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Supporting Information

Introduction of TiO_2-[bip]-NH_2^+ $C(NO_2)_3^-$ as an effective nanocatalyst for the Hantzsch reactions

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The spectral data of the selected compounds are as follow:

Ethyl 4-(4-chlorophenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate (1a; Fig. S1- Fig. S3): m.p.= 242-245 °C., FT-IR (KBr, cm^{-1}): 3284, 3212, 3075, 2948, 1698, 1611, 1481, 1377, 1227, 1079, 828 cm^{-1}, ^{1}H NMR (400 MHz, $CDCl_3$) δ= 0.948 (s, 3H, CH_3), 1.086 (s, 3H, CH_3), 1.219 (t, *J*=7.2 Hz, 3H, CH_3), 2.14-2.34 (m, 4H, CH_2), 2.38 (s, 3H, CH_3), 4.08 (q, *J*= 7.2 Hz, 2H, CH_2), 5.04 (s, 1H, CH), 6.5 (br, 1H, NH), 7.18 (d, *J*= 8.3 Hz, 2H, ArH), 7.28 (d, *J*= 8.2 Hz, 2H, ArH) ppm; ^{13}CNMR (101 MHz) δ= 14.5, 18.7,26.8, 29.5, 32.5, 36.0, 50.6, 59.5, 103.5, 110.1, 128.1, 129.7, 130.6, 145.8, 147.0, 150.0, 167.1,194.7; CHN analysis (%): C: 68.6, H: 7.17, N: 4.25.

Ethyl 4-(2-chlorophenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3 carboxylate (1b; Fig. S4- Fig. S6): m.p.= 205–207 °C., FT-IR (KBr, cm^{-1}): 3276, 3201, 3072, 2956, 1702, 1604, 1606, 1486, 1378 cm^{-1}, ^{1}H NMR (400 MHz, DMSO-d6) δ= 0.84 (s, 3H), 1.00 (s, 3H), 1.07 (t, *J*= 7.1, 3H), 1.91 (d, *J*= 16.1, 1H), 2.13 (d, *J*= 16.1, 1H), 2.20-2.32 (m with s at 2.24, 4H), 2.41 (d, *J*= 17.0, 1H), 3.87-3.98 (m, 2H), 5.18 (s, 1H), 7.06 (t, *J*= 7.0, 1H), 7.15-7.22 (m, 2H), 7.28 (d, *J*= 6.8, 1H), 9.07 (s, 1H), ppm; ^{13}CNMR (101 MHz) δ= 14.5,18.6, 26.8, 29.6, 32.4, 35.4, 50.7, 59.4, 103.7, 110.0, 127.1, 129.4, 131.9, 132.4, 145.4, 145.6, 150.1, 167.2, 194.3; CHN analysis (%): C: 68.2, H: 7.57, N: 4.49.

Ethyl 2,7,7-trimethyl-4-(4-nitrophenyl)-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate (1c, Fig. S7- Fig. S9): m.p.= 239-242 °C., FT-IR (KBr, cm^{-1}): 3293, 3215, 3082, 2958, 1699, 1619, 1528, 1487, 1379, 1221, 1068, 698 cm^{-1}, ^{1}H NMR (400 MHz, $CDCl_3$) δ= 0.920 (s, 3H, CH_3), 1.092 (s, 3H, CH_3), 1.199 (t, 3H, *J*=7.3 Hz, CH_3), 2.15 (dd, 2H, CH_2), 2.26 (dd, 2H, CH_2), 2.40 (s, 6H, 2×CH_3), 4.07 (q, 2H, *J*=7.4 Hz, OCH_2), 5.17 (s, 1H, CH), 6.71 (s, 1H, NH), 7.51 (d, 2H, *J*=9.4 Hz, ArH), 8.09 (d, 2H, *J*=9.4 Hz, ArH) ppm; ^{13}CNMR (101 MHz) δ= 14.5, 18.8, 26.9, 29.4, 32.6, 37.1, 50.5, 59.7,102.8, 109.5, 123.6, 129.2, 146.1, 150.5, 155.4, 166.8, 194.7; CHN analysis (%): C: 66.22, H: 7.19, N: 8.38.

Ethyl 2,7,7-trimethyl-4-(2-nitrophenyl)-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate (1d, Fig. S10- Fig. S12): m.p.= 202-205 °C., FT-IR (KBr, cm^{-1}): 3293, 3082, 2958, 1699, 1619, 1487, 1379, 1221, 1608 cm^{-1}, ^{1}H-NMR (500 MHz, $CDCl_3$) δ= 0.86 (s, 3H), 0.96 (s, 3H), 1.02 (t, *J* = 7 Hz, 3H), 2.04 (m, 4H), 2.28 (s, 3H), 3.95 (q, *J* = 7 Hz, 2H), 5.90 (s, 1H),7.21-7.72 (m, 5H) ppm; ^{13}CNMR (101 MHz) δ= 14.0, 19.0, 27.1, 29.1, 30.0, 31.9, 40.5, 50.6, 59.9, 104.9, 111.1, 123.9, 126.6, 131.4, 132.6, 1414.9, 145.2, 148.3, 150.1, 167.3, 195.7; CHN analysis (%): C: 66.35, H: 7.36, N: 8.45.

Ethyl 4-(4-methoxyphenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate (1e, Fig. S13- Fig. S15): m.p.= 254-257 °C., FT-IR (KBr, cm^{-1}): 3278, 3201, 3077, 2959, 1702, 1604, 1498, 1379, 1272, 1223, 1108, 1071, 1030, 841, 760 cm^{-1}, ^{1}H NMR (400 MHz, $CDCl_3$) δ= 0.95 (s, 3H, CH_3), 1.07

(s, 3H, CH_3), 1.23 (t, 3H, *J*=7.4 Hz, CH_3), 2.17-2.26 (m, 4H, 2×CH_2), 2.36 (s, 3H, CH_3), 3.74 (s, 3H, CH_3), 4.08 (q, 2H, *J*=7.4 Hz, OCH_2), 5.17 (s, 1H, CH), 6.74-6.76 (d, 2H, *J*=8.8 Hz, ArH), 7.23 (d, 2H, *J*=8.8 Hz, ArH), 7.29 (s, 1H, NH) ppm; ^{13}C NMR (101 MHz) δ=14.6, 18.7, 26.9, 29.6, 32.5, 35.4, 50.7, 55.3, 59.4, 104.4, 110.6, 113.5, 128.8, 140.5, 145.0, 149.6, 157.7, 167.4, d 194.7; CHN analysis (%): C: 71.31, H: 8.58, N: 4.15.

Ethyl 4-(2-methoxyphenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate (1f, Fig. S16- Fig. S18): m.p.= 252-255 °C., FT-IR (KBr, cm^{-1}): 3286, 2957, 1690, 1614, 1485, 1378, 1220 cm^{-1}, ^{1}H NMR (300 MHz, DMSO-d6) δ= 0.80 (s, 3H, CH_3), 0.90-1.10 (m, 6H), 1.91 (d, *J*= 16.4 Hz, 1H), 1.97-2.14 (m, 1H), 2.15-2.26 (m whit s at 2.18, 4H), 2.32 (d, *J*=17.0, 1H), 3.65 (s, 3H), 3.87 (q, *J*= 7 Hz, 2H), 5.06 (s, 1H), 6.56-6.79 (m, 2H), 6.93 (t, *J*= 7.4 Hz, 1H), 7.15 (d, *J*= 7Hz, 1H) ppm; ^{13}C NMR (101 MHz) δ= 14.1, 18.0, 26.2, 29.3, 32.0, 32.8, 50.4, 55.1, 58.7, 102.9, 108.6, 111.0, 119.4, 126.9, 130.5, 134.9, 144.1, 149.9, 157.1, 167.3,193.8; CHN analysis (%): C: 71.46, H: 8.66, N: 4.65.

Ethyl 4-(4-hydroxyphenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate (1g, Fig S19 and Fig S20): m.p.=218-220 °C., FT-IR (KBr, cm^{-1}): 3445, 3277, 2958, 1668, 1607, 1484, 1278, 1222, 1075, 843, 603 cm^{-1}, ^{1}H NMR (400 MHz, DMSO-d6) δ= 0.87 (s,3H) 1.00 (s, 3H), 1.14 (t, *J*= 7.1, 3H), 1.99 (d, *J*= 16.1, 1H), 2.16 (d, *J*= 16.1, 1H), 2.32–2.25 (m with s at 2.27, 4H), 2.40 (d, *J*= 17.0, 1H), 3.98 (q, *J*= 7.0, 2H), 4.78 (s, 1H), 6.45 (d, *J*= 7.3, 1H), 6.59–6.56 (m, 2H), 6.94 (t, *J*= 7.7, 1H), 9.00 (s, 1H), 9.05 (s, 1H) ppm; CHN analysis (%): C: 72.76, H: 8.39, N: 5.01.

Ethyl 2,7,7-trimethyl-5-oxo-4-(p-tolyl)-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate (1h, Fig. S21-Fig. S23): m.p.= 263-266 °C., FT-IR (KBr, cm^{-1}): 3278, 2962, 1701, 1605, 1492, 1370, 1213, 1071, 1028, 841, 748, 533 cm^{-1}, ^{1}H NMR (400 MHz, DMSO-d6) δ= 0.83 (s, 3H), 0.99 (s, 3H) 1.12 (s, 3H), 1.95 (d, *J*=16, 1H), 2.10-2.36 (m whit 2s at 2.18 and 2.25, 8H), 2.39 (d, *J*=17.1 Hz, 1H), 3.95 (m, 2H), 4.79 (s, 1H), 6.90-7.15 (m, 4H), 8.99 (s, 1H, NH) ppm; ^{13}C NMR (101 MHz) δ=, 14.6, 18.7, 21.0, 26.9, 29.6, 32.6, 35.8, 50.7, 59.4, 104.2, 110.5, 127.8, 128.7, 135.0, 145.2, 149.8, 167.3, 194.7; CHN analysis (%): C: 75.25, H: 8.82, N: 4.99.

Ethyl-4-(4-bromophenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate (1i, Fig. S24 and Fig. S25): m.p.= 258-261 °C., FT-IR (KBr, cm^{-1}): 3277, 3199, 3076, 2966, 1703, 1603, 1490, 1378, 1277, 1217, 1069, 842, 737, 529 cm^{-1}, ^{1}H NMR (400 MHz, $CDCl_3$) δ= 0.953 (s, 3H,CH_3), 1.099 (s, 3H, CH_3), 1.219 (t, *J*=7.2 Hz, 3H, CH_3), 2.152-2.399 (m, 7H, 2×CH_2, CH_3), 4.08 (q, *J*= 7.2 Hz, 2H, OCH_2), 5.037 (s, 1H, CH), 6.01 (br, 1H, NH), 7.21 (d, *J*= 8.3 Hz, 2H, ArH), 7.34 (d, *J*= 8.5 Hz, 2H, ArH), 8.23 (s, 1H, NH) ppm; CHN analysis (%): C: 62.02, H: 6.27, N: 4.46.

Ethyl-4-(2,4-dichlorophenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate: (1j, Fig. S26-Fig. S28):m.p.= 240–243 °C., FT-IR (KBr, cm^{-1}): 3277, 3203, 3078, 2951, 1694, 1607, 1490 cm^{-1}, ^{1}H NMR (400 MHz, DMSO-d6) δ= 0.83 (s, 3H), 0.99 (s, 3H), 1.07 (t, *J*= 6.8, 3H), 1.91 (d, *J*= 16.0, 1H), 2.13 (d, *J*= 16.1, 1H), 2.30-2.20 (m with s at 2.24, 4H), 2.41 (d, *J*= 17.1, 1H), 3.93 (m, 2H), 5.14 (s, 1H), 7.27 (s, 2H), 7.33 (s, 1H), 9.11 (s, 1H) ppm; ^{13}CNMR (101 MHz) δ= 18.7, 26.8, 29.5, 32.4, 35.2, 50.6, 59.5, 103.2, 109.7, 127.3, 128.6, 131.2, 133.2, 133.3, 144.7, 14.5, 145.9, 150.3, 167.0, 194.3; CHN analysis (%): C: 60.46, H: 6.37, N: 4.22.

Ethyl-4-(4-hydroxy-3-methoxyphenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3 carboxylate (1k, Fig. S29 and Fig. S30): m.p.= 217-220 ^{o}C., FT-IR (KBr, cm^{-1}): 3390, 2955, 1700, 1645, 1590, 1480, 1385, 1220, 1030, 782 cm^{-1}, ^{1}H NMR (400 MHz, DMSO-d6) δ= 1.01 (s, 3H, CH_3), 1.05 (s, 3H, CH_3), 1.18 (t, 3H, *J*= 7.2 Hz, CH_3), 1.96 (s, 2H, CH_2), 2.15 (s, 2H, CH_2), 2.26 (s, 3H, CH_3), 3.67 (s, 3H, OCH_3), 4.01 (q, 2H, J= 7.6 Hz, OCH_2), 4.75 (s, 1H, CH), 6.49 (s, 1H, OH), 6.52 (d, 2H, *J*= 2 Hz, ArH), 6.58 (s, 1H, ArH), 6.70 (d, 2H, *J*= 2 Hz, ArH), 8.99 (s, 1H, NH) ppm; CHN analysis (%): C: 69.31, H: 8.11, N: 4.55.

Diethyl 4,4'-(1,3-phenylene)bis(2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate) (1l, Fig. S31- Fig. S35): m.p.= >300 ^{o}C., FT-IR (KBr, cm^{-1}): 3295, 3214, 3079, 2959, 1692, 1614, 1489, 1379, 1218 cm^{-1}., ^{1}H NMR (400 MHz, DMSO-d6) δ= 0.80 (s, 3H, CH_3), 0.84 (s, 3H, CH_3), 1.006 (s, 3H, CH_3), 1.015 (s, 3H, CH_3), 1.07 (t, *J*=7.2 Hz, 3H, CH_3), 1.17 (t, *J*=7.2 Hz, 3H, CH_3), 1.90-1.99 (m, 2H), 2.13-2.20 (m, 2H), 2.26-2.31 (8H, $2CH_3$ and CH_2), 2.36-244 (m, 2H, CH_2), 3.9-4.1 (m, 4H, $2\times CH_2$), 4.77 (s, 1H, CH), 4.83(s, 1H, CH), 6.81-7 (m, 3H, ArH), 7 (s,1H, ArH), 9.00 (s, 1H, NH), 9.03(s, 1H, NH) ppm; CHN analysis (%): C: 72.87, H: 8.85, N: 5.05.

Methyl-4-(4-chlorophenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate (1m, Fig. S36- Fig. S38): m.p.= 256-258 °C., FT-IR (KBr, cm^{-1}): 3287, 3201, 3076, 2958, 1685, 1605, 1409, 1383, 1335, 1227, 1008, 841 cm^{-1}, ^{1}H NMR (400 MHz, DMSO-d6) δ= 0.948 (s, 3H, CH_3), 1.102 (s, 3H, CH_3), 2.243-2.412 (m, 3H, CH_3), 3.636 (s, 3H, CH_3), 5.062 (s, 1H, CH), 6.06 (br, 1H, NH), 7.18 (d, *J*= 8.6 Hz, 2H, ArH), 7.28 (d, *J* = 8.4 Hz, 2H, ArH) ppm; ^{13}CNMR (101 MHz) δ= 18.8, 26.8, 29.532.6, 35.8, 50.6, 51.1103.2, 110.1, 128.2, 129.6, 130.7, 146.1, 146.8, 150.0, 167.6, 194.7; CHN analysis (%): C: 65.88, H: 7.02, N: 4.20.

Methyl 2,7,7-trimethyl-5-oxo-4-(p-tolyl)-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate (1n, Fig S39-Fig. S41): m.p=272-274 °C., FT-IR (KBr, cm^{-1}): 3281, 3191, 3069, 2957, 1688, 1603, 1492, 1382, 1226, 1112, 779 cm^{-1}., ^{1}H NMR (300 MHz, EtOH-d6) δ= 0.80 (s, 3H, CH_3), 0.96 (s, 3H, CH_3), 1.90-2.15 (m with

s at 2.11, 5H), 2.19-2.27 (m with s at 2.25, 4H), 2.23 (d, *J*= 16.7 Hz, 1H), 3.47 (s, 3H), 4.48 (s, 1H), 6.83 (d, *J*= 7.6 Hz 2H), 7.01 (d, *J*= 7.8 Hz, 2H) ppm; ^{13}CNMR (101 MHz) δ= 18.7, 21.0, 26.9, 29.6, 32.5, 35.6, 50.7, 51.0, 103.8, 110.5, 127.6, 128.8, 135.0, 145.0, 145.5, 149.7, 167.8, 194.7; CHN analysis (%): C: 73.99, H: 8.13, N: 5.22.

Methyl 4-(4-methoxyphenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate (1o, Fig S42- Fig. S44): m.p.=254-257 °C., FT-IR (KBr, cm^{-1}): 3271, 3192, 3078, 2968, 1698, 1608, 1493, 1378, 1280, 1212, 842 cm^{-1}, ^{1}H NMR (300 MHz, EtOH-d6): δ= 0.80 (s, 3H, CH_3), 0.96 (s, 3H, CH_3), 1.97 (d, *J*= 16.5 Hz, 1H), 2.12 (d, *J*= 16.5 Hz, 1H), 2.16-2.28 (m with s at 2.25, 4H), 2.33 (d, *J*= 17 Hz, 1H), 3.46 (s, 3H), 3.59 (s, 3H), 4.82 (s, 1H), 6.58 (d, *J*= 8.1 Hz, 2H), 7.03 (d, *J*= 8.1 Hz, 2H) ppm; ^{13}CNMR (101 MHz) δ=18.7, 26.9, 29.6, 32.6, 35.2, 50.7, 51.1, 55.3, 104.0, 110.7, 113.6, 128.6, 140.3, 145.4, 149.6, 157.7, 167.8, 194.7; CHN analysis (%): C: 71.22, H: 6.35, N: 4.14.

Methyl-4-(4-hydroxy-3-methoxyphenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate (1p, Fig S45- Fig. S47) m.p.= 260-263 ^{o}C., FT-IR (KBr): 3372, 3292, 3243, 3069, 2956, 1702 cm^{-1}, ^{1}H NMR (400 MHz, DMSO-d6) δ= 0.88 (s, 3H, CH3), 1.01 (s, 3H, CH3), 2.01 (d, 1H, *J*= 7.8 Hz, CH2), 2.20 (d, 1H, *J*= 8.0 Hz, CH2), 2.26 (s, 3H, CH3), 2.30 (d, 1H, *J*= 6.4 Hz, CH2), 2.44 (d, 1H, *J*= 8.4 Hz, CH2), 3.55 (s, 3H, CH3), 3.66 (s, 3H, CH3), 4.76 (s, 1H, CH), 6.50 (d, 1H, *J*= 2.0 Hz, ArH), 6.58 (s, 1H, ArH), 6.70 (d, 1H, *J*= 1.6 Hz, ArH), 8.63 (s, 1H, OH), 9.03 (s, 1H, NH) ppm; ^{13}C NMR (100 MHz, DMSO-*d6*) δ= 18.7, 26.8, 32.6, 35.2, 51.1, 55.9, 112.2, 115.4, 119.7, 127.3, 129.0, 139.3, 145.0, 145.2, 145.9, 147.3, 149.7, 168.0, 184.7, 194.9; CHN analysis (%): C: 68.34, H: 7.15, N: 4.12.

Ethyl 4-(4-chlorophenyl)-2-methyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate (1q, Fig. S48 and Fig. S49): m.p.= 233-236 °C., FT-IR (KBr, cm^{-1}): 3278, 3199, 3077, 2967, 1705, 1603, 1491, 1379, 1278, 1216, 1154, 1076, 843, 739 cm^{-1}, ^{1}H NMR (400 MHz, $CDCl_3$) δ= 1.20 (t, *J*= 7.2 Hz, 3H, CH_3), 1.644 (s, 1H), 1.944-2.053 (m, 2H, CH_2), 2.33-2.48 (m, 7H), 4.08 (q, *J*= 7.2 Hz, 2H, CH_2), 5.08 (s, 1H, CH), 6.01 (br, 1H, NH), 7.19 (d, *J*= 8 Hz, 2H, ArH), 7.24 (d, *J*= 8 Hz, 2H, ArH) ppm; CHN analysis (%): C: 66.54, H: 6.12, N: 5.15.

Ethyl 4-(4-methoxyphenyl)-2-methyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate (1r, Fig. S50 and Fig. S51) m.p= 189-192 ^{o}C., FT-IR (KBr): 3295, 2970, 1695, 1604, 1480, 1378, 1220, 1179 cm^{-1}, ^{1}H NMR (400 MHz, $CDCl_3$) δ= 1.24 (t, *J*=7.2 Hz), 1.91 2.02 (m, 2H), 2.29 2.42 (m, 7H), 3.75 (s, 3H), 4. 08 (q, *J*= 7.2 Hz, 2H),5.06 (s, 1H), 6.74 6.78 (m, 3H),7.24 (d, *J*=8.8 Hz, 2H, Ar H) ppm; CHN analysis (%): C: 71.24, H: 7.12, N: 5.30.

Ethyl 4-(4-nitrophenyl)-2-methyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate (1s) m.p= 212-215 ^{o}C., FT-IR FT-IR (KBr, cm^{-1}): 3270, 3190, 2970, 1725, 1600, 1450, 1300, 1270, 843, 740 cm^{-1}, ^{1}H NMR (400 MHz, $CDCl_3$) = δ 1.18 (t, 3H, *J*= 6.8 Hz), 1.80-2.10 (m, 2H), 2.30-2.60 (m, 7H), 4.03-4.09 (m, 2H), 5.18 (s, 1H), 7.30 (s, 1H), 7.48 (d, 2H, *J*= 7.6 Hz), 8.10 (d, 2H, *J*=7.6 Hz) ppm; CHN analysis (%): C: 63.99, H: 6.12, N: 8.68.

Ethyl 2-methyl-5-oxo-4-(p-tolyl)-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate (1t, Fig S52 and Fig. S53): m.p.= 245-247 °C., FT-IR (KBr, cm^{-1}): 3275, 3187, 3068, 2963, 1705, 1606, 1498, 1381, 1213, 1025, 843 cm^{-1}., ^{1}H NMR (400 MHz, $CDCl_3$): δ= 1.24 (t, *J* = 7.2 Hz, 3H, CH_3), 1.91-2.02 (m, 2H, CH_2), 2.29-2.42 (m, 7H), 3.75 (s, 3H, CH_3), 4.08 (q, *J* = 7.2 Hz, 2H, CH_2), 5.06 (s, 1H, CH), 6.74-6.78 (m, 3H), 7.24 (d, *J* = 8.8 Hz, 2H, ArH) ppm; CHN analysis (%): C: 75.06, H: 8.18, N: 5.25.

Ethyl4-(4-hydroxy-3-methoxyphenyl)-2-methyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate (1u) m.p.= 222-225 °C., FT-IR (KBr, cm^{-1}): 3392, 3297, 2997, 1672, 1605, 1478, 1377, 1286, 1224, 1183, 1161, 1124, 1078, 726, 686 cm^{-1}, ^{1}H NMR (300 MHz, DMSO-d6) δ= 1.16 (t, 3H, *J*= 8.1 Hz, OCH_2CH_3). 1.62-2.29 (m, 6H, 3×CH_2), 2.48 (s, 3H, CH_3), 3.68 (s, 3H, OCH_3), 4.00 (q, *J*= 8.1 Hz, 2H, OCH_2CH_3) 4.80 (s, 1H, H4), 6.48 (d, *J*= 8.1 Hz, 1H, Ar-H), 6.58 (d, *J*= 8.1 Hz, 1H, Ar-H), 6.71 (s, 1H, Ar-H),8.63 (s, 1H, OH), 9.07 (s, 1H, NH) ppm; CHN analysis (%): C: 69.12, H: 7.54, N: 4.36.

Ethyl (E)-2-methyl-4-(2-nitrostyryl)-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate (1v, Fig S54 and Fig. S55) m.p.= 206-208 °C., FT-IR(KBr, cm^{-1}): 3,290, 3,071, 2,955, 1,724, 1,695, 1,608, 1,520, 1,472, 1,379, 1,136, 745 cm^{-1}, ^{1}H NMR (400, MHz DMSO-d6) δ= 1.21 (t, *J*=7.2 Hz, 3H), 1.92 (m, 2H), 2.26-2.27 (m, 5H, CH_2 and CH_3), 2.45-2.487 (m, 2H), 4.05-4.14 (m, 2H), 4.54 (d, *J*=8Hz, 1H), 6.198 (dd, J_1=16, J_2= 4Hz, 1H), 6.39 (d, *J*=16 Hz, 1H), 7.42 (td, J_1= 7.6 Hz, J_2= 1.2 Hz, 1H), 7.59 (t, J_1= 7.4 Hz, 1H), 7.67 (dd, J_1=8Hz, J_2=1.2 Hz, 1H), 7.86 (dd, J_1= 8Hz, J_2= 1.2 Hz, 1H), 9.22 (1H, NH) ppm; CHN analysis (%): C: 67.08, H: 6.20, N: 8.12.

9-(4-chlorophenyl)-3,3,6,6-tetramethyl-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione (2a, Fig S56 and Fig. S57): m.p. = >300 °C., FT-IR (KBr, cm^{-1}): 3174, 3065, 2954, 1651, 1609, 1493, 1365, 1221, 1148, 841 cm^{-1}.,^{1}H NMR (400 MHz, $CDCl_3$) δ= 0.99 (s, 6H, $2CH_3$), 1.11 (s, 6H, $2CH_3$), 2.18 (d, *J*= 16.4 Hz, 2H, CH_2), 2.24 (d, *J*= 16.4 Hz, 2H, CH_2), 2.28 (d, *J*= 16.4 Hz, 2H, CH_2), 2.35 (d, *J*= 16.4 Hz, 2H, CH_2), 5.08 (s, 1H, CH), 7.15 (br., 1H, NH), 7.19 (d, *J*= 8.4 Hz, 2H, Ar-H), 7.31 (d, *J*= 8.4 Hz, 2H, Ar-H) ppm; CHN analysis (%): C: 72.69, H: 7.38, N: 4.41.

3,3,6,6-tetramethyl-9-(4-nitrophenyl)- 3,4,6,7,9,10-hexahydroacridine-1,8(2H,5H)-dione (2b, Fig S58 and Fig. S59) m.p.= >300 °C., FT-IR (KBr, cm^{-1}): 3277, 3199, 3076, 2966, 1703, 1603, 1490, 1378, 1277,

1217 cm^{-1}, ^1H NMR (500 MHz, $CDCl_3$) δ= 1.00 (s, 6H, $2CH_3$), 1.14 (s, 6H, $2CH_3$), 2.19 (d, *J*= 16.2 Hz, 2H, CH_2), 2.28 (d, *J*= 16.2 Hz, 2H, CH_2), 2.32 (d, *J*= 16.8 Hz, 2H, CH_2), 2.46 (d, *J*= 16.8 Hz, 2H, CH_2), 5.19 (s, 1H, CH), 6.12 (s br., 1H, NH), 7.54 (d, *J*= 8.7 Hz, 2H, Ar-H), 8.11 (d, J = 8.74 Hz, 2H, Ar-H) ppm; CHN analysis (%): C: 71.88, H: 7.42, N: 6.53.

3,3,6,6-tetramethyl-9-(3-nitrophenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione (2c, Fig S60 and Fig. S61): m.p.= 297-300 °C., FT-IR (KBr, cm^{-1}): 3271, 3182, 3063, 2959, 1649, 1608, 1528, 1487, 1366, 1223, 1143, 691 cm^{-1}., ^1H NMR (400 MHz, $CDCl_3$) δ= 1.00 (s, 6H, $2CH_3$), 1.13 (s, 6H, $2CH_3$), 2.19 (d, *J*= 16.4 Hz, 2H, CH_2), 2.28 (d, *J*= 16.4 Hz, 2H, CH_2), 2.34 (d, J= 16.8 Hz, 2H, CH_2), 2.45 (d, *J*= 16.8 Hz, 2H, CH_2), 5.20 (s, 1H, CH), 6.20 (s, 1H, NH), 7.41 (t, *J*= 8.0 Hz, 1H, Ar-H), 7.91 (dt, *J*= 7.6, 1.6 Hz, 1H, Ar-H), 7.98 (ddd, *J*= 8.2, 2.4, 0.8 Hz, 1H, Ar-H), 8.07 (t, *J*= 2.0 Hz, 1H, Ar-H) ppm; CHN analysis (%): C: 72.30, H: 7.46, N: 8.05.

9-(4-methoxyphenyl)-3,3,6,6-tetramethyl-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione (2d, Fig S62 and Fig. S63): m.p.= >300 °C., FT-IR (KBr, cm^{-1}): 3276, 3206, 3070, 2957, 1645, 1606, 1482, 1365, 1223, 1143, 833 cm^{-1}., ^1H NMR (300 MHz, DMSO-d6) 0.85 (s, 6H, $2CH_3$), 0.99 (s, 6H, $2CH_3$), 1.96 (d, *J*= 16.1 Hz, 2H, CH_2), 2.15 (d, *J*= 16.1 Hz, 2H, CH_2), 2.29 (d, *J*= 17.0 Hz, 2H, CH_2), 2.43 (d, *J*= 17.0 Hz, 2H, CH_2), 3.64 (s, 3H, OCH_3), 4.74 (s, 1H, CH), 6.70 (d, *J*= 8.6 Hz, 2H, Ar-H), 7.04 (d, *J*= 8.6 Hz, 2H, Ar-H), 9.23 (s br., 1H, NH) ppm; CHN analysis (%): C: 76.69, H: 8.25, N: 4.45.

9-(2-methoxyphenyl)-3,3,6,6-tetramethyl-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione (2e, Fig S64): m.p.= >300°C., FT-IR (KBr, cm^{-1}): 3281, 3168, 3046, 2955, 1638, 1604, 1489, 1367, 1224, 1143, 748 cm^{-1}., ^1H NMR (250 MHz, $CDCl_3$) δ= 0.92 (s, 6H, $2\times CH_3$),1.04 (S, 6H, $2\times CH_3$), 2.04-2.11 (dd, 4H, $2\times CH_2$), 2.16-2.30 (dd, 4H, $2\times CH_2$), 3.80 (s, 3H, CH_3), 5.24 (s, 1H, CH), 6.76-7.0 (m, 4H, ArH), 7.29 (S, 1H, NH) ppm; CHN analysis (%): C: 76.15, H: 8.68, N: 4.36.

9-(4-hydroxyphenyl)-3,3,6,6-tetramethyl-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione (2f, Fig S65 and Fig. S66): m.p. = >300 °C., FT-IR (KBr, cm^{-1}): 3276, 3197, 2955, 1611, 1472, 1372, 1221, 1140, 838 cm^{-1}., ^1H NMR (400 MHz, DMSO-d6) δ= 0.85 (s, 6H, $2CH_3$), 0.99 (s, 6H, $2CH_3$), 1.96 (d, J= 16.1 Hz, 2H, CH_2), 2.14 (d, *J*= 16.1 Hz, 2H, CH_2), 2.29 (d, *J*= 17.0 Hz, 2H, CH_2), 2.41 (d, *J*= 17.0 Hz, 2H, CH_2), 4.68 (s, 1H, CH), 6.51 (d, *J*= 8.4 Hz, 2H, Ar-H), 6.91 (d, *J*= 8.4 Hz, 2H, Ar-H), 8.99 (s br., 1H, NH or OH), 9.25 (s br., 1H, NH or OH) ppm; CHN analysis (%): C: 76.24, H: 8.49, N: 4.65.

9-(4-hydroxy-3methoxyphenyl)-3,3,6,6-tetramethyl-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*) dione (2g, Fig. S 67) m.p.= 297-298 °C., FT-IR (KBr): 3409, 3274, 3168, 3049, 1623, 1511, 1370 cm^{-1}, ^1H

NMR (400 MHz, DMSO) δ= 0.88 (s, 6H), 1.01 (s, 6H), 2.46-1.98 (m, 8H), 3.65(s, 3H), 4.72 (s, 1H), 6.52 (s, 2H), 6.70 (s, 1H), 8.55 (s, 1H), 9.21 (s, 1H) ppm; CHN analysis (%): C: 73.78, H: 6.93, N: 4.45.

3,3,6,6-tetramethyl-9-(p-tolyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione (2h, Fig. S68 and Fig. S69) m.p.= >300 °C., FT-IR (KBr, cm^{-1}): 3283, 3206, 3082, 2963, 2880, 1703, 1606, 1494, 1379, ^{1}H-NMR (400 MHz, $CDCl_3$) δ= 1.09 (s, 6H, $2CH_3$), 1.25 (s, 6H, $2CH_3$), 2.19 (s, 3H, CH_3), 2.21-2.45 (m, 8H, $4CH_2$), 5.52 (s, 1H, CH), 6.98-7.03 (m, 2H, Ar-H), 7.08-7.10 (d, *J*= 8 *Hz*, 1H, Ar-H), 7.22-7.24 (d, *J*= 8 Hz, 1H, Ar-H), 11.93 (s, 1H, NH) ppm; CHN analysis (%): C: 80.68, H: 7.99, N: 4.56.

3,3,6,6-tetramethyl-9-(o-tolyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione (2i, Fig S70- Fig. S72): m.p.= >300 °C., FT-IR (KBr, cm^{-1}): 3273, 3182, 3063, 2959, 1647, 1611, 1490, 1365, 1222, 1143, 746 cm^{-1}, ^{1}H NMR (250 MHz, CDCl3) *δ*= 1.20 (s, 6H, CH_3), 1.34 (s, 6H), 2.32 (s, 3H), 2.38 (d, *J*=16.2 Hz, 2H), 2.44 (d, *J*=16.2 Hz, 2H), 2.51 (d, *J*= 16.2 Hz, 2H), 2.60 (d, *J*=16.2 Hz, 2H), 3.94 (s, 1H), 7.15-7.23 (m, ,5H), 9.37 (s, 1H) ppm; ^{13}C NMR (62.9 MHz, CDCl3): *δ*: 18.3, 26.7, 29.4, 32.3, 39.3, 40.2, 40.4, 50.7, 51.4, 114.3, 125.4, 128.0, 129.4, 135.9, 146.5, 148.7, 195.6; CHN analysis (%): C: 80.32, H: 8.06, N: 4.33.

9-phenyl-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione (2j, Fig S73 and Fig. S74): m.p. = >300°C., FT-IR (KBr, cm^{-1}): 3262, 3168, 3045, 2938, 2882, 1640, 1600, 1482, 1362, 1231, 1178, 1133, 957, 705 cm^{-1}., ^{1}H NMR (400 MHz, DMSO-d6) δ= 1.90-2.09 (m, 4H, $2\times CH_2$), 2.26-2.28 (m, 2H, CH_2), 2.30-2.38 (m, 2H, CH_2), 2.51-2.64 (m, 4H, $2\times CH_2$), 4.79 (s, 1H, CH), 7.05-7.09 (t, *J*= 7.6, 2H, ArH), 7.11-7.12 (d, *J*= 8.4 Hz, 1H, ArH), 7.23-7.31 (dd, *J*= 8, 24.2, 2H, ArH), 9.17 (s, 1H, NH) ppm; CHN analysis (%): C: 78.37, H: 7.35, N: 5.22.

9-(4-chlorophenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione (2k, Fig S75 and Fig. S76): m.p.= >300°C., FT-IR (KBr, cm^{-1}): 3269, 3202, 3057, 2931, 2880, 1642, 1596, 1472, 1362, 1229, 1176, 1133, 833 cm^{-1}., ^{1}H NMR (400 MHz, DMSO-d6), δ= 1.71-1.97 (m, 4H), 2.20-2.22(m, 4H), 2.50-2.56 (m, 4H), 4.88 (s, 1H), 7.18 (dd, 4H), 9.47 (s, 1H) ppm; CHN analysis (%): C: 70.05, H: 6.17, N: 5.16.

9-(4-bromophenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2H,5H)-dione (2l, Fig S77- Fig. S79) m.p.= >300 °C, FT-IR (KBr, cm^{-1}): 3340, 3244, 2958, 2927, 1647, 1627, 1549, 1450, 1367, 1227, 1171 cm^{-1} ^{1}H NMR (400 MHz, DMSO-*d6*): δ 1.92-2.08 (m, 4H), 2.28-2.32 (m, 2H), 2.34-2.40 (m, 2H), 2.53-2.65 (m, 4H), 4.76 (s, 1H), 7.13-7.27 (m, 2H), 7.33-7.43 (dd, *J*= 30.6, 8.4 Hz, 2H), 9.38 (s, 1H) ppm; ^{13}C NMR (100 MHz, DMSO-*d6*) δ= 20.10, 20.27, 27.13, 31.39, 36.76, 36.90, 112.08, 117.66, 127.83, 129.43, 146.47, 151.59, 171.19, 194.58; CHN analysis (%): C: 62.36, H: 5.08, N: 3.99.

9-(4-methoxyphenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione (2m, Fig S80 and Fig. S81) m.p. = >300°C., FT-IR (KBr, cm^{-1}): 3276, 3206, 3071, 2958, 1647, 1607, 1483, 1366, 1222, 1143, 1030,

834 cm^{-1}., ^1H NMR (400 MHz, DMSO-d6) δ= 1.71-1.96 (m, 4H), 2.19-2.20 (m, 4H), 2.43-2.50 (m, 4H), 3.66 (s, 3H), 4.84 (s, 1H), 6.71 (d, 2H), 7.04 (d, 2H), 9.38 (s, 1H) ppm; CHN analysis (%): C: 75.82, H: 7.15, N: 5.11.

9-(2-methoxyphenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione (2n, Fig S82 and Fig. S83): m.p. = >300°C., FT-IR (KBr, cm^{-1}): 3266, 3179, 3059, 2949, 2873, 1638, 1598, 1488, 1362 cm^{-1}, ^1H NMR (400 MHz, DMSO) δ= 1.68-1.96 (m, 4H), 2.12-2.26 (m, 7H), 2.46-2.55 (m, 4H), 4.87 (s, 1H), 6.98 (dd, 4H), 9.39 (s, 1H) ppm; CHN analysis (%): C: 75.09, H: 6.99, N: 5.68.

9-(p-tolyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2H,5H)-dione (2o, Fig S84- Fig. S86) >300 °C:IR (KBr, cm^{-1}): 3286, 3203, 3068, 2943, 2887, 1639, 1608, 1458, 1364, 1232, 1176 cm^{-1},^1H NMR (400 MHz, DMSO-*d6*) δ= 1.96-2.07 (m, 4H), 2.26 (s, 3H), 2.29-2.42 (m, 4H), 2.52-2.69 (m, 4H), 4.79 (s, 1H), 7.03-7.05 (d, J= 8 Hz, 2H), 7.12-7.21 (d, J= 7.6 Hz, 2H), 9.18 (s, 1H) ppm; ^{13}C NMR (100 MHz, DMSO-d6) δ= 20.31, 21.06, 27.15, 31.22, 36.98, 55.14, 113.52, 117.03, 128.25, 128.84, 129.33, 135.86, 146.36, 150.53, 169.57, 194.52; CHN analysis (%): C: 77.99, H: 7.05, N: 5.02.

9-(2,4-dichlorophenyl)-3,4,6,7,9,10- hexahydroacridine-1,8(2H,5H)-dione (2p) m.p: >300 °C; IR (KBr): 3272, 3070, 2953, 1643, 1609, 1485, 1365, 1222, 1136, 1022, 857, 737, 572 cm^{-1}, ^1H NMR (400 MHz, DMSO-d6) δ= 1.77- 2.23 (m, 12H, $6CH_2$), 5.07 (s, 1H, CH), 7.21-7.30 (m, 3H, Ar), 9.50 (s, 1H, NH) ppm; CHN analysis (%): C: 64.05, H: 4.99, N: 4.28.

9-(3-nitrophenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione (2q, Fig S87 and Fig. S88): m.p.= >300 °C., FT-IR (KBr, cm^{-1}): 3181, 3059, 2940, 1642, 1606, 1525, 1484, 1347, 1234, 1178, 1132, 714 cm^{-1}, ^1H NMR (400 MHz, DMSO) δ= 1.69-1.97 (m, 4H), 2.20-2.21 (m, 4H), 2.51-2.58 (m, 4H), 4.91 (s, 1H), 7.03 (d, 1H), 7.09-7.19 (m, 4H), 9.42 (s, 1H) ppm; CHN analysis (%): C: 68.24, H: 6.31, N: 7.89.

9-(4-Isopropylphenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2H,5H)-dione (2r, Fig. S89- Fig S93) m.p.= >300 °C, IR (KBr, cm^{-1}):3266, 3168, 3047, 2951, 1644, 1597, 1483, 1360, 1229, 1176 cm^{-1}, ^1H NMR (DMSO-d6, 500 MHz) δ= 1.13 (d, *J*=5, 6H), 1.73- 1.82 (m, 2H), 1.88-1.93 (m, 2H), 2.16-2.25 (m, 4H), 2.48-2.52 (m, 4H), 2.76 (h, *J*=5, 1H), 4.89 (s, 1H), 7.01 (d, *J*=10, 2H), 7.06 (d, *J*=10, 2H), 9.42 (s, 1H, NH) ppm, ^{13}C NMR (DMSO-d6, 125 MHz) δ= 21.2, 24.3, 26.8, 32.0, 33.4, 37.2, 113.0, 126.1, 127.8, 145.2, 145.6, 151.6, 196.2; CHN analysis (%): C: 77.26, H: 8.15, N: 5.29.

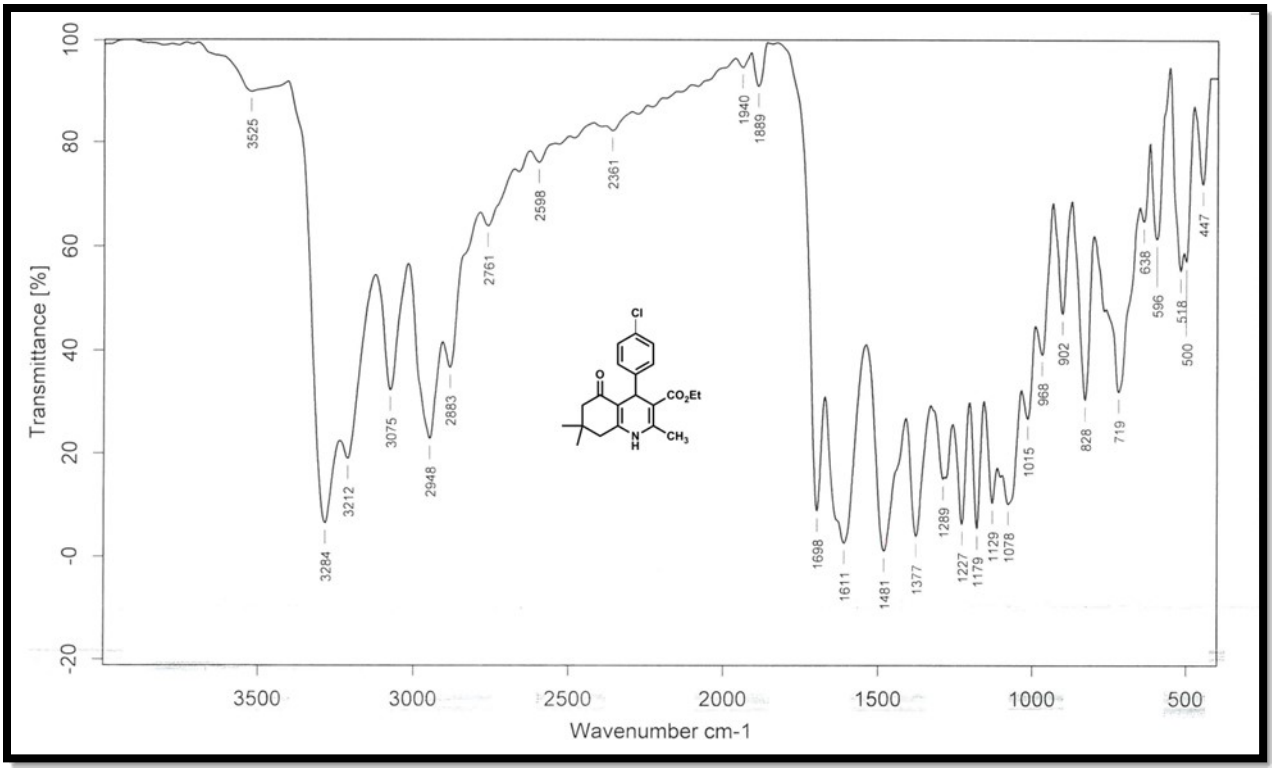

Fig. S1. FT-IR of ethyl 4-(4-chlorophenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

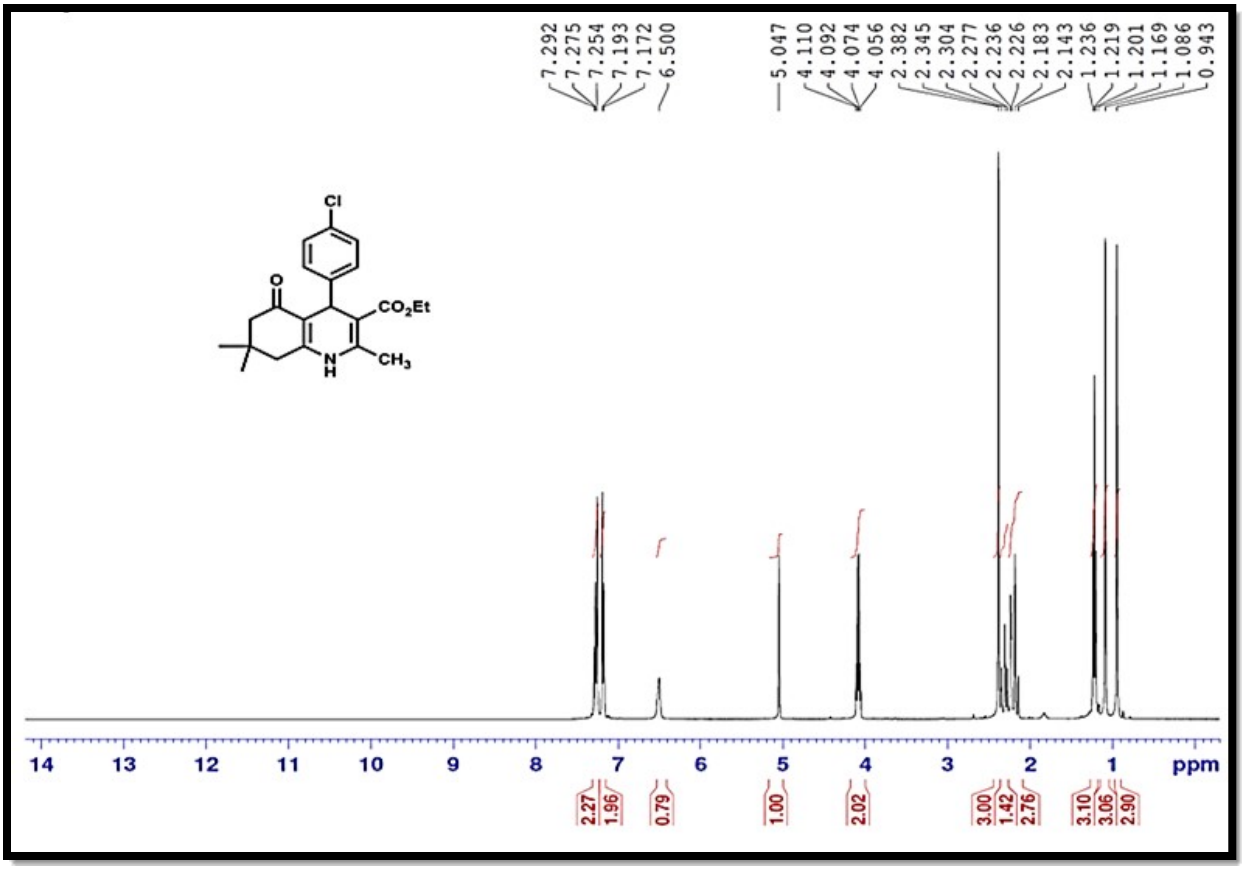

Fig. S2. ^{1}H NMR of ethyl 4-(4-chlorophenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

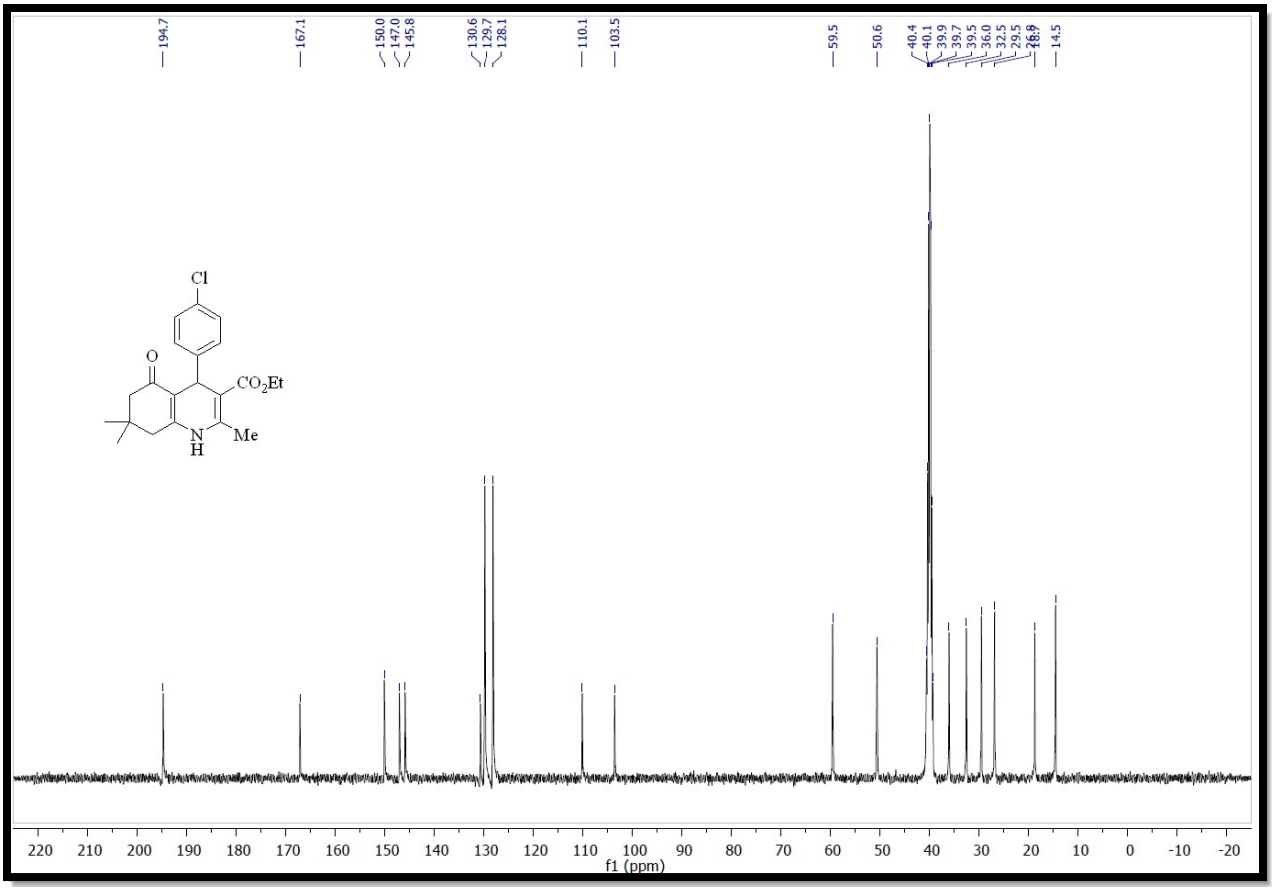

Fig. S3. ^{13}C NMR of ethyl 4-(4-chlorophenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

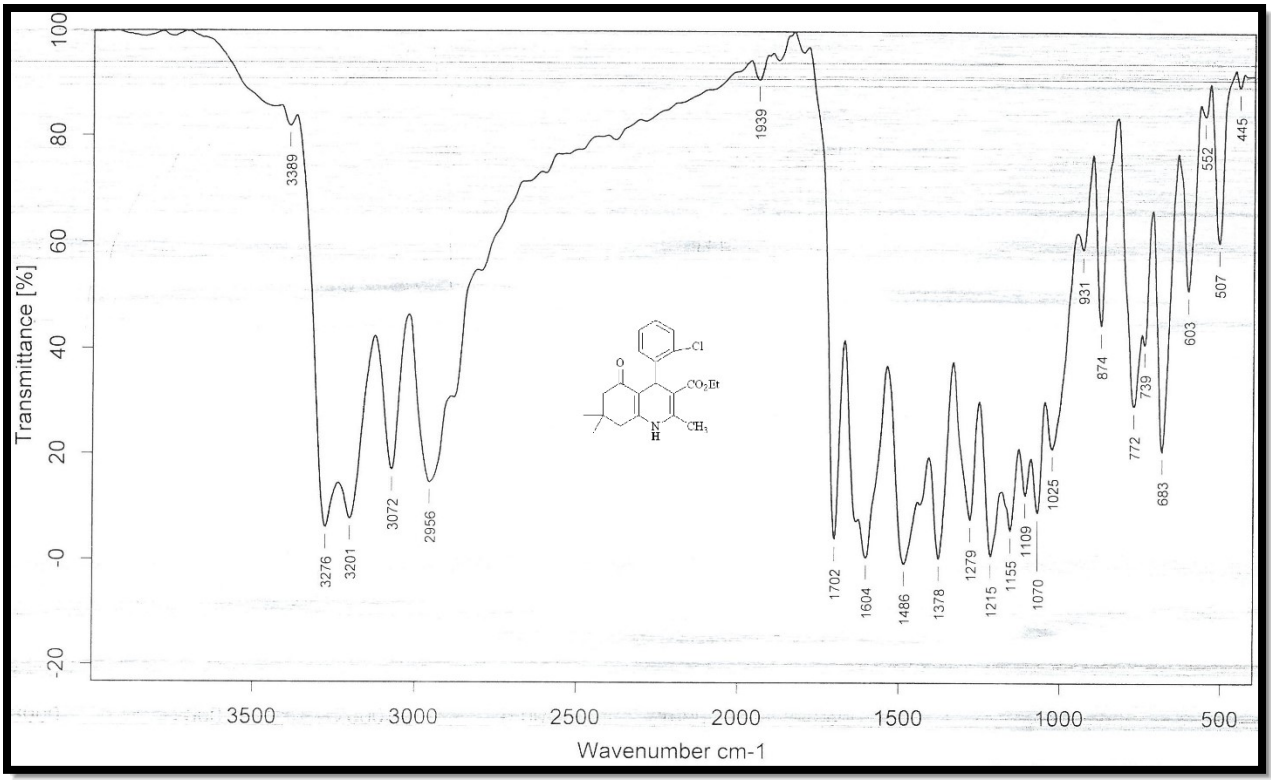

Fig. S4. FT-IR of ethyl 4-(2-chlorophenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

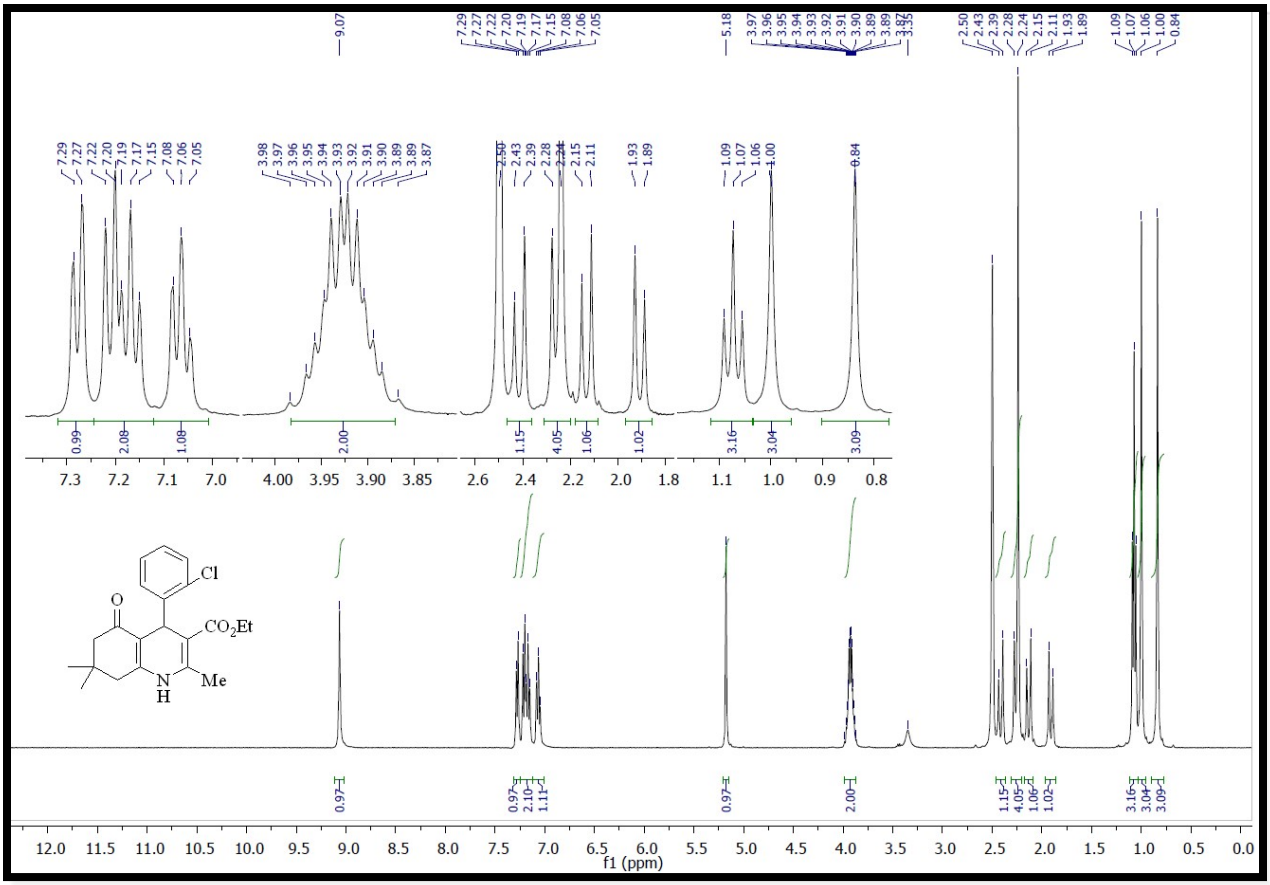

Fig. S5. ^{1}H NMR of ethyl 4-(2-chlorophenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

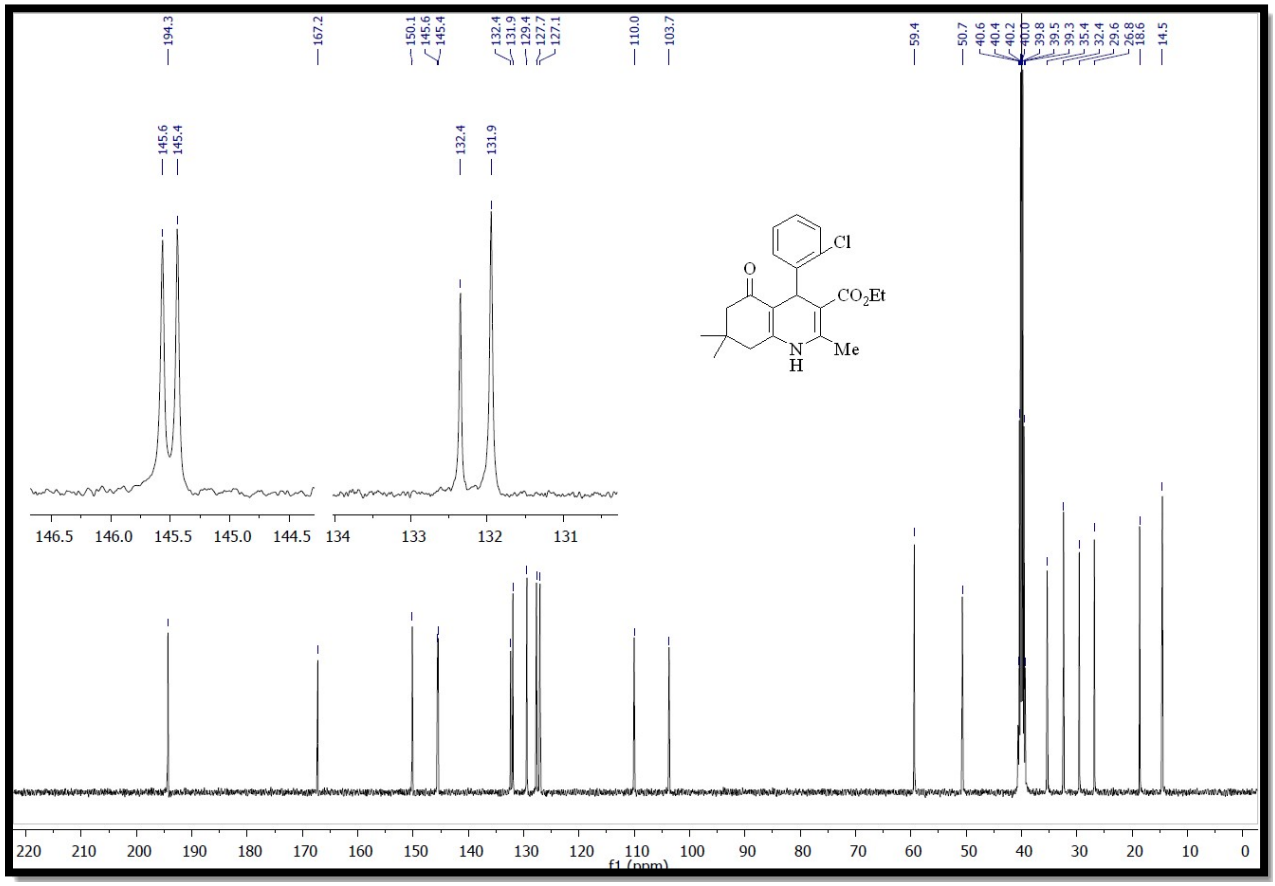

Fig. S6. ^{13}C NMR of ethyl 4-(2-chlorophenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

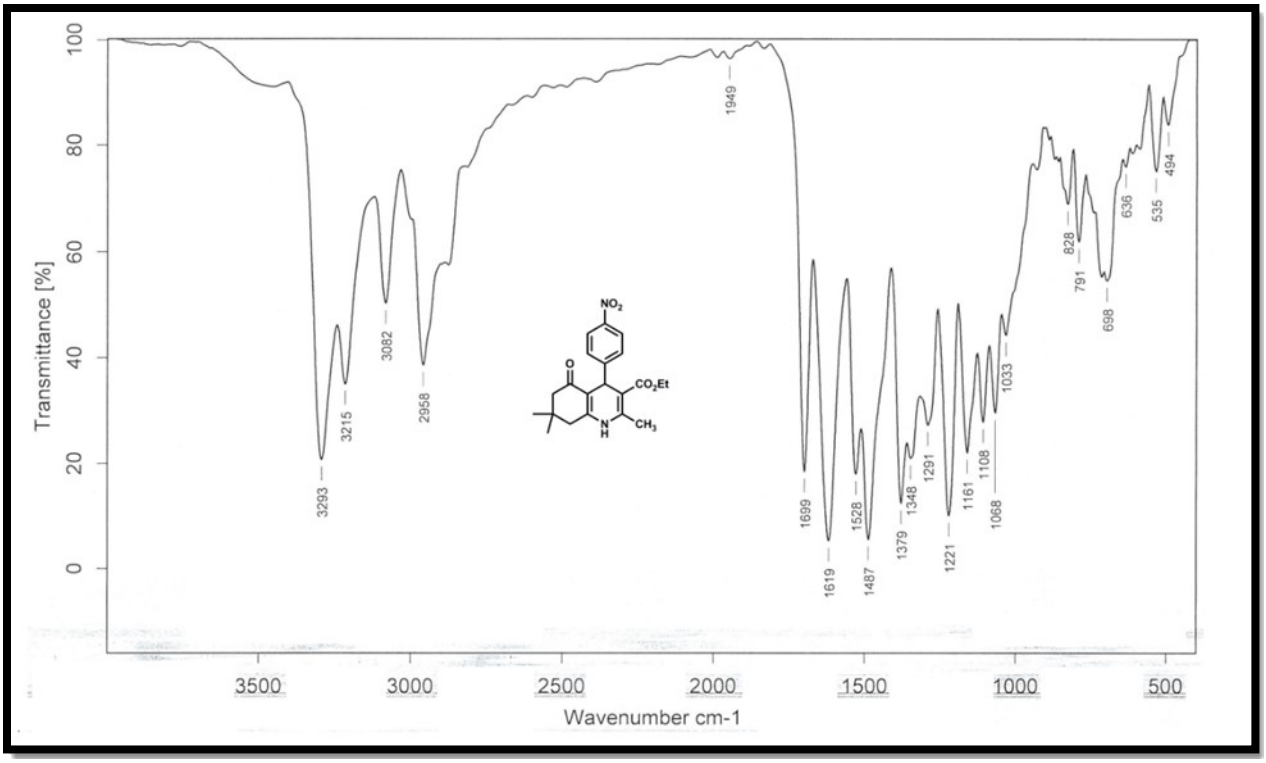

Fig. S7. FT-IR of ethyl 2,7,7-trimethyl-4-(4-nitrophenyl)-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

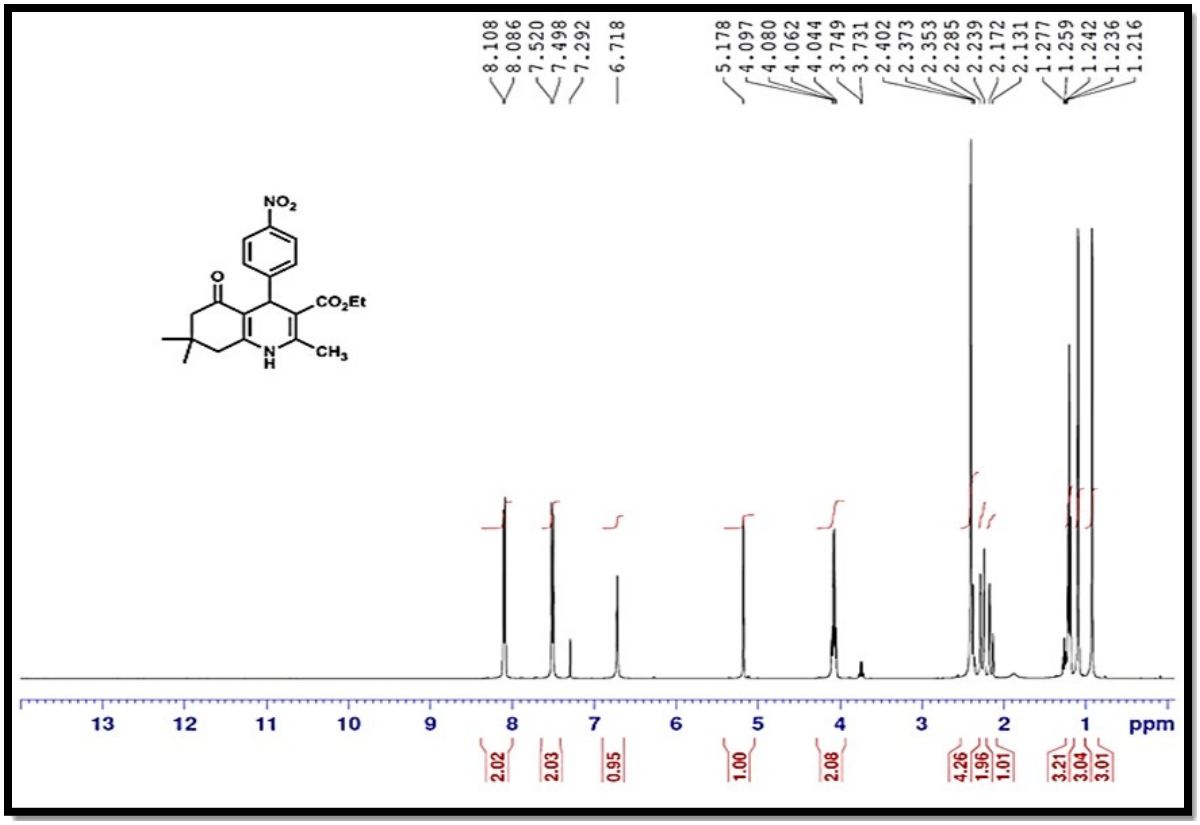

Fig. S8. ^{1}H NMR of ethyl 2,7,7-trimethyl-4-(4-nitrophenyl)-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

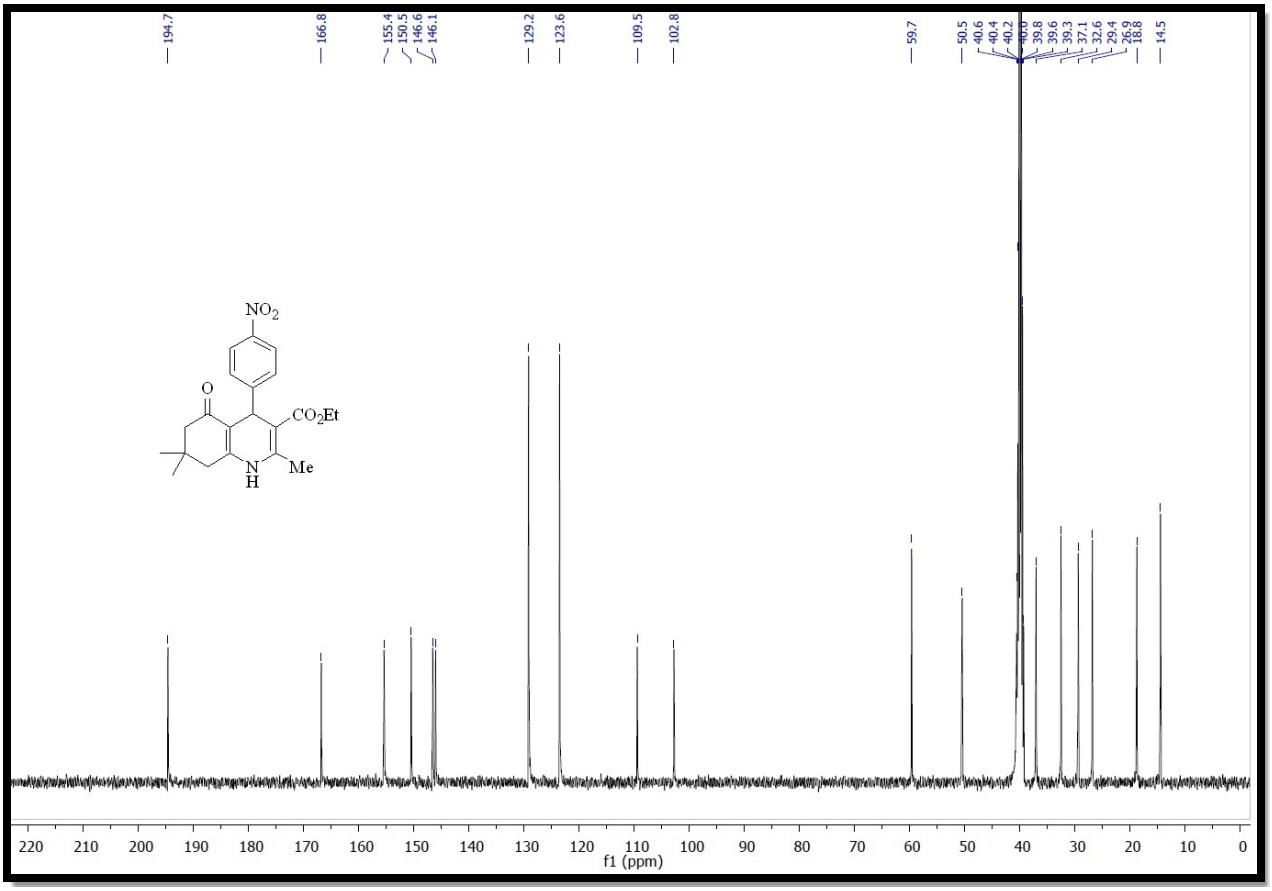

Fig. S9. ^{13}C NMR of ethyl 2,7,7-trimethyl-4-(4-nitrophenyl)-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

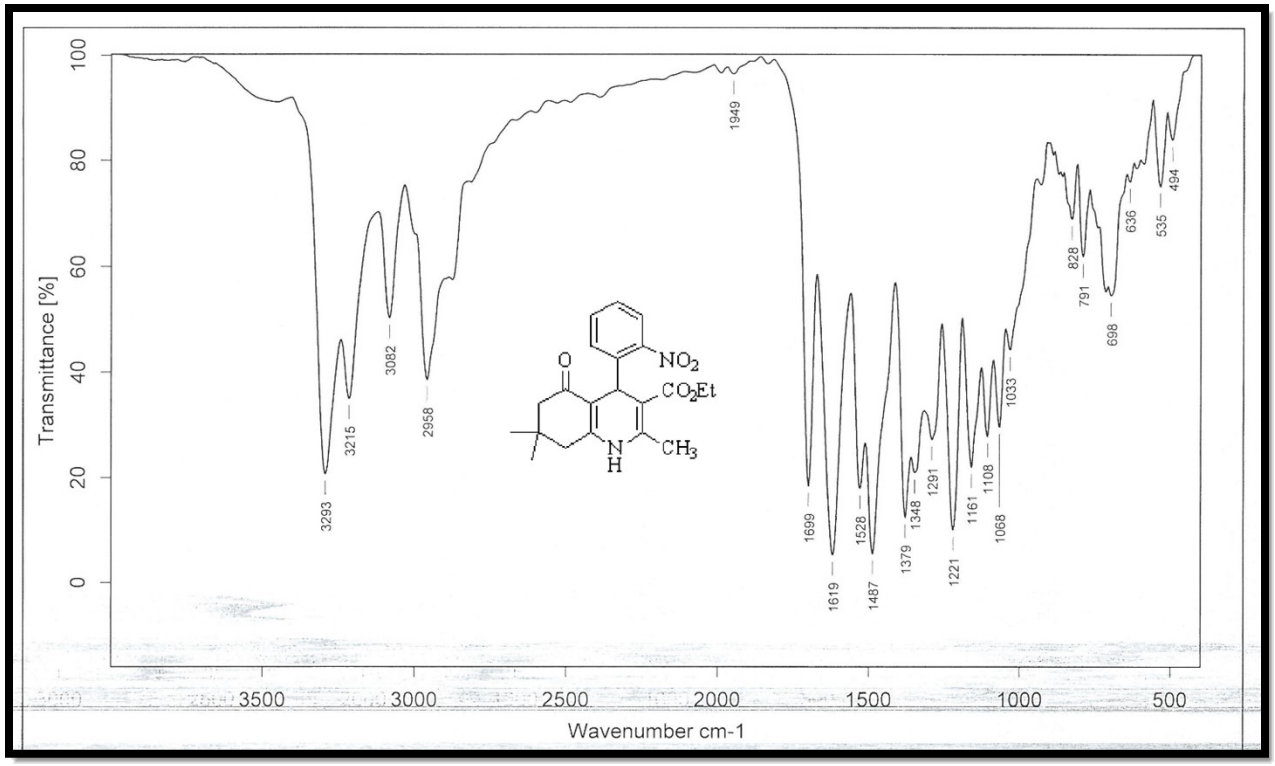

Fig. S10. FT-IR of ethyl 2,7,7-trimethyl-4-(2-nitrophenyl)-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

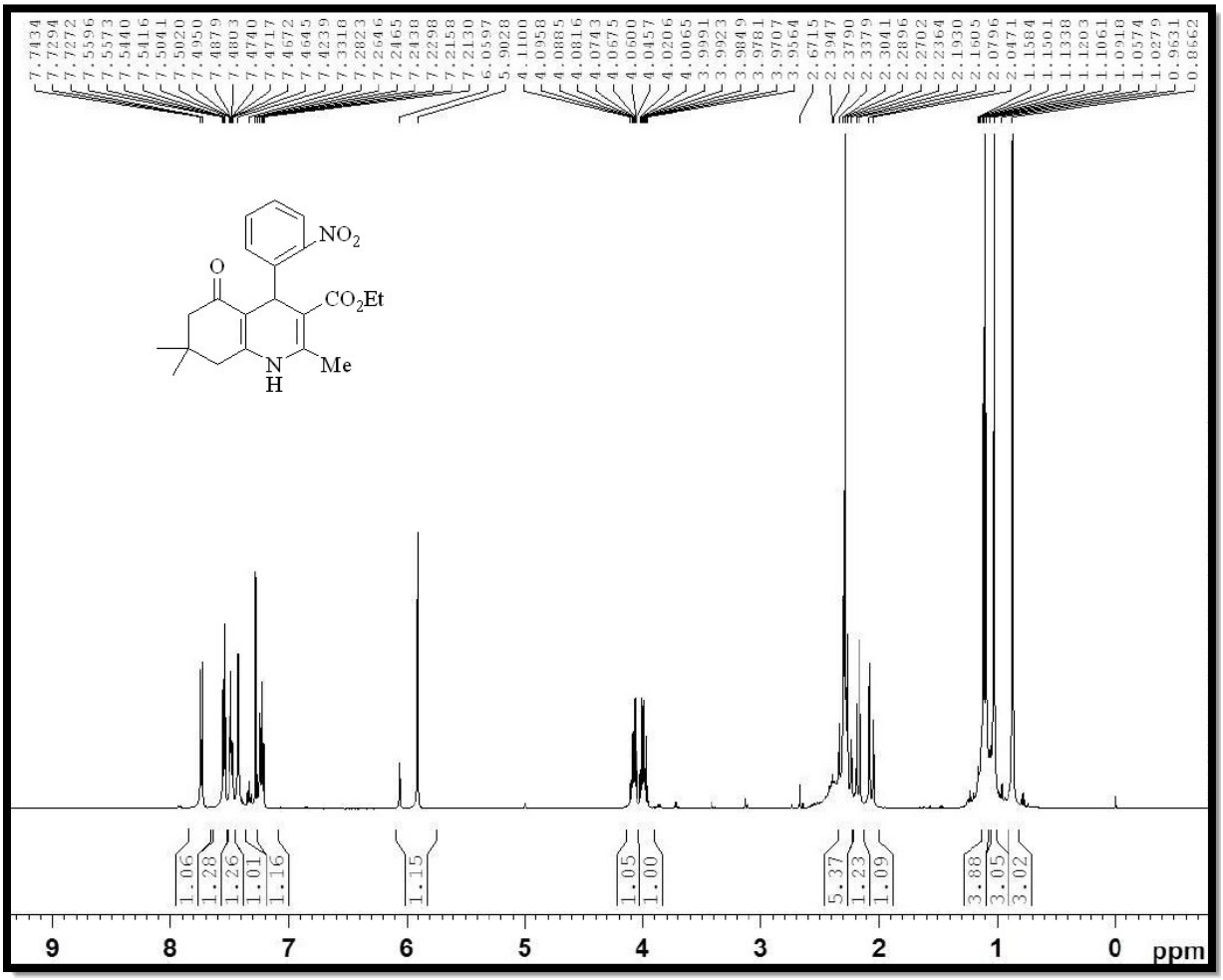

Fig. S11. [1]H NMR of ethyl 2,7,7-trimethyl-4-(2-nitrophenyl)-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

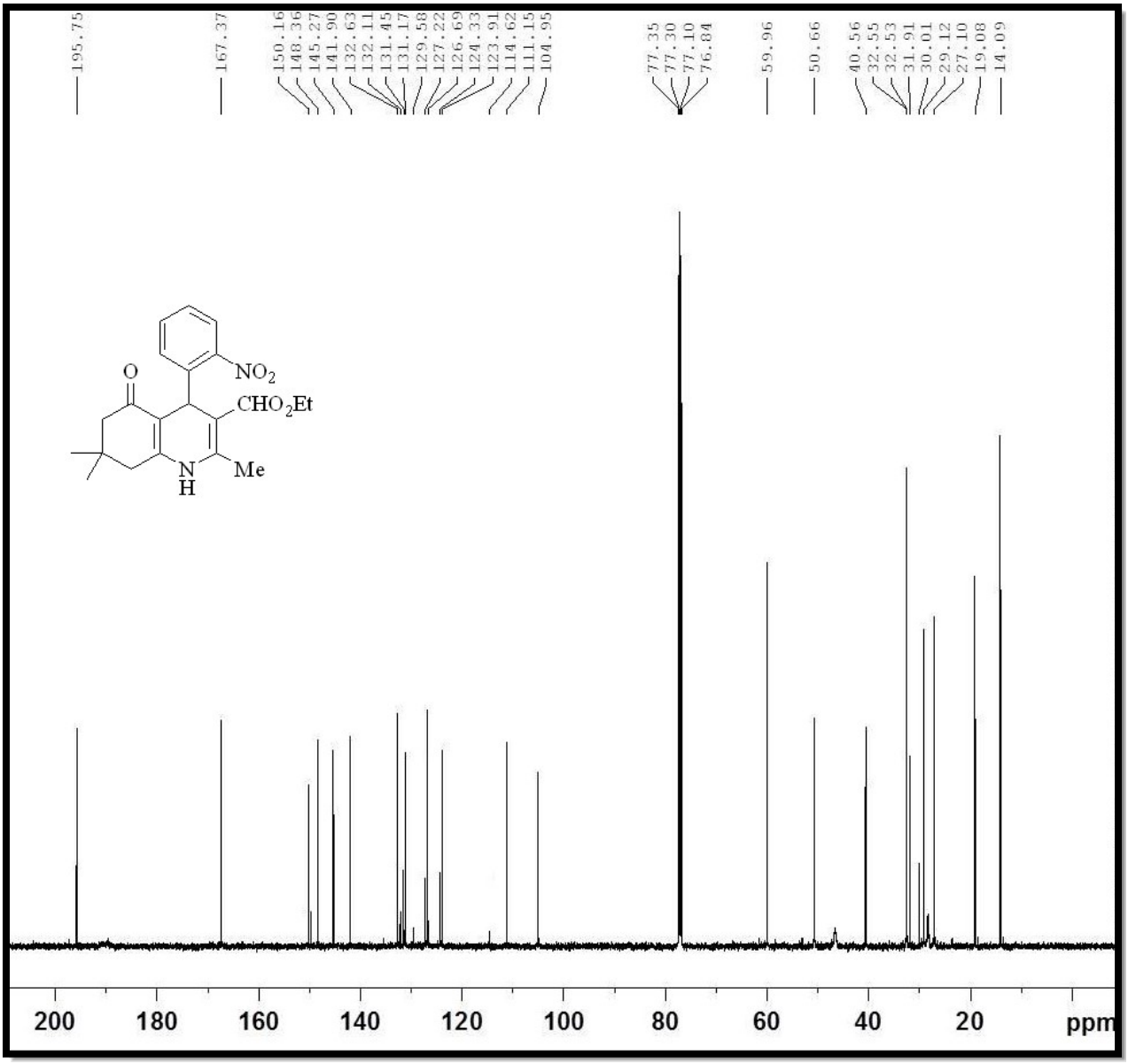

Fig. S12. ^{13}C NMR of ethyl 2,7,7-trimethyl-4-(2-nitrophenyl)-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

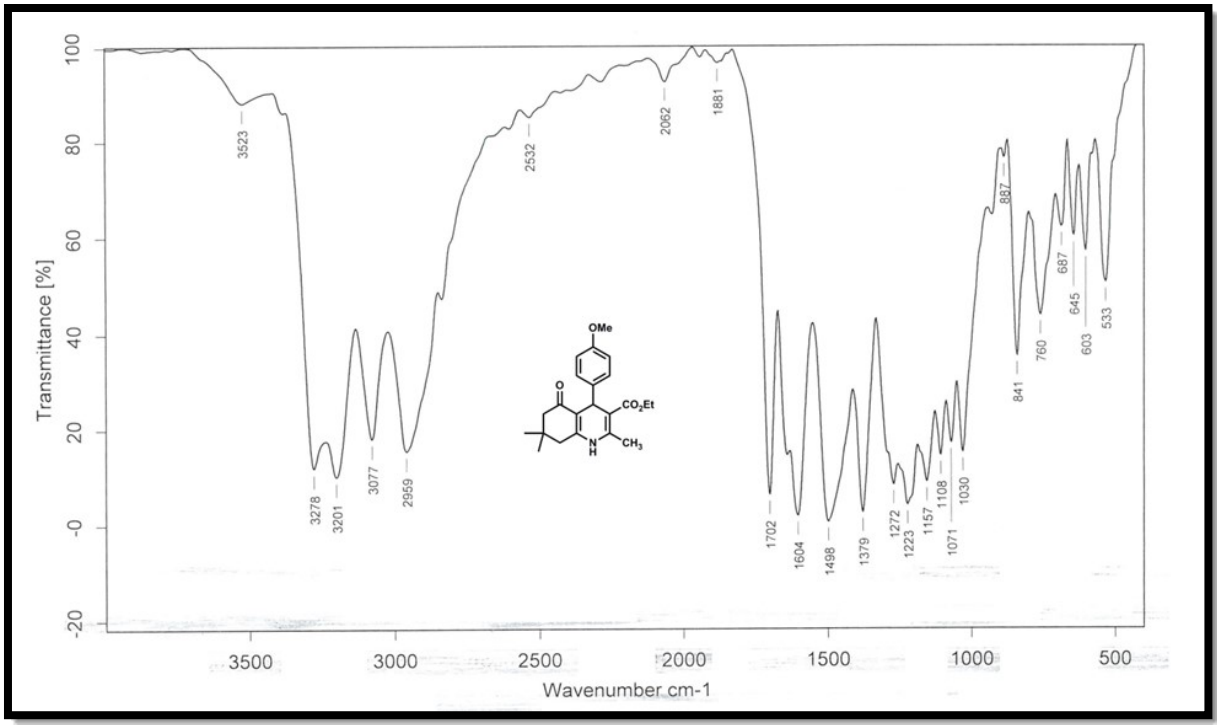

Fig. S13. FT-IR of ethyl 4-(4-methoxyphenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

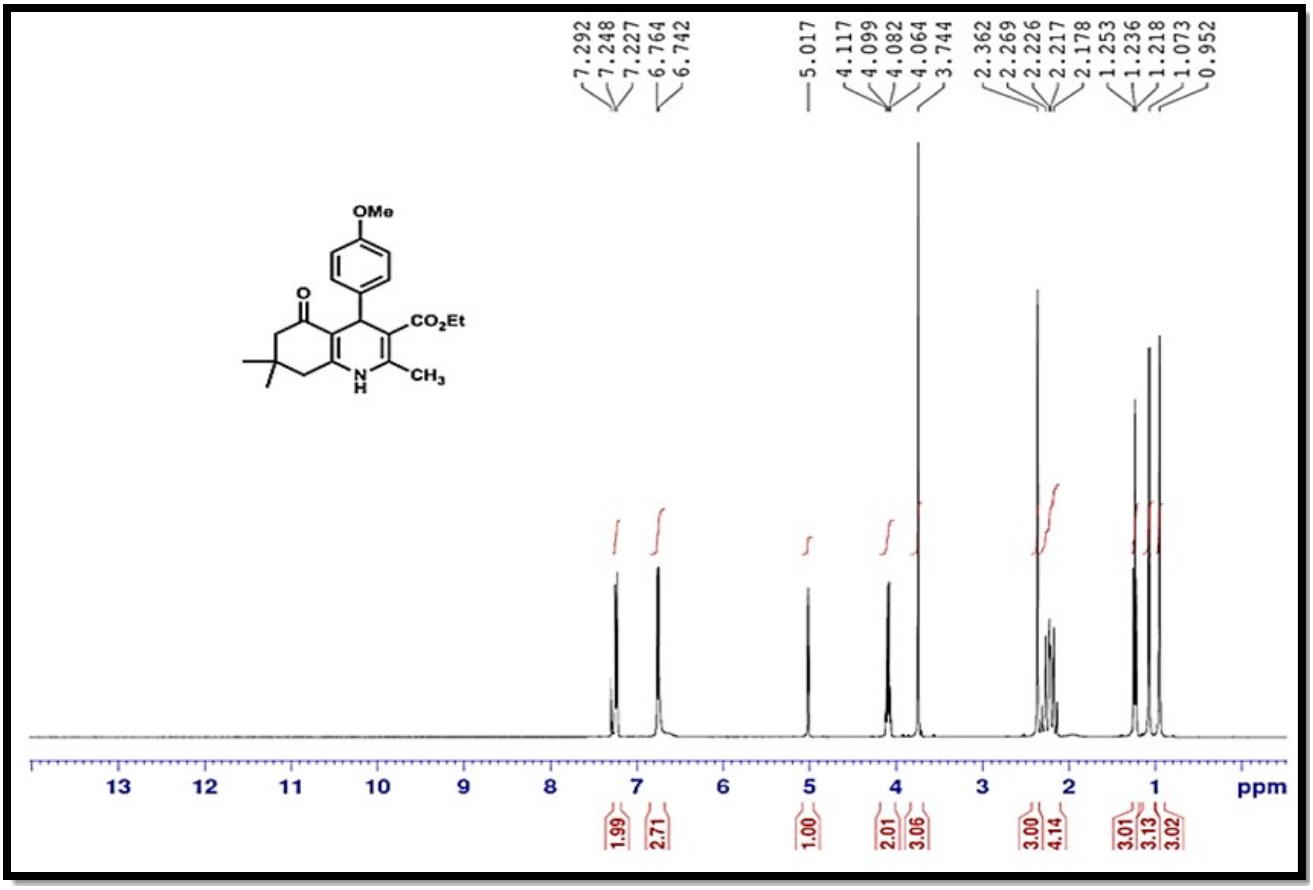

Fig. S14. ^{1}H NMR of of ethyl 4-(4-methoxyphenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

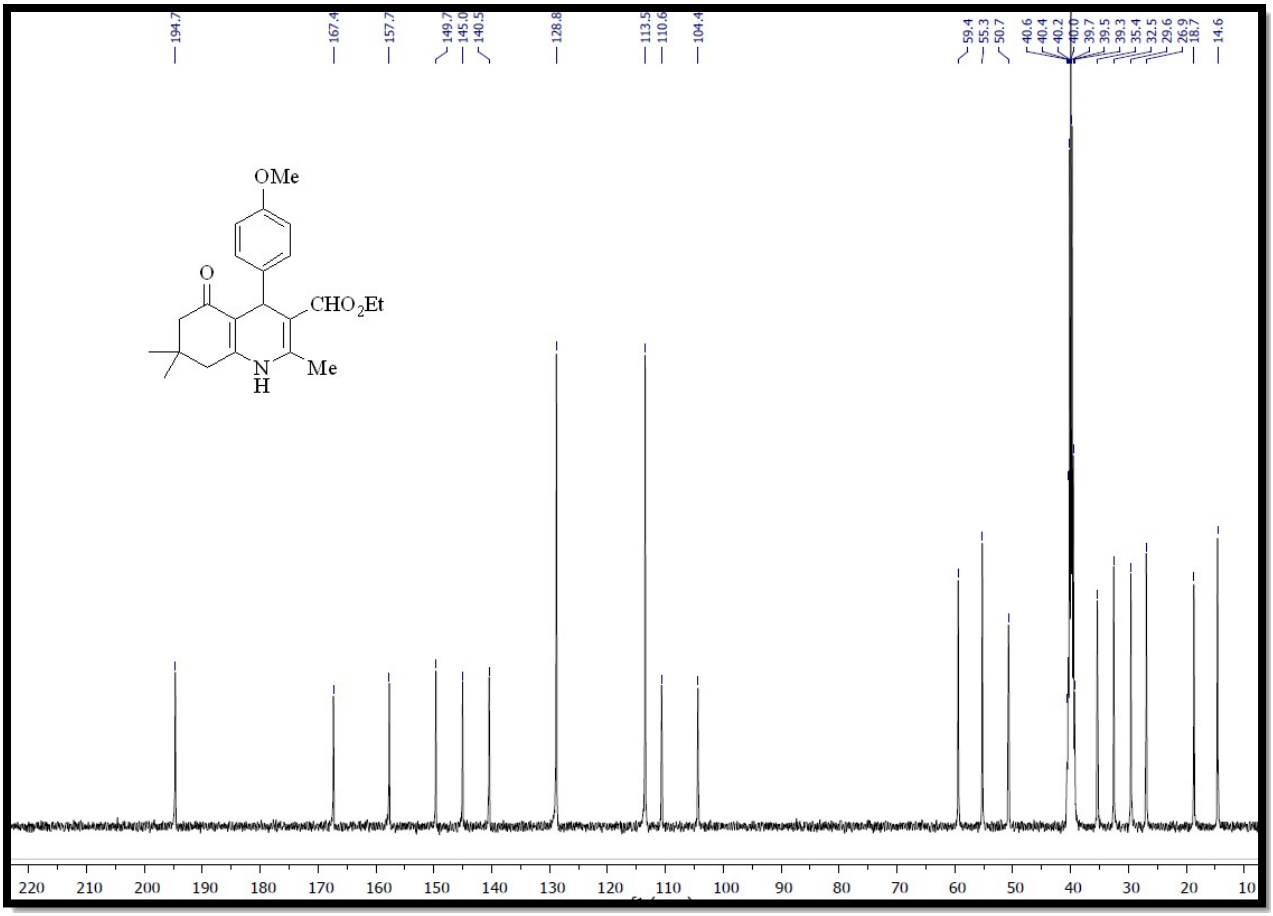

Fig. S15. ^{13}C NMR of of ethyl 4-(4-methoxyphenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

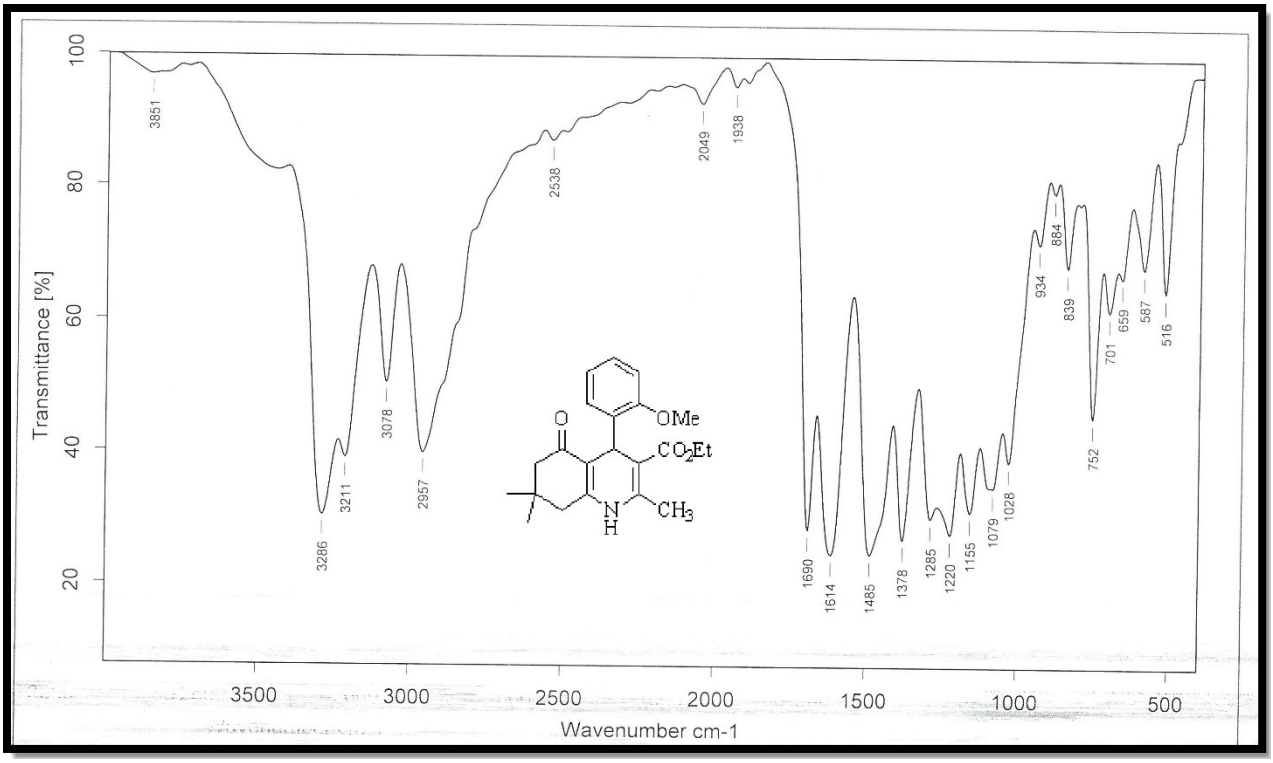

Fig. S16. FT-IR of ethyl 4-(2-methoxyphenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

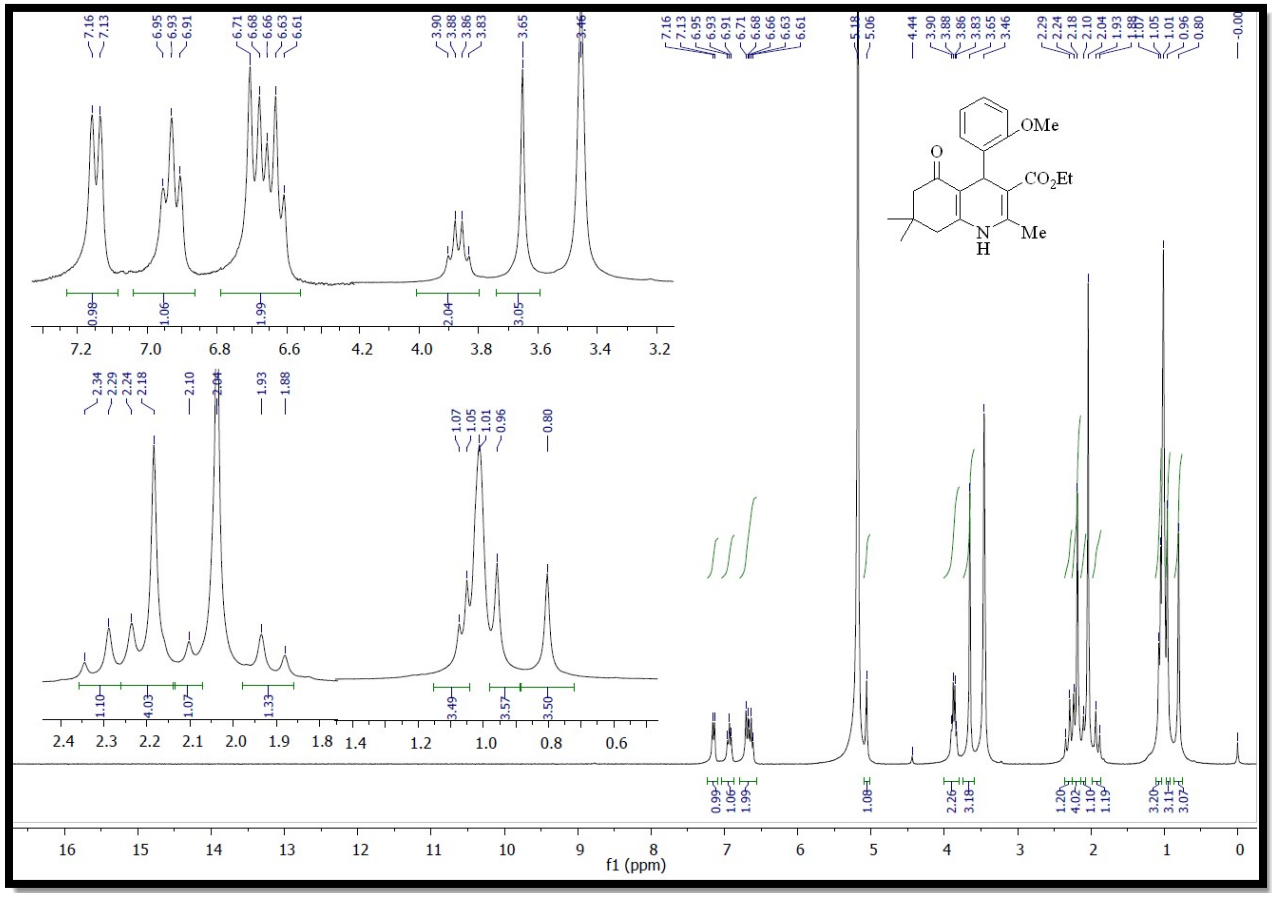

Fig. S17. ^{1}H NMR of ethyl 4-(2-methoxyphenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

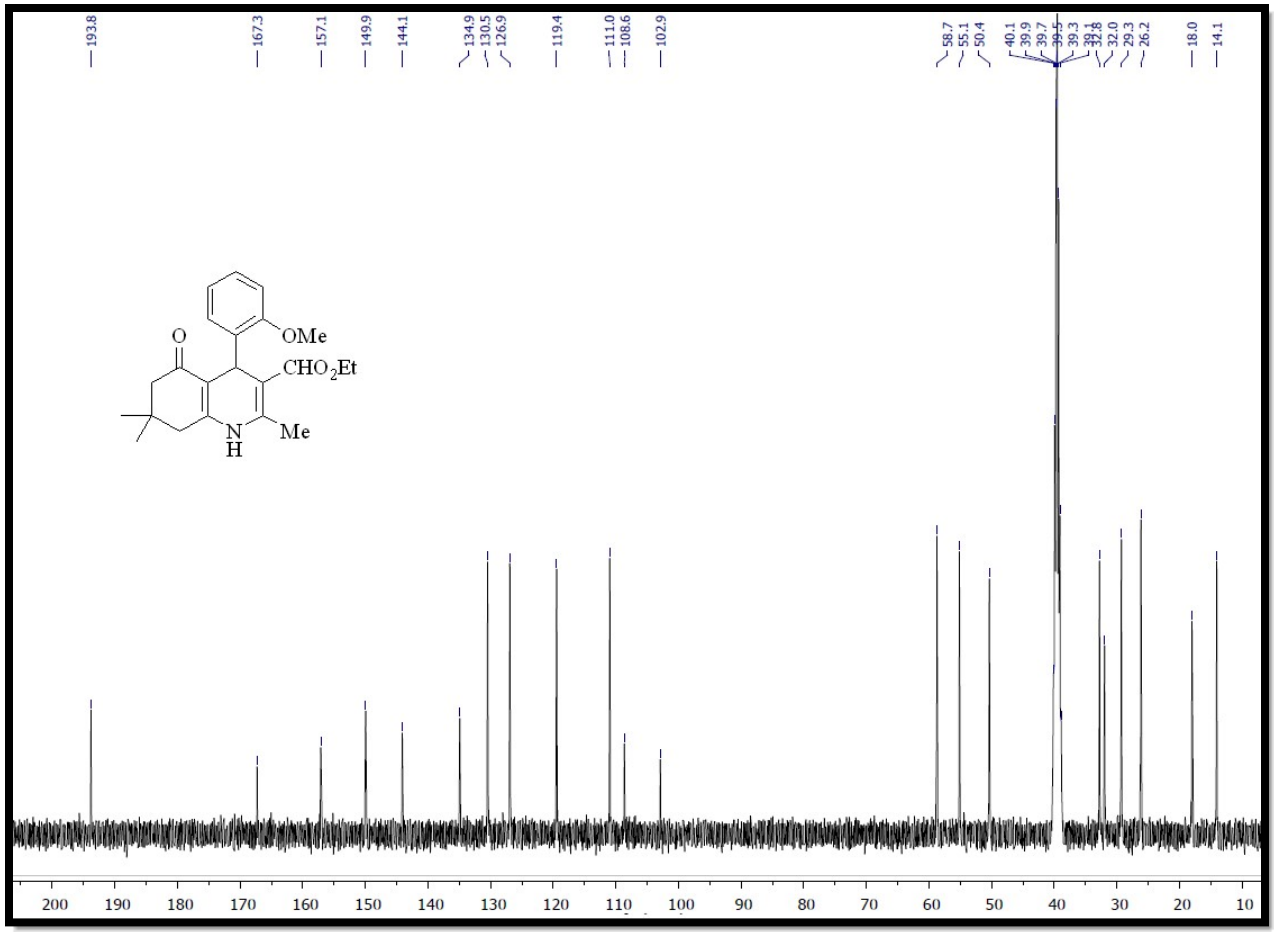

Fig. S18. ^{13}C NMR of ethyl 4-(2-methoxyphenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

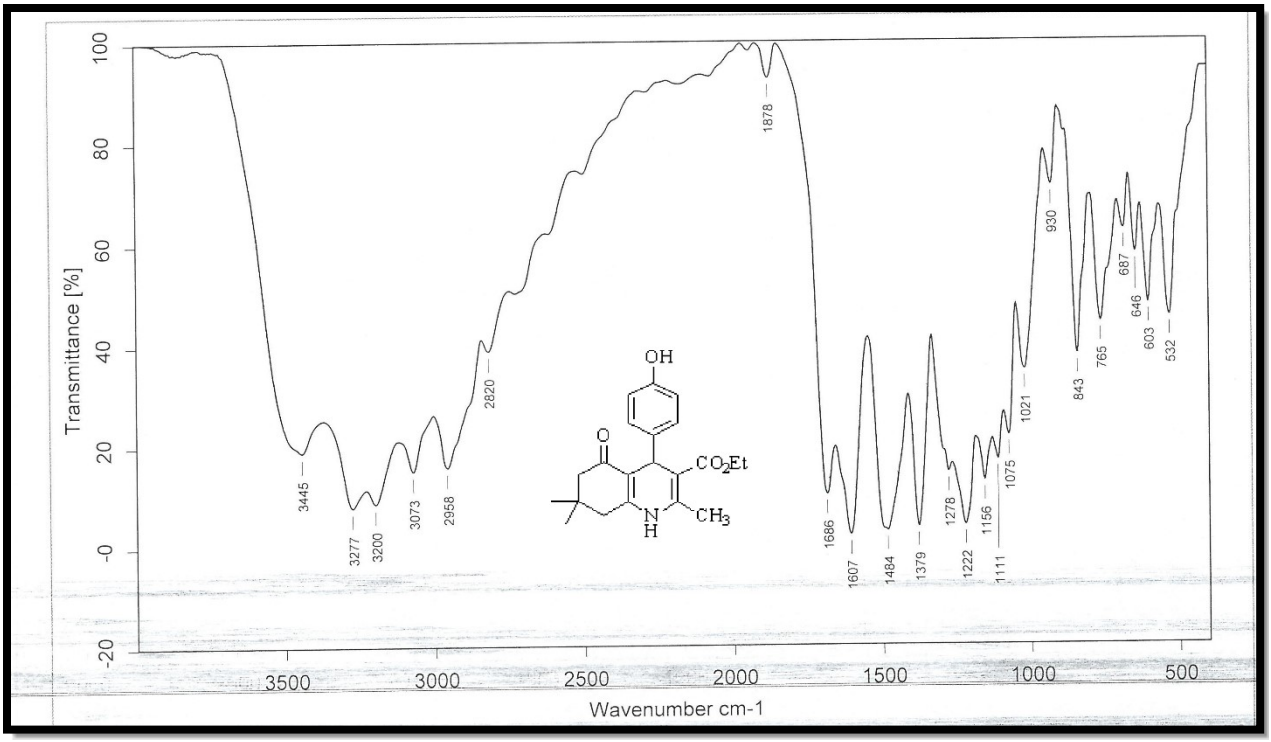

Fig. S19. FT-IR of ethyl 4-(4- hydroxyphenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

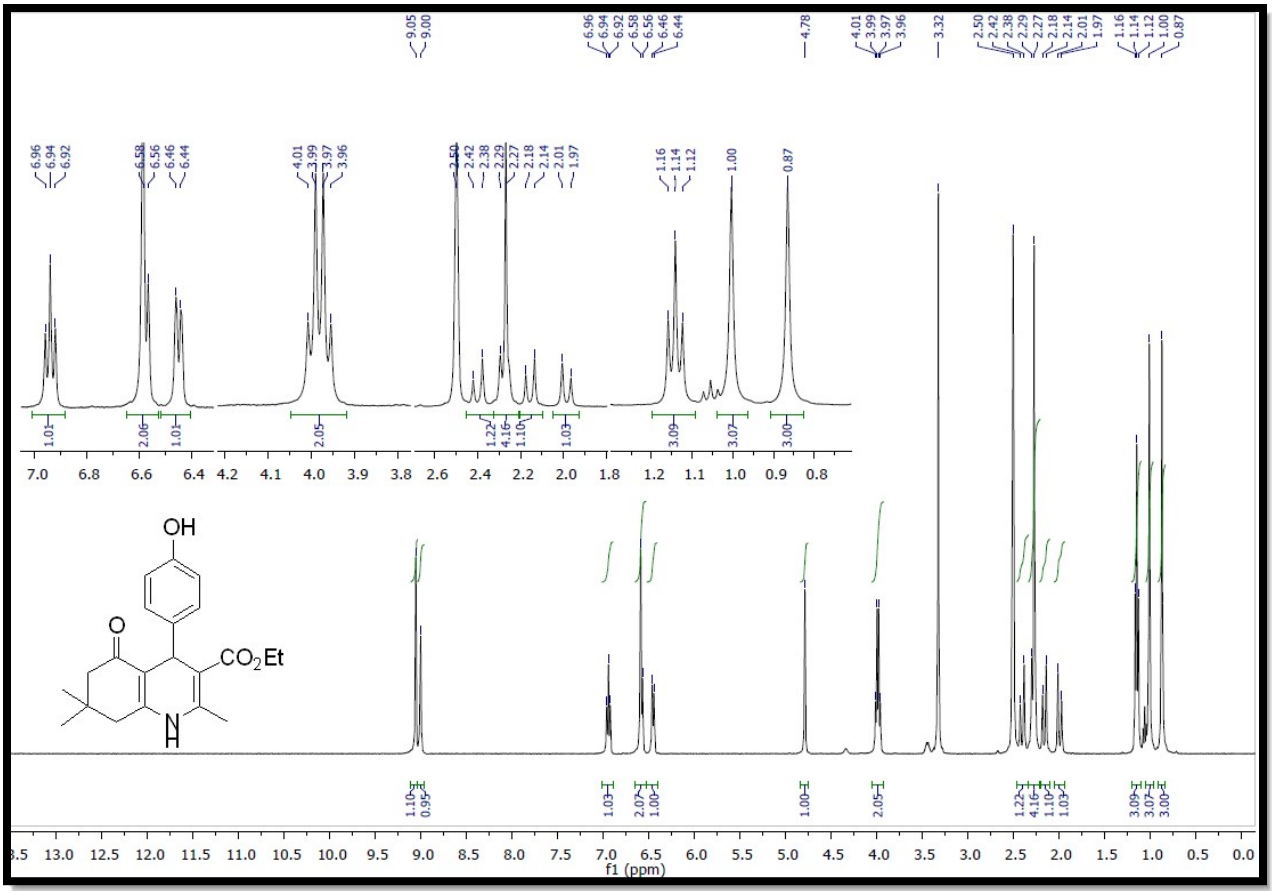

Fig. S20. ^{1}H NMR of ethyl 4-(4- hydroxyphenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

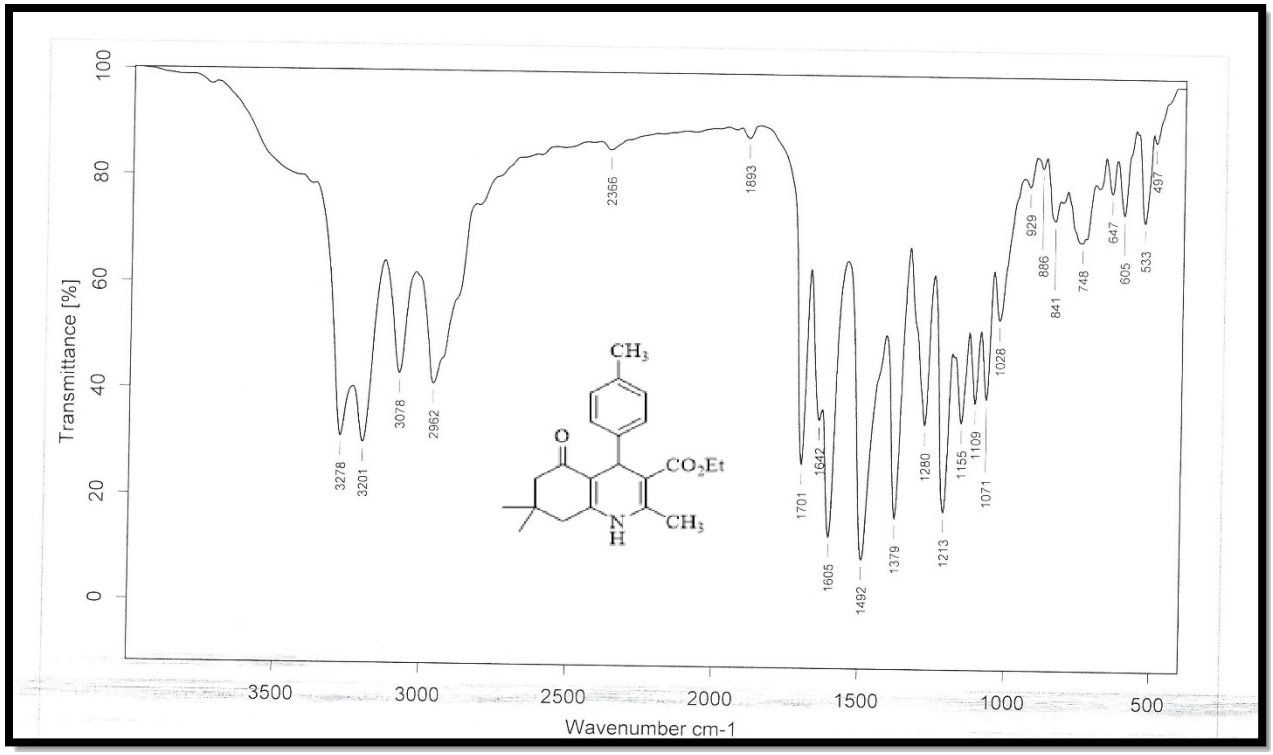

Fig. S21. FT-IR of ethyl 2,7,7-trimethyl-5-oxo-4-(p-tolyl)-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

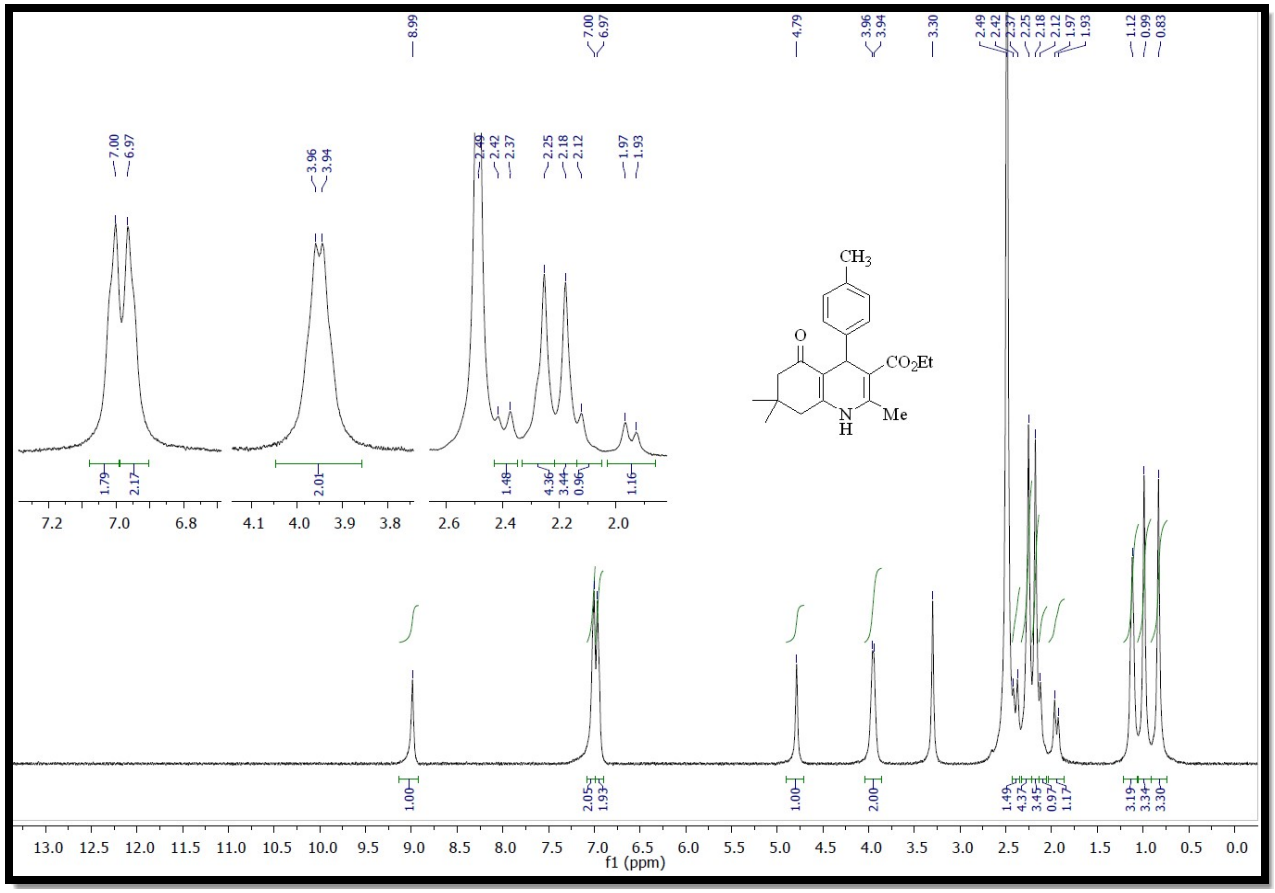

Fig. S22. ^{1}H NMR of ethyl 2,7,7-trimethyl-5-oxo-4-(p-tolyl)-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

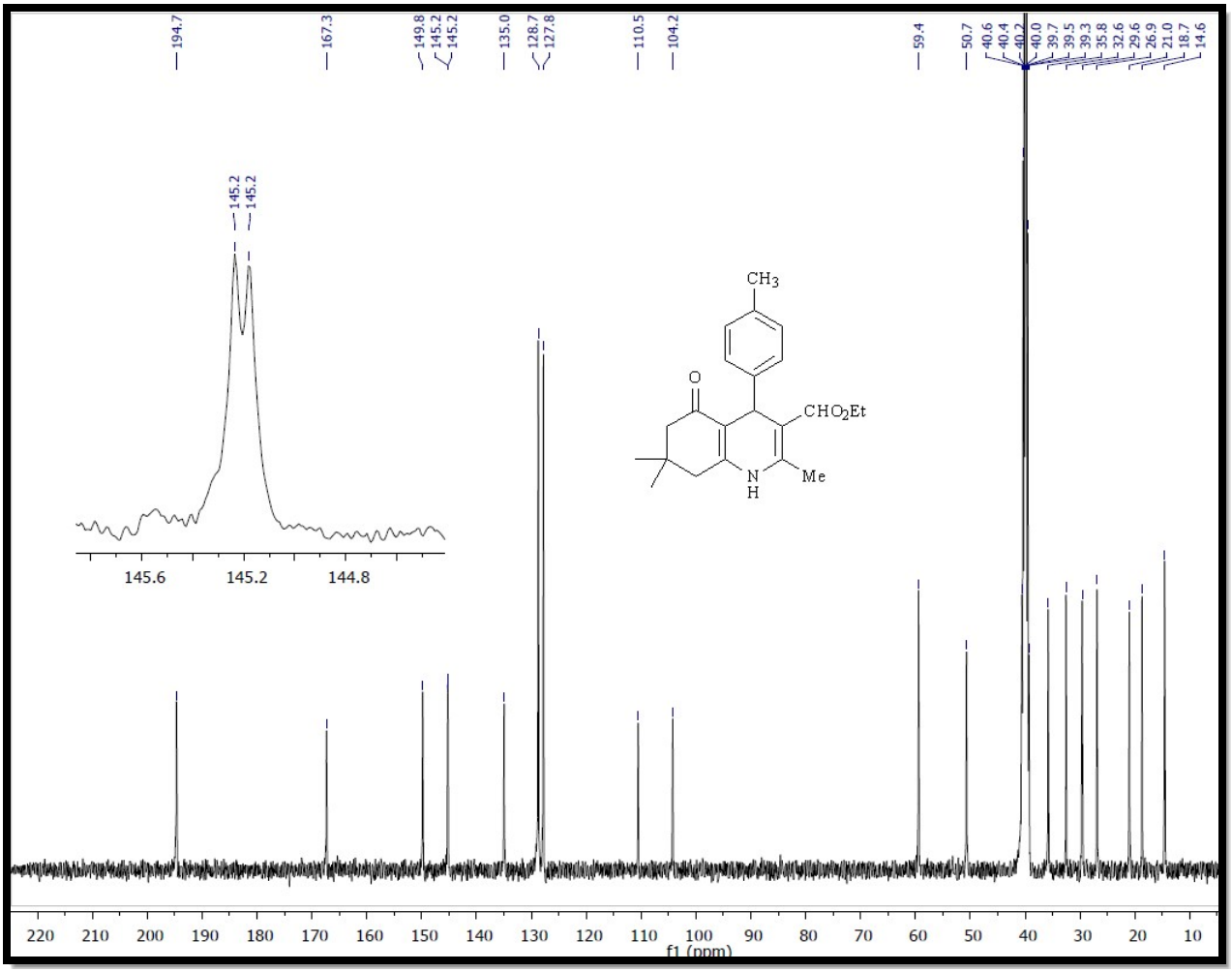

Fig. S23. ^{13}C NMR of ethyl 2,7,7-trimethyl-5-oxo-4-(p-tolyl)-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

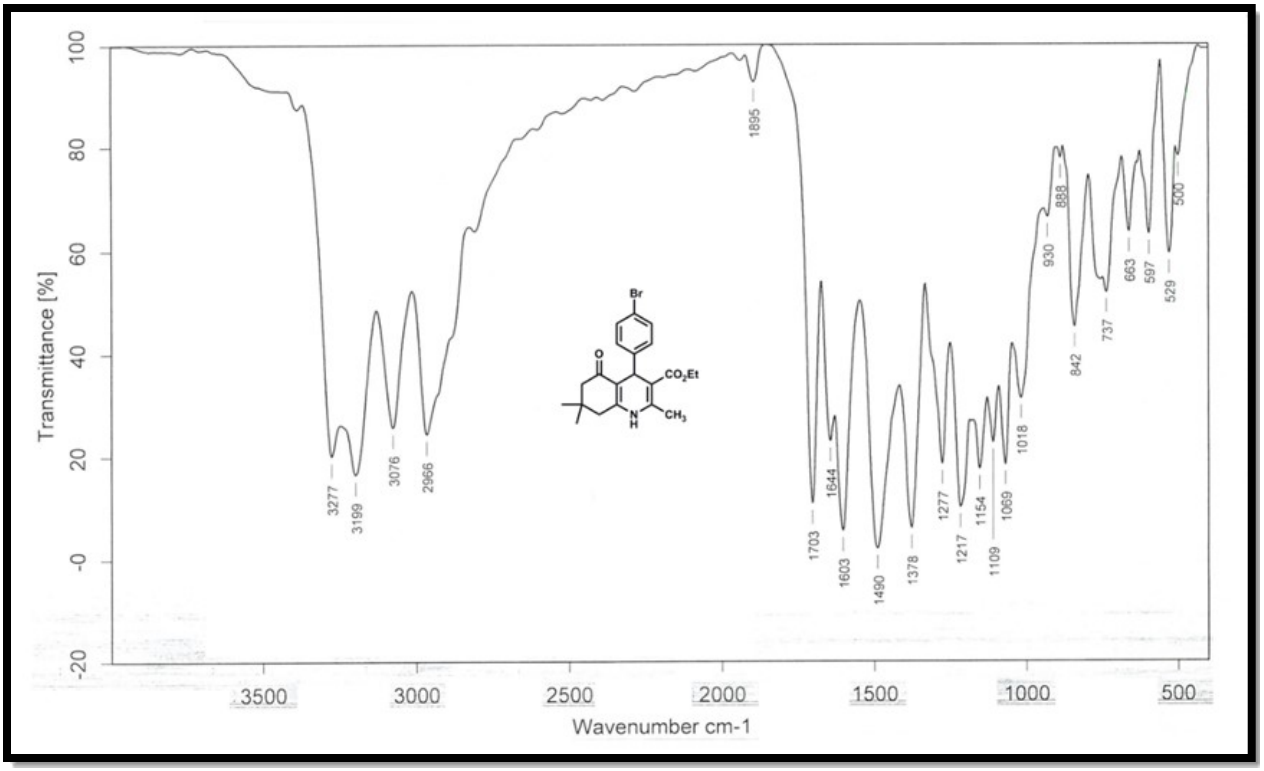

Fig. S24. FT-IR of ethyl-4-(4-bromophenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate.

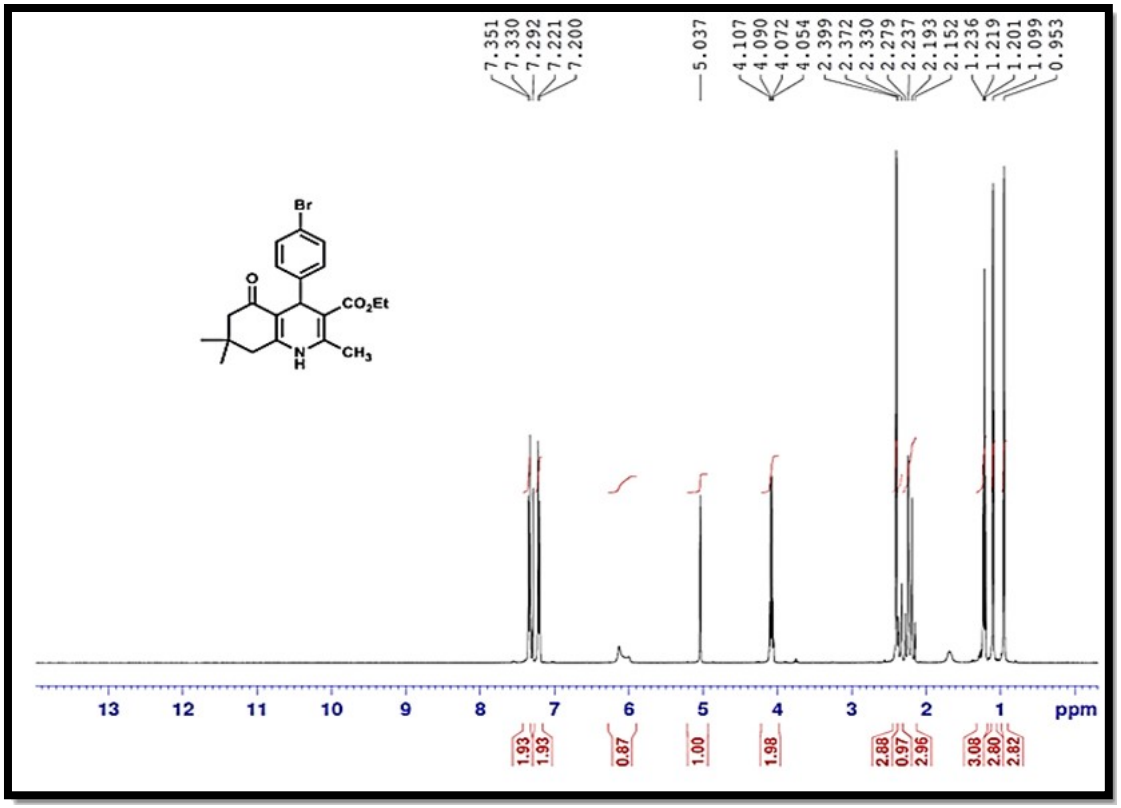

Fig. S25. [1]HNMR of ethyl-4-(4-bromophenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

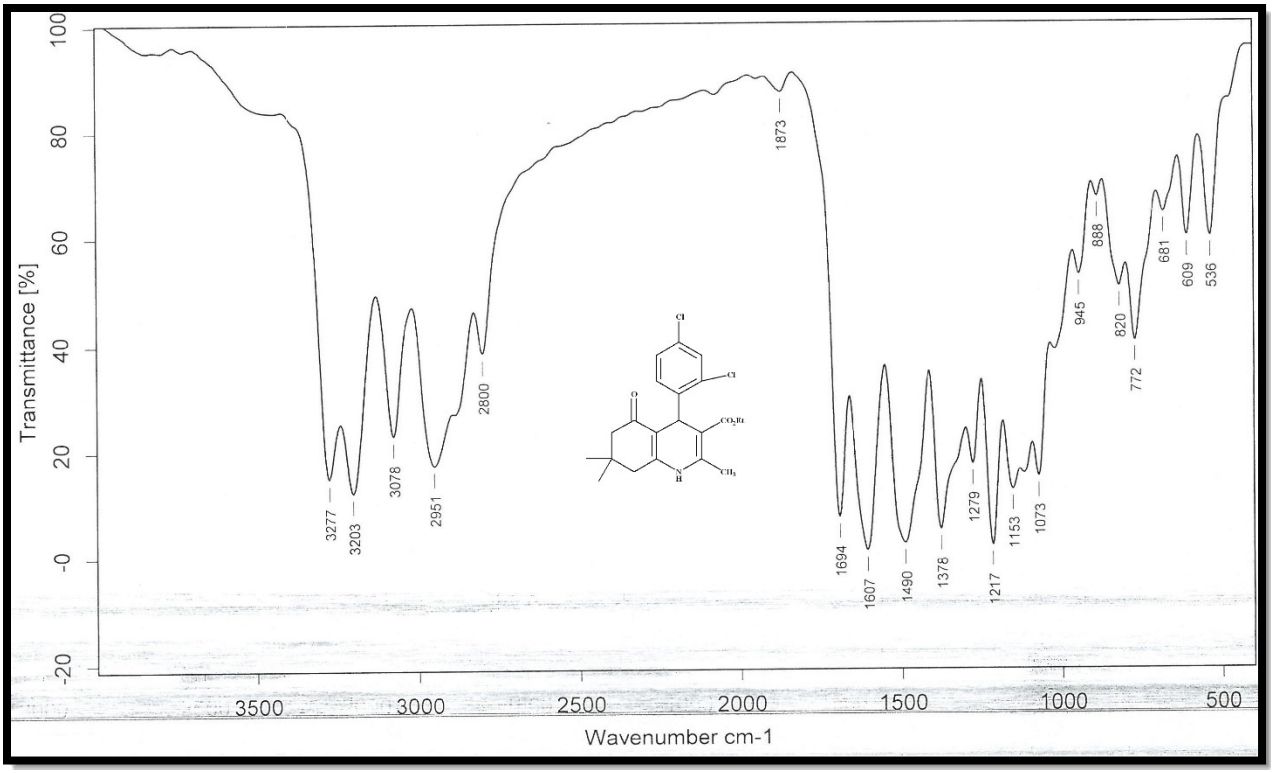

Fig. S26. FT-IR of ethyl-4-(2,4-dichlorophenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

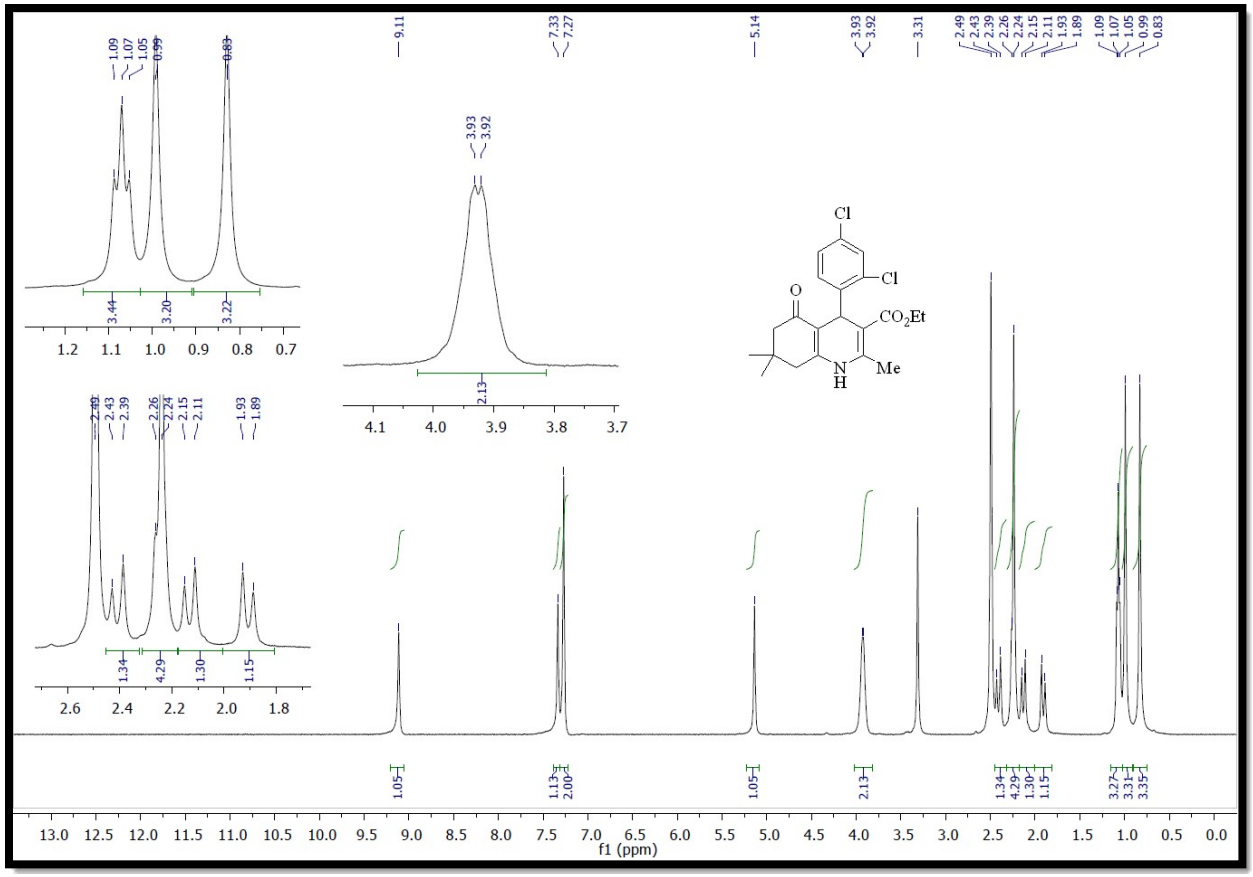

Fig. S27. ^{1}H NMR of ethyl-4-(2,4-dichlorophenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

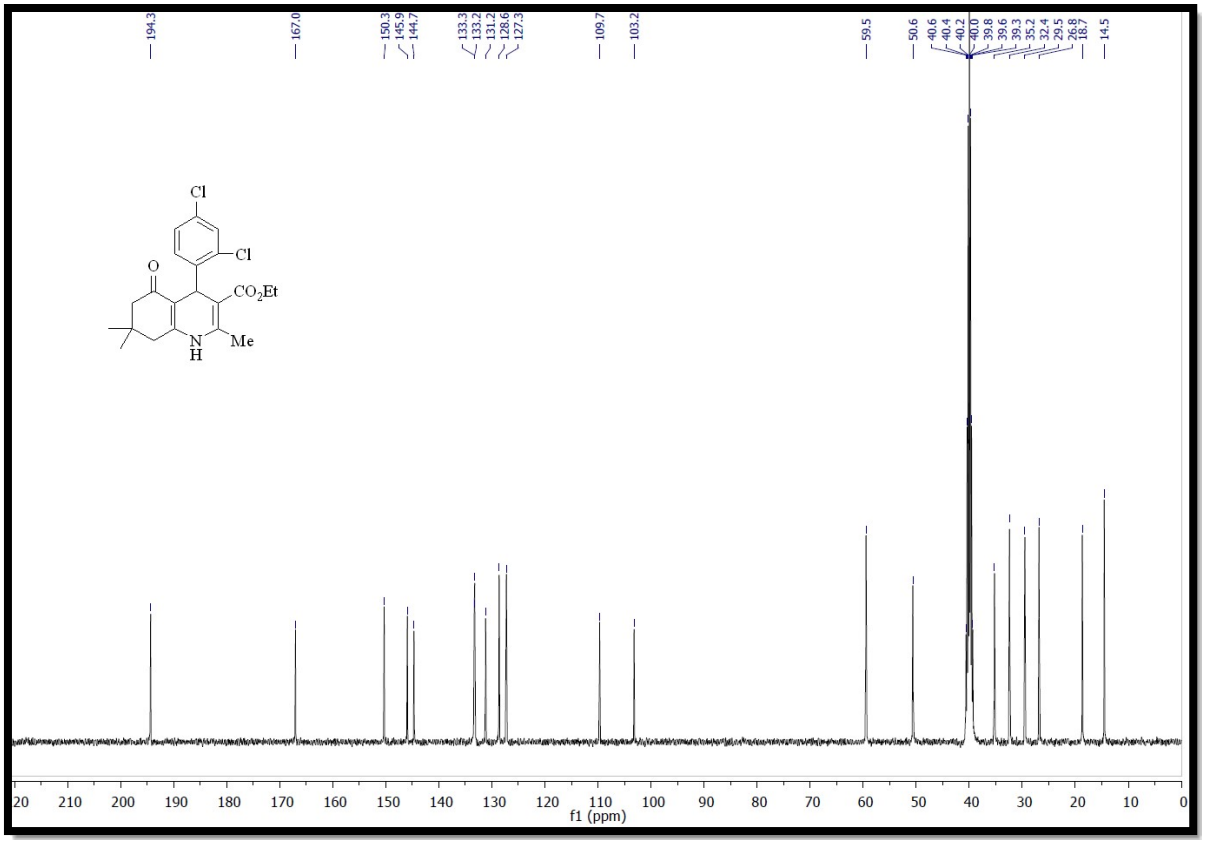

Fig. S28. ^{13} C NMR of ethyl-4-(2,4-dichlorophenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

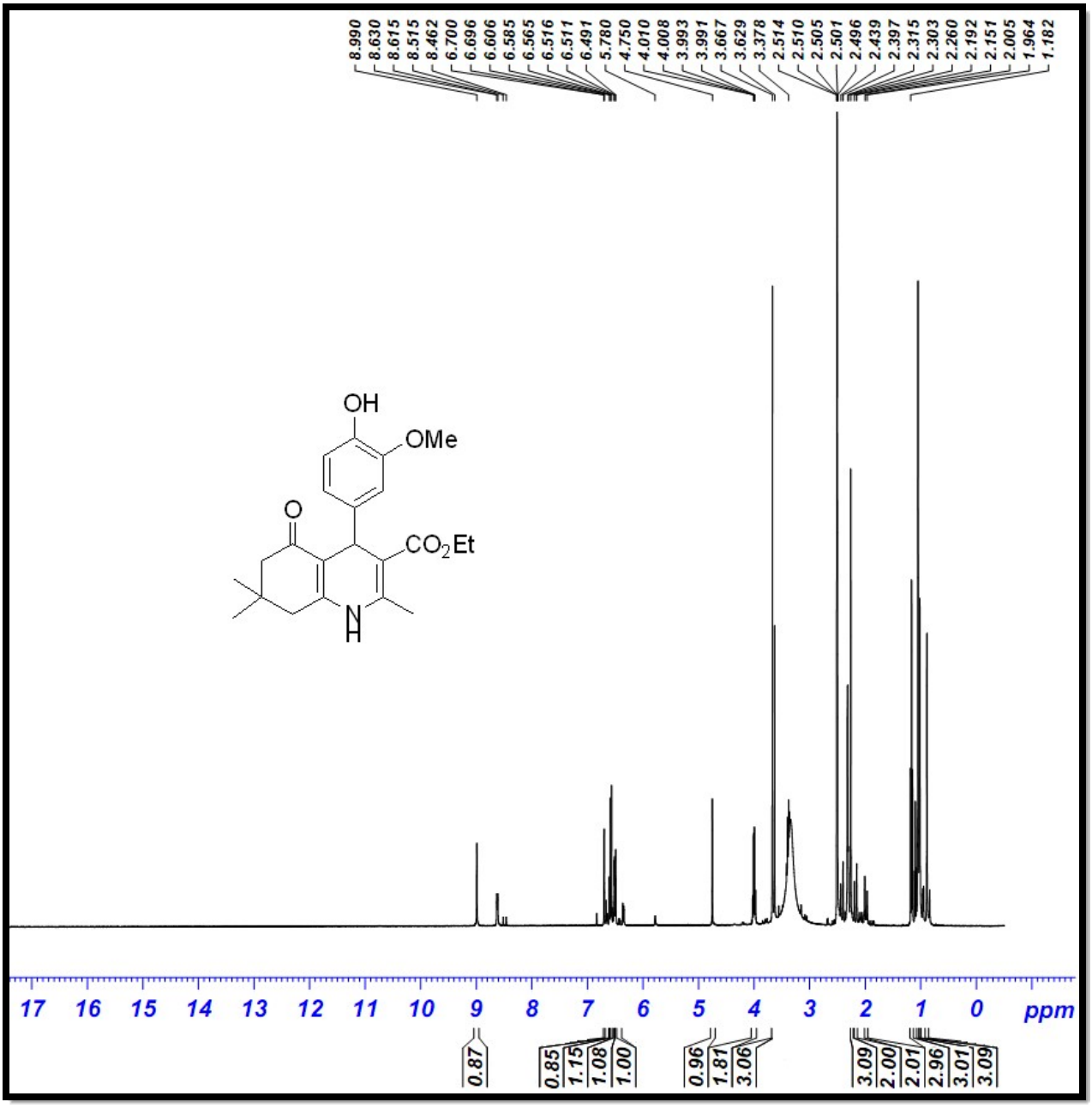

Fig. S29. [1]H NMR of ethyl-4-(4-hydroxy-3-methoxyphenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3 carboxylate

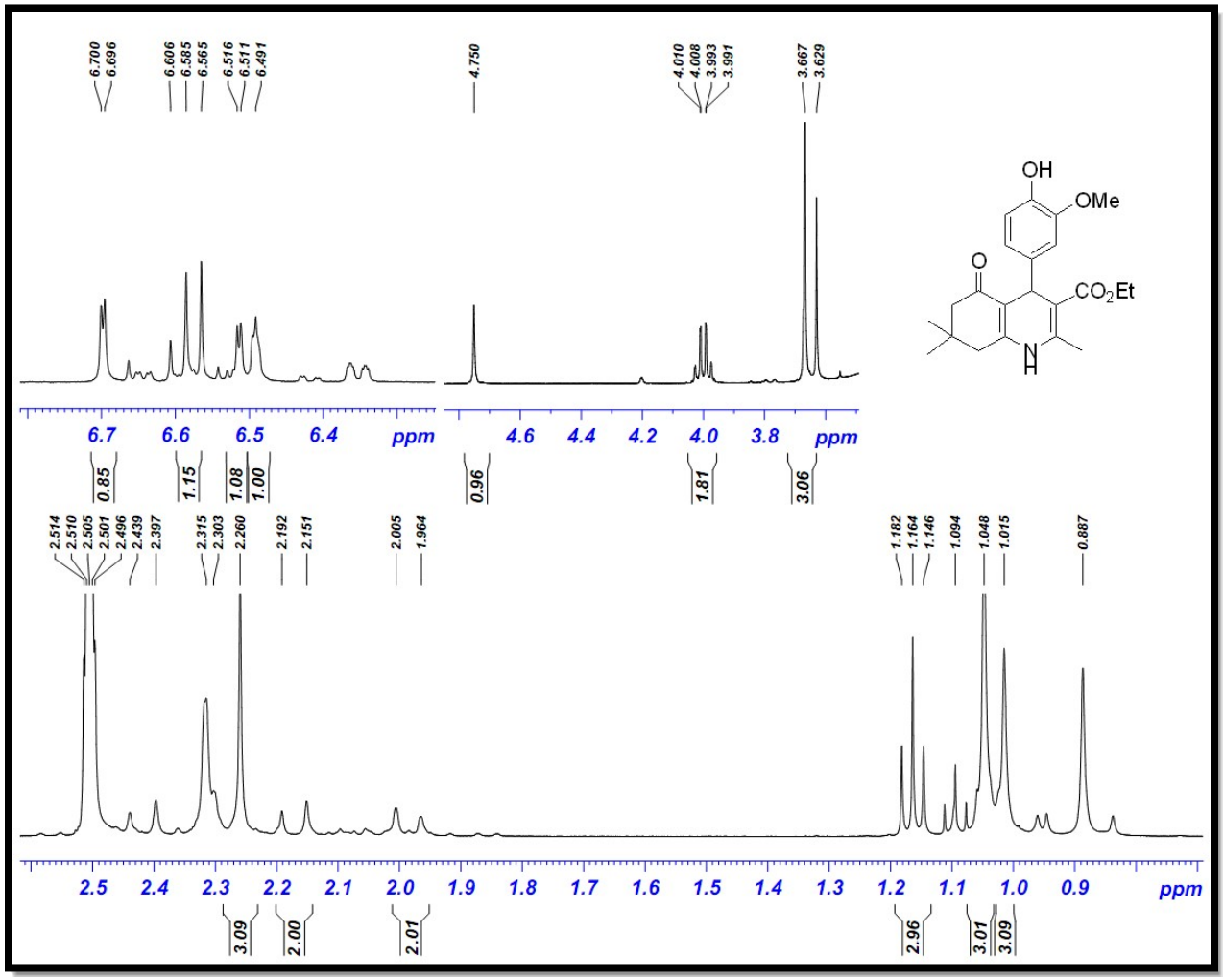

Fig. S30. ^{1}H NMR of ethyl-4-(4-hydroxy-3-methoxyphenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3 carboxylate

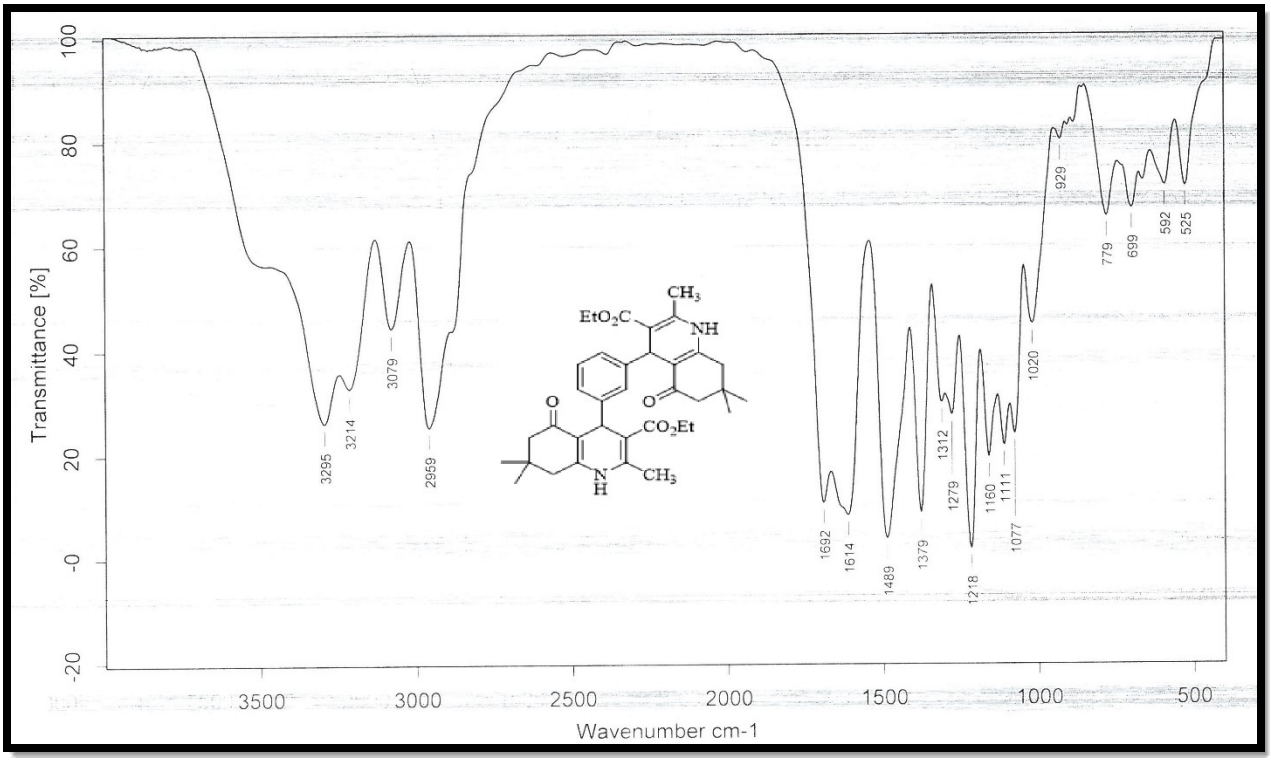

Fig. S31. FT-IR of diethyl 4,4'-(1,3-phenylene)bis(2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate)

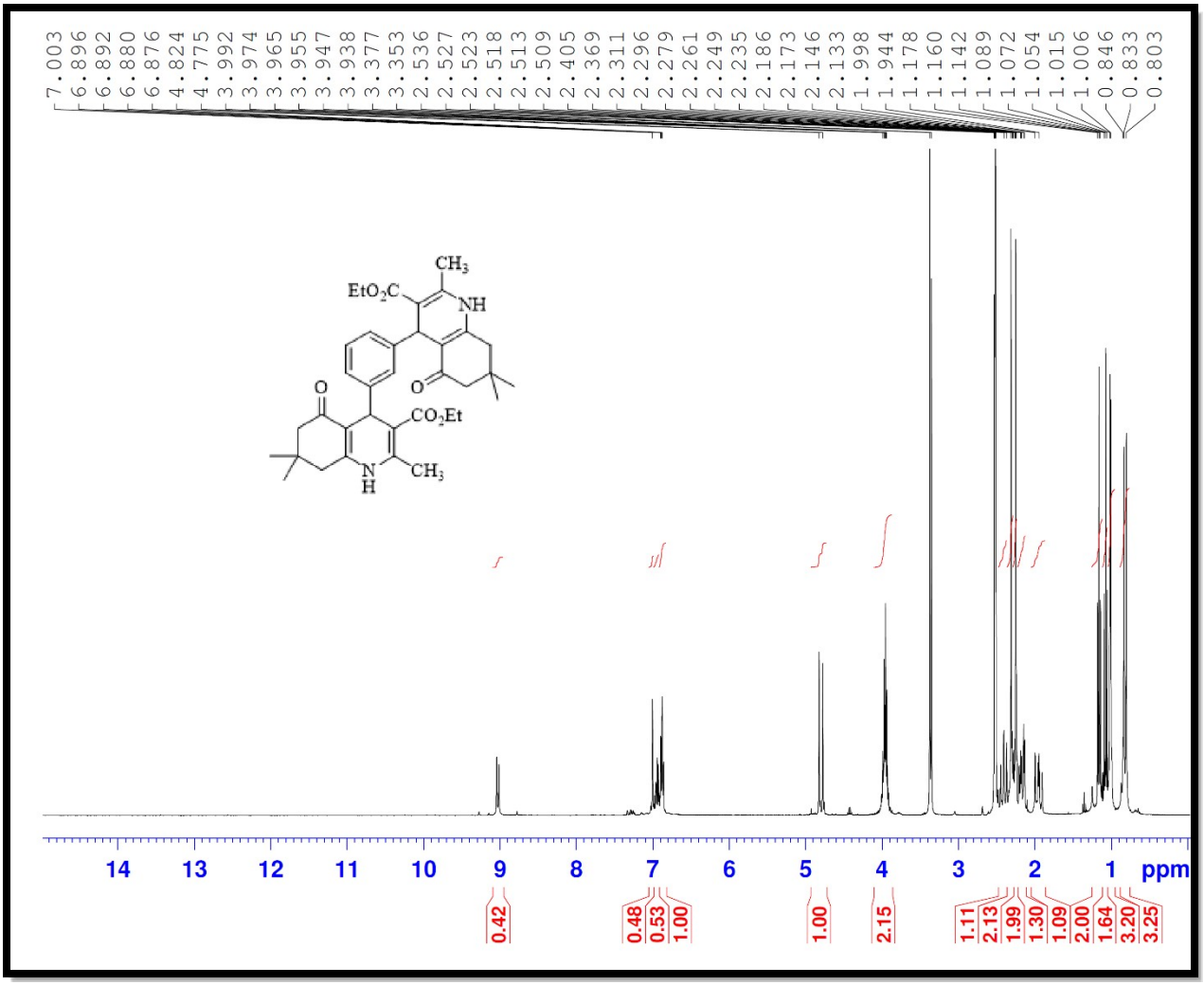

Fig. S32. ^{1}H NMR of diethyl 4,4'-(1,3-phenylene) bis(2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate)

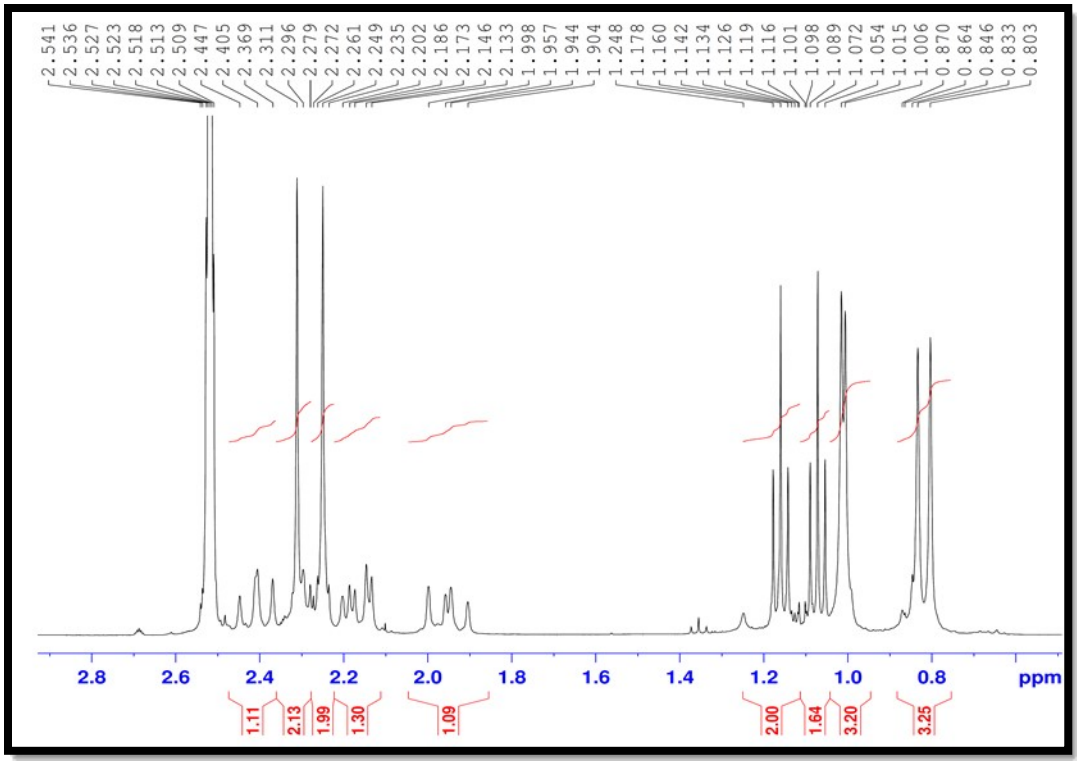

Fig. S33. ^{1}H NMR of diethyl 4,4'-(1,3-phenylene) bis(2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate)

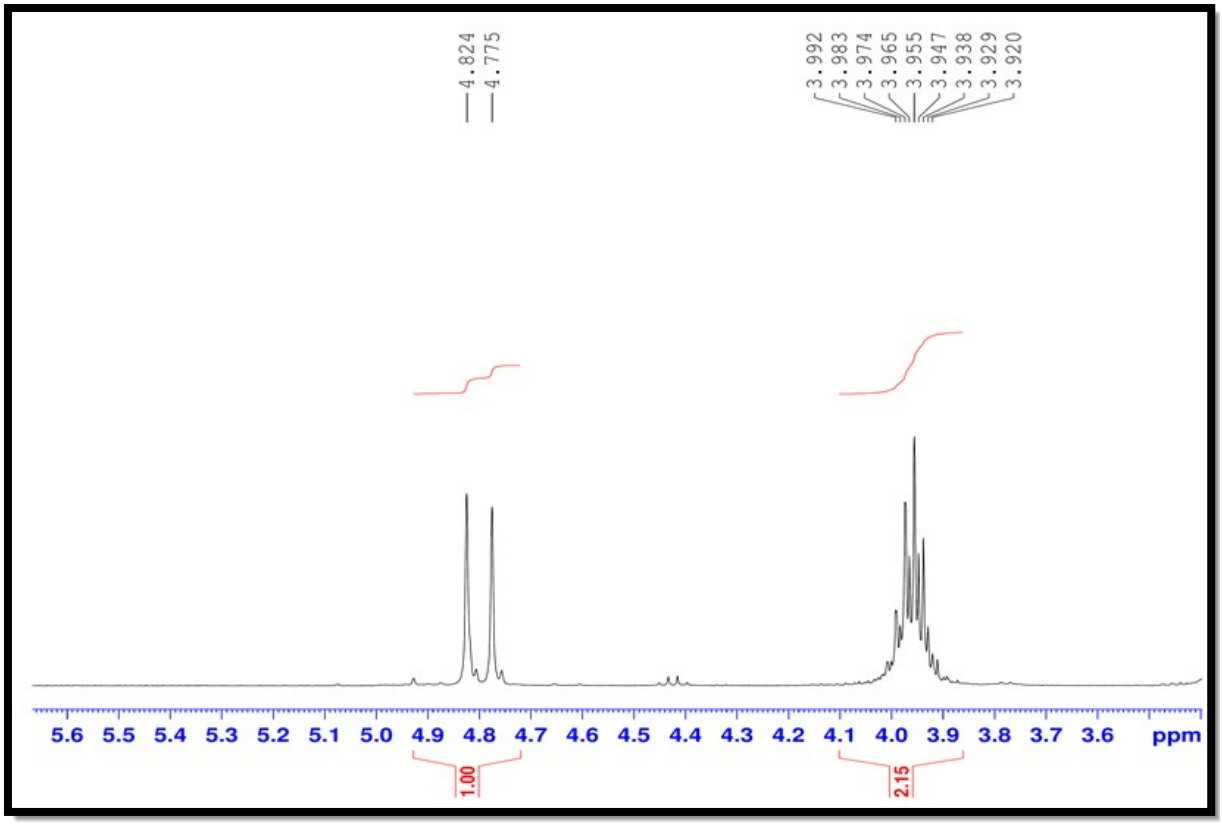

Fig. S34. [1]H NMR of diethyl 4,4'-(1,3-phenylene) bis(2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate)

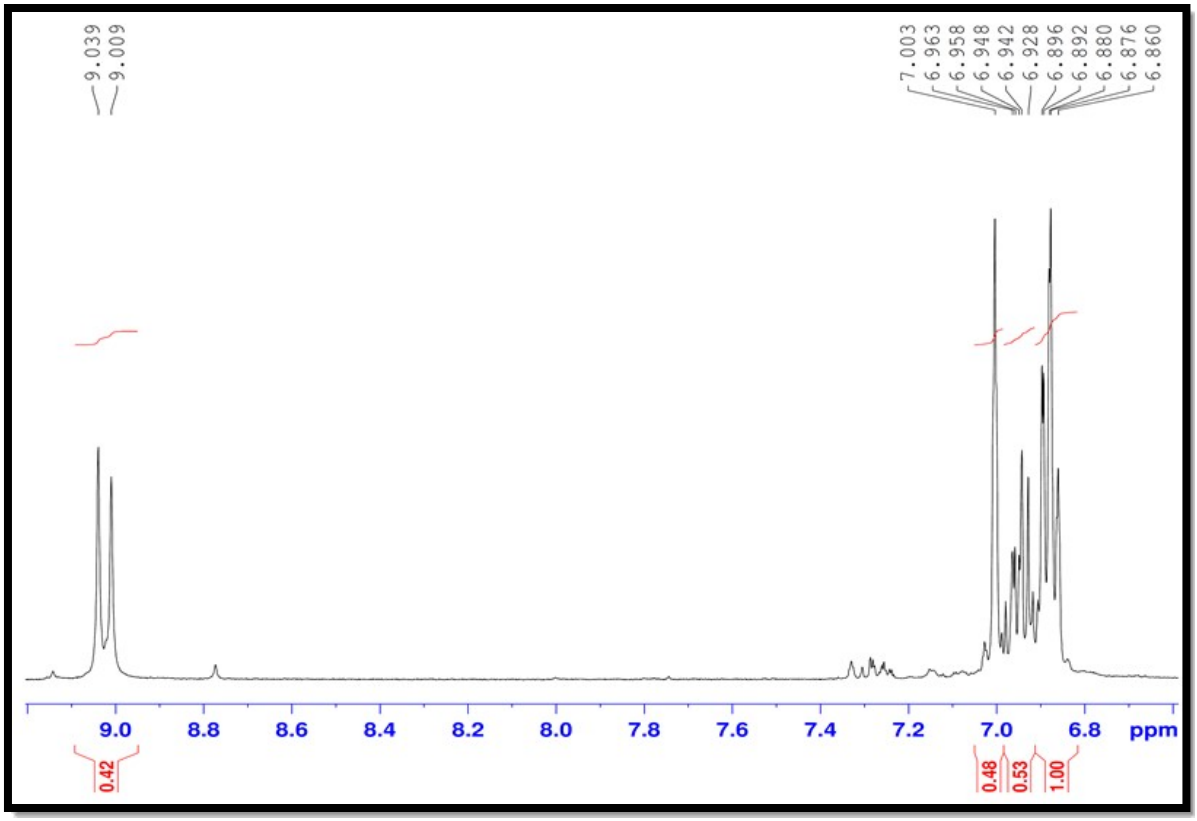

Fig. S35. ^{1}H NMR of diethyl 4,4'-(1,3-phenylene) bis(2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate)

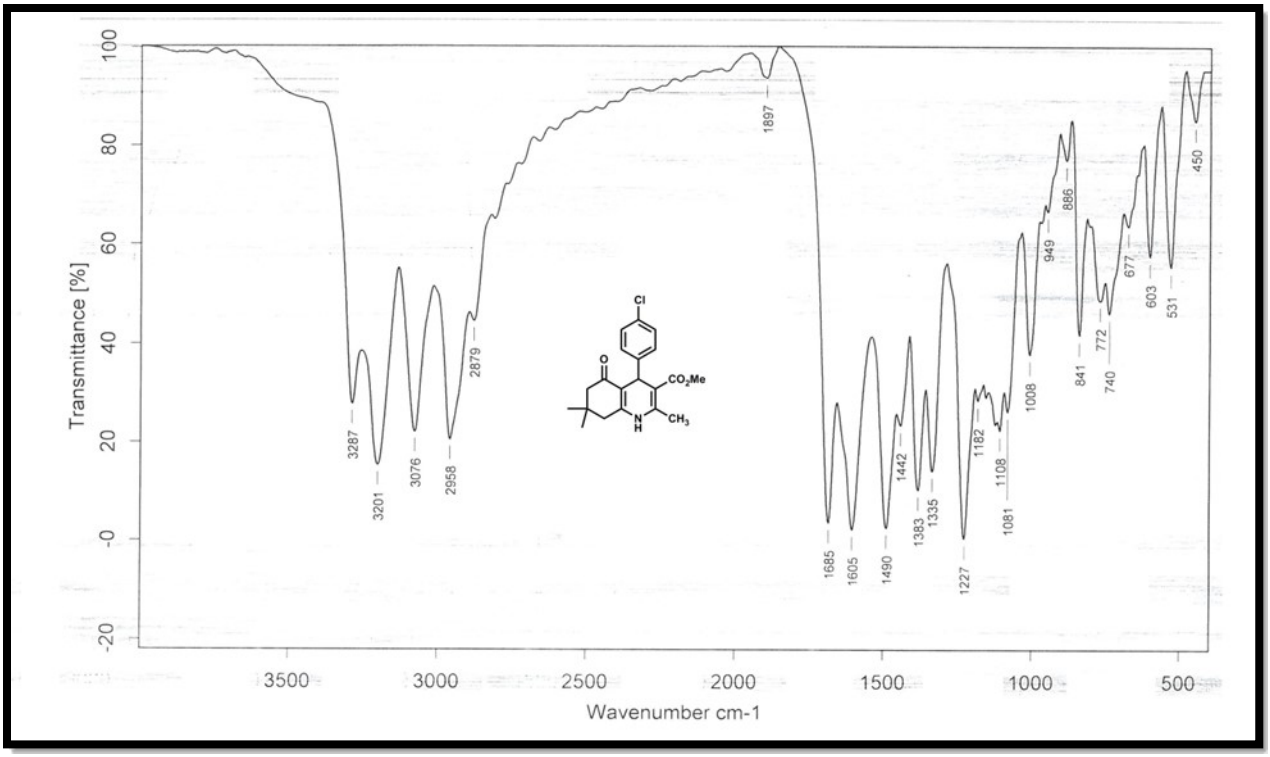

Fig. S36. FT-IR of methyl-4-(4-chlorophenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

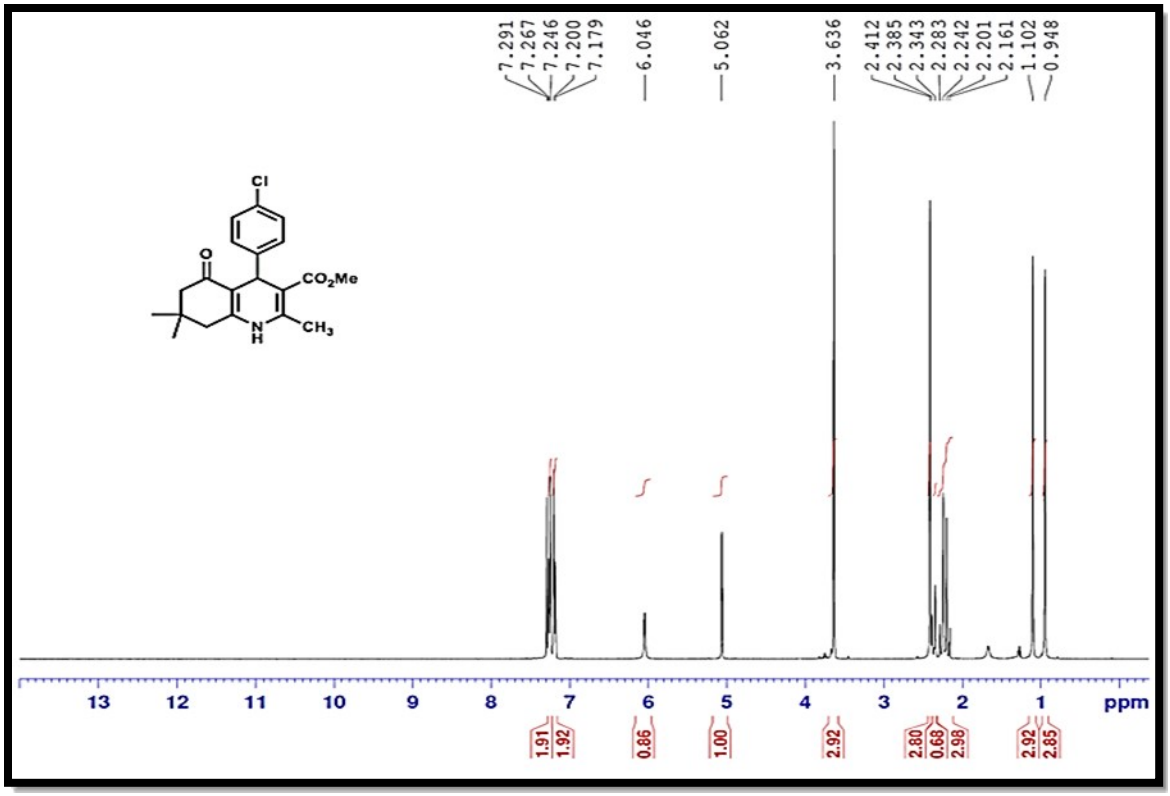

Fig. S37. ^{1}H NMR of methyl-4-(4-chlorophenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

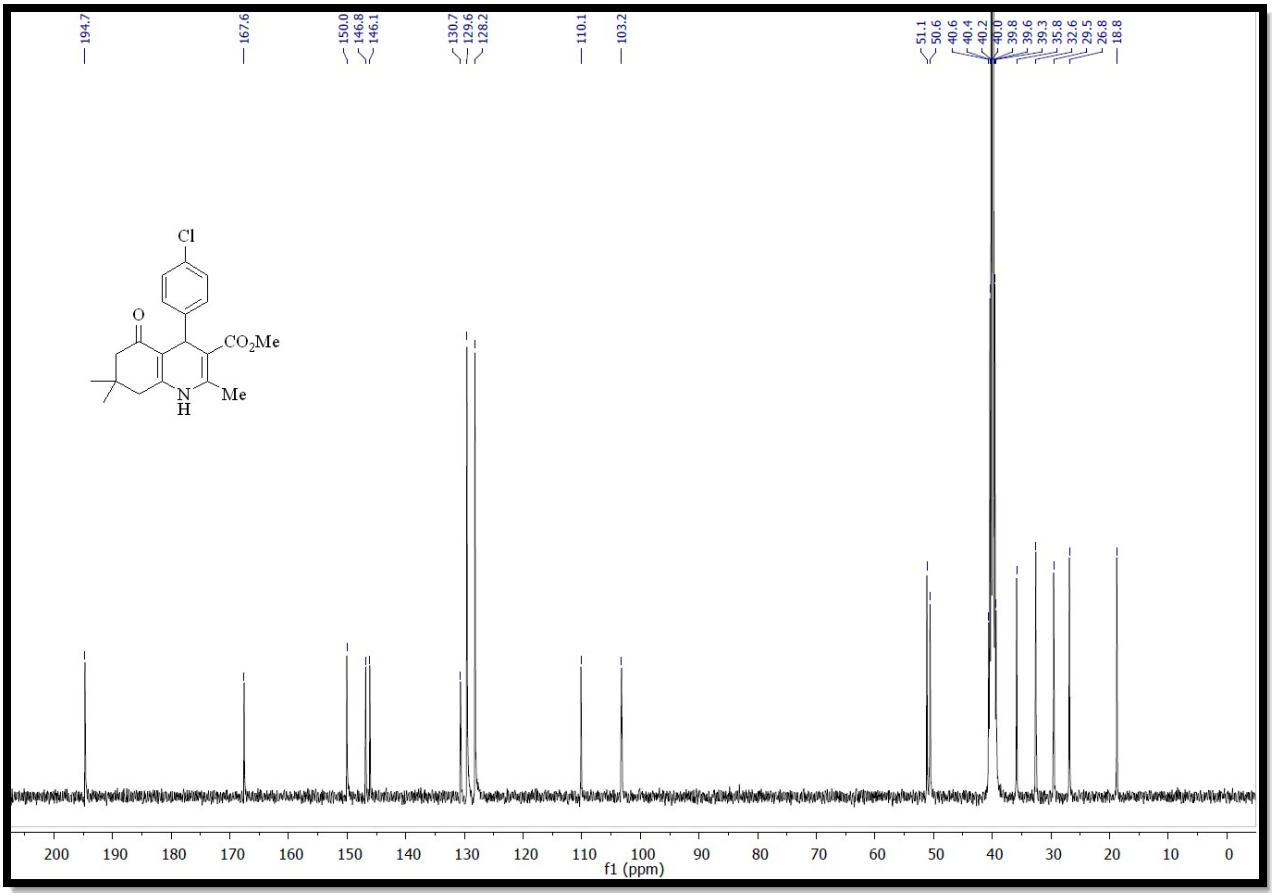

Fig. S38. ^{13}C NMR of methyl-4-(4-chlorophenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

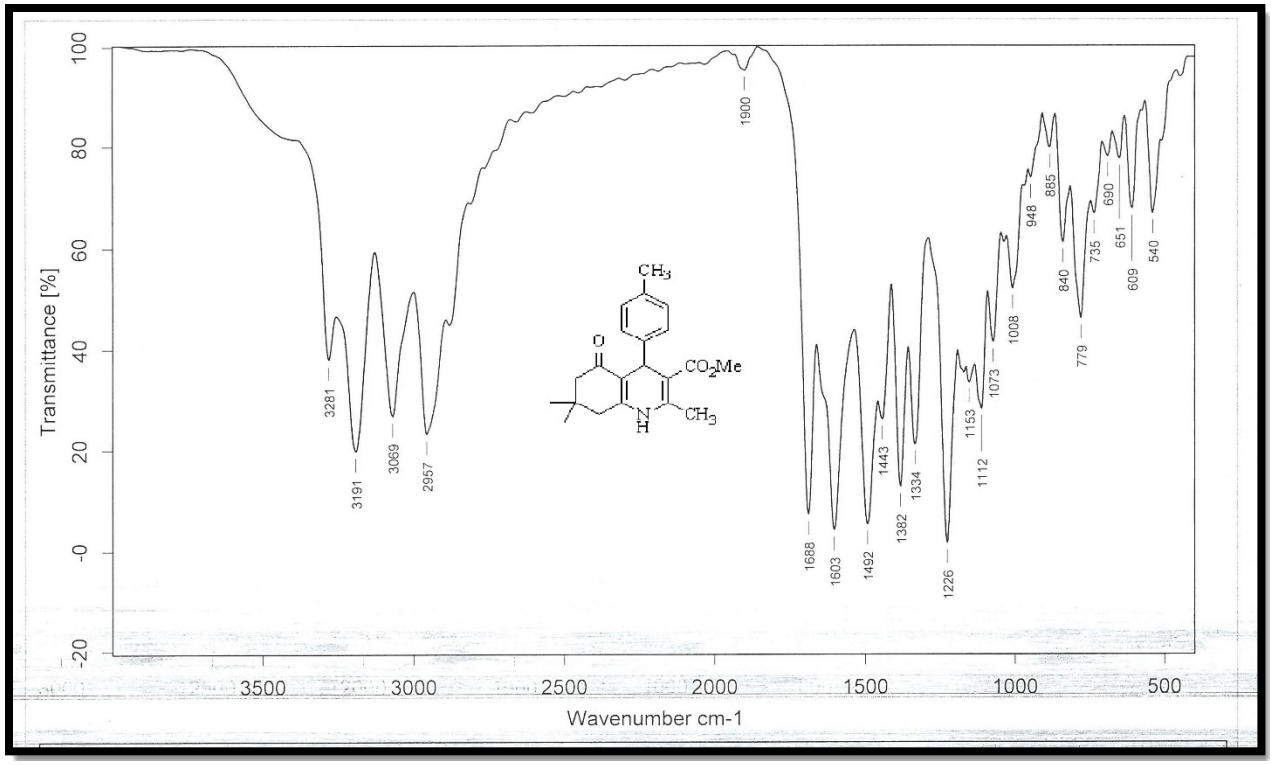

Fig. S39. FT-IR of methyl 2,7,7-trimethyl-5-oxo-4-(p-tolyl)-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

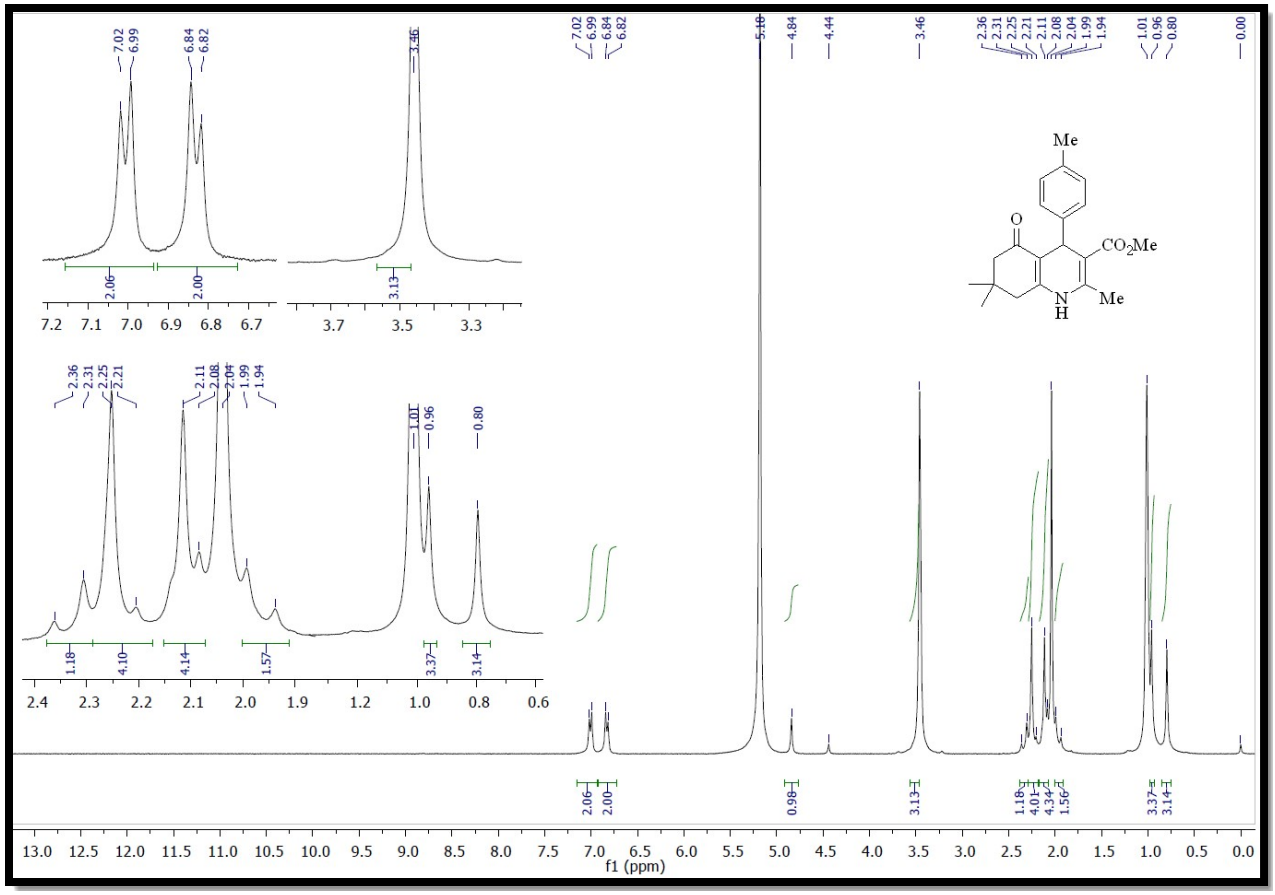

Fig. S40. [1]H NMR of methyl 2,7,7-trimethyl-5-oxo-4-(p-tolyl)-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

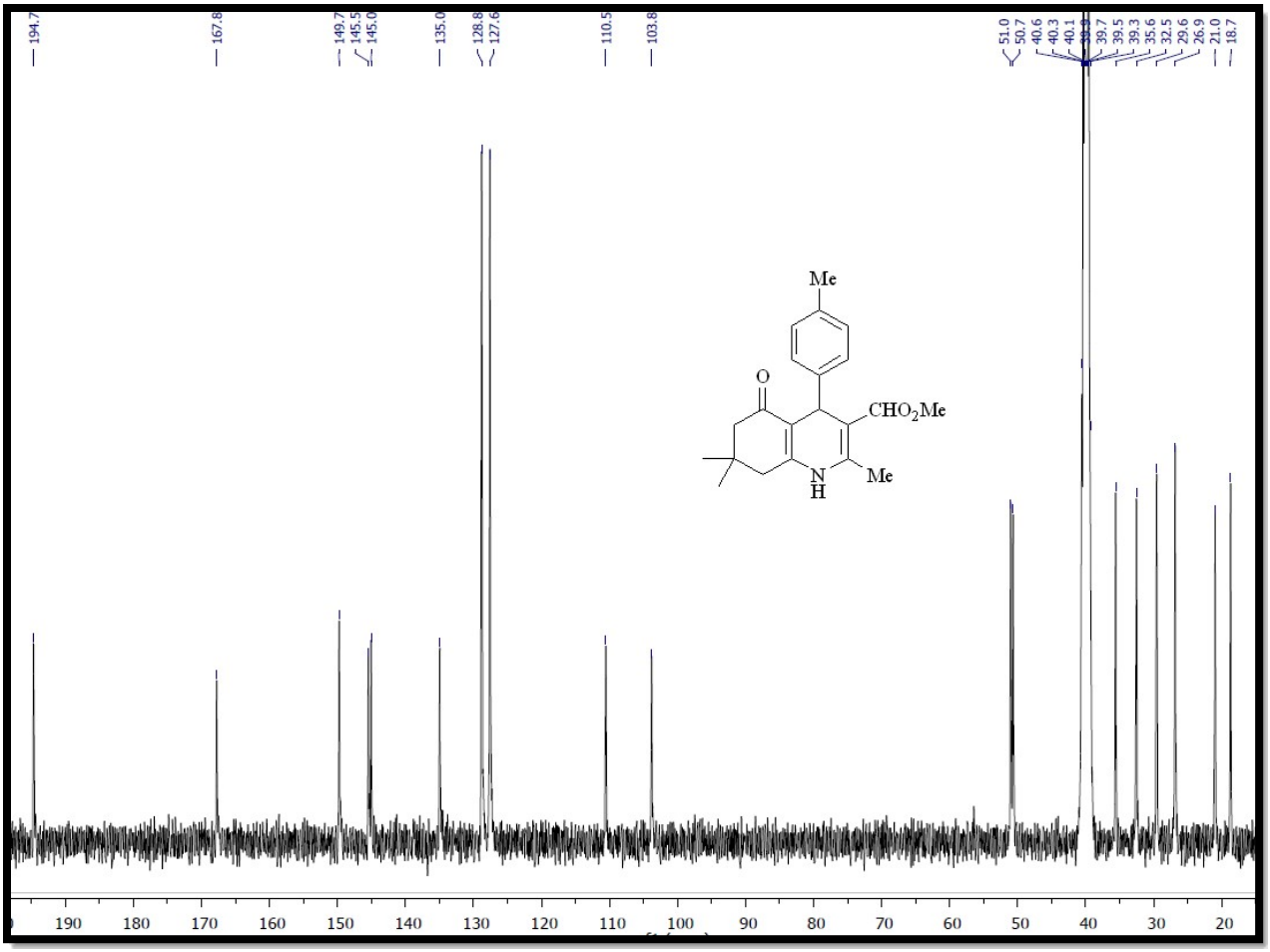

Fig. S41. ^{13}C NMR of methyl 2,7,7-trimethyl-5-oxo-4-(p-tolyl)-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

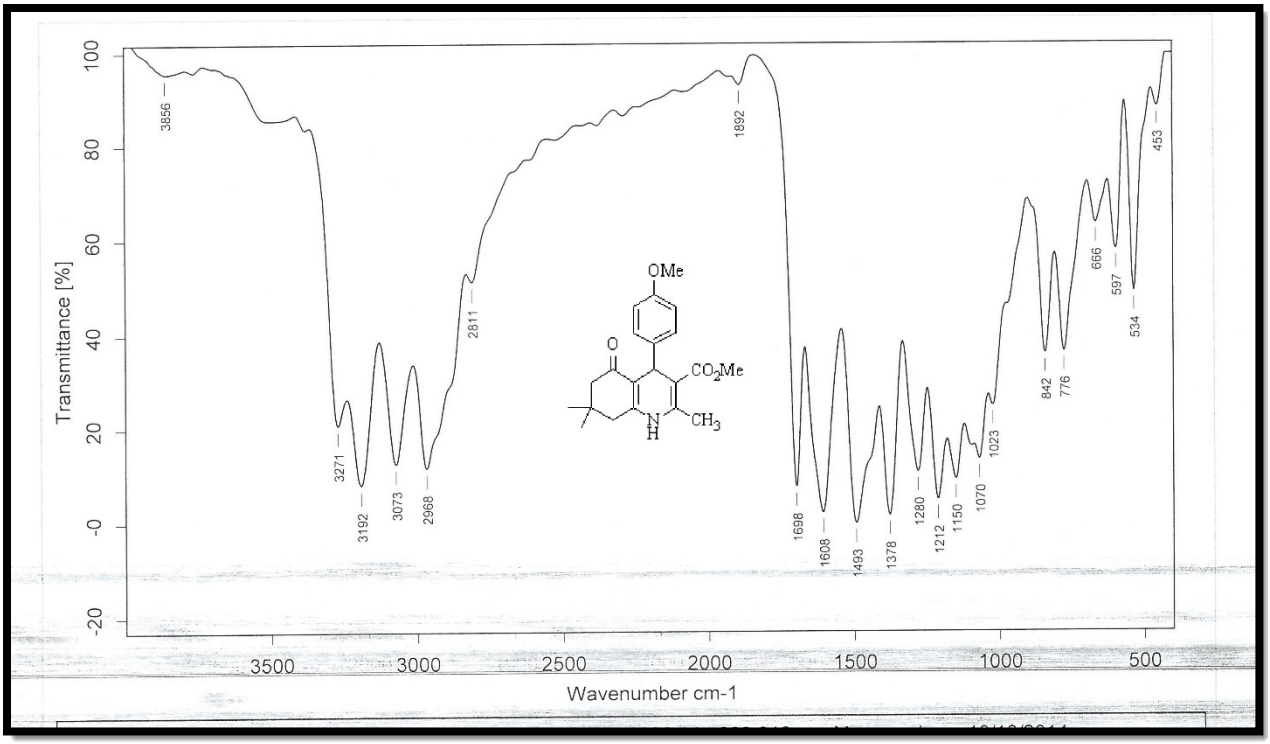

Fig. S42. FT-IR of methyl 4-(4-methoxyphenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

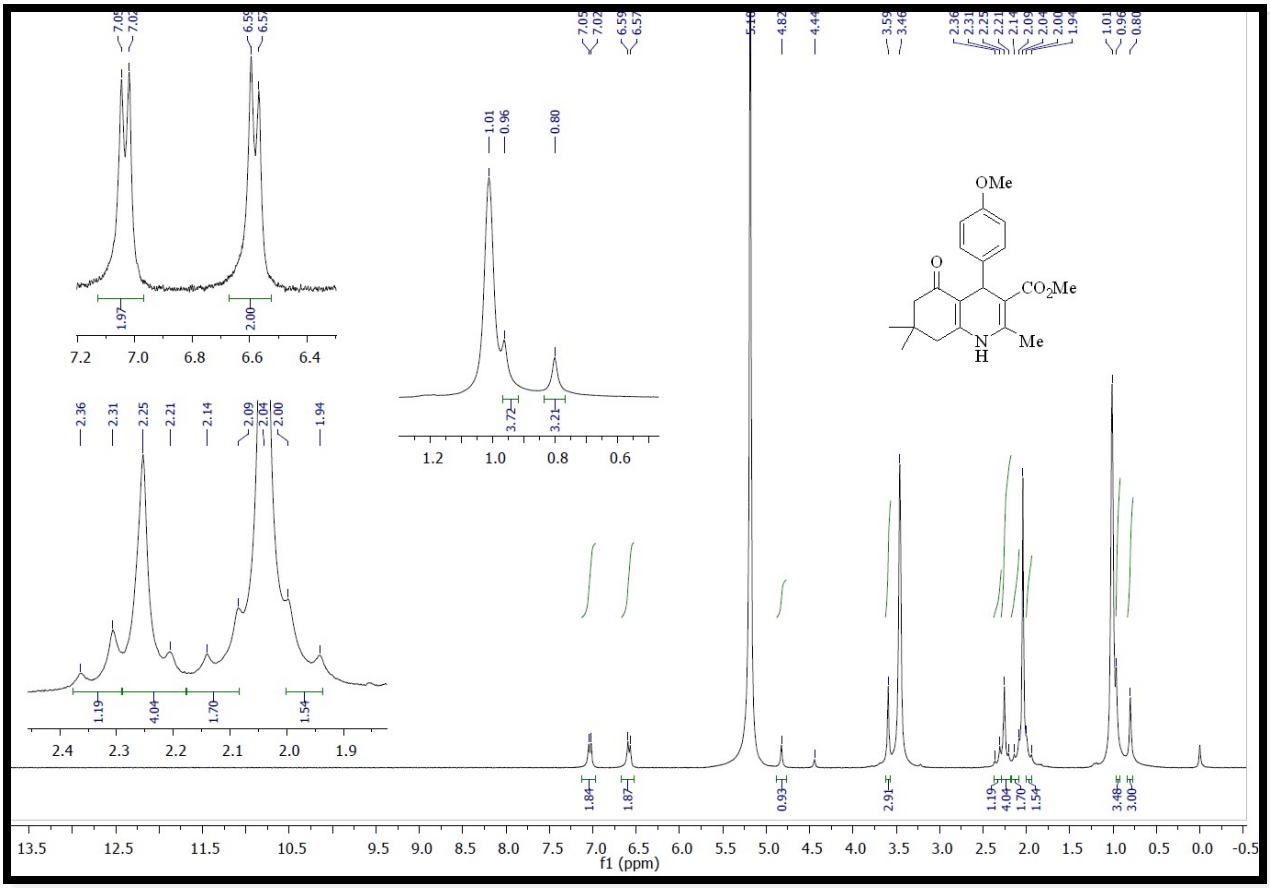

Fig. S43. ^{1}H NMR of methyl 4-(4-methoxyphenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

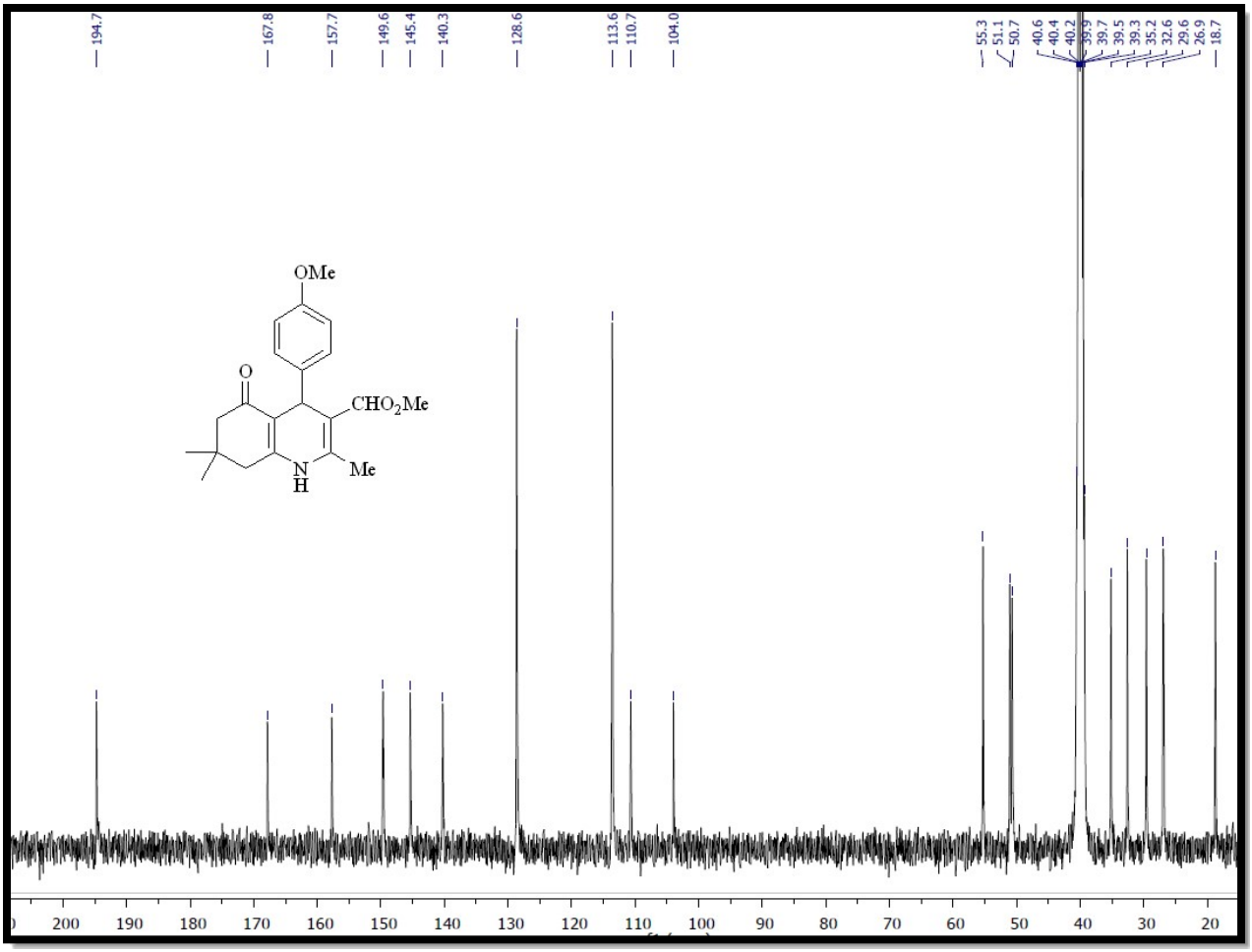

Fig. S44. ^{13}C NMR of methyl 4-(4-methoxyphenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

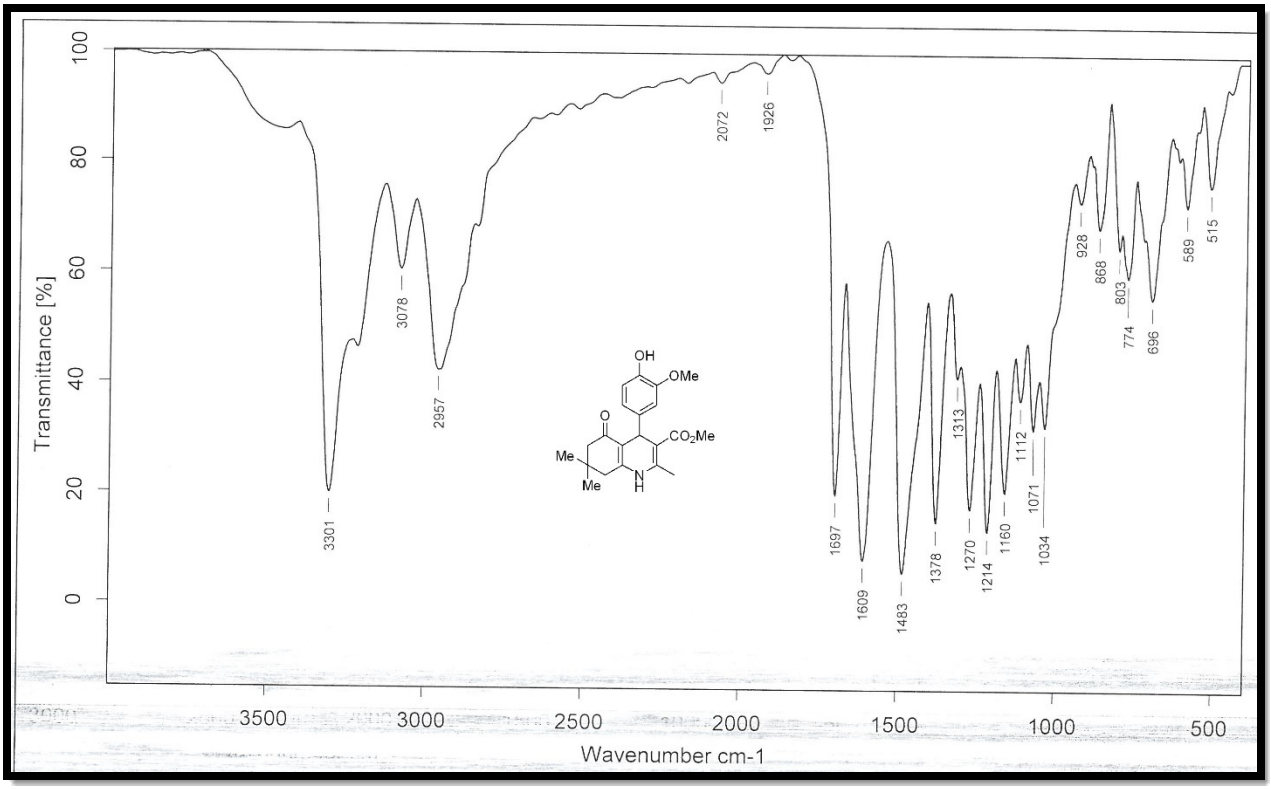

Fig. S45. FT-IR of methyl 4-(4-hydroxy-3-methoxyphenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

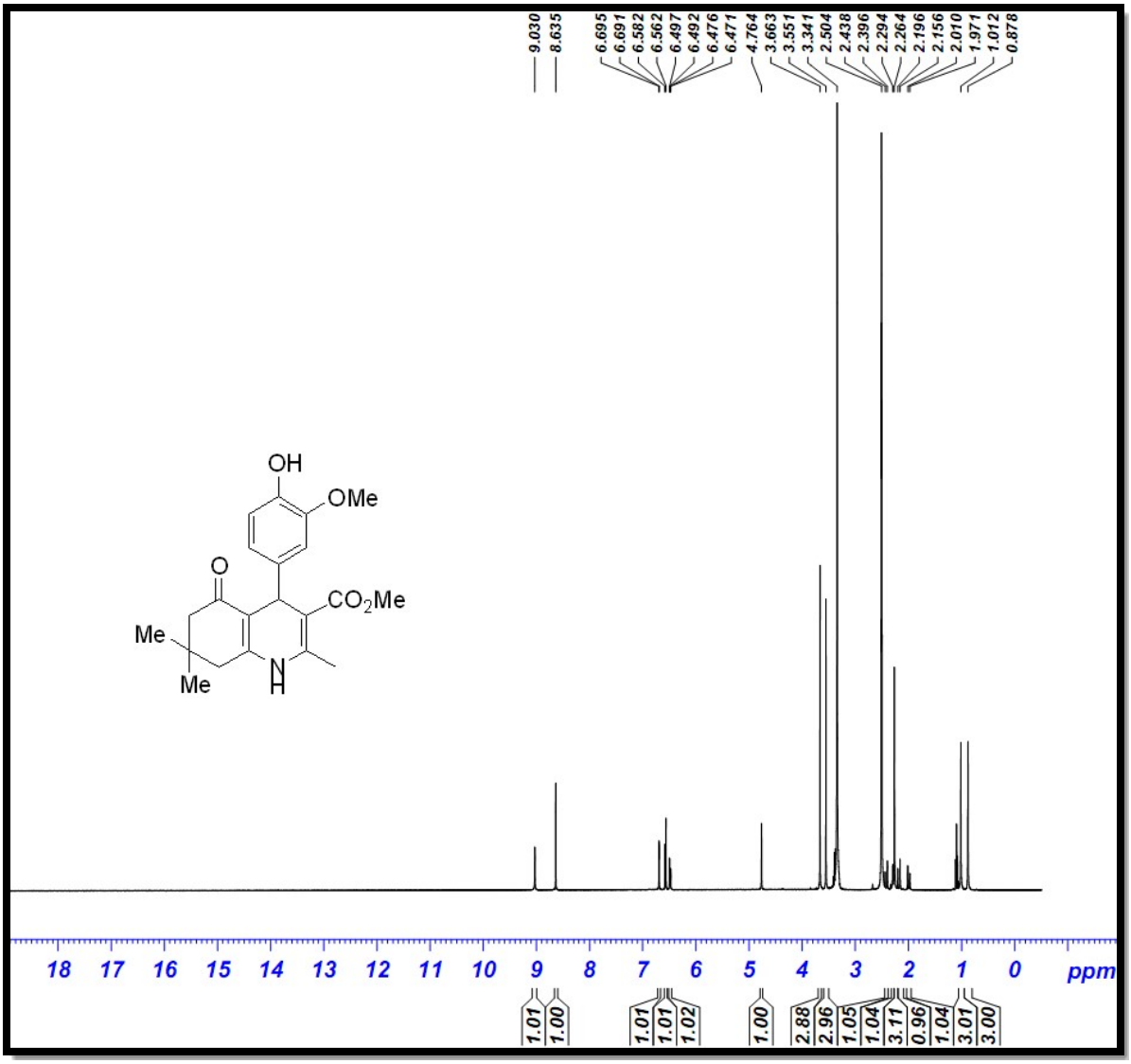

Fig. S46. ^{1}H NMR of methyl 4-(4-hydroxy-3-methoxyphenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

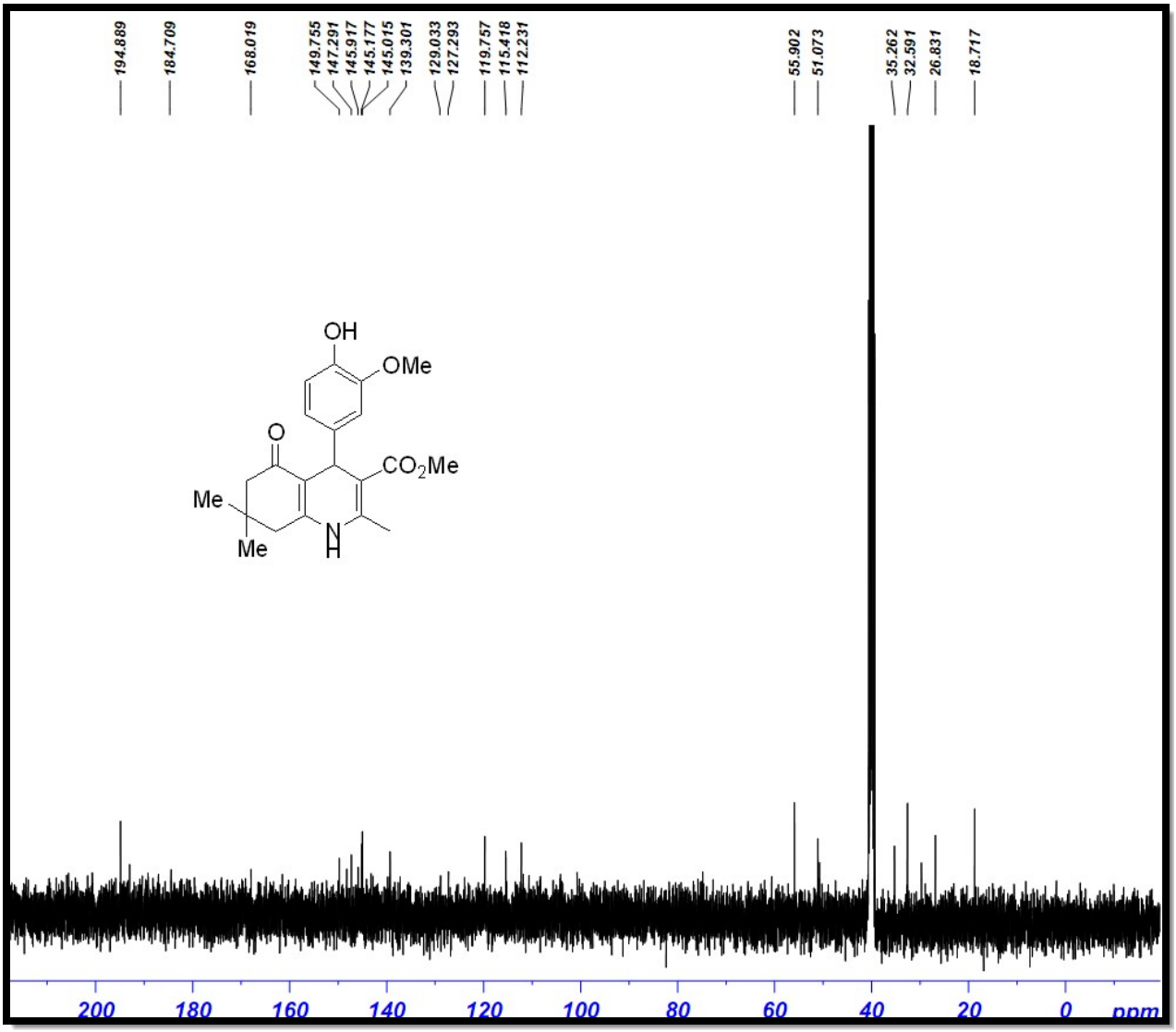

Fig. S47. The ^{13}C NMR of methyl 4-(4-hydroxy-3-methoxyphenyl)-2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

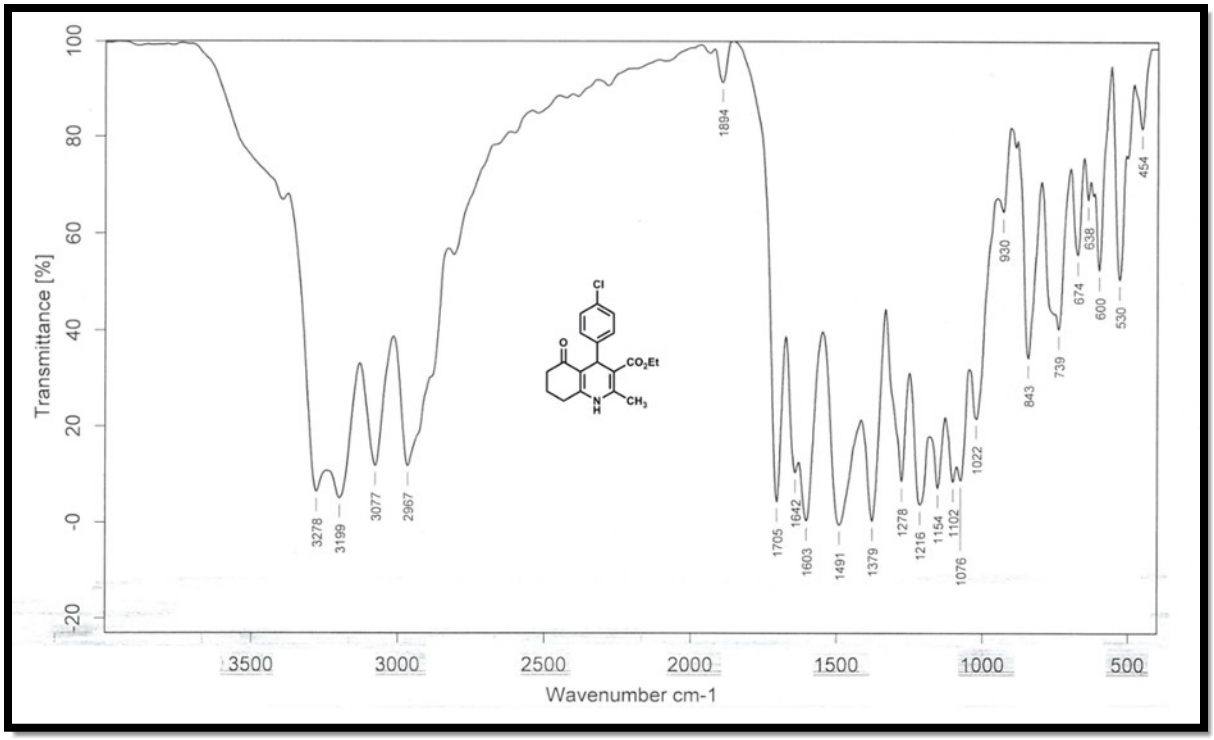

Fig. S48. FT-IR of ethyl 4-(4-chlorophenyl)-2-methyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

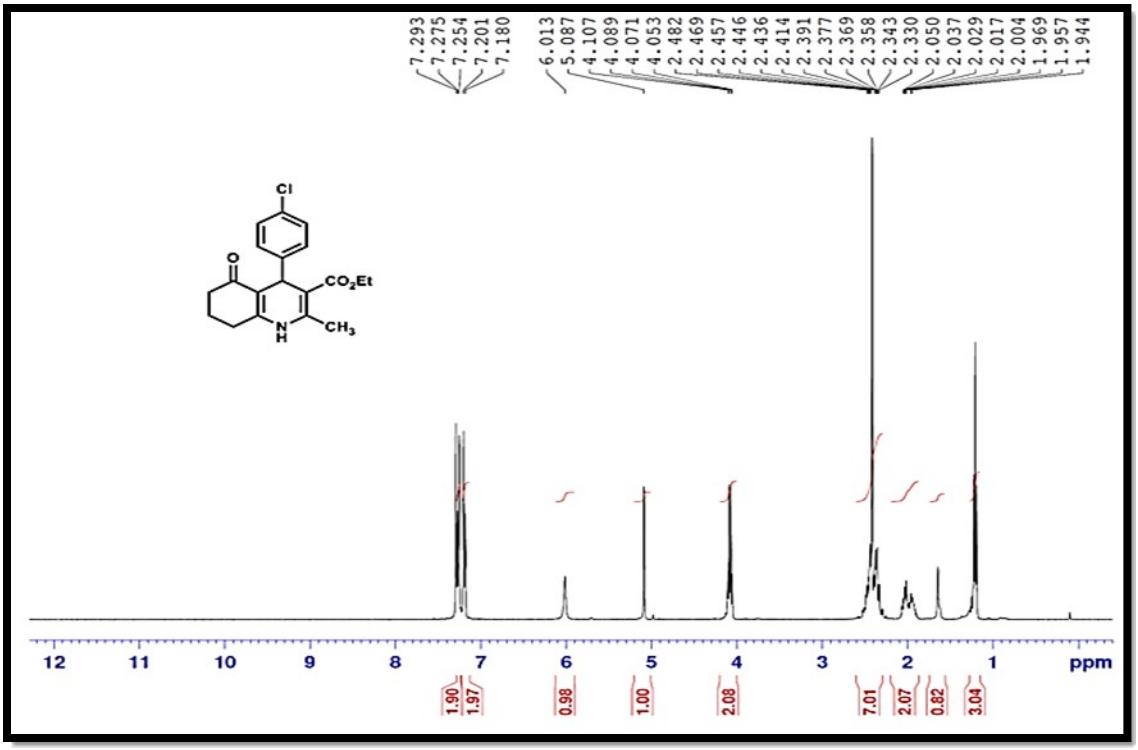

Fig. S49. ^{1}H NMR of ethyl 4-(4-chlorophenyl)-2-methyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

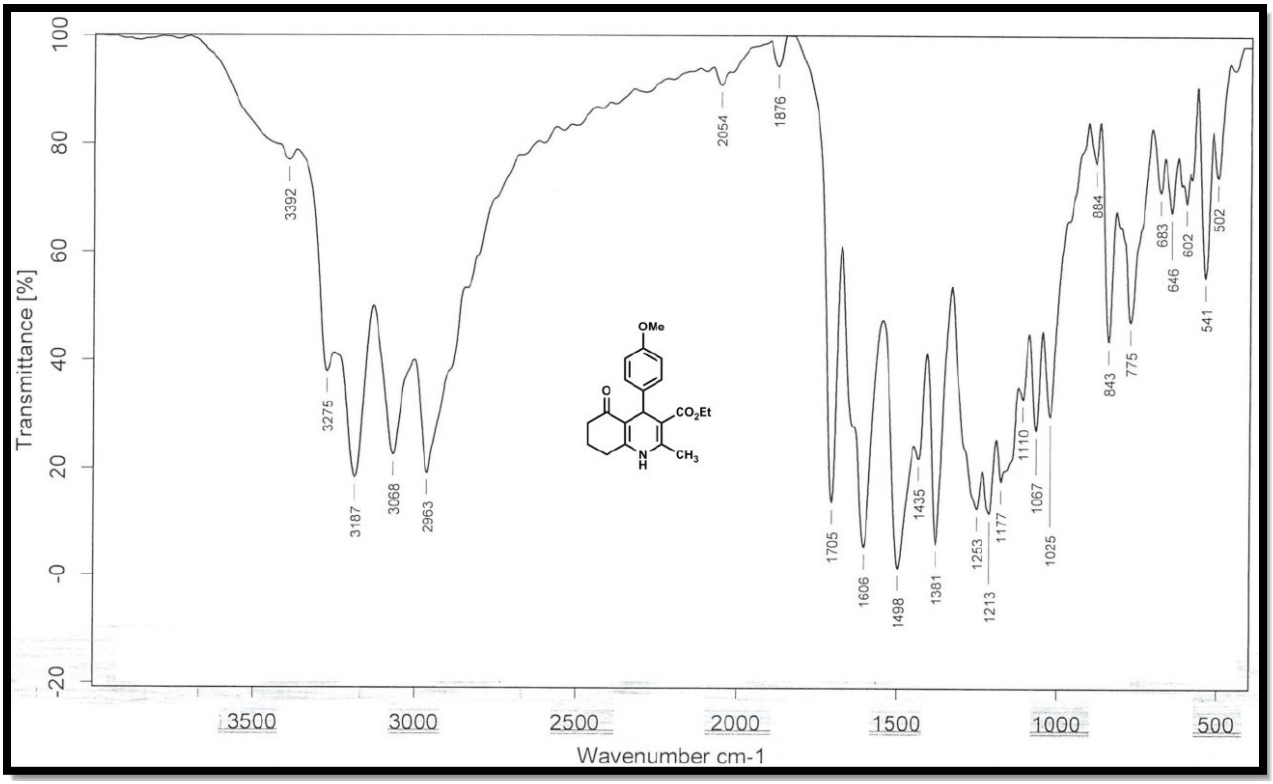

Fig. S50. FT-IR of ethyl 4-(4-methoxyphenyl)-2-methyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

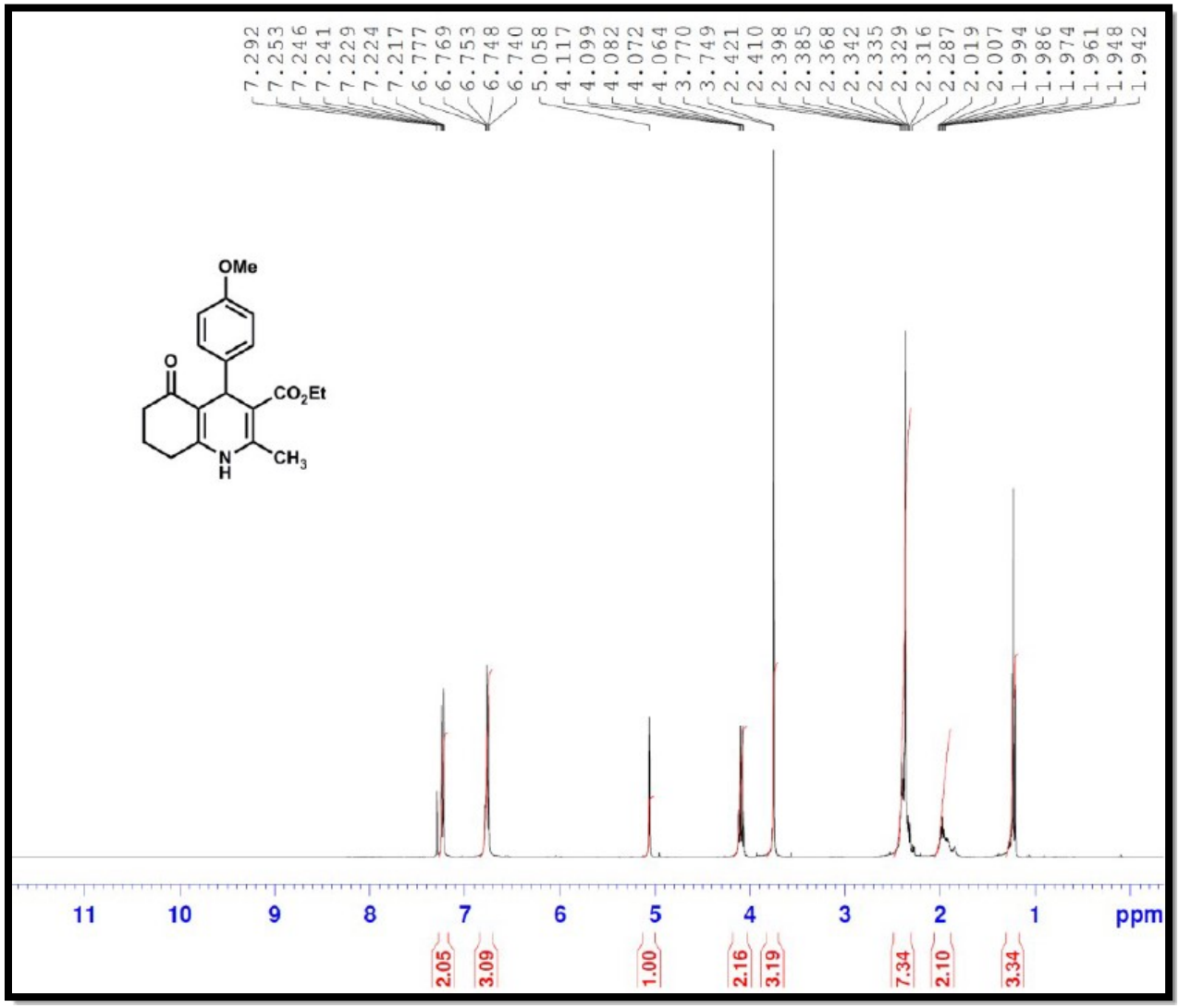

Fig. S51. ^{1}H NMR of ethyl 4-(4-methoxyphenyl)-2-methyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

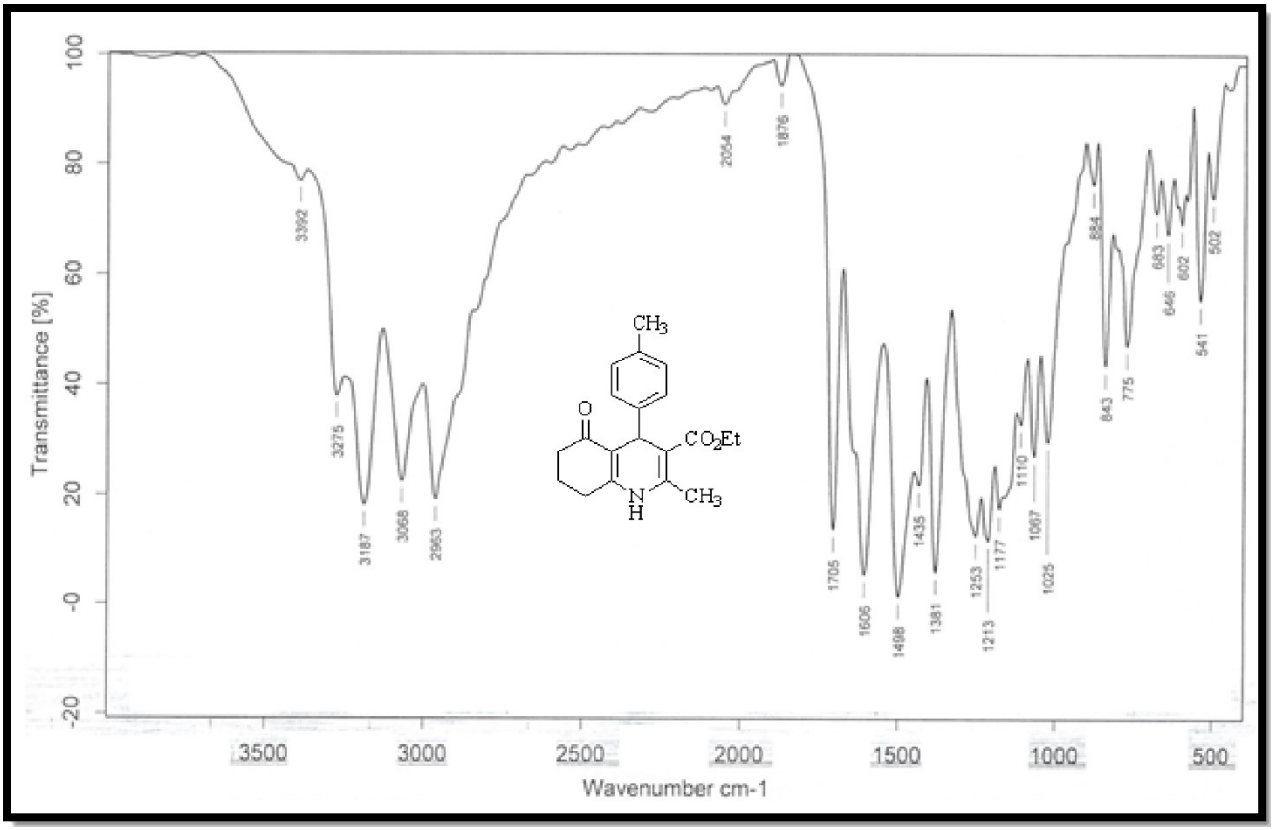

Fig. S52. FT-IR of ethyl 2-methyl-5-oxo-4-(p-tolyl)-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

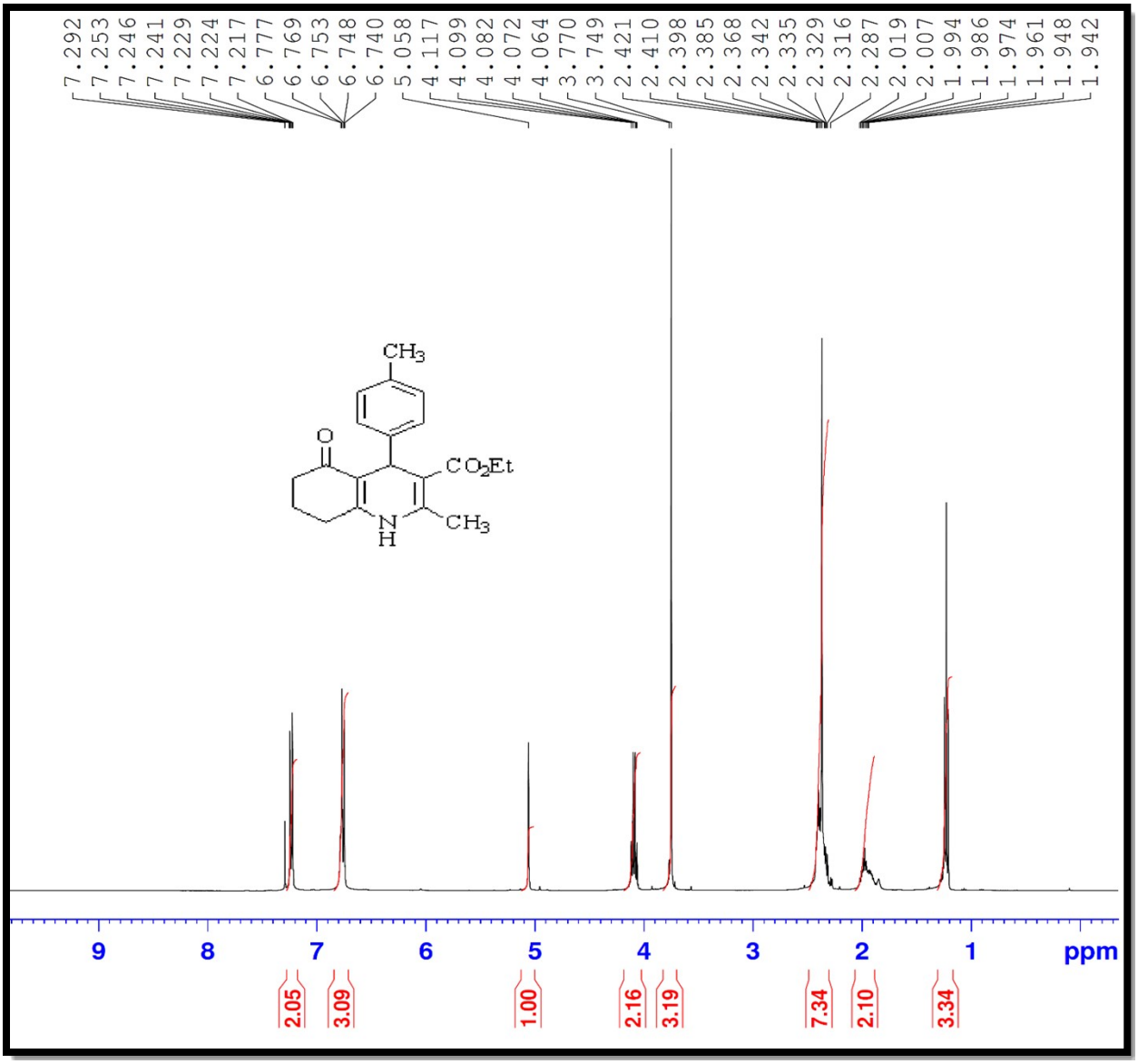

Fig. S53. ^{1}H NMR of ethyl 2-methyl-5-oxo-4-(p-tolyl)-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

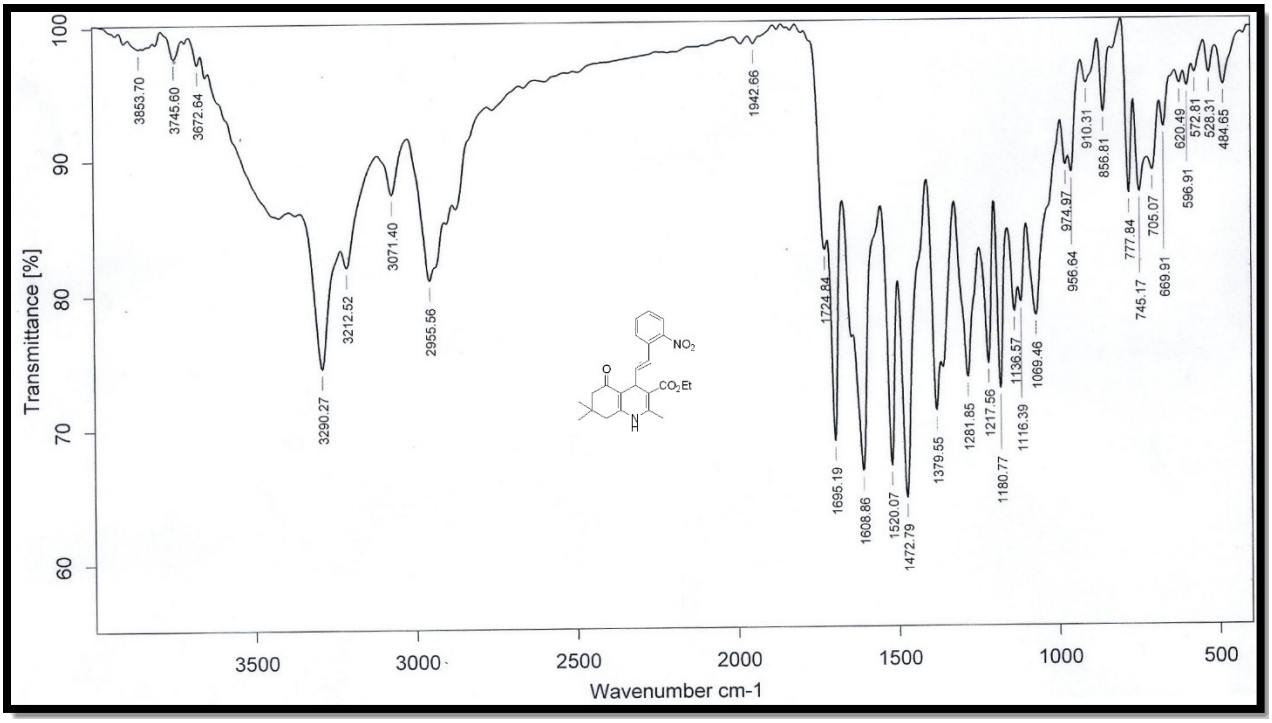

Fig. S54. FT-IR of ethyl (E)-2-methyl-4-(2-nitrostyryl)-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

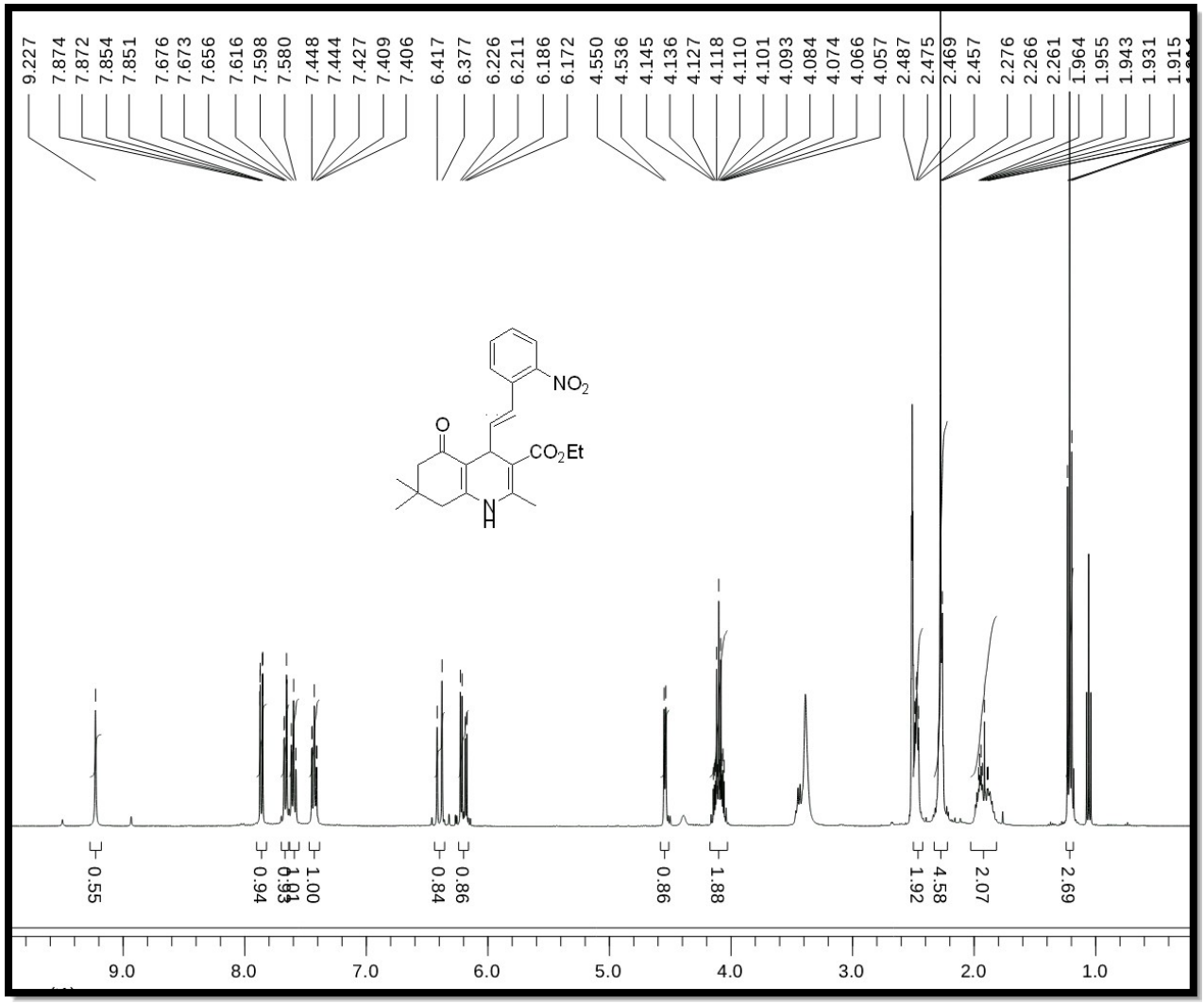

Fig. S55. ^{1}H NMR of ethyl (E)-2-methyl-4-(2-nitrostyryl)-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate

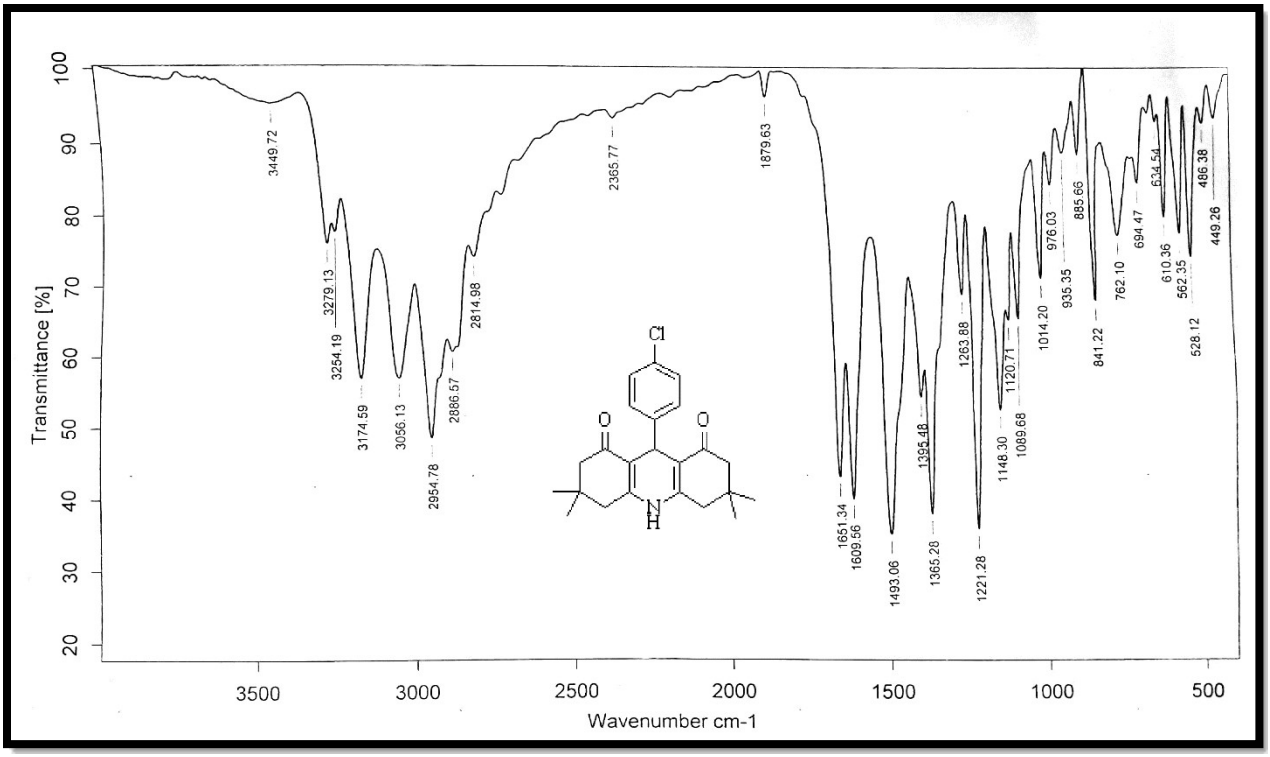

Fig. S56. FT-IR of 9-(4-chlorophenyl)-3,3,6,6-tetramethyl-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

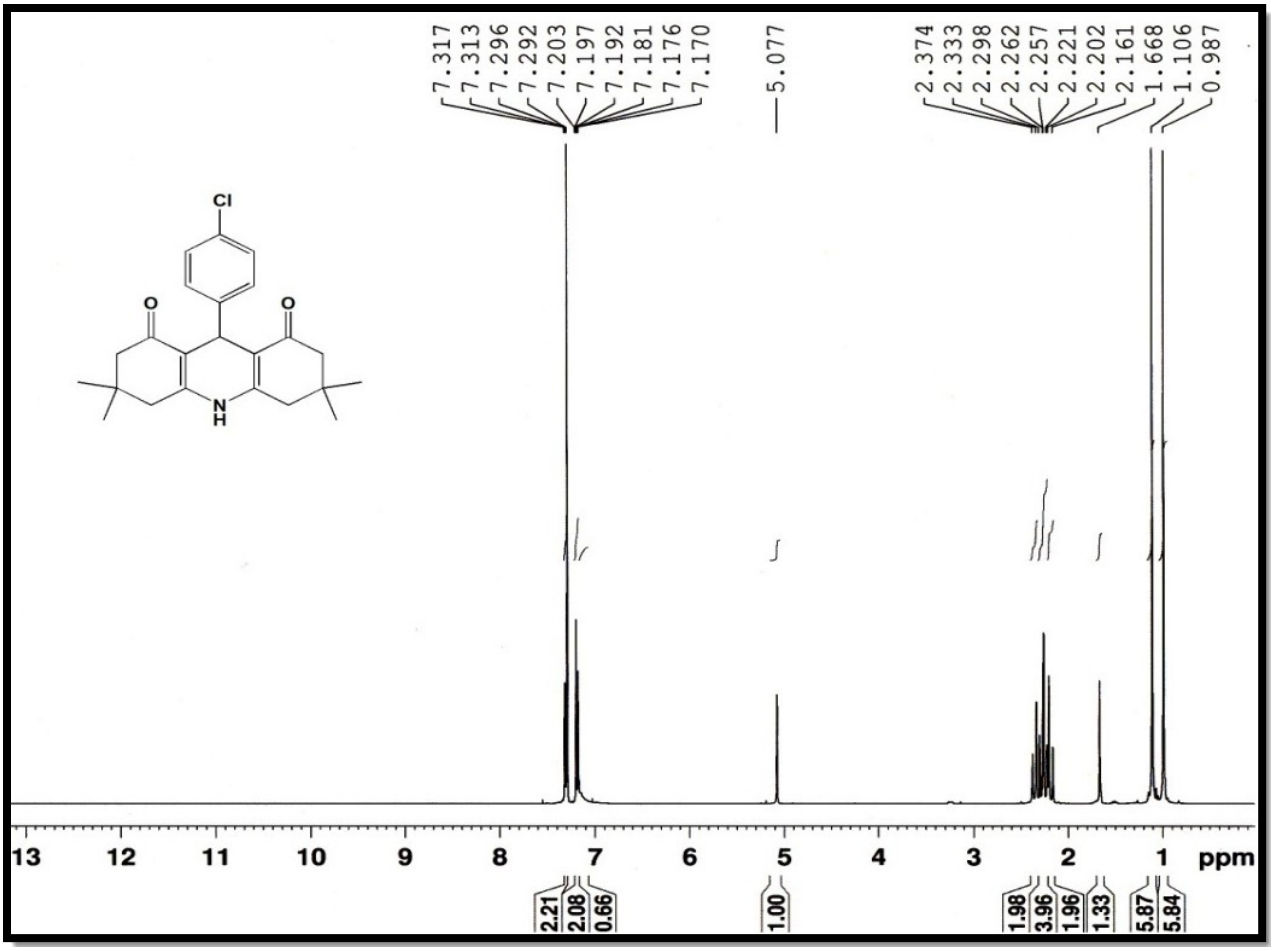

Fig. S57. ^{1}H NMR of 9-(4-chlorophenyl)-3,3,6,6-tetramethyl-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

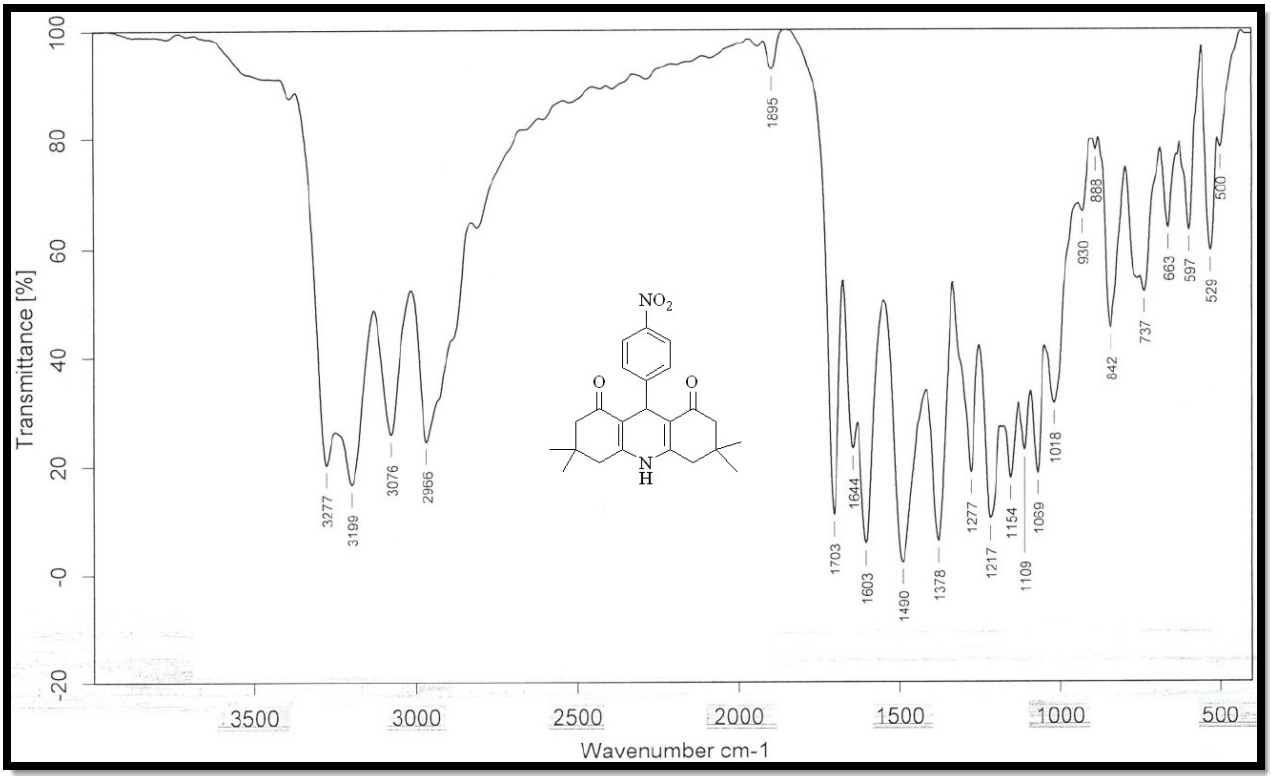

Fig. S58. FT-IR of 3,3,6,6-tetramethyl-9-(4-nitrophenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

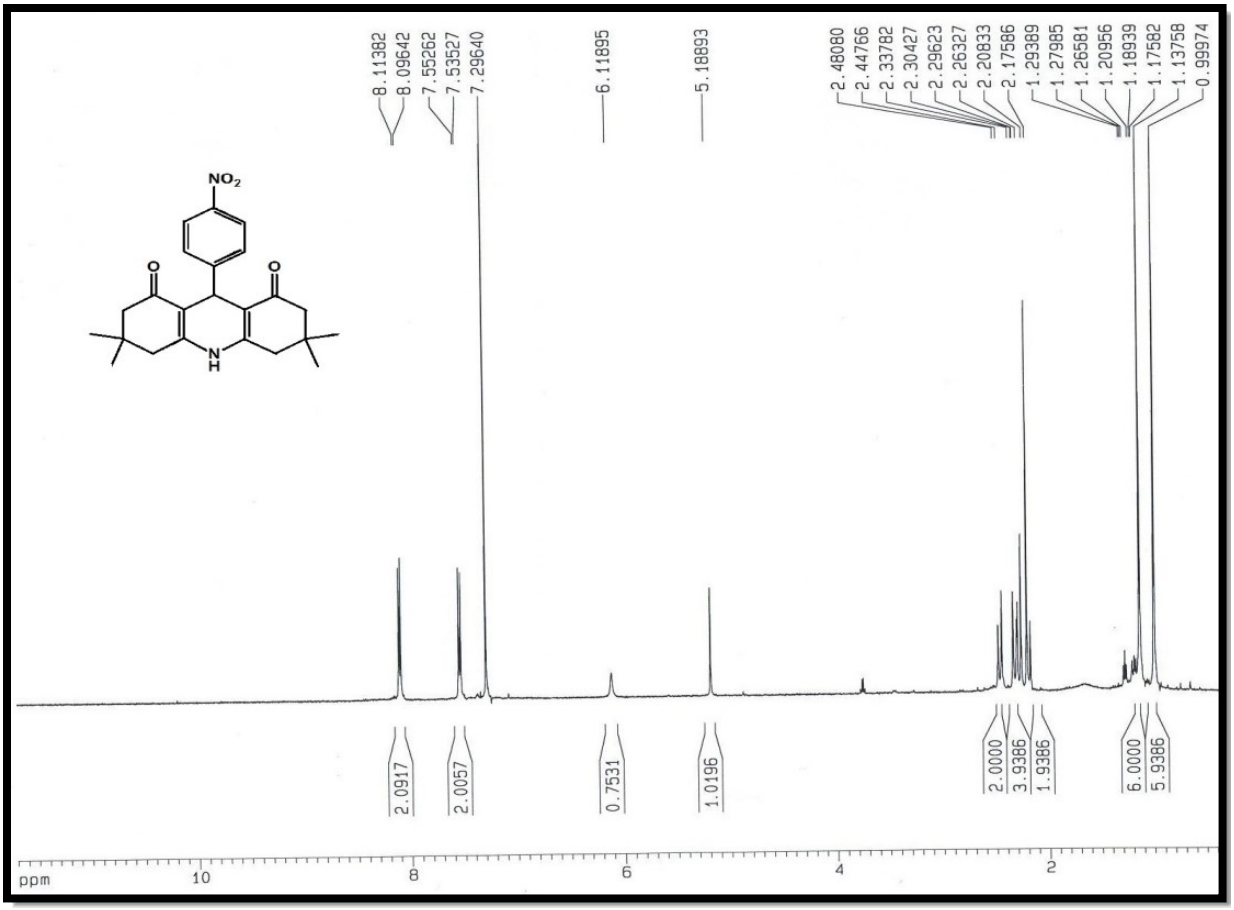

Fig. S59. [1]H NMR of 3,3,6,6-tetramethyl-9-(4-nitrophenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

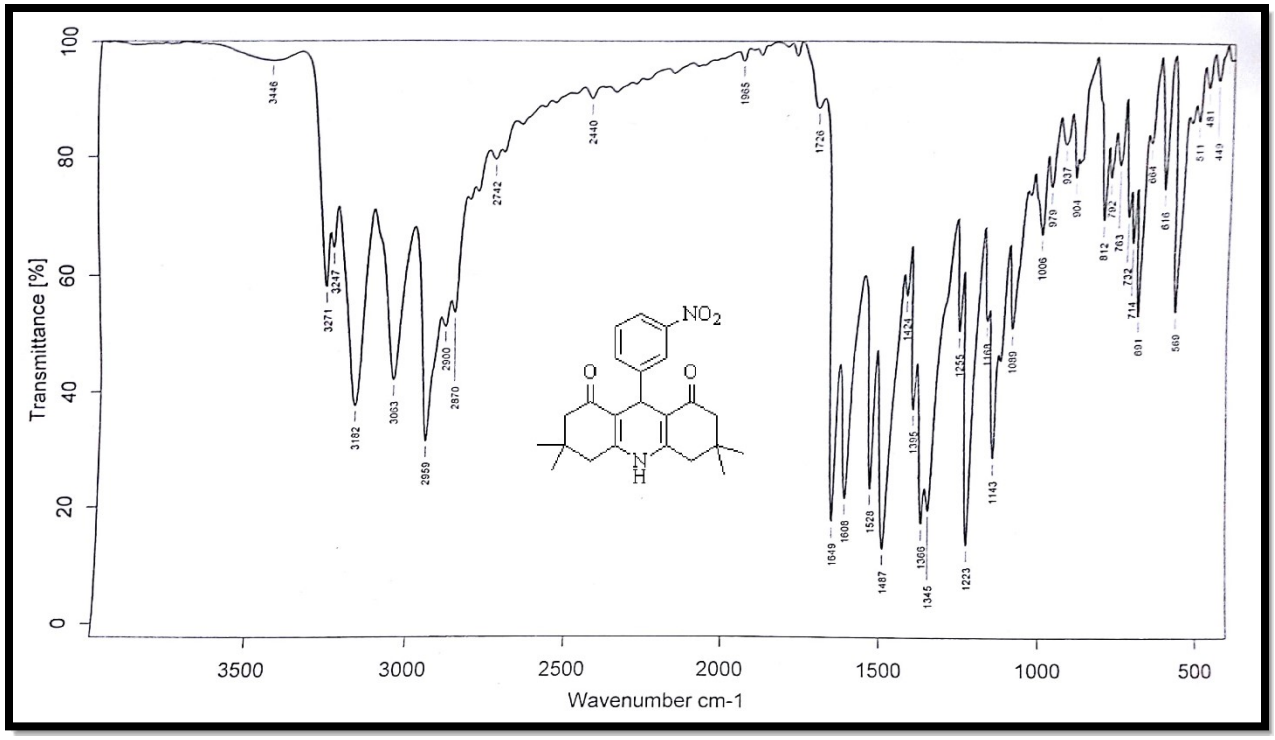

Fig. S60. FT-IR of 3,3,6,6-tetramethyl-9-(3-nitrophenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

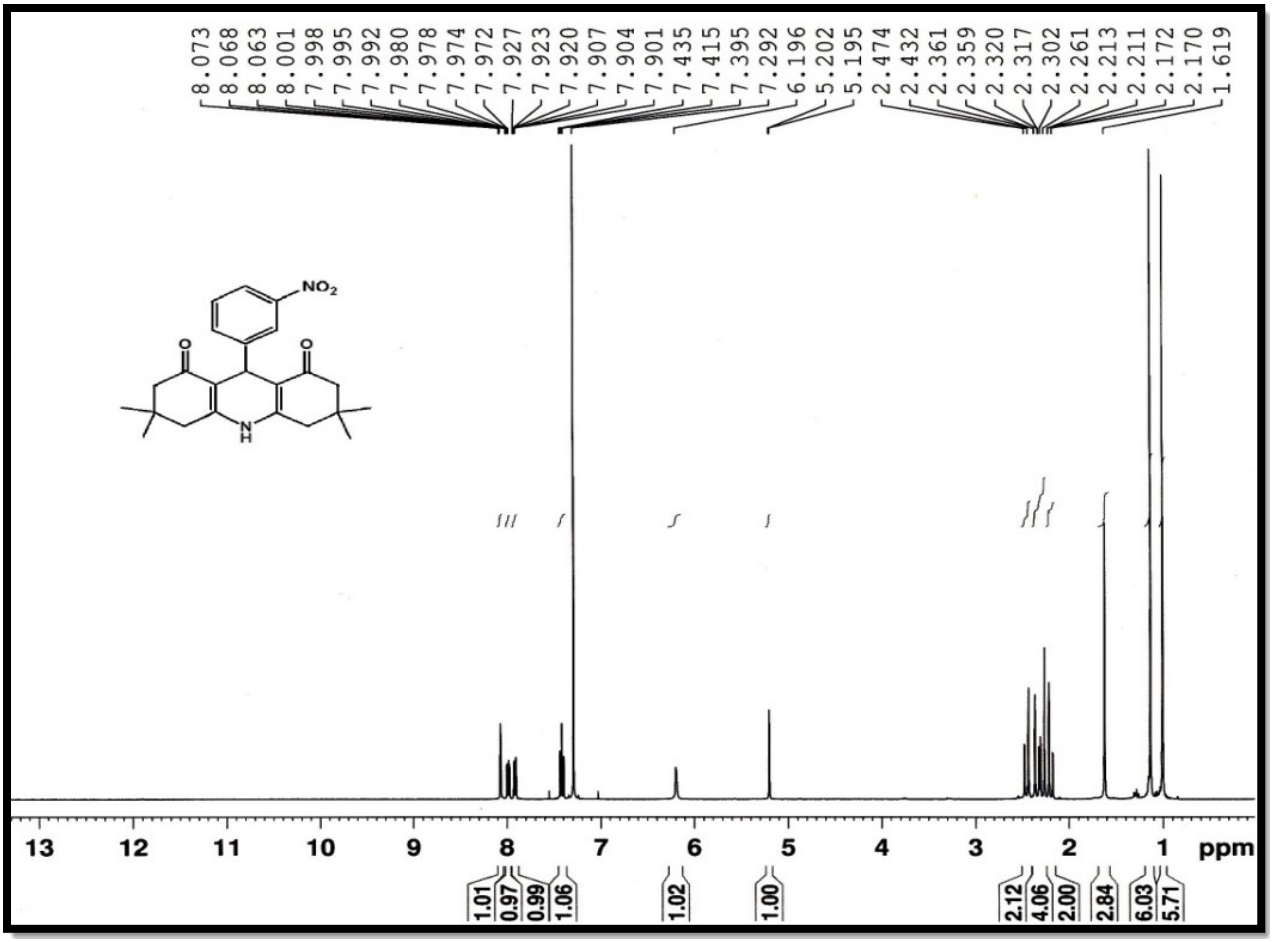

Fig. S61. ^{1}H NMR of 3,3,6,6-tetramethyl-9-(3-nitrophenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

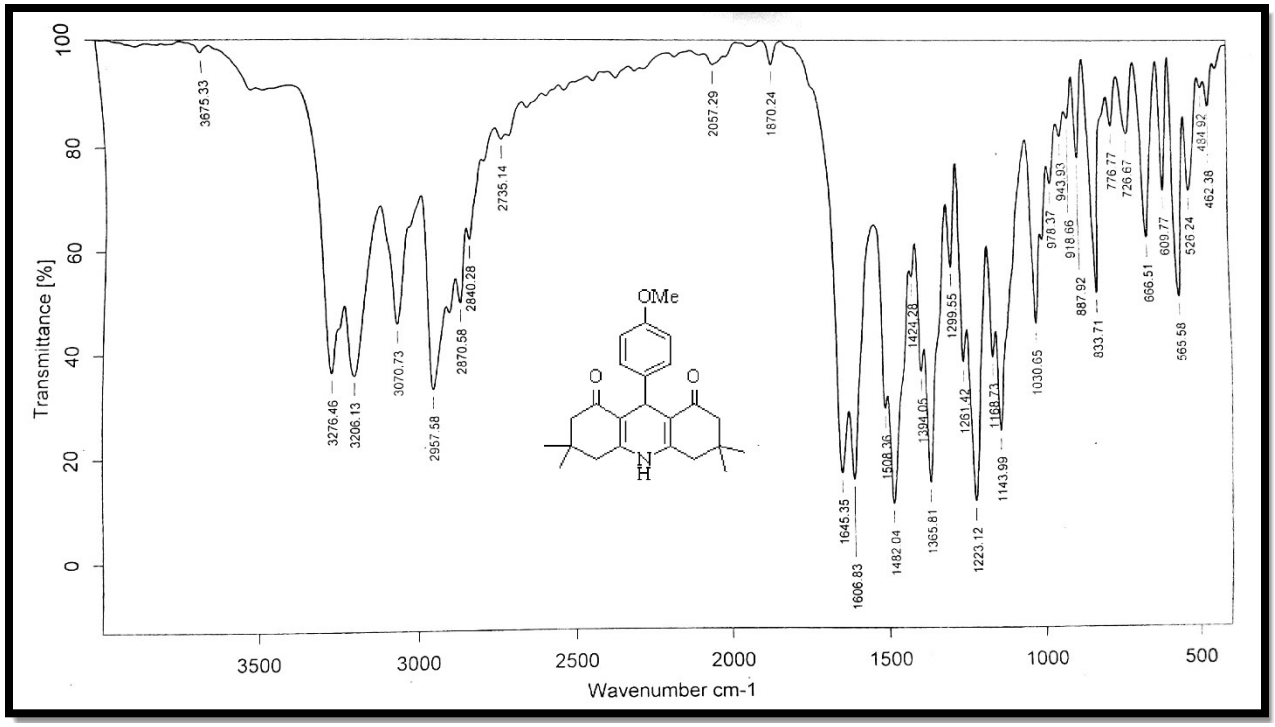

Fig. S62. FT-IR of 9-(4-methoxyphenyl)-3,3,6,6-tetramethyl-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

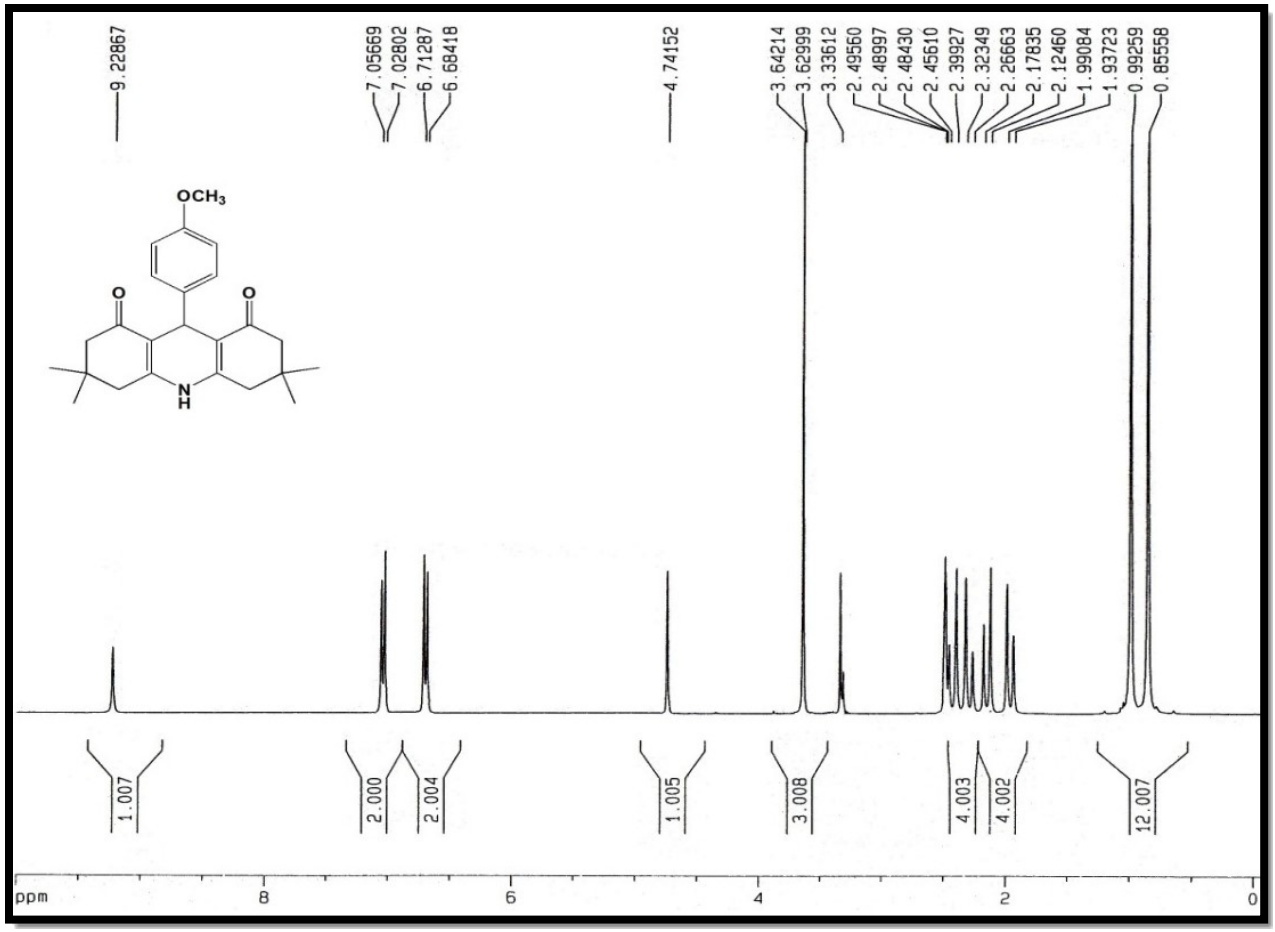

Fig. S63. ^{1}H NMR of 9-(4-methoxyphenyl)-3,3,6,6-tetramethyl-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

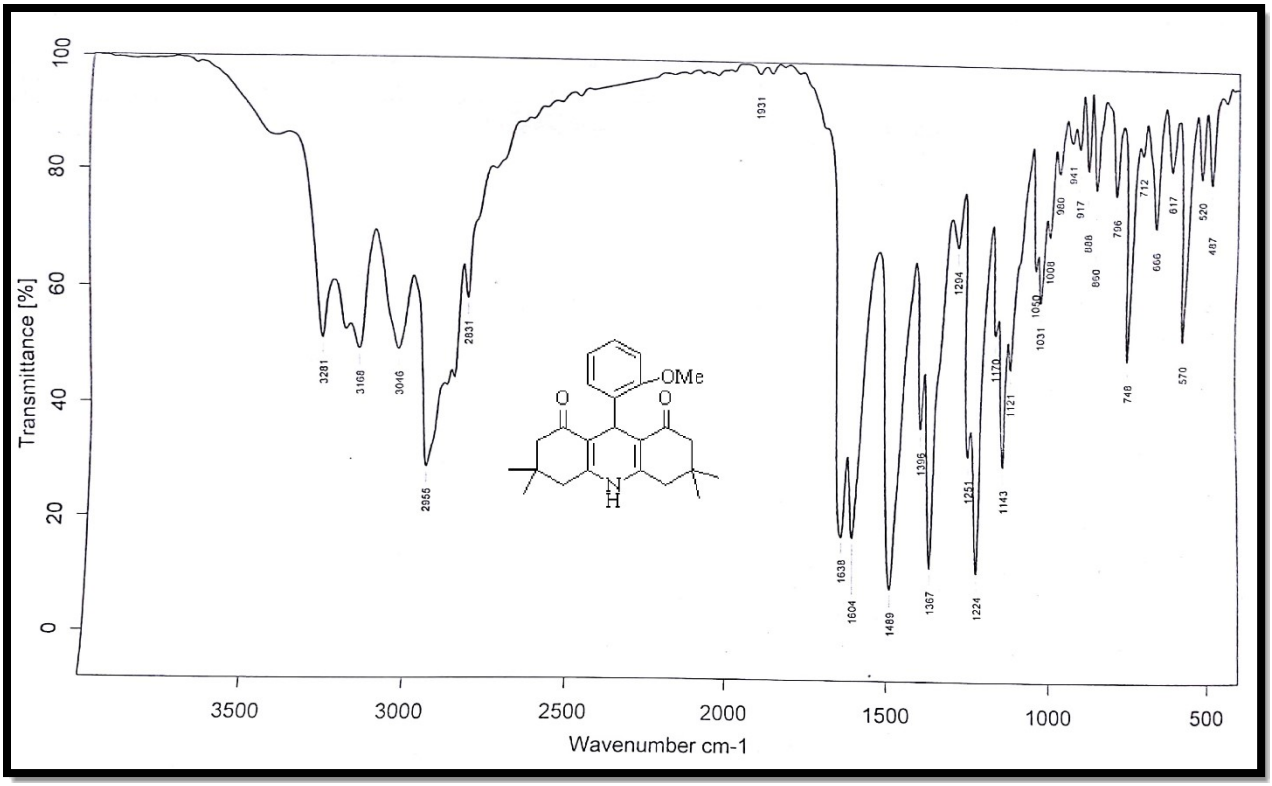

Fig. S64. FT-IR of 9-(2-methoxyphenyl)-3,3,6,6-tetramethyl-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

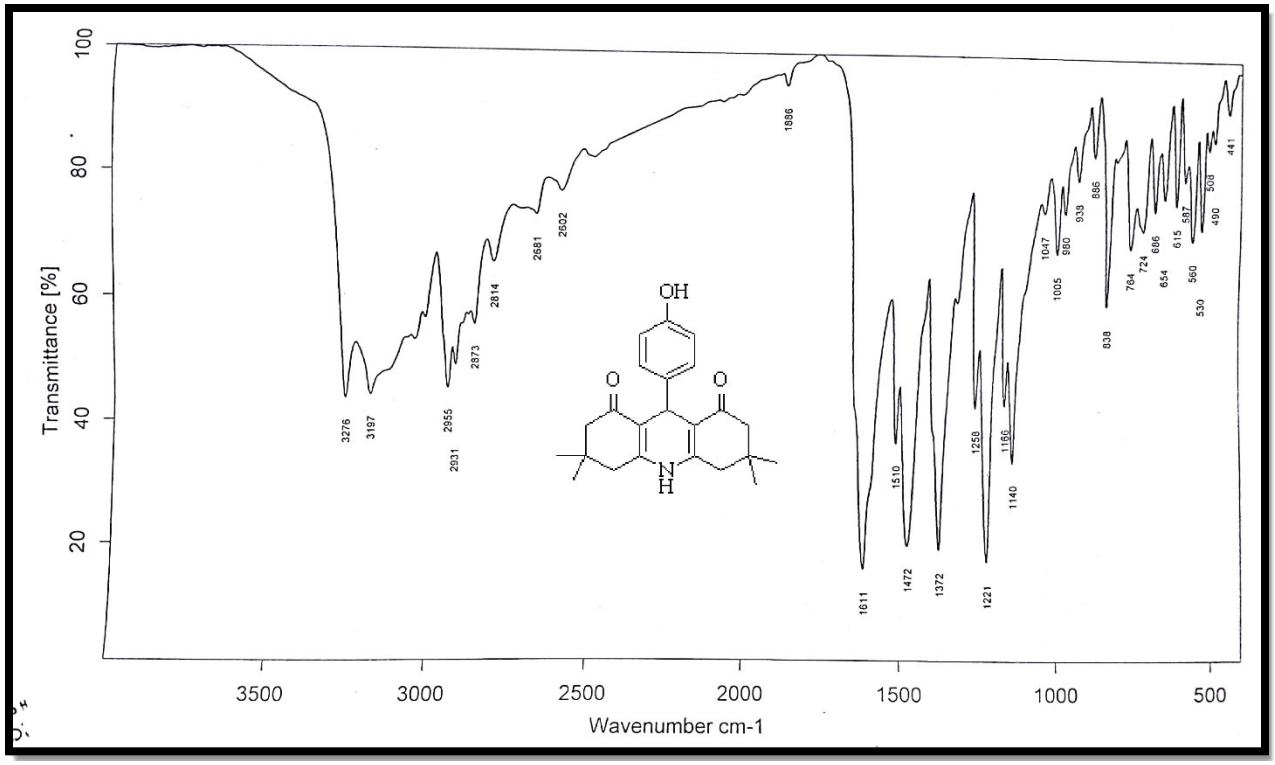

Fig. S65. FT-IR of 9-(4-hydroxyphenyl)-3,3,6,6-tetramethyl-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

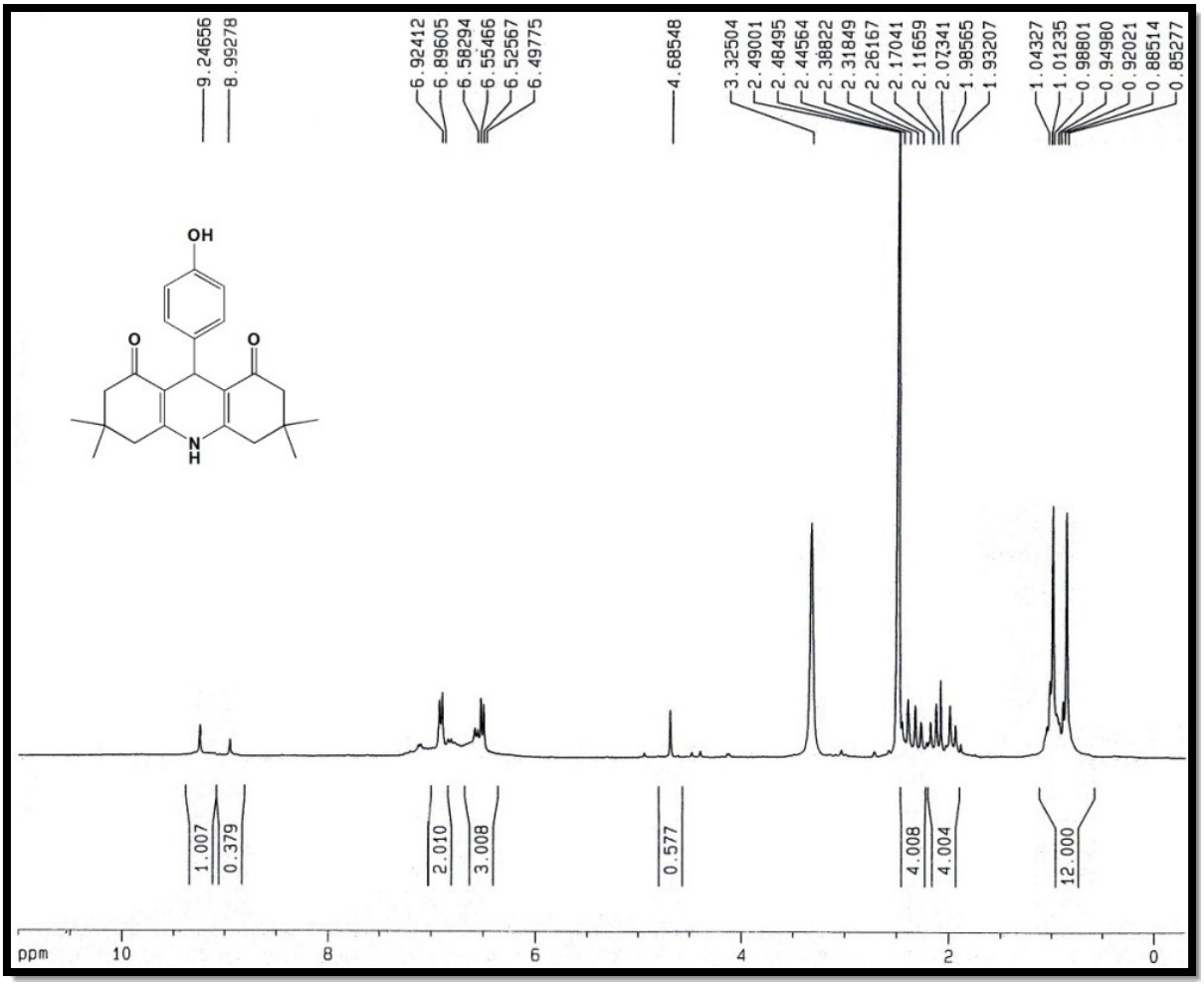

Fig. S66. ^{1}H NMR of 9-(4-hydroxyphenyl)-3,3,6,6-tetramethyl-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

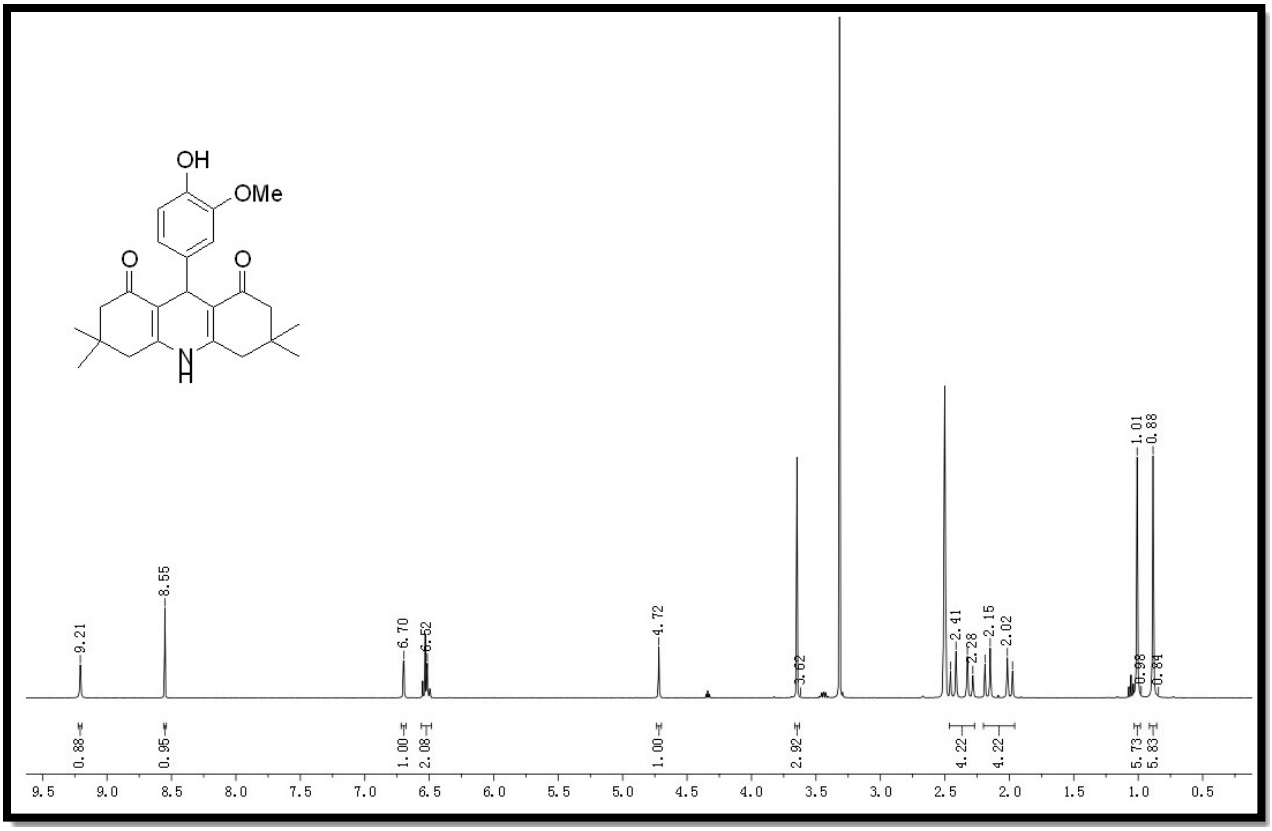

Fig. S67. ^{1}H NMR of 9-(4-hydroxy-3methoxyphenyl)-3,3,6,6-tetramethyl-3,4,6,7,9,10-hexahydroacridine-1,8(2H,5H) dione

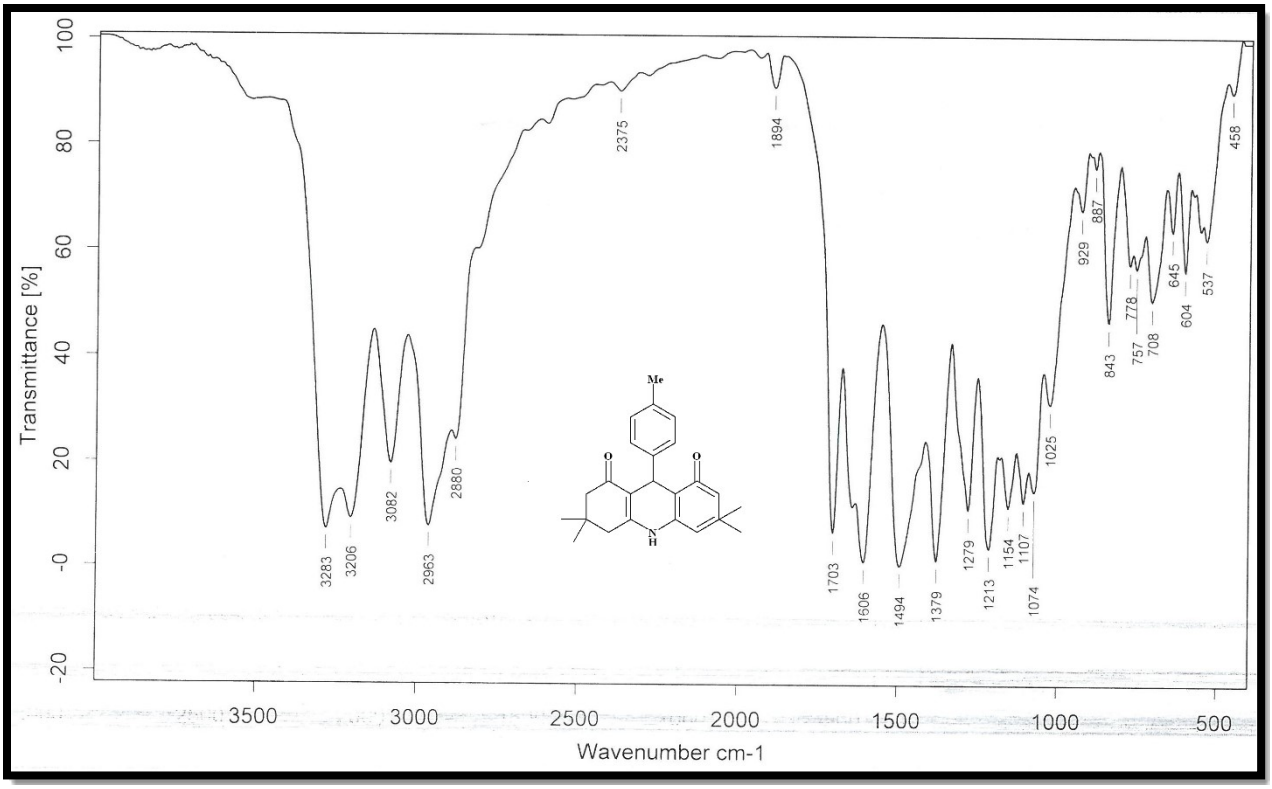

Fig. S68. FT-IR of 3,3,6,6-tetramethyl-9-(p-tolyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

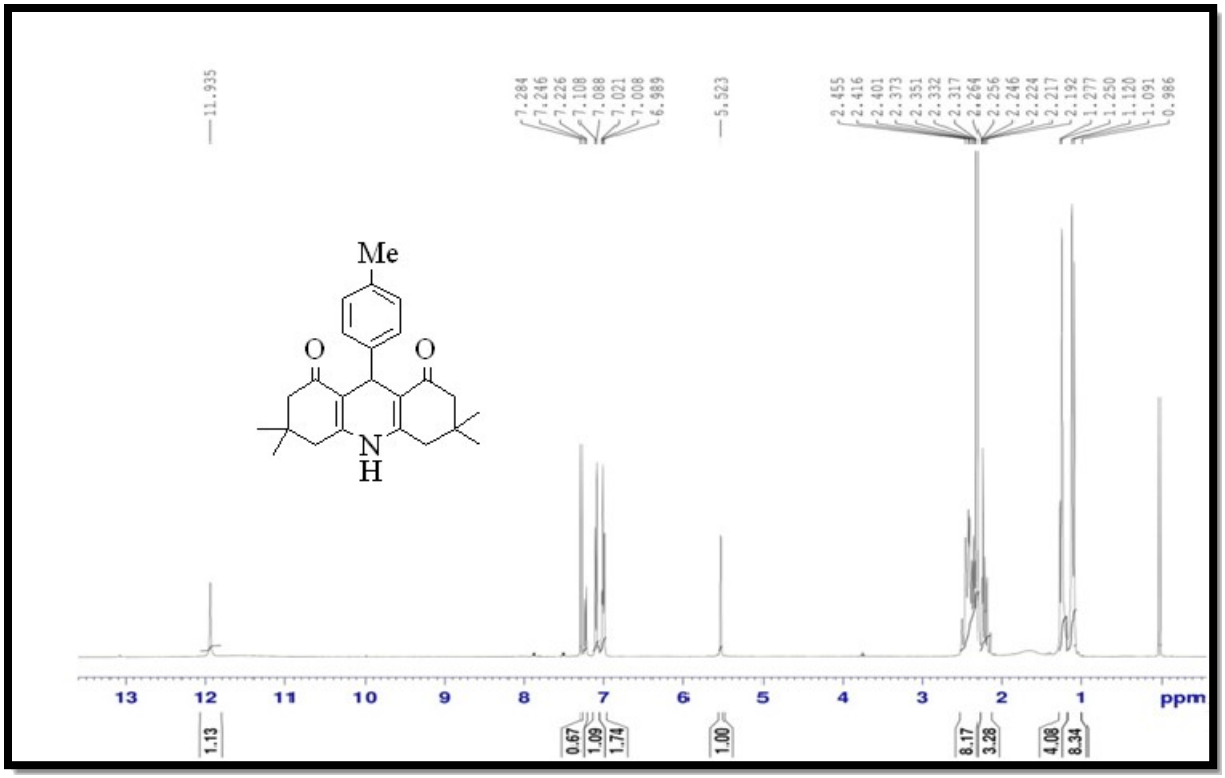

Fig. S69. ^{1}H NMR of 3,3,6,6-tetramethyl-9-(p-tolyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

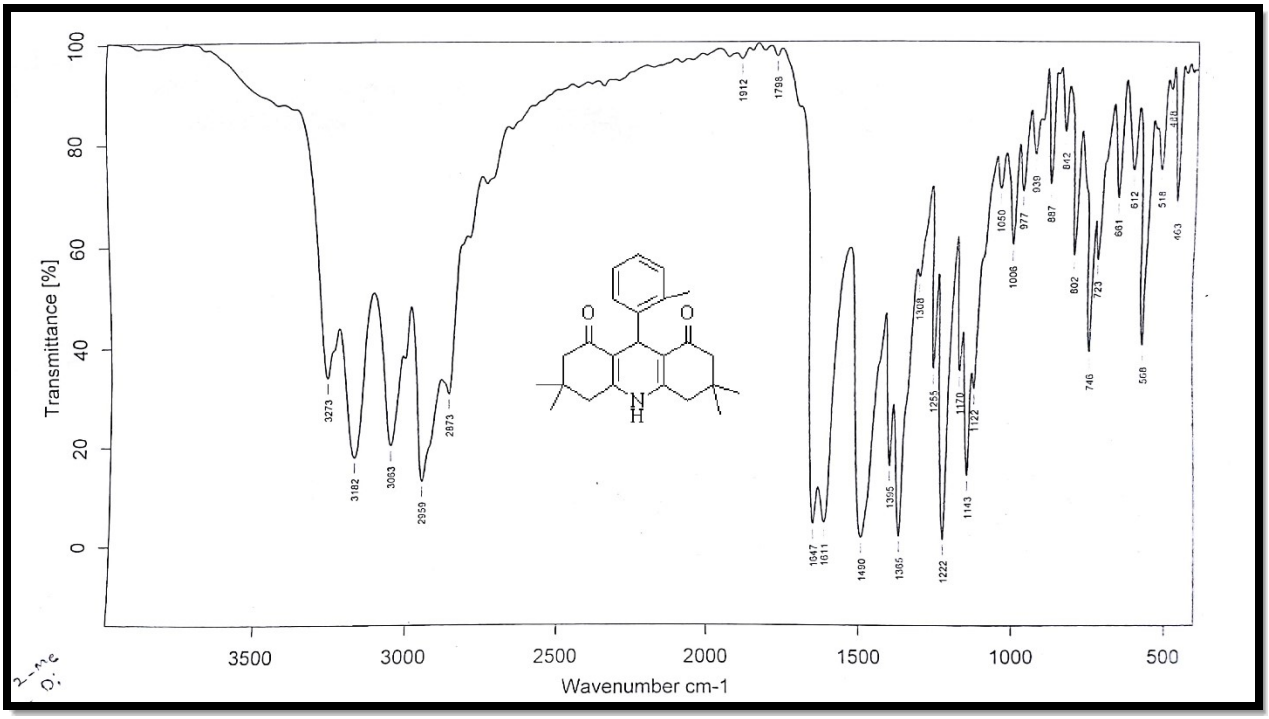

Fig. S70. FT-IR of 3,3,6,6-tetramethyl-9-(o-tolyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

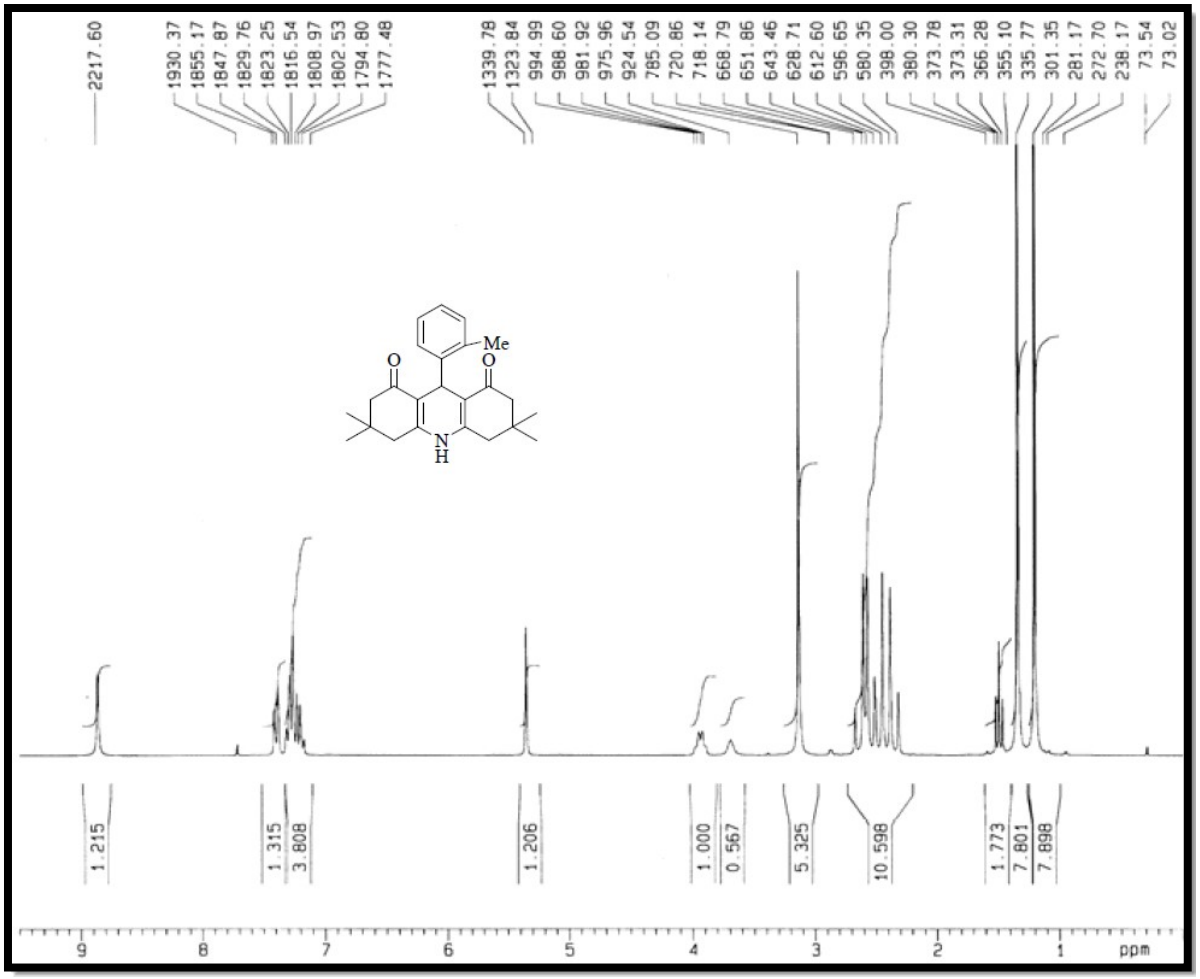

Fig. S71. [1]H NMR of 3,3,6,6-tetramethyl-9-(o-tolyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

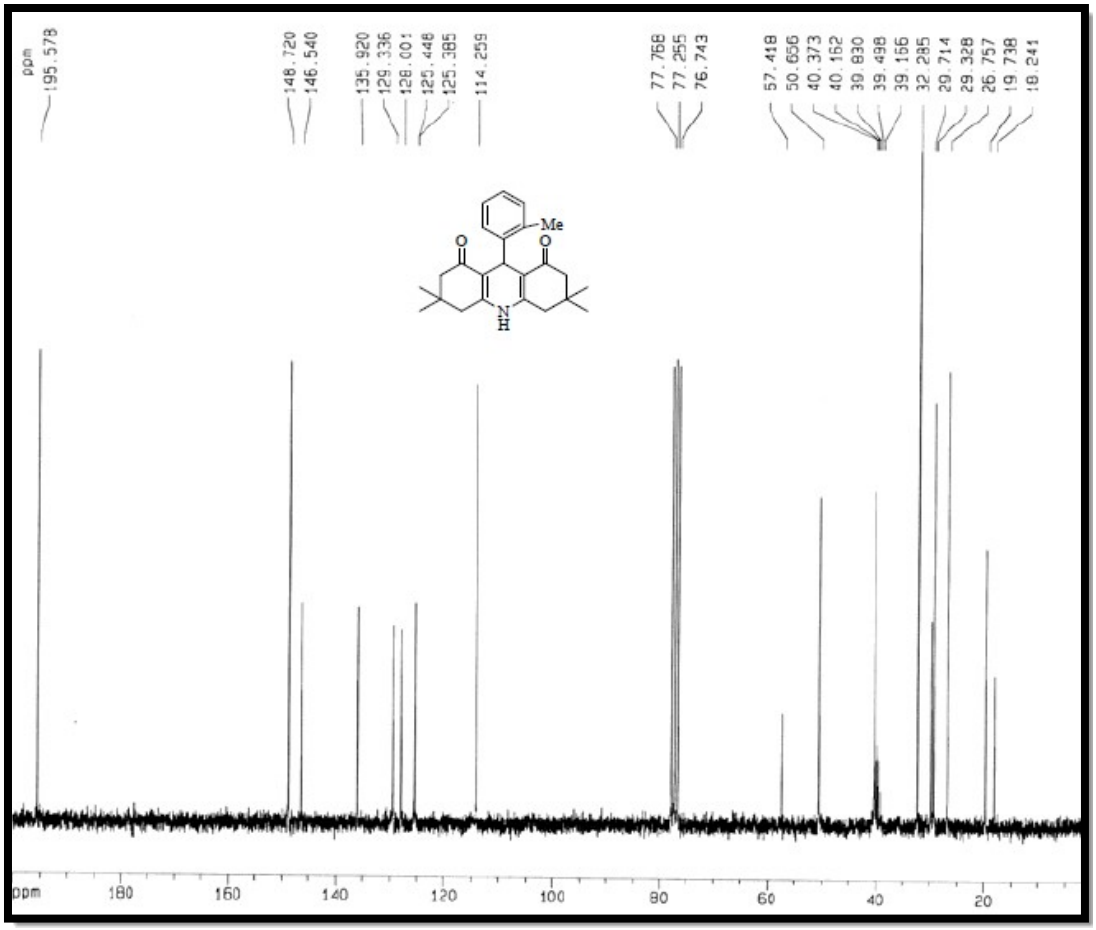

Fig. S72. ^{13}C NMR of 3,3,6,6-tetramethyl-9-(o-tolyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

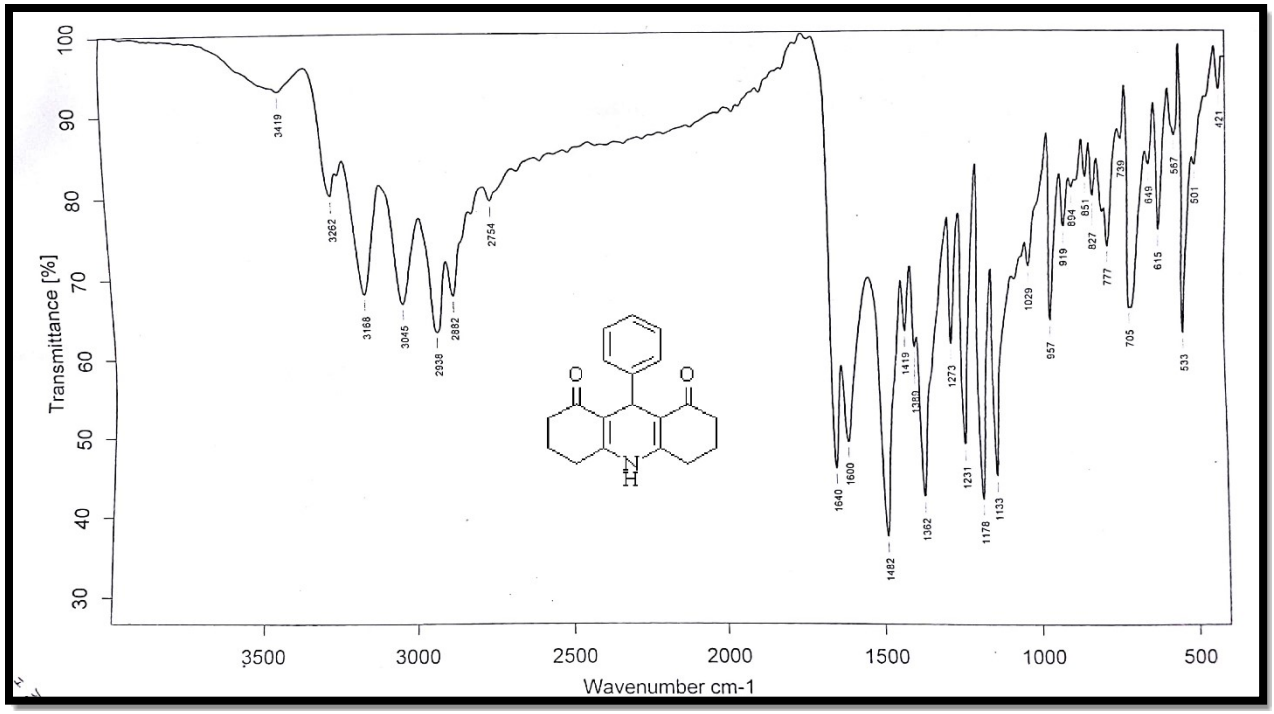

Fig. S73. FT-IR of 9-phenyl-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

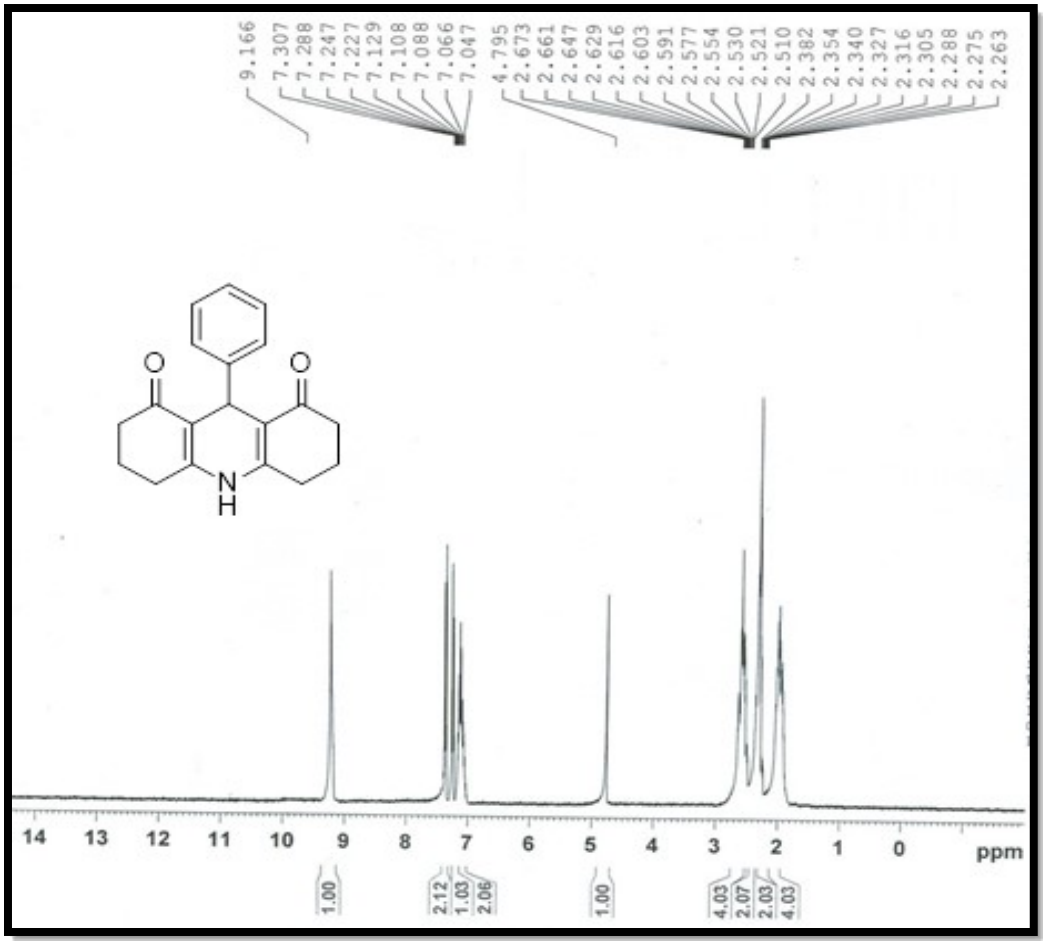

Fig. S74. ^{1}H NMR of 9-phenyl-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

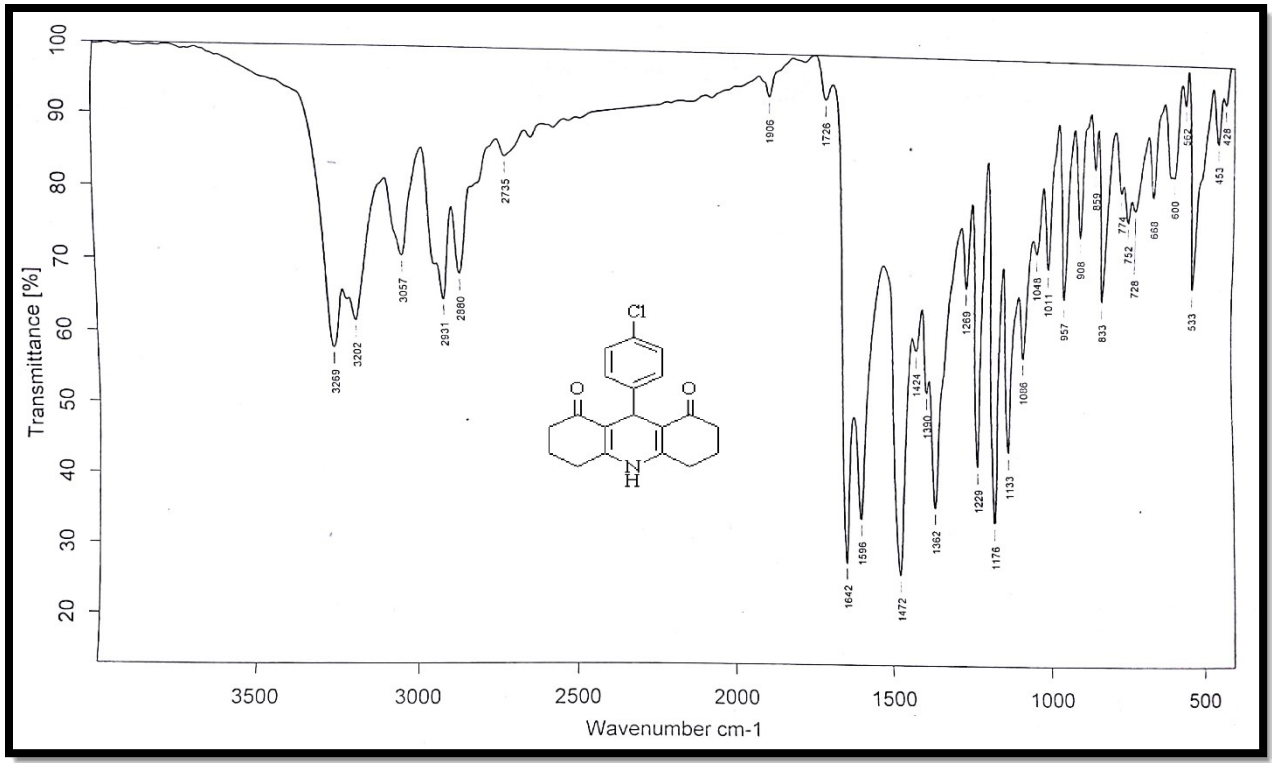

Fig. S75. FT-IR of 9-(4-chlorophenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

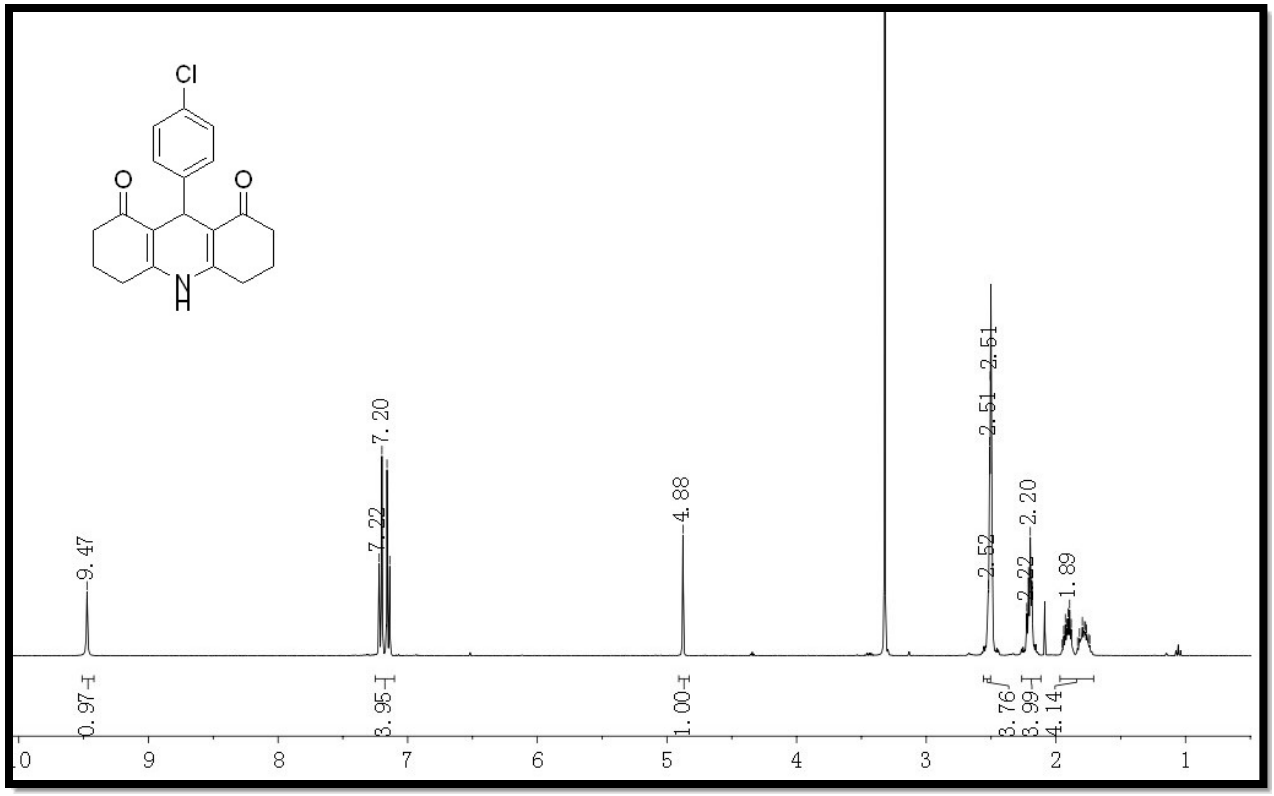

Fig. S76. ^{1}H NMR of 9-(4-chlorophenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

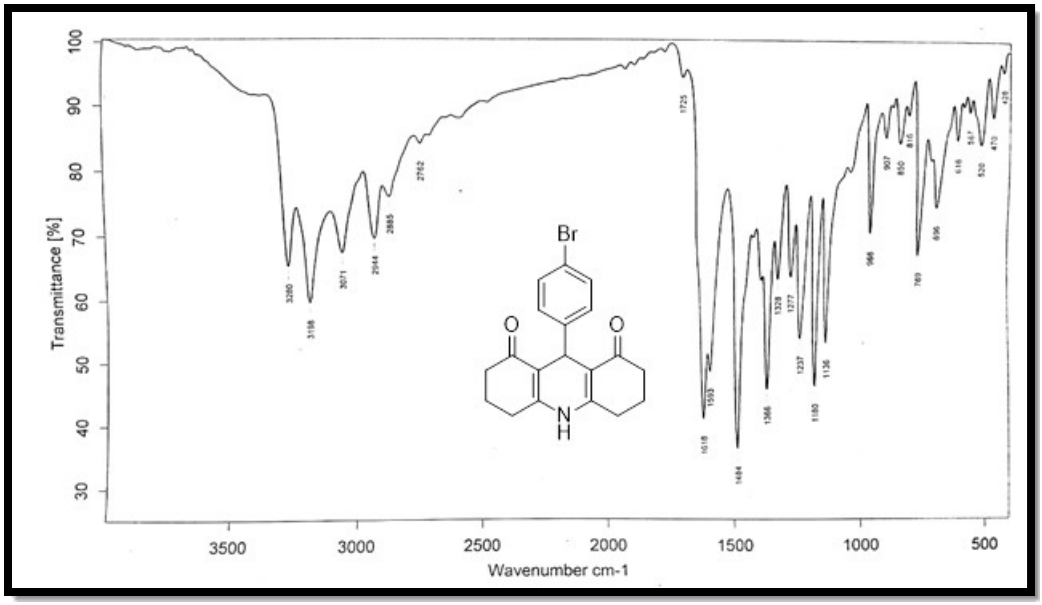

Fig. S77. FT-IR of 9-(4-bromophenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

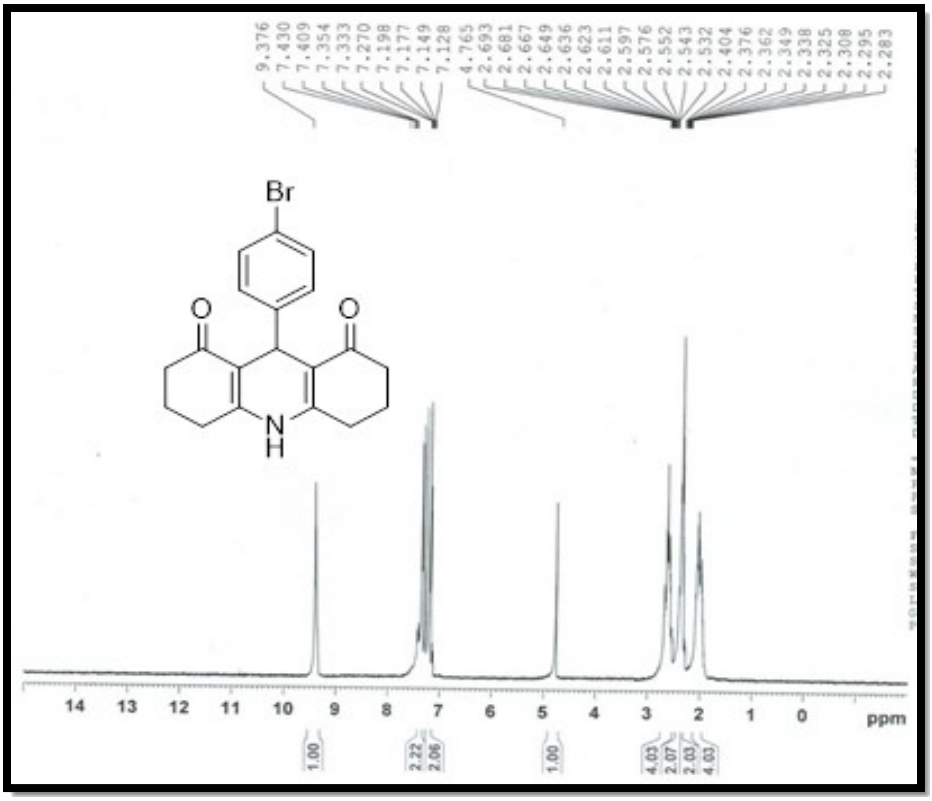

Fig. S78. ^{1}H NMR of 9-(4-bromophenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

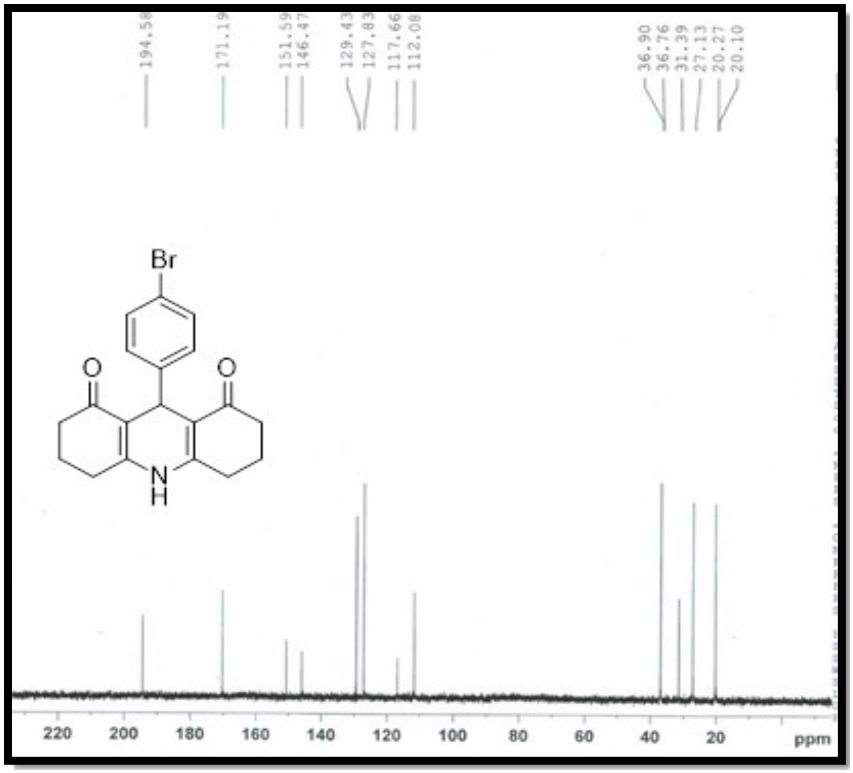

Fig. S79. ^{13}C NMR of 9-(4-bromophenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

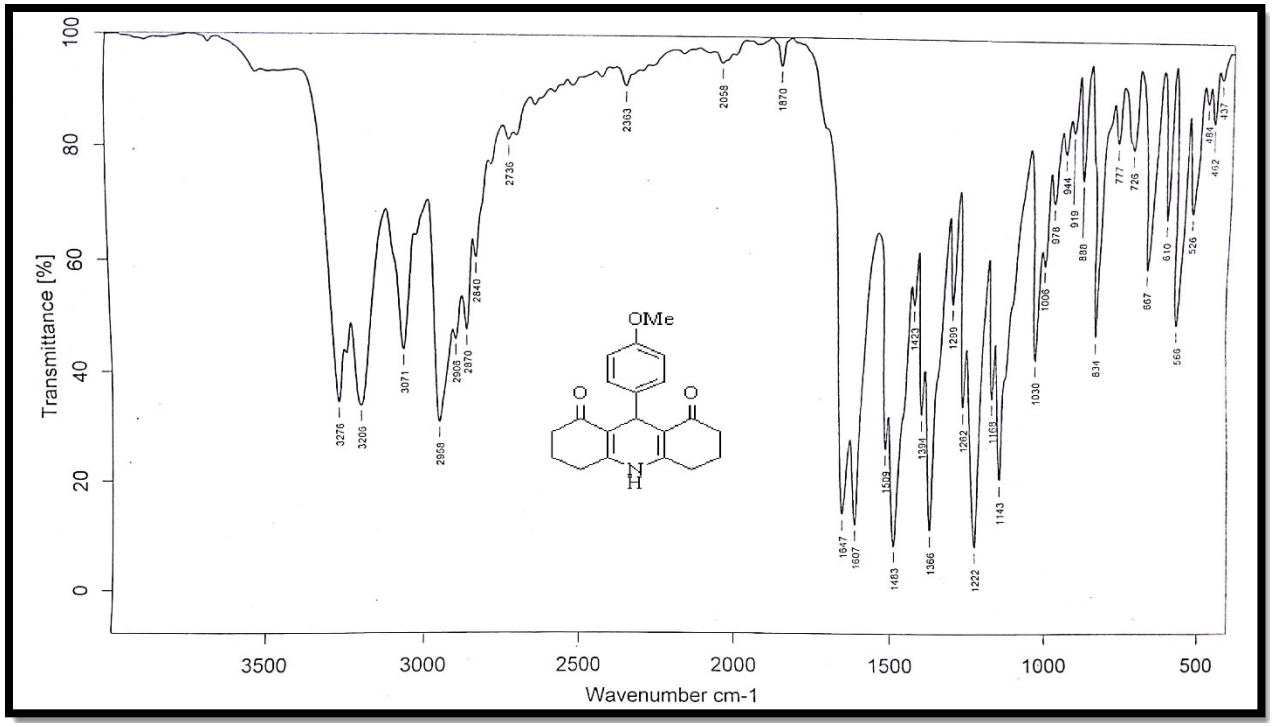

Fig. S80. FT-IR of 9-(4-methoxyphenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

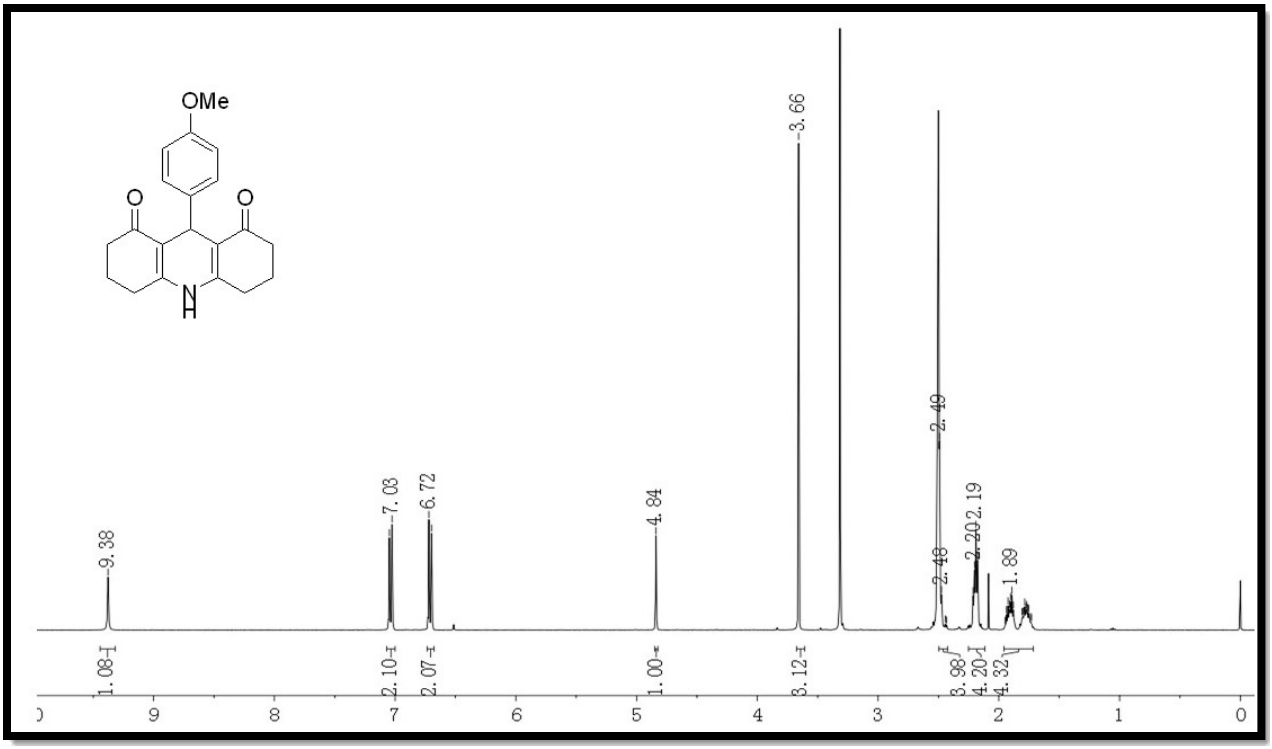

Fig. S81. ^{1}H NMR of 9-(4-methoxyphenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

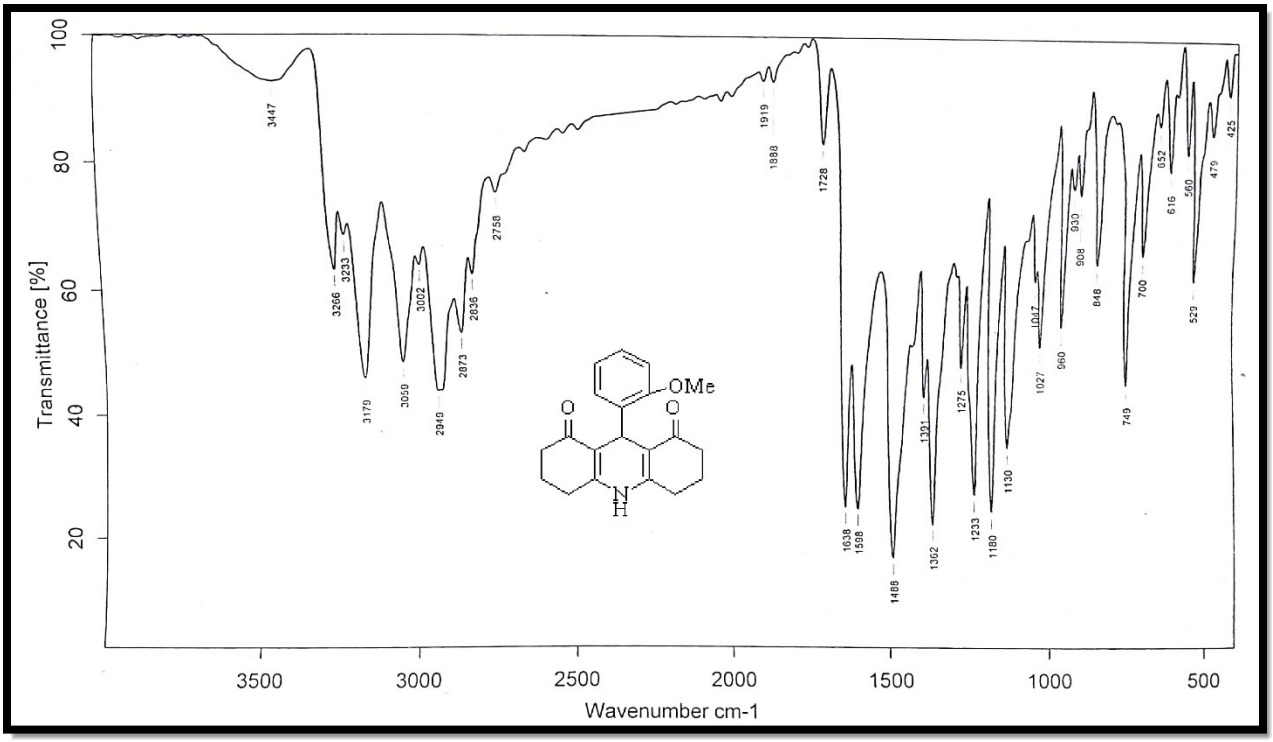

Fig. S82. FT-IR of 9-(2-methoxyphenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dion

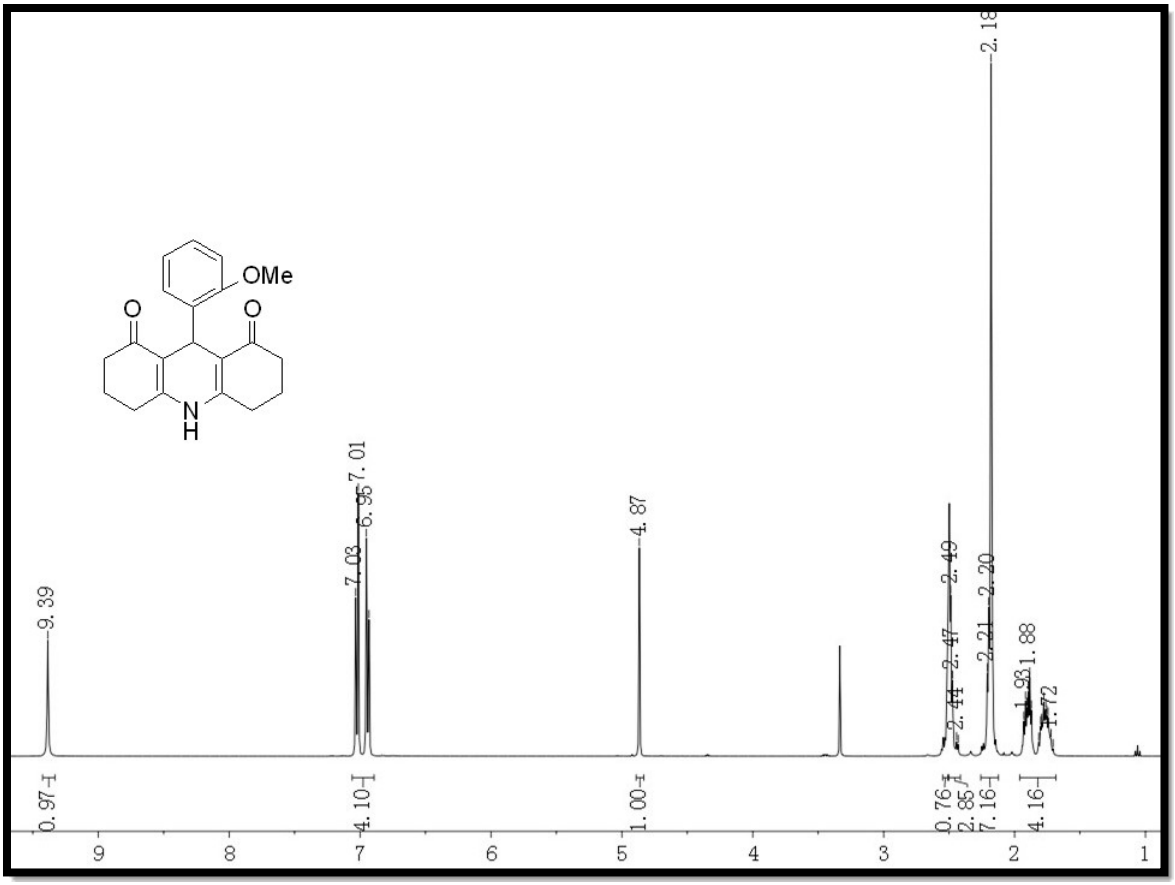

Fig. S83. [1]H NMR of 9-(2-methoxyphenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dion

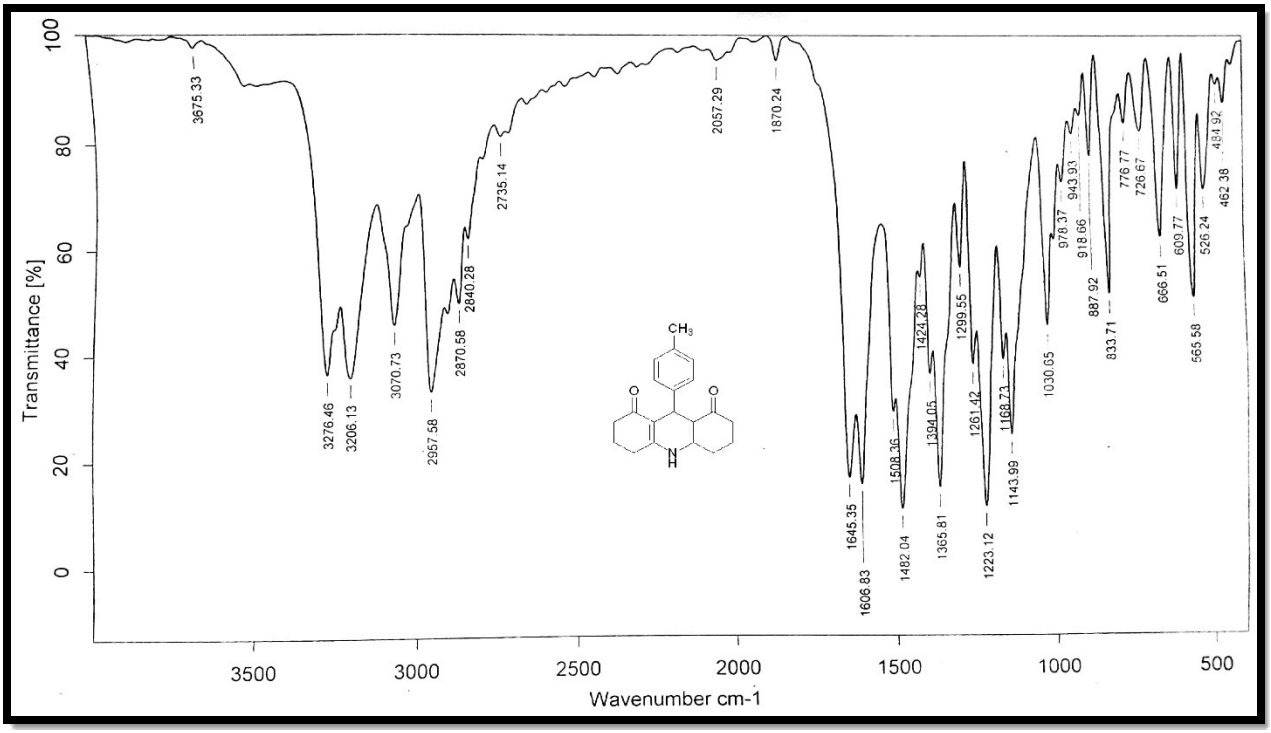

Fig. S84. FT-IR of 3,3,6,6-tetramethyl-9-(p-tolyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

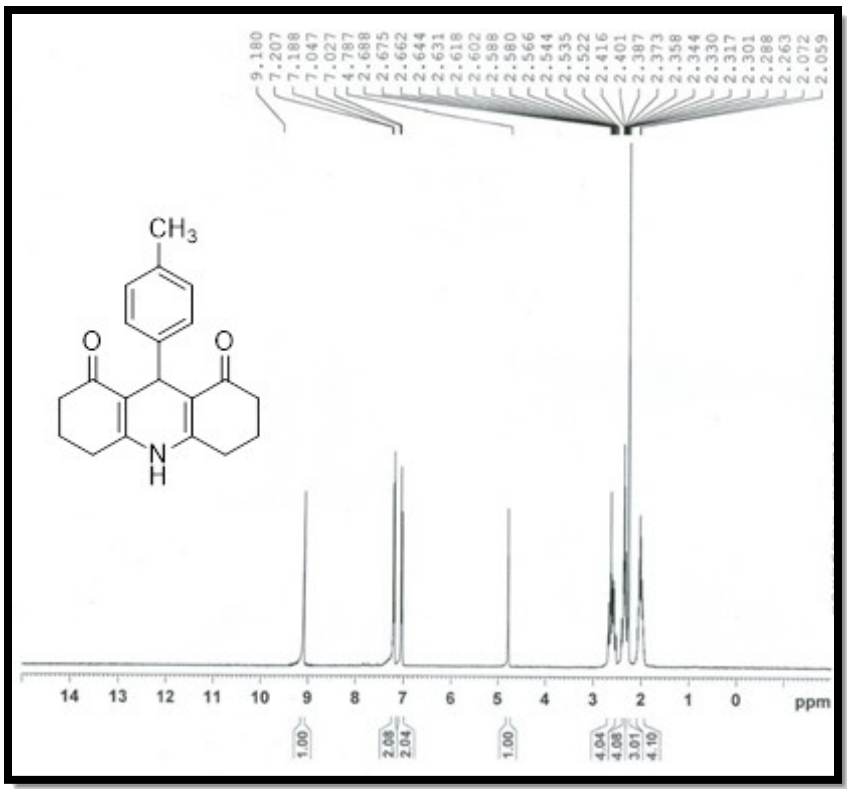

Fig. S85. ^{1}H NMR of 3,3,6,6-tetramethyl-9-(p-tolyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

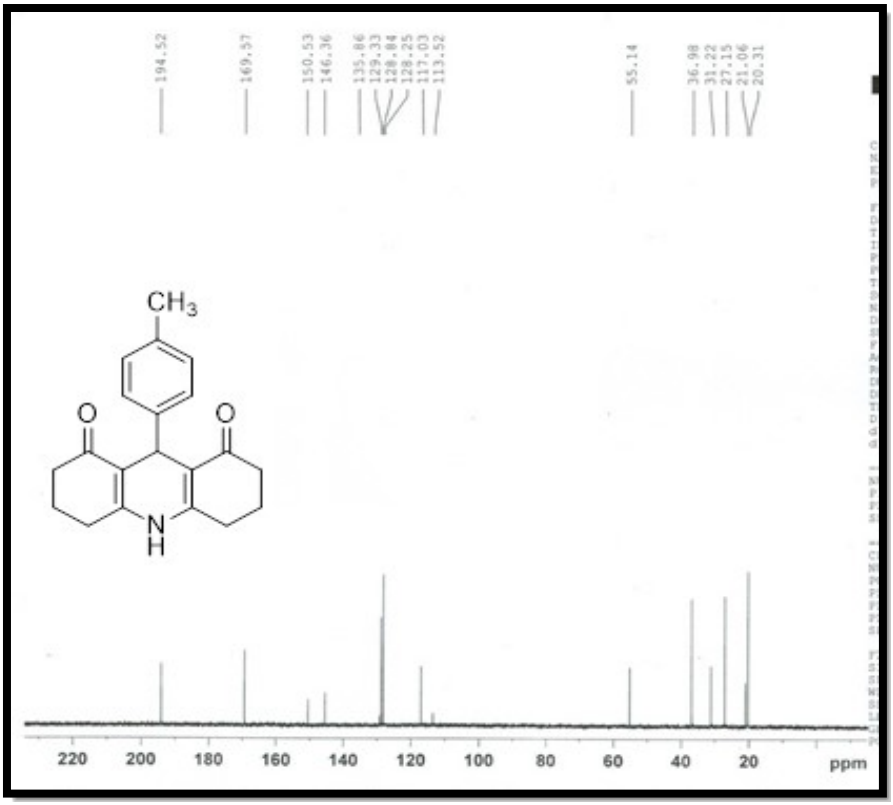

Fig. S86. ^{13}C NMR of 3,3,6,6-tetramethyl-9-(p-tolyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

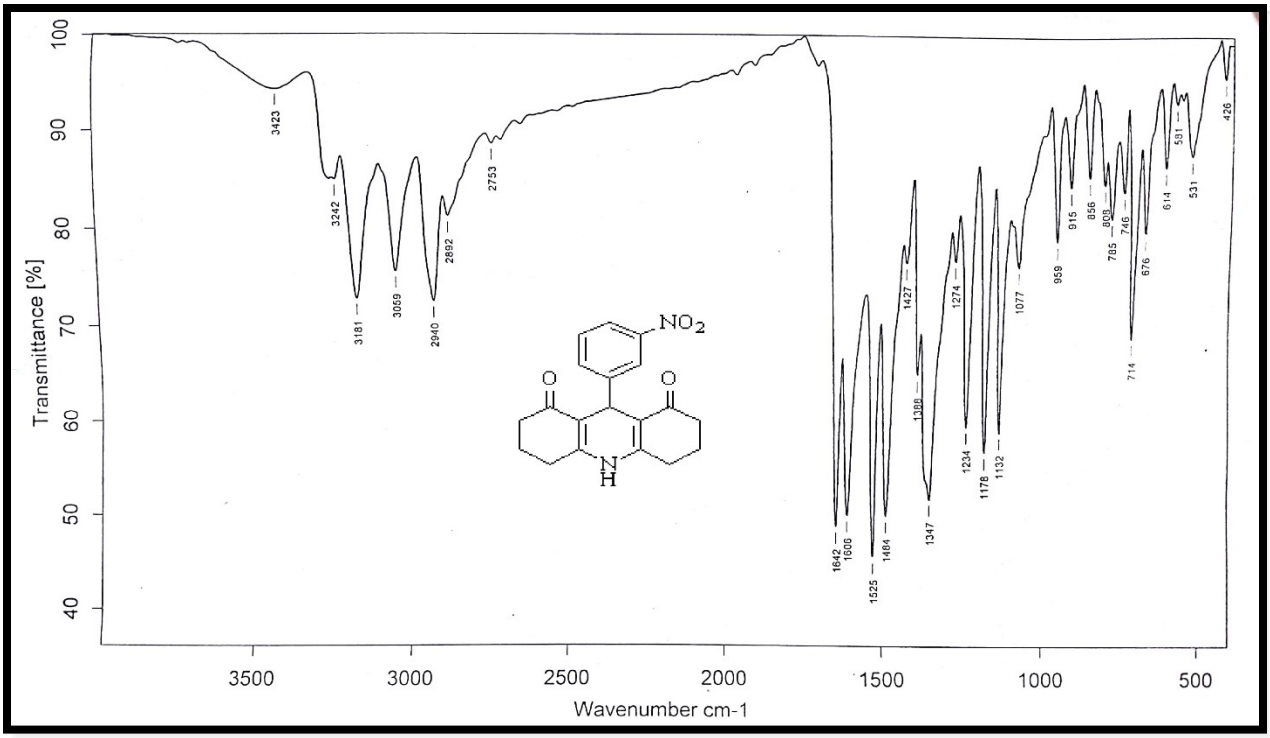

Fig. S87. FT-IR of 9-(3-nitrophenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

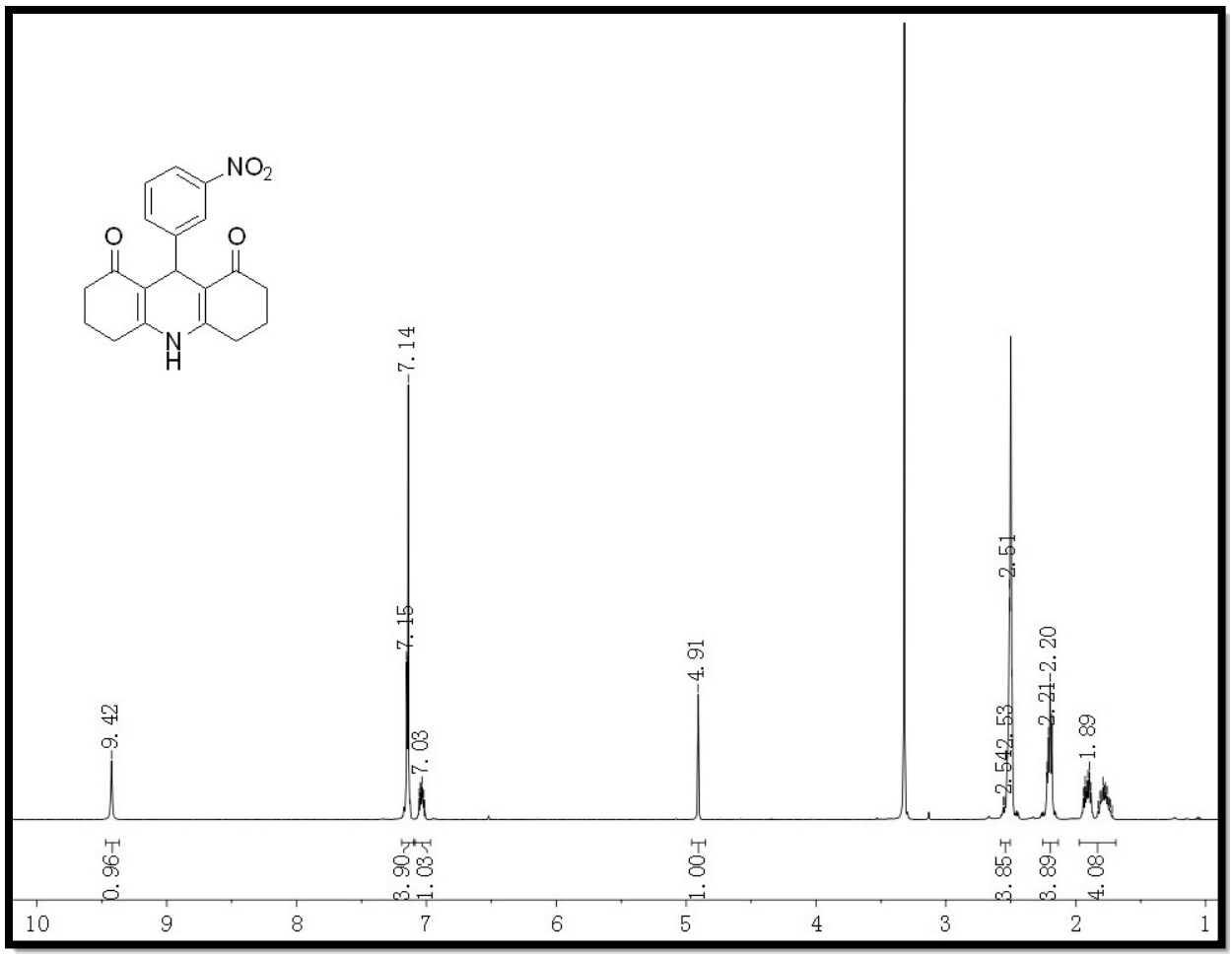

Fig. S88. ^{1}H NMR of 9-(3-nitrophenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

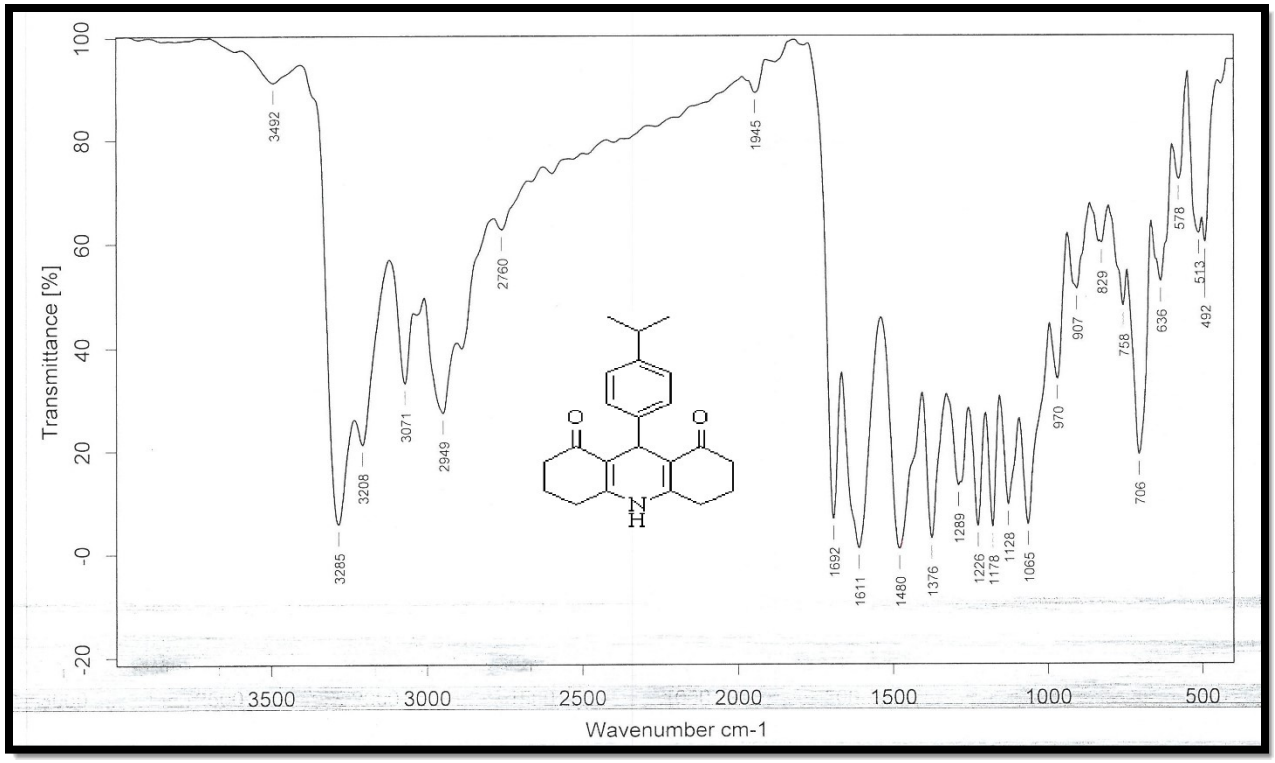

Fig. S89. FT-IR of 9-(4-isopropylphenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

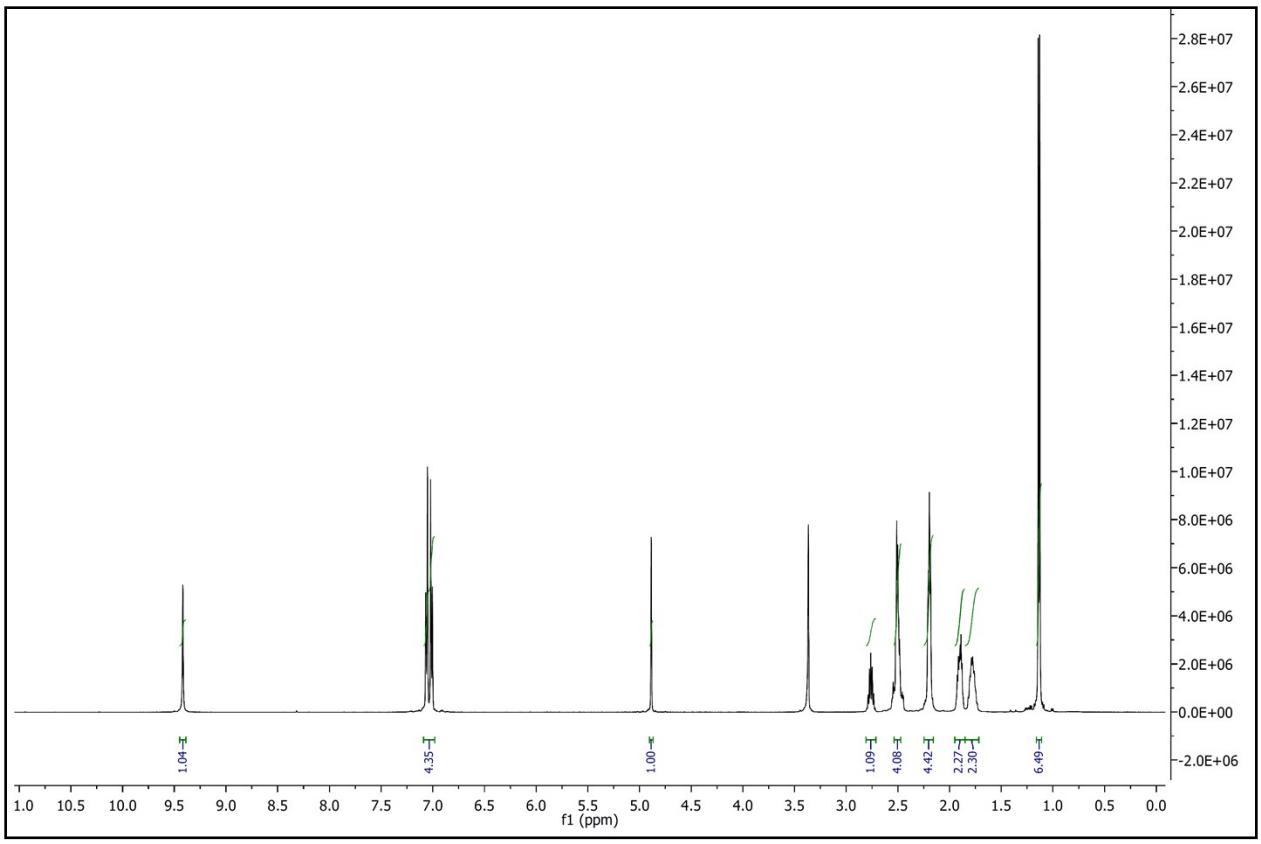

Fig. S90. [1]HNMR of 9-(4-Isopropylphenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

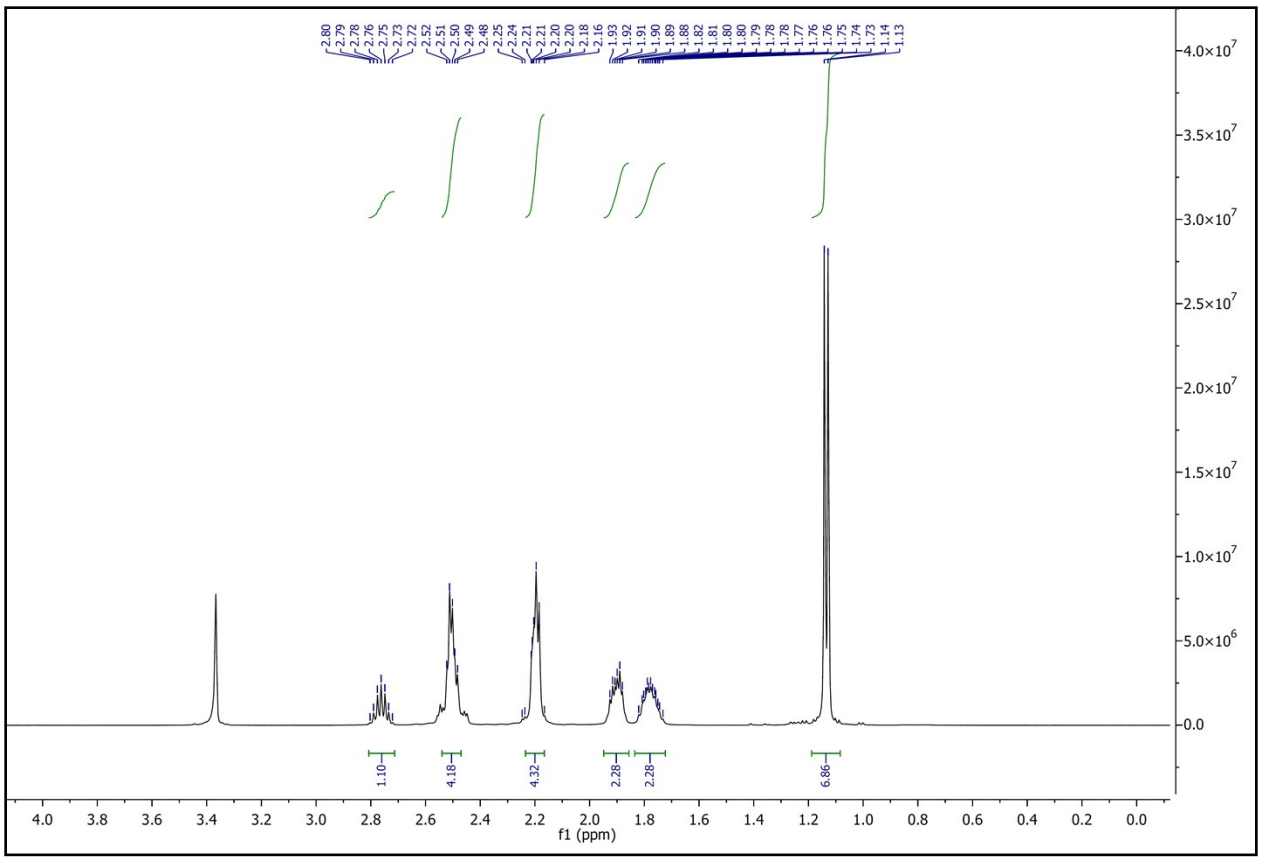

Fig. S91. [1]HNMR of 9-(4-Isopropylphenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

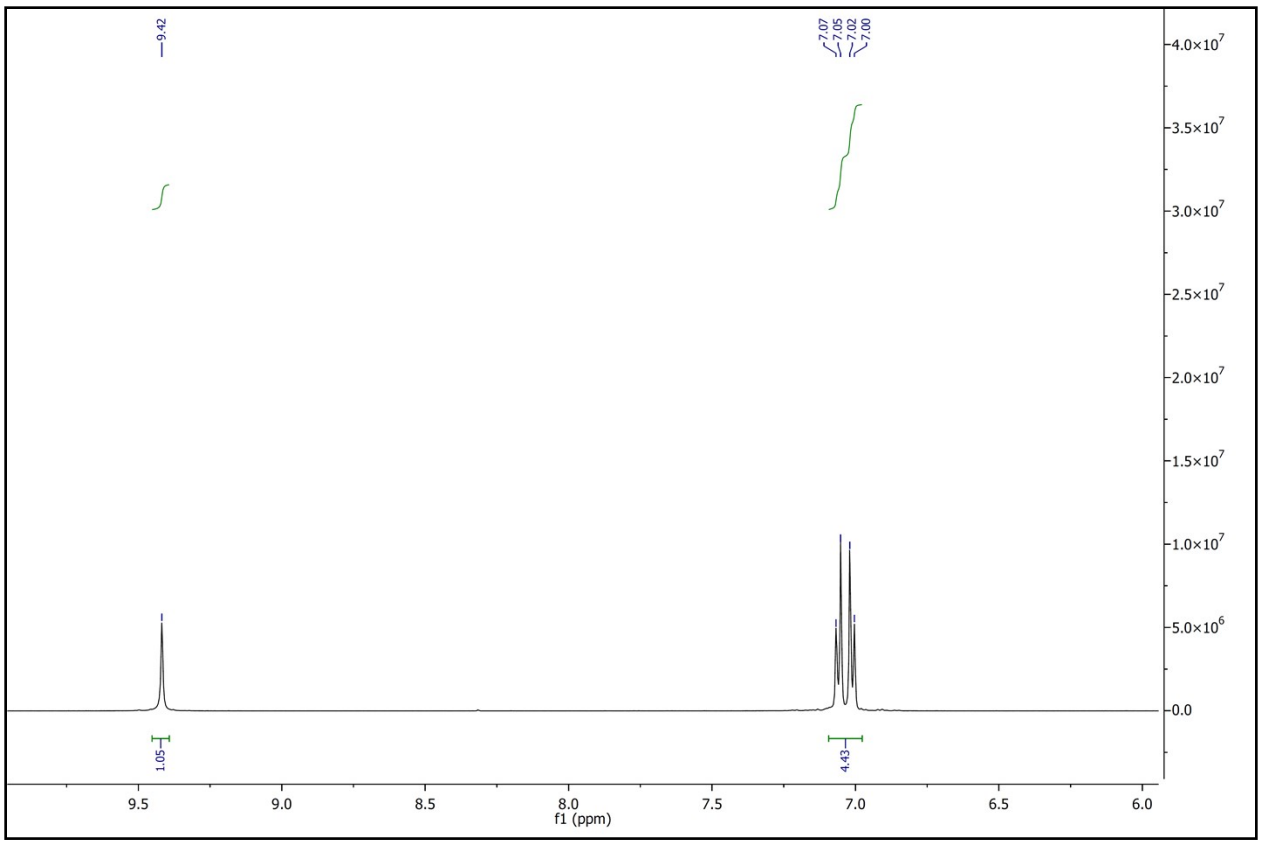

Fig. S92. [1]HNMR of 9-(4-Isopropylphenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione

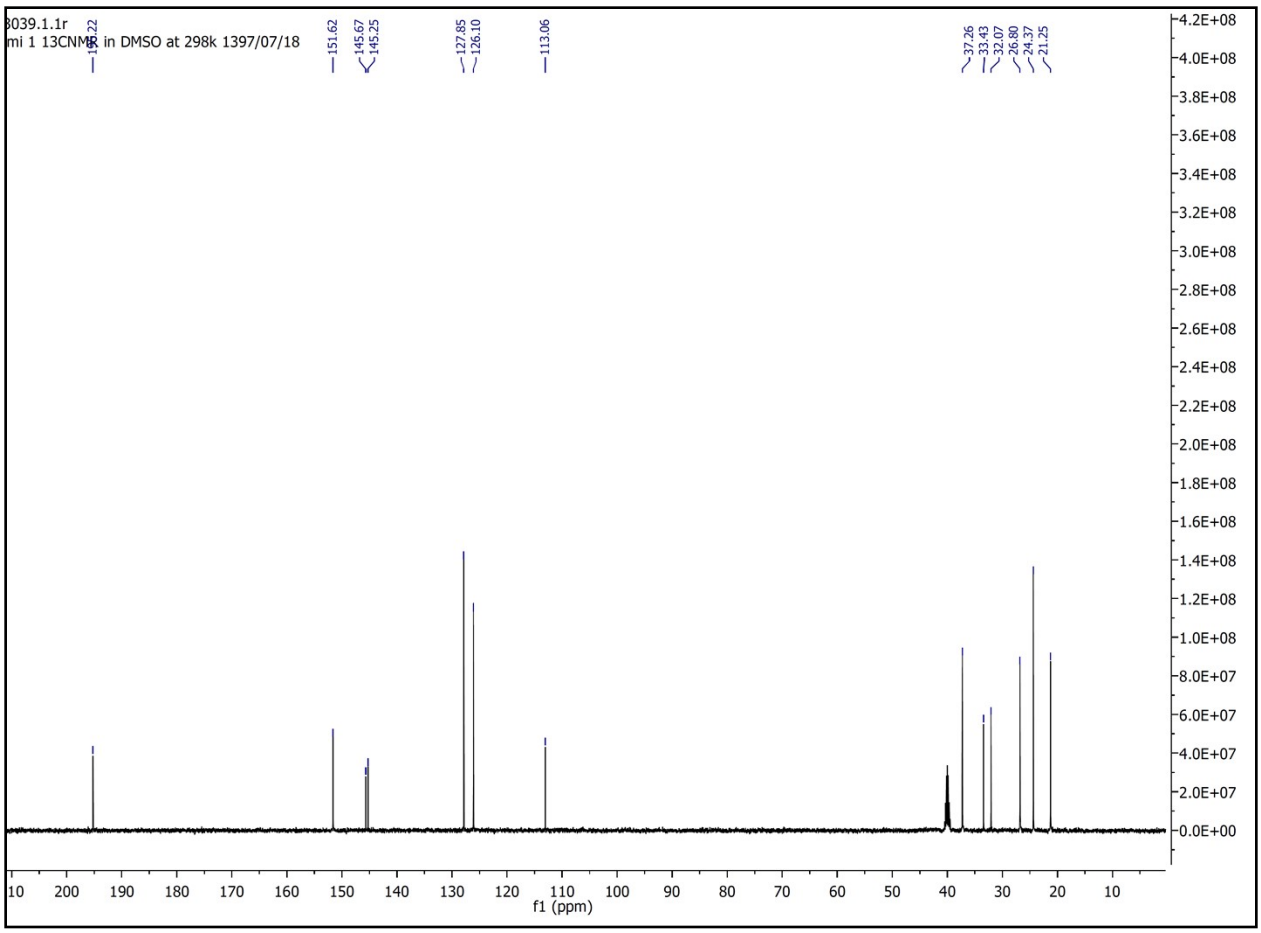

Fig. S93. ^{13}CNMR of 9-(4-Isopropylphenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione