# Electronic Supplementory Information

## Impact of Planarity of Unfused Aromatic Molecules on G-Quadruplex Binding: Learning from Isaindigotone Derivatives

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**FRET-melting Results**

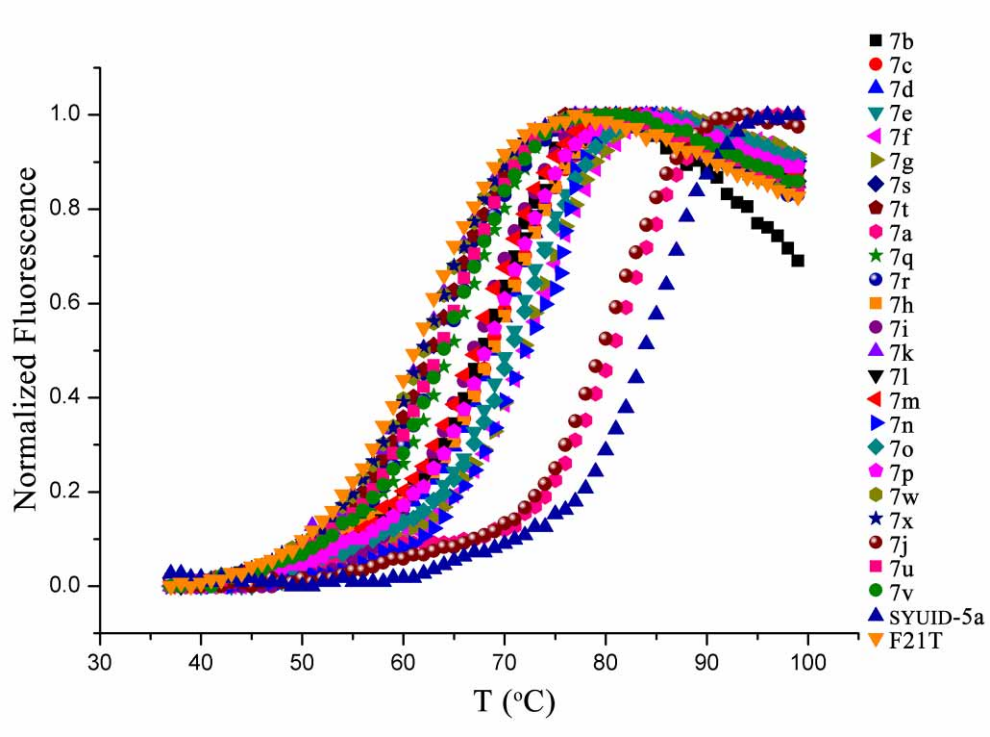



Fig S1. Representative FRET melting profiles of 0.2 μM F21T with 1μM isaindigotone derivatives

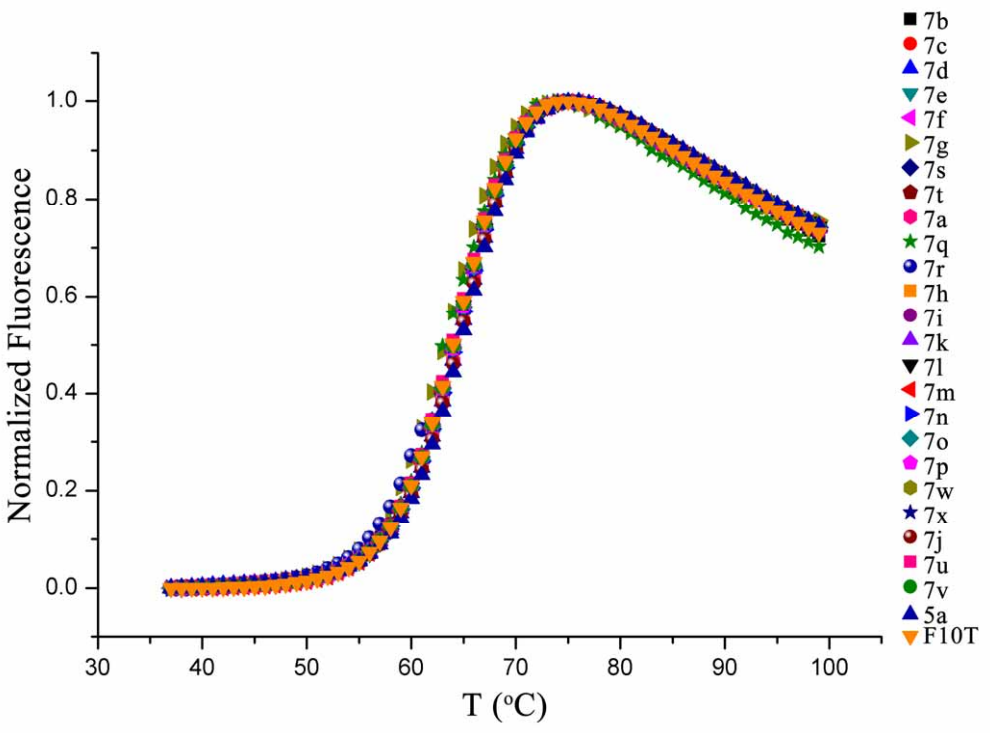



Fig S2. Representative FRET melting profiles of 0.2 μM F10T with 1μM isaindigotone derivatives

**SPR Results**

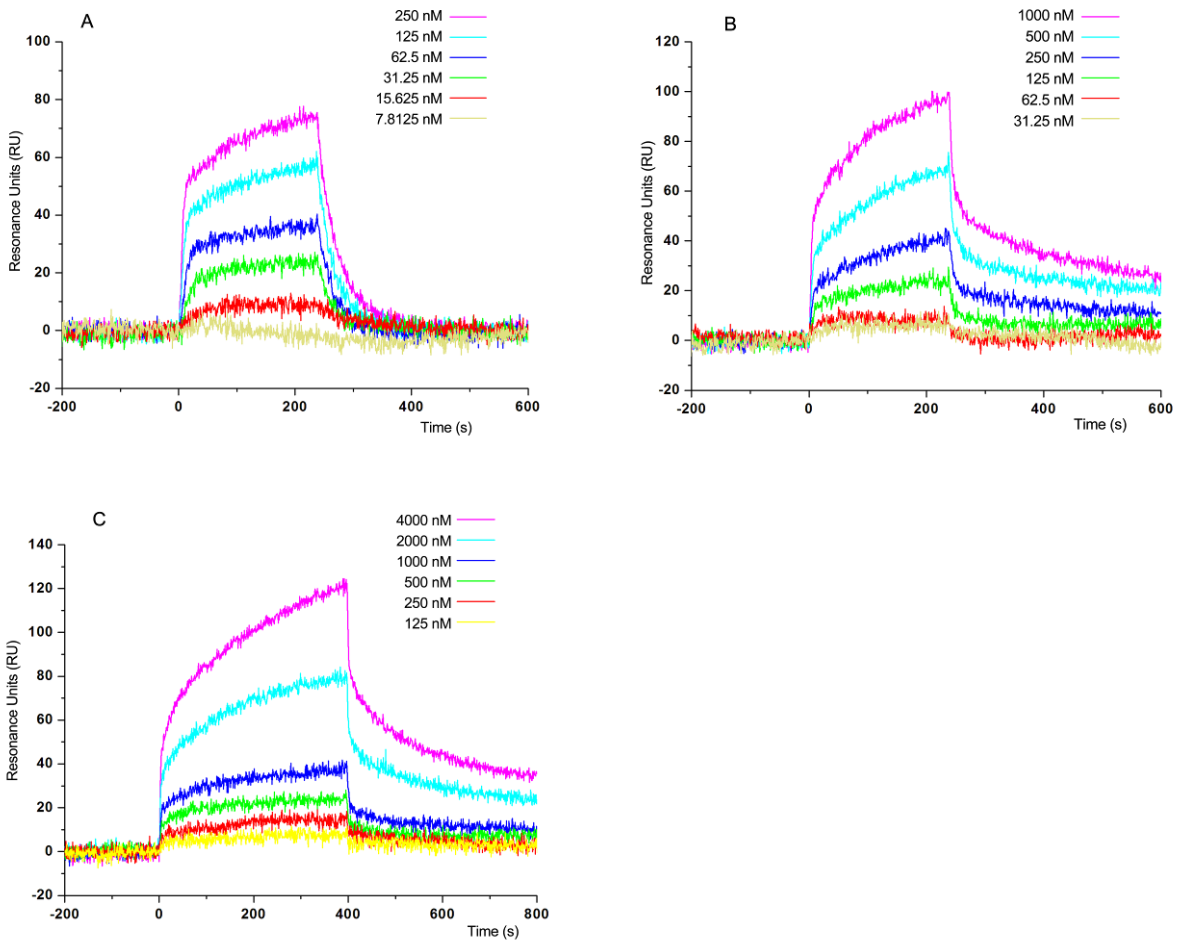



Fig S3. SPR sensorgram overlay for binding of **SYUID-5a** (A)**, 7e** (B) and **7h** (C) to HTG21. The ligand concentrations in the flow solution are given in the figure.

## $^1$H NMR Results

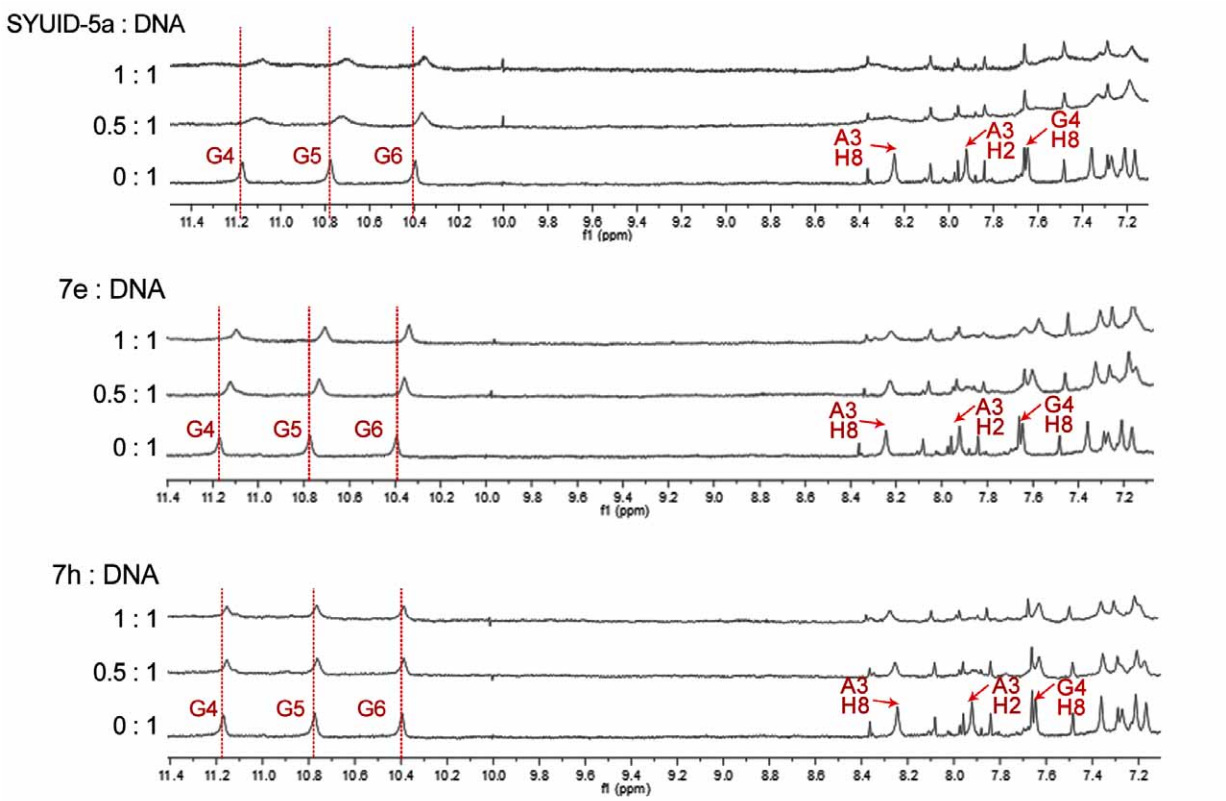



Fig S4. Titration of $[d(TTAGGG)]_4$ with **SYUID-5a, 7e** and **7h**. The $^1$H NMR spectra of the 600 MHz NMR is shown with increasing amounts of ligand added at 25 °C. Most DNA signals exhibited upfield shifts and were line-broadened with an increase in the ligand concentration. The assignments of some signals are given in the spectra.

**Molecular Modeling Studies of the Interactions between Ligand and G-quadruplex**

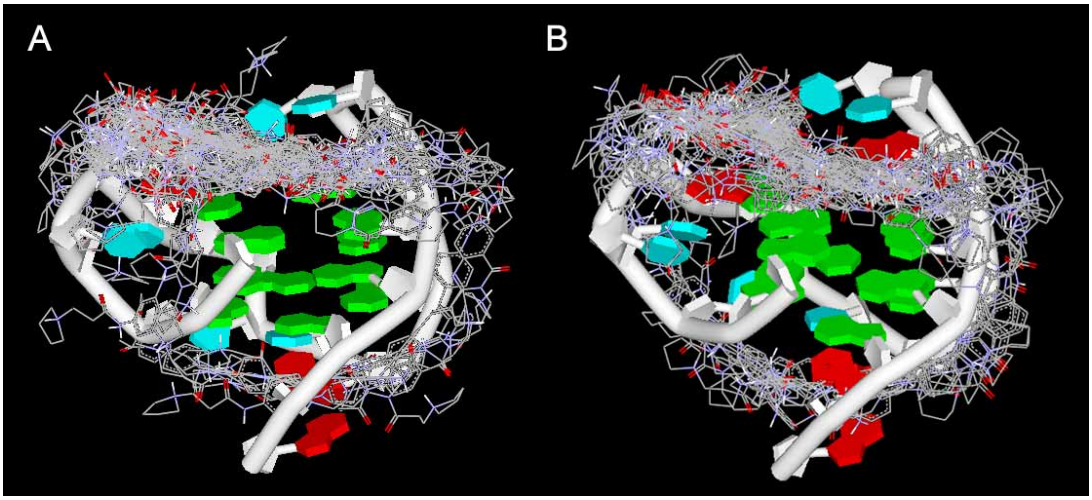



Fig S5. One hundred docking conformers of ligand-quadruplex complexes. A: **7e**-quadruplex complex. B: **7h**-quadruplex complex.

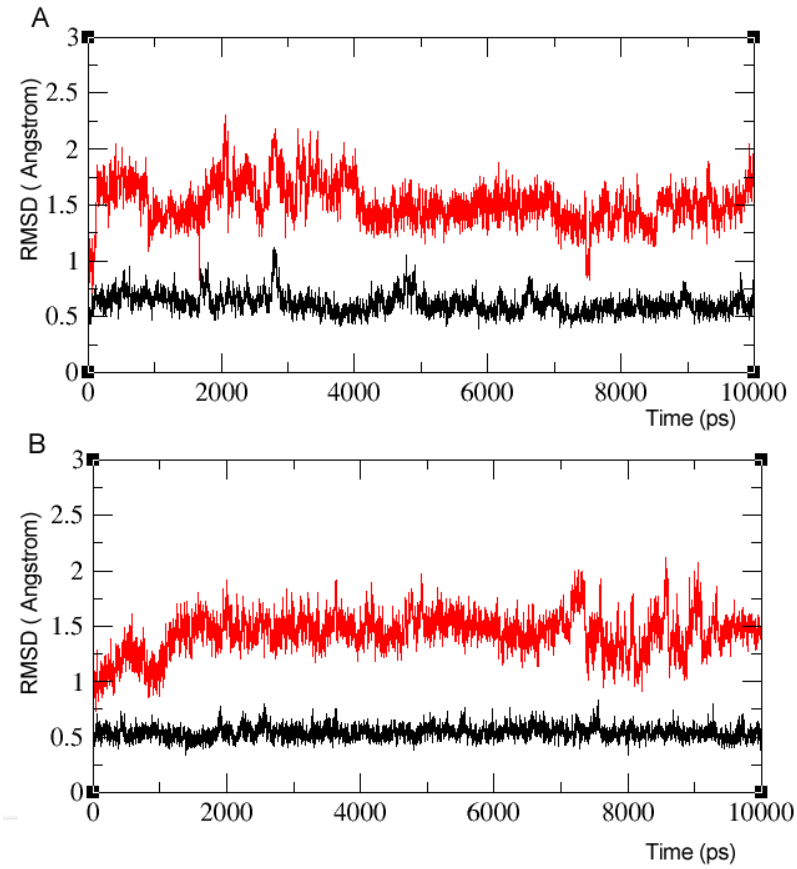
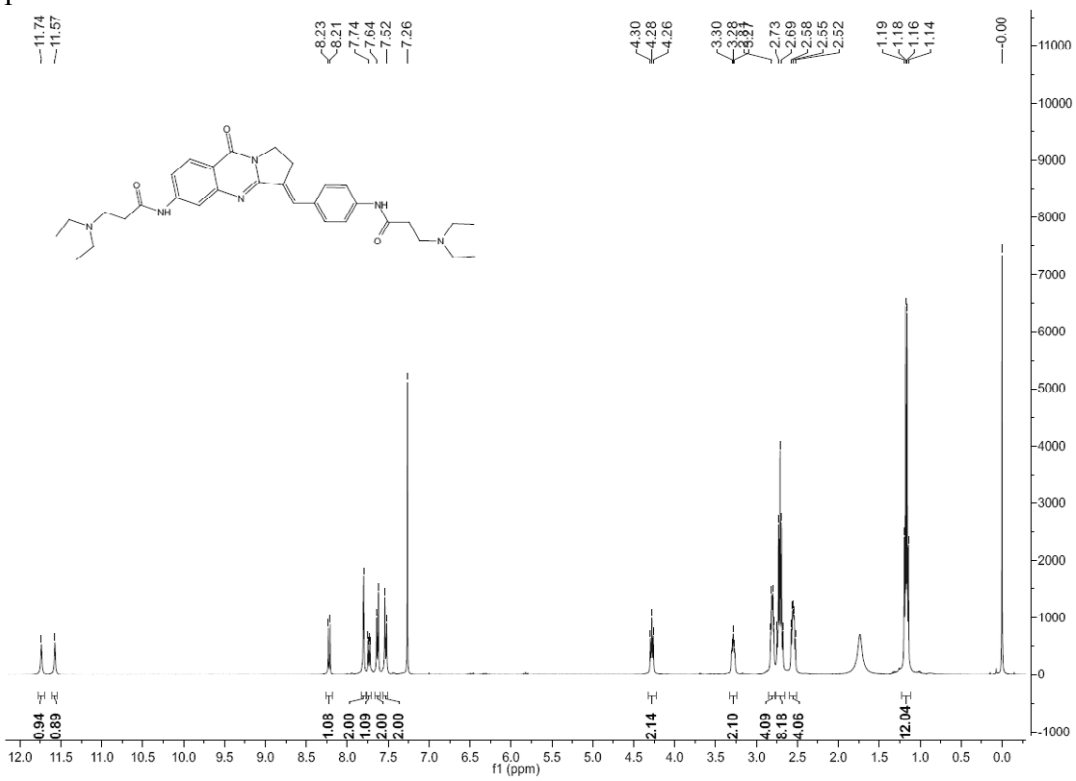


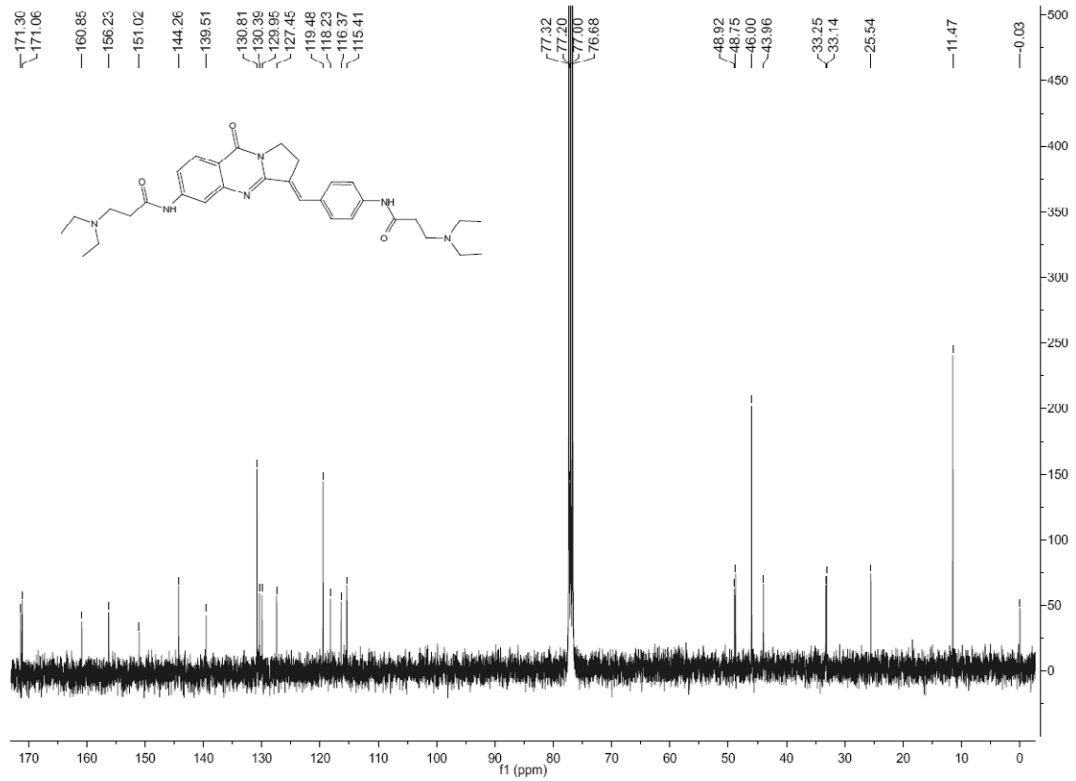

Fig S6. Time dependence of the RMSD of G-quartet heavy atoms (black) and ligand all atoms (red). A: **7e**-quadruplex complex. B: **7h**-quadruplex complex

# NMR spectra of compounds 7a-7x

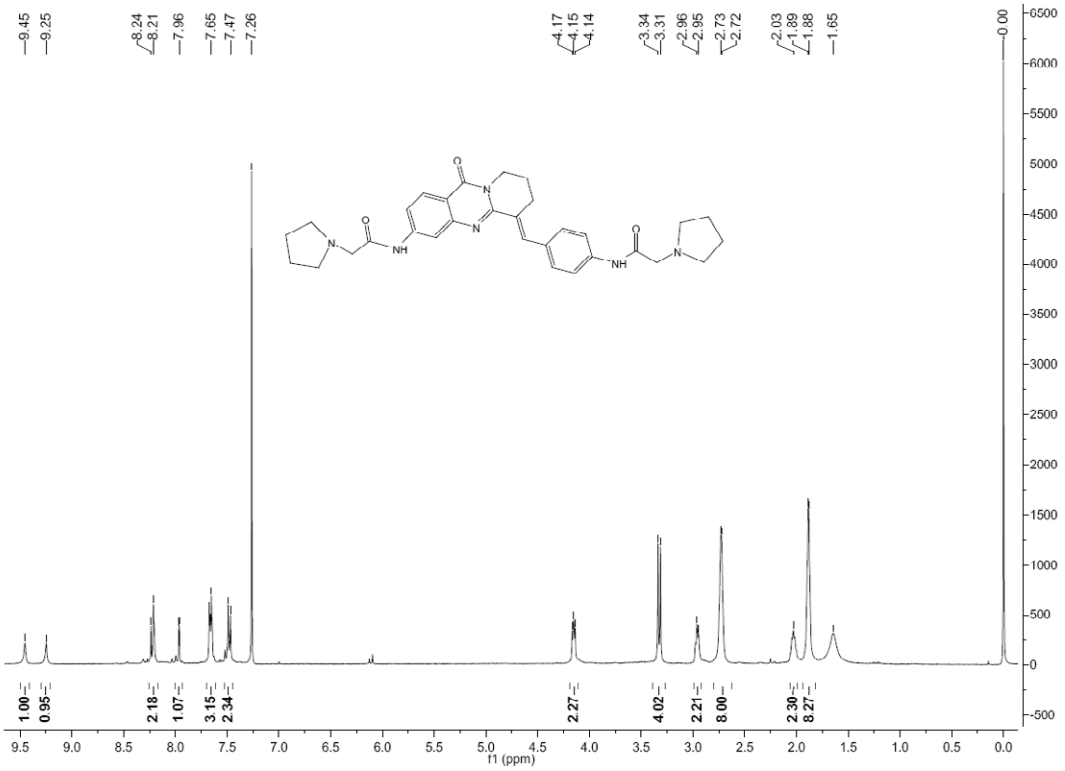
$^{1}$H NMR spectrum of **7a**




$^{13}$C NMR spectrum of **7a**



$^{1}$H NMR spectrum of **7b**

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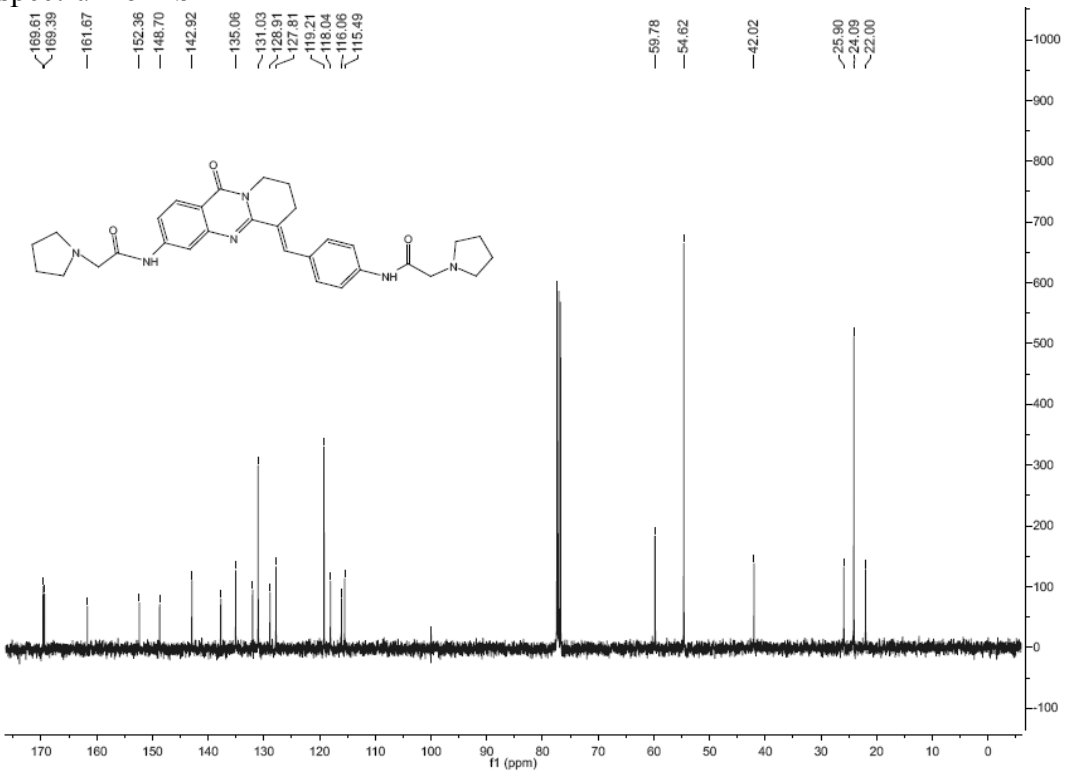

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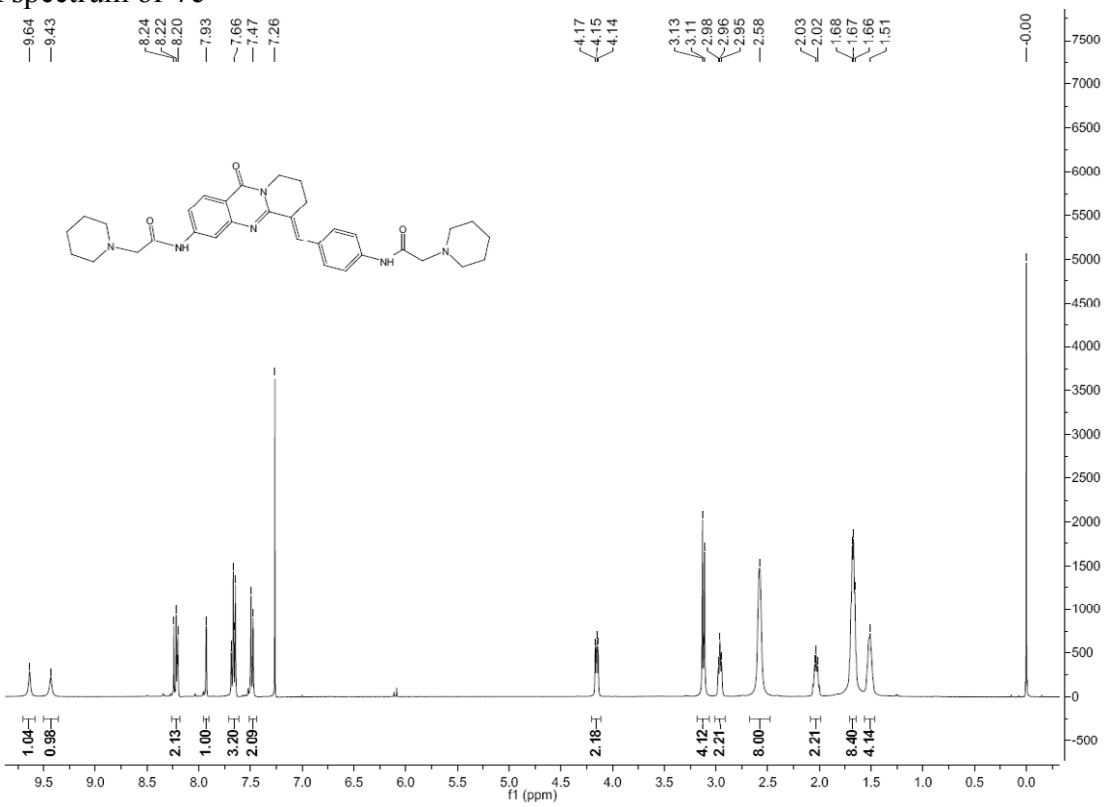
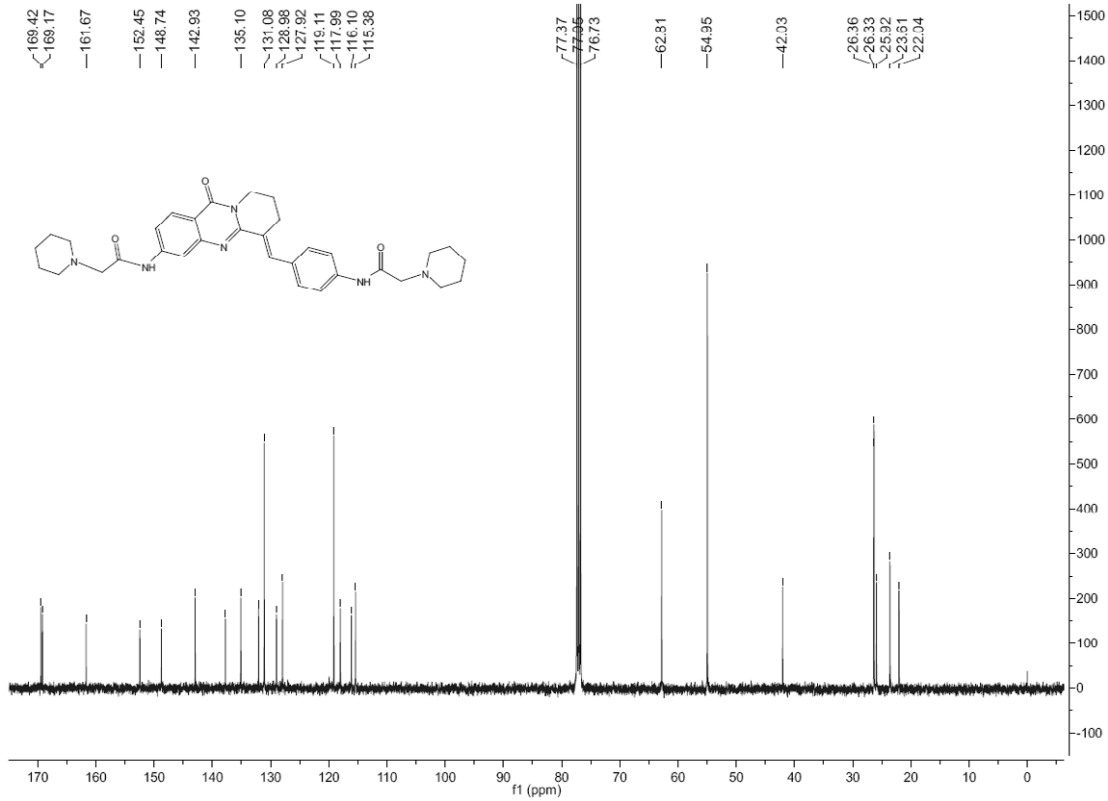



$^{13}$C NMR spectrum of **7c**



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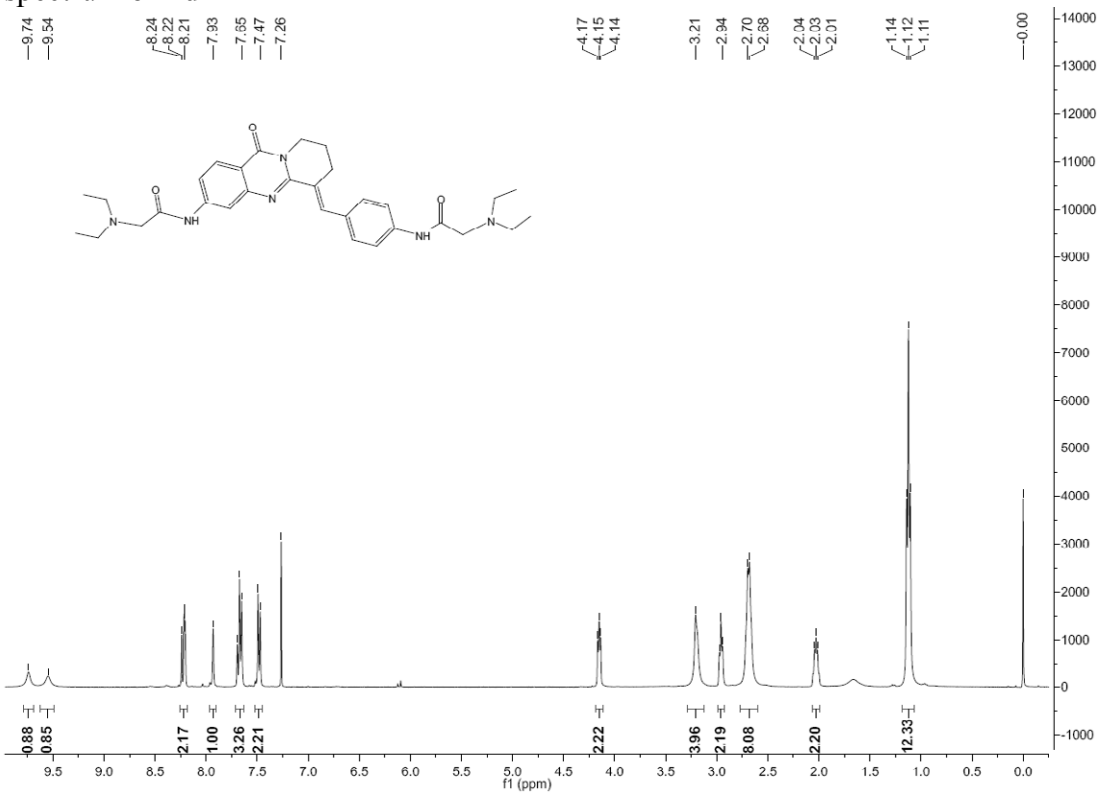
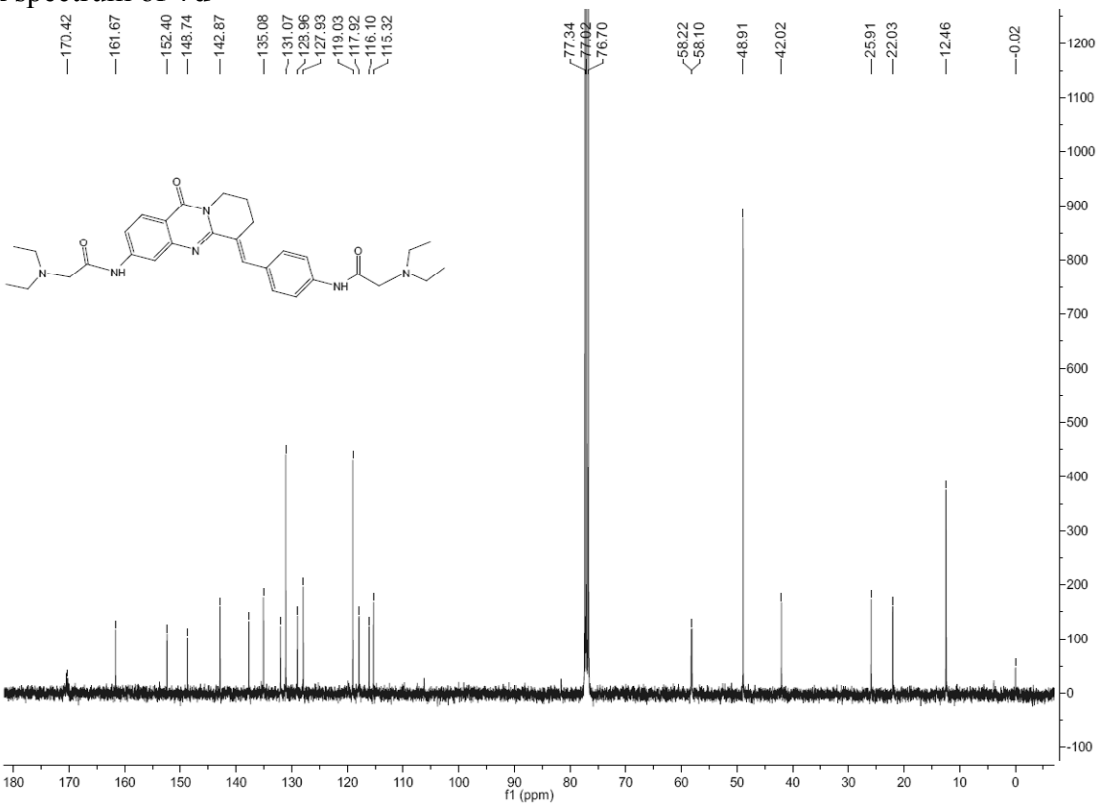



$^{13}$C NMR spectrum of **7d**



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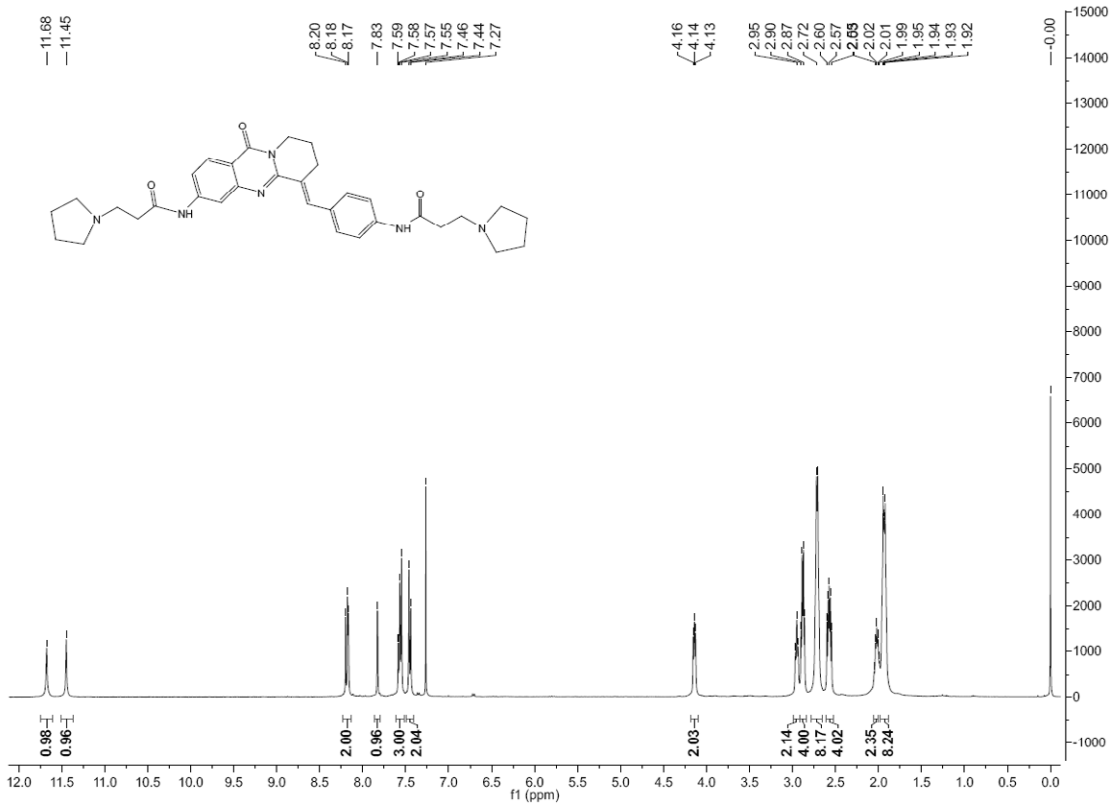


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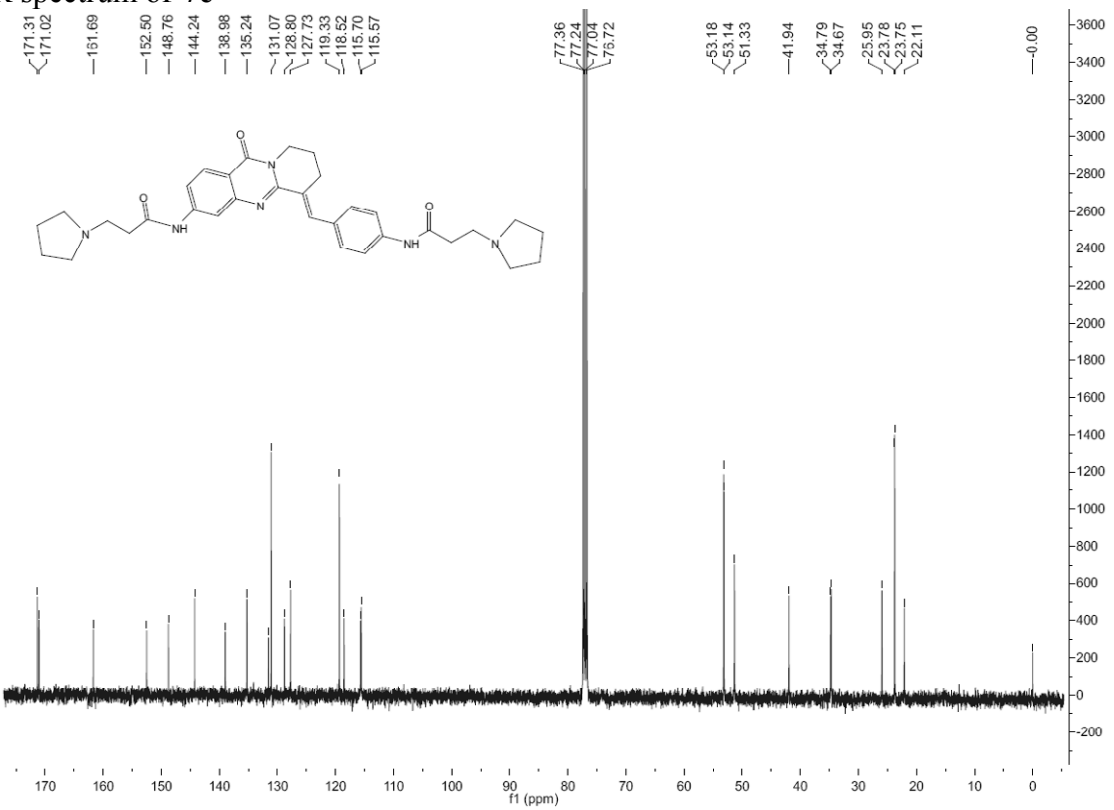

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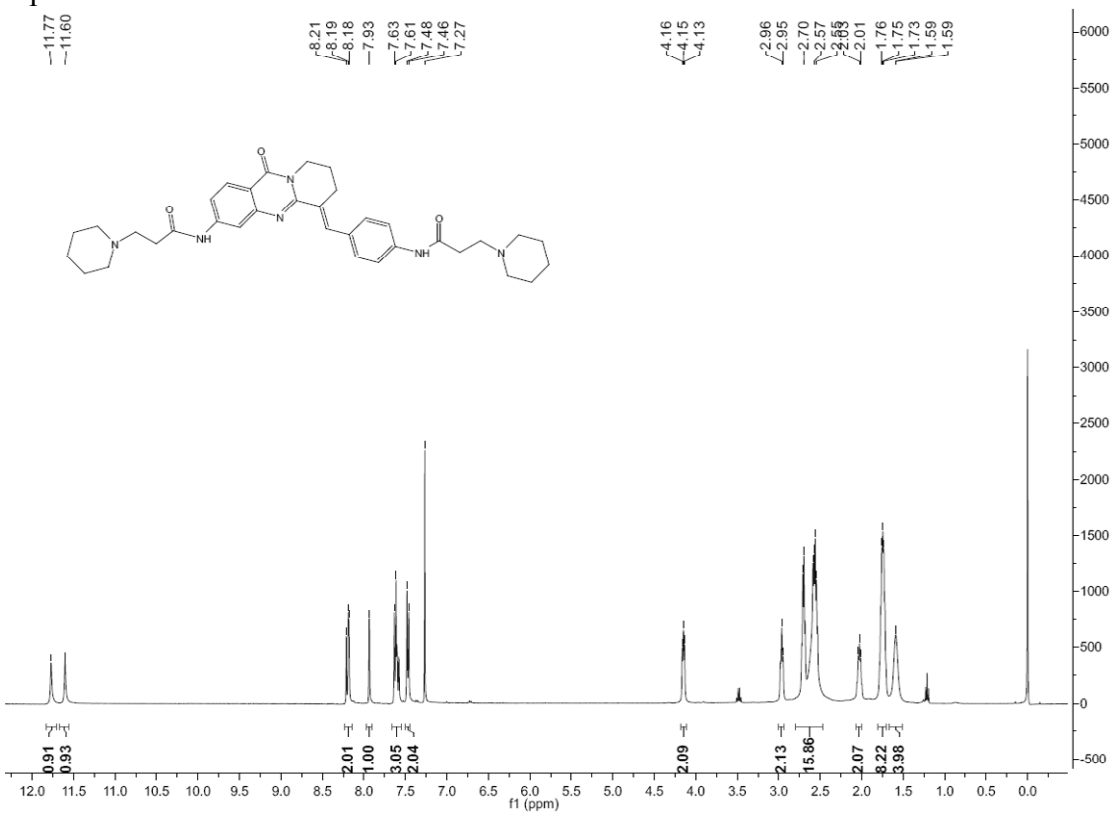


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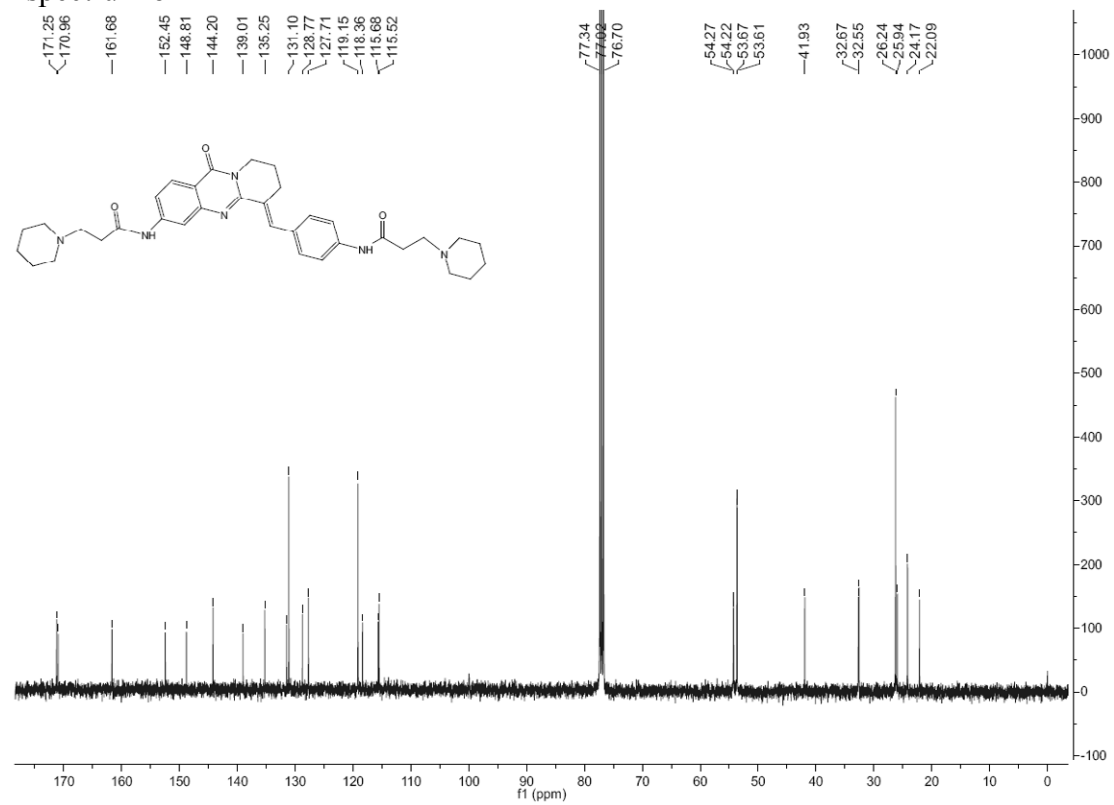

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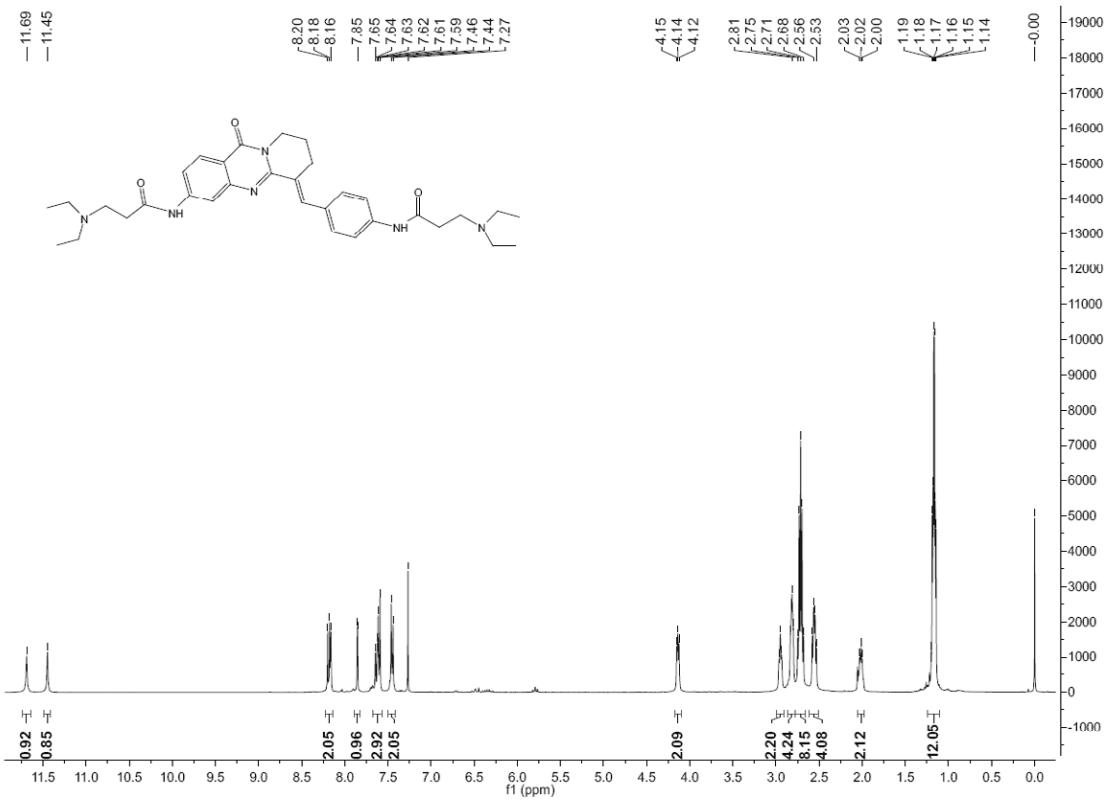


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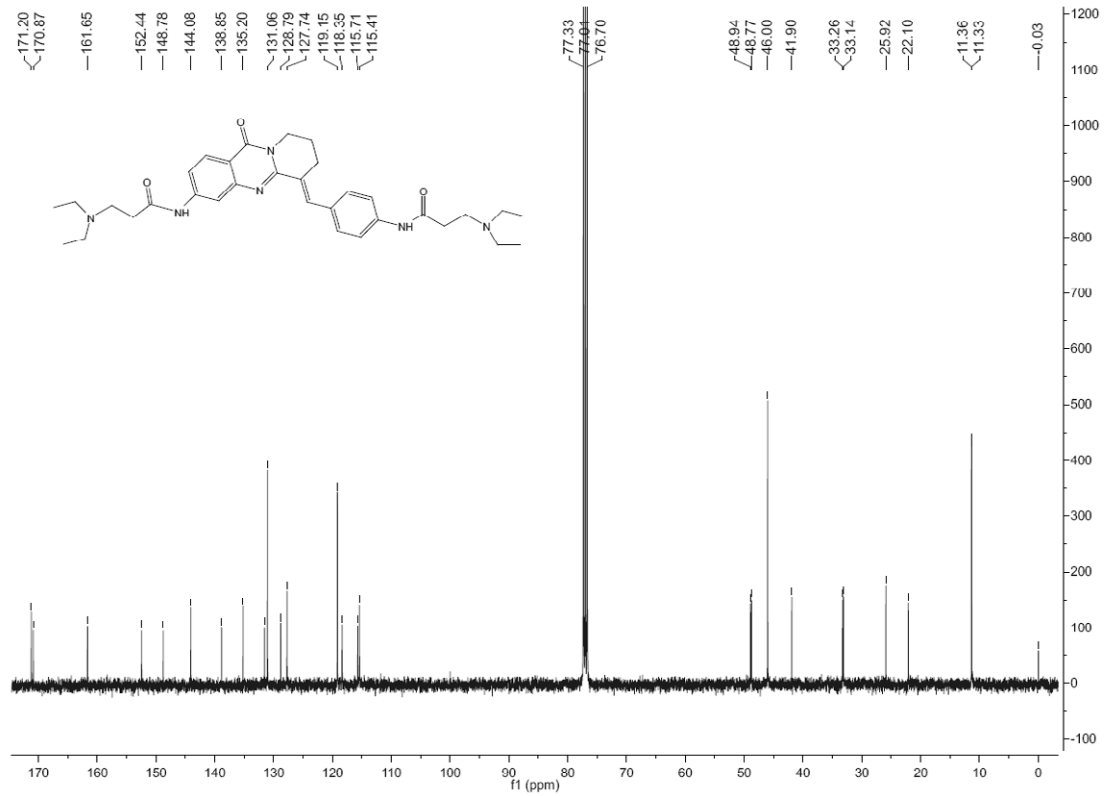

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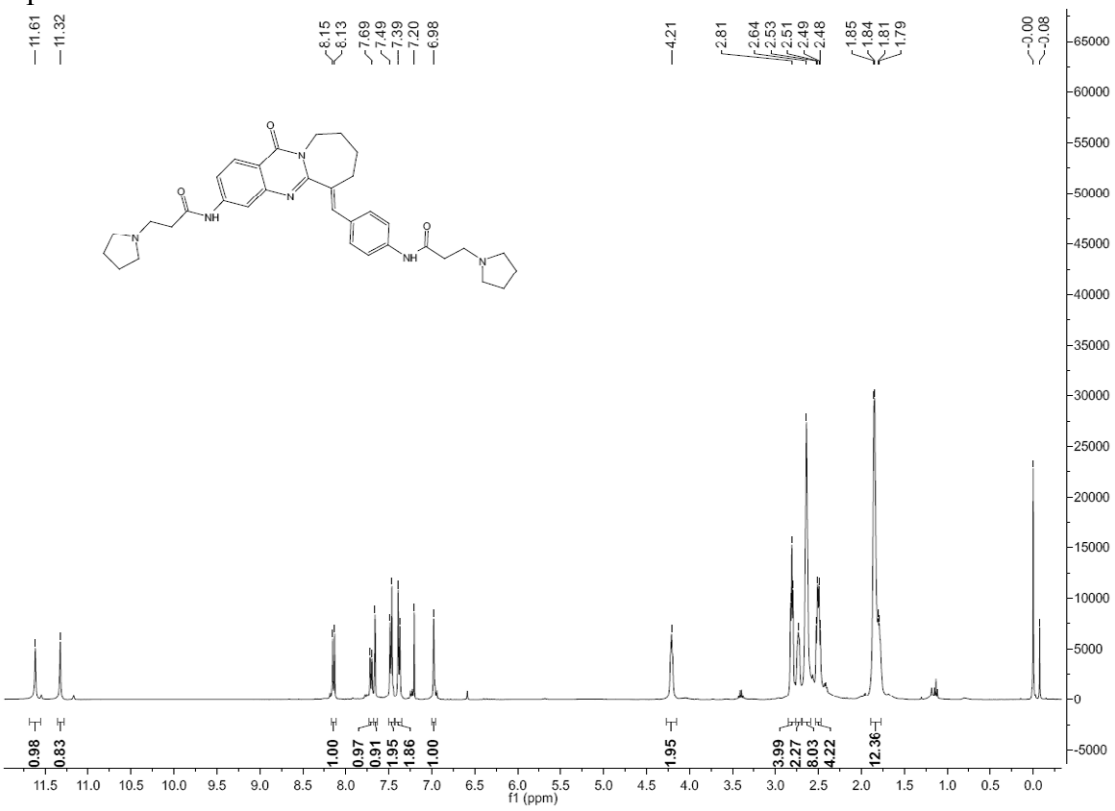
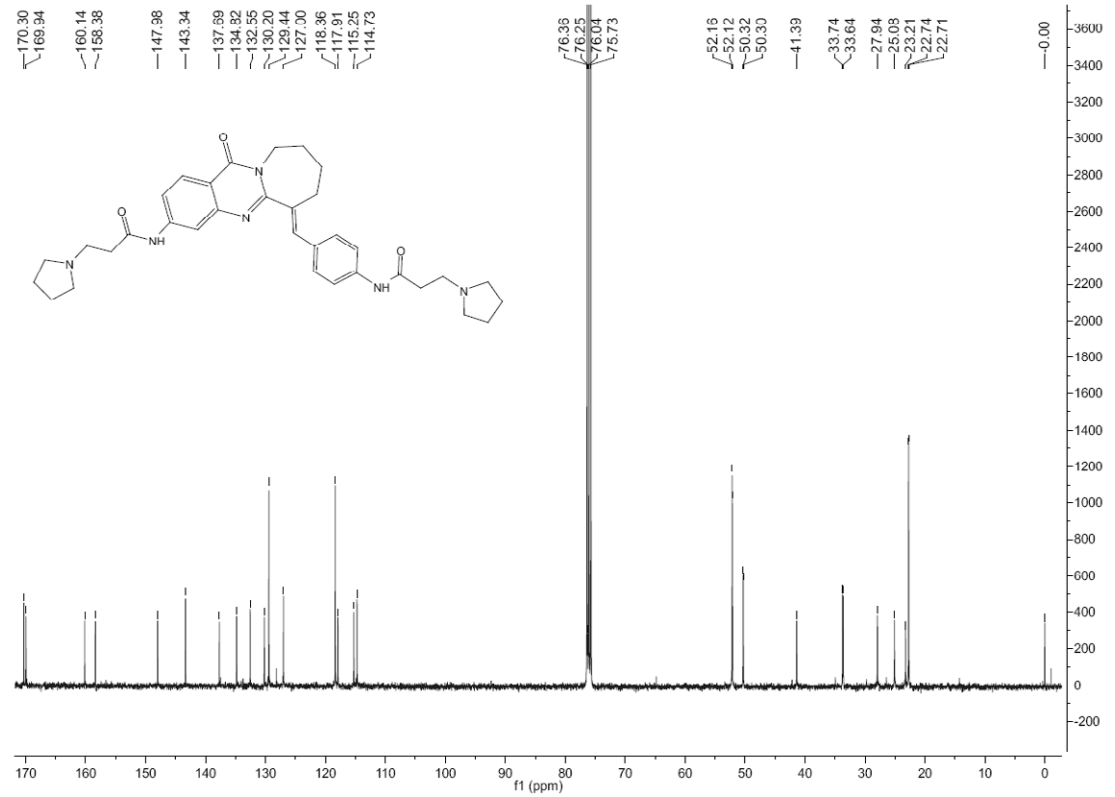



$^{13}$C NMR spectrum of **7h**



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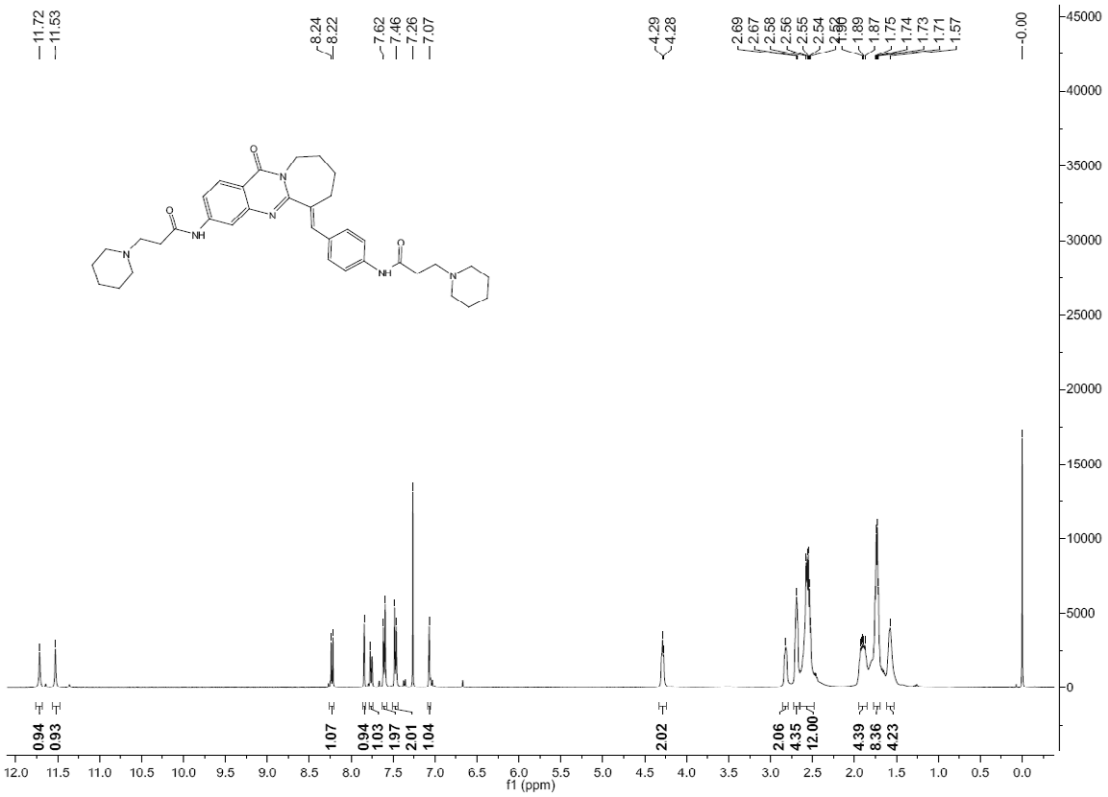


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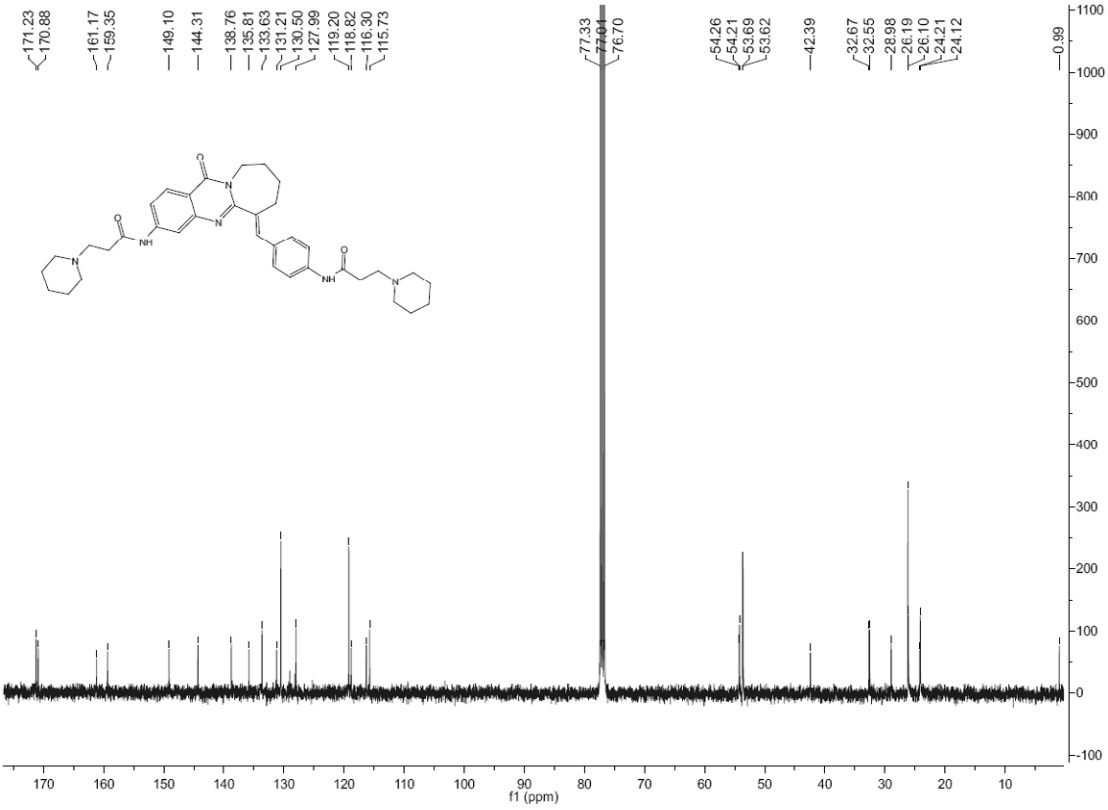

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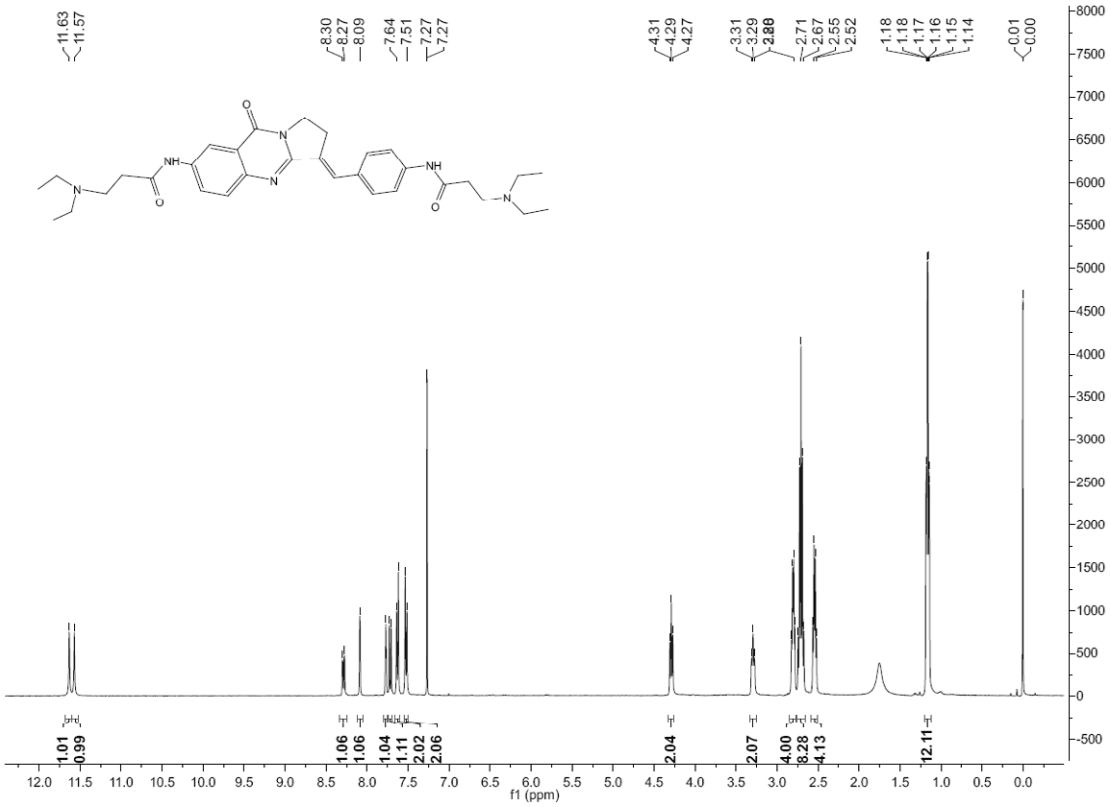


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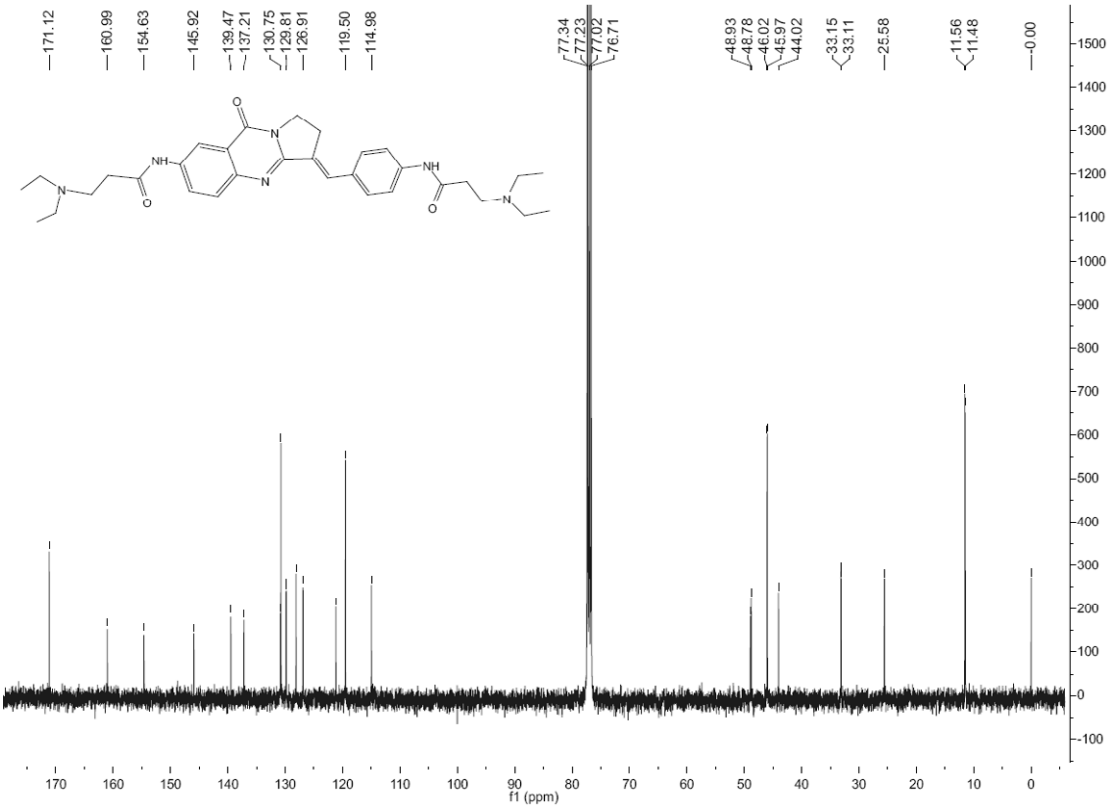

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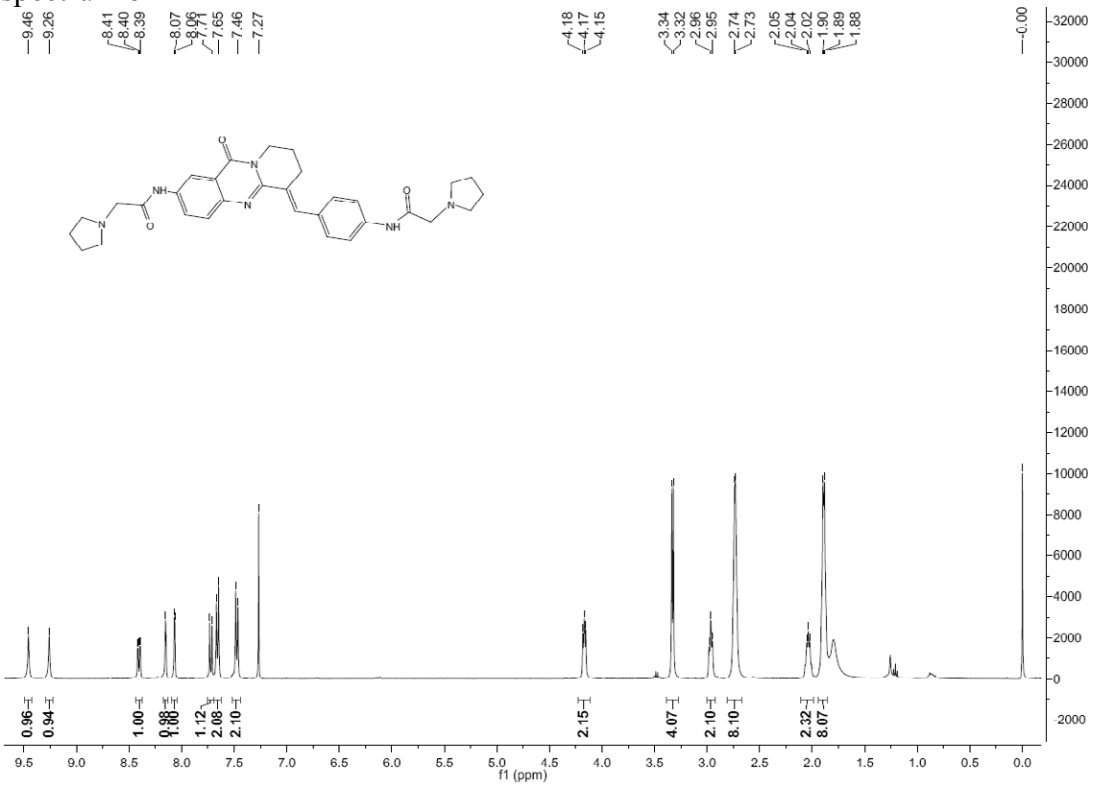
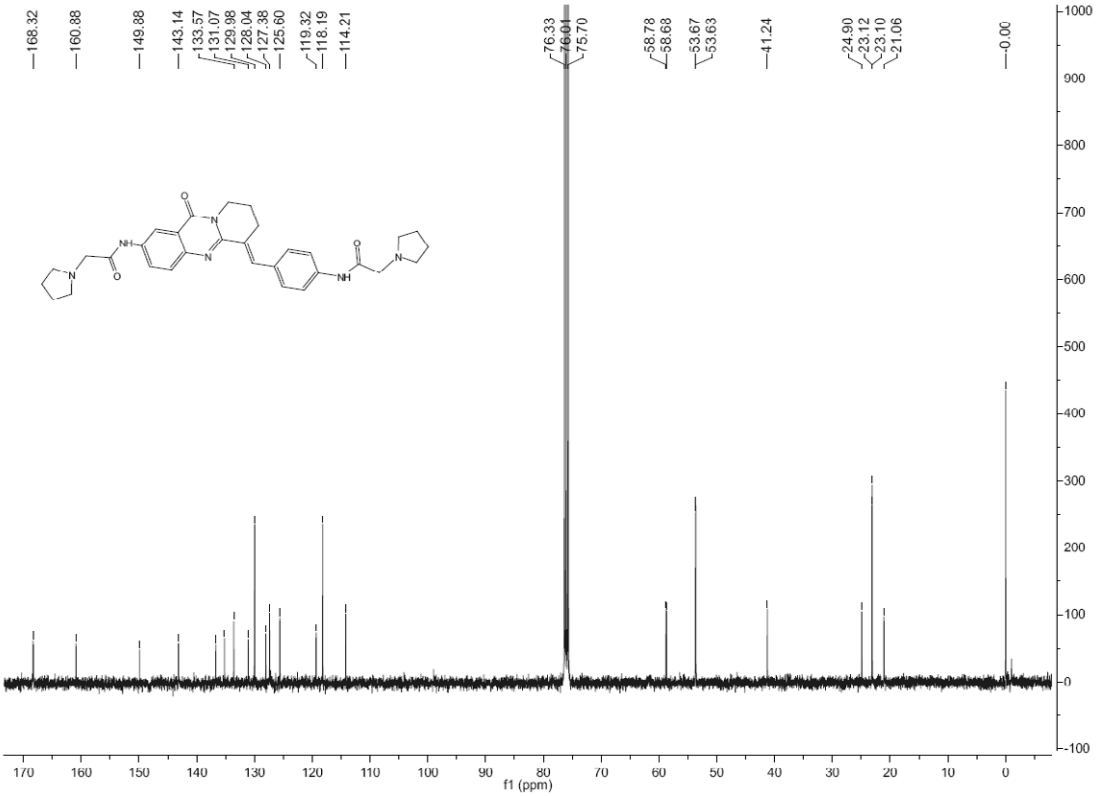



$^{13}$C NMR spectrum of **7k**



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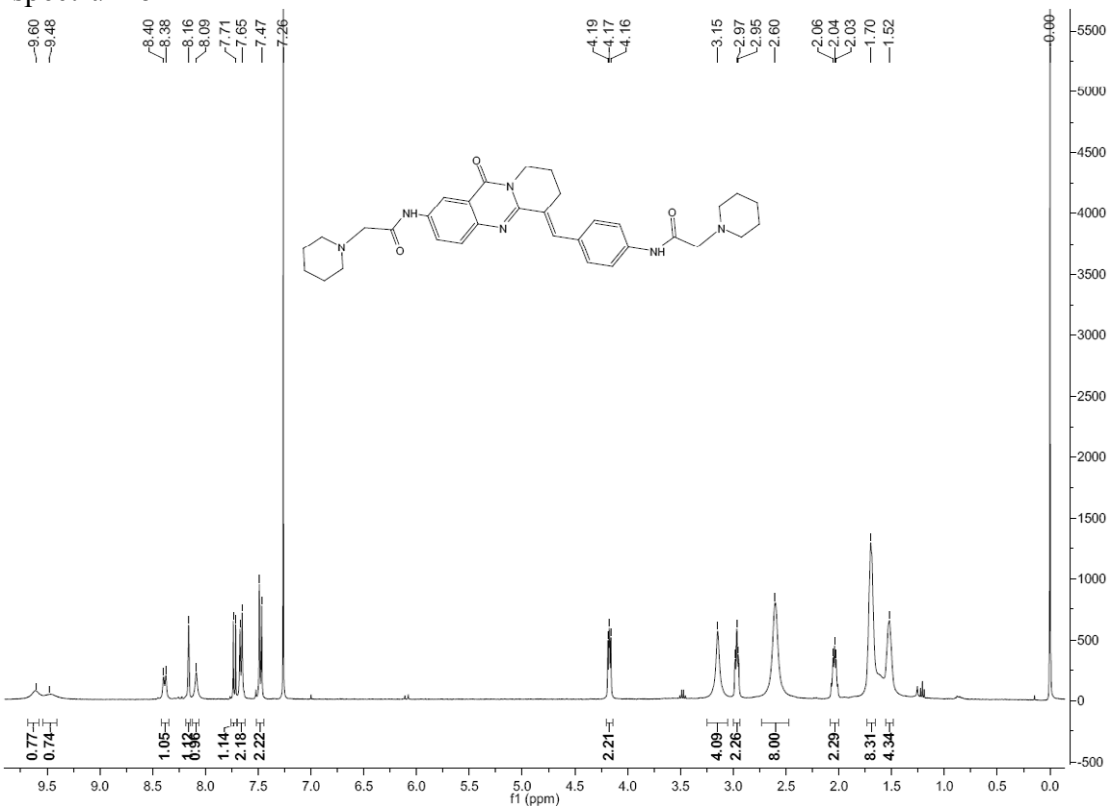


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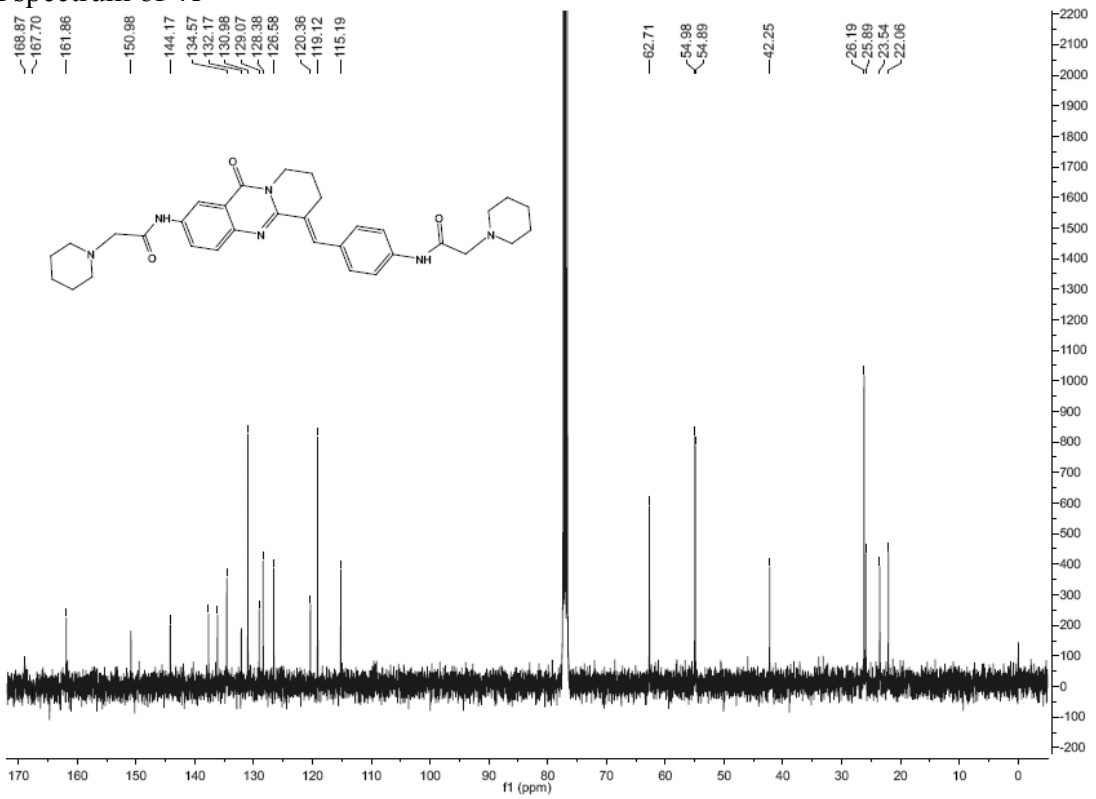

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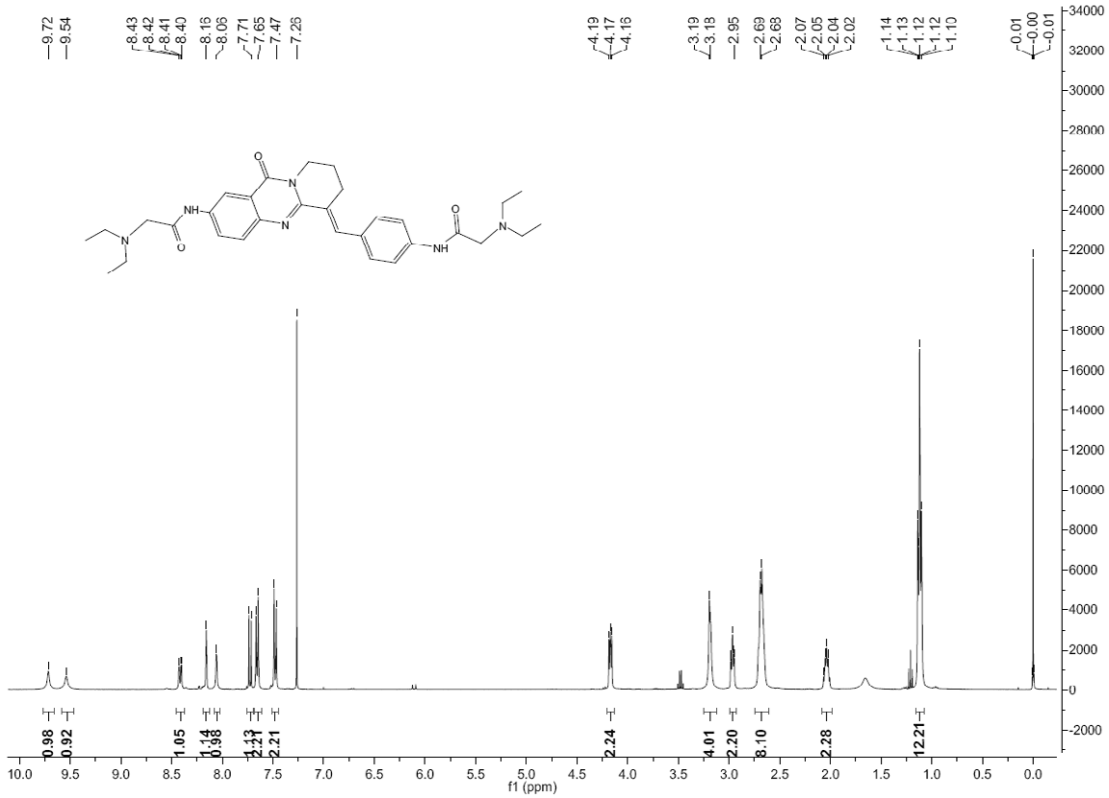
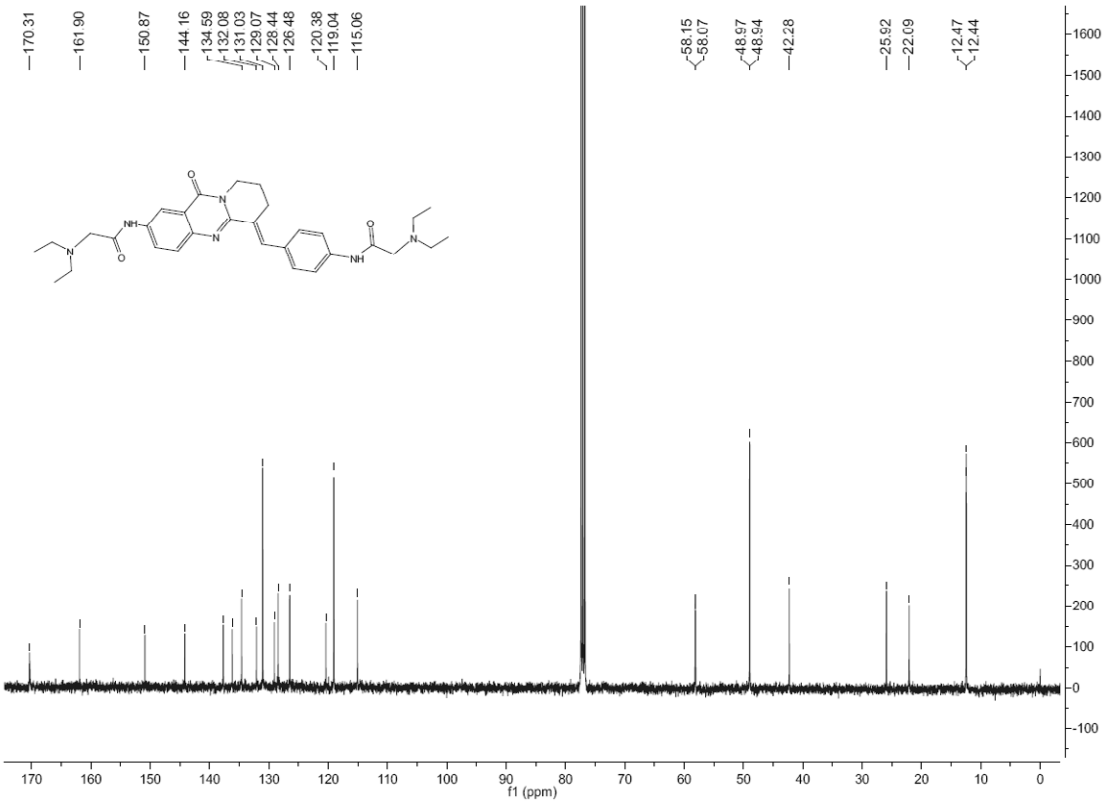



$^{13}$C NMR spectrum of **7m**



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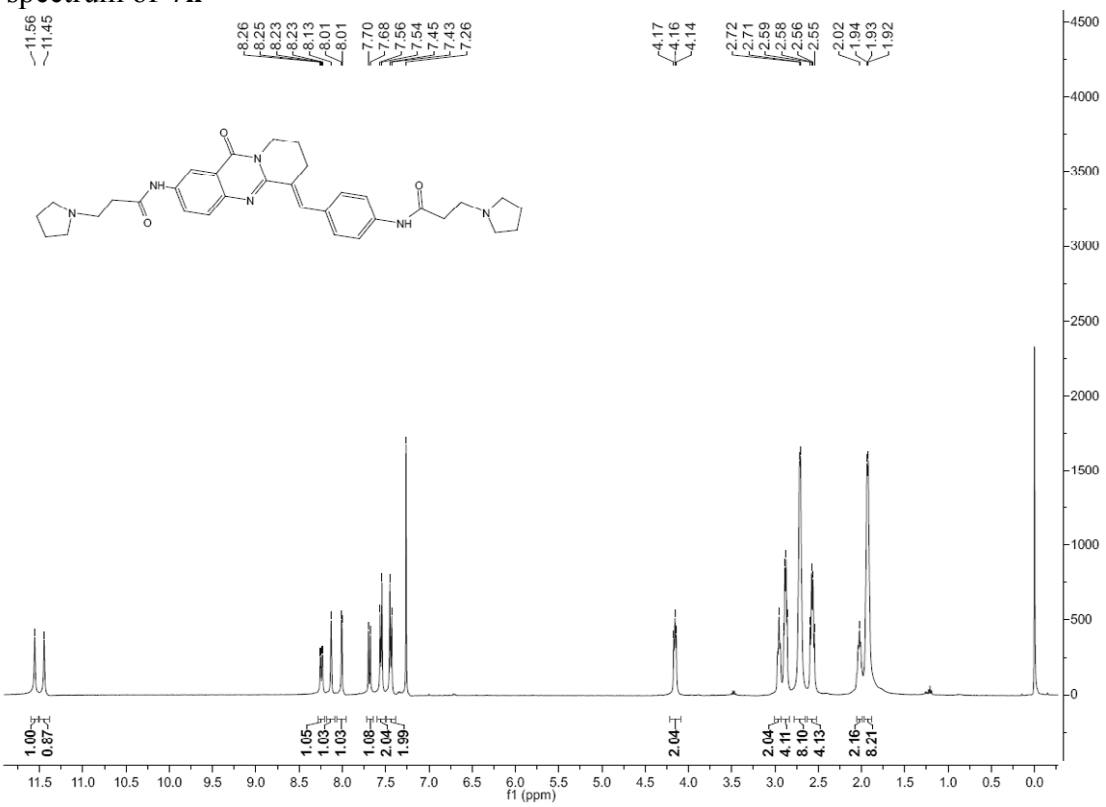


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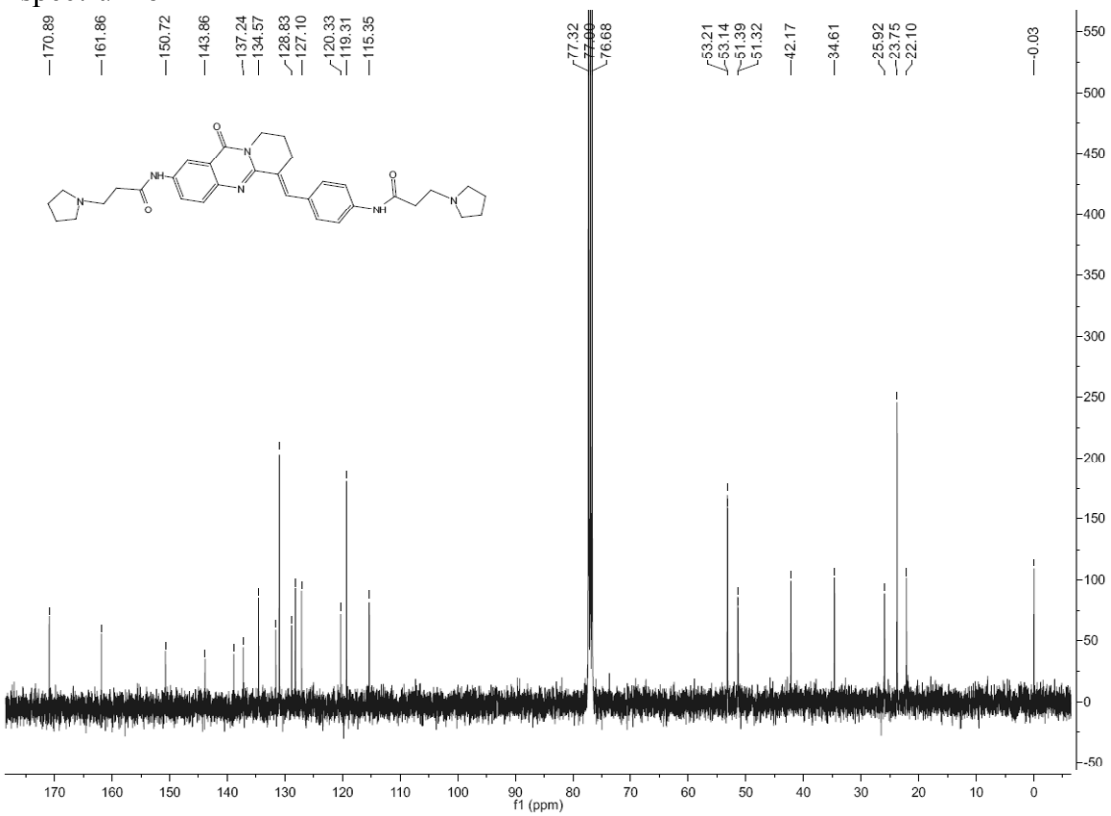

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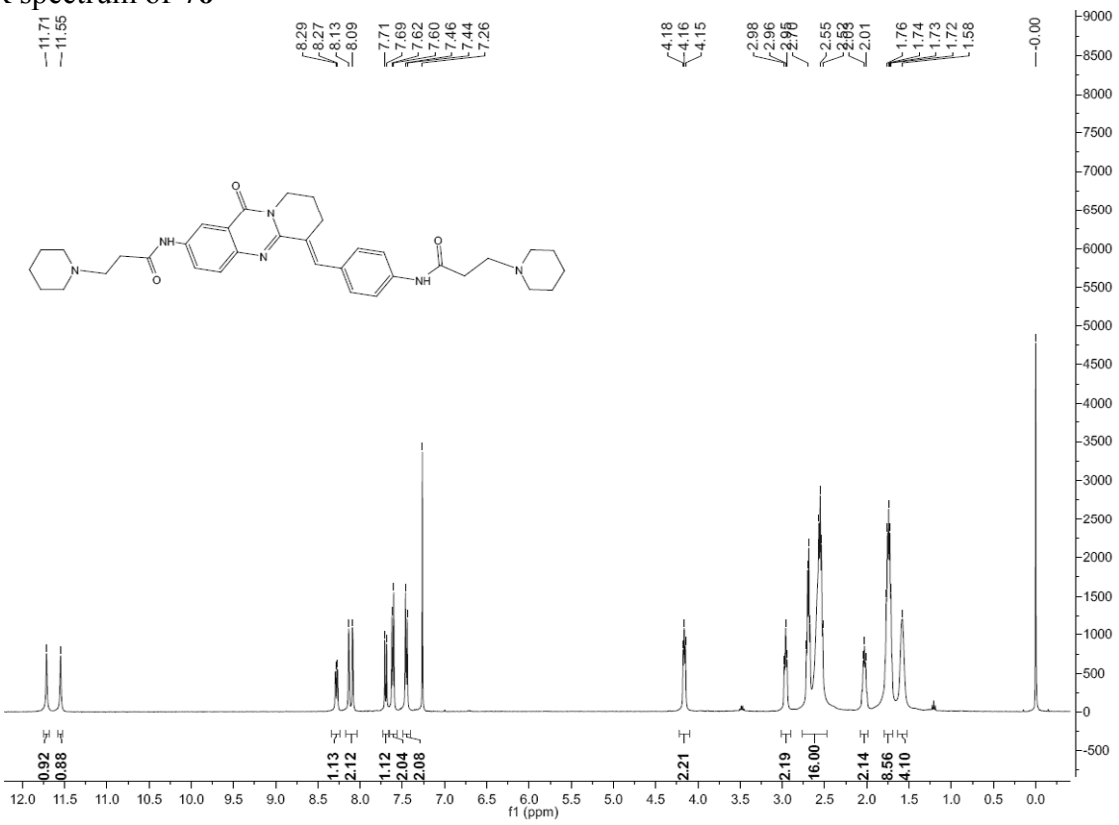


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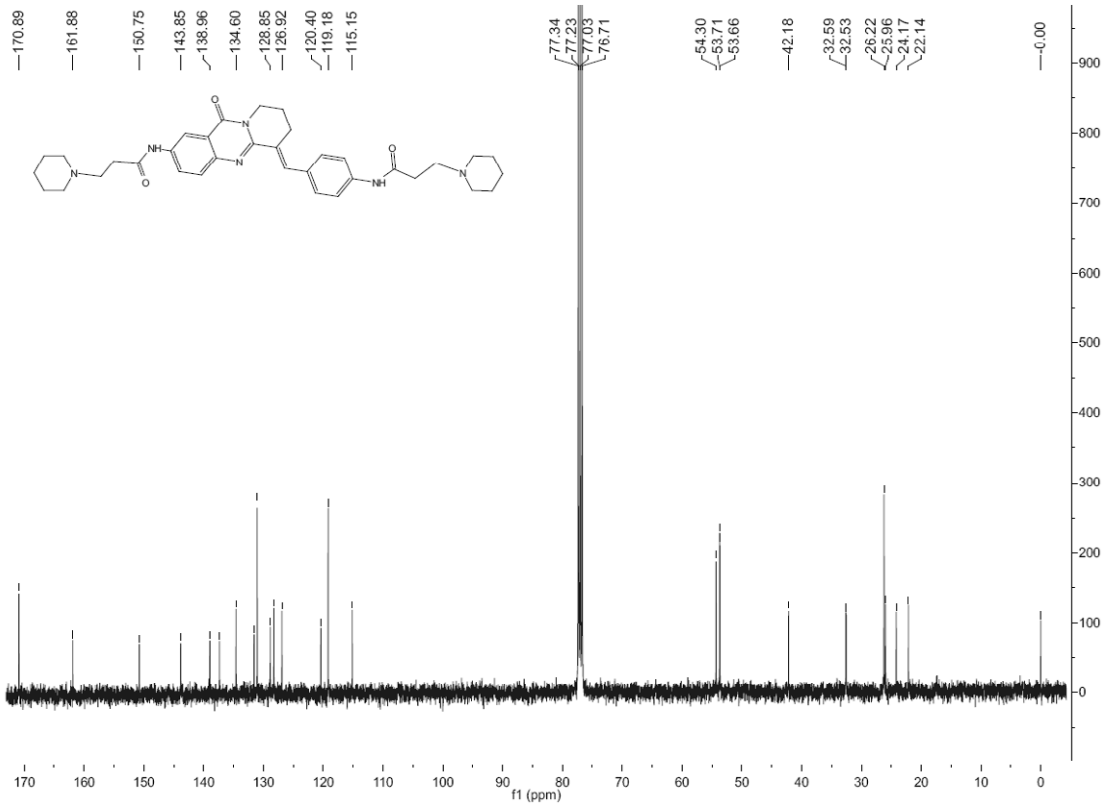

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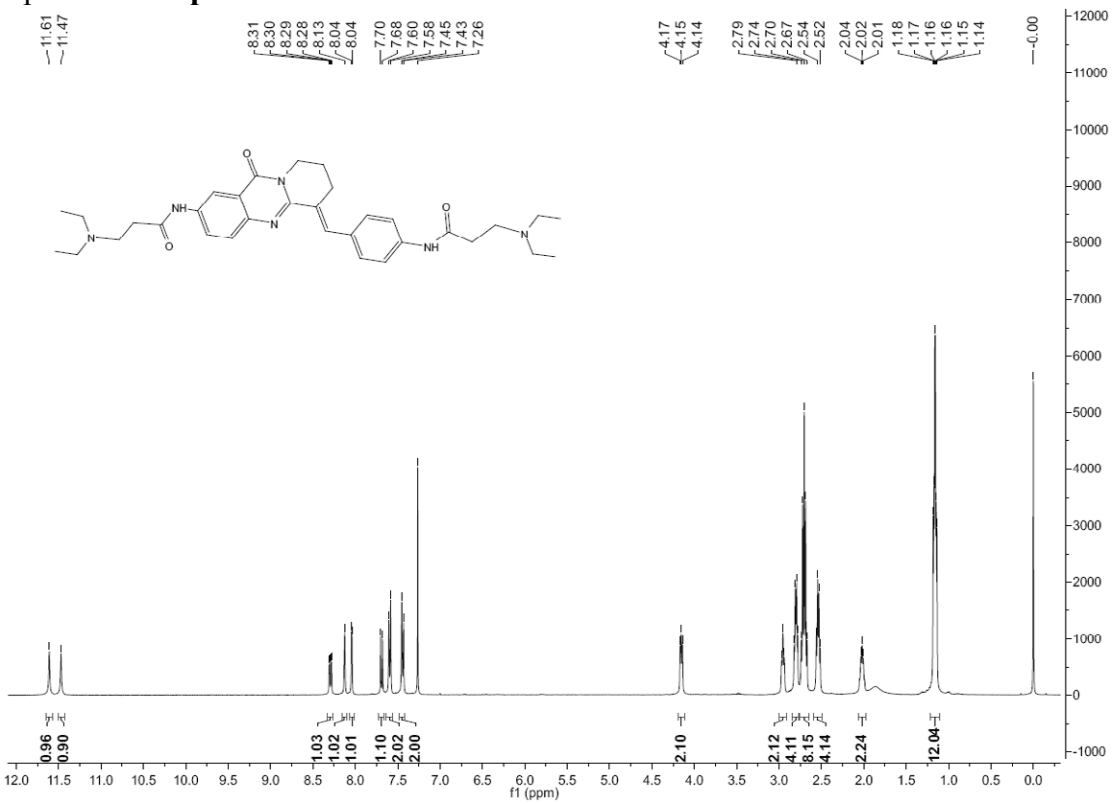
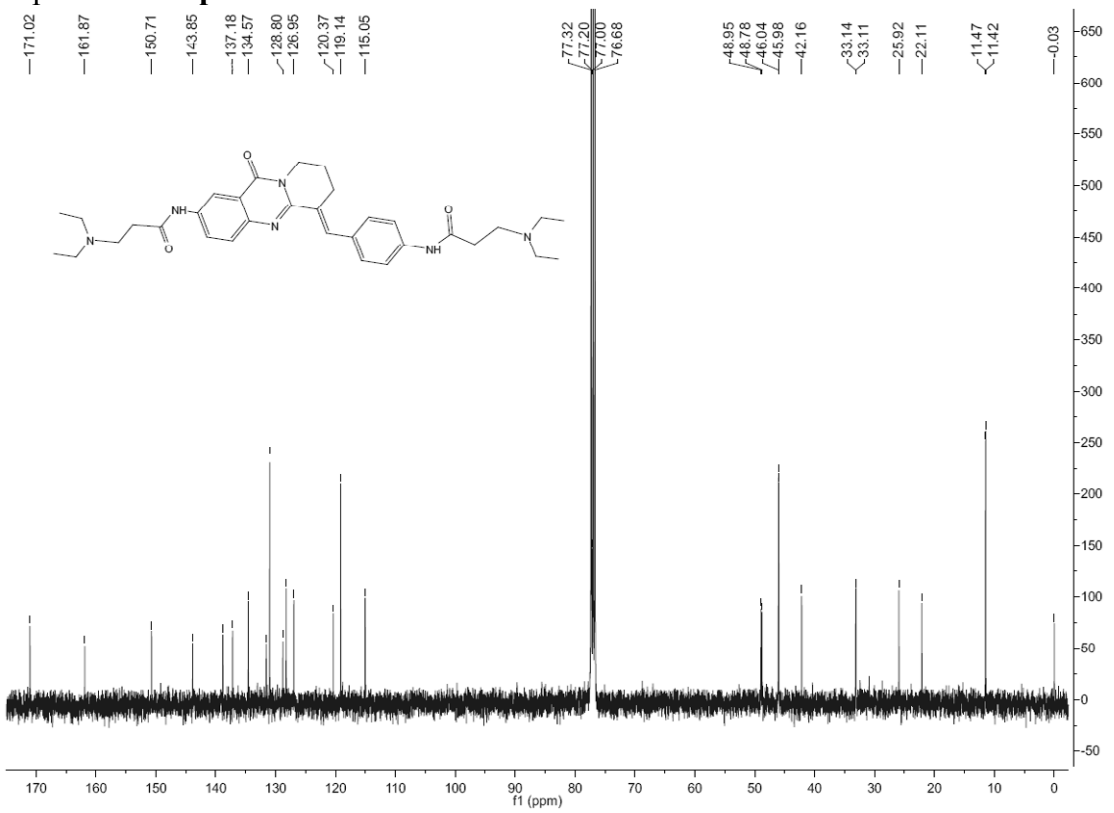



$^{13}$C NMR spectrum of **7p**



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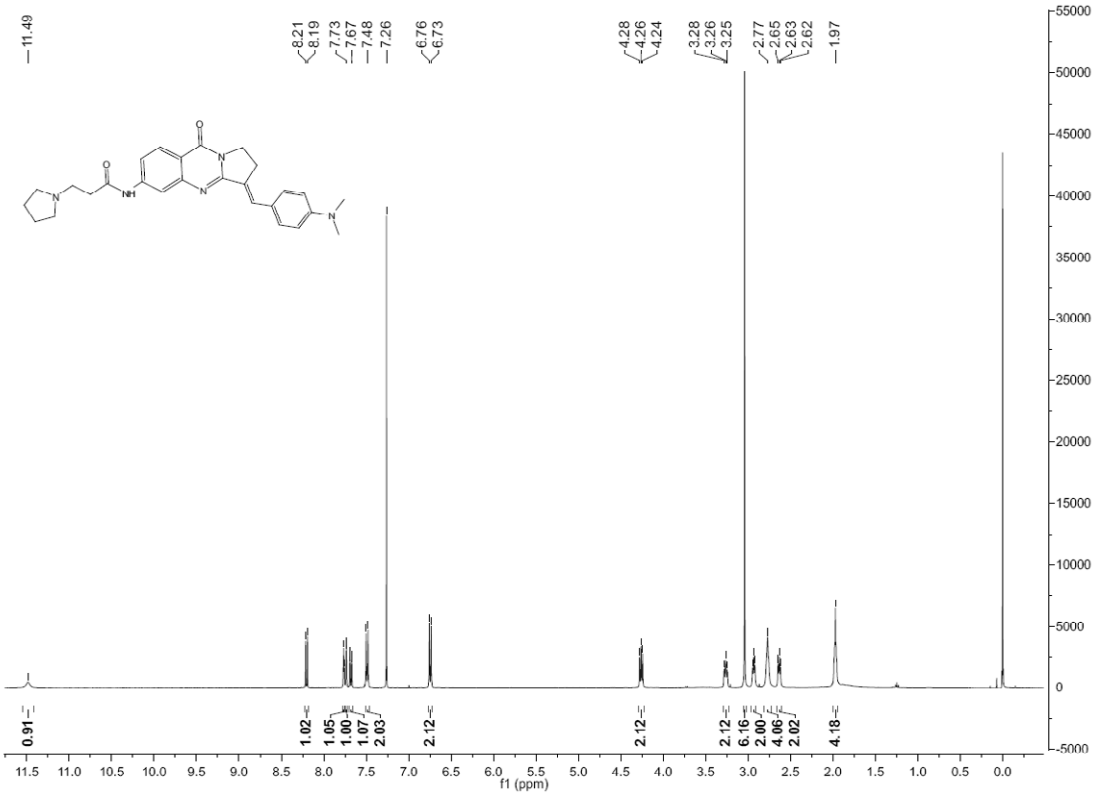
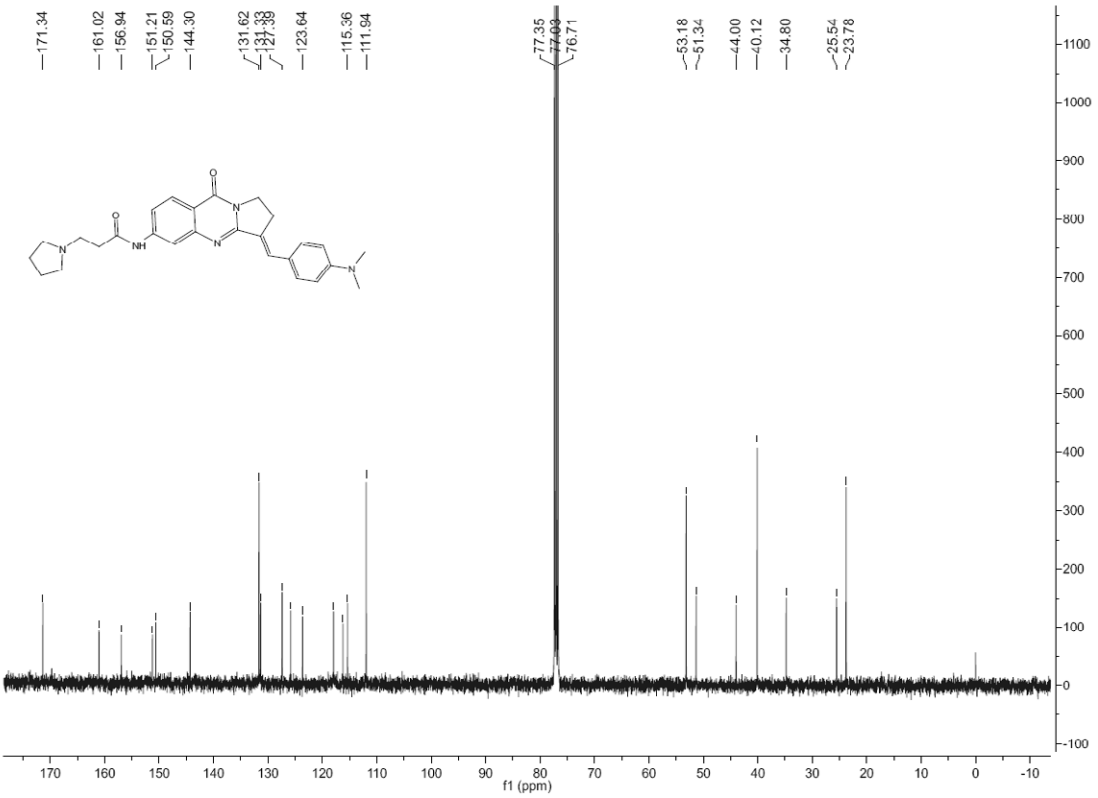



$^{13}$C NMR spectrum of **7q**



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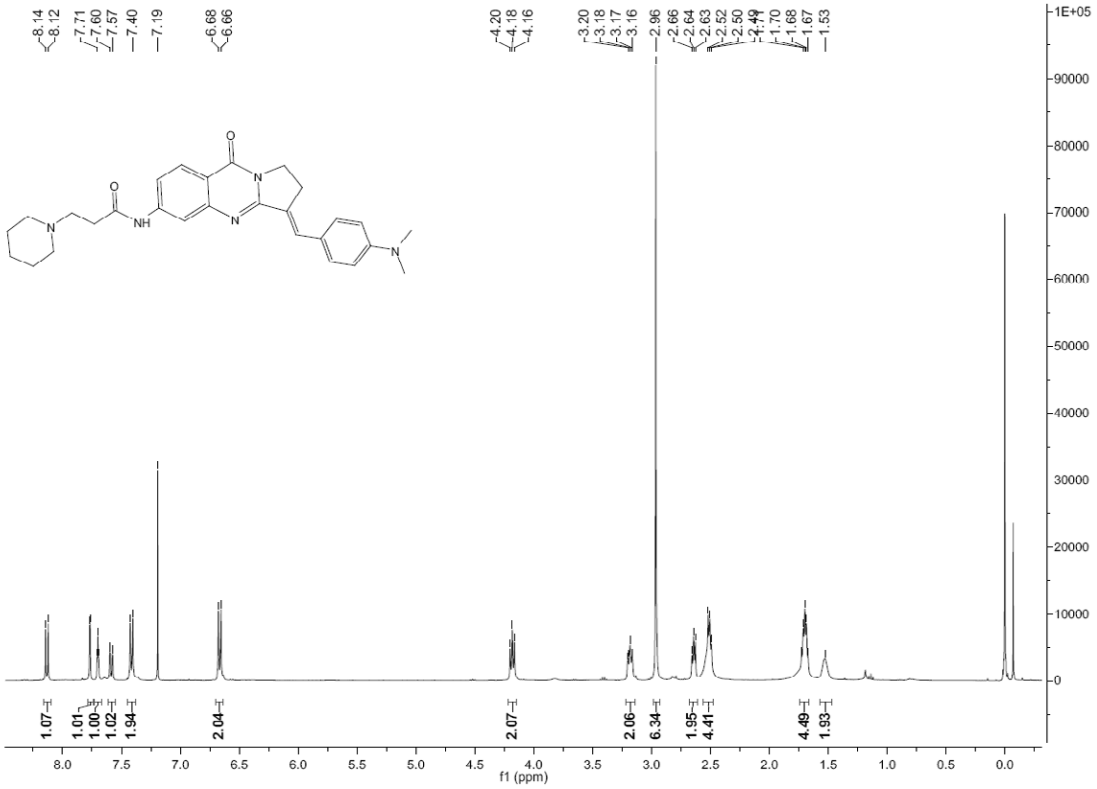


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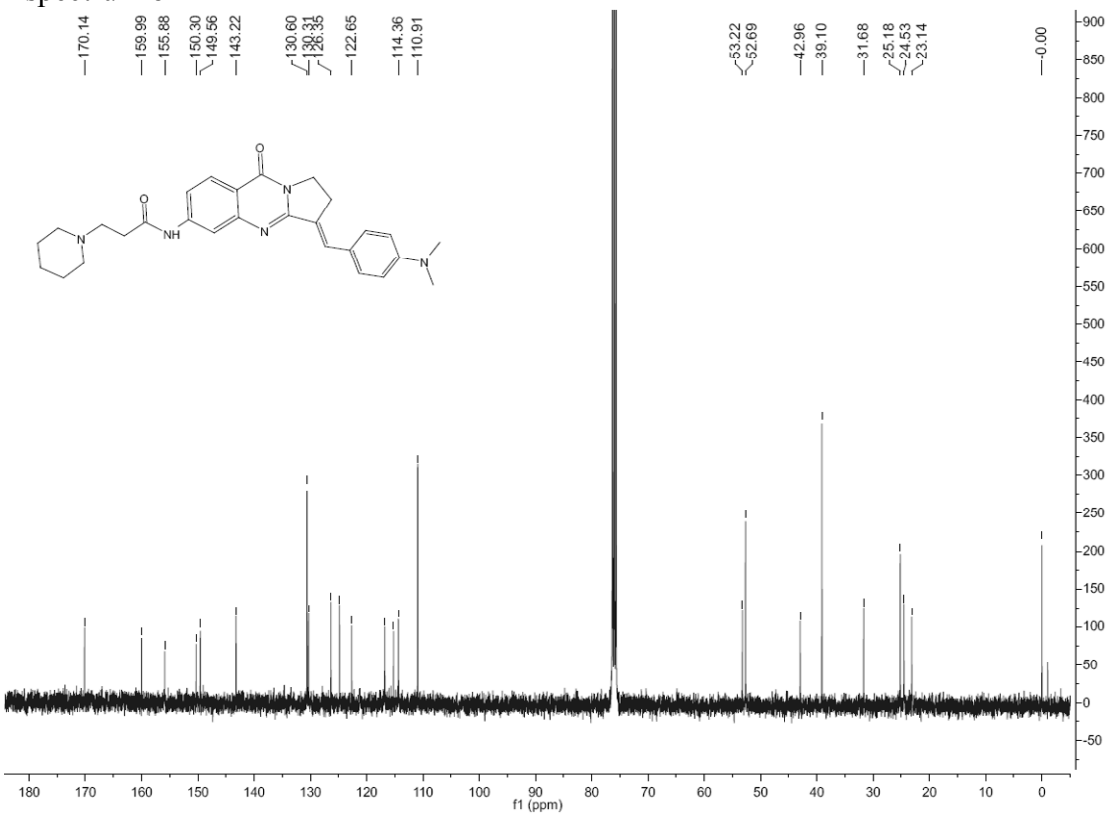

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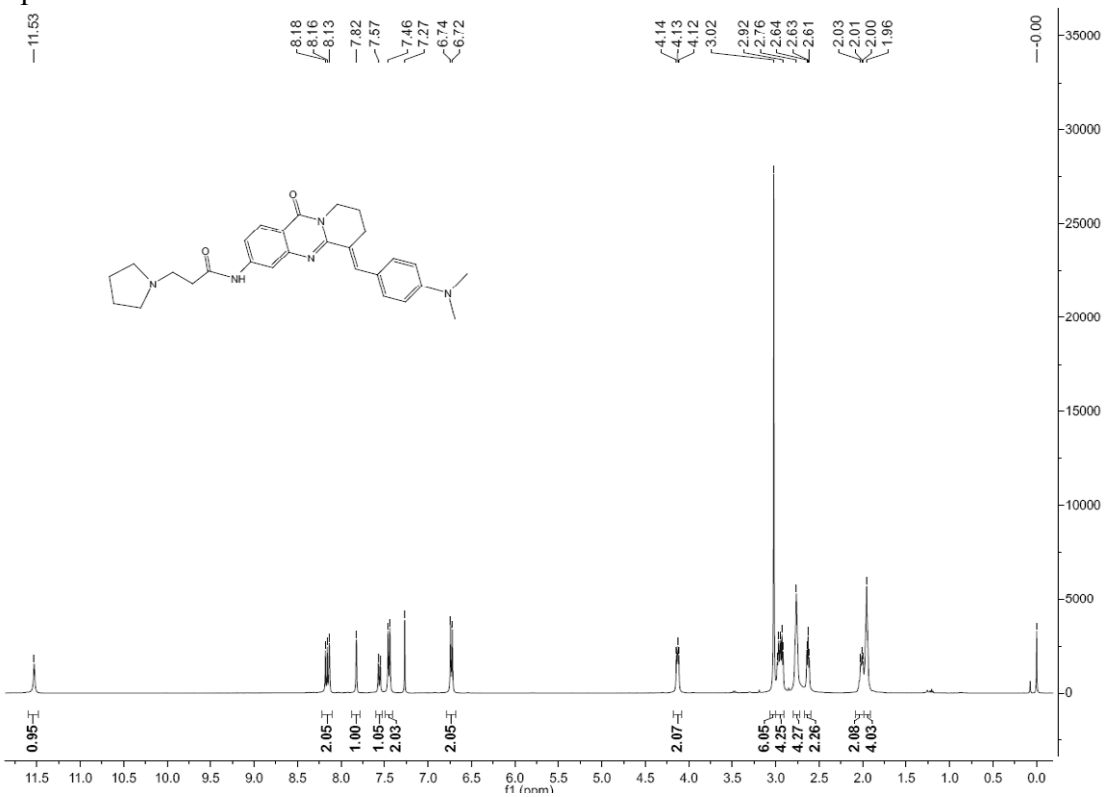


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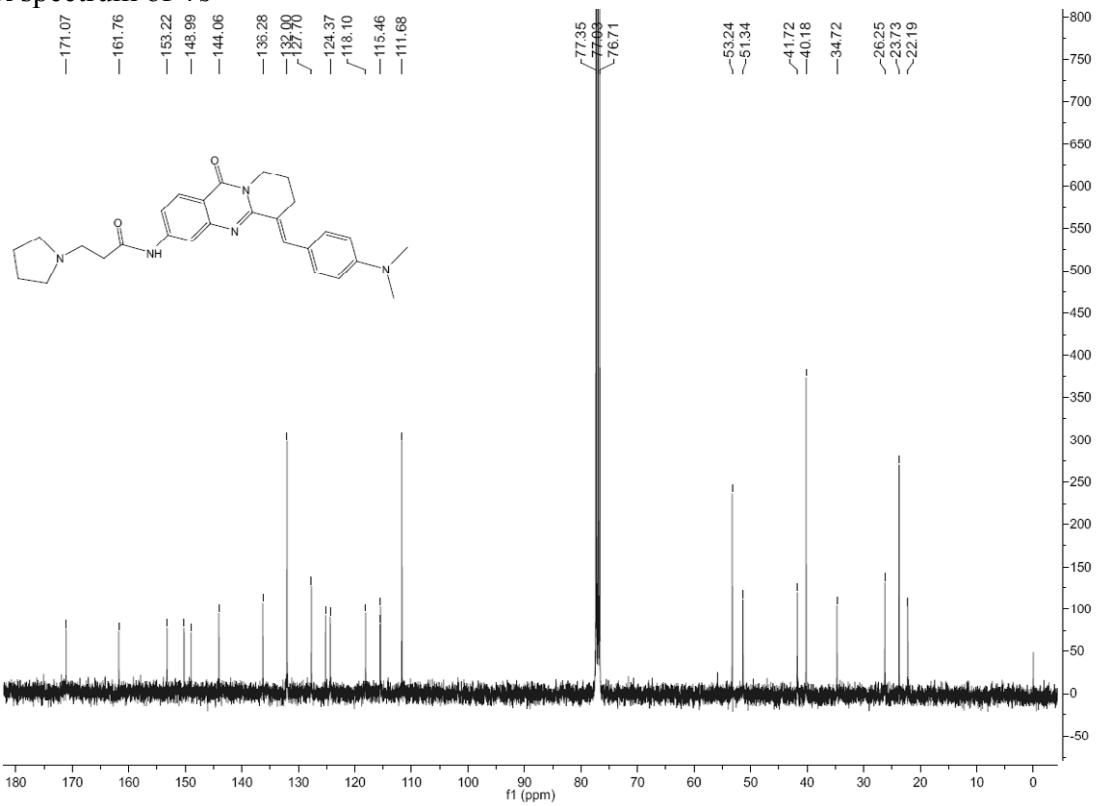

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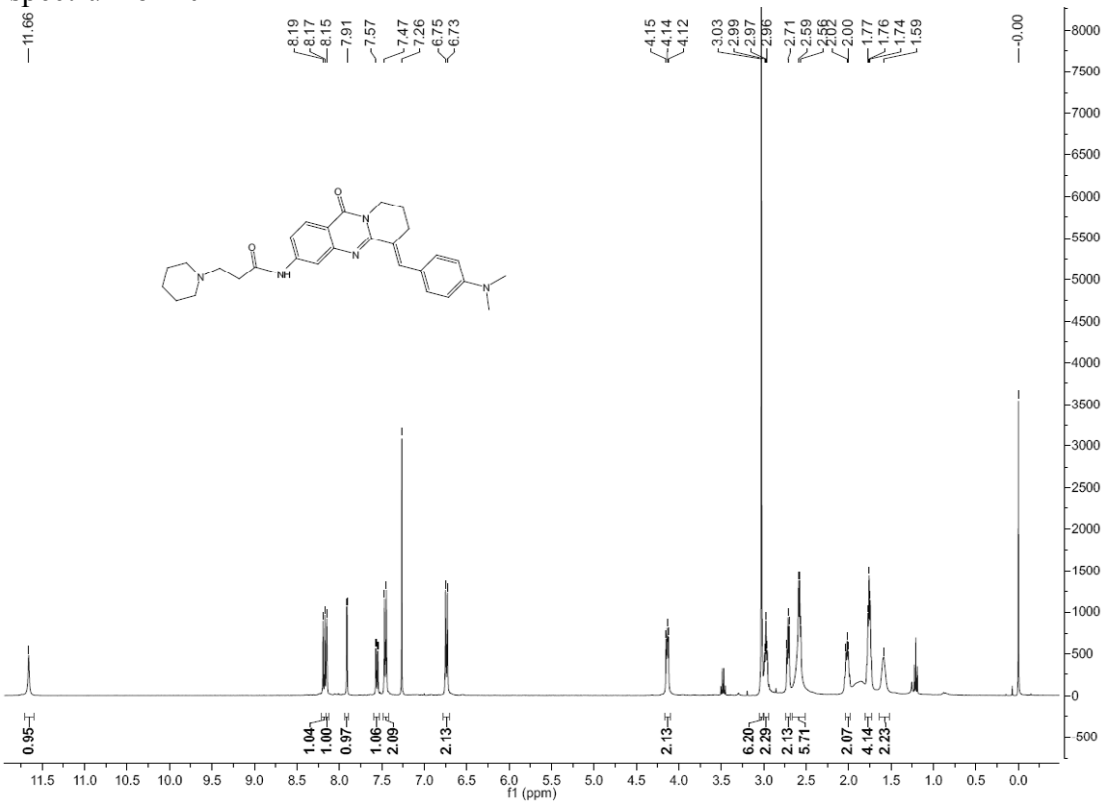


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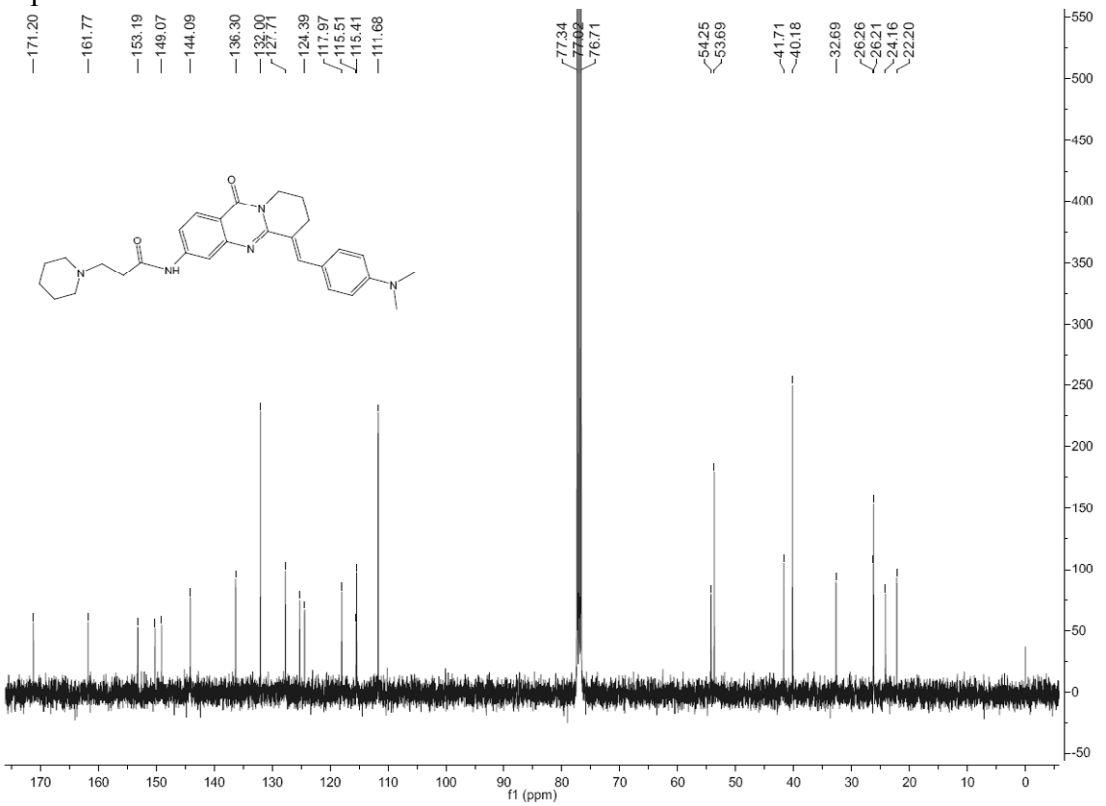

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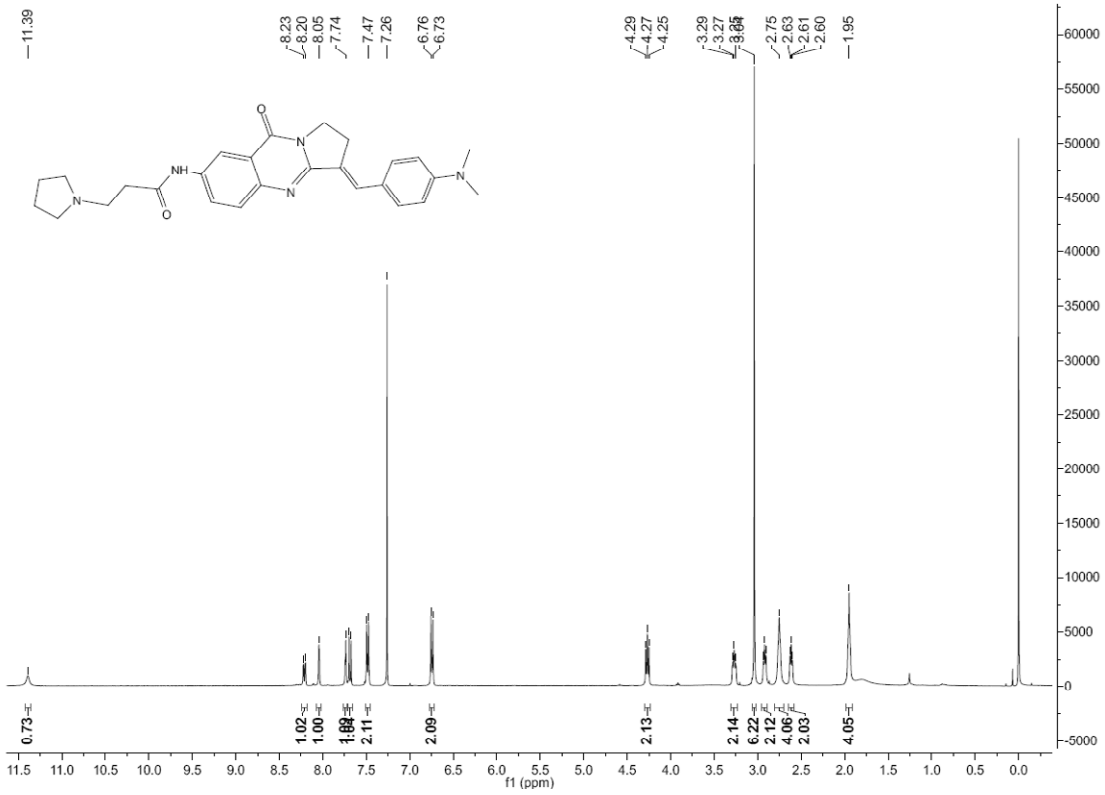


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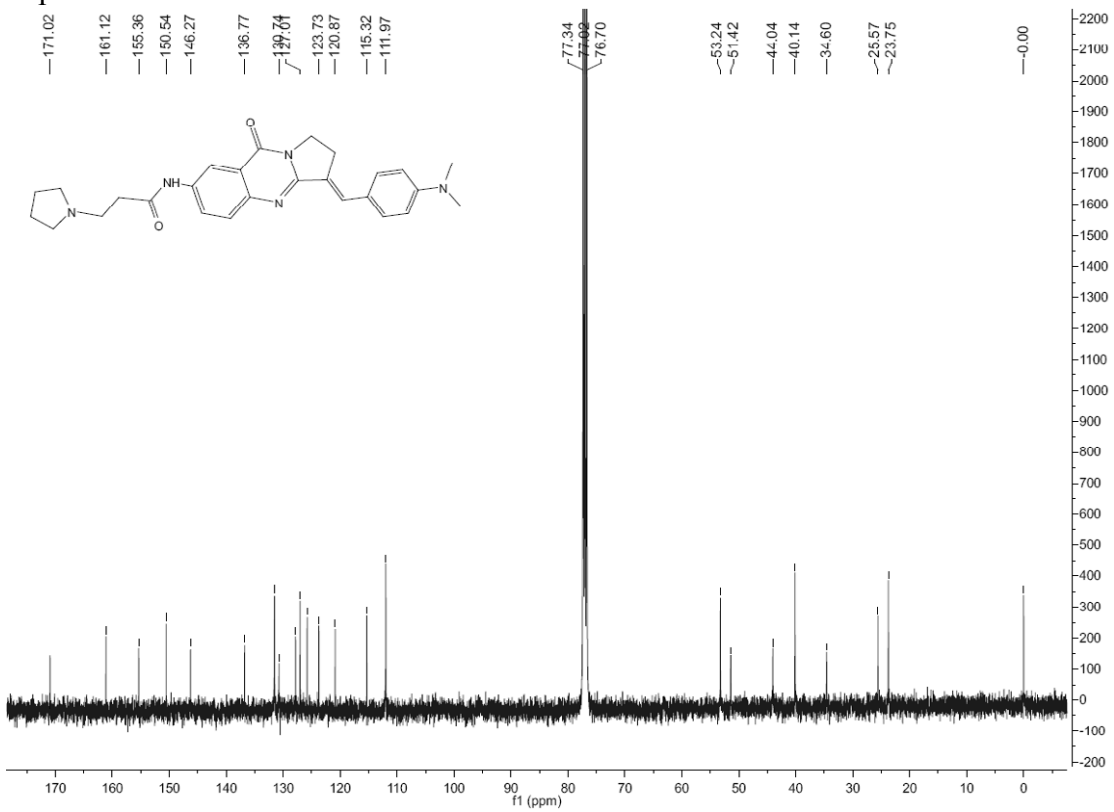

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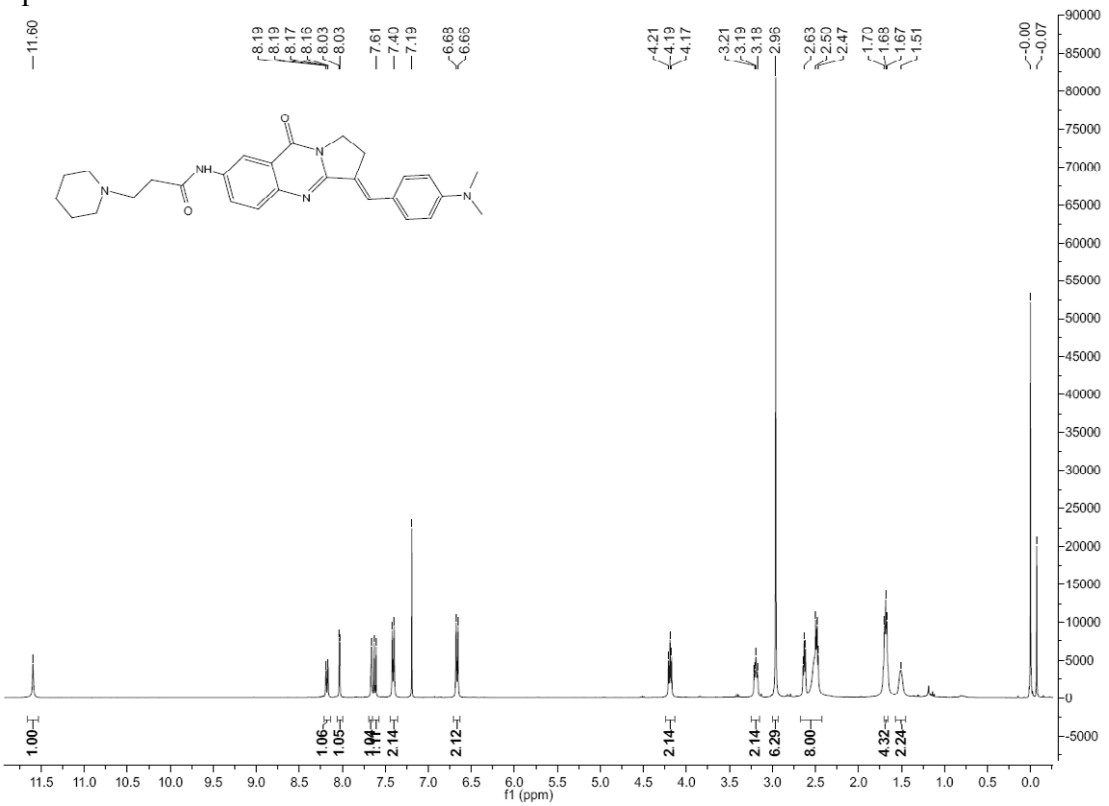


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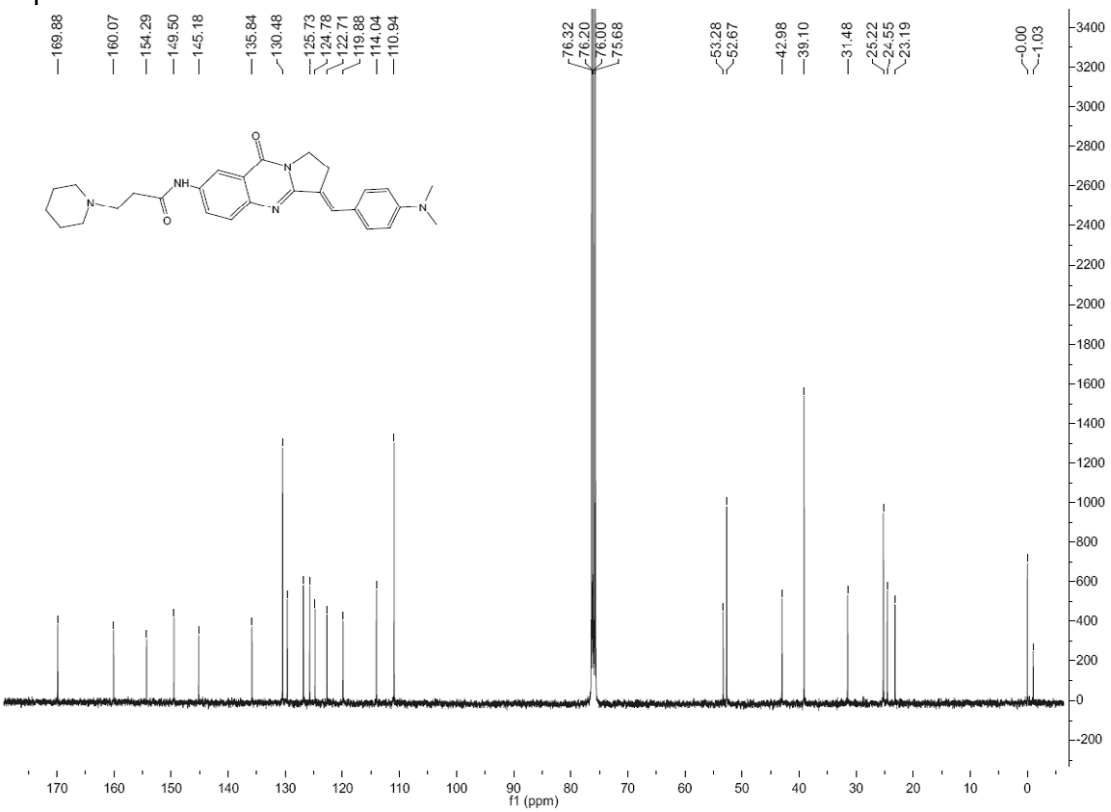

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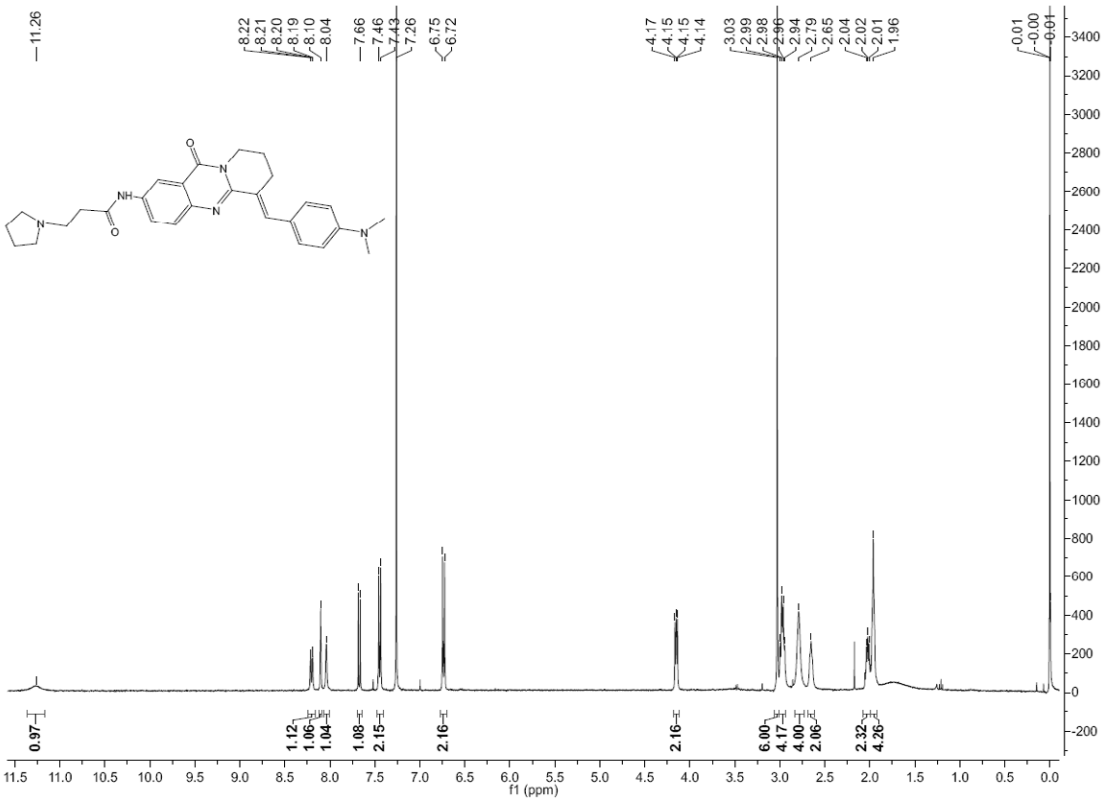


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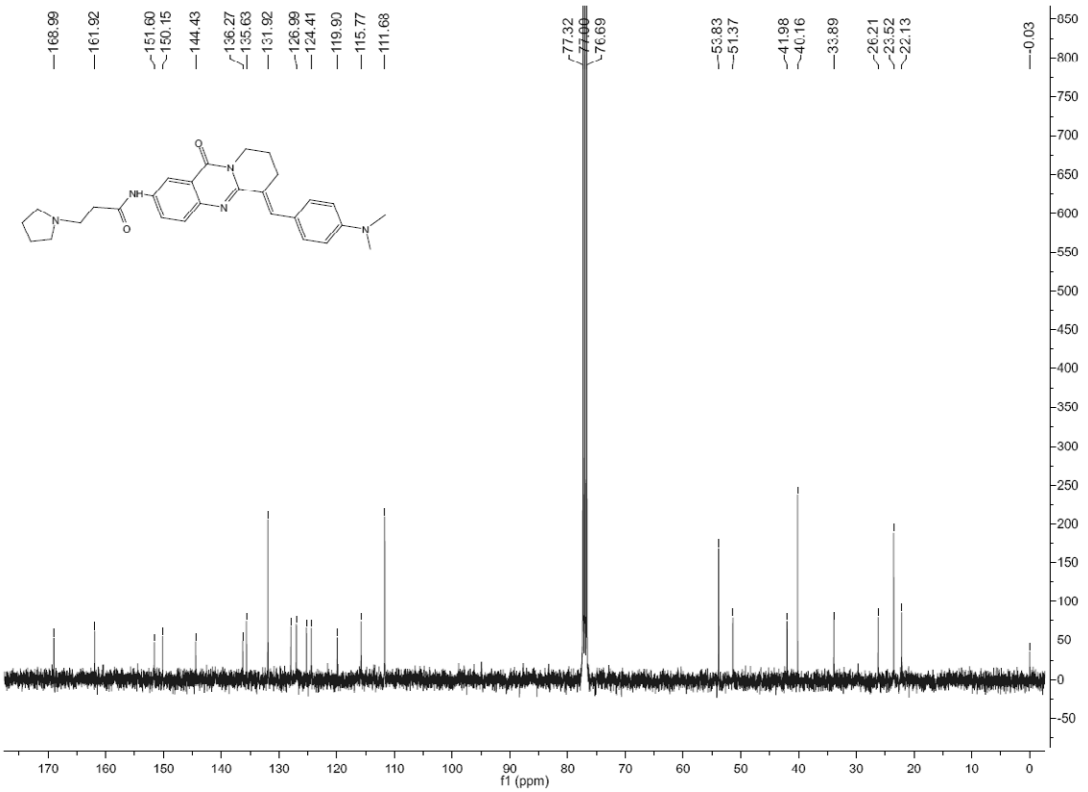

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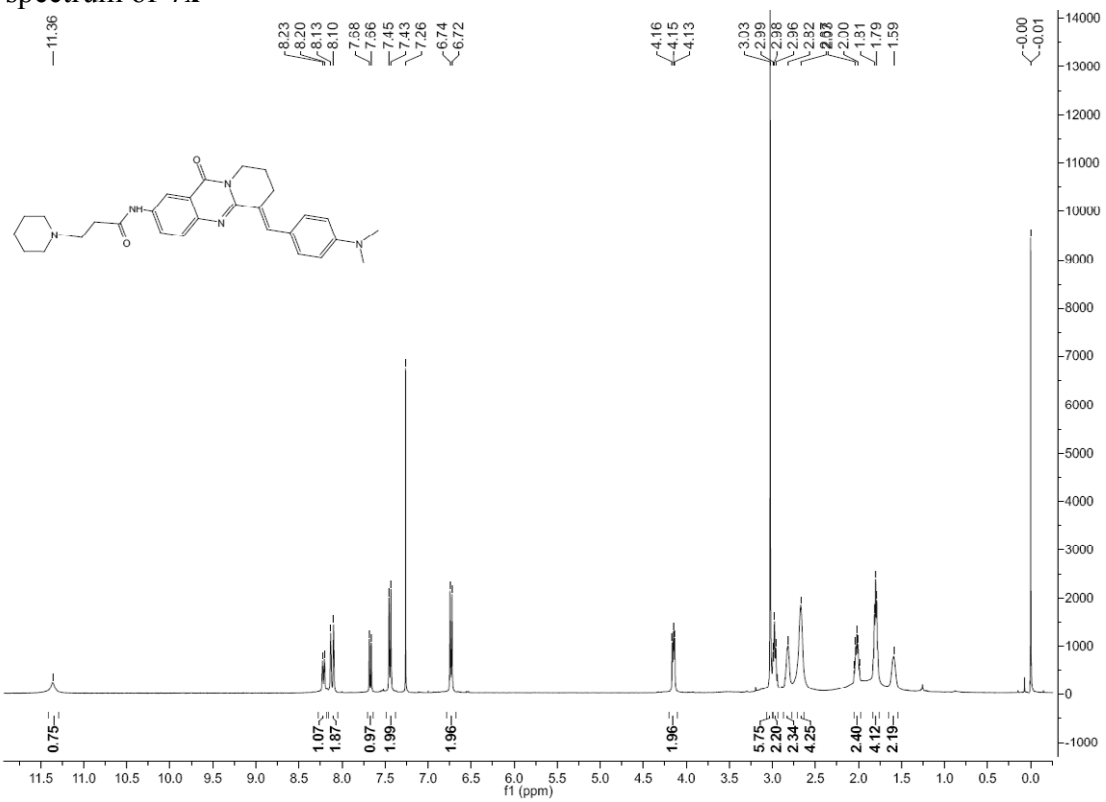
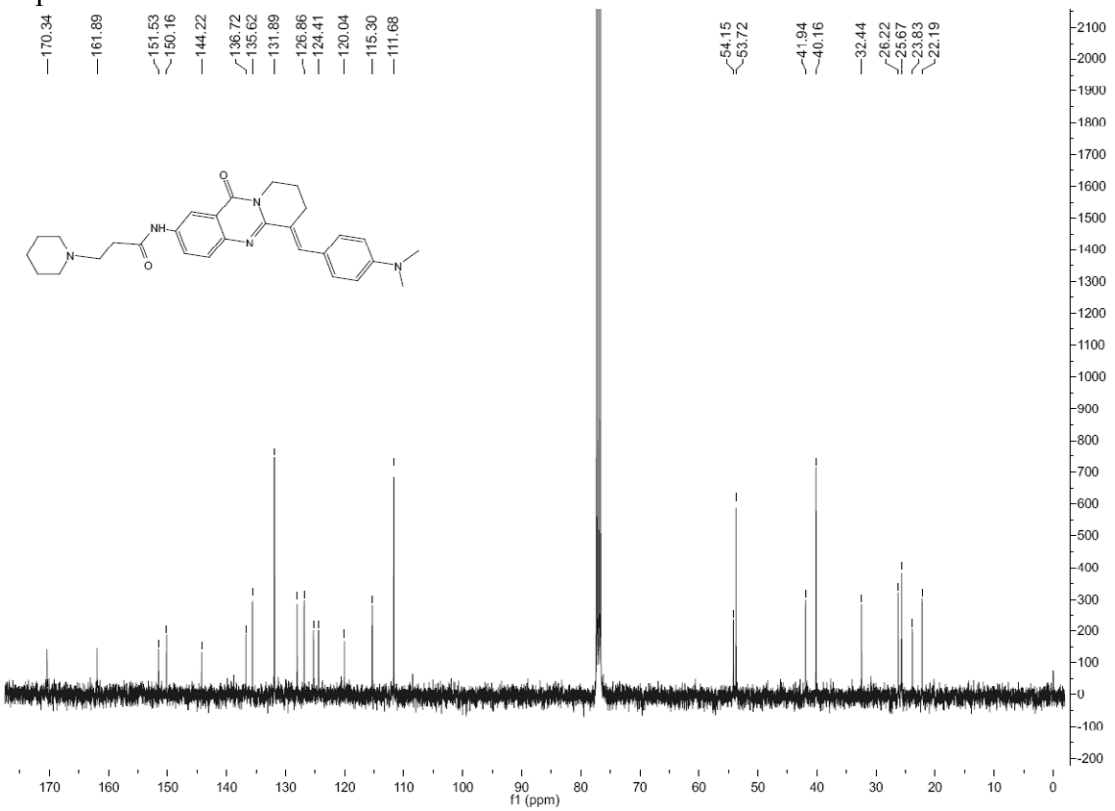
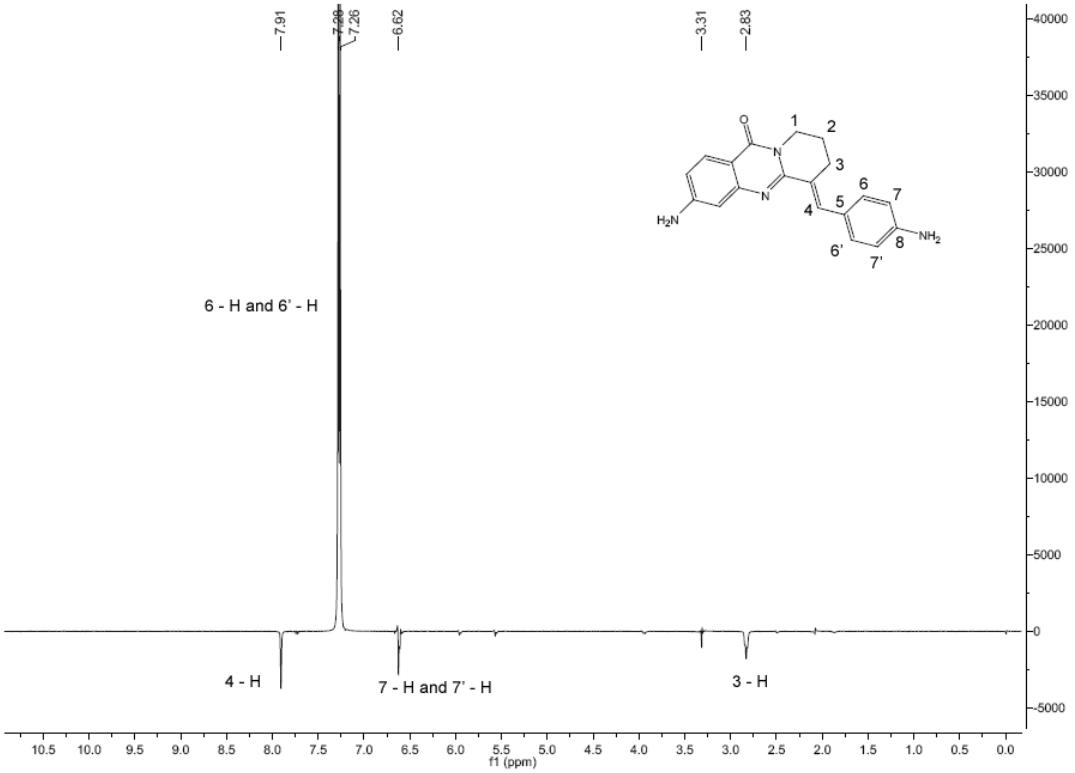



$^{13}$C NMR spectrum of **7x**

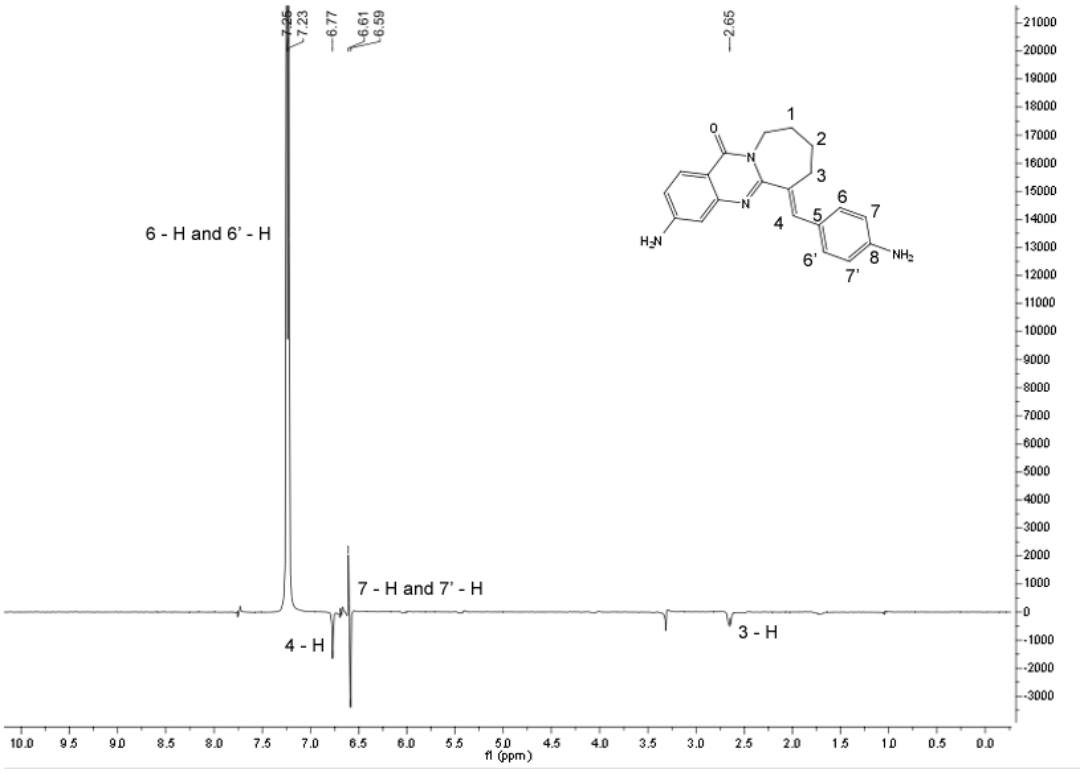


## NOE Analysis of 4b, 4c, 4e, 6a, 6b, 6c and 6d

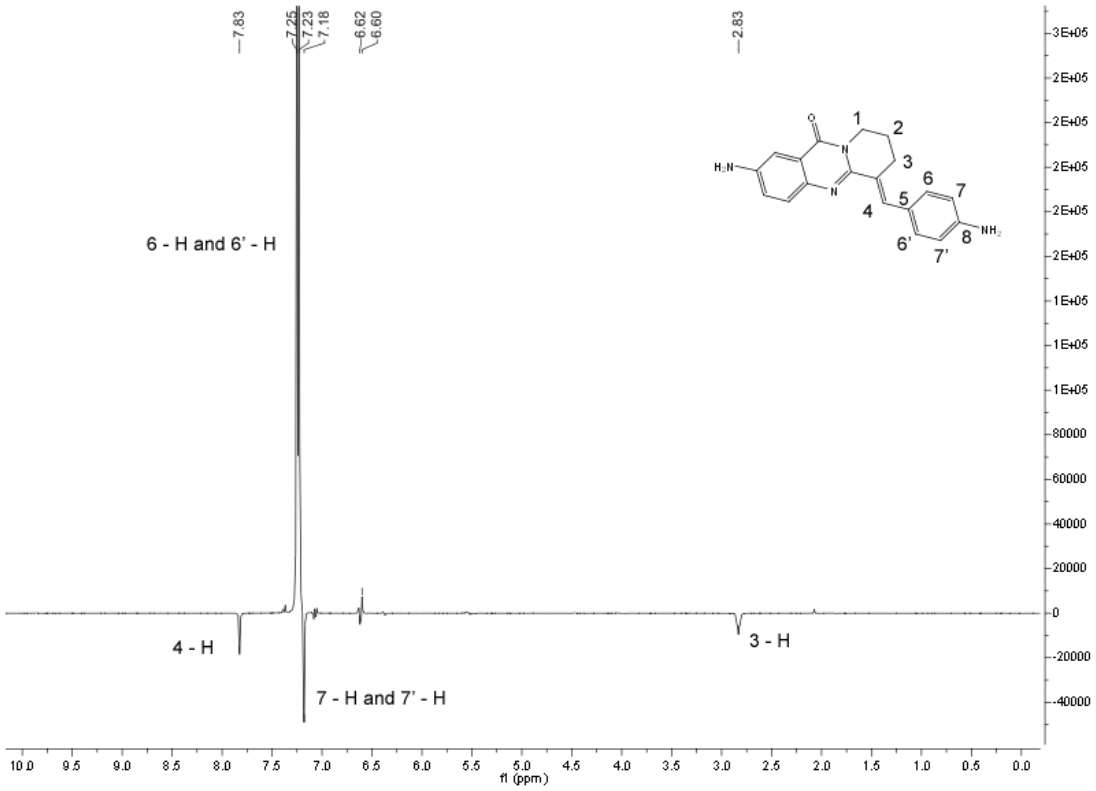
NOE spectrum of **4b**



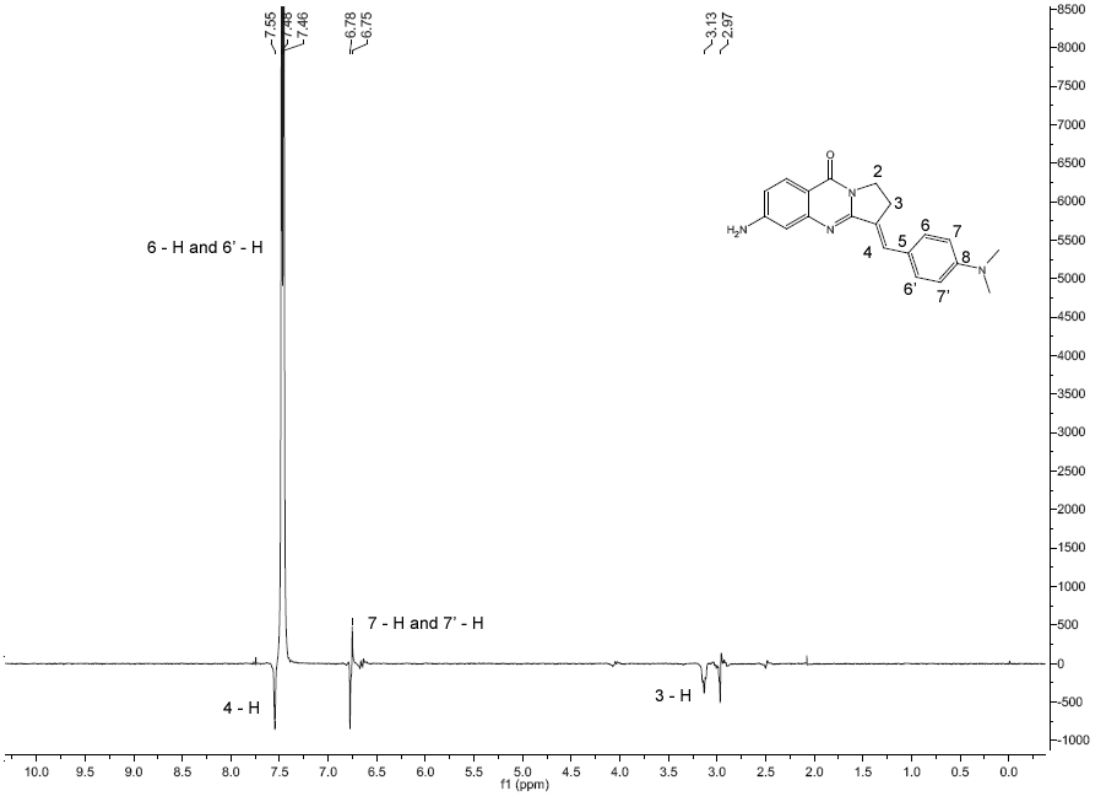

NOE spectrum of **4c**



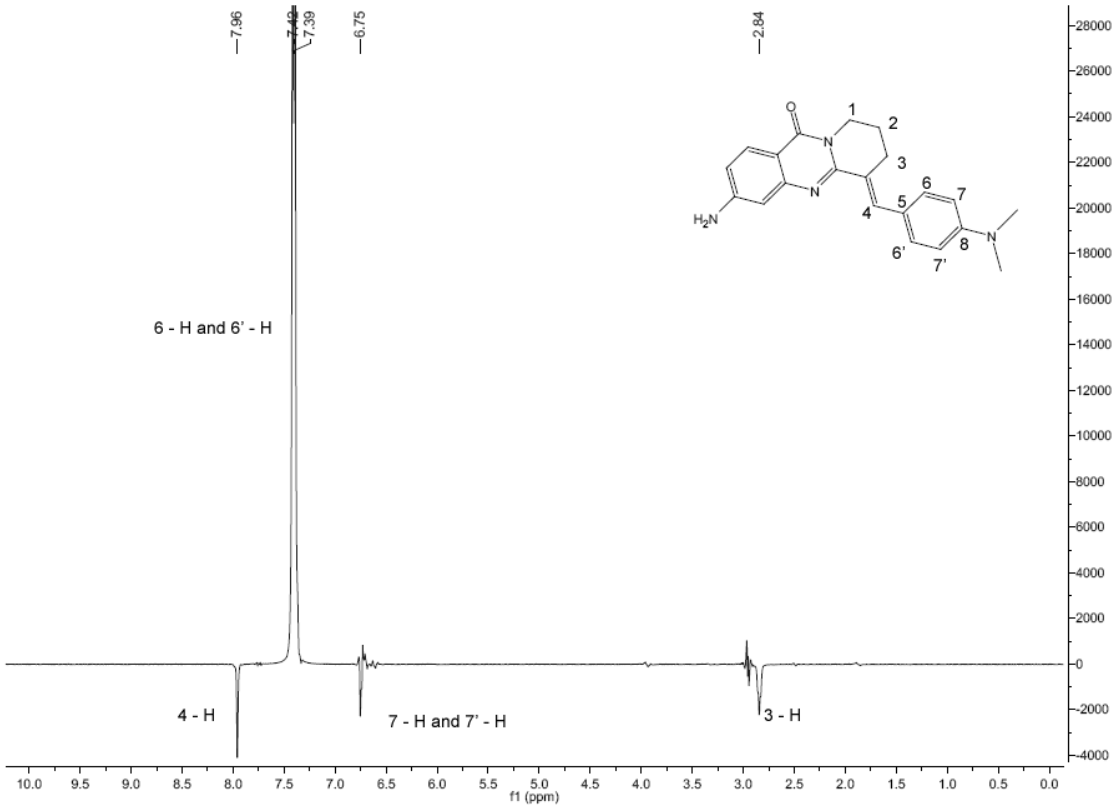
NOE spectrum of **4e**



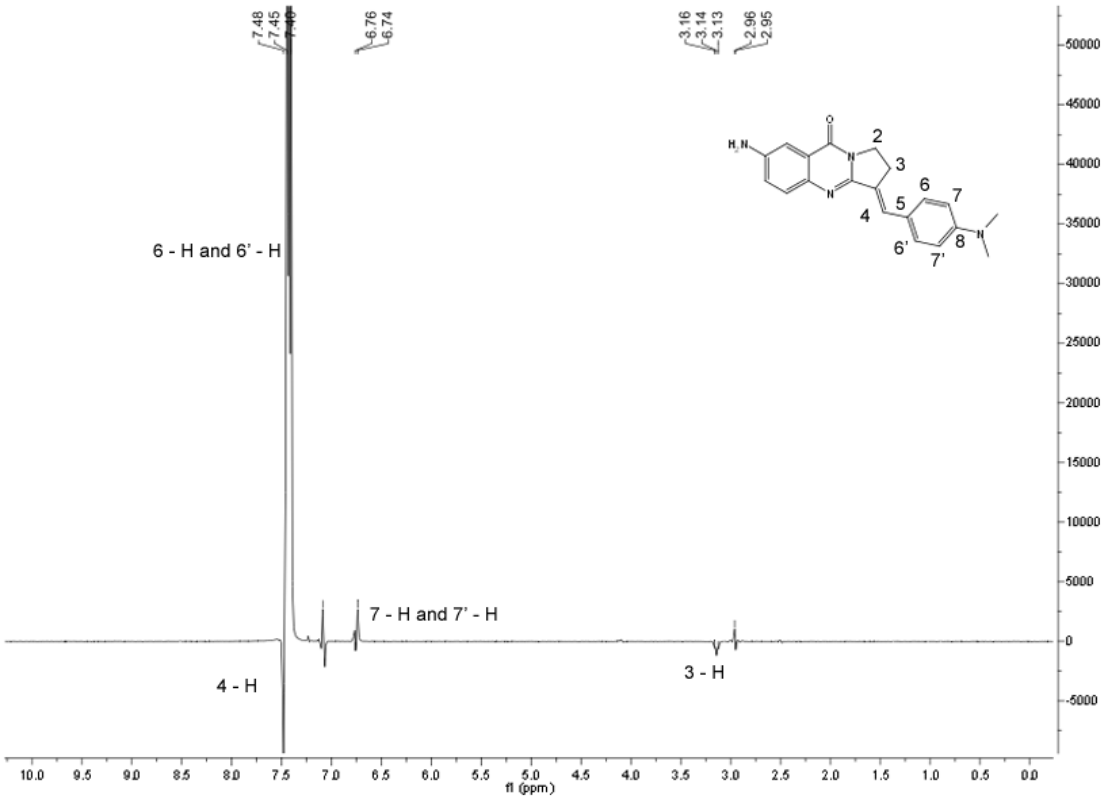

NOE spectrum of **6a**



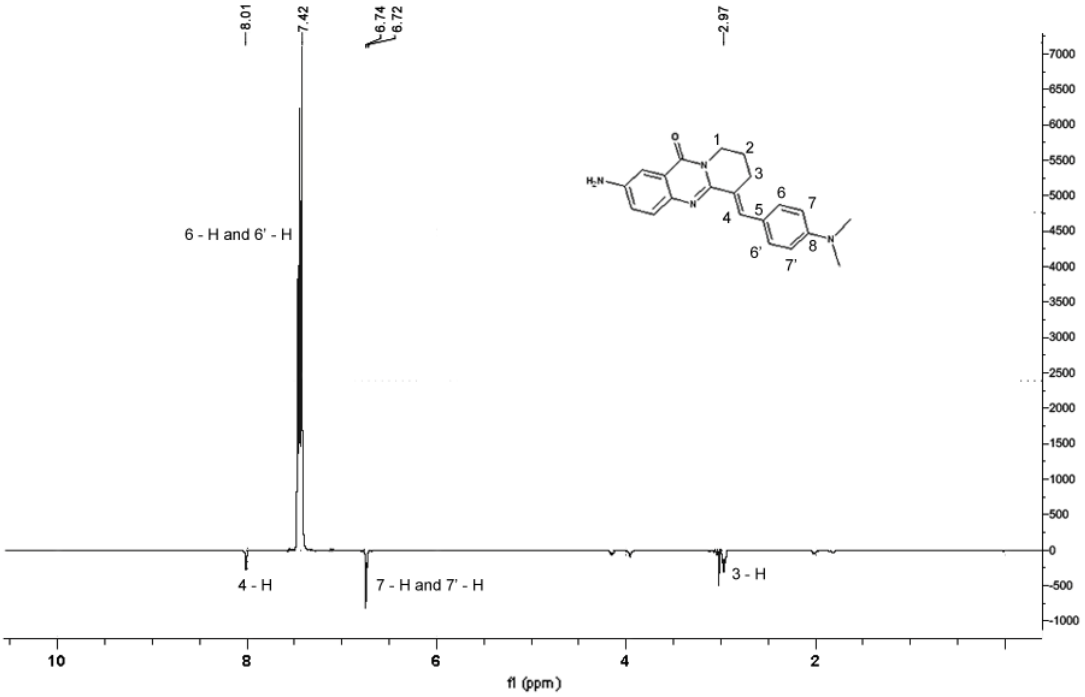
NOE spectrum of **6b**




NOE spectrum of **6c**



NOE spectrum of **6d**



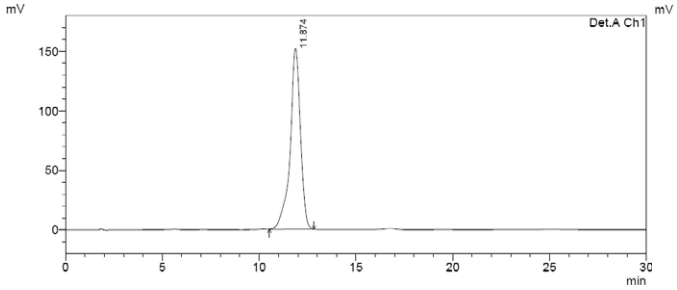
## HPLC Purity Analysis of Compounds 7a-7x Using Two Different Systems

Table1. HPLC Purity Analysis of Compounds **7a-7x** [a]

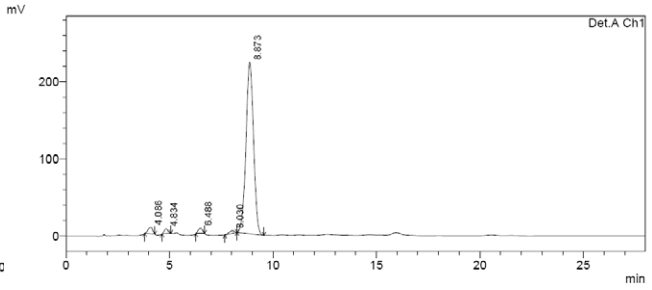
| Compound | Purity(%) | Methanol/Water | Retention time (min) |
|---|---|---|---|
| **7b** | 94 | 40/60 | 8.87 |
| **7c** | 100 | 40/60 | 15.31 |
| **7d** | 99 | 40/60 | 11.06 |
| **7e** | 94 | 40/60 | 9.20 |
| **7f** | 98 | 40/60 | 14.76 |
| **7g** | 98 | 40/60 | 11.66 |
| **7s** | 96 | 40/60 | 21.19 |
| **7t** | 99 | 45/55 | 13.88 |
| **7a** | 100 | 40/60 | 11.87 |
| **7q** | 99 | 40/60 | 20.71 |
| **7r** | 97 | 45/55 | 14.50 |
| **7h** | 91 | 40/60 | 10.96 |
| **7i** | 88 | 40/60 | 17.52 |
| **7j** | 100 | 40/60 | 13.99 |
| **7u** | 94 | 40/60 | 19.10 |
| **7v** | 96 | 45/55 | 14.50 |
| **7k** | 97 | 40/60 | 8.04 |
| **7l** | 100 | 40/60 | 15.44 |
| **7m** | 99 | 40/60 | 10.65 |
| **7n** | 99 | 40/60 | 8.49 |
| **7o** | 99 | 40/60 | 13.98 |
| **7p** | 100 | 40/60 | 10.98 |
| **7w** | 99 | 40/60 | 17.78 |
| **7x** | 98 | 45/55 | 12.57 |

[a] 0.1% TFA in MeOH and 0.1% aqueous TFA over 30 min (1 ml/min); Purity at 254nm.

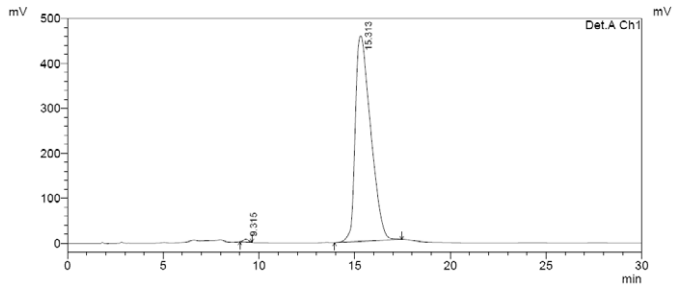
**7a**



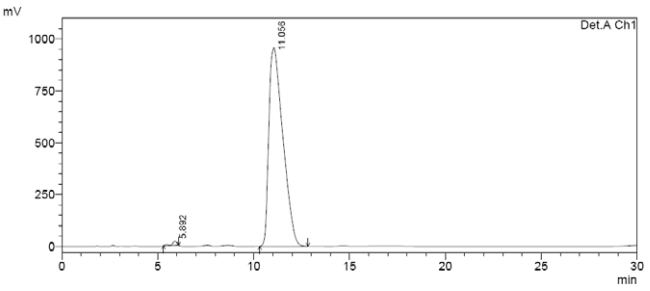

**7b**



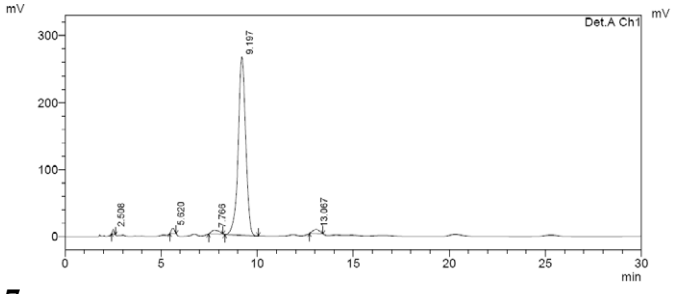

**7c**



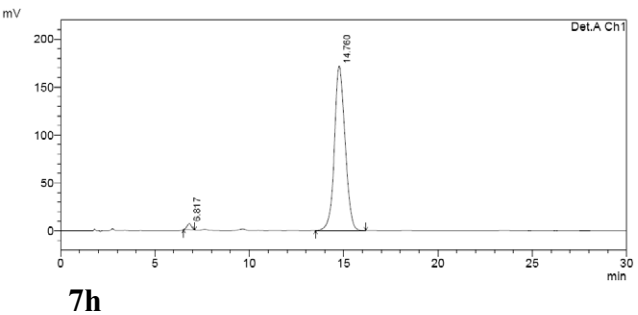

**7d**



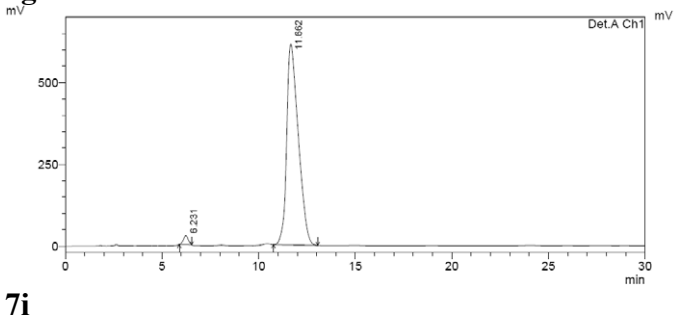

**7e**



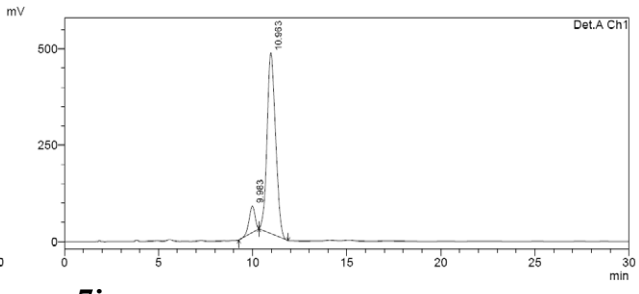

**7f**



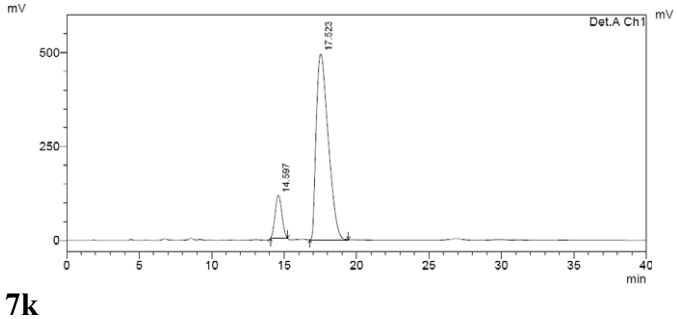

**7g**



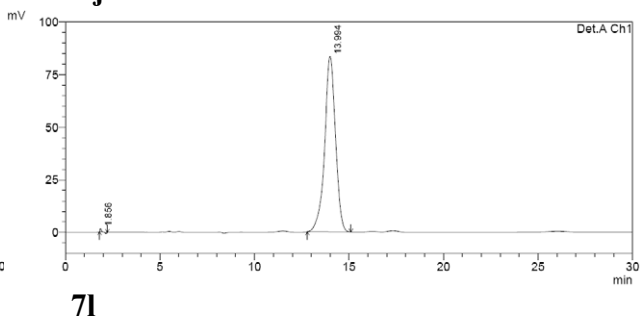

**7h**



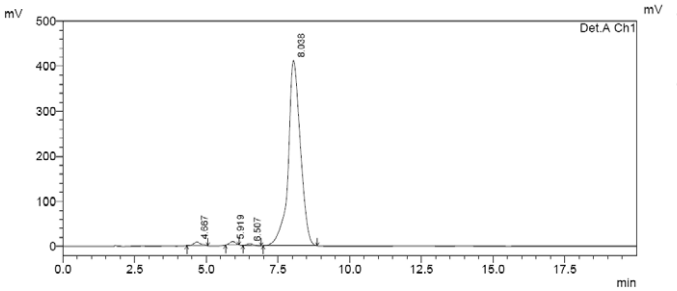

**7i**



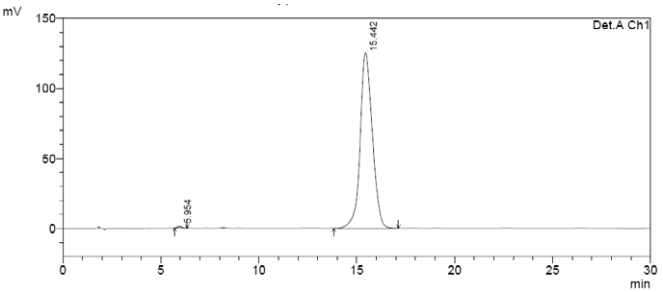

**7j**



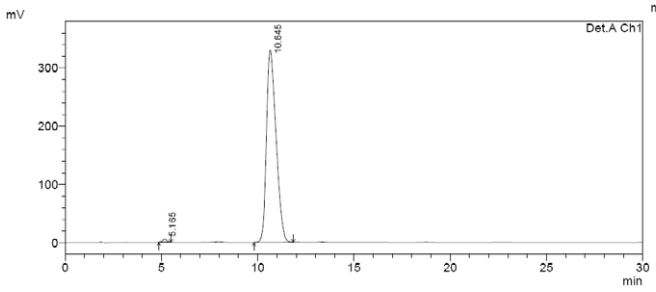

**7k**



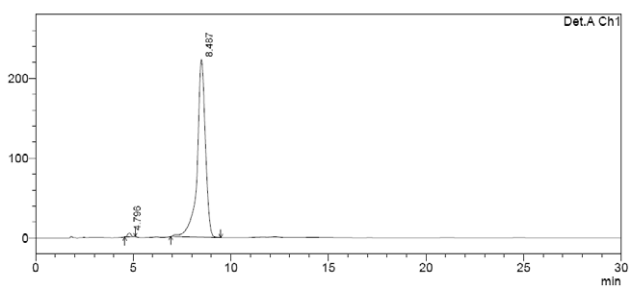

**7l**



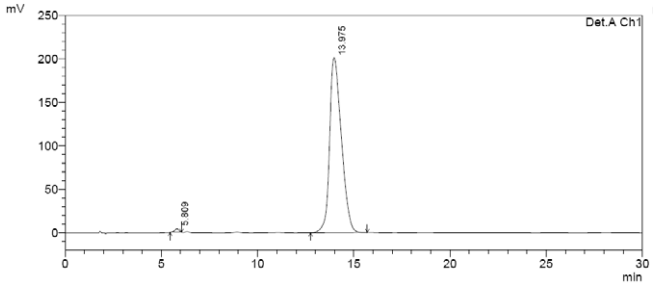
**7m**



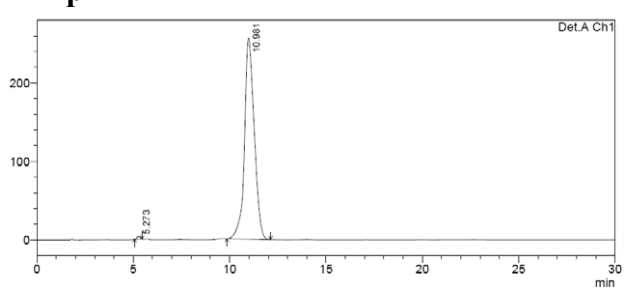

**7n**



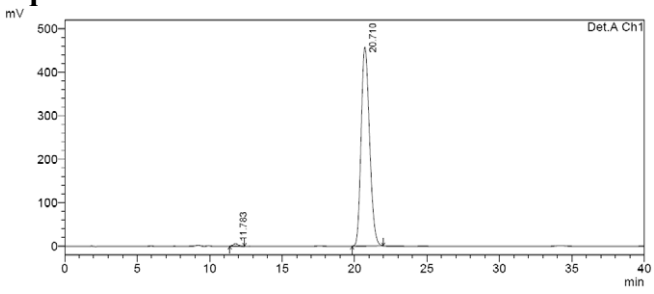

**7o**



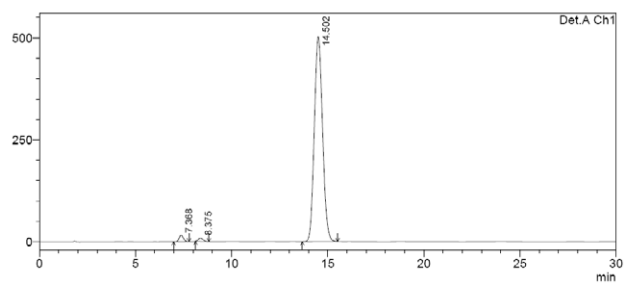

**7p**



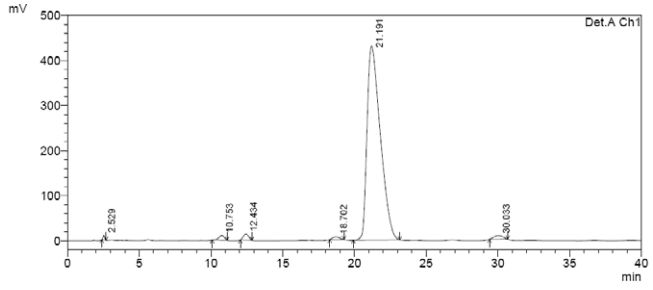

**7q**



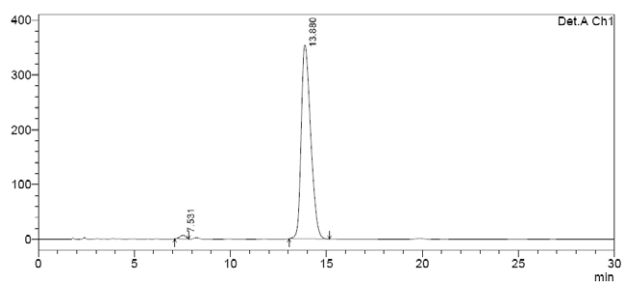

**7r**



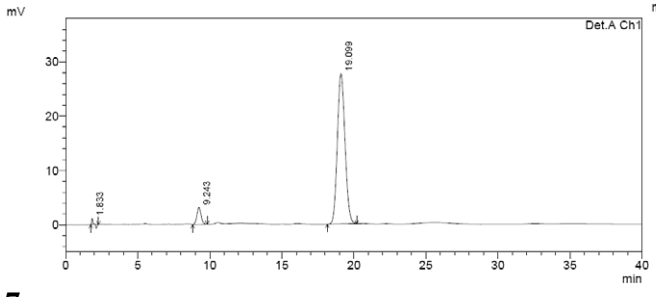

**7s**



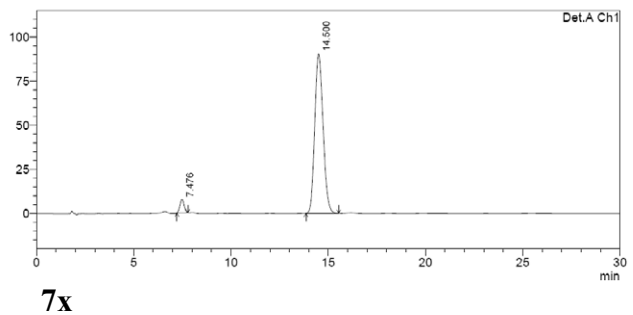

**7t**



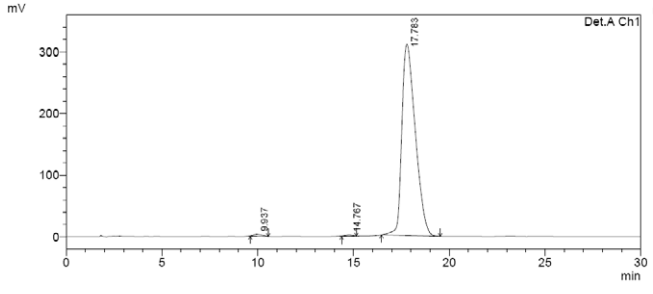

**7u**




**7v**




**7w**




**7x**

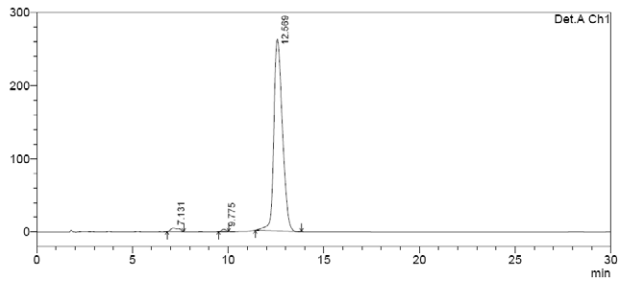
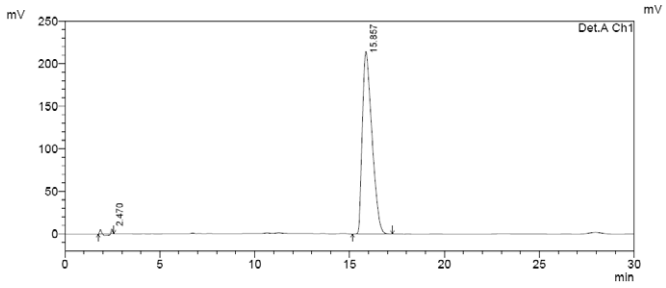


Table2. HPLC Purity Analysis of Compounds **7a-7x** [a]

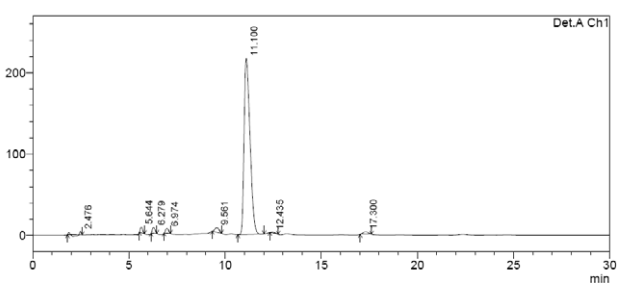
| Compound | Purity(%) | Acetonitrile/Water | Retention time (min) |
|---|---|---|---|
| **7b** | 93 | 20/80 | 11.10 |
| **7c** | 99 | 20/80 | 18.62 |
| **7d** | 98 | 20/80 | 13.74 |
| **7e** | 92 | 20/80 | 12.86 |
| **7f** | 97 | 22/78 | 12.91 |
| **7g** | 97 | 20/80 | 17.23 |
| **7s** | 96 | 20/80 | 28.11 |
| **7t** | 99 | 20/80 | 37.63 |
| **7a** | 100 | 20/80 | 15.86 |
| **7q** | 99 | 20/80 | 20.95 |
| **7r** | 97 | 20/80 | 28.73 |
| **7h** | 99 | 20/80 | 14.67 |
| **7i** | 99 | 20/80 | 26.67 |
| **7j** | 99 | 20/80 | 17.07 |
| **7u** | 88 | 20/80 | 19.19 |
| **7v** | 85 | 20/80 | 26.26 |
| **7k** | 98 | 20/80 | 9.86 |
| **7l** | 100 | 20/80 | 19.01 |
| **7m** | 99 | 20/80 | 13.42 |
| **7n** | 97 | 20/80 | 11.98 |
| **7o** | 99 | 20/80 | 16.32 |
| **7p** | 99 | 20/80 | 17.30 |
| **7w** | 99 | 20/80 | 22.72 |
| **7x** | 99 | 20/80 | 29.78 |

[a] 0.1% TFA in acetonitrile and 0.1% aqueous TFA over 60 min (1 ml/min); Purity at 254nm.

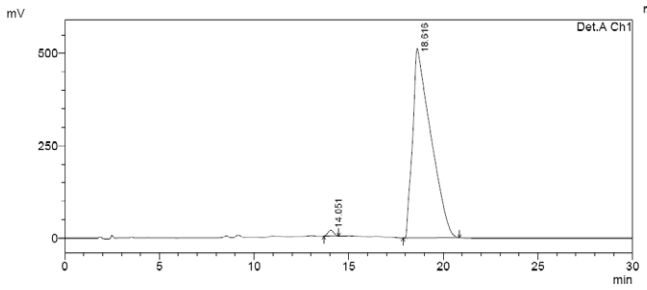
**7a**



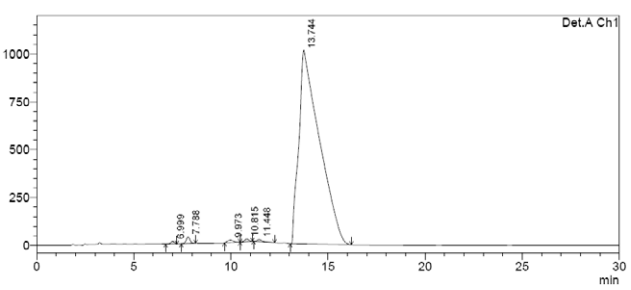

**7b**



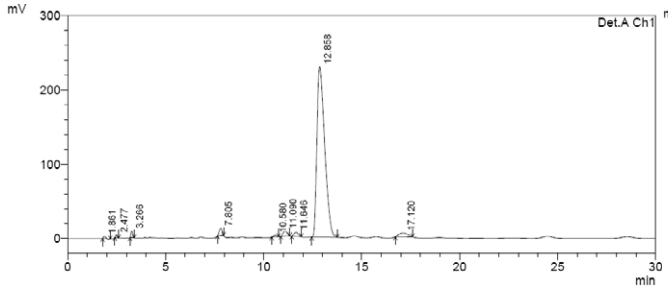

**7c**



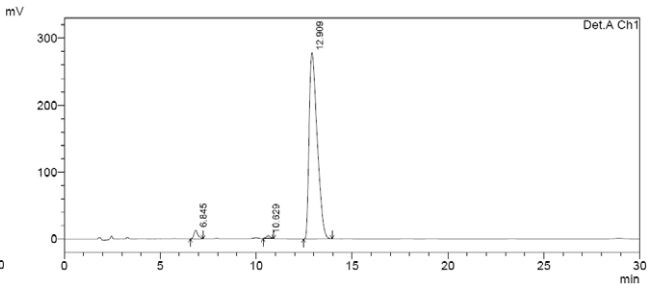

**7d**



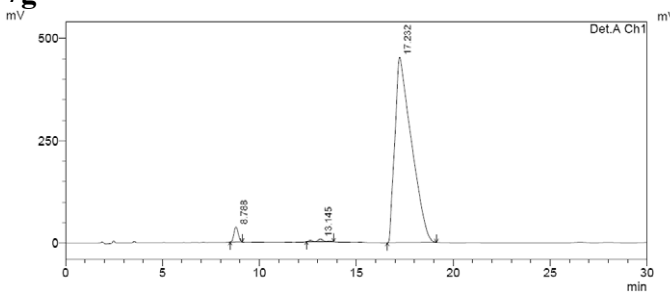

**7e**



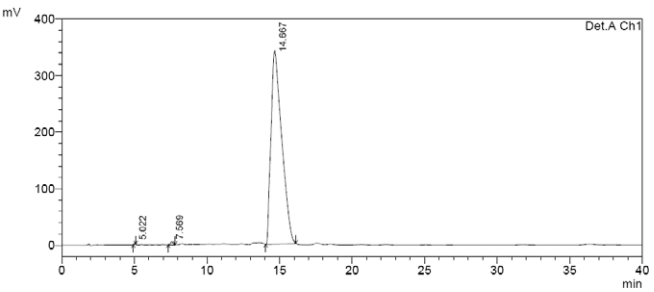

**7f**



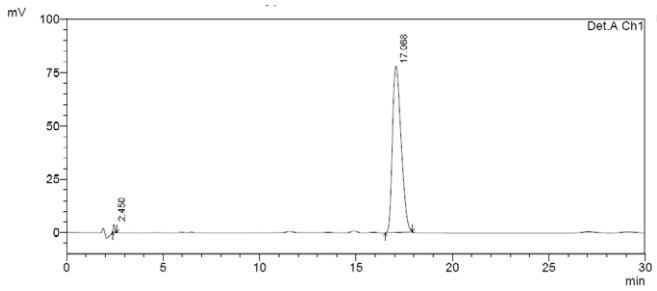

**7g**



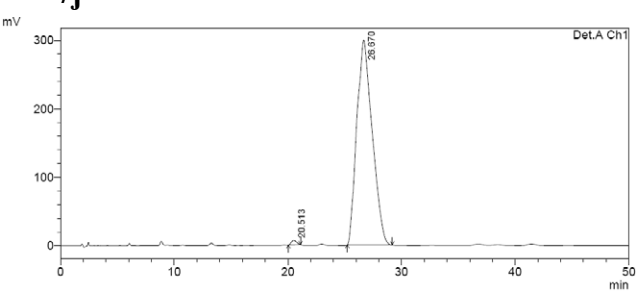

**7h**



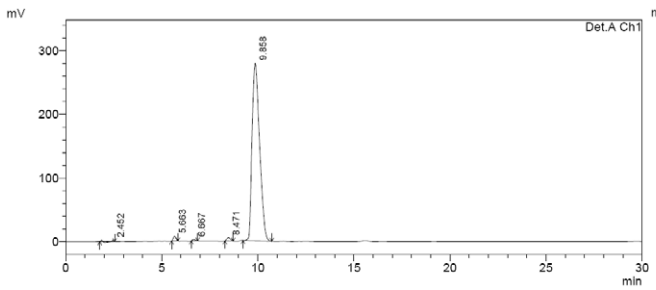

**7i**



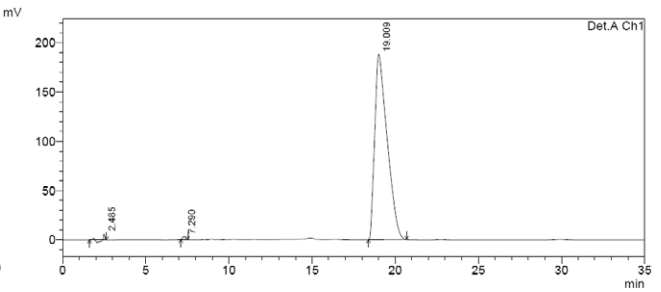

**7j**



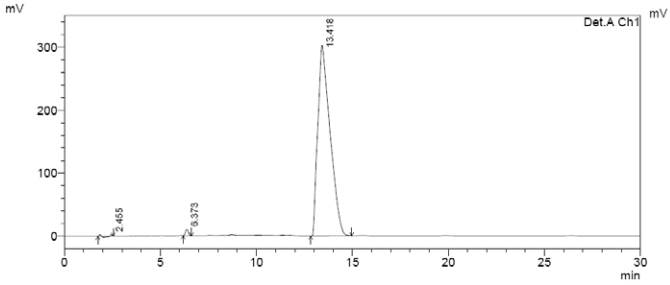

**7k**



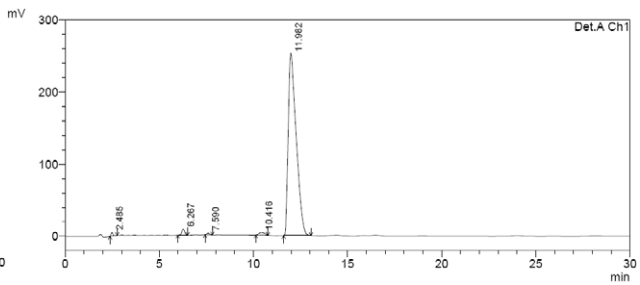

**7l**



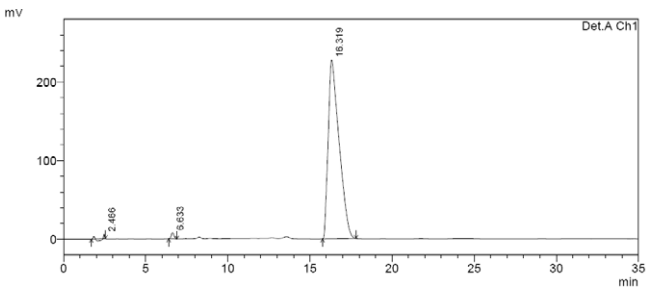
**7m**



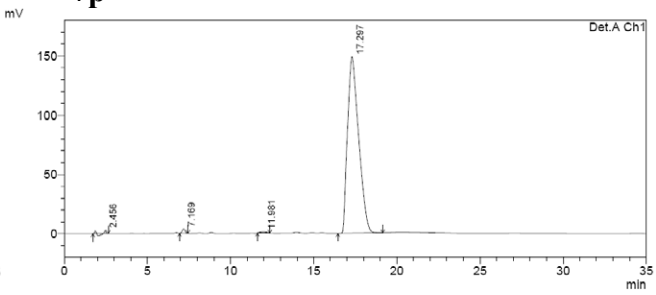

**7n**



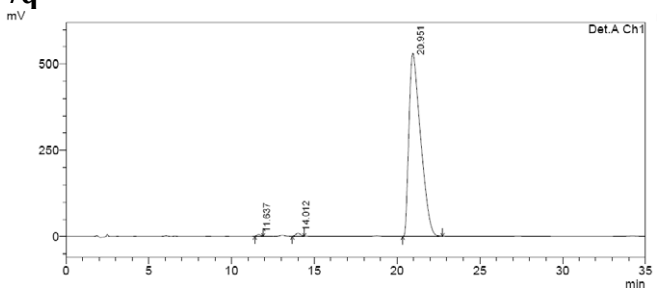

**7o**



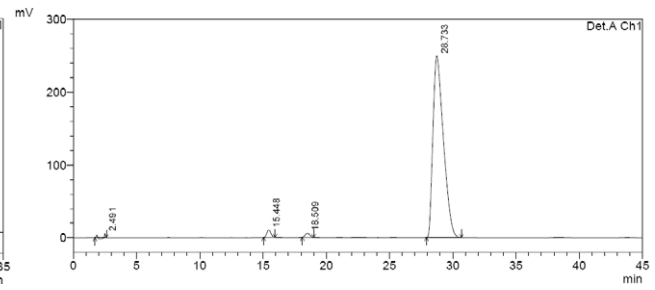

**7p**



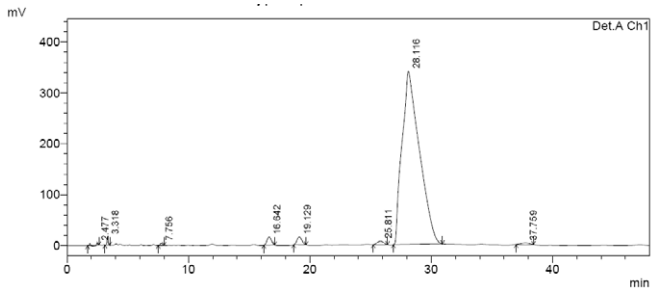

**7q**



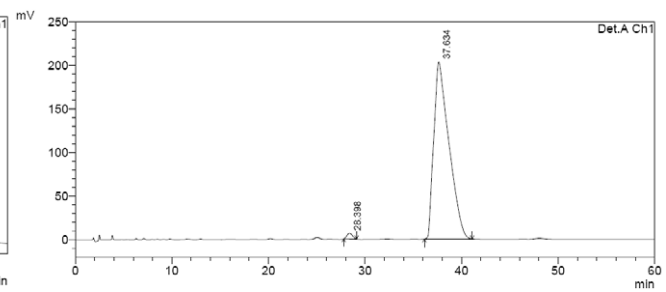

**7r**



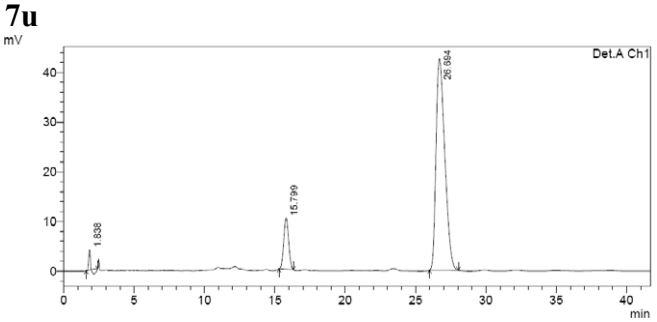

**7s**




**7t**




**7u**

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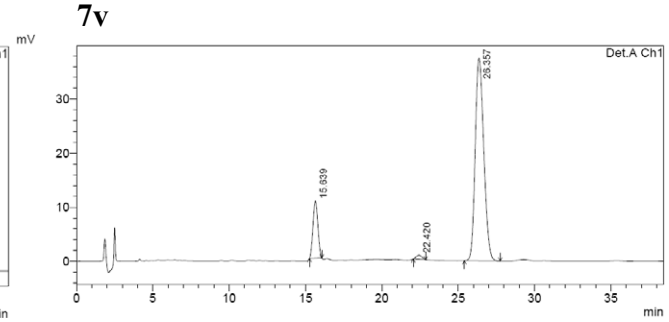
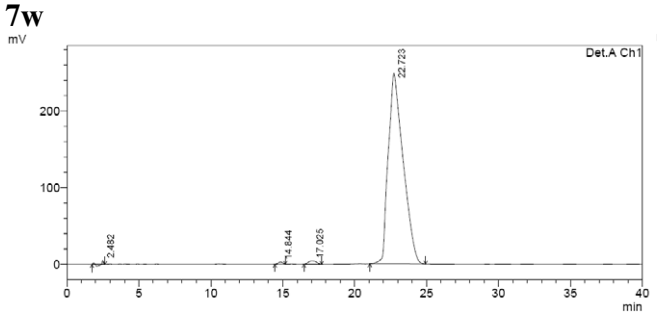



**7w**




**7x**