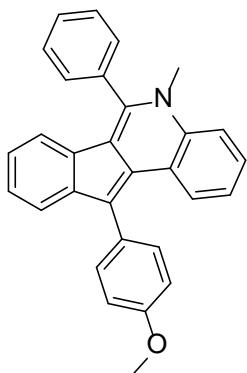
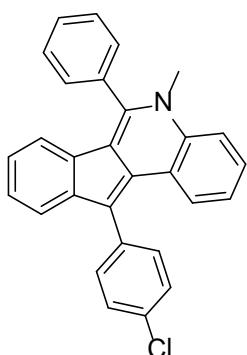


5- Methyl-6,11-diphenyl-5*H*-indeno[1,2-*c*]quinoline (**3a**).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ):  $\delta$  8.06 (d,  $J = 7.9$  Hz, 1H), 7.59-7.50 (m, 7H), 7.46-7.31 (m, 6H), 7.23 (t,  $J = 7.2$  Hz, 1H), 7.08 (t,  $J = 7.4$  Hz, 1H), 6.88 (t,  $J = 7.3$  Hz, 1H), 6.31 (d,  $J = 7.8$  Hz, 1H), 3.47 (s, 3H).  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ):  $\delta$  144.1, 142.5, 138.7, 136.1, 135.5, 130.6, 129.5, 129.0, 128.8, 126.6, 125.6, 125.4, 124.3, 123.0, 120.6, 120.4, 120.0, 118.3, 116.2, 115.5, 36.2. HRMS (ESI) calcd for  $\text{C}_{29}\text{H}_{22}\text{N}^+$ : 384.1747 ( $\text{M} + \text{H}^+$ ), found: 384.1753.

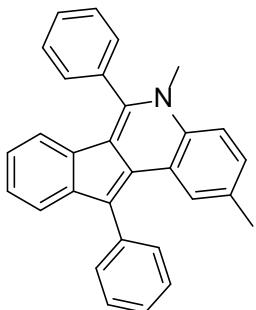


11-(4-Methoxyphenyl)-5-methyl-6-phenyl-5*H*-indeno[1,2-*c*]quinoline (**3b**).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ):  $\delta$  8.09 (d,  $J = 8.1$  Hz, 1H), 7.64-7.36 (m, 10H), 7.25-7.20 (m, 1H), 7.14-7.08 (m, 3H), 6.90-6.86 (m, 1H), 6.32 (d,  $J = 7.9$  Hz, 1H), 3.91 (s, 3H), 3.56 (s, 3H).  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ):  $\delta$  158.4, 143.9, 142.7, 136.2, 135.6, 132.7, 131.6, 130.8, 129.5, 129.1, 126.5, 125.6, 125.4, 124.3, 123.2, 123.0, 120.6, 120.3, 119.8, 118.3, 116.2, 115.4, 114.3, 113.9, 55.3, 36.3. HRMS (ESI) calcd for  $\text{C}_{30}\text{H}_{24}\text{NO}^+$ : 414.1852 ( $\text{M} + \text{H}^+$ ), found: 414.1870.

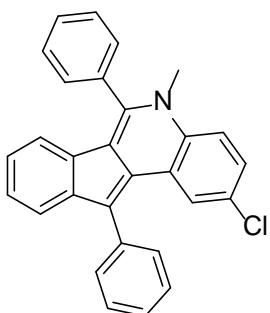


11-(4-Chlorophenyl)-5-methyl-6-phenyl-5*H*-indeno[1,2-*c*]quinoline (**3c**).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ):  $\delta$  8.06-8.03 (m, 1H), 7.67-7.66 (m, 3H), 7.56-7.50 (m, 7H), 7.46-7.40 (m, 2H), 7.26-7.22 (m, 1H), 7.19-7.15 (m, 1H), 6.90 (d,  $J = 7.1$  Hz, 1H), 6.32 (d,  $J = 8.0$  Hz, 1H), 3.62 (s, 3H).  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ):  $\delta$  144.3, 142.2, 137.3, 136.1, 135.5,

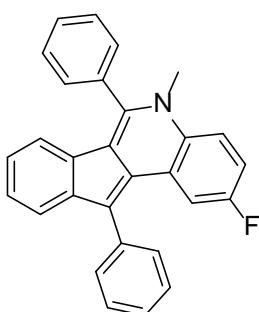
132.3, 132.1, 130.6, 129.7, 129.6, 129.1, 126.8, 125.8, 125.6, 124.5, 123.2, 122.9, 120.7, 120.5, 118.5, 118.0, 116.3, 115.7, 36.4. HRMS (ESI) calcd for  $C_{29}H_{21}ClN^+$ : 418.1357 ( $M + H^+$ ), found: 418.1361.



**2,5-Dimethyl-6,11-diphenyl-5*H*-indeno[1,2-*c*]quinoline (3d).**  $^1H$  NMR (400 MHz,  $CDCl_3$ ):  $\delta$  7.86 (s, 1H), 7.63-7.38 (m, 12H), 7.24-7.19 (m, 2H), 6.87 (t,  $J = 7.6$  Hz, 1H), 6.32 (d,  $J = 8.0$  Hz, 1H), 3.54 (s, 3H), 2.22 (s, 3H).  $^{13}C$  NMR (100 MHz,  $CDCl_3$ ):  $\delta$  143.9, 142.3, 138.8, 135.6, 134.1, 132.5, 130.6, 129.5, 129.1, 128.6, 127.7, 126.5, 125.8, 125.5, 124.2, 123.0, 120.6, 120.2, 119.7, 118.3, 116.0, 115.4, 36.3, 21.0. HRMS (ESI) calcd for  $C_{30}H_{24}N^+$ : 398.1903 ( $M + H^+$ ), found: 398.1904.

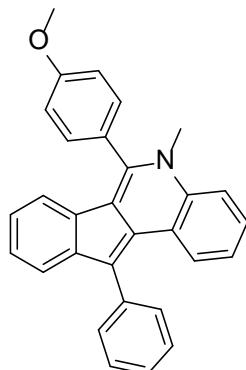


**2-Chloro-5-methyl-6,11-diphenyl-5*H*-indeno[1,2-*c*]quinoline (3e).**  $^1H$  NMR (400 MHz,  $CDCl_3$ ):  $\delta$  7.99-7.98 (m, 1H), 7.65-7.53 (m, 7H), 7.47-7.45 (m, 4H), 7.38-7.36 (m, 1H), 7.30-7.21 (m, 2H), 6.91 (t,  $J = 7.6$  Hz, 1H), 6.32 (d,  $J = 8.0$  Hz, 1H), 3.52 (s, 3H).  $^{13}C$  NMR (100 MHz,  $CDCl_3$ ):  $\delta$  143.9, 142.3, 137.8, 135.2, 134.7, 131.5, 130.3, 129.7, 129.6, 129.0, 128.9, 128.5, 127.0, 126.4, 124.8, 124.6, 124.3, 124.2, 121.3, 120.9, 120.7, 118.6, 116.8, 116.4, 36.4. HRMS (ESI) calcd for  $C_{29}H_{21}ClN^+$ : 418.1357 ( $M + H^+$ ), found: 418.1351.

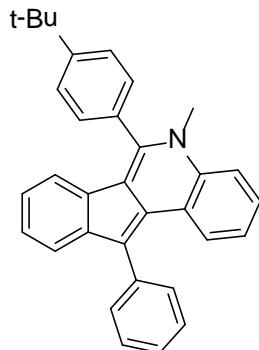


**2-Fluoro-5-methyl-6,11-diphenyl-5*H*-indeno[1,2-*c*]quinoline (3f).**  $^1H$  NMR (400 MHz,  $CDCl_3$ ):  $\delta$  7.71-7.64 (m, 4H), 7.59-7.44 (m, 9H), 7.26-7.22 (m, 1H), 7.12-7.07 (m, 1H), 6.93-6.89 (m, 1H), 6.33 (d,  $J = 8.0$  Hz, 1H), 3.91 (s, 3H), 3.56 (s, 3H).  $^{13}C$  NMR (100

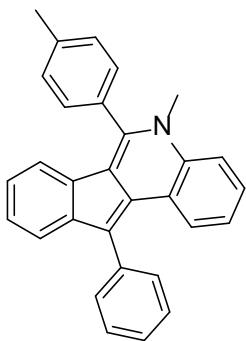
MHz, CDCl<sub>3</sub>): δ 158.4 (d, *J*<sub>CF</sub> = 241.1 Hz), 144.0, 142.2, 137.9, 135.3, 132.7, 130.5, 129.7, 129.6, 129.1, 128.9, 127.0, 124.6, 124.5, 121.0, 120.7 (d, <sup>3</sup>*J*<sub>CF</sub> = 6.5 Hz), 118.6, 117.1 (d, <sup>3</sup>*J*<sub>CF</sub> = 8.7 Hz), 115.5, 114.0 (d, <sup>2</sup>*J*<sub>CF</sub> = 24.0 Hz), 110.8 (d, <sup>2</sup>*J*<sub>CF</sub> = 23.6 Hz), 36.6. HRMS (ESI) calcd for C<sub>29</sub>H<sub>21</sub>FN<sup>+</sup>: 402.1653 (M + H<sup>+</sup>), found: 402.1656.



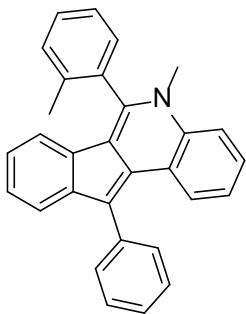
6-(4-Methoxyphenyl)-5-methyl-11-phenyl-5*H*-indeno[1,2-*c*]quinoline (**3g**). <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>): δ 8.06 (d, *J* = 8.0 Hz, 1H), 7.61-7.59 (m, 2H), 7.55-7.51 (m, 2H), 7.48-7.35 (m, 6H), 7.26-7.22 (m, 1H), 7.12-7.08 (m, 3H), 6.93 (t, *J* = 7.8 Hz, 1H), 6.47 (d, *J* = 7.4 Hz, 1H), 3.93 (s, 3H), 3.54 (s, 3H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>): δ 160.4, 144.1, 142.4, 138.8, 136.2, 130.6, 130.4, 129.2, 128.8, 127.6, 126.5, 125.6, 125.4, 124.3, 123.0, 122.9, 120.7, 120.4, 119.9, 118.3, 116.6, 115.6, 114.9, 55.4, 36.2. HRMS (ESI) calcd for C<sub>30</sub>H<sub>24</sub>NO<sub>+</sub>: 414.1852 (M + H<sup>+</sup>), found: 414.1850.



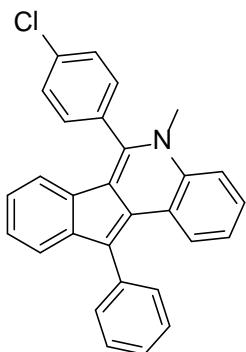
6-(4-(*tert*-Butyl)phenyl)-5-methyl-11-phenyl-5*H*-indeno[1,2-*c*]quinoline (**3h**). <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>): δ 8.07 (d, *J* = 8.1 Hz, 1H), 7.62 (d, *J* = 8.2 Hz, 4H), 7.55-7.49 (m, 3H), 7.45-7.39 (m, 5H), 7.25-7.21 (m, 1H), 7.11 (t, *J* = 7.8 Hz, 1H), 6.88 (t, *J* = 7.8 Hz, 1H), 6.33 (t, *J* = 7.9 Hz, 1H), 3.58 (s, 3H), 1.47 (s, 9H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>): δ 152.8, 144.4, 142.4, 138.8, 136.2, 132.5, 130.7, 129.2, 128.7, 128.7, 126.5, 126.4, 125.7, 125.4, 124.2, 123.1, 123.0, 120.7, 120.3, 119.9, 118.2, 116.4, 115.5, 36.4, 35.0, 31.4. HRMS (ESI) calcd for C<sub>33</sub>H<sub>30</sub>N<sup>+</sup>: 440.2373 (M + H<sup>+</sup>), found: 440.2370.



**5-Methyl-11-phenyl-6-(*p*-tolyl)-5*H*-indeno[1,2-*c*]quinoline (**3i**).**  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ):  $\delta$  8.07-8.05 (m, 1H), 7.62-7.36 (m, 12H), 7.26-7.19 (m, 1H), 7.12-7.09 (m, 1H), 6.93-6.89 (m, 1H), 6.42 (d,  $J = 7.9$  Hz, 1H), 3.56 (s, 3H), 2.55 (s, 3H).  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ):  $\delta$  144.4, 142.4, 139.5, 138.8, 136.2, 132.6, 130.7, 130.2, 129.2, 128.9, 128.8, 126.5, 125.7, 125.5, 124.3, 123.1, 123.0, 120.7, 120.3, 119.9, 118.3, 116.3, 115.5, 36.3, 21.6. HRMS (ESI) calcd for  $\text{C}_{30}\text{H}_{24}\text{N}^+$ : 398.1903 ( $\text{M} + \text{H}^+$ ), found: 398.1884.

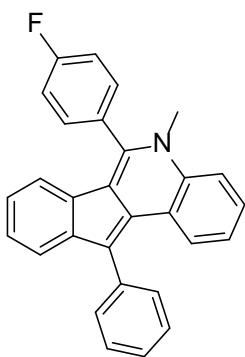


**5-Methyl-11-phenyl-6-(*o*-tolyl)-5*H*-indeno[1,2-*c*]quinoline (**3j**).**  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ):  $\delta$  8.09 (d,  $J = 8.1$  Hz, 1H), 7.63-7.36 (m, 12H), 7.23 (t,  $J = 7.2$  Hz, 1H), 7.12 (t,  $J = 7.6$  Hz, 1H), 6.90 (t,  $J = 7.5$  Hz, 1H), 6.27 (d,  $J = 7.9$  Hz, 1H), 3.58 (s, 3H), 2.15 (s, 3H).  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ):  $\delta$  143.5, 142.5, 138.7, 136.8, 136.1, 135.0, 130.9, 130.7, 129.9, 129.2, 129.0, 128.8, 127.1, 126.5, 125.8, 125.3, 124.3, 123.2, 123.0, 120.5, 120.2, 120.1, 118.3, 115.9, 115.5, 35.4, 19.3. HRMS (ESI) calcd for  $\text{C}_{30}\text{H}_{24}\text{N}^+$ : 398.1903 ( $\text{M} + \text{H}^+$ ), found: 398.1904.

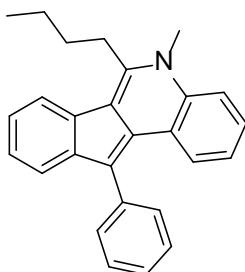


**6-(4-Chlorophenyl)-5-methyl-11-phenyl-5*H*-indeno[1,2-*c*]quinoline (**3k**).**  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ):  $\delta$  8.04 (d,  $J = 8.1$  Hz, 1H), 7.65-7.39 (m, 12H), 7.28-7.23 (m, 1H), 7.12 (t,  $J = 7.6$  Hz, 1H), 6.95 (t,  $J = 7.6$  Hz, 1H), 6.42 (d,  $J = 7.8$  Hz, 1H), 3.58 (s, 3H).  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ):  $\delta$  142.7, 142.6, 138.5, 136.1, 135.8, 134.0, 130.7, 130.6, 130.0, 128.8, 126.7, 125.8, 125.4, 124.6, 123.2, 123.0, 120.6, 120.5, 118.5, 116.5, 115.5, 36.4. HRMS

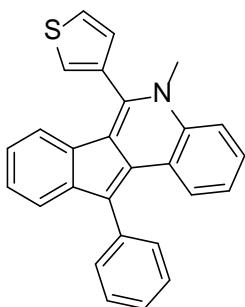
(ESI) calcd for  $C_{29}H_{21}ClN^+$ : 418.1357 ( $M + H^+$ ), found: 418.1345.



**6-(4-Fluorophenyl)-5-methyl-11-phenyl-5*H*-indeno[1,2-*c*]quinoline (3l).**  $^1H$  NMR (400 MHz,  $CDCl_3$ ):  $\delta$  8.05 (d,  $J = 8.1$  Hz, 1H), 7.60-7.20 (m, 13H), 7.11 (t,  $J = 7.4$  Hz, 1H), 6.93 (t,  $J = 7.6$  Hz, 1H), 6.35 (d,  $J = 7.9$  Hz, 1H), 3.52 (s, 3H).  $^{13}C$  NMR (100 MHz,  $CDCl_3$ ):  $\delta$  163.3 (d,  $J_{CF} = 248.8$  Hz), 142.9, 142.6, 138.5, 136.1, 131.5, 131.2, 131.1, 130.6, 129.0, 128.8, 126.7, 125.7, 125.4, 124.5, 123.1, 123.0, 120.5 (d,  $^3J_{CF} = 7.7$  Hz), 120.4, 118.5, 116.8 (d,  $^2J_{CF} = 21.6$  Hz), 116.7, 115.5, 36.2. HRMS (ESI) calcd for  $C_{29}H_{21}FN^+$ : 402.1653 ( $M + H^+$ ), found: 402.1648.

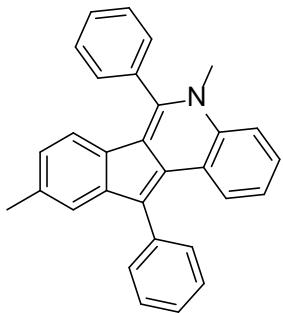


**6-Butyl-5-methyl-11-phenyl-5*H*-indeno[1,2-*c*]quinoline (3m).**  $^1H$  NMR (400 MHz,  $CDCl_3$ ):  $\delta$  8.03-8.95 (m, 2H), 7.59-7.51 (m, 5H), 7.44-7.28 (m, 5H), 7.04 (t,  $J = 7.2$  Hz, 1H), 3.78 (s, 3H), 3.38 (m, 2H), 1.92-1.84 (m, 2H), 1.72-1.63 (m, 2H), 1.07 (t,  $J = 7.6$  Hz, 3H).  $^{13}C$  NMR (100 MHz,  $CDCl_3$ ):  $\delta$  146.5, 142.4, 138.9, 136.3, 130.8, 128.8, 128.3, 126.5, 126.4, 125.7, 125.4, 123.9, 122.9, 122.7, 120.9, 120.7, 119.1, 118.8, 115.3, 115.0, 34.4, 30.5, 30.2, 23.1, 13.9. HRMS (ESI) calcd for  $C_{27}H_{26}N^+$ : 364.2060 ( $M + H^+$ ), found: 364.2038.

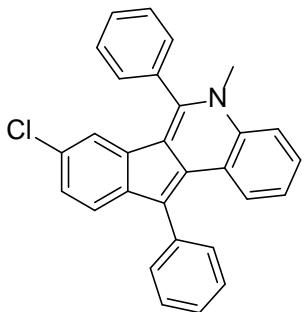


**5-Methyl-11-phenyl-6-(thiophen-3-yl)-5*H*-indeno[1,2-*c*]quinoline (3n).**  $^1H$  NMR (400 MHz,  $CDCl_3$ ):  $\delta$  8.04 (d,  $J = 8.1$  Hz, 1H), 7.68-7.66 (m, 1H), 7.61-7.59 (m, 2H), 7.55-7.37 (m, 7H), 7.28-7.24 (m, 1H), 7.21-7.20 (m, 1H), 7.11 (t,  $J = 7.7$  Hz, 1H), 6.98 (t,  $J = 7.5$  Hz, 1H), 6.49 (d,  $J = 7.9$  Hz, 1H), 3.61 (s, 3H).  $^{13}C$  NMR (100 MHz,  $CDCl_3$ ):  $\delta$  142.5, 139.2, 138.6, 136.2, 135.3, 130.6, 129.0, 128.8, 128.0, 127.8, 126.6, 126.0, 125.7,

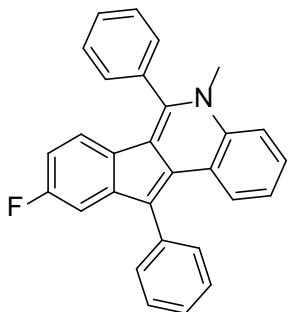
125.2, 124.5, 123.1, 123.0, 120.6, 120.4, 120.3, 118.4, 117.2, 115.5, 36.2. HRMS (ESI) calcd for  $C_{27}H_{20}NS^+$ : 390.1311 ( $M + H^+$ ), found: 390.1335.



**5,9-Dimethyl-6,11-diphenyl-5*H*-indeno[1,2-*c*]quinoline (3o).**  $^1H$  NMR (400 MHz,  $CDCl_3$ ):  $\delta$  8.03 (d,  $J = 8.1$  Hz, 1H), 7.63-7.35 (m, 12H), 7.23 (s, 1H), 7.09 (t,  $J = 7.9$  Hz, 1H), 6.73 (d,  $J = 8.0$  Hz, 1H), 6.21 (d,  $J = 8.0$  Hz, 1H), 3.56 (s, 3H), 2.36 (s, 3H).  $^{13}C$  NMR (100 MHz,  $CDCl_3$ ):  $\delta$  143.3, 142.9, 138.9, 136.1, 135.7, 134.2, 130.7, 129.5, 129.2, 128.8, 126.8, 126.5, 126.4, 125.7, 123.0, 122.9, 121.9, 120.4, 119.9, 118.4, 116.3, 115.4, 36.3, 21.8. HRMS (ESI) calcd for  $C_{30}H_{24}N^+$ : 398.1903 ( $M + H^+$ ), found: 398.1884.

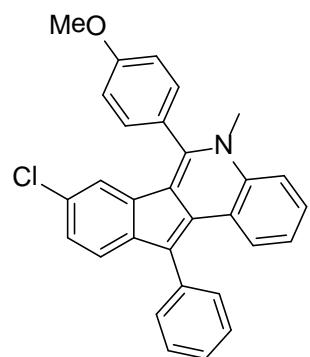


**8-Chloro-5-methyl-6,11-diphenyl-5*H*-indeno[1,2-*c*]quinoline (3p).**  $^1H$  NMR (400 MHz,  $CDCl_3$ ):  $\delta$  8.05 (d,  $J = 8.1$  Hz, 1H), 7.65-7.49 (m, 8H), 7.44-7.39 (m, 5H), 7.13 (t,  $J = 7.7$  Hz, 1H), 6.82 (d,  $J = 8.4$  Hz, 1H), 6.18 (d,  $J = 8.5$  Hz, 1H), 3.57 (s, 3H).  $^{13}C$  NMR (100 MHz,  $CDCl_3$ ):  $\delta$  144.6, 143.5, 138.0, 136.0, 135.1, 130.6, 130.3, 129.8, 129.6, 128.9, 127.2, 126.9, 126.8, 126.7, 125.8, 123.4, 122.9, 121.5, 120.3, 119.1, 117.8, 115.7, 115.6, 36.4. HRMS (ESI) calcd for  $C_{29}H_{21}ClN^+$ : 418.1357 ( $M + H^+$ ), found: 418.1331.



**9-Fluoro-5-methyl-6,11-diphenyl-5*H*-indeno[1,2-*c*]quinoline (3q).**  $^1H$  NMR (400 MHz,  $CDCl_3$ ):  $\delta$  8.07 (d,  $J = 8.0$  Hz, 1H), 7.66-7.39 (m, 12H), 7.15-7.06 (m, 2H), 6.62-6.57 (m, 1H), 6.23-6.19 (m, 1H), 3.58 (s, 3H).  $^{13}C$  NMR (100 MHz,  $CDCl_3$ ):  $\delta$  161.4 (d,  $J_{CF} = 239.5$  Hz), 143.9, 143.8, 138.5, 136.0, 135.3, 130.5, 129.7, 129.6, 129.0, 128.9, 127.1, 126.9, 126.8, 125.8, 125.2, 123.2, 122.6, 121.6 (d,  $^3J_{CF} = 9.4$  Hz), 119.5, 115.7, 115.6, 108.1 (d,  $^2J_{CF} = 24.0$  Hz), 103.7 (d,  $^2J_{CF} = 22.7$  Hz), 36.4. HRMS (ESI) calcd for

$C_{29}H_{21}FN^+$ : 402.1653 ( $M + H^+$ ), found: 402.1663.



8-Chloro-6-(4-methoxyphenyl)-5-methyl-11-phenyl-5*H*-indeno[1,2-*c*]quinoline (**3r**).  $^1H$  NMR (400 MHz,  $CDCl_3$ ):  $\delta$  8.03 (d,  $J = 8.0$  Hz, 1H), 7.58-7.51 (m, 5H), 7.45-7.33 (m, 6H), 7.19-7.10 (m, 4H), 6.38 (s, 1H), 3.97 (s, 3H), 3.60 (s, 3H).  $^{13}C$  NMR (100 MHz,  $CDCl_3$ ):  $\delta$  160.7, 145.1, 140.5, 138.3, 136.2, 130.6, 130.3, 130.2, 128.8, 127.1, 126.8, 126.7, 125.9, 125.6, 124.3, 123.4, 123.1, 120.5, 119.3, 119.1, 115.8, 115.1, 55.6, 36.4. HRMS (ESI) calcd for  $C_{30}H_{23}ClNO^+$ : 448.1463 ( $M + H^+$ ), found: 448.1461.

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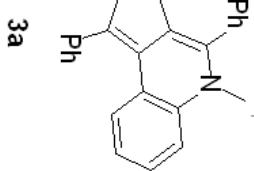
4006H

General  
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DATE = 2013/04/11

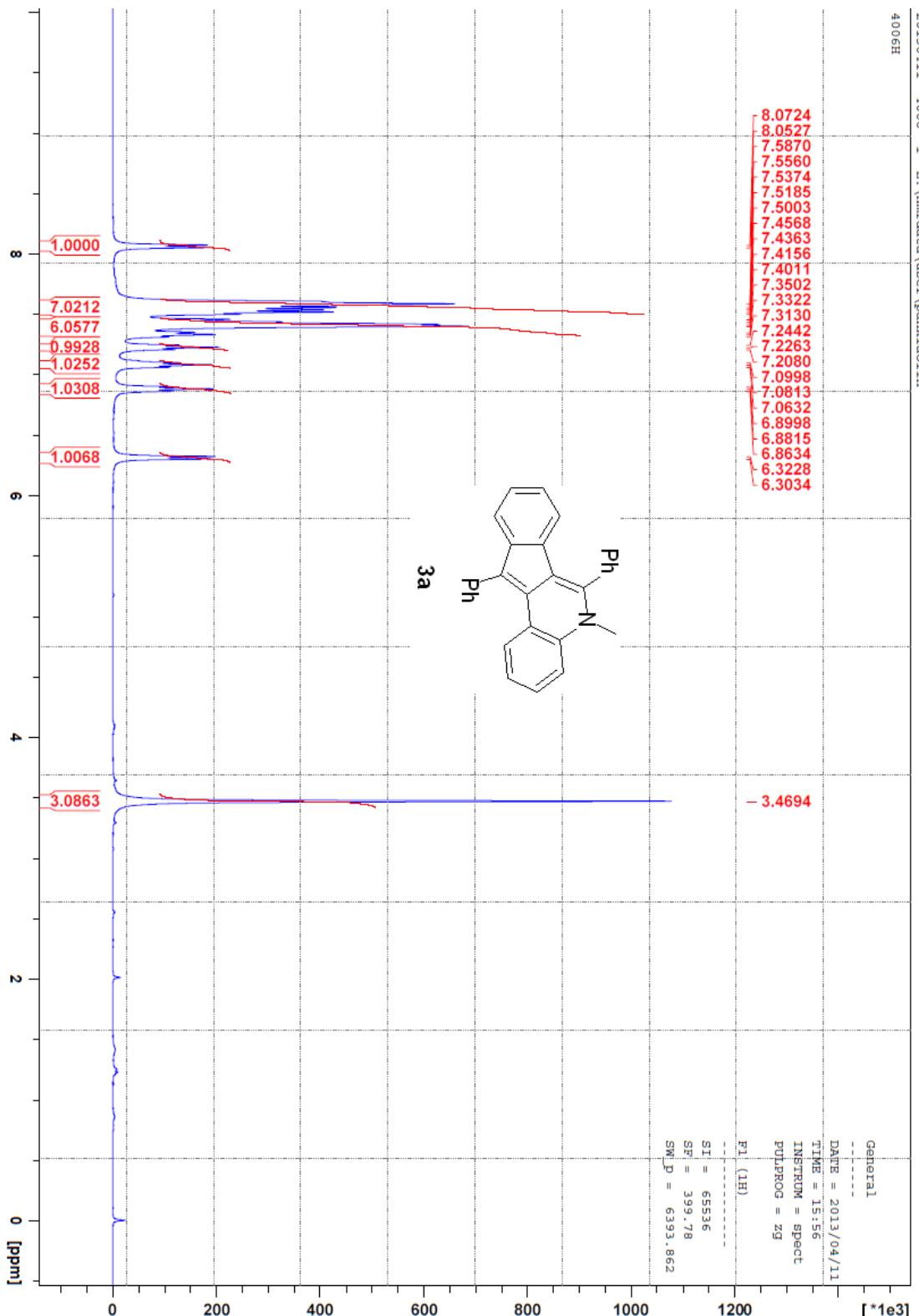
TIME = 15:56  
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PROG = zg  
SWP = 6393.062

-3.4694

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8.0527  
7.5870  
7.5560  
7.5374  
7.5185  
7.5003  
7.4568  
7.4363  
7.4156  
7.4011  
7.3502  
7.3322  
7.3130  
7.2442  
7.2263  
7.2080  
7.0998  
7.0813  
7.0632  
6.8998  
6.8815  
6.8634  
6.3228  
6.3034



1.0000  
7.0212  
6.0577  
0.9928  
1.0252  
1.0308  
1.0068  
3.0863



20130414 40062 1 E:\imrdata\user\panxiaolin

4006C

General

---

DATE = 2013/04/14

TIME = 21:32

INSTRUM = spect

PROBOD = 2gpg

PL (13C)

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SI = 32768

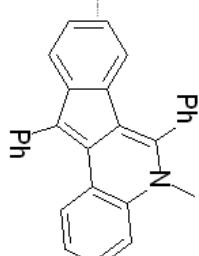
SF = 100.525

SWP = 24038.462

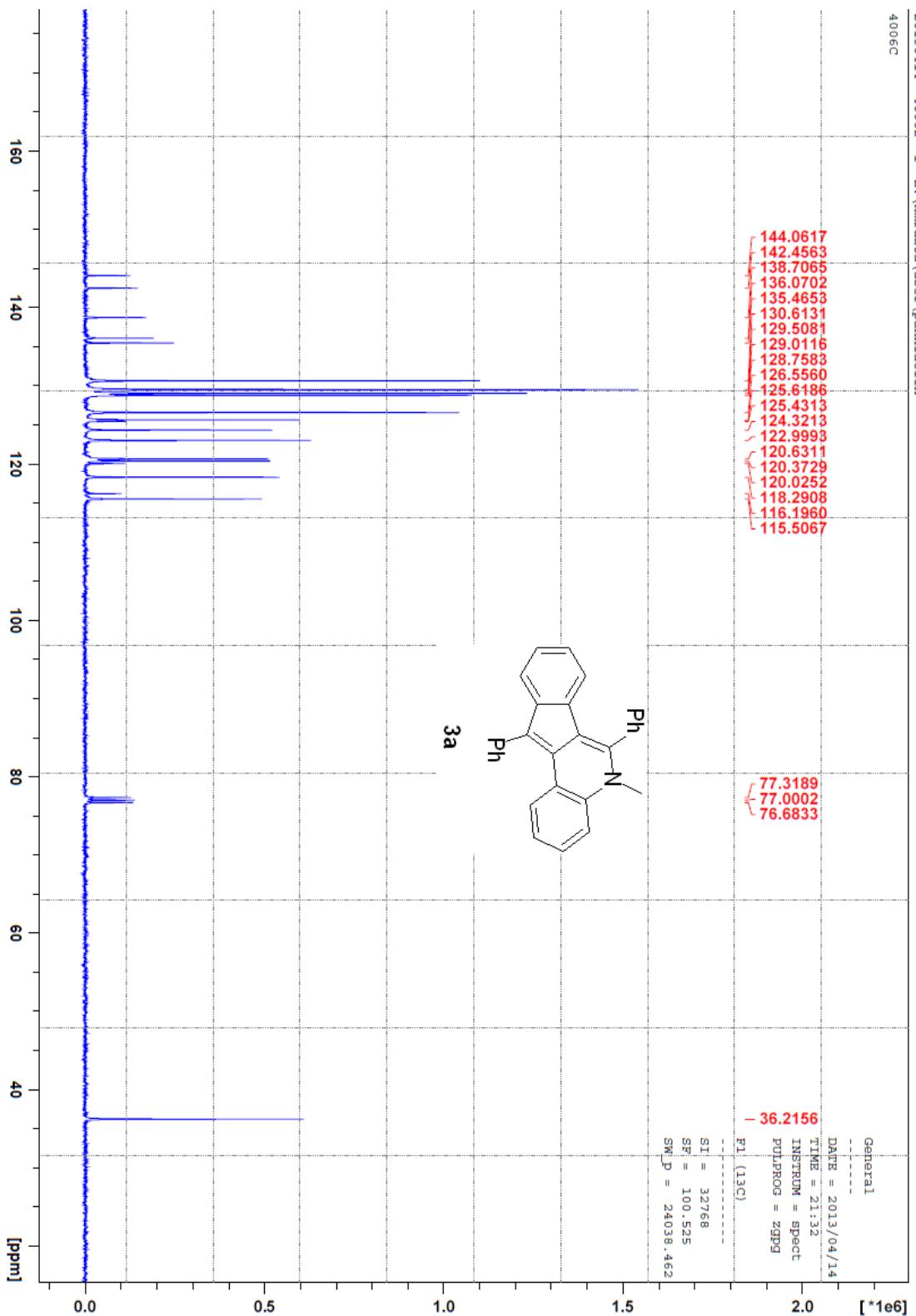
36.2156

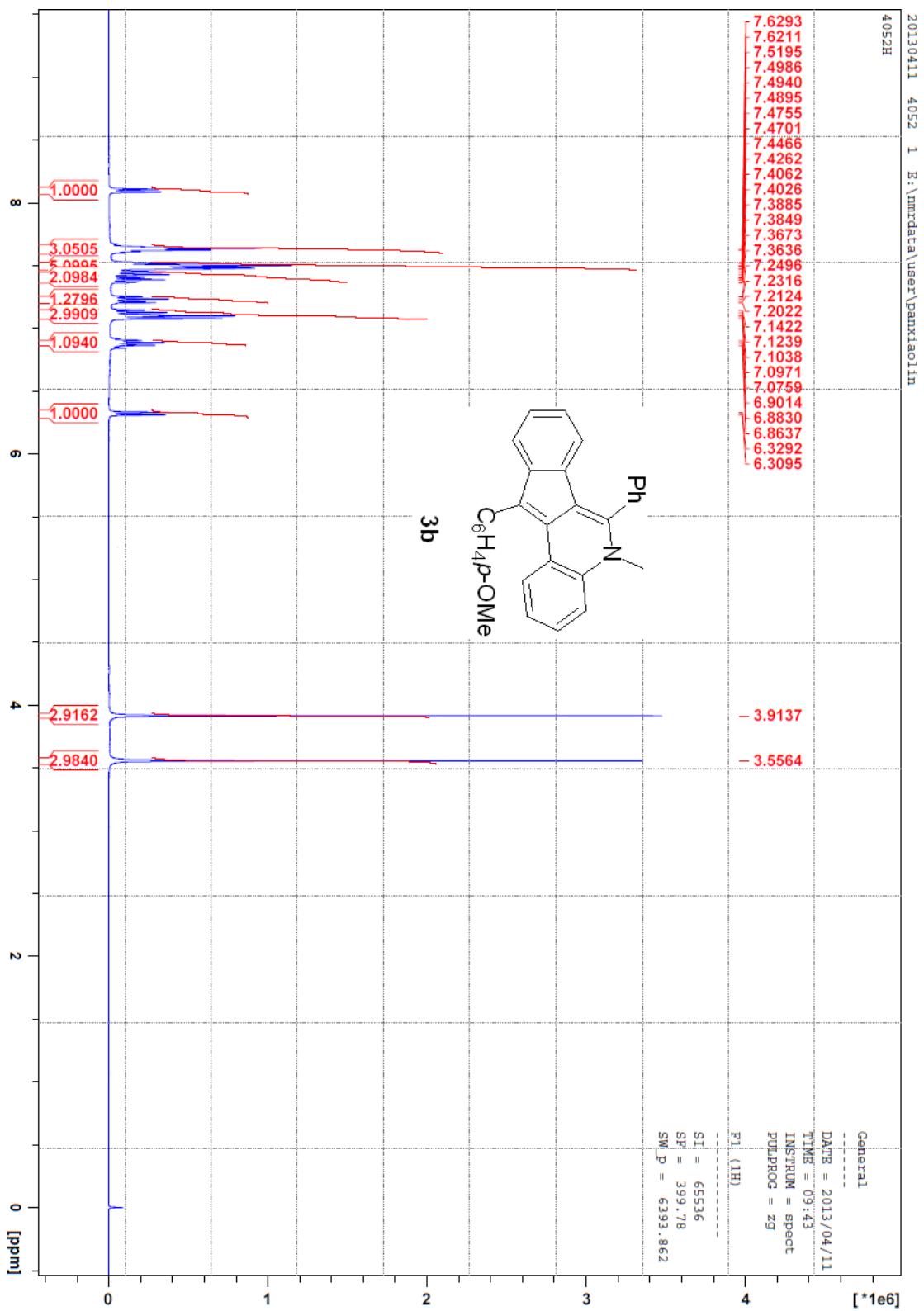
144.0617  
142.4563  
138.7065  
136.0702  
135.4653  
130.6131  
129.5081  
129.0116  
128.7583  
126.5560  
125.6186  
125.4313  
124.3213  
122.9993  
120.6311  
120.3729  
120.0252  
118.2908  
116.1960  
115.5067

77.3189  
77.0002  
76.6833



3a





20130411 40522 1 E:\mdrdata\user\panxiaoqin

4052C

General

- - -

DATE = 2013/04/11

TIME = 09:51

INSTRUM = spect

PULPROG = zgpg

SW\_P = 24038.462

F1 (13C)

SI = 32768

SF = 100.525

SW\_P = 24038.462

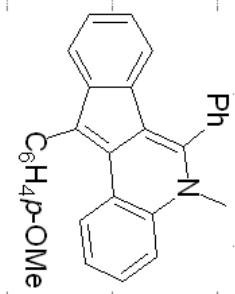
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- 158.3786  
143.8855  
142.7447  
136.1741  
135.5958  
132.6768  
131.6178  
130.7779  
129.5422  
129.1050  
126.4896  
125.6318  
125.4350  
124.3022  
123.2106  
122.9950  
120.6135  
120.3294  
119.8046  
118.3283  
116.2104  
115.4422  
114.2564  
113.9106

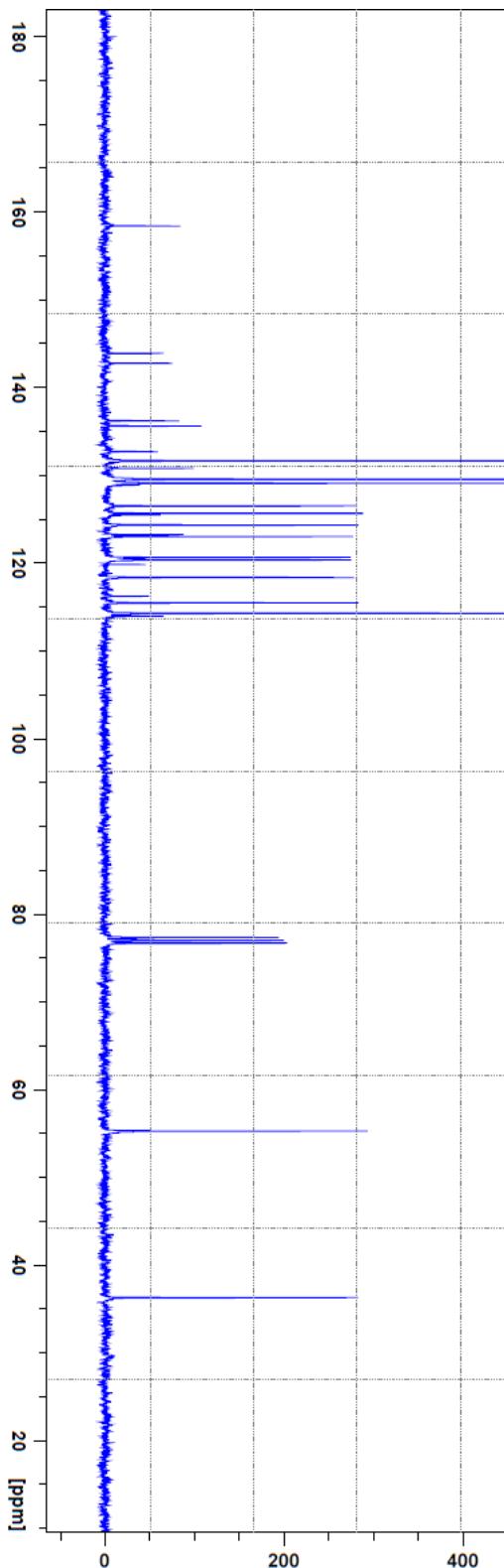
77.3196  
77.0014  
76.6833

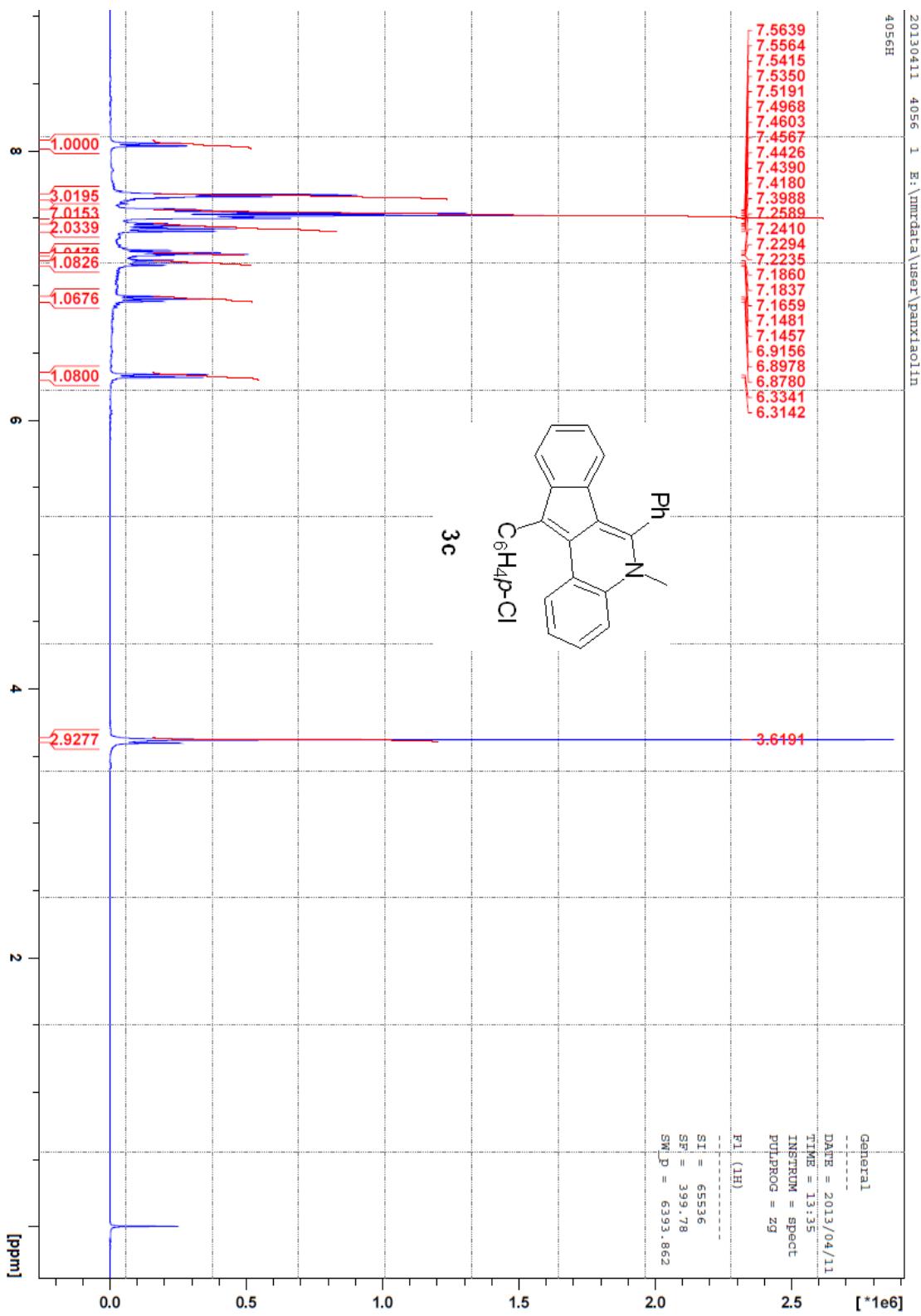
- 55.2693

- 36.2923



3b





20130411 40562 1 E:\imrdata\user\panxialin  
4056C

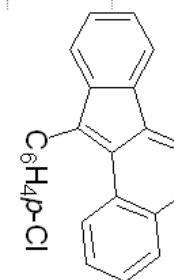
144.3076  
142.1525  
137.2542  
136.1370  
135.4671  
132.2888  
132.0582  
130.6510  
129.6826  
129.6324  
129.0551  
126.8023  
125.7652  
125.6049  
124.4687  
123.1965  
122.8854  
120.7190  
120.5262  
118.4919  
118.0227  
116.2761  
115.6677

{ 77.3194  
77.0016  
76.6837

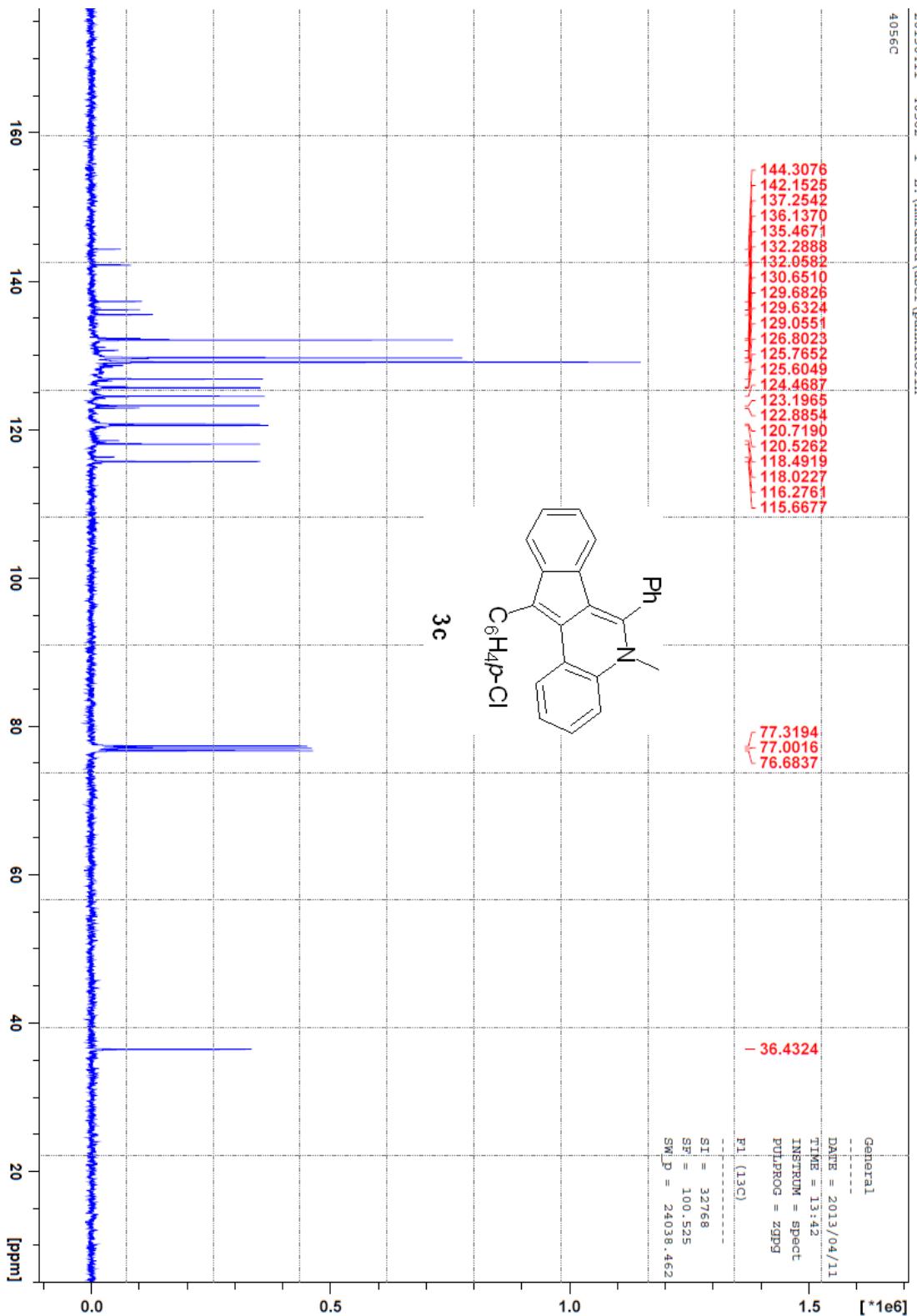
- 36.4324

General  
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DATE = 2013/04/11  
TIME = 13:42  
INSTRUM = spect  
PROG = zgpg  
P1 (13C)  
SI = 32768  
SF = 100.525  
SWP = 24038.462

Ph



3c



20130414 4075 1 E:\nnndata\user\panxialin

4075H

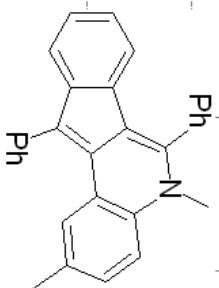
General  
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DATE = 2013/04/15

TIME = 09:15  
INSTRUM = spect  
PURPROG = zg

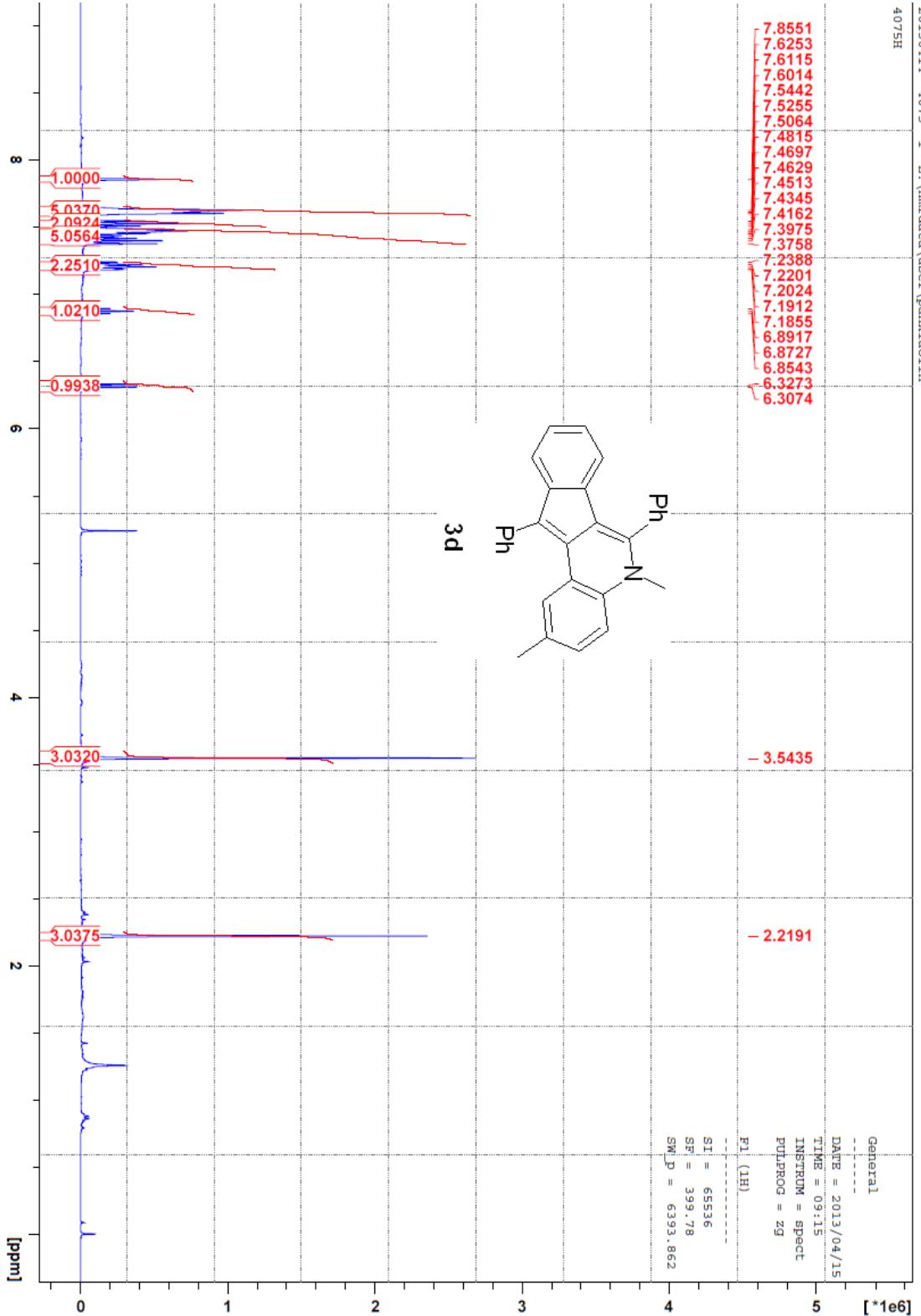
F1 (1H)

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SI = 65536  
SF = 399.78  
SWP = 6393.062

-3.5435  
-2.2191



3d



20130414 40752 1 E:\imrdata\user\panxialin  
4075C

General  
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DATE = 2013/04/15

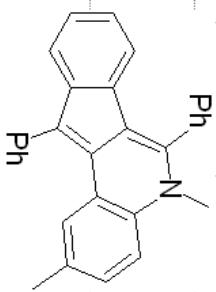
T9E = 0.9:1.9  
INSTRUM = spect  
PROG = zgpg

PL (13C)  
SI = 32768  
SF = 100.525  
SWP = 24038.462

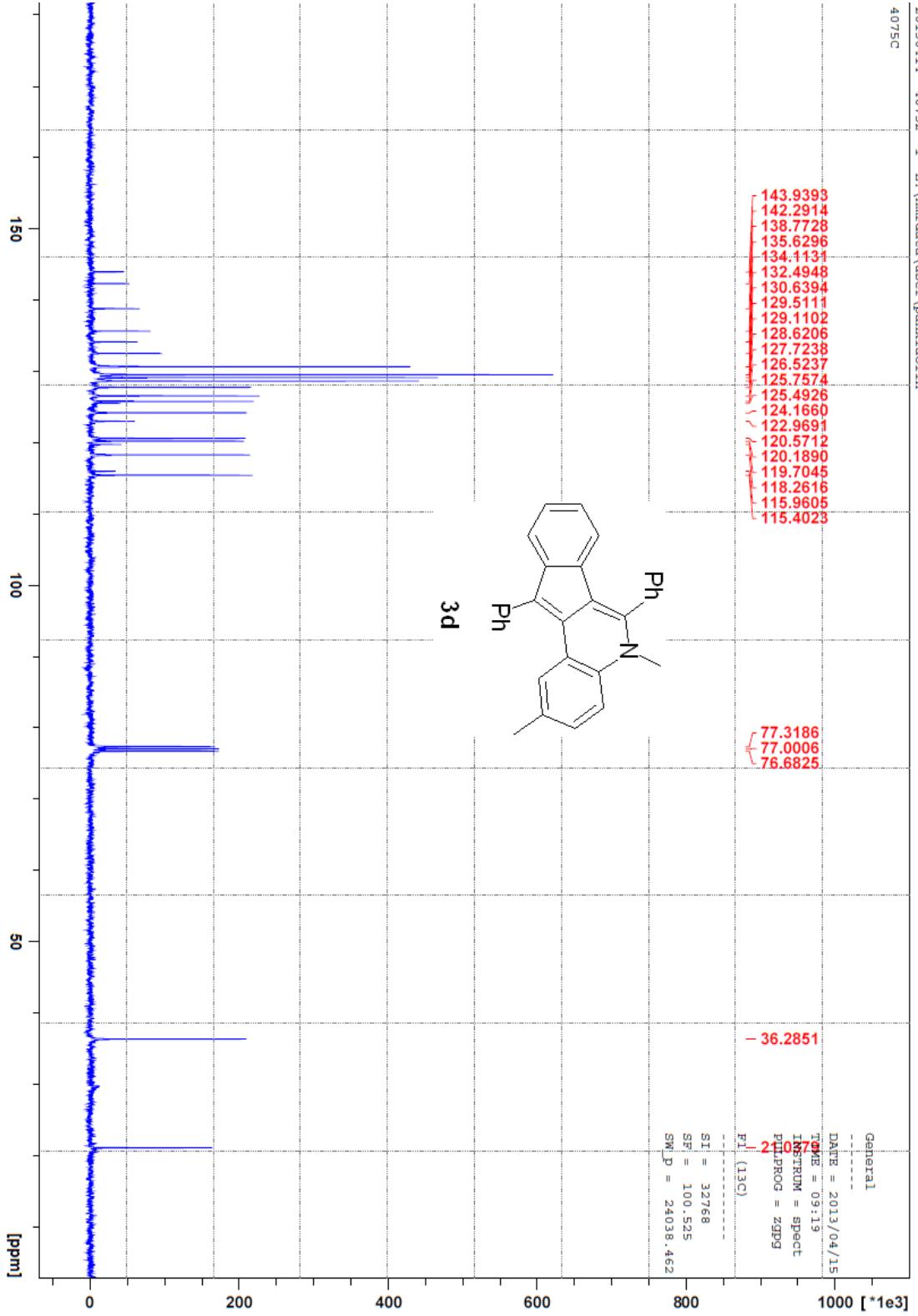
143.9393  
142.2914  
138.7728  
135.6296  
134.1131  
132.4948  
130.6394  
129.5111  
129.1102  
128.6206  
127.7238  
126.5237  
125.7574  
125.4926  
124.1660  
122.9691  
120.5712  
120.1890  
119.7045  
118.2616  
115.9605  
115.4023

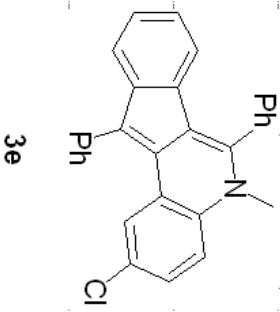
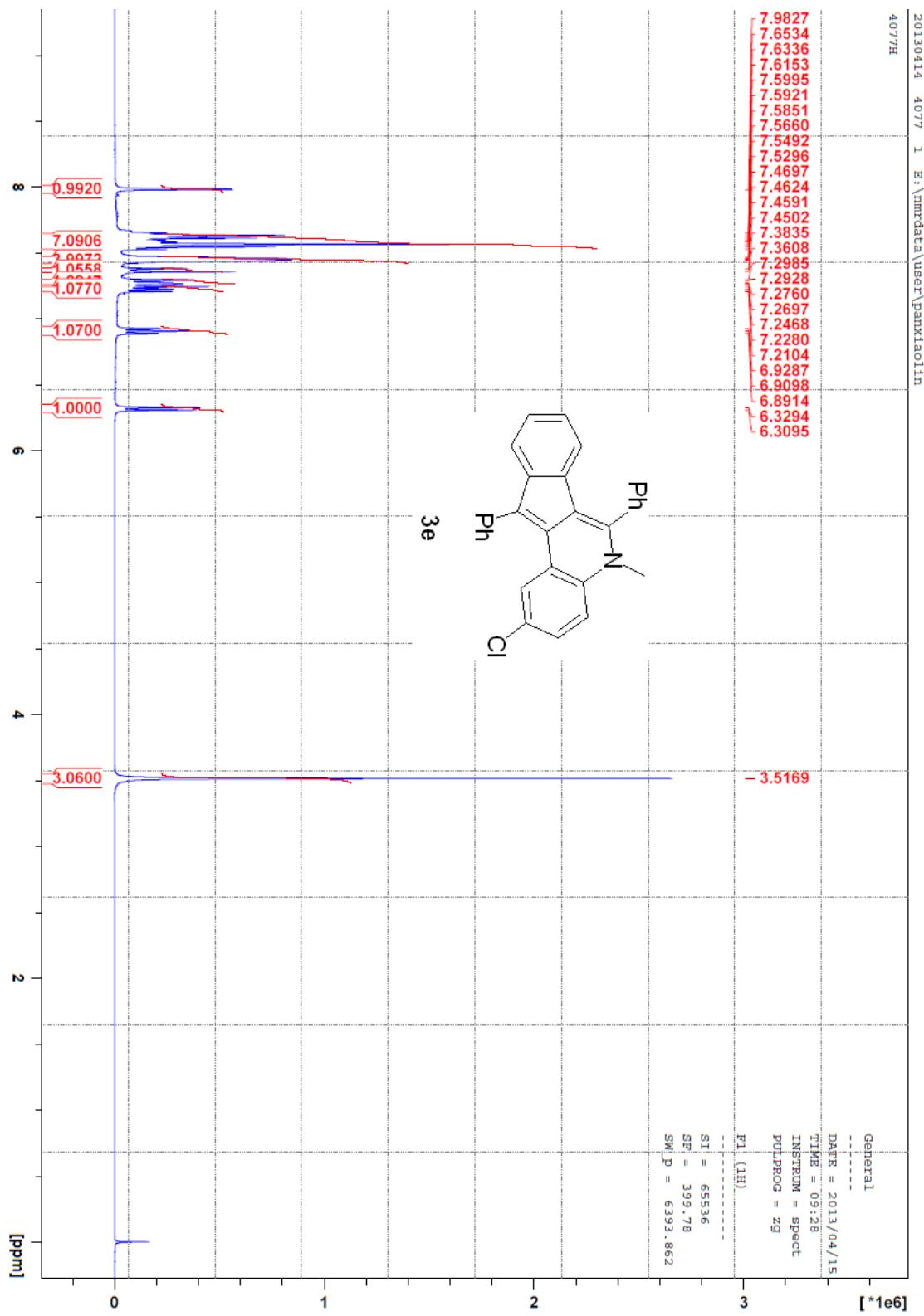
{ 77.3186  
77.0006  
76.6825

- 36.2851



3d





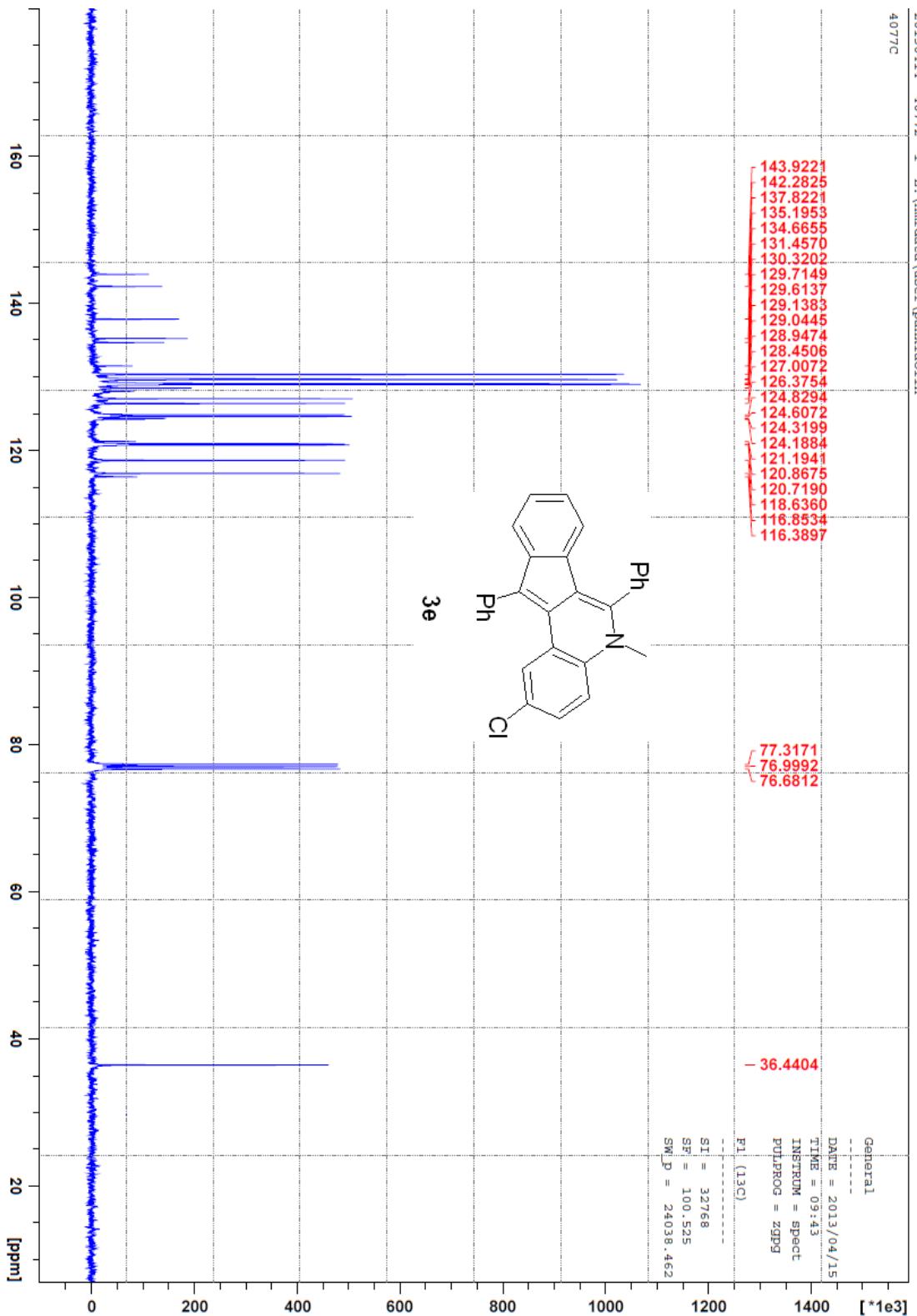
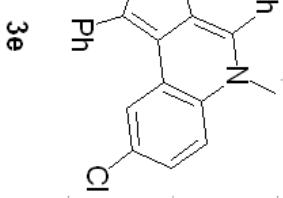
20130414 407772 1 E:\imrdata\user\panxialin  
4077C

143.9221  
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135.1953  
134.6655  
131.4570  
130.3202  
129.7149  
129.6137  
129.1383  
129.0445  
128.9474  
128.4506  
127.0072  
126.3754  
124.8294  
124.6072  
124.3199  
124.1884  
121.1941  
120.8675  
120.7190  
118.6360  
116.8534  
116.3897

77.3171  
76.9992  
76.6812

-36.4404

General  
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DATE = 2013/04/15  
TIME = 09:43  
INSTRUM = spect  
PROG = zgpg  
F1 (13C)  
SI = 32768  
SF = 100.525  
SWP = 24038.462



20130411 4054 1 E:\nnndata\user\panxialin

4054H

General  
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DATE = 2013/04/11

TIME = 09:59  
INSTRUM = spect  
PROG = zg

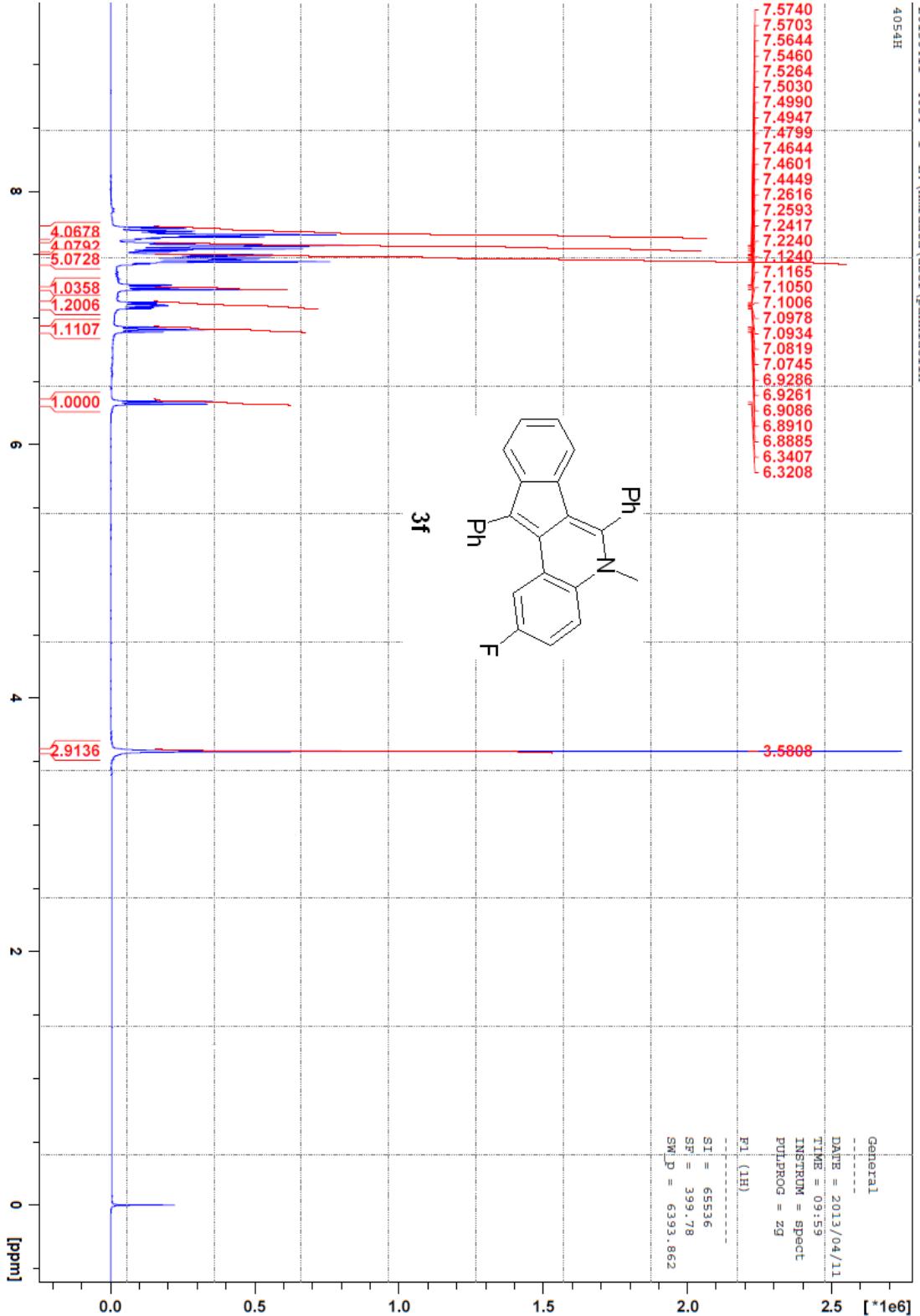
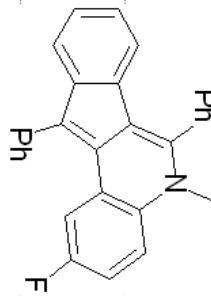
FID (1H)

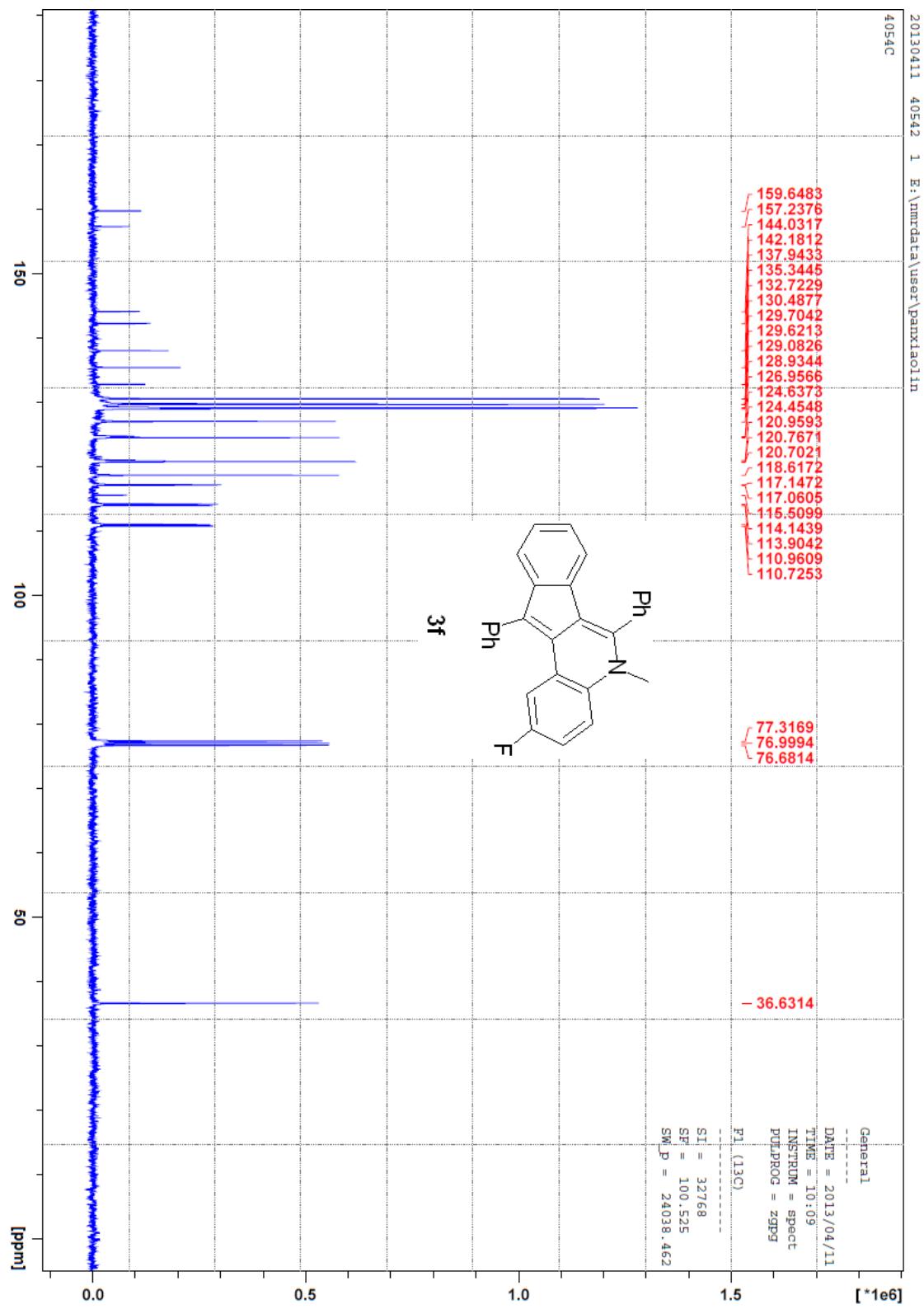
SI = 65536  
SF = 399.78  
SWP = 6393.062

[\*1e6]

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7.5460  
7.5264  
7.5030  
7.4990  
7.4947  
7.4799  
7.4644  
7.4601  
7.4449  
7.2616  
7.2593  
7.2417  
7.2240  
7.1240  
7.1165  
7.1050  
7.1006  
7.0978  
7.0934  
7.0819  
7.0745  
6.9286  
6.9261  
6.9086  
6.8910  
6.8885  
6.3407  
6.3208

3f





20130411 4060 1 E:\nnndata\user\panxialin

4060H

General  
-----  
DATE = 2013/04/11

TIME = 14:02  
INSTRUM = spect  
PROG = zg

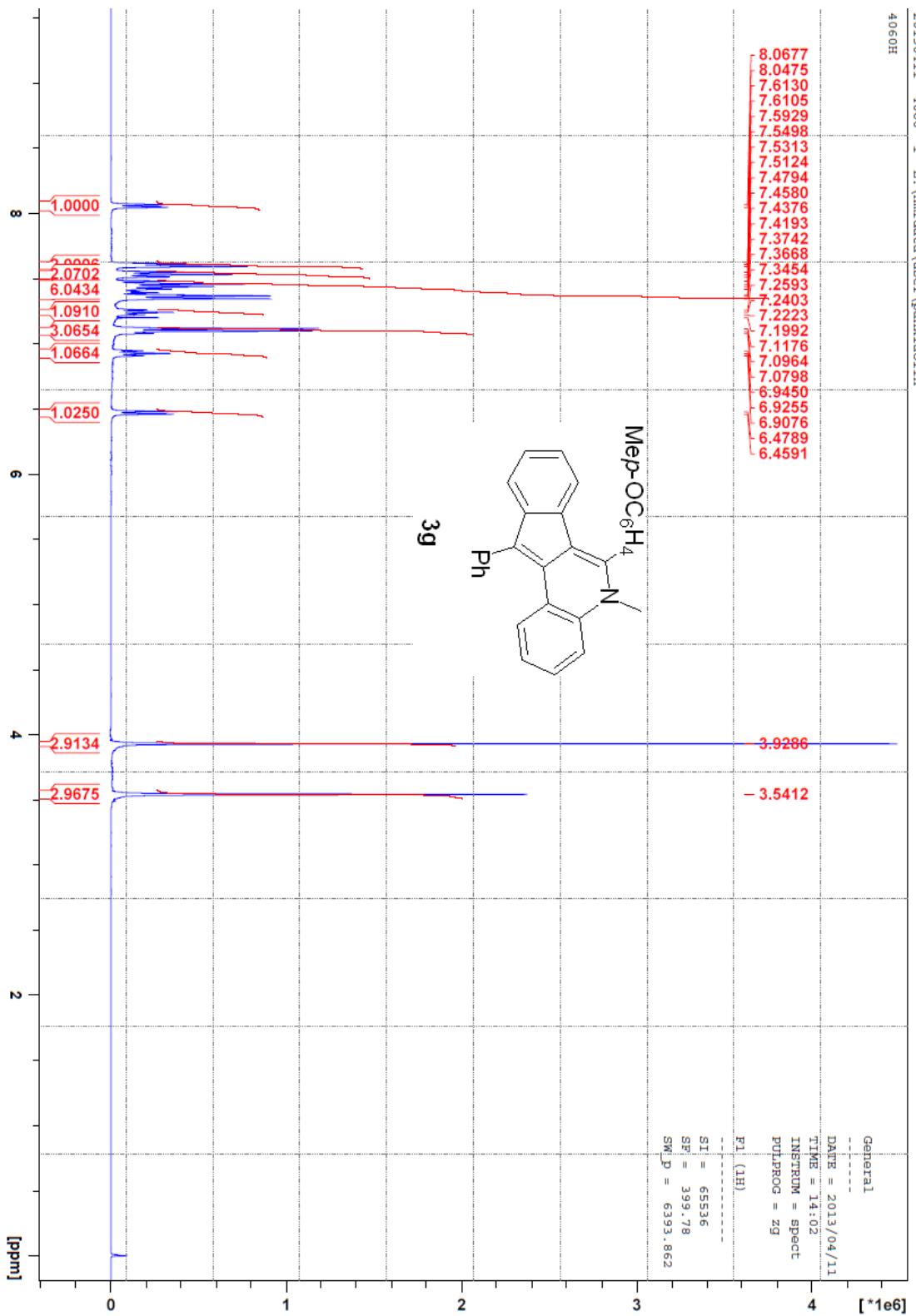
F1 (1H)  
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SI = 65536  
SF = 399.78  
SWP = 6393.062

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8.0475  
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7.6105  
7.5929  
7.5498  
7.5313  
7.5124  
7.4794  
7.4580  
7.4376  
7.4193  
7.3742  
7.3668  
7.3454  
7.2593  
7.2403  
7.2223  
7.1992  
7.1176  
7.0964  
7.0798  
6.9450  
6.9255  
6.9076  
6.4789  
6.4591

Me<sub>2</sub>-OC<sub>6</sub>H<sub>4</sub>



3g



20130411 40602 1 E:\mrdata\user\panxialin  
Carbon standard4060C

General  
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DATE = 2013/04/11

TIME = 14:08  
INSTRUM = spect  
PROG = zgpg

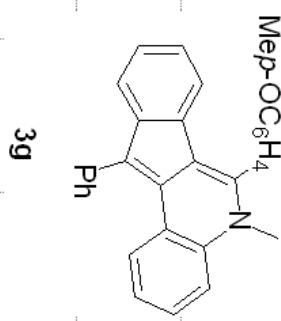
F1 (13C)  
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SI = 32768  
SF = 100.525  
SWP = 24038.462

- 160.3763  
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142.3877  
138.7610  
136.2104  
130.6417  
130.3864  
129.2440  
128.7530  
127.6325  
126.5313  
125.6389  
125.4421  
124.2743  
123.0403  
122.9443  
120.7438  
120.3503  
119.9243  
118.2665  
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115.5894  
114.8809

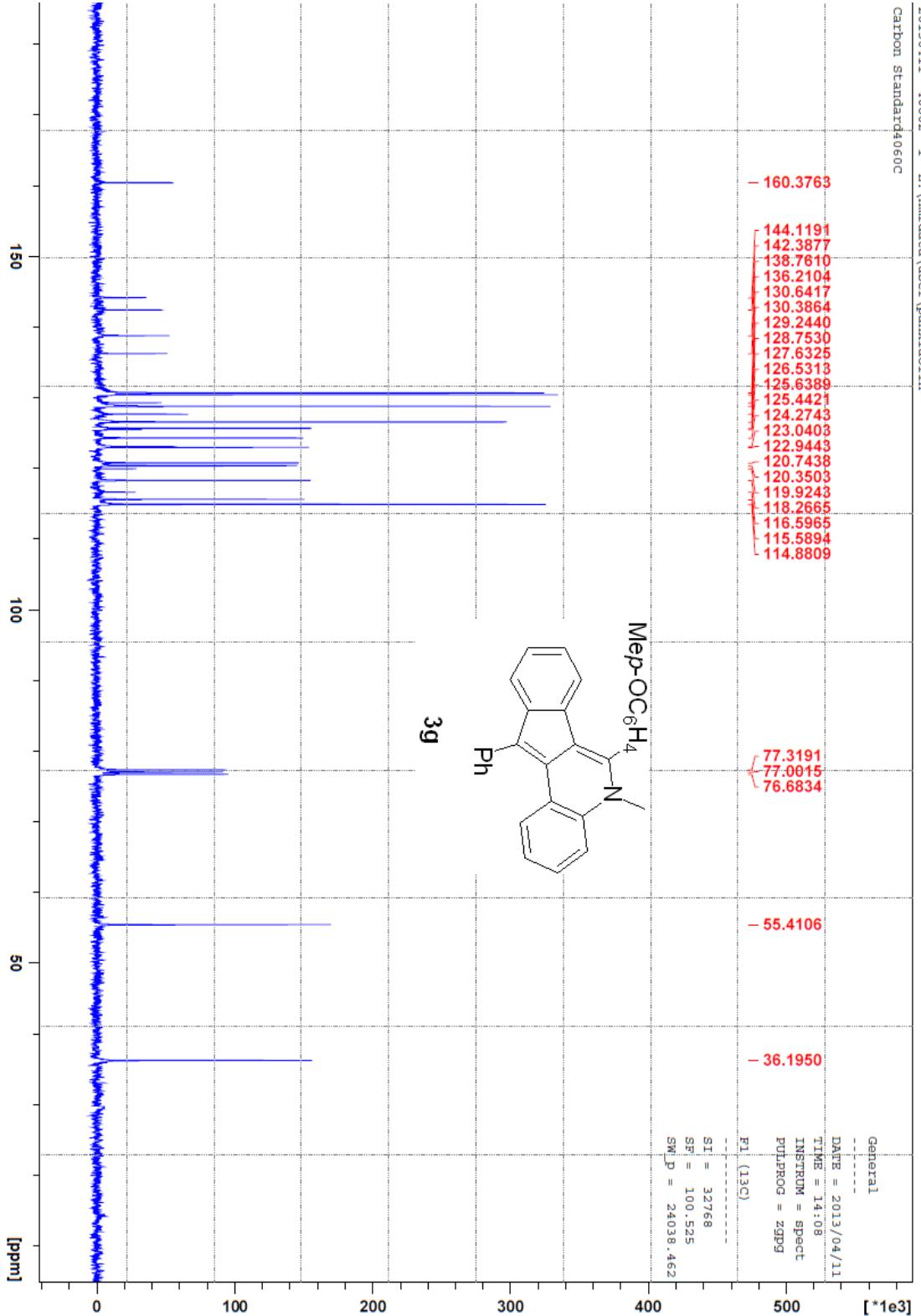
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77.0015  
76.6834

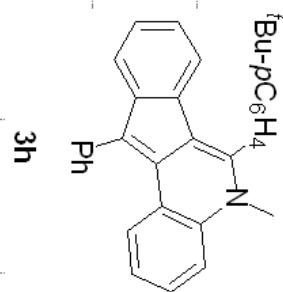
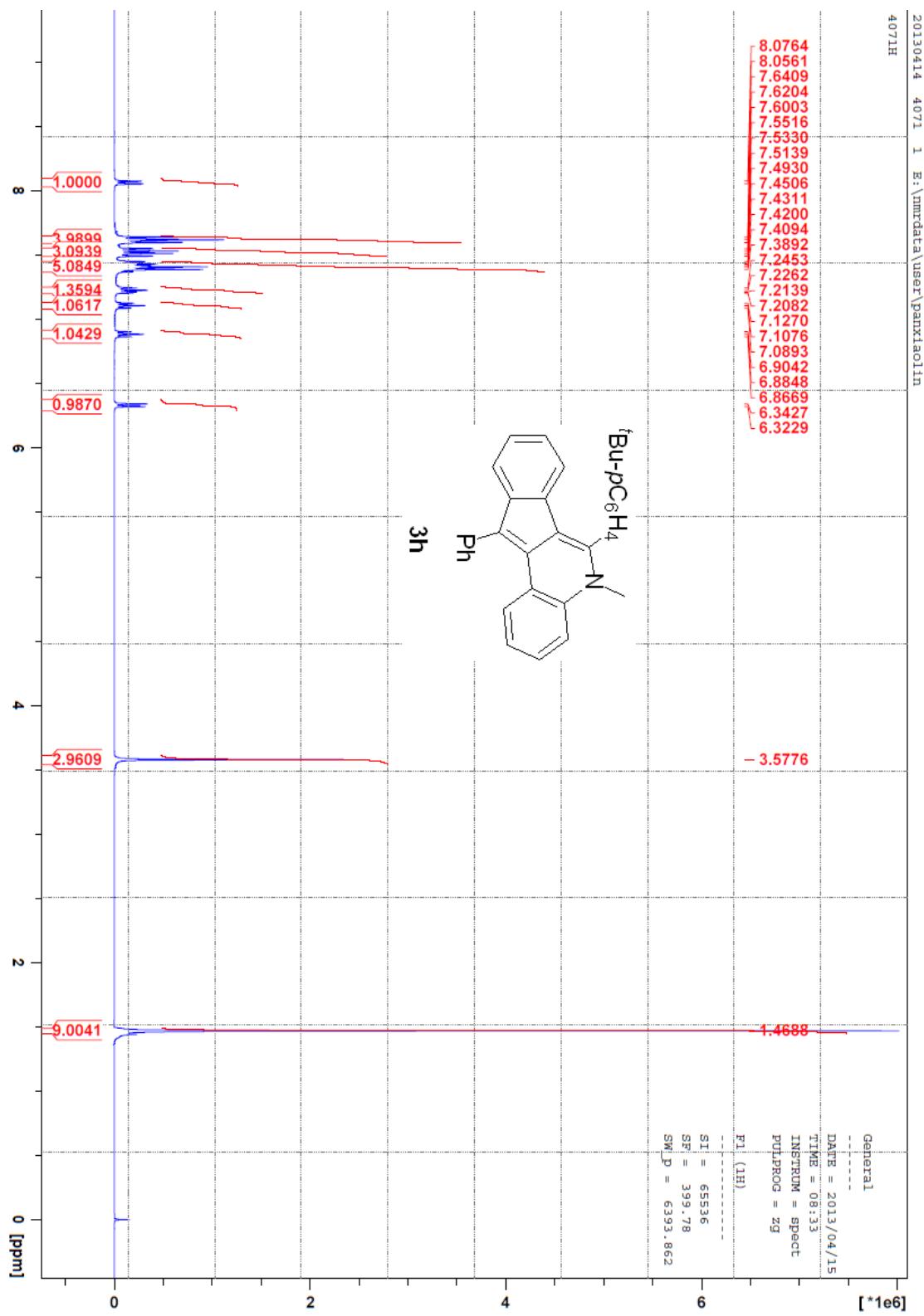
- 55.4106

- 36.1950



3g





20130414 40712 1 E:\unidata\user\panxialin  
4071C

General  
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DATE = 2013/04/15

TIME = 08:41

INSTRUM = spect

PROBODR = 2gpg

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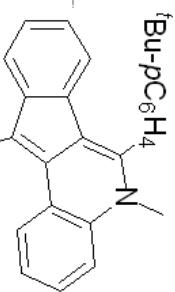
SI = 32768

SF = 100.525

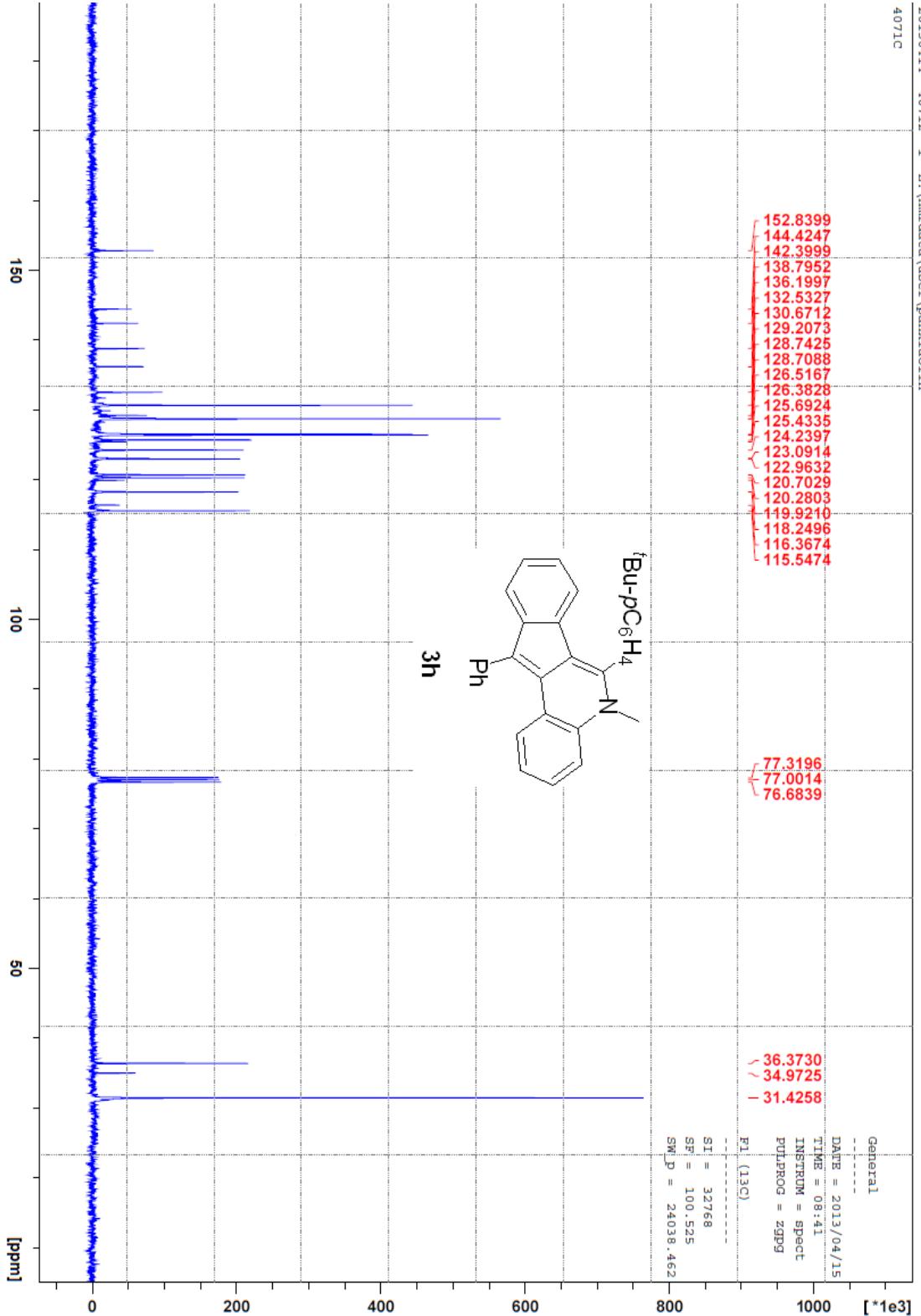
SWP = 24038.462

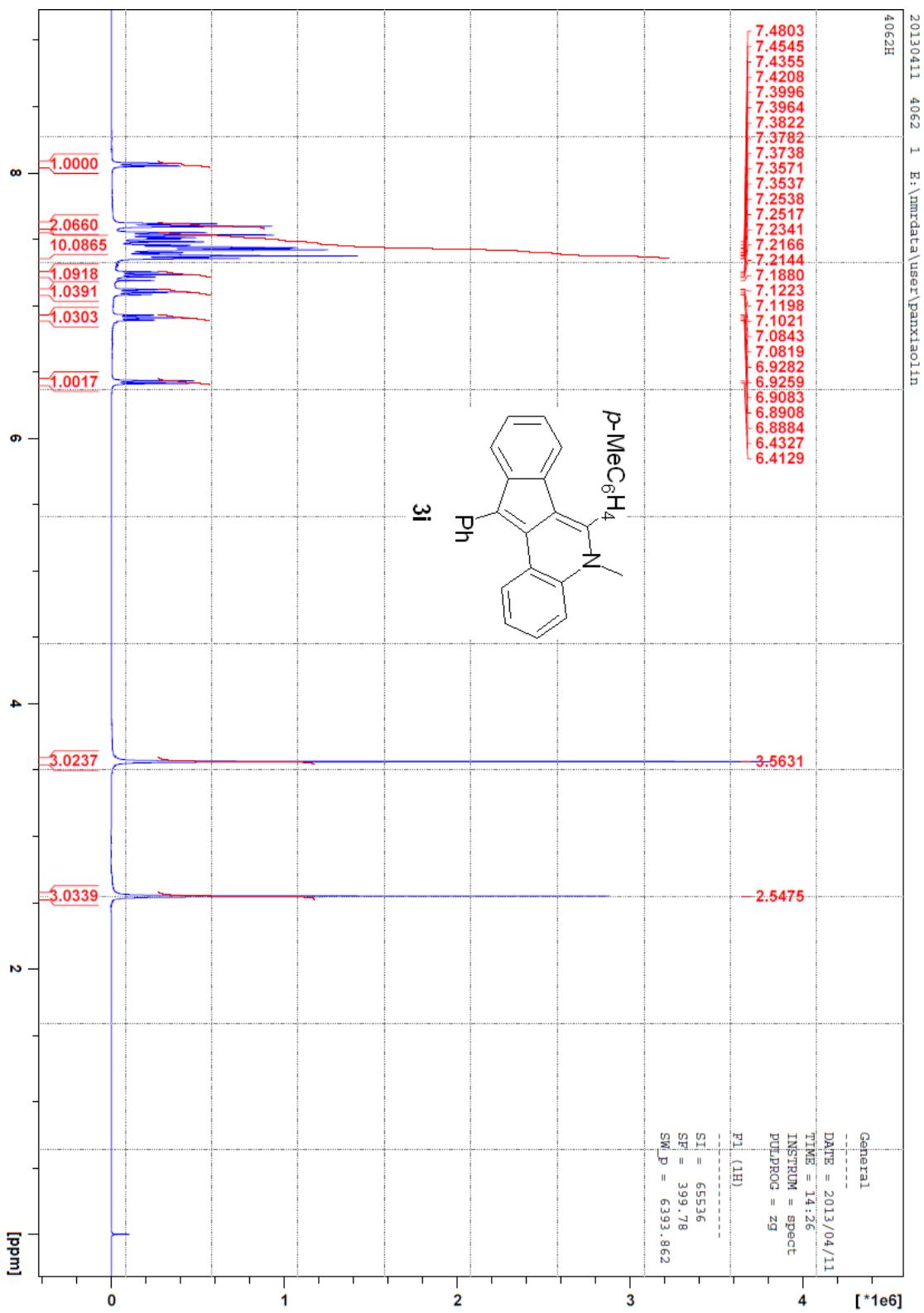
77.3196  
77.0014  
76.6839

36.3730  
34.9725  
-31.4258



3h





20130411 40622 1 E:\pdata\user\panxiaolin

4062C

General

-  
DATE = 2013/04/11

TIME = 14:33

INSTRUM = spect

DPPROG = zgpg

-

P1 (13C)

-

SI =

32768

SF =

100.525

SW\_p =

24038.462

[\*1e3]

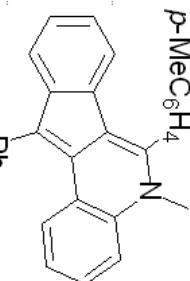
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130.2311  
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128.9274  
128.7548  
126.5322  
125.6924  
125.4510  
124.2760  
123.0815  
122.9679  
120.7286  
120.3172  
119.9497  
118.2762  
116.3095  
115.5245

77.3198  
77.0022  
76.6840

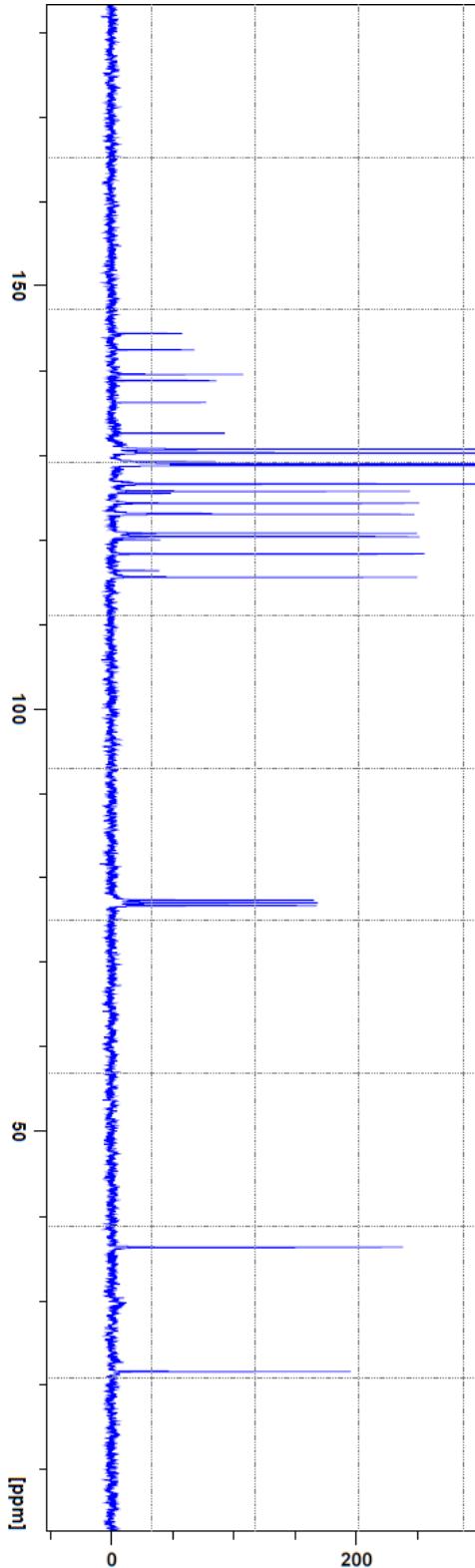
-36.2801

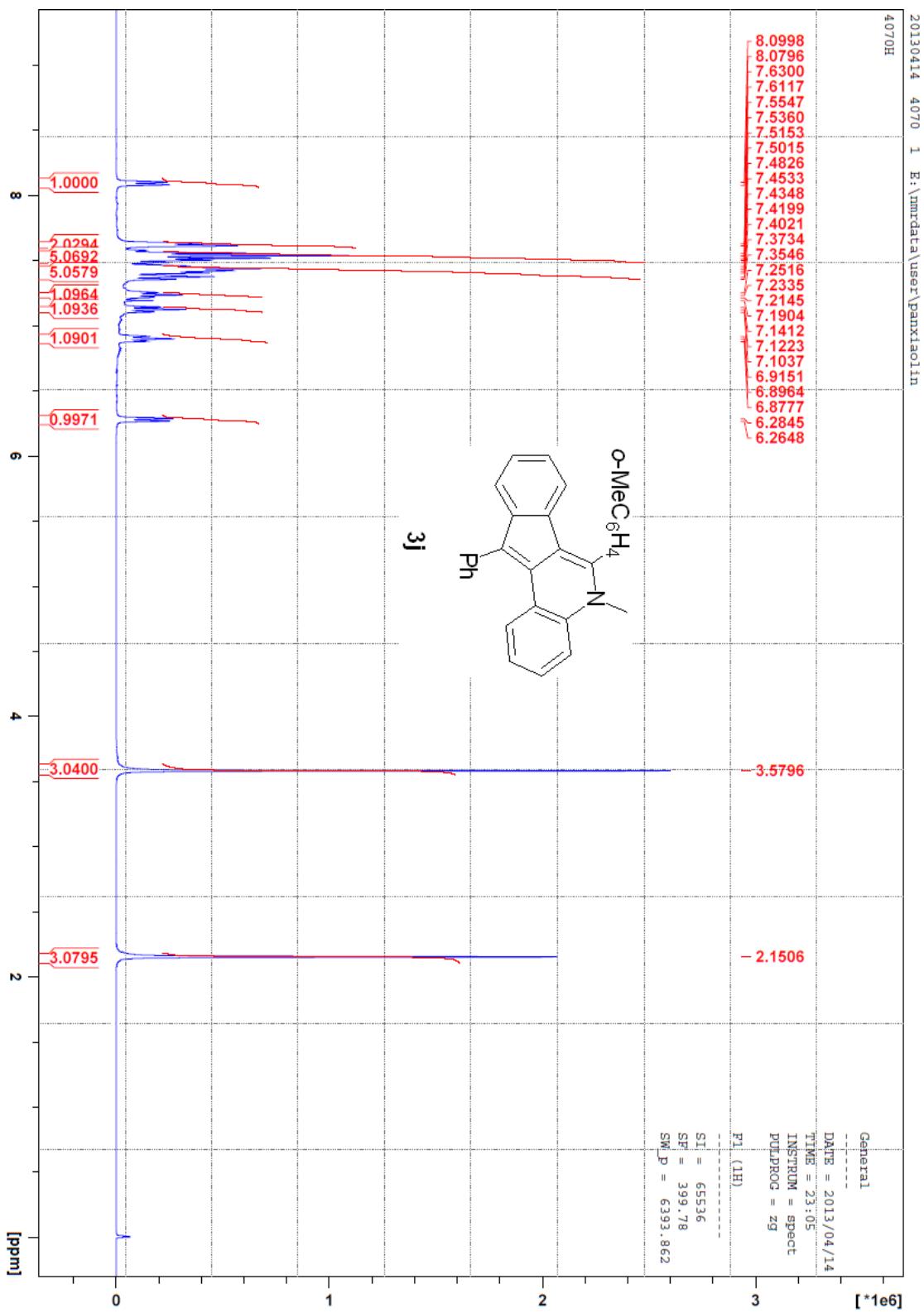
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215811

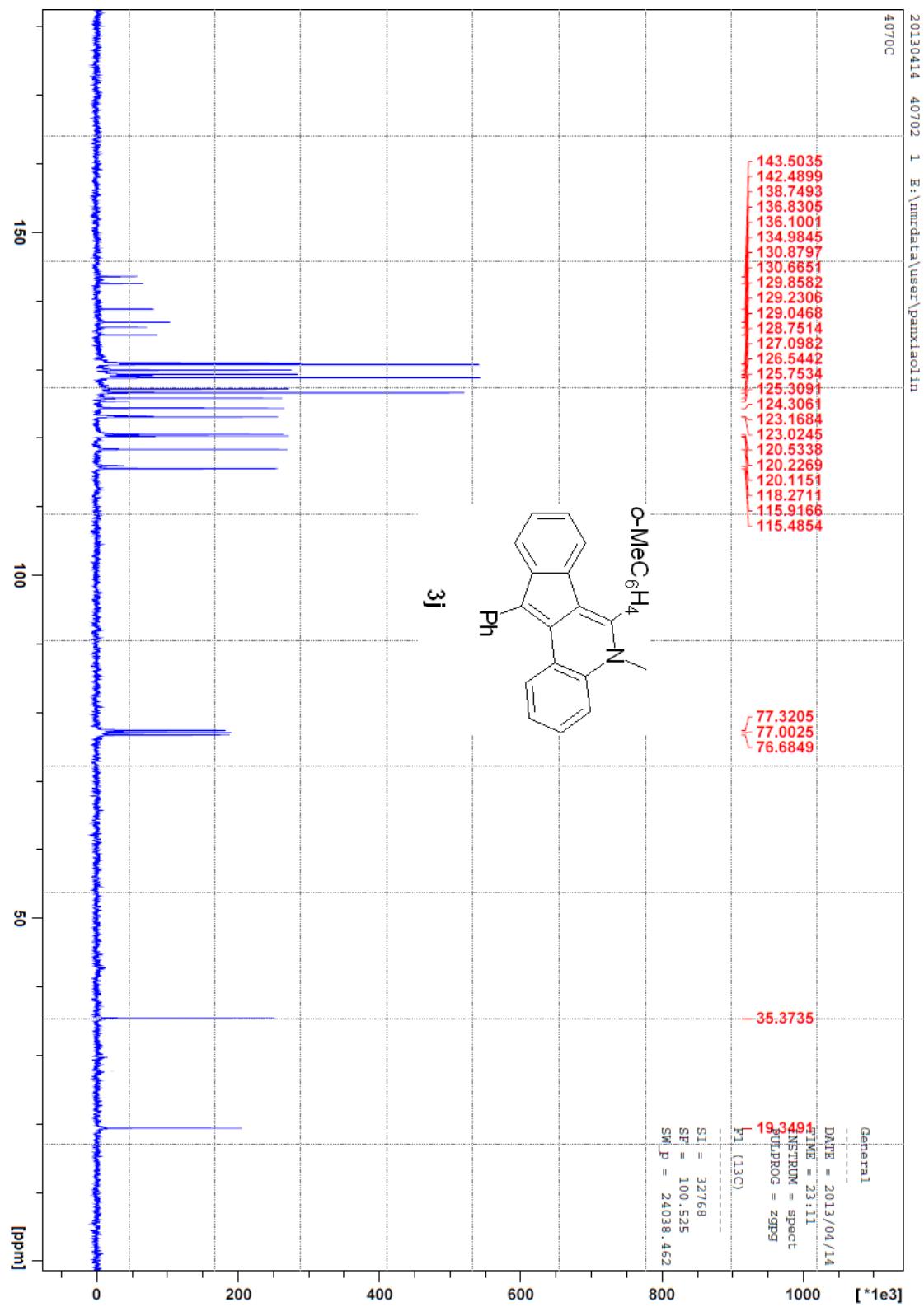
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3i







20130414 4064 1 E:\vnmrdata\user\panxiaolin

4064H

General

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DATE = 2013/04/14

TIME = 22:10

INSTRUM = spect

PULPROG = zg

SWP = 2g

SWD = 6393.162

PL (1H)

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SI = 65536

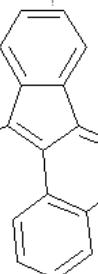
SF = 399.78

SW = 6393.162

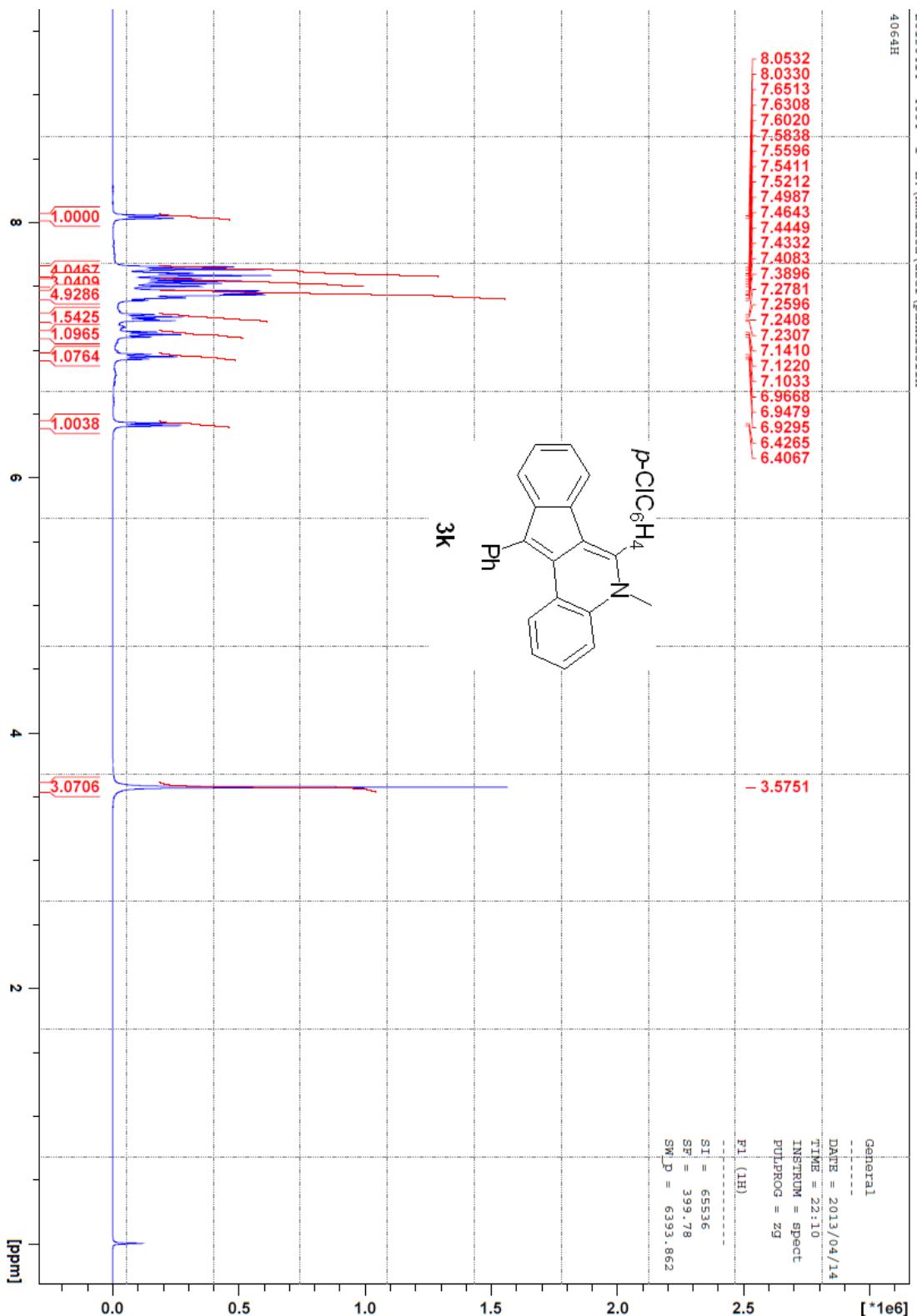
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- 3.5751

*p*-ClC<sub>6</sub>H<sub>4</sub>



3k



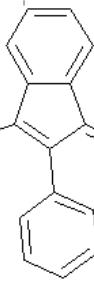
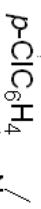
20130414 40642 1 E:\imrdata\user\panxialin  
4064C

[\*1e3]

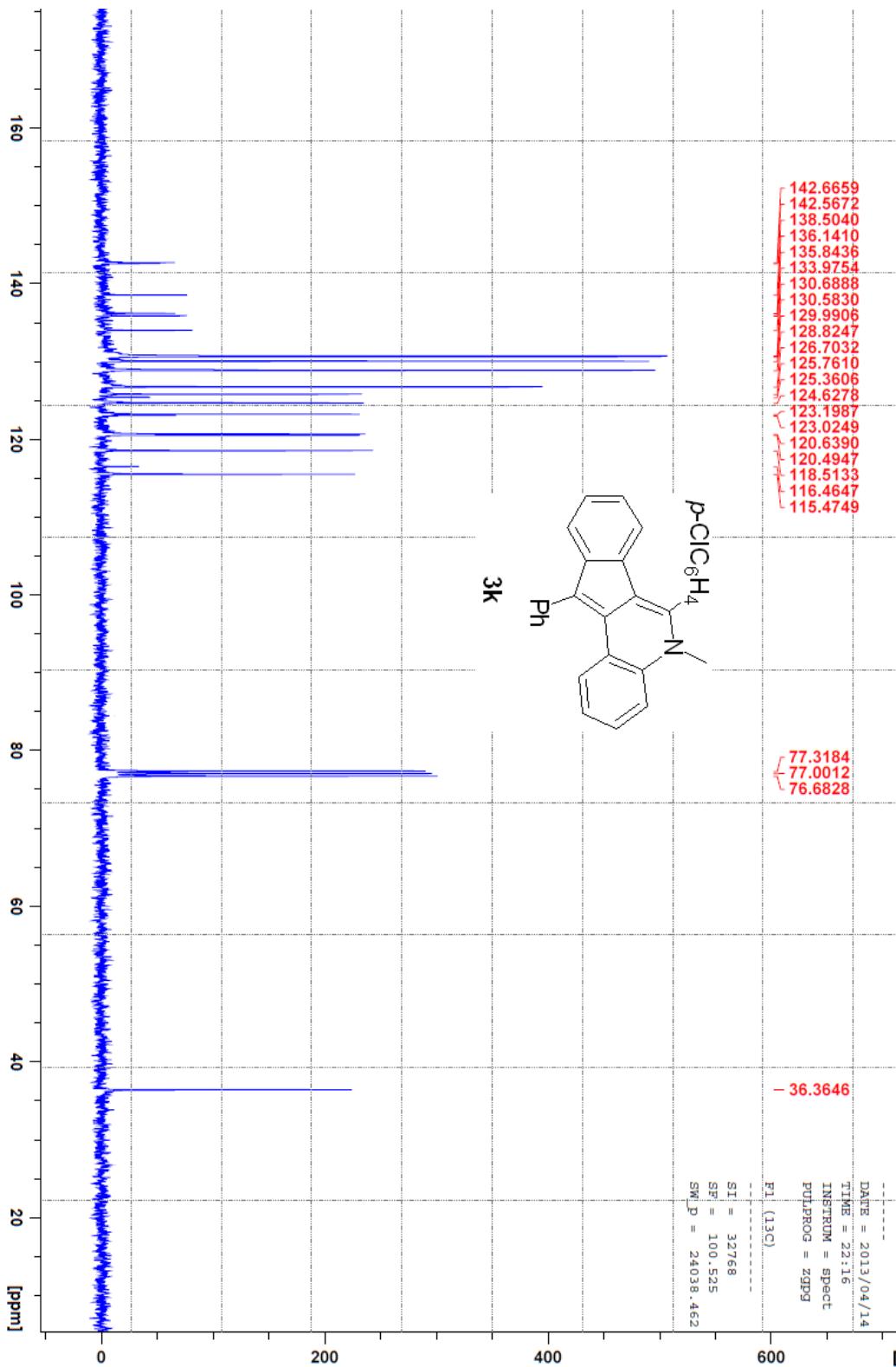
142.6659  
142.5672  
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135.8436  
133.9754  
130.6888  
130.5830  
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128.8247  
126.7032  
125.7610  
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123.0249  
120.6390  
120.4947  
118.5133  
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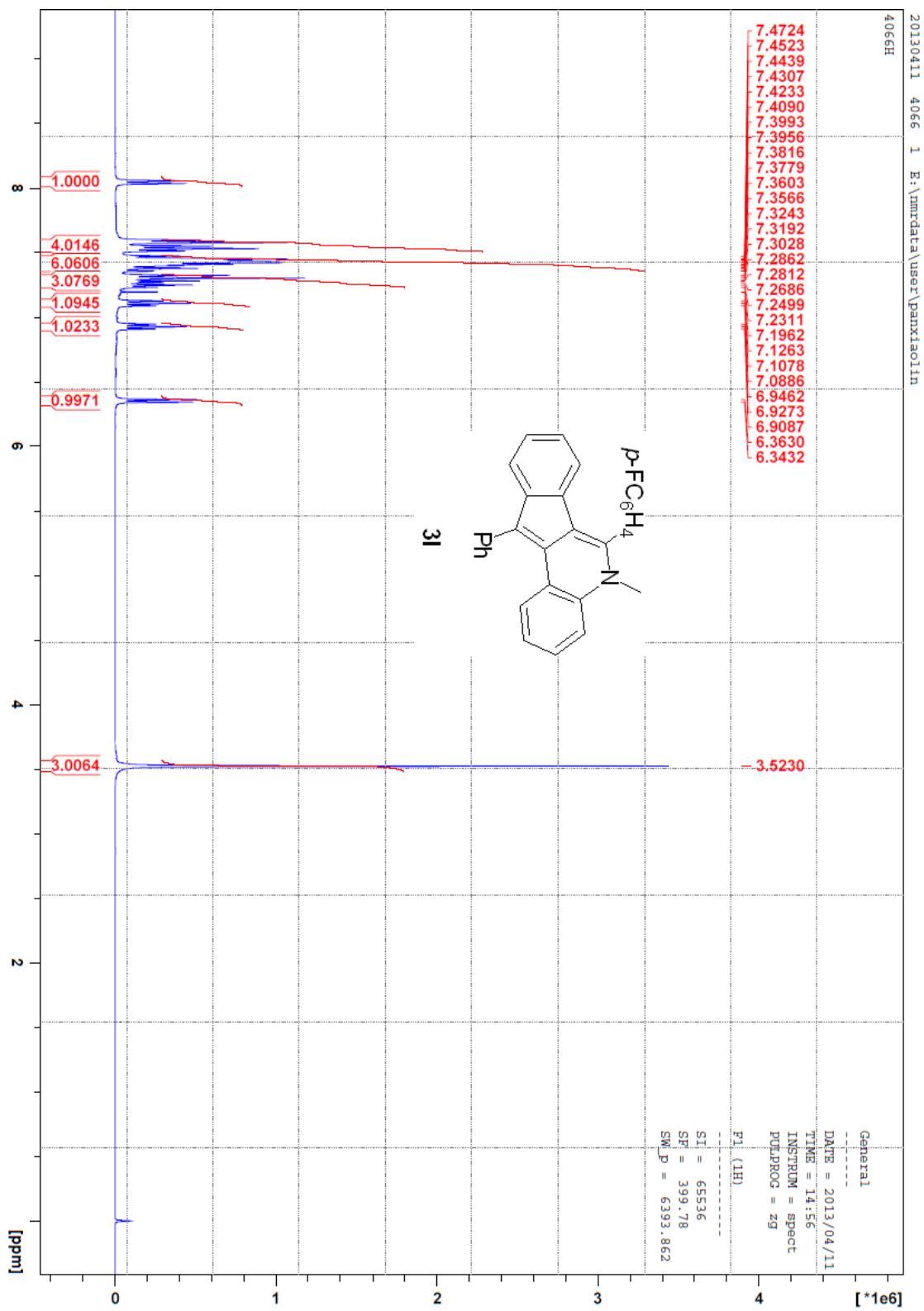
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76.6828

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TIME = 22:16  
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PROG = zgpg  
F1 (13C)  
SI = 32768  
SF = 100.525  
SWP = 24038.462



3k





20130411 40662 1 E:\umrdata\user\panxiao\lin  
4066C

General  
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DATE = 2013/04/11  
TIME = 15:41  
INSTRUM = spect  
PROG = zgpg

20130414 4065 1 E:\nnndata\user\panxialin

4065H

General  
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DATE = 2013/04/14

TIME = 21:52  
INSTRUM = spect  
PROG = zg

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1.9022

1.8829

1.8638

1.8442

1.7248

1.7063

1.6876

1.6691

1.6507

1.6325

-1.0690

7.9720  
7.9588  
7.9518  
7.5902  
7.5713  
7.5638  
7.5536  
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7.5262  
7.5127  
7.4430  
7.4268  
7.4219  
7.3781  
7.3674  
7.3603  
7.3500  
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7.3324  
7.3203  
7.3152  
7.3108  
7.3027  
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7.0443  
7.0245

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SI =

65536

SF =

399.78

SWP =

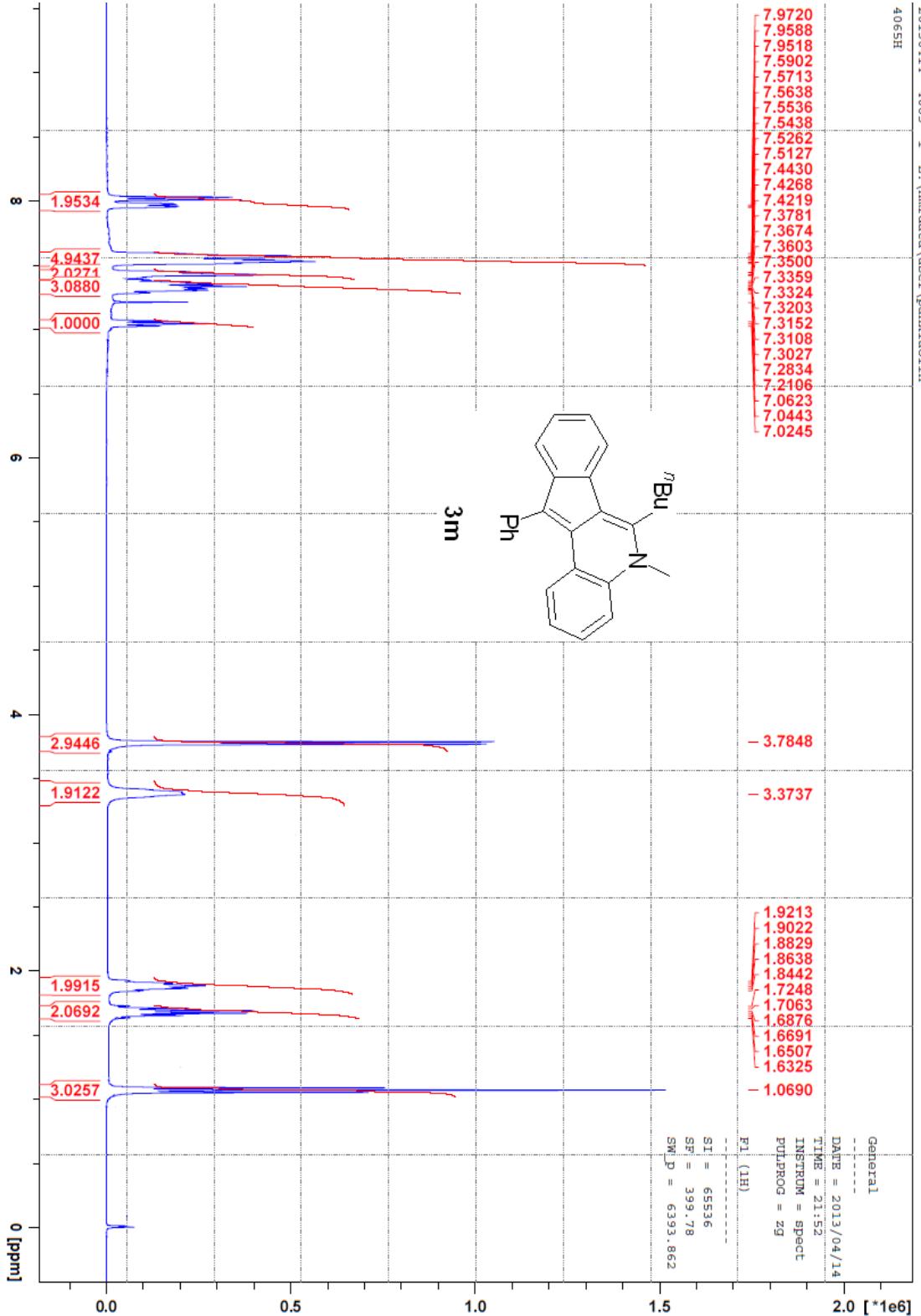
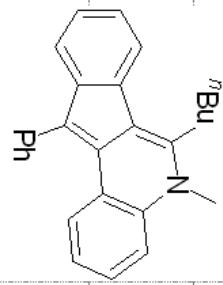
6393.062

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0 [ppm]

2.0 [\*1e6]

3m

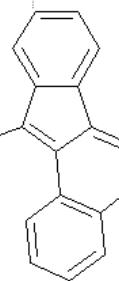


20130414 40652 1 E:\mdrdata\user\panxialin  
4065C

146.5089  
142.4158  
138.9464  
136.2781  
130.7582  
128.7696  
128.2701  
126.4801  
126.3678  
125.6643  
125.4379  
123.8838  
122.8796  
122.7264  
120.8988  
120.6697  
119.0784  
118.7706  
115.2860  
115.0125

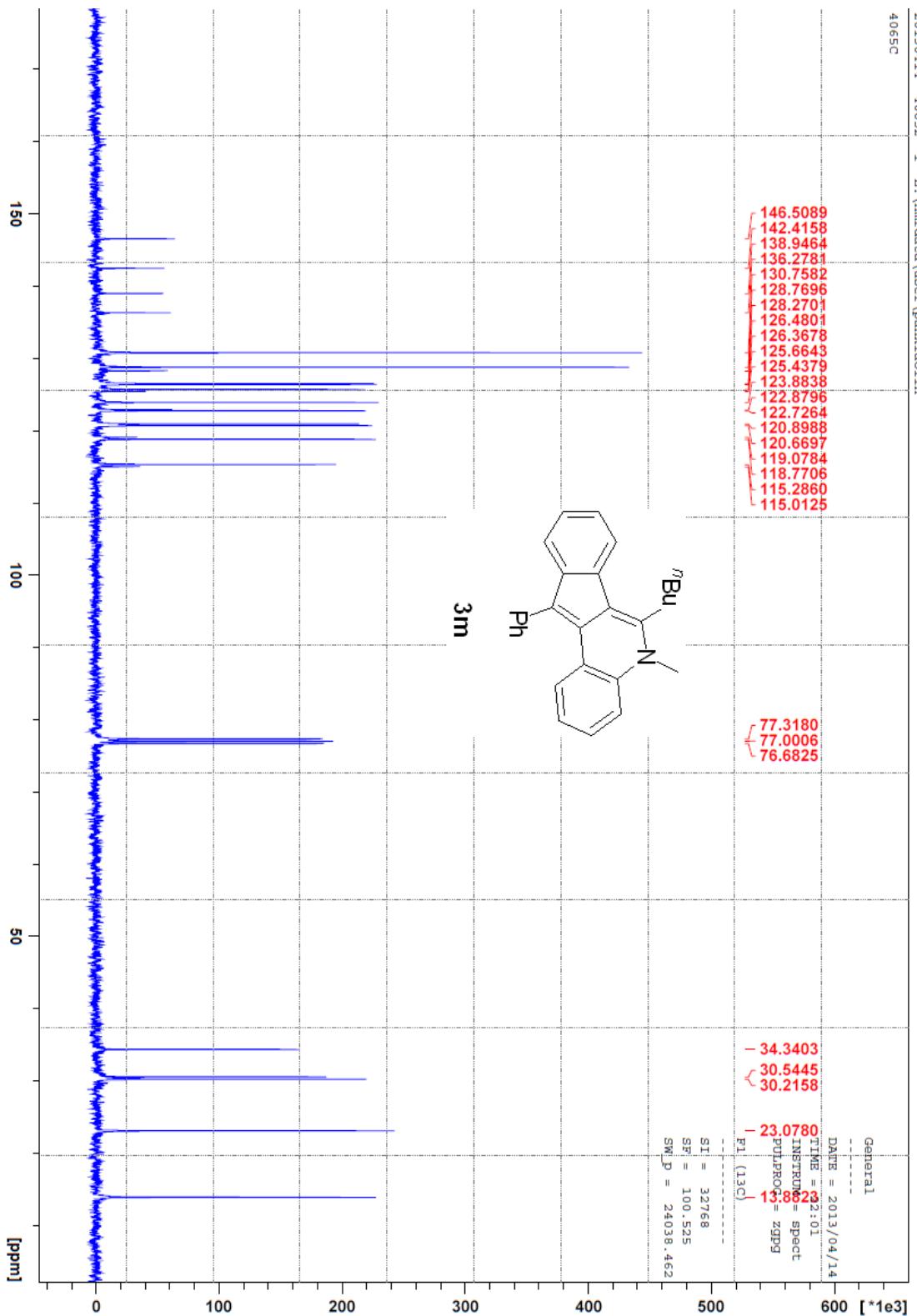
77.3180  
77.0006  
76.6825

*n*Bu



3m

General  
DATE = 2013/04/14  
TIME = 22:01  
INSTRUM = spect  
PUTPROG = zgpg  
P1 (13C) = 13.8623  
SI = 32768  
SF = 100.525  
SWP = 24038.462

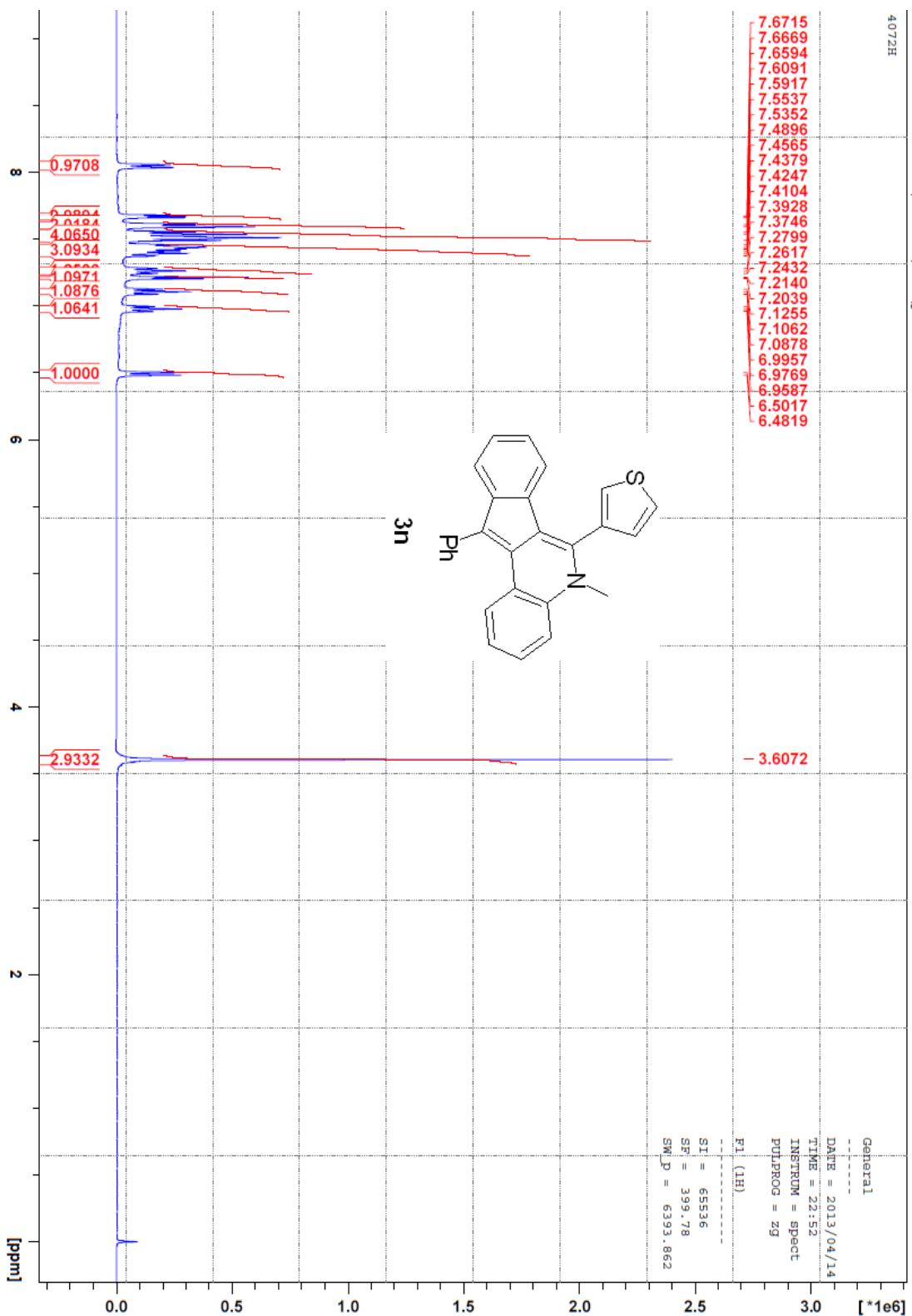
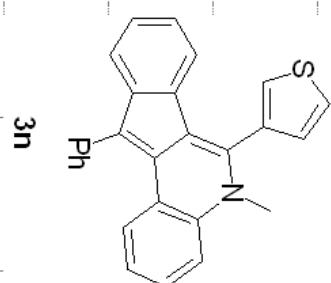


20130414 4072 1 E:\nnndata\user\panxialin  
4072H

7.6715  
7.6669  
7.6594  
7.6091  
7.5917  
7.5537  
7.5352  
7.4896  
7.4565  
7.4379  
7.4247  
7.4104  
7.3928  
7.3746  
7.2799  
7.2617  
7.2432  
7.2140  
7.2039  
7.1255  
7.1062  
7.0878  
6.9957  
6.9769  
6.9587  
6.5017  
6.4819

General  
-----  
DATE = 2013/04/14  
TIME = 22:52  
INSTRUM = spect  
PROG = zg  
SWP = 6393.062

F1 (1H)



20130414 40722 1 E:\imrdata\user\panxialin  
4072C

General  
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DATE = 2013/04/14

TIME = 22:59

INSTRUM = spect

PROG = zgpg

F1 (13C)

SI = 32768

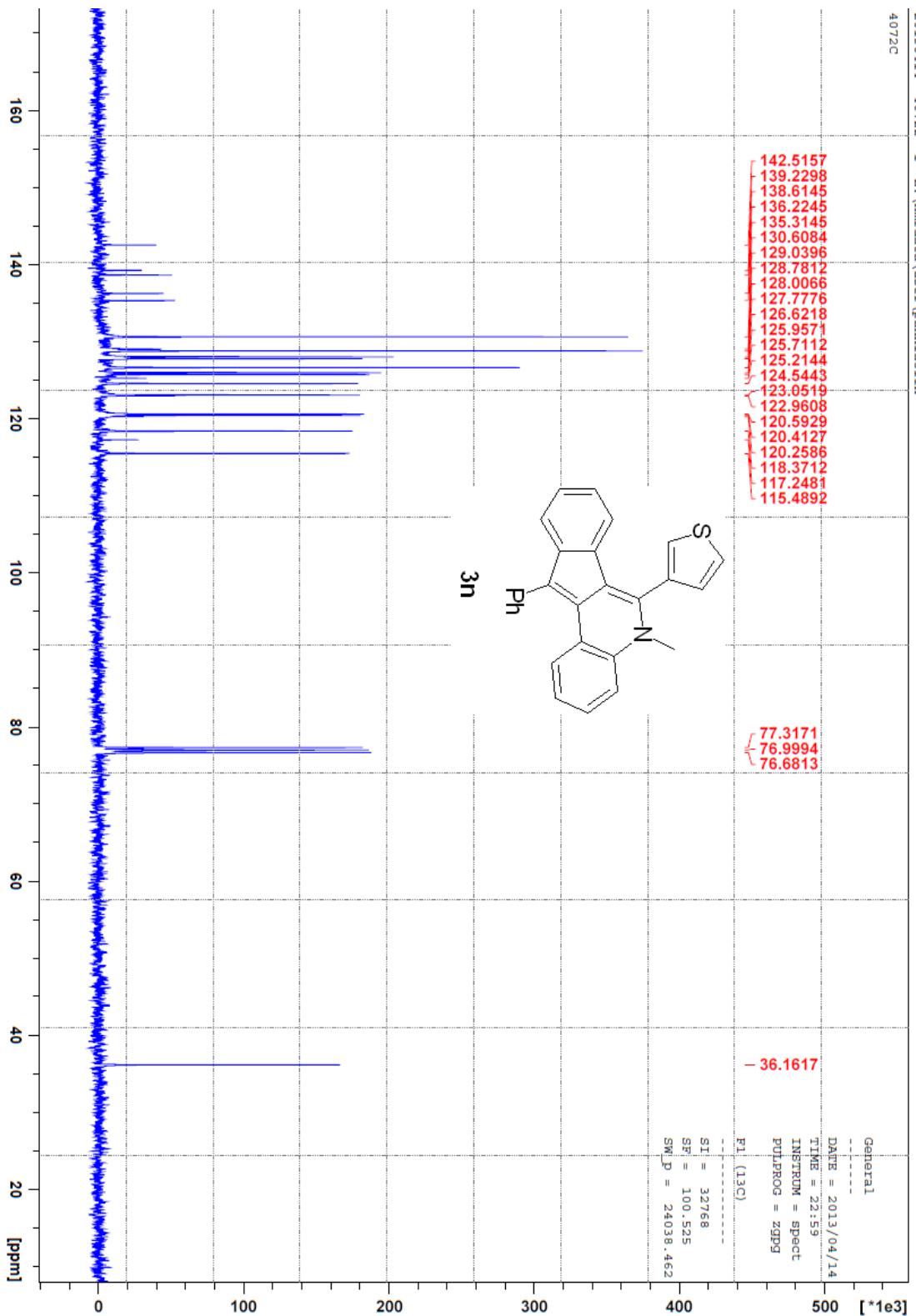
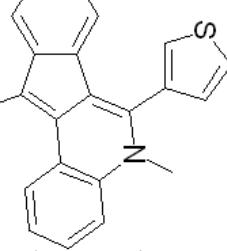
SF = 100.525

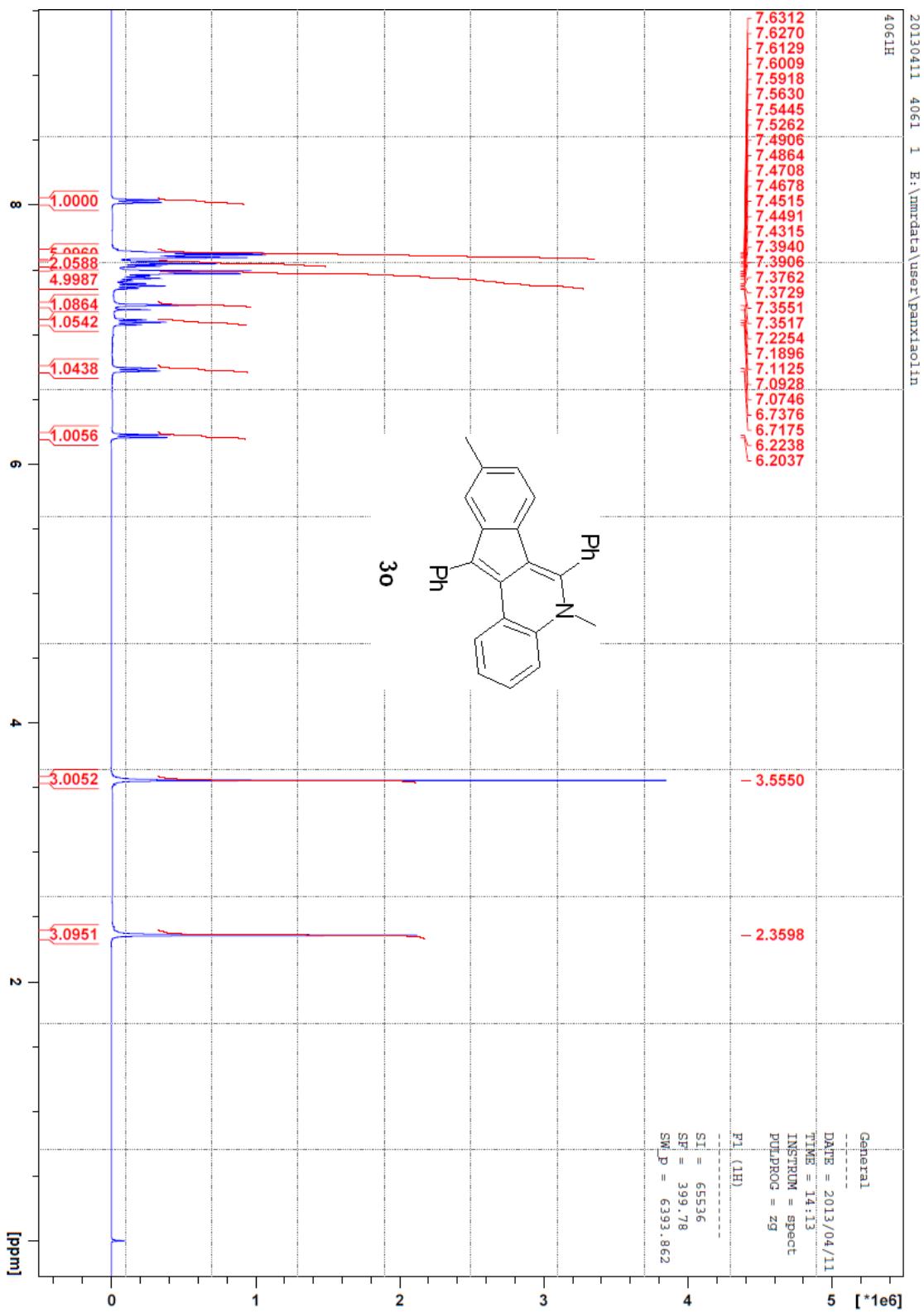
SWP = 24038.462

- 36.1617

{ 77.3171  
76.9994  
76.6813

3n





20130411 40612 1 E:\imrdata\user\panxiadolin  
4062C

[\*1e3]

143.2946  
142.9096  
138.8548  
136.1443  
135.6512  
134.1836  
130.6647  
129.4998  
129.1641  
128.7825  
126.8270  
126.5348  
126.4634  
125.6731

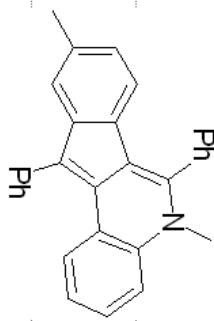
77.3188  
77.0010  
76.6830

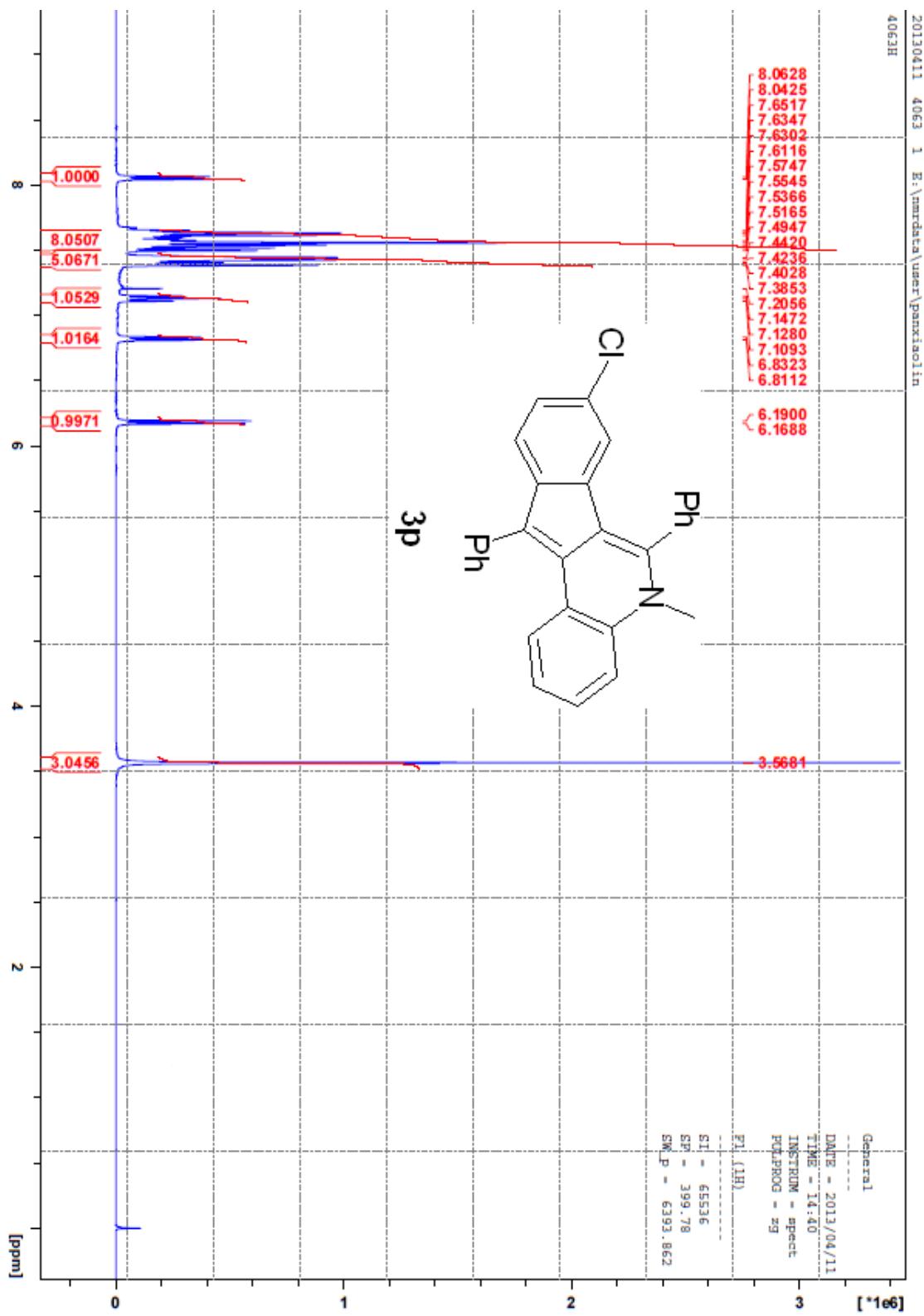
-36.2762

21.8128  
-21.8128  
F1 (13C)  
SI = 32768  
SF = 100.525  
SWP = 24038.462

General  
DATE = 2013/04/11  
TIME = 14:18  
INSTRUM = spect  
PROG = zgpg

30





20130411 40632 1 E:\imrdata\user\panxiadolin  
4063C

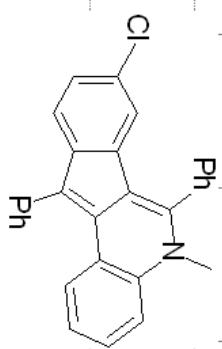
General  
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DATE = 2013/04/11

TIME = 14:45  
INSTRUM = spect  
PROG = zgpg

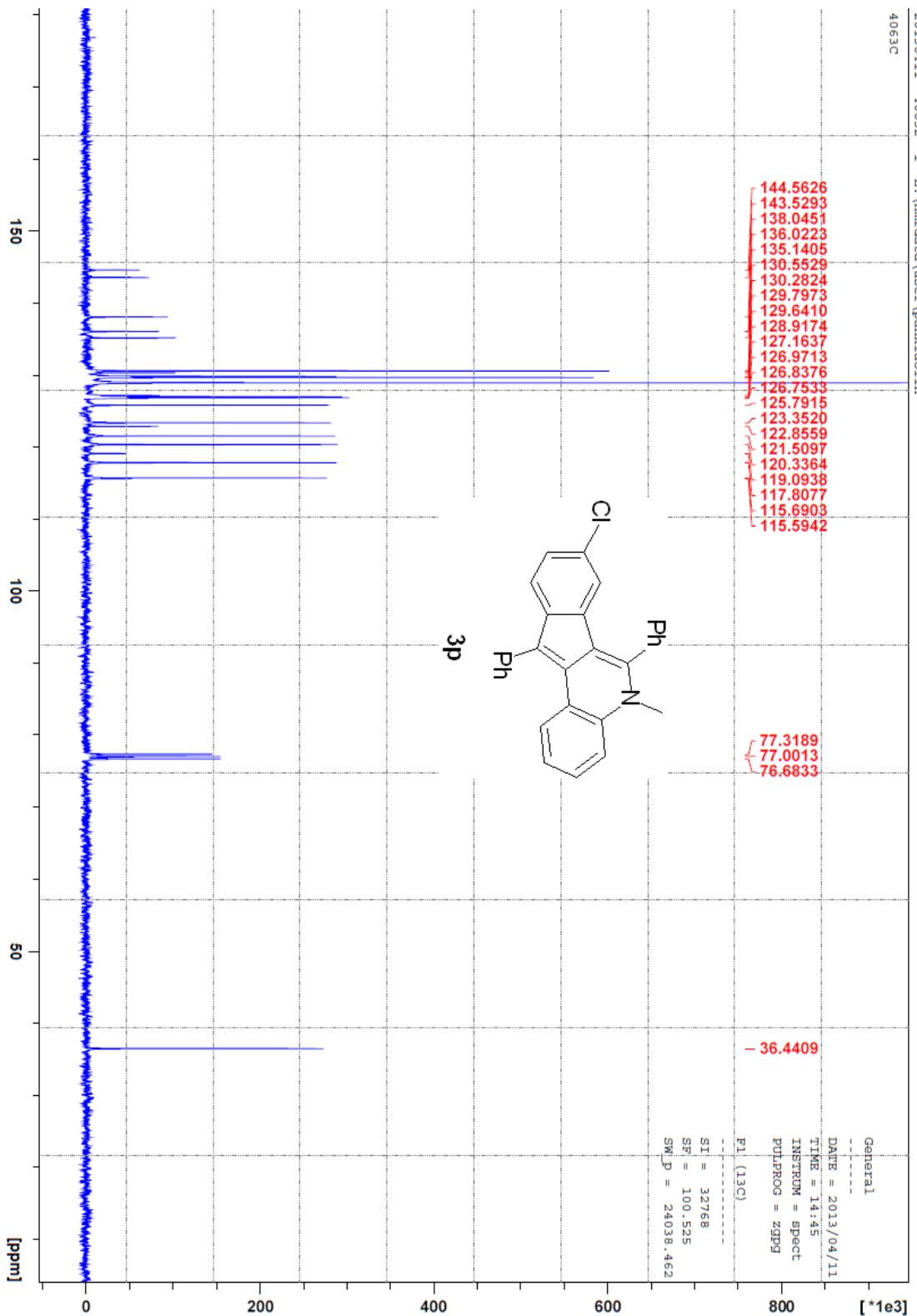
F1 (13C)  
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SI = 32768  
SF = 100.525  
SWP = 24038.462

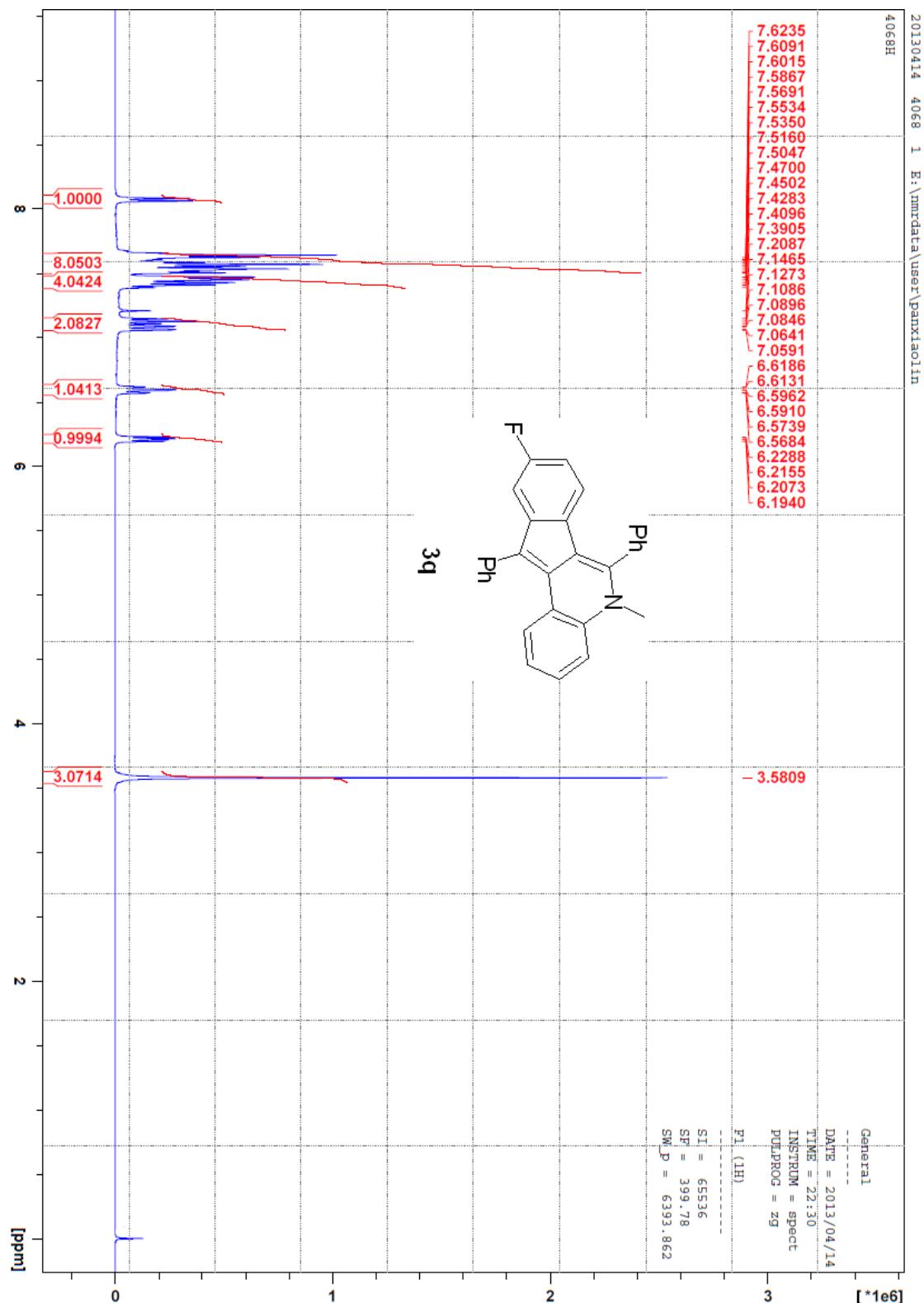
77.3189  
77.0013  
76.6833

-36.4409



3p





20130414 40692 1 E:\umrdata\user\panxialin  
4068C

General  
-----  
DATE = 2013/04/14

TIME = 22:58

INSTRUM = spect

PROBPG = zgpg

F1 (13C)

---

SI = 32768

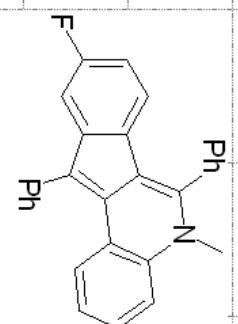
SF = 100.525

SWP = 24038.462

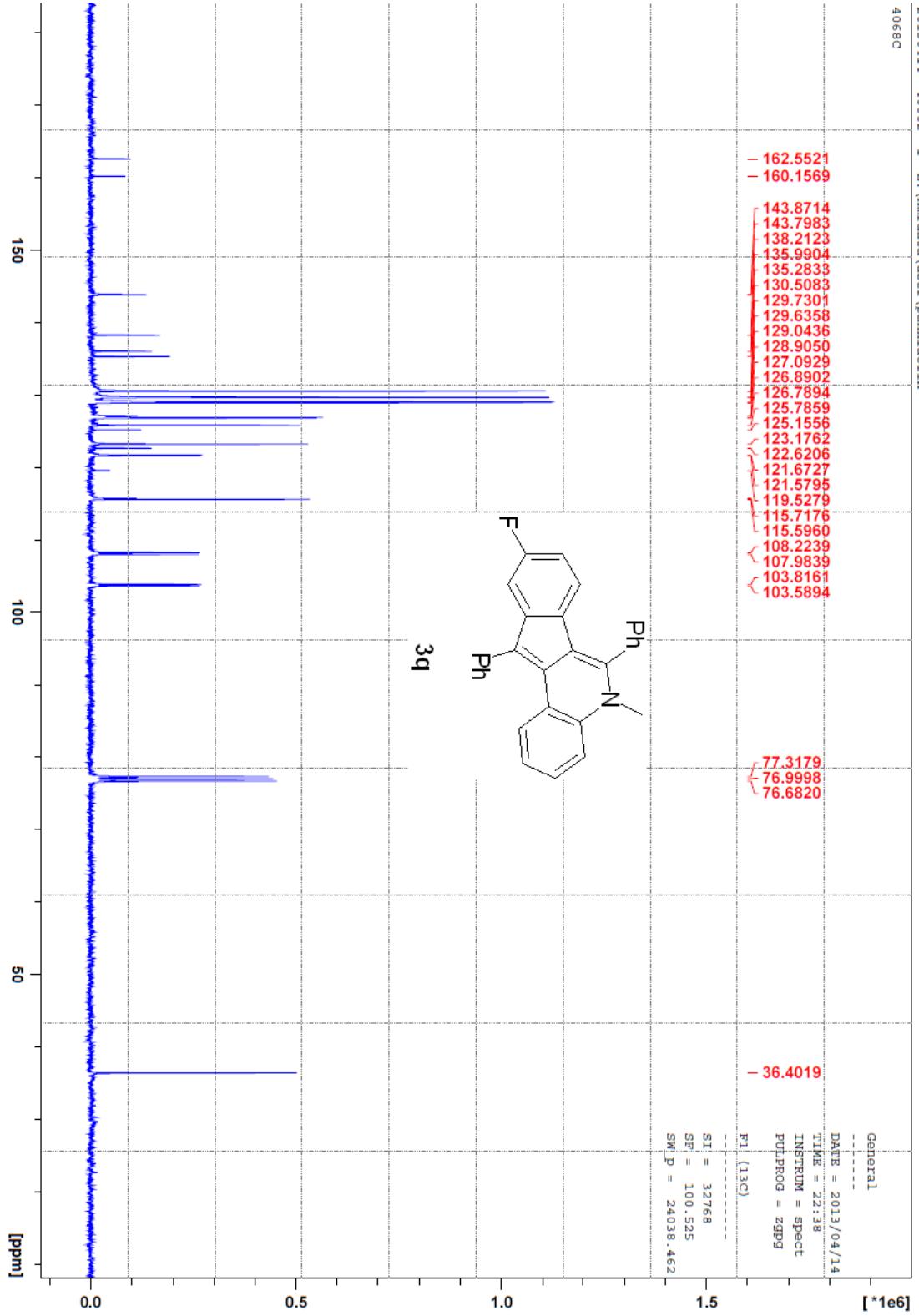
- 36.4019

77.3179  
76.9998  
76.6820

- 162.5521  
- 160.1569  
143.8714  
143.7983  
138.2123  
135.9904  
135.2833  
130.5083  
129.7301  
129.6358  
129.0436  
128.9050  
127.0929  
126.8902  
126.7894  
125.7859  
125.1556  
123.1762  
122.6206  
121.6727  
121.5795  
119.5279  
115.7176  
115.5960  
108.2239  
107.9839  
103.8161  
103.5894



3q



20130414 4073 1 E:\nnndata\user\panxialin

4073H

General  
-----  
DATE = 2013/04/14

TIME = 23:19  
INSTRUM = spect

PUTPROG = zg

F1 (1H)  
-----  
SI = 65536  
SF = 399.78  
SWP = 6393.062

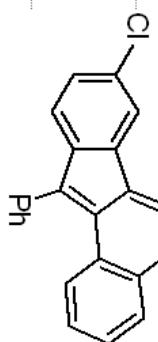
8.0427  
8.0226  
7.5765  
7.5589  
7.5319  
7.5120  
7.4456  
7.4267  
7.3963  
7.3753  
7.3465  
7.3255  
7.2374  
7.1869  
7.1661  
7.1399  
7.1207  
7.1020

- 6.3828

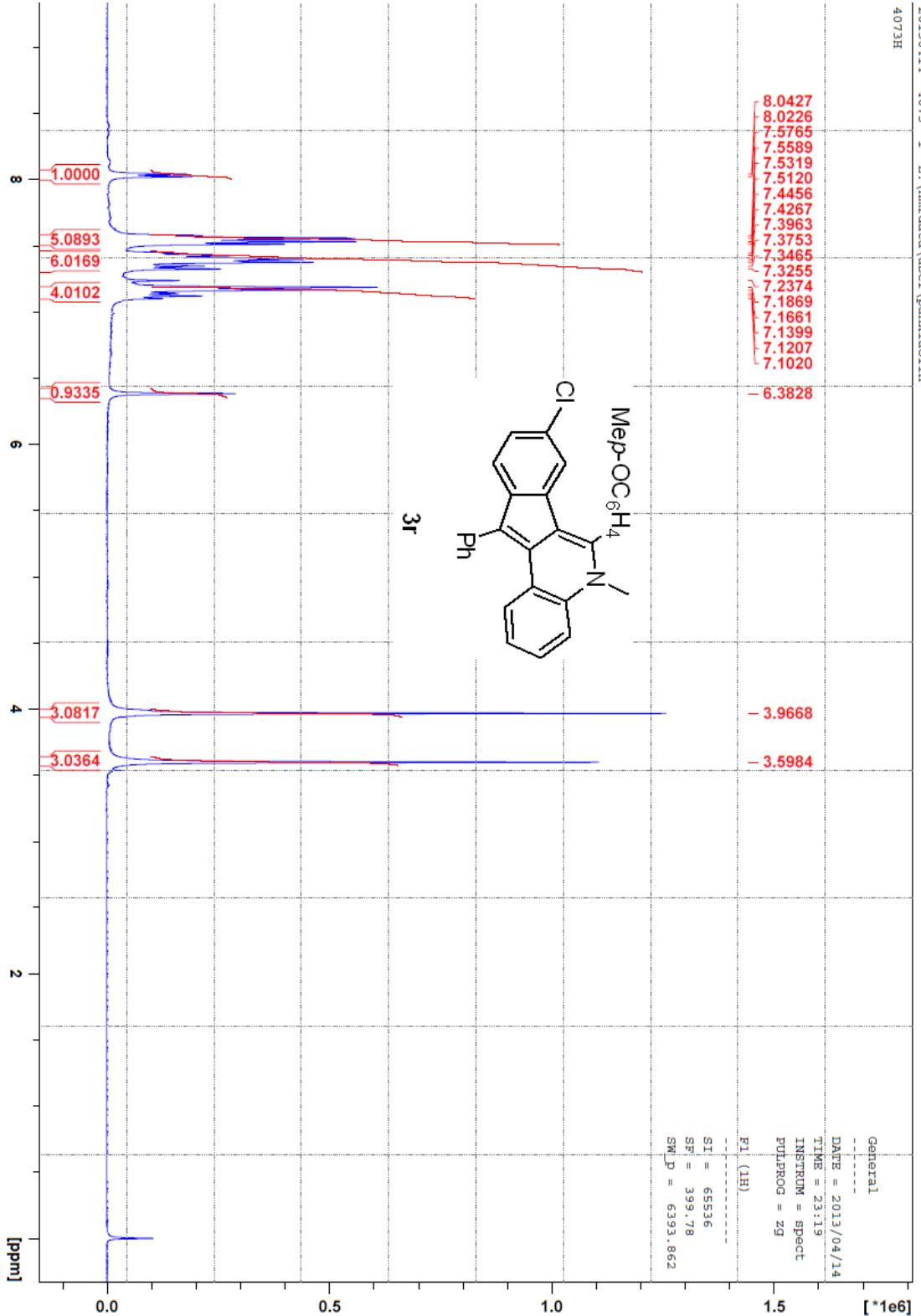
- 3.9668

- 3.5984

Me $\rho$ -OC<sub>6</sub>H<sub>4</sub>



3r



20130414 40732 1 E:\unidata\user\panxialin  
4073C

General  
-----  
DATE = 2013/04/15

TIME = 08:52  
INSTRUM = spect  
PROG = zgpg

F1 (13C)

SI = 32768  
SF = 100.525  
SWP = 24038.462

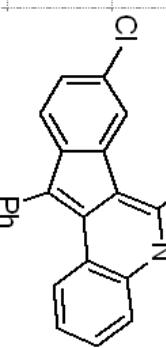
- 160.7265  
145.1483  
140.4988  
138.2962  
136.1855  
130.5772  
130.2616  
130.1675  
128.8447  
127.0831  
126.8148  
126.7414  
125.8647  
125.6286  
124.3041  
123.3506  
123.1235  
120.5194  
119.3357  
119.1289  
115.7666  
115.1338

77.3183  
77.0006  
76.6824

- 55.5765

- 36.3939

Mep-OC<sub>6</sub>H<sub>4</sub>



3f

