

Supporting Information

Cobalt-Rhodium Heterobimetallic Nanoparticle-Catalyzed N-Alkylation of Amines with Alcohols to Secondary and Tertiary Amines

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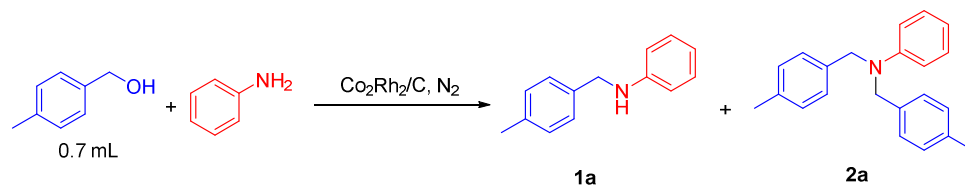
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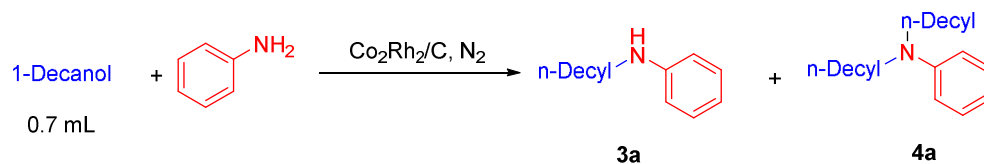
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1. Optimization data



Entry	Time (h)	Temp (°C)	Co_2Rh_2 (mol%)	Yield (%) ^a	
				1a	2a
1	24	90	5	83	0
2	24	100	5	99	0
3	18	100	5	74	0
4	24	110	5	99	0
5	24	120	5	87	12
6	24	120	10	54	43
7	24	140	10	7	92
8	24	150	10	10	89

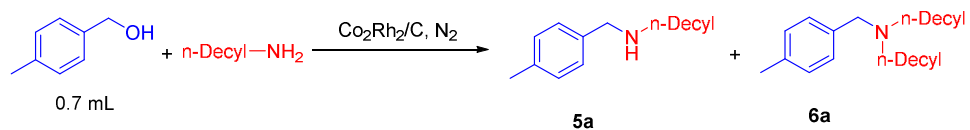
Reaction conditions: Aniline 0.5 mmol, 4-Methylbenzyl alcohol 0.7 ml ^aYields are of isolated yield.



Entry	Time (h)	Temp (°C)	Co_2Rh_2 (mol%)	Yield (%) ^b	
				3a	4a
1 ^{a)}	24	100	5	N.R	N.R
2 ^{a)}	24	130	5	28	0
3 ^{a)}	24	150	5	81	0
4	24	120	5	30	0
5	18	130	5	71	0
6	24	130	5	90	trace
7	24	140	5	91	6

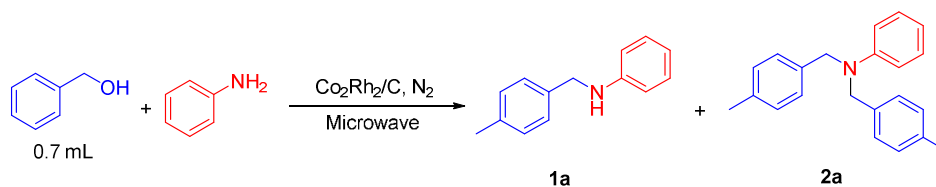
8	24	160	10	9	90
9	24	165	10	6	94
10	24	170	10	4	95

Reaction conditions: Aniline 0.5 mmol, 4-Methylbenzyl alcohol 0.7 mL. ^{a)} Aniline 0.5 mmol, Alcohol 0.5 mmol, Mesitylene 0.7 mL. ^{b)} Yields are of isolated yield.



Entry	Time (h)	Temp (°C)	Co ₂ Rh ₂ (mol%)	Yield (%) ^{b)}	
				5a	6a
1	24	70	5	77	0
2	24	80	5	92	0
3	18	80	5	82	0
4	24	100	5	47	43
5	24	120	5	0	88 ^{a)}
6	18	120	5	0	71 ^{a)}
7	24	130	5	0	89 ^{a)}

Reaction conditions: Aniline 0.5 mmol, 4-Methylbenzyl alcohol 0.7 mL. ^{a)} N-(4-methylbenzyl)-N,N-didecyl-1-amine was also formed. ^{b)} Yields are of isolated yield.



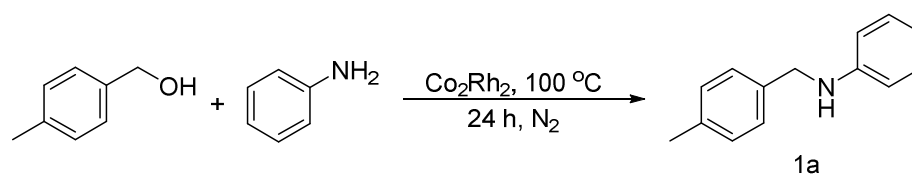
Entry	Time (h)	Temp (°C)	Co ₂ Rh ₂ (mol%)	Yield (%) ^{a)}	
				5a	6a
1	0.5	25	5	0	0
2	0.5	50	5	0	0
3	0.5	100	5	5	0

4	4	100	5	48	0
5	12	100	5	99	0

Reaction conditions: Aniline 0.5 mmol, Benzyl alcohol 0.7 ml. ^{a)} Yields are of isolated yield.

2. Recycle test

After each reaction, the catalyst was separated from the reaction mixture by centrifuge, dried in vacuum, and then reused for the further catalytic reactions. The catalytic system exhibited a great capability of reuse and significant air stability under the set reaction conditions. The catalyst maintained a high level of activity even after being reused for ten times. For ten runs, 97~99 % yields were observed. The conversion rate for each cycle was almost 100%. The catalyst is quite stable under our established reaction conditions. Although the maximum reusability was not tested, we expect the catalyst to be semi-permanent.

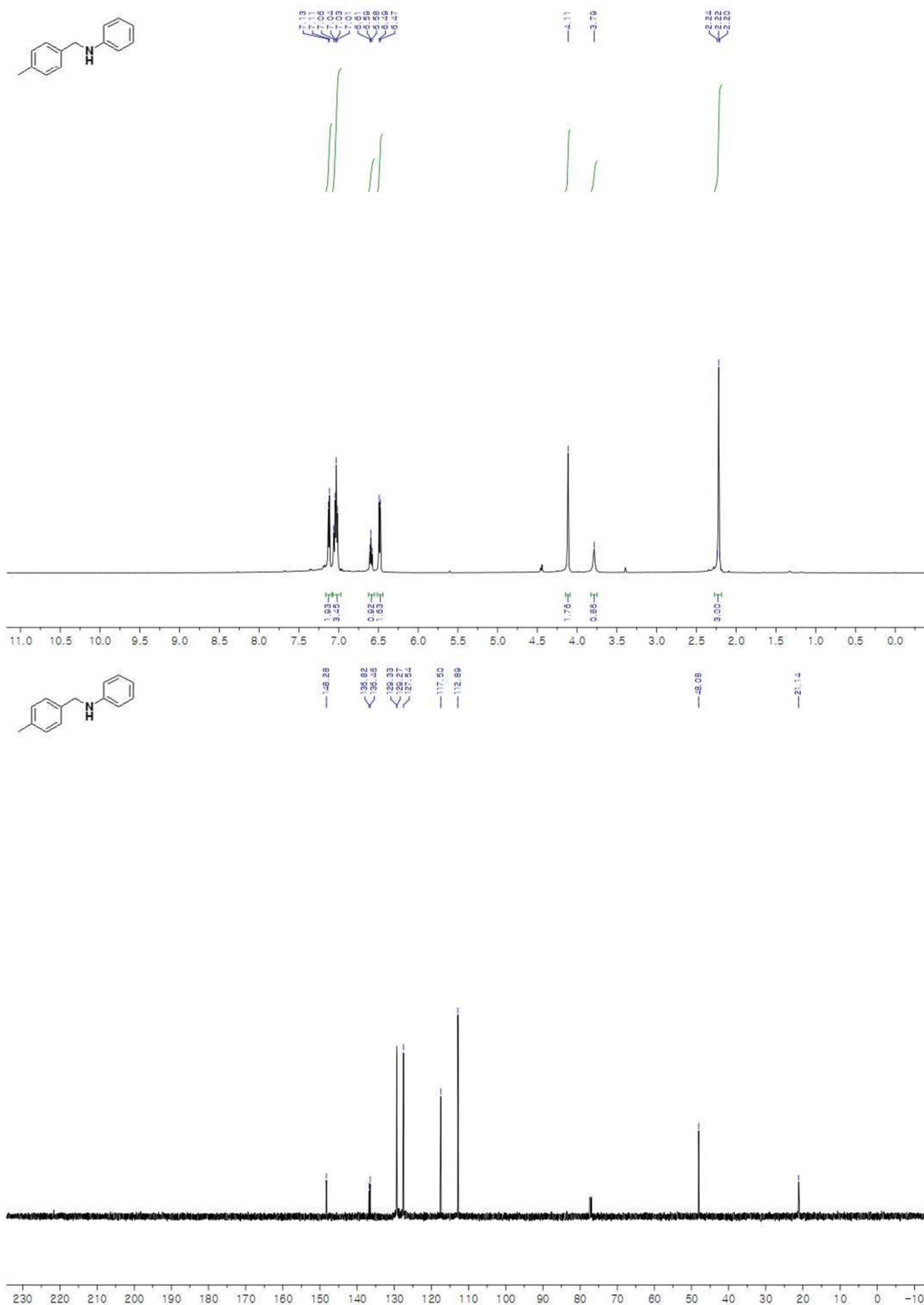


run	yield (%)
	1a
1	99
2	99
3	98
4	99
5	97
6	98
7	98
8	99
9	97
10	99

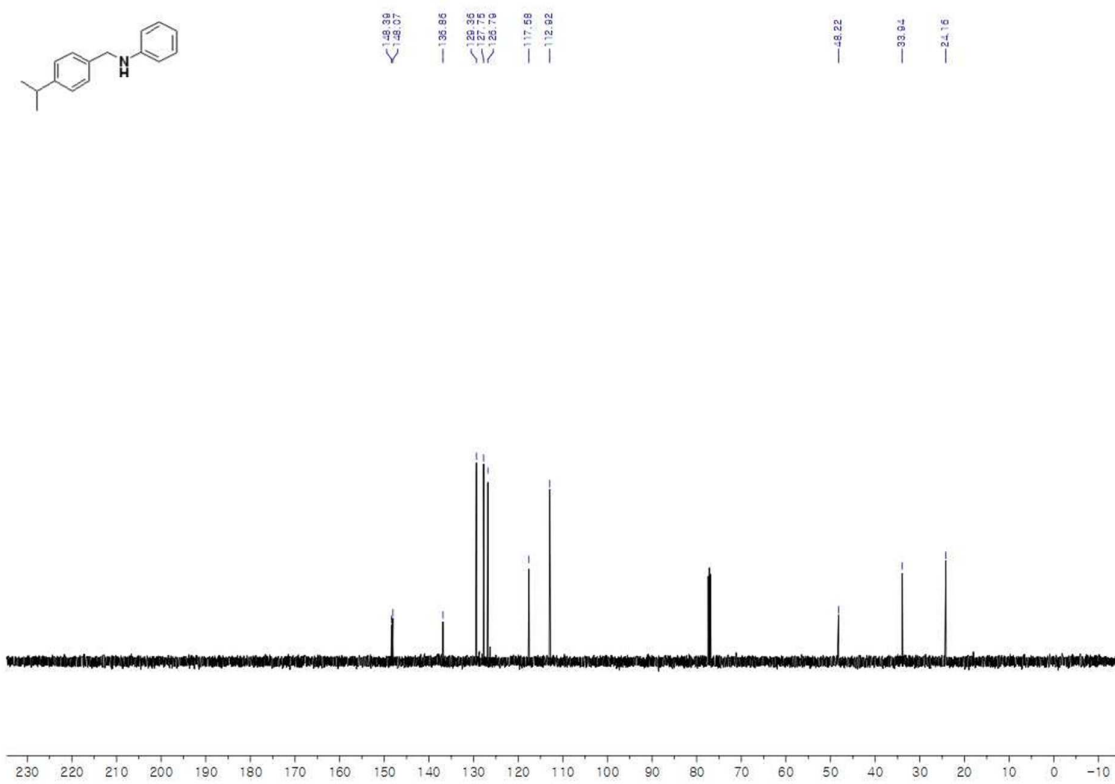
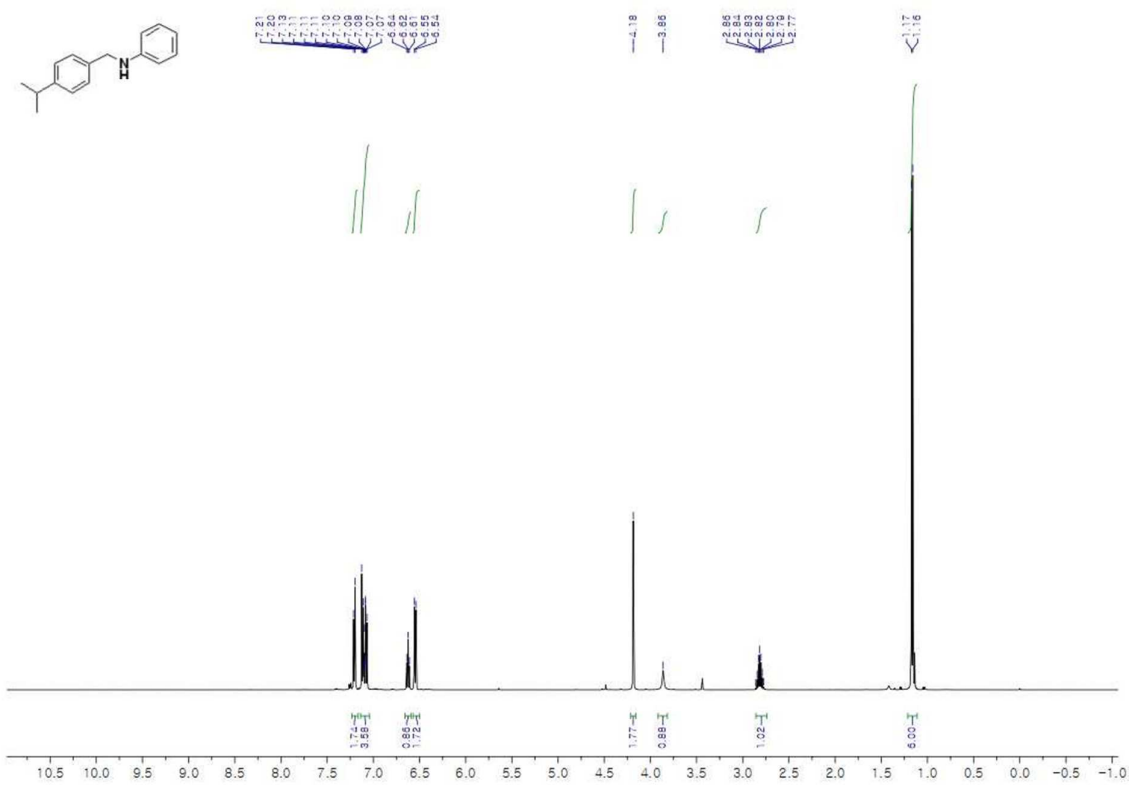
Yields are of isolated yield. Reaction conditions: Aniline 0.5 mmol, 4-methylbenzyl alcohol 0.7 ml, Co_2Rh_2 5 mol%, 100 °C, 24h, N_2 .

3. NMR Spectra

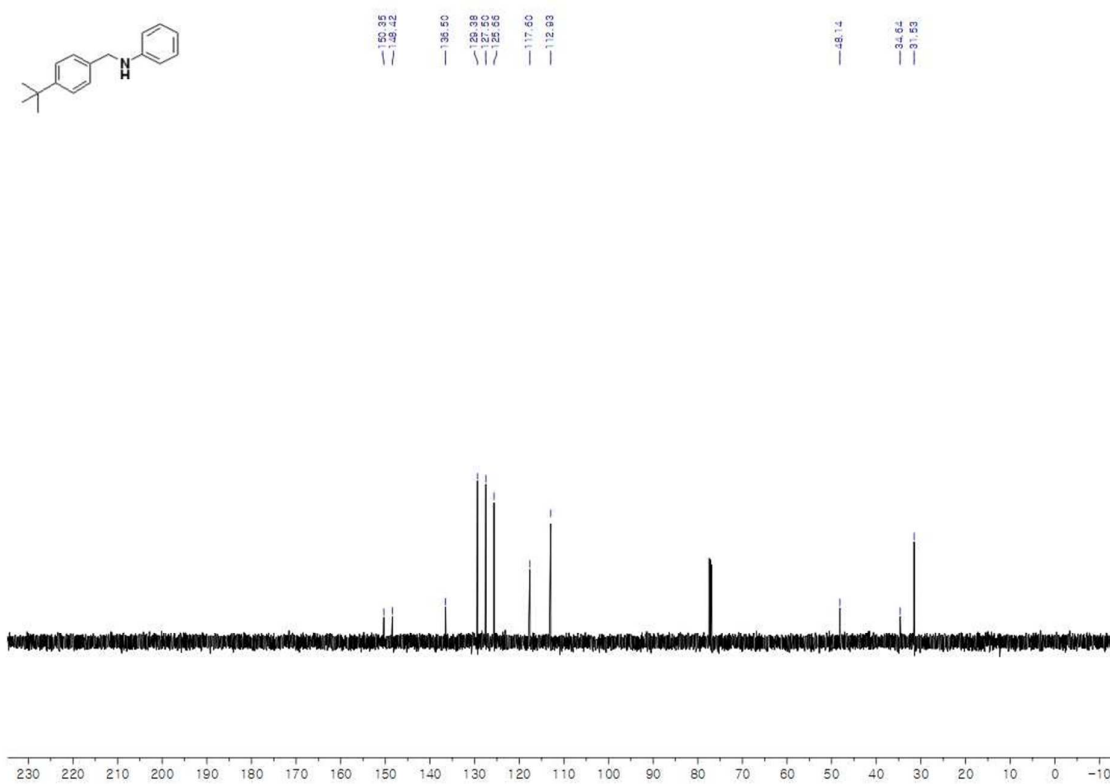
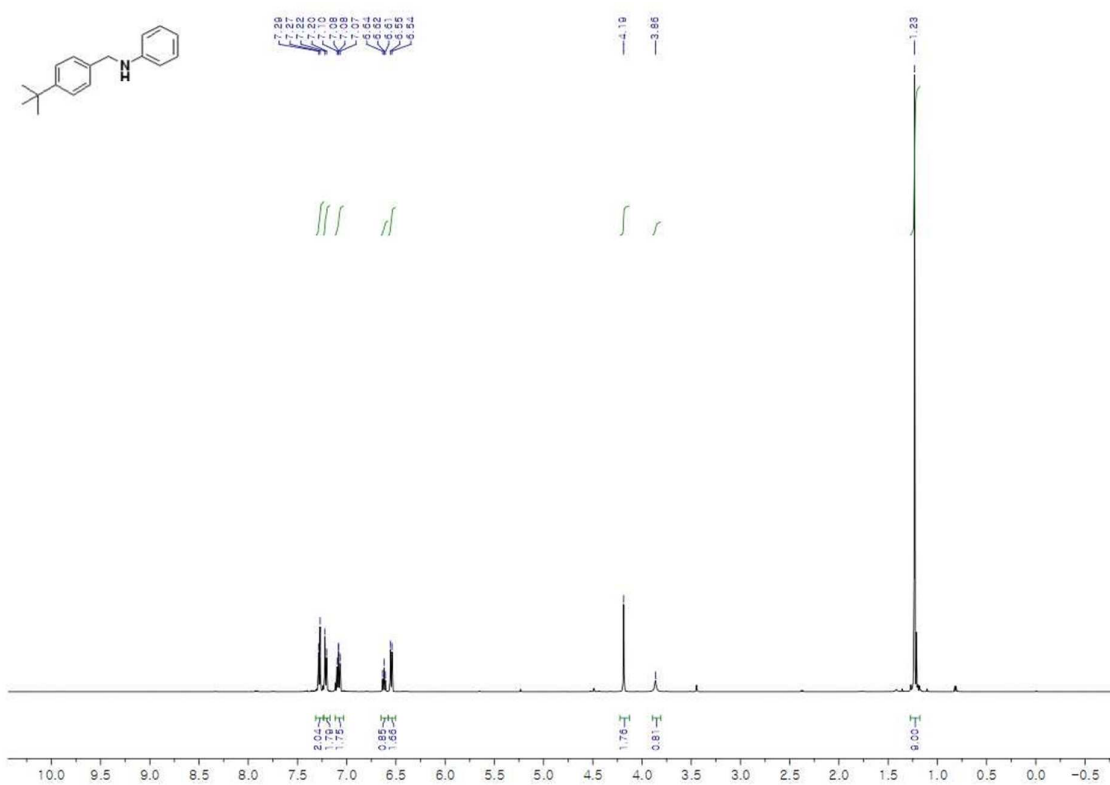
N-(4-methylbenzyl)aniline – (Table 2, 1a)



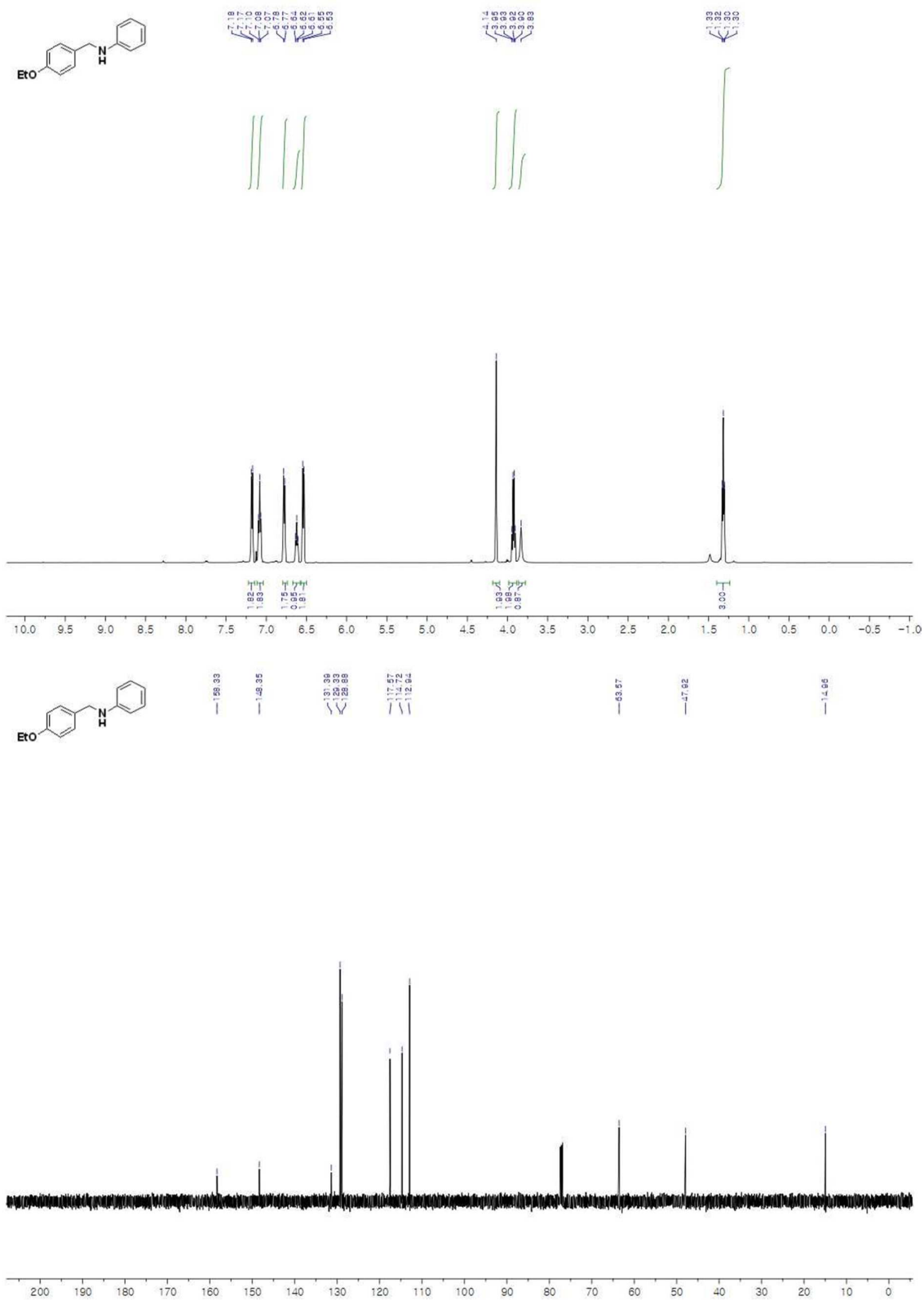
***N*-(4-isopropylbenzyl)aniline – (Table 2, 1c)**



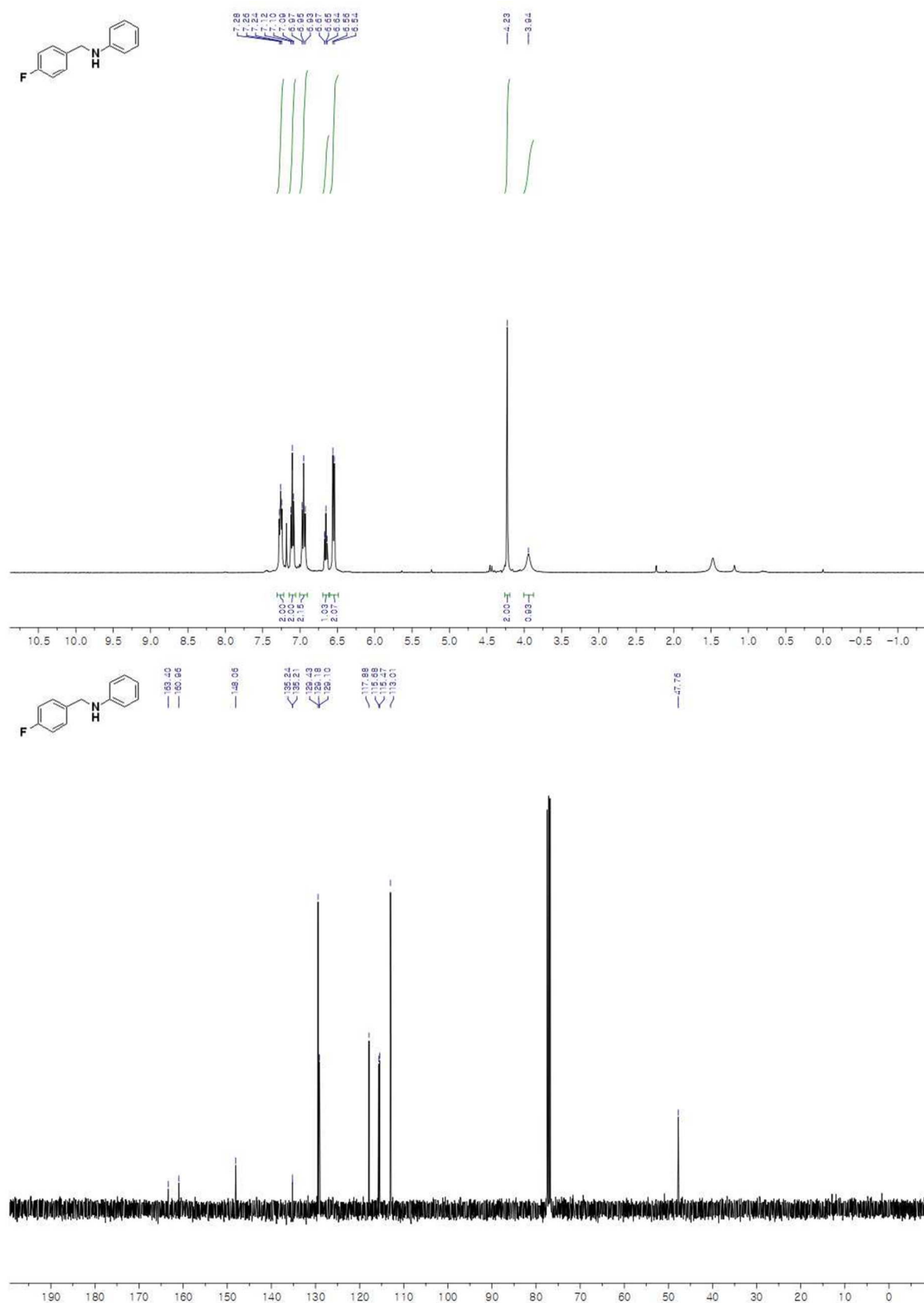
***N*-(4-(tert-butyl)benzyl)aniline – (Table 2, 1d)**



***N*-(4-ethoxybenzyl)aniline – (Table 2, 1c)**



***N*-(4-fluorobenzyl)aniline – (Table 2, 1f)**

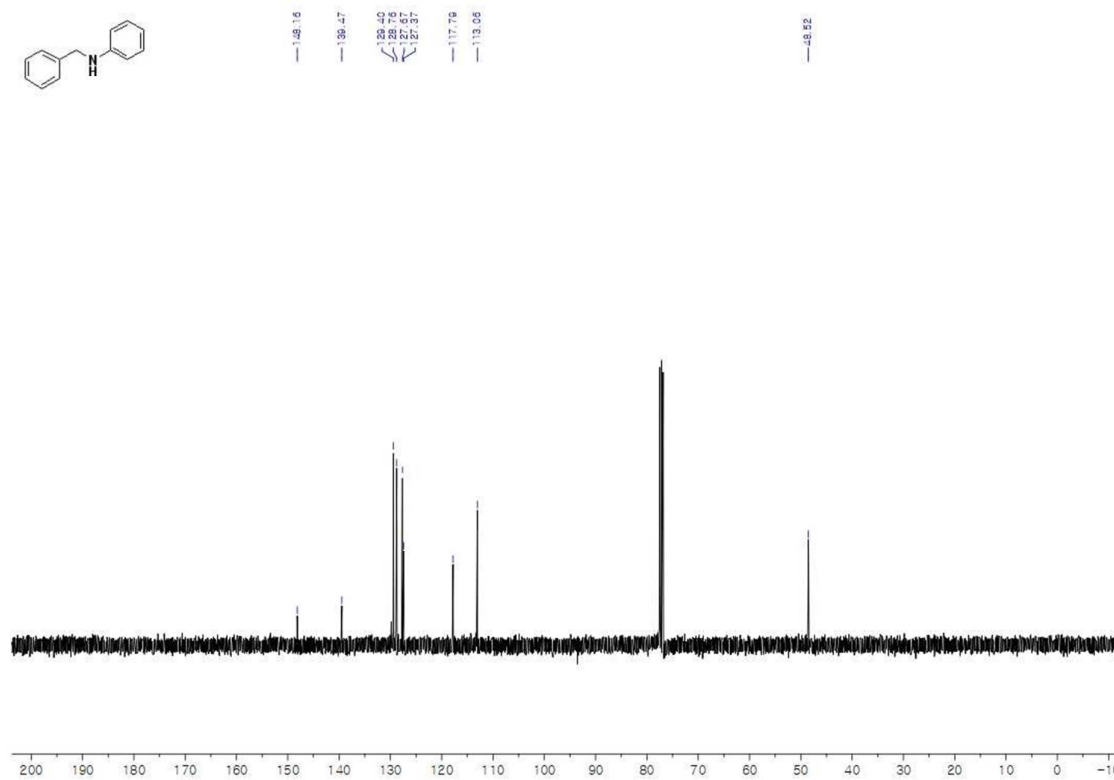
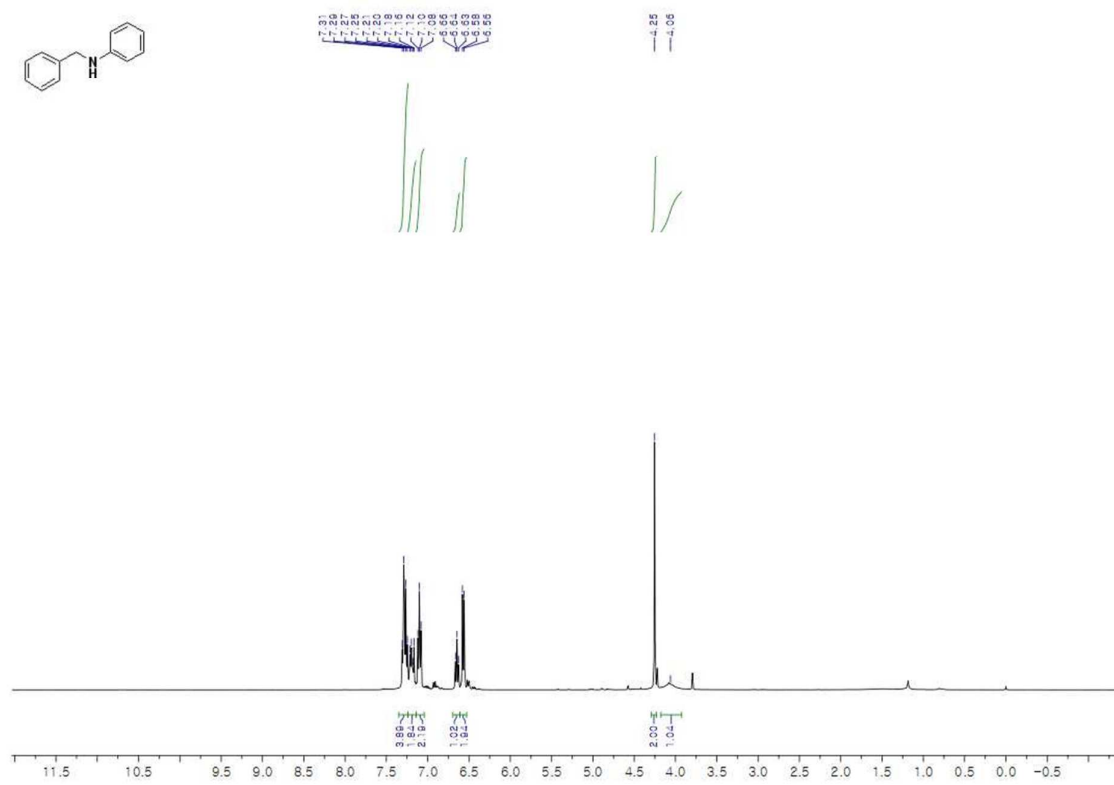


Chemical structure of 2,4-dimethoxy-N-phenylbenzylamine: COc1cc(CNc2ccccc2)cc(OC)c1

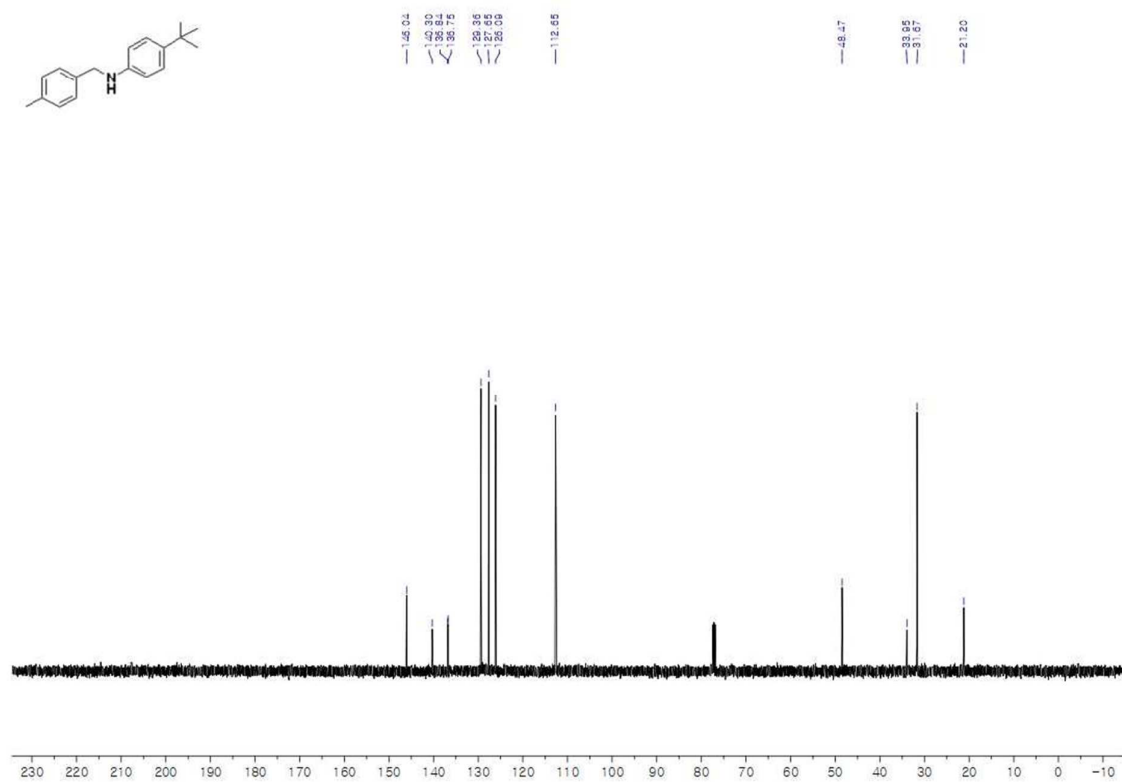
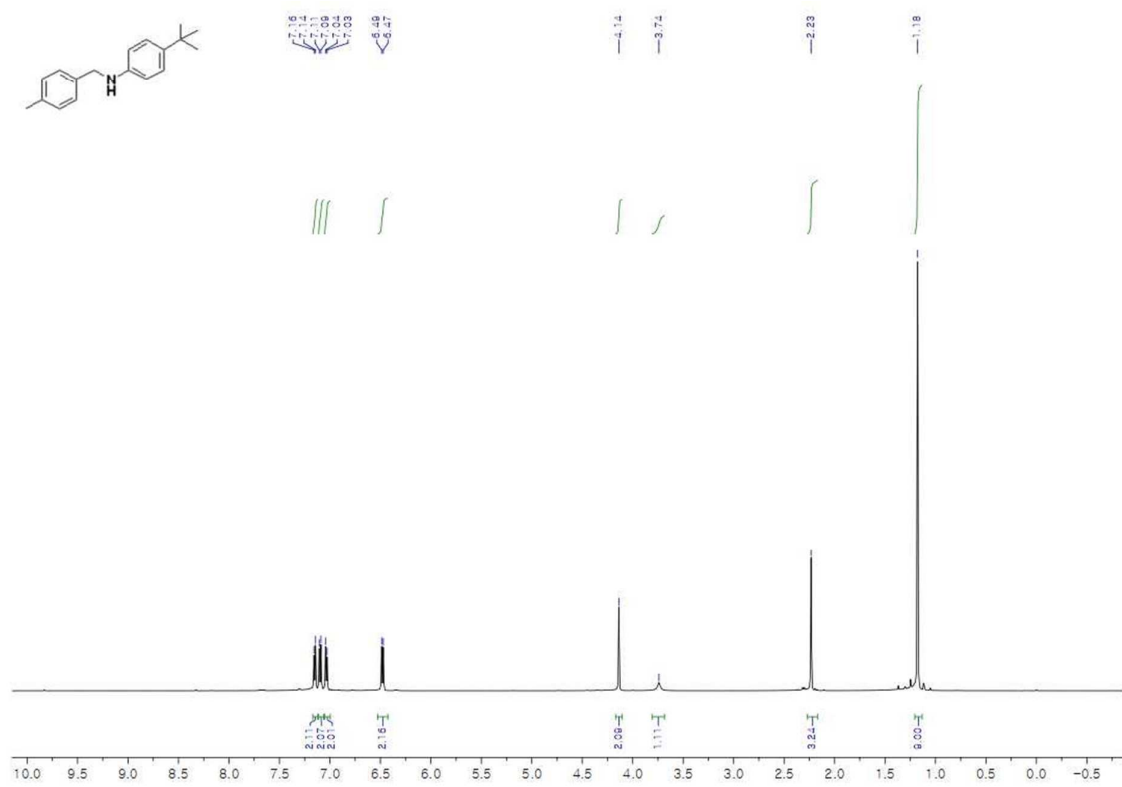
¹H NMR spectrum (CDCl₃) showing peaks in the aromatic region (6.5-7.2 ppm), a methoxy singlet (3.8 ppm), and a benzyl methylene doublet (3.5 ppm). Integration values are provided below the peaks.



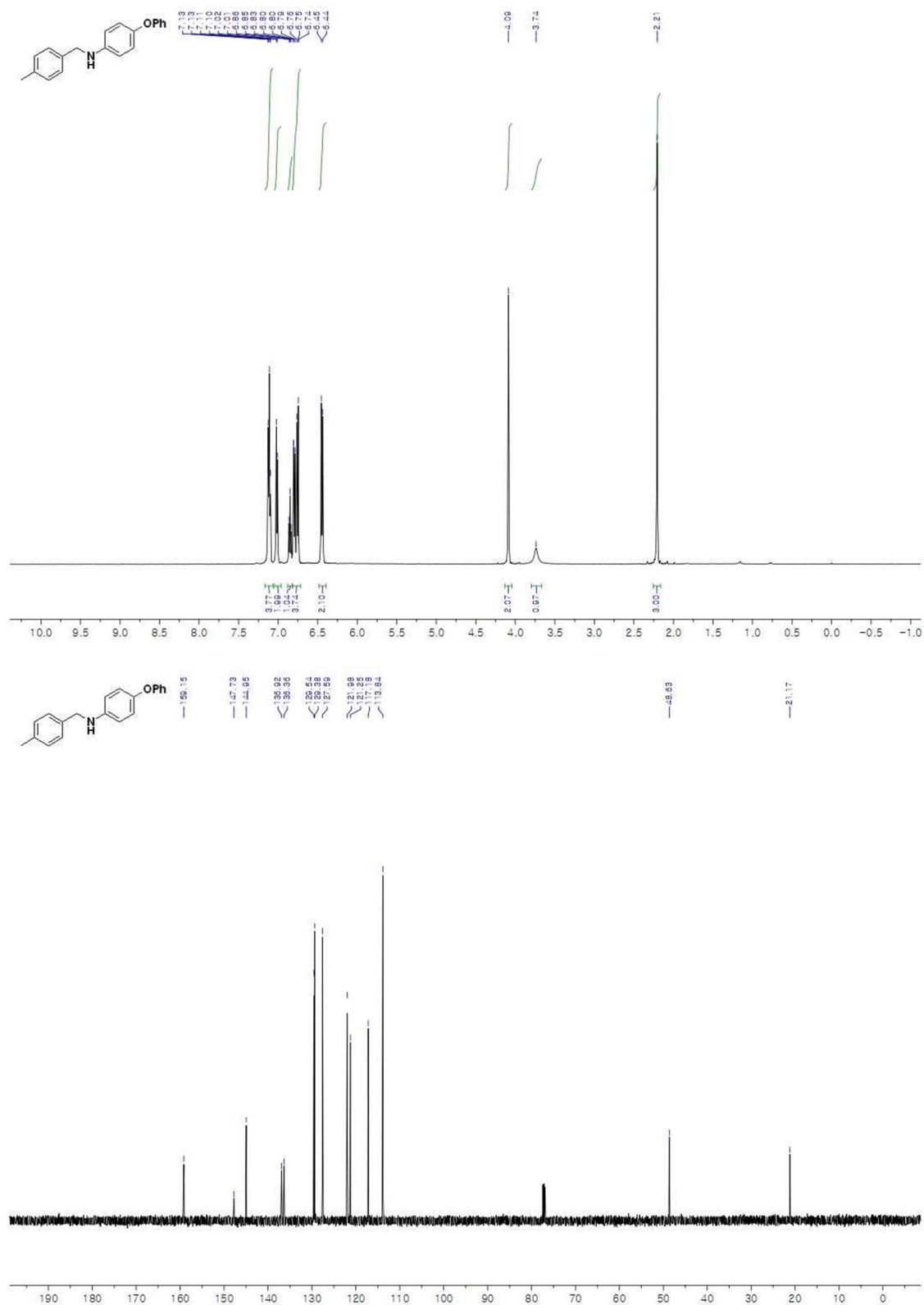
***N*-benzylaniline – (Table 2, 1b)**



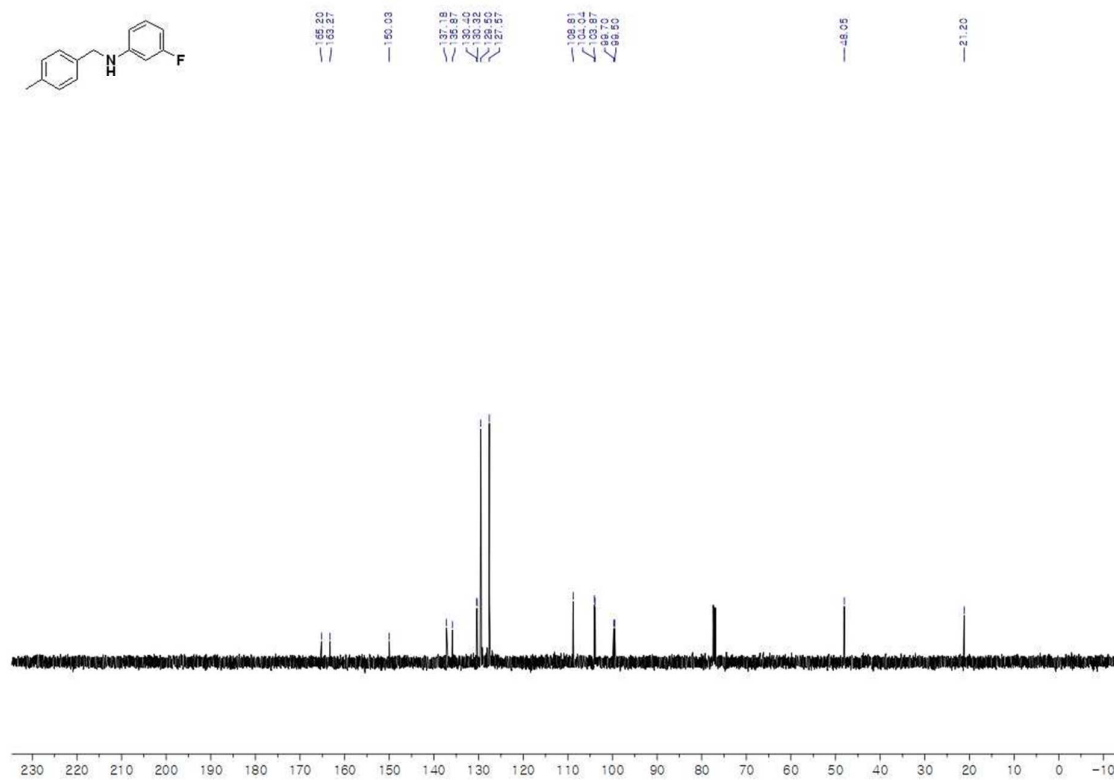
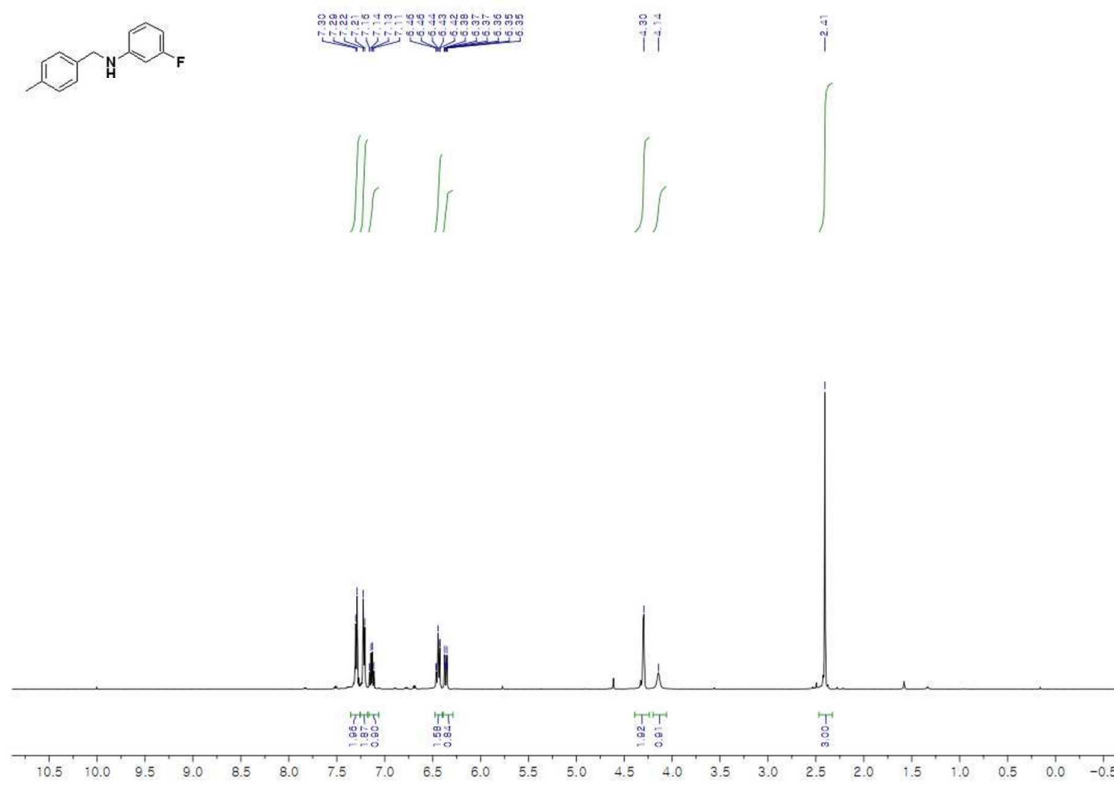
4-(*tert*-butyl)-*N*-(4-methylbenzyl)aniline – (Table 2, 1h)

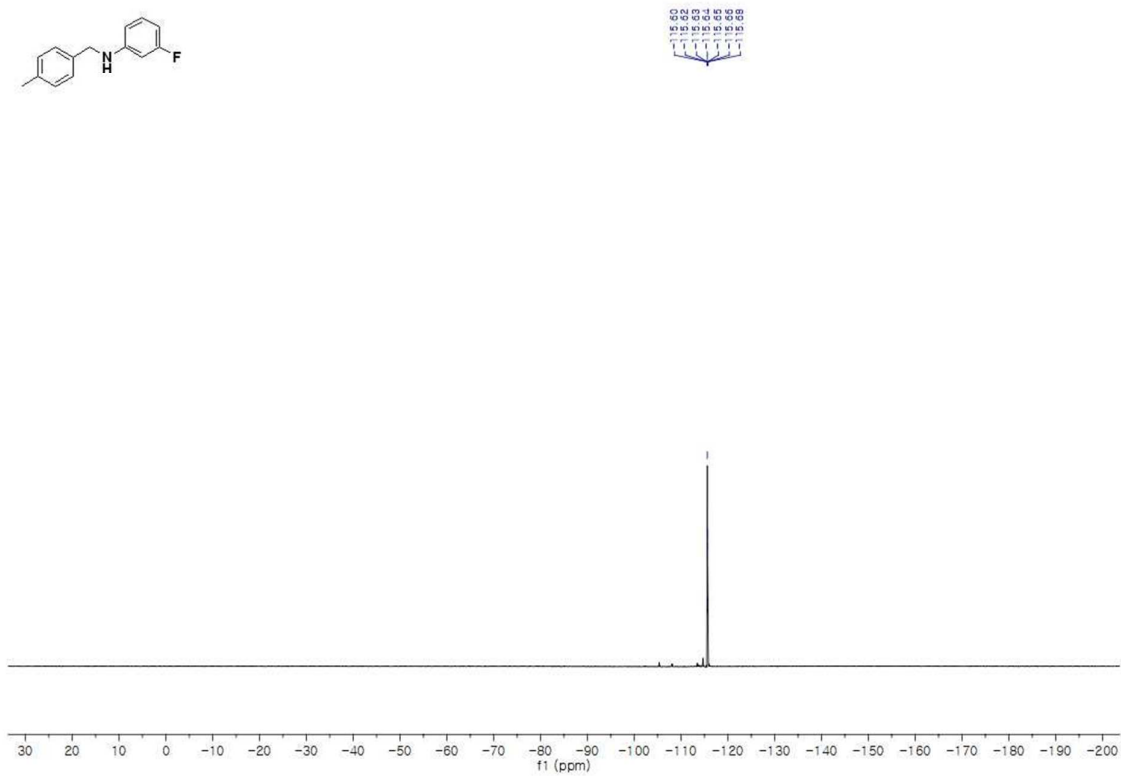


***N*-(4-methylbenzyl)-4-phenoxyaniline – (Table 2, 1i)**

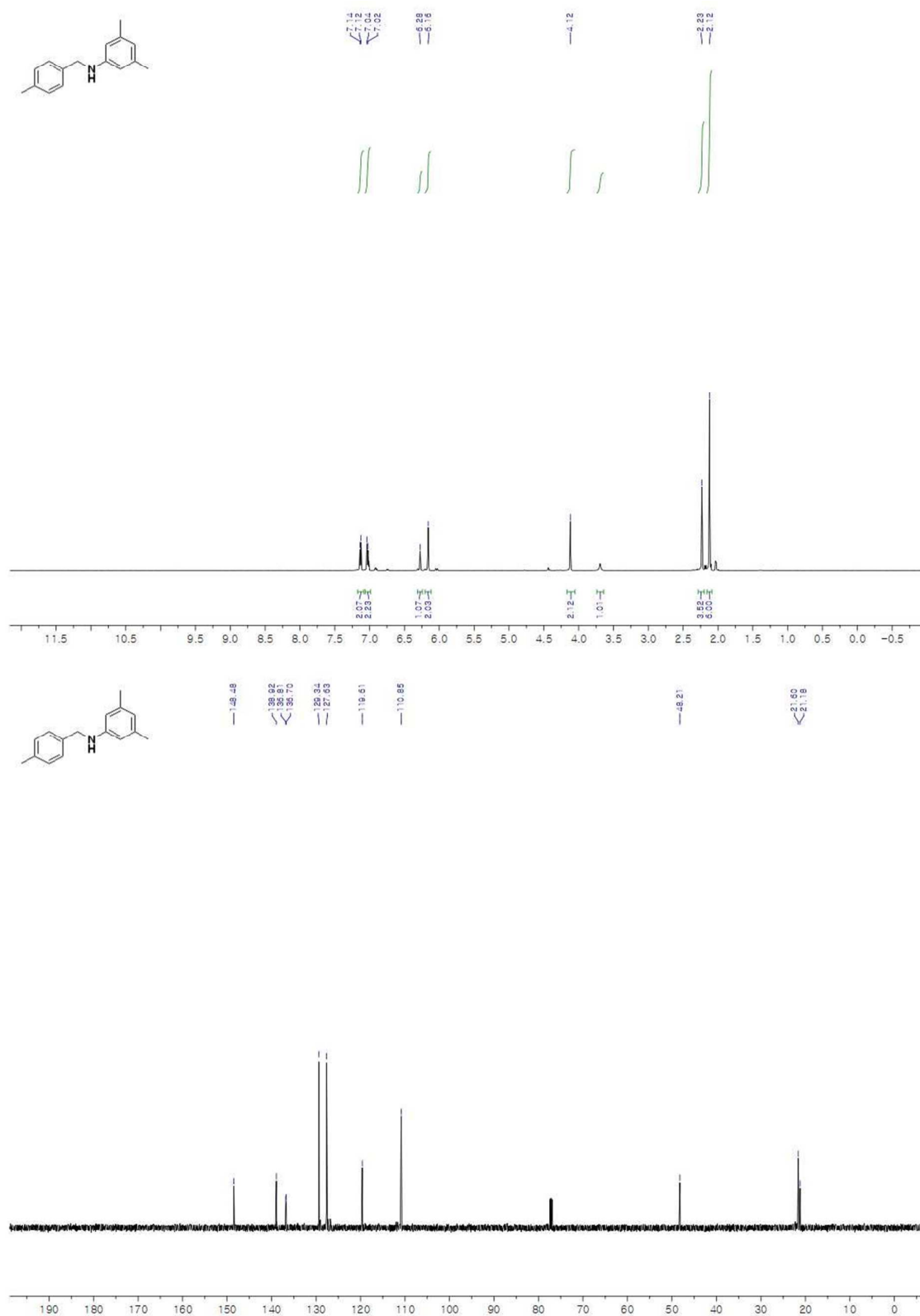


3-fluoro-*N*-(4-methylbenzyl)aniline – (Table 2, 1j)





3,5-dimethyl-N-(4-methylbenzyl)aniline – (Table 2, 1k)

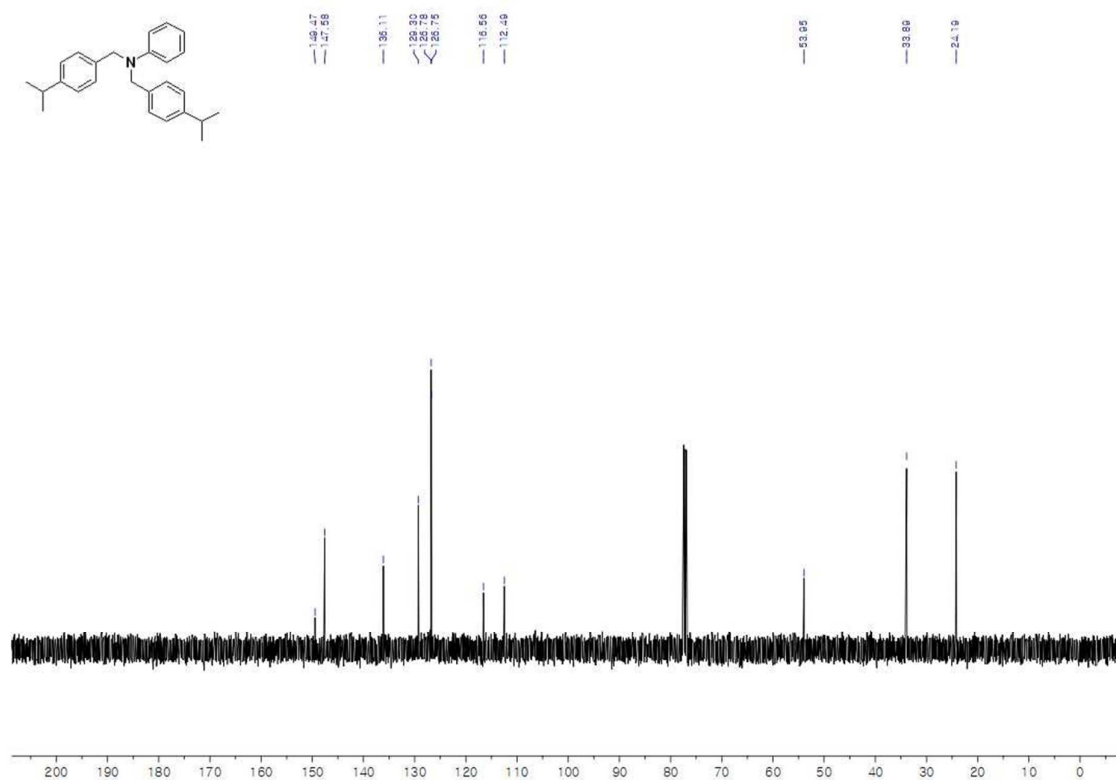
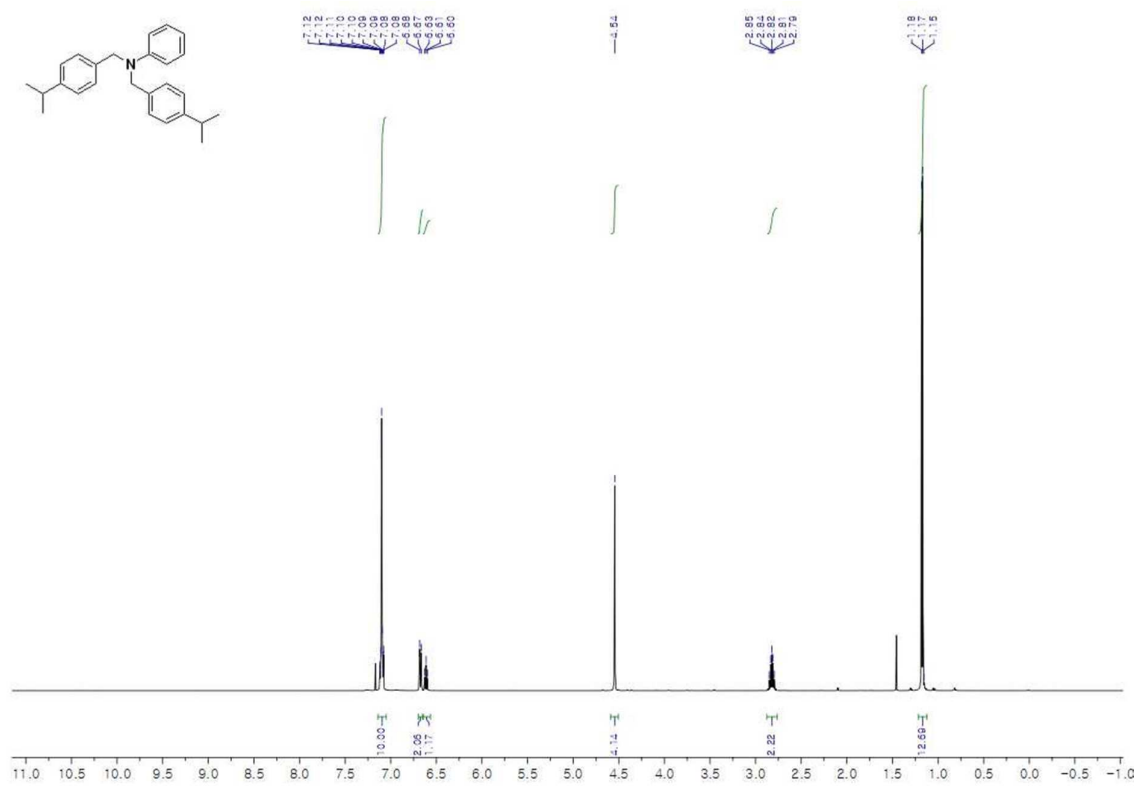


Chemical structure of the compound is shown above the spectra.

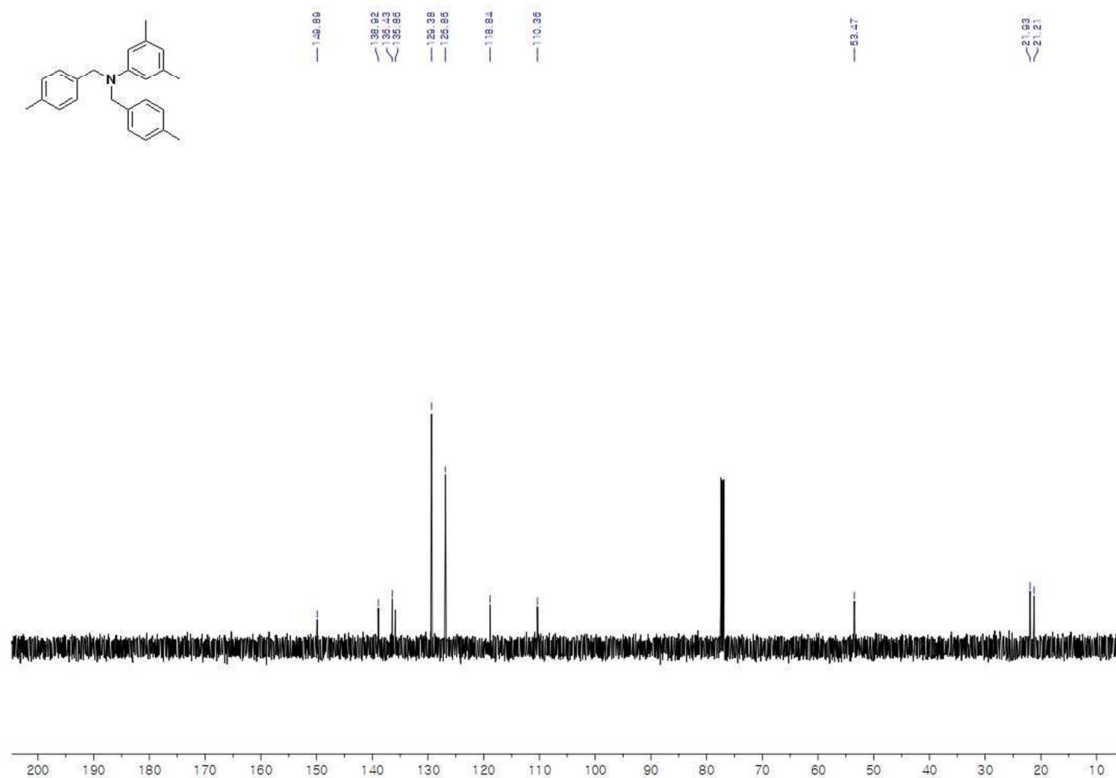
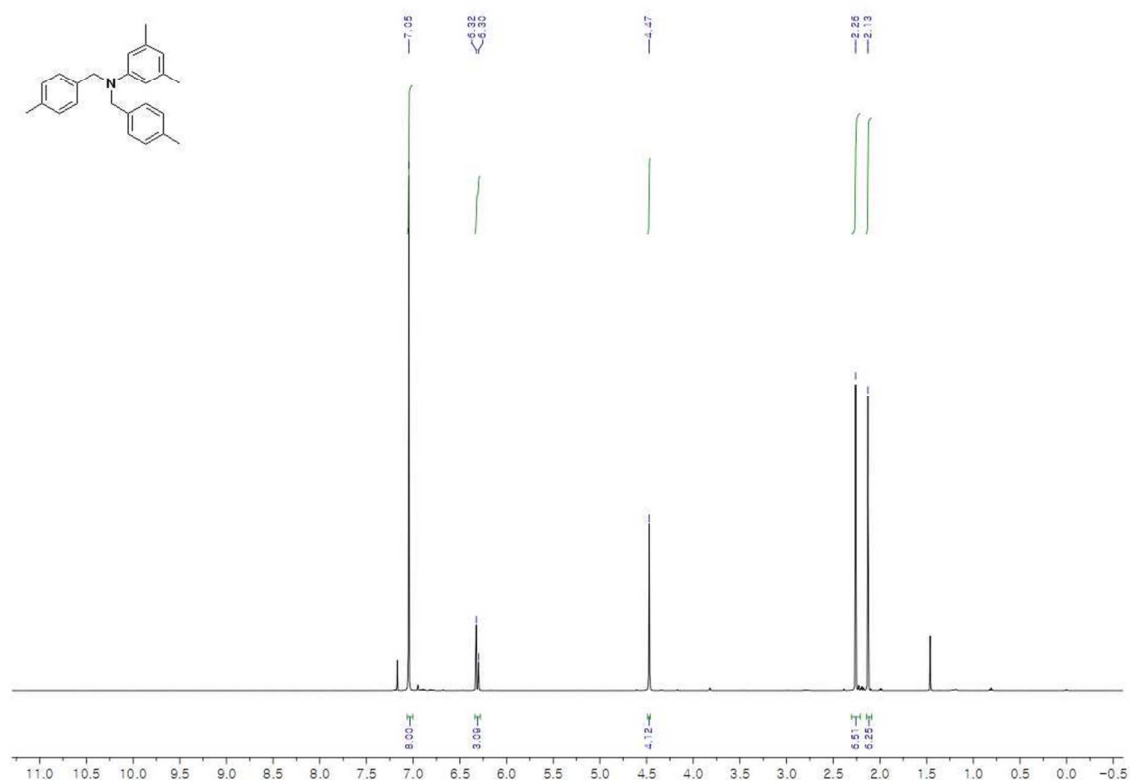
¹H NMR spectrum (top) shows peaks at approximately 7.2 (d, 2H), 6.8 (d, 2H), 6.6 (d, 2H), 6.4 (d, 2H), 3.8 (s, 2H), 1.5 (s, 6H), and 0.5 (s, 3H). Integration values are provided below the peaks.

¹³C NMR spectrum (bottom) shows peaks at approximately 132, 130, 128, 126, 124, 122, 120, 118, 116, 114, 112, 110, 108, 106, 104, 102, 100, 98, 96, 94, 92, 90, 88, 86, 84, 82, 80, 78, 76, 74, 72, 70, 68, 66, 64, 62, 60, 58, 56, 54, 52, 50, 48, 46, 44, 42, 40, 38, 36, 34, 32, 30, 28, 26, 24, 22, 20, 18, 16, 14, 12, 10, 8, 6, 4, 2, 0, -2, -4, -6, -8, -10, -12, -14, -16, -18, -20, -22, -24, -26, -28, -30, -32, -34, -36, -38, -40, -42, -44, -46, -48, -50, -52, -54, -56, -58, -60, -62, -64, -66, -68, -70, -72, -74, -76, -78, -80, -82, -84, -86, -88, -90, -92, -94, -96, -98, -100, -102, -104, -106, -108, -110, -112, -114, -116, -118, -120, -122, -124, -126, -128, -130, -132.

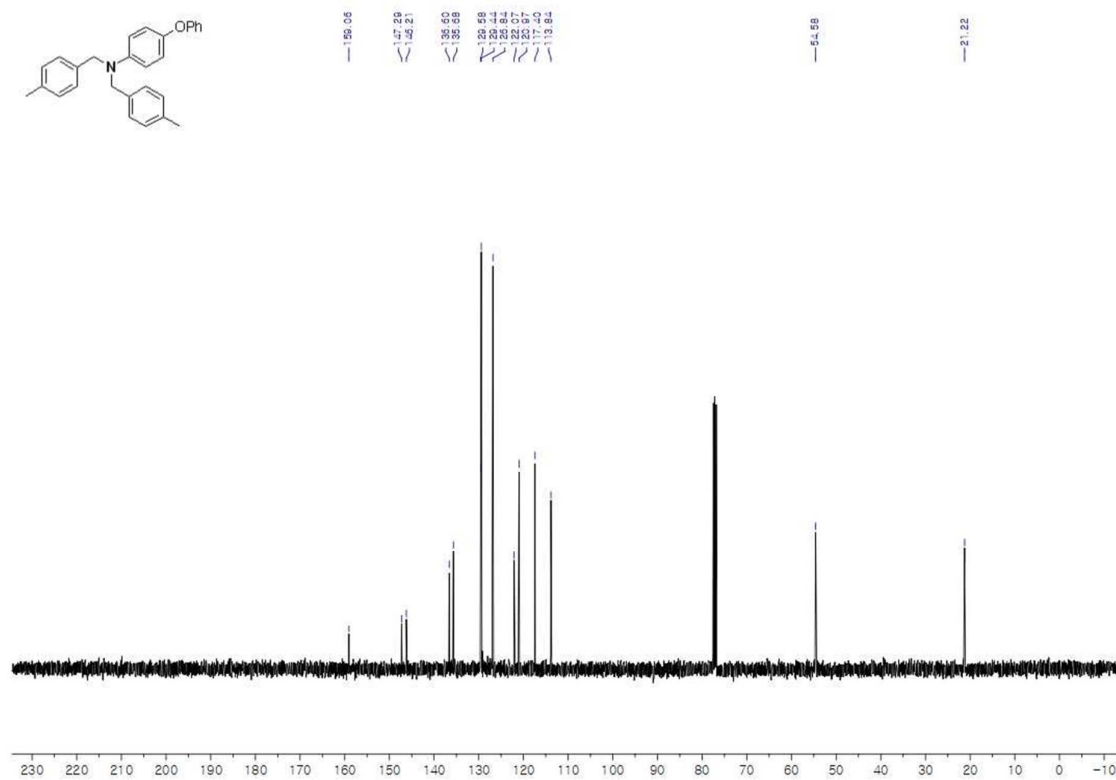
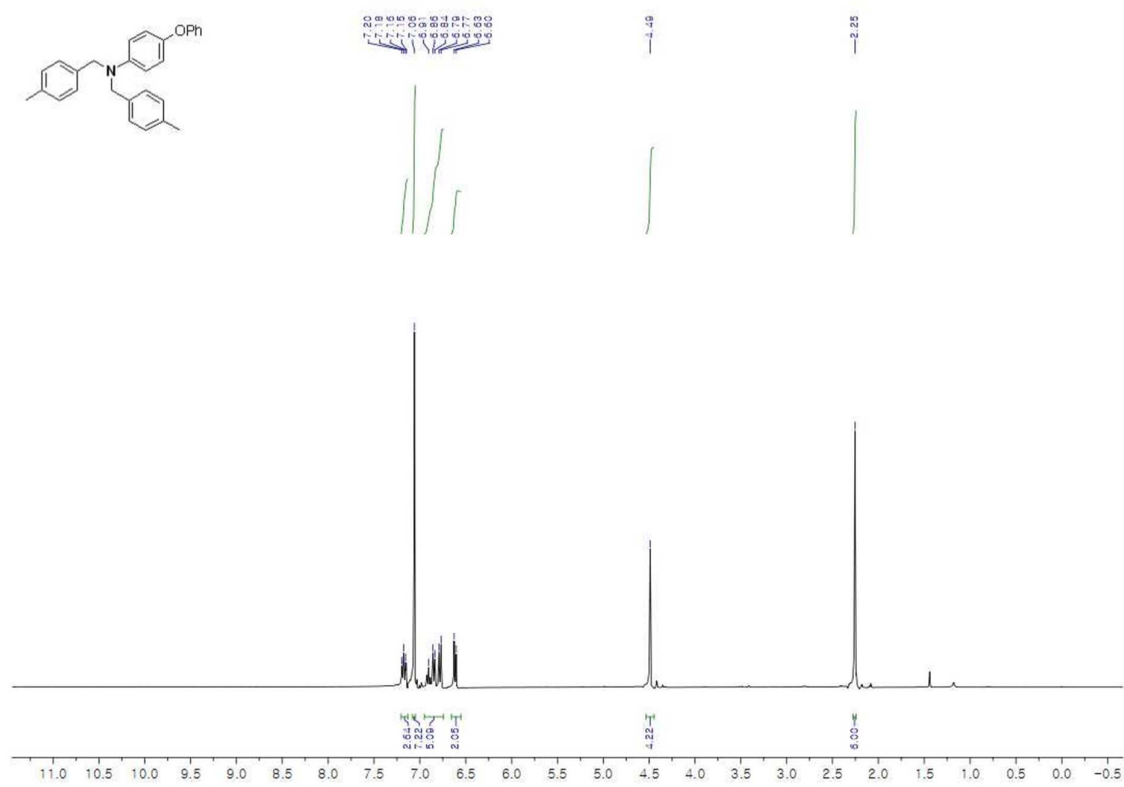
***N,N*-bis(4-isopropylbenzyl)aniline – (Table 2, 1bb)**



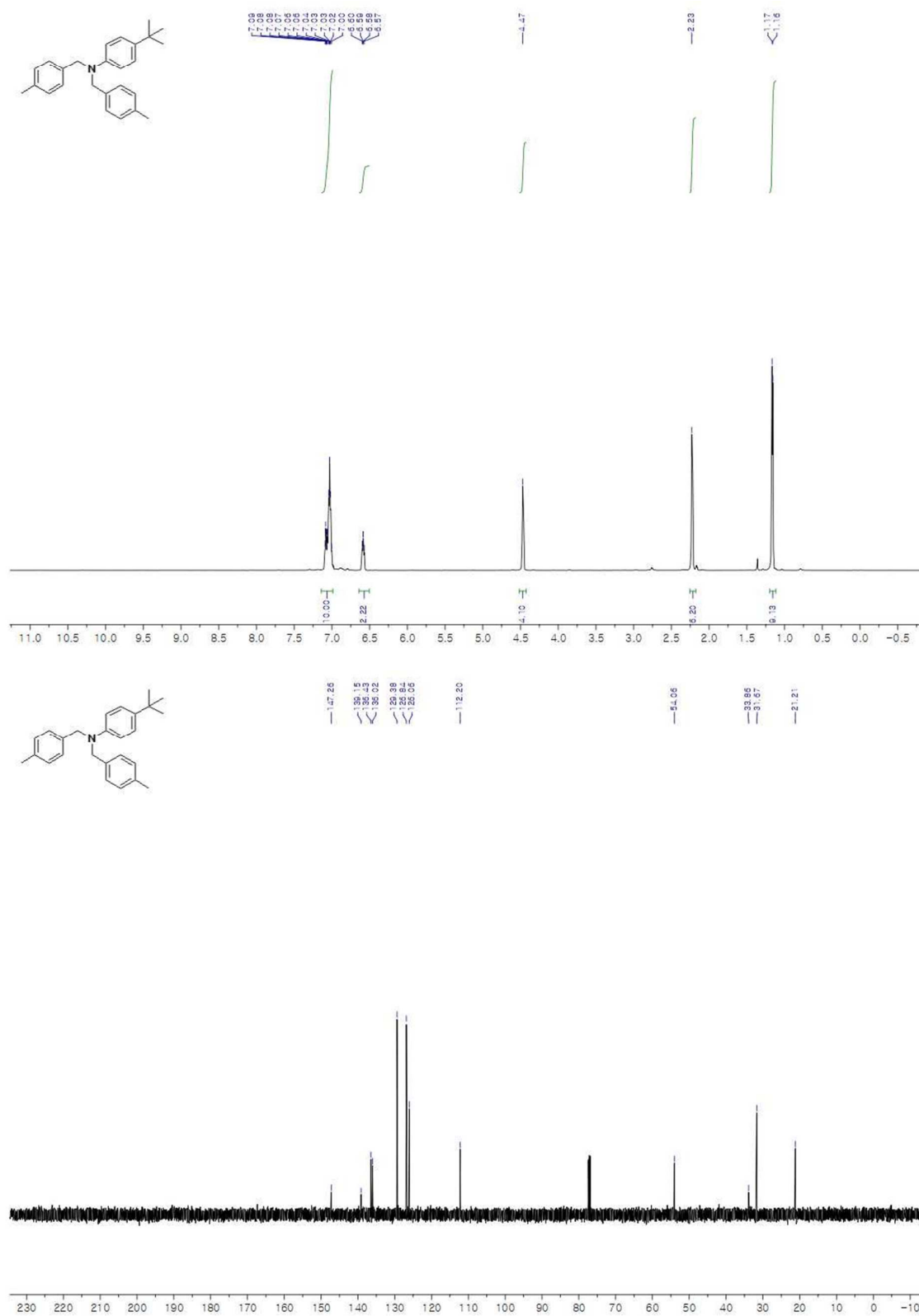
3,5-dimethyl-*N,N*-bis(4-methylbenzyl)aniline – (Table 2, 1cc)



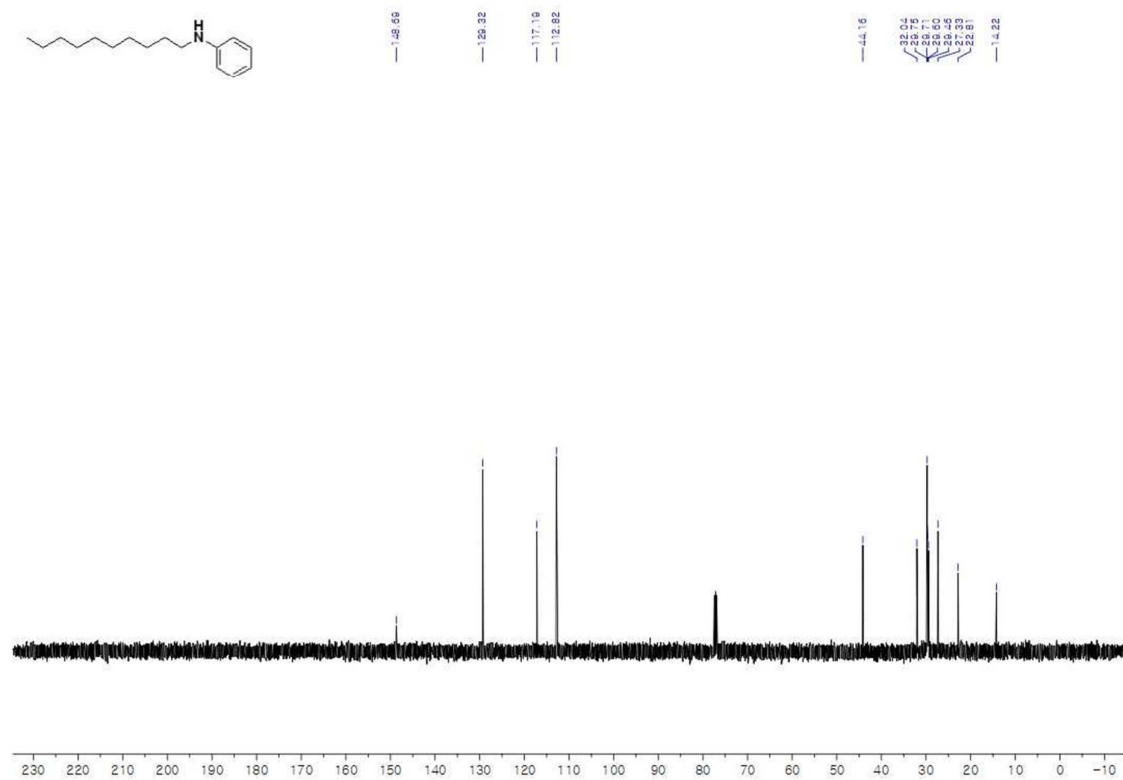
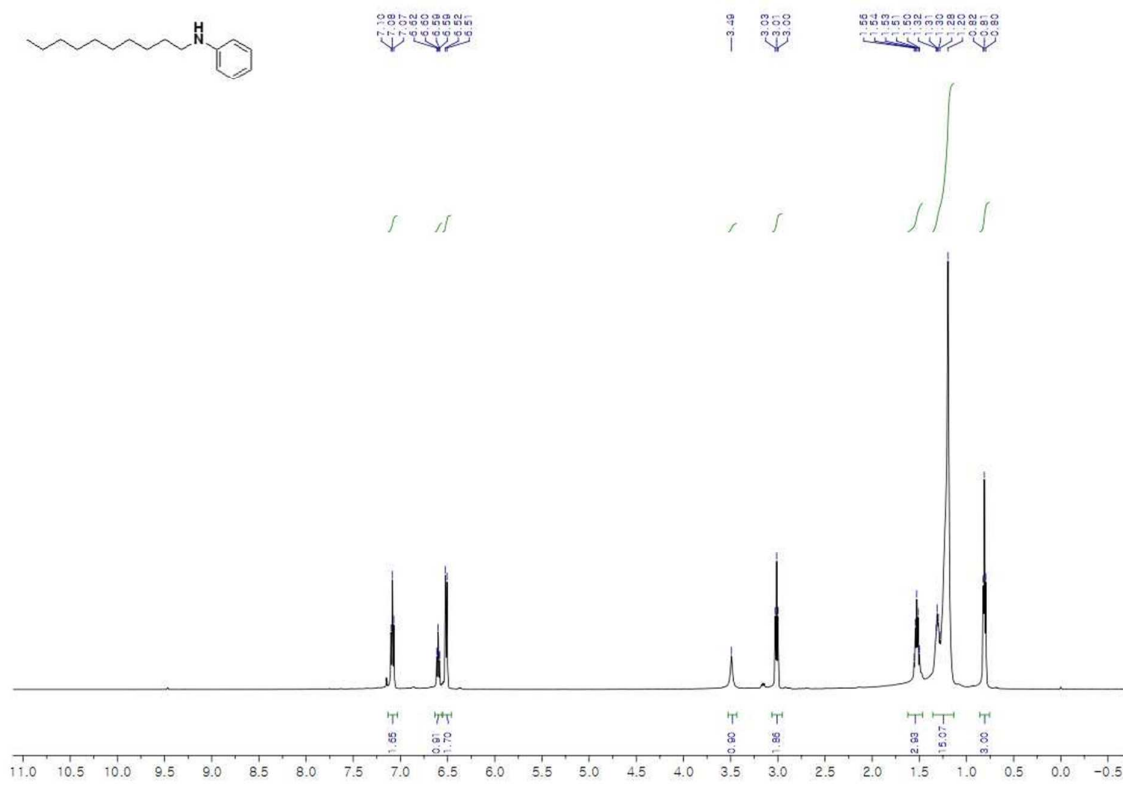
***N,N*-bis(4-methylbenzyl)-4-phenoxyaniline – (Table 2, 1dd)**



4-(*tert*-butyl)-*N,N*-bis(4-methylbenzyl)aniline – (Table 2, 1ee)



***N*-decylaniline – (Table 3, 2b)**



Chemical structure of N-octylbenzylamine: CCCCCCCCNCc1ccccc1

¹H NMR spectrum (CDCl₃) showing peaks at 7.25 (d, 2H), 6.55 (d, 2H), 3.35 (br s, 1H), 3.15 (s, 2H), 1.55 (m, 2H), 1.25 (m, 6H), and 0.85 (t, 3H). Integration values are provided for each peak.

¹³C NMR spectrum (CDCl₃) showing peaks at 149.66, 125.31, 117.16, 112.79, 77.00 (triplet), 41.82, 31.29, 30.14, 29.12, 28.10, 27.08, 26.06, 25.04, 24.02, 23.00, 22.00, 21.00, 20.00, 19.00, 18.00, 17.00, 16.00, 15.00, 14.00, 13.00, 12.00, 11.00, 10.00, 9.00, 8.00, 7.00, 6.00, 5.00, 4.00, 3.00, 2.00, 1.00, 0.00.

The figure displays the chemical structure of N-undecylbenzylamine and its corresponding ¹H and ¹³C NMR spectra.

Chemical Structure: N-undecylbenzylamine, CCCCCCCCCCCCNCc1ccccc1.

¹H NMR Spectrum (Top): The spectrum shows peaks in the aromatic region (7.1-7.3 ppm, integration 1.00, 1.00, 1.00), a methylene peak adjacent to the amine (3.3 ppm, integration 2.00), a methylene peak adjacent to the benzyl group (2.9 ppm, integration 2.00), a large peak for the undecyl chain (1.2 ppm, integration 21.77), and a small peak for the benzyl methylene group (1.5 ppm, integration 2.00).

¹³C NMR Spectrum (Bottom): The spectrum shows peaks for the aromatic carbons (128.8, 128.6, 117.1, 12.8 ppm), the carbonyl carbon (174.8 ppm), and the undecyl chain carbons (31.3, 31.1, 30.9, 30.7, 30.5, 30.3, 30.1, 29.9, 29.7, 29.5, 29.3, 29.1, 28.9, 28.7, 28.5, 28.3, 28.1, 27.9, 27.7, 27.5, 27.3, 27.1, 26.9, 26.7, 26.5, 26.3, 26.1, 25.9, 25.7, 25.5, 25.3, 25.1, 24.9, 24.7, 24.5, 24.3, 24.1, 23.9, 23.7, 23.5, 23.3, 23.1, 22.9, 22.7, 22.5, 22.3, 22.1, 21.9, 21.7, 21.5, 21.3, 21.1, 20.9, 20.7, 20.5, 20.3, 20.1, 19.9, 19.7, 19.5, 19.3, 19.1, 18.9, 18.7, 18.5, 18.3, 18.1, 17.9, 17.7, 17.5, 17.3, 17.1, 16.9, 16.7, 16.5, 16.3, 16.1, 15.9, 15.7, 15.5, 15.3, 15.1, 14.9, 14.7, 14.5, 14.3, 14.1, 13.9, 13.7, 13.5, 13.3, 13.1, 12.9, 12.7, 12.5, 12.3, 12.1, 11.9, 11.7, 11.5, 11.3, 11.1, 10.9, 10.7, 10.5, 10.3, 10.1, 9.9, 9.7, 9.5, 9.3, 9.1, 8.9, 8.7, 8.5, 8.3, 8.1, 7.9, 7.7, 7.5, 7.3, 7.1, 6.9, 6.7, 6.5, 6.3, 6.1, 5.9, 5.7, 5.5, 5.3, 5.1, 4.9, 4.7, 4.5, 4.3, 4.1, 3.9, 3.7, 3.5, 3.3, 3.1, 2.9, 2.7, 2.5, 2.3, 2.1, 1.9, 1.7, 1.5, 1.3, 1.1, 0.9, 0.7, 0.5, 0.3, 0.1, -0.1, -0.3, -0.5, -0.7, -0.9, -1.1, -1.3, -1.5, -1.7, -1.9, -2.1, -2.3, -2.5, -2.7, -2.9, -3.1, -3.3, -3.5, -3.7, -3.9, -4.1, -4.3, -4.5, -4.7, -4.9, -5.1, -5.3, -5.5, -5.7, -5.9, -6.1, -6.3, -6.5, -6.7, -6.9, -7.1, -7.3, -7.5, -7.7, -7.9, -8.1, -8.3, -8.5, -8.7, -8.9, -9.1, -9.3, -9.5, -9.7, -9.9, -10.1, -10.3, -10.5, -10.7, -10.9, -11.1, -11.3, -11.5, -11.7, -11.9, -12.1, -12.3, -12.5, -12.7, -12.9, -13.1, -13.3, -13.5, -13.7, -13.9, -14.1, -14.3, -14.5, -14.7, -14.9, -15.1, -15.3, -15.5, -15.7, -15.9, -16.1, -16.3, -16.5, -16.7, -16.9, -17.1, -17.3, -17.5, -17.7, -17.9, -18.1, -18.3, -18.5, -18.7, -18.9, -19.1, -19.3, -19.5, -19.7, -19.9, -20.1, -20.3, -20.5, -20.7, -20.9, -21.1, -21.3, -21.5, -21.7, -21.9, -22.1, -22.3, -22.5, -22.7, -22.9, -23.1, -23.3, -23.5, -23.7, -23.9, -24.1, -24.3, -24.5, -24.7, -24.9, -25.1, -25.3, -25.5, -25.7, -25.9, -26.1, -26.3, -26.5, -26.7, -26.9, -27.1, -27.3, -27.5, -27.7, -27.9, -28.1, -28.3, -28.5, -28.7, -28.9, -29.1, -29.3, -29.5, -29.7, -29.9, -30.1, -30.3, -30.5, -30.7, -30.9, -31.1, -31.3, -31.5, -31.7, -31.9, -32.1, -32.3, -32.5, -32.7, -32.9, -33.1, -33.3, -33.5, -33.7, -33.9, -34.1, -34.3, -34.5, -34.7, -34.9, -35.1, -35.3, -35.5, -35.7, -35.9, -36.1, -36.3, -36.5, -36.7, -36.9, -37.1, -37.3, -37.5, -37.7, -37.9, -38.1, -38.3, -38.5, -38.7, -38.9, -39.1, -39.3, -39.5, -39.7, -39.9, -40.1, -40.3, -40.5, -40.7, -40.9, -41.1, -41.3, -41.5, -41.7, -41.9, -42.1, -42.3, -42.5, -42.7, -42.9, -43.1, -43.3, -43.5, -43.7, -43.9, -44.1, -44.3, -44.5, -44.7, -44.9, -45.1, -45.3, -45.5, -45.7, -45.9, -46.1, -46.3, -46.5, -46.7, -46.9, -47.1, -47.3, -47.5, -47.7, -47.9, -48.1, -48.3, -48.5, -48.7, -48.9, -49.1, -49.3, -49.5, -49.7, -49.9, -50.1, -50.3, -50.5, -50.7, -50.9, -51.1, -51.3, -51.5, -51.7, -51.9, -52.1, -52.3, -52.5, -52.7, -52.9, -53.1, -53.3, -53.5, -53.7, -53.9, -54.1, -54.3, -54.5, -54.7, -54.9, -55.1, -55.3, -55.5, -55.7, -55.9, -56.1, -56.3, -56.5, -56.7, -56.9, -57.1, -57.3, -57.5, -57.7, -57.9, -58.1, -58.3, -58.5, -58.7, -58.9, -59.1, -59.3, -59.5, -59.7, -59.9, -60.1, -60.3, -60.5, -60.7, -60.9, -61.1, -61.3, -61.5, -61.7, -61.9, -62.1, -62.3, -62.5, -62.7, -62.9, -63.1, -63.3, -63.5, -63.7, -63.9, -64.1, -64.3, -64.5, -64.7, -64.9, -65.1, -65.3, -65.5, -65.7, -65.9, -66.1, -66.3, -66.5, -66.7, -66.9, -67.1, -67.3, -67.5, -67.7, -67.9, -68.1, -68.3, -68.5, -68.7, -68.9, -69.1, -69.3, -69.5, -69.7, -69.9, -70.1, -70.3, -70.5, -70.7, -70.9, -71.1, -71.3, -71.5, -71.7, -71.9, -72.1, -72.3, -72.5, -72.7, -72.9, -73.1, -73.3, -73.5, -73.7, -73.9, -74.1, -74.3, -74.5, -74.7, -74.9, -75.1, -75.3, -75.5, -75.7, -75.9, -76.1, -76.3, -76.5, -76.7, -76.9, -77.1, -77.3, -77.5, -77.7, -77.9, -78.1, -78.3, -78.5, -78.7, -78.9, -79.1, -79.3, -79.5, -79.7, -79.9, -80.1, -80.3, -80.5, -80.7, -80.9, -81.1, -81.3, -81.5, -81.7, -81.9, -82.1, -82.3, -82.5, -82.7, -82.9, -83.1, -83.3, -83.5, -83.7, -83.9, -84.1, -84.3, -84.5, -84.7, -84.9, -85.1, -85.3, -85.5, -85.7, -85.9, -86.1, -86.3, -86.5, -86.7, -86.9, -87.1, -87.3, -87.5, -87.7, -87.9, -88.1, -88.3, -88.5, -88.7, -88.9, -89.1, -89.3, -89.5, -89.7, -89.9, -90.1, -90.3, -90.5, -90.7, -90.9, -91.1, -91.3, -91.5, -91.7, -91.9, -92.1, -92.3, -92.5, -92.7, -92.9, -93.1, -93.3, -93.5, -93.7, -93.9, -94.1, -94.3, -94.5, -94.7, -94.9, -95.1, -95.3, -95.5, -95.7, -95.9, -96.1, -96.3, -96.5, -96.7, -96.9, -97.1, -97.3,

¹H NMR Spectrum (Top):

Chemical structure: Nc1ccccc1CCc2ccccc2

Peak assignments (ppm):

- Aromatic protons: 6.50 (d, 2H), 6.55 (d, 2H), 6.90 (t, 1H), 7.00 (t, 1H), 7.05 (t, 1H), 7.10 (t, 1H)
- Aliphatic protons: 1.60 (t, 3H), 2.50 (t, 2H), 2.90 (t, 2H), 3.30 (t, 2H)

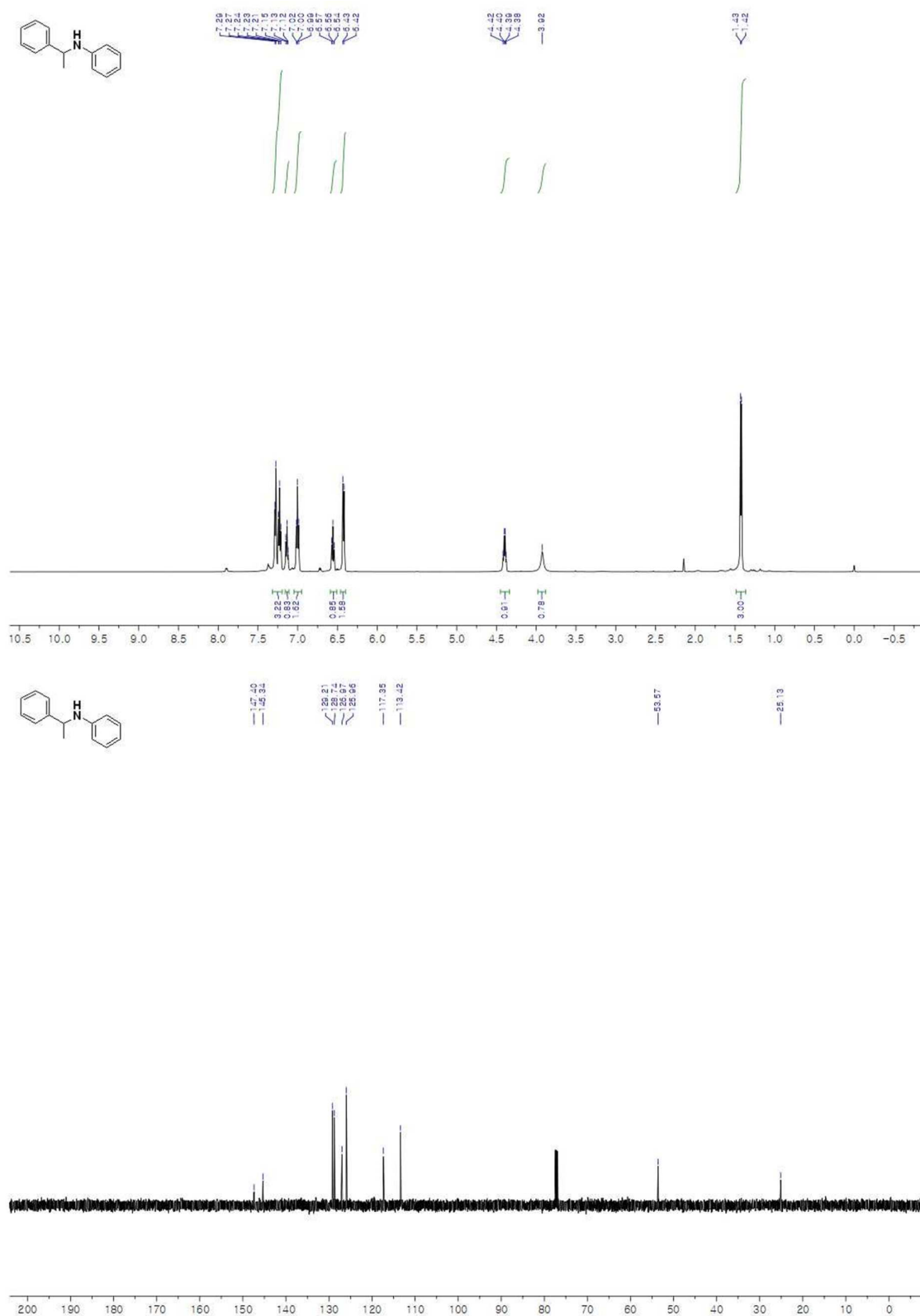
¹³C NMR Spectrum (Bottom):

Chemical structure: Nc1ccccc1CCc2ccccc2

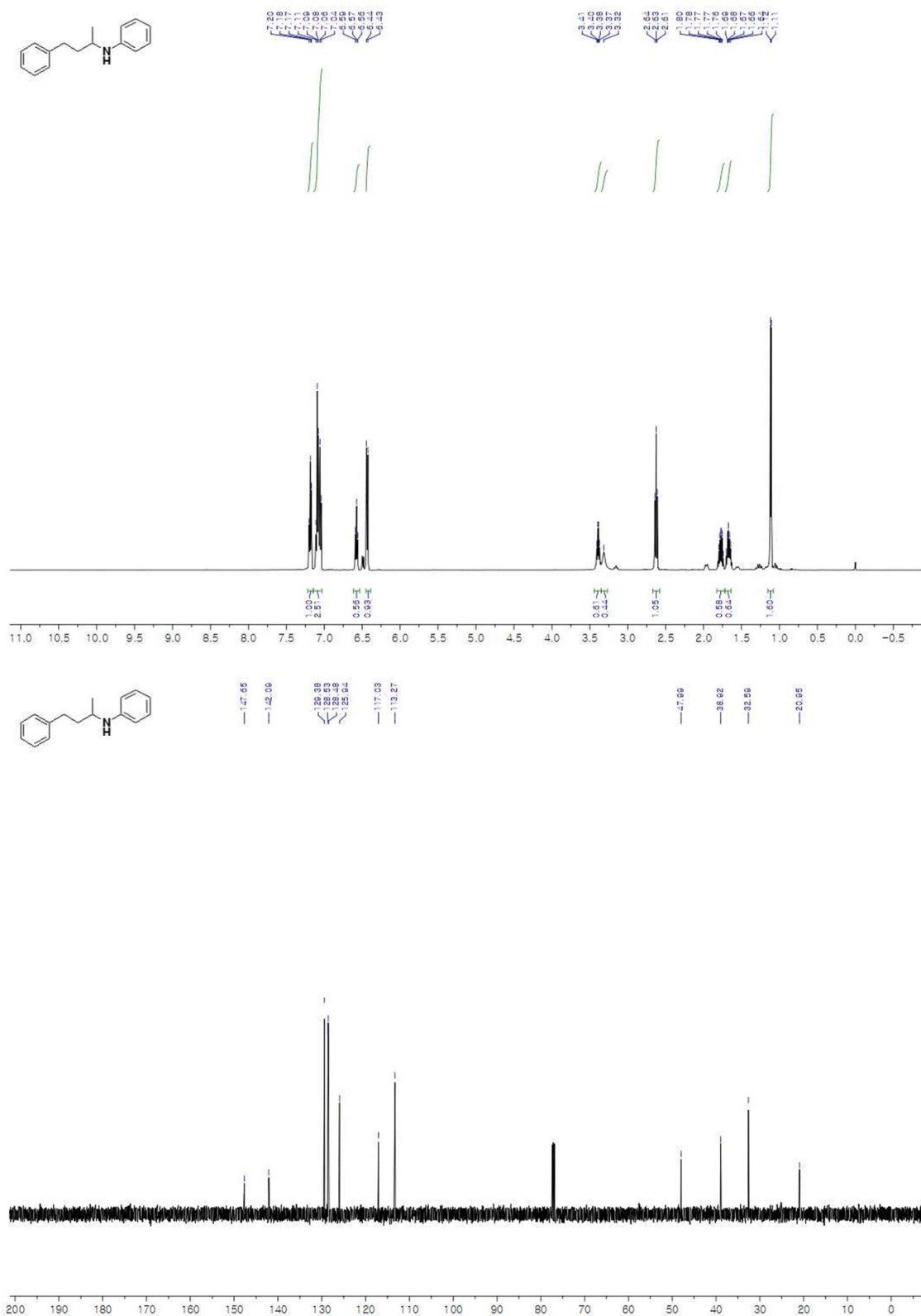
Peak assignments (ppm):

- Aromatic carbons: 112.7, 117.25, 123.0, 123.45, 123.9, 124.3, 124.75, 129.3, 130.3, 131.2, 132.7
- Aliphatic carbons: 31.2, 32.7, 77.0 (CDCl₃)

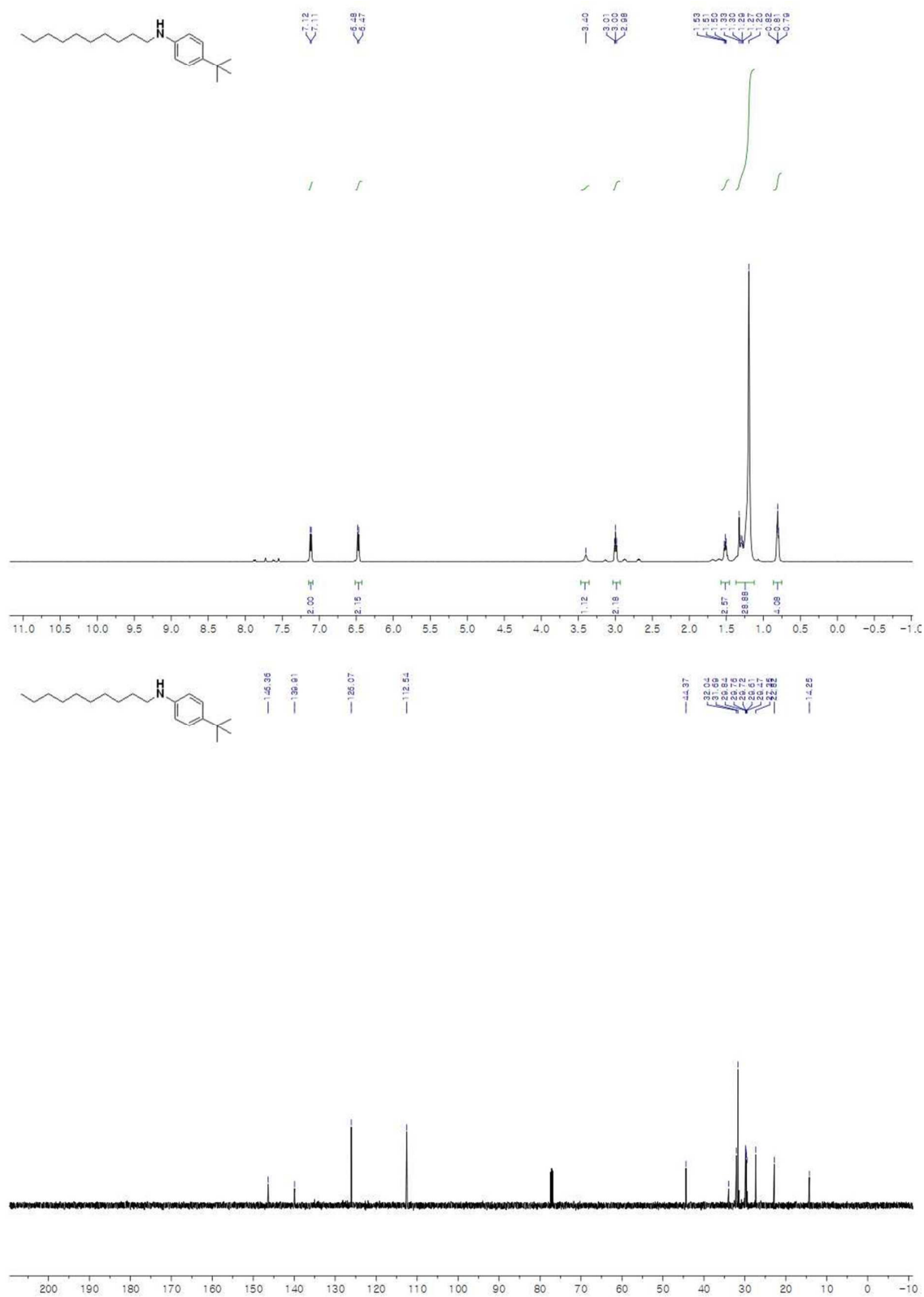
***N*-(1-phenylethyl)aniline – (Table 3, 2e)**



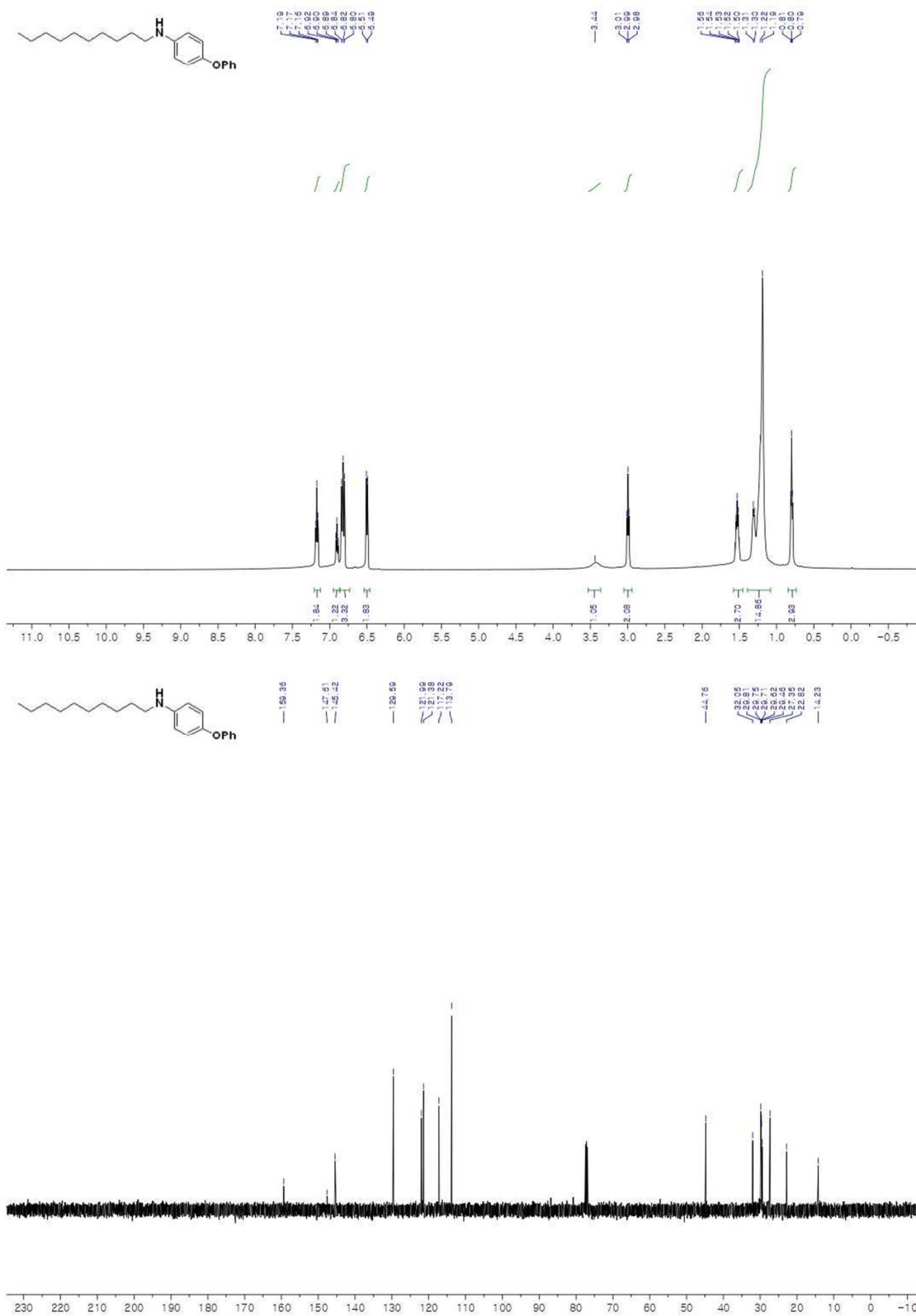
***N*-(4-phenylbutan-2-yl)aniline – (Table 3, 2f)**



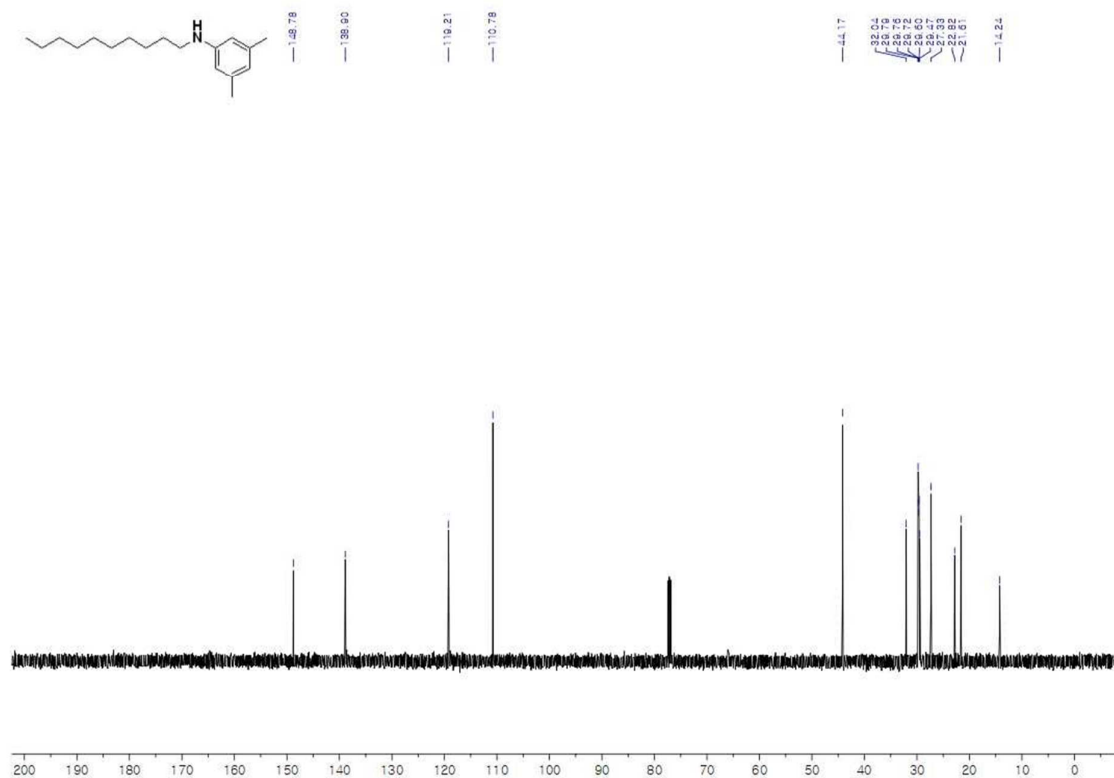
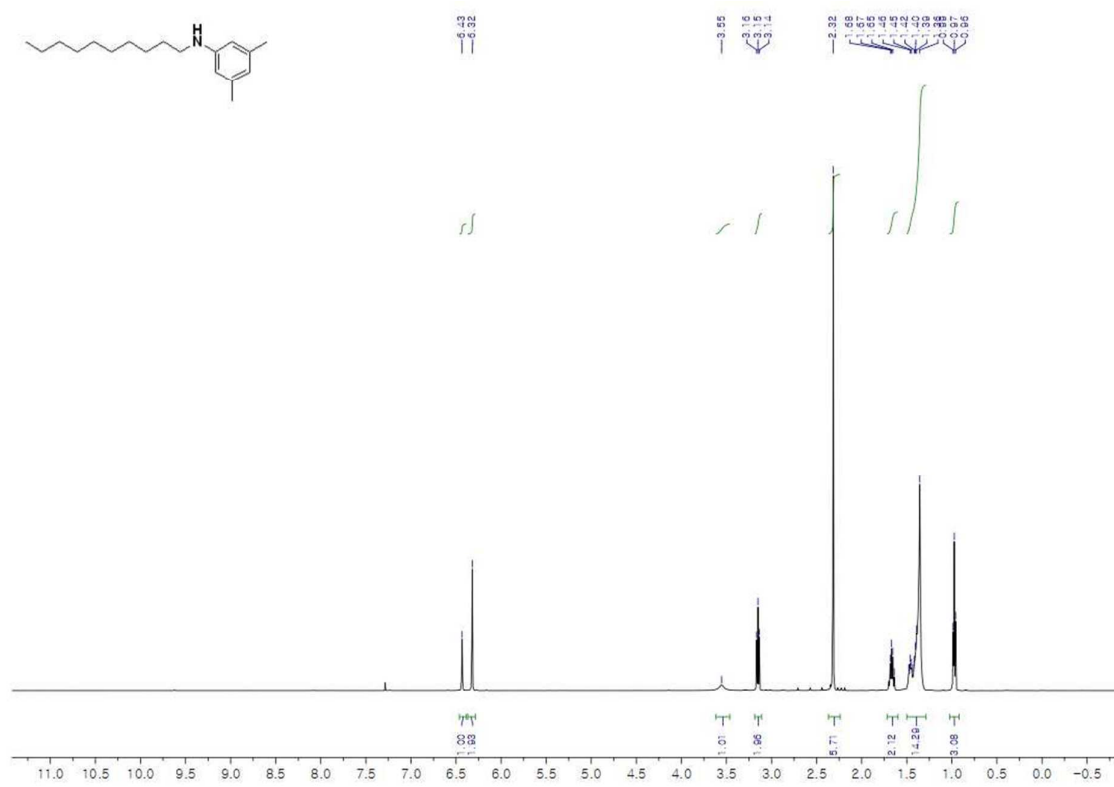
4-(*tert*-butyl)-*N*-decylaniline – (Table 3, 2i)



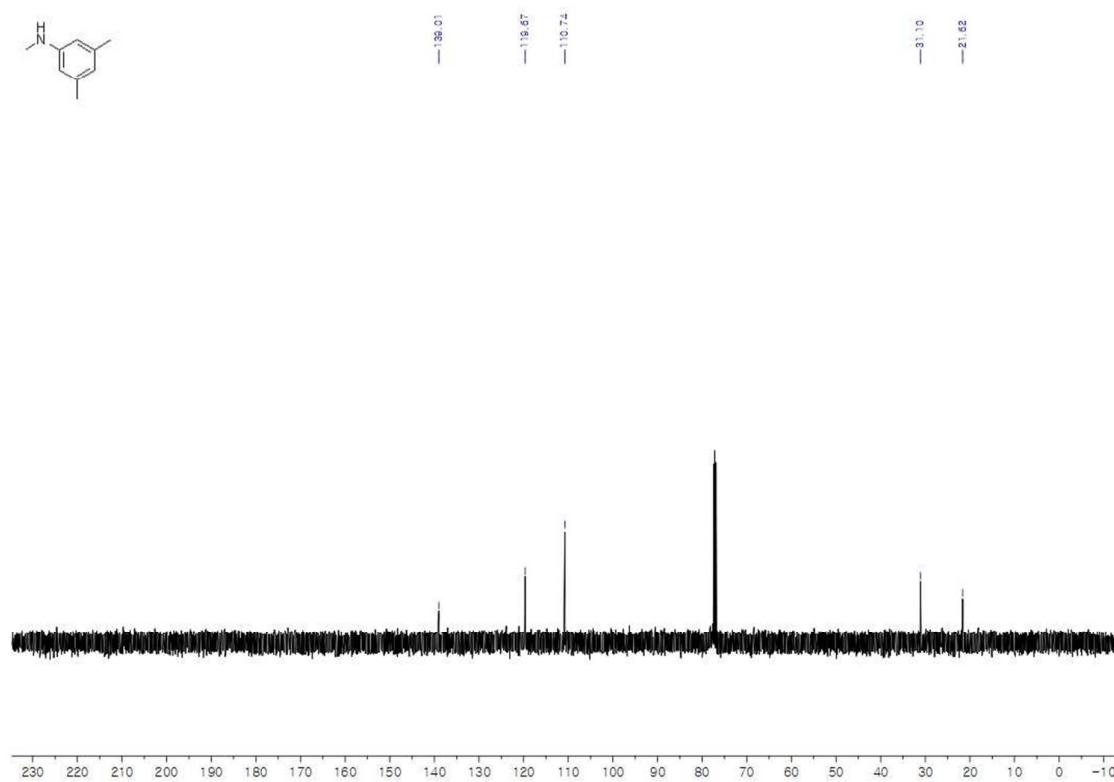
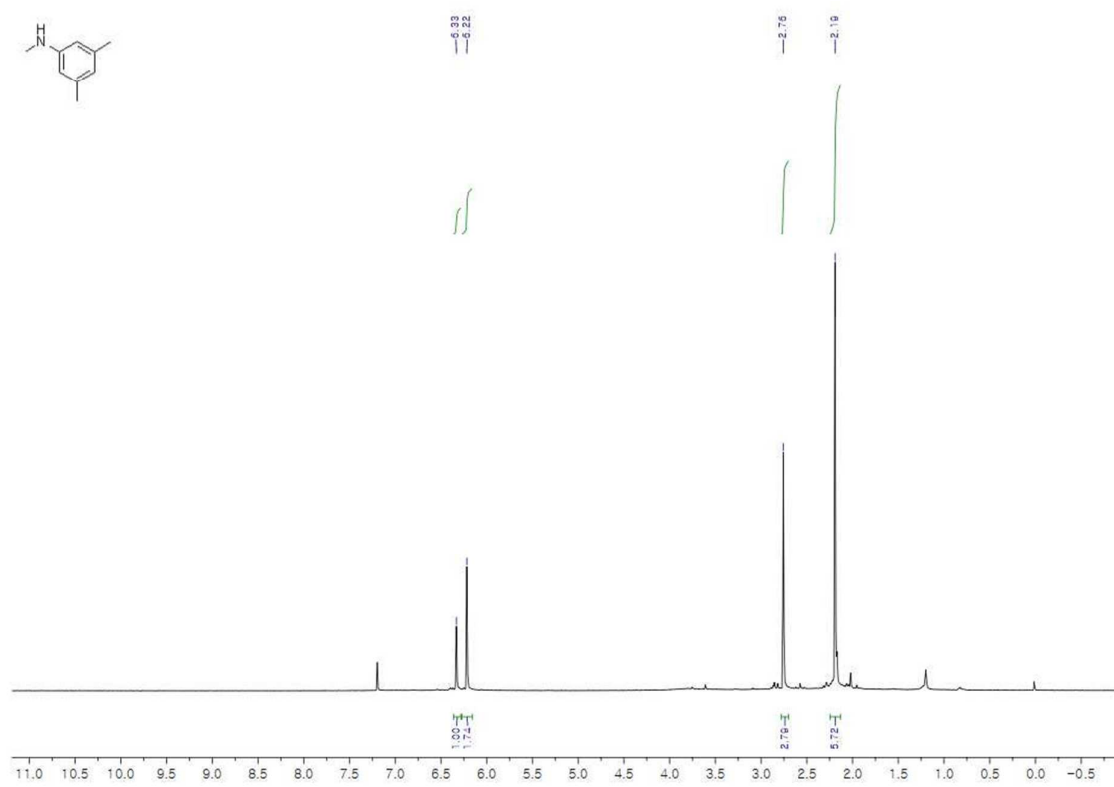
***N*-decyl-4-phenoxyaniline – (Table 3, 2j)**



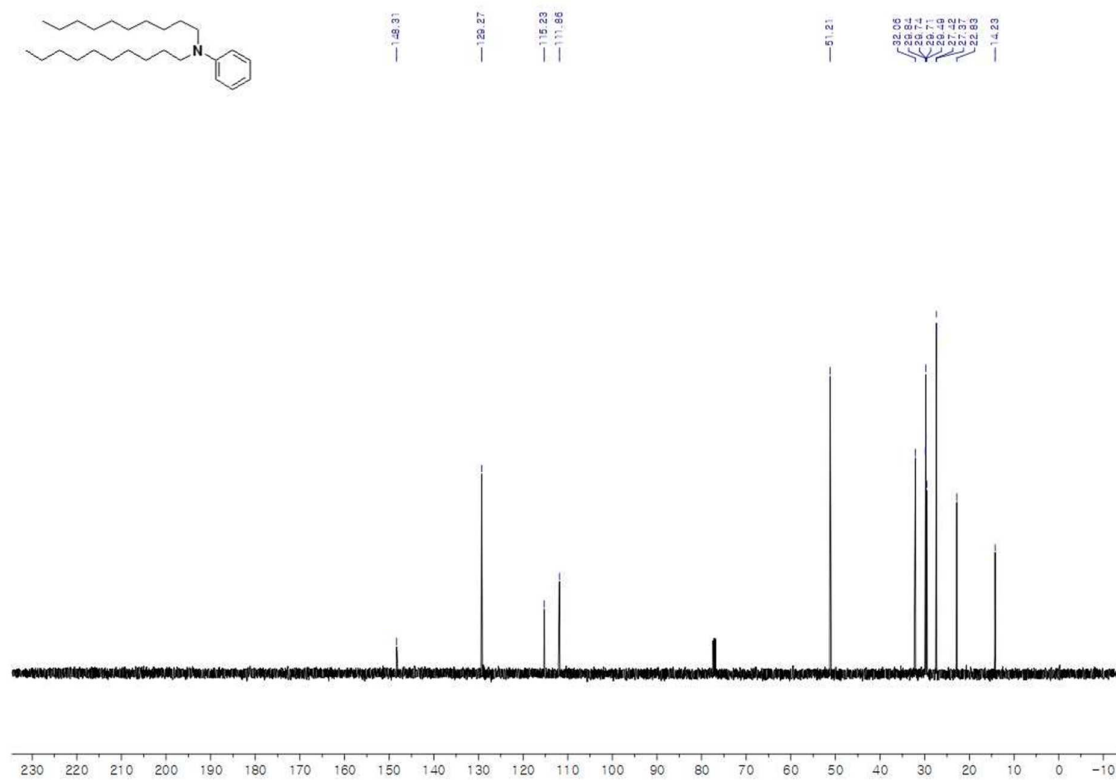
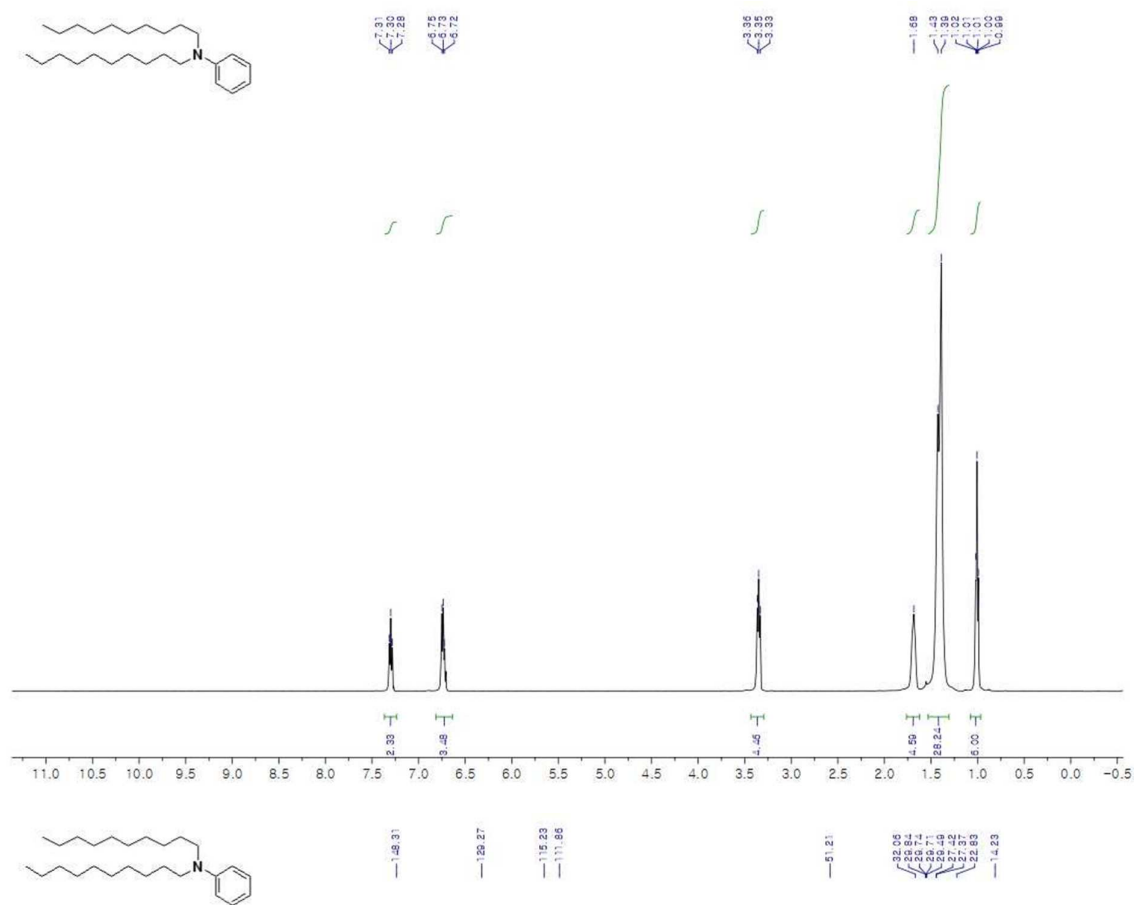
***N*-decyl-3,5-dimethylaniline – (Table 3, 2k)**



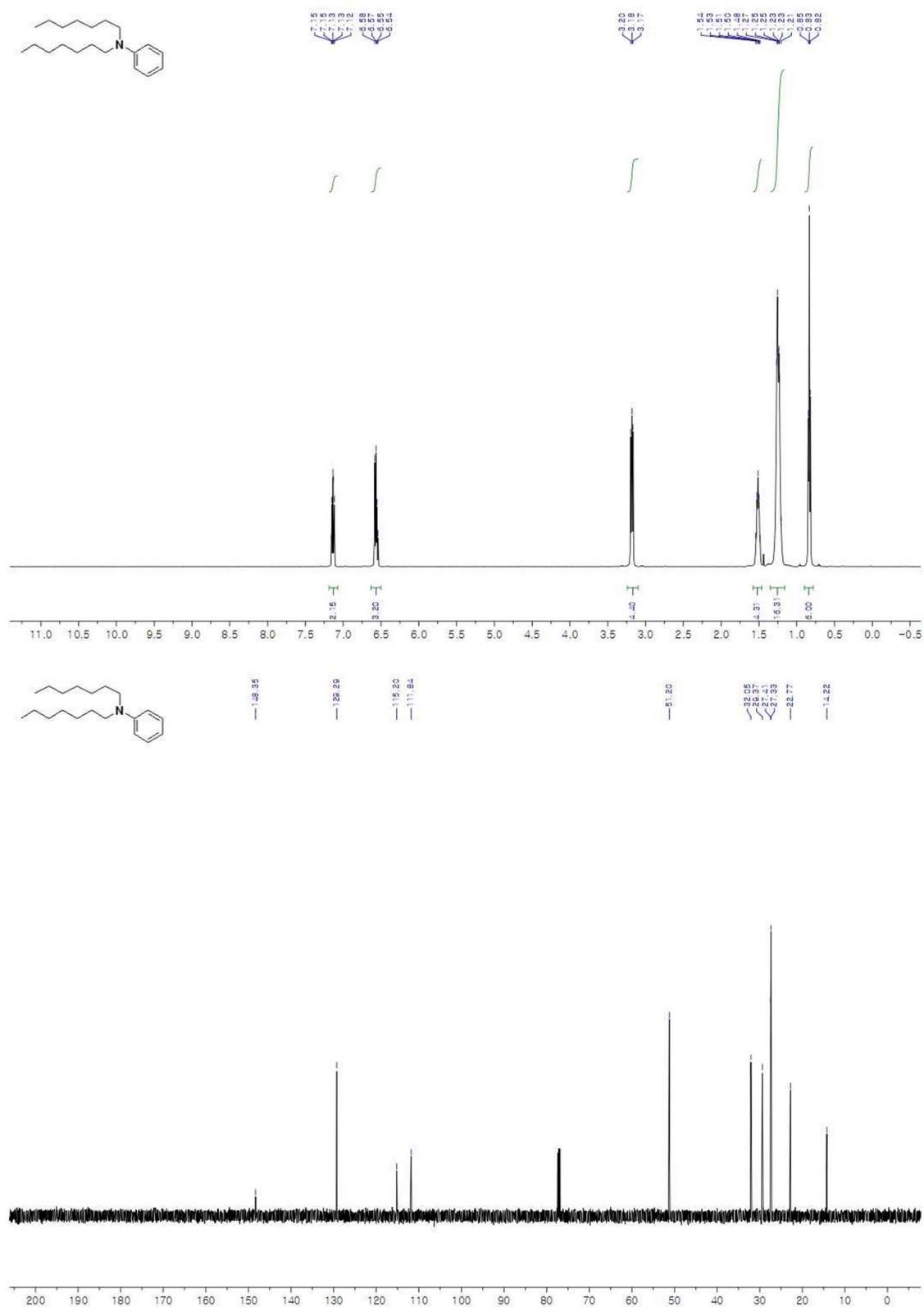
***N*-3,5-trimethylaniline – (Table 3, 2h)**



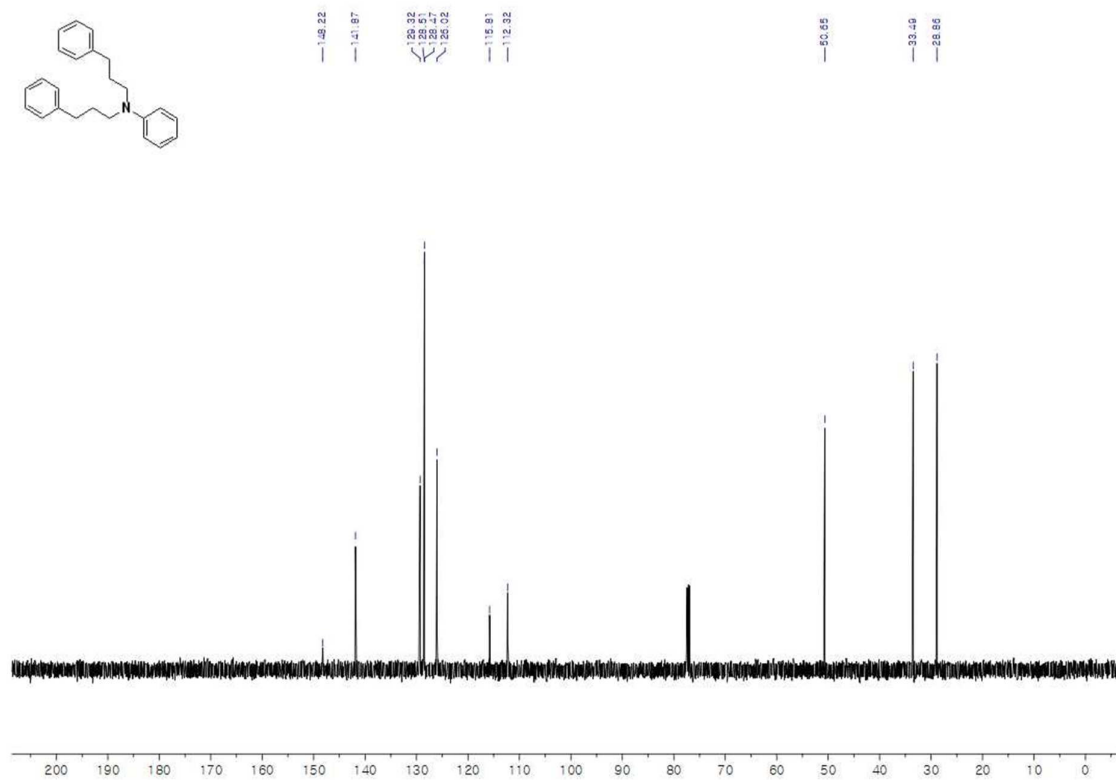
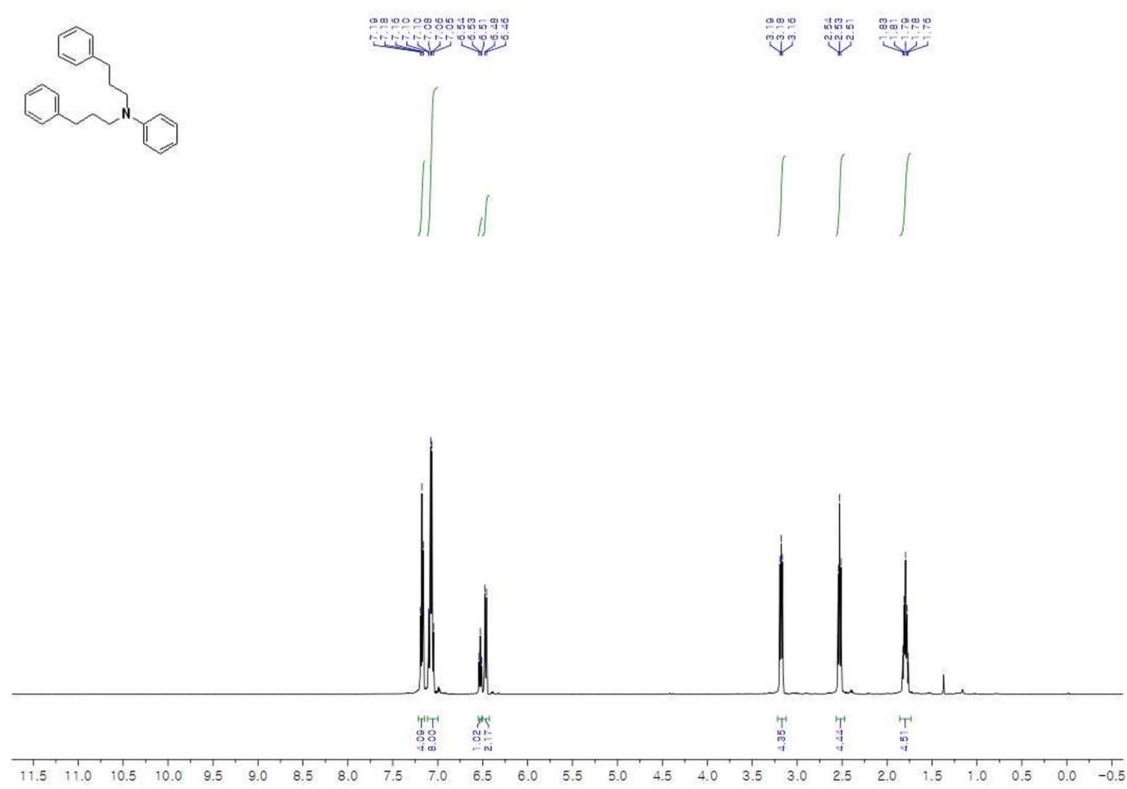
***N,N*-didecylaniline – (Table 3, 2bb)**



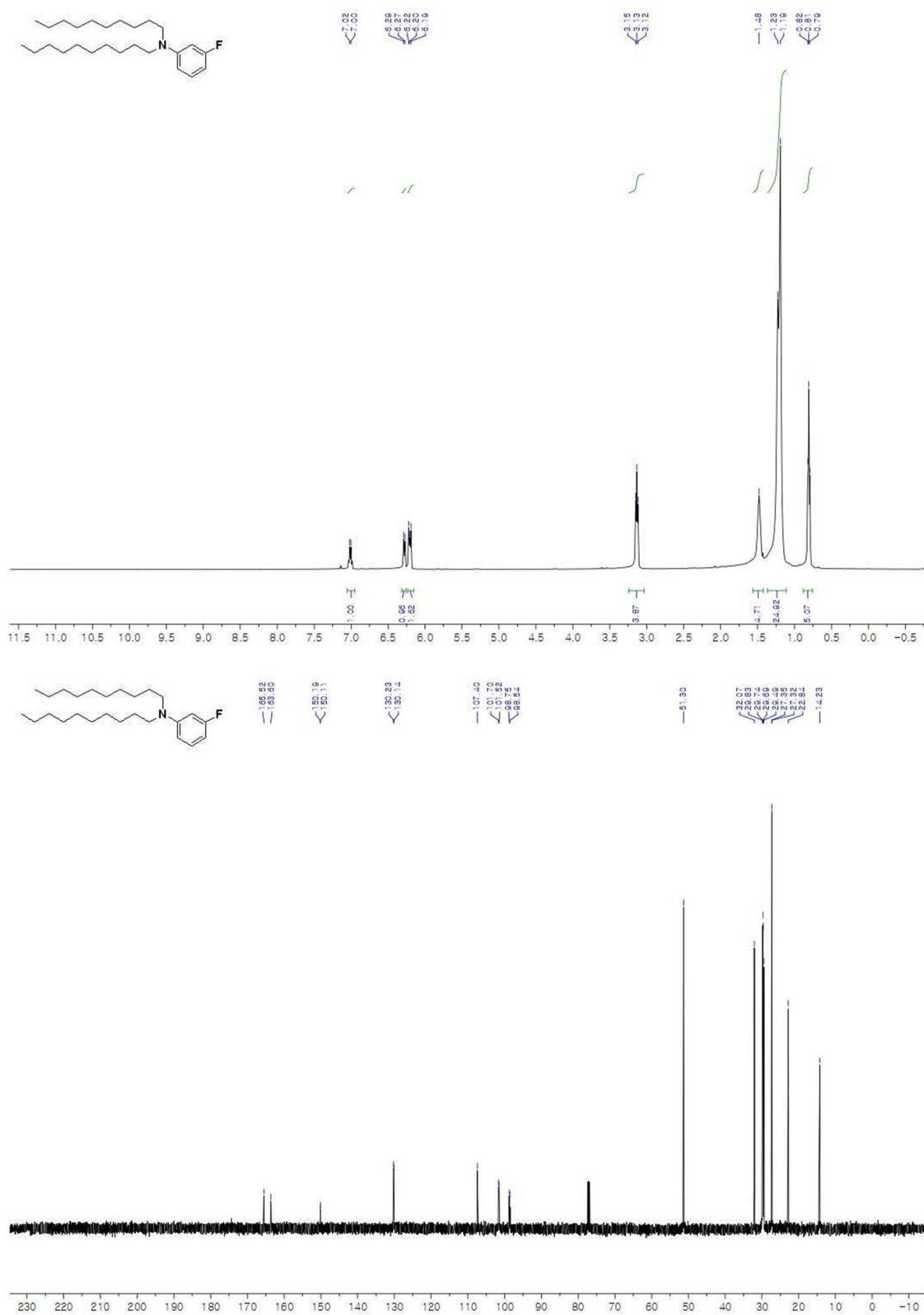
***N,N*-diheptylaniline – (Table 3, 2aa)**

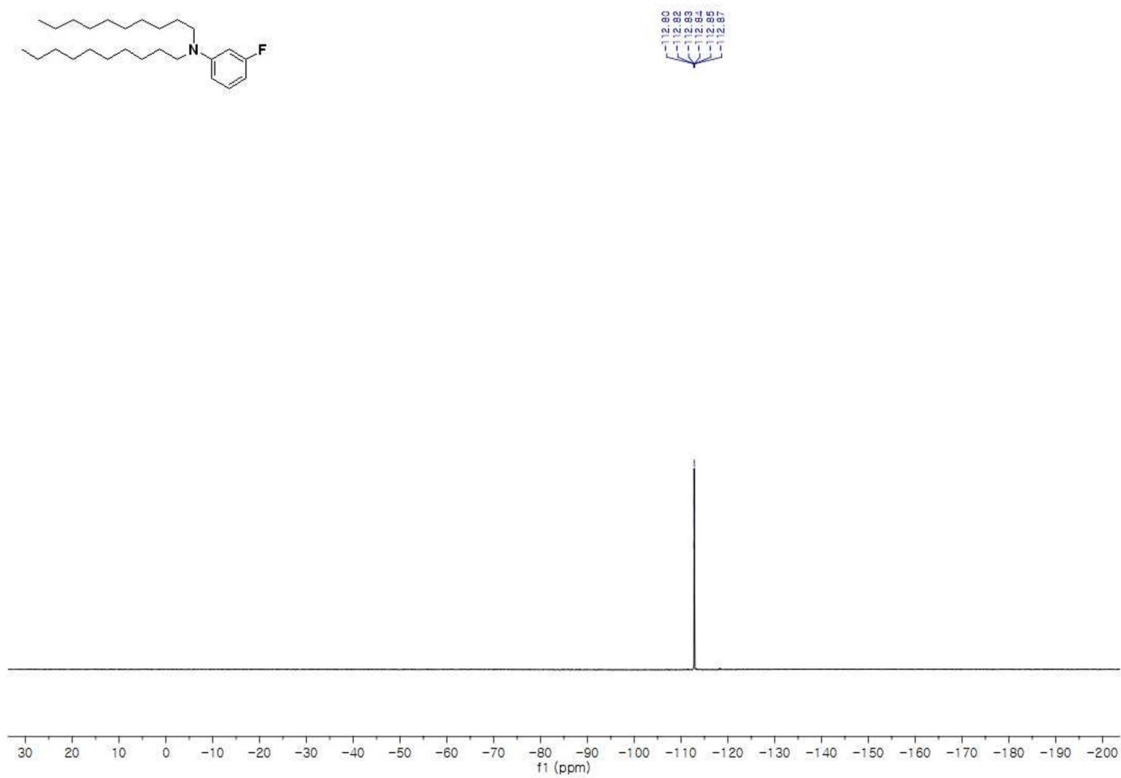


***N,N*-bis(3-phenylpropyl)aniline – (Table 3, 2cc)**

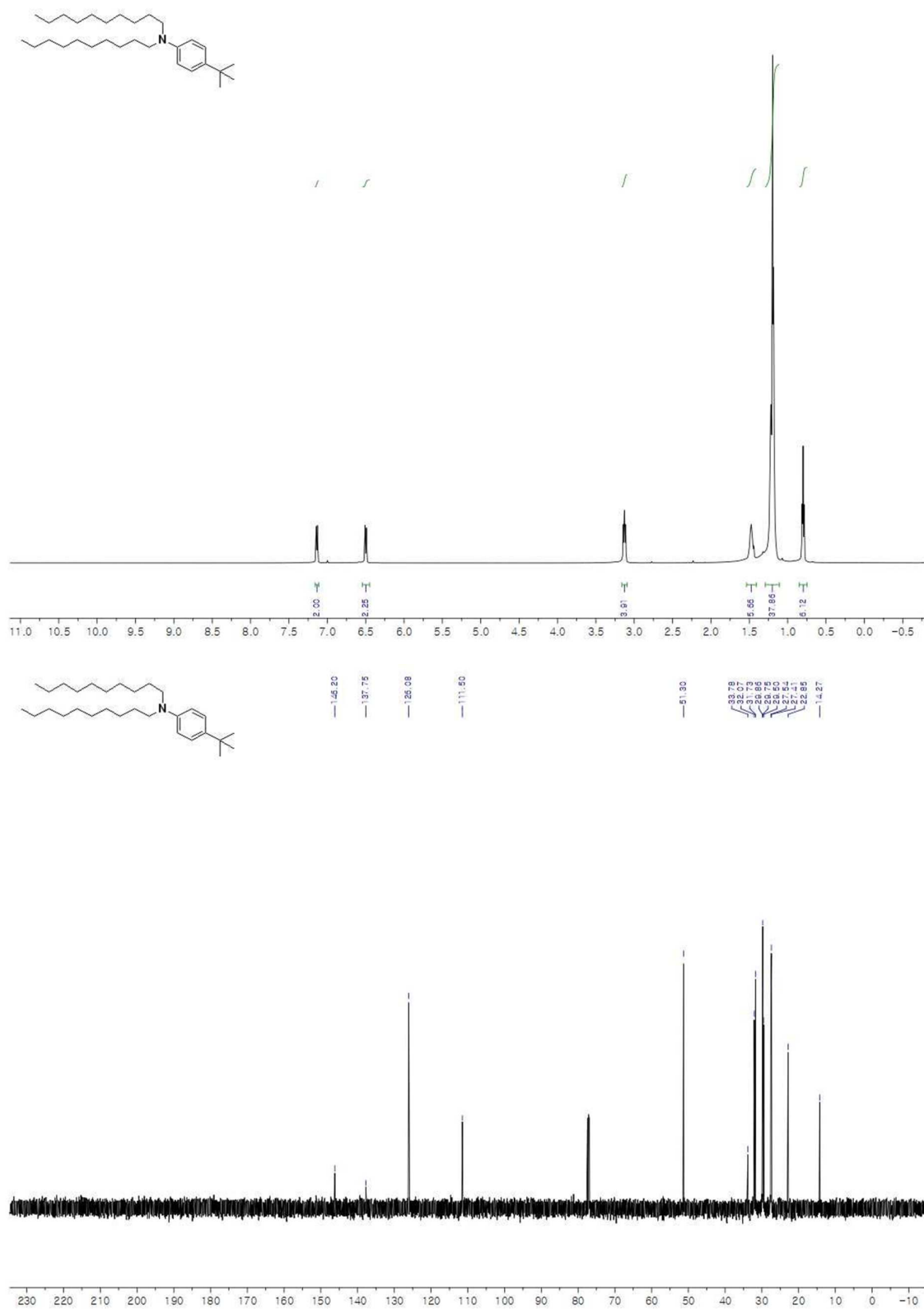


***N,N*-didecyl-3-fluoroaniline – (Table 3, 2dd)**





4-(*tert*-butyl)-*N,N*-didecylaniline – (Table 3, 2ee)

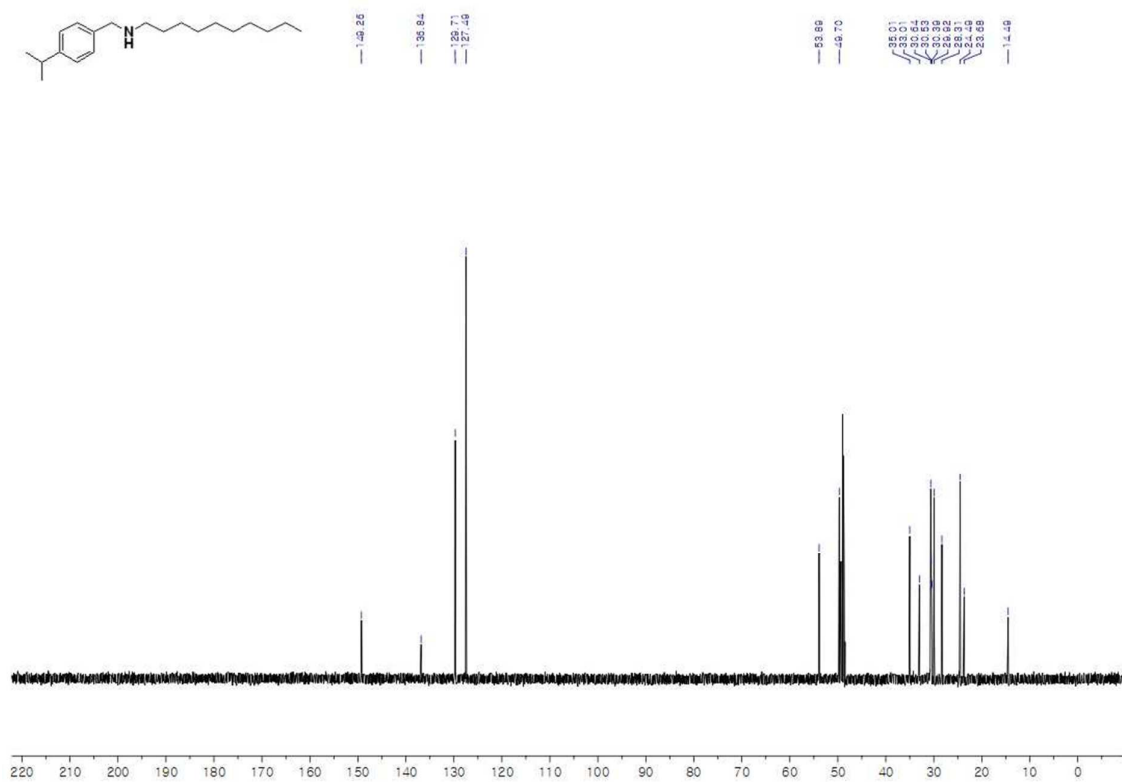
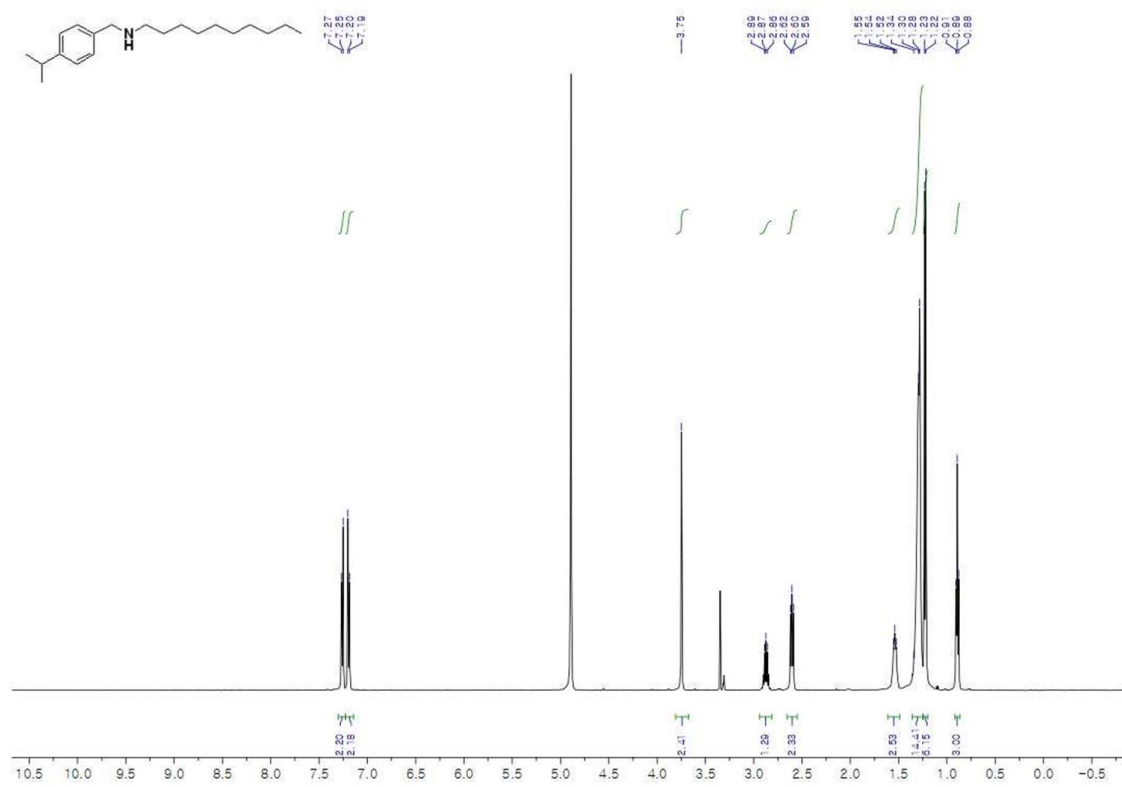


CCCCCCCCNC1=CC=C(C)C=C1

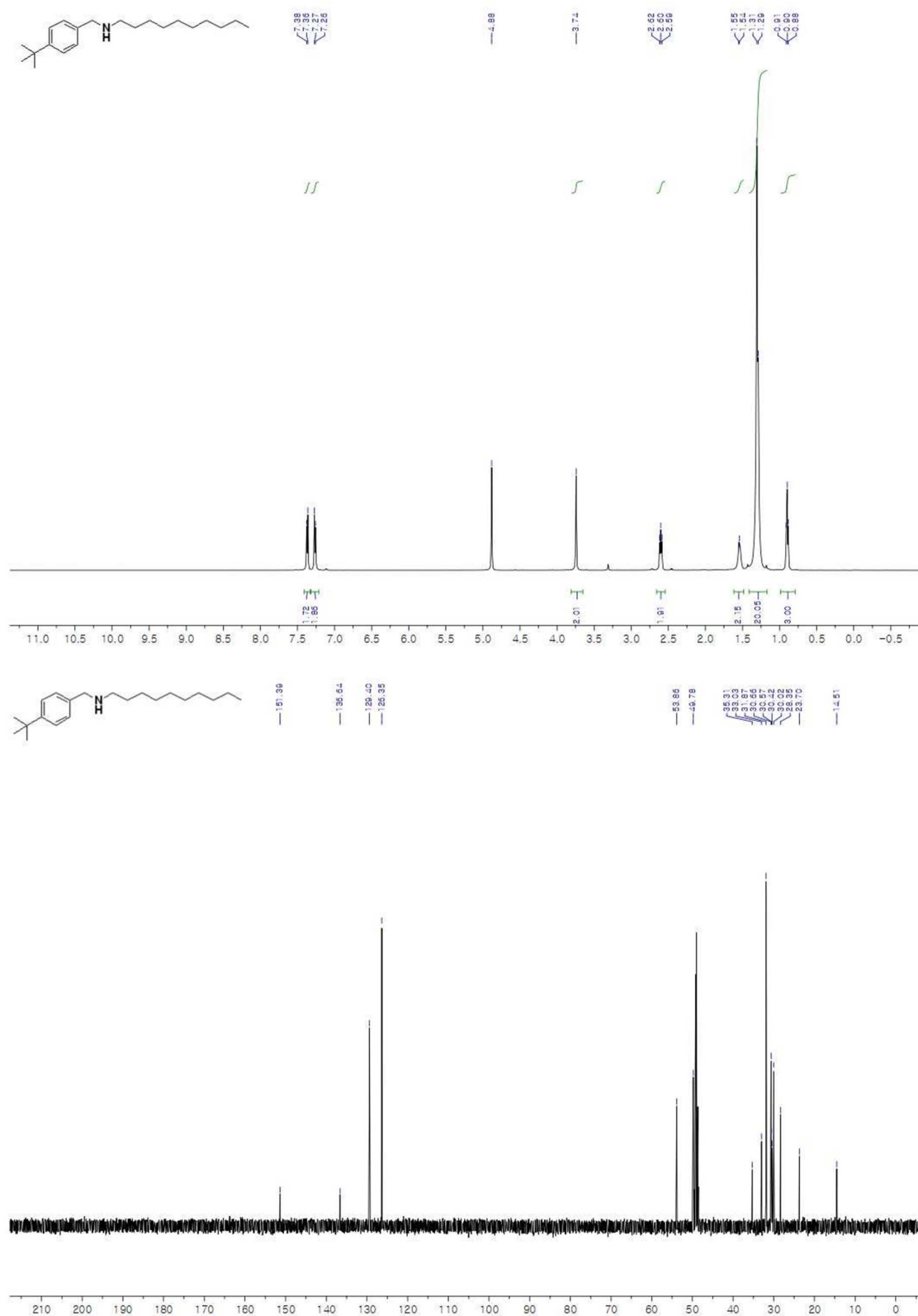
7.1 (d, 2H), 7.0 (d, 2H), 4.8 (s, 1H), 3.6 (t, 2H), 3.4 (t, 2H), 2.3 (s, 3H), 1.6 (m, 6H), 1.3 (m, 4H), 0.9 (t, 3H)

Integration: 0.96, 0.96, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00

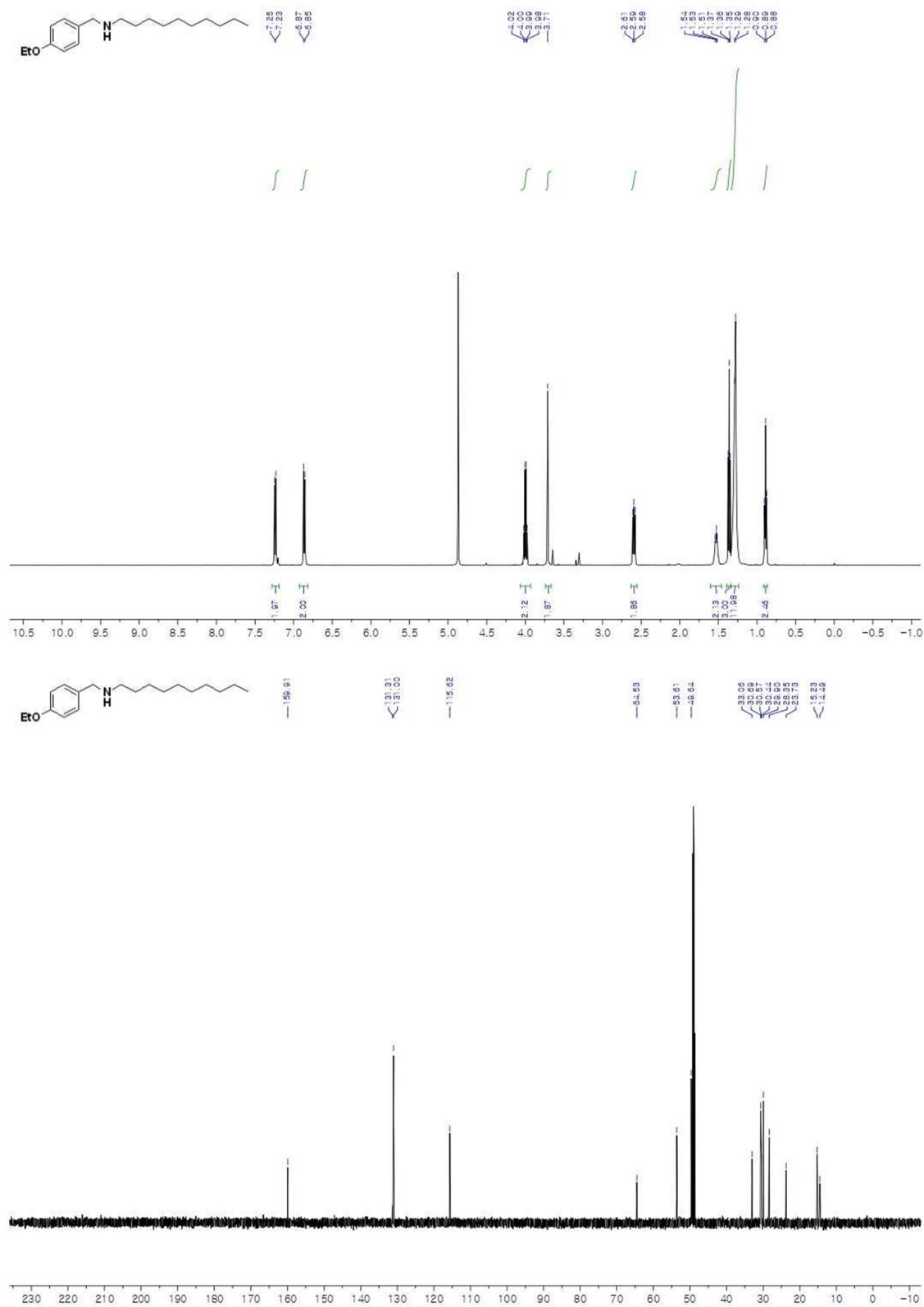
***N*-(4-isopropylbenzyl)decan-1-amine – (Table 4, 3b)**



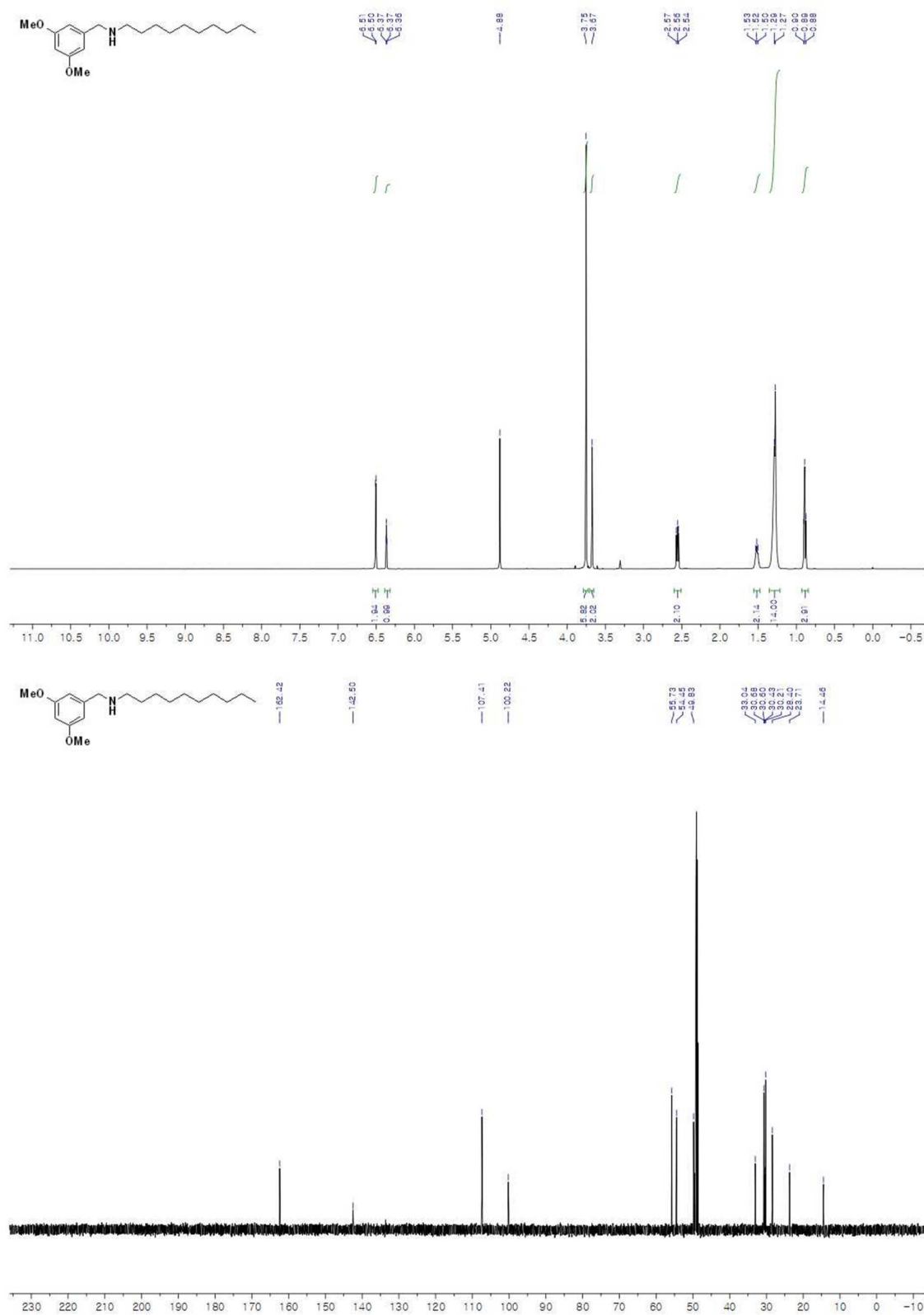
***N*-(4-(tert-butyl)benzyl)decan-1-amine – (Table 4, 3c)**



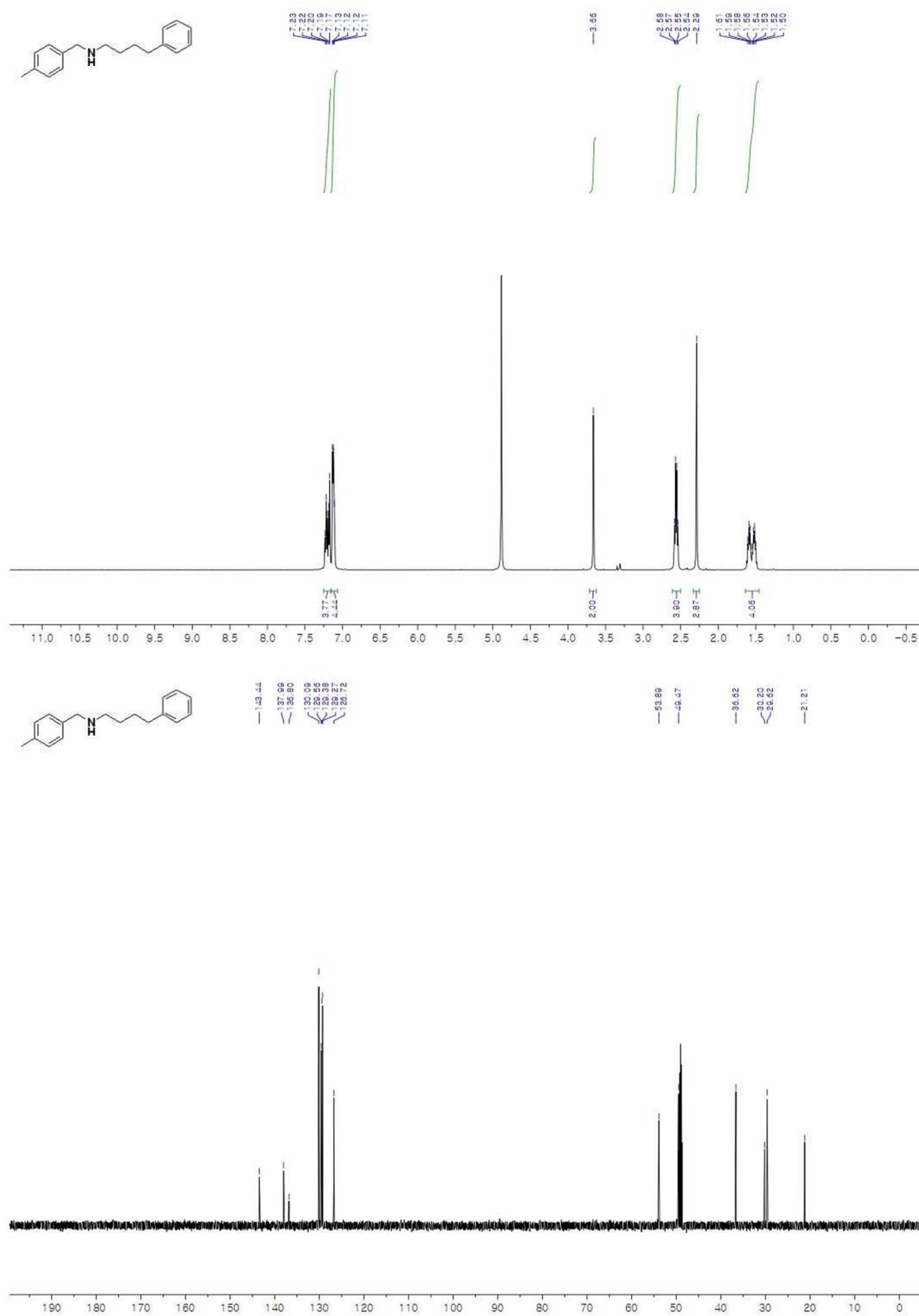
***N*-(4-ethoxybenzyl)decan-1-amine – (Table 4, 3d)**



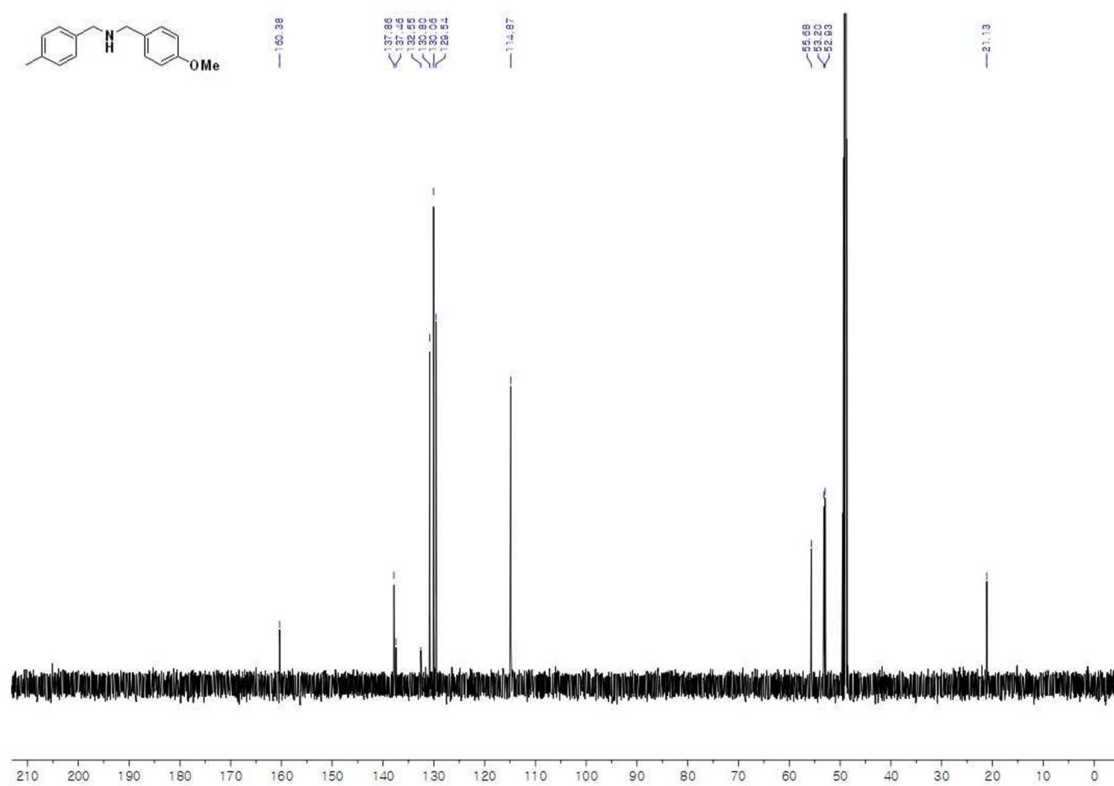
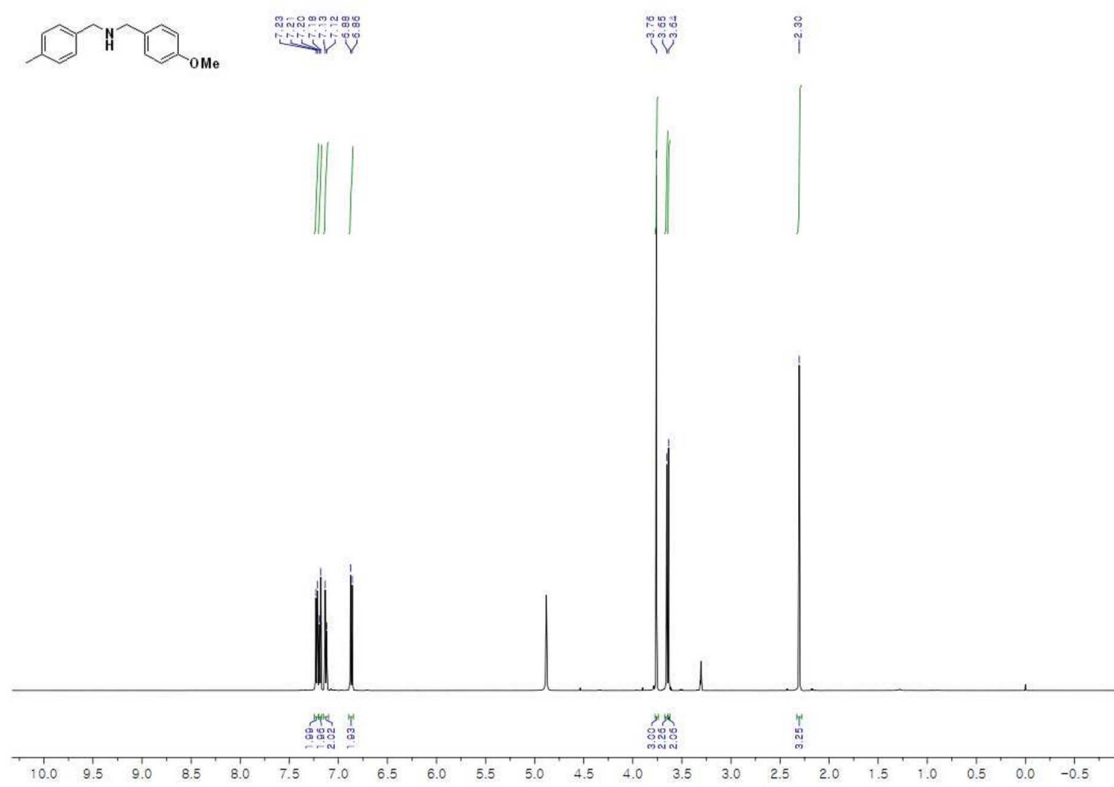
***N*-(3,5-dimethoxybenzyl)decan-1-amine – (Table 4, 3e)**



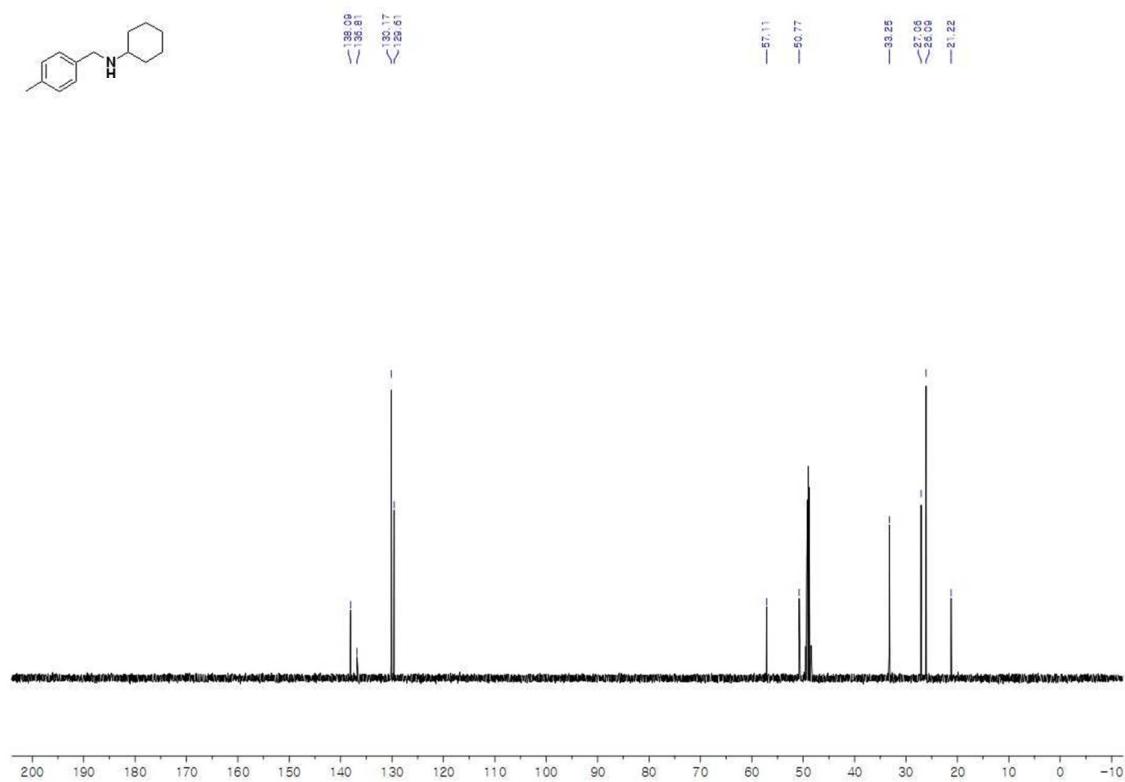
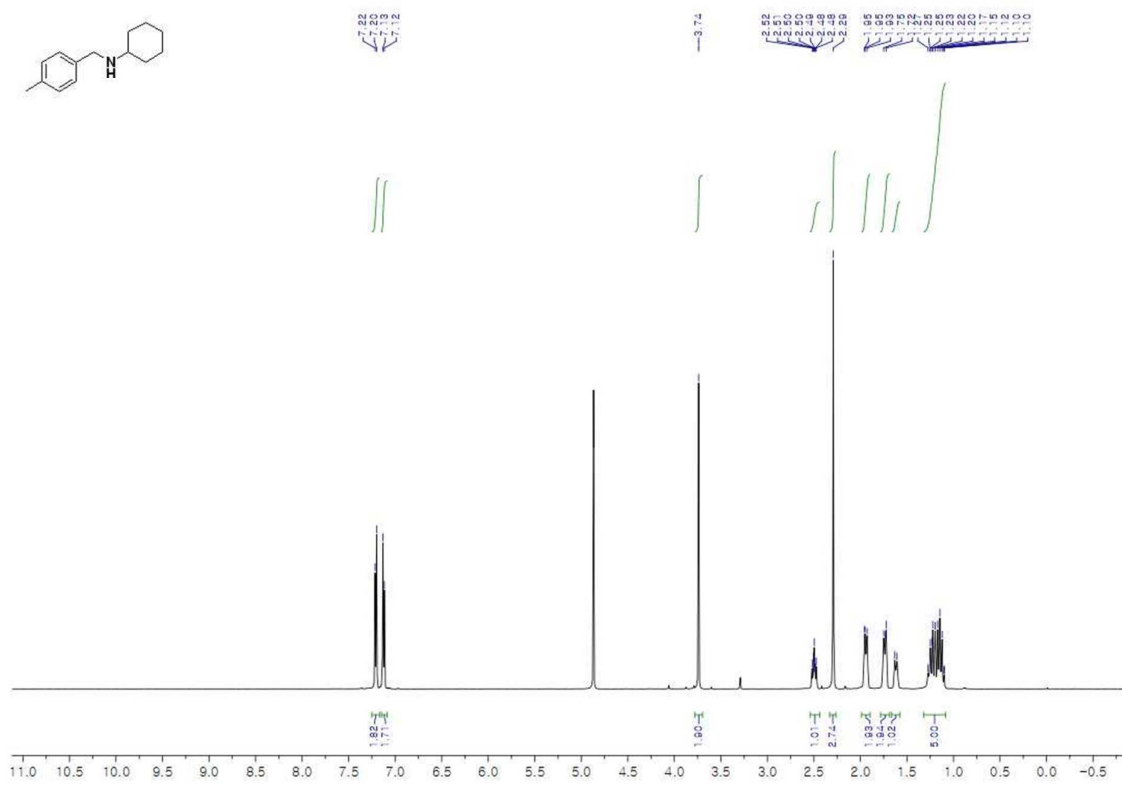
***N*-(4-methylbenzyl)-4-phenylbutan-1-amine – (Table 4, 3h)**



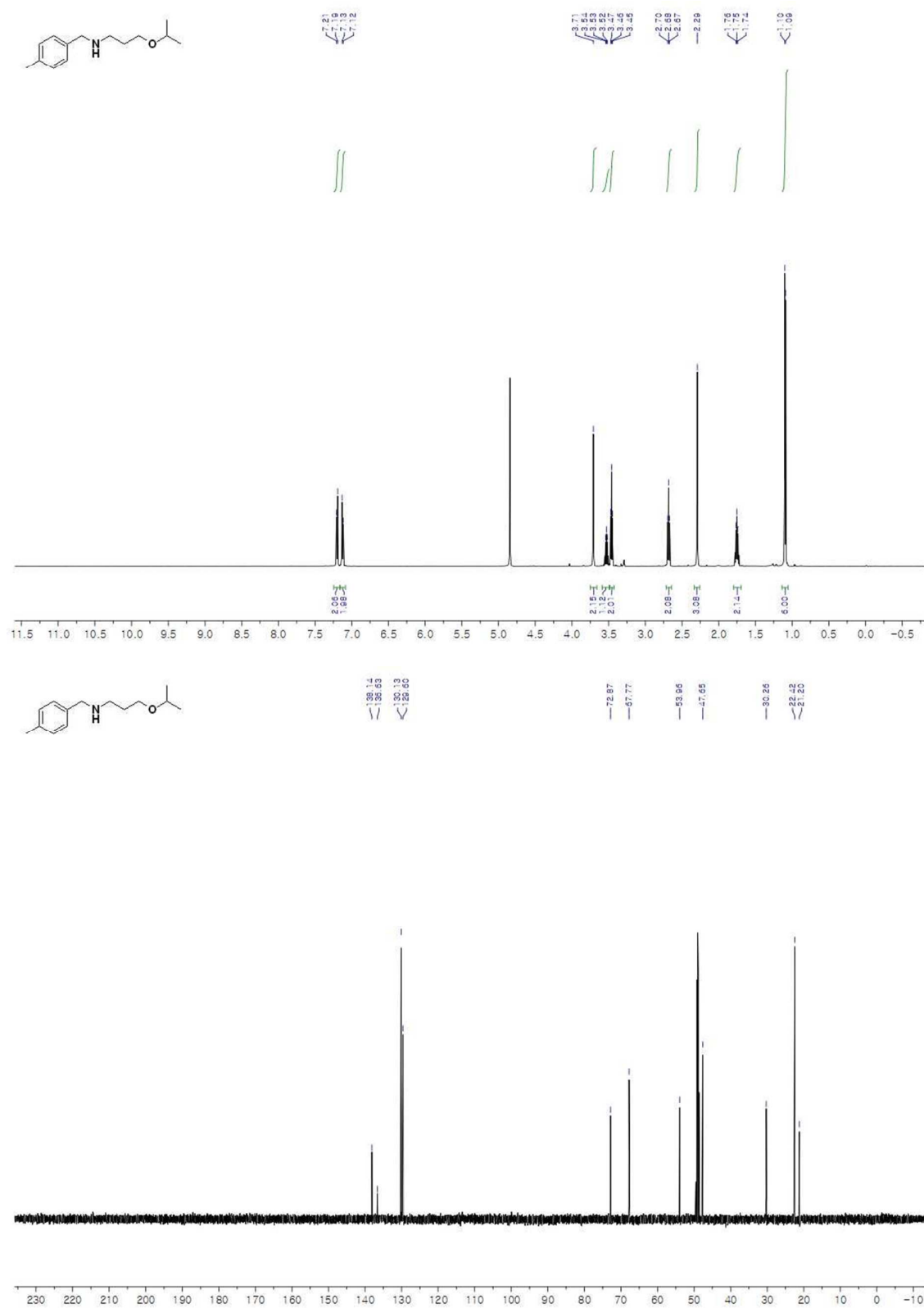
***N*-(4-methoxybenzyl)-1-(*p*-tolyl)methanamine – (Table 4, 3i)**



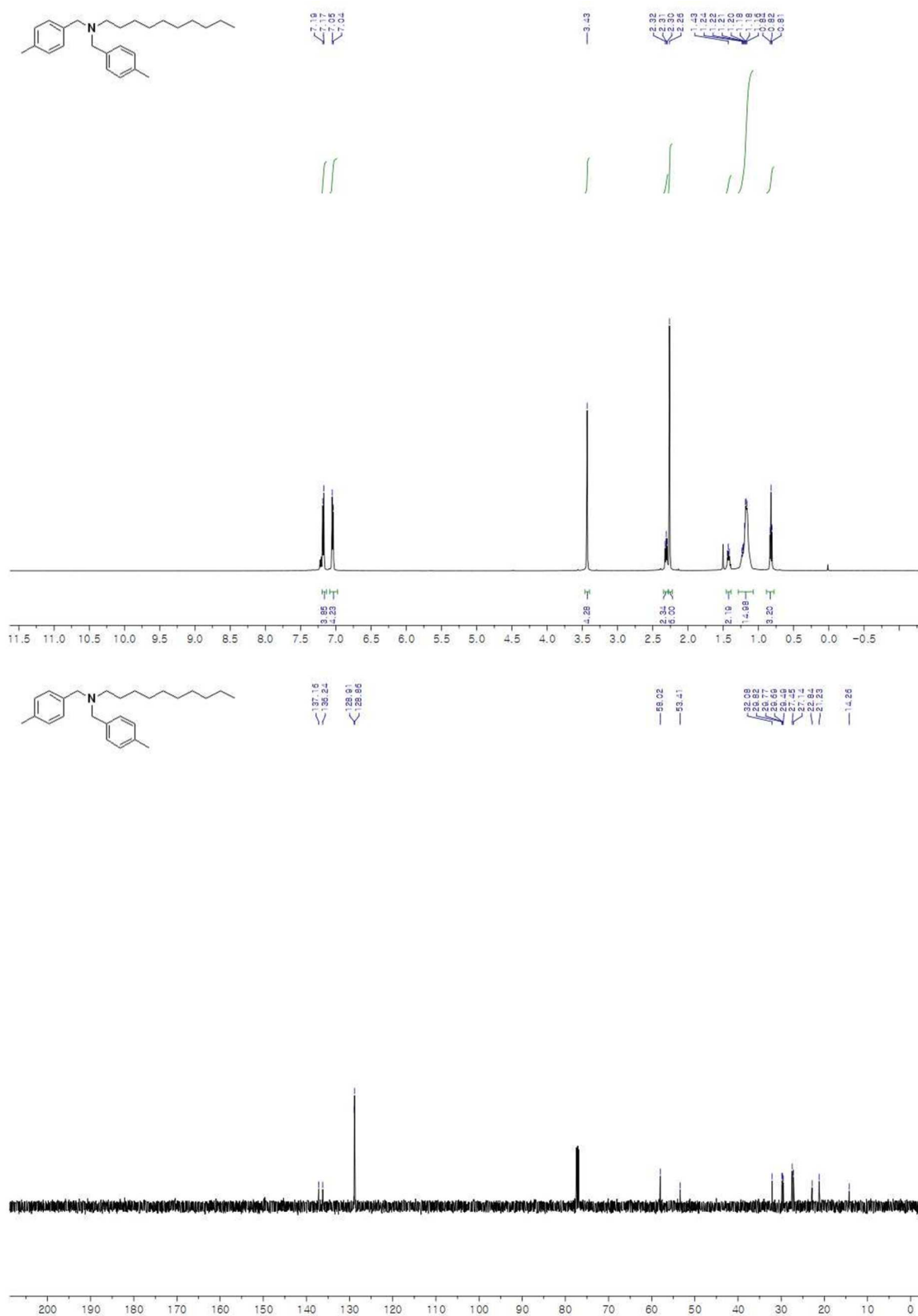
***N*-(4-methylbenzyl)cyclohexanamine – (Table 4, 3j)**



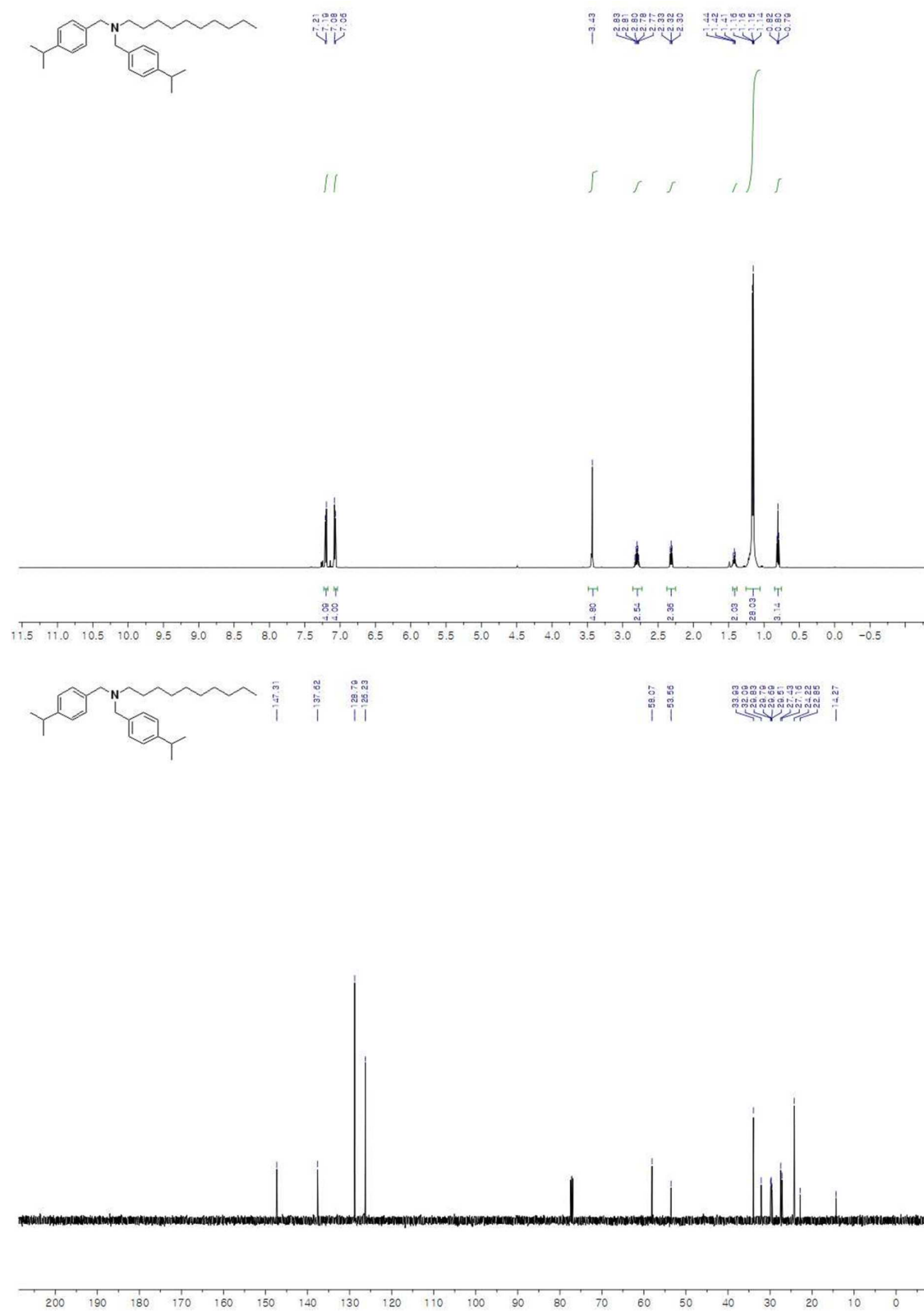
3-isopropoxy-*N*-(4-methylbenzyl)propan-1-amine – (Table 4, 3k)



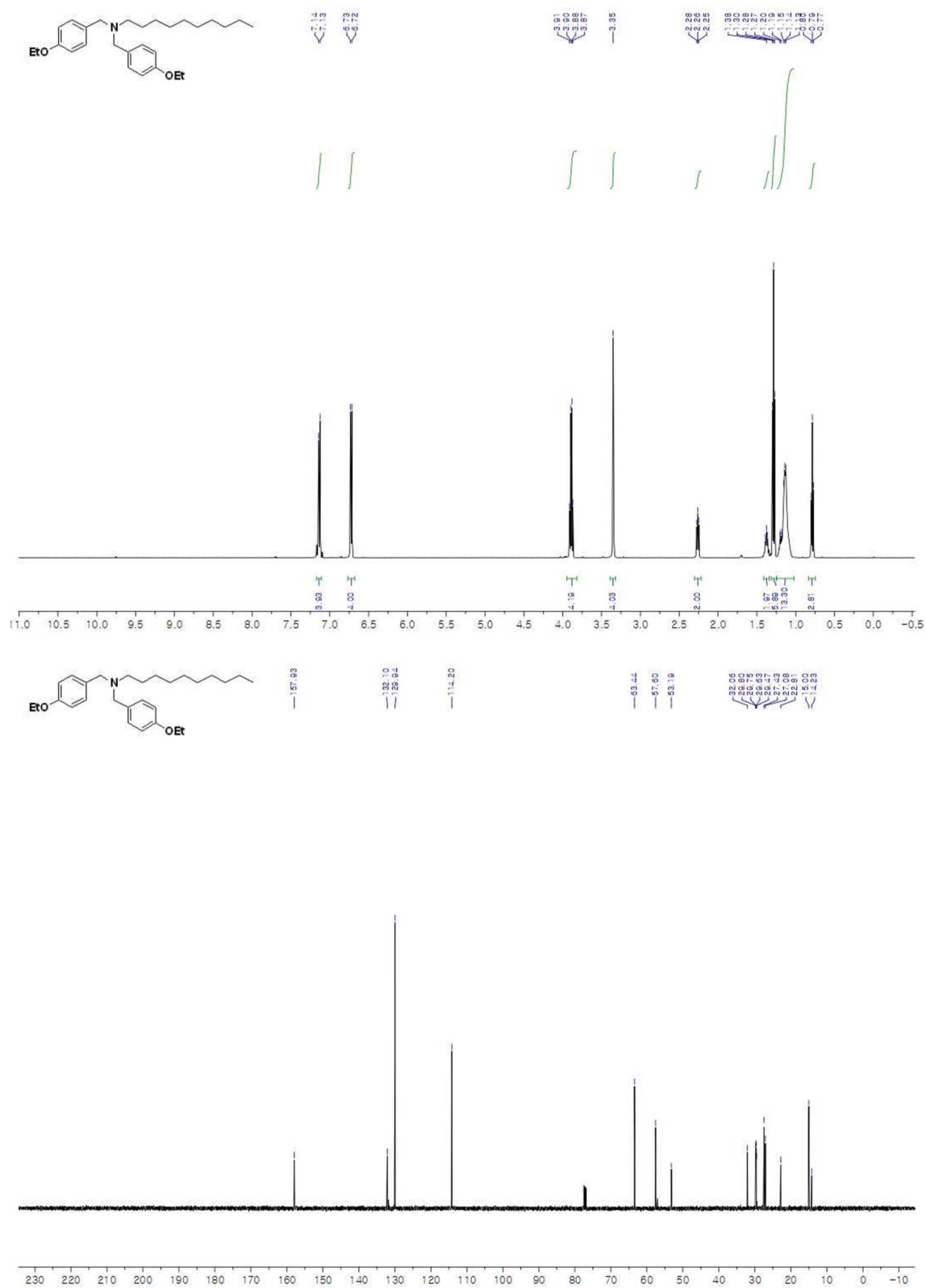
***N,N*-bis(4-methylbenzyl)decan-1-amine – (Table 4, 3aa)**



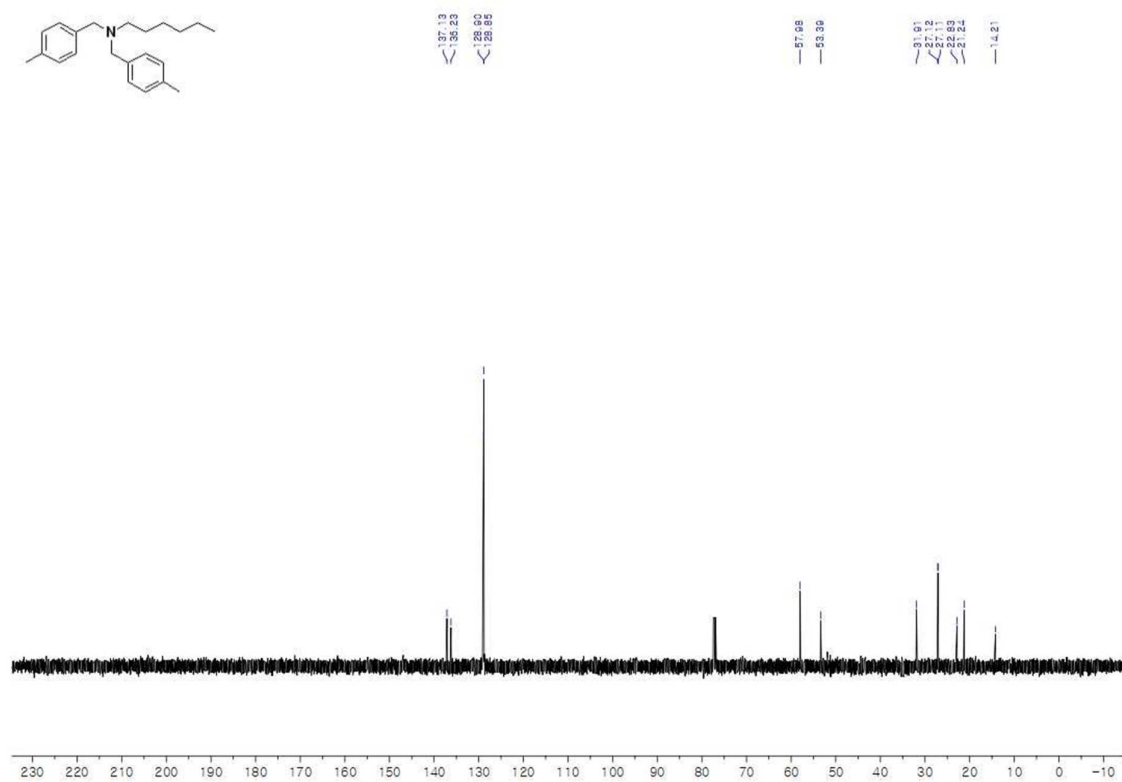
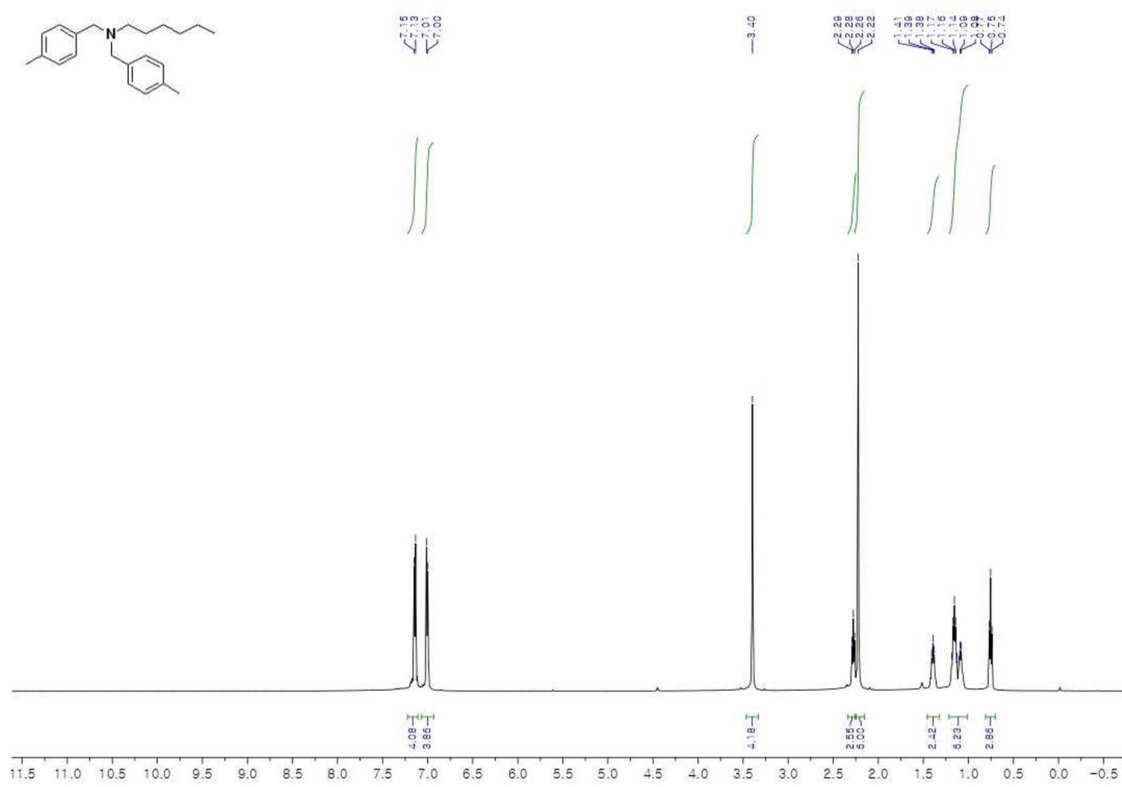
***N,N*-bis(4-isopropylbenzyl)decan-1-amine – (Table 4, 3bb)**



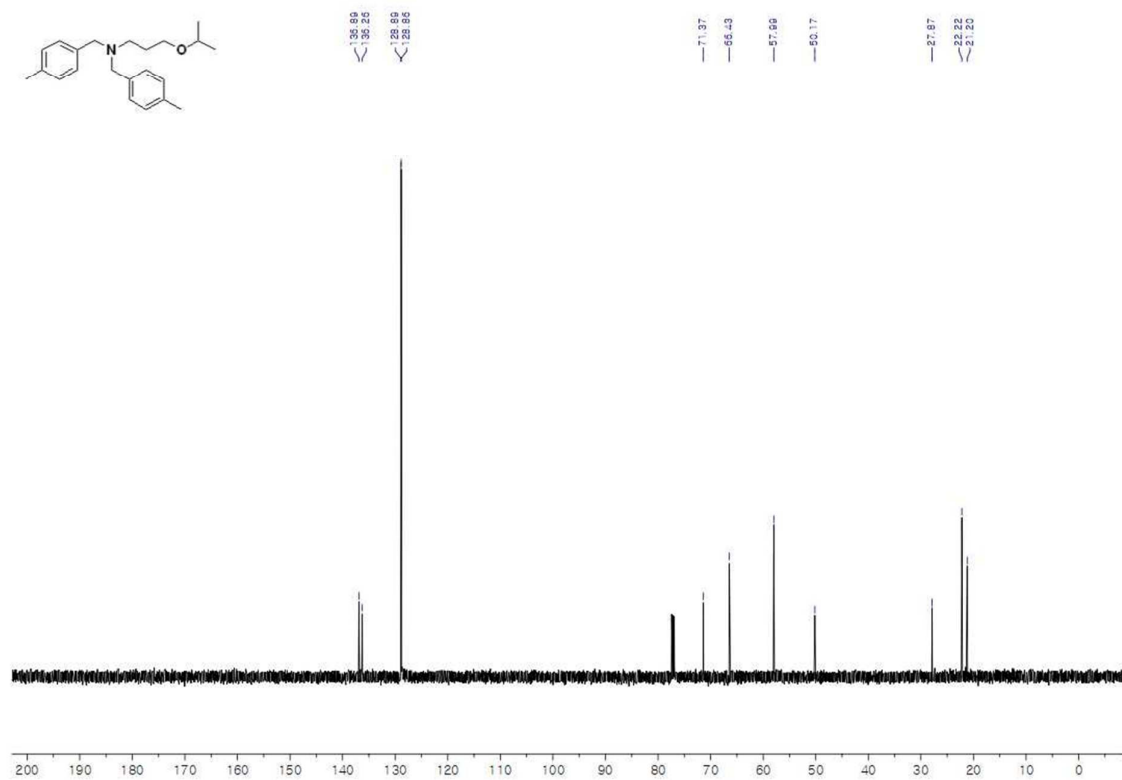
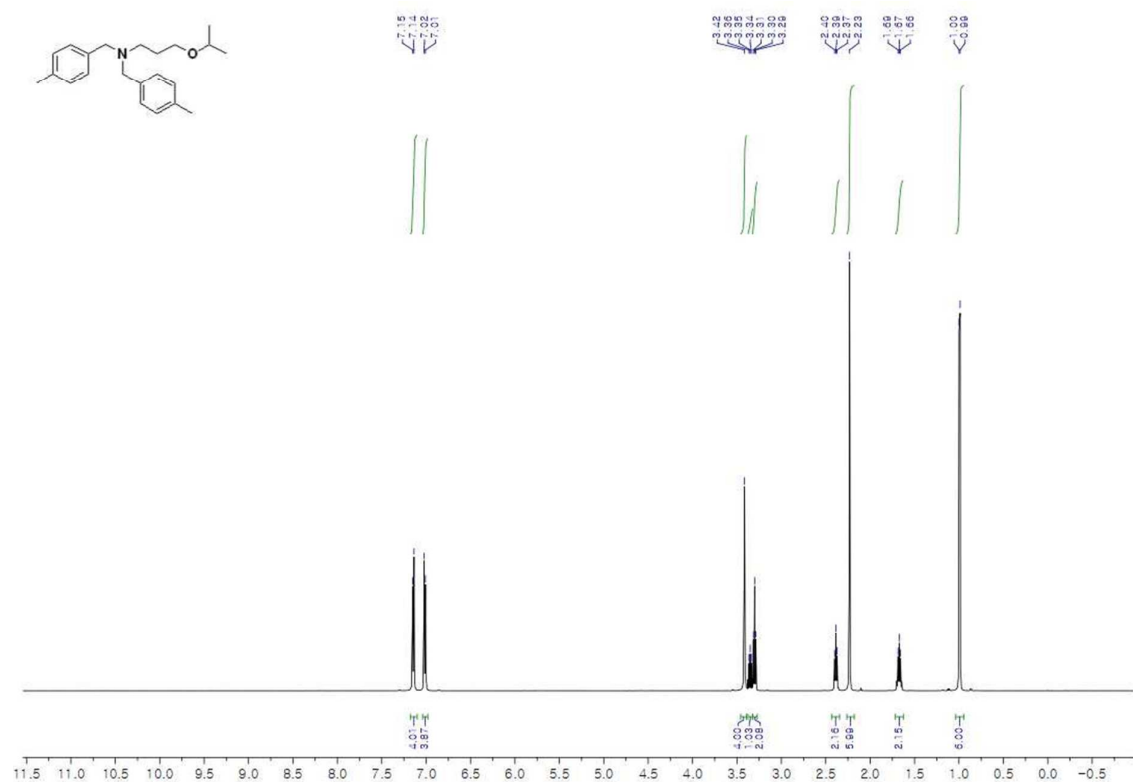
***N,N*-bis(4-ethoxybenzyl)decan-1-amine – (Table 4, 3cc)**



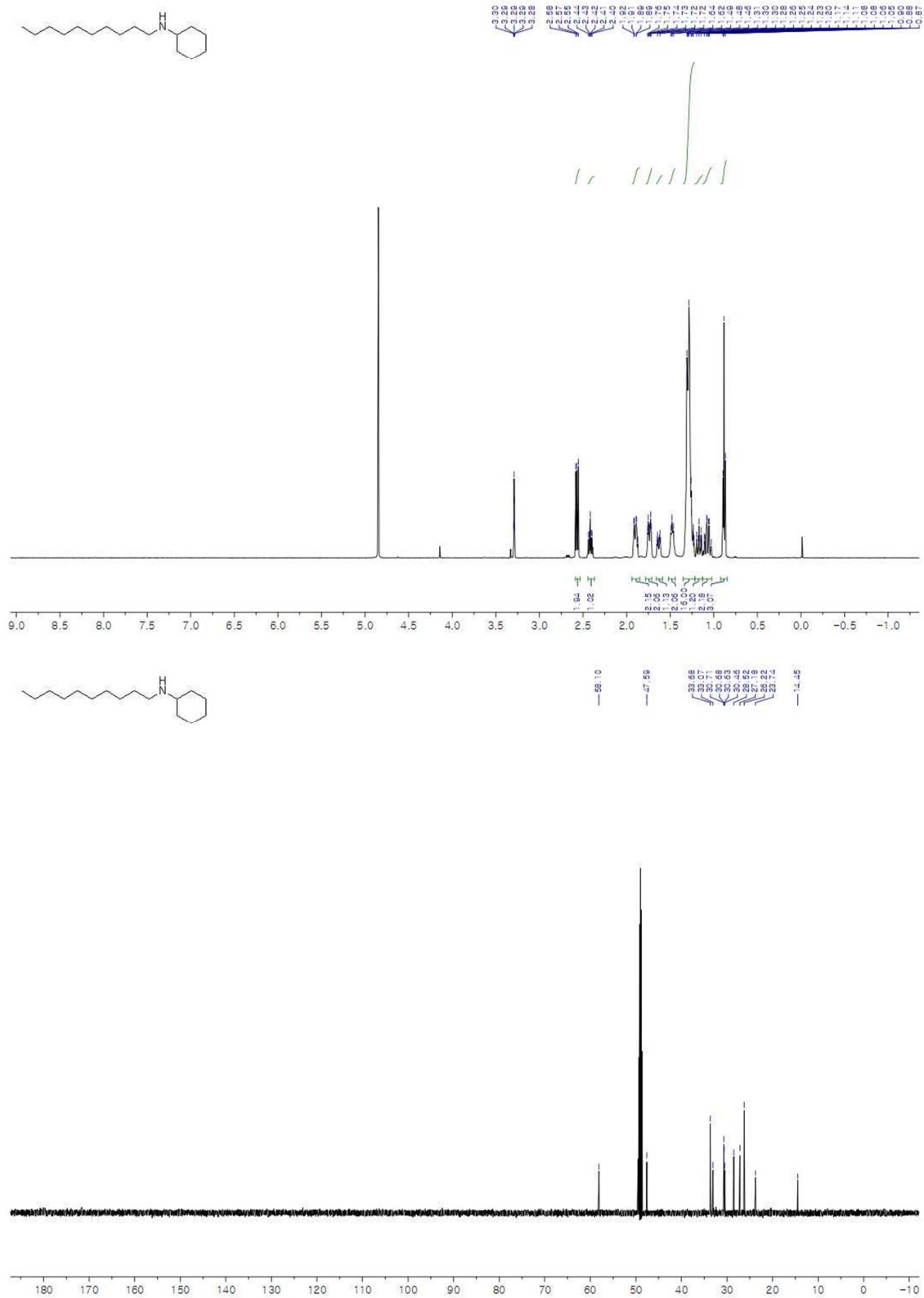
***N,N*-bis(4-methylbenzyl)hexan-1-amine – (Table 4, 3dd)**



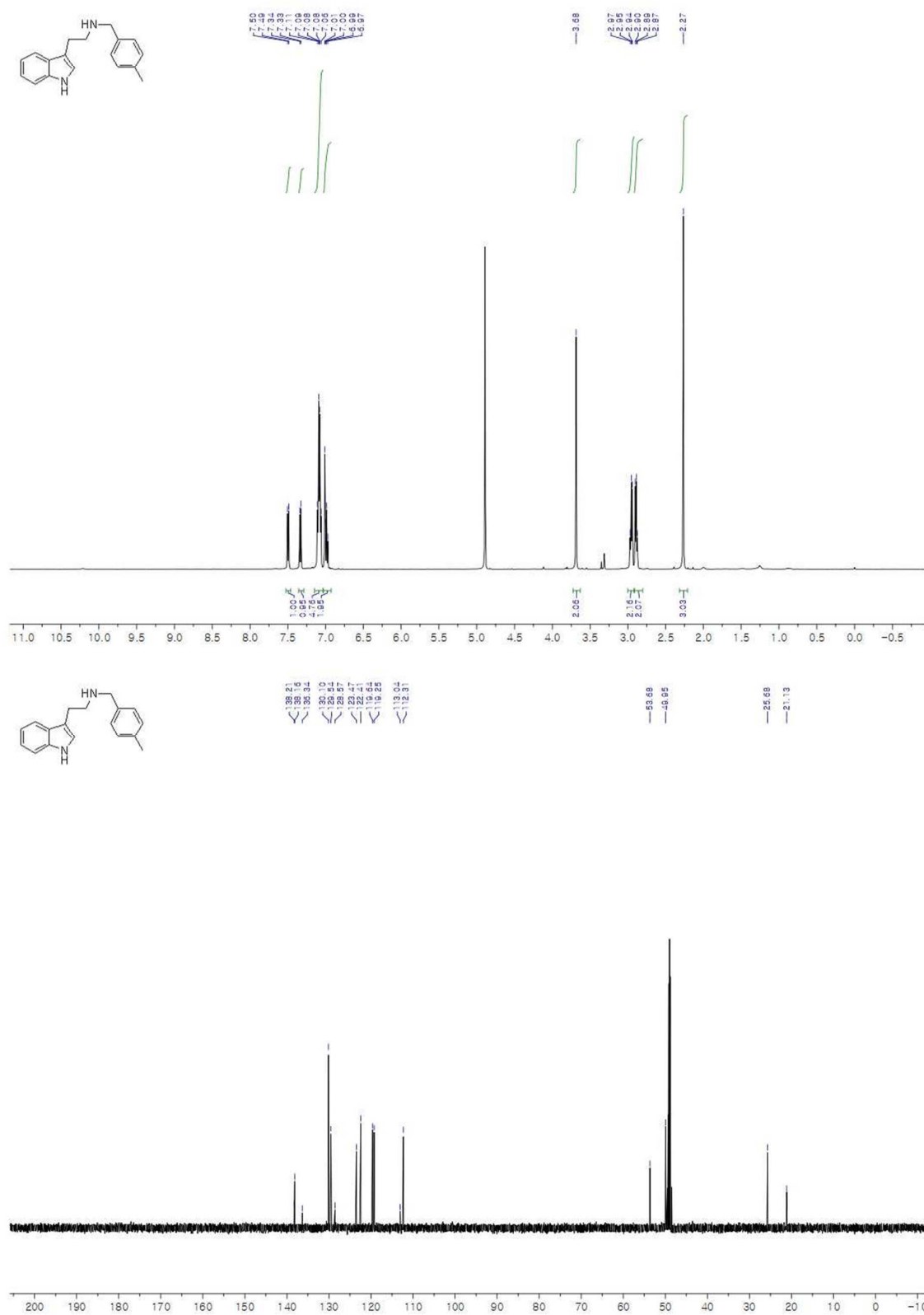
3-isopropoxy-*N,N*-bis(4-methylbenzyl)propan-1-amine – (Table 4, 3ee)



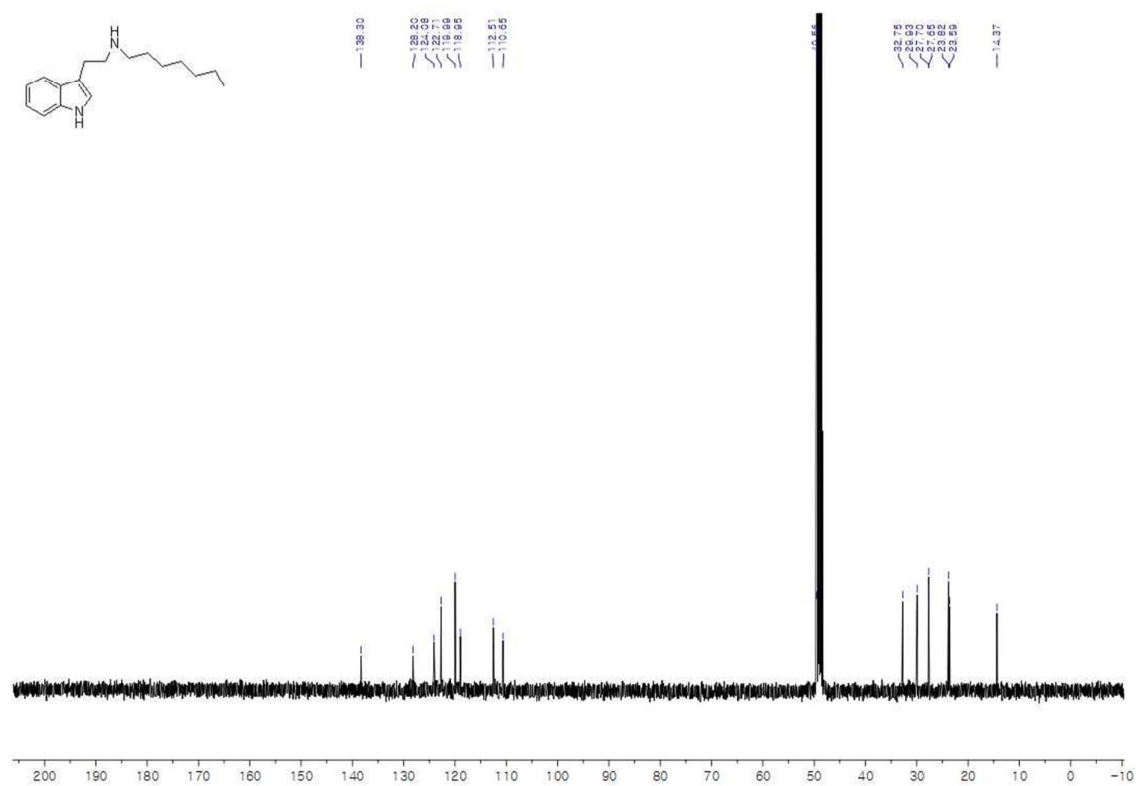
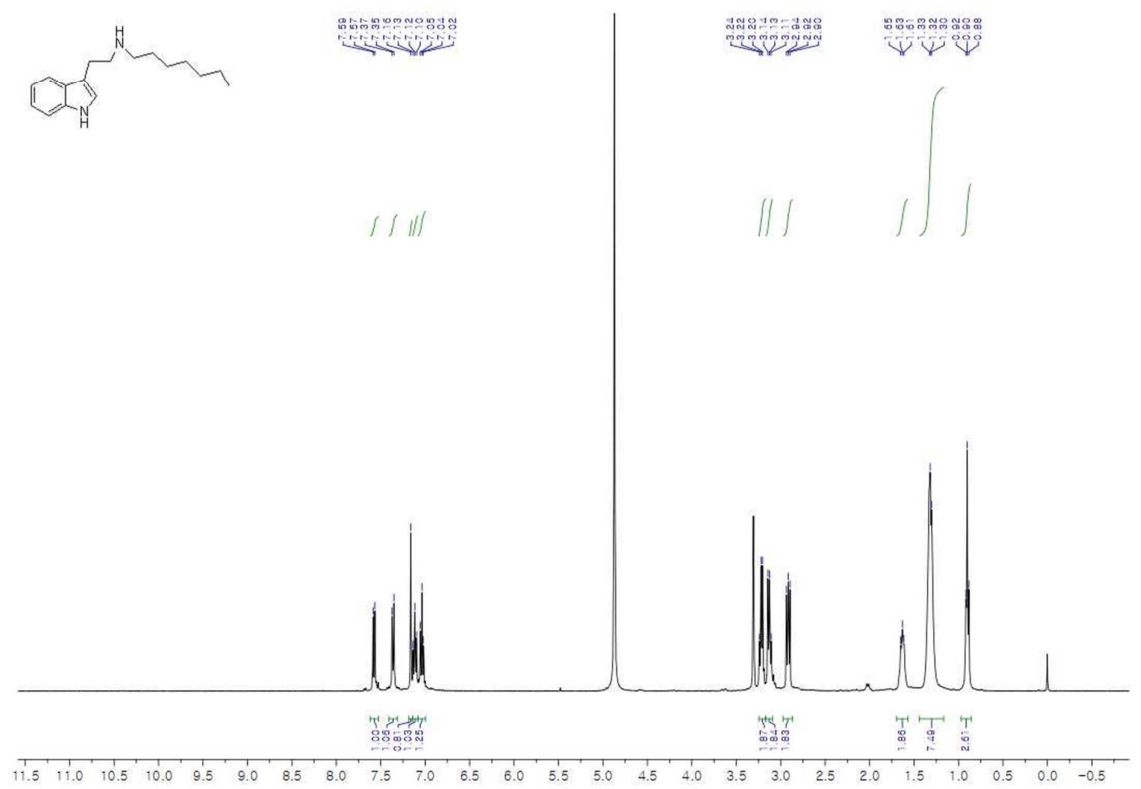
***N*-decylcyclohexanamine – (Table 4, 3l)**



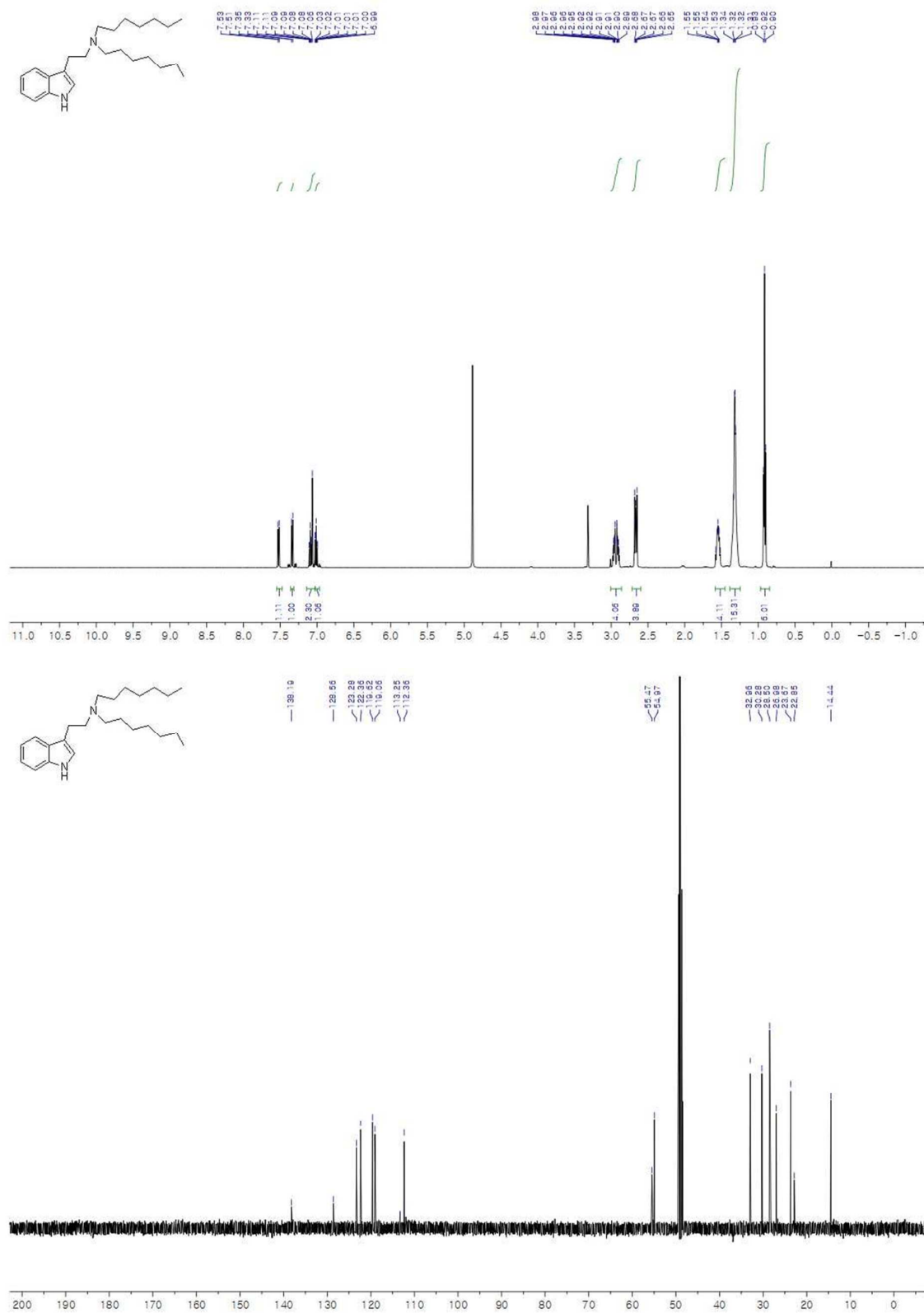
2-(1*H*-indol-3-yl)-*N*-(4-methylbenzyl)ethan-1-amine – (Scheme 1, 4a)



***N*-(2-(1*H*-indol-3-yl)ethyl)heptan-1-amine – (Scheme 1, 4b)**



***N*-(2-(1*H*-indol-3-yl)ethyl)-*N*-heptylheptan-1-amine – (Scheme 1, 4c)**



Chemical structure of N-cyclohexylbenzylamine is shown above the spectra.

¹H NMR spectrum (400 MHz, CDCl₃):

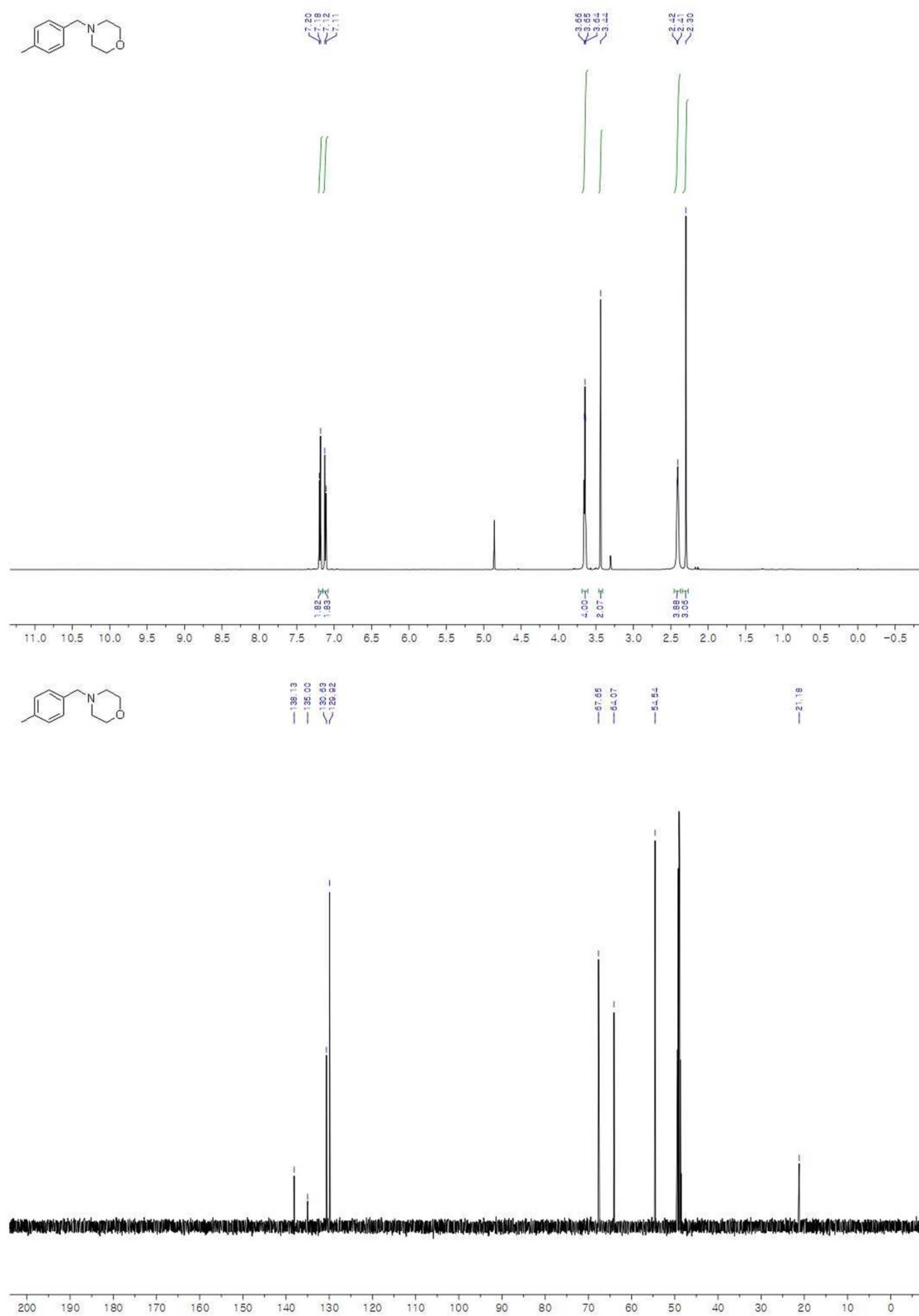
Chemical shift (ppm): 7.25 (d, 2H), 7.15 (d, 2H), 3.25 (t, 2H), 3.15 (t, 2H), 1.65 (m, 4H), 1.55 (m, 4H), 1.45 (m, 4H), 1.35 (m, 4H), 1.25 (m, 4H), 1.15 (m, 4H), 1.05 (m, 4H), 0.95 (m, 4H), 0.85 (m, 4H), 0.75 (m, 4H), 0.65 (m, 4H), 0.55 (m, 4H), 0.45 (m, 4H), 0.35 (m, 4H), 0.25 (m, 4H), 0.15 (m, 4H), 0.05 (m, 4H).

¹³C NMR spectrum (100 MHz, CDCl₃):

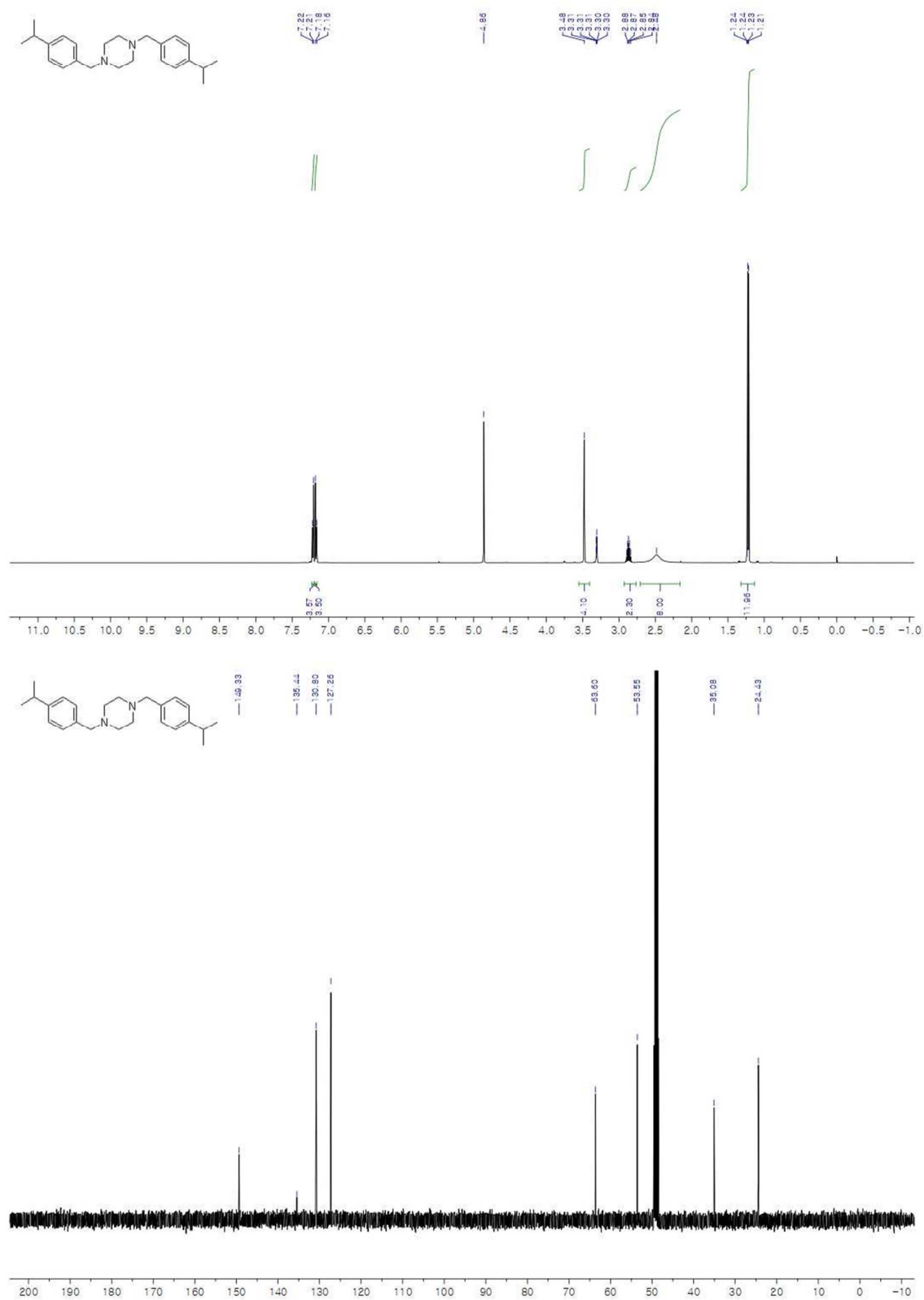
Chemical shift (ppm): 145.50, 132.34, 116.60, 113.22, 51.76, 33.69, 32.65, 31.61, 30.61, 29.61, 28.61, 27.61, 26.61, 25.61, 24.61, 23.61, 22.61, 21.61, 20.61, 19.61, 18.61, 17.61, 16.61, 15.61, 14.61, 13.61, 12.61, 11.61, 10.61, 9.61, 8.61, 7.61, 6.61, 5.61, 4.61, 3.61, 2.61, 1.61, 0.61.

[illegible]

4-(4-methylbenzyl)morpholine – (Scheme 2, 5a)



1,4-bis(4-isopropylbenzyl)piperazine – (Scheme 2, 5c)



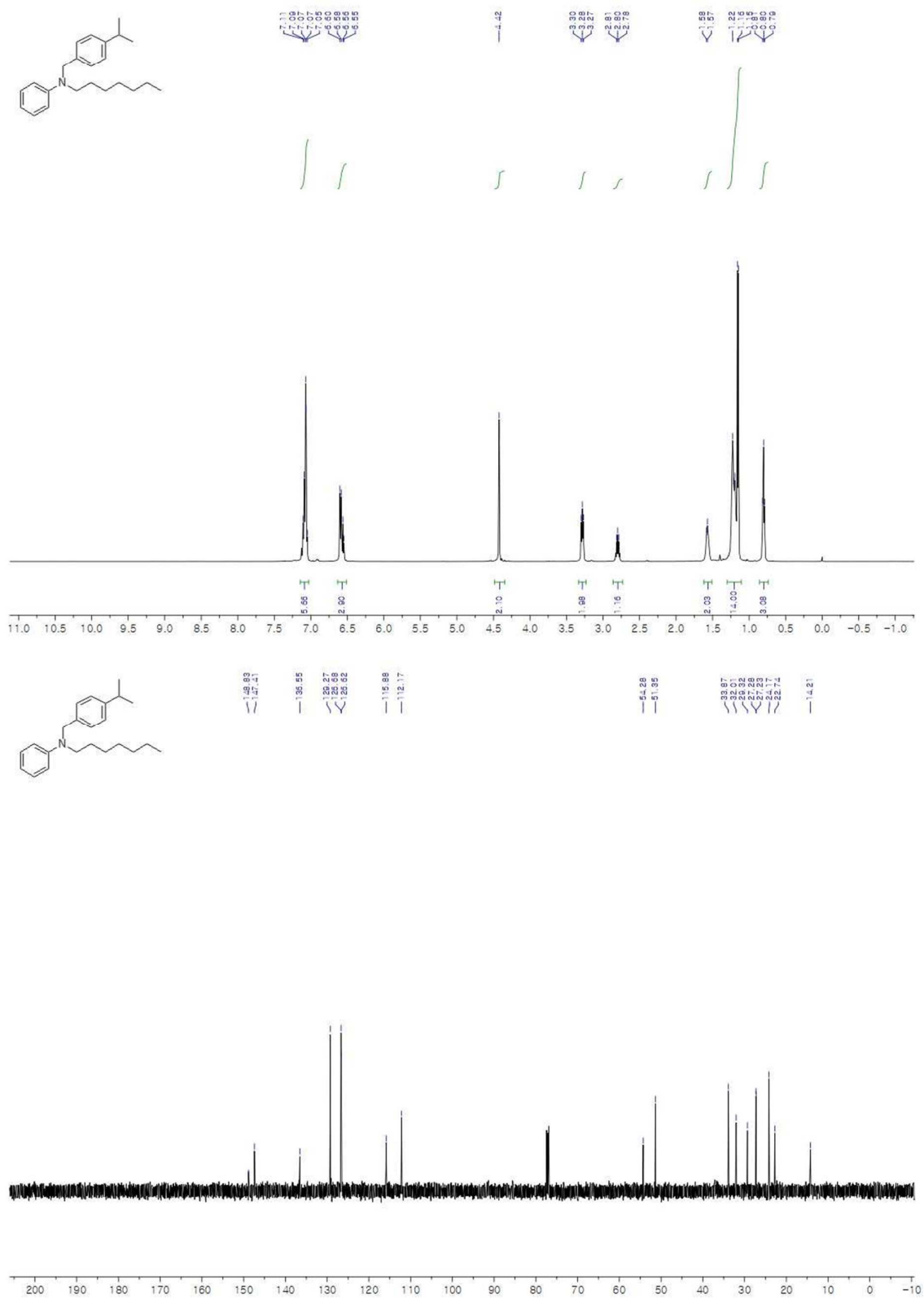
Chemical structure: CC(NCc1ccccc1)c2ccccc2

¹H NMR spectrum (CDCl₃) data:

Chemical Shift (ppm)	Multiplicity	Integration
7.2-7.4	m	10.00
4.8	s	2.00
3.4-3.6	m	4.13
1.4	d	3.28

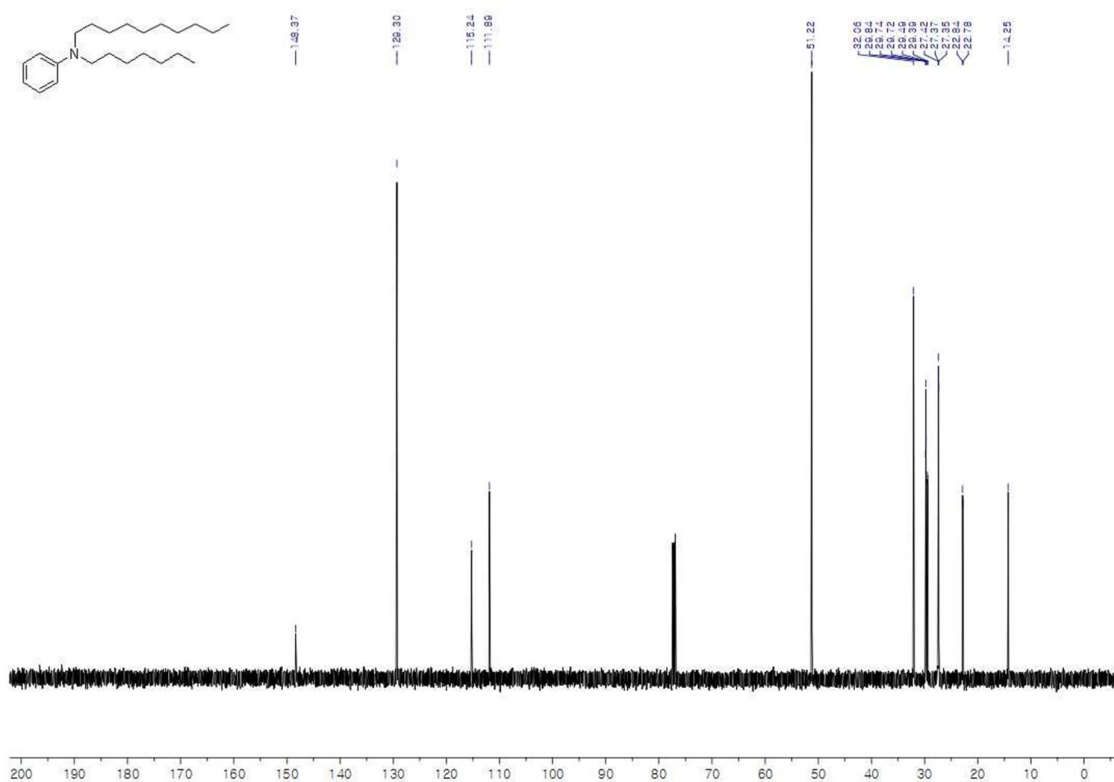
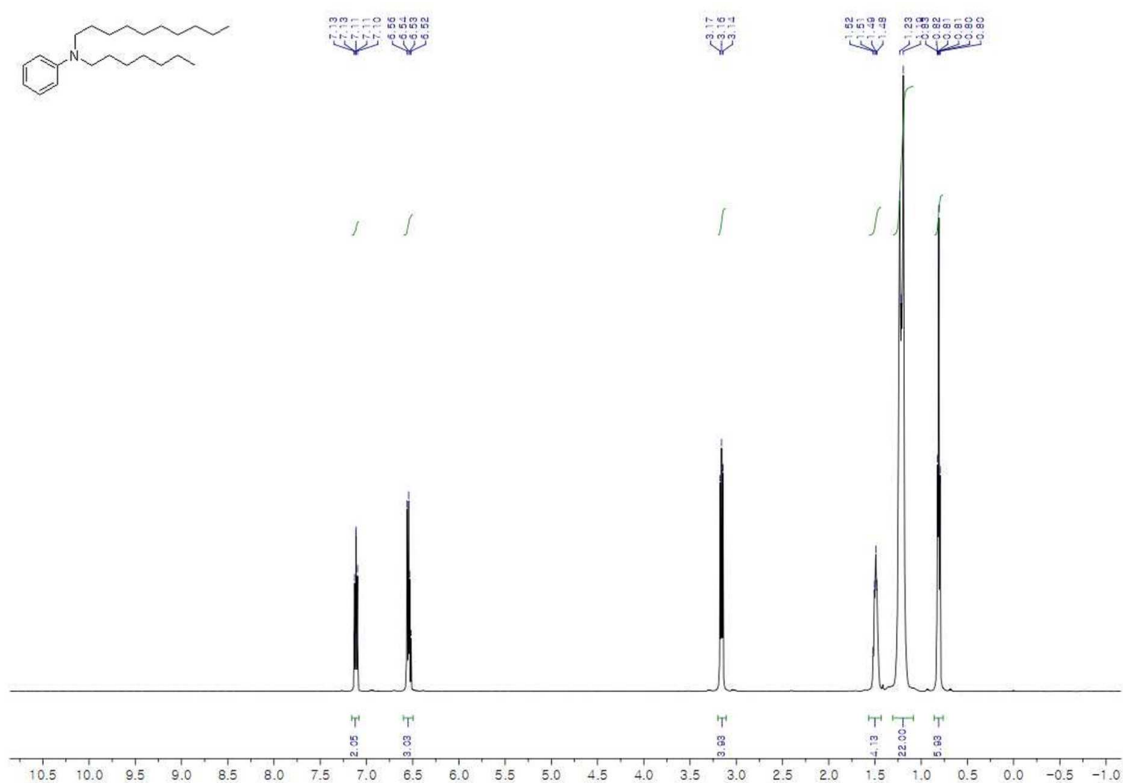


***N*-heptyl-*N*-(4-isopropylbenzyl)aniline – (eq 5, 6a)**

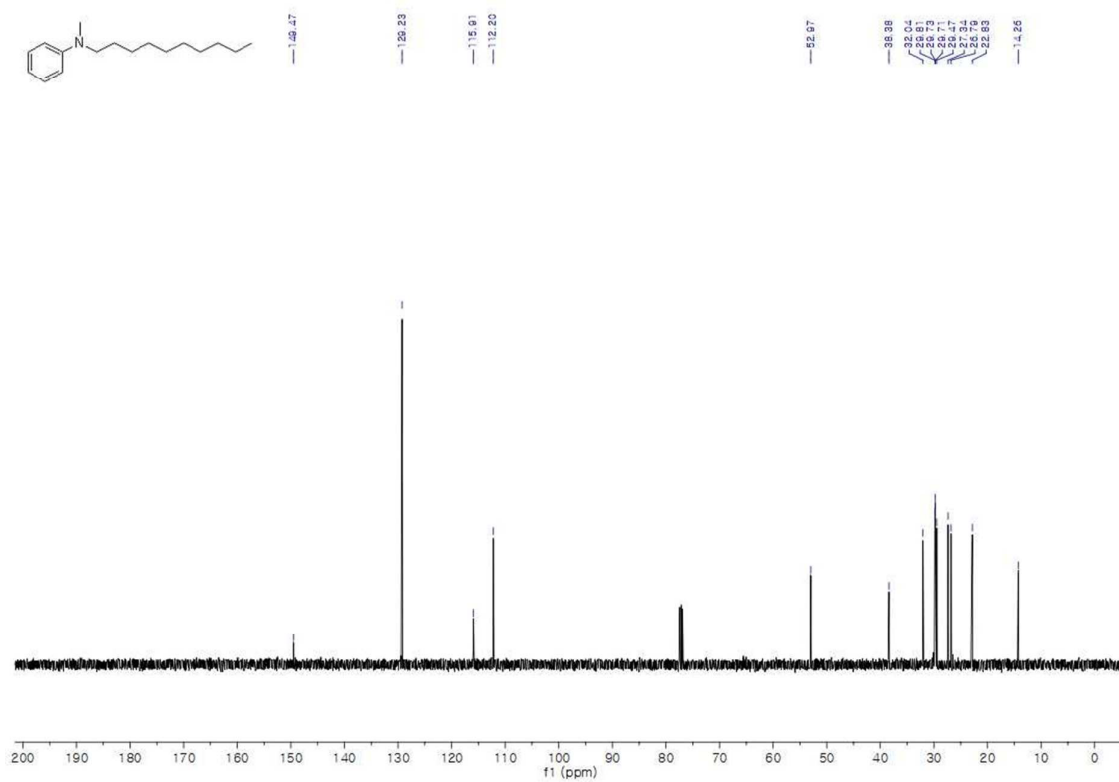
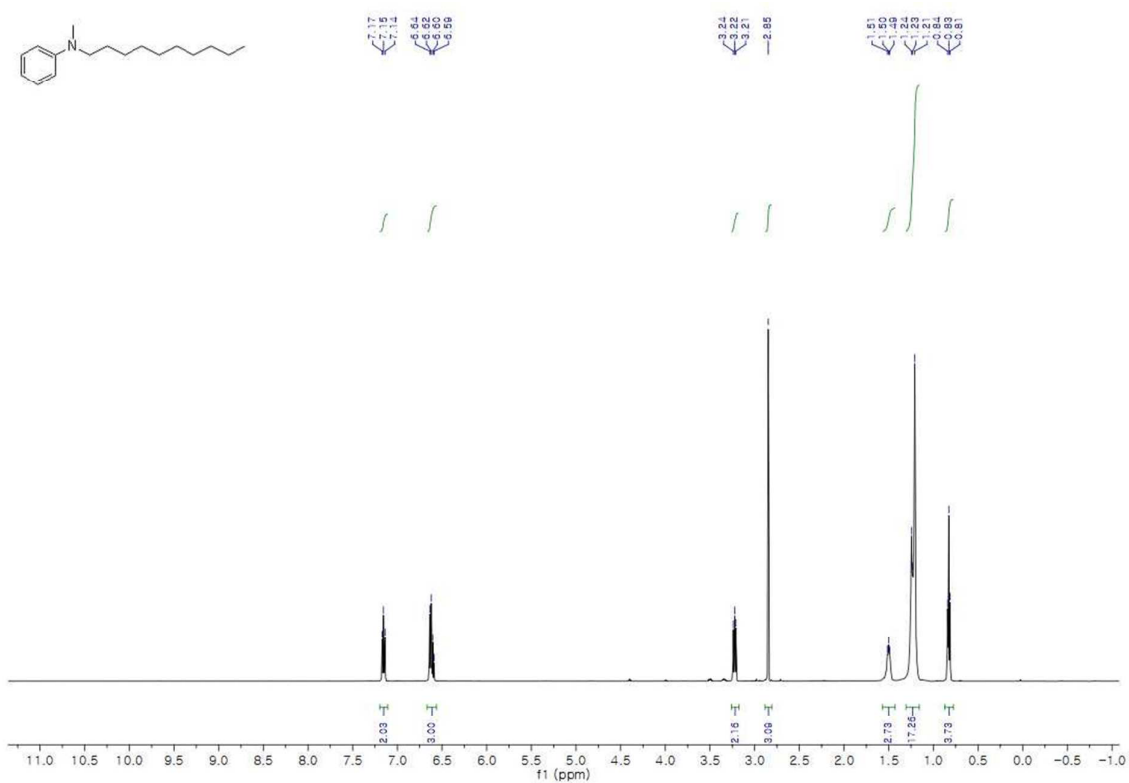


[illegible]

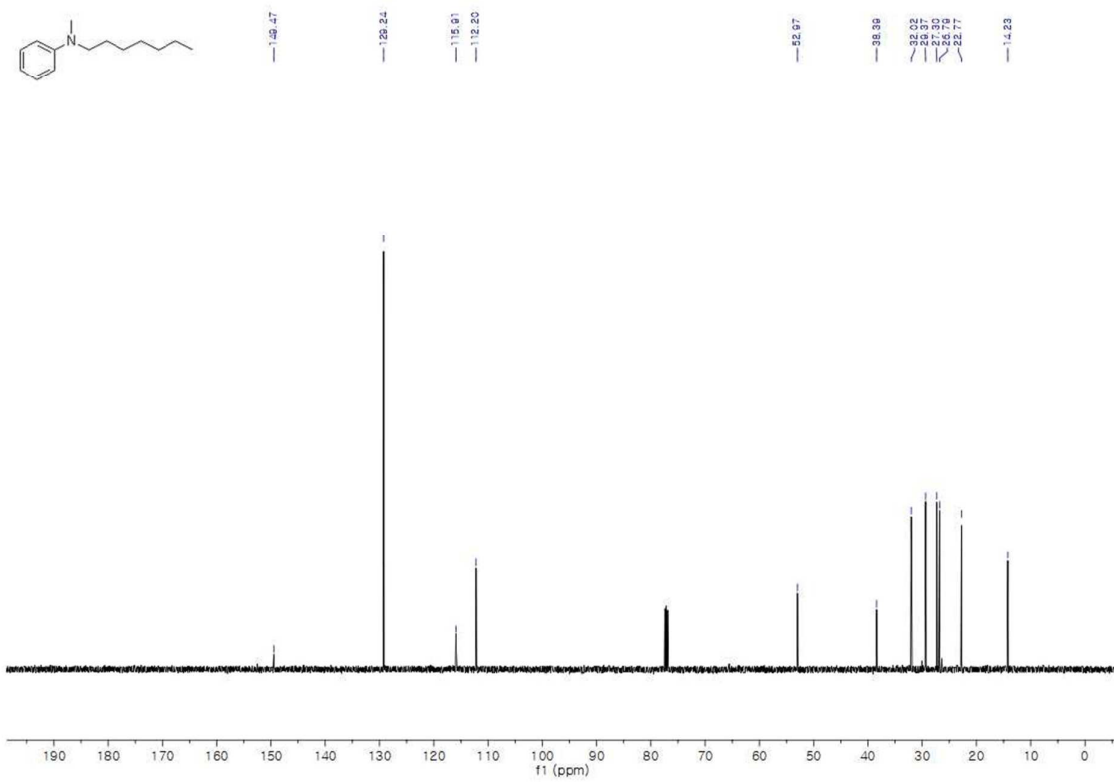
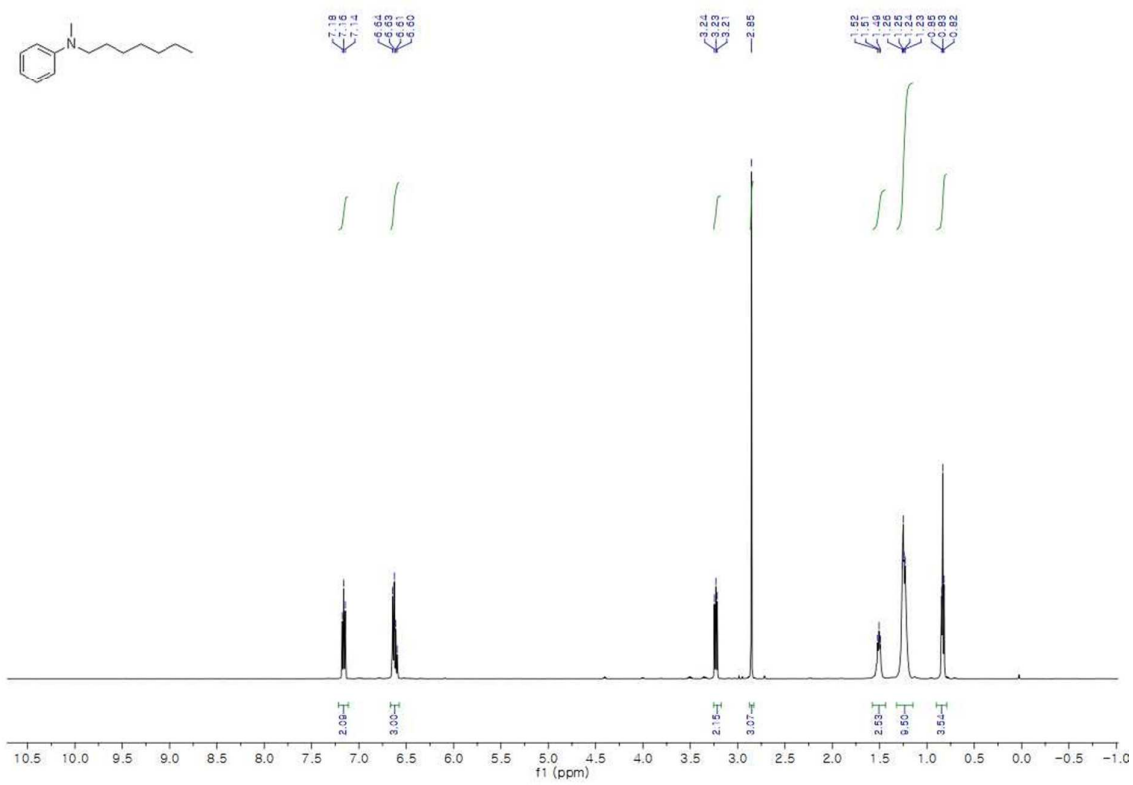
***N*-decyl-*N*-heptylaniline – (eq 5, 6c)**



***N*-decyl-*N*-methylaniline – (eq 5, 6d)**

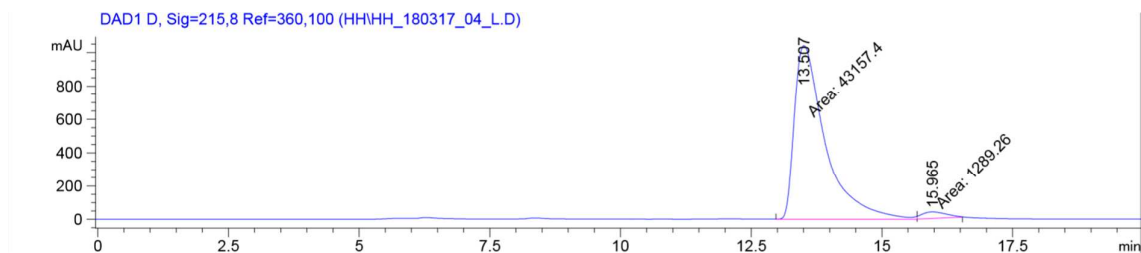
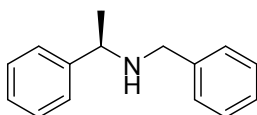


***N*-heptyl-*N*-methylaniline – (eq 5, 6e)**



4. HPLC Chromatogram

D-form

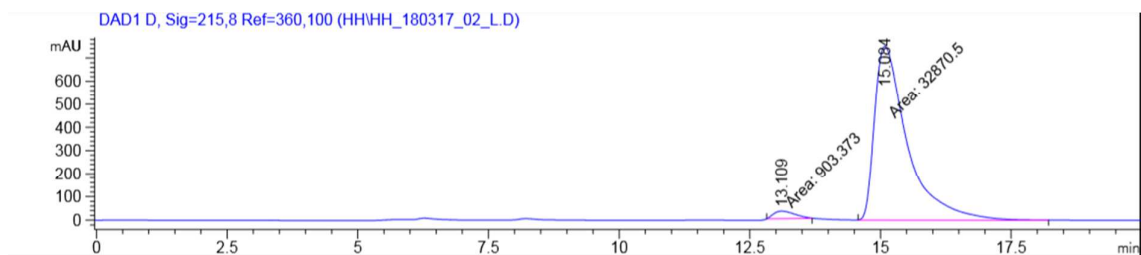
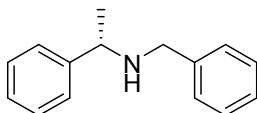


Signal 4: DAD1 D, Sig=215,8 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	13.507	MM	0.6900	4.31574e4	1042.52161	97.0993
2	15.965	MM	0.5432	1289.25708	39.55890	2.9007

Totals : 4.44466e4 1082.08051

L-form



Signal 4: DAD1 D, Sig=215,8 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	13.109	MM	0.4686	903.37305	32.13210	2.6748
2	15.084	MM	0.7306	3.28705e4	749.89319	97.3252

Totals : 3.37739e4 782.02529