Electronic Supplementary Material (ESI) for Organic & Biomolecular Chemistry.
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Supporting Information 1

Pseudo five component reaction towards densely functionalized spiro[indole-3,2'-pyrrole] by picric acid, an efficient *syn*-diastereoselective catalyst: An insight to the diastereoselection on $C(sp^3)$-$C(sp^3)$ axial conformation

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Experimental Section

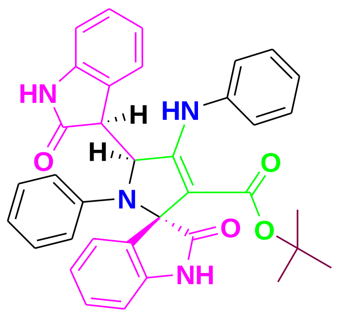
General information of materials and instruments:

All commercially available chemicals were purchased from Aldrich, USA or Spectrochem, India, and used without further purification. All solvents were used as received. All the reactions were performed in a round-bottomed flask with magnetic stir bar at 80 °C without taking precautions to exclude air and moisture. The progress of the reaction was checked by aluminum-backed plates pre-coated TLC with silica gel 60 (with F_{254} indicator, Merck) and visualized by UV irradiation. All compounds were purified by column chromatography using silica gel (100-200 mesh) andRediSep® normal-phase silica Flash columns in teledyne ISCO Combi Flash system.^{1}H / ^{13}C NMR spectra were recorded in a 400 MHz Bruker instrument using $CDCl_3$ and DMSO-d_6 solvent with TMS as reference. ^{1}H NMR spectra were recorded on 400 MHz spectrometers with ^{13}C operating frequencies of 100 MHz. Chemical shifts (δ) are reported in ppm relative to the residual solvent $CDCl_3$ signal (δ = 7.24 for 1H NMR and δ = 77.0 for ^{13}C NMR), DMSO-$d_6$signal (δ = 2.47 for ^{1}H NMR and δ = 39.4-40.6 for ^{13}C NMR). Data for ^{1}H NMR spectra are reported as follows: chemical shift (multiplicity, coupling constants and number of hydrogens). Abbreviations are as follows: s (singlet), d (doublet), t (triplet), q (quartet), m (multiplet), bs (broad singlet). HRMS with an ESI resource were acquired using a Waters XEVO-G2S Q TOF mass spectrometer.LCMSwere acquired from the Applied Biosystem equipped with API 2000 Triple Quadrupole Mass spectrometer. HPLCwere recorded using Agilent 1200 Series autosampler HPLC system. Melting points were recorded with an open capillary on an electrical melting point apparatus and the single crystal structures of the synthesized compounds were confirmed by an X-ray crystallography experiment on a Bruker SMART diffractometer. All DFT calculations were done with the Gaussian 09Wprogram package supported by Gauss View 4.1.

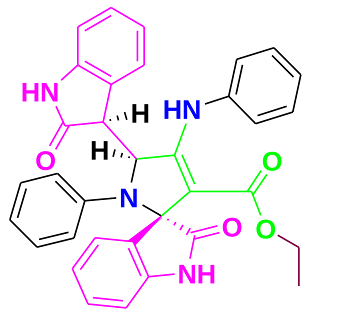
General procedure for synthesis of spiro[indoline-3,4'-pyridine] derivatives *syn*-60 and ***syn*-60′ (1a-1t):**

In a round bottom flask equipped with a condenser was taken a mixture of *β*-diketoester (1 mmol), amine (2 mmol) and isatin (2 mmol) in ethanol (15 mL) followed by addition of 10 mol% of Picric Acid (50% moist) (w/v). The reaction mixture was stirred at 80 °C for 16 h. The LCMS analysis of the reaction mixture showed the formation of desired products. After completion of the reaction, the mixture was cooled, concentrated and diluted with ethyl acetate and water. Then the organic portion was separated and aqueous portion was extracted with ethyl acetate for three times. The combined organic portion was washed with sat. $NaHCO_3$ solution, brine solution and dried over Na_2SO_4. The solvent was evaporated in a rotary evaporator to get crude residue which was purified by combi-flash column chromatography (silica gel) using 0-5% methanol in dichloromethane and 0-20% acetone in dichloromethane as eluent to afford the desired products. The obtained products were characterized by $^1H/^{13}C$ NMR, melting point measurements and HRMS and LCMS analysis.

Spectroscopic and Analytical characterization of compounds (1a-1t′):

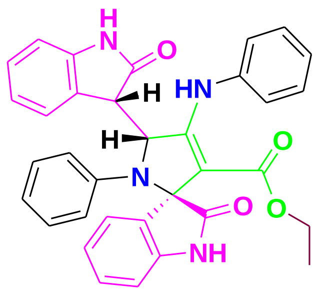


Tert-Butyl (3R,5'S)-2-oxo-5'-[(3S)-2-oxo-2,3-dihydro-1H-indol-3-yl]-1'-phenyl-4'-(phenylamino)-1,1',2,5'-tetrahydrospiro[indole-3,2'-pyrrole]-3'-carboxylate: (Table 2, 1a): Yield 88% (516 mg); yellow solid; mp 210-213 °C; R_f= 0.42 [5% methanol/dichloromethane]. NMR (400 MHz, DMSO-d$_6$) δ_H: 9.98 (s, 2H, CONH$_2$), 9.58 (s, 1H, NH), 7.4-7.39 (m, 4H, ArH), 7.29-7.23 (m, 2H, ArH), 7.14-7.03 (m, 3H, ArH), 6.93-6.91 (m, 2H, ArH), 6.81-6.78 (m, 1H, ArH), 6.69-6.53 (m, 5 H, ArH), 6.36 (s, 1H, CH), 5.95 (bs, 1H, ArH), 3.17 (s, 1H, CH), 1.03 (s, 9 H, C(CH$_3$)$_3$); ^{13}C NMR (400 MHz, DMSO-d$_6$) δ_C: 176.2, 175.1, 164.0, 155.2, 144.1, 144.0, 142.7, 139.0, 132.6, 129.4, 128.2, 127.9, 127.6, 125.2, 125.0, 124.3, 123.7, 123.1, 122.7, 121.9, 121.1, 120.7, 109.1, 109.0, 103.0, 79.5, 76.6, 63.5, 47.7, 27.3; LCMS (ESI) calcd for $C_{36}H_{32}N_4O_4$: 585.25 (M+H)$^+$; found: 585.40.

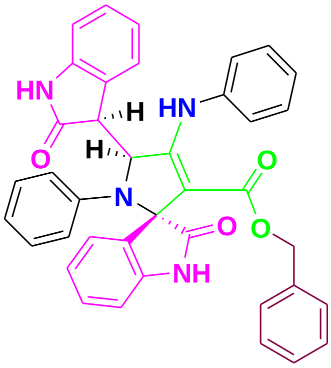


Ethyl (3R,5'S)-2-oxo-5'-[(3S)-2-oxo-2,3-dihydro-1H-indol-3-yl]-1'-phenyl-4'-(phenylamino)-1,1',2,5'-tetrahydrospiro[indole-3,2'-pyrrole]-3'-carboxylate: (Table 2, 1b): Yield 58% (320 mg); off white solid; mp 214-217 °C; R_f = 0.45[5%

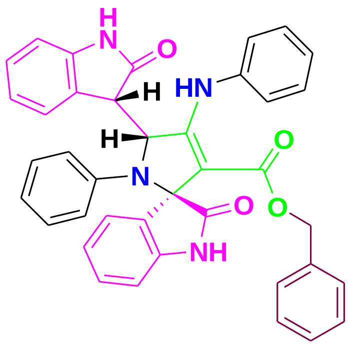
methanol/dichloromethane]; ^{1}H NMR (400 MHz, DMSO-d$_6$) δ_H: 10.0 (d, *J*=10.9Hz, 2H, CONH$_2$), 9.55 (s, 1H, NH), 7.42 (d, *J*=4.2 Hz, 4H, ArH), 7.31-7.24 (m, 2H, ArH), 7.18-7.16 (m, 1H, ArH), 7.07-7.02 (m, 2H, ArH), 6.96-6.92 (m, 2H, ArH), 6.82-6.7(m, 2H, ArH), 6.63-6.56 (m, 4H, ArH), 6.39 (s, 1H, CH), 5.91 (bs, 1H, ArH), 3.81-3.76 (m, 2H, CH$_2$), 3.18 (s, 1H, CH), 0.735 (t, *J*=7.08 Hz, 3H, CH$_3$); ^{13}C NMR (400 MHz, DMSO-d6) δ_C: 176.3, 175.1, 163.9, 155.7, 144.3, 144.1, 142.6, 139.0, 132.4, 129.5, 129.57, 128.4, 128.1, 127.6, 125.2, 125.1, 124.7, 123.8, 122.8, 122.7, 122.4, 121.2, 120.9, 109.1, 108.9, 101.6, 76.7, 63.6, 58.9, 47.8, 13.2; LCMS (ESI) calcd for $C_{34}H_{28}N_4O_4$: 557.22 $(M+H)^+$; found: 557.20.



Ethyl(3S,5'R)-2-oxo-5'-[(3S)-2-oxo-2,3-dihydro-1H-indol-3-yl]-1'-phenyl-4'-(phenylamino)-1,1',2,5'-tetrahydrospiro[indole-3,2'-pyrrole]-3'-carboxylate:(**Table 2, 1b′**): Yield 32% (180 mg); yellowish solid; mp 235-238 °C; R_f = 0.55[3 % methanol / dichloromethane]; ^{1}H NMR (400 MHz, DMSO-d$_6$) δ_H: 10.3 (bs, 1H, CONH$_2$), 10.03 (s, 1H, CONH$_2$), 9.38 (s, 1H, NH), 7.57 (d, *J*=7.2 Hz, 1H, ArH), 7.34-7.30 (m, 2H, ArH), 7.25-7.15 (m, 4H, ArH), 7.07-6.99 (m, 3H, ArH), 6.93 (m, 1H, ArH), 6.82-6.69 (m, 6H, ArH), 6.62-6.59 (m, 1H, ArH), 6.41 (d, *J*=7.6Hz, 1H, ArH), 6.31(s, 1H, CH), 3.87-3.74 (m, 2H, CH$_2$), 3.53 (s, 1H, CH), 0.73 (t, *J*=7.1 Hz, 3H, CH$_3$); ^{13}C NMR (400 MHz, DMSO-d$_6$) δ_C: 176.5, 174.7, 164.1, 156.1, 144.1, 142.7, 142.6, 138.1, 132.3, 129.1, 128.7, 127.8, 127.4, 126.1, 124.8, 124.2, 123.5, 122.5, 121.7, 120.5, 109.3, 108.8, 99.9, 99.8, 75.5, 63.3, 58.8, 48.4, 13;LCMS (ESI) calcd for $C_{34}H_{28}N_4O_4$: 557.22 $(M+H)^+$; found: 557.40.

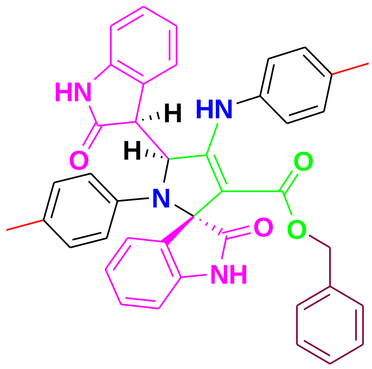


Benzyl (3R,5'S)-2-oxo-5'-[(3S)-2-oxo-2,3-dihydro-1H-indol-3-yl]-1'-phenyl-4'-(phenylamino)-1,1',2,5'-tetrahydrospiro[indole-3,2'-pyrrole]-3'-carboxylate: (Table 2, 1c): Yield 67% (414 mg); yellowish solid; mp 222-226 °C; R_f = 0.45 [5 % methanol / dichloromethane]; ^{1}H NMR (400 MHz, DMSO-d$_6$) δ_H: 9.97 (d, *J*=3.3 Hz, 2H, CONH$_2$), 9.70 (s, 1H, NH), 7.46-7.41 (m, 4H, ArH), 7.30-7.25 (m, 2H, ArH), 7.21-7.14 (m, 4H, ArH), 7.07-7.01 (m, 2H, ArH), 6.95-6.91 (m, 2H, ArH), 6.83-6.80 (m, 1H, ArH), 6.75-6.58 (m, 6H, ArH), 6.46 (d, *J*= 7.6 Hz, 1H, ArH), 6.38 (d, *J*=1.7Hz, 1H, CH,), 5.90 (d, *J*=5.6Hz, 1H, ArH), 4.98 (d, *J*=13.3 Hz, 1H, CH$_2$), 4.80 (d, *J*=13.2Hz, 1H, CH$_2$), 3.11 (s, 1H, CH); ^{13}C NMR (400 MHz, DMSO-d$_6$) δ_C: 176.2, 175.0, 163.9, 157.1, 144.2, 144.1, 142.5, 138.8, 135.9, 132.3, 129.6, 128.5, 128.1, 127.9, 127.6, 127.2, 126.6, 126.5, 125.2, 125.1, 125.0, 124.0, 123.7, 123.2, 122.6, 121.3, 120.8, 109.3, 109.1, 100.6, 76.6, 64.4, 63.7, 47.7;LCMS (ESI) calcd for $C_{39}H_{30}N_4O_4$: 619.23 $(M+H)^+$; found: 619.20.

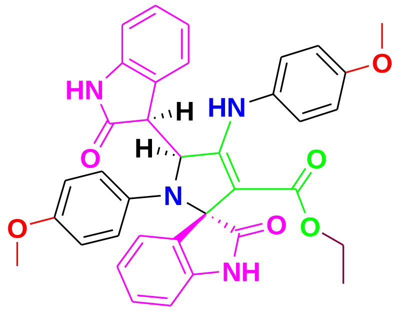


Benzyl (3S,5'R)-2-oxo-5'-[(3S)-2-oxo-2,3-dihydro-1H-indol-3-yl]-1'-phenyl-4'-(phenylamino)-1,1',2,5'-tetrahydrospiro[indole-3,2'-pyrrole]-3'-carboxylate: (Table 2,

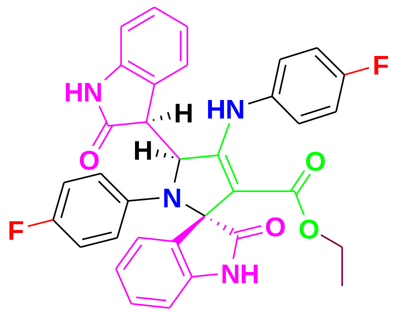
1c′): Yield 21% (141 mg); yellow solid; mp 240-243 °C ; R_f = 0.58 [3 % methanol / dichloromethane]; ^{1}H NMR (400 MHz, DMSO-d$_6$) δ_H: 10.19 (bs, 1H, CONH$_2$), 10.06 (s, 1H, CONH$_2$), 9.54 (s, 1H, NH), 7.60 (d, *J*=7.2Hz, 1H, ArH), 7.37-7.33 (m, 2H, ArH), 7.24-7.16 (m, 8H, ArH), 7.03 (t, *J*=7.5 Hz, 1H, ArH), 6.89-6.76 (m, 5H, ArH), 6.66-6.58 (m, 5H, ArH), 6.38-6.39 (m, 1H, ArH& CH), 5.02 (d, *J*=13.1Hz, 1H, CH$_2$), 4.80 (d, *J*= 13.1 Hz, 1H,CH$_2$), 3.45 (s, 1H, CH); ^{13}C NMR (400 MHz, DMSO-d$_6$) δ_C: 176.5, 174.7, 164.1, 157.2, 144.0, 142.6, 138.1, 136.0, 132.4, 129.2, 128.8, 128.0, 127.7, 127.4, 127.3, 126.7, 126.1, 125.0, 124.6, 123.6, 122.7, 121.8, 120.5, 109.6, 108.7, 99.0, 75.5, 64.4, 63.3, 48.4;LCMS (ESI) calcd for $C_{39}H_{30}N_4O_4$: 619.23 $(M+H)^+$; found: 619.50.



Benzyl (3R,5'S)-1'-(4-methylphenyl)-4'-[(4-methylphenyl)amino]-2-oxo-5'-[(3S)-2-oxo-2,3-dihydro-1H-indol-3-yl]-1,1',2,5'-tetrahydrospiro[indole-3,2'-pyrrole]-3'-carboxylate: (**Table 2, 1d**): Yield 78% (502 mg); yellowish solid; mp 230-235 °C; R_f = 0.44 [5 % methanol / dichloromethane]; ^{1}H NMR (400 MHz, DMSO-d$_6$) δ_H: 9.95 (s, 1H, CONH$_2$), 9.85 (s, 1H, CONH$_2$), 9.66 (s, 1H, NH), 7.36-7.23 (m, 5H, ArH), 7.19-7.15 (m, 3H, ArH), 6.72-6.6 (m, 5H, ArH), 6.47-6.41 (m, 3H, ArH), 6.27 (bs, 1H, CH), 5.87 (bs, 1H, ArH), 4.99 (d, *J*=12.8 Hz, 1H, CH$_2$), 4.78 (d, *J*=13.2 Hz, 1H, CH$_2$), 3.06 (s, 1 H, CH), 2.30 (s, 3H, CH$_3$), 2.10 (s, 3H, CH$_3$); ^{13}C NMR (400 MHz, DMSO-d$_6$) δ_C: 176.4, 174.9, 164.0, 157.8, 144.1, 142.5, 141.2, 136.0, 135.9, 134.4, 132.4, 130.0, 128.2, 128.0, 127.9, 127.8, 127.1, 126.6, 126.5, 126.4, 125.2, 124.9, 124.7, 123.9, 122.8, 121.1, 120.7, 109.1, 109.0, 76.5, 64.2, 63.9, 47.6, 20.3, 20.2;LCMS (ESI) calcd for $C_{41}H_{34}N_4O_4$: 647.27 $(M+H)^+$; found: 647.40.



Ethyl (3R,5'S)-1'-(4-methoxyphenyl)-4'-[(4-methoxyphenyl)amino]-2-oxo-5'-[(3S)-2-oxo-2,3-dihydro-1H-indol-3-yl]-1,1',2,5'-tetrahydrospiro[indole-3,2'-pyrrole]-3'-carboxylate: (**Table 2, 1e**): Yield 75% (464 mg); off white solid; mp 219-221 °C; R_f = 0.42 [5 % methanol / dichloromethane]; ^{1}H NMR (400 MHz, DMSO-d$_6$) δ_H: 9.92 (s, 1H, CONH$_2$), 9.81 (s, 1H, CONH$_2$), 9.43 (s, 1H, NH), 7.39-7.37 (m, 2H, ArH), 7.31-7.26 (m, 2H, ArH), 7.10-7.06 (m, 1H, ArH), 7.01-6.97 (m, 2H, ArH), 6.71-6.69 (m, 1H, ArH), 6.59-6.55 (m, 1H, ArH), 6.52-6.46 (m, 5H, ArH), 6.09 (s, 1H, CH), 5.87 (bs, 1H, ArH), 3.80-3.73 (m, 5H, CH$_3$& OCH$_2$), 3.59 (s, 3 H, CH$_3$), 2.99 (s, 1H, CH), 0.71 (t, J=7.1 Hz, 3H, CH$_3$); ^{13}C NMR (400 MHz, DMSO-d$_6$) δ_C: 177.02, 175.1, 164.2, 157.6, 156.8, 155.8, 144.2, 142.6, 136.5, 132.6, 131.5, 128.2, 127.9, 125.4, 125.0, 124.9, 123.7, 121.0, 120.8, 114.7, 112.6, 125.2, 124.9, 124.7, 123.9, 122.8, 109.0, 108.6, 99.7, 76.8, 64.8, 58.6, 55.2, 54.7, 47.5, 13.2;LCMS (ESI) calcd for $C_{36}H_{32}N_4O_6$: 617.24 $(M+H)^+$; found: 617.10.



Ethyl (3R,5'S)-1'-(4-fluorophenyl)-4'-[(4-fluorophenyl)amino]-2-oxo-5'-[(3S)-2-oxo-2,3-dihydro-1H-indol-3-yl]-1,1',2,5'-tetrahydrospiro[indole-3,2'-pyrrole]-3'-

carboxylate:(**Table 2, 1f**): Yield 65% (385 mg); off white solid; mp220-225 °C; R_f = 0.48 [5 % methanol / dichloromethane]; ^{1}H NMR (400 MHz, DMSO-d$_6$) δ_H: 9.97 (d, *J*= 21.3 Hz, 2H, CONH$_2$), 9.49 (s, 1H, NH), 7.49-7.28 (m, 6H, ArH), 7.09-7.01 (m, 2H, ArH), 6.78-6.70 (m, 3H, ArH), 6.61-6.51 (m, 4H, ArH), 6.2 (s, 1H, CH), 5.8 (bs, 1H, ArH), 3.76 (q, *J*=6.6 Hz, 2H, CH$_2$), 3.06 (s, 1H, CH), 0.72 (t, *J*=6.5 Hz, 3H, CH$_3$); ^{13}C NMR (400 MHz, DMSO-d$_6$) δ_C: 176.4, 175.0, 163.8, 160.5, 159.8, 158.1, 157.4, 156.1, 144.1, 142.6, 140.23, 140.21, 135.43, 135.41, 132.2, 128.5, 128.1, 125.2, 124.8, 123.7, 121.2, 120.9, 114.2, 114.0, 109.1, 108.9, 101.0, 76.9, 64.5, 58.8, 47.7, 14.0, 13.2;LCMS (ESI) calcd $C_{34}H_{26}F_2N_4O_4$: 593.20 $(M+H)^+$; found: 593.20.

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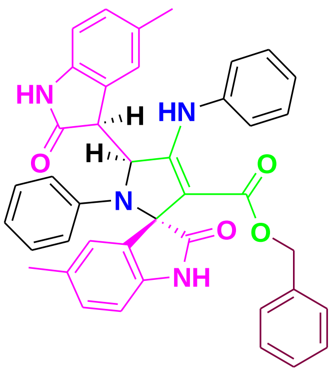

Benzyl (3R,5'S)-5-methyl-5'-[(3S)-5-methyl-2-oxo-2,3-dihydro-1H-indol-3-yl]-2-oxo-1'-phenyl-4'-(phenylamino)-1,1',2,5'-tetrahydrospiro[indole-3,2'-pyrrole]-3'-carboxylate:(Table 2, 1g): Yield 74% (478 mg); off white solid; mp 210-215 °C; R_f = 0.44 [3 % methanol / dichloromethane]; ^{1}H NMR (400 MHz, DMSO-d$_6$) δ_H: 9.92 (d, *J*=15.3 Hz, 2H, CONH$_2$), 9.68 (s, 1H, NH), 7.44-7.43 (m, 4H, ArH), 7.2-7.16 (m, 4H, ArH), 7.08-7.09 (m, 2H, ArH), 6.92-6.85 (m, 3H, ArH), 6.77-6.71(m, 3H, ArH), 6.62-6.58 (m, 3H, CH), 6.42-6.37(m, ArH&CH), 5.55 (bs, 1H, ArH), 5.09 (d, *J*=13.2 Hz, 1H, CH$_2$), 4.72 (d, *J*=13.2 Hz, 1H, CH$_2$), 3.08 (s, 1H, CH), 2.21 (s, 3H, CH$_3$), 2.07 (s, 3H, CH$_3$); ^{13}C NMR (400 MHz, DMSO-d$_6$) δ_C: 176.1, 175.1, 163.7, 156.5, 144.4, 141.8, 140.0, 138.9, 136.2, 132.6, 130.0, 129.5, 128.6, 128.5, 127.9, 127.8, 127.5, 127.1, 126.4, 126.1, 125.2, 124.8, 124.5, 122.68, 122.62, 122.5, 108.7, 101.1, 76.7, 64.1, 63.4, 47.8, 20.6, 20.2;LCMS (ESI) calcd for $C_{41}H_{34}N_4O_4$: 647.27 $(M+H)^+$; found: 647.20.

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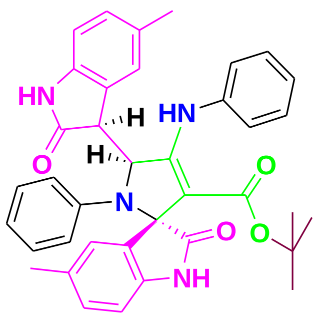
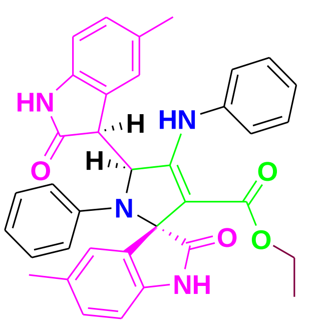
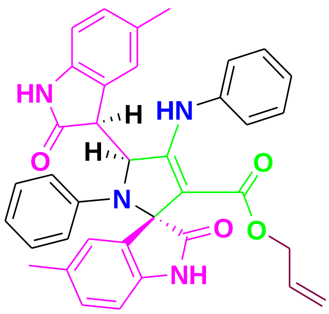


Tert-Butyl (3R,5'S)-5-methyl-5'-[(3S)-5-methyl-2-oxo-2,3-dihydro-1H-indol-3-yl]-2-oxo-1'-phenyl-4'-(phenylamino)-1,1',2,5'-tetrahydrospiro[indole-3,2'-pyrrole]-3'-carboxylate: (Table 2, 1h): Yield 91% (558 mg); yellow solid; mp: 210-215 °C; R_f = 0.48 [3 % methanol / dichloromethane]; ^{1}H NMR (400 MHz, DMSO-d$_6$) δ_H: 9.93 (s, 2H, $CONH_2$), 9.62 (s, 1H, NH), 7.41 (m, 4H, ArH), 7.17-7.07 (m, 3H, ArH), 6.92-6.87 (m, 3H, ArH), 6.77-6.75 (m, 1H, ArH), 6.61-6.60 (m, 3H, ArH), 6.46-6.44 (m, 1H, ArH), 6.36 (s, 1H, CH), 5.57 (bs, 1H, ArH), 3.14 (s, 1H, CH), 2.31(s, 3H, CH_3), 2.08 (s, 3H, CH_3), 1.03 (s, 9H, $C(CH_3)_3$); ^{13}C NMR (400 MHz, DMSO-d$_6$) δ_C: 176.0, 175.2, 164.1, 154.9, 144.6, 141.9, 140.2, 139.1, 132.9, 129.8, 129.54, 129.5, 128.51, 128.29, 127.6, 126.3, 125.2, 124.3, 124.2, 122.3, 122.1, 122.0, 108.9, 108.7, 103.2, 79.5, 76.9, 63.3, 48.0, 30.9, 30.6, 27.3, 22.07, 20.7, 20.1, 13.9; HRMS (ESI) *m/z*: $[M+Na]^+$Calcd. for $C_{38}H_{36}N_4O_4Na$: 635.2634; Found: 635.2652.

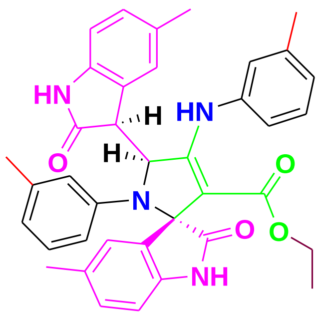


Ethyl (3R,5'S)-5-methyl-5'-[(3S)-5-methyl-2-oxo-2,3-dihydro-1H-indol-3-yl]-2-oxo-1'-phenyl-4'-(phenylamino)-1,1',2,5'-tetrahydrospiro[indole-3,2'-pyrrole]-3'-carboxylate:

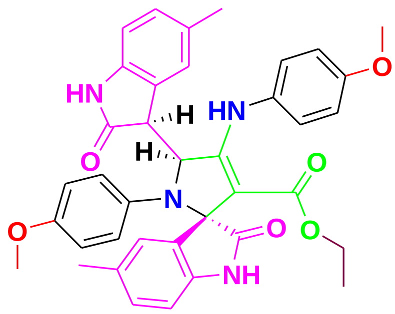
(Table 2, 1i): Yield 78% (456 mg); yellow solid; mp: 200-210 °C; R_f = 0.45 [3 % methanol / dichloromethane]; ^{1}H NMR (400 MHz, DMSO-d_6) δ_H: 9.95 (d, J=12.8 Hz, 2H, $CONH_2$), 9.52 (s, 1H, NH), 7.41 (m, 4H, ArH), 7.18-7.08 (m, 3H, ArH), 6.92-6.86 (m, 3H, ArH), 6.77-6.74 (m, 1H, ArH), 6.61-6.41(m, 4H, ArH), 6.35 (s, 1H, CH), 5.65 (bs, 1H, ArH), 3.82-3.75 (m, 2H, CH_2), 3.17 (s, 1H, CH), 2.31(s, 3H, CH_3), 2.05 (s, 3H, CH_3), 0.74 (t, J=6.8 Hz, 3H, CH_3); ^{13}C NMR (400 MHz, DMSO-d_6) δ_C: 176.2, 175.2, 163.8, 155.2, 144.6, 141.8, 140.1, 139.2, 132.7, 129.8, 129.57, 129.53, 128.57, 128.53, 127.6, 126.2, 125.2, 124.6, 124.3, 122.3, 122.1, 108.7, 108.6, 76.9, 63.4, 58.8, 47.8, 20.8, 20.2, 13.2; HRMS (ESI) m/z: $[M+Na]^+$Calcd. for $C_{36}H_{32}N_4O_6Na$: 607.2321; Found: 607.2351.



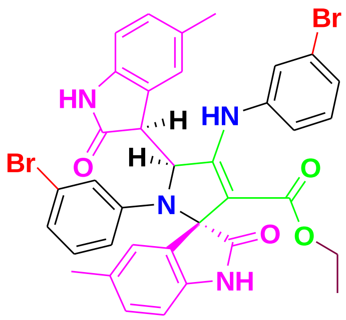
Prop-2-en-1-yl (3R,5'S)-5-methyl-5'-[(3S)-5-methyl-2-oxo-2,3-dihydro-1H-indol-3-yl]-2-oxo-1'-phenyl-4'-(phenylamino)-1,1',2,5'-tetrahydrospiro[indole-3,2'-pyrrole]-3'-carboxylate:(Table 2, 1j): Yield 68% (402 mg); yellowish solid; mp 200-210 °C; R_f = 0.47 [5 % acetone / dichloromethane]; ^{1}H NMR (400 MHz, DMSO-d_6) δ_H: 9.92 (d, J= 9.8 Hz, 2H, $CONH_2$), 9.59 (s, 1H, NH), 7.46-7.42 (m, 4H, ArH), 7.22-7.09 (m, 3H, ArH), 6.94-6.75 (m, 4H, ArH), 6.62-6.57 (m, 3H, ArH), 6.44 (d, J=7.8 Hz, 1H, ArH), 6.35 (bs, 1H, ArH), 5.65 (bs, 1H, ArH), 5.54-5.46 (m, 1 H, CH-allyl), 4.93-4.90 (m, 1H, CH_2), 4.79-4.75 (m, 1H, CH_2-allyl), 4.32-4.38 (m, 1H, CH-allyl), 4.29-4.24 (m, 1H, CH-allyl), 3.14 (s, 1H, CH), 2.31 (s, 3H, CH_3), 2.04 (s, 3H, CH_3); ^{13}C NMR (400 MHz, DMSO-d_6) δ_C: 176.1, 175.1, 163.3, 155.9, 144.4, 141.8, 140.0, 139.0, 132.5, 132.2, 129.8, 129.5, 128.5, 128.4, 127.5, 126.1, 125.2, 124.7, 124.4, 122.6, 122.5, 122.4, 115.72, 115.7, 108.7, 101.4, 76.8, 63.5, 63.0, 47.8, 20.7, 20.19;LCMS (ESI) calcd for $C_{37}H_{32}N_4O_4$: 597.25 $(M+H)^+$; found: 597.20.



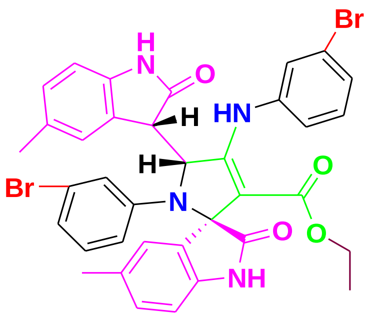
Ethyl (3R,5'S)-5-methyl-5'-[(3S)-5-methyl-2-oxo-2,3-dihydro-1H-indol-3-yl]-1'-(3-methylphenyl)-4'-[(3-methylphenyl)amino]-2-oxo-1,1',2,5'-tetrahydrospiro[indole-3,2'-pyrrole]-3'-carboxylate: (Table 2, 1k): Yield 80% (486 mg); yellowish solid; mp: 215-220 °C; R_f = 0.48 [3 % methanol / dichloromethane]; ^{1}H NMR (400 MHz, DMSO-d$_6$) δ_H: 10.0 (s, 1H, CONH$_2$), 9.96 (s, 1H, CONH$_2$), 9.42 (s, 1H, NH), 7.32-7.05 (m, 5H, ArH), 6.98-6.76 (m, 3H, ArH), 6.6-6.46 (m, 4H, ArH), 6.32-6.31(m, 2H, ArH& CH), 5.72 (bs, 1H, ArH), 3.85-3.73 (m, 2H, CH$_2$), 3.32 (s, 1H, CH), 2.32-2.27 (m, 6H, CH$_3$), 2.08-2.02 (m, 6H, CH$_3$), 0.75 (t, J= 7.0 Hz, 3H, CH$_3$); ^{13}C NMR (400 MHz, DMSO-d$_6$) δ_C: 176.3, 175.3, 163.8, 155.2, 144.4, 141.6, 140.1, 139.04, 139.0, 136.5, 132.6, , 129.8, 129.4, 129.2, 128.6, 128.4, 127.5, 126.0, 125.3, 124.5, 122.8, 122.3, 119.2, 117.7, 108.7, 108.6, 102.1, 76.6, 63.0, 58.8, 47.8, 21.2, 20.9, 20.8, 20.3, 13.2;LCMS (ESI) calcd for $C_{38}H_{36}N_4O_4$: 613.28 $(M+H)^+$; found: 613.20.



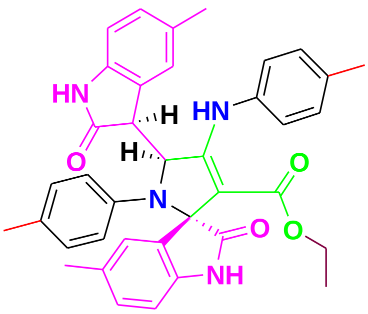
Ethyl (3R,5'S)-1'-(4-methoxyphenyl)-4'-[(4-methoxyphenyl)amino]-5-methyl-5'-[(3S)-5-methyl-2-oxo-2,3-dihydro-1H-indol-3-yl]-2-oxo-1,1',2,5'-tetrahydrospiro[indole-3,2'-pyrrole]-3'-carboxylate: (Table 2, 1l): Yield 83% (532 mg); off white solid; mp 210-215 °C; R_f = 0.55 [3 % methanol / dichloromethane]; ^{1}H NMR (400 MHz, DMSO-d$_6$) δ_H: 9.83 (s, 1H, $CONH_2$), 9.71 (s, 1H, $CONH_2$), 9.40 (s, 1H, NH), 7.37 (d, *J*=8.4 Hz, 2H, ArH), 7.11 (bs, 2H, ArH), 7.0 (d, *J*=8.6 Hz, 2H, ArH), 6.8 (d, *J*=7.5Hz, 1H, ArH), 6.61 (d, *J*= 8.0 Hz, 1H, ArH), 6.48 (s, 4H, ArH), 6.36 (d, *J*=7.7 Hz, 1H, ArH), 6.08 (s, 1H, CH), 5.66 (bs, 1H, ArH), 3.85-3.81 (m, 2H, CH_2), 3.76 (s, 3H, CH_3), 3.58 (s, 3H, CH_3), 2.98 (s, 1H, CH), 2.35 (s, 3H, CH_3), 2.04 (s, 3H, CH_3), 0.73 (t, *J*= 7.0 Hz, 3H, CH_3); ^{13}C NMR (400 MHz, DMSO-d_6) δ_C: 176.9, 175.2, 164.2, 157.2, 156.8, 155.6, 141.8, 140.1, 136.8, 132.9, 131.7, 129.6, 129.4, 128.3, 126.6, 126.1, 125.6, 125.1, 124.9, 124.3, 124.1, 114.8, 114.7, 112.6, 108.6, 108.3, 100.1, 76.9, 64.7, 58.6, 55.2, 54.7, 47.7, 20.9, 20.2, 13.3;LCMS (ESI) calcd for $C_{38}H_{36}N_4O_6$: 645.27 $(M+H)^+$; found: 645.50.



Ethyl (3R,5'S)-1'-(3-bromophenyl)-4'-[(3-bromophenyl)amino]-5-methyl-5'-[(3S)-5-methyl-2-oxo-2,3-dihydro-1H-indol-3-yl]-2-oxo-1,1',2,5'-tetrahydrospiro[indole-3,2'-pyrrole]-3'-carboxylate: (**Table 2, 1m)**: Yield 55% (408 mg); yellowish solid; mp 228-231 °C; R_f = 0.42 [3 % methanol / dichloromethane]; ^{1}H NMR (400 MHz, DMSO-d_6) δ_H: 10.29 (s, 1H, $CONH_2$), 10.04 (s, 1H, $CONH_2$), 9.37 (s, 1H, NH), 7.40 (bs, 1H, ArH), 7.30-7.27 (m, 4H, ArH), 7.12-6.92 (m, 4H, ArH), 6.75-6.54 (m, 4H, ArH), 6.48 (bs, 1H, ArH), 6.36-6.24 (m, 2H, CH &ArH), 3.84-3.78 (m, 2H, CH_2), 3.55 (s, 1H, CH), 2.28 (s, 3H, CH_3), 2.06 (s, 3H,CH_3), 0.80 (t, *J*= 6.9 Hz, 1H, CH_3); ^{13}C NMR (400 MHz, DMSO-d_6) δ_C: 175.8, 174.6, 154.4, 145.8, 140.2, 131.9, 130.8, 130.5, 129.5, 129.2, 127.7, 127.0, 126.1, 125.0, 124.7, 124.6, 123.2, 121.8, 121.2, 120.9, 109.2, 108.5, 101.2, 75.8, 63.3, 59.0, 48.4, 20.9, 20.7, 13.2;LCMS (ESI) calcd for $C_{36}H_{30}Br_2N_4O_4$: 743.07 $(M+H)^+$; found: 743.10.

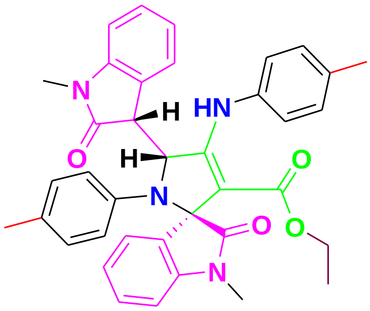


Ethyl (3S,5'R)-1'-(3-bromophenyl)-4'-[(3-bromophenyl)amino]-5-methyl-5'-[(3S)-5-methyl-2-oxo-2,3-dihydro-1H-indol-3-yl]-2-oxo-1,1',2,5'-tetrahydrospiro[indole-3,2'-pyrrole]-3'-carboxylate: (Table 2, 1m′): Yield 25% (186 mg); yellowish solid; mp 251-255 °C; R_f = 0.612 [3 % methanol / dichloromethane]; ^{1}H NMR (400 MHz, DMSO-d$_6$) δ_H: 10.25 (s, 1H, CONH$_2$), 10.10 (s, 1H, CONH$_2$), 9.40 (s, 1H, NH), 7.45 (bs, 1H, ArH), 7.31-7.28 (m, 3H, ArH), 7.08-7.05 (m, 2H, ArH), 6.92 (bs, 3H, ArH), 6.75 (bs, 1H, ArH), 6.64-6.56 (m, 3H, ArH), 6.24 (s, 1H, CH), 5.88 (bs, 1H ArH), 3.76 (t, *J*=7.0, 1H, CH$_2$), 3.43 (s, 1H, CH), 2.27 (s, 3H, CH$_3$), 2.07 (s, 3H,CH$_3$), 0.74 (t, *J*= 6.9 Hz, 1H, CH$_3$); ^{13}C NMR (400 MHz, DMSO-d$_6$) δ_C: 175.5, 174.5, 162.9, 154.3, 152.6, 146.1, 141.4, 141.3, 140.2, 140.0, 131.6, 130.9, 130.4, 130.1, 129.6, 129.0, 127.7, 126.5, 126.0, 125.0, 124.5, 123.9, 121.9, 121.9, 120.3, 108.9, 108.8, 76.9, 64.8, 63.2, 54.7, 47.9, 20.7, 20.6, 13.1;LCMS (ESI) calcd for $C_{36}H_{30}Br_2N_4O_4$: 743.07 $(M+H)^+$; found: 743.20.

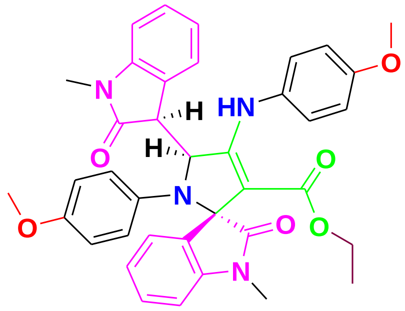


Ethyl (3R,5'S)-1'-(4-methylphenyl)-4'-[(4-methylphenyl)amino]-1-methyl-5'-[(3S)-1-methyl-2-oxo-2,3-dihydro-1H-indol-3-yl]-2-oxo-1,1',2,5'-tetrahydrospiro[indole-3,2'-pyrrole]-3'-carboxylate: (Table 2, 1n): Yield 85% (521 mg); yellowish solid; mp 215-220 °C ; R_f = 0.48 [3 % methanol / dichloromethane]; ^{1}H NMR (400 MHz, DMSO-d$_6$) δ_H: 9.88 (s, 1H, $CONH_2$), 9.82 (s, 1H, $CONH_2$), 9.47 (s, 1H, NH), 7.32-7.30 (m, 4H, ArH), 7.10-7.08 (m, 2H, ArH), 6.84-6.59 (m, 4H, ArH), 6.47-6.40 (m, 3H, ArH), 6.26 (s, 1H, ArH), 5.62 (bs, 1H, ArH), 3.85-3.72 (m, 2H, CH_2), 3.09 (s, 1H, CH), 2.32-2.3 (m, 6H, CH_3), 2.14-2.04 (m, 6H, CH_3), 0.74 (t, *J*= 7.1 Hz, 3H, CH_3); ^{13}C NMR (400 MHz, DMSO-d_6) δ_C: 176.4, 175.2, 164.0, 156.2, 141.9, 141.8, 140.1, 136.4, 134.1, 132.9, 130.0, 129.4, 128.4, 128.1, 126.1, 125.4, 124.3, 122.7, 108.7, 108.4, 101.1, 76.8, 63.7, 58.7, 47.8, 20.8, 20.4, 20.2, 13.2;LCMS (ESI) calcd for $C_{38}H_{36}N_4O_4$: 613.28 $(M+H)^+$; found: 613.40.

.



Ethyl (3S,5'R)-1-methyl-5'-[(3R)-1-methyl-2-oxo-2,3-dihydro-1H-indol-3-yl]-1'-(4-methylphenyl)-4'-[(4-methylphenyl)amino]-2-oxo-1,1',2,5'-tetrahydrospiro[indole-3,2'-pyrrole]-3'-carboxylate: (Table 2, 1o): Yield 85% (520 mg); white solid; mp 230-234 °C; R_f = 0.43 [1 % methanol / dichloromethane]; ^{1}H NMR (400 MHz, $CDCl_3$) δ_H: 9.61 (s, 1H, NH), 7.36 (q, *J*= 7.2 Hz, 2H, ArH), 7.28-7.25 (m, 2H, ArH), 7.19-7.15 (m, 3H, ArH), 7.08 (t, *J*= 7.5 Hz, 1H, ArH), 6.73 (q, *J*= 7.8 Hz, 3H, ArH), 6.635 (d, *J*=7.6Hz, 1H, ArH), 6.47 (d, *J*=7.6 Hz, 3H, ArH), 6.37 (d, *J*= 1.4 Hz, 1H, CH), 6.07 (d, *J*=7.0Hz, 1H, ArH),3.79 (q, *J*= 7.1 Hz, 2H, CH_2), 3.36 (s, 1H, CH), 2.82 (m, 3H, CH_3), 2.46 (m, 3H, CH_3), 2.30 (m, 3H, CH_3), 2.12 (m, 3H, CH_3), 0.70 (t, *J*= 7.1 Hz, 3H, CH_3); ^{13}C NMR (400 MHz, $CDCl_3$) δ_C: 176.1, 174.2, 165.5, 158.4, 145.7, 144.3, 140.0, 135.8, 135.3, 134.2, 131.9, 130.0, 128.4, 128.3, 128.0, 126.0, 125.5, 125.1, 124.1, 123.2, 122.1, 121.9, 107.5, 107.0, 100.4, 65.2, 59.0, 47.5, 25.7, 25.3, 20.85, 20.84, 13.4; HRMS (ESI) *m/z*: $[M+Na]^+$Calcd. for $C_{38}H_{36}N_4O_4Na$: 635.2634; Found: 635.2641.



Ethyl (3R,5'S)-1'-(4-methoxyphenyl)-4'-[(4-methoxyphenyl)amino]-1-methyl-5'-[(3S)-1-methyl-2-oxo-2,3-dihydro-1H-indol-3-yl]-2-oxo-1,1',2,5'-tetrahydrospiro[indole-3,2'-pyrrole]-3'-carboxylate: (Table 2, 1p): Yield 87% (562 mg); off white solid; mp 215-218 °C; R_f = 0.44 [1 % methanol / dichloromethane]; ^{1}H NMR (400 MHz, $CDCl_3$) δ_H: 9.51 (s, 1H, NH), 7.42-7.32 (m, 4H, ArH), 7.19 (t, *J*= 7.5 Hz, 1H, ArH), 7.06 (t, *J*= 7.6 Hz, 1H, ArH), 6.91(d, *J*= 8.8 Hz, 2H, ArH), 6.73-6.65 (m, 2H, ArH), 6.49-6.44 (m, 5H, ArH), 6.22 (d, *J*= 1.5 Hz, 1H, CH), 6.07 (d, *J*= 7.2 Hz, 1H, ArH), 3.81-3.77 (m, 5H, OCH_2 & OCH_3), 3.65 (s, 3H, OCH_3), 2.96 (s, 3H, CH_3), 2.49 (s, 3H, CH_3), 0.70 (t, *J*= 7.1 Hz, 3H, CH_3); ^{13}C NMR (400 MHz, $CDCl_3$) δ_C: 176.5, 174.1, 165.5, 159.0, 157.6, 156.8, 145.6, 144.2, 135.5, 131.7, 131.2, 128.4, 128.3, 128.08, 126.9, 125.4, 125.3, 125.1, 124.1, 122.1, 121.9, 114.9, 114.2, 112.8, 107.5, 106.9, 99.8, 65.7, 59.0, 55.3, 55.0, 47.3, 25.7, 25.4, 13.4;LCMS (ESI) calcd for $C_{38}H_{36}N_4O_6$: 645.27 $(M+H)^+$; found: 645.30.

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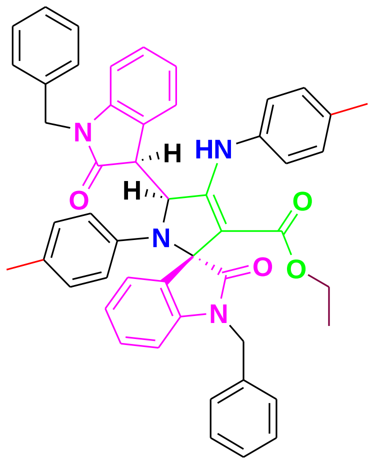
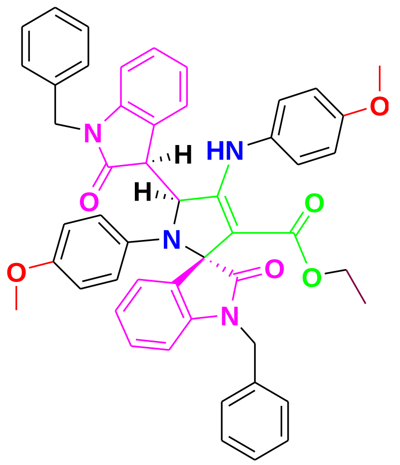


Ethyl (3R,5'S)-1-benzyl-5'-[(3S)-1-benzyl-2-oxo-2,3-dihydro-1H-indol-3-yl]-1'-(4-methylphenyl)-4'-[(4-methylphenyl)amino]-2-oxo-1,1',2,5'-tetrahydrospiro[indole-3,2'-pyrrole]-3'-carboxylate: (Table 2, 1q): Yield 71% (545 mg); off white solid; mp 228-231 °C ; R_f = 0.44 [5 % acetone / dichloromethane]; ^{1}H NMR (400 MHz, $CDCl_3$) δ_H: 9.66 (s, 1H, NH), 7.41 (d, *J*= 7.0 Hz, 1H, ArH), 7.31-7.16 (m, 5H, ArH), 7.12-7.03 (m, 7H, ArH), 6.94-6.84 (m, 5H, ArH), 6.70-6.52 (m, 7H, ArH& CH), 6.28 (d, *J*= 7.5 Hz, 1H, ArH), 6.12 (bs, 1H, ArH), 4.99 (d, *J*=15.8Hz, 1H, ArH), 4.27-4..06 (m, 2H, CH_2), 3.89-3.75 (m, 3H, CH_2), 3.52 (s, 1H, CH), 2.34-2.18 (m, 6H, CH_3), 0.65 (t, *J*= 6.7 Hz, 3H, CH_3); ^{13}C NMR (400 MHz, $CDCl_3$) δ_C: 176.1, 174.2, 165.5, 158.4, 144.9, 143.3, 140.5, 135.8, 135.6, 135.4, 134.4, 131.8, 130.5, 128.8,128.3, 128.2, 128.0, 127.2, 126.9, 126.6, 126.3, 125.3, 125.2, 124.2, 123.1, 122.2, 122.0, 108.8, 108.2, 100.6, 65.1, 59.1, 47.5, 43.5, 43.4, 21.0, 20.9, 13.4;LCMS (ESI) calcd for $C_{50}H_{44}N_4O_4$: 765.34 $(M+H)^+$; found: 765.20.



Ethyl (3R,5'S)-1-benzyl-5'-[(3S)-1-benzyl-2-oxo-2,3-dihydro-1H-indol-3-yl]-1'-(4-methoxyphenyl)-4'-[(4-methoxyphenyl)amino]-2-oxo-1,1',2,5'-tetrahydrospiro[indole-3,2'-pyrrole]-3'-carboxylate:(Table 2, 1r): Yield 74% (590 mg); yellowish solid; mp 222-225 °C ; R_f = 0.46 [5 % acetone / dichloromethane]; ^{1}H NMR (400 MHz, $CDCl_3$) δ_H: 9.56 (s, 1H, NH), 7.44 (d, *J*= 7.1 Hz, 1H, ArH), 7.36 (d, *J*= 8.7 Hz, 1H, ArH), 7.22-7.12 (m, 5H, ArH), 7.09-7.03 (m, 3H, ArH), 6.98-6.91 (m, 5H, ArH), 6.68 (t, *J*= 7.5 Hz, 1H, ArH), 6.59-6.56 (m, 3H, ArH), 6.43 (d, *J*= 7.3 Hz, 2H, ArH), 6.36 (d, *J*= 1.5 Hz, 1H, CH), 6.25 (d, *J*=7.7

Hz, 1H, ArH), 6.14 (d, *J*=7.2Hz, 1H, ArH), 5.03-4.99 (m, 1H, ,CH_2), 4.36-4.32 (m, 1H, CH_2), 4.18-4.14 (m, 1H, CH_2), 3.88-3.75 (m, 6H, CH_2& OCH_3),3.72-3.70 (m, 3H, OCH_3), 3.45 (s, 1H, CH), 0.66 (t, *J*= 7.1 Hz, 3H, CH_3); ^{13}C NMR (400 MHz, $CDCl_3$) δ_C: 176.3, 174.2, 165.6, 159.1, 157.7, 157.2, 144.9, 143.3, 135.8, 135.6, 135.3, 131.7, 131.3, 128.6, 128.4, 128.3, 128.2, 128.0, 127.2, 127.0, 126.5, 126.4, 125.4, 125.2, 124.2, 122.2, 122.0, 115.1, 113.3, 108.7, 108.2, 100.0, 65.7, 59.0, 55.4, 55.0, 47.4, 43.6, 43.2, 13.4;LCMS (ESI) calcd for $C_{50}H_{44}N_4O_6$: 797.33 $(M+H)^+$; found: 797.20.

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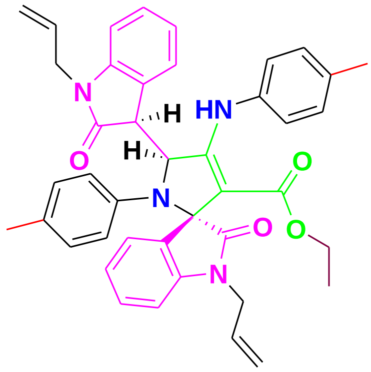
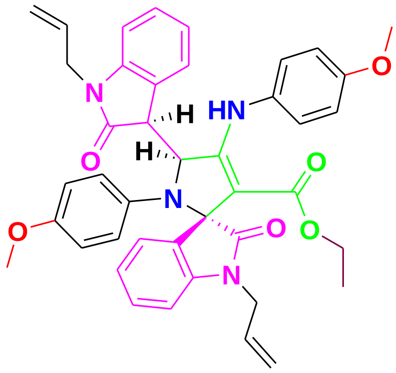
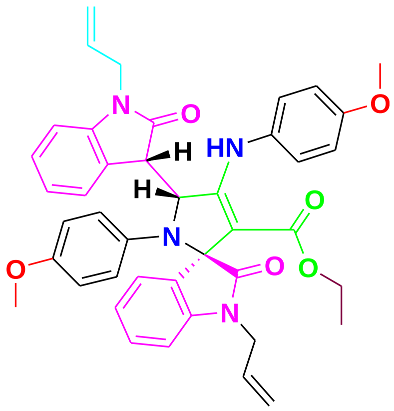


Ethyl (3R,5'S)-1'-(4-methylphenyl)-4'-[(4-methylphenyl)amino]-2-oxo-5'-[(3S)-2-oxo-1-(prop-2-en-1-yl)-2,3-dihydro-1H-indol-3-yl]-1-(prop-2-en-1-yl)-1,1',2,5'-tetrahydrospiro[indole-3,2'-pyrrole]-3'-carboxylate:(Table 2, 1s): Yield 68% (520 mg); brownish solid; mp 219-223 °C ; R_f = 0.48 [5 % acetone / dichloromethane]; ^{1}H NMR (400 MHz, $CDCl_3$) δ_H: 9.64 (s, 1H, NH), 7.41 (d, *J*=7.0Hz, 1H, ArH), 7.32-7.18 (m, 6H, ArH), 7.04 (t, *J*= 7.1 Hz, 1H, ArH), 6.75-6.65 (m, 4H, ArH), 6.48-6.41 (m, 4H, ArH& CH), 6.18 (d, *J*=6.8Hz, 1H, ArH), 5.33-5.29 (m, 2H, CH_2), 4.95-4.92 (m, 2H, CH_2), 4.75 (d, *J*= 10.1 Hz, 1H, CH), 4.31-4.19 (m, 2H, CH_2), 3.86-3.73 (m, 3H, CH & CH_2), 3.57-3.52 (m, 2H, CH_2), 3.44 (s, 1H, CH), 2.31 (s, 3H, CH_3), 2.13 (s, 3H, CH_3), 0.69 (t, *J*= 7.0 Hz, 3H, CH_3); ^{13}C NMR (400 MHz, $CDCl_3$) δ_C: 175.8, 173.9, 165.5, 158.6, 144.9, 143.4, 140.2, 135.8, 135.3, 134.4, 131.8, 131.6, 130.8, 130.4, 128.5, 128.2, 127.9, 126.2, 125.4, 125.2, 124.2, 123.1, 122.1, 121.8, 117.1, 116.0, 108.5, 107.9, 100.3, 64.8, 59.0, 47.3, 42.1, 41.6, 20.8, 20.7, 13.4;LCMS (ESI) calcd for $C_{42}H_{40}N_4O_4$: 665.31 $(M+H)^+$; found: 665.20.

.

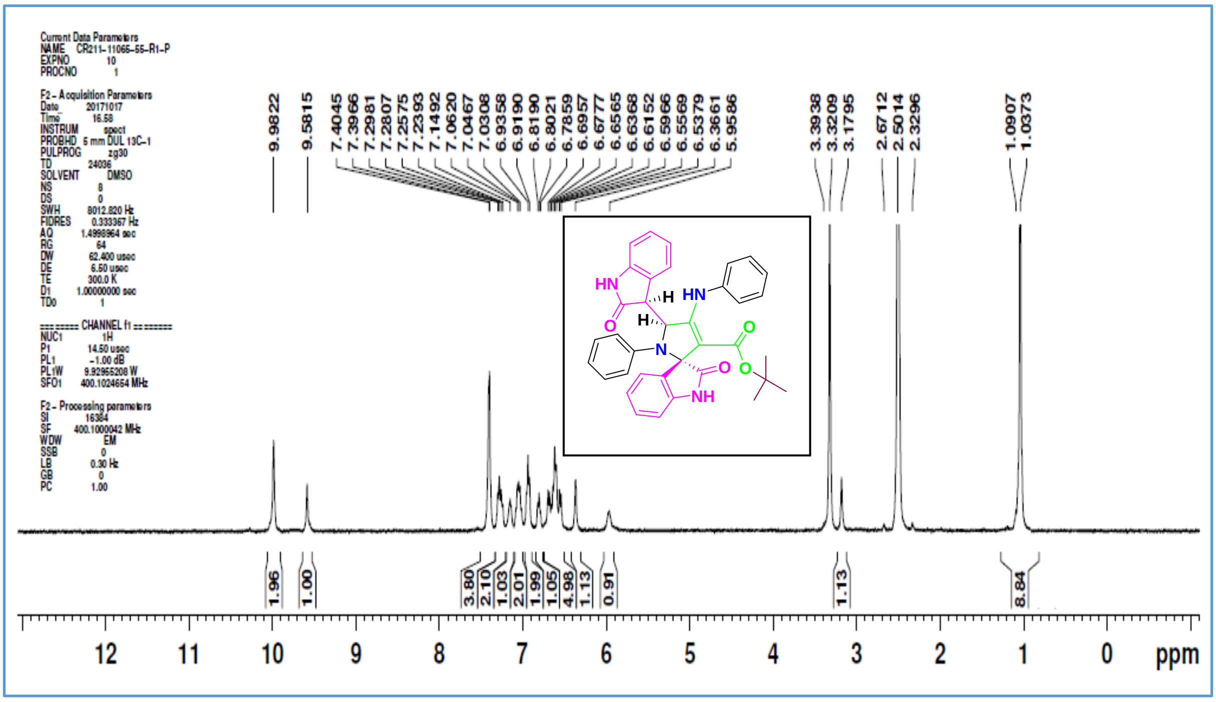


Ethyl (3R,5'S)-1'-(4-methoxyphenyl)-4'-[(4-methoxyphenyl)amino]-2-oxo-5'-[(3S)-2-oxo-1-(prop-2-en-1-yl)-2,3-dihydro-1H-indol-3-yl]-1-(prop-2-en-1-yl)-1,1',2,5'-tetrahydrospiro[indole-3,2'-pyrrole]-3'-carboxylate: (**Table 2, 1t**): Yield 45% (313 mg); brownish solid; mp 221-224 °C; R_f = 0.45 [5 % acetone / dichloromethane]; ^{1}H NMR (400 MHz, $CDCl_3$) δ_H: 9.54 (s, 1H, NH), 7.43 (d, *J*= 7.0 Hz, 1H, ArH), 7.34-7.30 (m, 3H, ArH), 7.20-7.17 (m, 1H, ArH), 7.05-7.01 (m, 1H, ArH), 6.93-6.91 (m, 2H, ArH), 6.80-6.67 (m, 3H, ArH), 6.49-6.38 (m, 5H, CH_2), 6.27 (s, 1H, CH), 6.20 (d, *J*=6.8Hz, 1H, ArH), 5.36-5.28 (m, 2H, CH_2), 5.04-4.95 (m, 3H, CH & CH_2), 4.33-4.17 (m, 4H, CH_2), 3.86-3.76 (m, 6H, CH_3), 3.66-3.64 (m, 4H, CH_3 & CH), 3.69-3.44 (m, 1H, CH), 3.36 (s, 1H, CH), 0.69 (t, *J*= 7.0 Hz, 3H, CH_3); ^{13}C NMR (400 MHz, $CDCl_3$) δ_C: 176.1, 173.8, 165.5, 159.1, 157.6, 157.0, 144.8, 143.3, 135.5, 131.6, 131.5, 131.4, 131.1, 130.7, 130.6, 128.5, 128.3, 128.2, 127.9, 125.3, 125.24, 125.20, 122.1, 121.8, 117.2, 117.1, 116.0, 114.9, 113.0, 108.5, 107.9, 99.6, 65.3, 59.09, 59.04, 55.4, 55.3, 55.2, 55.1, 47.2, 42.1, 41.6, 13.4;LCMS (ESI) calcd for $C_{42}H_{40}N_4O_6$: 697.30 $(M+H)^+$; found: 697.40.

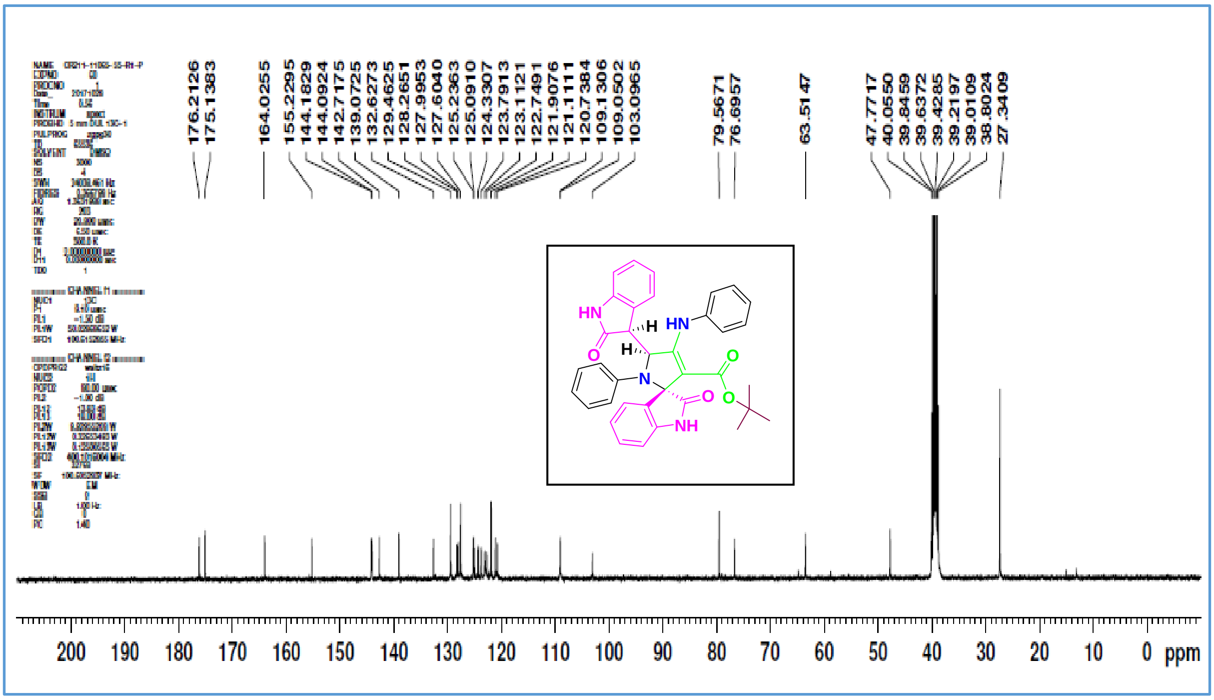


Ethyl (3S,5'R)-1'-(4-methoxyphenyl)-4'-[(4-methoxyphenyl)amino]-2-oxo-5'-[(3S)-2-oxo-1-(prop-2-en-1-yl)-2,3-dihydro-1H-indol-3-yl]-1-(prop-2-en-1-yl)-1,1',2,5'-tetrahydrospiro[indole-3,2'-pyrrole]-3'-carboxylate: (Table 2, 1t′): Yield 16% (110 mg); brownish solid; mp 248-252 °C ; R_f = 0.58 [1 % methanol / dichloromethane] ; ^{1}H NMR (400 MHz, $CDCl_3$) δ_H: 9.25 (s, 1H, NH), 7.60 (d, *J*= 7.0 Hz, 1H, ArH), 7.21-6.96 (m, 3H, ArH), 6.80-6.60 (m, 6H, ArH), 6.41 (s, 1H, CH), 6.17 (s, 1H, ArH), 5.64-5.44 (m, 2H, CH), 5.20-5.078 (m, 2H, CH_2), 4.87 (bs, 1H, CH), 4.60-4.51 (m, 1H, CH), 4.29-4.17 (m, 2H, CH_2), 3.88-3.78 (m, 8H, CH_3&CH_2), 3.59 (s, 3H, CH_3), 3.52 (s, 1H, CH), 0.74 (t, *J*= 6.8 Hz, 3H, CH_3); ^{13}C NMR (400 MHz, $CDCl_3$) δ_C: 176.2, 173.3, 165.3, 158.7, 157.4, 155.7, 143.5. 143.2, 136.6, 132.4, 131.7, 131.1, 128.5, 127.3, 125.9, 125.6, 124.8, 123.5, 122.6, 121.6, 117.5, 116.5, 114.3, 113.5, 108.2, 98.5, 58.9, 55.3, 55.2, 48.1, 42.1, 41.9, 13.6; HRMS (ESI) *m/z*: $[M+Na]^+$Calcd. for $C_{42}H_{40}N_4O_6Na$: 719.2846; Found: 719.2852.

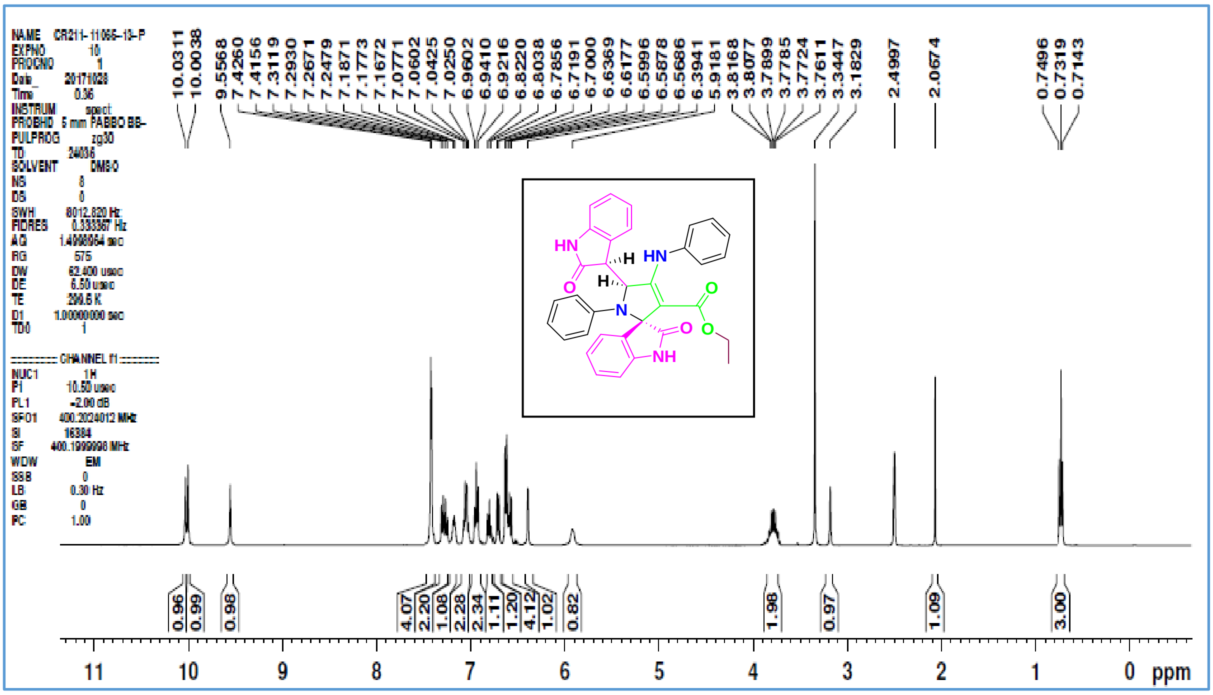
Copy of ^{1}H and ^{13}C NMR spectra of synthesized compounds in Table2 (entries 1 to20):



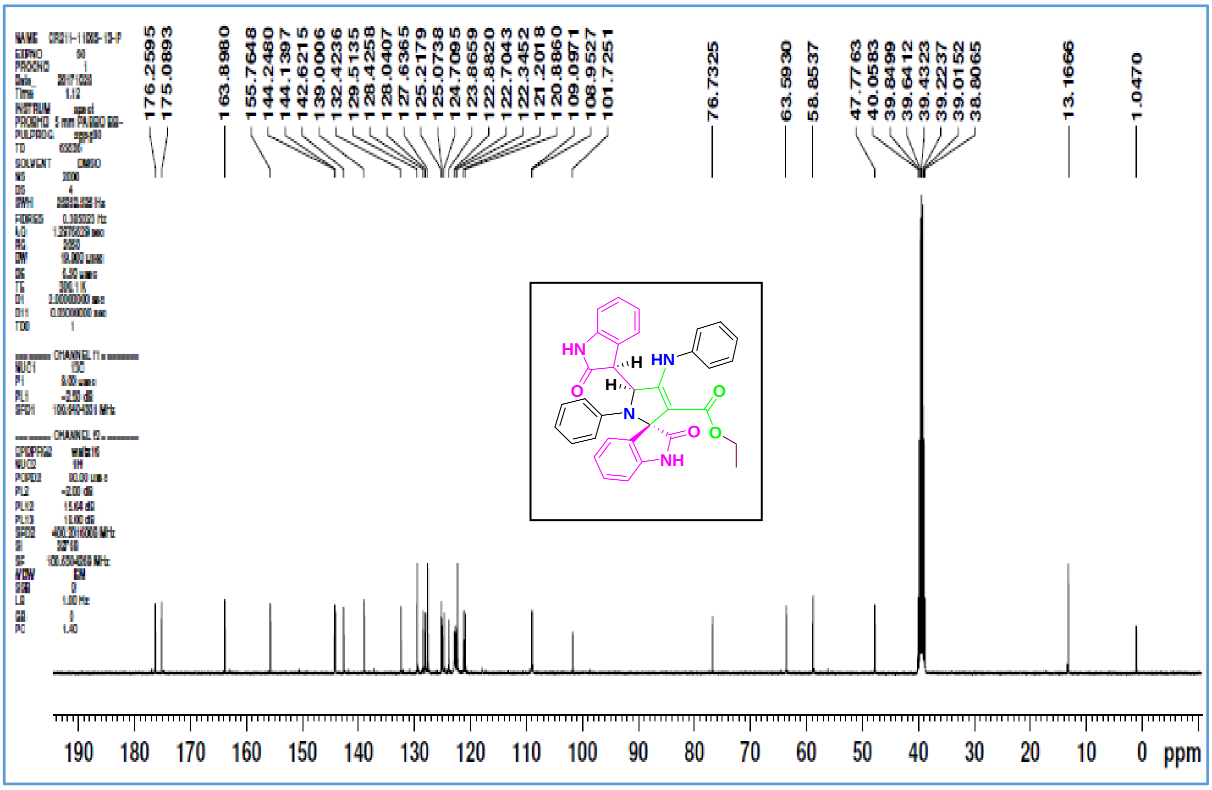
^{1}H NMR of compound **1a**



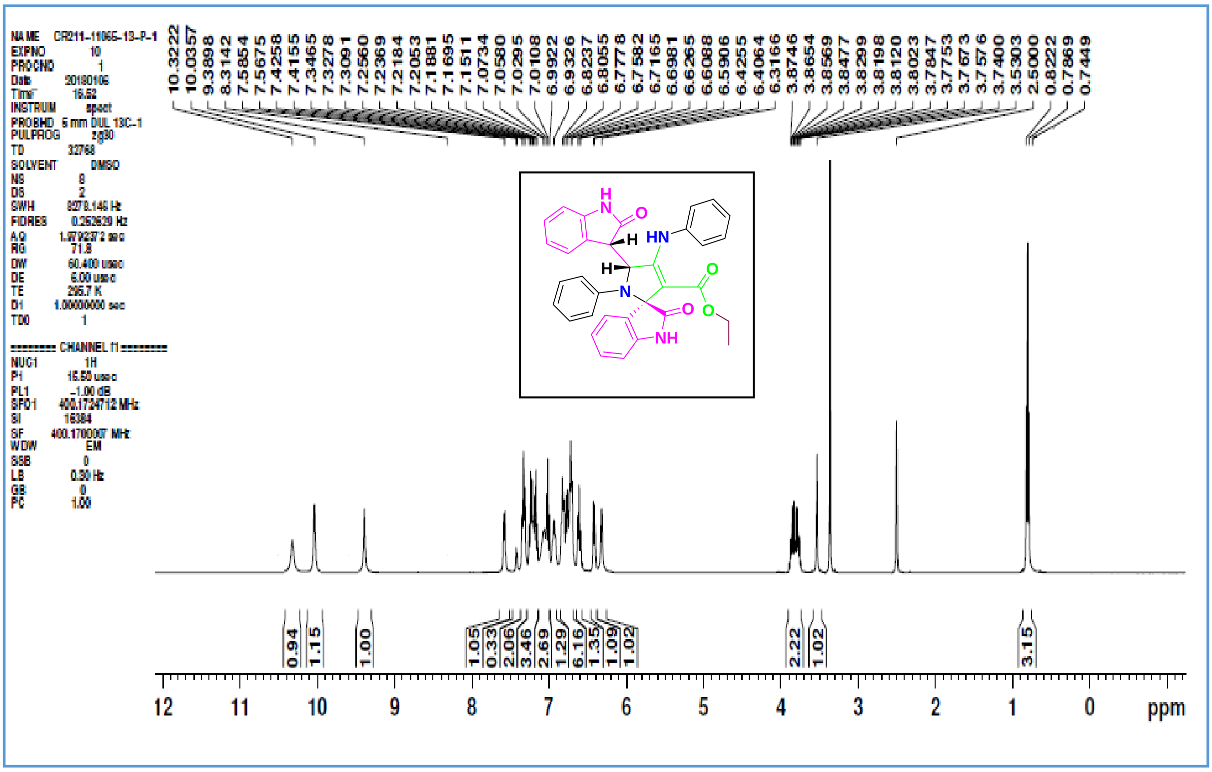
^{13}C NMR of compound **1a**



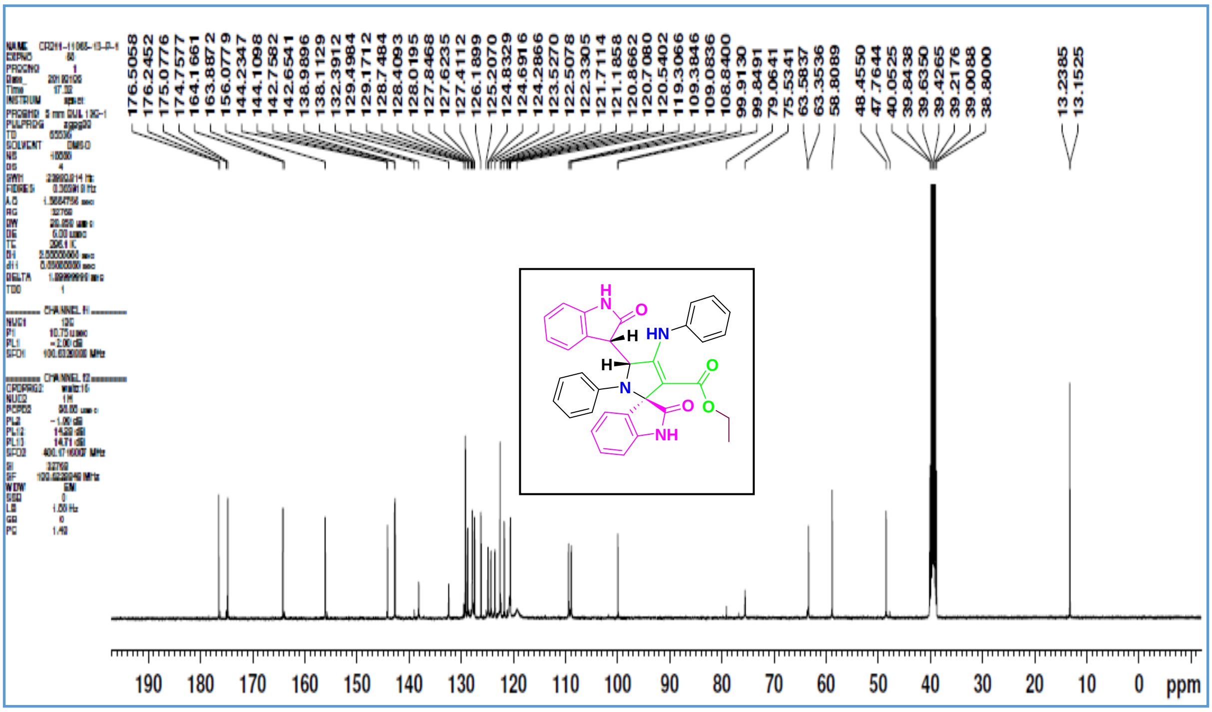
[1]H NMR of compound **1b**



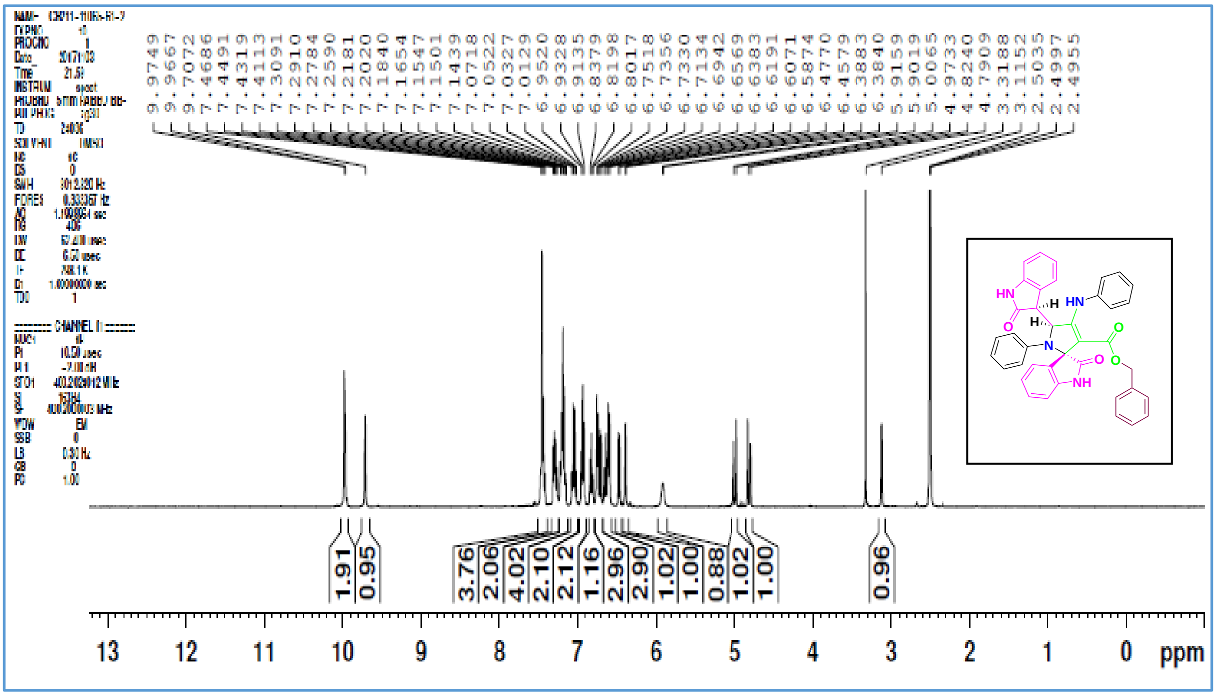
[13]C NMR of compound **1b**



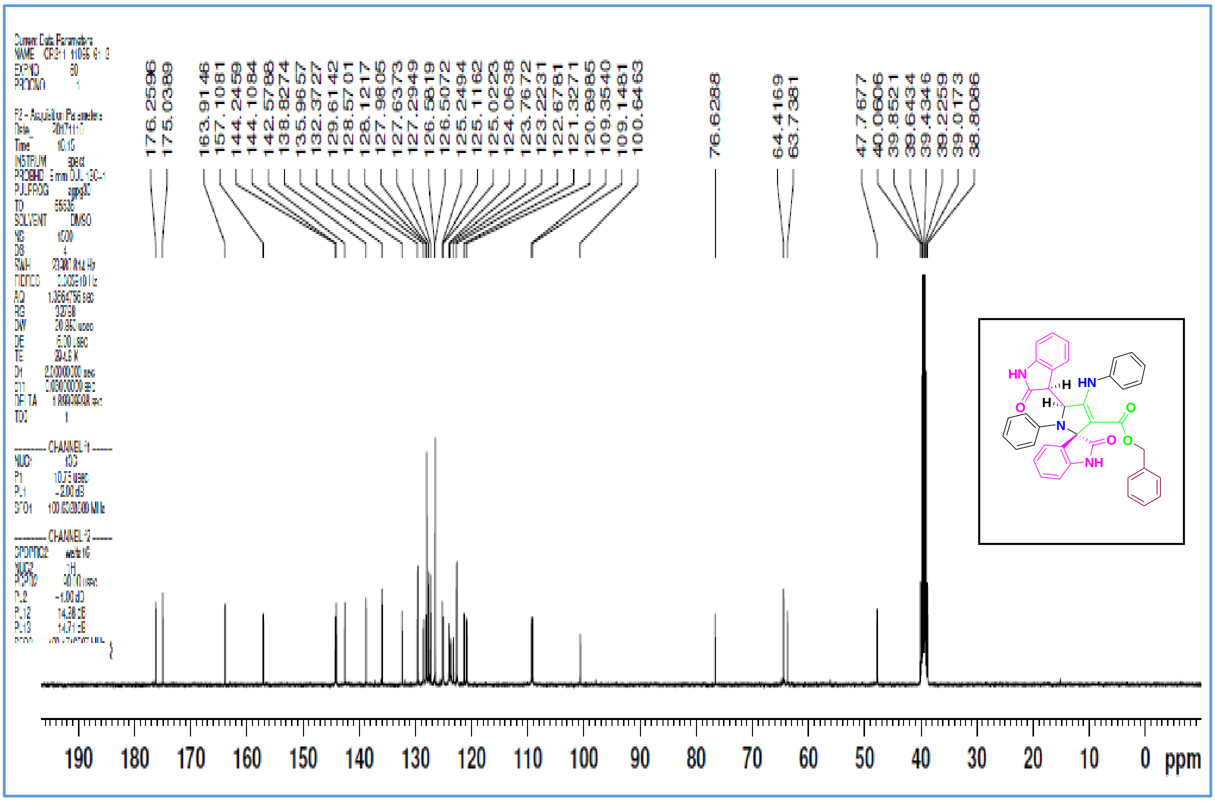
^{1}H NMR of compound **1b´**



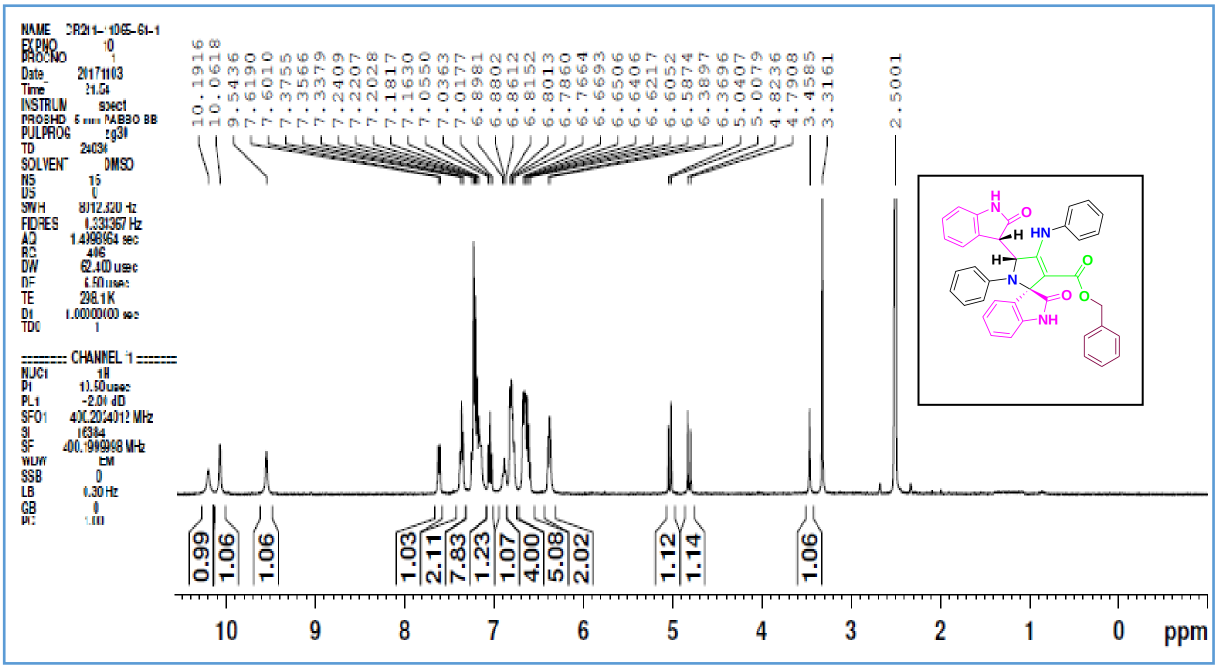
^{13}C NMR of compound **1b´**



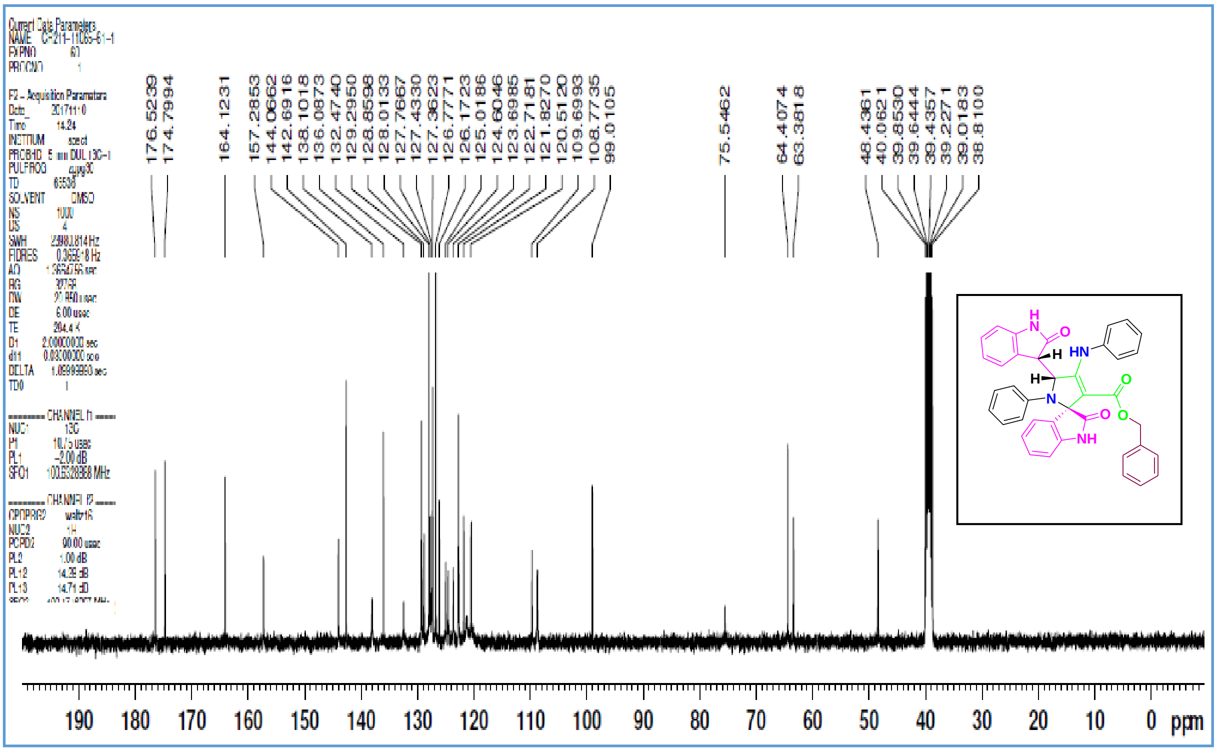
[1]H NMR of compound **1c**



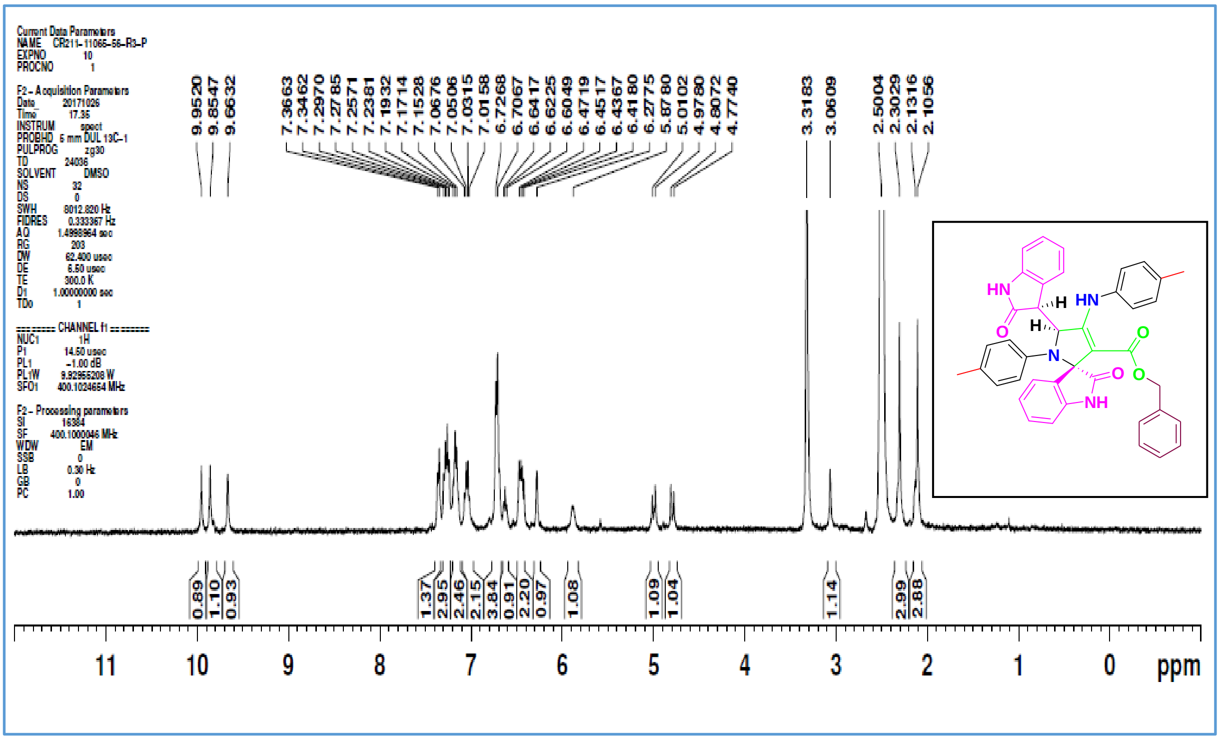
[13]C NMR of compound **1c**



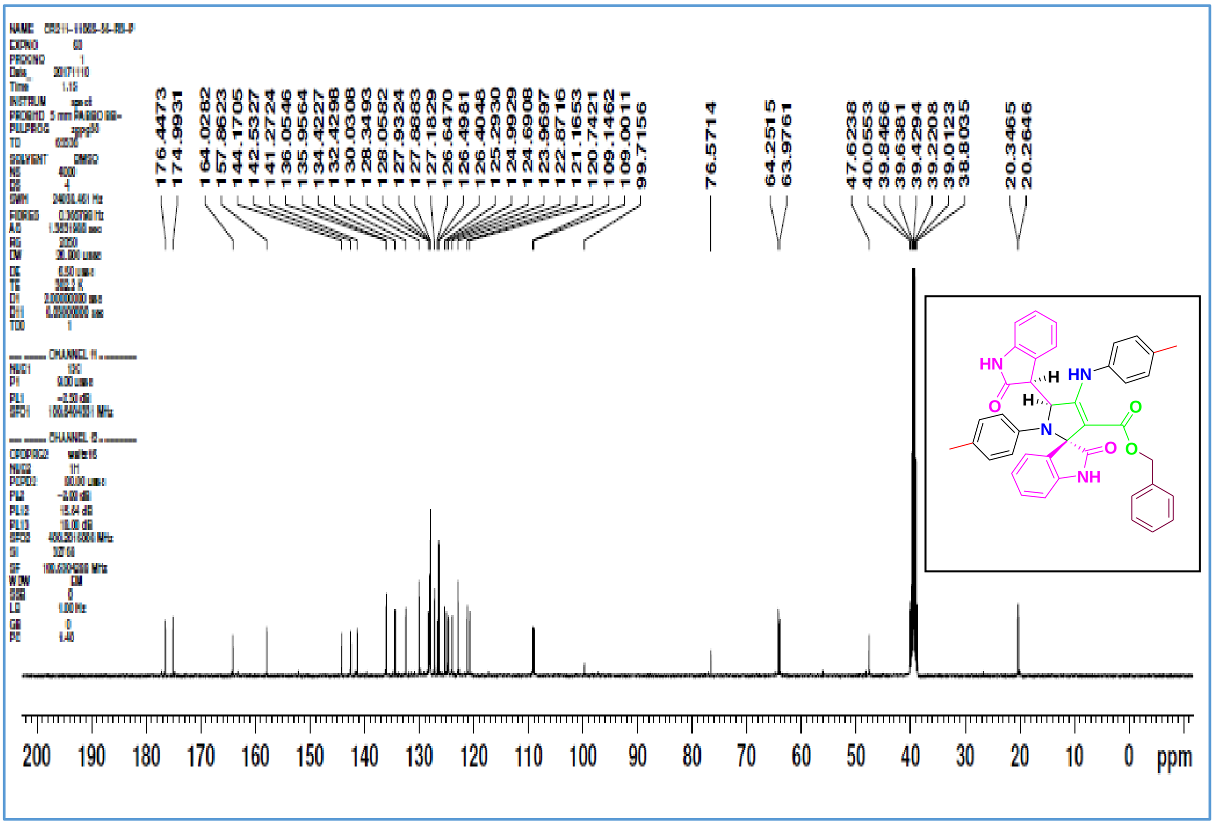
[1]H NMR of compound **1c´**



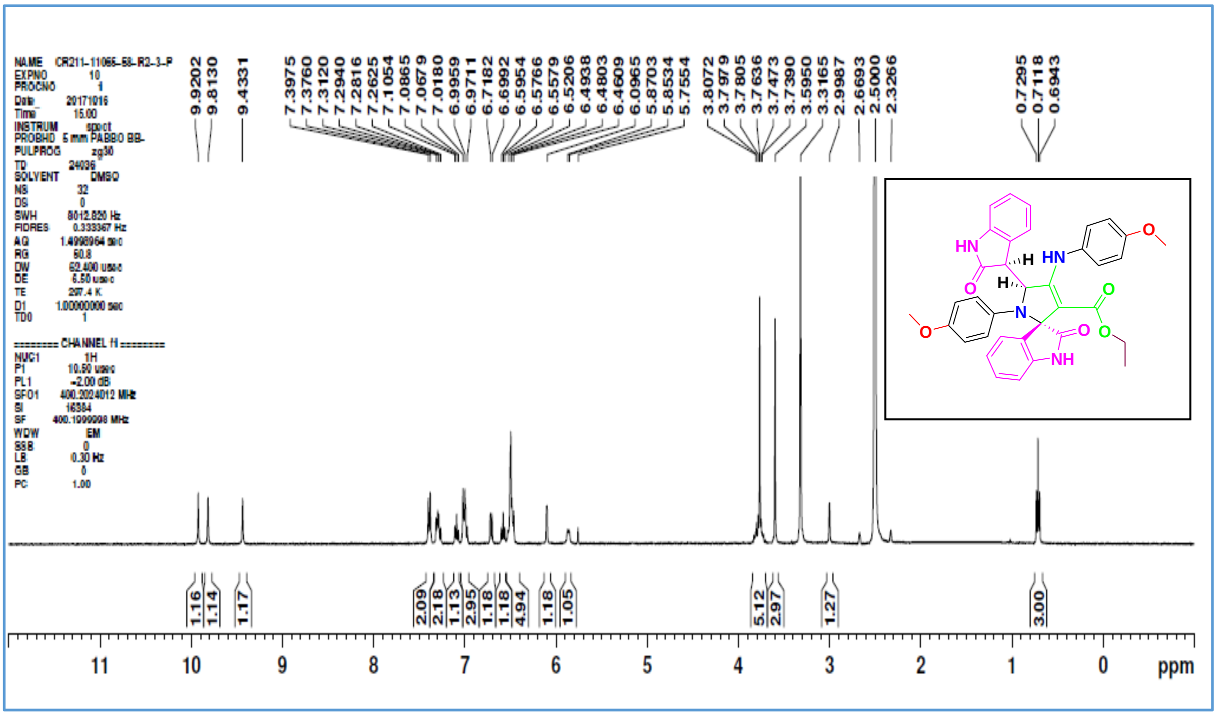
[13]C NMR of compound **1c´**



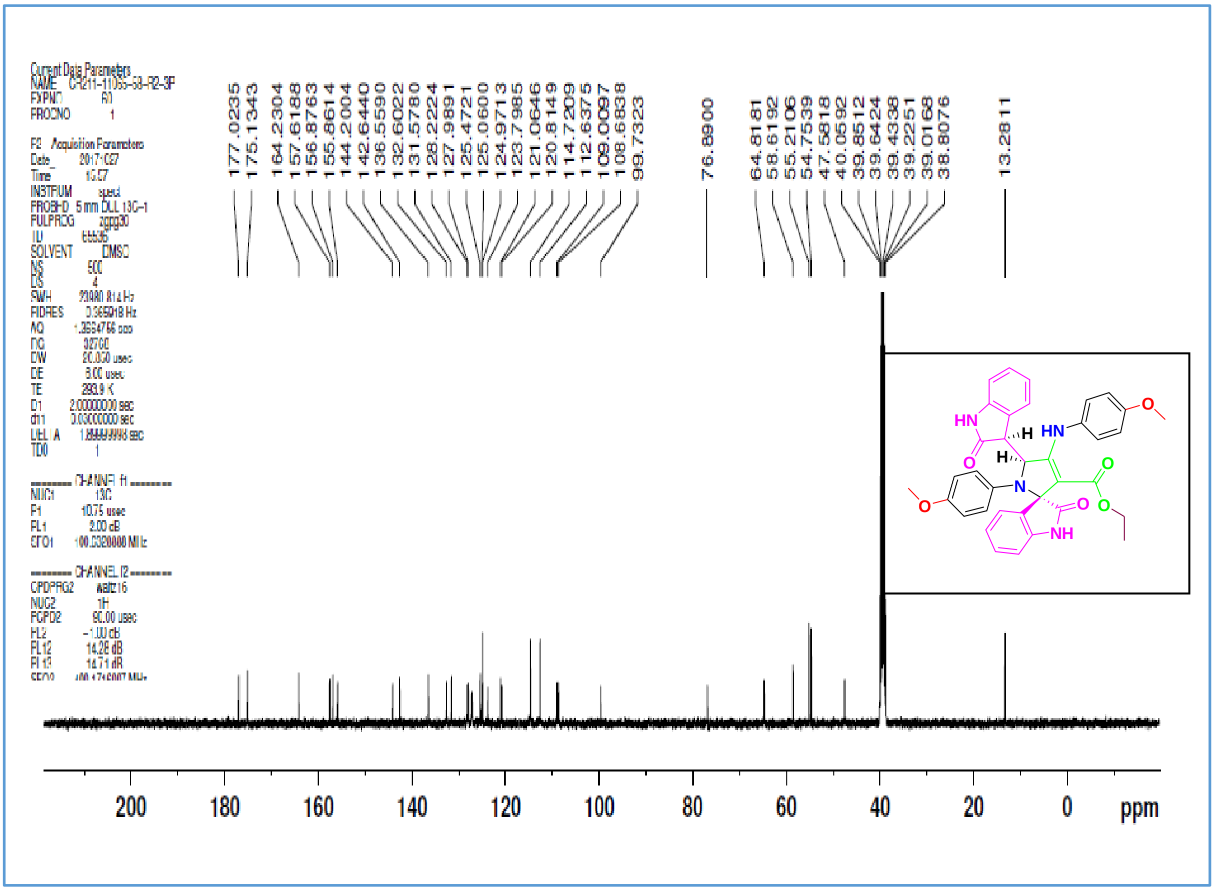
^{1}H NMR of compound **1d**



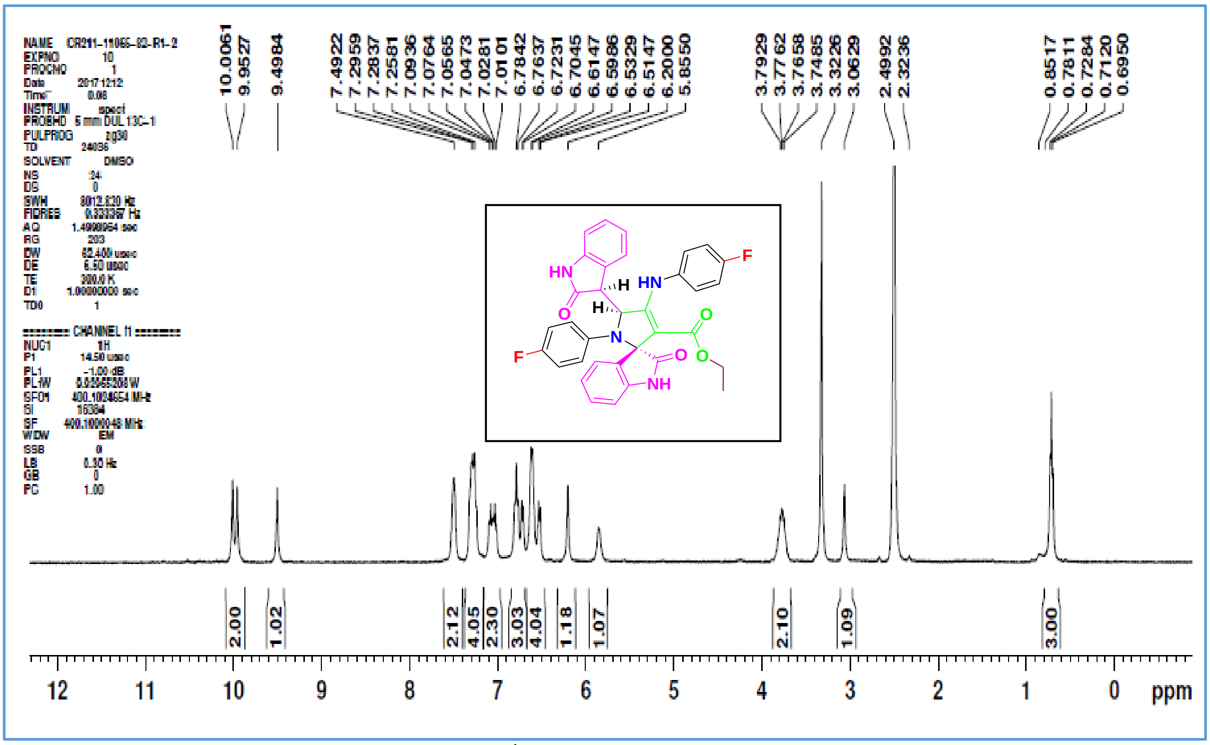
^{13}C NMR of compound **1d**



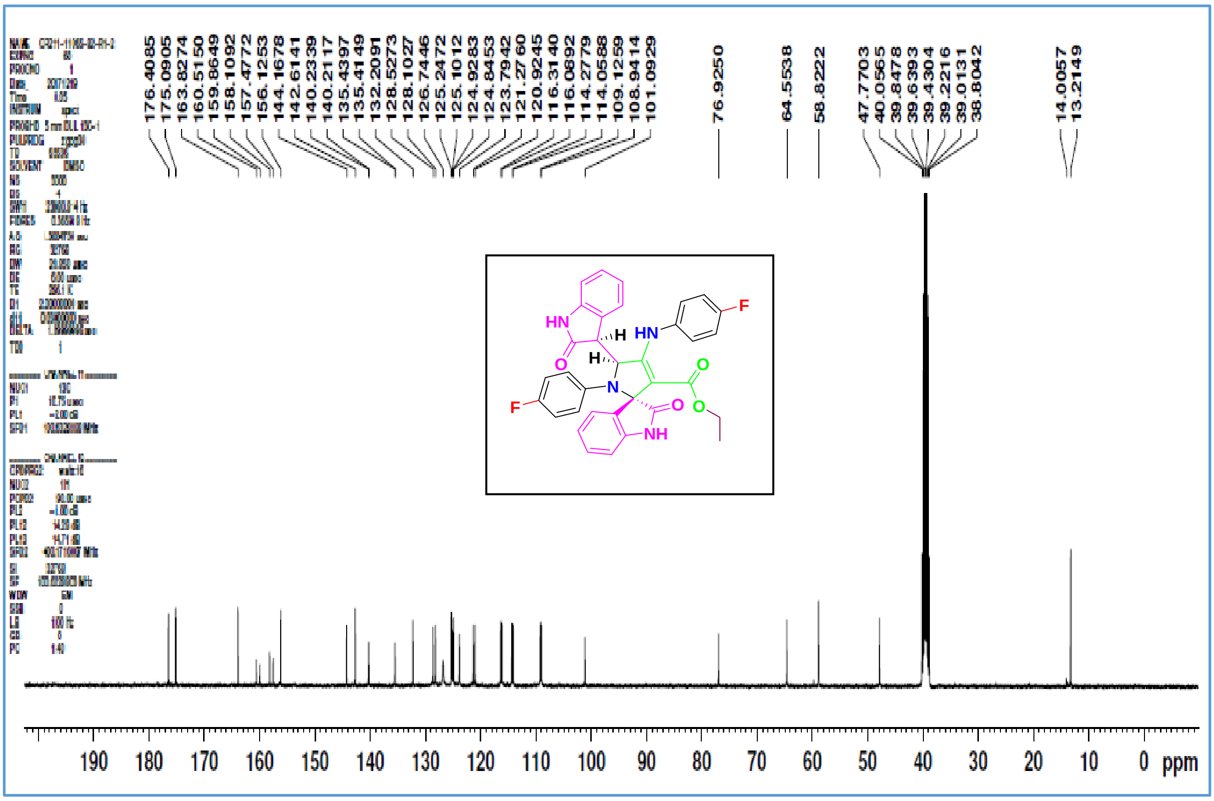
^{1}H NMR of compound **1e**



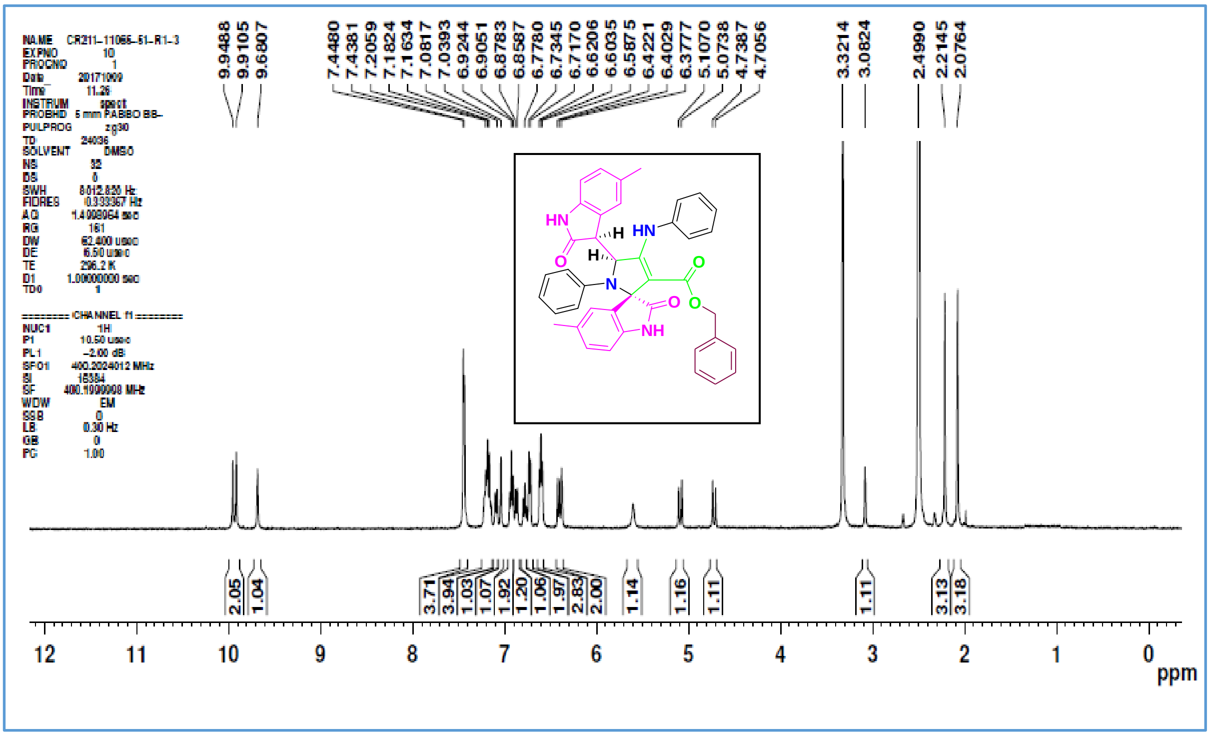
^{13}C NMR of compound **1e**



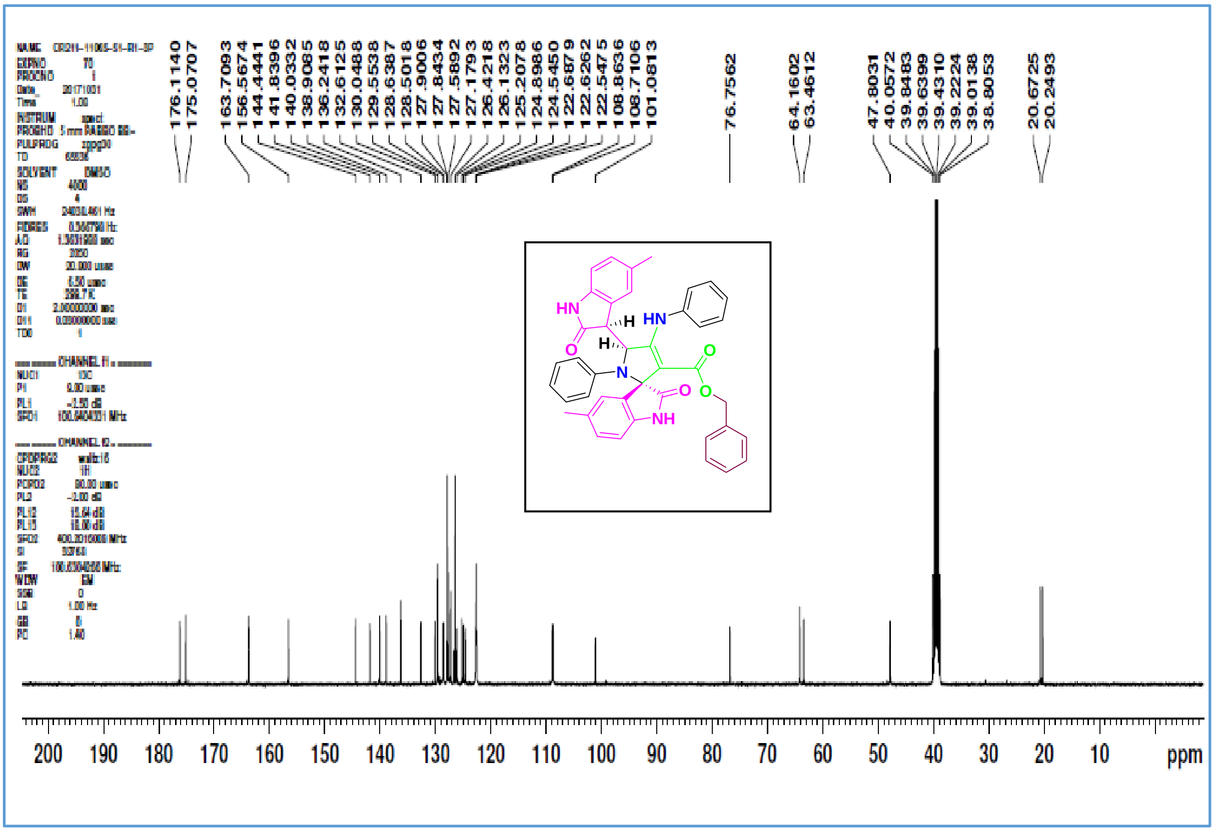
^{1}H NMR of compound **1f**



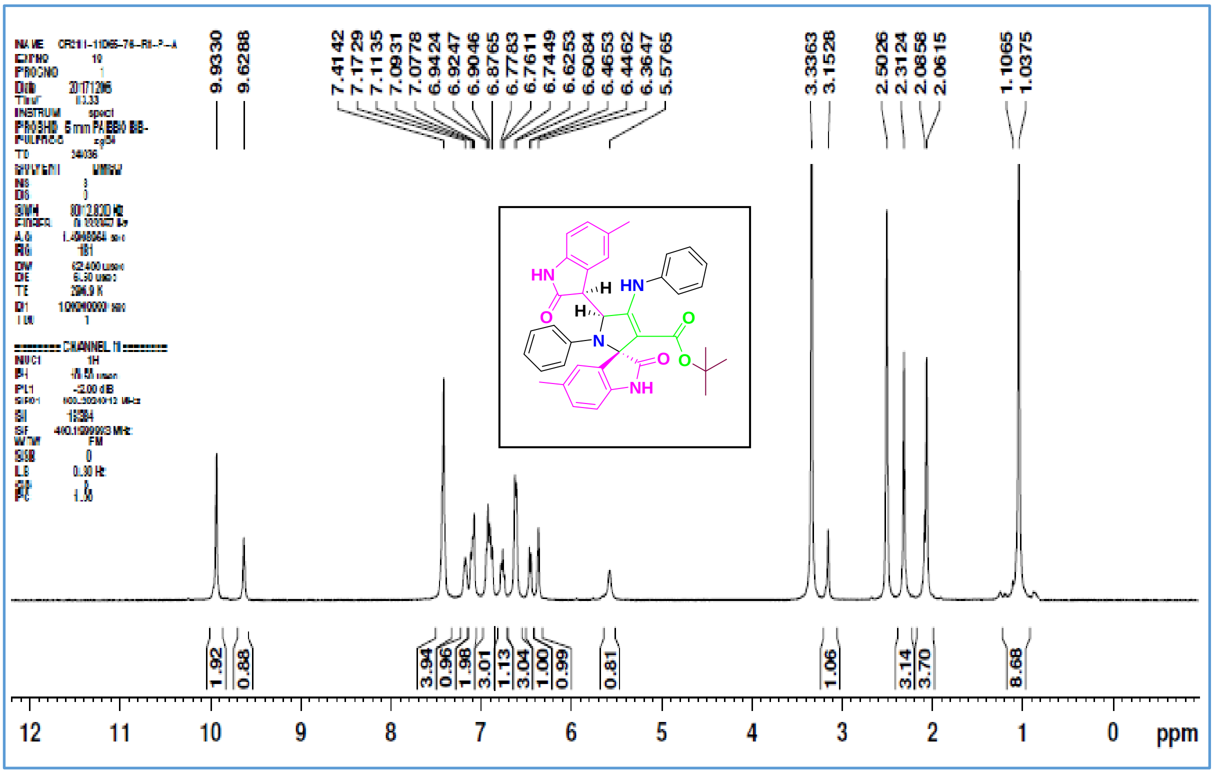
^{13}C NMR of compound **1f**



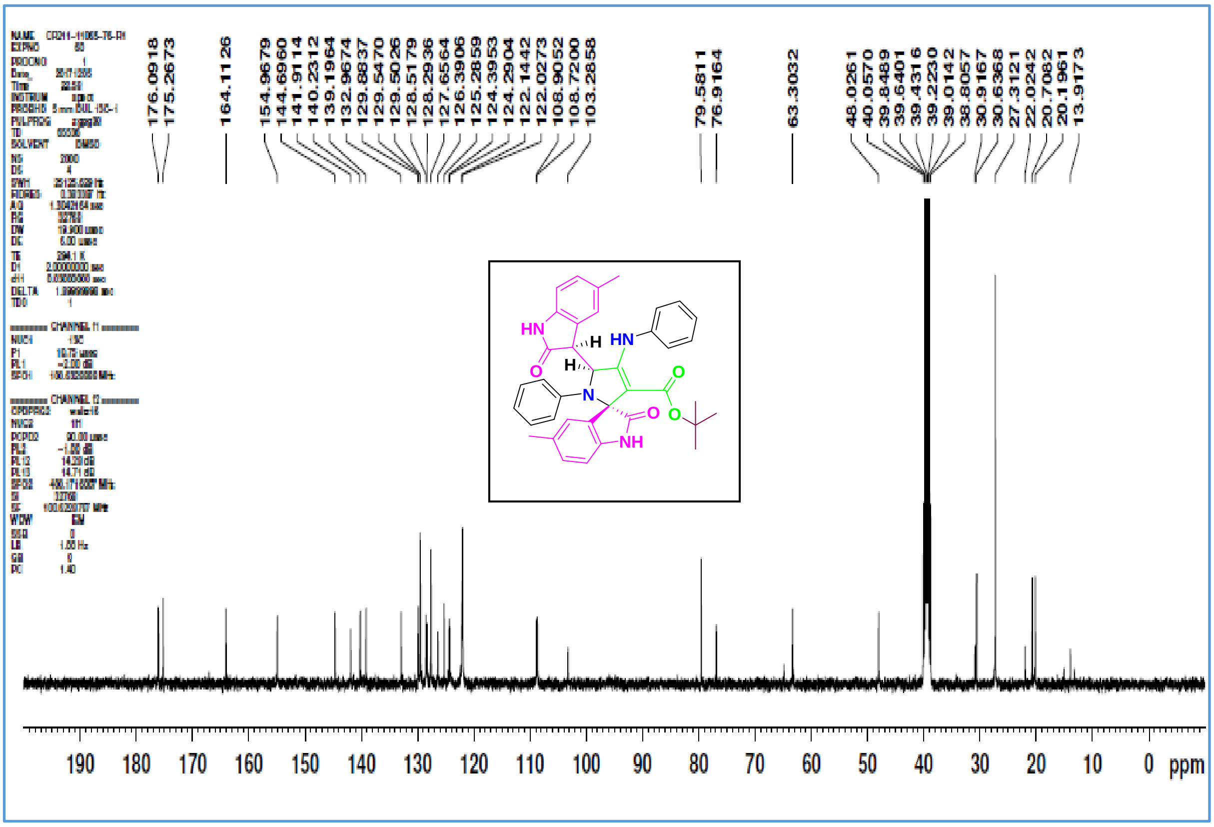
[1]H NMR of compound **1g**



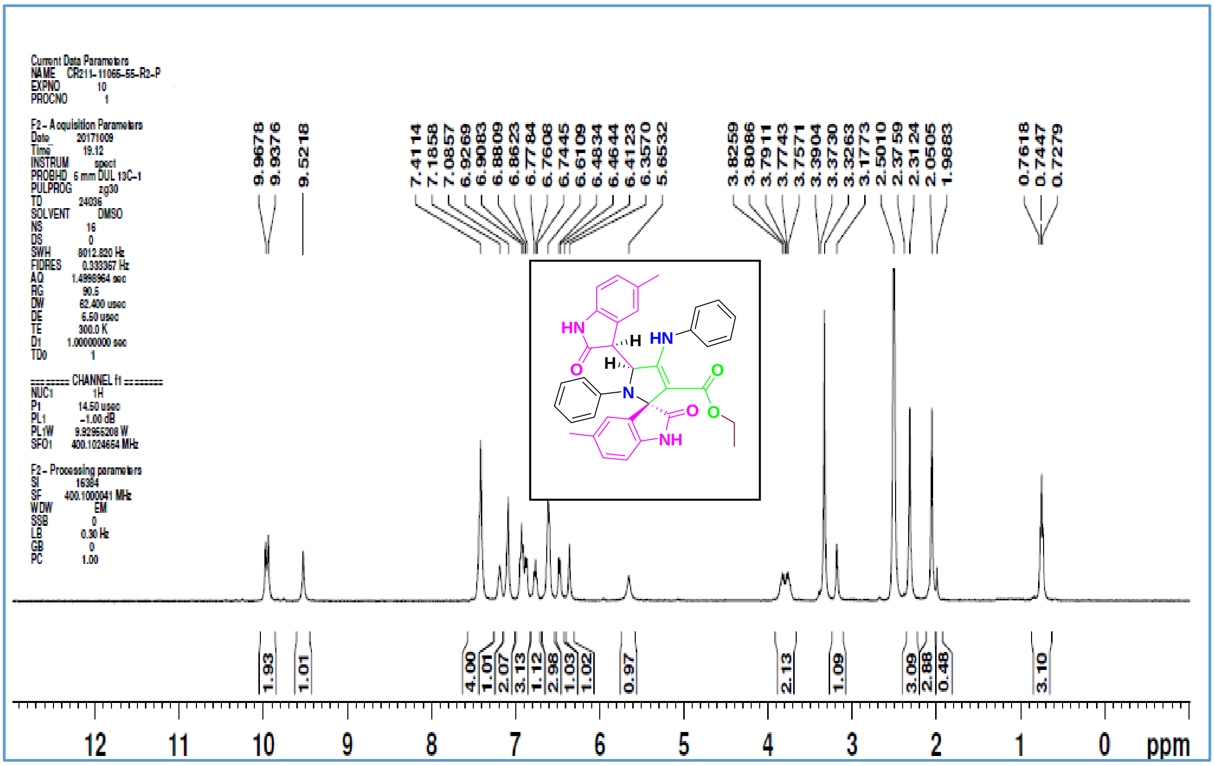
[13]C NMR of compound **1g**



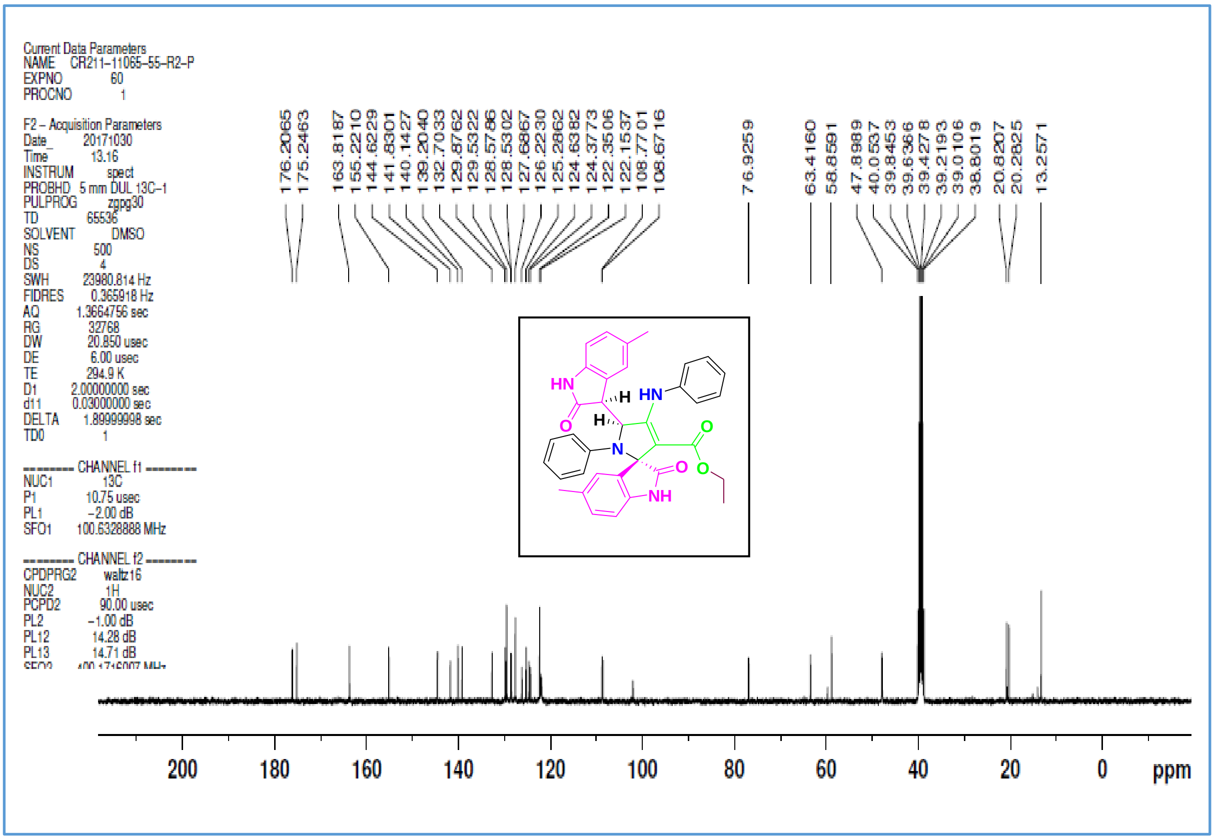
[1]H NMR of compound **1h**



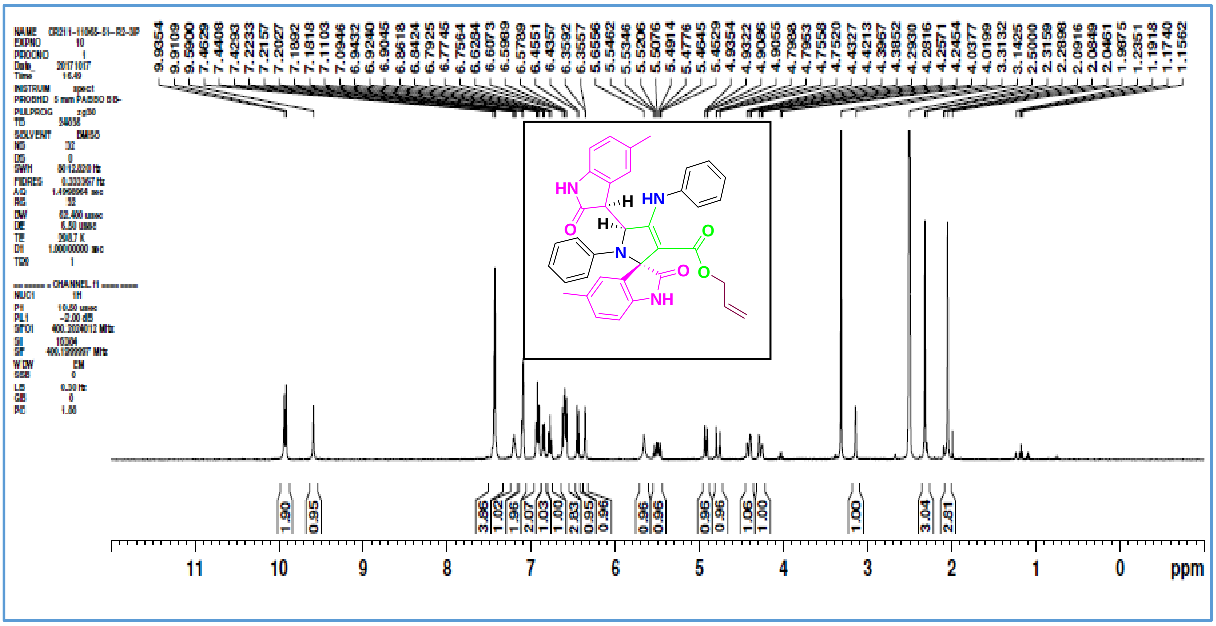
[13]C NMR of compound **1h**



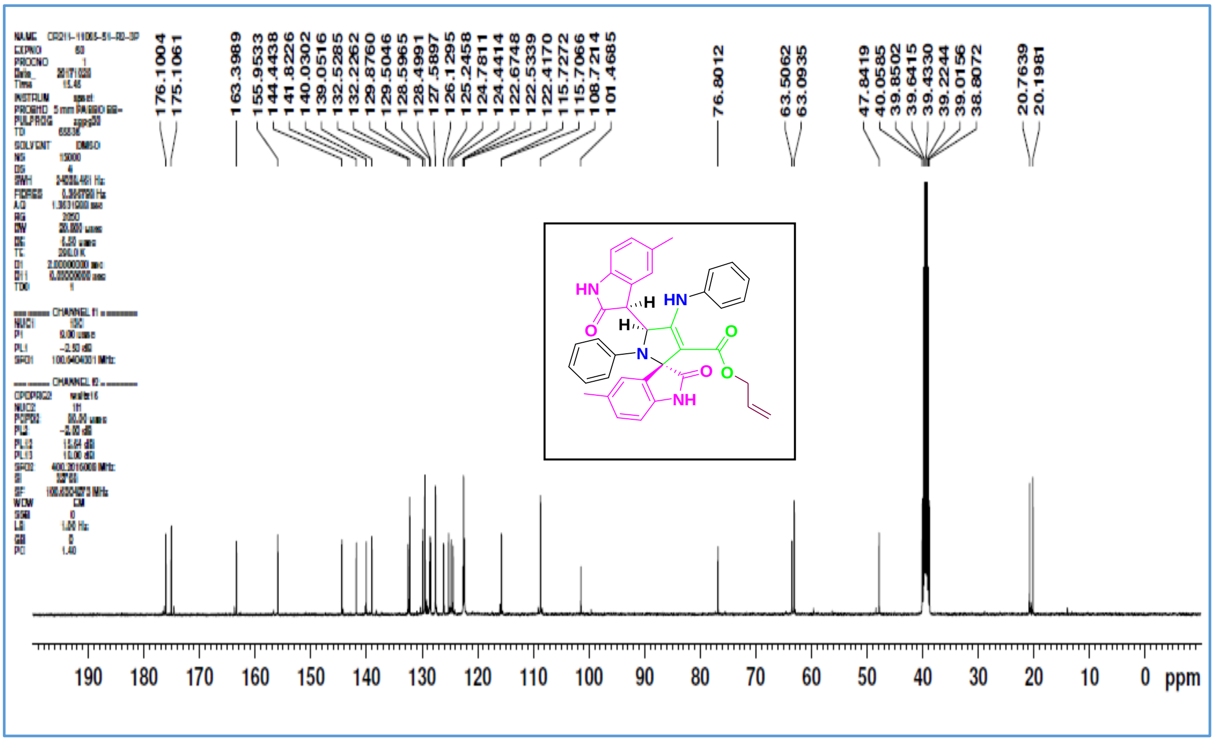
[1]H NMR of compound **1i**



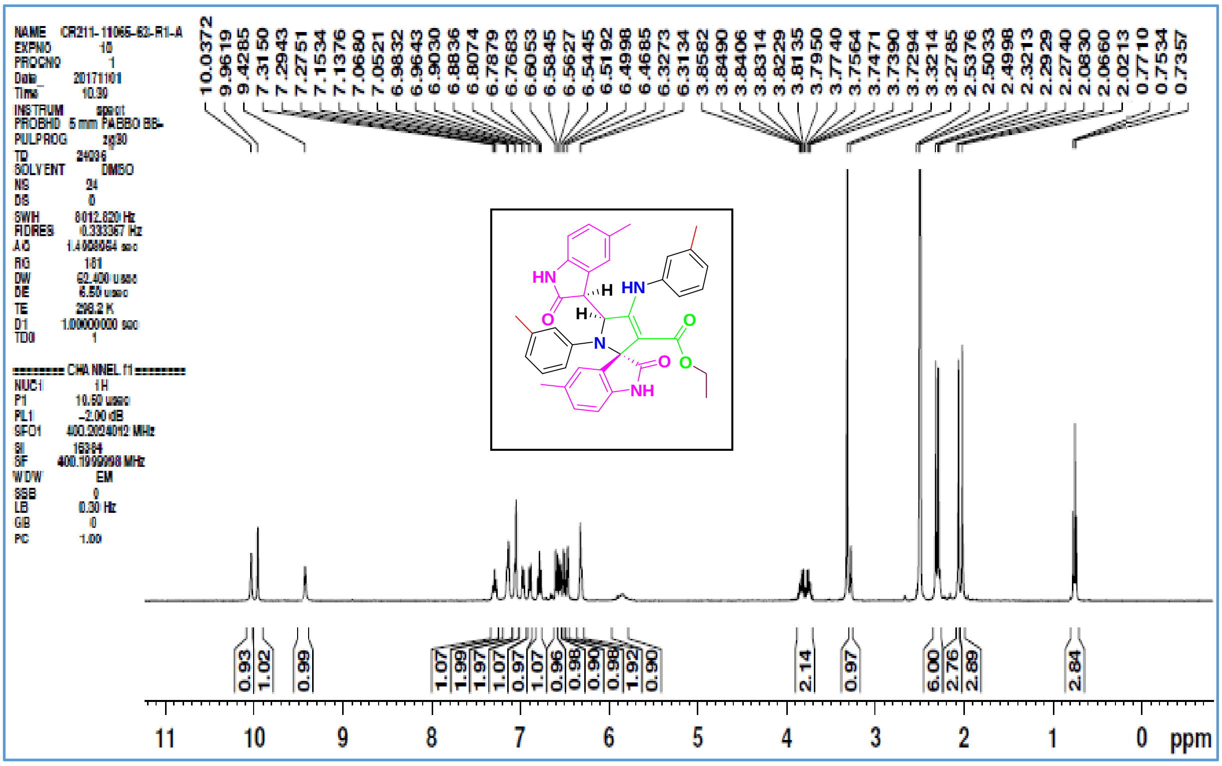
[13]C NMR of compound **1i**



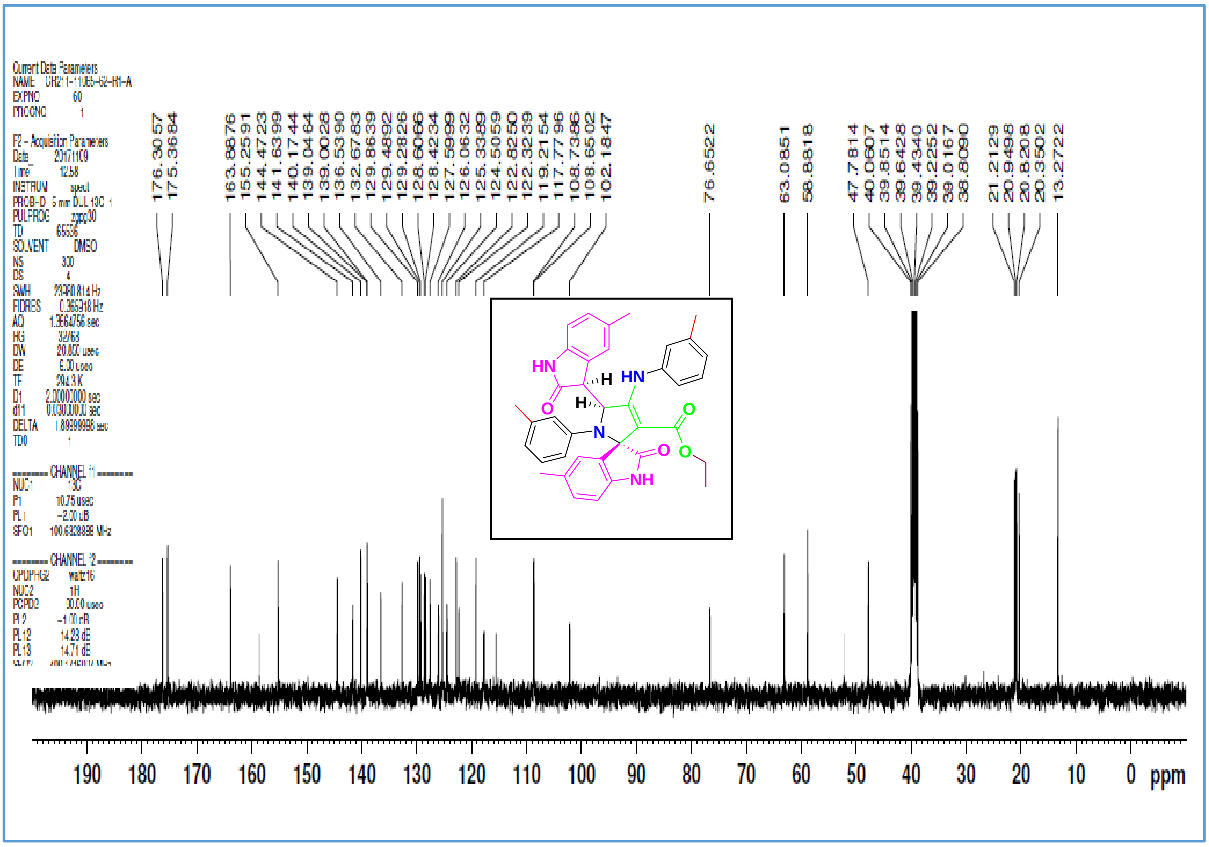
[1]H NMR of compound **1j**



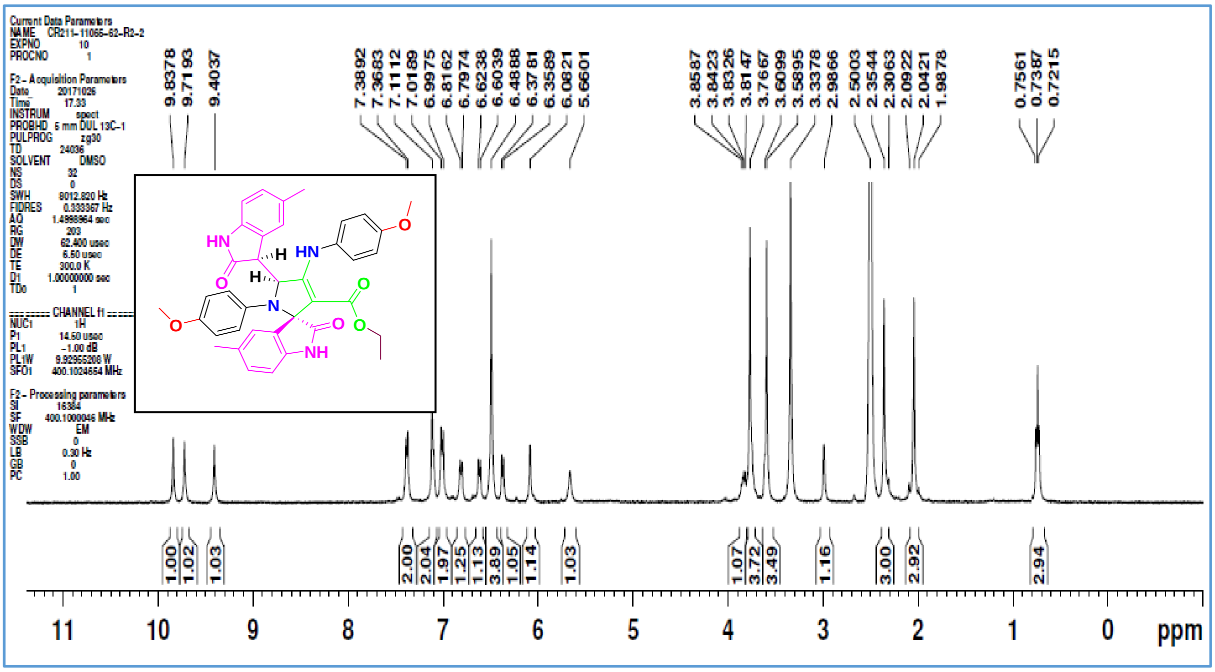
[13]C NMR of compound **1j**



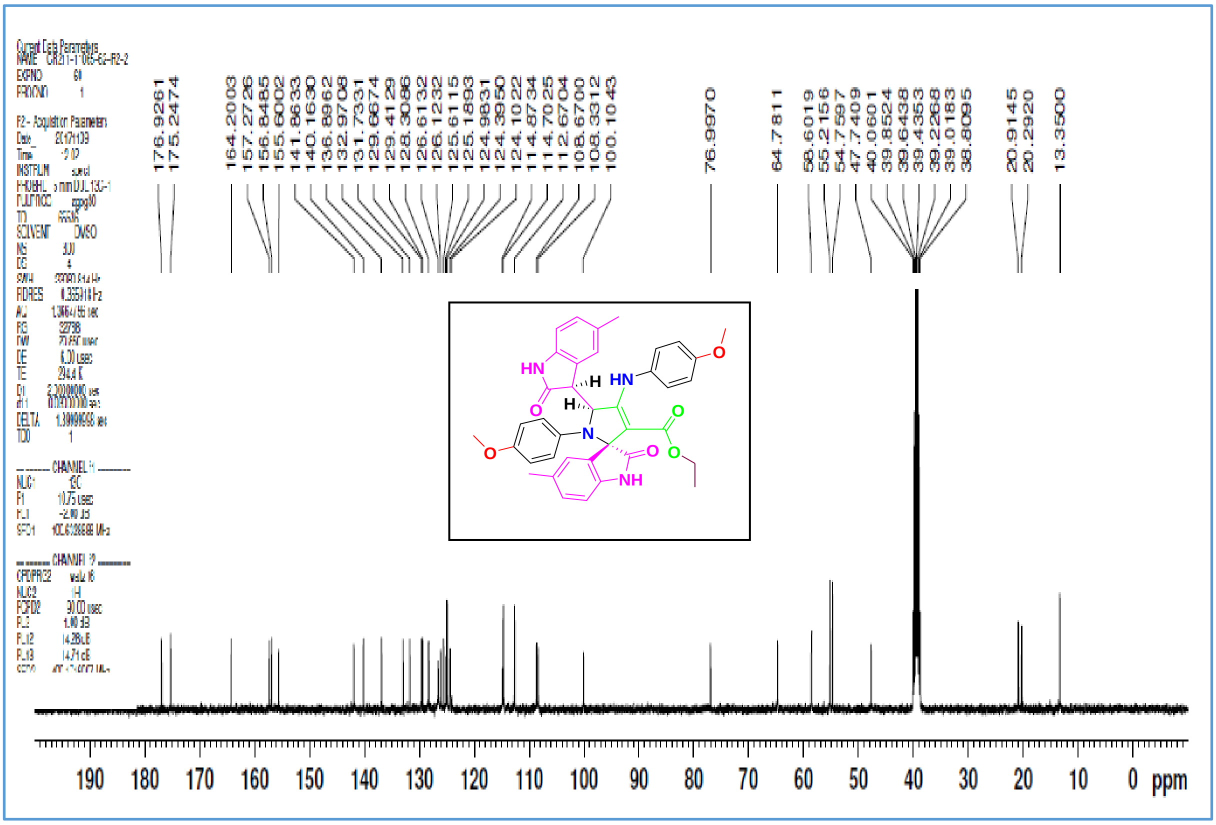
[1]H NMR of compound **1k**



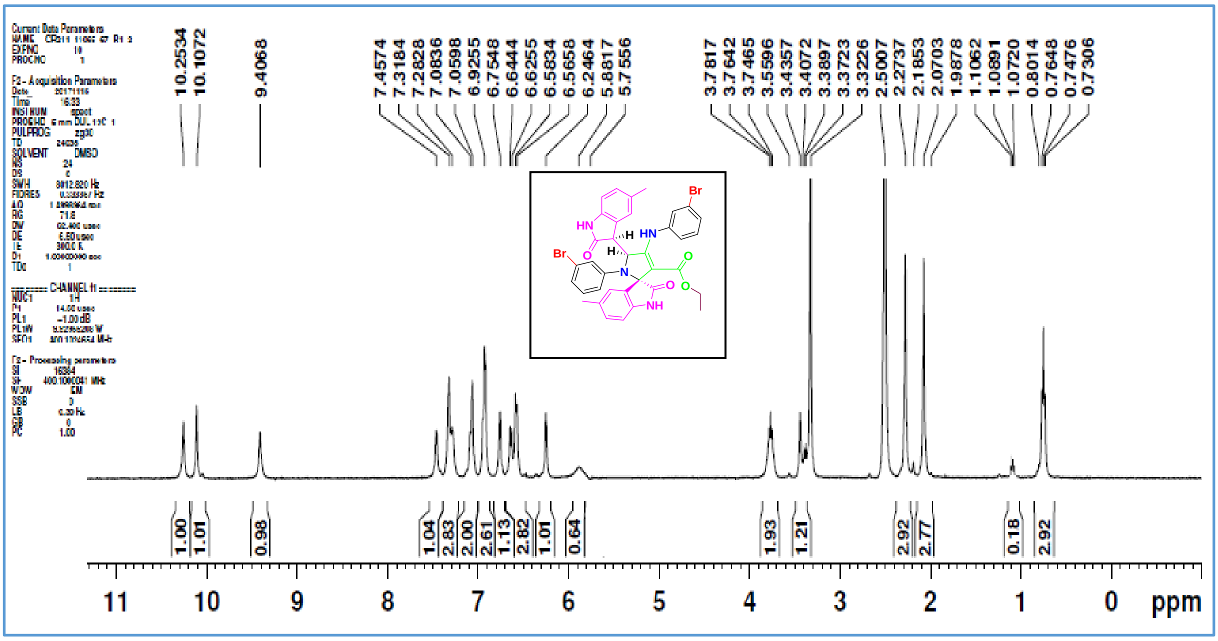
[13]C NMR of compound **1k**



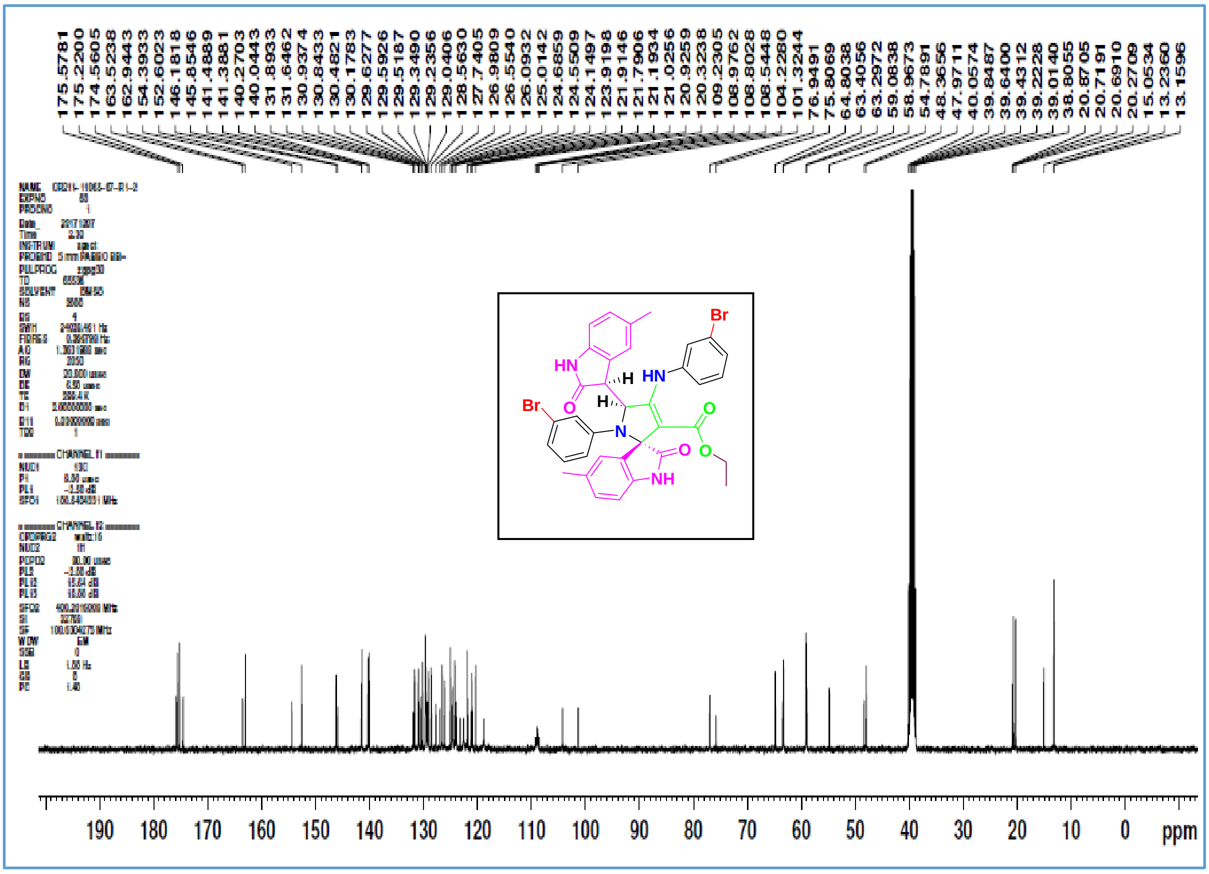
[1]H NMR of compound **1l**



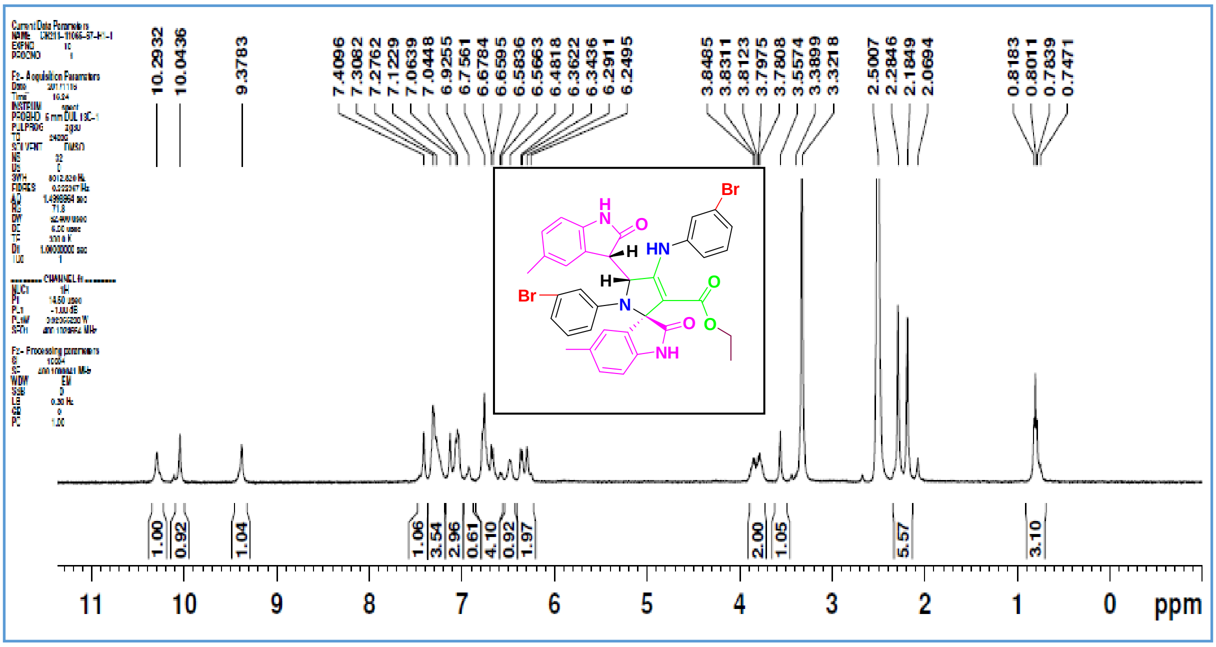
[13]C NMR of compound **1l**



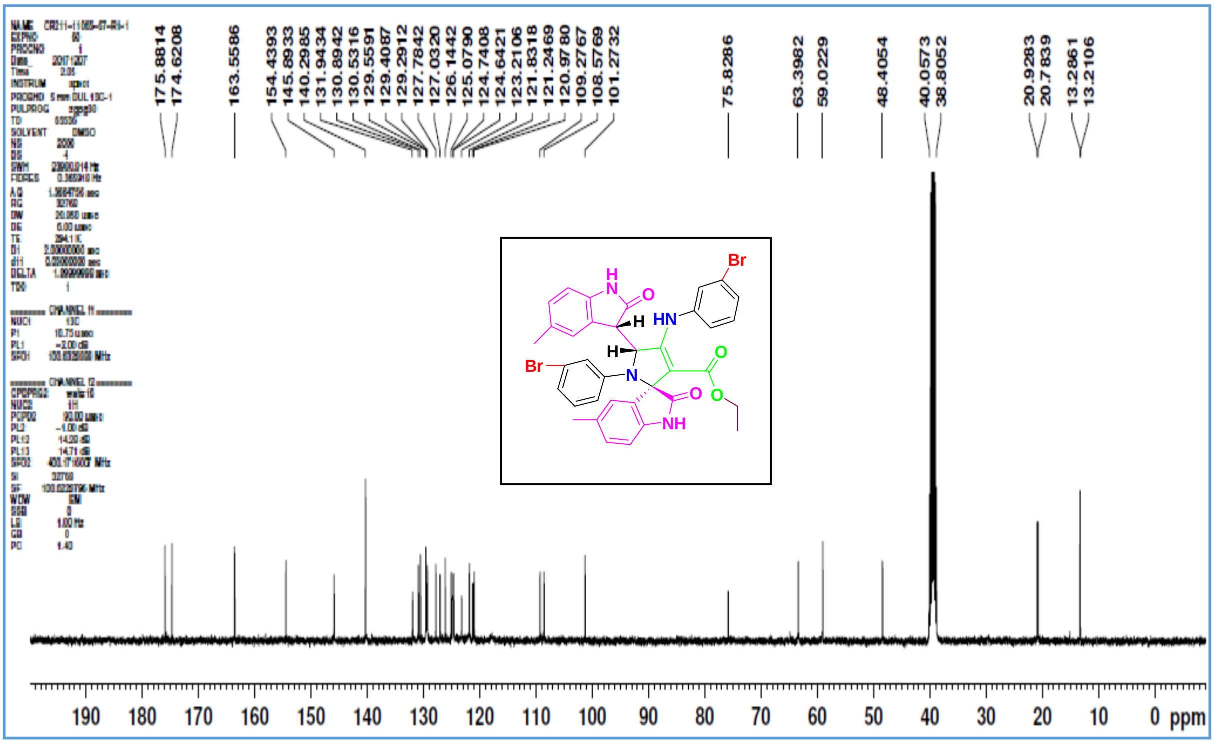
[1]H NMR of compound **1m**



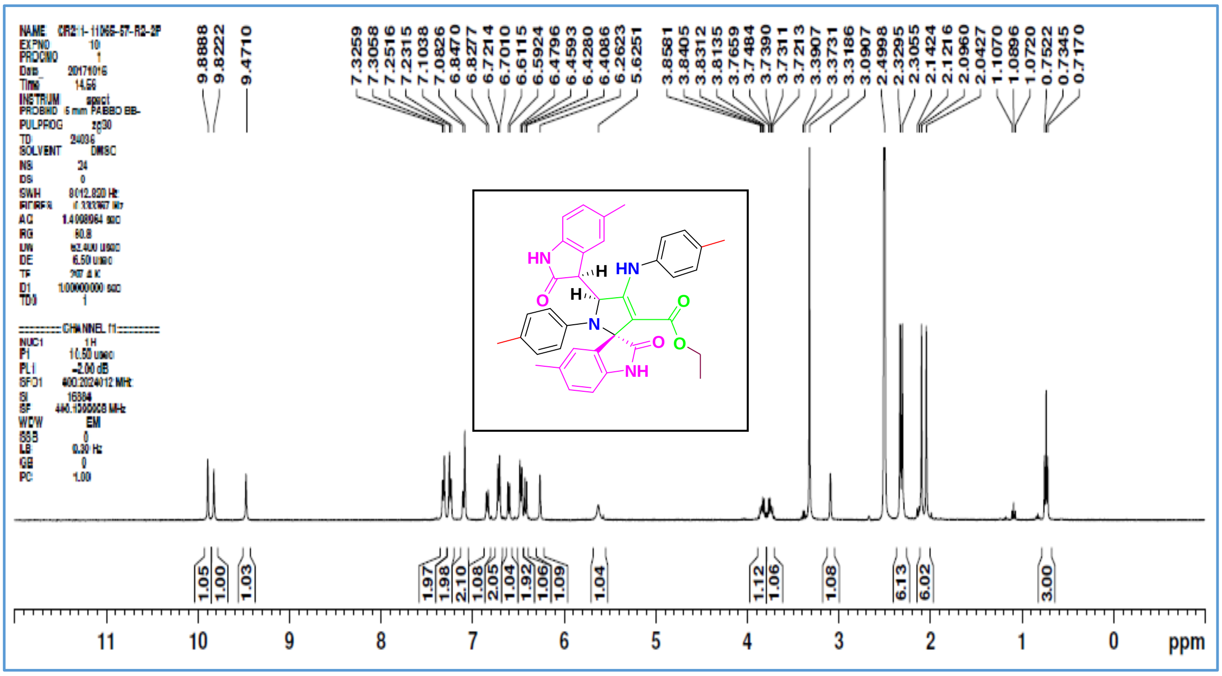
[13]C NMR of compound **1m**



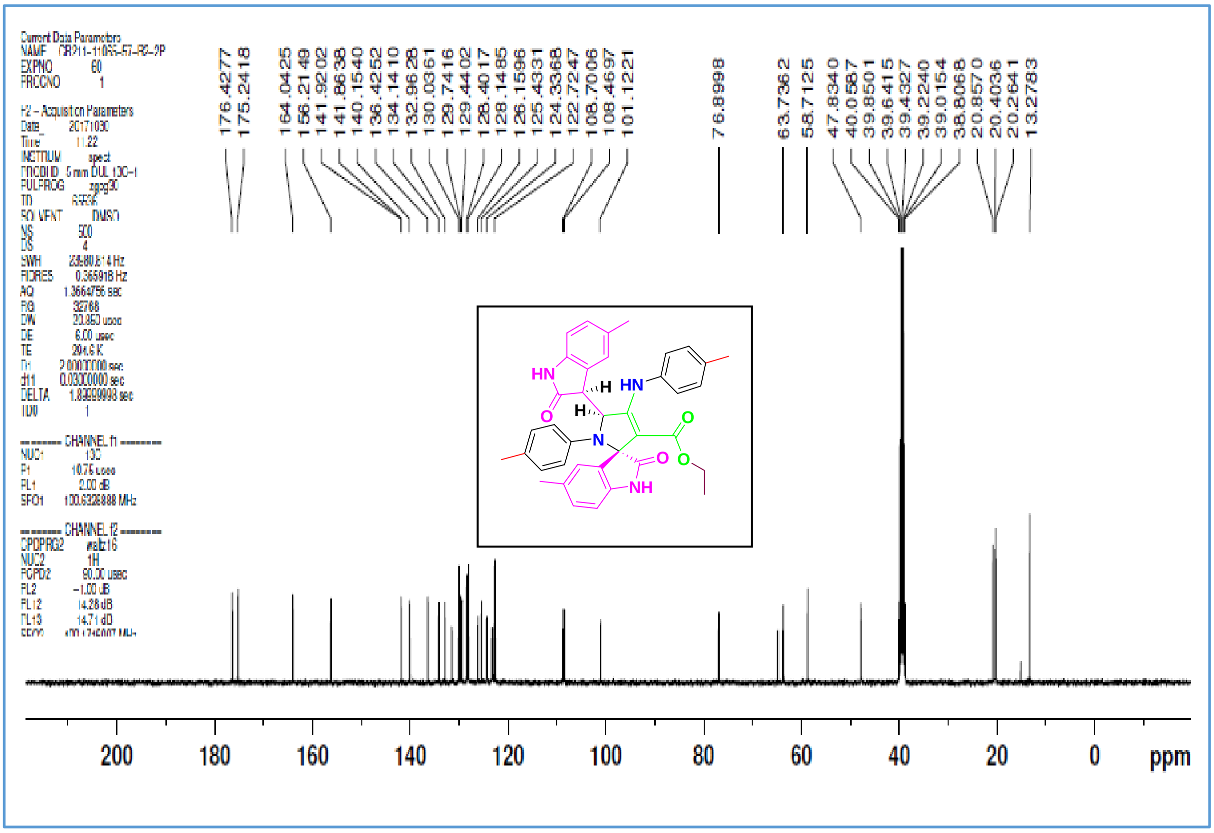
[1]H NMR of compound **1m´**



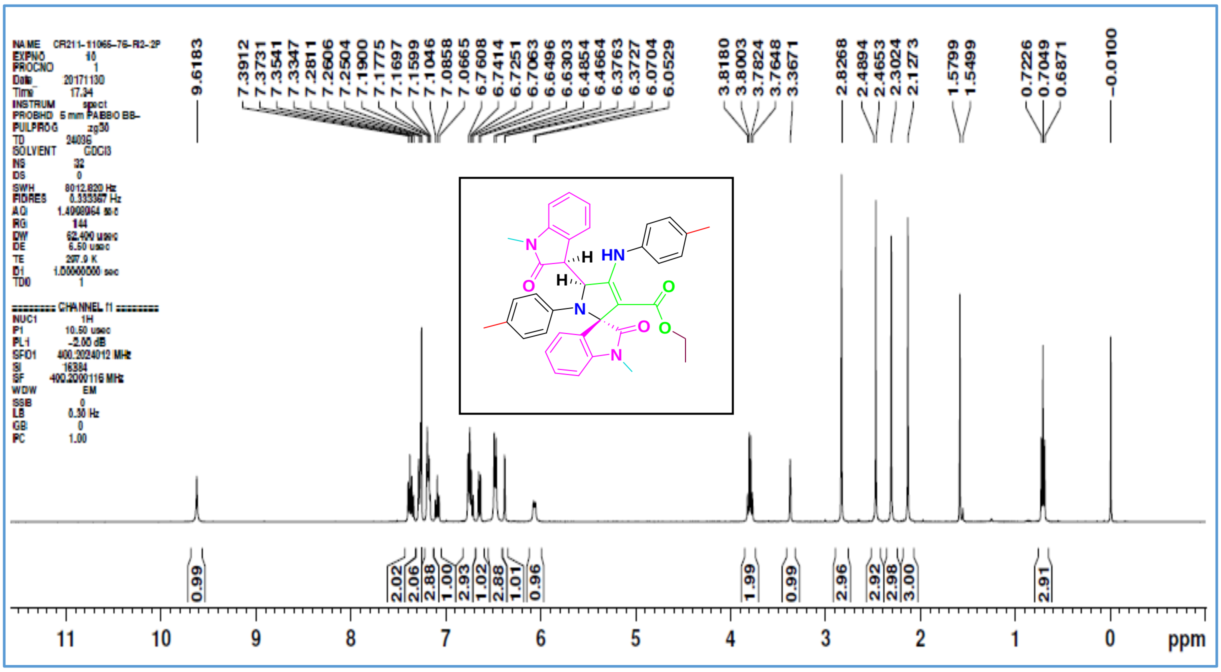
[13]C NMR of compound **1m´**



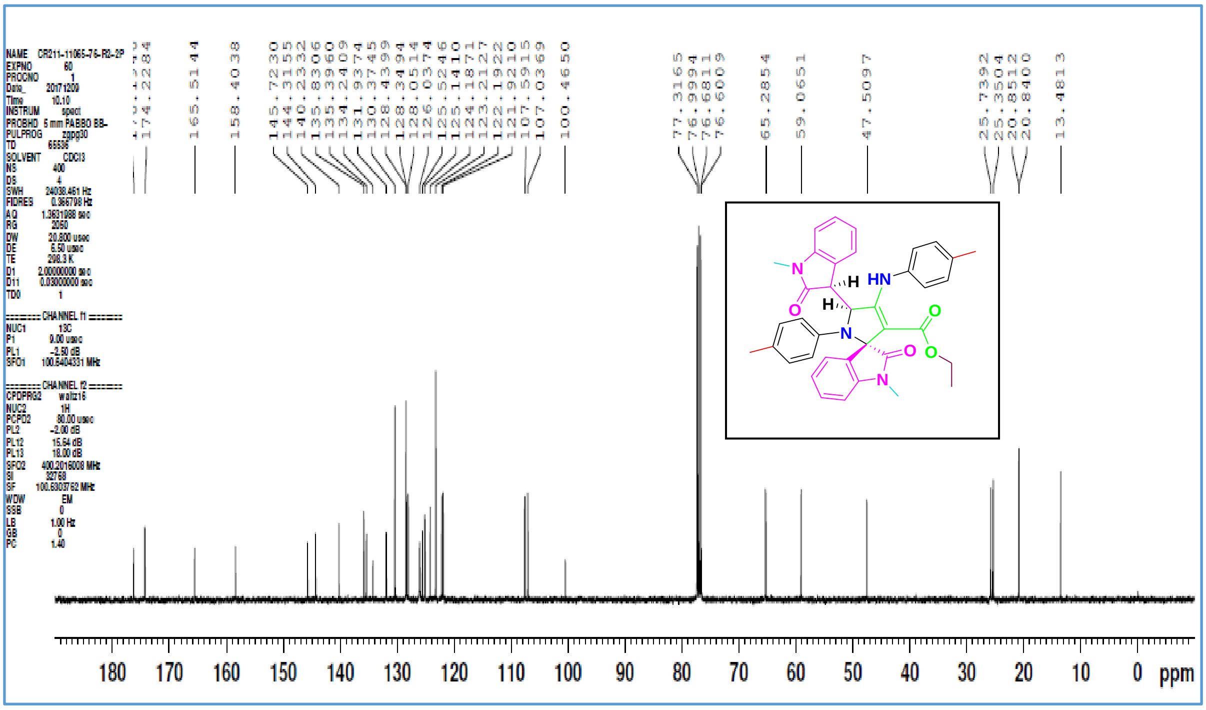
[1]H NMR of compound **1n**



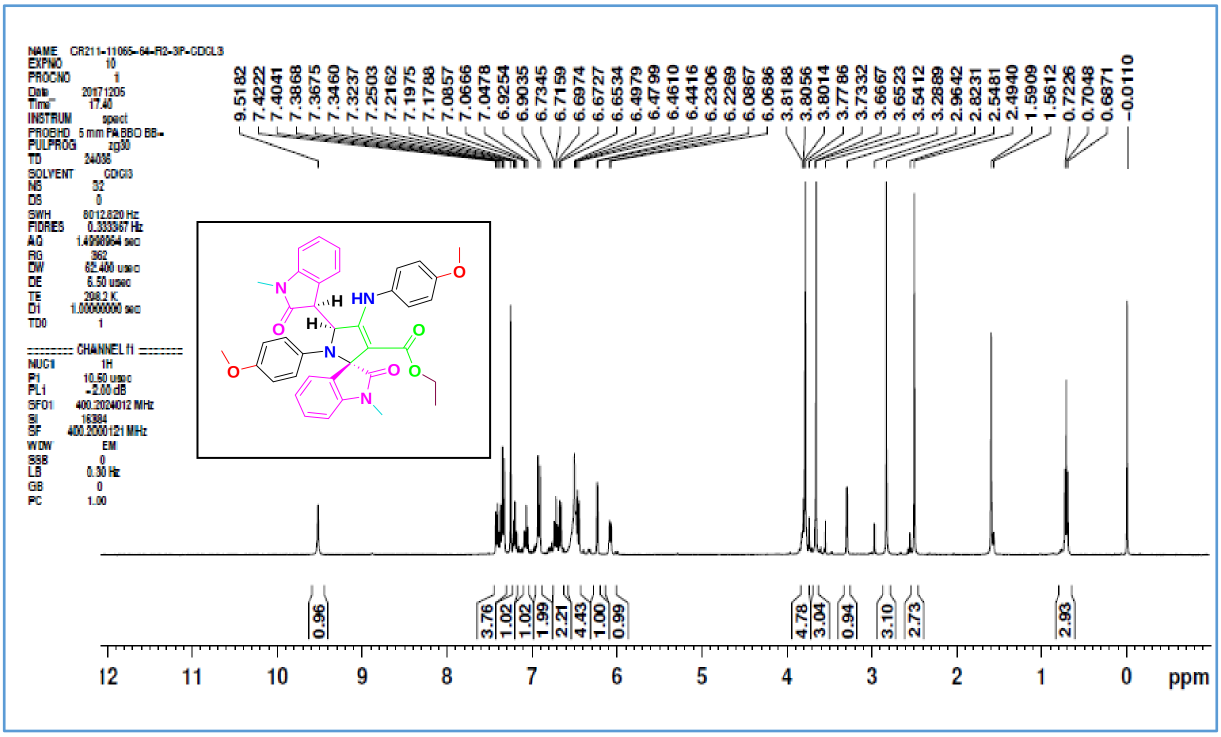
[13]C NMR of compound **1n**



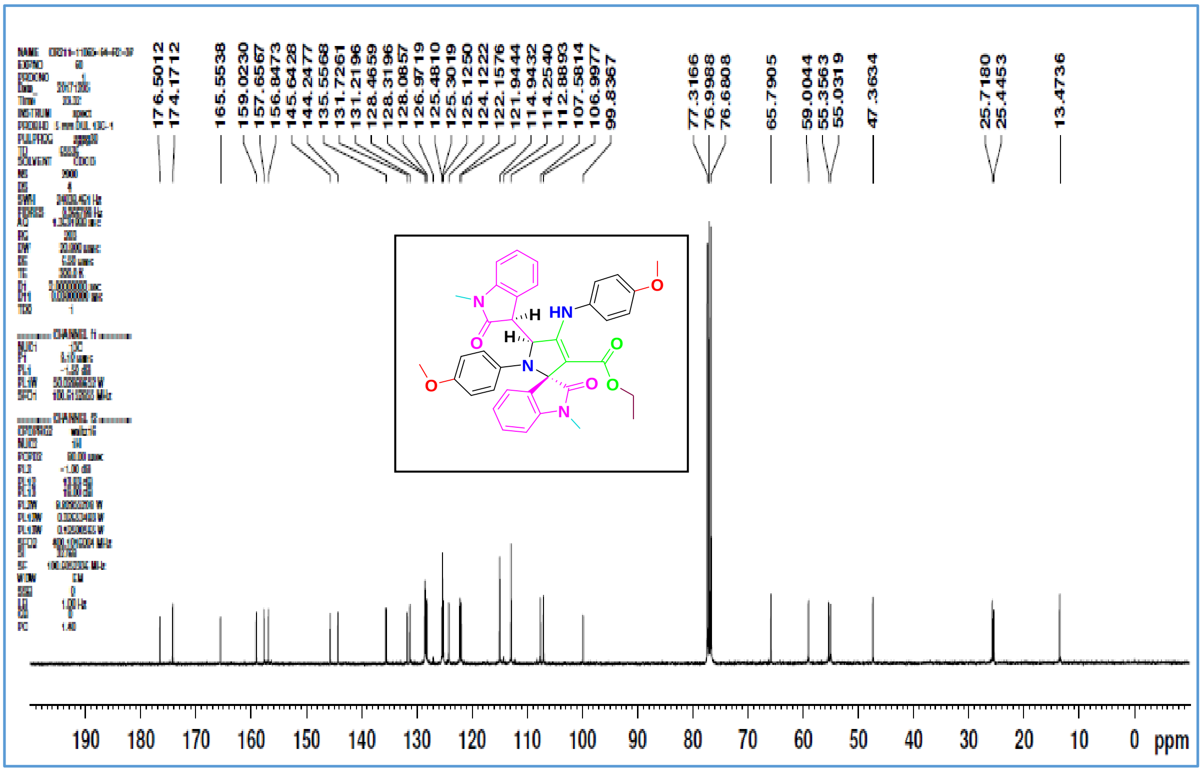
[1]H NMR of compound **1o**



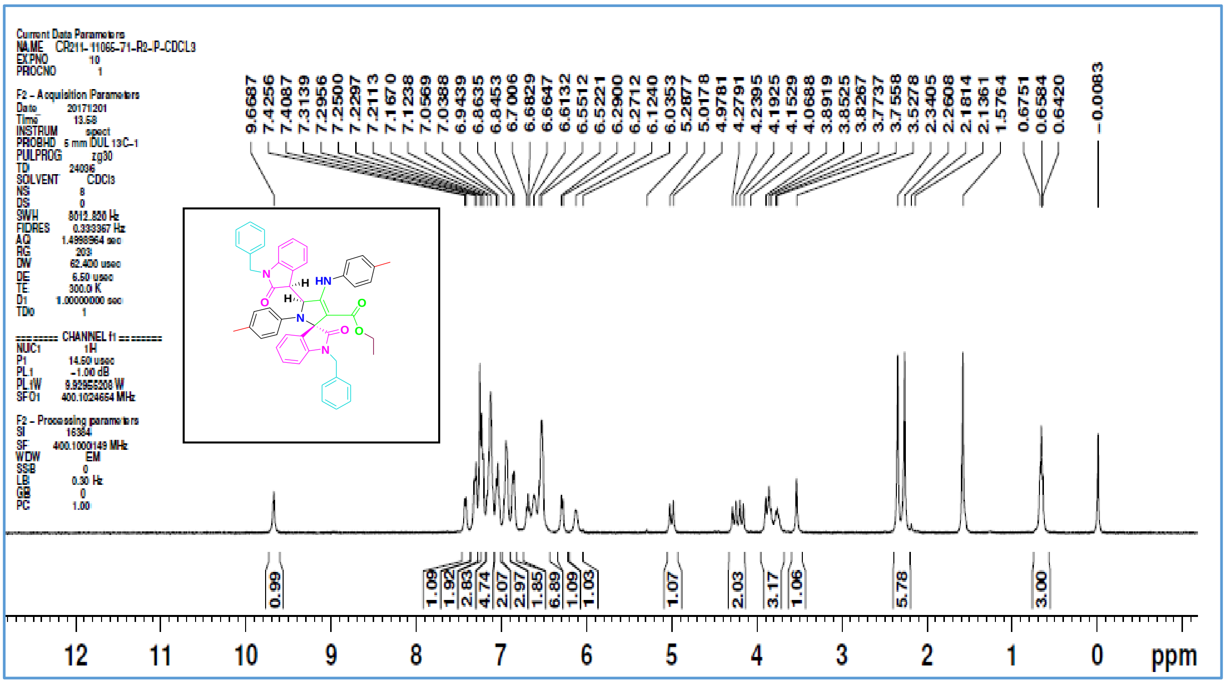
[13]C NMR of compound **1o**



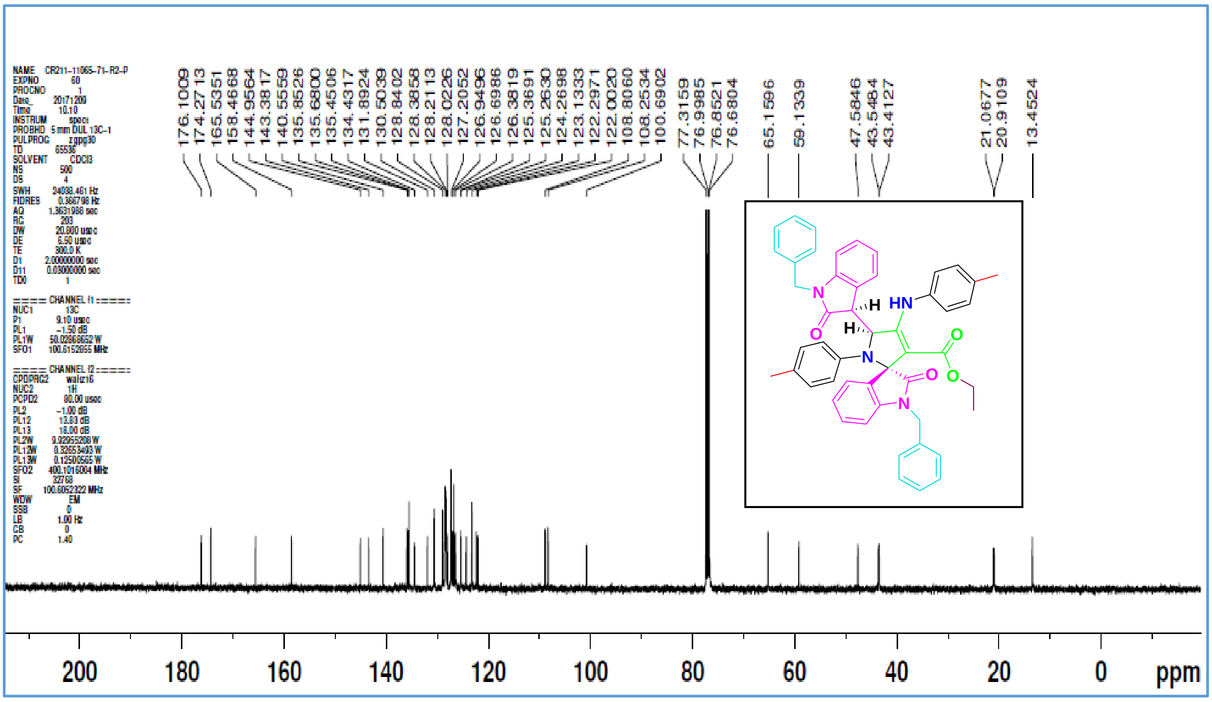
[1]H NMR of compound **1p**



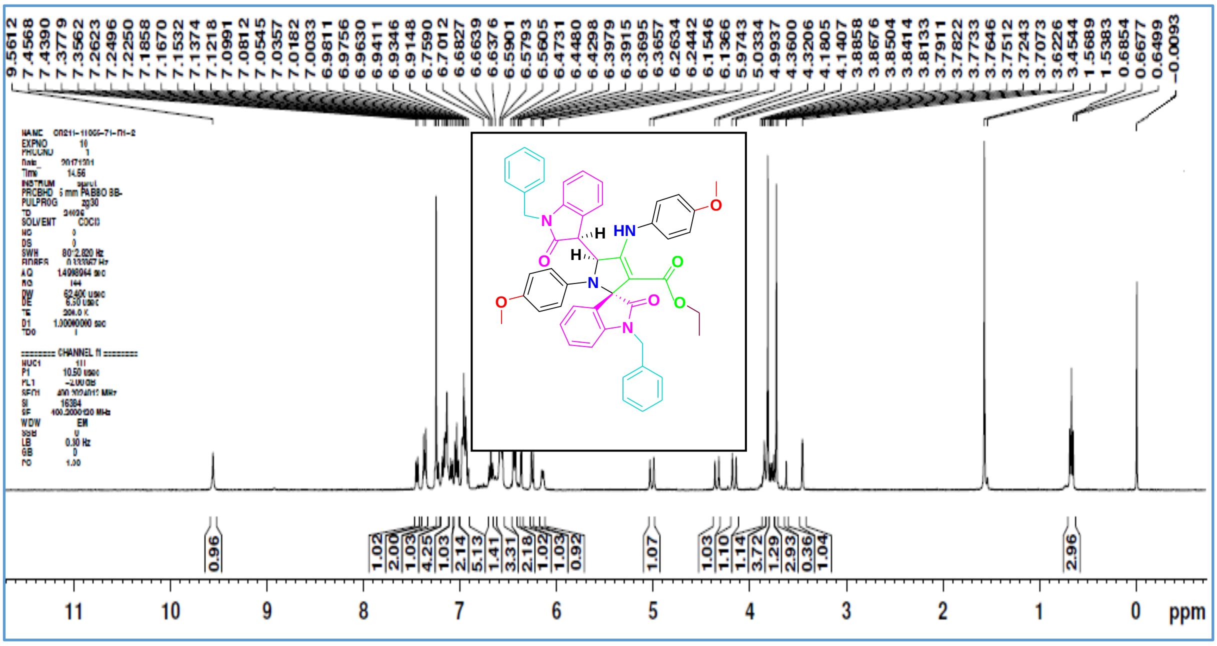
[13]C NMR of compound **1p**



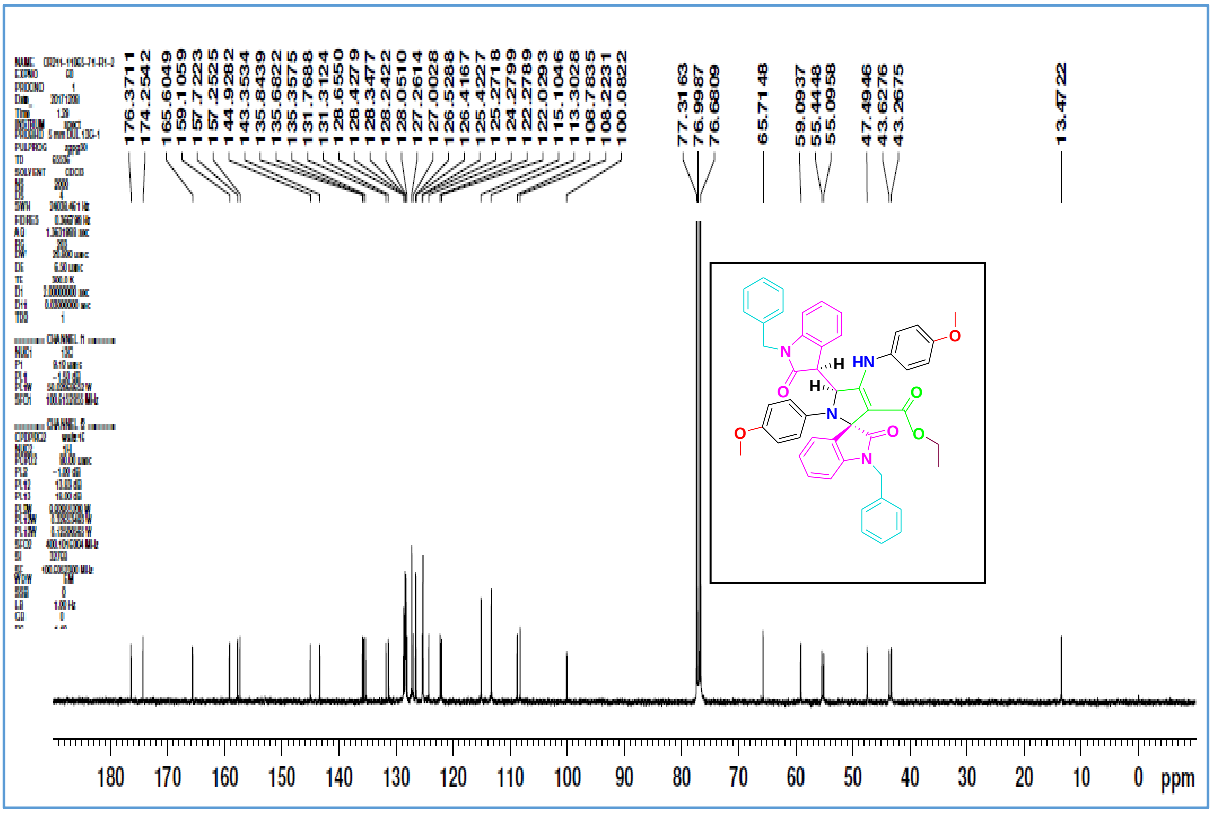
[1]H NMR of compound **1q**



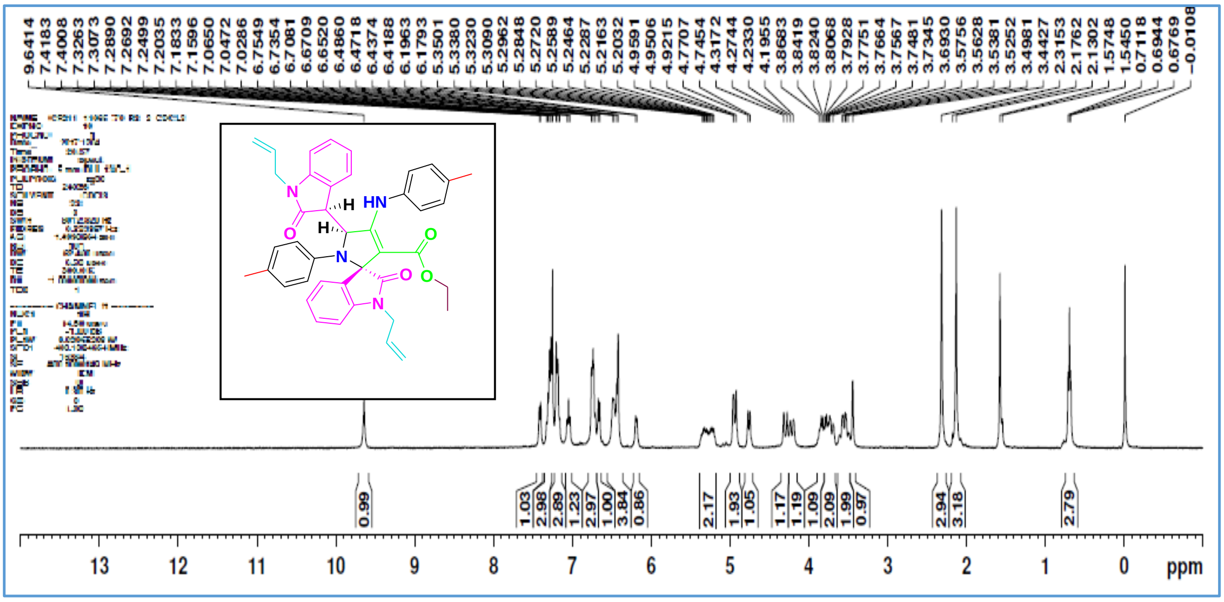
[13]C NMR of compound **1q**



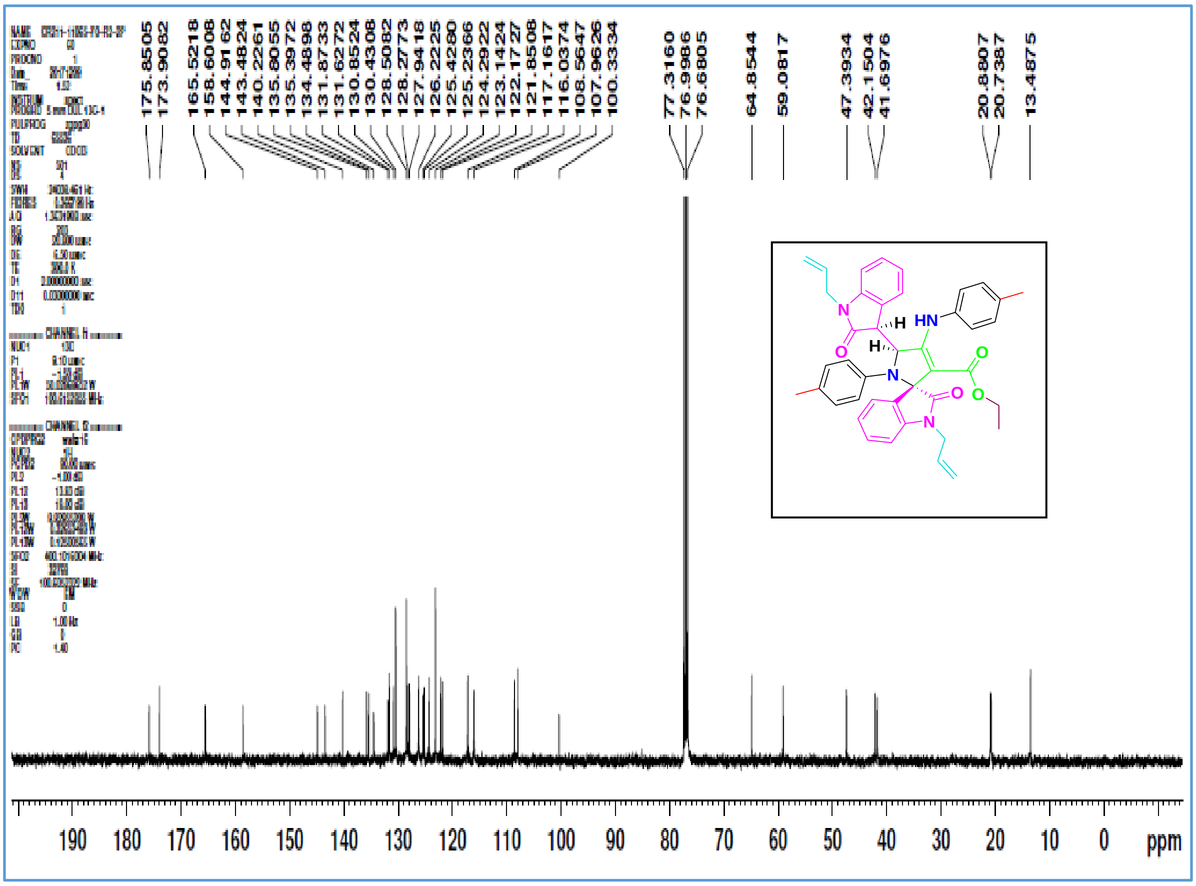
[1]H NMR of compound **1r**



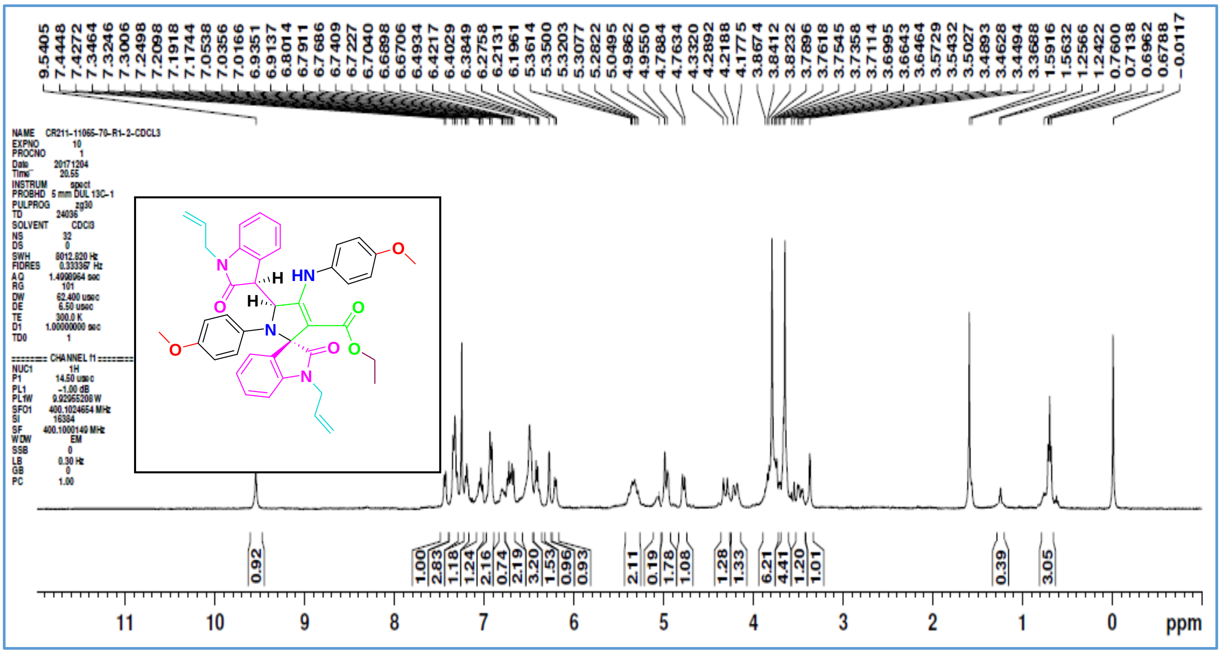
[13]C NMR of compound **1r**



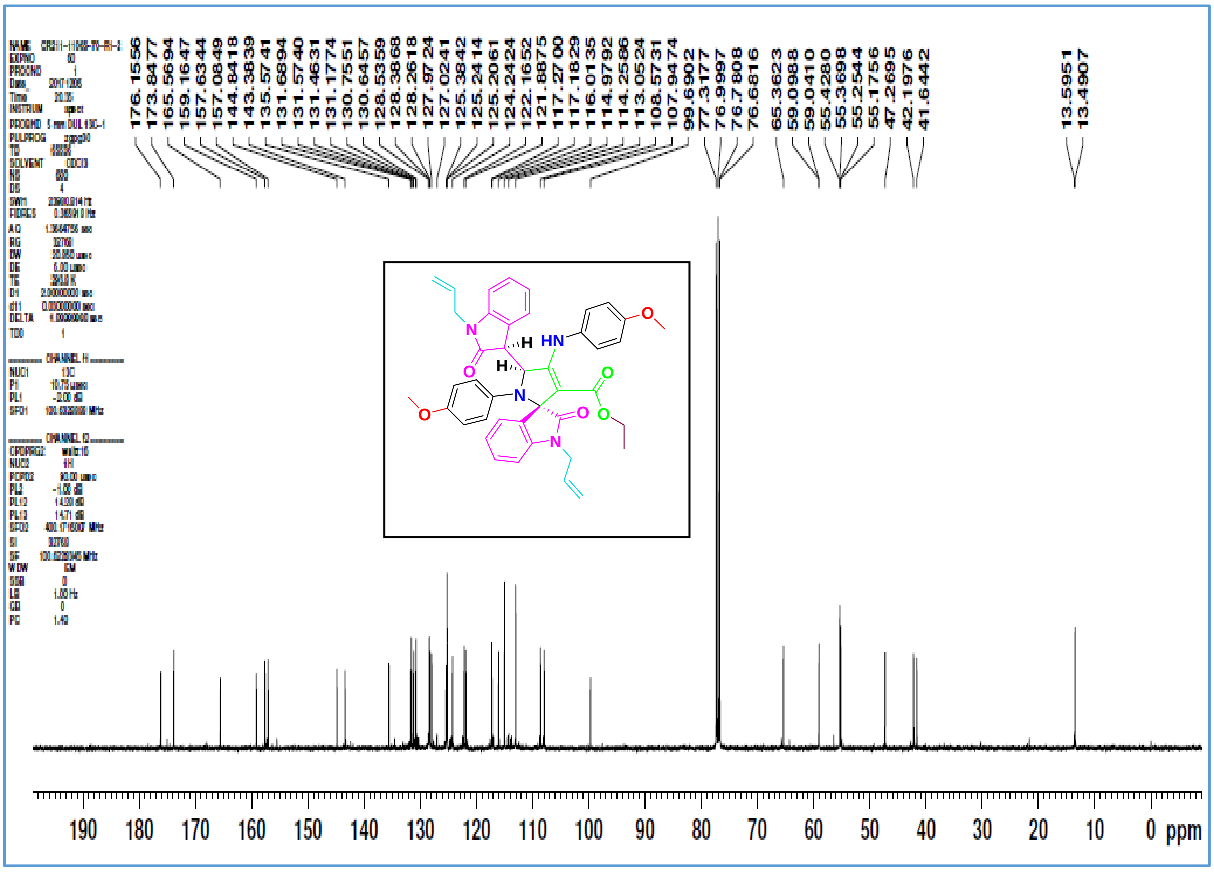
[1]H NMR of compound **1s**



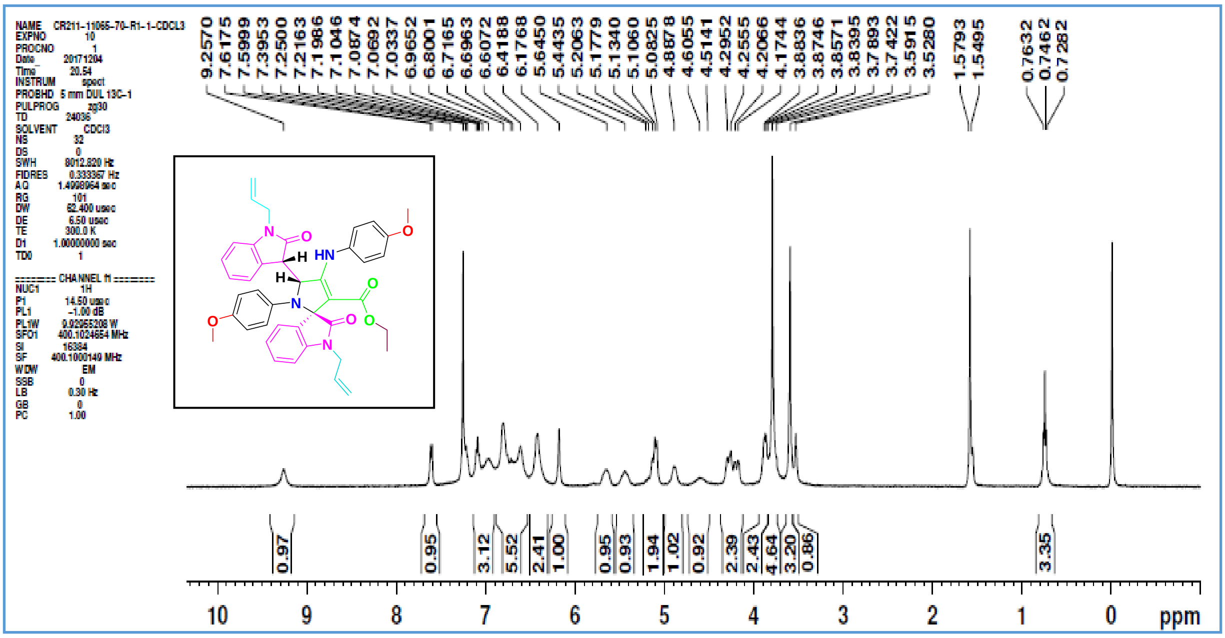
[13]C NMR of compound **1s**



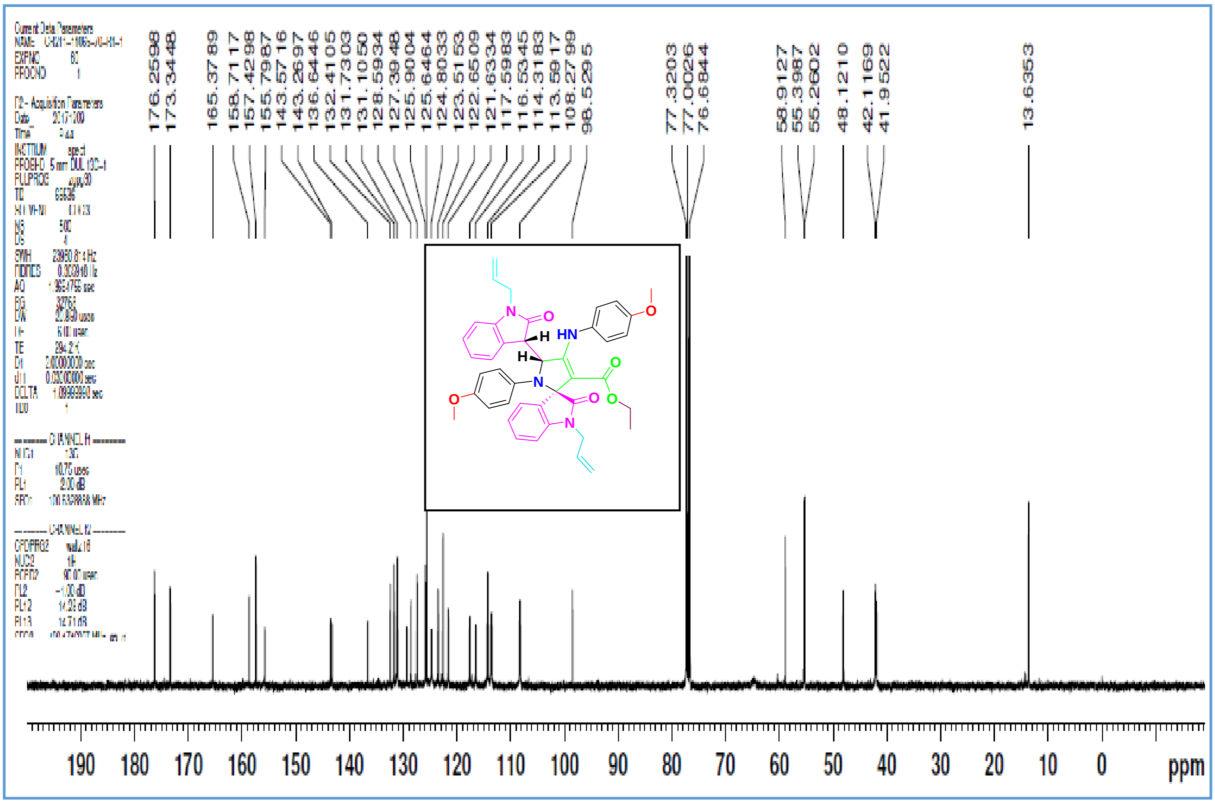
[1]H NMR of compound **1t**



[13]C NMR of compound **1t**

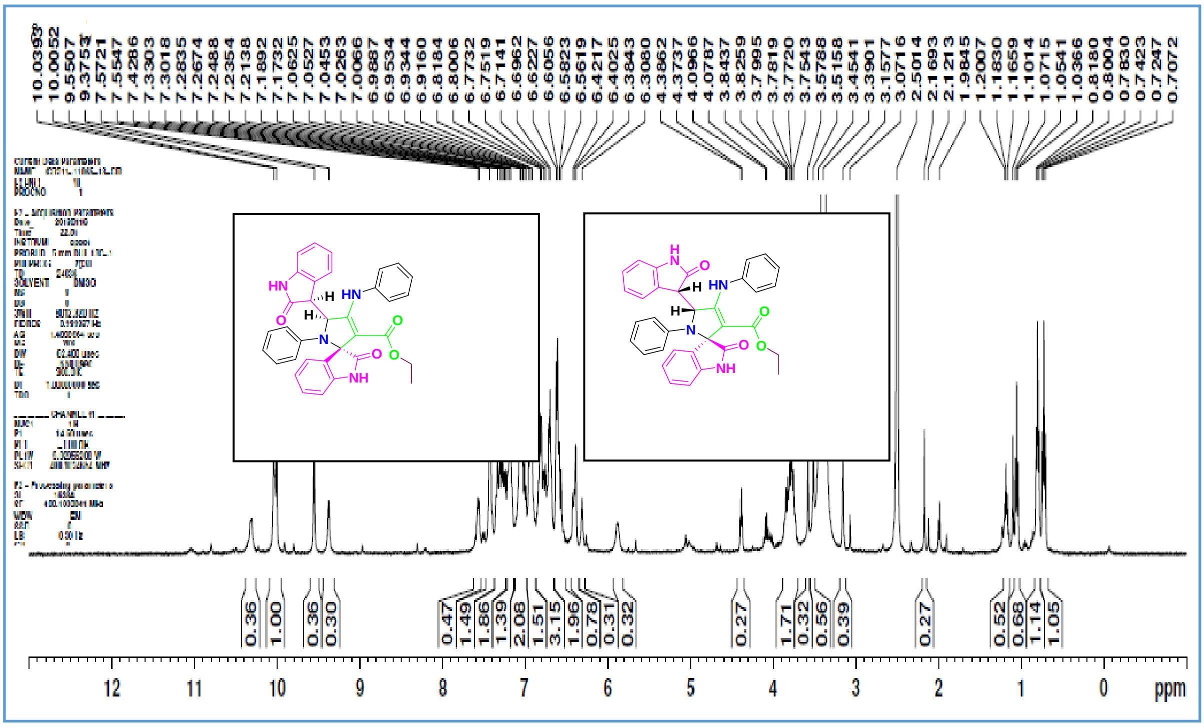


[1]H NMR of compound **1t´**

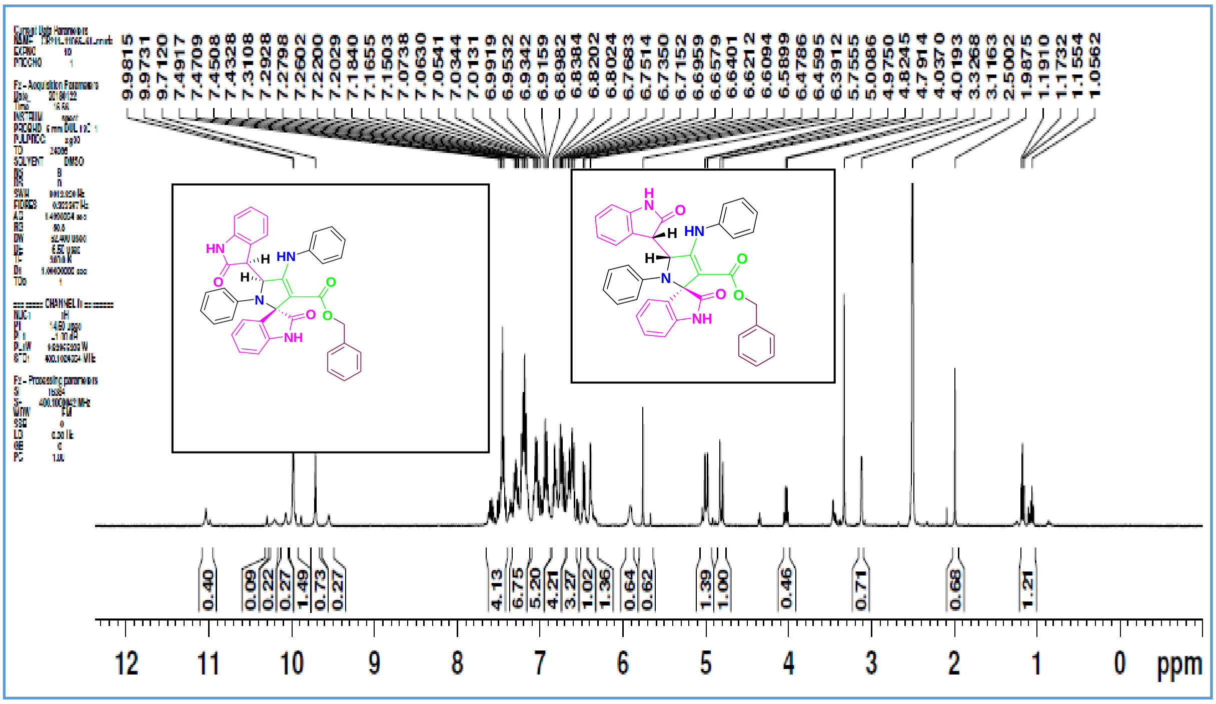


[13]C NMR of compound **1t´**

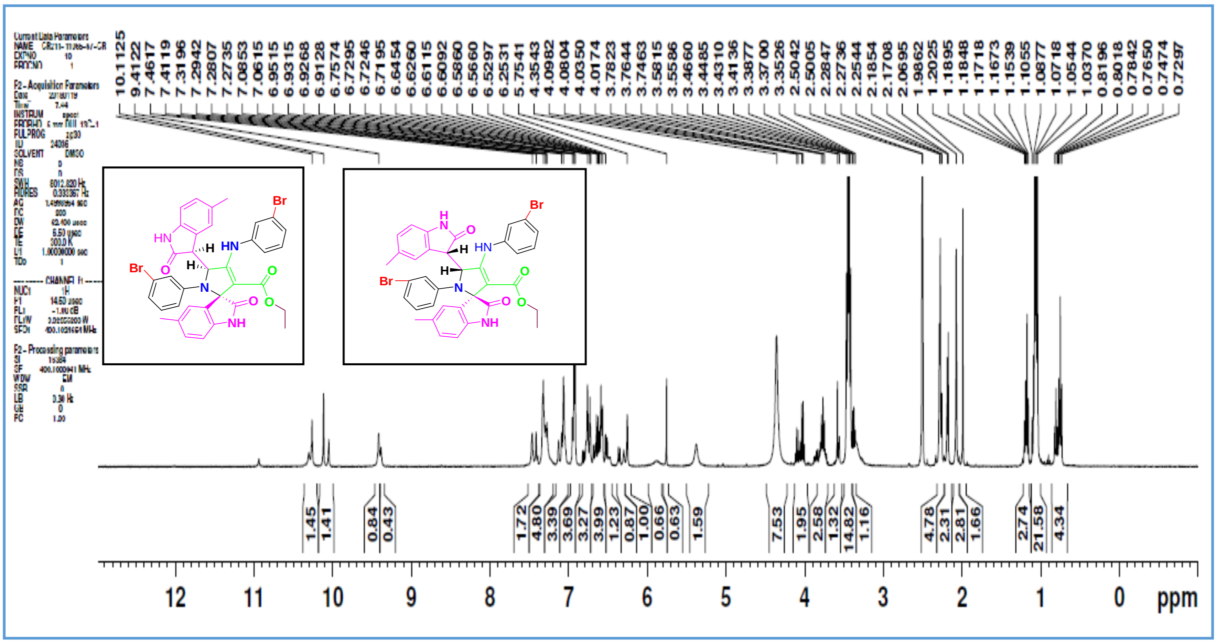
Copy of ^{1}H NMR spectra of crude mixture of compounds in Table2 (entries 2,3,13 & 20):



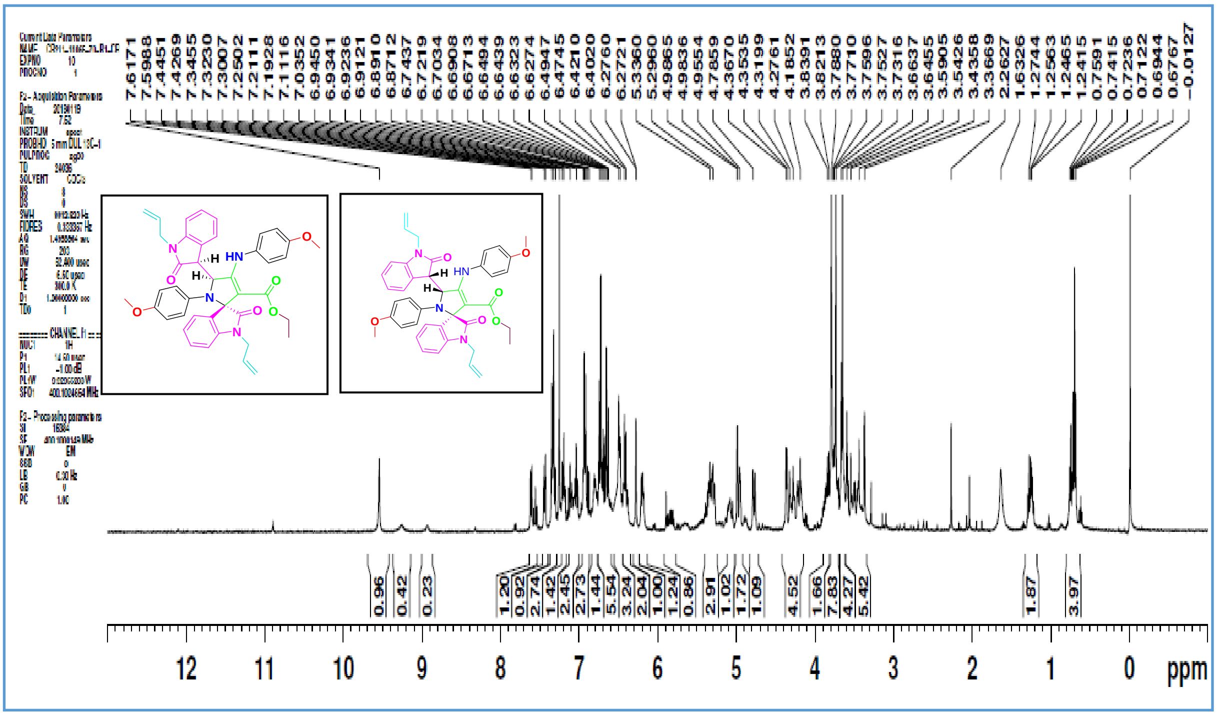
^{1}H NMR of Crude mixture of **1b** and **1b´**



^{1}H NMR of Crude mixture of **1c** and**1c´**

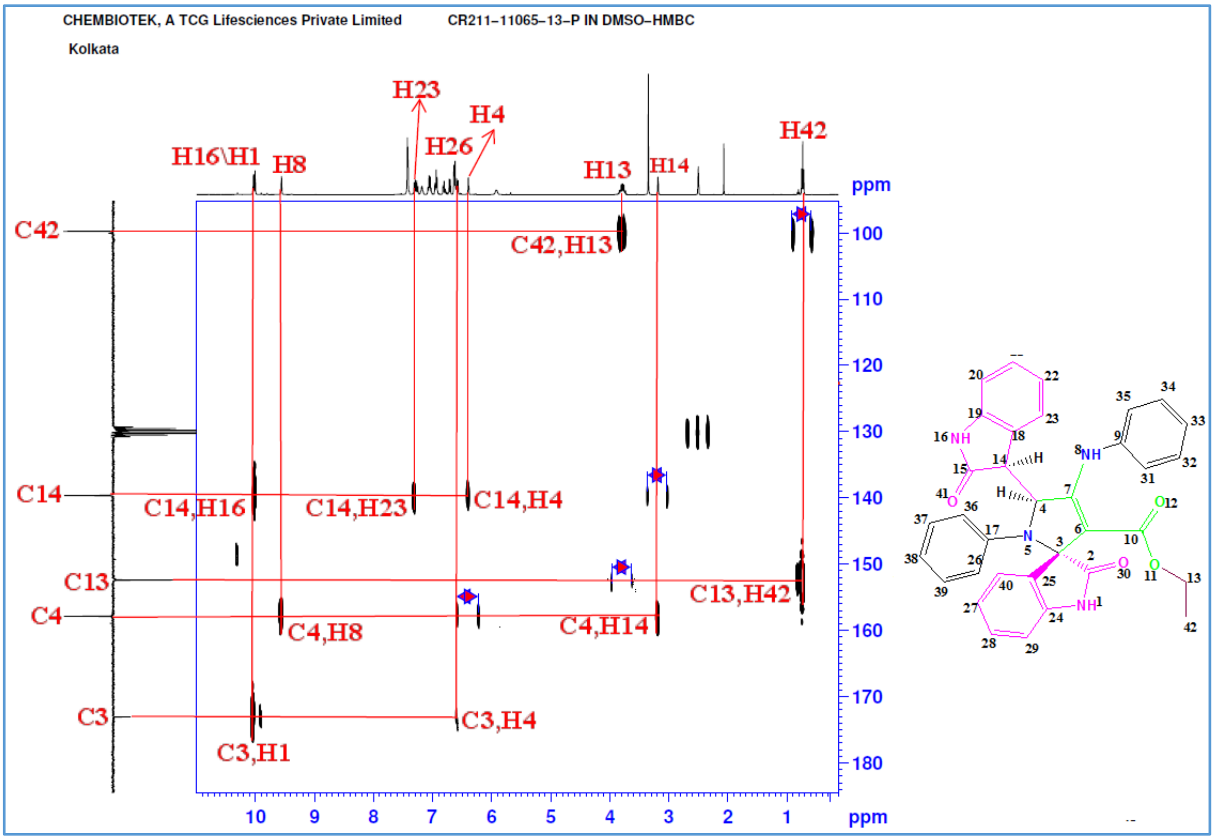


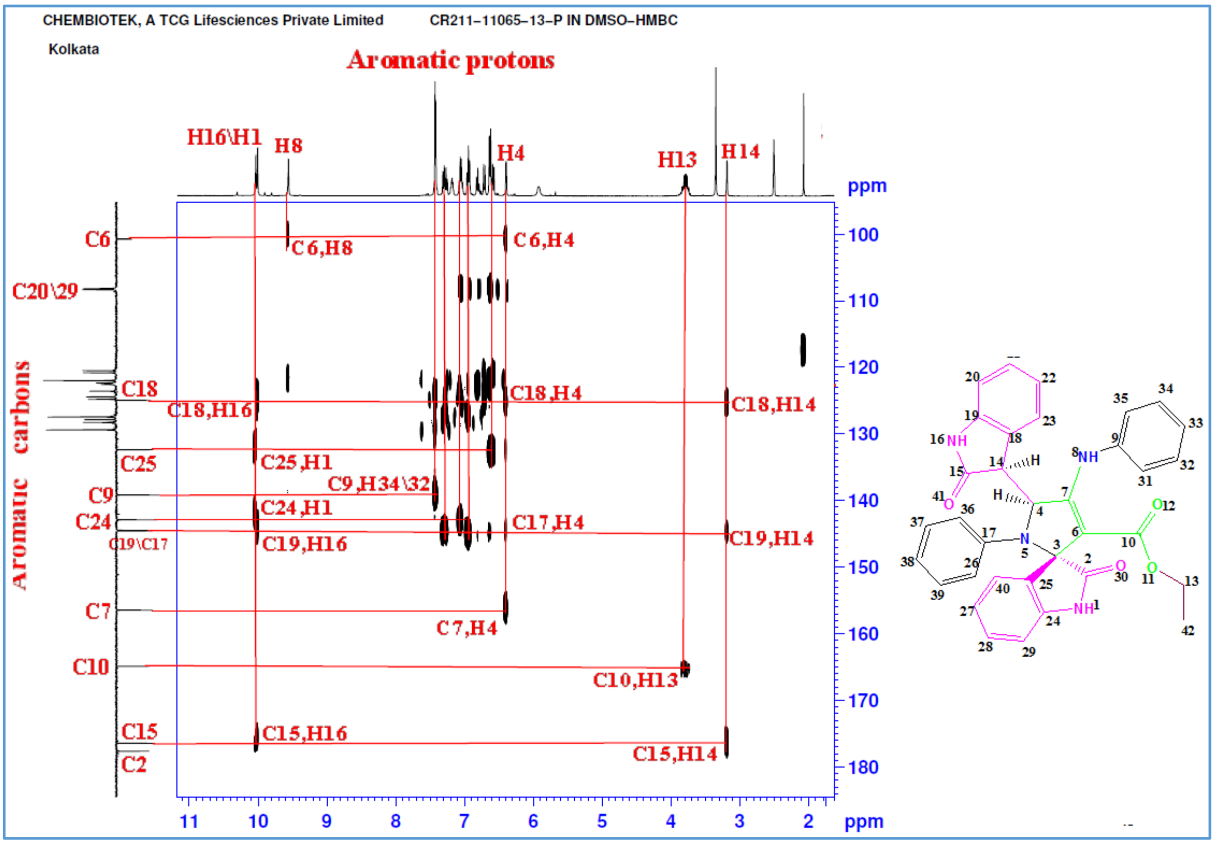
[1]H NMR of Crude mixture of **1m** and**1m´**



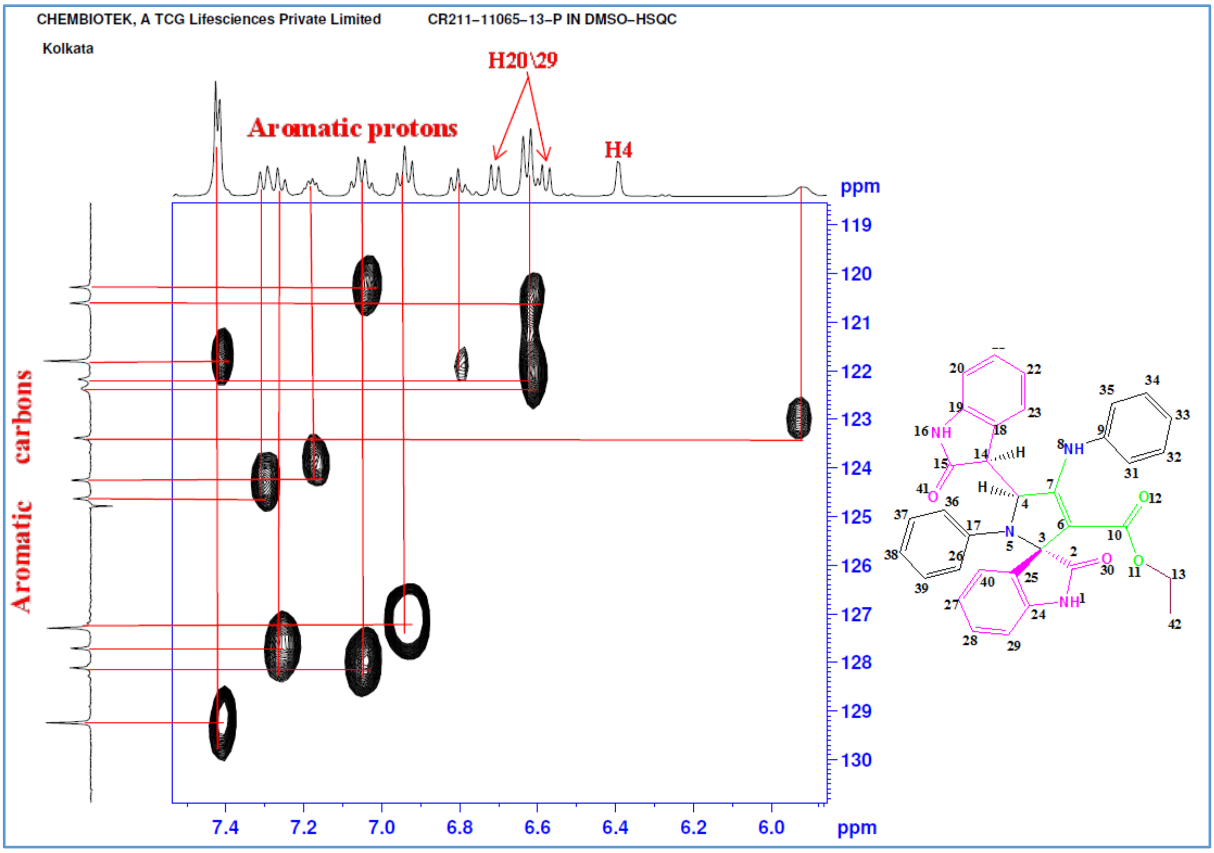
[1]H NMR of Crude mixture of **1t and 1t´**

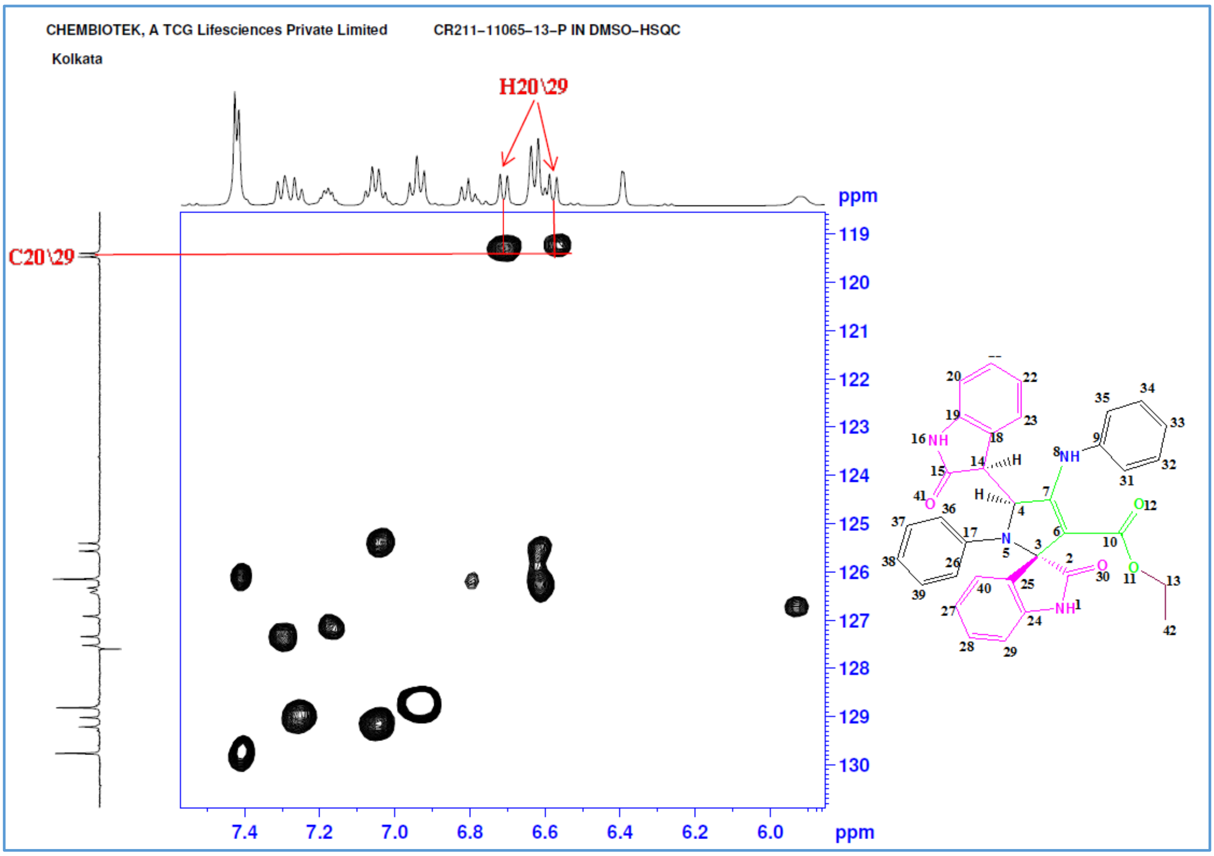
Copy of HMBC, HSQC and NOE NMR of compoundsinTable2 (entry 2& 3)



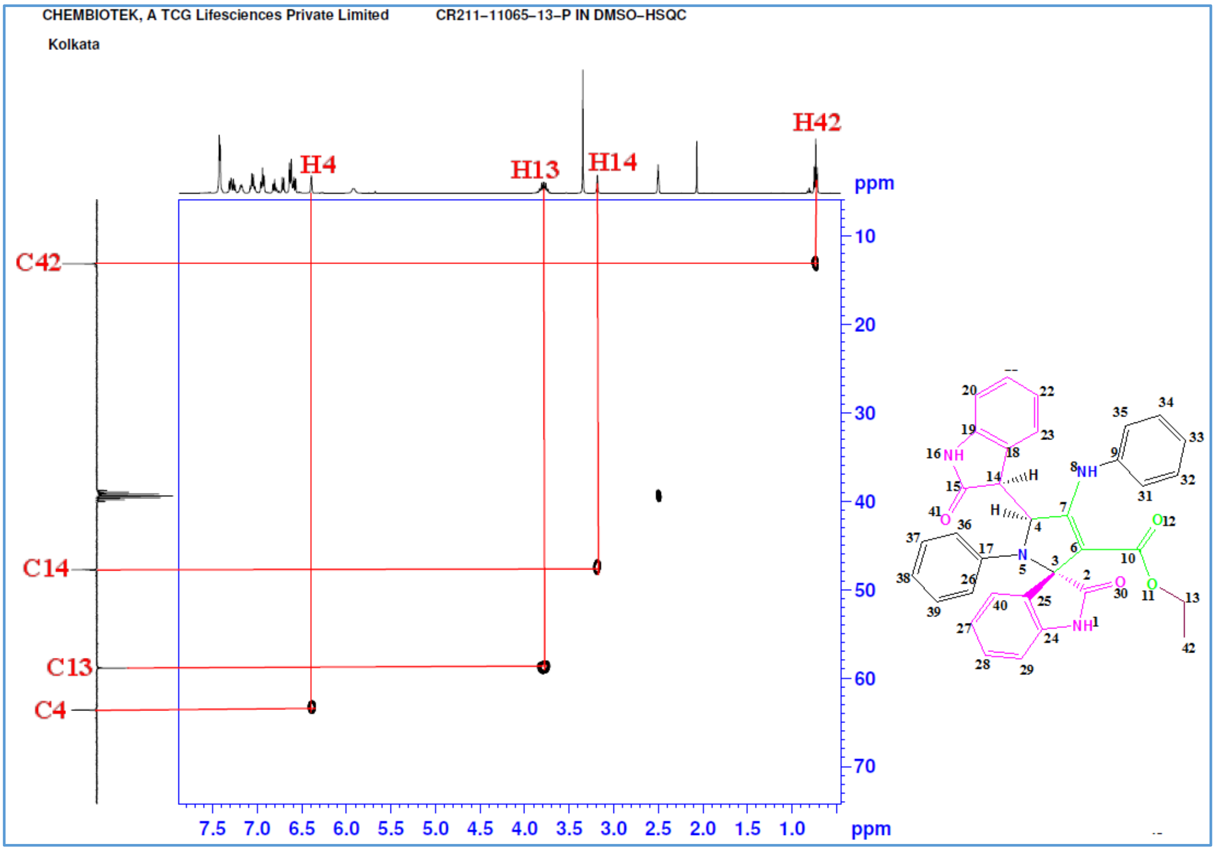


HMBC NMR of compound **1b**

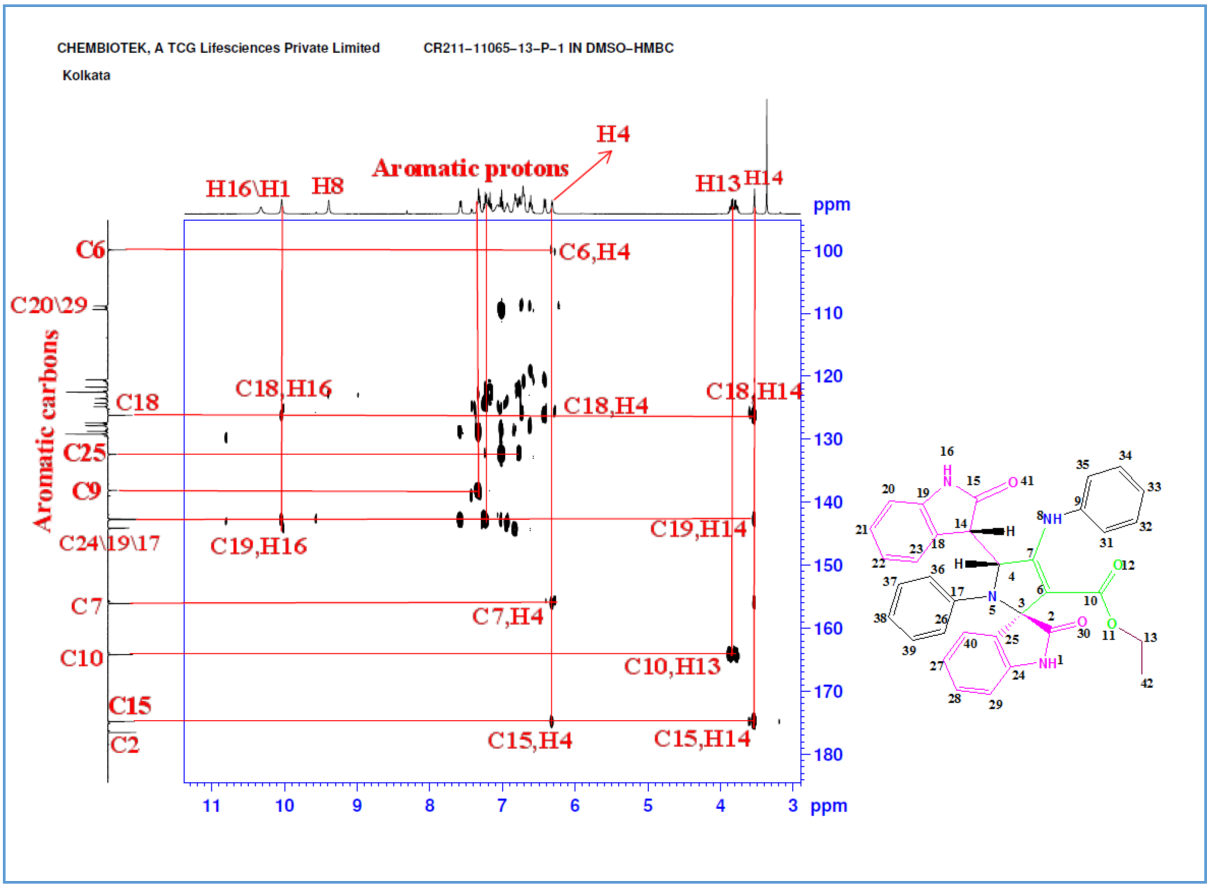


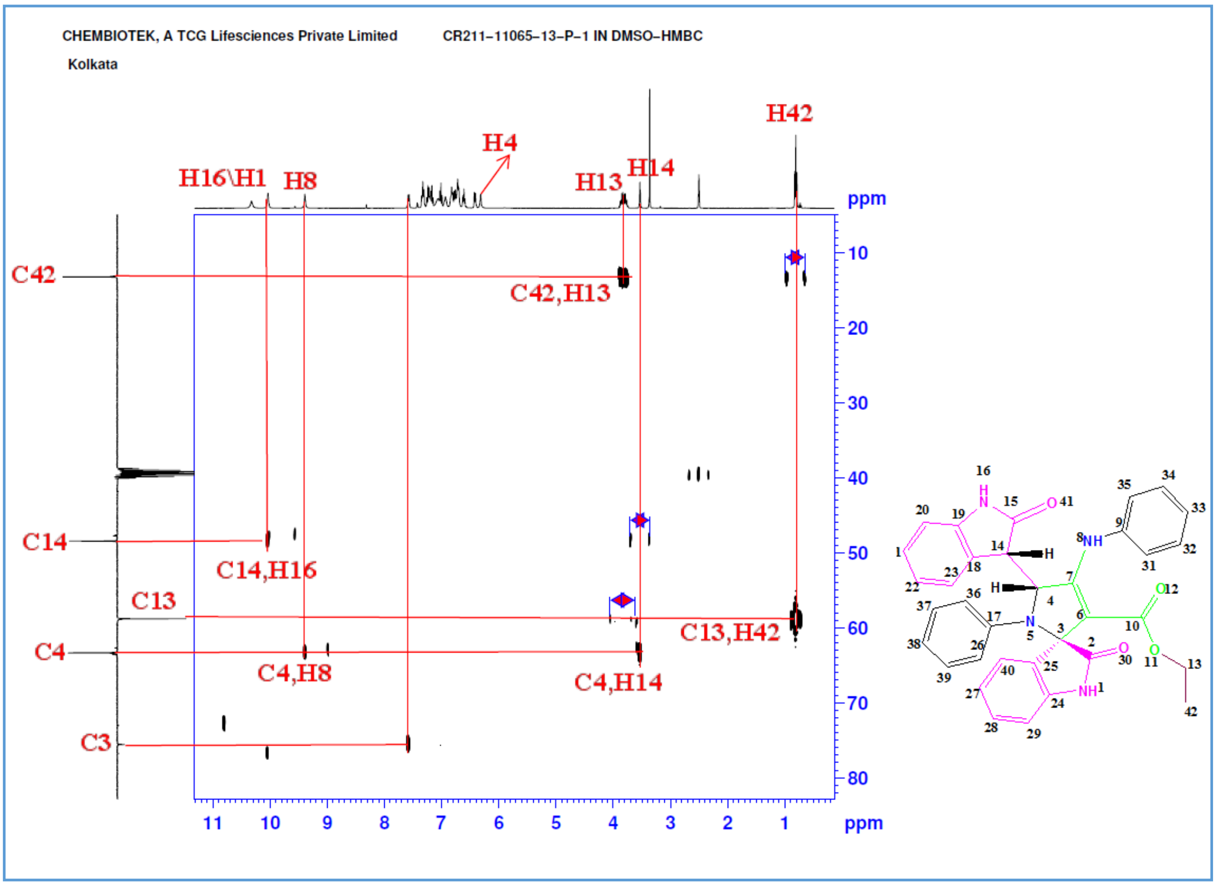


HSQC NMR of compound **1b**

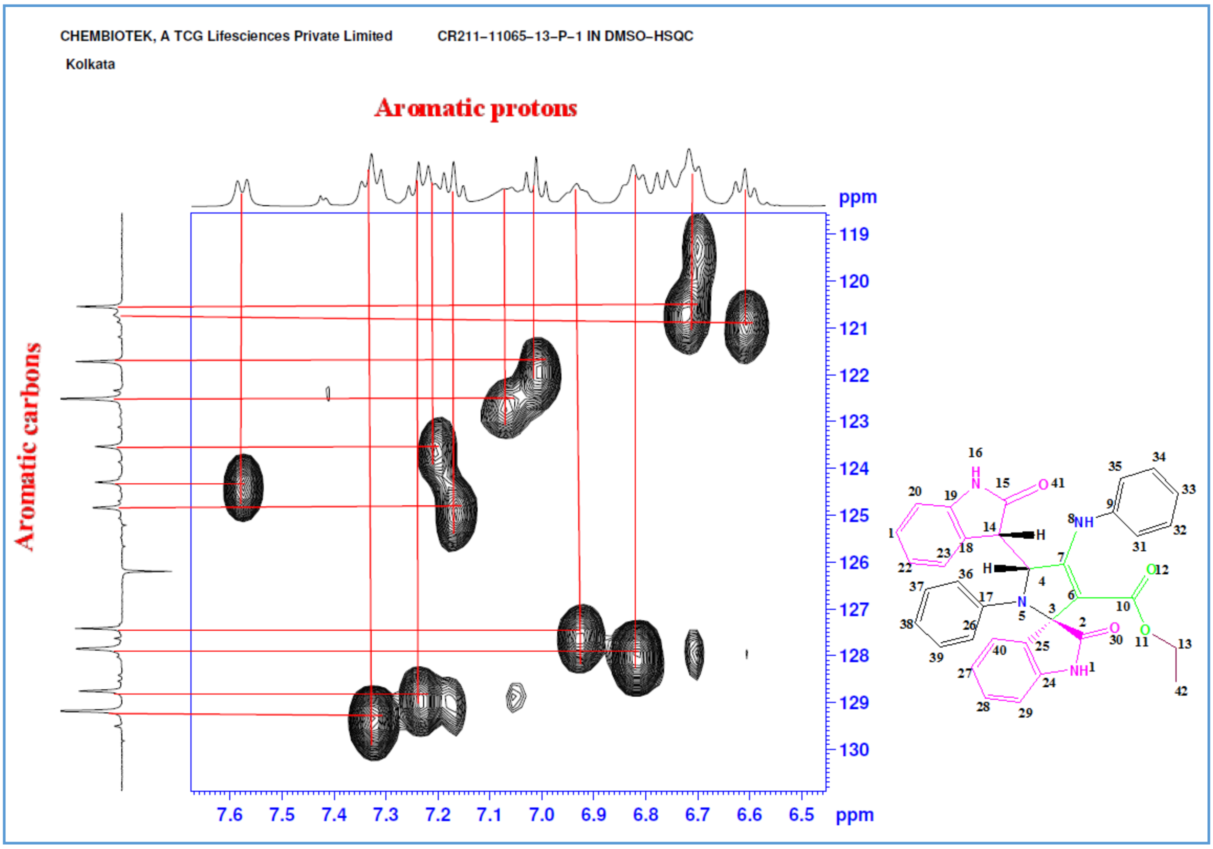


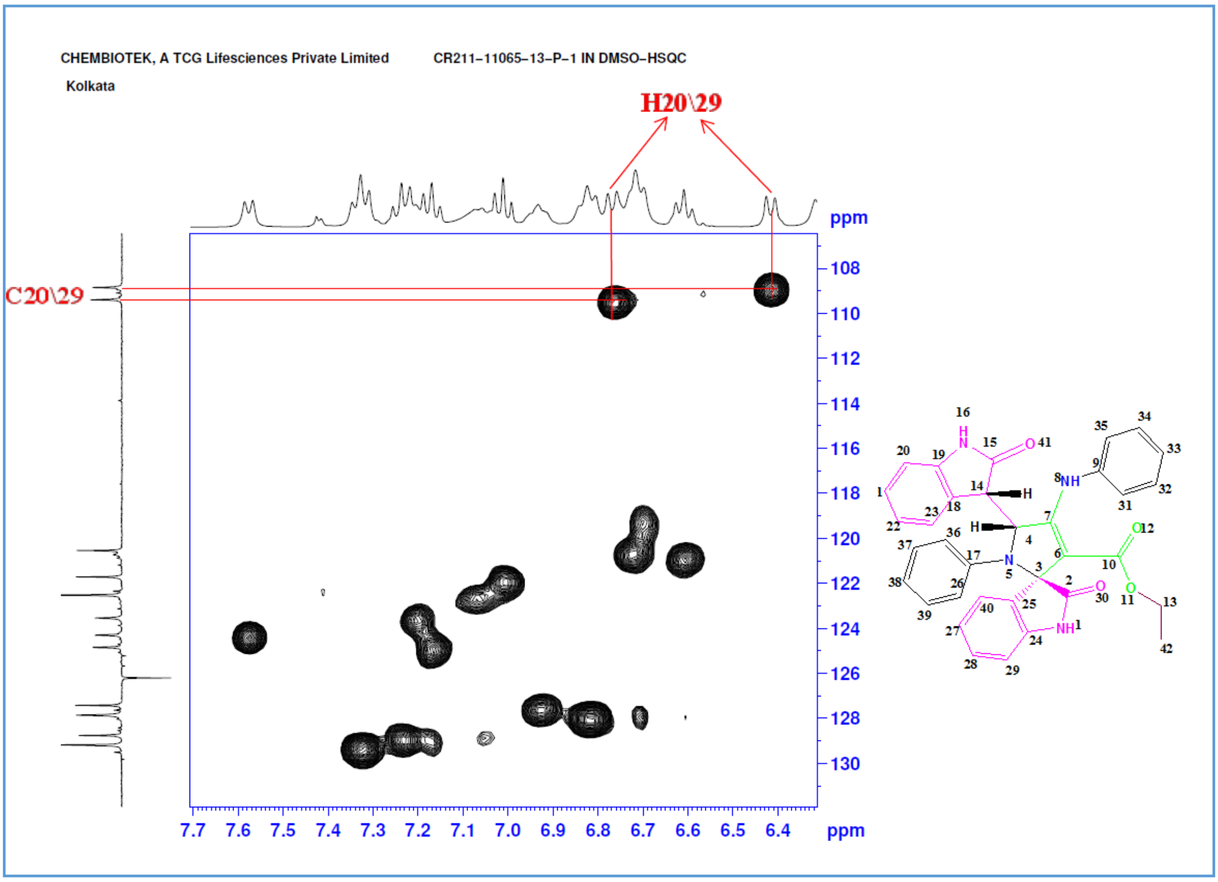
HSQC NMR of compound **1b**

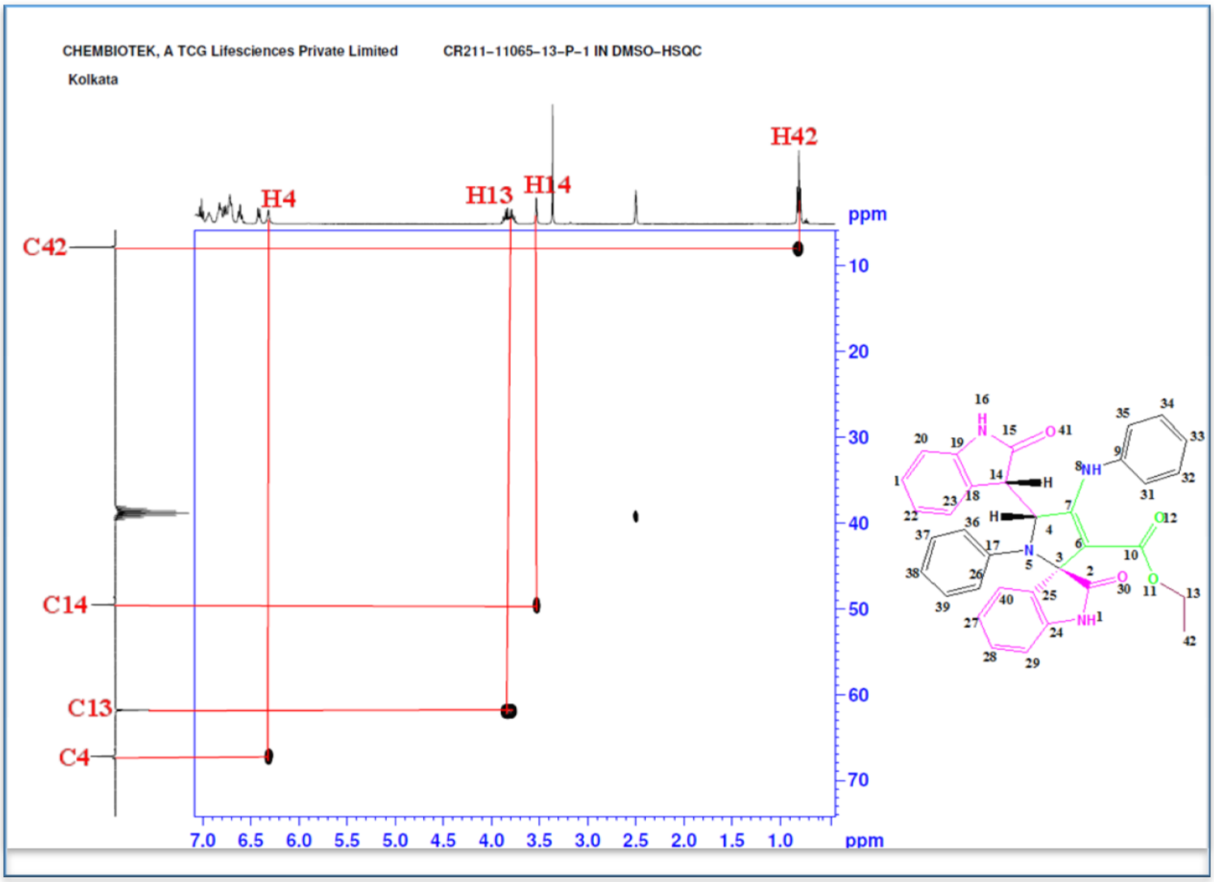




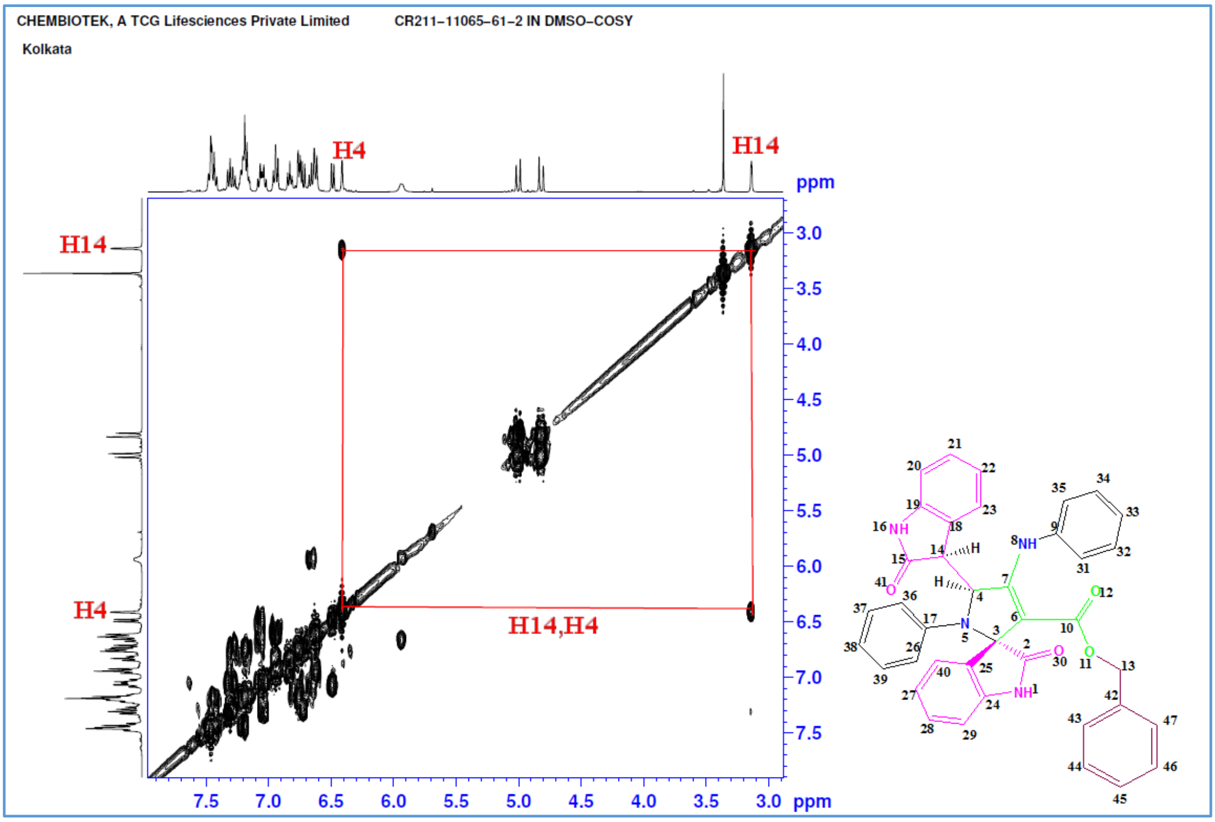
HMBC NMR of compound **1b´**


CHEMBIOTEK, A TCG Lifesciences Private Limited
Kolkata
CR211-11065-13-P-1 IN DMSO-HSQC
Aromatic protons
Aromatic carbons
ppm

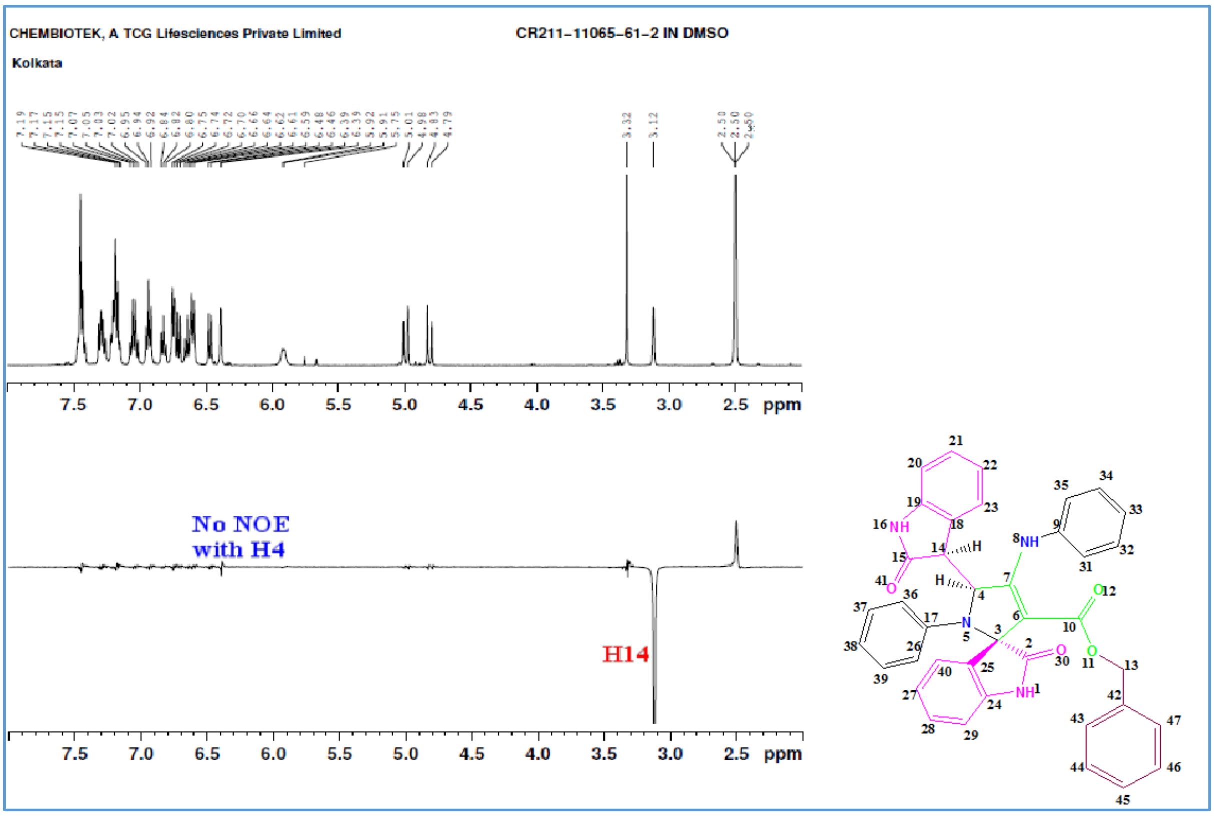

CHEMBIOTEK, A TCG Lifesciences Private Limited
Kolkata
CR211-11065-13-P-1 IN DMSO-HSQC
H20\29
C20\29
ppm



HSQC NMR of compound **1b´**

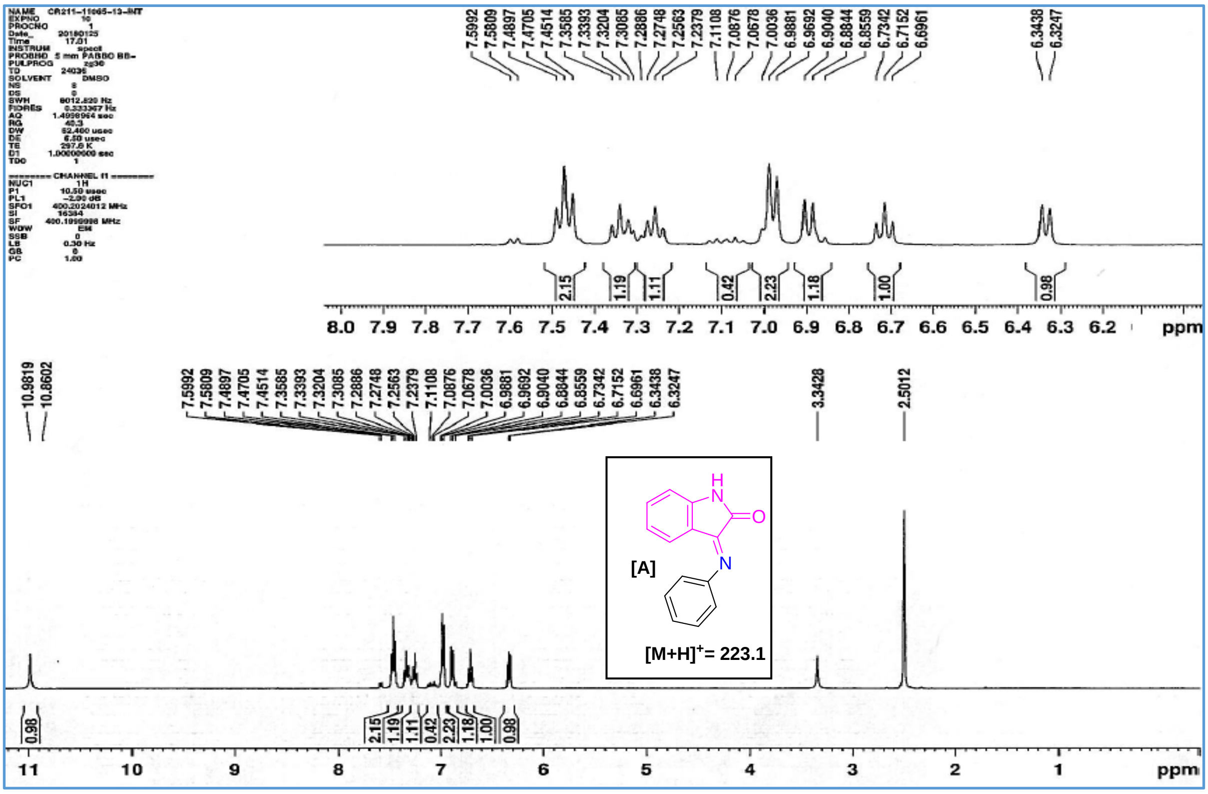


COSY NMR of compound **1c**

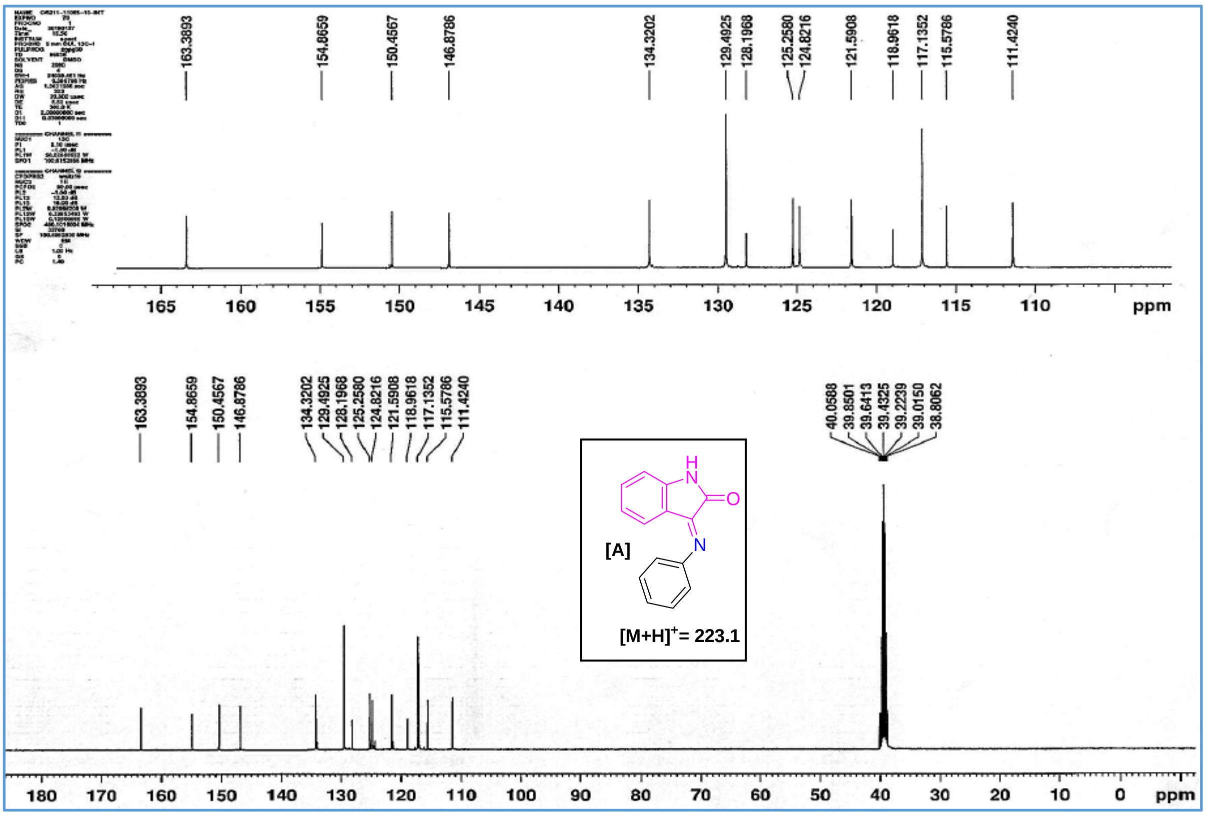


NOE NMR of compound **1c**

Copy of ^{1}H NMR and ^{13}C NMR spectra of Intermediate [A] for (1b, Table2)



^{1}H NMR of Intermediate **[A]**for**(1b, Table 2)**



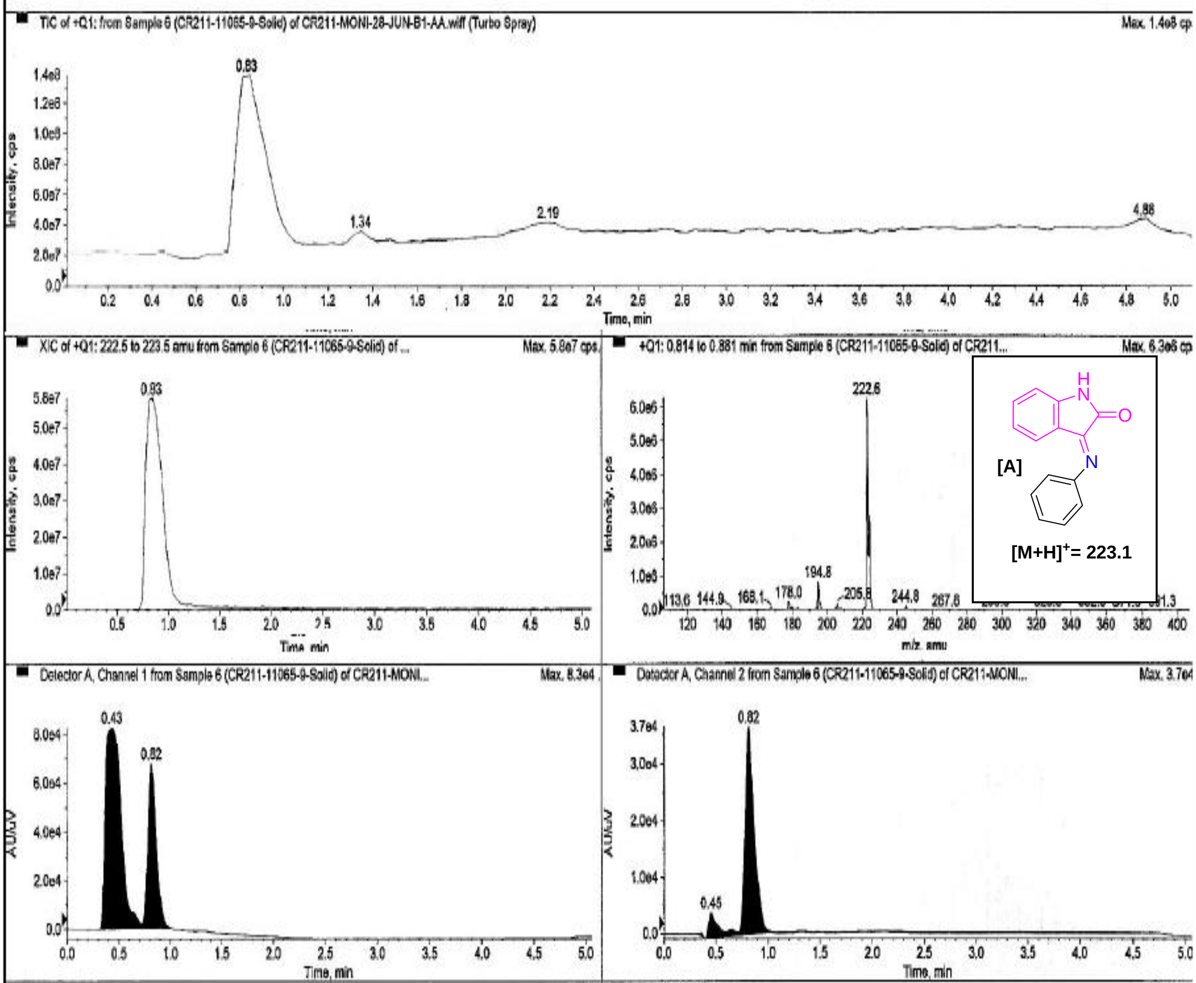
^{13}C NMR of Intermediate **[A]** for**(1b, Table2)**

Copy of LCMS-ESI of Intermediate [A], [B] and [C] of crude mixturefor (1b, Table 2)

TCG Lifesciences | Chembiotek

CHEMBIOTEK A TCG Lifesciences Enterprise, KOLKATA, INDIA

Sample Name: CR211-11065-9-Solid   Acq. Time: 17:24   Acq. Date: Wednesday, June 28, 2017



Peak List for "Detector A, Channel 1 from Sample 6 (CR211-11065-9-Solid) of CR211-MONI-28-JUN-B1-AA.wiff"

	Time (min)	Area (counts)	%Area	Height	%Height	Width (min)	Baseline Type
1	0.4349	9.1885e5	68.8517	8.3126e4	54.9326	0.4117	Valley
2	0.8159	4.1568e5	31.1483	6.8198e4	45.0674	0.3050	Valley

Peak List for "Detector A, Channel 2 from Sample 6 (CR211-11065-9-Solid) of CR211-MONI-28-JUN-B1-AA.wiff"

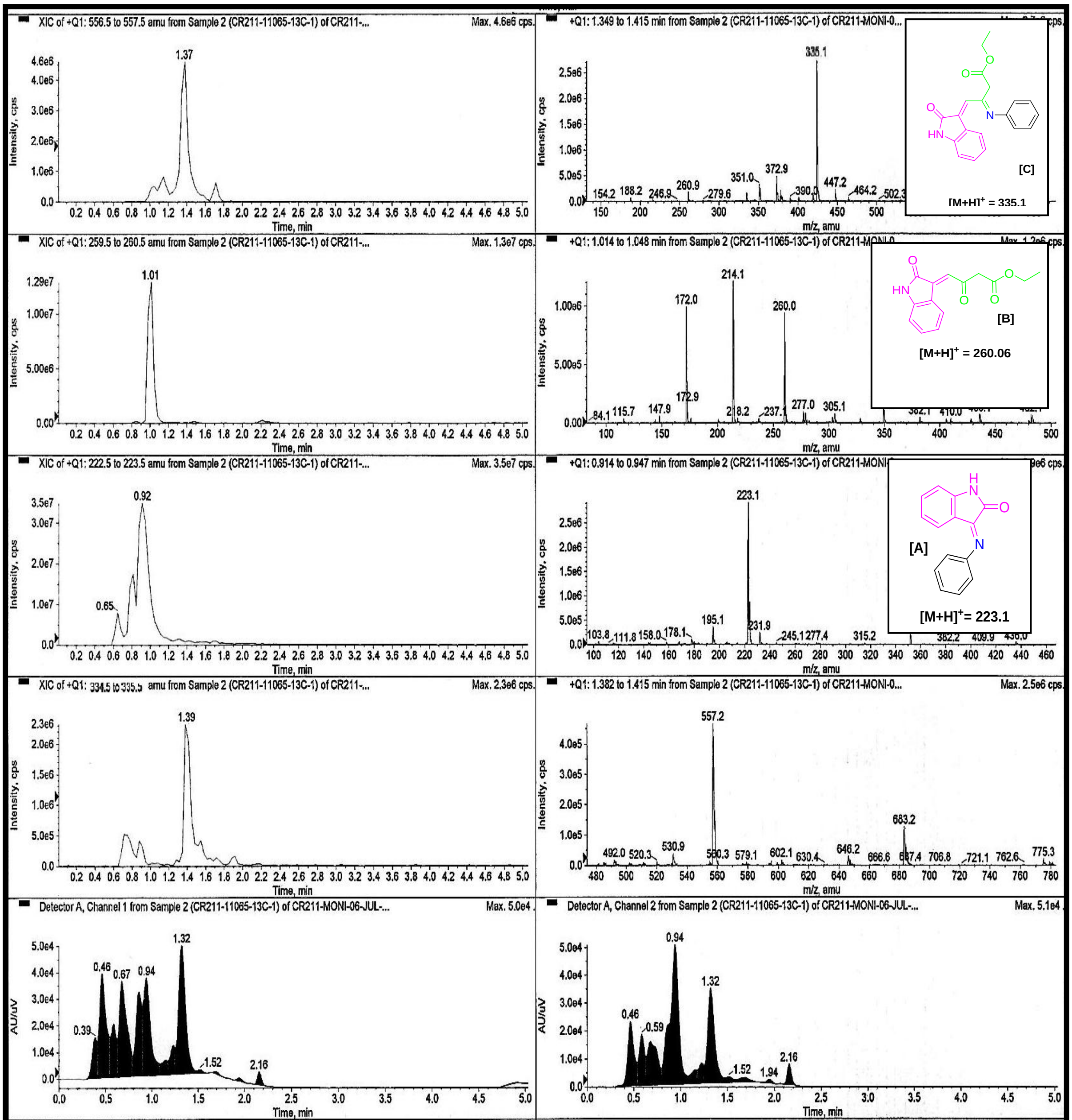
	Time (min)	Area (counts)	%Area	Height	%Height	Width (min)	Baseline Type
1	0.3586	1383.8045	0.5104	584.6282	1.3525	0.0733	Base to Base
2	0.4546	2.6935e4	9.9353	4580.1366	10.5958	0.1933	Valley
3	0.6488	6869.1682	2.5338	1253.3999	2.8997	0.1167	Valley
4	0.8176	2.3592e5	87.0205	3.6808e4	85.1520	0.3300	Valley

LCMS NONPOLAR SAMPLE IN 5 MIN RUN   *COLUMN- ZORBAX EXT (4.6X50mm , 5u) ACN:NH4OAc   TCGLS/ARD/LCMS18/K72

Channel 1 at wavelength 220 nm
Channel 2 at wavelength 260 nm

Anlalysed By   Checked By

LCMS-ESI of Intermediate **[A]**for**(1b, Table2)**



Peak List for "Detector A, Channel 2 from Sample 2 (CR211-11065-13C-1) of CR211-MONI-06-JUL-B01-AA.wiff"

	Time (min)	Area (counts)	%Area	Height	%Height	Width (min)	Baseline Type
1	0.4645	1.1326e5	11.7016	2.3206e4	13.9020	0.2383	Valley
2	0.5855	8.0109e4	8.2766	1.8494e4	11.0794	0.0967	Valley
3	0.6776	1.2144e5	12.5468	1.5758e4	9.4400	0.1633	Valley
4	0.9432	3.5354e5	36.5267	5.0288e4	30.1259	0.2833	Valley
5	1.1530	2.3464e4	2.4242	5018.7002	3.0066	0.0933	Valley
6	1.2248	3.1754e4	3.2807	7533.8256	4.5133	0.0817	Valley
7	1.3228	1.9014e5	19.6445	3.4088e4	20.4213	0.1833	Expo. Skim
8	1.5158	1.0283e4	1.0624	1865.3593	1.1175	0.1517	Expo. Daughter

Peak List for "Detector A, Channel 1 from Sample 2 (CR211-11065-13C-1) of CR211-MONI-06-JUL-B01-AA.wiff"

	Time (min)	Area (counts)	%Area	Height	%Height	Width (min)	Baseline Type
1	0.3873	5.5391e4	4.2518	1.5573e4	6.1181	0.1250	Valley
2	0.4630	2.0959e5	16.0878	3.9369e4	15.4671	0.1383	Valley
3	0.5856	8.0959e4	6.2143	2.0280e4	7.9676	0.0767	Valley
4	0.6744	2.2357e5	17.1611	3.6139e4	14.1981	0.1683	Valley
5	0.8574	1.4536e5	11.1579	3.1771e4	12.4821	0.1050	Valley
6	0.9429	2.1291e5	16.3430	3.6911e4	14.5013	0.1917	Valley
7	1.1497	2.6093e4	2.0029	5808.4804	2.2820	0.0833	Valley
8	1.2311	4.1776e4	3.2067	1.1133e4	4.3739	0.0800	Valley

LCMS NONPOLAR SAMPLE IN 5 MIN RUN

*COLUMN- ZORBAX EXT (4.6X50mm , 5u)
ACN:NH4OAc

TCGLS/ARD/LCMS01/K03

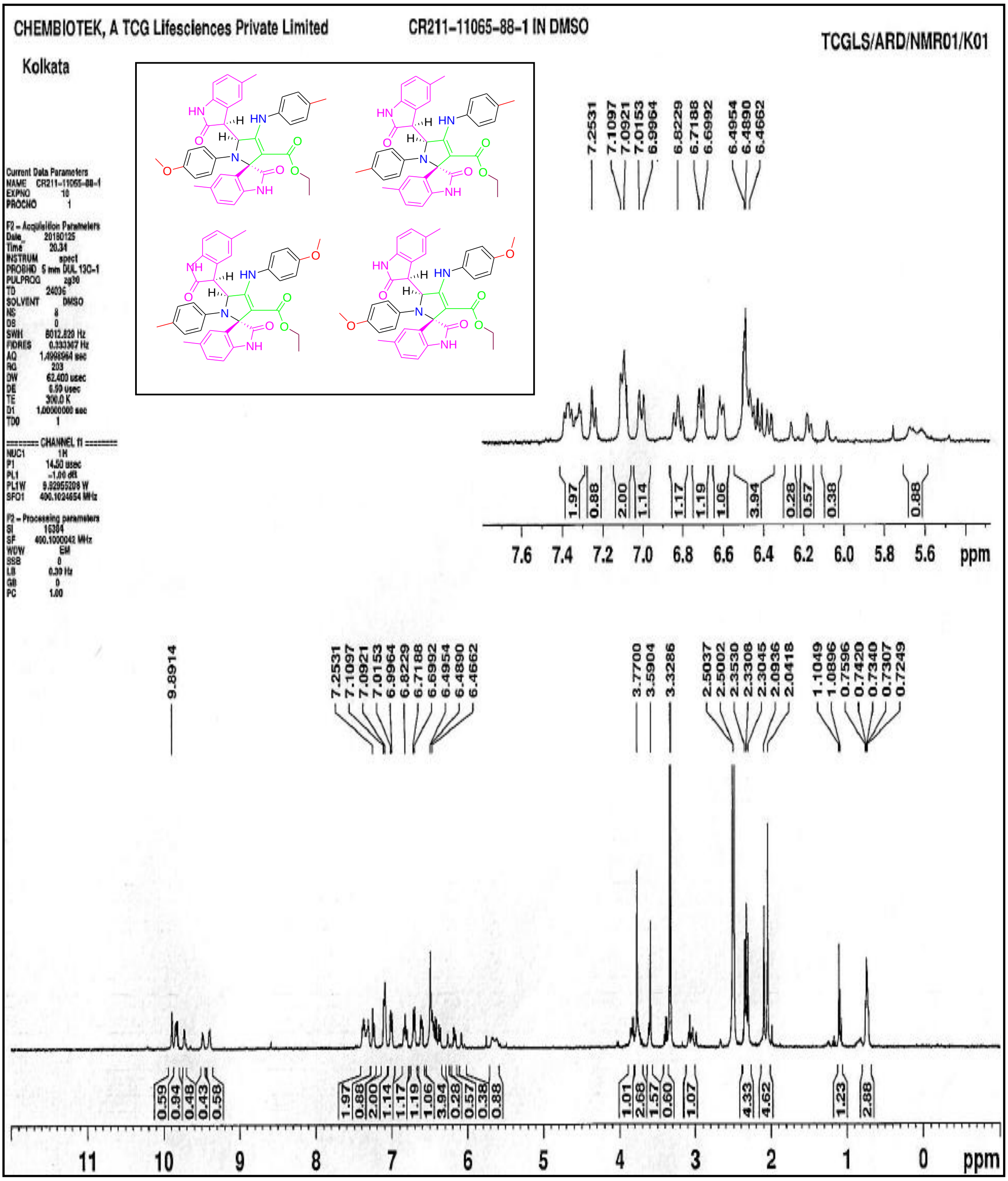
Channel 1 at wavelength 220 nm
Channel 2 at wavelength 260 nm

Anlalysed By

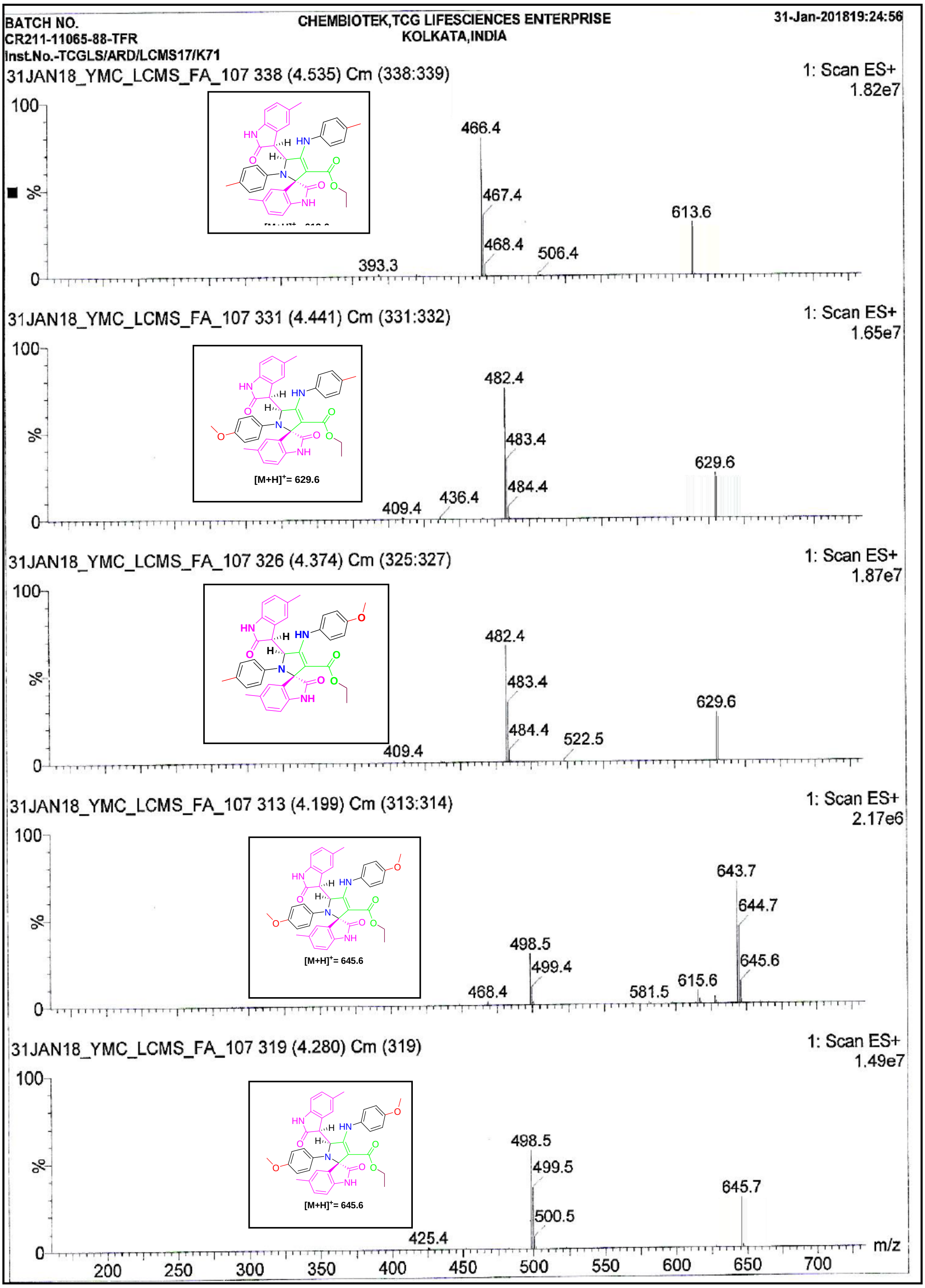
Checked By

LCMS-ESI of Intermediate**[A]**, **[B]** and **[C]** forcrude mixture of**(1b, Table2)**

Copy of ^{1}H NMR, LCMS-ESI and HPLC of Crude product for (Scheme2)



^{1}H NMR of Crude product for **Scheme2**



LCMS-ESIof Crude product for **Scheme2**

CHEMBIOTEK RESEARCH INTERNATIONAL, KOLKATA (HPLC MONITORING)

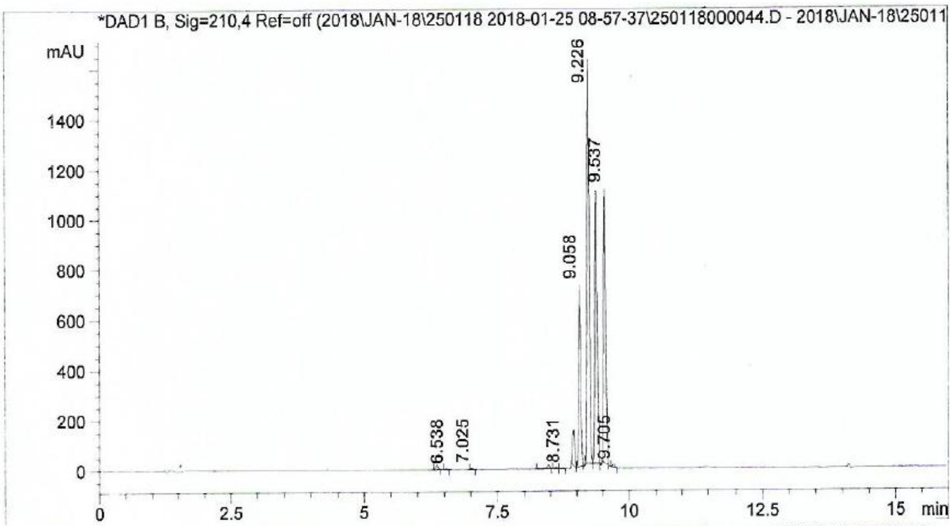
Sample Name: CR211-11065-88
Column Name:LUNA OMEGA POLAR (100*4.6mm),C18,3u,Diluen
t: MEOH
Mobile phase: A: 0.05%TFA in water : B: ACN

Injection Date : Thu, 25. Jan. 2018 10:53:39 PMLocation : Vial 7
Sample Name : CR211-11065-88 Inj. No.-> 1
Acq Operator : KALYAN Inj. Vol. : 2 µl

Analysis Method : C:\CHEM32\1\METHODS\POL_10_10_40N.M
Last Changed : Tue, 30. Jan. 2018, 03:48:00 pm
(modified after loading)

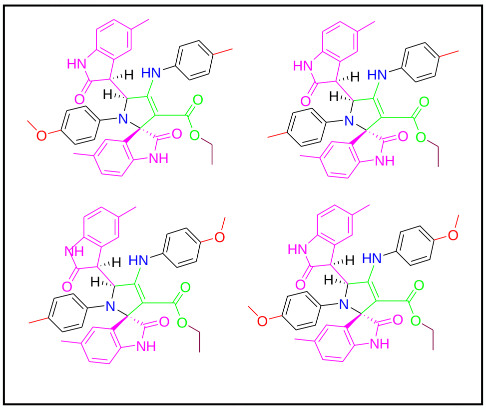
Acq. Method : C:\Chem32\1\DATA\2018\JAN-18\250118 2018-01-25 08-57-37\POL_2_5_50.M

Ref : KB/ 30.01.18/1250



Signal 1 :DAD1 B, Sig=210,4 Ref=off

Peak #	RT [min]	Area	Area %
1	6.36	53.07	0.37
2	6.54	13.62	0.10
3	7.03	14.62	0.10
4	8.46	65.20	0.46
5	8.60	16.30	0.11
6	8.73	8.28	0.06
7	8.94	395.60	2.78
8	9.06	2219.51	15.58
9	9.23	4875.13	34.23
10	9.37	3306.67	23.22
11	9.54	3235.37	22.72
12	9.70	38.52	0.27



*** End of Report ***

TCGLS/ARD/HPLC/K61 Tue, 30. Jan. 2018 03:49:11 pm Page 1 of 1

HPLC of Crude product for **Scheme 2**

Density Functional Theory (DFT) Calculations

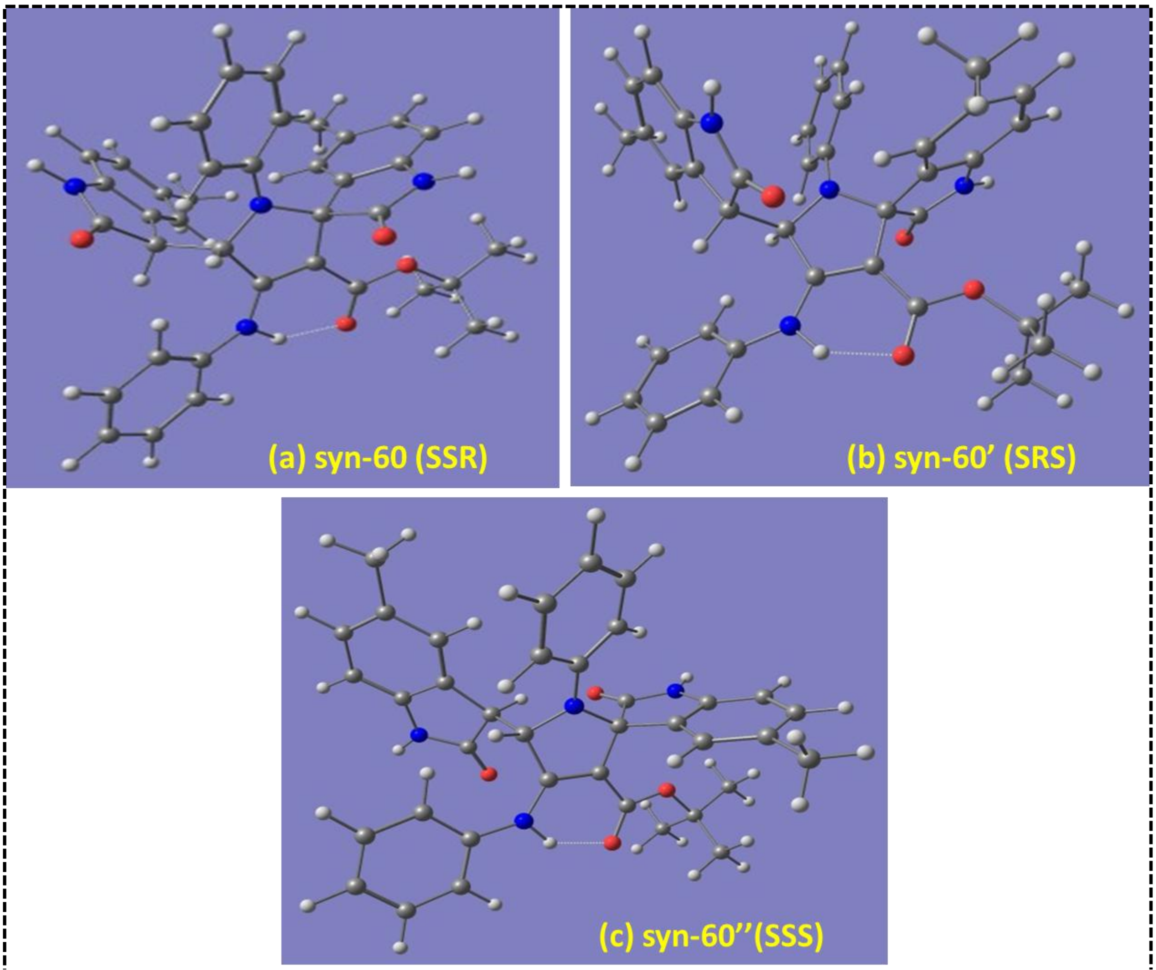


Figure 5. Optimized geometries of (a) ***syn*-60** (SSR), (b) ***syn*-60´** (SRS) and (c) ***syn*-60″** (SSS)

The DFT calculations were employed to elucidate the relative ground state energies of ***syn*-60** (SSR), ***syn*-60´**(SRS) and ***syn*-60″** (SSS) diastereomers of product 1h (entry 8, **Table 2**). All DFT calculations were performed with the ORCA program package.[30]Gas phase geometries of the diastereomers using singlet spin state were successfully optimized using pure density functional BP86 method.[31] The calculated energies are summarized in Table S1 and the coordinates are listed in Table S2-S4 (SI 1). For all calculations, the all-electron valence double-zeta, def2-SVP,[32] basis set with “new” polarisation function developed by Karlsruhe group was used for N, O, C and H atoms. Resolution of Identity (RI)[33] approximation with def2/J auxiliary basis set for Coulomb and HF exchange integral for HF DFT method was employed for self-consistent field (SCF) gradient calculations.[34] The geometry optimizations were carried out in redundant internal coordinates without imposing symmetry constraints. The SCF calculations were converged tightly. The calculated energies of these isomers are notably different. It is observed that ***syn*-60** (SSR) is the most stable conformer, while ***syn*-60′** (SRS) is 2.26 kJ/mol higher in energy than ***syn*-60** (SSR). The ***syn*-60″** (SSS) is the least stable and the ground state energy of it is 12.34 kJ/mol higher than that of ***syn*-60** (SSR). This provides a preliminary idea about their energetics and the ***syn*-60** (SSR) was isolated with all substituents. The energy minimized structures are shown in (**Figure 5**).

Table S1.

Isomer	Energy/HF
Original Isomer (SSR)	**-1988.3079929968296000**
SRS	**-1988.3071385918356000**
SSS	**-1988.3032965011143000**

Table S2. Optimized Coordinates of *syn*-60 (SSR)

Atoms	X	Y	Z
O(1)	**4.3767**	**14.4205**	**8.8736**
O(2)	**3.5924**	**12.6791**	**1.2797**
O(3)	**3.3231**	**15.9722**	**3.2015**
N(4)	**2.6738**	**13.9016**	**5.3167**
O(5)	**5.5567**	**11.9306**	**2.1885**
N(6)	**1.4826**	**14.9544**	**2.199**
H(7)	**1.2167**	**15.731**	**1.5912**

N(8)	**2.7934**	**12.723**	**9.1047**
H(9)	**2.4355**	**13.0061**	**10.018**
N(10)	**6.0589**	**12.6394**	**4.7125**
H(11)	**6.2758**	**12.1902**	**3.7947**
C(12)	**4.0554**	**12.6919**	**7.1193**
H(13)	**5.1083**	**12.342**	**7.1942**
C(14)	**3.1242**	**11.5056**	**7.1804**
C(15)	**3.7945**	**13.4281**	**8.4537**
C(16)	**1.7989**	**14.8337**	**5.9269**
C(17)	**4.7689**	**13.0762**	**4.6997**
C(18)	**4.0073**	**13.6512**	**5.8711**
H(19)	**4.4915**	**14.603**	**6.1951**
C(20)	**2.9692**	**10.3982**	**6.3449**
H(21)	**3.5634**	**10.322**	**5.4204**
C(22)	**2.3955**	**11.5789**	**8.395**
C(23)	**0.7793**	**13.7475**	**2.3174**
C(24)	**1.3854**	**12.9297**	**3.3012**
C(25)	**7.1375**	**12.7983**	**5.6001**
C(26)	**2.6152**	**13.6546**	**3.8553**
C(27)	**2.5599**	**15.034**	**3.0658**
C(28)	**3.9528**	**12.9917**	**3.581**
C(29)	**0.8342**	**11.6888**	**3.6101**
H(30)	**1.2943**	**11.0713**	**4.3966**
C(31)	**2.2423**	**15.7372**	**6.925**

H(32)	**3.2867**	**15.7396**	**7.2595**
C(33)	**2.0648**	**9.3603**	**6.692**
C(34)	**1.3308**	**9.4814**	**7.8904**
H(35)	**0.6256**	**8.6812**	**8.168**
C(36)	**1.4862**	**10.581**	**8.7598**
H(37)	**0.9211**	**10.6358**	**9.7022**
C(38)	**-0.3355**	**11.2385**	**2.9432**
C(39)	**7.1718**	**13.696**	**6.6962**
H(40)	**6.3223**	**14.3466**	**6.9395**
C(41)	**4.4462**	**12.4823**	**2.3081**
C(42)	**-0.3712**	**13.3341**	**1.6395**
H(43)	**-0.8482**	**13.9724**	**0.8801**
C(44)	**1.3555**	**16.6496**	**7.5173**
H(45)	**1.7402**	**17.3346**	**8.2898**
C(46)	**-0.915**	**12.0745**	**1.967**
H(47)	**-1.8273**	**11.7391**	**1.4484**
C(48)	**8.3183**	**13.773**	**7.5042**
H(49)	**8.3157**	**14.4727**	**8.3543**
C(50)	**0.4294**	**14.8878**	**5.5547**
H(51)	**0.037**	**14.1804**	**4.8143**
C(52)	**0.0072**	**16.7051**	**7.1314**
H(53)	**-0.6824**	**17.426**	**7.5965**
C(54)	**3.9038**	**12.2276**	**-0.0975**
C(55)	**1.9229**	**8.1454**	**5.8015**

H(56)	**1.1553**	**7.4445**	**6.1848**
H(57)	**2.8798**	**7.5857**	**5.7237**
H(58)	**1.6346**	**8.4265**	**4.7666**
C(59)	**-0.9346**	**9.8899**	**3.2743**
H(60)	**-1.9514**	**9.7776**	**2.8493**
H(61)	**-1.0057**	**9.7354**	**4.3708**
H(62)	**-0.3168**	**9.0586**	**2.8705**
C(63)	**-0.4426**	**15.8151**	**6.1417**
H(64)	**-1.4976**	**15.8269**	**5.8245**
C(65)	**8.288**	**12.0098**	**5.3351**
H(66)	**8.2743**	**11.317**	**4.4785**
C(67)	**9.4508**	**12.987**	**7.2389**
H(68)	**10.3449**	**13.0619**	**7.8763**
C(69)	**2.6663**	**12.6696**	**-0.8877**
H(70)	**1.7496**	**12.2086**	**-0.4699**
H(71)	**2.7644**	**12.3656**	**-1.9488**
H(72)	**2.5497**	**13.771**	**-0.8477**
C(73)	**9.4275**	**12.1074**	**6.1415**
H(74)	**10.3069**	**11.4865**	**5.9096**
C(75)	**5.1623**	**12.9433**	**-0.6117**
H(76)	**5.0437**	**14.0427**	**-0.5282**
H(77)	**5.318**	**12.694**	**-1.6812**
H(78)	**6.0576**	**12.6365**	**-0.0414**
C(79)	**4.0479**	**10.699**	**-0.1204**

H(80)	**4.9267**	**10.372**	**0.4648**
H(81)	**4.1696**	**10.3518**	**-1.1666**
H(82)	**3.1394**	**10.2189**	**0.2958**

Table S3. Optimized Coordinates of *syn*-60′ (SRS)

Atoms	X	Y	Z
O(1)	**3.3408**	**13.879**	**-9.2639**
O(2)	**8.227**	**15.6568**	**-9.5729**
O(3)	**8.9746**	**12.7618**	**-7.3666**
N(4)	**6.0307**	**12.284**	**-8.0999**
O(5)	**6.8167**	**16.901**	**-8.2578**
N(6)	**9.0918**	**12.4451**	**-9.6705**
N(7)	**2.4964**	**11.7614**	**-8.802**
N(8)	**5.2145**	**15.5228**	**-6.6052**
C(9)	**3.7674**	**12.749**	**-7.083**
C(10)	**3.2792**	**11.373**	**-6.6792**
C(11)	**3.2046**	**12.9219**	**-8.5139**
C(12)	**6.3358**	**10.8948**	**-7.9849**
C(13)	**5.7082**	**14.4349**	**-7.2604**
C(14)	**5.3157**	**12.9876**	**-7.0341**
C(15)	**3.4234**	**10.6427**	**-5.4998**
C(16)	**2.5179**	**10.8372**	**-7.7472**
C(17)	**8.2404**	**12.5761**	**-10.7795**
C(18)	**6.9646**	**13.0106**	**-10.3537**

C(19)	4.475	15.6626	-5.4218
C(20)	6.9756	13.1657	-8.8338
C(21)	8.4743	12.7842	-8.4785
C(22)	6.6276	14.532	-8.2897
C(23)	5.9497	13.2356	-11.2813
C(24)	6.8062	10.3262	-6.7789
C(25)	2.8271	9.3626	-5.3699
C(26)	2.0793	8.8578	-6.4536
C(27)	1.9097	9.5819	-7.6512
C(28)	6.192	13.0128	-12.6626
C(29)	4.4743	14.7113	-4.3723
C(30)	7.2091	15.8039	-8.6935
C(31)	8.5106	12.3447	-12.1317
C(32)	7.1175	8.9602	-6.7079
C(33)	7.47	12.5669	-13.0588
C(34)	3.7224	14.9407	-3.2094
C(35)	6.2039	10.0621	-9.1203
C(36)	6.9886	8.1397	-7.8425
C(37)	8.9728	16.8122	-10.1191
C(38)	3.0155	8.5583	-4.1031
C(39)	5.095	13.2547	-13.6759
C(40)	6.5372	8.7001	-9.0495
C(41)	3.7284	16.8566	-5.2531
C(42)	2.9771	16.121	-3.0535

C(43)	**9.9977**	**16.1453**	**-11.0443**
C(44)	**2.9944**	**17.0808**	**-4.082**
C(45)	**9.6741**	**17.5651**	**-8.9784**
C(46)	**8.022**	**17.7161**	**-10.918**
H(47)	**10.0609**	**12.1262**	**-9.7084**
H(48)	**2.0271**	**11.6247**	**-9.6983**
H(49)	**5.5559**	**16.3953**	**-7.0656**
H(50)	**3.2869**	**13.5202**	**-6.441**
H(51)	**5.653**	**12.6647**	**-6.0204**
H(52)	**4.0053**	**11.0556**	**-4.66**
H(53)	**4.964**	**13.5853**	**-10.9316**
H(54)	**6.957**	**10.9664**	**-5.8977**
H(55)	**1.6109**	**7.8649**	**-6.3638**
H(56)	**1.3161**	**9.1671**	**-8.4799**
H(57)	**5.0918**	**13.8058**	**-4.4493**
H(58)	**9.5001**	**12.0012**	**-12.4697**
H(59)	**7.4877**	**8.5375**	**-5.7606**
H(60)	**7.6664**	**12.3872**	**-14.1285**
H(61)	**3.7385**	**14.1889**	**-2.4044**
H(62)	**5.8288**	**10.5001**	**-10.0556**
H(63)	**7.2421**	**7.07**	**-7.7857**
H(64)	**2.3382**	**7.6827**	**-4.0688**
H(65)	**4.0556**	**8.1756**	**-4.0201**
H(66)	**2.8257**	**9.1704**	**-3.1967**

H(67)	**5.441**	**13.0589**	**-14.7102**
H(68)	**4.2143**	**12.6038**	**-13.4884**
H(69)	**4.7278**	**14.302**	**-13.6351**
H(70)	**6.4266**	**8.0685**	**-9.9453**
H(71)	**3.7278**	**17.6036**	**-6.0627**
H(72)	**2.3968**	**16.2962**	**-2.1352**
H(73)	**9.4887**	**15.5448**	**-11.8247**
H(74)	**10.6216**	**16.9151**	**-11.5413**
H(75)	**10.6647**	**15.4732**	**-10.4678**
H(76)	**2.4235**	**18.0163**	**-3.9753**
H(77)	**10.3089**	**16.8711**	**-8.3905**
H(78)	**10.3281**	**18.356**	**-9.3998**
H(79)	**8.9384**	**18.0355**	**-8.3004**
H(80)	**7.2666**	**18.1806**	**-10.2584**
H(81)	**8.6029**	**18.5199**	**-11.4142**
H(82)	**7.5014**	**17.1318**	**-11.7029**

Table S4. Optimized Coordinates of *syn*-60″ (SSS)

Atoms	**X**	**Y**	**Z**
O(1)	**6.7735**	**15.3929**	**-4.5118**
O(2)	**8.7632**	**15.4003**	**-9.1108**
O(3)	**8.6065**	**12.4877**	**-6.6638**
N(4)	**5.7172**	**12.6983**	**-7.7217**

O(5)	**7.3453**	**17.0219**	**-8.3192**
N(6)	**8.9778**	**12.1878**	**-8.9382**
N(7)	**5.4185**	**14.1561**	**-3.0903**
N(8)	**5.2542**	**16.178**	**-6.8581**
C(9)	**5.7378**	**13.2339**	**-5.2444**
C(10)	**4.8684**	**12.3366**	**-4.3824**
C(11)	**6.0598**	**14.4267**	**-4.2955**
C(12)	**5.1053**	**11.4924**	**-8.0919**
C(13)	**5.7133**	**14.9437**	**-7.1806**
C(14)	**5.1935**	**13.6037**	**-6.6926**
C(15)	**4.2801**	**11.0905**	**-4.614**
C(16)	**4.7189**	**12.9459**	**-3.1078**
C(17)	**8.2889**	**12.4032**	**-10.1439**
C(18)	**7.0369**	**12.9974**	**-9.8733**
C(19)	**4.2117**	**16.651**	**-6.0541**
C(20)	**6.9187**	**13.2527**	**-8.3719**
C(21)	**8.2637**	**12.6128**	**-7.8298**
C(22)	**6.7935**	**14.733**	**-8.0293**
C(23)	**6.16**	**13.2948**	**-10.9122**

C(24)	**5.8685**	**10.4057**	**-8.5937**
C(25)	**3.5262**	**10.448**	**-3.5975**
C(26)	**3.3867**	**11.0908**	**-2.3511**
C(27)	**3.9794**	**12.341**	**-2.0858**
C(28)	**6.5163**	**12.9944**	**-12.2522**
C(29)	**4.0626**	**18.0612**	**-5.9827**
C(30)	**7.6327**	**15.8246**	**-8.4965**
C(31)	**8.6757**	**12.0978**	**-11.4518**
C(32)	**5.2489**	**9.2134**	**-8.9965**
C(33)	**7.7732**	**12.4019**	**-12.4931**
C(34)	**3.0368**	**18.6402**	**-5.2282**
C(35)	**3.6976**	**11.319**	**-8**
C(36)	**3.8568**	**9.0526**	**-8.8987**
C(37)	**9.7764**	**16.3469**	**-9.6296**
C(38)	**2.9003**	**9.0961**	**-3.8587**
C(39)	**5.5598**	**13.3001**	**-13.3831**
C(40)	**3.091**	**10.1172**	**-8.3923**
C(41)	**3.298**	**15.8446**	**-5.3322**
C(42)	**2.1267**	**17.8334**	**-4.5213**

C(43)	**10.8575**	**15.416**	**-10.1923**
C(44)	**2.2708**	**16.438**	**-4.5805**
C(45)	**10.3376**	**17.1975**	**-8.4804**
C(46)	**9.1611**	**17.2049**	**-10.7443**
H(47)	**9.899**	**11.755**	**-8.8576**
H(48)	**5.4992**	**14.7843**	**-2.2893**
H(49)	**5.8676**	**16.8983**	**-7.2996**
H(50)	**6.7362**	**12.7769**	**-5.4439**
H(51)	**4.0873**	**13.5702**	**-6.6818**
H(52)	**4.3999**	**10.5942**	**-5.5886**
H(53)	**5.1863**	**13.7597**	**-10.6883**
H(54)	**6.9623**	**10.4848**	**-8.6528**
H(55)	**2.8019**	**10.6001**	**-1.5564**
H(56)	**3.8659**	**12.821**	**-1.102**
H(57)	**4.7725**	**18.7**	**-6.532**
H(58)	**9.6485**	**11.6317**	**-11.6696**
H(59)	**5.8733**	**8.391**	**-9.3802**
H(60)	**8.0608**	**12.1635**	**-13.5297**
H(61)	**2.9487**	**19.7378**	**-5.1927**

H(62)	**3.0622**	**12.1351**	**-7.6274**
H(63)	**3.3766**	**8.1126**	**-9.2096**
H(64)	**2.3114**	**8.7436**	**-2.9887**
H(65)	**2.2234**	**9.1232**	**-4.739**
H(66)	**3.6721**	**8.3273**	**-4.0757**
H(67)	**5.9981**	**13.0474**	**-14.3685**
H(68)	**4.6139**	**12.7272**	**-13.281**
H(69)	**5.2817**	**14.3749**	**-13.4022**
H(70)	**1.9965**	**10.0205**	**-8.3096**
H(71)	**3.3731**	**14.7502**	**-5.3361**
H(72)	**1.3168**	**18.2883**	**-3.9311**
H(73)	**10.4432**	**14.764**	**-10.9869**
H(74)	**11.6851**	**16.0134**	**-10.6239**
H(75)	**11.2738**	**14.7735**	**-9.3911**
H(76)	**1.5739**	**15.7868**	**-4.0299**
H(77)	**10.7231**	**16.5477**	**-7.669**
H(78)	**11.1791**	**17.8174**	**-8.8526**
H(79)	**9.5621**	**17.8638**	**-8.0616**
H(80)	**8.3668**	**17.8639**	**-10.3479**

H(81)	**9.9481**	**17.8363**	**-11.2055**
H(82)	**8.7294**	**16.5599**	**-11.5355**