

## Efficient synthesis of 2-phenyl-3- substituted furo/thieno[2,3-b]quinoxalines *via* Sonogashira coupling reaction followed by iodocyclization and subsequent palladium-catalyzed cross-coupling reactions

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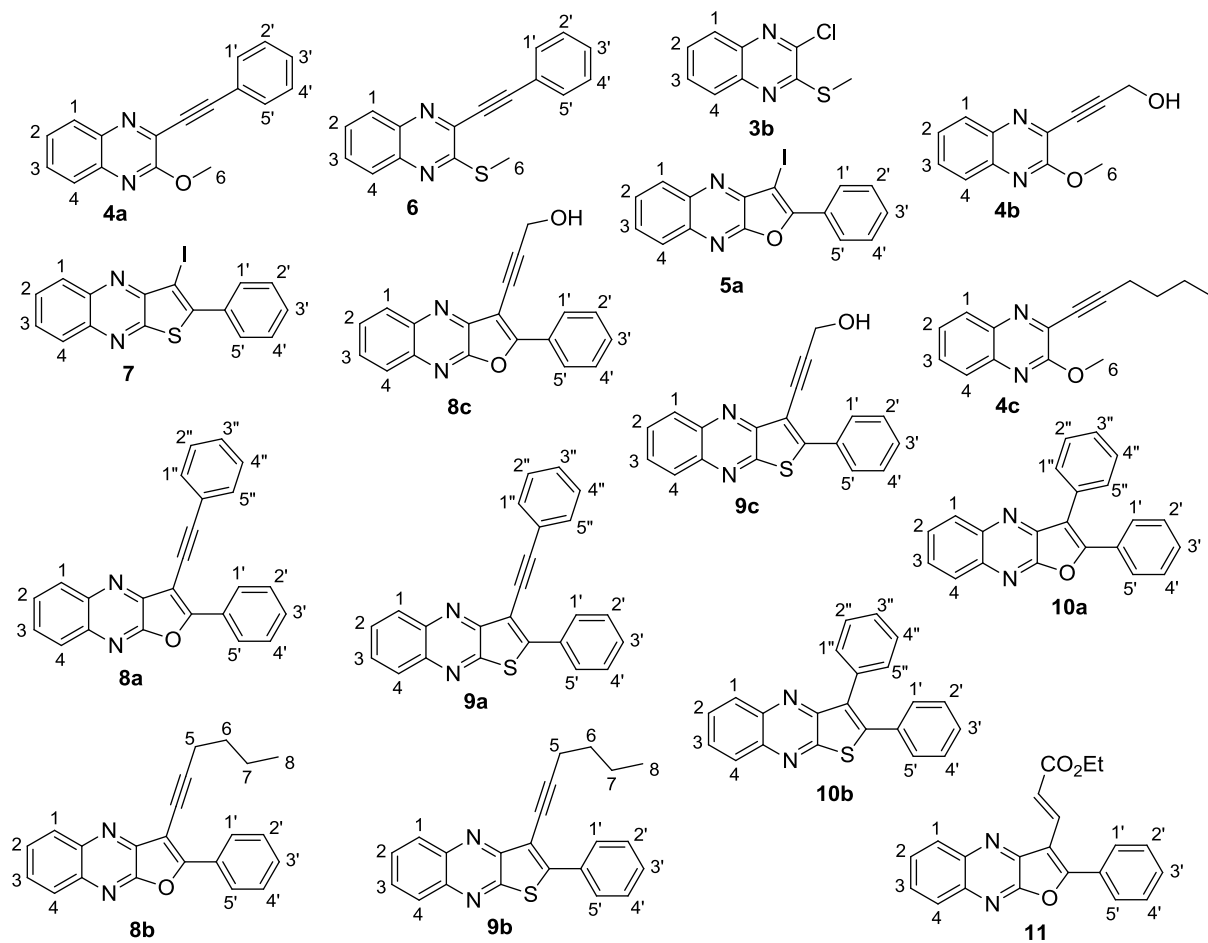
Characterization data and IR, <sup>1</sup>H NMR, <sup>13</sup>C NMR and mass spectra of the title compounds:

- 
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Supporting information for this article is given via a link at the end.

## Numbering employed in NMR analysis



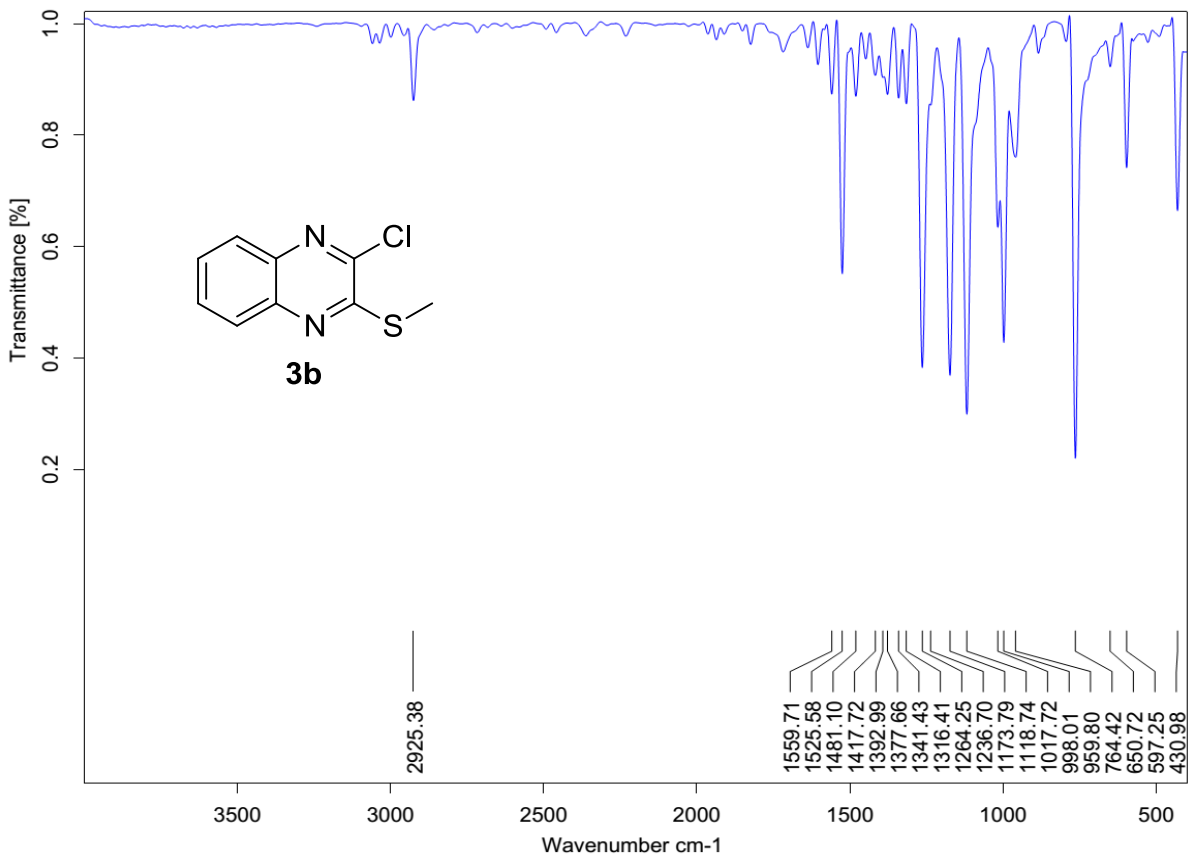
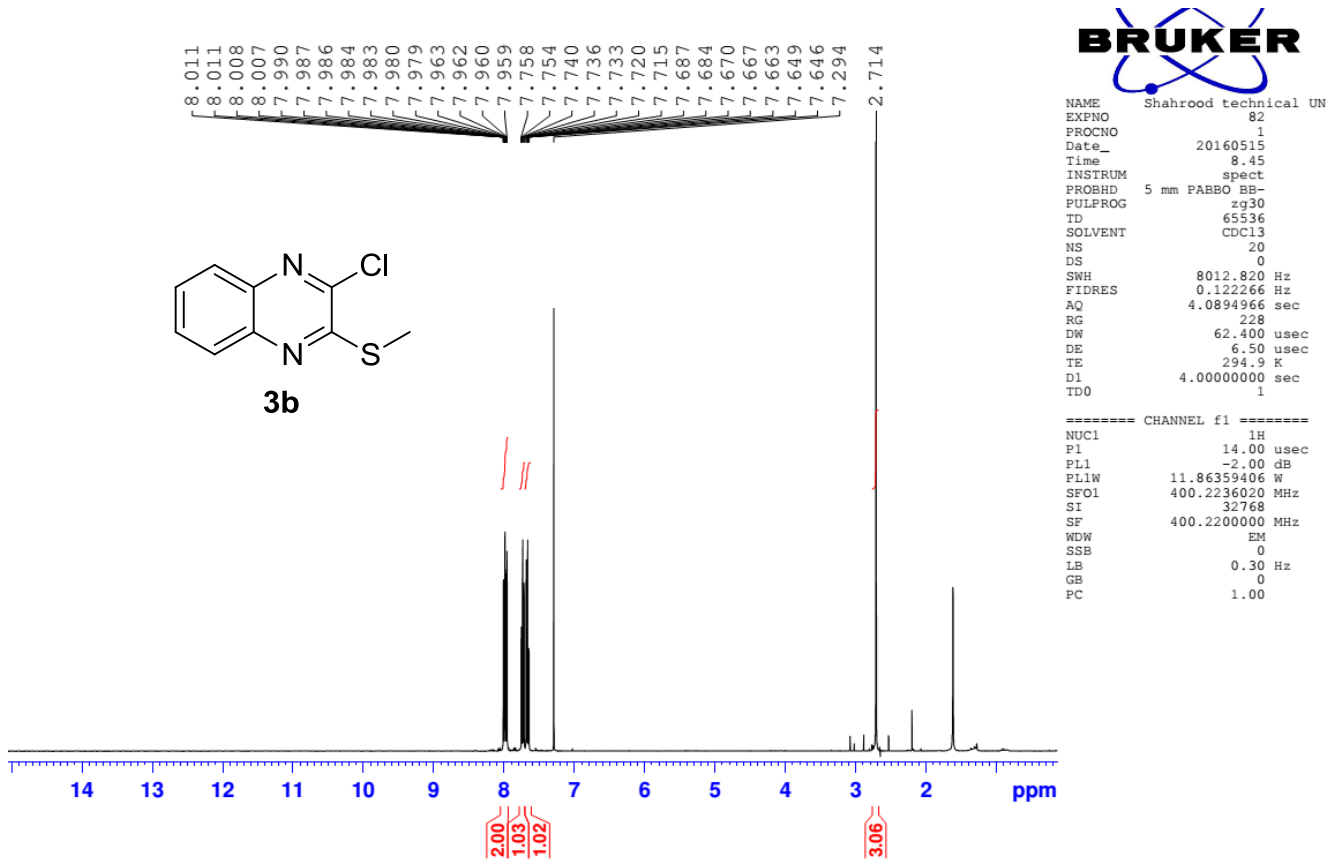


Figure 1: IR spectrum of 3b



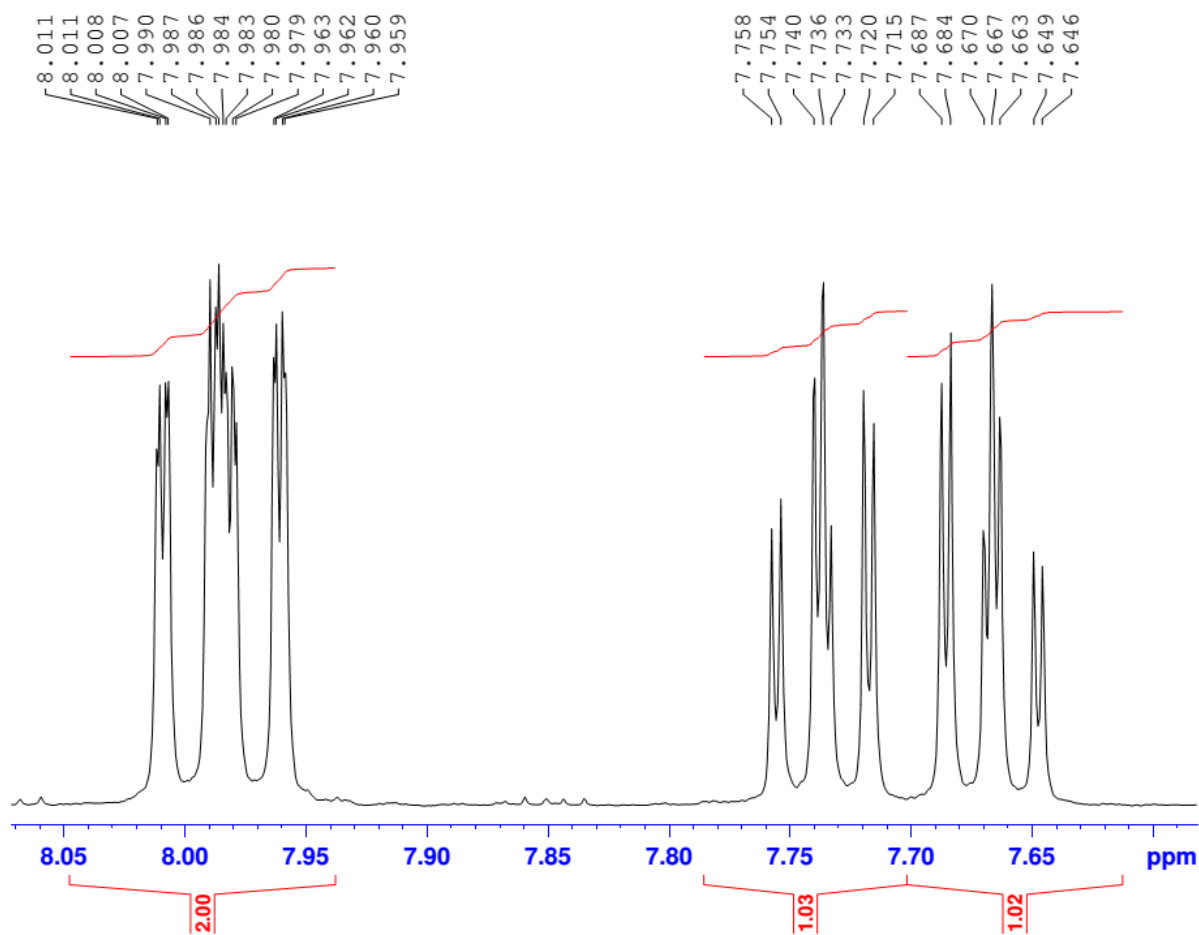
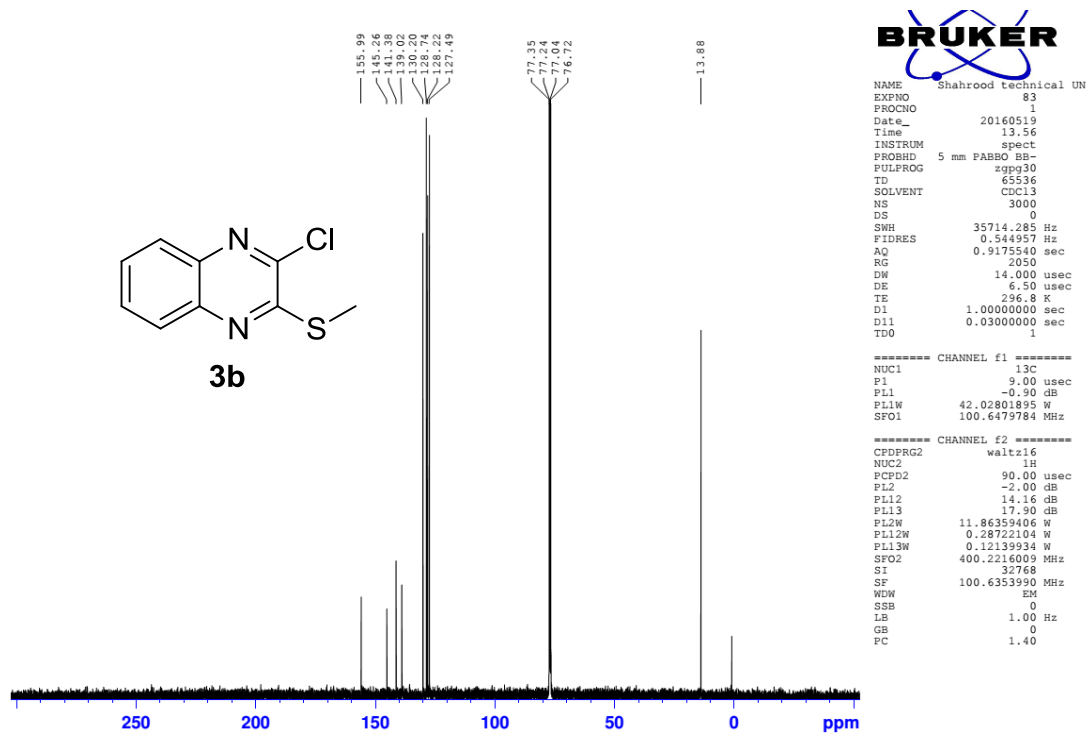
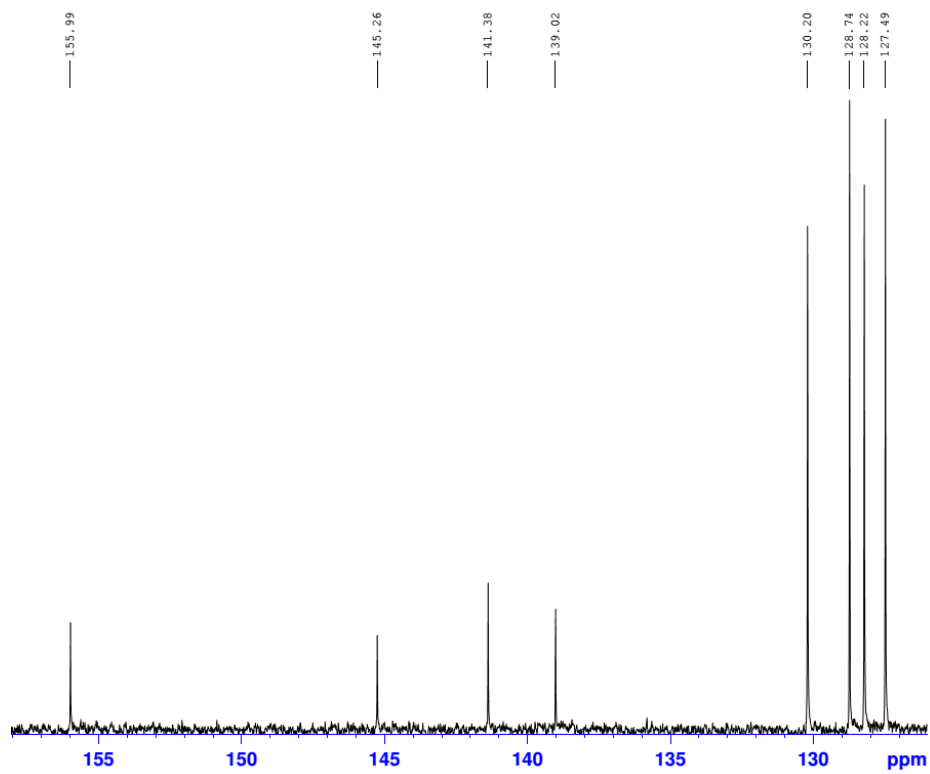
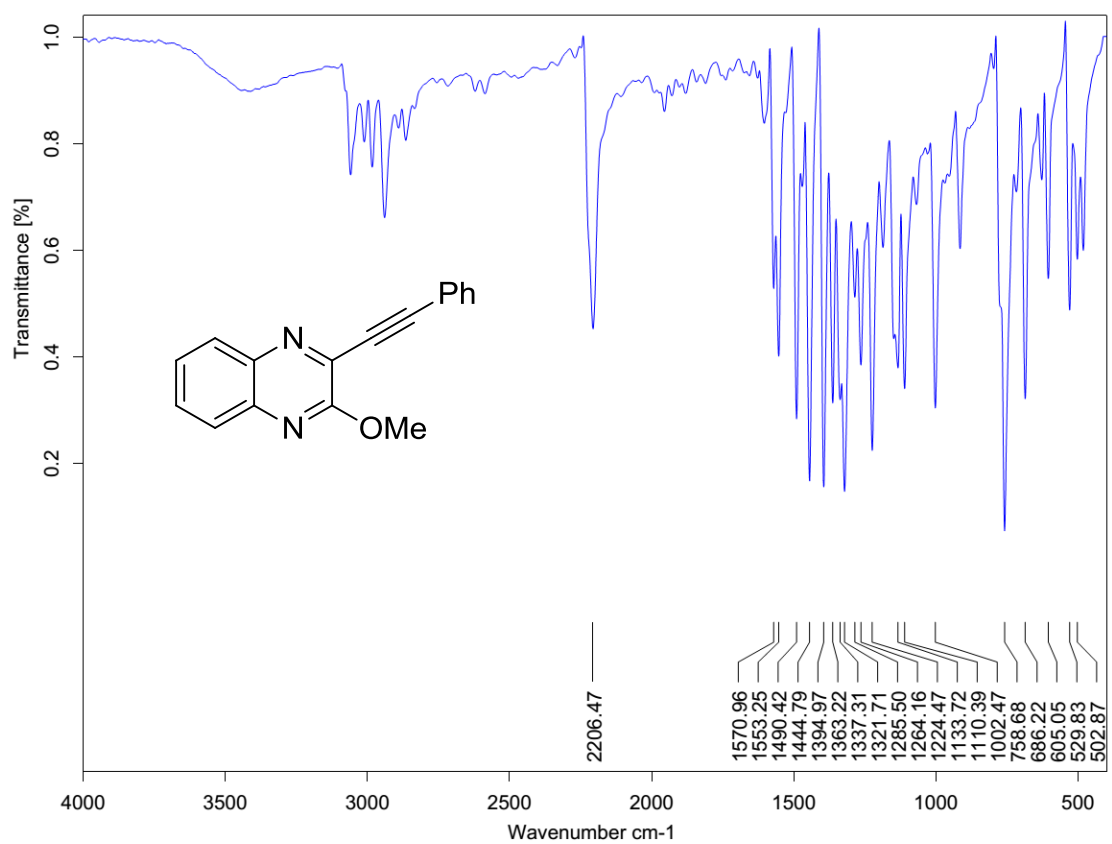


Figure 2: <sup>1</sup>H NMR spectrum of 3b





**Figure 3:** <sup>13</sup>C NMR spectrum of 3b



**Figure 4:** IR spectrum of 4a

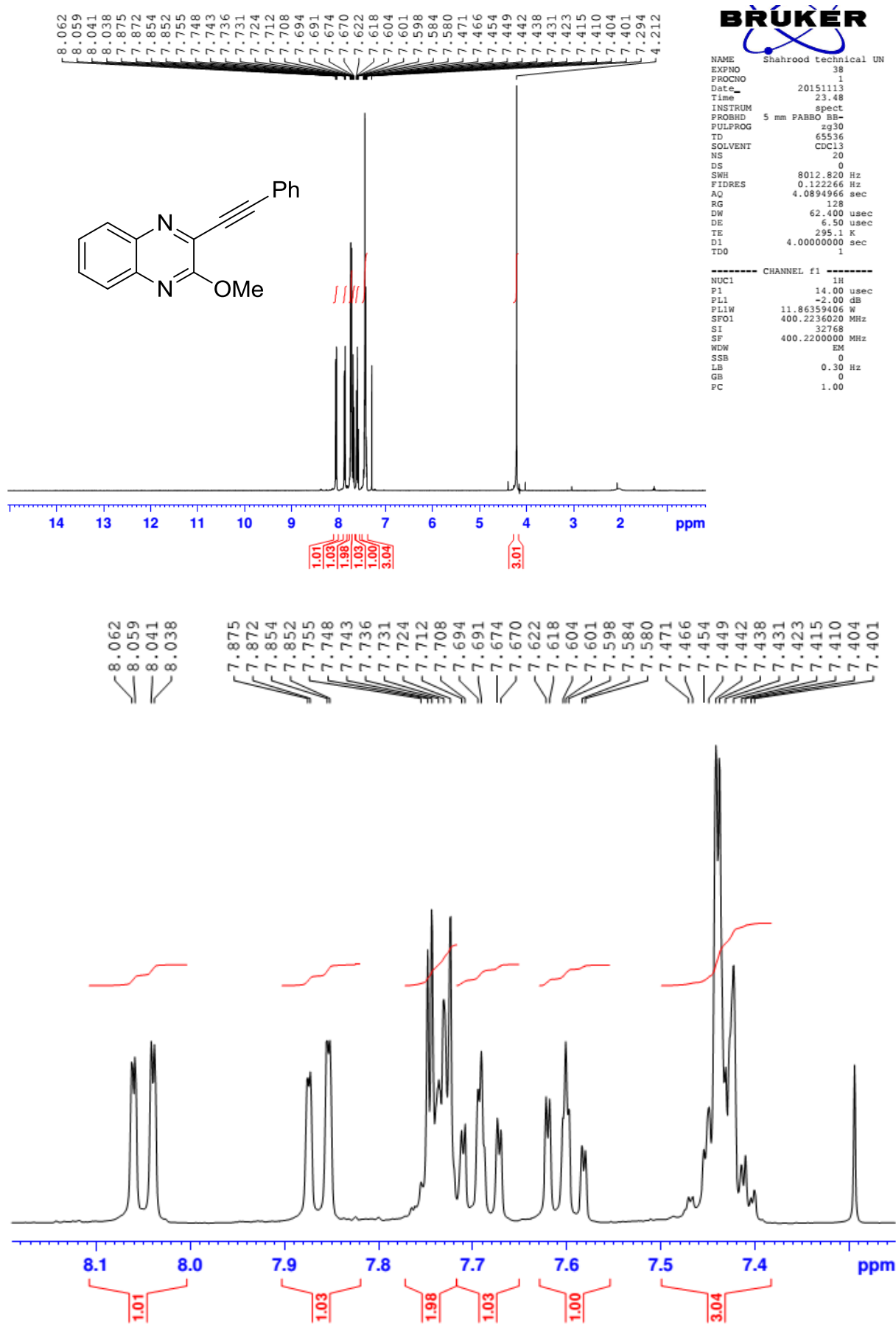


Figure 5:  $^1\text{H}$  NMR spectrum of 4a

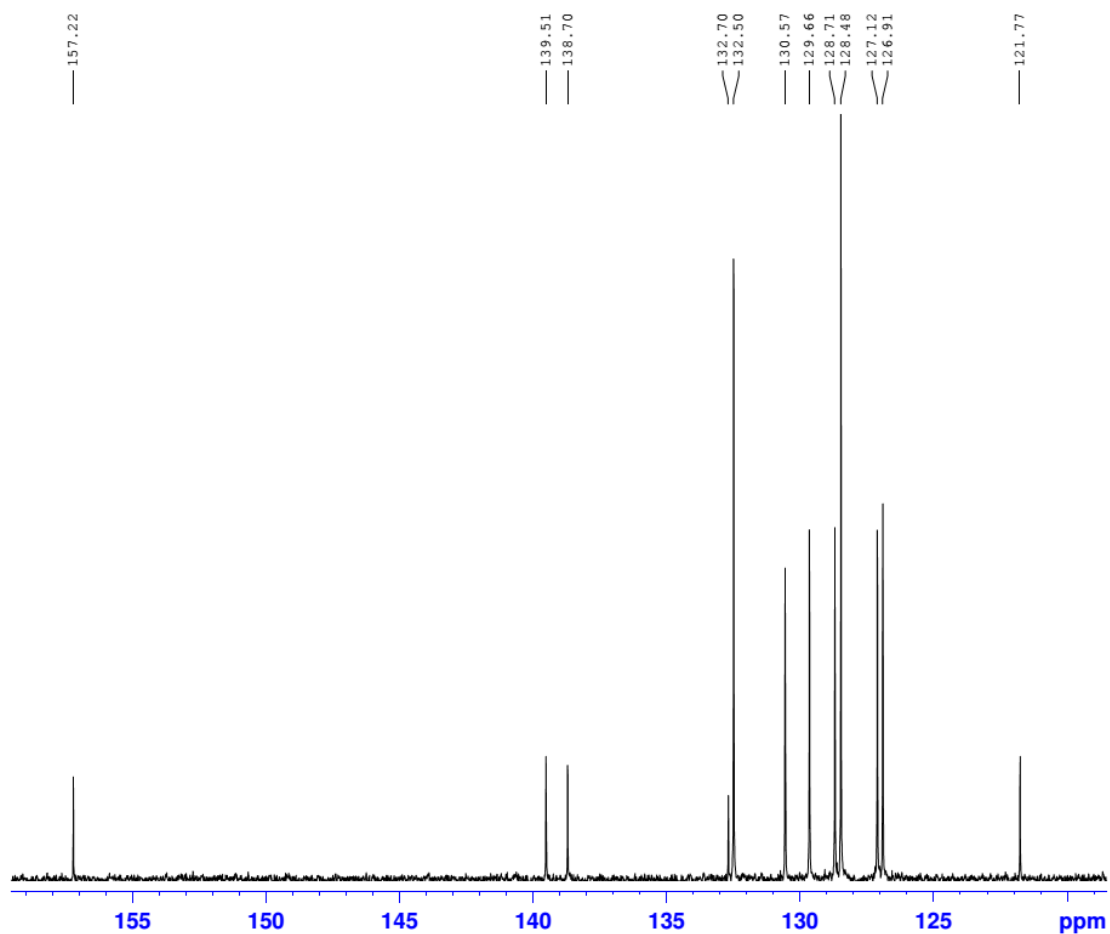
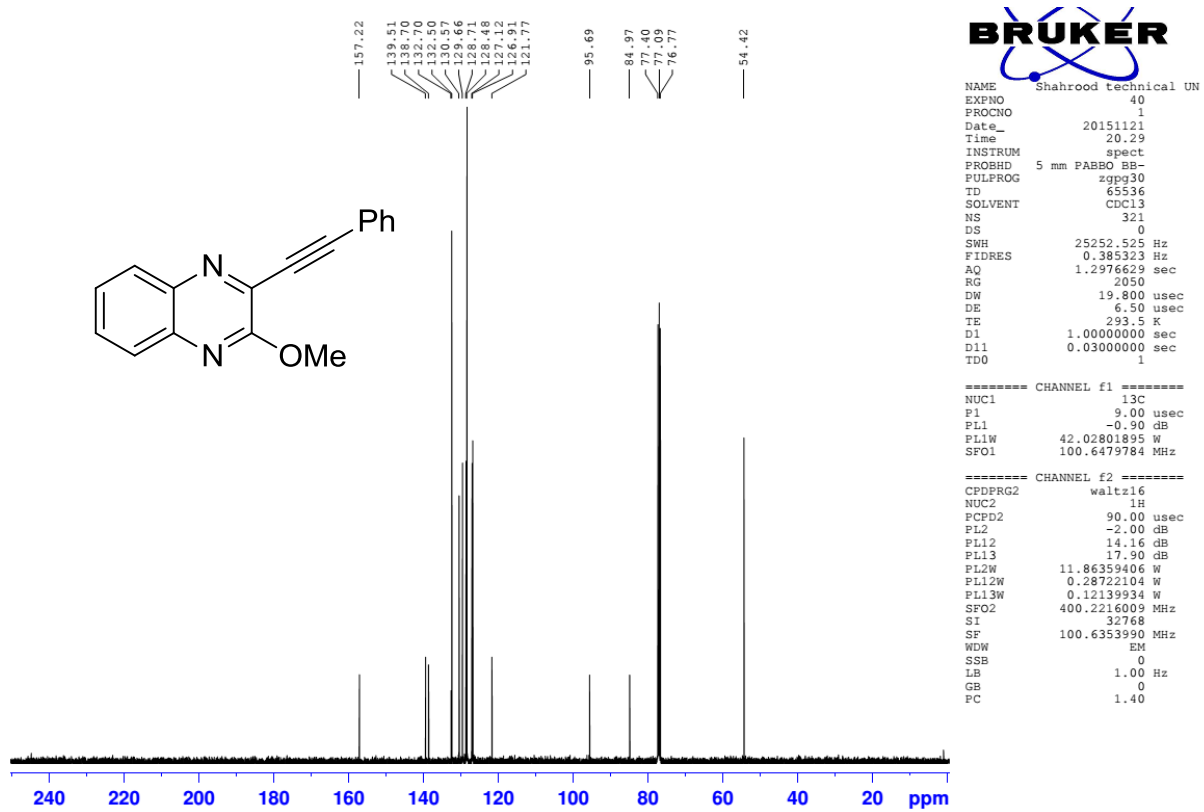


Figure 6:  $^{13}\text{C}$  NMR spectrum of 4a

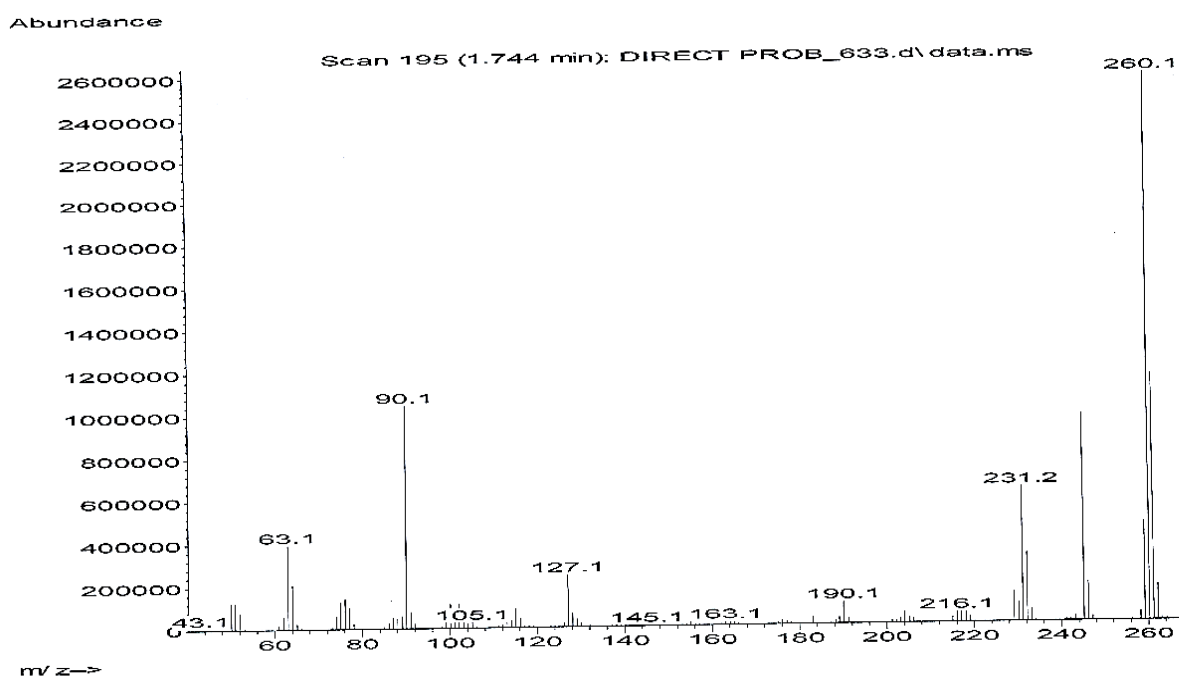
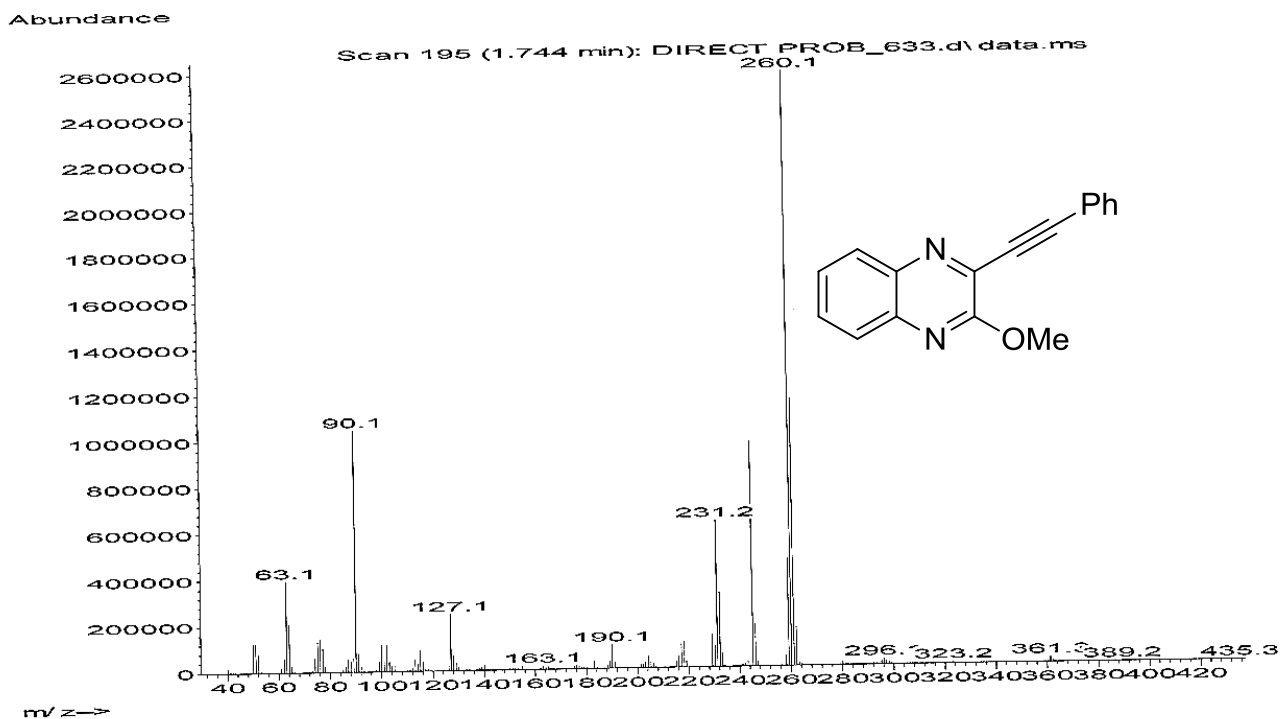


Figure 7: Mass spectrum of 4a



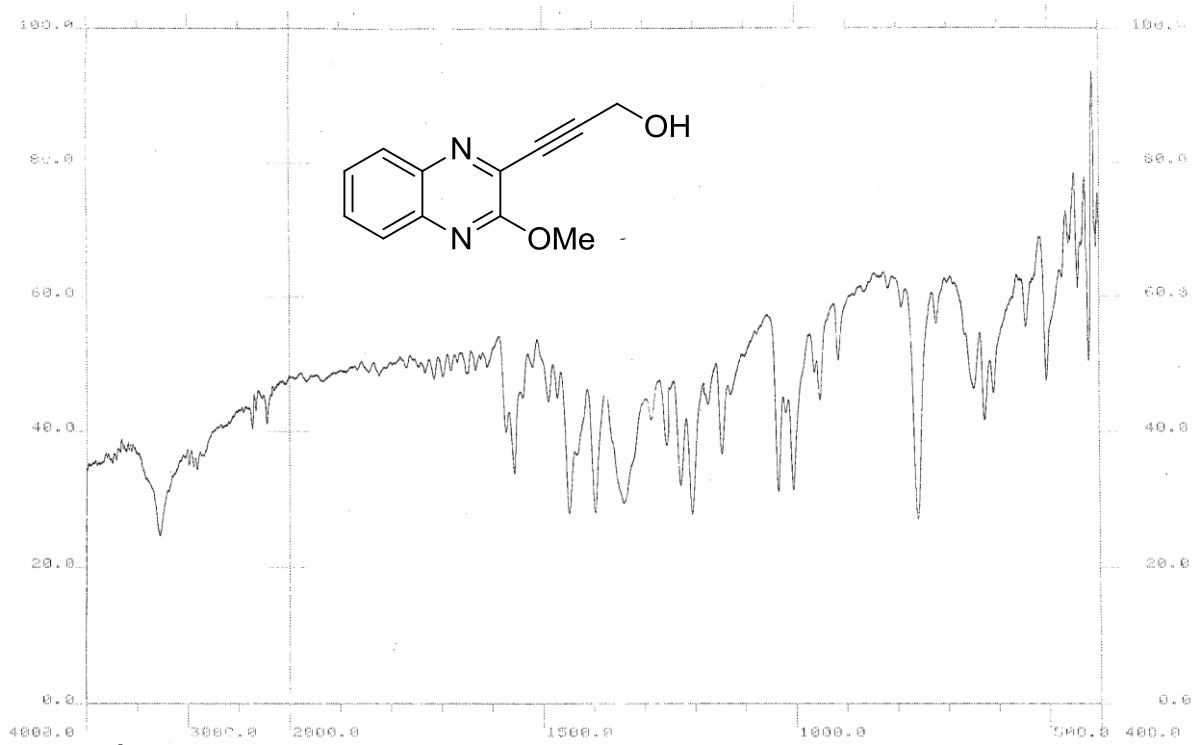
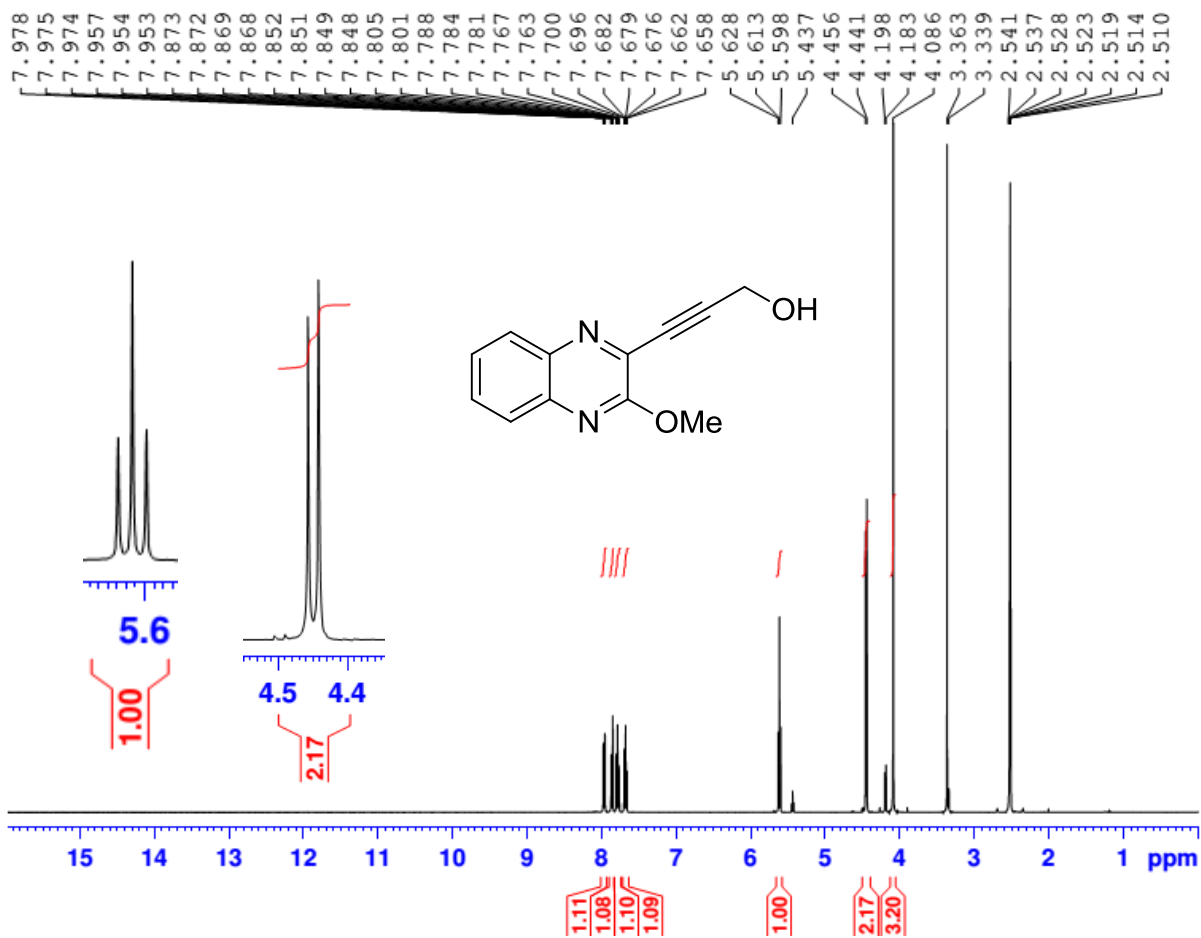


Figure 8: IR spectrum of 4b



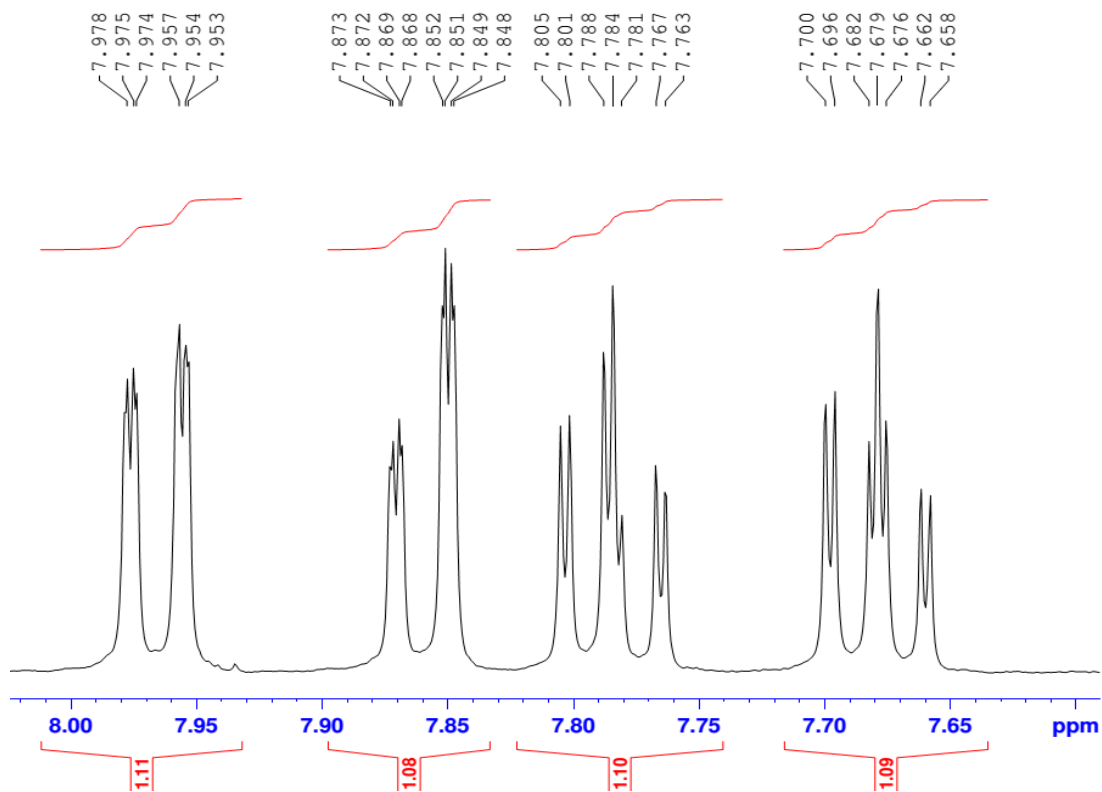


Figure 9:  $^1\text{H}$  NMR spectrum of **4b**

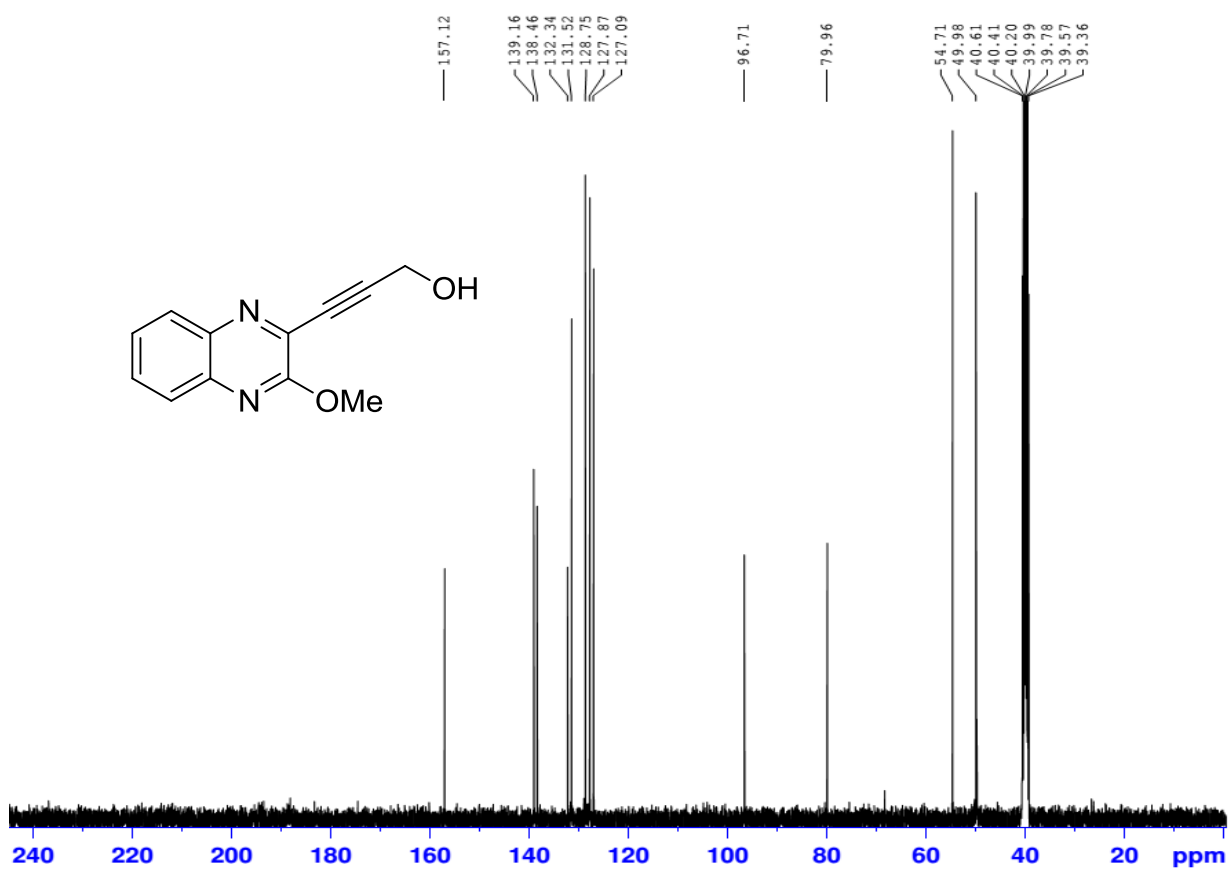


Figure 10:  $^{13}\text{C}$  NMR spectrum of **4b**

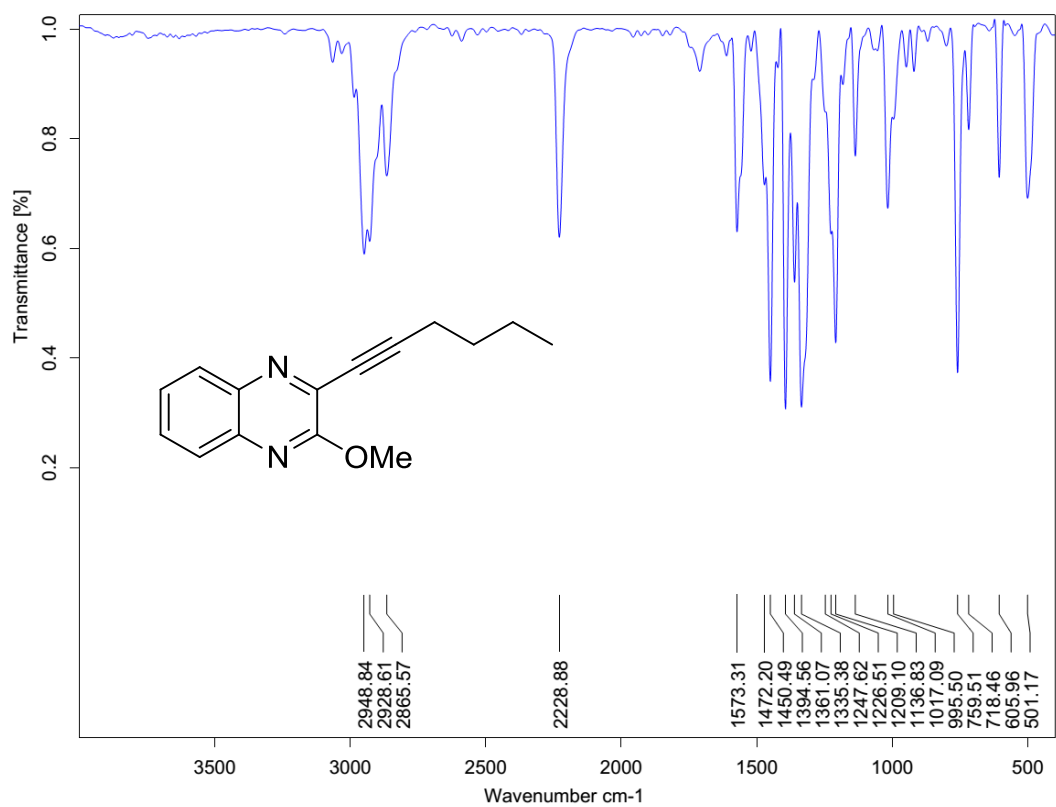
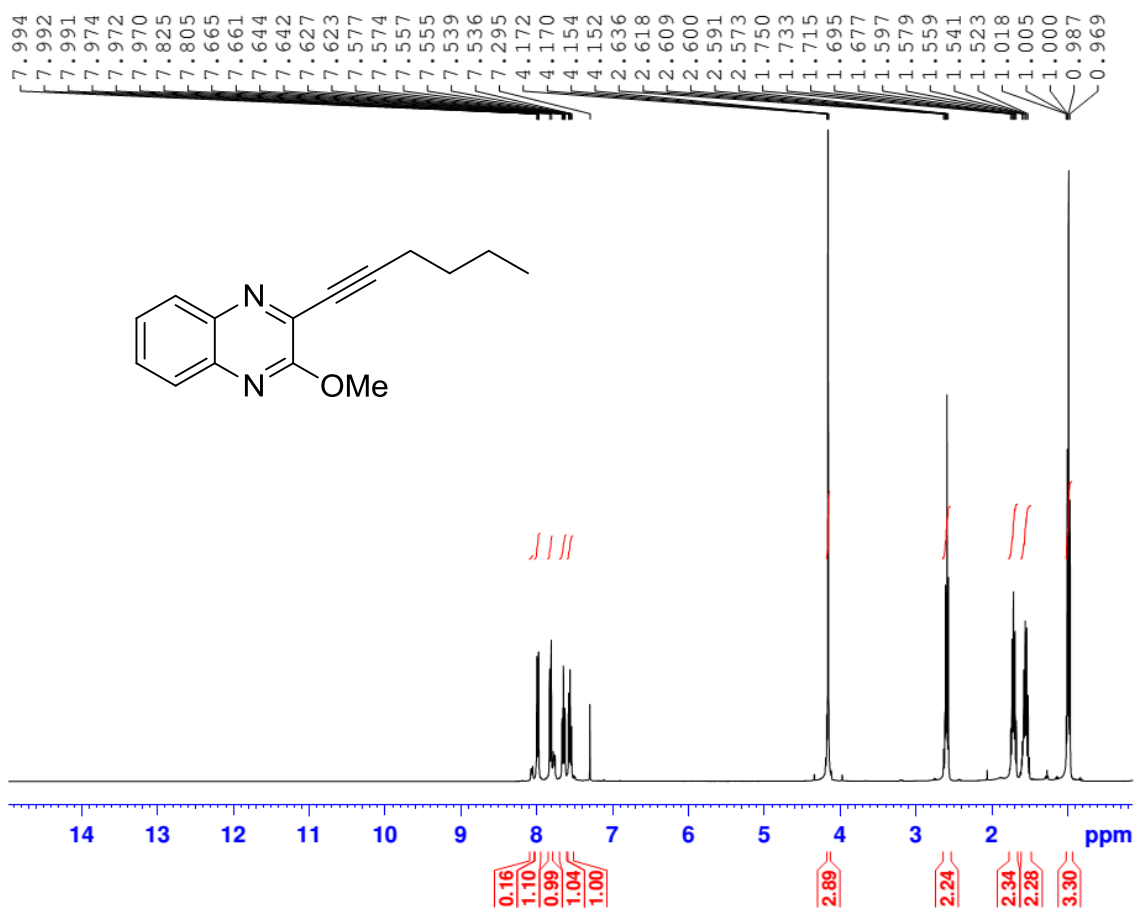


Figure 11: IR spectrum of 4c



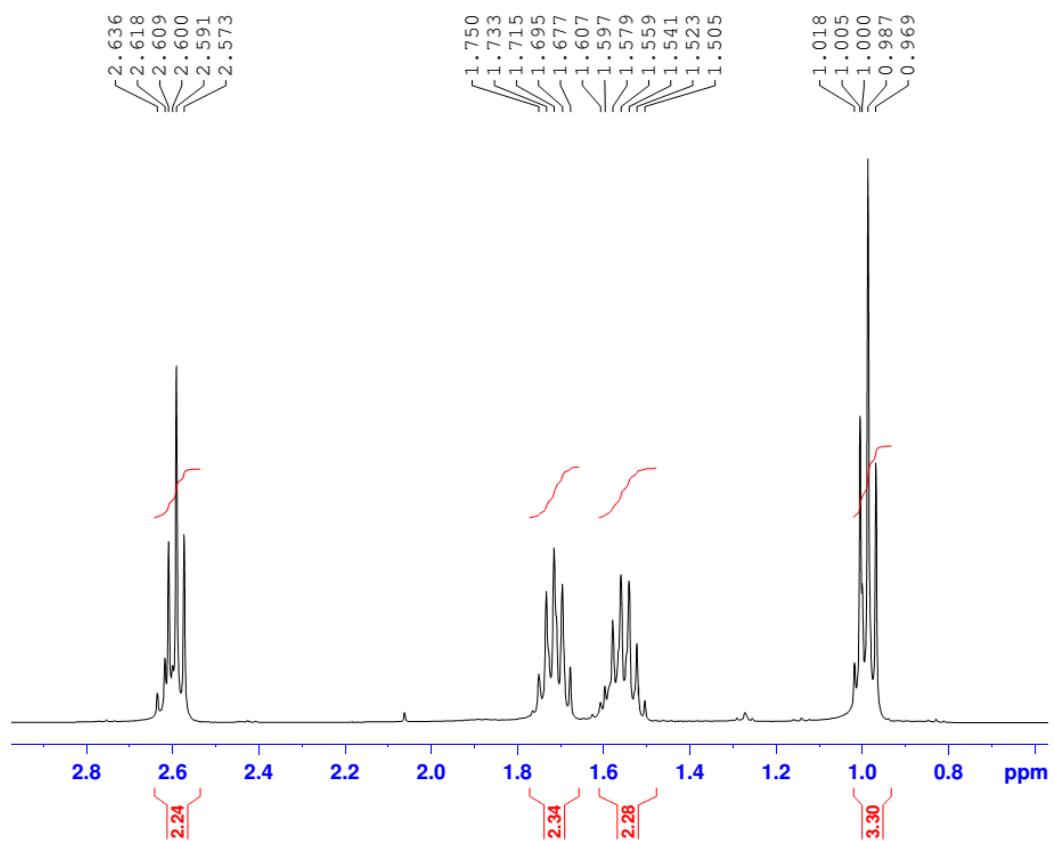


Figure 12:  $^1\text{H}$  NMR spectrum of **4c**

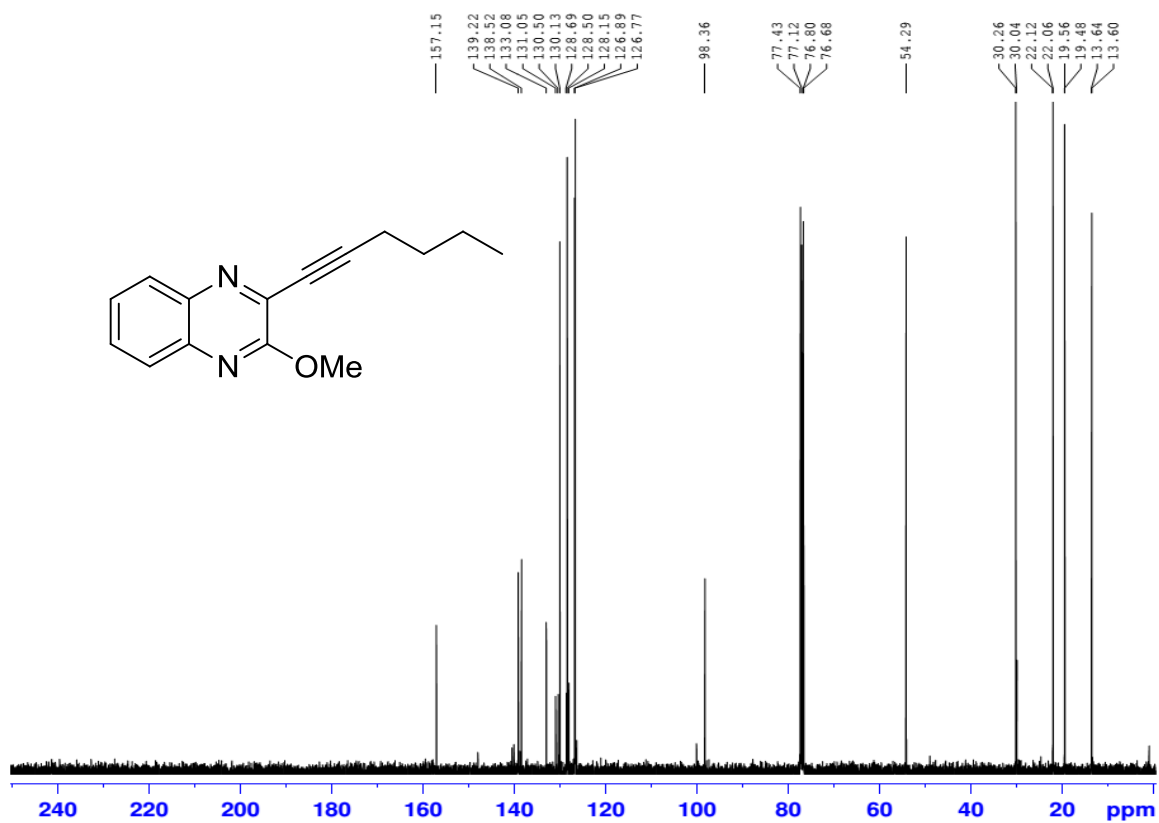


Figure 13:  $^{13}\text{C}$  NMR spectrum of **4c**

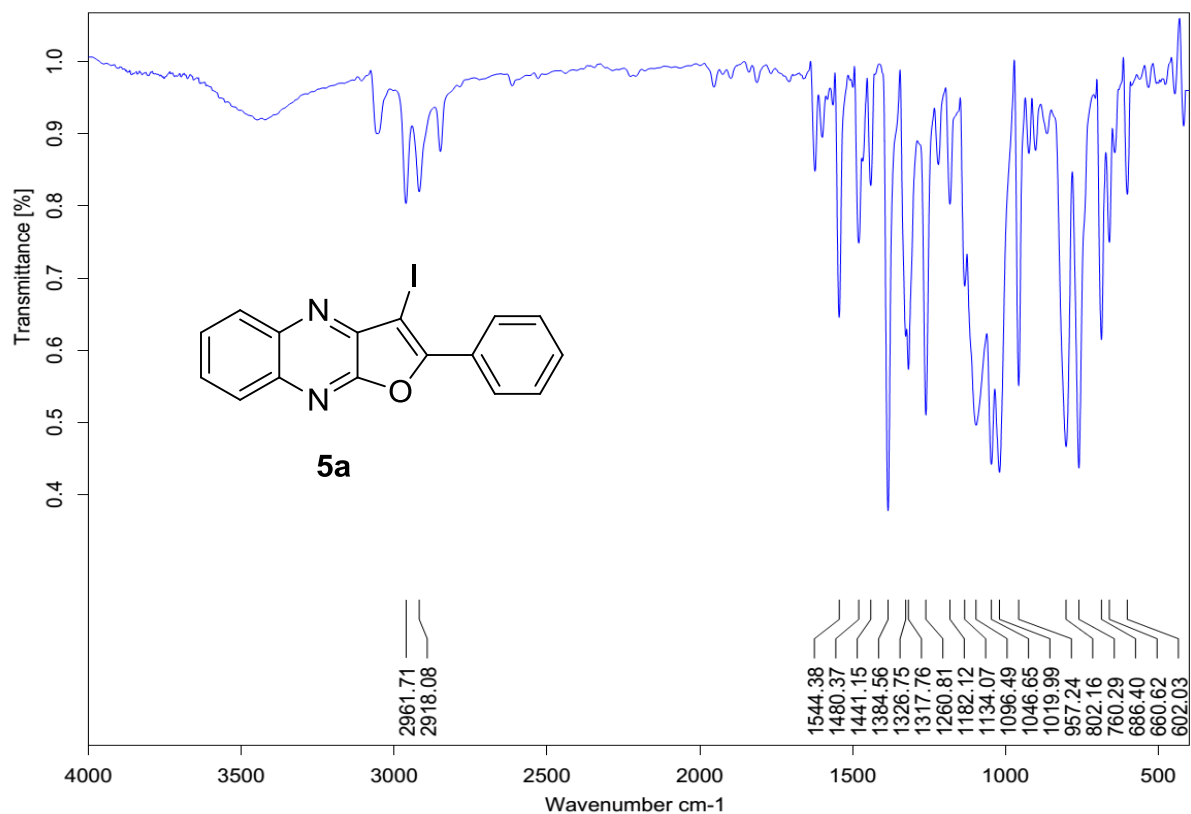
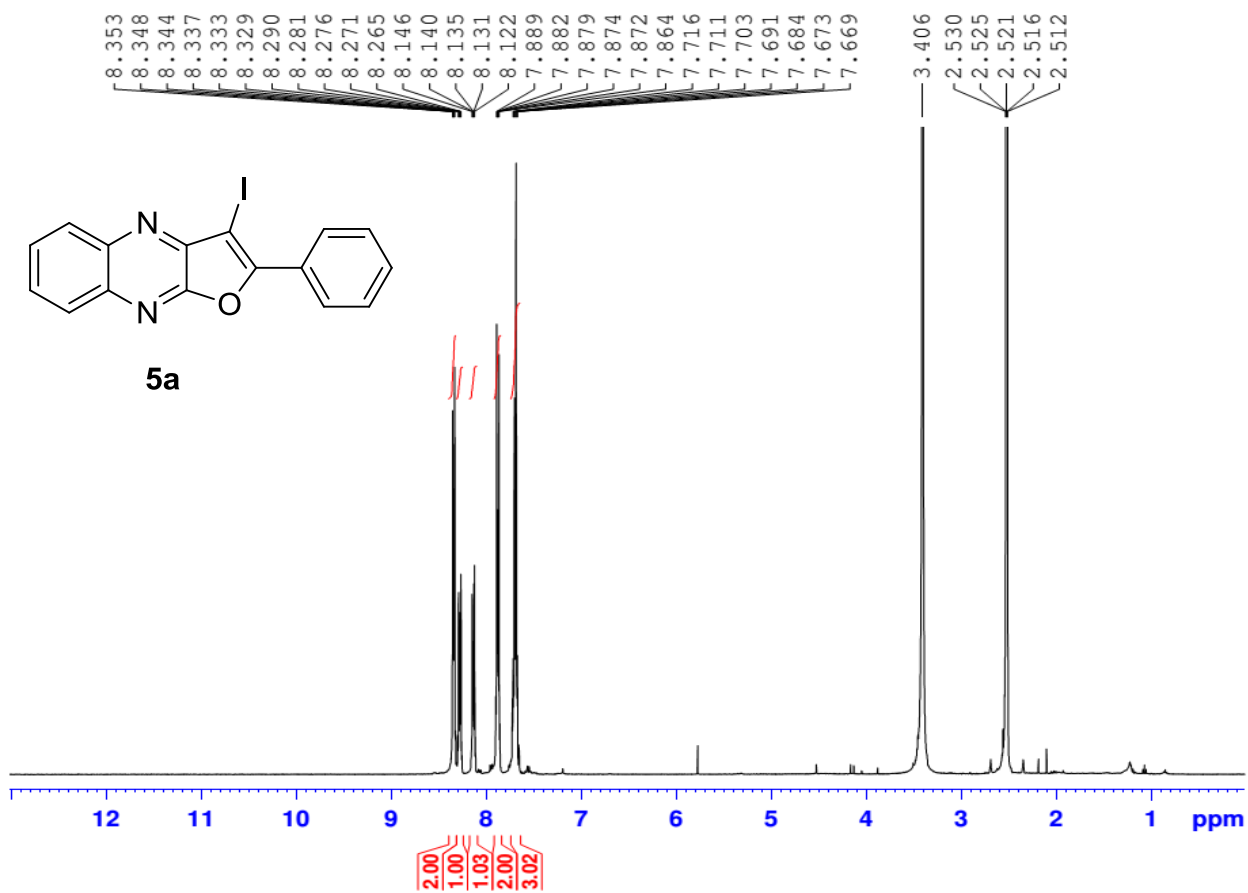


Figure 14: IR spectrum of 5a



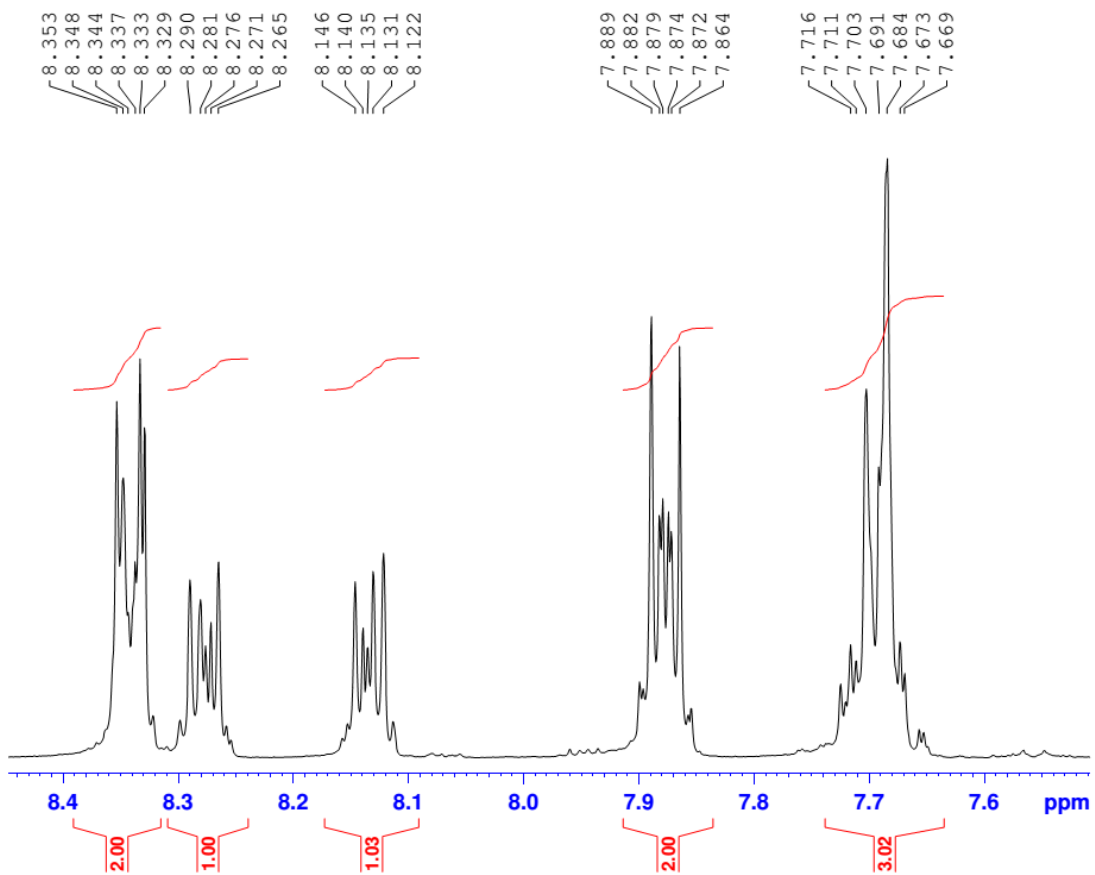
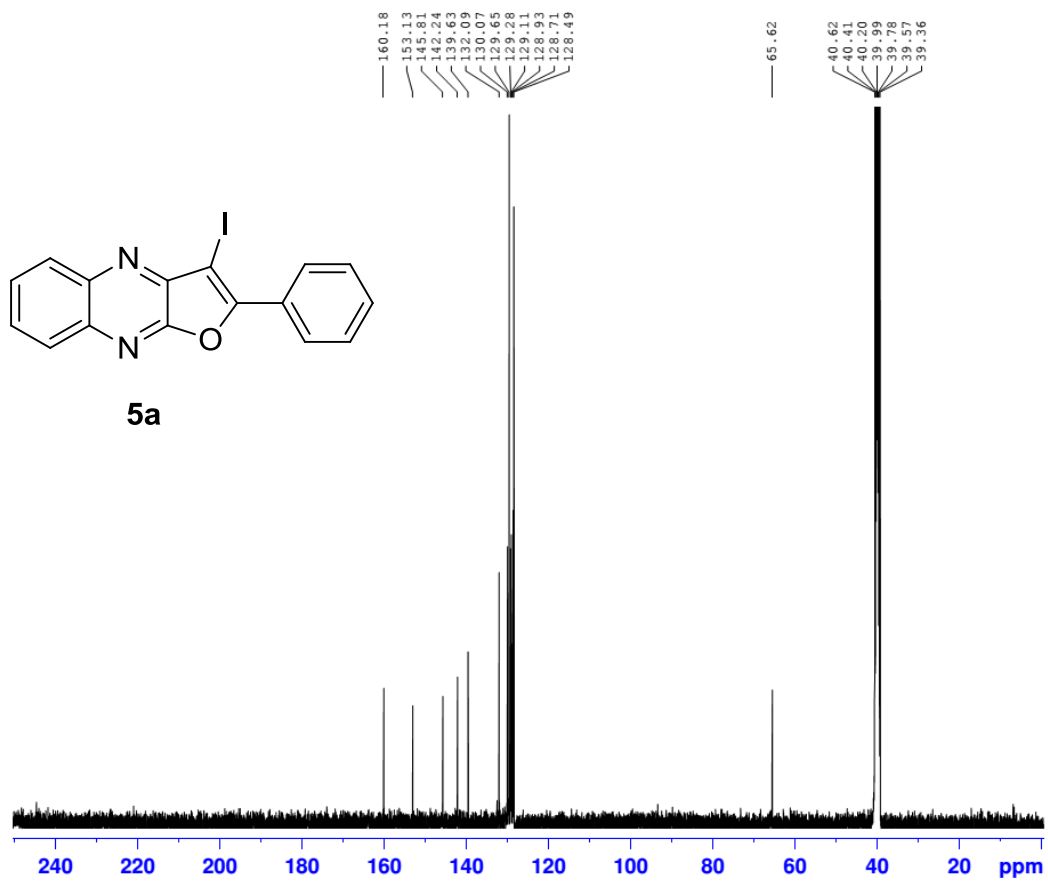


Figure 15: <sup>1</sup>H NMR spectrum of 5a



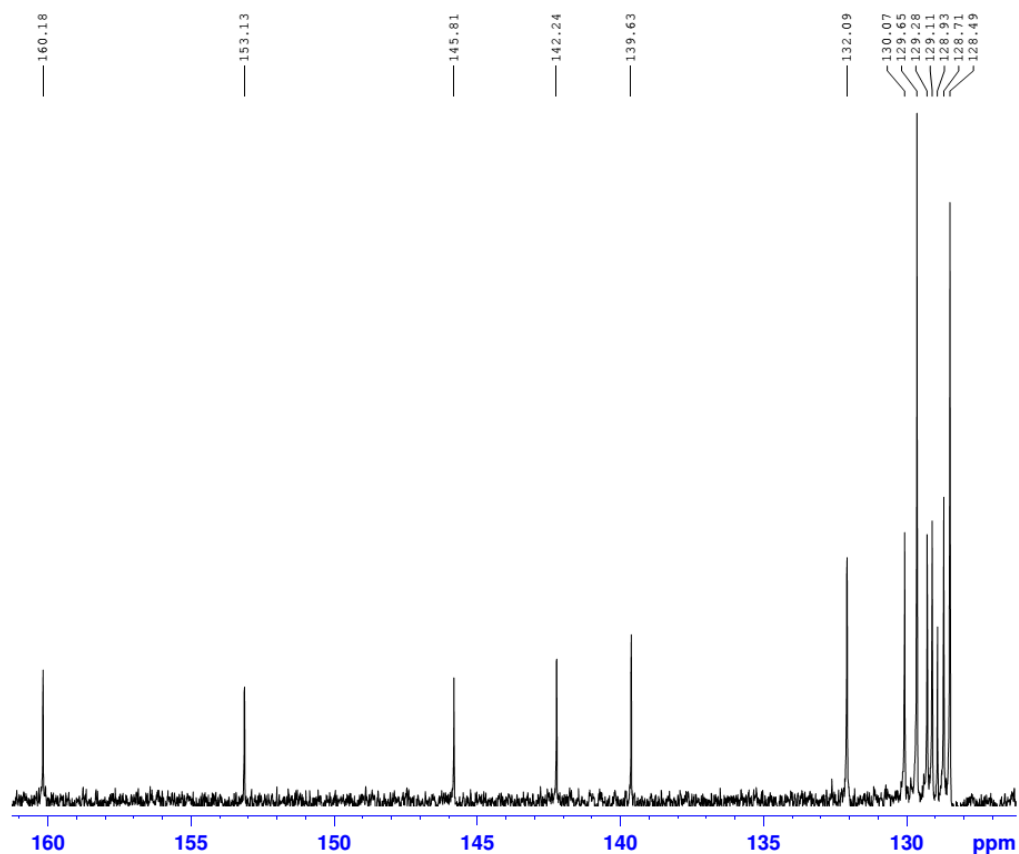
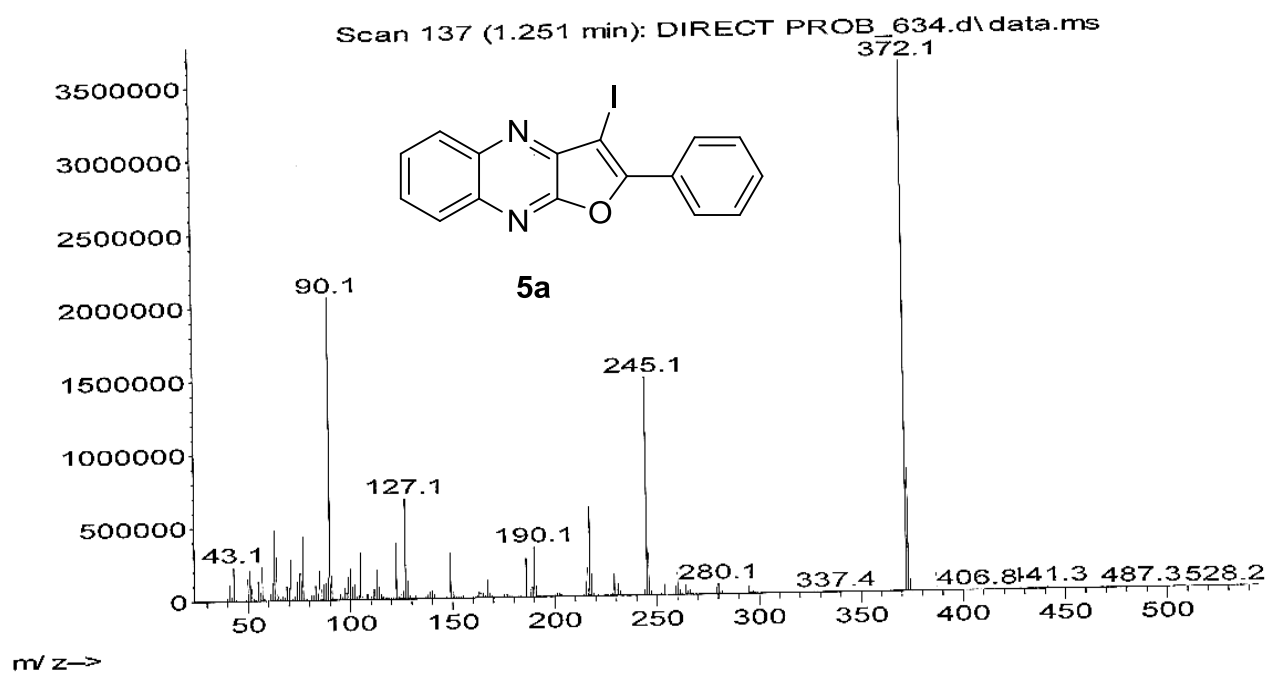


Figure 16:  $^{13}\text{C}$  NMR spectrum of 5a

Abundance



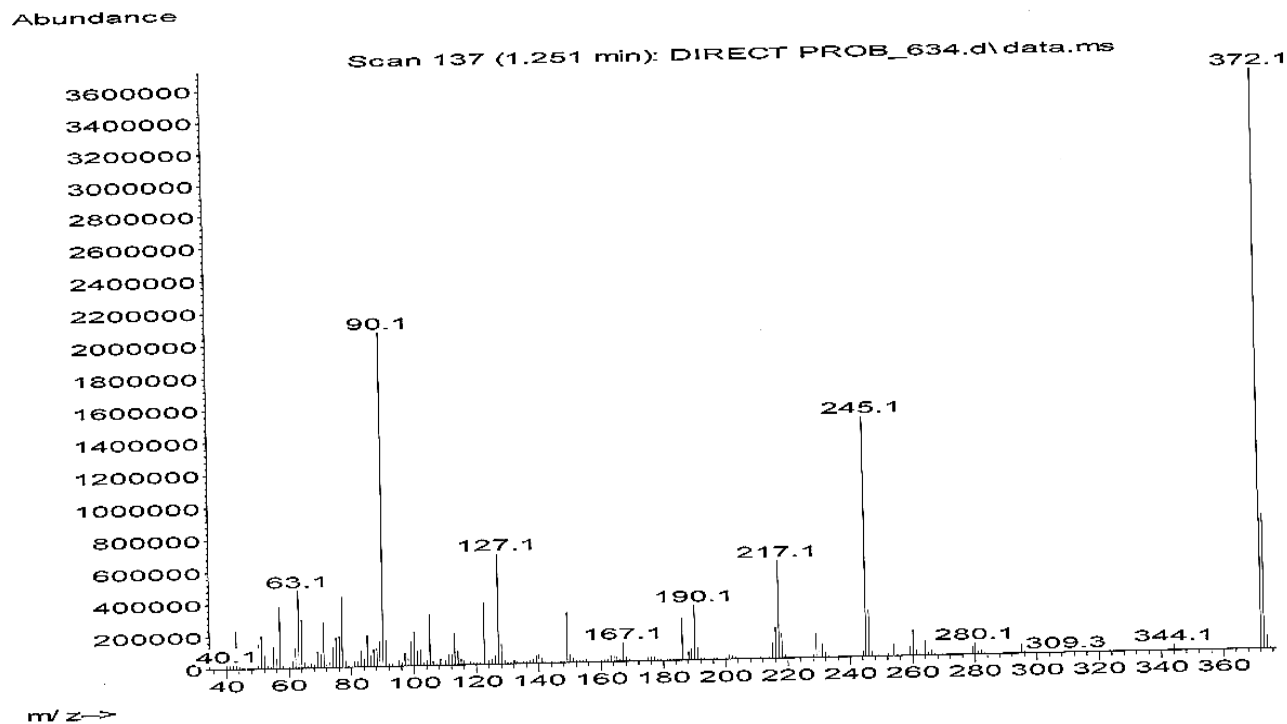


Figure 17: Mass spectrum of 5a

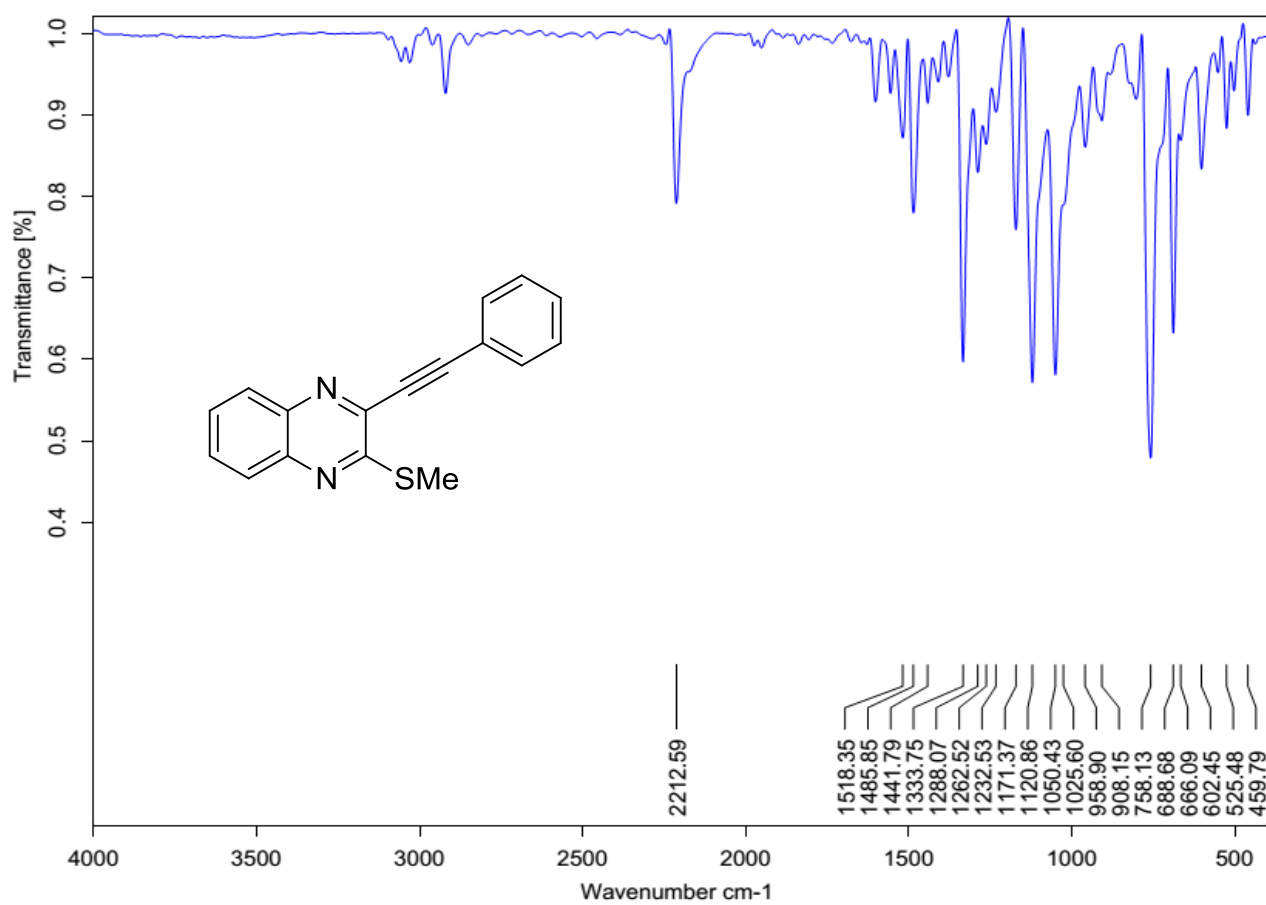


Figure 18: IR spectrum of 6



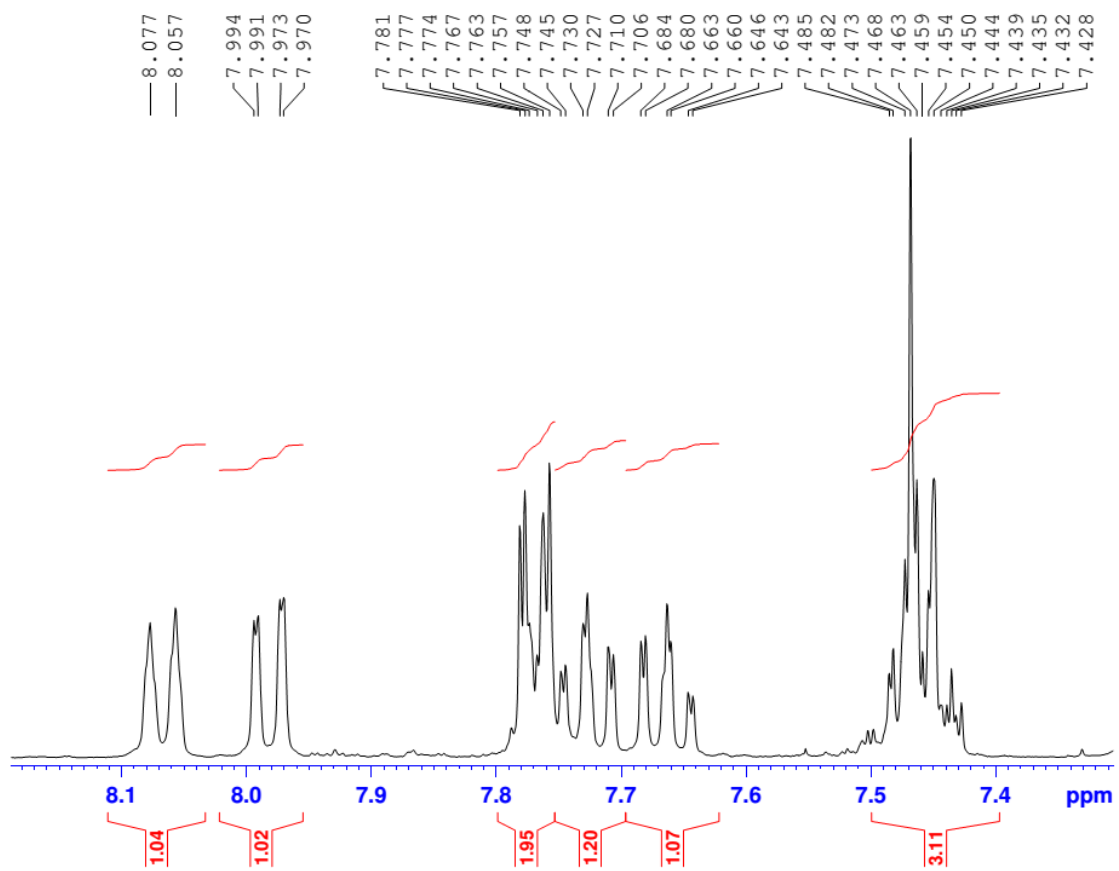
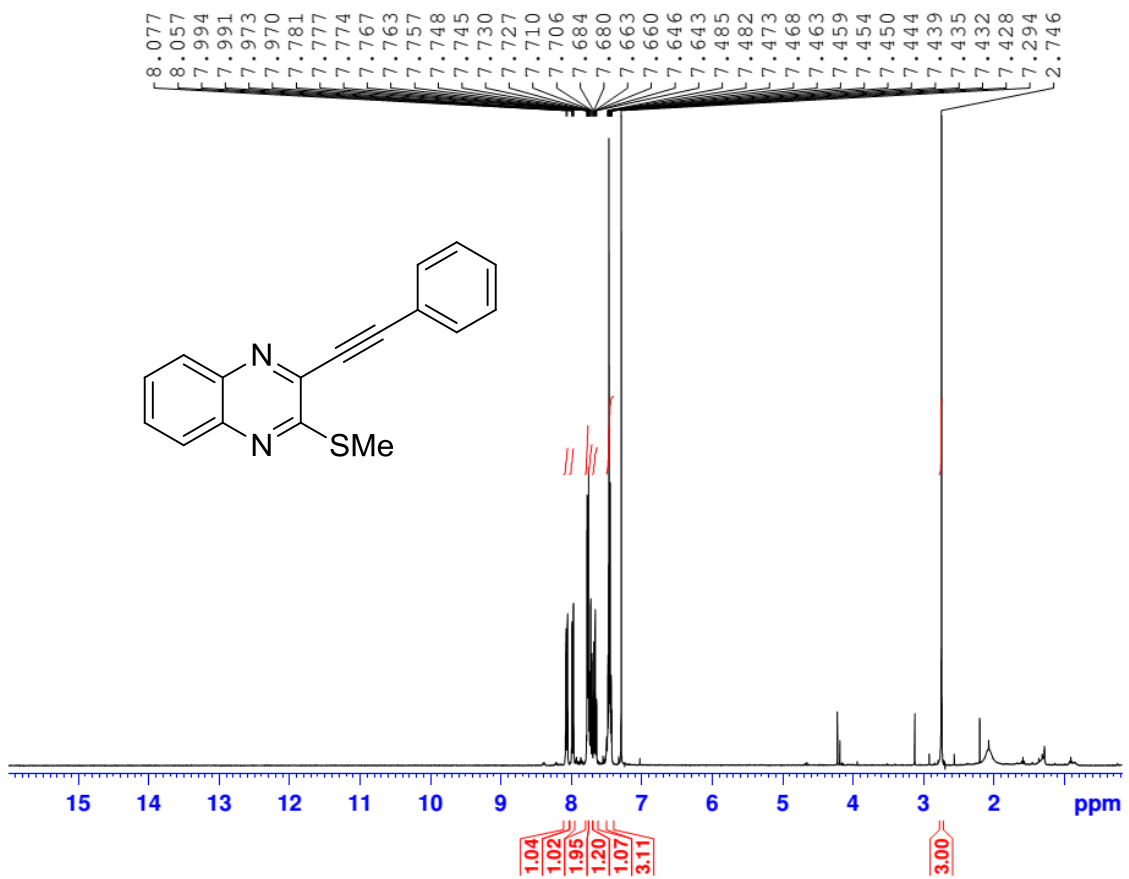
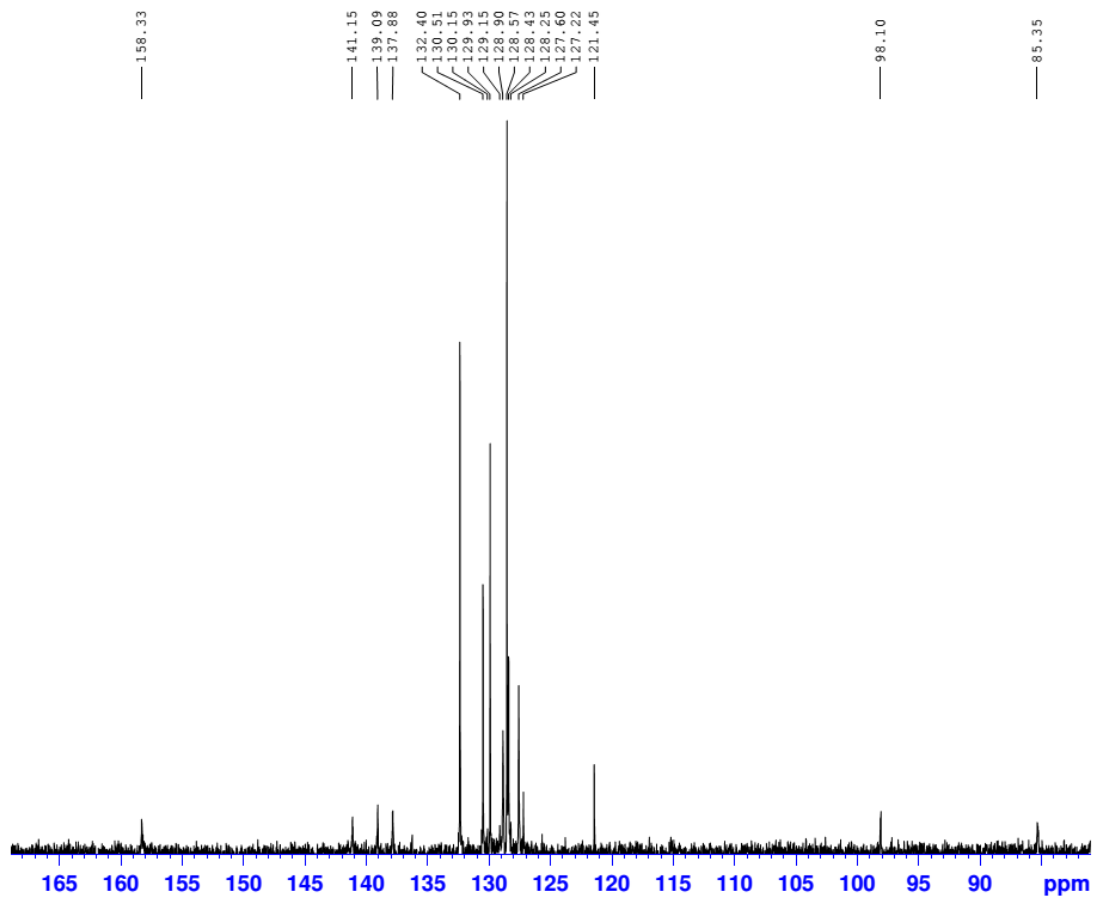
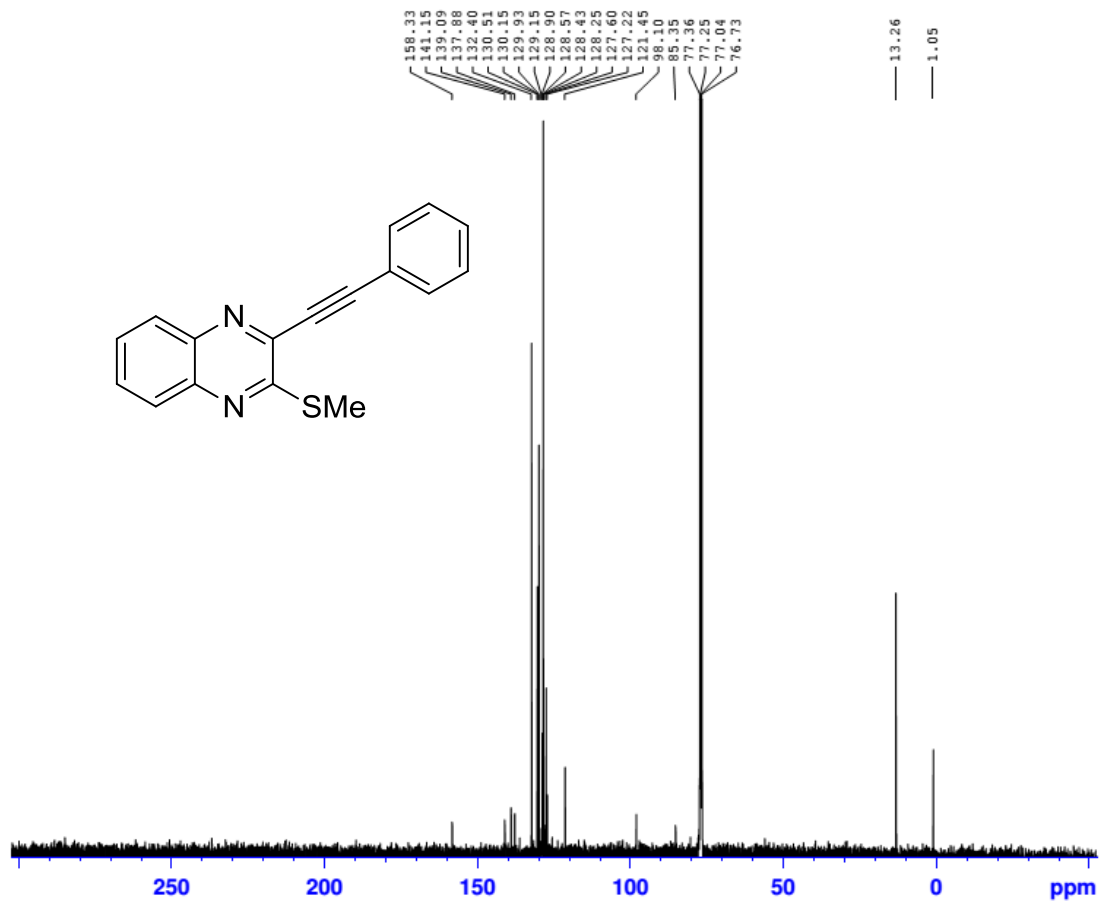


Figure 19:  $^1\text{H}$  NMR spectrum of 6



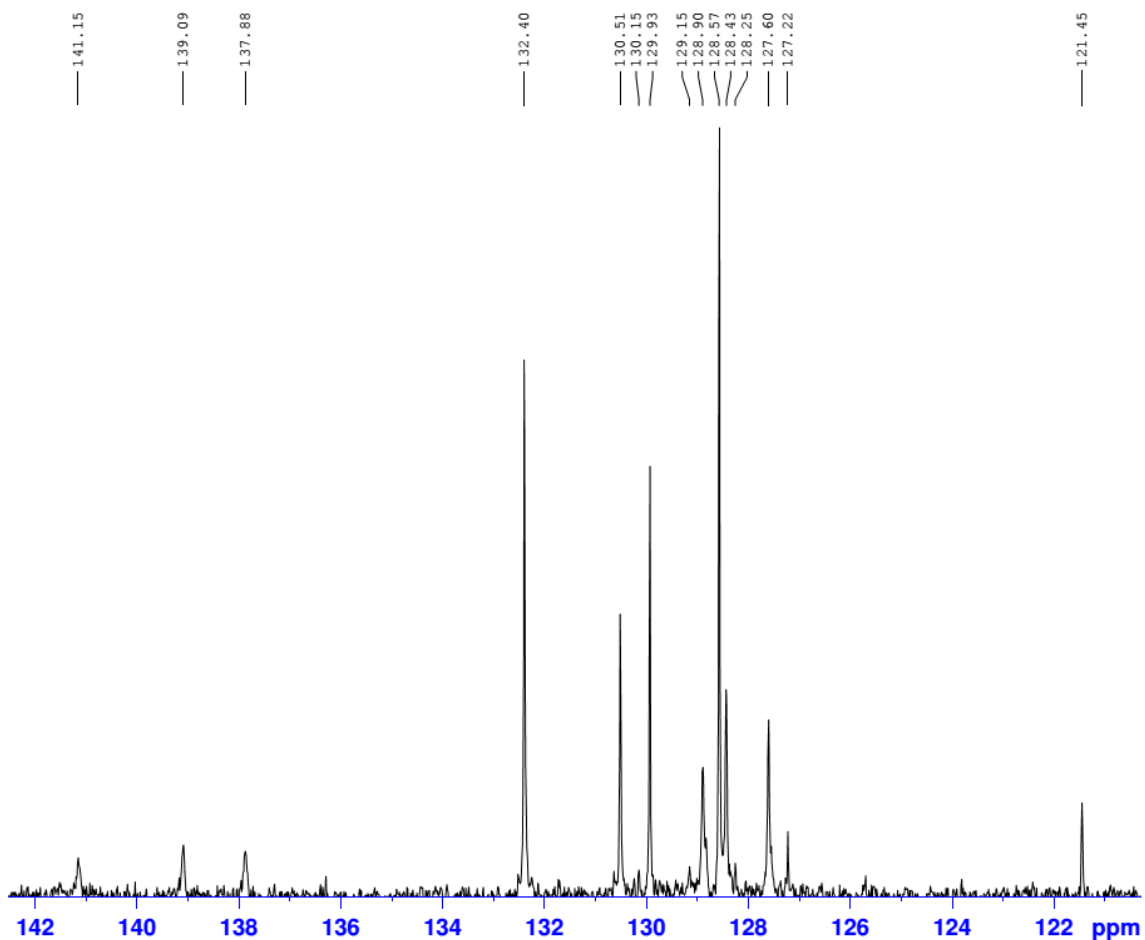
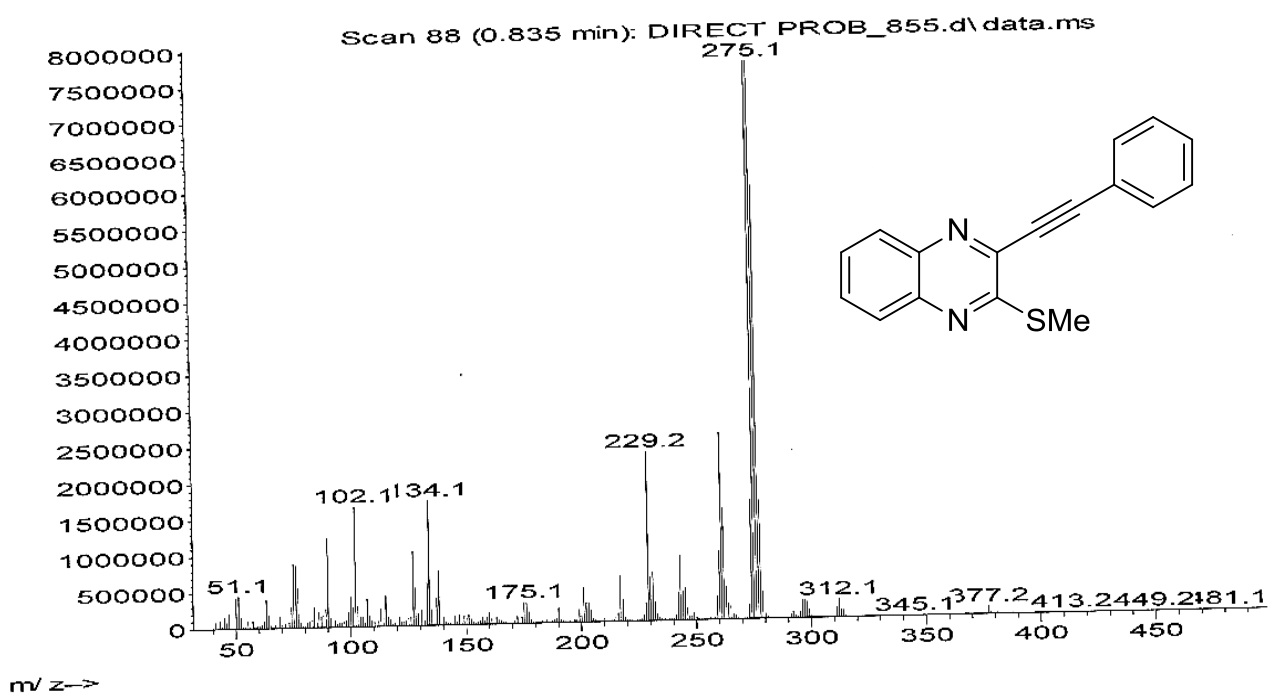


Figure 20:  $^{13}\text{C}$  NMR spectrum of **6**

Abundance



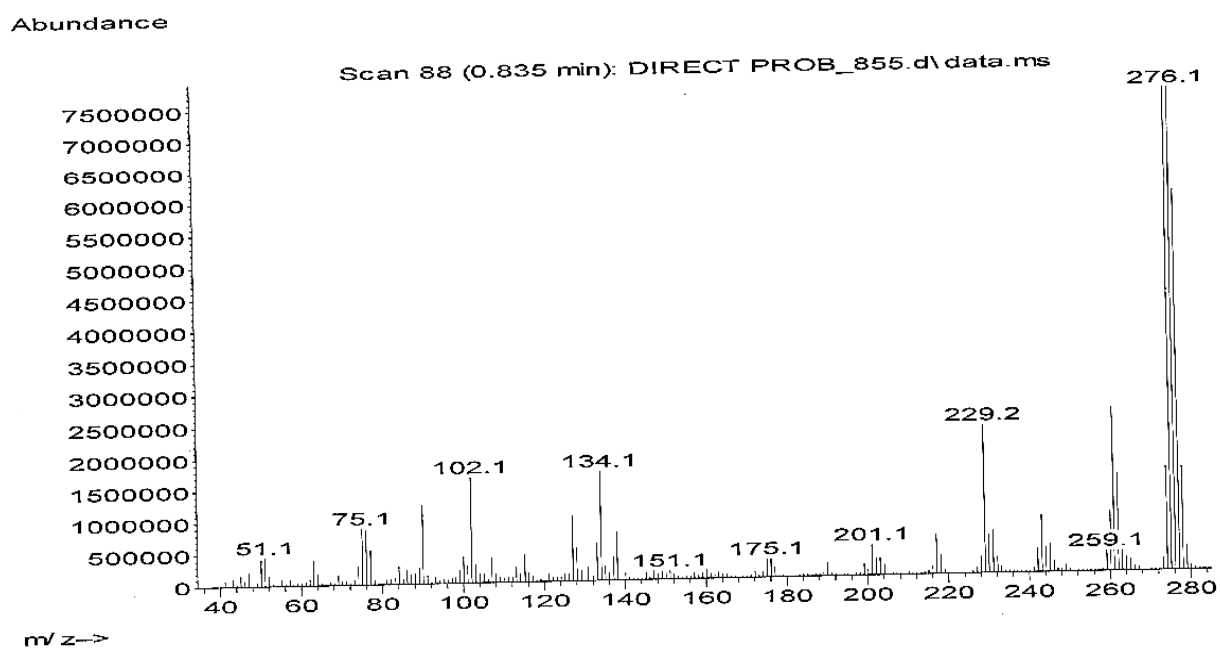


Figure 21: Mass spectrum of 6

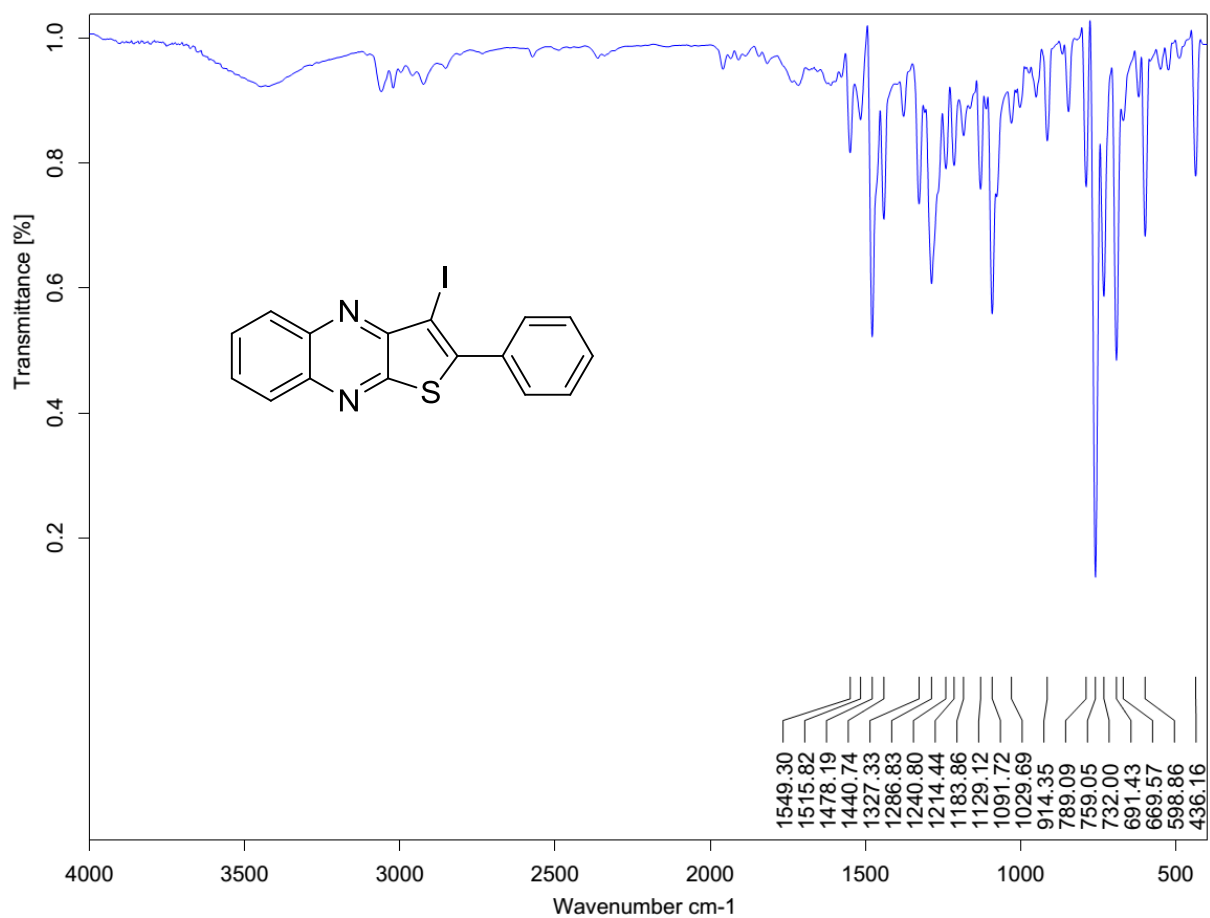


Figure 22: IR spectrum of 7

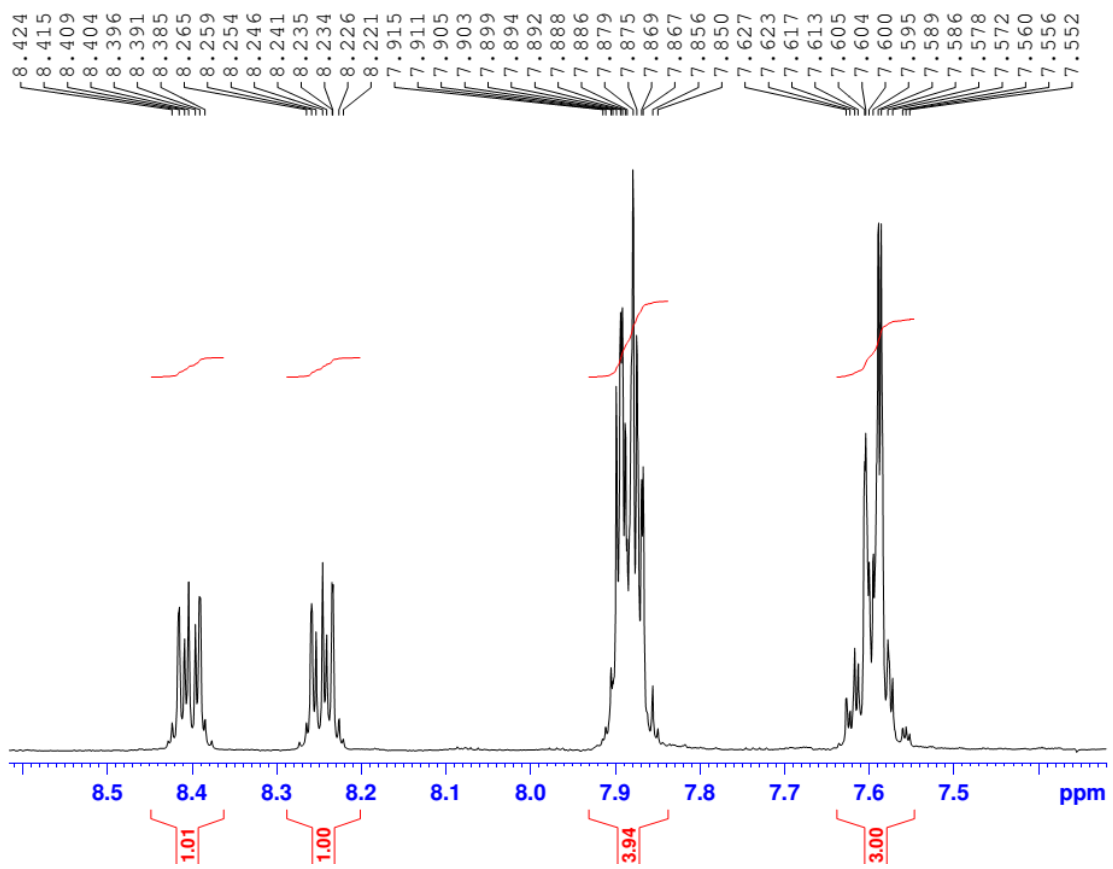
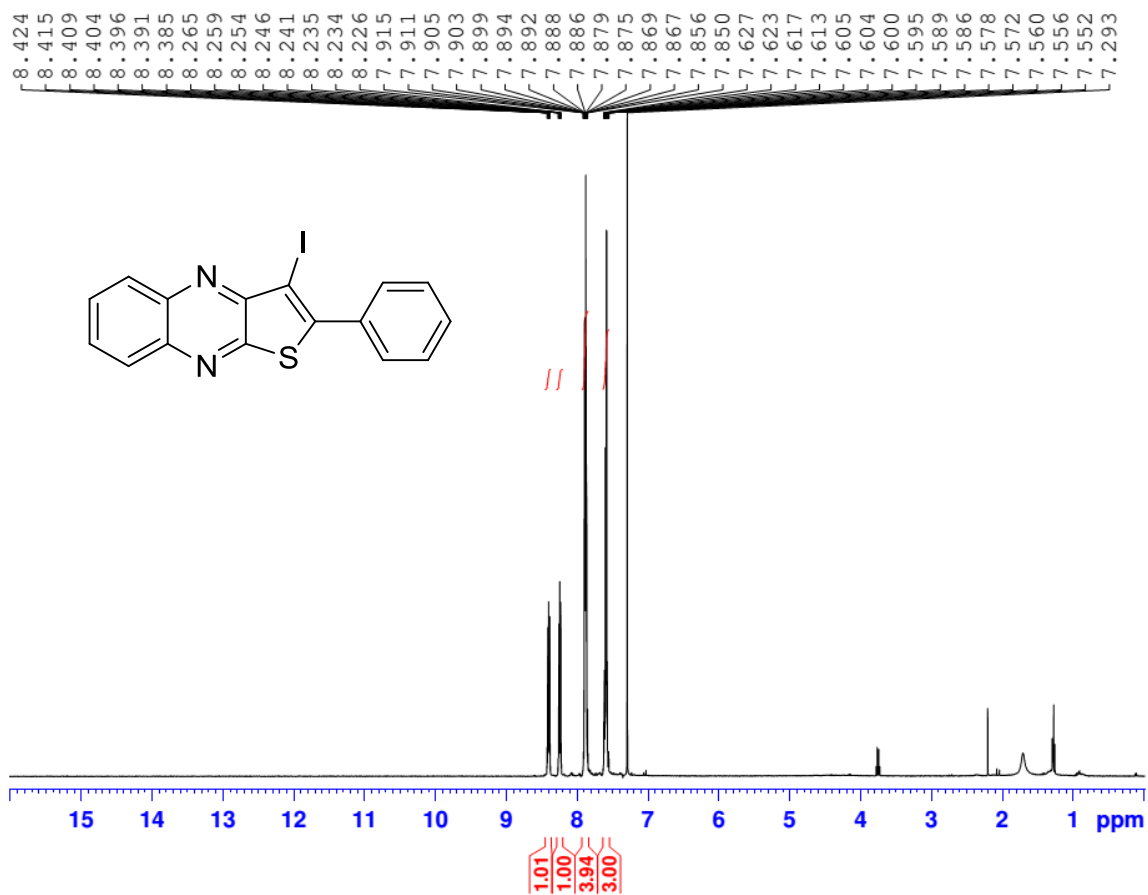


Figure 23: <sup>1</sup>H NMR spectrum of 7

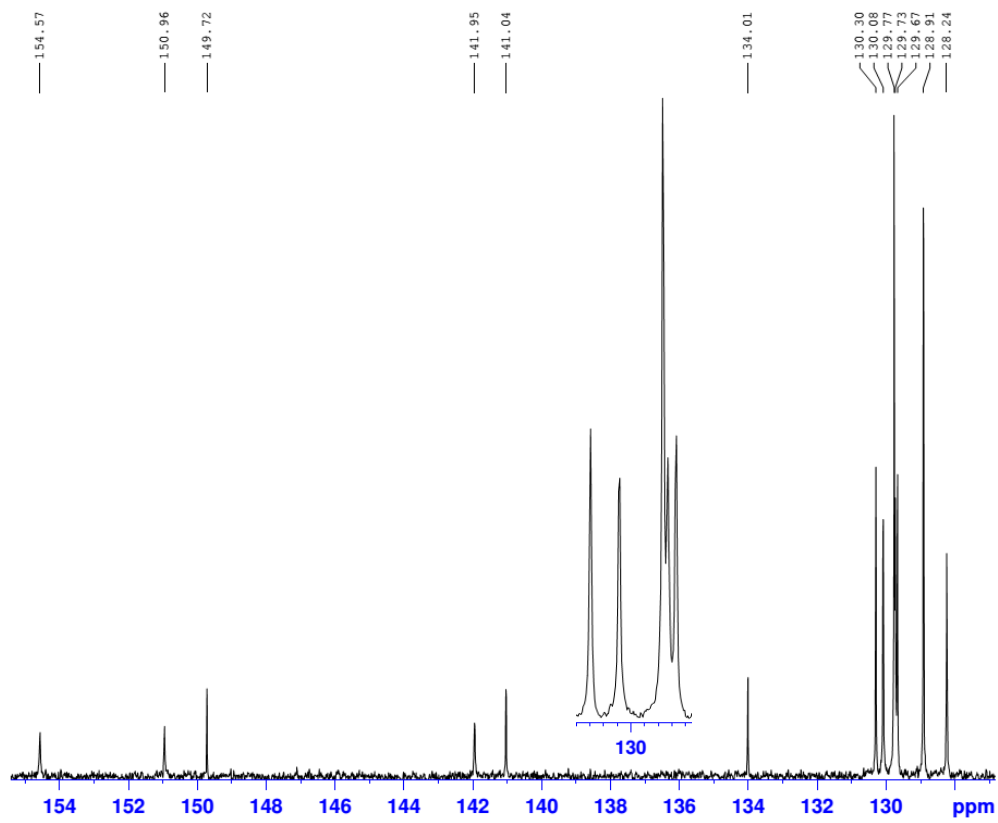
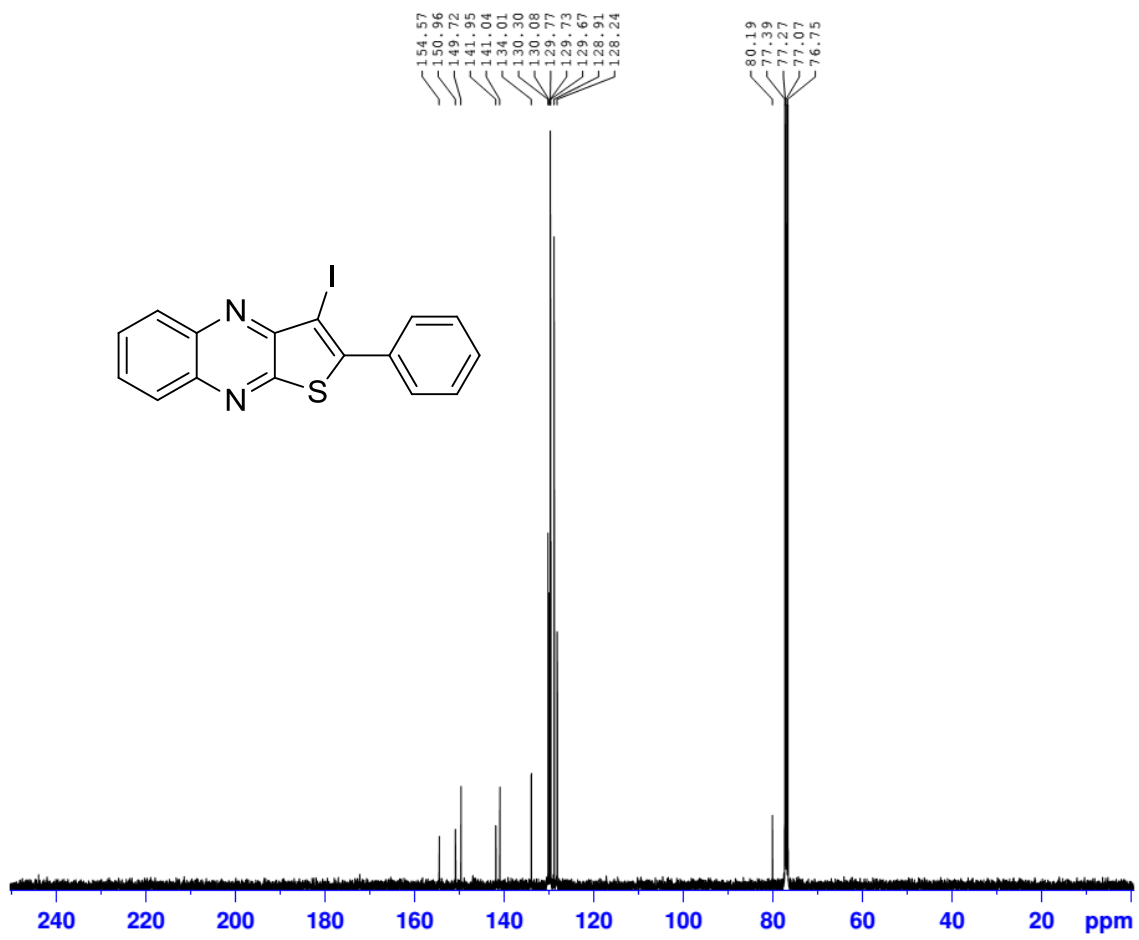
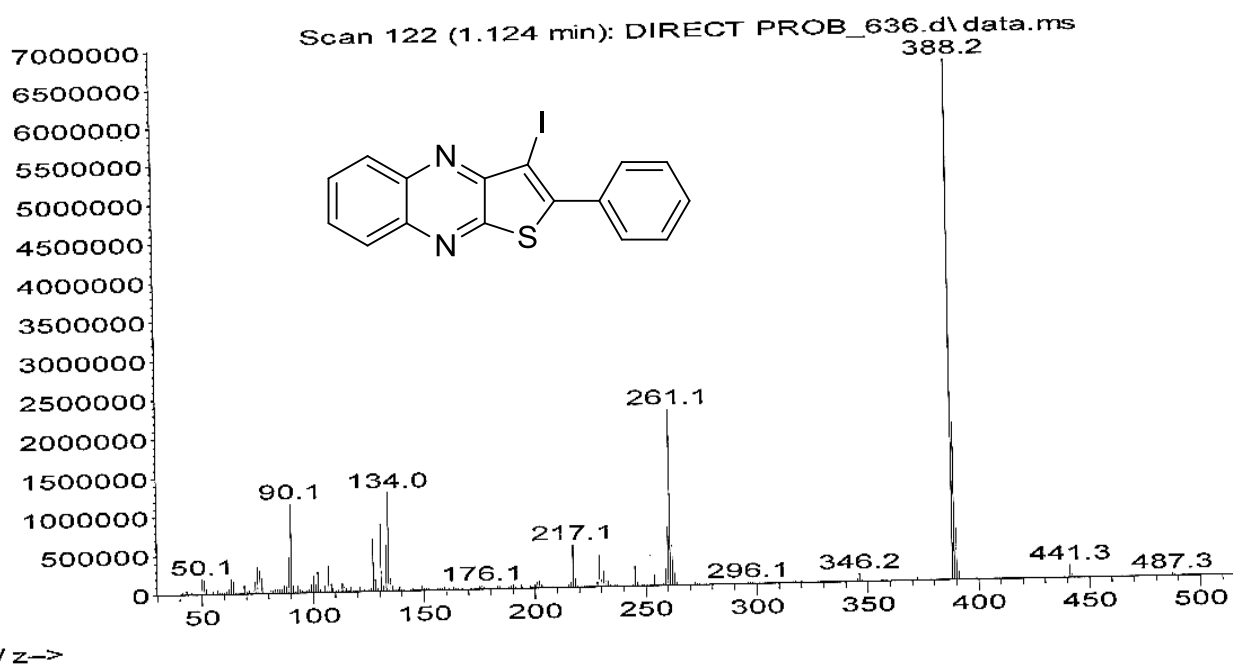


Figure 24: <sup>13</sup>C NMR spectrum of 7

Abundance



Abundance

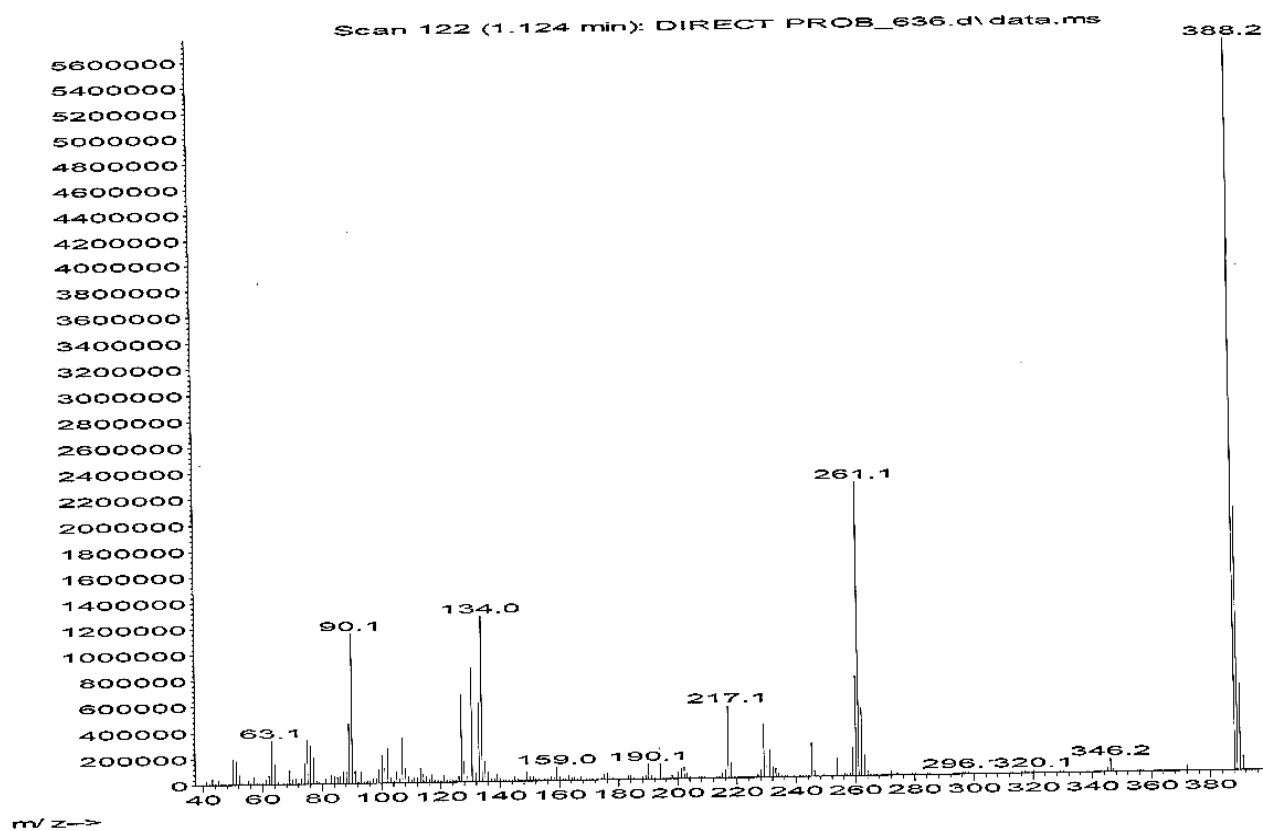
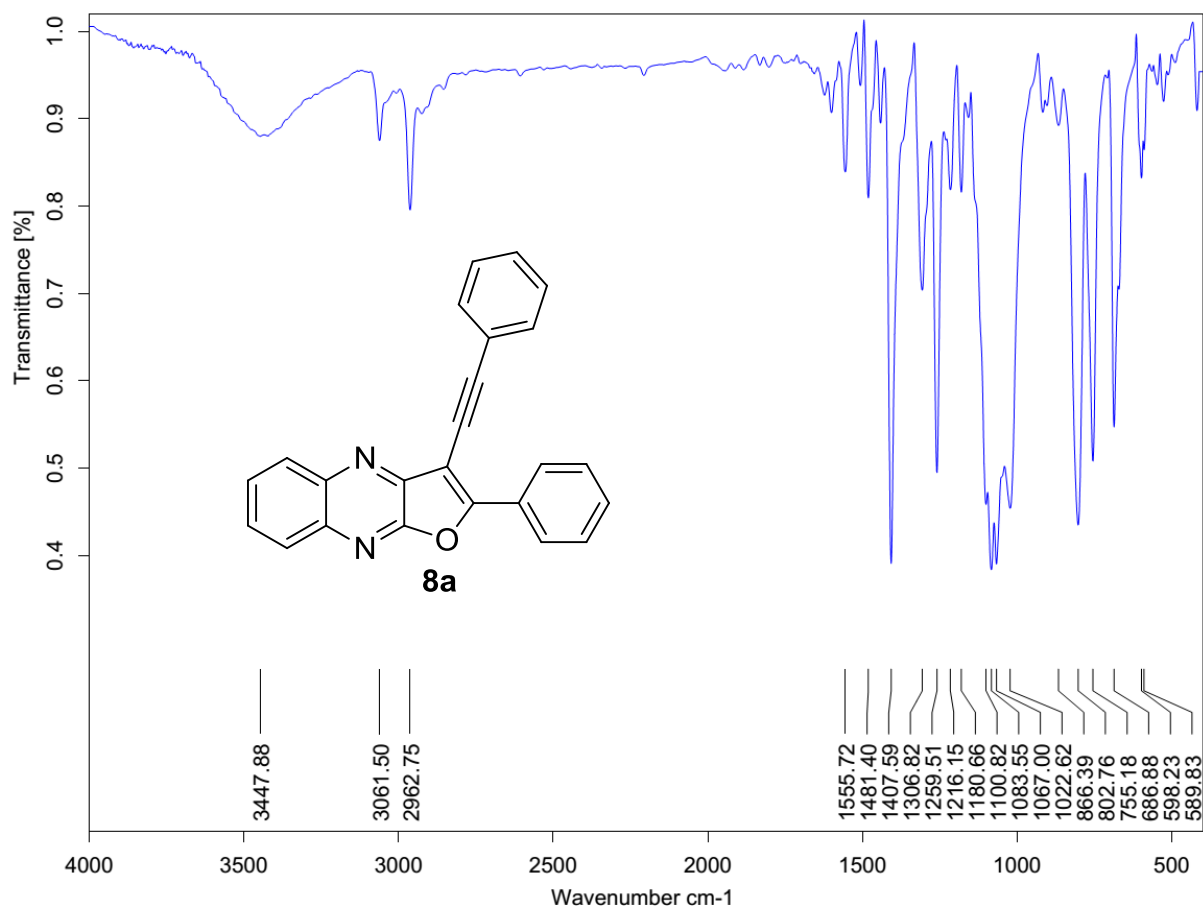
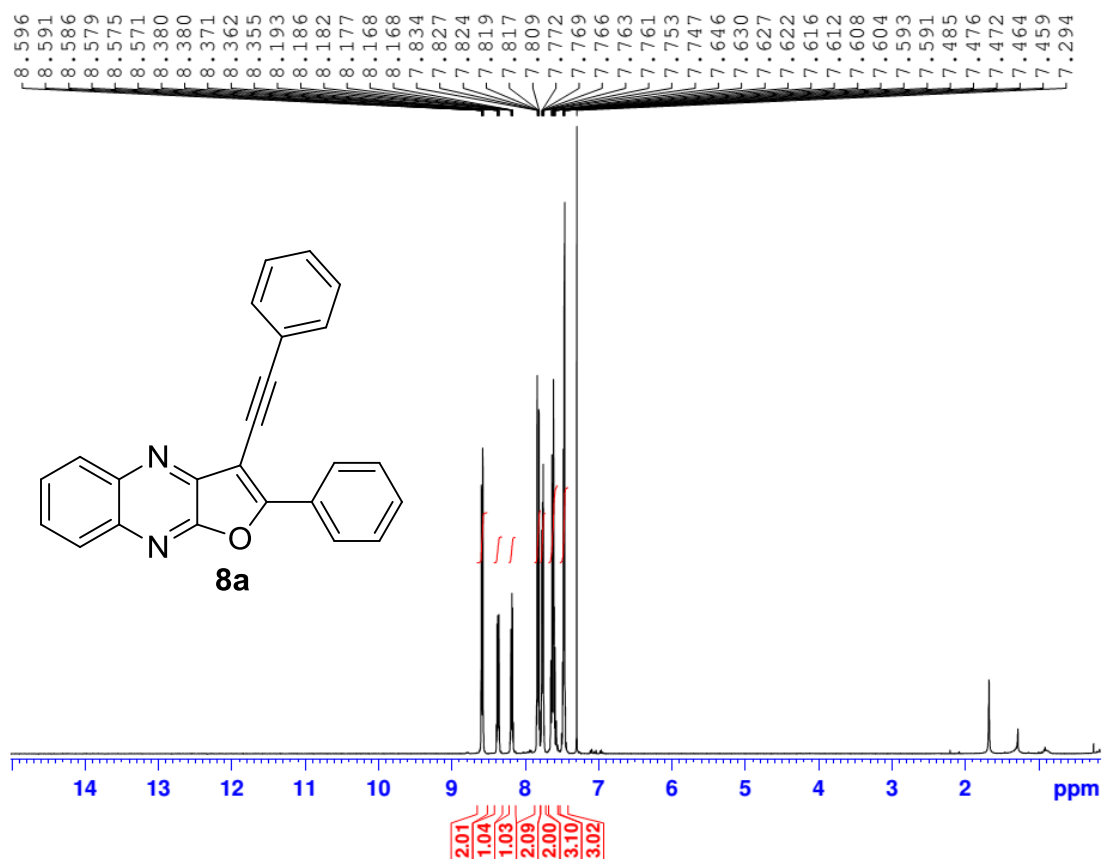


Figure 25: Mass spectrum of 7



**Figure 26: IR spectrum of 8a**





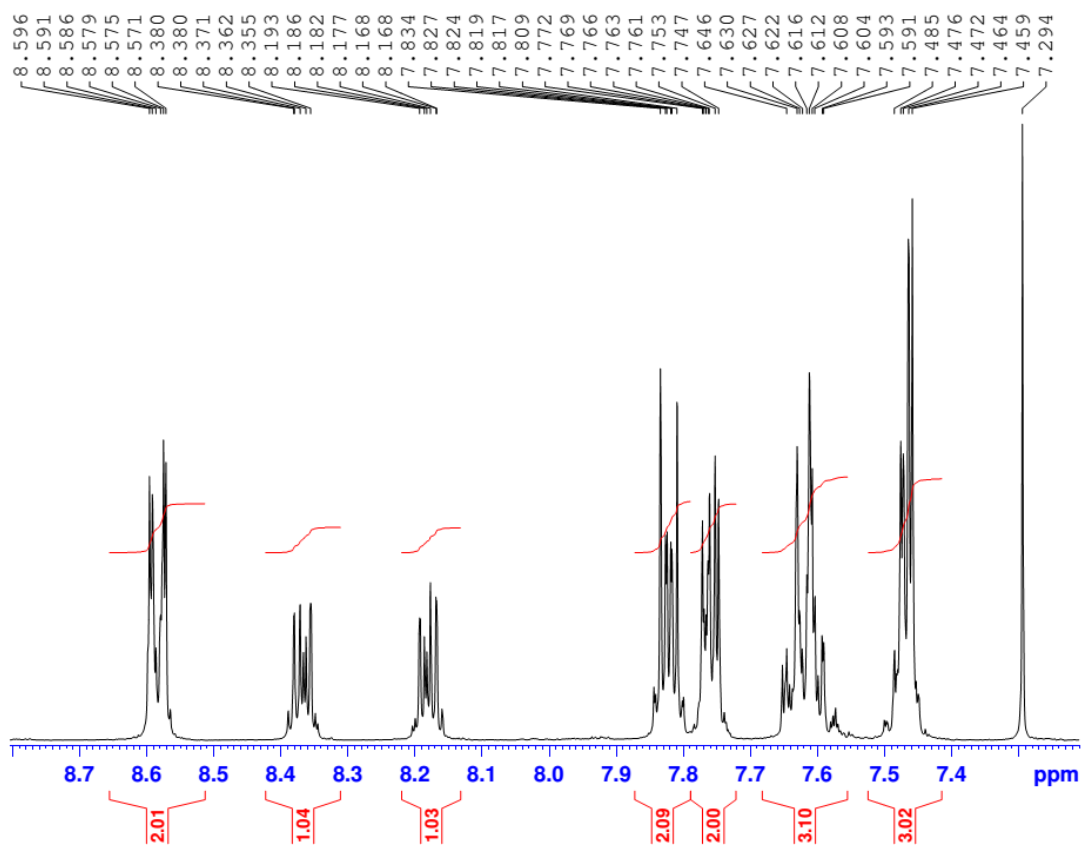
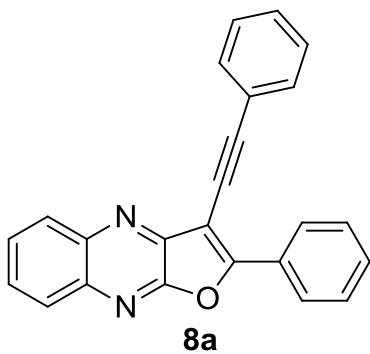
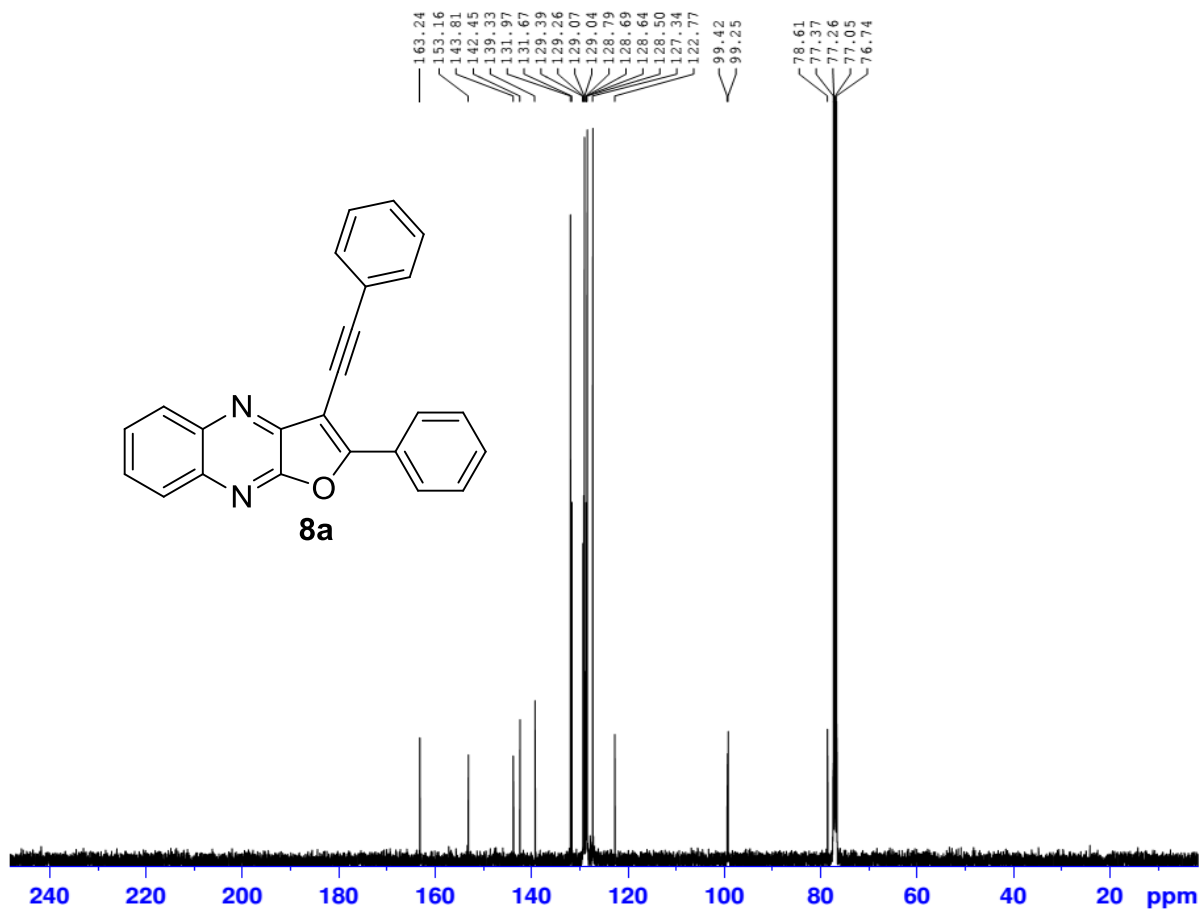


Figure 27: <sup>1</sup>H NMR spectrum of **8a**



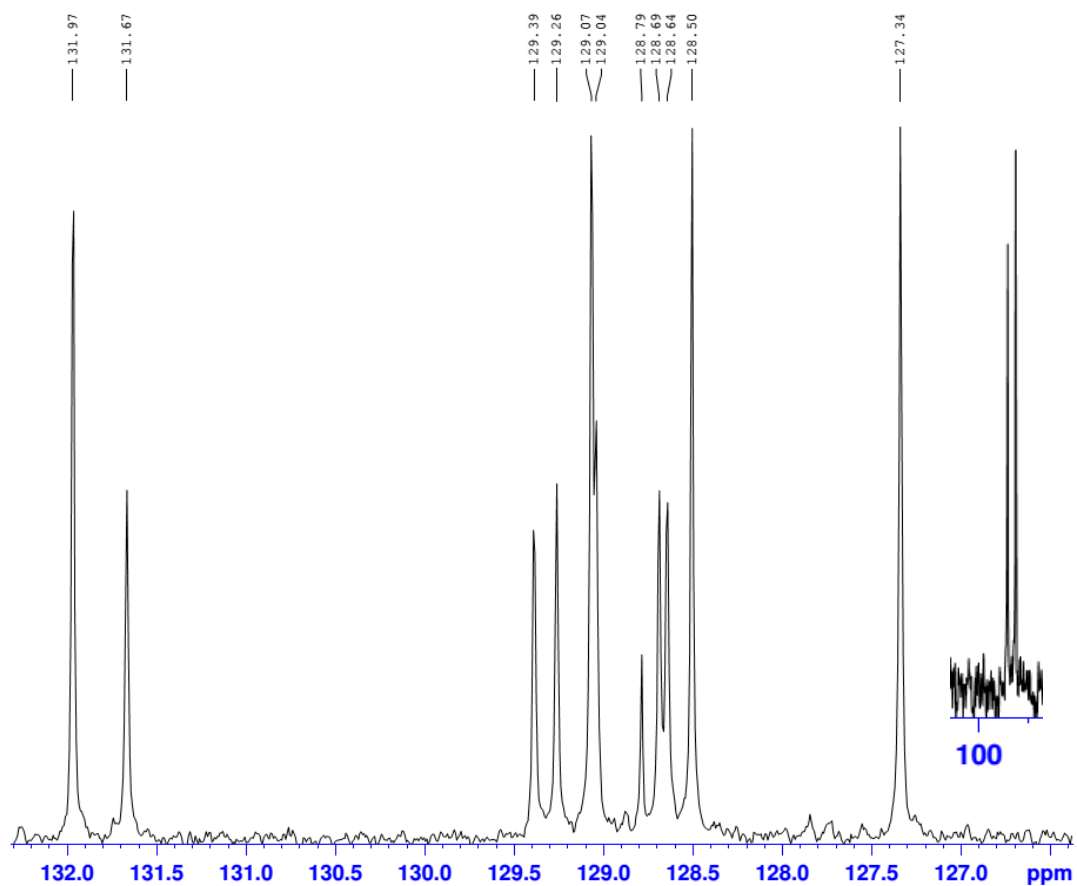
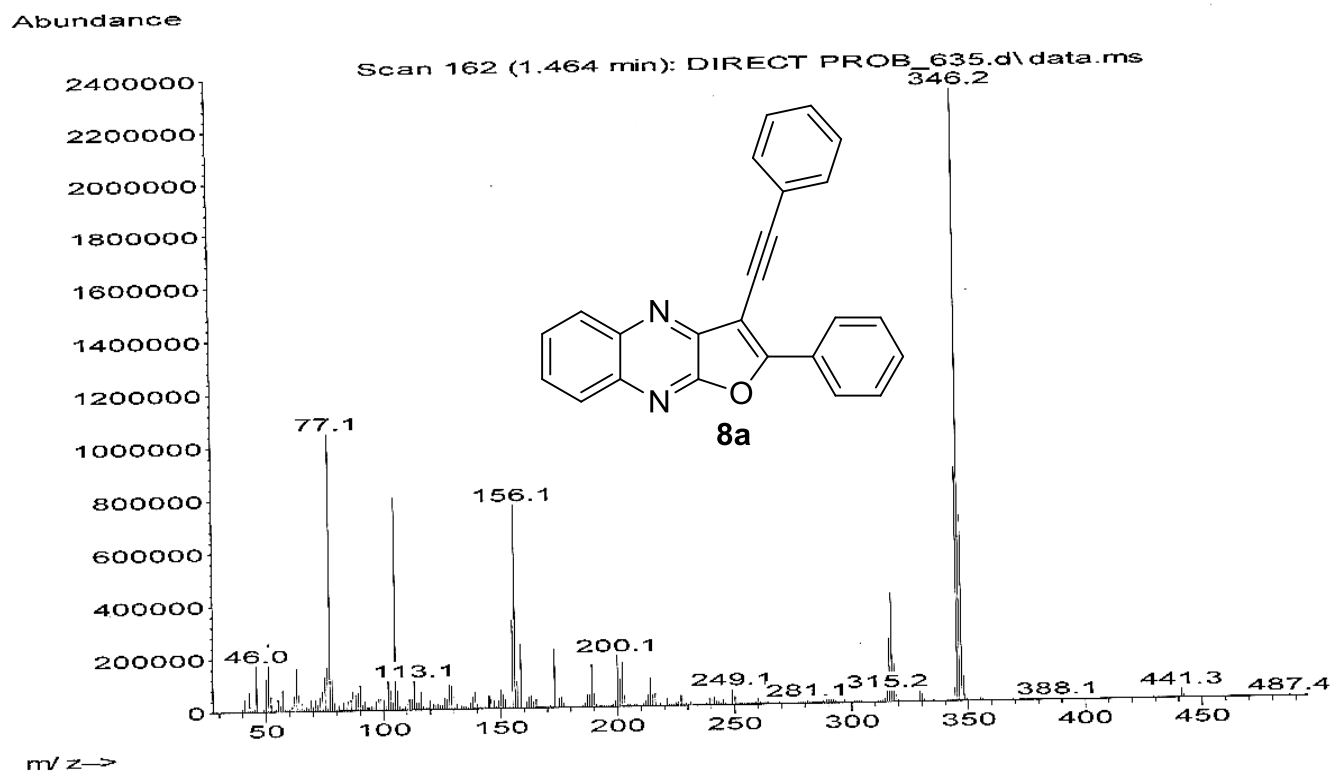


Figure 28:  $^{13}\text{C}$  NMR spectrum of **8a**



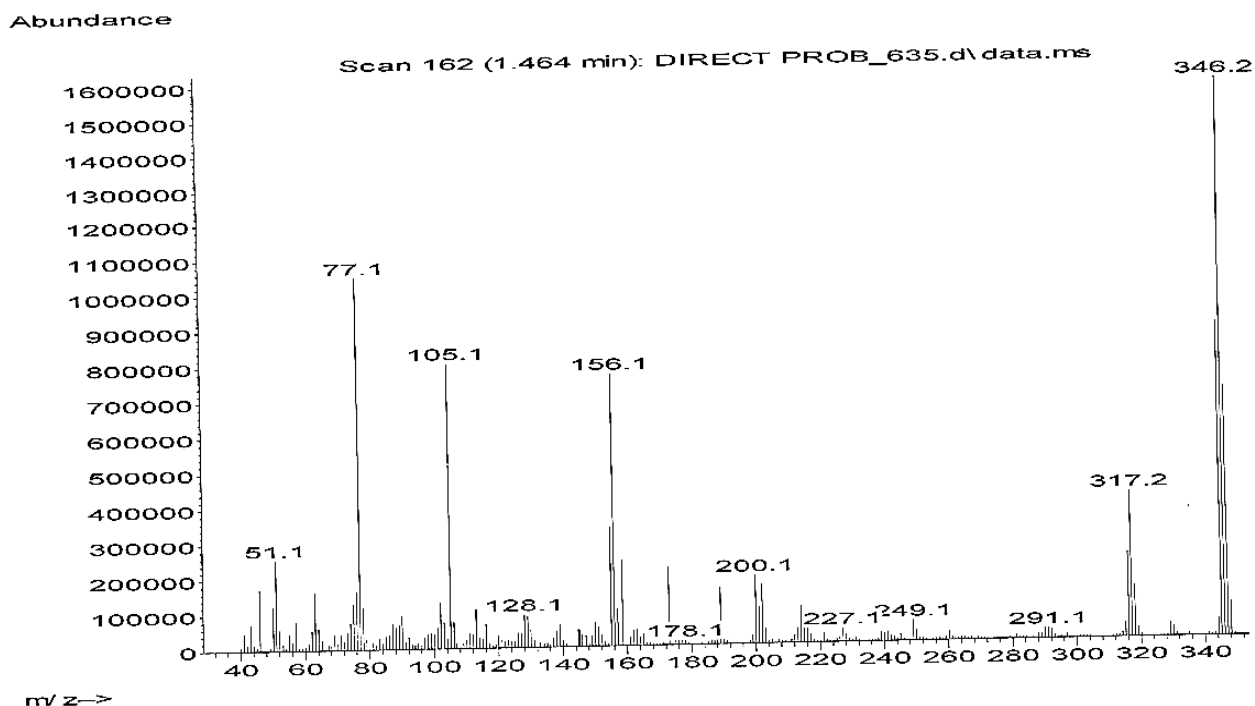


Figure 29: Mass spectrum of 8a

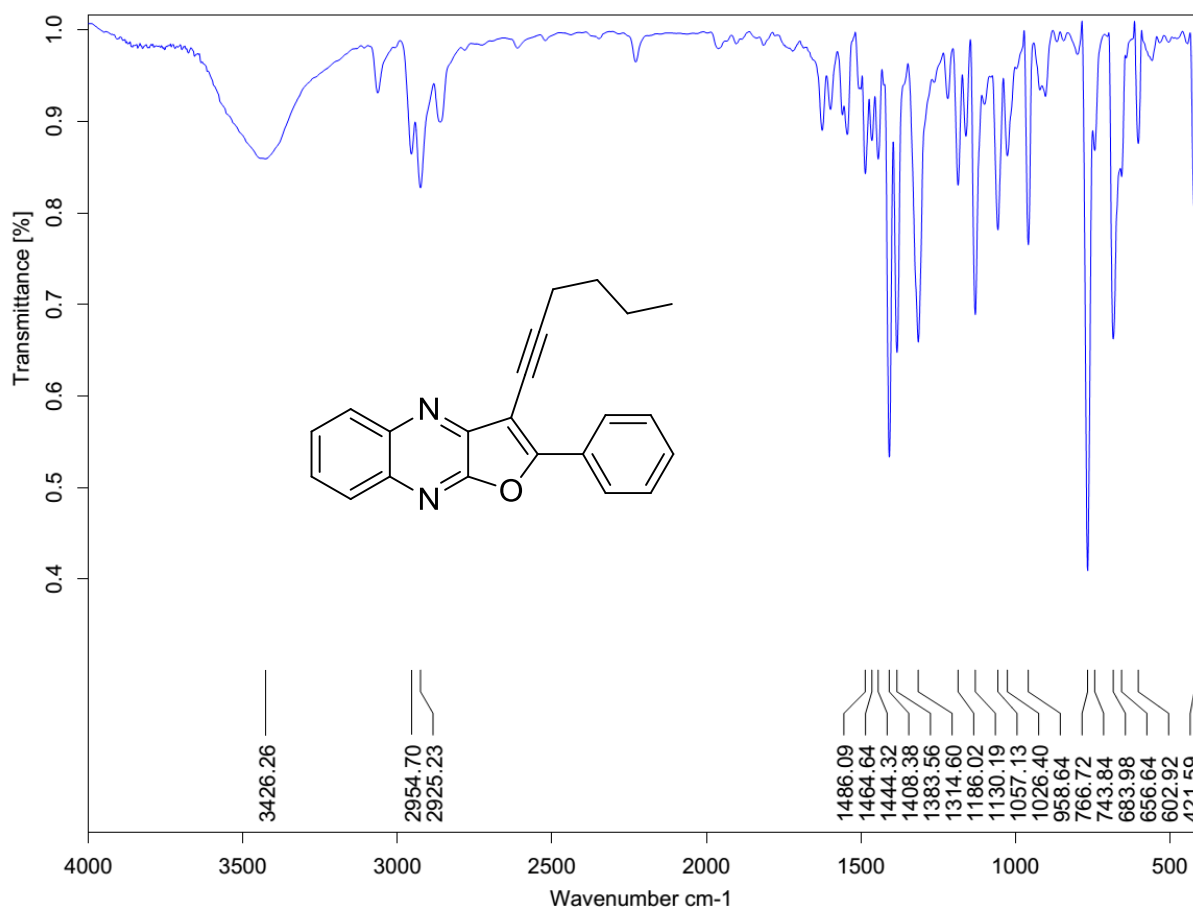
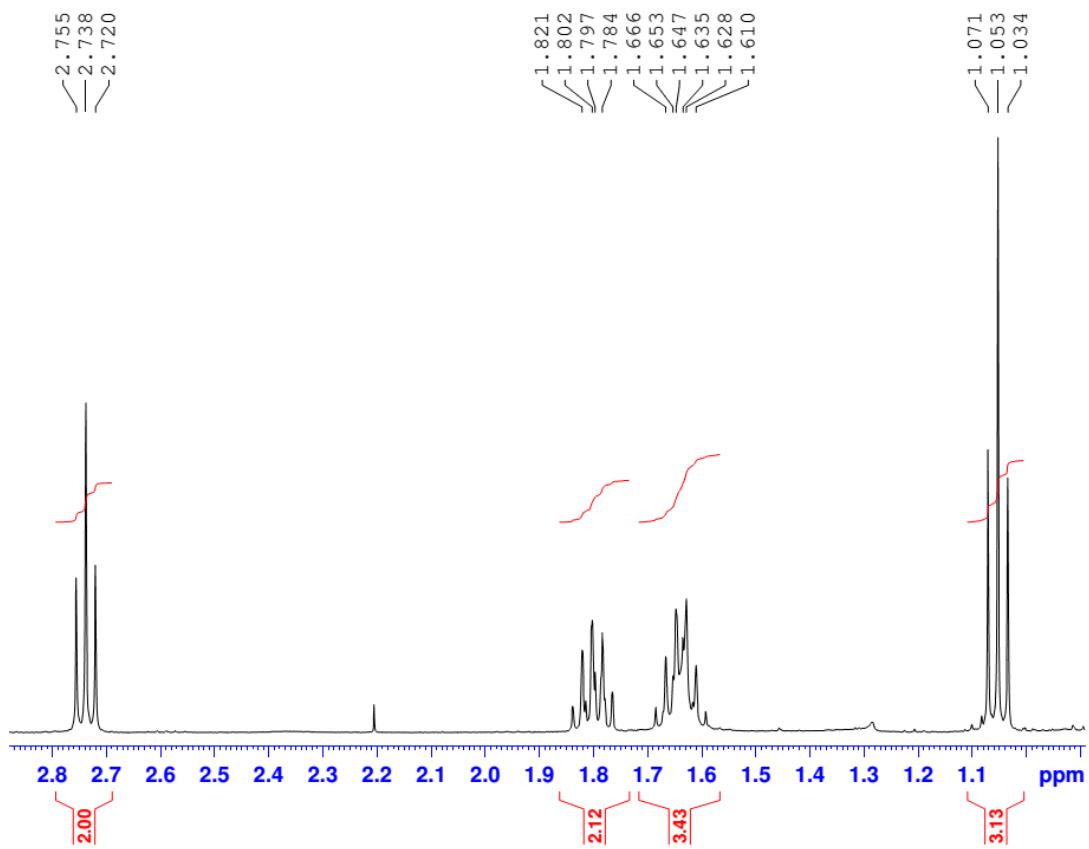
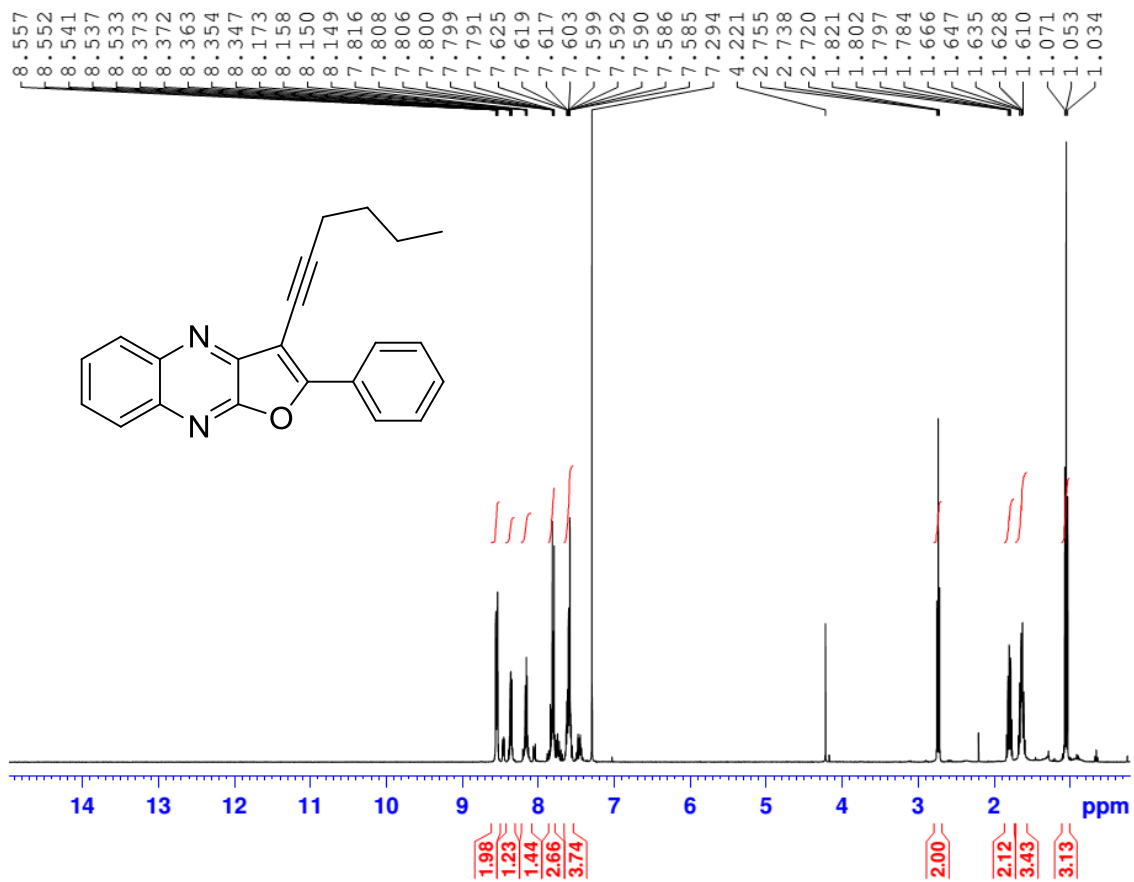


Figure 30: IR spectrum of 8b



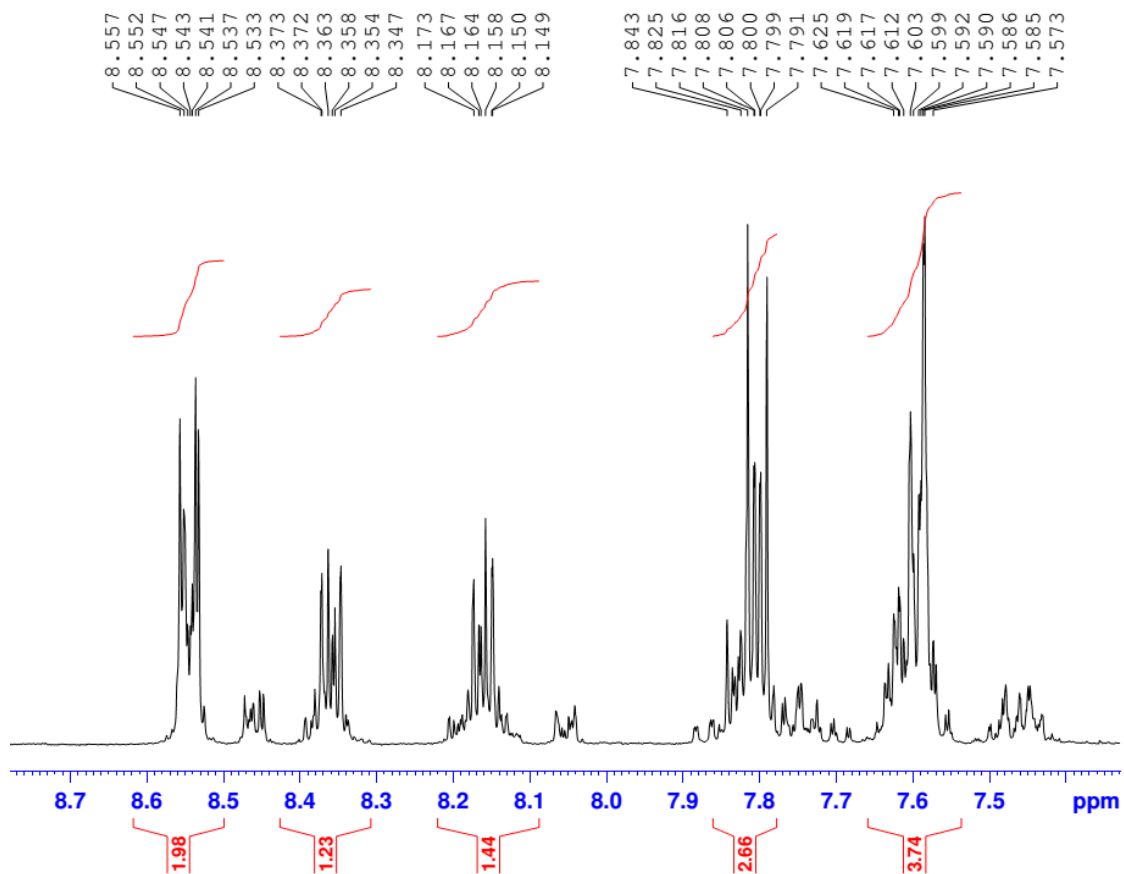
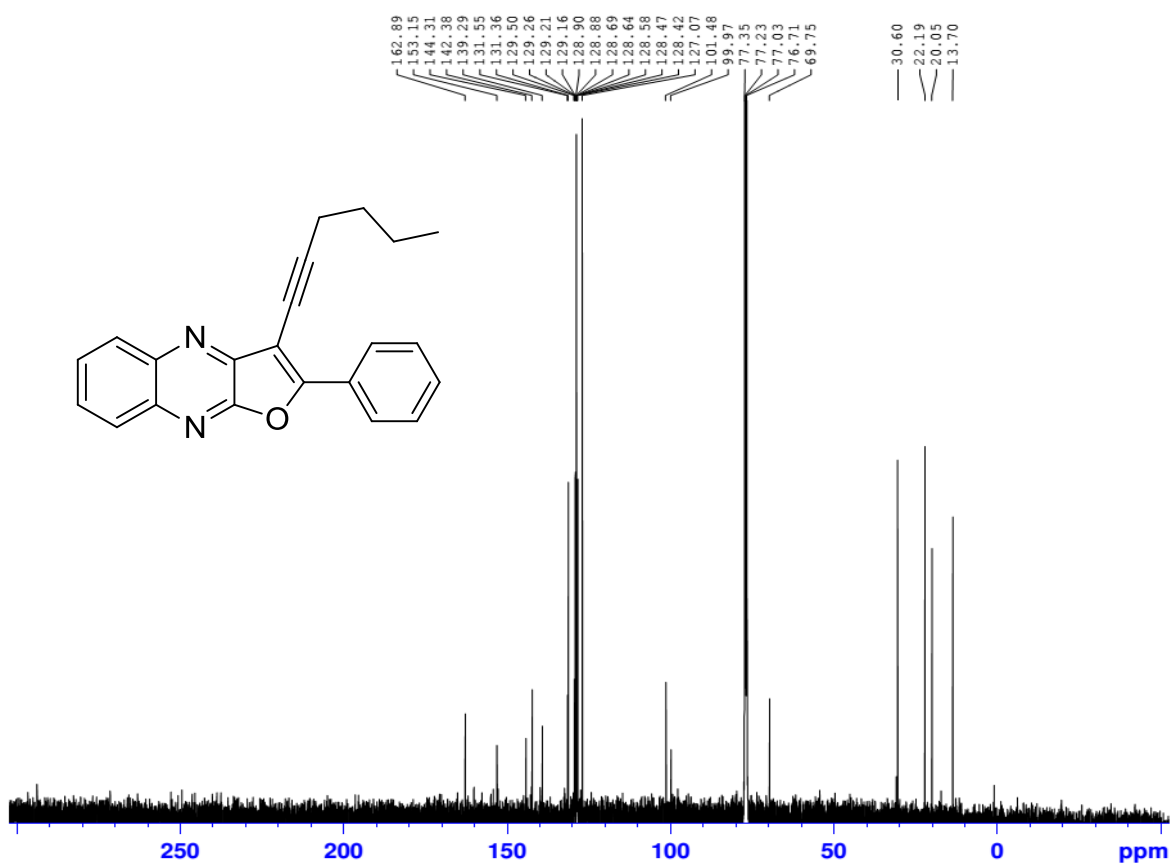


Figure 31:  $^1\text{H}$  NMR spectrum of **8b**



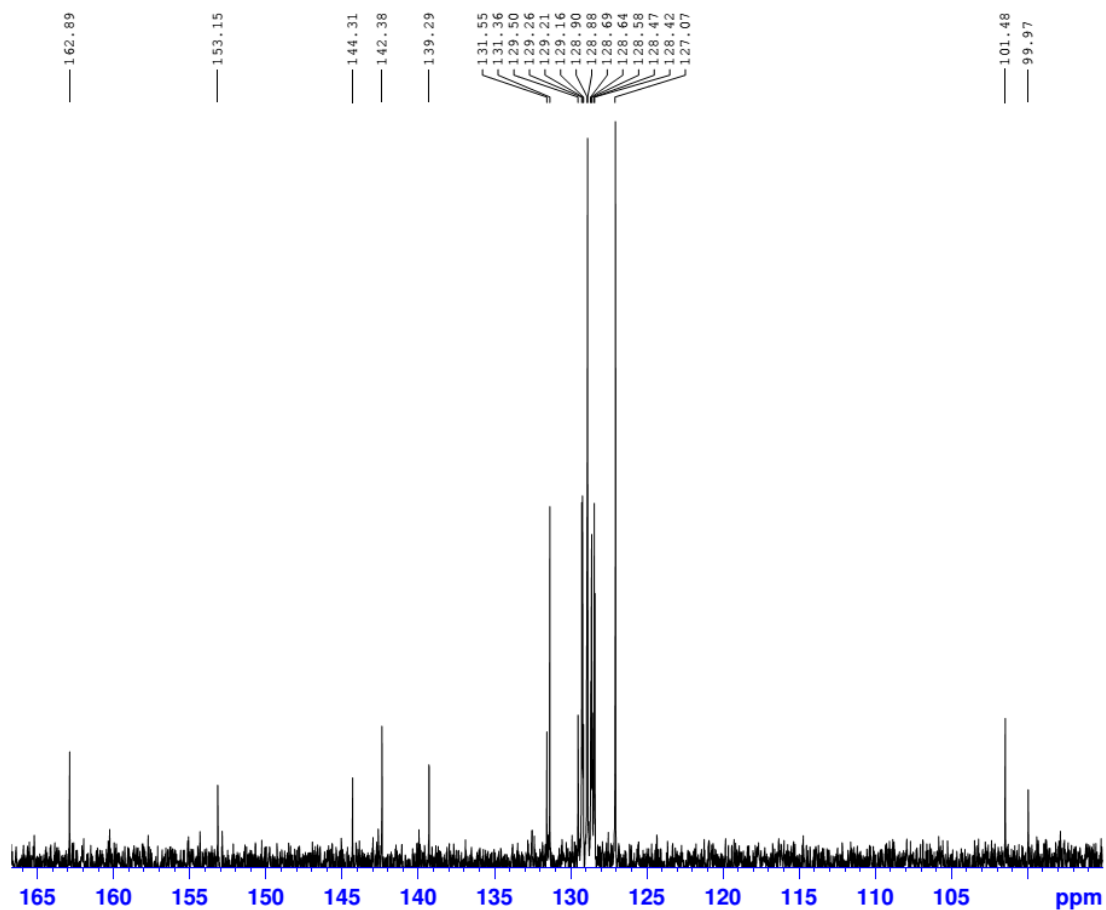
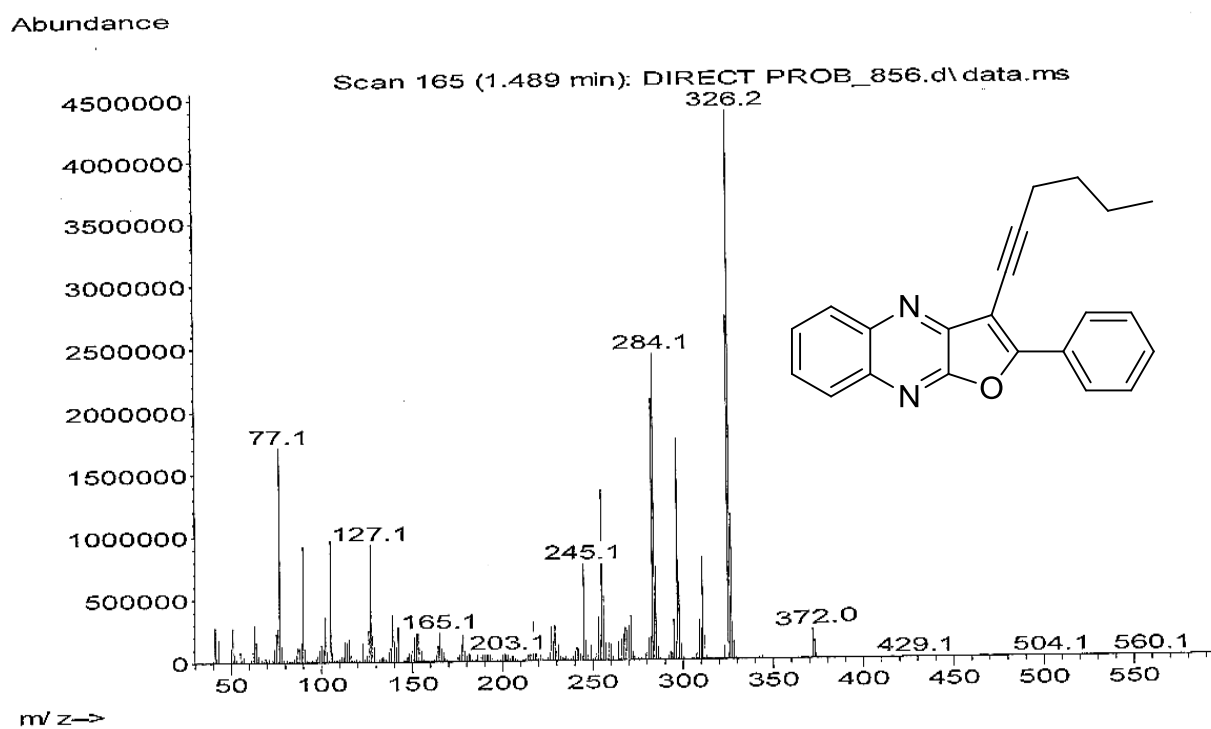


Figure 32:  $^{13}\text{C}$  NMR spectrum of **8b**



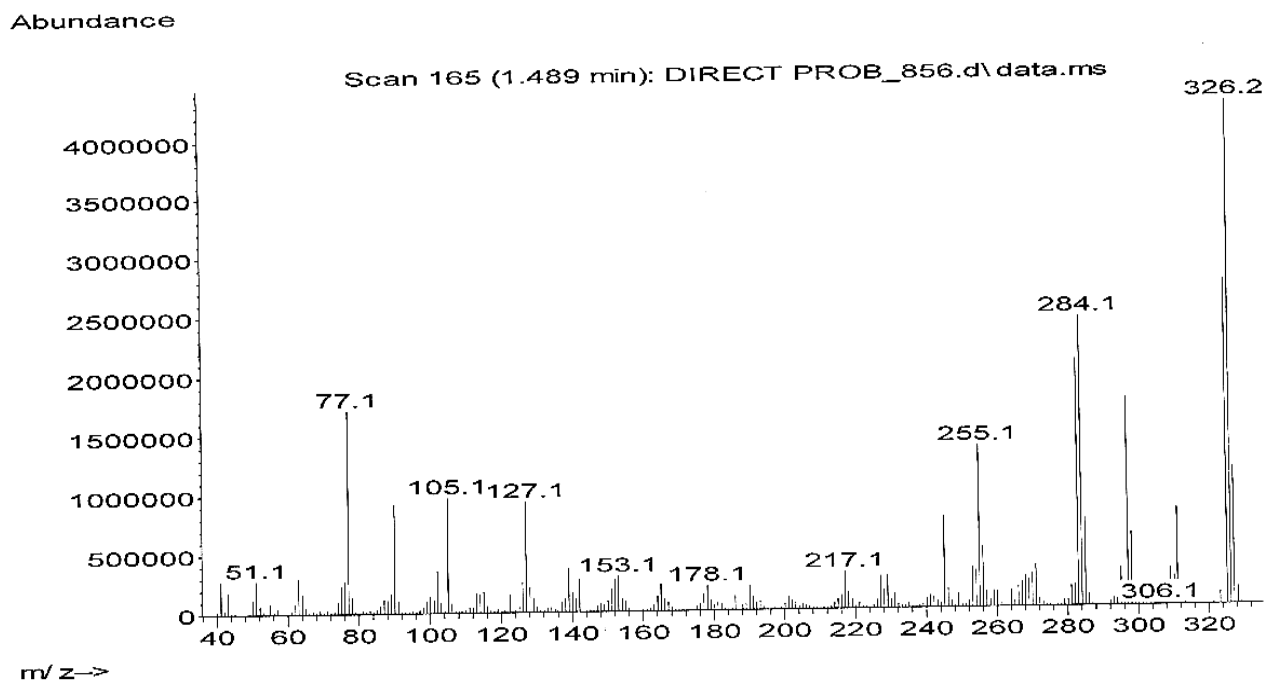


Figure 33: Mass spectrum of 8b

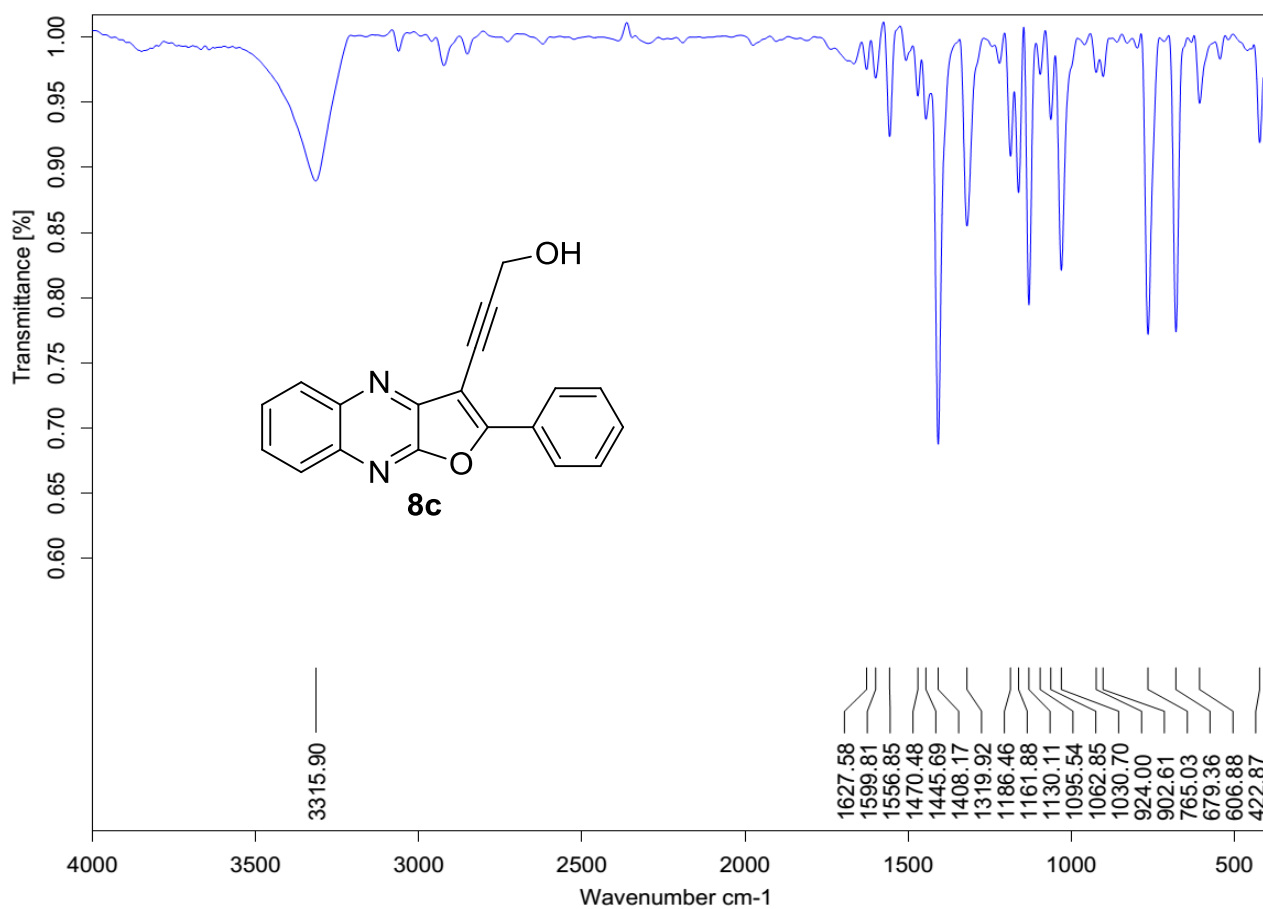


Figure 34: IR spectrum of 8c

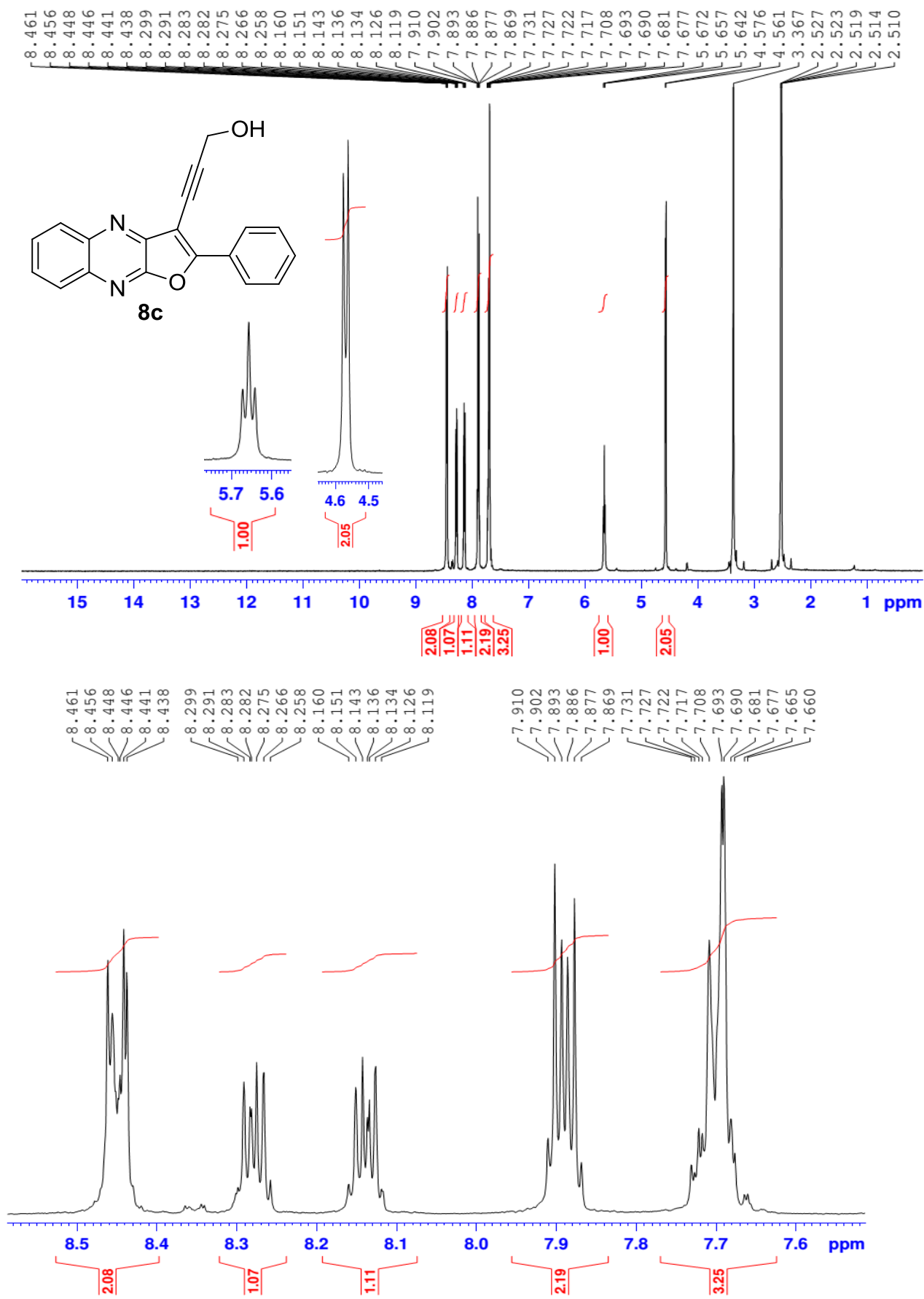


Figure 35:  $^1\text{H}$  NMR spectrum of **8c**



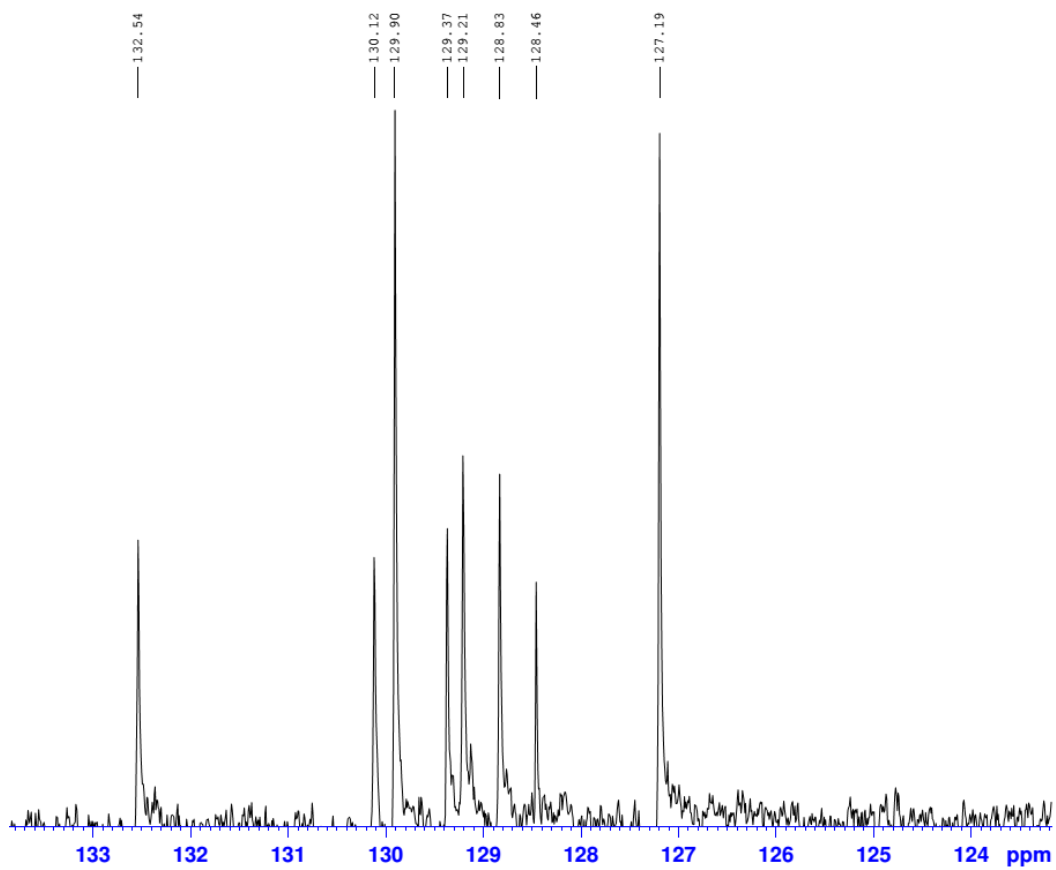
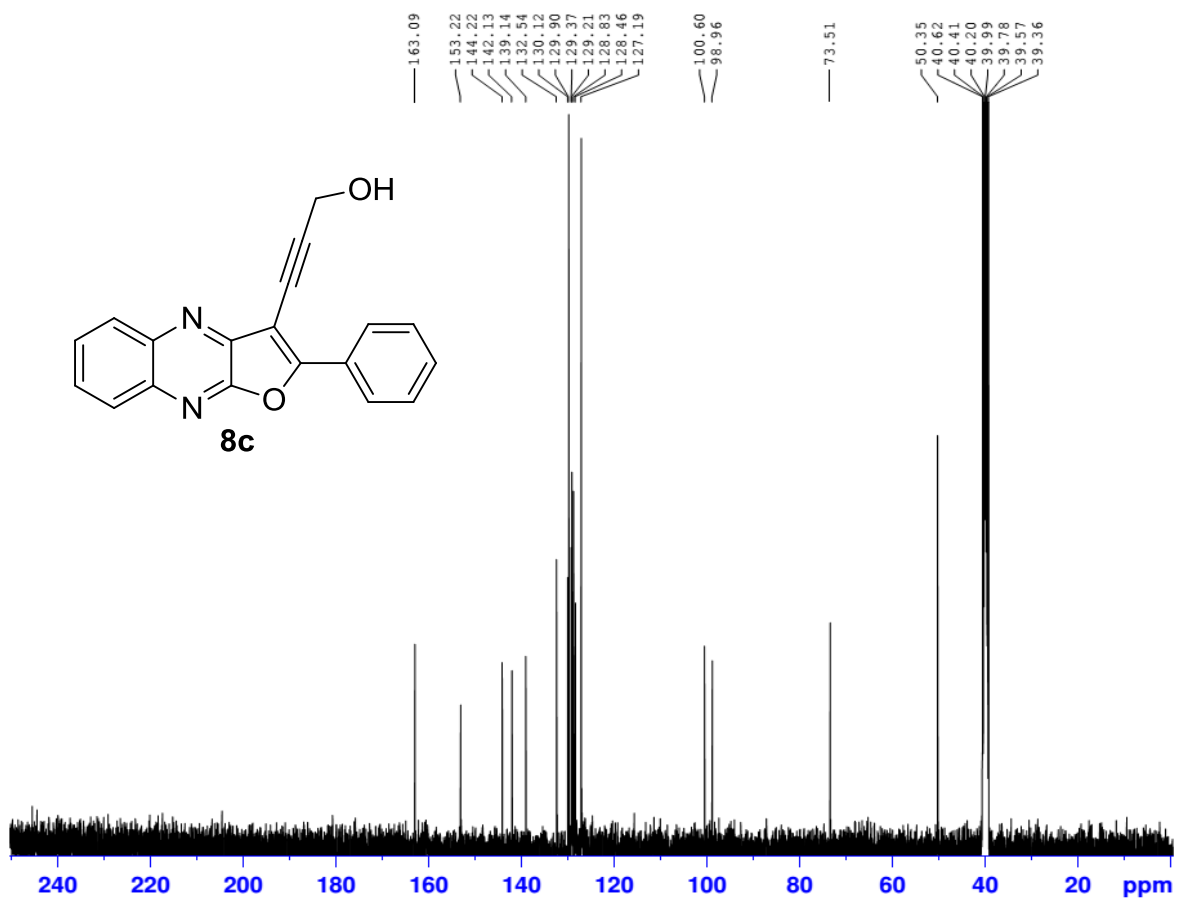
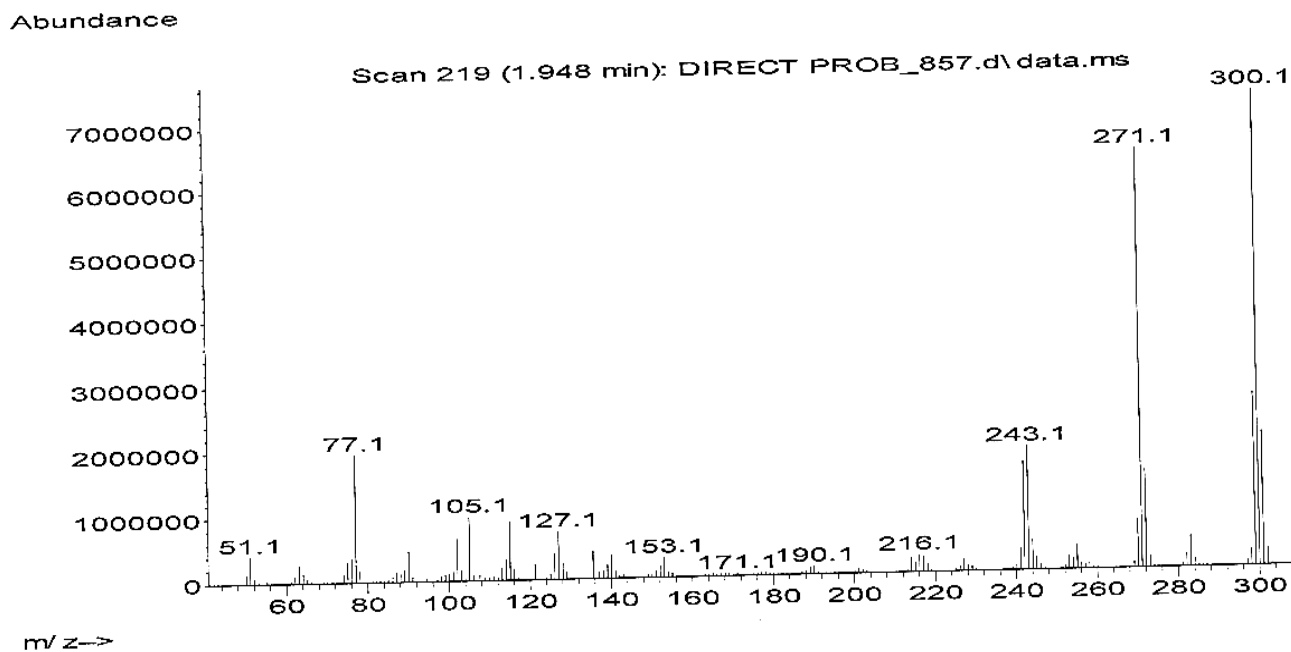
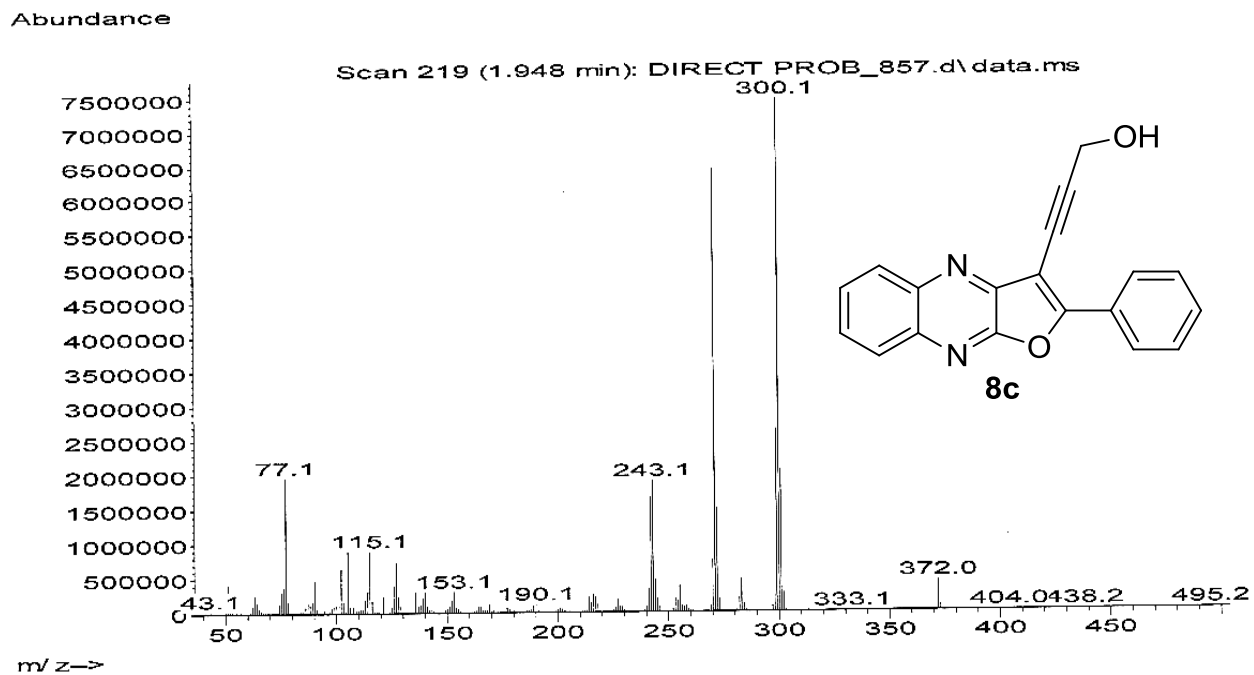


Figure 36: <sup>13</sup>C NMR spectrum of **8c**



**Figure 37:** Mass spectrum of **8c**

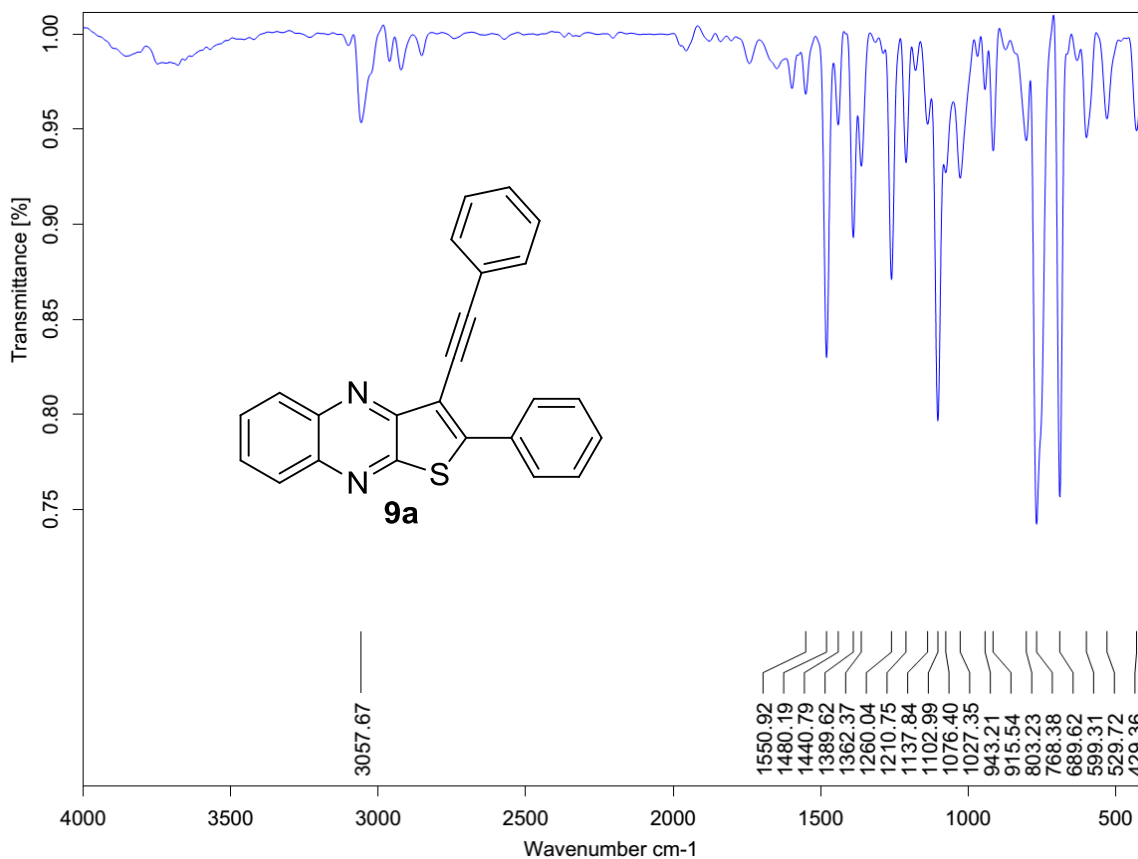
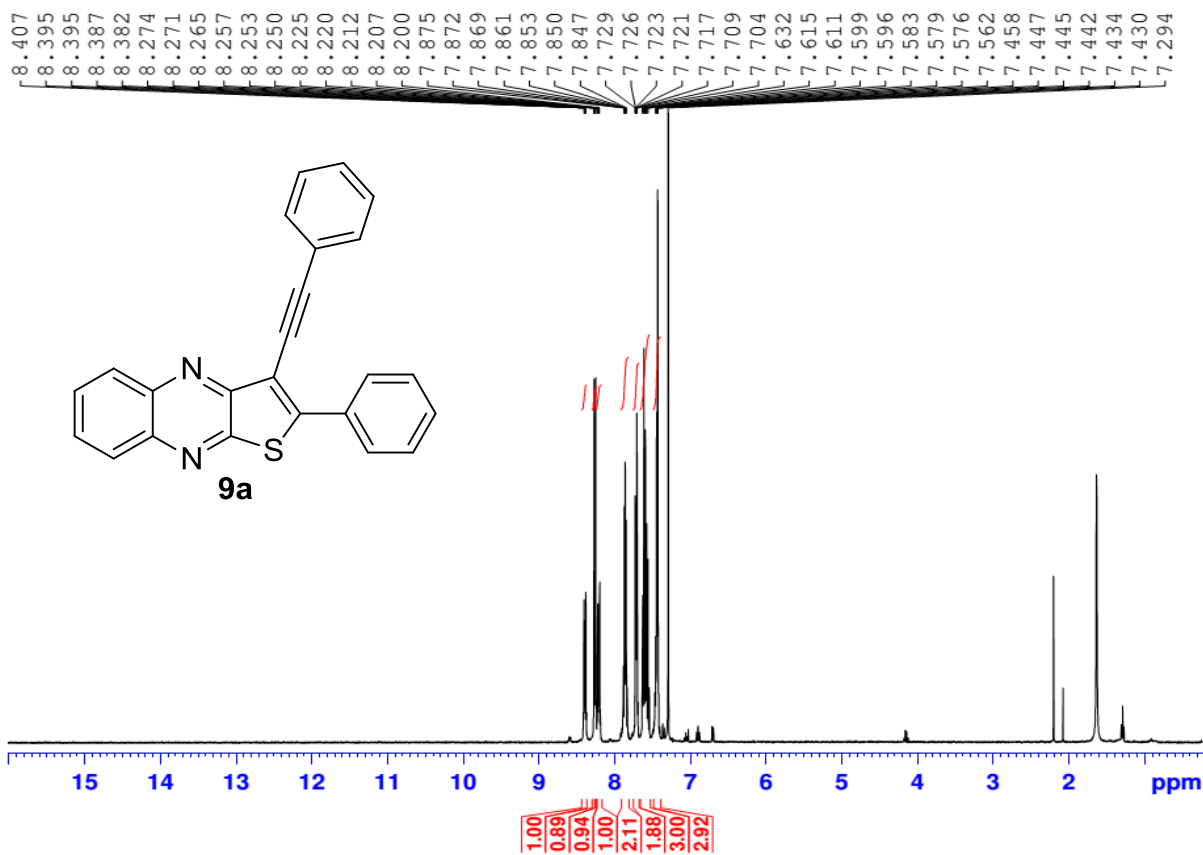


Figure 38: IR spectrum of **9a**



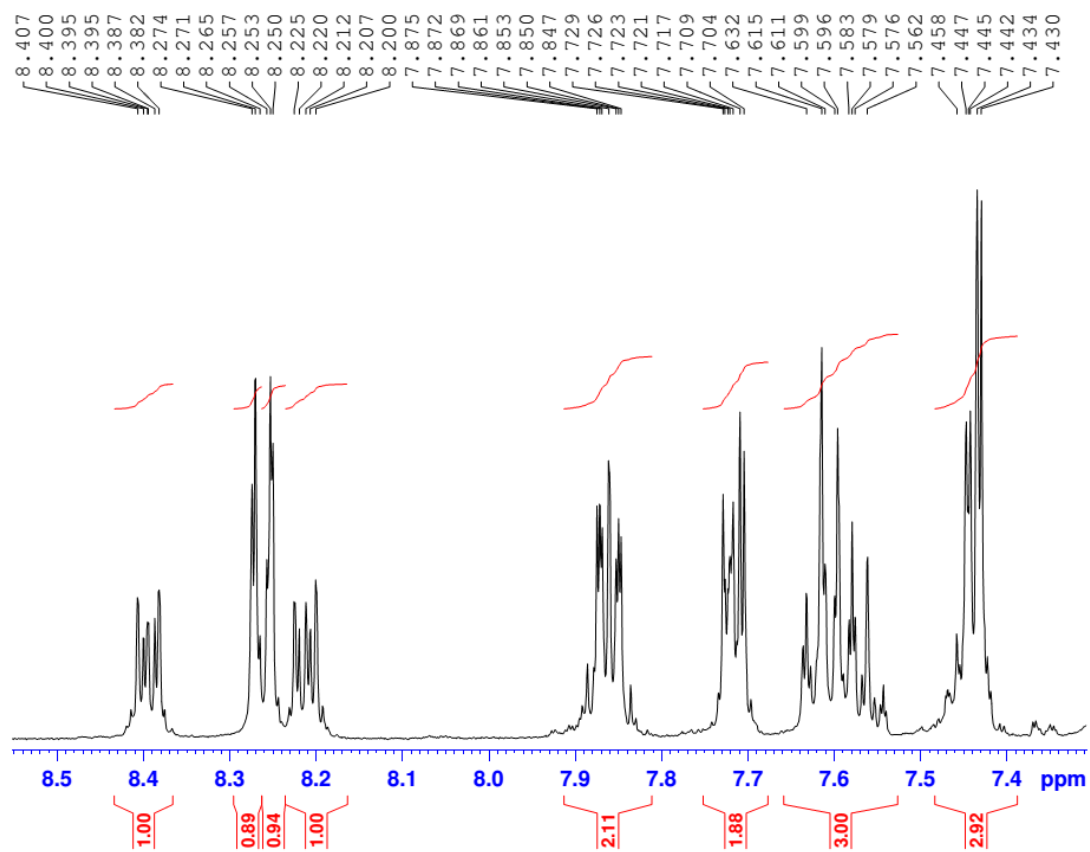
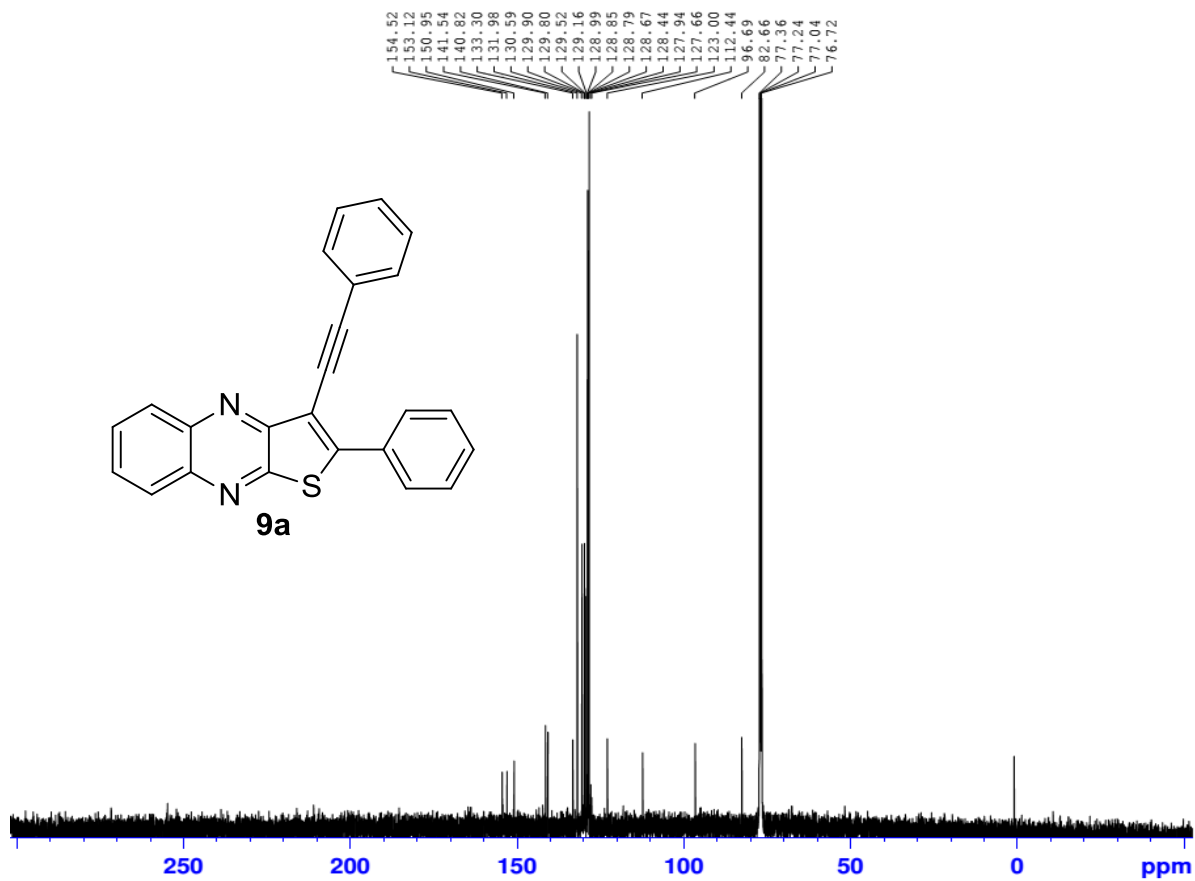


Figure 39:  $^1\text{H}$  NMR spectrum of **9a**



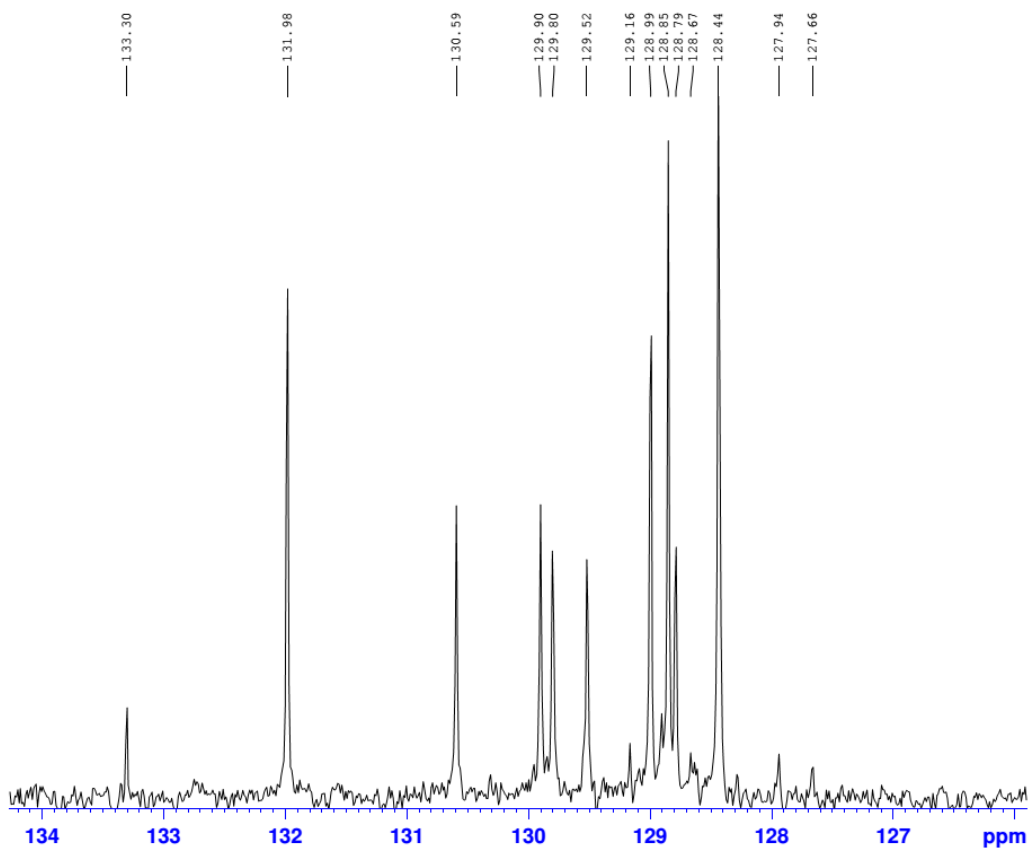
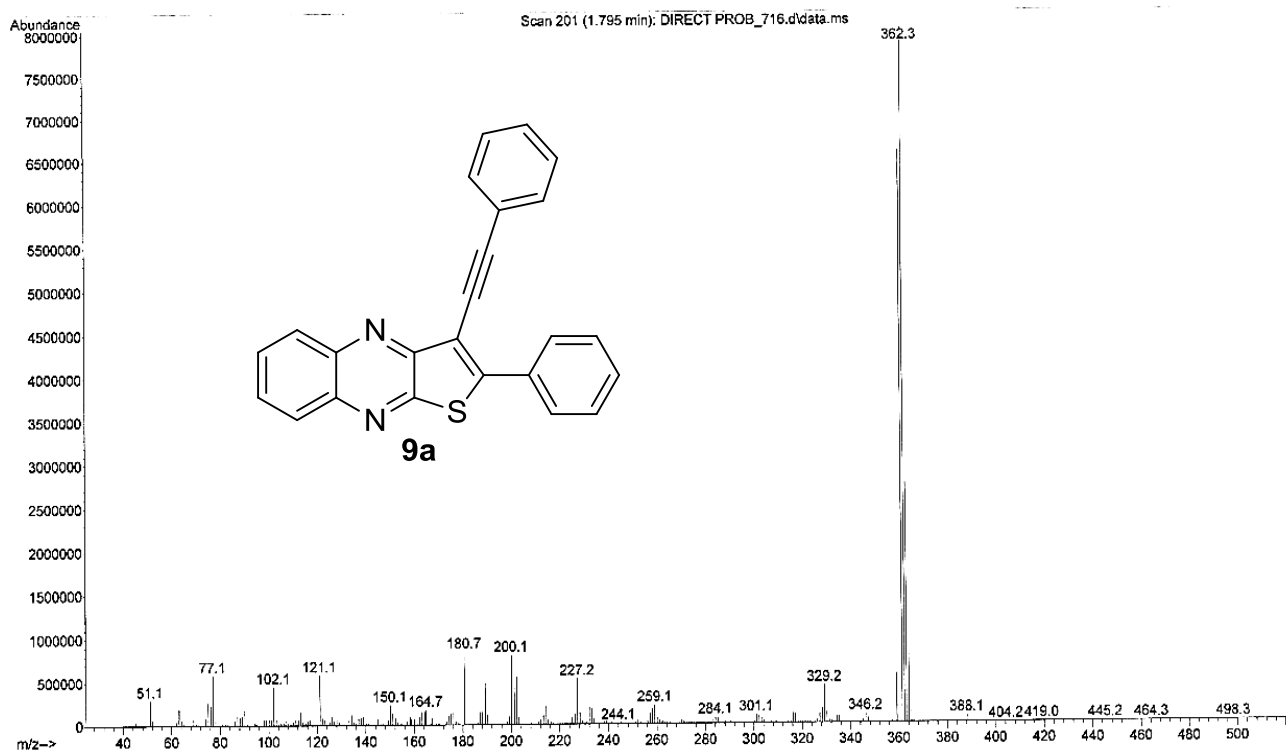


Figure 40:  $^{13}\text{C}$  NMR spectrum of **9a**



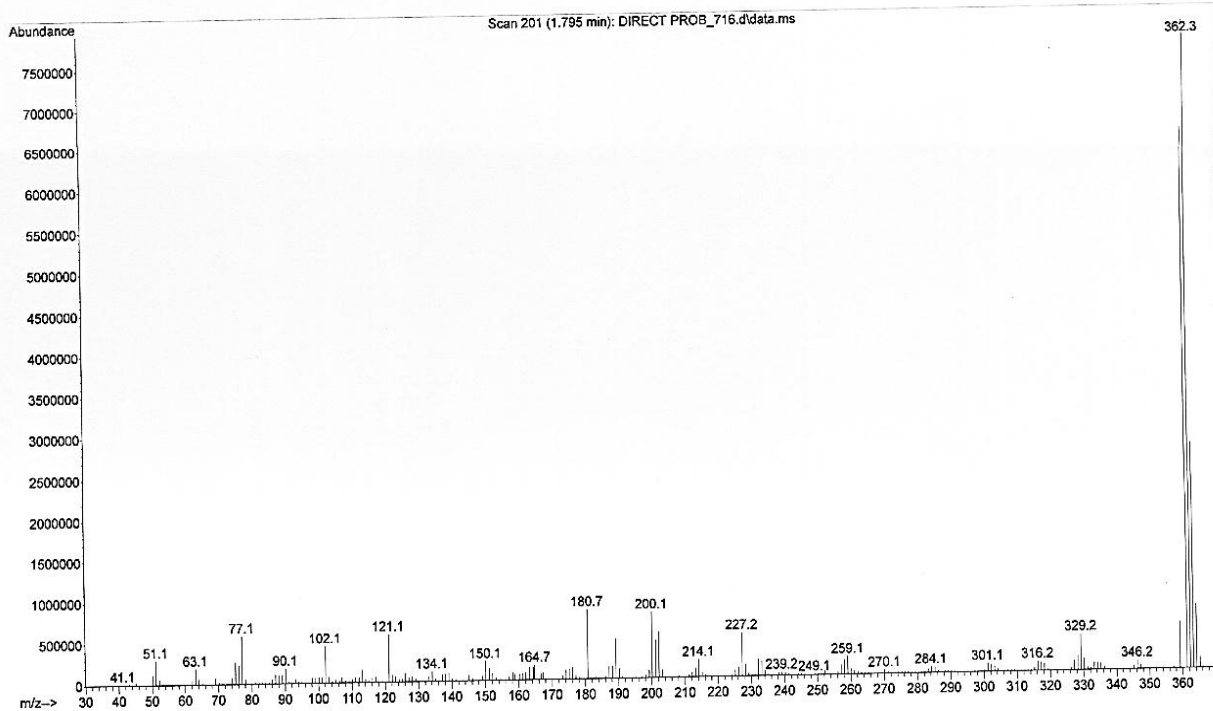


Figure 41: Mass spectrum of 9a

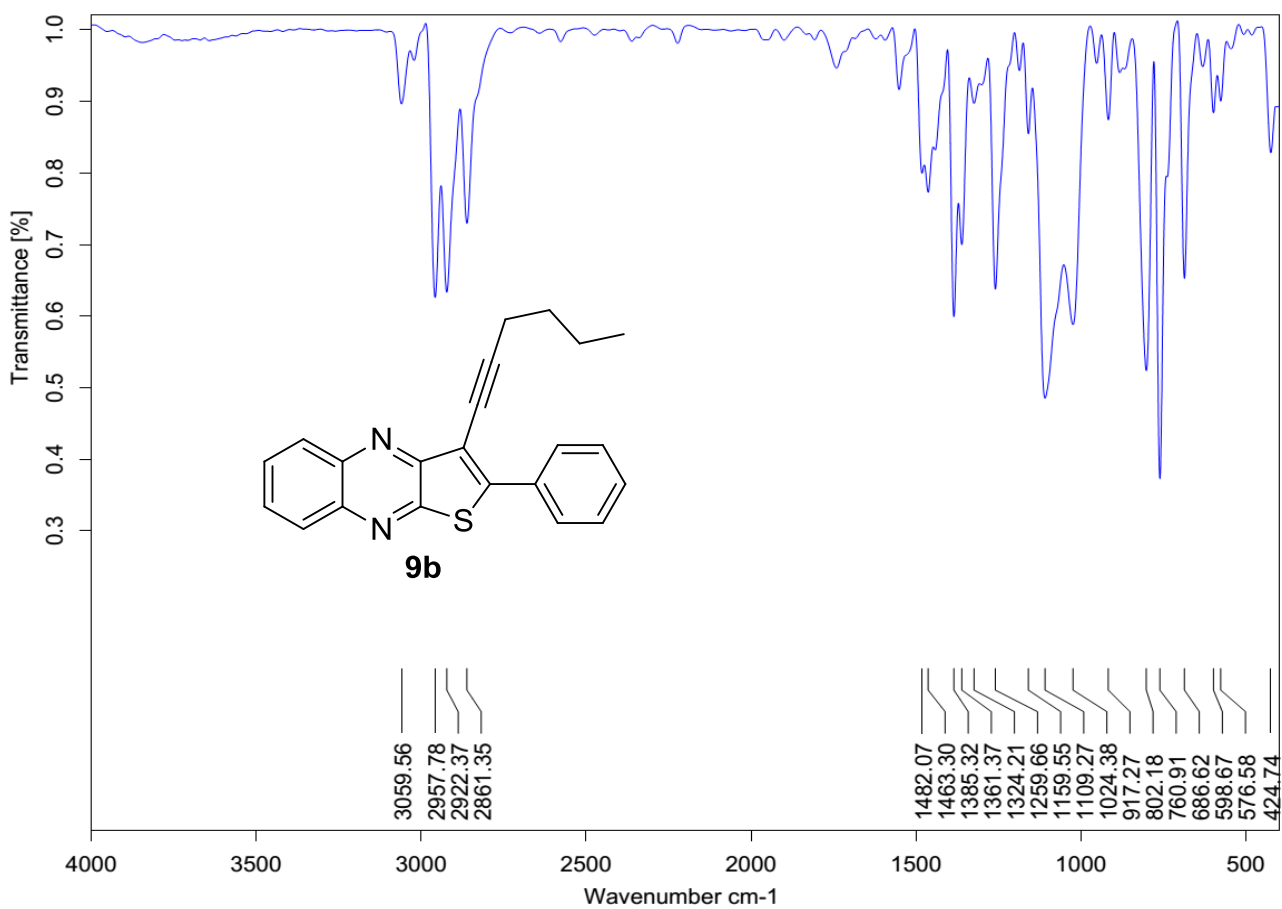
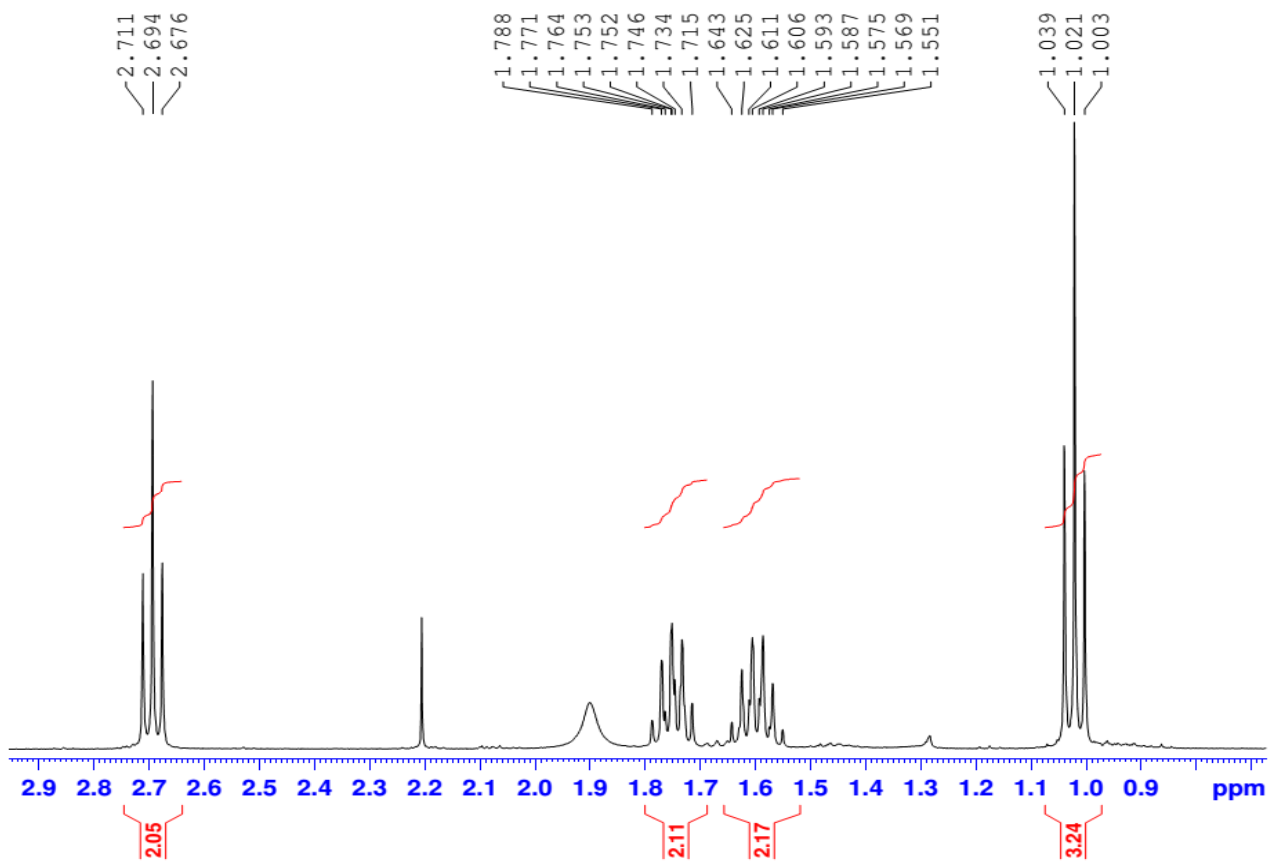
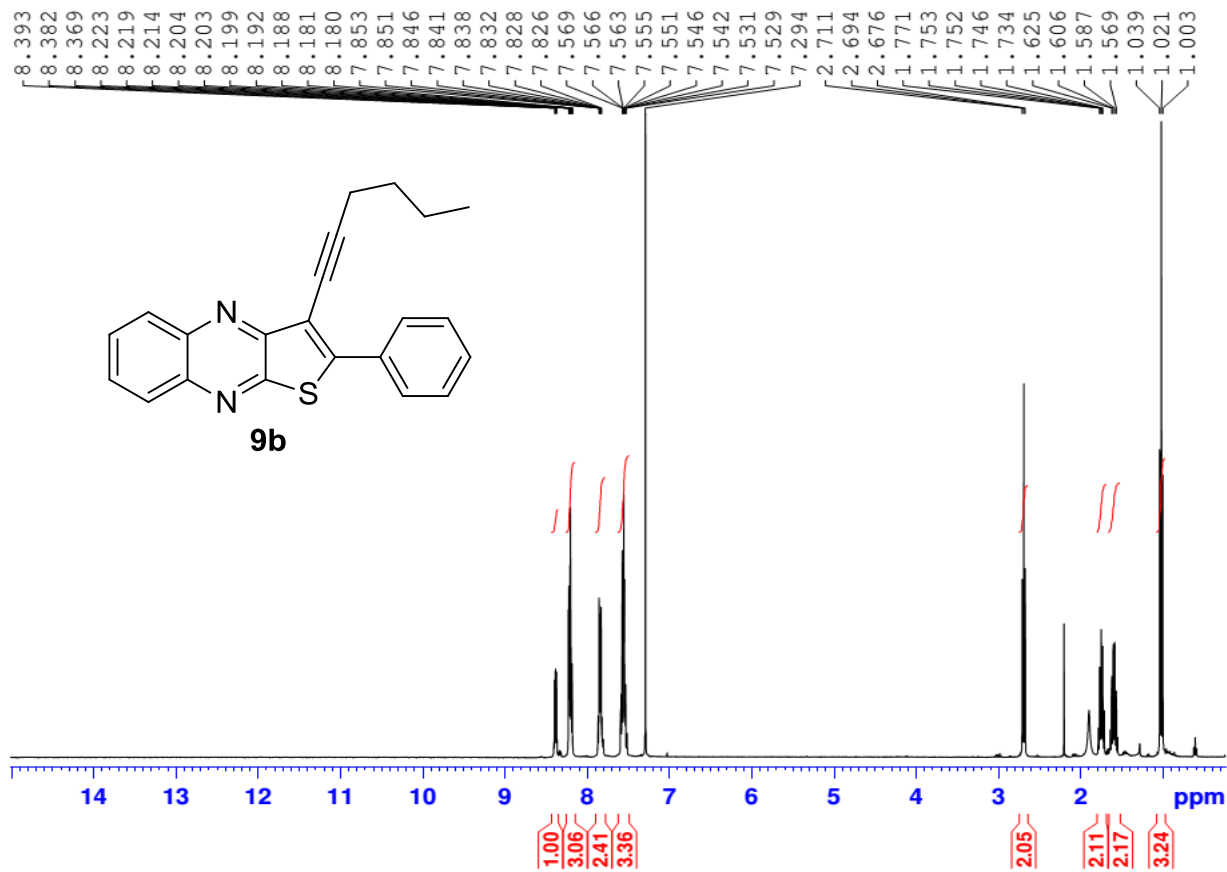


Figure 42: IR spectrum of 9b



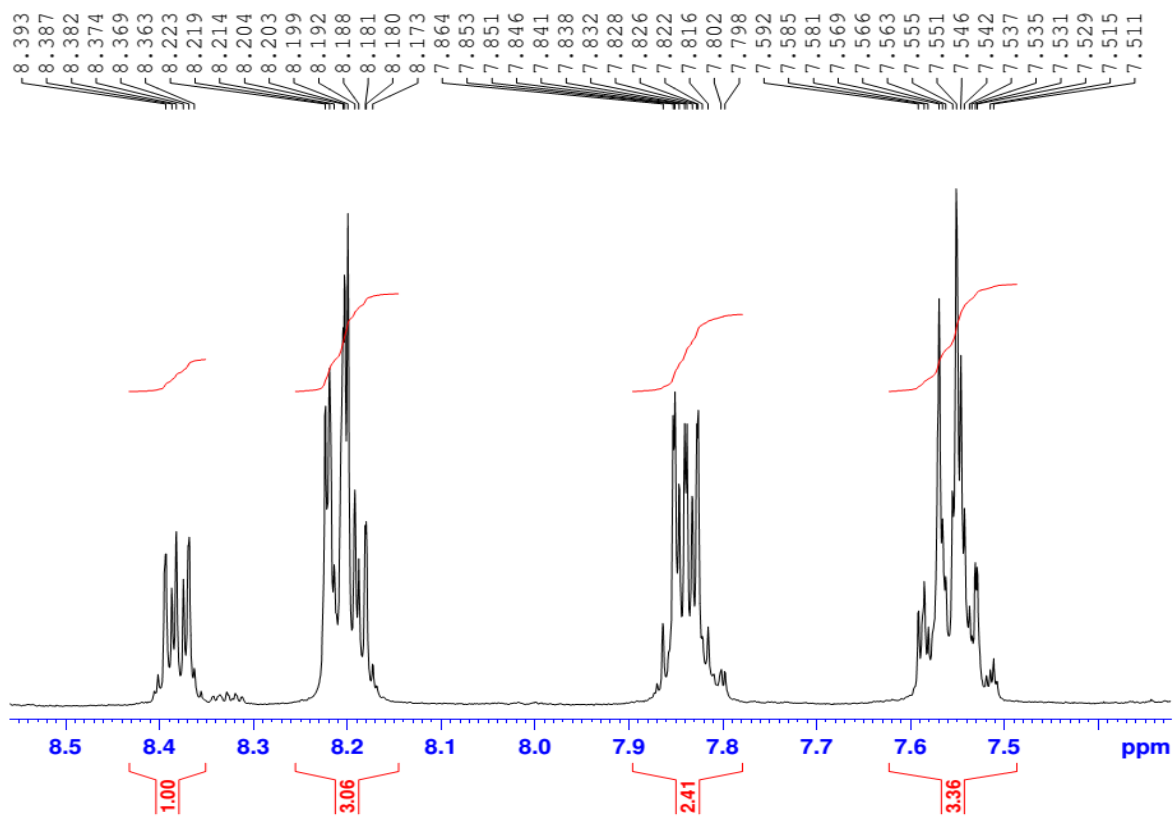
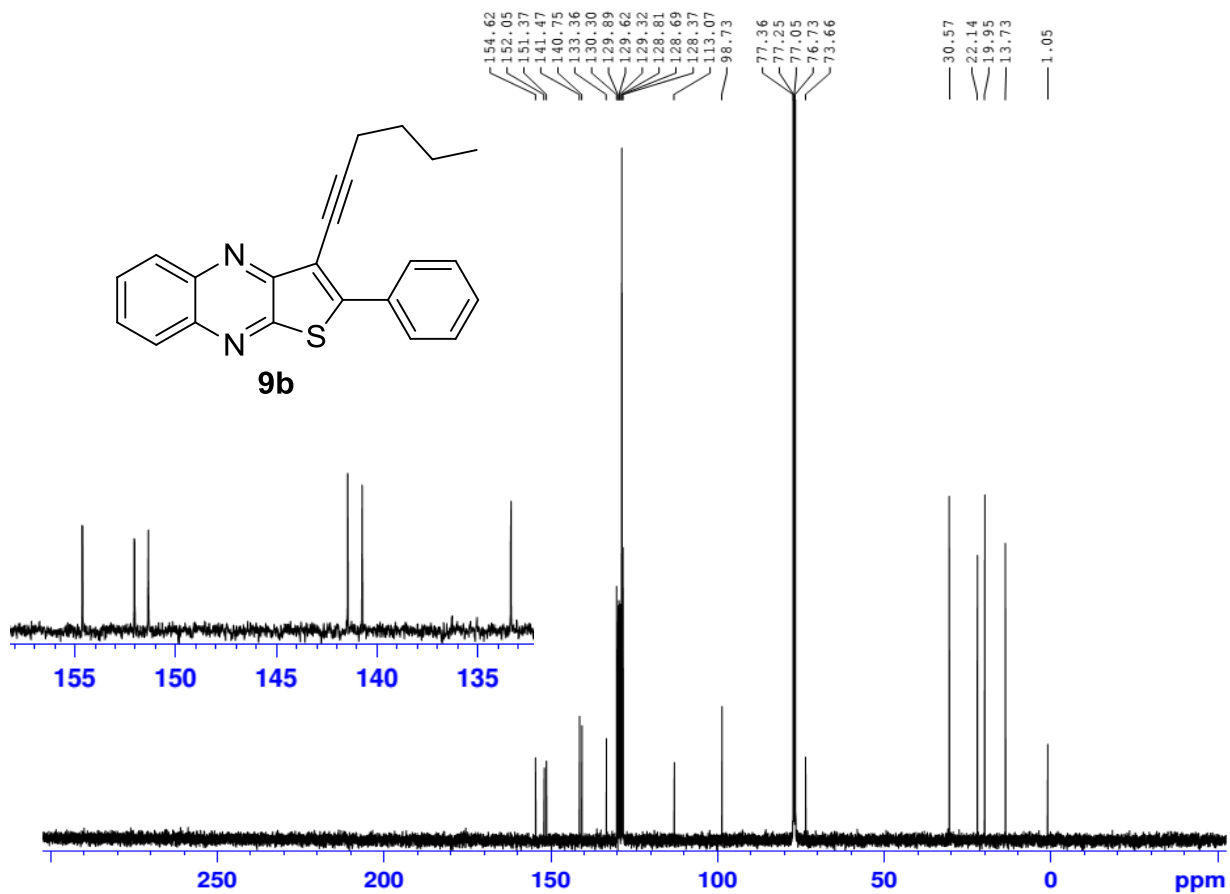


Figure 43:  $^1\text{H}$  NMR spectrum of **9b**





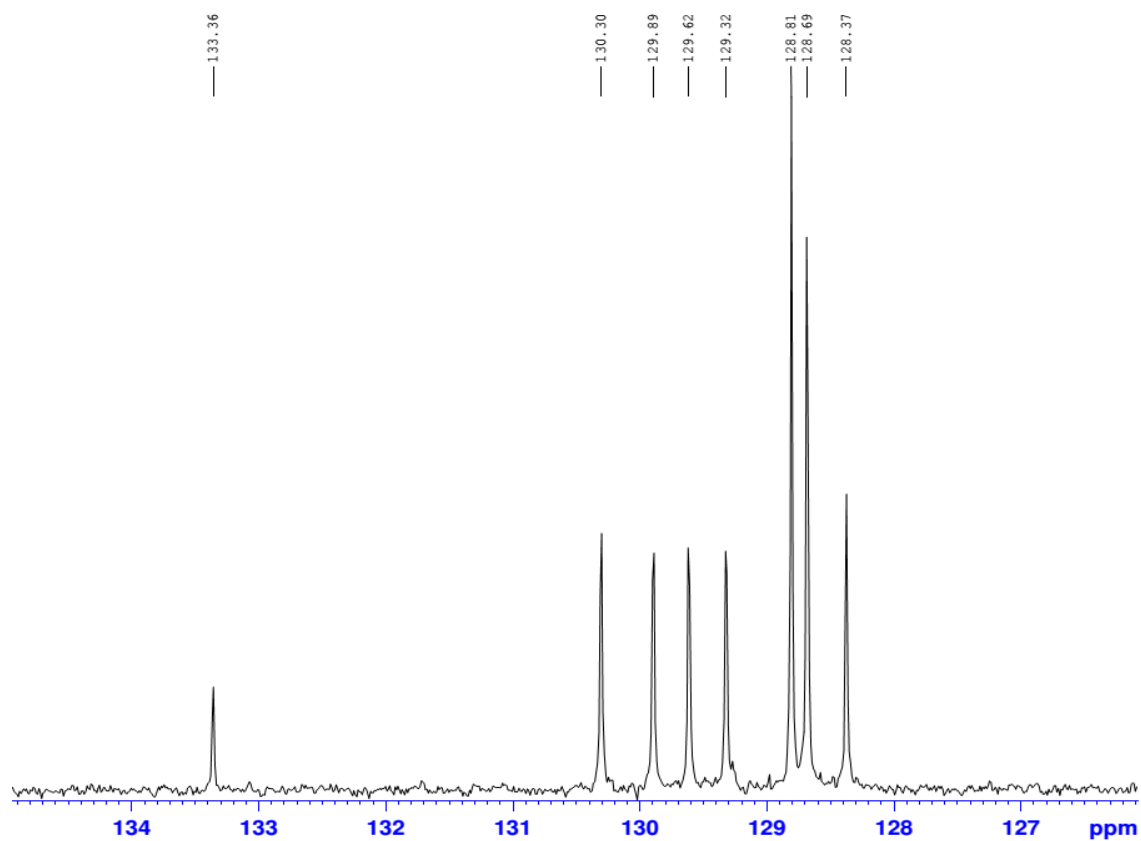
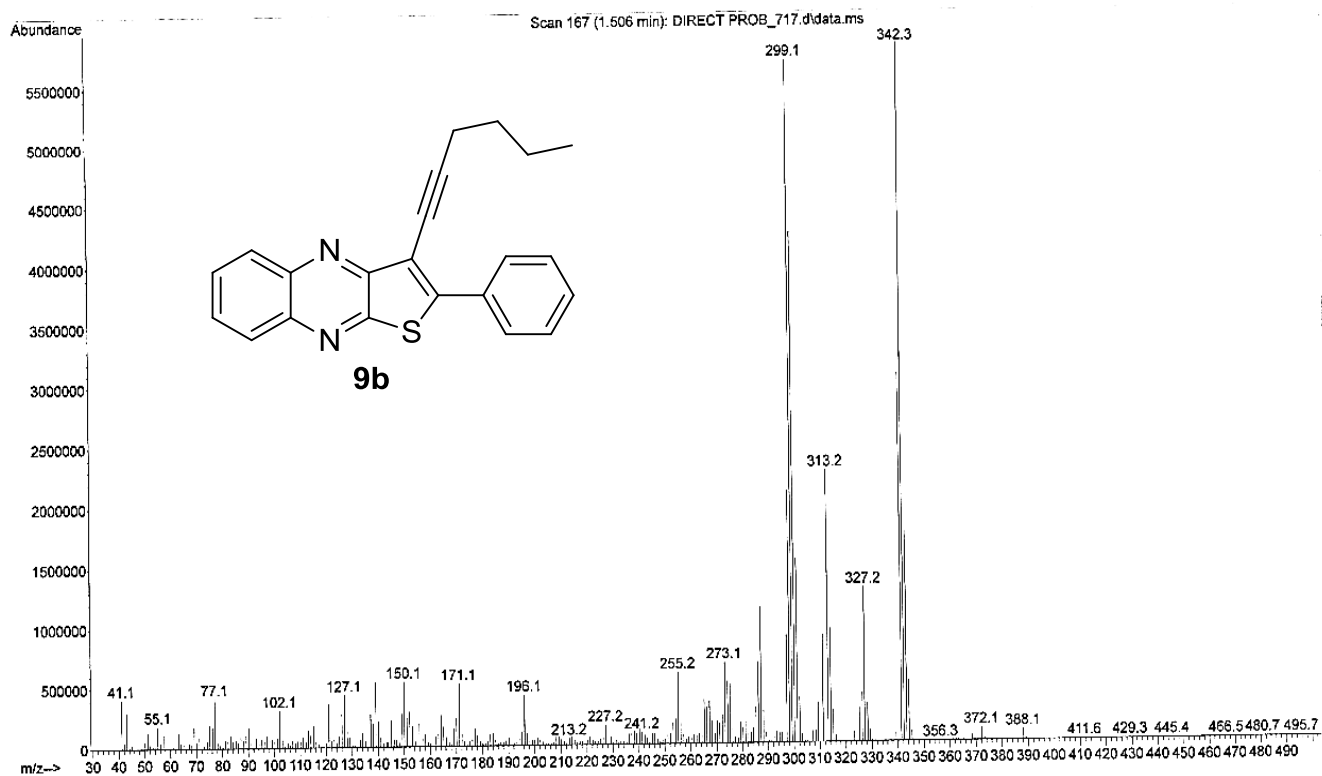


Figure 44:  $^{13}\text{C}$  NMR spectrum of **9b**



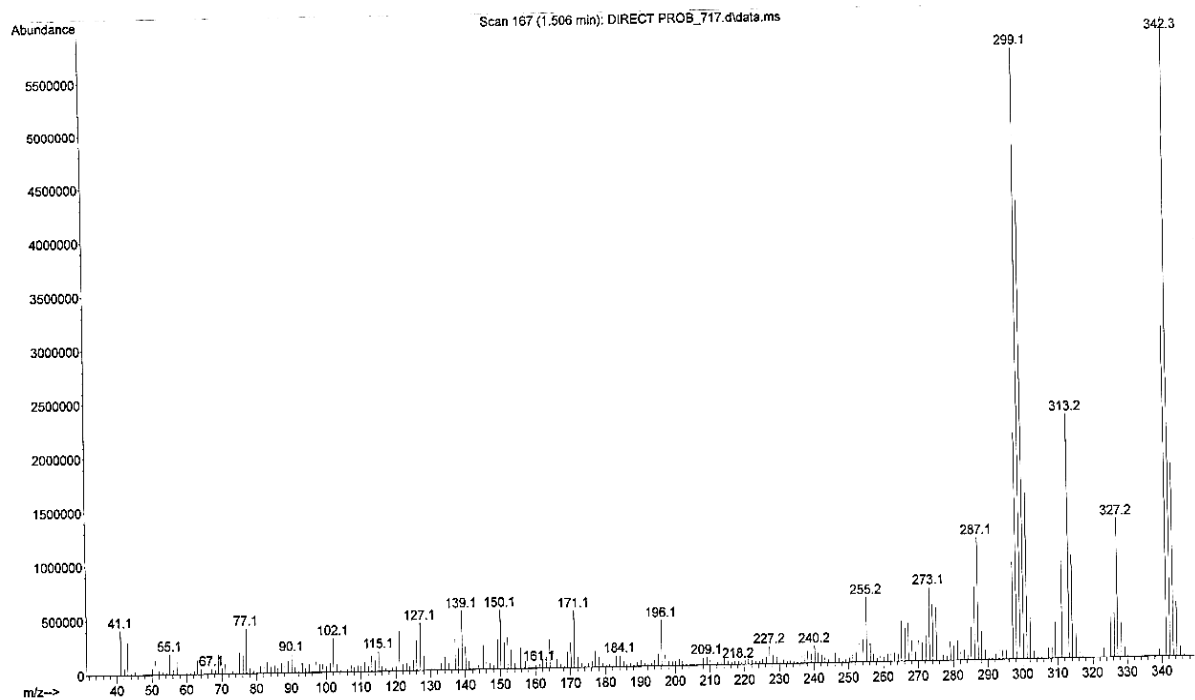


Figure 45: Mass spectrum of 9b

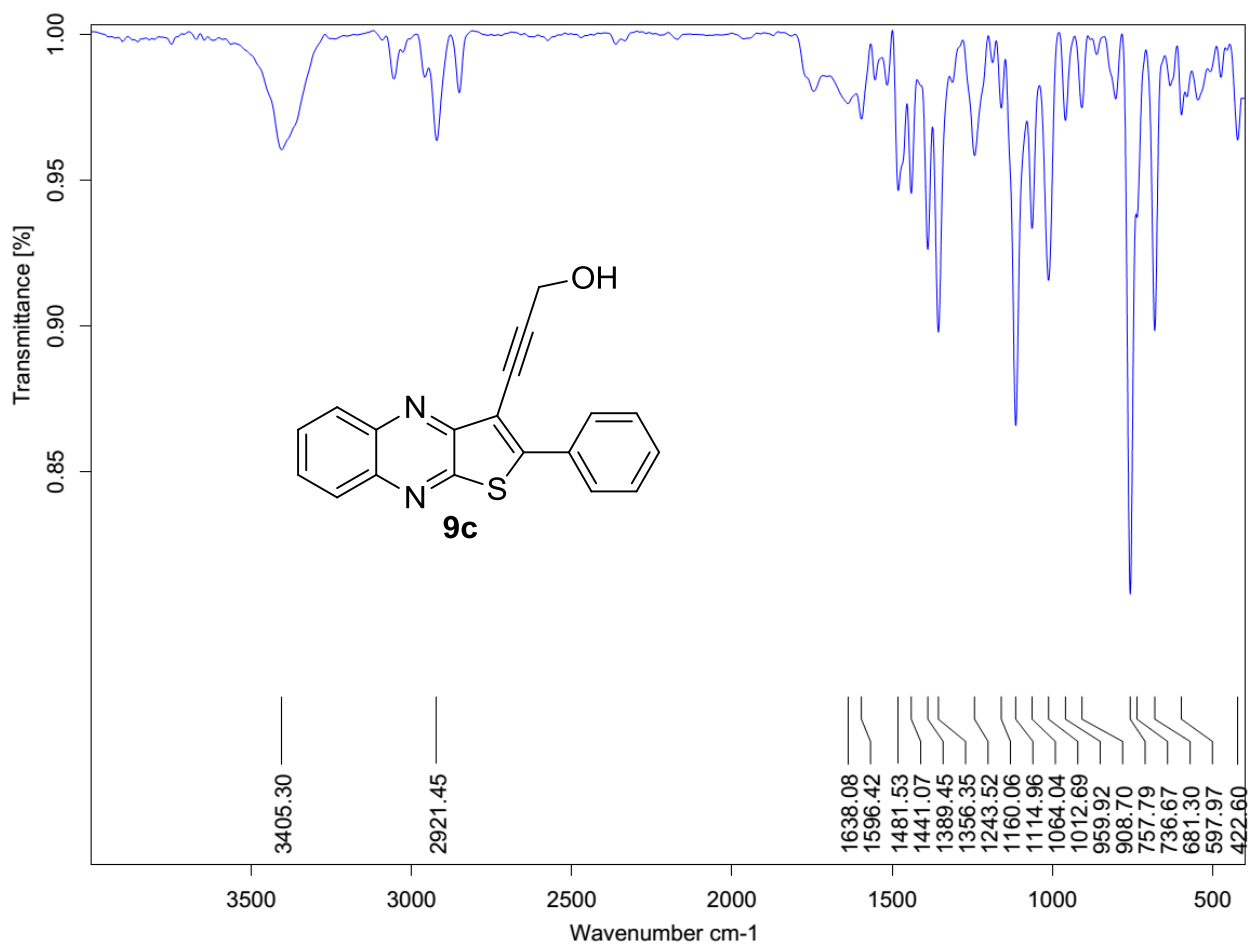


Figure 46: IR spectrum of 9c

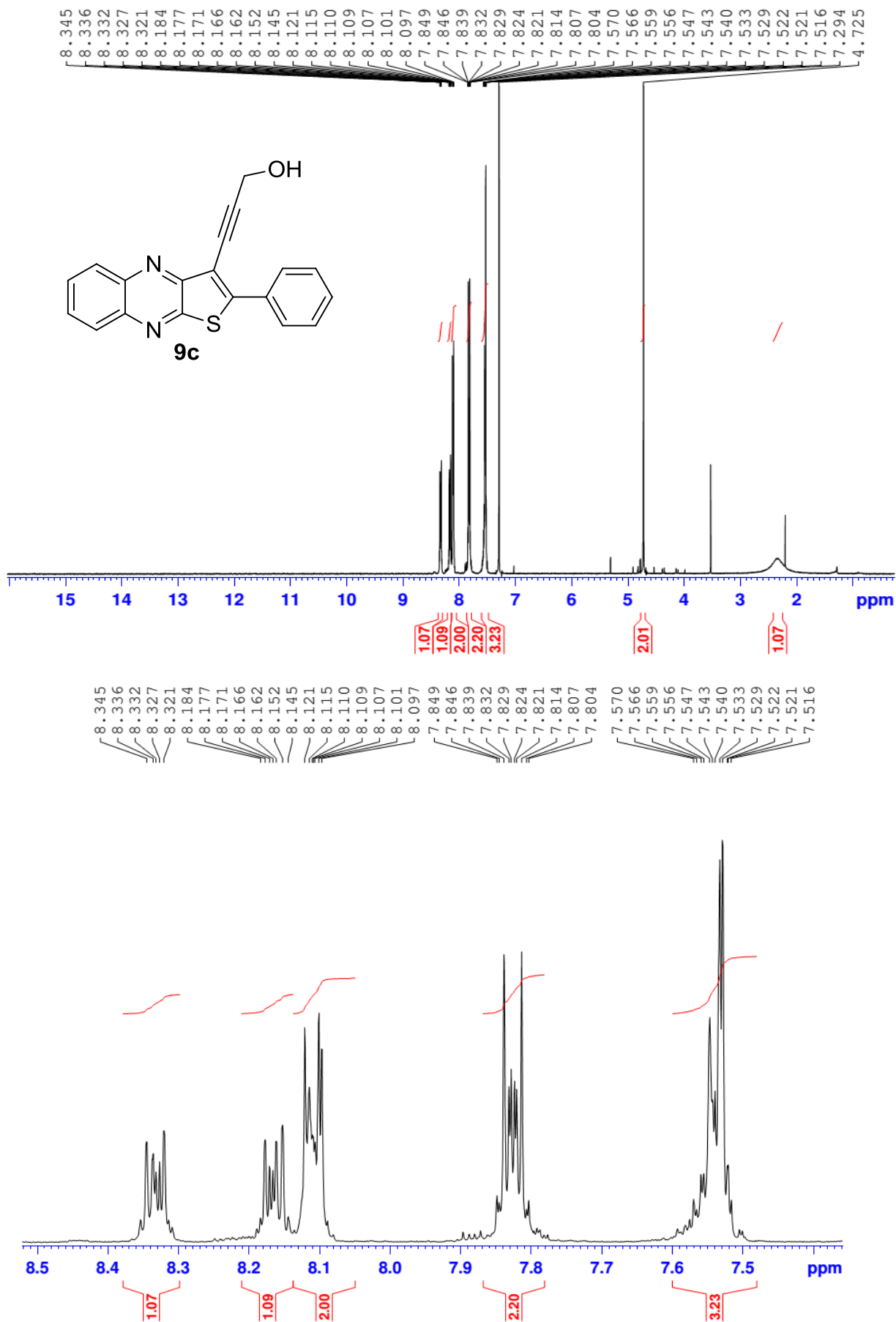
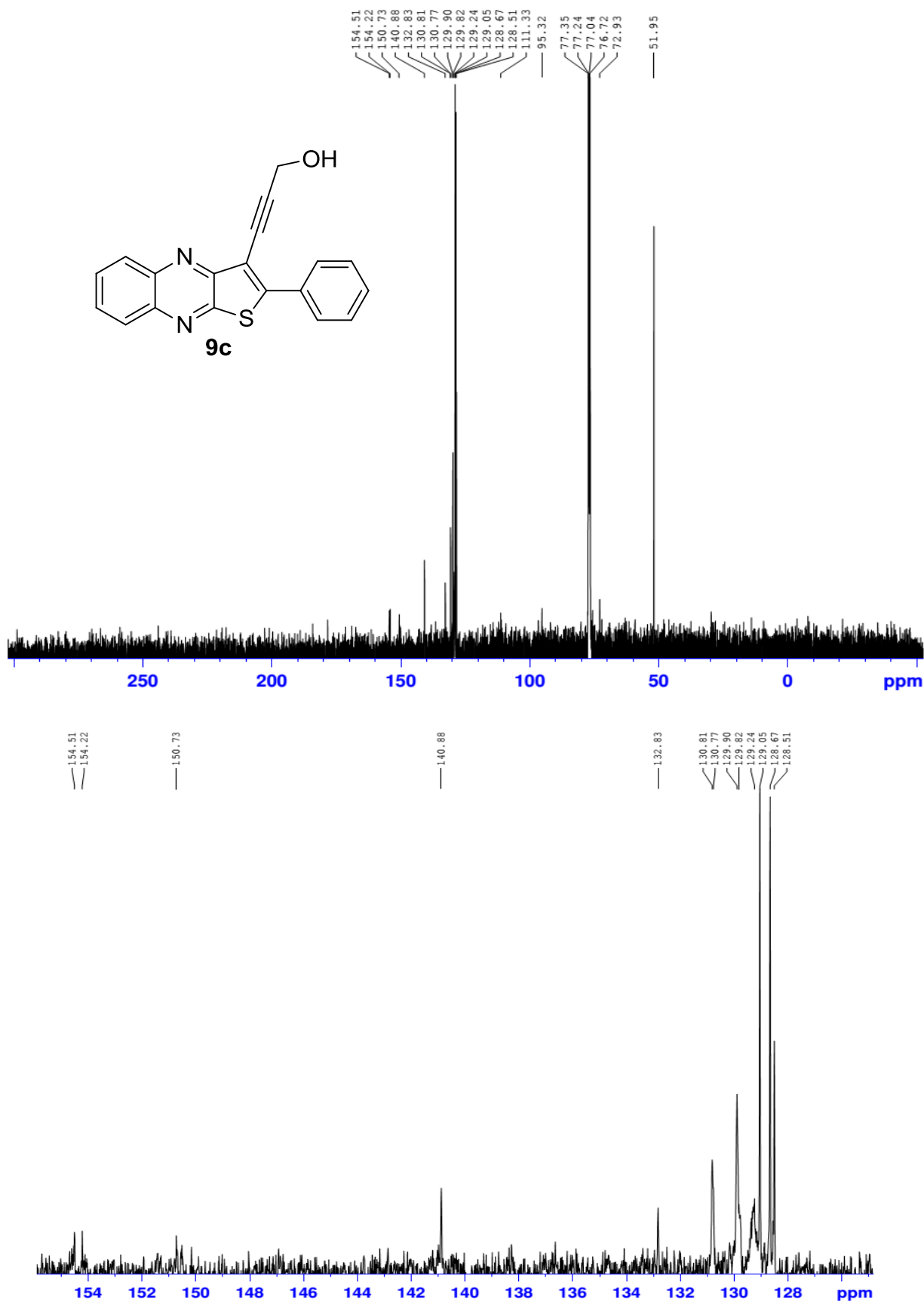


Figure 47: <sup>1</sup>H NMR spectrum of 9c



**Figure 48:**  $^{13}\text{C}$  NMR spectrum of **9c**

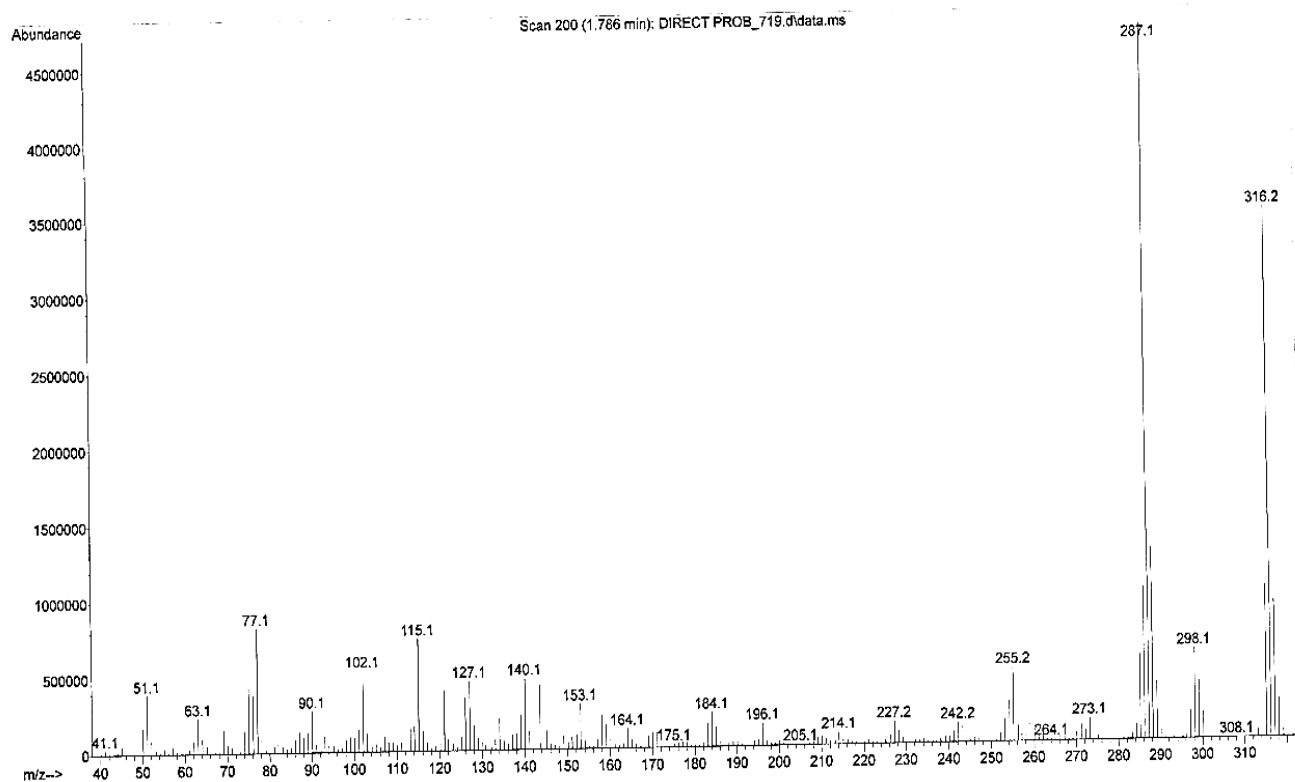
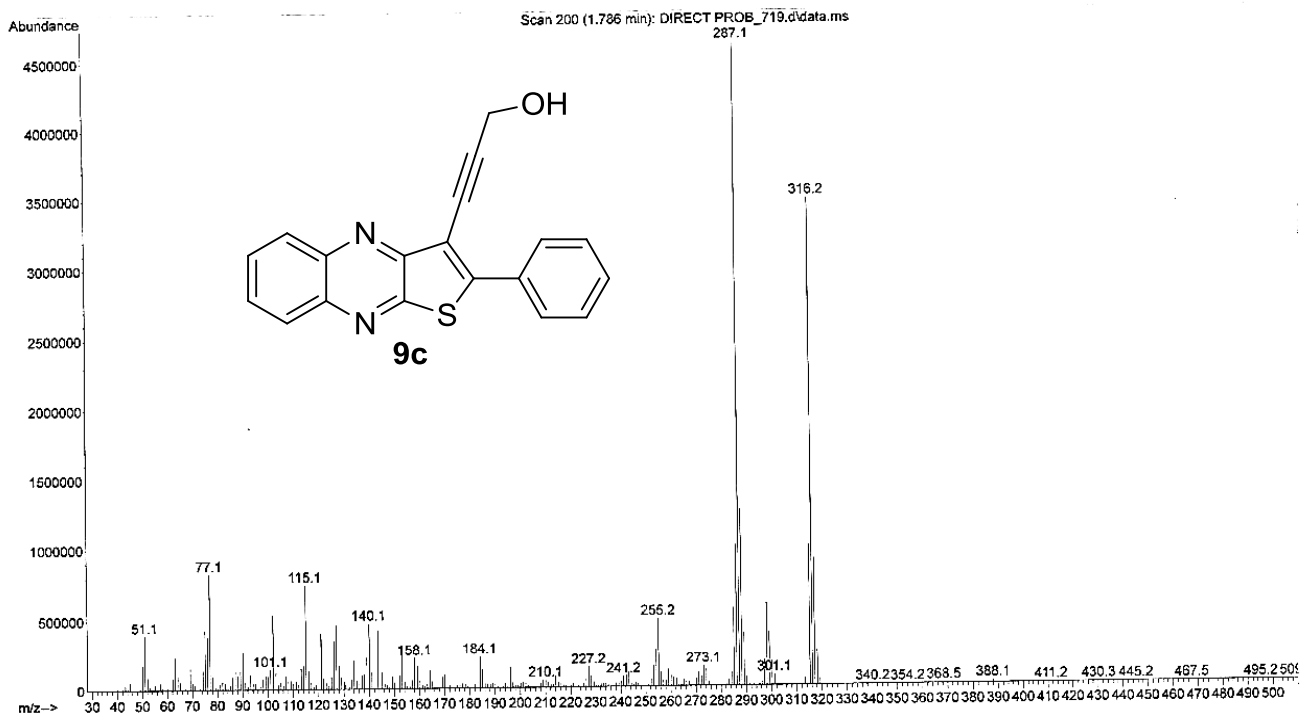


Figure 49: Mass spectrum of 9c

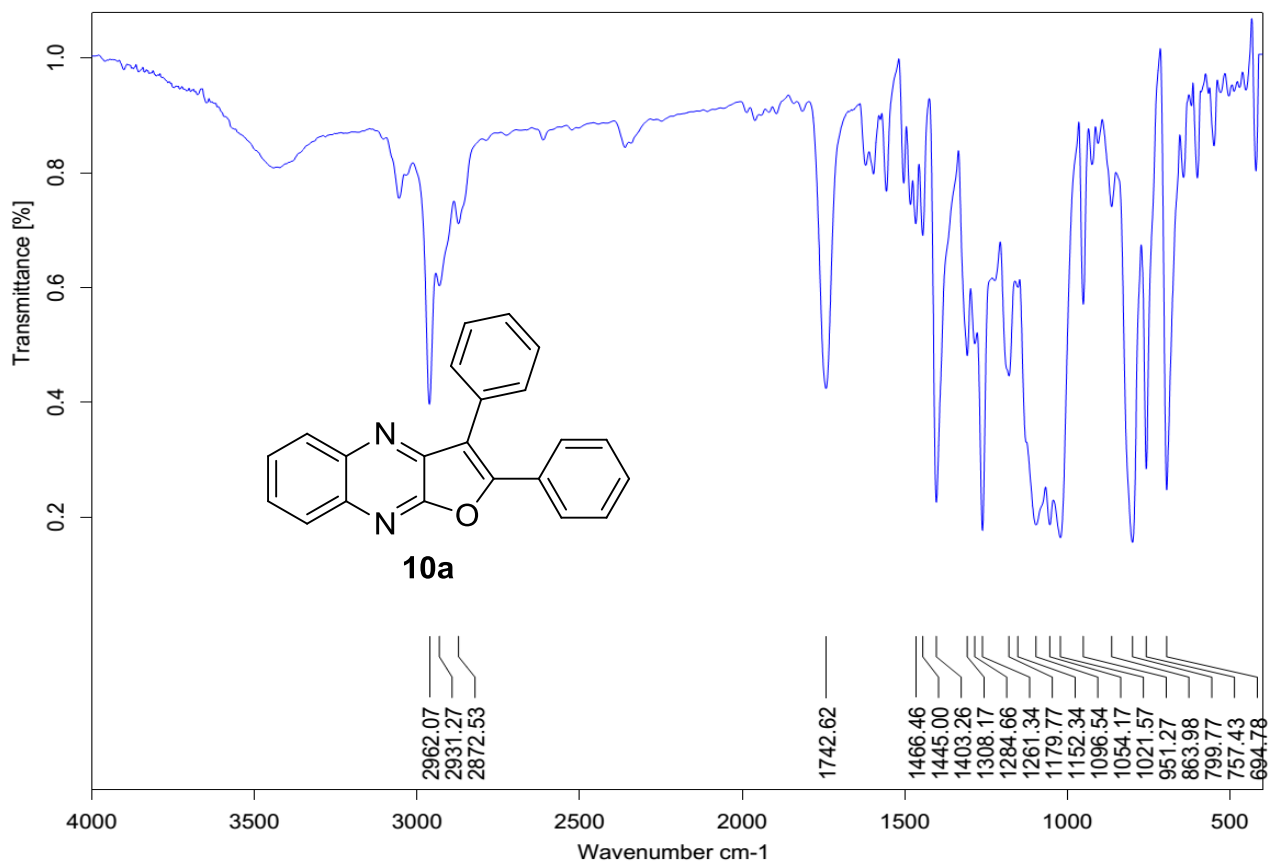
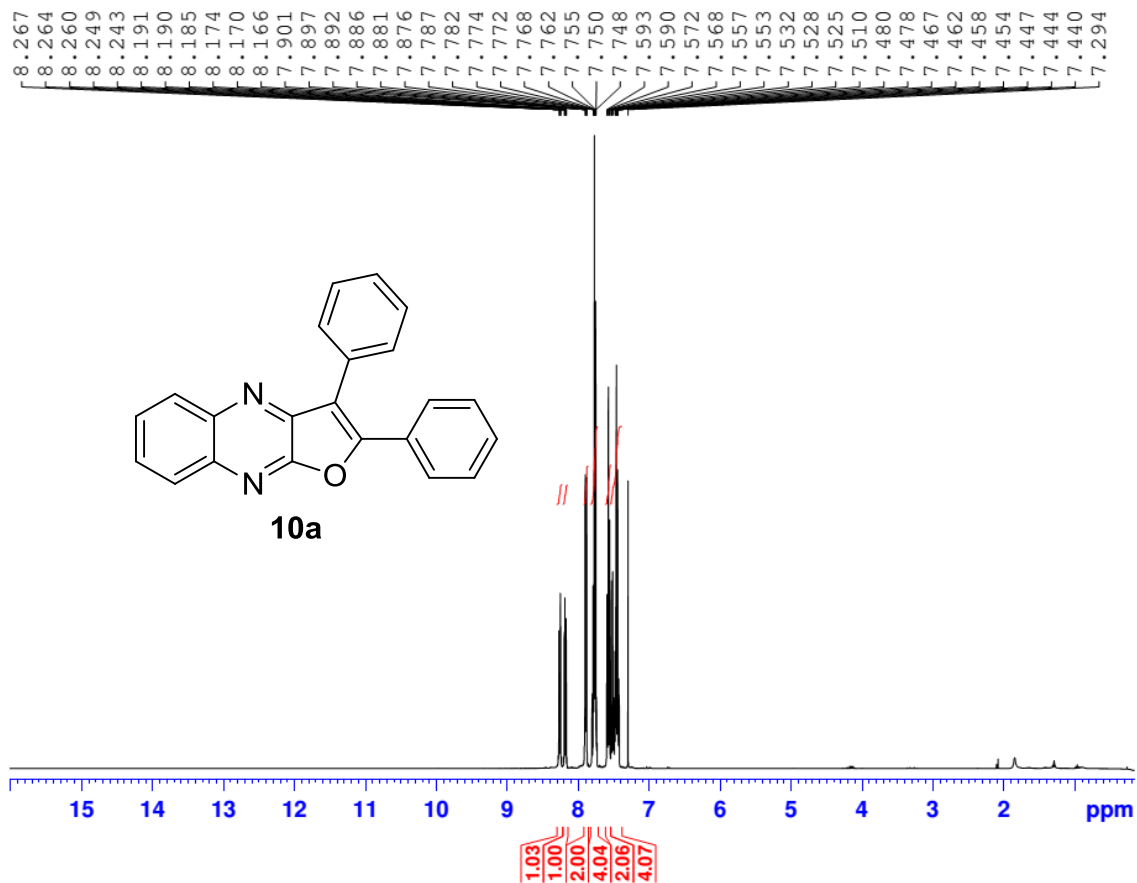


Figure 50: IR spectrum of 10a



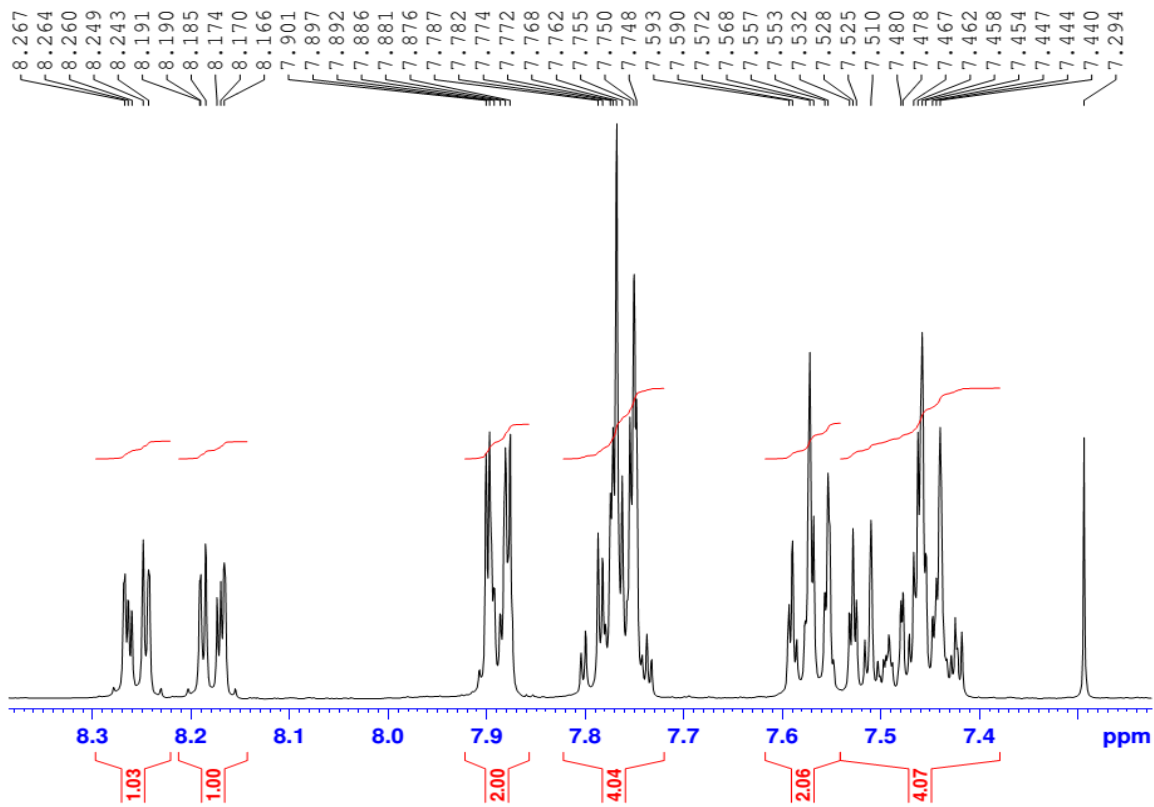
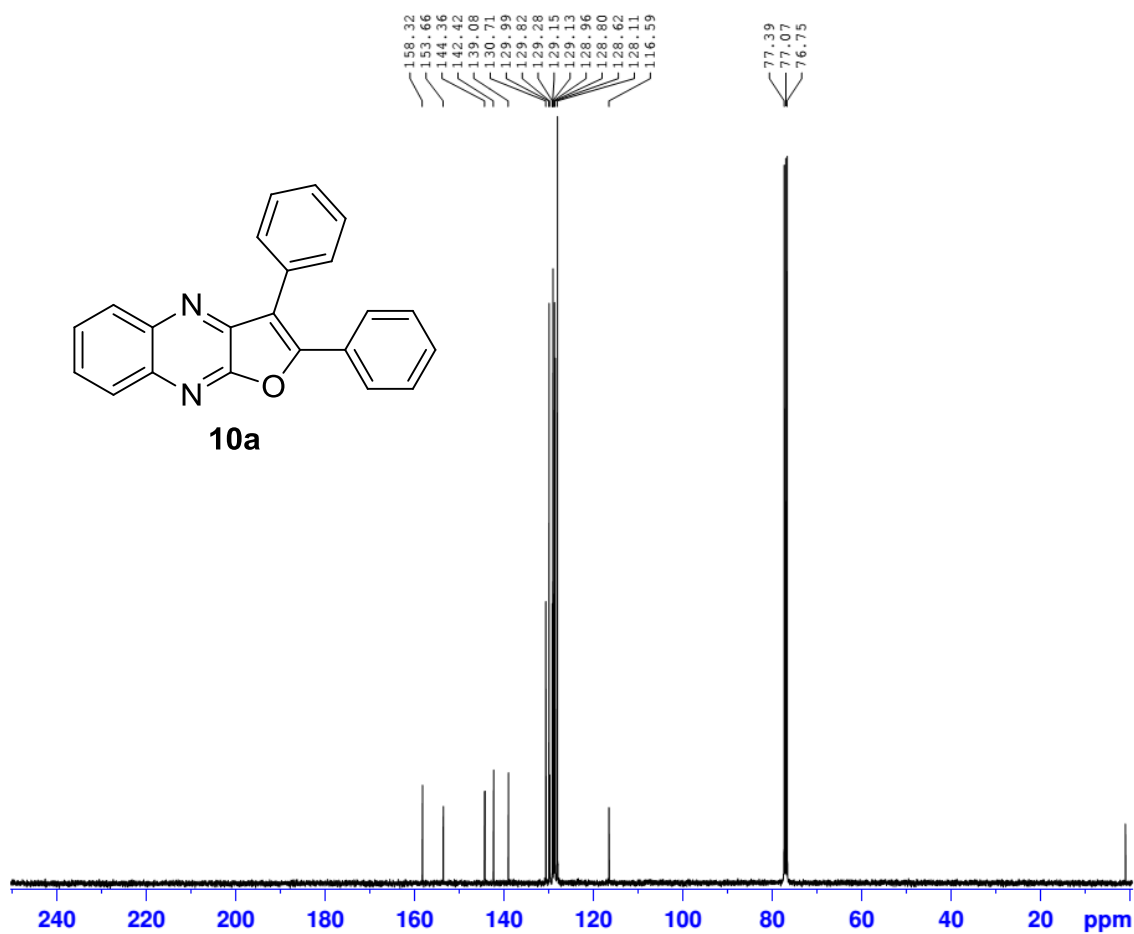


Figure 51:  $^1\text{H}$  NMR spectrum of **10a**



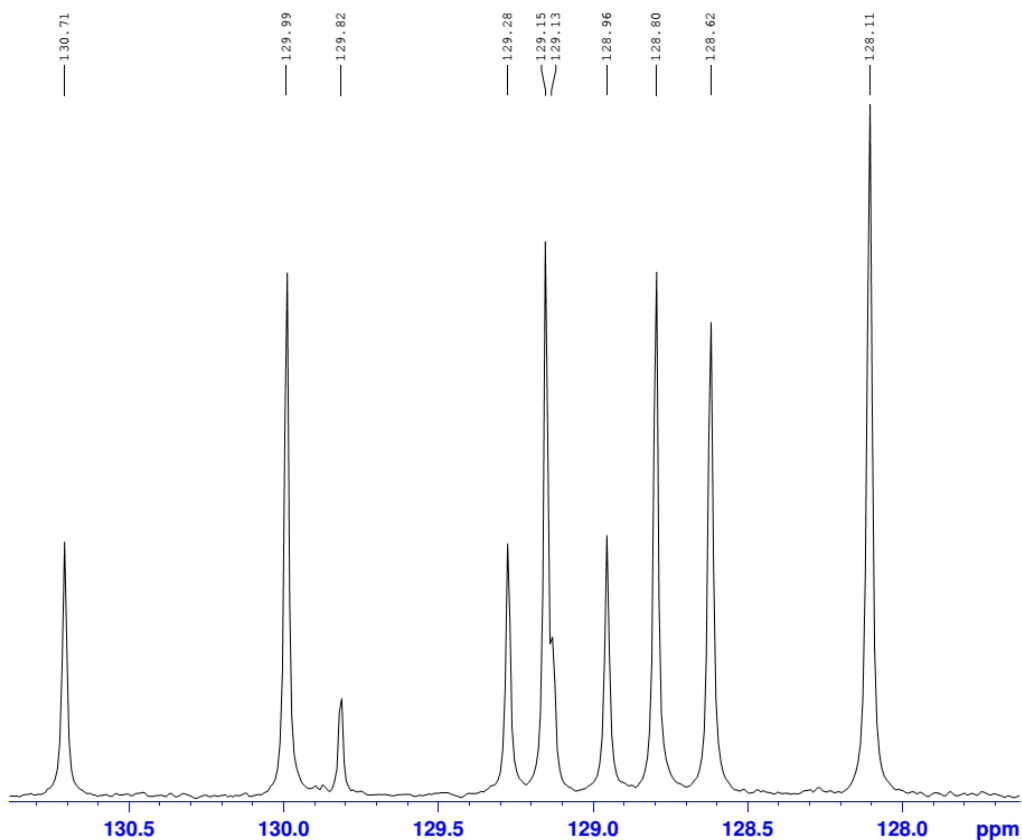
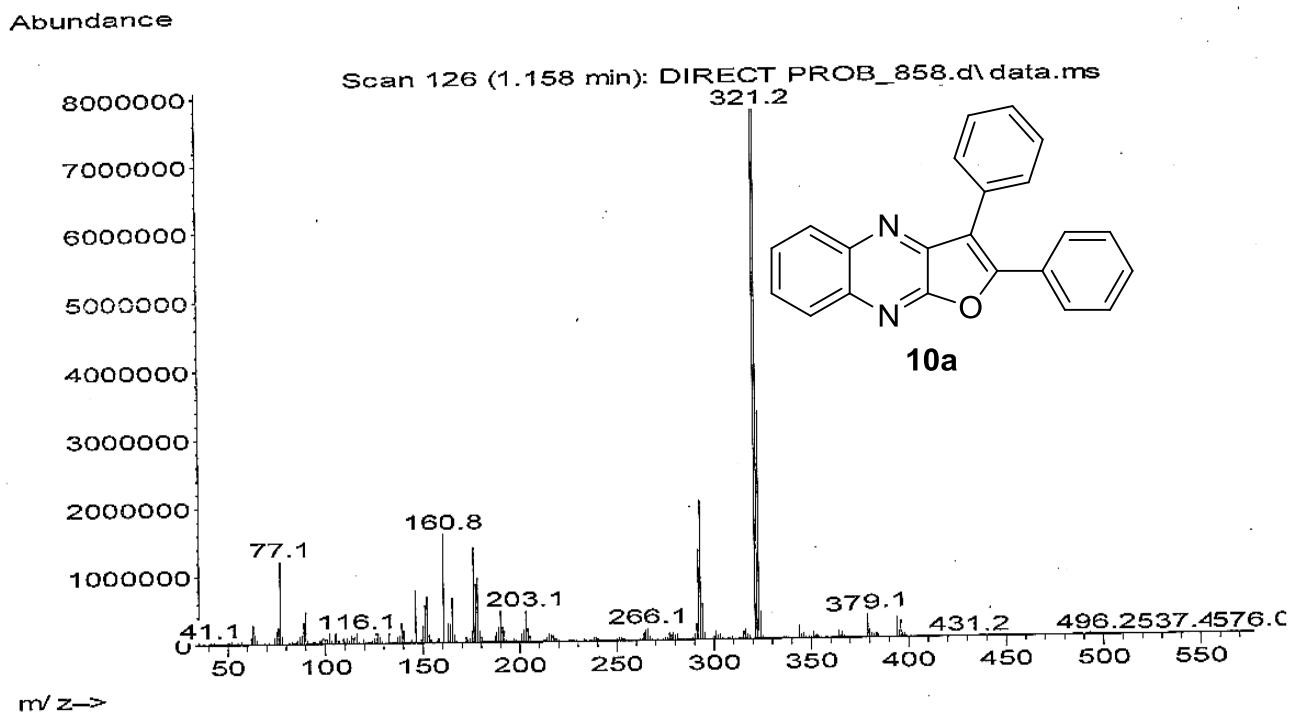


Figure 52:  $^{13}\text{C}$  NMR spectrum of **10a**





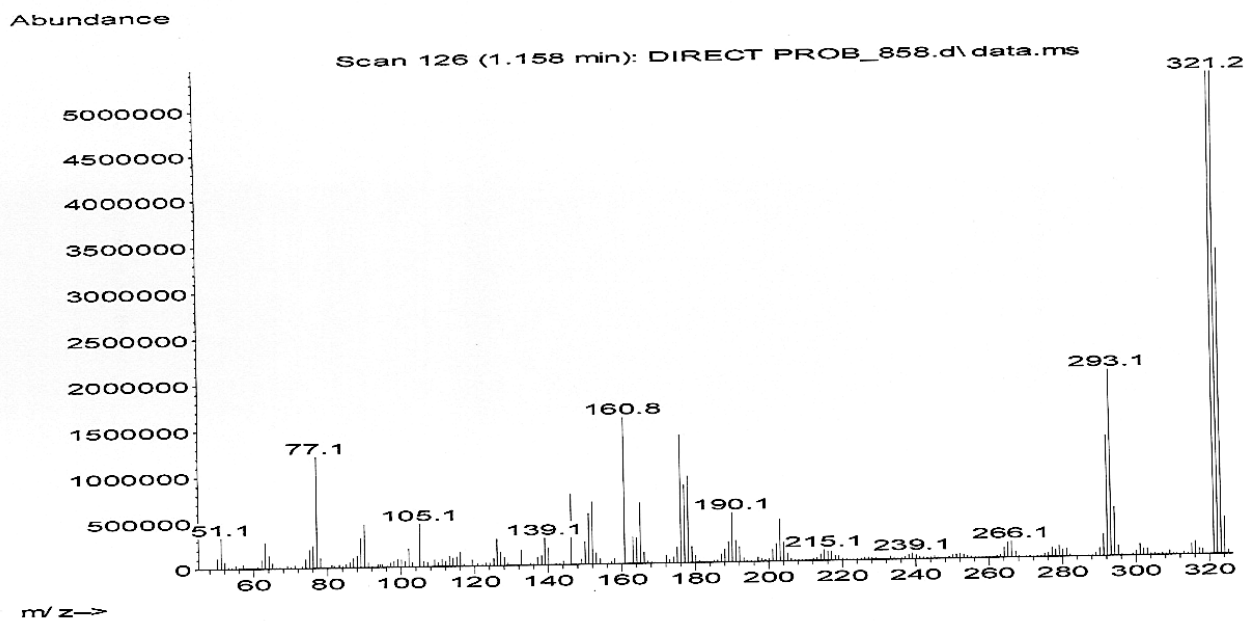


Figure 53: Mass spectrum of 10a

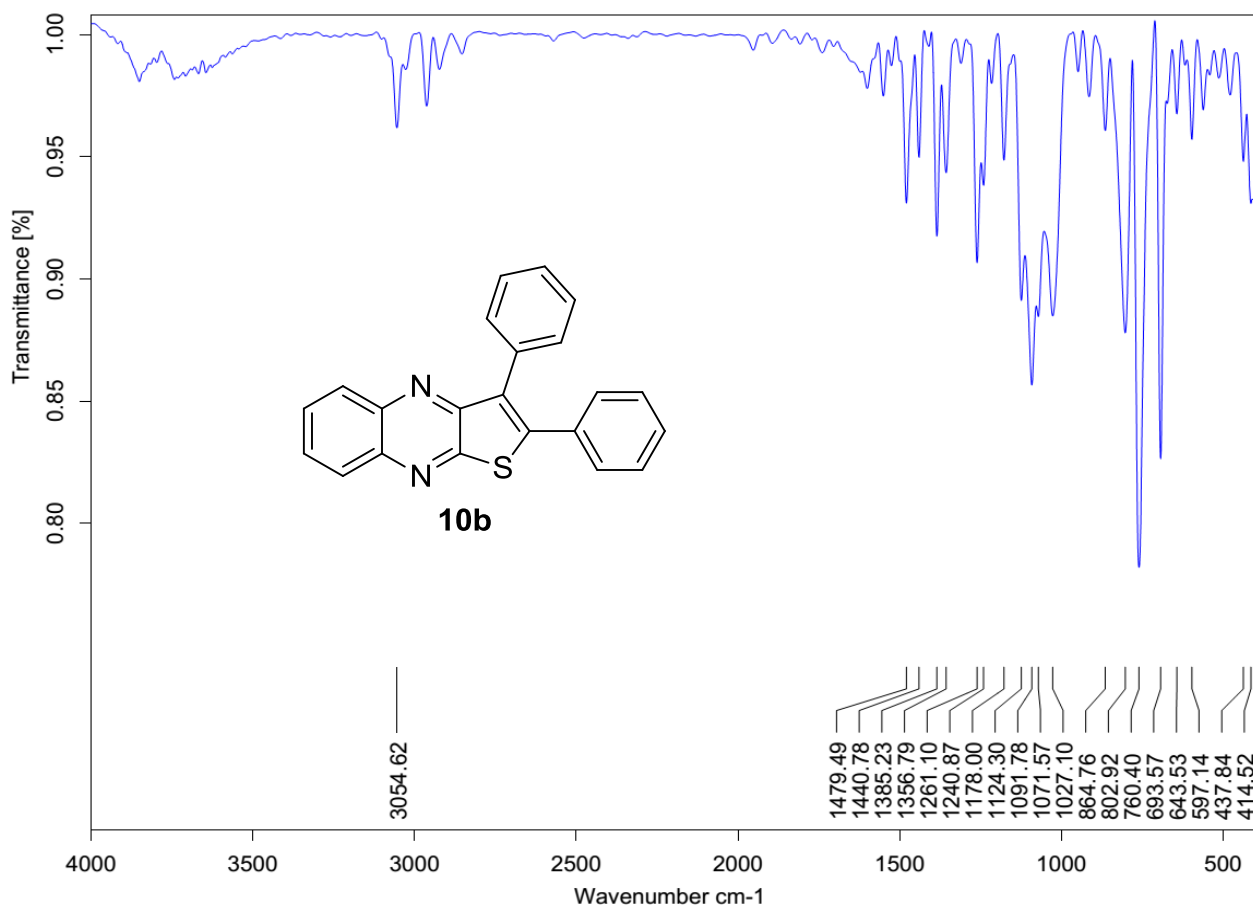


Figure 54: IR spectrum of 10b

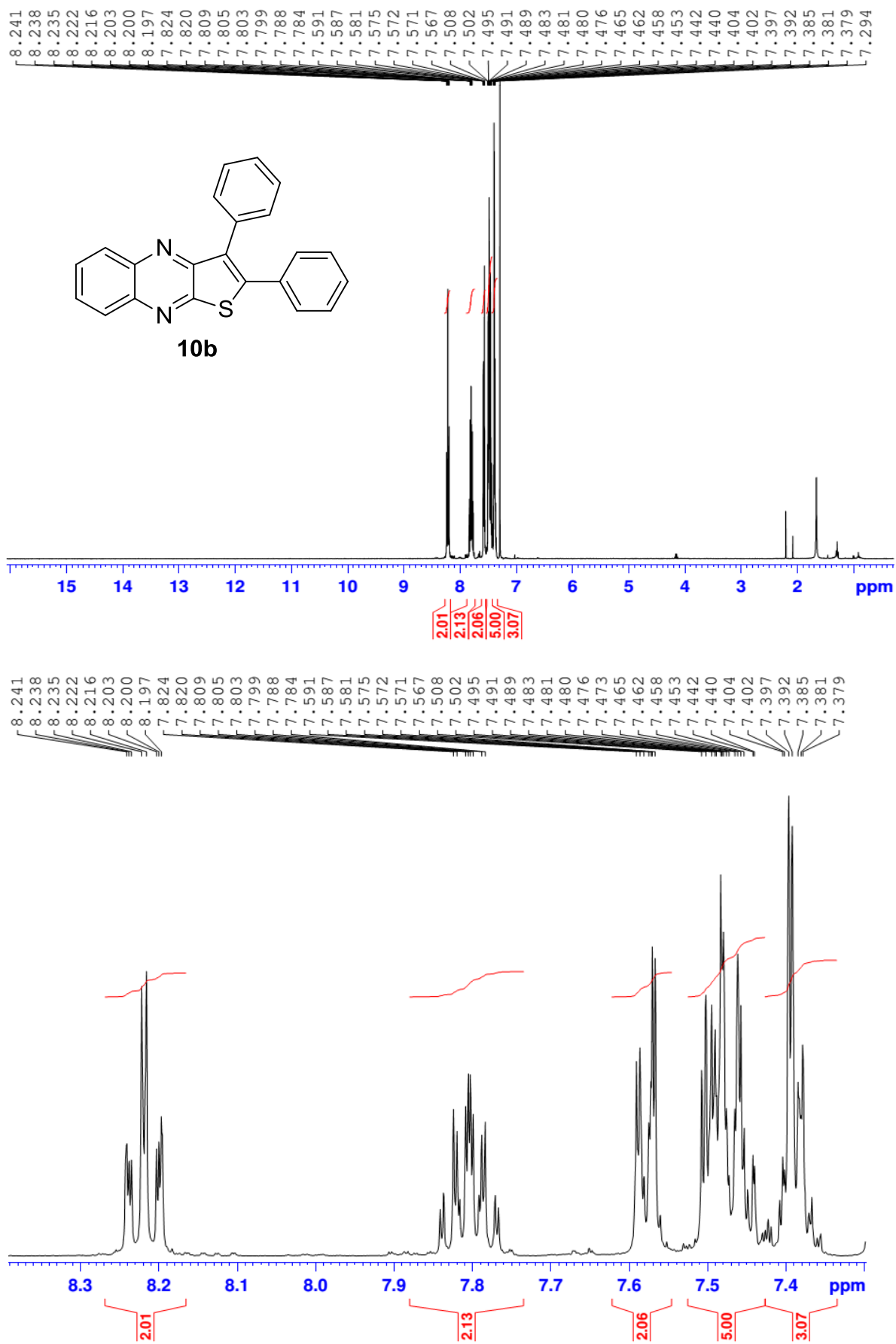


Figure 55: <sup>1</sup>H NMR spectrum of 10b

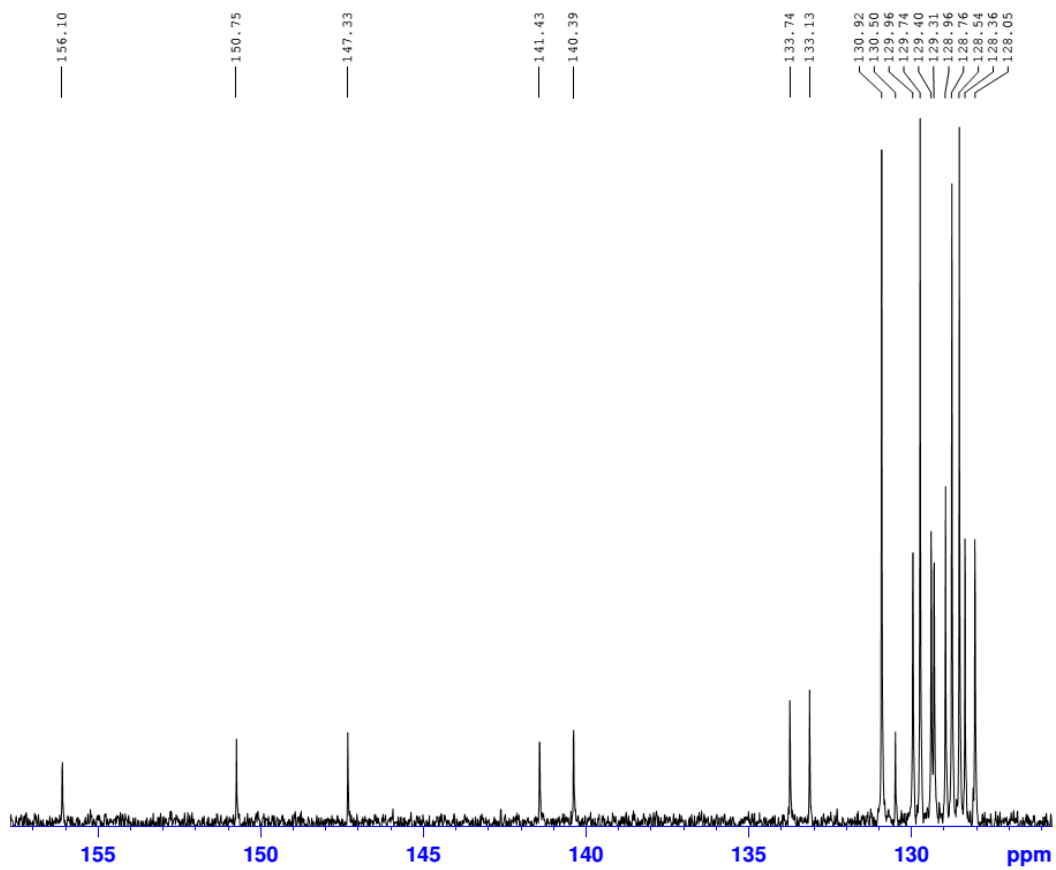
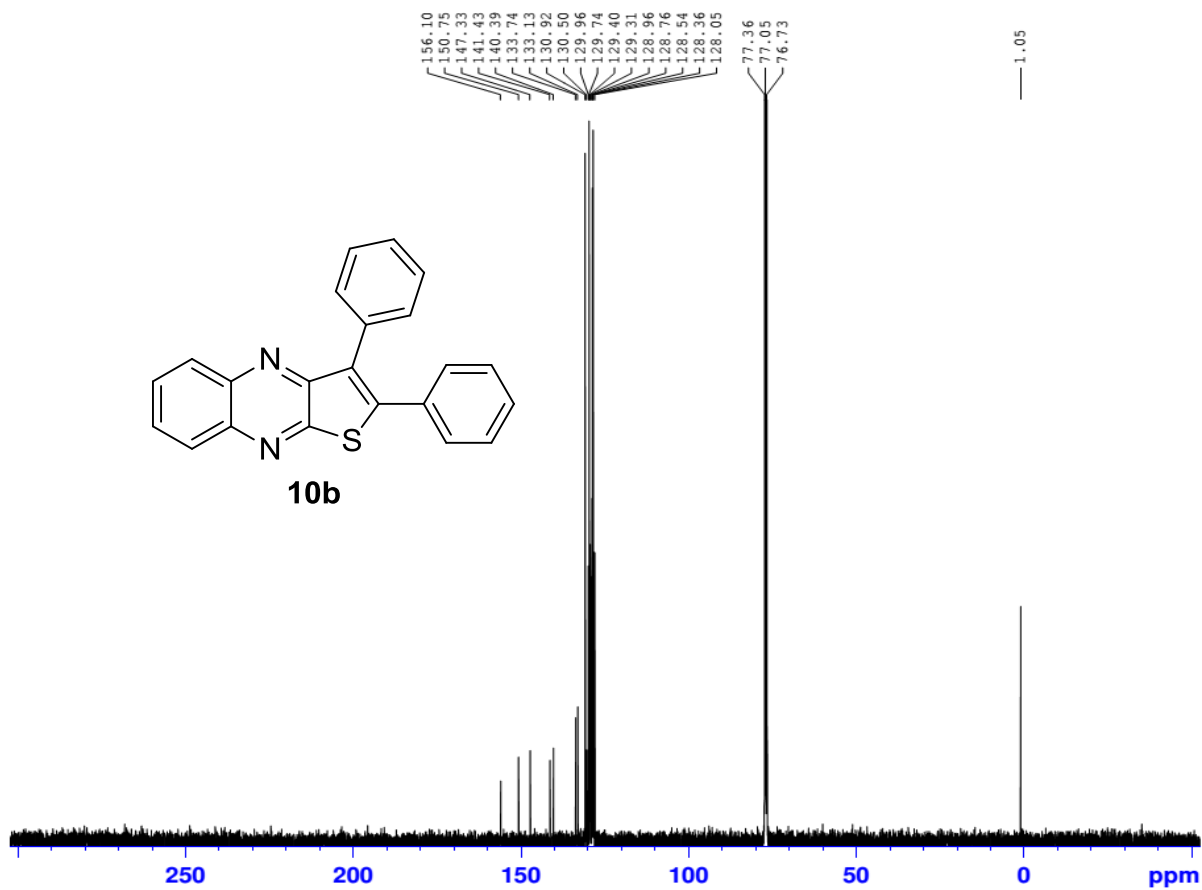
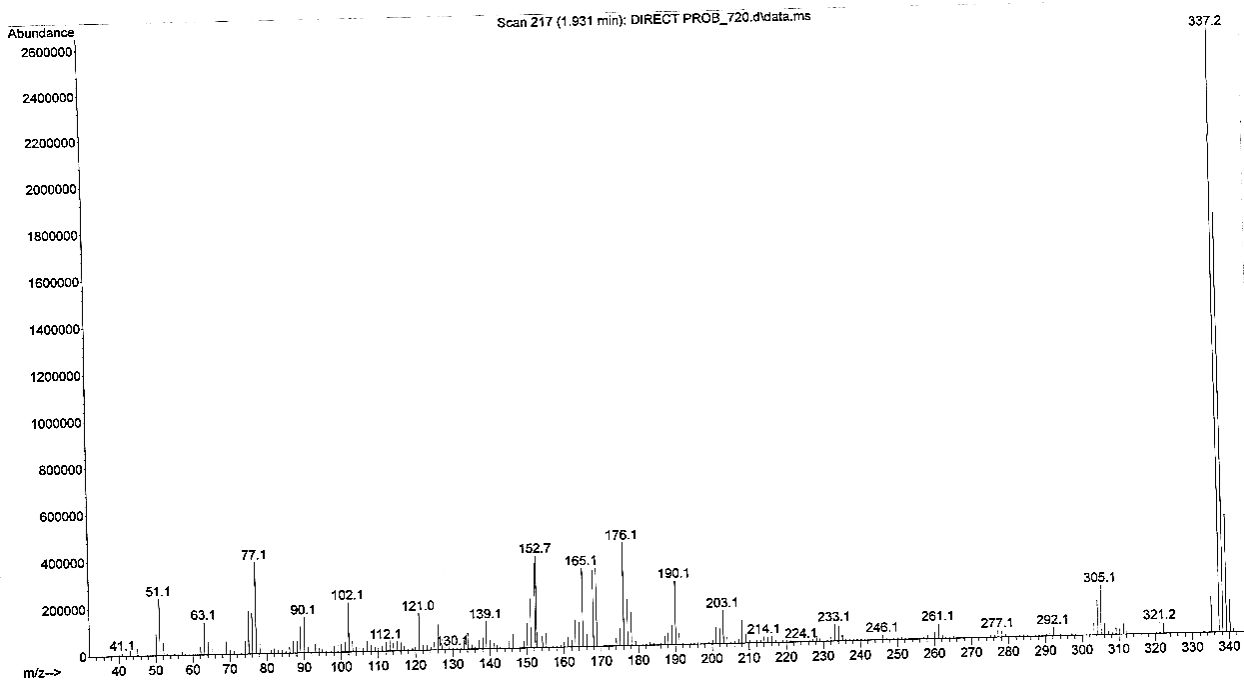
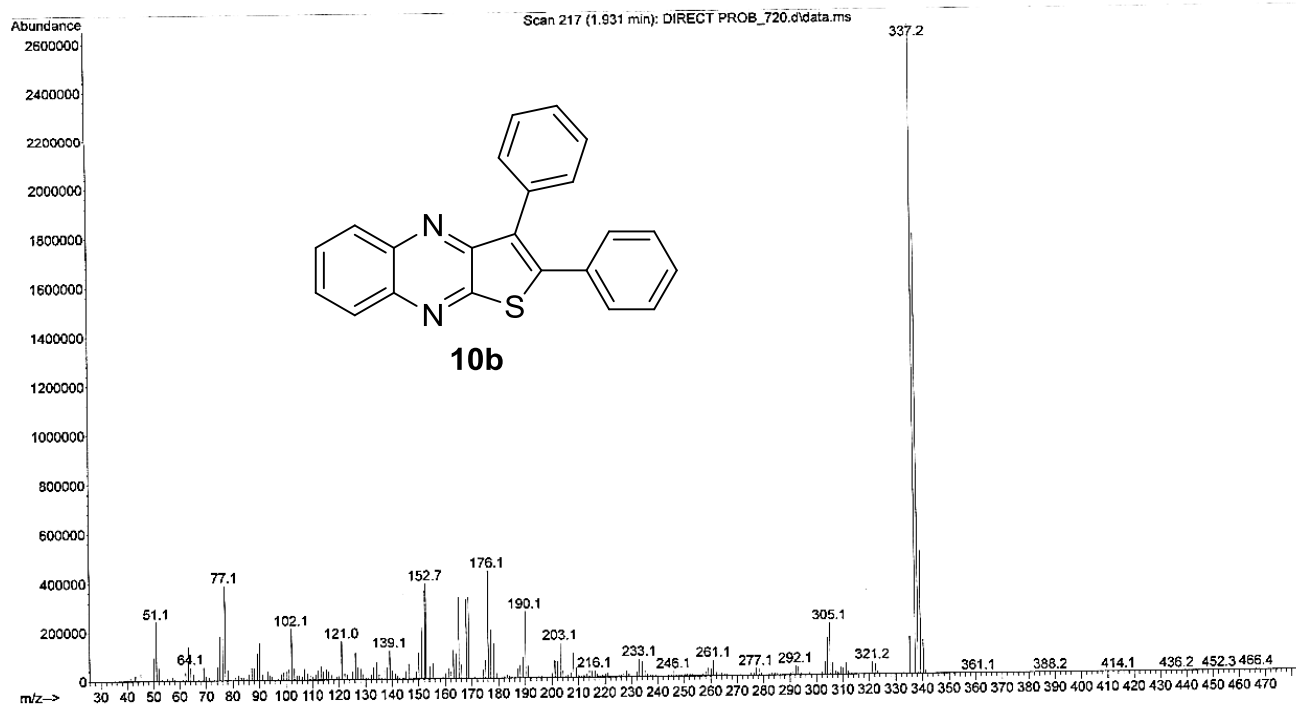


Figure 56:  $^{13}\text{C}$  NMR spectrum of **10b**



**Figure 57: Mass spectrum of 10b**

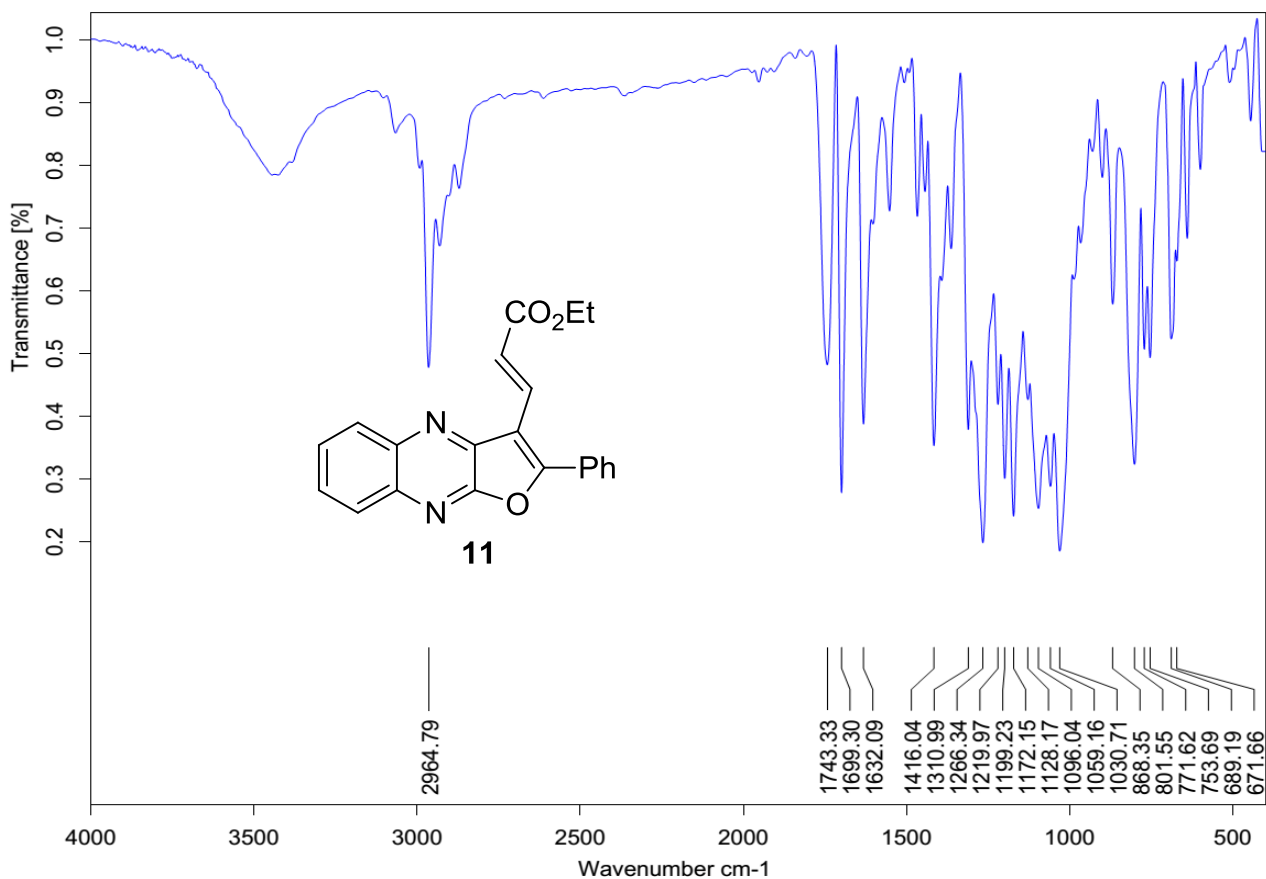
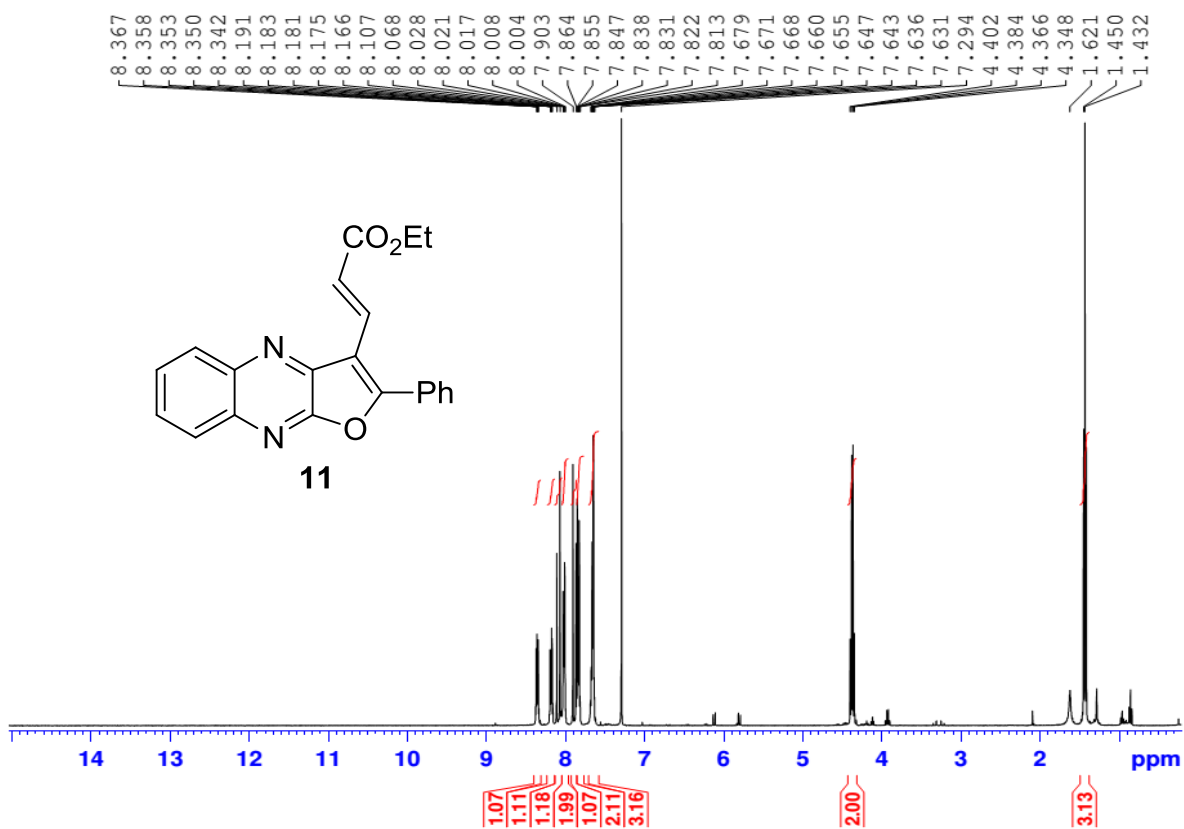


Figure 58: IR spectrum of 11



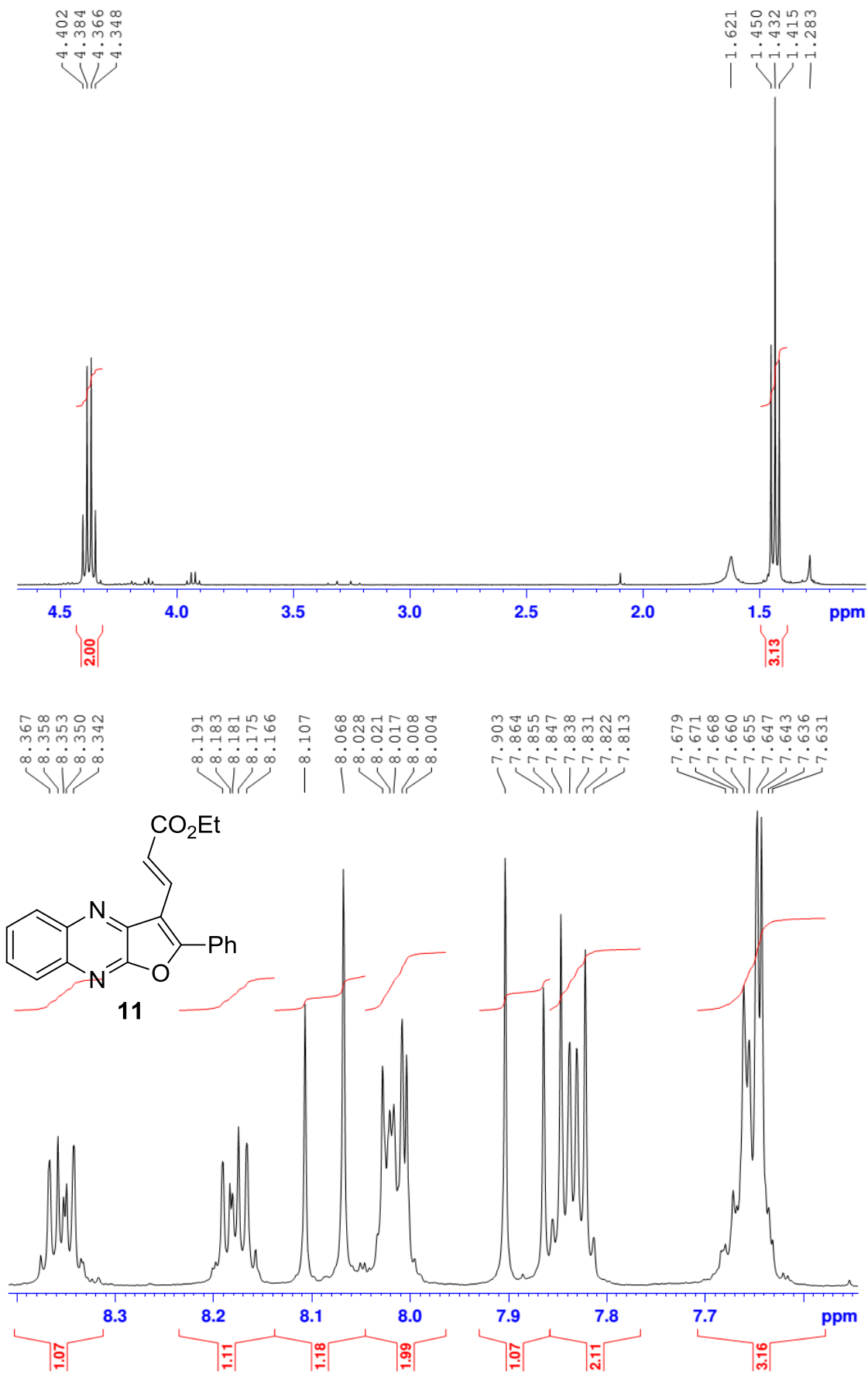
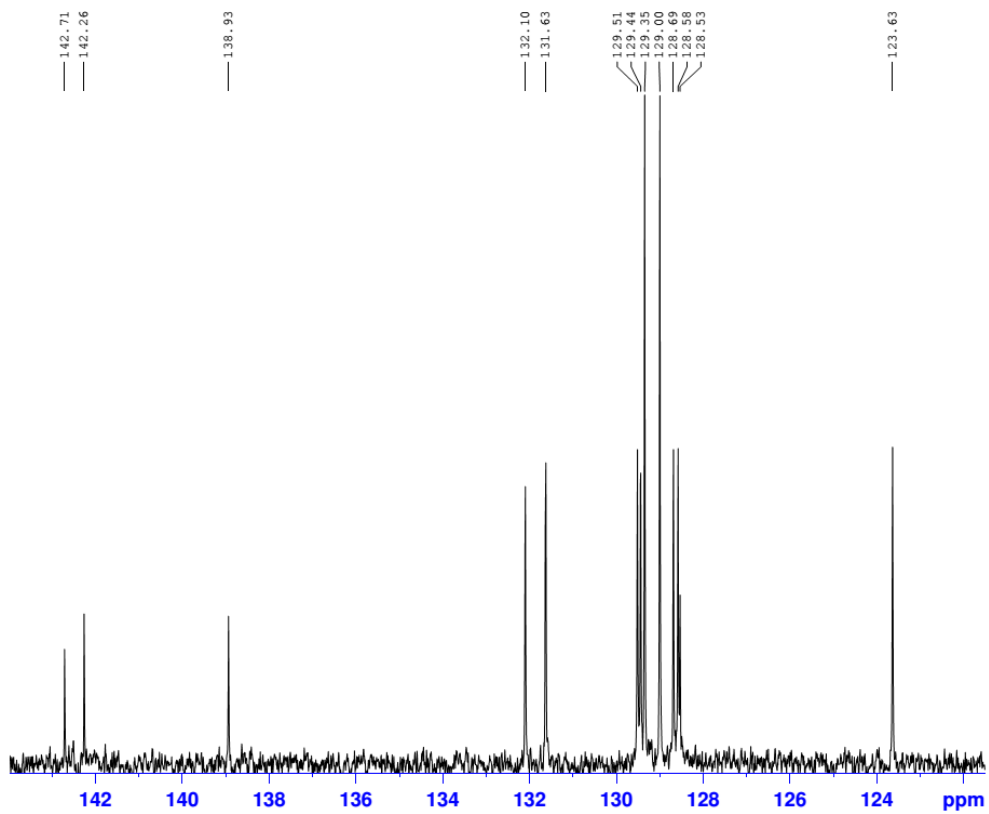
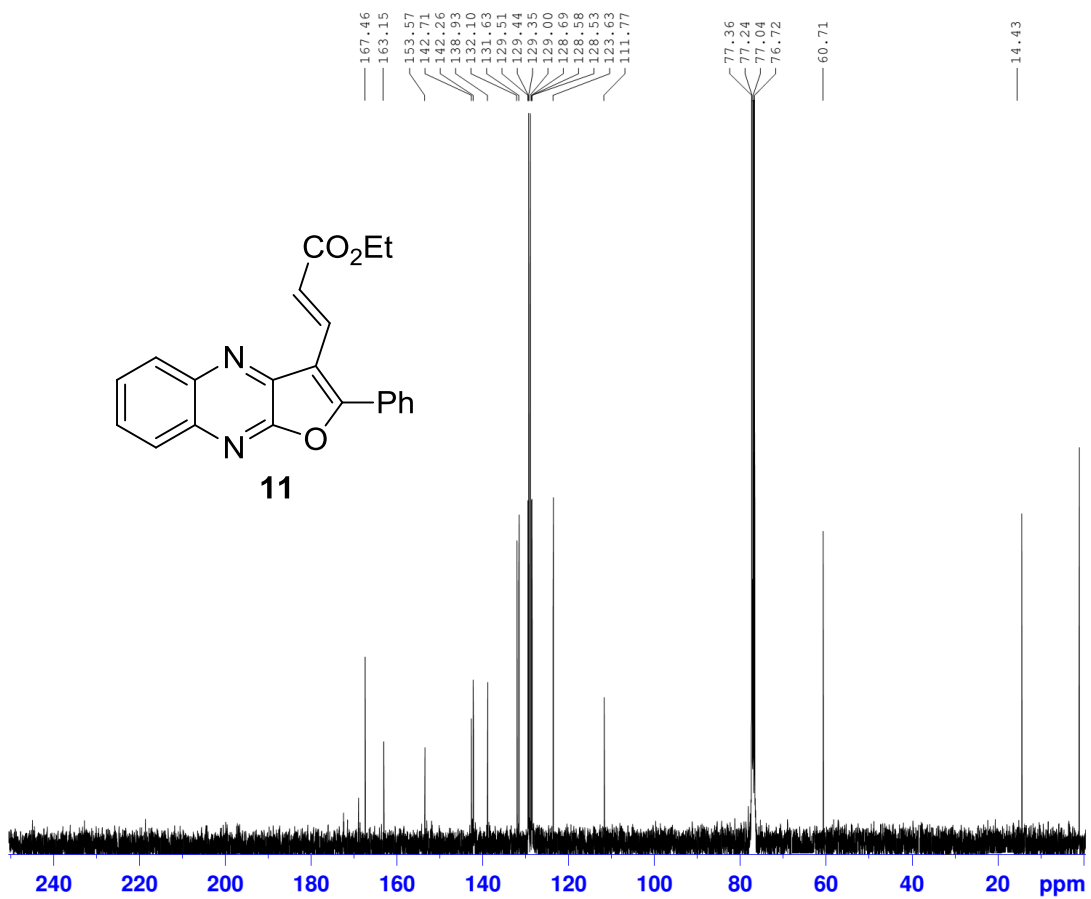
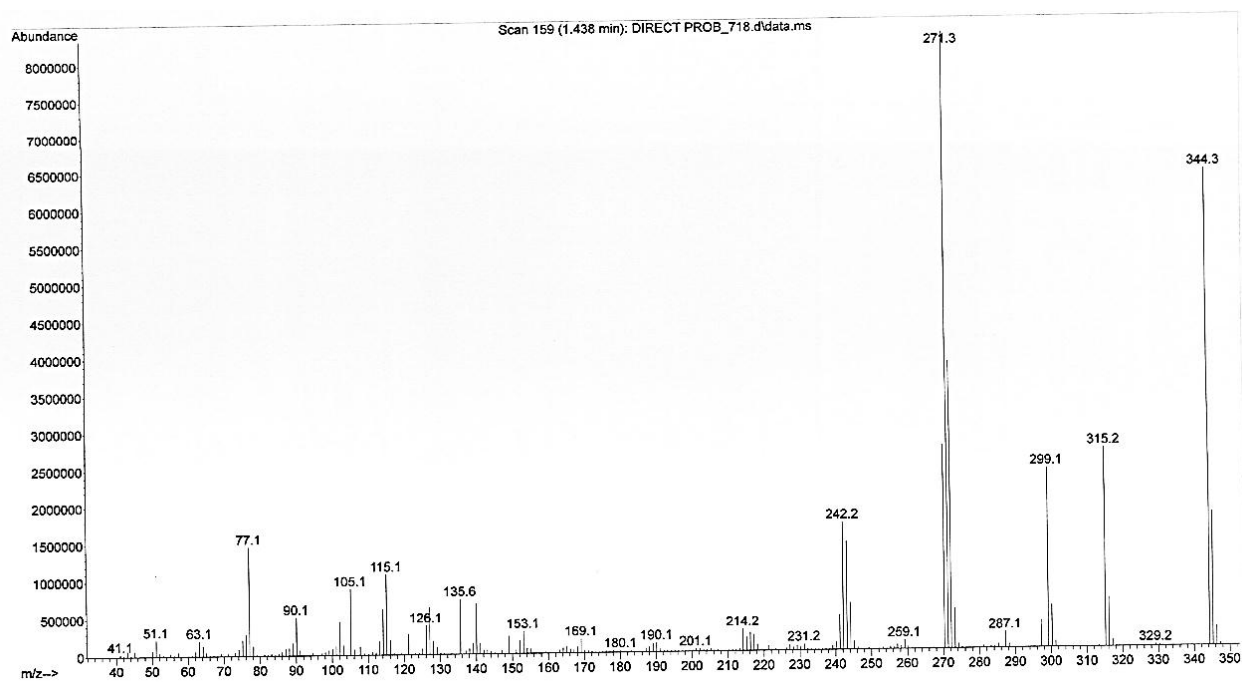
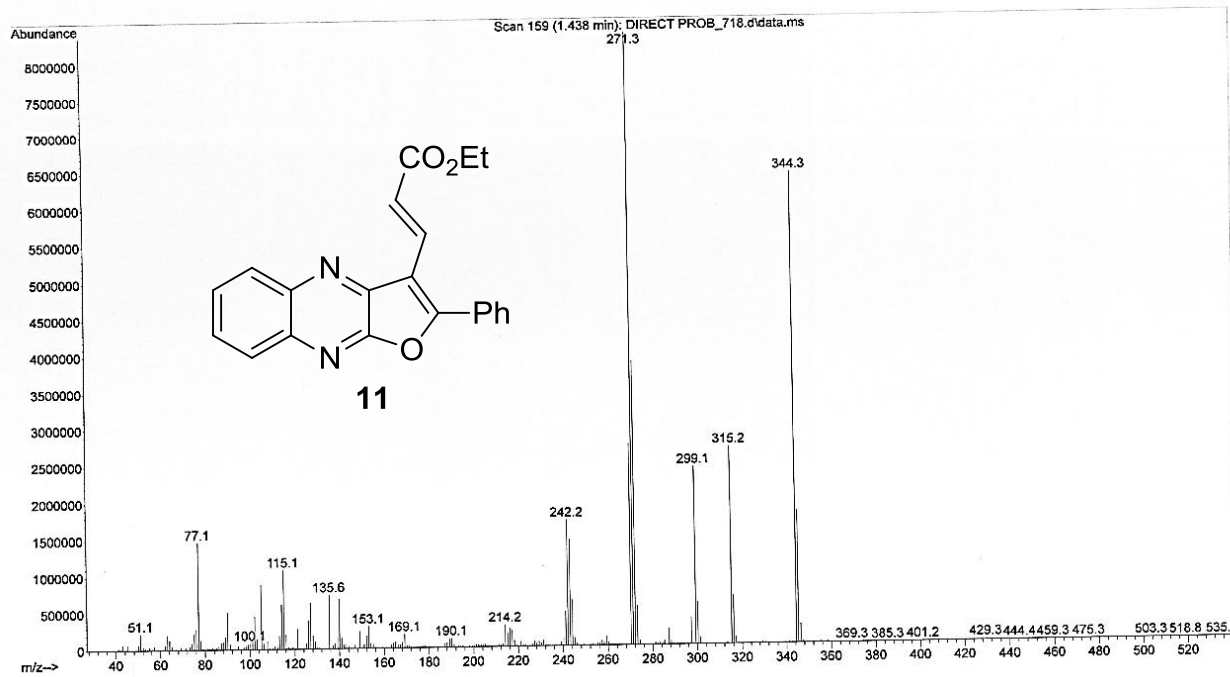


Figure 59: <sup>1</sup>H NMR spectrum of **11**



**Figure 60:** <sup>13</sup>C NMR spectrum of **11**



**Figure 61: Mass spectrum of 11**