Supporting Information for:

Palladium-Catalyzed Direct C–H Silylation and Germanylation of Benzamides and Carboxamides

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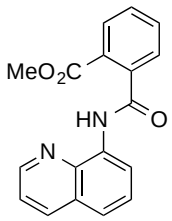
General Information. All reactions using oxygen- and moisture-sensitive materials were conducted by Schlenk techniques under an argon atmosphere or in a dry box filled with argon. Flash column chromatography was performed using Kanto Chemical silica gel (spherical, 40–63 μm). Thin layer chromatography (TLC) was performed on Merck Kieselgel 60 F_{254} (0.25 mm) plates. Visualization was accomplished with UV light (254 nm) and/or an alkaline $KMnO_4$ solution followed by heating.

Apparatus. NMR spectra were recorded on JEOL ECX500 (500 MHz for ^{1}H NMR and 126 MHZ for ^{13}C NMR) and JEOL ECS400 (400 MHZ for ^{1}H NMR and 100 MHz for ^{13}C NMR) spectrometers. Proton chemical shifts are reported relative for residual solvent peaks ($CDCl_3$ at δ 7.26 ppm or C_6D_6 at δ 7.15 ppm). Carbon chemical shifts are reported relative to $CDCl_3$ at δ 77.0 ppm. ^{1}H NMR data are reported as follows: chemical shift, multiplicity (s = singlet, d = doublet, t = triplet, q = quartet, br = broad, m = multiplet), coupling constants (Hz), and integration. Infrared (IR) spectra were recorded on a JASCO FT/IR 410 Fourier transform infrared spectrophotometer. High resolution mass spectra (HRMS) were obtained using JEOL JMS-T100LC AccuTOF spectrometer (for ESI+) or JEOL JMS-700 MStation (for FAB+). Microwave experiments were done using Initiator™ Exp Microwave Synthesis System (Biotage). Preparative recycling gel permeation chromatography (GPC) and preparative recycling silica gel chromatography were performed with a *JAI LC-908 chromatograph* equipped with *JAIGEL-H-P* and *2H* (chloroform as an eluent). Gas chromatography (GC) analysis was performed on a Shimadzu GCMS-QP2010 Ultra equipped with an ENV-1 column

(Kanto Chemical, 30 m x 0.25 mm, pressure = 31.7 kPa, detector = FID, 290 °C) with helium gas as a carrier.

Chemicals. Unless otherwise noted, commercially available chemicals were used without further purification or degassing. Anhydrous 1,4-dioxane was purchased from Kanto Chemical. $Pd(OAc)_2$ was purchased from Wako Pure Chemical Industries. Ag_2CO_3 was purchased from Sigma-Aldrich Corporation. Disilanes and hexamethyldigermane were purchased either from Sigma-Aldrich Corporation or Tokyo Chemical Industry (TCI). *N*-(8-Quinolinyl)benzamide (**1a**),[1] 2-methyl-*N*-(8-quinolinyl)benzamide (**1b**),[1] 3-methyl-*N*-(8-quinolinyl)benzamide (**1c**),[1] 4-methyl-*N*-(8-quinolinyl)benzamide (**1d**),[1] 3-(benzyloxy)-*N*-(8-quinolinyl)benzamide (**1e**),[2] 4-methoxy-*N*-(8-quinolinyl) benzamide (**1f**),[2] 3-((*tert*-butyldimethylsilyl)oxy)-*N*-(8-quinolinyl)benzamide (**1g**),[2] 4-fluoro-2-methyl-*N*-(8-quinolinyl)benzamide (**1h**),[2] 2-methyl-3-(8-quinolinylcarbamoyl)phenyl acetate (**1i**),[2] *N*-(8-quinolinyl)-4-(trifluoromethyl)benzamide (**1j**),[3] 3-acetyl-*N*-(8-quinolinyl)benzamide (**1l**),[2] *N*-(8-quinolinyl)-1-naphthamide (**1n**),[1] *N*-(8-quinolinyl)thiophene-2-carboxamide (**1o**),[4] *N*-(8-quinolinyl)cyclohexanecarboxamide (**1q**),[5] *N*-(8-quinolinyl)cyclopentanecarboxamide (**1r**),[5] 3-phenyl-*N*-(8-quinolinyl)propanamide (**1s**)[5] were prepared according to the respective literature procedures.

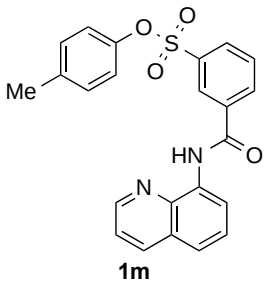
Synthesis of methyl 2-(8-quinolinylcarbamoyl)benzoate (**1k**). 8-Aminoquinoline (0.640 g, 4.40 mmol), 2-(methoxycarbonyl)benzoic acid (1.00 g, 5.60 mmol, 1.3 equiv), and 1-ethyl-3-(3-dimethylaminopropyl)carbodiimide hydrochloride (2.10 g, 11.1 mmol, 2.5 equiv) were measured into an oven-dried 100 mL round-bottomed flask. The flask was evacuated and filled with argon three times. The mixture was dissolved into CH_2Cl_2 (50 mL) and cooled to 0 ºC. Pyridine (10 mL) was added to the solution, then the solution was warmed gradually to ambient temperature. After stirring overnight (ca. 15 h), the reaction system was quenched with 1.0 M aq. HCl, and extracted with CH_2Cl_2. The combined organic layer was washed with sat. aq. $NaHCO_3$ and brine, then dried over Na_2SO_4. The clear solution was filtered and evaporated in vacuo. The obtained crude amide was purified using flash column chromatography on silica gel (eluent: hexane/ethyl acetate = 4/1) to afford the desired amide (1.30 g, 4.20 mmol, 95%) as a yellow solid, R_f = 0.38 (hexane/ethyl acetate = 4/1). ^{1}H NMR (500 MHz, $CDCl_3$) δ 10.10 (s, 1H), 8.93 (d, *J* = 7.5 Hz, 1H), 8.76 (dd, *J* = 4.0, 1.7 Hz, 1H), 8.18



1k

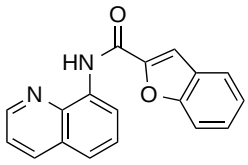
(dd, *J* = 8.0, 1.7 Hz, 1H), 7.98 (dd, *J* = 8.0, 1.2 Hz, 1H), 7.71 (dd, *J* = 7.5, 1.2 Hz, 1H), 7.68–7.54 (m, 4H), 7.45 (dd, *J* = 8.6, 4.0 Hz, 1H), 3.81 (s, 3H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 167.3, 167.0, 148.1, 138.38, 138.37, 136.2, 134.5, 132.0, 130.1, 129.9, 129.3, 127.7, 127.4, 127.3, 121.8, 121.6, 116.6, 52.5; IR (neat, ν / cm^{-1}) 3819, 3018, 1725, 1674, 1526, 1484, 1425, 1388, 1328, 1279, 1217, 771, 668; HRMS (ESI$^+$) Calcd for $C_{18}H_{14}N_2NaO_3$ $[M+Na]^+$ 329.0902, Found 329.0906.

***p*-Tolyl 3-(8-quinolinylcarbamoyl)benzenesulfonate (1m)**. Synthesized following the synthetic procedure of **1l**. Colorless solid, R_f = 0.30 (hexane/ethyl acetate = 4/1). ^{1}H NMR (500 MHz, $CDCl_3$) δ 10.76 (s, 1H), 8.90 (dd, *J* = 6.9, 2.3 Hz, 1H), 8.87 (dd, *J* = 4.3, 1.4 Hz, 1H), 8.55 (s, 1H), 8.37 (d, *J* = 8.0 Hz, 1H), 8.22 (dd, *J* = 8.3, 1.4 Hz, 1H), 8.02 (d, *J* = 8.0 Hz, 1H), 7.72 (dd, *J* = 8.0, 8.0 Hz, 1H), 7.66–7.57 (m, 2H), 7.51 (dd, *J* = 8.3, 4.3 Hz, 1H), 7.09 (d, *J* = 8.6 Hz, 2H), 6.92 (d, *J* = 8.6 Hz, 2H), 2.29 (s, 3H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 163.1, 148.5, 147.3, 138.7, 137.3, 136.48, 136.45, 134.0, 132.8, 131.4, 130.3, 129.7, 128.0, 127.4, 127.2, 122.4, 121.91, 121.89, 116.9, 20.8 (one pair of the aromatic carbons is overlapping); IR (neat, ν / cm^{-1}) 3338, 3019, 1675, 1533, 1503, 1425, 1380, 1176, 752, 669; HRMS (ESI$^+$) Calcd for $C_{23}H_{18}N_2NaO_4S$ $[M+Na]^+$ 441.0885, Found 441.0884.



1m

***N*-(8-Quinolinyl)benzofuran-2-carboxamide (1p).** Yellow solid, R_f = 0.46 (hexane/ethyl acetate = 4/1).^{1}H NMR (500 MHz, $CDCl_3$) δ 11.03 (s, 1H), 8.96 (dd, *J* = 4.1, 1.8 Hz, 1H), 8.94 (dd, *J* = 6.9, 2.3 Hz, 1H), 8.21 (dd, *J* = 8.1, 1.8 Hz, 1H), 7.73 (d, *J* = 7.9 Hz, 1H), 7.71 (d, *J* = 8.1 Hz, 1H), 7.66 (s, 1H), 7.65–7.56 (m, 2H), 7.52 (dd, *J* = 8.1, 4.1 Hz, 1H), 7.48 (ddd, *J* = 7.9, 7.9, 1.3 Hz, 1H), 7.34 (dd, *J* = 7.5, 7.5 Hz, 1H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 156.9, 155.1, 149.1, 148.5, 138.7, 136.3, 134.0, 128.0, 127.7, 127.3, 127.1, 123.8, 122.7, 122.2, 121.8, 117.0, 112.2, 111.2; IR (neat, ν / cm^{-1}) 3336, 3019, 1673, 1575, 1530, 1487, 1425, 1330, 1279, 1216, 771, 669; HRMS (ESI$^+$) Calcd for $C_{18}H_{12}N_2NaO_2$ $[M+Na]^+$ 311.0796, Found 311.0809.



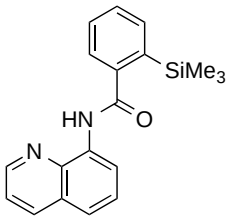
1p

A General Procedure for Palladium-Catalyzed C(sp^2)–H Silylation and Germanylation of Benzamides. Benzamide (**1**, 0.200 mmol), $Pd(OAc)_2$ (4.5 mg, 20 μmol), Ag_2CO_3 (110 mg,

0.400 mmol), and $CaSO_4$ (54.4 mg, 0.400 mmol) were measured into a 15 mL oven-dried vial. The vial was evacuated and refilled with argon three times, then taken into a dry box. 1,4-Dioxane (1.0 mL) and disilane or hexamethyldigermane (1.00 mmol) were added into the vial successively. The vial was then capped, taken out from the dry box, and heated. The temperature and reaction time are specified in Tables 1, Scheme 1, and Scheme 5. The resulting mixture was filtered through a silica gel pad, concentrated in vacuo, and purified by flash column chromatography on silica gel to give the corresponding products. The yields are listed in Table 1, Scheme 1, and Scheme 5.

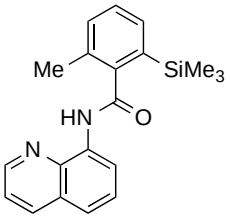
Spectroscopic Data for Silylated Benzamides

***N*-(8-Quinolinyl)-2-(trimethylsilyl)benzamide (3aa).** Colorless solid, R_f = 0.60 (hexane/ethyl acetate = 4/1). ^{1}H NMR (500 MHz, $CDCl_3$) δ 10.36 (s, 1H), 8.98 (d, *J* = 8.0 Hz, 1H), 8.79 (dd, *J* = 4.1, 1.7 Hz, 1H), 8.17 (dd, *J* = 8.6, 1.7 Hz, 1H), 7.82–7.75 (m, 2H), 7.62 (dd, *J* = 7.7, 7.7 Hz, 1H), 7.55 (dd, *J* = 8.3, 1.4 Hz, 1H), 7.54–7.51 (m, 2H), 7.45 (dd, *J* = 8.0, 4.1 Hz, 1H), 0.41 (s, 9H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 169.2, 148.2, 142.7, 140.0, 138.5, 136.3, 135.5, 134.7, 129.7, 128.9, 127.9, 127.4, 126.3, 121.7, 121.6, 116.4, 0.2; IR (neat, ν / cm^{-1}) 3346, 3018, 2975, 2400, 1672, 1524, 1487, 1424, 1386, 1327, 1216, 843, 769, 669; HRMS (ESI^+) Calcd for $C_{19}H_{20}N_2NaOSi$ $[M+Na]^+$ 343.1243, Found 343.1242.



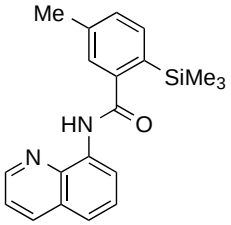
3aa

2-Methyl-*N*-(8-quinolinyl)-6-(trimethylsilyl)benzamide (3ba). Colorless solid, R_f = 0.52 (hexane/ethyl acetate = 4/1). ^{1}H NMR (500 MHz, $CDCl_3$) δ 9.96 (s, 1H), 8.99 (d, *J* = 7.5 Hz, 1H), 8.73 (d, *J* = 2.9 Hz, 1H), 8.18 (d, *J* = 6.9 Hz, 1H), 7.62 (dd, *J* = 7.7, 7.7 Hz, 1H), 7.57 (d, *J* = 7.5 Hz, 1H), 7.49 (d, *J* = 8.4, 4.3 Hz, 1H), 7.44 (dd, *J* = 8.4, 4.3 Hz, 1H), 7.35 (dd, *J* = 7.5, 7.5 Hz, 1H), 7.29 (d, *J* = 7.5 Hz, 1H), 2.36 (s, 3H), 0.28 (s, 9H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 169.9, 148.2, 143.3, 138.5, 137.3, 136.3, 134.5, 134.0, 132.2, 131.1, 128.5, 128.0, 127.5, 121.9, 121.7, 116.8, 19.6, -0.1; IR (neat, ν / cm^{-1}) 3343, 3019, 2975, 2898, 1672, 1523, 1484, 1425, 1386, 1326, 1216, 767, 669; HRMS (ESI^+) Calcd for $C_{20}H_{22}N_2NaOSi$ $[M+Na]^+$ 357.1399, Found 357.1395.



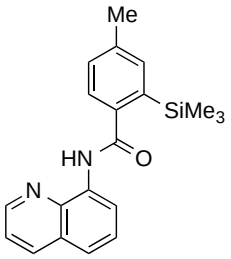
3ba

5-Methyl-*N*-(8-quinolinyl)-2-(trimethylsilyl)benzamide (3ca). Colorless solid, R_f = 0.52 (hexane/ethyl acetate = 4/1). ^{1}H NMR (500 MHz, $CDCl_3$) δ 10.27 (s, 1H), 8.95 (d, *J* = 7.2 Hz, 1H), 8.80 (d, *J* = 4.4 Hz, 1H), 8.18 (d, *J* = 8.1 Hz, 1H), 7.66–7.51 (m, 4H), 7.46 (dd, *J* = 8.1, 4.4 Hz, 1H), 7.33 (d, *J* = 7.2 Hz, 1H), 2.45 (s, 3H), 0.35 (s, 9H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 169.5, 148.2, 143.0, 139.0, 138.6, 136.3, 136.2, 135.5, 134.8, 130.4, 128.0, 127.5, 127.1, 121.6, 116.5, 21.3, 0.17 (one pair of the aromatic carbons is overlapping); IR (neat, ν / cm^{-1}) 3349, 3014, 2954, 1670, 1523, 1487, 1385, 1327, 1250, 1216, 755, 667; HRMS (ESI^+) Calcd for $C_{20}H_{22}N_2NaOSi$ $[M+Na]^+$ 357.1399, Found 357.1391.



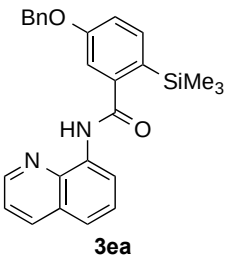
3ca

4-Methyl-*N*-(8-quinolinyl)-2-(trimethylsilyl)benzamide (3da). Colorless solid, R_f = 0.50 (hexane/ethyl acetate = 4/1). ^{1}H NMR (500 MHz, $CDCl_3$) δ 10.32 (s, 1H), 8.93 (dd, *J* = 7.7, 1.5 Hz, 1H), 8.79 (dd, *J* = 4.2, 1.5 Hz, 1H), 8.20 (dd, *J* = 8.6, 1.5 Hz, 1H), 7.70 (d, *J* = 7.7 Hz, 1H), 7.60 (dd, *J* = 7.7, 7.7 Hz, 1H), 7.55 (dd, *J* = 8.2, 1.5 Hz, 1H), 7.52 (s, 1H), 7.47 (dd, *J* = 8.2, 4.2 Hz, 1H), 7.31 (dd, *J* = 6.9, 1.5 Hz, 1H), 2.44 (s, 3H), 0.35 (s, 9H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 169.2, 148.2, 140.2, 139.9, 139.7, 138.6, 136.3, 134.9, 129.5, 128.0, 127.5, 126.5, 121.6, 121.5, 116.4, 21.6, 0.2 (one pair of the aromatic carbons is overlapping); IR (neat, ν / cm^{-1}) 3347, 3019, 2976, 1669, 1524, 1487, 1424, 1387, 1327, 1216, 1045, 771, 669; HRMS (ESI^+) Calcd for $C_{20}H_{22}N_2NaOSi$ $[M+Na]^+$ 357.1399, Found 357.1394.



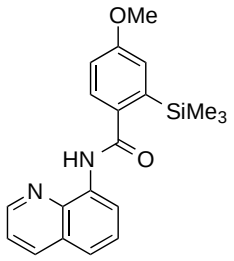
3da

5-(Benzyloxy)-*N*-(8-quinolinyl)-2-(trimethylsilyl)benzamide (3ea). Colorless oil, R_f = 0.48 (hexane/ethyl acetate = 4/1). ^{1}H NMR (500 MHz, $CDCl_3$) δ 10.26 (s, 1H), 8.94 (d, *J* = 3.7 Hz, 1H), 8.79 (d, *J* = 3.7 Hz, 1H), 8.19 (d, *J* = 9.2 Hz, 1H), 7.63 (d, *J* = 8.0 Hz, 1H), 7.60 (d, *J* = 7.2 Hz, 1H), 7.56 (d, *J* = 8.0 Hz, 1H), 7.51–7.44 (m, 3H), 7.43–7.37 (m, 3H), 7.35 (dd, *J* = 7.2, 7.2 Hz, 1H), 7.11 (dd, *J* = 8.0, 2.3 Hz, 1H), 5.16 (s, 2H), 0.33 (s, 9H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 169.0, 159.3, 148.3, 144.4, 138.6, 137.0, 136.5, 136.3, 134.7, 130.9, 128.7, 128.1, 128.0, 127.6, 127.4, 121.7, 121.6, 116.6, 115.7, 113.6, 70.1, 0.3; IR (neat, ν / cm^{-1}) 3344, 3017, 2954, 1733, 1671, 1593, 1523, 1488, 1424, 1385, 1327, 1216, 1085, 755, 668; HRMS (ESI^+) Calcd for $C_{26}H_{26}N_2NaO_2Si$ $[M+Na]^+$ 449.1661, Found 449.1640.



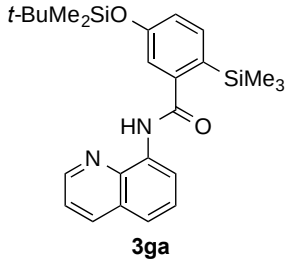
3ea

4-Methoxy-*N*-(8-quinolinyl)-2-(trimethylsilyl)benzamide (3fa). Colorless solid, R_f = 0.61 (hexane/ethyl acetate = 4/1). ^{1}H NMR (400 MHz, $CDCl_3$) δ 10.32 (s, 1H), 8.91 (dd, *J* = 7.8, 1.6 Hz, 1H), 8.80 (dd, *J* = 4.1, 1.6 Hz, 1H), 8.18 (dd, *J* = 8.5, 1.6 Hz, 1H), 7.80 (d, *J* = 8.7 Hz, 1H), 7.60 (dd, *J* = 8.0, 8.0 Hz, 1H), 7.53 (dd, *J* = 8.5, 1.6 Hz, 1H), 7.45 (dd, *J* = 8.5, 4.1 Hz, 1H), 7.26 (s, 1H), 6.98 (dd, *J* = 8.7, 2.7 Hz, 1H), 3.89 (s, 3H), 0.36 (s, 9H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 168.5, 160.6, 148.2, 143.1, 138.6, 136.3, 135.0, 134.8, 128.2, 128.0, 127.5, 122.0, 121.6, 121.4, 116.3, 112.7, 55.3. 0.3; IR (neat, ν / cm^{-1}) 3353, 3019, 1669, 1525, 1479, 1424, 1386, 1328, 1215, 770, 669; HRMS (ESI$^+$) Calcd for $C_{20}H_{22}N_2NaO_2Si$ $[M+Na]^+$ 373.1348, Found 373.1344.



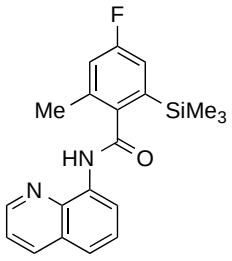
3fa

5-(*tert*-Butyldimethylsilyloxy)-*N*-(8-quinolinyl)-2-(trimethylsilyl)benzamide (3ga). Colorless solid, R_f = 0.60 (hexane/ethyl acetate = 4/1). ^{1}H NMR (500 MHz, $CDCl_3$) δ 10.30 (s, 1H), 8.93 (d, *J* = 8.0 Hz, 1H), 8.79 (dd, *J* = 4.2, 1.6 Hz, 1H), 8.20 (dd, *J* = 8.5, 1.6 Hz, 1H), 7.53–7.51 (m, 3H), 7.47 (dd, *J* = 8.5, 4.2 Hz, 1H), 7.26 (d, *J* = 9.2 Hz, 1H), 6.99 (dd, *J* = 8.5, 2.3 Hz, 1H), 1.03 (s, 9H), 0.34 (s, 9H), 0.29 (s, 6H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 168.7, 156.1, 147.9, 144.0, 138.4, 136.8, 136.1, 134.5, 131.2, 127.8, 127.2, 121.40, 121.38, 121.1, 118.1, 116.2, 25.4, 18.0, 0.0, -4.6; IR (neat, ν / cm^{-1}) 3346, 3015, 2955, 2931, 2859, 1672, 1590, 1524, 1473, 1298, 1252, 1216, 758, 668; HRMS (ESI$^+$) Calcd for $C_{25}H_{34}N_2NaO_2Si_2$ $[M+Na]^+$ 473.2057; Found 473.2033.



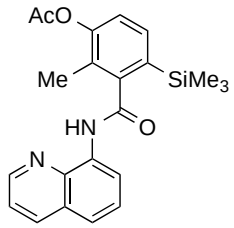
3ga

4-Fluoro-2-methyl-*N*-(8-quinolinyl)-6-(trimethylsilyl)benzamide (3ha). Colorless solid, R_f = 0.68 (hexane/ethyl acetate = 4/1). ^{1}H NMR (500 MHz, $CDCl_3$) δ 9.94 (s, 1H), 8.98 (d, *J* = 7.5 Hz, 1H), 8.75 (d, *J* = 4.5 Hz, 1H), 8.19 (d, *J* = 8.5 Hz, 1H), 7.70–7.55 (m, 2H), 7.45 (dd, *J* = 8.5, 4.5 Hz, 1H), 7.16 (d, *J* = 9.2 Hz, 1H), 6.97 (d, *J* = 9.2 Hz, 1H), 2.36 (s, 3H), 0.27 (s, 9H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 169.2, 162.4 (d, J_F = 255 Hz), 148.3, 141.0 (d, J_F = 3.8 Hz), 139.3 (d, J_F = 2.9 Hz), 138.4, 137.3 (d, J_F = 7.7 Hz), 136.4, 134.3 128.0, 127.5, 122.0, 121.7, 118.5 (d, J_F = 20.0 Hz), 117.6 (d, J_F = 20.9 Hz), 116.8, 19.7, -0.3; IR (neat, ν / cm^{-1}) 3336, 3018, 1697, 1684, 1653, 1558, 1541, 1507, 1215, 757, 668; HRMS (ESI$^+$) Calcd for $C_{20}H_{21}FN_2NaOSi$ $[M+Na]^+$ 375.1305, Found 375.1298.



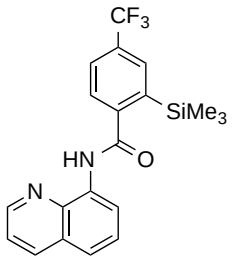
3ha

2-Methyl-3-(8-quinolinylcarbamoyl)-4-(trimethylsilyl)phenyl ethanoate (3ia). Colorless solid, R_f = 0.34 (hexane/ethyl acetate = 4/1). ^{1}H NMR (500 MHz, $CDCl_3$) δ 9.99 (s, 1H), 8.96 (dd, *J* = 5.7, 1.5 Hz, 1H), 8.74 (dd, *J* = 4.0, 1.5 Hz, 1H), 8.17 (d, *J* = 8.6 Hz, 1H), 7.64–7.54 (m, 2H), 7.51 (d, *J* = 8.0 Hz, 1H), 7.45 (dd, *J* = 8.0, 4.0 Hz, 1H), 7.12 (d, *J* = 8.0 Hz, 1H), 2.35 (s, 3H), 2.27 (s, 3H), 0.26 (s, 9H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 169.2, 168.7, 150.1, 148.3, 145.1, 138.4, 136.2, 135.2, 134.3, 133.5, 130.0, 127.4, 126.7, 122.1, 122.0, 121.7, 116.8, 20.8, 13.0, -0.2; IR (neat, ν / cm^{-1}) 3339, 3019, 2957, 2898, 1755, 1671, 1521, 1486, 1425, 1371, 1327, 1252, 1214, 1152, 1130, 1084, 889, 841, 764, 668; HRMS (ESI$^+$) Calcd for $C_{22}H_{24}N_2NaO_3Si$ $[M+H]^+$ 415.1454, Found 415.1442.



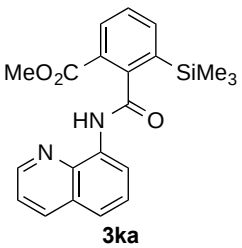
3ia

***N*-(8-Quinolinyl)-4-(trifluoromethyl)-2-(trimethylsilyl)benzamide (3ja).** Colorless solid, R_f = 0.65 (hexane/ethyl acetate = 4/1). ^{1}H NMR (400 MHz, $CDCl_3$) δ 10.31 (s, 1H), 8.91 (dd, *J* = 7.0, 2.1 Hz, 1H), 8.79 (dd, *J* = 4.4, 1.6 Hz, 1H), 8.21 (dd, *J* = 8.5, 1.6 Hz, 1H), 7.94 (s, 1H), 7.85 (d, *J* = 8.5 Hz, 1H), 7.75 (dd, *J* = 8.5, 1.6 Hz, 1H), 7.66–7.56 (m, 2H), 7.48 (dd, *J* = 8.5, 4.4 Hz, 1H), 0.38 (s, 9H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 168.1, 148.4, 145.9, 141.6, 138.5, 136.4, 134.4, 132.5 (q, J_F = 3.6 Hz), 131.4 (q, J_F = 32.8 Hz), 128.0, 127.4, 126.5, 125.9 (q, J_F = 3.6 Hz), 124.0 (q, J_F = 272 Hz), 122.2, 121.8, 116.7, -0.1; IR (neat, ν / cm^{-1}) 3340, 3019, 2958, 2899, 1676, 1524, 1489, 1425, 1387, 1325, 1216, 1131, 1079, 756, 669; HRMS (ESI$^+$) Calcd for $C_{20}H_{19}F_3N_2NaOSi$ $[M+Na]^+$ 411.1116, Found 411.1108.



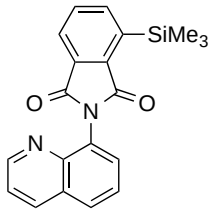
3ja

Methyl 2-(8-quinolinylcarbamoyl)-3-(trimethylsilyl)benzoate (3ka). Colorless solid, R_f = 0.33 (hexane/ethyl acetate = 4/1). ^{1}H NMR (500 MHz, $CDCl_3$) δ 9.60 (s, 1H), 8.66 (d, *J* = 7.5 Hz, 1H), 8.42 (d, *J* = 4.0 Hz, 1H), 7.87 (d, *J* = 8.0 Hz, 1H), 7.73 (d, *J* = 8.1 Hz, 1H), 7.54 (d, *J* = 7.5 Hz, 1H), 7.32 (d, *J* = 8.1 Hz, 1H), 7.27–7.19 (m, 2H), 7.13 (dd, *J* = 8.0, 4.0 Hz, 1H), 3.73 (s, 3H), 0.29 (s, 9H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 168.8, 166.9, 148.2, 144.1, 139.1, 138.8, 138.4, 136.3, 134.7, 130.9, 128.5, 128.1, 127.9, 127.6, 121.8, 121.6, 116.9, 52.4, -0.1; IR (neat, ν / cm^{-1}) 3343, 3018, 2954, 1719, 1677, 1524, 1486, 1386, 1327, 1253, 1216, 1113, 755, 668; HRMS (ESI$^+$) Calcd for $C_{21}H_{22}N_2NaO_3Si$ $[M+Na]^+$ 401.1297, Found 401.1288.



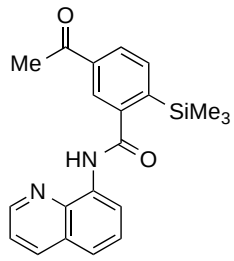
3ka

2-(8-Quinolinyl)-4-(trimethylsilyl)isoindoline-1,3-dione (3k′a). Colorless solid, R_f = 0.37 (hexane/ethyl acetate = 4/1). ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.86 (dd, *J* = 4.2, 1.8 Hz, 1H), 8.22 (dd, *J* = 8.5, 1.8 Hz, 1H), 7.99 (d, *J* = 7.6 Hz, 1H), 7.97–7.91 (m, 2H), 7.79–7.71 (m, 2H), 7.68 (d, *J* = 7.6 Hz, 1H), 7.44 (dd, *J* = 8.5, 4.2 Hz, 1H), 0.42 (s, 9H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 169.1, 168.3, 150.8, 144.3, 140.4, 140.0, 136.8, 136.1, 132.8, 132.6, 130.2, 129.9, 129.4, 129.3, 126.1, 124.2, 121.9, -1.2; IR (neat, ν / cm^{-1}) 3019, 2352, 2321, 1772, 1717, 1506, 1396, 1215, 1113; HRMS (ESI$^+$) Calcd for $C_{20}H_{18}N_2NaO_2Si$ $[M+Na]^+$ 369.1035, Found 369.1032.



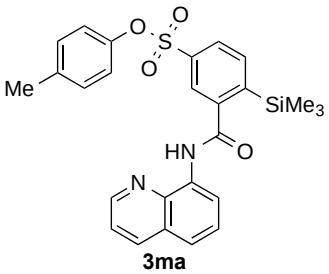
3k'a

5-Ethanoyl-*N*-(8-quinolinyl)-2-(trimethylsilyl)benzamide (3la). Colorless solid, R_f = 0.35 (hexane/ethyl acetate = 4/1). ^{1}H NMR (500 MHz, $CDCl_3$) δ 10.33 (s, 1H), 8.92 (d, *J* = 7.5 Hz, 1H), 8.79 (dd, *J* = 4.3, 1.7 Hz, 1H), 8.29 (d, *J* = 1.7 Hz, 1H), 8.19 (dd, *J* = 8.2, 1.7 Hz, 1H), 8.04 (dd, *J* = 8.2, 1.7 Hz, 1H), 7.83 (d, *J* = 8.2 Hz, 1H), 7.65–7.55 (m, 2H), 7.47 (dd, *J* = 8.2, 4.3 Hz, 1H), 2.66 (s, 3H), 0.37 (s, 9H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 197.5, 168.6, 148.4, 146.4, 143.4, 138.5, 137.2, 136.4, 135.9, 134.5, 128.9, 128.0, 127.4, 125.5, 122.0, 121.8, 116.6, 26.7, -0.1; IR (neat, ν / cm^{-1}) 3344, 3013, 2957, 2360, 1671, 1523, 1485, 1425, 1385, 1326, 1270, 1253, 1216, 1140, 757, 667; HRMS (ESI$^+$) Calcd for $C_{21}H_{22}N_2NaO_2Si$ $[M+Na]^+$ 385.1348, Found 385.1348.



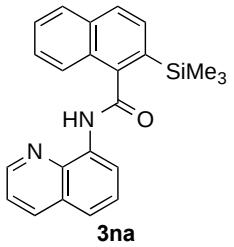
3la

***p*-Tolyl 3-(8-Quinolinylcarbamoyl)-4-(trimethylsilyl)benzenesulfonate (3ma).** Colorless solid, R_f = 0.48 (hexane/ethyl acetate = 4/1). ^{1}H NMR (500 MHz, $CDCl_3$) δ 10.30 (s, 1H), 8.87 (dd, *J* = 6.3, 2.9 Hz, 1H), 8.81 (dd, *J* = 4.6, 1.7 Hz, 1H), 8.21 (dd, *J* = 8.0, 1.7 Hz, 1H), 8.18 (d, *J* = 1.7 Hz, 1H), 7.90 (dd, *J* = 8.0, 1.7 Hz, 1H), 7.87 (d, *J* = 8.1 Hz, 1H), 7.62–7.59 (m, 2H), 7.49 (dd, *J* = 8.1, 8.1 Hz, 1H), 7.13 (d, *J* = 8.1 Hz, 2H), 7.00–6.94 (m, 2H), 2.30 (s, 3H), 0.38 (s, 9H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 167.2, 148.5, 147.3, 143.7, 138.5, 137.2, 136.4, 136.3, 136.2, 134.2, 130.3, 128.7, 128.0, 127.3, 125.3, 122.4, 121.9, 121.8, 116.7, 20.8, -0.1 (two pairs of the aromatic carbons are overlapping); IR (neat, ν / cm^{-1}) 3336, 3018, 2956, 1675, 1524, 1487, 1379, 1216, 1197, 756, 668; HRMS (ESI$^+$) Calcd for $C_{26}H_{26}N_2NaO_4SSi$ $[M+Na]^+$ 513.1280, Found 513.1261.



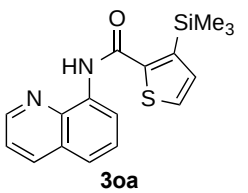
3ma

***N*-(8-Quinolinyl)-2-(trimethylsilyl)naphthalene-1-carboxamide (3na).** Colorless solid, R_f = 0.56 (hexane/ethyl acetate = 4/1). ^{1}H NMR (500 MHz, $CDCl_3$) δ 10.18 (s, 1H), 9.12 (dd, *J* = 7.5, 1.1 Hz, 1H), 8.65 (dd, *J* = 4.5, 1.8 Hz, 1H), 8.19 (dd, *J* = 8.6, 1.8 Hz, 1H), 8.09 (d, *J* = 7.5 Hz, 1H), 7.92 (d, *J* = 8.1 Hz, 1H), 7.88 (d, *J* = 8.0 Hz, 1H), 7.72 (d, *J* = 4.5 Hz, 1H), 7.67 (dd *J* = 8.0, 8.0 Hz, 1H), 7.60 (dd, *J* = 8.6, 1.1 Hz, 1H), 7.55–7.45 (m, 2H), 7.43 (dd, *J* = 8.3, 4.5 Hz, 1H), 0.34 (s, 9H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 169.4, 148.3, 141.8, 138.4, 136.3, 134.9, 134.5, 133.5, 130.4, 129.8, 128.3, 128.1, 128.0, 127.5, 126.9, 126.7, 125.2, 122.1, 121.7, 116.9, -0.2; IR (neat, ν / cm^{-1}) 3339, 3019, 1671, 1522, 1485, 1425, 1389, 1326, 1216, 842, 772, 669; HRMS (ESI^+) Calcd for $C_{23}H_{22}N_2NaOSi$ $[M+Na]^+$ 393.1399, Found 393.1407.



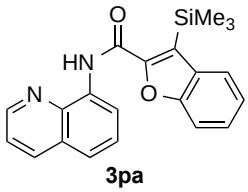
3na

***N*-(8-Quinolinyl)-3-(trimethylsilyl)thiophene-2-carboxamide (3oa).** Colorless solid, R_f = 0.66 (hexane/ethyl acetate = 4/1). ^{1}H NMR (500 MHz, $CDCl_3$) δ 10.43 (s, 1H), 8.91–8.80 (m, 2H), 8.18 (dd, *J* = 8.3, 1.2 Hz, 1H), 7.58 (dd, *J* = 8.3, 8.3 Hz, 1H), 7.53 (d, *J* = 7.5 Hz, 1H), 7.50–7.43 (m, 2H), 7.25 (d, *J* = 5.2 Hz, 1H), 0.4 (s, 9H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 161.3, 148.3, 147.1, 143.0, 138.6, 136.3, 135.0, 134.7, 128.0, 127.4, 127.2, 121.7, 121.6, 116.6, -0.2; IR (neat, ν / cm^{-1}) 3323, 3018, 2955, 2311, 1662, 1654, 1524, 1488, 1214, 756, 668; HRMS (ESI^+) Calcd for $C_{17}H_{18}N_2NaOSSi$ $[M+Na]^+$ 349.0807, Found 349.0809.



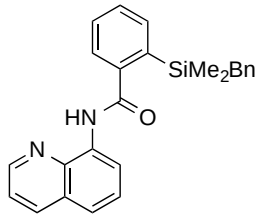
3oa

***N*-(8-Quinolinyl)-3-(trimethylsilyl)benzofuran-2-carboxamide (3pa).** Colorless solid, R_f = 0.65 (hexane/ethyl acetate = 4/1). ^{1}H NMR (500 MHz, $CDCl_3$) δ 11.11 (s, 1H), 8.96 (dd, *J* = 4.2, 1.7 Hz, 1H), 8.94 (dd, *J* = 7.5, 1.7 Hz, 1H), 8.20 (dd, *J* = 8.3, 1.7 Hz, 1H), 7.91 (d, *J* = 8.3 Hz, 1H), 7.71 (d, *J* = 8.3 Hz, 1H), 7.60 (dd, *J* = 7.7, 7.7 Hz, 1H), 7.56 (dd, *J* = 8.3, 1.7 Hz, 1H), 7.51 (dd, *J* = 8.3, 4.2 Hz, 1H), 7.46 (dd, *J* = 7.7, 7.7 Hz, 1H), 7.30 (dd, *J* = 7.7, 7.7 Hz, 1H), 0.56 (s, 9H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 157.7, 154.7, 152.7, 148.5, 138.8, 136.3, 134.3, 132.8, 128.1, 127.3, 126.6, 124.2, 123.2, 122.0, 121.7, 121.2, 116.9, 112.0, 0.4; IR (neat, ν / cm^{-1}) 3019, 2976, 2899, 1777, 1718, 1503, 1397, 1379, 1248, 1215, 1114, 854, 757, 669; HRMS (ESI^+) Calcd for $C_{21}H_{20}N_2NaO_2Si$ $[M+H]^+$ 383.1192, Found 383.1189.



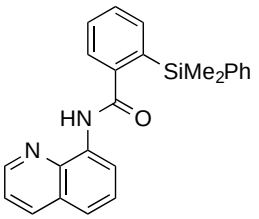
3pa

2-(Benzyldimethylsilyl)-*N*-(8-quinolinyl)benzamide (3ab). Colorless solid, R_f = 0.53 (hexane/ethyl acetate = 4/1). ^{1}H NMR (400 MHz, $CDCl_3$) δ 10.39 (s, 1H), 8.99 (d, *J* = 8.2 Hz, 1H), 8.80 (dd, *J* = 4.0, 1.6 Hz, 1H), 8.20 (dd, *J* = 8.2, 1.6 Hz, 1H), 7.82 (d, *J* = 7.5 Hz, 1H), 7.65–7.32 (m, 6H), 7.13 (dd, *J* = 7.5, 7.5 Hz, 2H), 7.04–6.95 (m, 3H), 2.57 (s, 2H), 0.28 (s, 6H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 169.1, 148.3, 142.7, 140.4, 138.63, 138.56, 136.4, 136.1, 134.8, 129.7, 129.1, 128.5, 128.0, 127.9, 127.5, 126.3, 123.8, 121.8, 121.7, 116.5, 26.3, -2.0; IR (neat, ν / cm^{-1}) 3346, 3018, 1670, 1524, 1488, 1215, 756, 668; HRMS (ESI$^+$) Calcd for $C_{25}H_{24}N_2NaOSi$ $[M+Na]^+$ 419.1556, Found 419.1540.



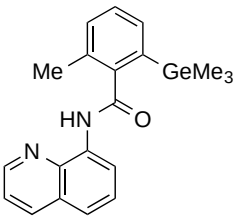
3ab

2-(Dimethyl(phenyl)silyl)-*N*-(8-quinolinyl)benzamide (3ac). Colorless solid, R_f = 0.55 (hexane/ethyl acetate = 4/1). ^{1}H NMR (400 MHz, $CDCl_3$) δ 10.12 (s, 1H), 8.73 (dd, *J* = 6.9, 1.8 Hz, 1H), 8.71 (dd, *J* = 4.6, 1.8 Hz, 1H), 8.15 (dd, *J* = 8.6, 1.8 Hz, 1H), 7.74 (d, *J* = 7.5 Hz, 1H), 7.61–7.39 (m, 8H), 7.20–7.10 (m, 3H), 0.64 (s, 6H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 167.0, 148.1, 143.3, 139.1, 138.6, 138.2, 136.8, 136.3, 134.6, 134.2, 129.6, 129.2, 128.5, 127.9, 127.45, 127.36, 126.3, 121.6, 121.5, 116.6, -1.2; IR (neat, ν / cm^{-1}) 3019, 2977, 1524, 1425, 1216, 1046, 929, 768, 669; HRMS (ESI$^+$) Calcd for $C_{24}H_{22}N_2NaOSi$ $[M+Na]^+$ 405.1399, Found 405.1392.



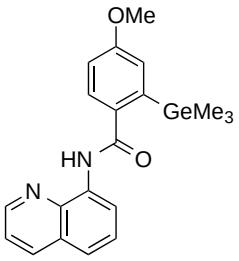
3ac

2-Methyl-*N*-(8-quinolinyl)-6-(trimethylgermyl)benzamide (4ba). Colorless solid, R_f = 0.48 (Hexane/EtOAc = 4/1). ^{1}H NMR (400 MHz, $CDCl_3$) δ 9.97 (s, 1H), 9.01 (d, *J* = 7.4 Hz, 1H), 8.74 (d, *J* = 2.3 Hz, 1H), 8.19 (d, *J* = 6.9 Hz, 1H), 7.63 (dd, *J* = 8.0, 8.0 Hz, 1H), 7.58 (d, *J* = 7.5 Hz, 1H), 7.47–7.40 (m, 2H), 7.35 (dd, *J* = 7.5, 7.5 Hz, 1H), 7.27 (d, *J* = 4.0 Hz, 1H), 2.48 (s, 3H), 0.39 (s, 9H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 169.5, 148.2, 143.0, 139.5, 138.5, 136.3, 134.5, 134.3, 131.5, 130.6, 128.7, 128.0, 127.5, 121.9, 121.7, 116.8, 19.7, -0.5; IR (neat, ν / cm^{-1}) 3343, 3018, 2975, 2910, 1671, 1521, 1484, 1425, 1386, 1326, 1215, 1123, 1042, 827, 783, 668; HRMS (FAB+) Calcd for $C_{20}H_{22}GeN_2O$ $[M]^+$ 380.0944, Found 380.0942.



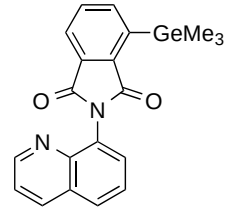
4ba

4-Methoxy-*N*-(8-quinolinyl)-2-(trimethylgermyl)benzamide (4fa). Colorless solid, R_f = 0.56 (Hexane/EtOAc = 4/1). Colorless solid. ^{1}H NMR (400 MHz, $CDCl_3$) δ 10.4 (s, 1H), 8.92 (d, *J* = 7.5 Hz, 1H), 8.81 (d, *J* = 4.4 Hz, 1H), 8.18 (d, *J* = 8.6 Hz, 1H), 7.84 (d, *J* = 8.0 Hz, 1H), 7.59 (dd, *J* = 8.0, 7.5 Hz, 1H), 7.53 (d, *J* = 8.0 Hz, 1H), 7.46 (dd, *J* = 8.6, 4.4 Hz, 1H), 7.22 (d, *J* = 2.9 Hz, 1H), 6.97 (dd, *J* = 8.6, 2.9 Hz, 1H), 3.90 (s, 3H), 0.48 (s, 9H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 168.1, 160.7, 148.2, 145.6, 138.7, 136.3, 135.0, 134.0, 128.2, 128.0, 127.5, 121.6, 121.3, 121.0, 116.3, 112.6, 55.3, 0.1; IR (neat, ν / cm^{-1}) 3354, 3019, 2975, 1668, 1590, 1525, 1480, 1424, 1386, 1328, 1216, 757, 669; HRMS (FAB+) Calcd for $C_{20}H_{23}GeN_2O_2$ $[M+H]^+$ 393.0971, Found 393.0970.



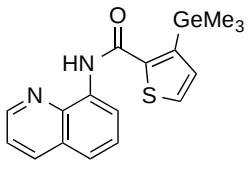
4fa

2-(8-Quinolinyl)-4-(trimethylgermyl)isoindoline-1,3-dione (4k′a). Colorless solid, R_f = 0.25 (Hexane/EtOAc = 4/1). ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.85 (d, *J* = 2.9 Hz, 1H), 8.21 (d, *J* = 6.7 Hz, 1H), 8.00–7.92 (m, 2H), 7.90 (d, *J* = 7.5 Hz, 1H), 7.77 (d, *J* = 6.9 Hz, 1H), 7.72 (dd, *J* = 7.5, 7.5 Hz, 1H), 7.67 (dd, *J* = 7.7, 7.7 Hz, 1H), 7.43 (dd, *J* = 8.6, 4.1 Hz, 1H), 0.54 (s, 9H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 169.1, 168.3, 150.8, 144.3, 142.4, 139.3, 136.4, 136.1, 132.8, 132.6, 130.1, 130.0, 129.4, 129.3, 126.1, 123.8, 121.9, -1.4; IR (neat, ν / cm^{-1}) 3019, 2976, 1718, 1523, 1475, 1426, 1397, 1216, 1046, 929, 770, 669; HRMS (FAB+) Calcd for $C_{20}H_{19}GeN_2O_2$ $[M+H]^+$ 393.0658, Found 393.0661.



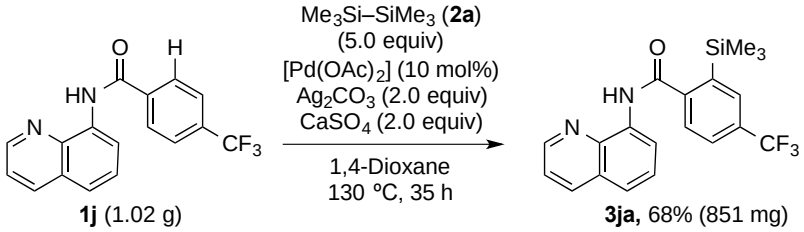
4k'a

***N*-(8-Quinolyl)-3-(trimethylgermyl)thiophene-2-carboxamide (4oa).** Colorless solid, R_f = 0.68 (Hexane/EtOAc = 4/1). ^{1}H NMR (400 MHz, $CDCl_3$) δ 10.42 (s, 1H), 8.86-8.83 (m, 2H), 8.17 (dd, *J* = 8.6, 1.5 Hz, 1H), 7.58 (dd, *J* = 7.7, 7.7 Hz, 1H), 7.53 (dd, *J* = 8.0, 1.5 Hz, 1H), 7.51 (d, *J* = 4.9 Hz, 1H), 7.47 (dd, *J* = 8.3, 4.3 Hz, 1H), 7.23 (d, *J* = 4.9 Hz, 1H), 0.53 (s, 9H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 161.1, 148.6, 148.3, 141.2, 138.6, 136.3, 134.7, 134.0, 128.0, 127.43, 127.37, 121.7, 121.5, 116.6, -0.3; IR (neat, ν / cm^{-1}) 3322, 3019, 1661, 1524, 1484, 1424, 1329, 1215, 758, 669; HRMS (FAB+) Calcd for $C_{17}H_{19}GeN_2OS$ $[M+H]^+$ 373.0430, Found 373.0420.



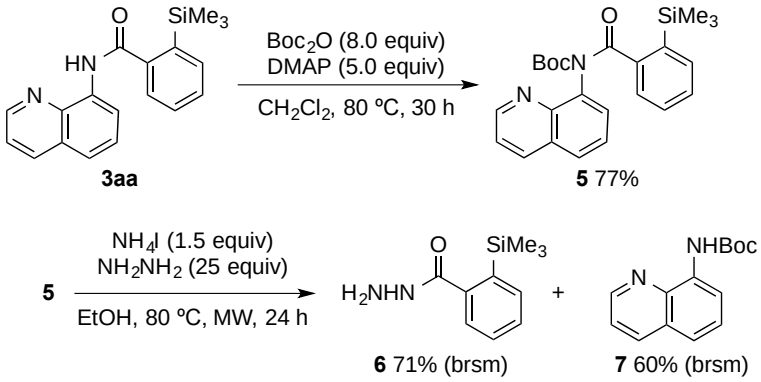
4oa

Large-Scale Preparation of 3ja.



N-(8-Quinolinyl)-4-(trifluoromethyl)benzamide (**1j**, 1.02 g, 3.23 mmol), $Pd(OAc)_2$ (72.5 mg, 0.330 mmol), Ag_2CO_3 (1.78 g, 6.45 mmol), and $CaSO_4$ (0.878 g, 6.45 mmol) were measured into a 100 mL oven-dried vial. The vial was evacuated and refilled with argon three times, then taken into a dry box. 1,4-Dioxane (15 mL) and hexamethyldisilane (2.36 g, 16.1 mmol) were added into the vial. The vial was then capped, taken out from the dry box, and heated at 130 °C for 35 h. The resulting mixture was filtered through a silica gel pad, concentrated in vacuo, and purified by flash column chromatography on silica gel (hexane/ethyl acetate = 4/1) to give the corresponding silytated product **3ja** in 68% yield (851 mg).

Removal and Recovery of Directing Group



tert-Butyl (8-quinolinyl)(2-(trimethylsilyl)benzoyl)carbamate (**5**) was prepared following a reported procedure:[6] *N*-(8-quinolinyl)-2-(trimethylsilyl)benzamide (**3aa**, 150 mg, 0.470 mmol) was placed in a 50 mL round-bottomed flask, and the flask was flushed with nitrogen. Dichloromethane (5.0 mL) and Boc_2O (0.825 g, 3.78 mmol) were added. *N*,*N*-Dimethyl-4-aminopyridine (0.287 g, 2.35 mmol) was added in one portion and the resulting solution was refluxed for 30 h. The reaction mixture was concentrated in vacuo, followed by column chromatography on silica gel (hexane/ethyl acetate = 4/1) gave *tert*-butyl (8-quinolinyl)(2-(trimethylsilyl)benzoyl)carbamate (**5**, 152 mg, 0.361 mmol, 77%) as a white

solid.

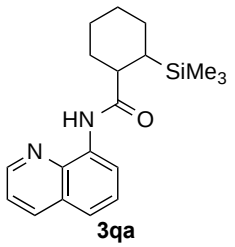
Next, following a modified procedure,[7] compound **5** (24.1 mg, 57.0 μmol) and NH_4I (24.1 mg, 85.5 μmol) were placed in a 5 mL microwave-vial. Ethanol (1.0 mL) and hydrazine monohydrate (71.6 mg, 1.43 mmol) were added into the vial, then the reaction was carried out under microwave irradiation at 80 ºC for 24 h. The resulting solution was then concentrated in vacuo, followed by column chromatography on silica gel (hexane/ethyl acetate = 4/1) to give 2-(trimethylsilyl)benzohydrazide (**6**, 5.1 mg, 25 μmol) and *tert*-butyl 8-quinolinylcarbamate (**7**, 5.0 mg, 21 μmol) in 71% and 60% yields (based on recovered starting material), respectively.

Spectral data of **6.** Colorless liquid, R_f = 0.28 (hexane/ethyl acetate = 1/1). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.65 (d, *J* = 7.4 Hz, 1H), 7.44 (ddd, *J* = 7.5, 7.5, 1.7 Hz, 1H), 7.40 (dd, *J* = 7.5, 1.7 Hz, 1H), 7.37 (ddd, *J* = 8.0, 8.0, 1.4 Hz, 1H), 7.12 (s, 1H), 4.06 (br, 2H), 0.32 (s, 9H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 171.9, 140.0, 139.8, 135.5, 129.9, 128.8, 126.2, -0.1; IR (neat, ν / cm^{-1}) 3287, 3053, 2952, 1655, 1584, 1521, 1459, 1324, 1255, 1245, 1129, 1067, 945, 841, 742; LRMS (ESI) m/z 231.02, $[M+Na]^+$; HRMS (ESI^+) Calcd for $C_{10}H_{16}N_2NaOSi$ $[M+Na]^+$ 231.0930; Found 231.0930.

The spectral data of compound **7** matched that of the reported compound.[8]

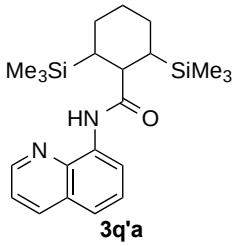
A General Procedure of Palladium-Catalyzed C(sp^3)–H Silylation of Carboxyamides. Carboxyamide (**1**, 0.200 mmol), $Pd(OAc)_2$ (4.5 mg, 20 μmol), and Ag_2CO_3 (110 mg, 0.400 mmol) were measured into a 15 mL oven-dried vial. The vial was evacuated and refilled with argon three times, then taken into a dry box. 1,4-Dioxane (1.0 mL), dimethylformamide (50.0 μL, 0.640 μmol), and hexamethyl disilane (87.8 mg, 0.600 mmol) were successively added into the vial. The vial was then capped, taken out from the dry box, and heated at 130 ºC for 35 h (Scheme 4). The resulting mixture was filtered through a silica gel pad, concentrated in vacuo, and purified by flash column chromatography on silica gel to give the corresponding products. The yields are listed in Scheme 6. A mixture of **3qa** and **3q′a** (or **3ra** and **3r′a**) was further separated by preparative recycling GPC.

***N*-(8-Quinolinyl)-2-(trimethylsilyl)cyclohexane-1-carboxamide (3qa).** Colorless liquid, R_f = 0.70 (hexane/ethyl acetate = 4/1). ^{1}H NMR (500 MHz, $CDCl_3$) δ 9.88 (br, 1H), 8.80 (dd, *J* = 4.2, 1.5 Hz, 1H), 8.79 (dd, *J* = 7.6, 1.5 Hz, 1H), 8.15 (dd, *J* = 7.6, 1.5 Hz, 1H), 7.53 (dd, *J* = 8.6, 8.6 Hz, 1H), 7.48 (dd, *J* = 8.3, 1.5 Hz, 1H), 7.44 (dd, *J* = 8.3, 4.2 Hz, 1H), 2.88 (ddd, *J* = 4.8, 4.8, 4.8 Hz, 1H), 2.13–2.02 (m, 2H), 1.95–1.85 (m, 1H); 1.83–1.69 (m, 2H), 1.66–1.60 (m, 1H), 1.58–1.50 (m, 1H), 1.45–1.35 (m, 1H), 1.12 (ddd, *J* = 8.6, 4.6, 4.6 Hz, 1H), 0.03 (s, 9H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 174.5, 148.1, 138.5, 136.3, 134.8, 128.0, 127.5, 121.5, 121.0, 116.3, 44.7, 30.1, 29.0, 26.7, 24.8, 23.3, -1.4; IR (neat, ν / cm^{-1}) 3357, 2925, 2853, 1686, 1523, 1485, 1424, 1381, 1324, 1247, 1159, 842, 826, 756; HRMS (ESI$^+$) Calcd for $C_{19}H_{26}N_2NaOSi$ $[M+Na]^+$ 349.1712; Found 349.1714; (According to NMR and GC-MS, only one product was observed. The stereochemistry was not determined).



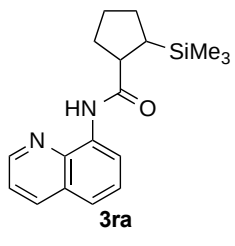
3qa

***N*-(8-Quinolinyl)-2,6-bis(trimethylsilyl)cyclohexane-1-carboxamide (3q′a).** Colorless liquid, R_f = 0.75 (hexane/ethyl acetate = 4/1). ^{1}H NMR (500 MHz, $CDCl_3$) δ 9.93 (s, 1H), 8.81 (dd, *J* = 4.5, 1.6 Hz, 1H), 8.76 (dd, *J* = 7.7, 1.6 Hz, 1H), 8.16 (dd, *J* = 7.7, 1.6 Hz, 1H), 7.52 (dd, *J* = 7.7, 7.7 Hz, 1H), 7.48 (dd, *J* = 8.3, 1.6 Hz, 1H), 7.45 (dd, *J* = 8.3, 4.5 Hz, 1H), 2.82 (t, *J* = 4.0 Hz, 1H), 2.19 (dddd, *J* = 13.2, 13.2, 13.2, 4.0 Hz, 2H), 2.01 (ddd, *J* = 13.2, 3.6, 3.6 Hz, 1H), 1.65–1.56 (m, 2H), 1.32 (dtt, *J* = 13.2, 13.2, 3.6 Hz, 1H), 0.92 (ddd, *J* = 13.2, 3.6, 3.6 Hz, 2H), -0.04 (s, 18H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 174.1, 158.6, 150.0, 136.4, 134.7, 134.0, 128.0, 126.7, 121.5, 121.1, 52.5, 36.2, 31.0, 27.2, -1.8; IR (neat, ν / cm^{-1}) 3358, 3019, 2922, 1681, 1521, 1483, 1424, 1250, 1215, 756, 668; HRMS (ESI$^+$) Calcd for $C_{22}H_{34}N_2NaOSi_2$ $[M+Na]^+$ 421.2107; Found 421.2094; (According to NMR and GC-MS, only one product was observed. The stereochemistry was not determined).



3q'a

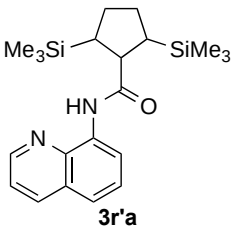
***N*-(8-Quinolinyl)-2-(trimethylsilyl)cyclopentane-1-carboxamide (3ra).** Colorless liquid, R_f = 0.65 (hexane/ethyl acetate = 4/1). ^{1}H NMR (500 MHz, $CDCl_3$) δ 9.86 (br, 1H), 8.80 (dd, *J* = 4.3, 1.5 Hz, 1H), 8.78 (dd, *J* = 7.7, 1.5 Hz, 1H), 8.16 (dd, *J* = 8.3, 1.5 Hz, 1H), 7.53 (dd, *J* = 7.7, 7.7 Hz, 1H), 7.48 (dd, *J* = 8.3, 1.5 Hz, 1H), 7.45 (dd, *J* = 8.3, 4.3 Hz, 1H), 3.14 (ddd, *J* = 7.8, 7.8, 4.3 Hz, 1H), 2.14–2.02 (m, 2H), 2.00–1.80 (m, 3H), 1.72–1.64 (m, 1H), 1.29 (ddd, *J* = 11.5, 11.5, 8.1 Hz, 1H), 0.01 (s, 9H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 175.2, 148.0, 138.4,



3ra

136.3, 134.7, 127.9, 127.5, 121.5, 121.1, 116.3, 49.5, 33.3, 31.6, 28.0, 26.2, -1.7; IR (neat, ν / cm^{-1}) 3357, 3012, 2951, 2864, 1683, 1523, 1485, 1424, 1388, 1324, 1249, 1162, 837, 755, 666; HRMS (ESI^+) Calcd for $C_{18}H_{24}N_2NaOSi$ $[M+Na]^+$ 335.1556; Found 335.1561; (According to NMR and GC-MS, only one product was observed. The stereochemistry was not determined).

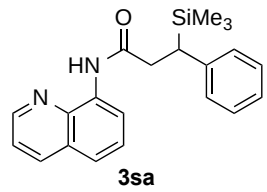
***N*-(8-Quinolinyl)-2,5-bis(trimethylsilyl)cyclopentane-1-carboxamide (3r′a).** Colorless liquid,



3r'a

R_f = 0.70 (hexane/ethyl acetate = 4/1). ^1H NMR (500 MHz, C_6D_6) δ 10.06 (s, 1H), 9.25 (dd, *J* = 8.0, 1.2 Hz, 1H), 8.48 (dd, *J* = 4.2, 1.6 Hz, 1H), 7.40 (dd, *J* = 8.4, 1.6 Hz, 1H), 7.20 (dd, *J* = 8.0, 8.0 Hz, 1H), 6.99 (dd, *J* = 8.0, 1.2 Hz, 1H), 6.69 (dd, *J* = 8.4, 4.2 Hz, 1H), 2.93 (t, *J* = 6.3 Hz, 1H), 2.41–2.31 (m, 2H), 1.96–1.88 (m, 2H), 1.08–1.01 (m, 2H), -0.14 (s, 18H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 174.0, 148.1, 138.4, 136.3, 134.7, 127.9, 127.5, 121.5, 121.0, 116.3, 52.5, 36.2, 27.2, -1.8; IR (neat, ν / cm^{-1}) 3358, 3019, 2953, 1683, 1523, 1485, 1250, 1215, 757, 668; HRMS (ESI^+) Calcd for $C_{21}H_{32}N_2NaOSi_2$ $[M+Na]^+$ 407.1951; Found 407.1960; (According to NMR and GC-MS, only one product was observed. The stereochemistry was not determined).

3-Phenyl-*N*-(8-quinolinyl)-3-(trimethylsilyl)propanamide (3sa). Colorless liquid, R_f = 0.53

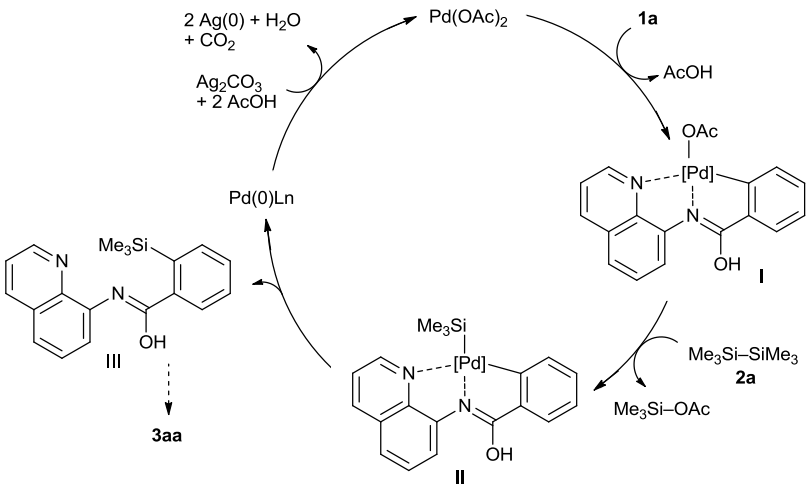


3sa

(hexane/ethyl acetate = 4/1). ^1H NMR (500 MHz, $CDCl_3$) δ 9.80 (br, 1H); 8.75 (dd, *J* = 4.2, 1.7 Hz, 1H), 8.68 (dd, *J* = 7.7, 1.7 Hz, 1H), 8.11 (dd, *J* = 7.7, 1.7 Hz, 1H), 7.46 (t, *J* = 7.7 Hz, 1H), 7.44 (dd, *J* = 6.8, 1.7 Hz, 1H), 7.42 (dd, *J* = 8.3, 4.2 Hz, 1H), 7.23 (dd, *J* = 7.6, 7.6 Hz, 2H), 7.18 (dd, *J* = 7.6, 1.4 Hz, 2H), 7.02 (tt, *J* = 7.6, 1.4 Hz, 1H), 3.08 (dd, *J* = 15.7, 11.5 Hz, 1H), 2.96 (dd, *J* = 15.7, 4.2 Hz, 1H), 2.83 (dd, *J* = 11.5, 4.2 Hz, 1H), 0.03 (s, 9H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 171.1, 147.9, 142.2, 138.3, 136.2, 134.5, 128.3, 127.8, 127.5, 127.3, 124.9, 121.4, 121.2, 116.4, 38.4, 32.8, -3.0; IR (neat, ν / cm^{-1}) 3352, 3018, 2957, 2400, 1683, 1525, 1487, 1424, 1251, 1216, 756, 668; HRMS (ESI^+) Calcd for $C_{21}H_{24}N_2NaOSi$ $[M+Na]^+$ 371.1556; Found 371.1546.

An alternative mechanism for the silylation reaction is shown below: Activation of *ortho*-C–H bond of a benzamide by $Pd(OAc)_2$ may form intermediate **I**, followed by transmetallation between intermediate **I** and disilane **2a** to form Ar–Pd–$SiMe_3$ complex **II** (Scheme S1). Subsequent C–Si reductive elimination would afford Pd(0) species and intermediate **III**, which tautomerizes to the desired product **3aa**. Oxidation of the Pd(0) species by $AgCO_3$ then regenerates $Pd(OAc)_2$.

Scheme S1. An Alternative Mechanism for the Silylation Reaction



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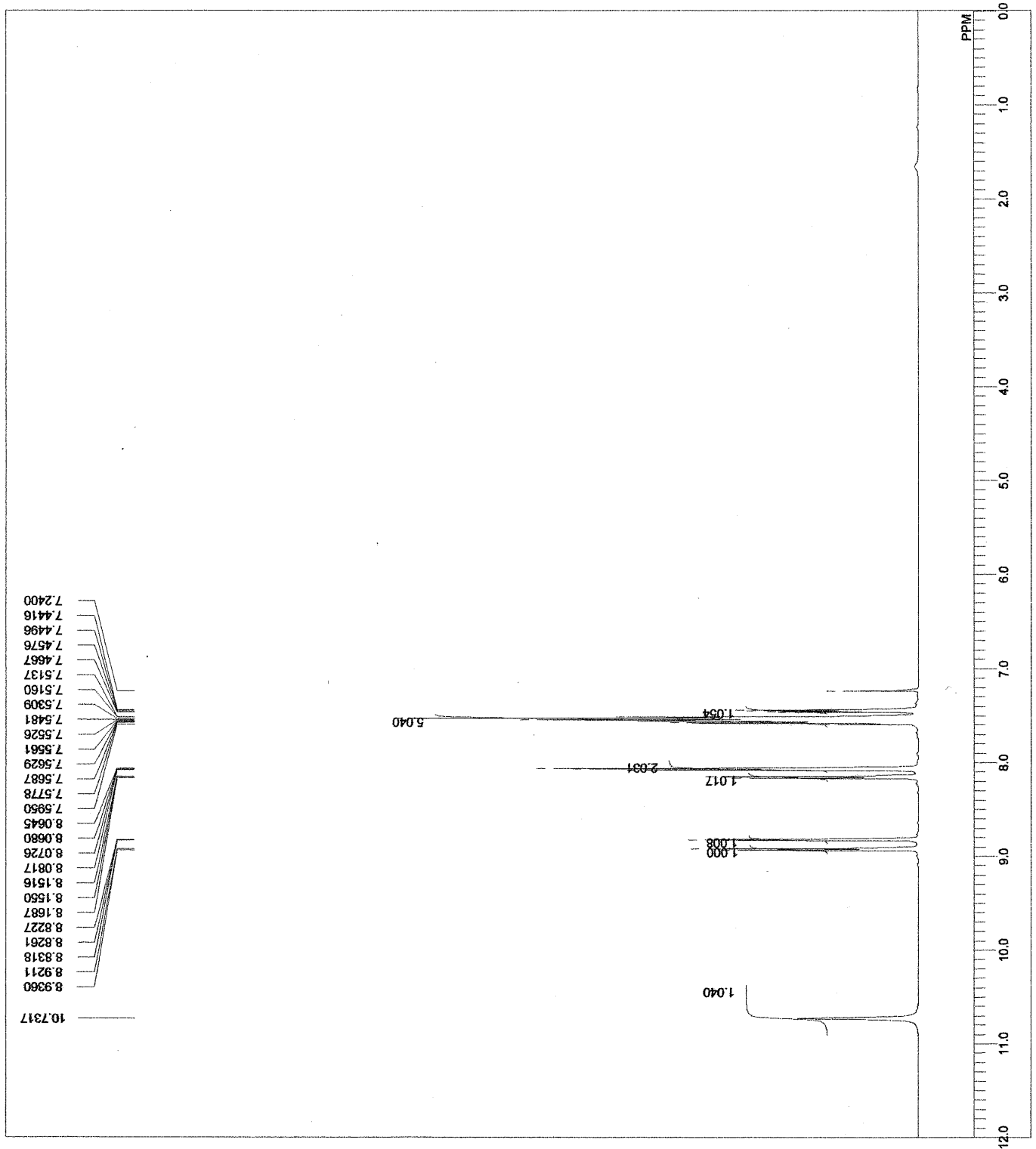
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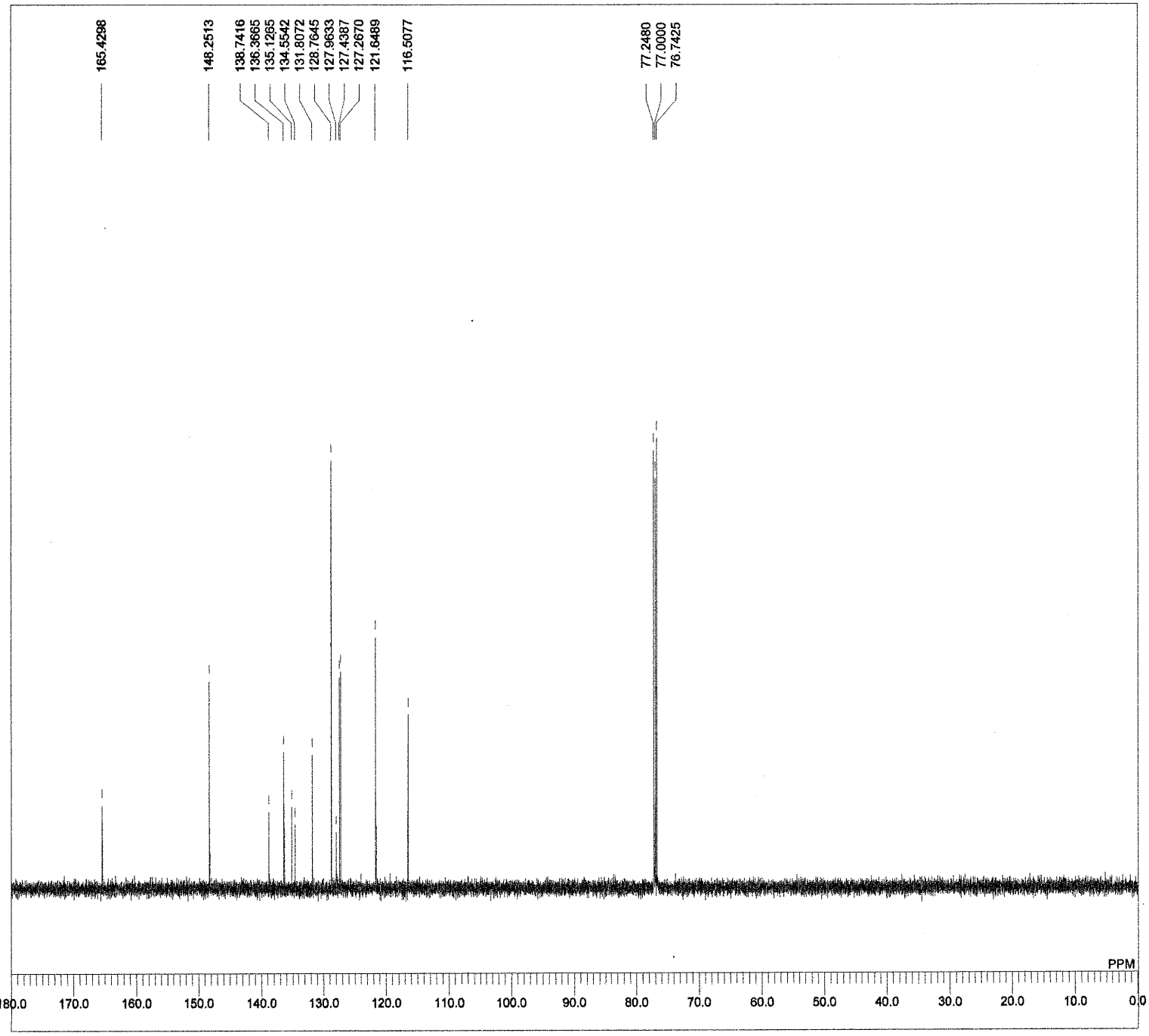

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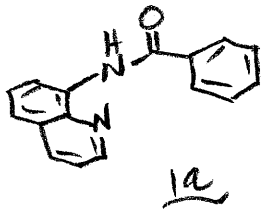

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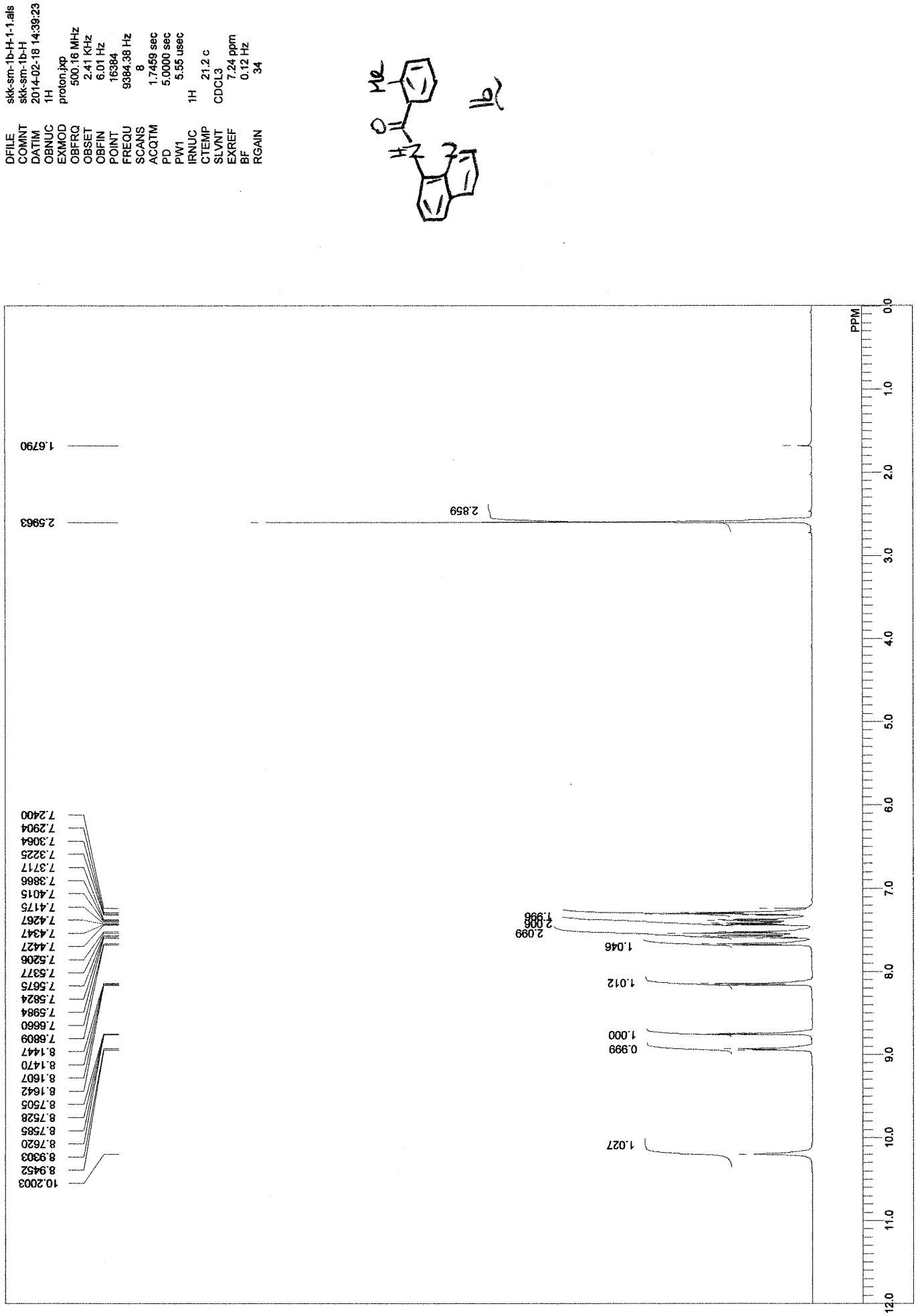
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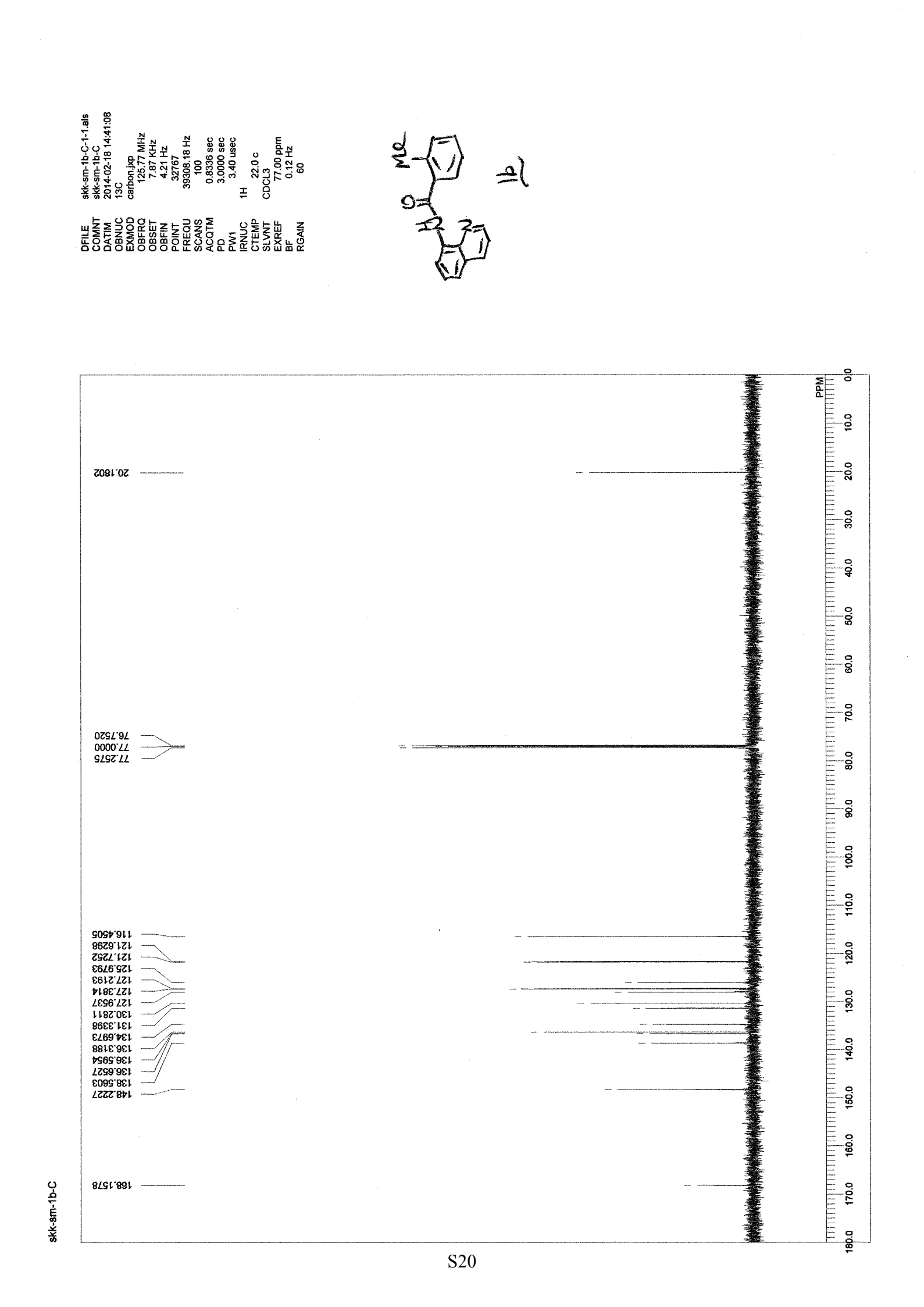
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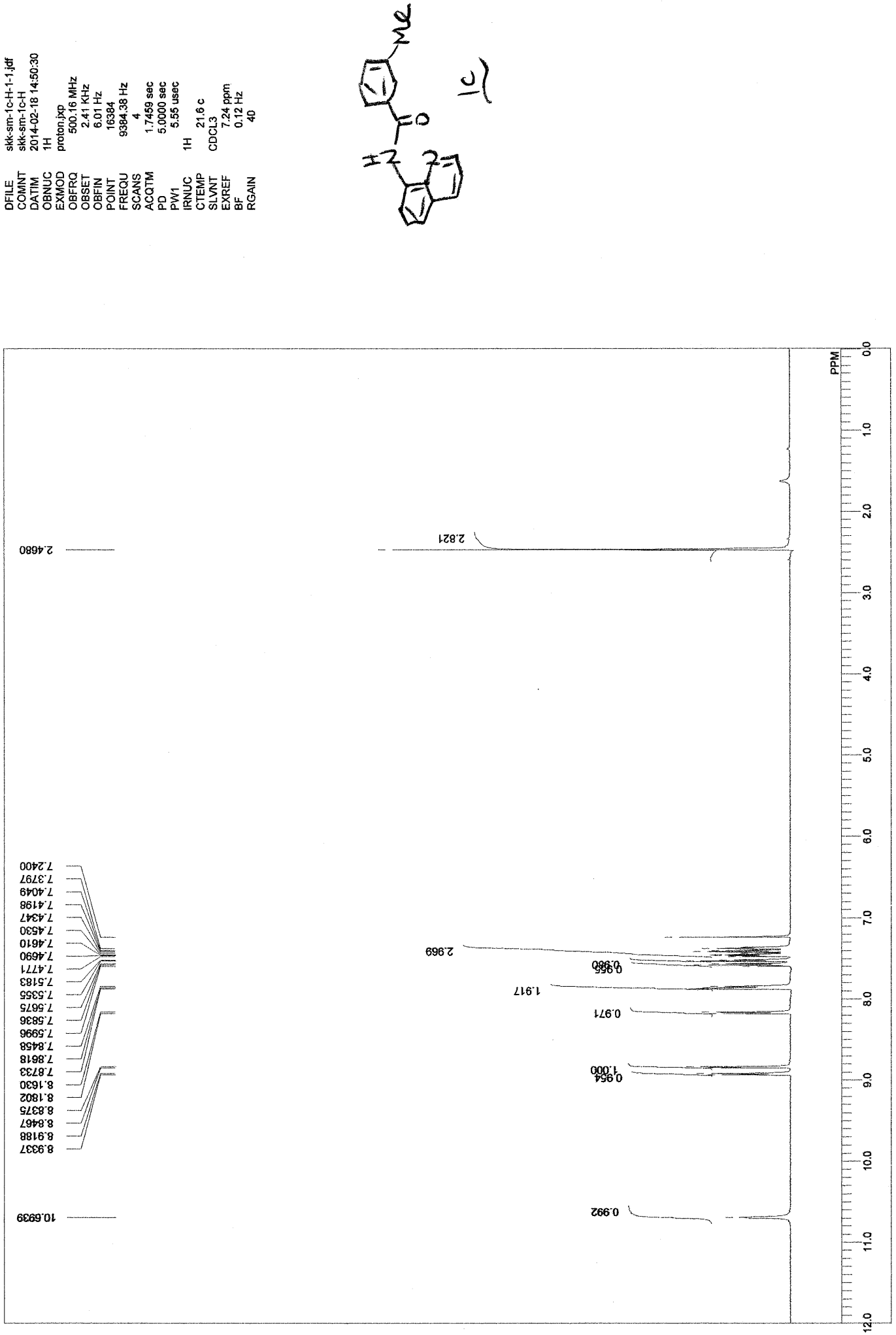
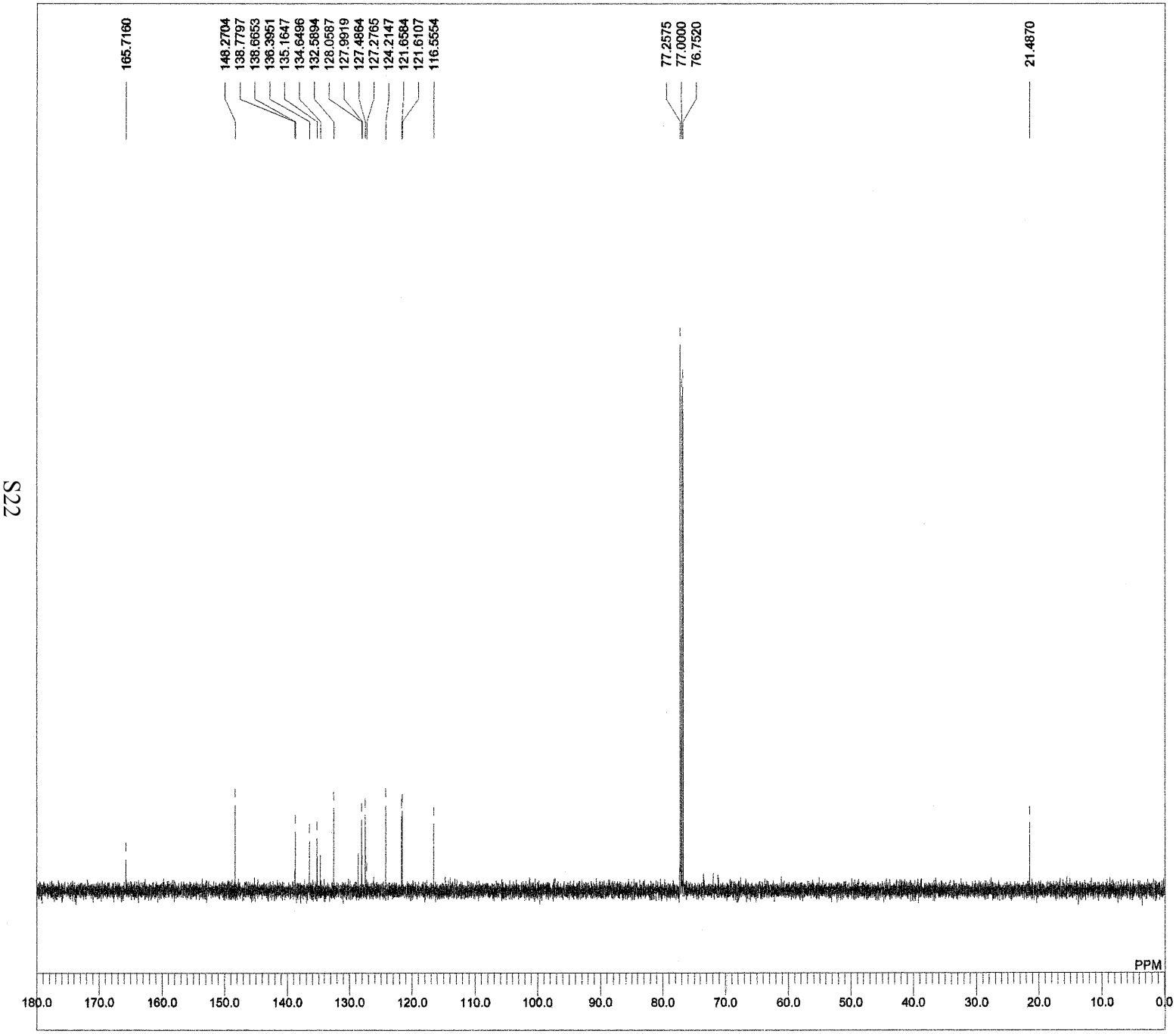
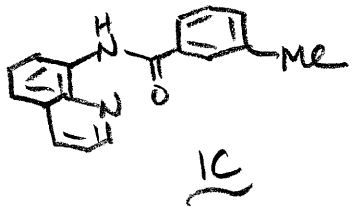
77.2575
116.4505
121.6298
121.7252
125.9793
127.2193
127.3814
127.9537
130.2811
131.3398
134.6973
136.3188
136.5954
136.6527
138.5603
148.2227
168.1578
PPM
skk-sm-1b-C


DFILE skk-sm-1c-H-1-1.jdf
COMNT skk-sm-1c-H
DATIM 2014-02-18 14:50:30
OBNUC 1H
EXMOD proton.jxp
OBFRQ 500.16 MHz
OBSET 2.41 KHz
OBFIN 6.01 Hz
POINT 16384
FREQU 9384.38 Hz
SCANS 4
ACQTM 1.7459 sec
PD 5.0000 sec
PW1 5.55 usec
IRNUC 1H
CTEMP 21.6 c
SLVNT CDCL3
EXREF 7.24 ppm
BF 0.12 Hz
RGAIN 40
Me
O
1c)
skk-sm-1c-H
PPM
2.4680
2.821
2.969
0.965
0.960
1.917
0.971
0.954
1.000
0.992
10.6939
8.9337
8.9188
8.8467
8.8375
8.1802
8.1630
7.8733
7.8618
7.8458
7.5996
7.5836
7.5675
7.5355
7.5183
7.4771
7.4690
7.4610
7.4530
7.4347
7.4198
7.4049
7.3797
7.2400

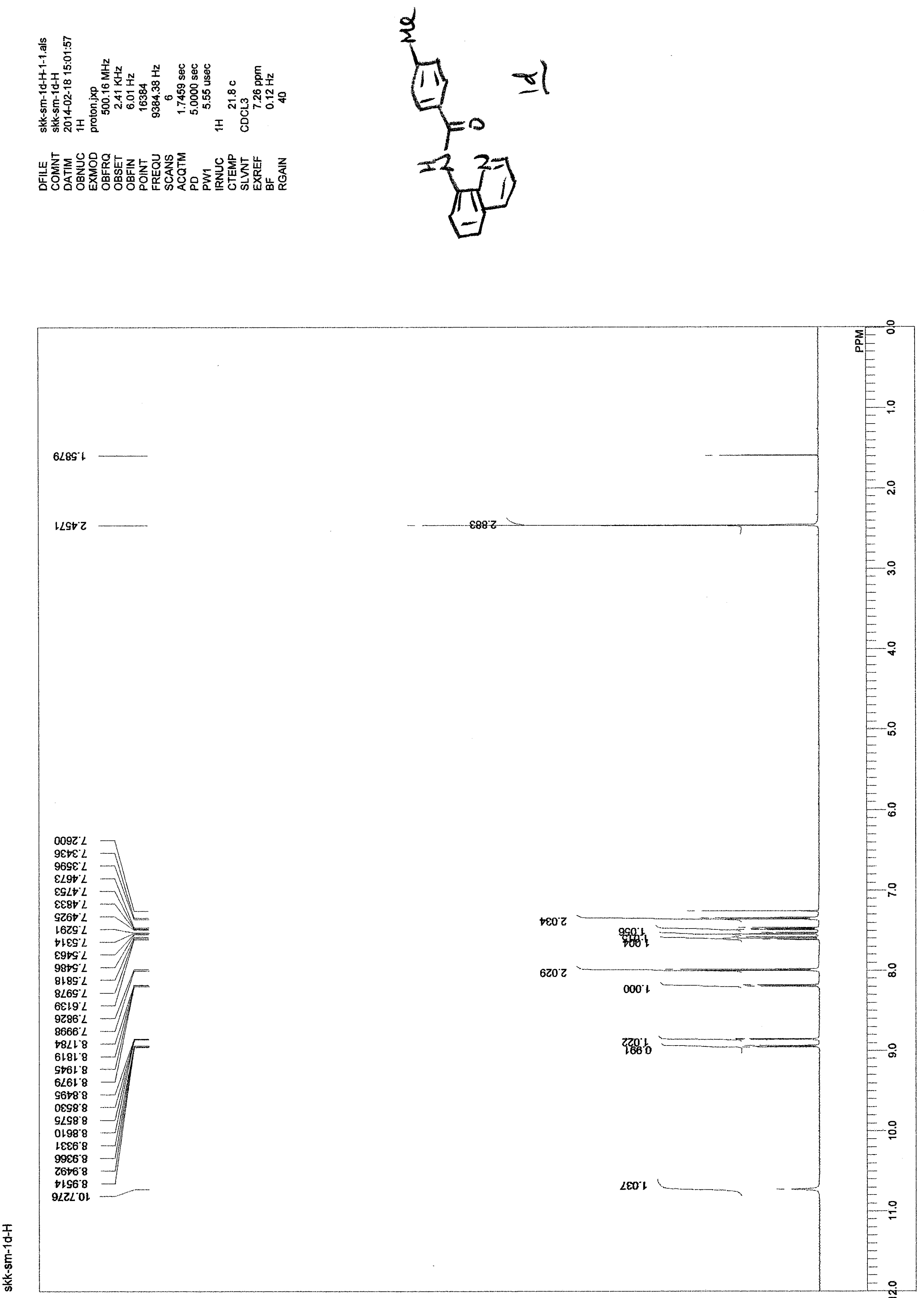
skk-sm-1c-C

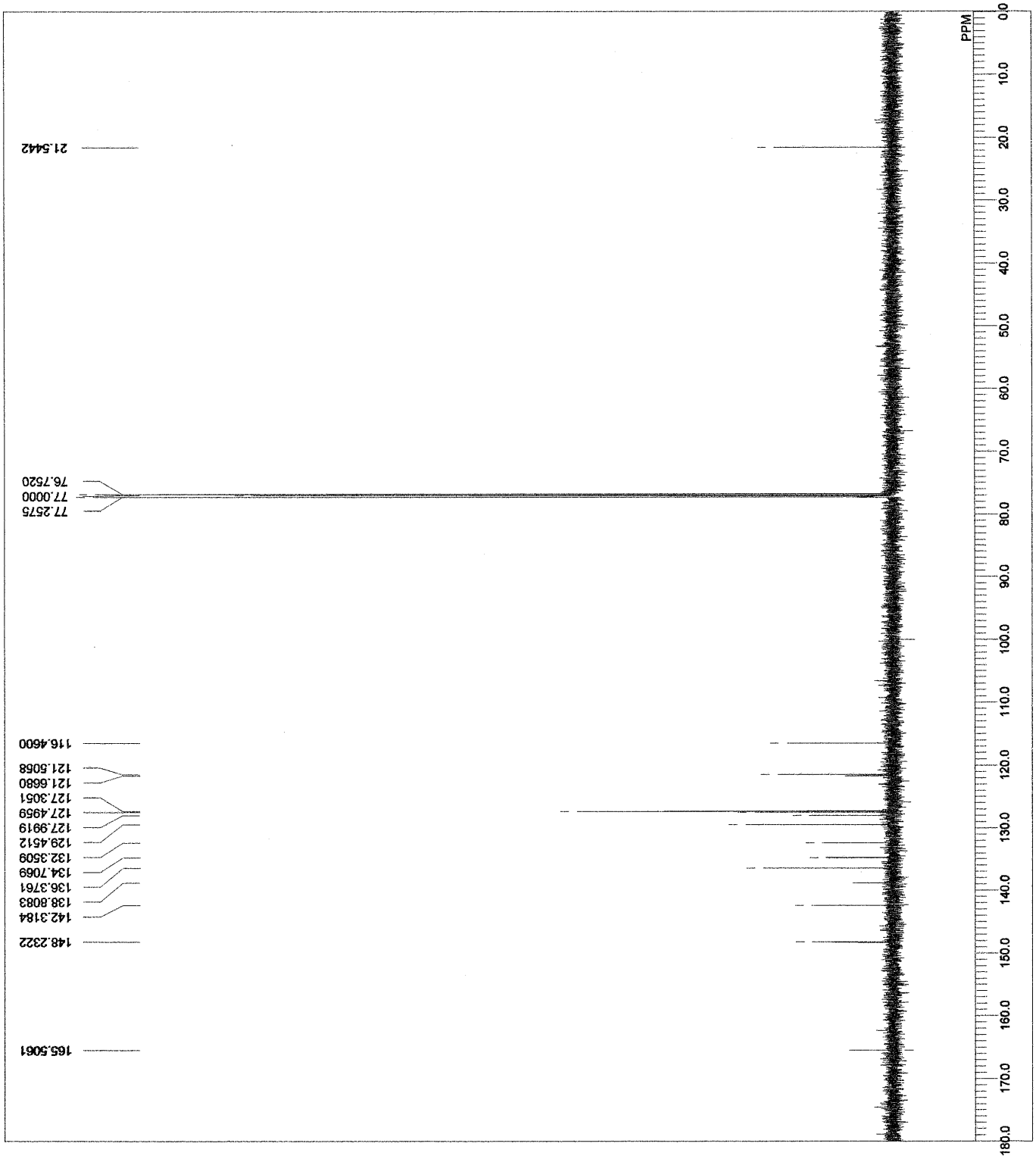


DFILE	skk-sm-1c-C_copy3-1-1.als
COMNT	skk-sm-1c-C
DATIM	2014-02-18 14:51:45
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	85
ACQTM	0.0000 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	21.7 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	0.12 Hz
RGAIN	60

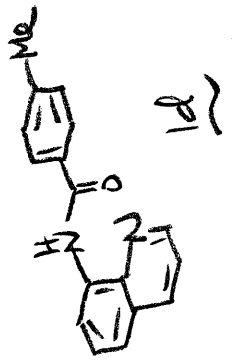


1c

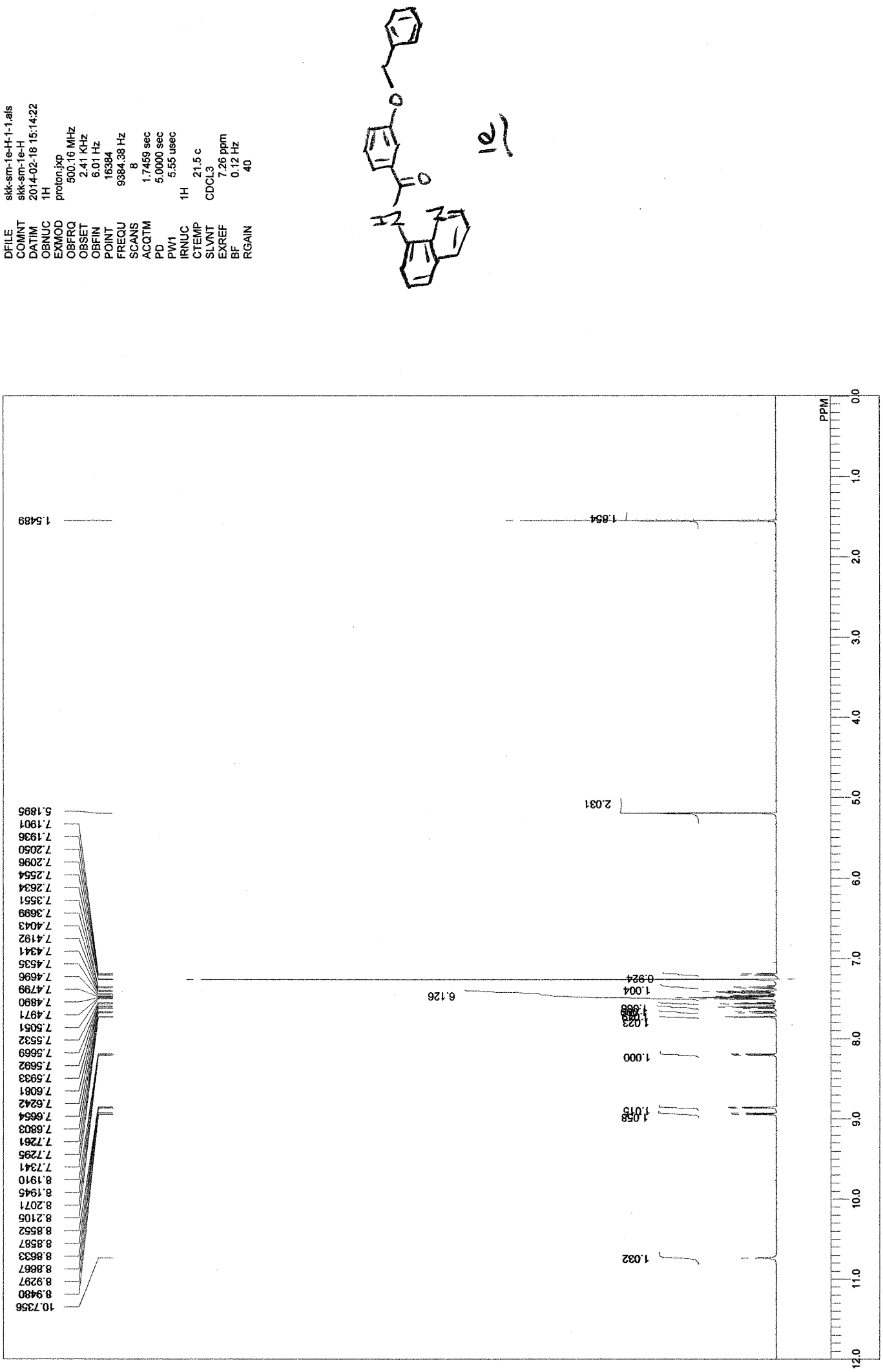

DFILE skk-sm-1d-H-1-1.als
COMNT skk-sm-1d-H
DATIM 2014-02-18 15:01:57
OBNUC 1H
EXMOD proton.jxp
OBFRQ 500.16 MHz
OBSET 2.41 KHz
OBFIN 6.01 Hz
POINT 16384
FREQU 9384.38 Hz
SCANS 6
ACQTM 1.7459 sec
PD 5.0000 sec
PW1 5.55 usec
IRNUC 1H
CTEMP 21.8 c
SLVNT CDCL3
EXREF 7.26 ppm
BF 0.12 Hz
RGAIN 40
Me
1d
PPM
skk-sm-1d-H



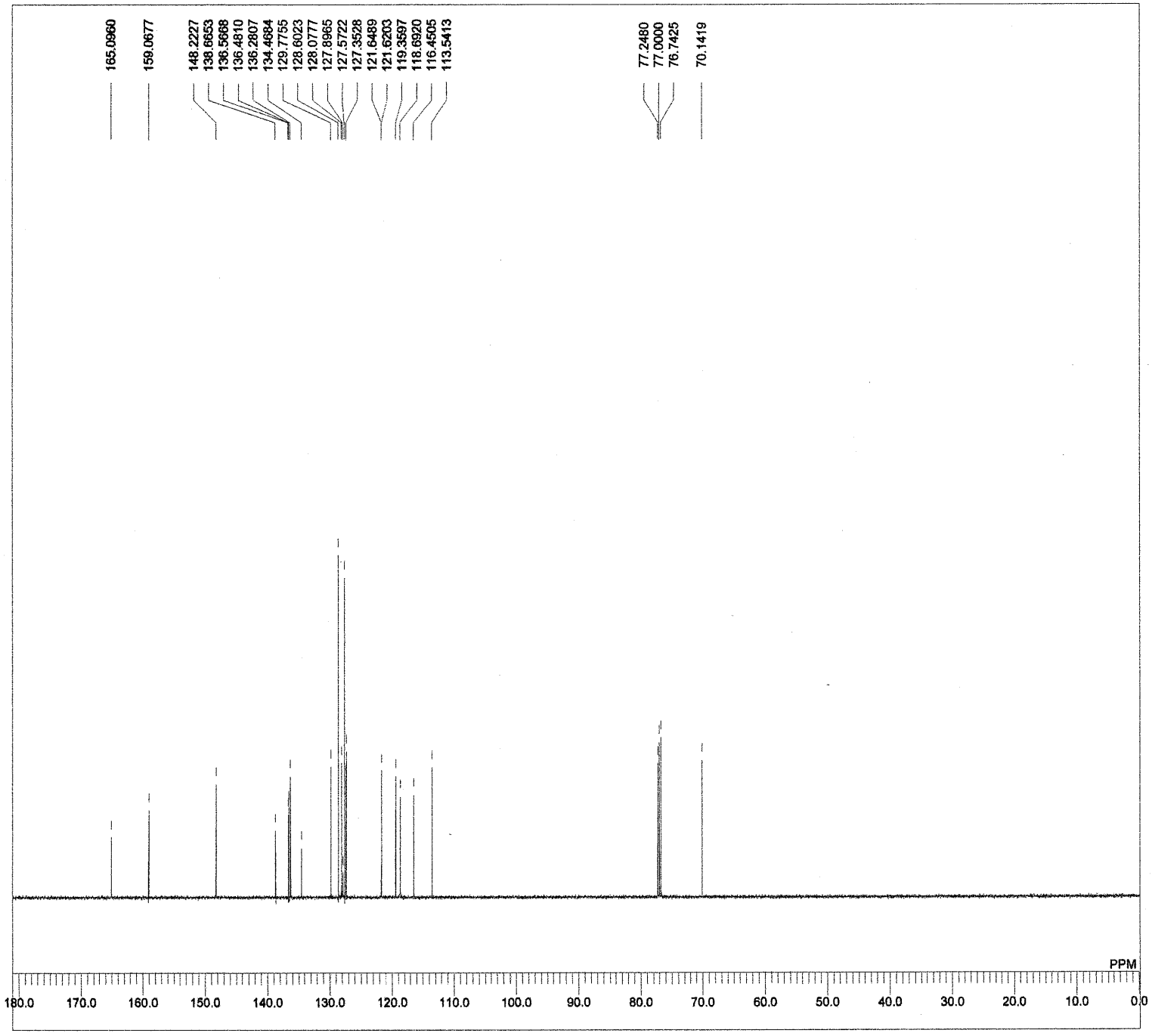
DFILE skk-sm-1d-C-1-1.als
COMNT skk-sm-1d-C
DATIM 2014-02-18 15:03:30
OBNUC 13C
EXMOD carbon.jxp
OBFRQ 125.77 MHz
OBSET 7.87 KHz
OBFIN 4.21 Hz
POINT 32767
FREQU 39308.18 Hz
SCANS 129
ACQTM 0.8336 sec
PD 3.0000 sec
PW1 3.40 usec
IRNUC 1H
CTEMP 21.9 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 0.12 Hz
RGAIN 60



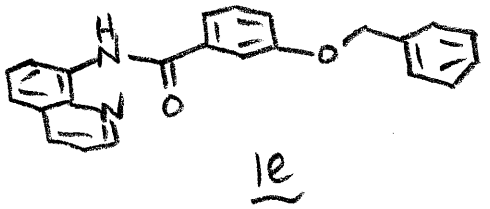
1d


DFILE skk-sm-1e-H-1-1.als
COMNT skk-sm-1e-H
DATIM 2014-02-18 15:14:22
OBNUC 1H
EXMOD proton.jxp
OBFRQ 500.16 MHz
OBSET 2.41 KHz
OBFIN 6.01 Hz
POINT 16384
FREQU 9384.38 Hz
SCANS 8
ACQTM 1.7459 sec
PD 5.0000 sec
PW1 5.55 usec
IRNUC 1H
CTEMP 21.5 c
SLVNT CDCL3
EXREF 7.26 ppm
BF 0.12 Hz
RGAIN 40
1e
skk-sm-1e-H
PPM

skk-sm-1e-C

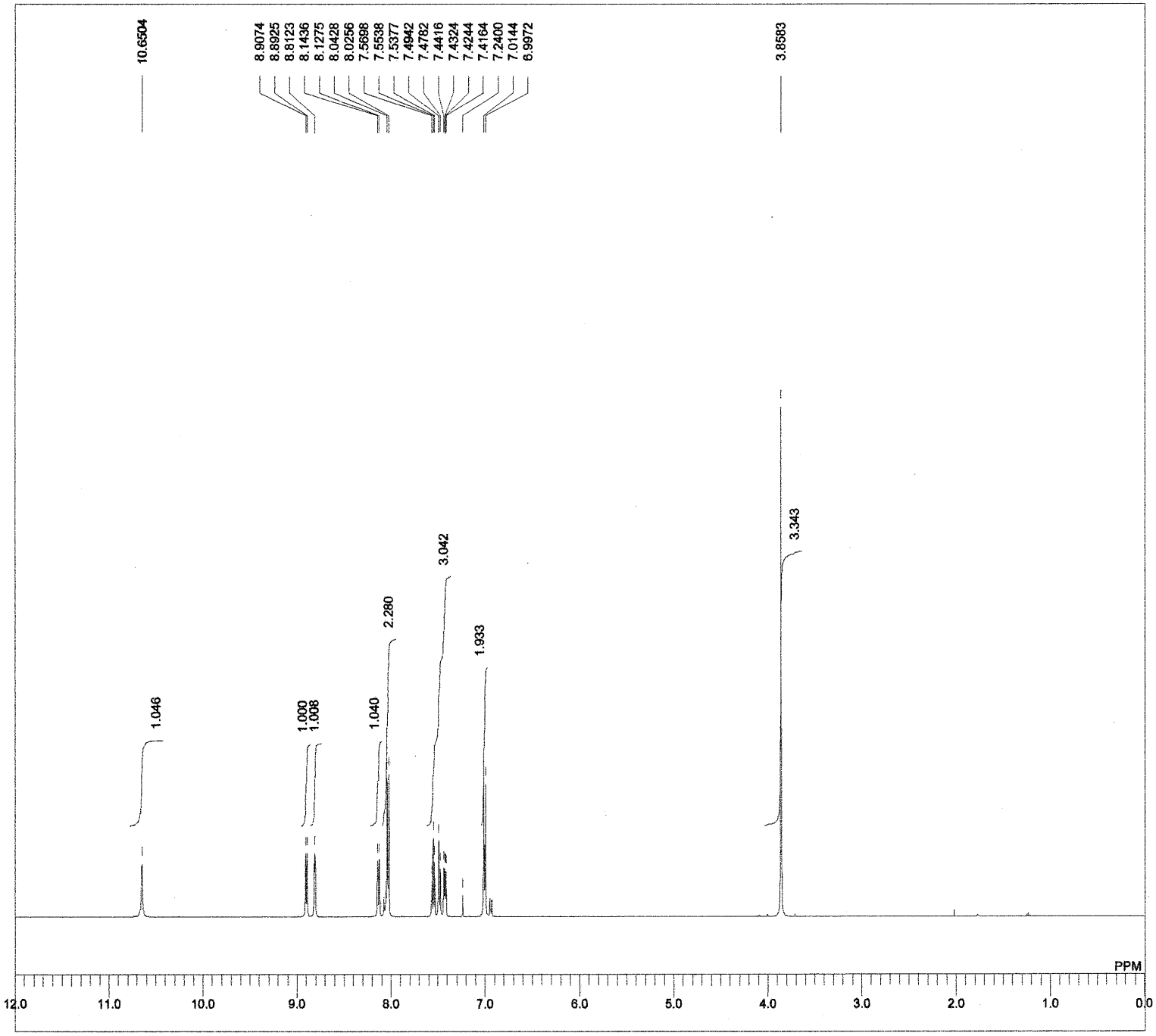


DFILE	skk-sm-1e-C_copy12-1-1.als
COMNT	skk-sm-1e-C
DATIM	2014-02-18 19:24:54
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	211
ACQTM	0.0000 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	21.8 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	0.12 Hz
RGAIN	60

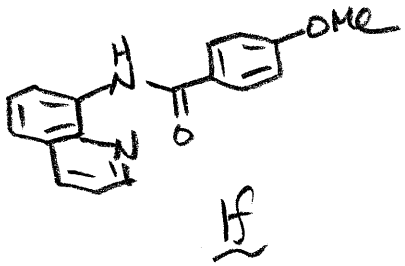


1e

skk-sm-1f-H

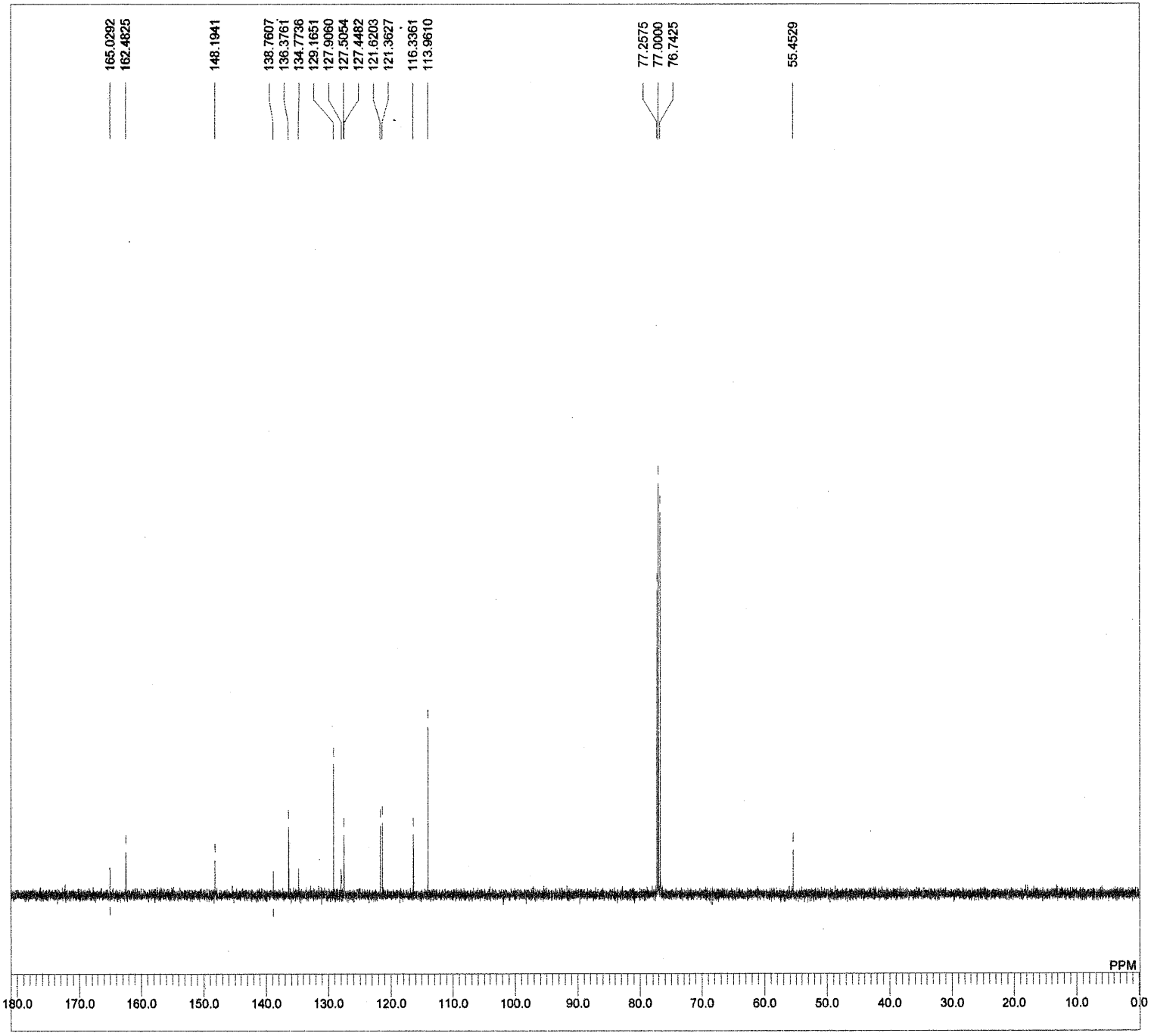


DFILE	skk-sm-1f-H-2-1.als
COMNT	skk-sm-1f-H
DATIM	2014-02-18 19:16:24
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	16384
FREQU	9384.38 Hz
SCANS	8
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	21.2 c
SLVNT	CDCL3
EXREF	7.24 ppm
BF	0.12 Hz
RGAIN	32

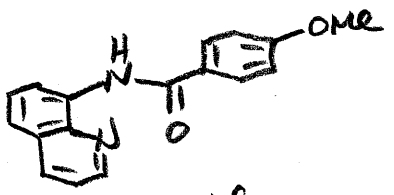


1f

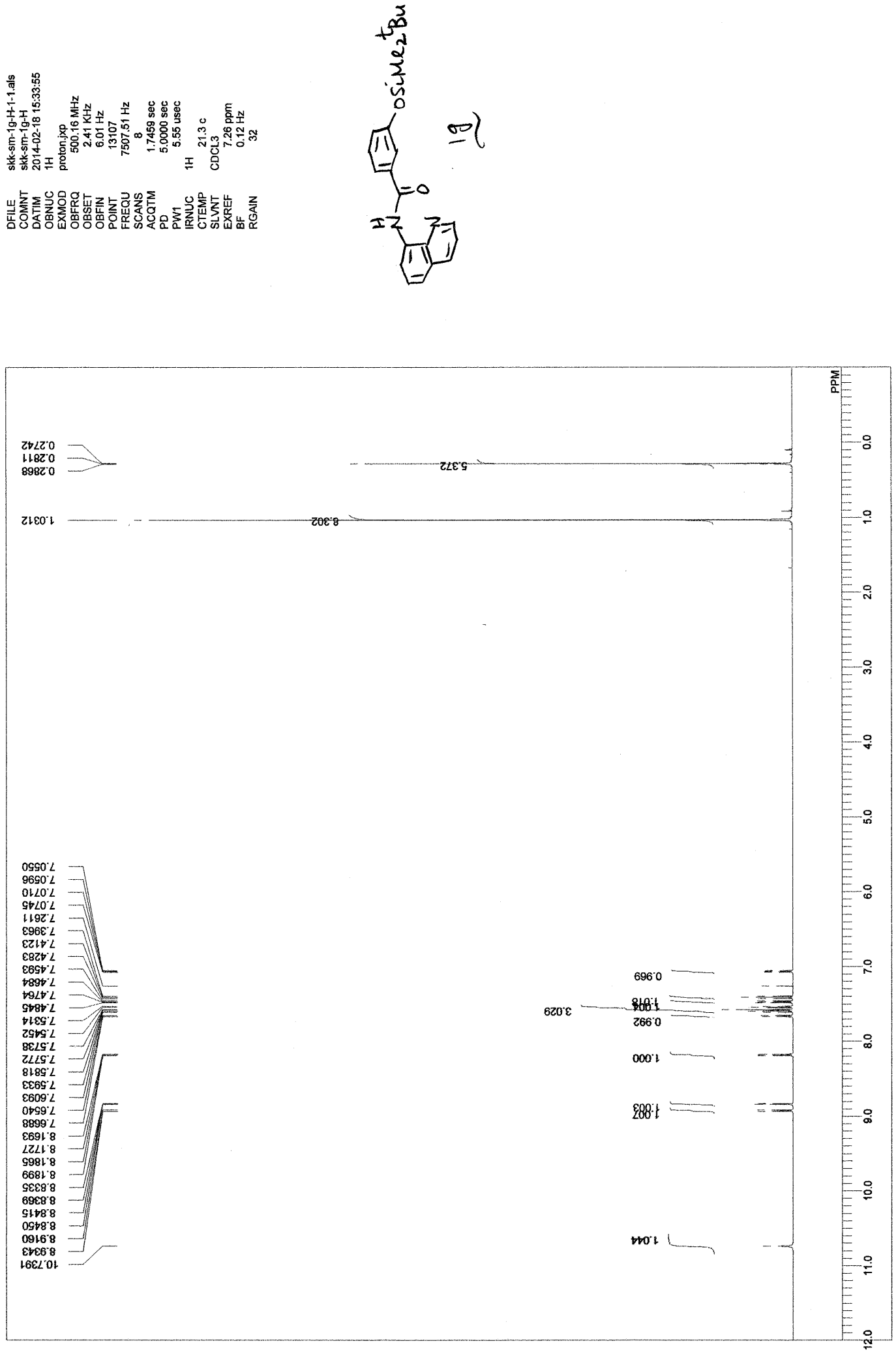
skk-sm-1f-C



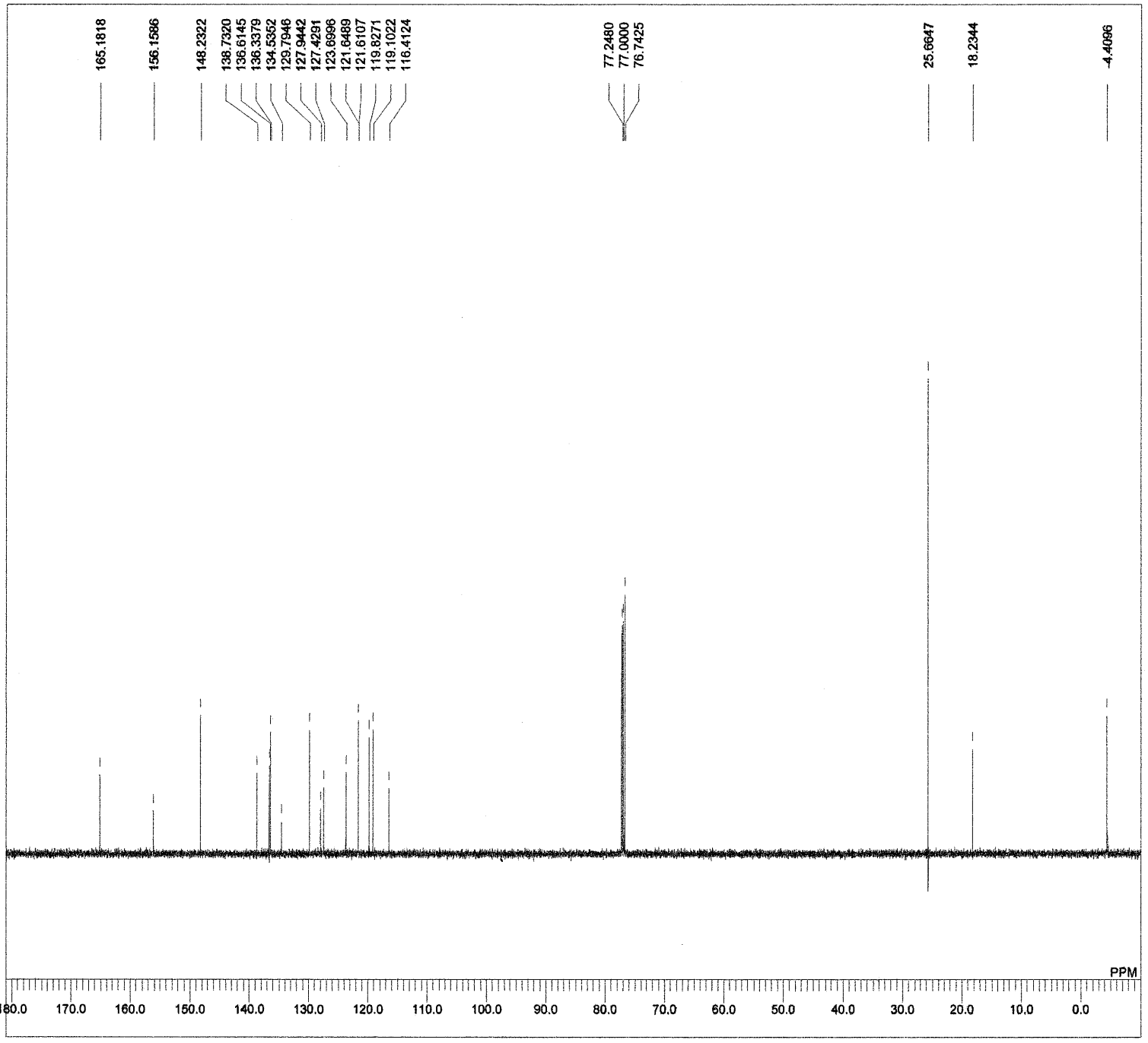
DFILE	skk-sm-1f-C-1-1.jdf
COMNT	skk-sm-1f-C
DATIM	2014-02-18 15:24:22
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	102
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	21.3 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	0.12 Hz
RGAIN	60



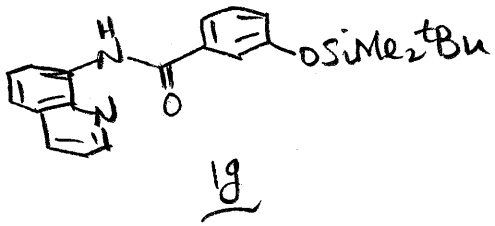
1f


DFILE skk-sm-1g-H-1-1.als
COMNT skk-sm-1g-H
DATIM 2014-02-18 15:33:55
OBNUC 1H
EXMOD proton.jxp
OBFRQ 500.16 MHz
OBSET 2.41 KHz
OBFIN 6.01 Hz
POINT 13107
FREQU 7507.51 Hz
SCANS 8
ACQTM 1.7459 sec
PD 5.0000 sec
PW1 5.55 usec
IRNUC 1H
CTEMP 21.3 c
SLVNT CDCL3
EXREF 7.26 ppm
BF 0.12 Hz
RGAIN 32
OSiMe2tBu
19
skk-sm-1g-H
PPM
0.2742
0.2811
0.2868
1.0312
8.302
5.372
10.7391
8.9343
8.9160
8.8450
8.8415
8.8369
8.8335
8.1899
8.1865
8.1727
8.1693
7.6688
7.6540
7.6093
7.5933
7.5818
7.5772
7.5738
7.5452
7.5314
7.4845
7.4764
7.4684
7.4593
7.4283
7.4123
7.3963
7.2611
7.0745
7.0710
7.0596
7.0550
0.969
1.018
1.004
3.029
0.992
1.000
1.007
1.003
1.044

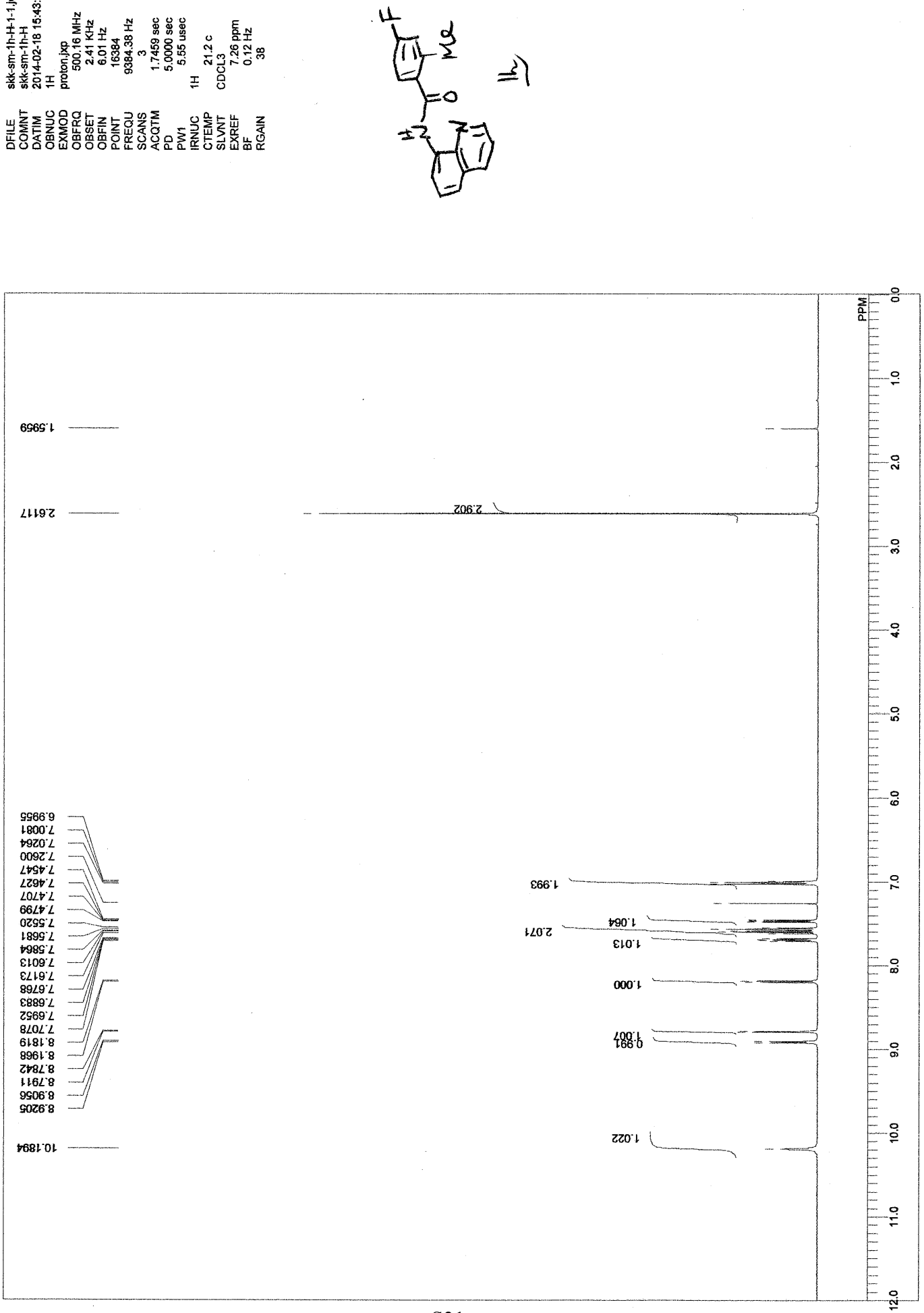
skk-sm-1g-C



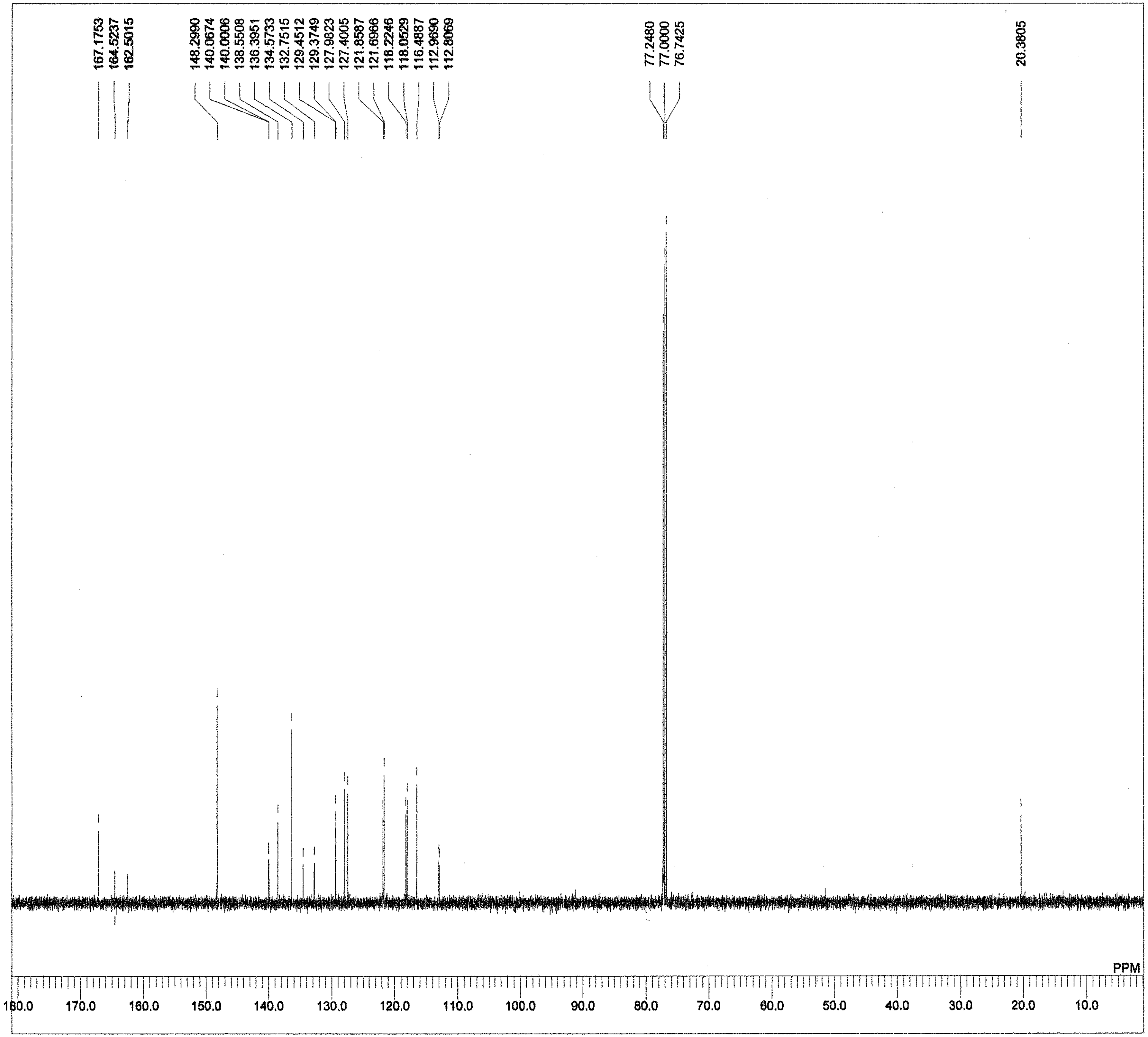
DFILE	skk-sm-1g-C-1-1.als
COMNT	skk-sm-1g-C
DATIM	2014-02-18 15:35:41
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	81
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	21.3 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	0.12 Hz
RGAIN	60



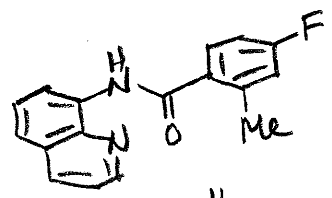
1g


DFILE skk-sm-1h-H-1-1.jdf
COMNT skk-sm-1h-H
DATIM 2014-02-18 15:43:40
OBNUC 1H
EXMOD proton.jxp
OBFRQ 500.16 MHz
OBSET 2.41 KHz
OBFIN 6.01 Hz
POINT 16384
FREQU 9384.38 Hz
SCANS 3
ACQTM 1.7459 sec
PD 5.0000 sec
PW1 5.55 usec
IRNUC 1H
CTEMP 21.2 c
SLVNT CDCL3
EXREF 7.26 ppm
BF 0.12 Hz
RGAIN 38
PPM
skk-sm-1h-H

skk-sm-1h-C

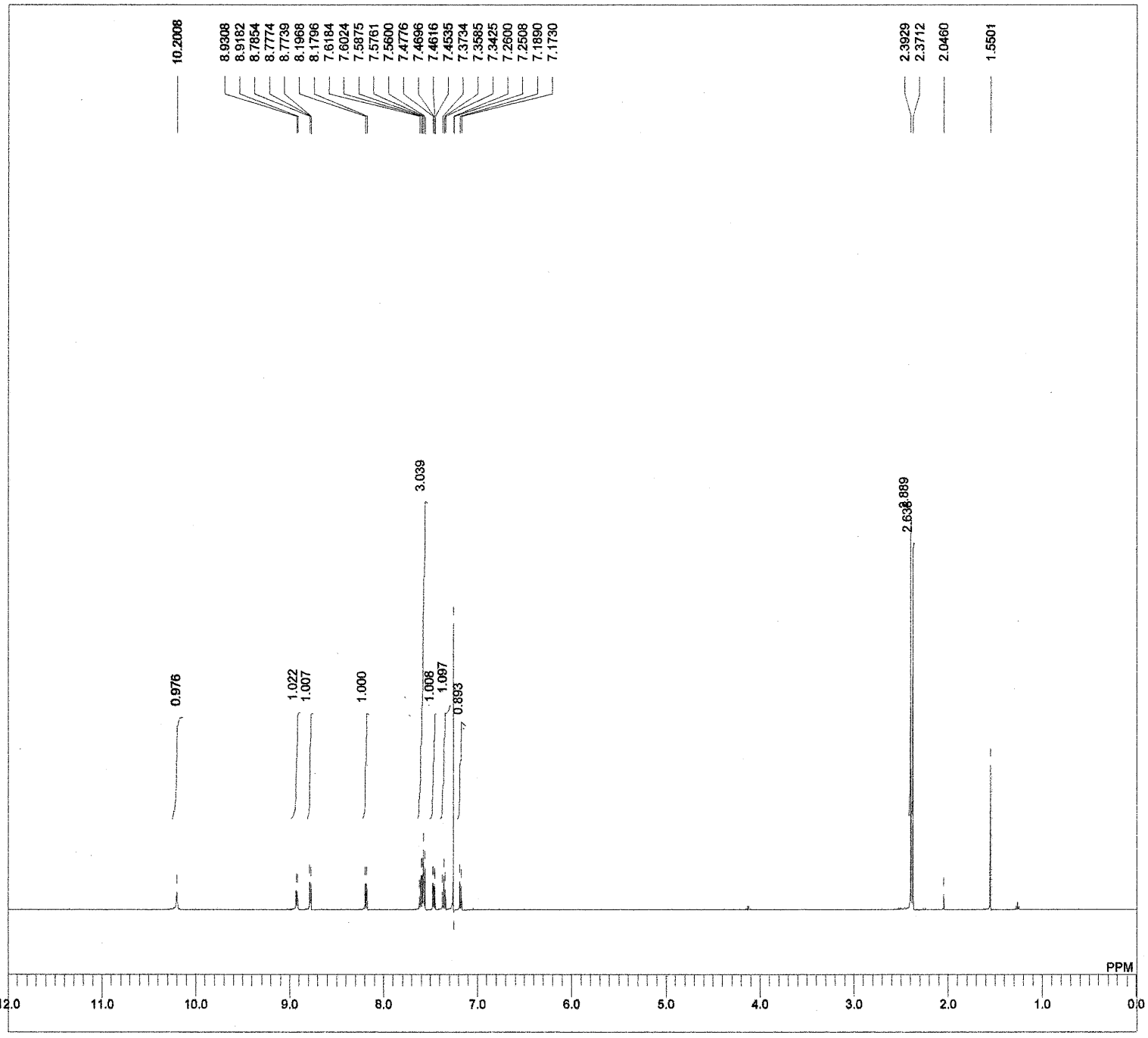


DFILE	skk-sm-1h-C-1-1.als
COMNT	skk-sm-1h-C
DATIM	2014-02-18 15:51:03
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	200
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	21.6 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	0.12 Hz
RGAIN	60

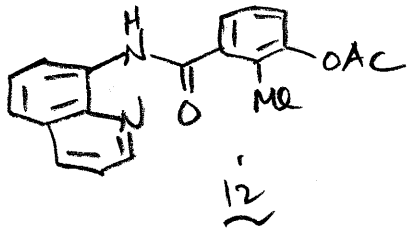


1h

skk-sm-1i-H(OAc_Me)

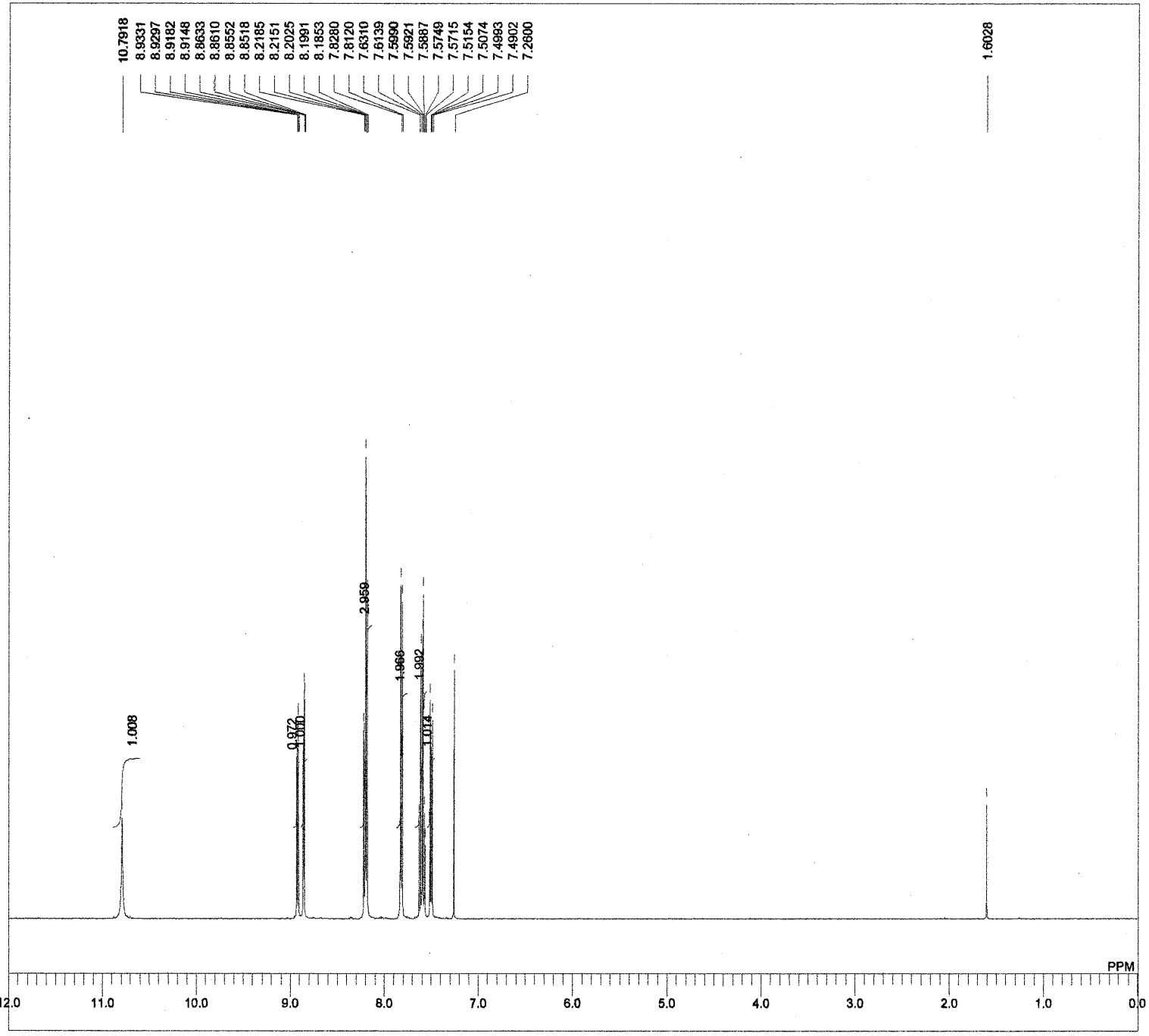


DFILE	skk-sm-1i-H(OAc_Me)-1-1.jdf
COMNT	skk-sm-1i-H(OAc_Me)
DATIM	2014-02-18 16:07:08
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	16384
FREQU	9384.38 Hz
SCANS	8
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	21.7 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	0.12 Hz
RGAIN	40

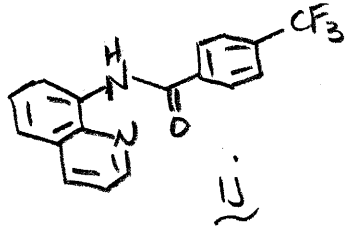


12

skk-sm-1j-H(CF3)

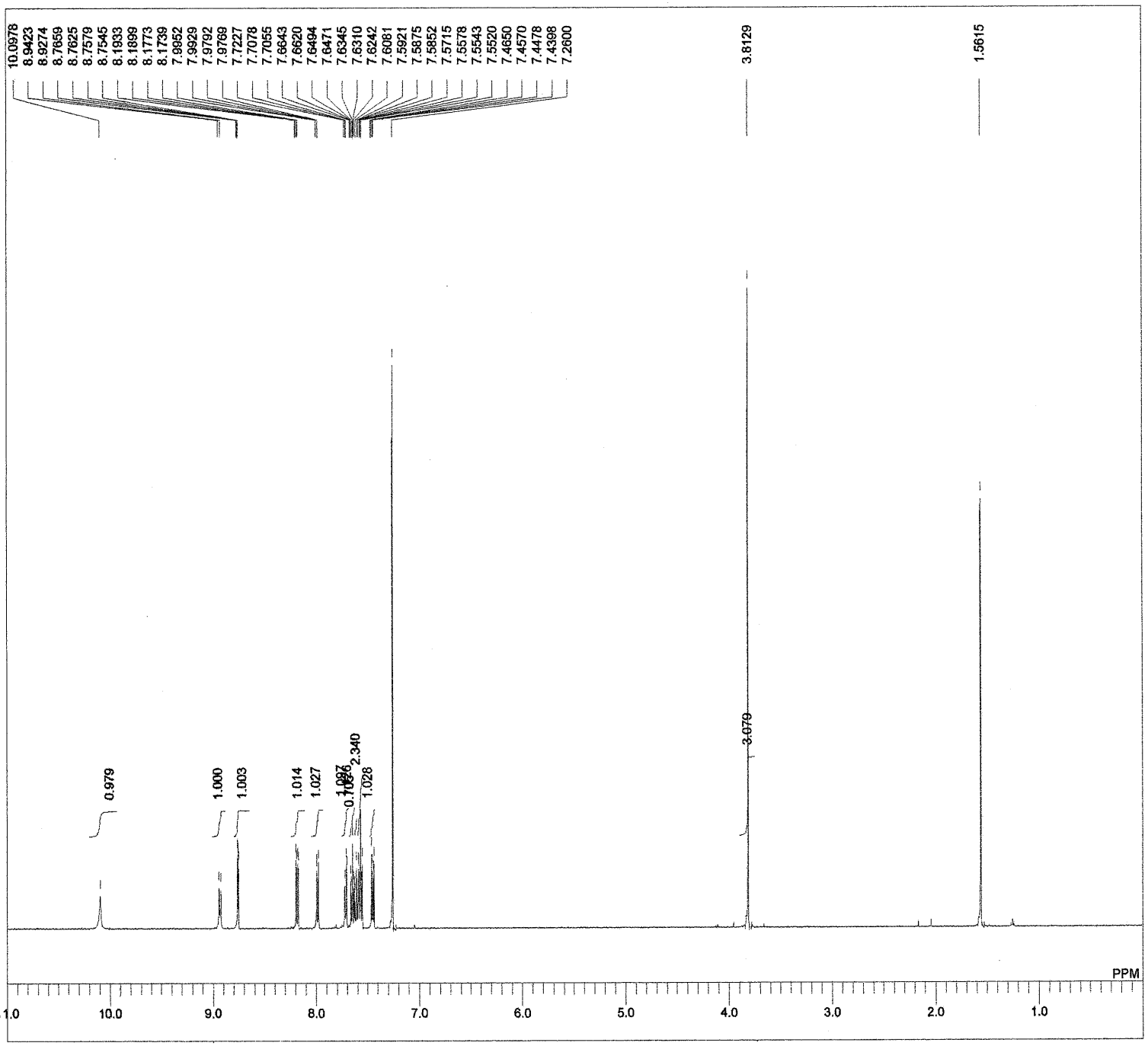


DFILE	skk-sm-1j-H(CF3)-1-1.als
COMNT	skk-sm-1j-H(CF3)
DATIM	2014-02-18 16:17:02
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	16384
FREQU	9384.38 Hz
SCANS	8
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	21.4 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	0.12 Hz
RGAIN	38

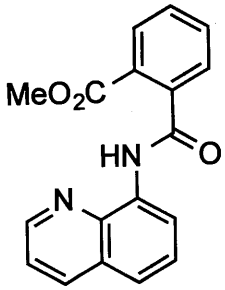


skk-p55-SMsyn-ArCO2Me-H

1k

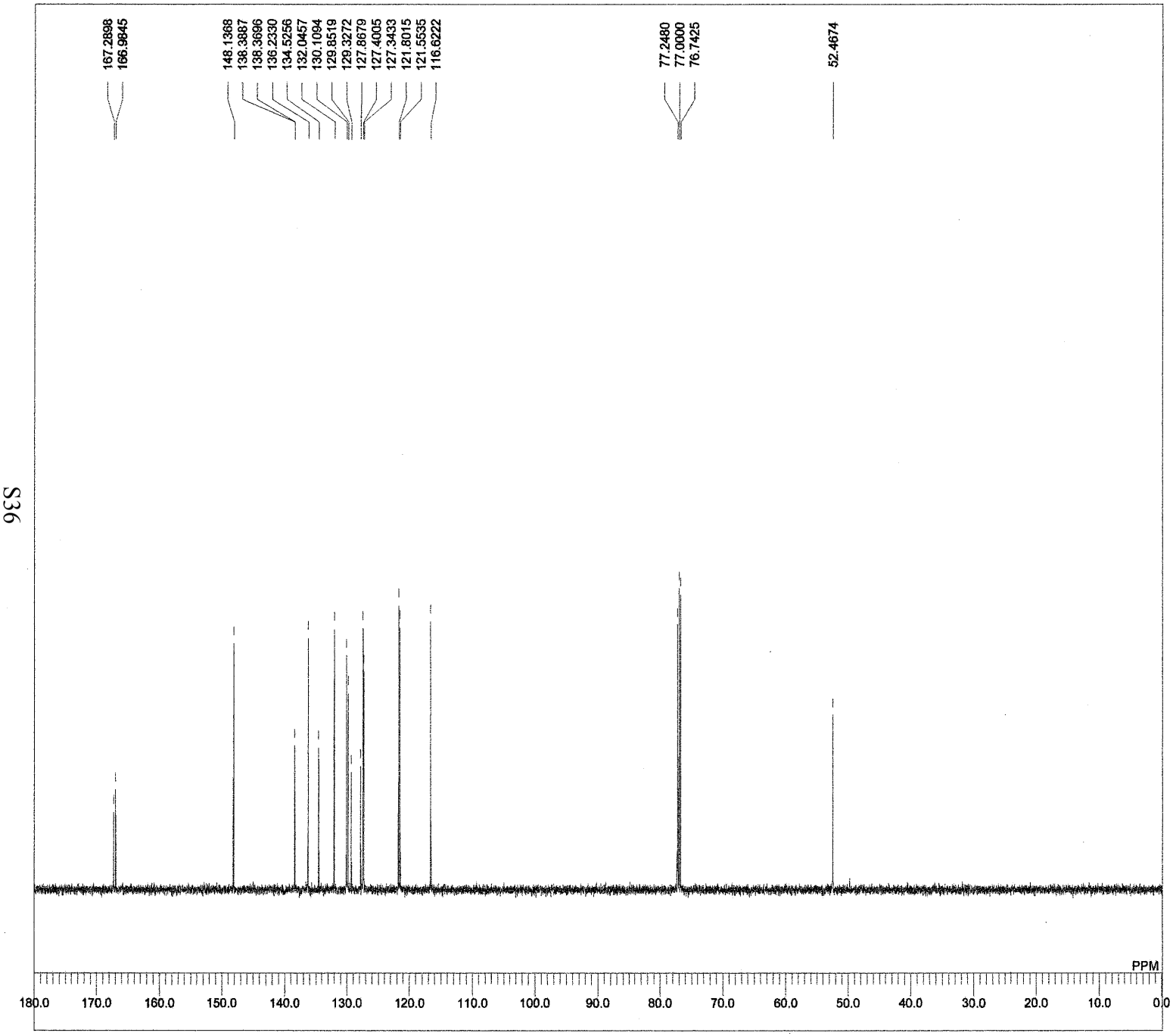


DFILE	skk-p55-SMsyn-ArCO2Me-H1-1.als
COMNT	skk-p55-SMsyn-ArCO2Me-H
DATIM	2013-10-28 14:31:49
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	13107
FREQU	7507.51 Hz
SCANS	8
ACQTM	0.0000 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	23.6 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	0.12 Hz
RGAIN	34

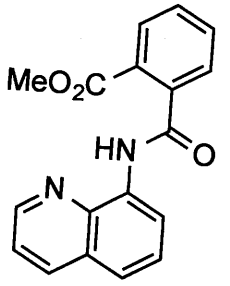


1k

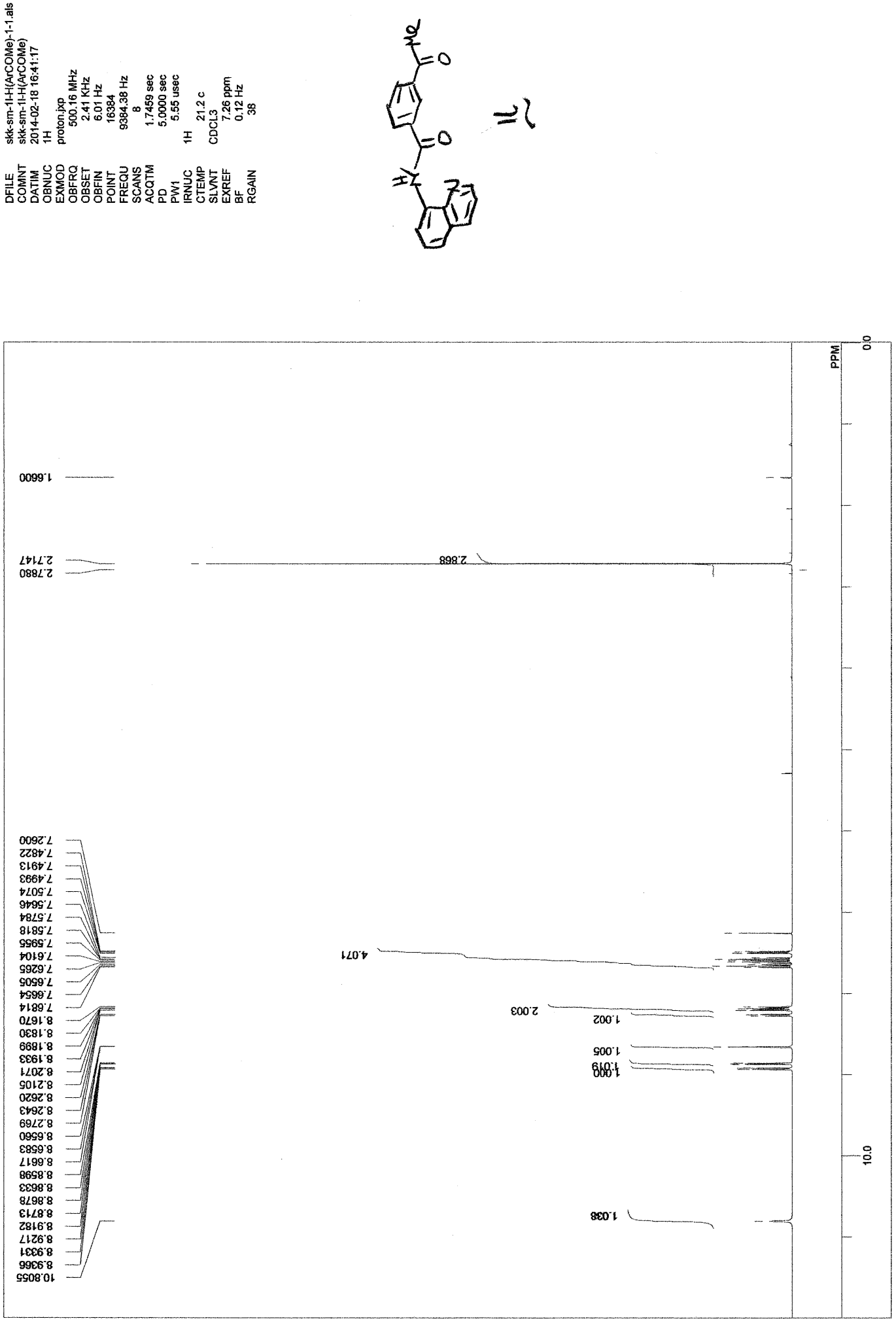
skk-p55-SMsyn-ArCO2Me-C 1k



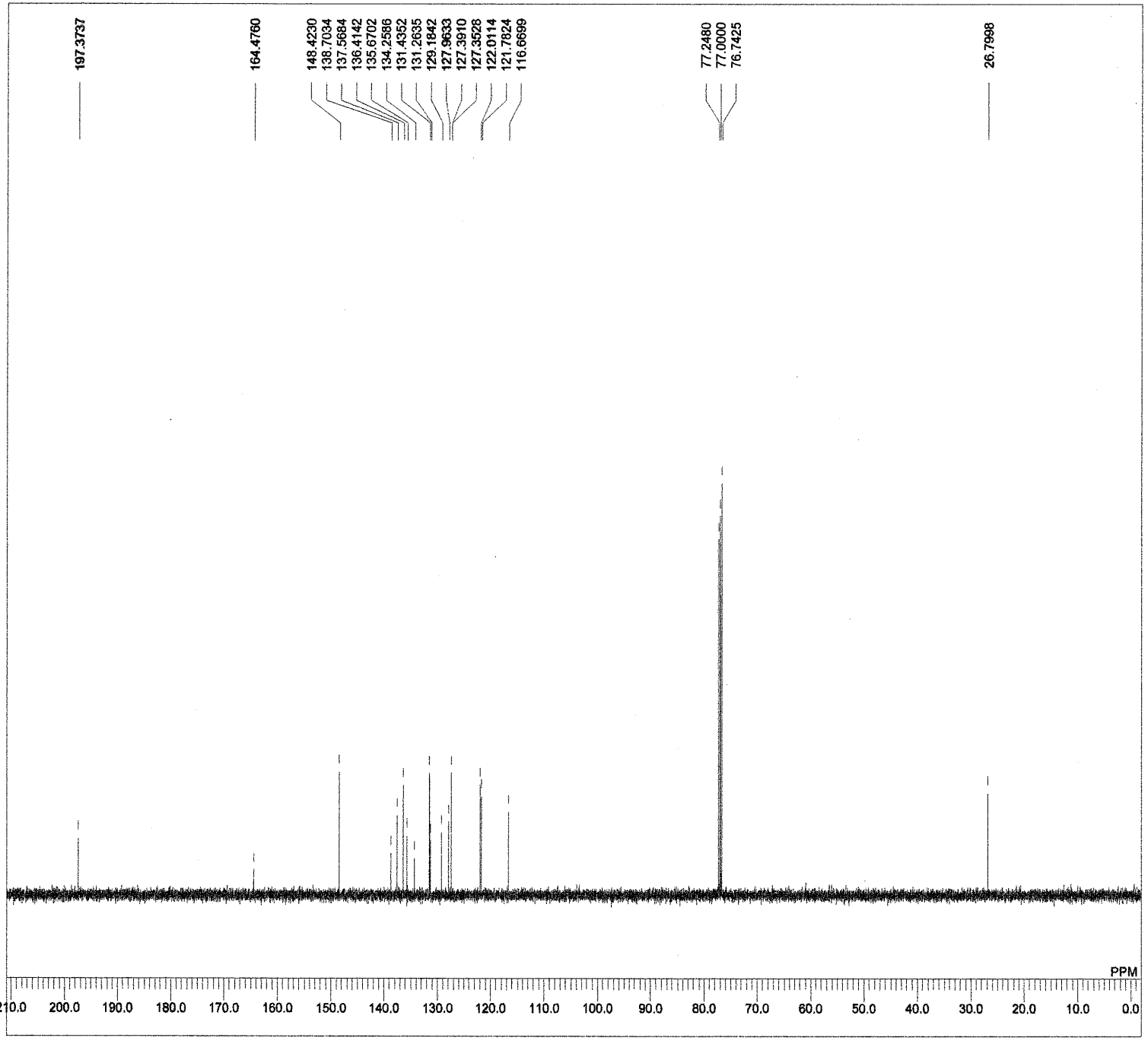
DFILE skk-p55-SMsyn-ArCO2Me-C-2-1.jdf
COMNT skk-p55-SMsyn-ArCO2Me-C
DATIM 2013-10-28 16:13:39
OBNUC 13C
EXMOD carbon.jxp
OBFRQ 125.77 MHz
OBSET 7.87 KHz
OBFIN 4.21 Hz
POINT 32767
FREQU 39308.18 Hz
SCANS 55
ACQTM 0.8336 sec
PD 3.0000 sec
PW1 3.40 usec
IRNUC 1H
CTEMP 23.8 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.00 Hz
RGAIN 60



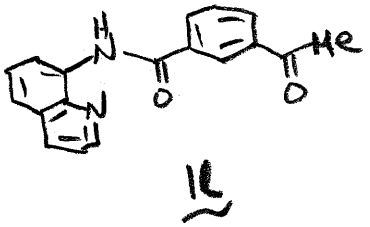
1k


DFILE skk-sm-1l-H(ArCOMe)-1-1.als
COMNT skk-sm-1l-H(ArCOMe)
DATIM 2014-02-18 16:41:17
OBNUC 1H
EXMOD proton.jxp
OBFRQ 500.16 MHz
OBSET 2.41 KHz
OBFIN 6.01 Hz
POINT 16384
FREQU 9384.38 Hz
SCANS 8
ACQTM 1.7459 sec
PD 5.0000 sec
PW1 5.55 usec
IRNUC 1H
CTEMP 21.2 c
SLVNT CDCL3
EXREF 7.26 ppm
BF 0.12 Hz
RGAIN 38
1l
PPM
0.0
10.0
1.6600
2.7147
2.7880
2.868
4.071
2.003
1.002
1.005
1.019
1.000
1.038
10.8055
8.9366
8.9331
8.9217
8.9182
8.8713
8.8678
8.8633
8.8598
8.8617
8.6583
8.6560
8.2769
8.2643
8.2620
8.2105
8.2071
8.1933
8.1899
8.1830
8.1670
7.6814
7.6654
7.6505
7.6265
7.6104
7.5955
7.5818
7.5784
7.5646
7.5074
7.4993
7.4913
7.4822
7.2600
skk-sm-1l-H(ArCOMe)

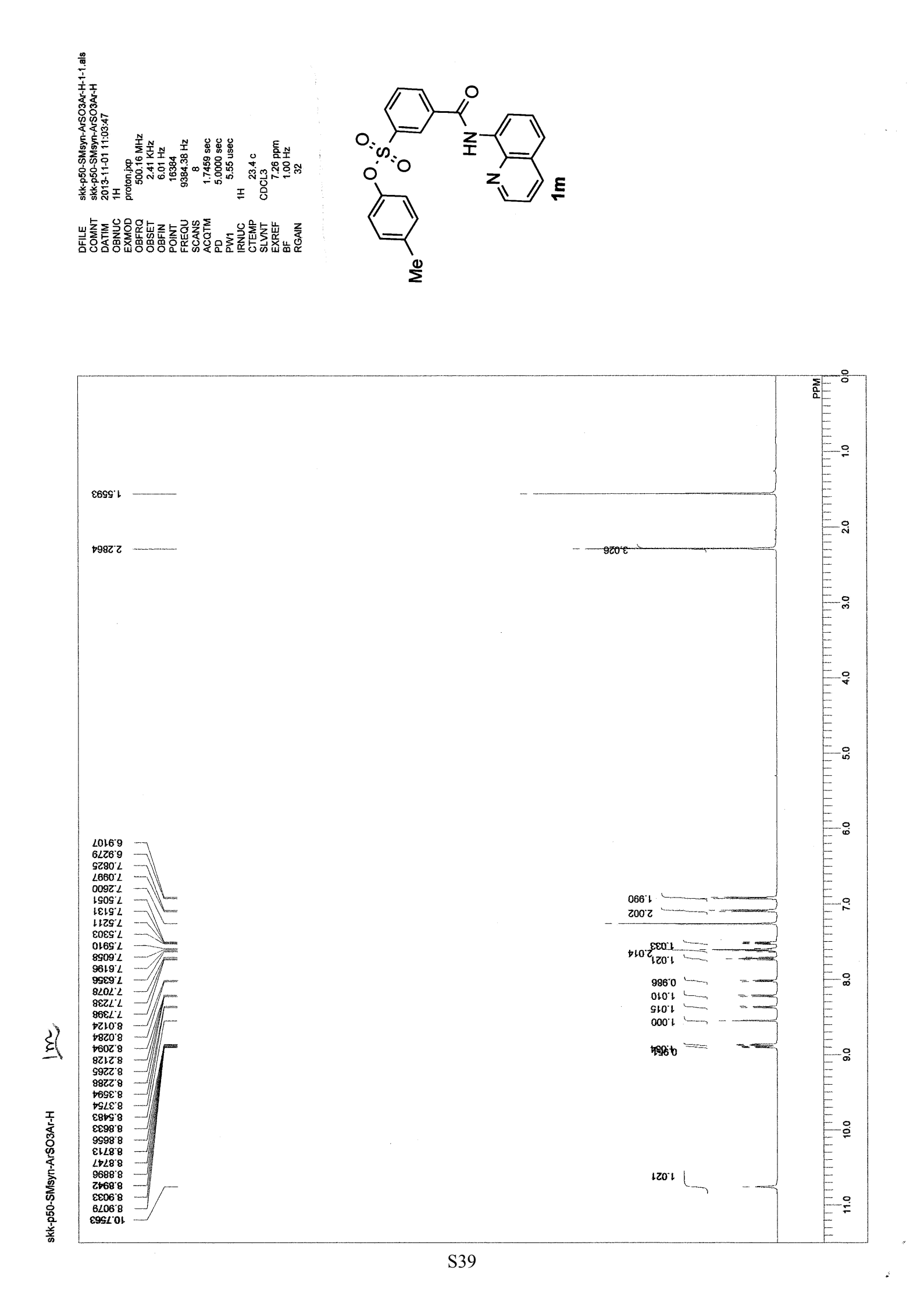
skk-sm-1l-C(ArCOMe)



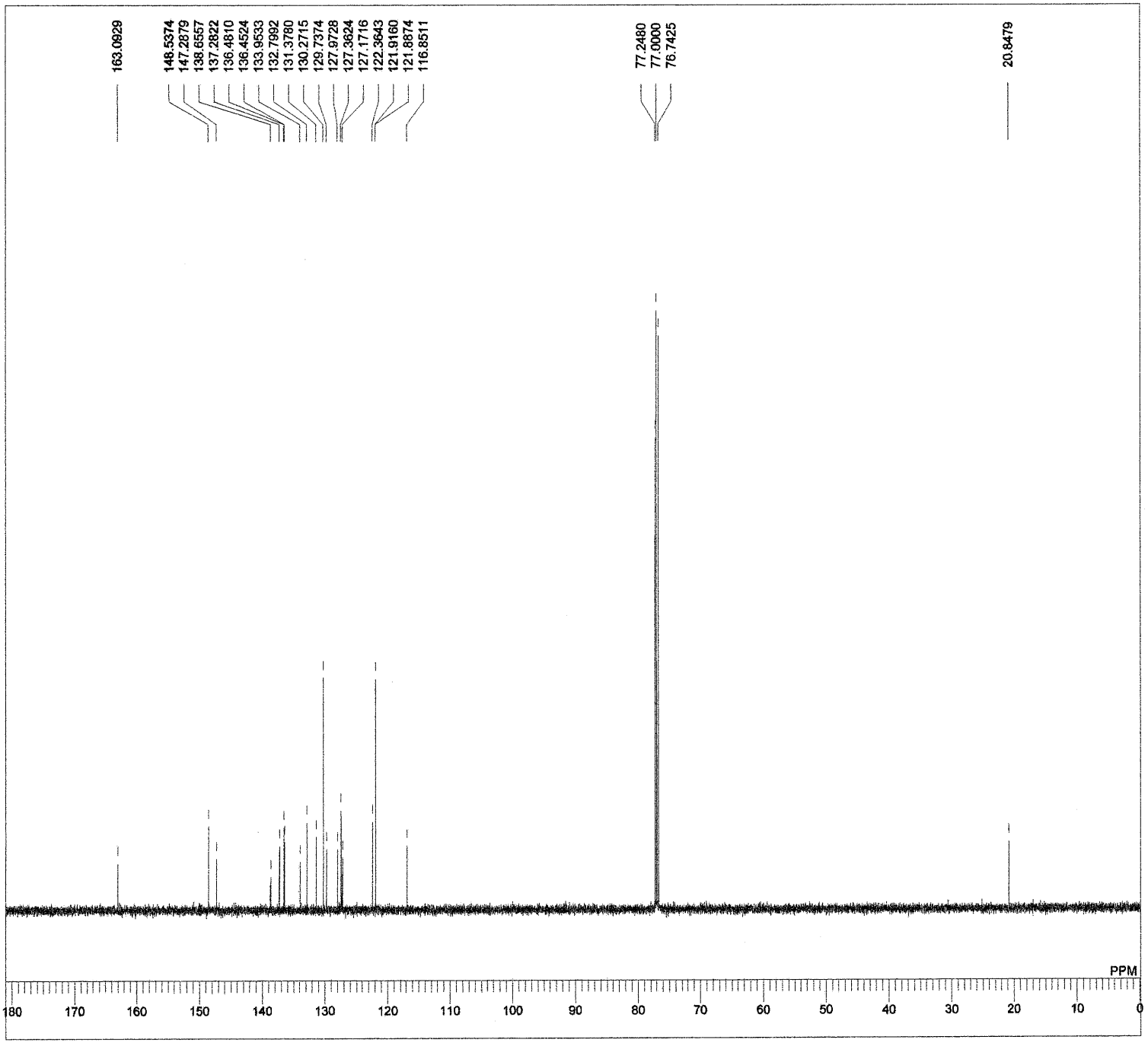
DFILE	skk-sm-1l-C(ArCOMe)-1-1.jdf
COMNT	skk-sm-1l-C(ArCOMe)
DATIM	2014-02-18 16:43:09
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	105
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	22.0 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	0.12 Hz
RGAIN	60



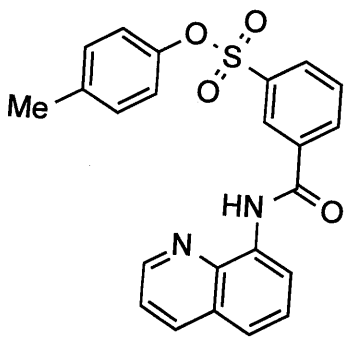
1L


DFILE skk-p50-SMsyn-ArSO3Ar-H-1-1.als
COMNT skk-p50-SMsyn-ArSO3Ar-H
DATIM 2013-11-01 11:03:47
OBNUC 1H
EXMOD proton.jxp
OBFRQ 500.16 MHz
OBSET 2.41 KHz
OBFIN 6.01 Hz
POINT 16384
FREQU 9384.38 Hz
SCANS 8
ACQTM 1.7459 sec
PD 5.0000 sec
PW1 5.55 usec
IRNUC 1H
CTEMP 23.4 c
SLVNT CDCL3
EXREF 7.26 ppm
BF 1.00 Hz
RGAIN 32
Me
HN
N
1m
skk-p50-SMsyn-ArSO3Ar-H
PPM

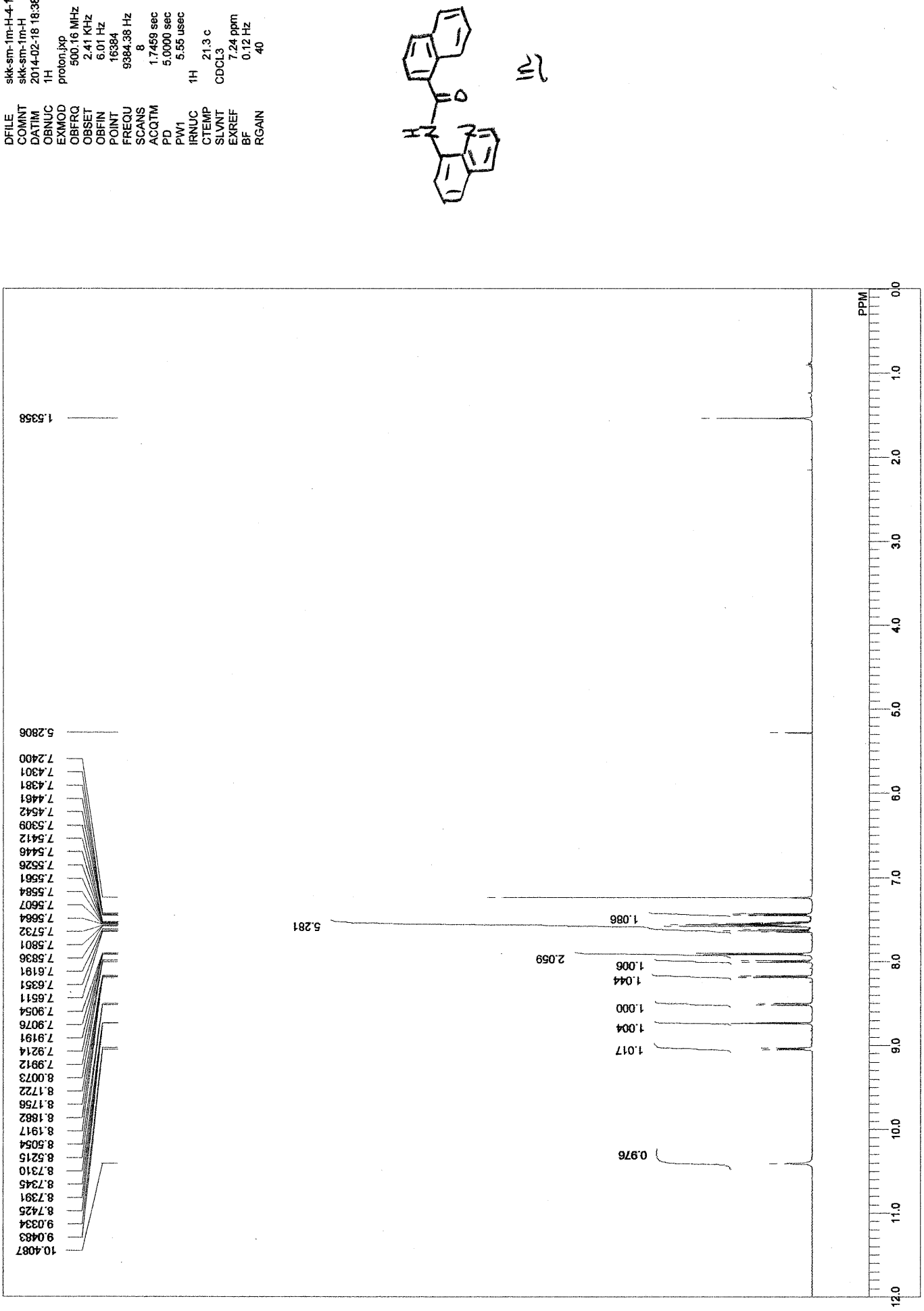
skk-p55-SMsyn-8AQSO3Ar-C

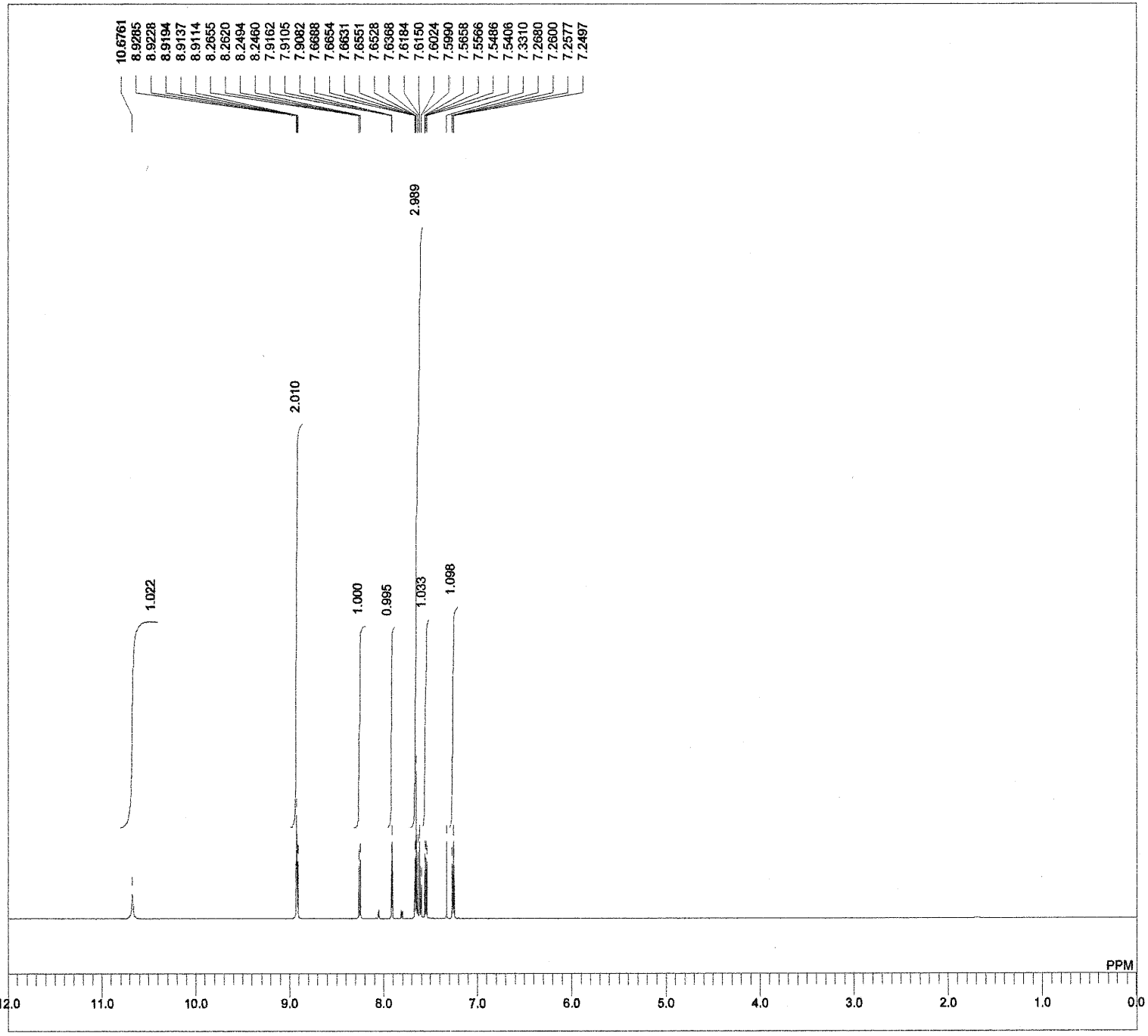


DFILE	skk-p55-SMsyn-8AQSO3Ar-C-1-1.jdf
COMNT	skk-p55-SMsyn-8AQSO3Ar-C
DATIM	2013-10-28 15:05:11
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	357
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	24.2 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	0.12 Hz
RGAIN	60

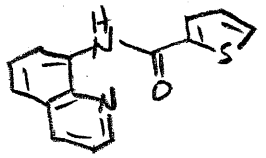


1m

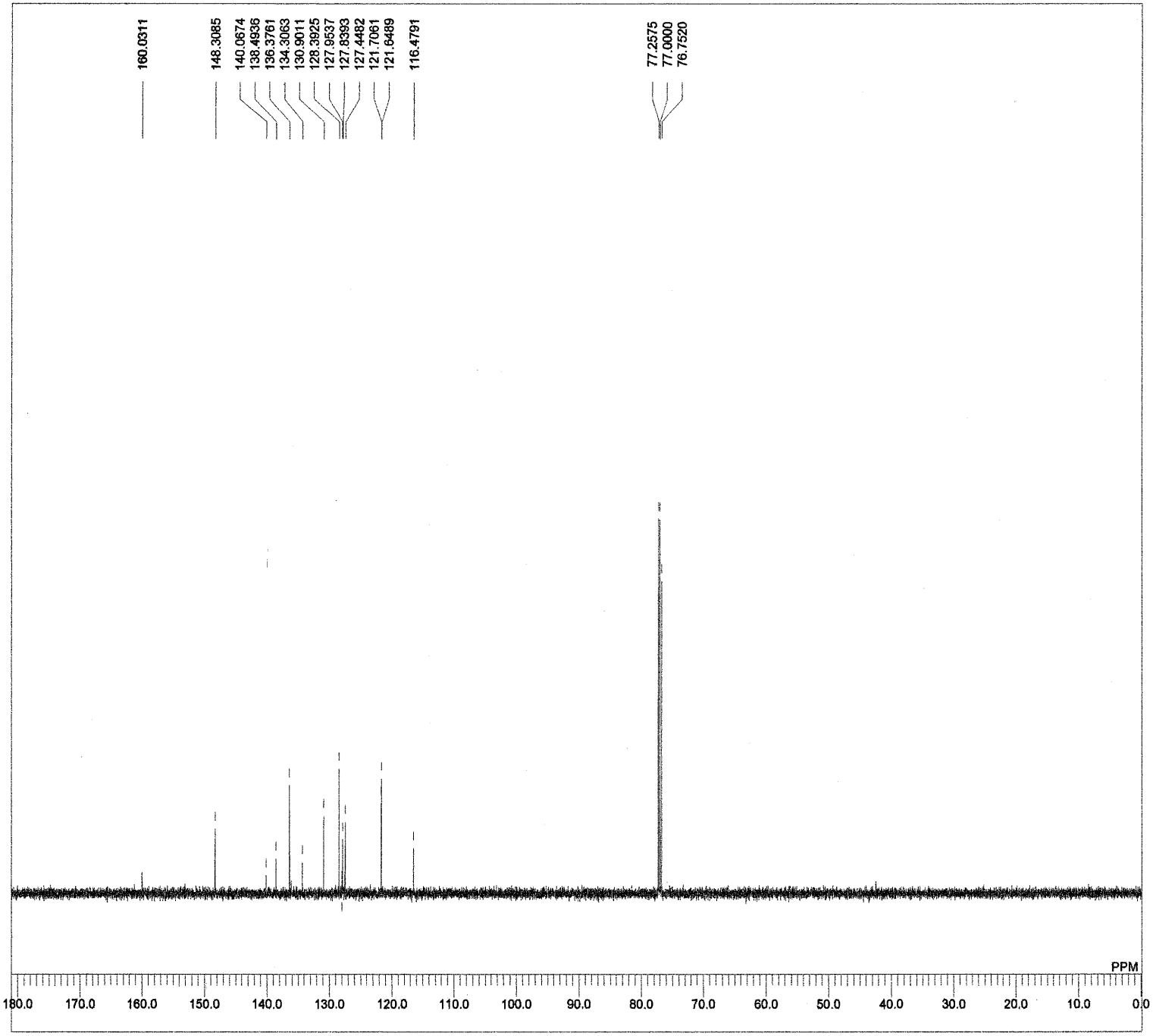

DFILE skk-sm-1m-H-4-1.jdf
COMNT skk-sm-1m-H
DATIM 2014-02-18 18:38:43
OBNUC 1H
EXMOD proton.jxp
OBFRQ 500.16 MHz
OBSET 2.41 KHz
OBFIN 6.01 Hz
POINT 16384
FREQU 9384.38 Hz
SCANS 8
ACQTM 1.7459 sec
PD 5.0000 sec
PW1 5.55 usec
IRNUC 1H
CTEMP 21.3 c
SLVNT CDCL3
EXREF 7.24 ppm
BF 0.12 Hz
RGAIN 40
1.5358
5.2806
7.2400
7.4301
7.4381
7.4461
7.4542
7.5309
7.5412
7.5446
7.5526
7.5561
7.5584
7.5607
7.5664
7.5732
7.5801
7.5836
7.6191
7.6351
7.6511
7.9054
7.9076
7.9191
7.9214
7.9912
8.0073
8.1722
8.1756
8.1862
8.1917
8.5054
8.5215
8.7310
8.7345
8.7391
8.7425
9.0334
9.0483
10.4087
5.281
1.086
2.059
1.006
1.044
1.000
1.004
1.017
0.976
PPM
skk-sm-1m-H



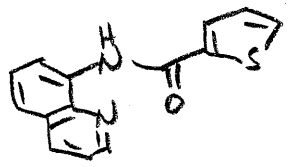
DFILE	skk-sm-1H-H(thioP)-1-1.als
COMNT	skk-sm-1H-H(thioP)
DATIM	2014-02-18 16:52:49
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	16384
FREQU	9384.38 Hz
SCANS	8
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	21.7 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	0.12 Hz
RGAIN	40



1q

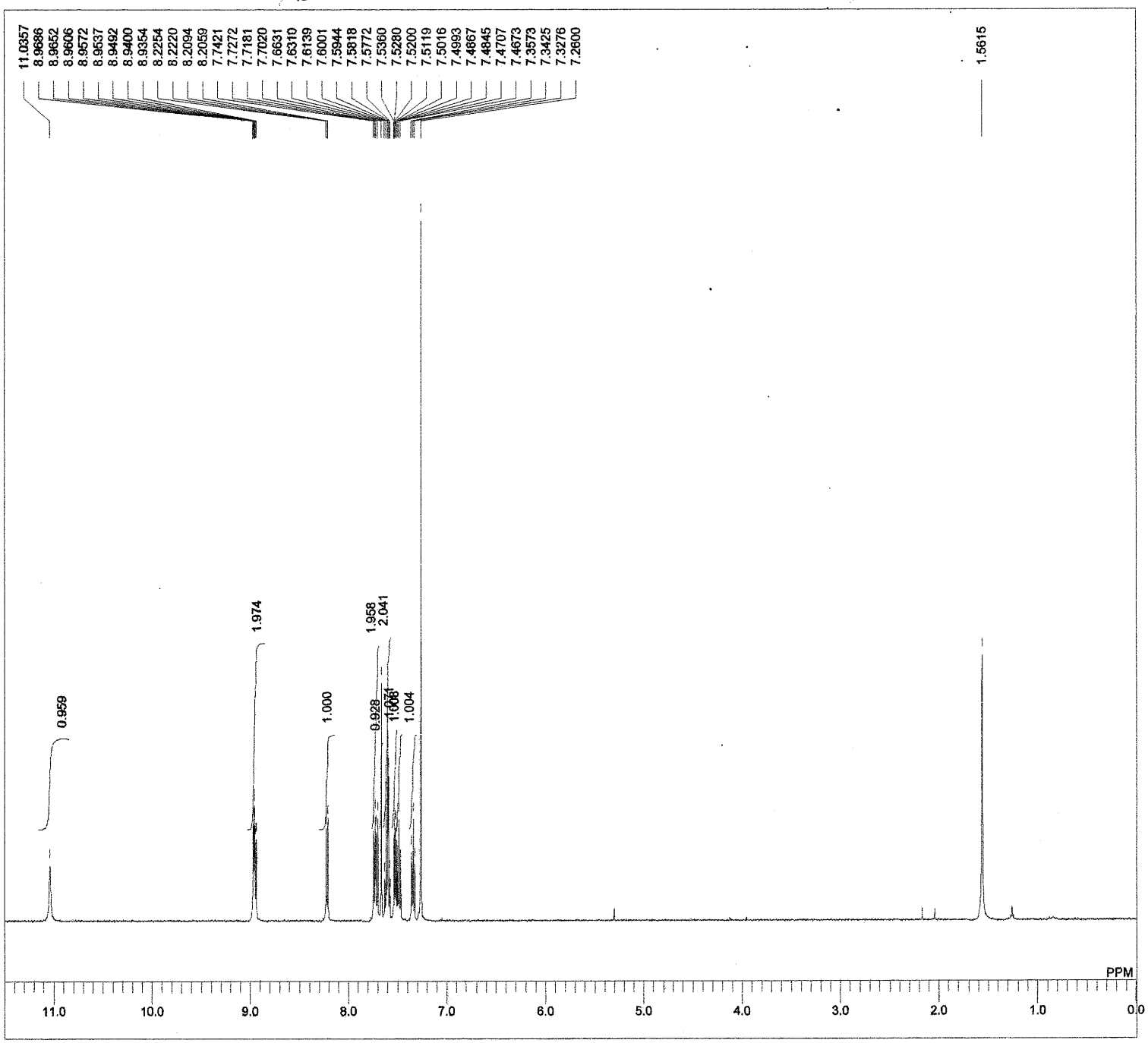


DFILE	skk-sm-1l-C(thioP)-1-1.als
COMNT	skk-sm-1l-C(thioP)
DATIM	2014-02-18 16:54:44
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	105
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	22.0 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	0.12 Hz
RGAIN	60

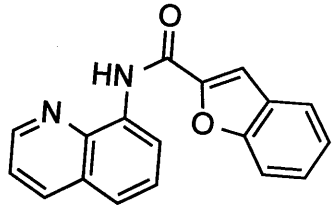


1d

skk-p55-SMsyn-Benzofuran-H

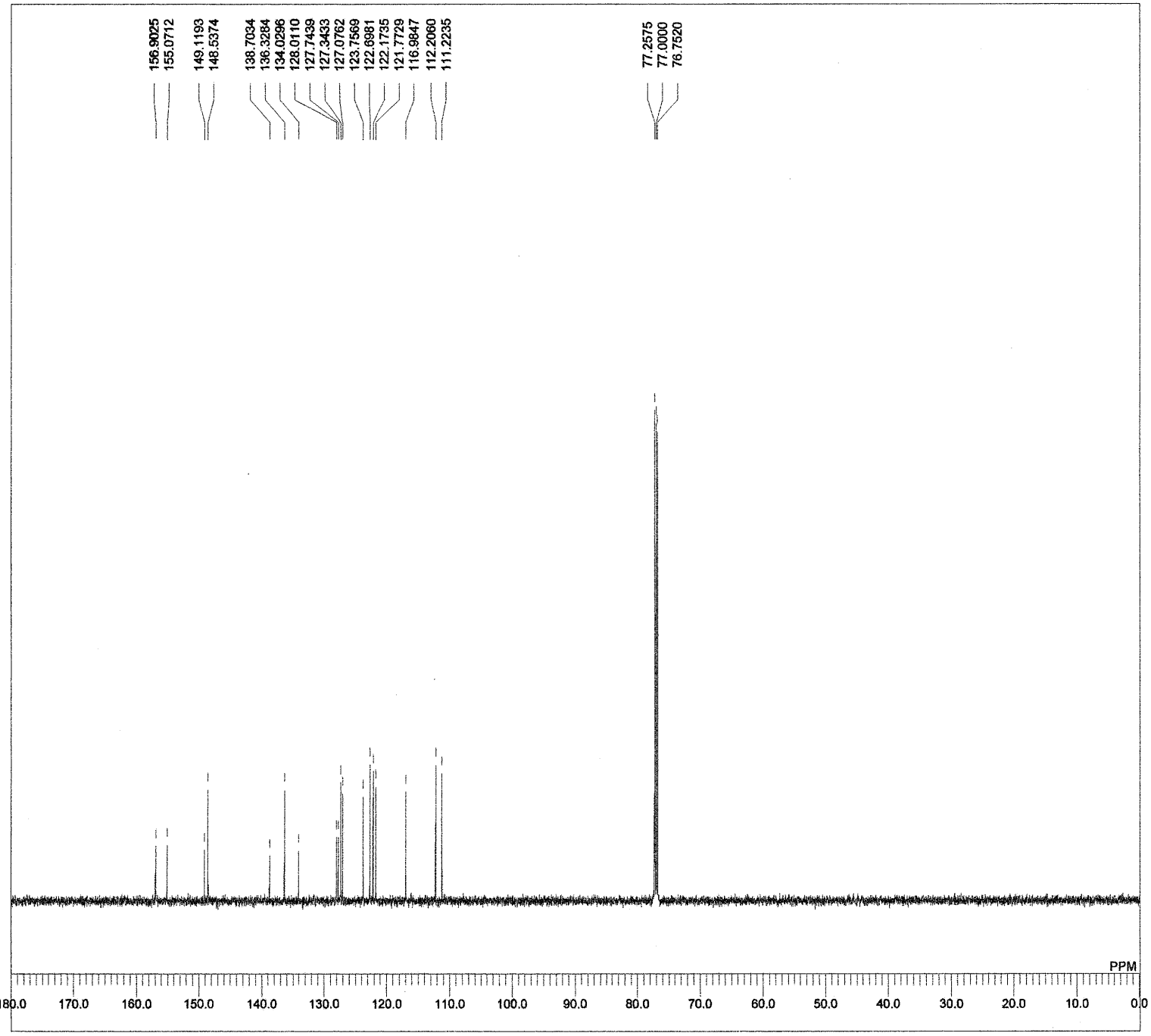


DFILE	skk-p55-SMsyn-Benzofuran-H-1-1.jdf
COMNT	skk-p55-SMsyn-Benzofuran-H
DATIM	2013-10-28 15:31:22
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	16384
FREQU	9384.38 Hz
SCANS	8
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	23.8 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	0.12 Hz
RGAIN	32

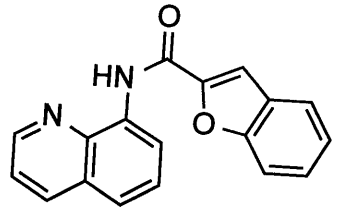


1p

skk-p55-SMsyn-Bfuran-C

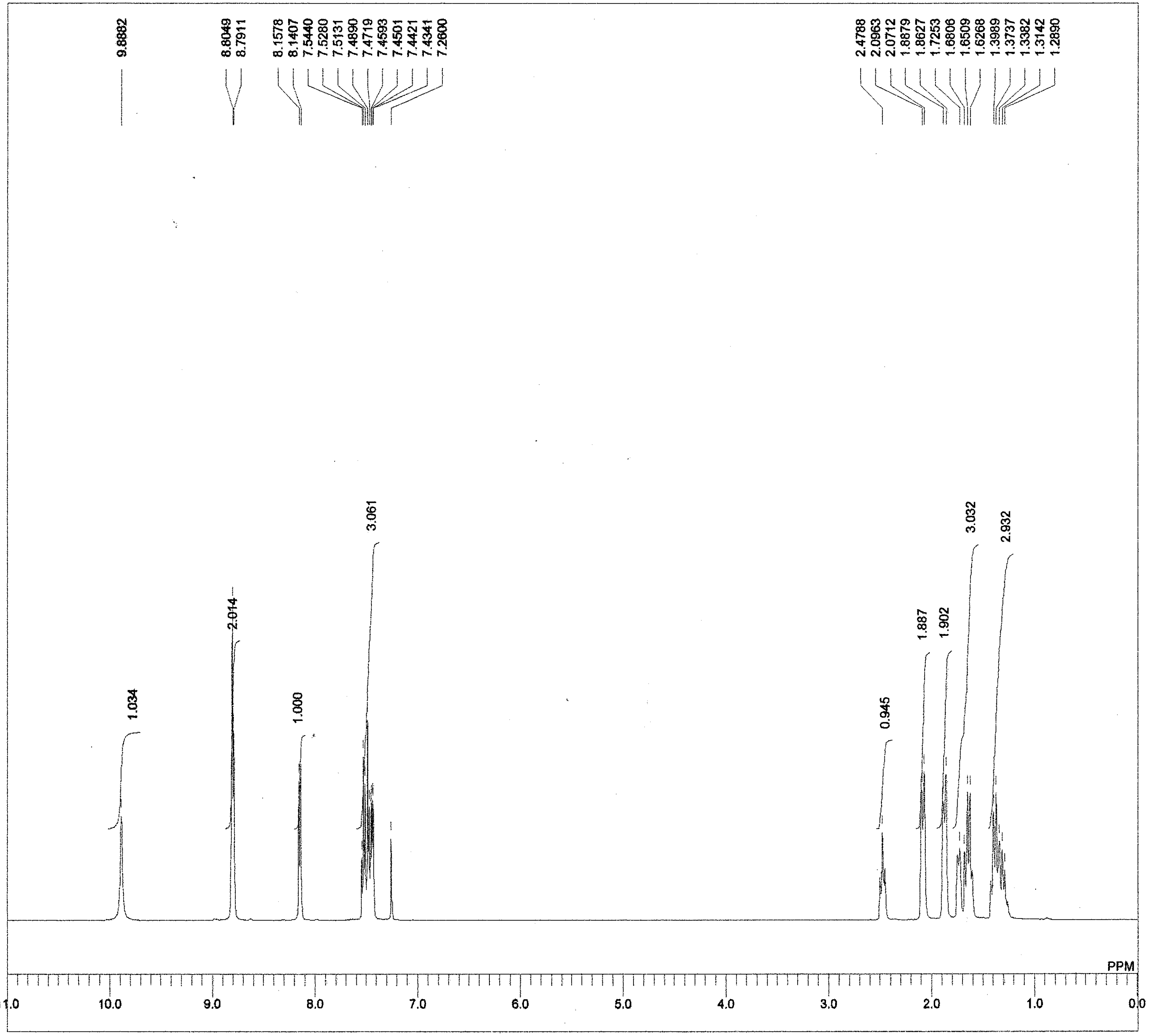


DFILE	skk-p55-SMsyn-Bfuran-C-1-1.als
COMNT	skk-p55-SMsyn-Bfuran-C
DATIM	2013-10-28 16:20:01
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	170
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	24.0 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	1.20 Hz
RGAIN	60

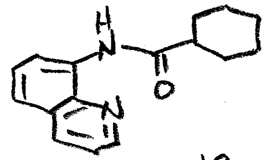


1p

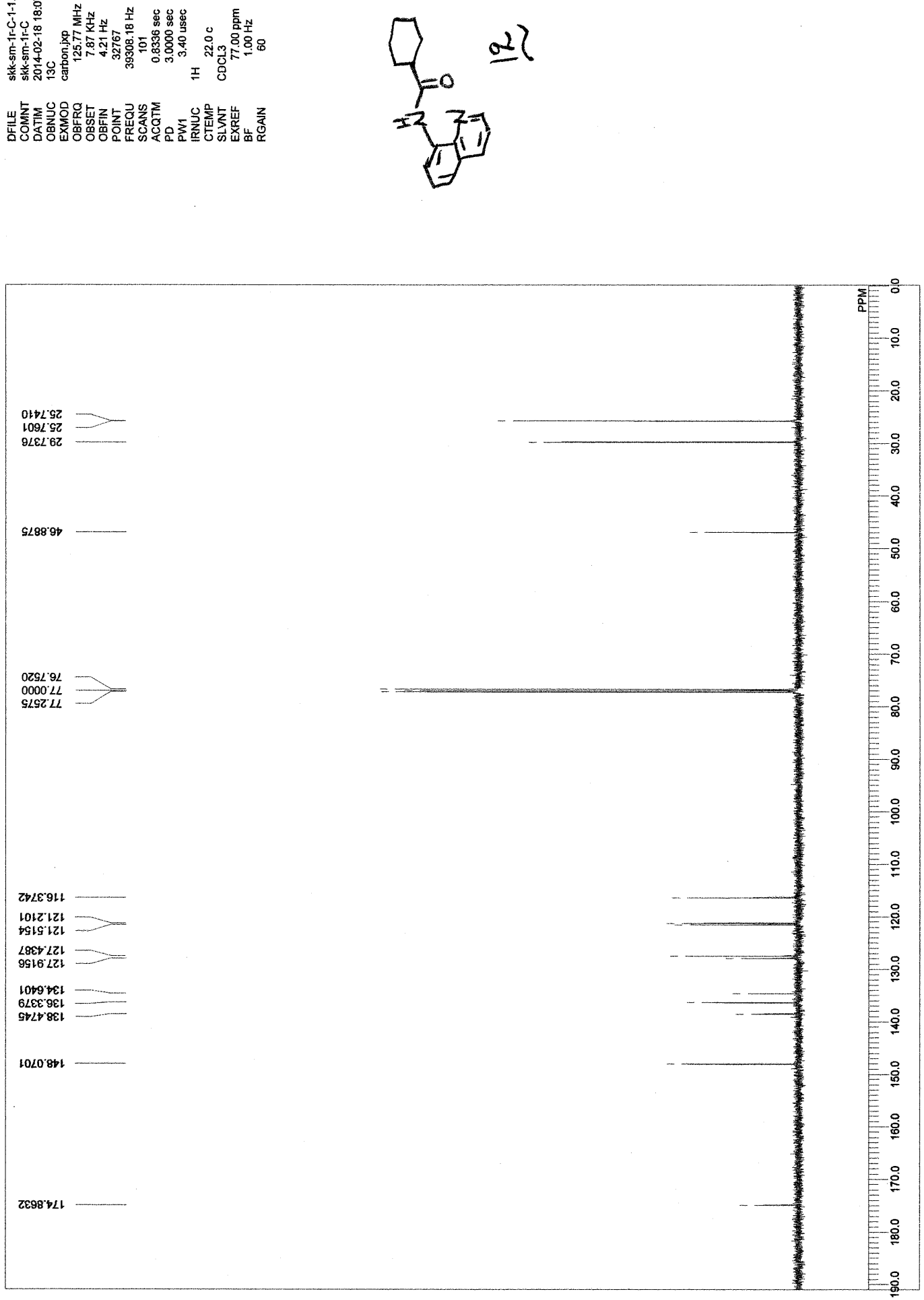
12
skk-sm-1r-H



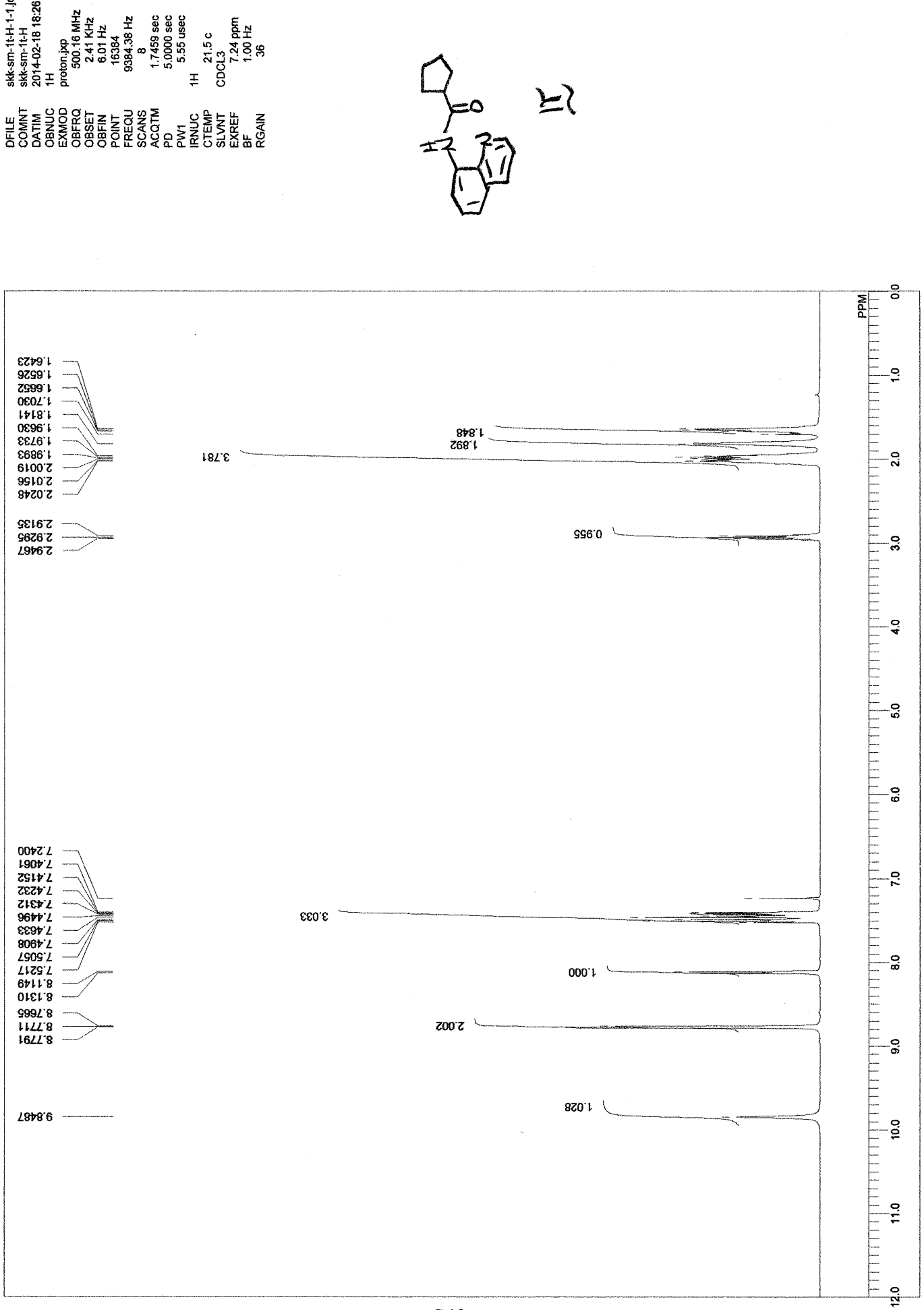
DFILE	skk-sm-1r-H-1-1.jdf
COMNT	skk-sm-1r-H
DATIM	2014-02-18 18:06:01
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	16384
FREQU	9384.38 Hz
SCANS	8
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	21.1 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	1.00 Hz
RGAIN	36



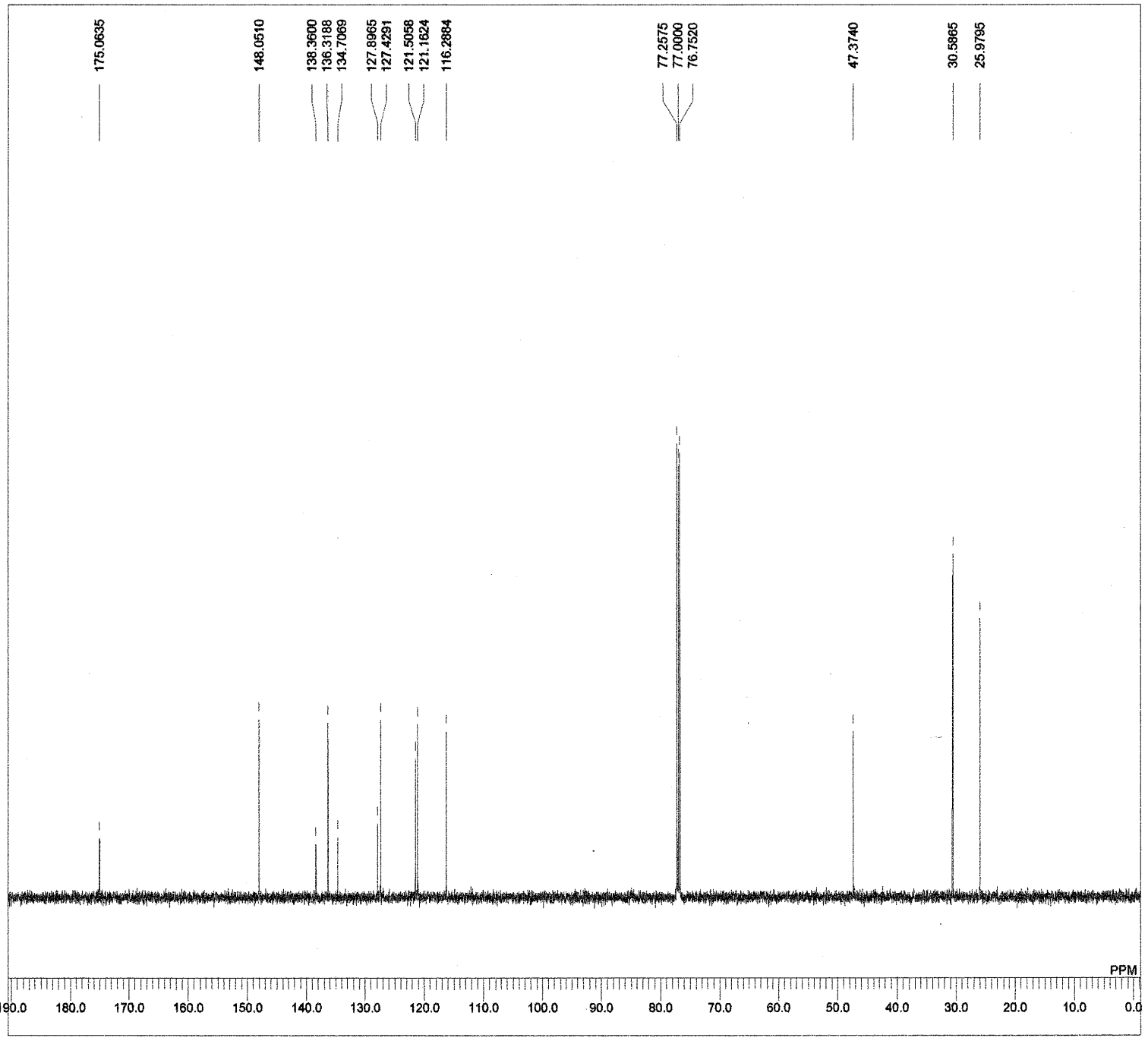
12


DFILE skk-sm-1r-C-1-1.jdf
COMNT skk-sm-1r-C
DATIM 2014-02-18 18:07:53
OBNUC 13C
EXMOD carbon.jxp
OBFRQ 125.77 MHz
OBSET 7.87 KHz
OBFIN 4.21 Hz
POINT 32767
FREQU 39308.18 Hz
SCANS 101
ACQTM 0.8336 sec
PD 3.0000 sec
PW1 3.40 usec
IRNUC 1H
CTEMP 22.0 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.00 Hz
RGAIN 60
192
25.7410
25.7601
29.7376
46.8875
76.7520
77.0000
77.2575
116.3742
121.2101
121.5154
127.4387
127.9156
134.6401
136.3379
138.4745
148.0701
174.8632
PPM
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
100.0
110.0
120.0
130.0
140.0
150.0
160.0
170.0
180.0
190.0

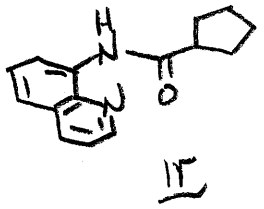
19
skk-sm-1r-C


DFILE skk-sm-1t-H-1-1.jdf
COMNT skk-sm-1t-H
DATIM 2014-02-18 18:26:30
OBNUC 1H
EXMOD proton.jxp
OBFRQ 500.16 MHz
OBSET 2.41 KHz
OBFIN 6.01 Hz
POINT 16384
FREQU 9384.38 Hz
SCANS 8
ACQTM 1.7459 sec
PD 5.0000 sec
PW1 5.55 usec
IRNUC 1H
CTEMP 21.5 c
SLVNT CDCL3
EXREF 7.24 ppm
BF 1.00 Hz
RGAIN 36
1
skk-sm-1t-H
PPM
9.8487
8.7791
8.7711
8.7665
8.1310
8.1149
7.5217
7.5057
7.4908
7.4633
7.4496
7.4312
7.4232
7.4152
7.4061
7.2400
2.9467
2.9285
2.9135
2.0248
2.0156
2.0019
1.9893
1.9733
1.9630
1.8141
1.7030
1.6852
1.6526
1.6423
1.028
2.002
1.000
3.033
0.955
3.781
1.892
1.848

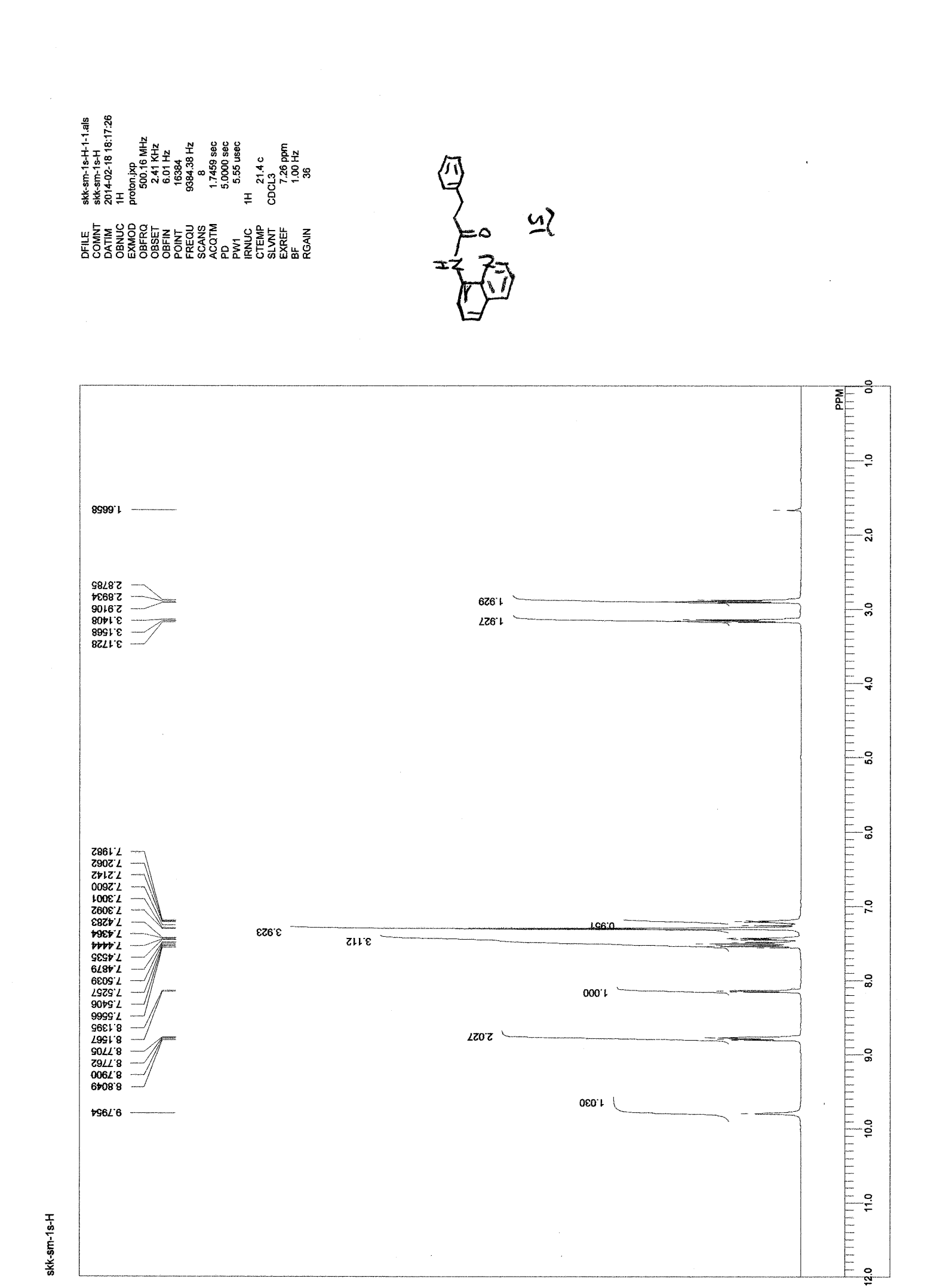
17
skk-sm-~~1t~~-C

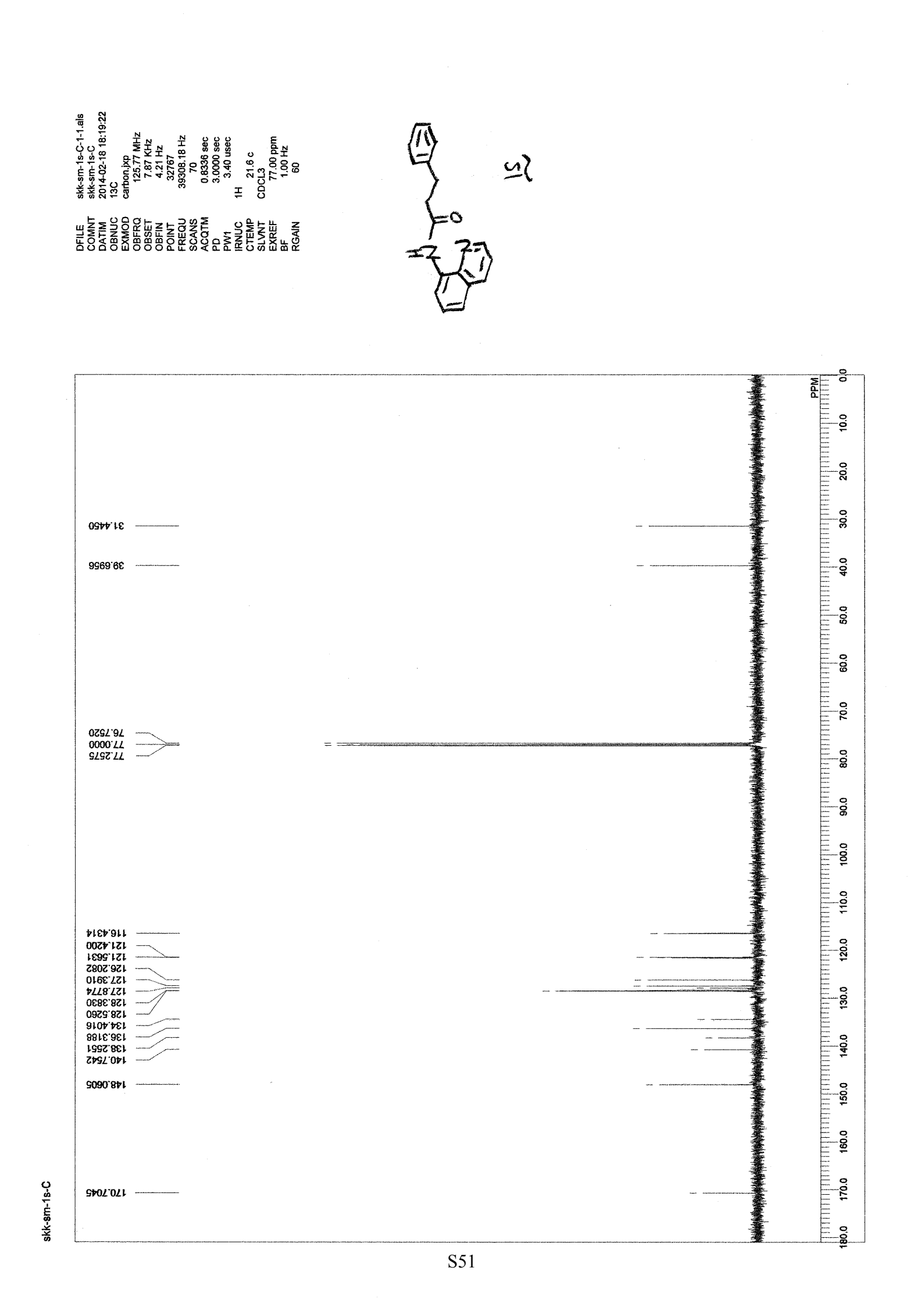


DFILE	skk-sm-1t-C-1-1.als
COMNT	skk-sm-1t-C
DATIM	2014-02-18 18:28:22
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	91
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	21.4 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	1.00 Hz
RGAIN	60

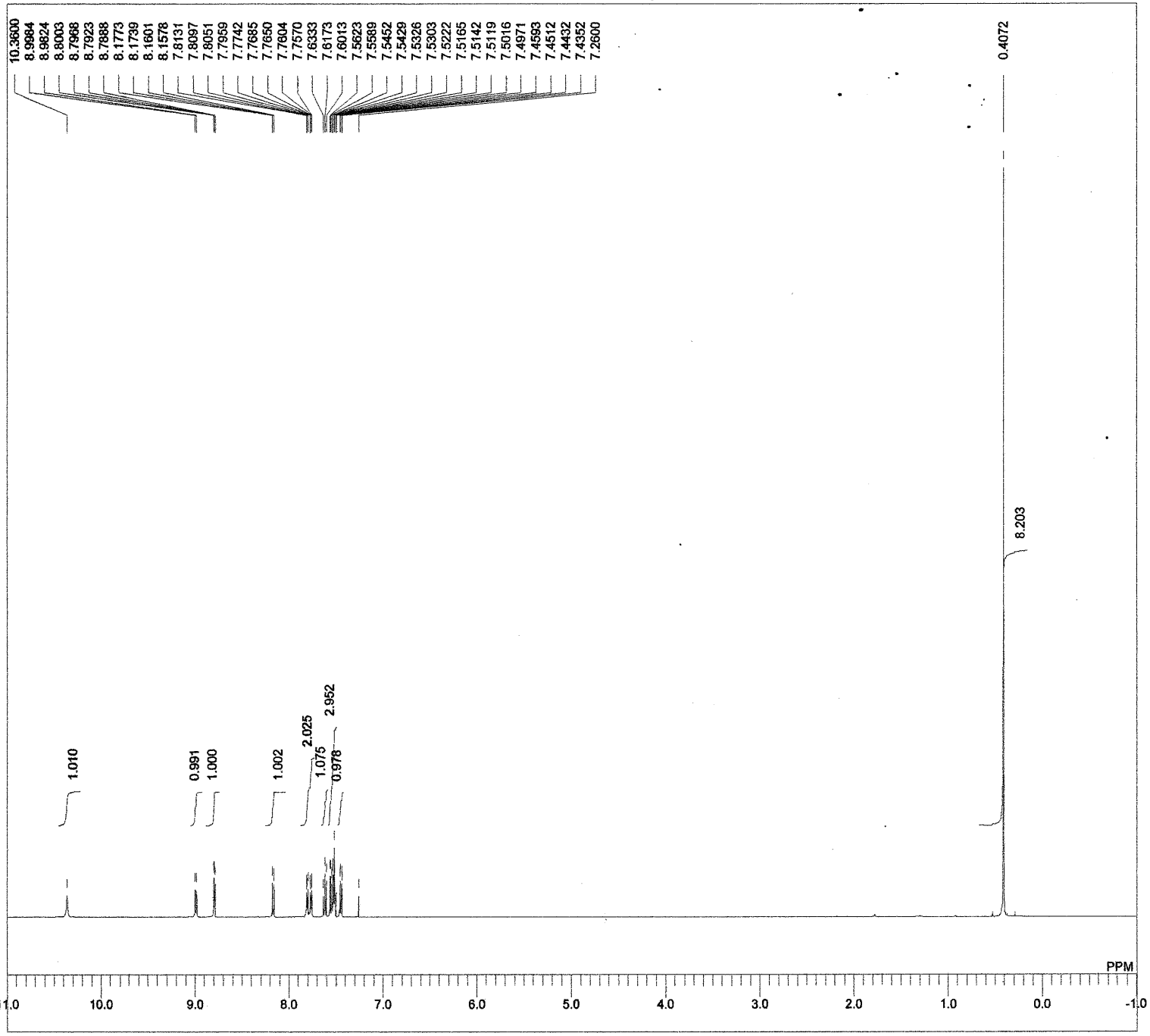


17

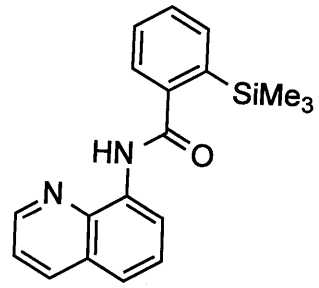

DFILE skk-sm-1s-H-1-1.als
COMNT skk-sm-1s-H
DATIM 2014-02-18 18:17:26
OBNUC 1H
EXMOD proton.jxp
OBFRQ 500.16 MHz
OBSET 2.41 KHz
OBFIN 6.01 Hz
POINT 16384
FREQU 9384.38 Hz
SCANS 8
ACQTM 1.7459 sec
PD 5.0000 sec
PW1 5.55 usec
IRNUC 1H
CTEMP 21.4 c
SLVNT CDCL3
EXREF 7.26 ppm
BF 1.00 Hz
RGAIN 36
1s
PPM
1.6658
2.8785
2.8934
2.9106
3.1408
3.1568
3.1728
1.929
1.927
7.1982
7.2062
7.2142
7.2600
7.3001
7.3092
7.4283
7.4364
7.4444
7.4535
7.4879
7.5039
7.5257
7.5406
7.5666
8.1395
8.1567
8.7705
8.7762
8.7900
8.8049
9.7954
3.923
3.112
0.951
1.000
2.027
1.030
skk-sm-1s-H


DFILE skk-sm-1s-C-1-1.als
COMNT skk-sm-1s-C
DATIM 2014-02-18 18:19:22
OBNUC 13C
EXMOD carbon.jxp
OBFRQ 125.77 MHz
OBSET 7.87 KHz
OBFIN 4.21 Hz
POINT 32767
FREQU 39308.18 Hz
SCANS 70
ACQTM 0.8336 sec
PD 3.0000 sec
PW1 3.40 usec
IRNUC 1H
CTEMP 21.6 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.00 Hz
RGAIN 60
1s
31.4450
39.6956
76.7520
77.0000
77.2575
116.4314
121.4200
121.5631
126.2082
127.3910
127.8774
128.3830
128.5260
134.4016
136.3188
138.2551
140.7542
148.0605
170.7045
PPM
skk-sm-1s-C

skk-p75-ArSiMe3 3aa

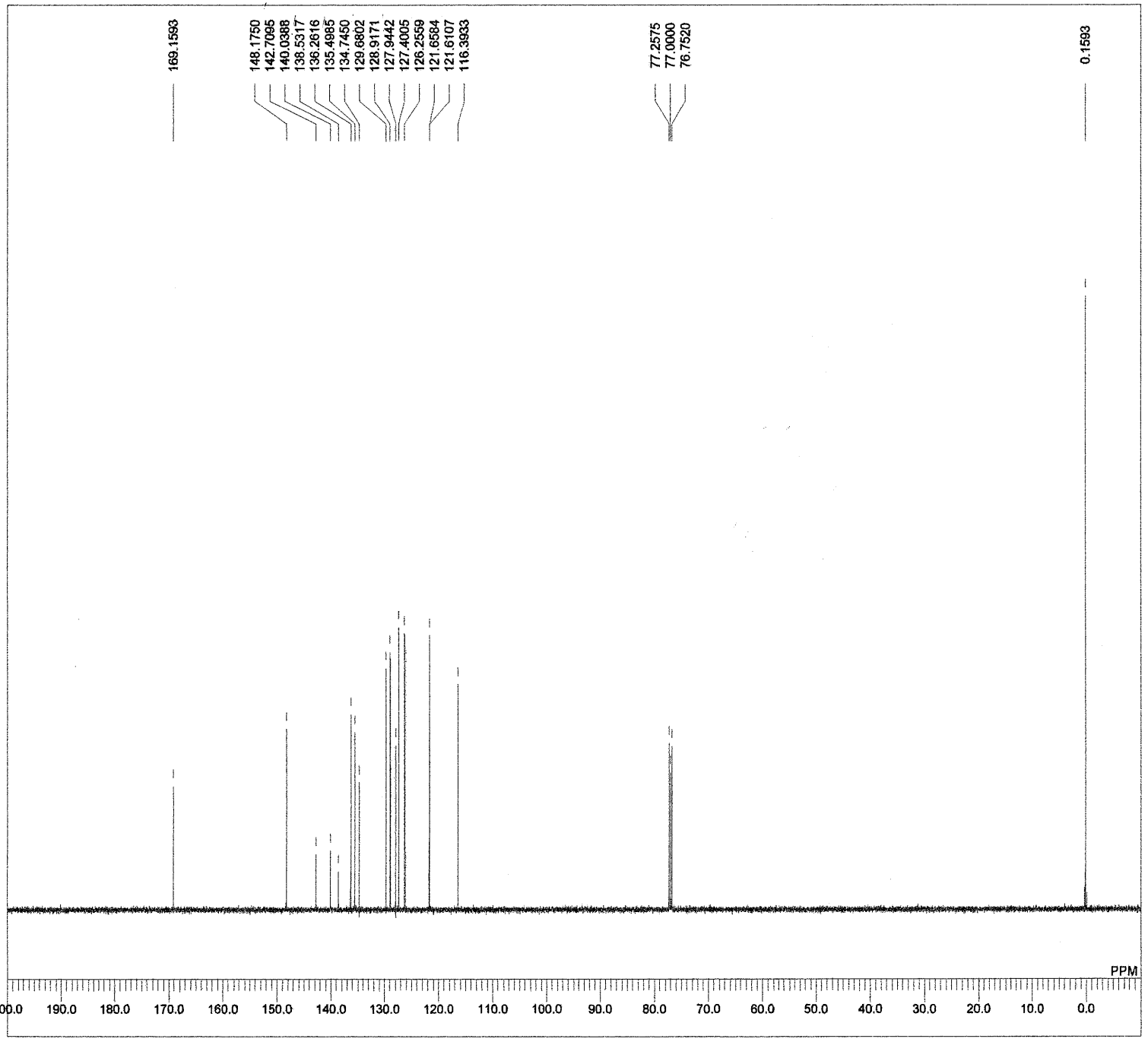


DFILE	skk-p75-ArSiMe3-1-1.jdf
COMNT	skk-p75-ArSiMe3
DATIM	2013-12-10 17:24:00
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	16384
FREQU	9384.38 Hz
SCANS	8
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	21.4 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	0.12 Hz
RGAIN	28

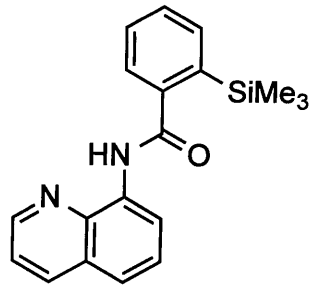


3aa

skk-p75-ArSiMe3-C 3aa

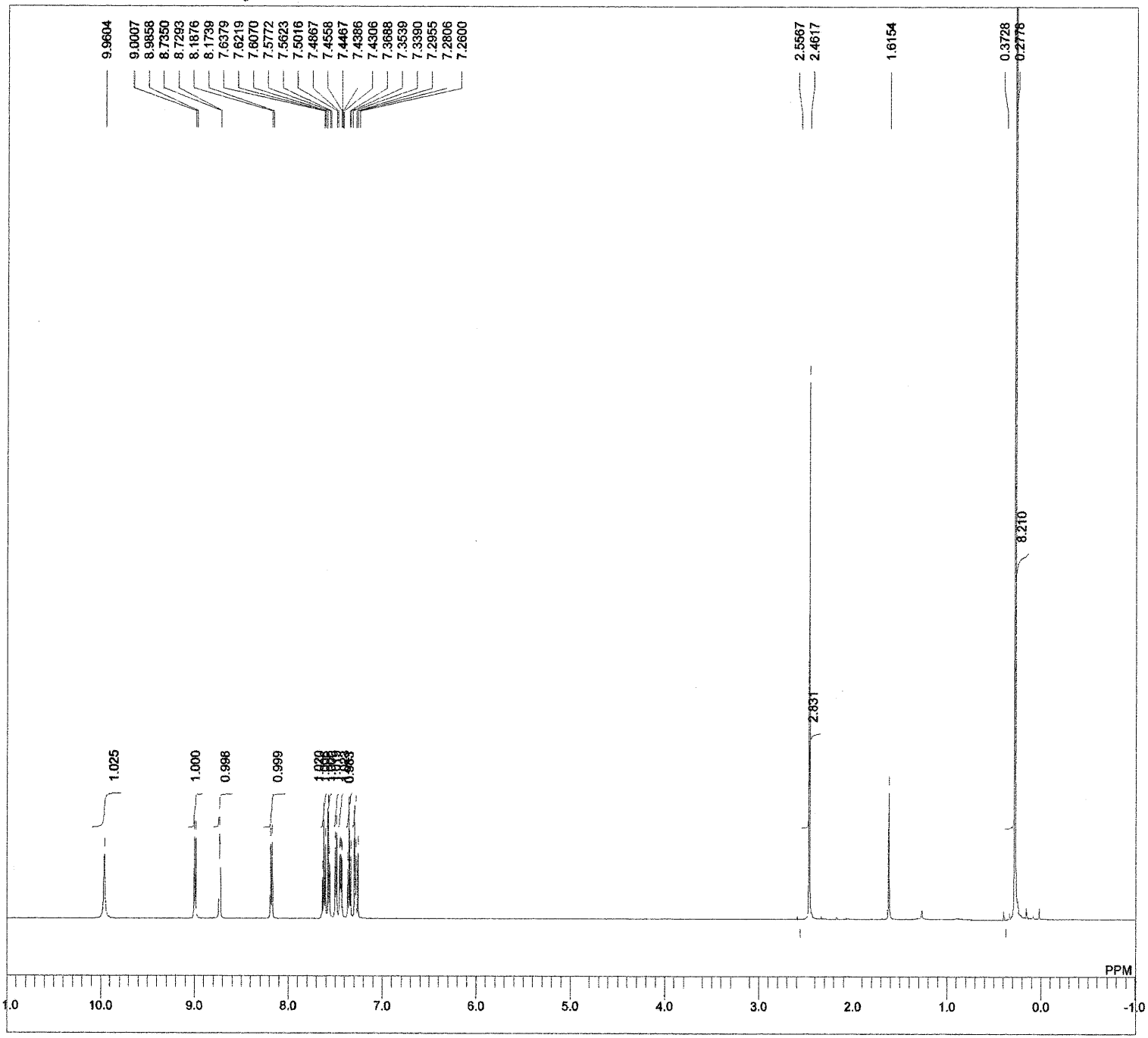


DFILE	skk-p75-ArSiMe3-C_copy1-1-1.jdf
COMNT	skk-p75-ArSiMe3-C
DATIM	2013-12-10 17:26:09
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	88
ACQTM	0.0000 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	21.6 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	0.12 Hz
RGAIN	60

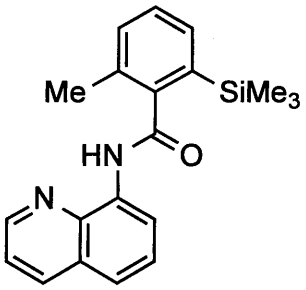


3aa

skk-p202-SI-H 3ba

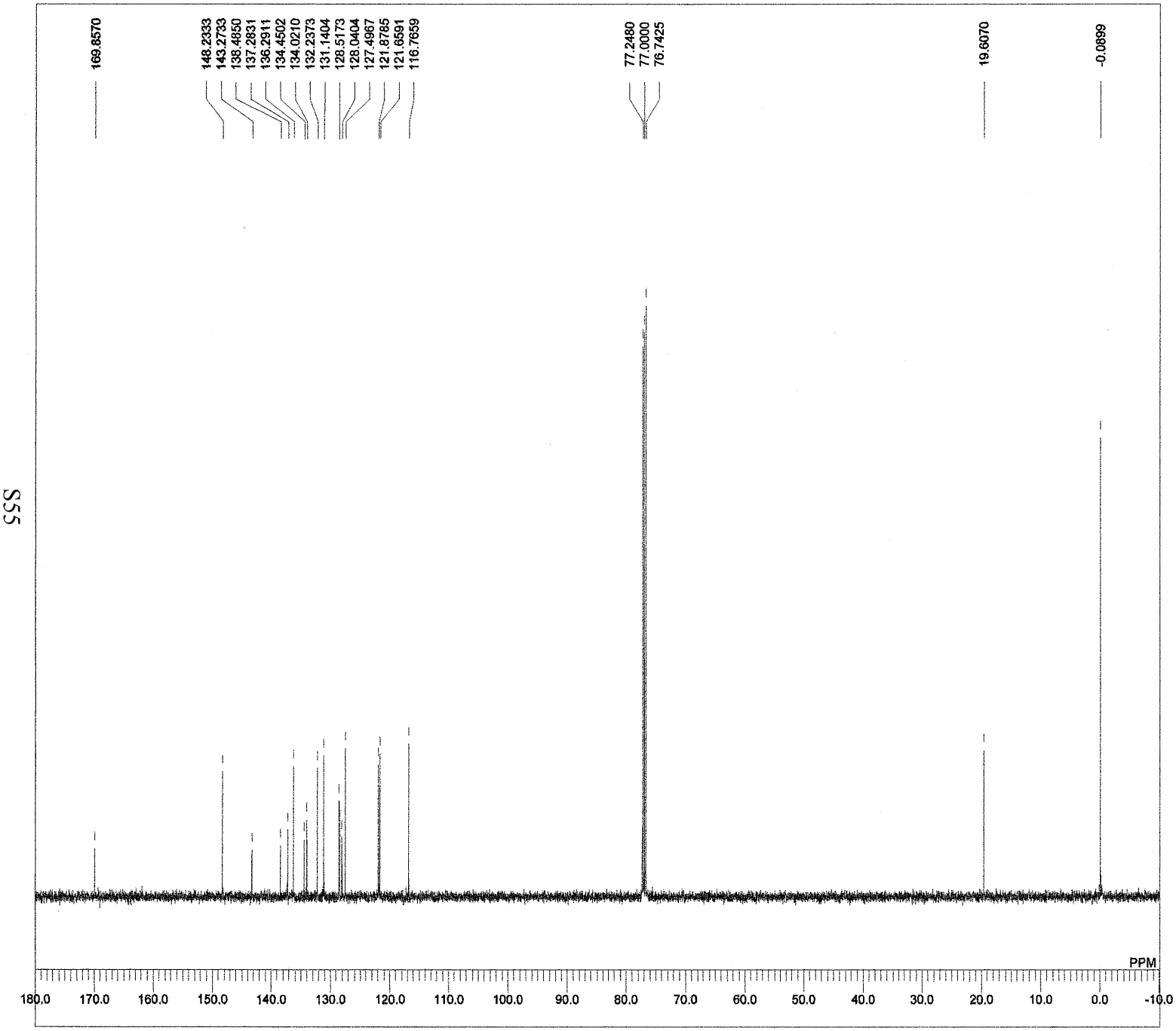


DFILE	skk-p202-SI-H-1-1.jdf
COMNT	skk-p202-SI-H
DATIM	2013-08-12 17:50:53
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	16384
FREQU	9384.38 Hz
SCANS	18
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	26.2 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	1.00 Hz
RGAIN	36

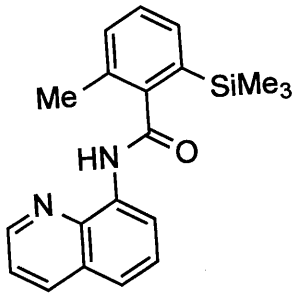


3ba

skk-p202-SI-C 3ba

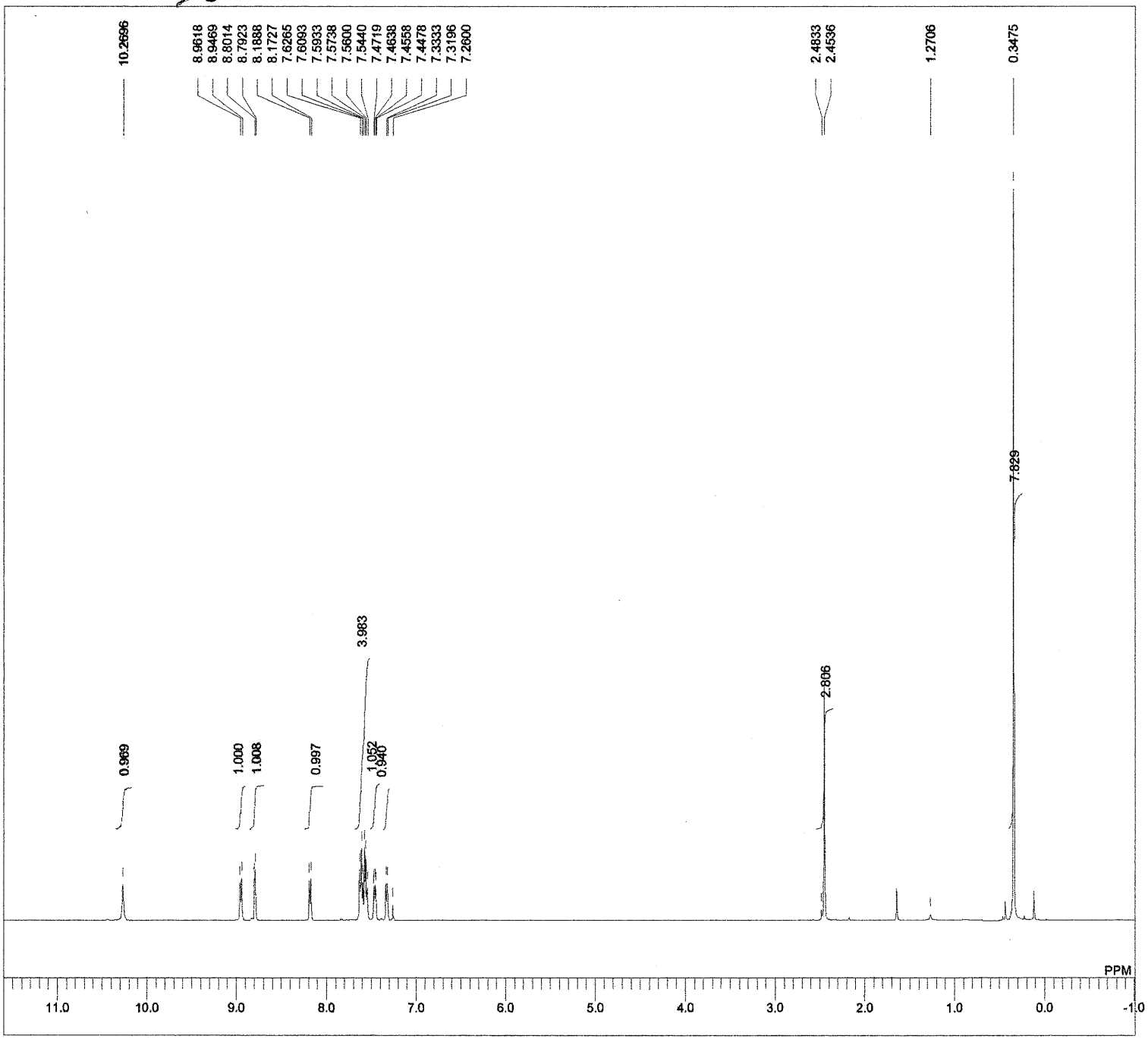


DFILE	skk-p202-SI-C-1-1.als
COMNT	skk-p202-SI-C
DATIM	2013-08-12 17:53:52
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	26214
FREQU	31446.54 Hz
SCANS	169
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	26.5 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	1.00 Hz
RGAIN	60

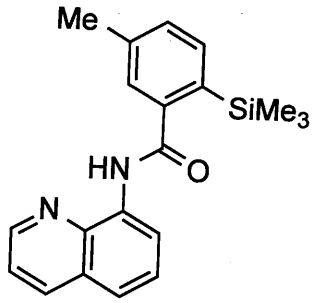


3ba

skk-p18-SI-Ar(m)-Me 3ca

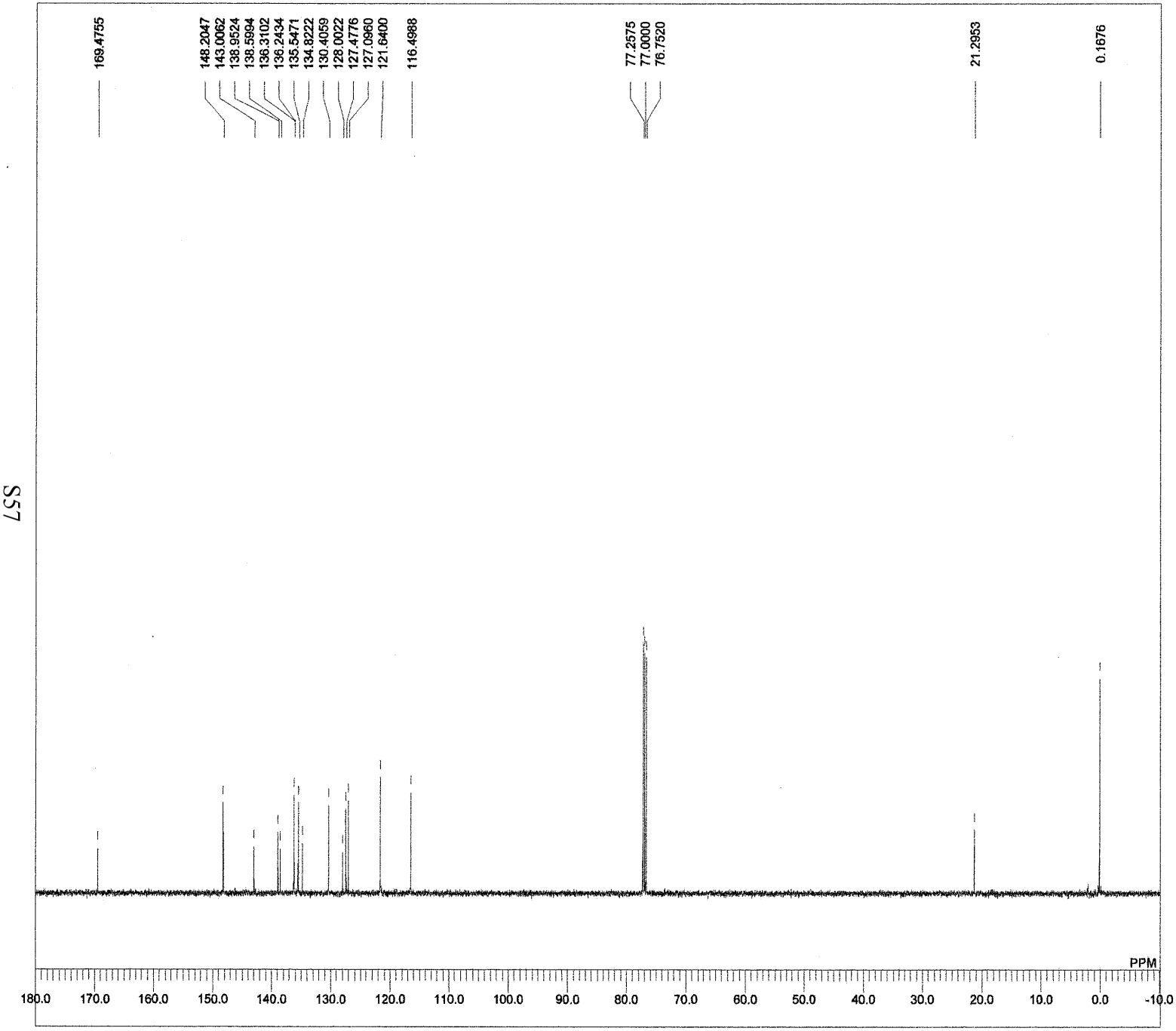


DFILE	skk-p18-SI-Ar(m)-Me-1-1.als
COMNT	skk-p18-SI-Ar(m)-Me
DATIM	2013-09-16 18:50:50
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	13107
FREQU	7507.51 Hz
SCANS	16
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	23.1 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	1.00 Hz
RGAIN	34

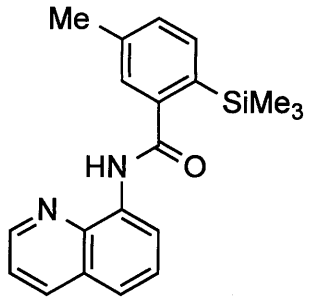


3ca

skk-p18-SI-Ar(m)-Me-C 3ca

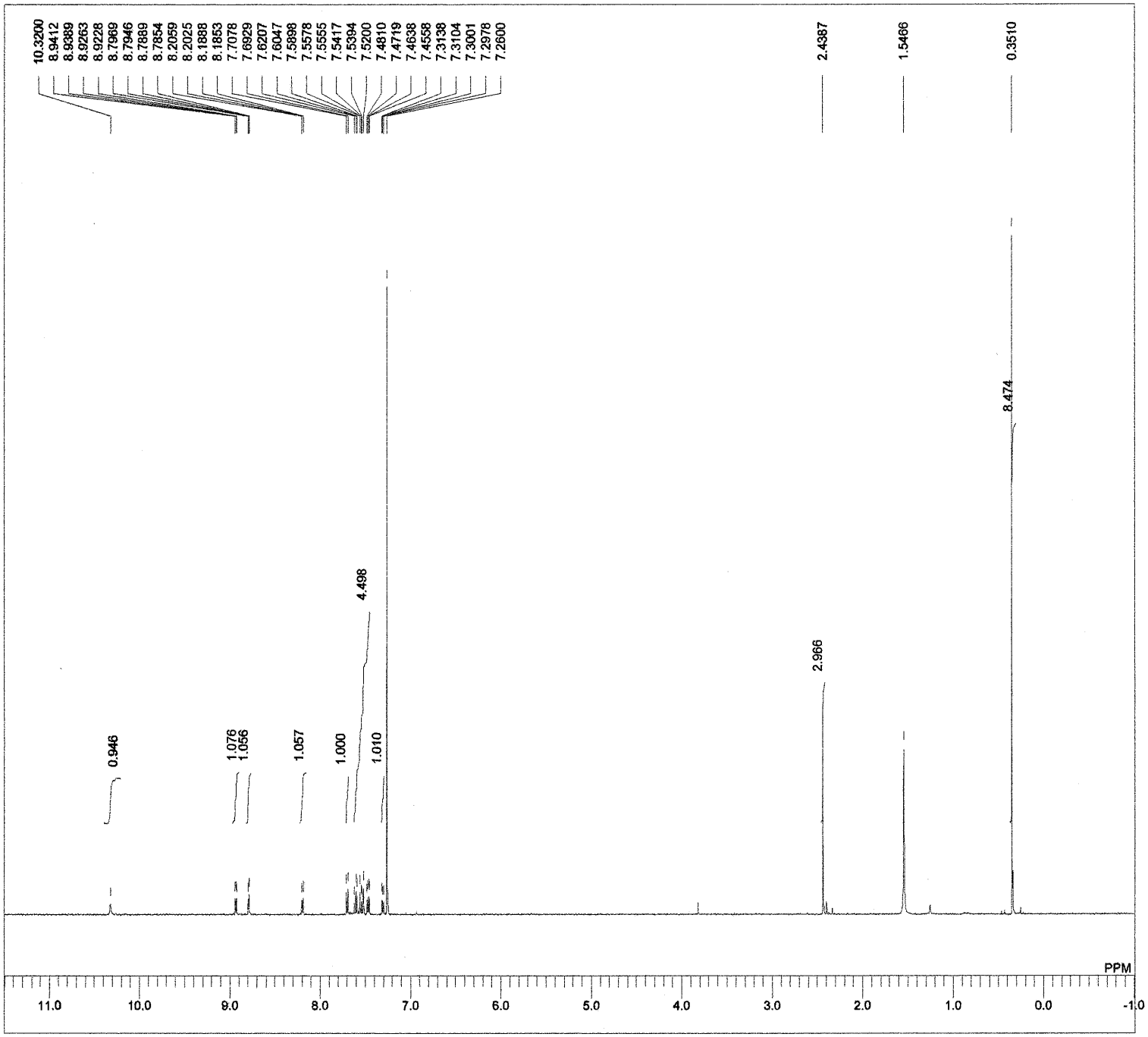


DFILE	skk-p18-SI-Ar(m)-Me-C-1-1.als
COMNT	skk-p18-SI-Ar(m)-Me-C
DATIM	2013-09-16 18:53:47
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	26214
FREQU	31446.54 Hz
SCANS	102
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	23.4 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	1.00 Hz
RGAIN	60

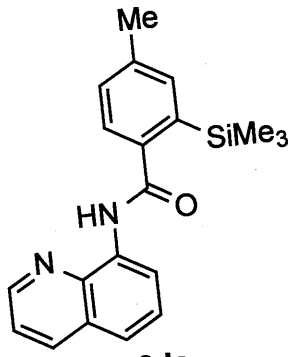


3ca

skk-ArpMe-SiMe3-H 3da

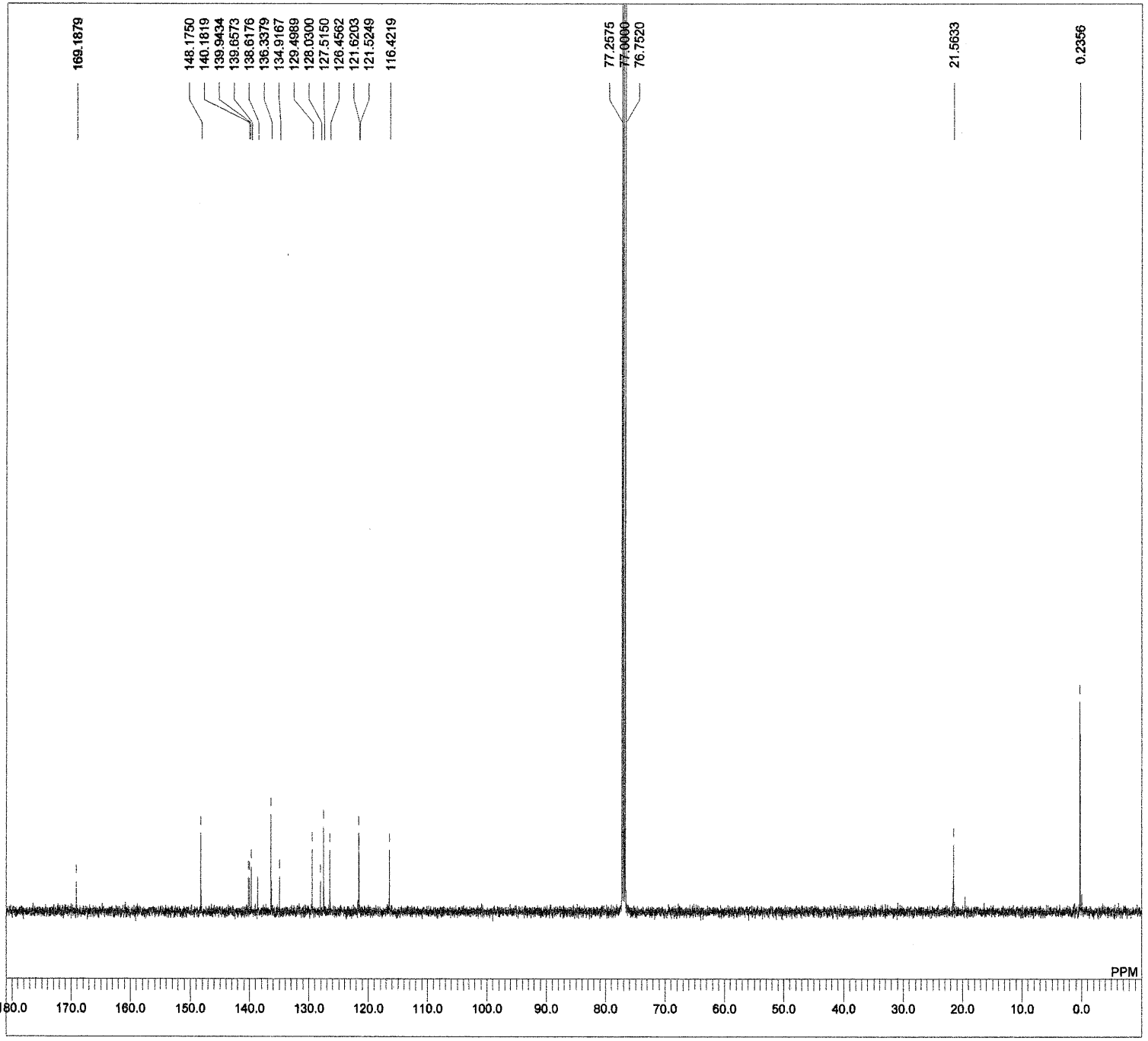


DFILE	skk-ArpMe-SiMe3-H-1-1.als
COMNT	skk-ArpMe-SiMe3-H
DATIM	2013-11-18 19:56:52
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	13107
FREQU	7507.51 Hz
SCANS	8
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	22.4 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	0.12 Hz
RGAIN	42

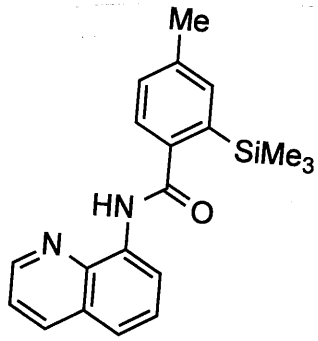


3da

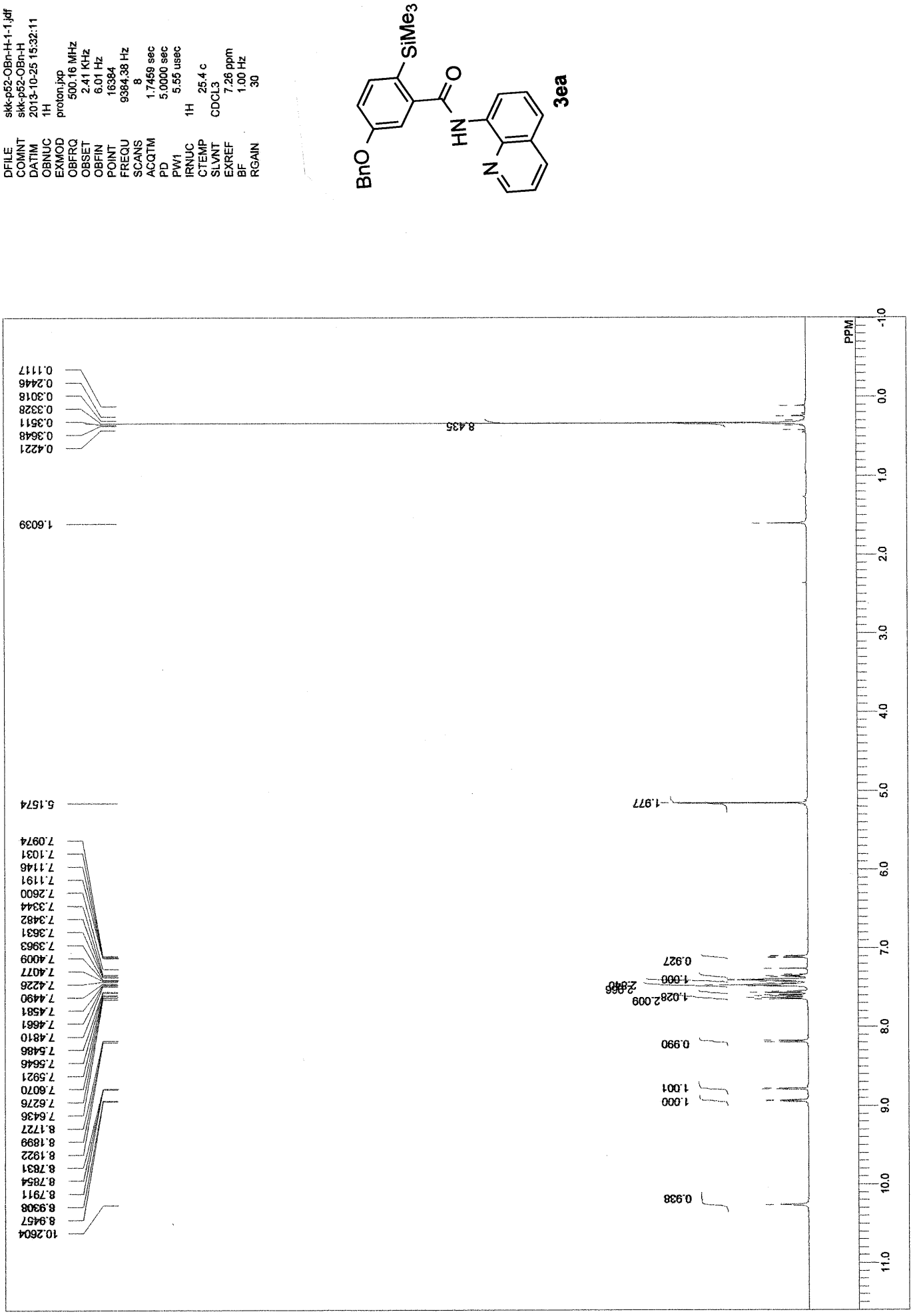
skk-C 3da



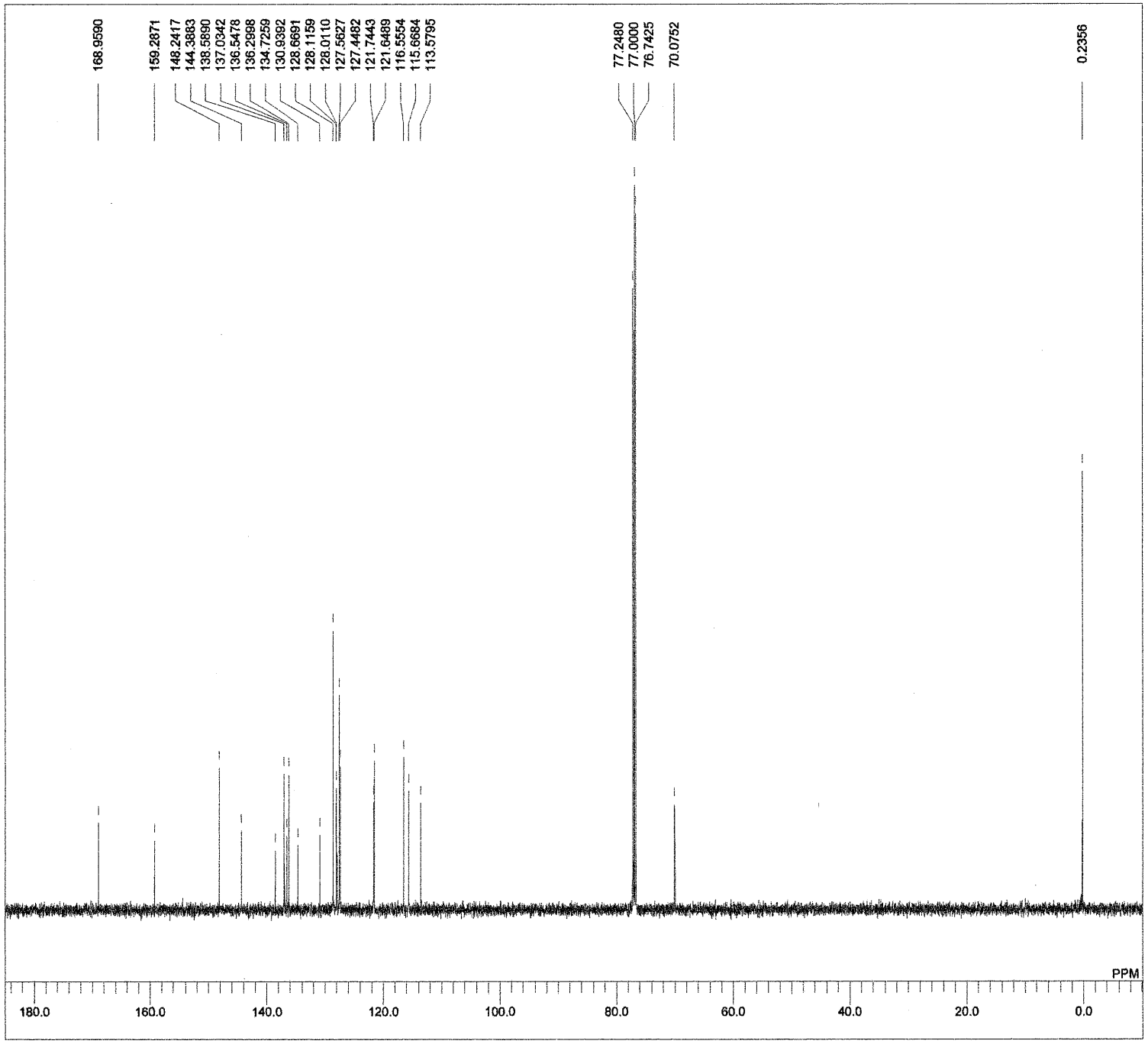
DFILE	skk-C_copy10-1-1.als
COMNT	skk-C
DATIM	2013-11-26 18:28:37
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	502
ACQTM	0.0000 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	22.8 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	1.00 Hz
RGAIN	60



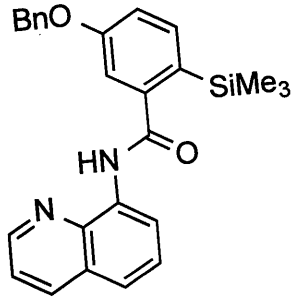
3da


DFILE skk-p52-OBn-H-1-1.jdf
COMNT skk-p52-OBn-H
DATIM 2013-10-25 15:32:11
OBNUC 1H
EXMOD proton.jxp
OBFRQ 500.16 MHz
OBSET 2.41 KHz
OBFIN 6.01 Hz
POINT 16384
FREQU 9384.38 Hz
SCANS 8
ACQTM 1.7459 sec
PD 5.0000 sec
PW1 5.55 usec
IRNUC 1H
CTEMP 25.4 c
SLVNT CDCL3
EXREF 7.26 ppm
BF 1.00 Hz
RGAIN 30
SiMe3
BnO
HN
O
N
3ea
skk-p52-OBn-H
PPM

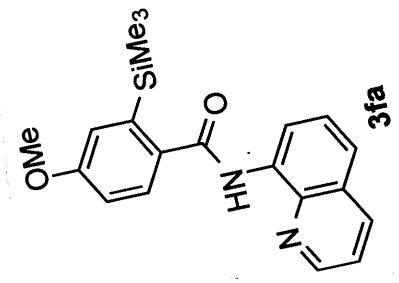
skk-p52-OBn-C 3ea



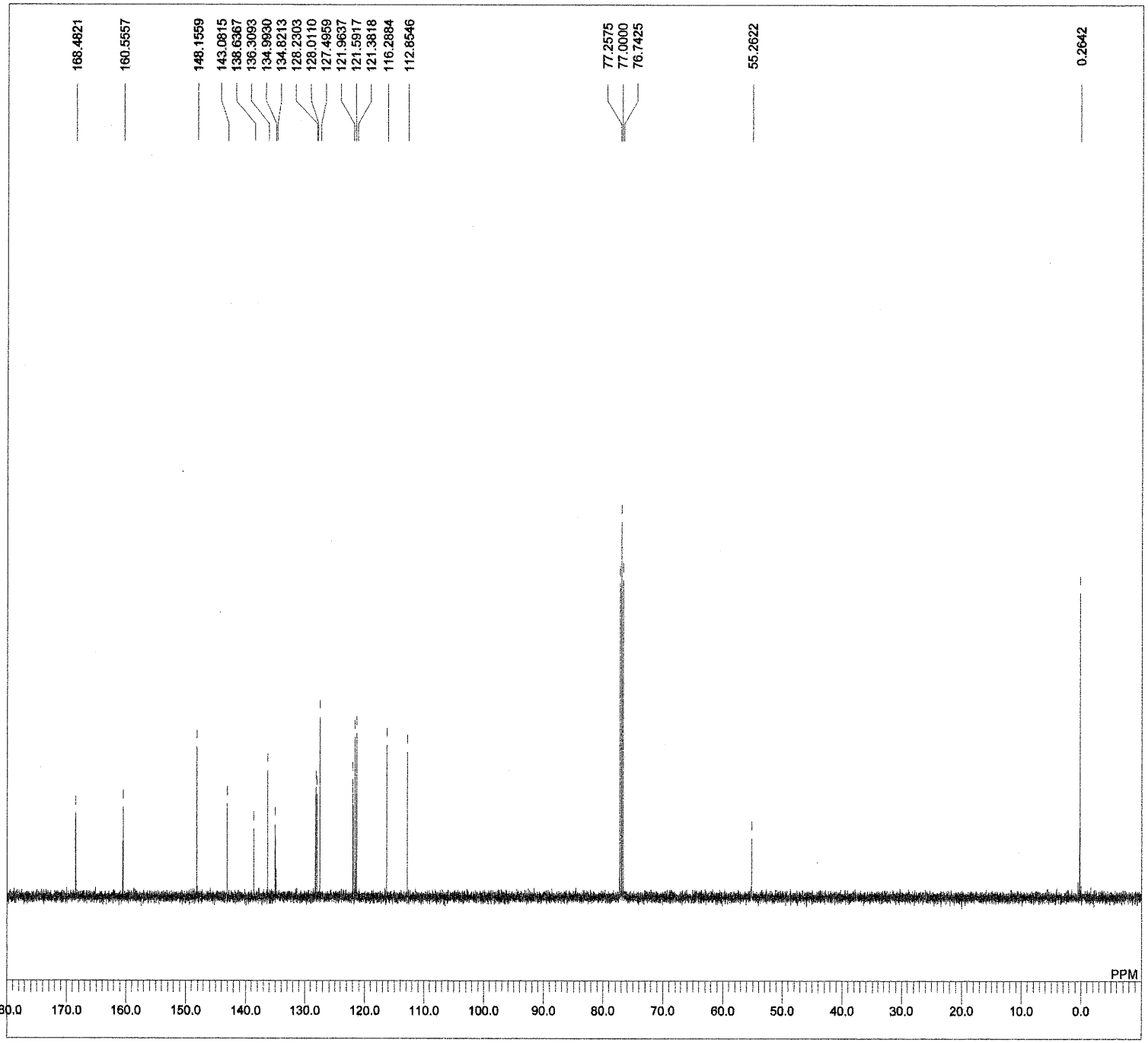
DFILE	skk-p52-OBn-C_copy2-1-1.jdf
COMNT	skk-p52-OBn-C
DATIM	2013-10-25 15:34:07
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	145
ACQTM	0.0000 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	25.3 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	1.00 Hz
RGAIN	60



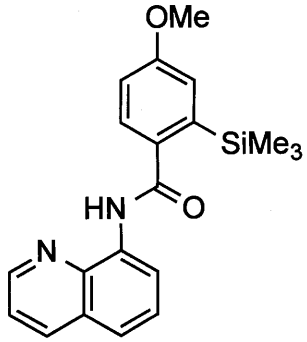
3ea


OMe
SiMe3
O
HN
N
3fa

skk-p169-Ar(OMe)-C 3fa

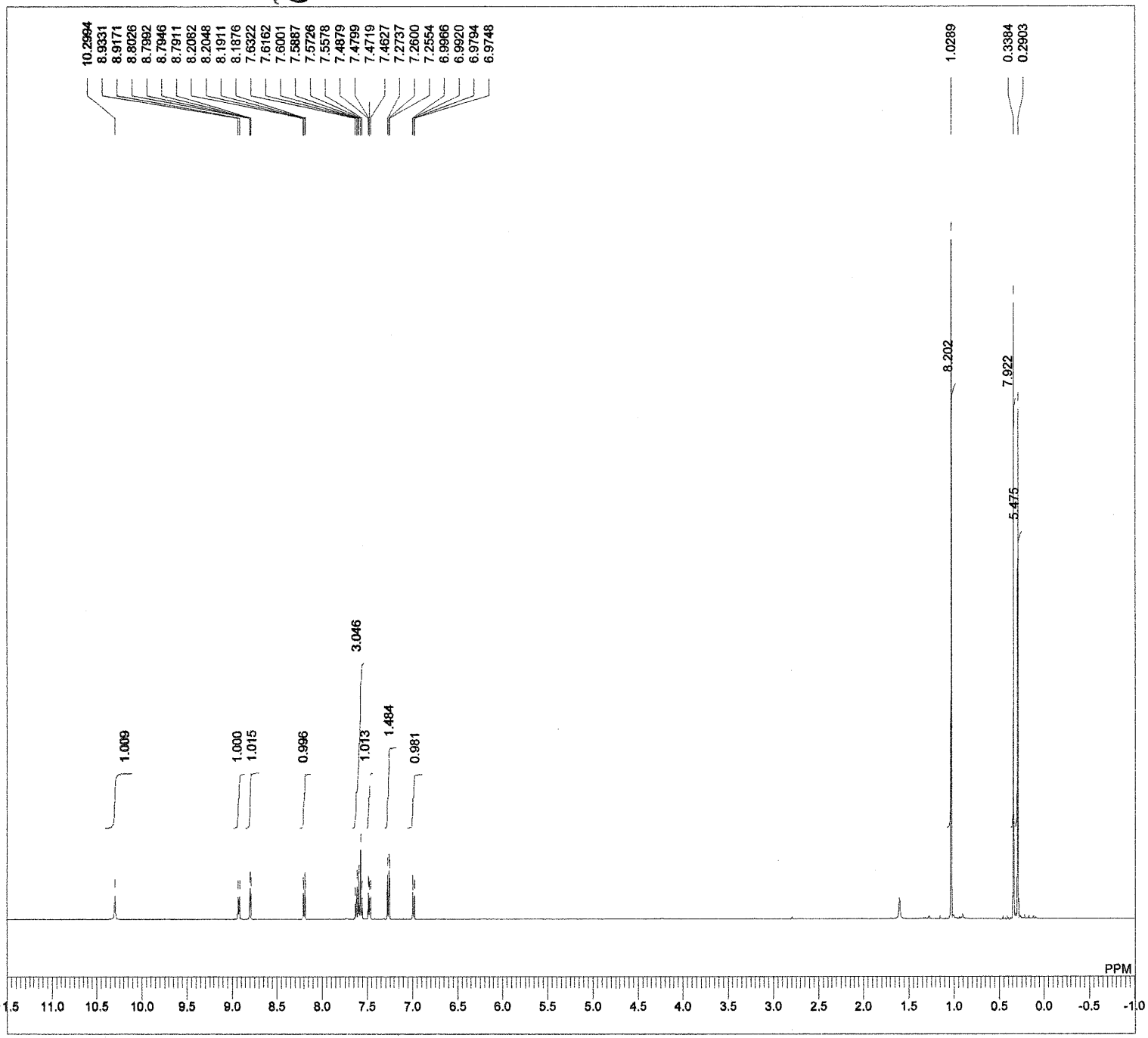


DFILE	skk-p169-Ar(OMe)-C-1-1.jdf
COMNT	skk-p169-Ar(OMe)-C
DATIM	2013-07-08 18:18:01
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	103
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	24.8 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	0.12 Hz
RGAIN	60

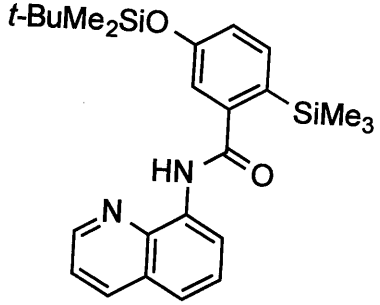


3fa

skk-173-ArOTBS-H 3ga

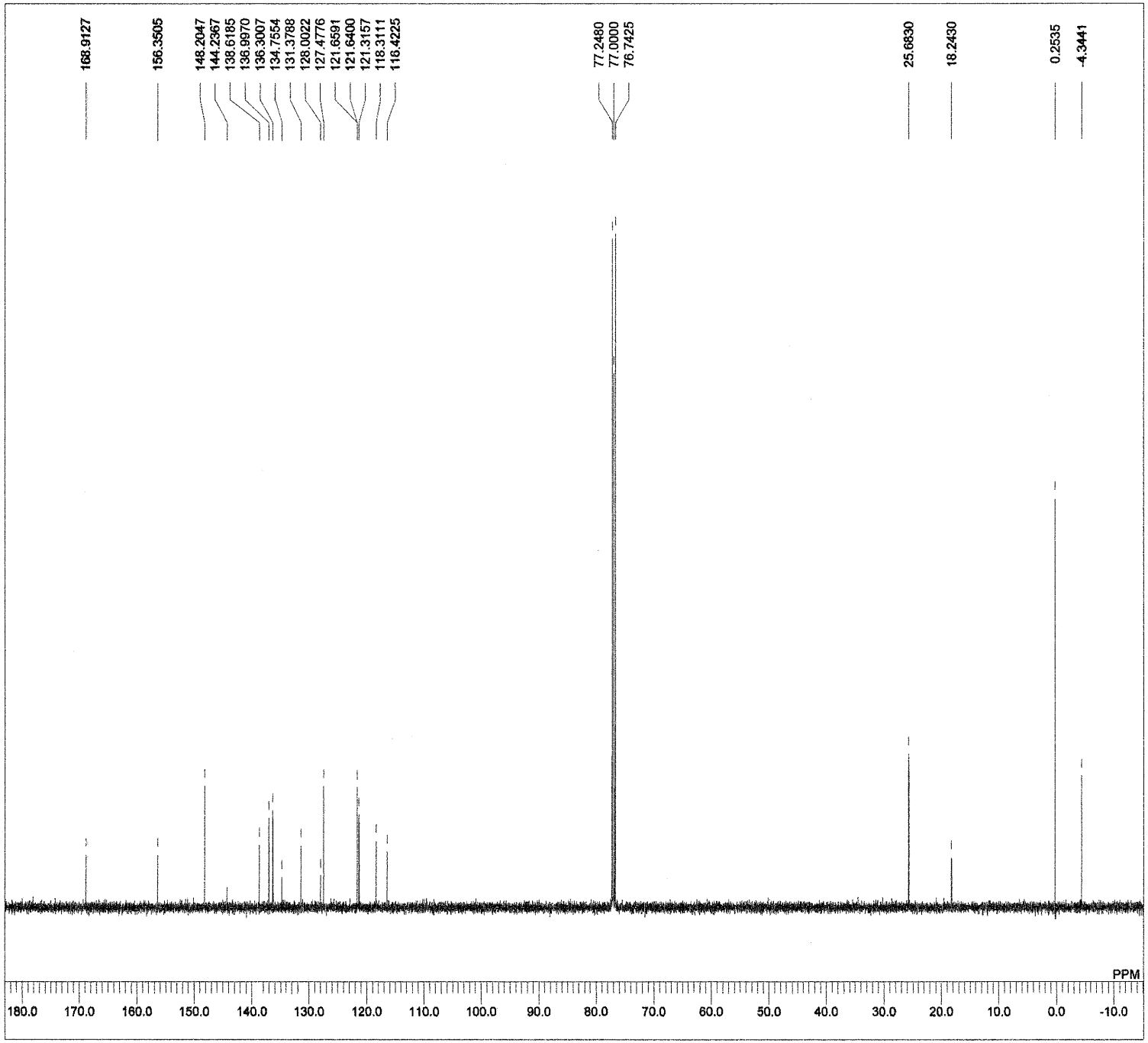


DFILE	skk-173-ArOTBS-H-1-1.als
COMNT	skk-173-ArOTBS-H
DATIM	2013-08-02 19:35:20
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	13107
FREQU	7507.51 Hz
SCANS	16
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	22.9 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	0.12 Hz
RGAIN	36

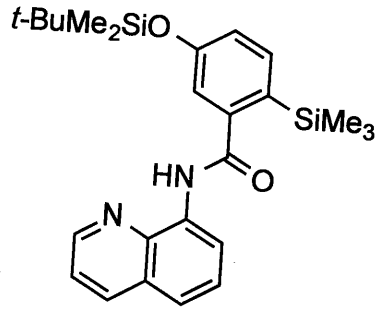


3ga

skk-p173-ArOTBS-C 3ga

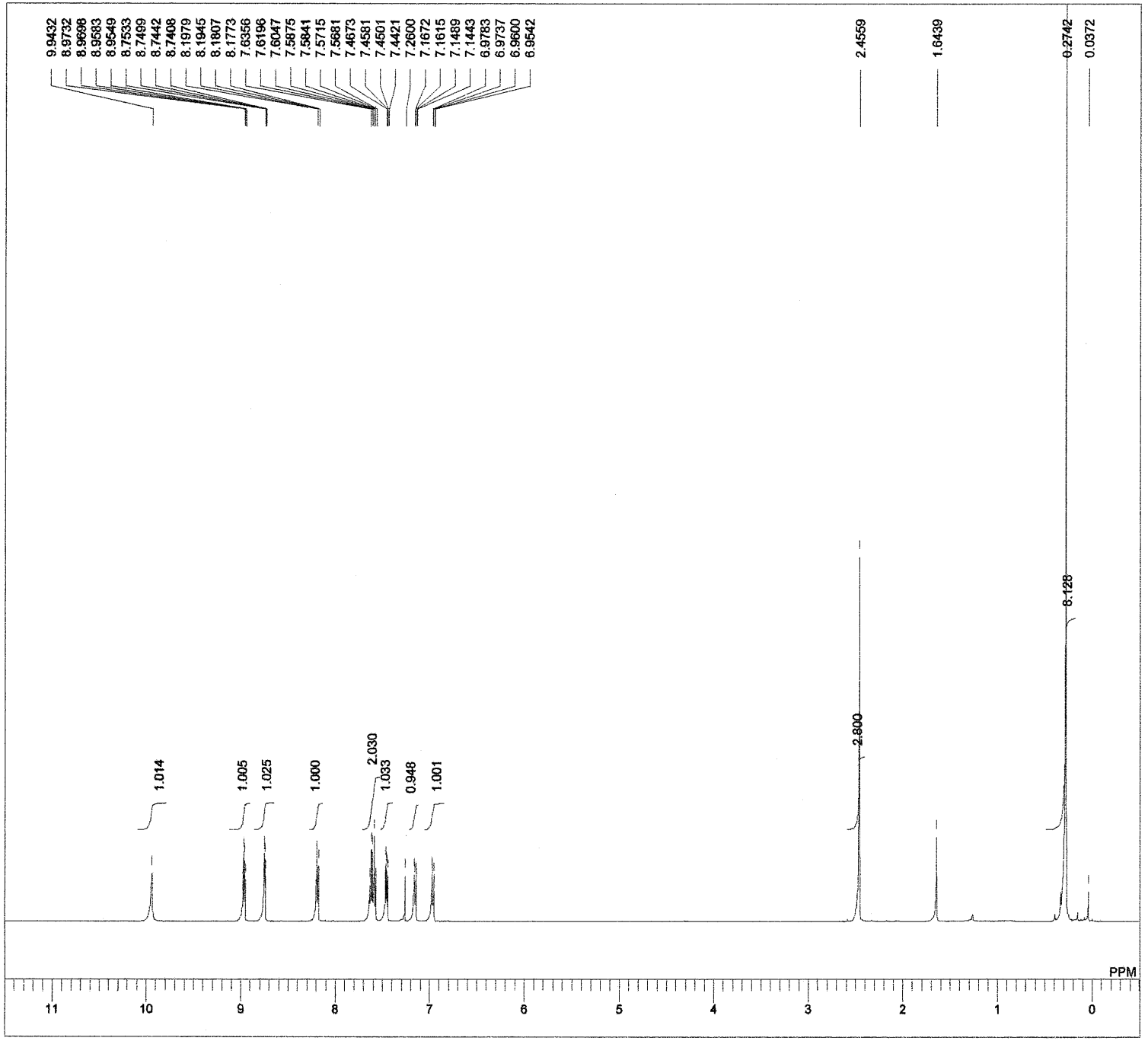


DFILE	skk-p173-ArOTBS-C-2-1.als
COMNT	skk-p173-ArOTBS-C
DATIM	2013-08-02 19:37:60
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	26214
FREQU	31446.54 Hz
SCANS	363
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	23.4 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	0.12 Hz
RGAIN	60

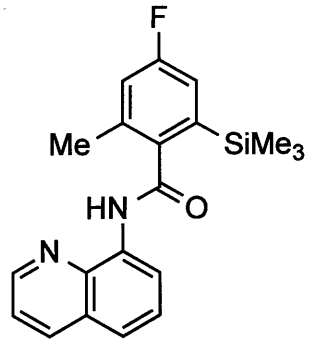


3ga

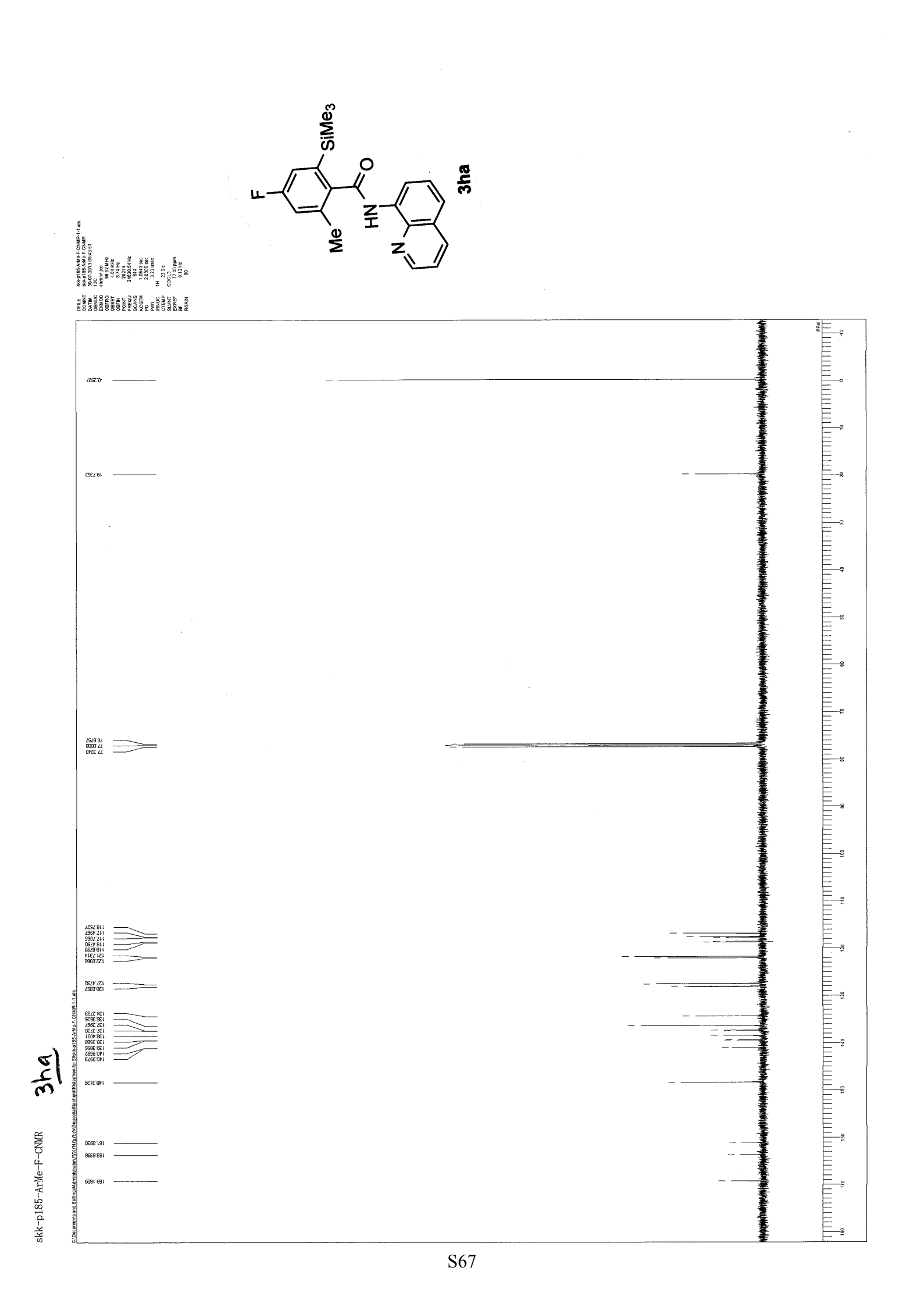
skk-p185-~~ArCOMe-H~~ ArMe)F-SiMe3 3ha



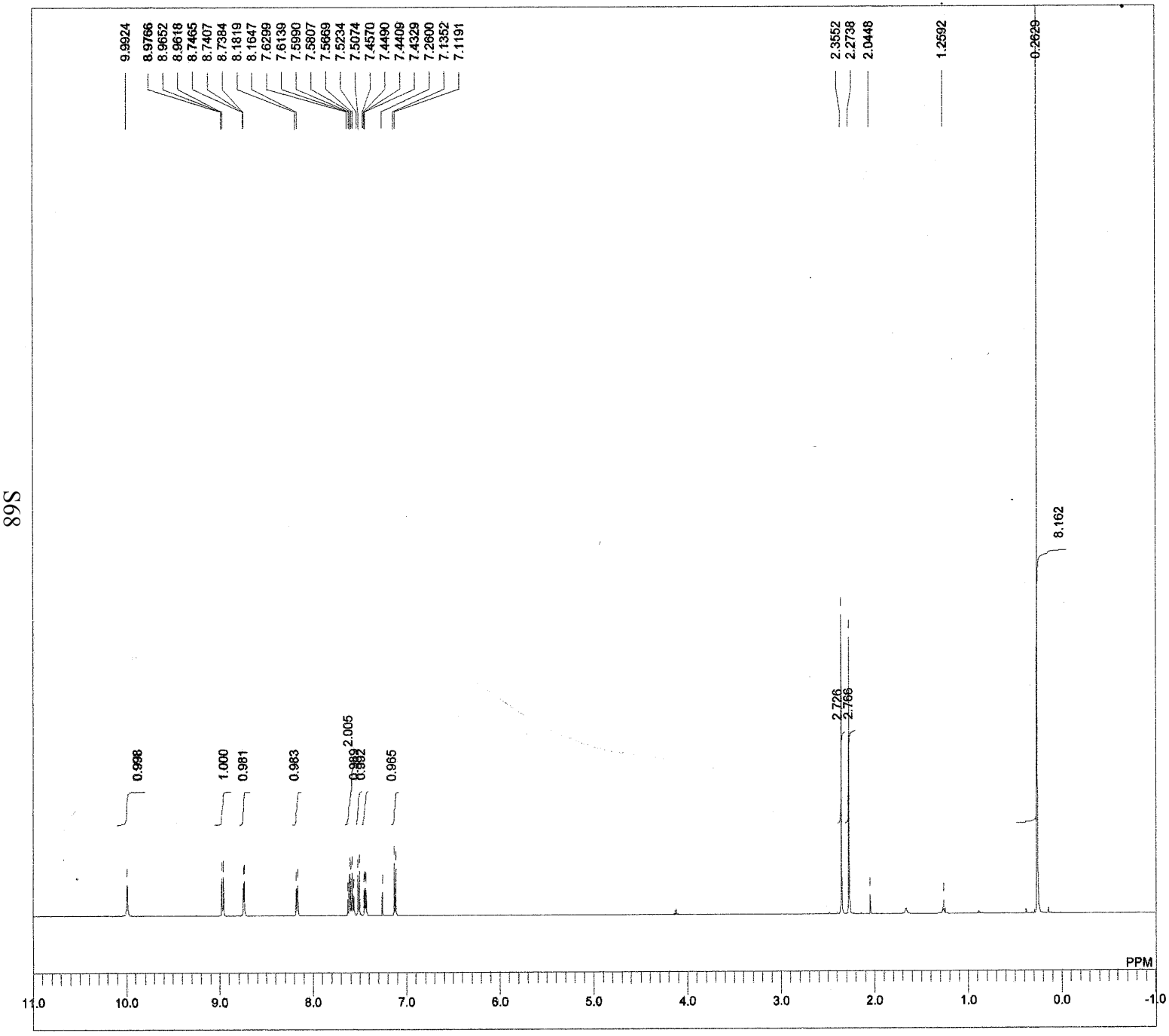
DFILE	skk-p185-ArCOMe-H-1-1.als
COMNT	skk-p185-ArCOMe-H
DATIM	2013-07-29 13:59:38
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	13107
FREQU	7507.51 Hz
SCANS	16
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	22.9 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	0.12 Hz
RGAIN	34



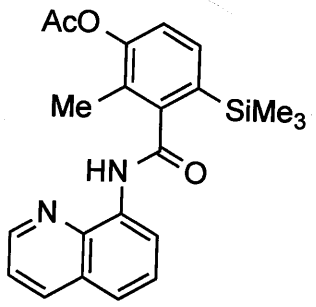
3ha


SiMe3
F
Me
HN
N
3ha
skk-p185-ArMe-F-CNMR
3ha

skk-p30-ArMe/OAc-Si-H 3ia

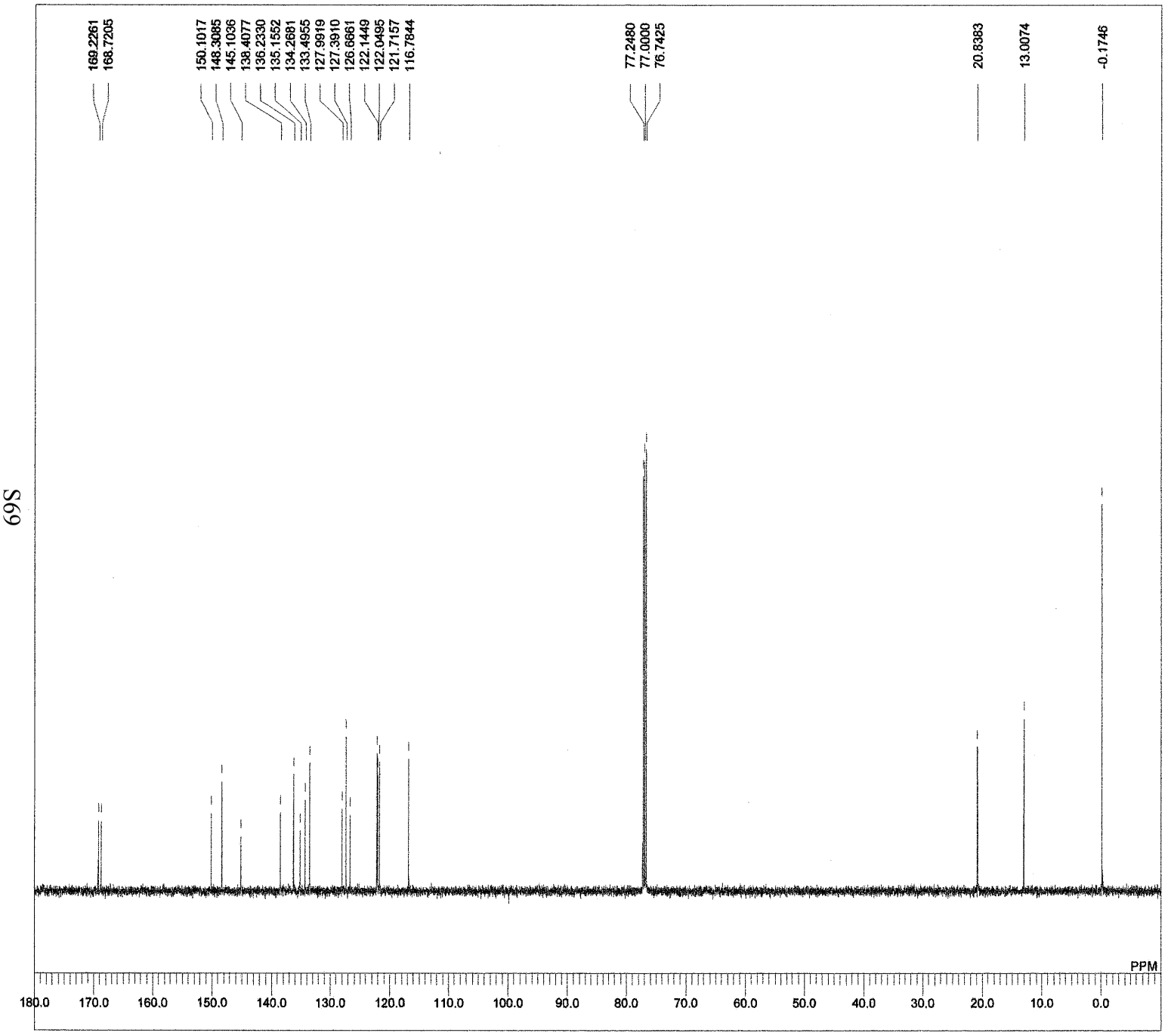


DFILE	skk-p30-ArMe_OAc-Si-H-1-1.jdf
COMNT	skk-p30-ArMe/OAc-Si-H
DATIM	2013-09-30 13:25:03
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	16384
FREQU	9384.38 Hz
SCANS	8
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	24.7 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	0.12 Hz
RGAIN	36

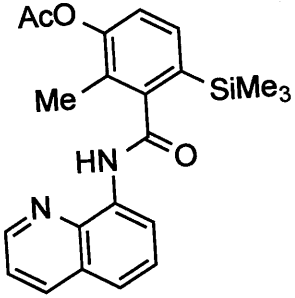


3ia

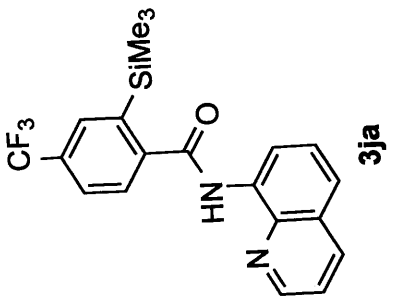
skk-p30-ArMe/OAc-Si-C



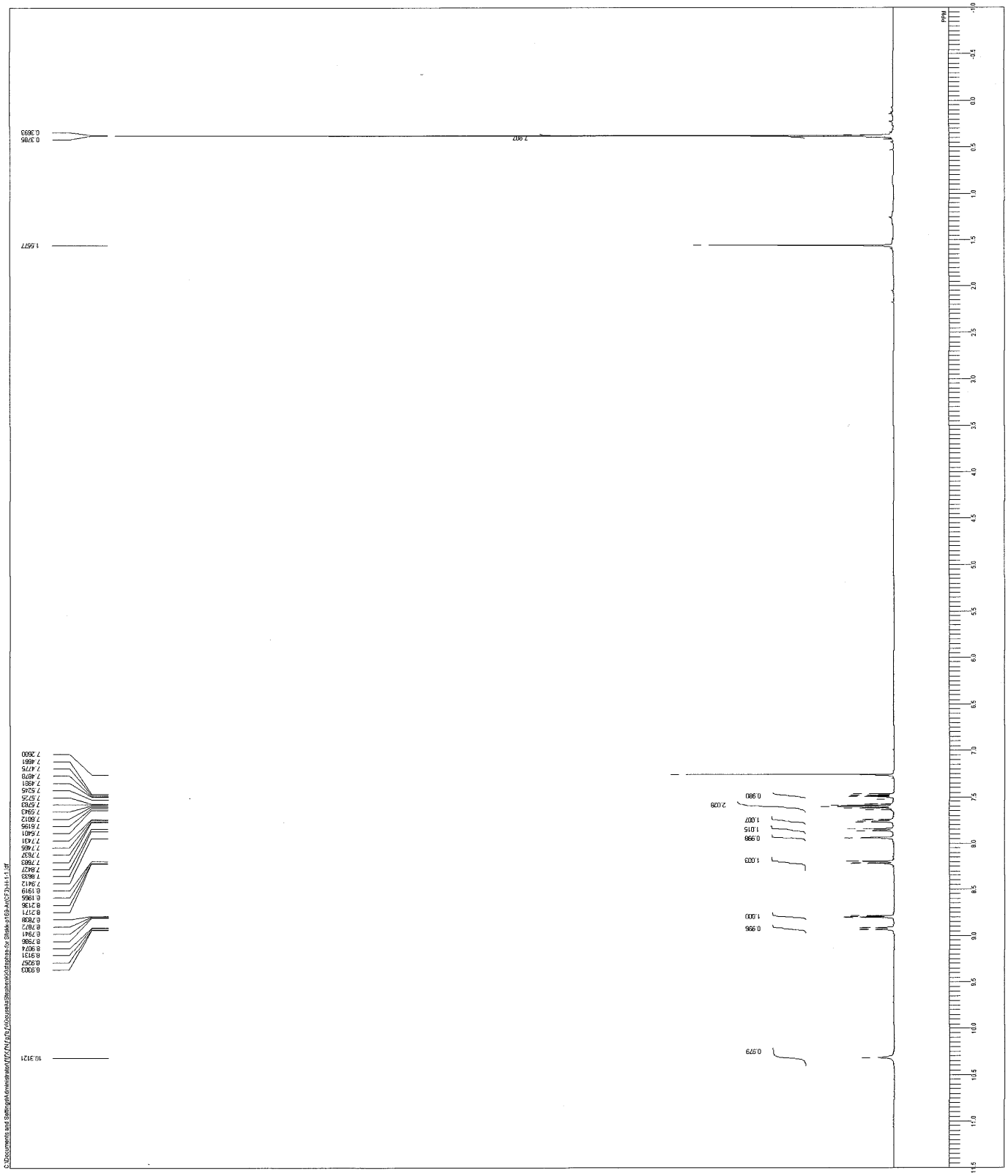
DFILE	skk-p30-ArMe_OAc-Si-C-1-1.jdf
COMNT	skk-p30-ArMe/OAc-Si-C
DATIM	2013-09-30 13:27:40
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	102
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	25.3 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	1.00 Hz
RGAIN	60



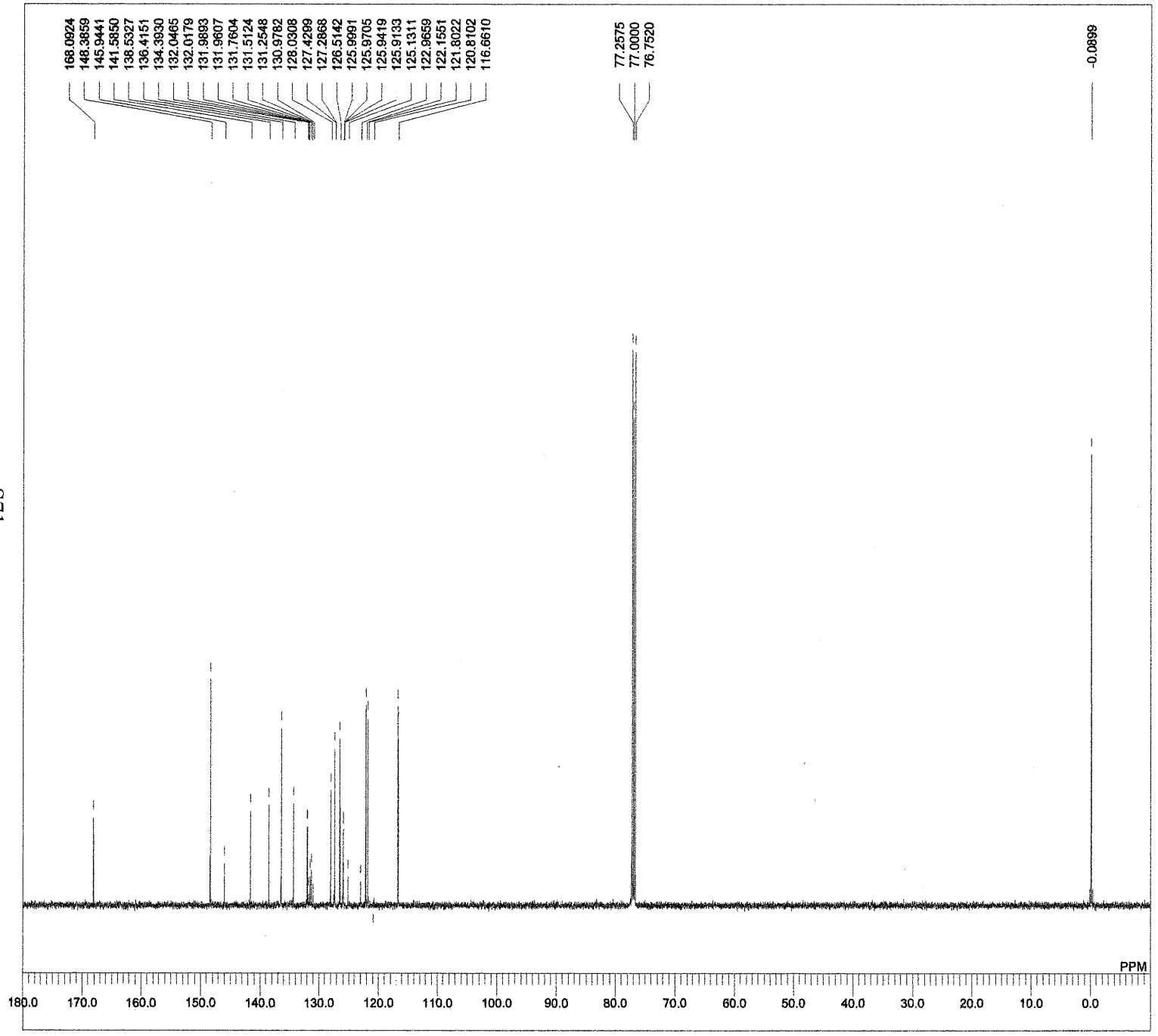
3ia



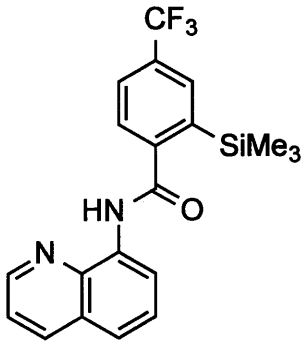
3ja



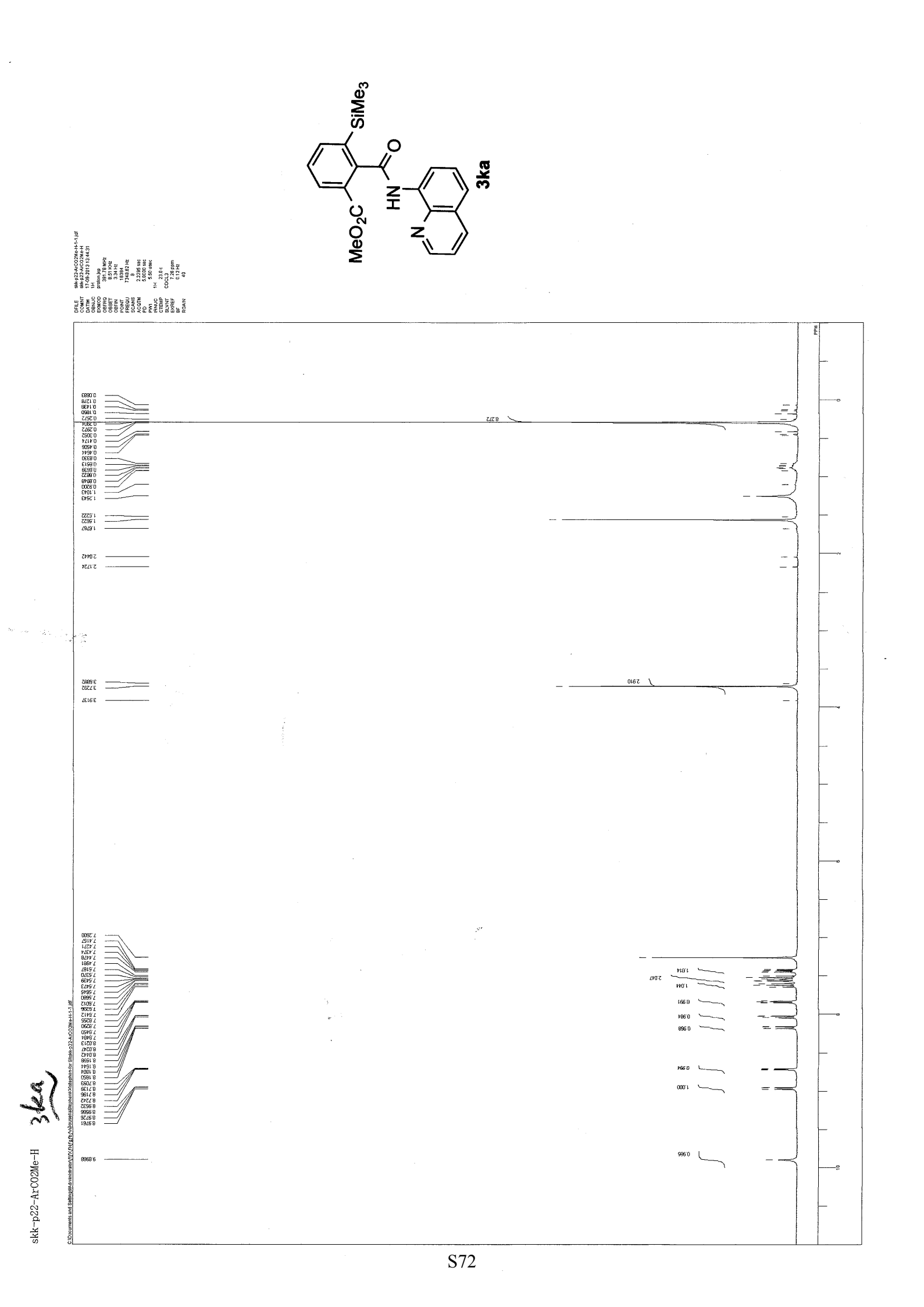
skk-p169-Ar(CF3)-C 3ja



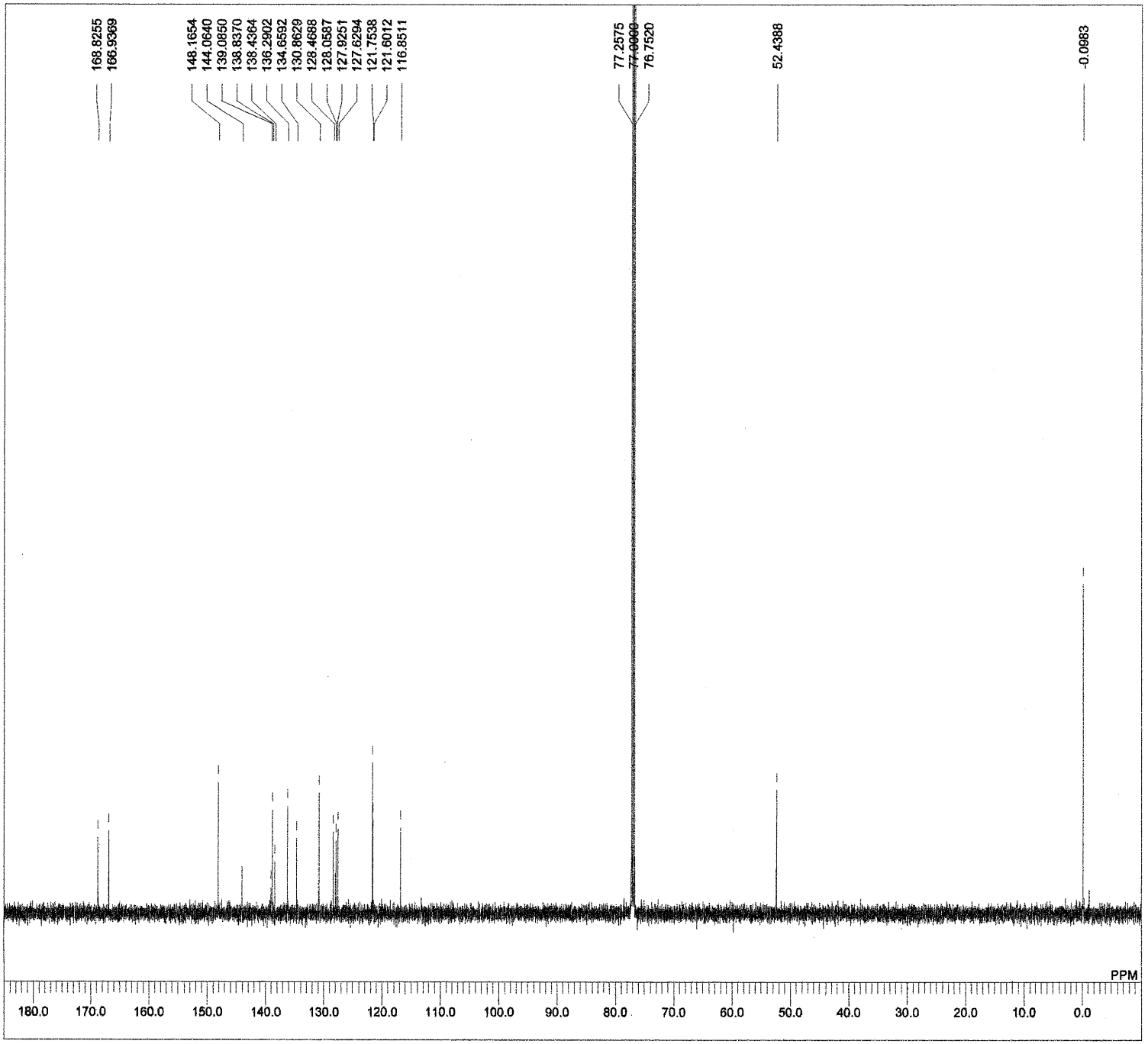
DFILE	skk-p169-Ar(CF3)-C-1-1.als
COMNT	skk-p169-Ar(CF3)-C
DATIM	2013-07-08 16:59:06
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	26214
FREQU	31446.54 Hz
SCANS	387
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	24.8 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	1.00 Hz
RGAIN	60



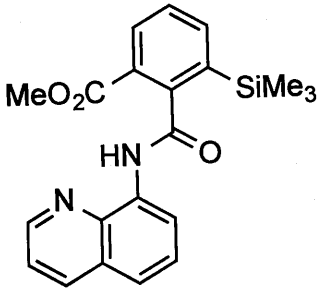
3ja


SiMe3
MeO2C
HN
O
N
3ka
skk-p22-ArCO2Me-H
3ka

skk-p41-ArCO2Me-1-C 3ka

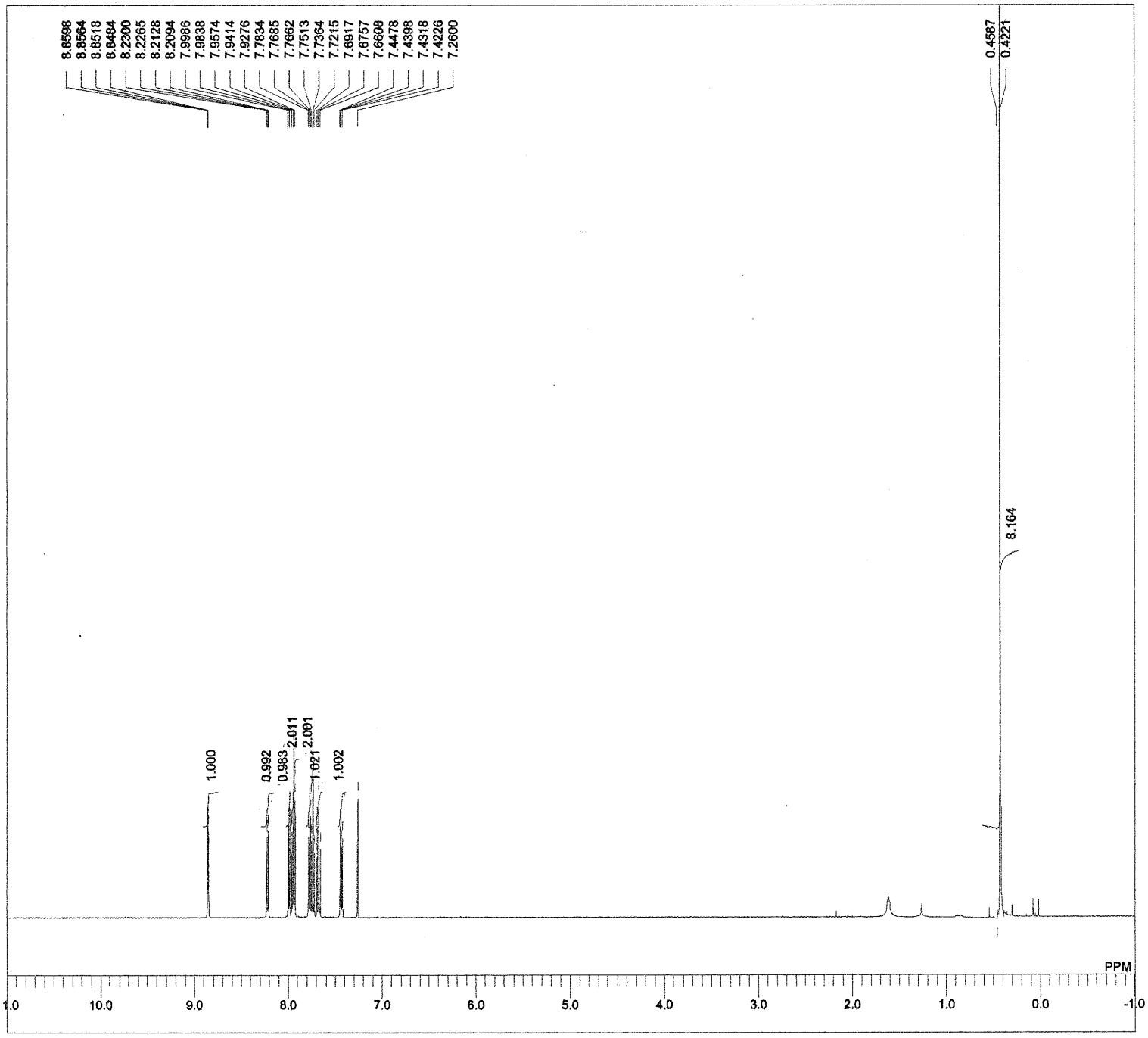


DFILE	skk-p41-ArCO2Me-1-C-1-1.jdf
COMNT	skk-p41-ArCO2Me-1-C
DATIM	2013-10-08 19:15:15
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	1002
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	25.8 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	0.12 Hz
RGAIN	60

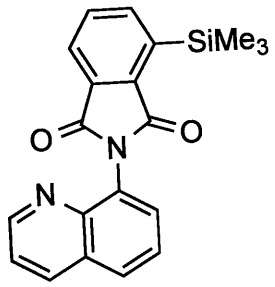


3ka

skk-p31-ArCO2Me-Si-H 3k'a

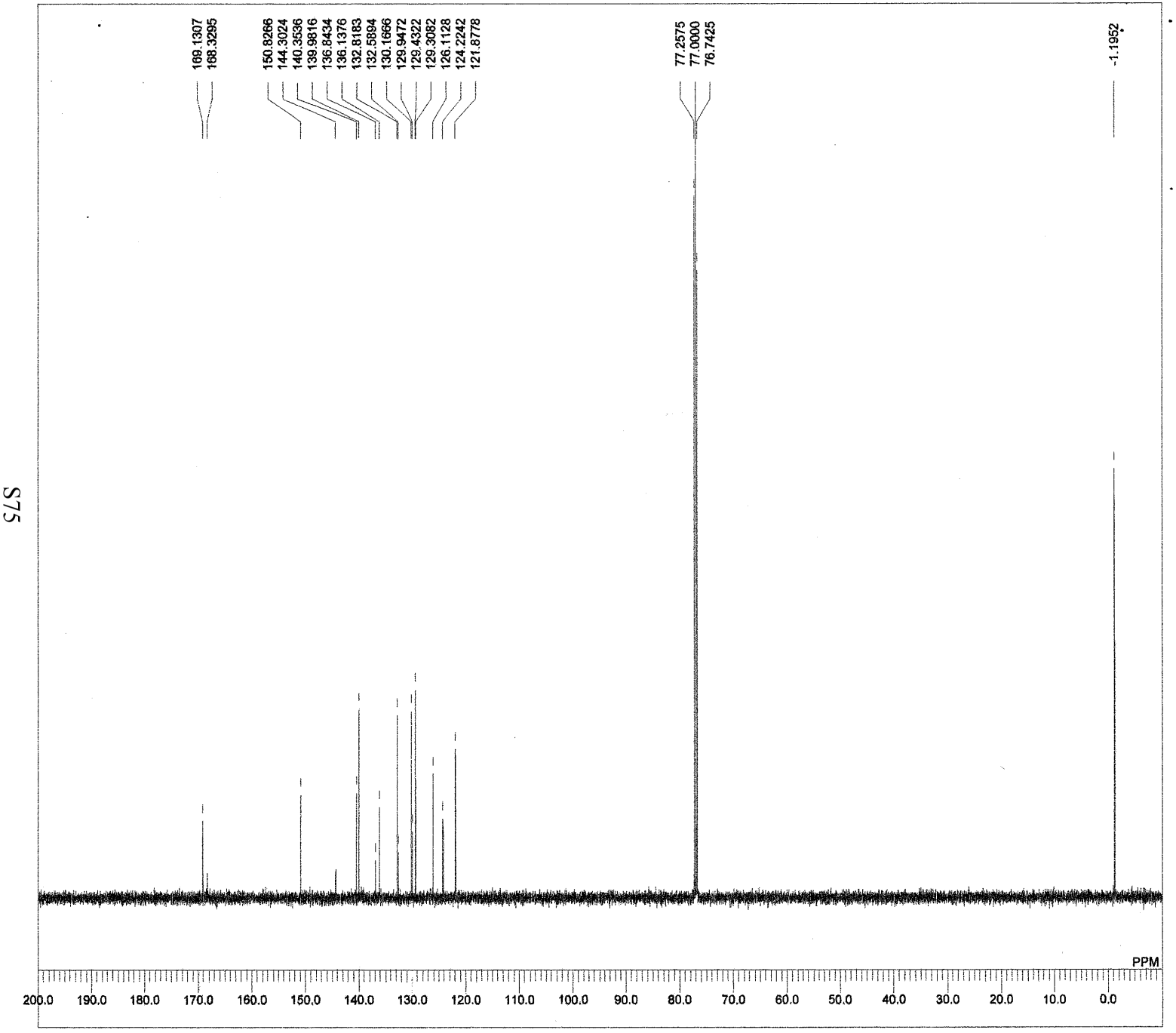


DFILE	skk-p31-ArCO2Me-Si-H-1-1.jdf
COMNT	skk-p31-ArCO2Me-Si-H
DATIM	2013-10-02 14:19:24
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	16384
FREQU	9384.38 Hz
SCANS	8
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	24.6 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	0.12 Hz
RGAIN	38

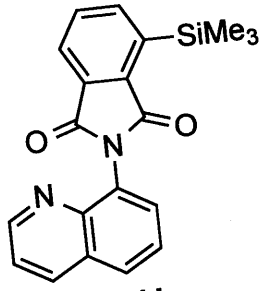


3k'a

skk-p31-ArCO2Me-Si-C 3k'a



DFILE	skk-p31-ArCO2Me-Si-C_copy4-1-1.jdf
COMNT	skk-p31-ArCO2Me-Si-C
DATIM	2013-10-02 14:21:11
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	300
ACQTM	0.0000 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	25.1 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	0.12 Hz
RGAIN	60

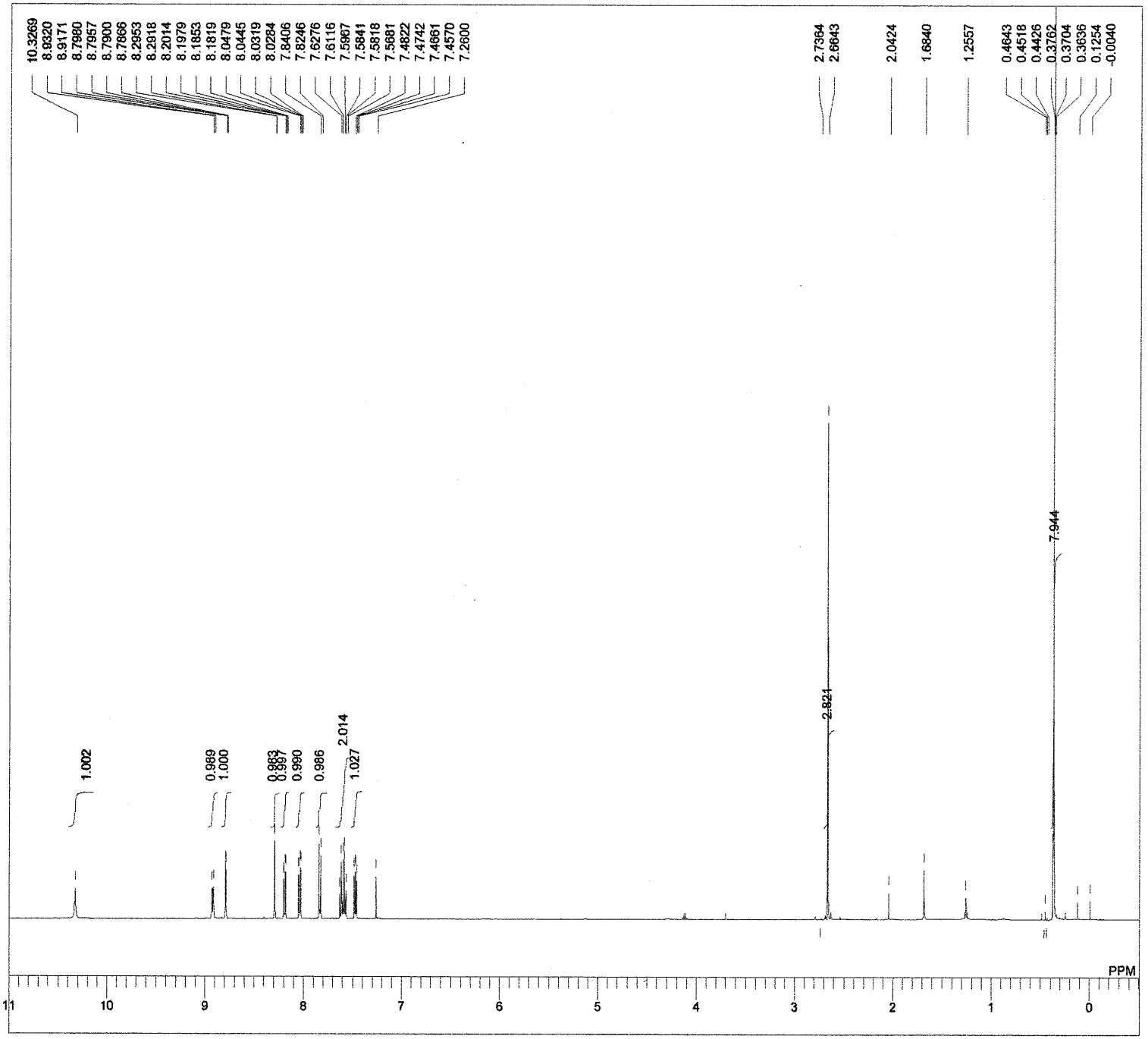


3k'a

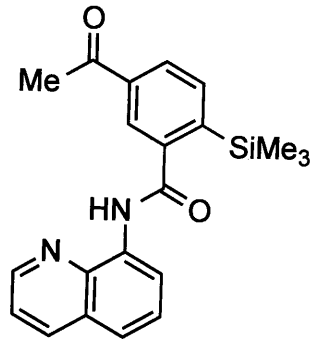
Acome - $SiMe_3$

skk-p185-~~ArMeF-H~~

3la



DFILE	skk-p185-ArMeF-H-1-1.als
COMNT	skk-p185-ArMeF-H
DATIM	2013-07-29 14:23:07
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	13107
FREQU	7507.51 Hz
SCANS	16
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	22.8 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	0.12 Hz
RGAIN	34

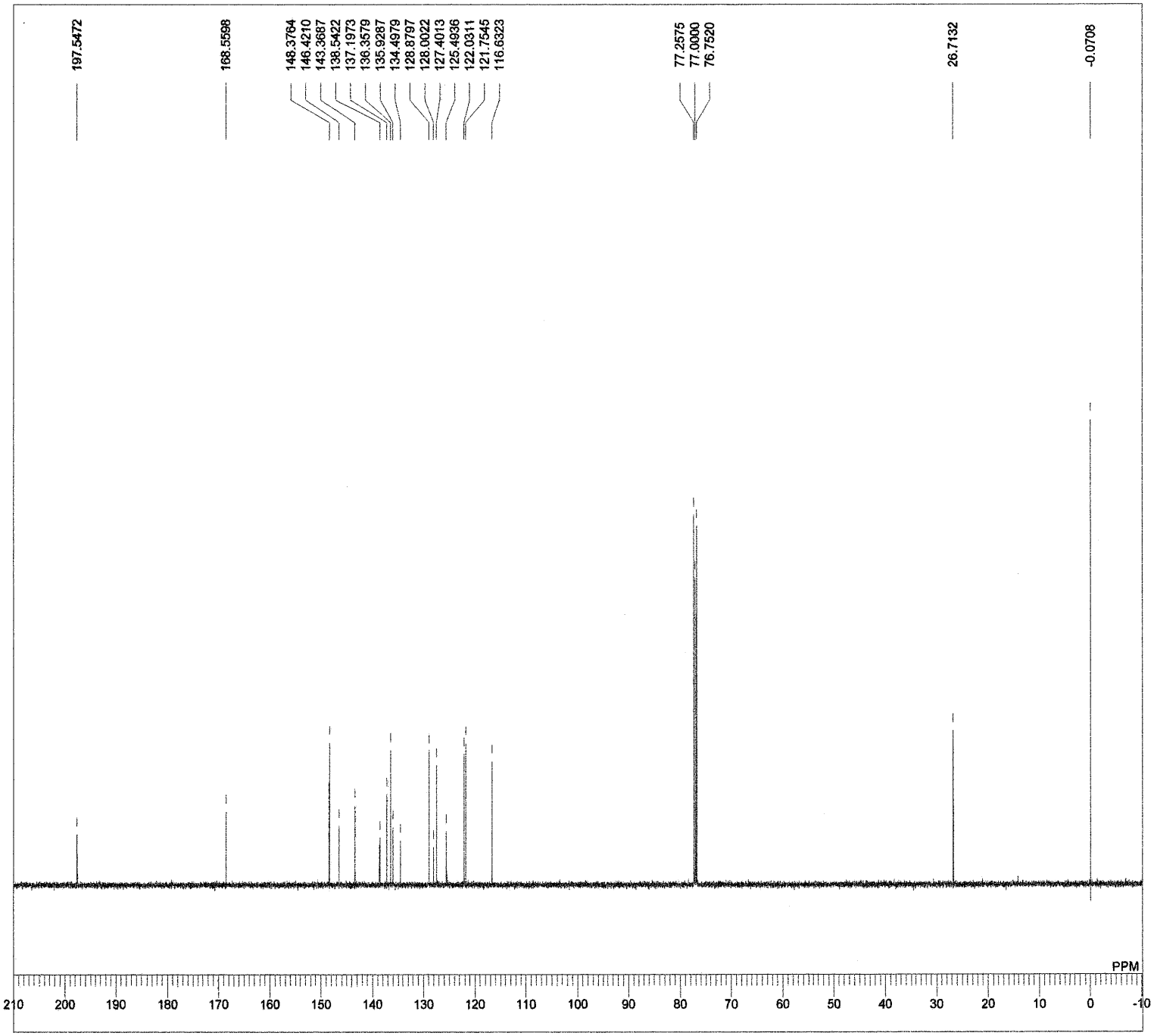


3la

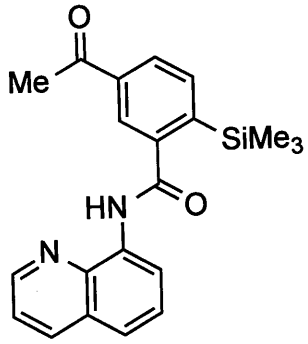
ArCOMe-SiMe3

skk-p185-~~ArMeF-C~~

3la

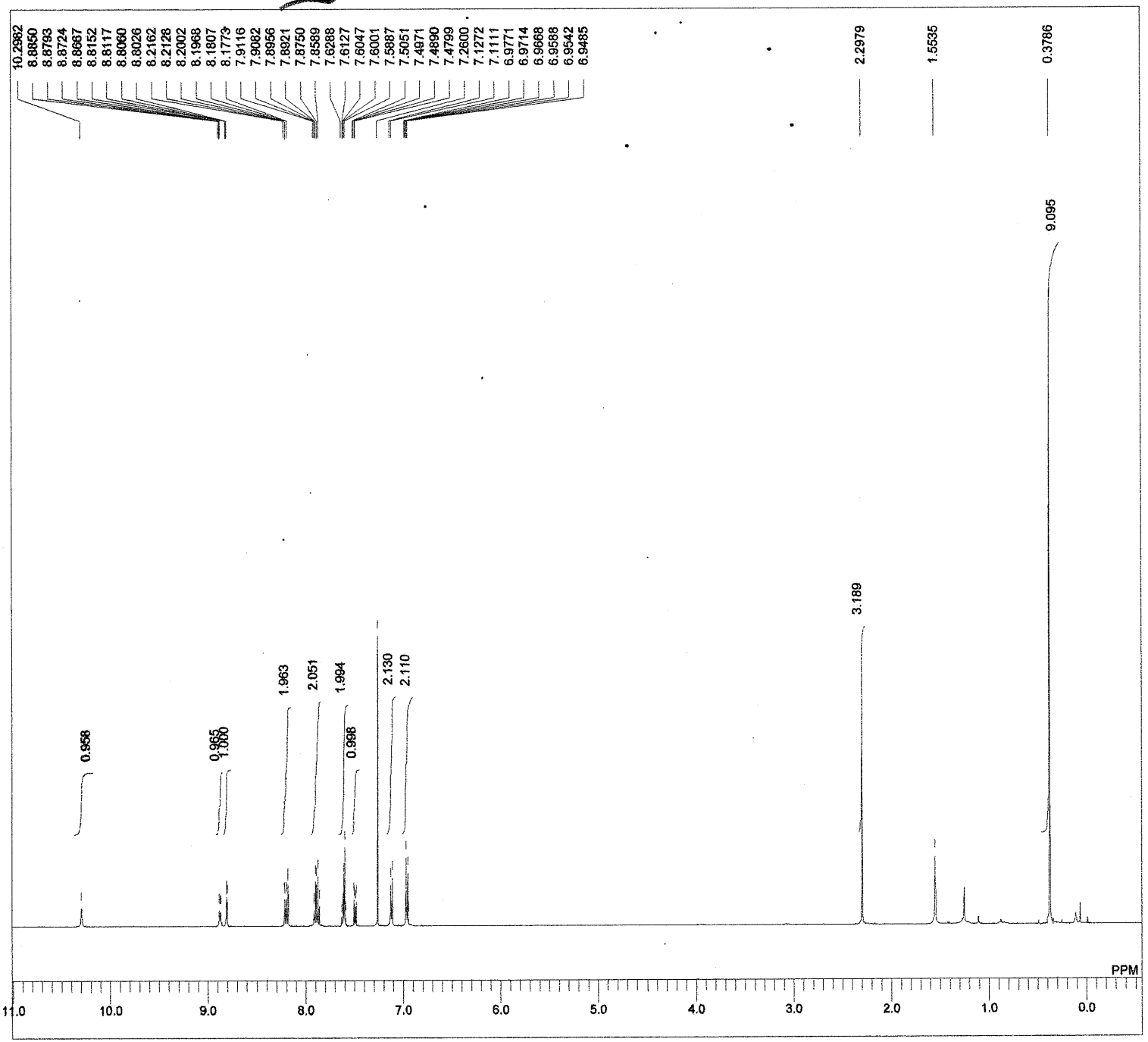


DFILE	skk-p185-ArCOMe-C-1-1.als
COMNT	skk-p185-ArMeF-C
DATIM	2013-07-29 14:25:49
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	26214
FREQU	31446.54 Hz
SCANS	386
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	23.6 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	0.12 Hz
RGAIN	60

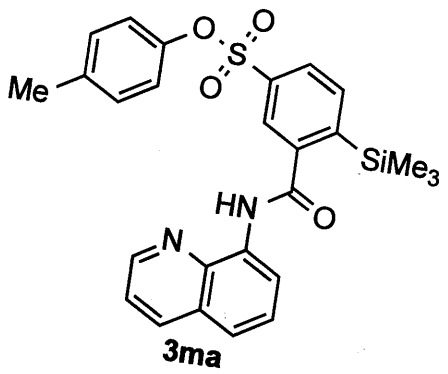


3la

skk-p41-ArSO3Ar-SiMe3-H 3ma



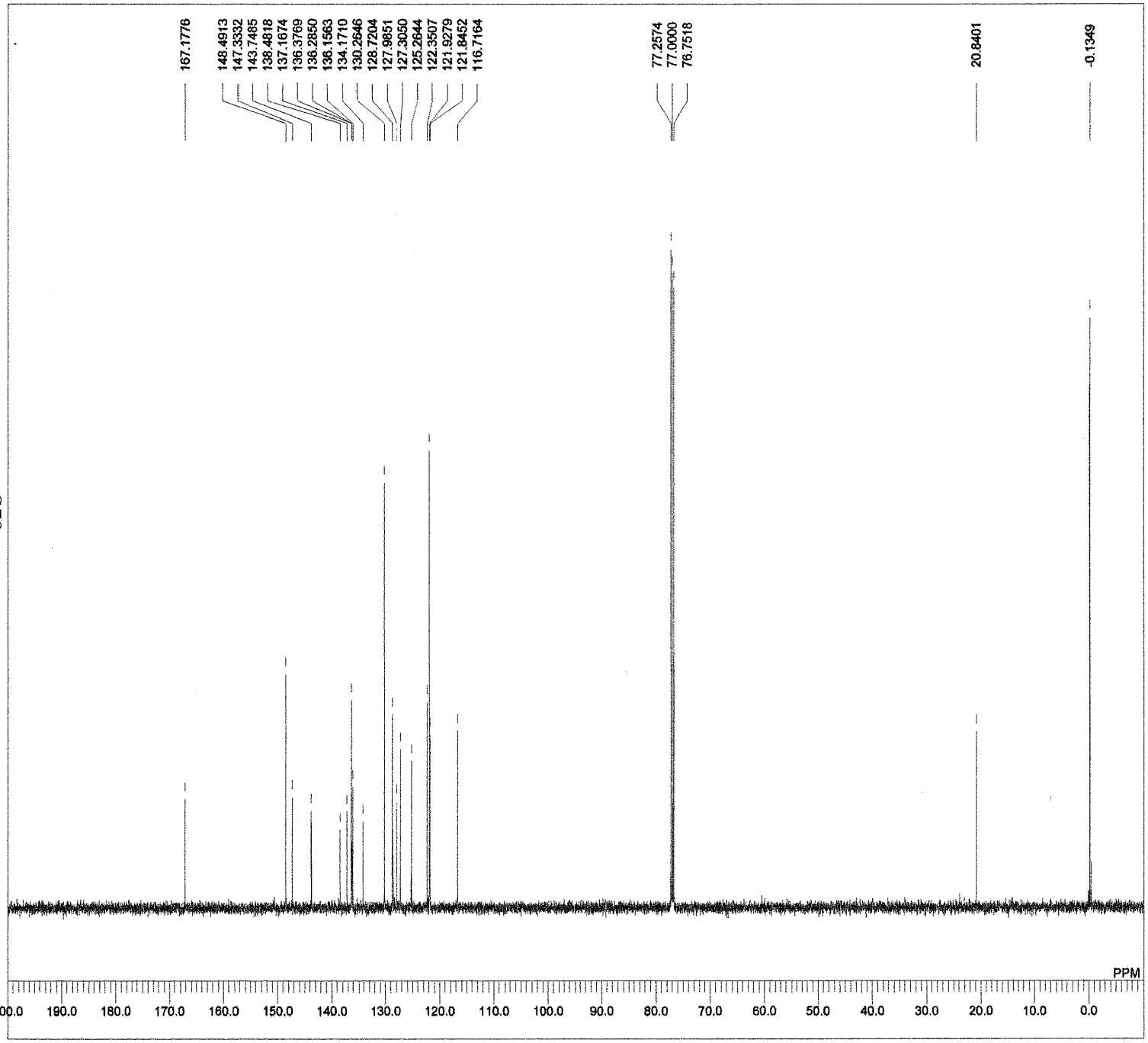
DFILE	skk-p41-ArSO3Ar-SiMe3-H-3-1.jdf
COMNT	skk-p41-ArSO3Ar-SiMe3-H
DATIM	2013-11-06 14:30:30
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	16384
FREQU	9384.38 Hz
SCANS	8
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	24.1 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	0.12 Hz
RGAIN	32



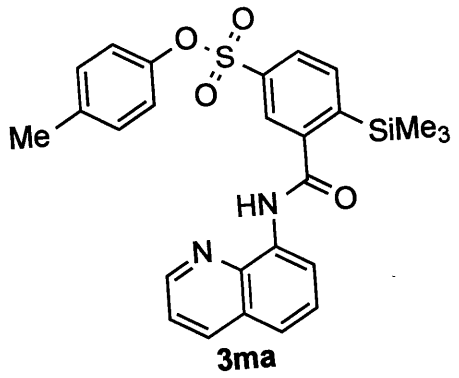
3ma

skk-p41-ArSO3Ar-SiMe3-C

3ma

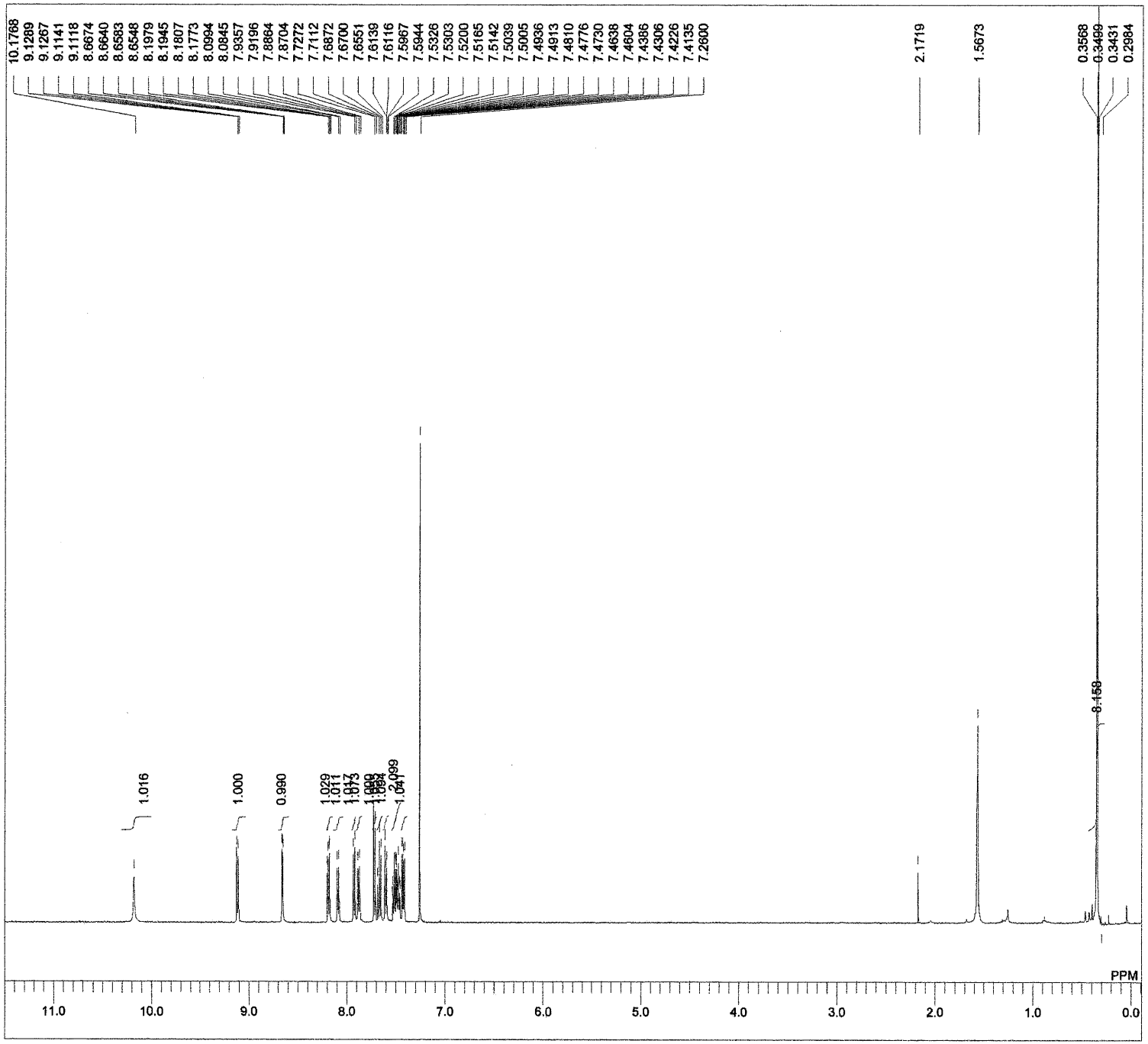


DFILE	skk-p41-ArSO3Ar-SiMe3-C_copy4-1-1.jdf
COMNT	skk-p41-ArSO3Ar-SiMe3-C
DATIM	2013-10-11 17:24:00
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	37878.79 Hz
SCANS	151
ACQTM	0.0000 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	26.0 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	1.00 Hz
RGAIN	60

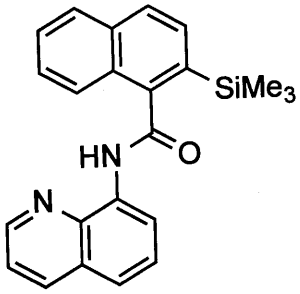


3ma

skk-p192-ArNaph-H 3na

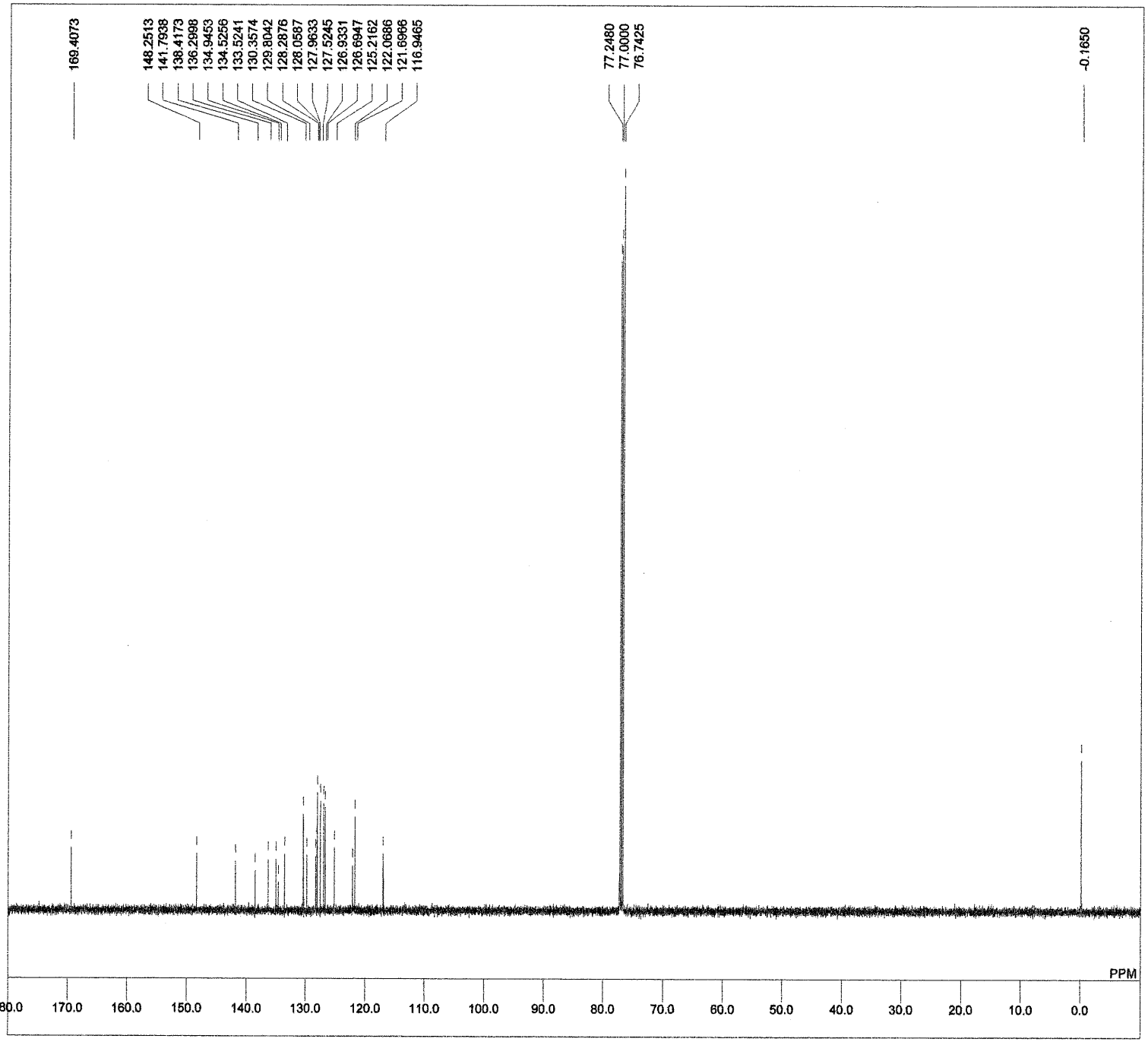


DFILE	skk-p192-ArNaph-H-2-1.jdf
COMNT	skk-p192-ArNaph-H
DATIM	2013-08-05 19:19:59
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	16384
FREQU	9384.38 Hz
SCANS	16
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	23.6 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	0.12 Hz
RGAIN	40

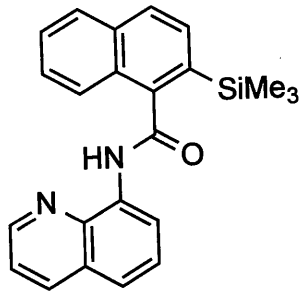


3na

skk-p192-ArNaphth-C 3na

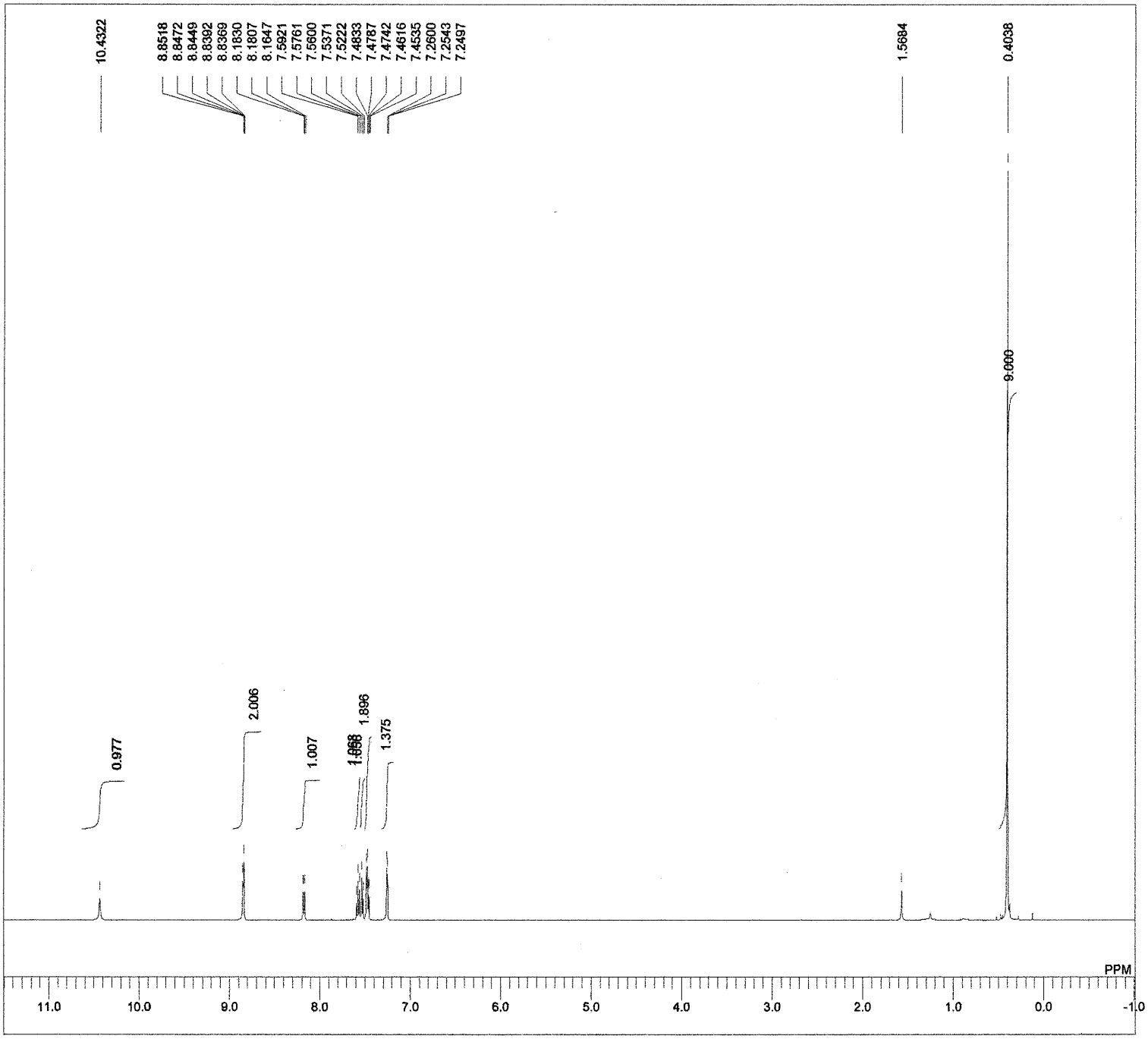


DFILE	skk-p192-ArNaphth-C-1-1.jdf
COMNT	skk-p192-ArNaphth-C
DATIM	2013-08-05 14:11:56
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	551
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	23.9 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	0.12 Hz
RGAIN	60

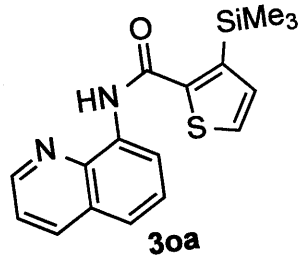


3na

skk-bk2-p135-8AqCOthiophene-H 30a

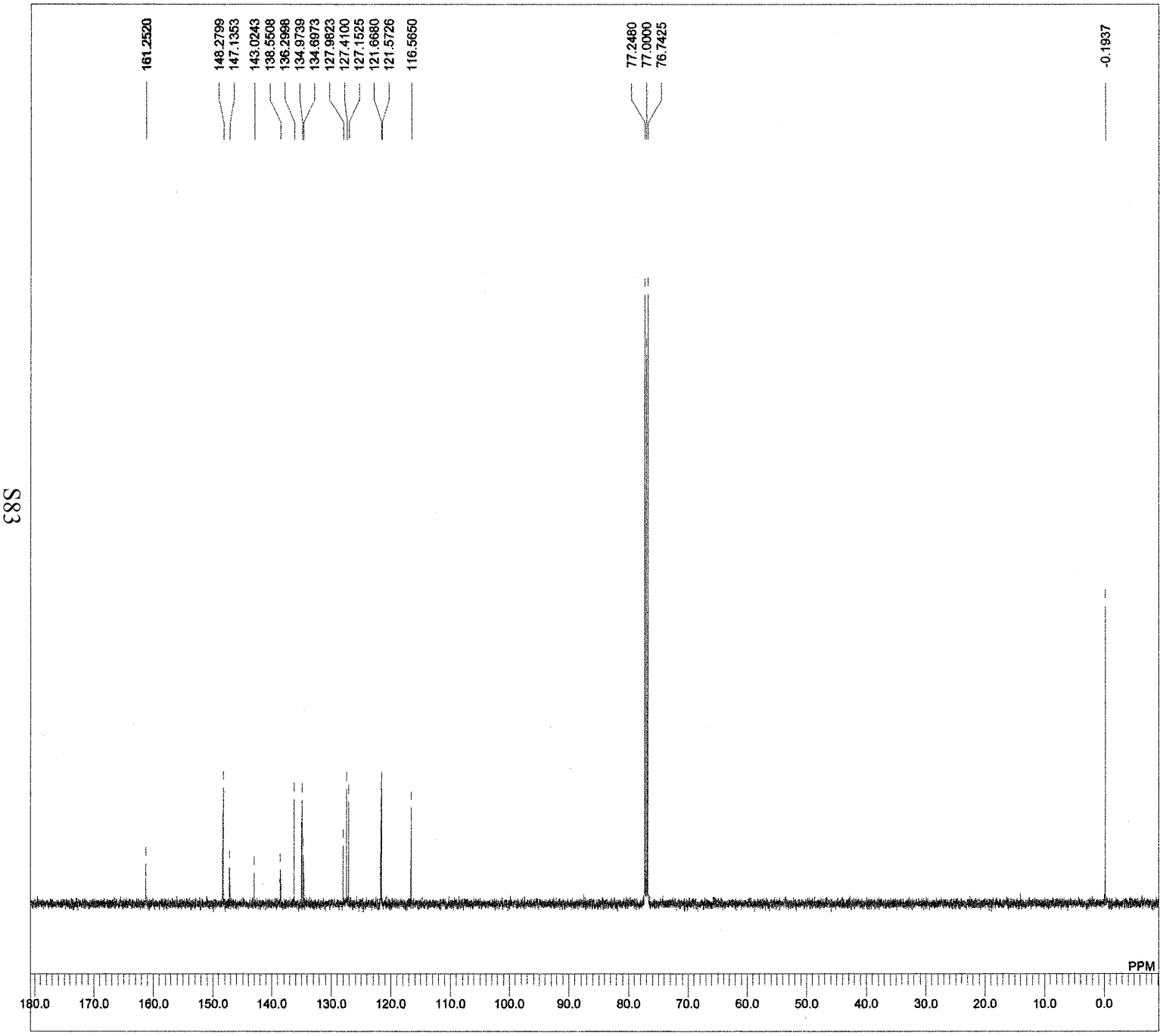


DFILE	skk-bk2-p135-8AqCOthiophene-H-1-1.als
COMNT	skk-bk2-p135-8AqCOthiophene-H
DATIM	2013-11-01 12:57:41
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	16384
FREQU	9384.38 Hz
SCANS	8
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	24.0 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	1.00 Hz
RGAIN	30

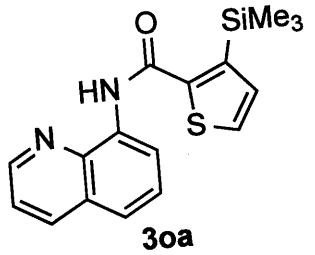


3oa

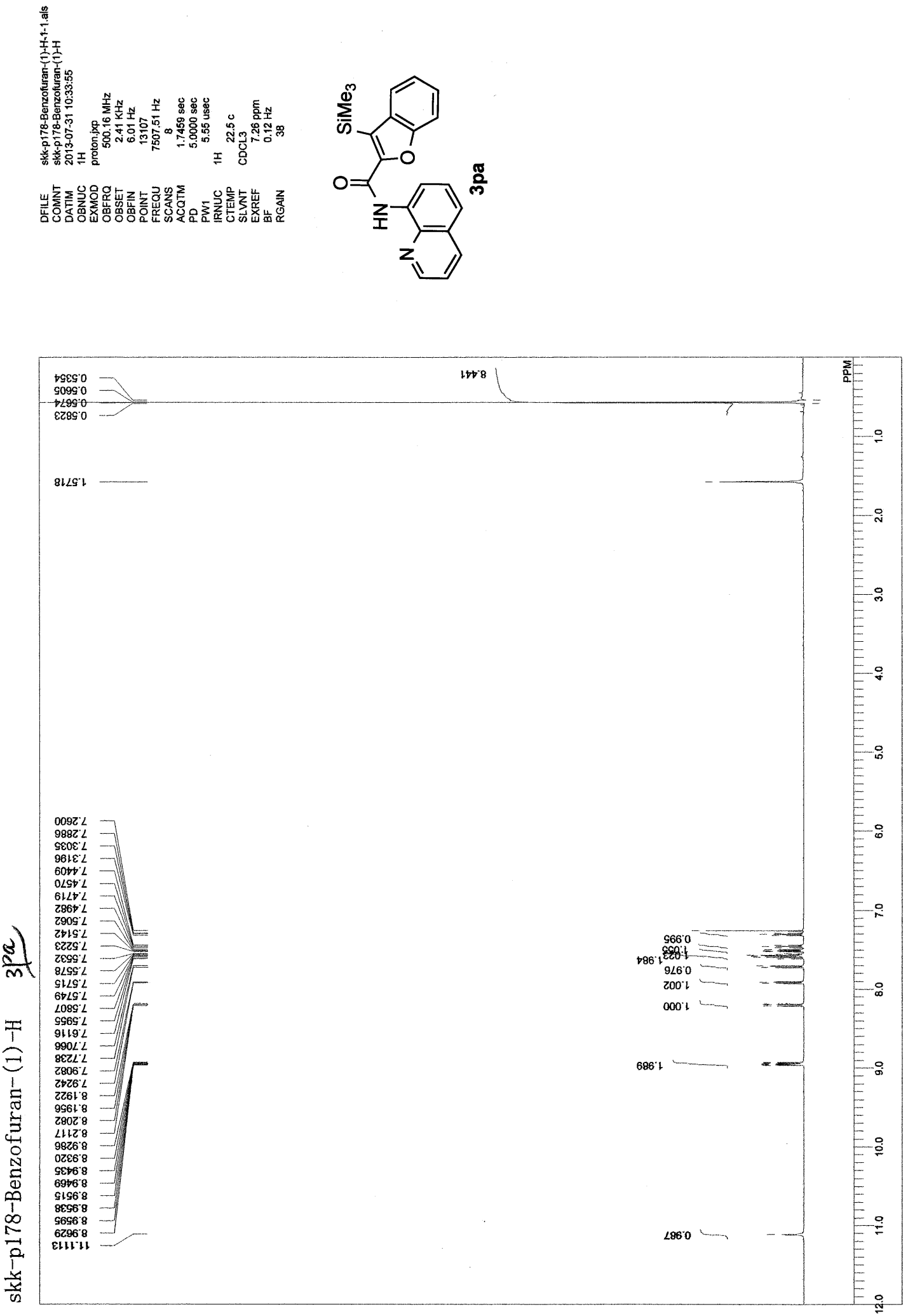
skk-bk2-p135-8AqCOthiophene-C 30a



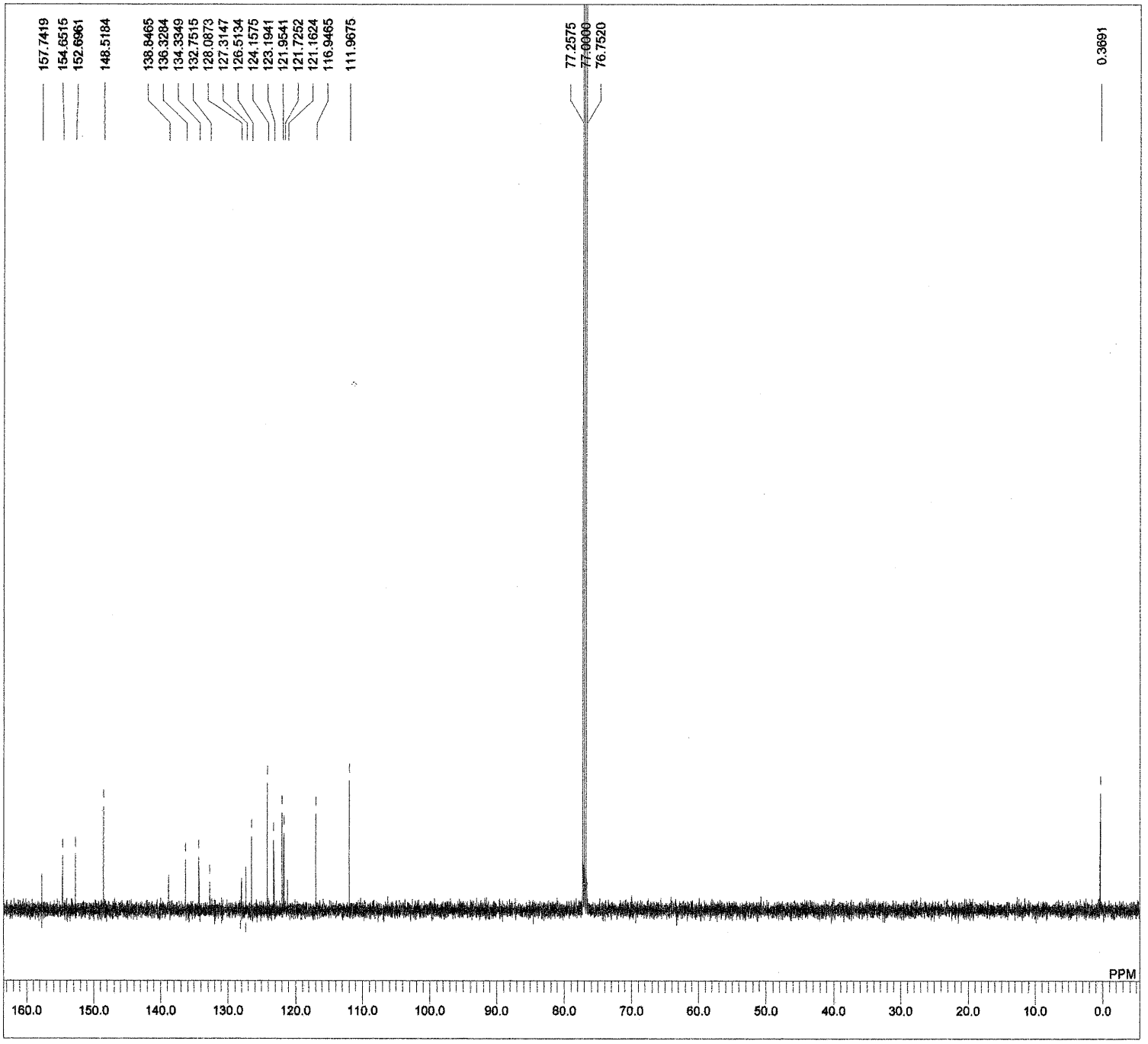
DFILE	skk-bk2-p135-8AqCOthiophene-C-1-1.jdf
COMNT	skk-bk2-p135-8AqCOthiophene-C
DATIM	2013-11-01 12:59:60
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	194
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	24.6 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	1.00 Hz
RGAIN	60



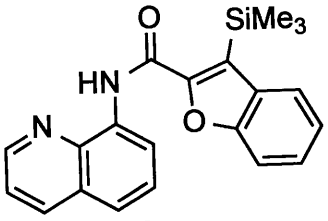
3oa


DFILE skk-p178-Benzofuran-(1)-H-1-1.als
COMNT skk-p178-Benzofuran-(1)-H
DATIM 2013-07-31 10:33:55
OBNUC 1H
EXMOD proton.jxp
OBFRQ 500.16 MHz
OBSET 2.41 KHz
OBFIN 6.01 Hz
POINT 13107
FREQU 7507.51 Hz
SCANS 8
ACQTM 1.7459 sec
PD 5.0000 sec
PW1 5.55 usec
IRNUC 1H
CTEMP 22.5 c
SLVNT CDCL3
EXREF 7.26 ppm
BF 0.12 Hz
RGAIN 38
SiMe3
O
HN
N
3pa
skk-p178-Benzofuran-(1)-H
3pa
PPM

skk-p178-Benzofuran-(1)-C 3pa

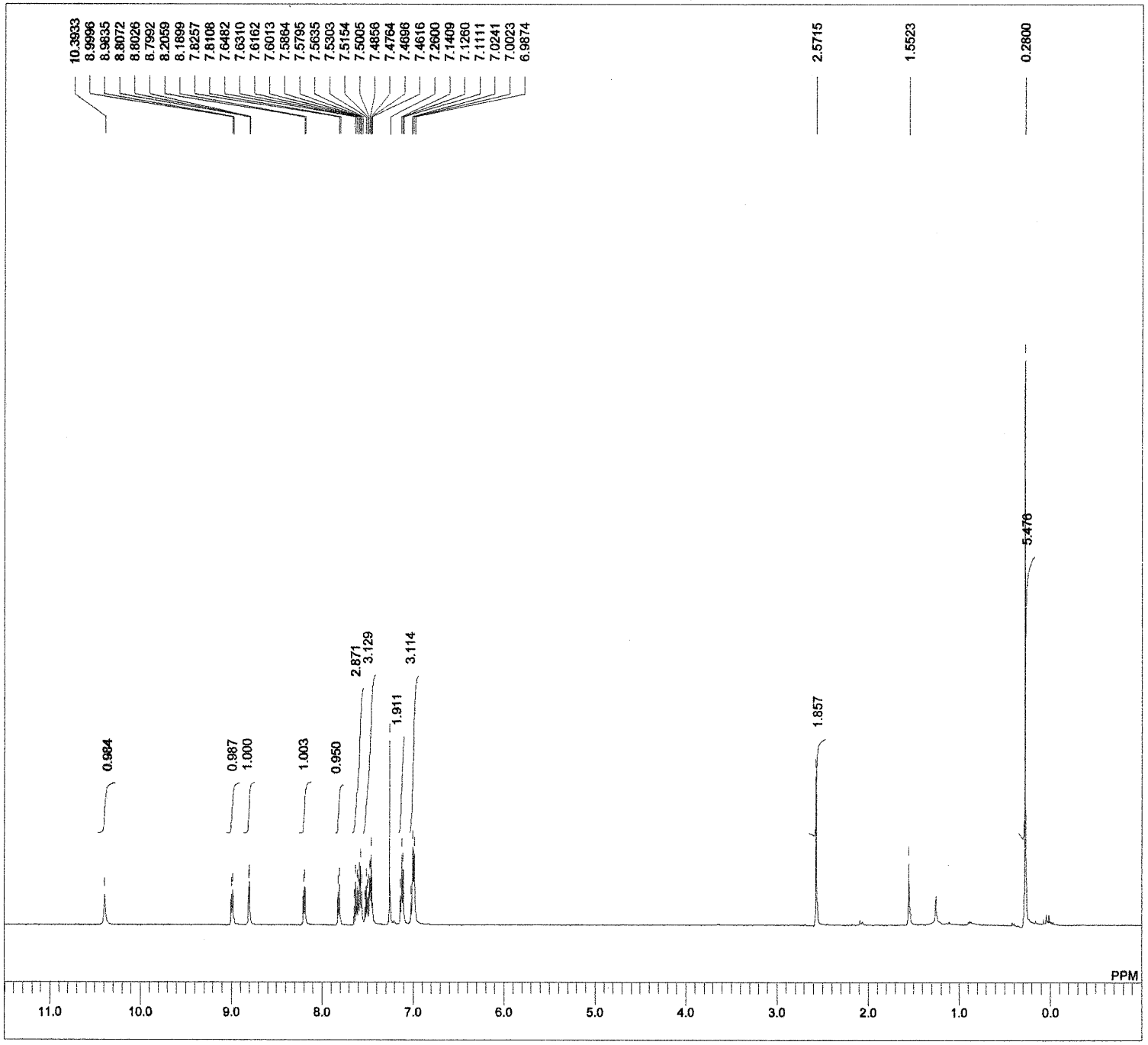


DFILE	skk-p178-Benzofuran-(1)-C-1-1.jdf
COMNT	skk-p178-Benzofuran-(1)-C
DATIM	2013-07-31 10:36:07
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	376
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	23.2 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	0.12 Hz
RGAIN	60

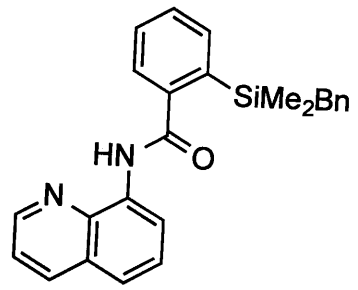


3pa

skk-p3-ArSiMe2Bn-H 3ab



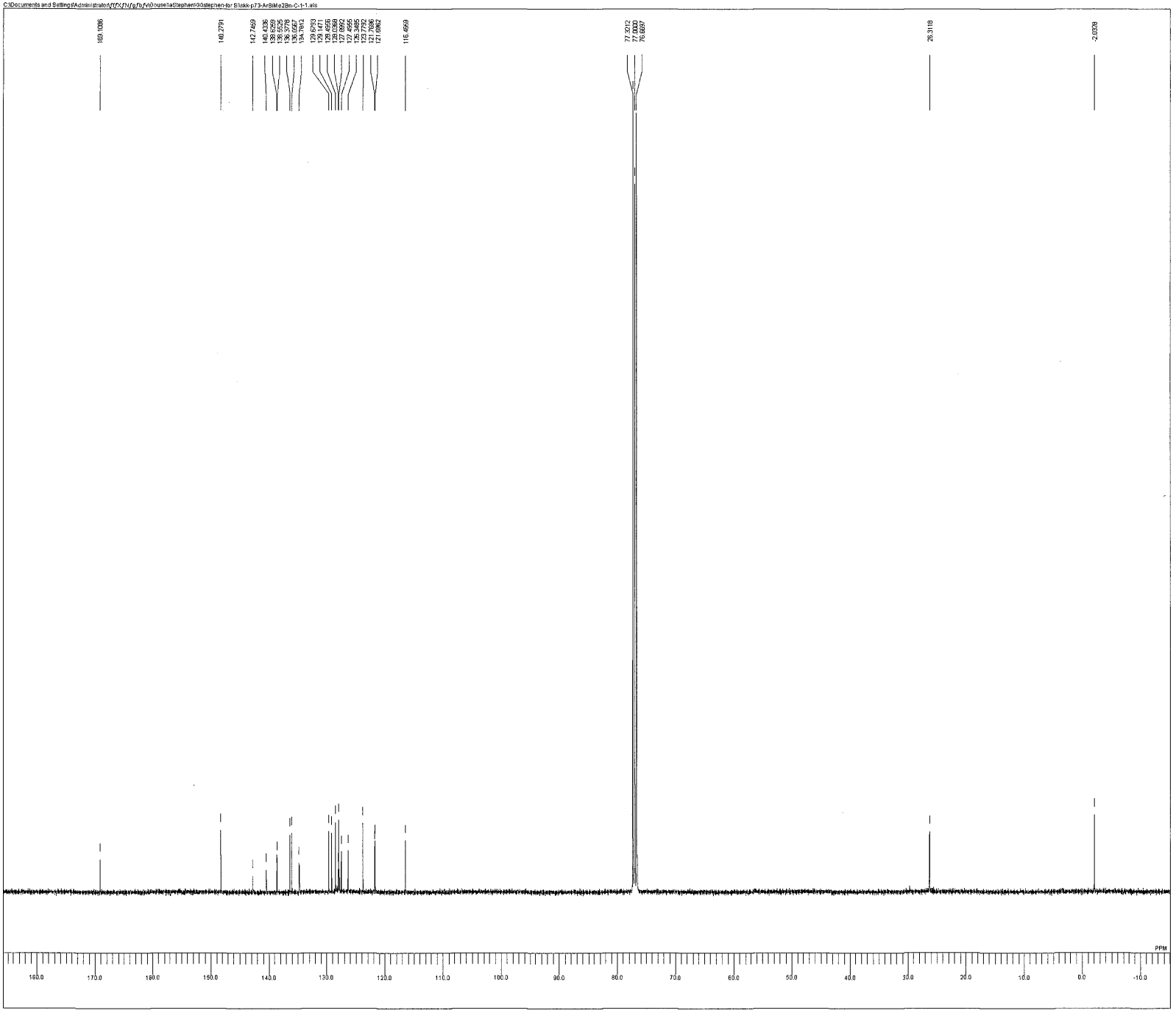
DFILE	skk-p3-ArSiMe2Bn-H-1-1.als
COMNT	skk-p3-ArSiMe2Bn-H
DATIM	2013-12-11 16:43:32
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	13107
FREQU	7507.51 Hz
SCANS	16
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	21.7 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	0.12 Hz
RGAIN	40



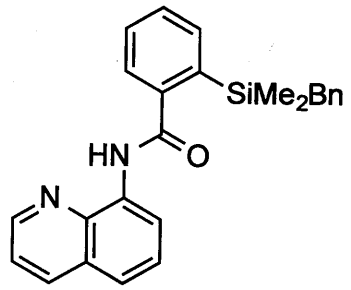
3ab

3ab

C:\Documents and Settings\Administrator\ƒÚƒÑƒgƒbƒv\ÎÀ•ûStephen\30stephen-for Slskk-p73-ArSiMe2Bn-C-1-1.als

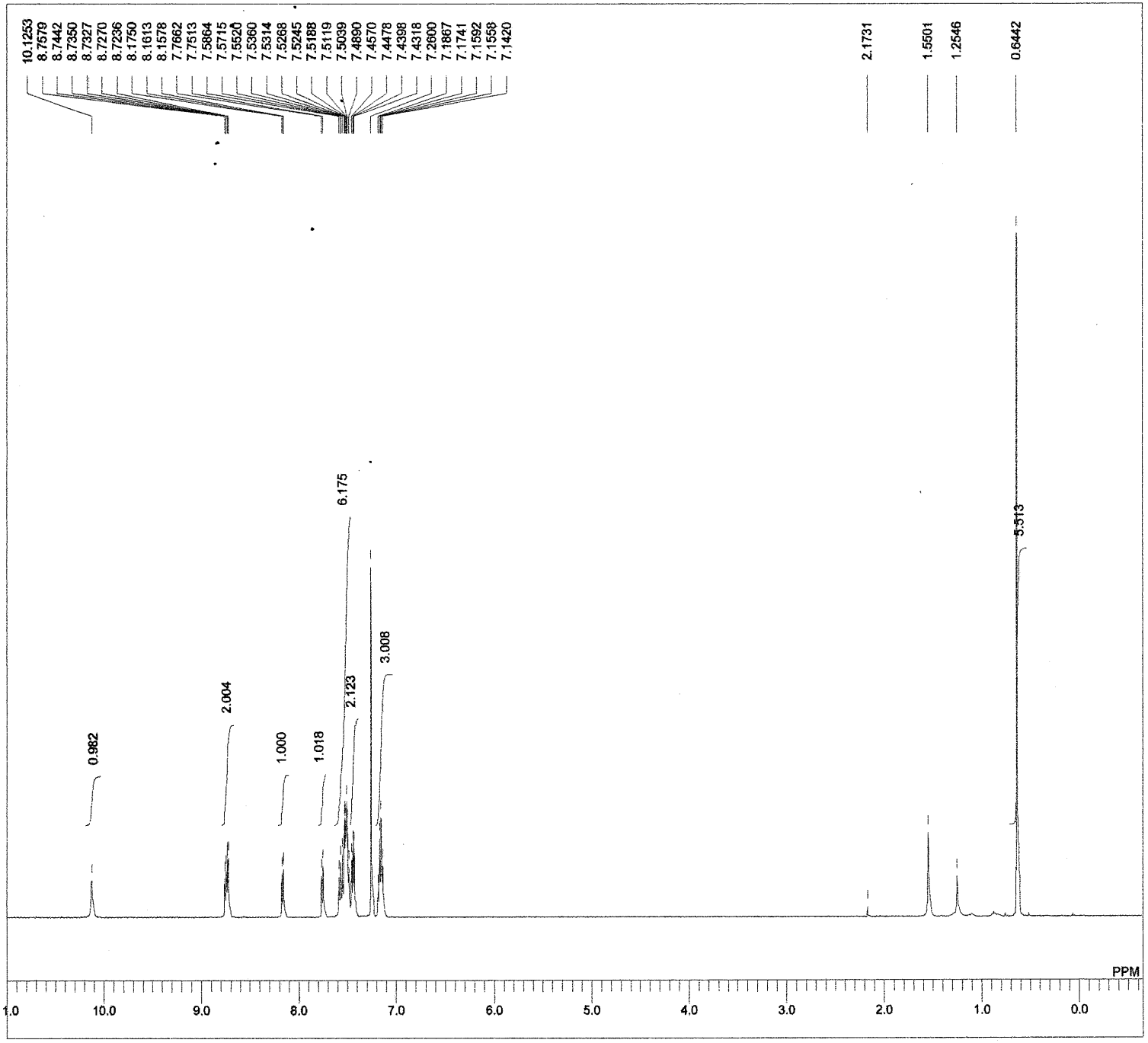


DFILE skk-p73-ArSiMe2Bn-C-1-1.alq
COMNT skk-p73-ArSiMe2Bn-C
DATIM 11-12-2013 23:04:15
OBNUC 13C
EXMOD carbon.jxp
OBFRQ 98.53 MHz
OBSET 4.64 KHz
OBFIN 8.74 Hz
POINT 26214
FREQU 23696.68 Hz
SCANS 8000
ACQTM 1.1062 sec
PD 2.0000 sec
PW1 3.00 usec
IRNUC 1H
CTEMP 21.2 c
SLVNT CDCl3
EXREF 77.00 ppm
BF 0.12 Hz
RGAIN 90

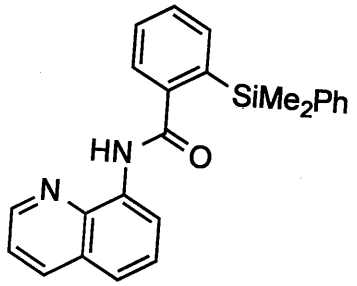


3ab

skk-p3-ArSiMe2Ph-H 3ac



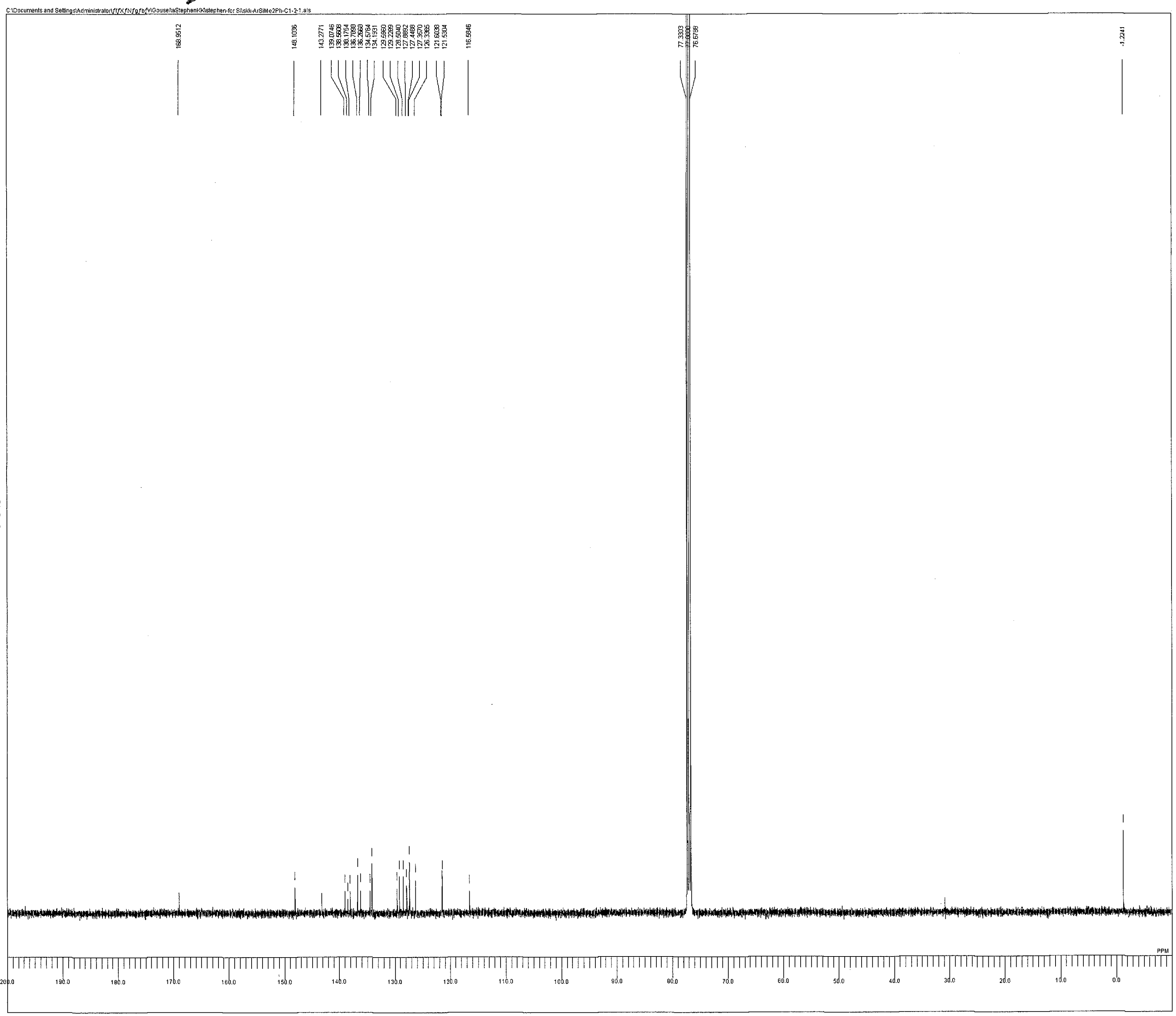
DFILE	skk-p3-ArSiMe2Ph-H-1-1.jdf
COMNT	skk-p3-ArSiMe2Ph-H
DATIM	2013-12-11 16:25:17
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	16384
FREQU	9384.38 Hz
SCANS	16
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	21.5 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	0.12 Hz
RGAIN	40



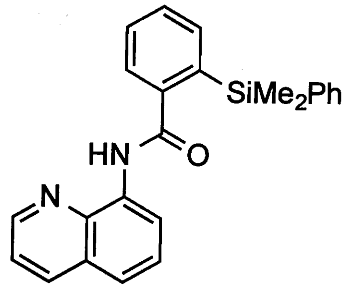
3ac

skk-ArSiMe2Ph-C1

3ac

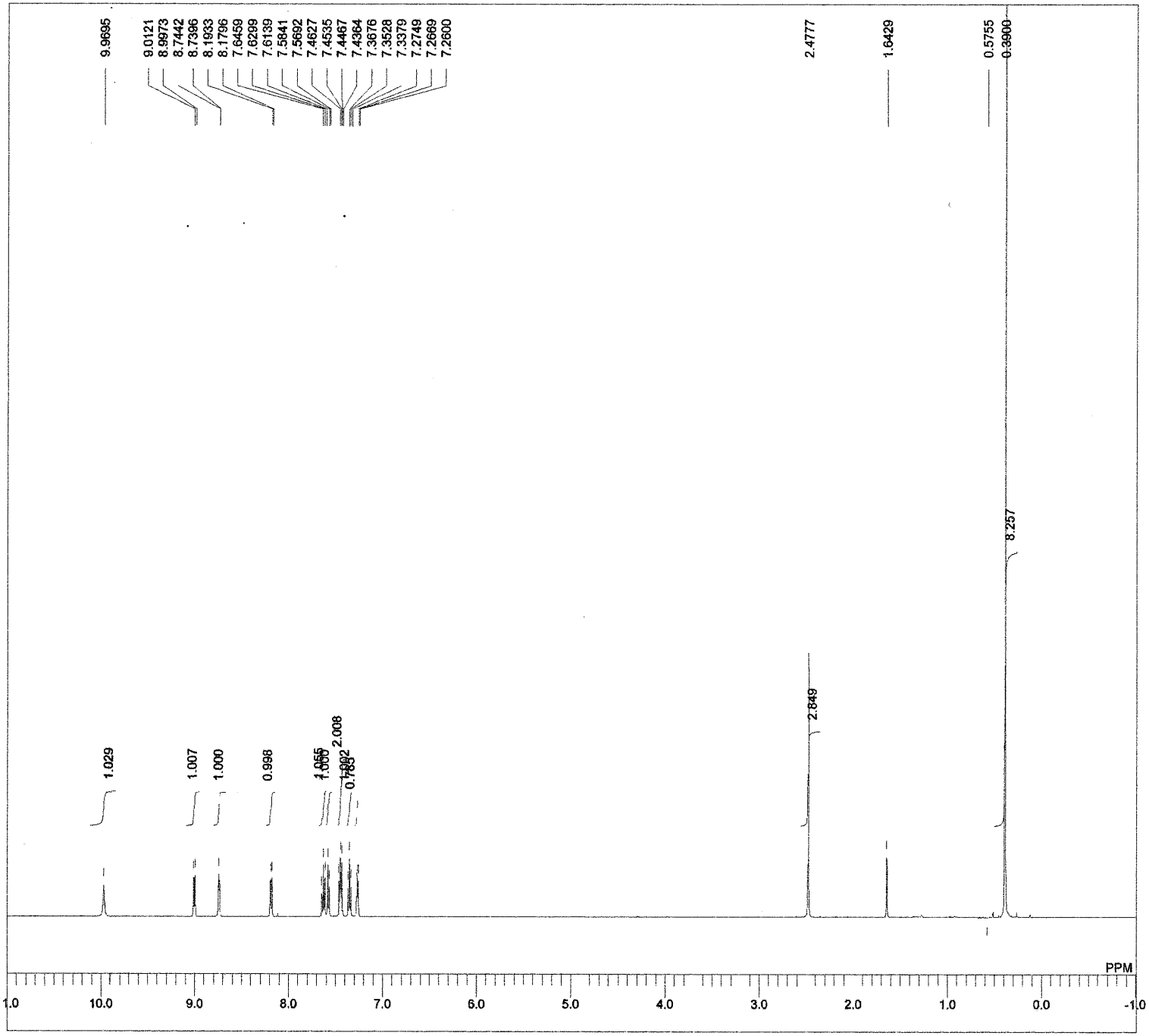


DFILE	skk-ArSiMe2Ph-C1-2-1.als
COMNT	skk-ArSiMe2Ph-C1
DATIM	12-12-2013 23:09:16
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	98.52 MHz
OBSET	4.64 KHz
OBFIN	8.74 Hz
POINT	32767
FREQU	29620.85 Hz
SCANS	10500
ACQTM	1.1062 sec
PD	2.0000 sec
PW1	3.00 usec
IRNUC	1H
CTEMP	21.1 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	0.12 Hz
RGAIN	60

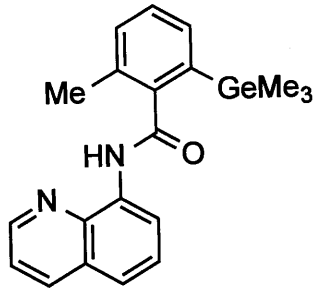


3ac

skk-p202-ArMe-Ge-H 4ba

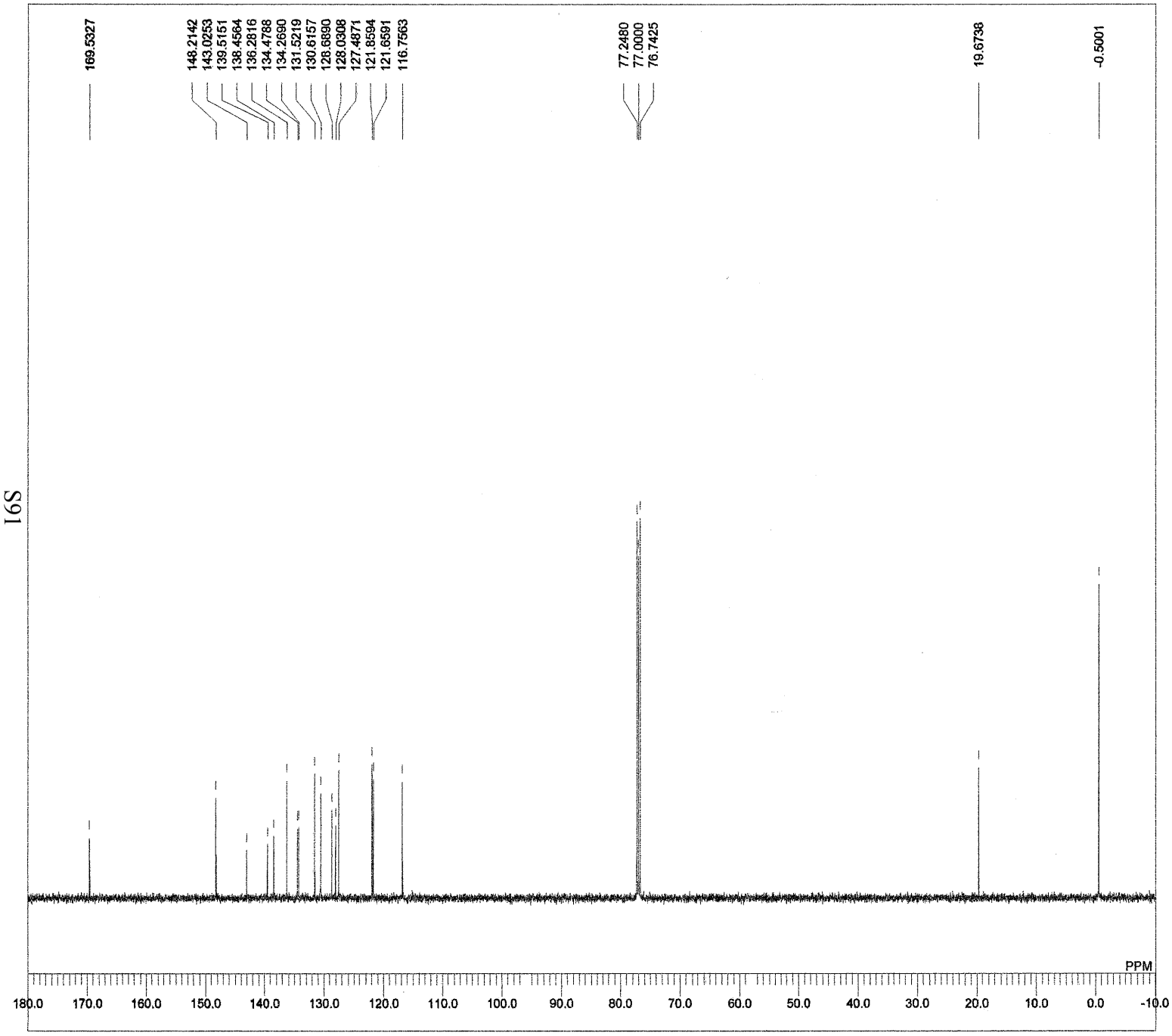


DFILE	skk-p202-ArMe-Ge-H-1-1.jdf
COMNT	skk-p202-ArMe-Ge-H
DATIM	2013-08-12 18:08:06
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	16384
FREQU	9384.38 Hz
SCANS	16
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	26.3 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	1.00 Hz
RGAIN	34

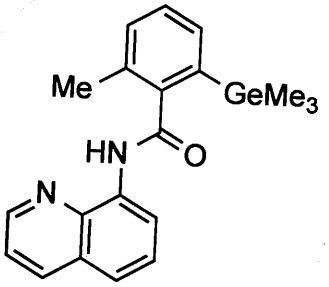


4ba

skk-p202-ArMe-Ge-C 4ba

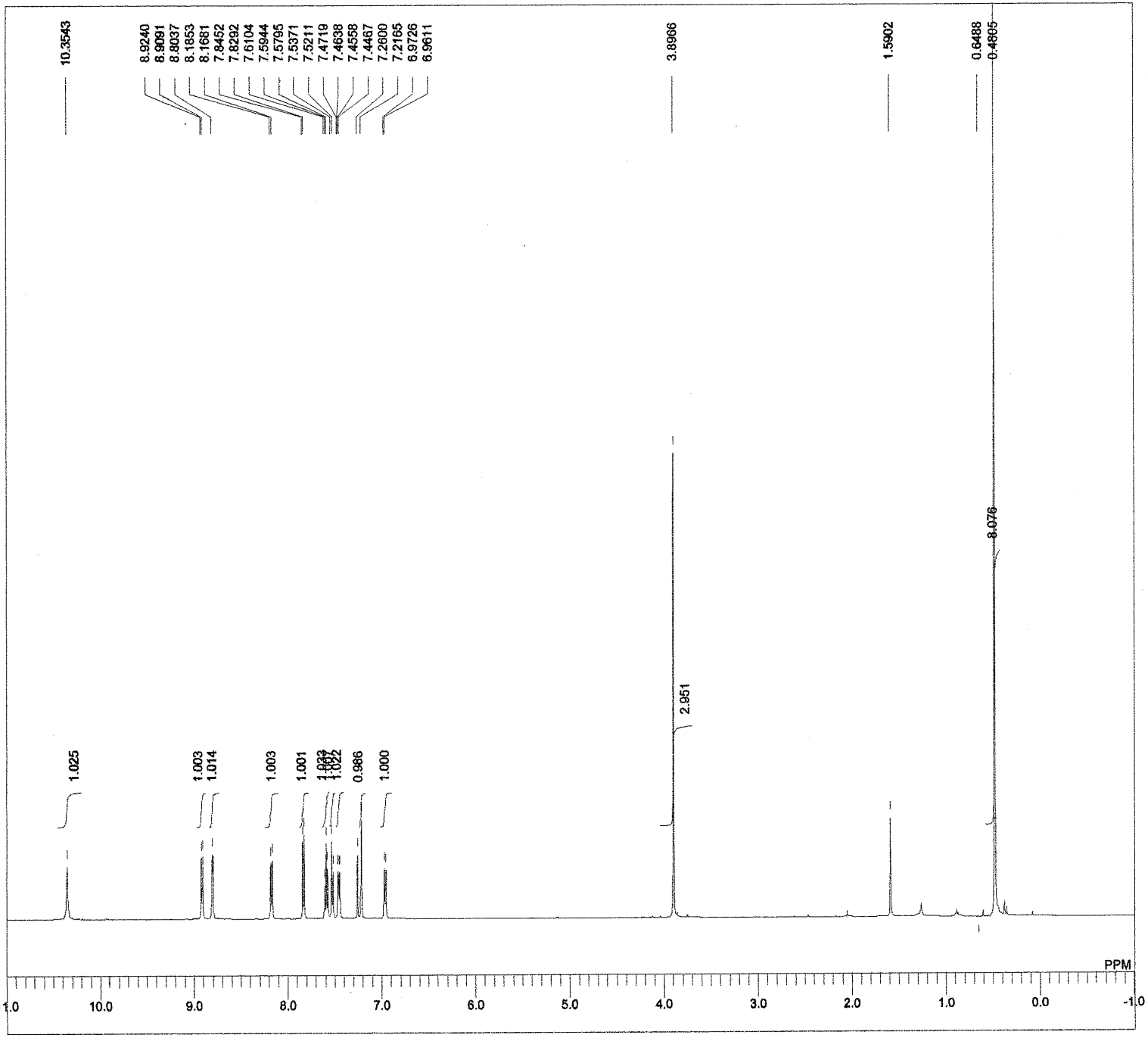


DFILE	skk-p202-ArMe-Ge-C-1-1.als
COMNT	skk-p202-ArMe-Ge-C
DATIM	2013-08-12 18:11:17
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	26214
FREQU	31446.54 Hz
SCANS	122
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	26.6 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	1.00 Hz
RGAIN	60

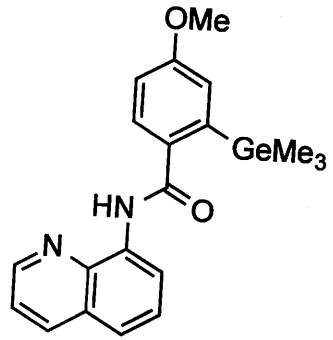


4ba

skk-p20-Ge-ArOMe-H 4fa



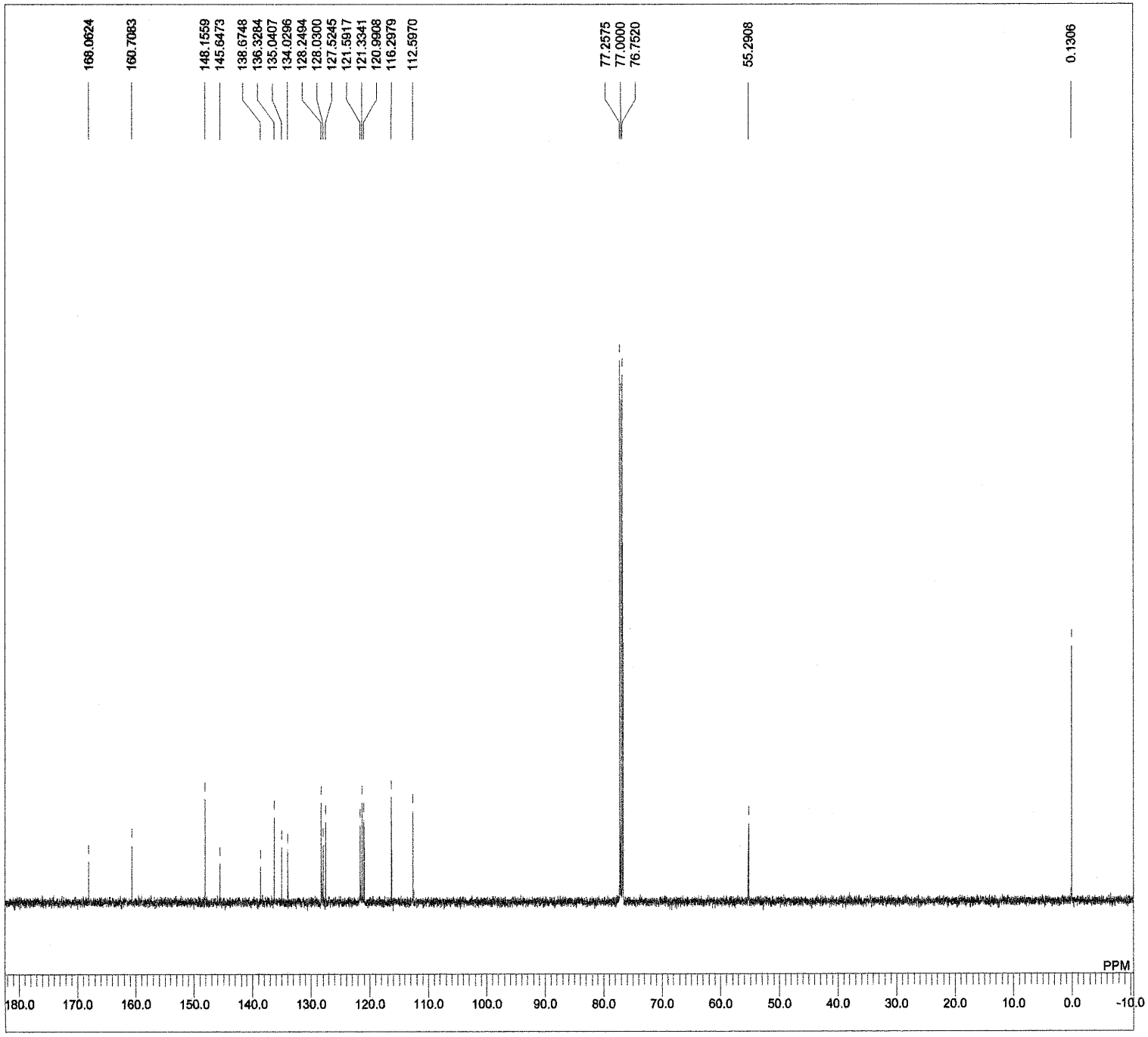
DFILE	skk-p20-Ge-ArOMe-H-1-1.jdf
COMNT	skk-p20-Ge-ArOMe-H
DATIM	2013-09-17 16:54:53
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	16384
FREQU	9384.38 Hz
SCANS	16
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	25.0 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	1.20 Hz
RGAIN	38



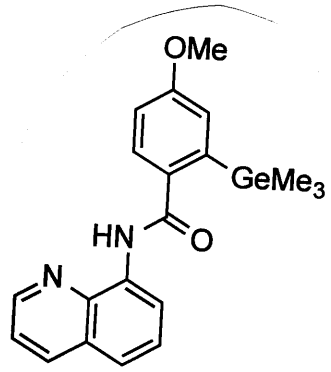
4fa

skk-p20-Ge-ArOMe-C

4fa



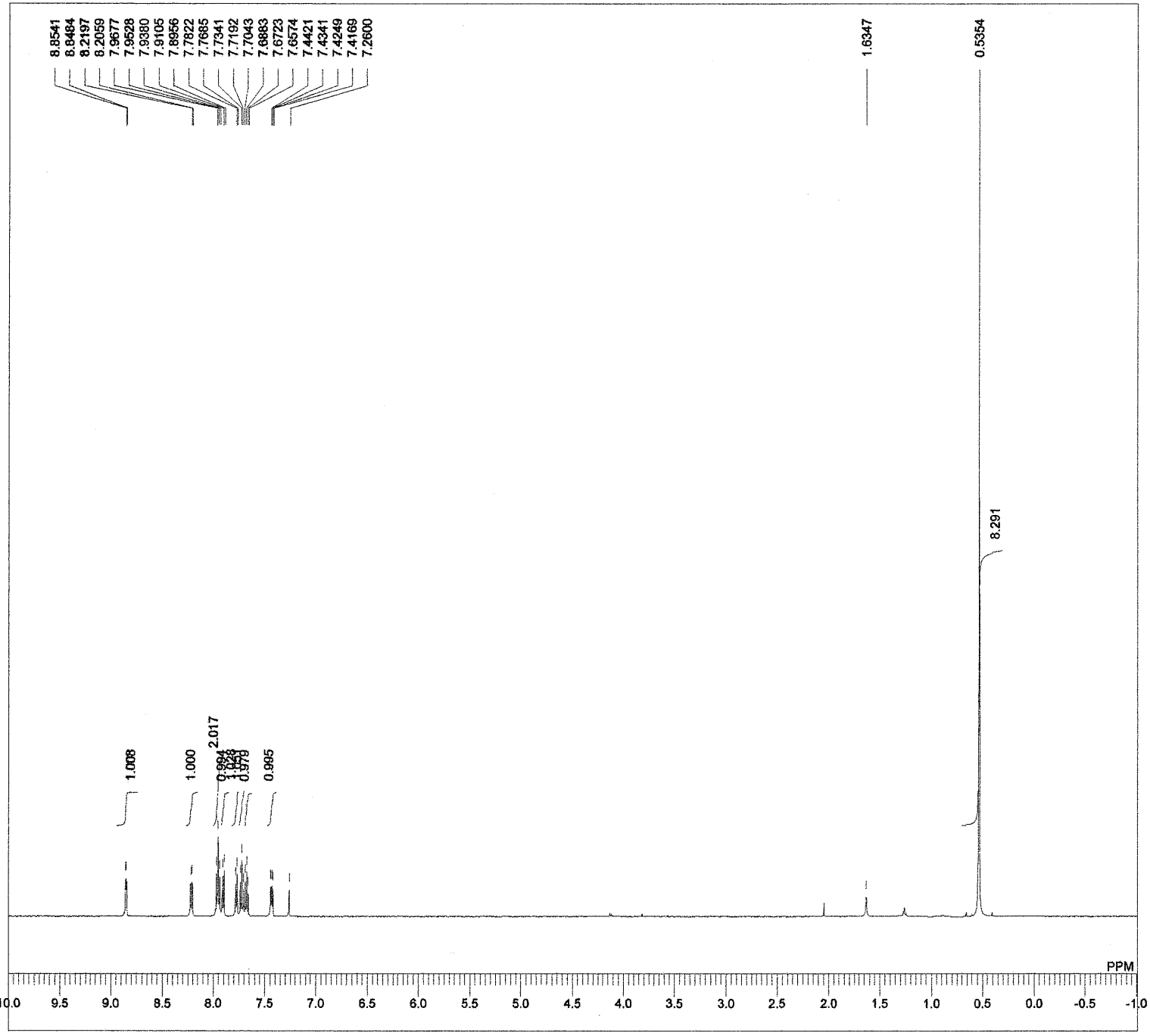
DFILE	skk-p20-Ge-ArOMe-C-1-1.als
COMNT	skk-p20-Ge-ArOMe-C
DATIM	2013-09-17 16:57:35
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	159
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	25.7 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	1.20 Hz
RGAIN	60



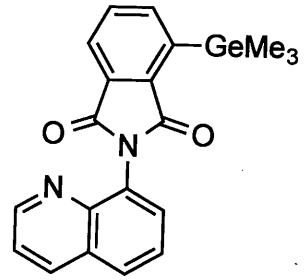
4fa

skk-p20-Ge-ArCO2Me-H

4k'a

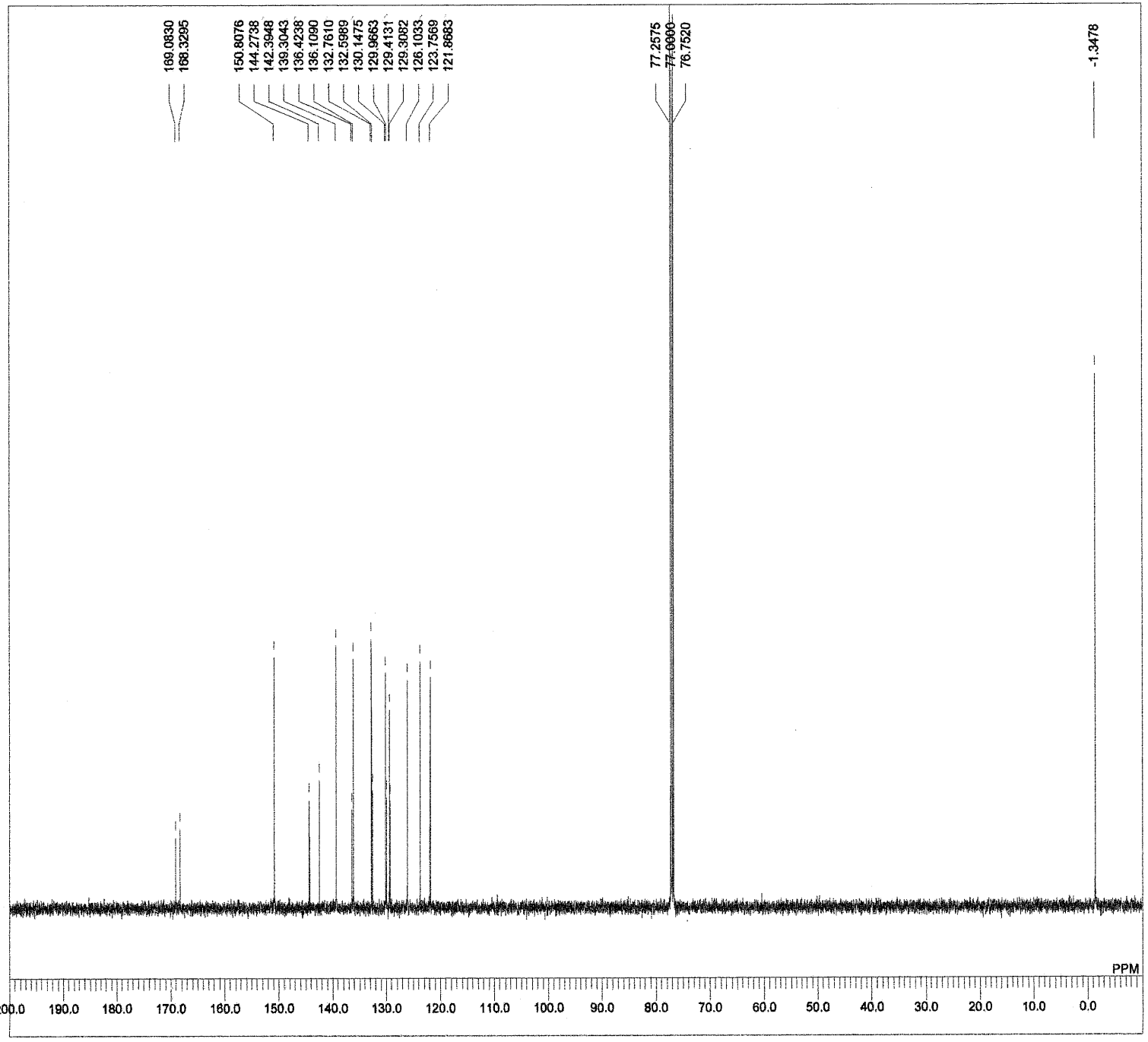


DFILE	skk-p20-Ge-ArCO2Me-H-1-1.als
COMNT	skk-p20-Ge-ArCO2Me-H
DATIM	2013-09-17 16:33:03
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	13107
FREQU	7507.51 Hz
SCANS	16
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	24.5 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	1.20 Hz
RGAIN	36

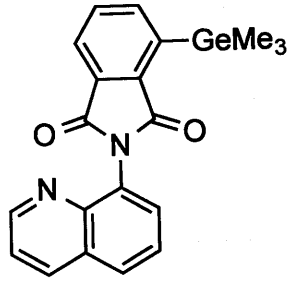


4k'a

skk-p20-Ge-ArCO2Me-C 4k'a

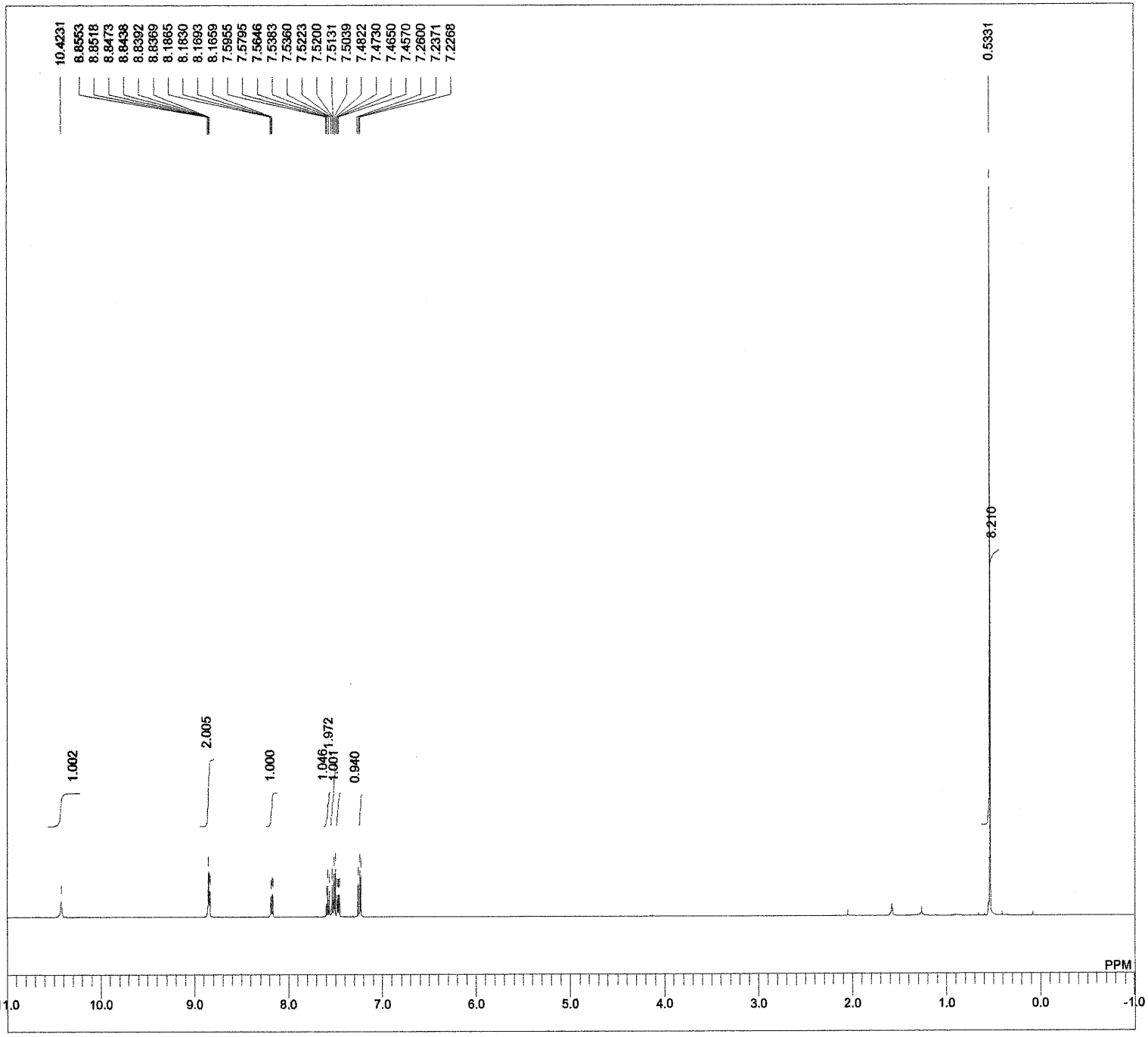


DFILE	skk-p20-Ge-ArCO2Me-C-1-1.jdf
COMNT	skk-p20-Ge-ArCO2Me-C
DATIM	2013-09-17 16:36:03
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	216
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	25.3 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	1.20 Hz
RGAIN	60

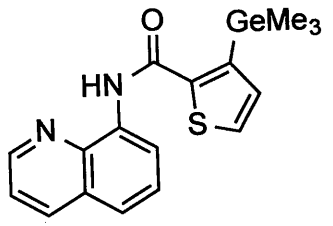


4k'a

skk-p30-thiophene-Ge-H1 4oa

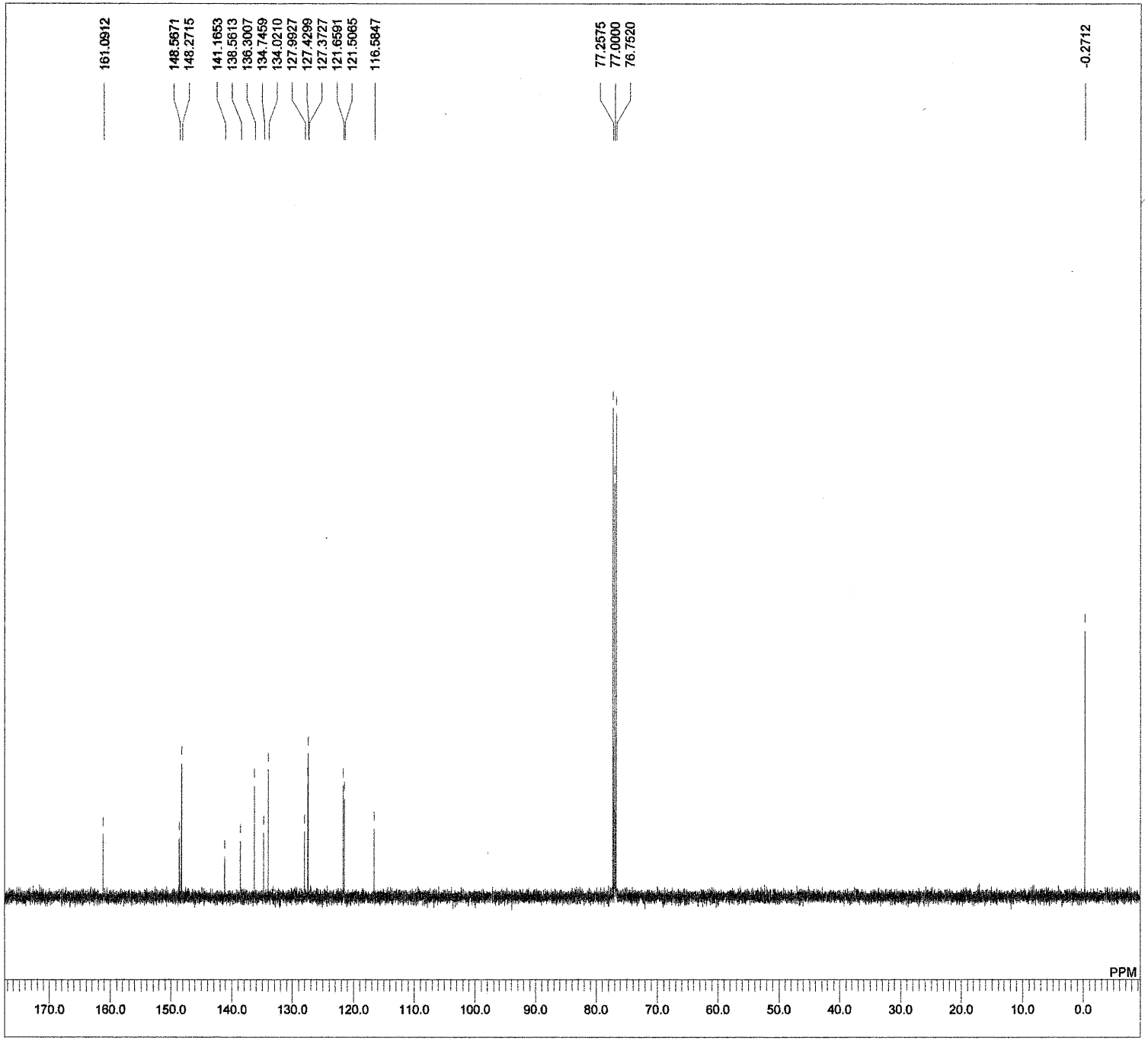


DFILE	skk-p30-thiophene-Ge-H1-1-1.als
COMNT	skk-p30-thiophene-Ge-H1
DATIM	2013-09-30 13:41:43
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	13107
FREQU	7507.51 Hz
SCANS	8
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	25.4 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	0.12 Hz
RGAIN	38

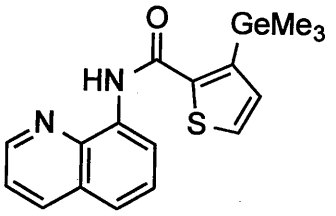


4oa

skk-p30-thiophene-Ge-C 4oa

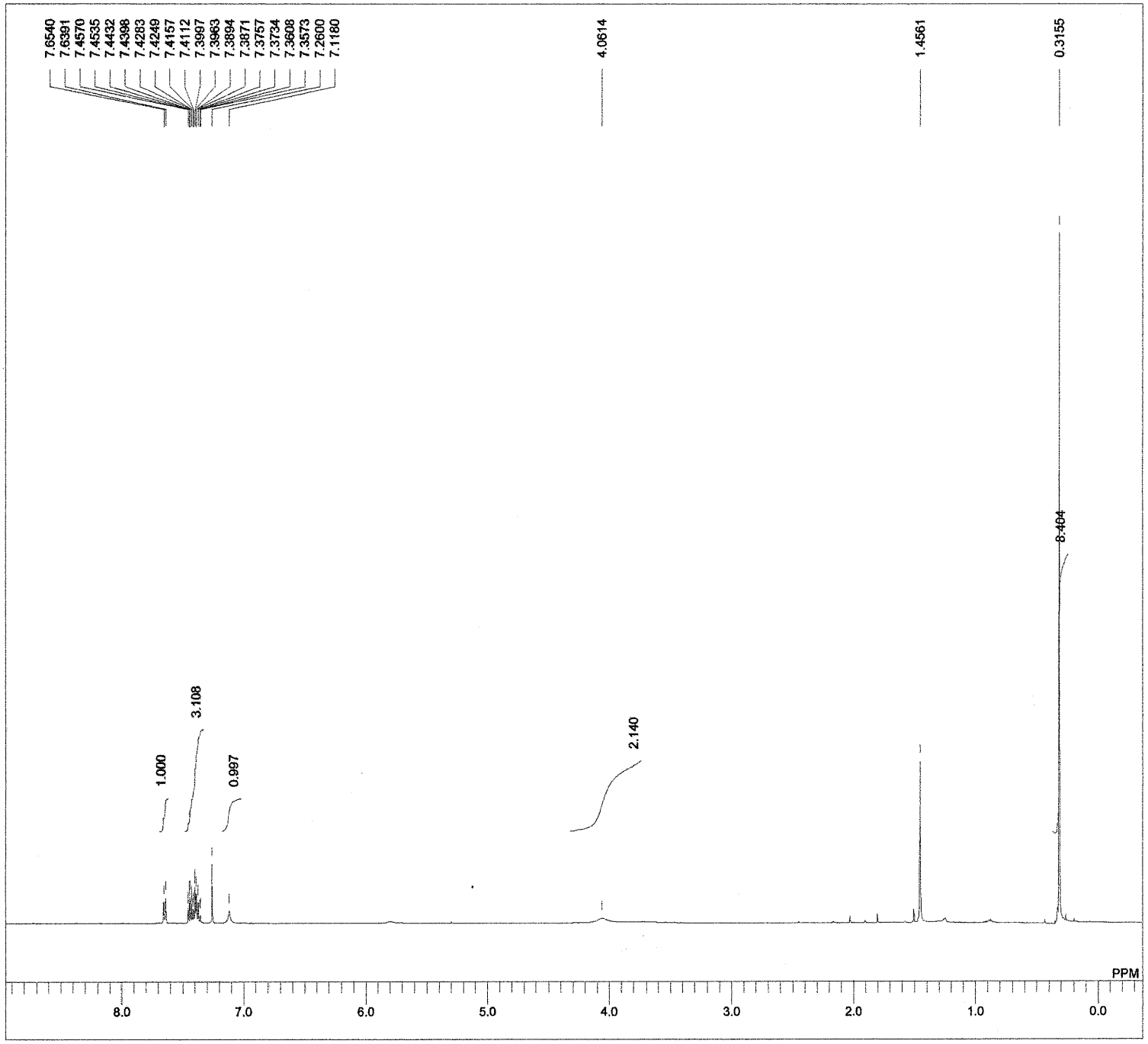


DFILE	skk-p30-thiophene-Ge-C-1-1.als
COMNT	skk-p30-thiophene-Ge-C
DATIM	2013-09-30 13:43:38
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	26214
FREQU	31446.54 Hz
SCANS	130
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	25.6 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	0.12 Hz
RGAIN	60

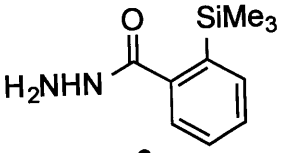


4oa

skk-p80-fr2 6

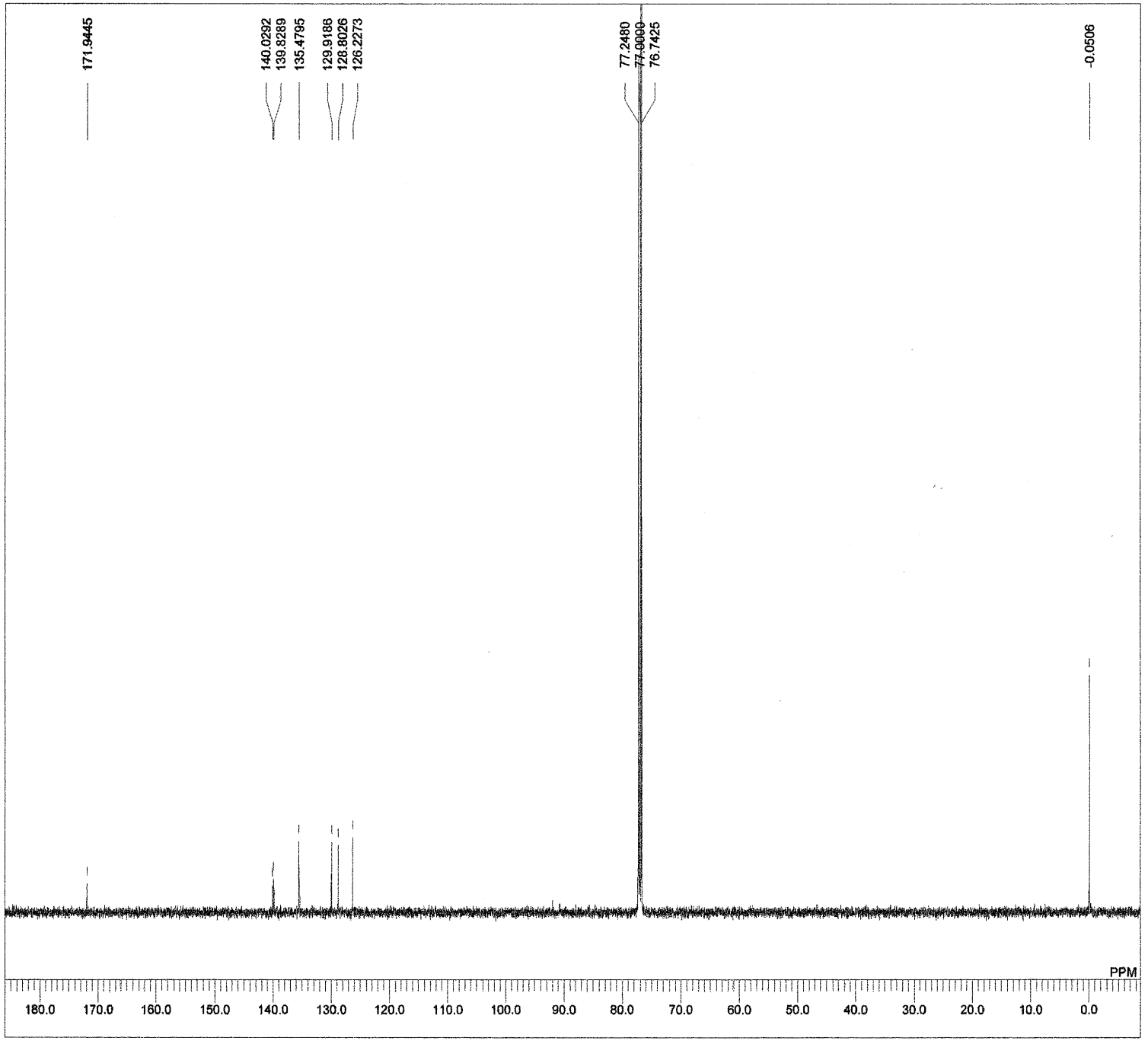


DFILE	skk-p80-fr2-1-1.als
COMNT	skk-p80-fr2
DATIM	2013-12-26 15:34:50
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	13107
FREQU	7507.51 Hz
SCANS	8
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	21.1 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	0.12 Hz
RGAIN	38

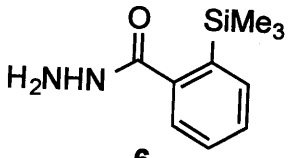


6

skk-hydrazone- 6

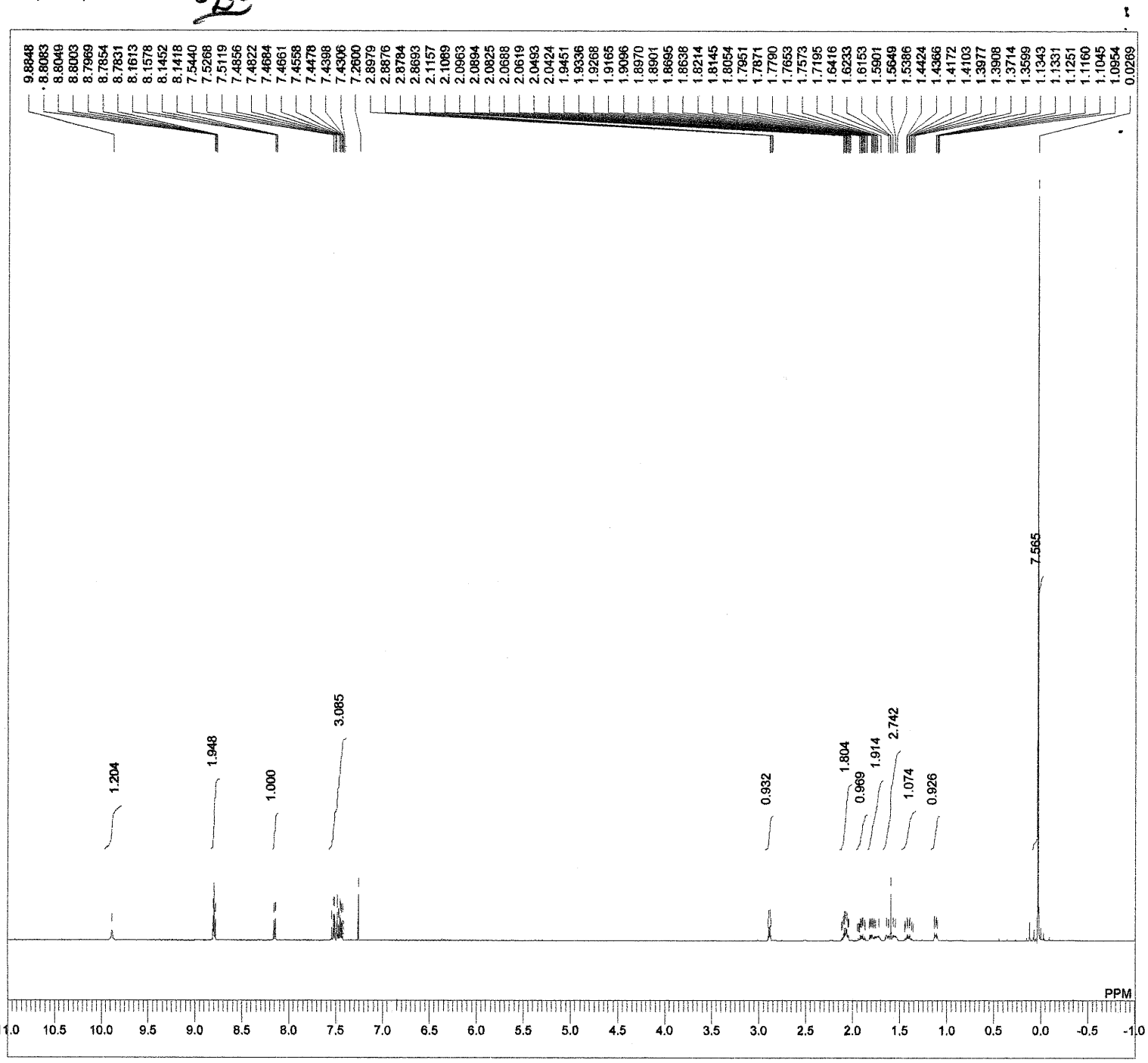


DFILE	skk-hydrazone-1-1.jdf
COMNT	skk-hydrazone-
DATIM	2013-12-27 13:39:18
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	623
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	21.9 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	1.00 Hz
RGAIN	60

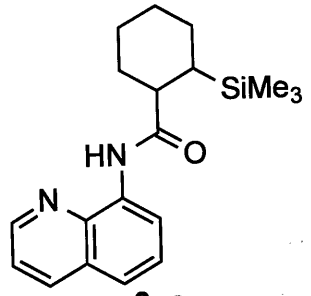


6

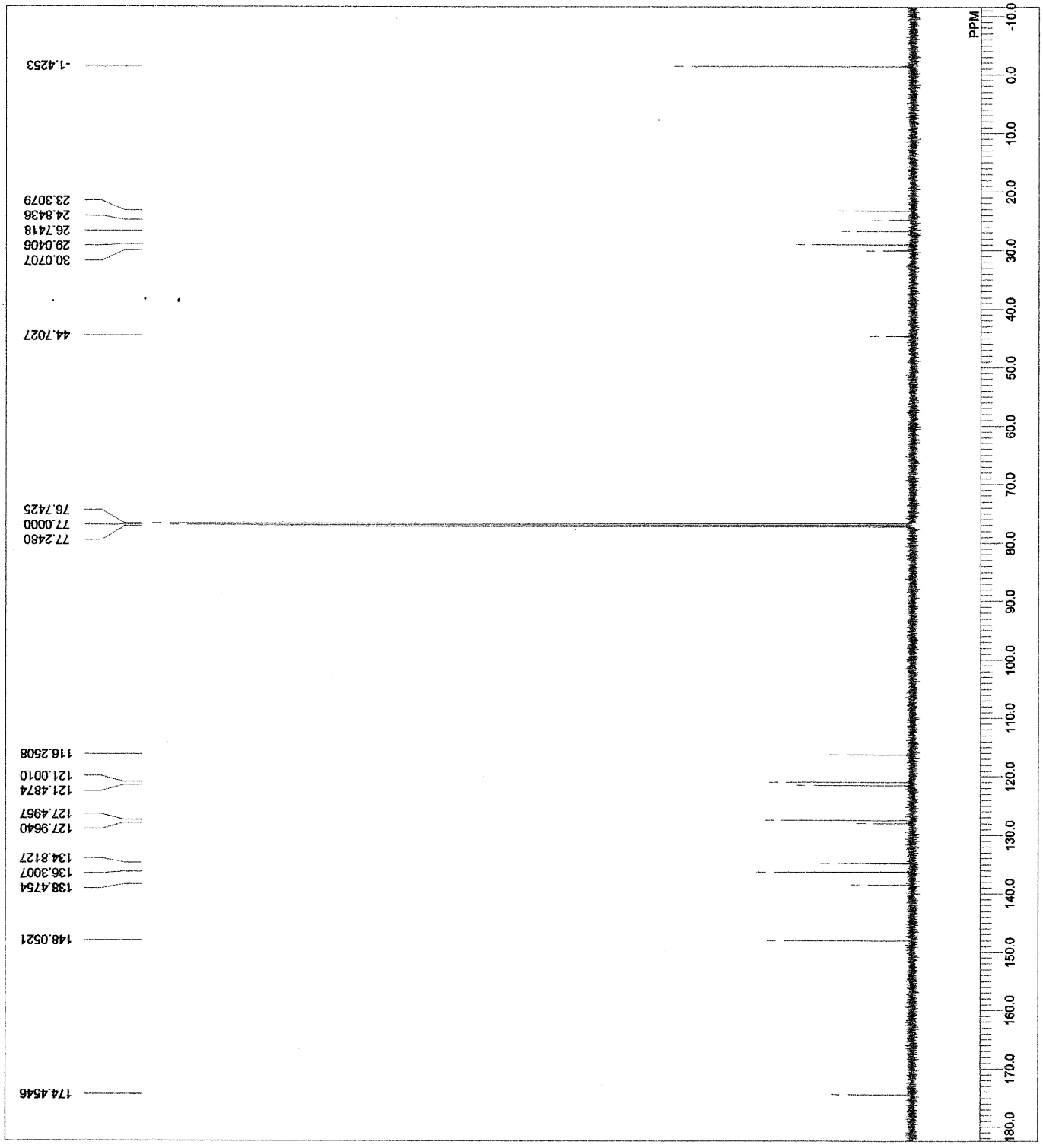
skk-p172-Cy-H-HNMR 3qa



DFILE	skk-p172-Cy-H-HNMR-1-1.als
COMNT	skk-p172-Cy-H-HNMR
DATIM	2013-07-08 18:28:44
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	13107
FREQU	7507.51 Hz
SCANS	16
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	24.3 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	0.12 Hz
RGAIN	38

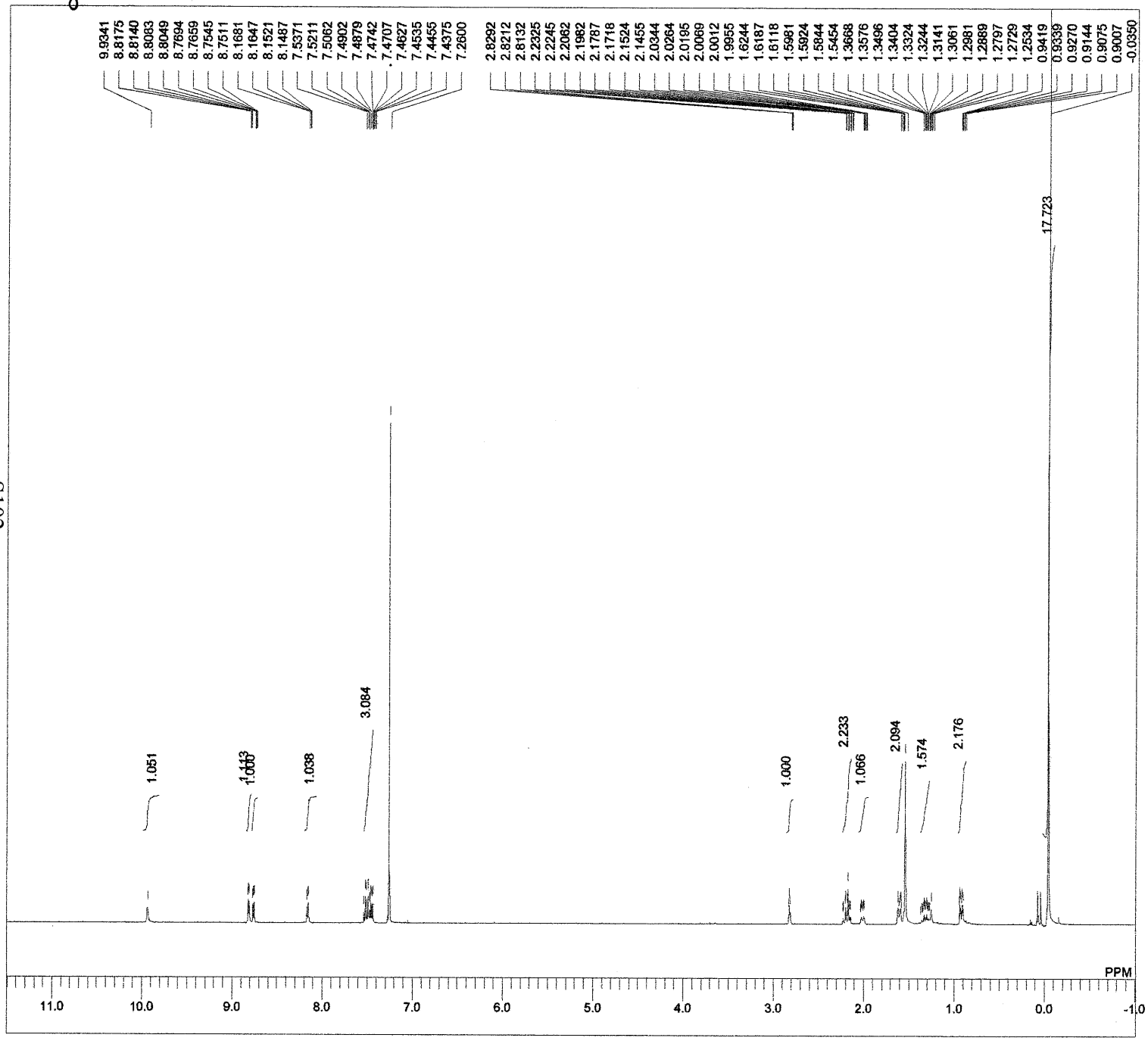


3qa

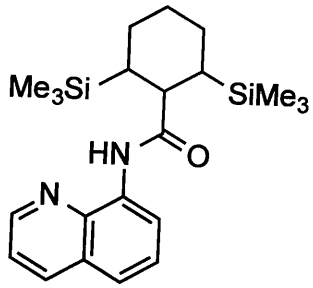

DFILE skk-p172-CyH-CNMR-1-1.als
COMNT skk-p172-CyH-CNMR
DATIM 2013-07-08 18:31:45
OBNUC 13C
EXMOD carbon.jxp
OBFRQ 125.77 MHz
OBSET 7.87 KHz
OBFIN 4.21 Hz
POINT 26214
FREQU 31446.54 Hz
SCANS 612
ACQTM 0.8336 sec
PD 3.0000 sec
PW1 3.40 usec
IRNUC 1H
CTEMP 24.9 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 0.12 Hz
RGAIN 60
SiMe3
HN
O
N
3qa
skk-p172-CyH-CNMR
3qa
-1.4253
23.3079
24.8436
26.7418
29.0406
30.0707
44.7027
76.7425
77.0000
77.2480
116.2508
121.0010
121.4874
127.4967
127.9640
134.8127
136.3007
138.4754
148.0521
174.4546
PPM

skk-~~ArPent~~-diSiMe3-H 3q'a

-Aryl-



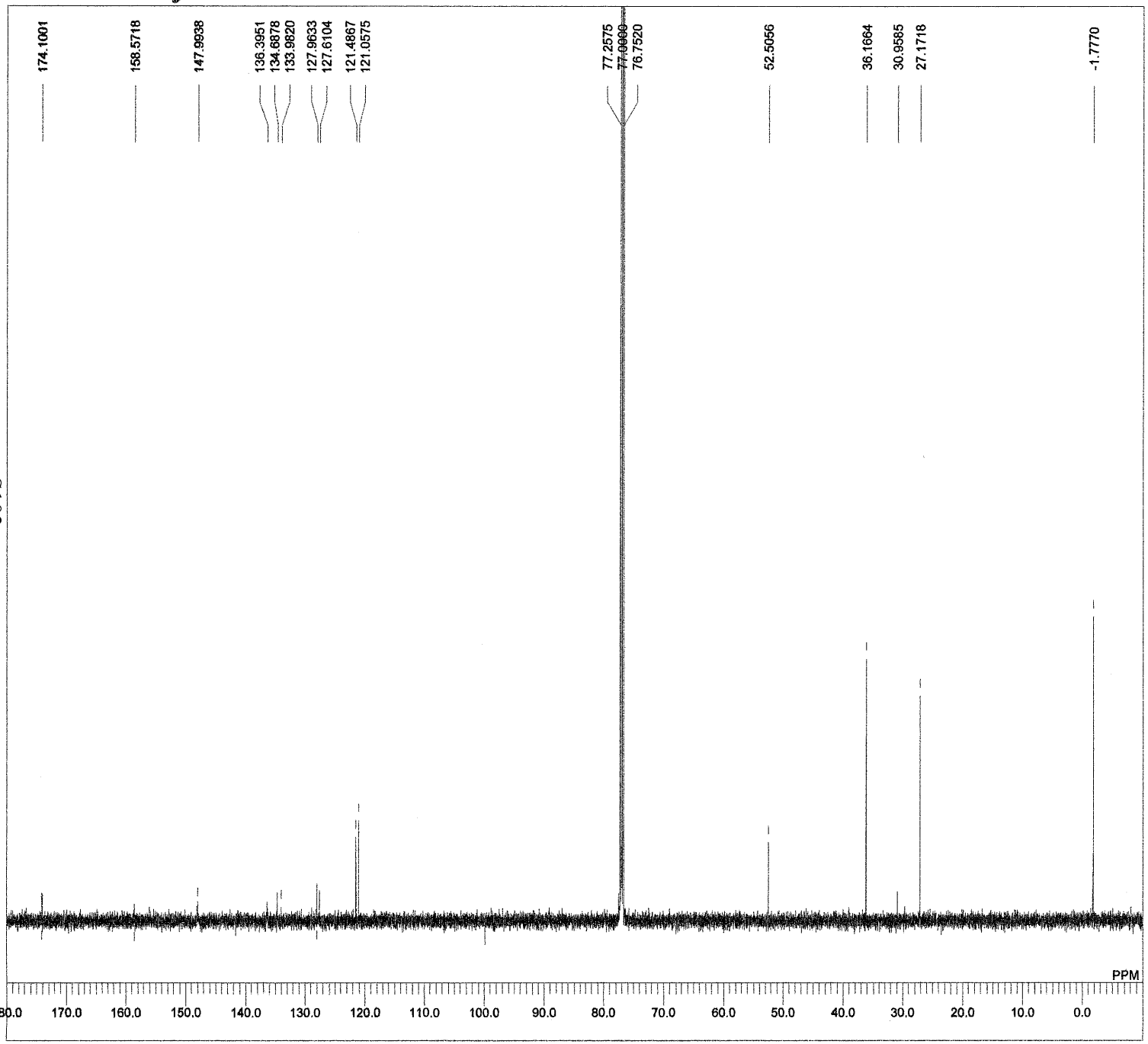
DFILE	skk-ArPent-diSiMe3-H-1-1.als
COMNT	skk-ArPent-diSiMe3-H
DATIM	2013-11-16 10:54:44
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	13107
FREQU	7507.51 Hz
SCANS	32
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	23.3 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	0.12 Hz
RGAIN	32



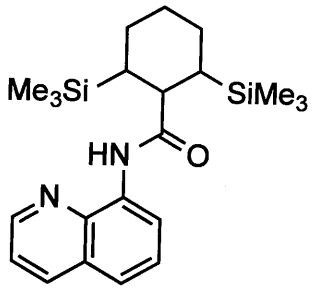
3q'a

skk-ArCy-diSI-C

3q'a

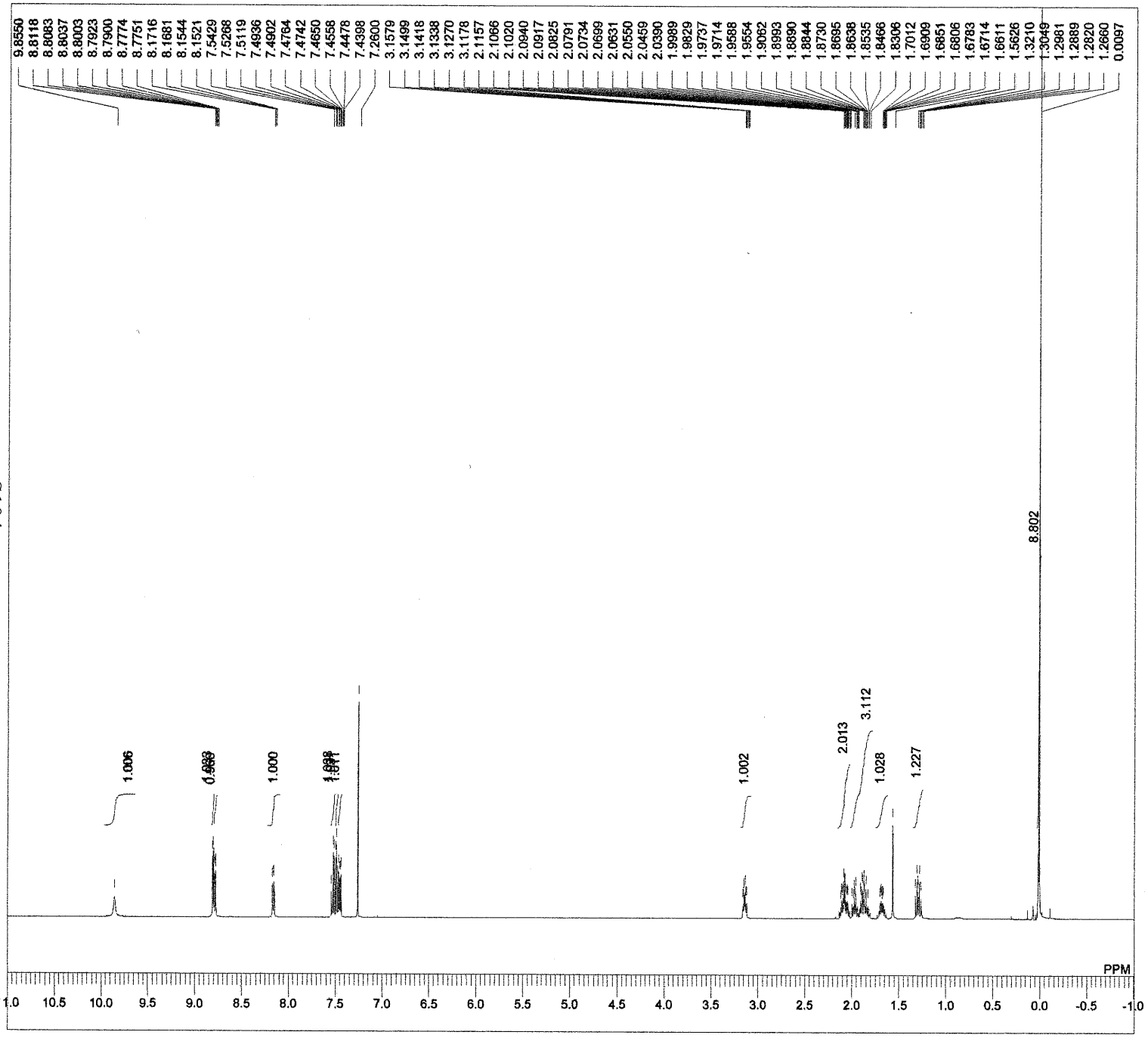


DFILE	skk-ArCy-diSI-C-1-1.als
COMNT	skk-ArCy-diSI-C
DATIM	2013-11-15 23:01:45
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	9386
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	23.5 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	0.12 Hz
RGAIN	60

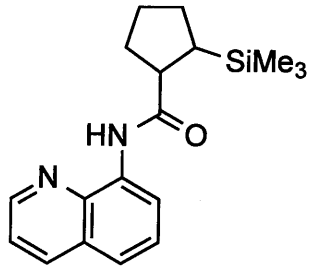


3q'a

skk-pg60-cycloPentane-SiMe3-H 3ra

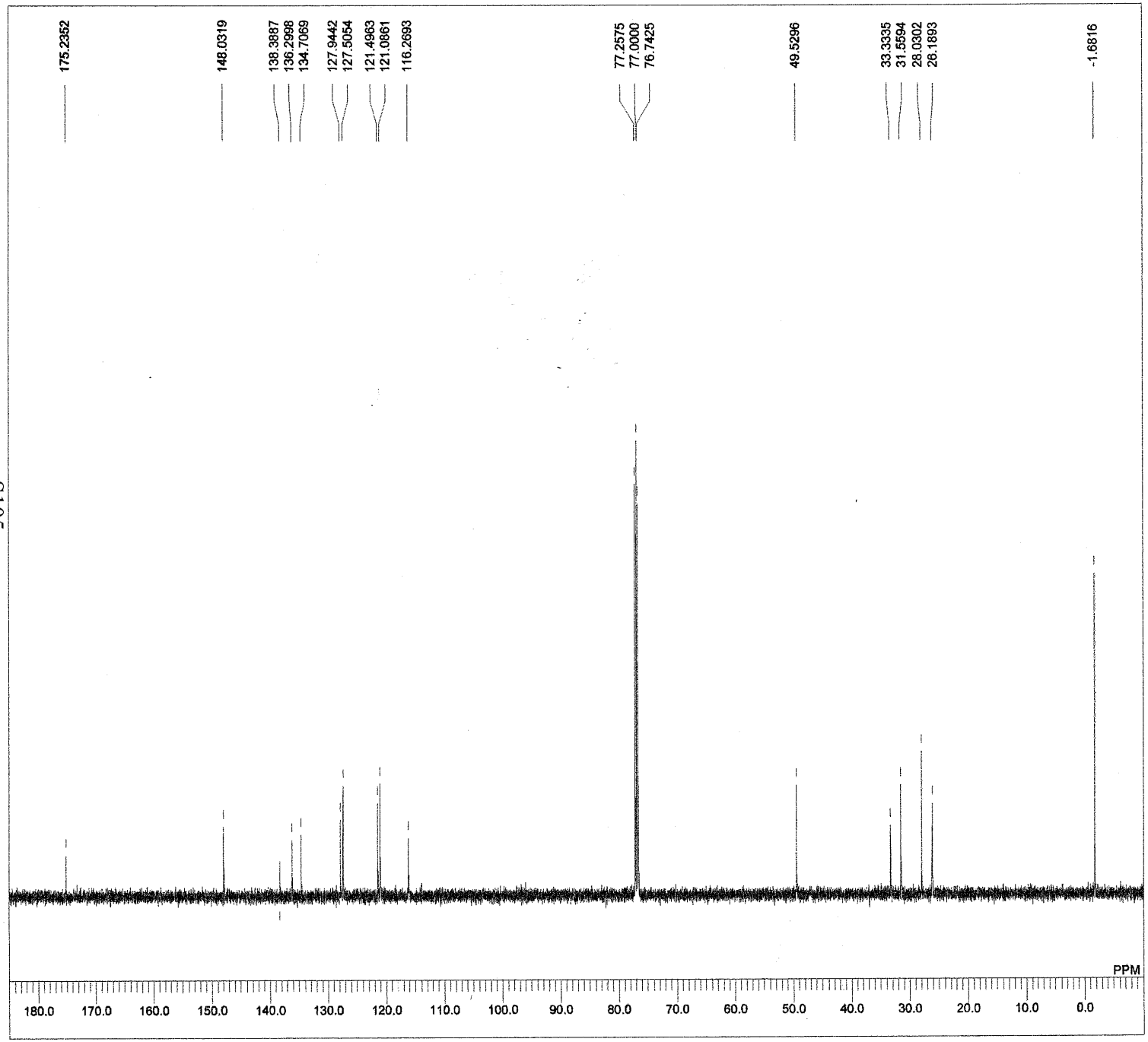


DFILE	skk-pg60-cycloPentane-SiMe3-H-3-1.als
COMNT	skk-pg60-cycloPentane-SiMe3-H
DATIM	2013-11-13 14:37:06
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	13107
FREQU	7507.51 Hz
SCANS	16
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	23.1 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	0.12 Hz
RGAIN	32

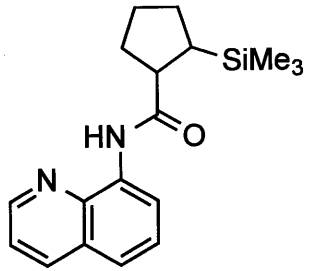


3ra

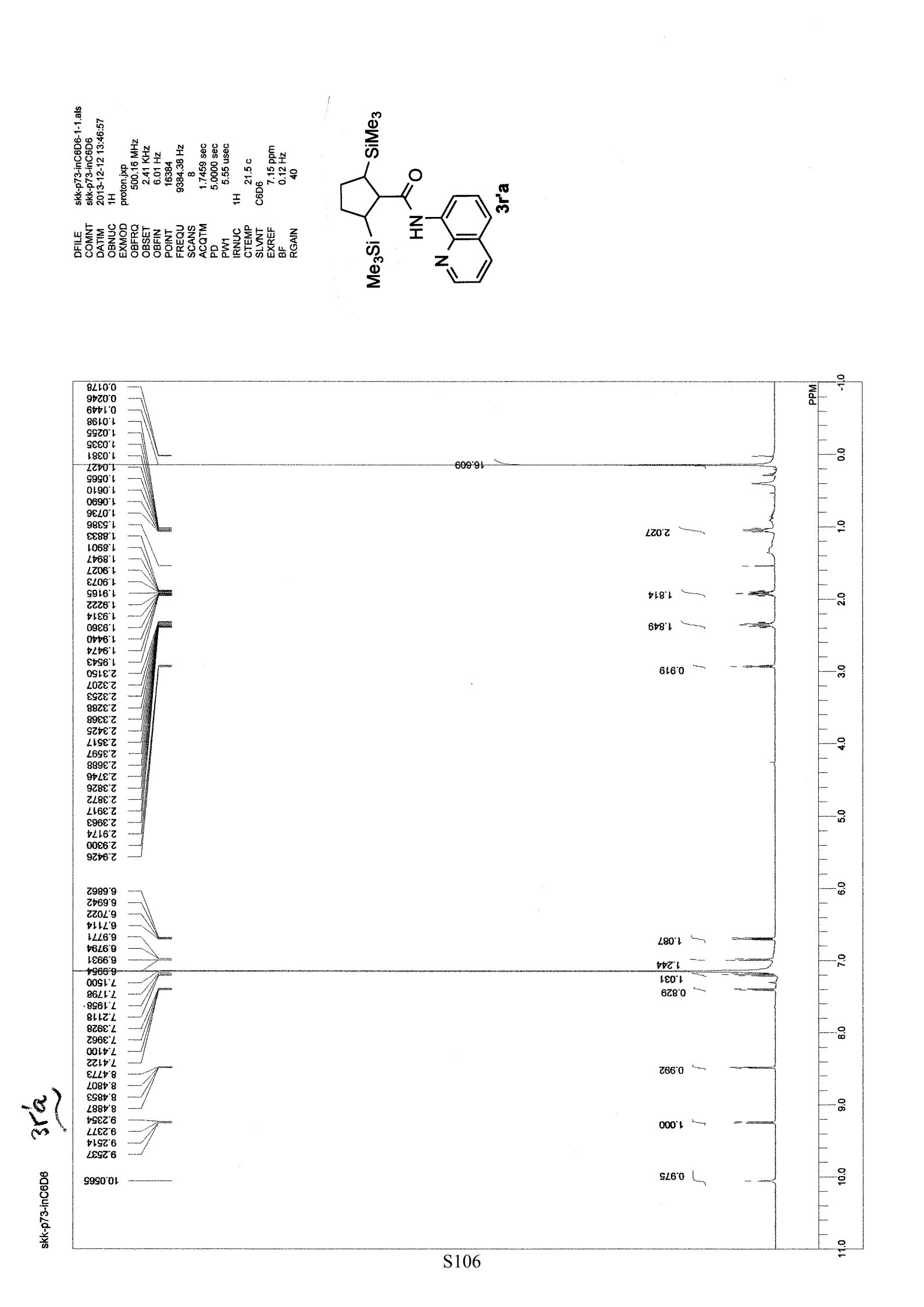
skk-pg60-cycloPentane-SiMe3-H 3ra



DFILE skk-pg60-cycloPentane-SiMe3-H-2-1.jdf
COMNT skk-pg60-cycloPentane-SiMe3-H
DATIM 2013-11-13 12:17:37
OBNUC 13C
EXMOD carbon.jxp
OBFRQ 125.77 MHz
OBSET 7.87 KHz
OBFIN 4.21 Hz
POINT 32767
FREQU 39308.18 Hz
SCANS 372
ACQTM 0.8336 sec
PD 3.0000 sec
PW1 3.40 usec
IRNUC 1H
CTEMP 23.8 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 0.12 Hz
RGAIN 60

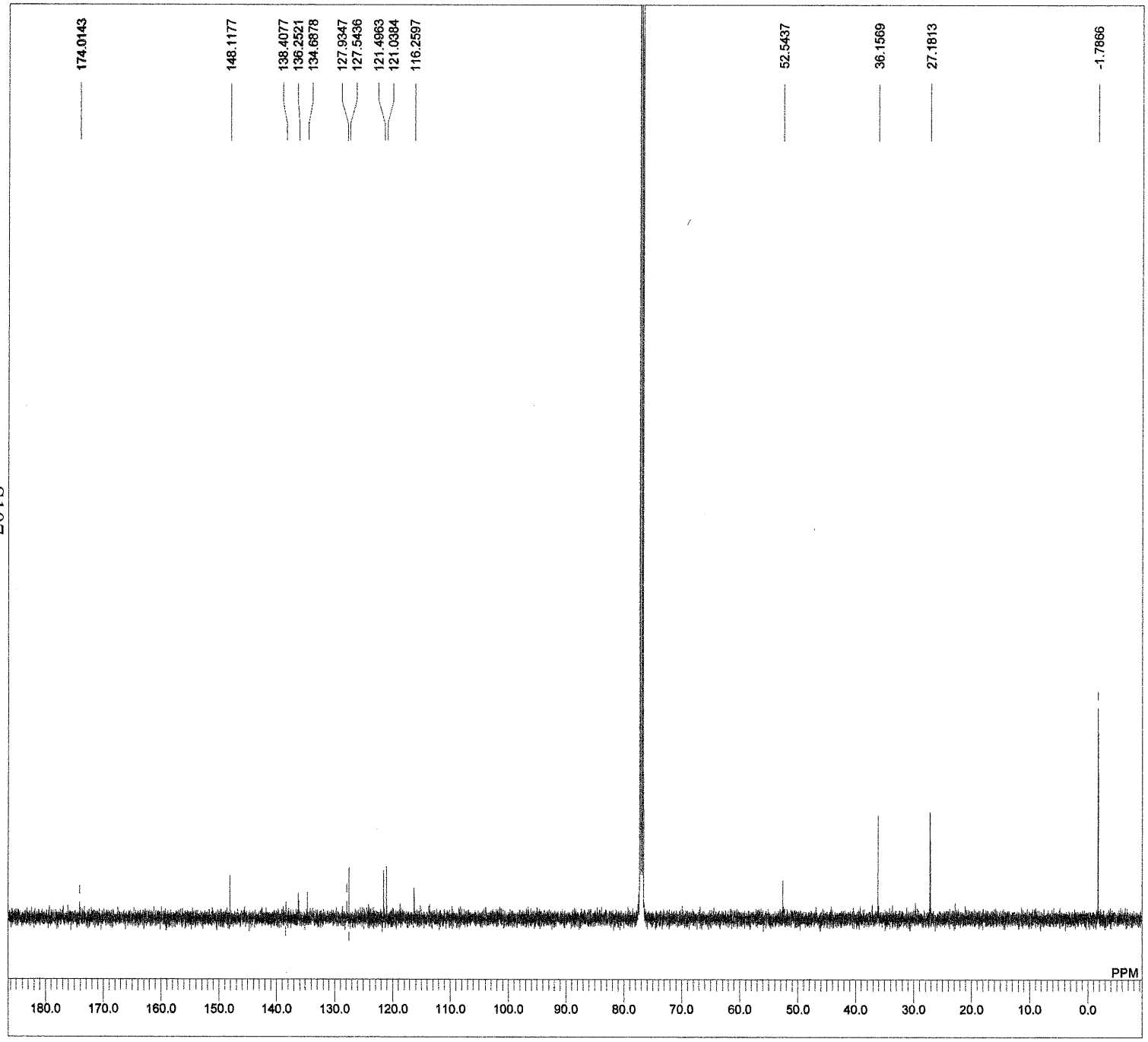


3ra

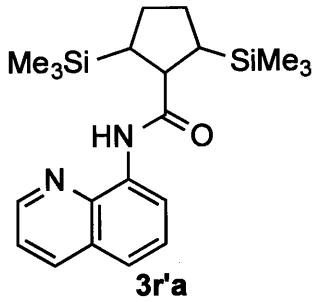

DFILE skk-p73-inC6D6-1-1.als
COMNT skk-p73-inC6D6
DATIM 2013-12-12 13:46:57
OBNUC 1H
EXMOD proton.jxp
OBFRQ 500.16 MHz
OBSET 2.41 KHz
OBFIN 6.01 Hz
POINT 16384
FREQU 9384.38 Hz
SCANS 8
ACQTM 1.7459 sec
PD 5.0000 sec
PW1 5.55 usec
IRNUC 1H
CTEMP 21.5 c
SLVNT C6D6
EXREF 7.15 ppm
BF 0.12 Hz
RGAIN 40
SiMe3
Me3Si
HN
O
N
3r'a
skk-p73-inC6D6
3r'a
PPM
16.609
2.027
1.814
1.849
0.919
1.087
1.244
1.031
0.829
0.992
1.000
0.975
10.0565

skk-diSI-overnight

3r'a

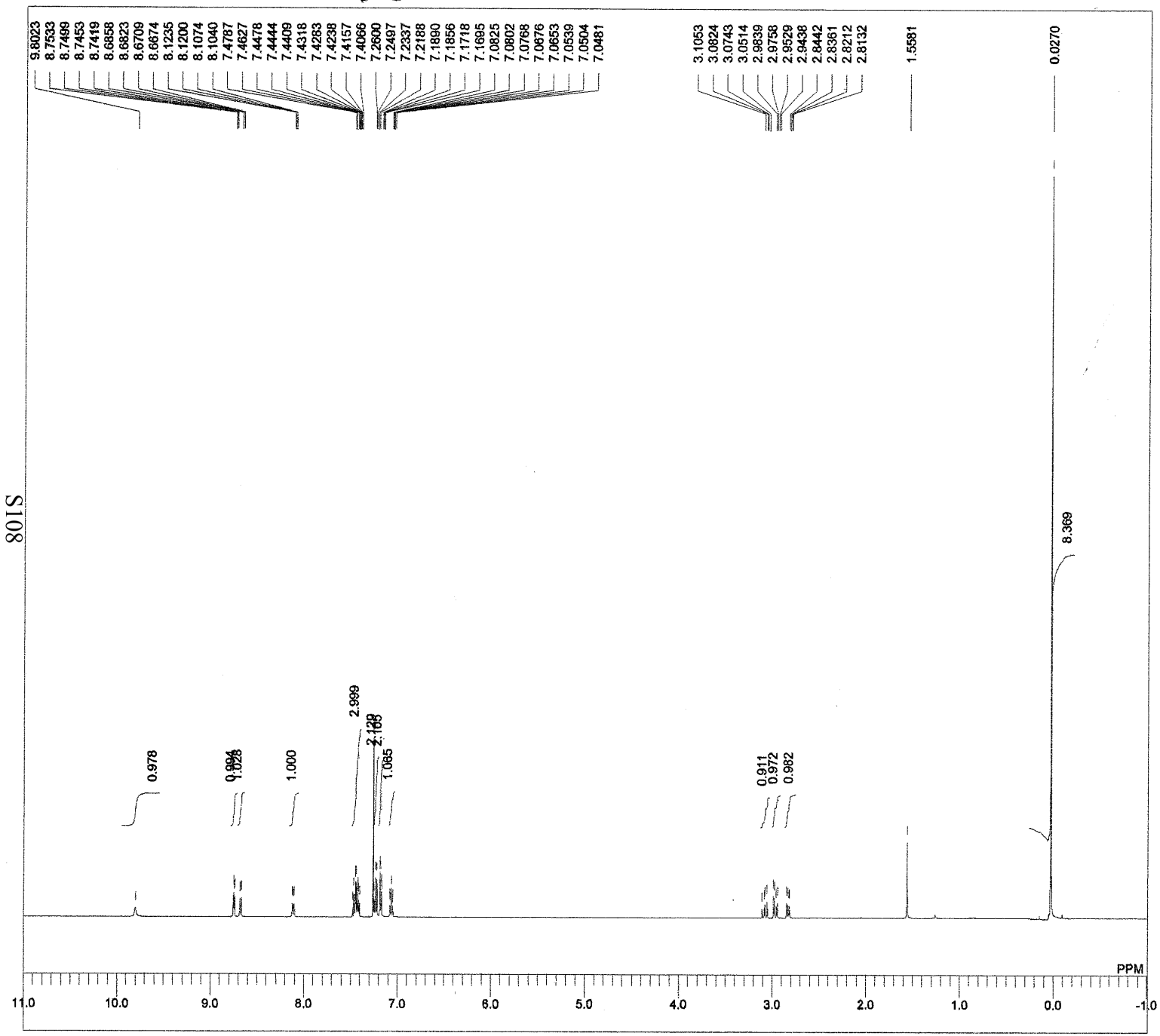


DFILE	skk-diSI-overnight-2-1.als
COMNT	skk-diSI-overnight
DATIM	2013-12-22 15:26:02
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	17000
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	21.7 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	0.12 Hz
RGAIN	60



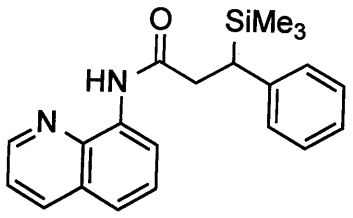
3r'a

skk-p69-cinna-SiMe3 3sa



S108

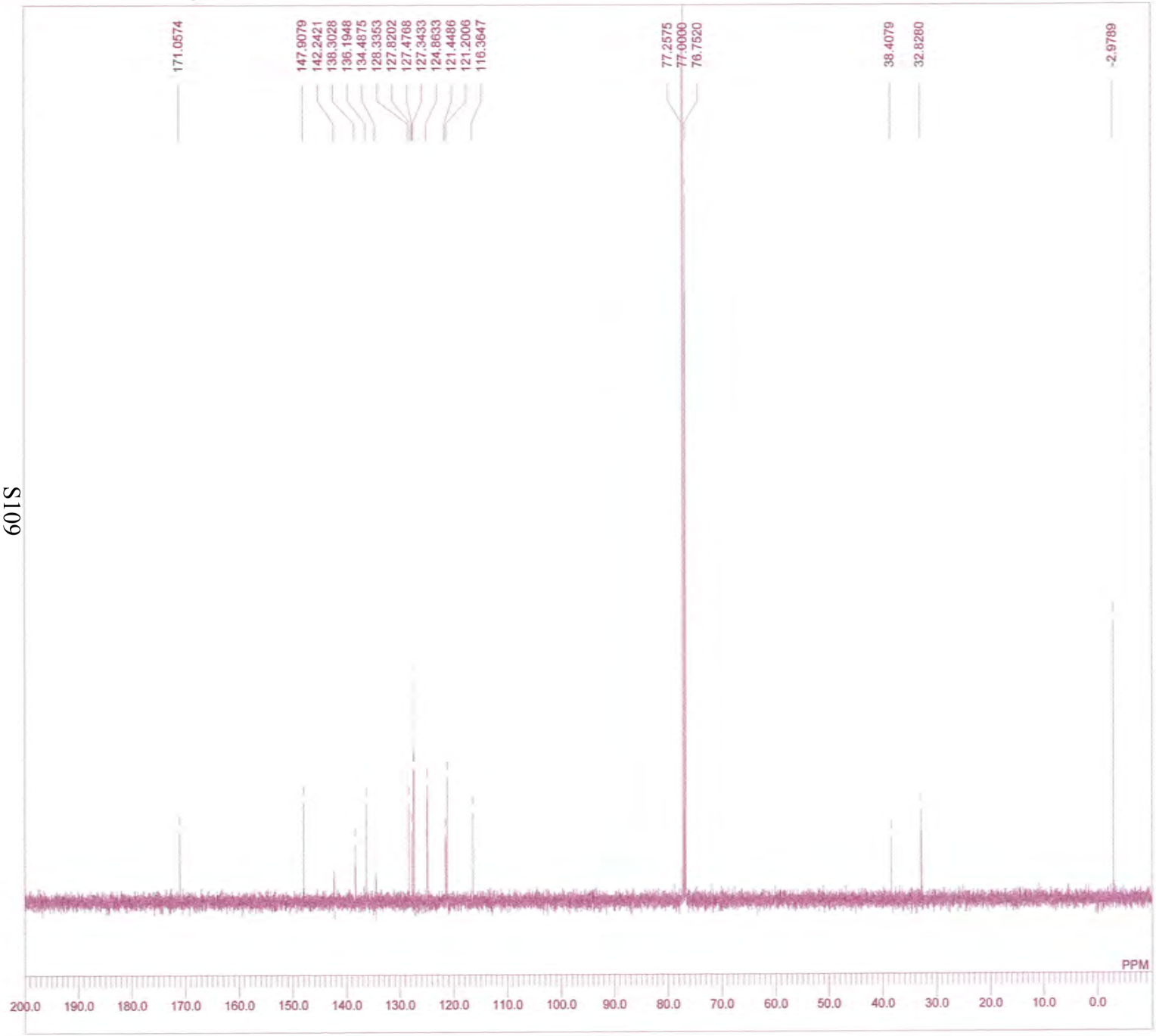
DFILE	skk-p69-cinna-1-1.jdf
COMNT	skk-p69-cinna
DATIM	2013-11-19 19:21:03
OBNUC	1H
EXMOD	proton.jxp
OBFRQ	500.16 MHz
OBSET	2.41 KHz
OBFIN	6.01 Hz
POINT	16384
FREQU	9384.38 Hz
SCANS	8
ACQTM	1.7459 sec
PD	5.0000 sec
PW1	5.55 usec
IRNUC	1H
CTEMP	22.8 c
SLVNT	CDCL3
EXREF	7.26 ppm
BF	0.10 Hz
RGAIN	40



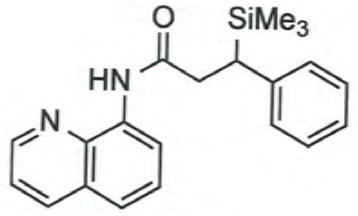
3sa

skk-p174-TM-C

3sa



DFILE	skk-p174-TM-C-1-1.jdf
COMNT	skk-p174-TM-C
DATIM	2013-07-16 19:09:06
OBNUC	13C
EXMOD	carbon.jxp
OBFRQ	125.77 MHz
OBSET	7.87 KHz
OBFIN	4.21 Hz
POINT	32767
FREQU	39308.18 Hz
SCANS	222
ACQTM	0.8336 sec
PD	3.0000 sec
PW1	3.40 usec
IRNUC	1H
CTEMP	24.4 c
SLVNT	CDCL3
EXREF	77.00 ppm
BF	0.12 Hz
RGAIN	60



3sa