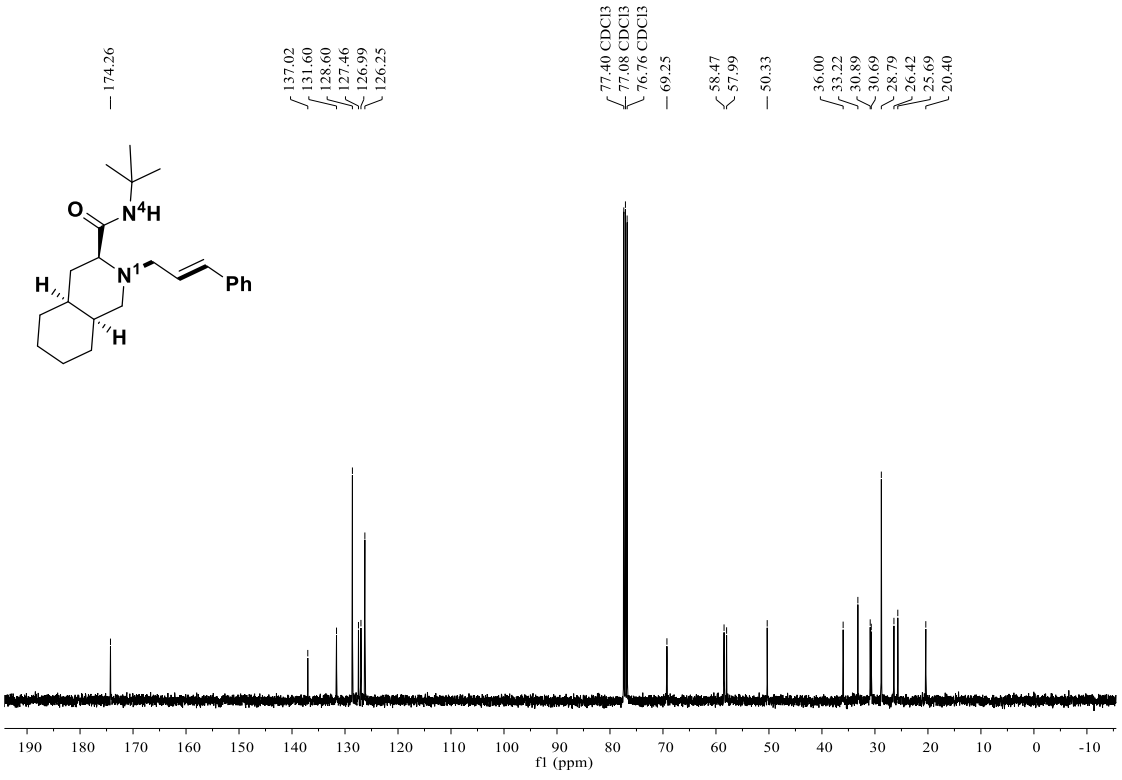




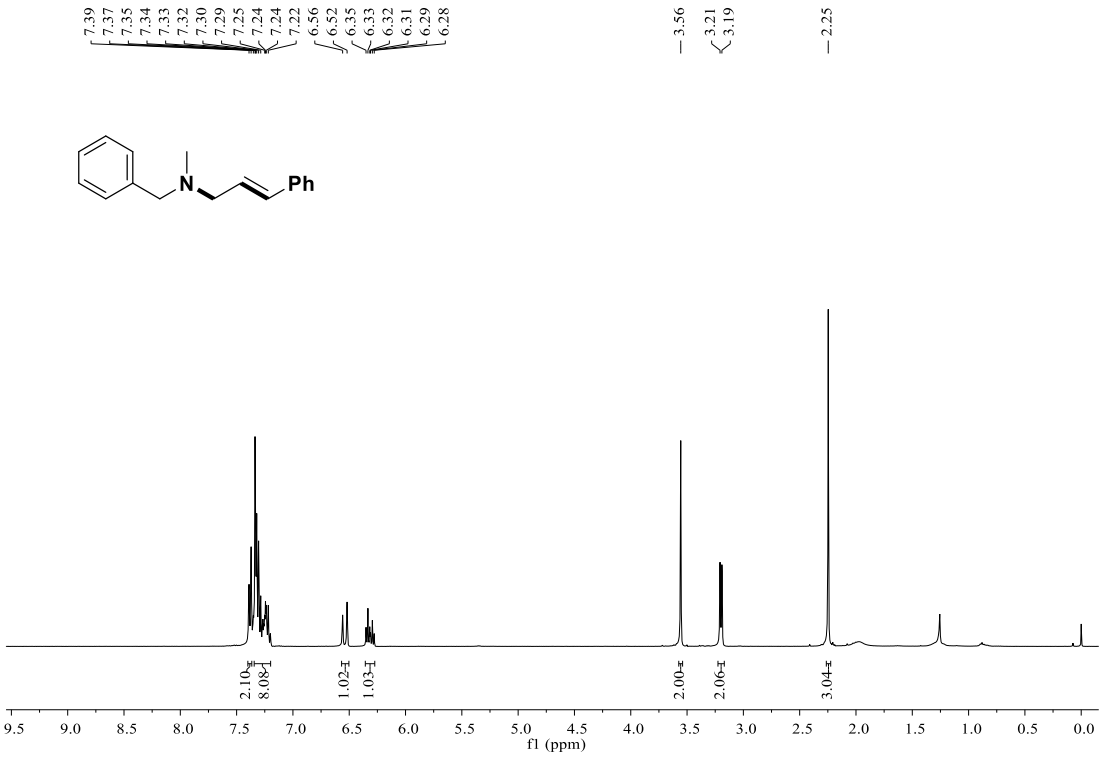


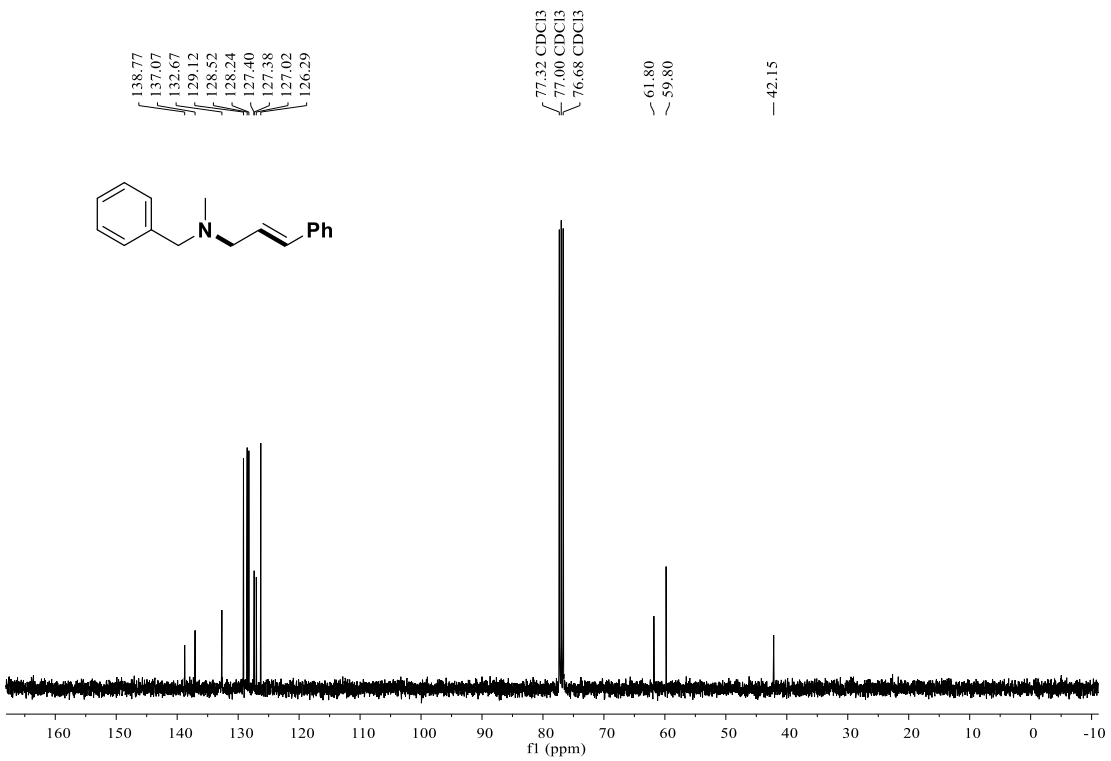
(3*S*, 4*aS*, 8*aS*)-*N*-(*tert*-Butyl)-2-cinnamyldecahydroisoquinoline-3-carboxamide (32)



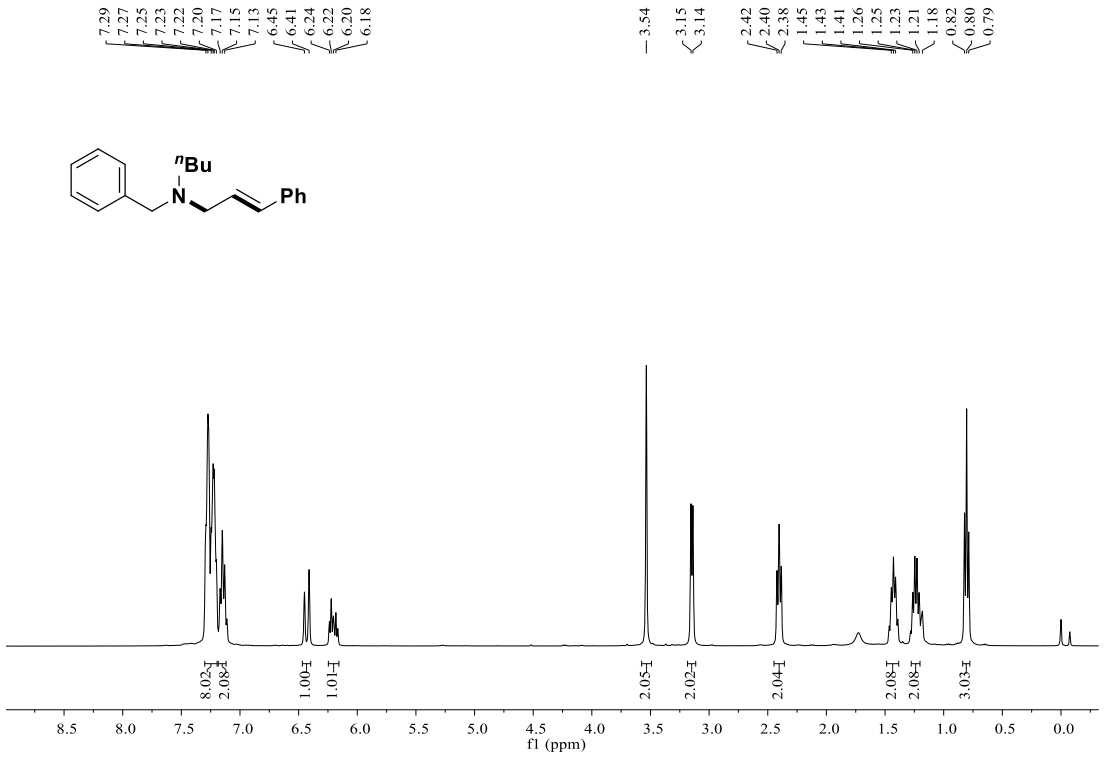


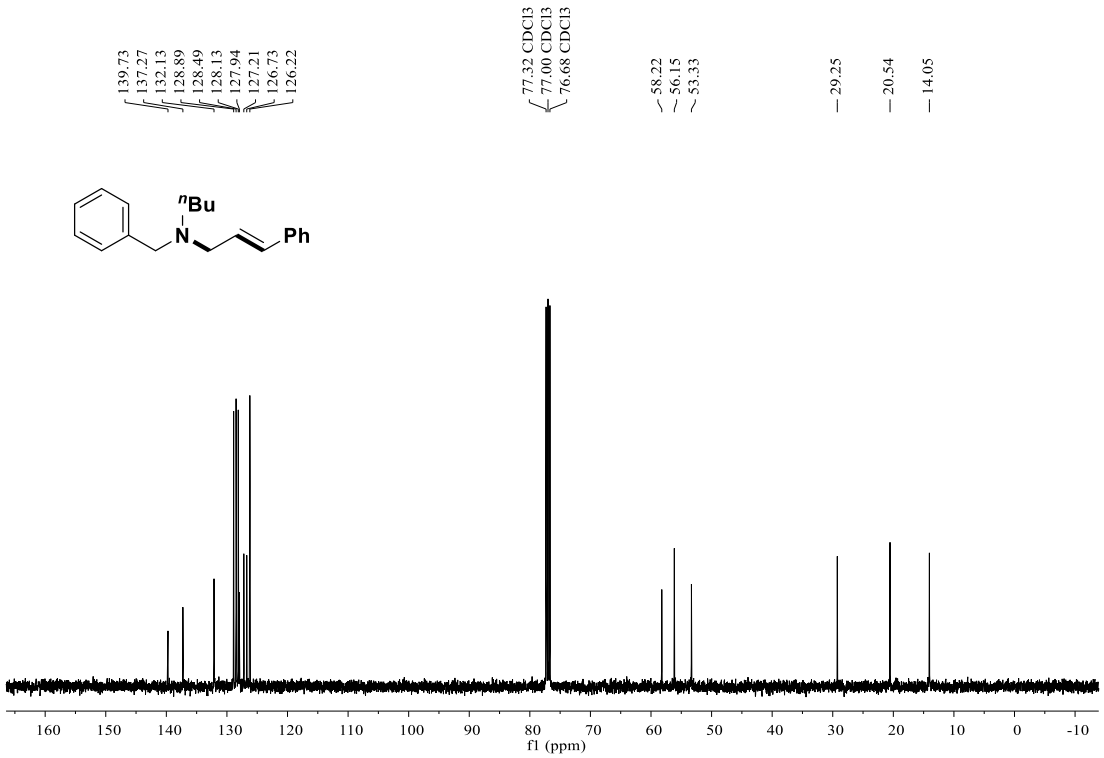
(*E*)-*N*-Benzyl-*N*-methyl-3-phenylprop-2-en-1-amine (33)



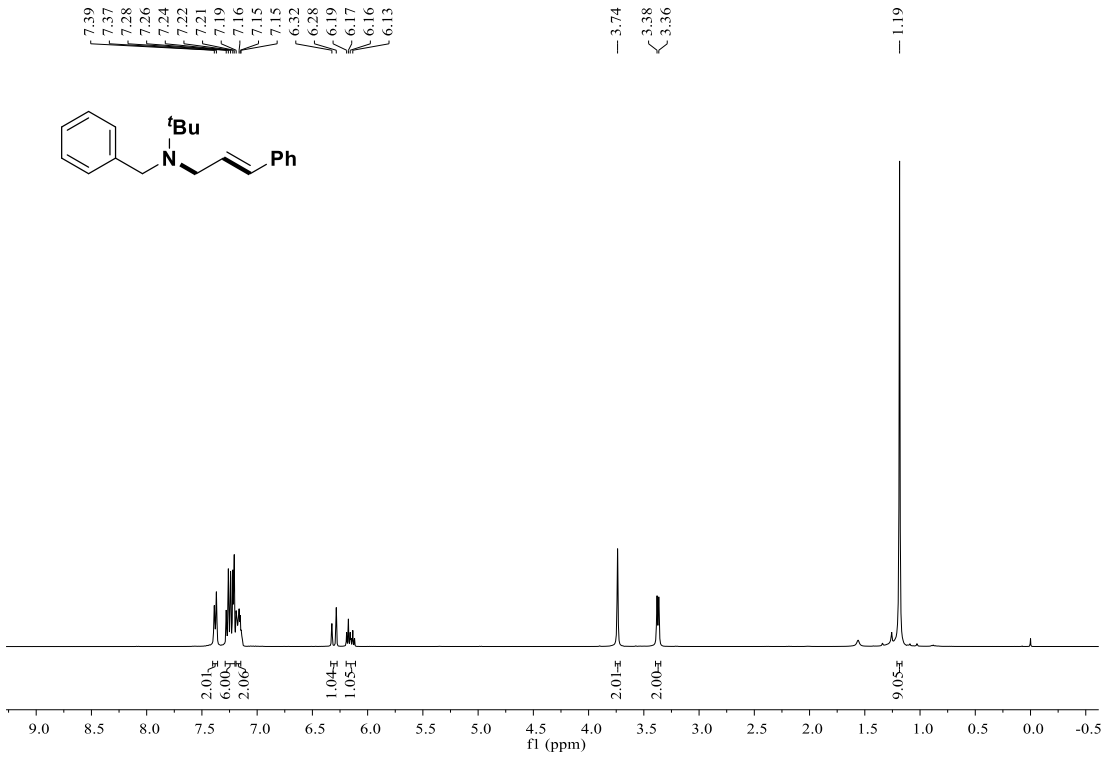


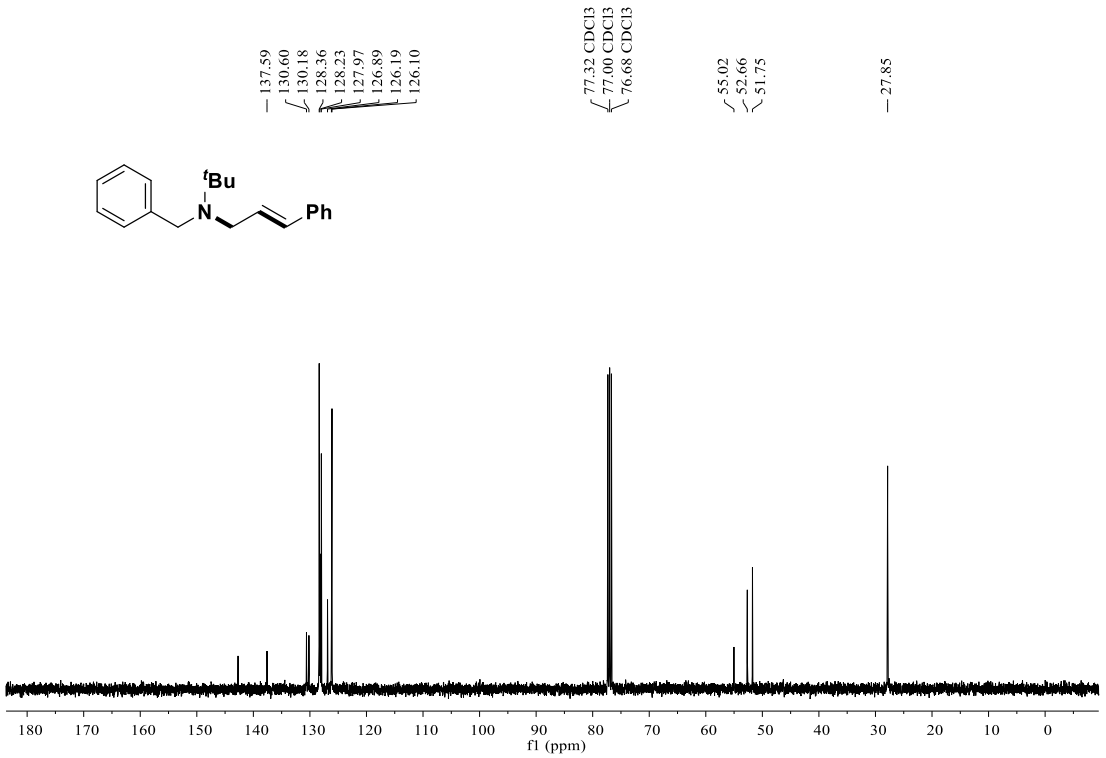
N-Benzyl-*N*-cinnamylbutan-1-amine (34)



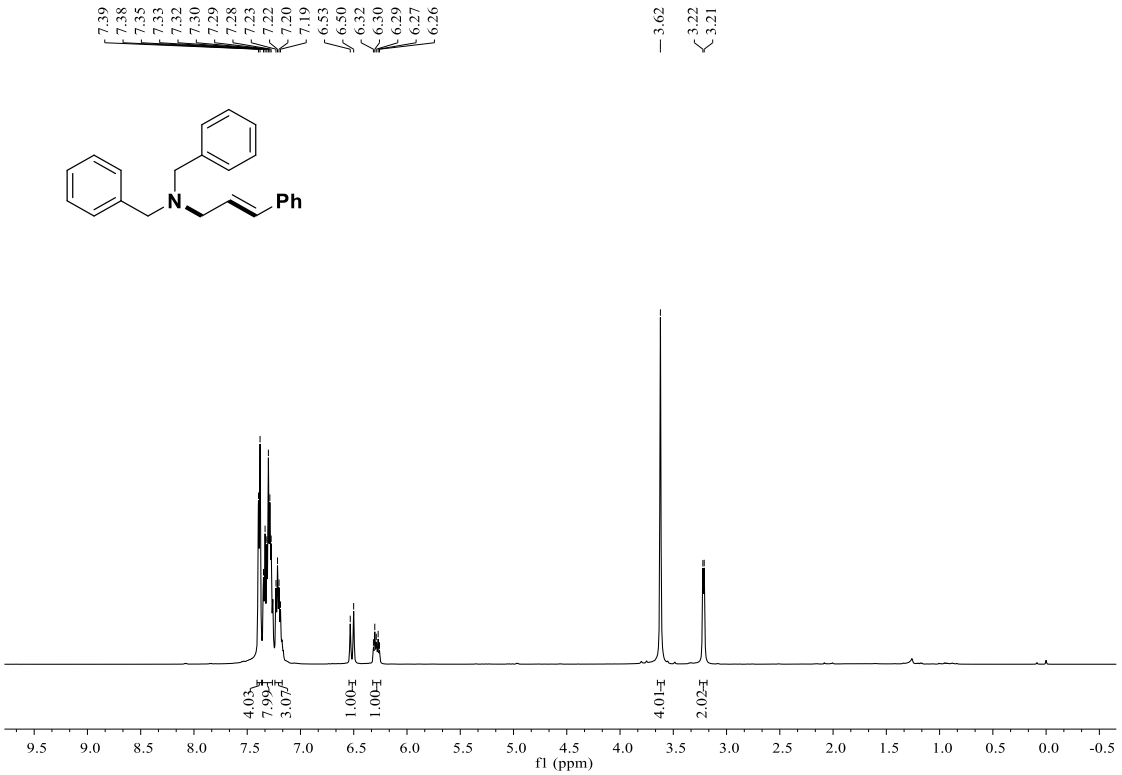


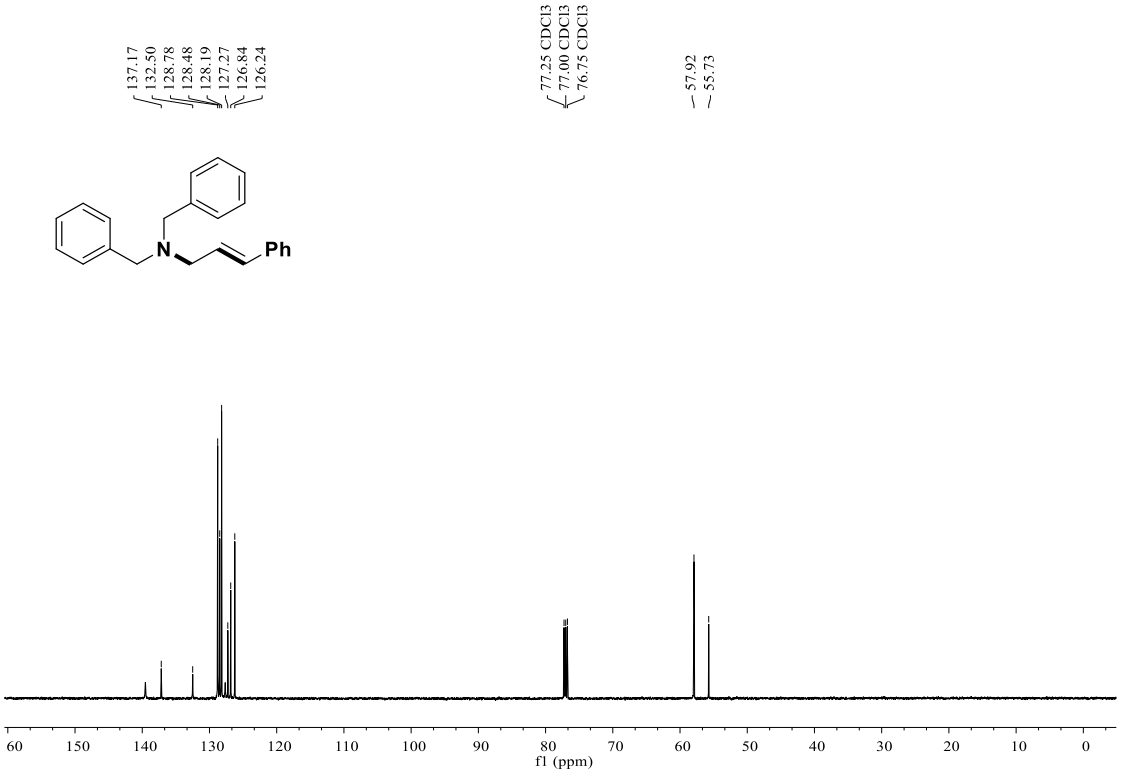
(*E*)-*N*-Benzyl-*N*-(*tert*-butyl)-3-phenylprop-2-en-1-amine (35)



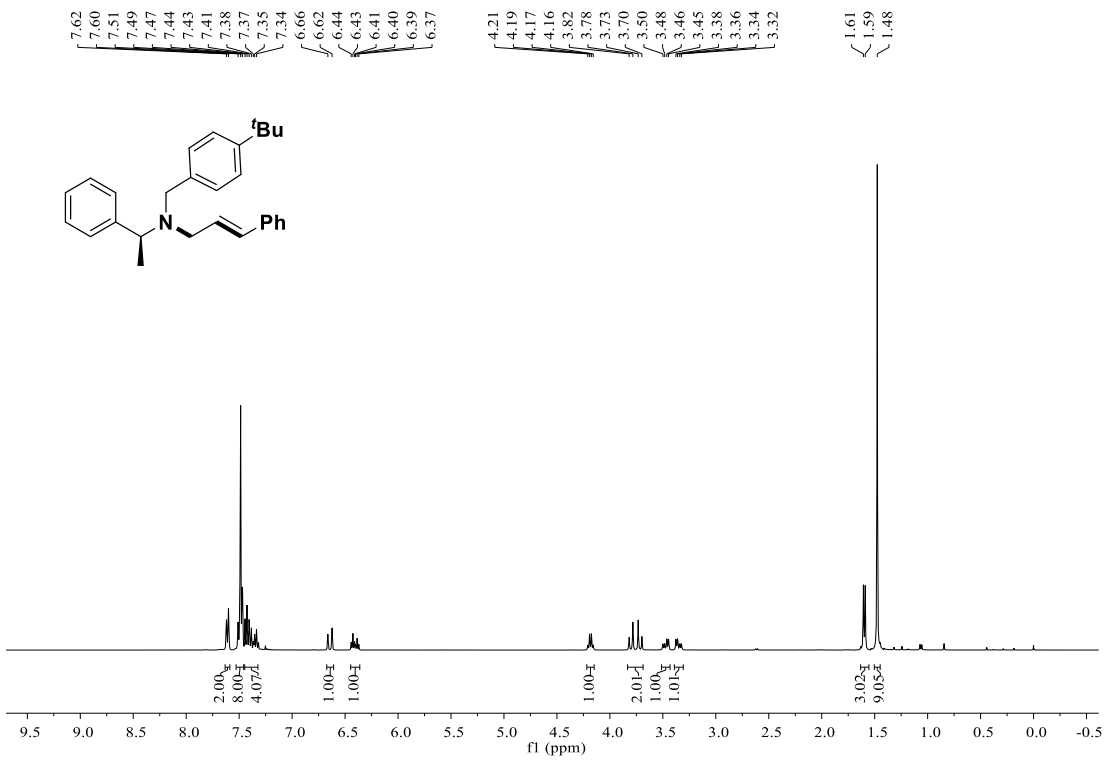


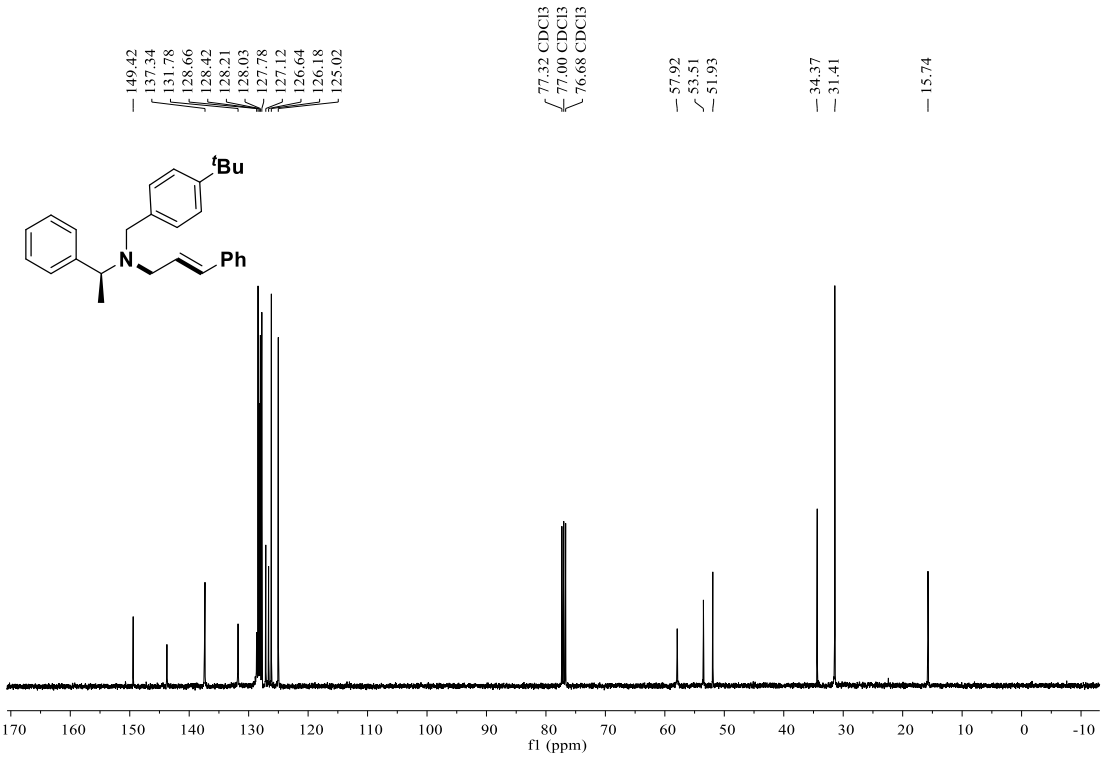
(*E*)-*N*, *N*-Dibenzyl-3-phenylprop-2-en-1-amine (36)



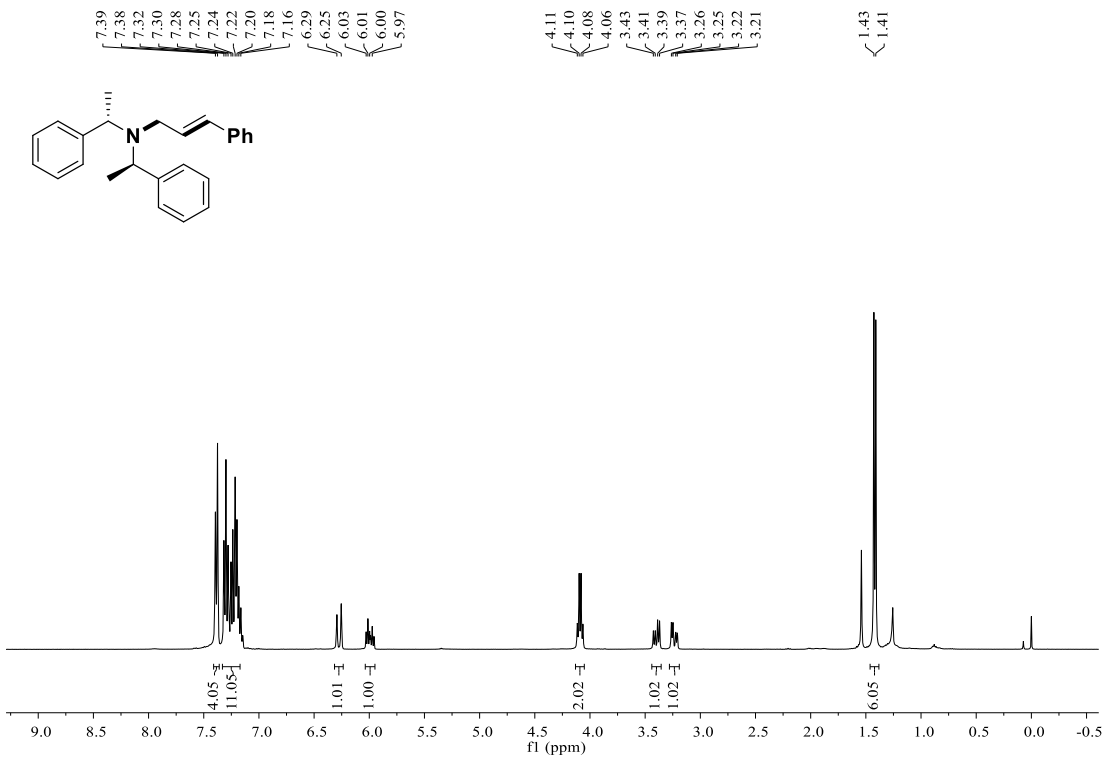


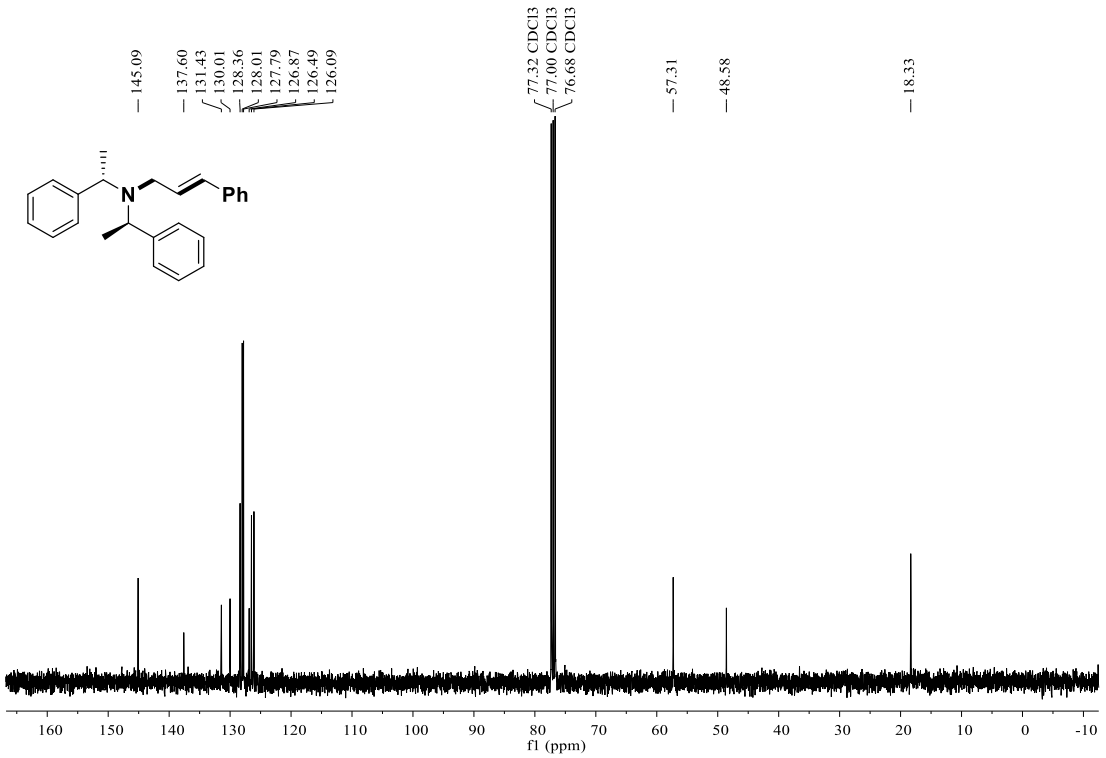
(*S*, *E*)-*N*-(4-(*tert*-Butyl) benzyl)-3-phenyl-*N*-(1-phenylethyl) prop-2-en-1-amine (37)



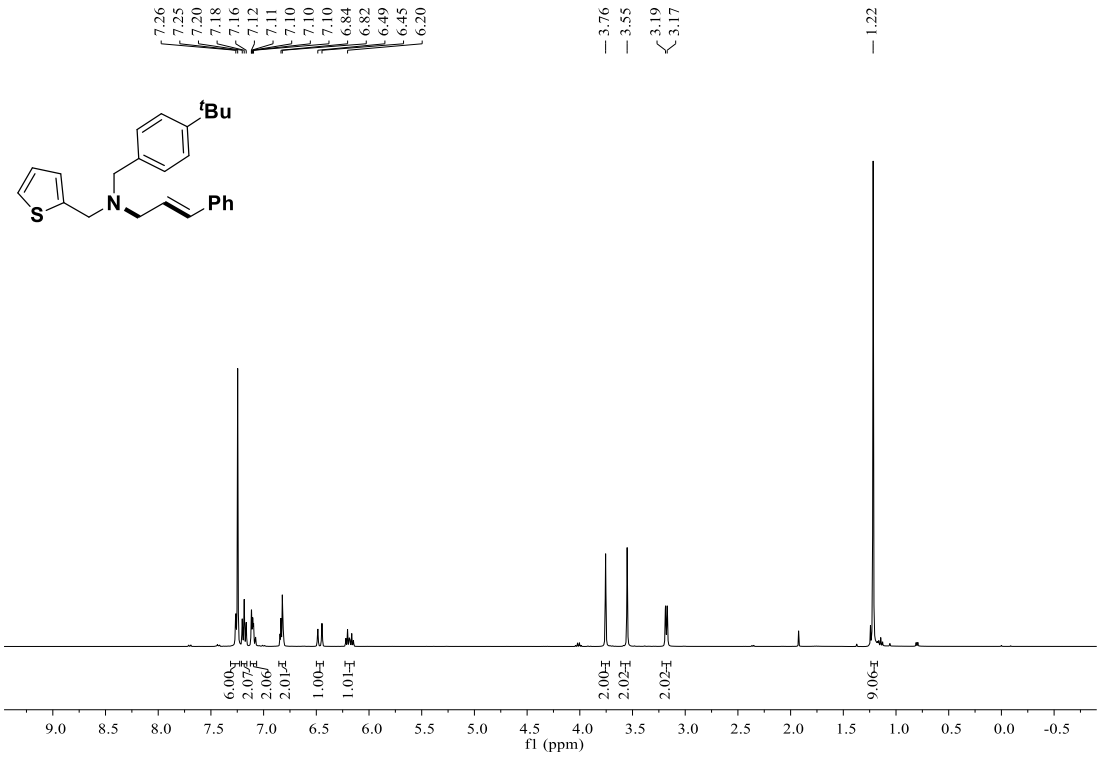


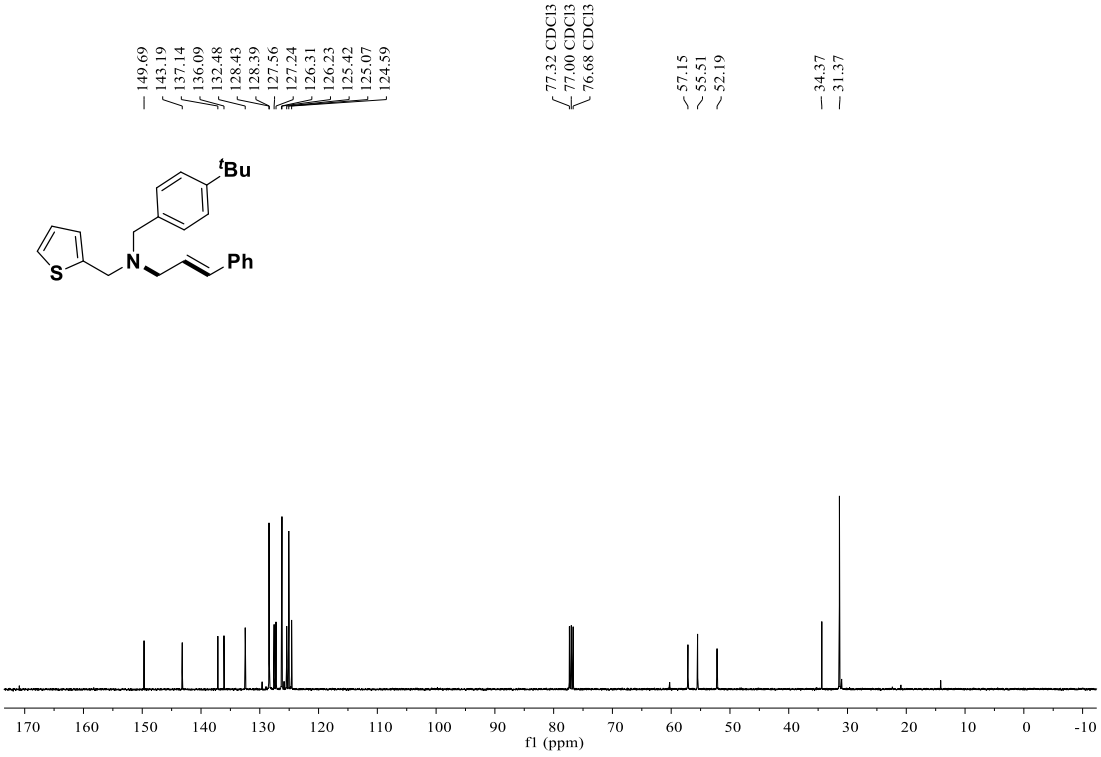
(*E*)-3-Phenyl-*N*-((*R*)-1-phenylethyl)-*N*-((*S*)-1-phenylethyl) prop-2-en-1-amine (38)



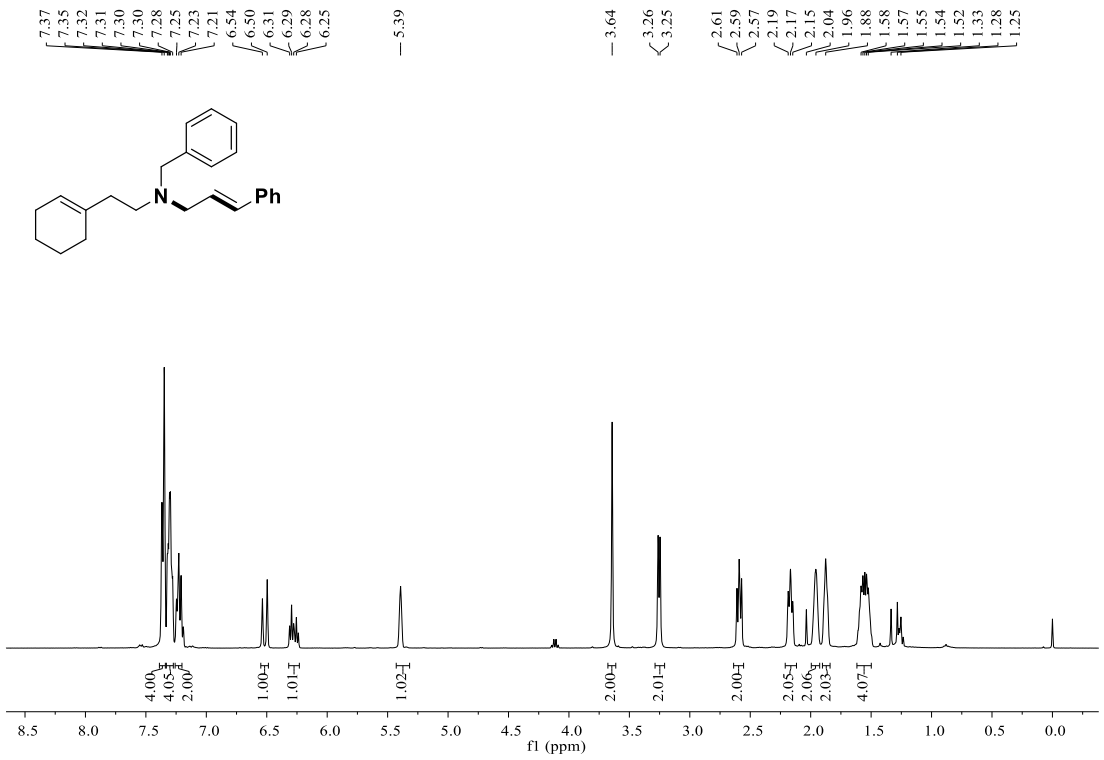


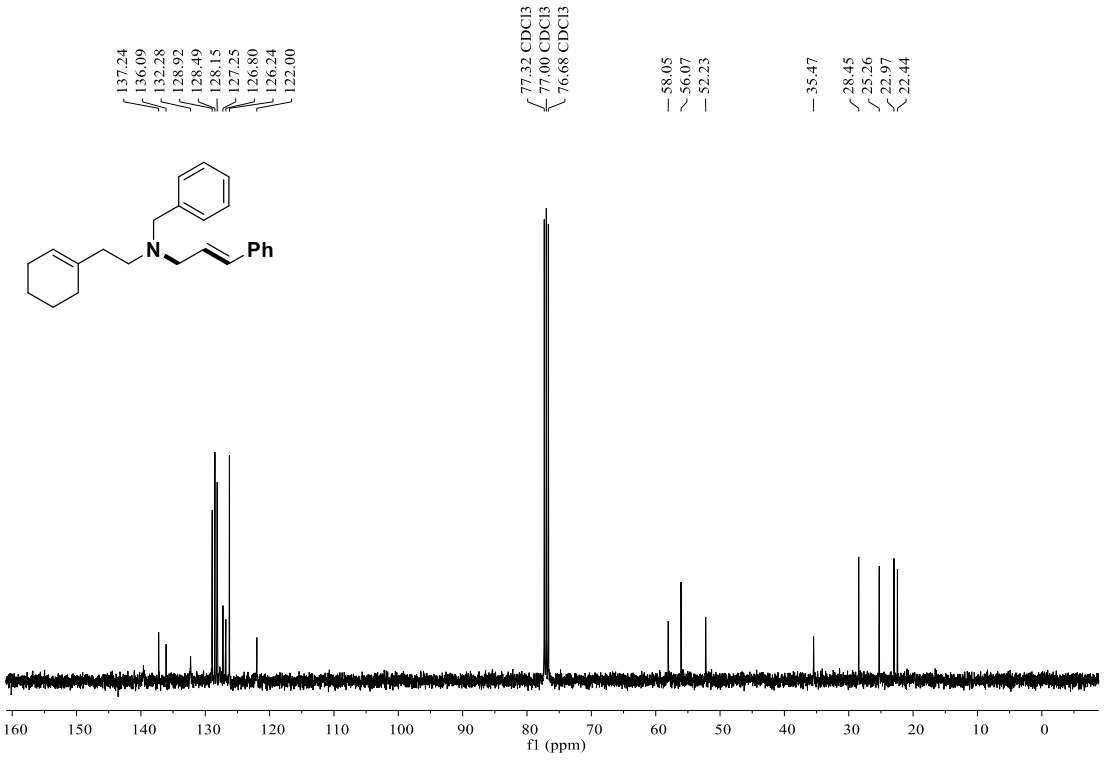
(*E*)-*N*-(4-(*tert*-Butyl) benzyl)-3-phenyl-*N*-(thiophen-2-ylmethyl) prop-2-en-1-amine (39)



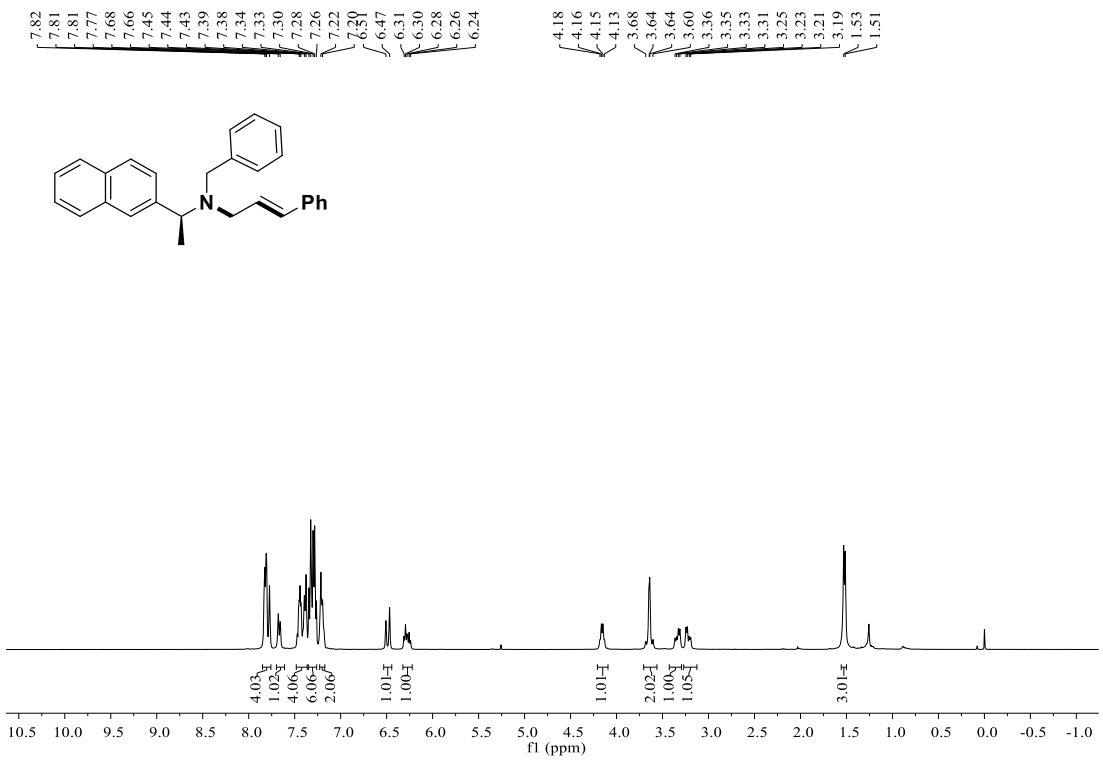


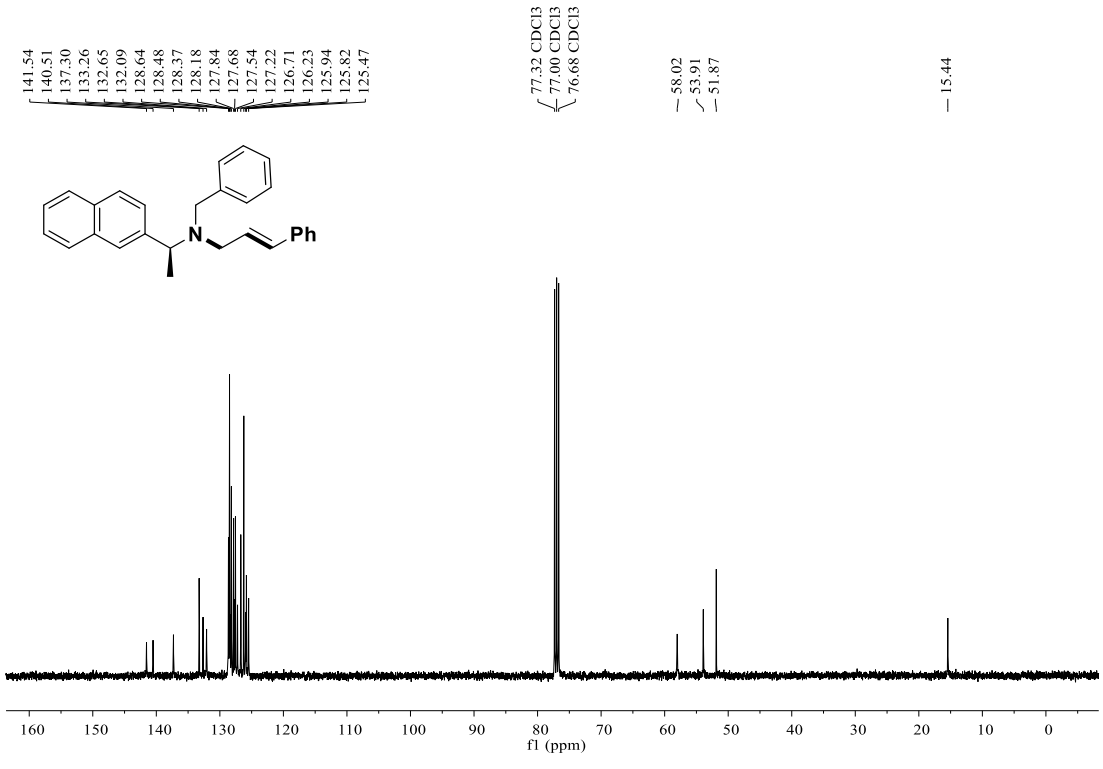
(*E*)-*N*-Benzyl-*N*-(2-(cyclohex-1-en-1-yl)ethyl)-3-phenylprop-2-en-1-amine (40)



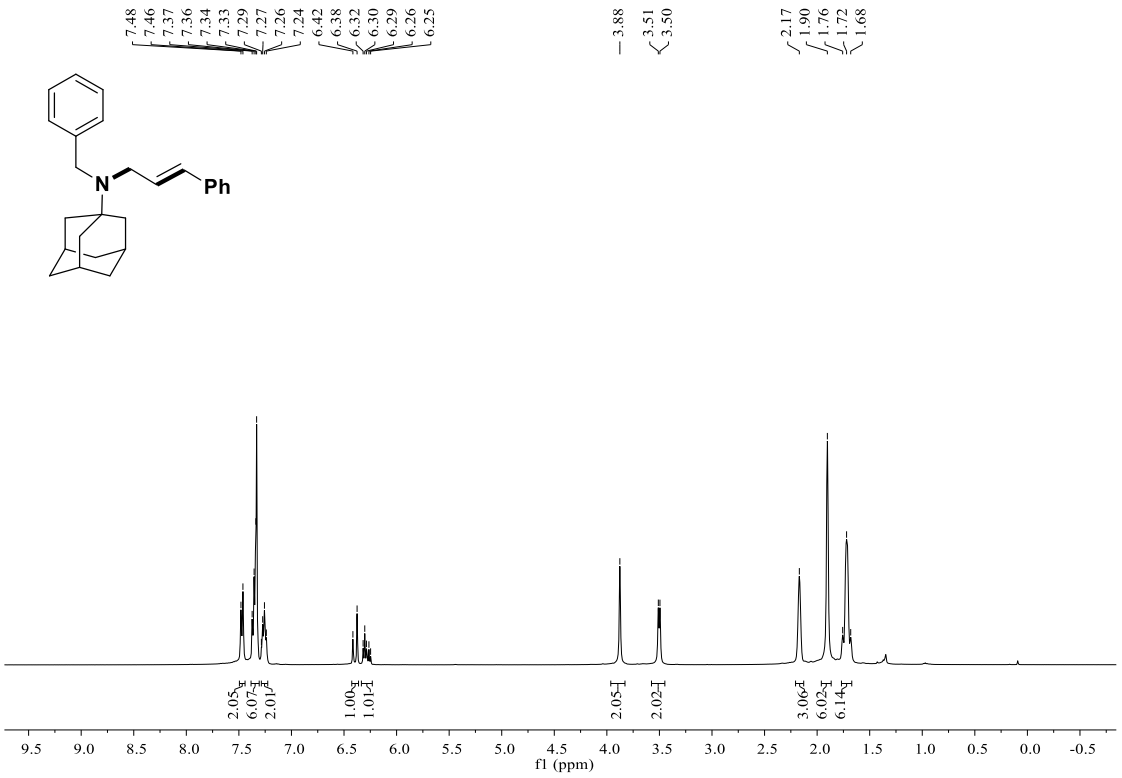


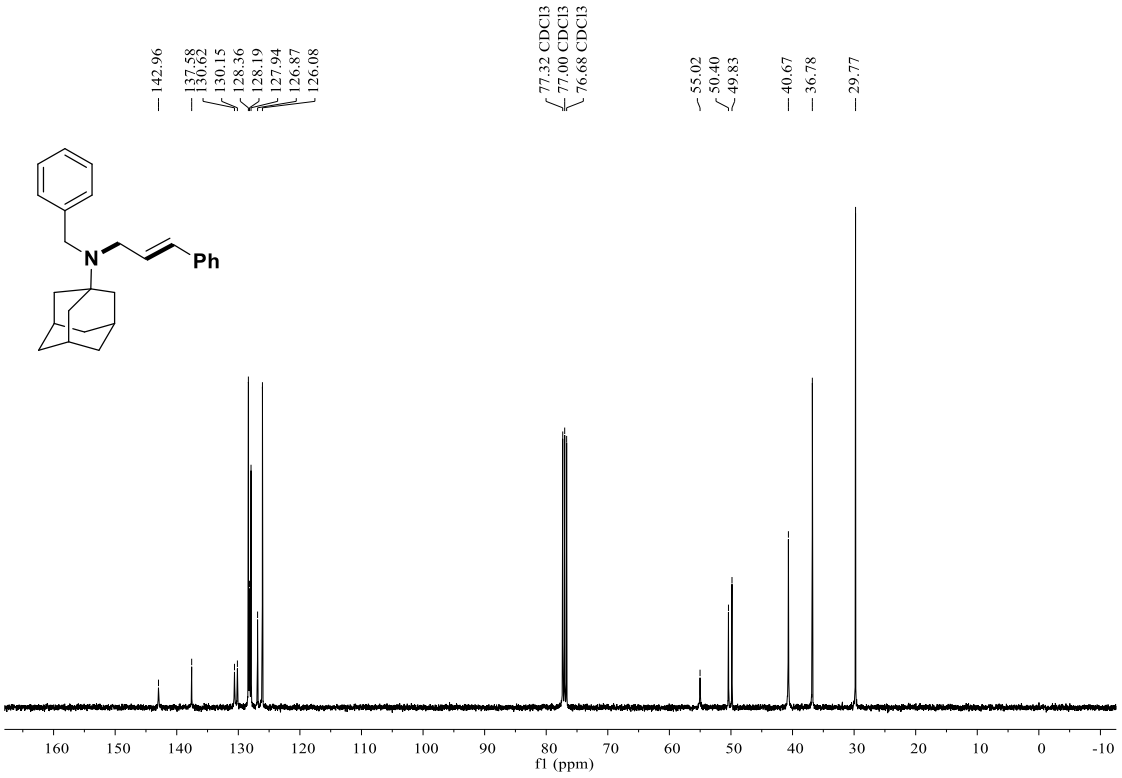
(*S*, *E*)-*N*-Benzyl-*N*-(1-(naphthalen-2-yl)ethyl)-3-phenylprop-2-en-1-amine (41)



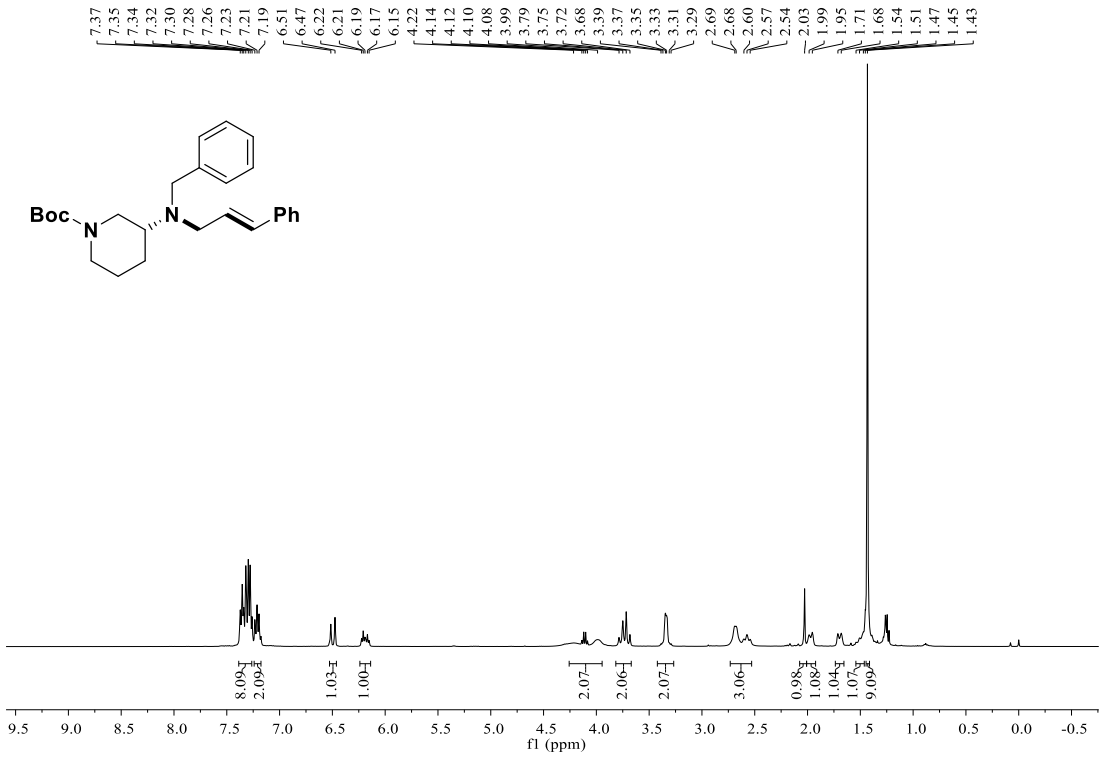


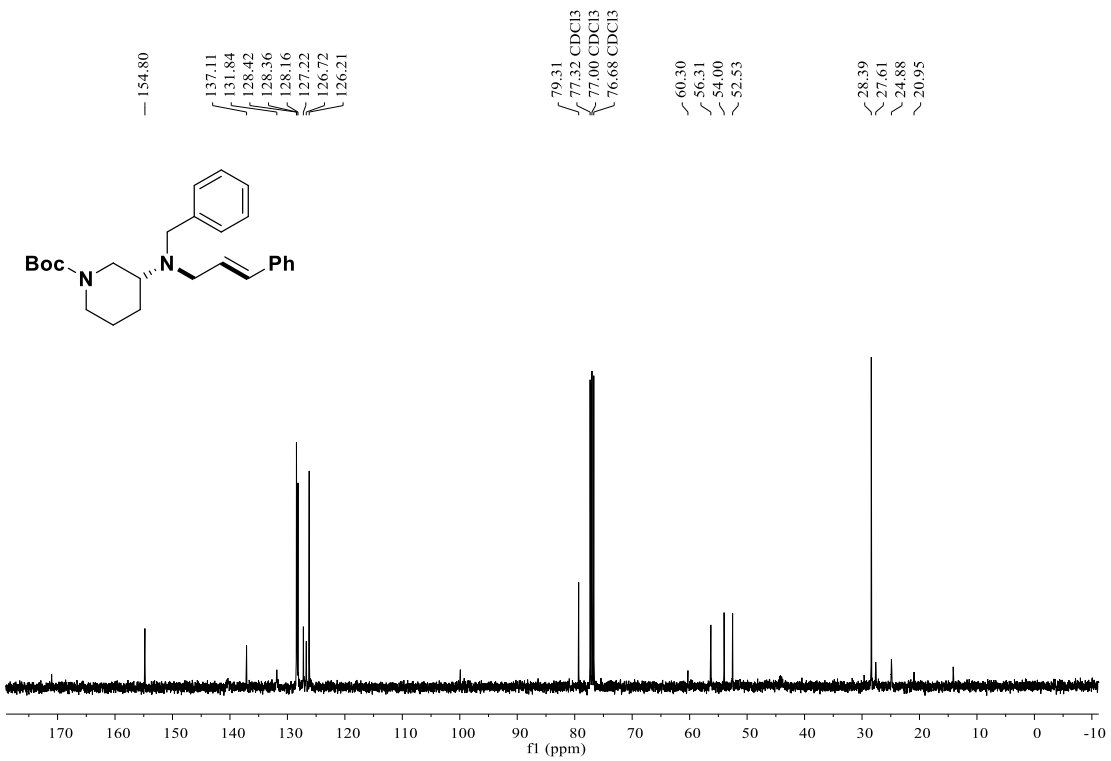
(*3s,5s,7s*)-*N*-Benzyl-*N*-cinnamyladamantan-1-amine (42)



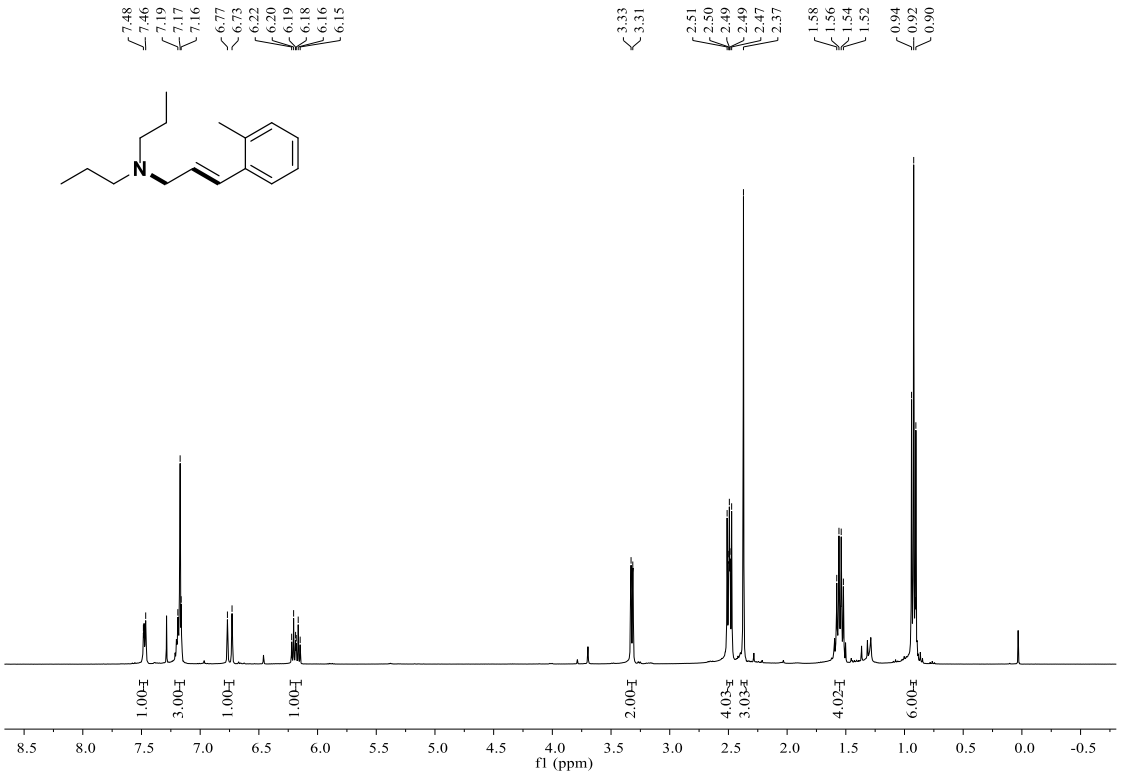


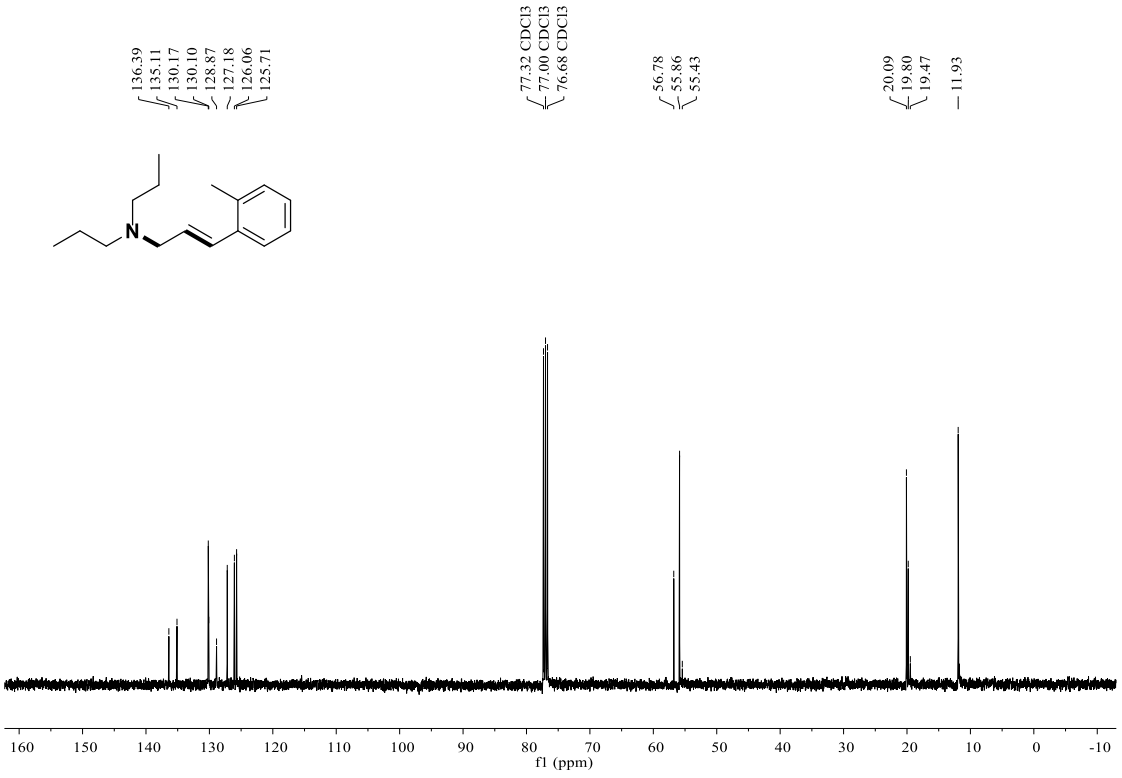
***tert*-Butyl-(*R*)-3-(benzyl(cinnamyl)amino) piperidine-1-carboxylate (43)**



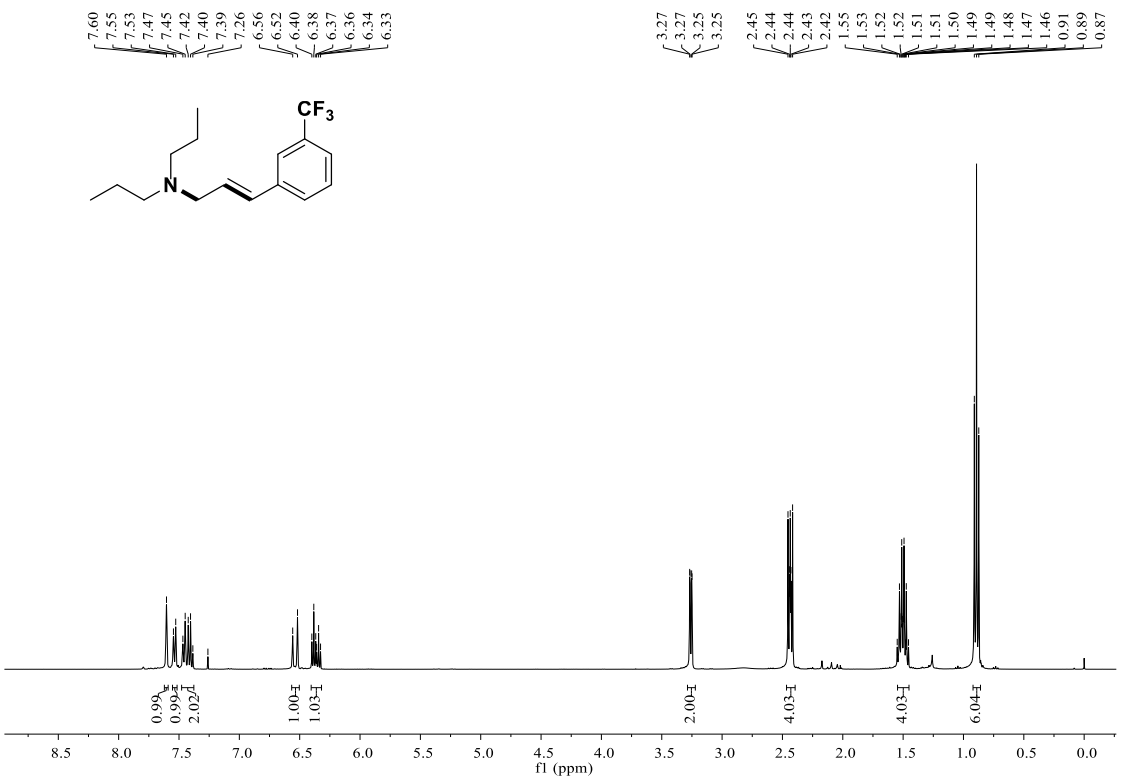


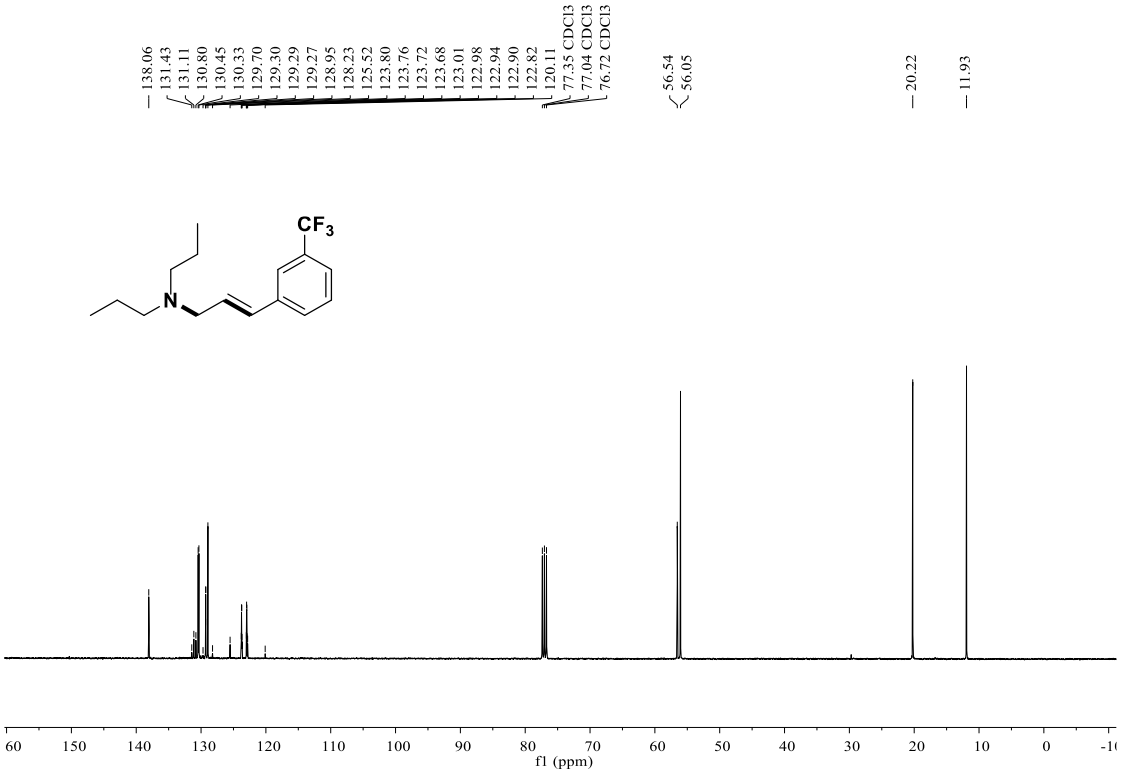
(*E*)-*N*,*N*-Dipropyl-3-(*o*-tolyl)prop-2-en-1-amine (44)



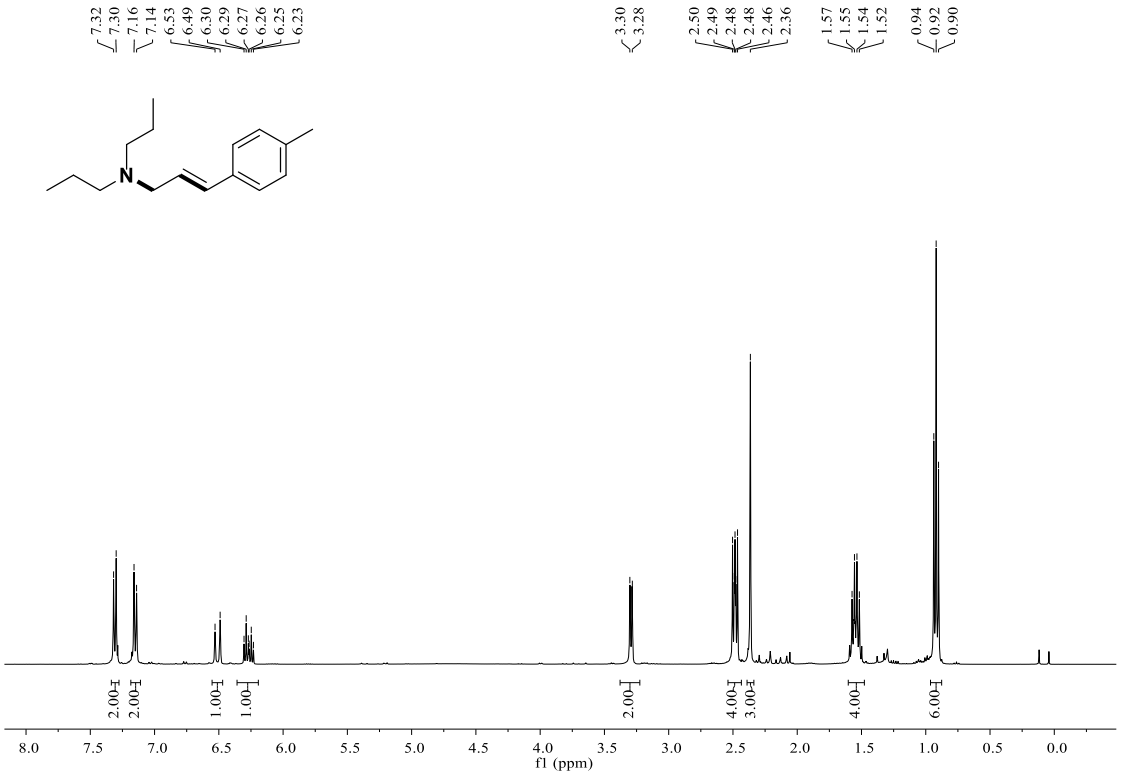


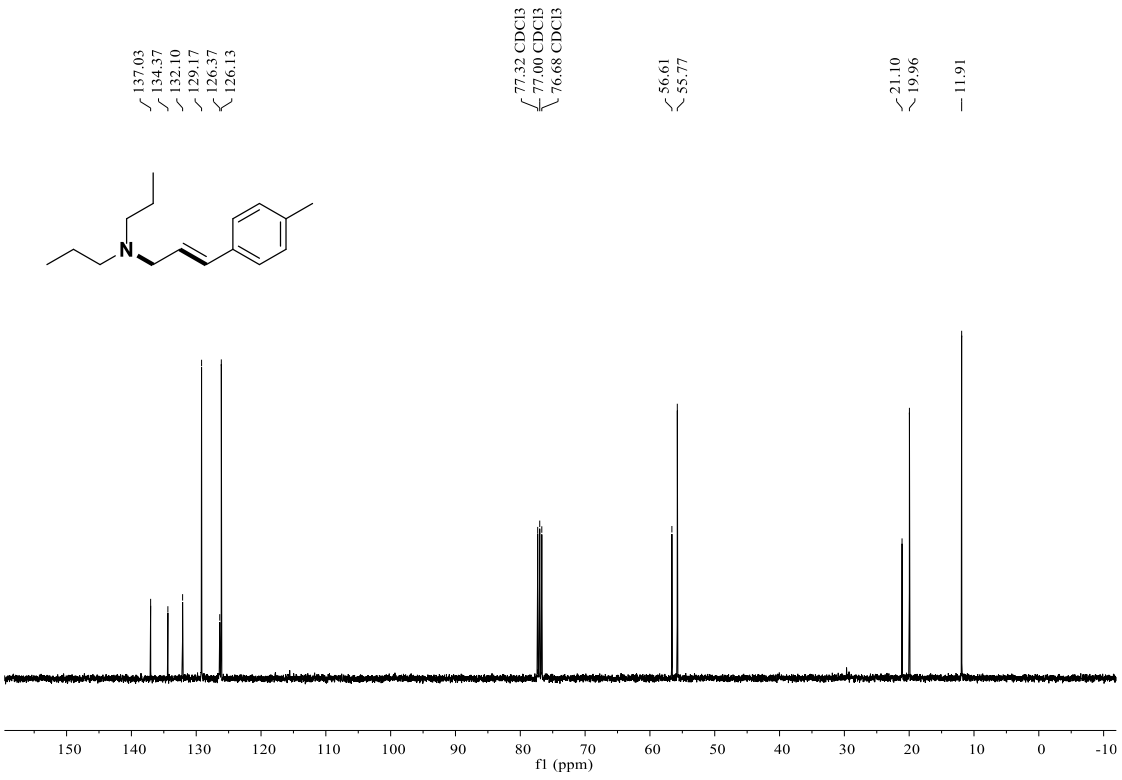
(*E*)-*N*,*N*-Dipropyl-3-(3-(trifluoromethyl)phenyl)prop-2-en-1-amine (45)



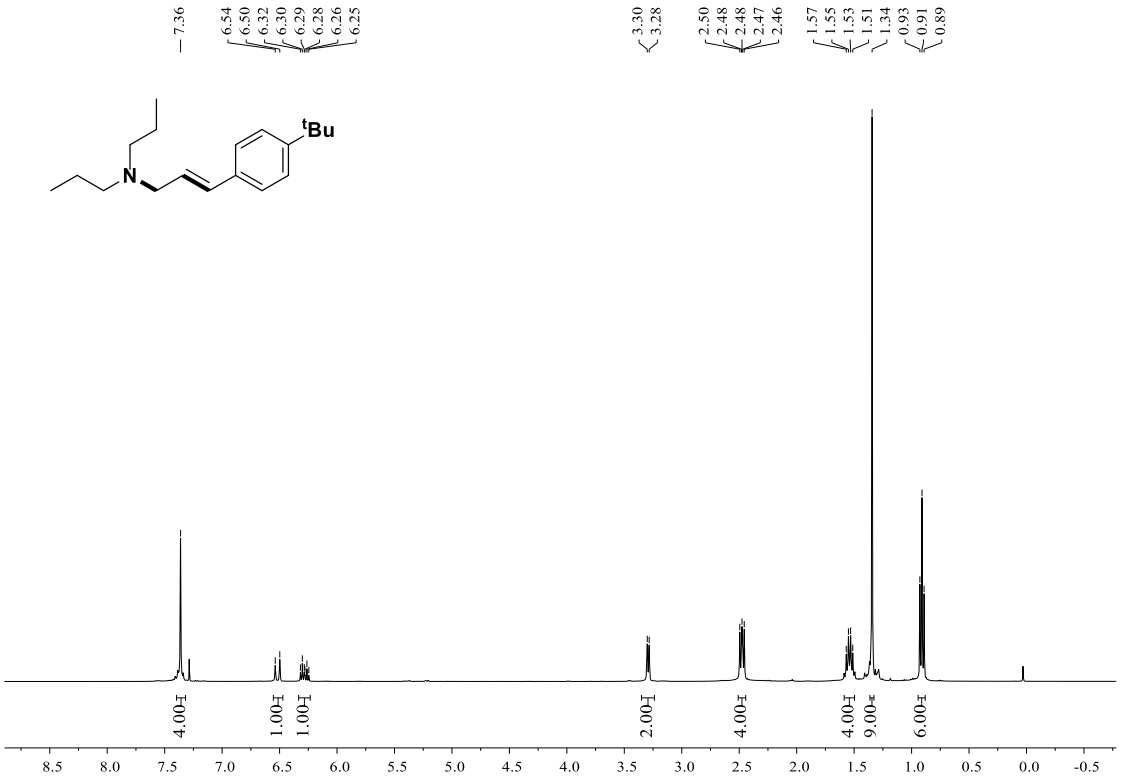


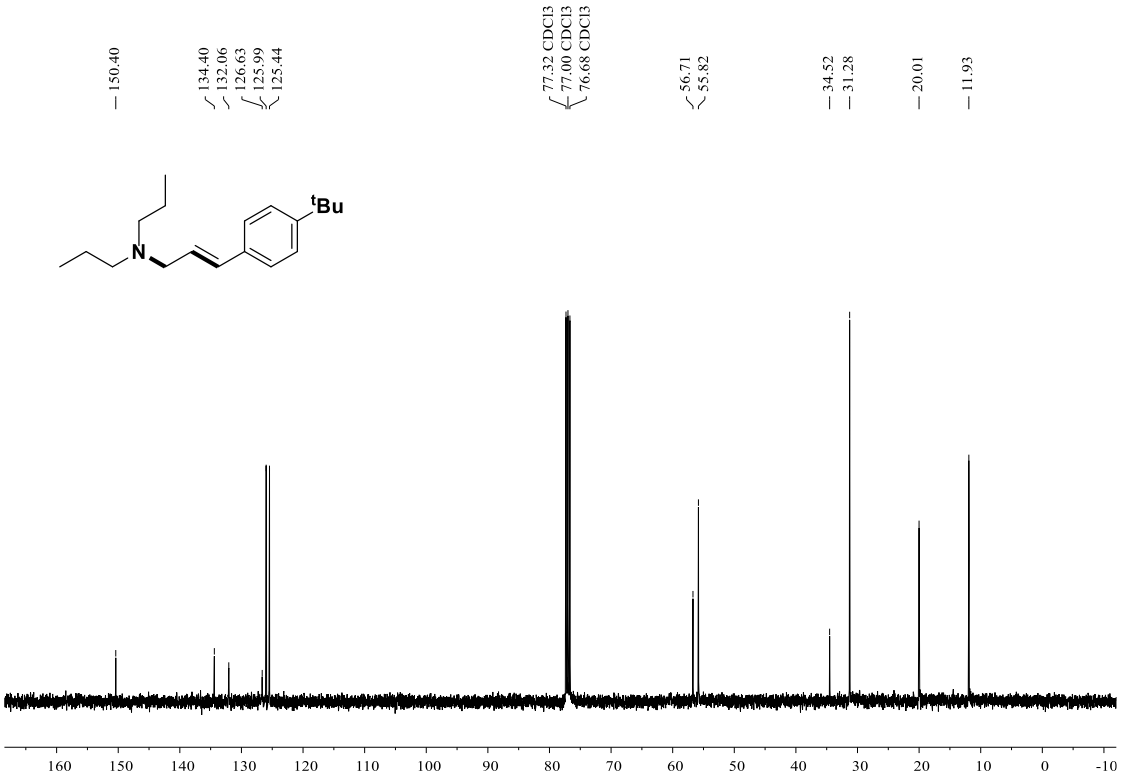
(*E*)-*N*,*N*-Dipropyl-3-(*p*-tolyl)prop-2-en-1-amine (46)



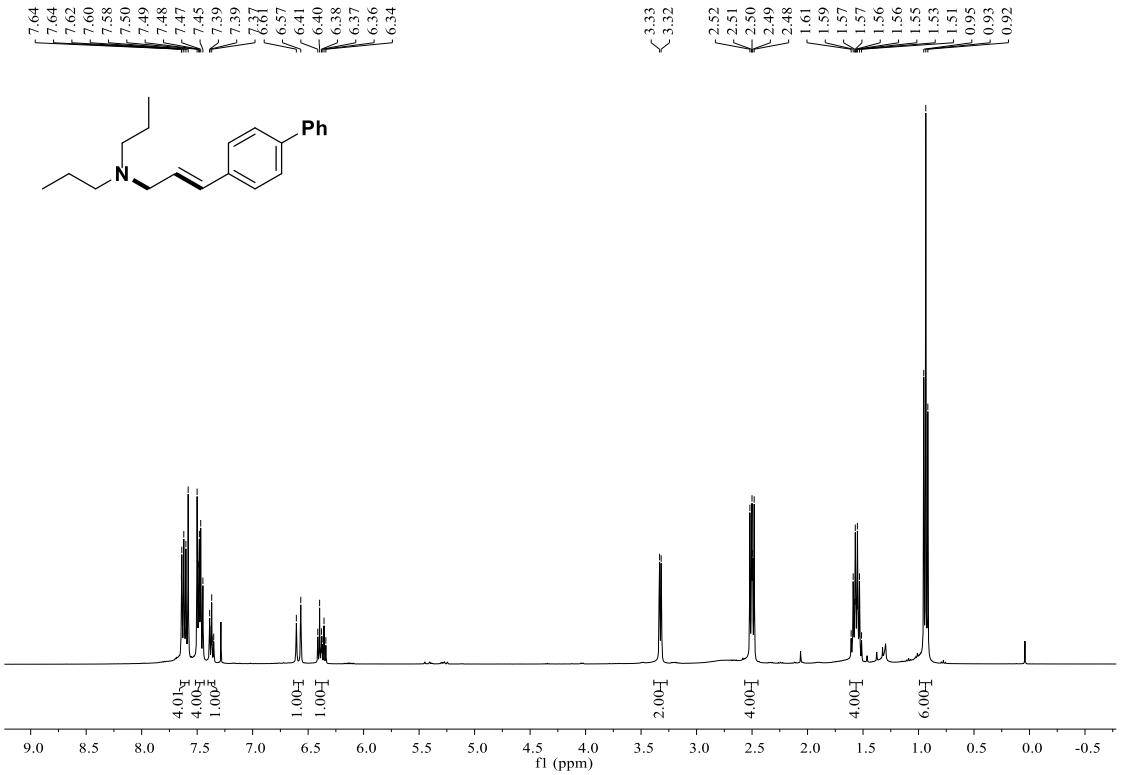


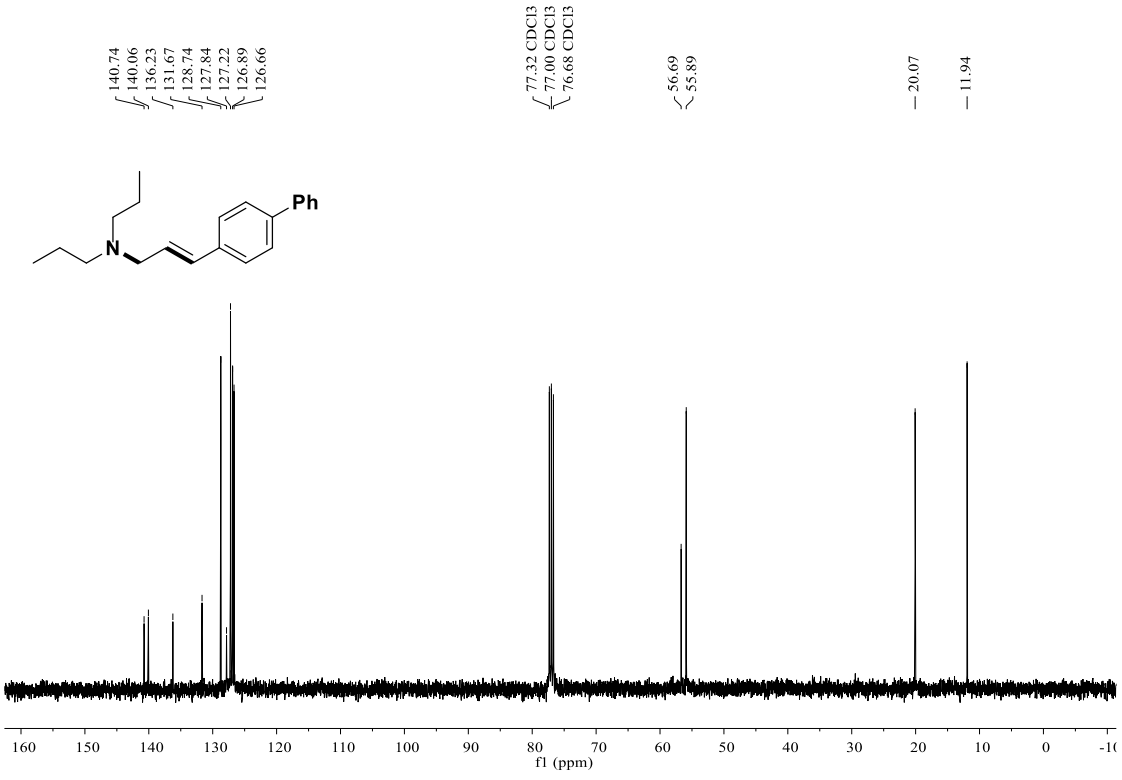
(*E*)-3-(4-(*tert*-Butyl)phenyl)-*N*,*N*-dipropylprop-2-en-1-amine (47)



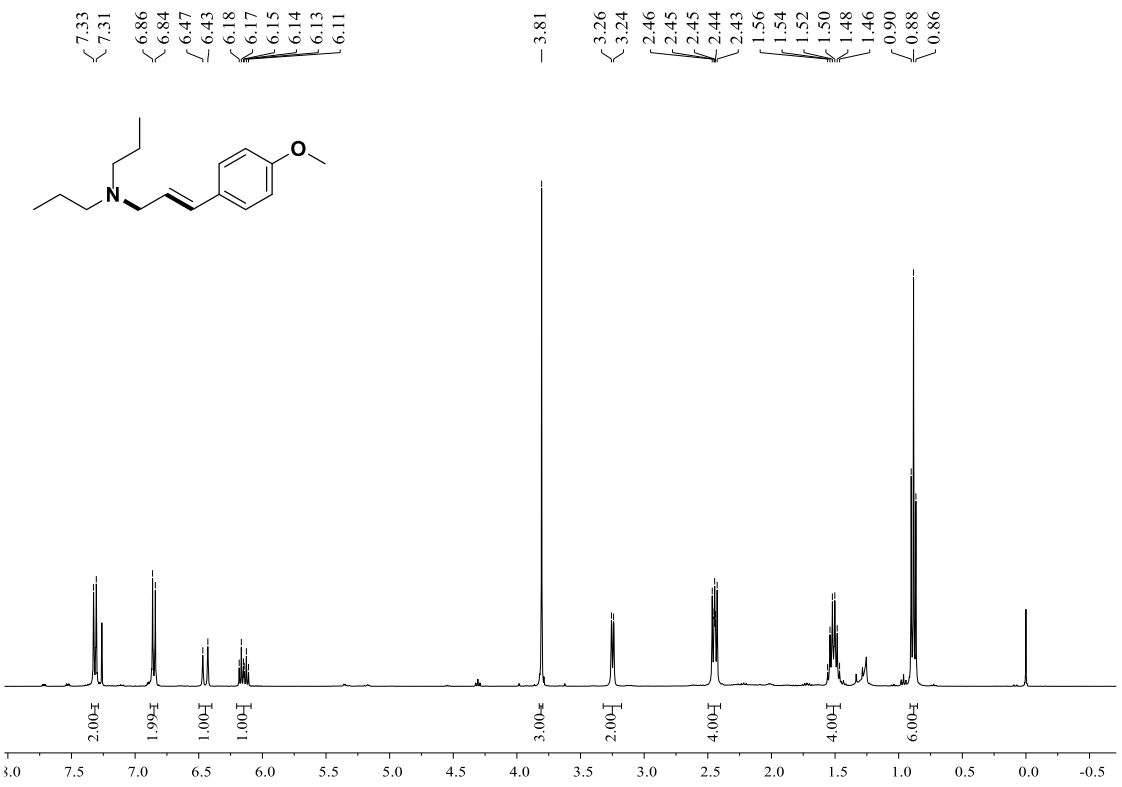


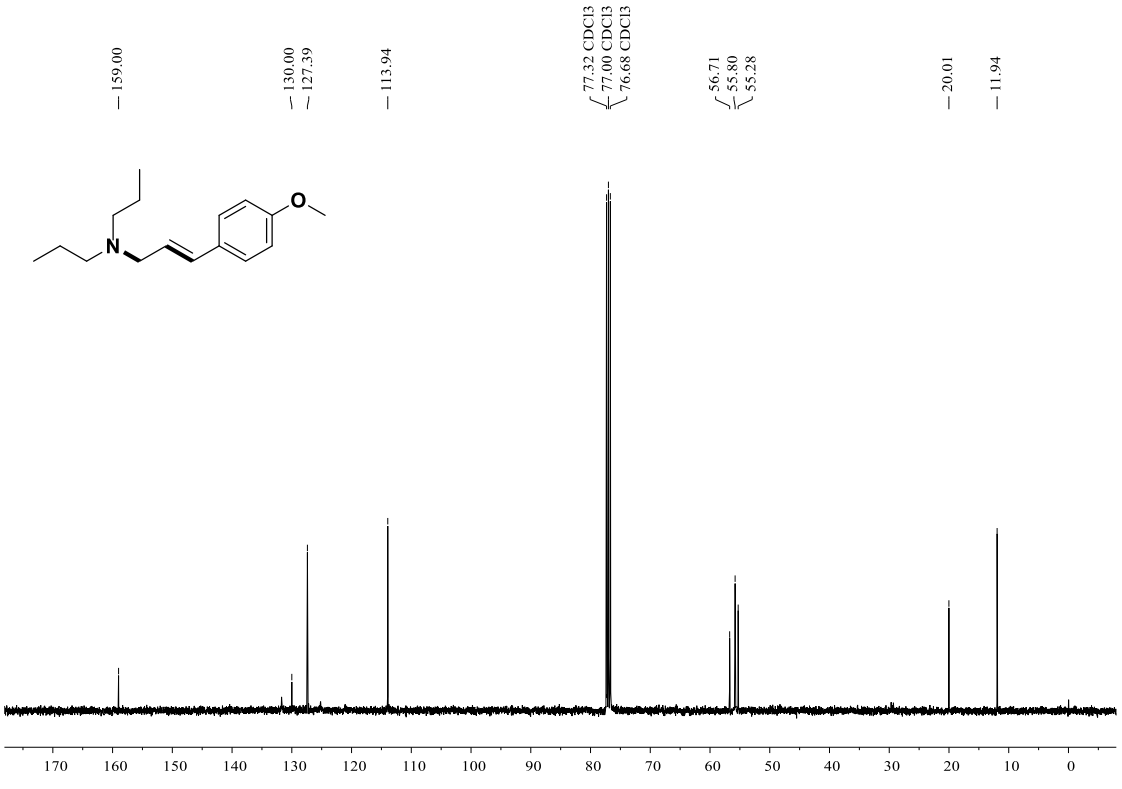
(*E*)-3-([1,1'-Biphenyl]-4-yl)-*N*,*N*-dipropylprop-2-en-1-amine (48)



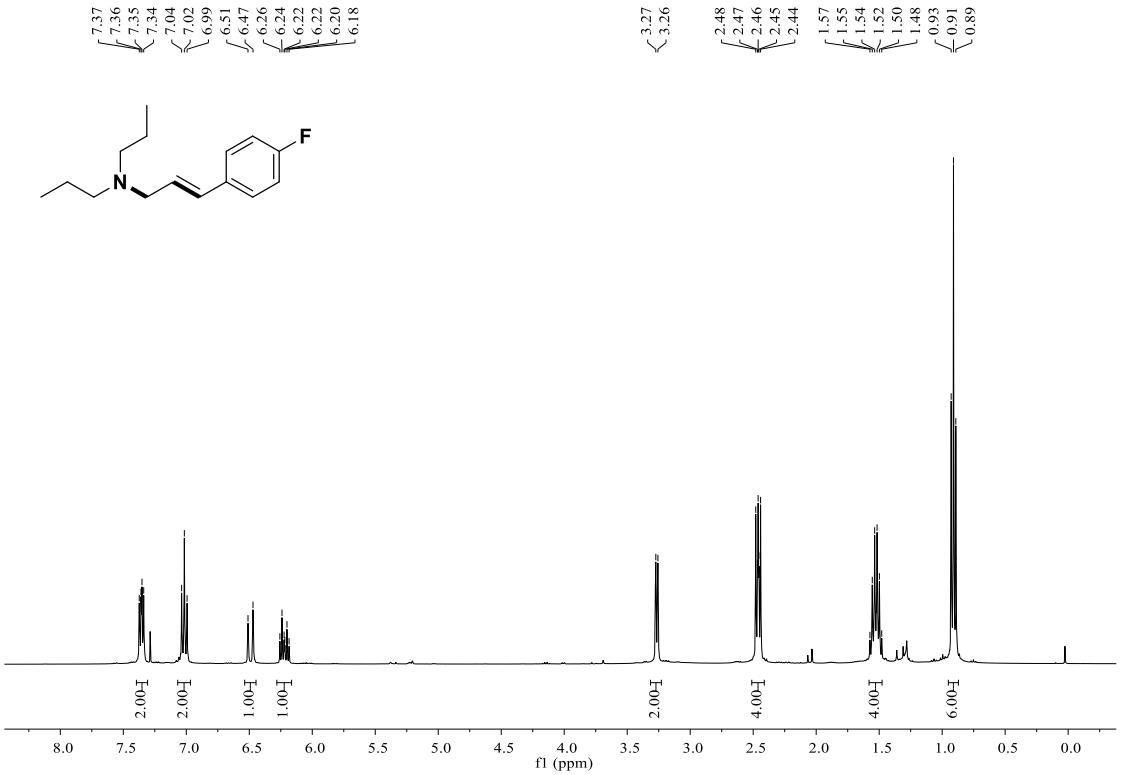


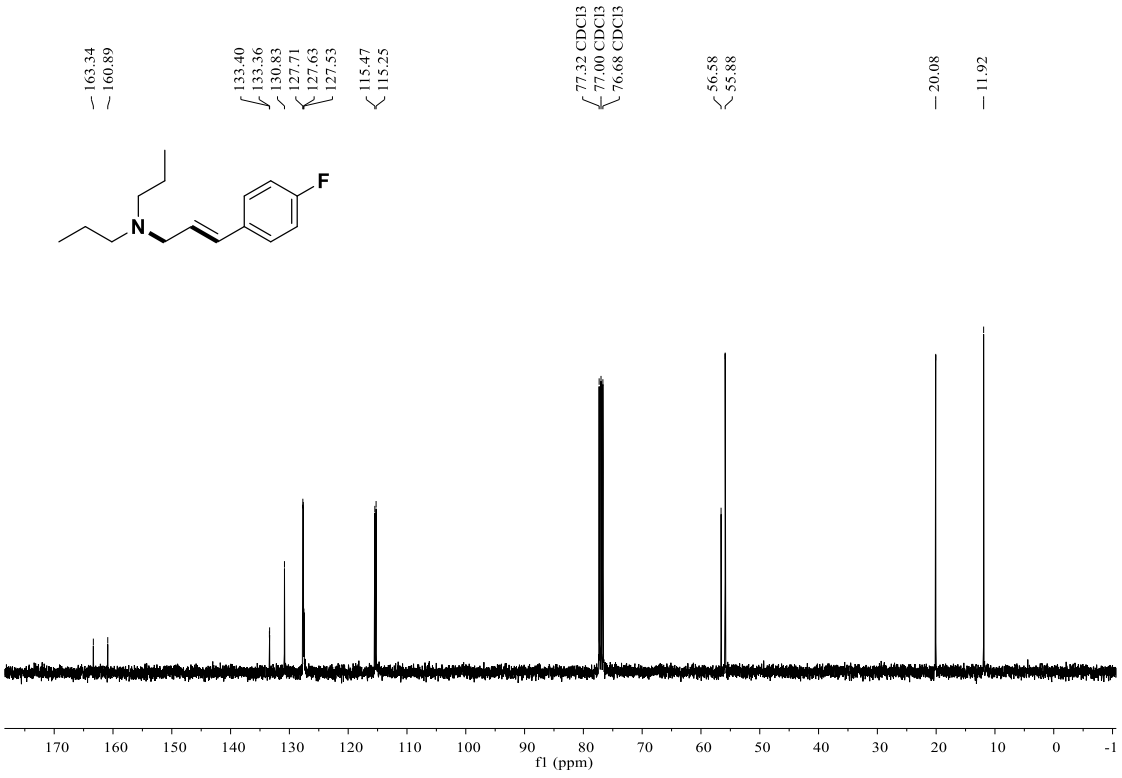
(*E*)-3-(4-Methoxyphenyl)-*N*,*N*-dipropylprop-2-en-1-amine (49)



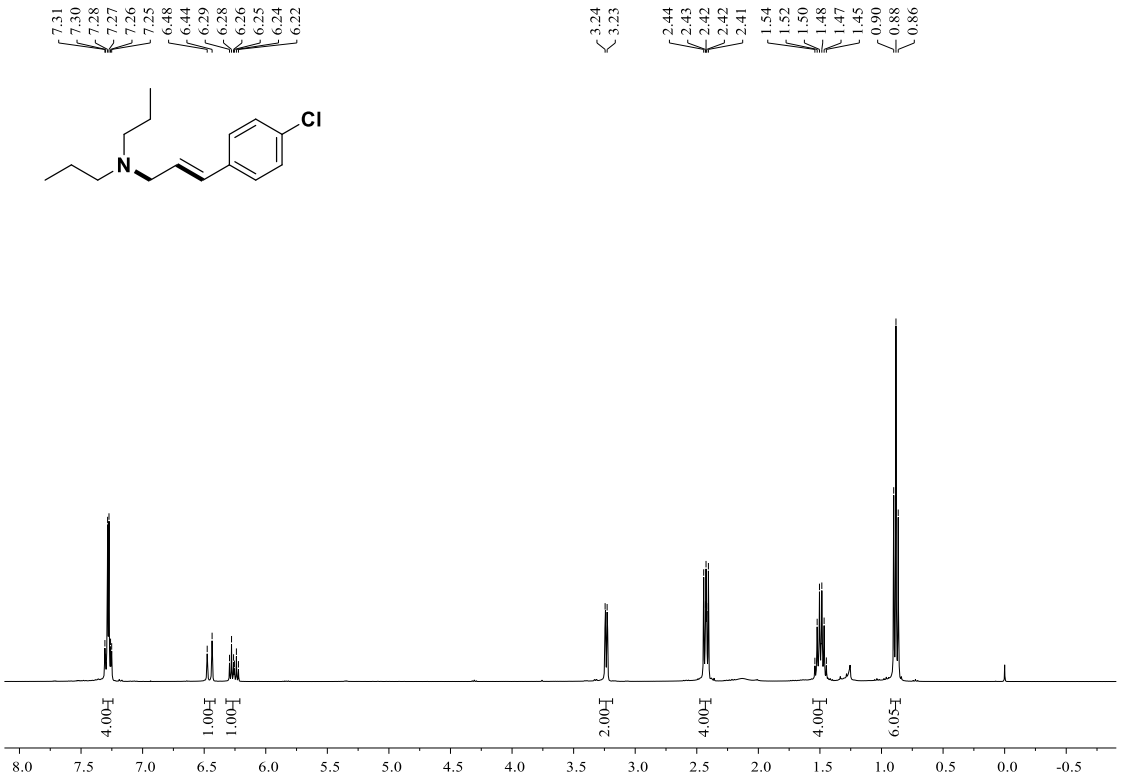


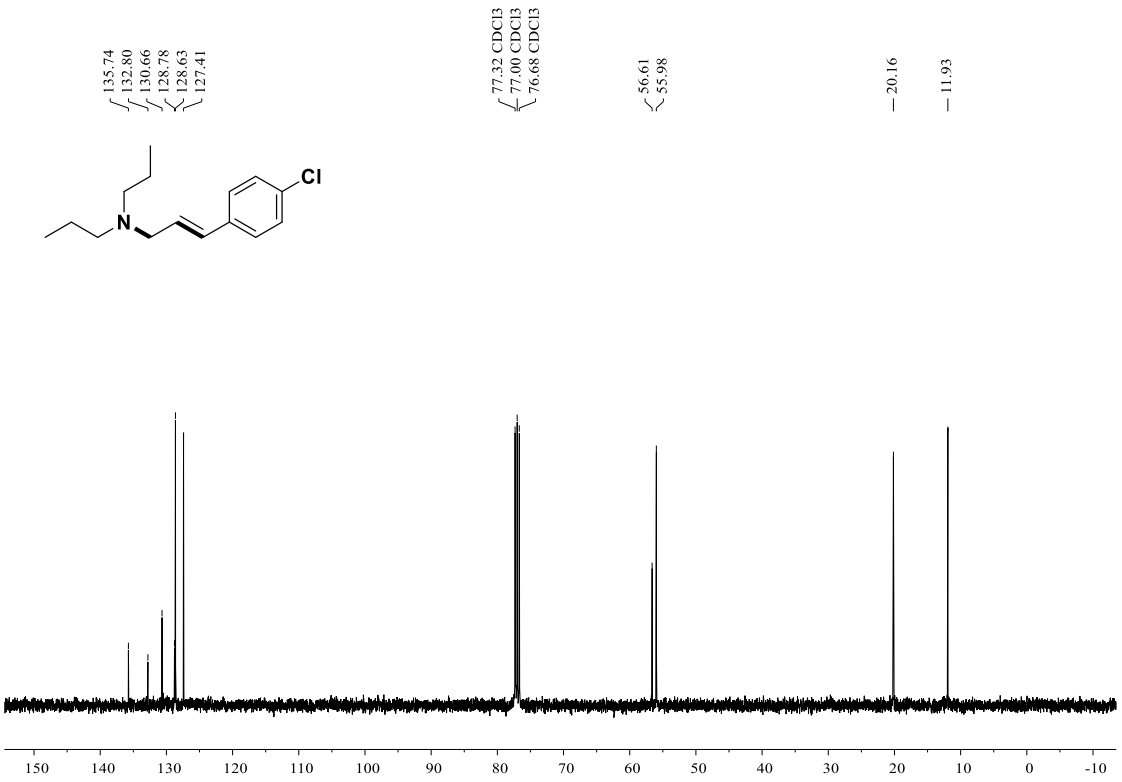
(*E*)-3-(4-Fluorophenyl)-*N*,*N*-dipropylprop-2-en-1-amine (50)



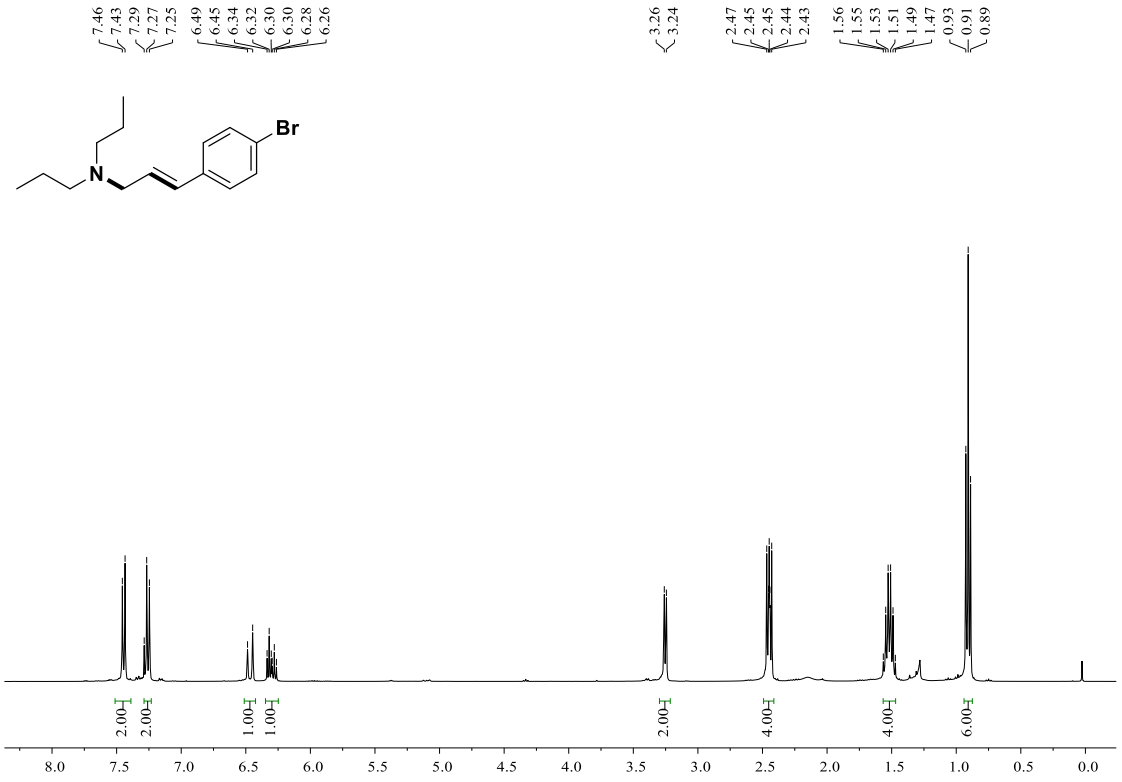


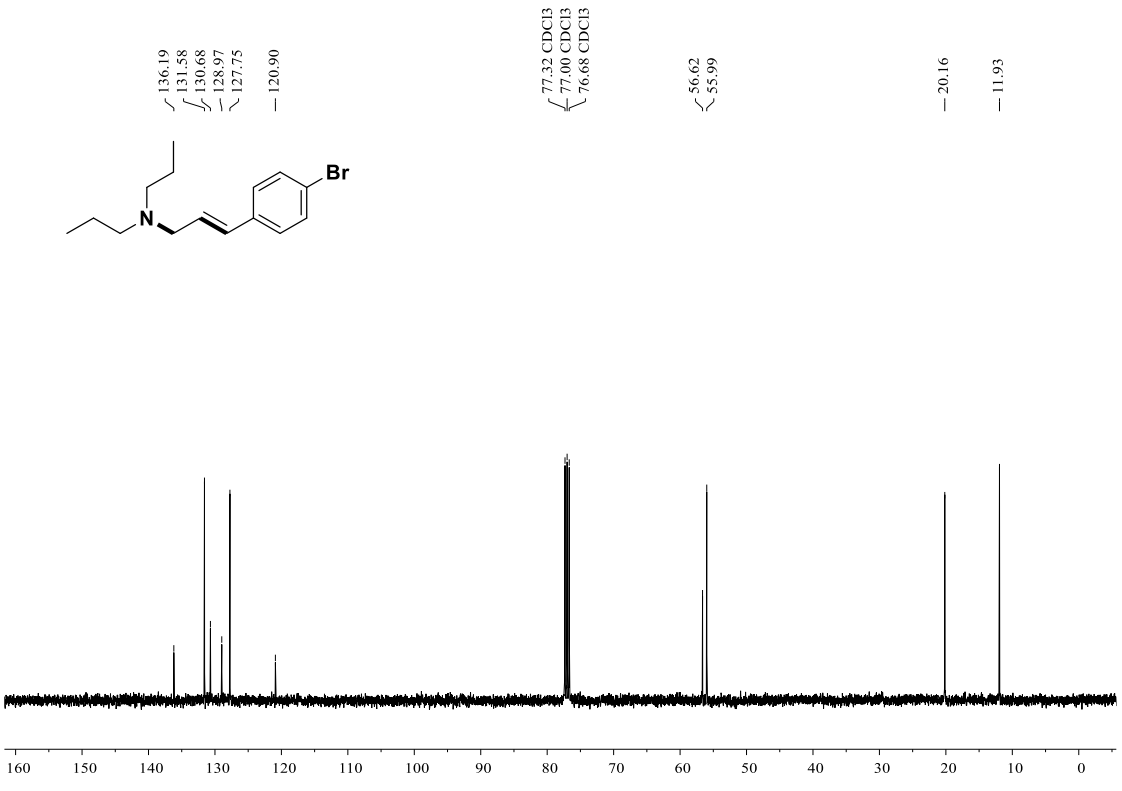
(*E*)-3-(4-Chlorophenyl)-*N*,*N*-dipropylprop-2-en-1-amine (51)



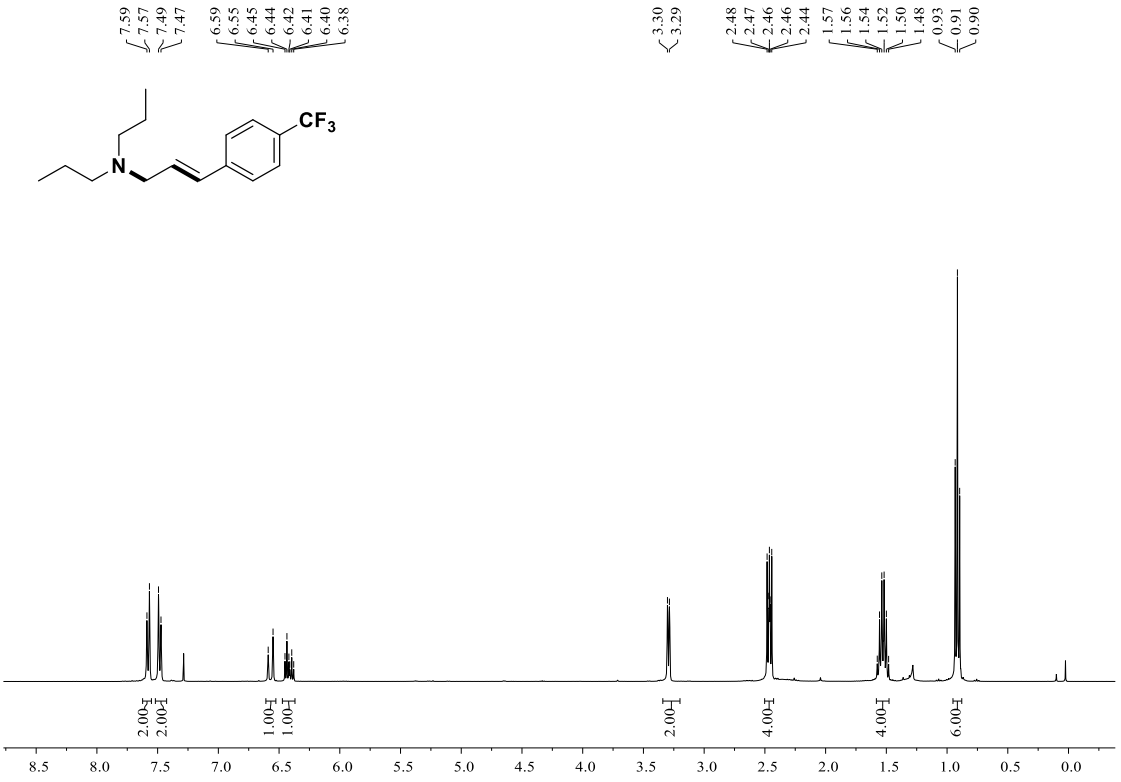


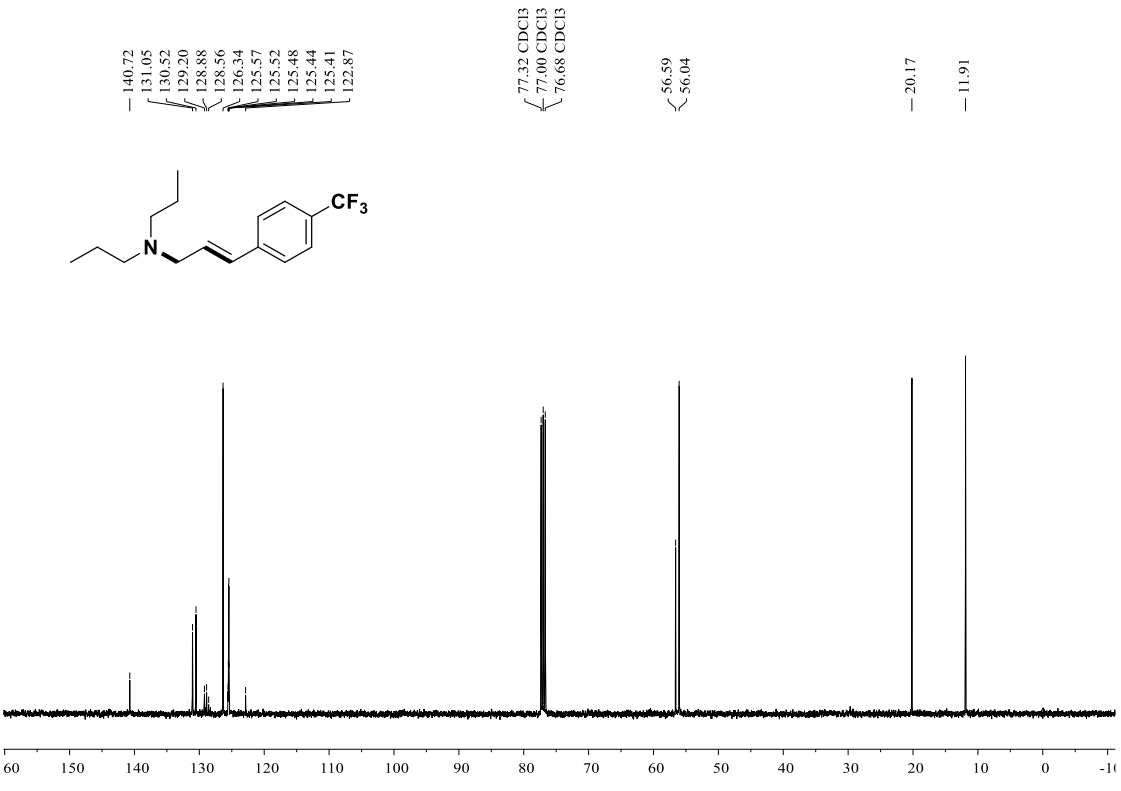
(*E*)-3-(4-Bromophenyl)-*N*,*N*-dipropylprop-2-en-1-amine (52)



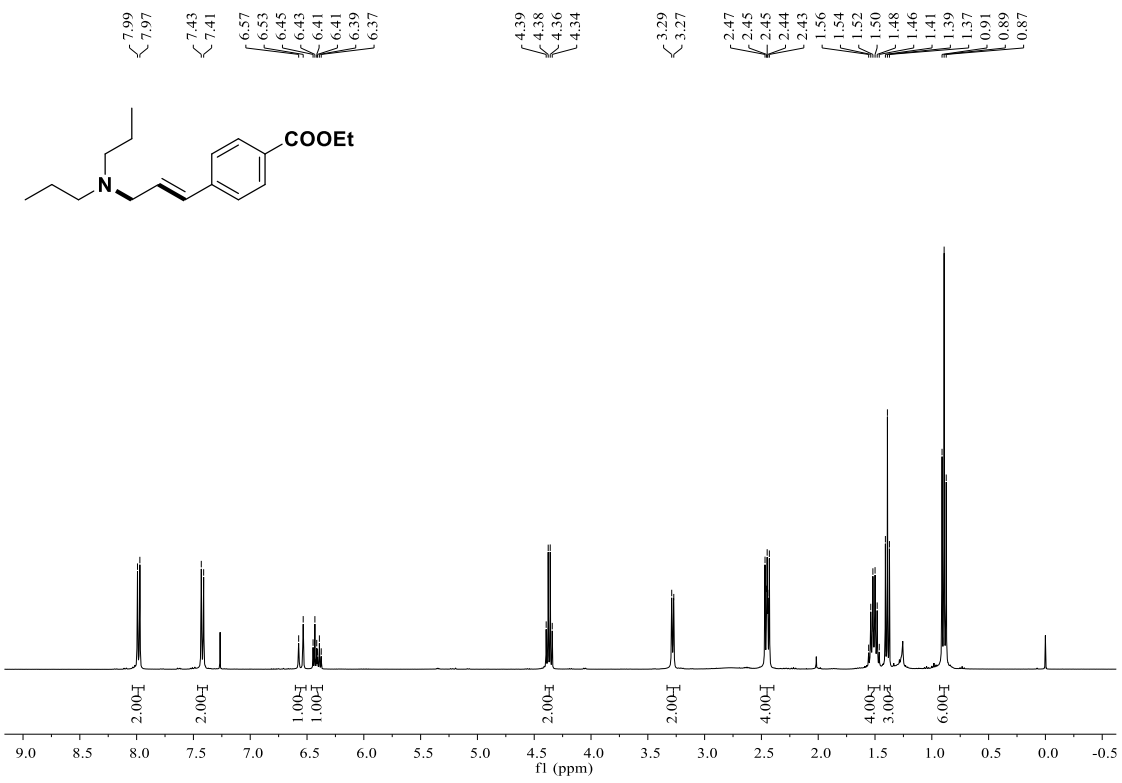


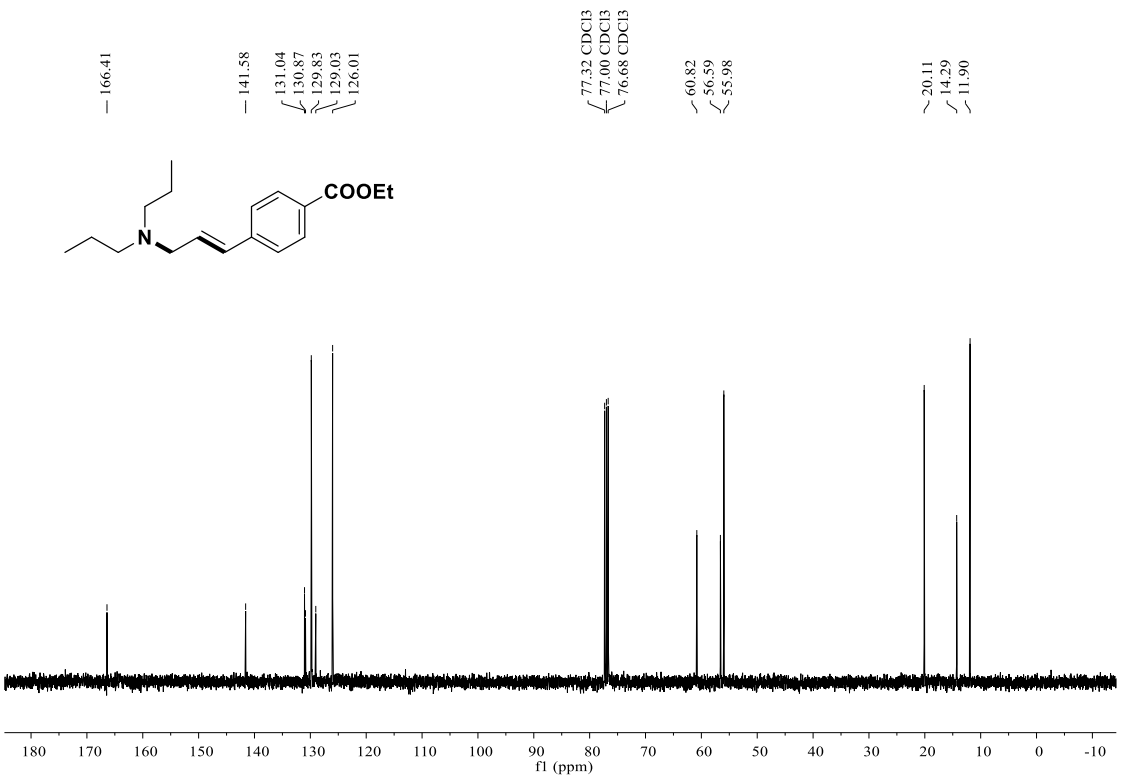
(*E*)-*N*,*N*-Dipropyl-3-(4-(trifluoromethyl)phenyl)prop-2-en-1-amine (53)



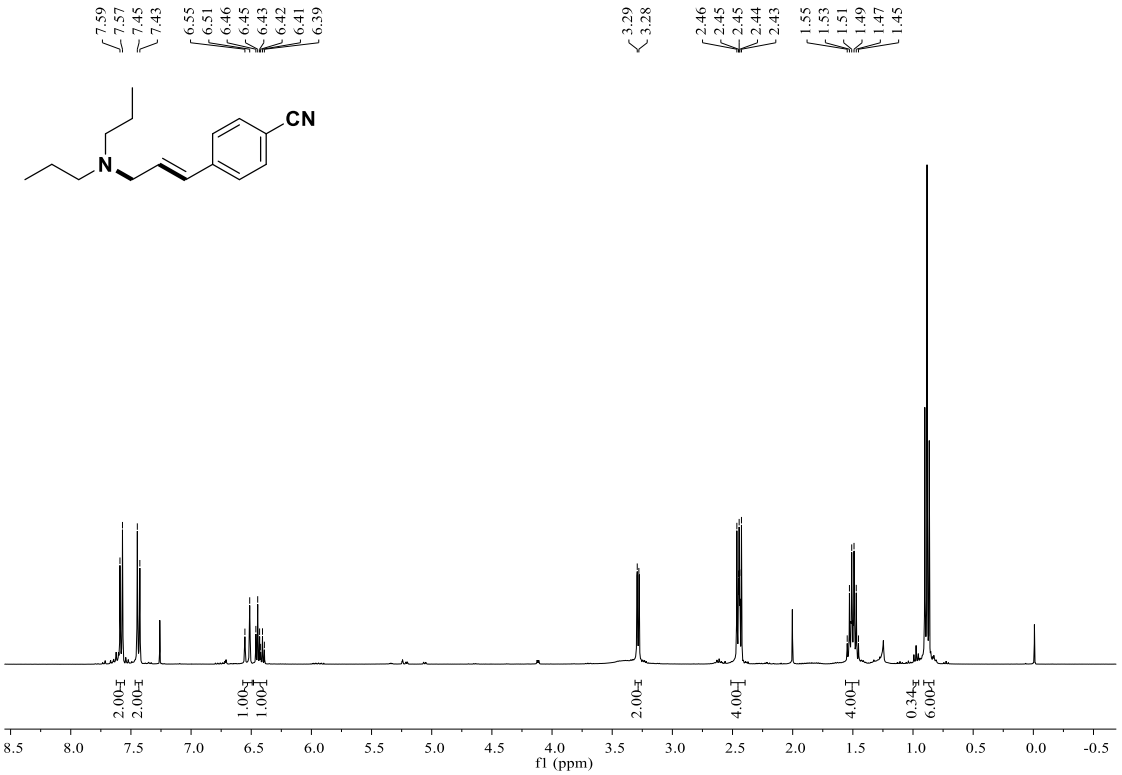


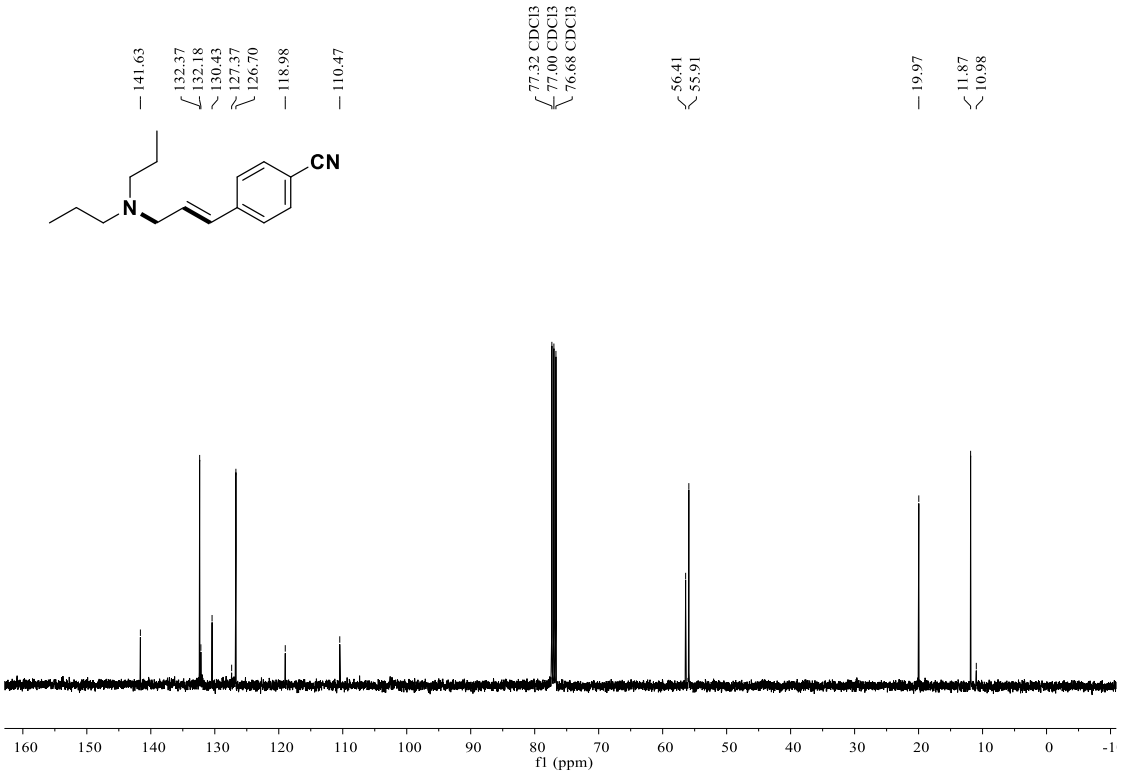
Ethyl (*E*)-4-(3-(dipropylamino)prop-1-en-1-yl)benzoate (54)



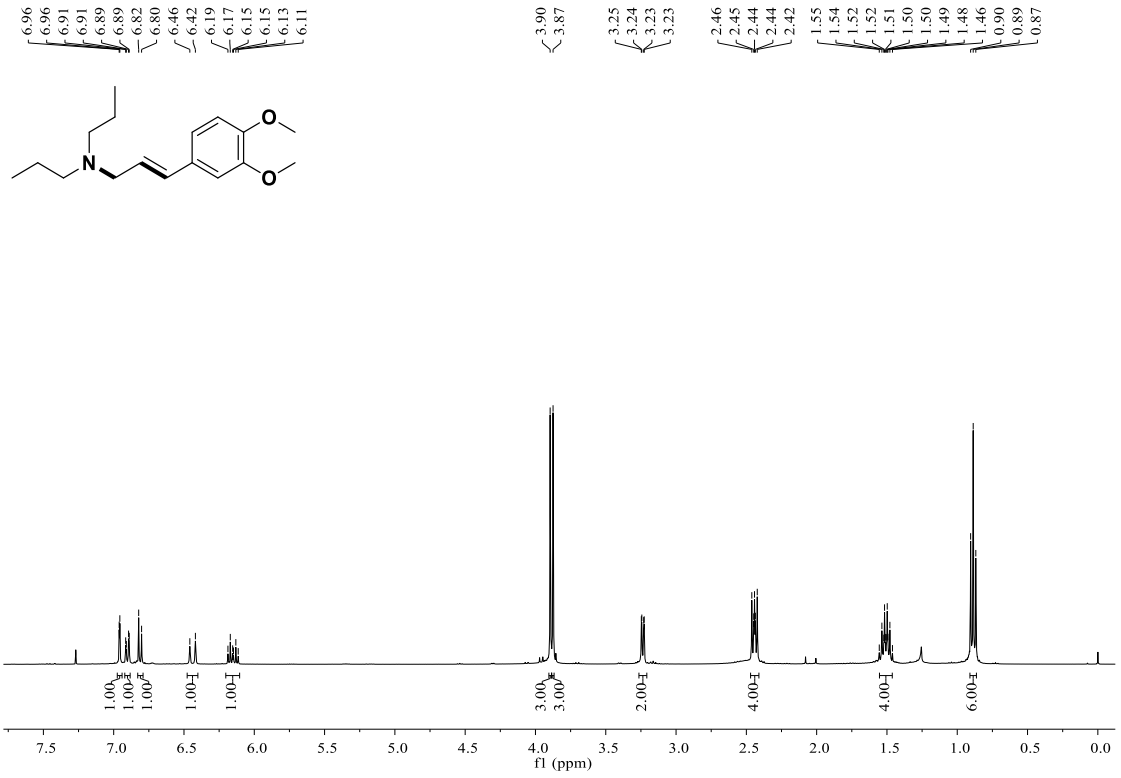


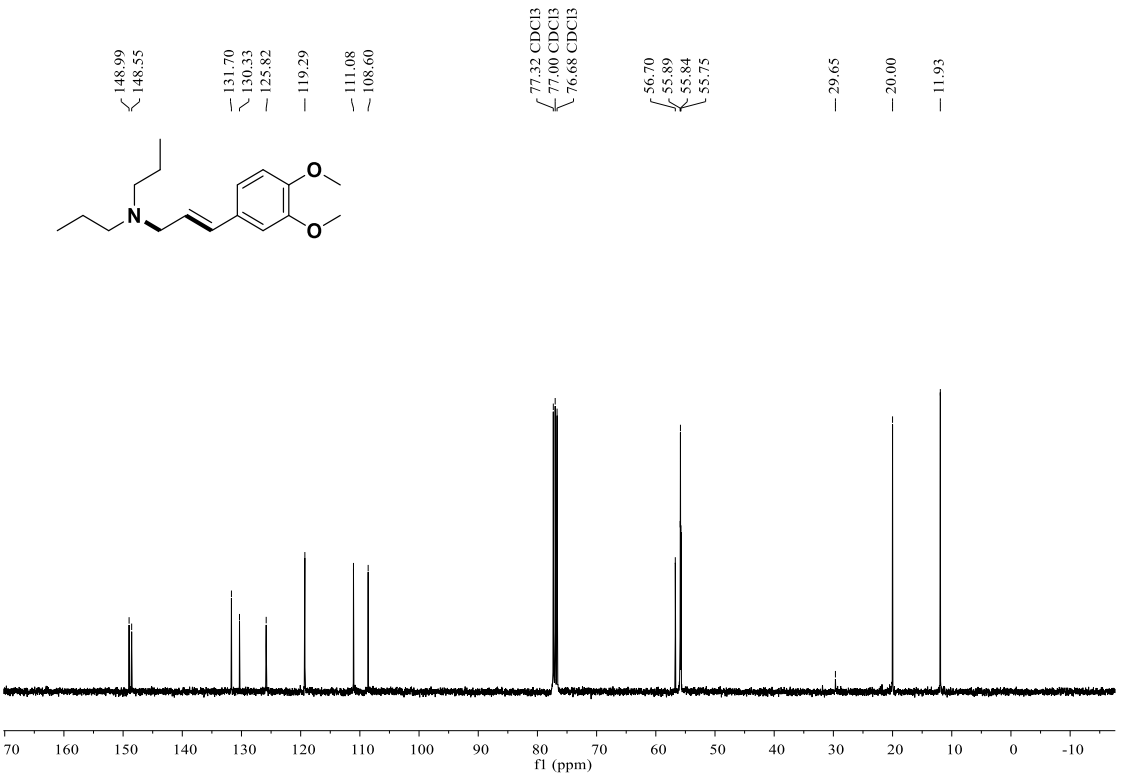
(*E*)-4-(3-(Dipropylamino)prop-1-en-1-yl)benzonitrile (55)



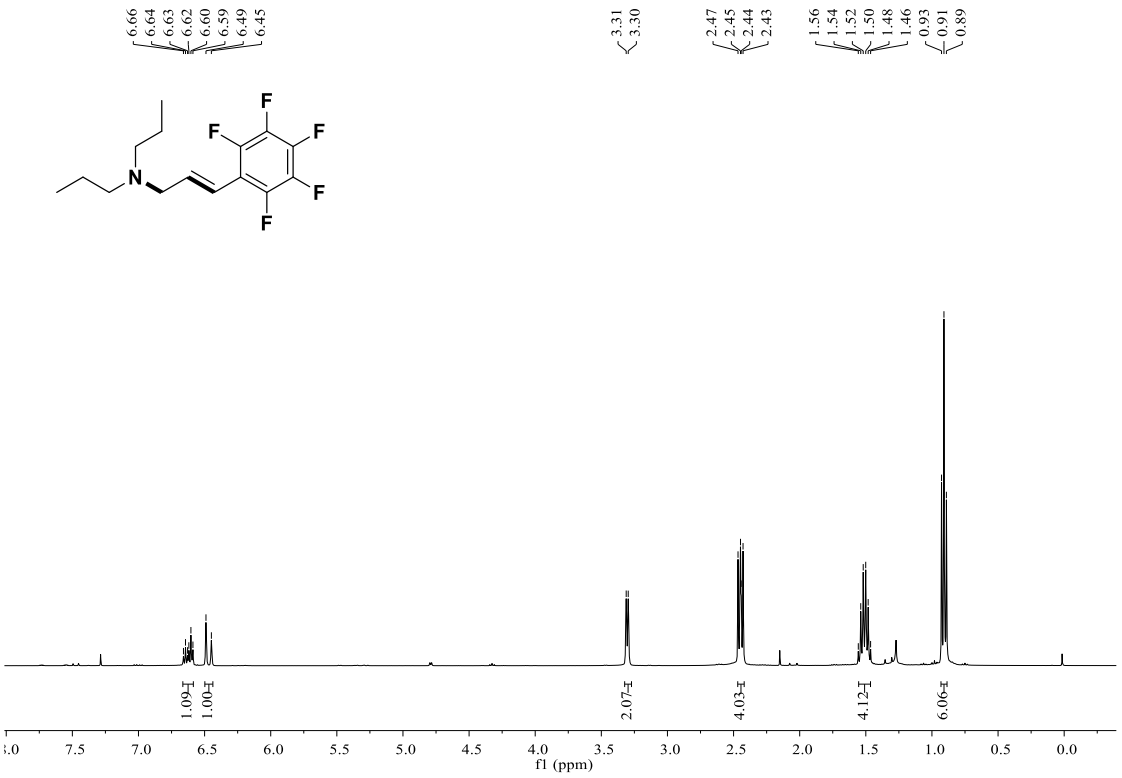


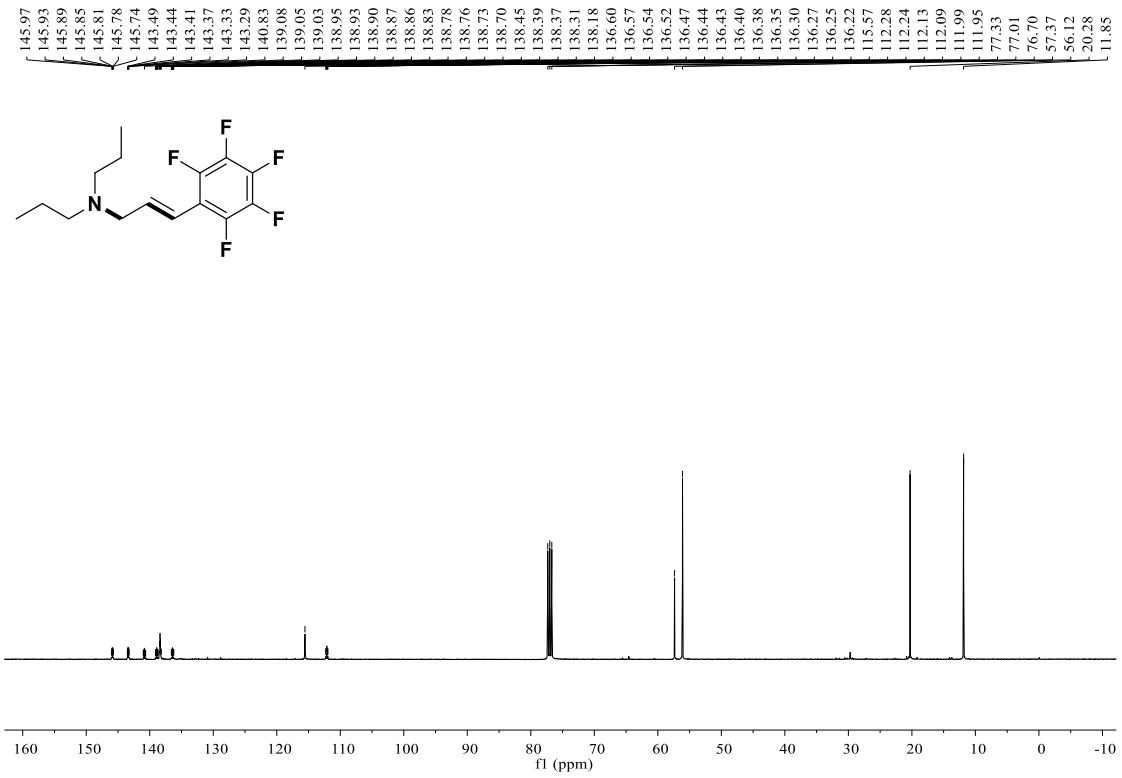
(*E*)-3-(3,4-Dimethoxyphenyl)-*N*,*N*-dipropylprop-2-en-1-amine (56)



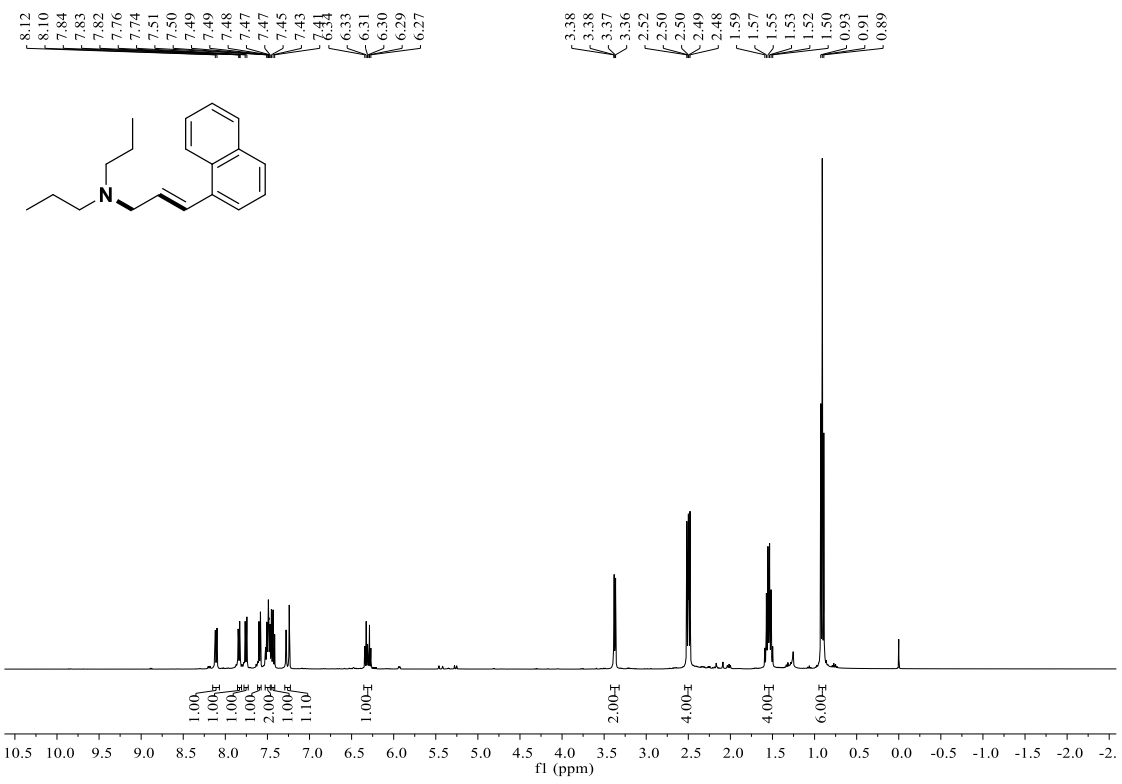


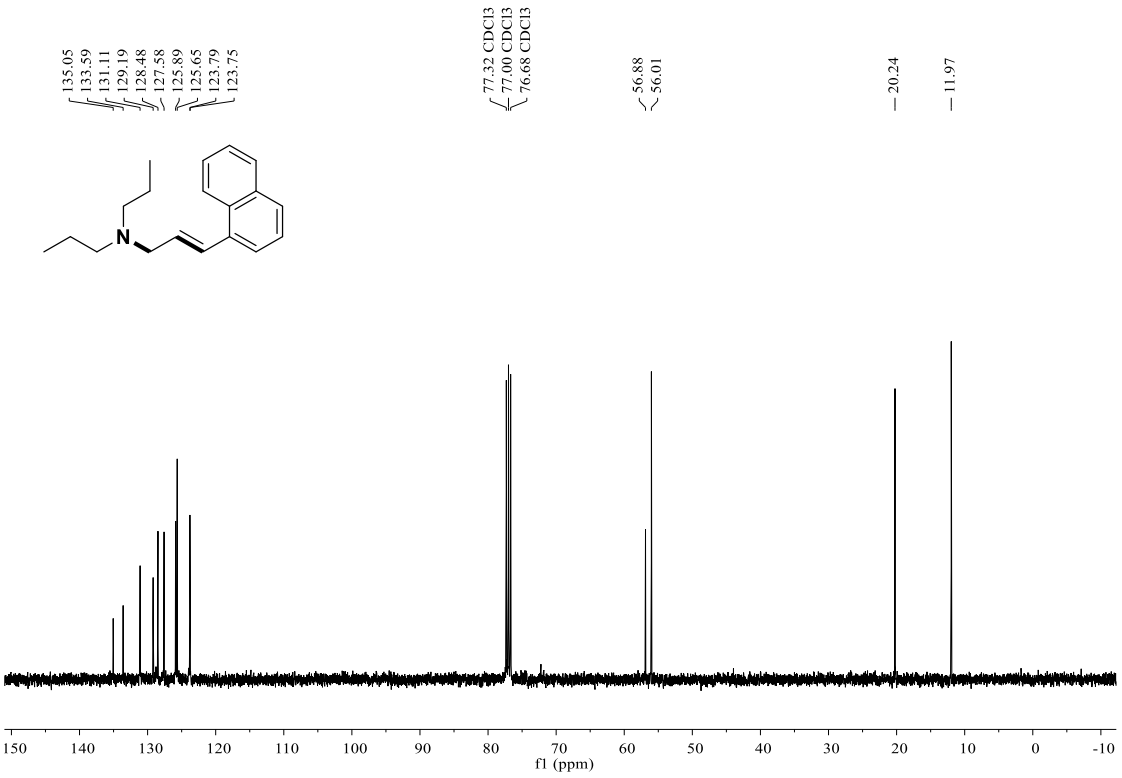
(*E*)-3-(Perfluorophenyl)-*N*,*N*-dipropylprop-2-en-1-amine (57)



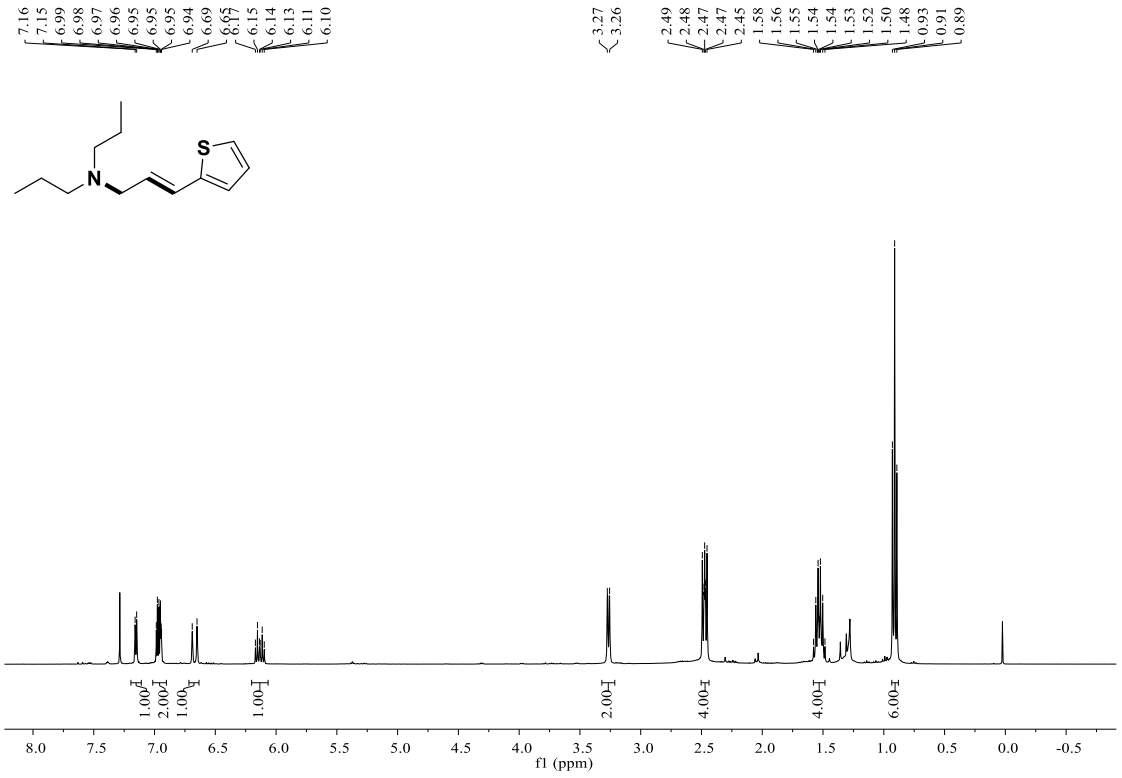


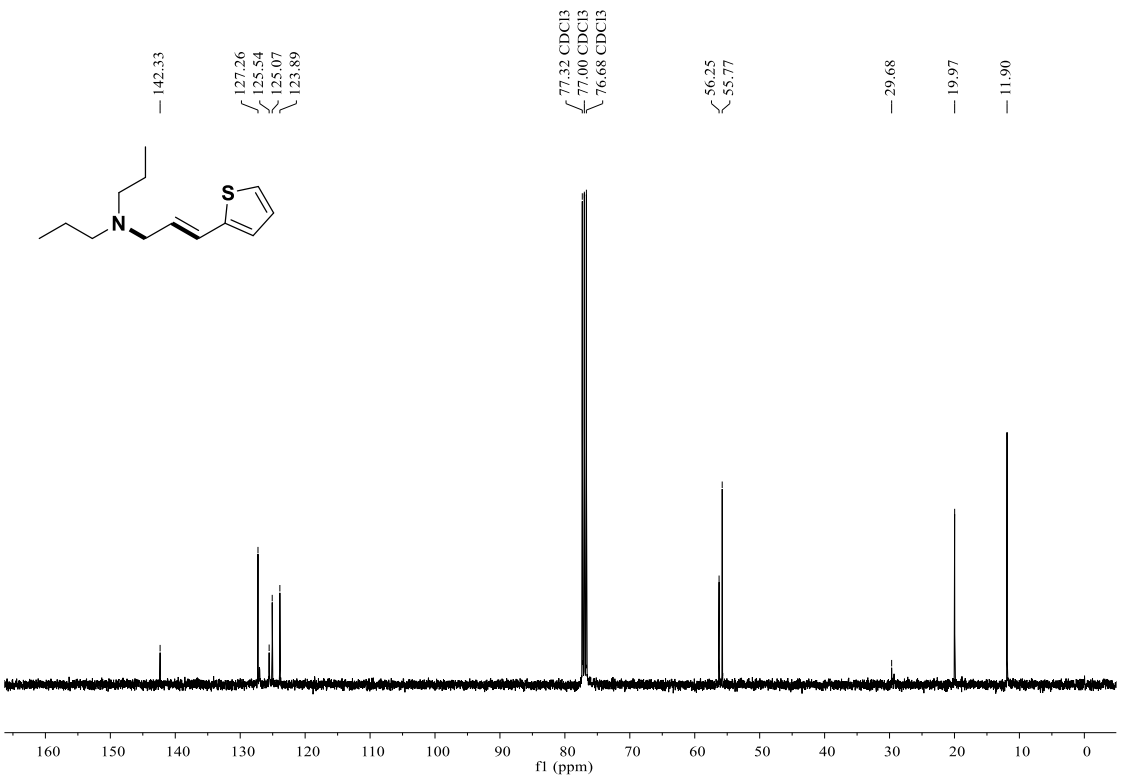
(*E*)-3-(Naphthalen-1-yl)-*N*,*N*-dipropylprop-2-en-1-amine (58)



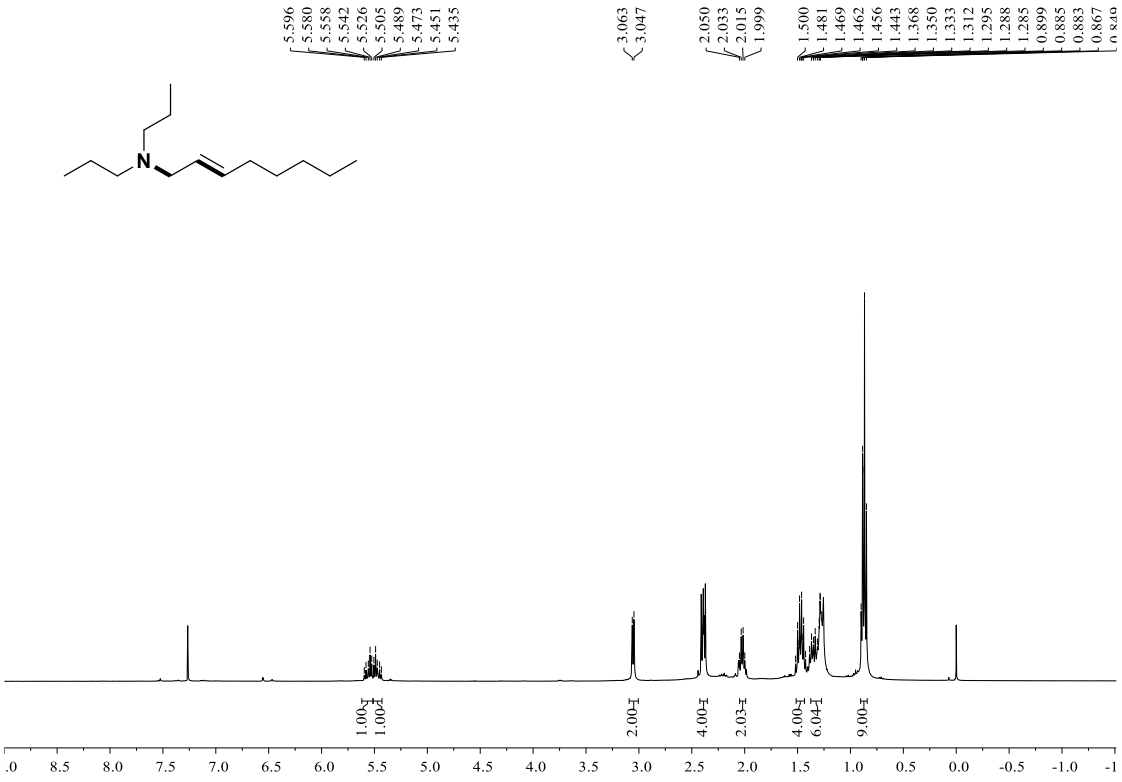


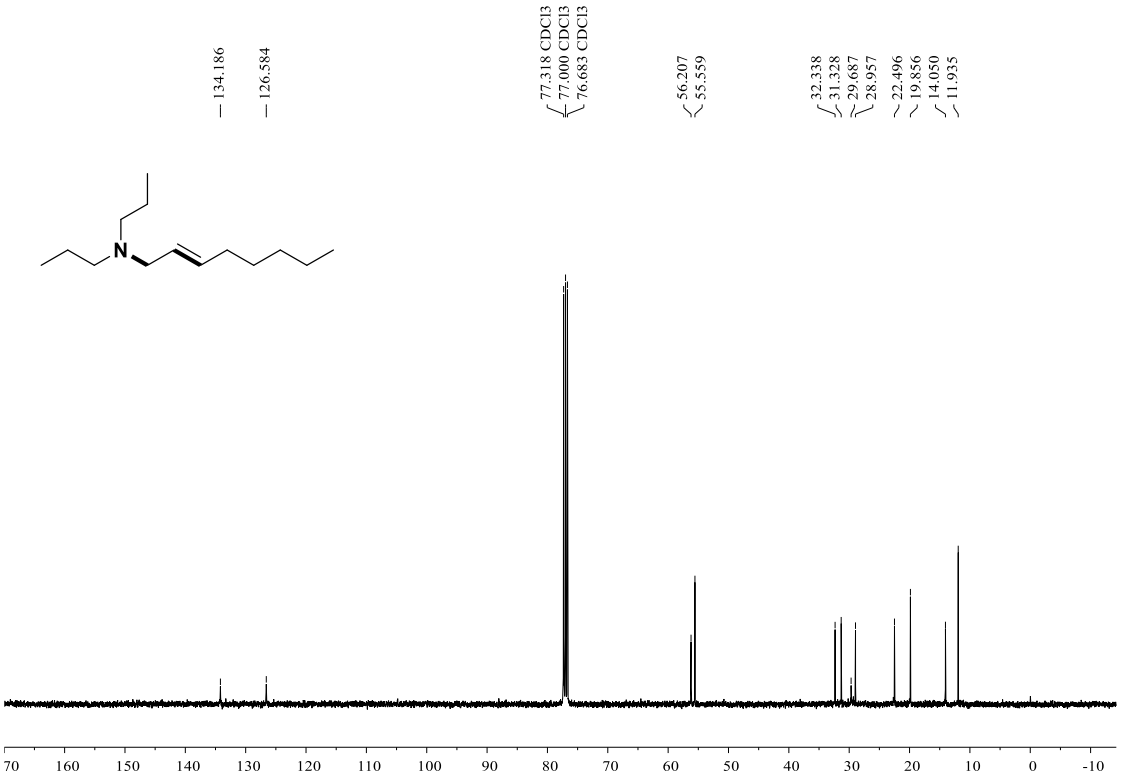
(*E*)-*N*,*N*-Dipropyl-3-(thiophen-2-yl)prop-2-en-1-amine (59)



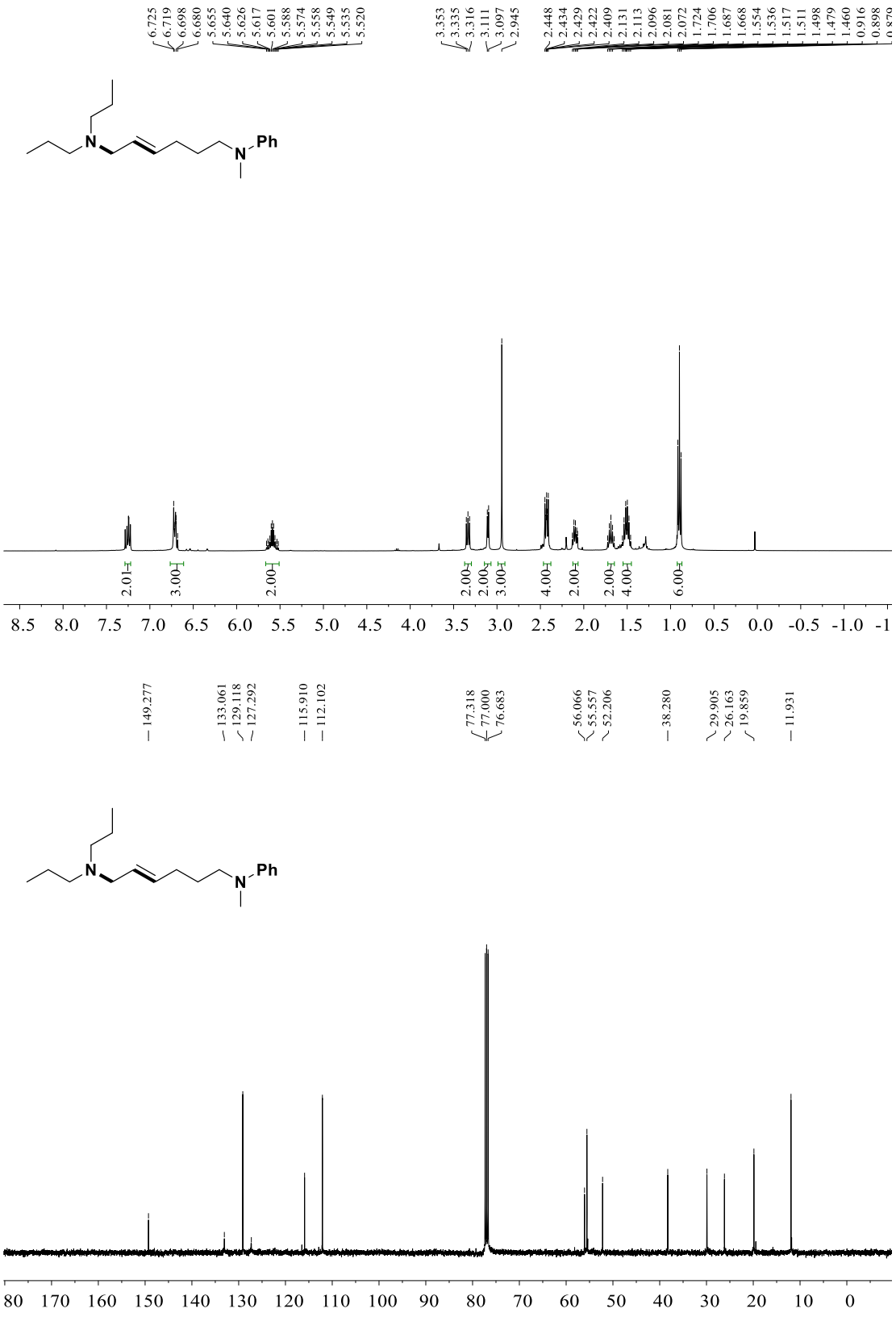


(*E*)-*N*, *N*-Dipropyloct-2-en-1-amine (60)

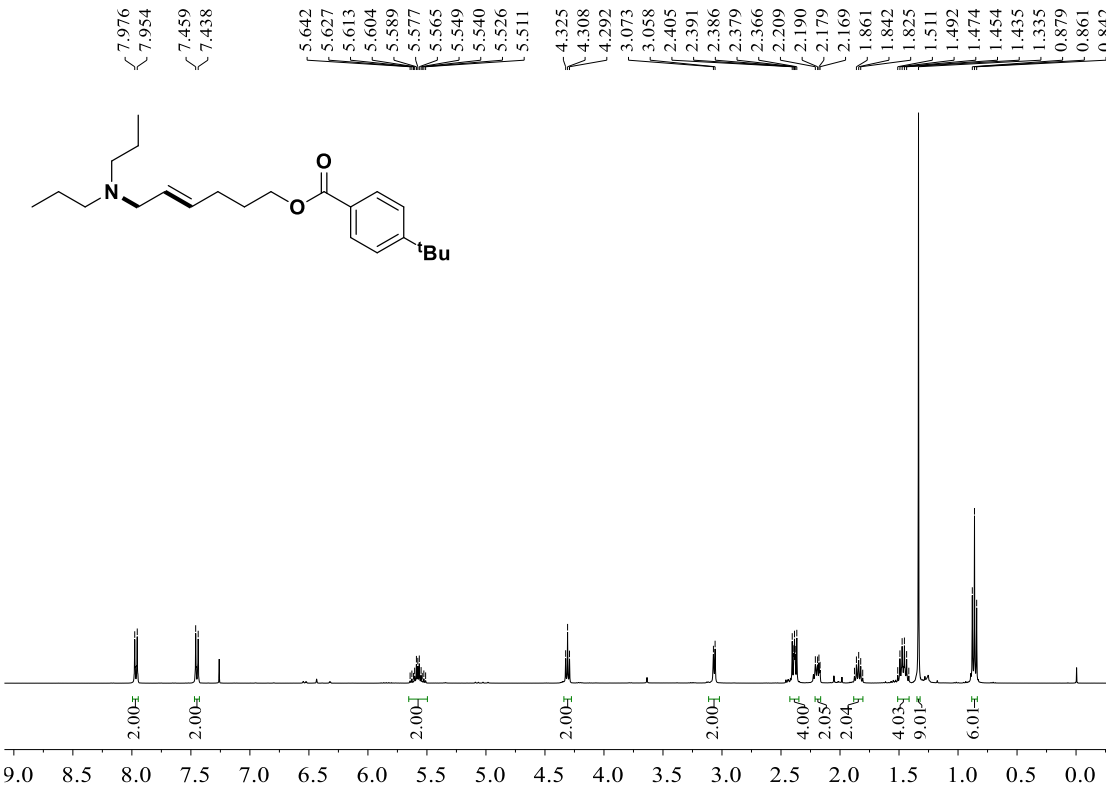


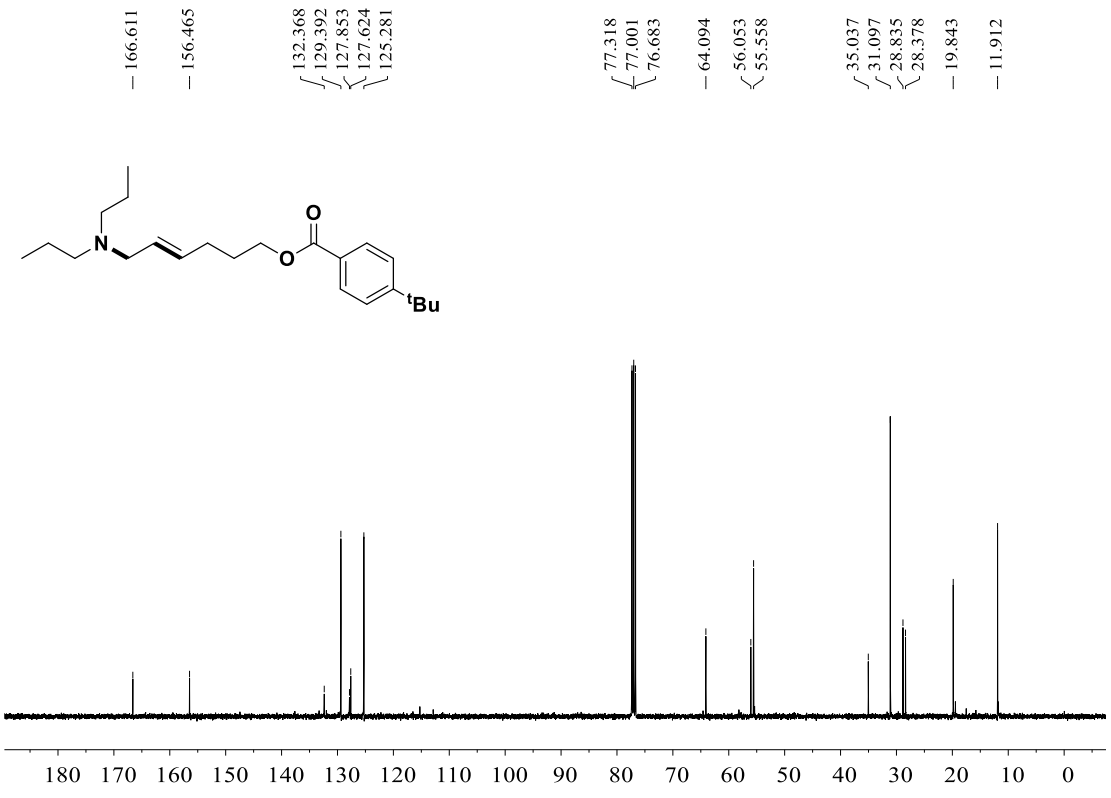


(*E*)-N^6-Methyl-N^6-phenyl-N^1,N^1-dipropylhex-2-ene-1,6-diamine (61)

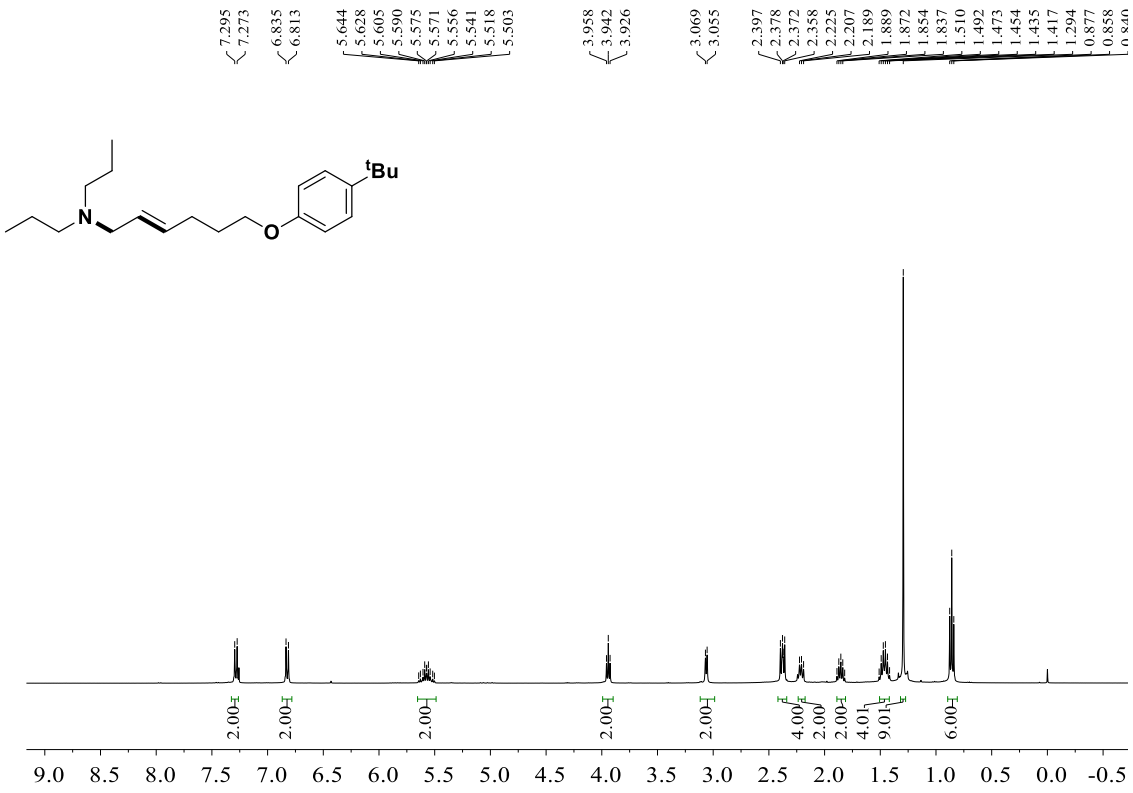


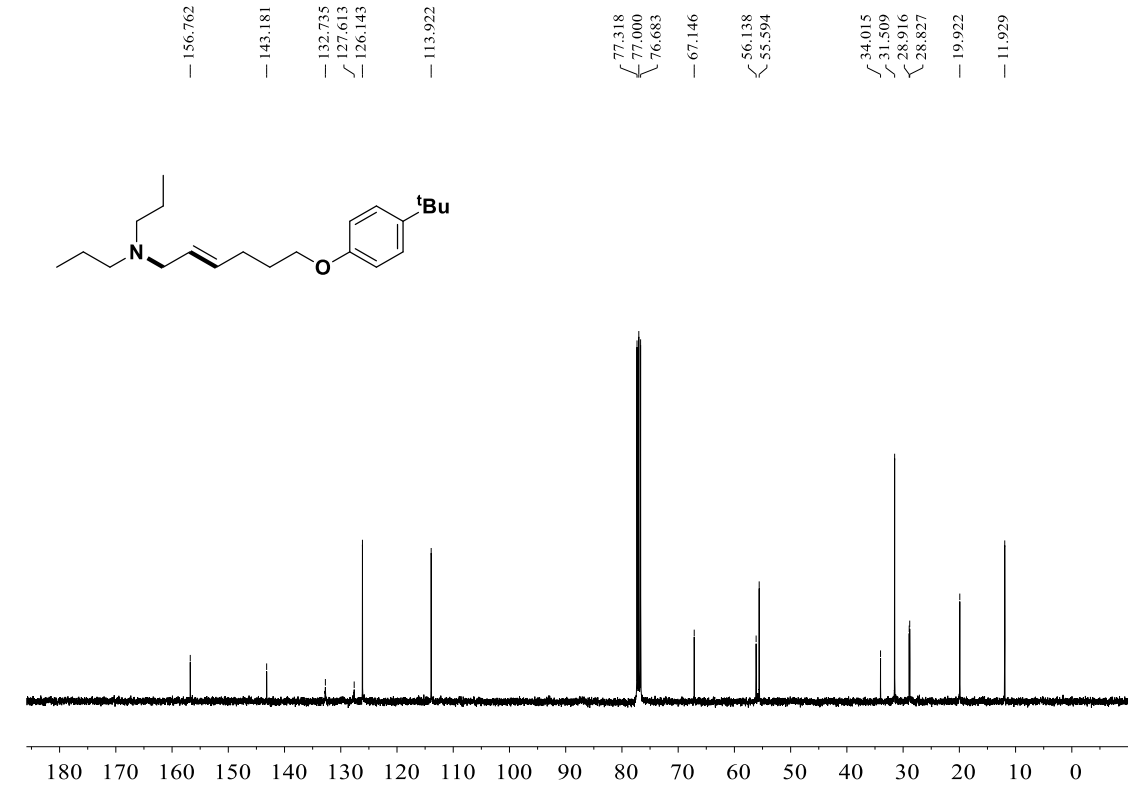
(*E*)-6-(Dipropylamino)hex-4-en-1-yl 4-(tert-butyl)benzoate (62)



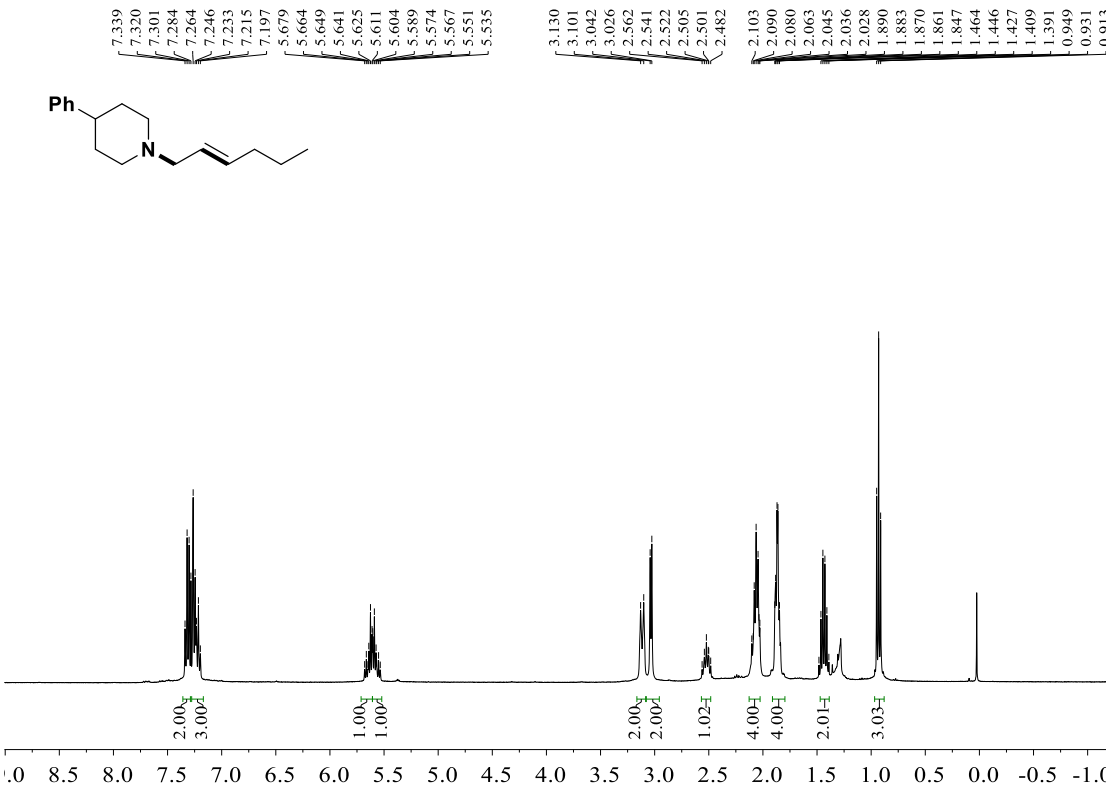


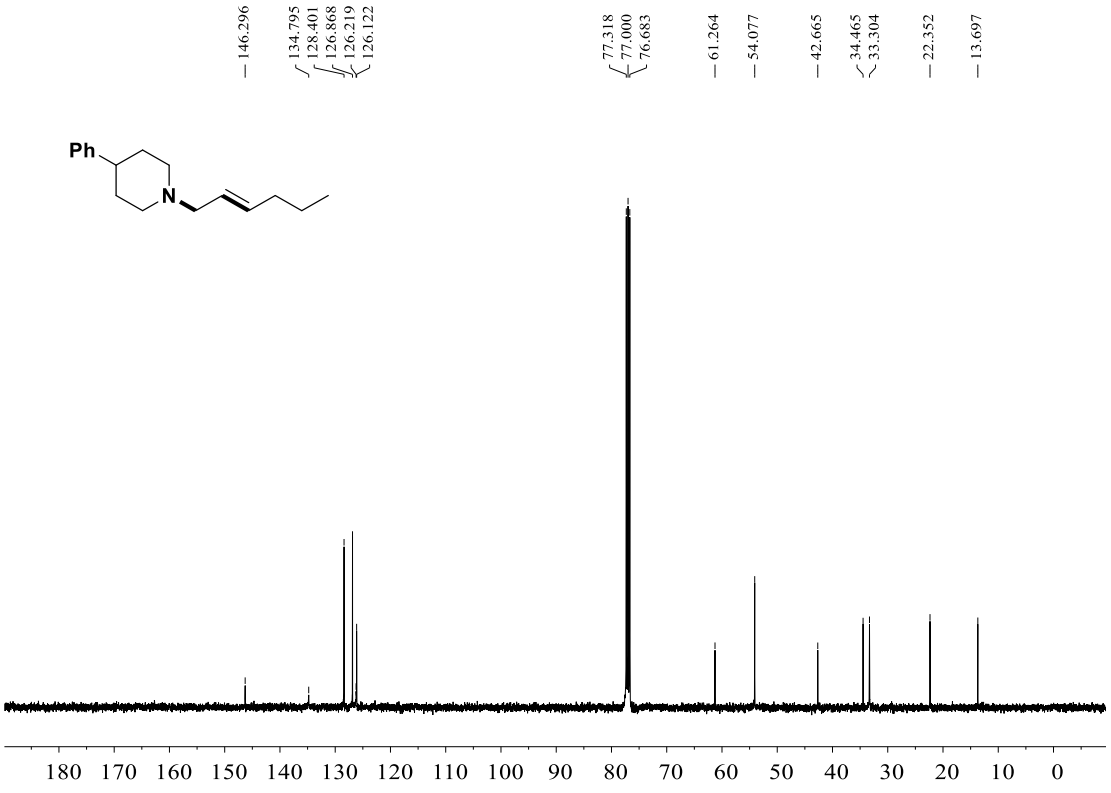
(*E*)-6-(4-(tert-Butyl)phenoxy)-*N*,*N*-dipropylhex-2-en-1-amine (63)



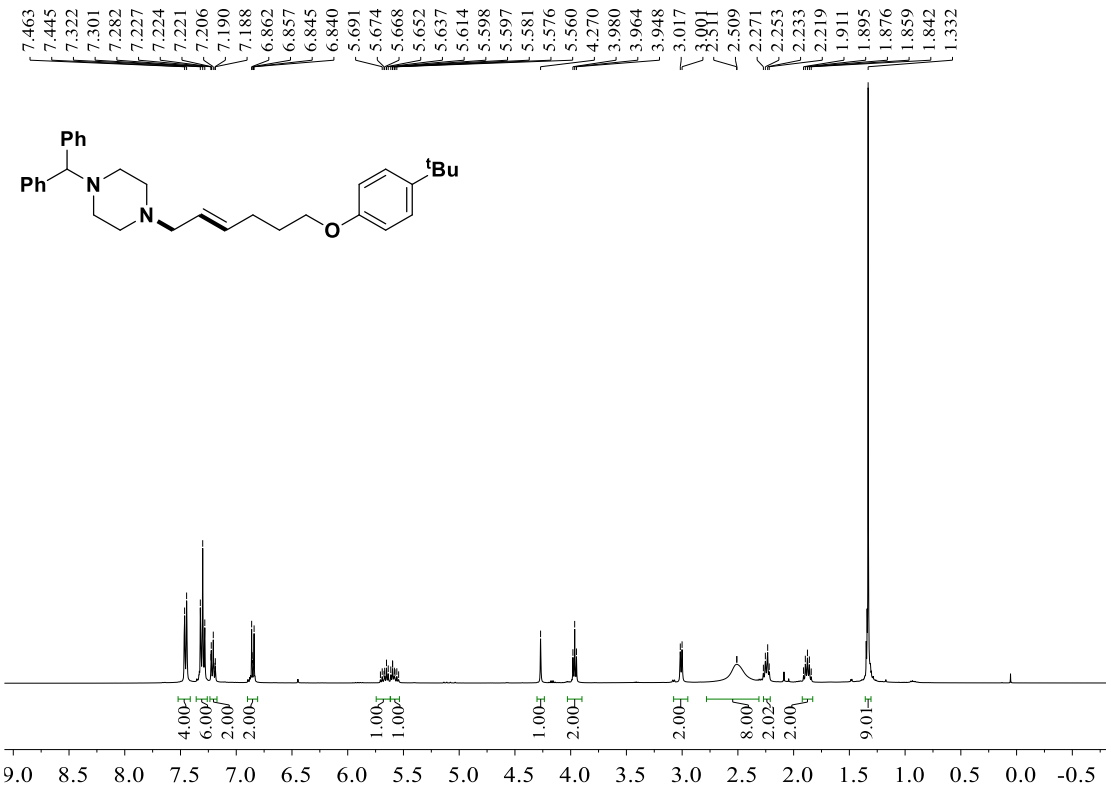


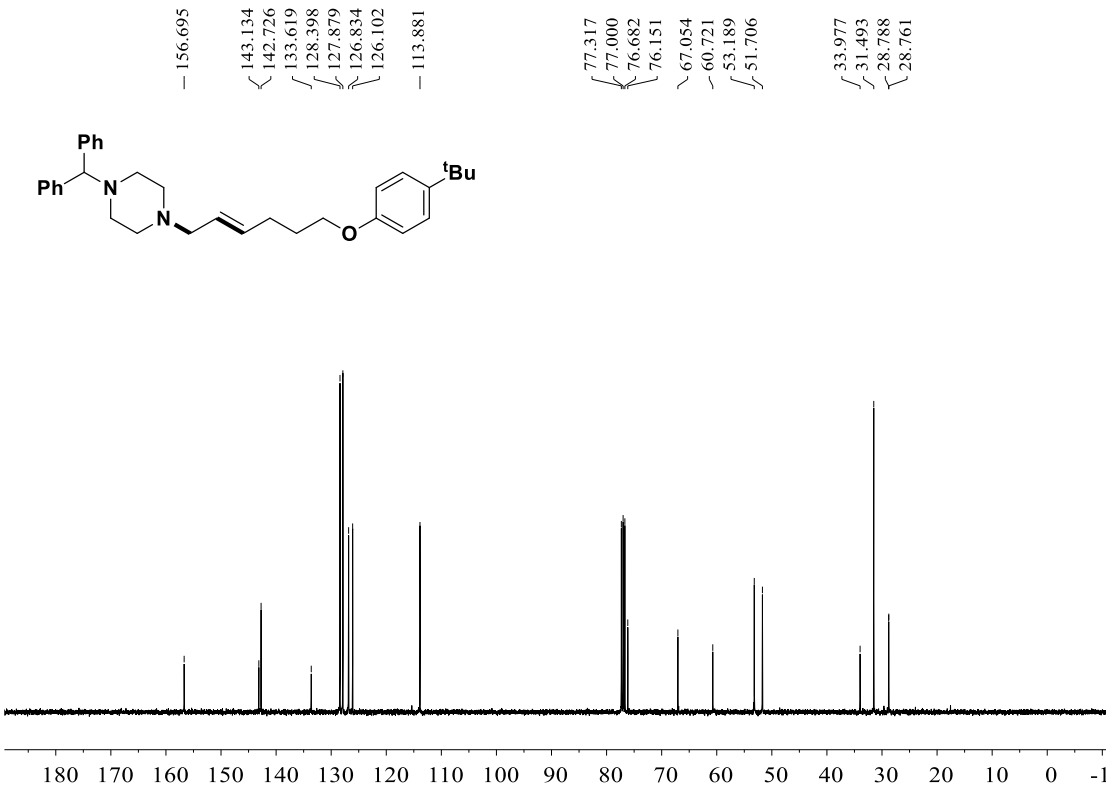
(*E*)-1-(Hex-2-en-1-yl)-4-phenylpiperidine (64)



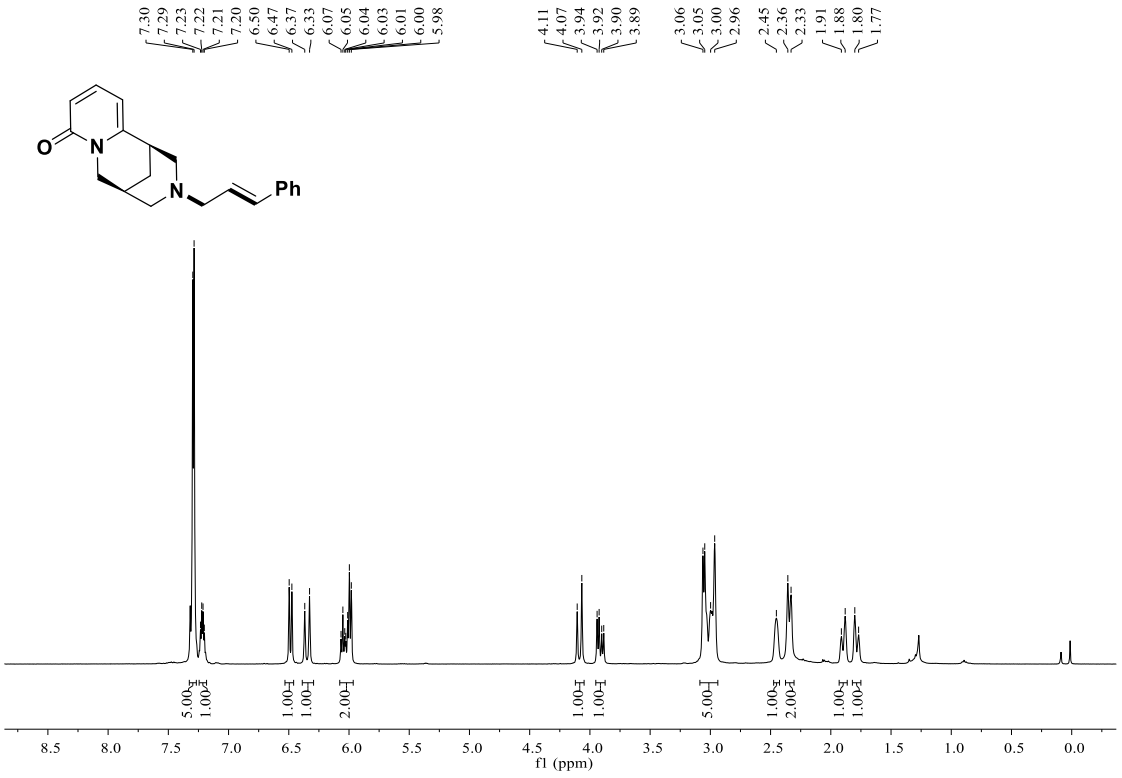


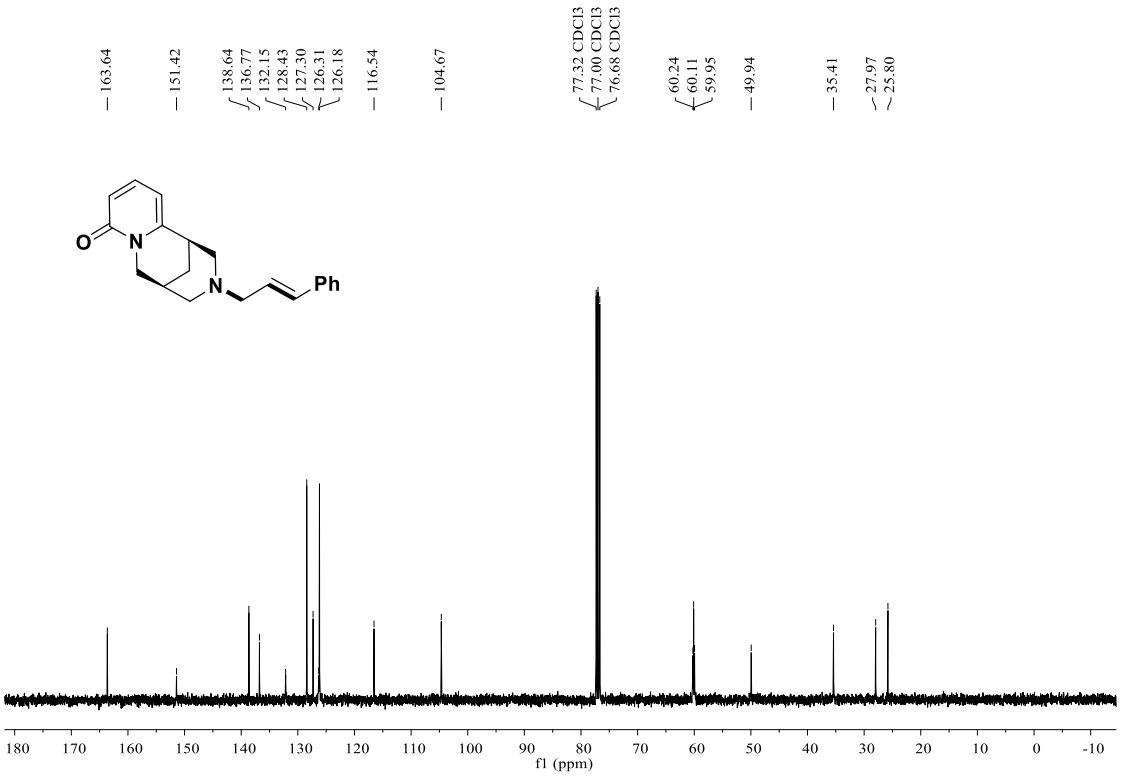
(*E*)-1-Benzhydryl-4-(6-(4-(tert-butyl)phenoxy)hex-2-en-1-yl)piperazine (65)



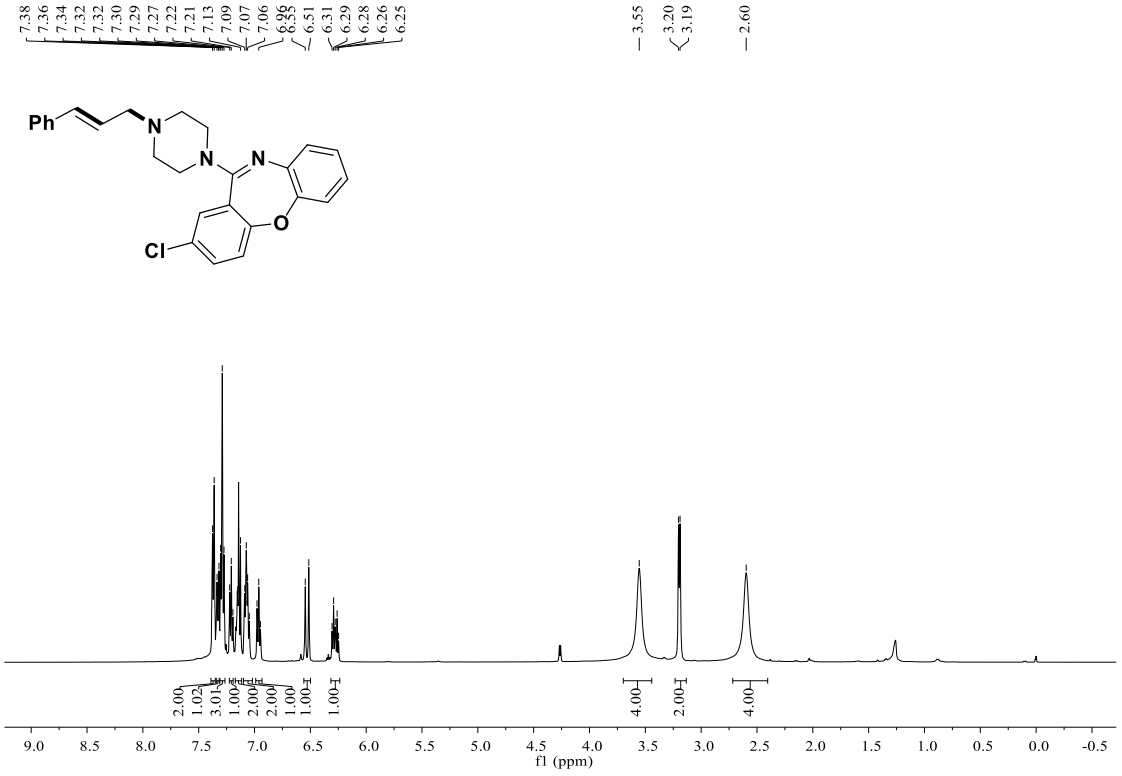


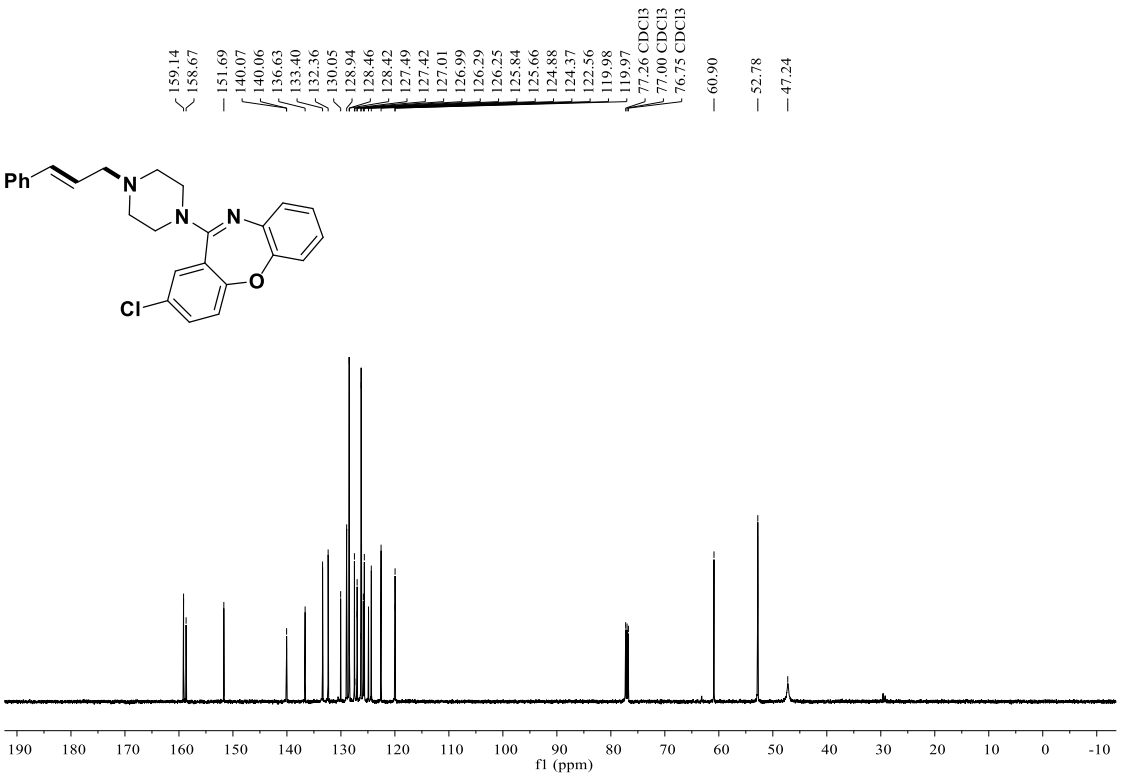
(*1R*,*5S*)-3-Cinnamyl-1,2,3,4,5,6-hexahydro-8H-1,5-methanopyrido[1,2-a][1,5]diazocin-8-one (66)



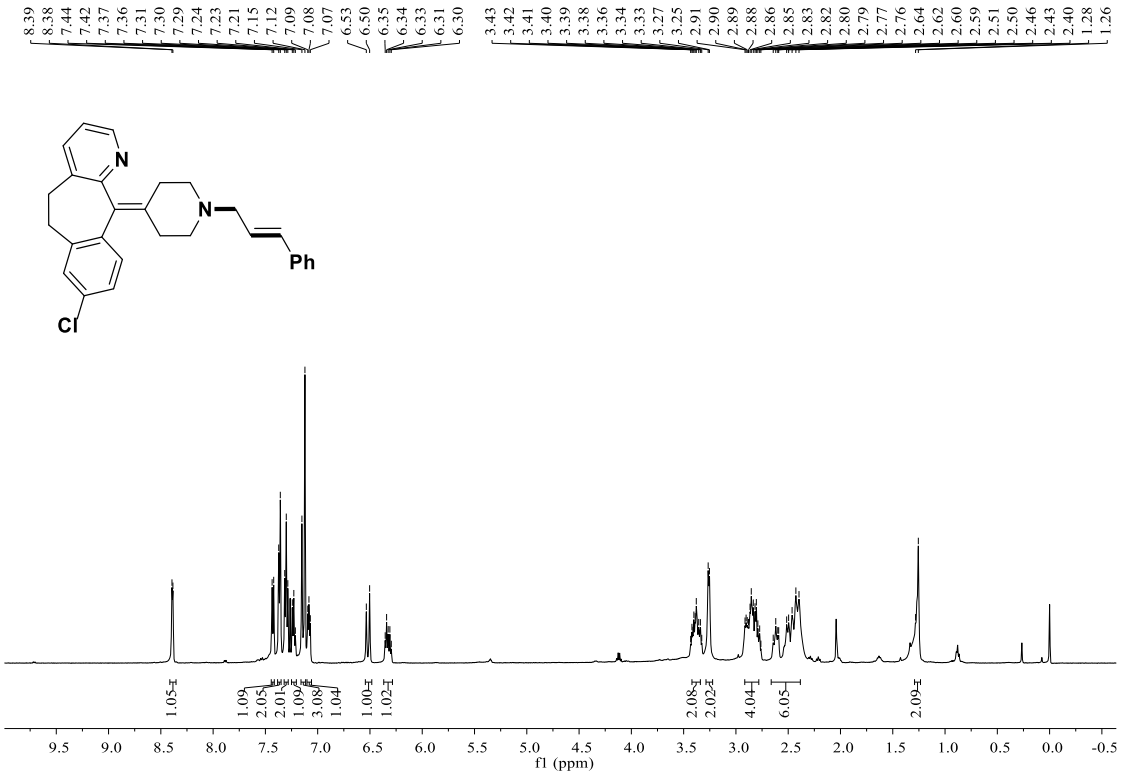


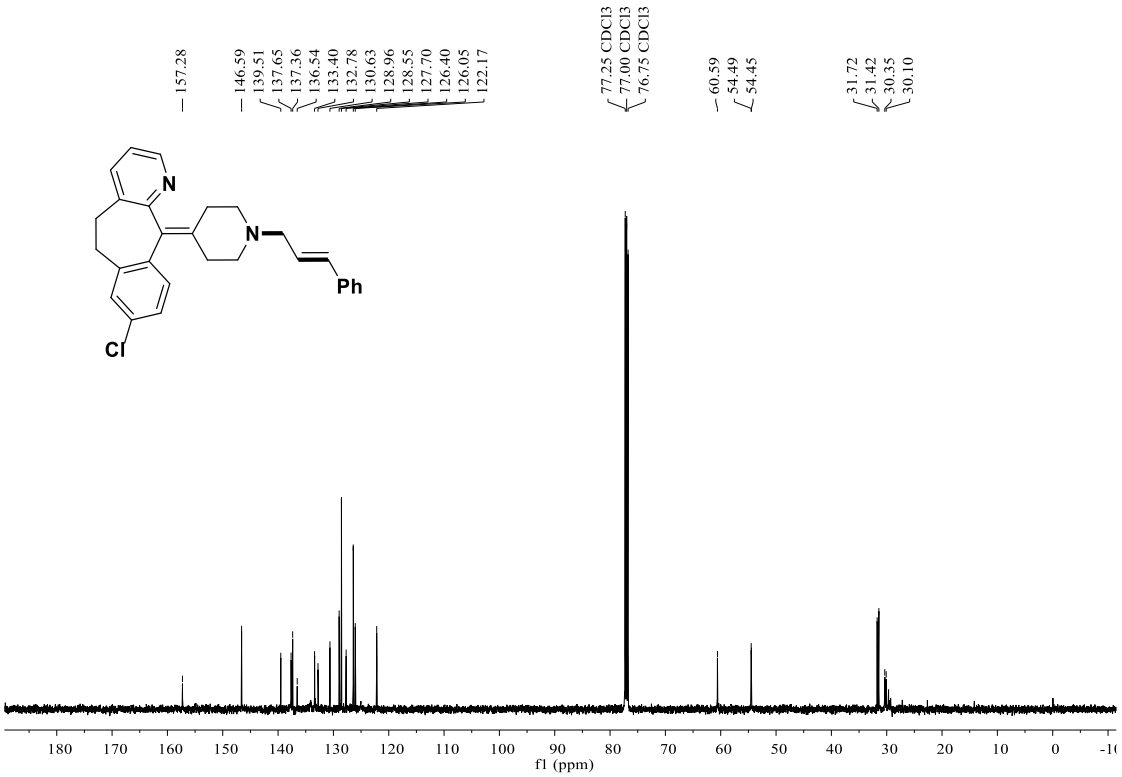
2-Chloro-11-(4-cinnamylpiperazin-1-yl)dibenzo[*b*,*f*][1,4]oxazepane (67)



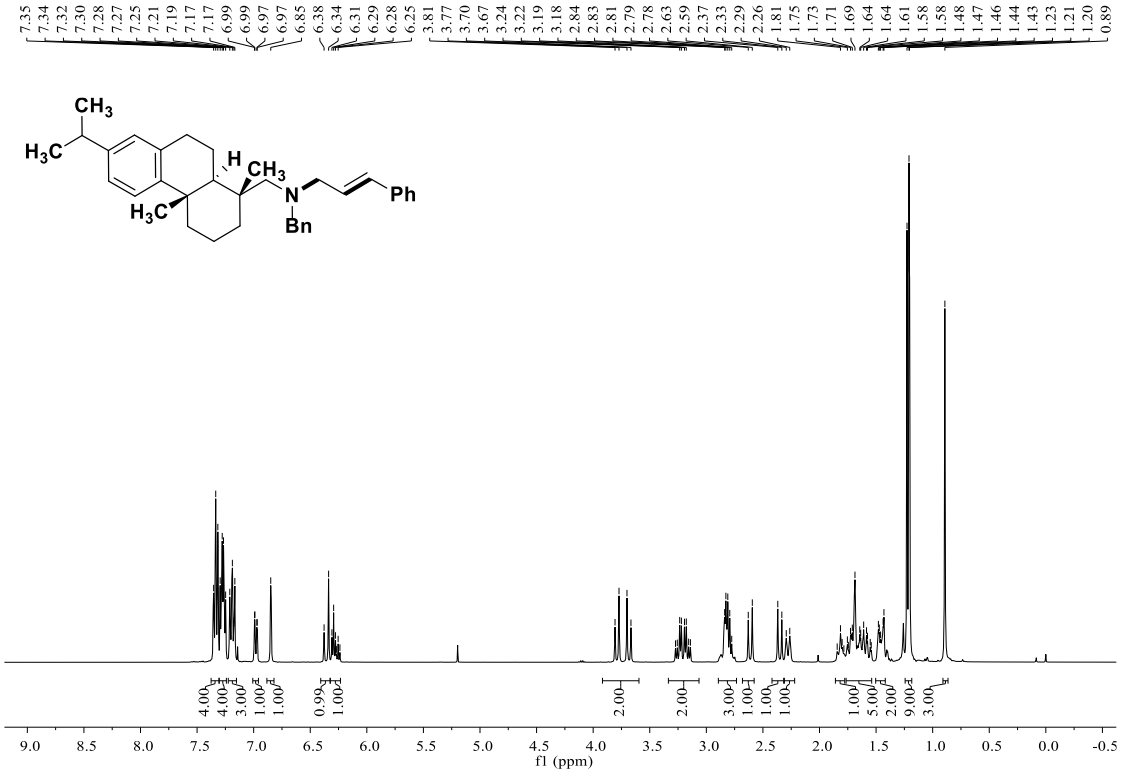


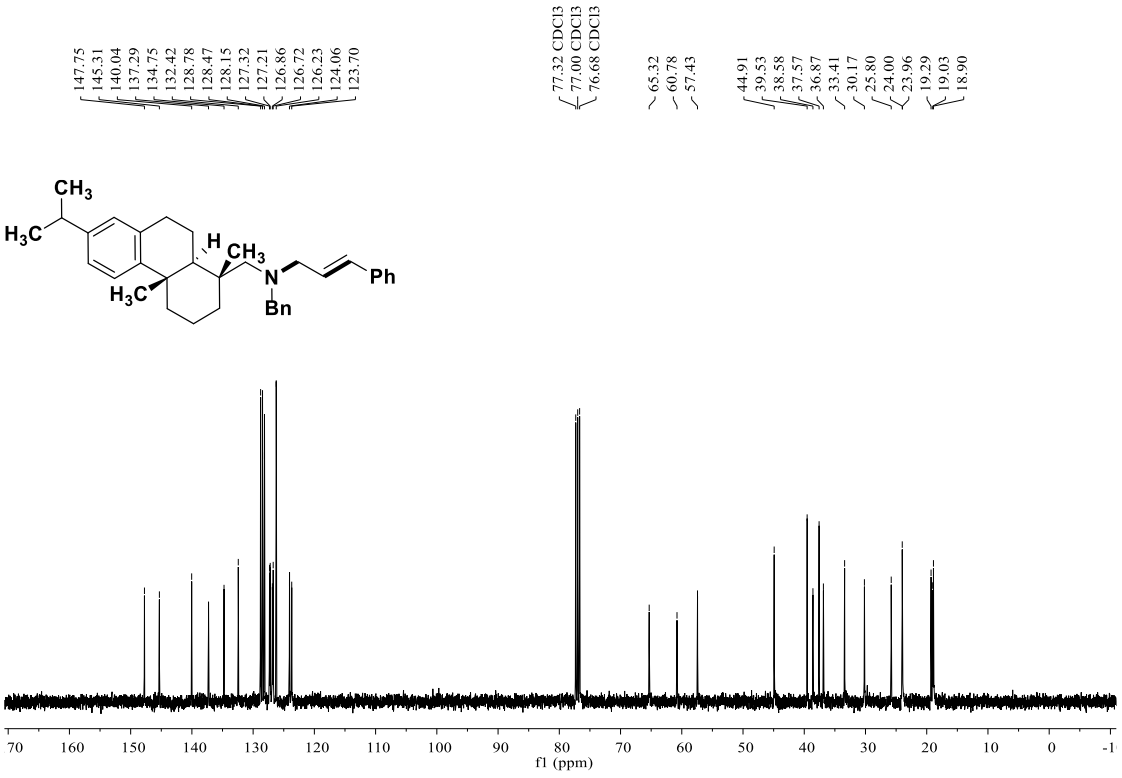
8-Chloro-11-(1-cinnamylpiperidin-4-ylidene)-6,11-dihydro-5H-benzo[5,6]cyclohepta[1,2-b]pyridine (68)



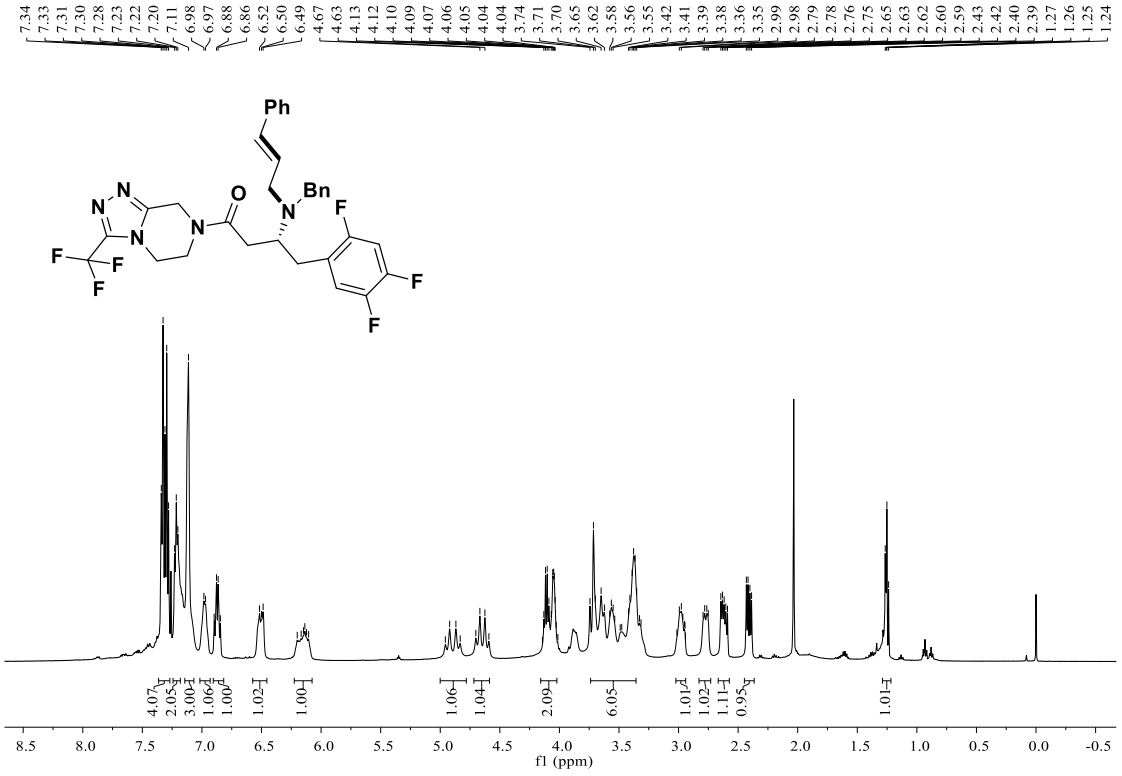


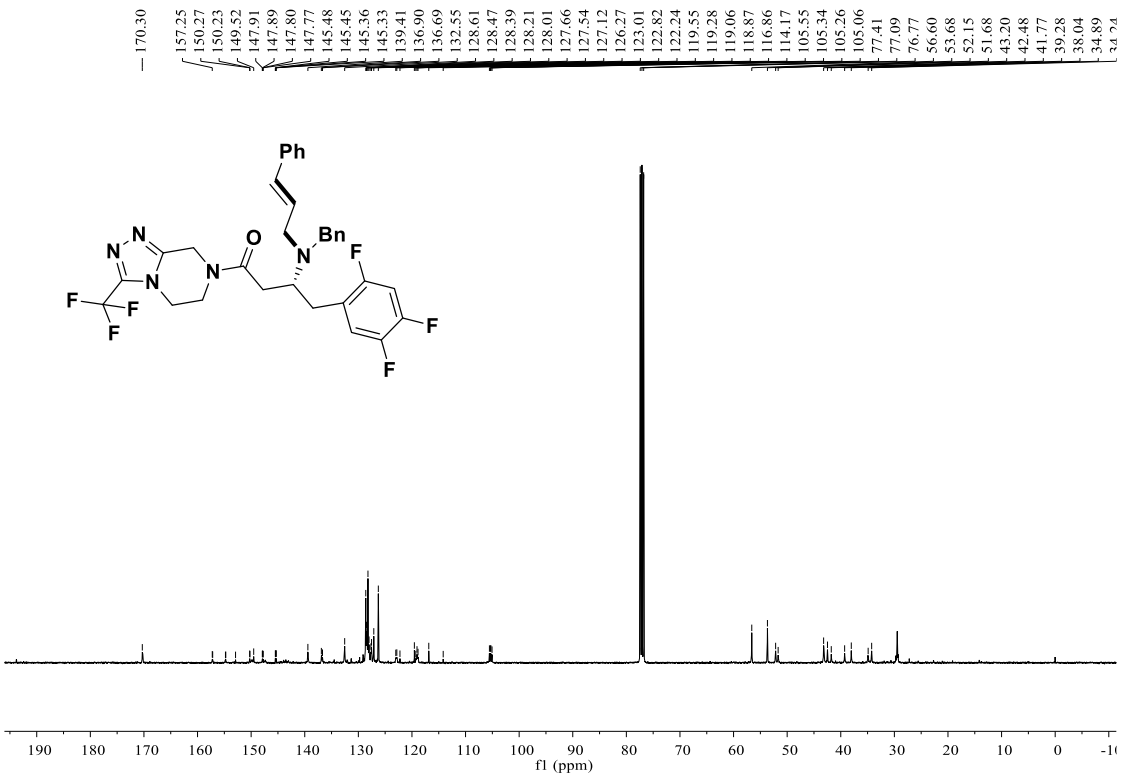
(*E*)-*N*-Benzyl-*N*-(((1R,4aS,10aR)-7-isopropyl-1,4a-dimethyl-1,2,3,4,4a,9,10,10a-octahydrophenanthren-1-yl)methyl)-3-phenylprop-2-en-1-amine (69)



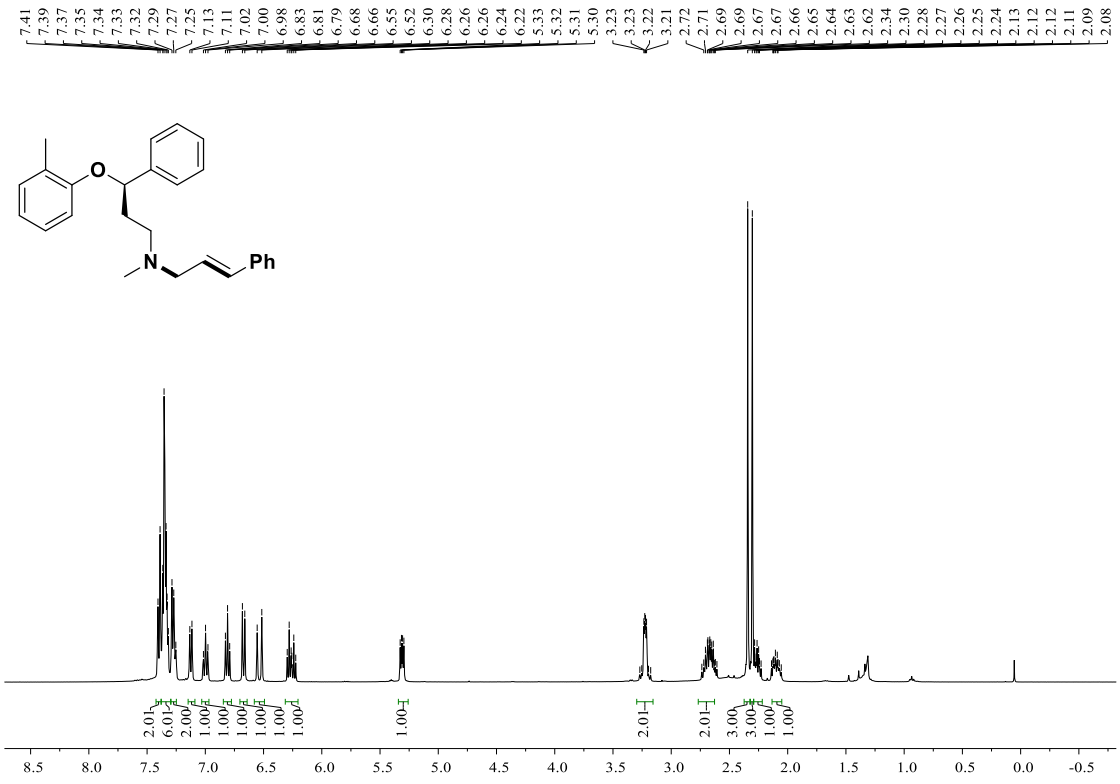


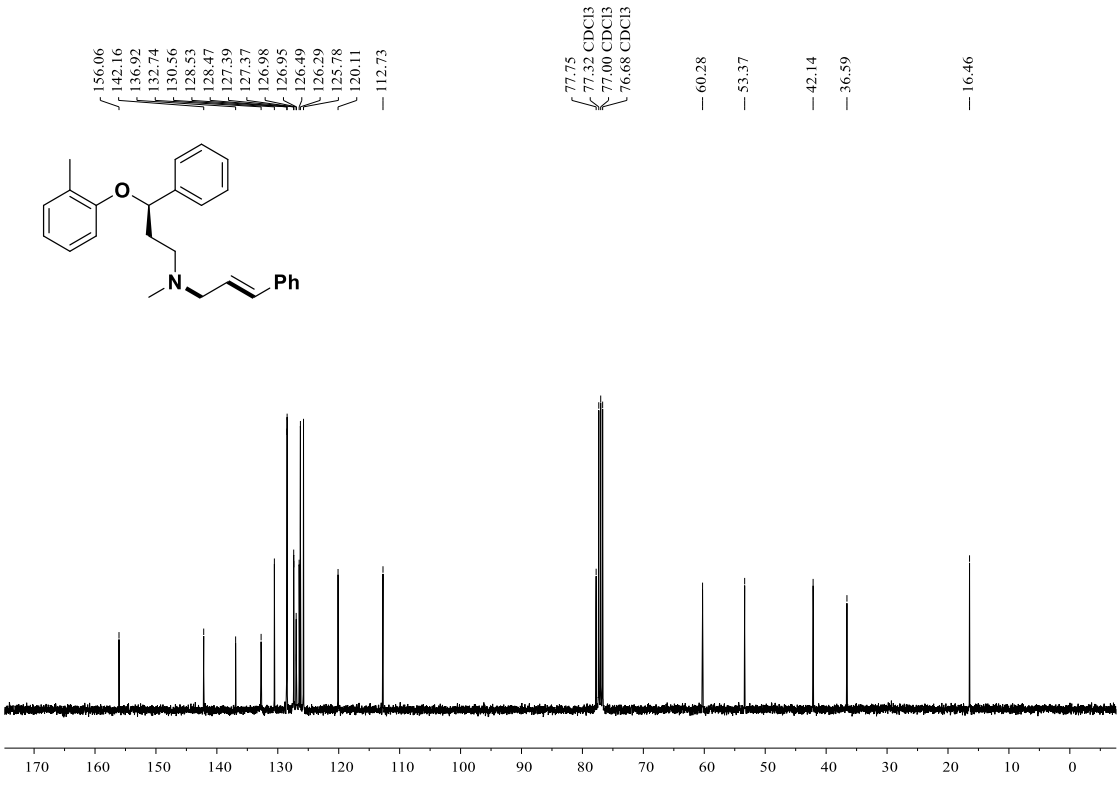
(*R*)-3-(Benzyl(cinnamyl)amino)-1-(3-(trifluoromethyl)-5,6-dihydro-[1,2,4]triazolo[4,3-a]pyrazin-7(8H)-yl)-4-(2,4,5-trifluorophenyl)butan-1-one (70)



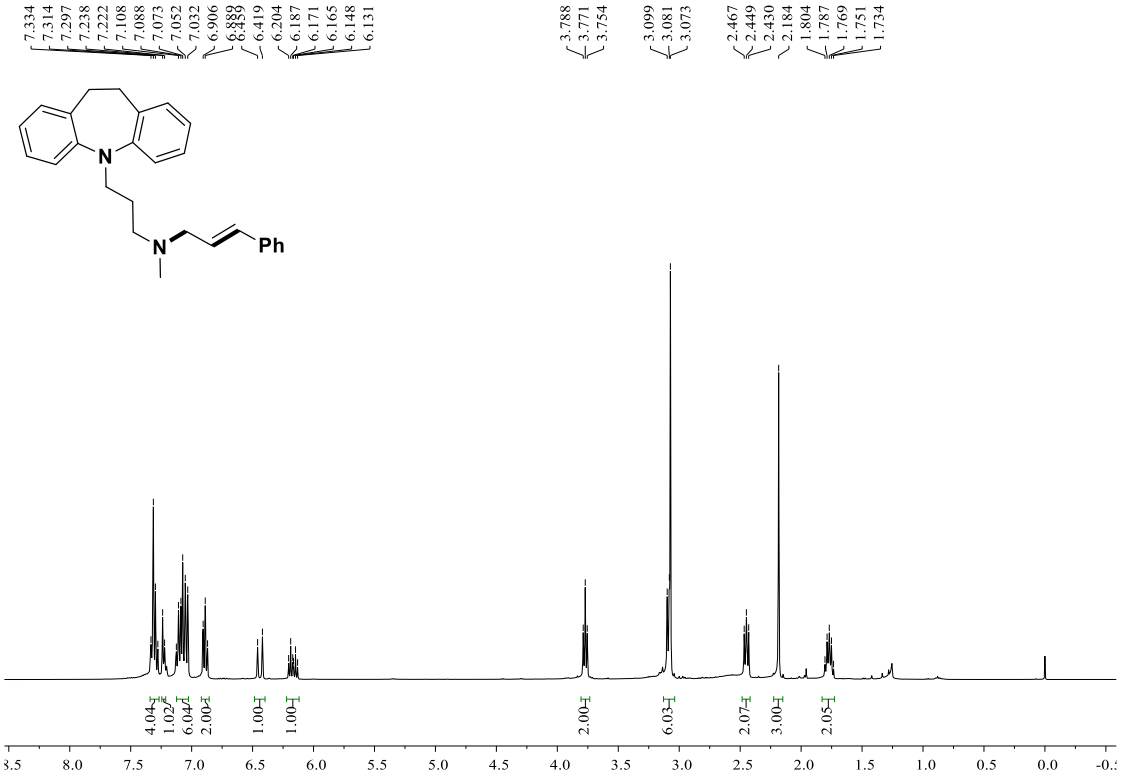


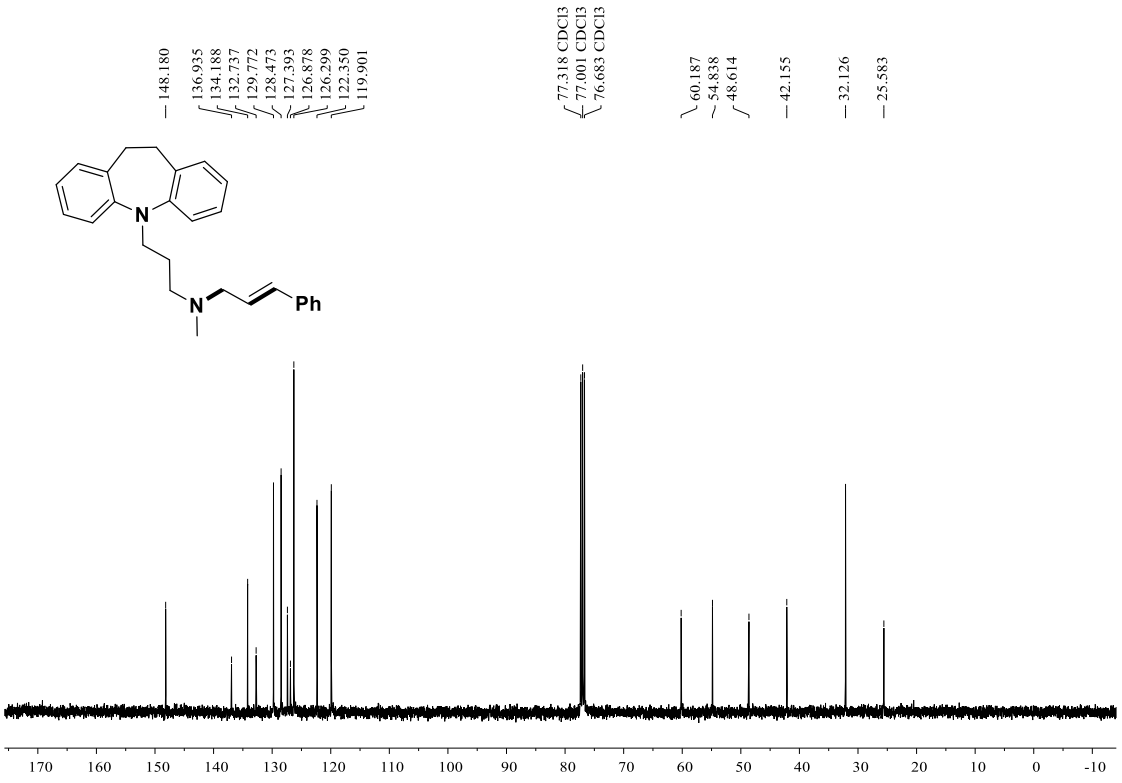
(*R*,*E*)-*N*-Methyl-3-phenyl-N-(3-phenyl-3-(o-tolyloxy)propyl)prop-2-en-1-amine (71)



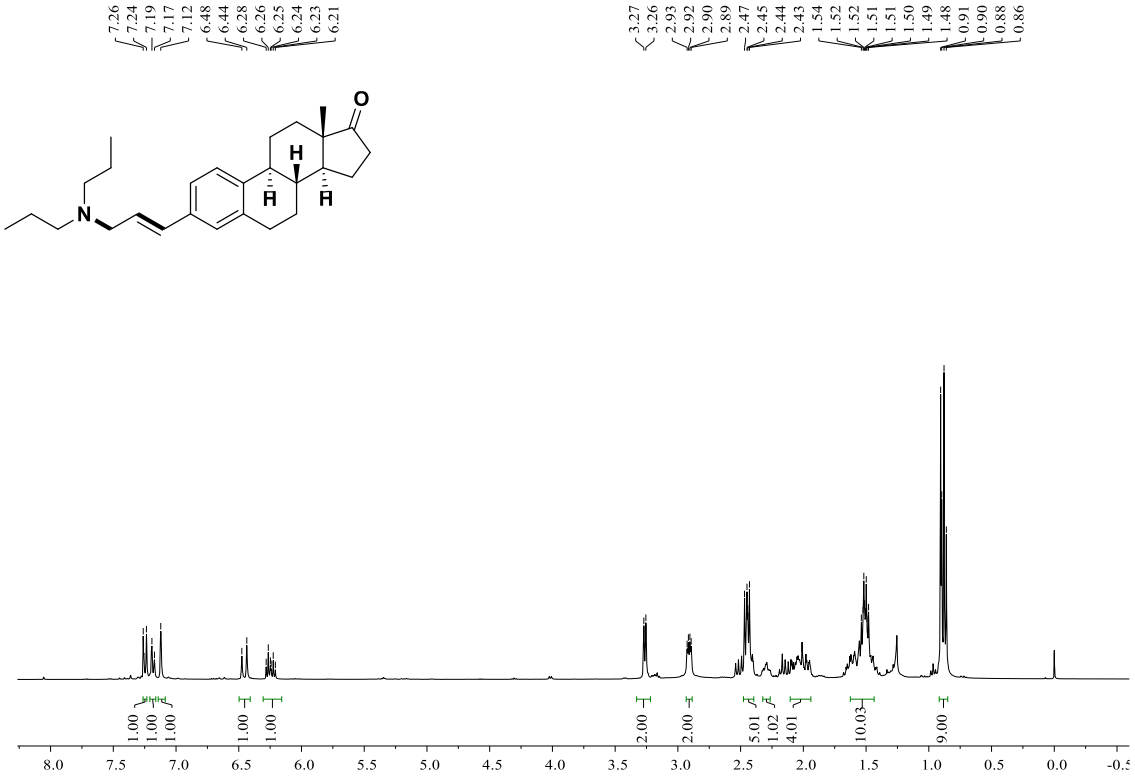


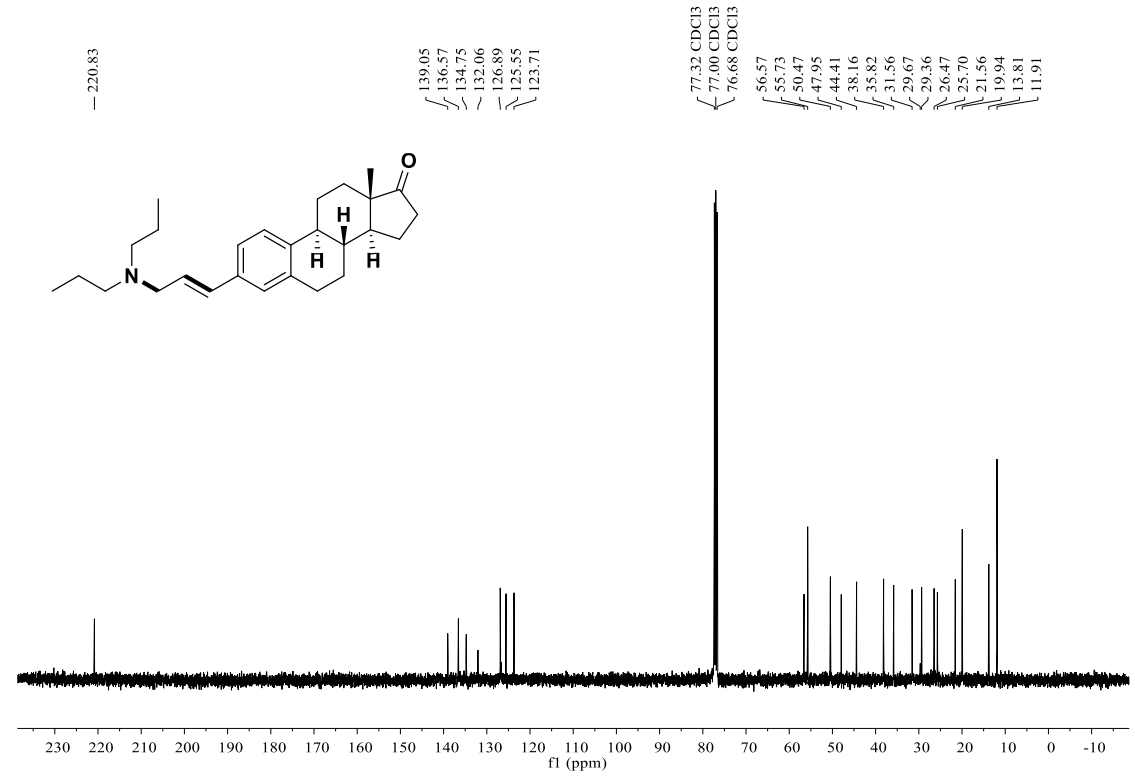
(*E*)-*N*-(3-(10,11-Dihydro-5H-dibenzo[b,f]azepin-5-yl)propyl)-*N*-methyl-3-phenylprop-2-en-1-amine (72)



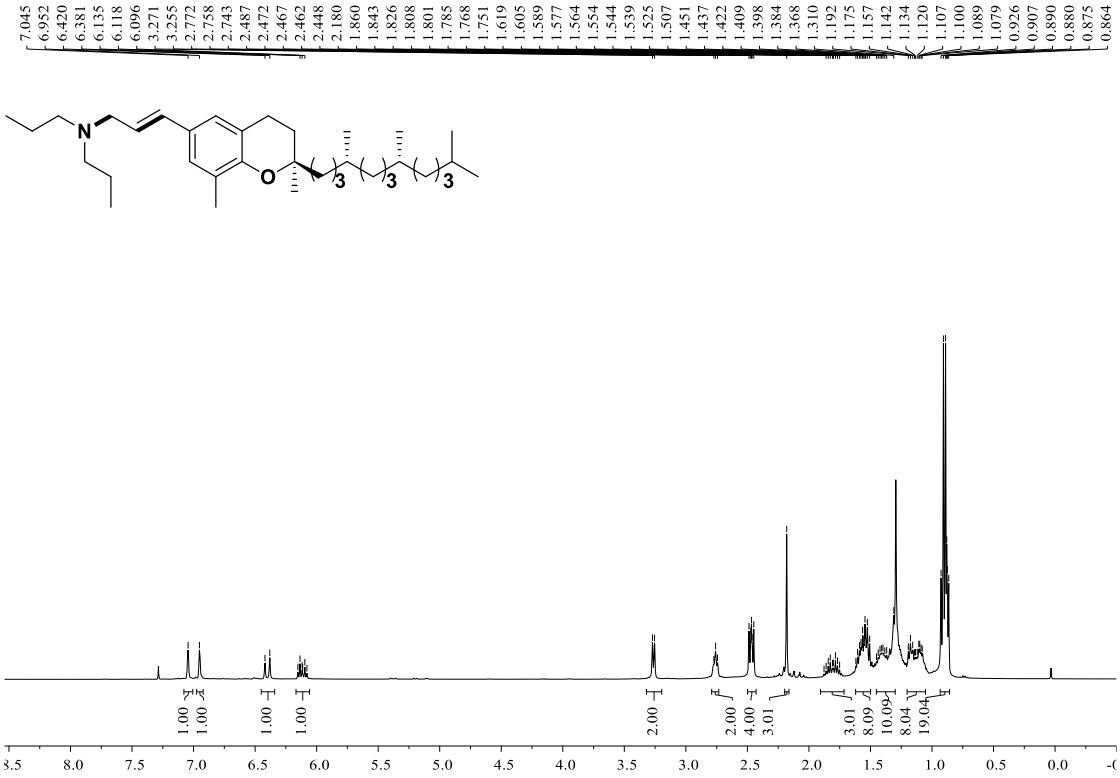


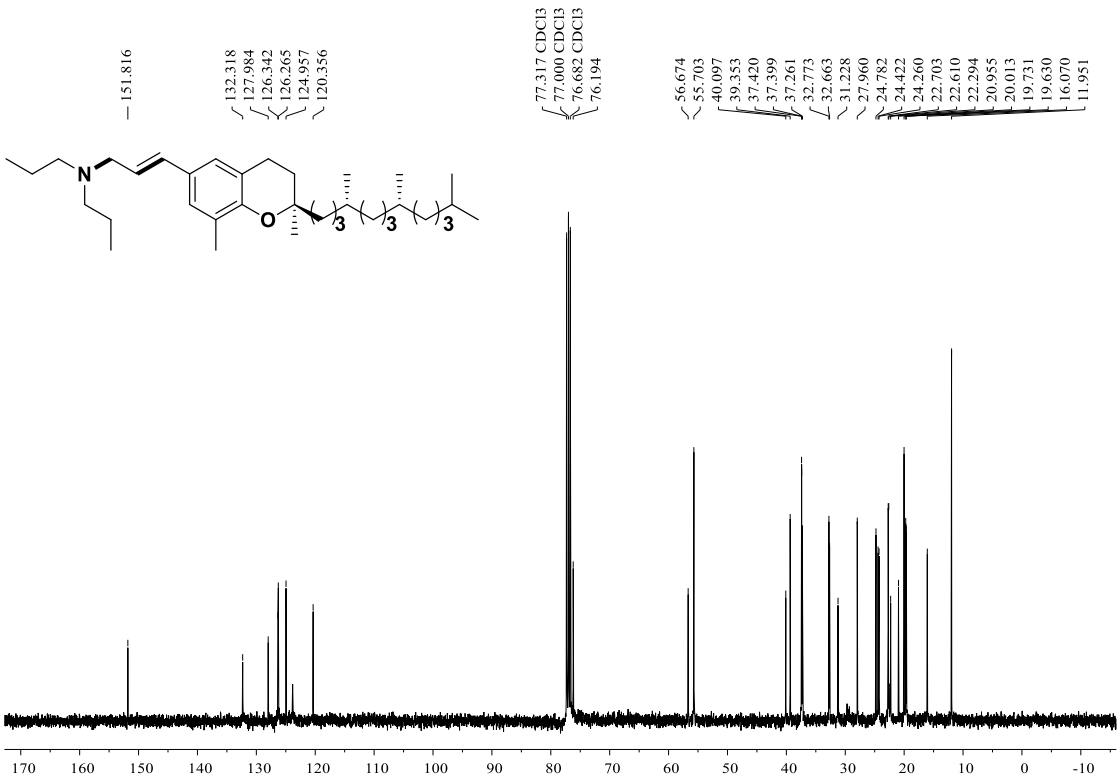
(8R,9S,13S,14S)-3-((*E*)-3-(Dipropylamino)prop-1-en-1-yl)-13-methyl-6,7,8,9,11,12,13,14,15,16-decahydro-17H-cyclopenta[a]phenanthren-17-one (73)



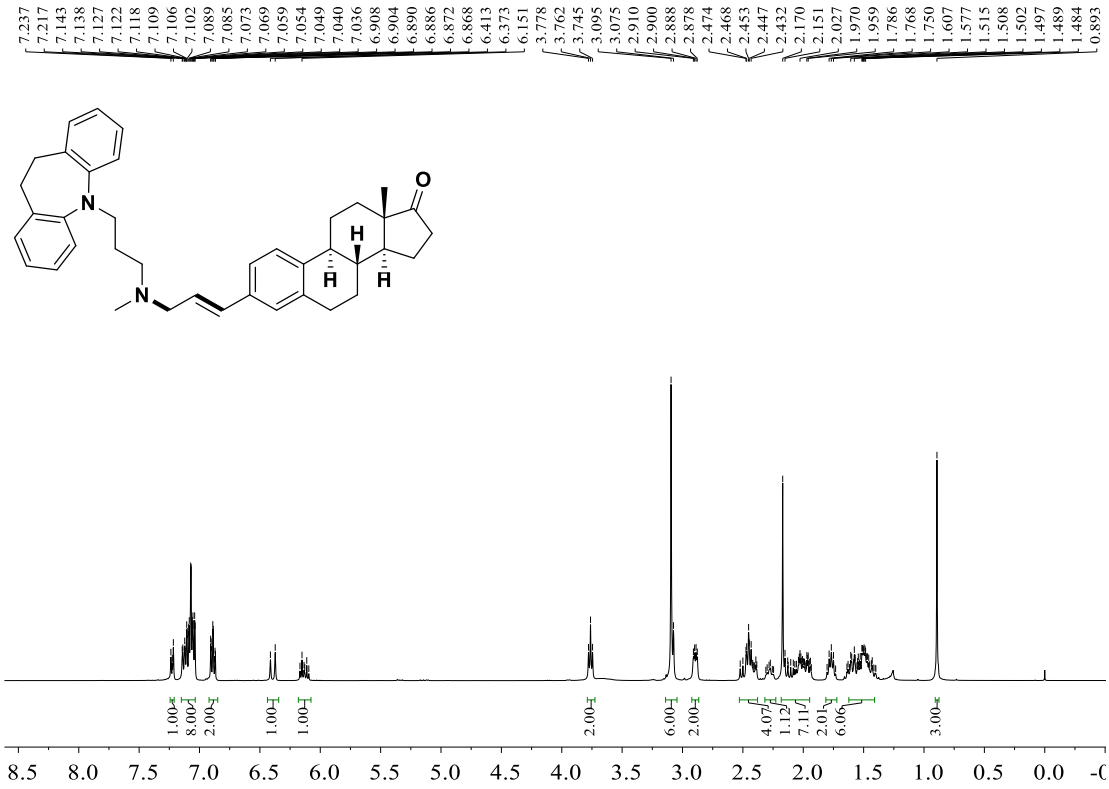


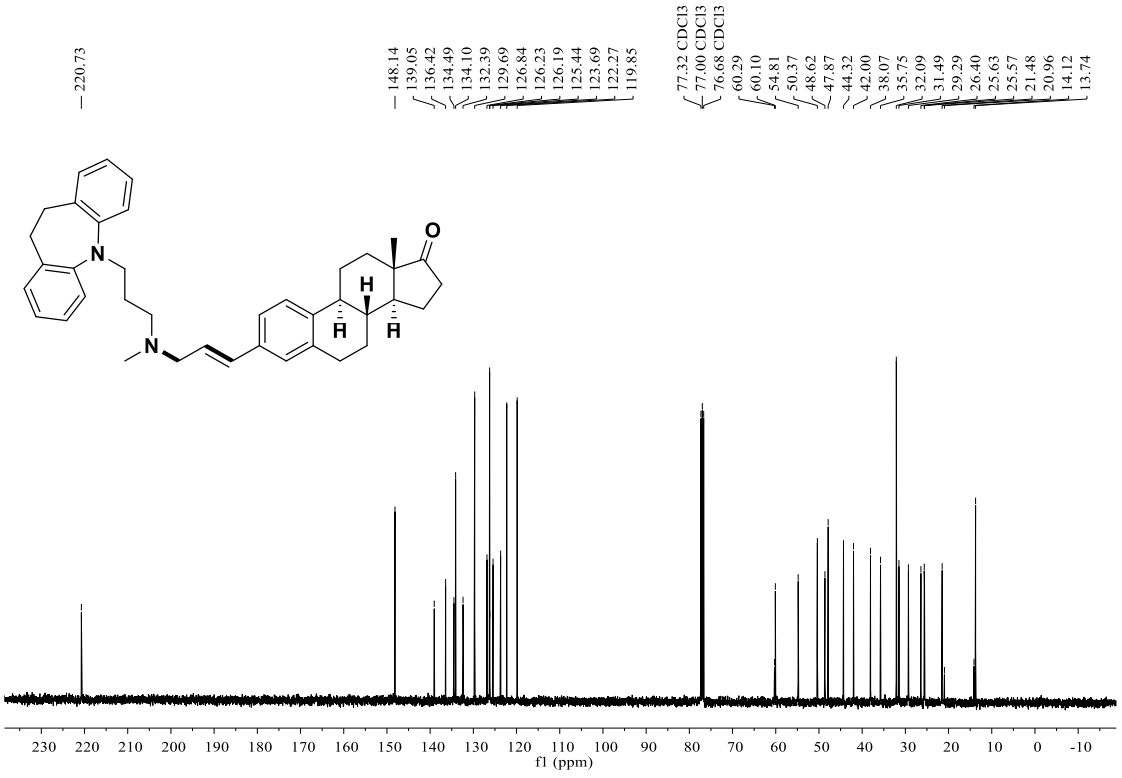
(*E*)-3-((*R*)-2,8-Dimethyl-2-((4*R*,8*R*)-4,8,12-trimethyltridecyl)chroman-6-yl)-*N*,*N*-dipropylprop-2-en-1-amine (74)



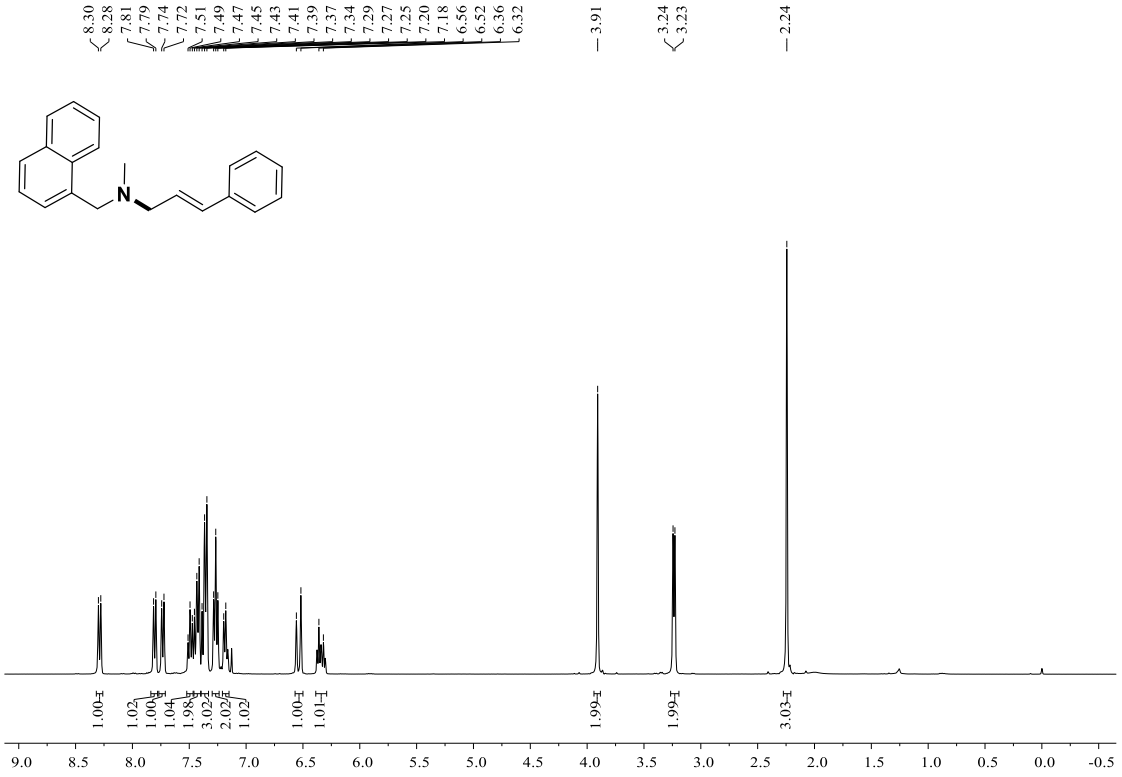


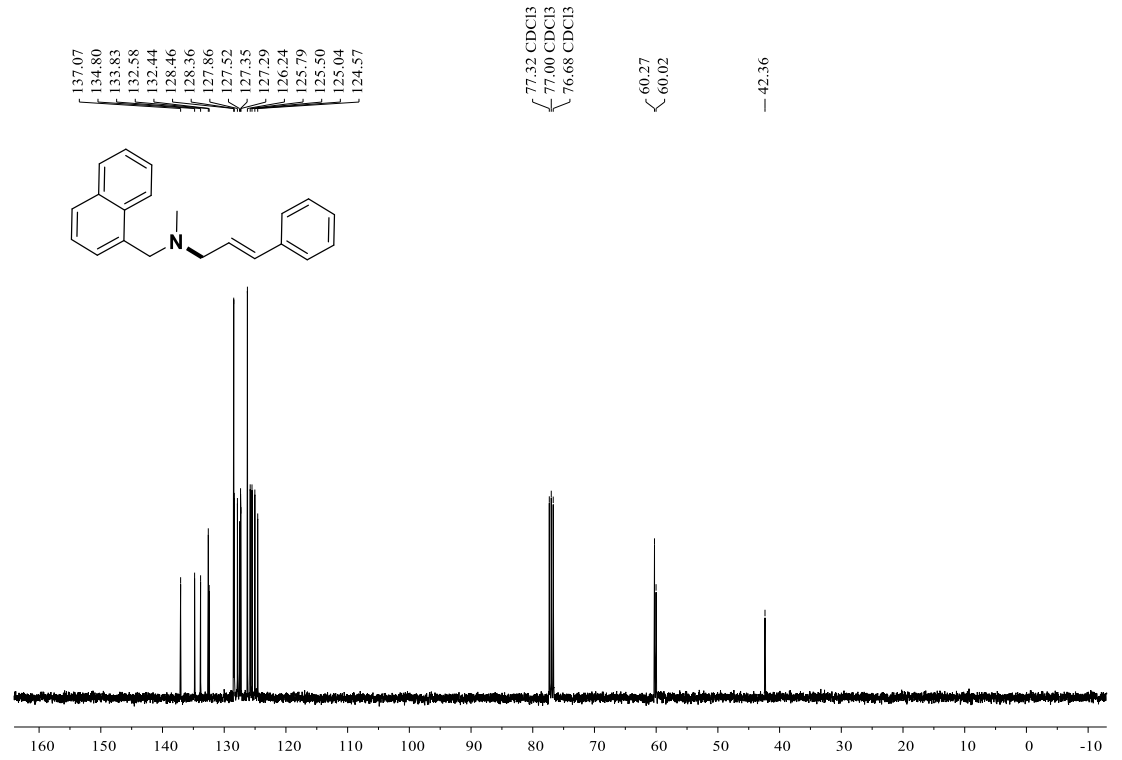
(8*R*,9*S*,13*S*,14*S*)-3-((*E*)-3-((3-(10,11-Dihydro-5*H*-dibenzo[*b*,*f*]azepin-5-yl)propyl)(methyl)amino)prop-1-en-1-yl)-13-methyl-6,7,8,9,11,12,13,14,15,16-decahydro-17*H*-cyclopenta[*a*]phenanthren-17-one (75)



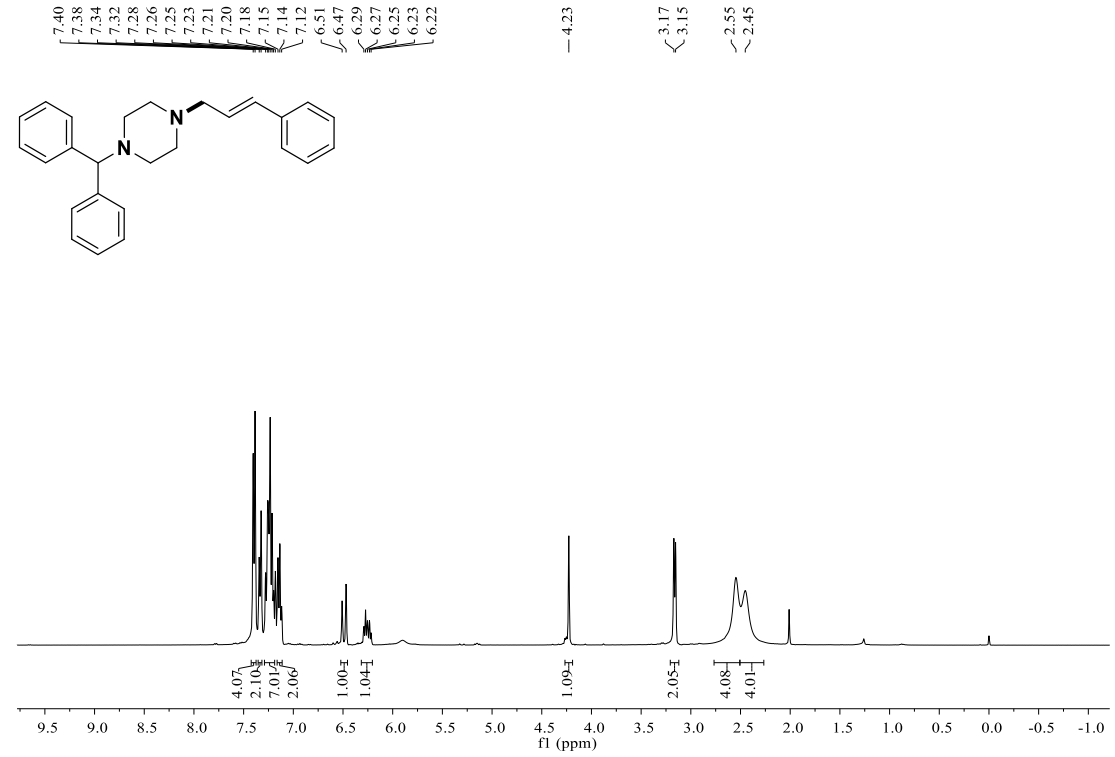


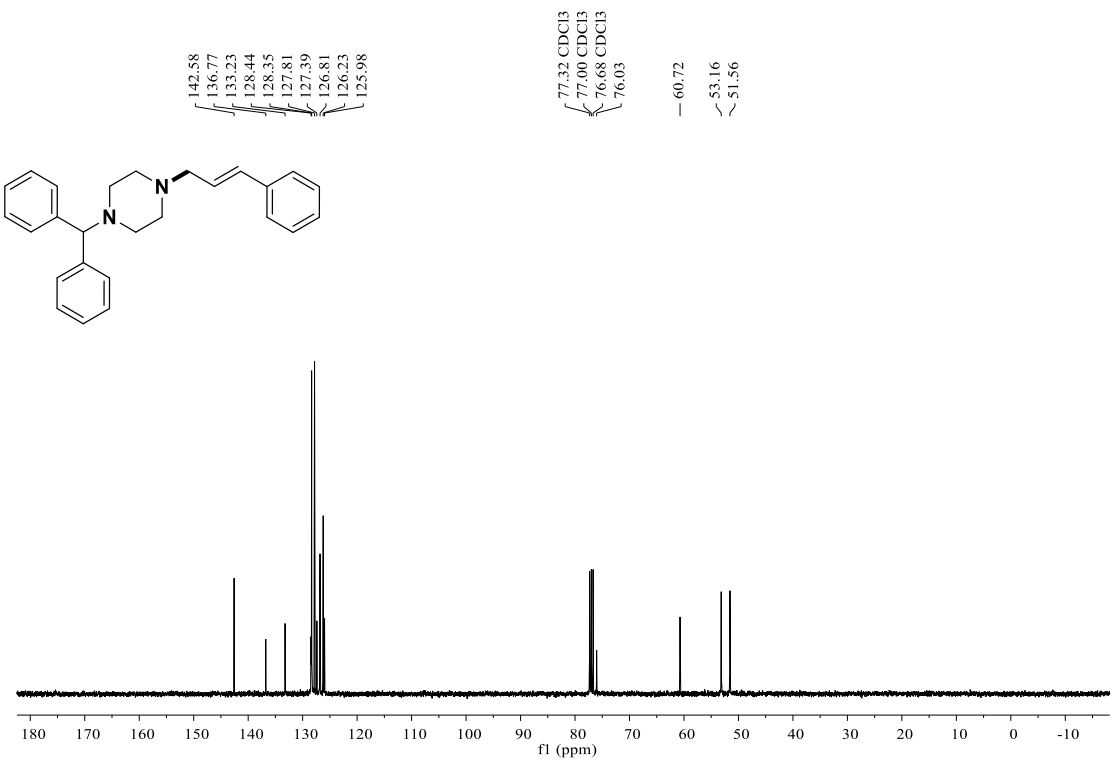
(*E*)-*N*-Methyl-*N*-(naphthalen-1-ylmethyl)-3-phenylprop-2-en-1-amine (76)



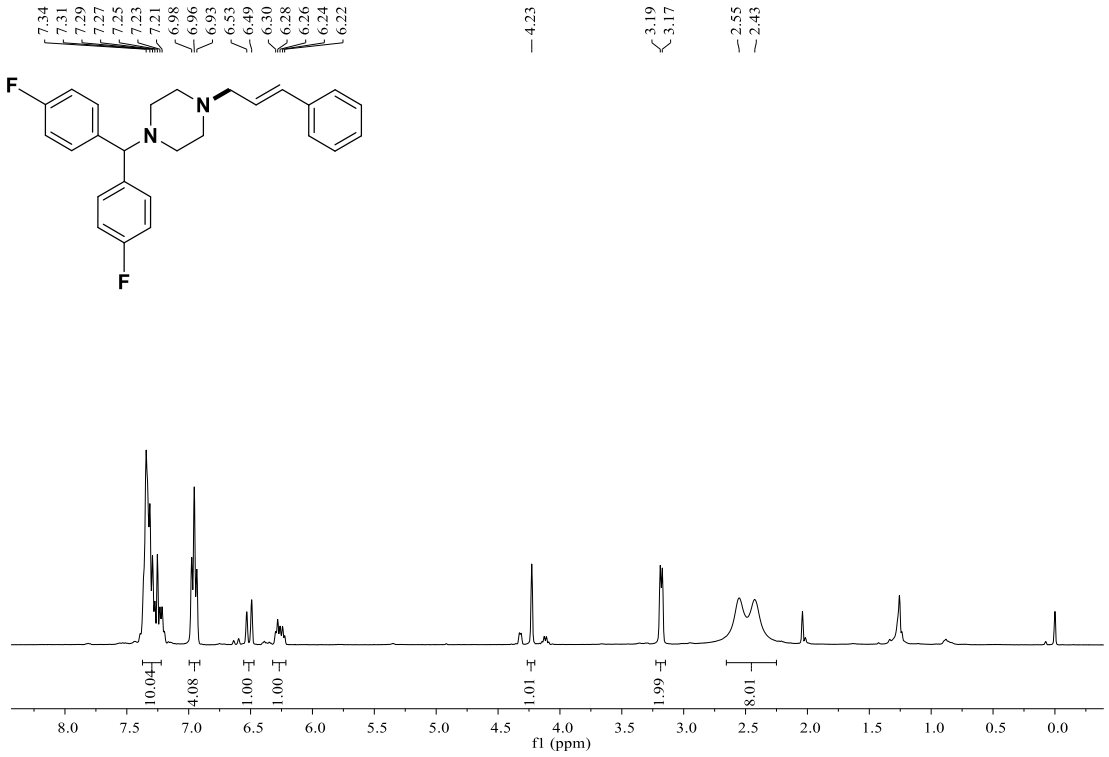


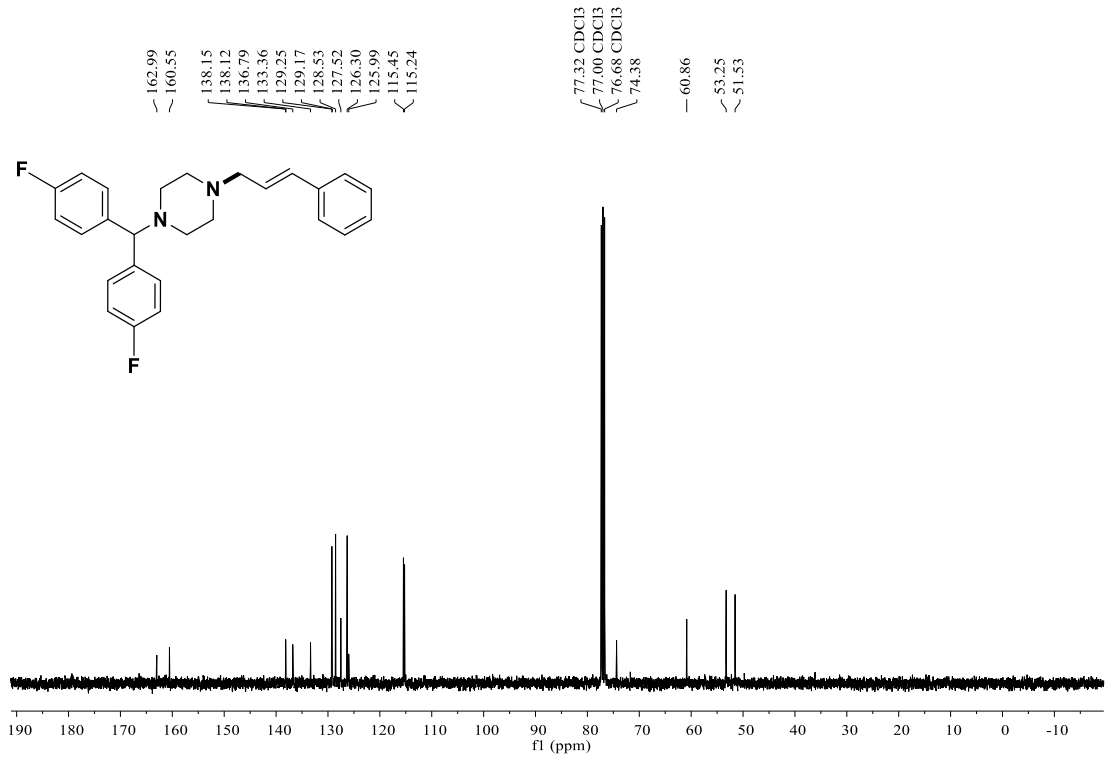
1-Benzhydryl-4-cinnamylpiperazine (77)



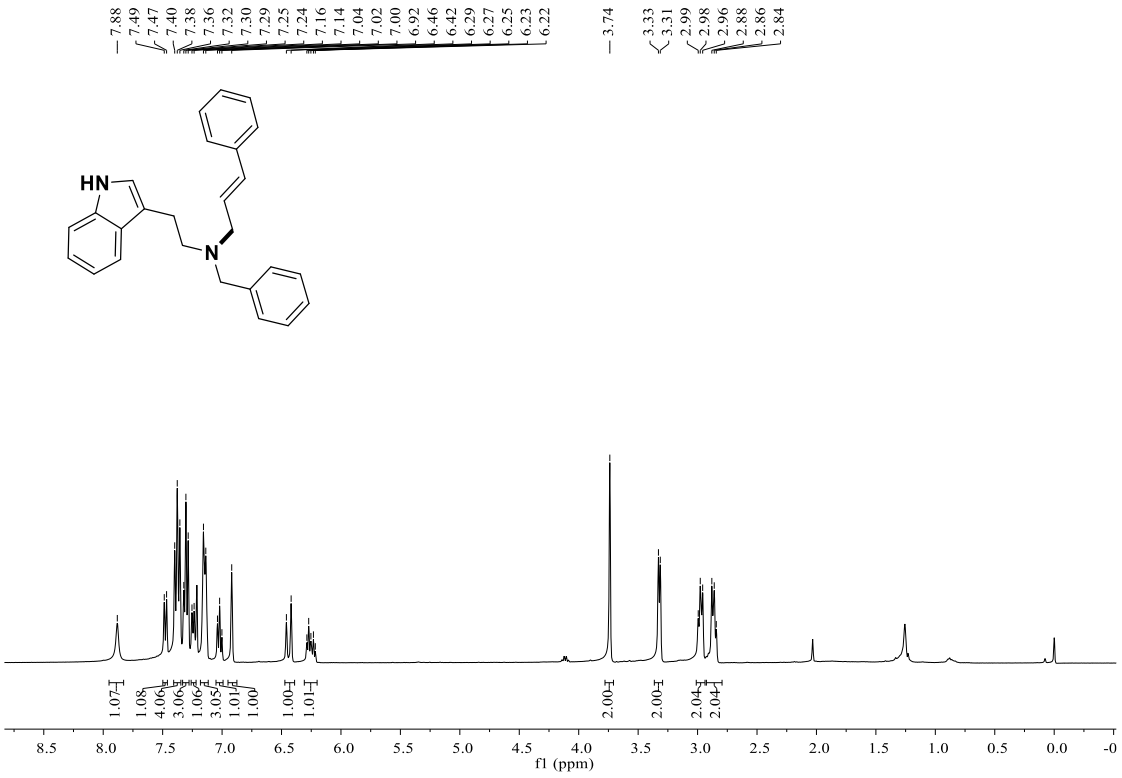


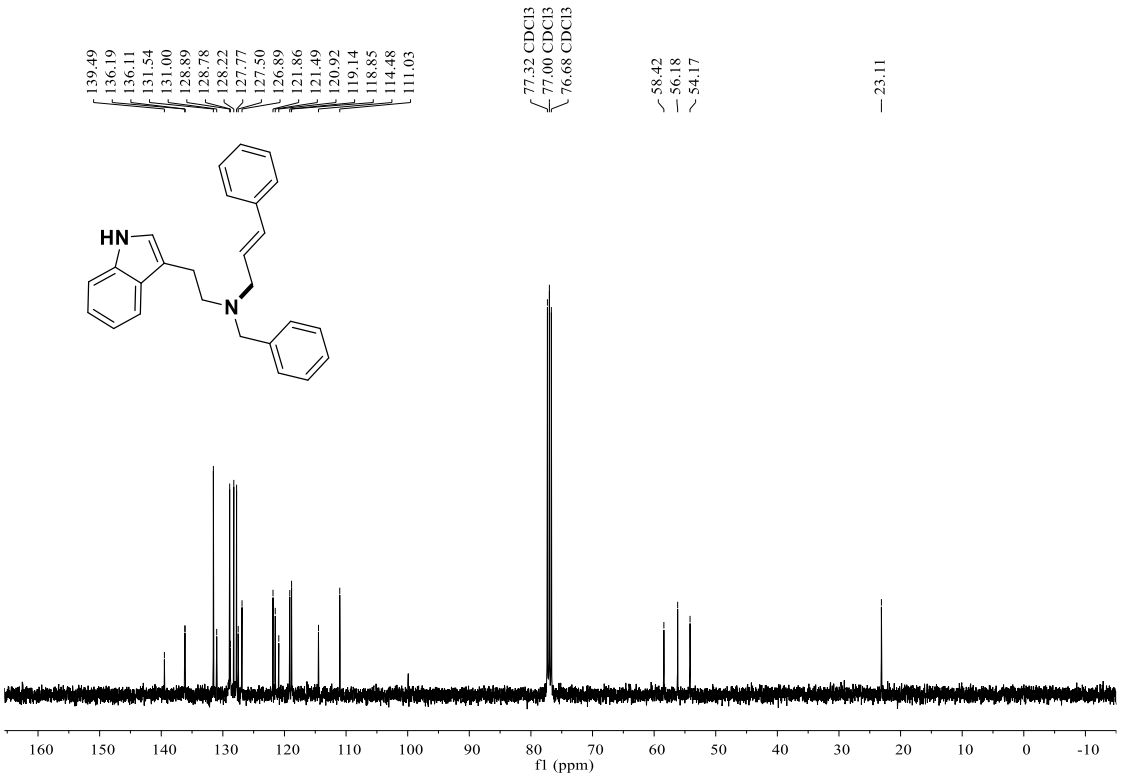
1-(bis(4-Fluorophenyl)methyl)-4-cinnamylpiperazine (78)



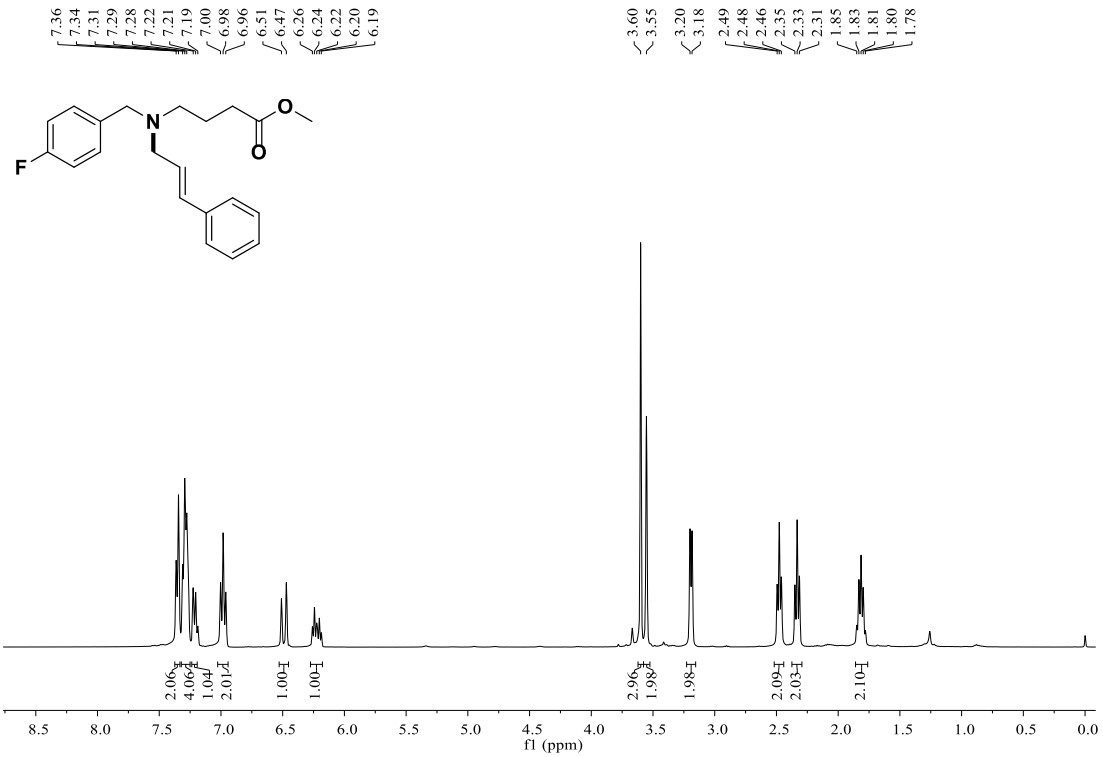


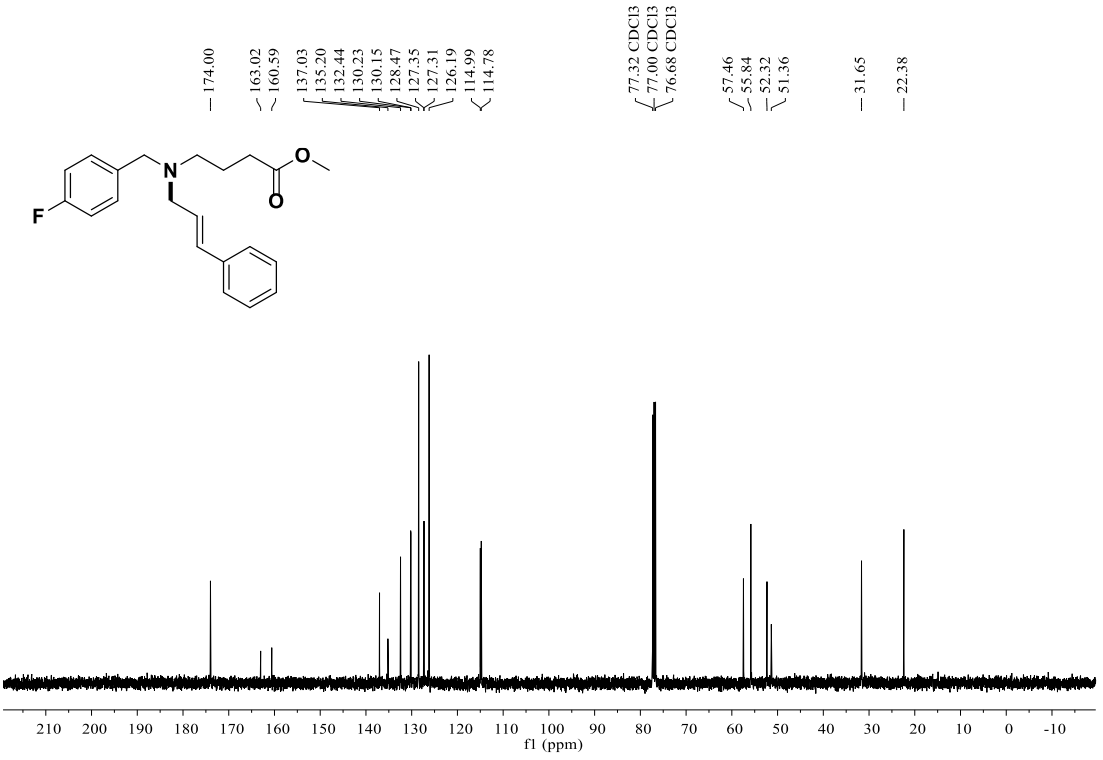
(*E*)-*N*-(2-(1*H*-Indol-3-yl)ethyl)-*N*-benzyl-3-phenylprop-2-en-1-amine (79)



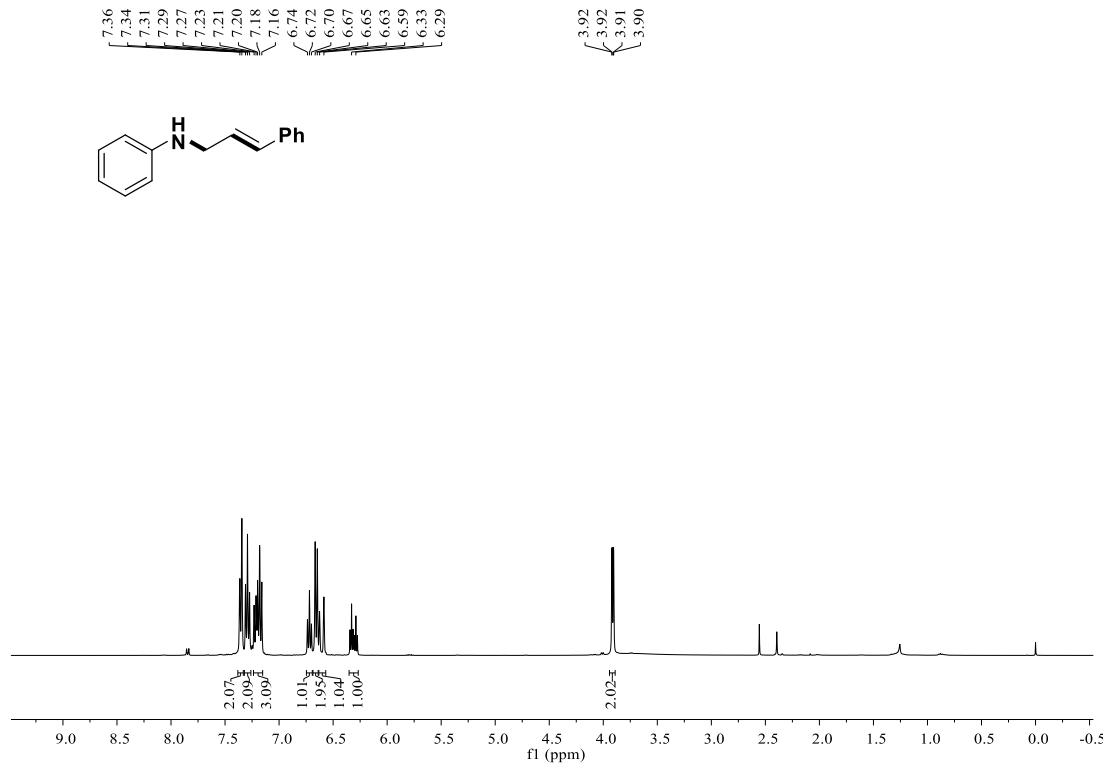


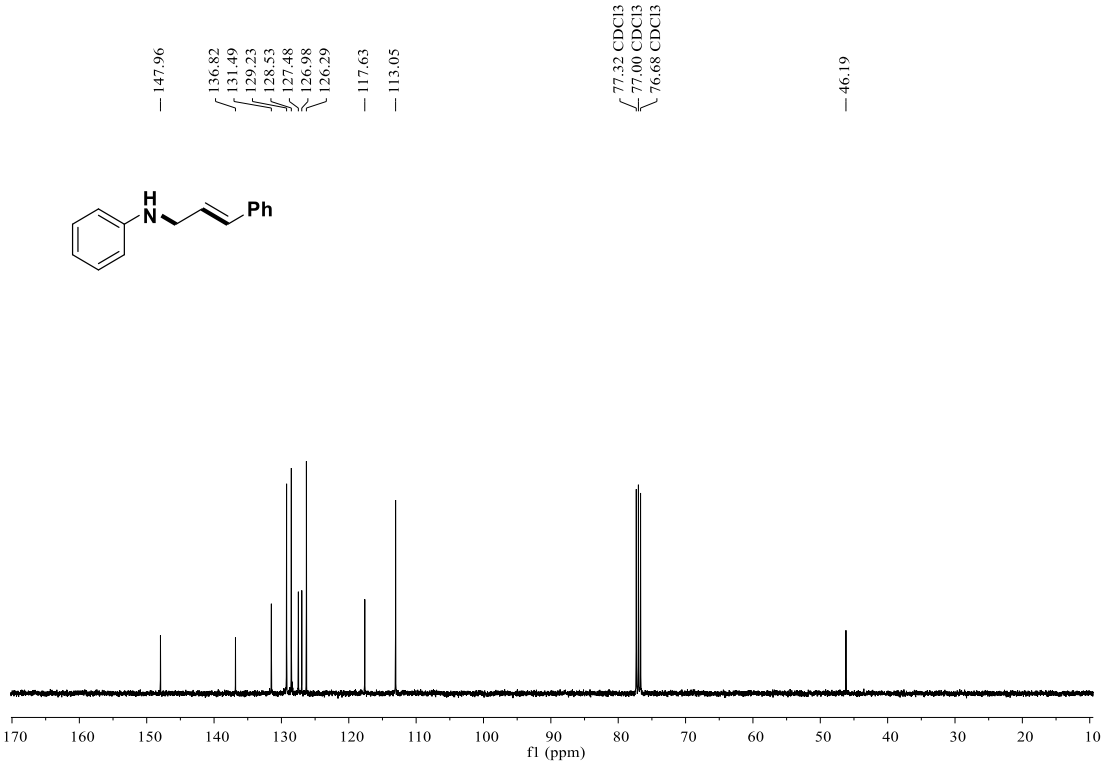
Methyl 4-(cinnamyl(4-fluorobenzyl)amino)butanoate (80)



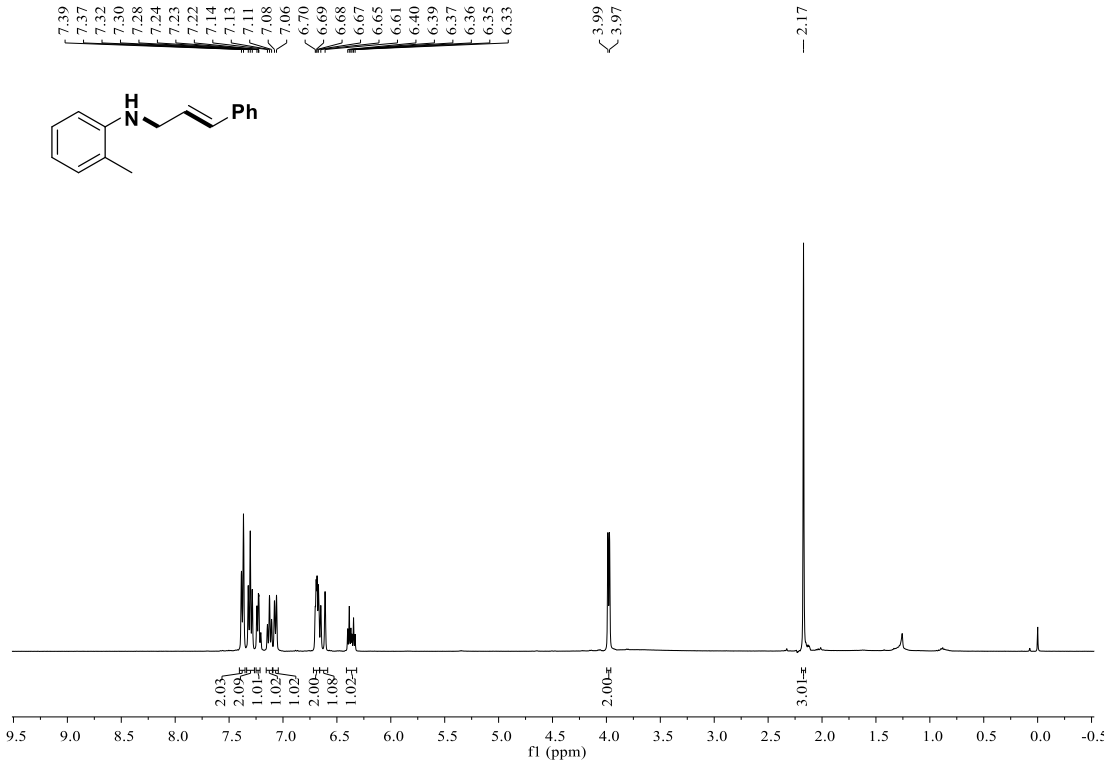


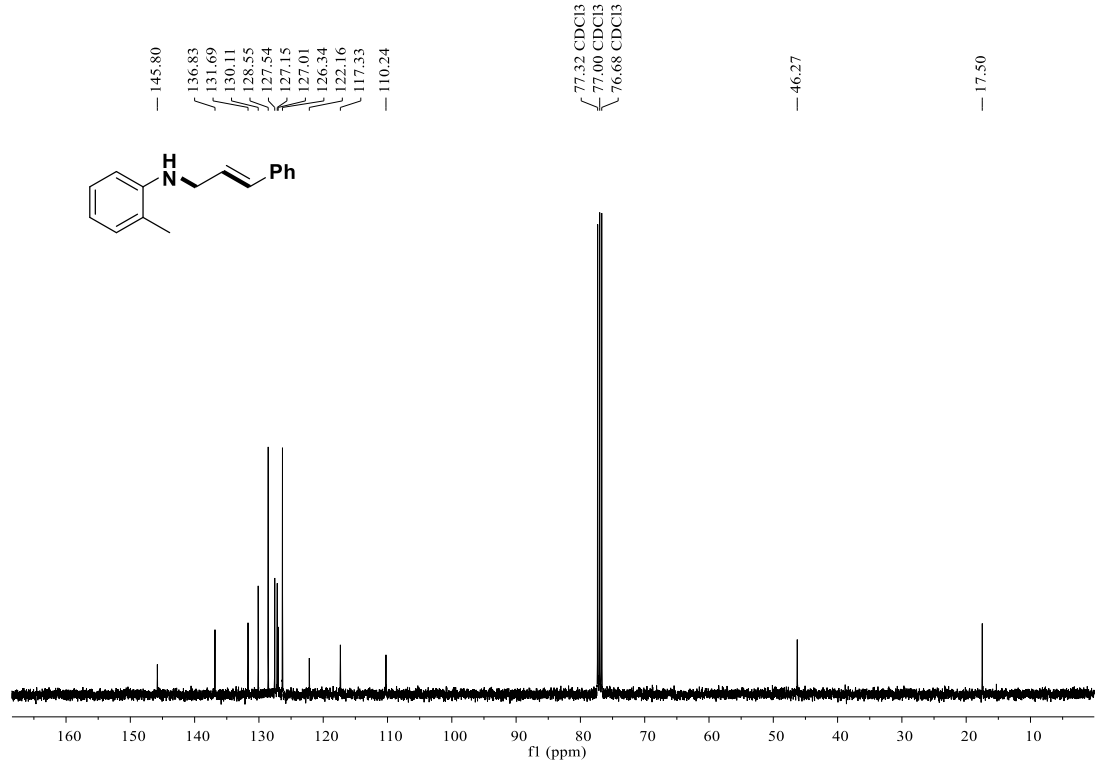
N-Cinnamylaniline (81)



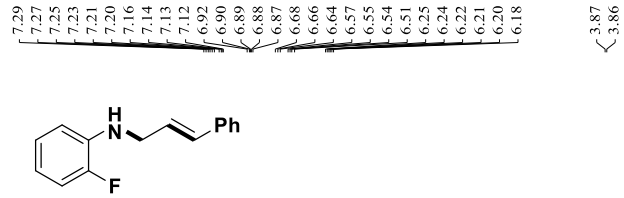


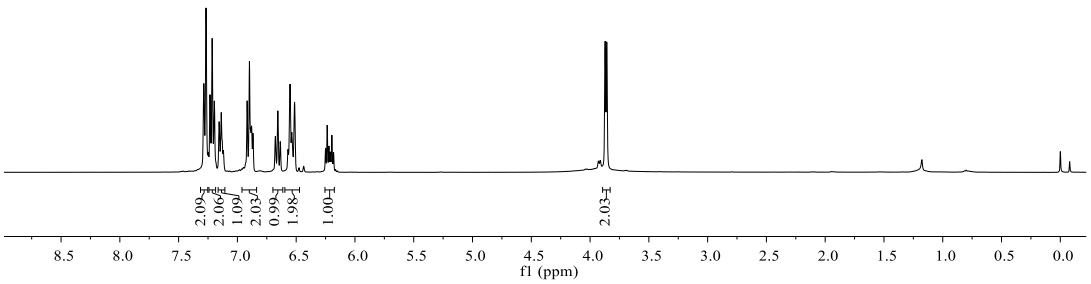
N-Cinnamyl-2-methylaniline (82)

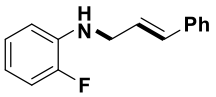


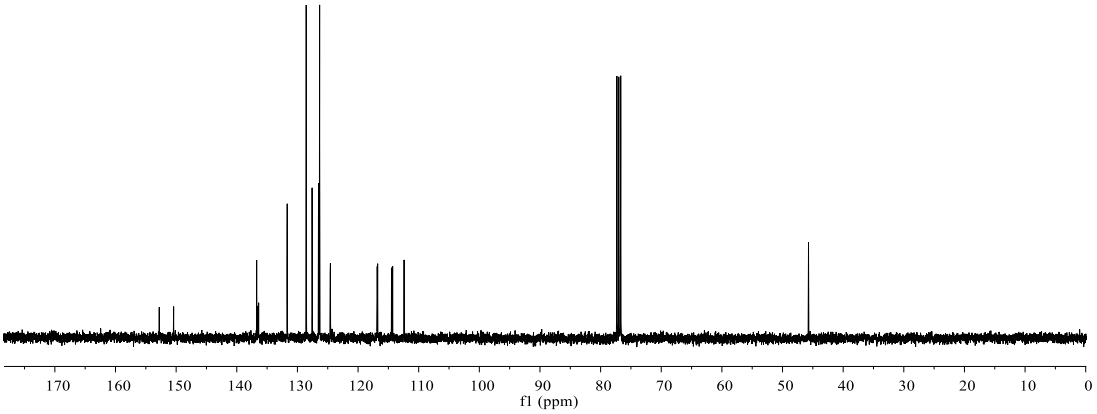


N-Cinnamyl-2-fluoroaniline (83)

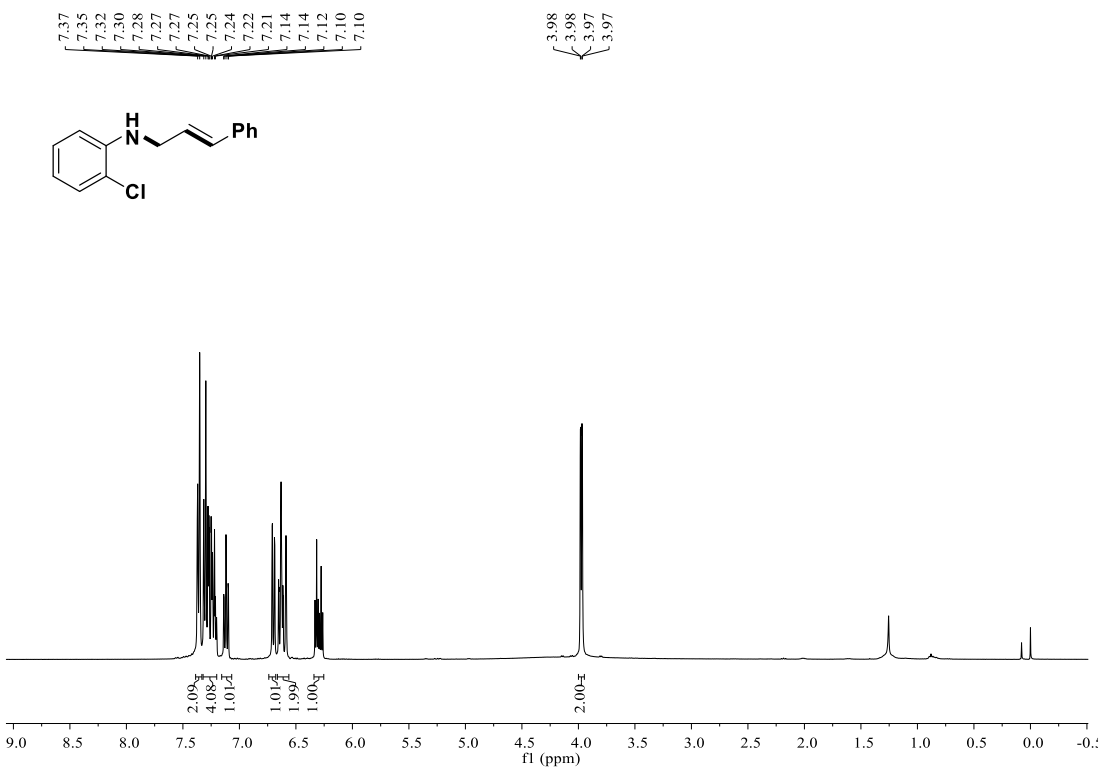


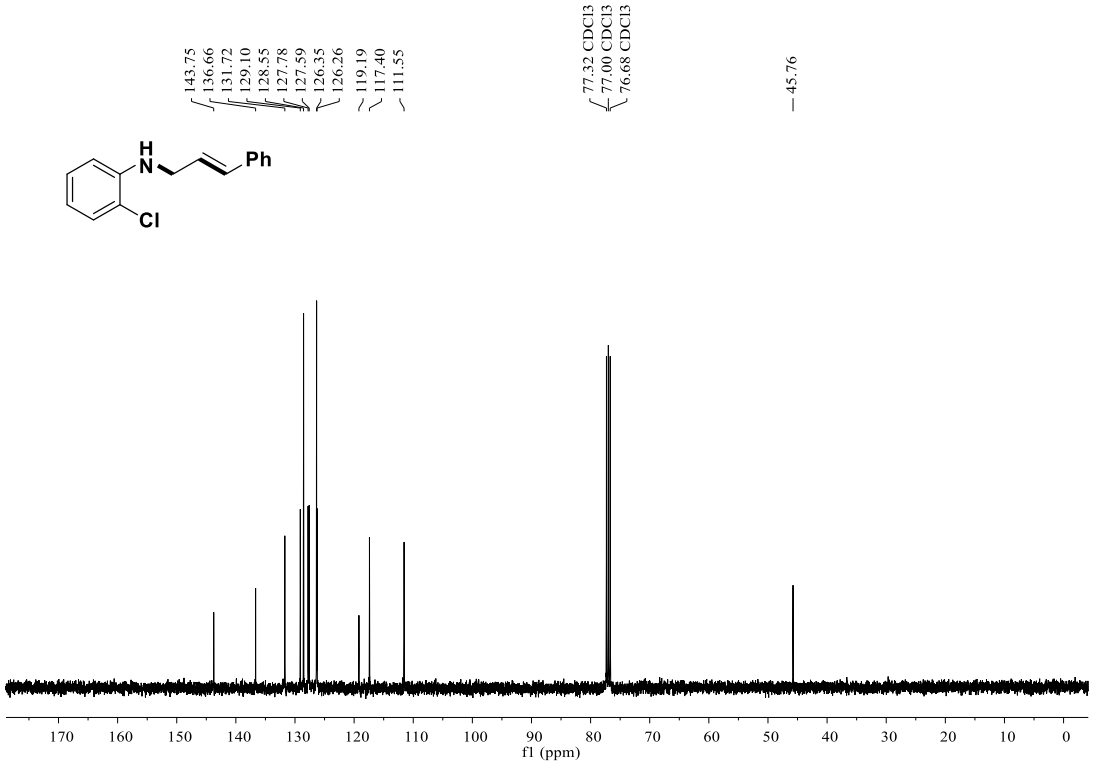




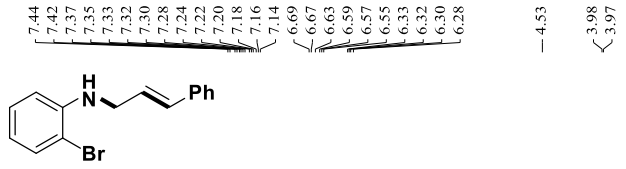


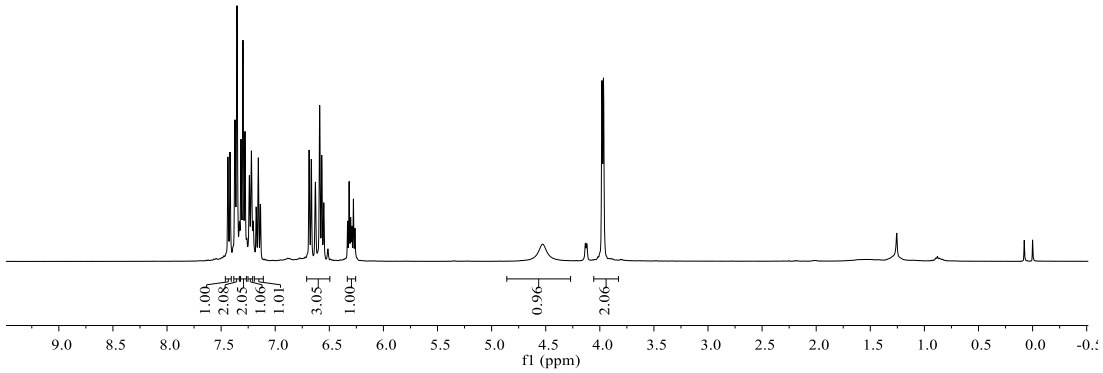
2-Chloro-*N*-cinnamylaniline (84)

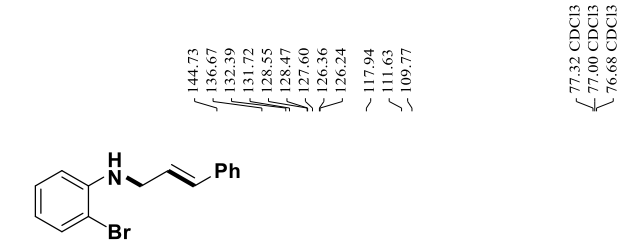


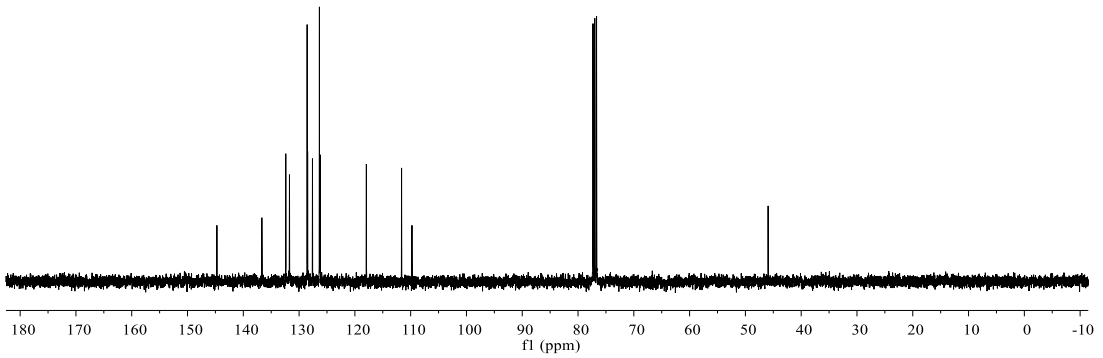


2-Bromo-*N*-cinnamylaniline (85)

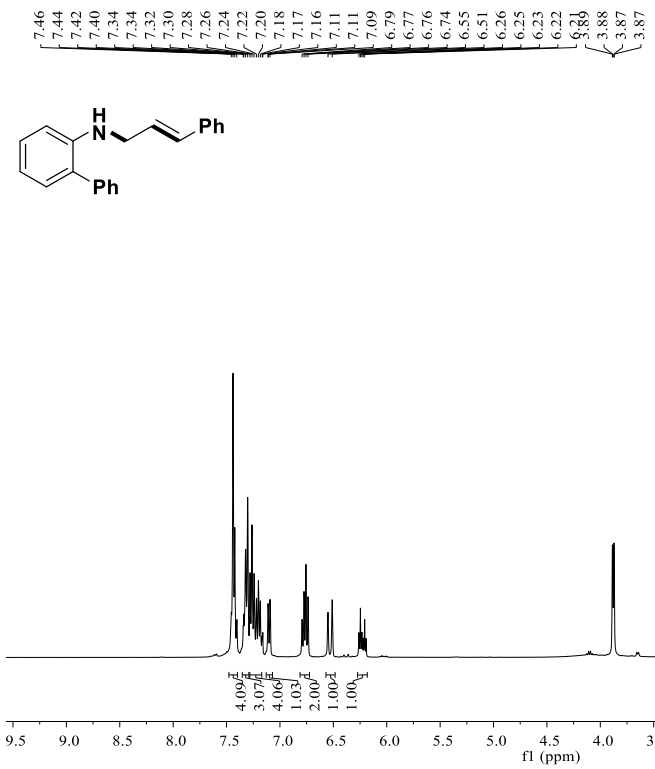


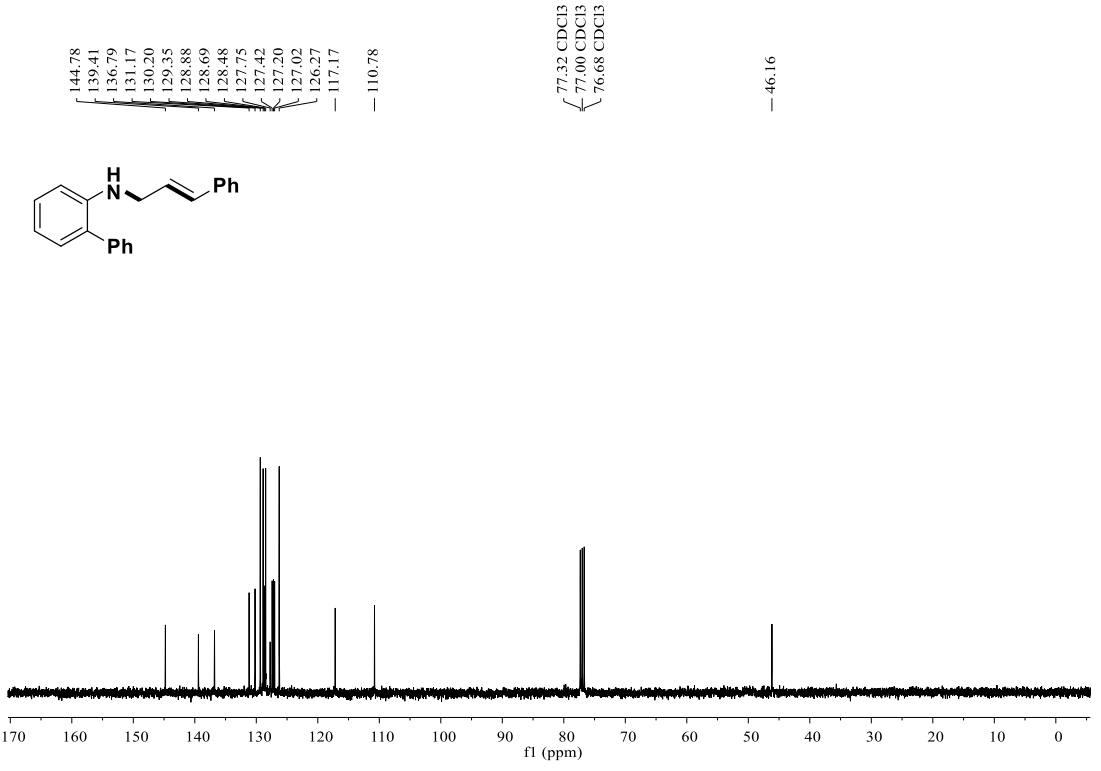




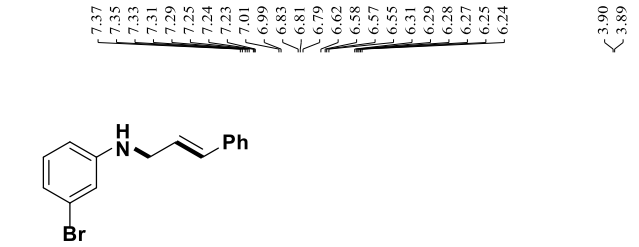


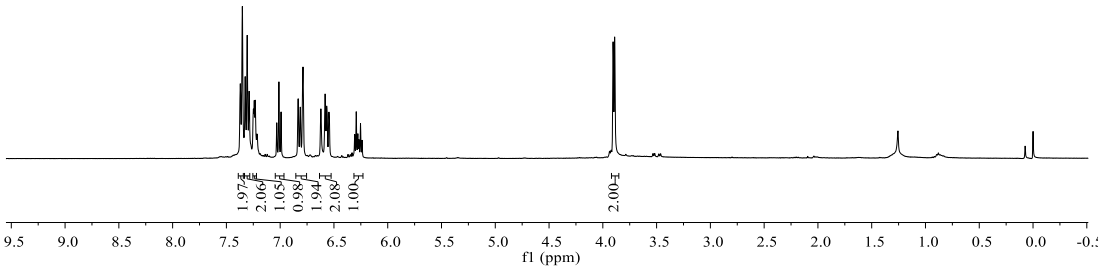
N-Cinnamyl-[1,1'-biphenyl]-2-amine (86)

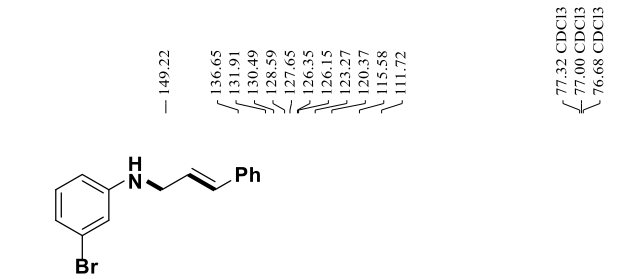


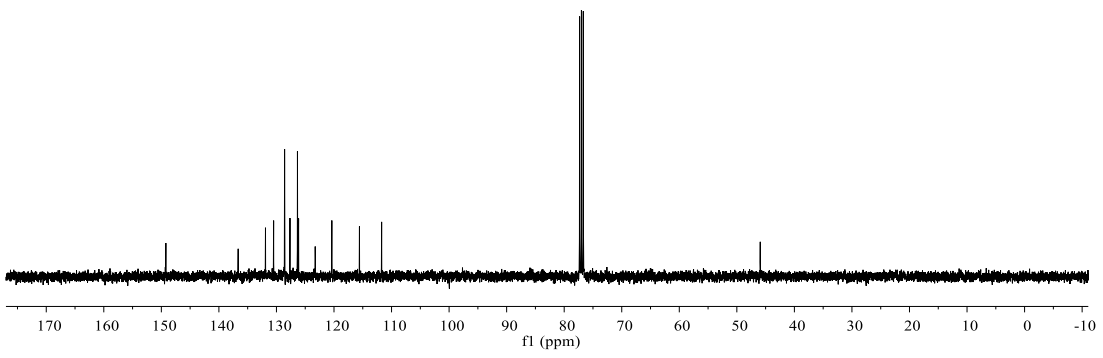


3-Bromo-*N*-cinnamylaniline (87)

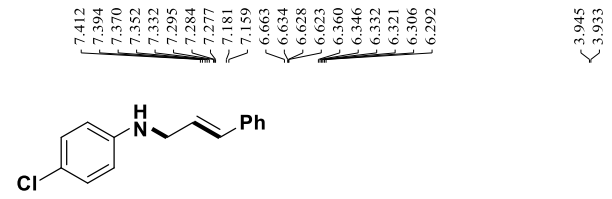


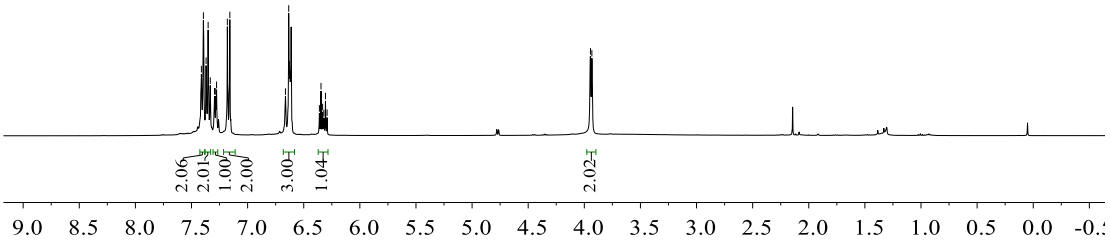


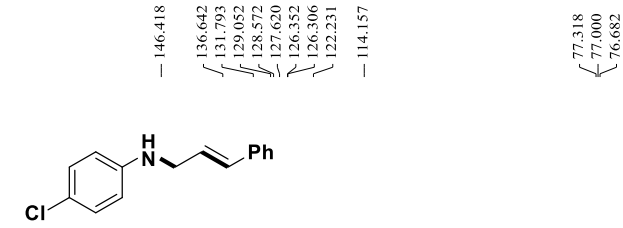


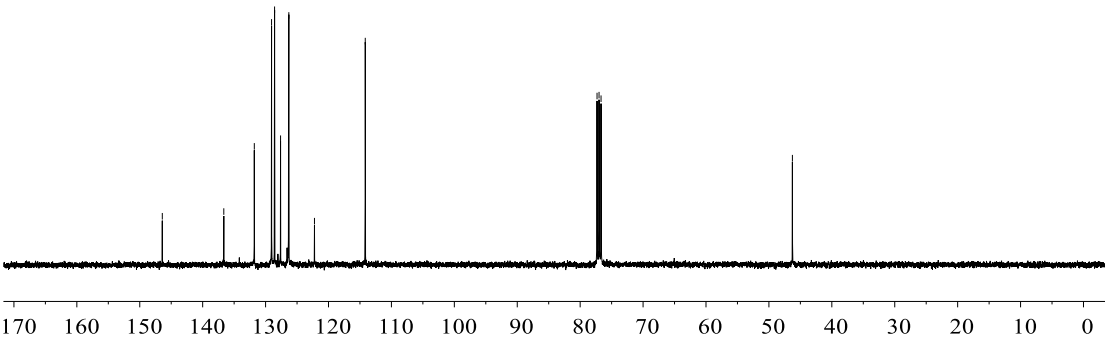


4-Chloro-*N*-cinnamylaniline (88)

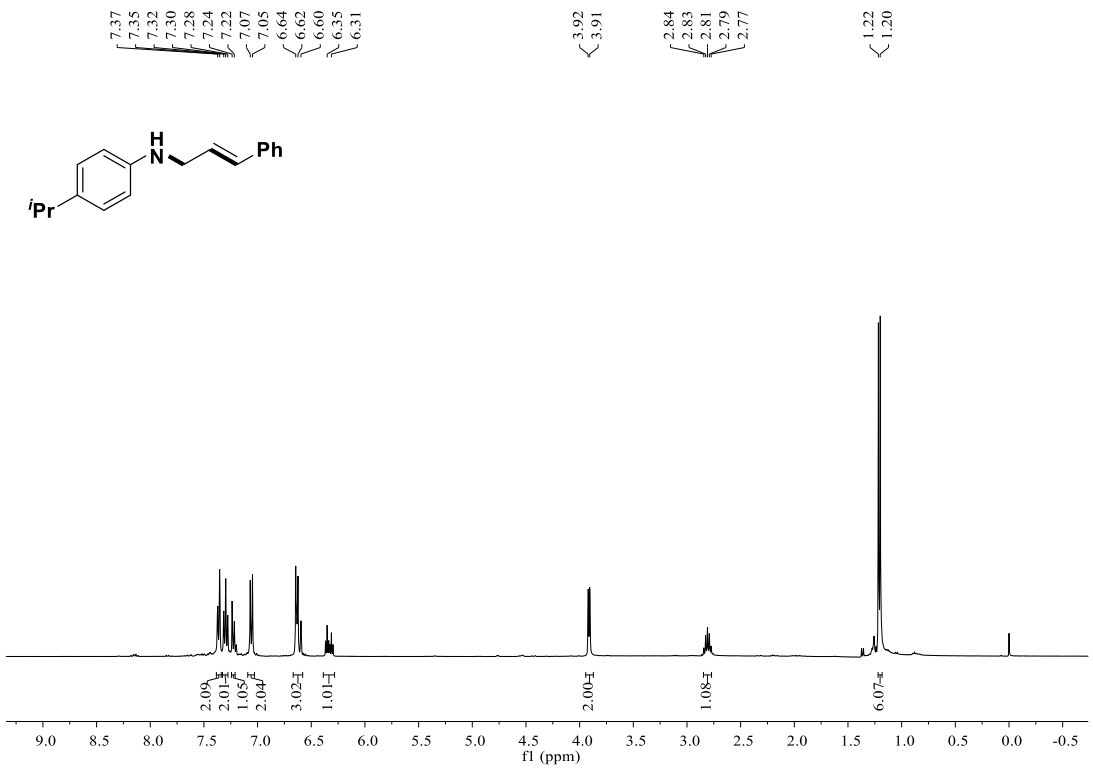


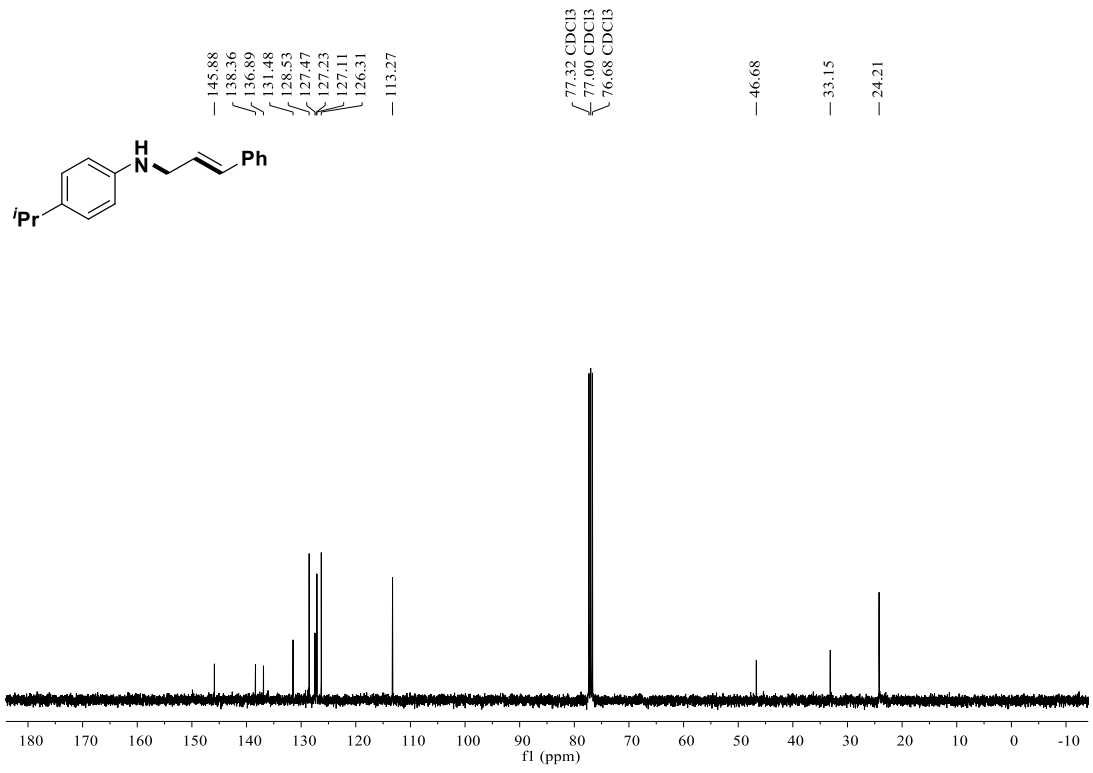




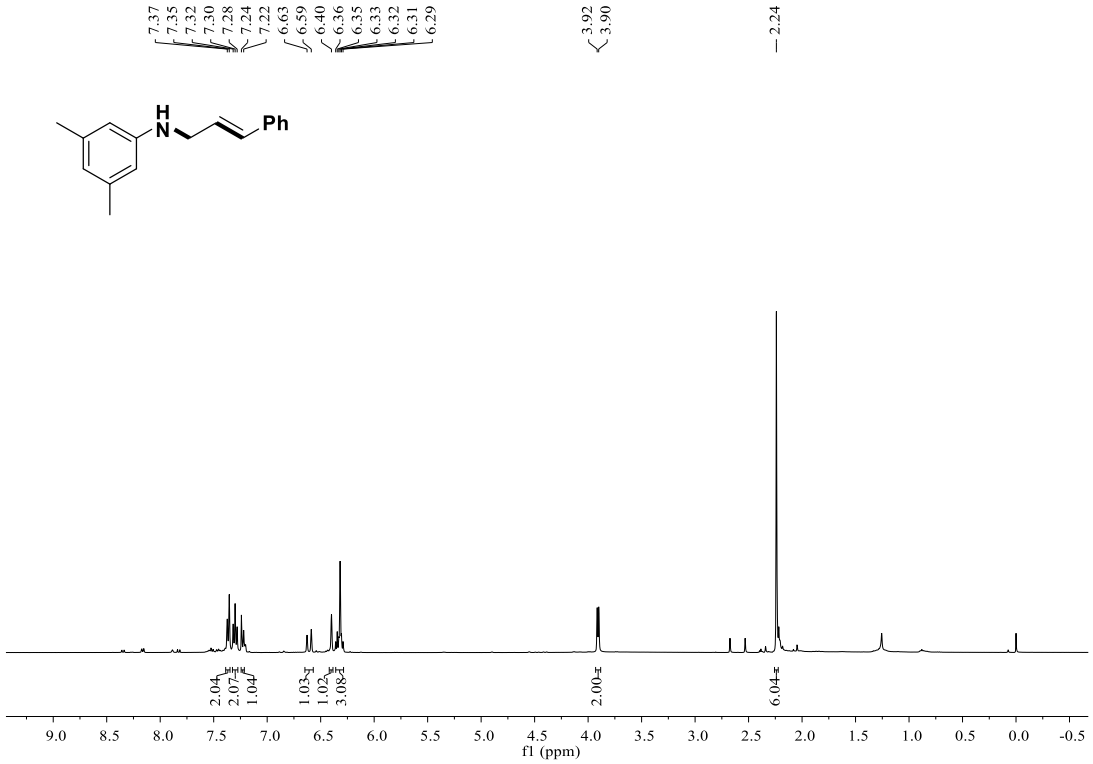


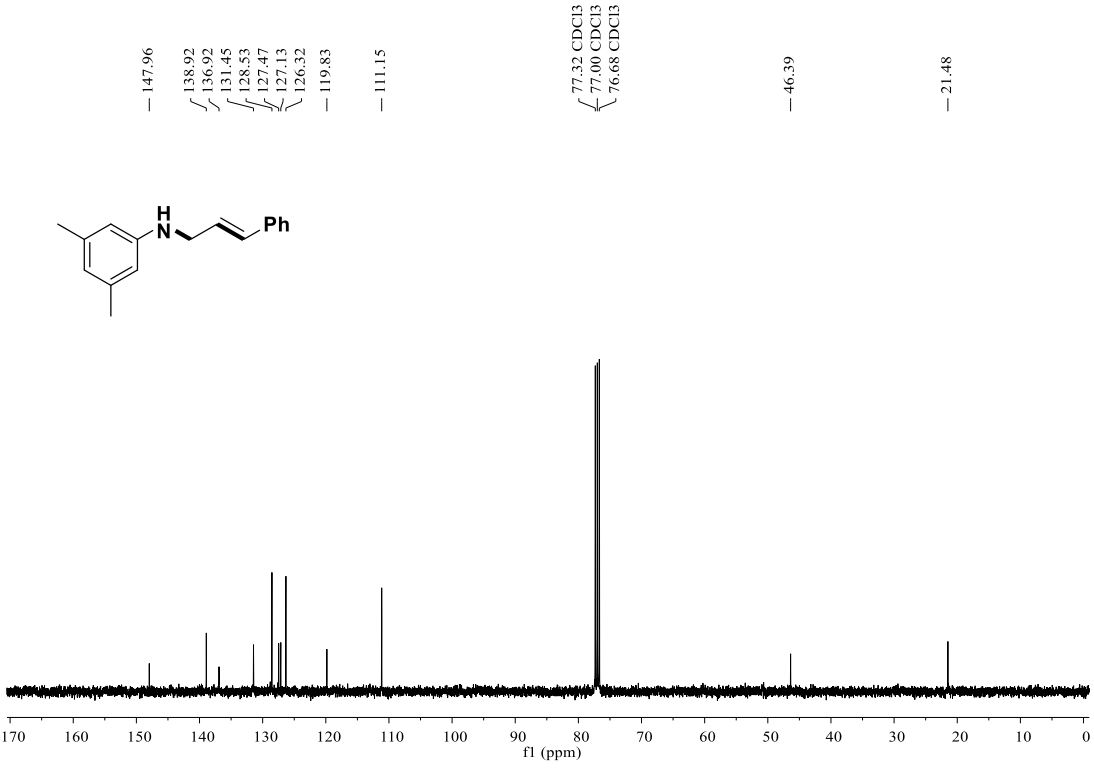
N-Cinnamyl-4-*iso*propylaniline (89)



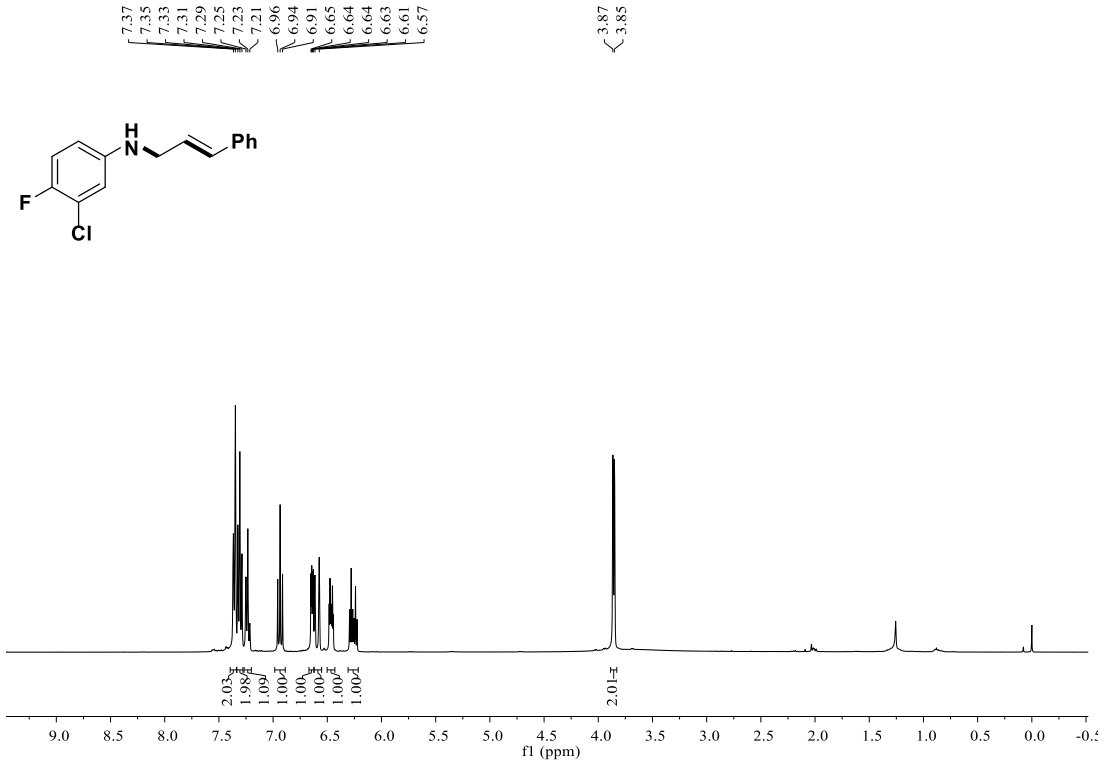


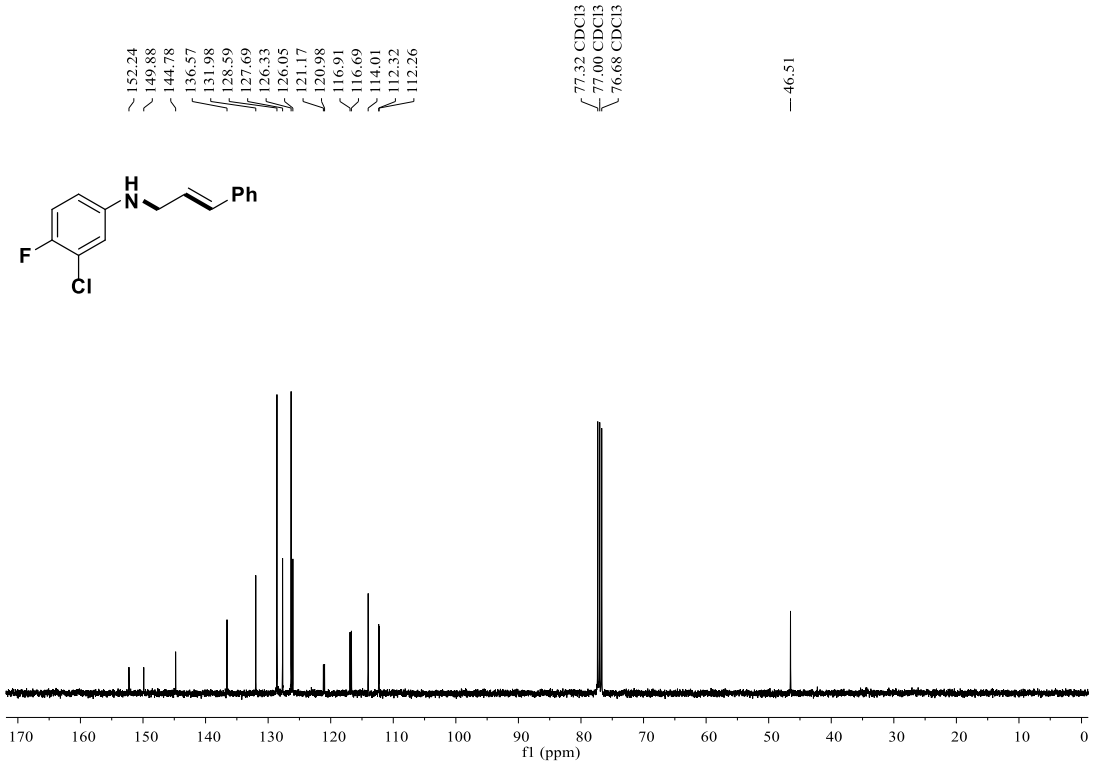
N-Cinnamyl-3,5-dimethylaniline (90)



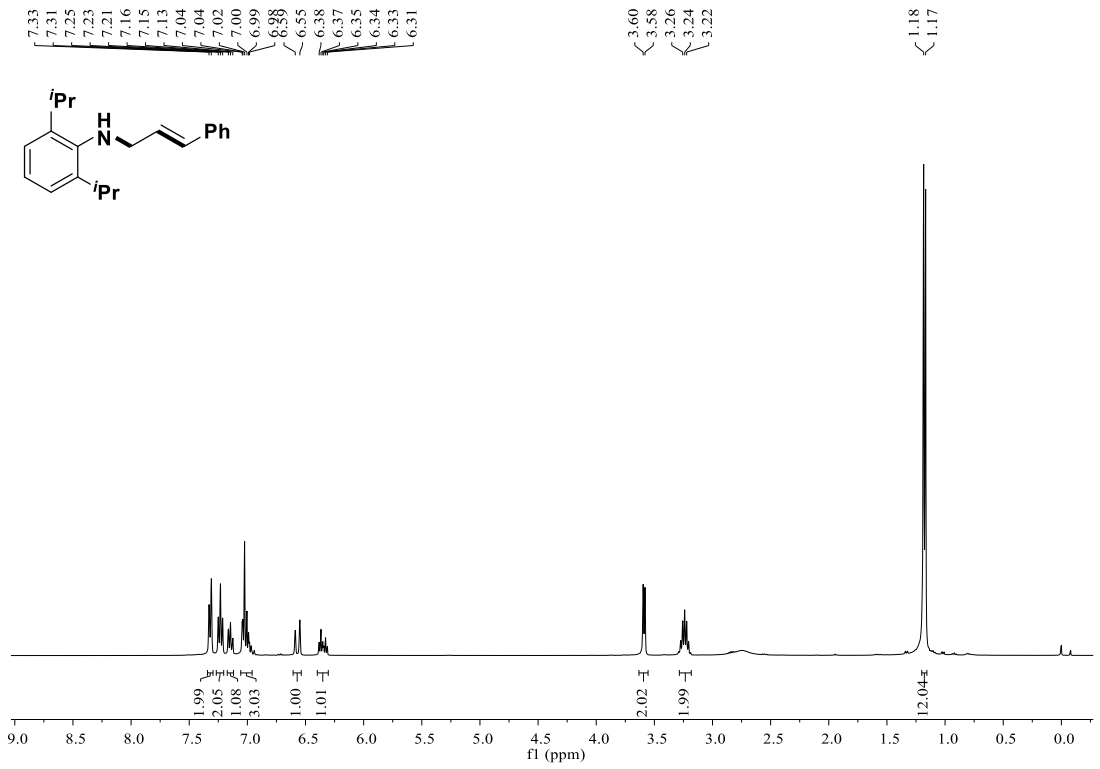


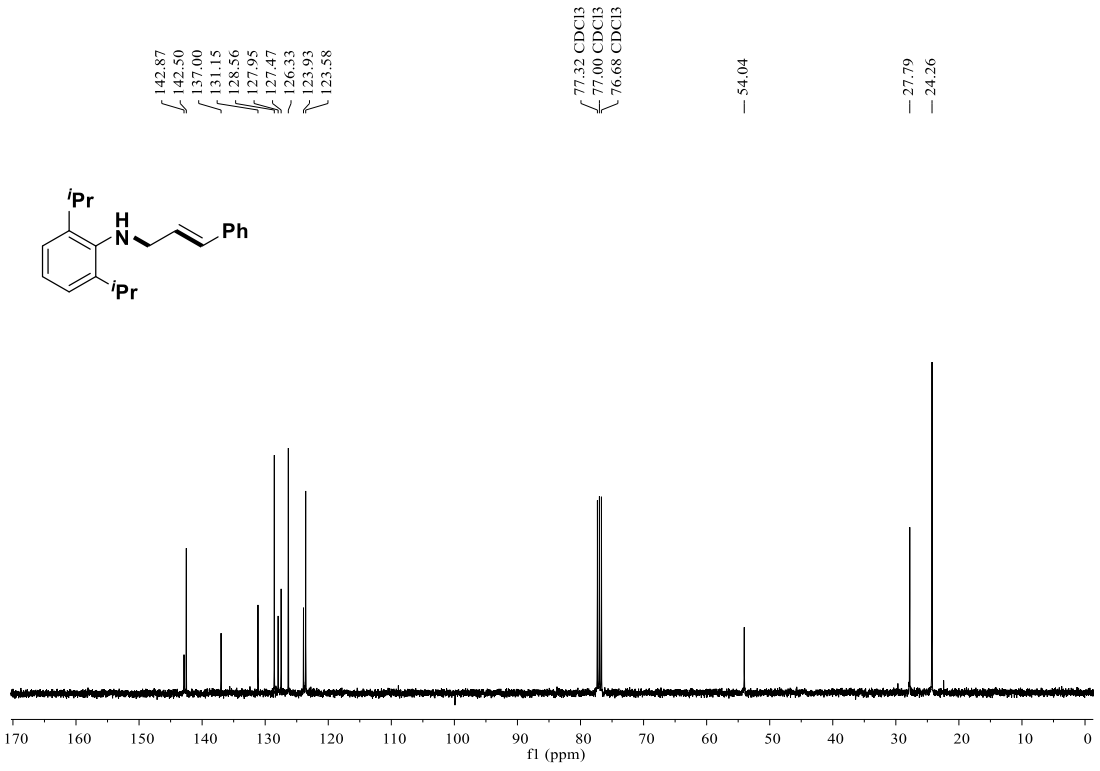
3-Chloro-*N*-cinnamyl-4-fluoroaniline (91)



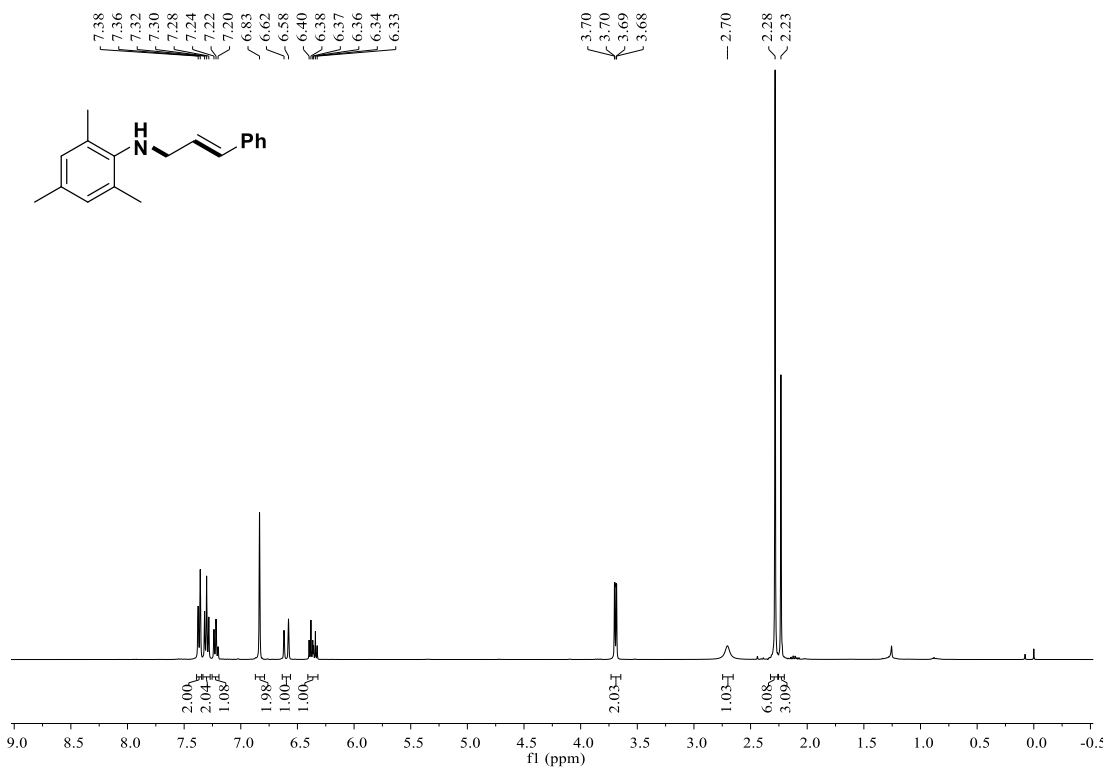


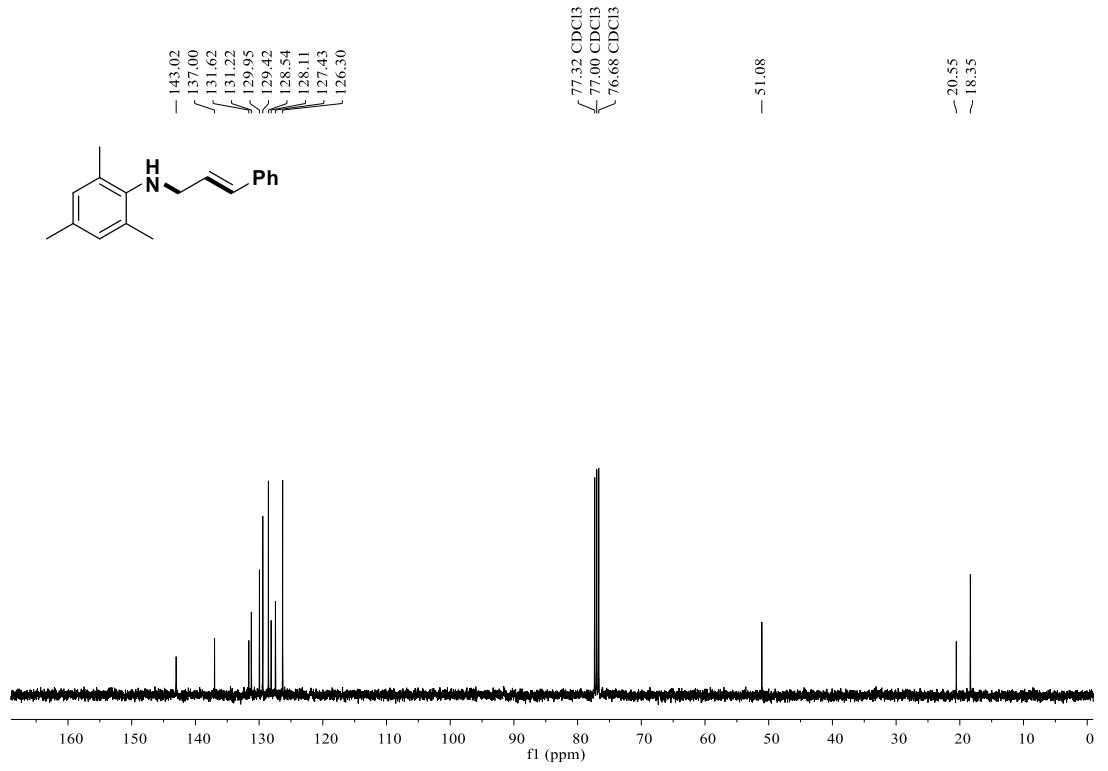
N-Cinnamyl-2,6-di-*iso*-propylaniline (92)



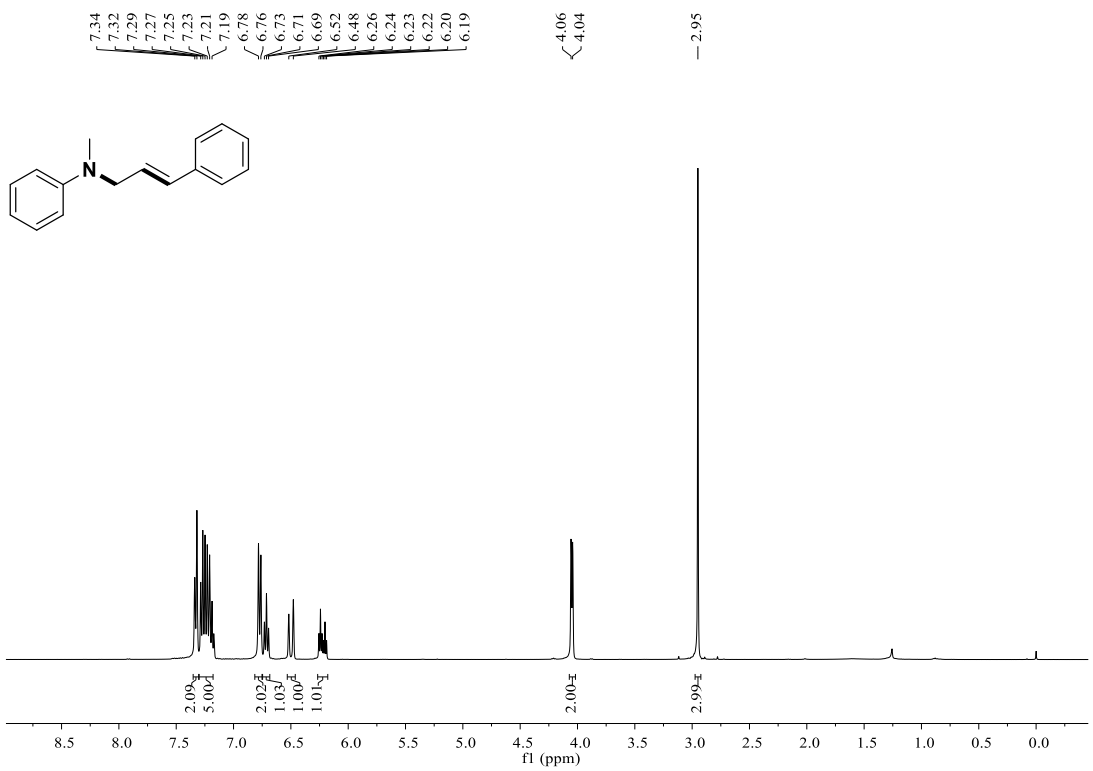


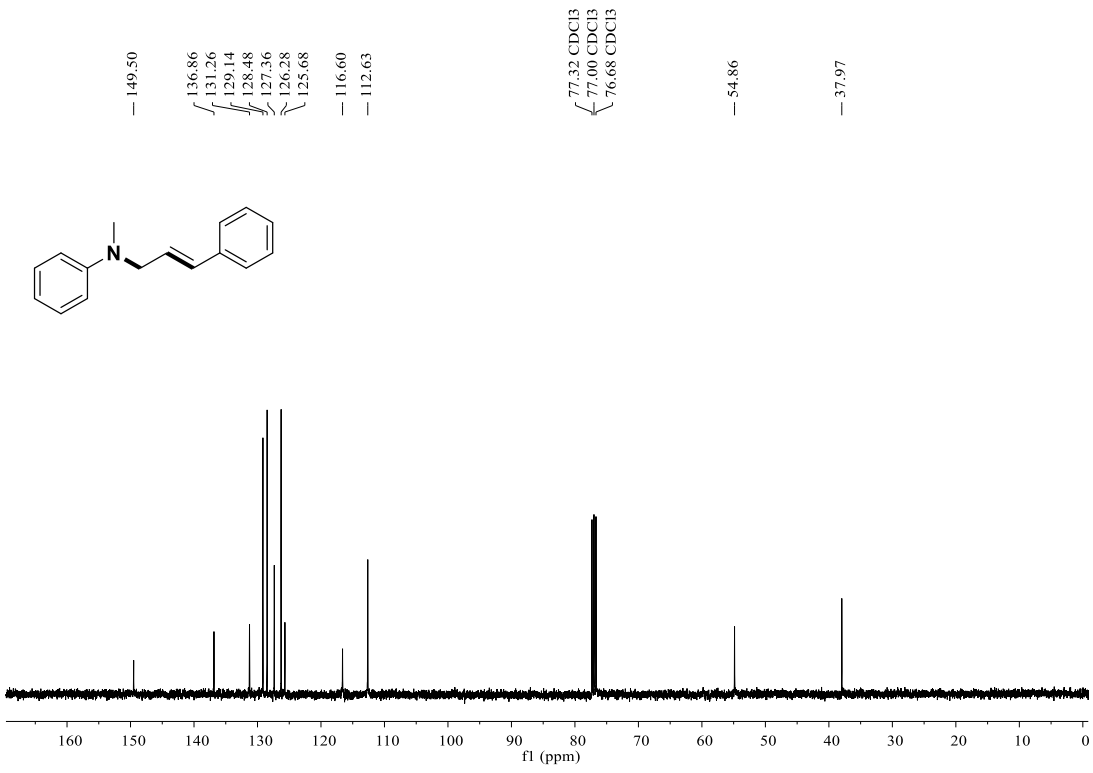
N-Cinnamyl-2,4,6-trimethylaniline (93)



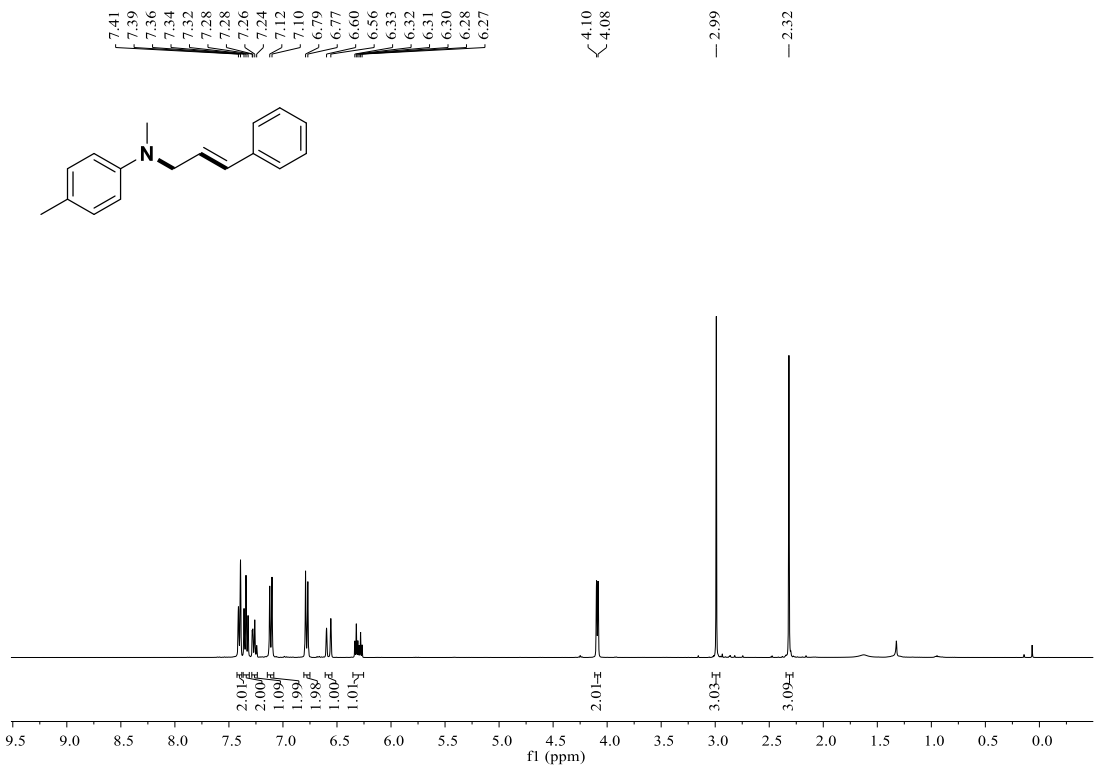


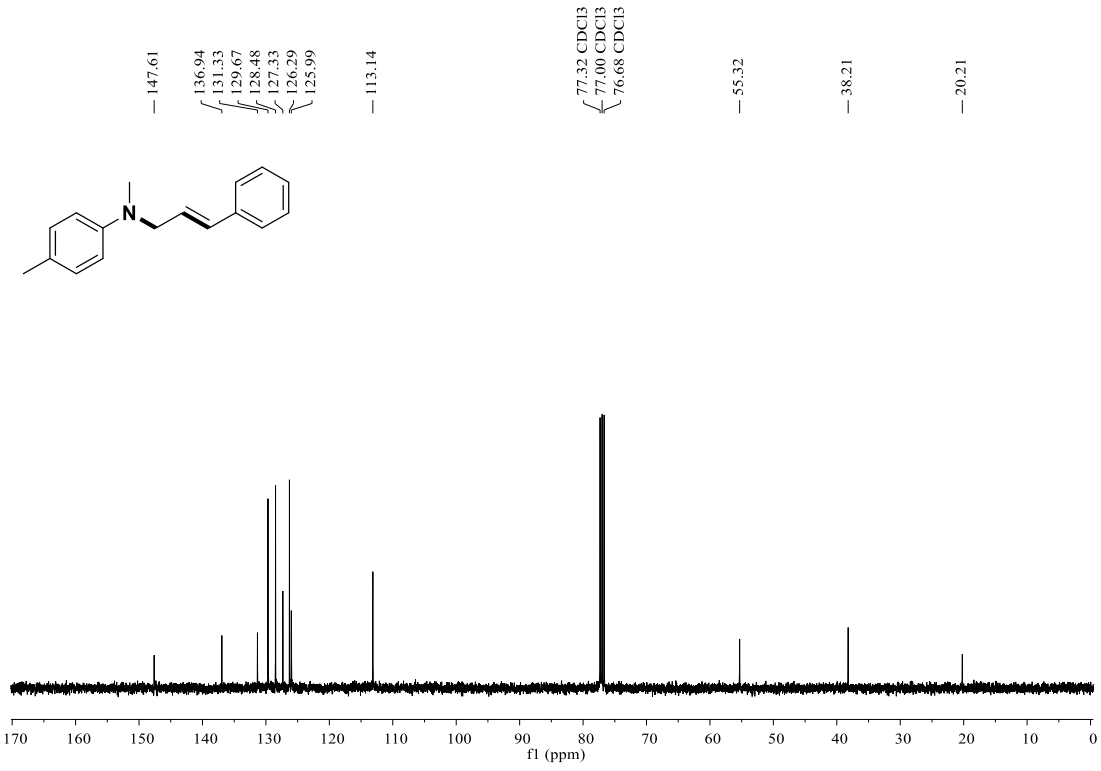
N-Cinnamyl-*N*-methylaniline (94)



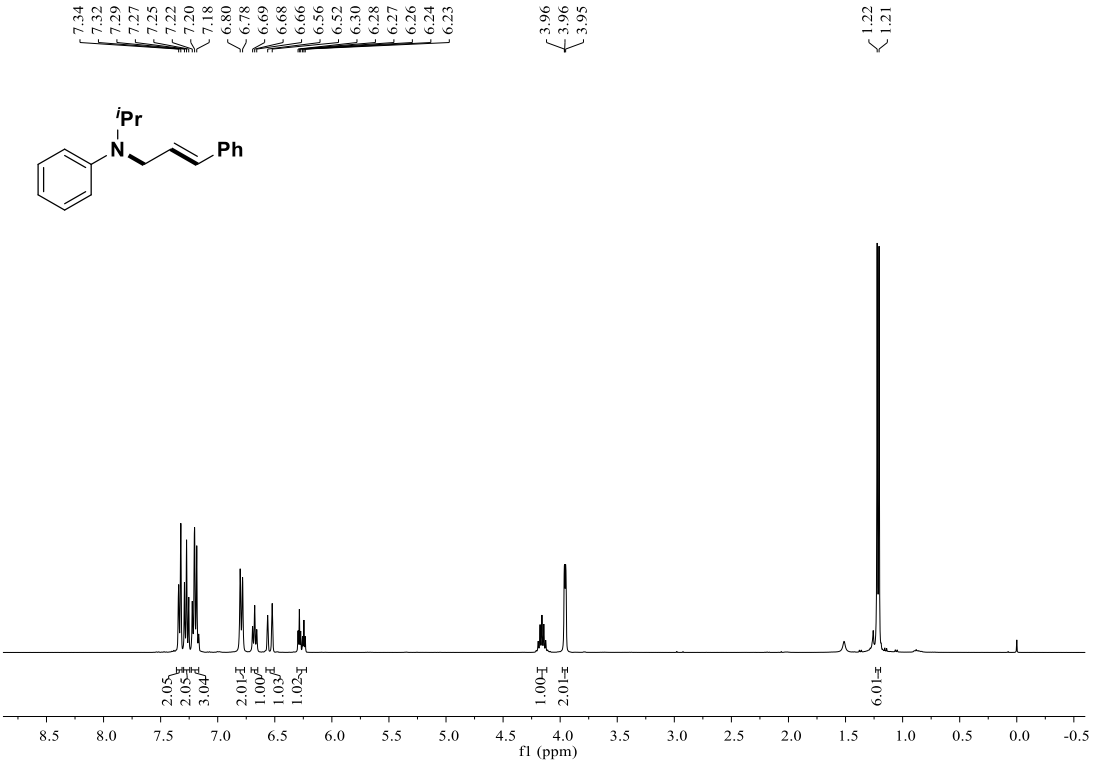


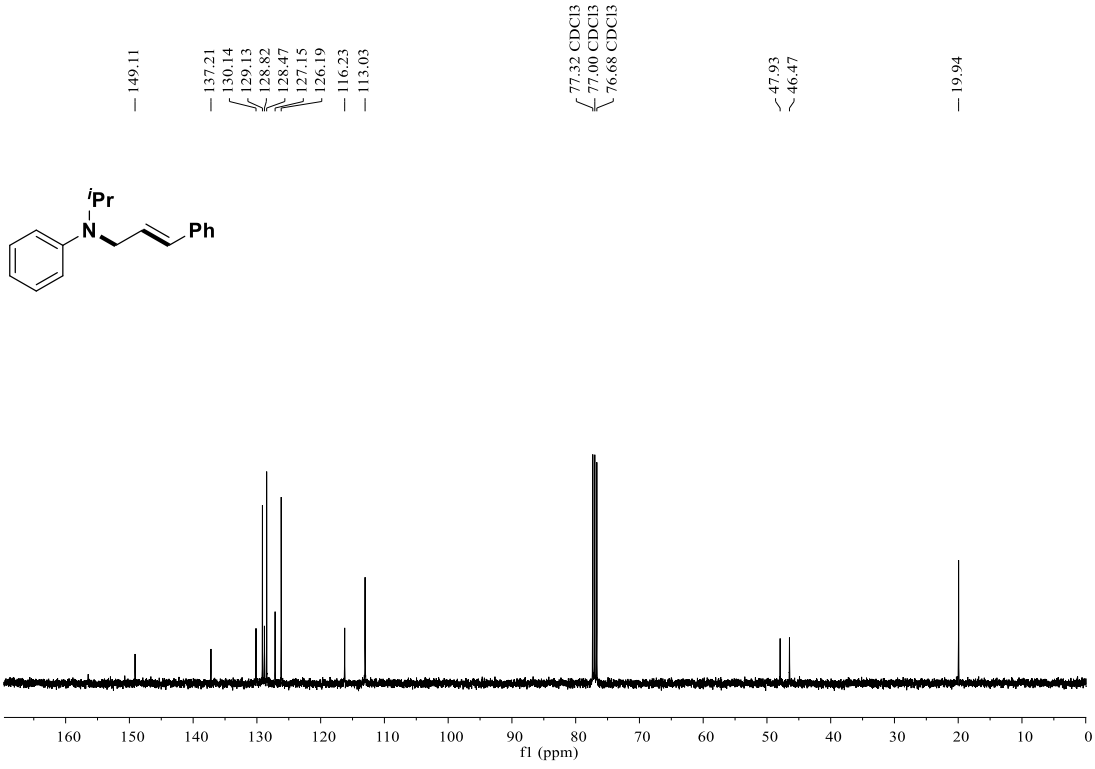
_N_-Cinnamyl-_N_,4-dimethylaniline (95)



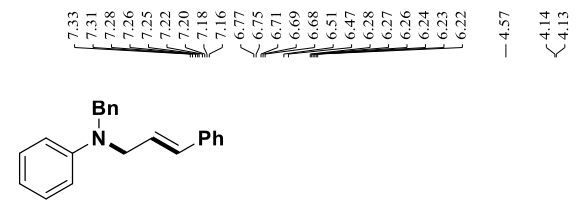


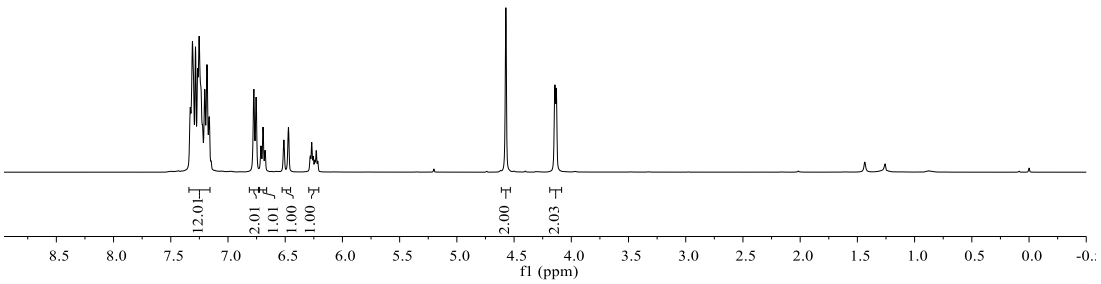
N-Cinnamyl-*N*-*iso*propylaniline (96)

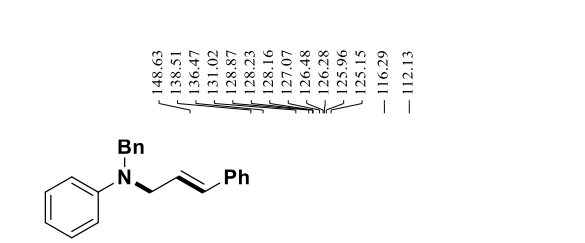


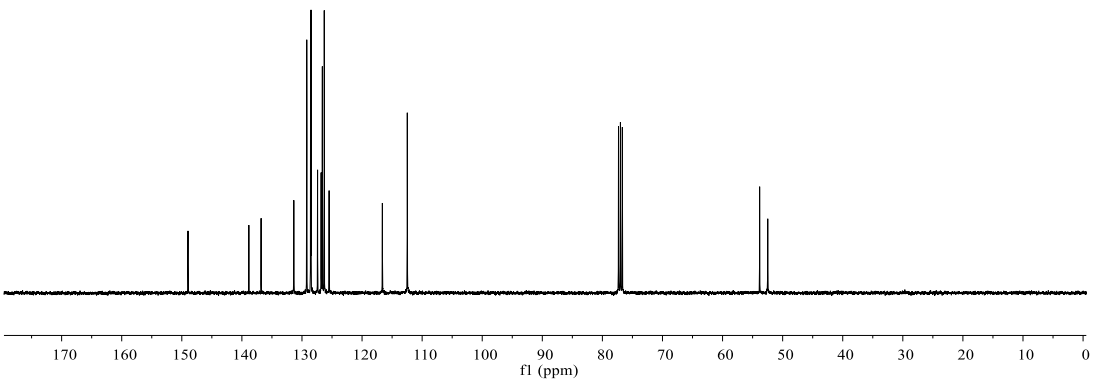


N-Benzyl-*N*-cinnamylaniline (97)

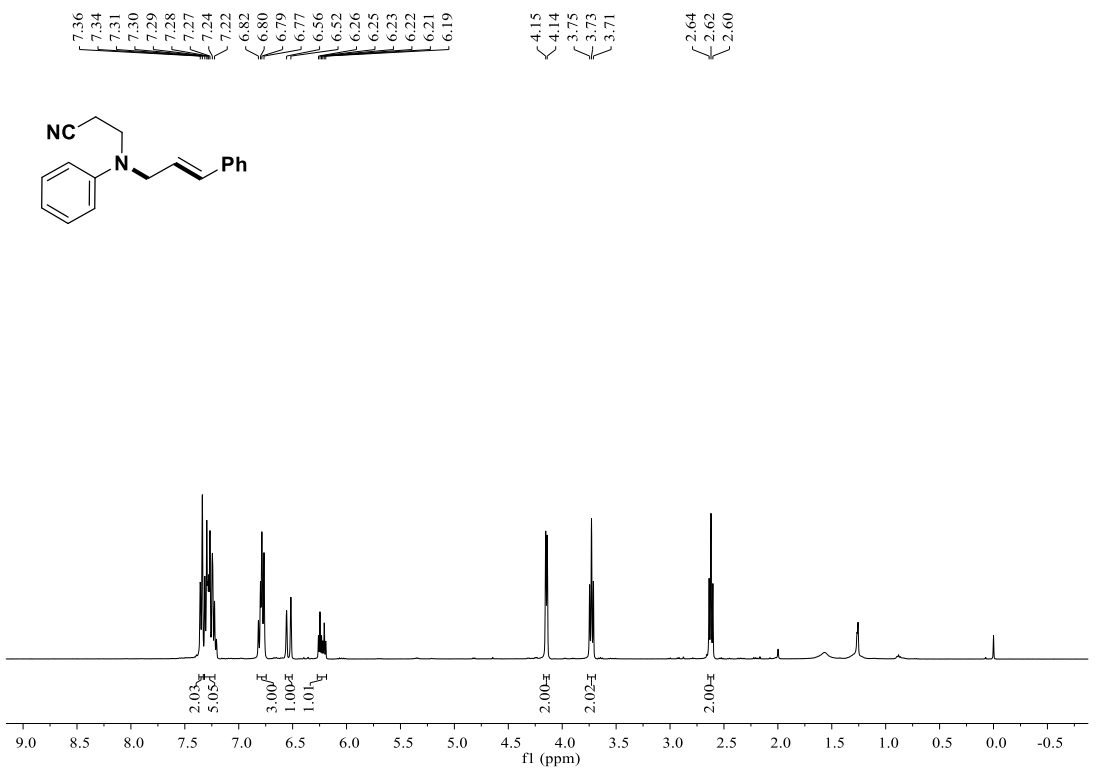


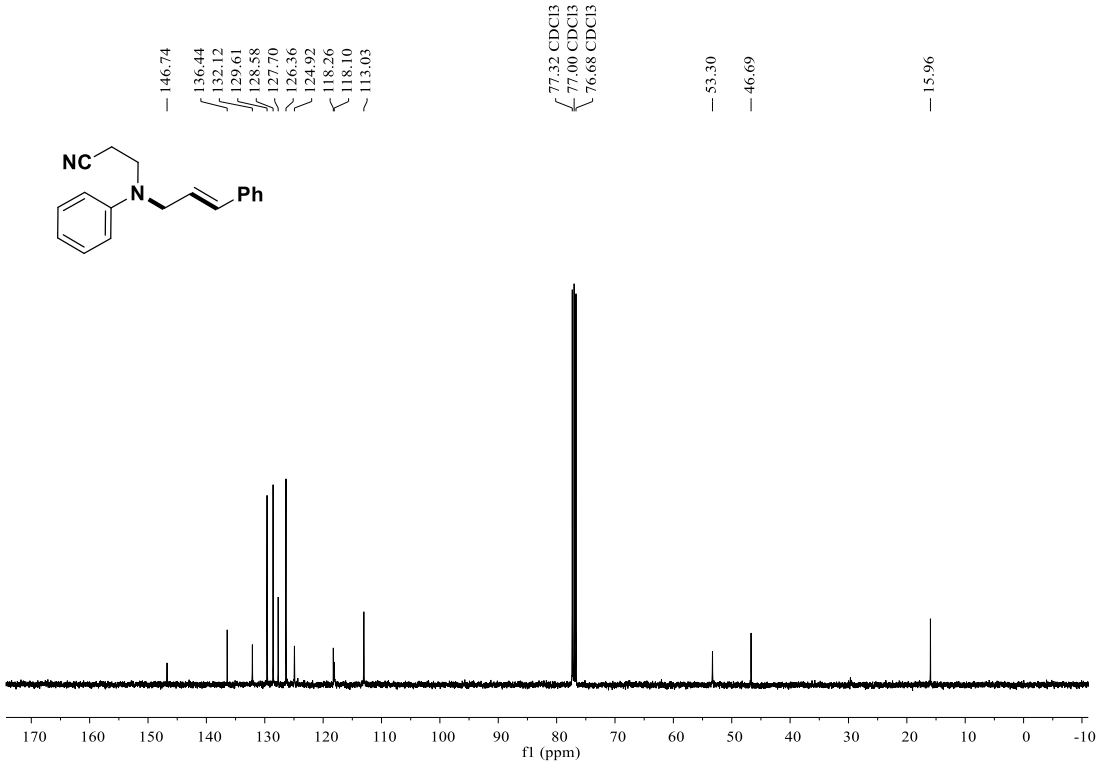




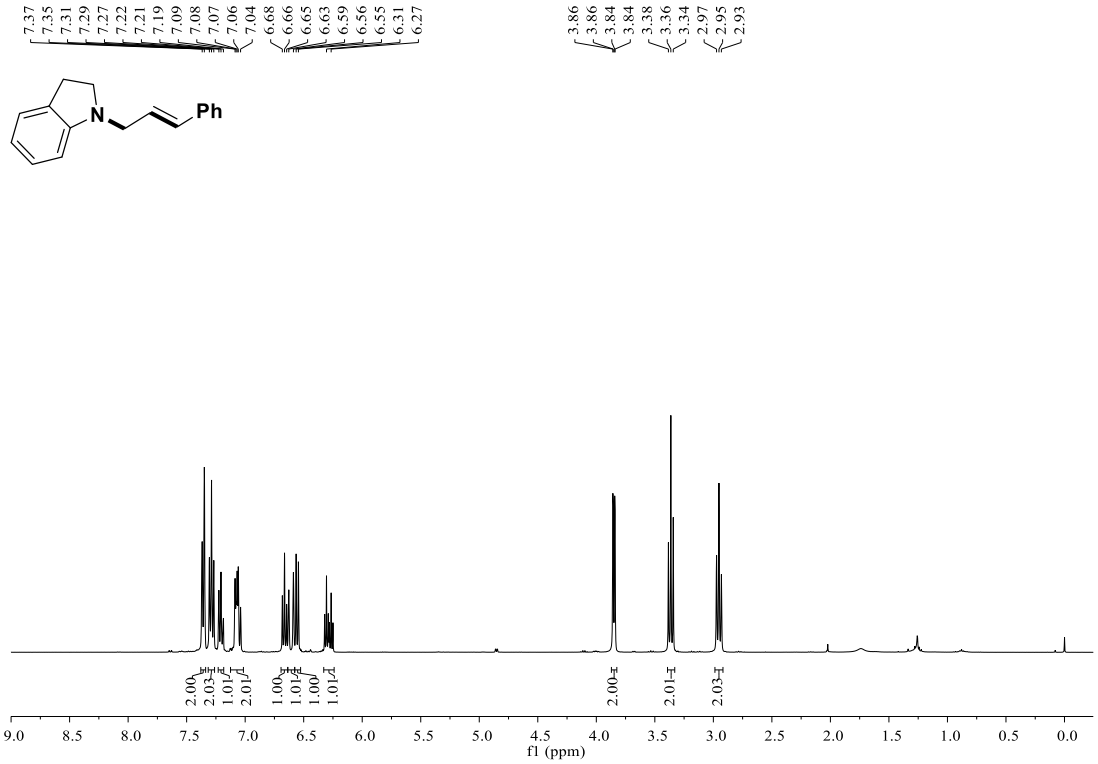


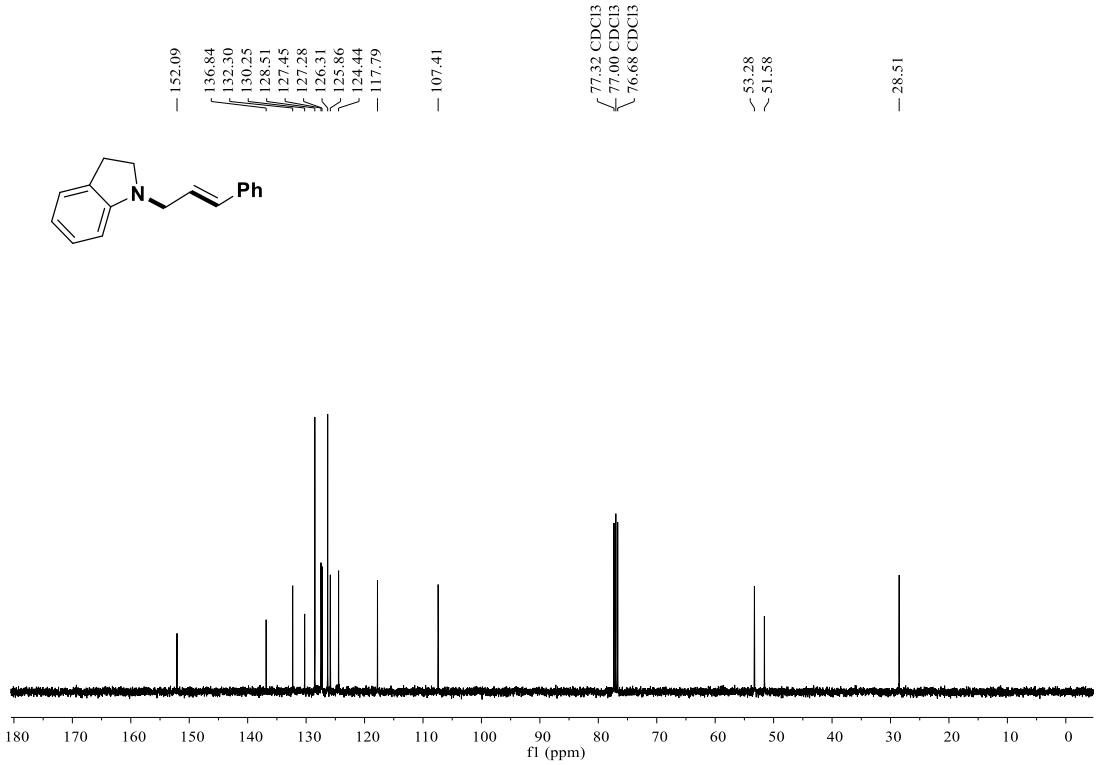
3-(Cinnamyl(phenyl)amino)propanenitrile (98)



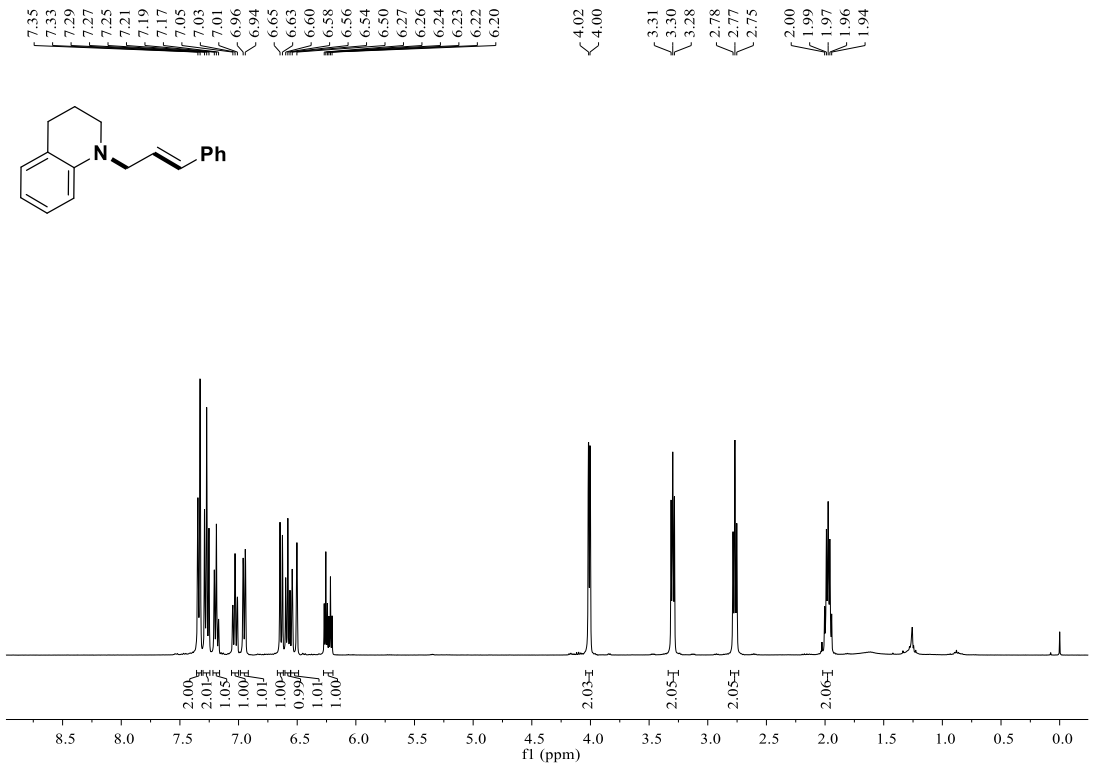


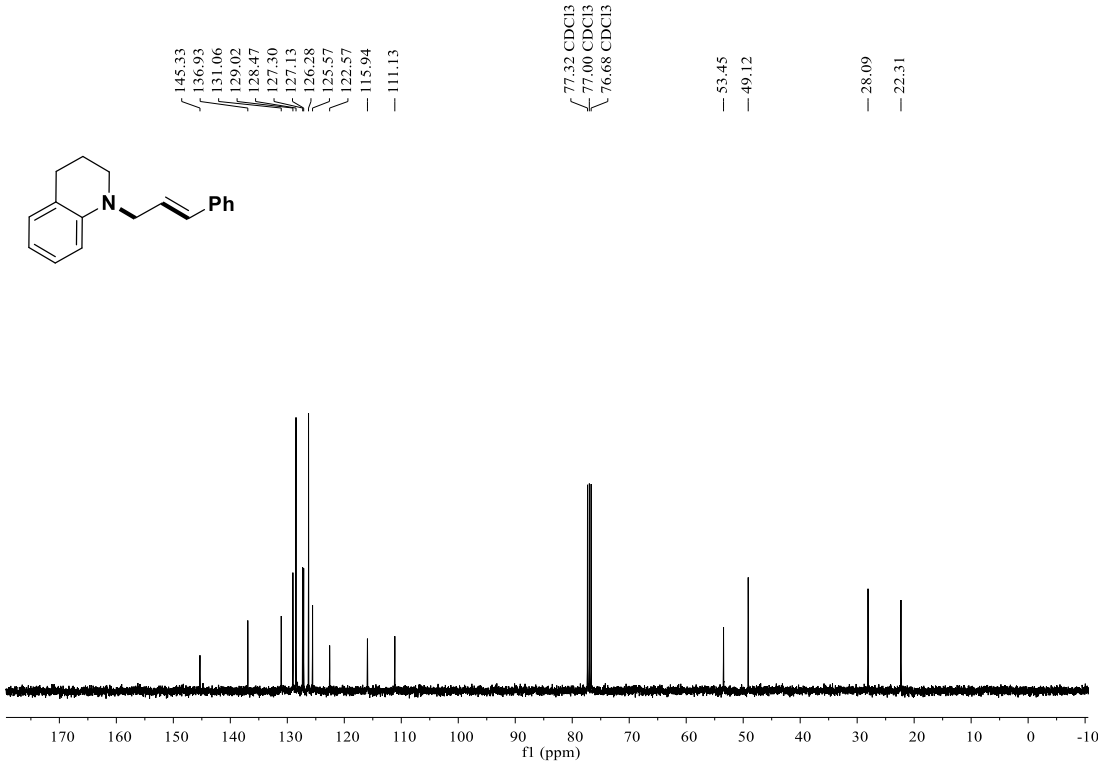
1-Cinnamylindoline (99)



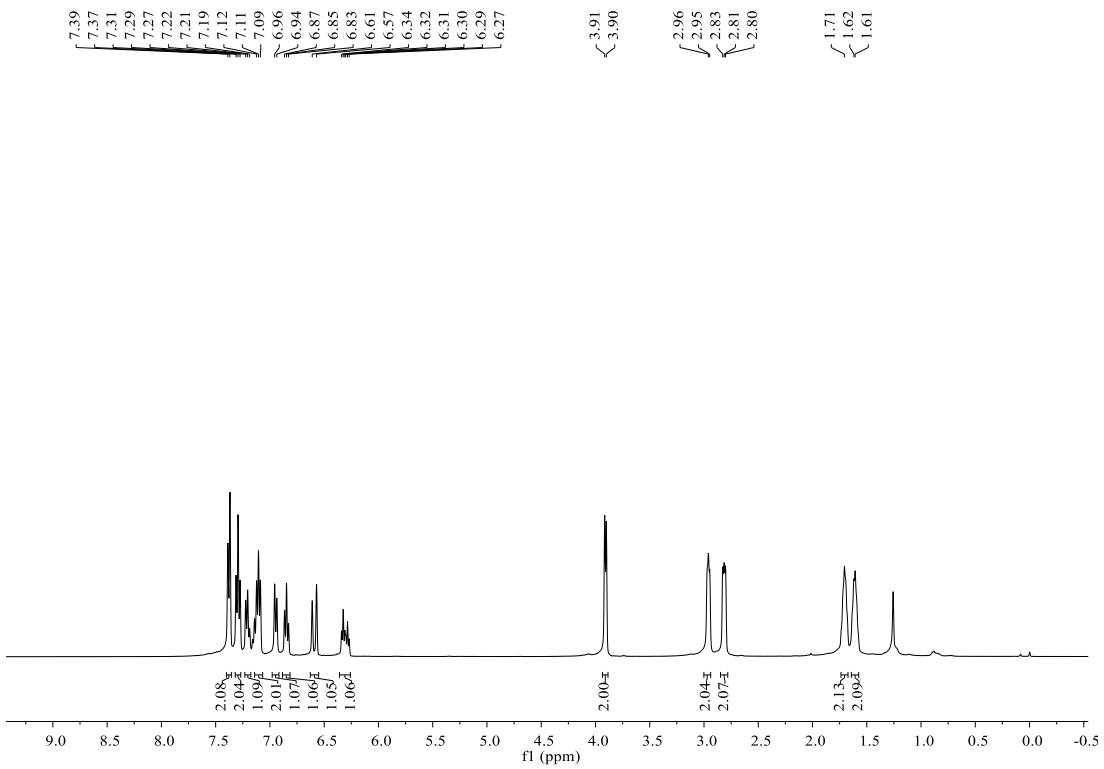


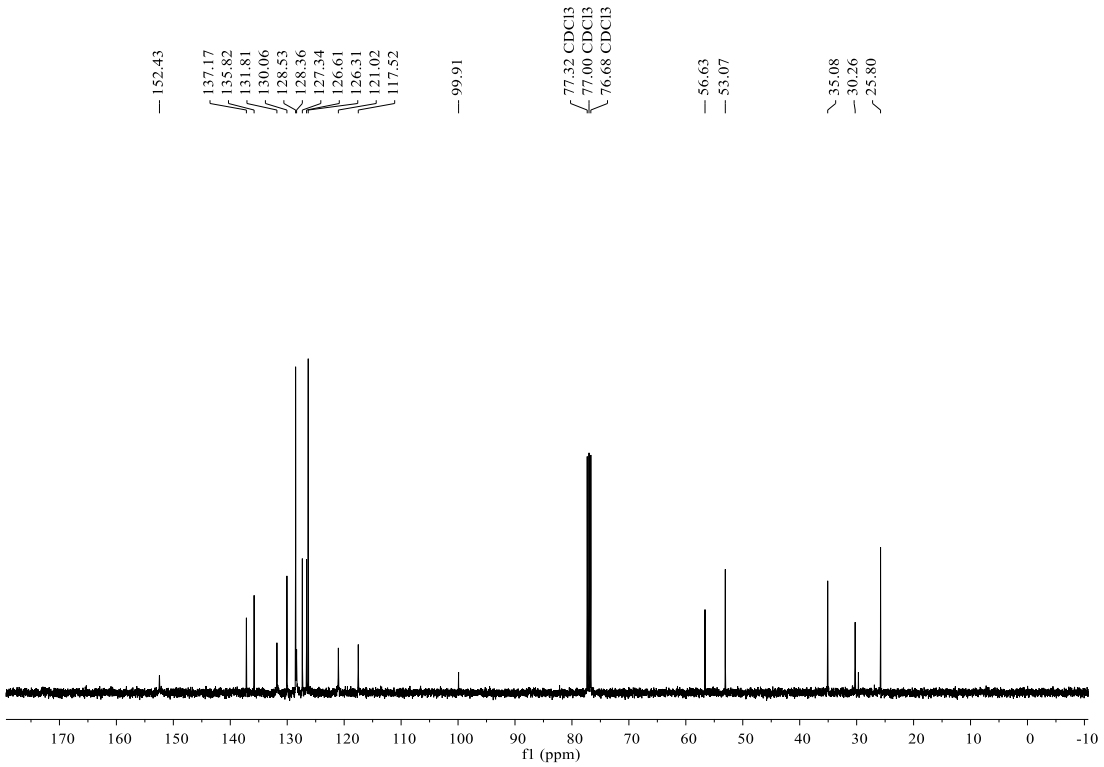
1-Cinnamyl-1,2,3,4-tetrahydroquinoline (100)



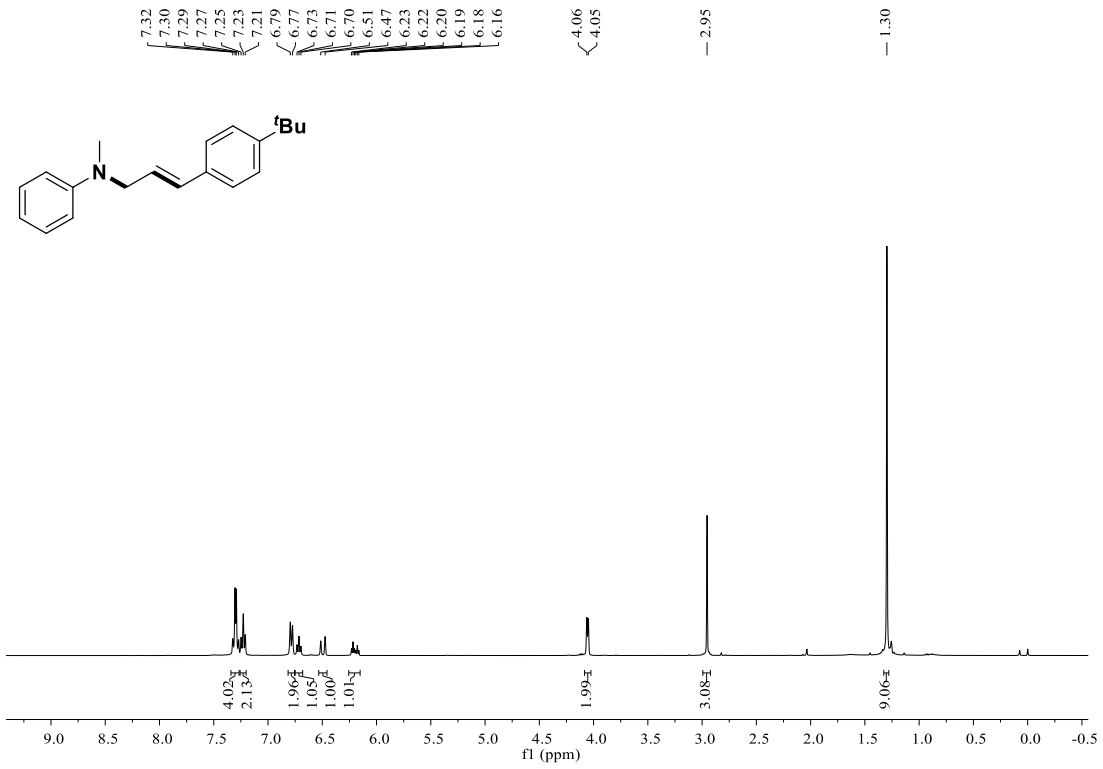


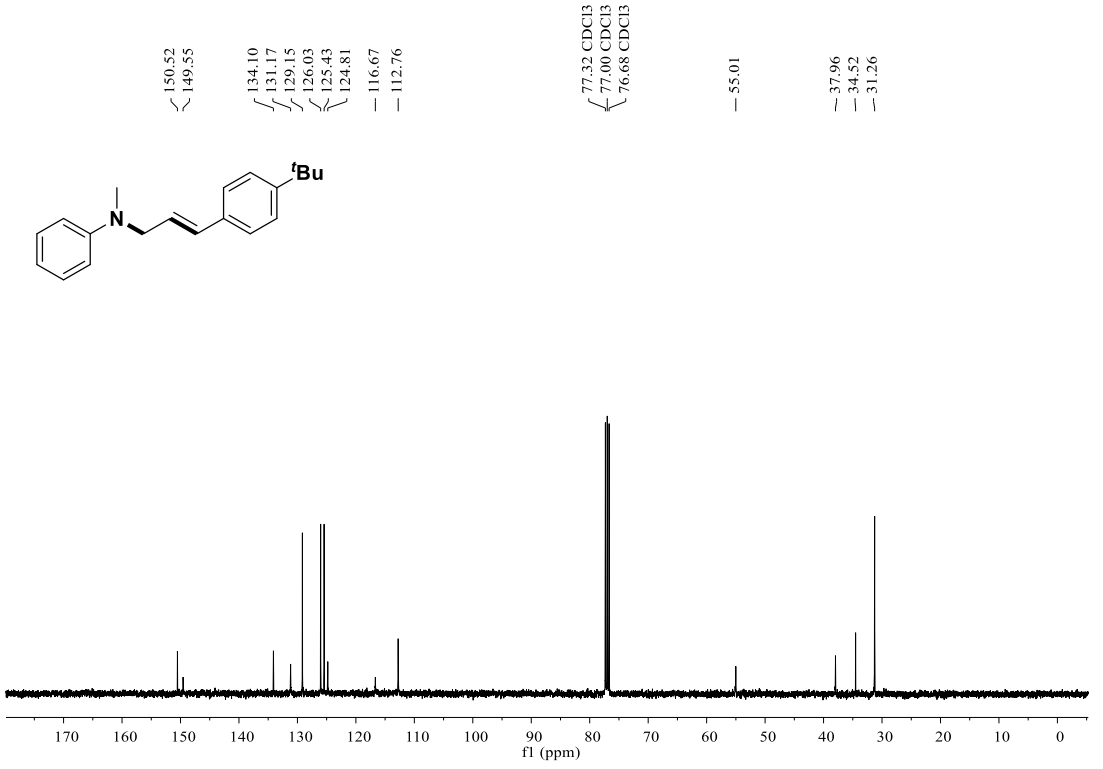
1-Cinnamyl-2,3,4,5-tetrahydro-1*H*-benzo[*b*]azepine (101)



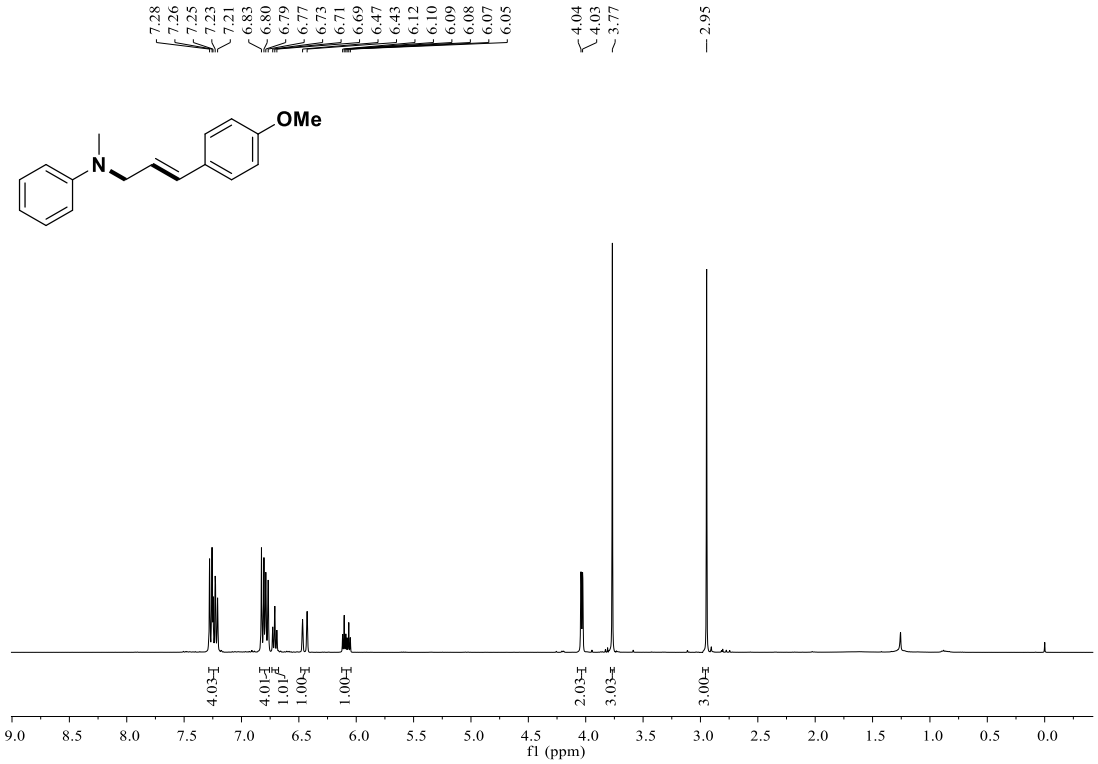


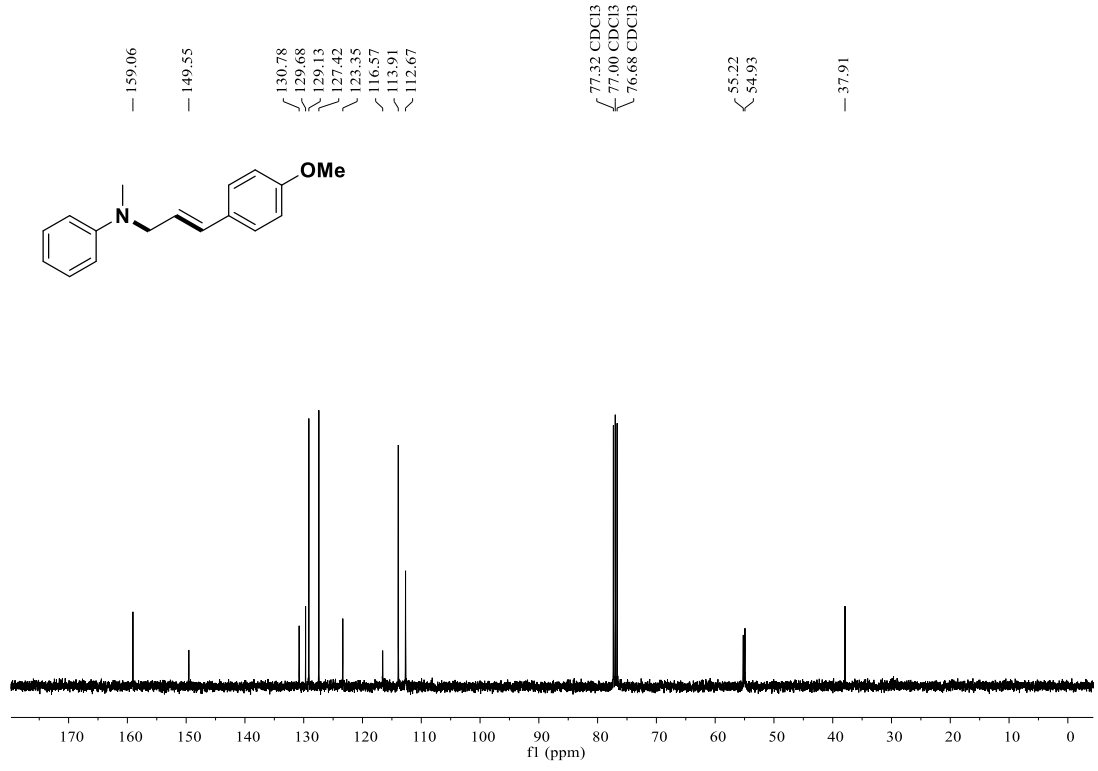
(*E*)-*N*-(3-(4-(tert-Butyl)phenyl)allyl)-*N*-methylaniline (102)



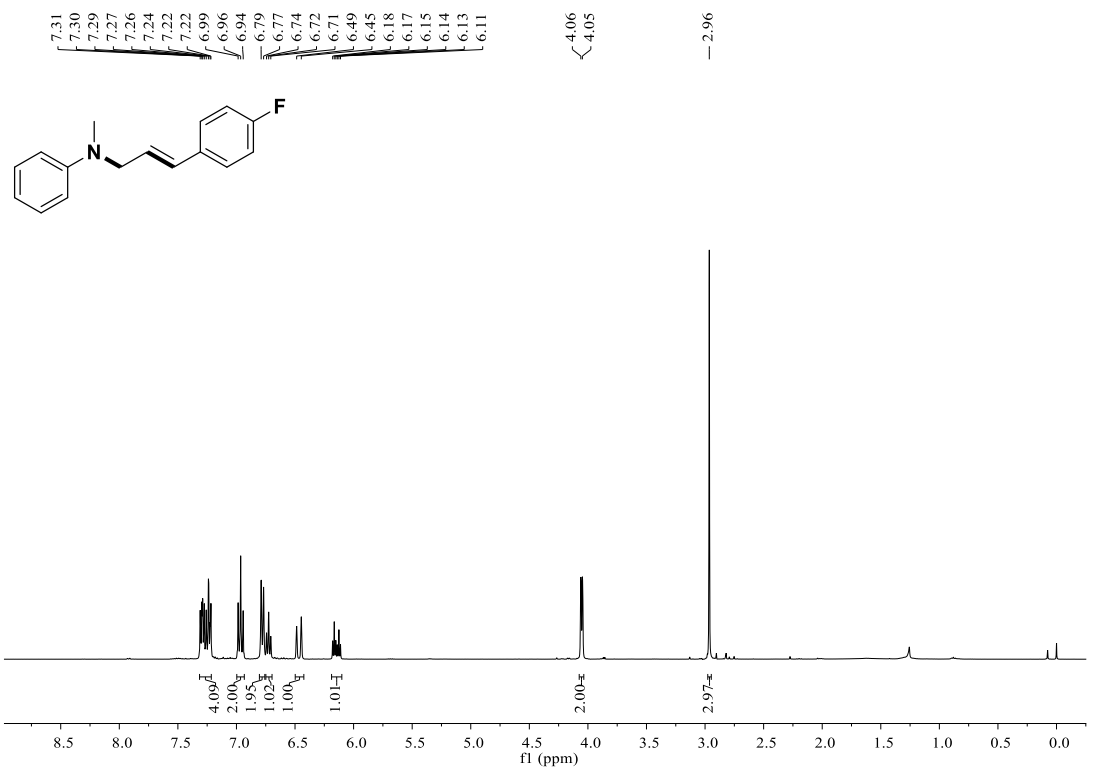


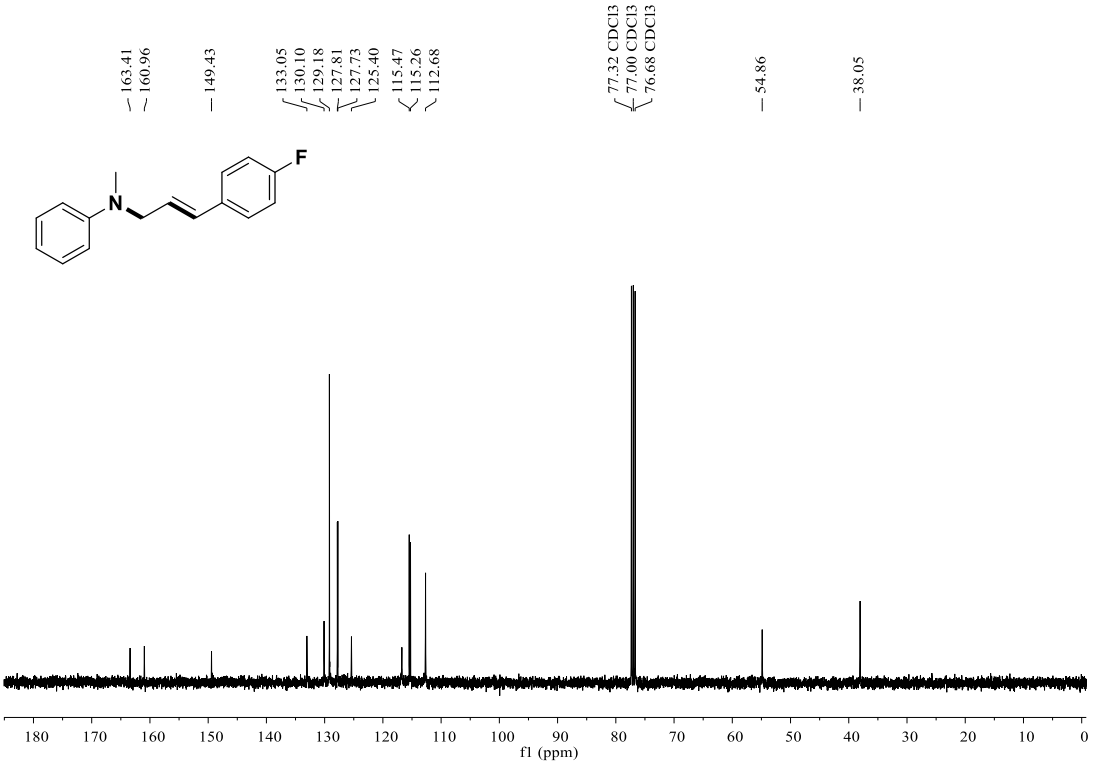
(*E*)-*N*-(3-(4-Methoxyphenyl)allyl)-*N*-methylaniline (103)



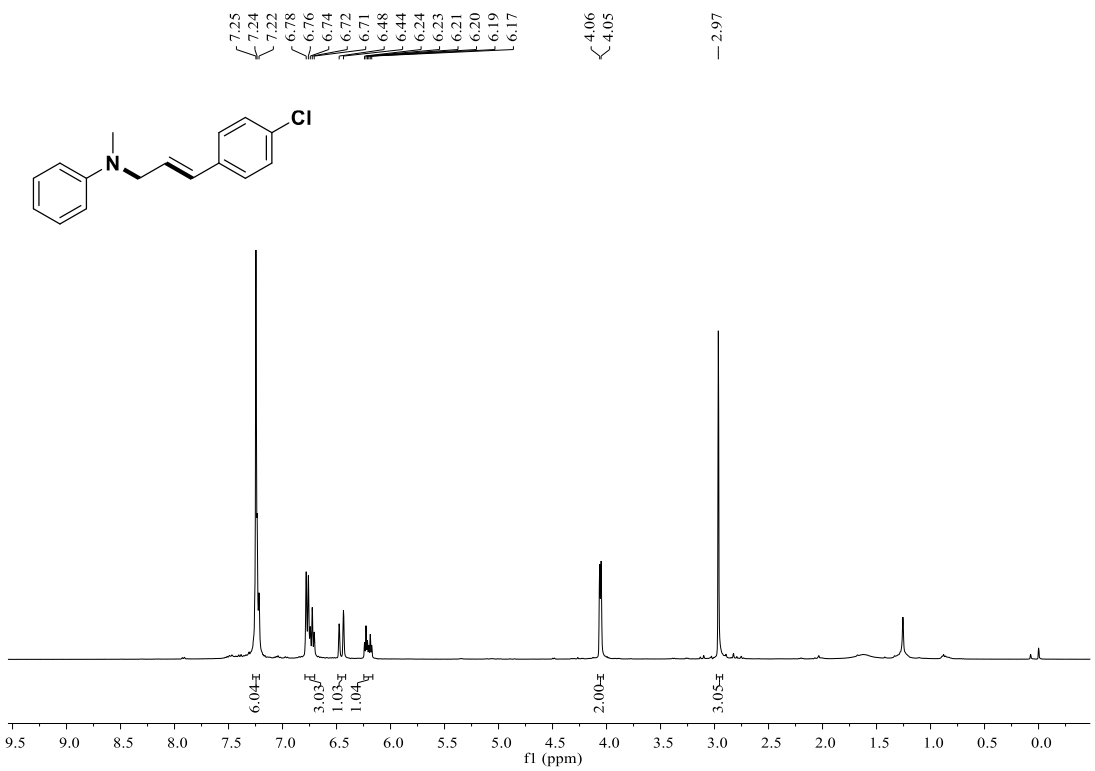


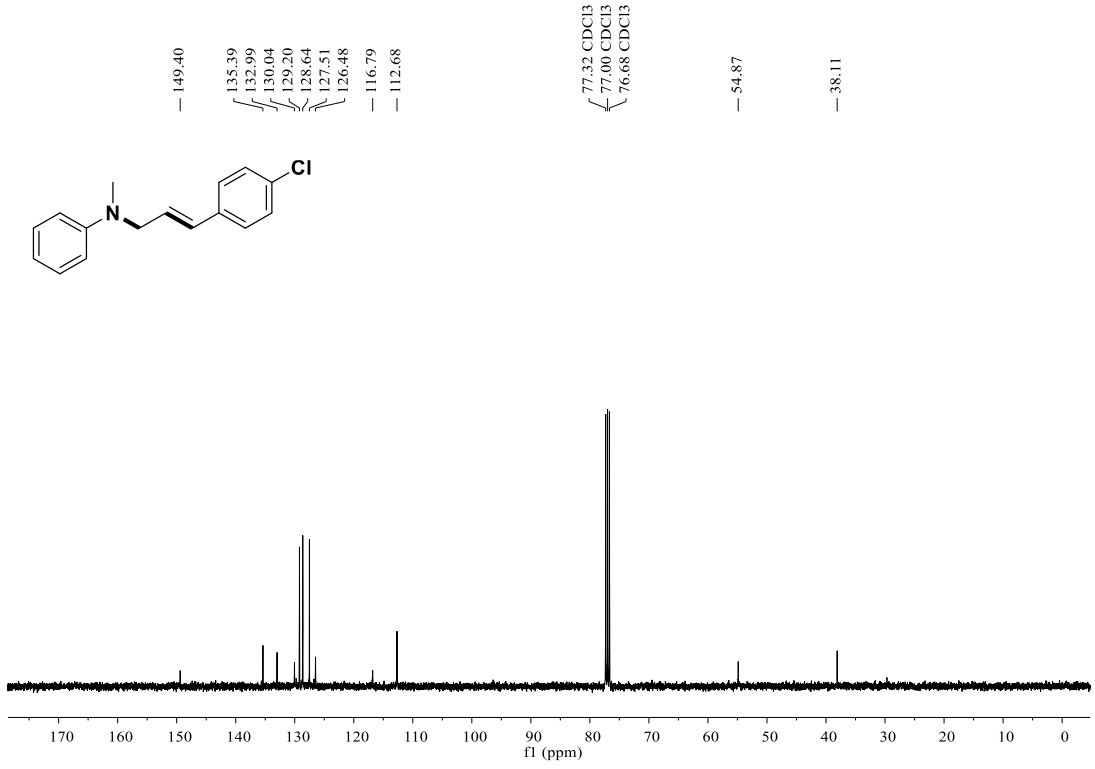
(*E*)-*N*-(3-(4-Fluorophenyl)allyl)-*N*-methylaniline (104)



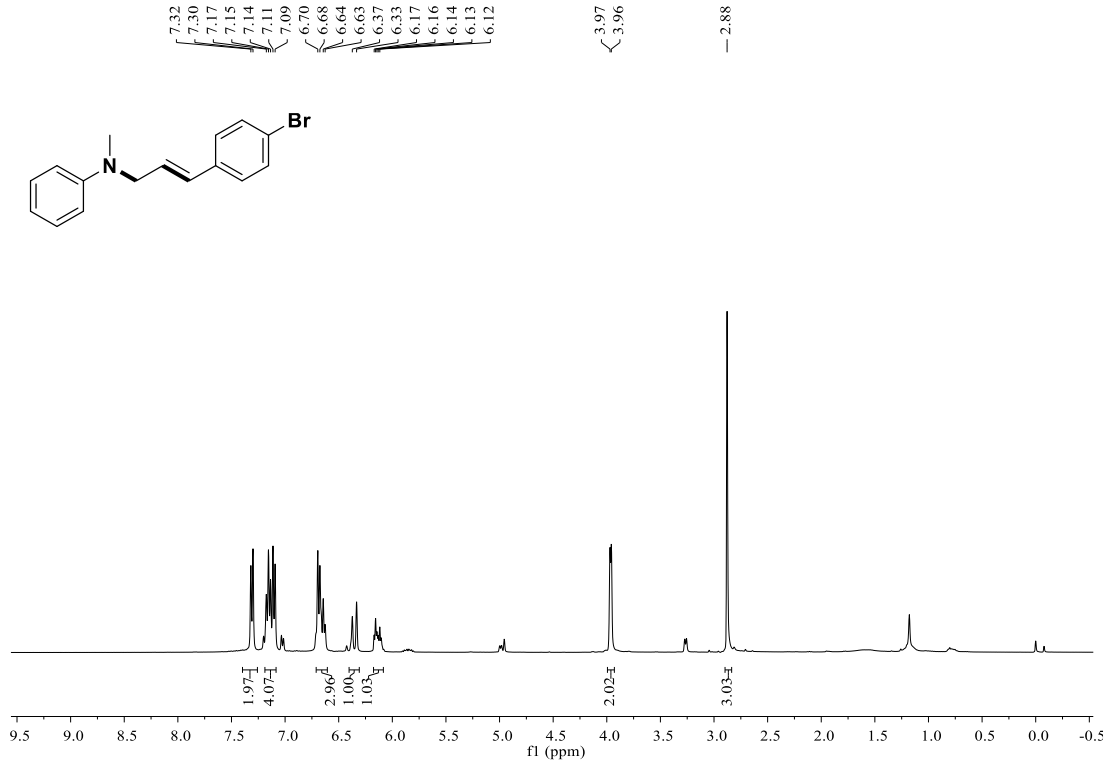


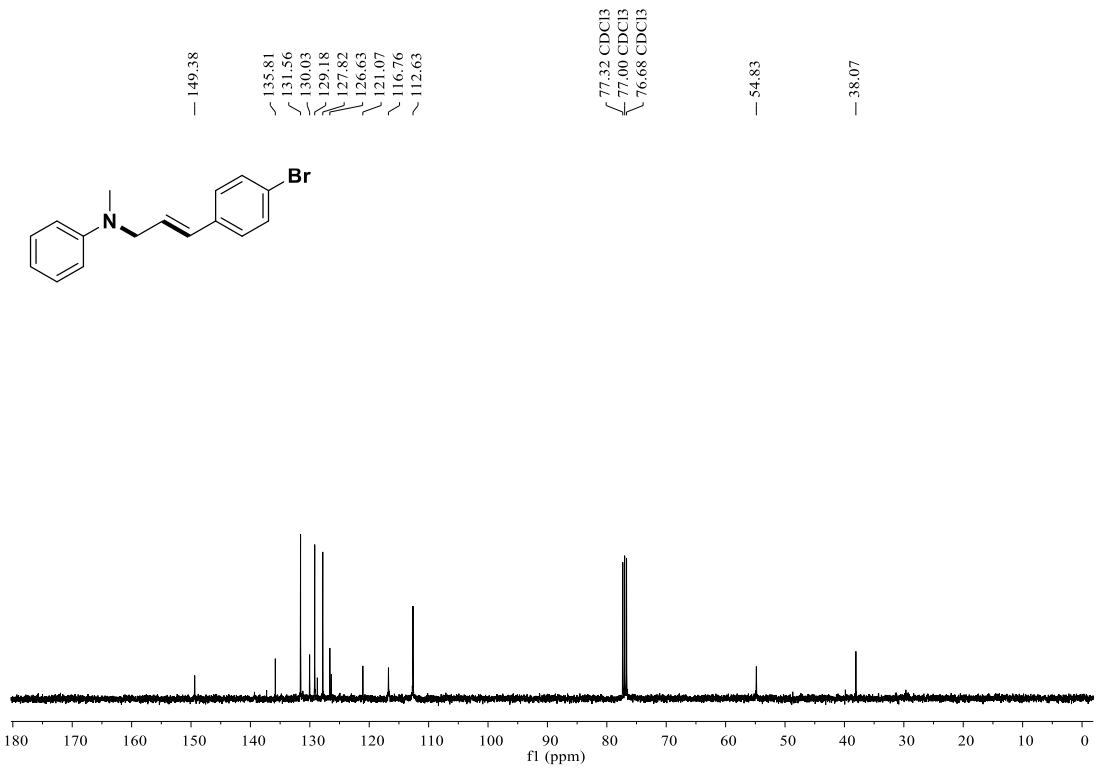
(*E*)-*N*-(3-(4-Chlorophenyl)allyl)-*N*-methylaniline (105)



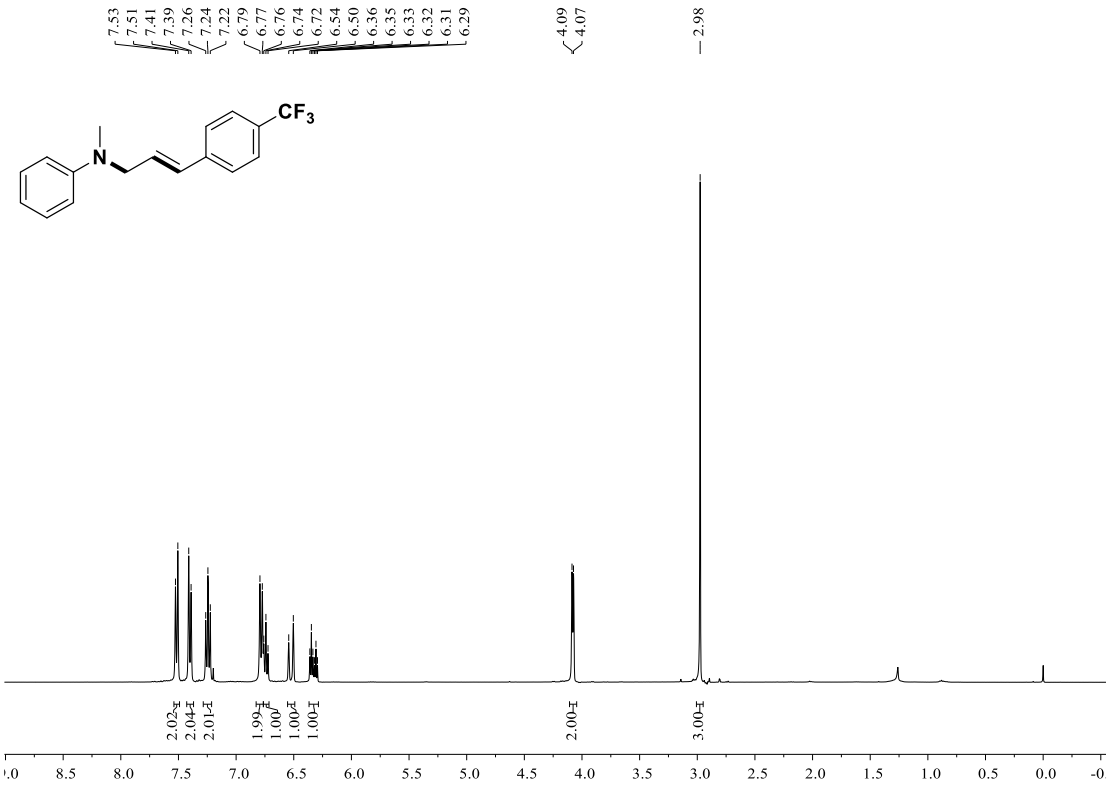


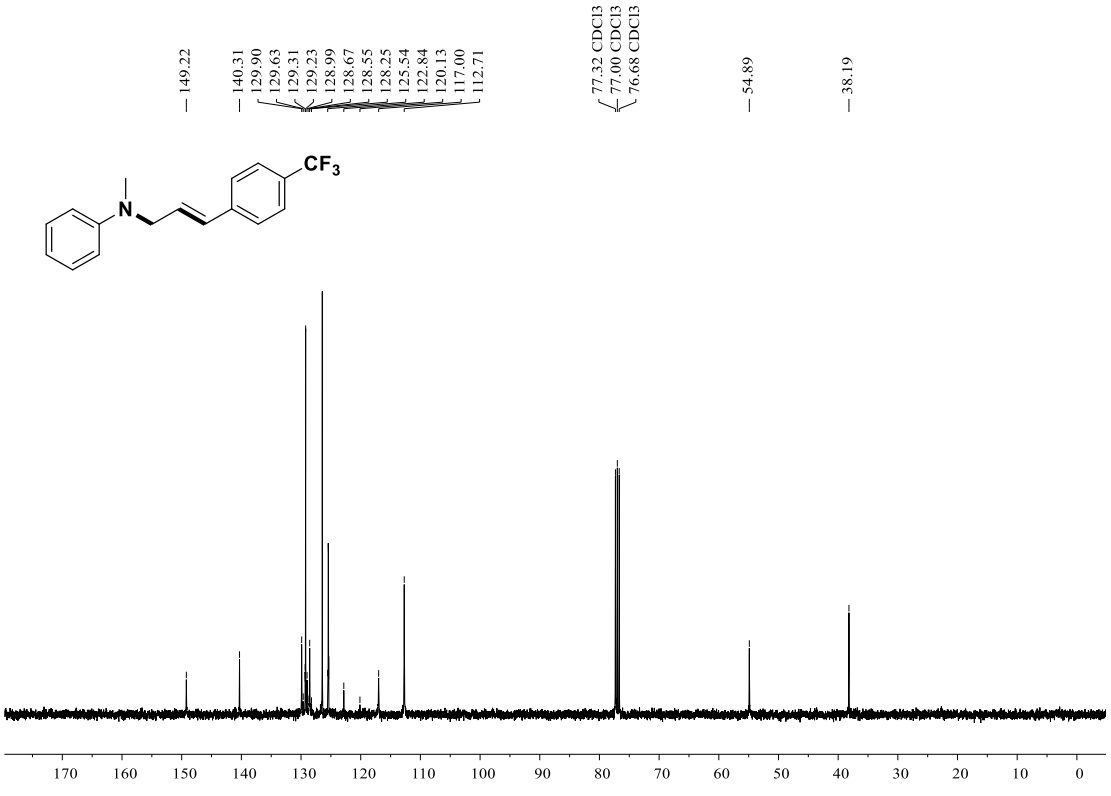
(*E*)-*N*-(3-(4-Bromophenyl)allyl)-*N*-methylaniline (106)



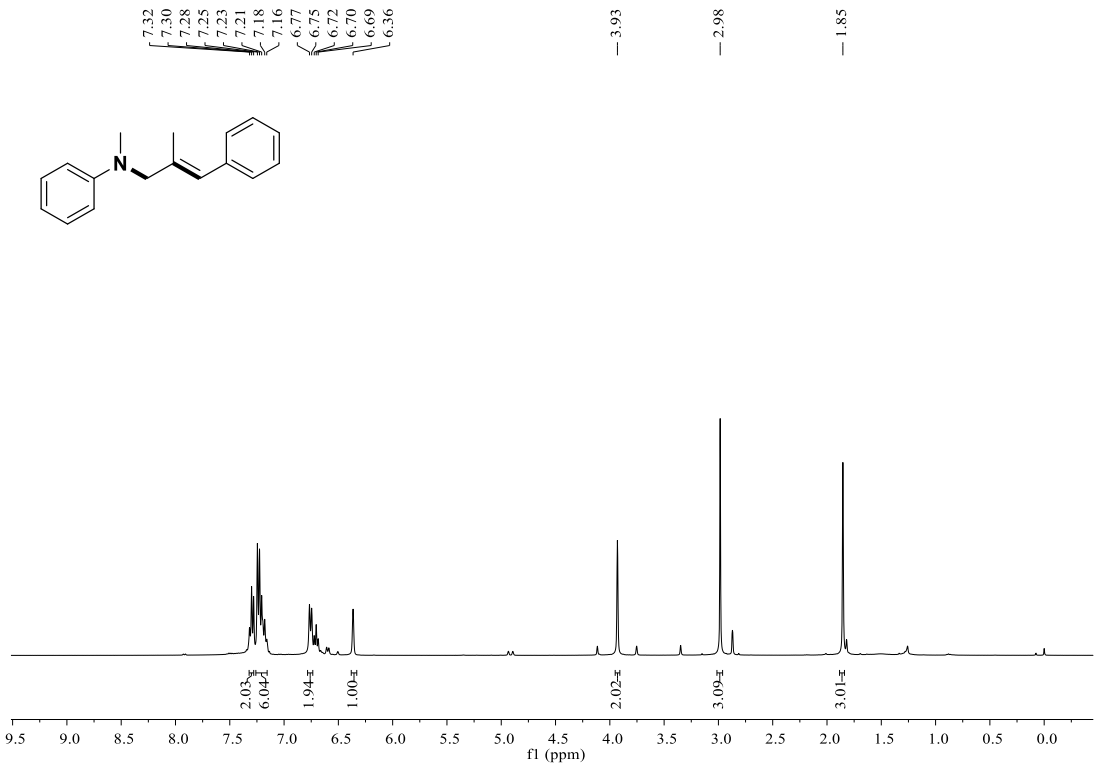


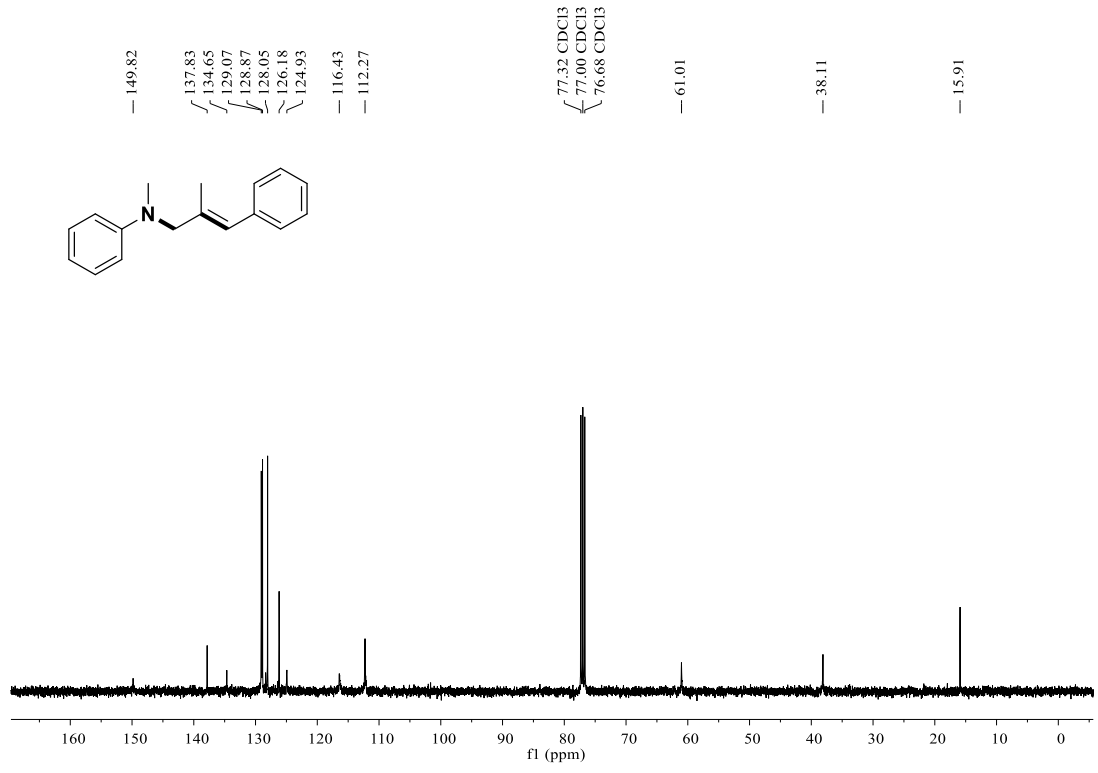
(*E*)-*N*-Methyl-*N*-(3-(4-(trifluoromethyl)phenyl)allyl)aniline (107)



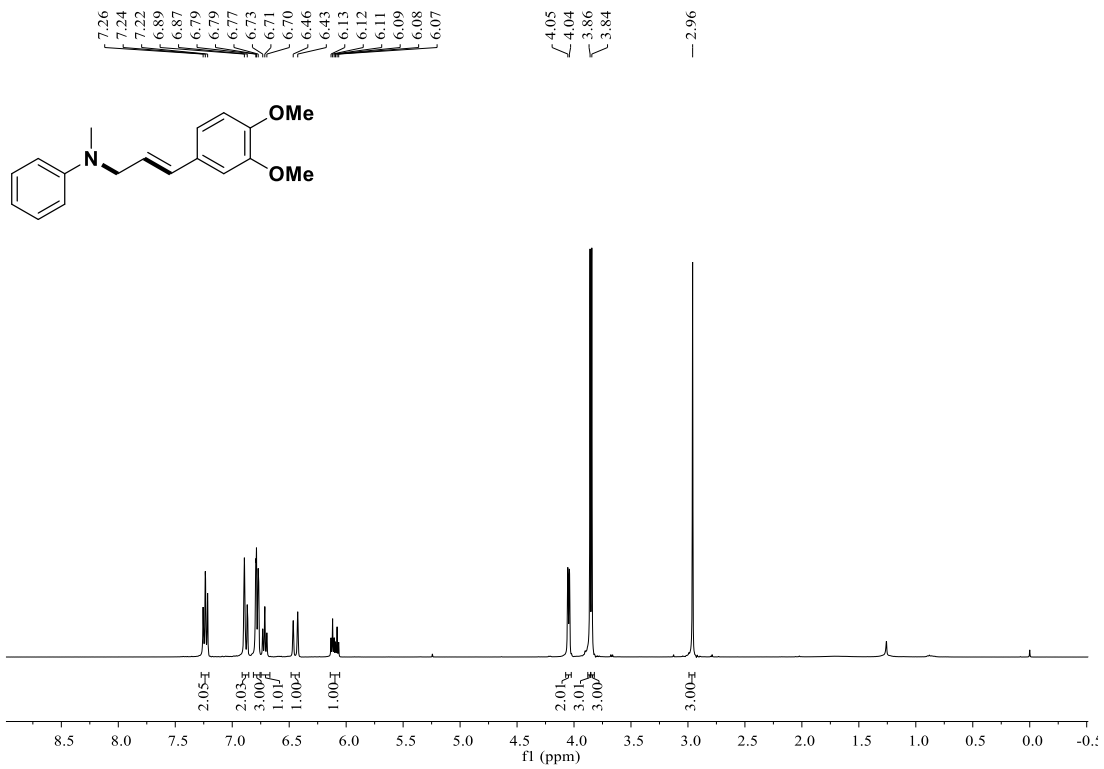


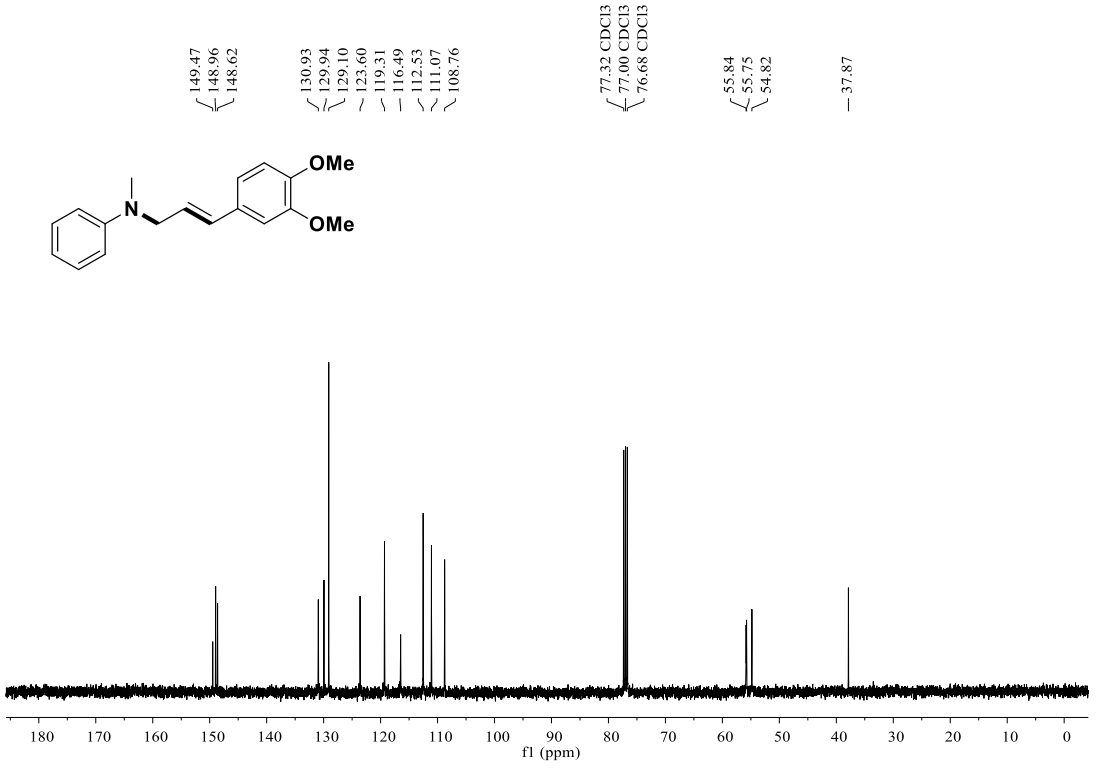
(*E*)-*N*-Methyl-*N*-(2-methyl-3-phenylallyl)aniline (108)



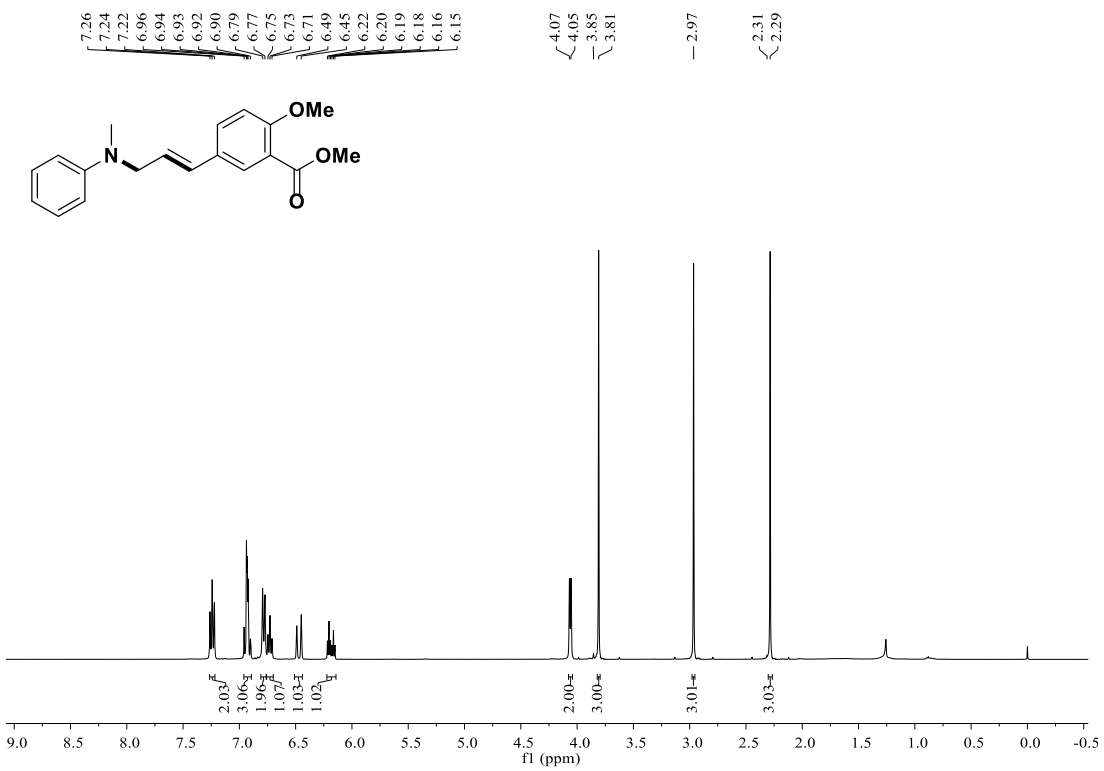


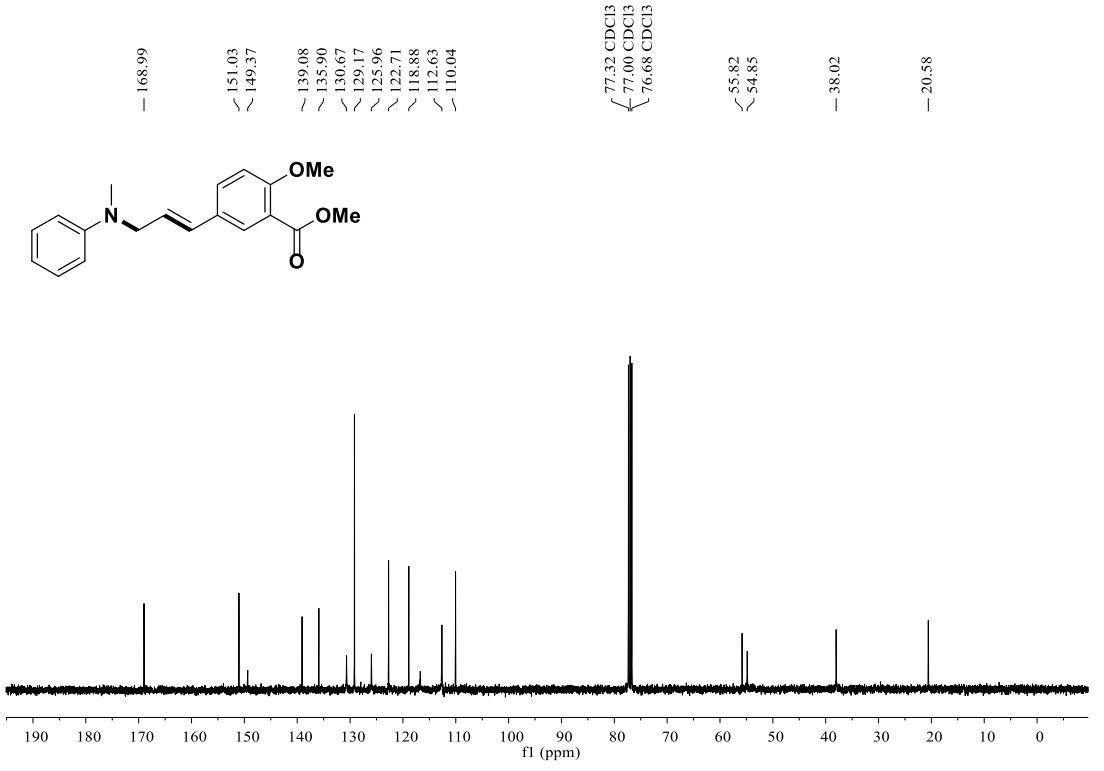
(*E*)-*N*-(3-(3,4-Dimethoxyphenyl)allyl)-*N*-methylaniline (109)



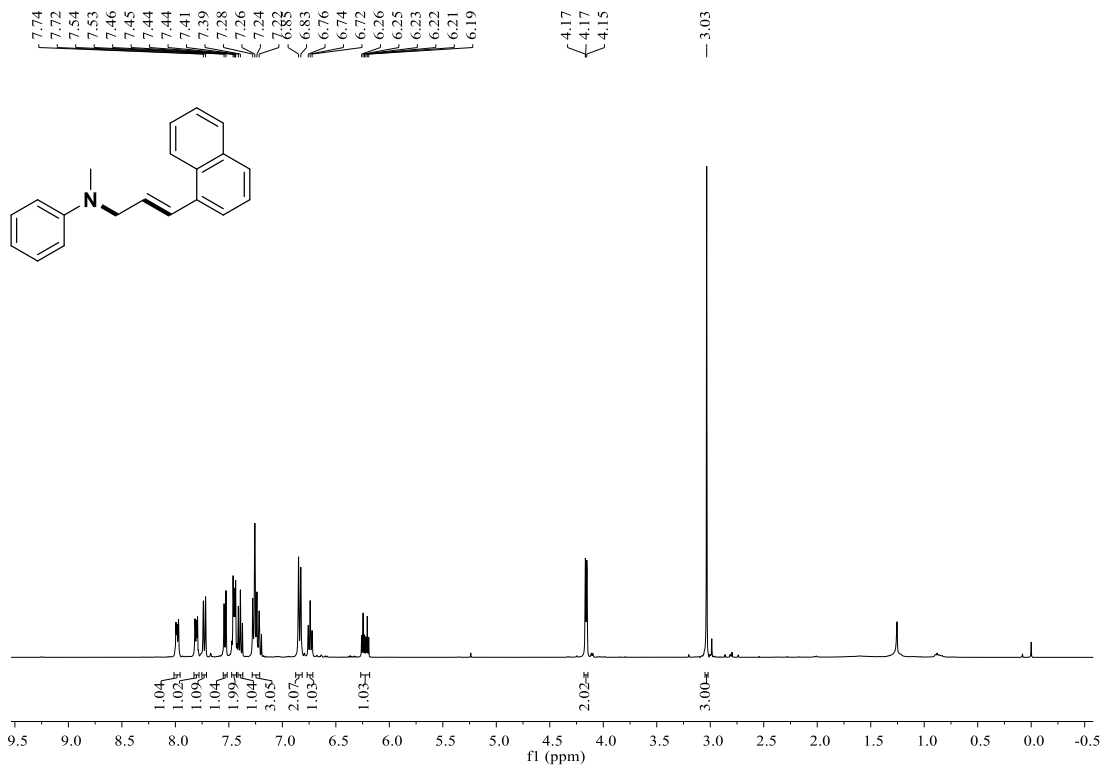


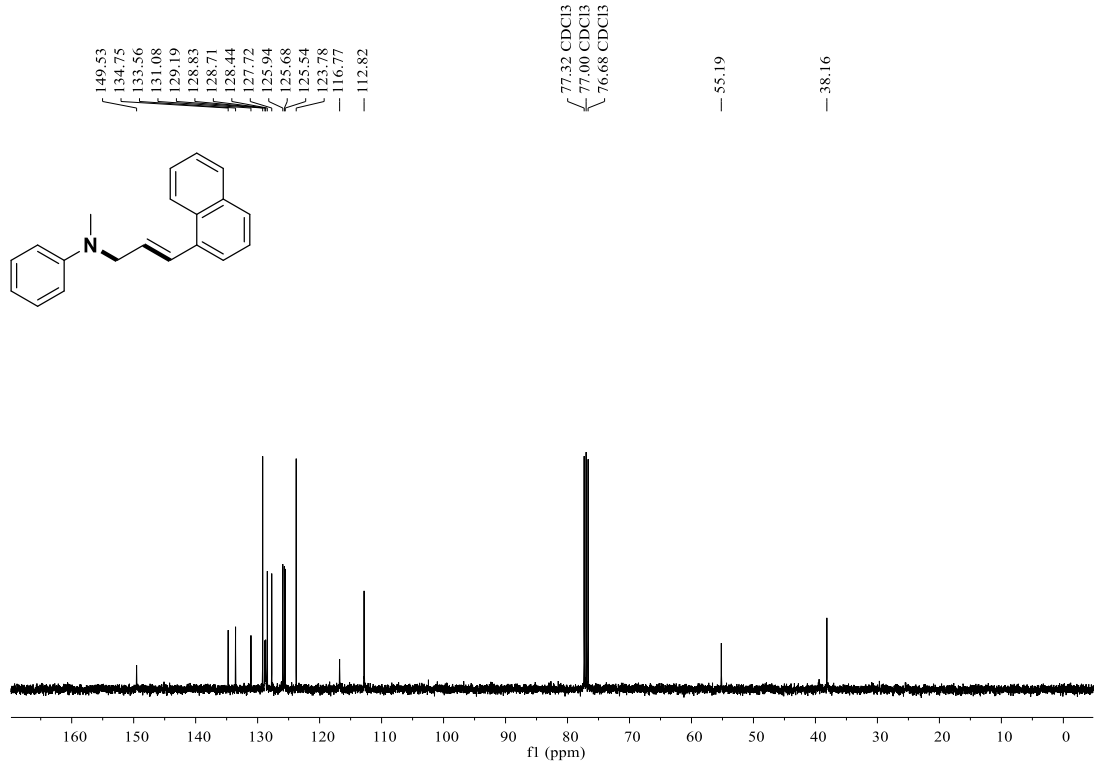
Methyl (*E*)-2-methoxy-5-(3-(methyl(phenyl)amino)prop-1-en-1-yl)benzoate (110)



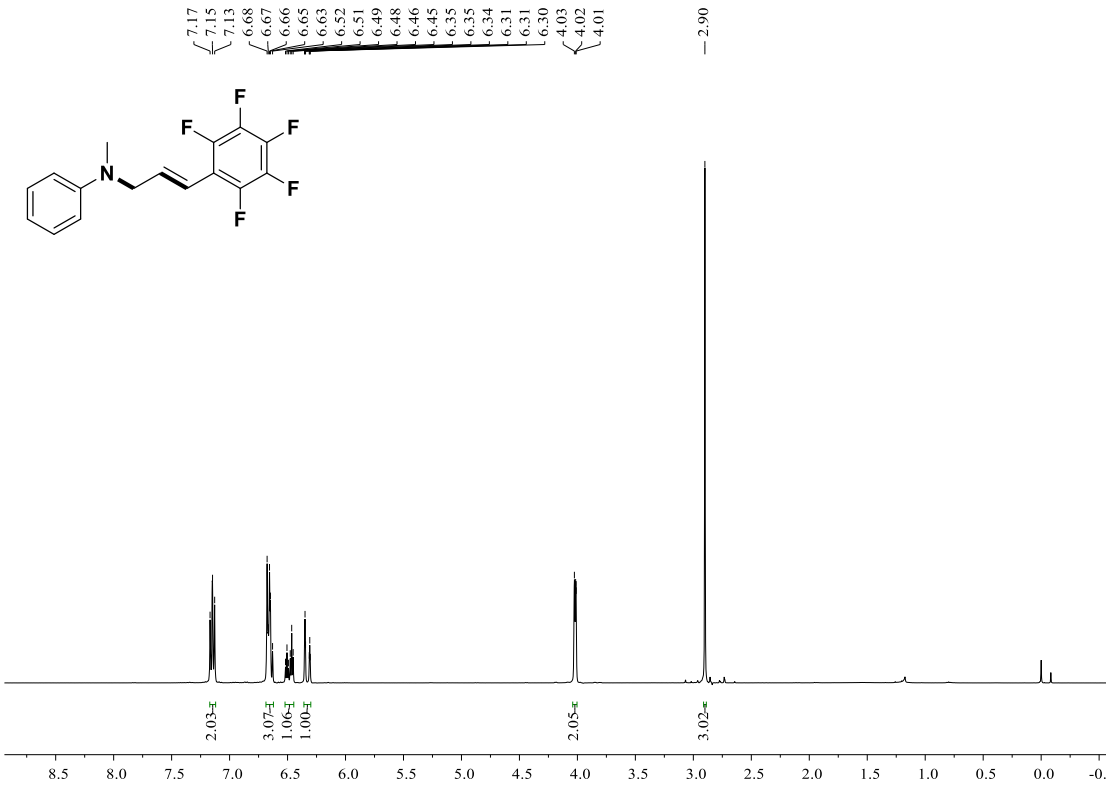


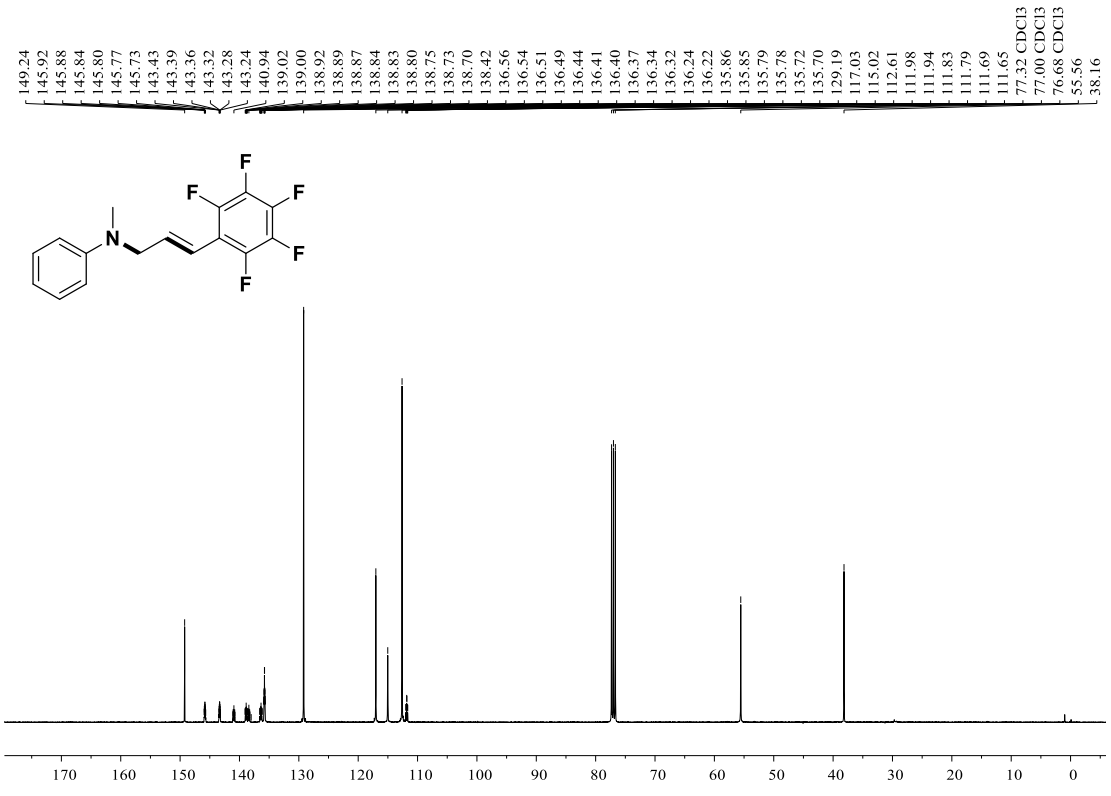
(*E*)-*N*-Methyl-*N*-(3-(naphthalen-1-yl)allyl)aniline (111)



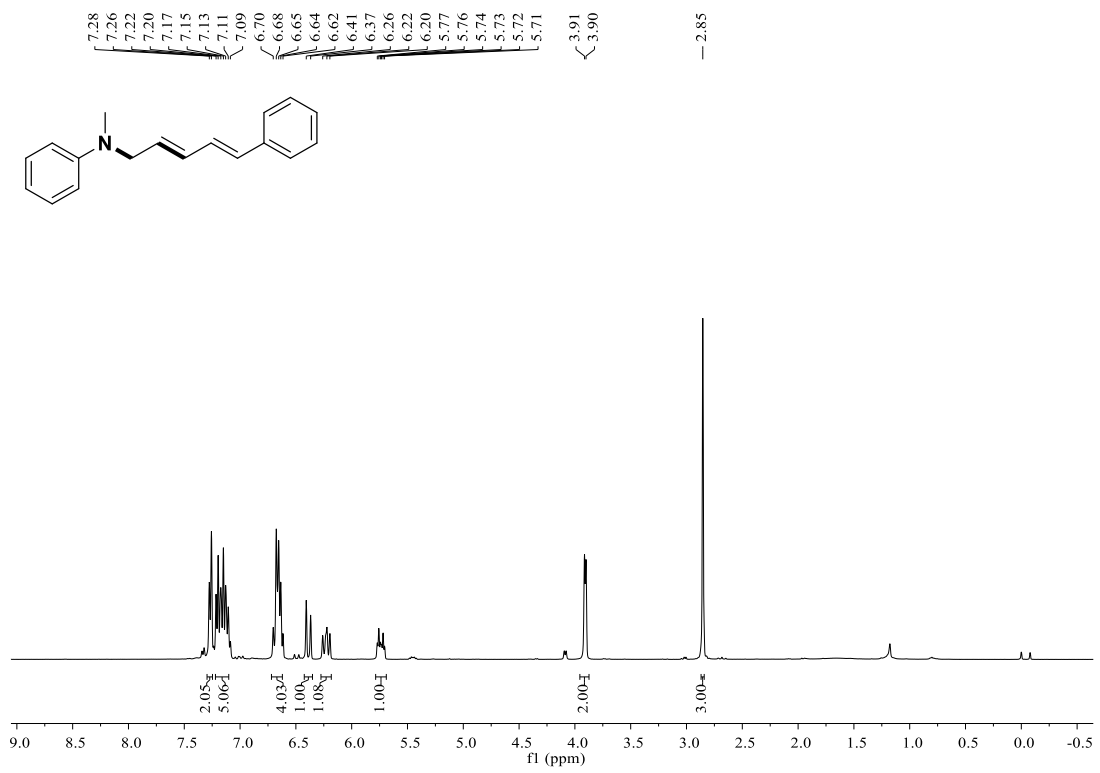


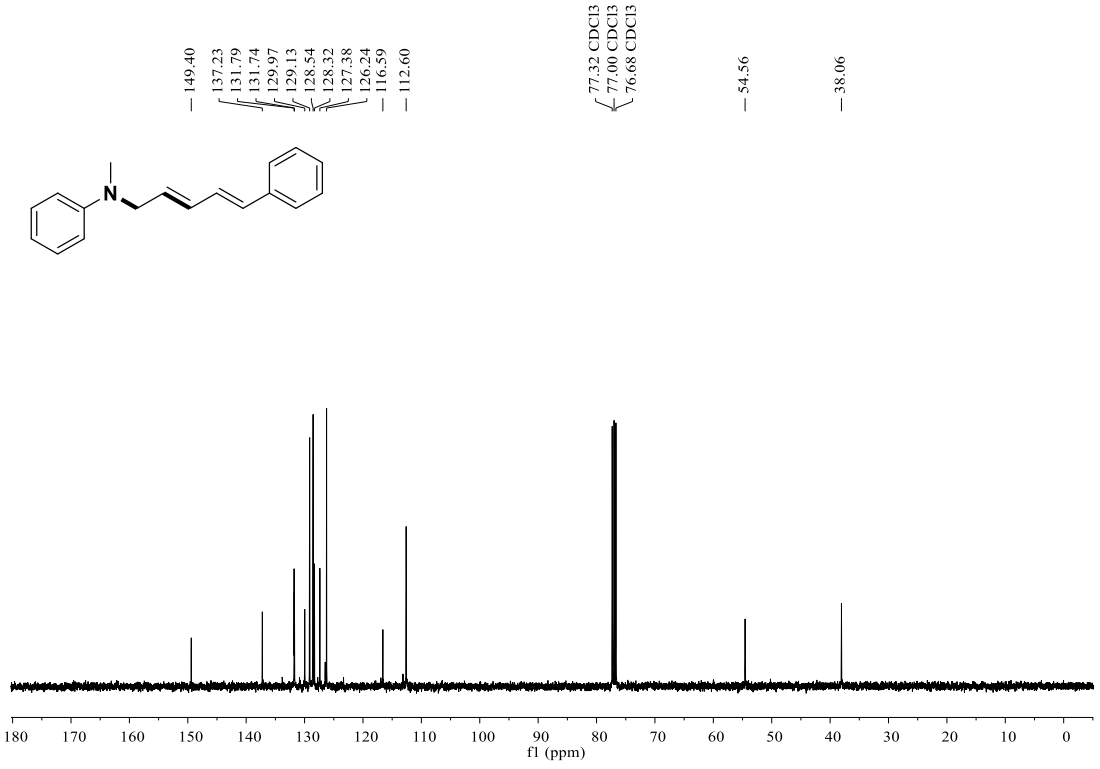
(*E*)-*N*-Methyl-*N*-(3-(perfluorophenyl)allyl)aniline (112)



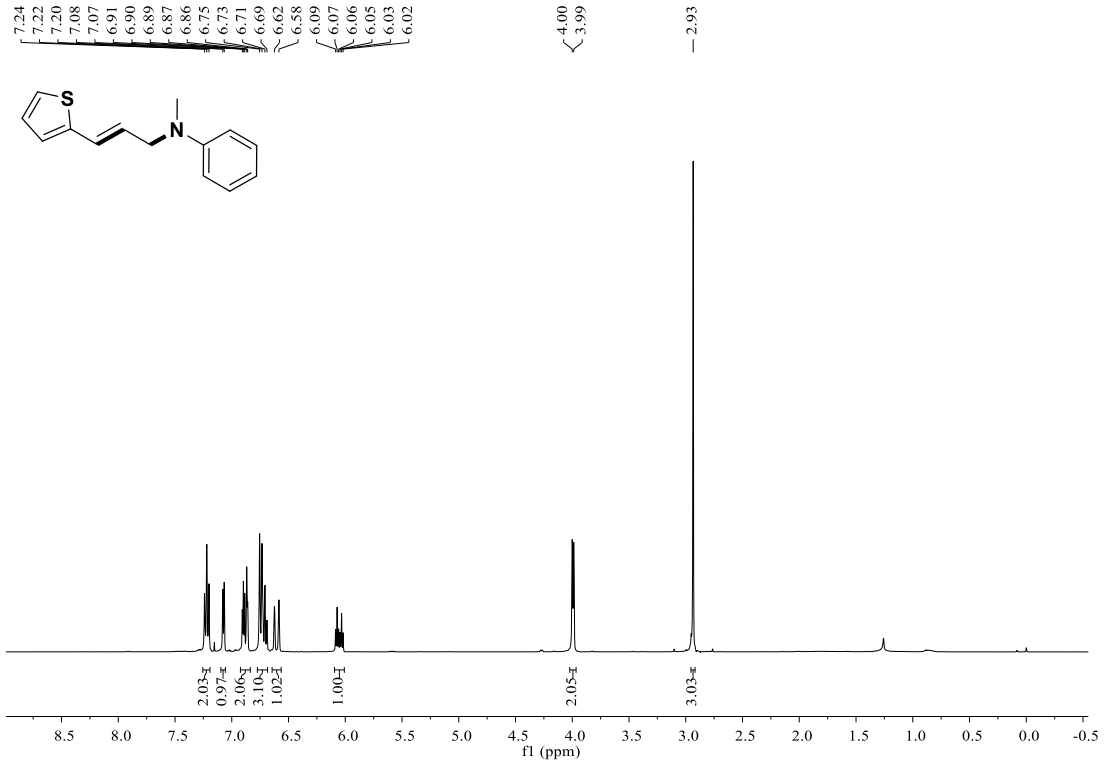


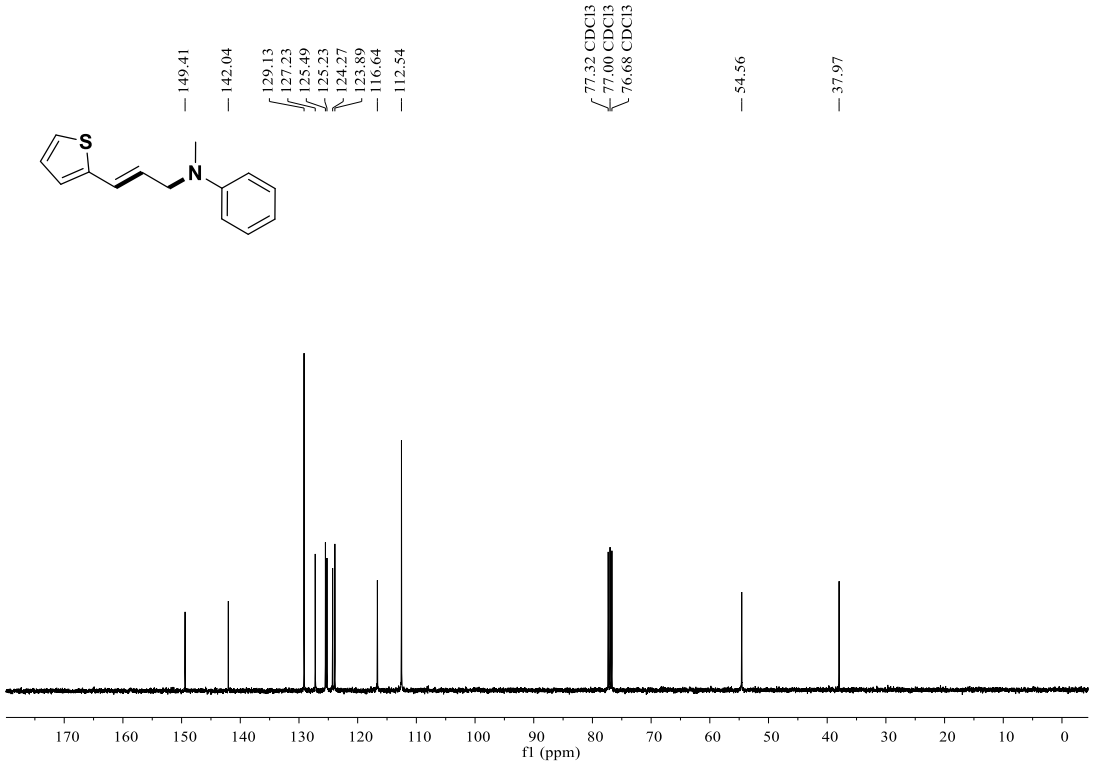
***N*-Methyl-*N*-((2*E*,4*E*)-5-phenylpenta-2,4-dien-1-yl)aniline (113)**



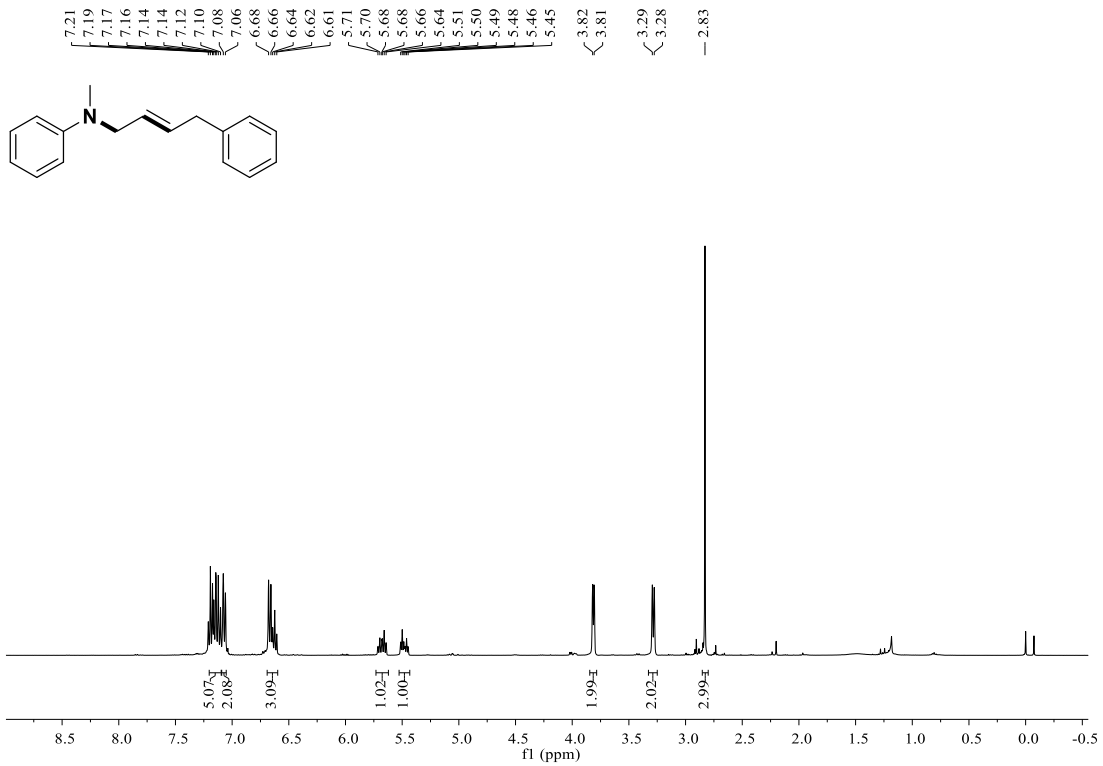


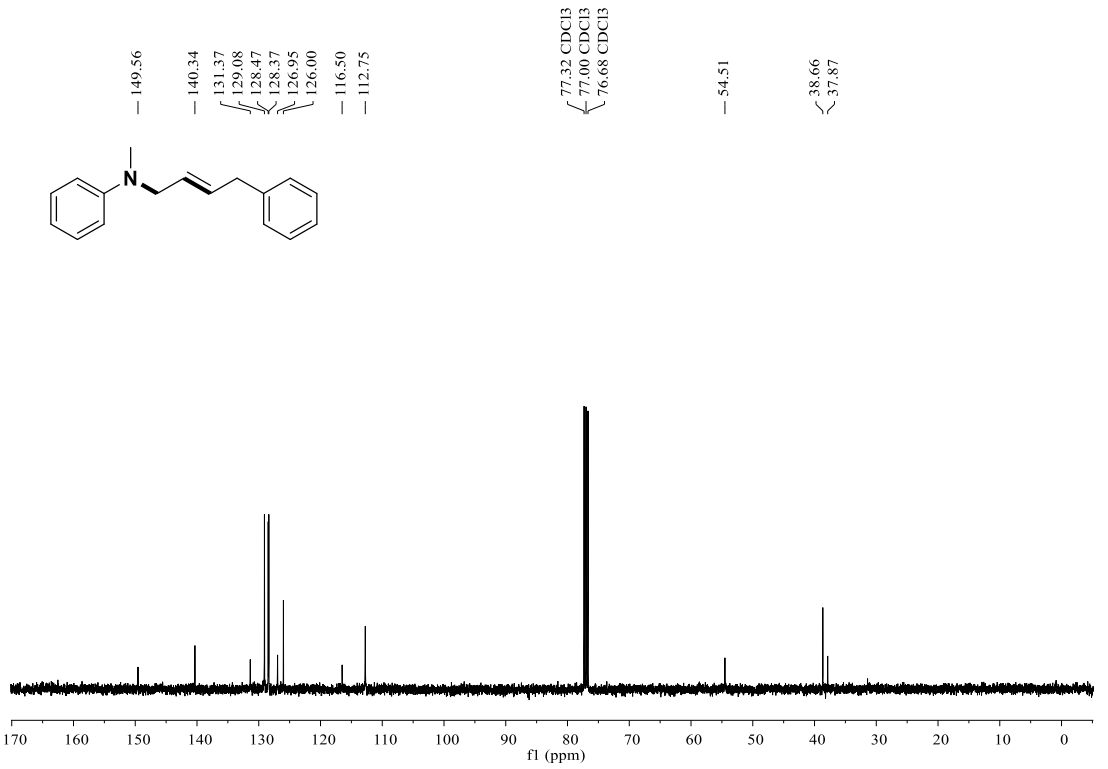
(*E*)-*N*-Methyl-*N*-(3-(thiophen-2-yl)allyl)aniline (114)



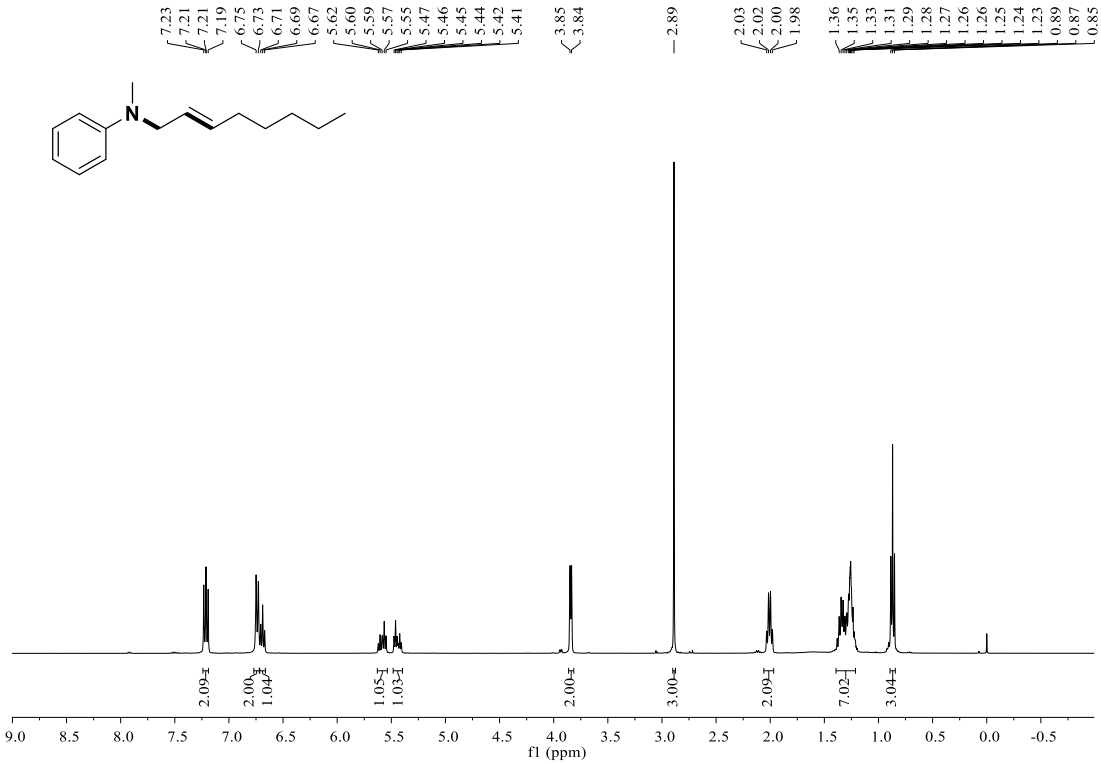


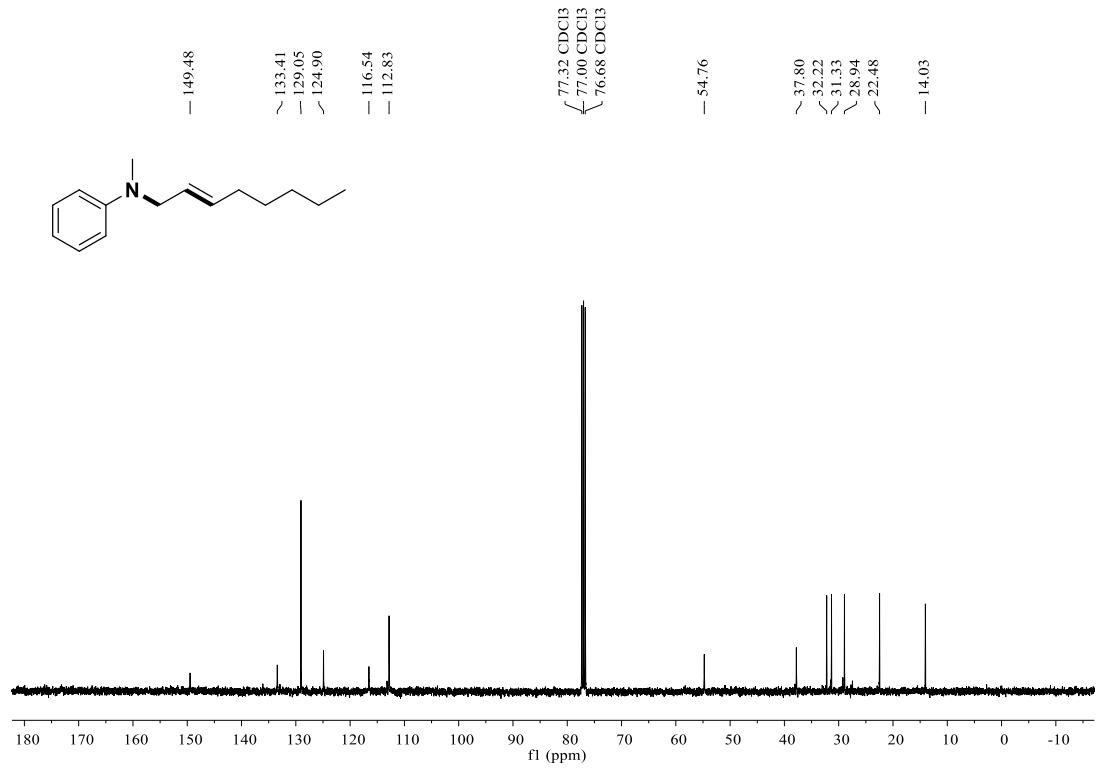
(*E*)-*N*-Methyl-*N*-(4-phenylbut-2-en-1-yl)aniline (115)



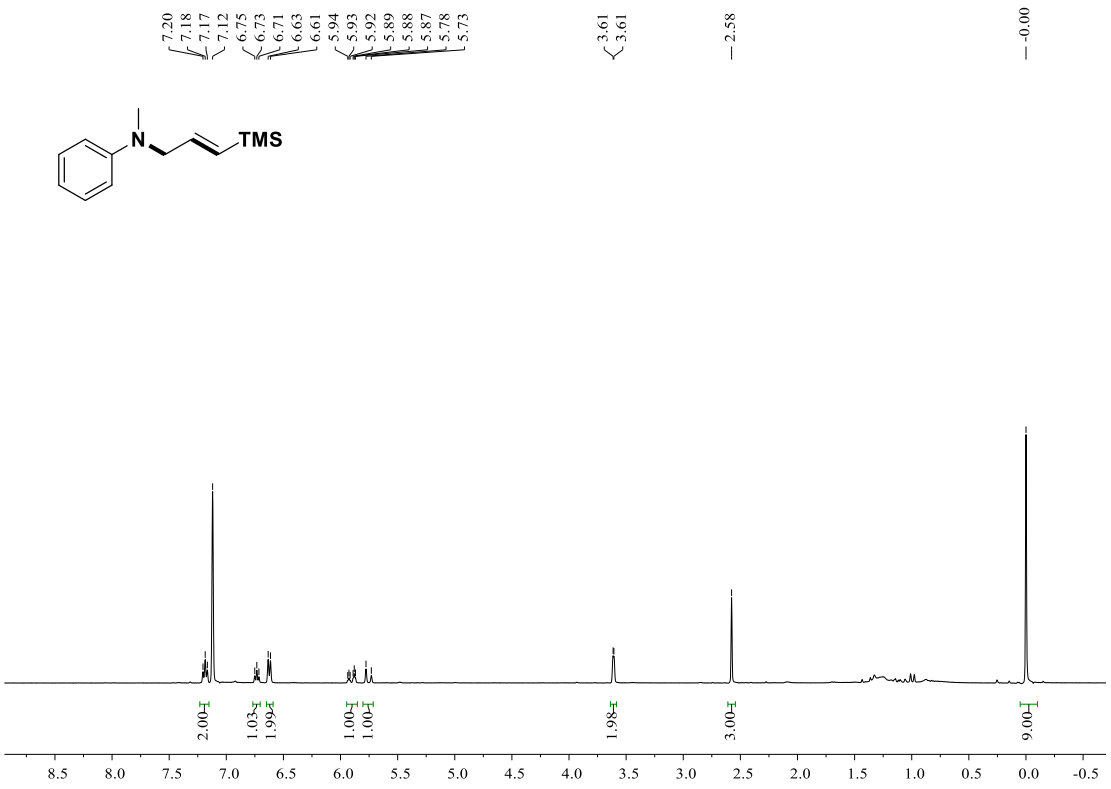


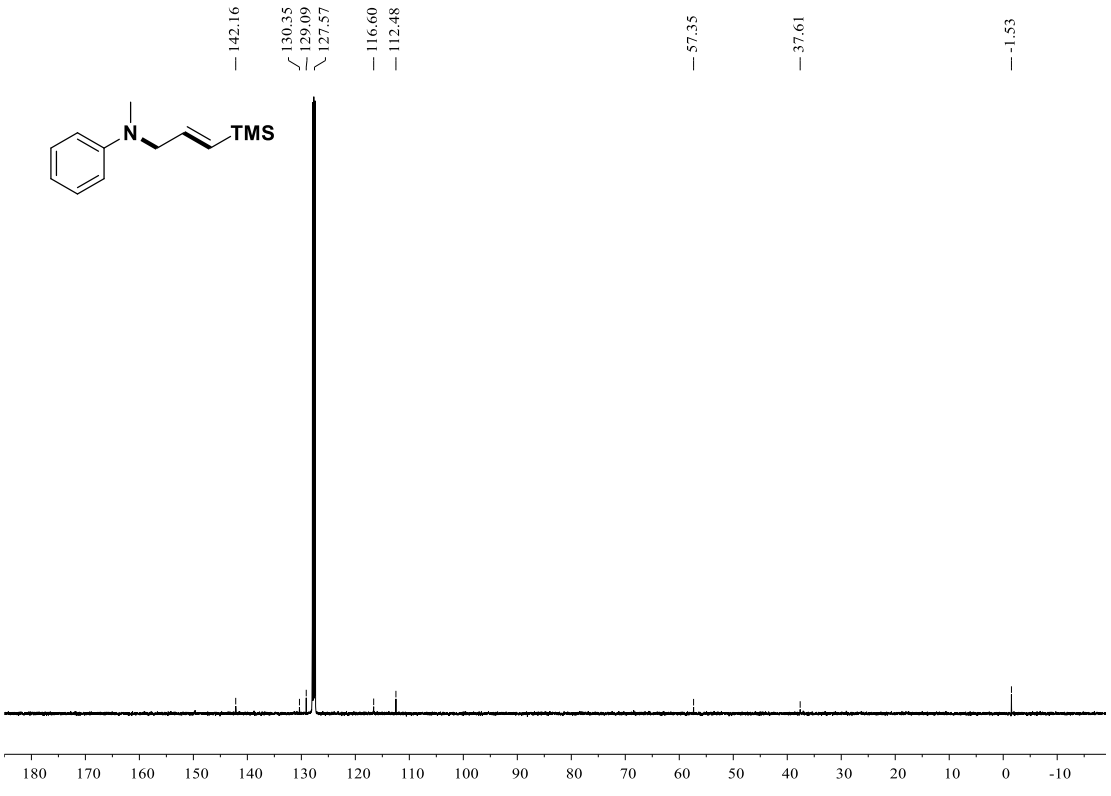
(*E*)-*N*-Methyl-*N*-(oct-2-en-1-yl)aniline (116)



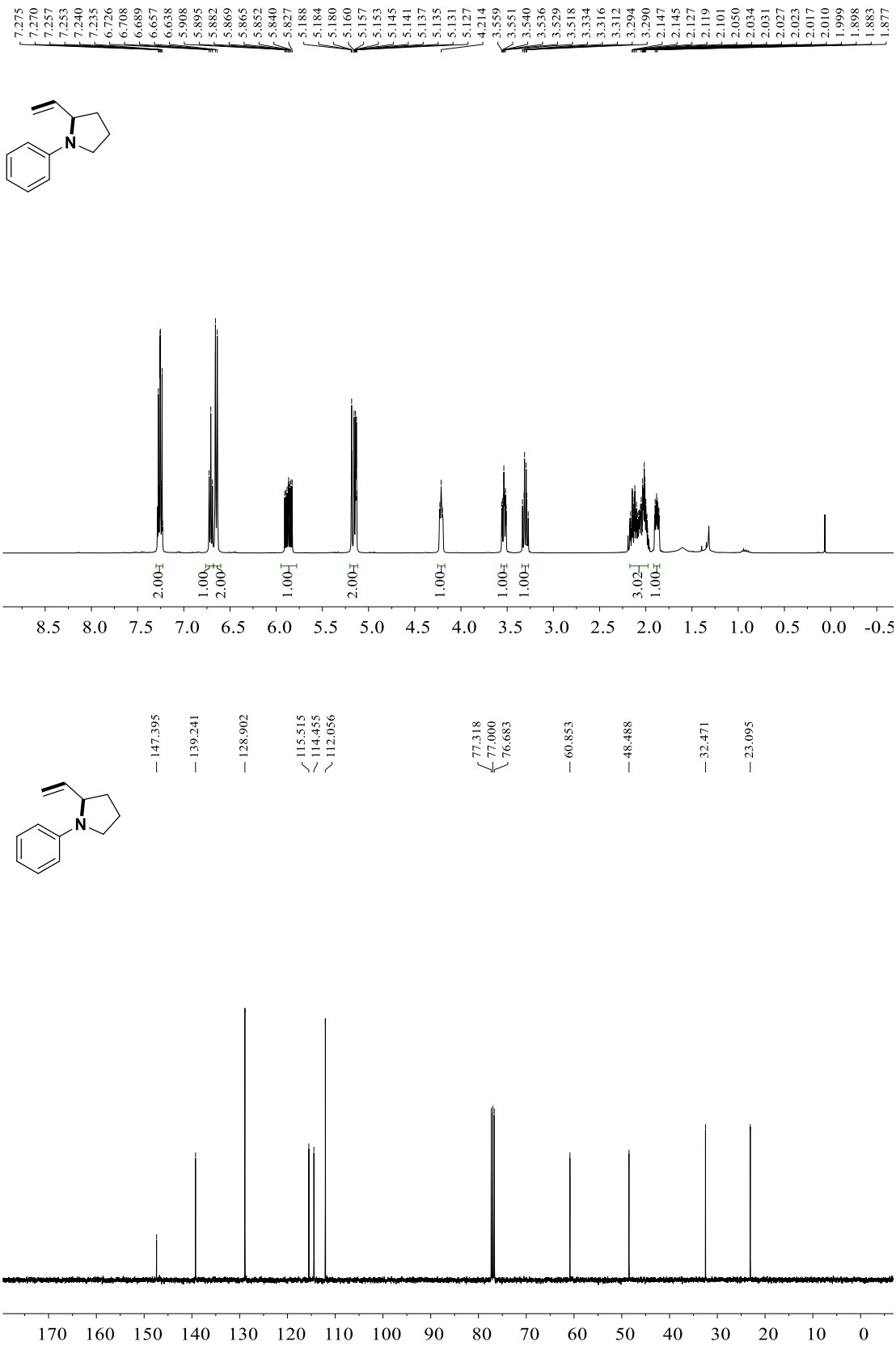


(*E*)-*N*-Methyl-*N*-(3-(trimethylsilyl)allyl)aniline (117)

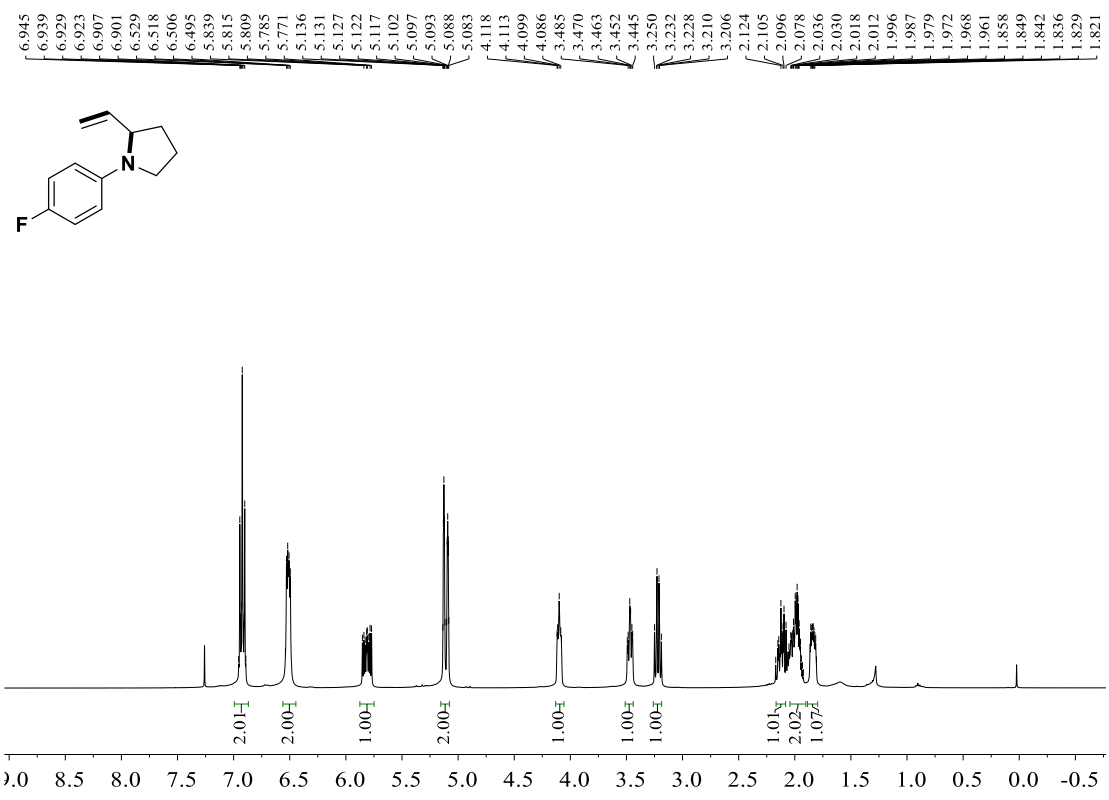


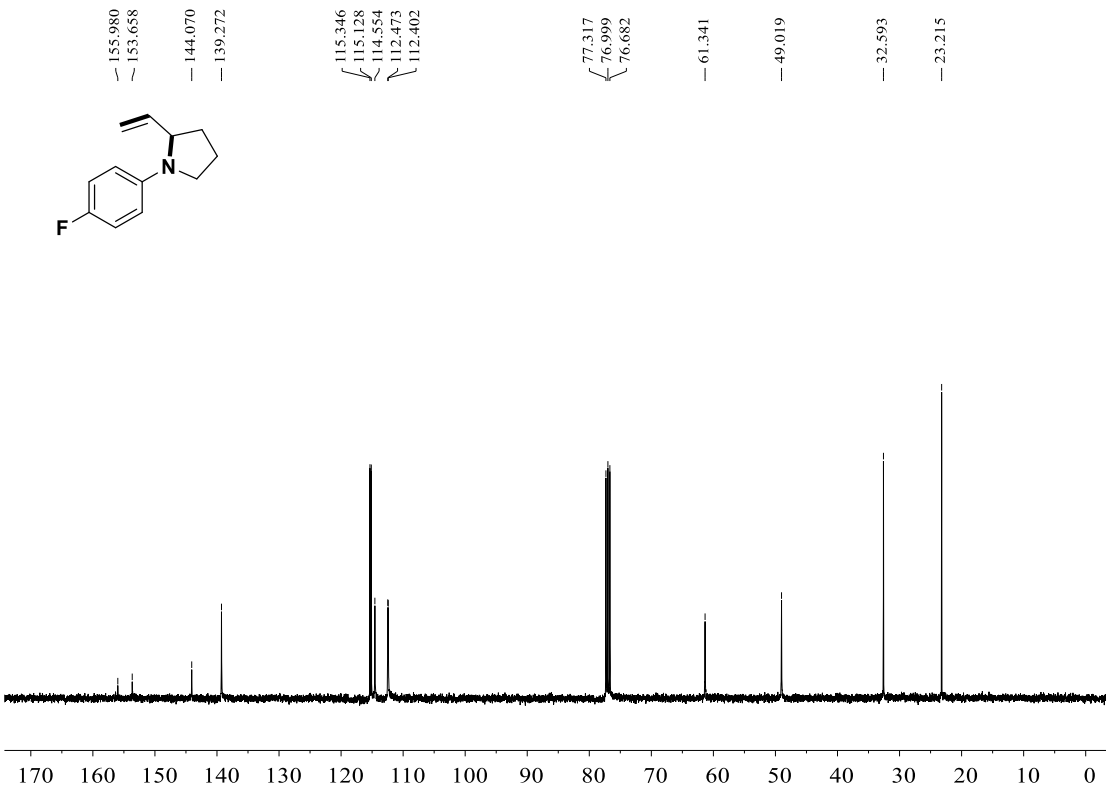


1-Phenyl-2-vinylpyrrolidine (119)

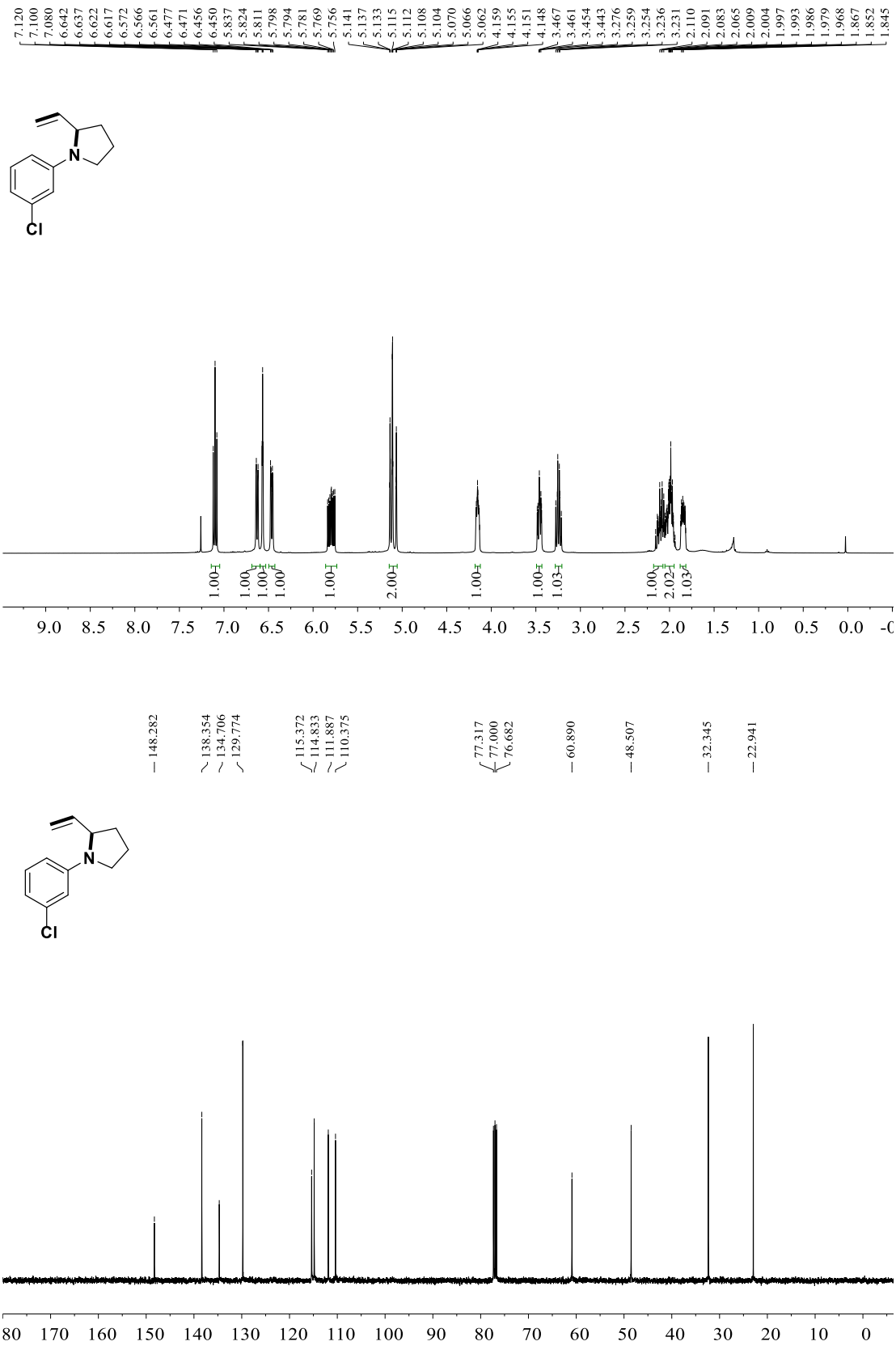


1-(4-Fluorophenyl)-2-vinylpyrrolidine (120)

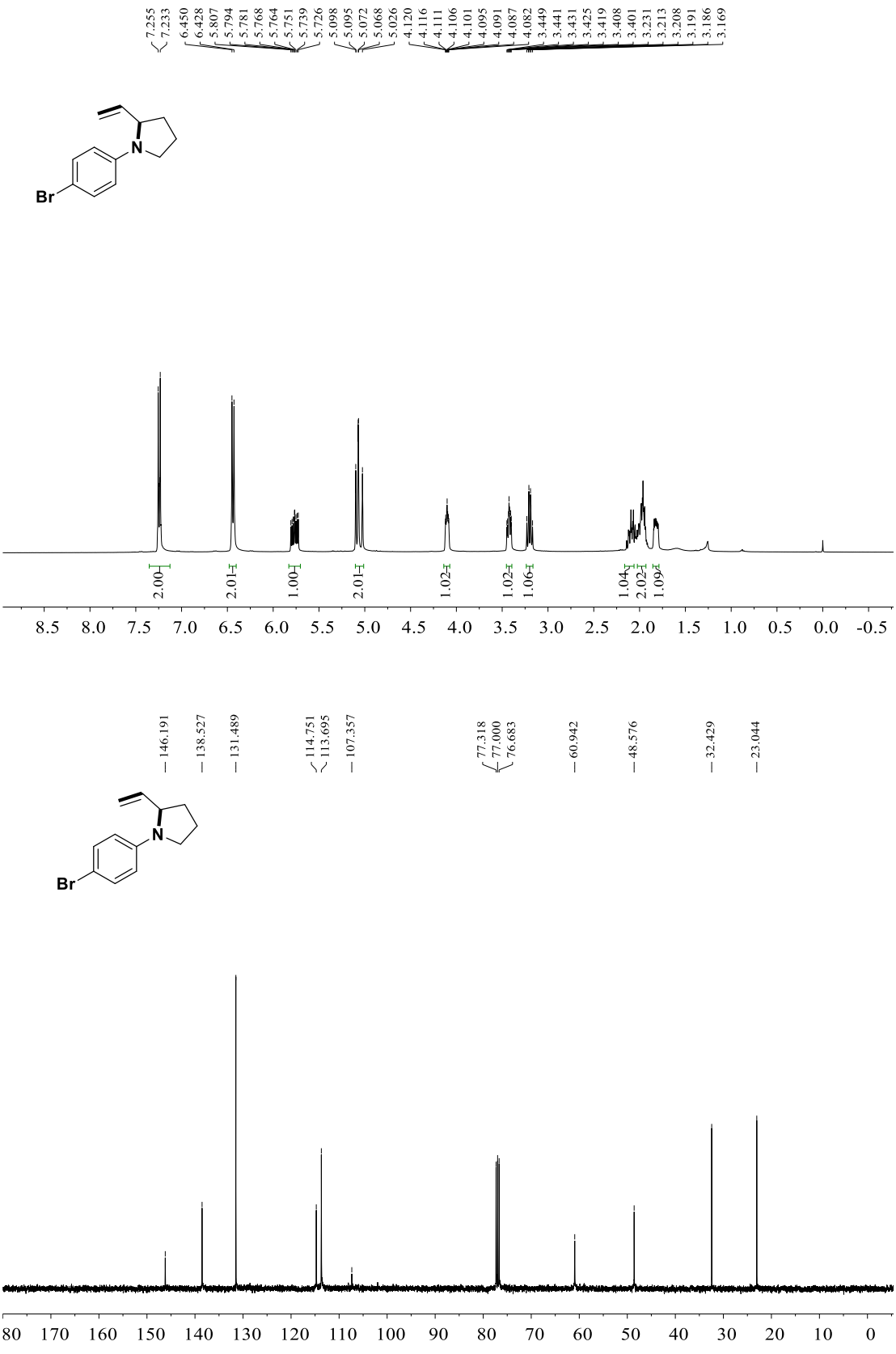




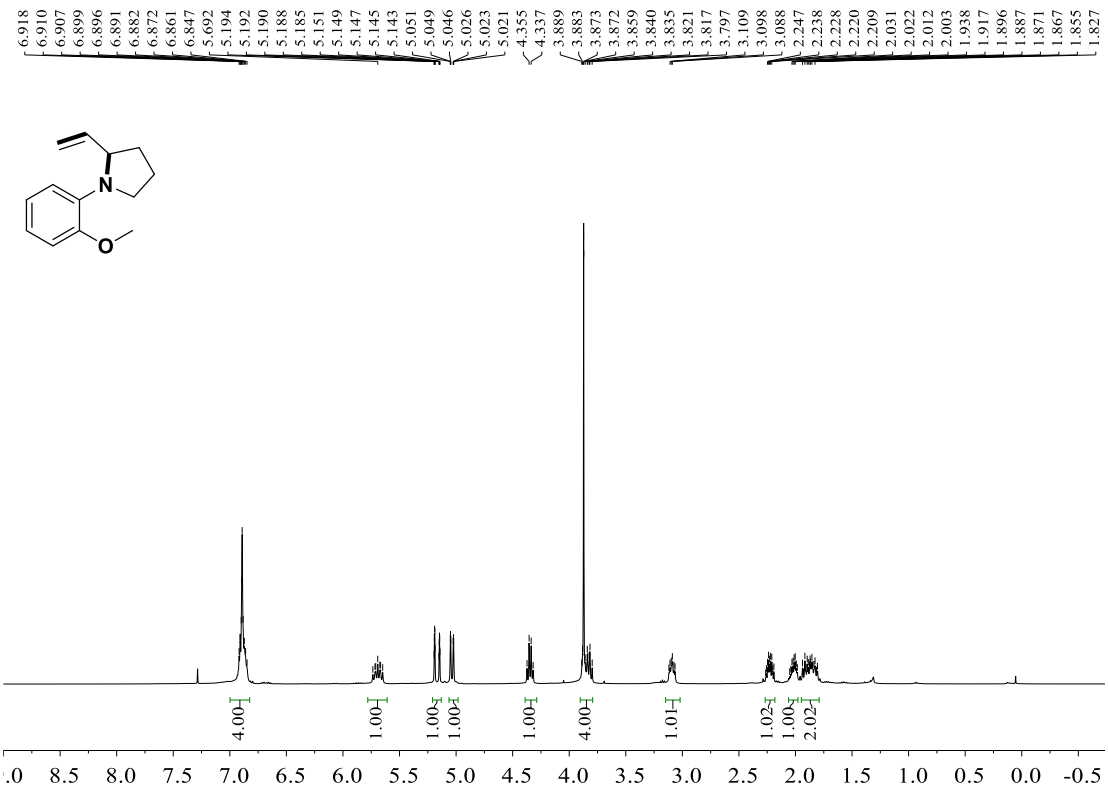
1-(3-Chlorophenyl)-2-vinylpyrrolidine (121)

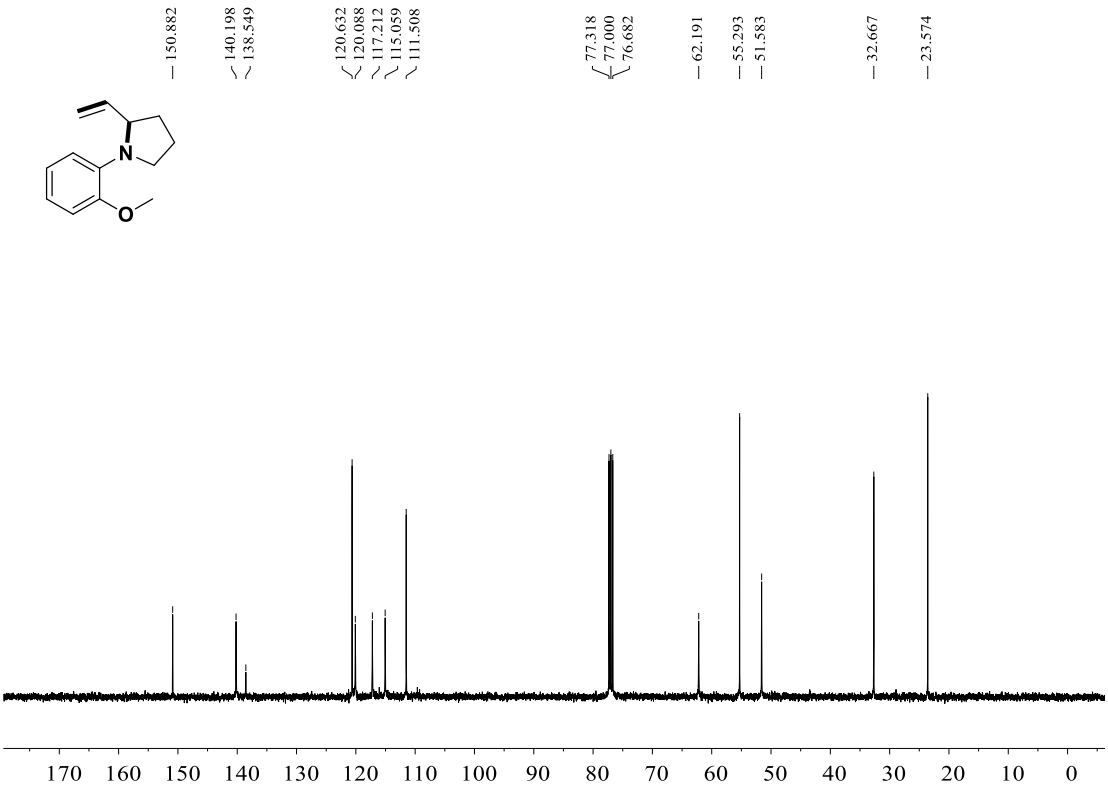


1-(4-Bromophenyl)-2-vinylpyrrolidine (122)

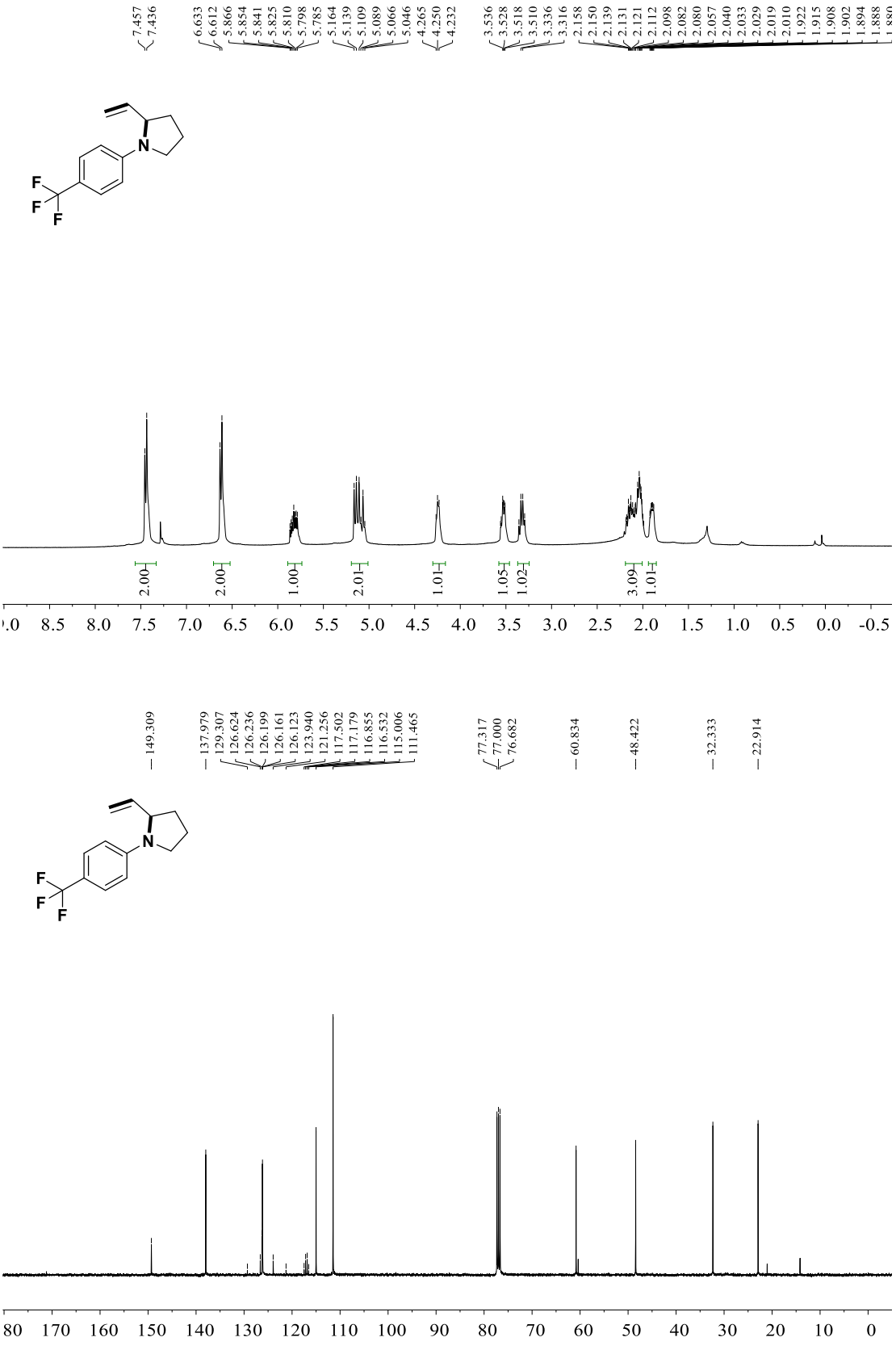


1-(2-Methoxyphenyl)-2-vinylpyrrolidine (123)

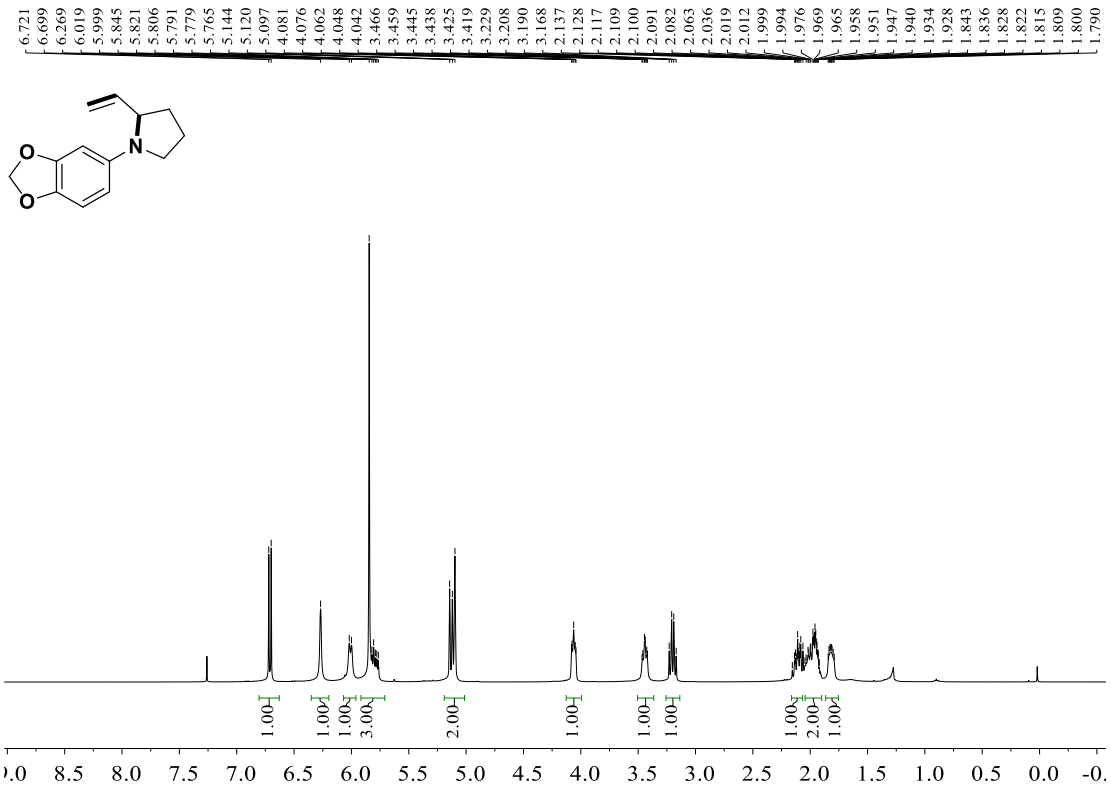


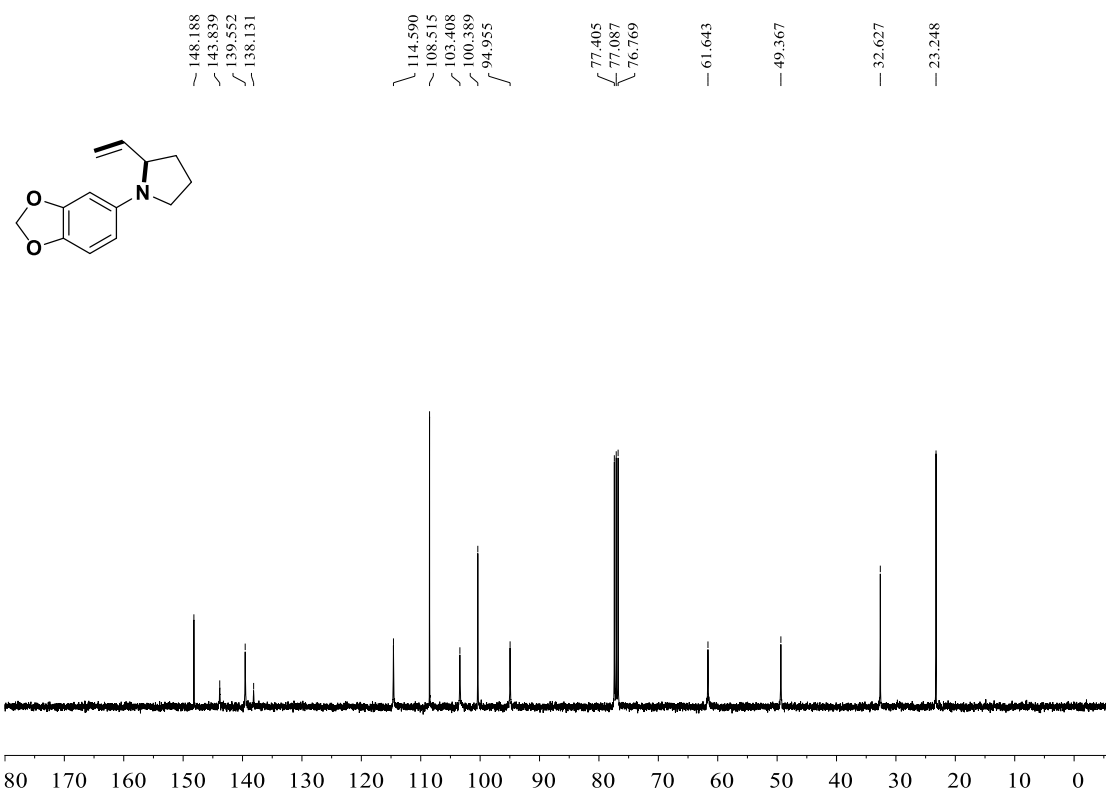


1-(4-(Trifluoromethyl)phenyl)-2-vinylpyrrolidine (124)

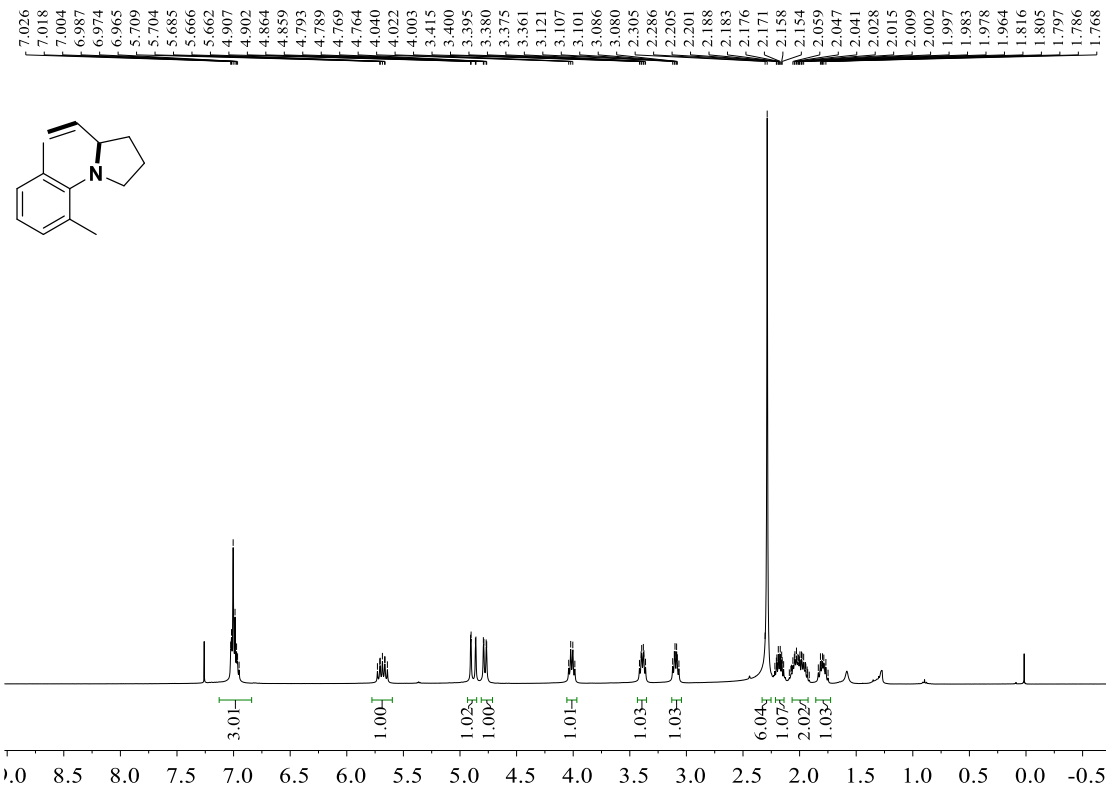


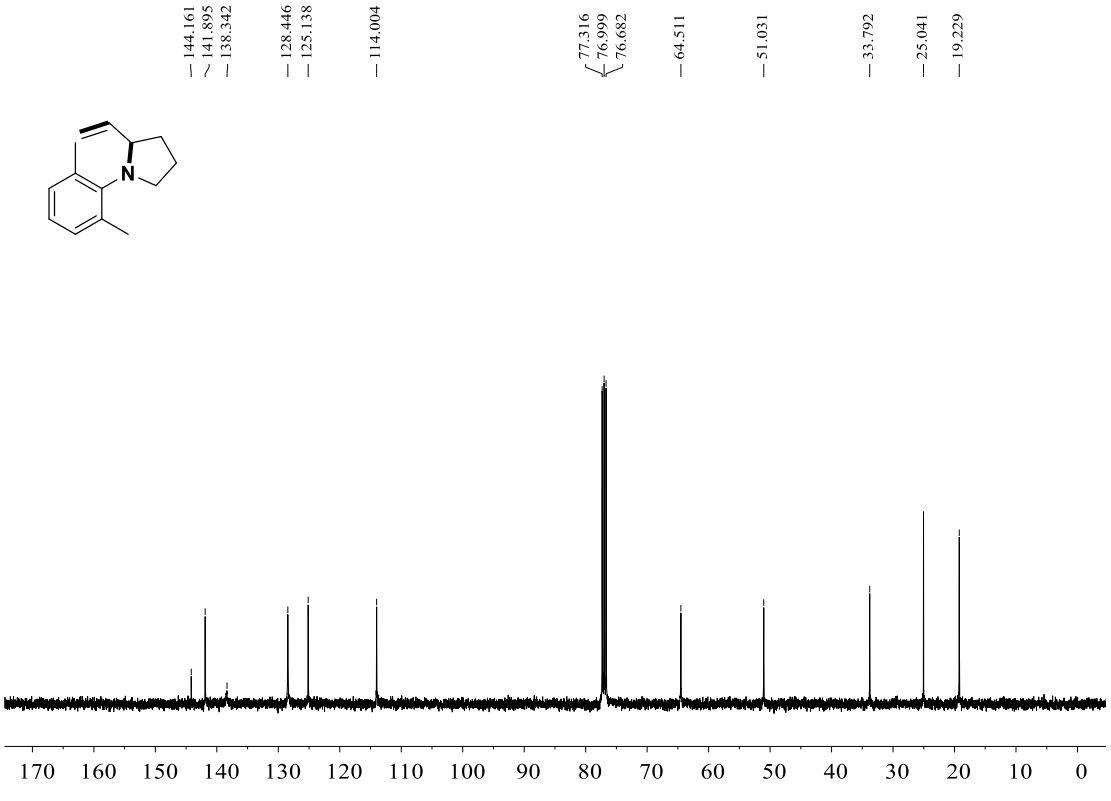
1-(Benzo[d][1,3]dioxol-5-yl)-2-vinylpyrrolidine (125)



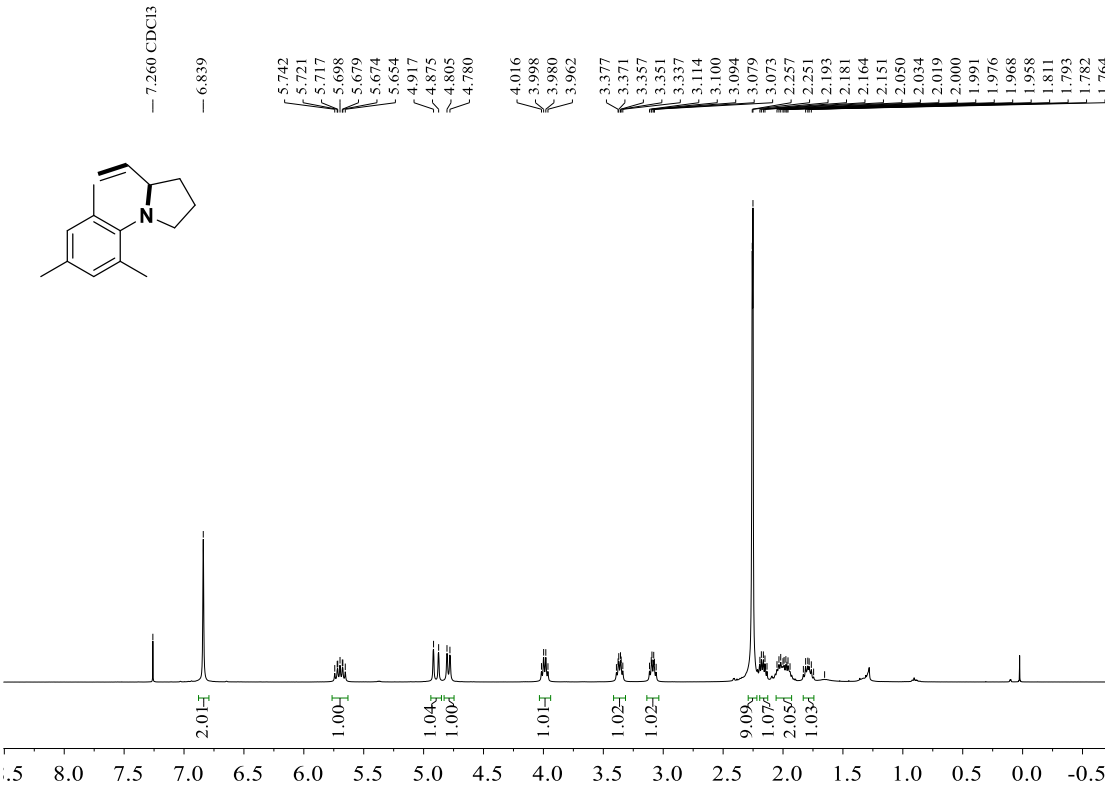


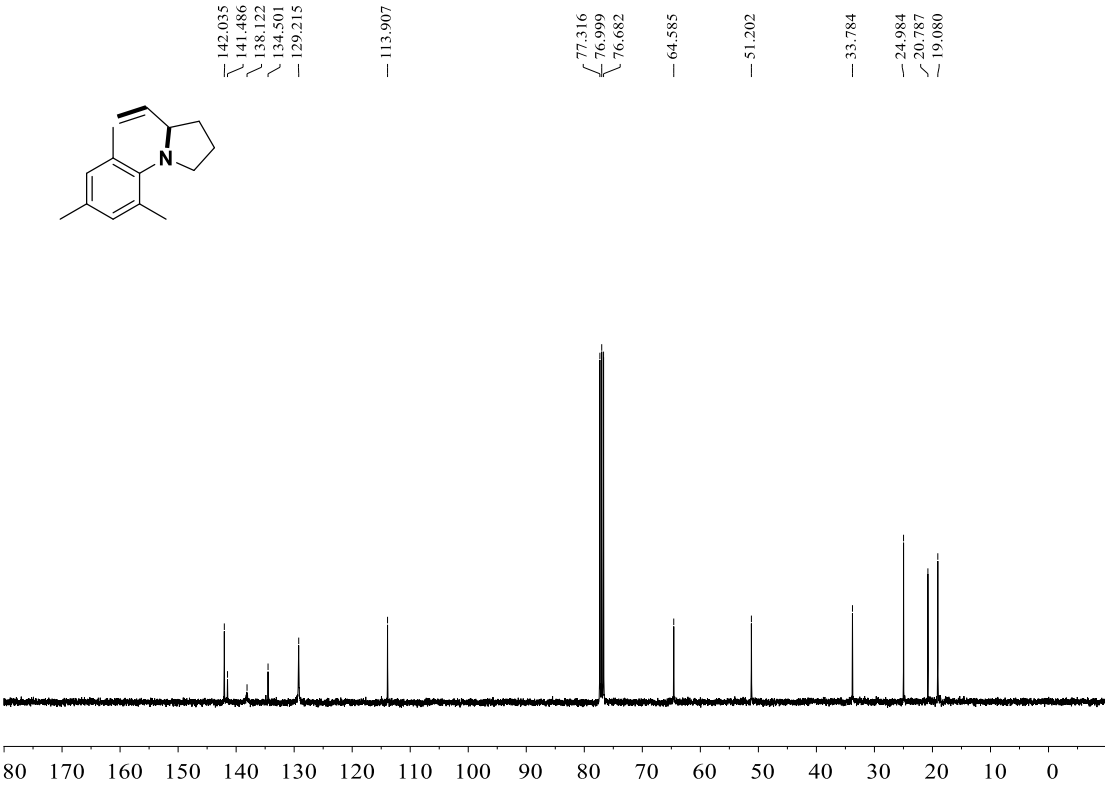
1-(2,6-Dimethylphenyl)-2-vinylpyrrolidine (126)



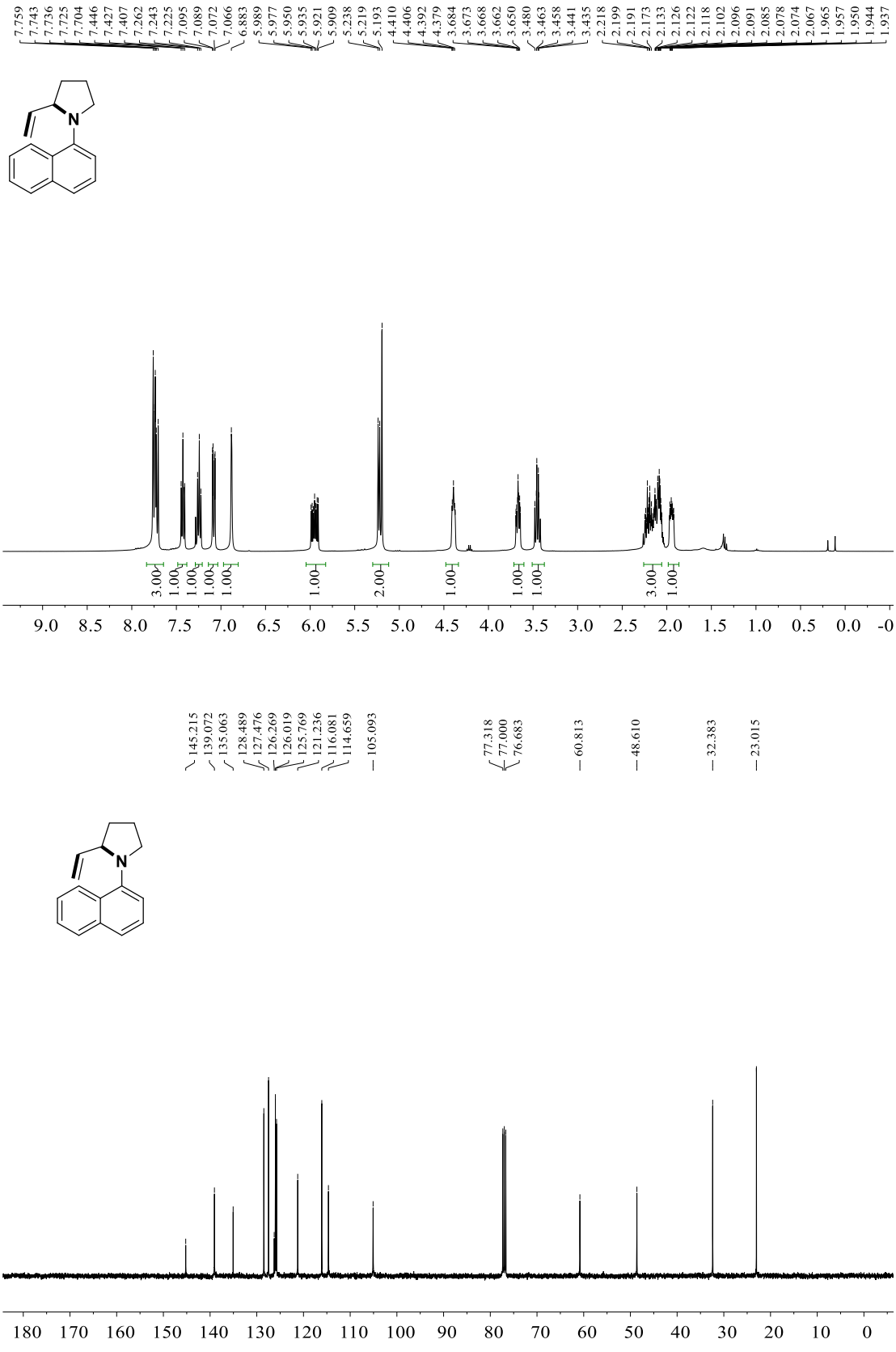


1-Mesityl-2-vinylpyrrolidine (127)

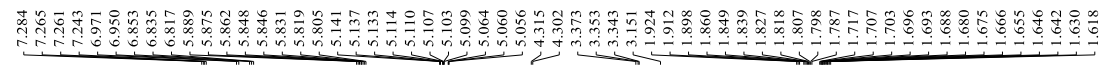


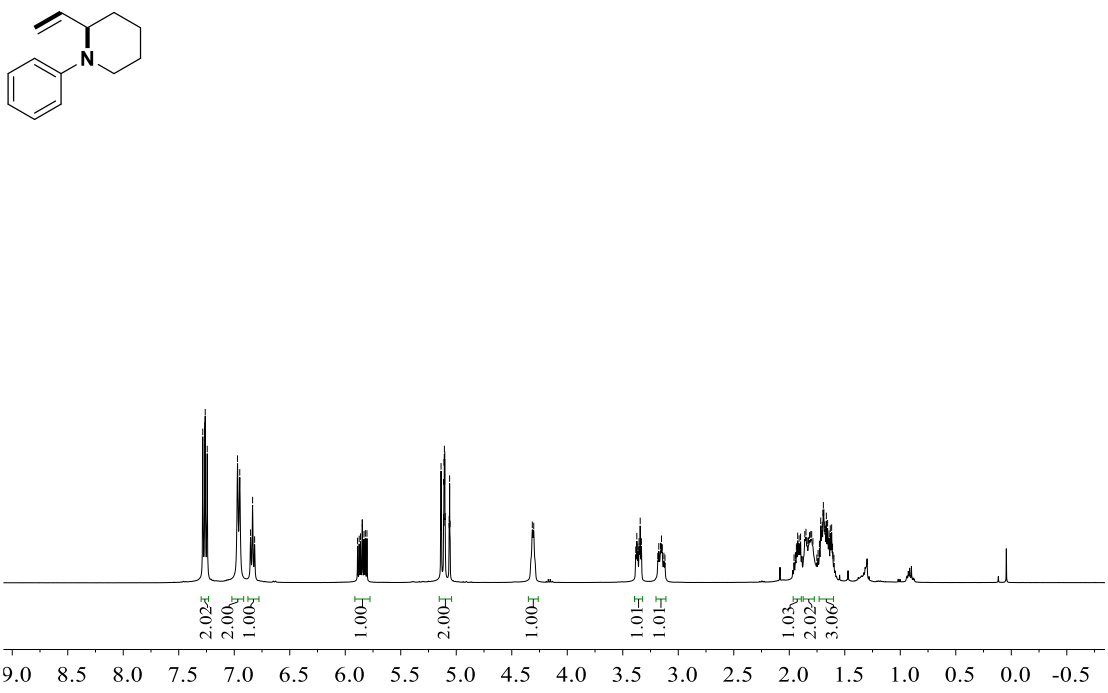


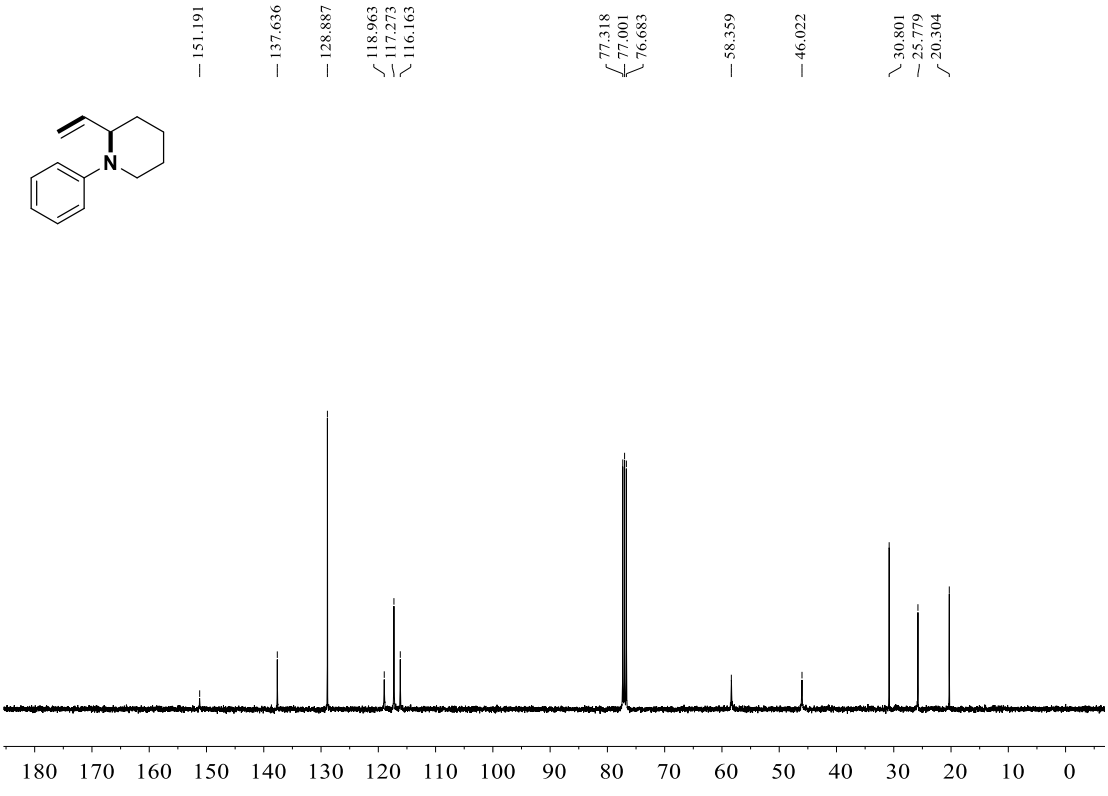
1-(Naphthalen-1-yl)-2-vinylpyrrolidine (128)



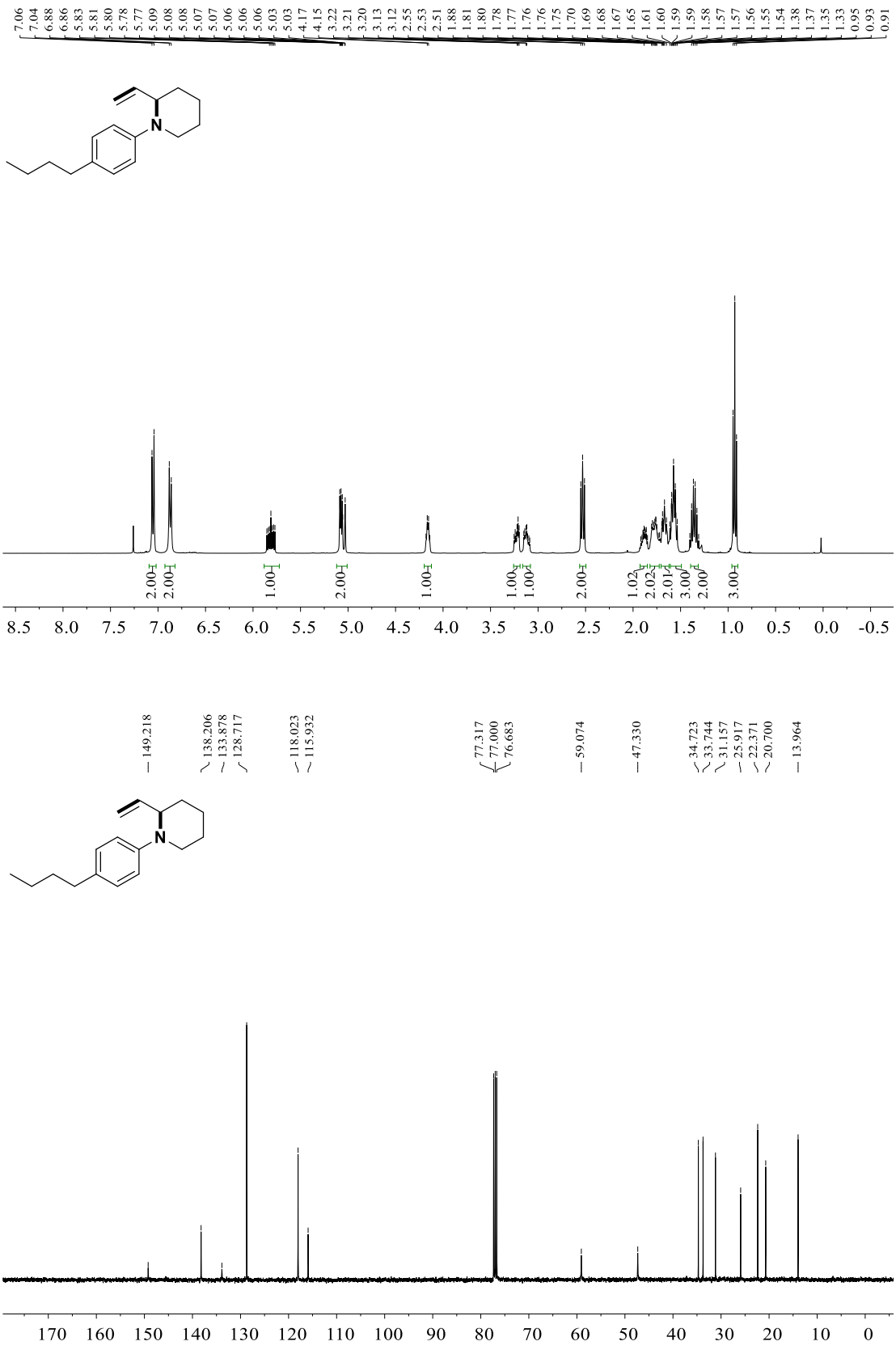
1-Phenyl-2-vinylpiperidine (129)







1-(4-Butylphenyl)-2-vinylpiperidine (130)



12. References and Notes

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2. V. Hoogenband, J. J. Hartog, N. F. Hilhorst, J. M. Lange, J. W. Terpstra, A straightforward synthesis of 1,3-dichloro-5,8-dihydroisoquinoline by consecutive Stille cross-coupling and metathesis reactions. *Tetrahedron Lett.* **2009**, *50*, 5040-5043.
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