Supporting Information

Base mediated spirocyclization of quinazoline: one-step synthesis of spiro-isoindolinone dihydroquinazolinones

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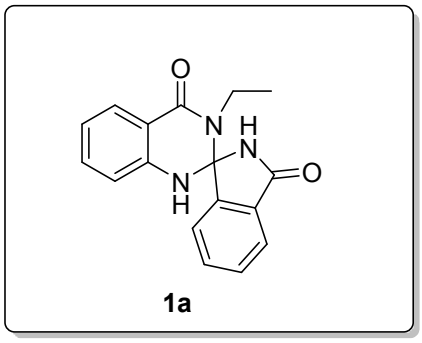
General information

Unless stated otherwise, solvents and chemicals were obtained from commercial sources and used without further purification. Reactions were monitored by thin layer chromatography (TLC) on silica gel plates (60 F254) using EtOAc-Hexane as eluent and visualizing with ultraviolet light or iodine spray. Flash chromatography was performed on silica gel (230-400 mesh) using hexane and ethyl acetate. ^{1}H and ^{13}C NMR spectra were recorded in DMSO-d_6 solution by using a 400 MHz spectrometer. Proton chemical shifts (δ) are relative to tetramethylsilane (TMS, δ = 0.00) as internal standard and expressed in ppm. Spin multiplicities are given as s (singlet), d (doublet), t (triplet) and m (multiplet) as well as b (broad). Coupling constants (*J*) are given in hertz. Infrared spectra were recorded on a FT-IR spectrometer. Melting points were determined using melting point B-540 apparatus and are uncorrected. HRMS was determined using waters LCT premier XETOF ARE-047 apparatus.

Experimental Procedures and Characterization data

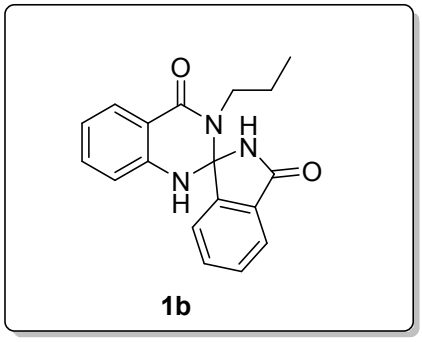
General Procedure:

KHMDS (1M, 1.5 mmol) was added slowly to a solution of 2-aminobenzamide (1 mmol) and methyl-2-cyanobenzoate (1.5 mmol) in 1,4-dioxane (10 mL) under nitrogen atmosphere at 25-35°C and stirred for 4-5h. The reaction was monitored by TLC and after the completion of reaction, the reaction mass was diluted with water (5 mL) and extracted with ethyl acetate (3 x 20 mL). The organic layer was washed with 5% HCl (5 mL) followed by water (2 x 10 mL). The combined organic layer was dried over anhydrous sodium sulphate and the solvent was evaporated to get the crude residue which was purified by column chromatography (EtOAc-Hexane) to get pure compound.



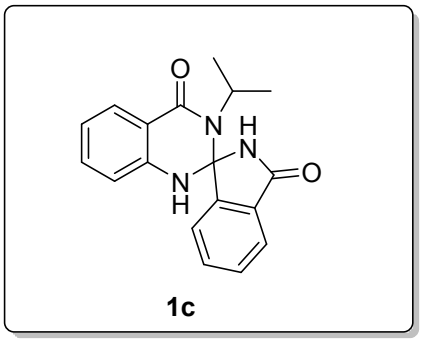
1a

3'-Ethyl-1'*H*-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'*H*)-dione (1a): Light brown color solid; Yield: 48%; ^{1}H NMR (400 MHz, $CDCl_3$): **δ**8.28 (d, *J* = 8.4 Hz, 1H), 8.22 (bs, 1H), 8.01 (d, *J* = 7.6 Hz, 1H), 7.94 (d, *J* = 7.2 Hz, 1H), 7.83-7.74 (m, 3H), 7.51 (d, *J* = 7.6 Hz, 1H), 7.34 (d, *J* = 8.4 Hz, 1H), 6.99 (d, *J* = 8.0 Hz, 1H), 3.47-3.40 (m, 2H), 1.17 (t, *J* = 7.2 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$); **δ** 167.7, 165.4, 149.8, 144.9, 135.5, 133.9, 133.1, 131.9 (2C), 131.1, 126.7, 125.8, 124.1, 121.9, 120.5, 34.5, 14.7; ESMS-Mass: 294.1 (M+H); HRMS (ESI): Anal. calcd for $C_{17}H_{15}N_3O_2$ $(M+H)^+$ 294.1243, found 294.1232.



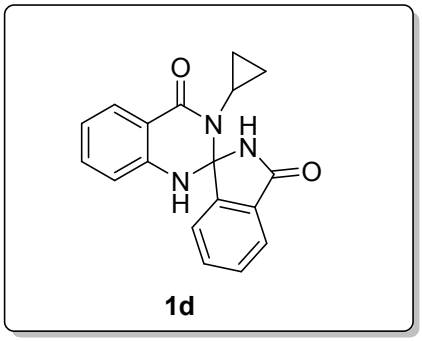
1b

3'-Propyl-1'*H*-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'*H*)-dione (1b): Light brown color solid; Yield: 55%;^{1}H NMR (400 MHz, $CDCl_3$): **δ** 8.57 (bs, 1H), 8.24 (bs, 1H), 8.17 (d, *J* = 7.6 Hz, 1H), 7.98 (d, *J* = 7.2 Hz, 1H), 7.91 (d, *J* = 7.2 Hz, 1H), 7.83-7.72 (m, 2H), 7.45 (t, *J* = 7.2 Hz, 1H), 7.35 (t, *J* = 7.2 Hz, 1H), 6.99-6.91 (m, 1H), 3.34 (q, J_1 = 6.8 Hz, J_2 = 6.0 Hz, 2H), 1.55-1.46 (m, 2H), 0.88 (t, *J* = 7.6 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$);**δ** 168.2, 165.6, 150.2, 145.1, 135.5, 133.8, 132.9, 131.8, 131.6, 131.3, 126.5, 125.6, 123.9, 121.9, 120.8, 41.5, 22.6, 11.6; HRMS (ESI): Anal. calcd for $C_{18}H_{17}N_3O_2$ $(M+H)^+$ 308.1399, found 308.1407.



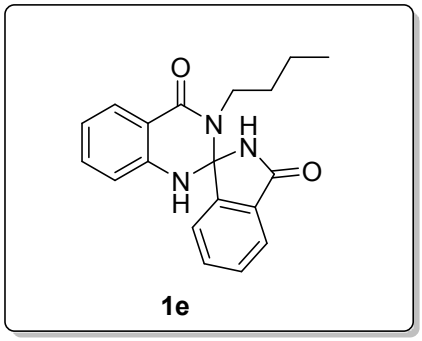
1c

3'-Isopropyl-1'*H*-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'*H*)-dione (1c): Light brown color solid; Yield: 58%; ^{1}H NMR (400 MHz, $CDCl_3$): **δ** 8.24 (d, *J* = 7.6 Hz, 1H), 8.13 (bs, 1H), 8.00 (d, *J* = 7.2 Hz, 2H), 7.93 (d, *J* = 7.2 Hz, 1H), 7.83-7.74 (m, 2H), 7.49 (t, *J* = 7.2 Hz, 1H), 7.32 (t, *J* = 7.6 Hz, 1H), 6.99 (d, *J* = 8.0 Hz, 1H), 4.22-4.13 (m, 1H), 1.16 (d, *J* = 6.4 Hz, 6H); ^{13}C NMR (100 MHz, $CDCl_3$); **δ** 167.8, 164.7, 149.8, 144.9, 135.4, 133.8, 133.0, 131.8, 131.8, 131.1, 126.9, 125.8, 124.1, 121.8, 120.5, 41.4, 22.9 (2C);HRMS (ESI): Anal. calcd for $C_{18}H_{17}N_3O_2$ $(M+H)^+$ 308.1399, found 308.1413.



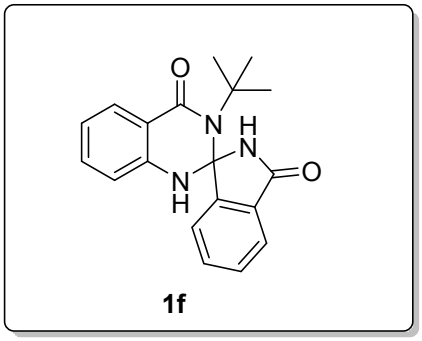
1d

3'-Cyclopropyl-1'*H*-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'*H*)-dione(1d): Off white color solid; Yield: 58%; ^{1}H NMR (400 MHz, DMSO-d_6): **δ** 10.89 (bs, 1H), 8.34 (d, *J*= 3.6 Hz, 1H), 8.02 (d, *J*= 7.2 Hz, 1H), 7.86-7.74 (m, 3H), 7.65-7.62 (m, 1H), 7.48-7.44 (m, 1H), 7.27-7.20 (m, 1H), 7.04-7.01 (m, 1H), 2.80-2.70 (m, 1H), 0.66-0.57(m, 2H), 0.42-0.37 (m, 2H); ^{13}C NMR (100 MHz, DMSO-d_6): **δ** 169.1, 164.6, 150.6, 145.3, 135.5, 133.7, 132.8, 131.1, 130.9, 129.5, 127.4, 124.4, 123.1, 122.1,121.7, 50.1, 28.5 (2C);HRMS (ESI): Anal. calcd for $C_{18}H_{15}N_3O_2$ $(M+H)^+$ 306.1243, found 306.1253.



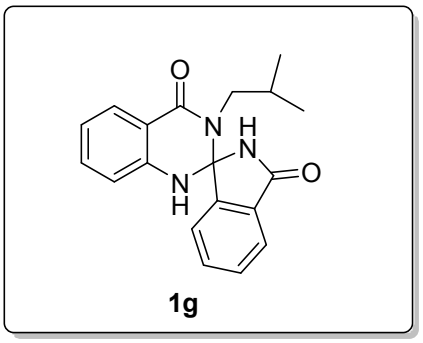
1e

3'-Butyl-1'*H*-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'*H*)-dione(1e): Off white color solid; Yield: 62%; ^{1}H NMR (400 MHz, $CDCl_3$): **δ** 8.22 (d, *J*= 7.2 Hz, 1H), 8.00 (d, *J*= 7.2 Hz, 1H), 7.93 (d, *J*= 7.2 Hz, 1H), 7.82-7.73 (m, 2H), 7.29-7.25 (m, 1H), 6.99 (d, *J*= 7.6 Hz, 1H), 3.40 (t, *J*= 6.4 Hz, 2H), 1.51-0.1.43 (m, 2H), 1.34-1.24 (m, 2H), 0.82 (t, *J*= 7.2 Hz, 3H): ^{13}C NMR (100 MHz, $CDCl_3$): **δ** 167.9, 165.6, 150.1, 145.1, 135.5, 133.8, 133.0, 131.9, 131.8, 131.2, 126.6, 125.7, 123.9, 122.0, 120.7, 39.5, 31.5, 20.2, 13.6;HRMS (ESI): Anal. calcd for $C_{18}H_{15}N_3O_2$ $(M+H)^+$ 322.1556, found 322.1550.



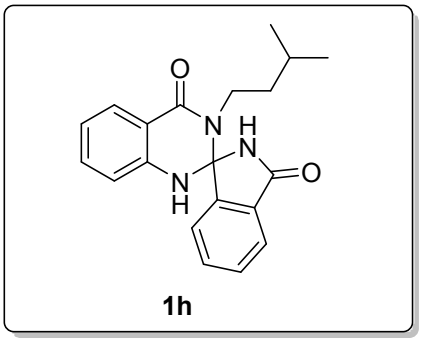
1f

3'-(*tert*-Butyl)-1'*H*-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'*H*)-dione (1f): Off white color solid; Yield: 62%; ^{1}H NMR (400 MHz, DMSO-d_6): **δ** 8.13 (s, 1H), 8.04 (d, *J* = 3.2 Hz, 1H), 7.88-7.85 (m, 3H), 7.82-7.78 (m, 1H), 7.48 (t, *J* = 7.6 Hz, 1H), 7.28-7.22 (m, 1H), 7.21-7.03 (m, 1H), 1.25 (s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$); **δ** 167.8, 164.6, 149.8, 144.8, 135.3, 133.8, 133.0, 131.7, 131.6, 131.1, 127.6, 125.8,124.0, 122.1, 120.6, 51.0, 28.9(3C);ESMS-Mass:322.1(M+H); HRMS (ESI): Anal. calcd for $C_{19}H_{19}N_3O_2$ $(M+H)^+$ 322.1556, found 322.1544.



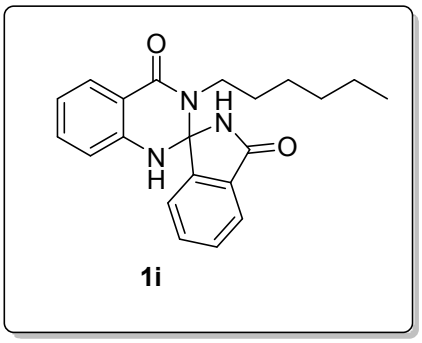
1g

3'-Isobutyl-1'*H*-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'*H*)-dione(1g): Off white color solid; Yield: 60%; ^{1}H NMR (400 MHz, $CDCl_3$): **δ** 8.26-8.21 (m, 2H), 8.19 (bs, 1H), 8.00 (d, *J* = 7.2 Hz 1H), 7.92 (d, *J* = 6.8 Hz, 1H), 7.86-7.77 (m, 2H), 7.33-7.26 (m, 1H), 7.49-7.46 (m,1H), 6.99 (d, *J* = 7.6 Hz, 1H), 3.24-3.21 (t, *J* = 6.0 Hz, 2H), 1.80-1.74 (m,1H), 0.89-0.88 (d, *J* = 4.4 Hz, 6H); ^{13}C NMR (100 MHz, $CDCl_3$); **δ** 167.8, 165.6, 150.2, 145.1, 135.4, 133.7, 133.0, 131.9, 131.4, 125.9, 125.8, 123.9, 122.1, 120.7, 47.3, 28.4, 20.3; ESMS-Mass:350.18 (M+H); HRMS (ESI): Anal. calcd for $C_{19}H_{24}NO_4$ $(M+H)^+$ 322.1556, found 322.1544.



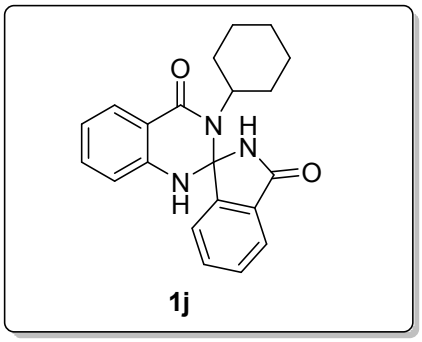
1h

3'-Isopentyl-1'*H*-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'*H*)-dione (1h): Off white color solid; Yield: 60%; ^{1}H NMR (400 MHz, $CDCl_3$): **δ** 8.25 (d, *J* = 8.0 Hz, 1H), 8.13 (bs, 1H), 8.03-799 (m, 2H), 7.93 (d, *J* = 7.2 Hz, 1H), 7.80-7.77 (m, 2H), 7.49-7.45 (m, 1H), 7.31 (t, *J* = 7.2 Hz, 1H), 6.98 (d, *J* = 7.6 Hz, 1H), 3.43-3.38 (m, 2H), 1.59-1.53 (m, 1H), 1.40-1.35 (m, 2H), 0.82 (d, *J* = 6.4 Hz, 6H); ^{13}C NMR (100 MHz, $CDCl_3$): **δ** 167.8, 165.5, 150.1, 145.1, 135.4, 133.8, 133.1, 131.9, 131.9, 131.1, 126.6, 125.8, 124.0, 122.1, 120.6, 38.3, 37.9, 25.7, 22.3 (2C); ESMS-Mass:350.18 (M+H); HRMS (ESI): Anal. calcd for $C_{19}H_{24}NO_4$ $(M+H)^+$ 336.1712, found 336.1697.



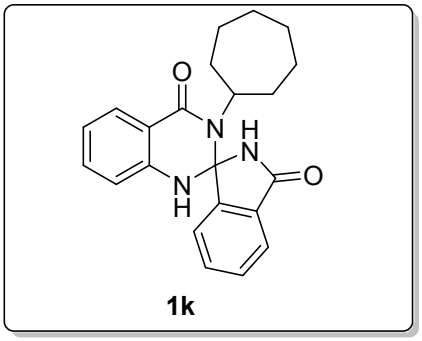
1i

3'-Hexyl-1'*H*-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'*H*)-dione (1i): Light brown color solid; Yield: 62% ; ^{1}H NMR (400 MHz, $CDCl_3$): **δ** 8.30 (bs, 1H), 8.21-8.17 (m, 2H), 8.00 (d, *J*= 6.8 Hz, 1H), 7.93 (d, *J* = 7.2 Hz, 1H), 7.81-7.73 (m, 2H), 7.47 (t, *J* = 7.2 Hz, 1H), 7.28 (t, *J* = 7.2 Hz, 1H), 6.98 (d, *J* = 7.6 Hz, 1H), 3.39-3.34 (m, 2H), 1.51-1.43 (m, 2H), 1.24-1.18 (m, 2H),1.14-1.12 (m, 4H), 0.81 (t, *J* = 6.8 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): **δ** 167.9, 165.5, 150.1, 145.0, 135.5, 133.8, 133.0, 131.9, 131.8, 131.1, 126.5, 125.7, 123.9, 121.9, 120.7,39.8,31.5, 29.4, 26.8, 22.4, 13.9;HRMS (ESI): Anal. Calc.Mass for $C_{21}H_{24}N_3O_2$ $(M+H)^+$ 350.1869, found 350.1885.



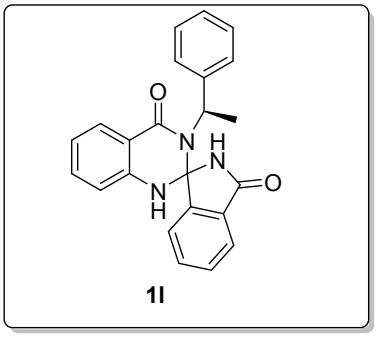
1j

3'-Cyclohexyl-1'*H*-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'*H*)-dione (1j): Light brown color solid; Yield: 61%; ^{1}H NMR (400 MHz, $CDCl_3$): **δ** 8.20 (d, *J* = 8.0 Hz, 1H), 8.13 (d, *J* = 7.6 Hz, 1H), 8.00 (d, *J* =7.2 Hz, 1H), 7.92 (d, *J* = 7.6 Hz, 1H), 7.82-7.73 (m, 2H), 7.46 (t, *J* = 7.6 Hz, 1H),7.28 (t, *J* = 8.0 Hz, 1H), 6.97 (d, *J* = 8.0 Hz, 1H), 3.91-3.87 (m, 1H), 1.91-1.87 (m, 2H), 1.65-1.55 (m, 3H), 1.40-1.37 (m, 2H),1.18-1.09 (m, 3H); 13C NMR (100 MHz, CDCl3); **δ** 167.9, 164.7, 149.9, 144.9, 135.4, 133.8, 133.0, 131.8, 131.8, 131.2, 126.8, 125.7, 123.9, 121.9, 120.6, 48.2, 32.9 (2C), 25.6, 24.6 (2C); HRMS (ESI): Anal. Calc.Mass $C_{21}H_{22}N_3O_2$ $(M+H)^+$ 348.1712, found 348.1721.



1k

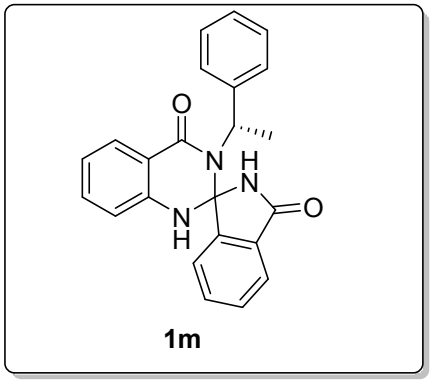
3'-Cycloheptyl-1'*H*-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'*H*)-dione (1k): Light brown color solid; Yield: 62%; ^{1}H NMR (400 MHz, $CDCl_3$): **δ** 8.12-8.05 (m, 2H), 8.02 (bs, 1H), 7.93 (d, *J*= 7.2 Hz, 1H), 7.86 (d, *J* =7.6 Hz, 1H), 7.82-7.74 (m, 2H), 7.47 (t, *J* = 6.8 Hz, 1H), 7.33-7.26 (m, 1H), 6.98 (d, *J* = 8.0 Hz, 1H), 4.10-4.07 (m, 1H), 1.93-1.89 (m, 2H), 1.68-1.50 (m, 4H), 1.45-1.25 (m, 6H); ^{13}C NMR (100 MHz, $CDCl_3$); **δ** 167.8, 164.3, 149.9, 144.9, 135.4, 133.7, 133.0, 131.8, 131.8, 131.2, 126.8, 125.7, 124.0, 122.1, 120.6, 50.4, 35.0 (2C), 28.2 (2C), 23.9 (2C); ESMS-Mass:362.18 (M+H); HRMS (ESI): Anal. calcd for $C_{22}H_{23}N_3O_2$ $(M+H)^+$ 362.1869, found 362.1874.



1l

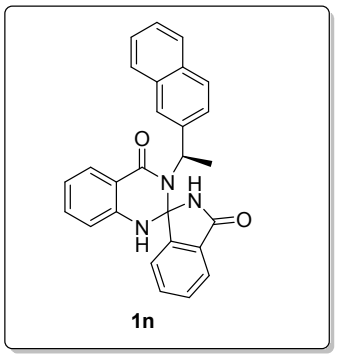
3'-(*R*)-1-Phenylethyl-1'*H*-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'*H*)-dione (1l): Light brown color solid; Yield: 55%; ^{1}H NMR (400 MHz, $CDCl_3$): **δ** 8.64 (bs, 1H), 8.28 (d, *J* = 7.6 Hz, 1H), 7.90 (d, *J* = 7.2 Hz, 1H), 7.84-7.80 (m, 1H), 7.75-7.72 (m, 1H), 7.71-7.61 (m, 2H), 7.50 (t, *J*= 7.6 Hz, 1H), 7.36-7.26 (m, 3H), 7.21-7.16 (m, 3H), 6.98 (d, *J* = 8.0 Hz, 1H), 5.27-5.19 (m, 1H), 1.53 (d, *J* = 6.8 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$); **δ** 167.7, 164.7, 143.4, 135.2, 133.9, 132.9, 132.1 (2C), 130.9, 128.6 (3C), 127.2, 126.7, 126.3 (3C), 125.9, 123.9, 122.2, 120.6, 49.3,

21.8; ESMS-Mass:370.15 (M+H); HRMS (ESI): Anal. calcd for $C_{23}H_{19}N_3O_2$ $(M+H)^+$ 370.1556, found 370.1567.



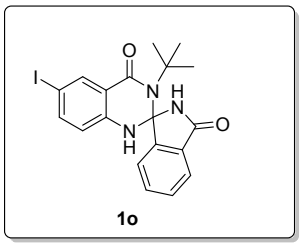
1m

3'-(*S*)-1-Phenylethyl-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione (1m): Light brown color solid; Yield: 55%; ^{1}H NMR (400 MHz, $CDCl_3$): **δ** 8.64 (bs, 1H), 8.25 (d, *J* = 8.0 Hz, 1H), 8.05 (bs, 1H), 7.89 (d, *J* = 7.2 Hz, 1H), 7.73 (t, *J* = 6.8 Hz, 1H), 7.68 (t, *J* = 7.6 Hz, 1H), 7.61 (d, *J* = 7.2 Hz, 1H), 7.49 (t, *J* = 7.2 Hz, 1H), 7.36-7.26 (m, 3H), 7.22-7.17 (m, 3H), 6.98 (d, *J*= 8.0 Hz, 1H), 5.26-5.19 (m, 1H), 1.52 (d, *J* = 6.8 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$); **δ** 167.8, 164.7, 143.3, 135.2, 133.8, 132.8, 132.1 (2C), 130.9, 128.6 (3C), 127.2, 126.6, 126.3 (3C), 125.8, 123.8, 122.1, 120.6, 49.3, 21.8; ESMS-Mass:370.15 (M+H); HRMS (ESI): Anal. calcd for $C_{23}H_{19}N_3O_2$ $(M+H)^+$ 370.1556, found 370.1554.



1n

3'-[(*R*)-1-(Naphthalen-2-yl)ethyl]-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione (1n): Light brown color solid; Yield: 60%; ^{1}H NMR (400 MHz, $CDCl_3$): **δ** 8.56 (bs, 1H), 8.33 (d, *J*= 7.6 Hz, 1H), 7.90 (d, *J* = 8.4 Hz, 1H), 7.67 (d, *J* = 7.6 Hz, 1H), 7.60-7.51 (m, 4H), 7.46-7.41 (m, 2H), 7.39-7.35 (m, 3H), 7.33-7.26(m,1H),7.24-7.19 (m, 1H),6.89 (d, *J* = 7.6 Hz, 1H), 6.84 (d, *J* = 7.6 Hz, 1H), 5.98 (t, *J* = 7.2 Hz, 1H), 1.75 (d, *J* = 6.8 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$); **δ** 167.5, 164.6, 149.8, 145.2, 137.9, 134.4, 133.7, 133.6, 132.3, 132.2, 132.0, 131.0, 130.4, 128.5, 128.4, 126.2, 126.1, 125.8, 125.5, 124.8, 123.5, 123.2, 122.7, 121.3, 120.5, 45.2, 19.9; ESMS-Mass:420.17 (M+H); HRMS (ESI): Anal. calcd for $C_{27}H_{21}N_3O_2$ $(M+H)^+$ 420.1712, found 420.1711.



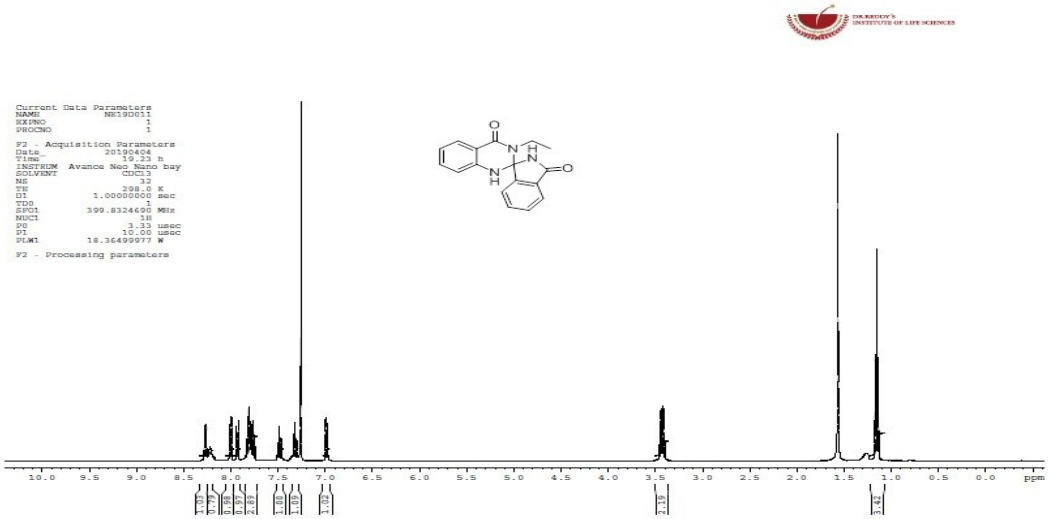
1o

3'-(tert-butyl)-6'-iodo-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione(1o): Light brown white color solid; Yield: 70%; ^{1}H NMR (400 MHz, $CDCl_3$): □ 8.57 (s, 1H), 8.46-8.45 (d, *J* = 8.4 Hz, 1H), 8.15 (s, 1H), 7.97-7.792(m, 1H), 7.80-7.70 7.28-7.22 (m, 1H), 6.75-6.72 (m, 1H), 1.34 (s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$); □ 166.4,162.0,148.9, 143.4,139.5,139.4,134.4,133.1,132.9,132.2,128.1,123.1,121.4,121.1, 88.9, 50.1, 27.8 (3C); ESMS-Mass: 447.28 (M+H); HRMS (ESI): Anal. calcd for $C_{19}H_{19}IN_3O_2$ $(M+H)^+$ 448.0522, found 448.0516.

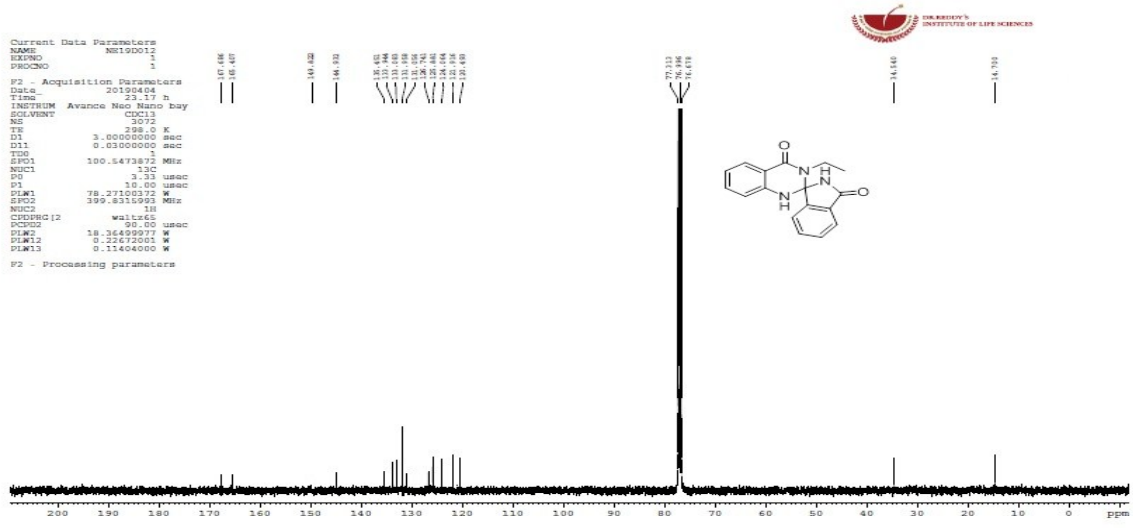
Spectra Data

^{1}H and ^{13}C NMR Spectra

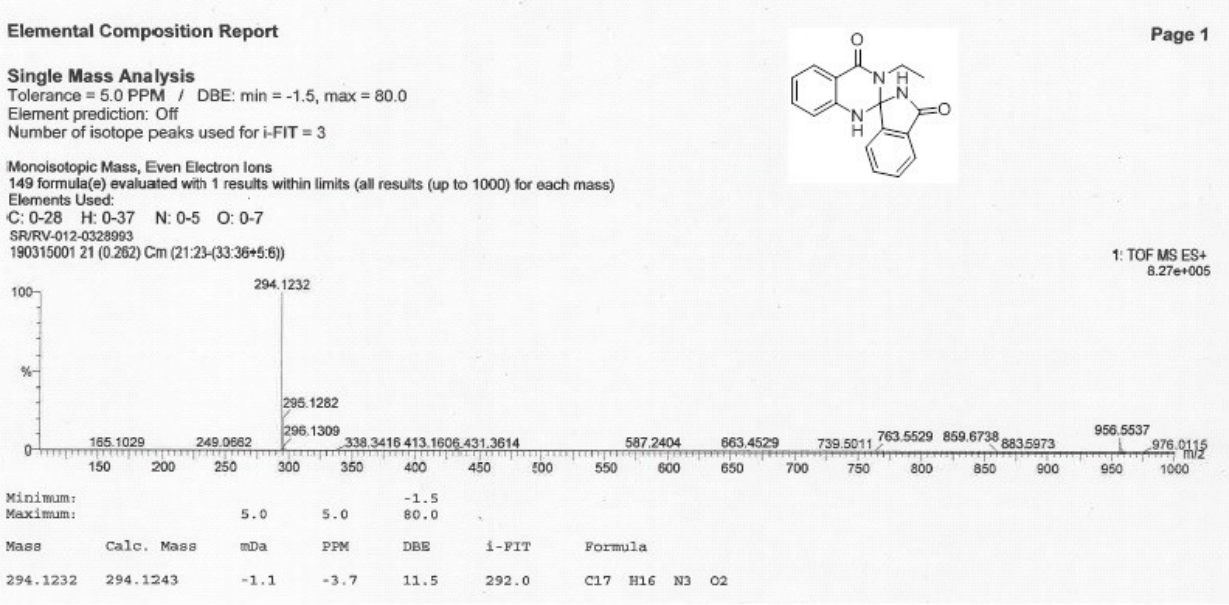
^{1}H NMR of 3'-Ethyl-1'H-spiro [isoindoline-1, 2'-quinazoline]-3, 4' (3'H)-dione (1a):



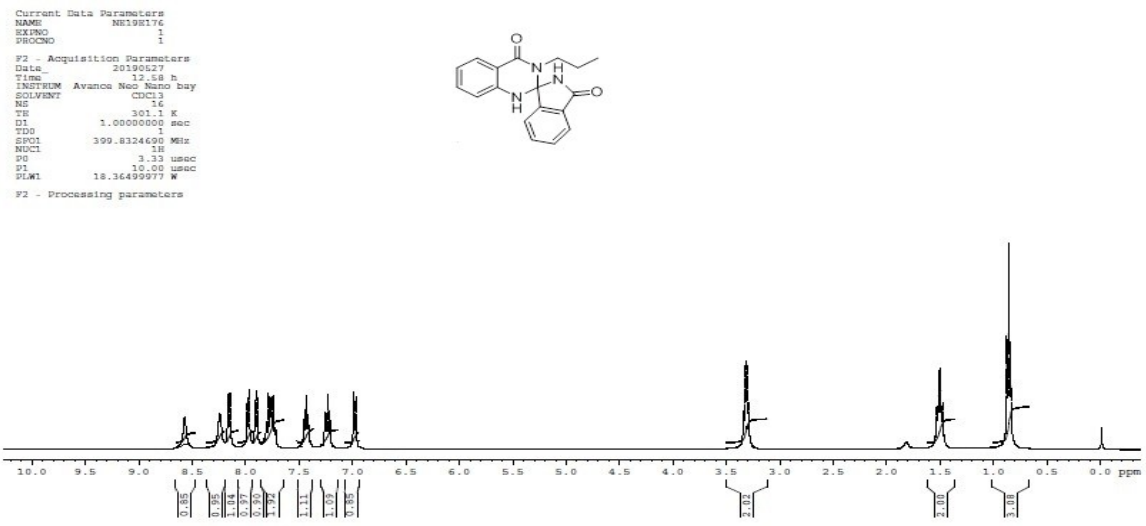
^{13}C NMR of 3'-Ethyl-1'H-spiro [isoindoline-1, 2'-quinazoline]-3, 4' (3'H)-dione (1a):



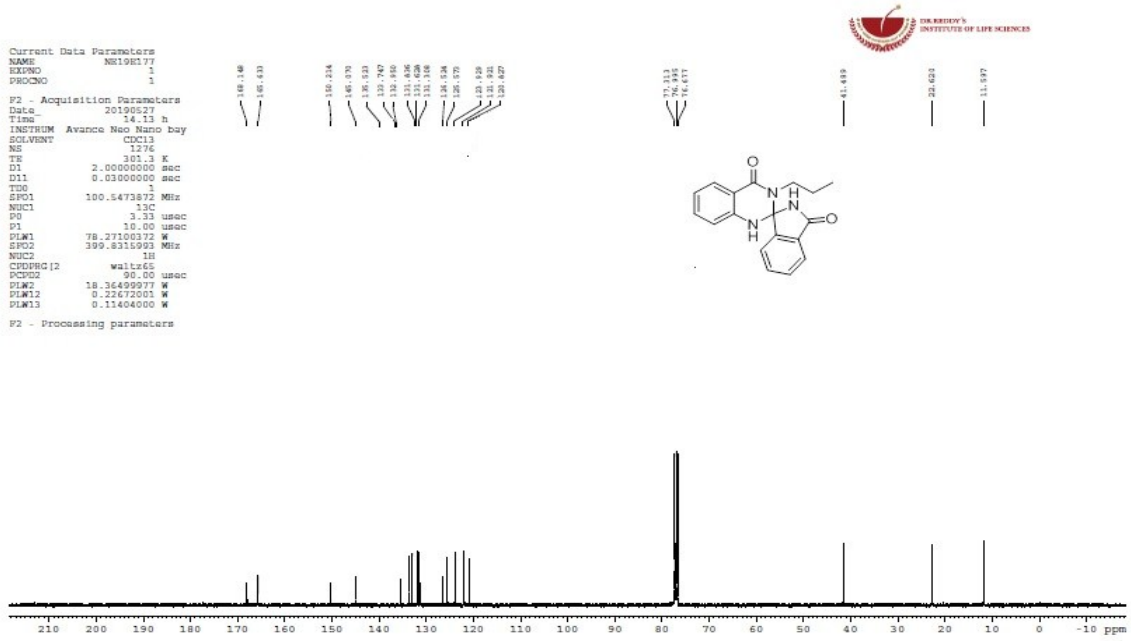
HRMS of 3'-Ethyl-1'H-spiro [isoindoline-1, 2’-quinazoline]-3, 4’ (3'H)-dione (1a):



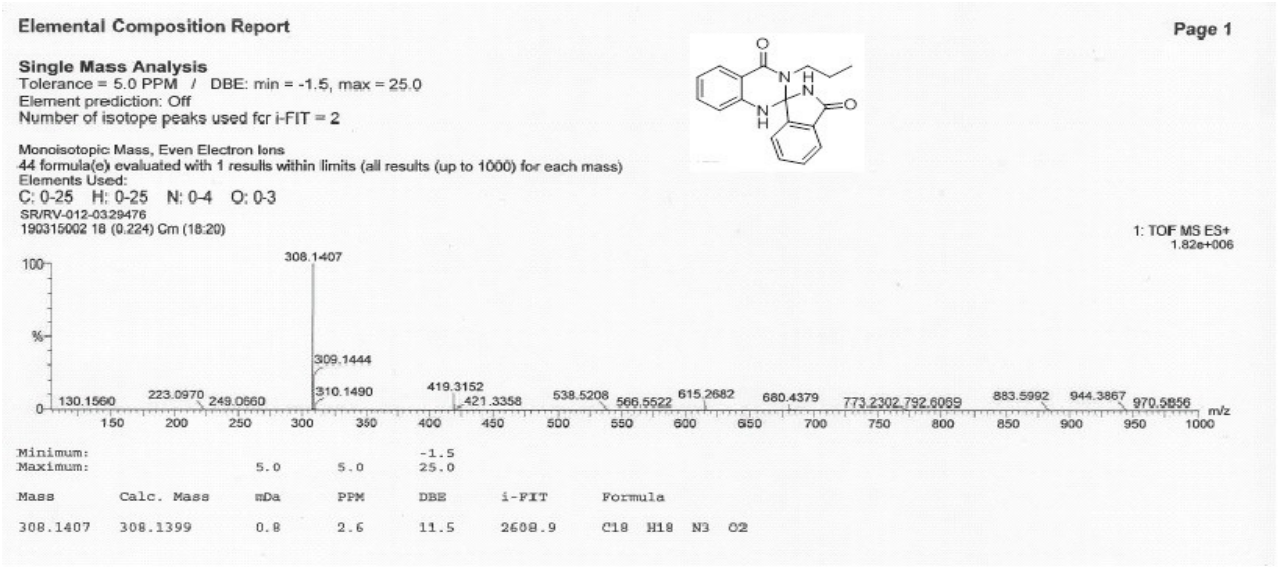
f 3'-Propyl-1'H-spiro [isoindoline-1, 2’-quinazoline]-3, 4’(3'H)-dione (1b):



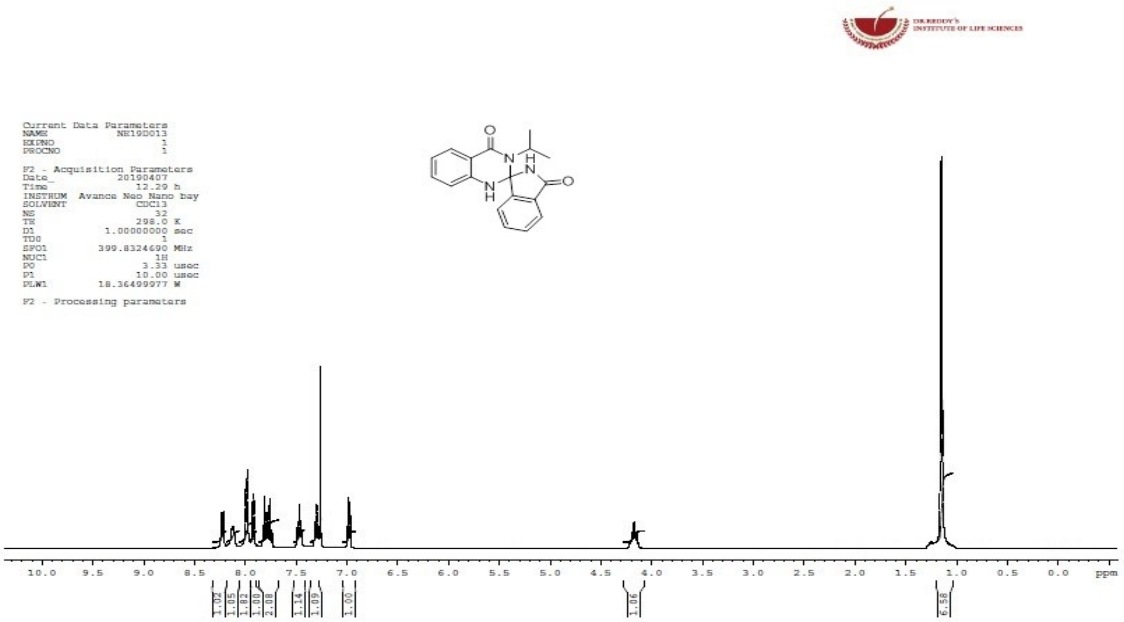
^{13}C NMR of 3'-Propyl-1'H-spiro [isoindoline-1, 2’-quinazoline]-3, 4’(3'H)-dione (1b):



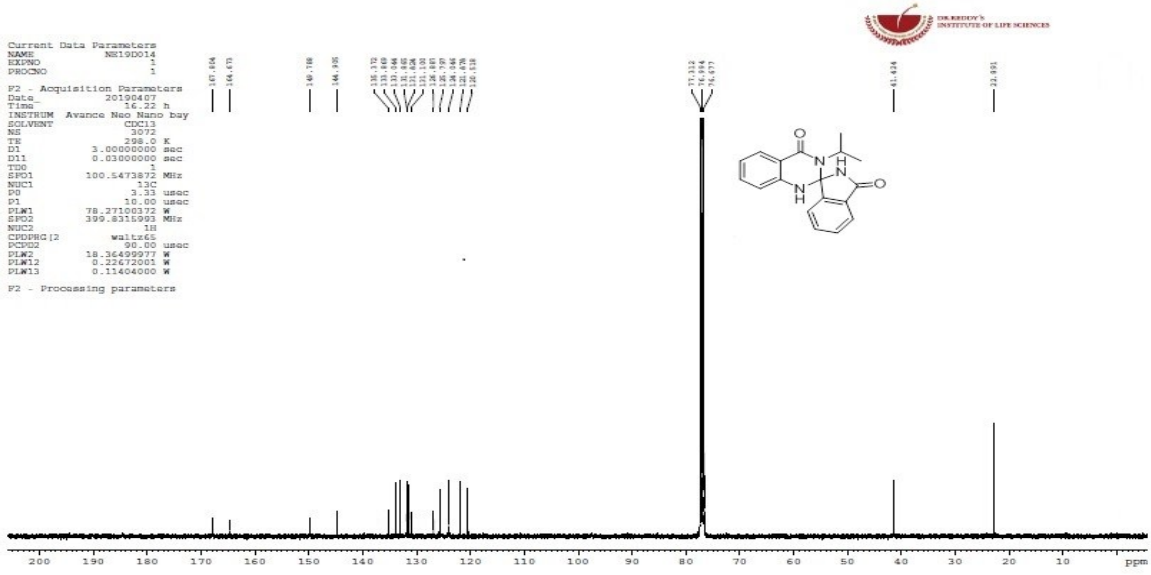
HRMS of 3'-Propyl-1'H-spiro [isoindoline-1, 2’-quinazoline]-3, 4’(3'H)-dione (1b):



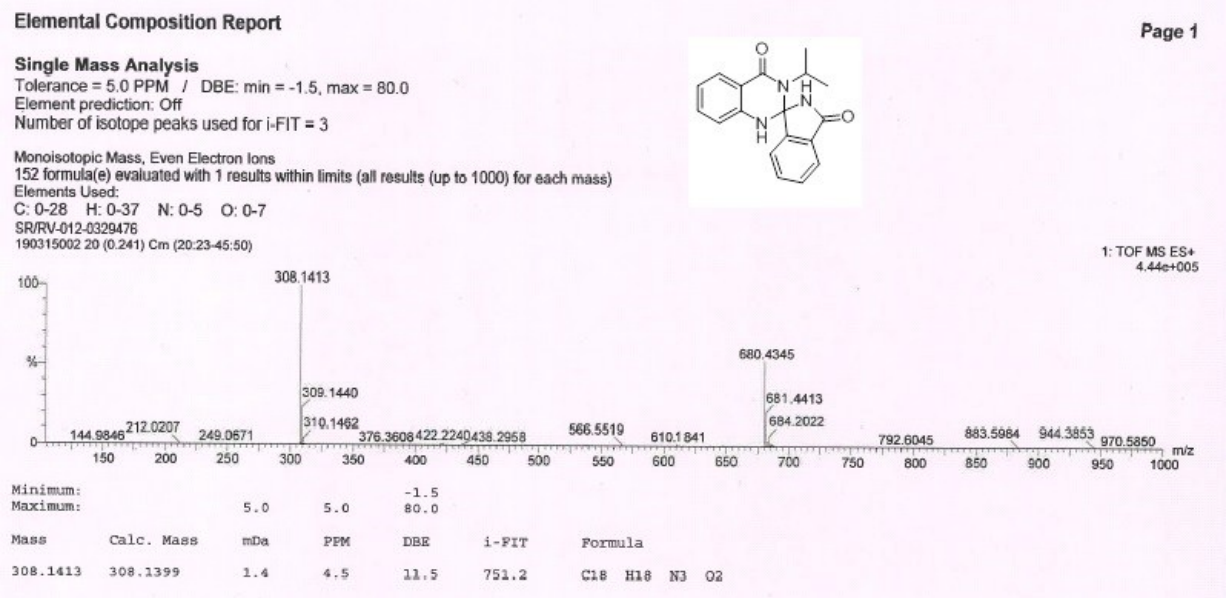
^{1}H NMR of 3'-Isopropyl-1'H-spiro[isoindoline-1, 2'-quinazoline]-3,4'(3'H)-dione (1c):



^{13}C NMR of 3'-Isopropyl-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione(1c):



HRMS of 3'-Isopropyl-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione (1c):



Elemental Composition Report

Page 1

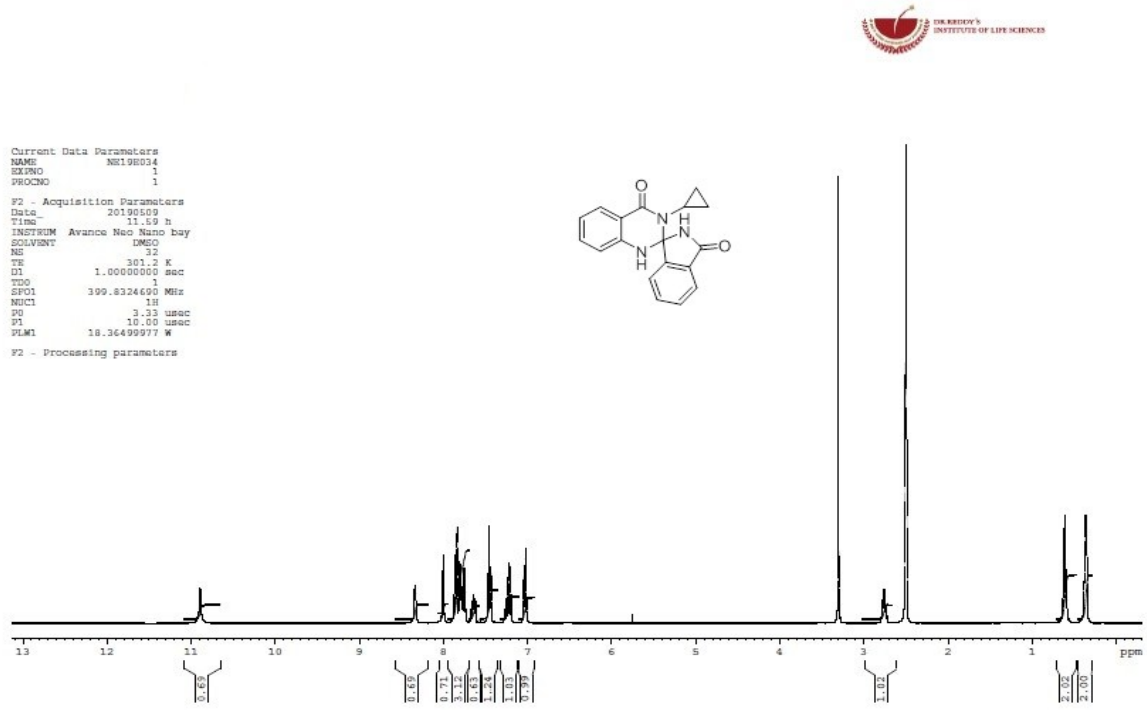
Single Mass Analysis
Tolerance = 5.0 PPM / DBE: min = -1.5, max = 80.0
Element prediction: Off
Number of isotope peaks used for i-FIT = 3

Monoisotopic Mass, Even Electron Ions
152 formula(e) evaluated with 1 results within limits (all results (up to 1000) for each mass)
Elements Used:
C: 0-28 H: 0-37 N: 0-5 O: 0-7
SR/RV-012-0329476
190315002 20 (0.241) Cm (20:23-45:50)

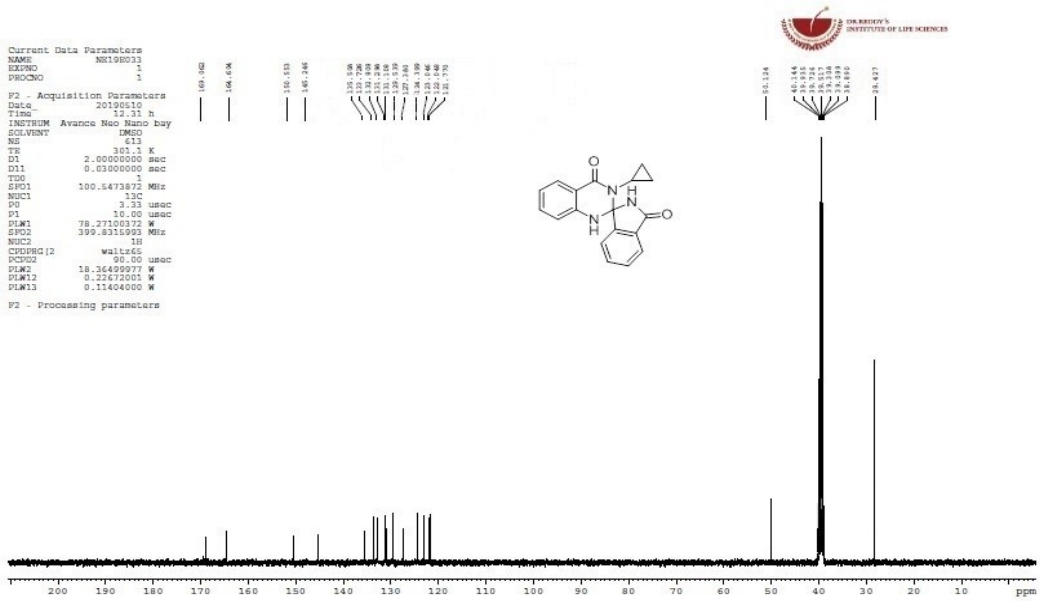
1: TOF MS ES+
4.44e+005

Minimum:				-1.5		
Maximum:		5.0	5.0	80.0		
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Formula
308.1413	308.1399	1.4	4.5	11.5	751.2	C18 H18 N3 O2

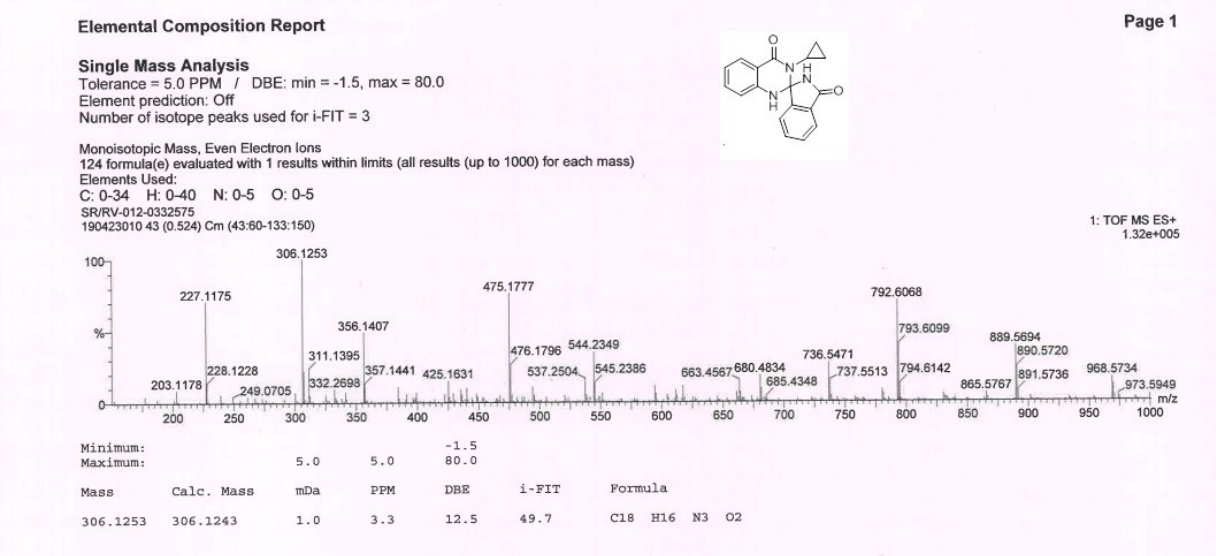
^{1}H NMR of 3'-Cyclopropyl-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione(1d)



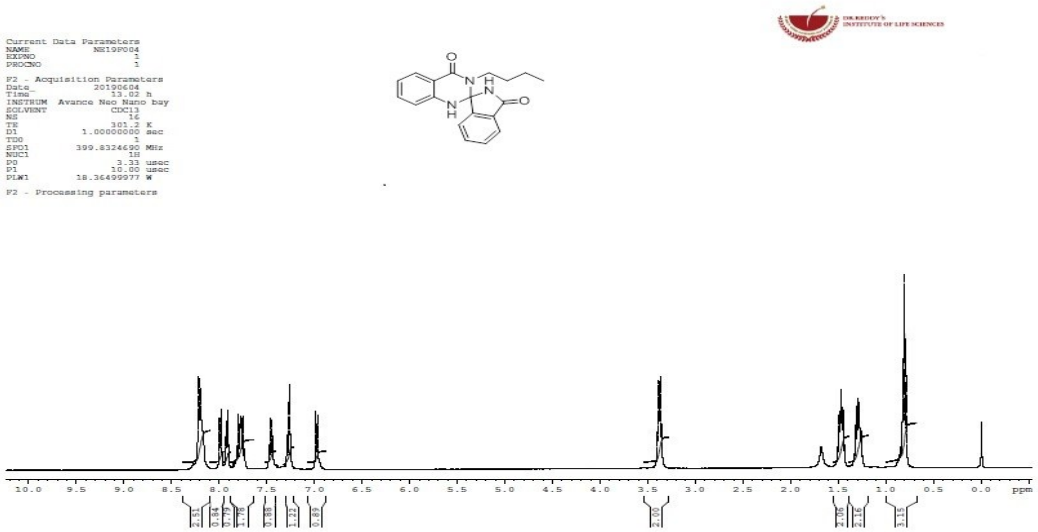
^{13}C NMR of 3'-Cyclopropyl-1'H-spiro [isoindoline-1, 2'-quinazoline]-3, 4' (3'H)-dione(1d)



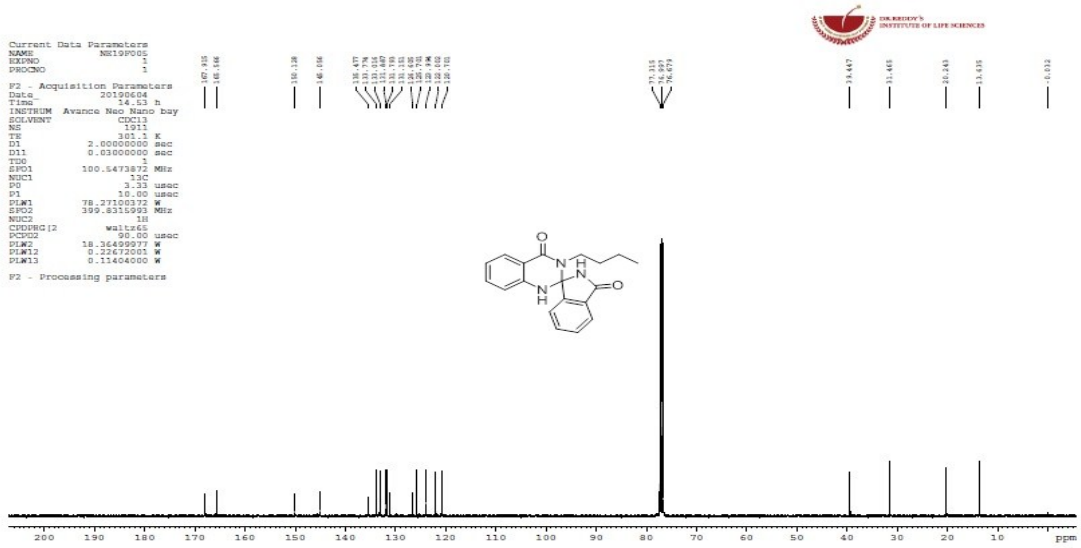
HRMS of 3'-cyclopropyl-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione(1d)



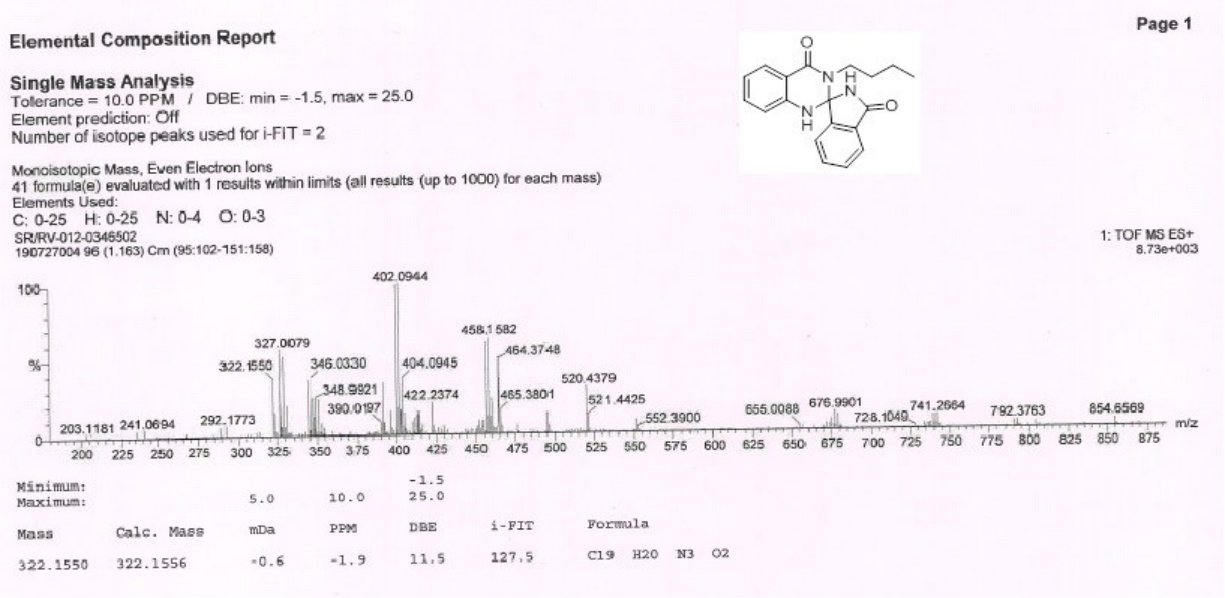
^{1}H NMR of 3'-Butyl-1'H-spiro[isoindoline-1, 2'-quinazoline]-3, 4' (3'H)-dione(1e):



^{13}C NMR of 3'-Butyl-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione(1e):

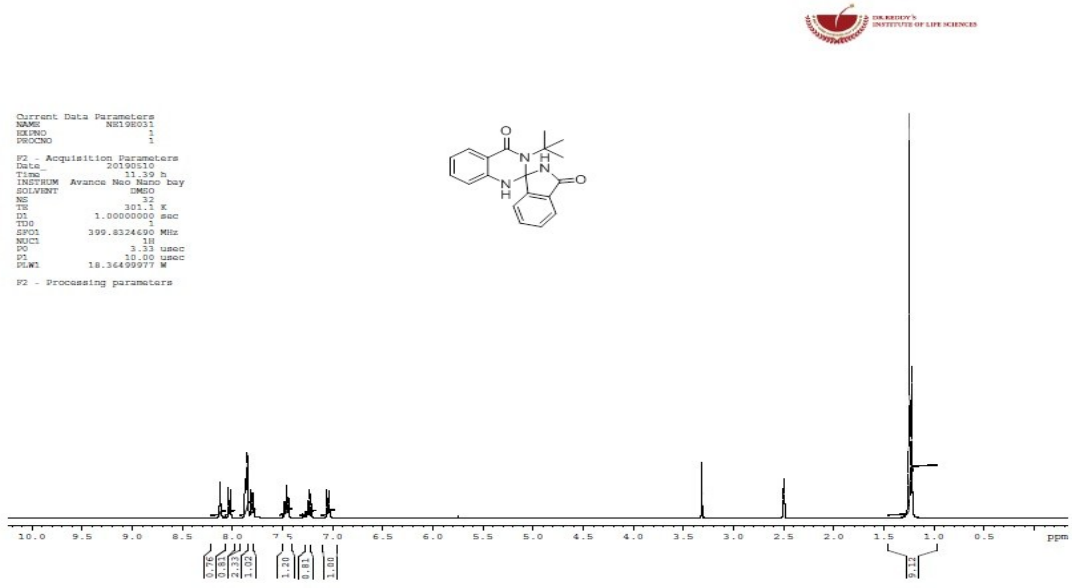


HRMS of 3'-Butyl-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione(1e):

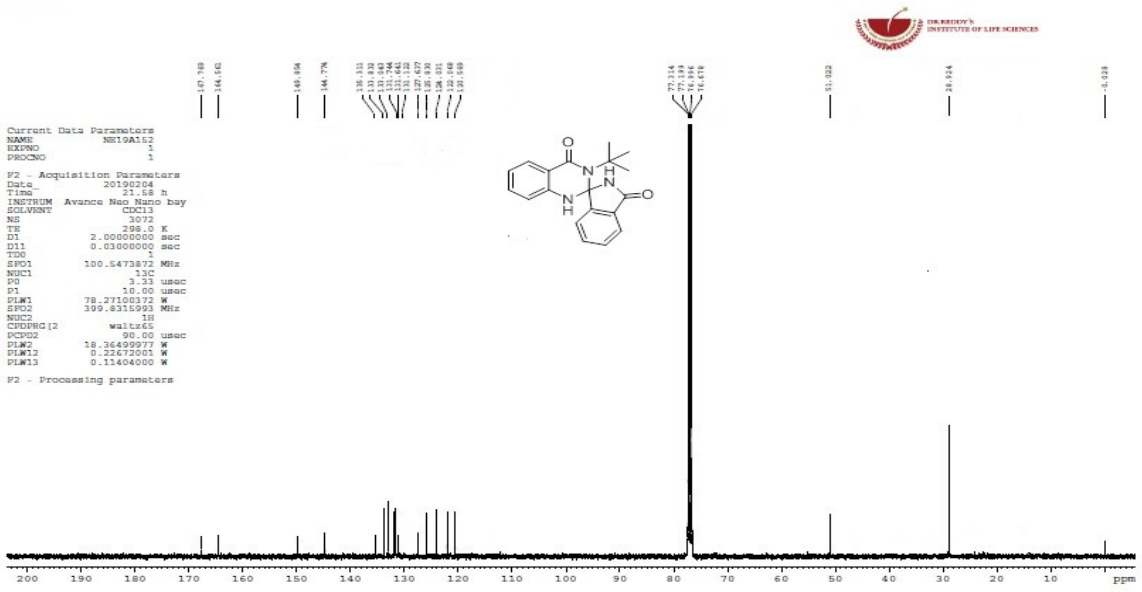


1

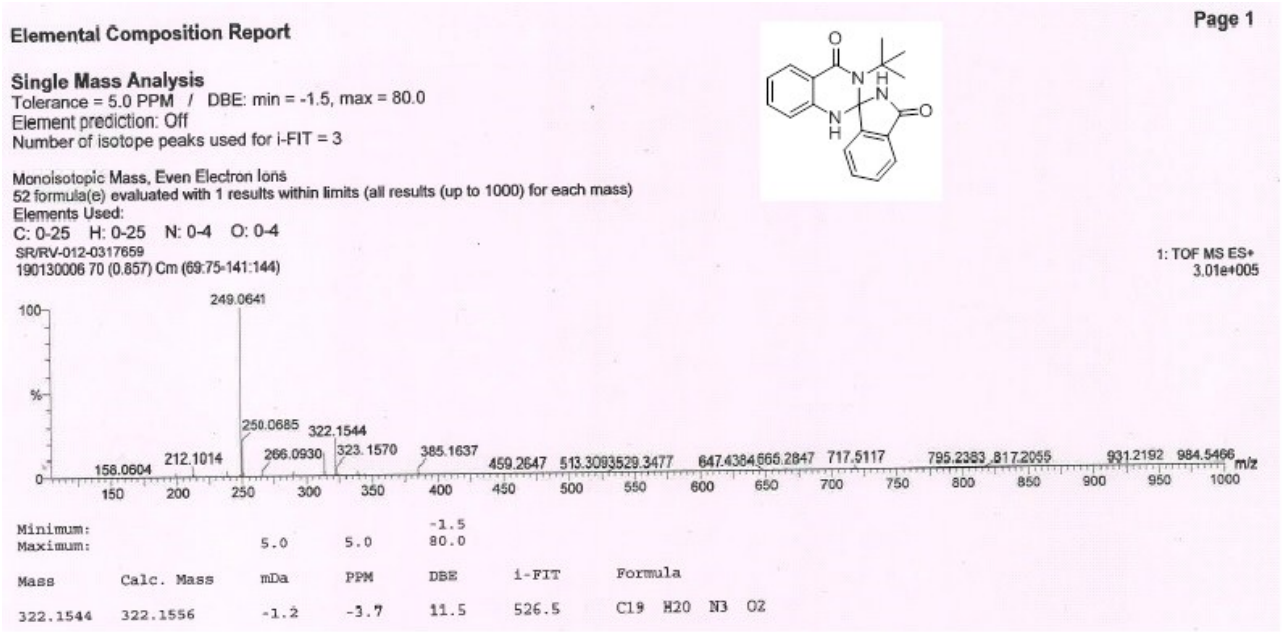
H-NMR of 3'-(tert-butyl)-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione (1f):



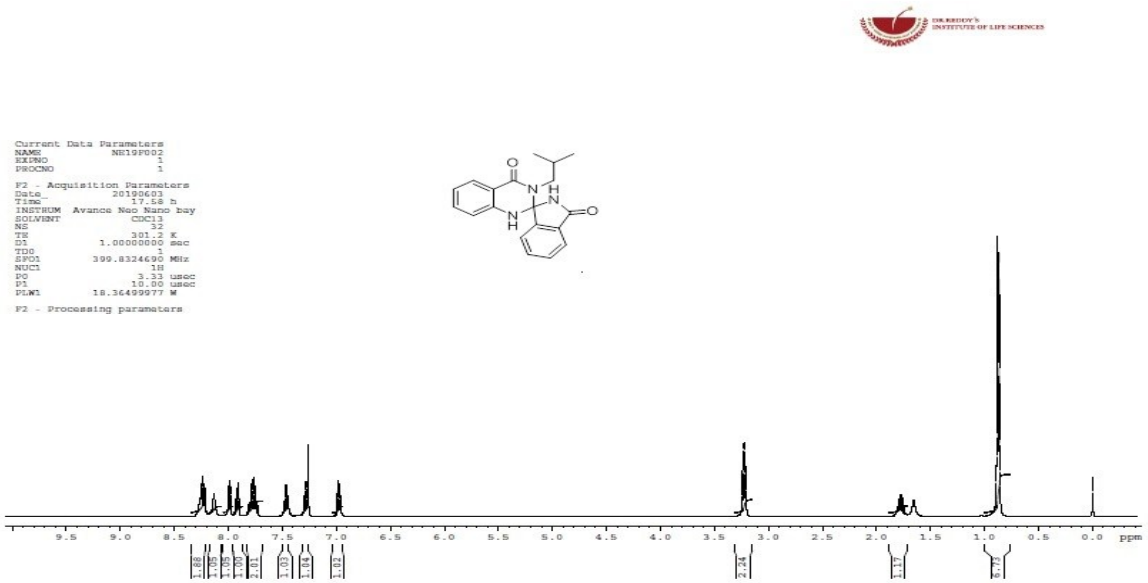
^{13}C-NMR of 3'-(tert-butyl)-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione (1f):



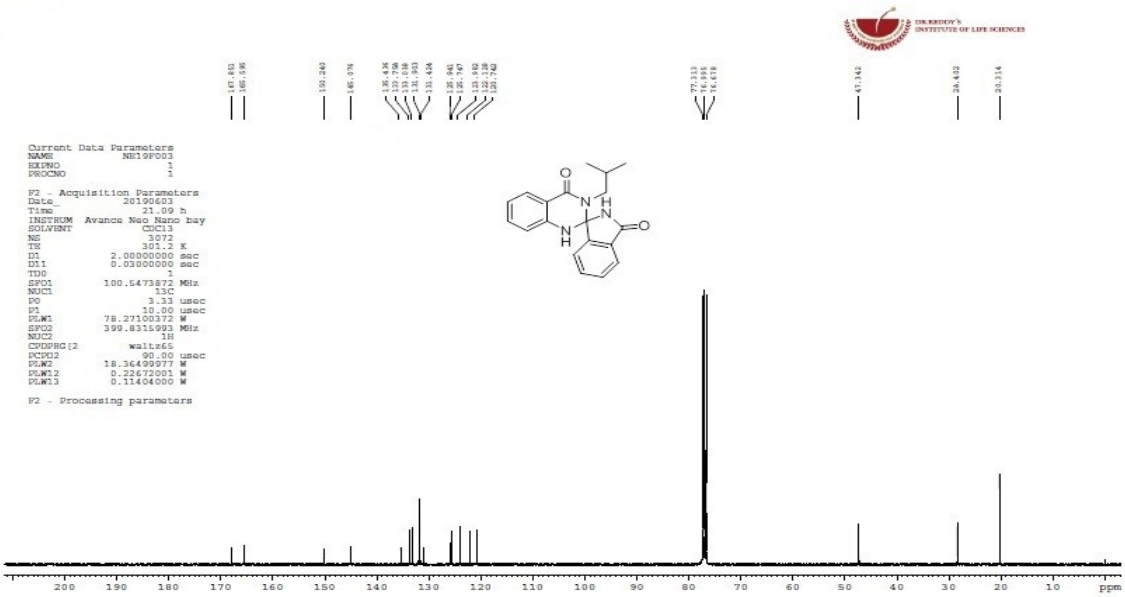
HRMS of 3'-(tert-butyl)-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione (1f):



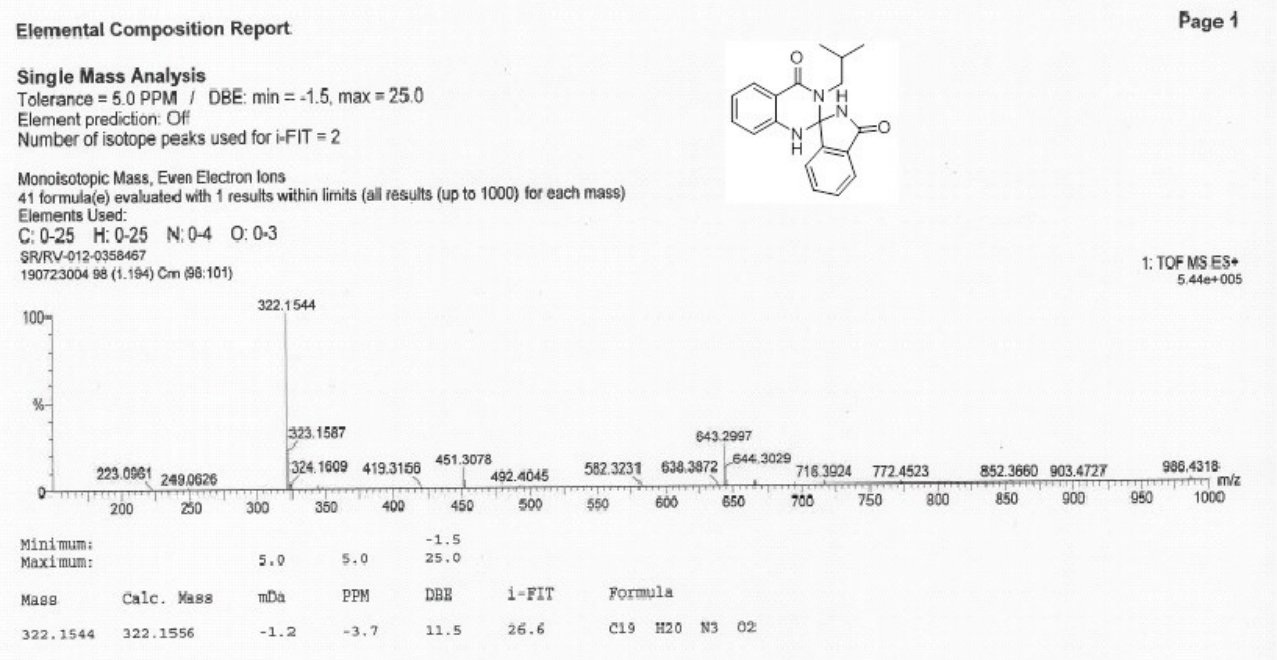
[1]H-NMR of 3'-isobutyl-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione(1g):



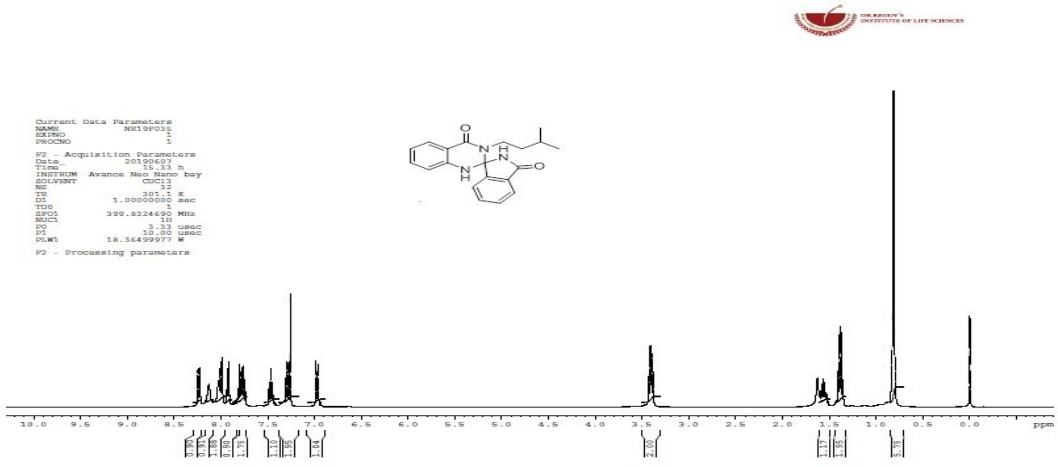
[13]C NMR of 3'-Isobutyl-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione(1g):



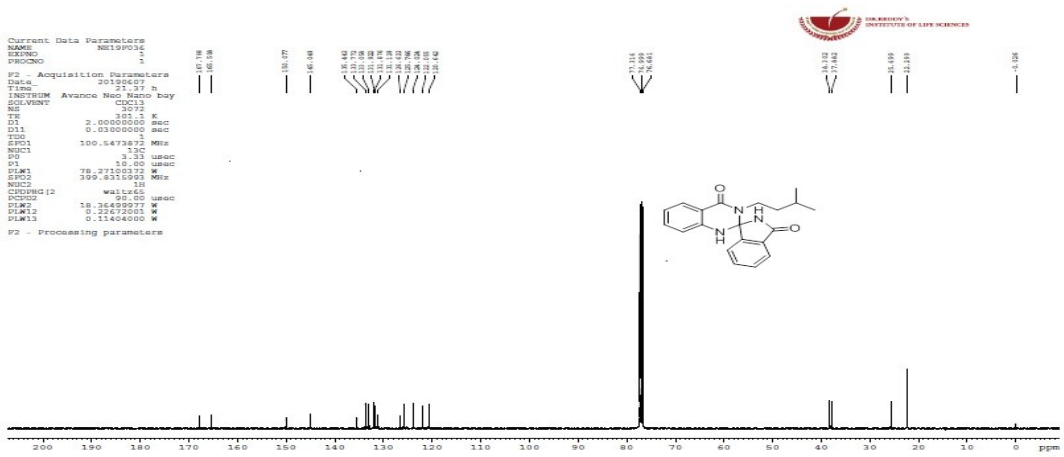
HRMS of 3'-Isobutyl-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione(1g):



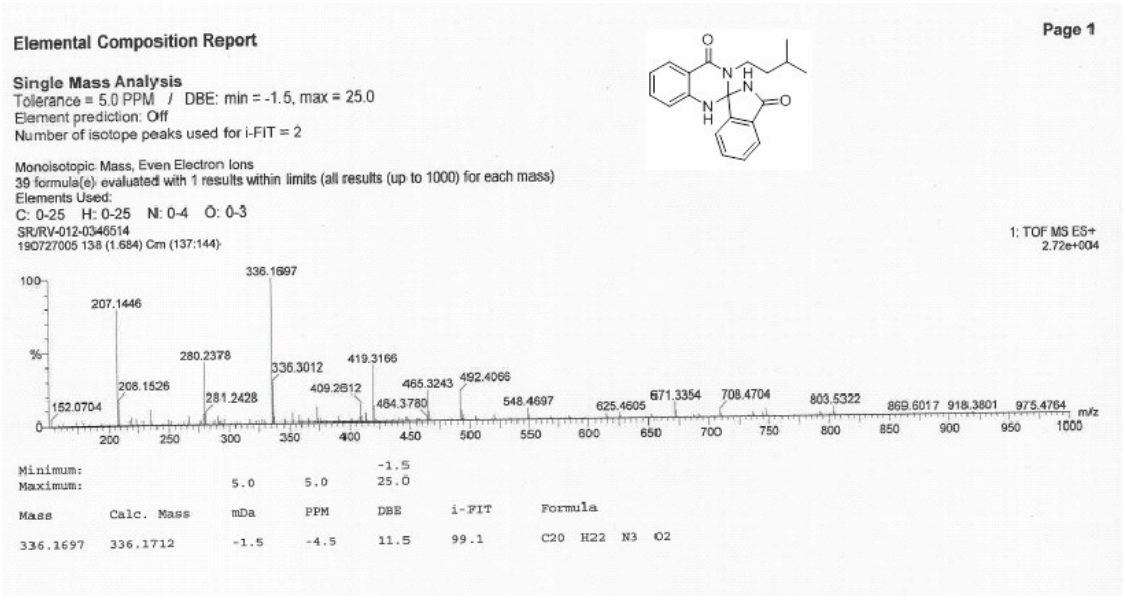
^{1}H-NMR of 3'-isopentyl-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione (1h):



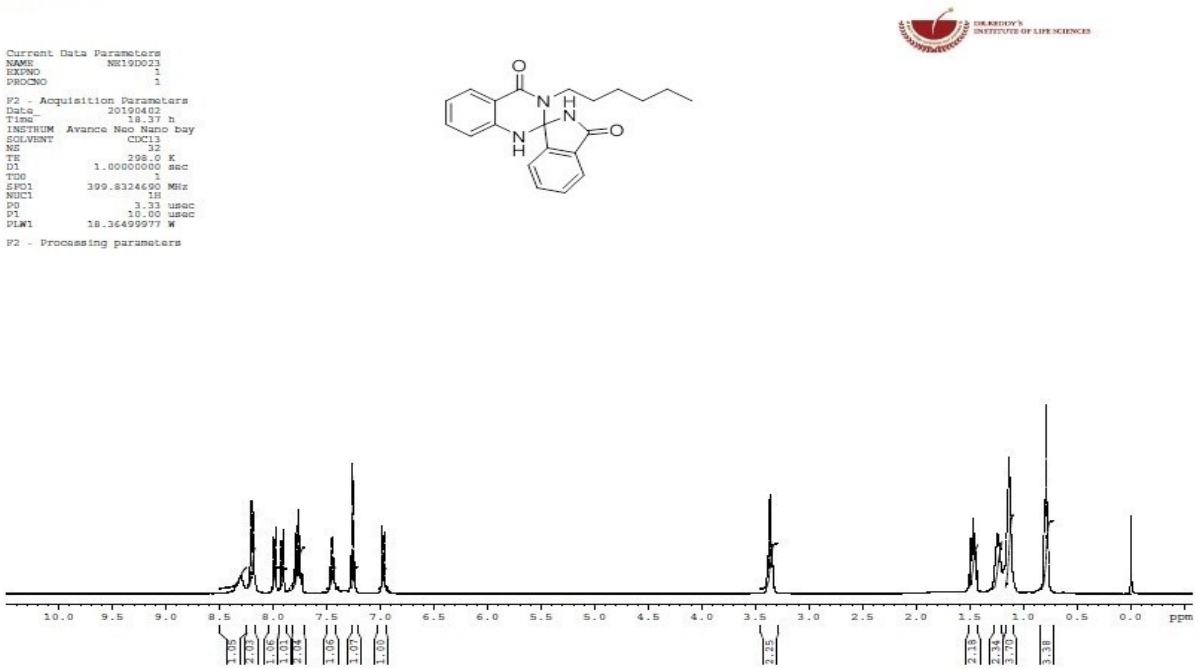
^{13}C NMR of 3'-Isopentyl-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione (1h):



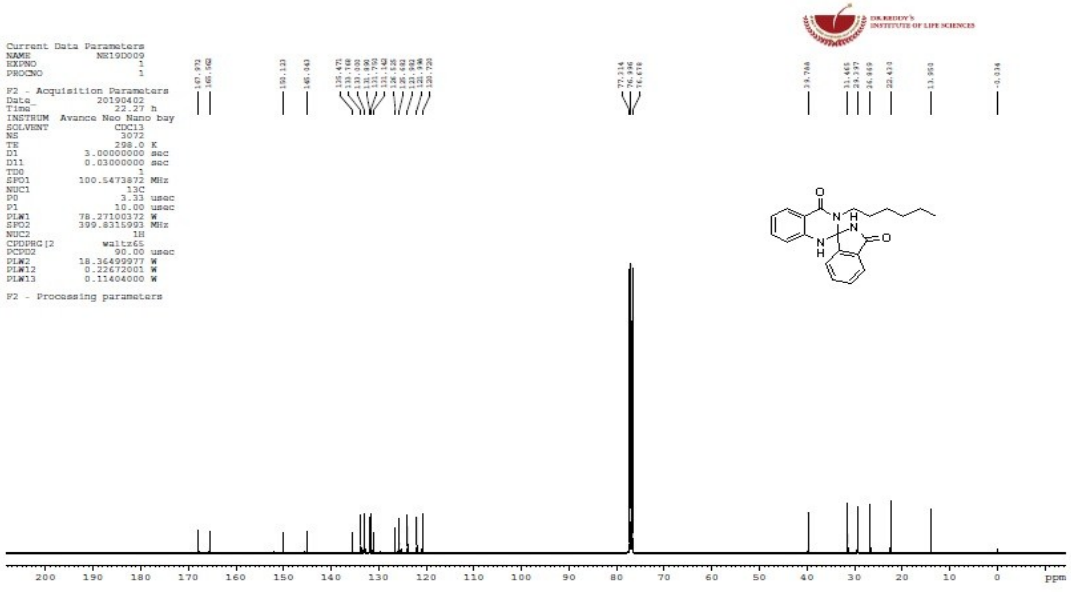
HRMS of 3'-isopentyl-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione (1h):



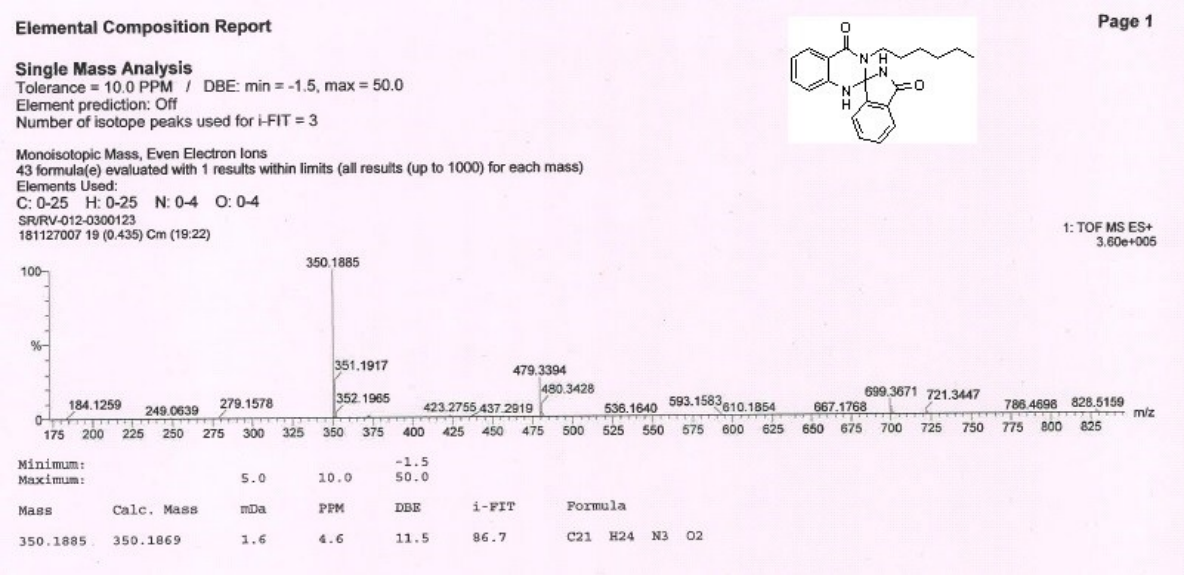
^{1}H NMR of 3'-Hexyl-1'H-spiro [isoindoline-1, 2'-quinazoline]-3, 4' (3'H)-dione (1i):



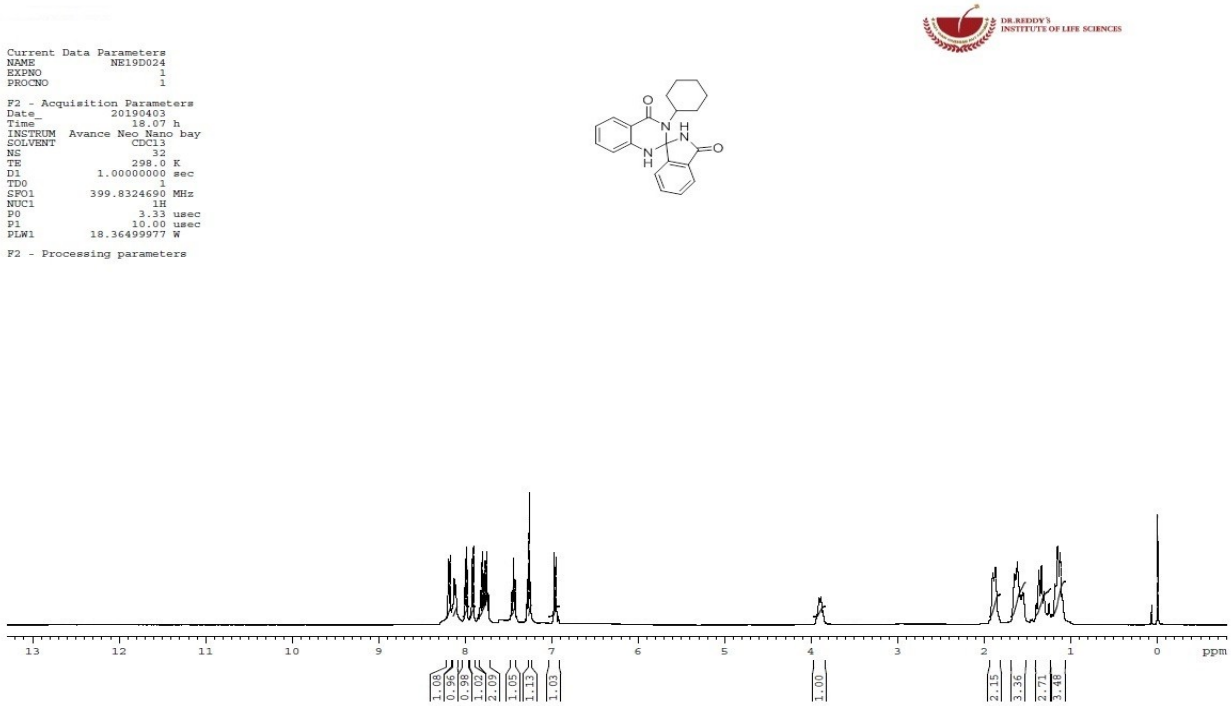
^{13}C NMR of 3'-Hexyl-1'H-spiro [isoindoline-1, 2'-quinazoline]-3, 4' (3'H)-dione (1i):



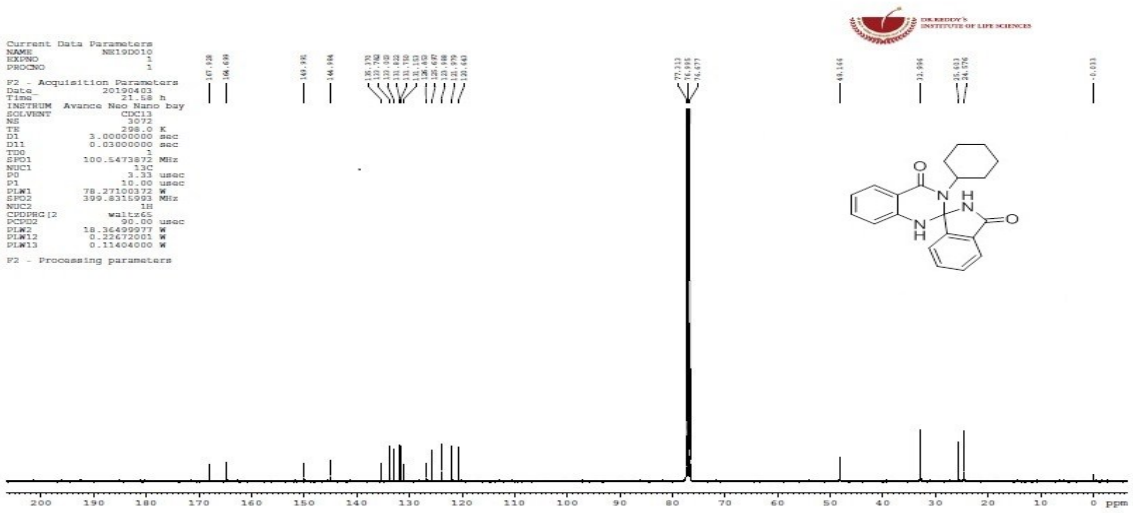
HRMS of 3'-hexyl-1'H-spiro [isoindoline-1, 2’-quinazoline]-3, 4’ (3'H)-dione (1i):



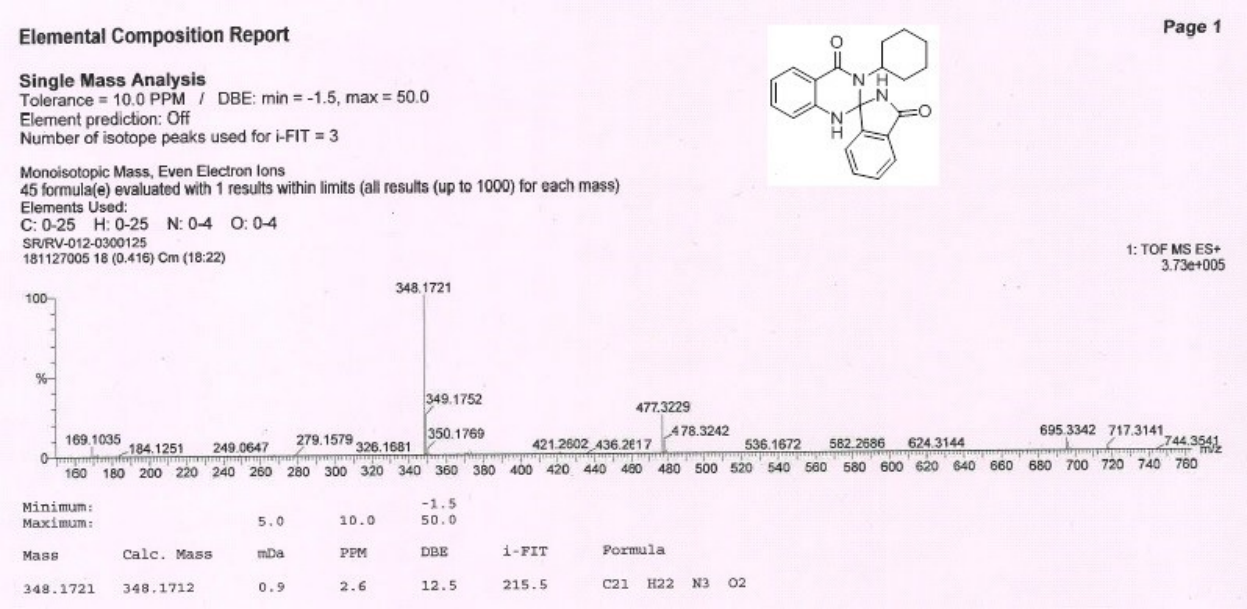
¹H-NMR of 3'-cyclohexyl-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione (1j):



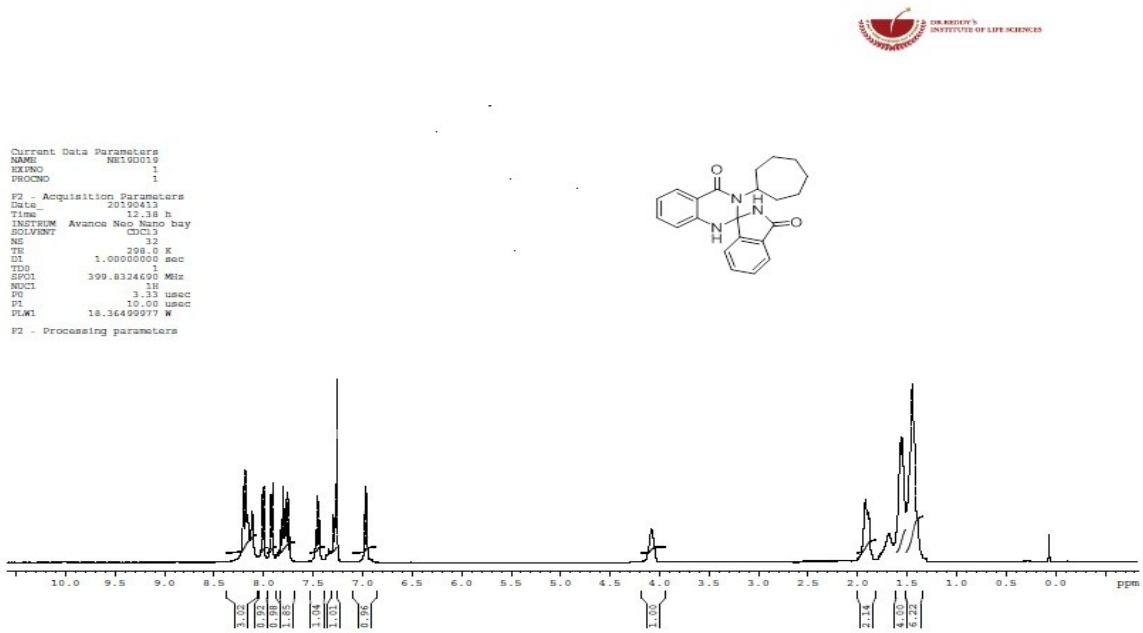
^{13}C NMR of 3'-Cyclohexyl-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione (1j):



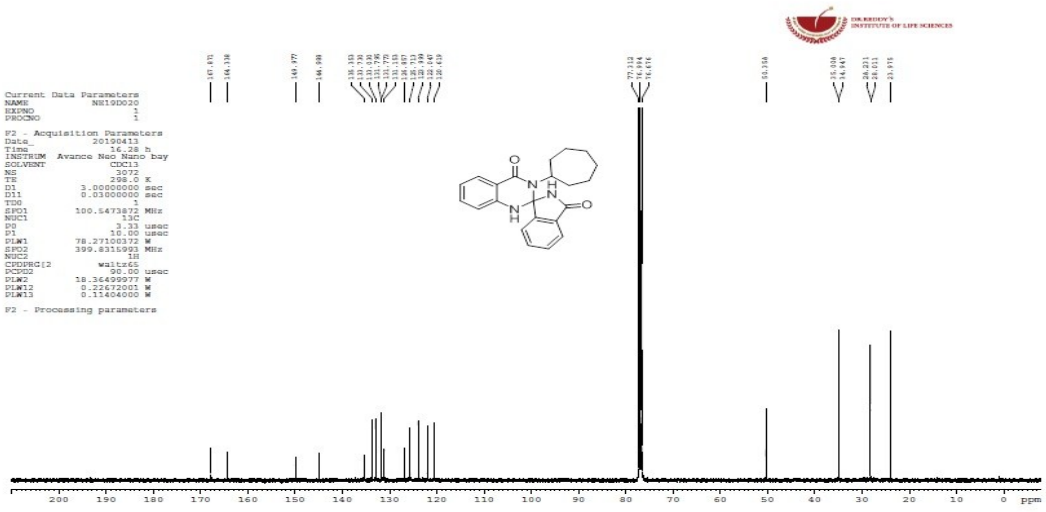
HRMS of 3'-cyclohexyl-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione (1j):



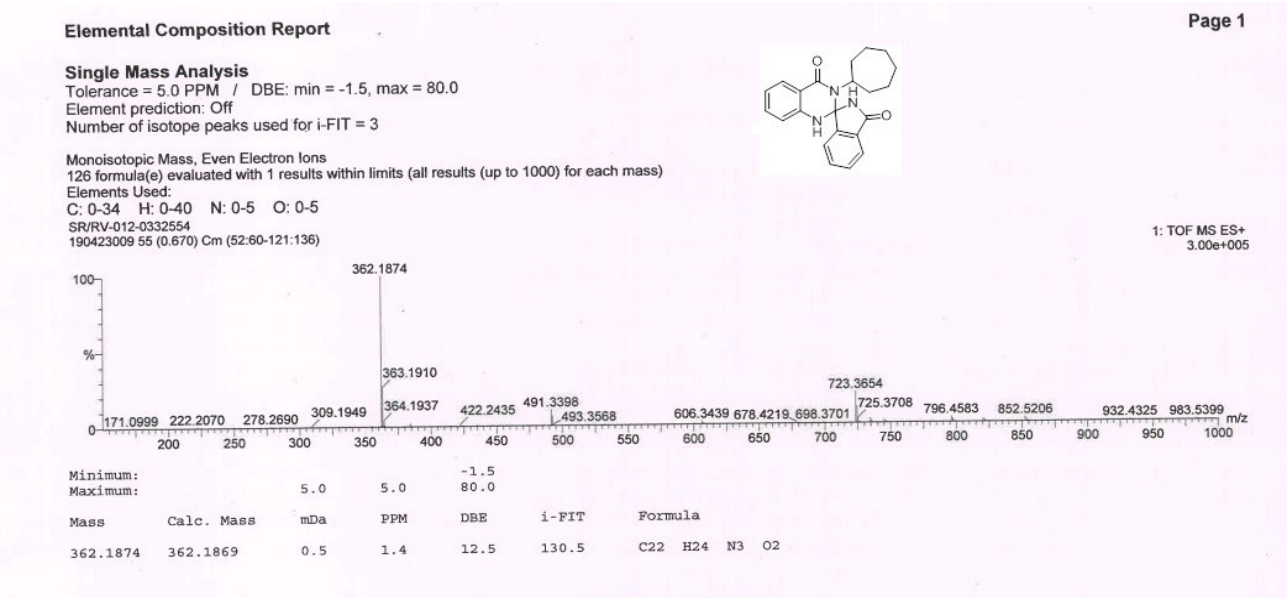
^{1}H-NMR of 3'-cycloheptyl-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione (1k):



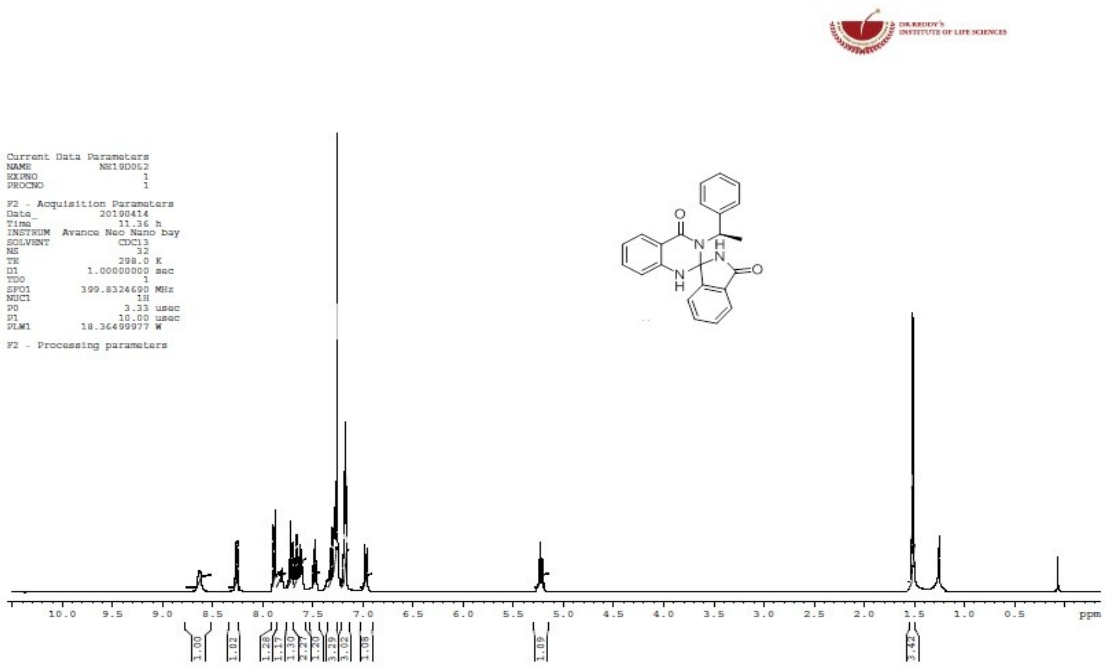
^{13}C-NMR of 3'-cycloheptyl-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione (1k):



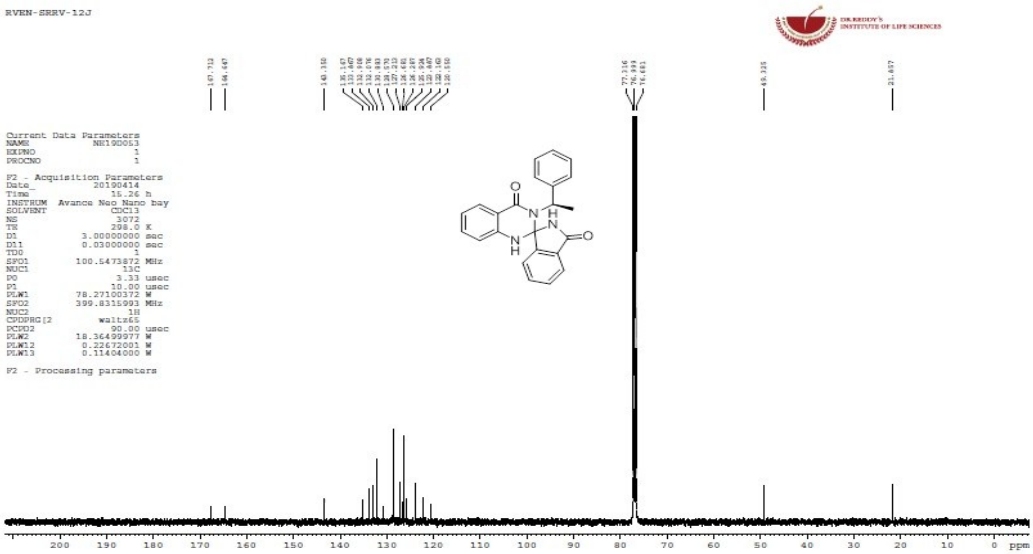
HRMS of 3'-cycloheptyl-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione (1k):



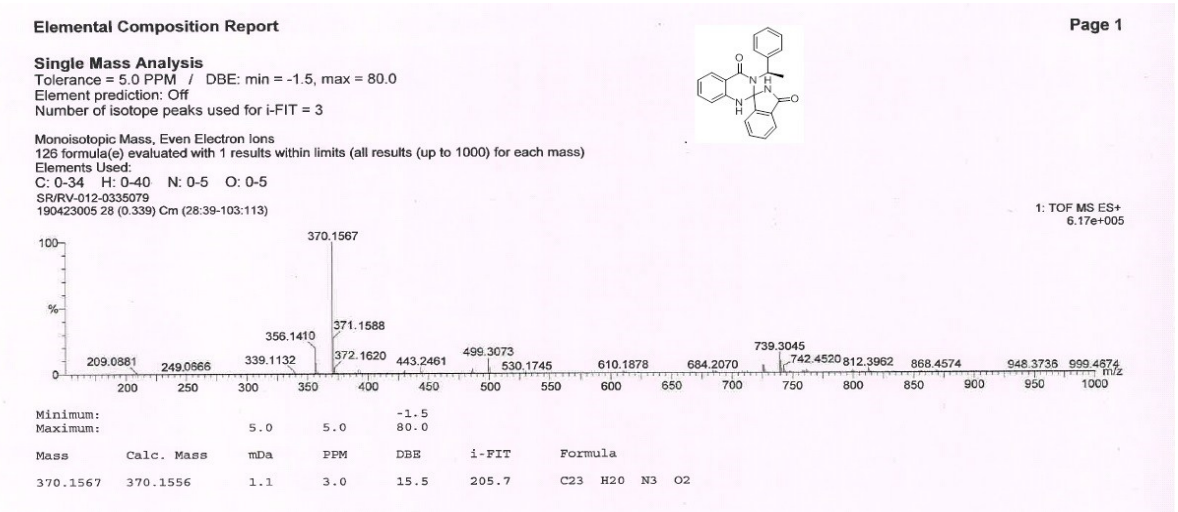
^{1}H-NMR of 3'-((R)-1-phenylethyl)-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione(1l):



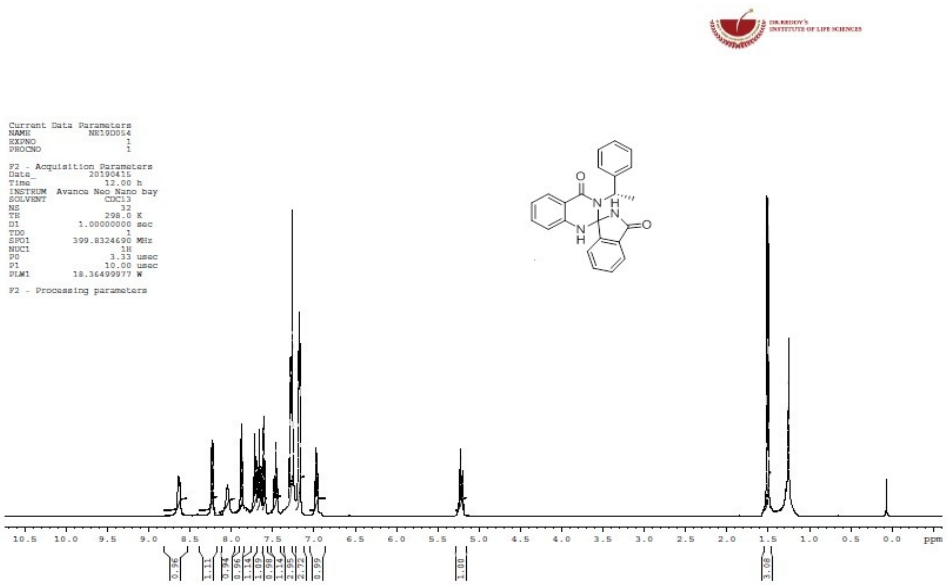
^{13}C-NMR of 3'-((R)-1-phenylethyl)-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione(1l):



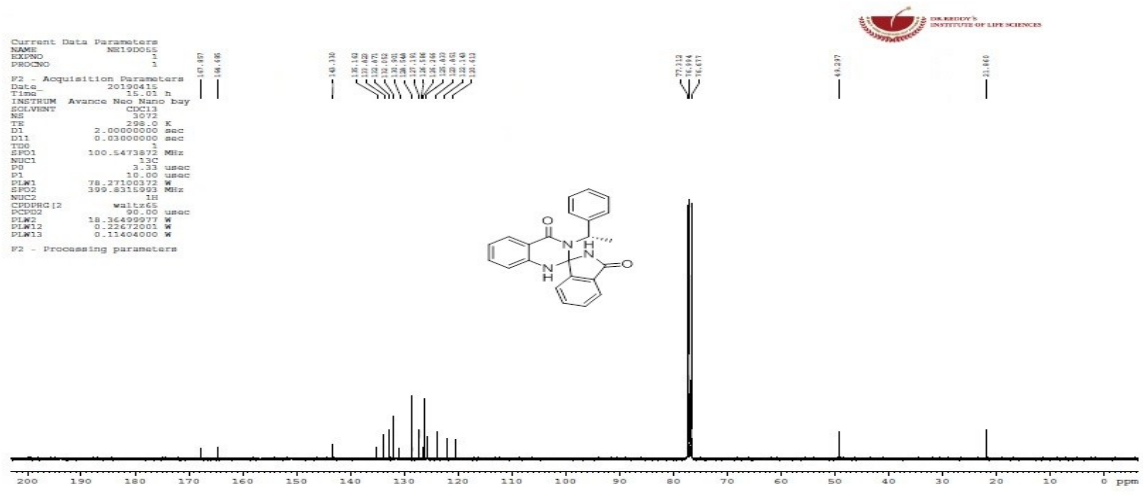
HRMS of 3'-((R)-1-phenylethyl)-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione(1l):



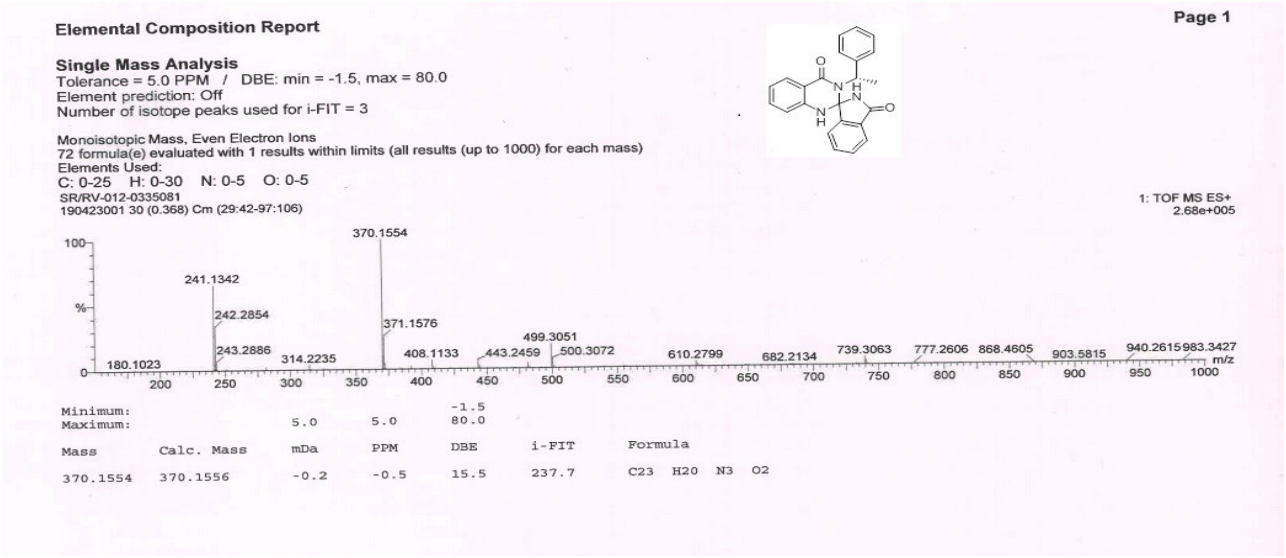
^{1}H-NMR of 3'-((S)-1-phenylethyl)-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione (1m):



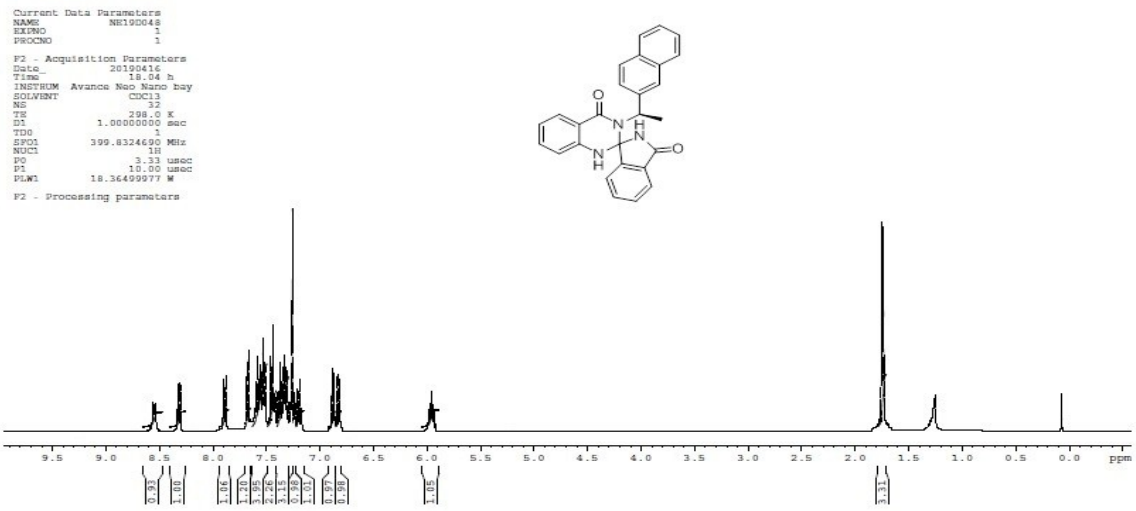
^{13}C-NMR of 3'-((S)-1-phenylethyl)-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione (1m):



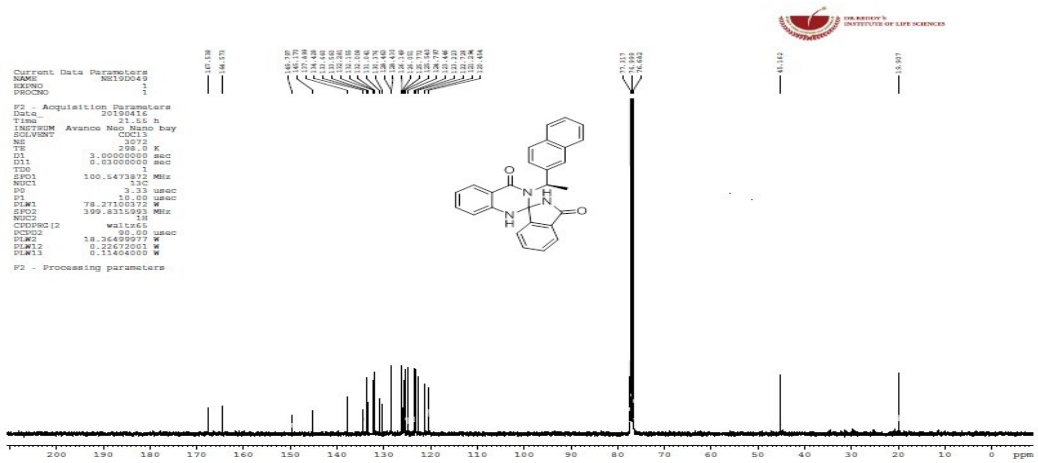
HRMS of 3'-((S)-1-phenylethyl)-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione (1m):



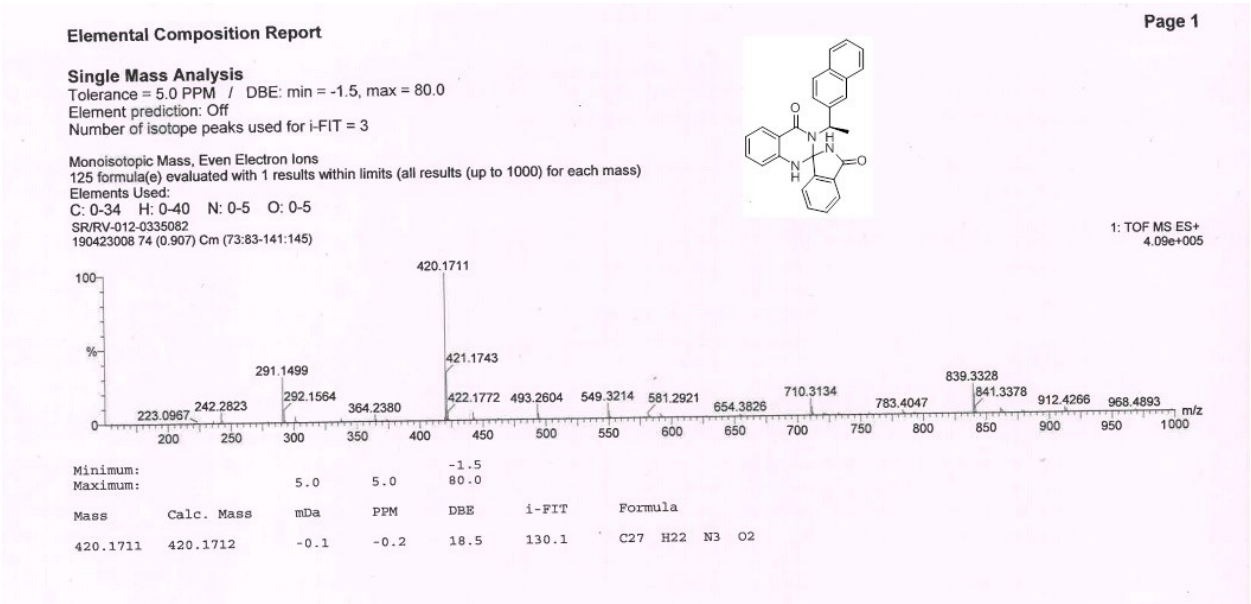
^{1}H NMR of 3'-((R)-1-(Naphthalen-2-yl)ethyl)-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione (1n):



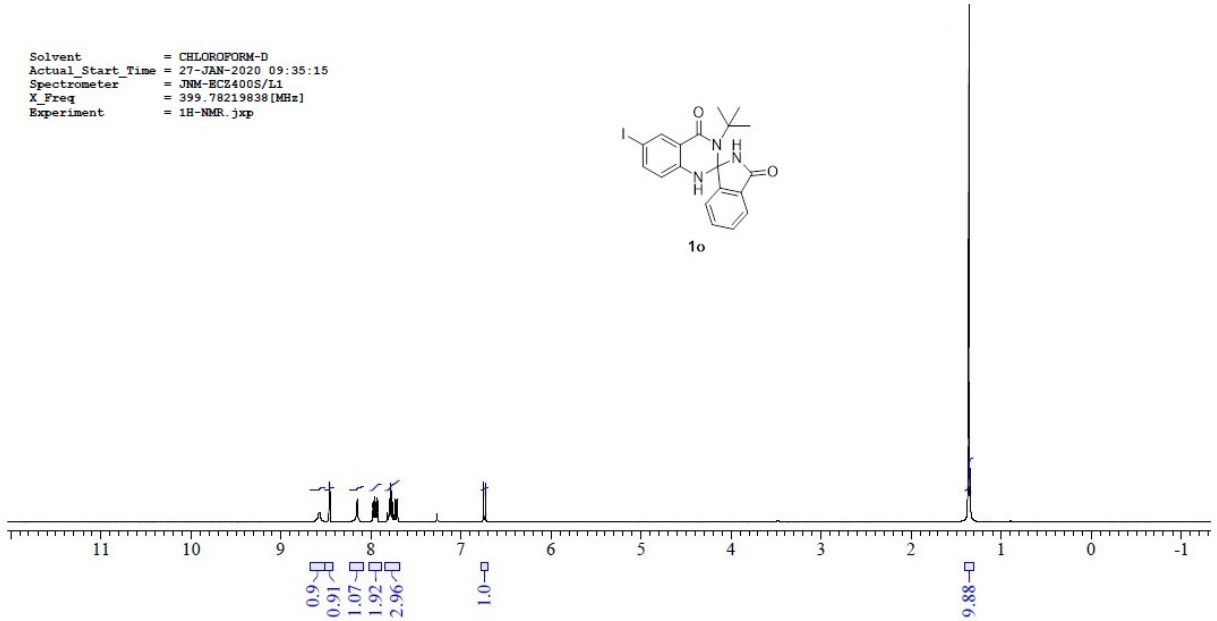
^{13}C-NMR of 3'-((R)-1-(naphthalen-2-yl) ethyl)-1'H-spiro [isoindoline-1, 2'-quinazoline]-3, 4' (3'H)-dione (1n):



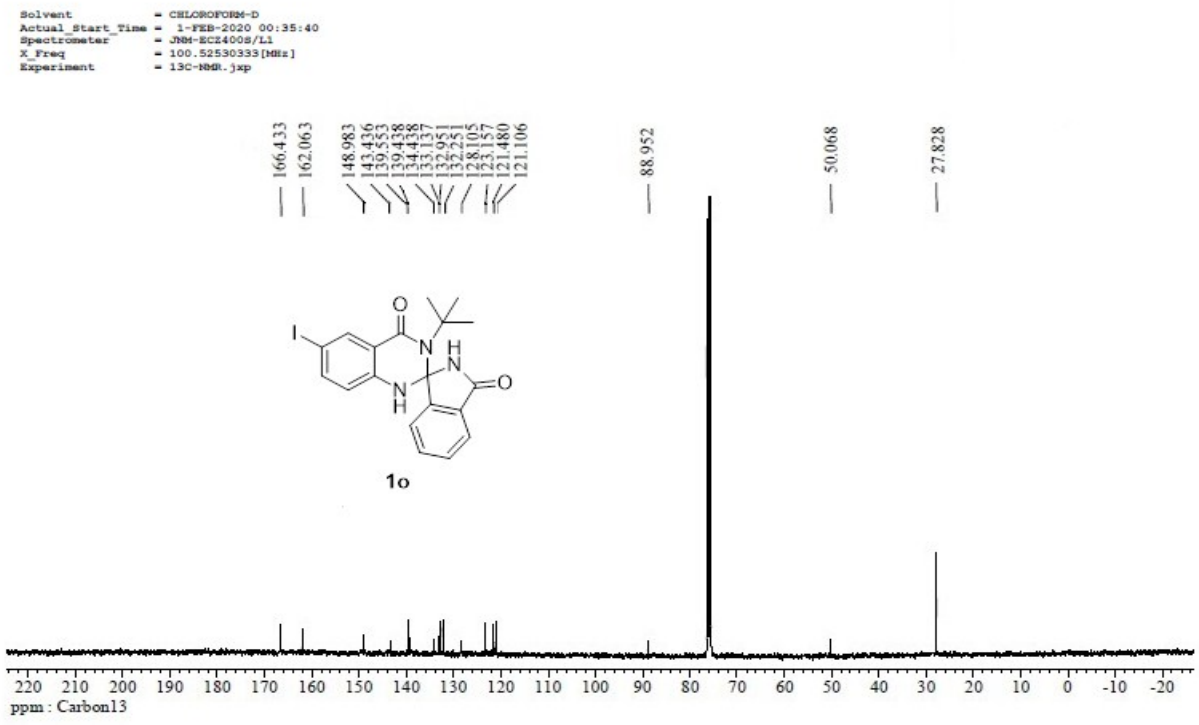
HRMS of 3'-((R)-1-(naphthalen-2-yl)ethyl)-1'H-spiro [isoindoline-1, 2'-quinazoline]-3, 4' (3'H)-dione (1n):



^{1}H NMR 3'-(tert-butyl)-6'-iodo-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione(1o):



^{13}C-NMR of 3'-(tert-butyl)-6'-iodo-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione(1o):



HRMS of 3'-(tert-butyl)-6'-iodo-1'H-spiro[isoindoline-1,2'-quinazoline]-3,4'(3'H)-dione(1o):