

Supporting Information

**A Convenient Approach to Phenanthridine and Isoquinoline
Derivatives by Silver-Catalyzed Oxidative Radical
Decarboxylation**

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[†]Q.Y. and X.Z. contributed equally to this work.

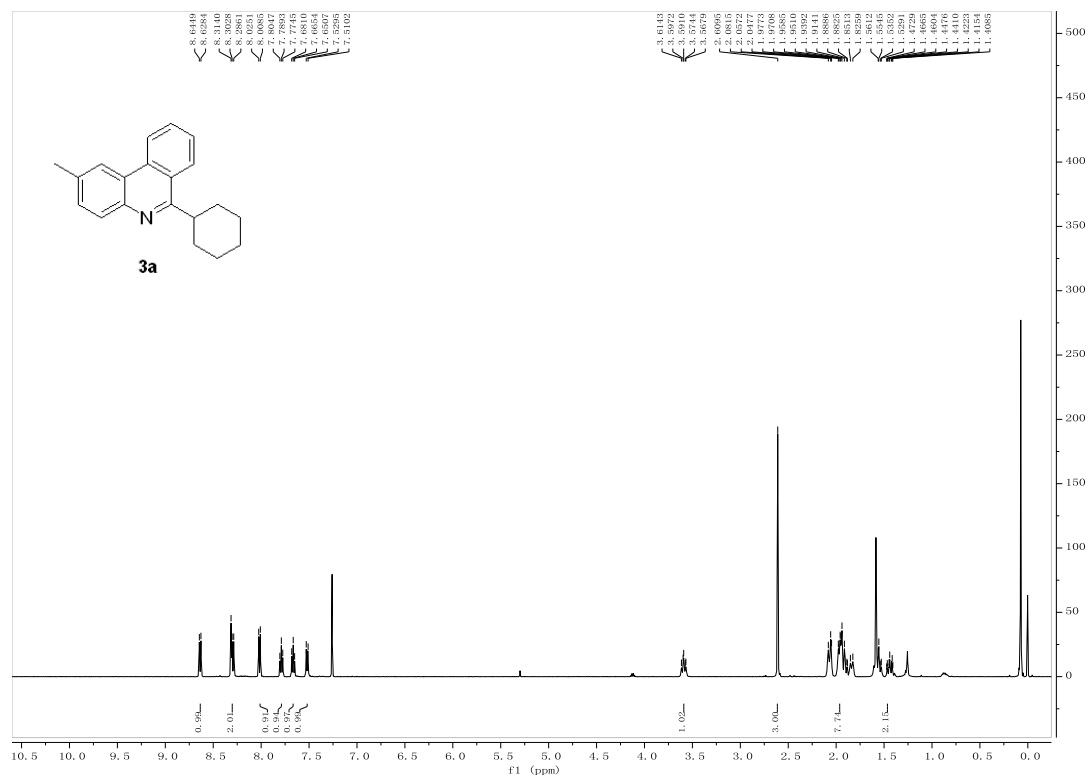
Contents	page
¹ H NMR and ¹³ C NMR spectra for 3a	S4
¹ H NMR and DEPT-Q spectra for 3b	S5
¹ H NMR and DEPT-Q spectra for 3c	S6
¹ H NMR and DEPT-Q spectra for 3d	S7
¹ H NMR and ¹³ C NMR spectra for 3e	S8
¹ H NMR and ¹³ C NMR spectra for 3f	S9
¹ H NMR and ¹³ C NMR spectra for 3g	S10
¹ H NMR and ¹³ C NMR spectra for 3h	S11
¹ H NMR and ¹³ C NMR spectra for 3i	S12

¹ H NMR and ¹³ C NMR spectra for 3j	S13
¹ H NMR and ¹³ C NMR spectra for 3k	S14
¹ H NMR and DEPT-Q spectra for 3l	S15
¹ H NMR and DEPT-Q spectra for 3m	S16
¹ H NMR and ¹³ C NMR spectra for 3n	S17
¹ H NMR and ¹³ C NMR spectra for 3o	S18
¹ H NMR and DEPT-Q spectra for 3p	S19
¹ H NMR and ¹³ C NMR spectra for 3q	S20
¹ H NMR and DEPT-Q spectra for 3r	S21
¹ H NMR and ¹³ C NMR spectra for 3s	S22
¹ H NMR and ¹³ C NMR spectra for 3t	S23
¹ H NMR and ¹³ C NMR spectra for 3u	S24
¹ H NMR and ¹³ C NMR spectra for 3v	S25
¹ H NMR and ¹³ C NMR spectra for 3w	S26
¹ H NMR and ¹³ C NMR spectra for 3x	S27
¹ H NMR and DEPT-Q spectra for 5a	S28
¹ H NMR and ¹³ C NMR spectra for 5b	S29
¹ H NMR and DEPT-Q spectra for 5c	S30
¹ H NMR and ¹³ C NMR spectra for 5d	S31
¹ H NMR and DEPT-Q spectra for 5e	S32
¹ H NMR and DEPT-Q spectra for 5f	S33
¹ H NMR and DEPT-Q spectra for 5g	S34
¹ H NMR and DEPT-Q spectra for 5h	S35
¹ H NMR and DEPT-Q spectra for 5i	S36
¹ H NMR and DEPT-Q spectra for 5j	S37
¹ H NMR and DEPT-Q spectra for 5k	S38
¹ H NMR and DEPT-Q spectra for 5l	S39
¹ H NMR and DEPT-Q spectra for 5m	S40
¹ H NMR and DEPT-Q spectra for 5o	S41

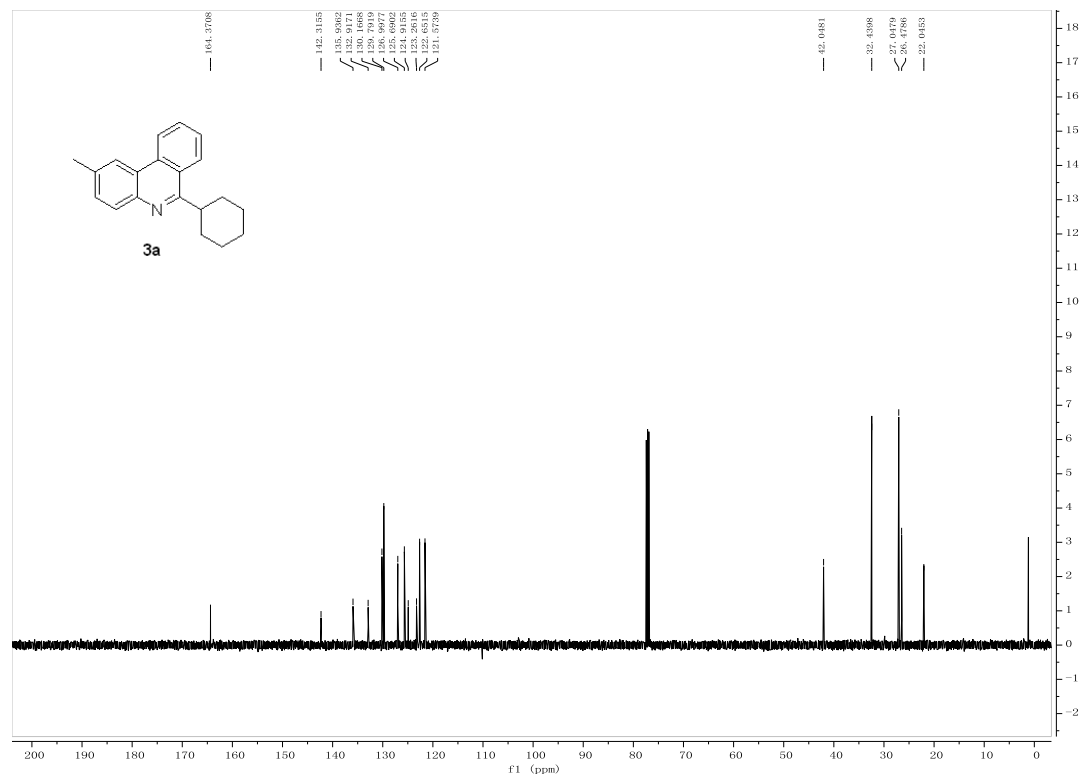
¹ H NMR and DEPT-Q spectra for 5p	S42
¹ H NMR and DEPT-Q spectra for 5q	S43
¹ H NMR and DEPT-Q spectra for 5r	S44
¹ H NMR and DEPT-Q spectra for 5s	S45
¹ H NMR and DEPT-Q spectra for 5t	S46
¹ H NMR and DEPT-Q spectra for 5u	S47
¹ H NMR and DEPT-Q spectra for 5v	S48
¹ H NMR and DEPT-Q spectra for 5w	S49
¹ H NMR and DEPT-Q spectra for 7	S50
¹ H NMR and DEPT-Q spectra for 8	S51
¹ H NMR and DEPT-Q spectra for 10	S52
¹ H NMR and DEPT-Q spectra for 11	S53

Copies of ^1H , ^{13}C spectra in table 2 and 3

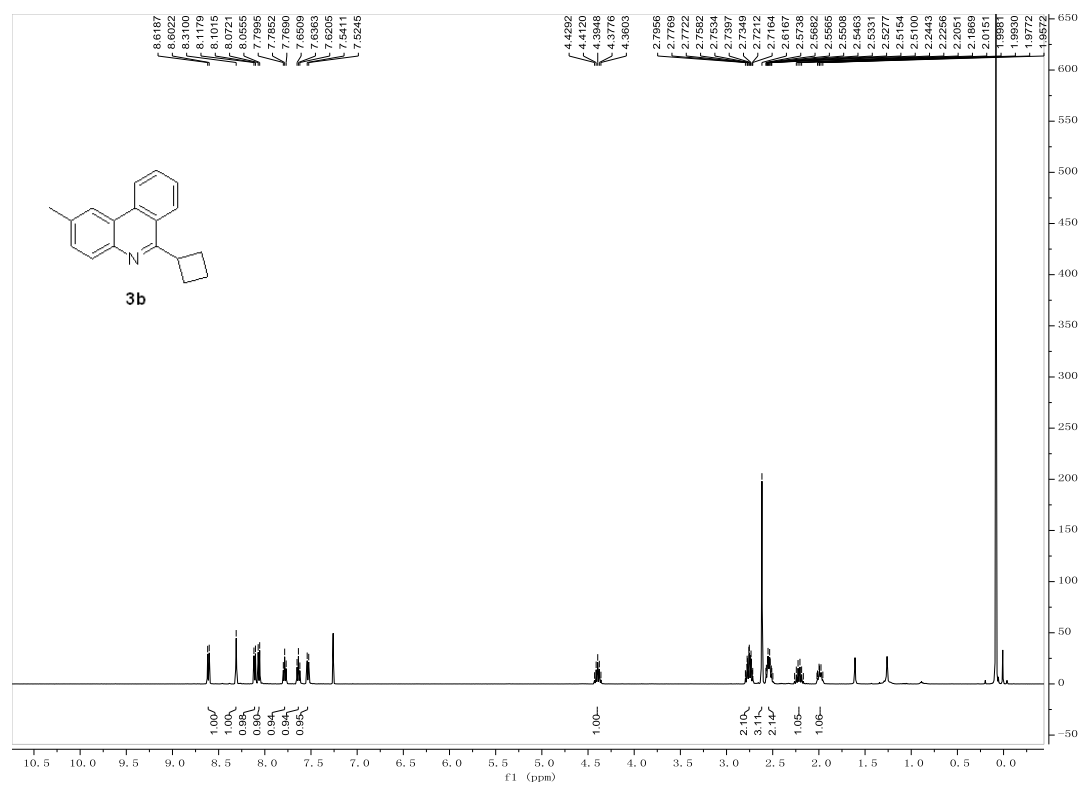
^1H NMR spectrum of **3a**



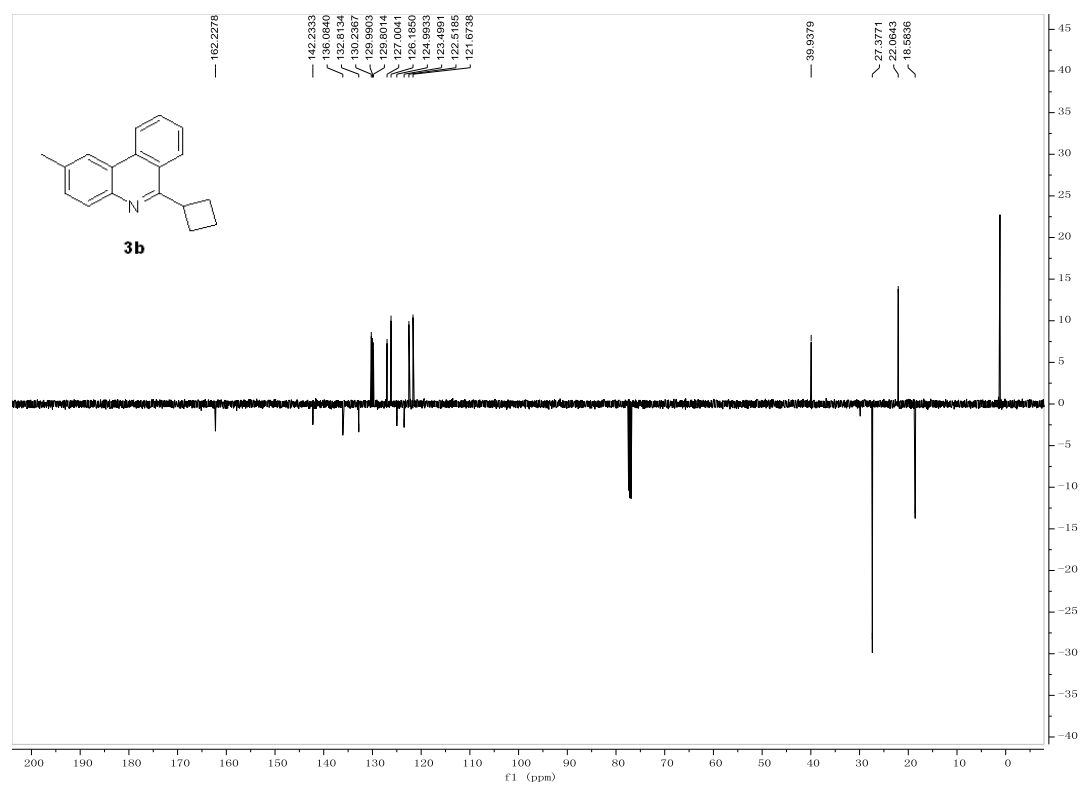
^{13}C NMR spectrum of **3a**



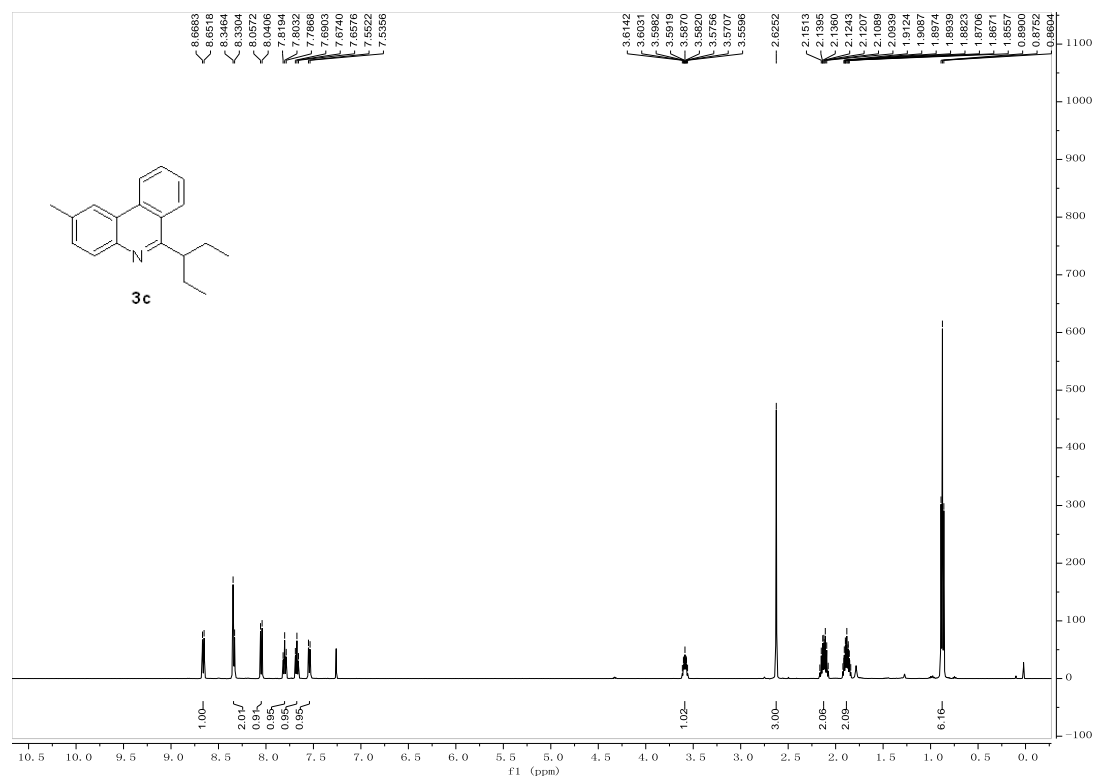
^1H NMR spectrum of **3b**



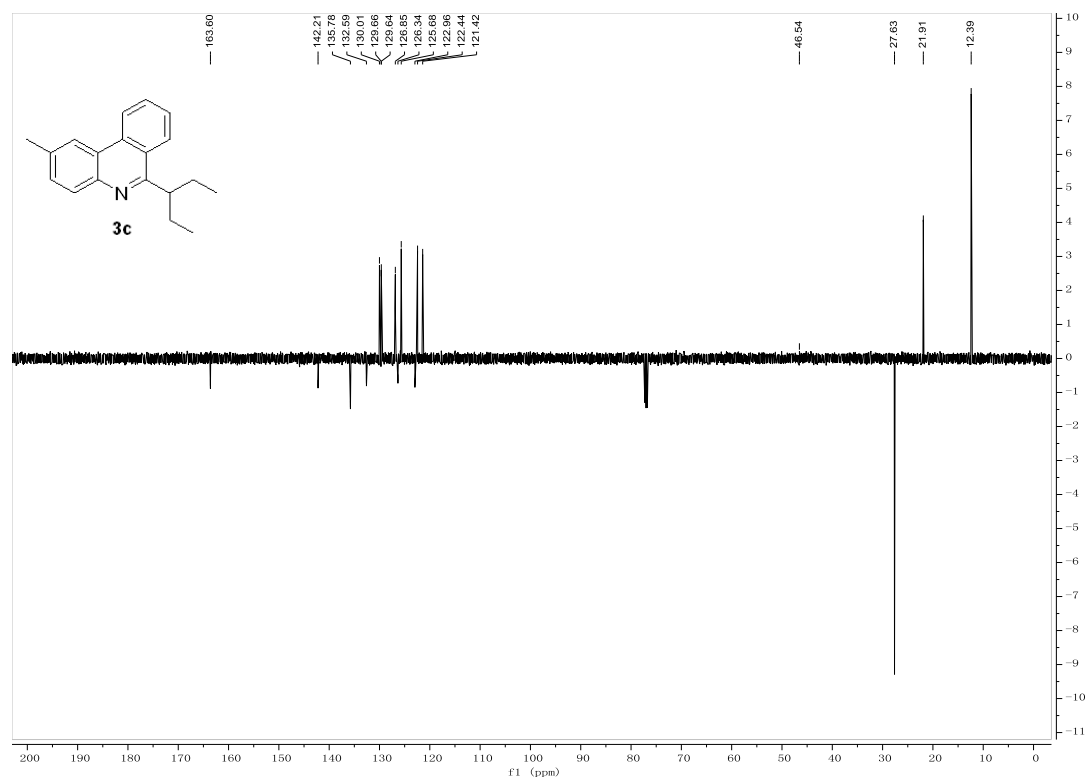
DEPT-Q spectrum of **3b**



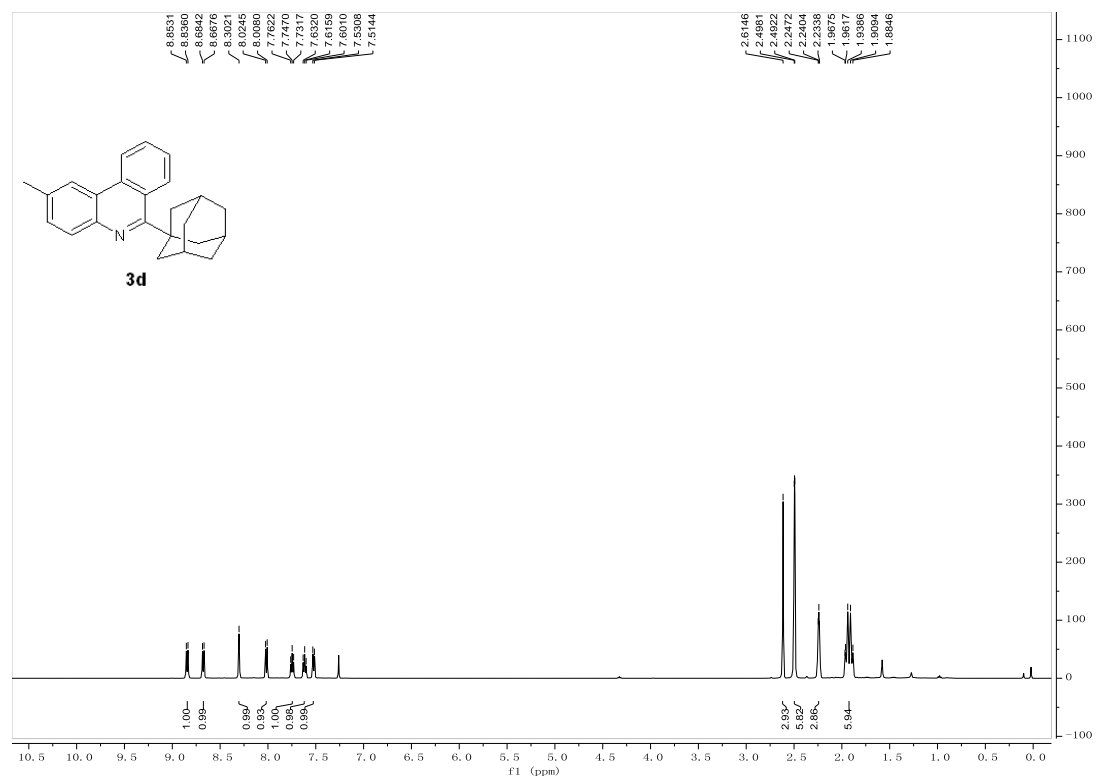
^1H NMR spectrum of **3c**



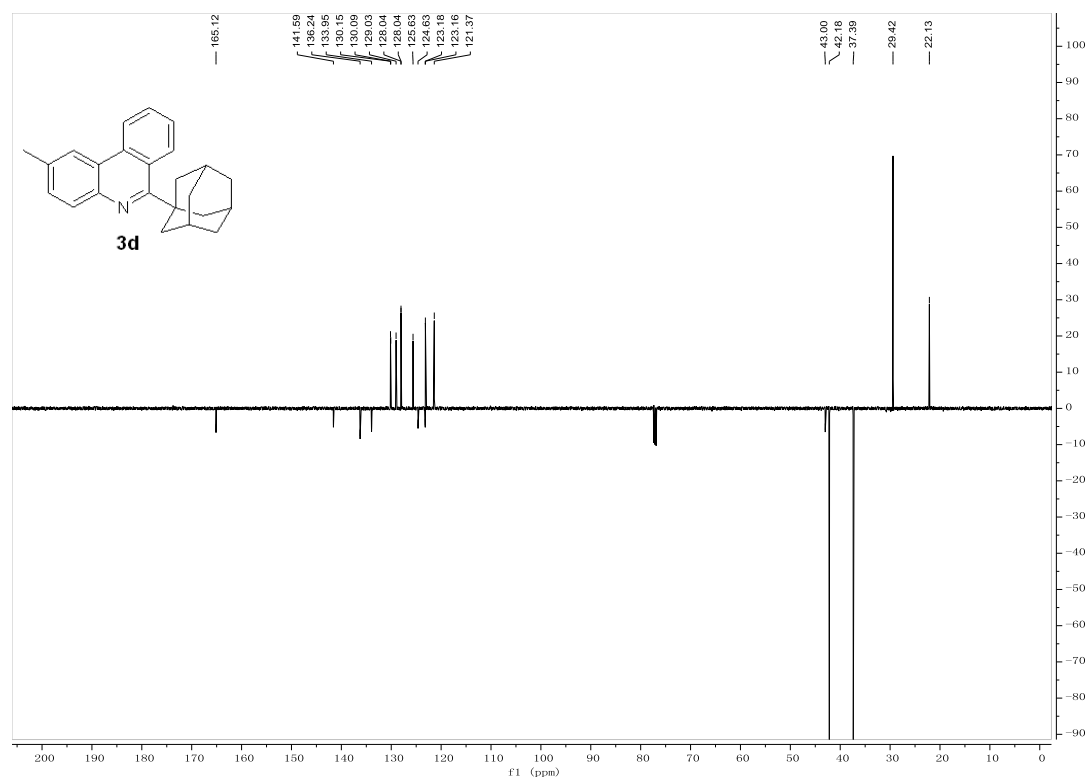
DEPT-Q spectrum of **3c**



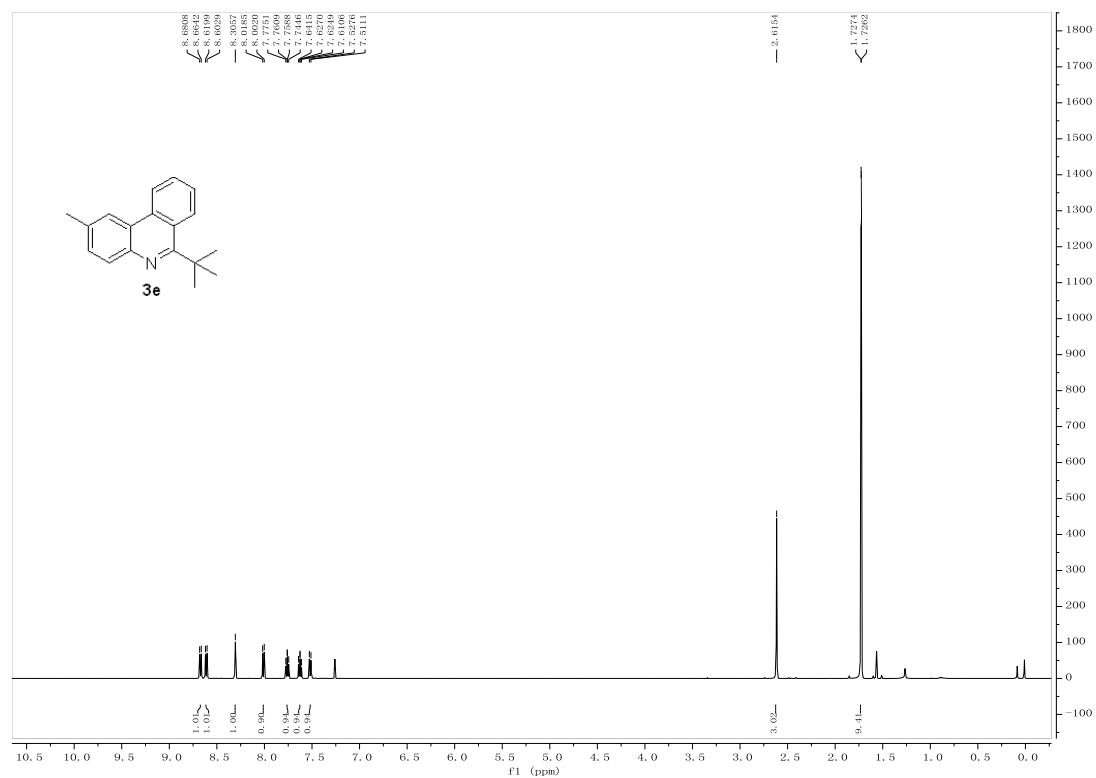
¹HNMR spectrum of **3d**



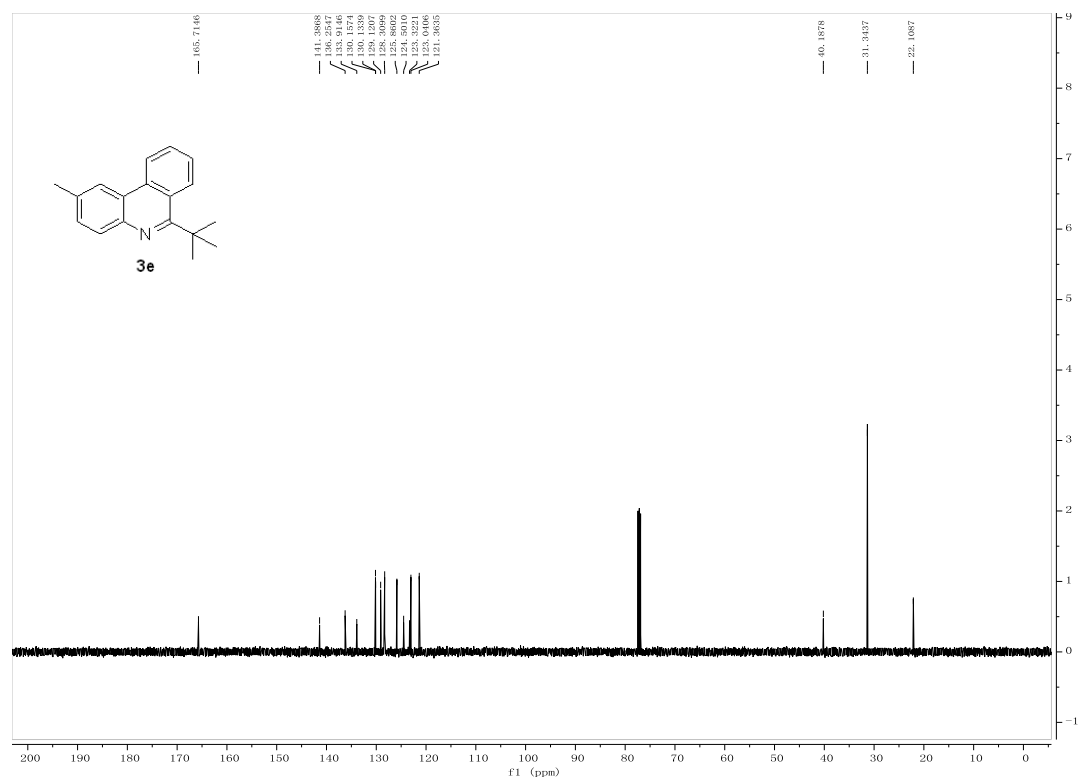
DEPT-Q spectrum of **3d**



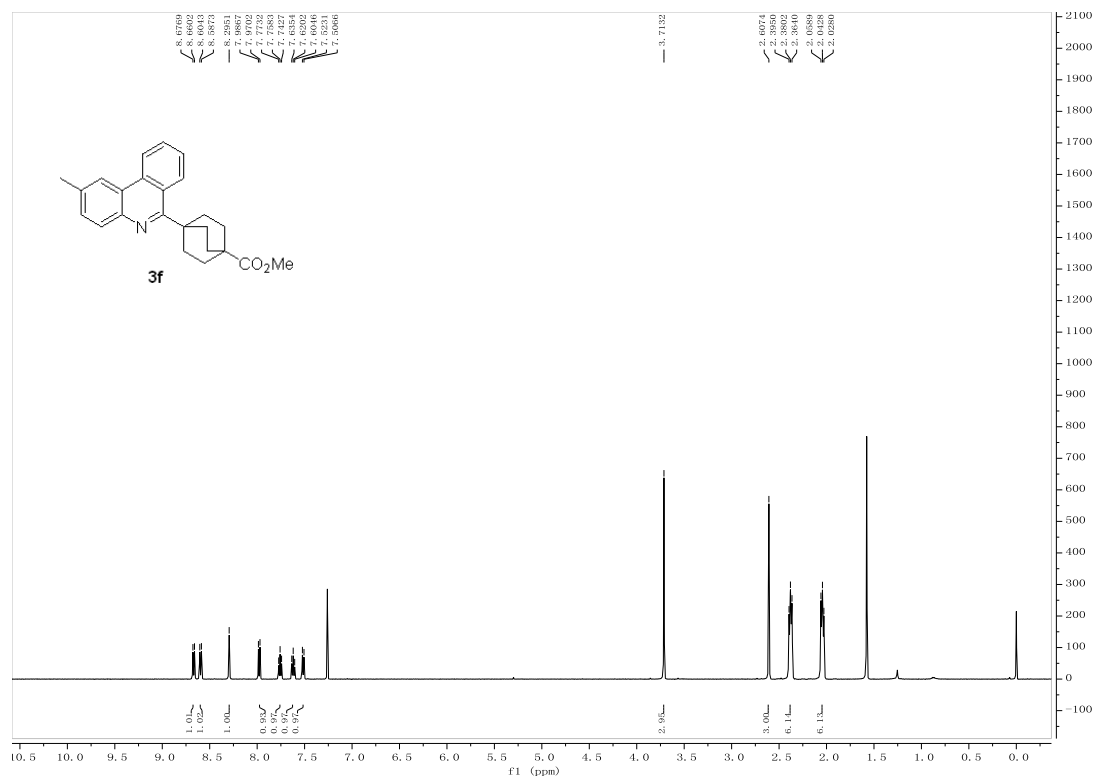
^1H NMR spectrum of **3e**



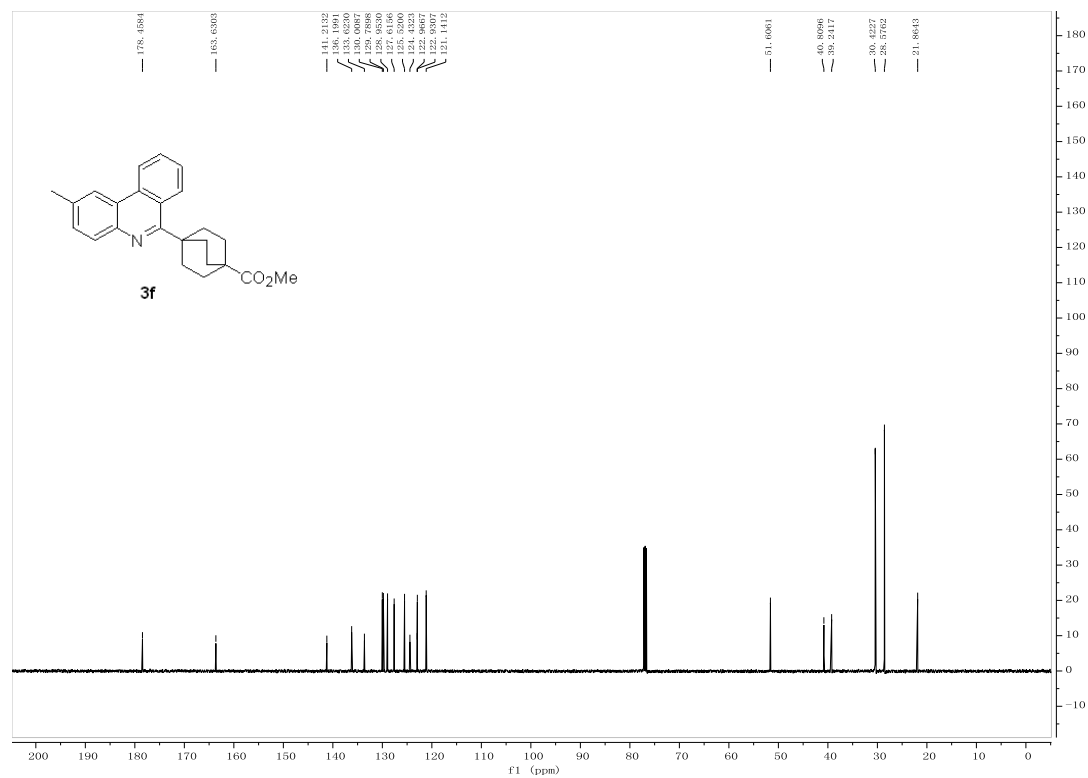
^{13}C NMR spectrum of **3e**

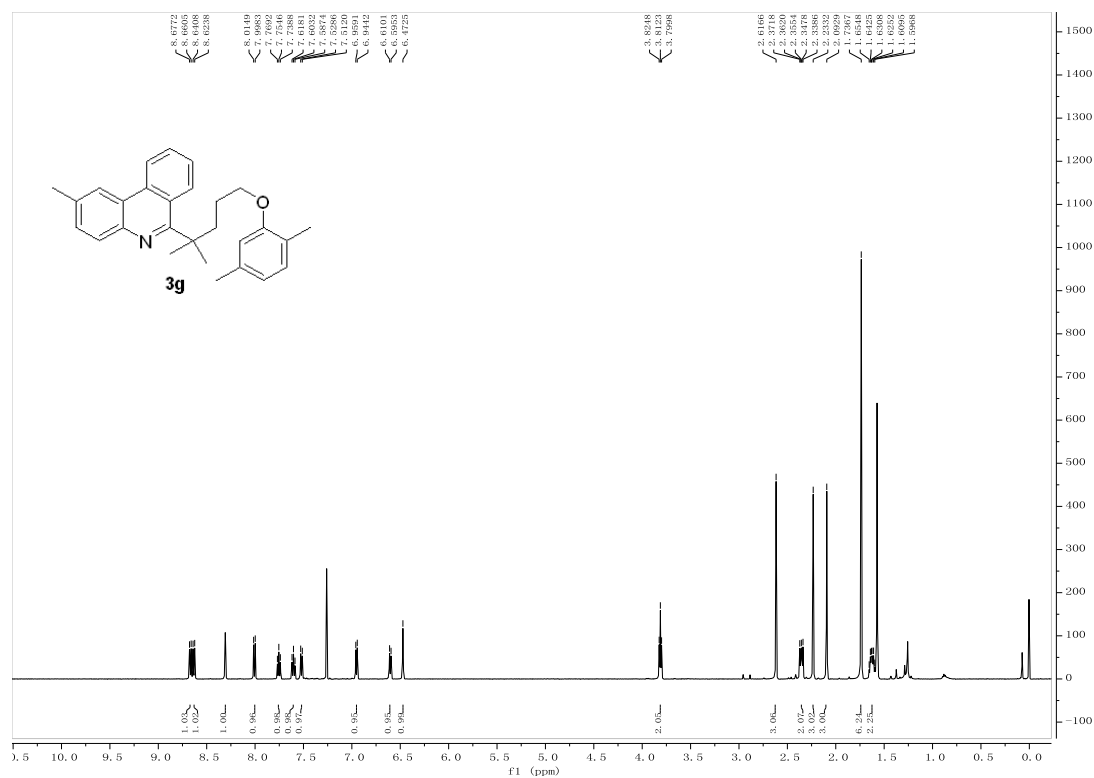
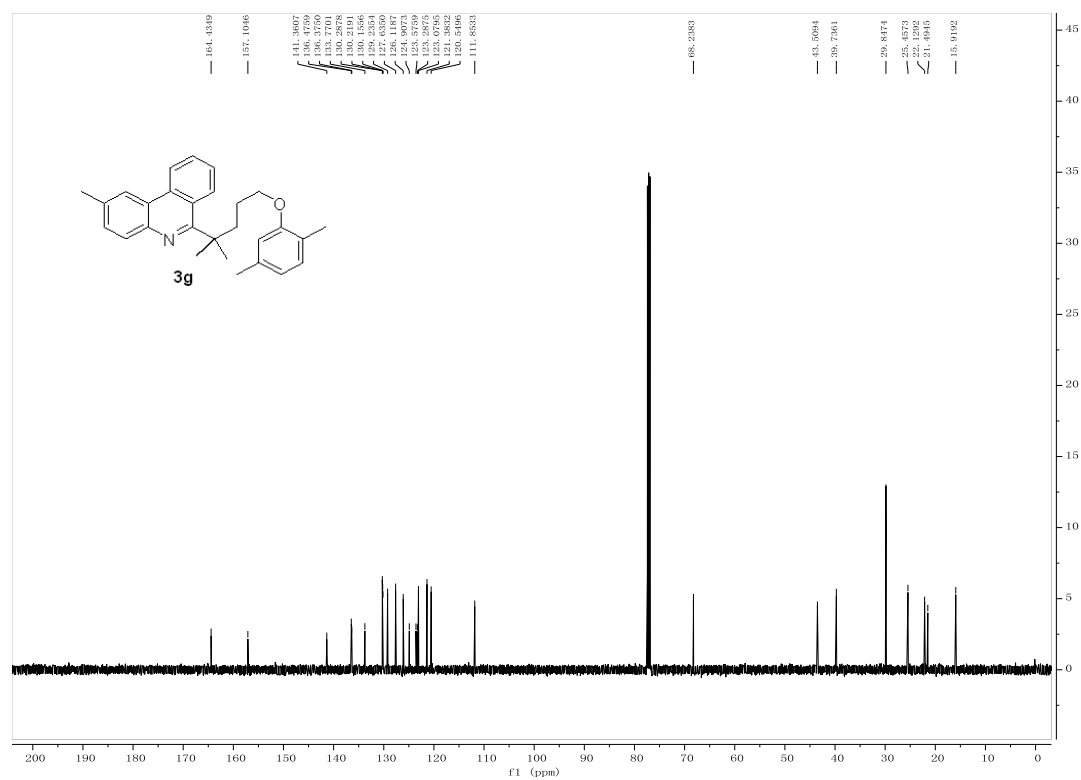


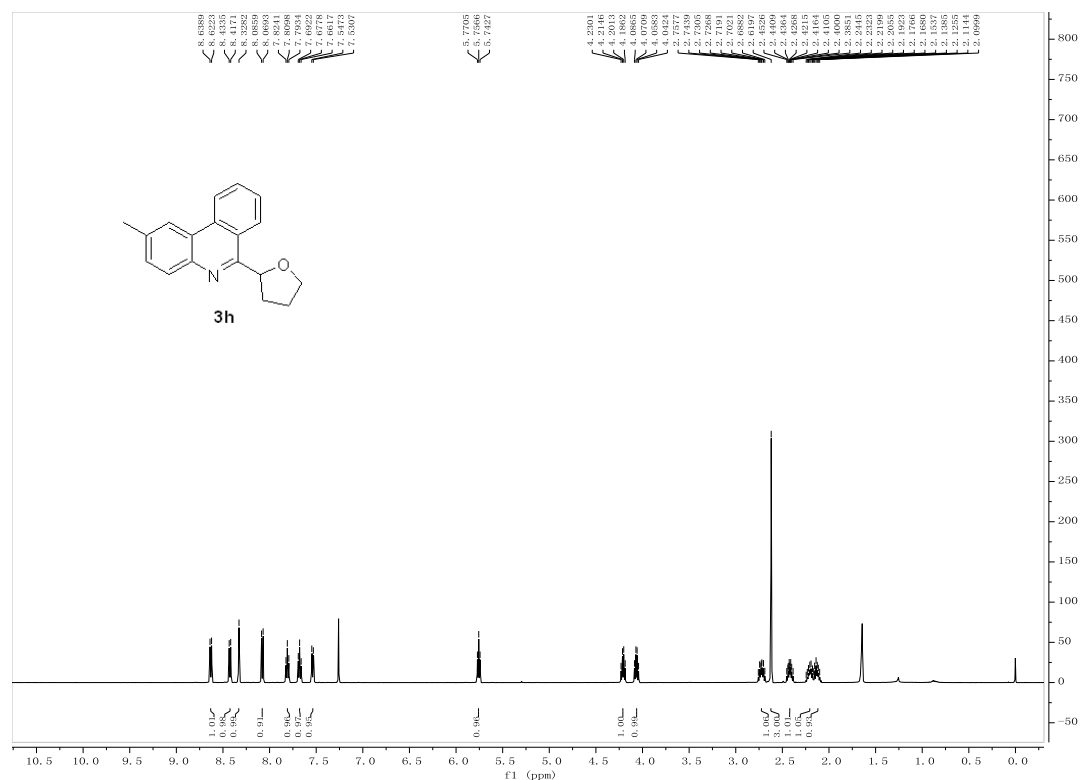
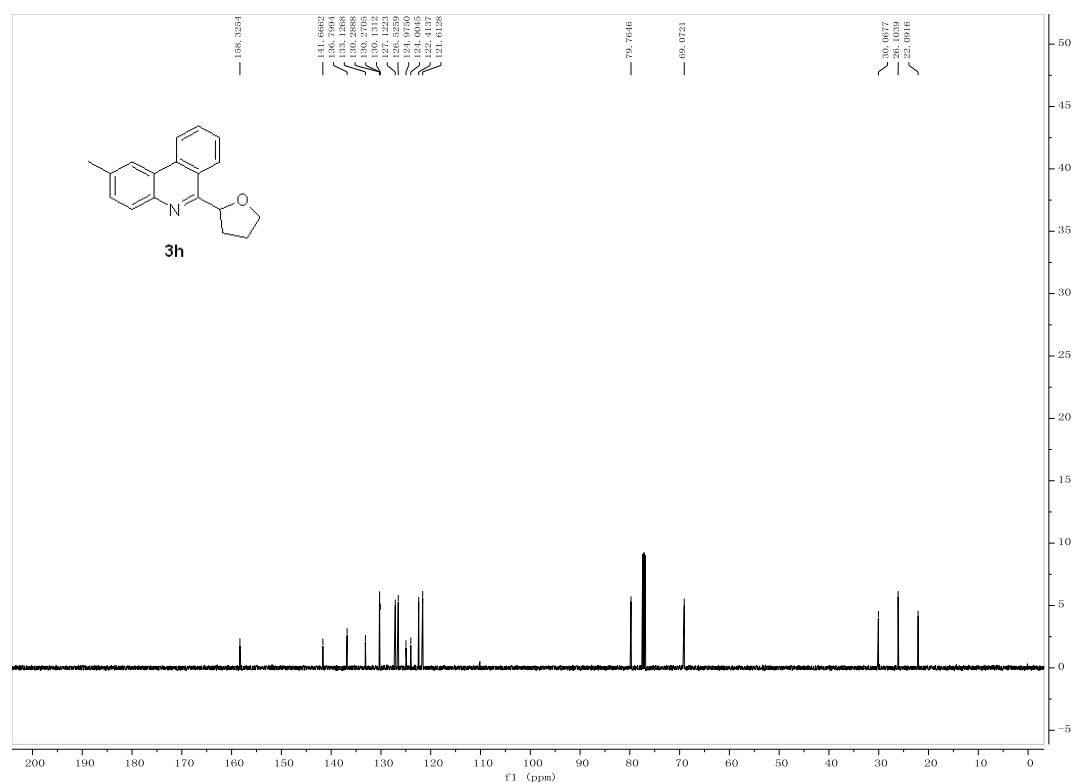
¹H NMR spectrum of **3f**



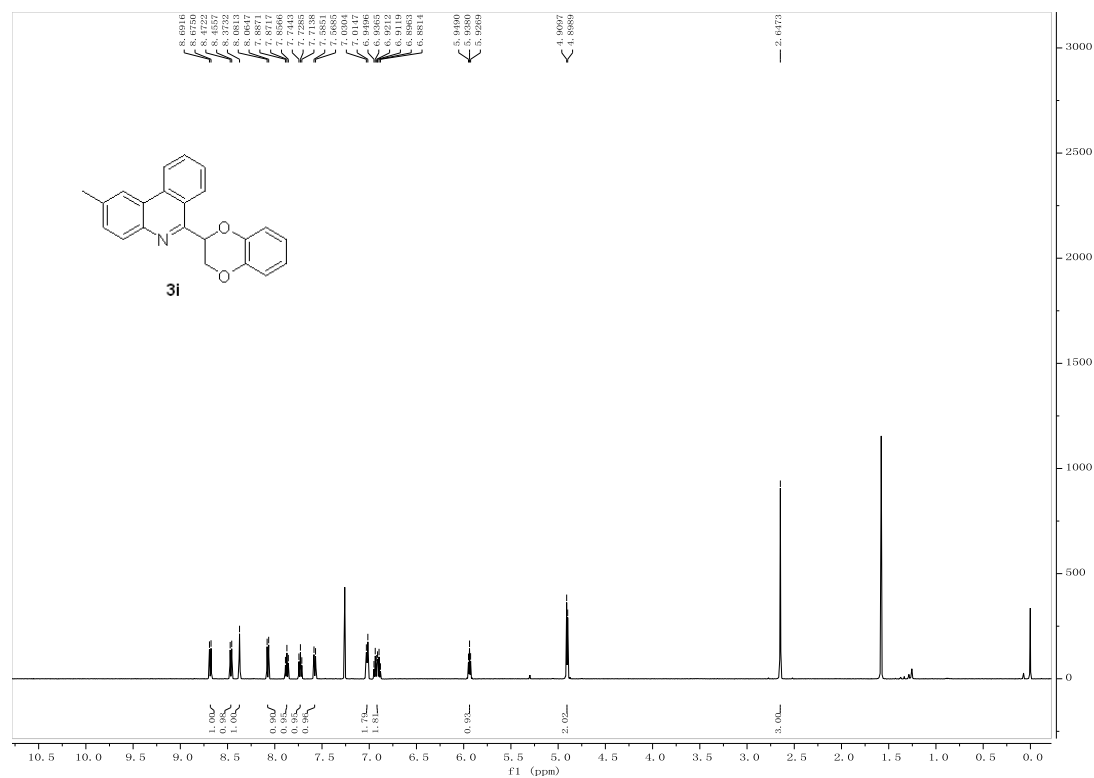
¹³C NMR spectrum of **3f**



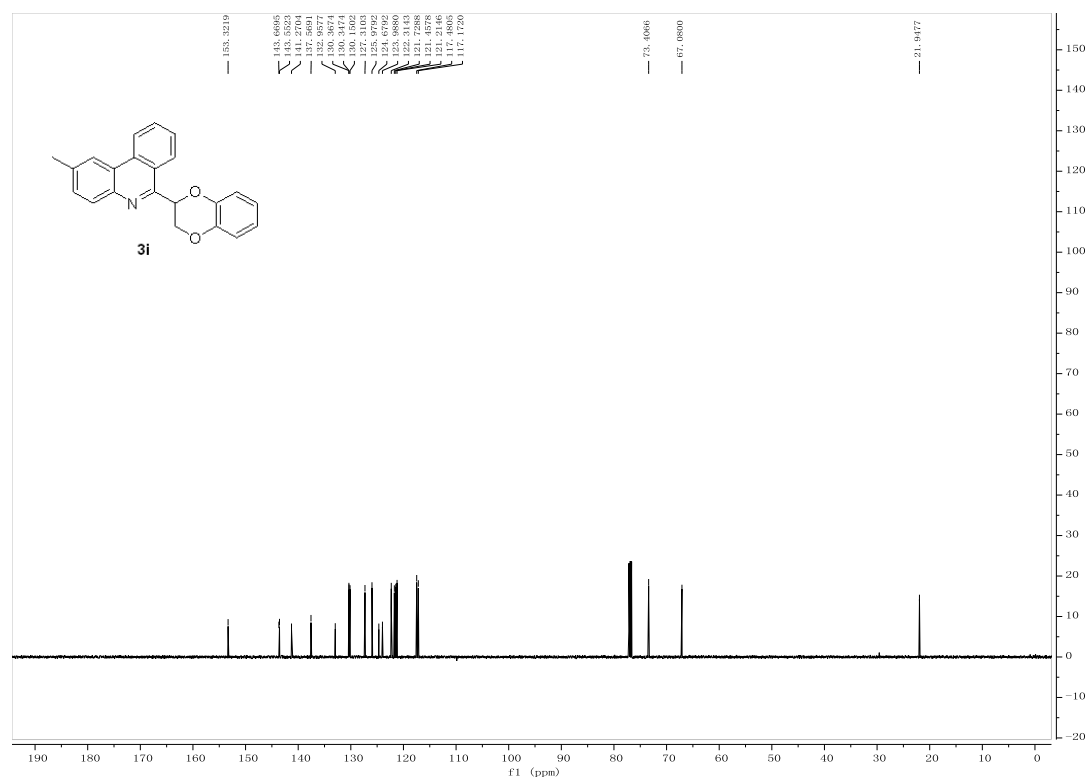
¹HNMR spectrum of **3g** ^{13}C NMR spectrum of **3g**

¹HNMR spectrum of **3h** ^{13}C NMR spectrum of **3h**

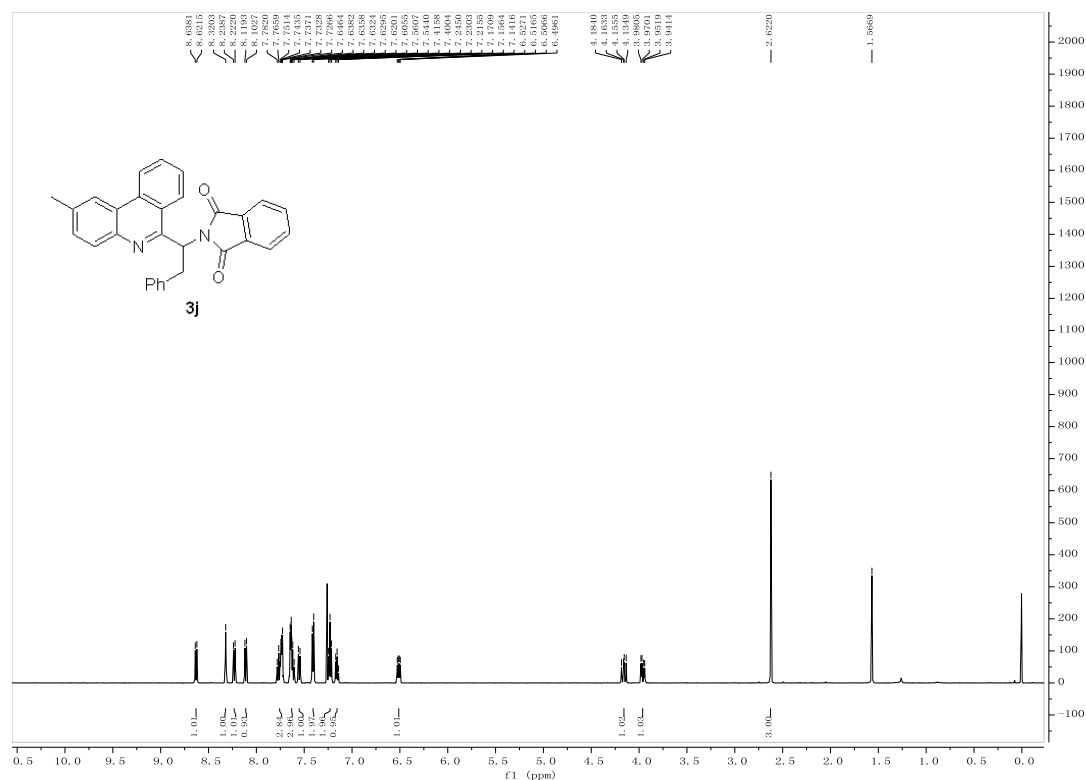
¹H NMR spectrum of **3i**



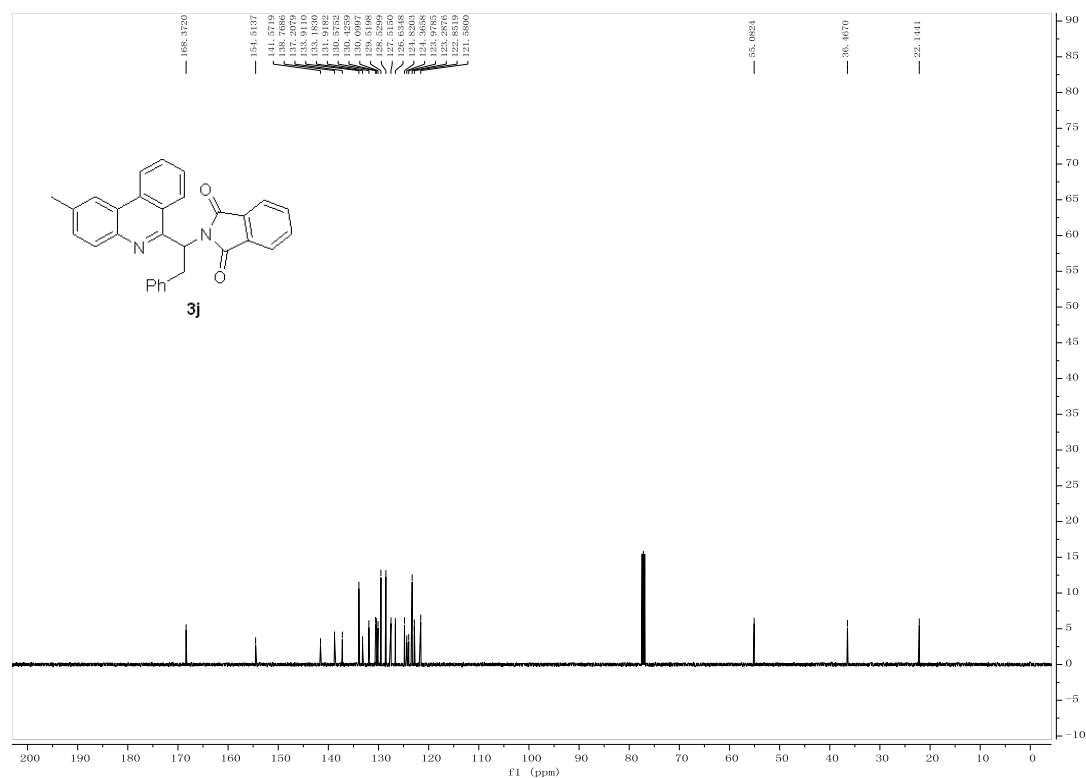
¹³C NMR spectrum of **3i**



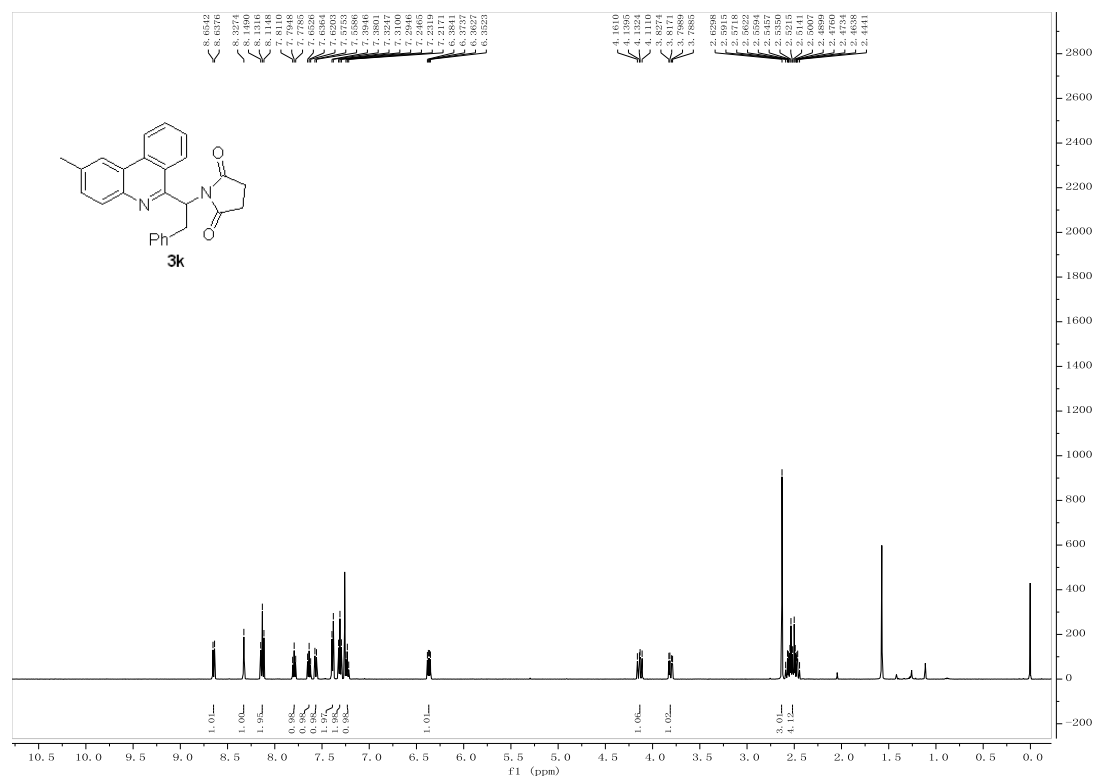
¹H NMR spectrum of **3j**



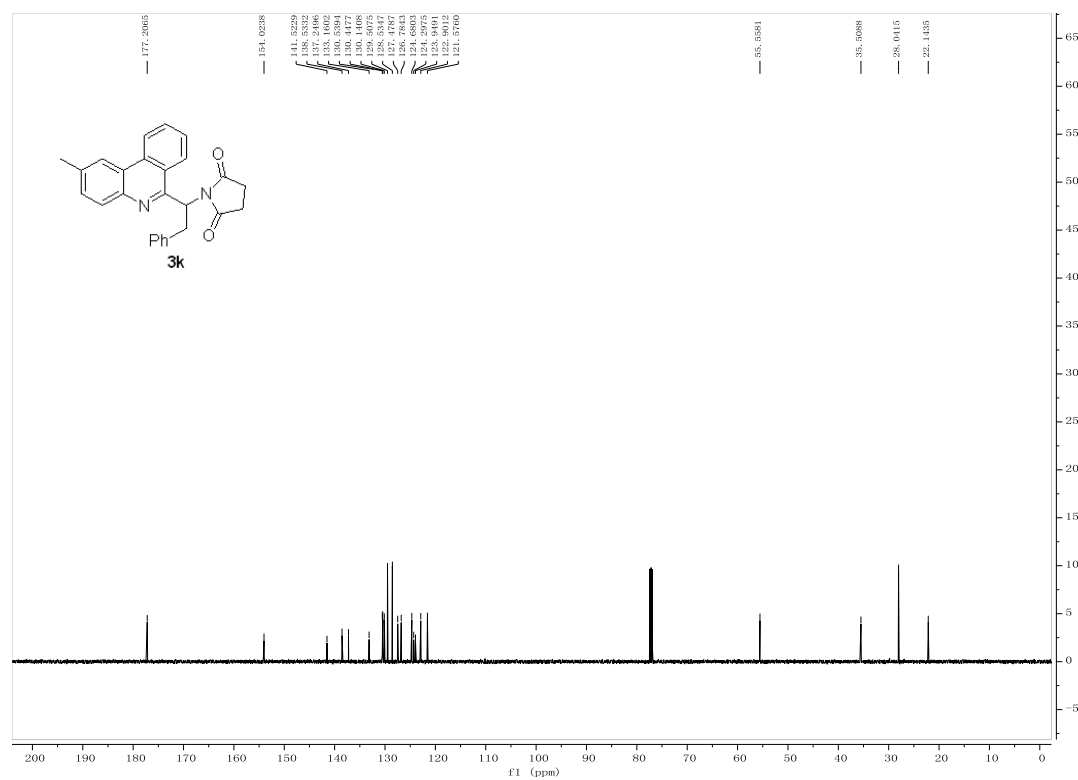
¹³C NMR spectrum of **3j**



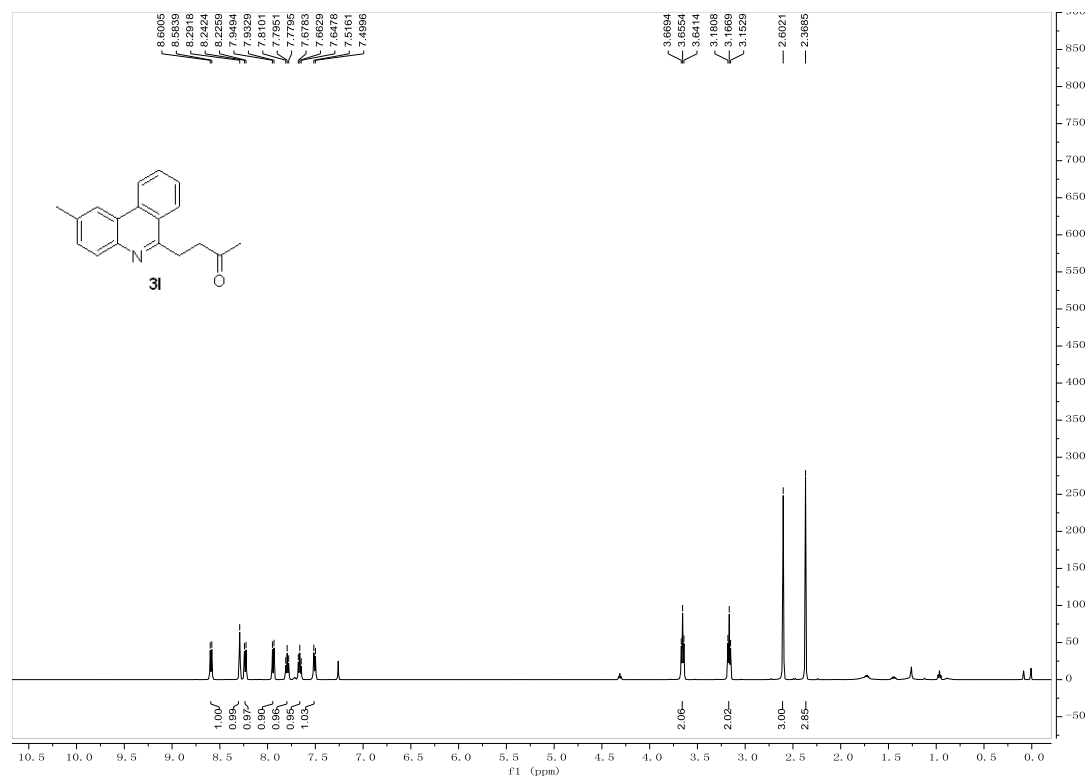
¹H NMR spectrum of **3k**



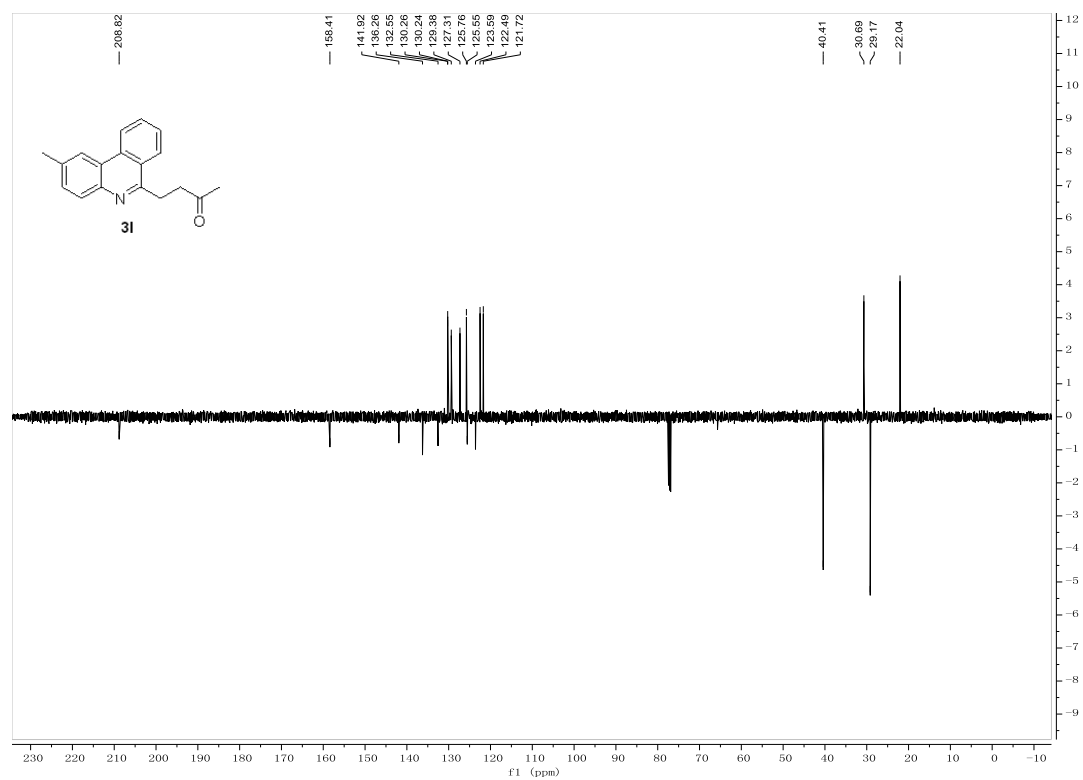
¹³C NMR spectrum of **3k**



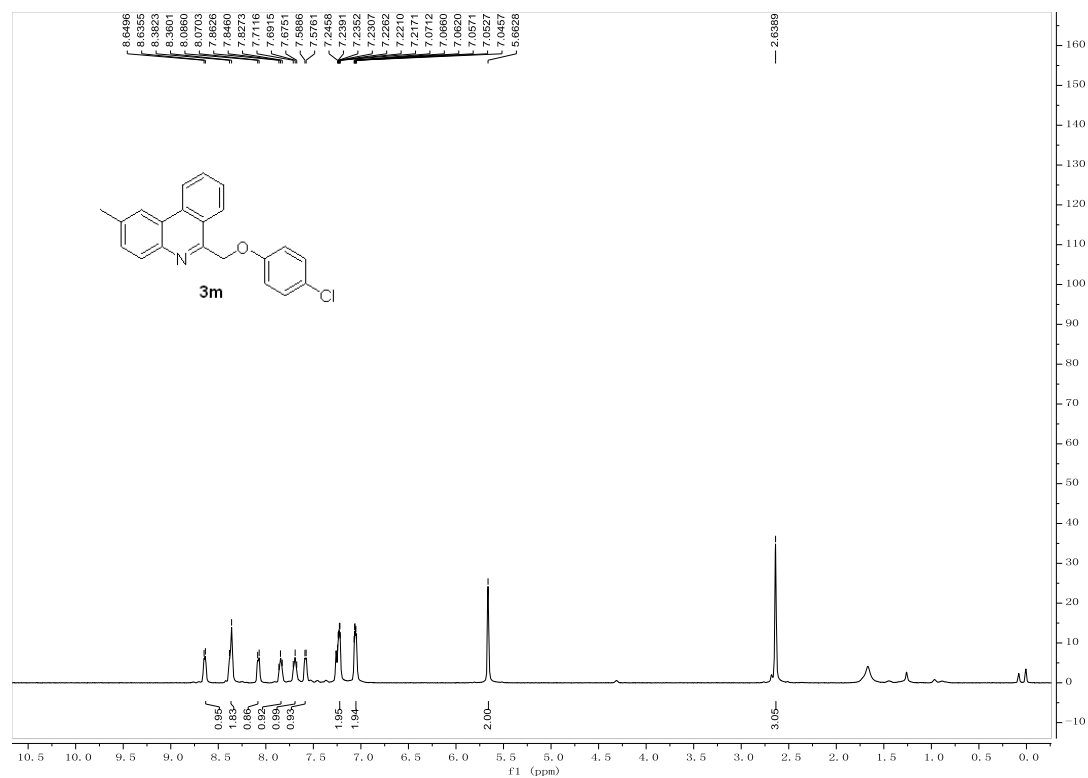
¹HNMR spectrum of **3I**



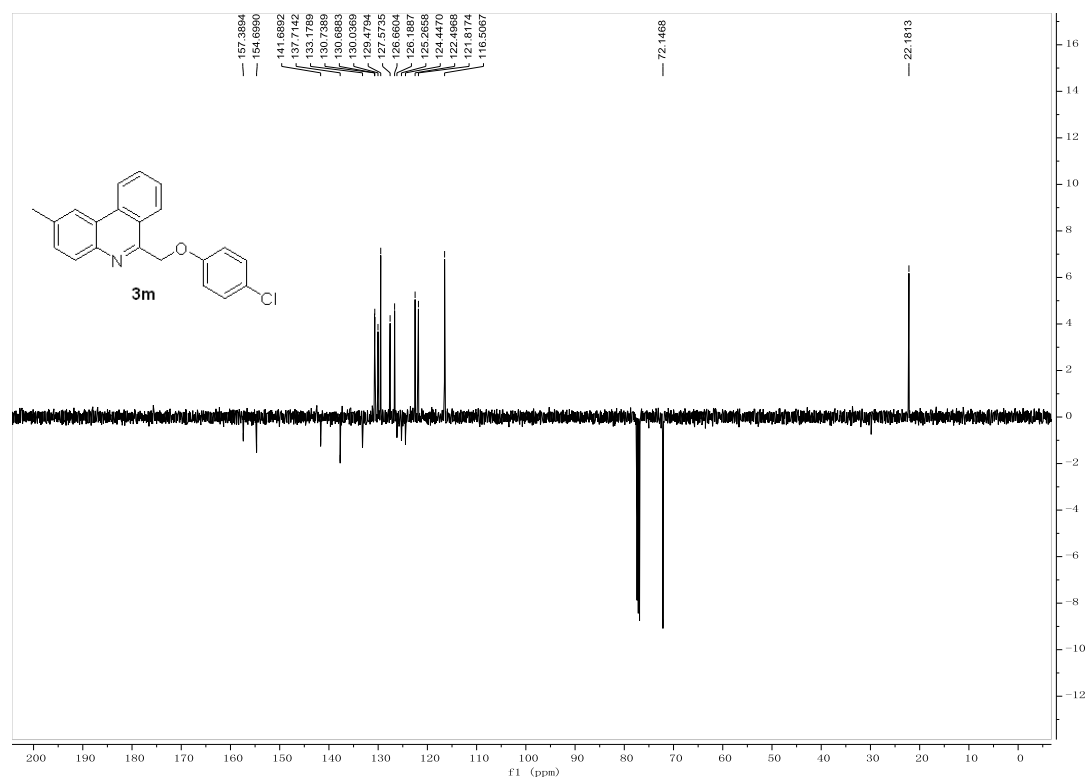
DEPT-Q spectrum of **3I**



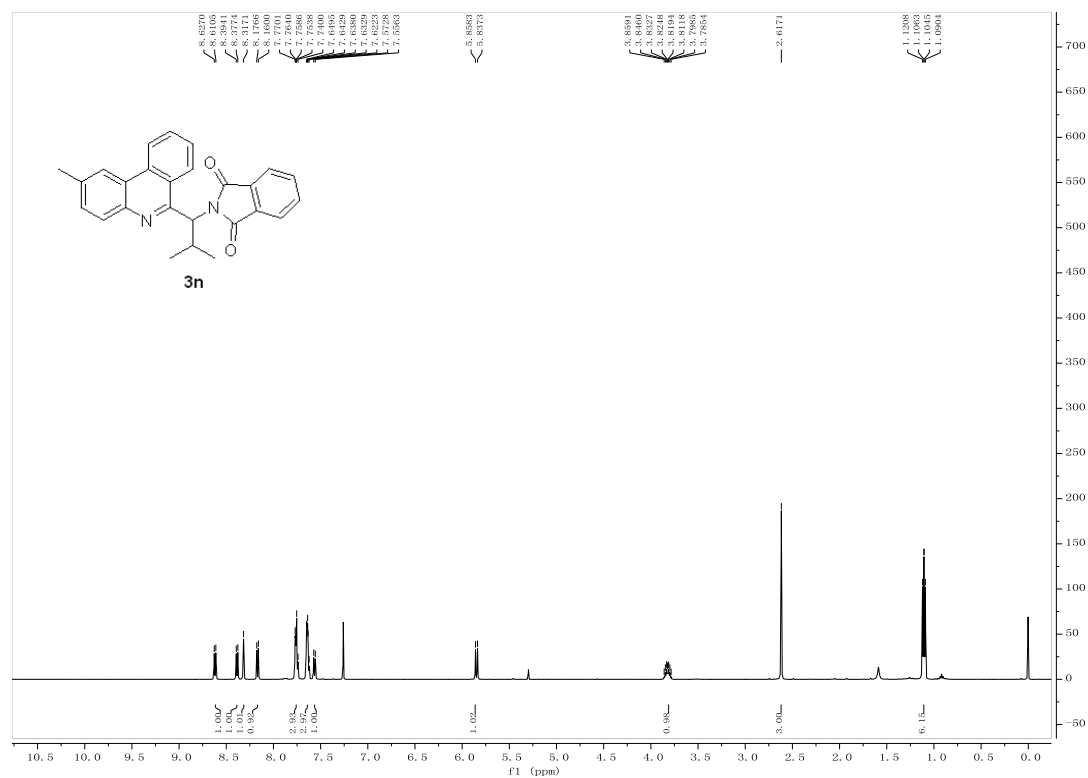
^1H NMR spectrum of **3m**



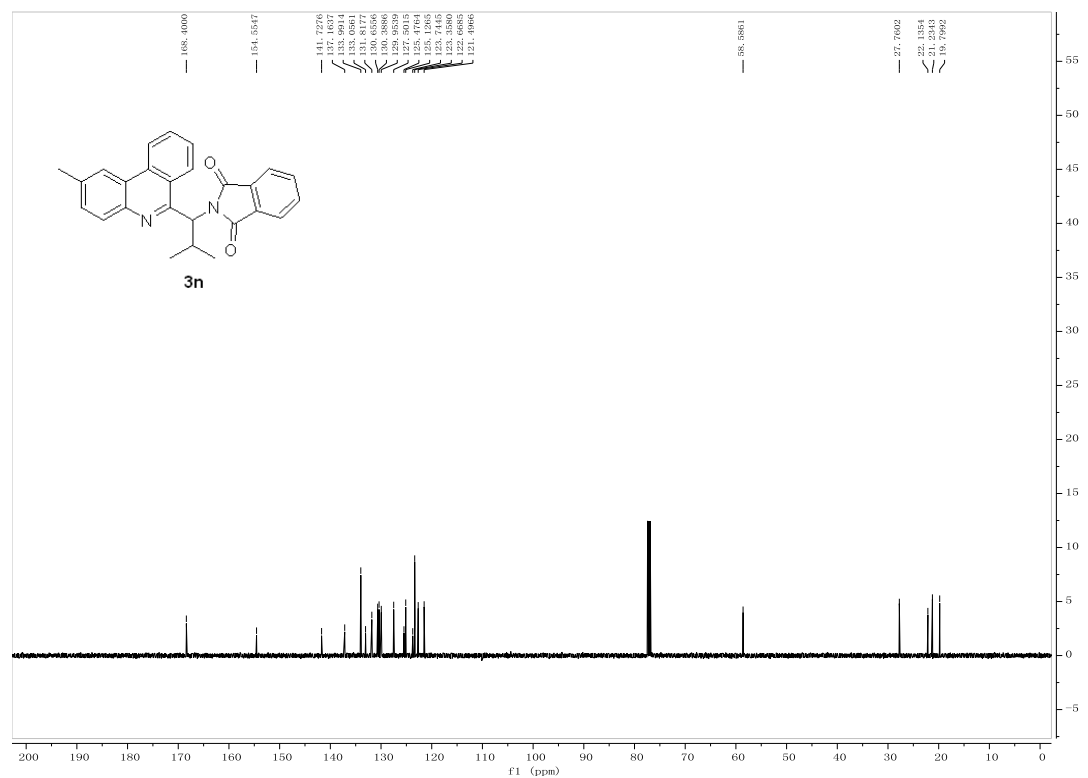
DEPT-Q spectrum of **3m**



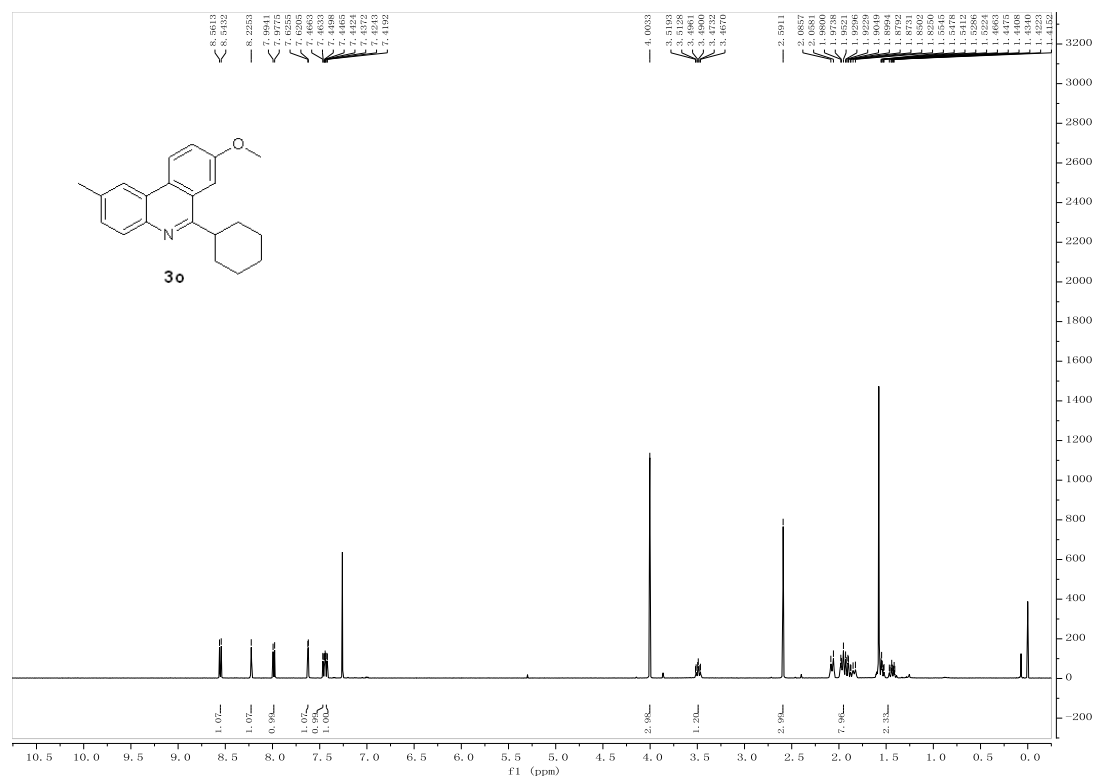
¹H NMR spectrum of **3n**



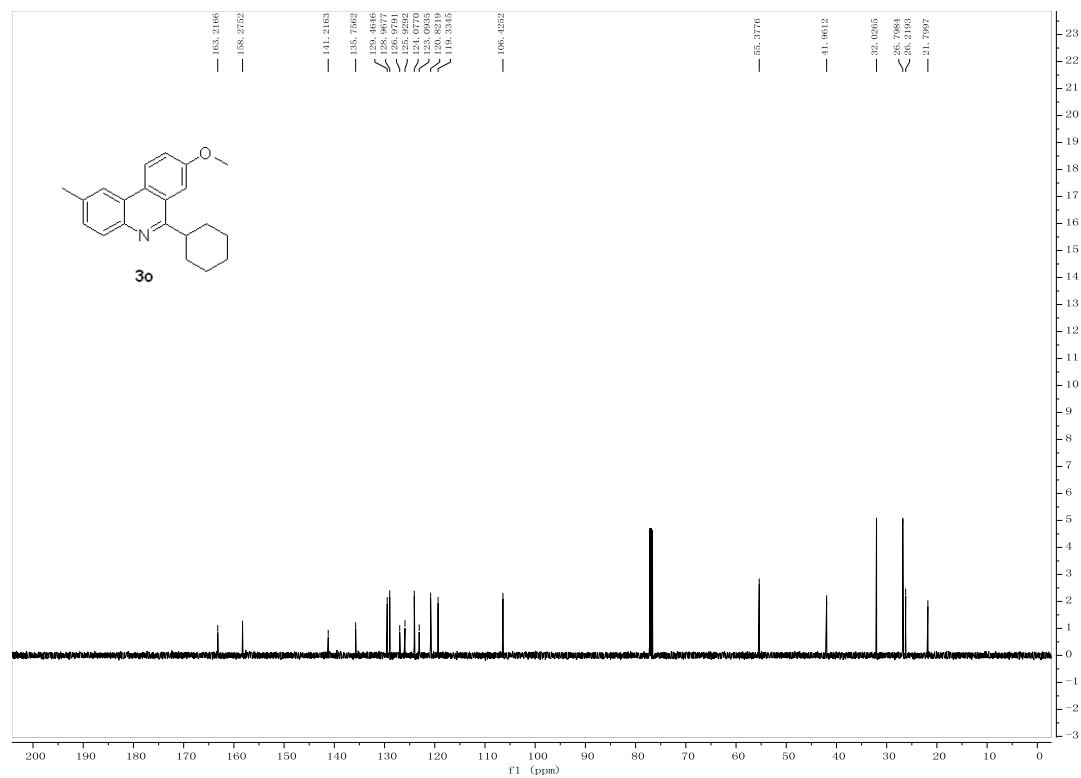
¹³C NMR spectrum of **3n**



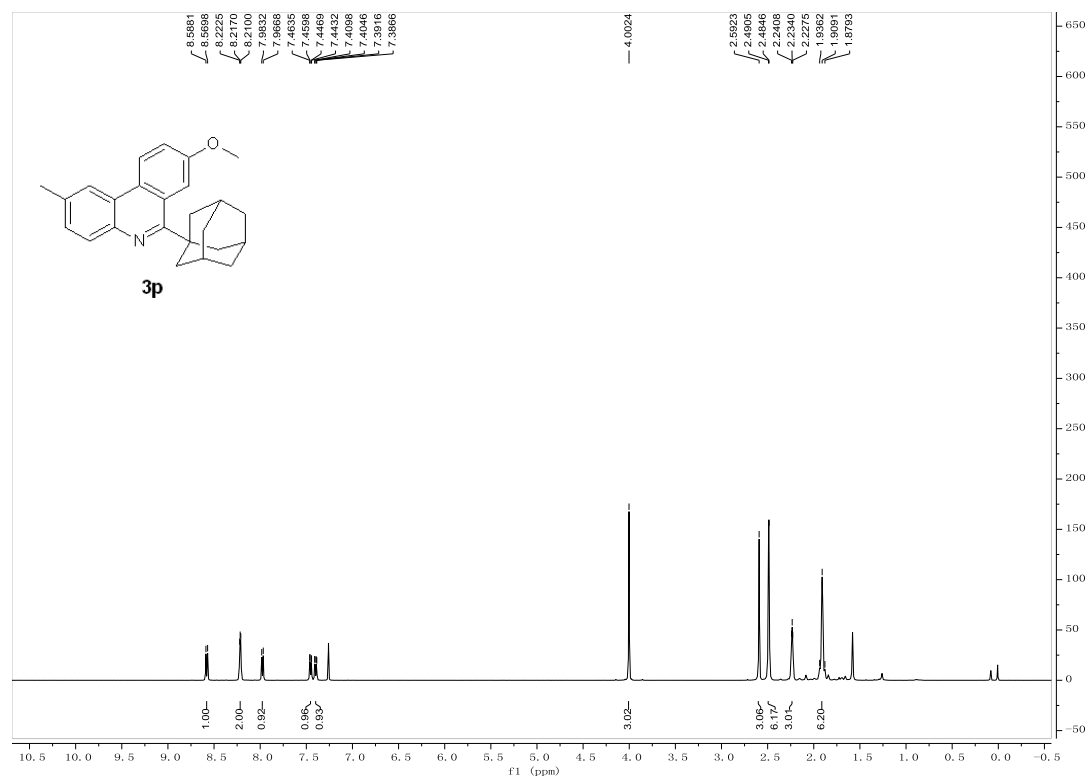
¹H NMR spectrum of **3o**



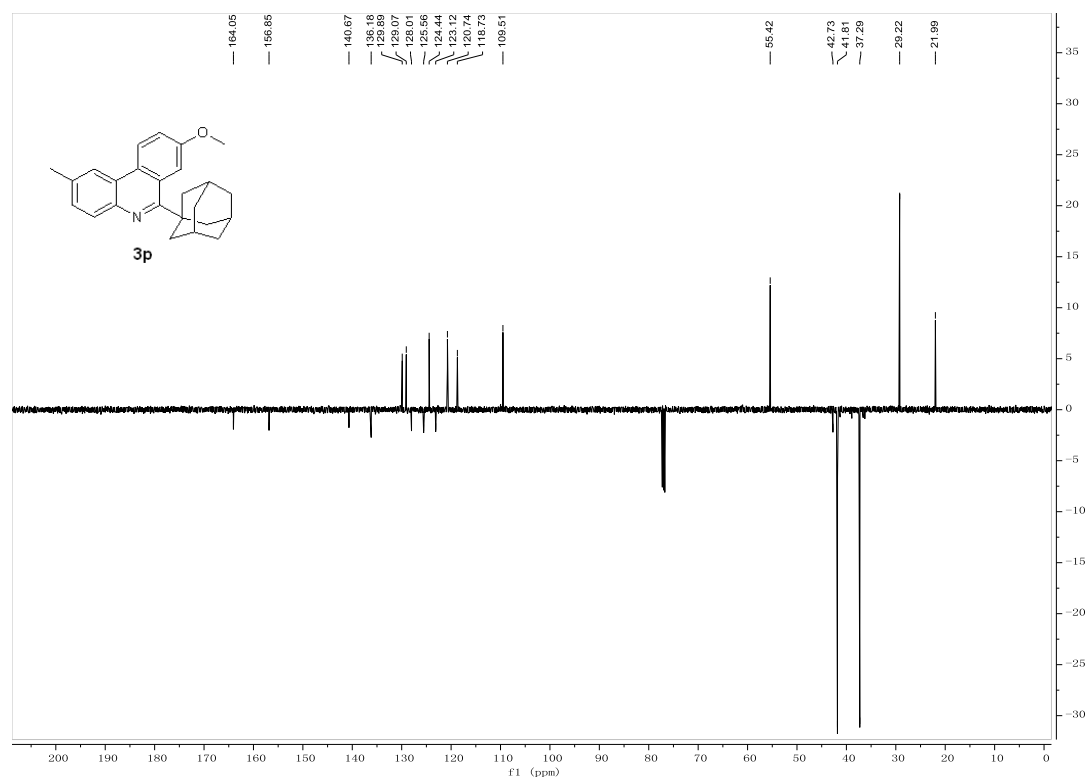
¹³C NMR spectrum of **3o**



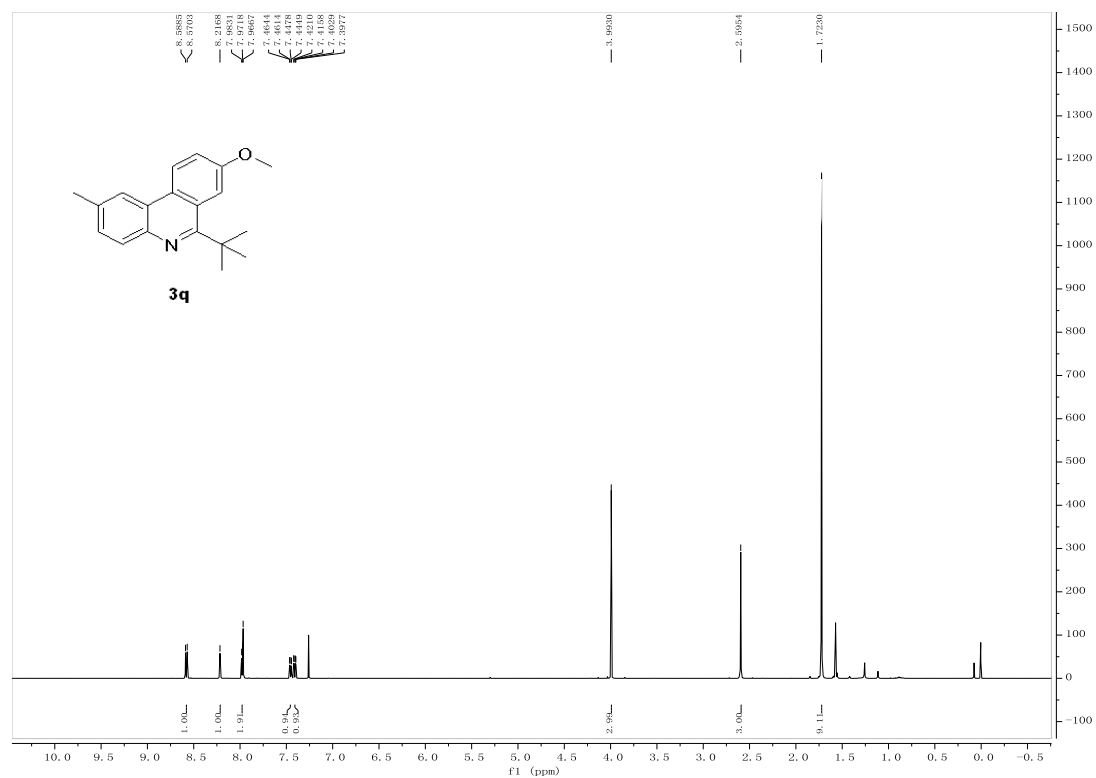
¹HNMR spectrum of **3p**



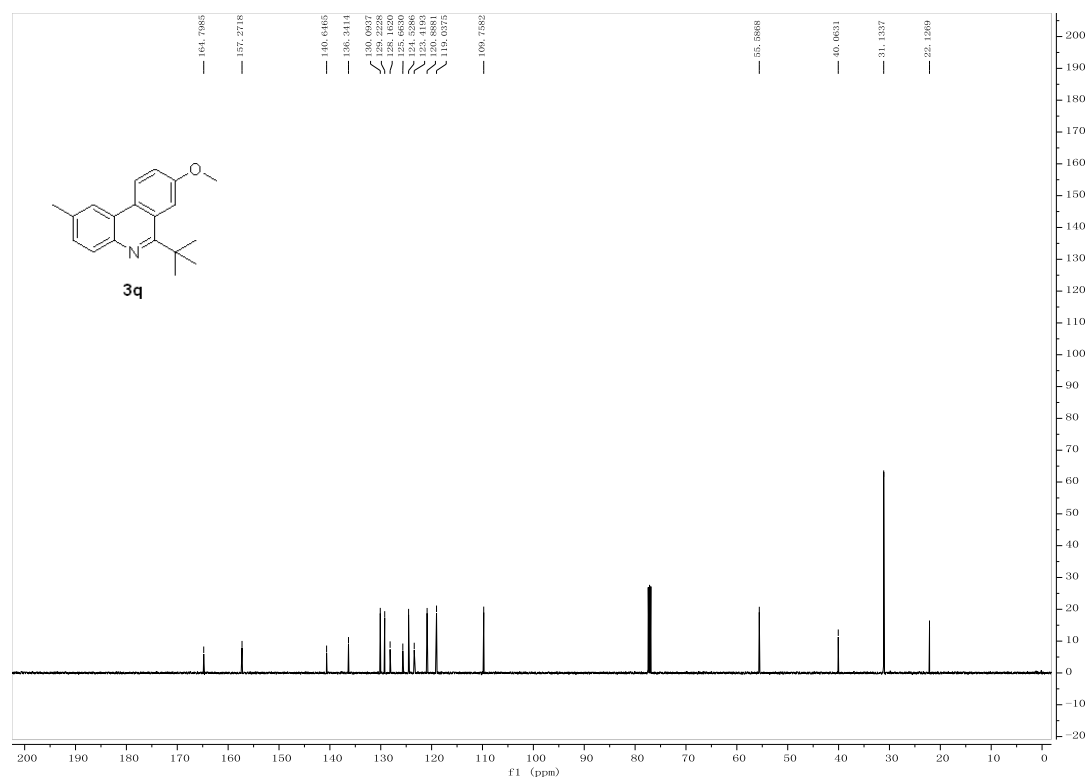
DEPT-Q spectrum of **3p**



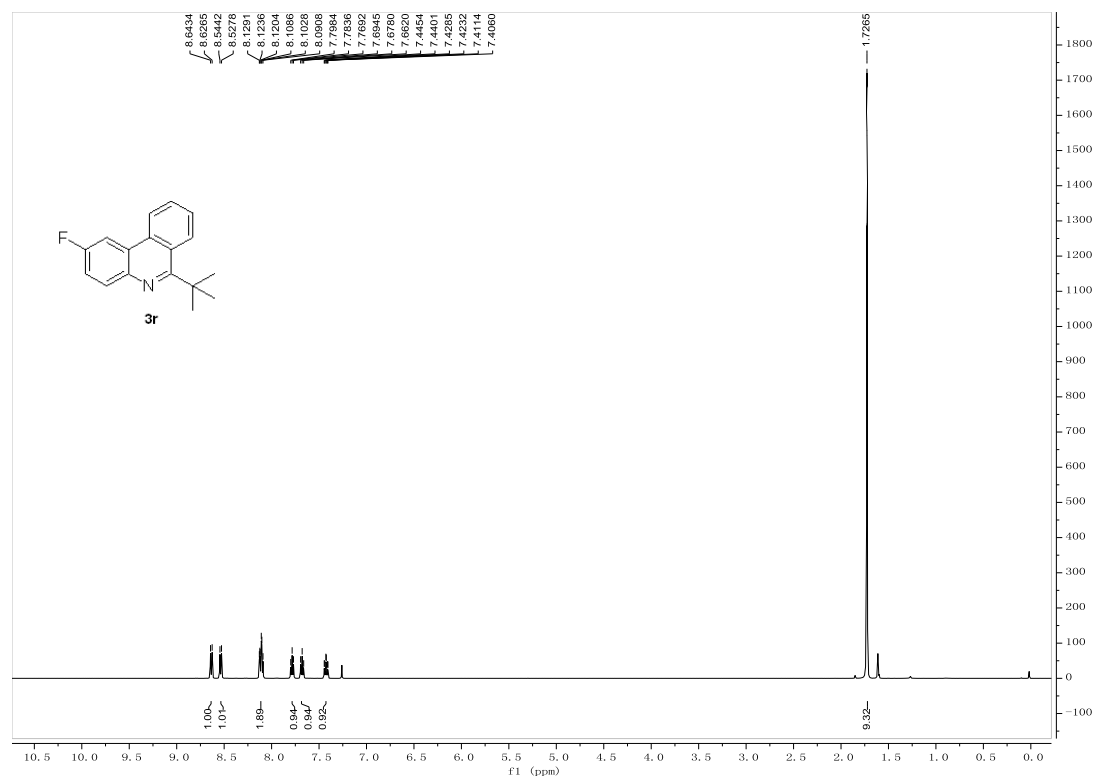
¹H NMR spectrum of **3q**



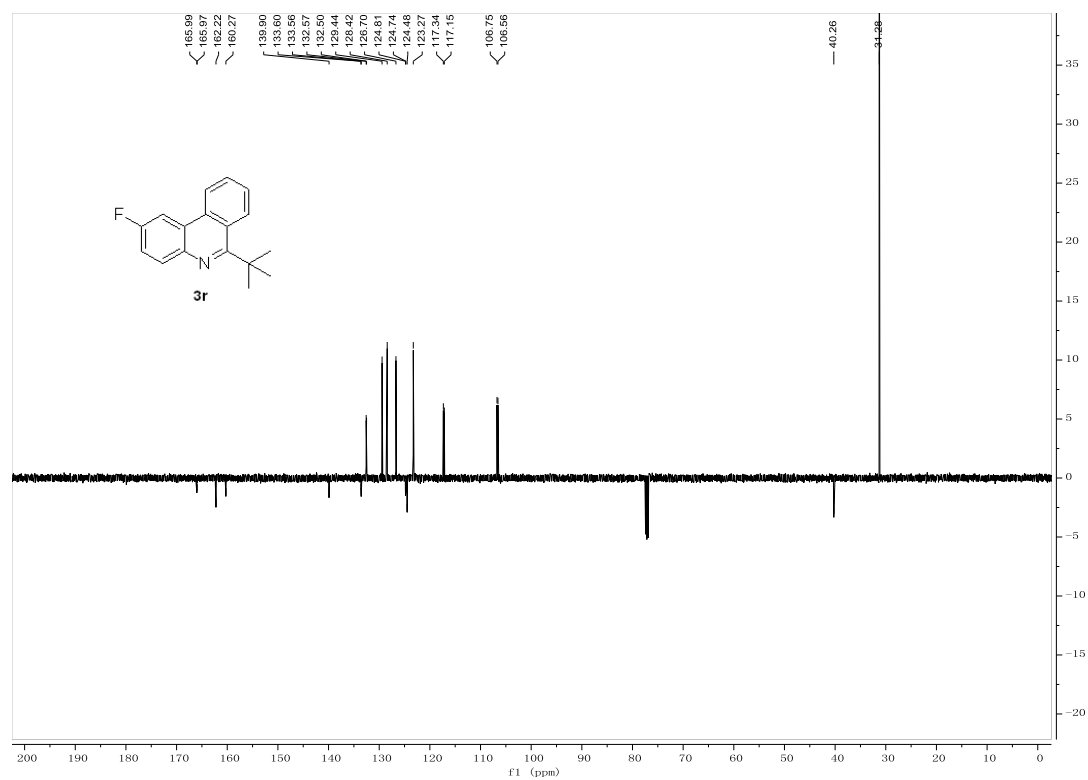
¹³C NMR spectrum of **3q**



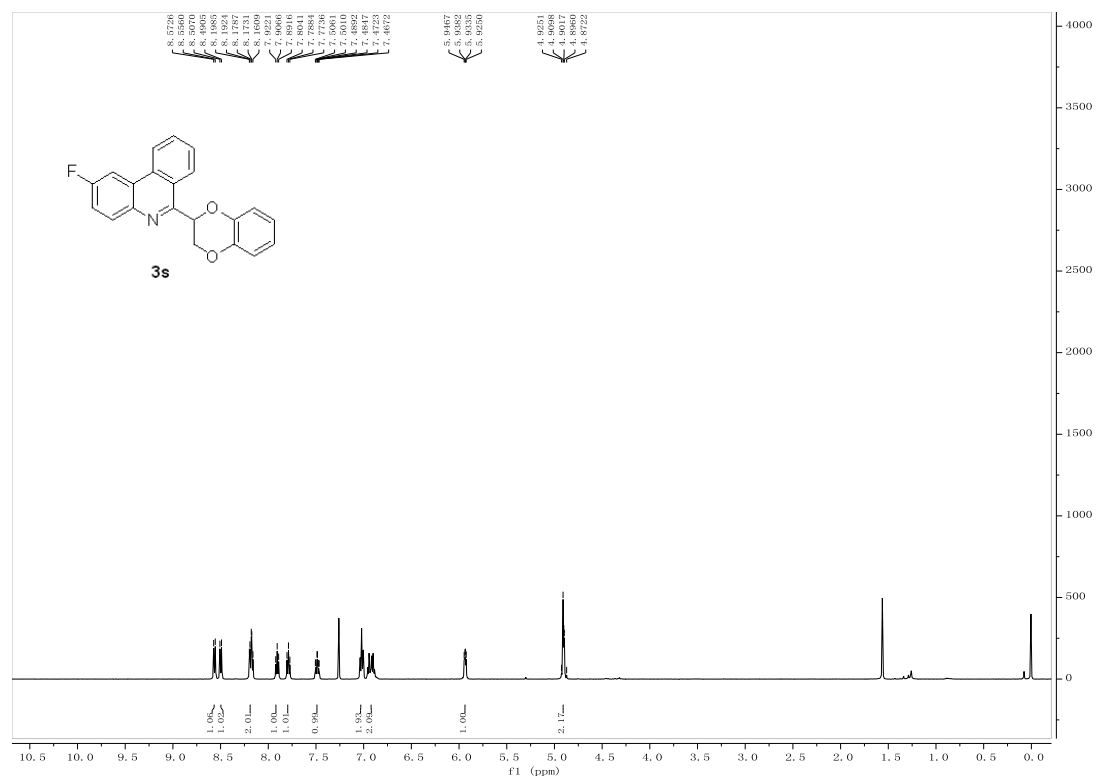
^1H NMR spectrum of **3r**



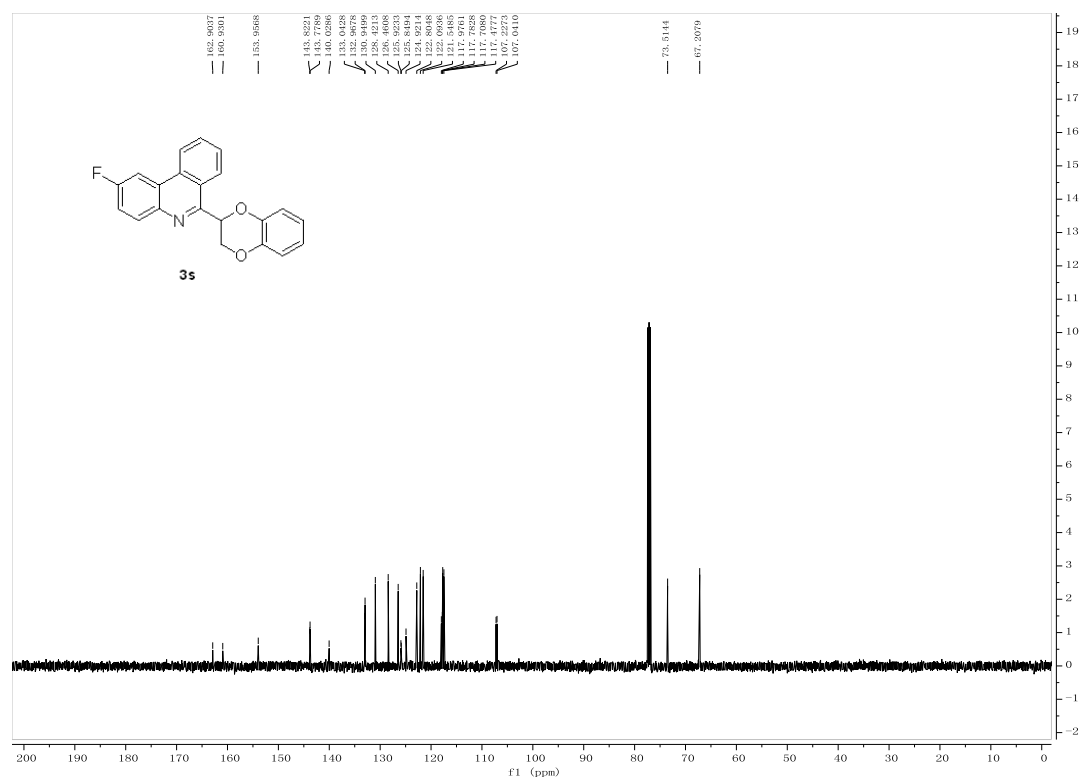
DEPT-Q spectrum of **3r**



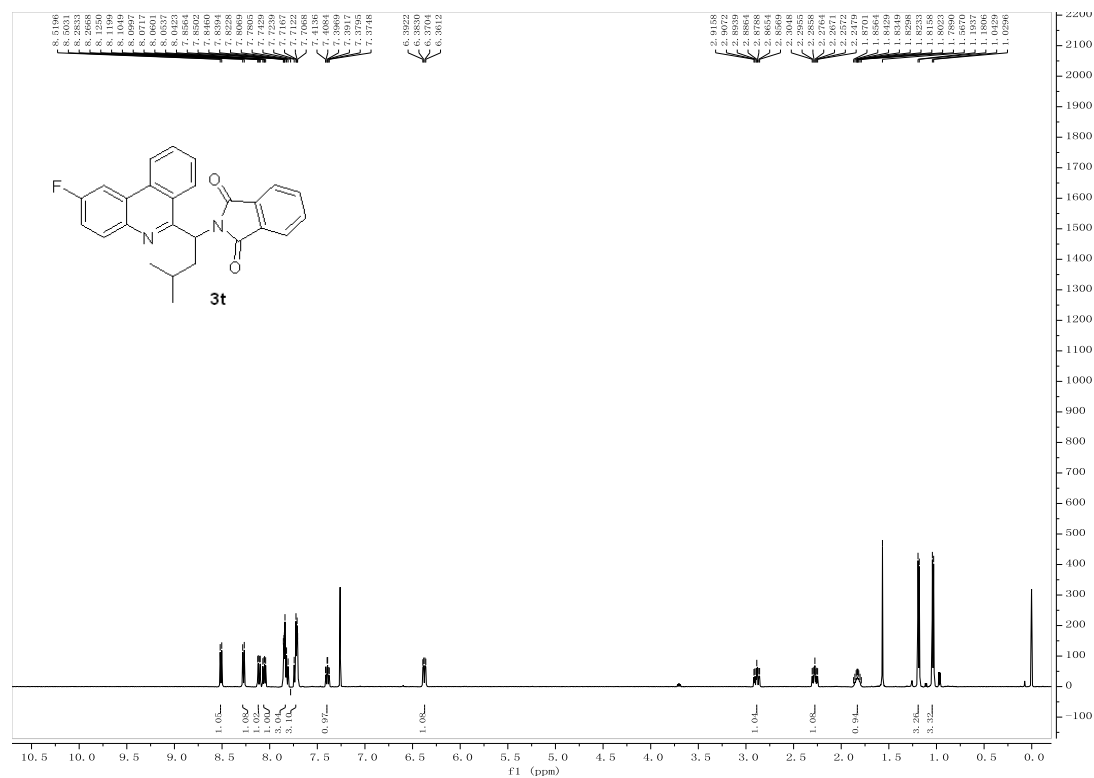
¹H NMR spectrum of **3s**



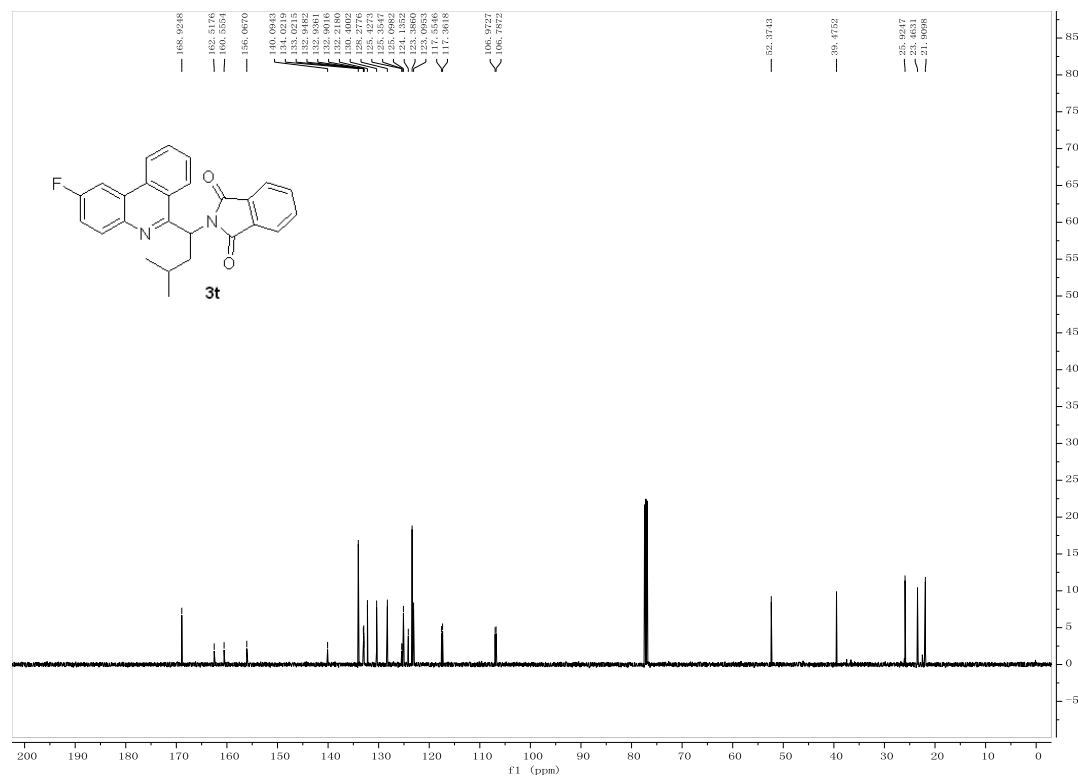
¹³C NMR spectrum of **3s**



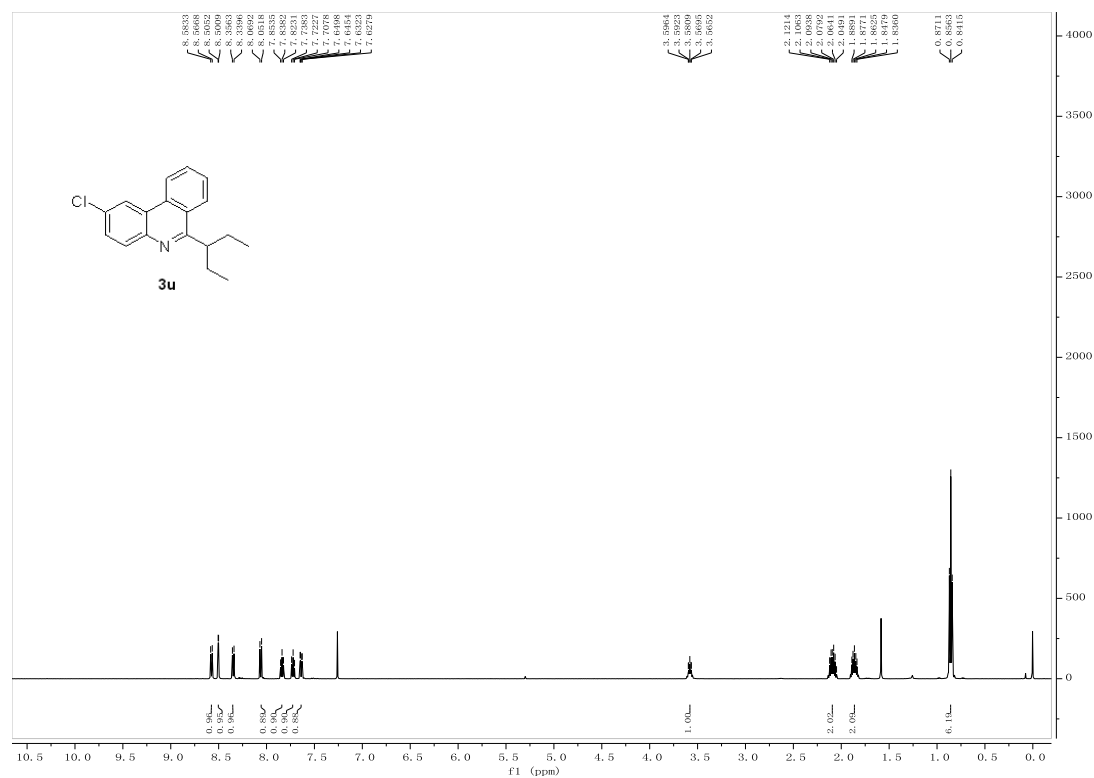
^1H NMR spectrum of **3t**



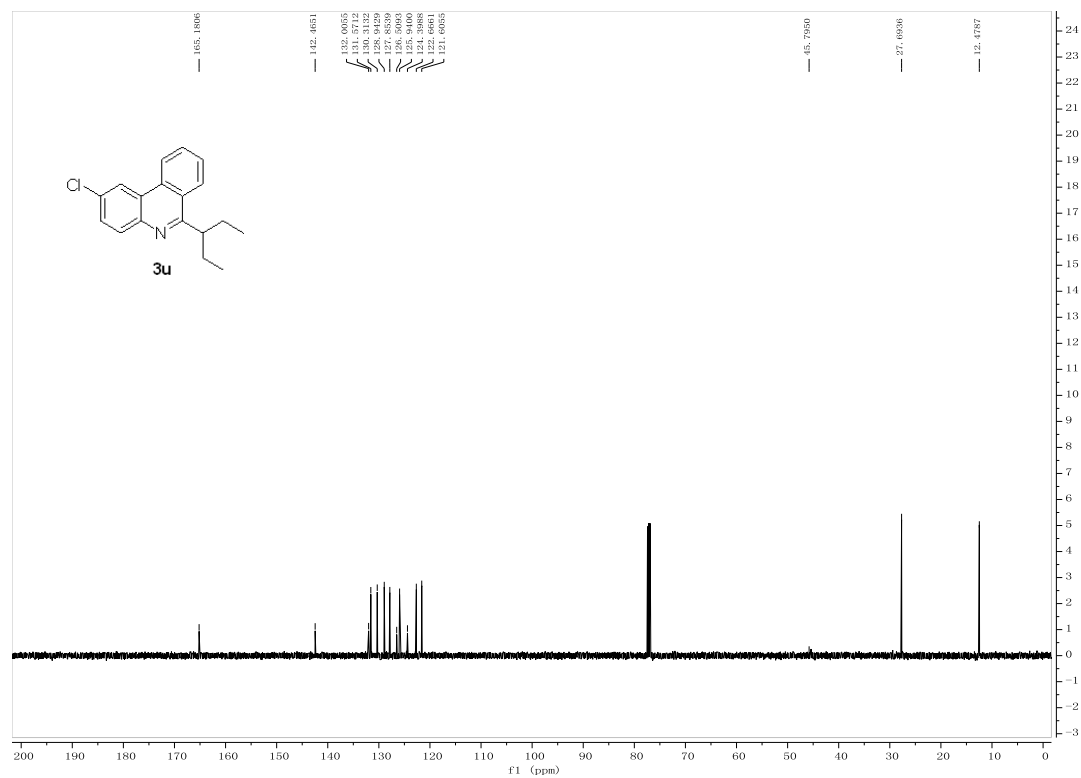
^{13}C NMR spectrum of **3t**



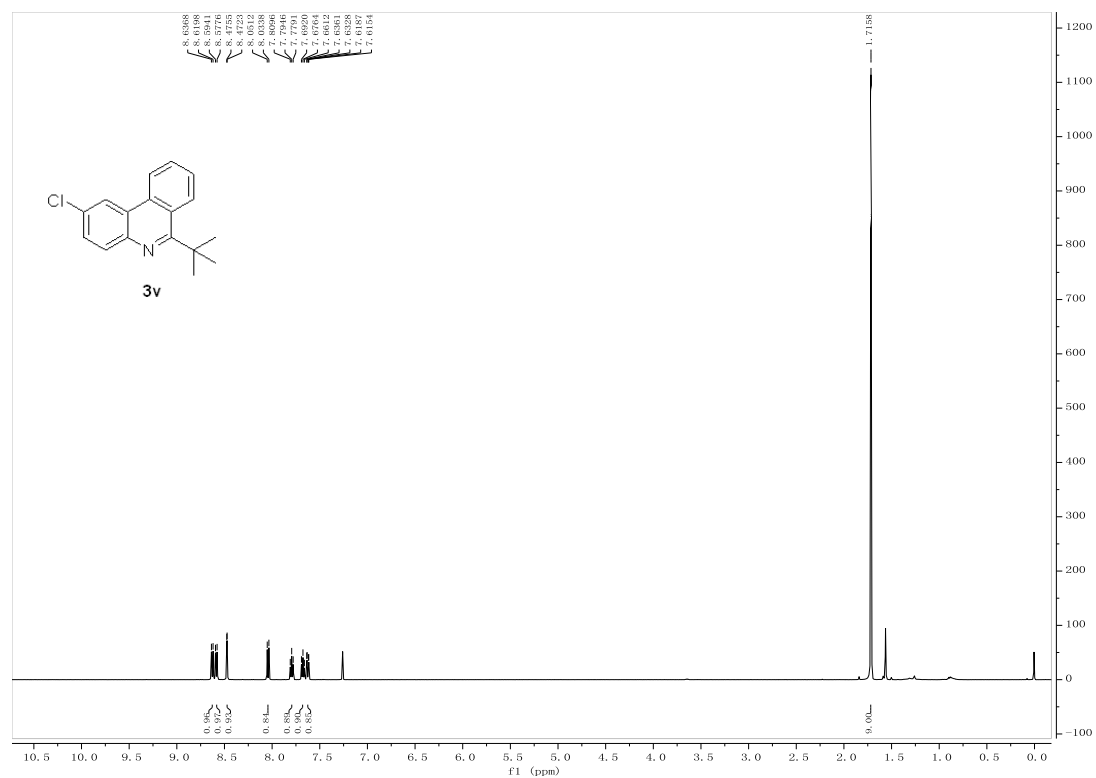
¹H NMR spectrum of **3u**



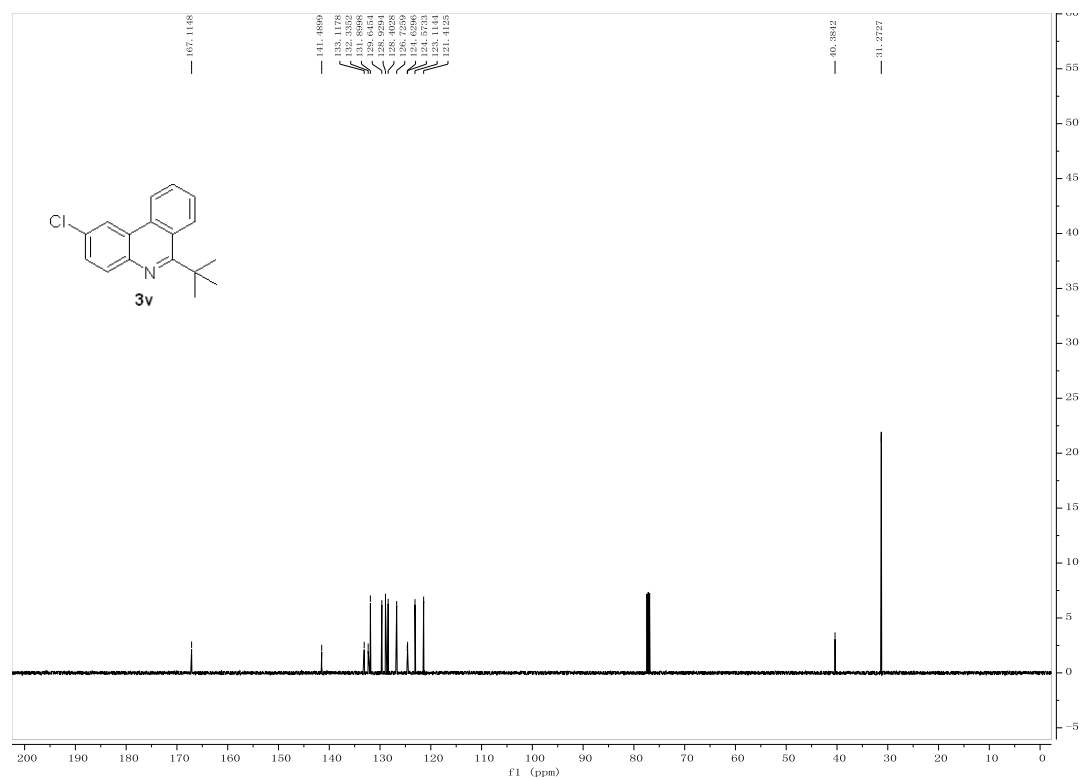
¹³C NMR spectrum of **3u**

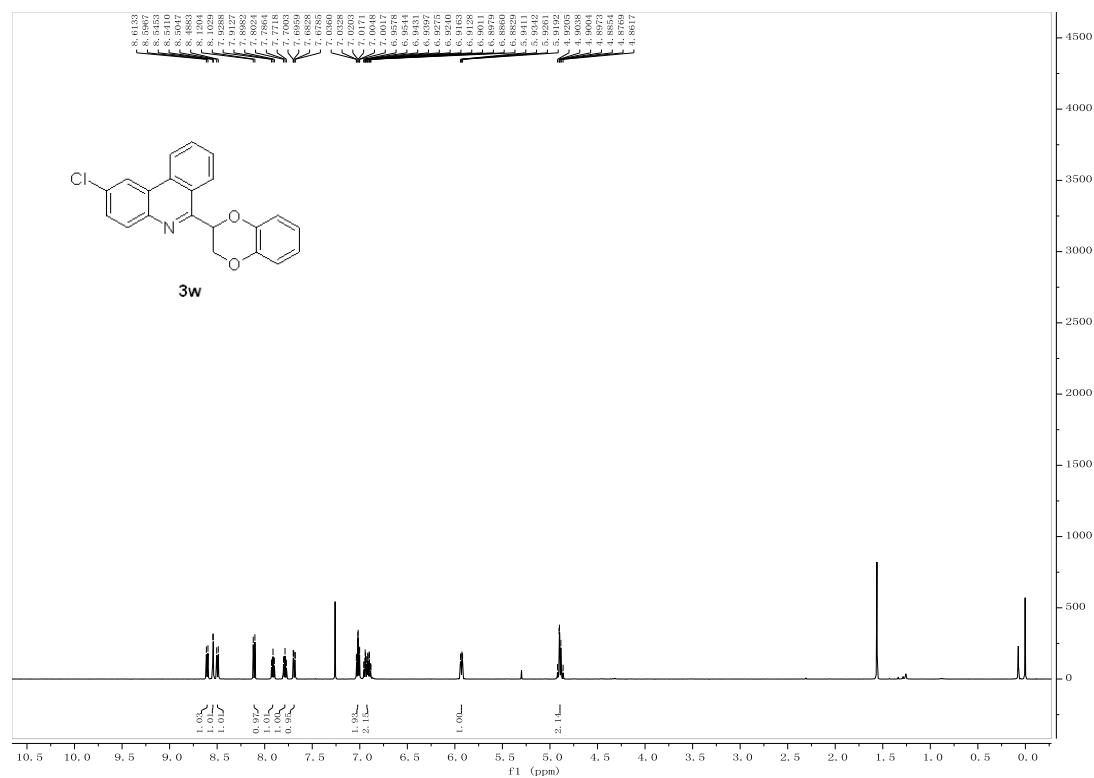
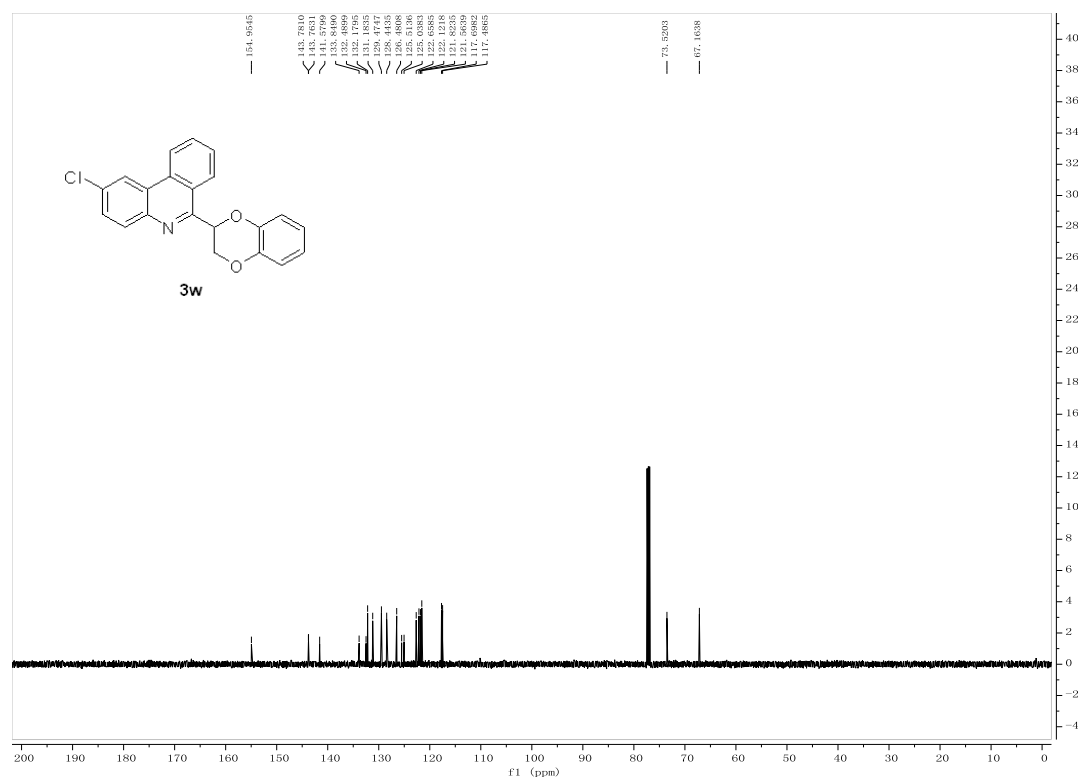


^1H NMR spectrum of **3v**

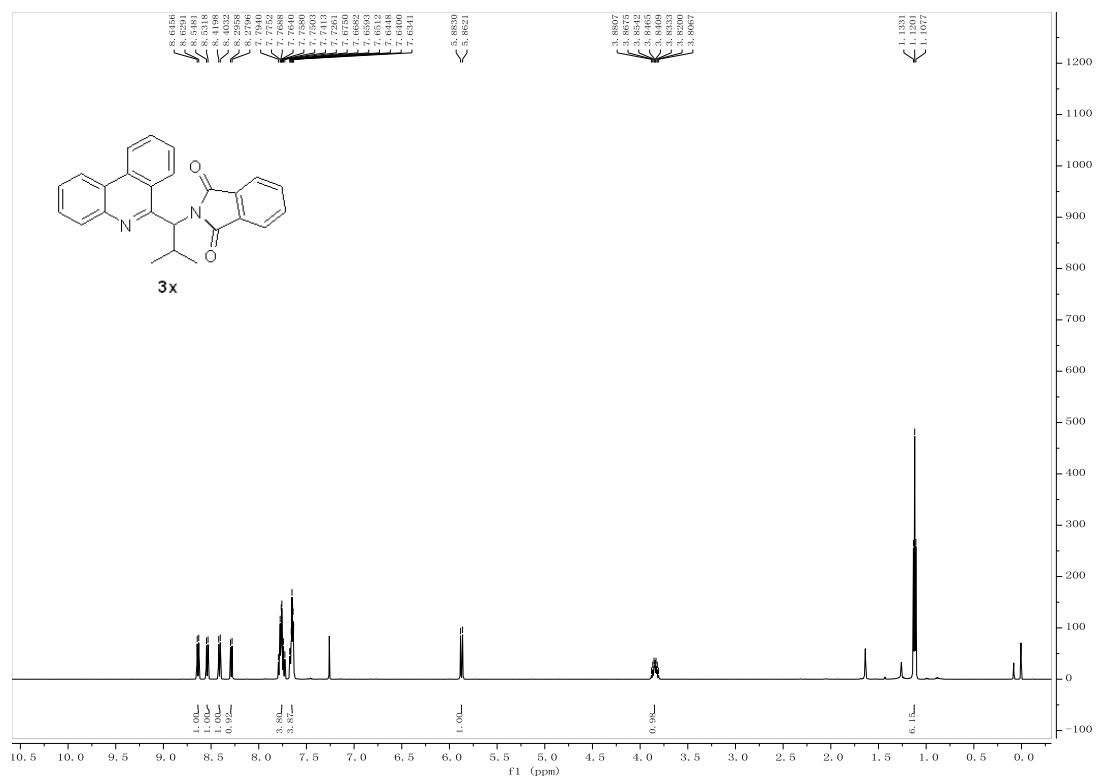


^{13}C NMR spectrum of **3v**

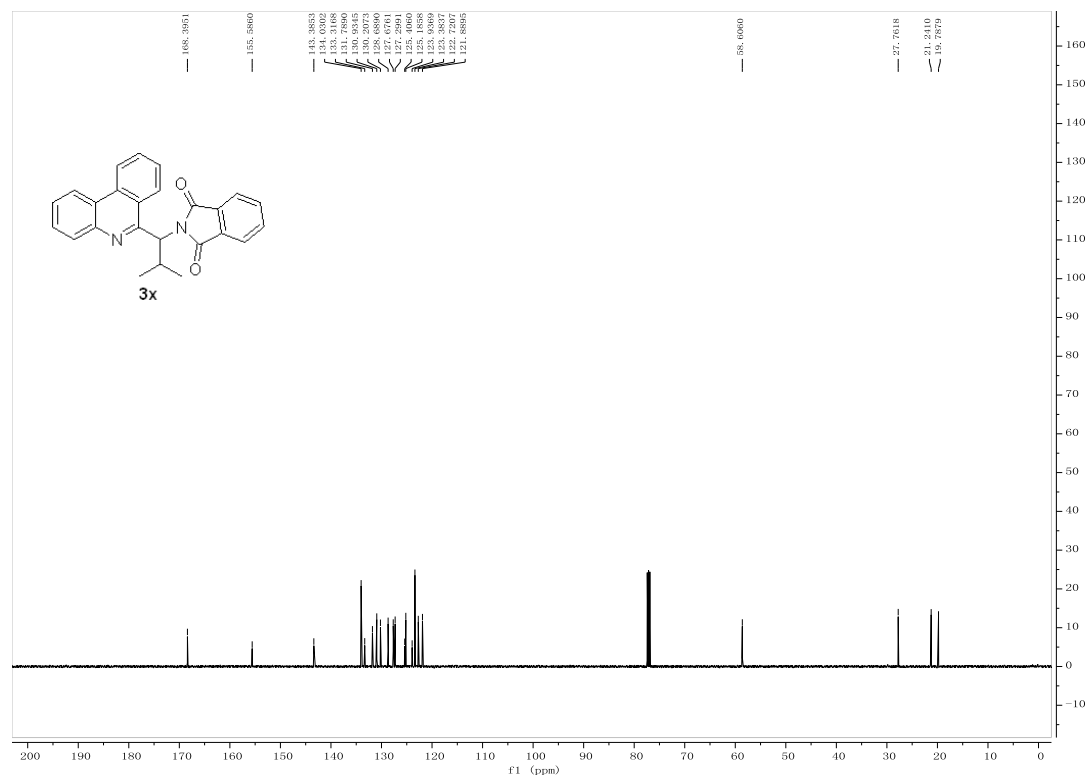


¹H NMR spectrum of **3w** ^{13}C NMR spectrum of **3w**

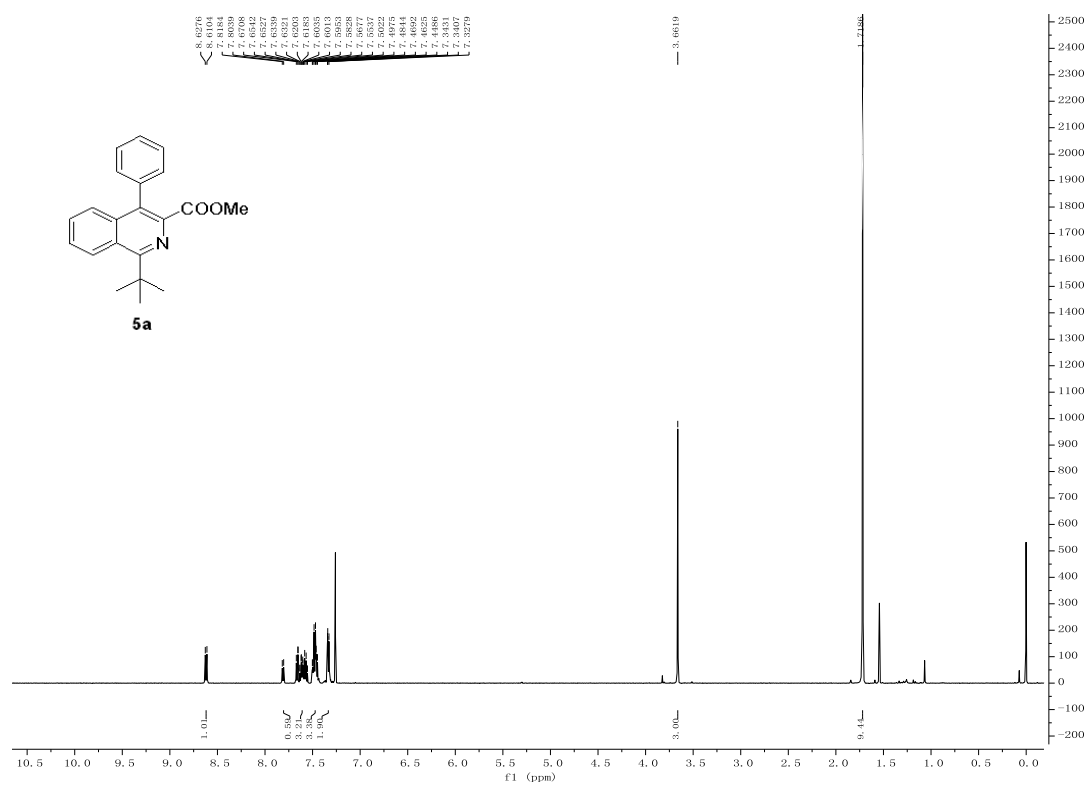
¹H NMR spectrum of **3x**



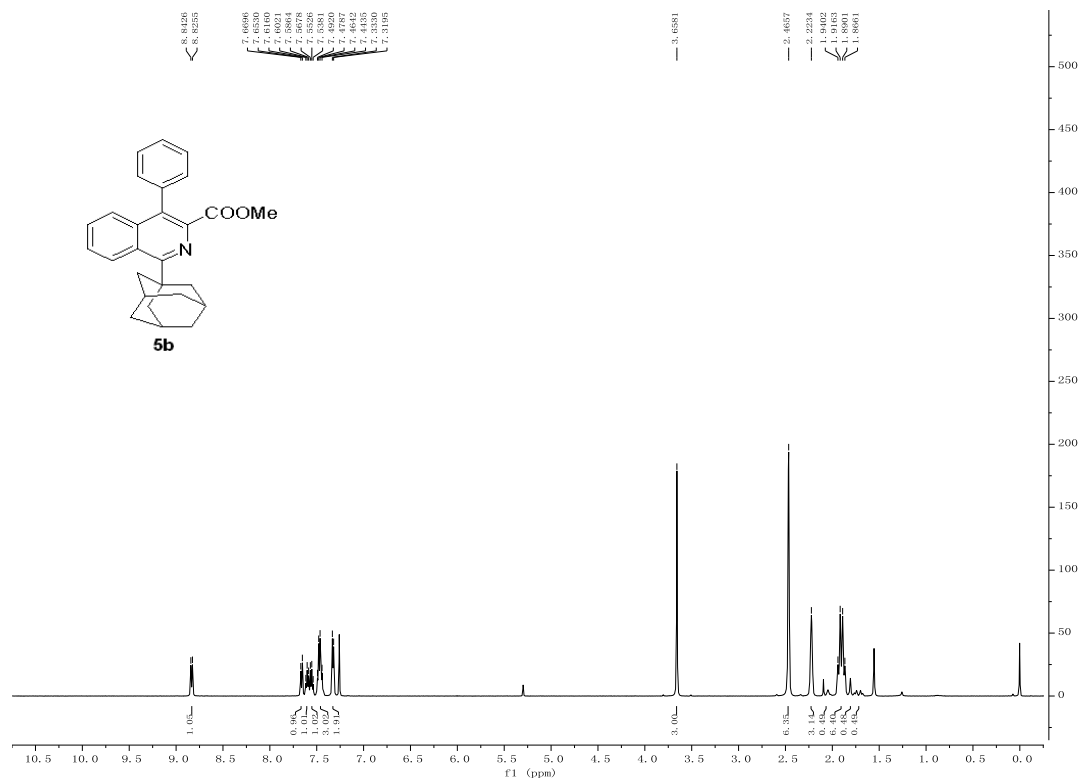
¹³C NMR spectrum of **3x**



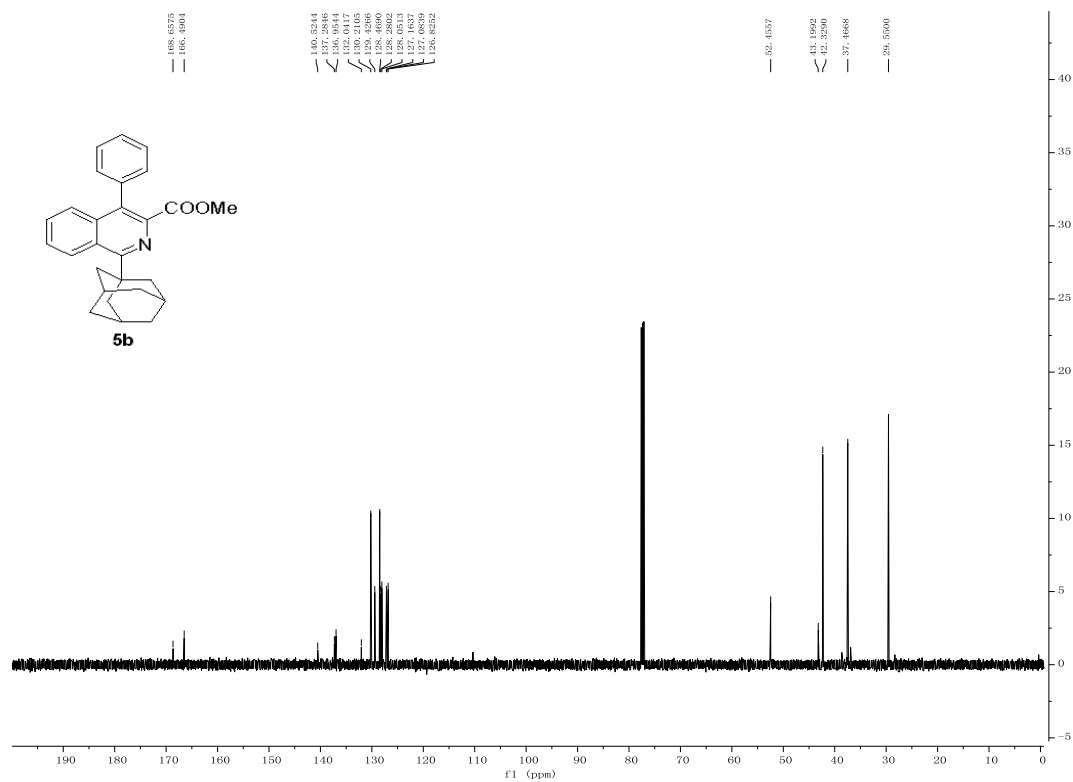
¹HNMR spectrum of 5a

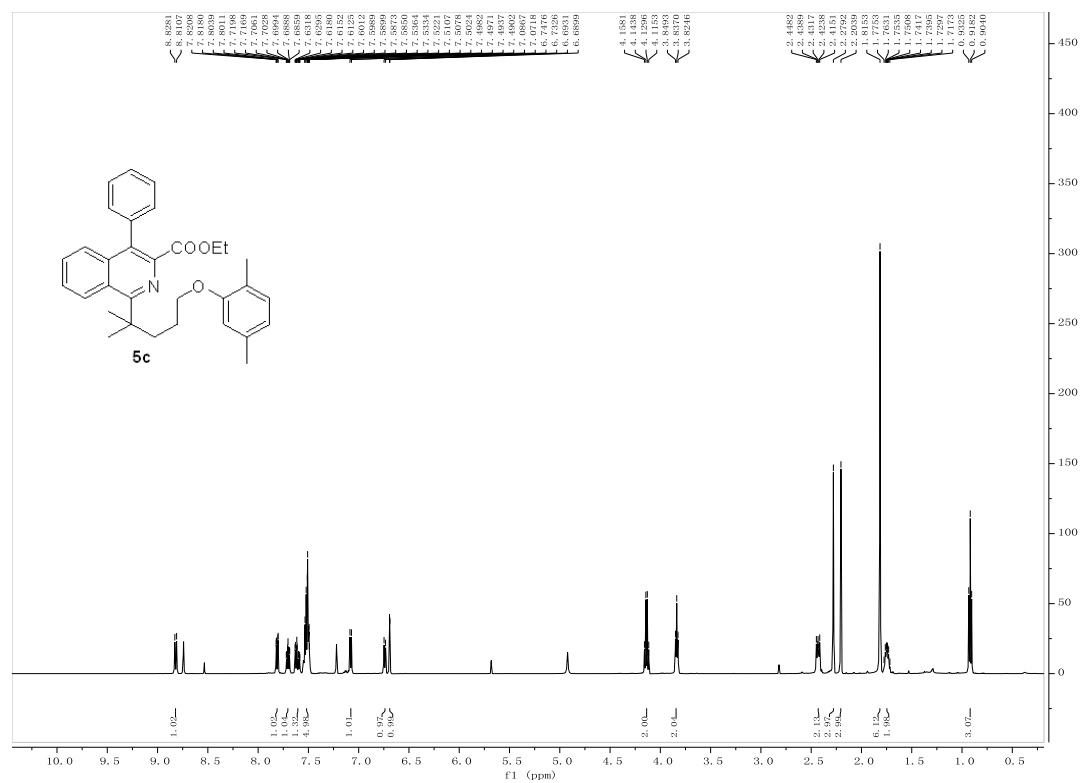
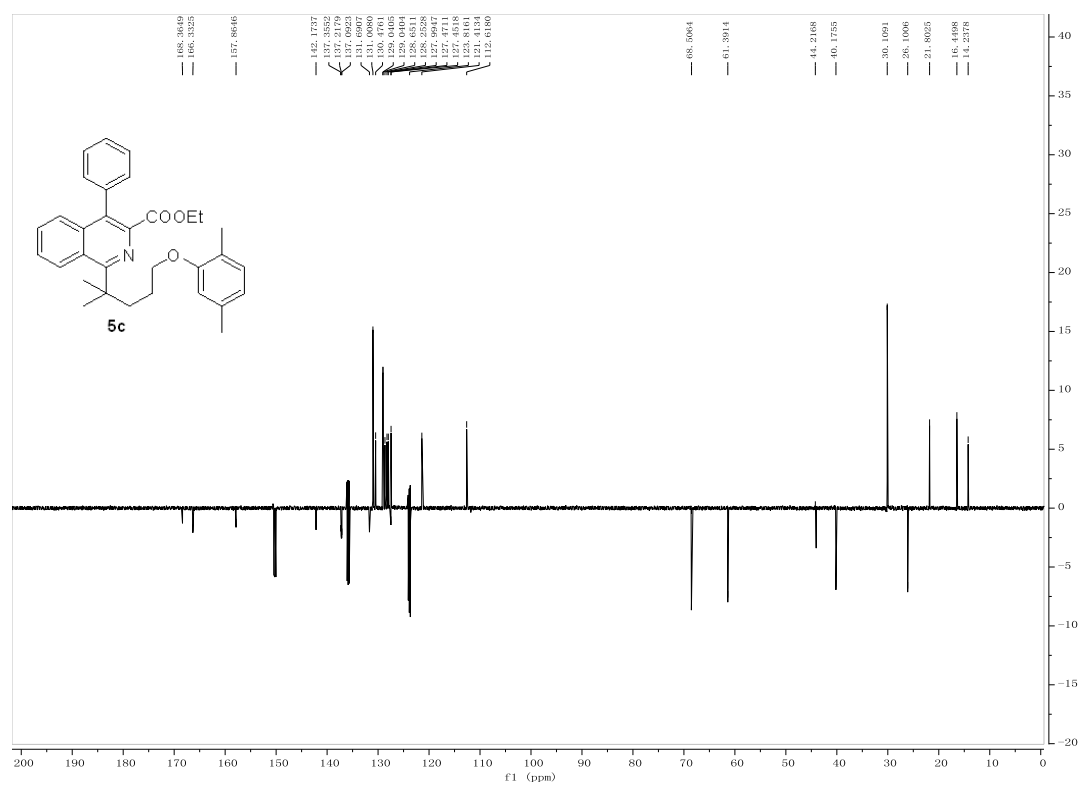


¹H NMR spectrum of 5b

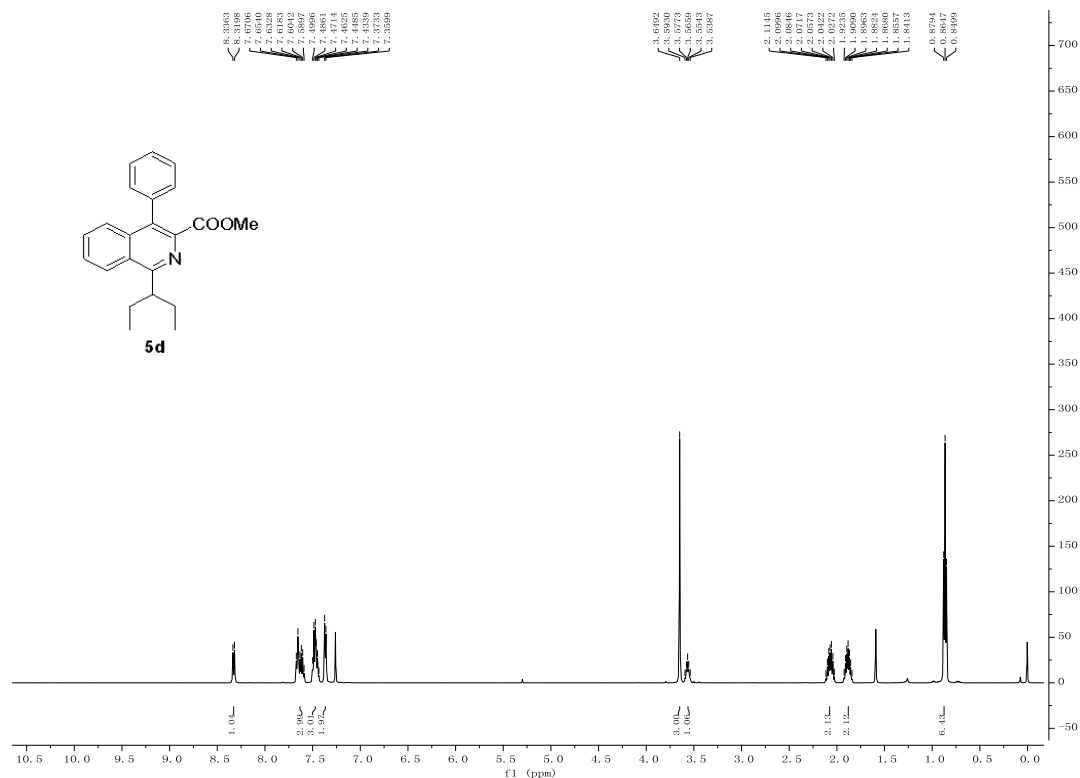


¹³C NMR spectrum of 5b

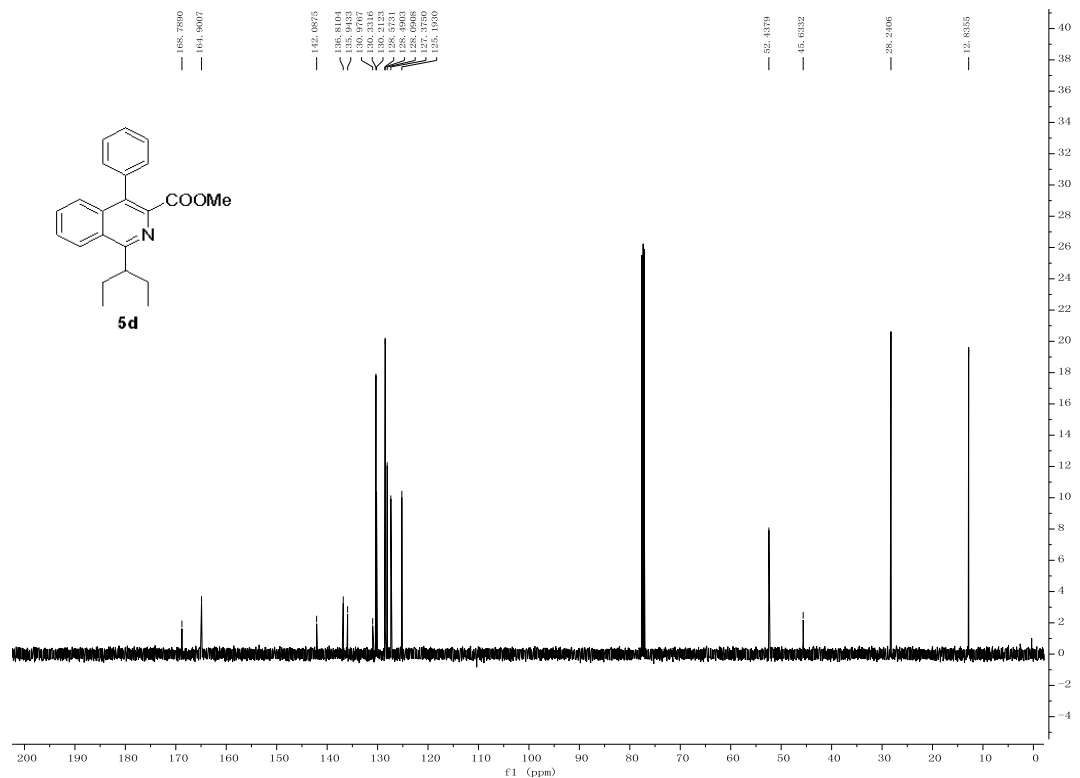


¹H NMR spectrum of **5c**DEPT-Q spectrum of **5c**

¹H NMR spectrum of **5d**



¹³C NMR spectrum of **5d**



Chemical structure of **5e** is shown above the spectrum.

¹H NMR spectrum (CDCl₃) of compound **5e**. The x-axis represents the chemical shift in ppm (f1), ranging from 10.5 to 0.0. The y-axis represents the intensity, ranging from -100 to 1400. The spectrum shows several peaks corresponding to the structure of **5e**.

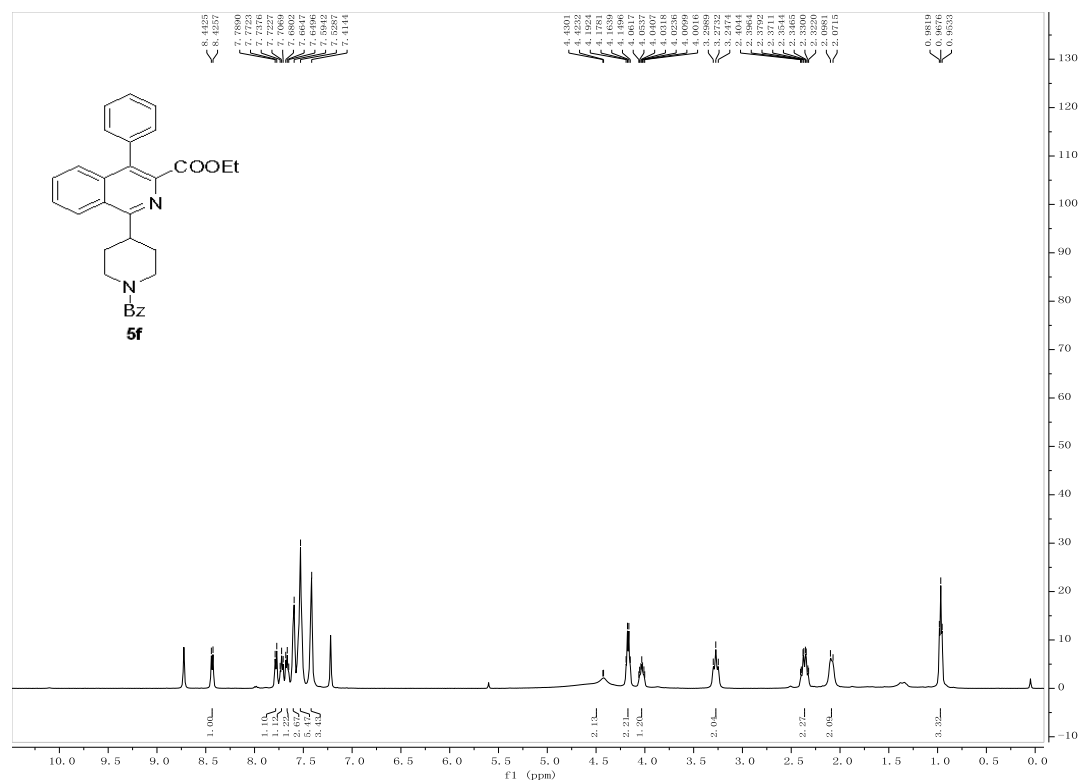
Peak list (ppm):

- 8.31309, 8.31139, 8.30969, 8.30799, 8.30629, 8.30459, 8.30289, 8.30119, 8.29949, 8.29779, 8.29609, 8.29439, 8.29269, 8.29099, 8.28929, 8.28759, 8.28589, 8.28419, 8.28249, 8.28079, 8.27909, 8.27739, 8.27569, 8.27399, 8.27229, 8.27059, 8.26889, 8.26719, 8.26549, 8.26379, 8.26209, 8.26039, 8.25869, 8.25699, 8.25529, 8.25359, 8.25189, 8.25019, 8.24849, 8.24679, 8.24509, 8.24339, 8.24169, 8.23999, 8.23829, 8.23659, 8.23489, 8.23319, 8.23149, 8.22979, 8.22809, 8.22639, 8.22469, 8.22299, 8.22129, 8.21959, 8.21789, 8.21619, 8.21449, 8.21279, 8.21109, 8.20939, 8.20769, 8.20599, 8.20429, 8.20259, 8.20089, 8.19919, 8.19749, 8.19579, 8.19409, 8.19239, 8.19069, 8.18899, 8.18729, 8.18559, 8.18389, 8.18219, 8.18049, 8.17879, 8.17709, 8.17539, 8.17369, 8.17199, 8.17029, 8.16859, 8.16689, 8.16519, 8.16349, 8.16179, 8.16009, 8.15839, 8.15669, 8.15499, 8.15329, 8.15159, 8.14989, 8.14819, 8.14649, 8.14479, 8.14309, 8.14139, 8.13969, 8.13799, 8.13629, 8.13459, 8.13289, 8.13119, 8.12949, 8.12779, 8.12609, 8.12439, 8.12269, 8.12099, 8.11929, 8.11759, 8.11589, 8.11419, 8.11249, 8.11079, 8.10909, 8.10739, 8.10569, 8.10399, 8.10229, 8.10059, 8.09889, 8.09719, 8.09549, 8.09379, 8.09209, 8.09039, 8.08869, 8.08699, 8.08529, 8.08359, 8.08189, 8.08019, 8.07849, 8.07679, 8.07509, 8.07339, 8.07169, 8.06999, 8.06829, 8.06659, 8.06489, 8.06319, 8.06149, 8.05979, 8.05809, 8.05639, 8.05469, 8.05299, 8.05129, 8.04959, 8.04789, 8.04619, 8.04449, 8.04279, 8.04109, 8.03939, 8.03769, 8.03599, 8.03429, 8.03259, 8.03089, 8.02919, 8.02749, 8.02579, 8.02409, 8.02239, 8.02069, 8.01899, 8.01729, 8.01559, 8.01389, 8.01219, 8.01049, 8.00879, 8.00709, 8.00539, 8.00369, 8.00199, 8.00029, 7.99859, 7.99689, 7.99519, 7.99349, 7.99179, 7.99009, 7.98839, 7.98669, 7.98499, 7.98329, 7.98159, 7.97989, 7.97819, 7.97649, 7.97479, 7.97309, 7.97139, 7.96969, 7.96799, 7.96629, 7.96459, 7.96289, 7.96119, 7.95949, 7.95779, 7.95609, 7.95439, 7.95269, 7.95099, 7.94929, 7.94759, 7.94589, 7.94419, 7.94249, 7.94079, 7.93909, 7.93739, 7.93569, 7.93399, 7.93229, 7.93059, 7.92889, 7.92719, 7.92549, 7.92379, 7.92209, 7.92039, 7.91869, 7.91699, 7.91529, 7.91359, 7.91189, 7.91019, 7.90849, 7.90679, 7.90509, 7.90339, 7.90169, 7.90009, 7.89839, 7.89669, 7.89499, 7.89329, 7.89159, 7.88989, 7.88819, 7.88649, 7.88479, 7.88309, 7.88139, 7.87969, 7.87799, 7.87629, 7.87459, 7.87289, 7.87119, 7.86949, 7.86779, 7.86609, 7.86439, 7.86269, 7.86099, 7.85929, 7.85759, 7.85589, 7.85419, 7.85249, 7.85079, 7.84909, 7.84739, 7.84569, 7.84399, 7.84229, 7.84059, 7.83889, 7.83719, 7.83549, 7.83379, 7.83209, 7.83039, 7.82869, 7.82699, 7.82529, 7.82359, 7.82189, 7.82019, 7.81849, 7.81679, 7.81509, 7.81339, 7.81169, 7.80999, 7.80829, 7.80659, 7.80489, 7.80319, 7.80149, 7.79979, 7.79809, 7.79639, 7.79469, 7.79299, 7.79129, 7.78959, 7.78789, 7.78619, 7.78449, 7.78279, 7.78109, 7.77939, 7.77769, 7.77599, 7.77429, 7.77259, 7.77089, 7.76919, 7.76749, 7.76579, 7.76409, 7.76239, 7.76069, 7.75899, 7.75729, 7.75559, 7.75389, 7.75219, 7.75049, 7.74879, 7.74709, 7.74539, 7.74369, 7.74199, 7.74029, 7.73859, 7.73689, 7.73519, 7.73349, 7.73179, 7.73009, 7.72839, 7.72669, 7.72499, 7.72329, 7.72159, 7.71989, 7.71819, 7.71649, 7.71479, 7.71309, 7.71139, 7.70969, 7.70799, 7.70629, 7.70459, 7.70289, 7.70119, 7.69949, 7.69779, 7.69609, 7.69439, 7.69269, 7.69099, 7.68929, 7.68759, 7.68589, 7.68419, 7.68249, 7.68079, 7.67909, 7.67739, 7.67569, 7.67399, 7.67229, 7.67059, 7.66889, 7.66719, 7.66549, 7.66379, 7.66209, 7.66039, 7.65869, 7.65699, 7.65529, 7.65359, 7.65189, 7.65019, 7.64849, 7.64679, 7.64509, 7.64339, 7.64169, 7.63999, 7.63829, 7.63659, 7.63489, 7.63319, 7.63149, 7.62979, 7.62809, 7.62639, 7.62469, 7.62299, 7.62129, 7.61959, 7.61789, 7.61619, 7.61449, 7.61279, 7.61109, 7.60939, 7.60769, 7.60599, 7.60429, 7.60259, 7.60089, 7.59919,

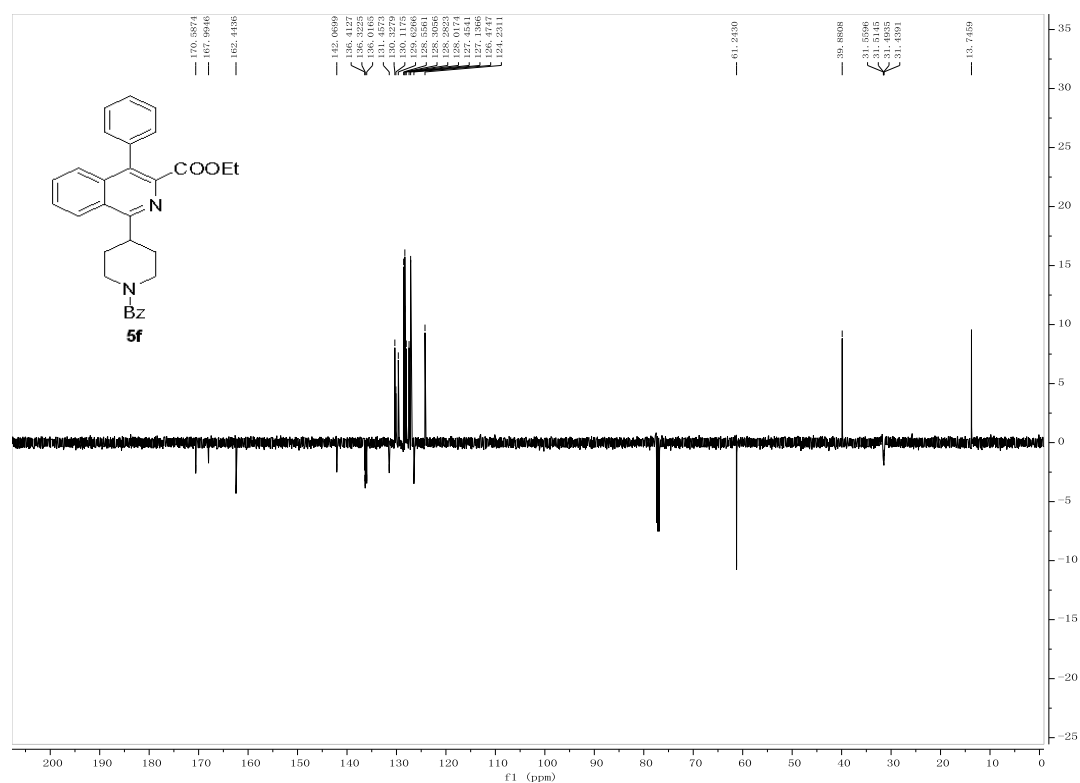
Chemical structure of **5e** is shown. The ¹³C NMR spectrum (ppm) is displayed below the structure, with peaks labeled with their corresponding chemical shifts:

- 168.4065
- 165.2226
- 144.4750
- 136.5357
- 135.9665
- 135.9242
- 130.9569
- 130.0326
- 129.9524
- 127.6679
- 127.8816
- 127.8816
- 126.7062
- 124.8503
- 52.2020
- 41.9489
- 32.4148
- 28.9431
- 26.2562

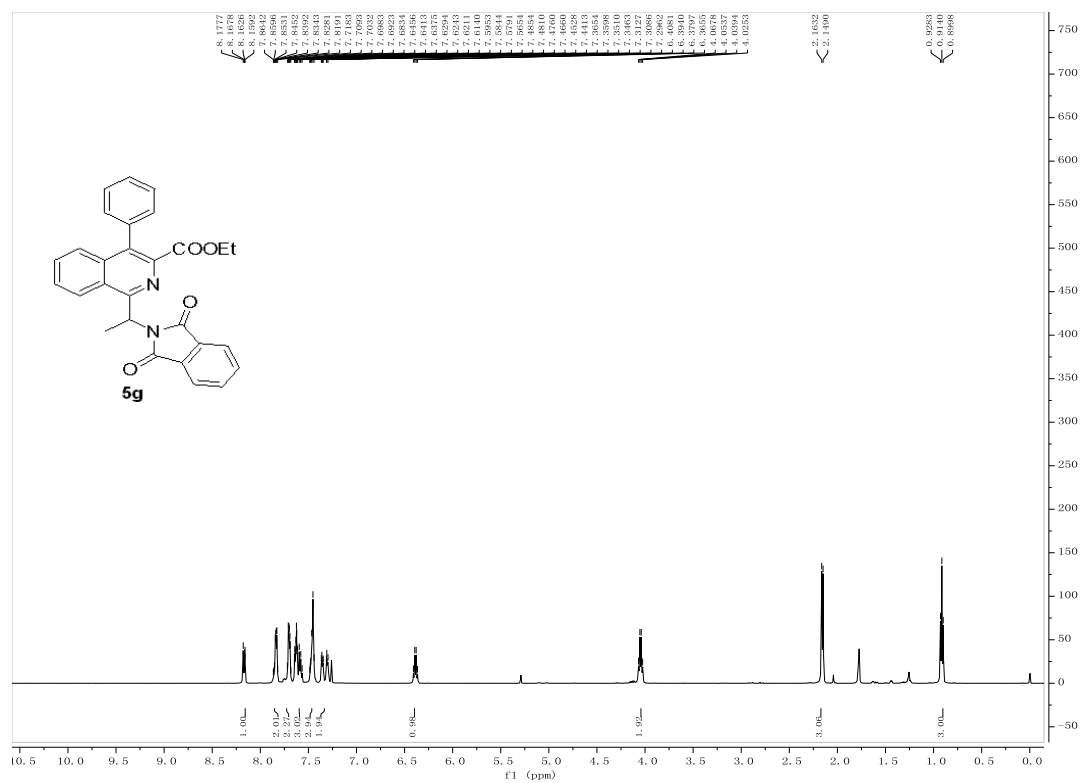
¹HNMR spectrum of **5f**



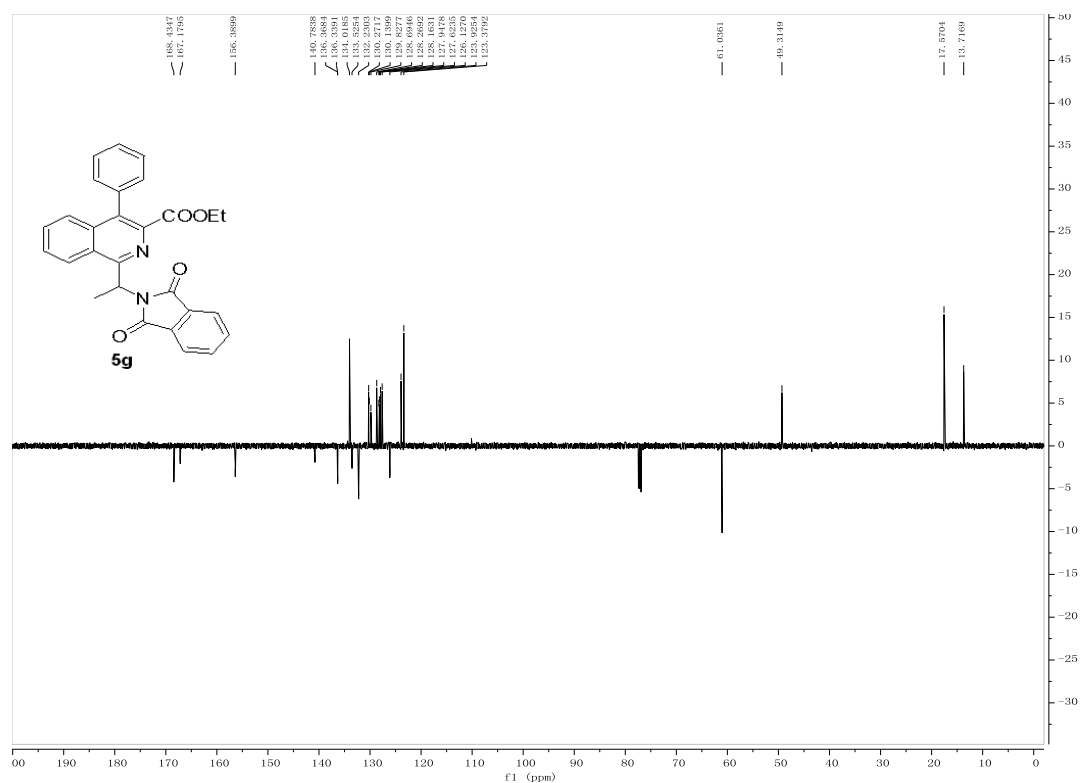
DEPT-Q spectrum of **5f**



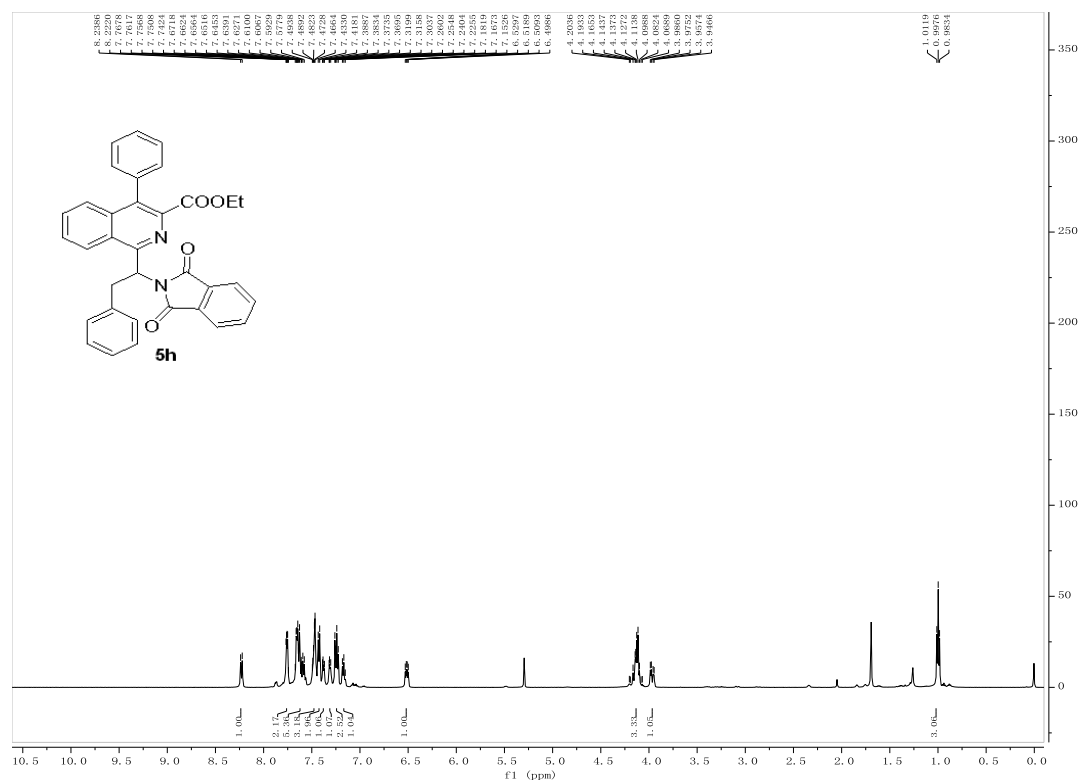
¹HNMR spectrum of **5g**



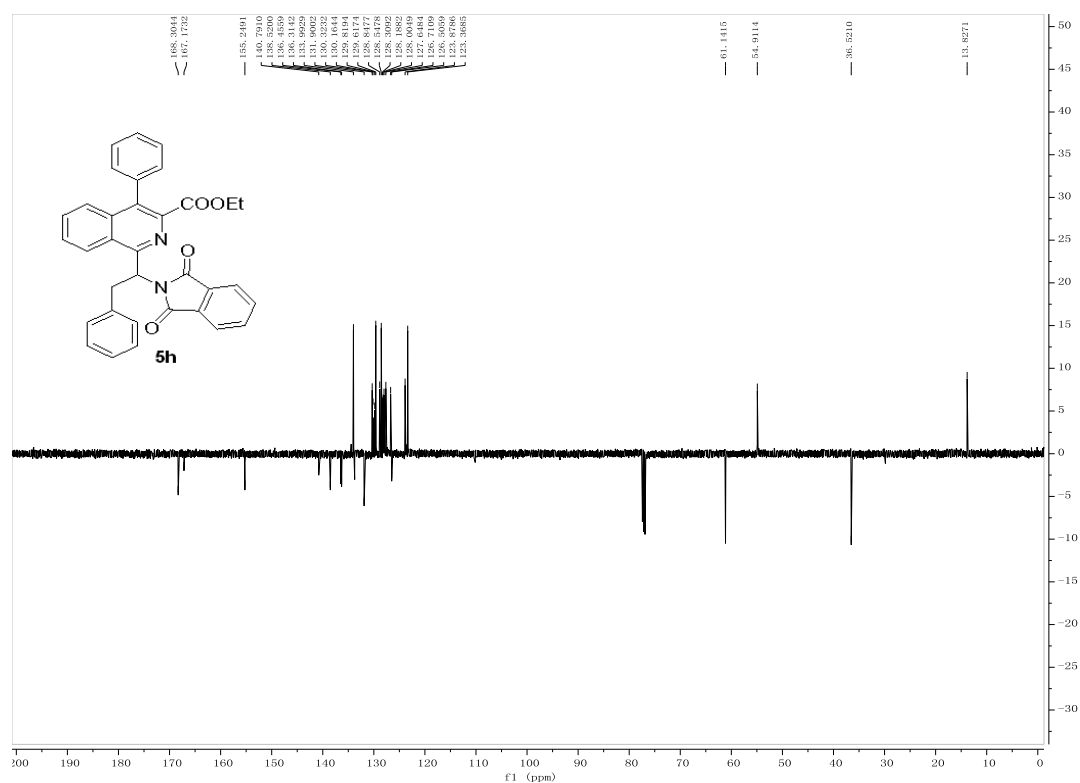
DEPT-Q spectrum of **5g**



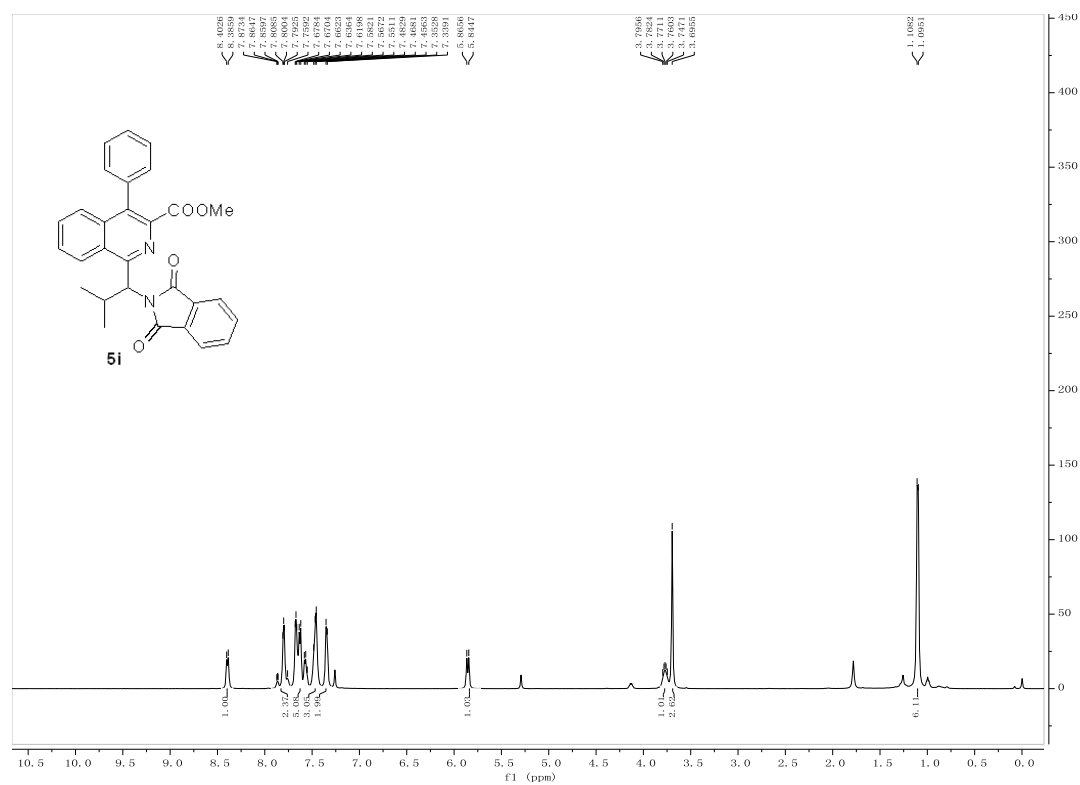
¹HNMR spectrum of **5h**



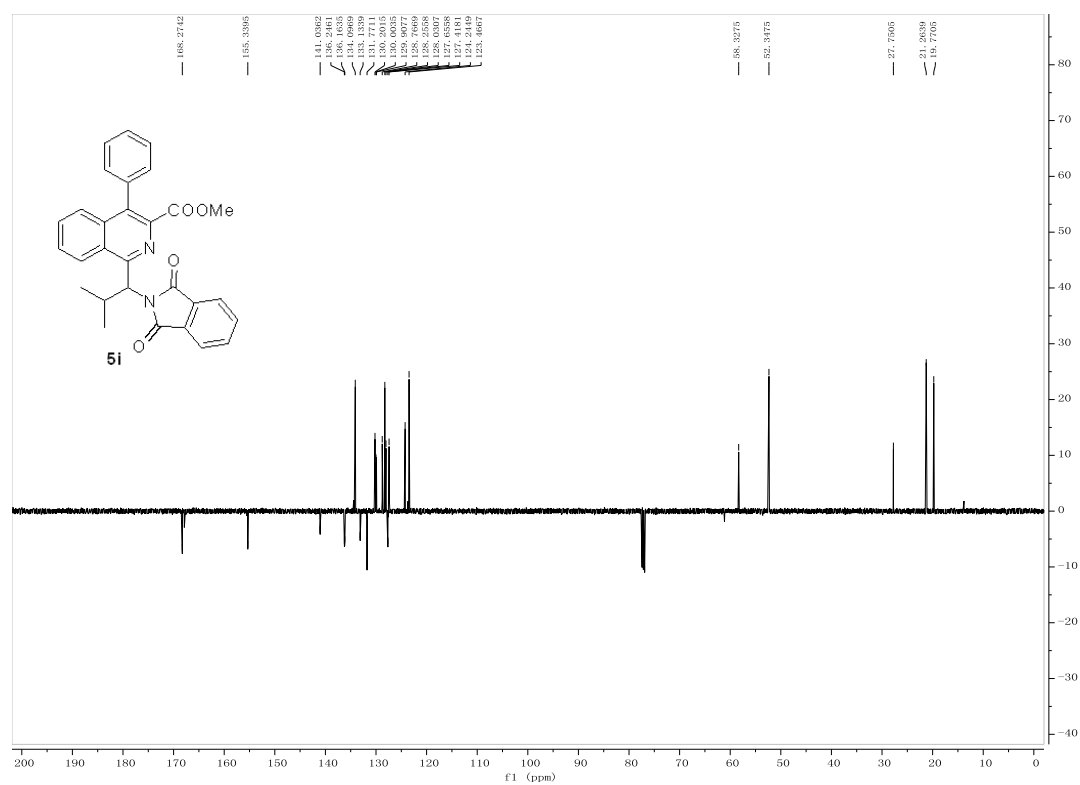
DEPT-Q spectrum of **5h**



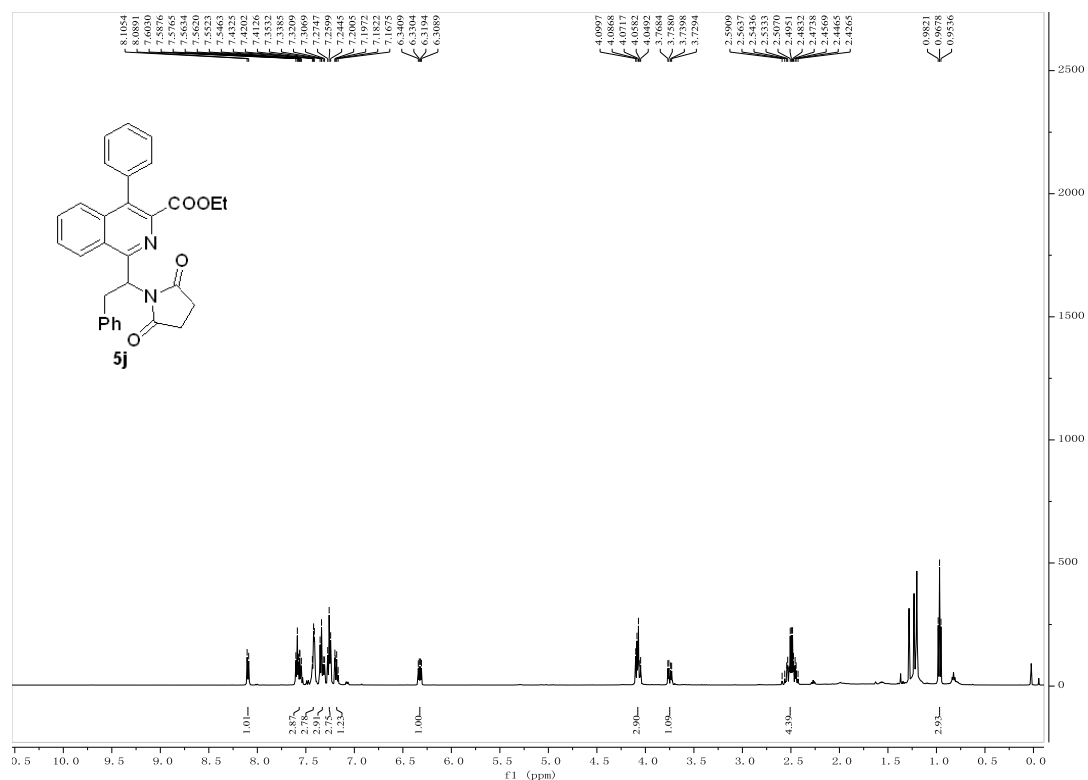
¹HNMR spectrum of **5i**



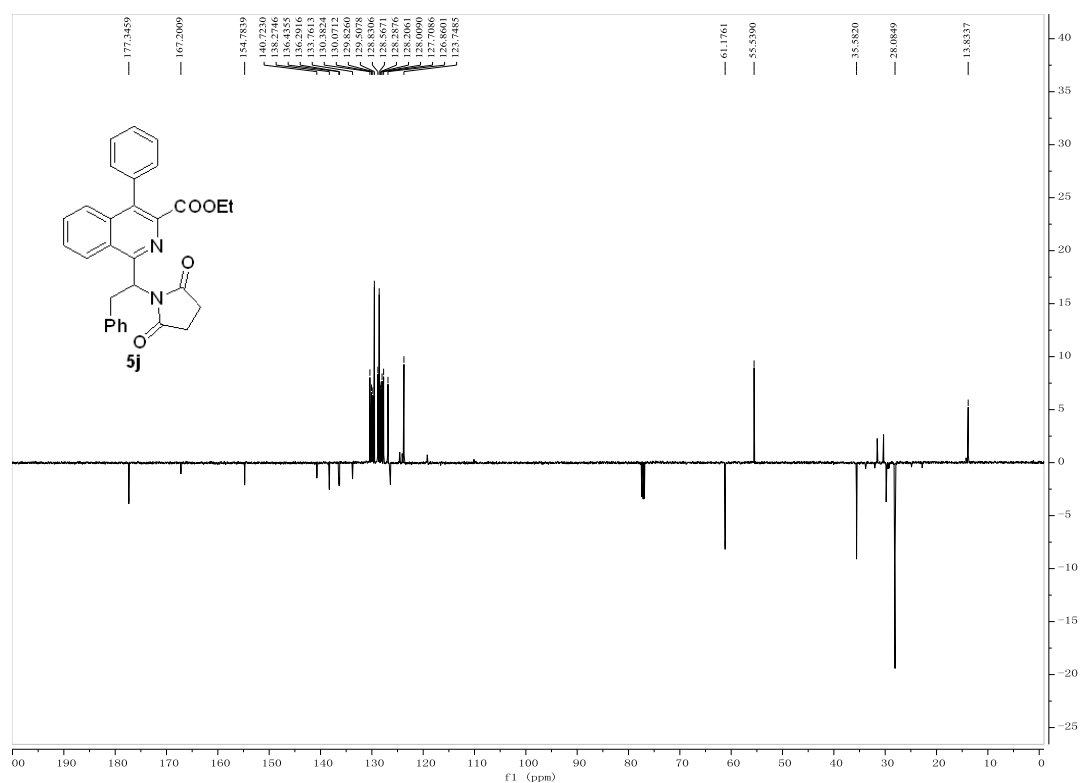
DEPT-Q spectrum of **5i**



¹HNMR spectrum of **5j**



DEPT-Q spectrum of **5j**



Chemical structure of **5k** is shown above the spectrum.

¹H NMR spectrum (CDCl₃) of **5k**. The x-axis represents the chemical shift in ppm (f1), ranging from 0.0 to 10.0. The y-axis represents the intensity, ranging from -500 to 8000. Integration values are shown below the baseline, and chemical shifts are listed above the peaks.

Chemical shifts (ppm) listed above the spectrum:

- 8.5413, 8.5245
- 7.46925, 7.4622, 7.4113, 7.403, 7.431, 7.386, 7.3213, 7.3079
- 5.7272, 5.7332, 5.7192
- 4.1785, 4.1633, 4.158, 4.141, 4.0608, 4.052, 4.038, 4.0239, 3.6657
- 2.8516, 2.8366, 2.8208, 2.7957, 2.781, 2.753, 2.729, 2.720, 2.705, 2.6879, 2.5831, 2.5695, 2.5539, 2.5299, 2.1977, 2.1814, 2.164, 2.1226, 2.103, 2.0693

Integration values shown below the baseline:

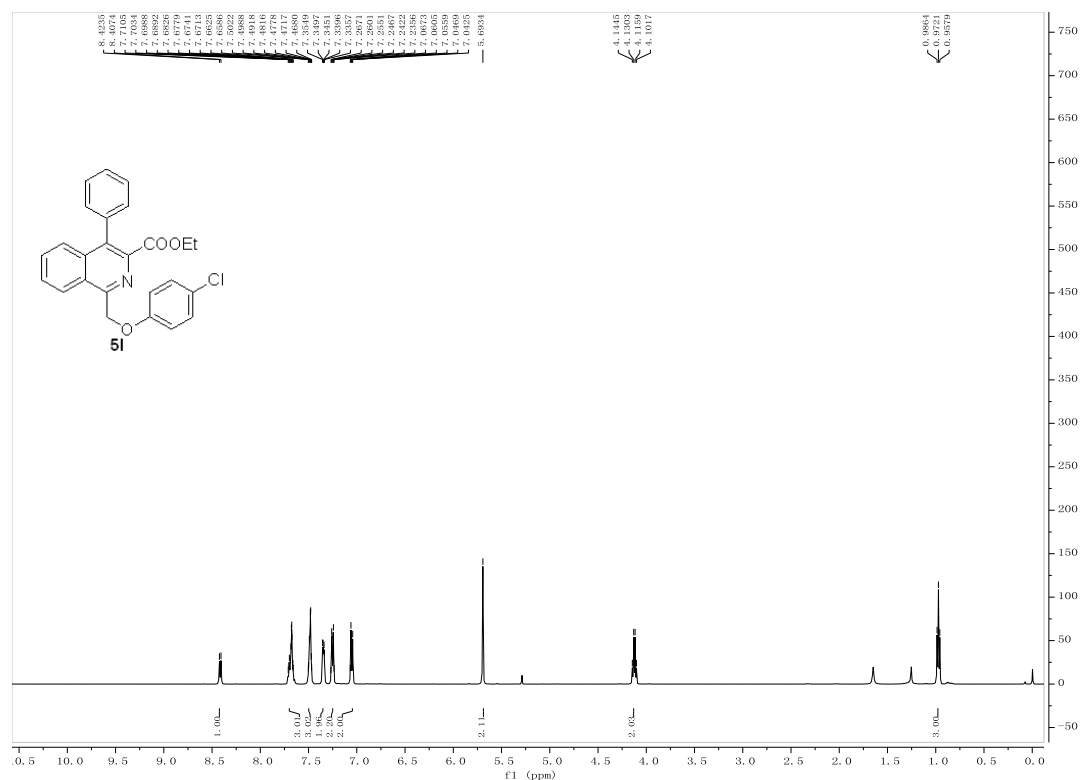
- 1.01
- 0.96, 1.97, 2.96, 1.91
- 0.96
- 1.06, 1.04
- 3.06
- 1.06
- 1.02, 1.01, 1.02
- 1.06
- 1.02

5k

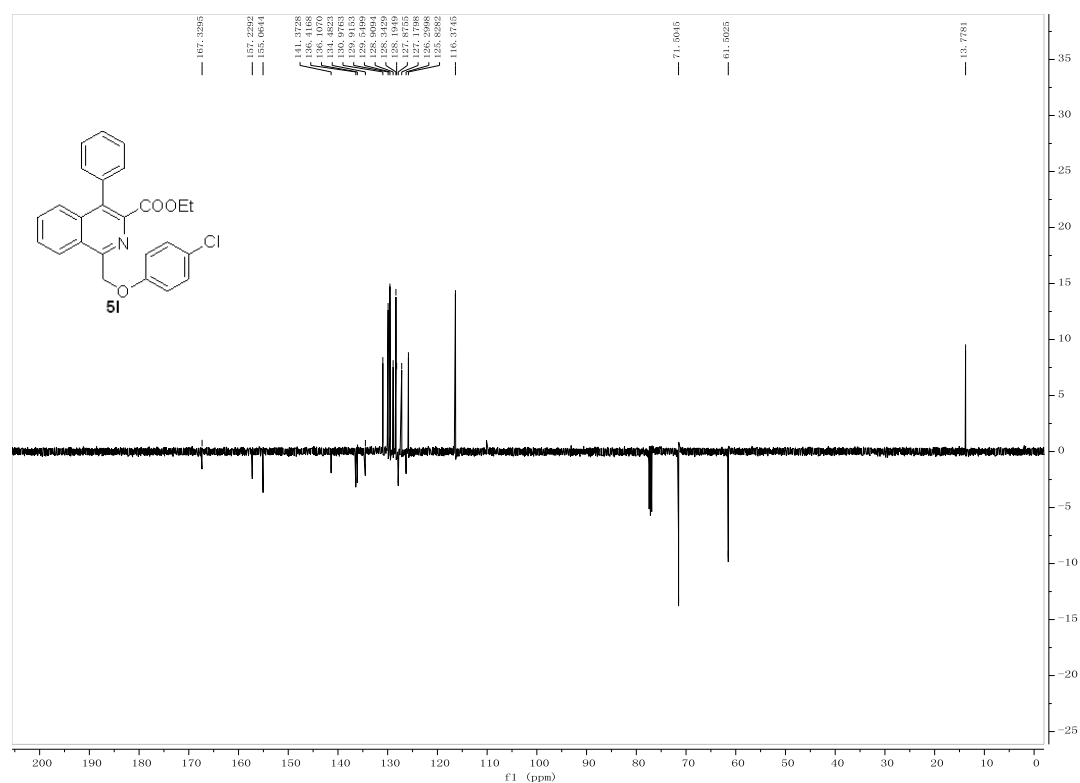
¹H NMR (CDCl₃) peaks (ppm): 7.48, 7.46, 7.44, 7.42, 7.40, 7.38, 7.36, 7.34, 7.32, 7.30, 7.28, 7.26, 7.24, 7.22, 7.20, 7.18, 7.16, 7.14, 7.12, 7.10, 7.08, 7.06, 7.04, 7.02, 7.00, 6.98, 6.96, 6.94, 6.92, 6.90, 6.88, 6.86, 6.84, 6.82, 6.80, 6.78, 6.76, 6.74, 6.72, 6.70, 6.68, 6.66, 6.64, 6.62, 6.60, 6.58, 6.56, 6.54, 6.52, 6.50, 6.48, 6.46, 6.44, 6.42, 6.40, 6.38, 6.36, 6.34, 6.32, 6.30, 6.28, 6.26, 6.24, 6.22, 6.20, 6.18, 6.16, 6.14, 6.12, 6.10, 6.08, 6.06, 6.04, 6.02, 6.00, 5.98, 5.96, 5.94, 5.92, 5.90, 5.88, 5.86, 5.84, 5.82, 5.80, 5.78, 5.76, 5.74, 5.72, 5.70, 5.68, 5.66, 5.64, 5.62, 5.60, 5.58, 5.56, 5.54, 5.52, 5.50, 5.48, 5.46, 5.44, 5.42, 5.40, 5.38, 5.36, 5.34, 5.32, 5.30, 5.28, 5.26, 5.24, 5.22, 5.20, 5.18, 5.16, 5.14, 5.12, 5.10, 5.08, 5.06, 5.04, 5.02, 5.00, 4.98, 4.96, 4.94, 4.92, 4.90, 4.88, 4.86, 4.84, 4.82, 4.80, 4.78, 4.76, 4.74, 4.72, 4.70, 4.68, 4.66, 4.64, 4.62, 4.60, 4.58, 4.56, 4.54, 4.52, 4.50, 4.48, 4.46, 4.44, 4.42, 4.40, 4.38, 4.36, 4.34, 4.32, 4.30, 4.28, 4.26, 4.24, 4.22, 4.20, 4.18, 4.16, 4.14, 4.12, 4.10, 4.08, 4.06, 4.04, 4.02, 4.00, 3.98, 3.96, 3.94, 3.92, 3.90, 3.88, 3.86, 3.84, 3.82, 3.80, 3.78, 3.76, 3.74, 3.72, 3.70, 3.68, 3.66, 3.64, 3.62, 3.60, 3.58, 3.56, 3.54, 3.52, 3.50, 3.48, 3.46, 3.44, 3.42, 3.40, 3.38, 3.36, 3.34, 3.32, 3.30, 3.28, 3.26, 3.24, 3.22, 3.20, 3.18, 3.16, 3.14, 3.12, 3.10, 3.08, 3.06, 3.04, 3.02, 3.00, 2.98, 2.96, 2.94, 2.92, 2.90, 2.88, 2.86, 2.84, 2.82, 2.80, 2.78, 2.76, 2.74, 2.72, 2.70, 2.68, 2.66, 2.64, 2.62, 2.60, 2.58, 2.56, 2.54, 2.52, 2.50, 2.48, 2.46, 2.44, 2.42, 2.40, 2.38, 2.36, 2.34, 2.32, 2.30, 2.28, 2.26, 2.24, 2.22, 2.20, 2.18, 2.16, 2.14, 2.12, 2.10, 2.08, 2.06, 2.04, 2.02, 2.00, 1.98, 1.96, 1.94, 1.92, 1.90, 1.88, 1.86, 1.84, 1.82, 1.80, 1.78, 1.76, 1.74, 1.72, 1.70, 1.68, 1.66, 1.64, 1.62, 1.60, 1.58, 1.56, 1.54, 1.52, 1.50, 1.48, 1.46, 1.44, 1.42, 1.40, 1.38, 1.36, 1.34, 1.32, 1.30, 1.28, 1.26, 1.24, 1.22, 1.20, 1.18, 1.16, 1.14, 1.12, 1.10, 1.08, 1.06, 1.04, 1.02, 1.00, 0.98, 0.96, 0.94, 0.92, 0.90, 0.88, 0.86, 0.84, 0.82, 0.80, 0.78, 0.76, 0.74, 0.72, 0.70, 0.68, 0.66, 0.64, 0.62, 0.60, 0.58, 0.56, 0.54, 0.52, 0.50, 0.48, 0.46, 0.44, 0.42, 0.40, 0.38, 0.36, 0.34, 0.32, 0.30, 0.28, 0.26, 0.24, 0.22, 0.20, 0.18, 0.16, 0.14, 0.12, 0.10, 0.08, 0.06, 0.04, 0.02, 0.00.

¹³C NMR (CDCl₃) peaks (ppm): 167.9, 167.8, 167.7, 167.6, 167.5, 167.4, 167.3, 167.2, 167.1, 167.0, 166.9, 166.8, 166.7, 166.6, 166.5, 166.4, 166.3, 166.2, 166.1, 166.0, 165.9, 165.8, 165.7, 165.6, 165.5, 165.4, 165.3, 165.2, 165.1, 165.0, 164.9, 164.8, 164.7, 164.6, 164.5, 164.4, 164.3, 164.2, 164.1, 164.0, 163.9, 163.8, 163.7, 163.6, 163.5, 163.4, 163.3, 163.2, 163.1, 163.0, 162.9, 162.8, 162.7, 162.6, 162.5, 162.4, 162.3, 162.2, 162.1, 162.0, 161.9, 161.8, 161.7, 161.6, 161.5, 161.4, 161.3, 161.2, 161.1, 161.0, 160.9, 160.8, 160.7, 160.6, 160.5, 160.4, 160.3, 160.2, 160.1, 160.0, 159.9, 159.8, 159.7, 159.6, 159.5, 159.4, 159.3, 159.2, 159.1, 159.0, 158.9, 158.8, 158.7, 158.6, 158.5, 158.4, 158.3, 158.2, 158.1, 158.0, 157.9, 157.8, 157.7, 157.6, 157.5, 157.4, 157.3, 157.2, 157.1, 157.0, 156.9, 156.8, 156.7, 156.6, 156.5, 156.4, 156.3, 156.2, 156.1, 156.0, 155.9, 155.8, 155.7, 155.6, 155.5, 155.4, 155.3, 155.2, 155.1, 155.0, 154.9, 154.8, 154.7, 154.6, 154.5, 154.4, 154.3, 154.2, 154.1, 154.0, 153.9, 153.8, 153.7, 153.6, 153.5, 153.4, 153.3, 153.2, 153.1, 153.0, 152.9, 152.8, 152.7, 152.6, 152.5, 152.4, 152.3, 152.2, 152.1, 152.0, 151.9, 151.8, 151.7, 151.6, 151.5, 151.4, 151.3, 151.2, 151.1, 151.0, 150.9, 150.8, 150.7, 150.6, 150.5, 150.4, 150.3, 150.2, 150.1, 150.0, 149.9, 149.8, 149.7, 149.6, 149.5, 149.4, 149.3, 149.2, 149.1, 149.0, 148.9, 148.8, 148.7, 148.6, 148.5, 148.4, 148.3, 148.2, 148.1, 148.0, 147.9, 147.8, 147.7, 147.6, 147.5, 147.4, 147.3, 147.2, 147.1, 147.0, 146.9, 146.8, 146.7, 146.6, 146.5, 146.4, 146.3, 146.2, 146.1, 146.0, 145.9, 145.8, 145.7, 145.6, 145.5, 145.4, 145.3, 145.2, 145.

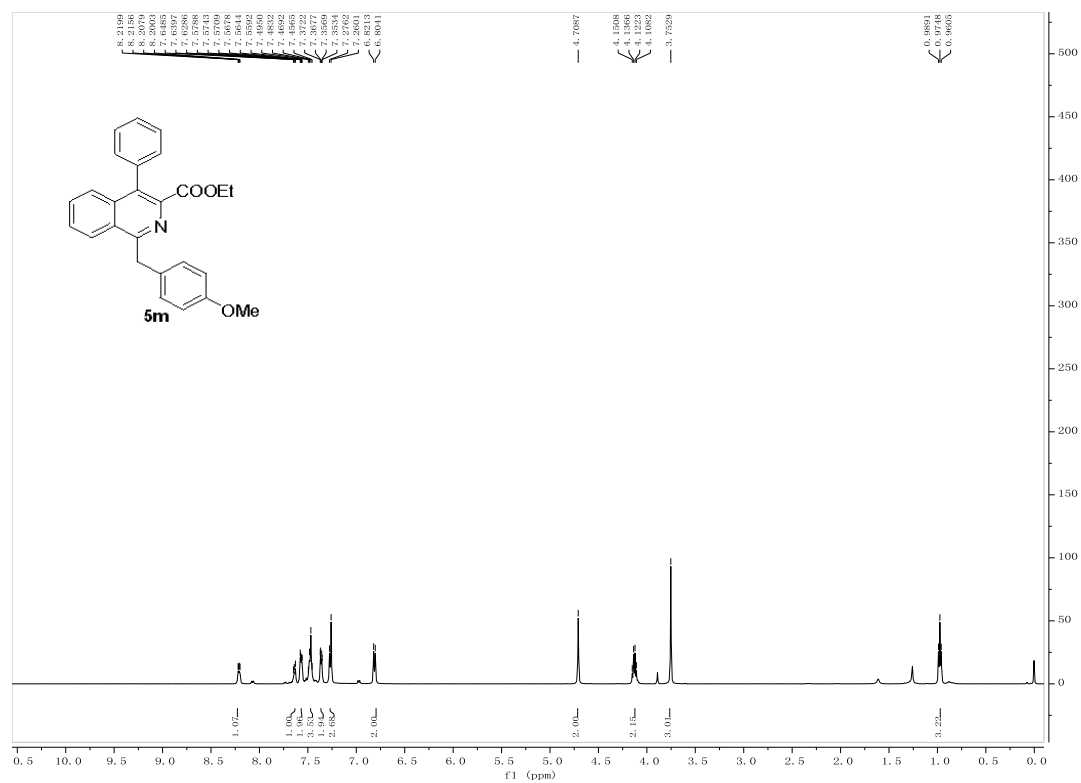
¹HNMR spectrum of **5I**



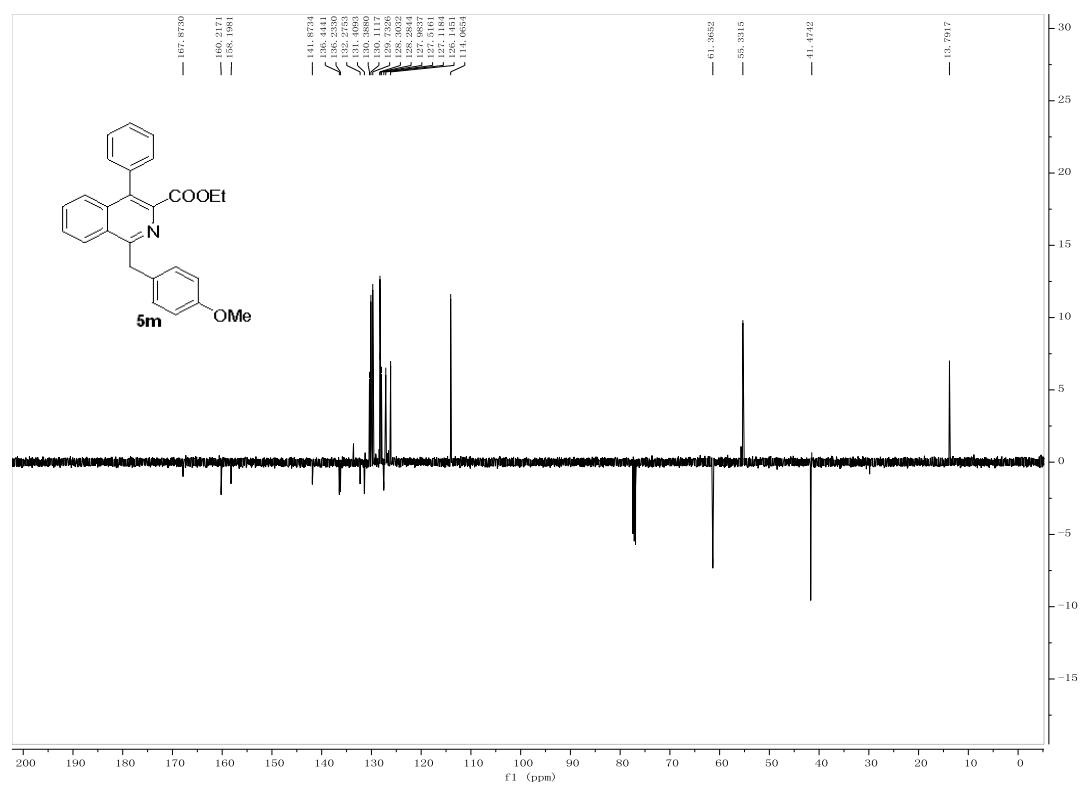
DEPT-Q spectrum of **5I**



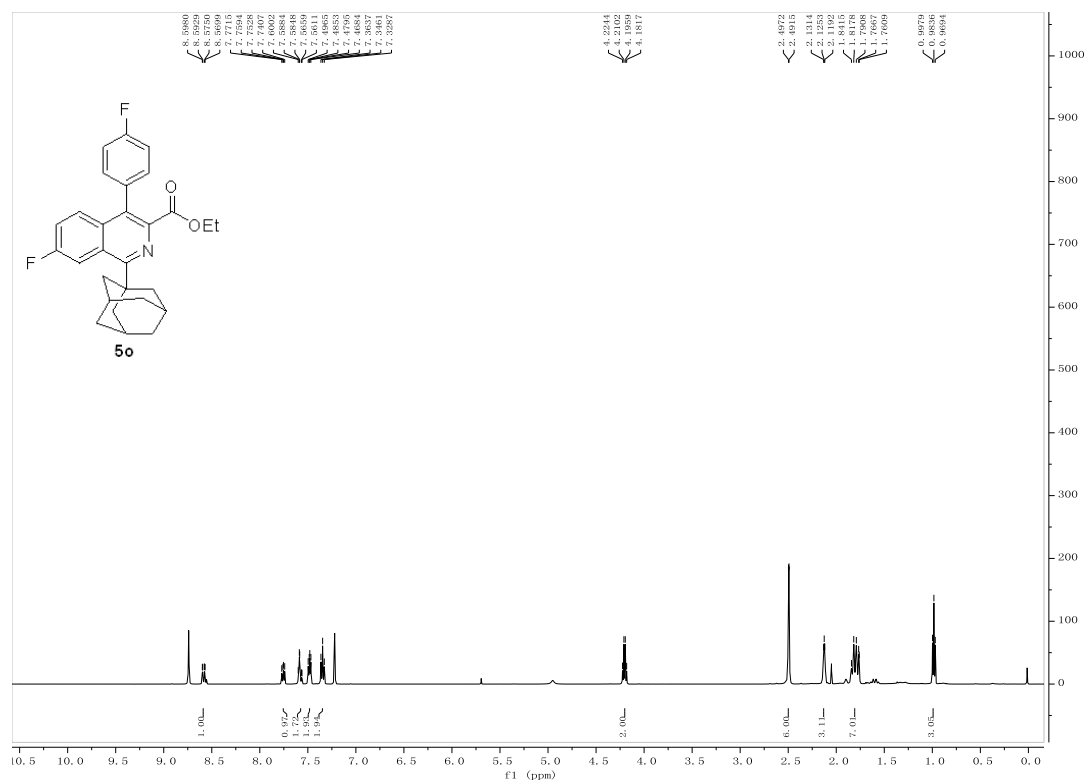
¹HNMR spectrum of **5m**

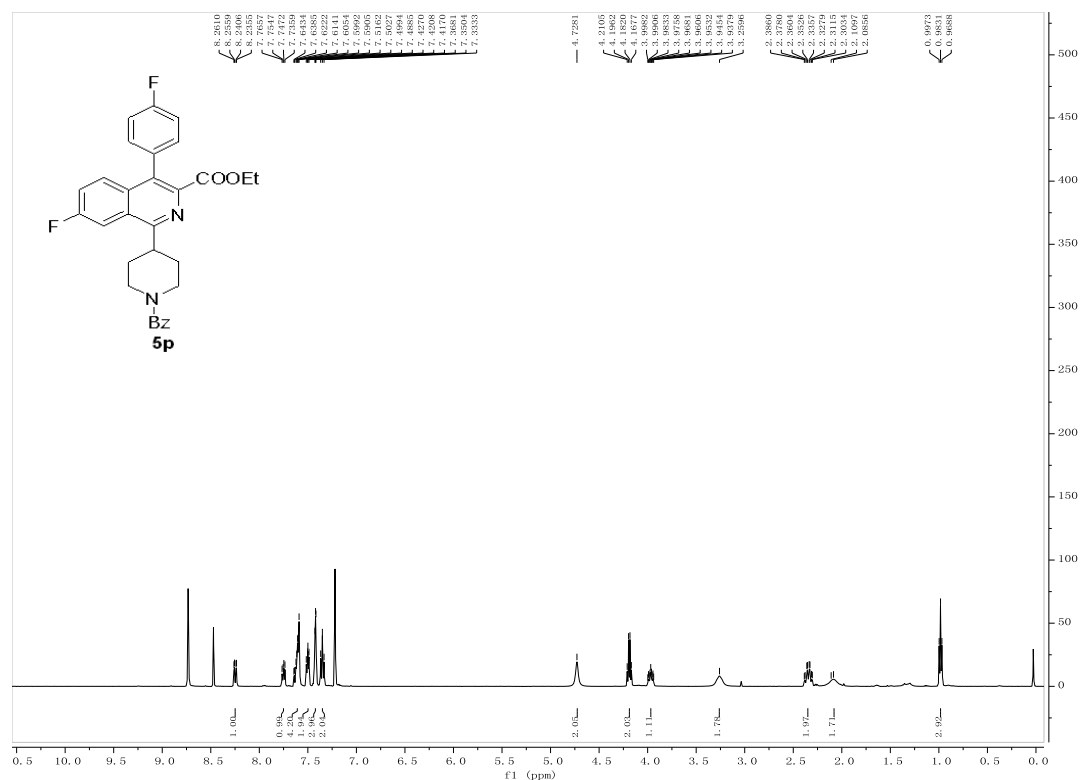
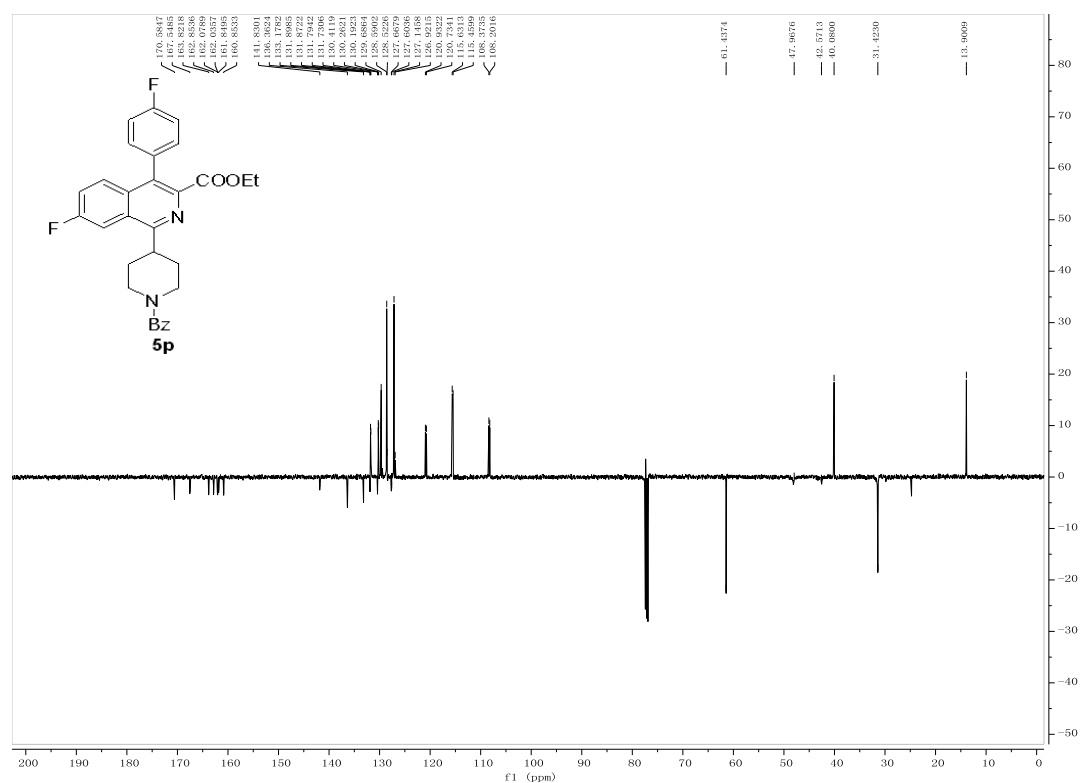


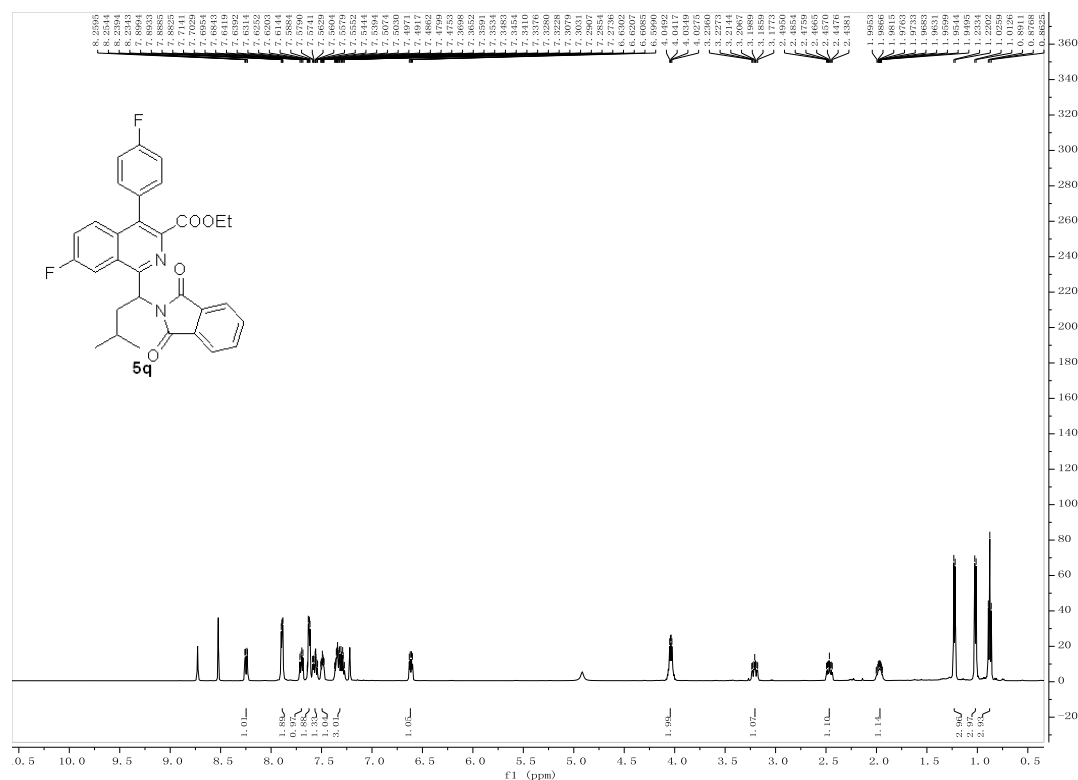
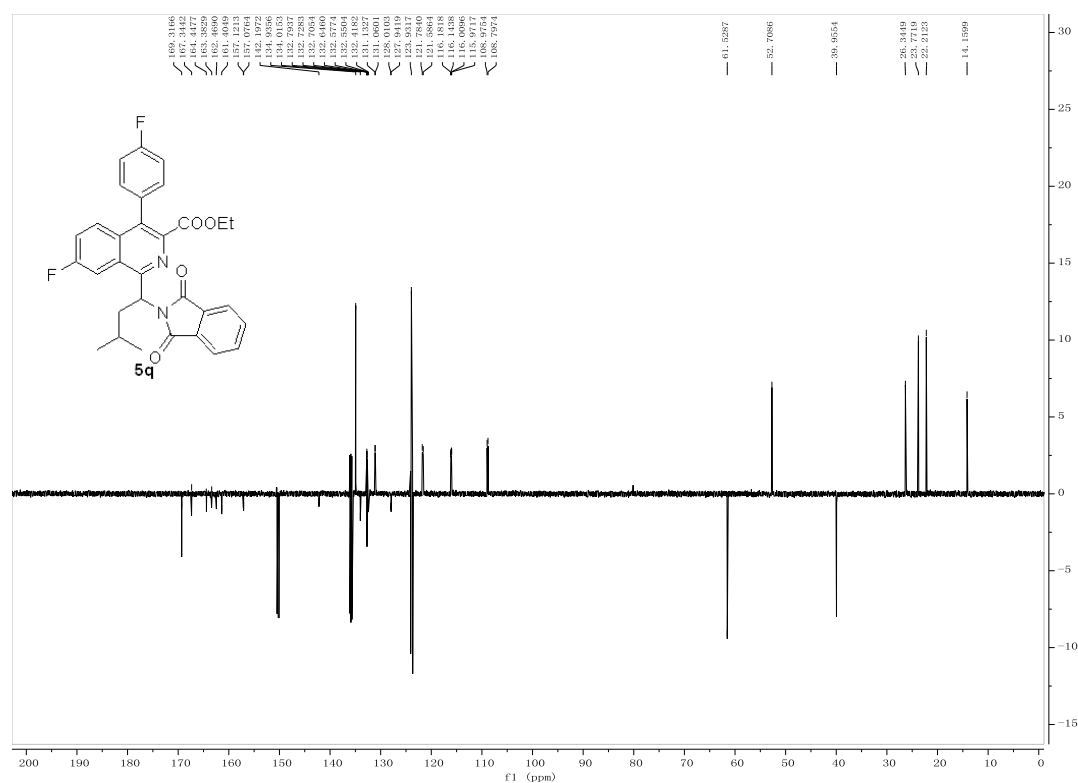
DEPT-Q spectrum of **5m**



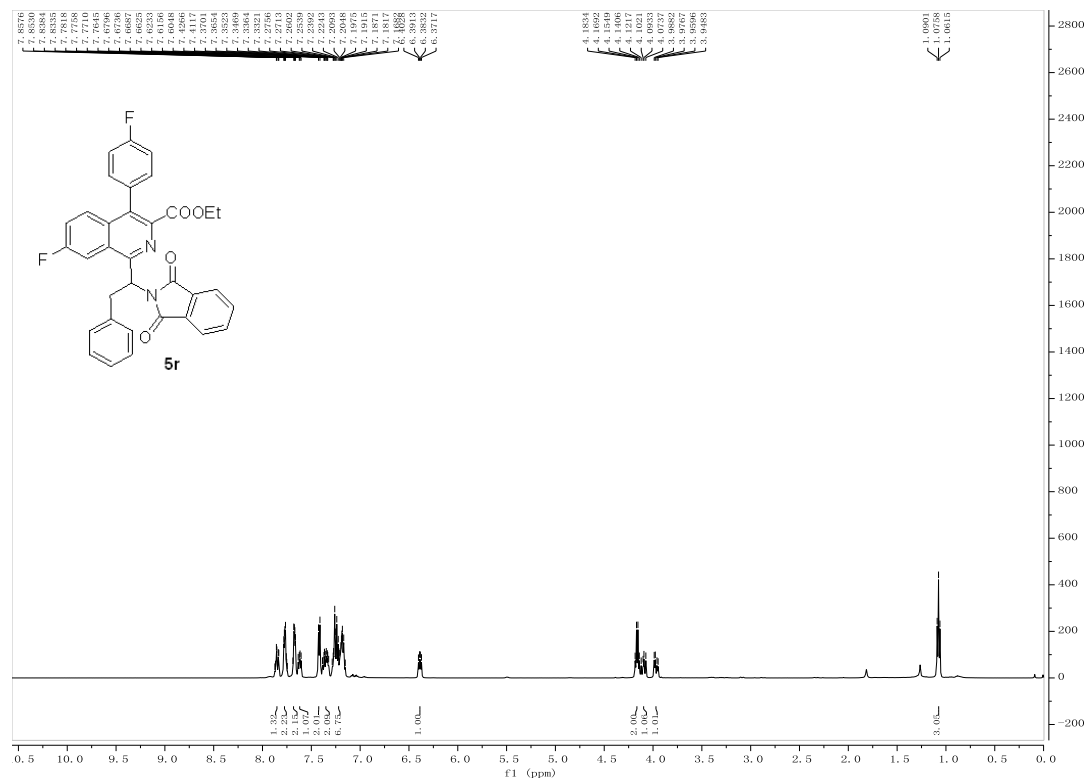
¹HNMR spectrum of **5o**



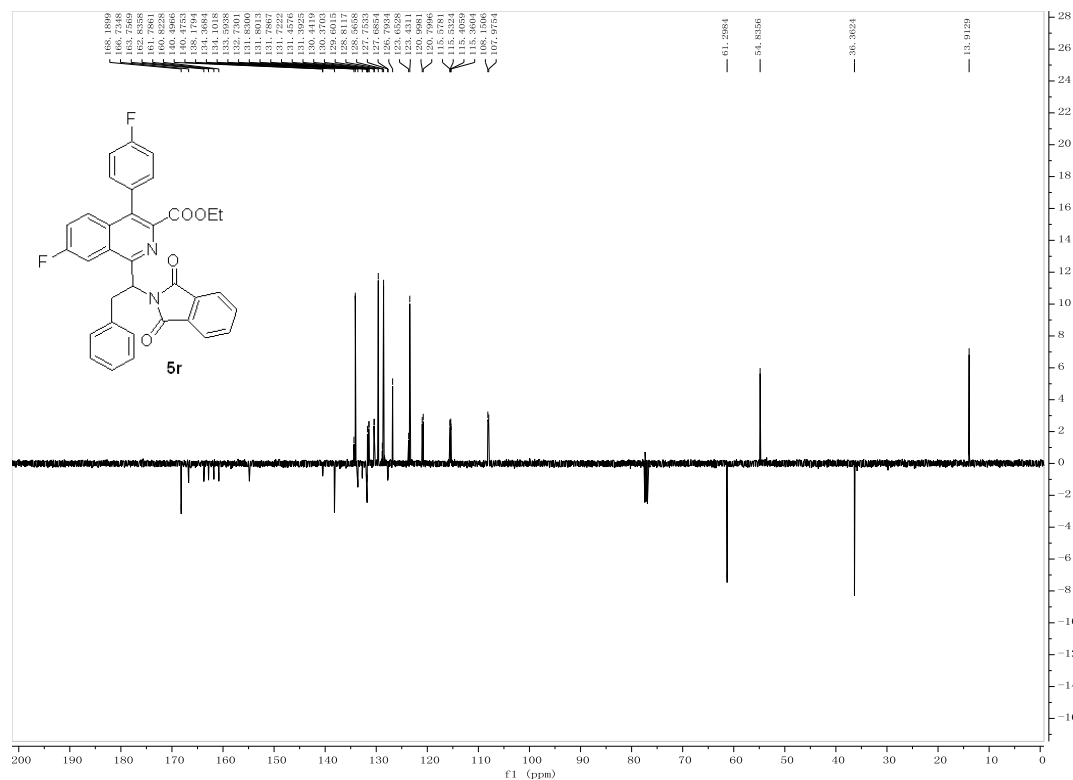
¹H NMR spectrum of **5p**DEPT-Q spectrum of **5p**

¹HNMR spectrum of **5q**DEPT-Q spectrum of **5g**

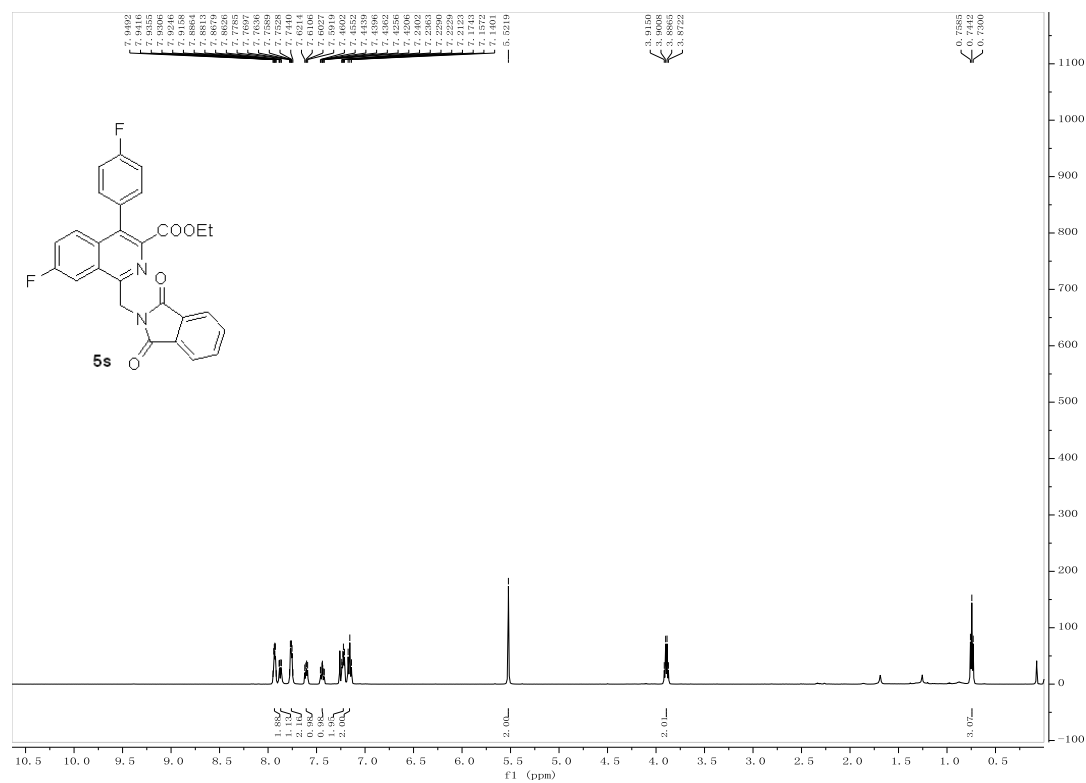
¹HNMR spectrum of **5r**



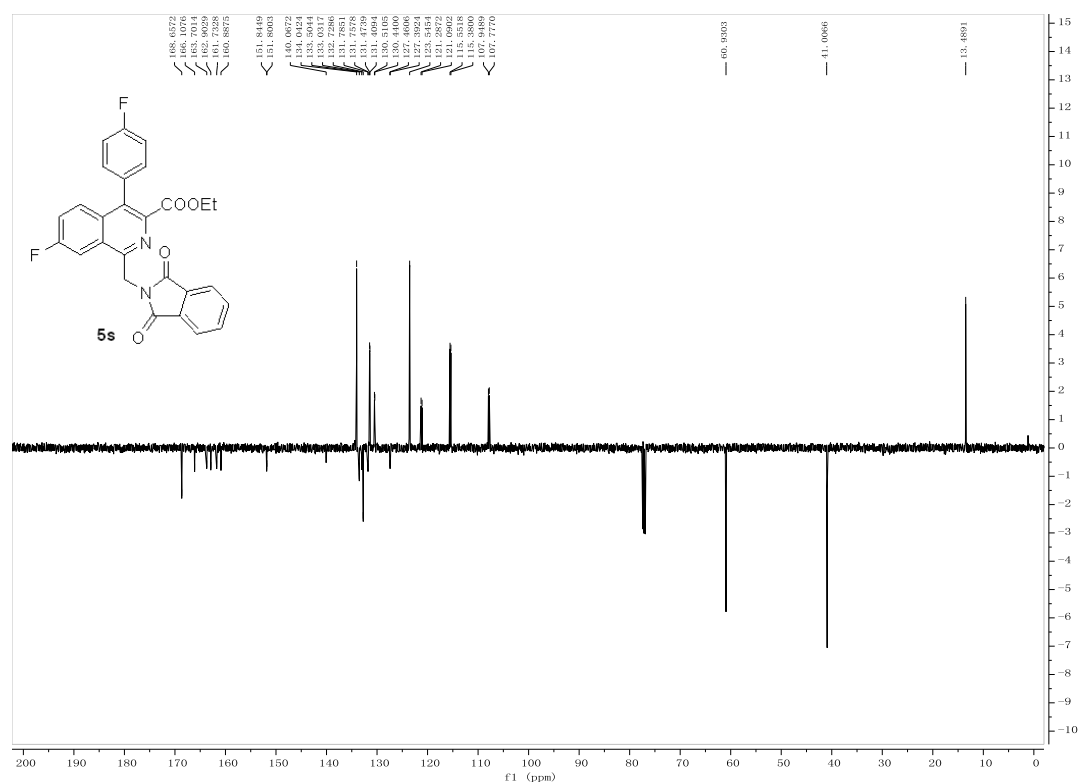
DEPT-Q spectrum of **5r**



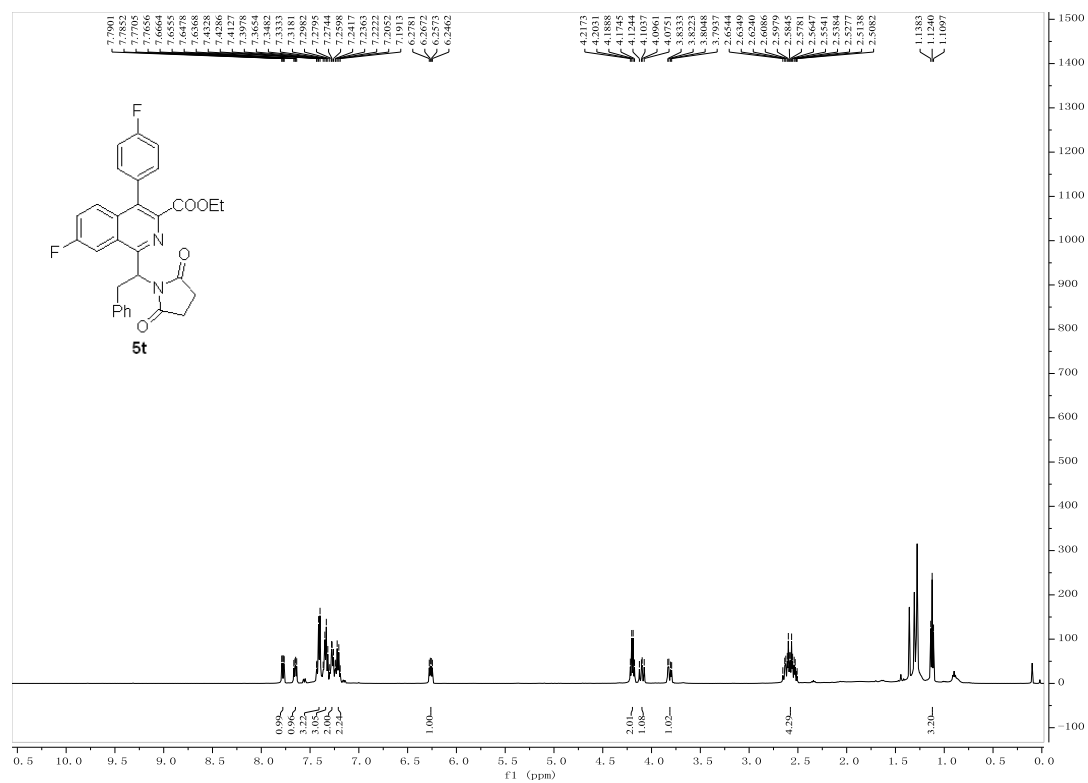
¹HNMR spectrum of 5s



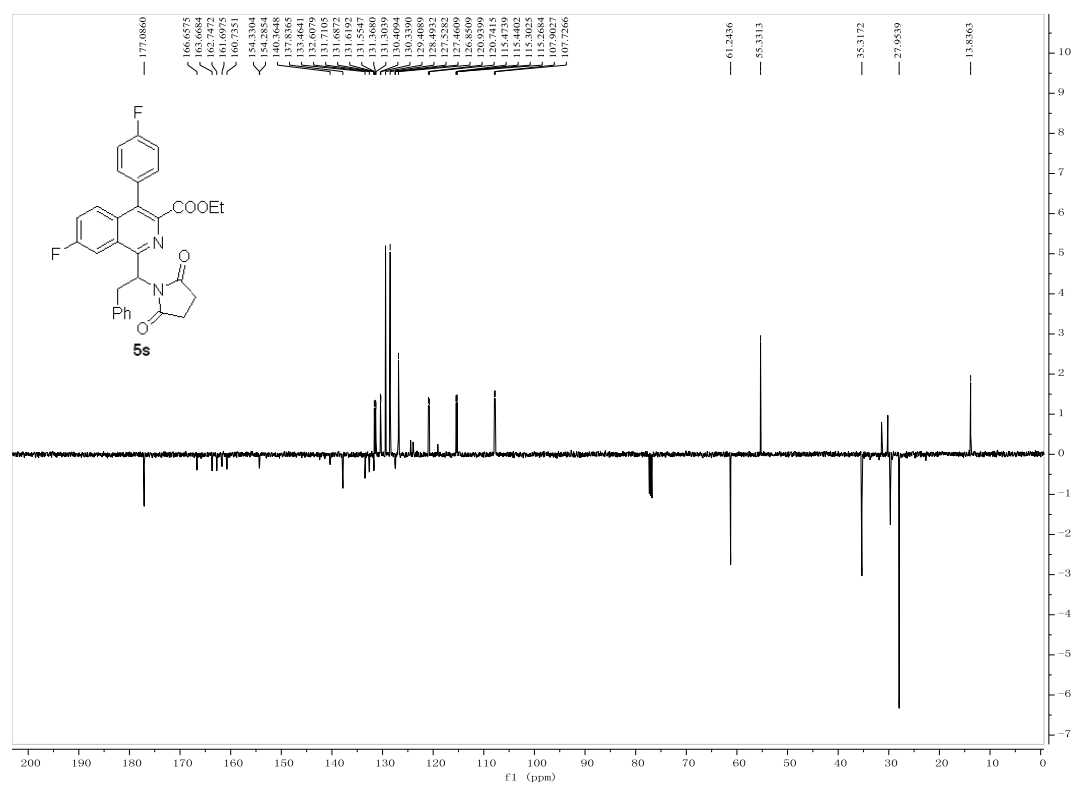
DEPT-Q spectrum of 5s

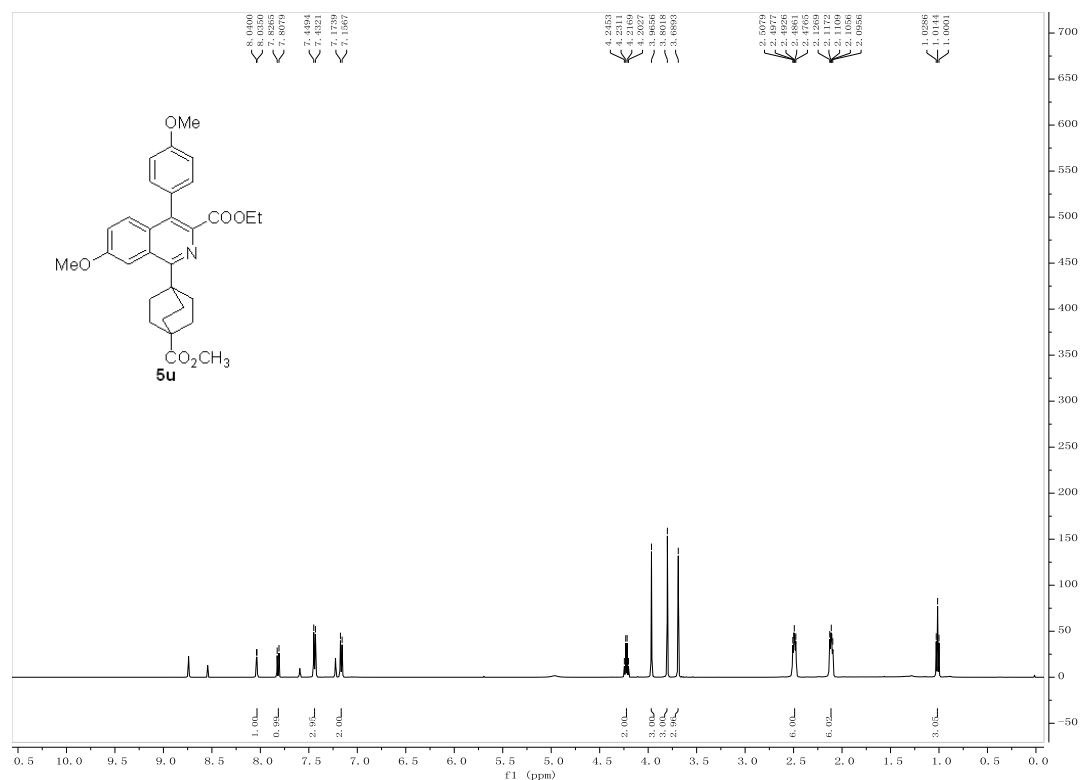
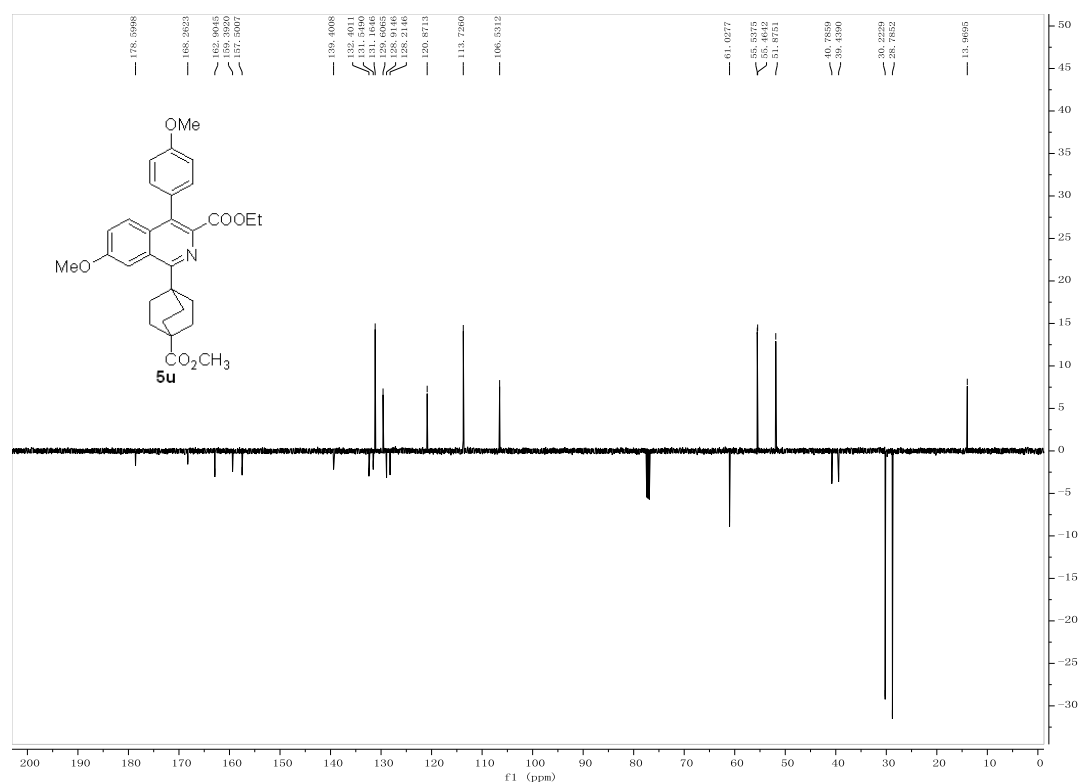


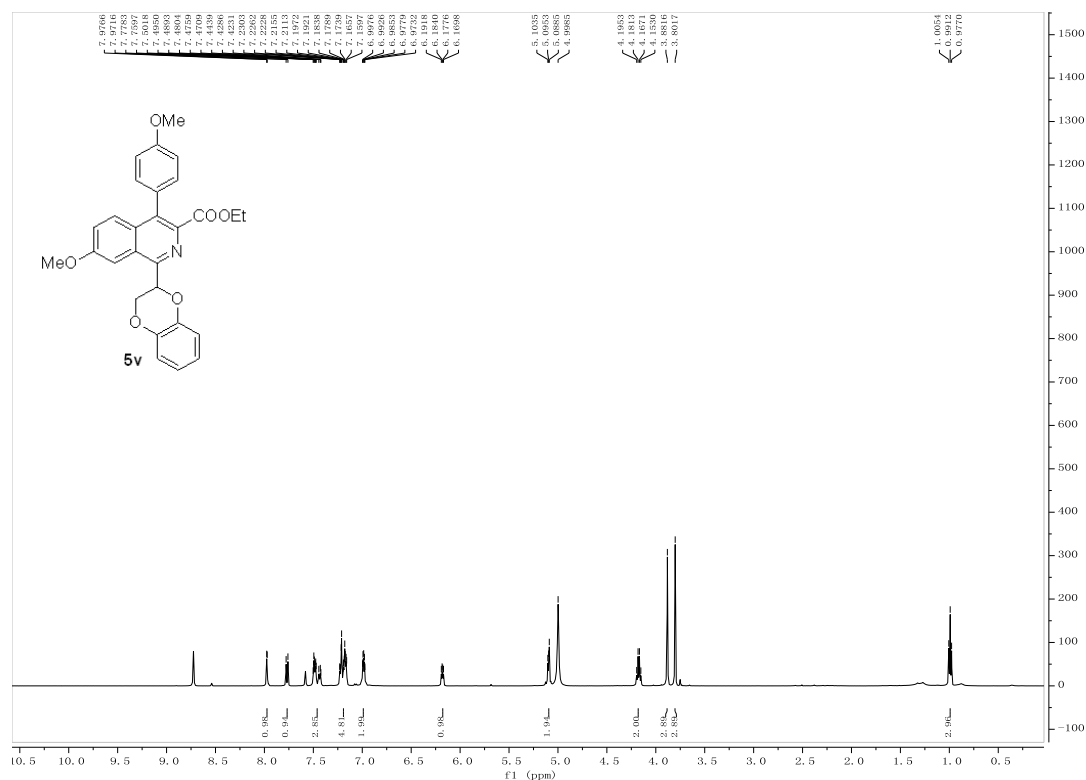
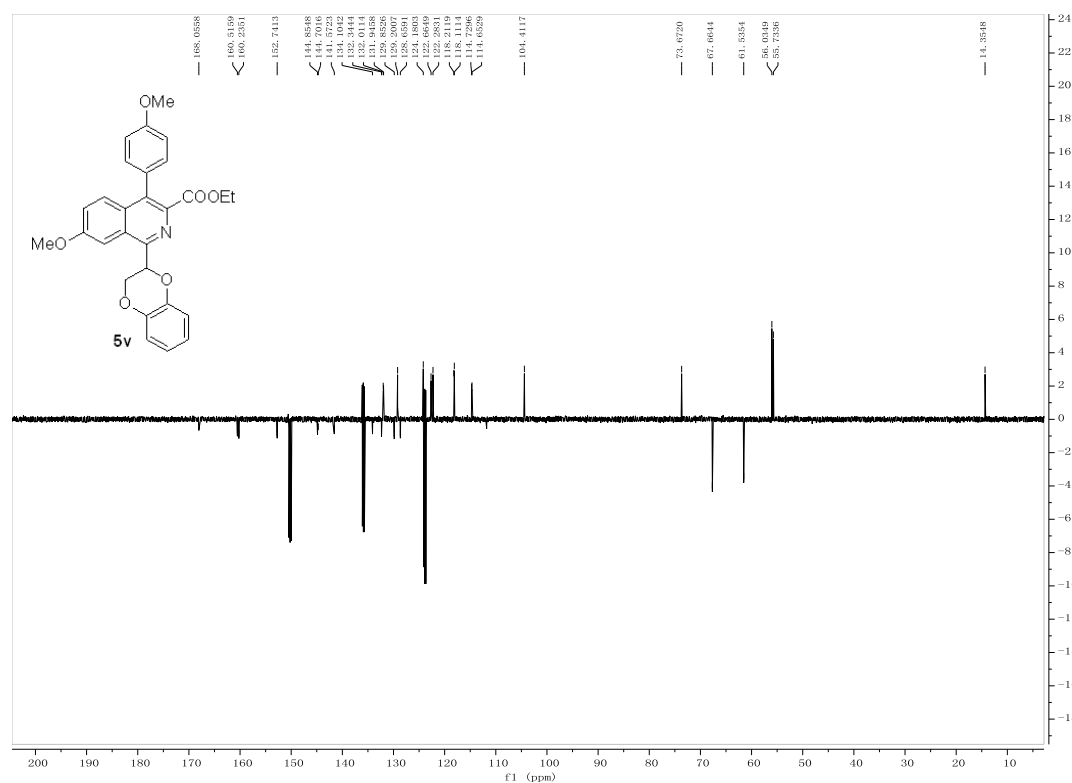
¹HNMR spectrum of **5t**



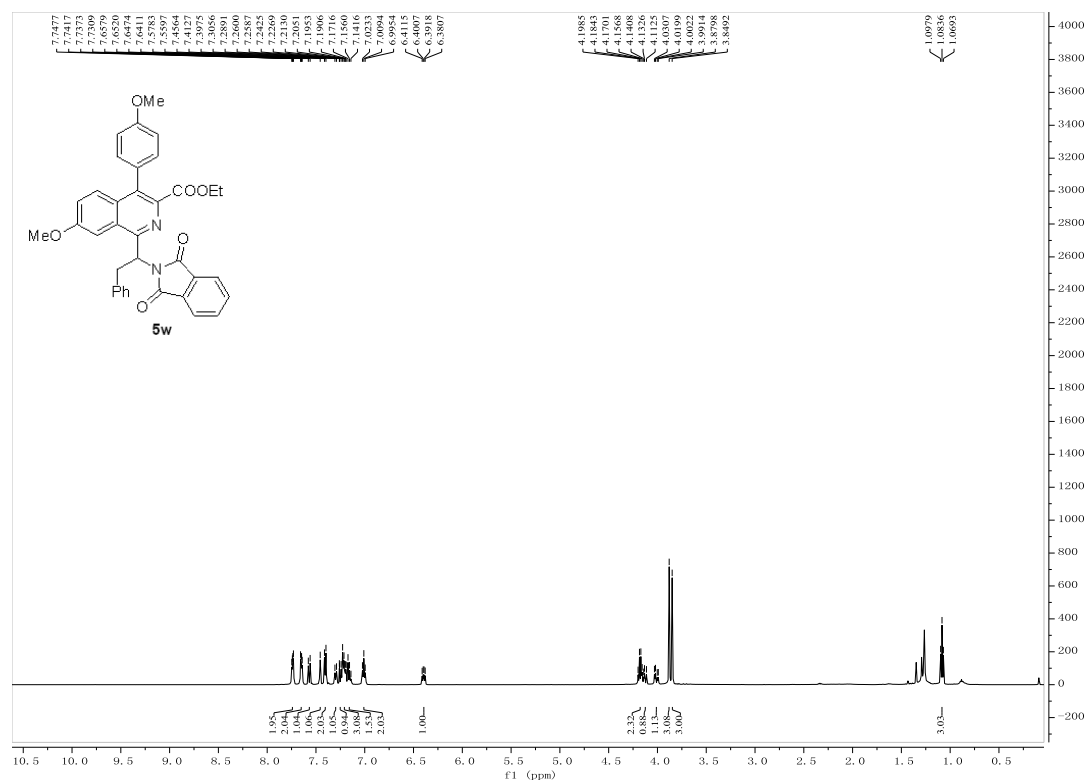
DEPT-Q spectrum of **5t**



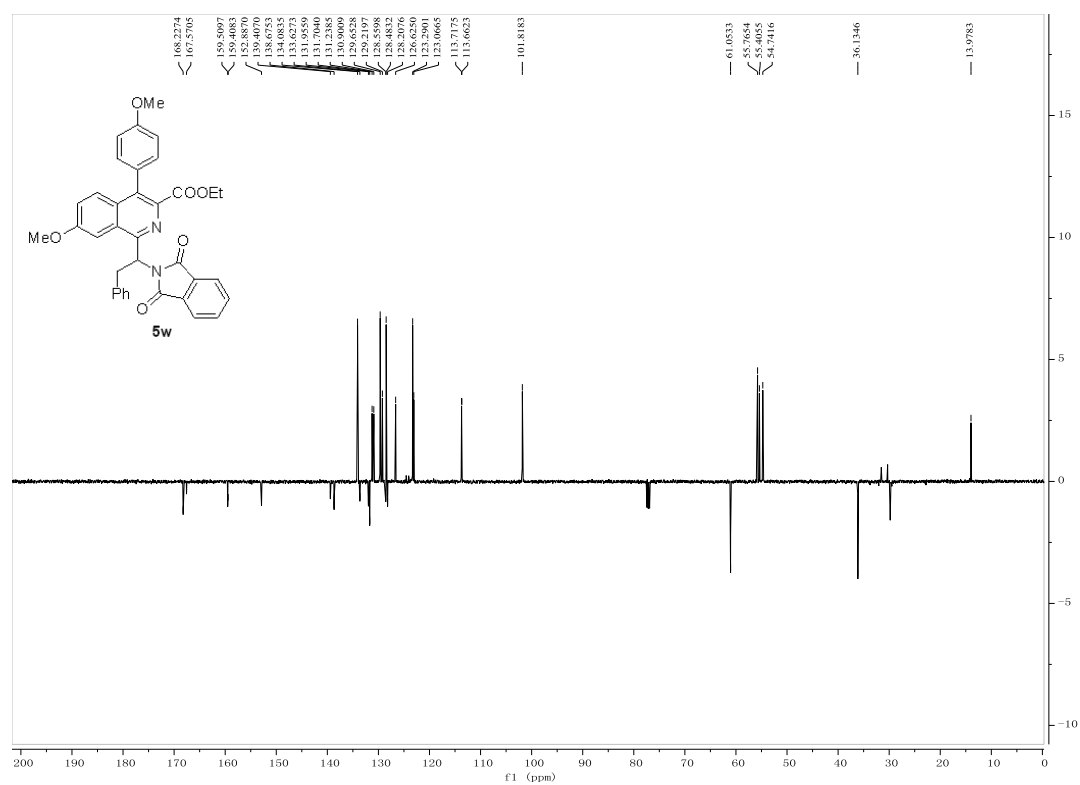
¹H NMR spectrum of **5u**DEPT-Q spectrum of **5u**

¹HNMR spectrum of **5v**DEPT-Q spectrum of **5v**

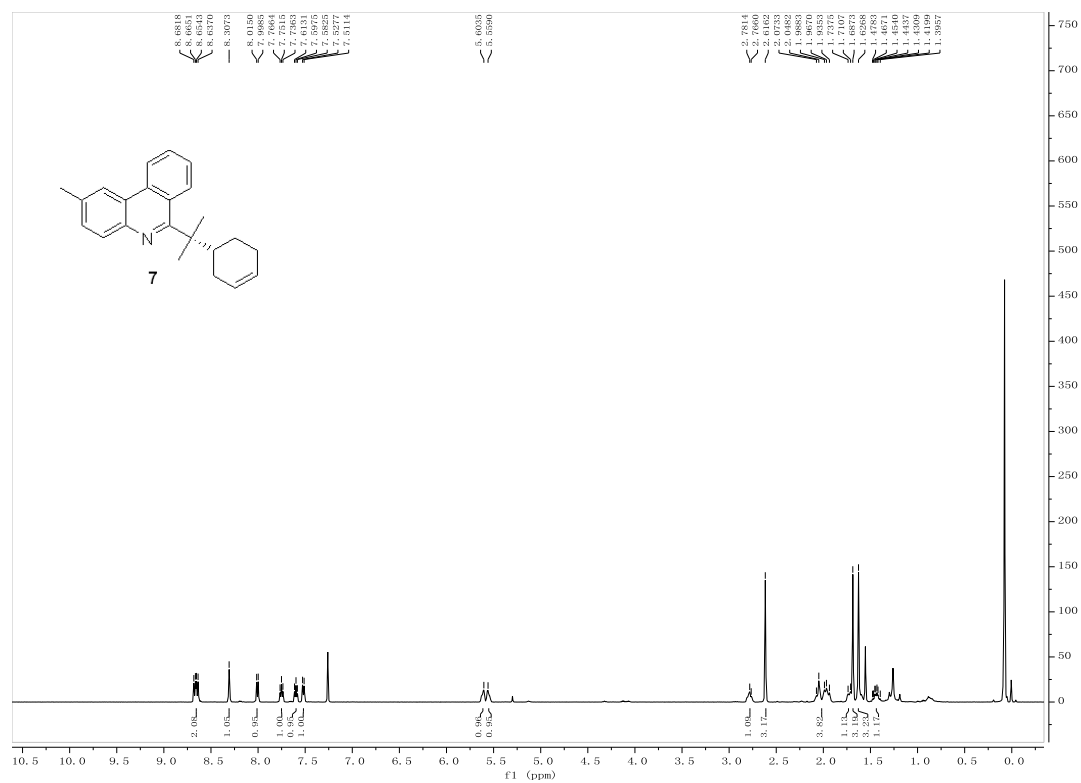
¹HNMR spectrum of **5w**



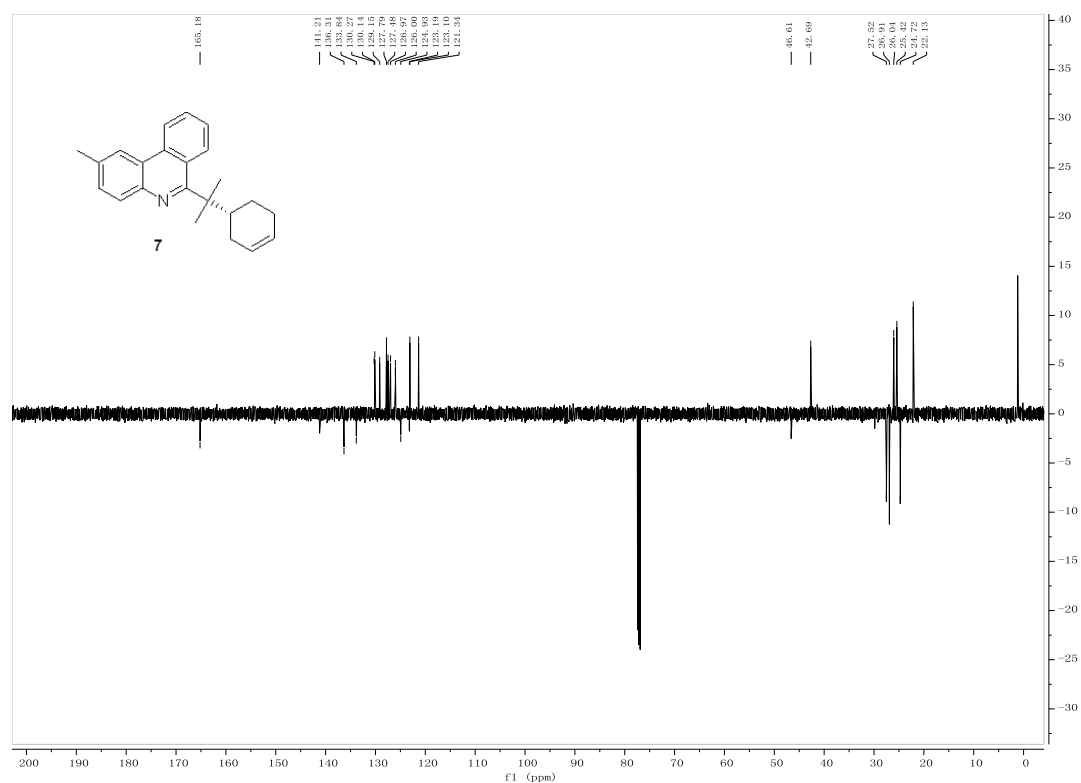
DEPT-Q spectrum of **5w**



¹HNMR spectrum of 7



DEPT-Q spectrum of 7



Chemical Structure of 8: COc1ccc(cc1)C(=O)N2C(=Nc3cc(OC)ccc3C2Cc4ccccc4)OC

¹H NMR Spectrum (CDCl₃):

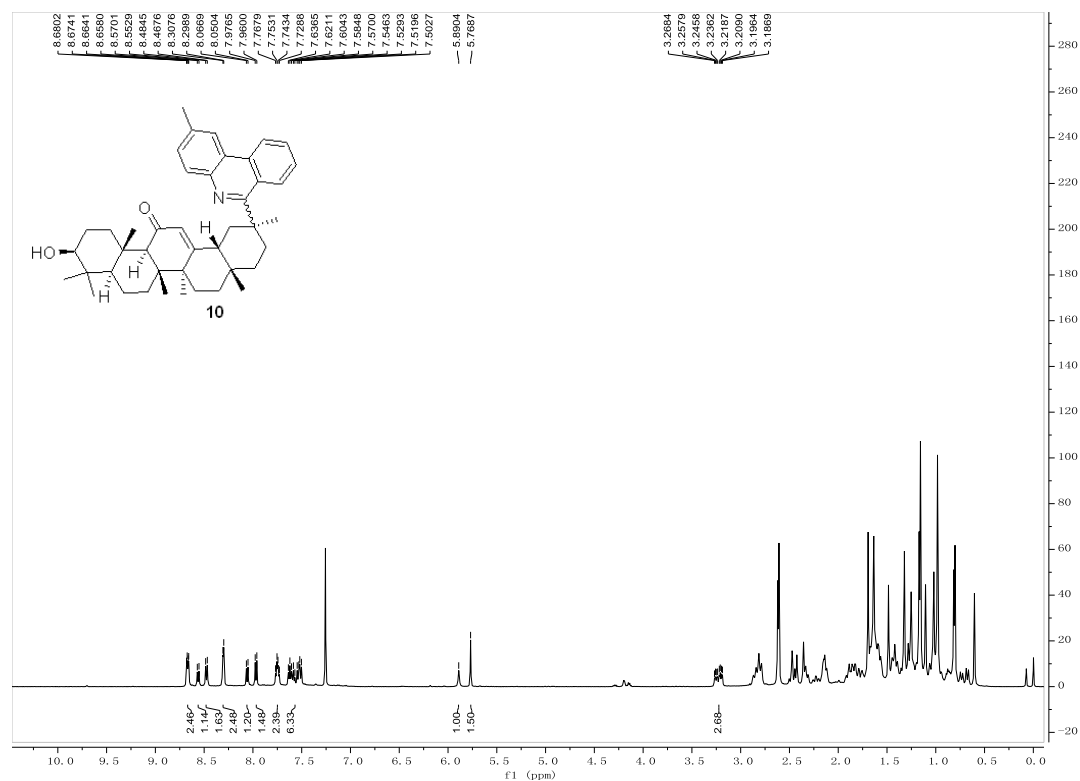
Chemical Shift (ppm)	Integration
7.4070, 7.4082, 7.4096, 7.4249, 7.4362, 7.4375, 7.4388, 7.4395	0.97, 0.94, 1.40, 1.90
5.4303, 5.4213, 5.4293	1.90
4.1532, 4.1547, 4.1604, 4.1615, 3.8638, 3.8657	2.00, 2.90, 2.90
3.8002, 3.7984, 3.7965	0.96
2.7502, 2.7408, 2.7313, 2.7284, 2.7065	3.20, 1.20, 4.40, 1.13
2.1331, 2.1214, 2.1097, 1.9702, 1.9460, 1.9289, 1.9175, 1.7259, 1.7141, 1.6971, 1.6396, 1.6289, 1.6095, 1.4251, 1.40175	3.02

Chemical structure of compound **8** is shown above the spectrum. The structure is a pyridine ring substituted with a methoxy group (MeO), a 4-methoxyphenyl group (OMe), an ethyl ester group (COOEt), and a 1-methylcyclohexyl group.

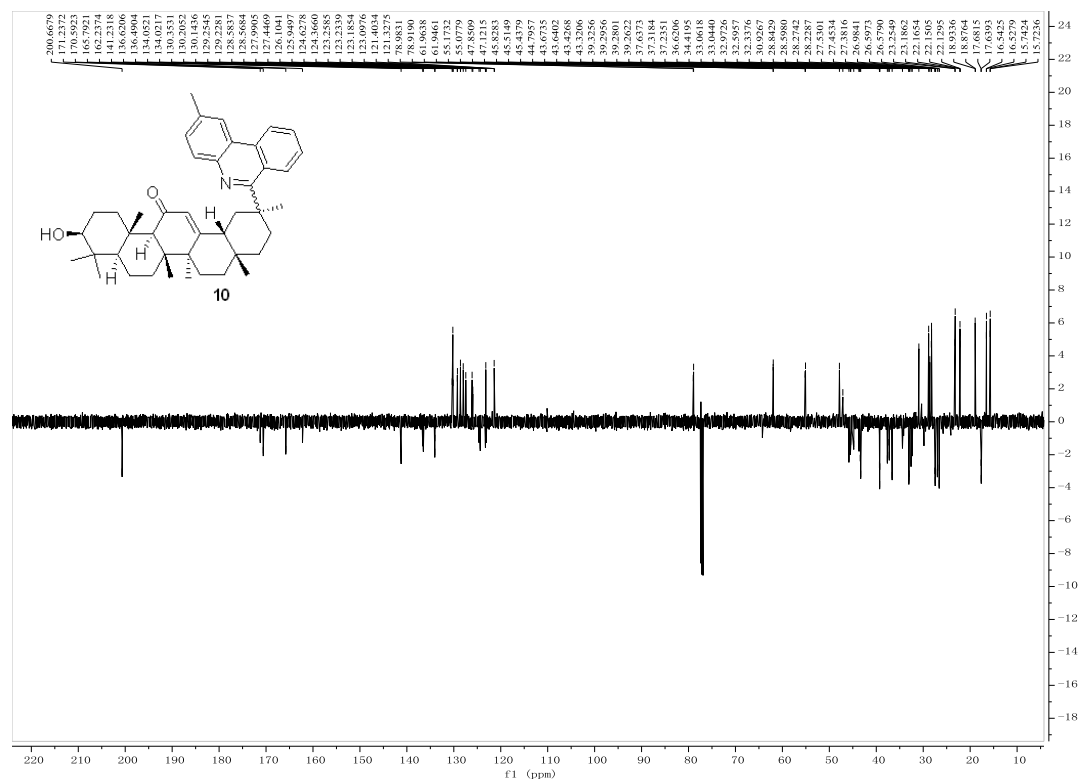
¹³C NMR spectrum (f1 (ppm)) showing peaks corresponding to the structure. The x-axis ranges from 0 to 24 ppm. The spectrum shows several peaks, with the most prominent ones labeled with their chemical shifts (ppm):

- 168.3079
- 164.3013
- 159.3468
- 137.6204
- 138.8953
- 132.8778
- 131.2199
- 129.8897
- 128.9848
- 128.2988
- 127.6072
- 126.9212
- 120.7704
- 113.7145
- 108.4732
- 60.9391
- 55.6094
- 55.4610
- 46.3425
- 42.7618
- 27.6014
- 26.9652
- 26.1731
- 24.7610
- 13.9991

¹HNMR spectrum of **10**



DEPT-Q spectrum of **10**



Chemical structure of 11: CCOC(=O)c1ccc2c(c1)c(c3ccccc3n2)C[C@H]4C[C@@H](C)[C@H]5[C@@H](C)[C@H](O)CC[C@]54C

¹H NMR spectrum (CDCl₃):

Chemical Shift (ppm)	Integration
8.5747, 8.4841, 8.5014	1.02, 0.89
7.6018, 7.6095, 7.6100, 7.6150, 7.6591, 7.6594, 7.6644, 7.6886, 7.6968, 7.7298, 7.8077, 7.8355, 7.8508, 7.8577, 7.8598, 7.8608, 7.8717, 7.8737, 7.8810, 7.8829, 7.8859, 7.8859, 5.8053, 5.7550	2.08, 6.31, 4.30
5.96, 5.90	0.96, 0.90
4.2796, 4.2512, 4.2369, 4.2369, 4.0954, 4.0910, 4.0666	2.14, 2.04
3.2208, 3.2198, 3.2198, 3.2186, 3.2088, 3.1862	2.48

Chemical structure of compound **11** is shown. The structure is a steroid derivative with a 3-hydroxy group, a 13-ethyl 2-oxo-2-phenyl-1H-benzimidazole-5-carboxylate side chain, and a 14-methyl group.

¹H NMR spectrum (CDCl₃) of compound **11**. The x-axis represents the chemical shift in ppm (f1), ranging from 0 to 210. The y-axis represents the intensity. The spectrum shows several peaks, with the following chemical shifts (ppm) listed on the right side:

- 200.6482
- 199.5005
- 199.4954
- 199.4902
- 199.4850
- 199.4798
- 199.4746
- 199.4694
- 199.4642
- 199.4590
- 199.4538
- 199.4486
- 199.4434
- 199.4382
- 199.4330
- 199.4278
- 199.4226
- 199.4174
- 199.4122
- 199.4070
- 199.4018
- 199.3966
- 199.3914
- 199.3862
- 199.3810
- 199.3758
- 199.3706
- 199.3654
- 199.3602
- 199.3550
- 199.3498
- 199.3446
- 199.3394
- 199.3342
- 199.3290
- 199.3238
- 199.3186
- 199.3134
- 199.3082
- 199.3030
- 199.2978
- 199.2926
- 199.2874
- 199.2822
- 199.2770
- 199.2718
- 199.2666
- 199.2614
- 199.2562
- 199.2510
- 199.2458
- 199.2406
- 199.2354
- 199.2302
- 199.2250
- 199.2198
- 199.2146
- 199.2094
- 199.2042
- 199.1990
- 199.1938
- 199.1886
- 199.1834
- 199.1782
- 199.1730
- 199.1678
- 199.1626
- 199.1574
- 199.1522
- 199.1470
- 199.1418
- 199.1366
- 199.1314
- 199.1262
- 199.1210
- 199.1158
- 199.1106
- 199.1054
- 199.1002
- 199.0950
- 199.0898
- 199.0846
- 199.0794
- 199.0742
- 199.0690
- 199.0638
- 199.0586
- 199.0534
- 199.0482
- 199.0430
- 199.0378
- 199.0326
- 199.0274
- 199.0222
- 199.0170
- 199.0118
- 199.0066
- 199.0014
- 198.9962
- 198.9910
- 198.9858
- 198.9806
- 198.9754
- 198.9702
- 198.9650
- 198.9598
- 198.9546
- 198.9494
- 198.9442
- 198.9390
- 198.9338
- 198.9286
- 198.9234
- 198.9182
- 198.9130
- 198.9078
- 198.9026
- 198.8974
- 198.8922
- 198.8870
- 198.8818
- 198.8766
- 198.8714
- 198.8662
- 198.8610
- 198.8558
- 198.8506
- 198.8454
- 198.8402
- 198.8350
- 198.8298
- 198.8246
- 198.8194
- 198.8142
- 198.8090
- 198.8038
- 198.7986
- 198.7934
- 198.7882
- 198.7830
- 198.7778
- 198.7726
- 198.7674
- 198.7622
- 198.7570
- 198.7518
- 198.7466
- 198.7414
- 198.7362
- 198.7310
- 198.7258
- 198.7206
- 198.7154
- 198.7102
- 198.7050
- 198.6998
- 198.6946
- 198.6894
- 198.6842
- 198.6790
- 198.6738
- 198.6686
- 198.6634
- 198.6582
- 198.6530
- 198.6478
- 198.6426
- 198.6374
- 198.6322
- 198.6270
- 198.6218
- 198.6166
- 198.6114
- 198.6062
- 198.6010
- 198.5958
- 198.5906
- 198.5854
- 198.5802
- 198.5750
- 198.5698
- 198.5646
- 198.5594
- 198.5542
- 198.5490
- 198.5438
- 198.5386
- 198.5334
- 198.5282
- 198.5230
- 198.5178
- 198.5126
- 198.5074
- 198.5022
- 198.4970
- 198.4918
- 198.4866
- 198.4814
- 198.4762
- 198.4710
- 198.4658
- 198.4606
- 198.4554
- 198.4502
- 198.4450
- 198.4398
- 198.4346
- 198.4294
- 198.4242
- 198.4190
- 198.4138
- 198.4086
- 198.4034
- 198.3982
- 198.3930
- 198.3878
- 198.3826
- 198.3774
- 198.3722
- 198.3670
- 198.3618
- 198.3566
- 198.3514
- 198.3462
- 198.3410
- 198.3358
- 198.3306
- 198.3254
- 198.3202
- 198.3150
- 198.3098
- 198.3046
- 198.2994
- 198.2942
- 198.2890
- 198.2838
- 198.2786
- 198.2734
- 198.2682
- 198.2630
- 198.2578
- 198.2526
- 198.2474
- 198.2422
- 198.2370
- 198.2318
- 198.2266
- 198.2214
- 198.2162
- 198.2110
- 198.2058
- 198.2006
- 198.1954
- 198.1902
- 198.1850
- 198.1798
- 198.1746
- 198.1694
- 198.1642
- 198.1590
- 198.1538
- 198.1486
- 198.1434
- 198.1382
- 198.1330
- 198.1278
- 198.1226
- 198.1174
- 198.1122
- 198.1070
- 198.1018
- 198.0966
- 19