

Supplementary Information

A new rapid multicomponent domino heteroannulation of heterocyclic ketene amins: solvent-free regioselective synthesis of functionalized benzo[g]imidazo[1,2-*a*]quinolinediones

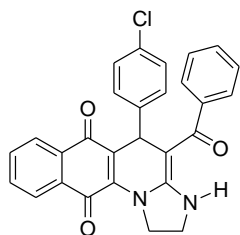
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Engineering, Qingdao University of Science and Technology, Qingdao 266042, P. R. China*

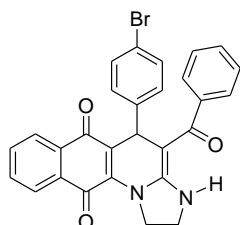
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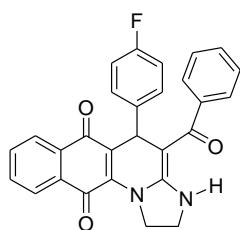
Characterization data of Compounds 4 and 5	S2-S9
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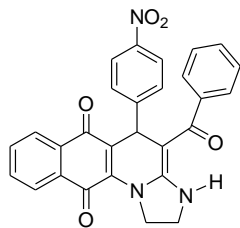
4-Benzoyl-5-(4-chlorophenyl)-2,3-dihydrobenzo[g]imidazo[1,2-a]quinoline-6,11(1H,5H)-dione (4a). Black Solid, mp. 247–248 °C; IR (KBr, ν , cm^{-1}): 3294 (NH), 1663 (C=O), 1636 (C=O), 1258 (C–N); ^1H NMR (500 MHz, DMSO- d_6) (δ , ppm): 9.54 (s, 1H, NH), 6.80–7.98 (m, 13H, ArH), 5.22 (s, 1H, CH), 4.53–4.58 (m, 1H, CH_2), 4.33–4.39 (m, 1H, CH_2), 3.77–3.87 (m, 2H, CH_2); ^{13}C NMR (125 MHz, DMSO- d_6) (δ , ppm): 191.6, 181.7, 180.6, 156.4, 146.0, 142.2, 139.9, 134.9, 133.9, 131.6, 131.5, 131.2, 129.5, 128.6, 126.7, 125.7, 122.2, 86.4, 47.7, 44.1, 36.7; HRMS (ESI-TOF, $[\text{M}+\text{H}]^+$): calcd for $\text{C}_{28}\text{H}_{20}\text{N}_2\text{O}_3\text{Cl}$, 467.1162; found, 467.1158.



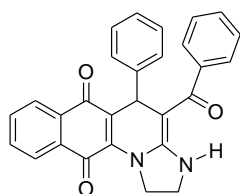
4-Benzoyl-5-(4-bromophenyl)-2,3-dihydrobenzo[g]imidazo[1,2-a]quinoline-6,11(1H,5H)-dione (4b). Black solid, mp. 252–253 °C; IR (KBr, ν , cm^{-1}): 3295 (NH), 1662 (C=O), 1640 (C=O), 1257 (C–N); ^1H NMR (500 MHz, DMSO- d_6) (δ , ppm): 9.53 (s, 1H, NH), 6.74–7.97 (m, 13H, ArH), 5.20 (s, 1H, CH), 4.52–4.58 (m, 1H, CH_2), 4.32–4.38 (m, 1H, CH_2), 3.77–3.86 (m, 2H, CH_2); ^{13}C NMR (125 MHz, DMSO- d_6) (δ , ppm): 191.6, 181.7, 180.6, 156.4, 146.4, 142.2, 140.0, 135.0, 133.9, 131.5, 129.9, 129.4, 128.6, 126.7, 126.6, 125.7, 122.1, 119.8, 86.3, 47.7, 44.1, 36.8; HRMS (ESI-TOF, $[\text{M}+\text{H}]^+$): calcd for $\text{C}_{28}\text{H}_{20}\text{N}_2\text{O}_3\text{Br}$, 511.0657; found, 511.0665.



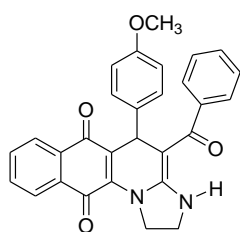
4-Benzoyl-5-(4-fluorophenyl)-2,3-dihydrobenzo[g]imidazo[1,2-a]quinoline-6,11(1H,5H)-dione (4c). Black solid, mp. 239–240 °C; IR (KBr, ν , cm^{-1}): 3299 (NH), 1667 (C=O), 1637 (C=O), 1258 (C–N); ^1H NMR (500 MHz, DMSO- d_6) (δ , ppm): 9.52 (s, 1H, NH), 6.80–7.97 (m, 13H, ArH), 5.21 (s, 1H, CH), 4.53–4.58 (m, 1H, CH_2), 4.32–4.38 (m, 1H, CH_2), 3.77–3.87 (m, 2H, CH_2); ^{13}C NMR (125 MHz, DMSO- d_6) (δ , ppm): 191.7, 181.7, 180.7, 161.1 ($^1J_{\text{CF}}=239.4$ Hz), 156.4, 143.3, 142.3, 139.9, 134.9, 133.8, 131.4, 129.4, 128.6, 126.6, 125.7, 122.5, 115.3 ($^2J_{\text{CF}}=21$ Hz), 86.7, 47.7, 44.1, 36.5; HRMS (ESI-TOF, $[\text{M}+\text{H}]^+$): calcd for $\text{C}_{28}\text{H}_{20}\text{N}_2\text{O}_3\text{F}$, 451.1458; found, 451.1462.



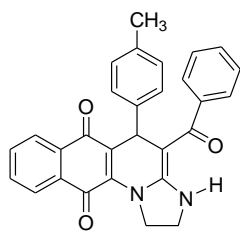
4-Benzoyl-5-(4-nitrophenyl)-2,3-dihydrobenzo[g]imidazo[1,2-a]quinoline-6,11(1H,5H)-dione (4d). Black solid, mp. 252–253 °C; IR (KBr, ν , cm^{-1}): 3295 (NH), 1667 (C=O), 1641 (C=O), 1521 (NO_2), 1347 (NO_2), 1258 (C–N); ^1H NMR (500 MHz, DMSO-d_6) (δ , ppm): 9.52 (s, 1H, NH), 6.80–7.97 (m, 13H, ArH), 7.04–7.99 (m, 13H, ArH), 5.37 (s, 1H, CH), 4.54–4.59 (m, 1H, CH_2), 4.38–4.42 (m, 1H, CH_2), 3.81–3.89 (m, 2H, CH_2); ^{13}C NMR (125 MHz, DMSO-d_6) (δ , ppm): 191.6, 181.5, 180.5, 156.2, 154.2, 146.3, 142.1, 140.2, 134.9, 133.8, 131.5, 131.4, 129.4, 128.9, 128.7, 126.6, 125.7, 123.8, 121.2, 85.9, 47.6, 44.1, 37.6; HRMS (ESI-TOF, $[\text{M}+\text{H}]^+$): calcd for $\text{C}_{28}\text{H}_{20}\text{N}_3\text{O}_5$, 478.1403; found, 478.1412.



4-Benzoyl-5-phenyl-2,3-dihydrobenzo[g]imidazo[1,2-a]quinoline-6,11(1H,5H)-dione (4e). Black solid, mp. 246–247 °C; IR (KBr, ν , cm^{-1}): 3296 (NH), 1688 (C=O), 1636 (C=O), 1258 (C–N); ^1H NMR (500 MHz, DMSO-d_6) (δ , ppm): 9.52 (s, 1H, NH), 6.82–7.97 (m, 14H, ArH), 5.23 (s, 1H, CH), 4.53–4.59 (m, 1H, CH_2), 4.33–4.39 (m, 1H, CH_2), 3.78–3.85 (m, 2H, CH_2); ^{13}C NMR (125 MHz, DMSO-d_6) (δ , ppm): 191.6, 181.7, 180.7, 156.5, 147.0, 142.3, 139.9, 134.9, 133.8, 131.6, 129.4, 128.7, 127.5, 126.7, 126.7, 126.6, 125.7, 122.8, 86.7, 47.7, 44.1, 37.0; HRMS (ESI-TOF, $[\text{M}+\text{H}]^+$): calcd for $\text{C}_{28}\text{H}_{21}\text{N}_2\text{O}_3$, 433.1552; found, 433.1565.

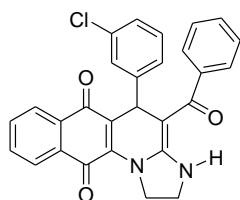


4-Benzoyl-5-(4-methoxyphenyl)-2,3-dihydrobenzo[g]imidazo[1,2-a]quinoline-6,11(1H,5H)-dione (4f). Red solid, mp. 219–220 °C; IR (KBr, ν , cm^{-1}): 3292 (NH), 1665 (C=O), 1632 (C=O), 1255 (OCH_3); ^1H NMR (500 MHz, DMSO-d_6) (δ , ppm): 9.51 (s, 1H, NH), 6.65–7.96 (m, 13H, ArH), 5.15 (s, 1H, CH), 4.52–4.58 (m, 1H, CH_2), 4.31–4.37 (m, 1H, CH_2), 3.76–3.86 (m, 2H, CH_2), 3.60 (s, 3H, CH_3); ^{13}C NMR (125 MHz, DMSO-d_6) (δ , ppm): 191.6, 181.8, 180.8, 158.1, 156.5, 142.3, 139.5, 139.2, 134.9, 133.8, 131.7, 131.4, 129.4, 128.6, 128.5, 126.8, 126.6, 125.7, 123.3, 114.1, 86.9, 55.4, 47.7, 44.1, 36.0; HRMS (ESI-TOF, $[\text{M}+\text{H}]^+$): calcd for $\text{C}_{28}\text{H}_{23}\text{N}_2\text{O}_4$, 463.1658; found, 463.1662.



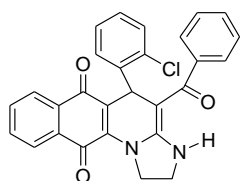
4-Benzoyl-5-(p-tolyl)-2,3-dihydrobenzo[g]imidazo[1,2-a]quinoline-6,11(1H,5H)-dione (4g).

Black solid, mp. 239–240 °C; IR (KBr, ν , cm^{-1}): 3296 (NH), 1669 (C=O), 1659 (C=O), 1637 (C=O), 1257 (C–N); ^1H NMR (500 MHz, DMSO- d_6) (δ , ppm): 9.51 (s, 1H, NH), 6.71–7.96 (m, 13H, ArH), 5.19 (s, 1H, CH), 4.52–4.57 (m, 1H, CH_2), 4.31–4.37 (m, 1H, CH_2), 3.76–3.86 (m, 2H, CH_2), 2.13 (s, 3H, CH_3); ^{13}C NMR (125 MHz, DMSO- d_6) (δ , ppm): 191.5, 181.7, 180.7, 156.6, 144.1, 142.3, 139.8, 135.8, 134.9, 133.8, 131.6, 131.4, 129.4, 128.5, 127.4, 126.8, 126.6, 125.7, 123.0, 86.9, 47.7, 44.1, 36.5, 21.0; HRMS (ESI–TOF, $[\text{M}+\text{H}]^+$): calcd for $\text{C}_{29}\text{H}_{23}\text{N}_2\text{O}_3$, 447.1709; found, 447.1712.



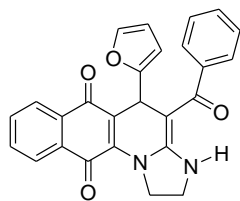
4-Benzoyl-5-(3-chlorophenyl)-2,3-dihydrobenzo[g]imidazo[1,2-a]quinoline-6,11(1H,5H)-

dione (4h). Black solid, mp. 226–27 °C; IR (KBr, ν , cm^{-1}): 3272 (NH), 1671 (C=O), 1637 (C=O), 1255 (C–N); ^1H NMR (500 MHz, DMSO- d_6) (δ , ppm): 9.54 (s, 1H, NH), 7.97–7.98 (m, 13H, ArH), 5.20 (s, 1H, CH), 4.54–4.59 (m, 1H, CH_2), 4.33–4.39 (m, 1H, CH_2), 3.76–3.87 (m, 2H, CH_2); ^{13}C NMR (125 MHz, DMSO- d_6) (δ , ppm): 191.7, 181.7, 180.8, 156.4, 149.7, 142.6, 138.1, 134.9, 133.9, 132.4, 131.6, 130.7, 128.6, 127.5, 126.7, 125.8, 122.5, 121.8, 86.4, 47.4, 43.9, 37.3; HRMS (ESI–TOF, $[\text{M}+\text{H}]^+$): calcd for $\text{C}_{28}\text{H}_{20}\text{N}_2\text{O}_3\text{Cl}$, 467.1162; found, 467.1168.



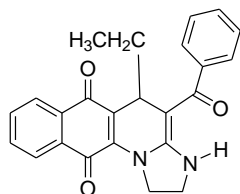
4-Benzoyl-5-(2-chlorophenyl)-2,3-dihydrobenzo[g]imidazo[1,2-a]quinoline-6,11(1H,5H)-

dione (4i). Black solid, mp. 226–27 °C; IR (KBr, ν , cm^{-1}): 3284 (NH), 1671 (C=O), 1640 (C=O), 1258 (C–N); ^1H NMR (500 MHz, DMSO- d_6) (δ , ppm): 9.48 (s, 1H, NH), 6.84–7.99 (m, 13H, ArH), 5.64 (s, 1H, CH), 4.57–4.62 (m, 1H, CH_2), 4.42–4.48 (m, 1H, CH_2), 3.73–3.87 (m, 2H, CH_2); ^{13}C NMR (125 MHz, DMSO- d_6) (δ , ppm): 192.3, 181.4, 180.8, 156.1, 144.3, 142.4, 140.3, 135.0, 133.7, 132.3, 131.8, 131.6, 131.3, 129.9, 129.4, 128.8, 127.3, 126.9, 126.6, 125.7, 121.6, 86.6, 47.5, 43.9, 36.6; HRMS (ESI–TOF, $[\text{M}+\text{H}]^+$): calcd for $\text{C}_{28}\text{H}_{20}\text{N}_2\text{O}_3\text{Cl}$, 467.1162; found, 467.1168.



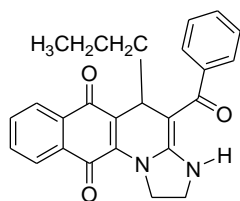
4-Benzoyl-5-(furan-2-yl)-2,3-dihydrobenzo[g]imidazo[1,2-a]quinoline-6,11(1H,5H)-dione (4j).

Black solid, mp. 204–205 °C; IR (KBr, ν , cm^{-1}): 3290 (NH), 1671 (C=O), 1637 (C=O), 1254 (C–N); ^1H NMR (500 MHz, DMSO- d_6) (δ , ppm): 9.48 (s, 1H, NH), 7.26–8.01 (m, 9H, ArH), 7.36 (s, 1H, *furan*-H), 6.20 (s, 1H, *furan*-H), 5.70 (s, 1H, *furan*-H), 5.34 (s, 1H, CH), 4.51–4.54 (m, 1H, CH_2), 4.35–4.39 (m, 1H, CH_2), 3.79–3.84 (m, 1H, CH_2); ^{13}C NMR (125 MHz, DMSO- d_6) (δ , ppm): 191.2, 181.3, 180.6, 157.7, 156.8, 142.4, 142.0, 140.6, 135.0, 133.9, 131.6, 129.5, 128.6, 126.8, 126.7, 125.8, 119.3, 110.8, 105.5, 83.9, 47.7, 44.1, 31.2; HRMS (ESI-TOF, $[\text{M}+\text{H}]^+$): calcd for $\text{C}_{26}\text{H}_{19}\text{N}_2\text{O}_4$, 423.1345, found, 423.1351.



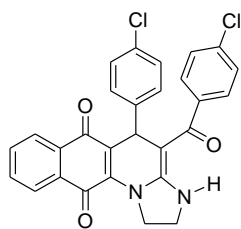
4-Benzoyl-5-ethyl-2,3-dihydrobenzo[g]imidazo[1,2-a]quinoline-6,11(1H,5H)-dione (4k).

Black solid, mp. 180–181 °C; IR (KBr, ν , cm^{-1}): 3291 (NH), 1669 (C=O), 1637 (C=O), 1260 (C–N); ^1H NMR (500 MHz, DMSO- d_6) (δ , ppm): 9.38 (s, 1H, NH), 7.33–8.00 (m, 9H, ArH), 4.47–4.52 (m, 1H, CH), 4.27–4.33 (m, 1H, CH_2), 4.00–4.13 (m, 1H, CH_2), 3.71–3.81 (m, 2H, CH_2), 1.06–1.18 (m, 2H, CH_2), 0.49–0.52 (m, 3H, CH_3); ^{13}C NMR (125 MHz, DMSO- d_6) (δ , ppm): 191.6, 182.3, 180.9, 157.1, 142.6, 141.1, 135.0, 133.7, 131.8, 129.6, 128.8, 127.2, 126.6, 125.7, 123.3, 85.7, 47.7, 44.0, 32.2, 30.9, 9.8; HRMS (ESI-TOF, $[\text{M}+\text{H}]^+$): calcd for $\text{C}_{24}\text{H}_{21}\text{N}_2\text{O}_3$, 385.1552, found, 385.1565.



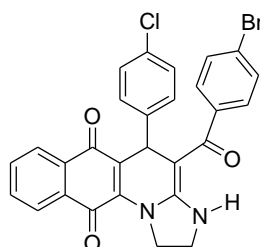
4-Benzoyl-5-propyl-2,3-dihydrobenzo[g]imidazo[1,2-a]quinoline-6,11(1H,5H)-dione (4l).

Black solid, mp. 182–183 °C; IR (KBr, ν , cm^{-1}): 3287 (NH), 1670 (C=O), 1633 (C=O); ^1H NMR (500 MHz, DMSO- d_6) (δ , ppm): 9.36 (s, 1H, NH), 7.36–8.02 (m, 9H, ArH), 4.50–4.56 (m, 1H, CH), 4.29–4.35 (m, 1H, CH_2), 4.18–4.20 (m, 1H, CH_2), 3.76–3.84 (m, 2H, CH_2), 1.06–1.18 (m, 2H, CH_2), 0.89–1.21 (m, 4H, $\text{CH}_2 \times 2$), 0.54–0.57 (m, 3H, CH_3); ^{13}C NMR (125 MHz, DMSO- d_6) (δ , ppm): 191.4, 181.9, 180.6, 157.1, 142.3, 140.8, 134.8, 133.7, 131.9, 131.6, 129.4, 128.7, 127.3, 126.6, 125.8, 123.8, 86.3, 47.7, 44.0, 30.6, 18.1, 14.1; HRMS (ESI-TOF, $[\text{M}+\text{H}]^+$): calcd for $\text{C}_{25}\text{H}_{23}\text{N}_2\text{O}_3$, 399.1709, found, 399.1715.



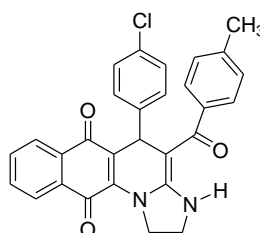
4-(4-Chlorobenzoyl)-5-(4-chlorophenyl)-2,3-dihydrobenzo[g]imidazo[1,2-a]quinoline-6,11

(1*H*,5*H*)-dione (4m). Black solid, mp. 234–235 °C; IR (KBr, ν , cm^{-1}): 3246 (NH), 1671 (C=O), 1636 (C=O), 1256 (C–N); ^1H NMR (500 MHz, DMSO- d_6) (δ , ppm): 9.53 (s, 1H, NH), 6.83–7.96 (m, 12H, ArH), 5.15 (s, 1H, CH), 4.52–4.58 (m, 1H, CH_2), 4.32–4.38 (m, 1H, CH_2), 3.77–3.86 (m, 2H, CH_2); ^{13}C NMR (125 MHz, DMSO- d_6) (δ , ppm): 190.1, 181.7, 180.6, 156.5, 145.8, 141.0, 139.8, 135.0, 134.0, 133.9, 131.6, 131.4, 131.4, 129.5, 128.7, 128.6, 126.6, 125.8, 122.3, 86.4, 47.7, 44.2, 36.7; HRMS (ESI–TOF, $[\text{M}+\text{H}]^+$): calcd for $\text{C}_{28}\text{H}_{19}\text{N}_2\text{O}_3\text{Cl}_2$, 501.0773; found, 501.0780.



4-(4-Bromobenzoyl)-5-(4-chlorophenyl)-2,3-dihydrobenzo[g]imidazo[1,2-a]quinoline-6,11

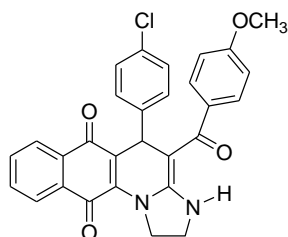
(1*H*,5*H*)-dione (4n). Black solid, mp. 244–245 °C; IR (KBr, ν , cm^{-1}): 3242 (NH), 1669 (C=O), 1634 (C=O), 1256 (C–N); ^1H NMR (500 MHz, DMSO- d_6) (δ , ppm): 9.52 (s, 1H, NH), 6.84–7.96 (m, 12H, ArH), 5.15 (s, 1H, CH), 4.52–4.58 (m, 1H, CH_2), 4.33–4.39 (m, 1H, CH_2), 3.76–3.86 (m, 2H, CH_2); ^{13}C NMR (125 MHz, DMSO- d_6) (δ , ppm): 190.1, 181.8, 180.6, 156.5, 145.8, 141.3, 139.9, 135.0, 133.9, 131.7, 131.6, 131.4, 131.4, 129.5, 128.9, 128.7, 126.6, 125.7, 122.2, 122.2, 86.3, 47.7, 44.1, 36.7; HRMS (ESI–TOF, $[\text{M}+\text{H}]^+$): calcd for $\text{C}_{28}\text{H}_{19}\text{N}_2\text{O}_3\text{ClBr}$, 545.0268; found, 545.0272.



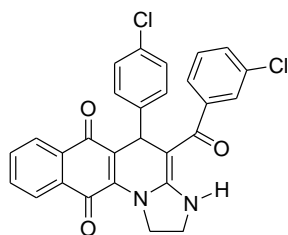
5-(4-Chlorophenyl)-4-(4-methylbenzoyl)-2,3-dihydrobenzo[g]imidazo[1,2-a]quinoline-6,11

(1*H*,5*H*)-dione (4o). Black solid, mp. 240–241 °C; IR (KBr, ν , cm^{-1}): 3275 (NH), 1673 (C=O), 1637 (C=O), 1254 (C–N); ^1H NMR (500 MHz, DMSO- d_6) (δ , ppm): 9.47 (s, 1H, NH), 6.83–7.96 (m, 12H, ArH), 5.26 (s, 1H, CH), 4.51–4.56 (m, 1H, CH_2), 4.32–4.38 (m, 1H, CH_2), 3.75–3.85 (m, 2H, CH_2), 2.34 (s, 3H, CH_3); ^{13}C NMR (125 MHz, DMSO- d_6) (δ , ppm): 191.6, 181.7, 180.6, 156.4, 145.9, 140.1, 139.4, 139.0, 134.9, 133.9, 131.6, 131.5, 131.3, 129.4, 129.1, 128.7, 128.6,

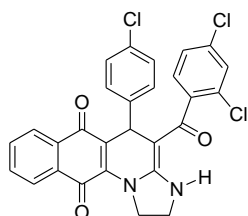
126.9, 126.6, 125.7, 122.1, 86.3, 47.7, 44.1, 36.6, 21.5; HRMS (ESI-TOF, $[M+H]^+$): calcd for $C_{29}H_{22}N_2O_3Cl$, 481.1319; found, 481.1325.



5-(4-Chlorophenyl)-4-(4-methoxybenzoyl)-2,3-dihydrobenzo[g]imidazo[1,2-a]quinoline-6,11(1H,5H)-dione (4p). Black solid, mp. 213–214 °C; IR (KBr, ν , cm^{-1}): 3281 (NH), 1663 (C=O), 1639 (C=O), 1250 (OCH₃); ¹H NMR (500 MHz, DMSO-d₆) (δ , ppm): 9.44 (s, 1H, NH), 6.84–7.96 (m, 12H, ArH), 5.33 (s, 1H, CH), 4.50–4.55 (m, 1H, CH₂), 4.31–4.37 (m, 1H, CH₂), 3.76–3.84 (m, 5H, CH₂, CH₃); ¹³C NMR (125 MHz, DMSO-d₆) (δ , ppm): 191.2, 181.8, 180.7, 160.5, 156.4, 145.9, 140.0, 134.9, 134.5, 133.8, 131.7, 131.5, 131.2, 129.4, 129.3, 128.7, 128.6, 126.6, 125.8, 122.2, 113.9, 86.4, 55.8, 47.7, 44.0, 36.7; HRMS (ESI-TOF, $[M+H]^+$): calcd for $C_{29}H_{22}N_2O_4Cl$, 497.1268; found, 497.1265.

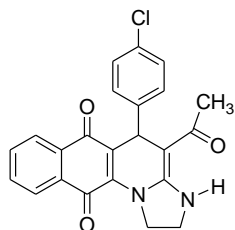


4-(3-Chlorobenzoyl)-5-(4-chlorophenyl)-2,3-dihydrobenzo[g]imidazo[1,2-a]quinoline-6,11(1H,5H)-dione (4q). Black solid, mp. 245–246 °C; IR (KBr, ν , cm^{-1}): 3271 (NH), 1670 (C=O), 1633 (C=O), 1254 (C–N); ¹H NMR (500 MHz, DMSO-d₆) (δ , ppm): 9.54 (s, 1H, NH), 6.85–7.98 (m, 12H, ArH), 5.17 (s, 1H, CH), 4.54–4.59 (m, 1H, CH₂), 4.34–4.40 (m, 1H, CH₂), 3.80–3.88 (m, 2H, CH₂); ¹³C NMR (125 MHz, DMSO-d₆) (δ , ppm): 190.1, 181.7, 180.6, 156.5, 145.8, 140.9, 139.8, 135.0, 134.0, 133.9, 131.9, 131.6, 131.5, 131.4, 129.5, 128.7, 126.6, 125.8, 122.3, 122.2, 86.4, 47.7, 44.2, 36.7; HRMS (ESI-TOF, $[M+H]^+$): calcd for $C_{28}H_{18}N_2O_3Cl_2$, 501.0773; found, 501.0782.

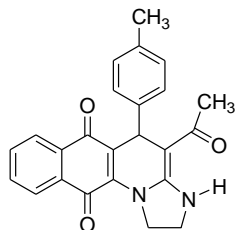


5-(4-Chlorophenyl)-4-(2,4-dichlorobenzoyl)-2,3-dihydrobenzo[g]imidazo[1,2-a]quinoline-6,11(1H,5H)-dione (4r). Black solid, mp. 235–236 °C; IR (KBr, ν , cm^{-1}): 3308 (NH), 1669 (C=O), 1636 (C=O), 1256 (C–N); ¹H NMR (500 MHz, DMSO-d₆) (δ , ppm): 9.59 (s, 1H, NH), 6.85–7.98 (m, 11H, ArH), 4.77 (s, 1H, CH), 4.56–4.62 (m, 1H, CH₂), 4.32–4.39 (m, 1H, CH₂), 3.81–3.88 (m, 2H, CH₂); ¹³C NMR (125 MHz, DMSO-d₆) (δ , ppm): 190.7, 181.6, 180.4, 156.4, 145.5, 140.1,

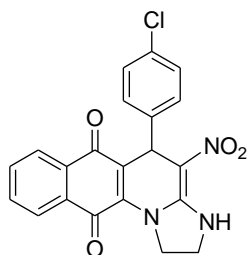
135.0, 134.1, 131.5, 130.2, 128.7, 128.0, 126.6, 125.8, 123.2, 87.1, 47.8, 44.3, 37.0; HRMS (ESI-TOF, $[M+H]^+$): calcd for $C_{28}H_{18}N_2O_3Cl_3$, 535.0383; found, 535.0378.



4-Acetyl-5-(4-chlorophenyl)-2,3-dihydrobenzo[g]imidazo[1,2-a]quinoline-6,11(1H,5H)-dione (4s). Red solid, mp. 242–243 °C; IR (KBr, ν , cm^{-1}): 3234 (NH), 1669 (C=O), 1644 (C=O), 1256 (C–N); 1H NMR (500 MHz, DMSO- d_6) (δ , ppm): 9.26 (s, 1H, NH), 7.27–7.95 (m, 8H, ArH), 5.20 (s, 1H, CH), 4.49–4.54 (m, 1H, CH_2), 4.20–4.27 (m, 1H, CH_2), 3.70–3.76 (m, 2H, CH_2), 1.89 (s, 3H, CH_3); ^{13}C NMR (125 MHz, DMSO- d_6) (δ , ppm): 192.7, 181.6, 180.6, 154.7, 145.8, 139.7, 134.9, 133.7, 131.7, 131.4, 130.2, 128.7, 126.5, 125.6, 122.0, 87.4, 47.5, 43.8, 37.1, 27.1; HRMS (ESI-TOF, $[M+H]^+$): calcd for $C_{23}H_{18}N_2O_3Cl$, 405.1006; found, 405.1015.

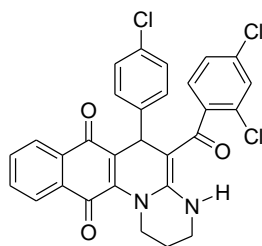


4-Acetyl-5-(p-tolyl)-2,3-dihydrobenzo[g]imidazo[1,2-a]quinoline-6,11(1H,5H)-dione (4t). Black solid, mp. 235–236 °C; IR (KBr, ν , cm^{-1}): 3275 (NH), 1655 (C=O), 1258 (C–N); 1H NMR (500 MHz, DMSO- d_6) (δ , ppm): 9.26 (s, 1H, NH), 7.04–7.98 (m, 8H, ArH), 5.19 (s, 1H, CH), 4.53–4.58 (m, 1H, CH_2), 4.22–4.28 (m, 1H, CH_2), 3.73–3.81 (m, 2H, CH_2), 2.20 (s, 3H, CH_3), 1.93 (s, 3H, CH_3); ^{13}C NMR (125 MHz, DMSO- d_6) (δ , ppm): 192.4, 181.2, 180.3, 154.2, 143.5, 138.9, 135.4, 134.4, 133.2, 131.2, 130.8, 128.8, 127.7, 126.0, 125.1, 122.4, 87.2, 46.9, 43.3, 36.6, 26.6, 20.5; HRMS (ESI-TOF, $[M+H]^+$): calcd for $C_{24}H_{20}N_2O_3$, 385.1552; found, 385.1561.

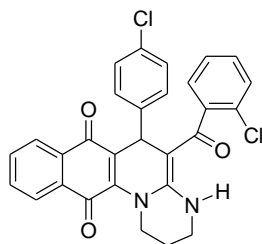


5-(4-Chlorophenyl)-4-nitro-2,3-dihydrobenzo[g]imidazo[1,2-a]quinoline-6,11(1H,5H)-dione (4u). Red solid, mp. 282–283 °C; IR (KBr, ν , cm^{-1}): 3353 (NH), 1672 (C=O), 1647 (C=O), 1345 (NO_2); 1H NMR (500 MHz, DMSO- d_6) (δ , ppm): 9.68 (s, 1H, NH), 7.27–8.02 (m, 8H, ArH), 5.45 (s, 1H, CH), 4.64–4.69 (m, 1H, CH_2), 4.47–4.53 (m, 1H, CH_2), 3.87–3.90 (m, 2H, CH_2); ^{13}C NMR (125 MHz, DMSO- d_6) (δ , ppm): 190.3, 189.1, 161.6, 151.6, 148.2, 144.0, 143.1, 140.8, 140.4, 139.7, 137.5, 135.7, 134.8, 131.3, 115.5, 57.7, 53.8, 47.2; HRMS (ESI-TOF, $[M+H]^+$): calcd for

$C_{21}H_{15}N_3O_4Cl$, 408.0751; found, 408.0759.

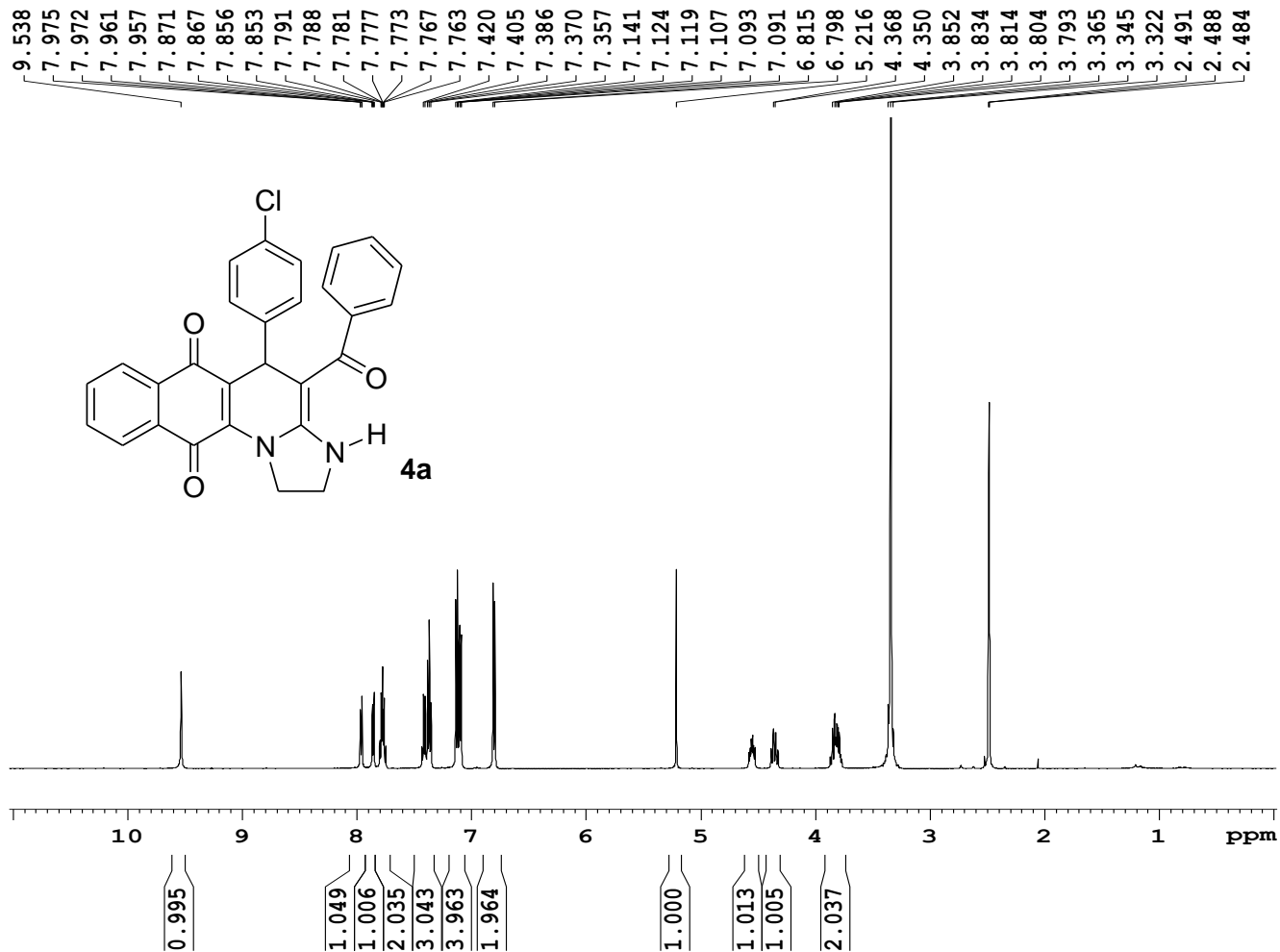


6-(4-Chlorophenyl)-5-(2,4-dichlorobenzoyl)-3,4-dihydro-1H-benzo[g]pyrimido[1,2-a]quinoline-7,12(2H,6H)-dione (5a). Red solid, mp 255–256 °C. IR (KBr, ν , cm^{-1}): 3308 (NH), 1669 (C=O), 1636 (C=O); 1H NMR (500 MHz, DMSO- d_6) (δ , ppm): 11.65 (s, 1H, NH), 6.68–7.93 (m, 11H, ArH), 4.64 (s, 1H, CH), 4.52–4.58 (m, 1H, CH_2), 3.75–3.79 (m, 1H, CH_2), 2.96–3.02 (m, 2H, CH_2), 2.19–2.25 (m, 1H, CH_2), 1.97–2.05 (m, 1H, CH_2); ^{13}C NMR (125 MHz, DMSO- d_6) (δ , ppm): 184.8, 182.6, 180.9, 156.5, 144.0, 140.9, 139.6, 134.2, 133.7, 132.9, 130.8, 130.4, 129.3, 128.7, 127.8, 127.0, 125.8, 88.5, 46.2, 44.9, 35.8, 22.1; HRMS (ESI-TOF, $[M+H]^+$): calcd for $C_{29}H_{20}N_2O_3Cl_3$, 549.0540; found, 549.0542.



5-(2-Chlorobenzoyl)-6-(4-chlorophenyl)-3,4-dihydro-1H-benzo[g]pyrimido[1,2-a]quinoline-7,12(2H,6H)-dione (5b). Red solid. mp. 248–249 °C; IR (KBr, ν , cm^{-1}): 3205 (NH), 1713 (C=O), 1649 (C=O), 1253 (C–N); 1H NMR (500 MHz, DMSO- d_6) (δ , ppm): 11.73 (s, 1H, NH), 6.69–7.95 (m, 12H, ArH), 4.71 (s, 1H, CH), 4.54–4.59 (m, 1H, CH_2), 3.79–3.82 (m, 1H, CH_2), 3.60–3.69 (m, 1H, CH_2), 3.60–3.69 (m, 1H, CH_2), 3.50–3.59 (m, 1H, CH_2), 2.20–2.31 (m, 1H, CH_2), 2.00–2.10 (m, 1H, CH_2), ^{13}C NMR (125 MHz, DMSO- d_6) (δ , ppm): 186.2, 182.5, 181.0, 156.4, 144.2, 140.9, 134.4, 134.1, 132.9, 131.4, 130.9, 130.3, 130.1, 129.4, 128.9, 128.6, 128.5, 127.7, 127.4, 127.2, 126.9, 125.6, 88.5, 46.0, 36.1, 35.7, 22.1; HRMS (ESI-TOF, $[M+H]^+$): calcd for $C_{29}H_{21}N_2O_3Cl$, 515.0929; found, 515.0935.

SQC-4-a 1H 2011 11 10



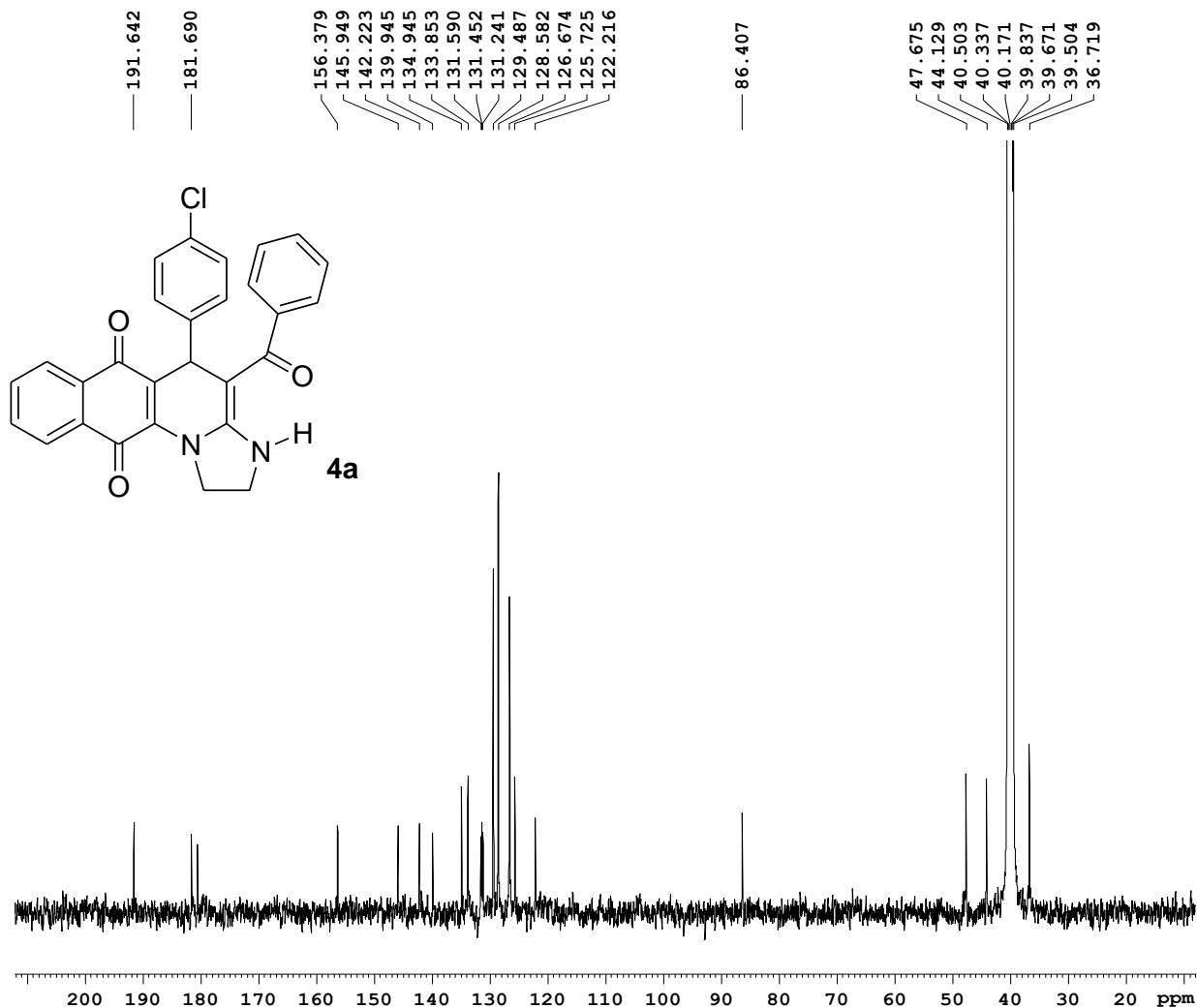
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PROCNO        1
Date_         20111110
Time_         19.56
INSTRUM       av500
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            32768
SOLVENT       DMSO
NS            4
DS            1
SWH           10000.000 Hz
FIDRES        0.305176 Hz
AQ            1.6385000 sec
RG            287
DW            50.000 usec
DE            6.00 usec
TE            295.8 K
D1            2.00000000 sec
TD0           1
    
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```

===== CHANNEL f1 =====
NUC1          1H
P1            13.50 usec
PL1           2.20 dB
SFO1          500.0335010 MHz
SI            16384
SF            500.0300080 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            2.00
    
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sqc-4-a 13C 1D 2011 11 15

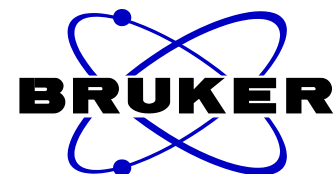
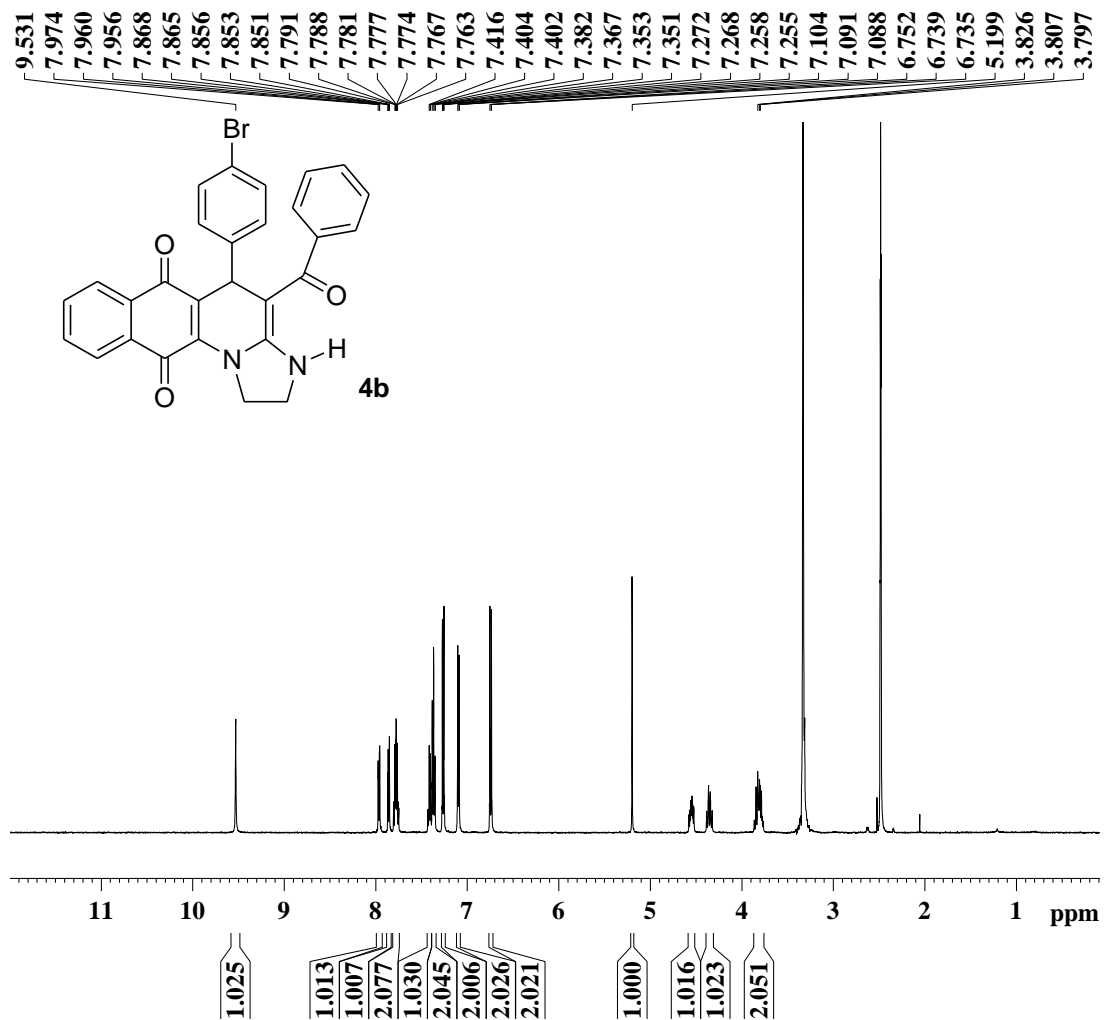


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NAME          SQC-4-a
EXPNO         2
PROCNO        1
Date_         20111115
Time          14.14
INSTRUM       av500
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       DMSO
NS            1482
DS            2
SWH           32679.738 Hz
FIDRES        0.498653 Hz
AQ            1.0027661 sec
RG            18400
DW            15.300 usec
DE            6.00 usec
TE            297.6 K
D1            2.00000000 sec
d11           0.03000000 sec
DELTA         1.89999998 sec
TD0           1
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```
===== CHANNEL f1 =====
NUC1           13C
P1             9.60 usec
PL1            2.00 dB
SFO1          125.7464750 MHz
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```
===== CHANNEL f2 =====
CPDPRG2       waltz16
NUC2           1H
PCPD2         80.00 usec
PL2            2.20 dB
PL12          17.66 dB
PL13          17.66 dB
SFO2          500.0355000 MHz
SI            32768
SF            125.7326387 MHz
WDW            EM
SSB            0
LB             6.00 Hz
GB            0
PC             2.00
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sqc-4-C 1H 2011 11 23

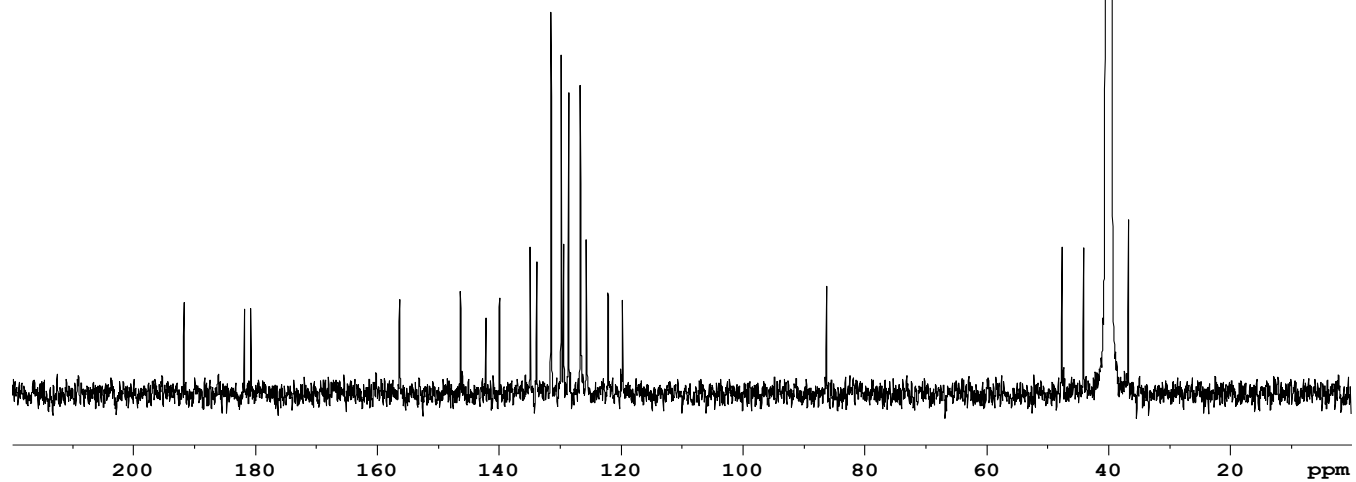
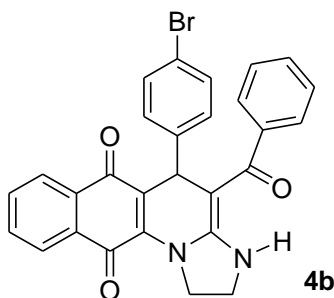


NAME sqc-4-C
EXPNO 1
PROCNO 1
Date_ 20111123
Time 16.04
INSTRUM av500
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT DMSO
NS 4
DS 1
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 1.6385000 sec
RG 322
DW 50.000 usec
DE 6.00 usec
TE 295.1 K
D1 2.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 13.50 usec
PL1 2.20 dB
SFO1 500.0335010 MHz
SI 16384
SF 500.0300101 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 2.00

sqc-4-C 13C 1D 2011 11 28

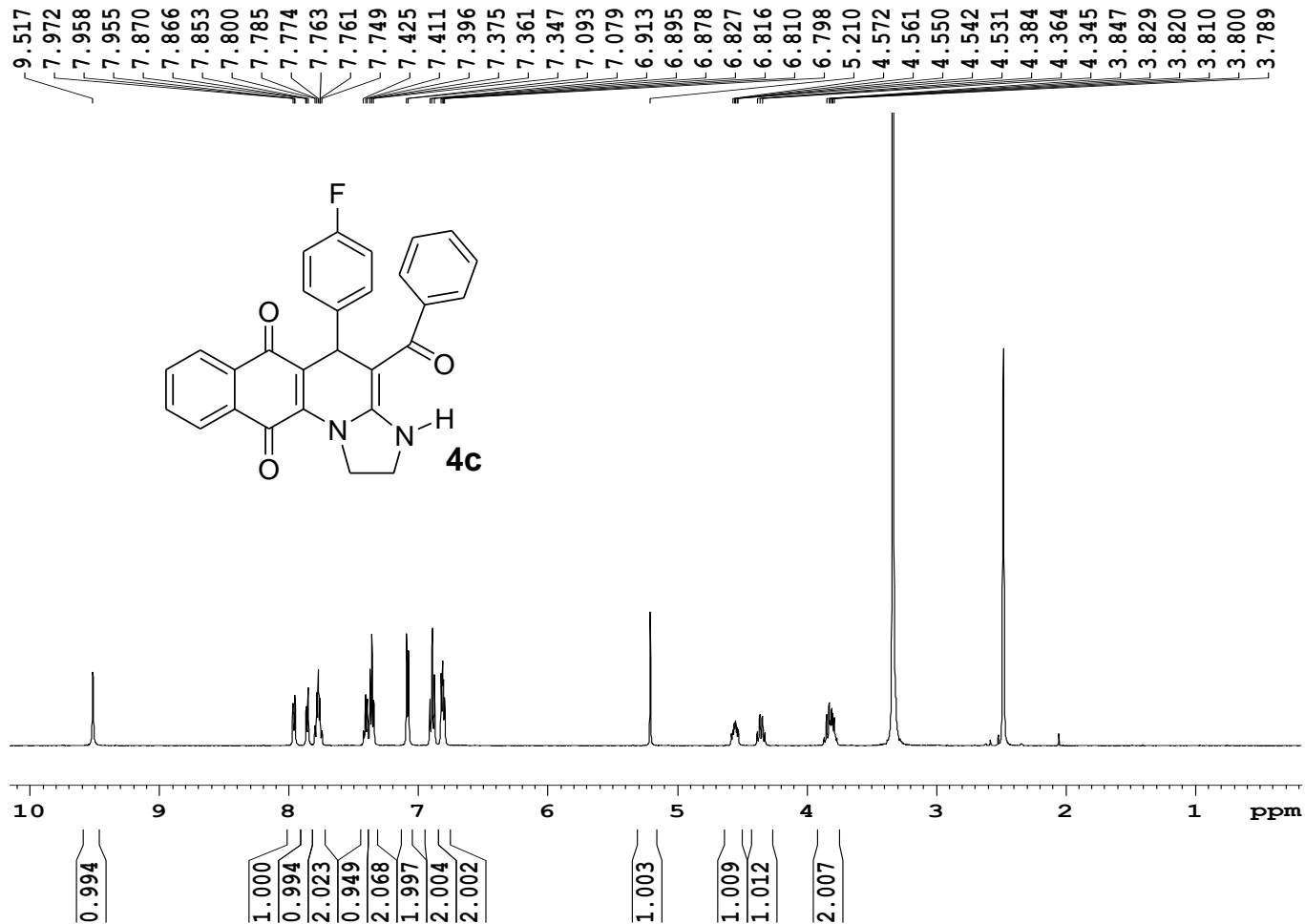
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180.625
156.381
146.351
142.205
139.968
134.948
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131.499
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129.436
128.625
126.688
125.730
122.143
119.801
86.316
47.678
44.134
36.781



NAME sqc-4-C
EXPNO 2
PROCNO 1
Date_ 20111128
Time 9.42
INSTRUM av500
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 2972
DS 2
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 sec
RG 18400
DW 15.300 usec
DE 6.00 usec
TE 297.7 K
D1 2.0000000 sec
d11 0.0300000 sec
DELTA 1.89999998 sec
TD0 1

===== CHANNEL f1 =====
NUC1 13C
P1 9.60 usec
PL1 2.00 dB
SFO1 125.7464750 MHz
===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.20 dB
PL12 17.66 dB
PL13 17.66 dB
SFO2 500.0355000 MHz
SI 32768
SF 125.7326387 MHz
WDW EM
SSB 0
LB 6.00 Hz
GB 0
PC 2.00

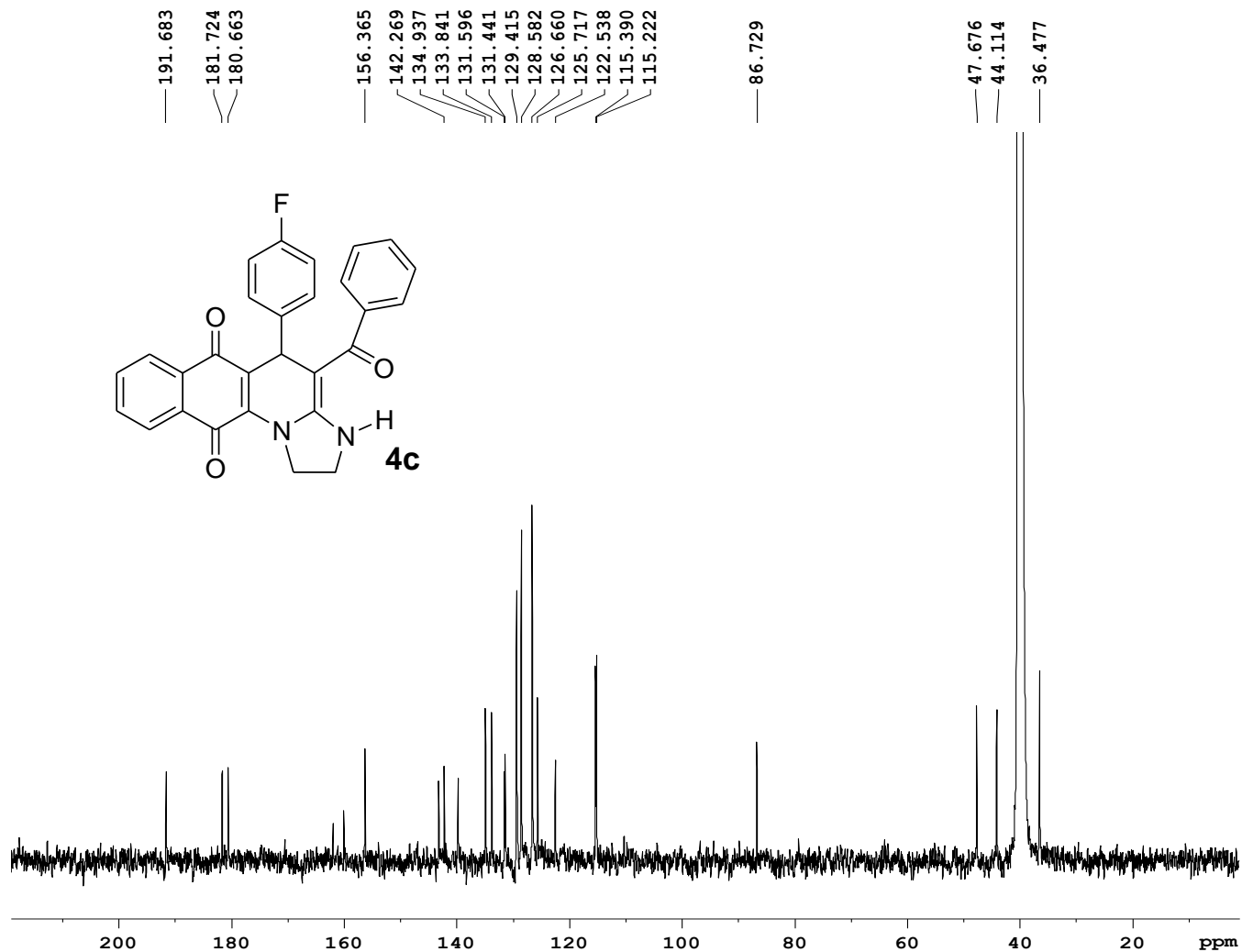
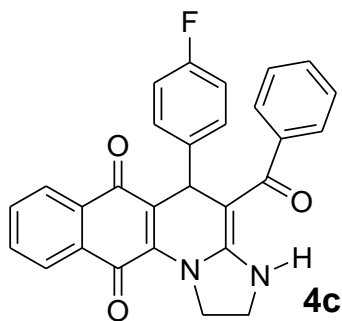
sqc-4-G 1H 2011 11 28



NAME sqc-4-G
EXPNO 1
PROCNO 1
Date_ 20111128
Time_ 19.49
INSTRUM av500
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT DMSO
NS 4
DS 1
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 1.6385000 sec
RG 322
DW 50.000 usec
DE 6.00 usec
TE 296.4 K
D1 2.00000000 sec
TDO 1

===== CHANNEL f1 =====
NUC1 1H
P1 13.50 usec
PL1 2.20 dB
SFO1 500.0335010 MHz
SI 16384
SF 500.0300101 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 2.00

sqc-4-g 13C 1D 2011 12 01

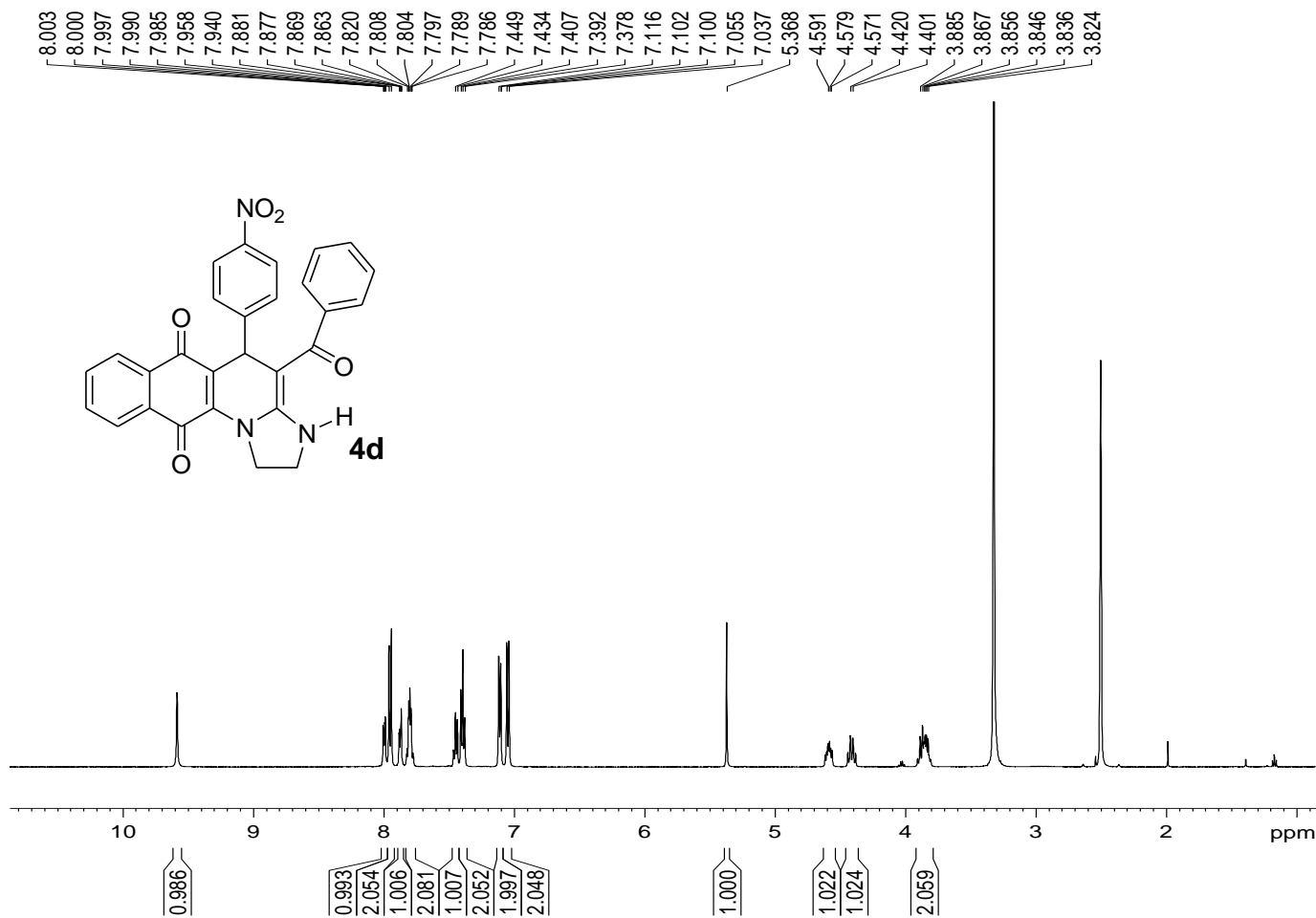


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NAME          sqc-4-g
EXPNO         2
PROCNO        1
Date_         20111201
Time          8.51
INSTRUM       av500
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       DMSO
NS            3169
DS            2
SWH           32679.738 Hz
FIDRES        0.498653 Hz
AQ            1.0027661 sec
RG            18400
DW            15.300 usec
DE            6.00 usec
TE            295.2 K
D1            2.0000000 sec
d11           0.0300000 sec
DELTA         1.89999998 sec
TD0           1
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```
===== CHANNEL f1 =====
NUC1          13C
P1            9.60 usec
PL1           2.00 dB
SFO1          125.7464750 MHz
```

```
===== CHANNEL f2 =====
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           2.20 dB
PL12          17.66 dB
PL13          17.66 dB
SFO2          500.0355000 MHz
SI            32768
SF            125.7326387 MHz
WDW           EM
SSB           0
LB            6.00 Hz
GB            0
PC            2.00
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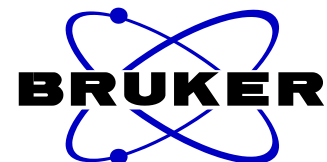
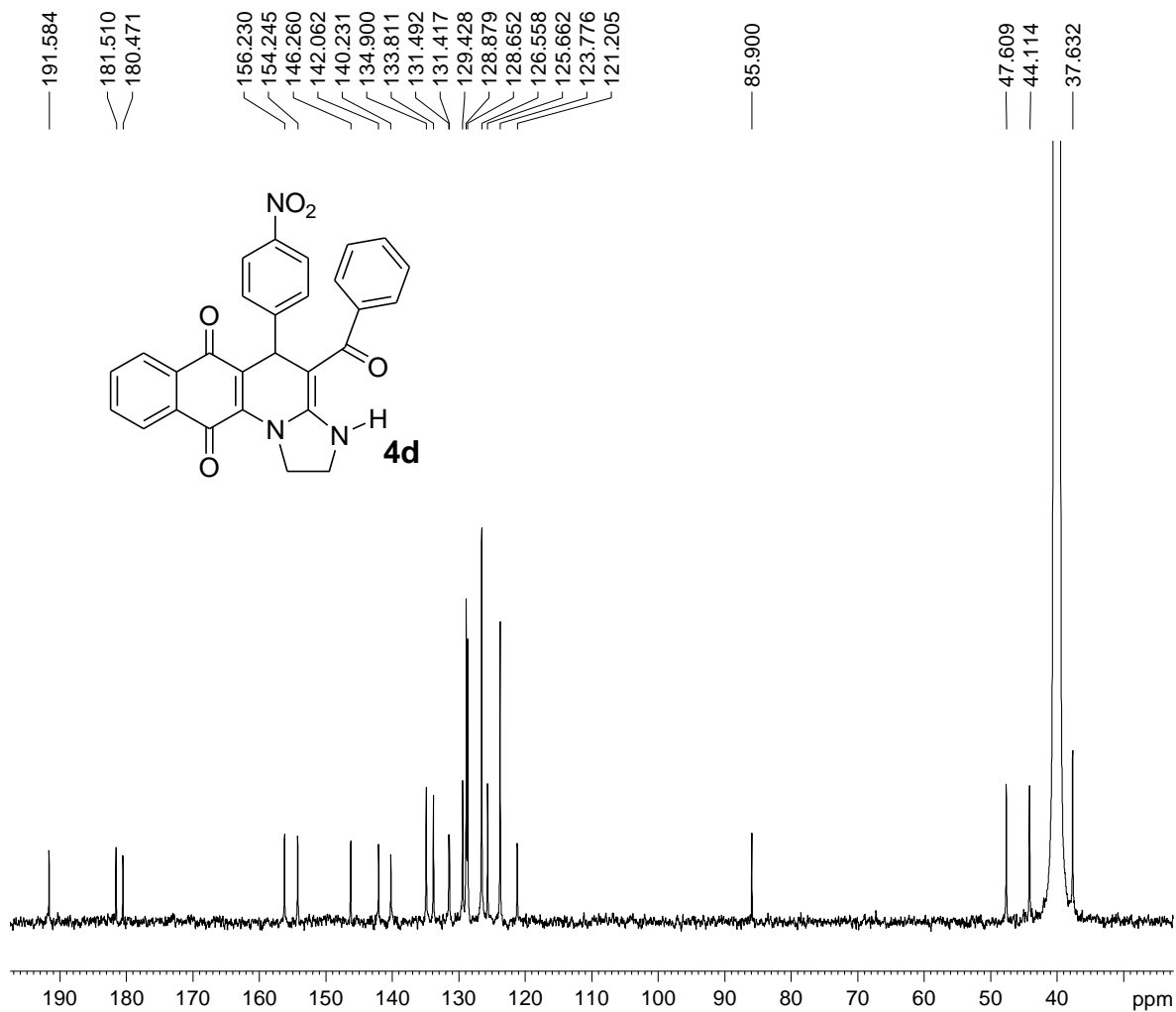
1-e-0628 1H 2012 06



NAME Sqc-4-e-0626
EXPNO 1
PROCNO 1
Date_ 20120628
Time_ 13.28
INSTRUM av500
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT DMSO
NS 16
DS 1
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 1.6385000 sec
RG 203
DW 50.000 usec
DE 6.00 usec
TE 300.7 K
D1 2.00000000 sec
TD0 1

==== CHANNEL f1 =====
NUC1 1H
P1 13.50 usec
PL1 2.20 dB
SFO1 500.0335010 MHz
SI 16384
SF 500.0300015 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 2.00

-4-e1 13C 1D 2012 07

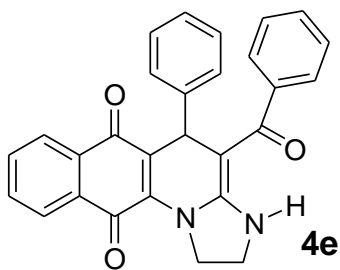
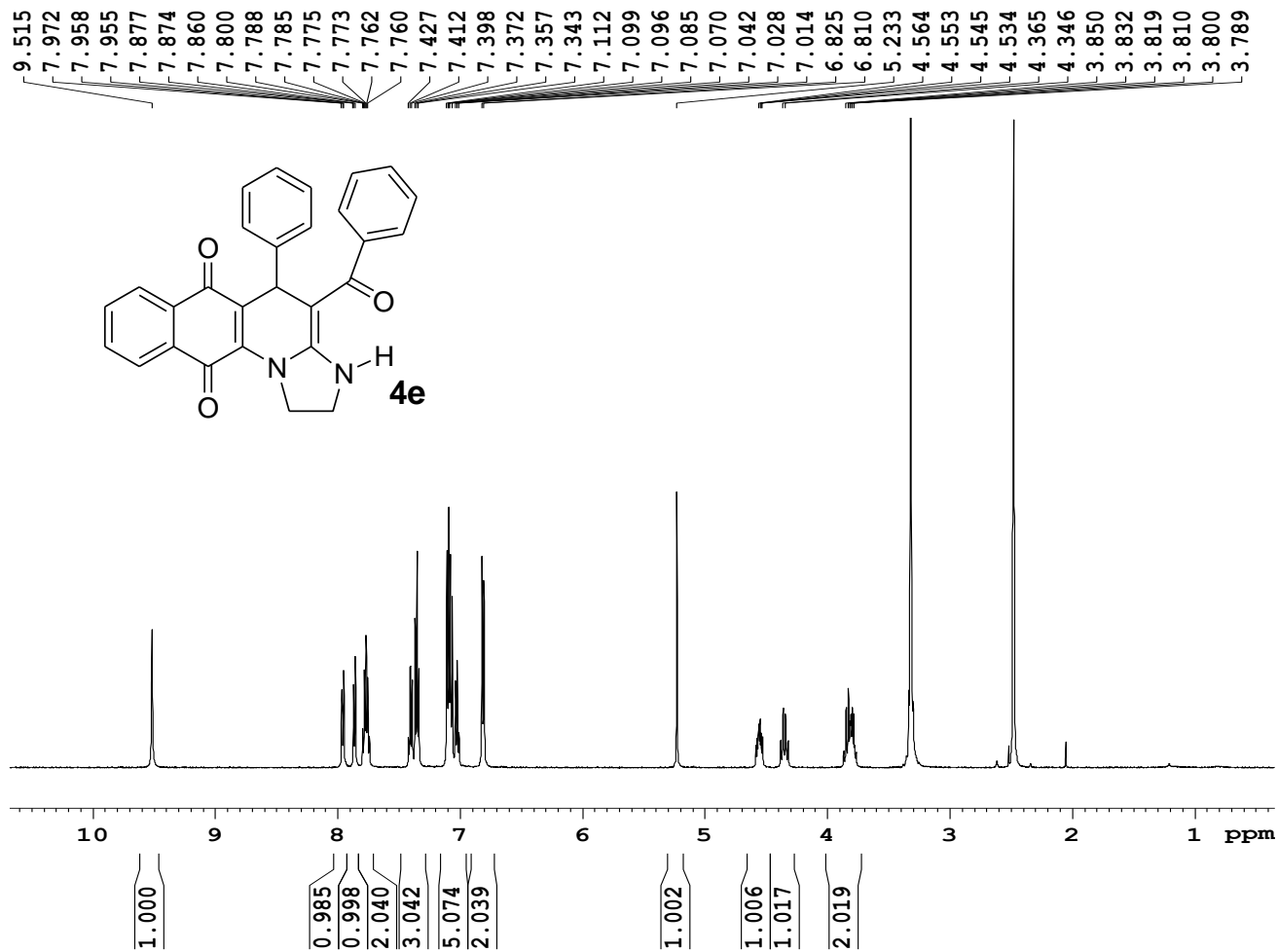


NAME SQC-4-e1
EXPNO 21
PROCNO 1
Date_ 20120723
Time 20.58
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 12395
DS 2
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 sec
RG 912
DW 15.300 usec
DE 6.00 usec
TE 298.4 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 80

==== CHANNEL f1 =====
NUC1 13C
P1 12.20 usec
PL1 3.00 dB
SFO1 125.7464750 MHz

==== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PT2 2.00 dB

sqc-4-B 1H 2011 11 17

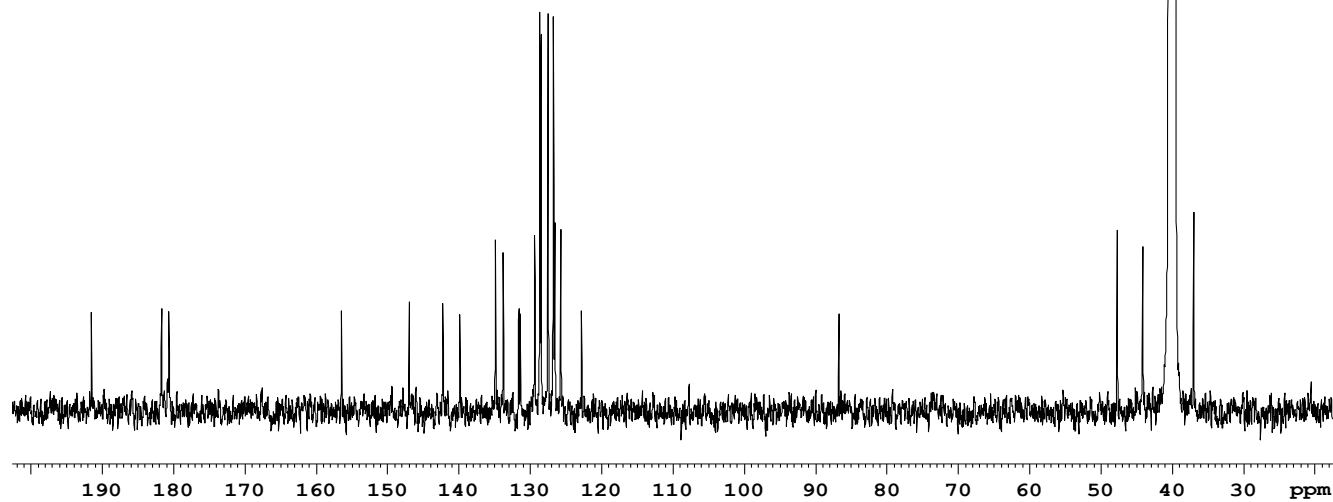
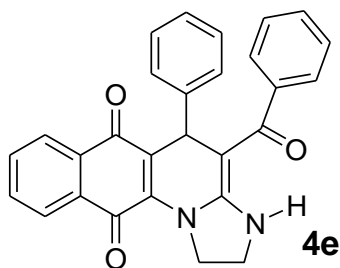


NAME sqc-4-B
EXPNO 1
PROCNO 1
Date_ 20111117
Time_ 22.05
INSTRUM av500
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT DMSO
NS 4
DS 1
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 1.6385000 sec
RG 322
DW 50.000 usec
DE 6.00 usec
TE 296.3 K
D1 2.00000000 sec
TD0 1

==== CHANNEL f1 =====
NUC1 1H
P1 13.50 usec
PL1 2.20 dB
SFO1 500.0335010 MHz
SI 16384
SF 500.0300101 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 2.00

sqc-4-b 13C 1D 2011 11 19

191.586
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 180.693
 156.508
 146.984
 142.262
 139.888
 134.910
 133.802
 131.618
 131.434
 129.367
 128.676
 128.513
 127.519
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 126.559
 125.719
 122.820
 86.723
 47.668
 44.093
 36.957



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NAME          sqc-4-B
EXPNO         2
PROCNO        1
Date_         20111119
Time_         13.22
INSTRUM       av500
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       DMSO
NS            1216
DS            2
SWH           32679.738 Hz
FIDRES        0.498653 Hz
AQ            1.0027661 sec
RG            18400
DW            15.300 usec
DE            6.00 usec
TE            298.0 K
D1            2.00000000 sec
d11           0.03000000 sec
DELTA         1.89999998 sec
TD0           1
    
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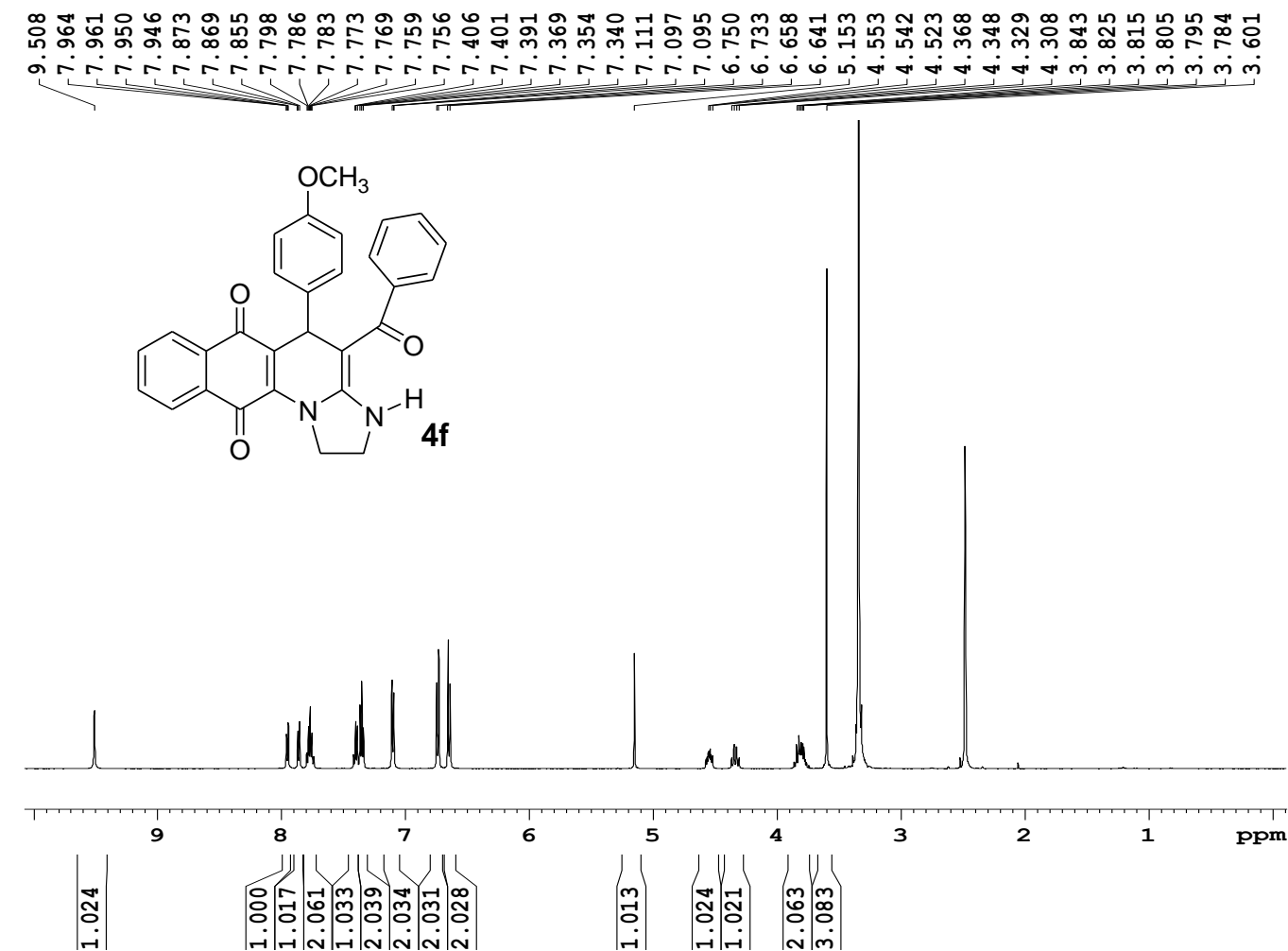
```

===== CHANNEL f1 =====
NUC1          13C
P1            9.60 usec
PL1           2.00 dB
SFO1         125.7464750 MHz
    
```

```

===== CHANNEL f2 =====
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           2.20 dB
PL12          17.66 dB
PL13          17.66 dB
SFO2         500.0355000 MHz
SI            32768
SF           125.7326413 MHz
WDW           EM
SSB           0
LB            6.00 Hz
GB            0
PC            2.00
    
```

sqc-4-D 1H 2011 11 23



```

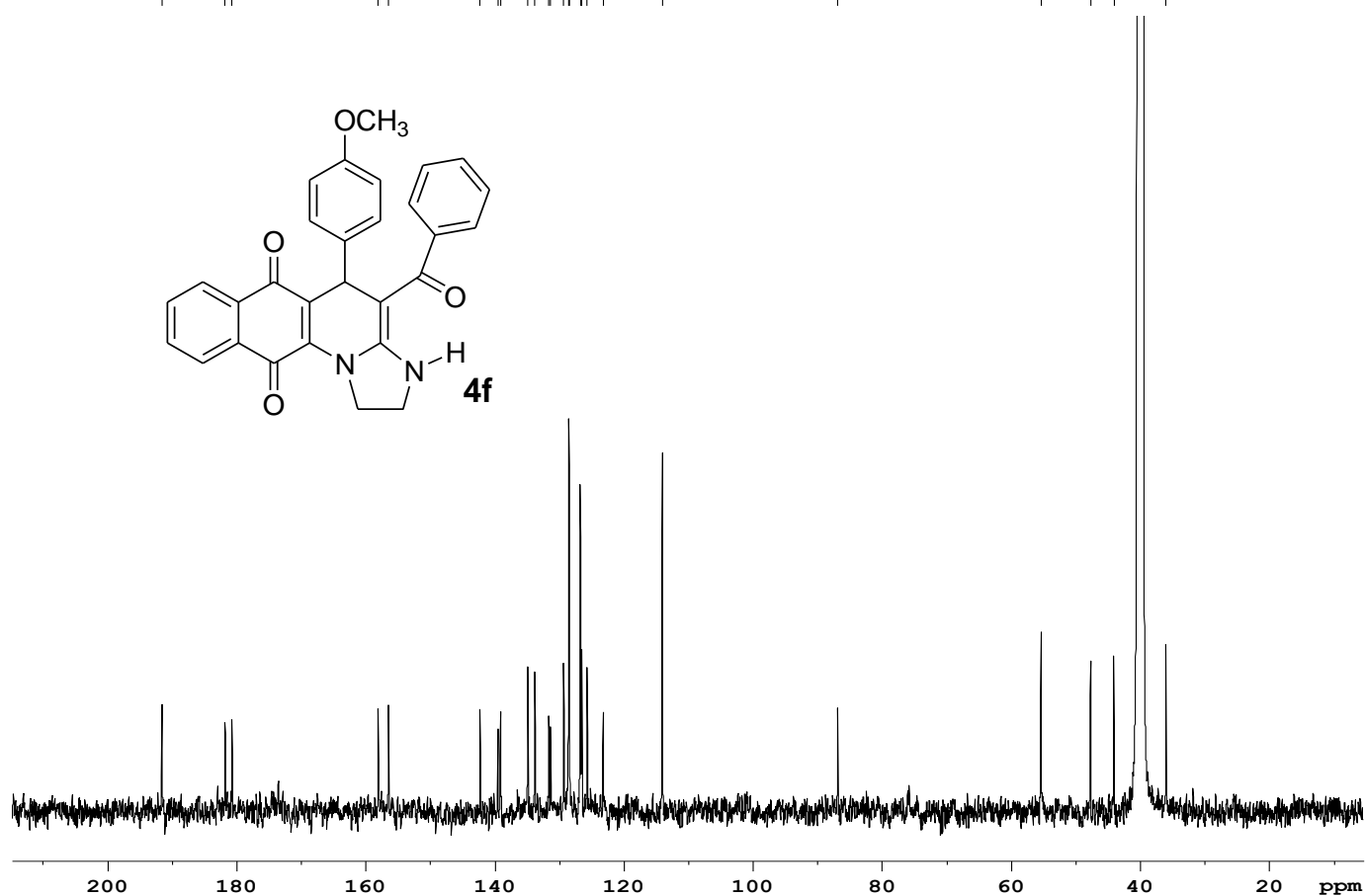
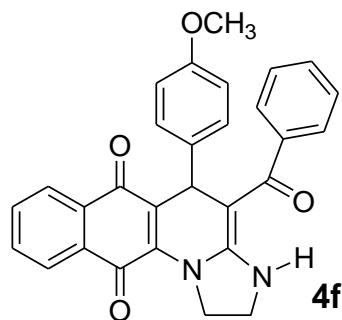
NAME          sqc-4-D
EXPNO         1
PROCNO        1
Date_         20111123
Time_         19.43
INSTRUM       av500
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            32768
SOLVENT       DMSO
NS            4
DS            1
SWH           10000.000 Hz
FIDRES        0.305176 Hz
AQ            1.6385000 sec
RG            322
DW            50.000 usec
DE            6.00 usec
TE            294.7 K
D1            2.00000000 sec
TD0           1
    
```

```

===== CHANNEL f1 =====
NUC1          1H
P1            13.50 usec
PL1           2.20 dB
SFO1          500.0335010 MHz
SI            16384
SF            500.0300101 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            2.00
    
```

sqc-4-D 13C 1D 2011 11 28

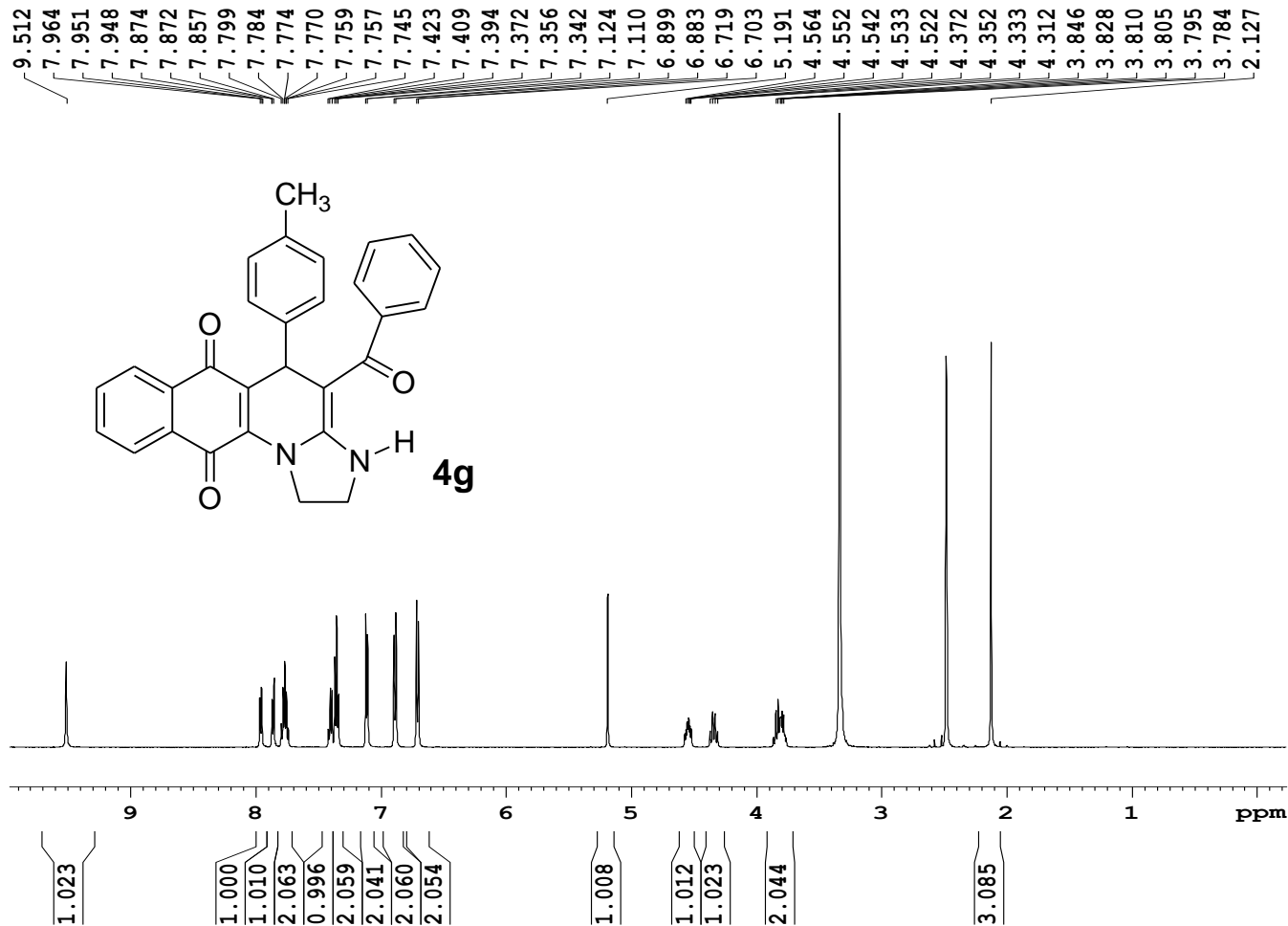
191.631
181.828
180.760
158.103
156.530
142.307
139.524
139.169
134.922
133.814
131.649
131.426
129.352
128.589
128.495
126.783
126.550
125.719
123.252
114.076
86.896
55.383
47.694
44.094
36.029



NAME sqc-4-D
EXPNO 2
PROCNO 1
Date_ 20111128
Time 10.07
INSTRUM av500
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 2639
DS 2
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 sec
RG 18400
DW 15.300 usec
DE 6.00 usec
TE 297.9 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1

==== CHANNEL f1 =====
NUC1 13C
P1 9.60 usec
PL1 2.00 dB
SFO1 125.7464750 MHz
==== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.20 dB
PL12 17.66 dB
PL13 17.66 dB
SFO2 500.0355000 MHz
SI 32768
SF 125.7326387 MHz
WDW EM
SSB 0
LB 6.00 Hz
GB 0
PC 2.00

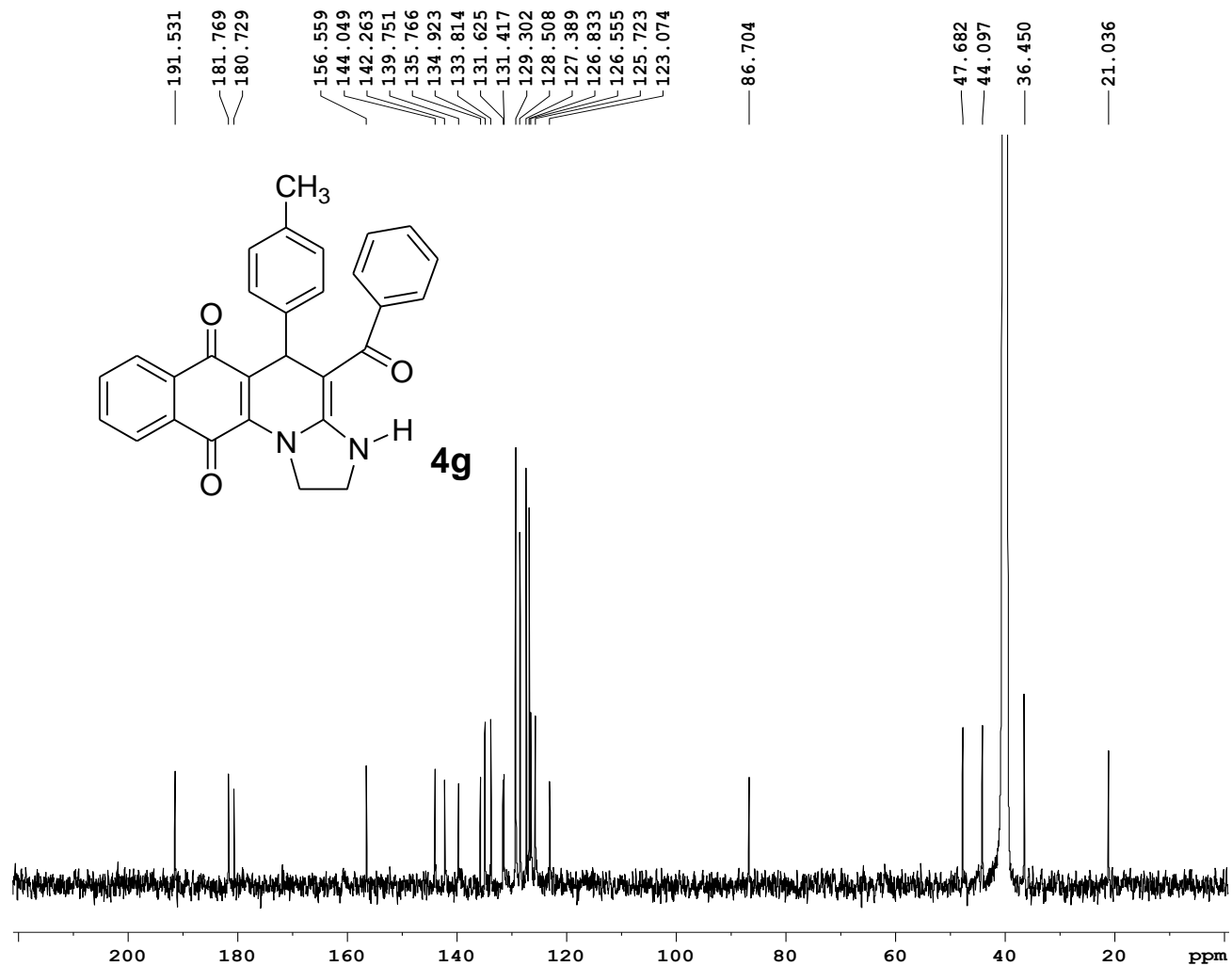
sqc-4-F 1H 2011 11 28



NAME sqc-4-F
EXPNO 1
PROCNO 1
Date_ 20111128
Time_ 19.56
INSTRUM av500
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT DMSO
NS 4
DS 1
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 1.6385000 sec
RG 322
DW 50.000 usec
DE 6.00 usec
TE 296.3 K
D1 2.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 13.50 usec
PL1 2.20 dB
SFO1 500.0335010 MHz
SI 16384
SF 500.0300101 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 2.00

sqc-4-F 13C 1D 2011 12 01

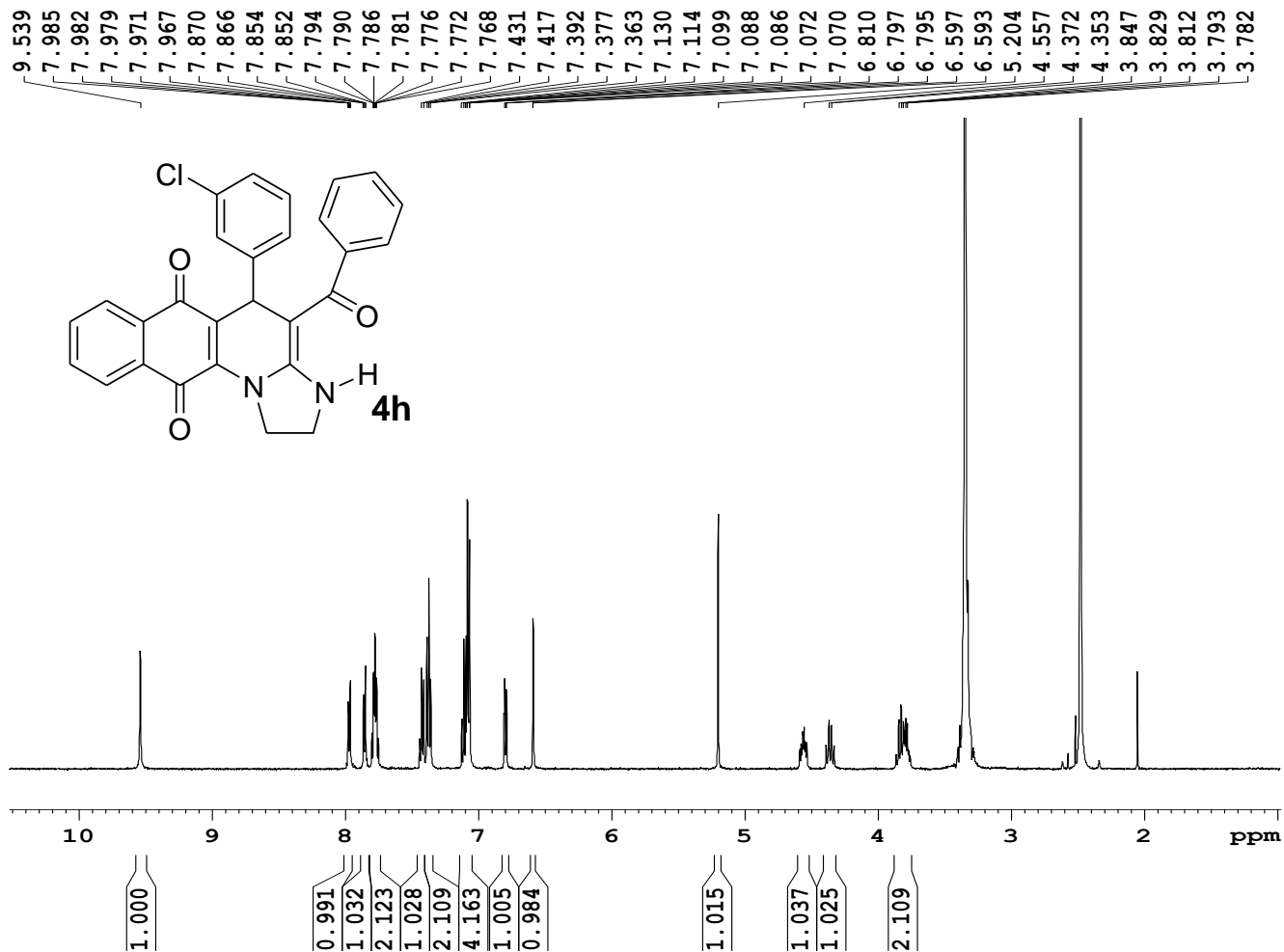


NAME sqc-4-F
EXPNO 2
PROCNO 1
Date_ 20111201
Time 13.52
INSTRUM av500
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 2180
DS 2
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 sec
RG 18400
DW 15.300 usec
DE 6.00 usec
TE 295.6 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1

==== CHANNEL f1 =====
NUC1 13C
P1 9.60 usec
PL1 2.00 dB
SFO1 125.7464750 MHz

==== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.20 dB
PL12 17.66 dB
PL13 17.66 dB
SFO2 500.0355000 MHz
SI 32768
SF 125.7326387 MHz
WDW EM
SSB 0
LB 6.00 Hz
GB 0
PC 2.00

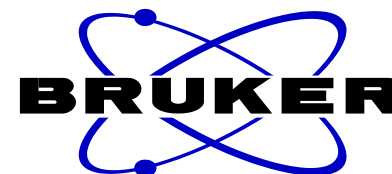
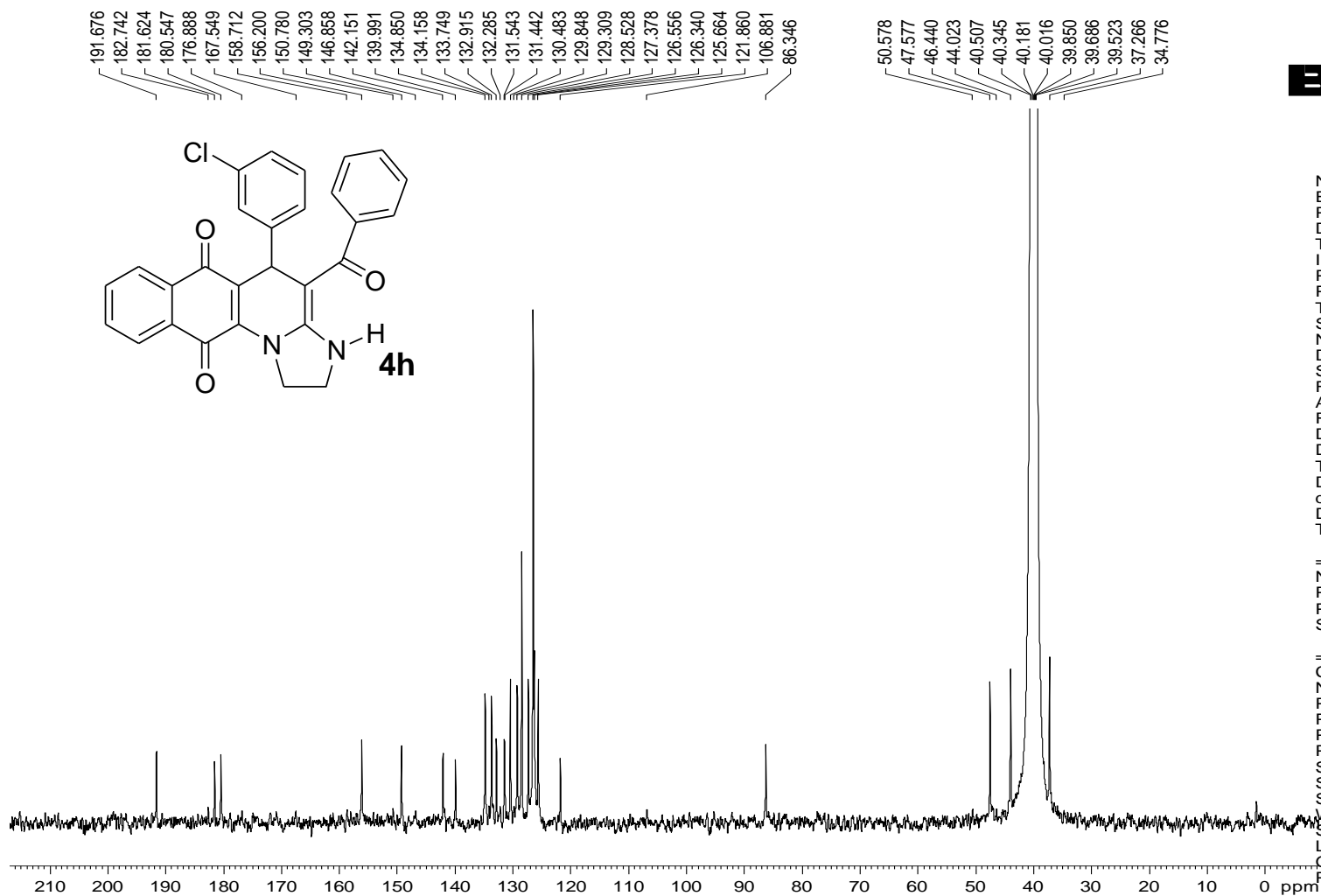
sqc-4-H 1H 2011 12 02



NAME sqc-4-H
EXPNO 1
PROCNO 1
Date_ 20111202
Time_ 21.24
INSTRUM av500
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT DMSO
NS 4
DS 1
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 1.6385000 sec
RG 322
DW 50.000 usec
DE 6.00 usec
TE 292.3 K
D1 2.0000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 13.50 usec
PL1 2.20 dB
SFO1 500.0335010 MHz
SI 16384
SF 500.0300101 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 2.00

SQC-4-HZ 13C 1D 2012 09 30

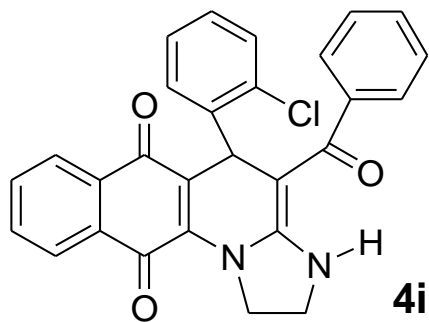
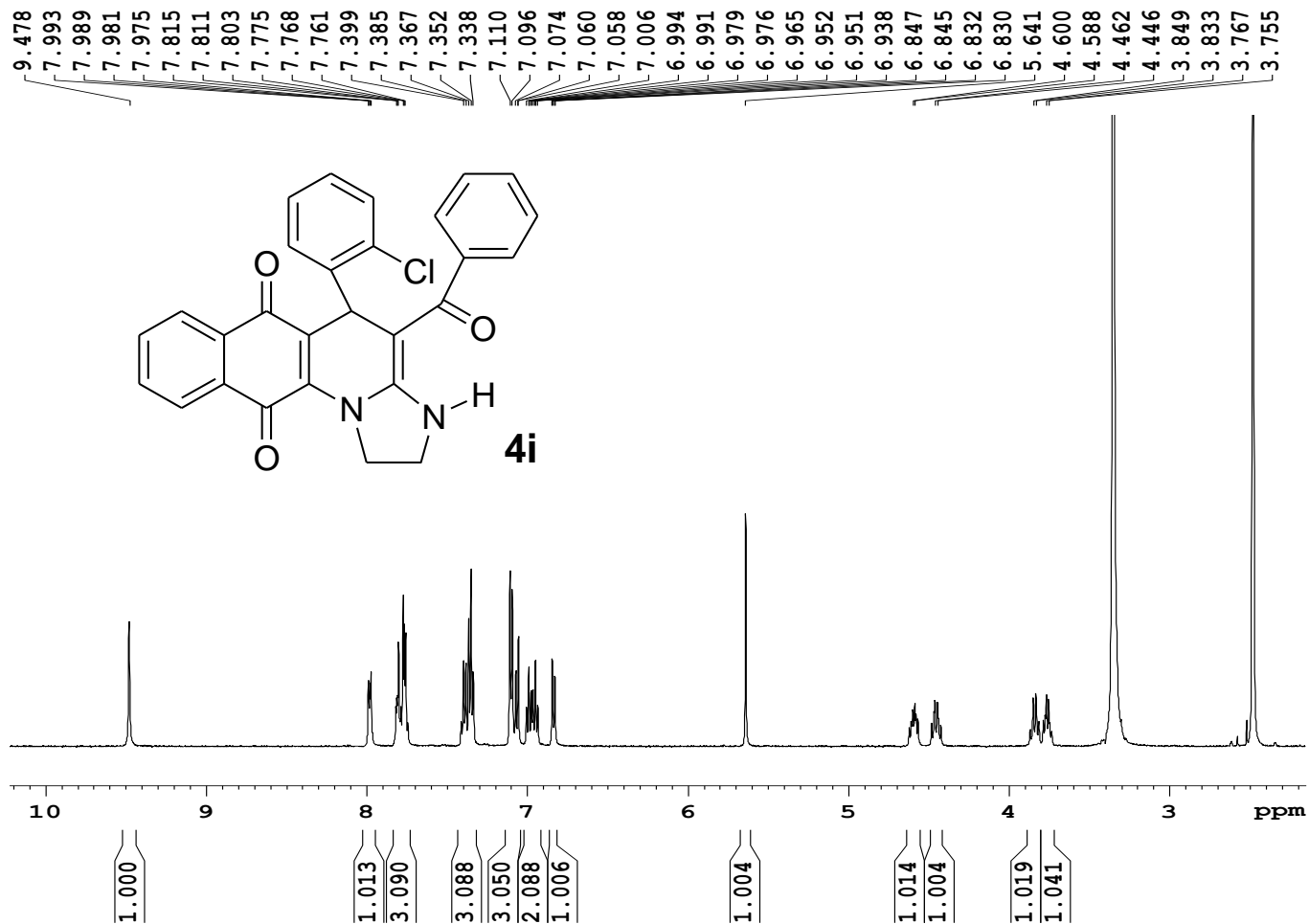


NAME SQC-4-HZ
EXPNO 2
PROCNO 1
Date_ 20121001
Time_ 7.41
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 20000
DS 2
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 sec
RG 512
DW 15.300 usec
DE 6.00 usec
TE 302.4 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1

===== CHANNEL f1 =====
NUC1 13C
P1 12.20 usec
PL1 3.00 dB
SFO1 125.7464750 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.00 dB
PL12 17.70 dB
PL13 17.70 dB
SFO2 500.0355000 MHz
SI 32768
SF 125.7326497 MHz
WDW EM
SSB 0
LB 12.00 Hz
GB 0
PC 1.00

sqc-4-i 1H 2011 12 02



NAME sqc-4-i
EXPNO 1
PROCNO 1
Date_ 20111202
Time 21.29
INSTRUM av500
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT DMSO
NS 4
DS 1
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 1.6385000 sec
RG 322
DW 50.000 usec
DE 6.00 usec
TE 292.4 K
D1 2.00000000 sec
TDO 1

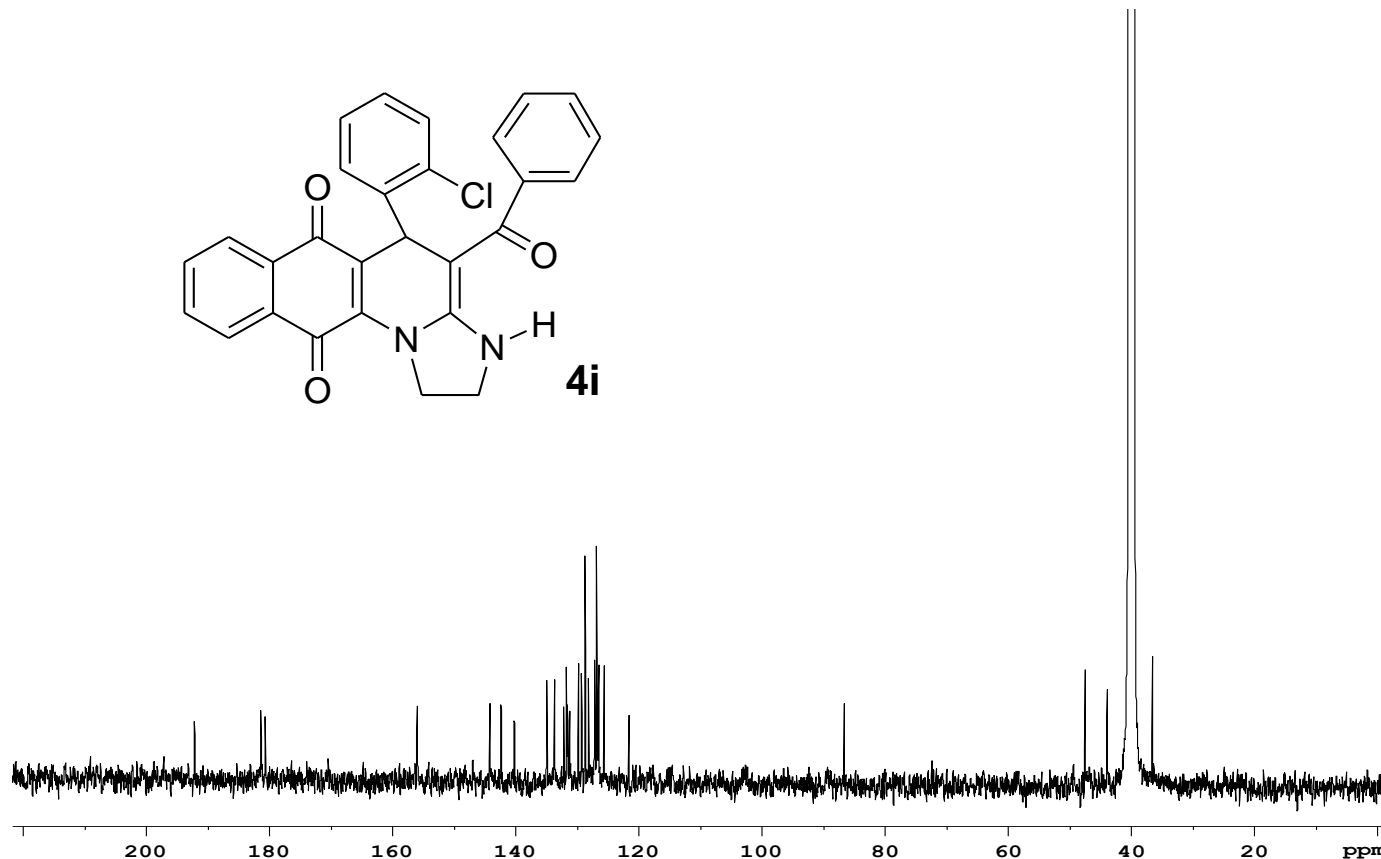
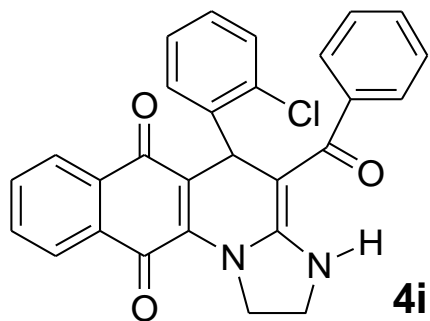
===== CHANNEL f1 =====
NUC1 1H
P1 13.50 usec
PL1 2.20 dB
SFO1 500.0335010 MHz
SI 16384
SF 500.0300101 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 2.00

sqc-4-I

13C 1D 2011 12 07

192.254
181.469
180.819
156.098
144.261
142.442
140.275
135.024
133.760
132.265
131.815
131.647
131.309
129.873
129.360
128.779
128.238
127.261
126.915
126.582
125.683
121.658
86.642

47.526
43.944
36.592



```
NAME          sqc-4-i
EXPNO         2
PROCNO        1
Date_         20111207
Time          9.42
INSTRUM       av500
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       DMSO
NS            2384
DS            2
SWH           32679.738 Hz
FIDRES        0.498653 Hz
AQ            1.0027661 sec
RG            18400
DW            15.300 usec
DE            6.00 usec
TE            296.1 K
D1            2.00000000 sec
d11           0.03000000 sec
DELTA         1.89999998 sec
TD0           1
```

```
===== CHANNEL f1 =====
NUC1          13C
P1            9.60 usec
PL1           2.00 dB
SFO1          125.7464750 MHz
```

```
===== CHANNEL f2 =====
CPDPRG2      waltz16
NUC2          1H
PCPD2        80.00 usec
PL2           2.20 dB
PL12         17.66 dB
PL13         17.66 dB
SFO2          500.0355000 MHz
SI            32768
SF           125.7326387 MHz
WDW           EM
SSB           0
LB            6.00 Hz
GB            0
PC            2.00
```

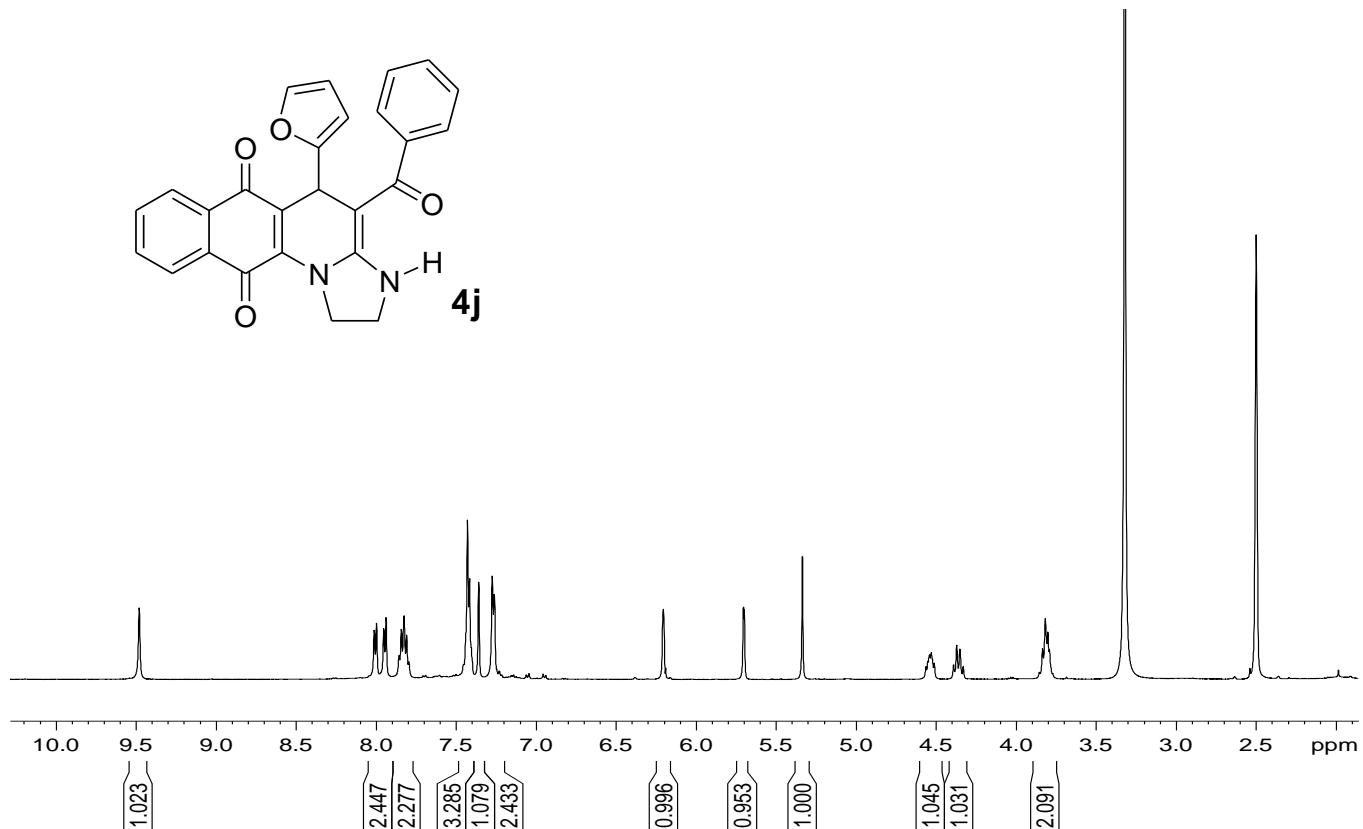
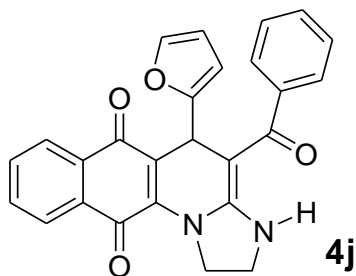
SQC-4-V

1H

2012 06



9.479
8.009
7.995
7.950
7.936
7.854
7.840
7.823
7.807
7.793
7.427
7.414
7.356
7.272
7.260
6.203
5.706
5.700
5.336
4.541
4.530
4.512
4.391
4.372
4.352
3.836
3.818
3.802
3.792

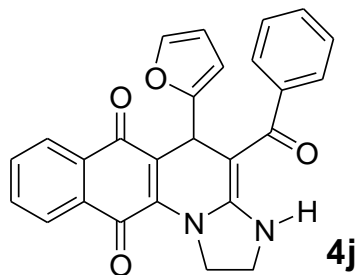


NAME SQC-4-V
EXPNO 1
PROCNO 1
Date_ 20120628
Time_ 13.50
INSTRUM av500
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT DMSO
NS 16
DS 1
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 1.6385000 sec
RG 256
DW 50.000 usec
DE 6.00 usec
TE 300.7 K
D1 2.00000000 sec
TDO 1

==== CHANNEL f1 =====
NUC1 1H
P1 13.50 usec
PL1 2.20 dB
SFO1 500.0335010 MHz
SI 16384
SF 500.030015 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 2.00

SQC-4-V 13C 1D 2012 07

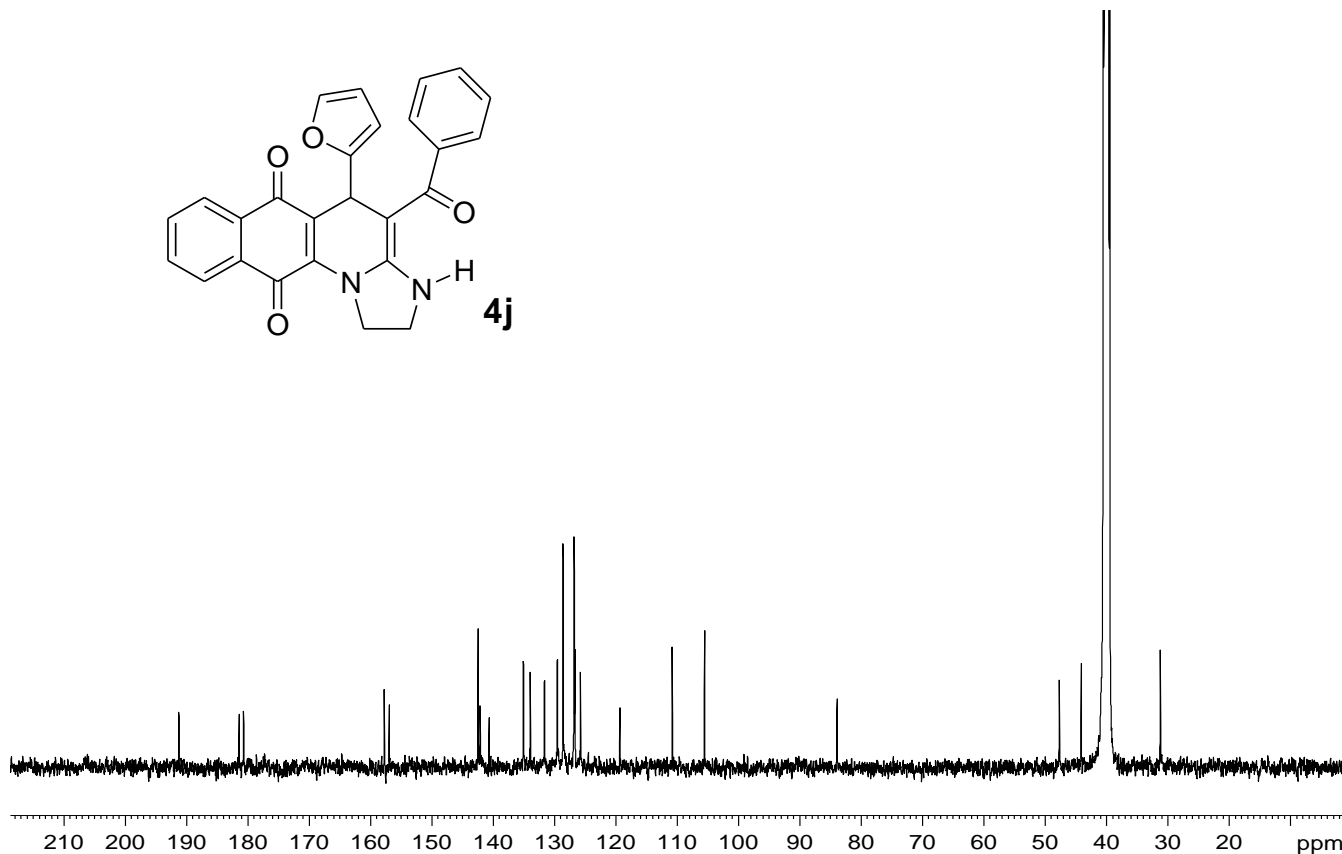
191.160
181.325
180.592
157.674
156.856
142.357
142.036
140.578
134.977
133.869
131.547
129.454
128.601
126.796
126.679
125.781
119.335
110.817
105.537
83.935
47.701
44.111
31.217

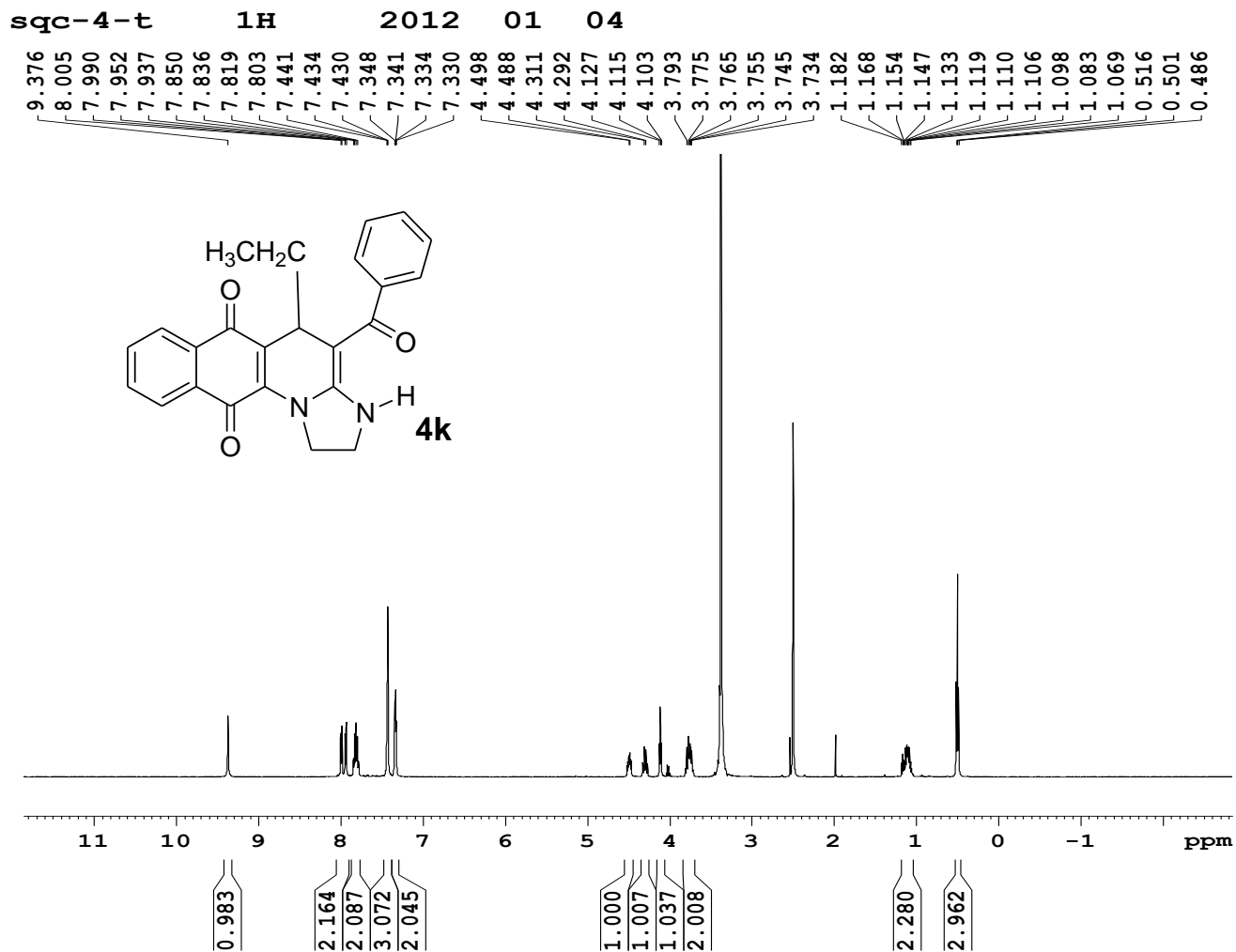


NAME SQC-4-V
EXPNO 2
PROCNO 1
Date_ 20120725
Time_ 11.43
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 1879
DS 2
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 sec
RG 1820
DW 15.300 usec
DE 6.00 usec
TE 298.0 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1

==== CHANNEL f1 =====
NUC1 13C
P1 12.20 usec
PL1 3.00 dB
SFO1 125.7464750 MHZ

==== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PT.2 2 00 dB





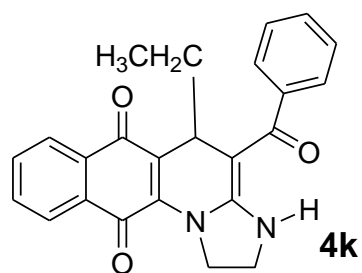
```

NAME          sqc-4-t
EXPNO         12
PROCNO        1
Date_         20120104
Time_         14.44
INSTRUM       av500
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            32768
SOLVENT       DMSO
NS            8
DS            1
SWH           10000.000 Hz
FIDRES        0.305176 Hz
AQ            1.6385000 sec
RG            203
DW            50.000 usec
DE            6.00 usec
TE            292.2 K
D1            2.00000000 sec
TD0           1

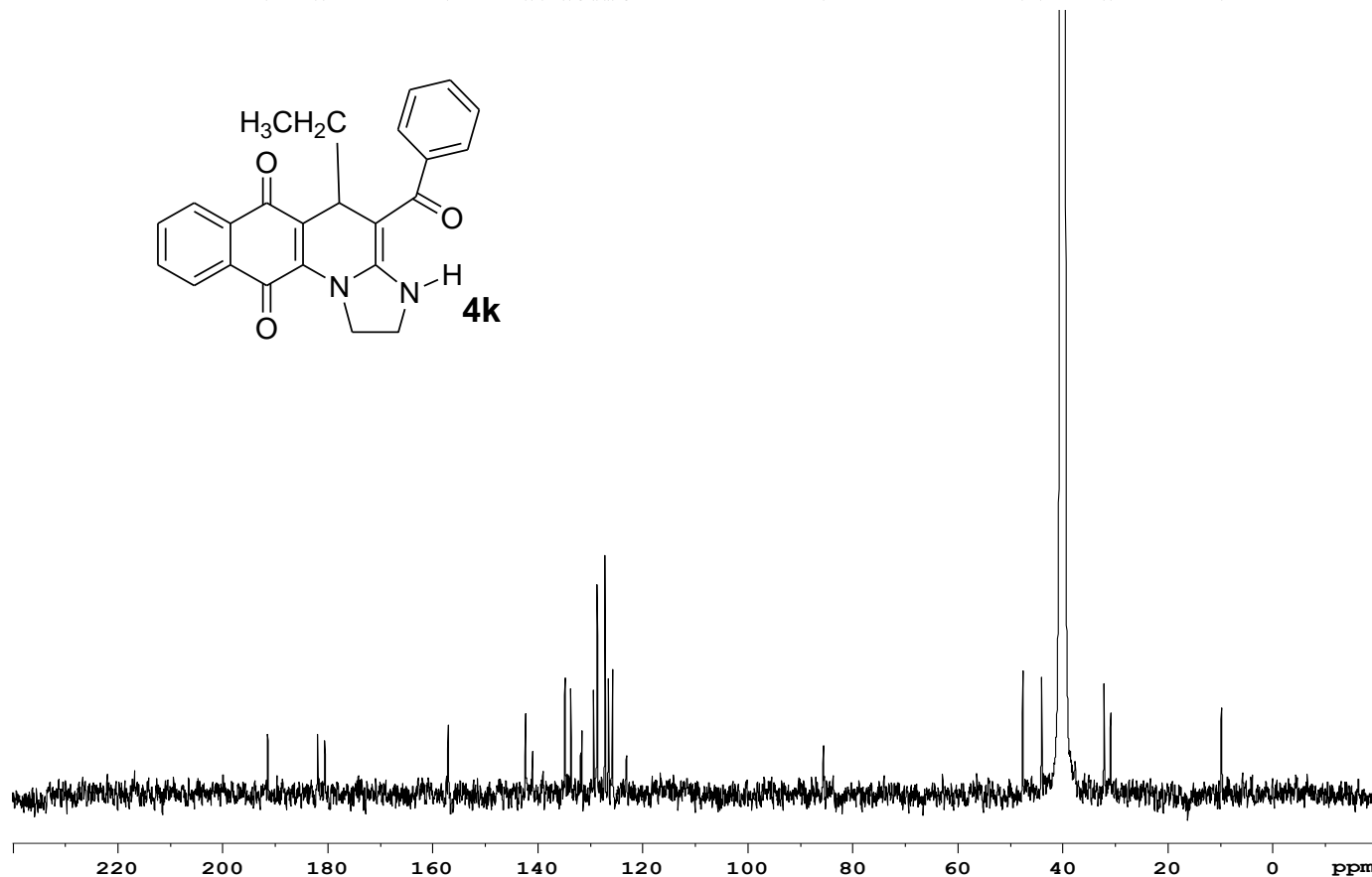
===== CHANNEL f1 =====
NUC1          1H
P1            13.50 usec
PL1           2.20 dB
SFO1          500.0335010 MHz
SI            16384
SF            500.0300008 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            2.00
    
```

SQC-4-T

13C 1D 2012 03 23



191.690
 182.275
 180.769
 157.231
 142.356
 141.226
 139.154
 135.200
 133.882
 131.900
 131.811
 129.417
 128.736
 127.242
 126.605
 125.792
 123.287
 123.155
 85.610
 47.720
 44.239
 32.155
 30.926
 9.831



```

NAME          sqc-4-t
EXPNO         2
PROCNO        1
Date_         20120323
Time          10.07
INSTRUM       av500
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       DMSO
NS            5794
DS            2
SWH           32679.738 Hz
FIDRES        0.498653 Hz
AQ            1.0027661 sec
RG            14600
DW            15.300 usec
DE            6.00 usec
TE            294.1 K
D1            2.0000000 sec
d11           0.0300000 sec
DELTA         1.89999998 sec
TD0           1
    
```

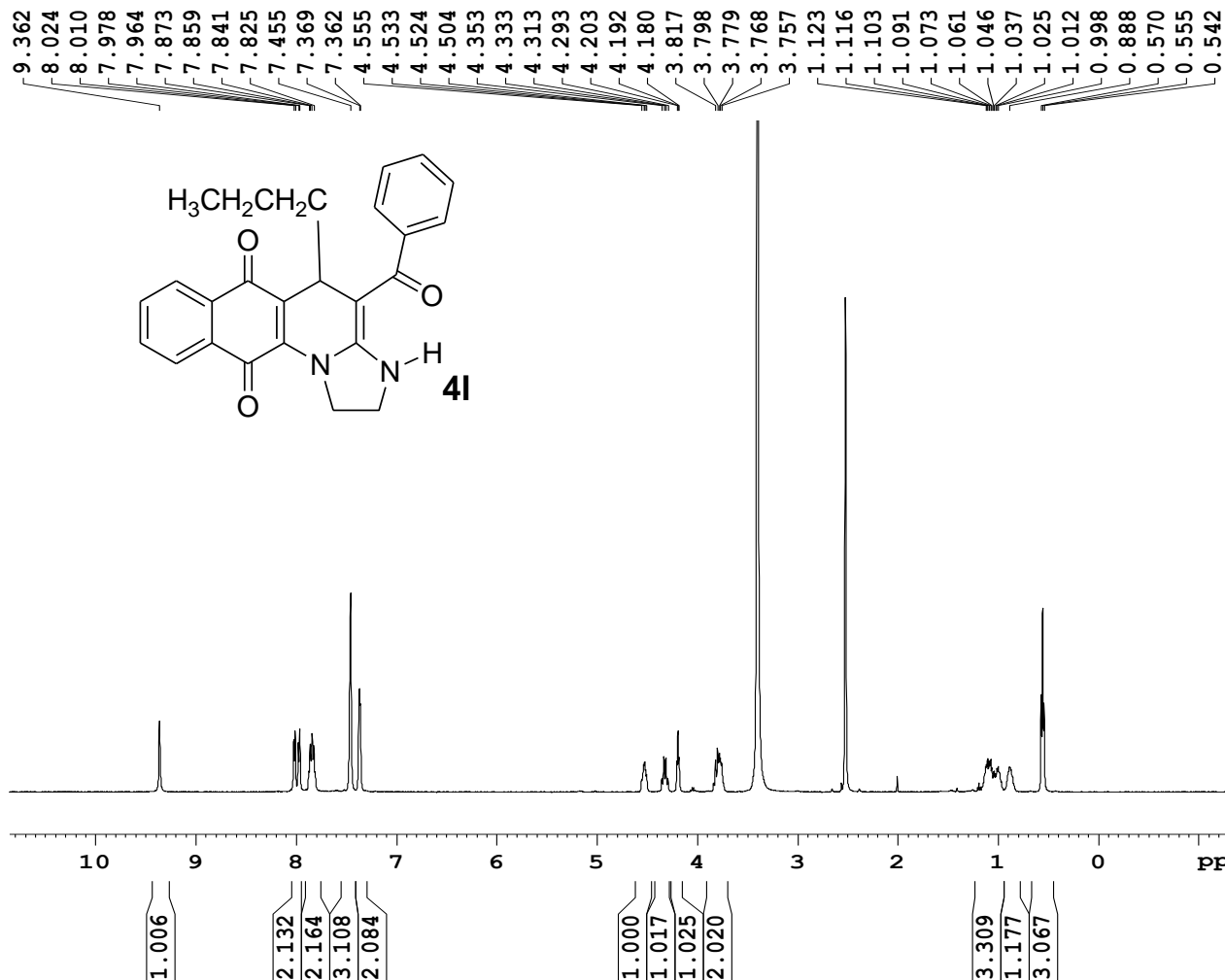
```

===== CHANNEL f1 =====
NUC1          13C
P1            9.60 usec
PL1           2.00 dB
SFO1         125.7464750 MHz
    
```

```

===== CHANNEL f2 =====
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           2.60 dB
PL12         17.66 dB
PL13         17.66 dB
SFO2         500.0355000 MHz
SI            32768
SF           125.7326332 MHz
WDW           EM
SSB           0
LB            8.00 Hz
GB            0
PC            2.00
    
```

Sqc-4-w 1H 2012 03 16



```

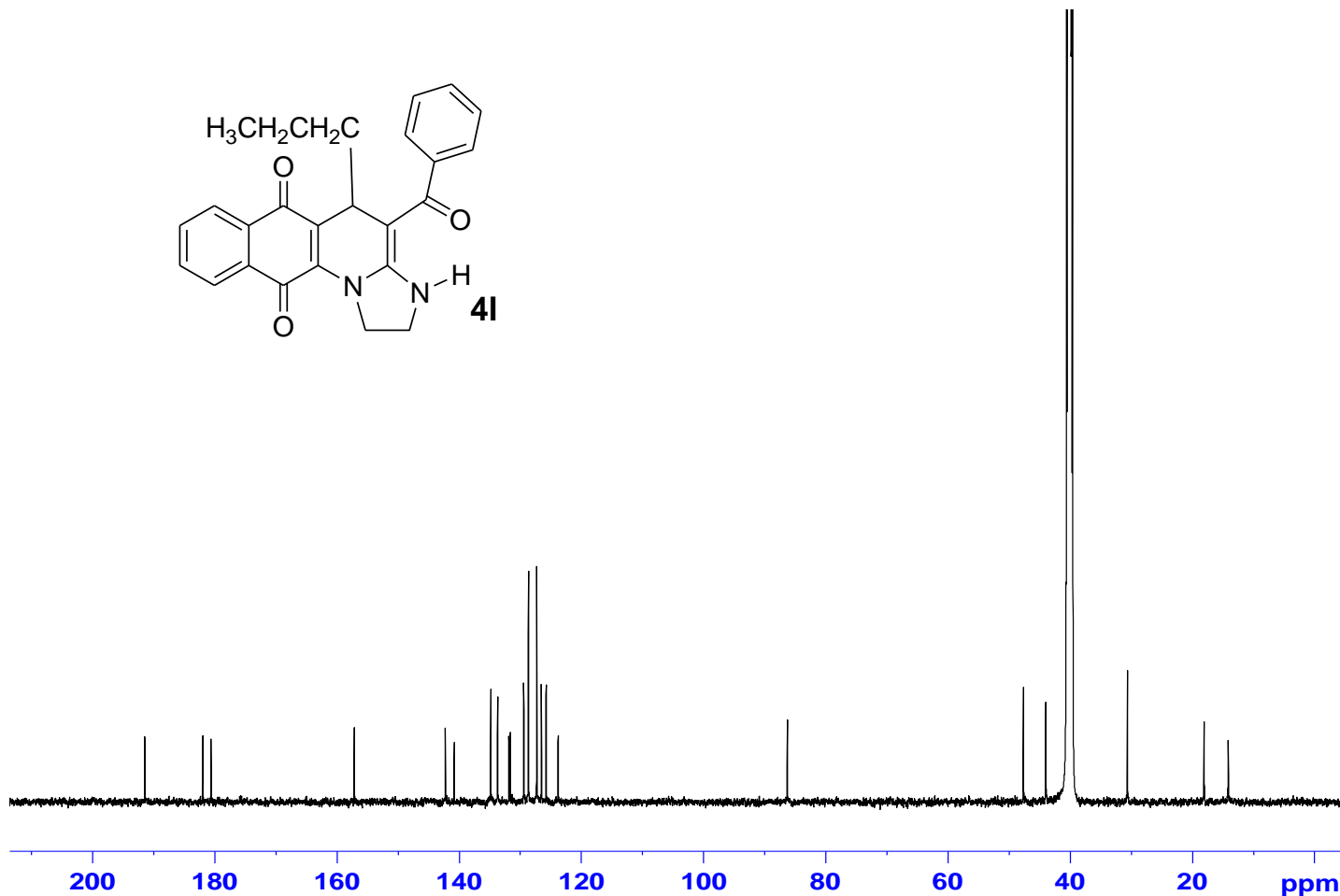
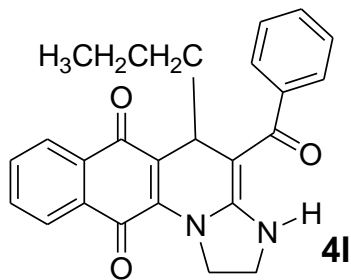
NAME          Sqc-4-w
EXPNO         1
PROCNO        1
Date_         20120109
Time          19.10
INSTRUM       av500
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            32768
SOLVENT       DMSO
NS            8
DS            1
SWH           10000.000 Hz
FIDRES        0.305176 Hz
AQ            1.6385000 sec
RG            256
DW            50.000 usec
DE            6.00 usec
TE            293.2 K
D1            2.00000000 sec
TD0           1
    
```

```

===== CHANNEL f1 =====
NUC1          1H
P1            13.50 usec
PL1           2.20 dB
SFO1          500.0335010 MHz
SI            16384
SF            500.0299896 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            2.00
    
```


SQC-4-W 13C 1D 2012 03 25

191.36
181.97
180.64
157.09
142.27
140.83
134.83
133.72
131.87
131.64
129.43
128.68
127.32
126.55
125.78
123.82
86.30
47.66
44.01
30.62
18.08
14.14



NAME Sqc-4-w
EXPNO 2
PROCNO 1
Date_ 20120326
Time 7.12
INSTRUM av500
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 11175
DS 2
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 sec
RG 14600
DW 15.300 usec
DE 6.00 usec
TE 296.9 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.899999998 sec
TD0 1

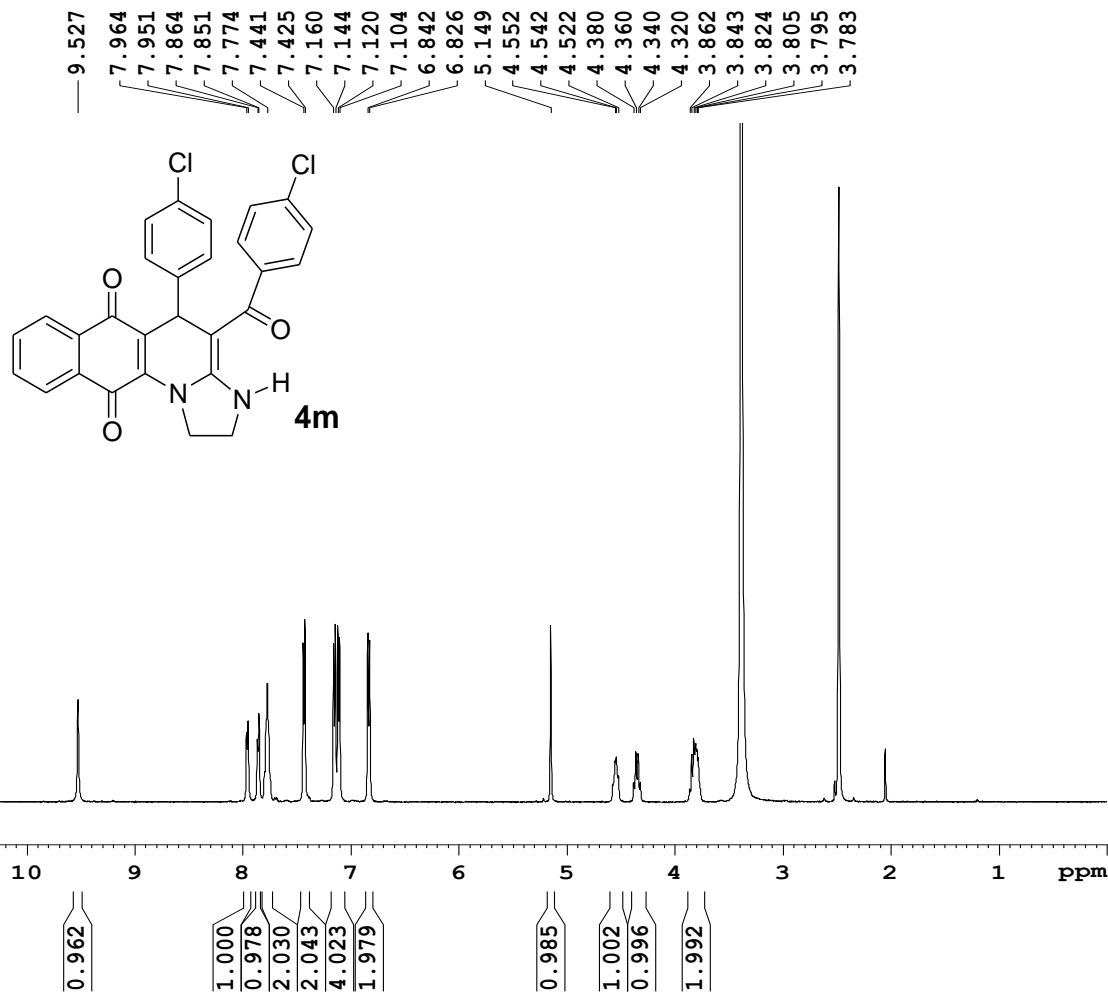
==== CHANNEL f1 =====
NUC1 13C
P1 9.60 usec
PL1 2.00 dB
SFO1 125.7464750 MHz

==== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.20 dB
PL12 17.66 dB
PL13 17.66 dB
SFO2 500.0355000 MHz
SI 32768
SF 125.7326332 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 2.00

SQC-4-M2

1H

2011 12 19



```

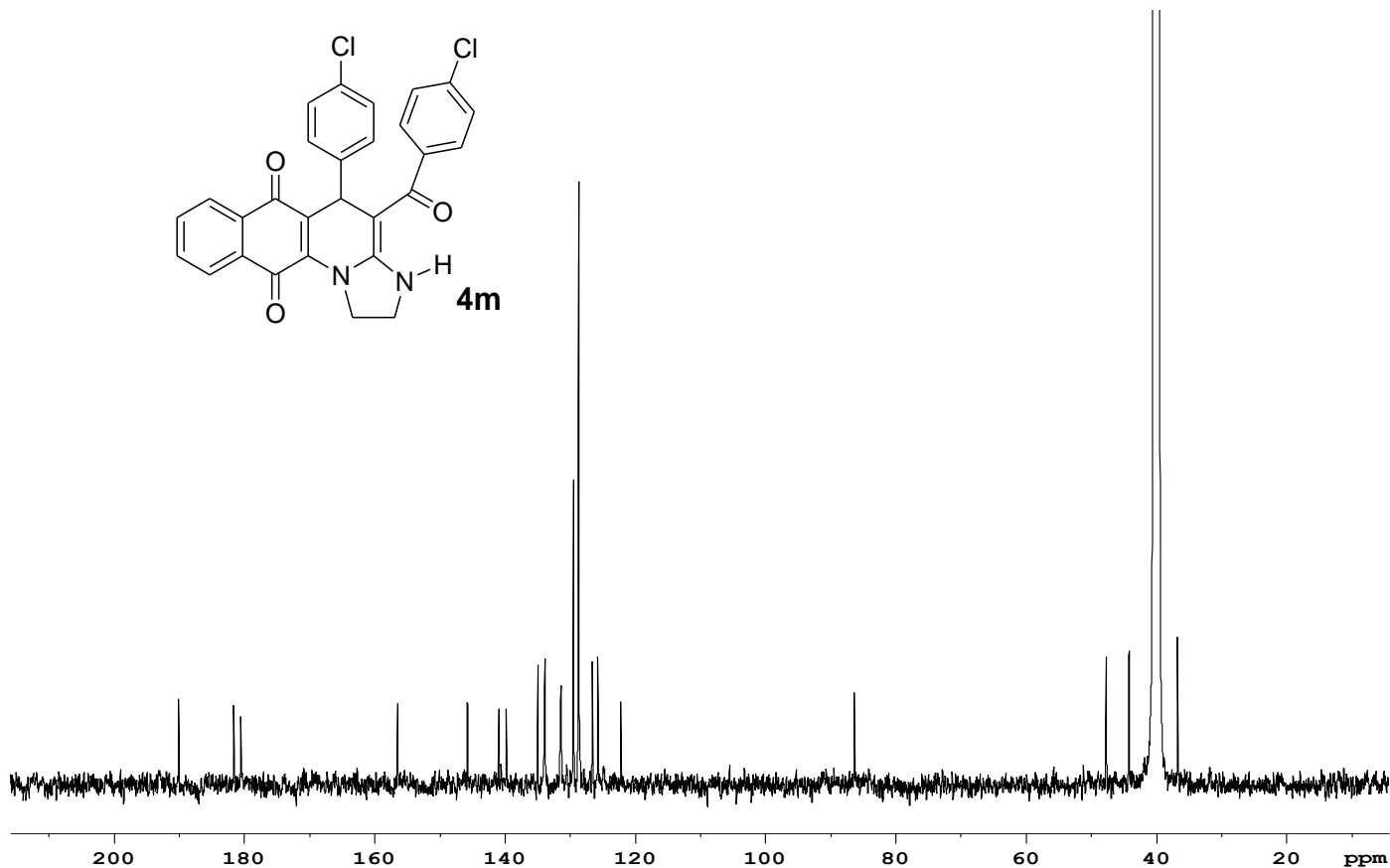
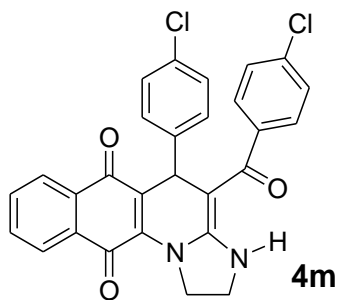
NAME          SQC-4-M2
EXPNO         1
PROCNO        1
Date_         20111219
Time_         21.24
INSTRUM       av500
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            32768
SOLVENT       DMSO
NS            4
DS            1
SWH           10000.000 Hz
FIDRES        0.305176 Hz
AQ            1.6385000 sec
RG            161
DW            50.000 usec
DE            6.00 usec
TE            292.2 K
D1            2.00000000 sec
TD0           1
    
```

```

===== CHANNEL f1 =====
NUC1          1H
P1            13.50 usec
PL1           2.20 dB
SFO1          500.0335010 MHz
SI            16384
SF            500.0300101 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            2.00
    
```

sqc-4-M2 13C 1D 2011 12 21

190.127
 181.680
 180.587
 156.525
 145.780
 140.958
 139.801
 134.975
 134.004
 133.891
 131.559
 131.427
 129.493
 128.680
 126.618
 125.747
 122.255
 86.355
 47.683
 44.167
 36.723



```

NAME          SQC-4-M2
EXPNO         2
PROCNO        1
Date_         20111221
Time_         16.57
INSTRUM       av500
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       DMSO
NS            2632
DS            2
SWH           32679.738 Hz
FIDRES        0.498653 Hz
AQ            1.0027661 sec
RG            18400
DW            15.300 usec
DE            6.00 usec
TE            298.0 K
D1            2.00000000 sec
d11           0.03000000 sec
DELTA         1.89999998 sec
TDO           1
    
```

```

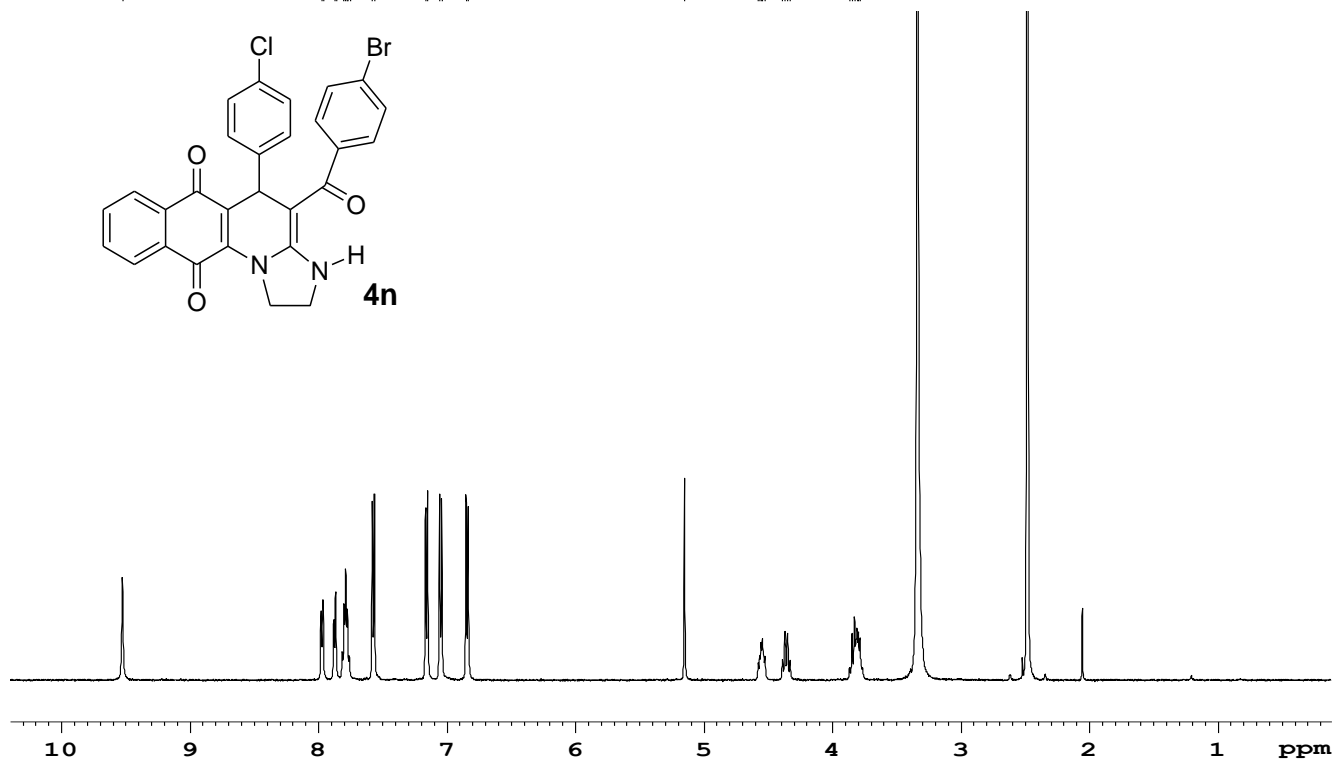
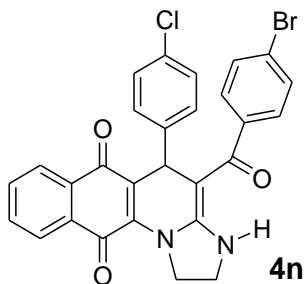
===== CHANNEL f1 =====
NUC1          13C
P1            9.60 usec
PL1           2.00 dB
SFO1          125.7464750 MHz
    
```

```

===== CHANNEL f2 =====
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           2.20 dB
PL12          17.66 dB
PL13          17.66 dB
SFO2          500.0355000 MHz
SI            32768
SF            125.7326387 MHz
WDW           EM
SSB           0
LB            6.00 Hz
GB            0
PC            2.00
    
```

sqc-4-J 1H 2011 12 05

9.520
 7.973
 7.958
 7.874
 7.859
 7.807
 7.793
 7.781
 7.768
 7.754
 7.581
 7.565
 7.167
 7.150
 7.057
 7.041
 6.851
 6.834
 5.150
 4.577
 4.565
 4.555
 4.544
 4.524
 4.388
 4.368
 4.349
 4.328
 3.865
 3.845
 3.827
 3.807
 3.796
 3.785



0.981
 1.029
 1.012
 2.085
 2.047
 2.017
 2.041
 2.024

1.000
 1.020
 1.029
 2.061



NAME sqc-4-J
 EXPNO 1
 PROCNO 1
 Date_ 20111205
 Time_ 20.21
 INSTRUM av500
 PROBHD 5 mm PABBO BB-
 PULPROG zg30
 TD 32768
 SOLVENT DMSO
 NS 4
 DS 1
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 1.6385000 sec
 RG 322
 DW 50.000 usec
 DE 6.00 usec
 TE 295.0 K
 D1 2.00000000 sec
 TD0 1

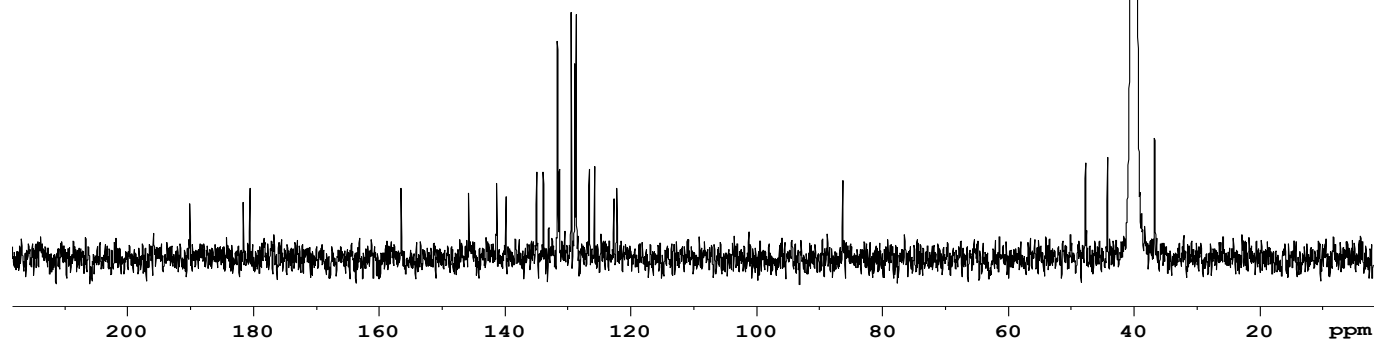
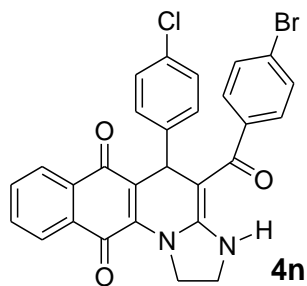
===== CHANNEL f1 =====
 NUC1 1H
 P1 13.50 usec
 PL1 2.20 dB
 SFO1 500.0335010 MHz
 SI 16384
 SF 500.0300101 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 2.00

sqc-4-J 13C 1D 2011 12 09

189.994
181.594
180.606
156.641
145.770
141.569
139.840
135.146
133.910
131.687
129.576
128.947
128.753
126.623
125.751
122.701
122.216

86.226

47.684
43.978
36.566



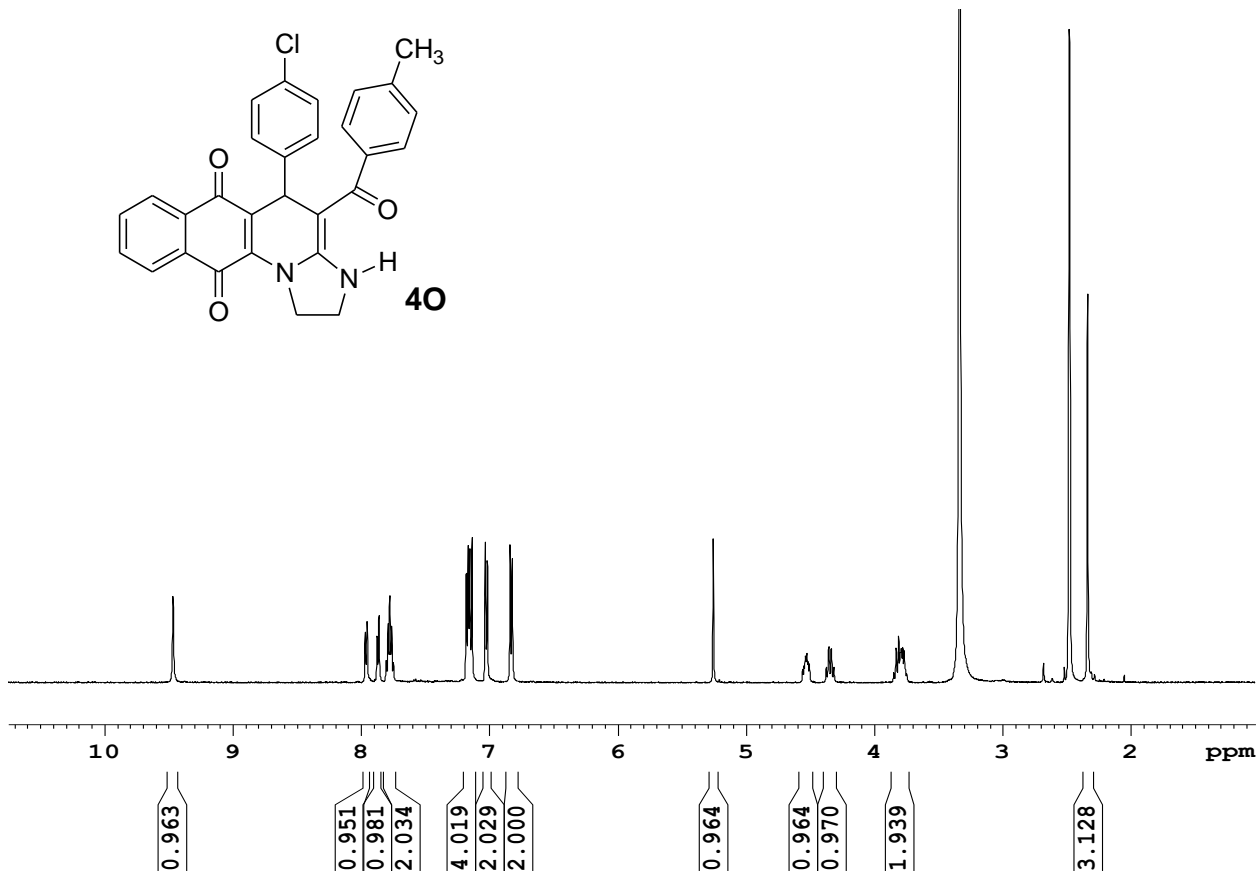
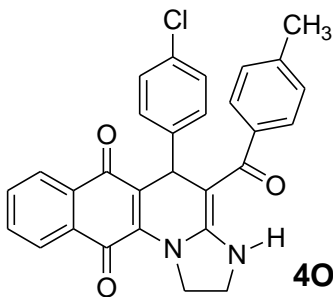
NAME sqc-4-J
EXPNO 2
PROCNO 1
Date_ 20111209
Time 13.53
INSTRUM av500
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 2109
DS 2
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 sec
RG 18400
DW 15.300 usec
DE 6.00 usec
TE 295.5 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1

===== CHANNEL f1 =====
NUC1 13C
P1 9.60 usec
PL1 2.00 dB
SFO1 125.7464750 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.20 dB
PL12 17.66 dB
PL13 17.66 dB
SFO2 500.0355000 MHz
SI 32768
SF 125.7326387 MHz
WDW EM
SSB 0
LB 6.00 Hz
GB 0
PC 2.00

sqc-4-K 1H 2011 12 05

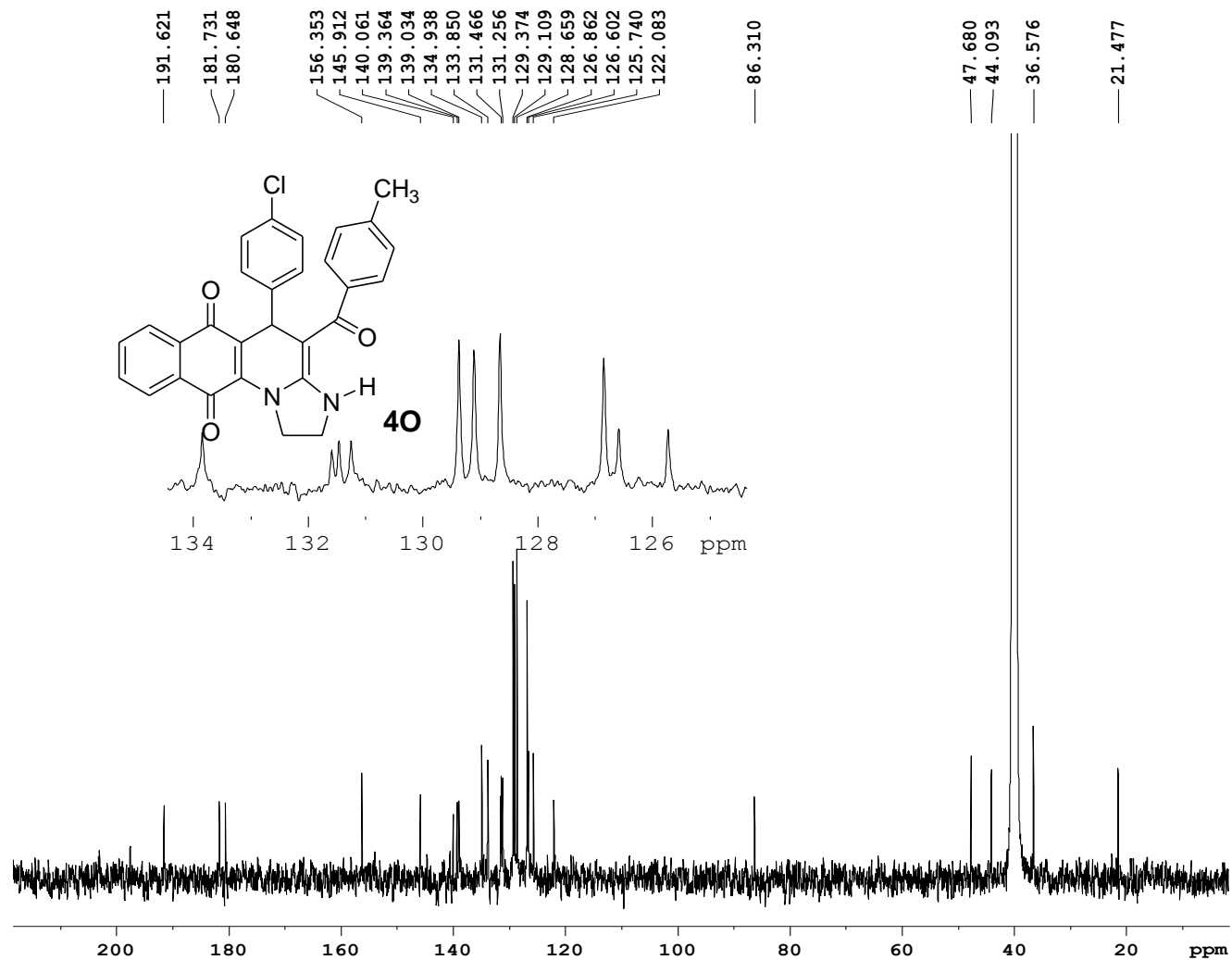
9.470
7.972
7.958
7.879
7.864
7.807
7.793
7.781
7.767
7.752
7.184
7.168
7.156
7.140
7.035
7.020
6.842
6.825
5.258
4.560
4.549
4.538
4.527
4.519
4.508
4.377
4.357
4.338
4.317
3.850
3.831
3.813
3.792
3.781
3.769
2.340



NAME sqc-4-K
EXPNO 1
PROCNO 1
Date_ 20111205
Time_ 20.28
INSTRUM av500
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT DMSO
NS 4
DS 1
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 1.6385000 sec
RG 322
DW 50.000 usec
DE 6.00 usec
TE 294.9 K
D1 2.00000000 sec
TDO 1

===== CHANNEL f1 =====
NUC1 1H
P1 13.50 usec
PL1 2.20 dB
SFO1 500.0335010 MHz
SI 16384
SF 500.0300101 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 2.00

sqc-4-K 13C 1D 2011 12 08

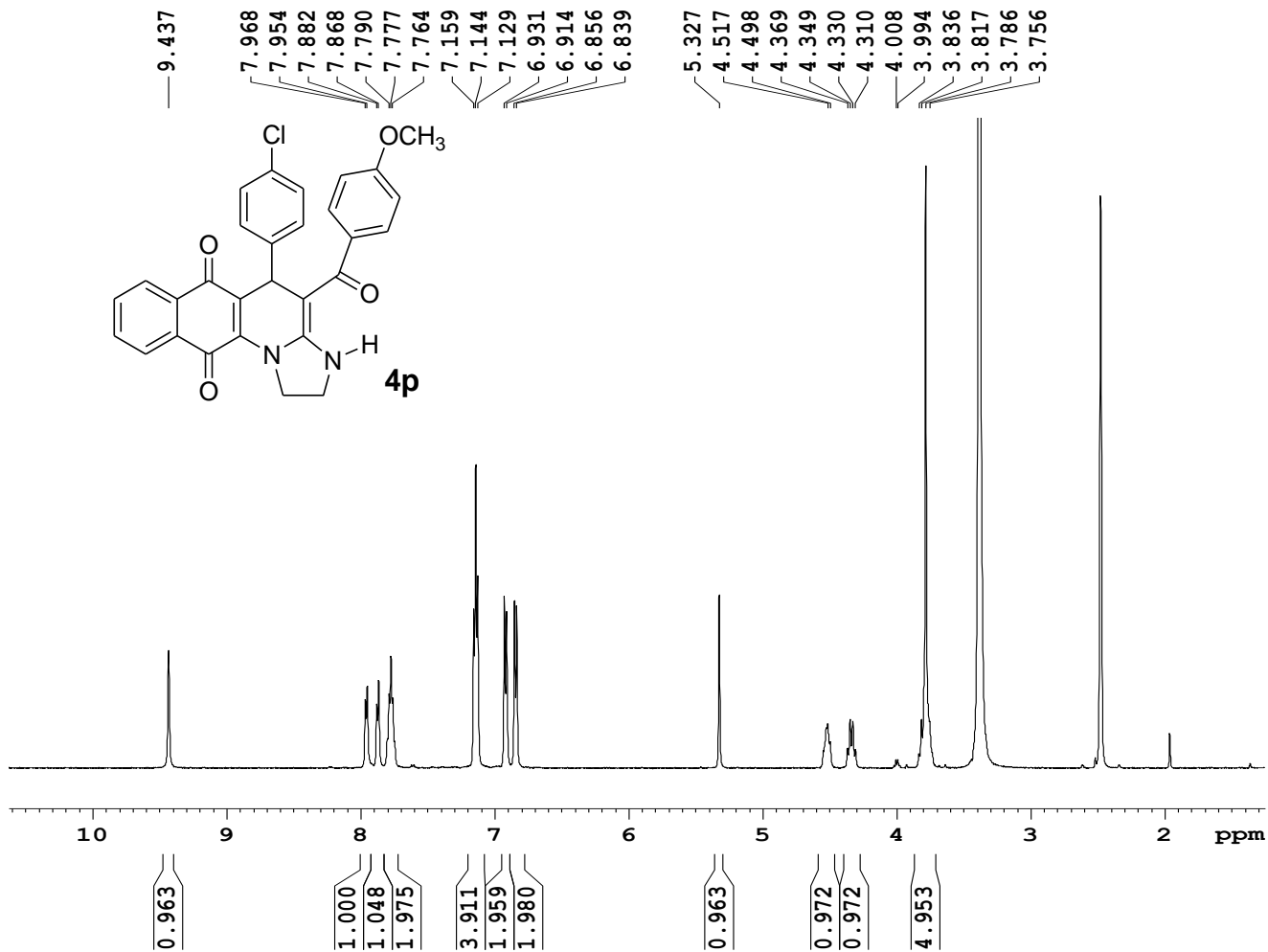
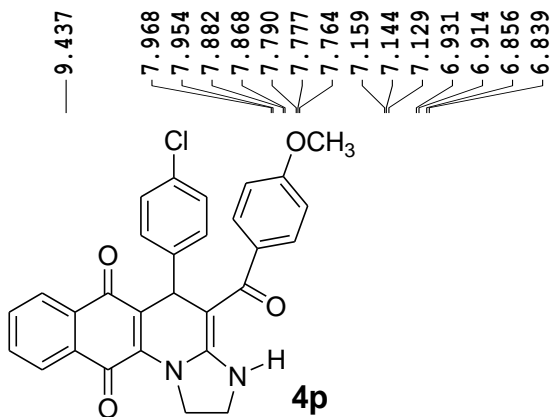


NAME sqc-4-K
EXENO 2
PROCNO 1
Date 20111208
Time 17.40
INSTRUM av500
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 2846
DS 2
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 sec
RG 18400
DW 15.300 usec
DE 6.00 usec
TE 294.8 K
D1 2.0000000 sec
d11 0.0300000 sec
DELTA 1.89999998 sec
TD0 1

==== CHANNEL f1 =====
NUC1 13C
P1 9.60 usec
PL1 2.00 dB
SFO1 125.7464750 MHz

==== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.20 dB
PL12 17.66 dB
PL13 17.66 dB
SFO2 500.0355000 MHz
SI 32768
SF 125.7326387 MHz
WDW EM
SSB 0
LB 6.00 Hz
GB 0
PC 2.00

SQC-4-L 1H 2011 12 19

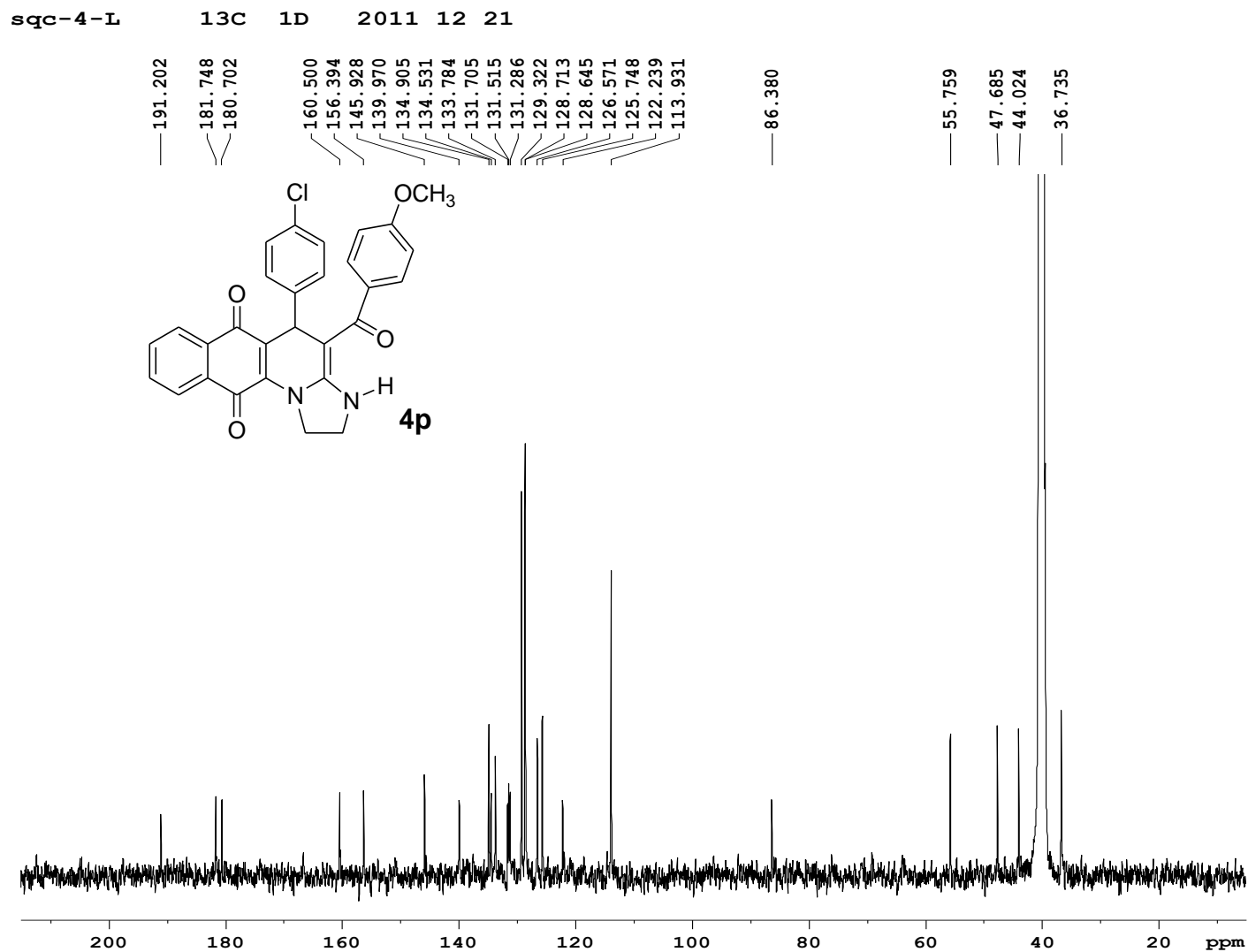


```

NAME          SQC-4-L
EXPNO         1
PROCNO        1
Date_         20111219
Time_         21.20
INSTRUM       av500
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            32768
SOLVENT       DMSO
NS            4
DS            1
SWH           10000.000 Hz
FIDRES        0.305176 Hz
AQ            1.6385000 sec
RG            161
DW            50.000 usec
DE            6.00 usec
TE            292.1 K
D1            2.00000000 sec
TD0           1
    
```

```

===== CHANNEL f1 =====
NUC1          1H
P1            13.50 usec
PL1           2.20 dB
SFO1          500.0335010 MHz
SI            16384
SF            500.0300101 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            2.00
    
```

```

NAME          SQC-4-L
EXPNO         2
PROCNO        1
Date_         20111221
Time          12.10
INSTRUM       av500
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       DMSO
NS            2362
DS            2
SWH           32679.738 Hz
FIDRES        0.498653 Hz
AQ            1.0027661 sec
RG            18400
DW            15.300 usec
DE            6.00 usec
TE            293.4 K
D1            2.0000000 sec
d11           0.0300000 sec
DELTA         1.89999998 sec
TD0           1
    
```

```

===== CHANNEL f1 =====
NUC1          13C
P1            9.60 usec
PL1           2.00 dB
SFO1          125.7464750 MHz
    
```

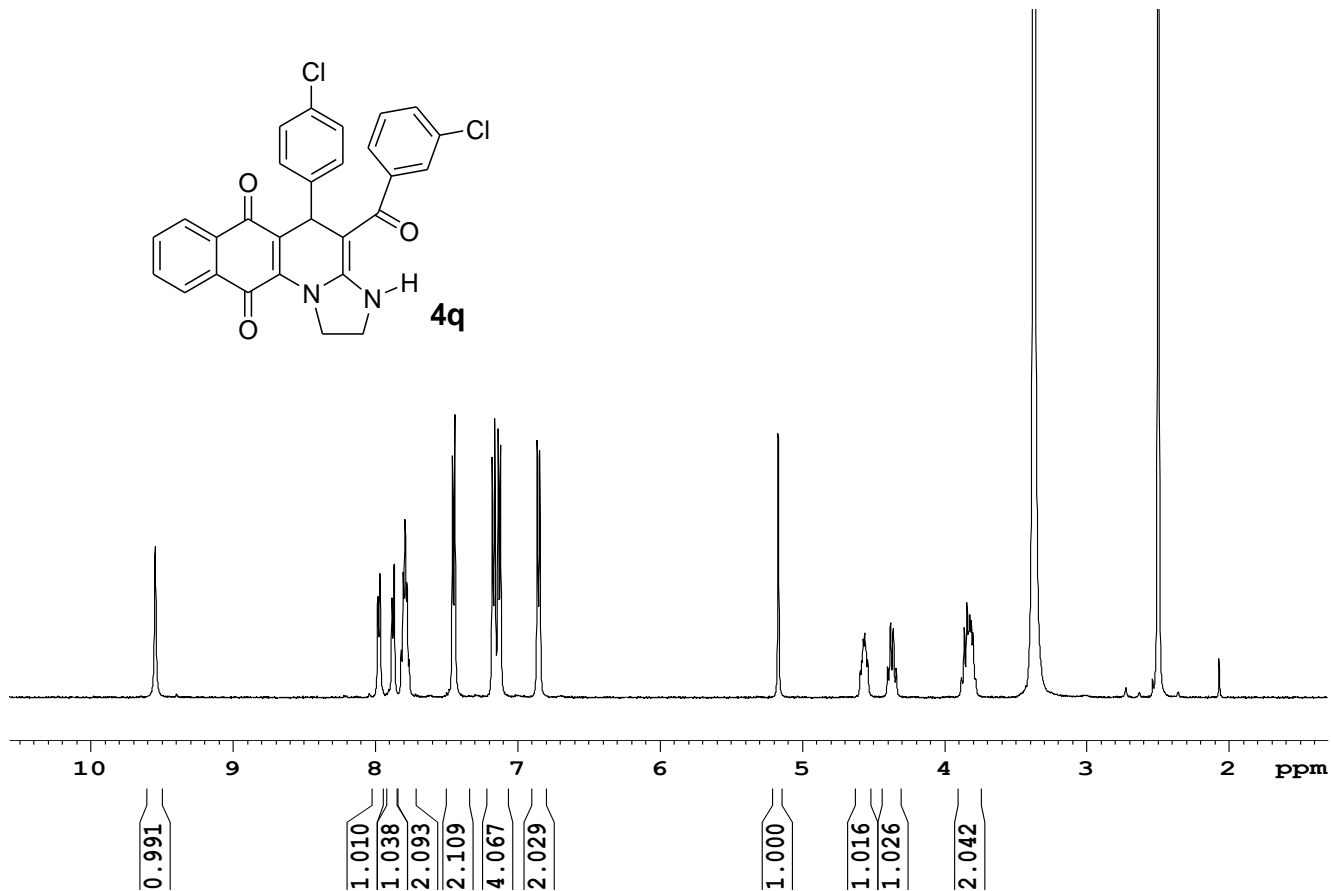
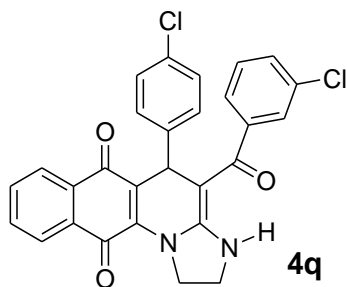
```

===== CHANNEL f2 =====
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           2.20 dB
PL12          17.66 dB
PL13          17.66 dB
SFO2          500.0355000 MHz
SI            32768
SF            125.7326387 MHz
WDW           EM
SSB           0
LB            6.00 Hz
GB            0
PC            2.00
    
```

SQC-4-N1H

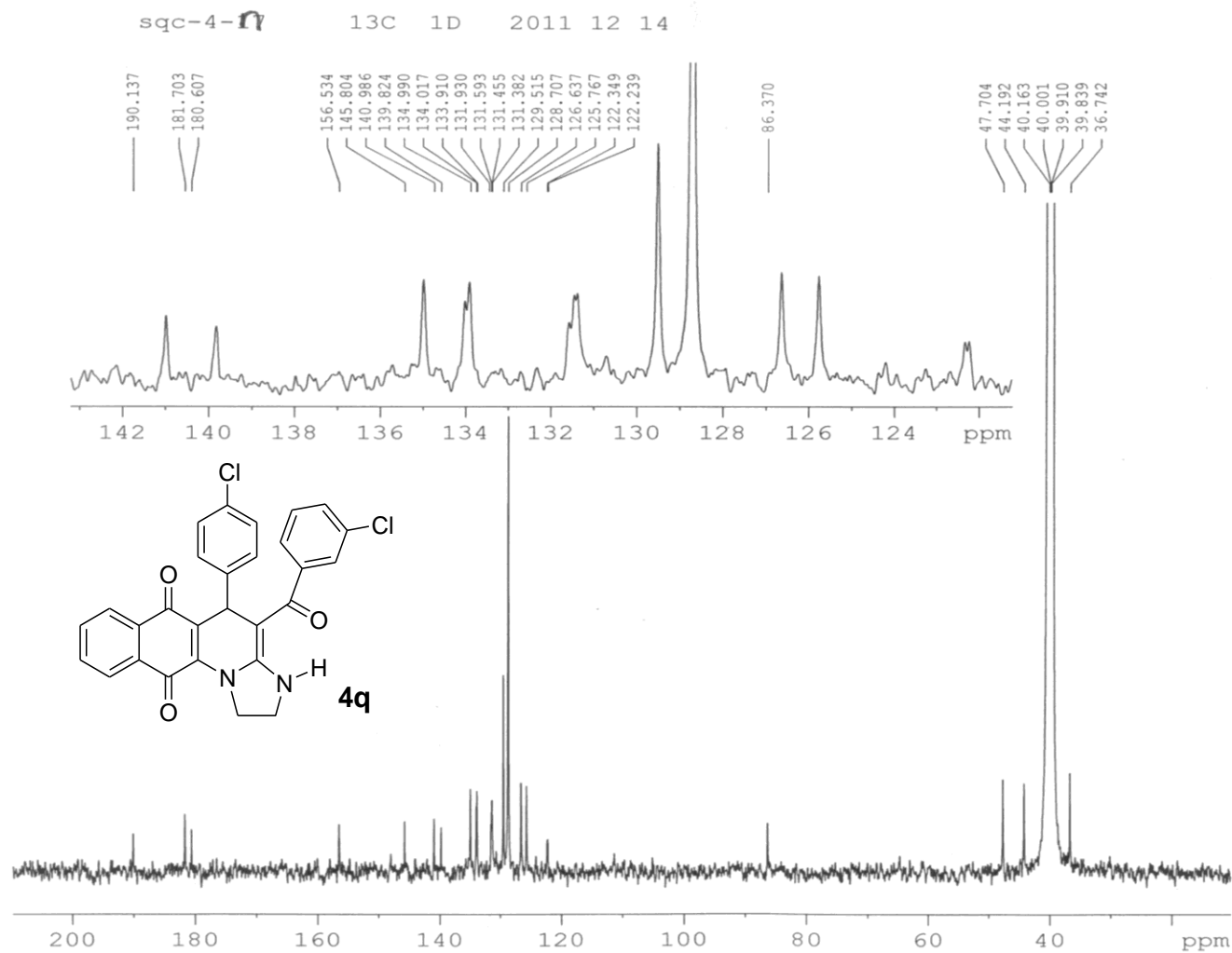
2011 12 12

9.543
7.984
7.970
7.884
7.870
7.819
7.804
7.793
7.781
7.767
7.460
7.444
7.180
7.163
7.140
7.123
6.863
6.846
5.170
4.593
4.570
4.560
4.541
4.401
4.380
4.361
4.341
3.881
3.862
3.844
3.824
3.813
3.802



NAME SQC-4-N
EXPNO 11
PROCNO 1
Date 20111212
Time 20.55
INSTRUM av500
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT DMSO
NS 4
DS 1
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 1.6385000 sec
RG 228
DW 50.000 usec
DE 6.00 usec
TE 293.7 K
D1 2.00000000 sec
TD0 1

==== CHANNEL f1 =====
NUC1 1H
P1 13.50 usec
PL1 2.20 dB
SFO1 500.0335010 MHz
SI 16384
SF 500.0300016 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 2.00



Current Data Parameters
NAME sqc-4-17
EXPNO 2
PROCNO 1

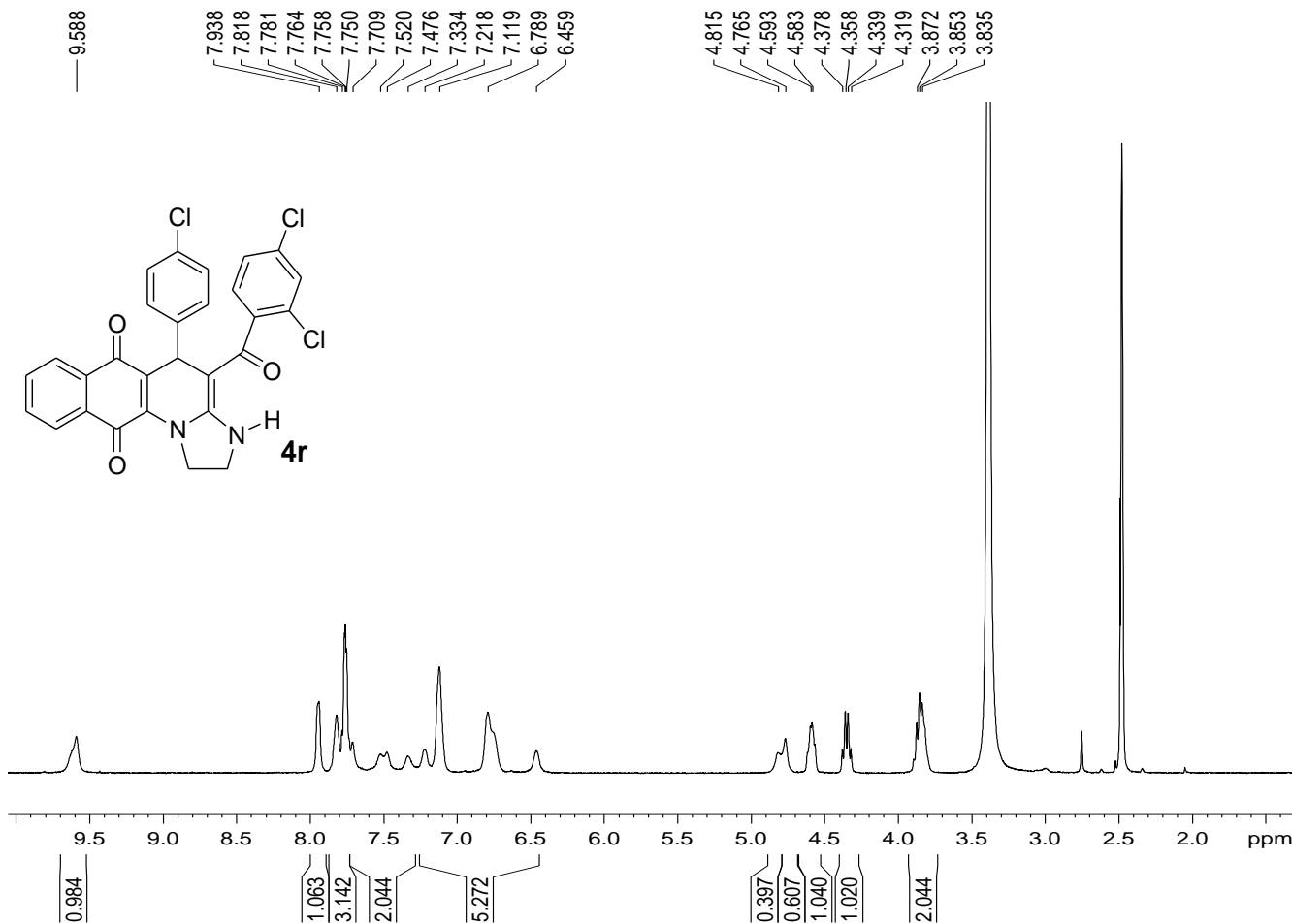
F2 - Acquisition Parameters
Date_ 20111214
Time_ 17.35
INSTRUM av500
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 2583
DS 2
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 sec
RG 18400
DW 15.300 usec
DE 6.00 usec
TE 297.0 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TDO 1

----- CHANNEL f1 -----
NUC1 13C
P1 9.60 usec
PL1 2.00 dB
SFO1 125.7464750 MHz

----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.20 dB
PL12 17.66 dB
PL13 17.66 dB
SFO2 500.0355000 MHz

F2 - Processing parameters
SI 32768
SF 125.7326360 MHz
WDW EM
SSB 0
LB 10.00 Hz
GB 0
PC 2.00

QC-4-O 1H 2011 12 1

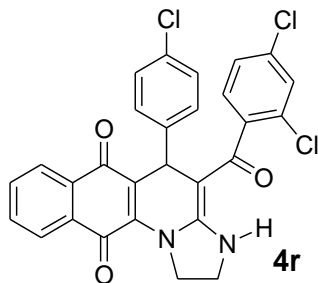
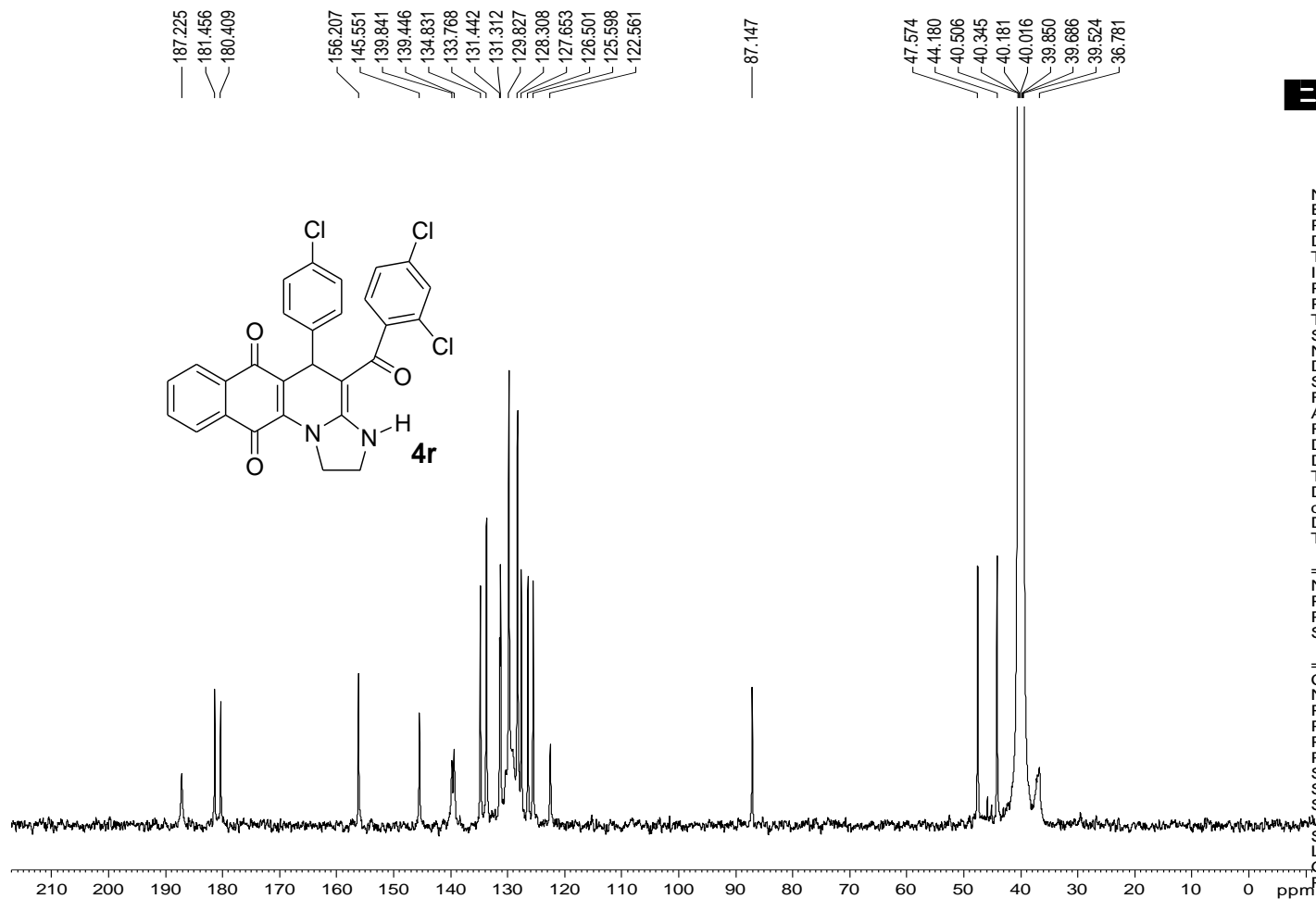


```

NAME          SQC-4-O
EXPNO         1
PROCNO        1
Date_         20111219
Time_         21.27
INSTRUM       av500
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            32768
SOLVENT       DMSO
NS            4
DS            1
SWH           10000.000 Hz
FIDRES        0.305176 Hz
AQ            1.6385000 sec
RG            161
DW            50.000 usec
DE            6.00 usec
TE            292.2 K
D1            2.00000000 sec
TD0           1

===== CHANNEL f1 =====
NUC1          1H
P1            13.50 usec
PL1           2.20 dB
SFO1          500.0335010 MHz:
SI            16384
SF            500.0300101 MHz:
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            2.00
    
```

SQC-4-OZ 13C 1D 2012 10 01



NAME SQC-4-OZ
EXPNO 2
PROCNO 1
Date_ 20121001
Time 11.45
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 5274
DS 2
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 sec
RG 512
DW 15.300 usec
DE 6.00 usec
TE 302.4 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TDO 1

===== CHANNEL f1 =====
NUC1 13C
P1 12.20 usec
PL1 3.00 dB
SFO1 125.7464750 MHz

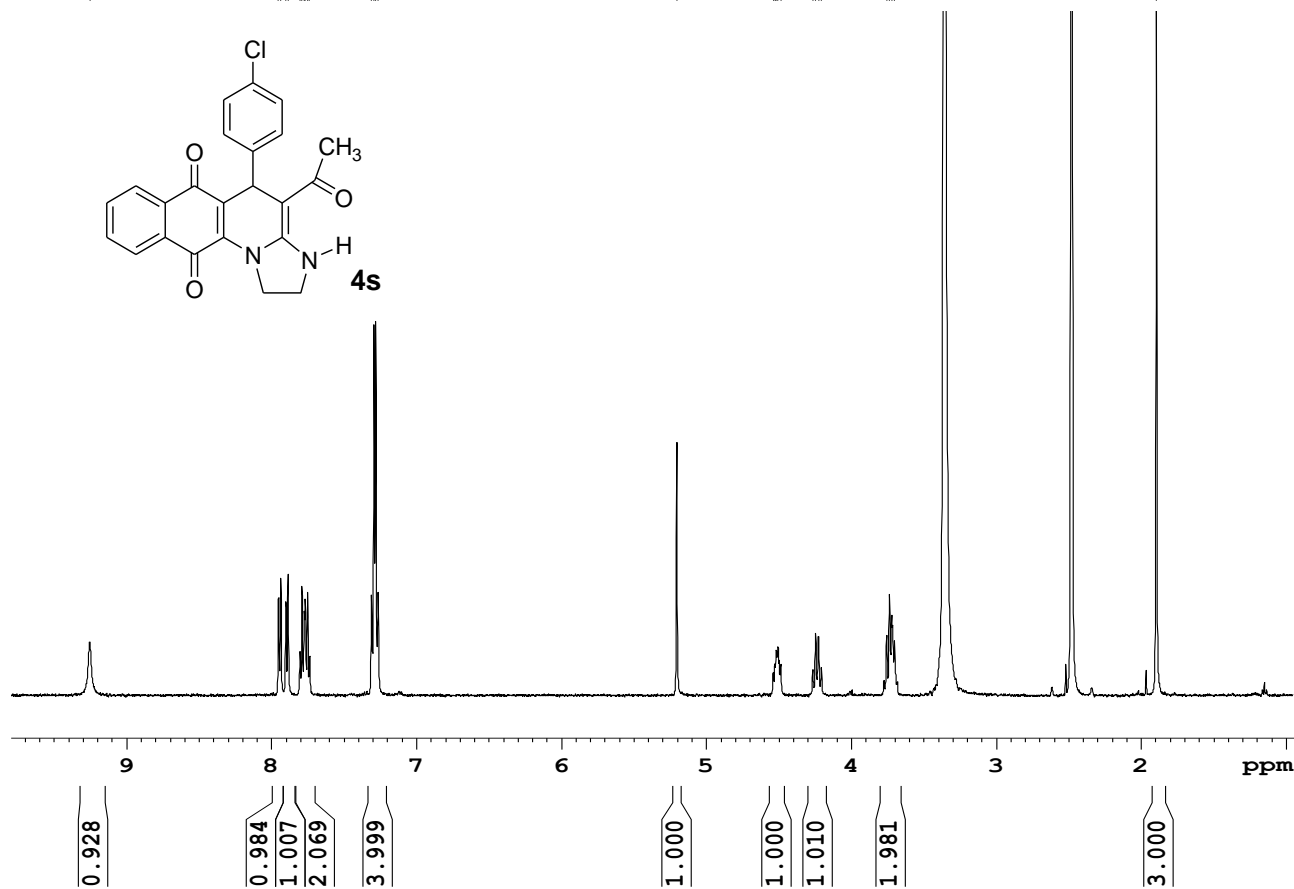
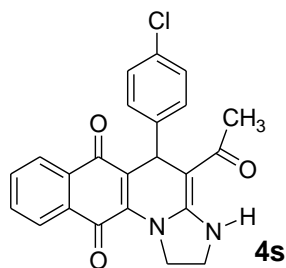
===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.00 dB
PL12 17.70 dB
PL13 17.70 dB
SFO2 500.0355000 MHz
SI 32768
SF 125.7326497 MHz
WDW EM
SSB 0
LB 12.00 Hz
GB 0
PC 1.00

SQC-4-U 1H 2011 12 27

9.255
7.953
7.938
7.903
7.888
7.806
7.791
7.777
7.769
7.754
7.739
7.312
7.295
7.282
7.265

5.205
4.540
4.529
4.519
4.507
4.488
4.266
4.246
4.228
4.207
3.756
3.737
3.721
3.703

1.895

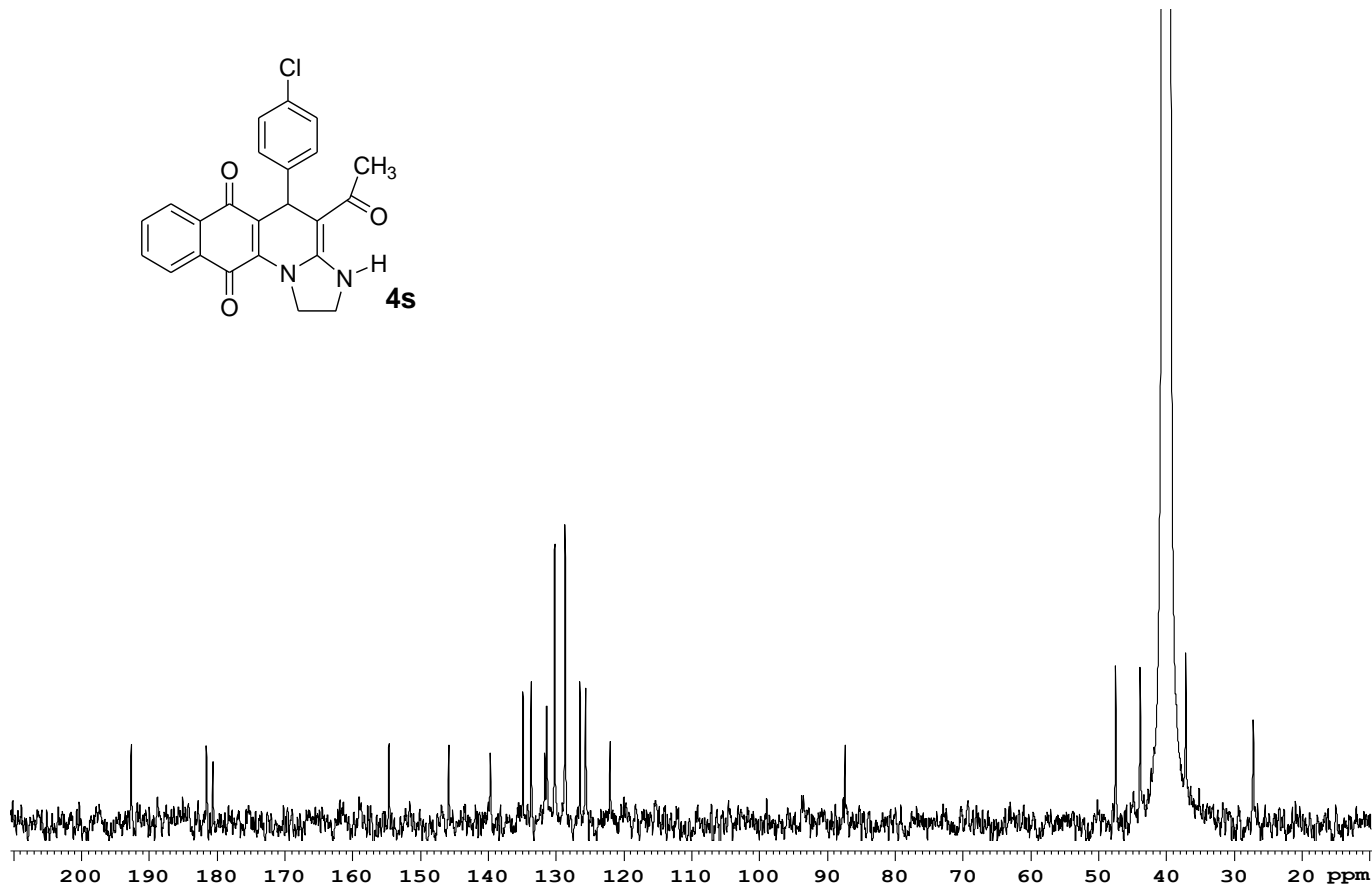
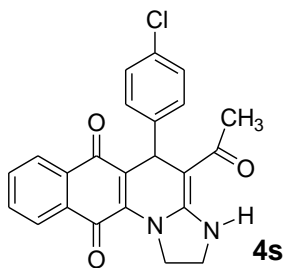


NAME SQC-4-U
EXPNO 1
PROCNO 1
Date_ 20111227
Time_ 19.23
INSTRUM av500
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT DMSO
NS 4
DS 1
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 1.6385000 sec
RG 256
DW 50.000 usec
DE 6.00 usec
TE 293.1 K
D1 2.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 13.50 usec
PL1 2.20 dB
SF01 500.0335010 MHz
SI 16384
SF 500.0300101 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 2.00

SQC-4-U 13C 1D 2012 01 02

192.710
 181.621
 180.646
 154.682
 145.844
 139.717
 134.900
 133.693
 131.671
 131.391
 130.224
 128.697
 126.491
 125.643
 122.044
 87.359
 47.450
 43.833
 37.100
 27.145



```

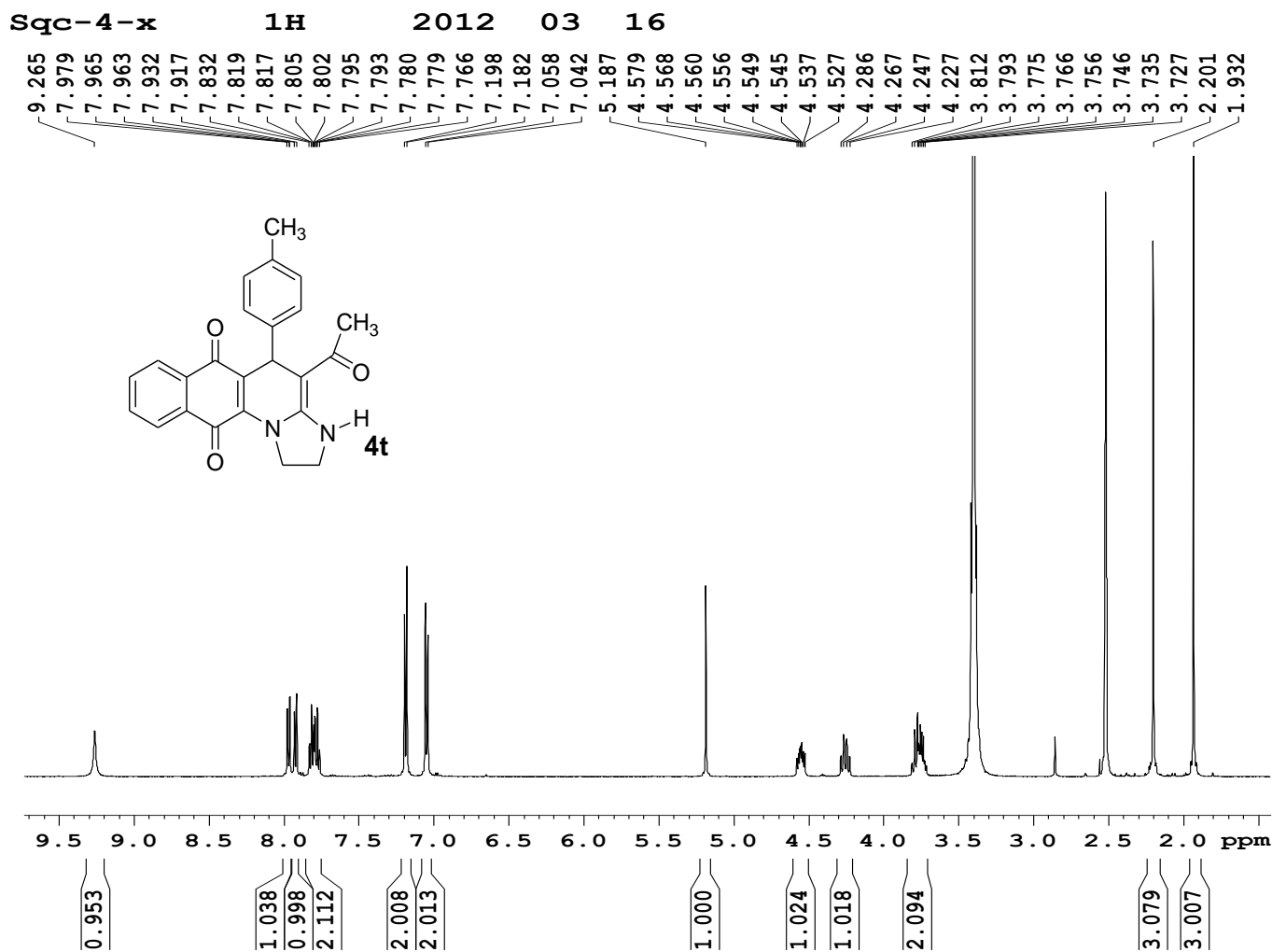
NAME          SQC-4-U
EXPNO         2
PROCNO        1
Date_         20120102
Time          3.07
INSTRUM       av500
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            6227
DS            2
SWH           32679.738 Hz
FIDRES        0.498653 Hz
AQ            1.0027661 sec
RG            18400
DW            15.300 usec
DE            6.00 usec
TE            294.4 K
D1            2.00000000 sec
d11           0.03000000 sec
DELTA         1.89999998 sec
TD0           1
    
```

```

===== CHANNEL f1 =====
NUC1           13C
P1             9.60 usec
PL1            2.00 dB
SFO1          125.7464750 MHz
    
```

```

===== CHANNEL f2 =====
CPDPRG2       waltz16
NUC2           1H
PCPD2         80.00 usec
PL2            2.60 dB
PL12          17.66 dB
PL13          17.66 dB
SFO2          500.0355000 MHz
SI            32768
SF            125.7326453 MHz
WDW            EM
SSB            0
LB            12.00 Hz
GB            0
PC            1.00
    
```



```

NAME          Sqc-4-x
EXPNO         1
PROCNO        1
Date_         20120109
Time_         19.06
INSTRUM       av500
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            32768
SOLVENT       DMSO
NS            8
DS            1
SWH           10000.000 Hz
FIDRES        0.305176 Hz
AQ            1.6385000 sec
RG            256
DW            50.000 usec
DE            6.00 usec
TE            293.2 K
D1            2.0000000 sec
TD0           1
    
```

```

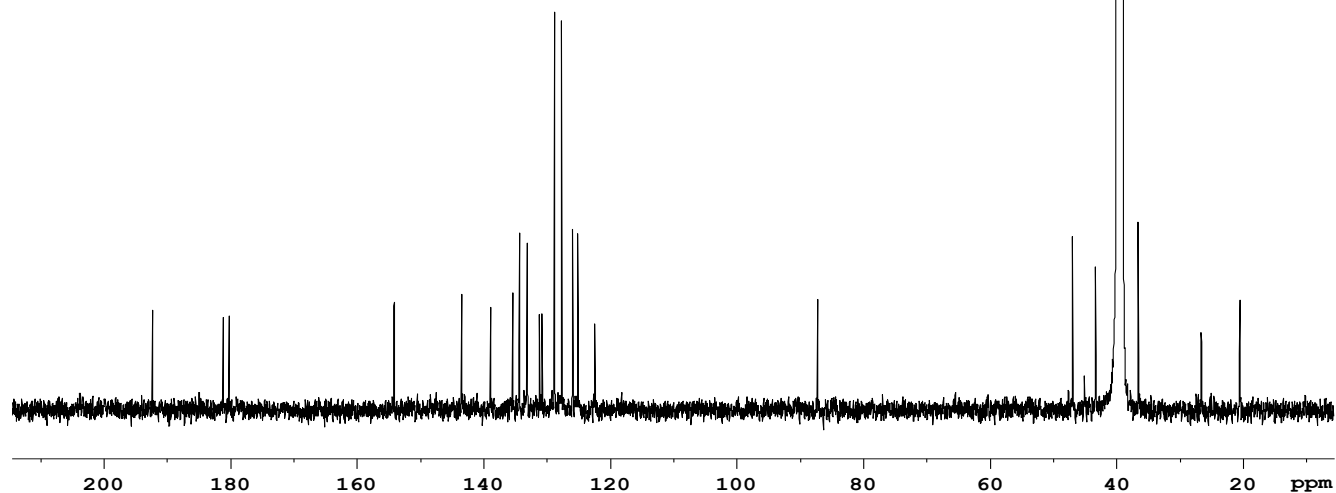
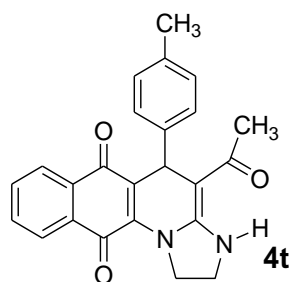
===== CHANNEL f1 =====
NUC1          1H
P1            13.50 usec
PL1           2.20 dB
SFO1          500.0335010 MHz
SI            16384
SF            500.0299915 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            2.00
    
```


SQC-4-X 13C 1D 2012 04 01

192.352
181.208
180.266
154.199
143.521
138.919
135.436
134.387
133.155
131.223
130.802
128.847
127.721
125.953
125.135
122.456

87.228

46.945
43.306
36.572
26.612
20.509



NAME Sqc-4-x
EXPNO 22
PROCNO 1
Date_ 20120402
Time 9.54
INSTRUM av500
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 14126
DS 2
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 sec
RG 724
DW 15.300 usec
DE 6.00 usec
TE 296.1 K
D1 2.0000000 sec
d11 0.0300000 sec
DELTA 1.89999998 sec
TD0 1

==== CHANNEL f1 =====
NUC1 13C
P1 9.60 usec
PL1 2.00 dB
SFO1 125.7464750 MHz

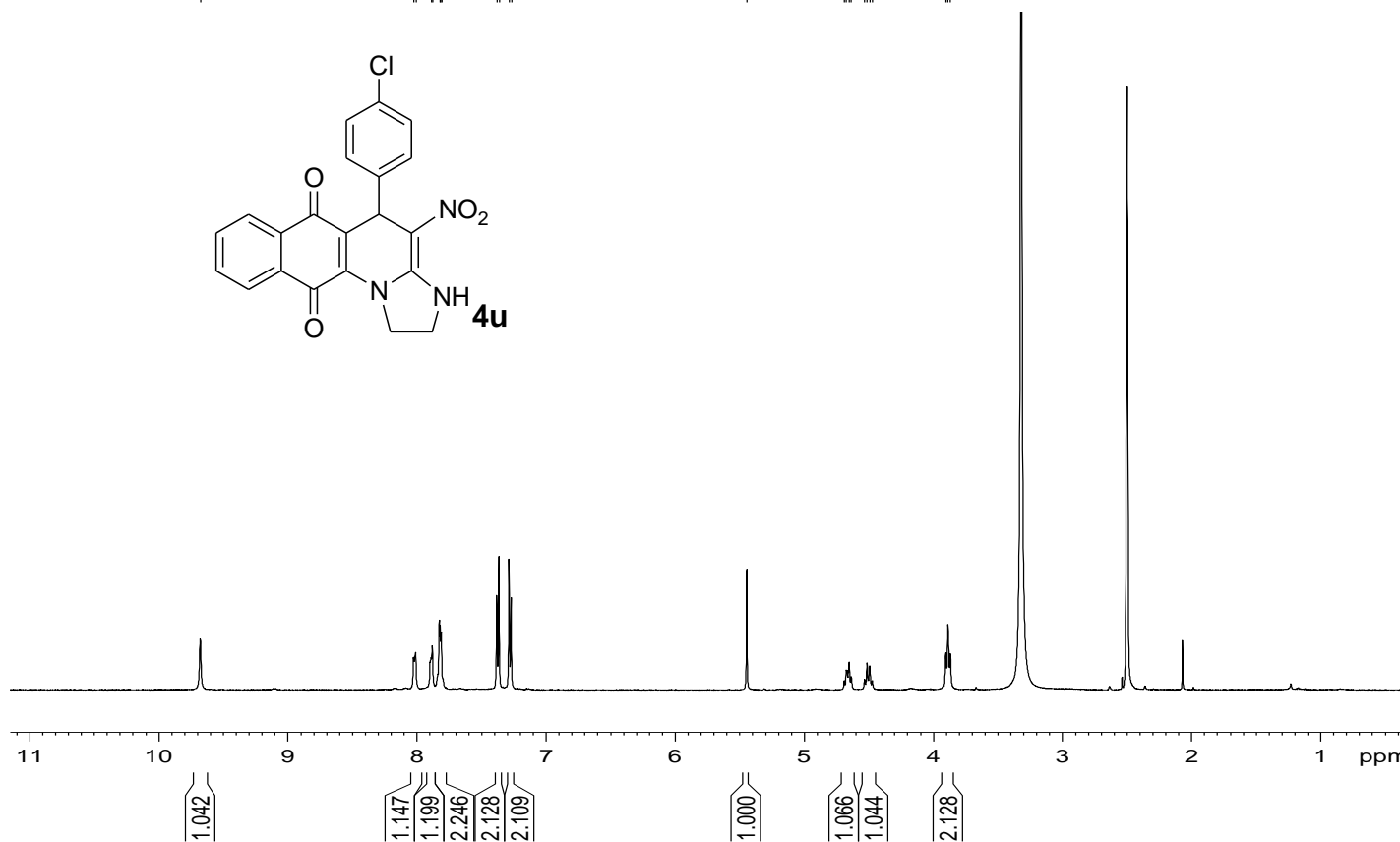
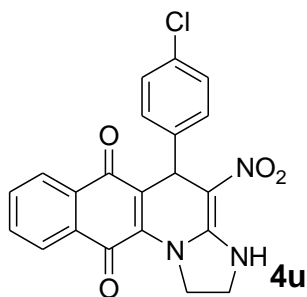
==== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.20 dB
PL12 17.66 dB
PL13 17.66 dB
SFO2 500.0355000 MHz
SI 32768
SF 125.7327069 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 2.00

l-y-0628

1H 2012 06



9.675
8.023
8.006
7.885
7.877
7.823
7.816
7.808
7.379
7.362
7.284
7.267
5.447
4.691
4.675
4.653
4.636
4.534
4.514
4.494
4.474
3.904
3.888
3.869

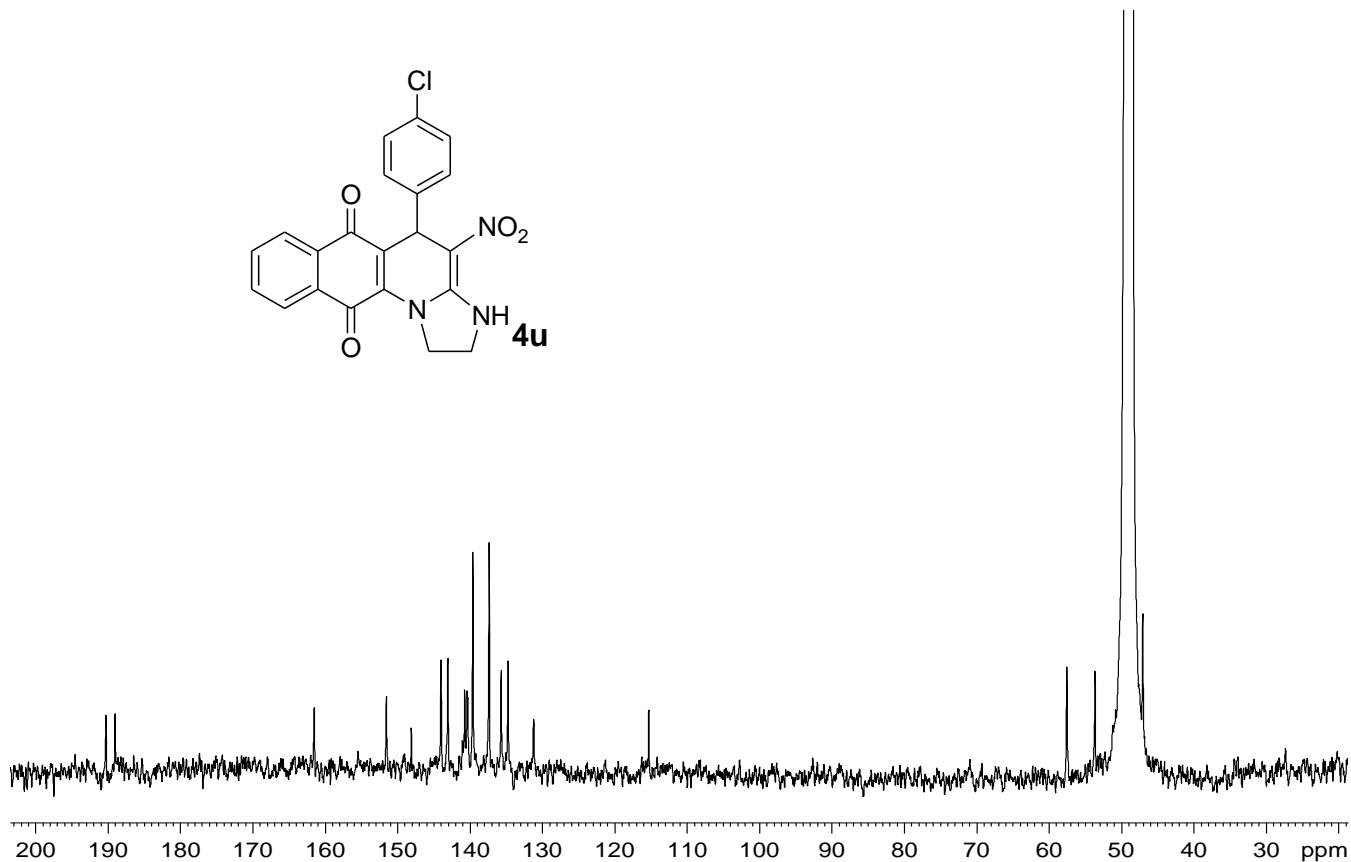
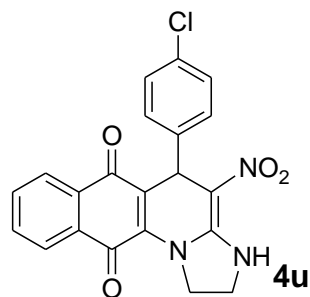


NAME Sqc-4-y-0628
EXPNO 1
PROCNO 1
Date_ 20120628
Time_ 14.09
INSTRUM av500
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT DMSO
NS 8
DS 1
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 1.6385000 sec
RG 362
DW 50.000 usec
DE 6.00 usec
TE 300.8 K
D1 2.00000000 sec
TDO 1

==== CHANNEL f1 =====
NUC1 1H
P1 13.50 usec
PL1 2.20 dB
SFO1 500.0335010 MHz
SI 16384
SF 500.0300015 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 2.00

S-4-Y 13C 1D 2012 07

190.328
189.113
161.657
151.534
148.213
144.082
143.191
140.762
140.357
139.709
137.522
135.821
134.768
131.124
115.250
57.665
53.778
47.136



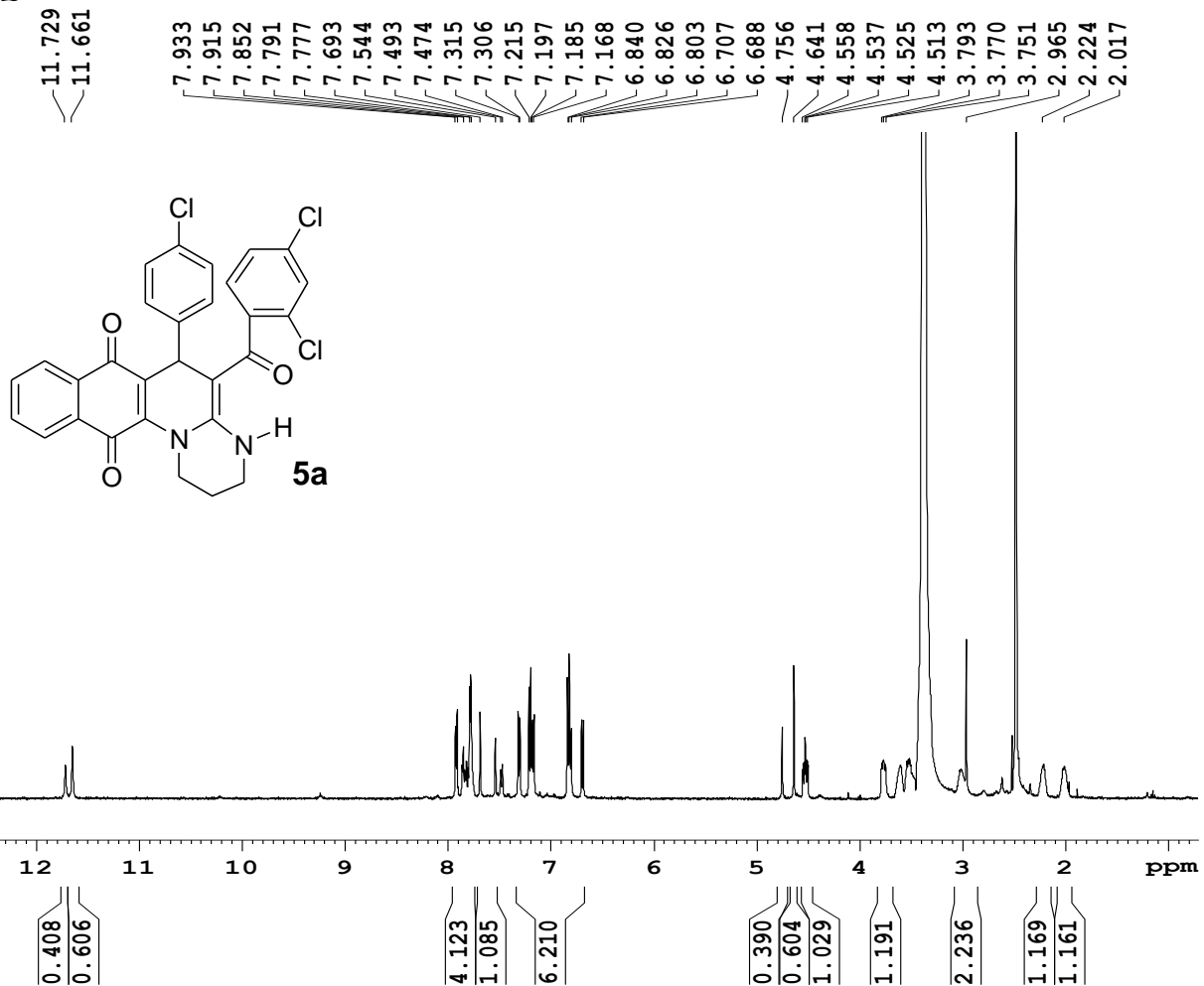
NAME SQC-4-Y
EXPNO 2
PROCNO 1
Date_ 20120725
Time_ 17.09
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 4240
DS 2
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 se
RG 512
DW 15.300 us
DE 6.00 us
TE 302.1 K
D1 2.00000000 se
d11 0.03000000 se
DELTA 1.899999998 se
TD0 1

==== CHANNEL f1 =====
NUC1 13C
P1 12.20 us
PL1 3.00 dB
SFO1 125.7464750 MH

==== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 us
PL2 2.00 dB

SQC-4-Q 1H

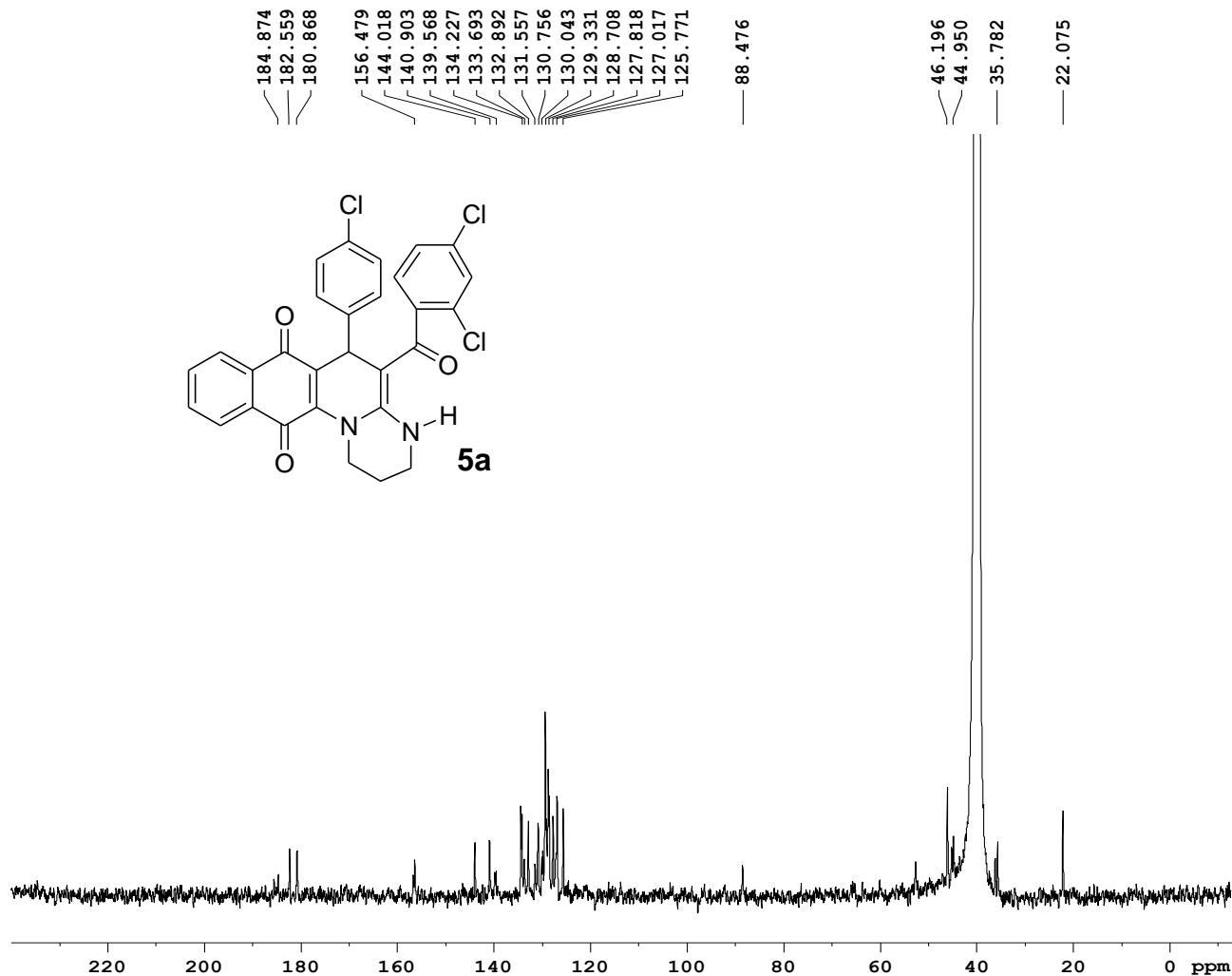
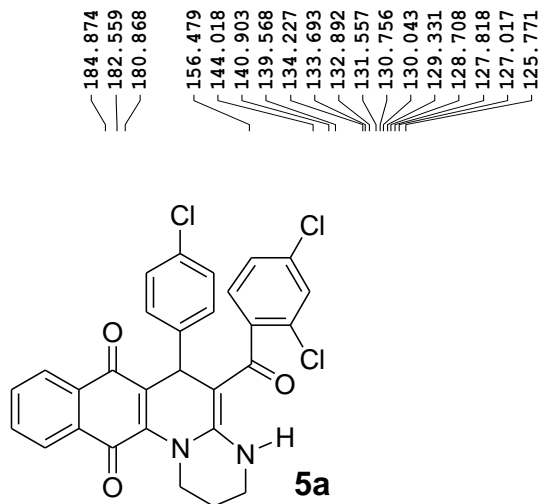
2011 12 25



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NAME SQC-4-Q
EXPNO 1
PROCNO 1
Date_ 20111225
Time_ 19.26
INSTRUM av500
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT DMSO
NS 4
DS 1
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 1.6385000 sec
RG 161
DW 50.000 usec
DE 6.00 usec
TE 293.3 K
D1 2.00000000 sec
TD0 1
```

```
===== CHANNEL f1 =====
NUC1 1H
P1 13.50 usec
PL1 2.20 dB
SFO1 500.0335010 MHz
SI 16384
SF 500.0300101 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 2.00
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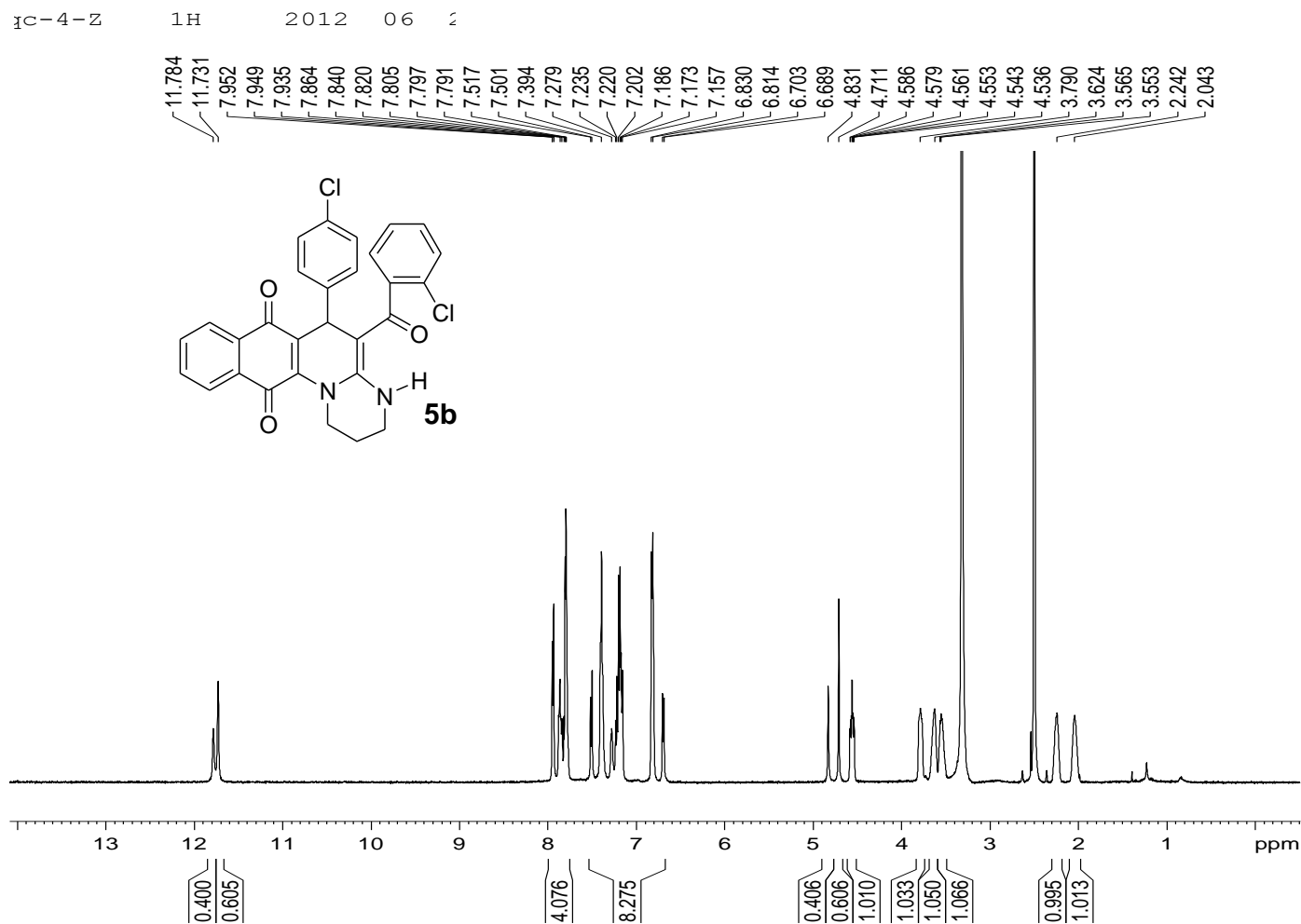
sqc-4-Q 13C 1D 2012 01 02



NAME sqc-4-Q
EXPNO 2
PROCNO 1
Date_ 20120103
Time 15.04
INSTRUM av500
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 20000
DS 2
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 sec
RG 18400
DW 15.300 usec
DE 6.00 usec
TE 296.6 K
D1 2.0000000 sec
d11 0.0300000 sec
DELTA 1.89999998 sec
TD0 1

===== CHANNEL f1 =====
NUC1 13C
P1 9.60 usec
PL1 2.00 dB
SFO1 125.7464750 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.20 dB
PL12 17.66 dB
PL13 17.66 dB
SFO2 500.0355000 MHz
SI 32768
SF 125.7326413 MHz
WDW EM
SSB 0
LB 10.00 Hz
GB 0
PC 2.00



NAME Sqc-4-Z
EXPNO 1
PROCNO 1
Date_ 20120628
Time_ 14.18
INSTRUM av500
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT DMSO
NS 16
DS 1
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 1.6385000 sec
RG 362
DW 50.000 usec
DE 6.00 usec
TE 300.8 K
D1 2.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 13.50 usec
PL1 2.20 dB
SFO1 500.0335010 MHz
SI 16384
SF 500.0300015 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 2.00

SQC-4-Z 13C 1D 2012 07

186.097
182.279
180.787
156.324
144.272
140.930
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134.128
132.816
130.847
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129.415
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127.147
126.849
125.656

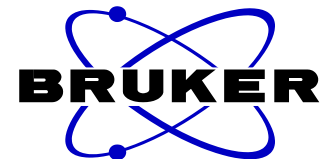
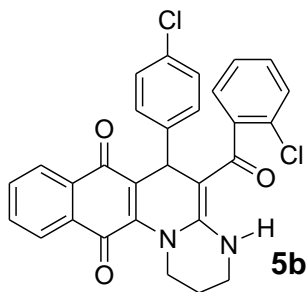
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22.196



NAME SQC-4-Z
EXPNO 2
PROCNO 1
Date_ 20120726
Time_ 6.41
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 10595
DS 2
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 sec
RG 512
DW 15.300 usec
DE 6.00 usec
TE 299.7 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1

==== CHANNEL f1 =====
NUC1 13C
P1 12.20 usec
PL1 3.00 dB
SFO1 125.7464750 MHz

==== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PT2 2.00 dB

