A Facile Synthesis of Phthalimides from *o*-Phthalaldehyde and Amines via Tandem Cyclocondensation and *α*-C-H Oxidation by Electrochemical Oxygen Reduction Reaction

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1. General considerations

All chemicals are commercially available and purchased. The ^{1}H and ^{13}C NMR spectra were recorded in $CDCl_3$ on Bruker spectrometers 300 MHz, and 400 MHz spectrometer with TMS as an internal standard. Mass spectra were recorded on Xevo G2S Q-TOF spectrometer. Instrument IKA ElectraSyn 2.0 is used for electrolysis reaction by applying constant current DC power supply and platinum electrodes were used as anode and cathode (Figure S1). TLC was performed on using Merck pre-coated silica gel TLC plates (Merck 60 F254) and detected under UV light. Column chromatographic separation was carried out with silica gel (100-200 mesh). Reagents and solvents were purified as per standard procedures and used.

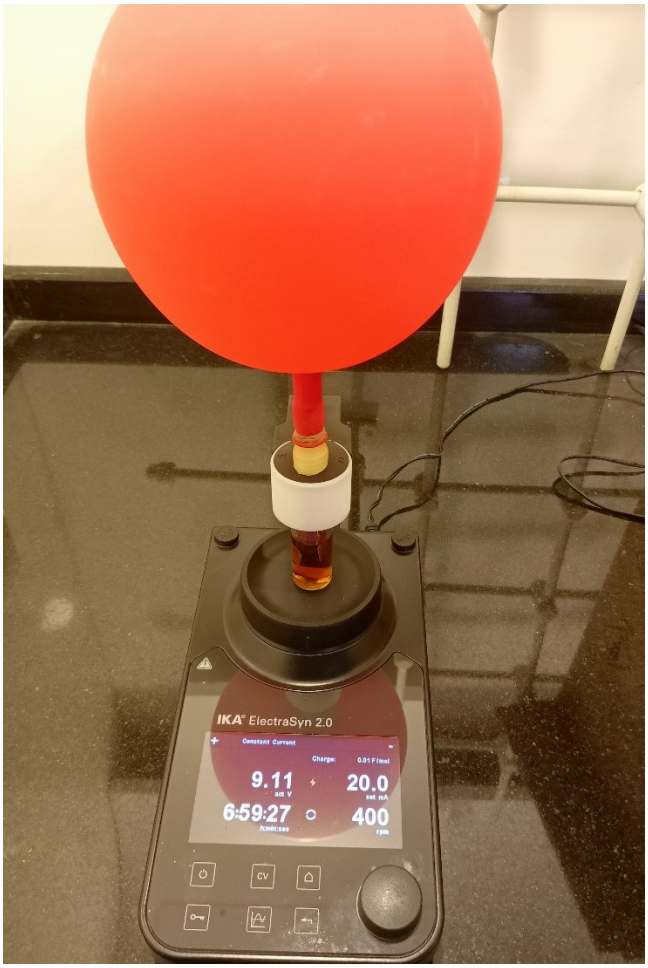


Figure S1: Reaction setup with IKA ElectraSyn 2.0 DC power supply

2. General experimental procedure for synthesis of phthalimides

An undivided cell with a platinum anode and a platinum cathode was equipped. To 10 mL vial, **1a** *o*-phthalaldehyde (1.10 mmol), **2** amines (1.10 mmol), KNO_3 as supporting electrolyte (1.10 mmol) in ACN (7 mL) were electrolyzed with constant current 20 mA under oxygen atmosphere at room temperature. After completion of the reaction, the reaction mixture was extracted with ethyl acetate (20 mL). The combined organic layer was dried over sodium sulphate, filtered, and evaporated with a rotary evaporator. The crude product was purified by column chromatography using EtOAc/Hexanes (1:9) as eluent to furnish the corresponding phthalimides compounds.

3. Preliminary mechanistic study

3.1 Intermediate-trapping experiments

To 10 mL vial, **1a** *o*-phthalaldehyde (1.10 mmol), **2a** *tert*-butylamine (1.10 mmol), KNO_3 as supporting electrolyte (1.10 mmol) in ACN (7 mL) solvent were electrolyzed with constant current 20 mA under oxygen atmosphere at room temperature for 3h. The intermediates **C**, **5** and product **3a** were detected by HRMS (Figure S2 & S3), which reveals the formation of superoxide radical anion.

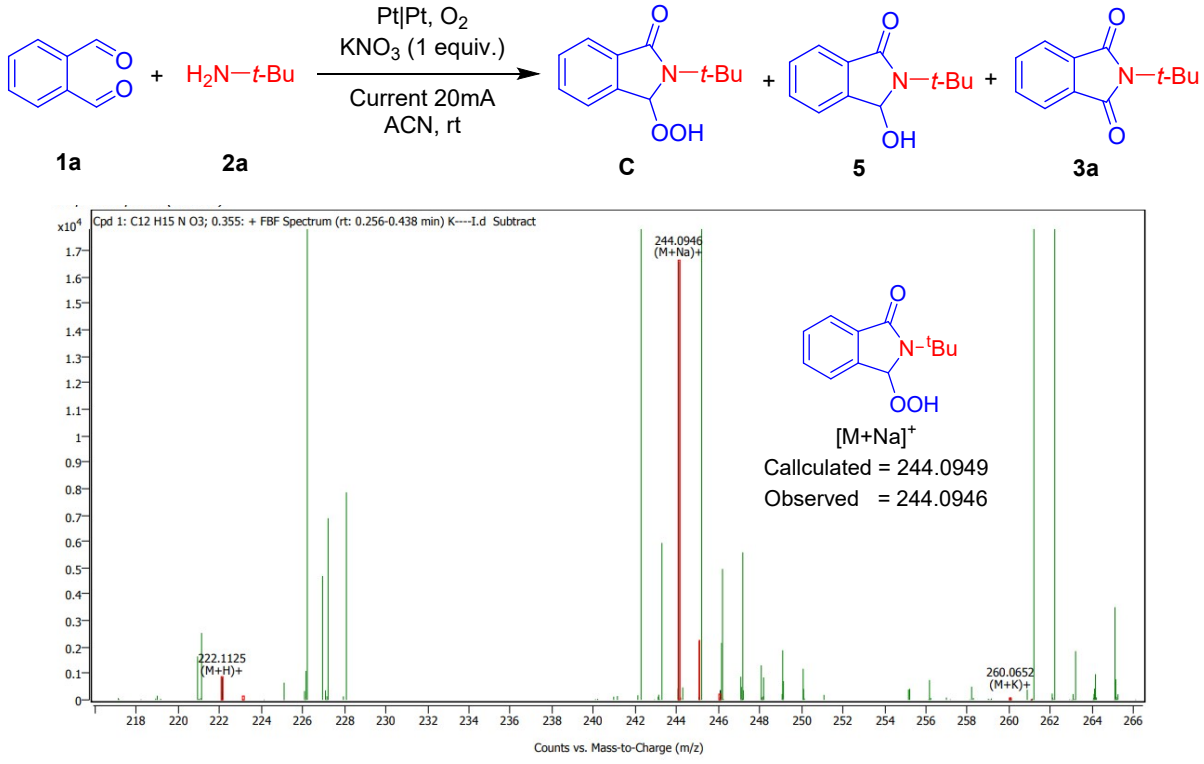


Figure S2: HRMS Spectrum of intermediate **C**

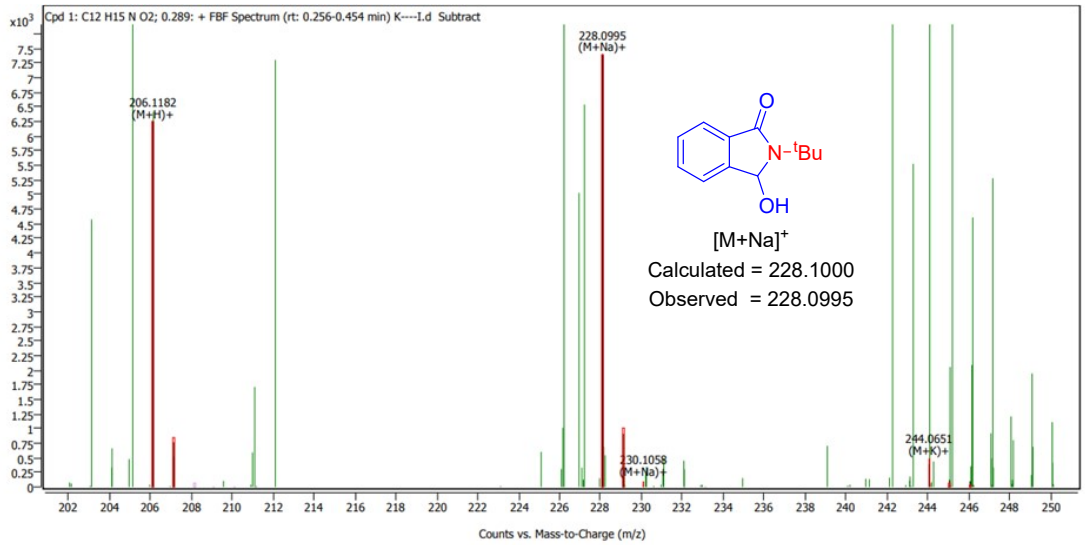
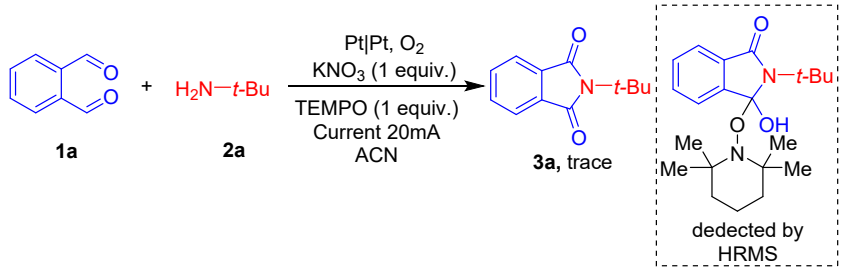


Figure S3: HRMS Spectrum of intermediate **5**

3.2 Radical-trapping experiments

To 10 mL vial, **1a** *o*-phthalaldehyde (1.10 mmol), **2a** *tert*-butylamine (1.10 mmol), KNO_3 as supporting electrolyte (1.10 mmol) and TEMPO (1.10 mmol) in ACN (7 mL) were electrolyzed with constant current 20 mA under oxygen atmosphere at room temperature. The product of phthalimide **3a** was suppressed and TEMPO adduct was detected using HRMS (Figure S4), which confirms the formation of intermediate **E**.



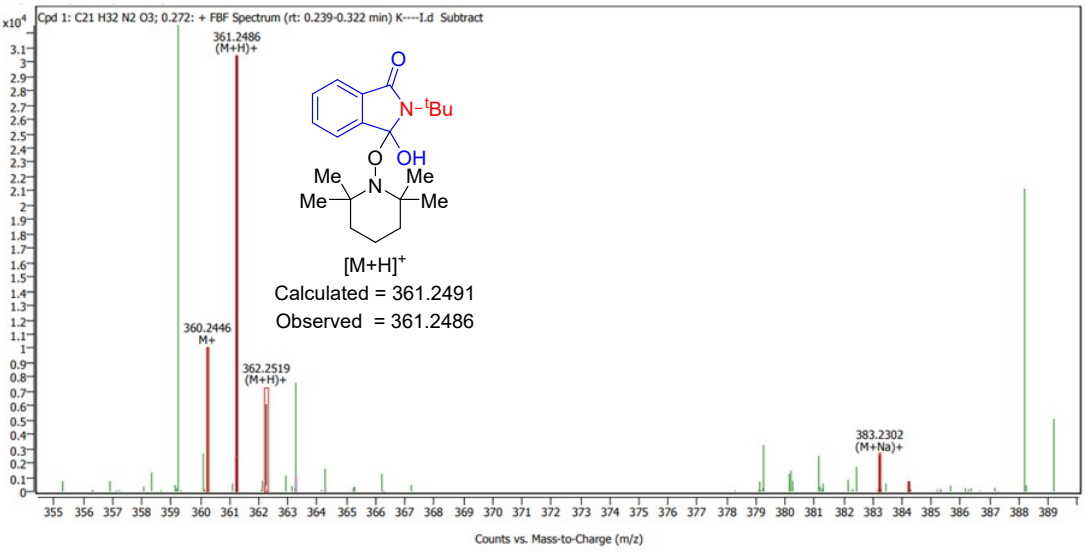


Figure S4: HRMS spectrum of TEMPO adduct

3.3 General Procedure for Cyclic Voltammogram.

A cyclic voltammogram (CV) is an electrochemical tool used to study oxidation and reduction reactions. Thus, CV experiments were conducted using three electrodes. All experiments were performed in 7 mL ACN containing KNO3 (1.10 mmol) (Figure 1). The scan rate is 20 mV/s. Compound **4** showed an oxidation peak at +0.61 V. Further, cyclic voltammetry was performed for compound **4** at different scan rate such as 20 mV/s, 40 mV/s, 60 mV/s, 80 mV/s, 100 mV/s (Figure 2).

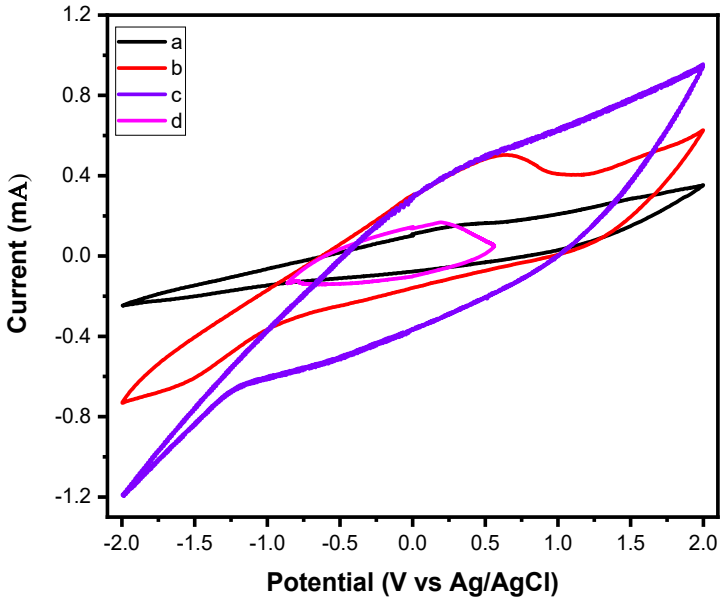


Figure S5: Cyclic voltammogram of (a) blank, (b) **4**, (c) **5**, (d) **3a** in ACN with KNO_3 (1.10 mmol) as supporting electrolyte, Pt as working and counter electrode, scan rate = 20 mV/s. blank = KNO_3 + ACN.

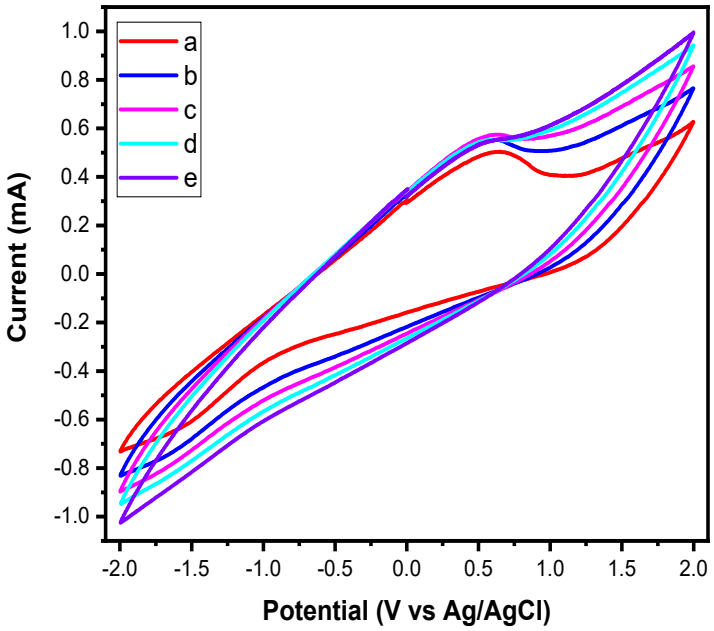
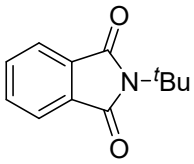


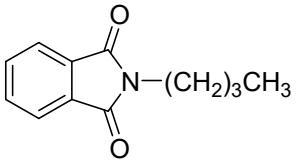
Figure S6: Cyclic voltammograms of **4** at various scan rates. (a) 20 mV/s, (b) 40 mV/s, (c) 60 mV/s, (d) 80 mV/s and (e) 100 mV/s.

4. Spectral data



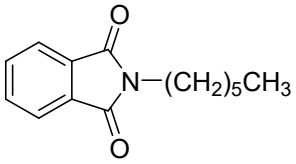
2-(tert-butyl)isoindoline-1,3-dione 3a[1]

3a (189 mg) was synthesized from *o*-phthalaldehyde **1a** (147 mg) and *tert*-butylamine **2a** (80 mg) using general experimental procedure; White solid; 85% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 7.78- 7.75 (m, 2H), 7.68- 7.65 (m, 2H), 1.69 (s, 9H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 169.7, 133.6, 132.5, 122.5, 57.8, 29.1.



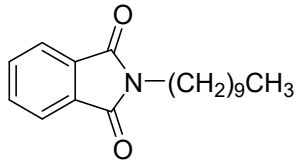
2-butylisoindoline-1,3-dione 3b[1]

3b (189 mg) was synthesized from *o*-phthalaldehyde **1a** (147 mg) and *n*-butylamine **2b** (80 mg) using general experimental procedure; White solid; 82% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 7.85- 7.82 (m, 2H), 7.72- 7.69 (m, 2H), 3.68 (t, *J*= 7.2 Hz, 2H), 1.71- 1.61 (m, 2H), 1.40- 1.33 (m, 2H), 0.94 (t, *J*= 7.2 Hz, 3H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 168.4, 133.8, 132.1, 123.1, 37.7, 30.6, 20.0, 13.6.



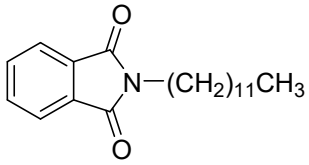
2-hexylisoindoline-1,3-dione 3c[2]

3c (203 mg) was synthesized from *o*-phthalaldehyde **1a** (147 mg) and *n*-hexylamine **2c** (111 mg) using general experimental procedure; White solid; 80% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 7.85- 7.82 (m, 2H), 7.73- 7.69 (m, 2H), 3.67 (t, *J*= 7.2 Hz, 2H), 1.74- 1.64 (m, 2H), 1.31- 1.25 (m, 6H), 0.87 (t, *J*= 6.3 Hz, 3H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 168.4, 133.8, 132.1, 123.1, 38.0, 31.3, 28.5, 26.5, 22.5, 14.0.



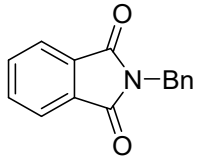
2-decylisoindoline-1,3-dione 3d[1]

3d (252 mg) was synthesized from *o*-phthalaldehyde **1a** (147 mg) and *n*-decylamine **2d** (172 mg) using general experimental procedure; White solid; 80% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 7.85- 7.82 (m, 2H), 7.73- 7.70 (m, 2H), 3.67 (t, *J*= 7.2 Hz, 2H), 1.69- 1.64 (m, 2H), 1.32- 1.25 (m, 14H), 0.87 (t, *J*= 6.3 Hz, 3H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 168.4, 133.8, 132.2, 123.1, 38.1, 31.8, 29.5, 29.4, 29.3, 29.2, 28.6, 26.8, 22.6, 14.1.



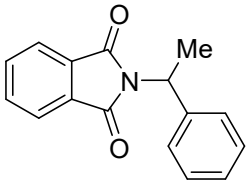
2-dodecylisoindoline-1,3-dione 3e[3]

3e (270 mg) was synthesized from *o*-phthalaldehyde **1a** (147 mg) and *n*-dodecylamine **2e** (203 mg) using general experimental procedure; White solid; 78% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 7.85- 7.82 (m, 2H), 7.72- 7.69 (m, 2H), 3.67 (t, *J*= 7.2 Hz, 2H), 1.68- 1.60 (m, 2H), 1.32- 1.30 (m, 18H), 0.87 (t, *J*= 3H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 168.4, 133.8, 132.1, 123.1, 38.0, 31.9, 29.6, 29.5, 29.4, 29.3, 29.2, 28.6, 26.8, 22.6, 14.1.



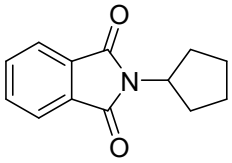
2-benzylisoindoline-1,3-dione 3f[1]

3f (211 mg) was synthesized from *o*-phthalaldehyde **1a** (147 mg) and benzylamine **2f** (117 mg) using general experimental procedure; White solid; 81% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 7.84- 7.82 (m, 2H), 7.70- 7.67 (m, 2H), 7.44 (d, *J*= 7.2 Hz, 2H), 7.33- 7.23 (m, 3H), 4.84 (s, 2H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 168.0, 136.3, 134.3, 132.1, 128.7, 128.6, 127.8, 123.3, 41.6.



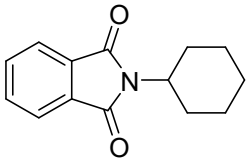
2-(1-phenylethyl)isoindoline-1,3-dione 3g[4]

3g (207 mg) was synthesized from *o*-phthalaldehyde **1a** (147 mg) and 1-phenylethan-1-amine **2g** (133 mg) using general experimental procedure; White solid; 75% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 7.80- 7.76 (m, 2H), 7.69- 7.65 (m, 2H), 7.51 (d, *J*= 7.2 Hz, 2H), 7.34- 7.30 (t, *J*= 6.9 Hz, 2H), 7.25 (t, *J*= 6.6 Hz, 1H), 5.60- 5.53 (m, 1H), 1.94 (d, *J*= 7.2 Hz, 3H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 168.1, 140.3, 133.9, 131.9, 128.5, 127.6, 127.4, 123.1, 49.6, 17.5.



2-cyclopentylisoindoline-1,3-dione 3h[1]

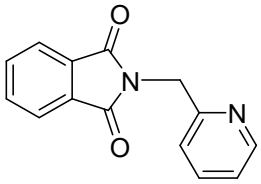
3h (165) was synthesized from *o*-phthalaldehyde **1a** (147 mg) and cyclopentylamine **2h** (95 mg) using general experimental procedure; White solid; 70% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 7.82- 7.78 (m, 2H), 7.71- 7.67 (m, 2H), 4.68- 4.57 (m, 1H), 2.16- 2.05 (m, 2H), 1.96- 1.92 (m, 4H), 1.66- 1.63 (m, 2H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 168.5, 133.7, 132.1, 122.9, 50.9, 29.5, 25.0.



2-cyclohexylisoindoline-1,3-dione 3i[1]

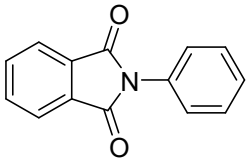
3i (176 mg) was synthesized from *o*-phthalaldehyde **1a** (147 mg) and cyclohexylamine **2i** (108 mg) using general experimental procedure; White solid; 70% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 7.81- 7.80 (m, 2H), 7.70 (d, *J*= 2.7 Hz, 2H), 4.15- 4.07 (m, 1H), 2.26- 2.15 (m, 2H), 1.89 (d, *J*= 11.7 Hz, 2H), 1.74- 1.66 (m,

3H), 1.43- 1.25 (m, 3H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 168.5, 133.7, 132.0, 123.0, 50.9, 29.8, 26.0, 25.1.



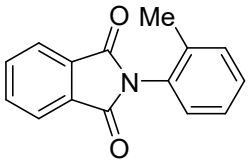
2-(pyridin-2-ylmethyl)isoindoline-1,3-dione 3j[3]

3j (170 mg) was synthesized from *o*-phthalaldehyde **1a** (147 mg) and pyridin-2-ylmethanamine **2j** (118 mg) using general experimental procedure; White solid; 65% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 8.53 (d, *J*= 4.5 Hz, 1H), 7.90-7.86 (m, 2 H), 7.75- 7.72 (m, 2H), 7.67- 7.61 (m, 1H), 7.30 (d, *J*= 9 Hz, 1H), 7.17 (t, *J*= 5.4 Hz, 1H), 5.02 (s, 2H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 168.1, 155.3, 149.6, 136.7, 134.0, 132.2, 123.5, 122.5, 121.6, 42.9.



2-phenylisoindoline-1,3-dione 3k[1]

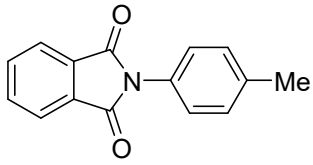
3k (171 mg) was synthesized from *o*-phthalaldehyde **1a** (147 mg) and aniline **2k** (102 mg) using general experimental procedure; White solid; 70% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 8.00- 7.99 (m, 2H), 7.83 (d, *J*= 3 Hz, 2H), 7.54 (t, *J*= 7.5 Hz, 2H), 7.47- 7.41 (t, *J*= 6.3 Hz, 3H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 167.3, 134.4, 131.8, 131.7, 129.1, 128.1, 126.6, 123.7.



2-(o-tolyl)isoindoline-1,3-dione 3l[5]

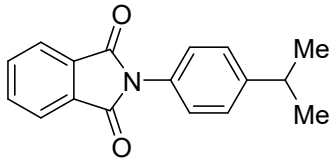
3l (190 mg) was synthesized from *o*-phthalaldehyde **1a** (147 mg) and 2-methylaniline **2l** (117 mg) using general experimental procedure; White solid; 73% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (400 MHz, $CDCl_3$):δ_H 7.96- 7.93 (m, 2H), 7.81- 7.77 (m, 2H), 7.40- 7.30 (m,

3H), 7.21 (d, *J*= 7.6 Hz, 1H), 2.21 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$):δ_C 167.3, 136.5, 134.3, 132.0, 131.1, 130.6, 129.4, 128.7, 126.9, 123.7, 18.0.



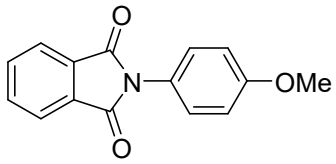
2-(p-tolyl)isoindoline-1,3-dione 3m[1]

3m (200 mg) was synthesized from *o*-phthalaldehyde **1a** (147 mg) and 4-methylaniline **2m** (117 mg) using general experimental procedure; White solid; 77% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 7.96- 7.93 (m, 2H), 7.79- 7.77 (m, 2H), 7.31 (s, 4H), 2.41 (s, 3H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 167.4, 138.2, 134.3, 131.8, 129.8, 128.9, 126.4, 123.7, 21.2.



2-(4-isopropylphenyl)isoindoline-1,3-dione 3n[1]

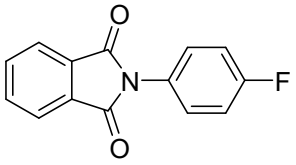
3n (227 mg) was synthesized from *o*-phthalaldehyde **1a** (147 mg) and 4-isopropylaniline **2n** (148 mg) using general experimental procedure; White solid; 78% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 7.96- 7.94 (m, 2H), 7.79- 7.77 (m, 2H), 7.37- 7.33 (m, 4H), 3.00- 2.91 (m, 1H), 1.29 (d, *J*= 6.8 Hz, 6H). ^{13}C NMR (101 MHz, $CDCl_3$):δ_C 167.4, 148.9, 134.3, 131.8, 129.1, 127.2, 126.4, 123.7, 33.9, 23.9.



2-(4-methoxyphenyl)isoindoline-1,3-dione 3o[5]

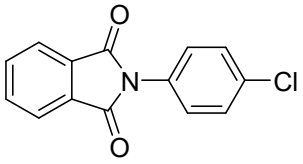
3o (194 mg) was synthesized from o-phthalaldehyde **1a** (147 mg) and 4-methoxyaniline **2o** (135 mg) using general experimental procedure; White solid; 70% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 7.96- 7.93 (m, 2H), 7.79-7.76 (m,

2H), 7.35 (d, *J*= 8.7 Hz, 2H), 7.03 (d, *J*= 8.7 Hz, 2H), 3.85 (s, 3H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 167.6, 159.2, 134.3, 131.8, 127.9, 124.2, 123.6, 114.5, 55.5.



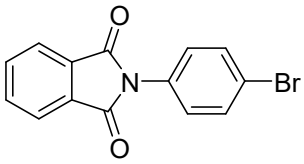
2-(4-fluorophenyl)isoindoline-1,3-dione 3p[1]

3p (188 mg) was synthesized from *o*-phthalaldehyde **1a** (147 mg) and 4-fluoroaniline **2p** (122 mg) using general experimental procedure; White solid; 71% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (400 MHz, $CDCl_3$):δ_H 7.95- 7.93 (m, 2H), 7.80- 7.78 (m, 2H), 7.44- 7.40 (m, 2H), 7.26- 7.17 (m, 2H). ^{13}C NMR (101 MHz, $CDCl_3$): δ_C 167.2, 163.1, 160.7, 134.5, 131.6, 128.4, 128.3, 127.6, 127.5, 123.8, 116.2, 116.0. ^{19}F NMR (471 MHz, $CDCl_3$): δ_F -113.0 (s, 1F).



2-(4-chlorophenyl)isoindoline-1,3-dione 3q[1]

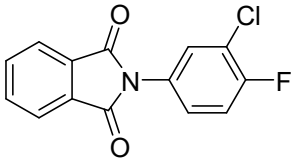
3q (220 mg) was synthesized from *o*-phthalaldehyde **1a** (147 mg) and 4-Chloroaniline **2q** (140 mg) using general experimental procedure; White solid; 78% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 7.98- 7.96 (m, 2H), 7.82- 7.79 (m, 2H), 7.50 (d, *J*= 8.7 Hz, 2H), 7.47 (d, *J*= 8.7 Hz, 2H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 167.0, 134.5, 133.8, 131.6, 130.2, 129.3, 127.6, 123.8.



2-(4-bromophenyl)isoindoline-1,3-dione 3r[1]

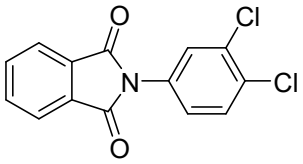
3r (223 mg) was synthesized from *o*-phthalaldehyde **1a** (147 mg) and 4-Bromoaniline **2r** (189 mg) using general experimental procedure; White solid; 69% yield (eluent:

EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 7.97- 7.95 (m, 2H), 7.82- 7.79 (m, 2H), 7.65 (d, *J*= 8.4 Hz, 2H), 7.34 (d, *J*= 8.4 Hz, 2H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 166.9, 134.6, 132.3, 131.6, 130.7, 127.9, 123.8, 121.8.



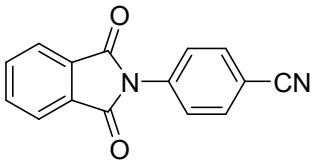
2-(3-chloro-4-fluorophenyl)isoindoline-1,3-dione 3s[6]

3s (220 mg) was synthesized from *o*-phthalaldehyde **1a** (147 mg) and 3-chloro-4-fluoroaniline **2s** (159 mg) using general experimental procedure; White solid; 73% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 7.97-7.95 (m, 2H), 7.82- 7.80 (m, 2H), 7.57- 7.55 (m, 1H), 7.39- 7.35 (m, 1H), 7.29- 7.25 (m, 1H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 166.8, 158.7, 156.2, 134.7, 131.4, 128.8, 126.4, 126.3, 123.9, 117.0, 116.8. ^{19}F NMR (471 MHz, $CDCl_3$): δ_F -115.2 (s, 1F).



2-(3,4-dichlorophenyl)isoindoline-1,3-dione 3t[7]

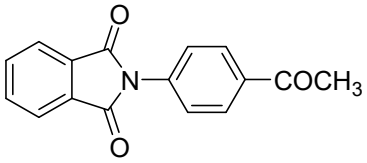
3t (224 mg) was synthesized from *o*-phthalaldehyde **1a** (147 mg) and 3,4-dichloroaniline **2t** (178 mg) using general experimental procedure; White solid; 70% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 7.98- 7.94 (m, 2H), 7.83- 7.80 (m, 2H), 7.64 (d, *J*= 2.1 Hz, 1H), 7.59 (d, *J*= 8.7 Hz, 1H), 7.39- 7.35 (m, 1H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 166.6, 134.7, 133.0, 132.1, 131.4, 131.0, 130.7, 128.1, 125.5, 124.0.



4-(1,3-dioxoisoindolin-2-yl)benzonitrile 3u[5]

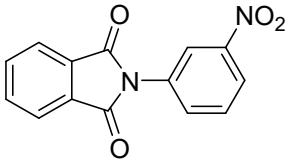
3u (191 mg) was synthesized from *o*-phthalaldehyde **1a** (147 mg) and 4-aminobenzonitrile **2u** (130 mg) using general experimental procedure; White solid; 70% yield (eluent:

EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 8.02- 7.99 (m, 2H), 7.87- 7.84 (m, 3H), 7.81- 7.77 (m, 1H), 7.72- 7.69 (d, *J*= 8.4 Hz, 2H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 166.4, 134.9, 132.9, 131.3, 126.4, 124.1, 123.6, 118.2, 111.3.



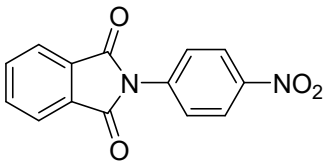
2-(4-acetylphenyl)isoindoline-1,3-dione 3v[5]

3v (189 mg) was synthesized from *o*-phthalaldehyde **1a** (147 mg) and 1-(4-aminophenyl)ethan-1-one **2v** (148 mg) using general experimental procedure; White solid; 65% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 8.12 (d, *J*= 8.4 Hz, 2H), 8.00- 7.97 (m, 2H), 7.84- 7.81 (m, 2H), 7.64 (d, *J*= 8.4 Hz, 2H), 2.65 (s, 3H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 197.1, 166.8, 136.0, 135.9, 134.7, 131.5, 129.1, 126.1, 123.9, 26.7.



2-(3-nitrophenyl)isoindoline-1,3-dione 3w[8]

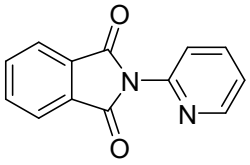
3w (195 mg) was synthesized from *o*-phthalaldehyde **1a** (147 mg) and 3-nitroanline **2w** (151 mg) using general experimental procedure; White solid; 66% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 8.44 (s, 1H), 8.29 (d, *J*= 8.1 Hz, 1H), 8.02- 7.99 (m, 2H), 7.87- 7.84 (m, 3H), 7.73- 7.67 (t, *J*= 8.4 Hz, 1H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 166.5, 148.5, 134.9, 132.9, 132.0, 131.3, 129.9, 124.1, 122.5, 121.4.



2-(4-nitrophenyl)isoindoline-1,3-dione 3x[5]

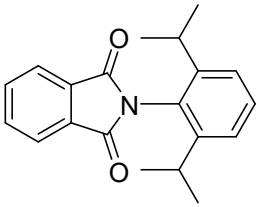
3x (192 mg) was synthesized from *o*-phthalaldehyde **1a** (147 mg) and 3-nitroanline **2x** (151 mg) using general experimental procedure; White solid; 65% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 8.39 (d, *J*= 8.2 Hz, 2H), 8.01- 7.99 (m, 2H), 7.86- 7.84

(m, 2H), 7.78 (d, *J*= 8.2 Hz, 2H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 166.4, 146.4, 137.5, 135.0, 131.3, 126.3, 124.4, 124.2.



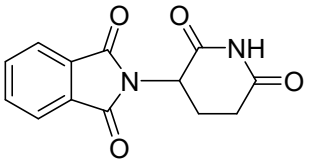
2-(pyridin-2-yl)isoindoline-1,3-dione 3y[9]

3y (148 mg) was synthesized from *o*-phthalaldehyde **1a** (147 mg) and 4-aminopyridine **2y** (103 mg) using general experimental procedure; White solid; 60% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 8.70 (d, *J*= 3.9 Hz,1H), 8.00- 7.97 (m, 2H), 7.93- 7.90 (t, *J*= 7.8 Hz, 1H), 7.82- 7.81 (m, 2H), 7.47 (d, *J*= 7.8 Hz, 1H), 7.38 (t, *J*= 5.4 Hz, 1H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 166.6, 149.6, 146.2, 138.2, 134.6, 131.7, 123.9, 123.4, 122.0.



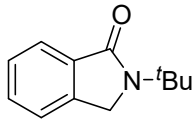
2-(2,6-diisopropylphenyl)isoindoline-1,3-dione 3z[10]

3z (256 mg) was synthesized from *o*-phthalaldehyde **1a** (147 mg) and 2,6-diisopropylaniline **2z (**194 mg) using general experimental procedure; White solid; 76% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 7.99- 7.95 (m, 2H), 7.84- 7.79 (m, 2H), 7.49- 7.44 (t, *J*= 7.5 Hz, 1H), 7.31 (d, *J*= 7.8 Hz, 2H), 2.78- 2.67 (m, 2H), 1.18 (d, *J*= 6.9 Hz, 12H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 168.2, 147.3, 134.3, 131.9, 130.2, 126.8, 124.0, 123.9, 29.3, 24.0.



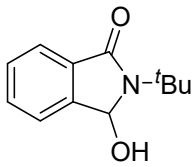
2-(2,6-dioxopiperidin-3-yl)isoindoline-1,3-dione(Thalidomide) 3aa[11]

3aa (157 mg) was synthesized from o-phthalaldehyde **1a** (147 mg) and 3-aminopiperidine-2,6-dione **2aa** (140 mg) using general experimental procedure; White solid; 56% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, DMSO-D_6):δ_H 11.51 (s, 1H), 7.90 (d, *J*= 3Hz, 4H), 5.16- 5.10 (m, 1H), 2.93- 2.83 (m, 1H), 2.63- 2.50 (m, 2H), 2.08 (d, *J*= 12.3 Hz, 1H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 173.3, 170.3, 167.7, 135.4, 131.6, 123.9, 49.4, 31.3, 22.4.



2-(tert-butyl)isoindolin-1-one 4[12]

4 (166 mg) was synthesized from o-phthalaldehyde **1a** (147 mg) and *t*-butylamine **2a** (80 mg); White solid; 85% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 7.79 (d, *J*= 7.2 Hz, 1H), 7.51- 7.43 (m, 1H), 7.41- 7.29 (t, *J*= 7.2 Hz, 2H), 4.45 (s, 2H), 1.56 (s, 9H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 168.8, 140.7, 134.4, 130.8, 127.8, 123.0, 122.3, 54.3, 48.5, 28.0.



2-(tert-butyl)-3-hydroxyisoindolin-1-one 5[13]

5 (69 mg) was synthesized from o-phthalaldehyde **1a** (147 mg) and *t*-butylamine **2a** (80 mg) using general experimental procedure; White solid; 20% yield (eluent: EtOAc/Hexanes= 1:9);^{1}H NMR (300 MHz, $CDCl_3$):δ_H 7.56 (d, *J*= 7.2 Hz, 1H), 7.48 (d, *J*= 3.6 Hz, 2H), 7.44-7.37 (m, 1H), 5.97 (d, *J*= 11.1 Hz, 1H), 3.58- 3.42(m, 1H), 1.56 (s, 9H). ^{13}C NMR (75 MHz, $CDCl_3$):δ_C 168.0, 143.6, 132.5, 131.5, 129.5, 122.9, 122.7, 82.2, 54.7, 28.5.

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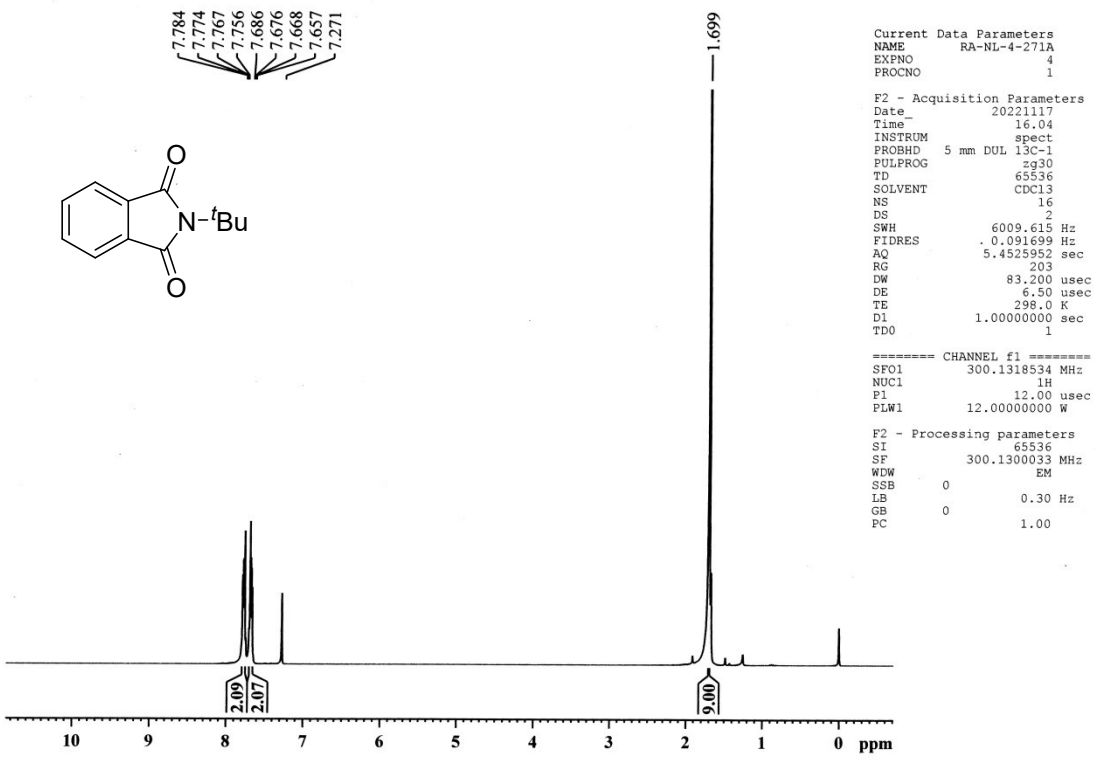
6. Copies of ^{1}H, ^{13}C NMR and ^{19}F NMR

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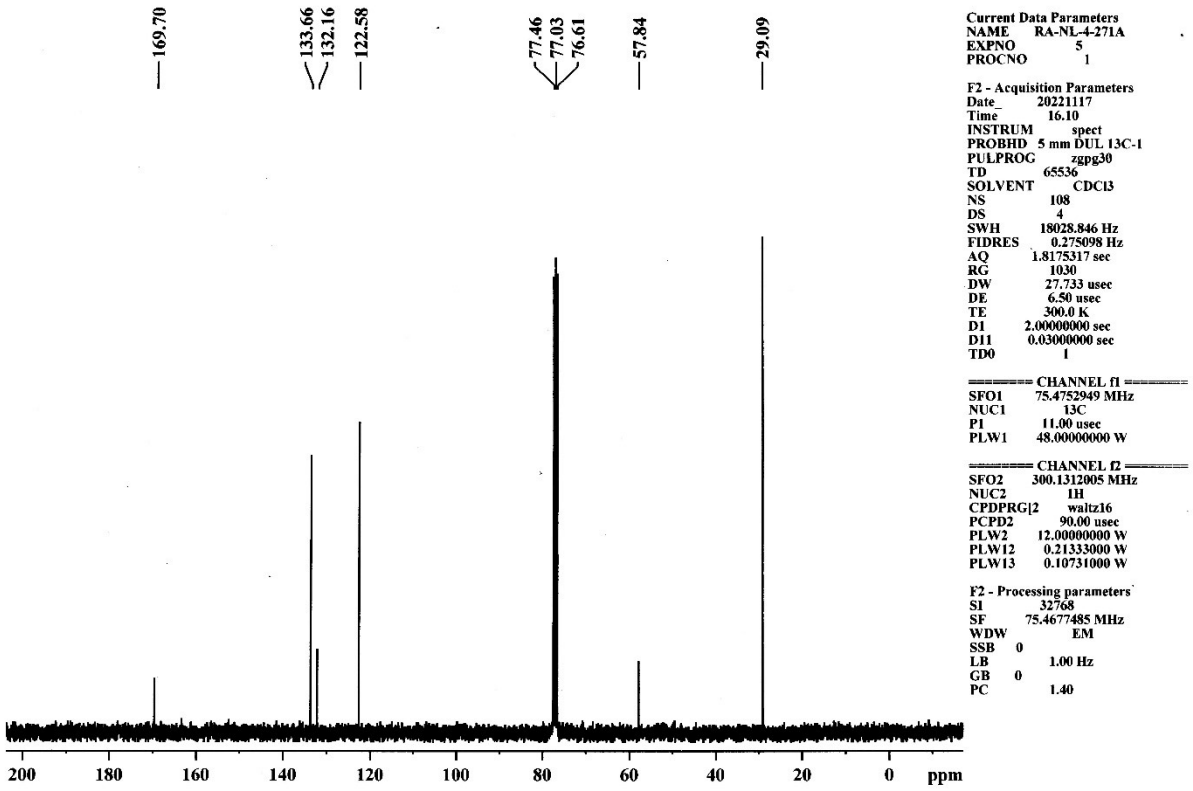
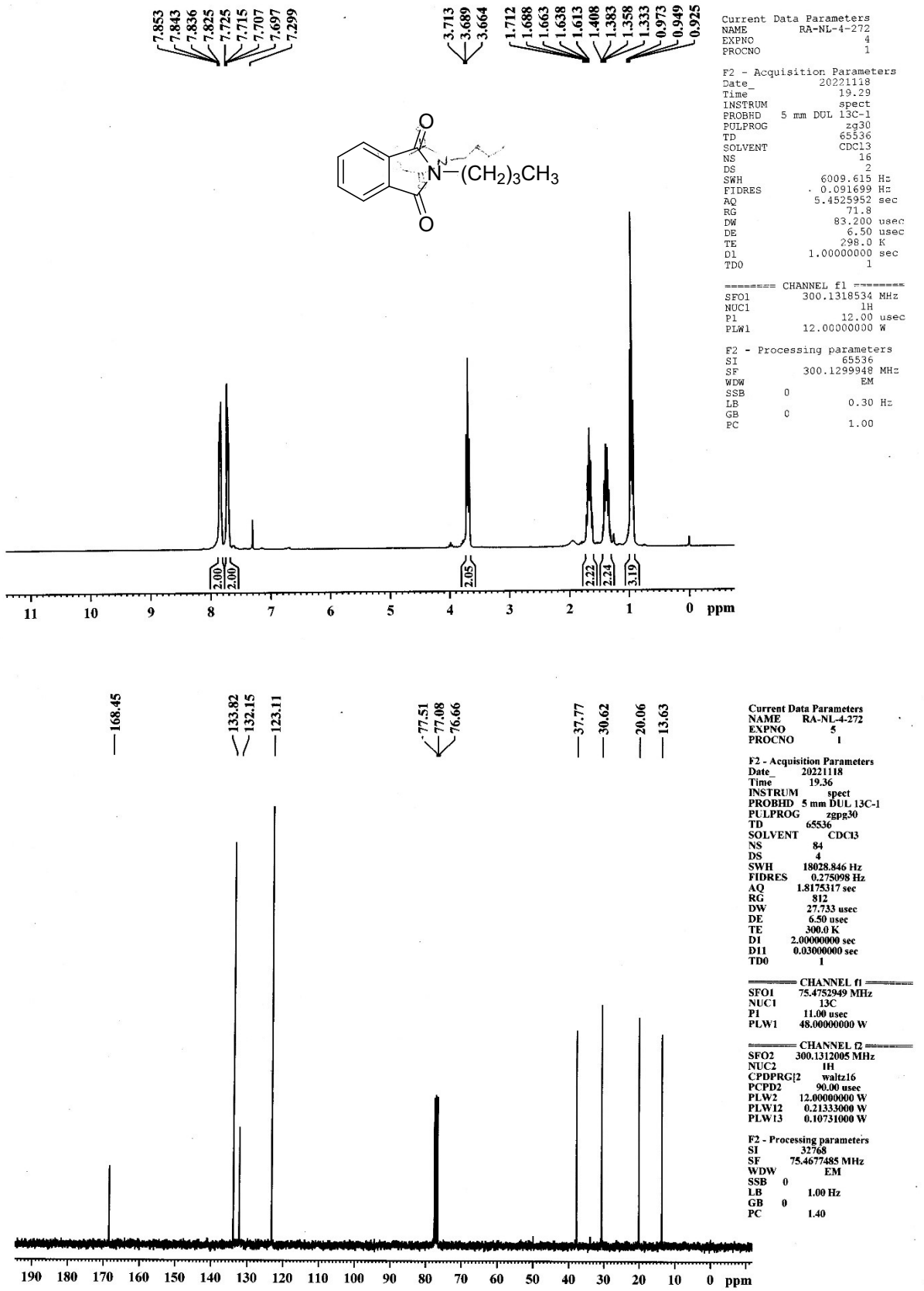
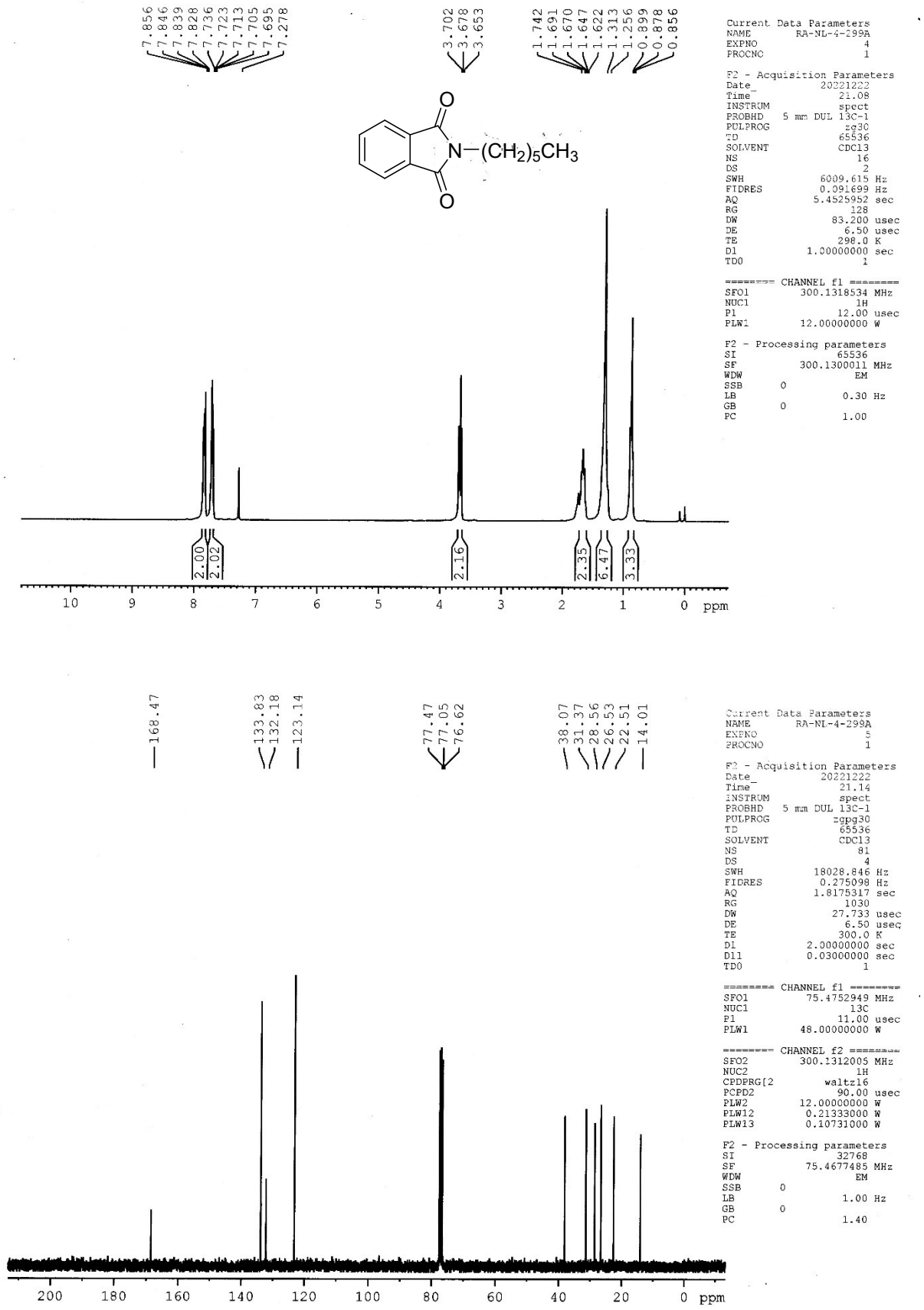


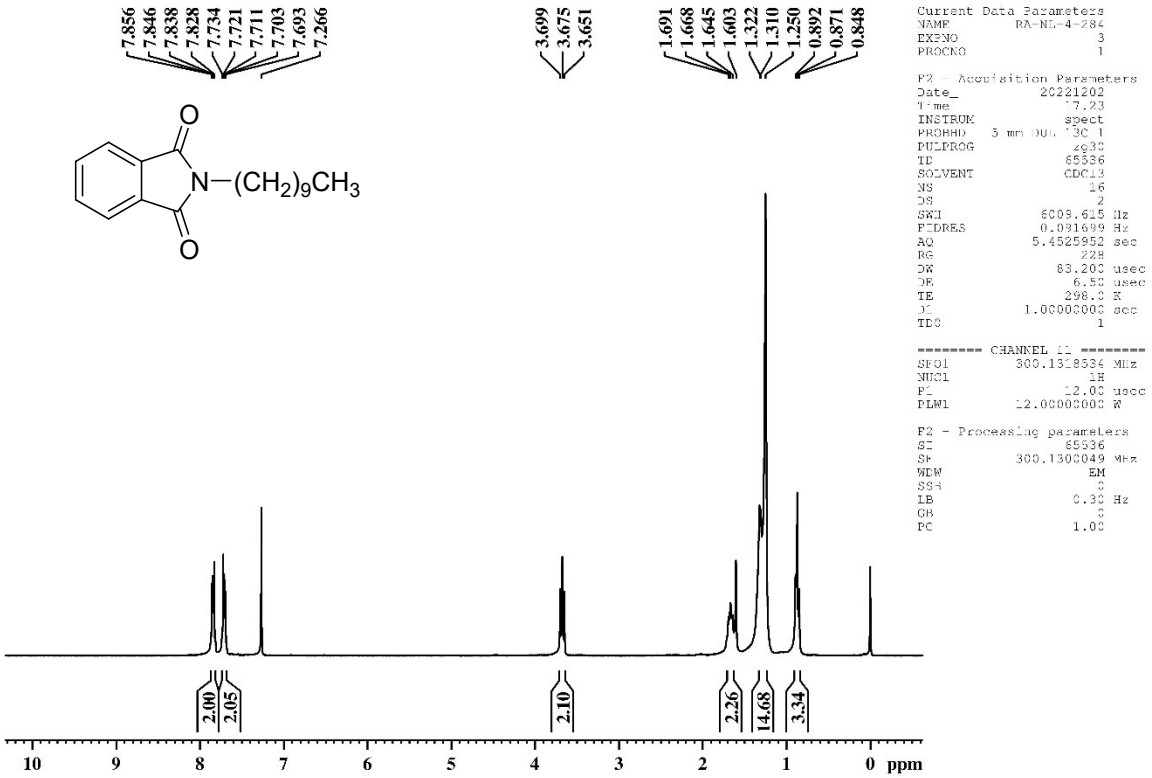
H^1 & C^{13} NMR spectra of compound **3a**

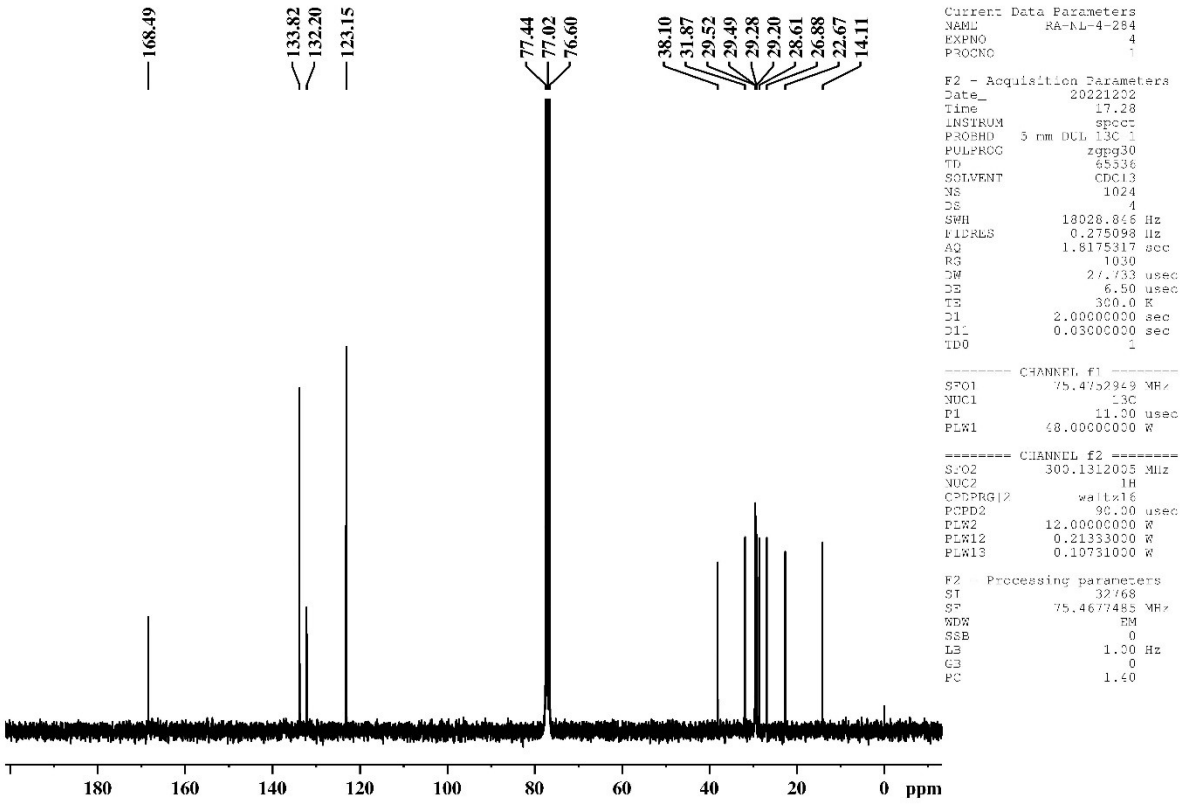


H^1 & C^{13} NMR spectra of compound **3b**



H[1] & C[13] NMR spectra of compound **3c**





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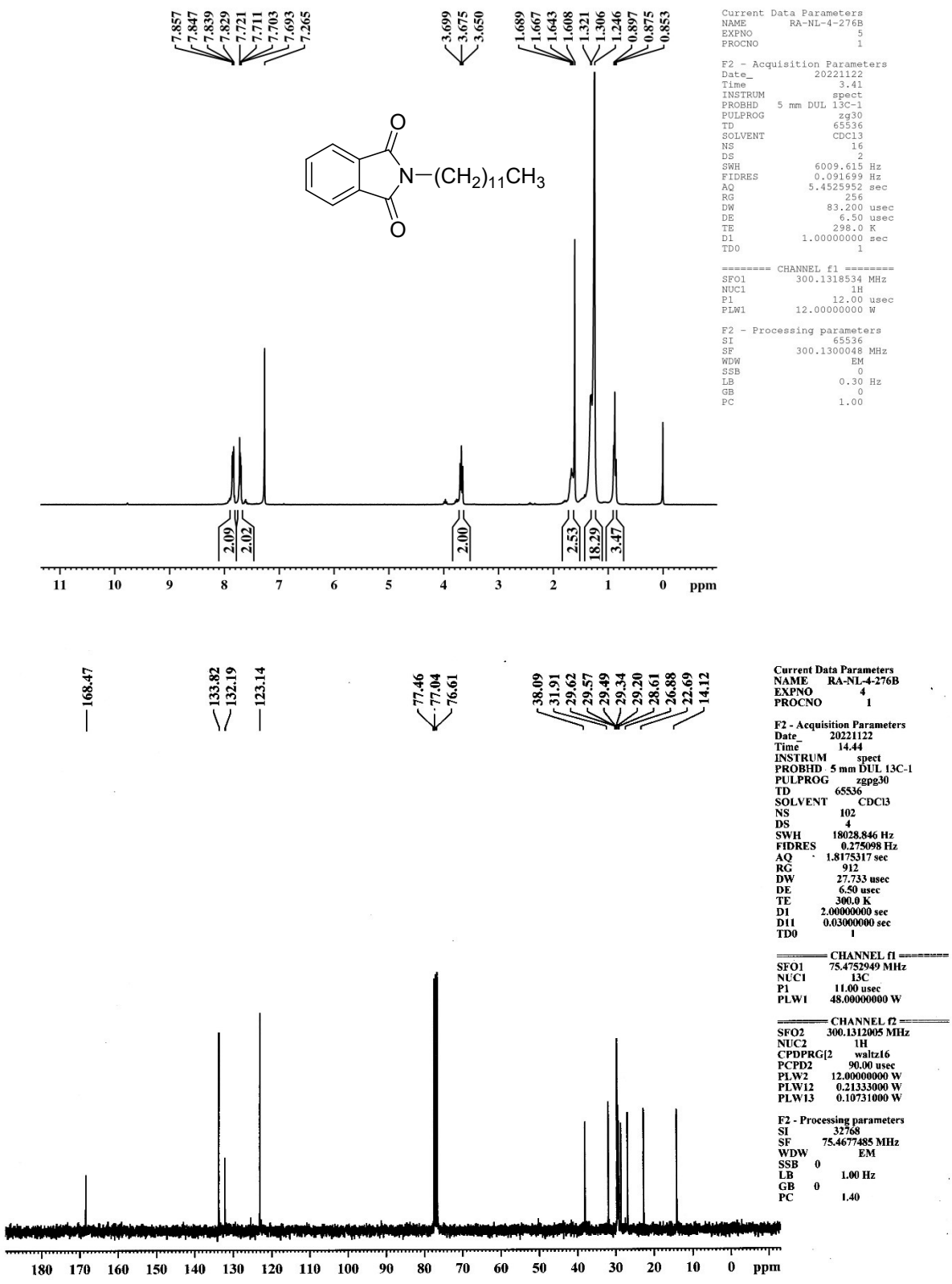

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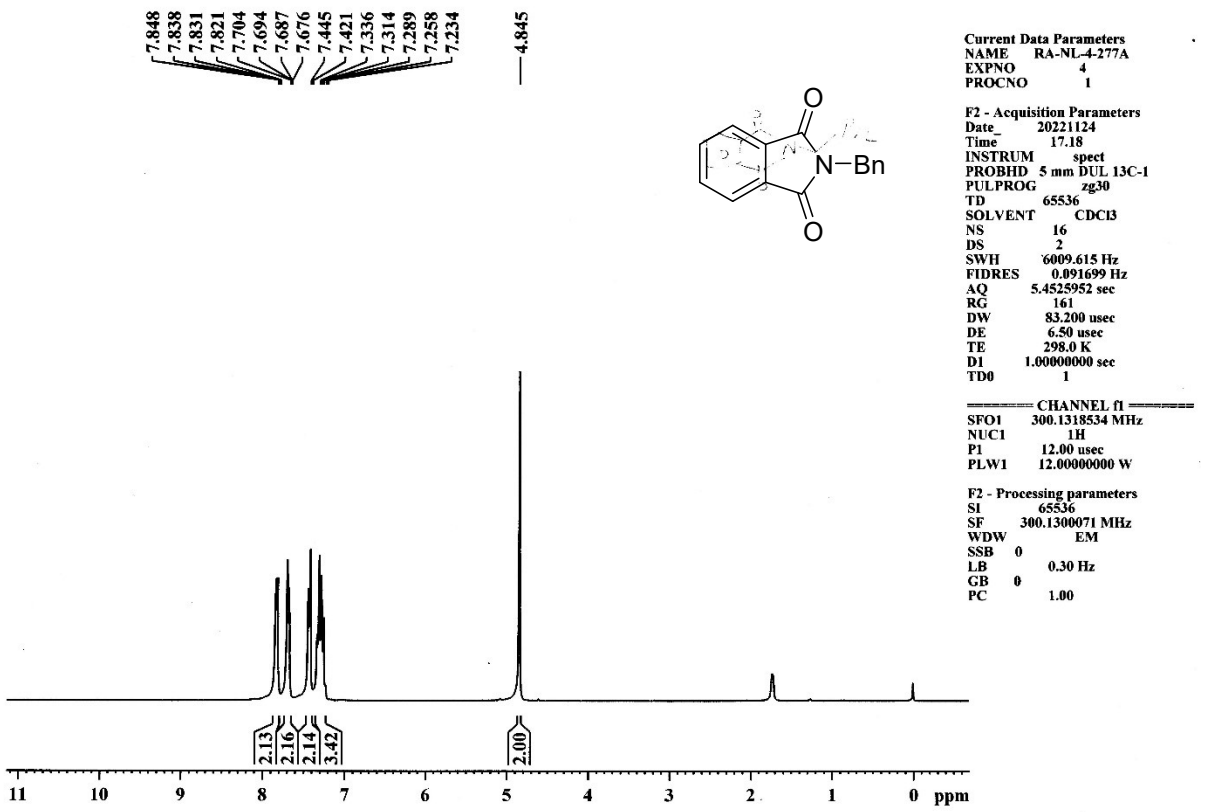
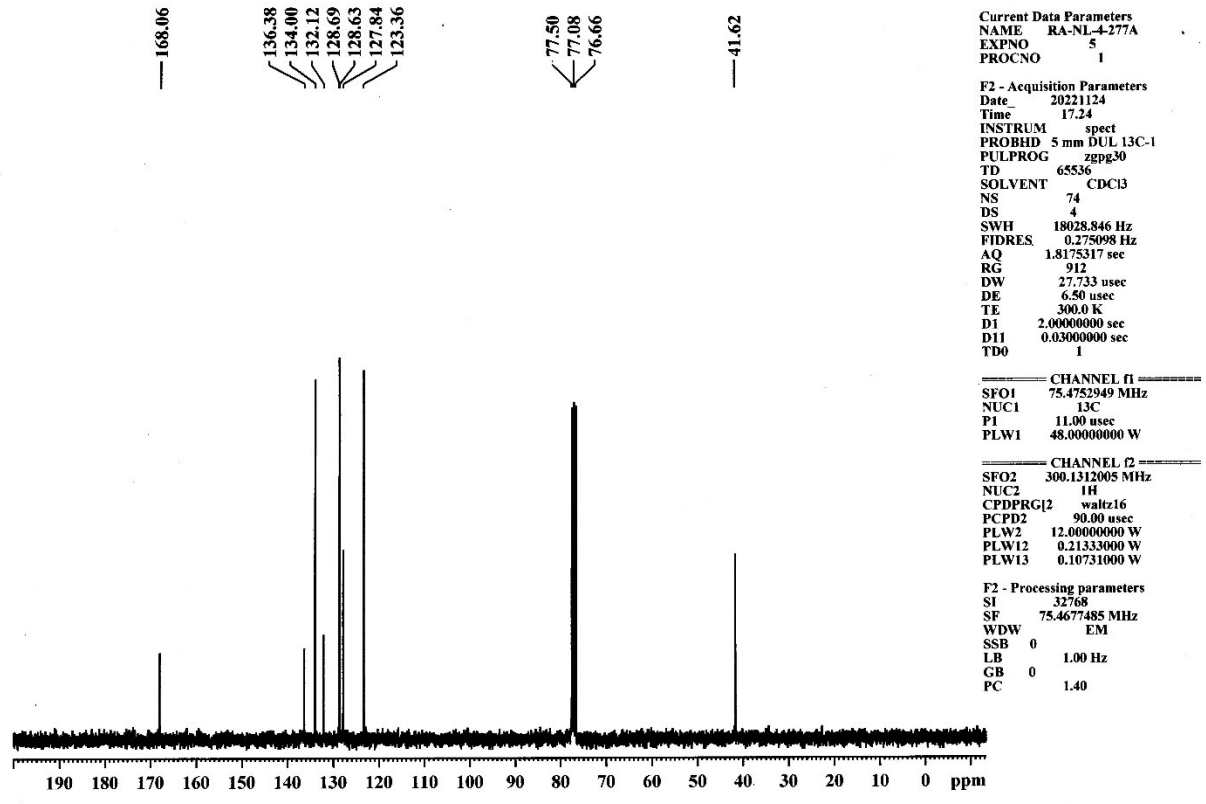
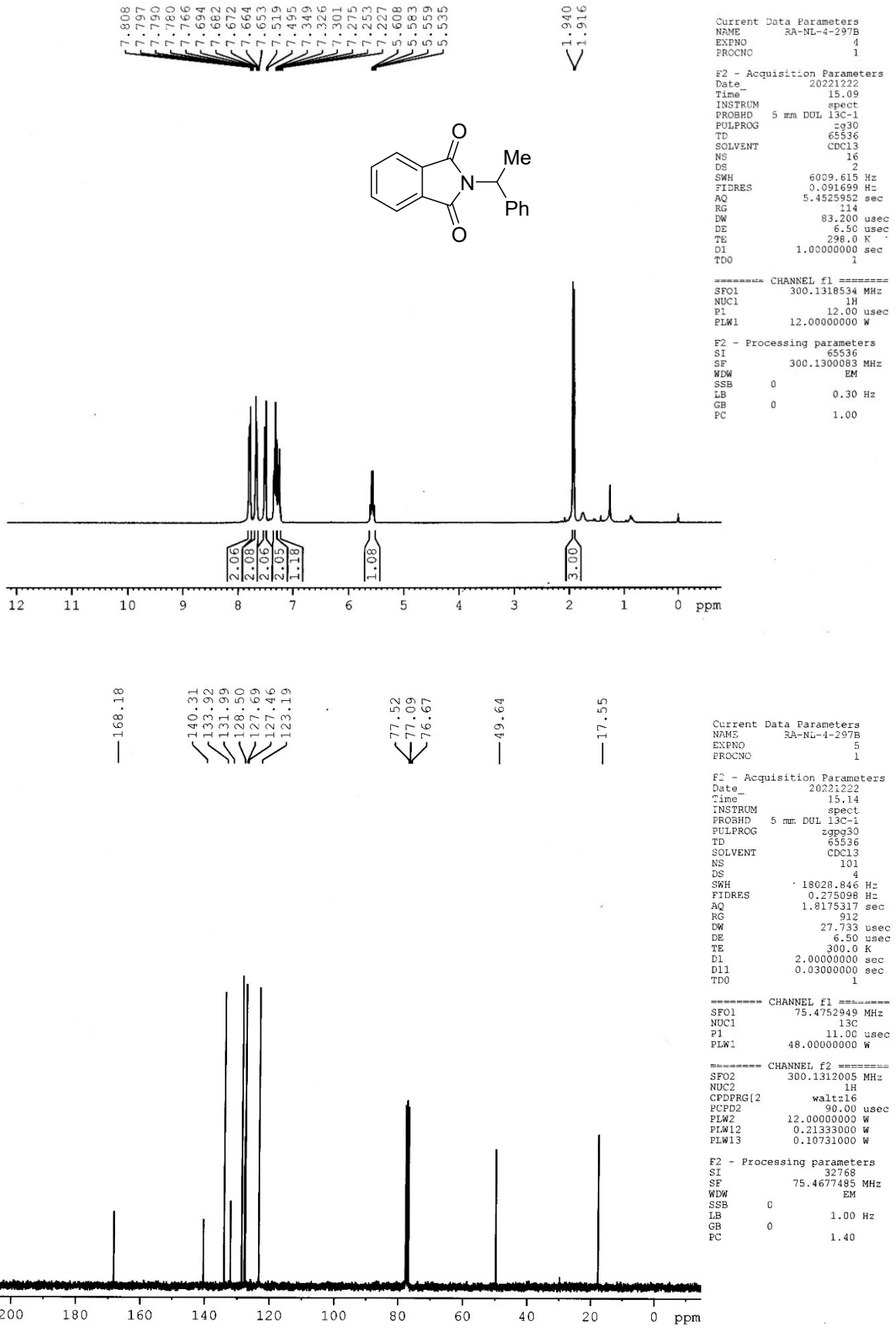
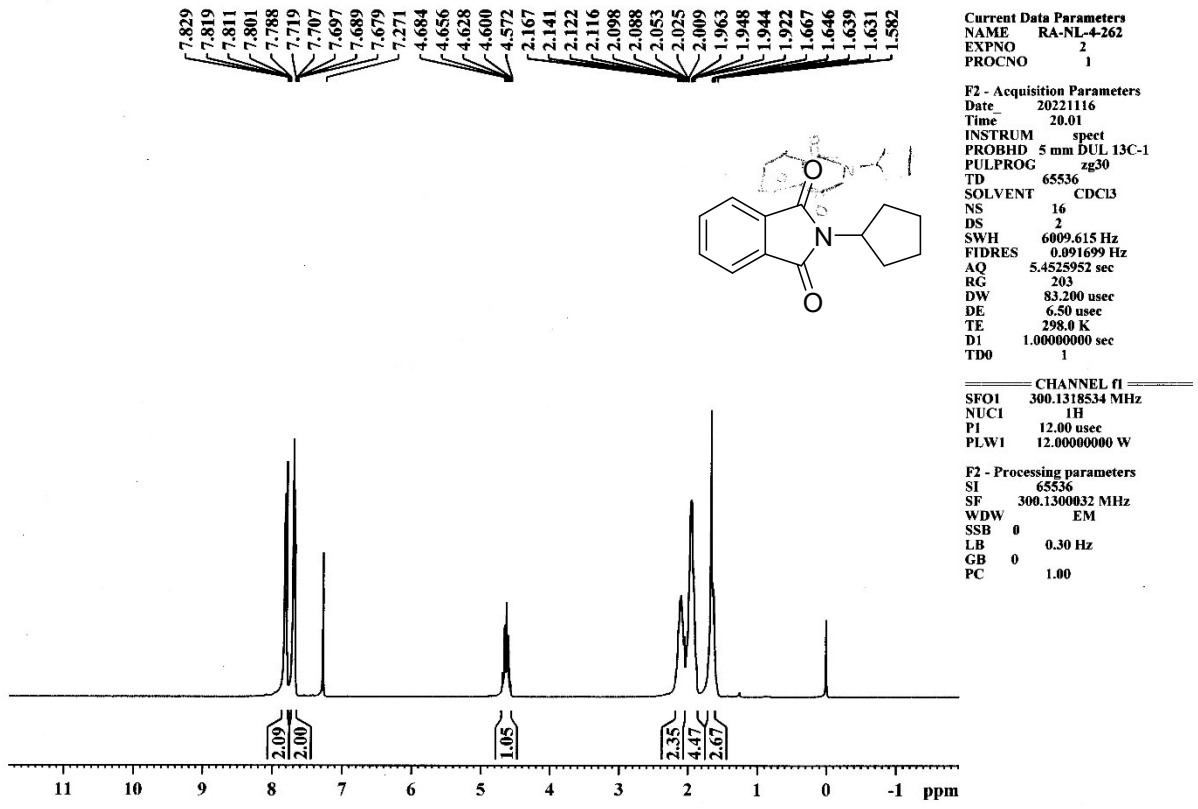


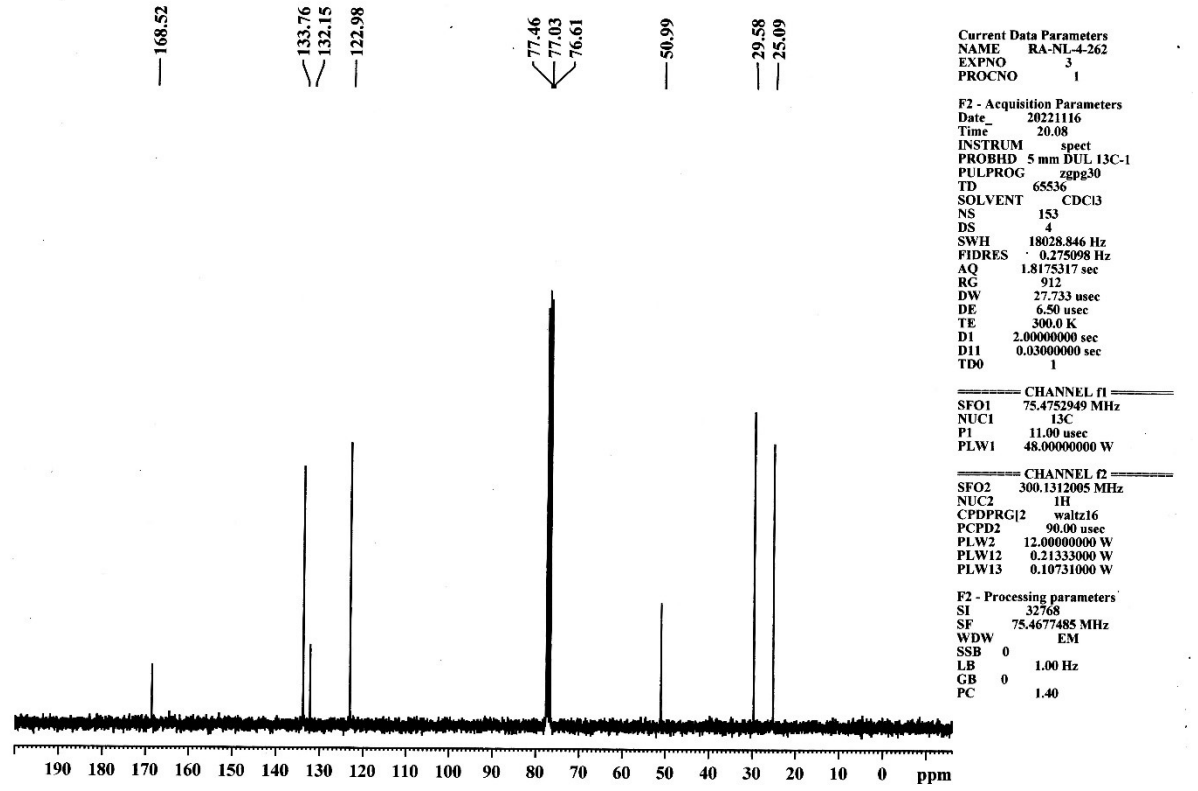


H^1 & C^{13} NMR spectra of compound **3f**

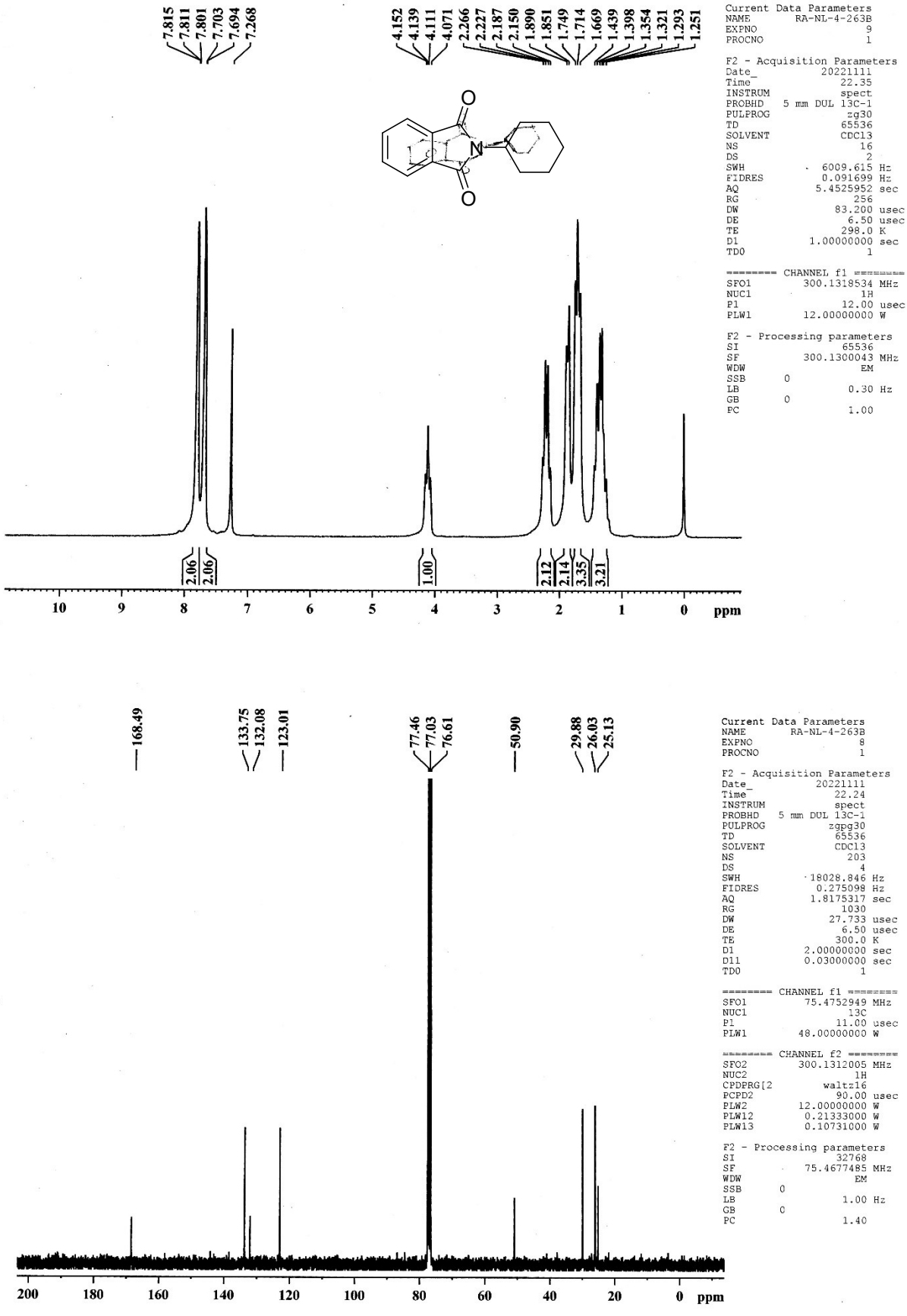


H[1] & C[13] NMR spectra of compound **3g**

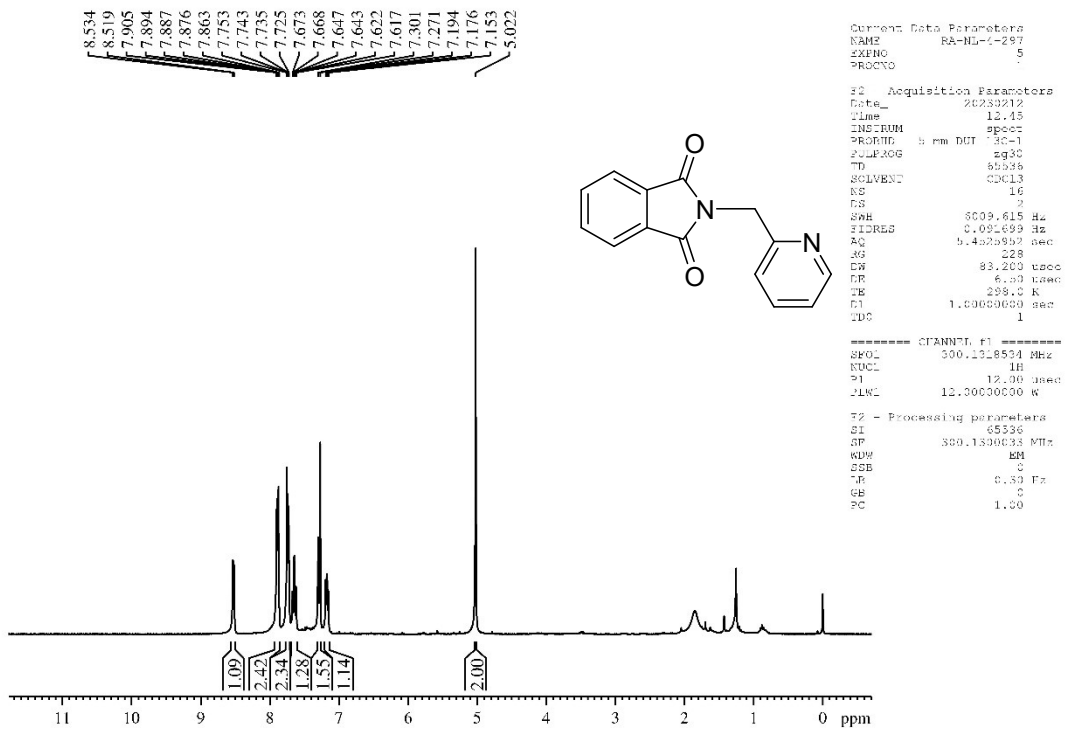


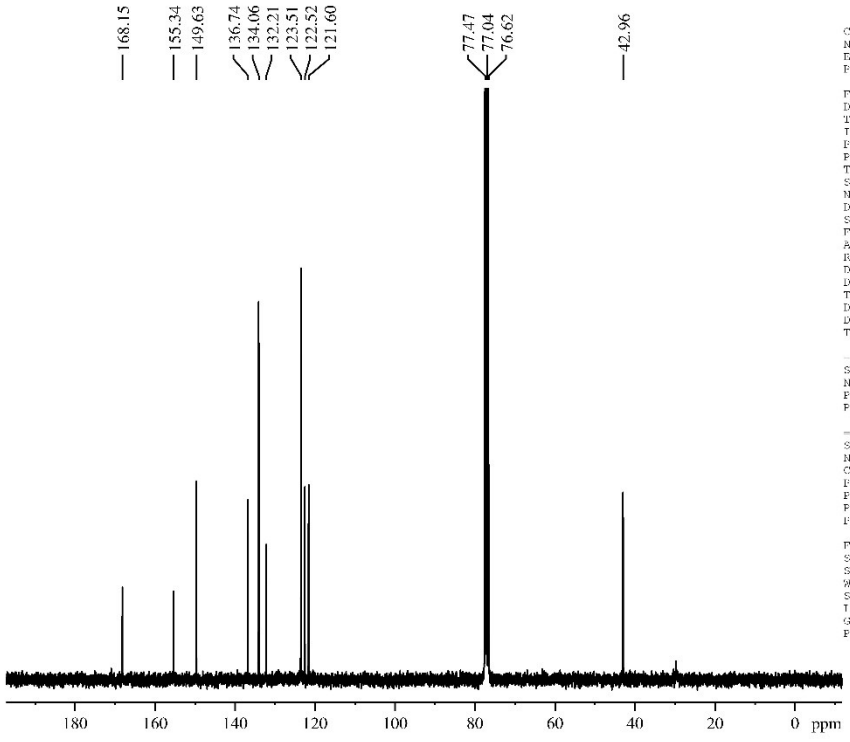


H^1 & C^{13} NMR spectra of compound **3h**



H^1 & C^{13} NMR spectra of compound **3i**





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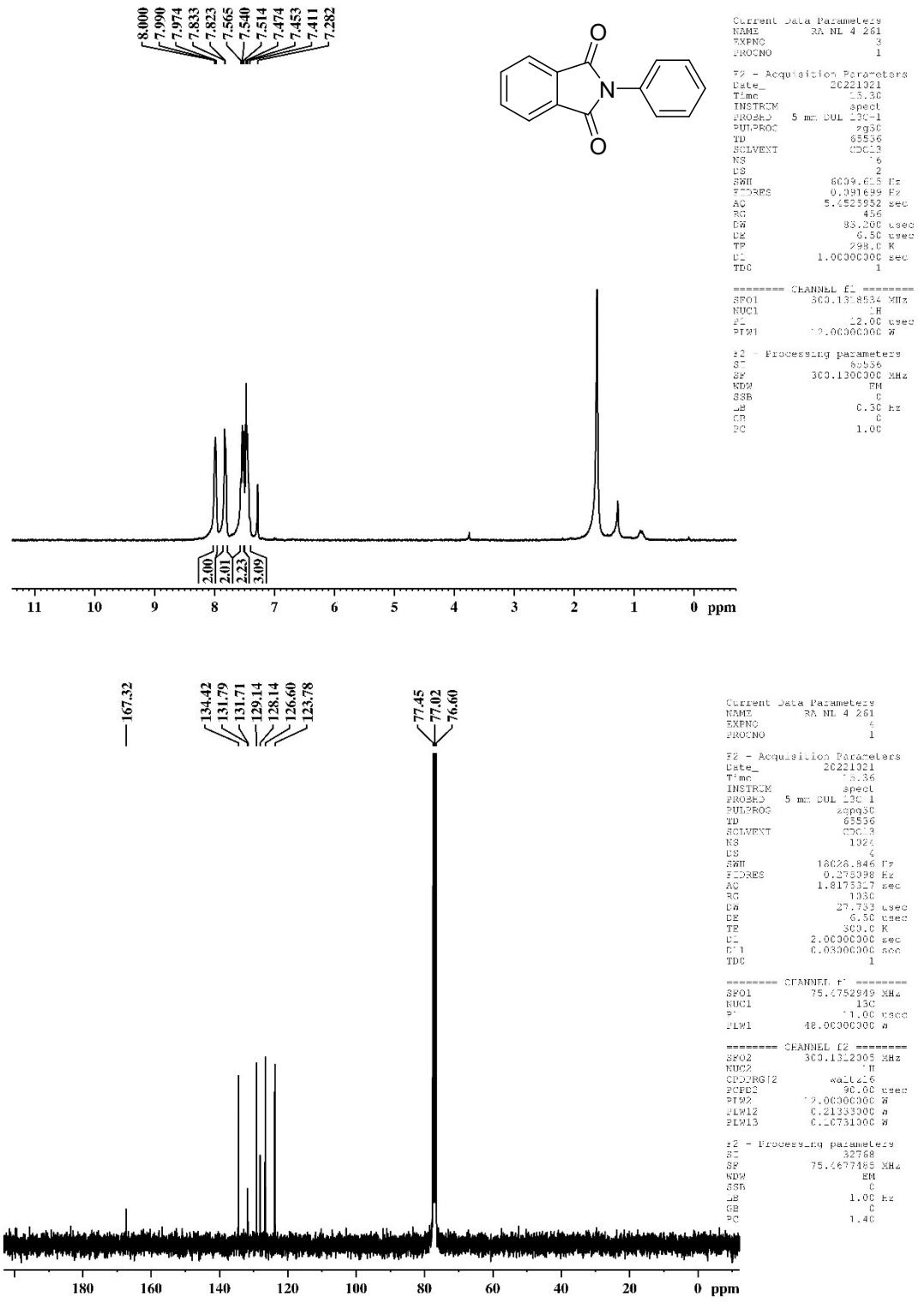
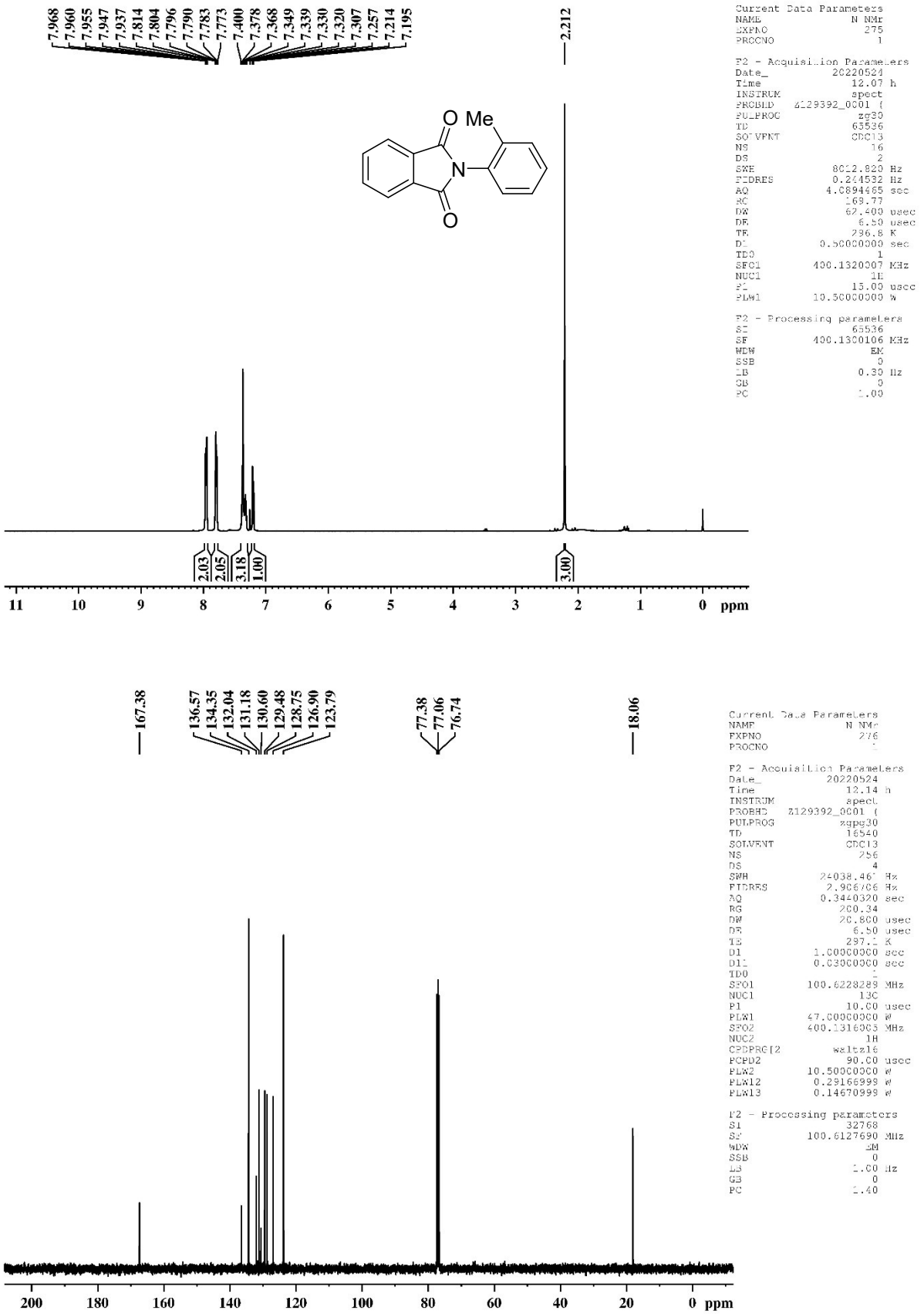
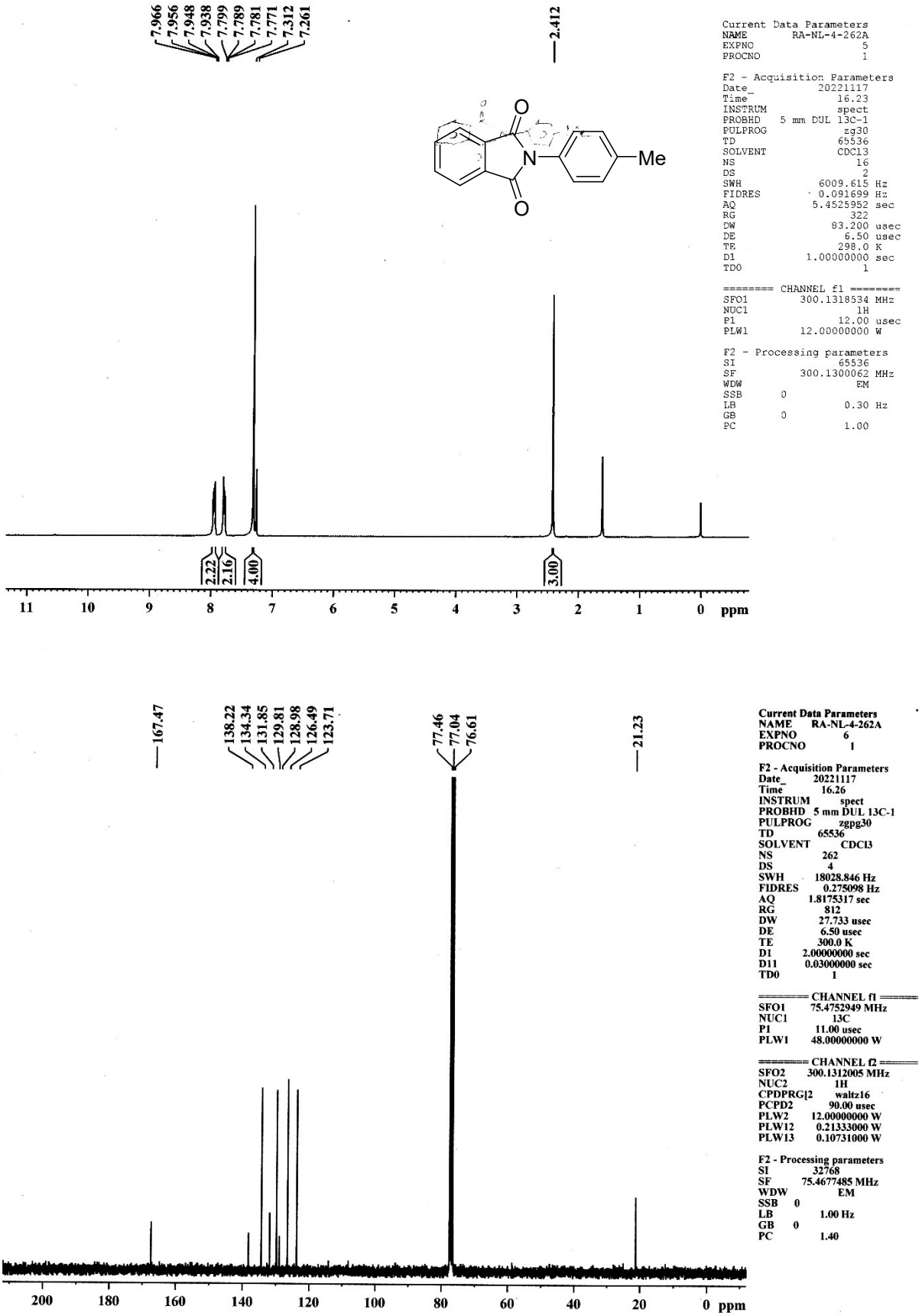


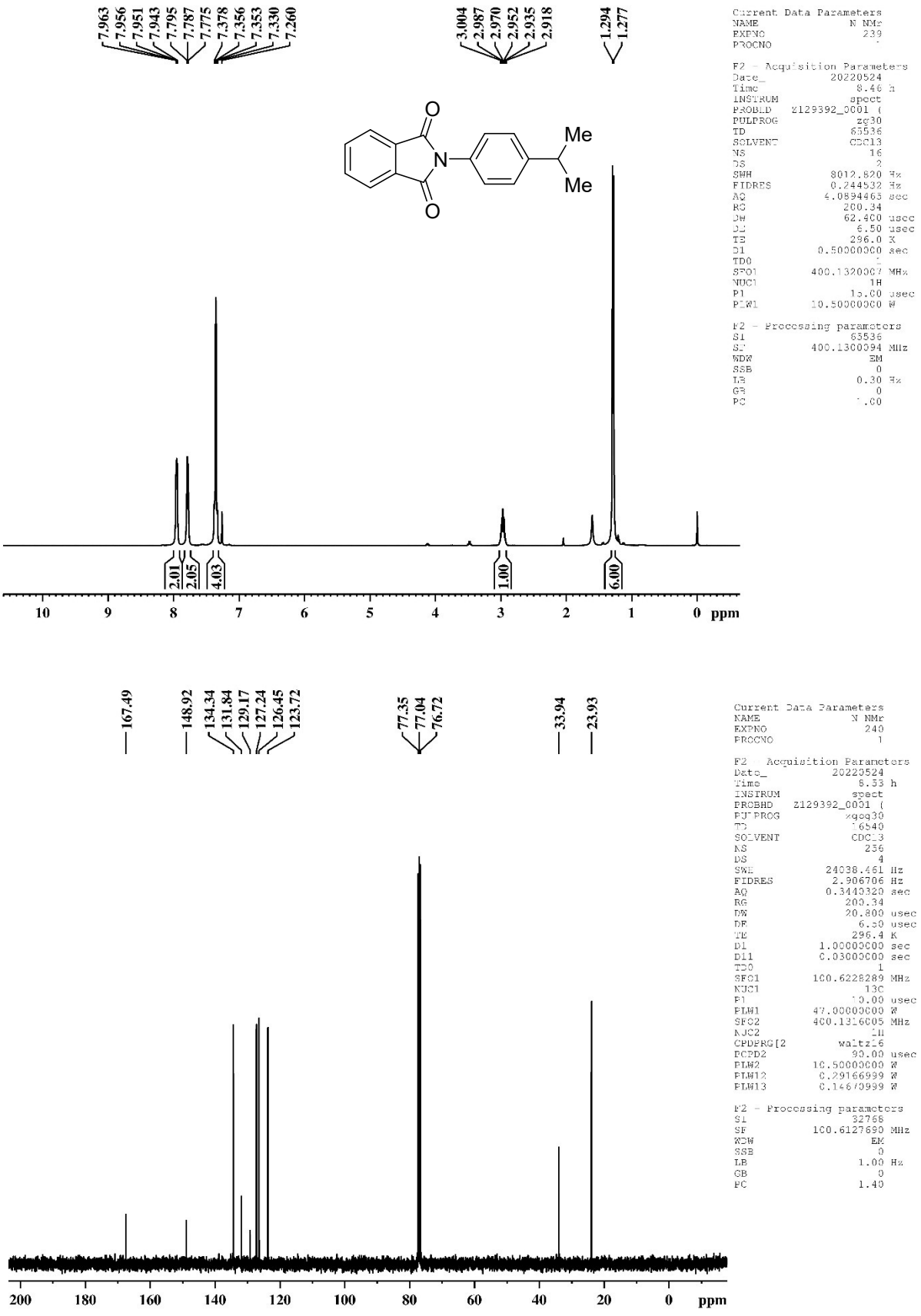
H^1 & C^{13} NMR spectra of compound **3k**



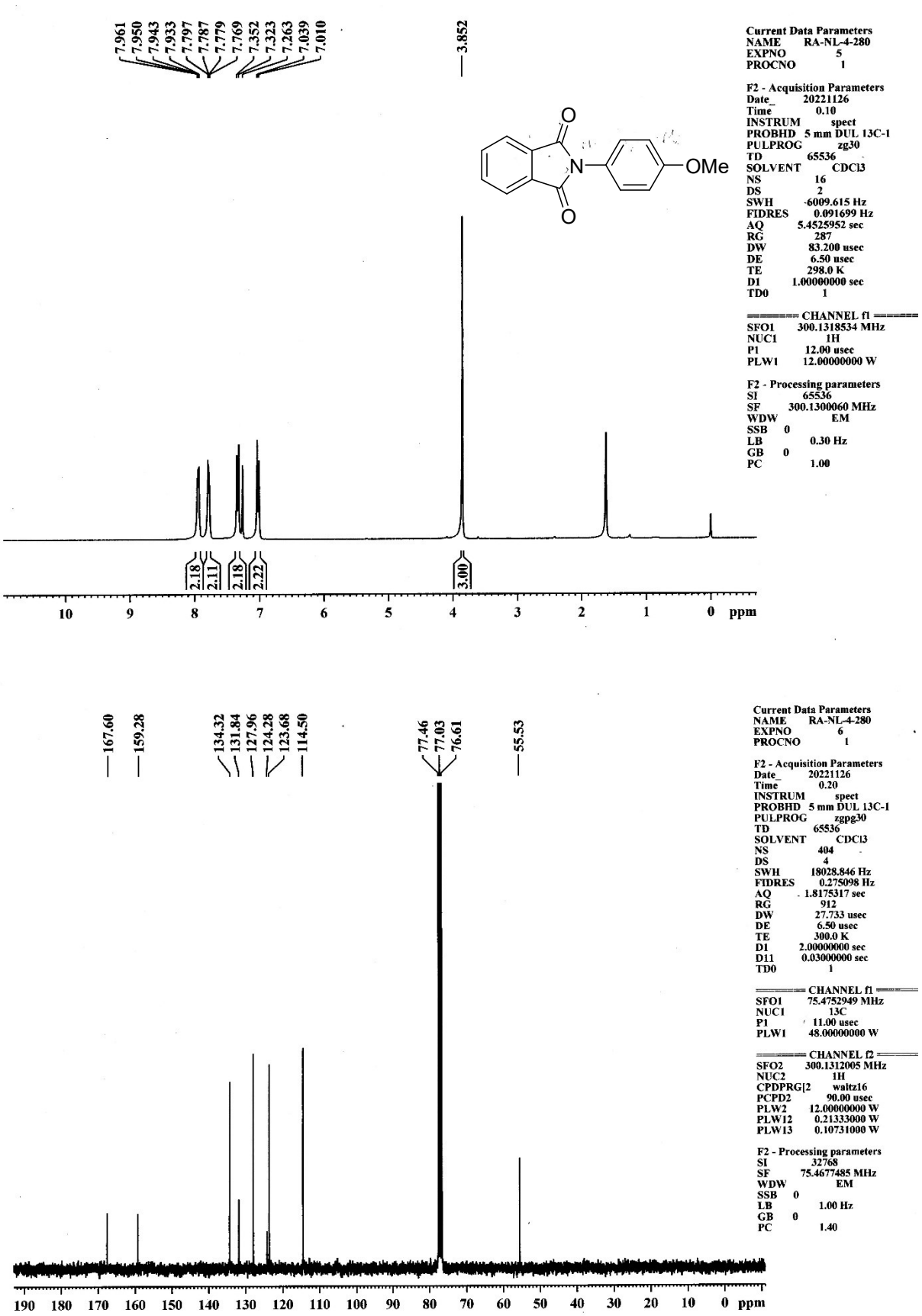
H^1 & C^{13} NMR spectra of compound **3l**



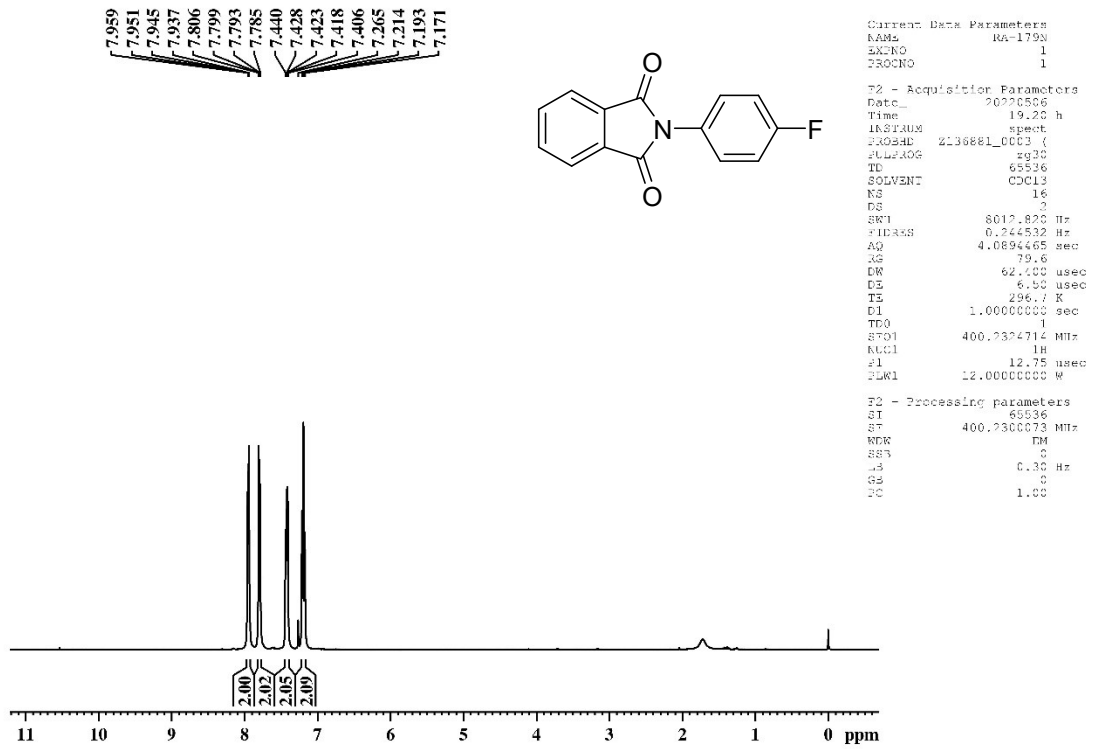
H^1 & C^{13} NMR spectra of compound **3m**

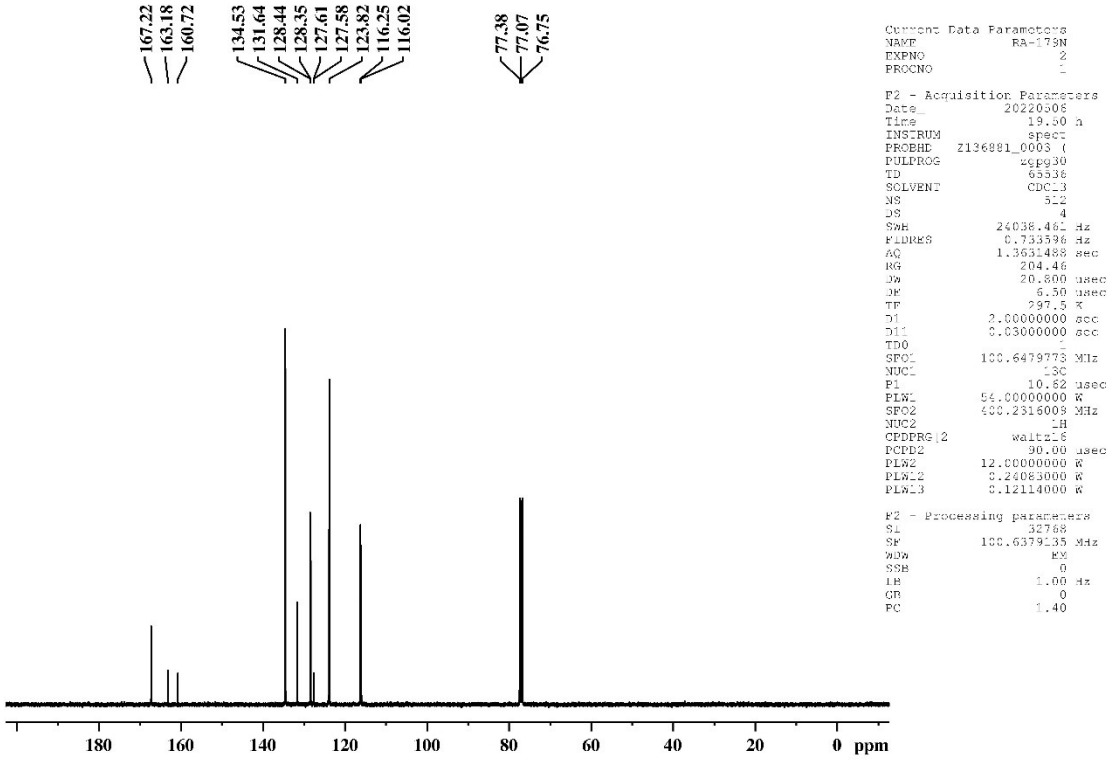


H^1 & C^{13} NMR spectra of compound **3n**

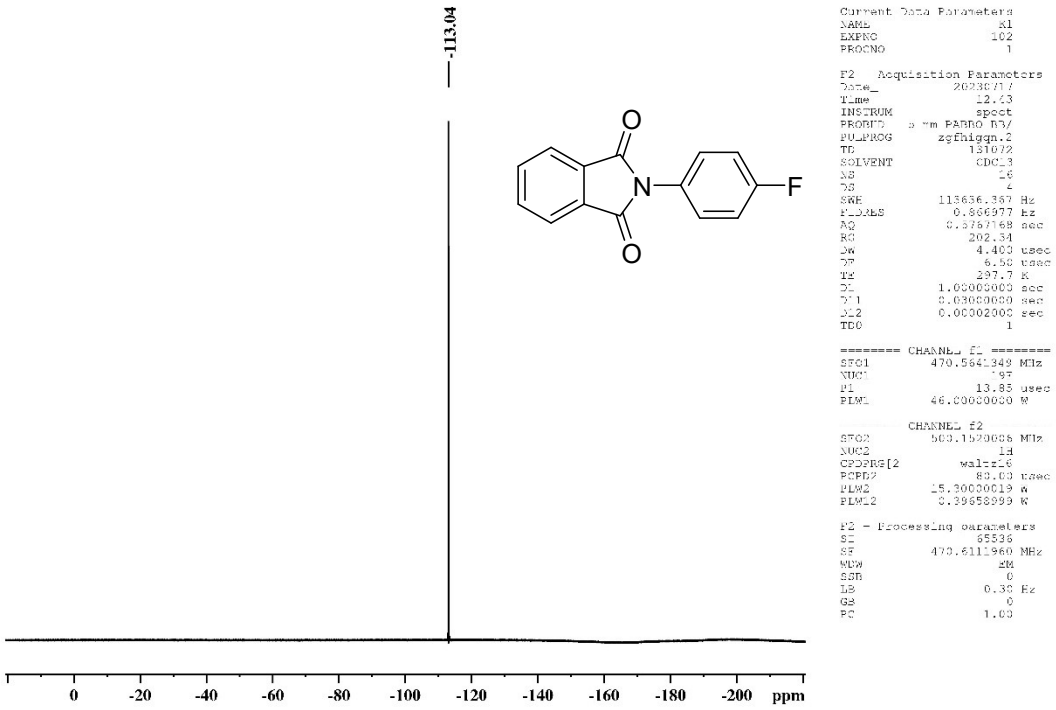


H^1 & C^{13} NMR spectra of compound **3o**

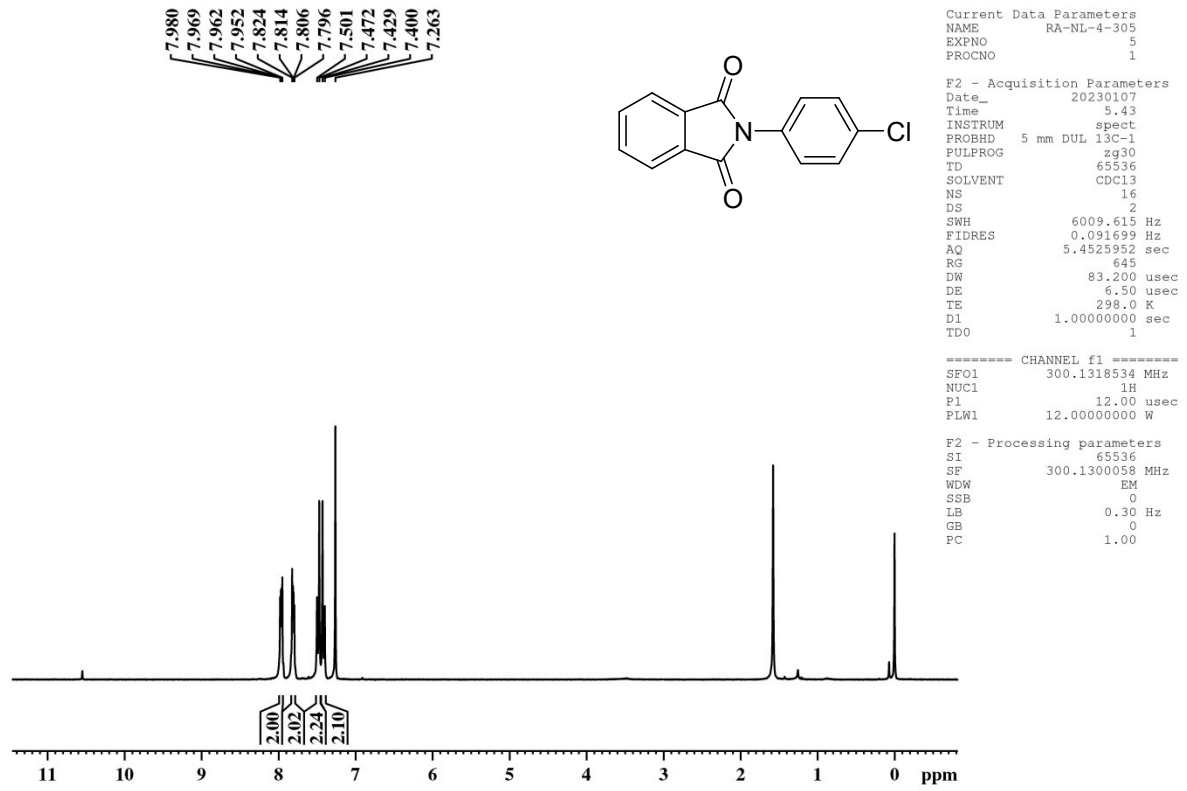




H[1] & C[13] NMR spectra of compound **3p**



^{19}F NMR spectra of compound **3p**

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PROCNO                 1

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TD                 65536
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NS                    16
DS                     2
SWH             6009.615 Hz
FIDRES             0.091699 Hz
AQ              5.4525952 sec
RG                   645
DW                83.200 usec
DE                 6.50 usec
TE                298.0 K
D1             1.00000000 sec
TD0                    1

======== CHANNEL f1 ========
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NUC1                  1H
P1                 12.00 usec
PLW1          12.00000000 W

F2 - Processing parameters
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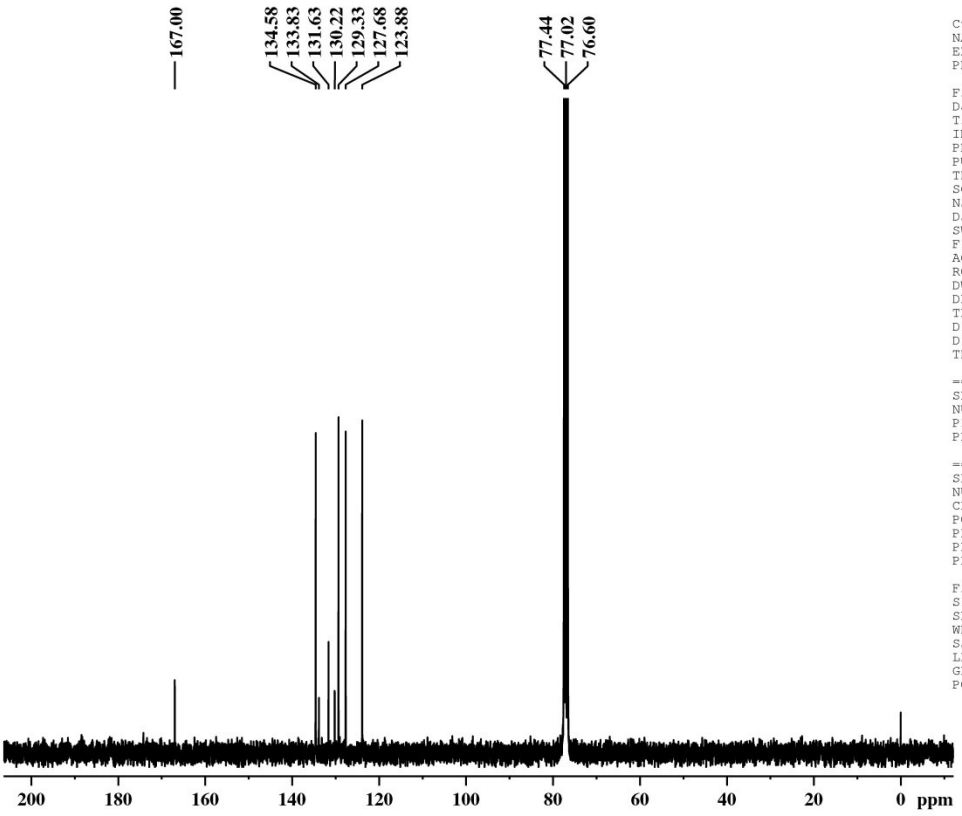


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PROCNO                 1

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NS                  1024
DS                     4
SWH            18028.846 Hz
FIDRES             0.275098 Hz
AQ              1.8175317 sec
RG                  1030
DW                27.733 usec
DE                 6.50 usec
TE                300.0 K
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======== CHANNEL f1 ========
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NUC1                  13C
P1                 11.00 usec
PLW1          48.00000000 W

======== CHANNEL f2 ========
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NUC2                  1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2          12.00000000 W
PLW12          0.21333000 W
PLW13          0.10731000 W

F2 - Processing parameters
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SSB                    0
LB                  1.00 Hz
GB                     0
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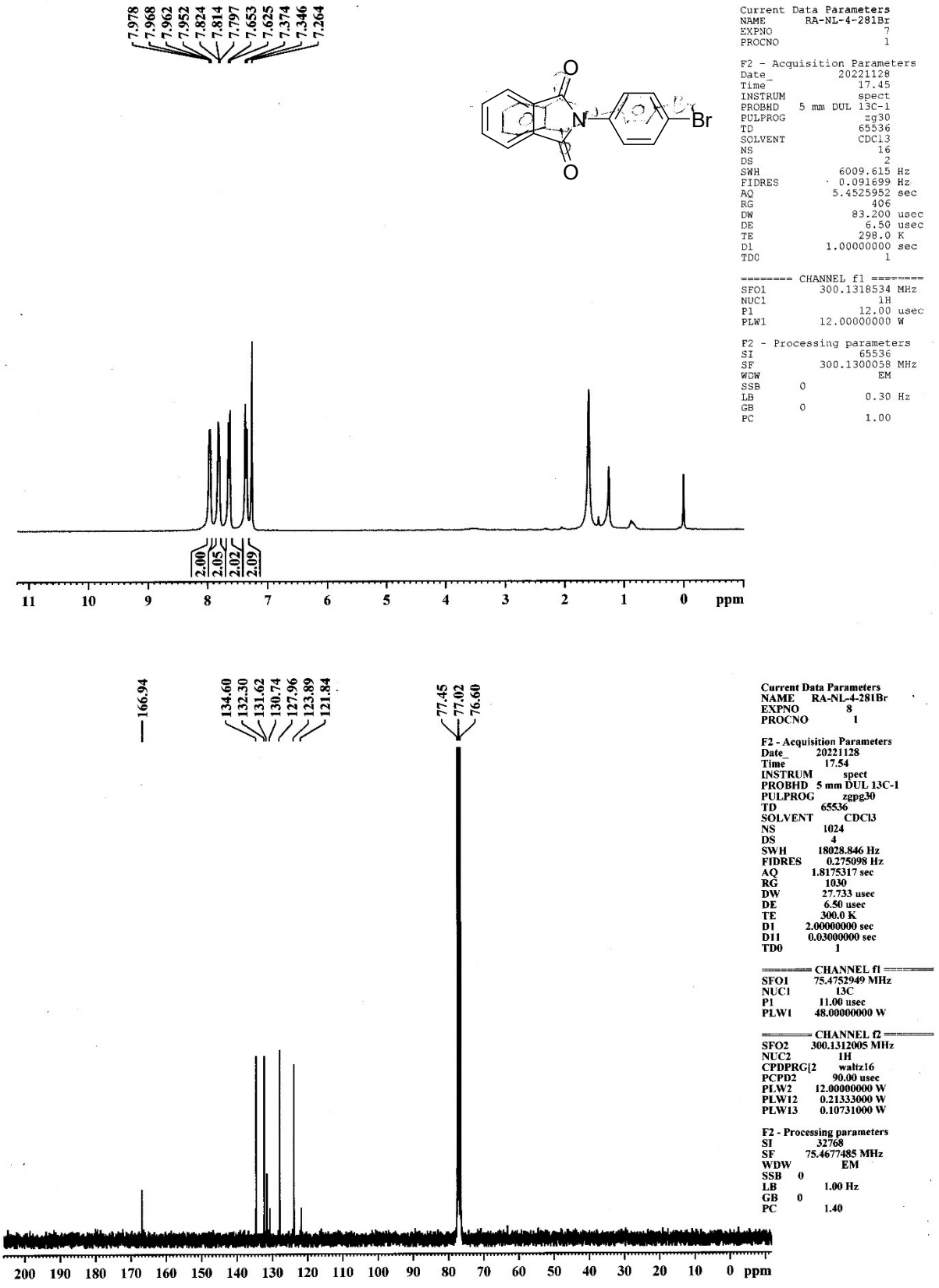
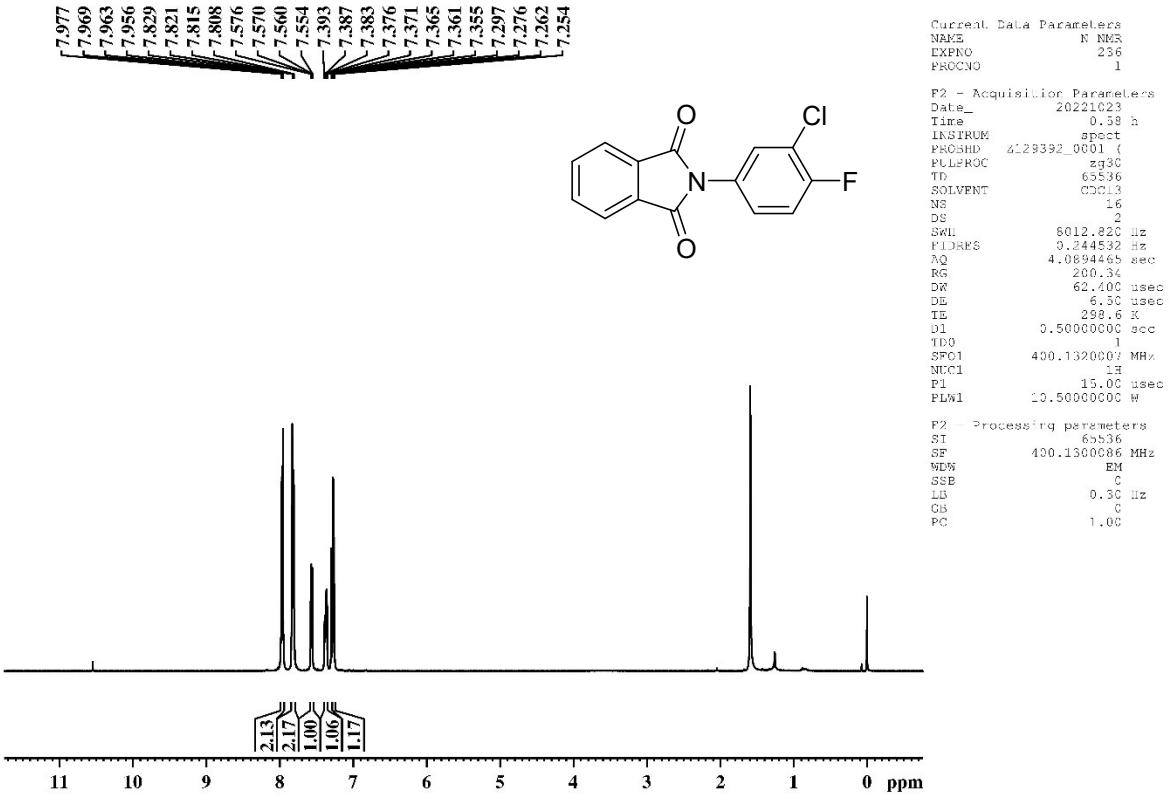
H^1 & C^{13} NMR spectra of compound **3q**



H^1 & C^{13} NMR spectra of compound **3r**

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PROCNO                    1

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INSTRUM                spect
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PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH                6012.820 Hz
FIDRES             0.244532 Hz
AQ                 4.0894465 sec
RG                    200.34
DW                   62.400 usec
DE                     6.50 usec
TE                   298.6 K
D1                 0.50000000 sec
TD0                       1
SFO1          400.1320007 MHz
NUC1                     1H
P1                   15.00 usec
PLW1          10.50000000 W

F2 - Processing parameters
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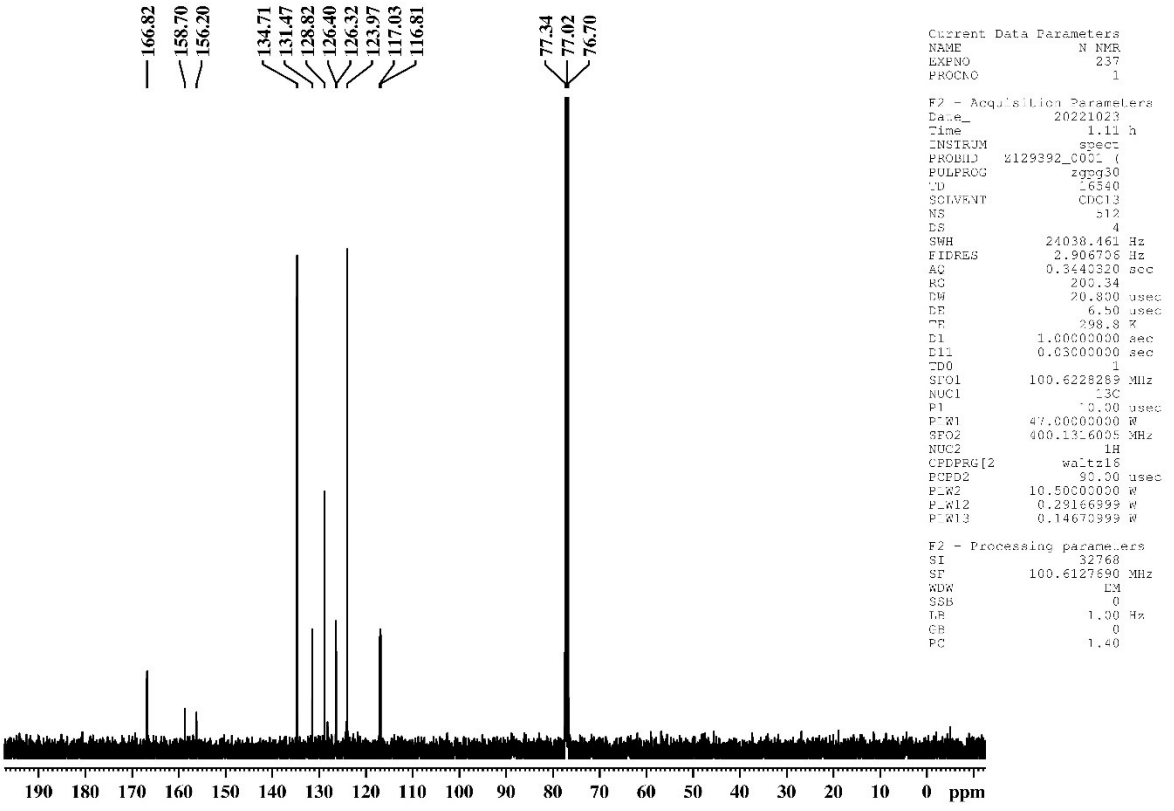


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Current Data Parameters
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EXPNO                   237
PROCNO                    1

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PULPROG             zgpg30
TD                    65540
SOLVENT               CDCl3
NS                      512
DS                        4
SWH               24038.461 Hz
FIDRES             2.906708 Hz
AQ                 0.3440320 sec
RG                    200.34
DW                   20.800 usec
DE                     6.50 usec
TE                   298.8 K
D1                 1.00000000 sec
D11                0.03000000 sec
TD0                       1
SFO1          100.6228289 MHz
NUC1                     13C
P1                   10.00 usec
PLW1          47.00000000 W
SFO2          400.1316005 MHz
NUC2                     1H
CPDPRG[2              waltz16
PCPD2                80.00 usec
PLW2          10.50000000 W
PLW12          0.29166999 W
PLW13          0.14670999 W

F2 - Processing parameters
SI                    32768
SF            100.6127690 MHz
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SSB                       0
LB                     1.00 Hz
GB                        0
PC                     1.40
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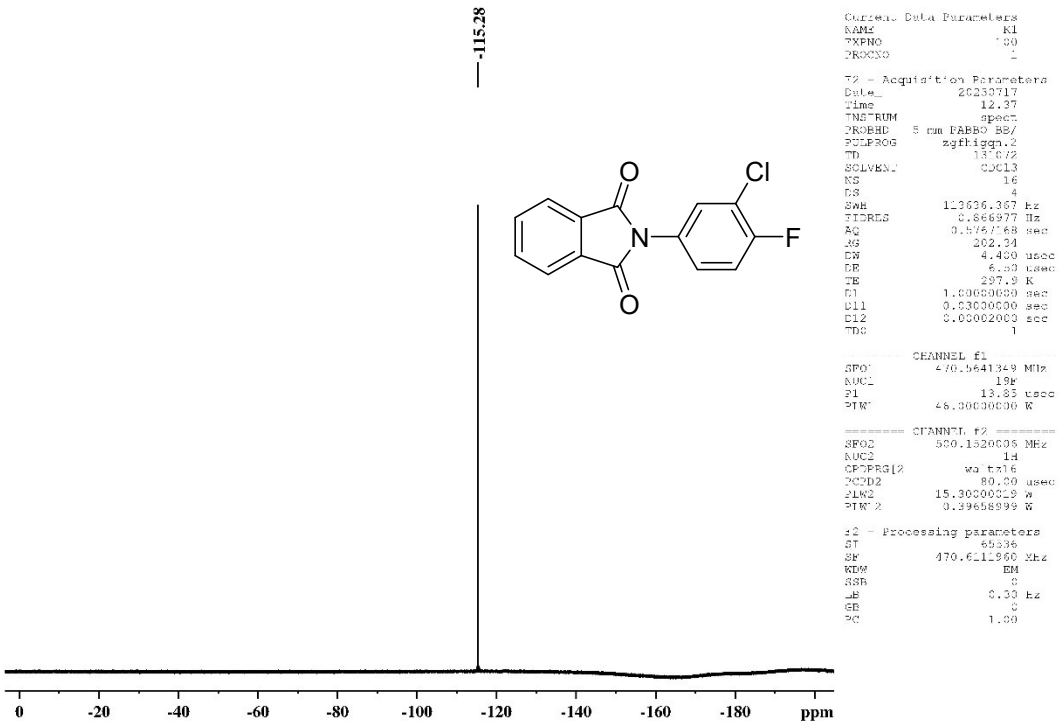
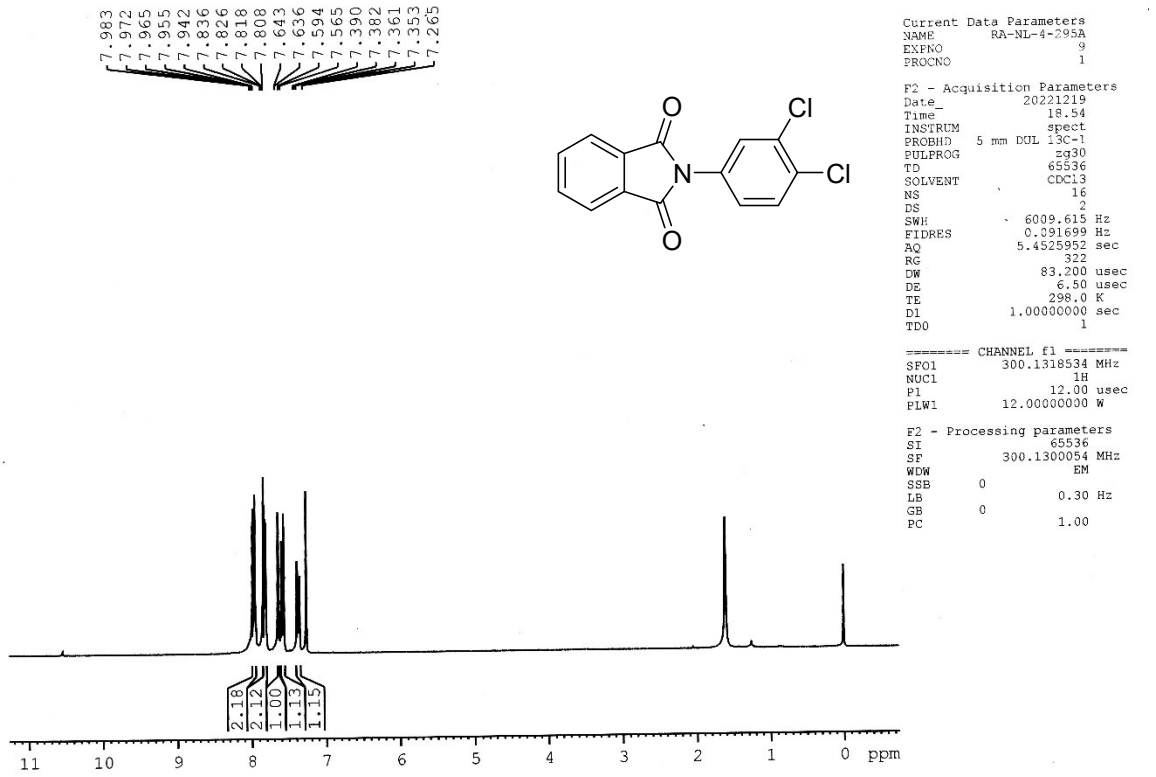
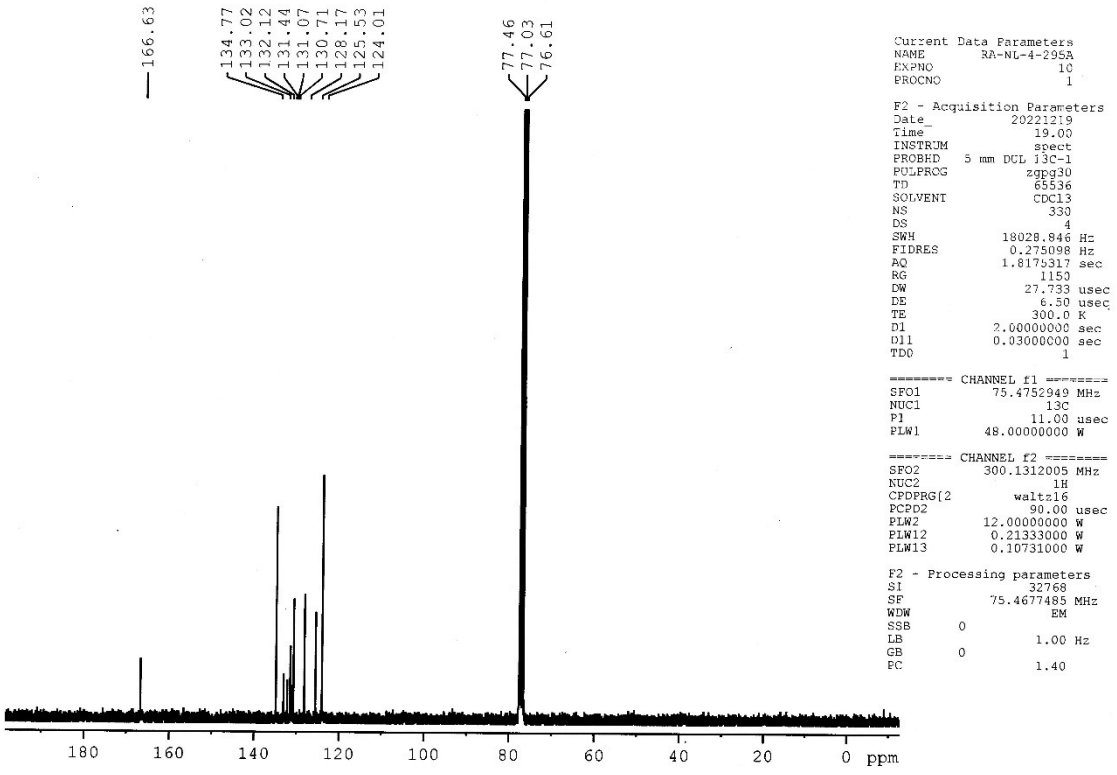
H[1] & C[13] NMR spectra of compound **3s**

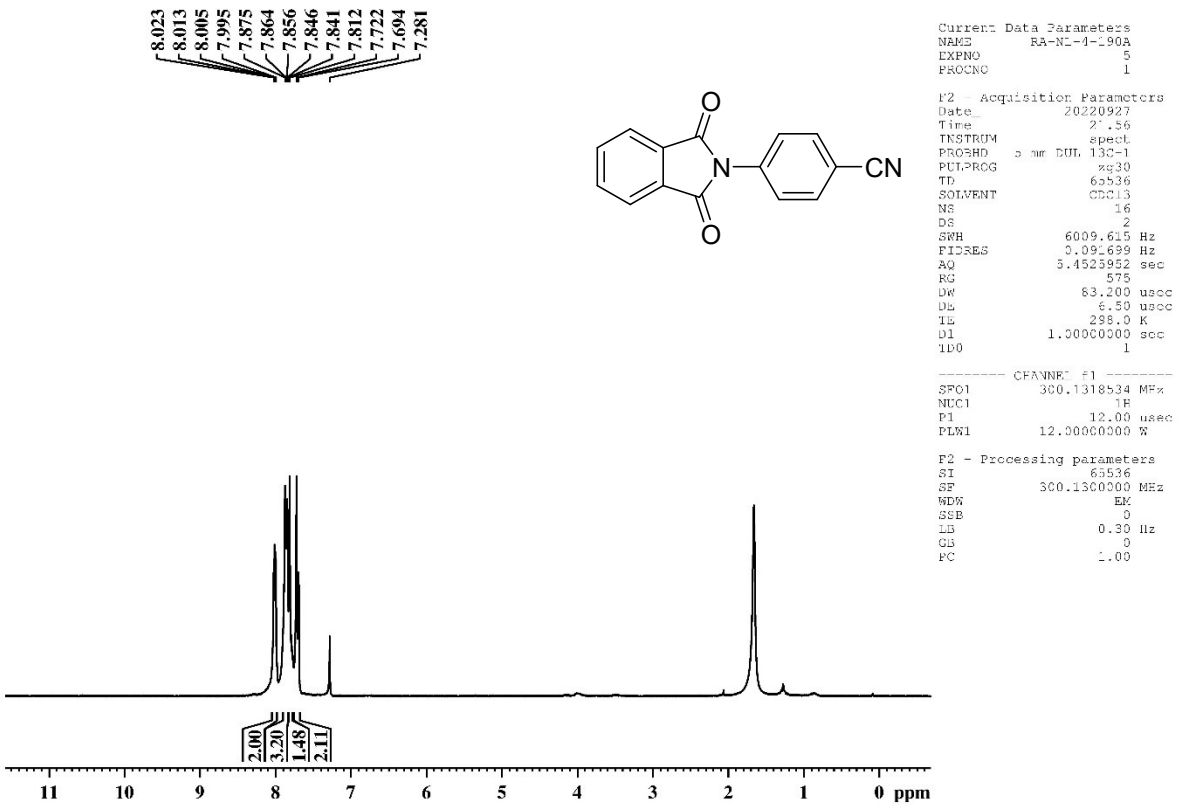


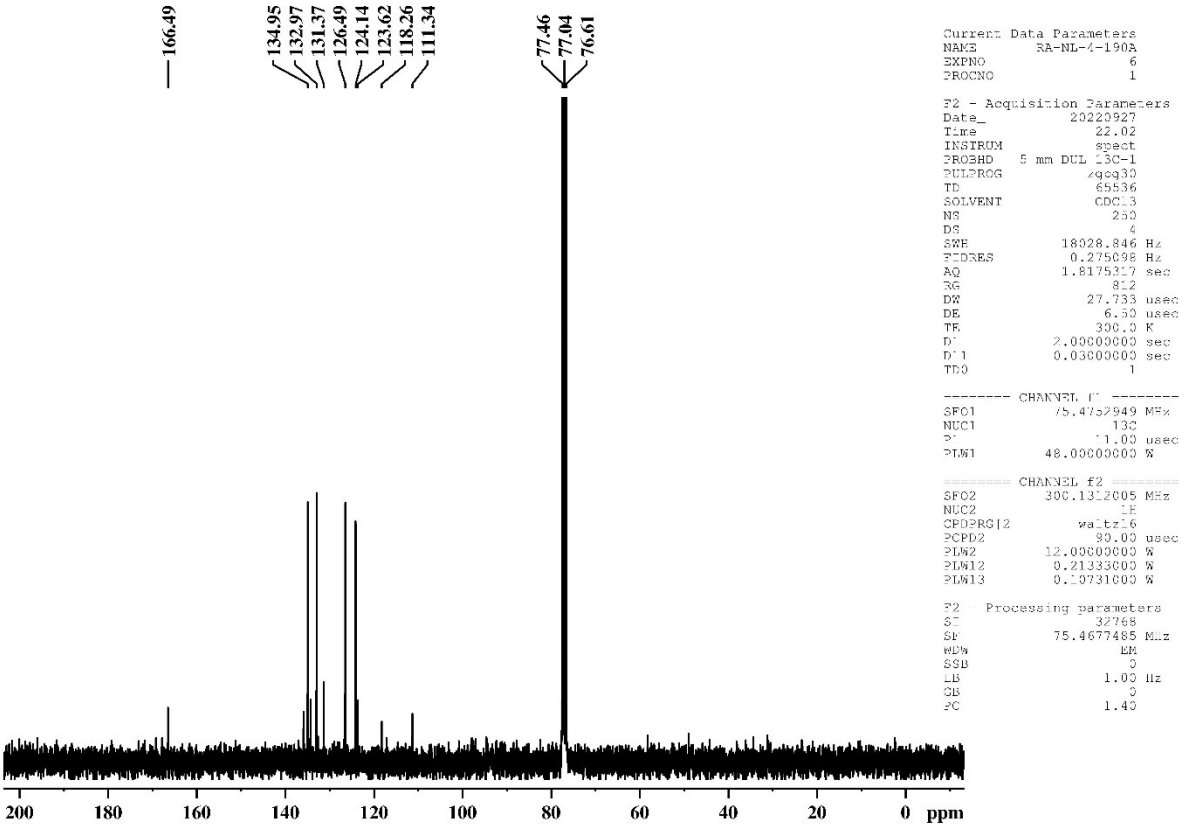
^{19}F NMR spectra of compound **3s**



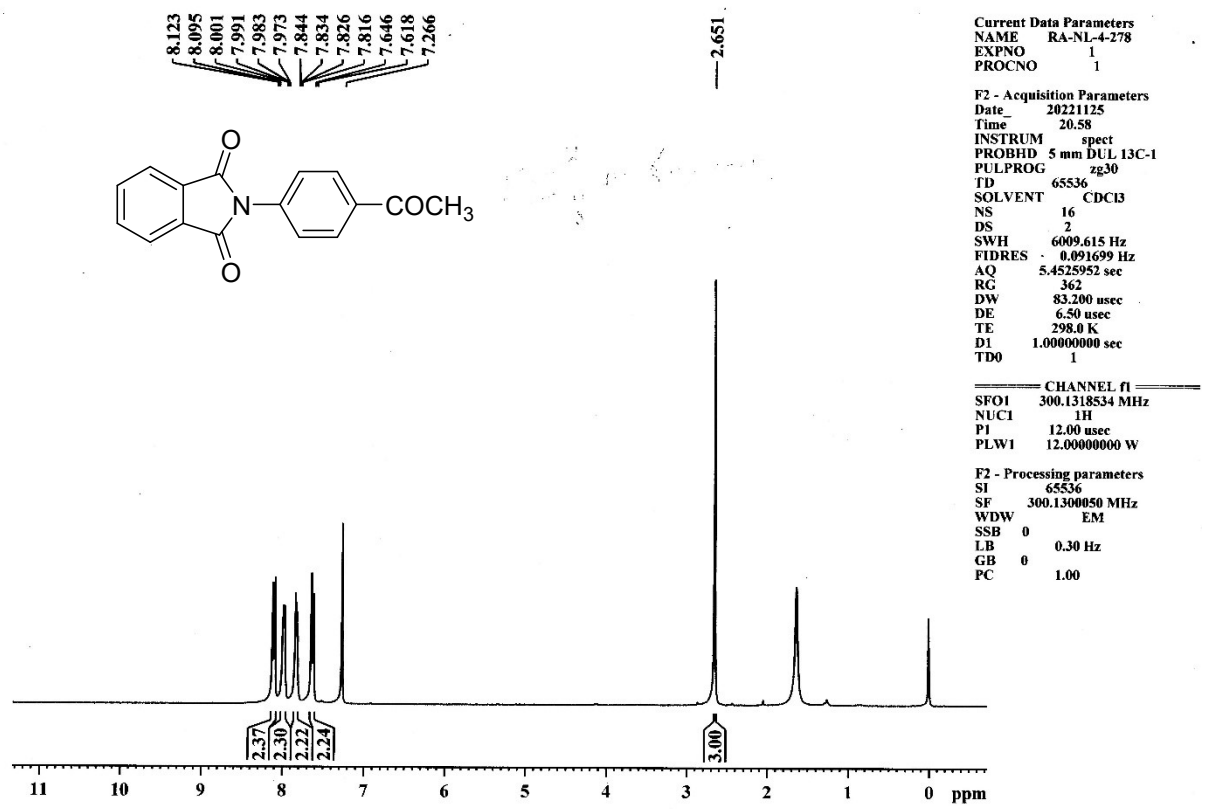


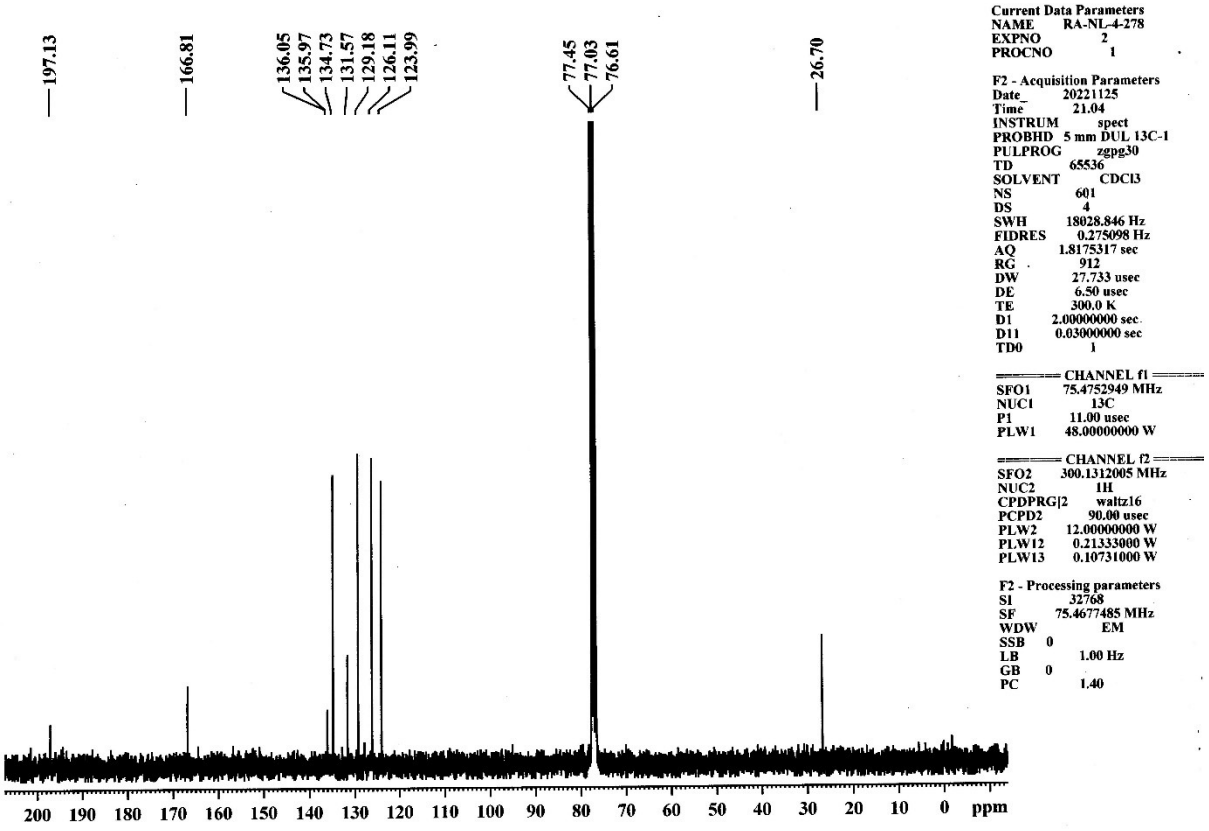
H^1 & C^{13} NMR spectra of compound **3t**



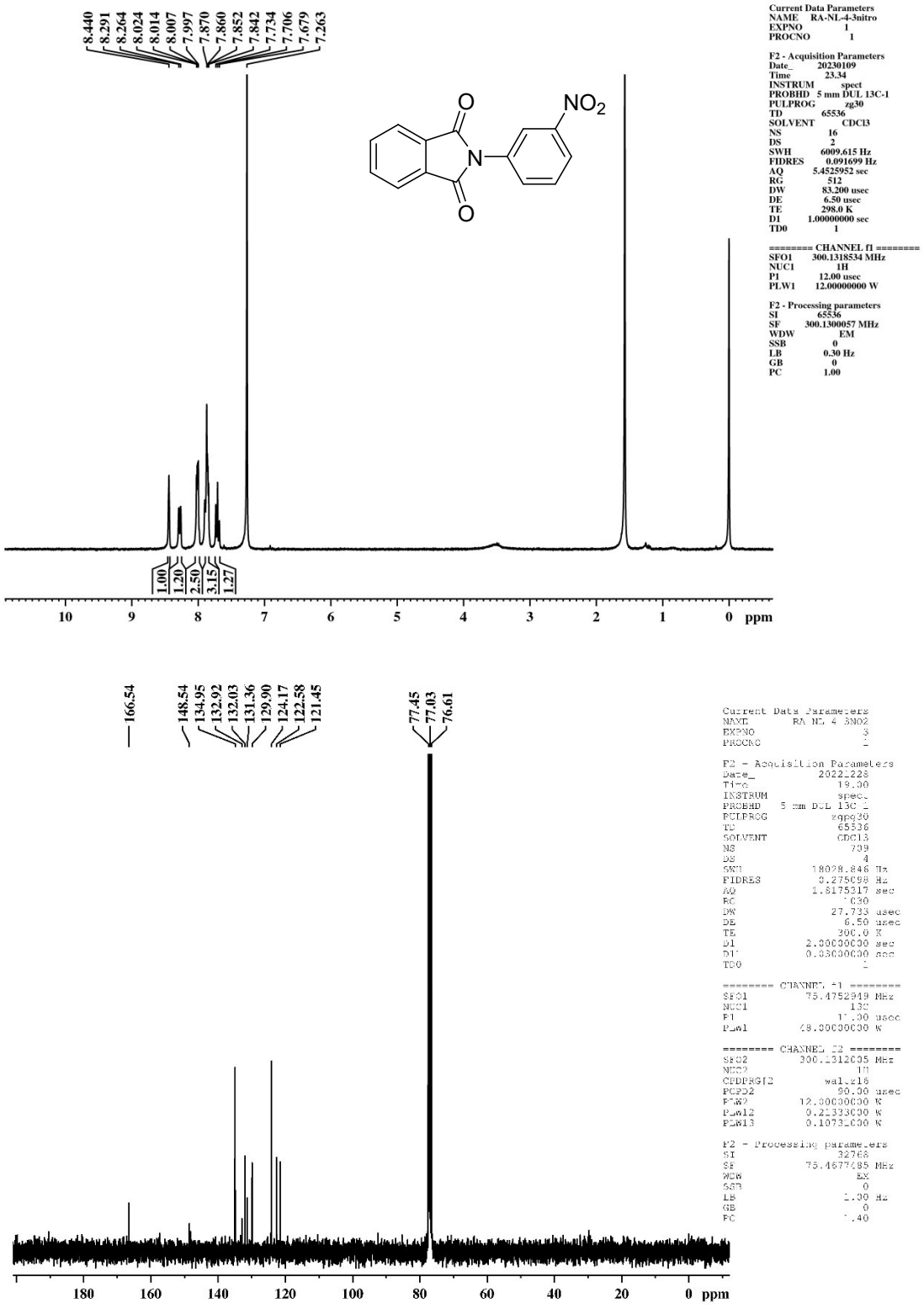


H^1 & C^{13} NMR spectra of compound **3u**

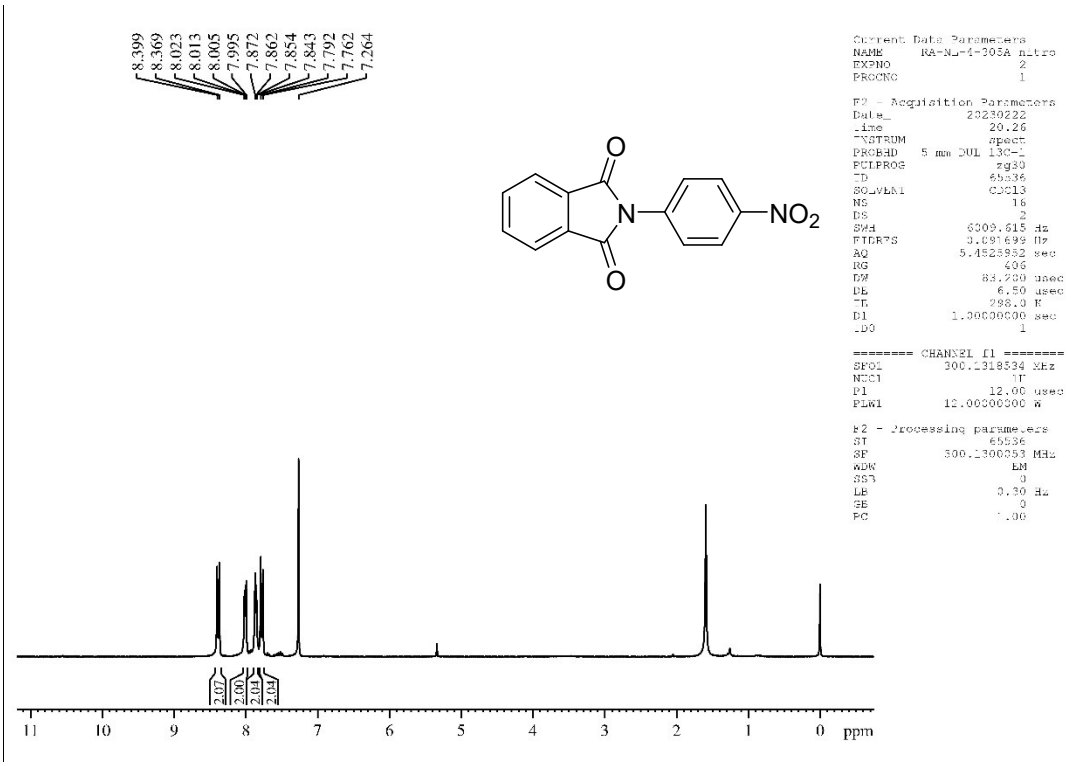


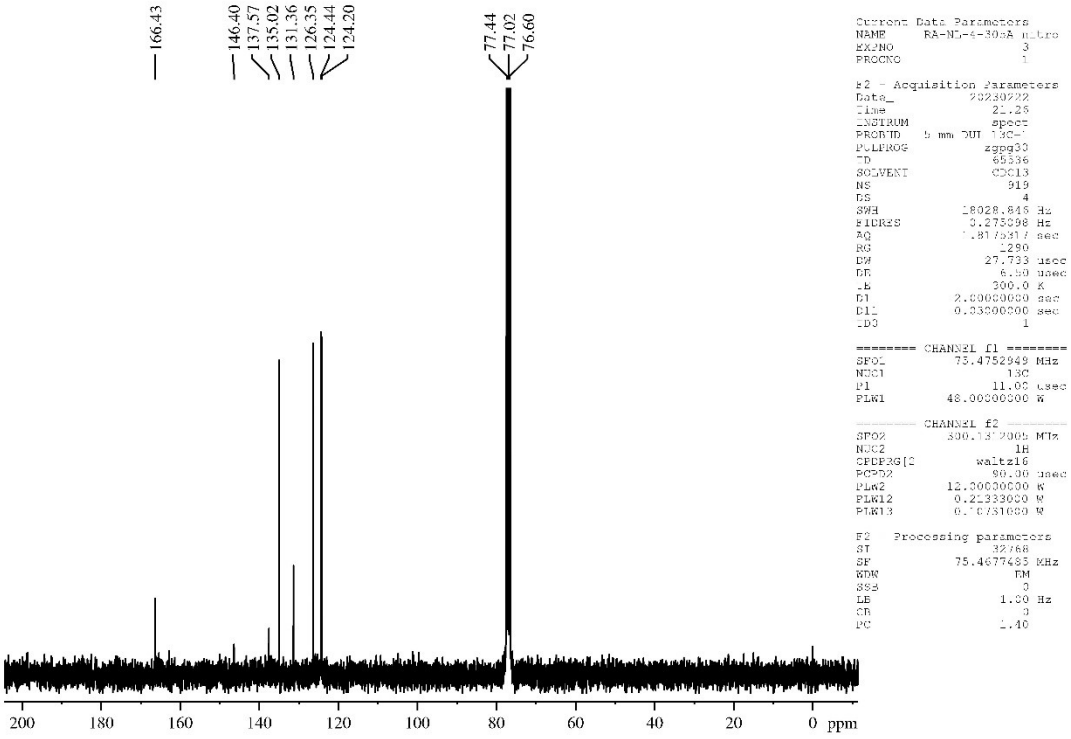


H^1 & C^{13} NMR spectra of compound **3v**

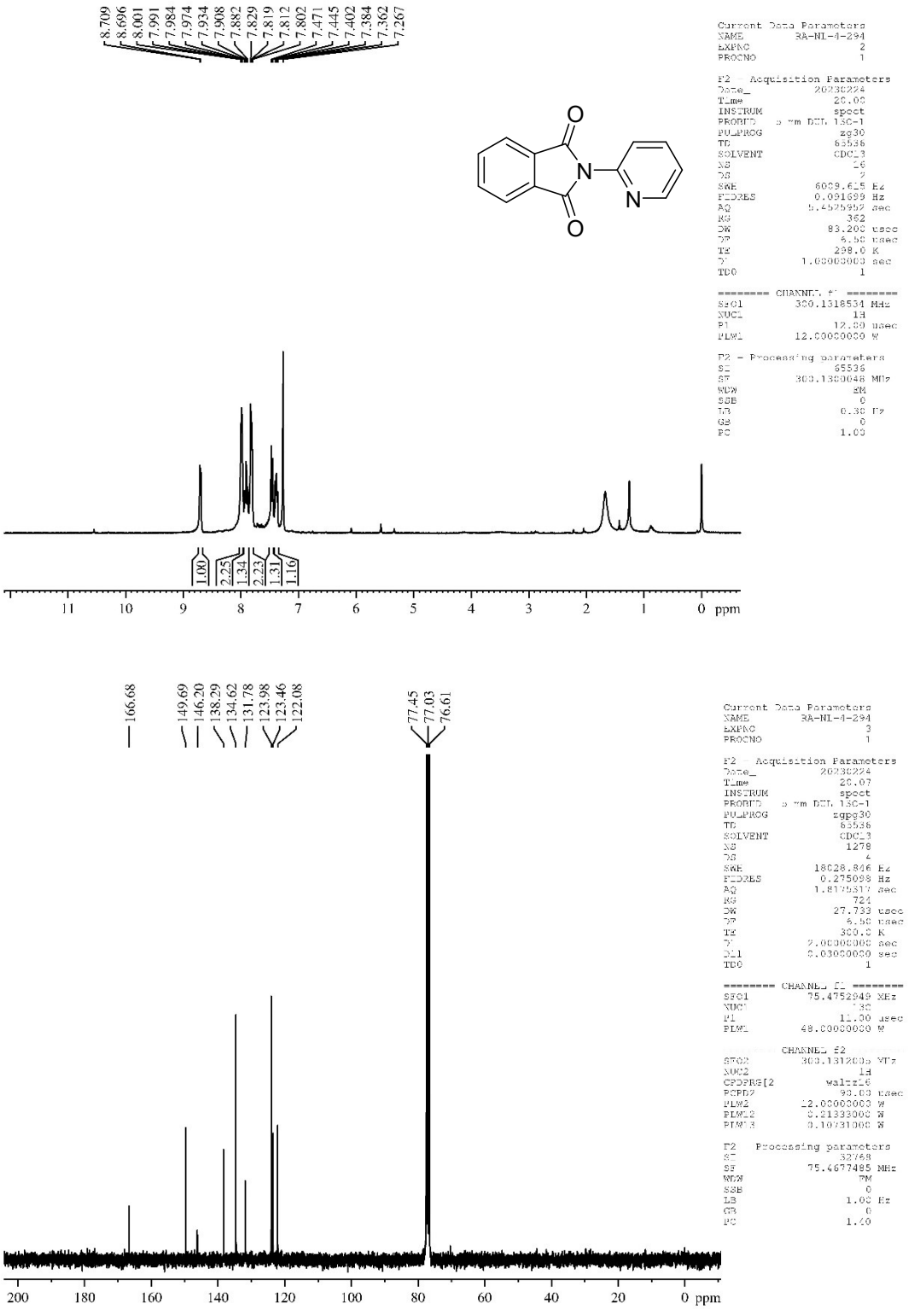


H[1] & C[13] NMR spectra of compound **3w**

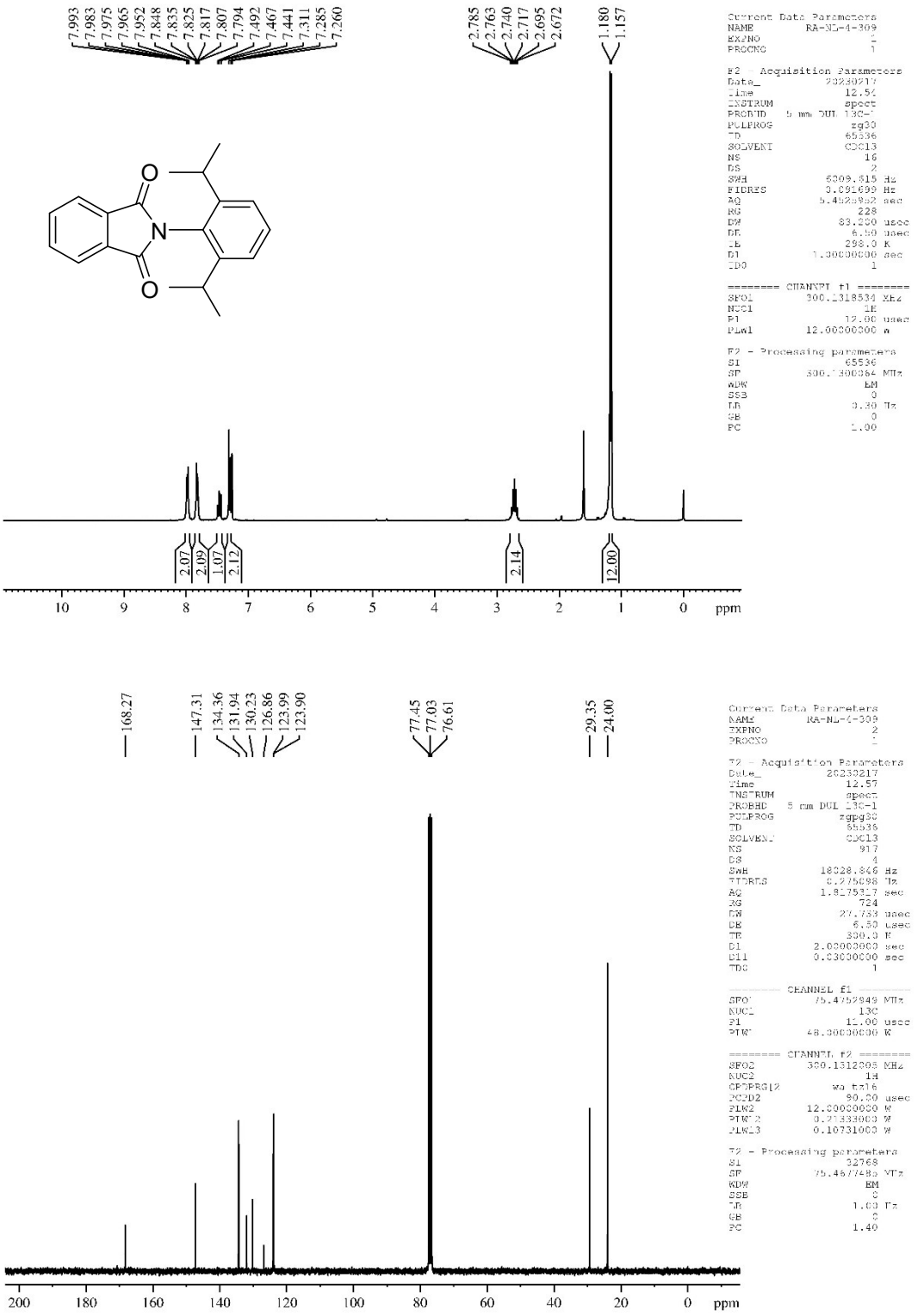




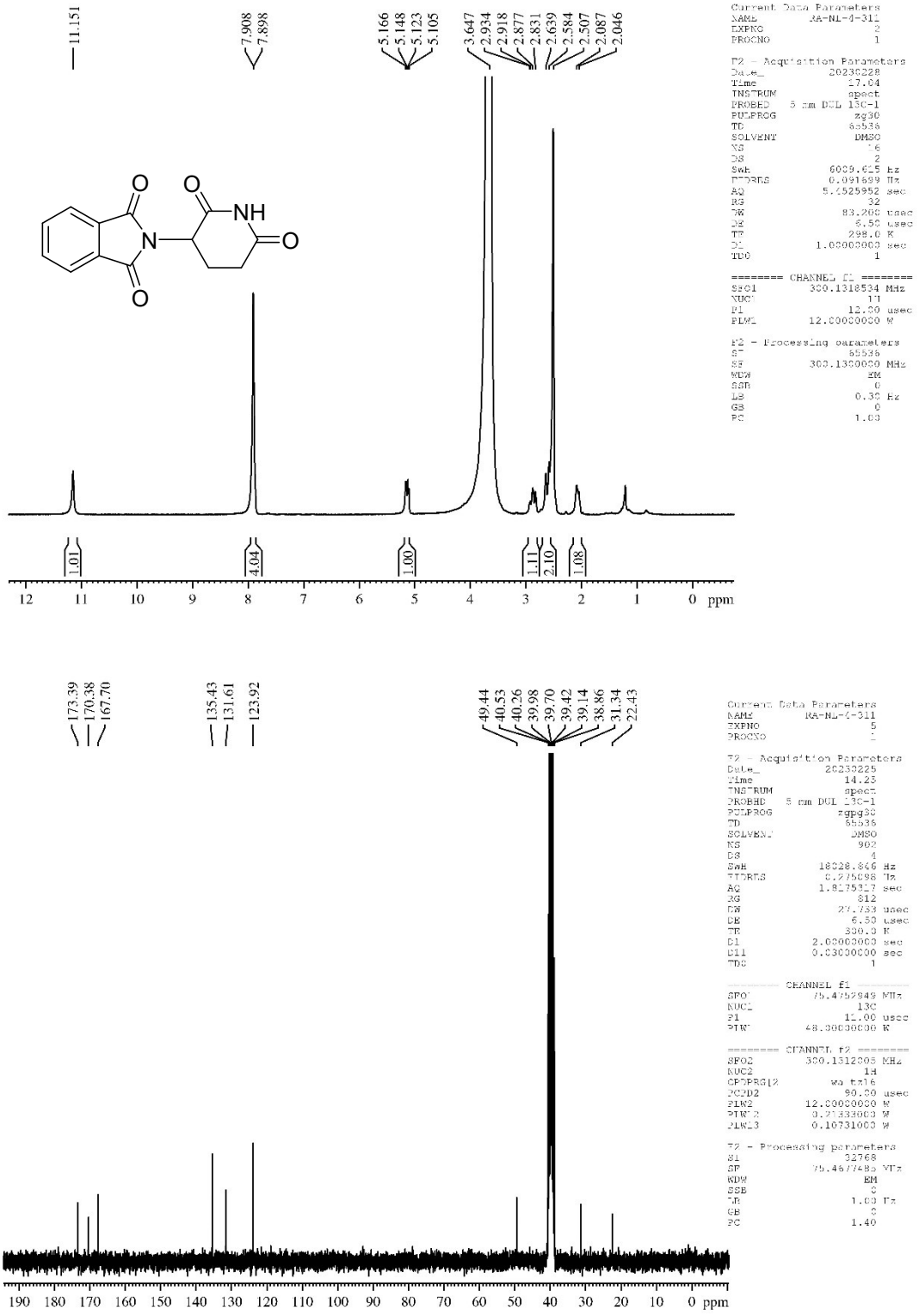
H[1] & C[13] NMR spectra of compound **3x**



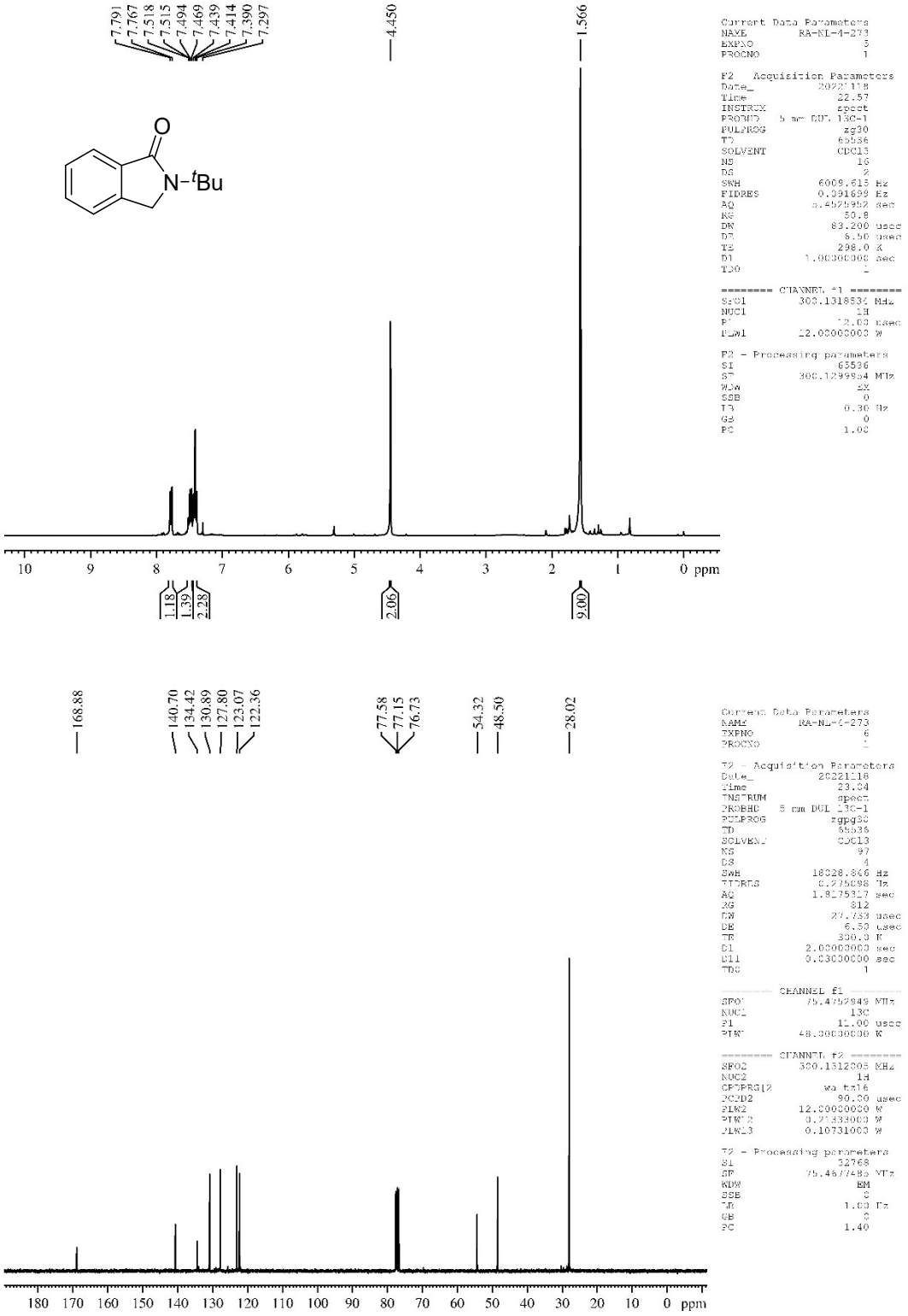
H[1] & C[13] NMR spectra of compound **3y**



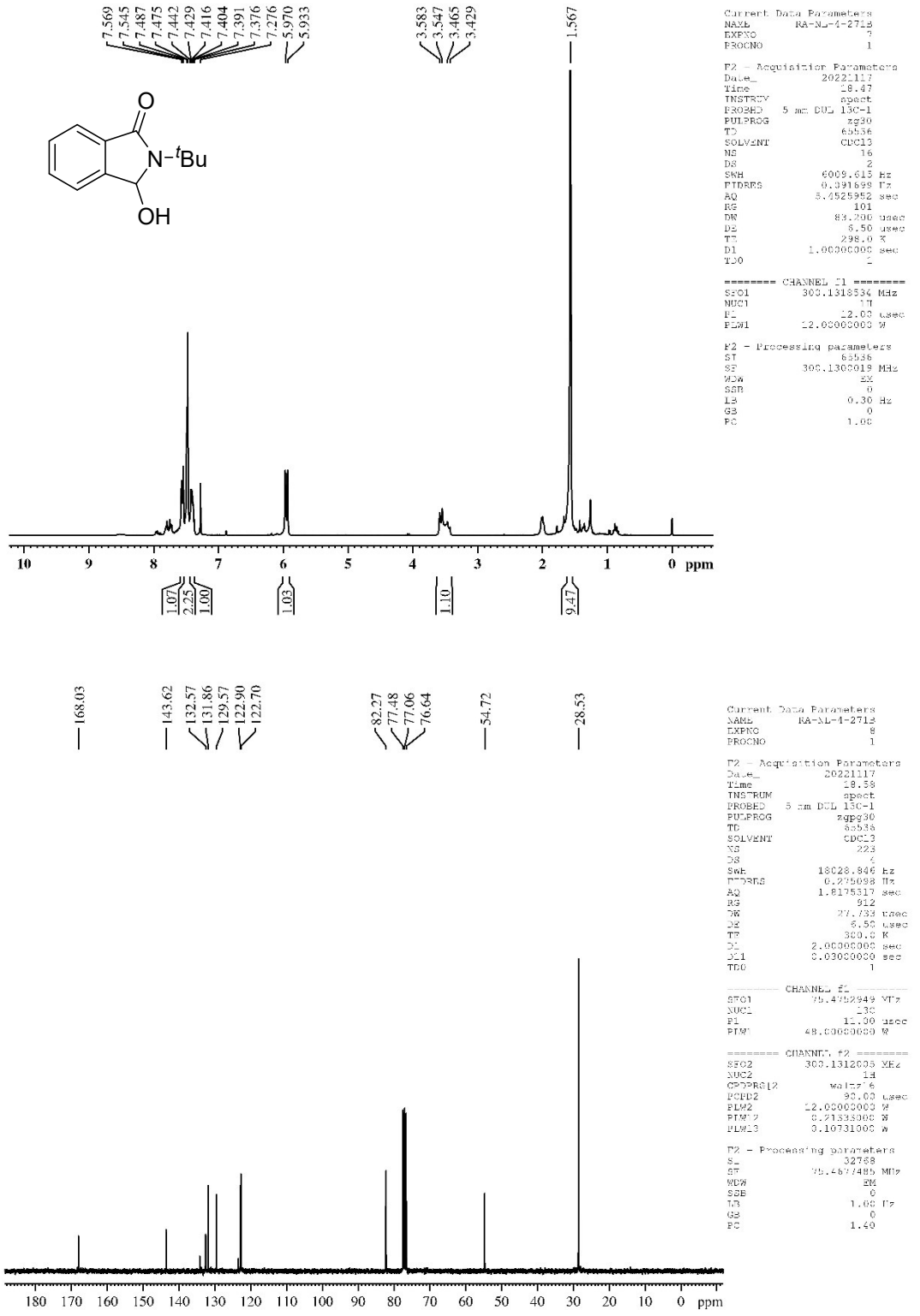
H^1 & C^{13} NMR spectra of compound **3z**



H[1] & C[13] NMR spectra of compound **3aa**



H[1] & C[13] NMR spectra of compound **4**



H^1 & C^{13} NMR spectra of compound **5**