

# **Synthesis, Characterization, Cytotoxic Activity Assessment and Structure Activity Relationship of 4-Aryl-6-(2,5-dichlorothiophen-3-yl)-2-methoxypyridine-3-carbonitriles**

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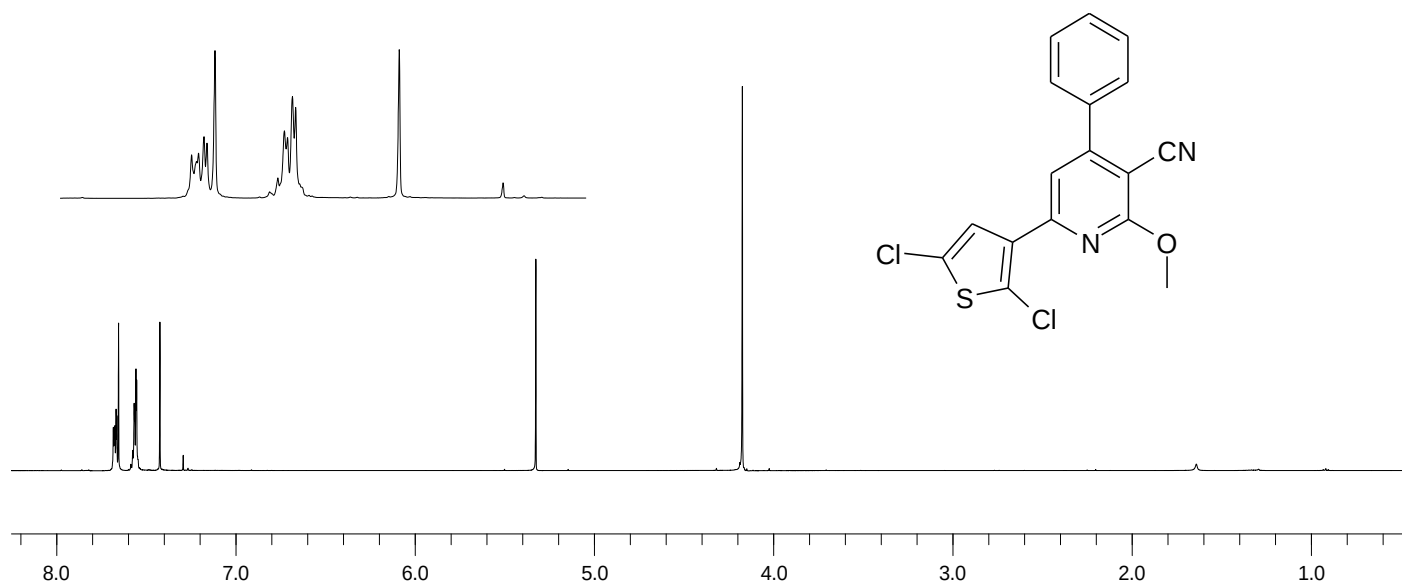
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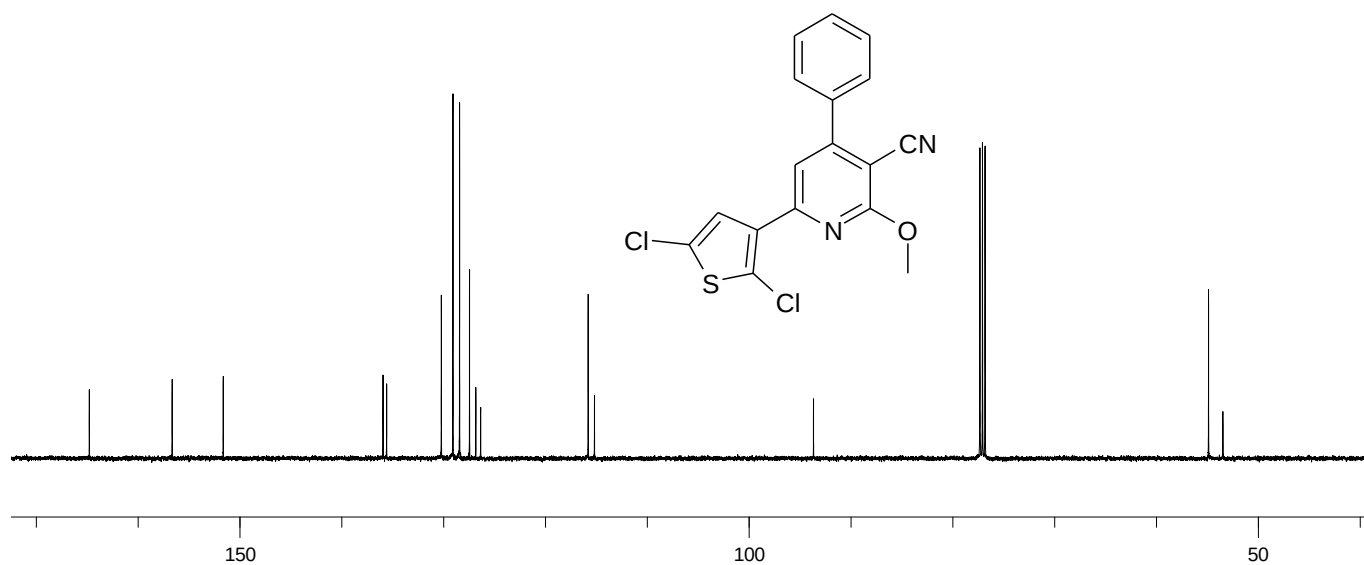
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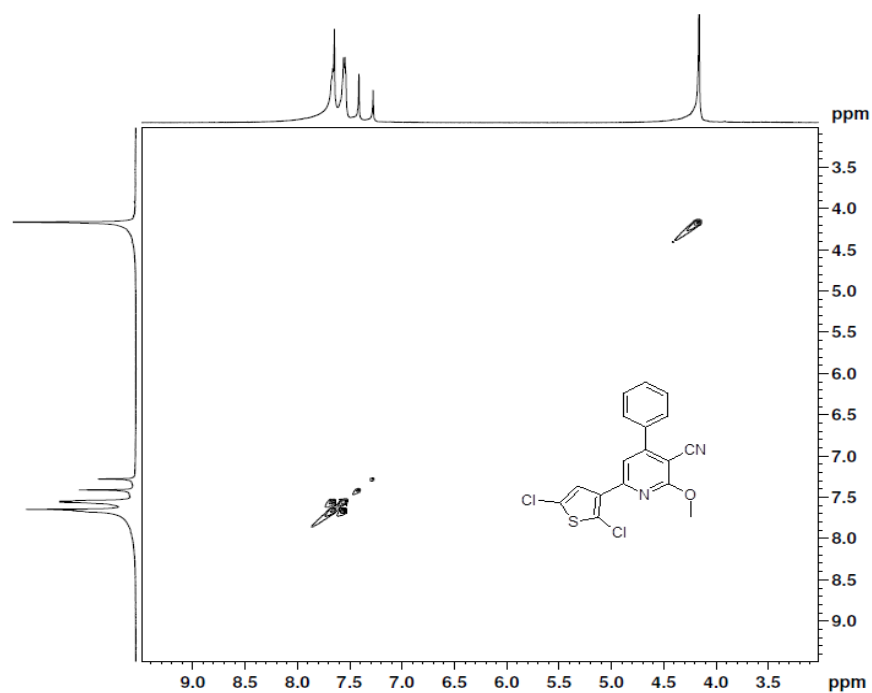
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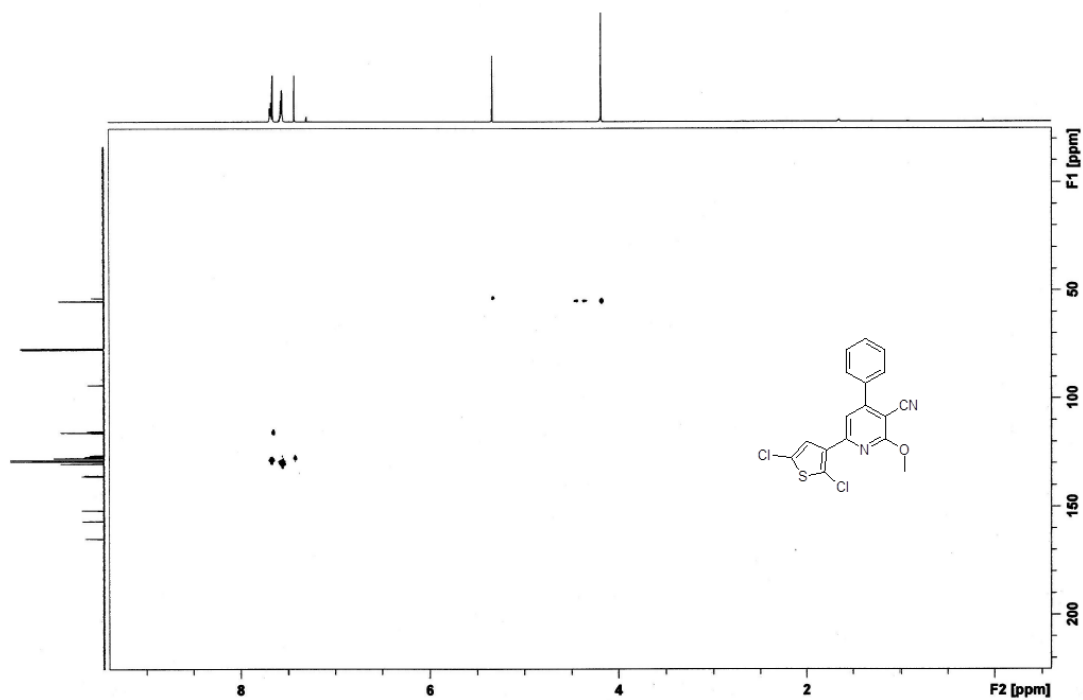
**S 1:** <sup>1</sup>H NMR spectrum (CDCl<sub>3</sub>, 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-phenylpyridine-3-carbonitrile (**5a**).



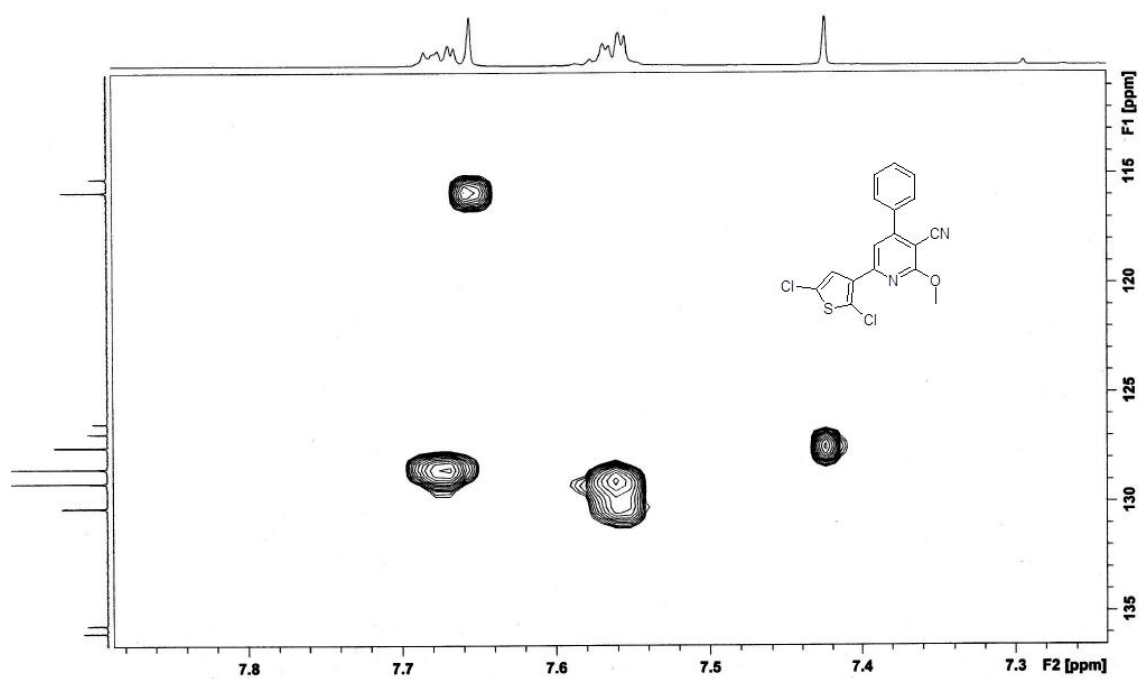
**S 2:** <sup>13</sup>C NMR spectrum (CDCl<sub>3</sub>, 125 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-phenylpyridine-3-carbonitrile (**5a**).



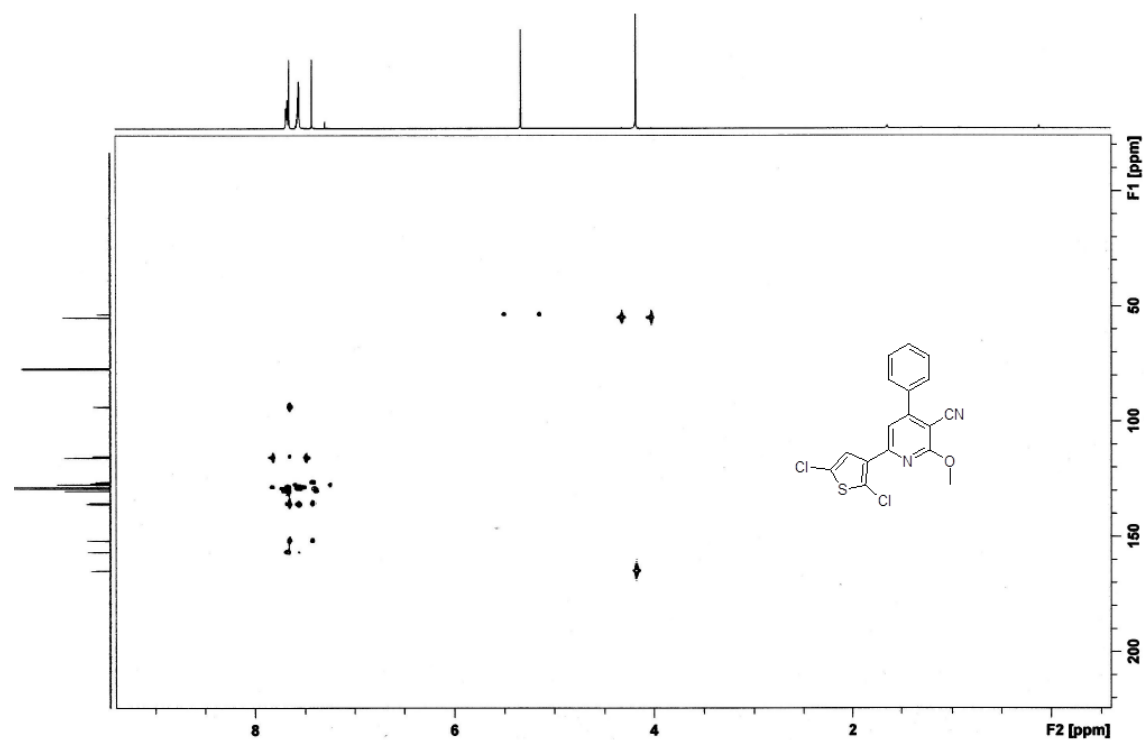
**S 3 :** H,H COSY spectrum (CDCl<sub>3</sub>, 300 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-phenylpyridine-3-carbonitrile (**5a**).



**S 4:** HSQC spectrum (CDCl<sub>3</sub>, 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-phenylpyridine-3-carbonitrile (**5a**).

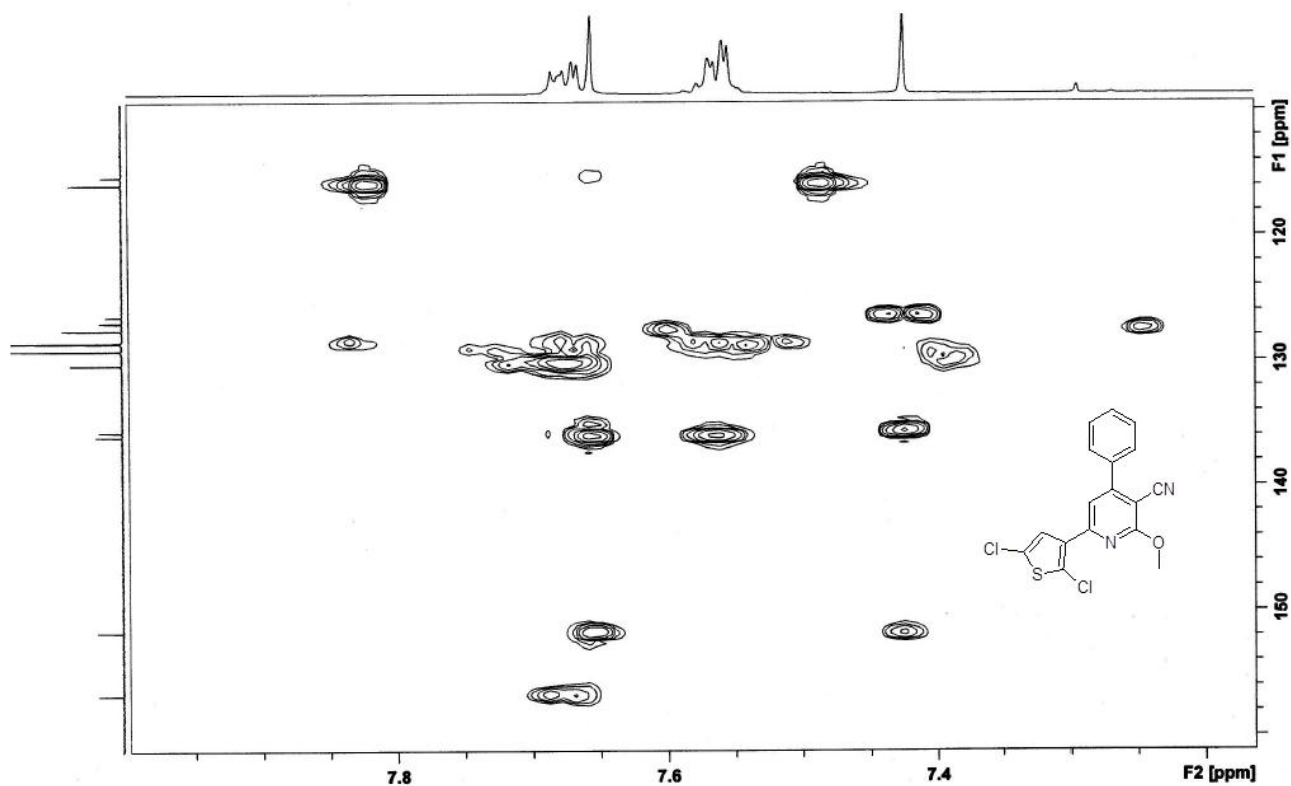


S 5: HSQC spectrum (CDCl<sub>3</sub>, 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-phenylpyridine-3-carbonitrile (5a).

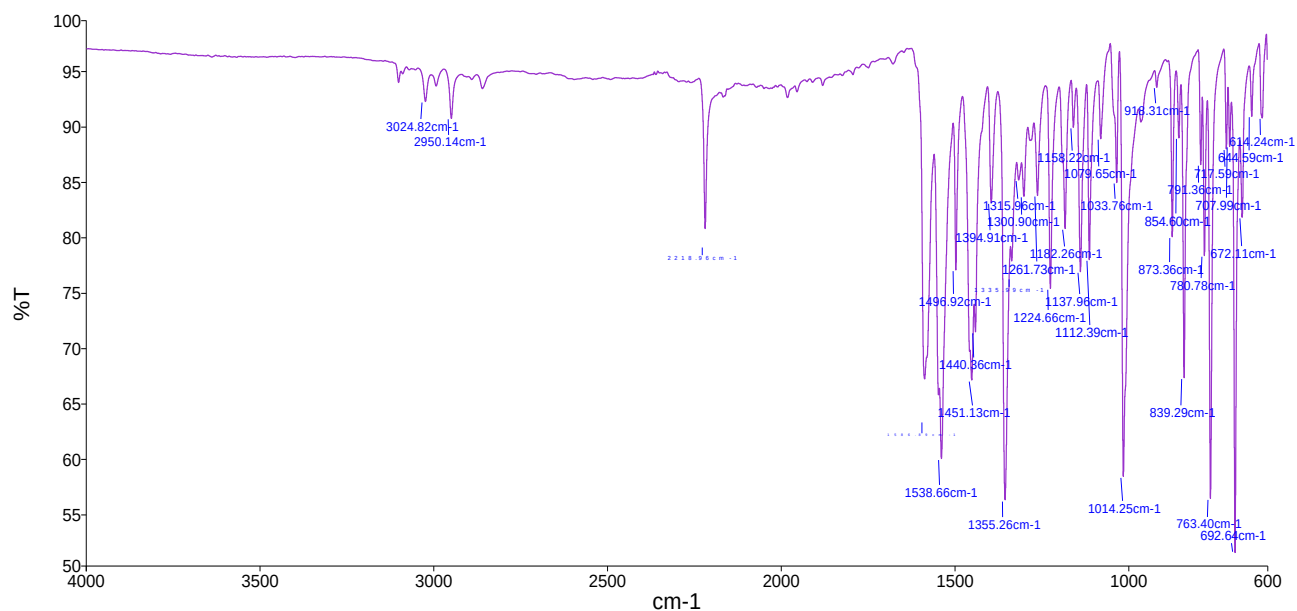


S 6: HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-phenylpyridine-3-carbonitrile (5a).

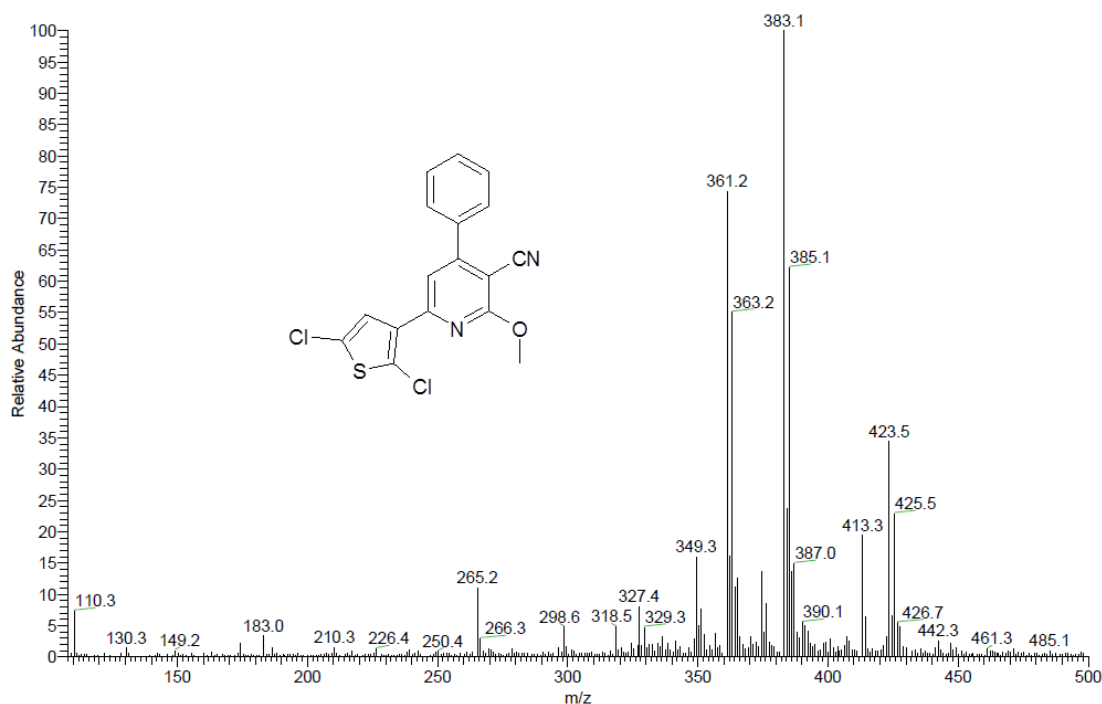




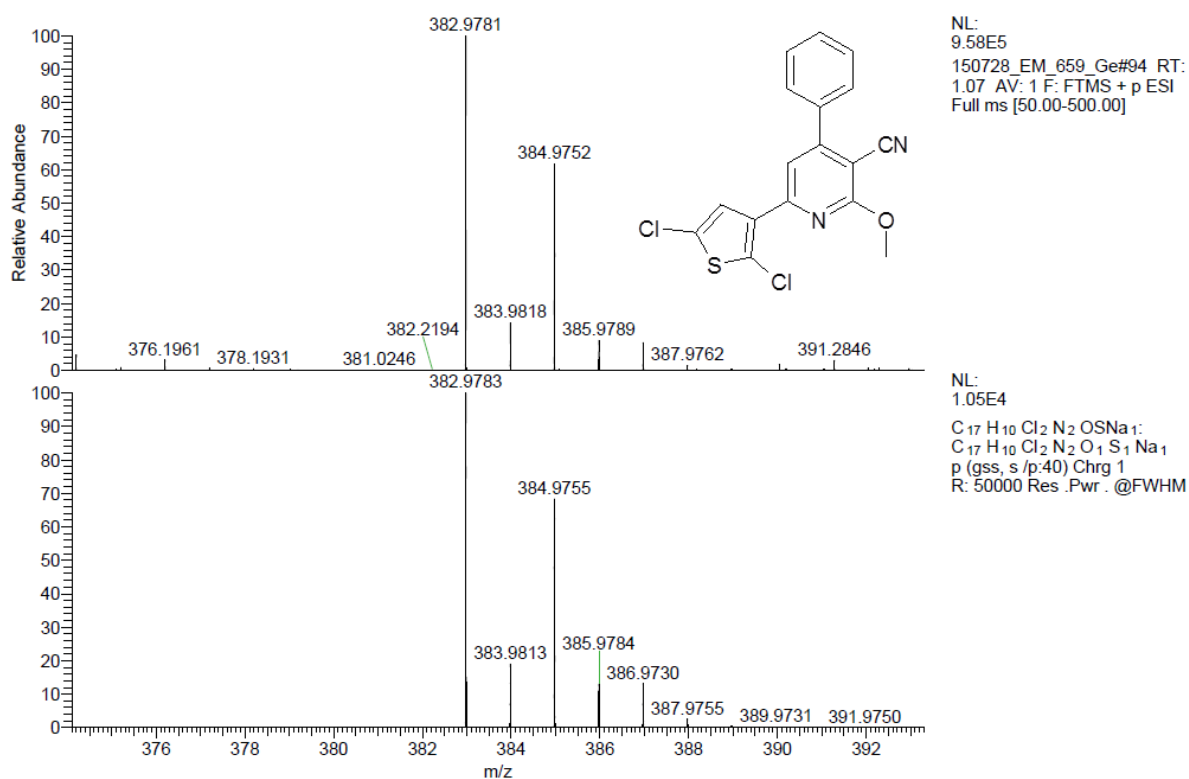
**S 7:** HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-phenylpyridine-3-carbonitrile (**5a**).



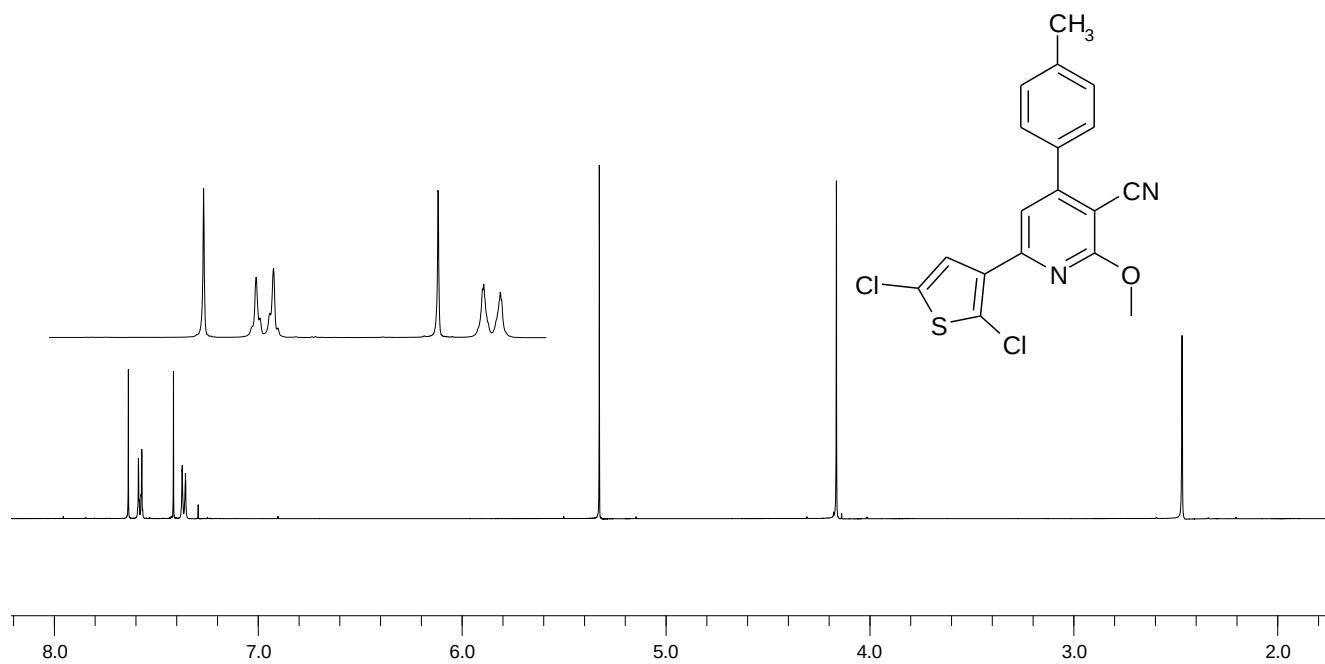
**S 8:** IR spectrum of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-phenylpyridine-3-carbonitrile (**5a**).



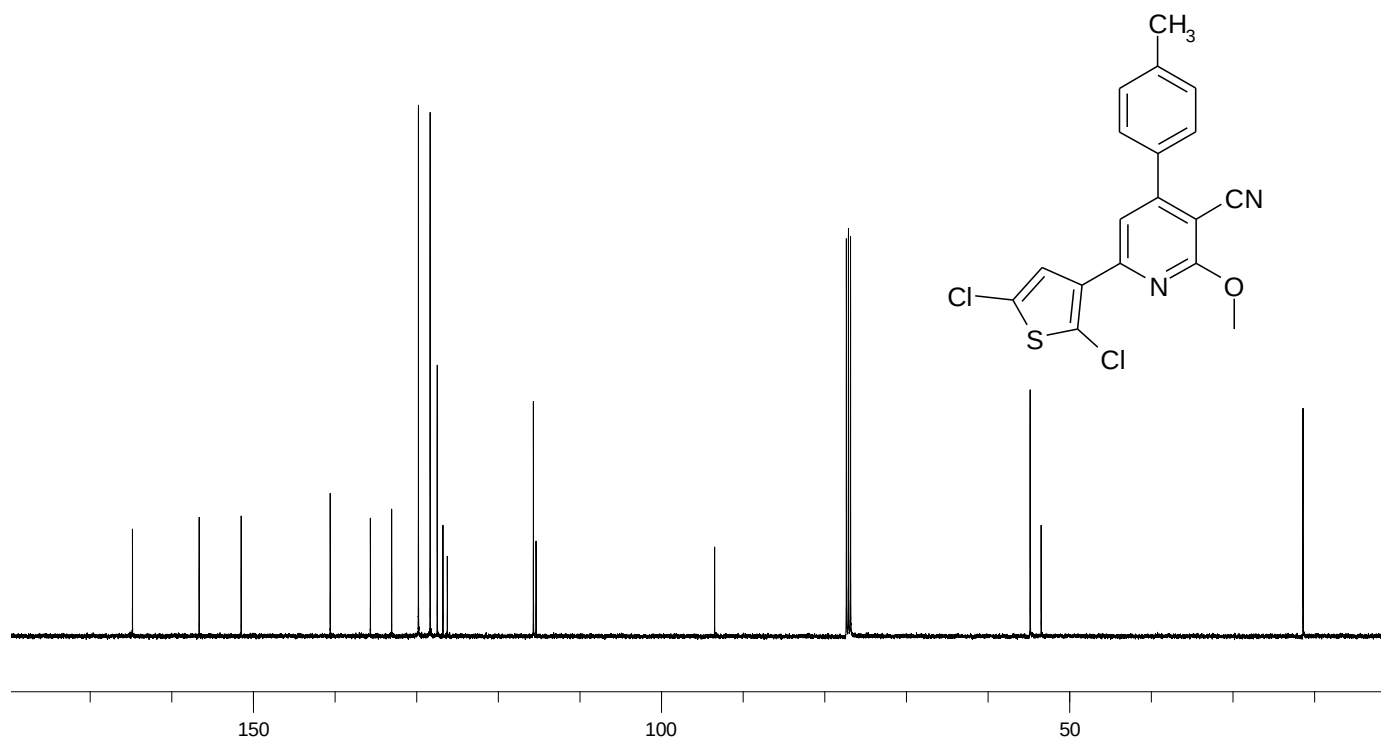
**S 9:** ESI mass spectrum of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-phenylpyridine-3-carbonitrile (**5a**).



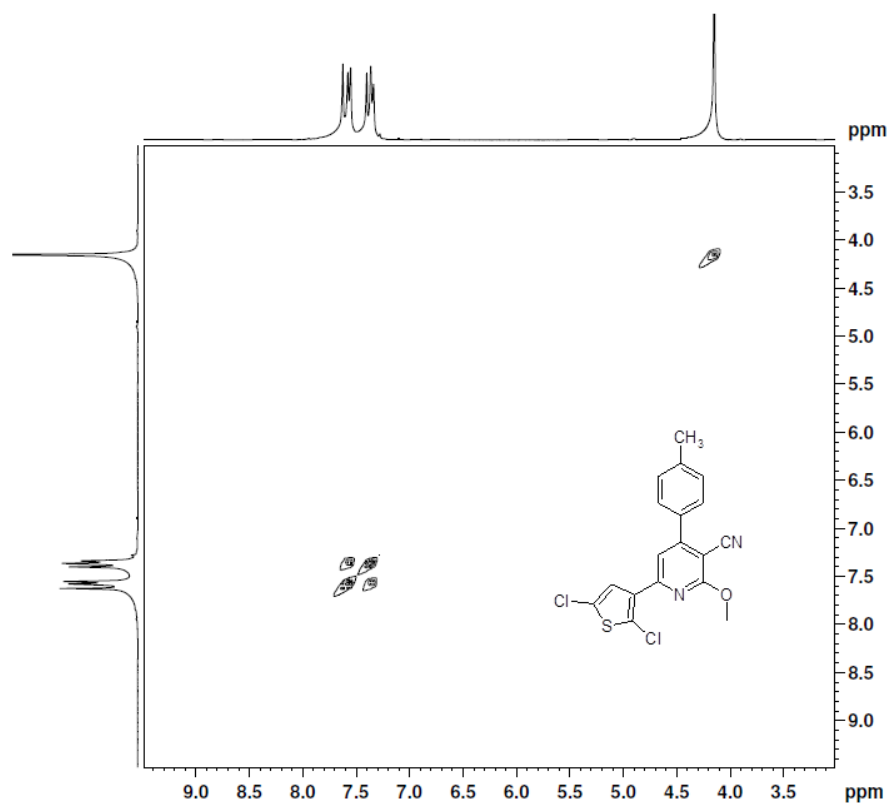
**S 10:** HRESI mass spectrum of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-phenylpyridine-3-carbonitrile (**5a**).



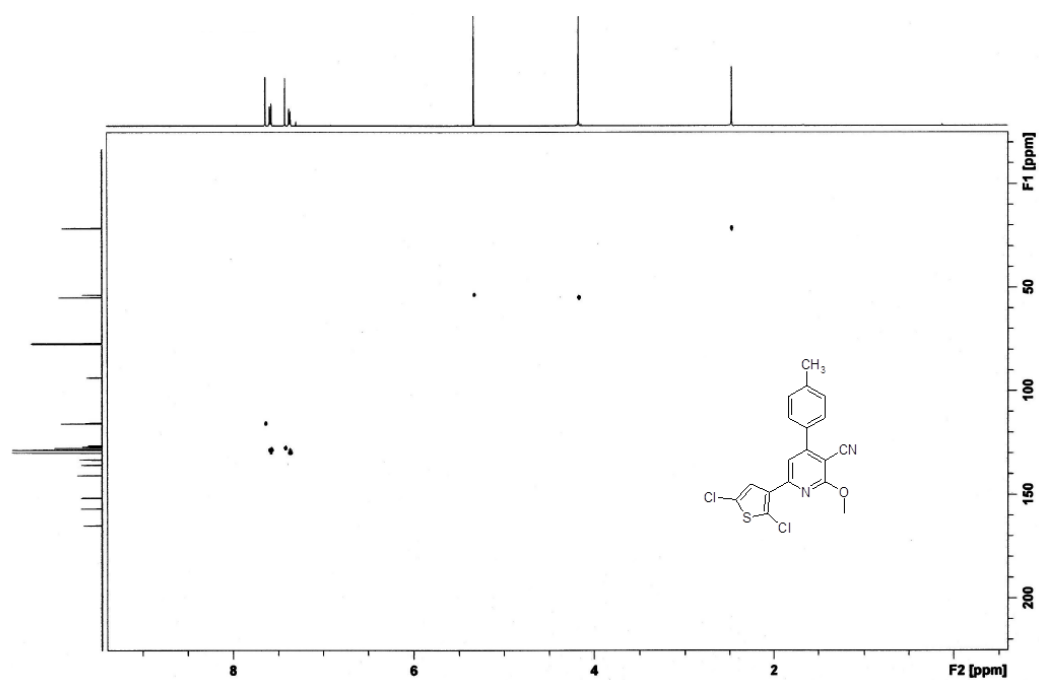
**S 11:**  $^1\text{H}$  NMR spectrum ( $\text{CDCl}_3$ , 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-p-tolylpyridine-3-carbonitrile (**5b**).



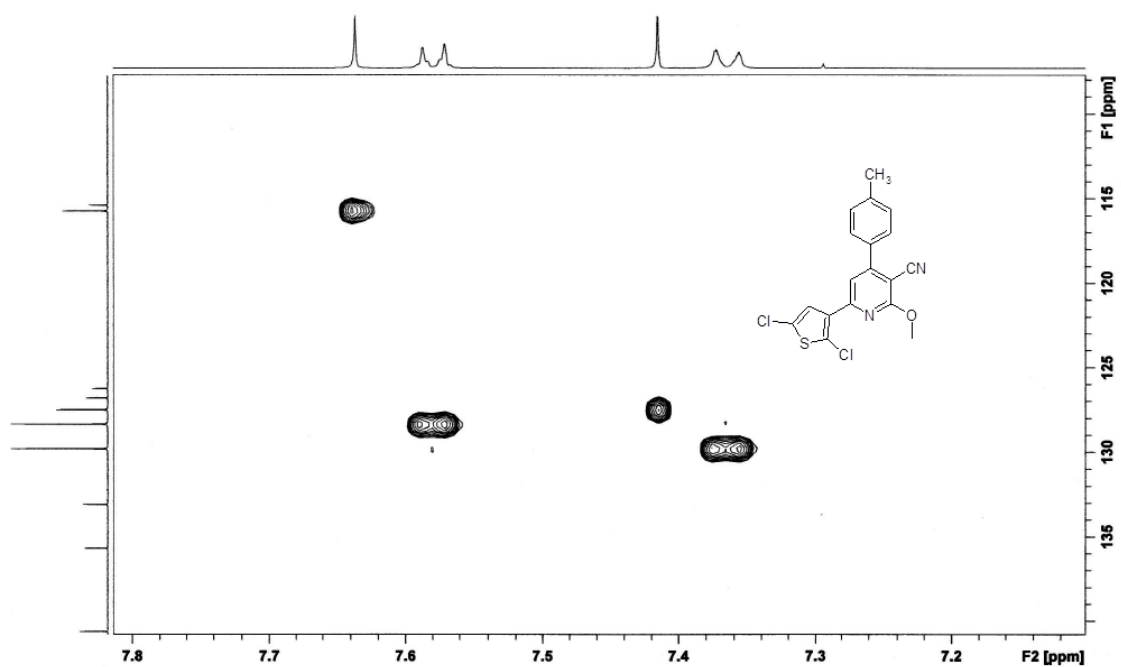
**S 12:**  $^{13}\text{C}$  NMR spectrum ( $\text{CDCl}_3$ , 125 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-p-tolylpyridine-3-carbonitrile (**5b**).



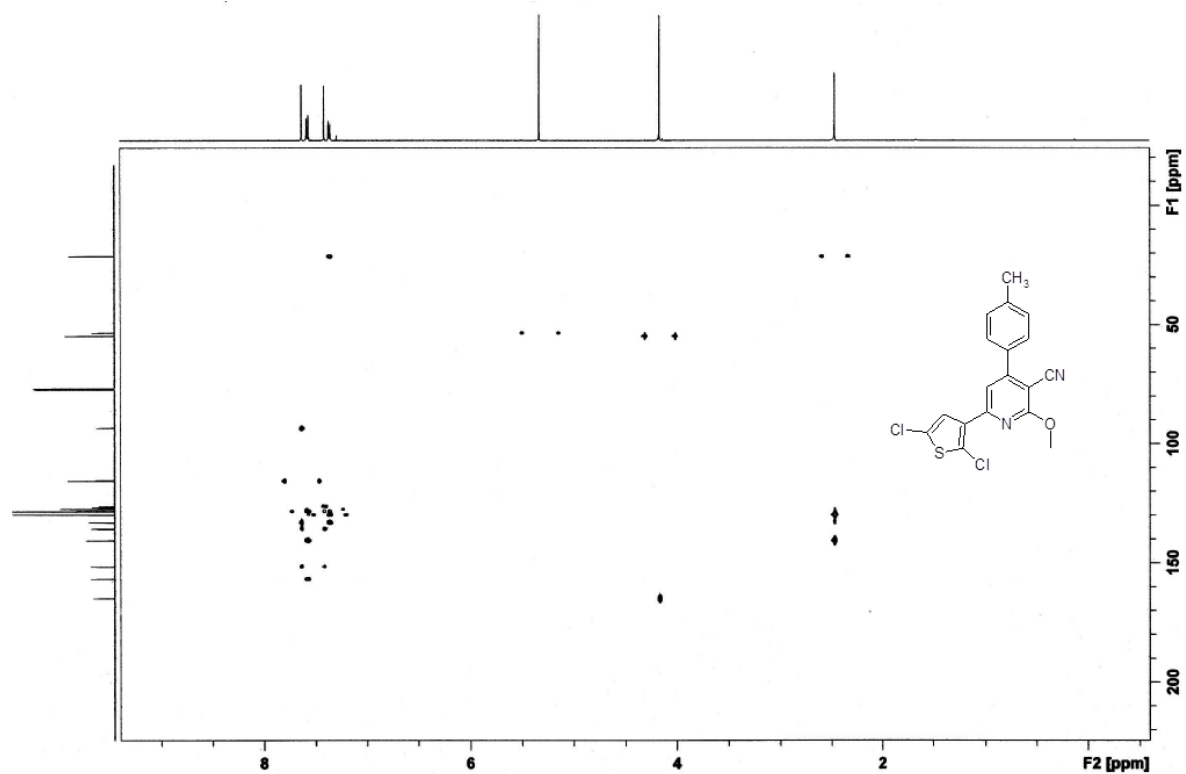
**S 13:** H,H COSY spectrum (CDCl<sub>3</sub>, 300 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-*p*-tolylpyridine-3-carbonitrile (**5b**).



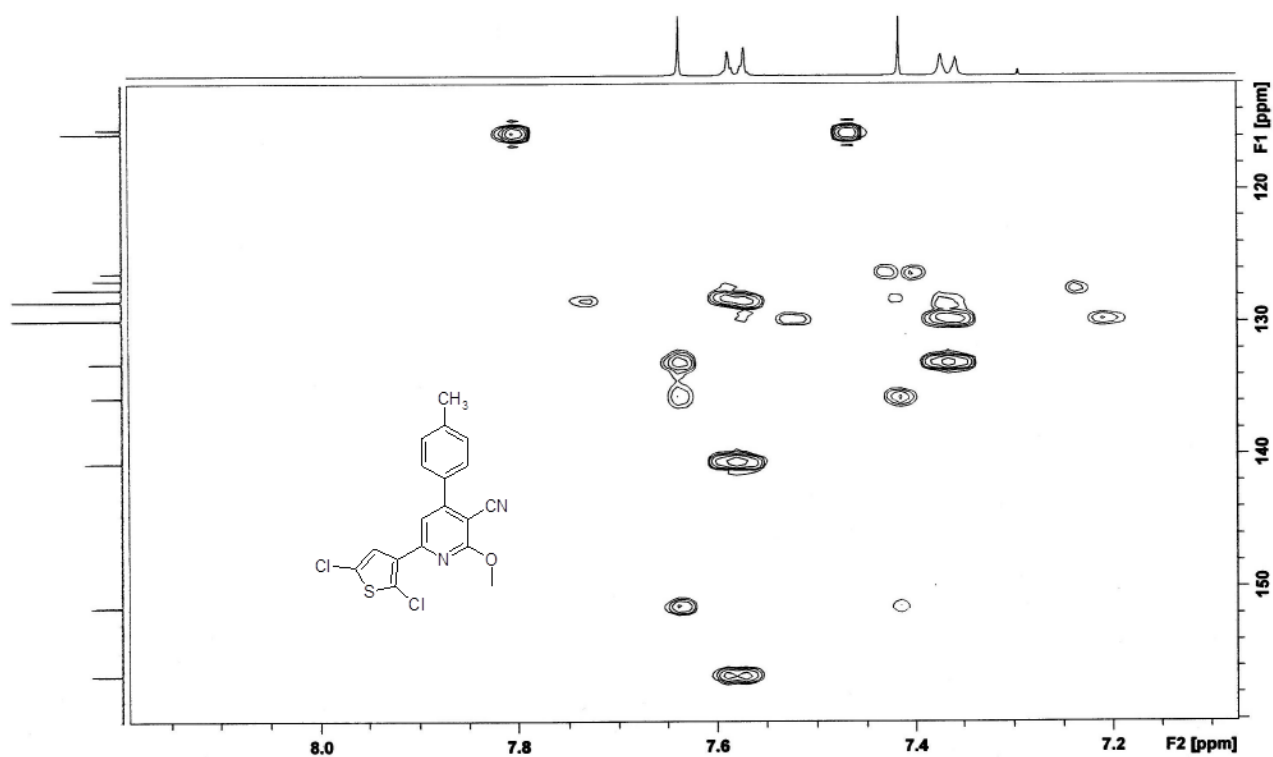
**S 14:** HSQC spectrum (CDCl<sub>3</sub>, 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-*p*-tolylpyridine-3-carbonitrile (**5b**).



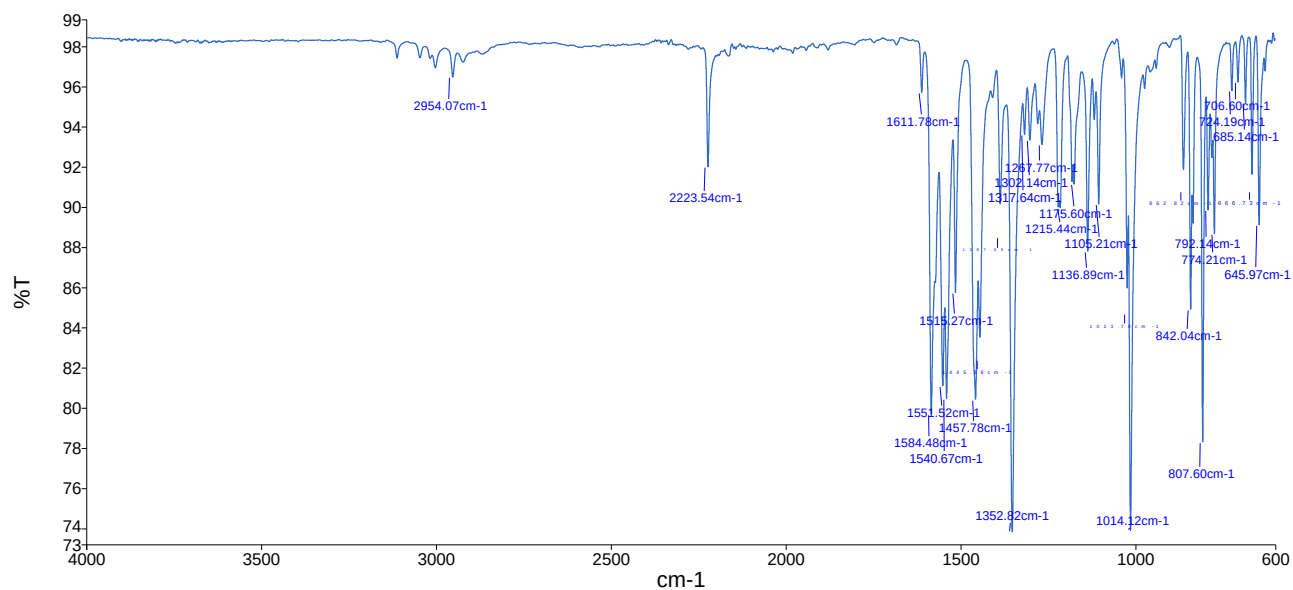
**S 15:** HSQC spectrum (CDCl<sub>3</sub>, 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-*p*-tolylpyridine-3-carbonitrile (**5b**).



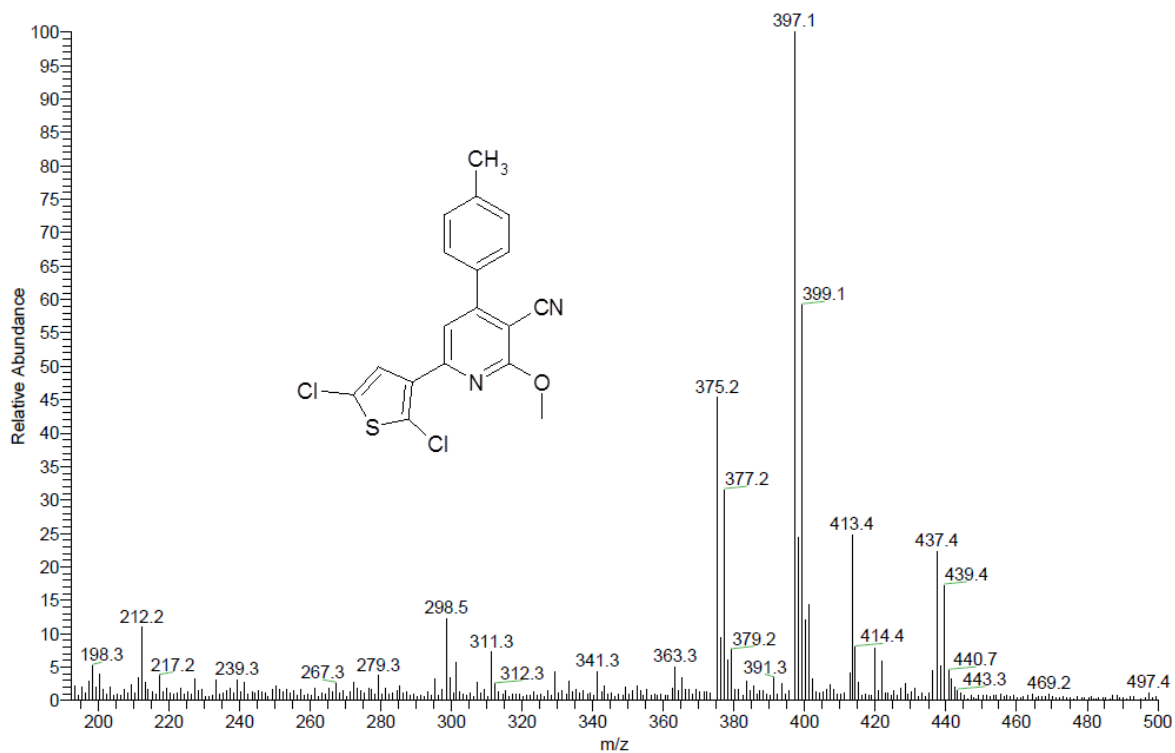
**S 16:** HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-*p*-tolylpyridine-3-carbonitrile (**5b**).



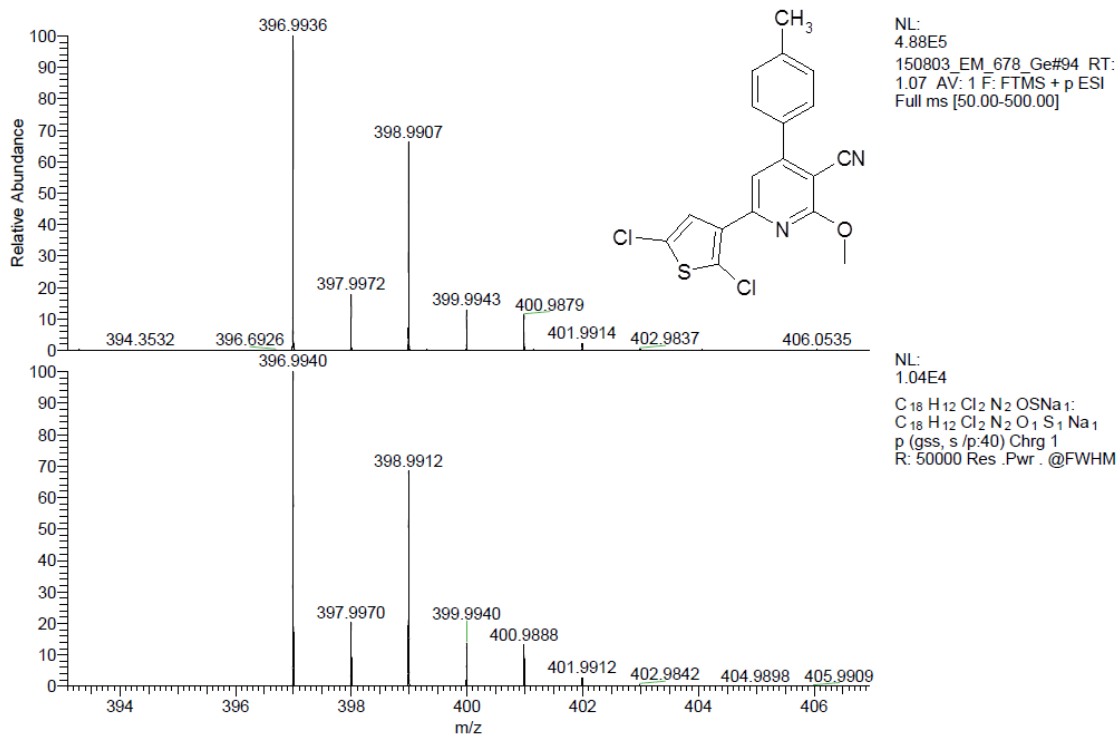
**S 17:** HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-*p*-tolylpyridine-3-carbonitrile (**5b**).



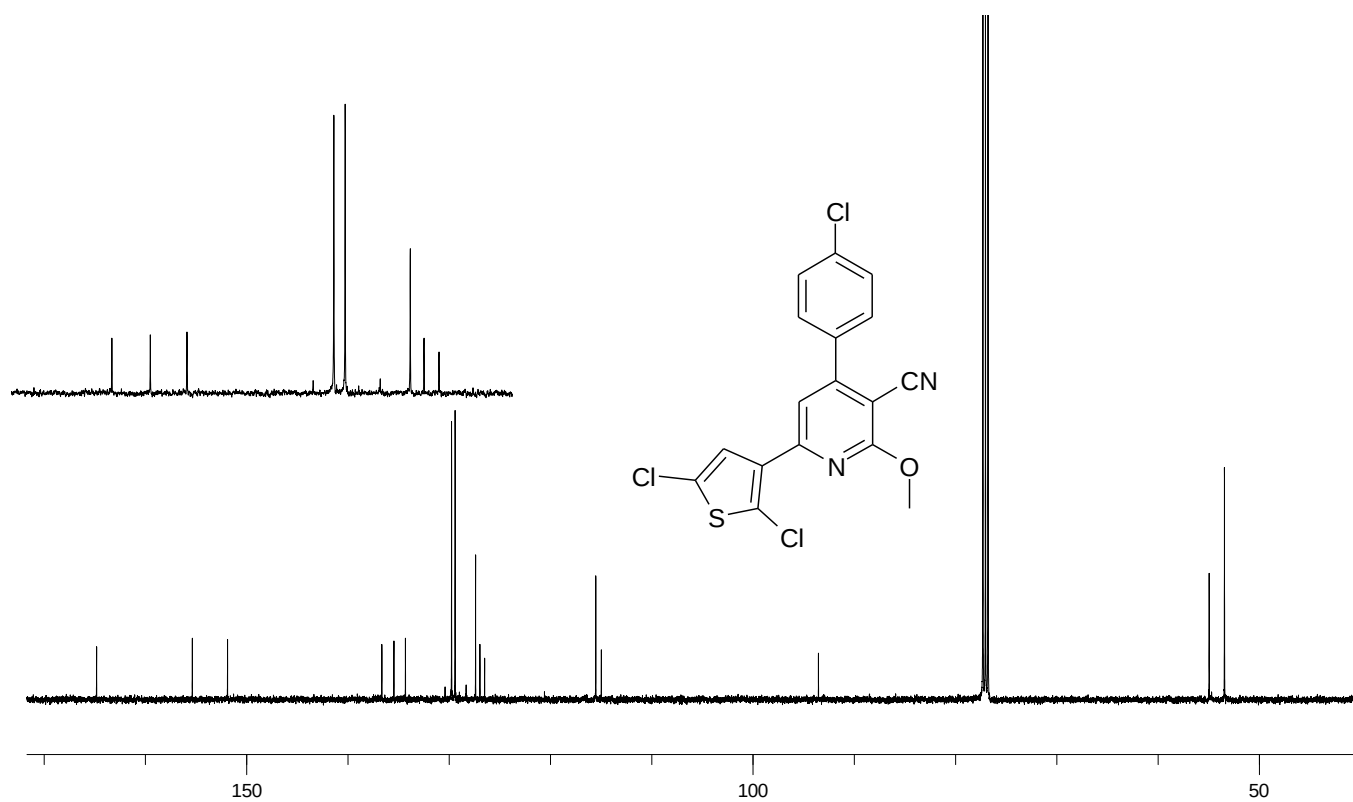
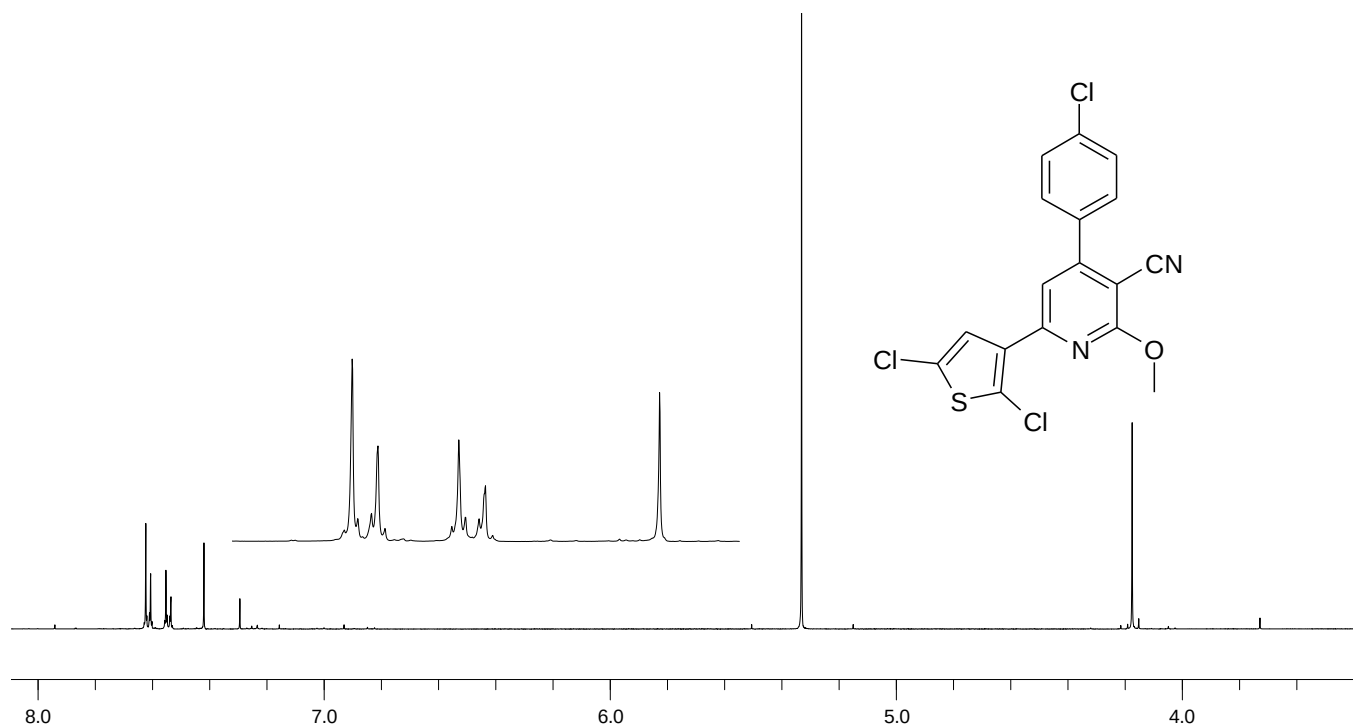
**S 18:** IR spectrum of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-*p*-tolylpyridine-3-carbonitrile (**5b**).



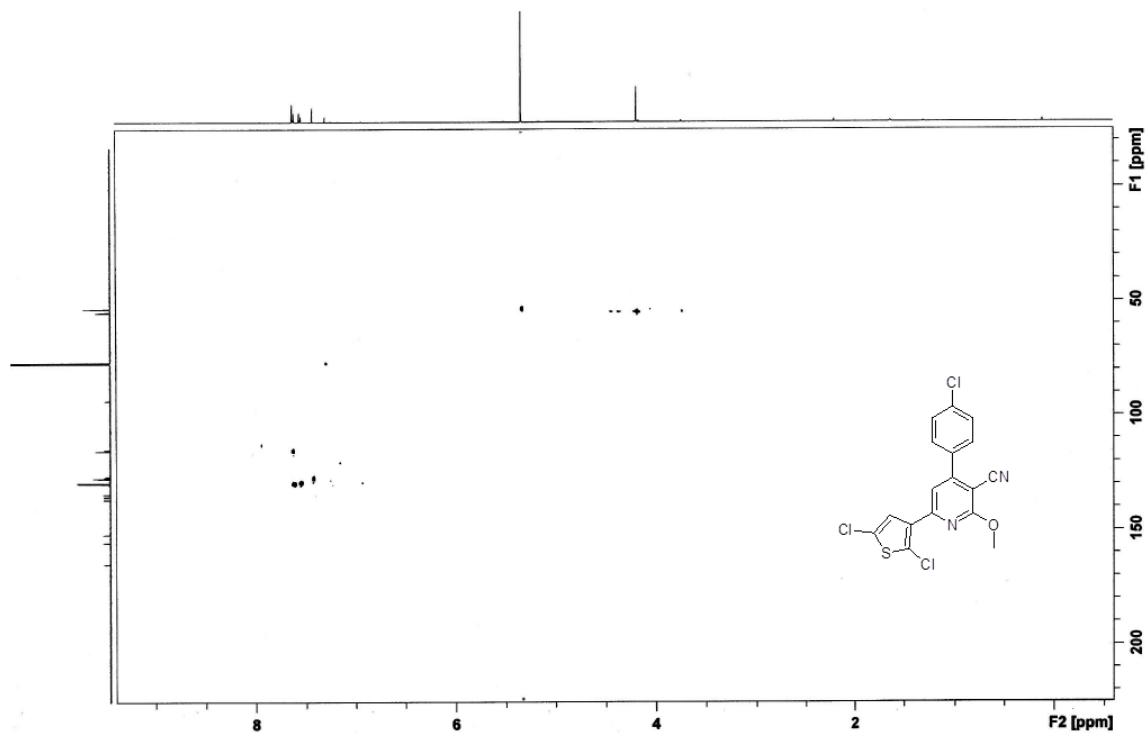
**S 19:** ESI mass spectrum of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-*p*-tolylpyridine-3-carbonitrile (**5b**).



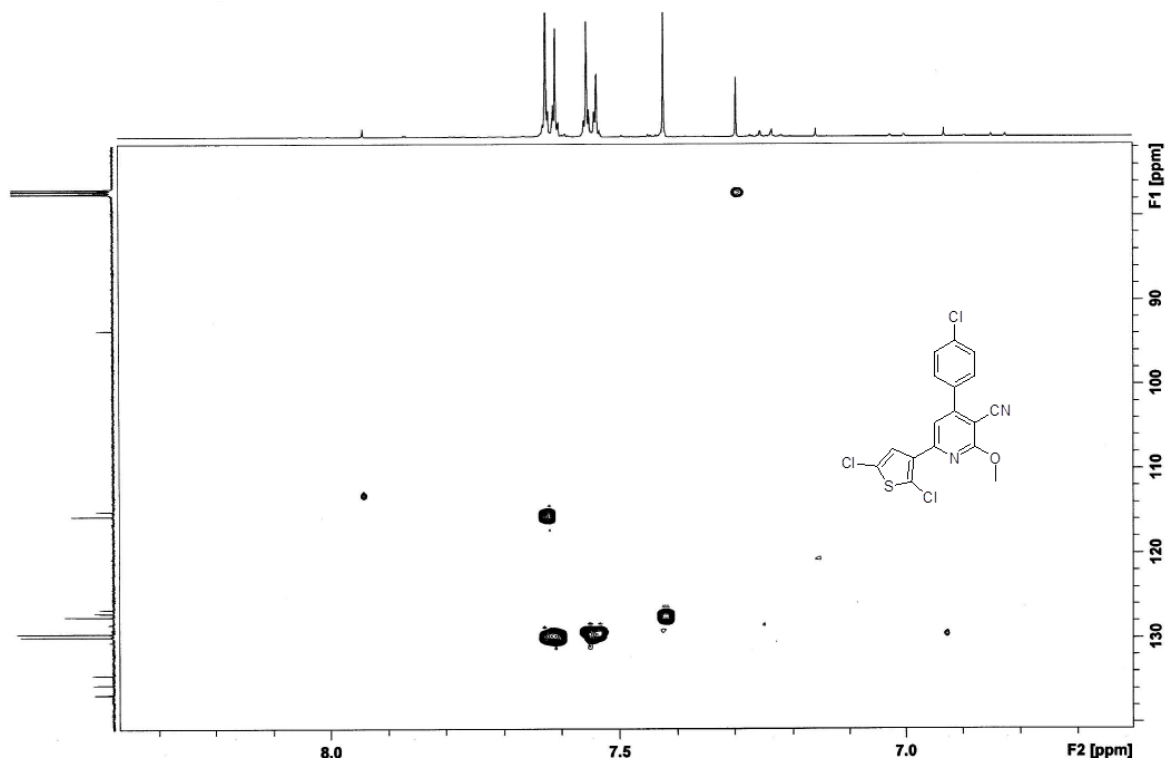
**S 20:** HRESI mass spectrum of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-*p*-tolylpyridine-3-carbonitrile (**5b**).



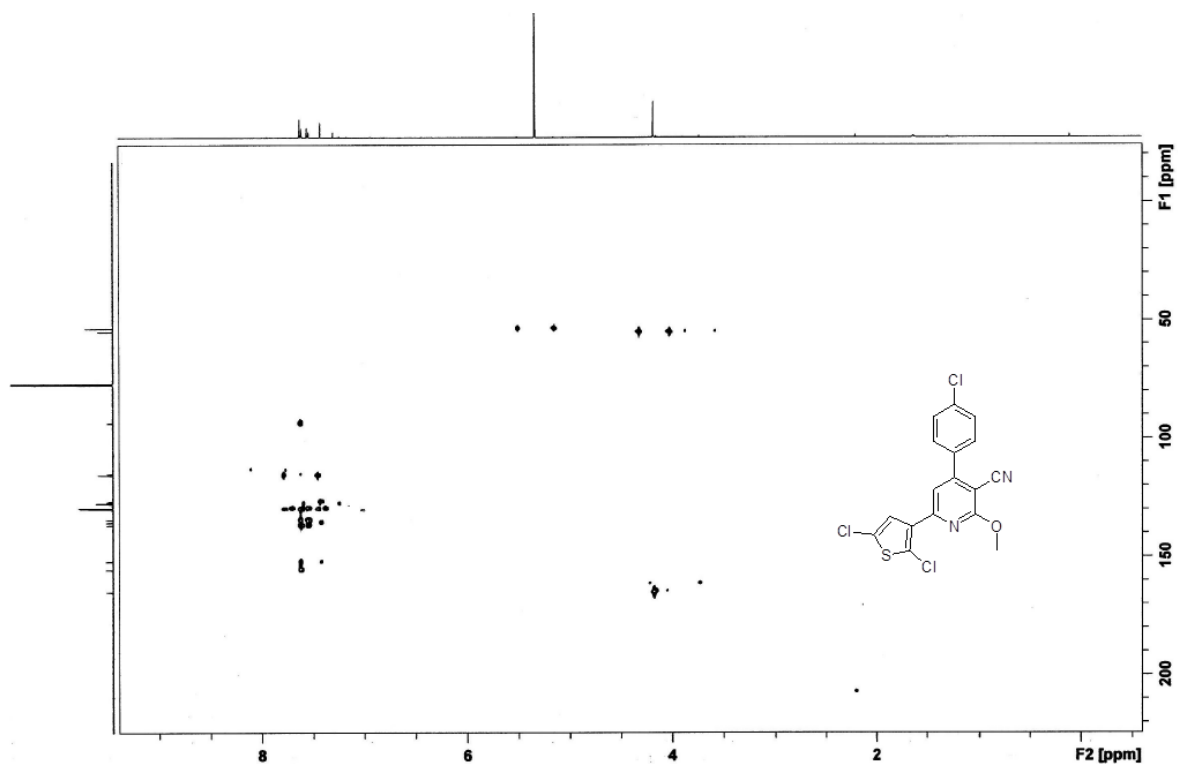




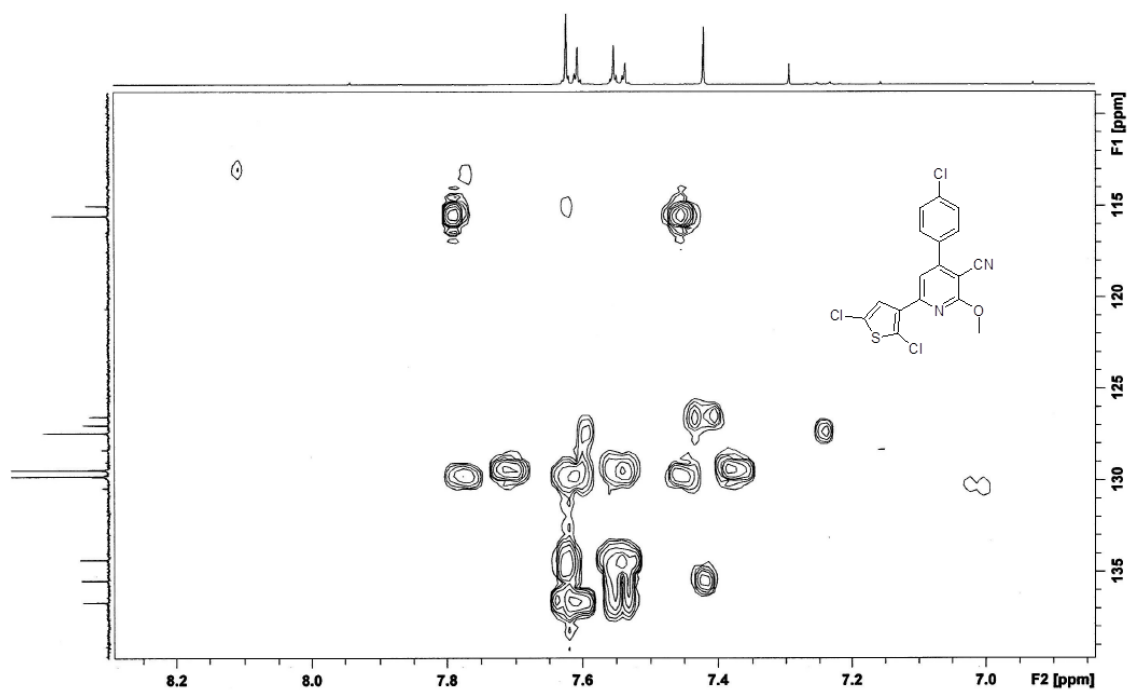
S 23: HSQC spectrum (CDCl<sub>3</sub>, 500 MHz) of 4-(4-chlorophenyl)-6-(2,5-dichlorothiophen-3-yl)-2-methoxypyridine-3-carbonitrile (5c).



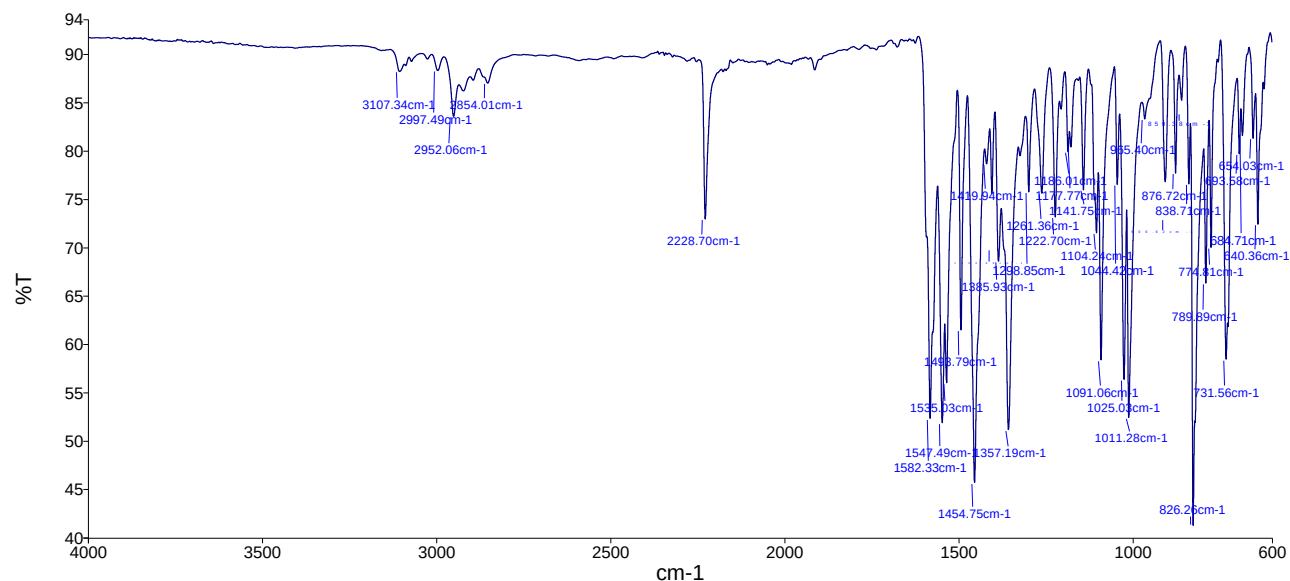
S 24: HSQC spectrum (CDCl<sub>3</sub>, 500 MHz) of 4-(4-chlorophenyl)-6-(2,5-dichlorothiophen-3-yl)-2-methoxypyridine-3-carbonitrile (5c).



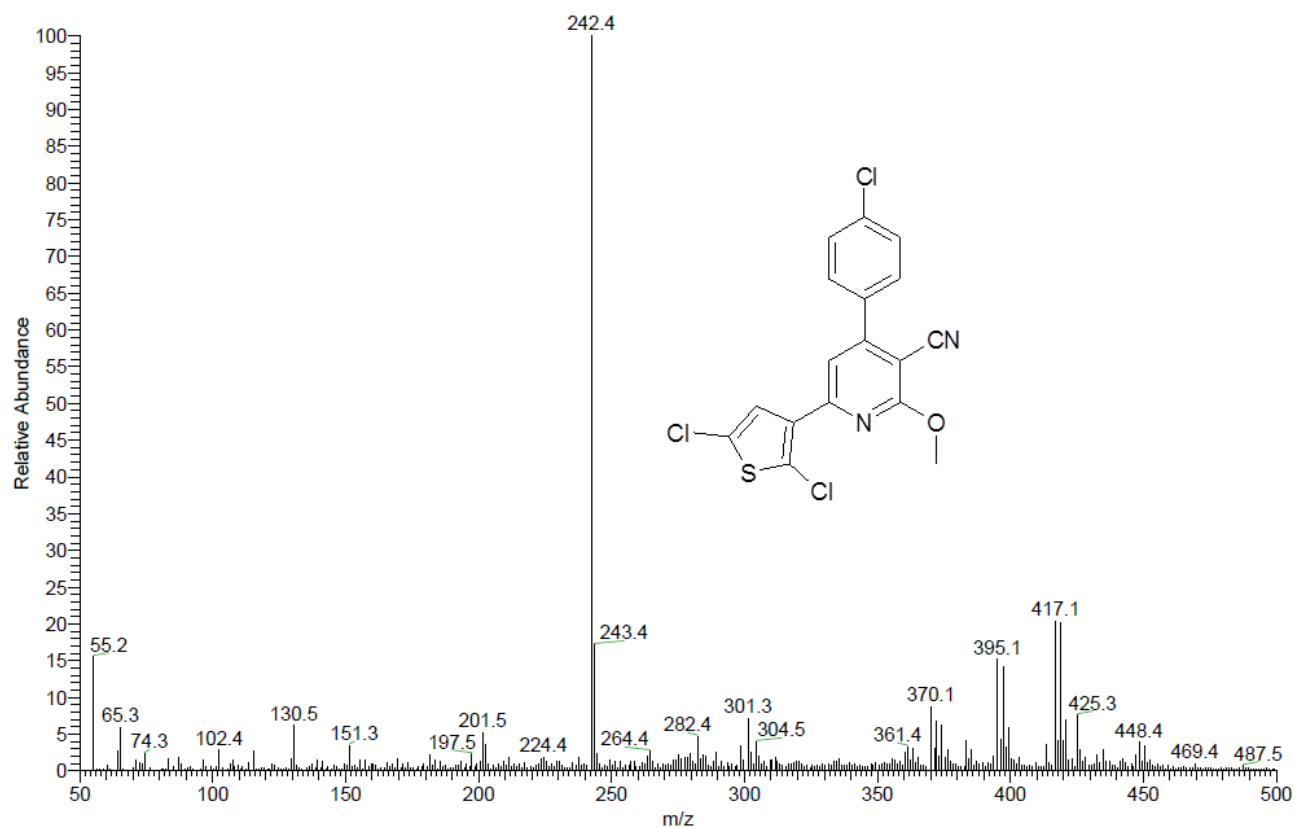
S 25: HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 4-(4-chlorophenyl)-6-(2,5-dichlorothiophen-3-yl)-2-methoxypyridine-3-carbonitrile (**5c**).



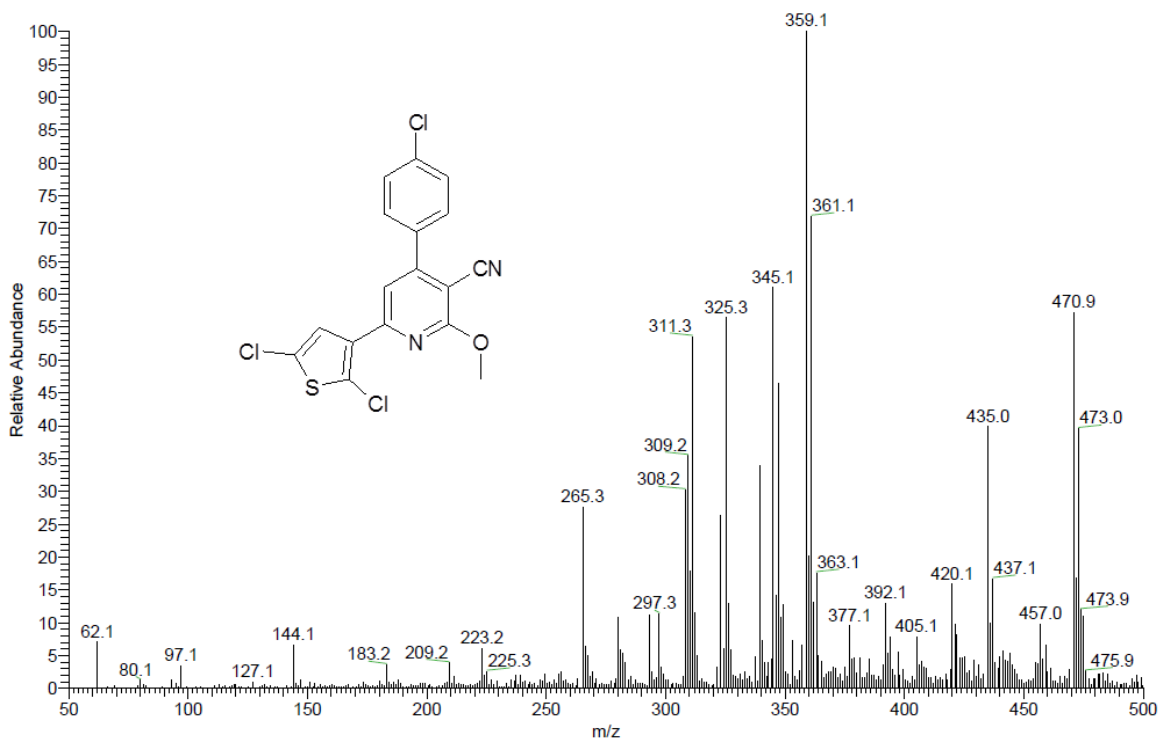
S 26: HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 4-(4-chlorophenyl)-6-(2,5-dichlorothiophen-3-yl)-2-methoxypyridine-3-carbonitrile (**5c**).



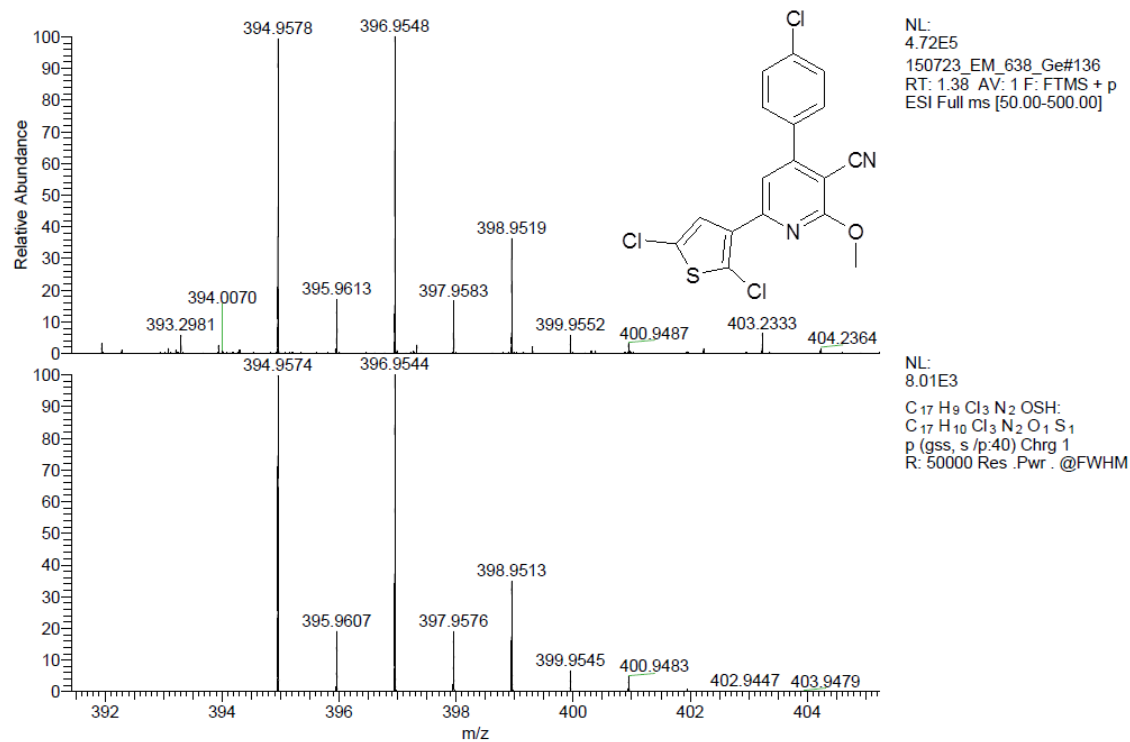
S 27: IR spectrum of 4-(4-chlorophenyl)-6-(2,5-dichlorothiophen-3-yl)-2-methoxypyridine-3-carbonitrile (**5c**).



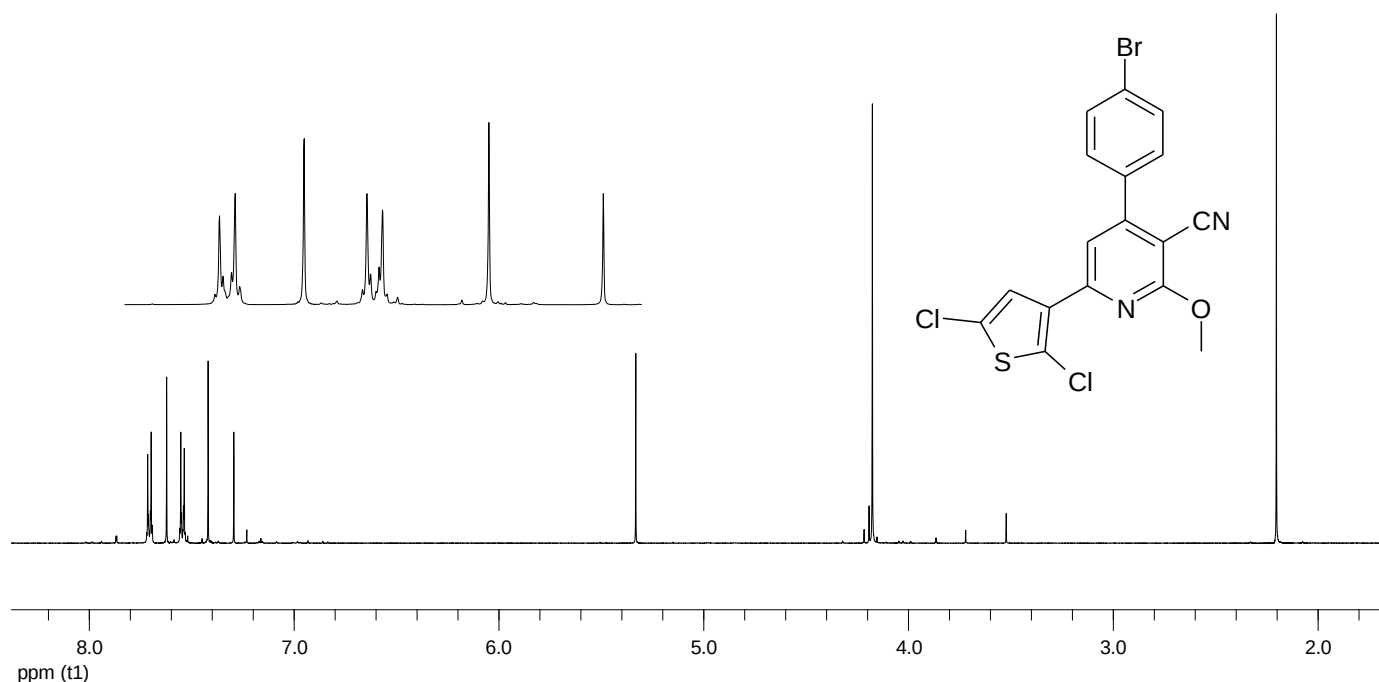
S 28: ESI mass spectrum of 4-(4-chlorophenyl)-6-(2,5-dichlorothiophen-3-yl)-2-methoxypyridine-3-carbonitrile (**5c**).



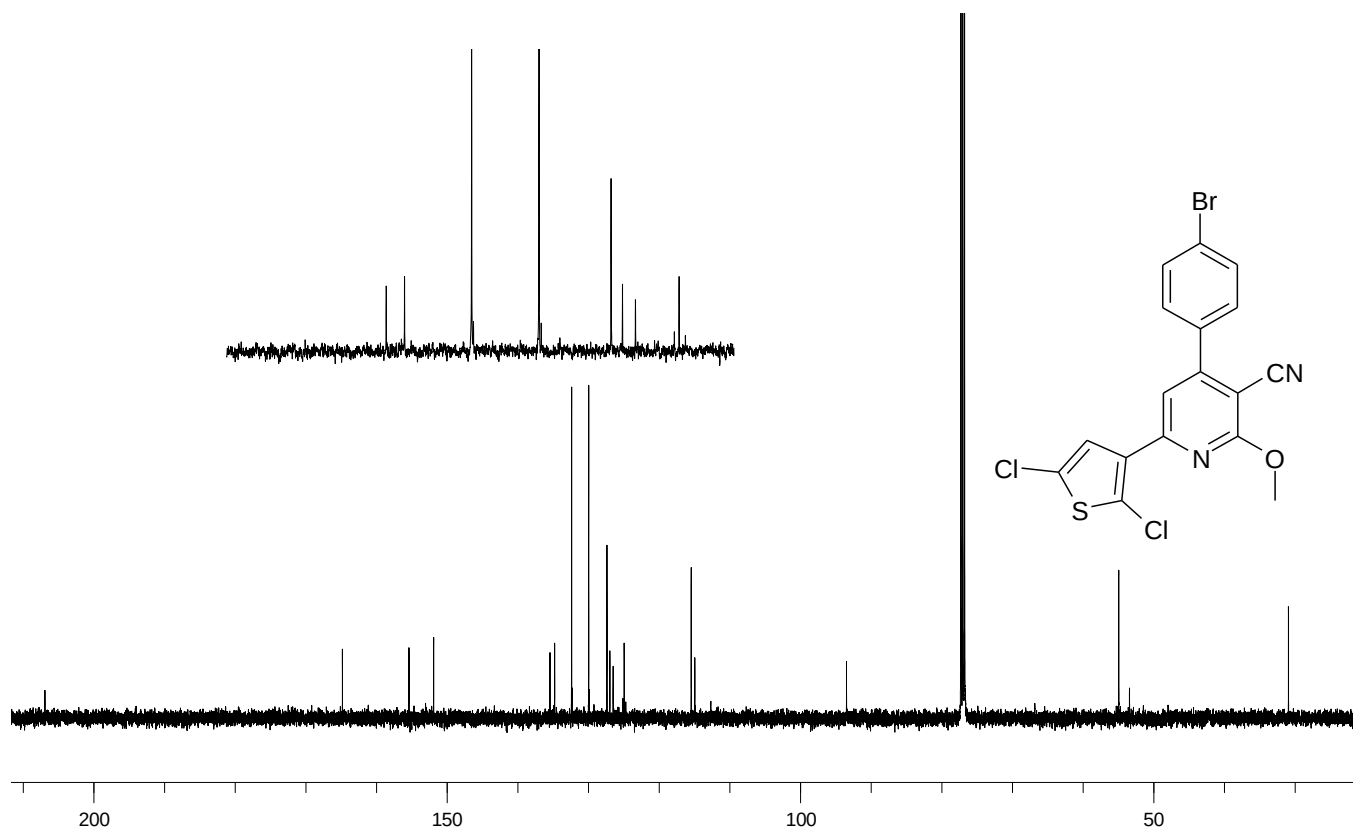
**S 29:** ESI mass spectrum of 4-(4-chlorophenyl)-6-(2,5-dichlorothiophen-3-yl)-2-methoxypyridine-3-carbonitrile (5c).



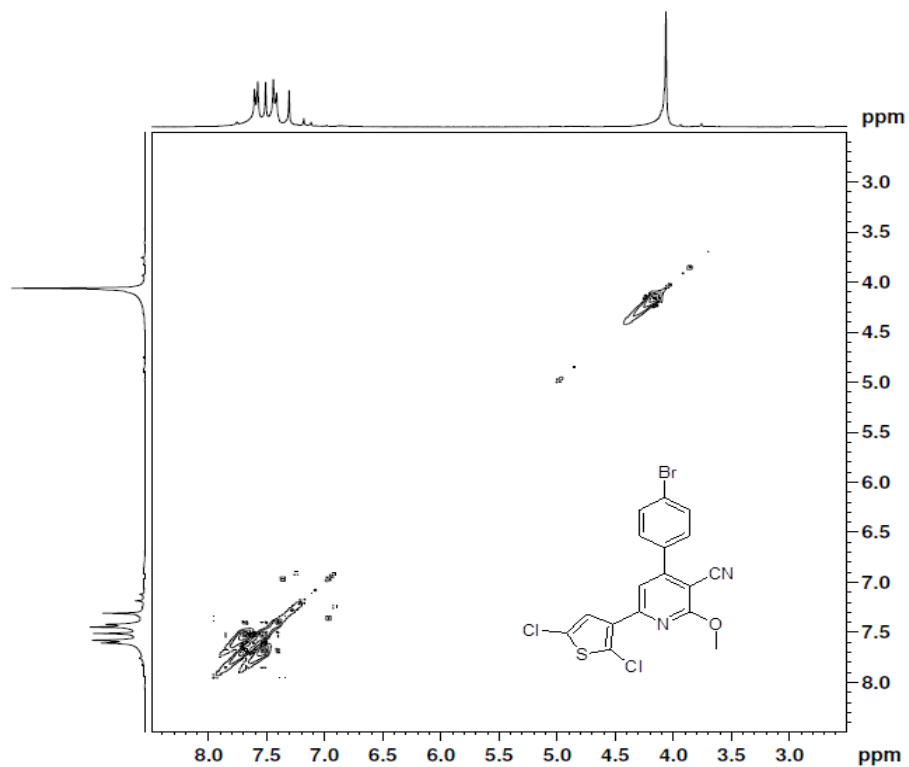
**S 30:** HRESI mass spectrum of 4-(4-chlorophenyl)-6-(2,5-dichlorothiophen-3-yl)-2-methoxypyridine-3-carbonitrile (5c).



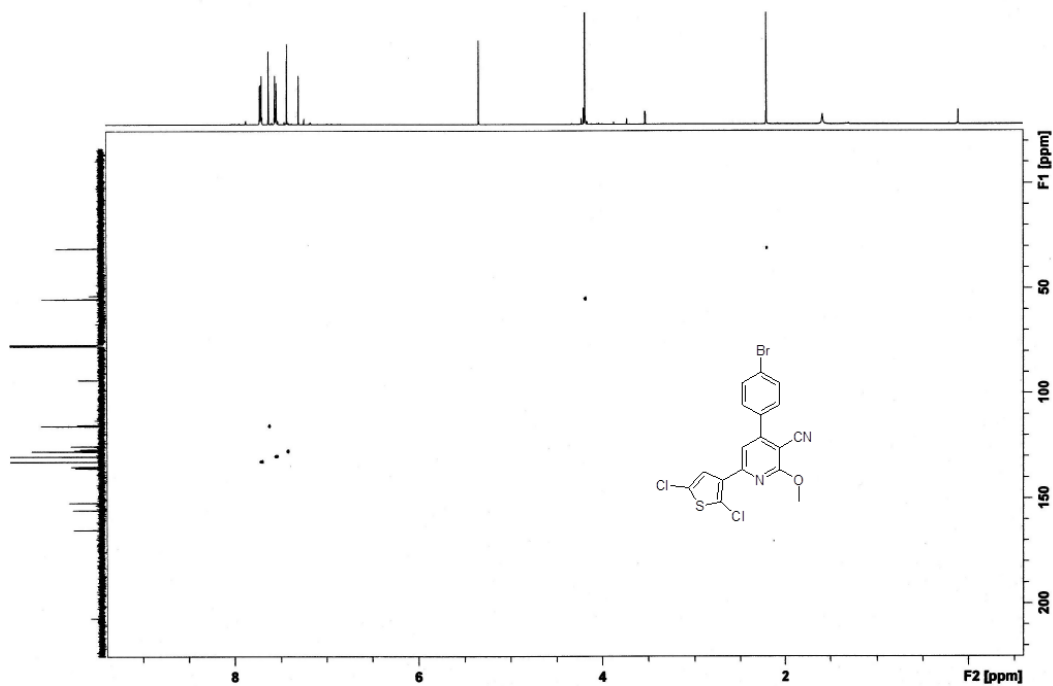
**S 31:**  $^1\text{H}$  NMR spectrum ( $\text{CDCl}_3$ , 500 MHz) of 4-(4-bromophenyl)-6-(2,5-dichlorothiophen-3-yl)-2-methoxypyridine-3-carbonitrile (**5d**).



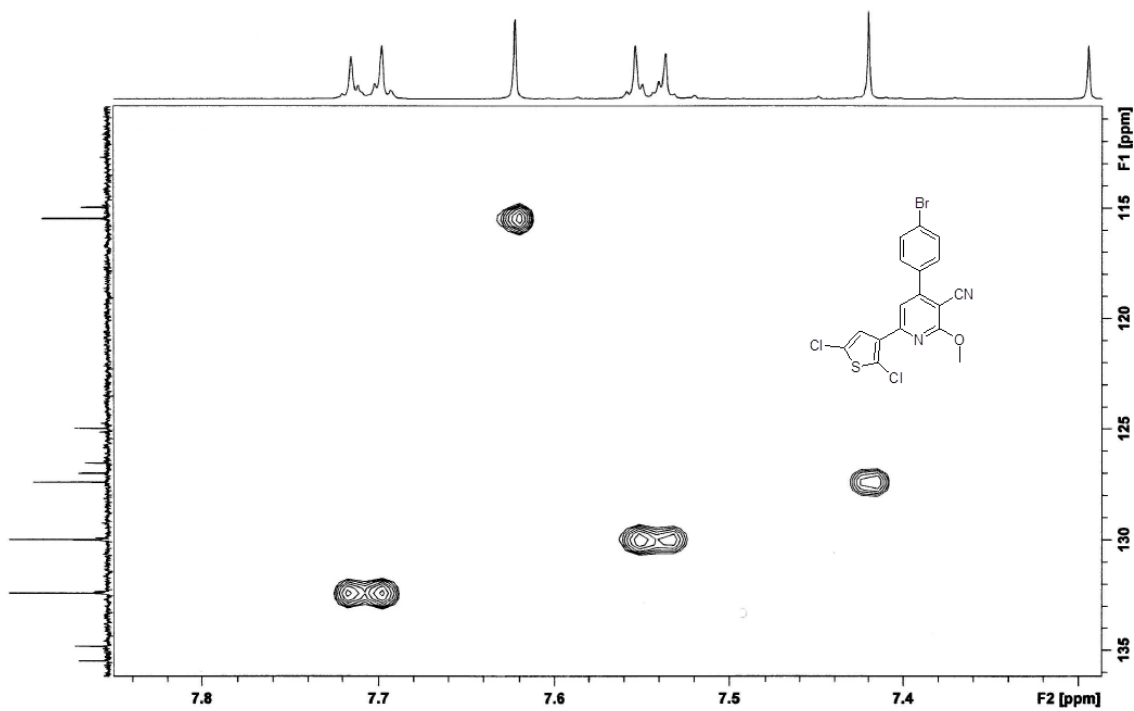
**S 32:**  $^{13}\text{C}$  NMR spectrum ( $\text{CDCl}_3$ , 125MHz) of 4-(4-bromophenyl)-6-(2,5-dichlorothiophen-3-yl)-2-methoxypyridine-3-carbonitrile (**5d**).



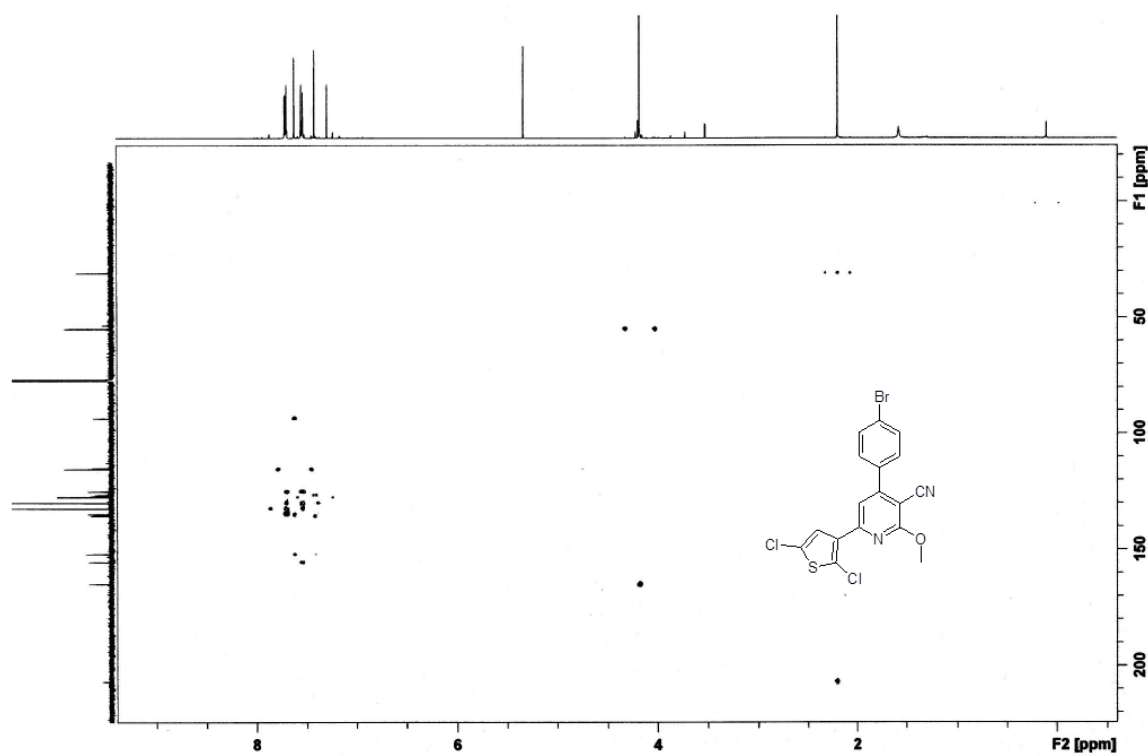
**S 33:**  $^1\text{H}$ , $^1\text{H}$  COSY spectrum ( $\text{CDCl}_3$ , 300 MHz) of 4-(4-bromophenyl)-6-(2,5-dichlorothiophen-3-yl)-2-methoxypyridine-3-carbonitrile (**5d**).



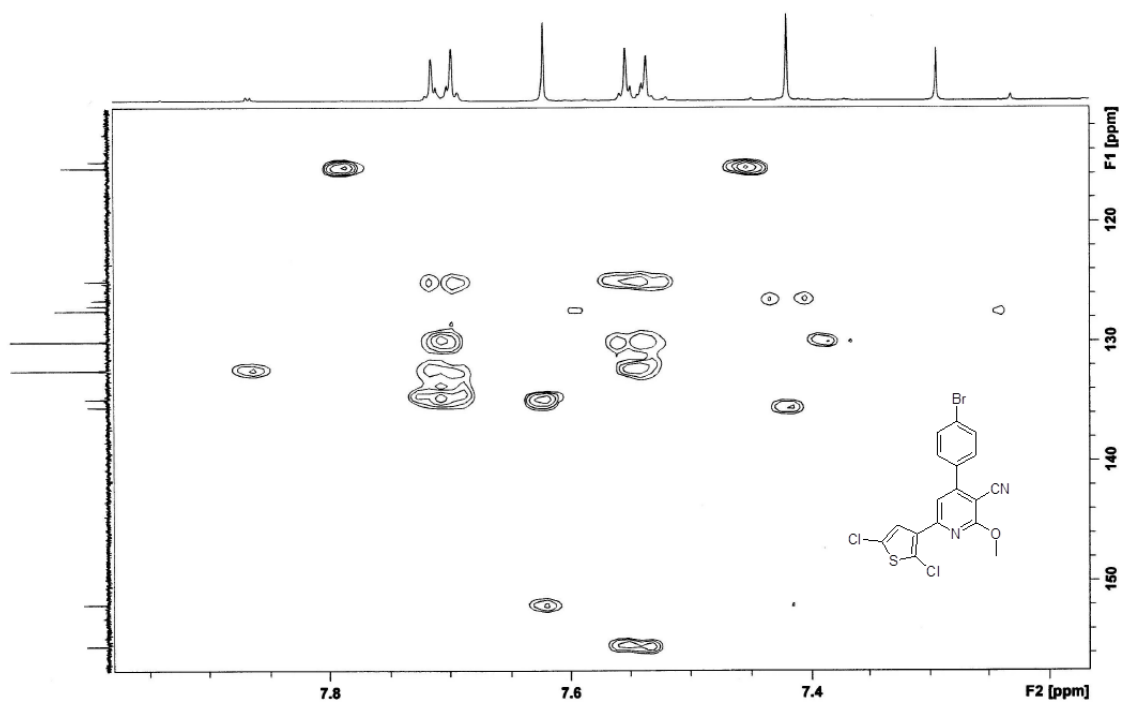
**S 34:** HSQC spectrum ( $\text{CDCl}_3$ , 500 MHz) of 4-(4-bromophenyl)-6-(2,5-dichlorothiophen-3-yl)-2-methoxypyridine-3-carbonitrile (**5d**).



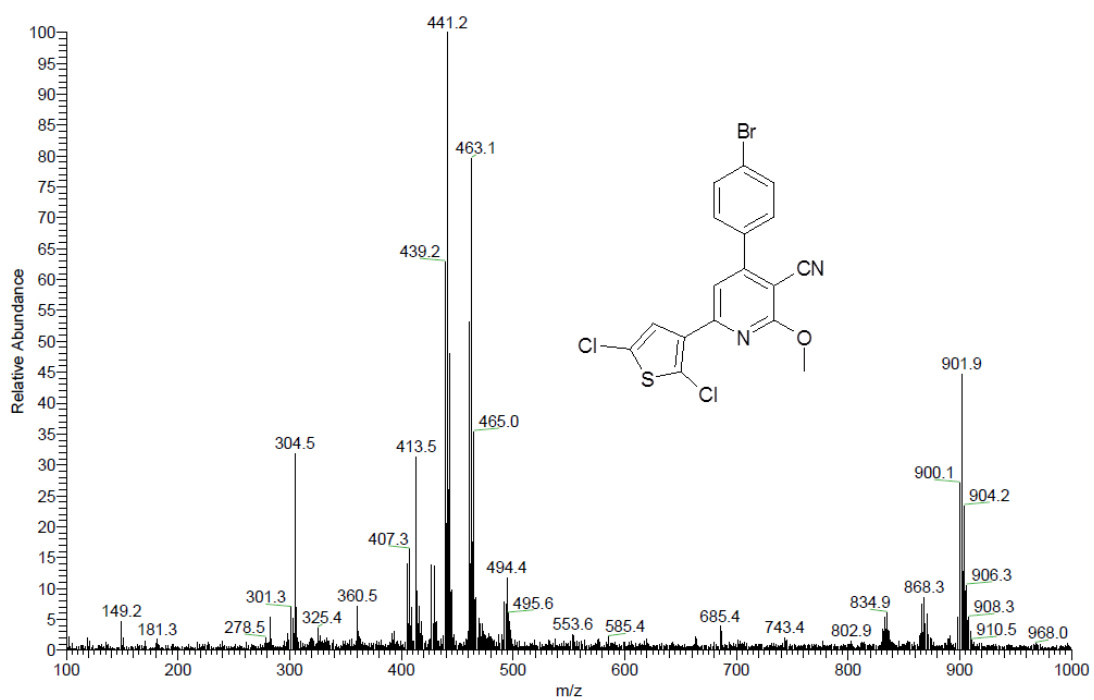
**S 35:** HSQC spectrum (CDCl<sub>3</sub>, 500 MHz) of 4-(4-bromophenyl)-6-(2,5-dichlorothiophen-3-yl)-2-methoxypyridine-3-carbonitrile (**5d**).



**S 36:** HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 4-(4-bromophenyl)-6-(2,5-dichlorothiophen-3-yl)-2-methoxypyridine-3-carbonitrile (**5d**).

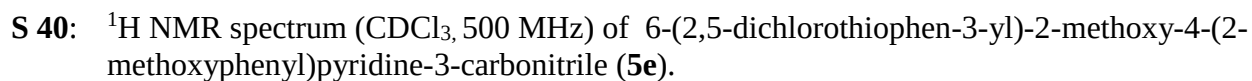
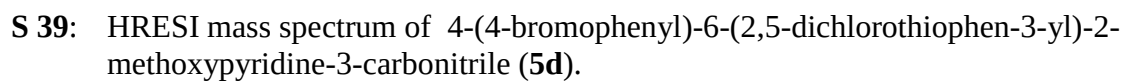


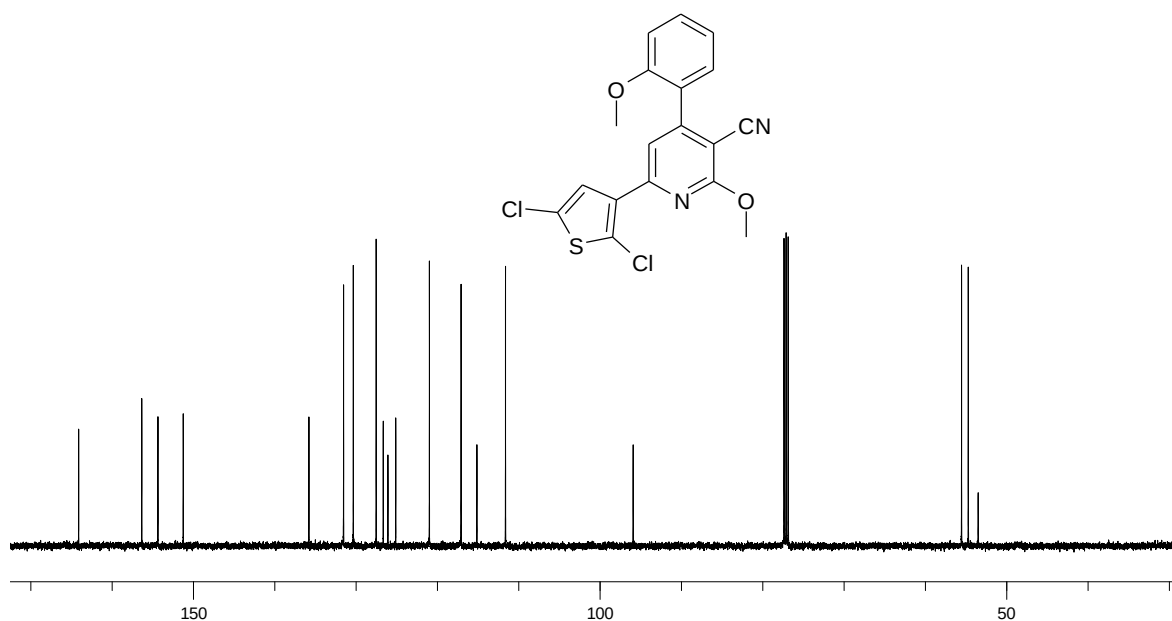
**S 37:** HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 4-(4-bromophenyl)-6-(2,5-dichlorothiophen-3-yl)-2-methoxypyridine-3-carbonitrile (**5d**).



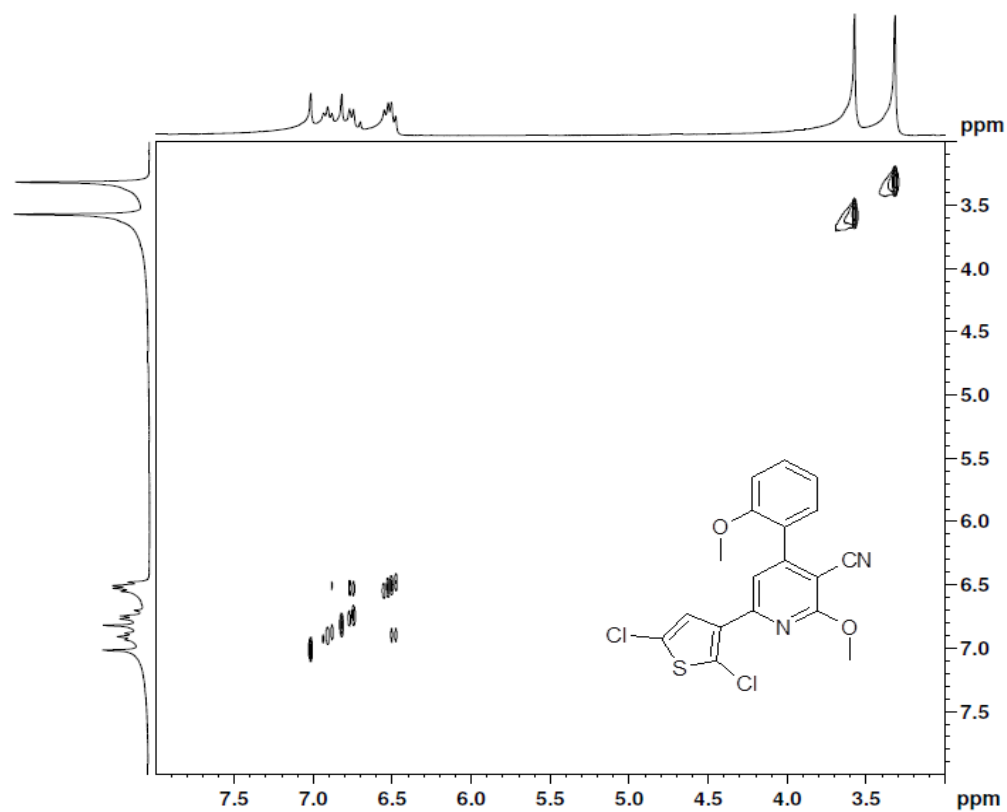
**S 38:** ESI mass spectrum of 4-(4-bromophenyl)-6-(2,5-dichlorothiophen-3-yl)-2-methoxypyridine-3-carbonitrile (**5d**).



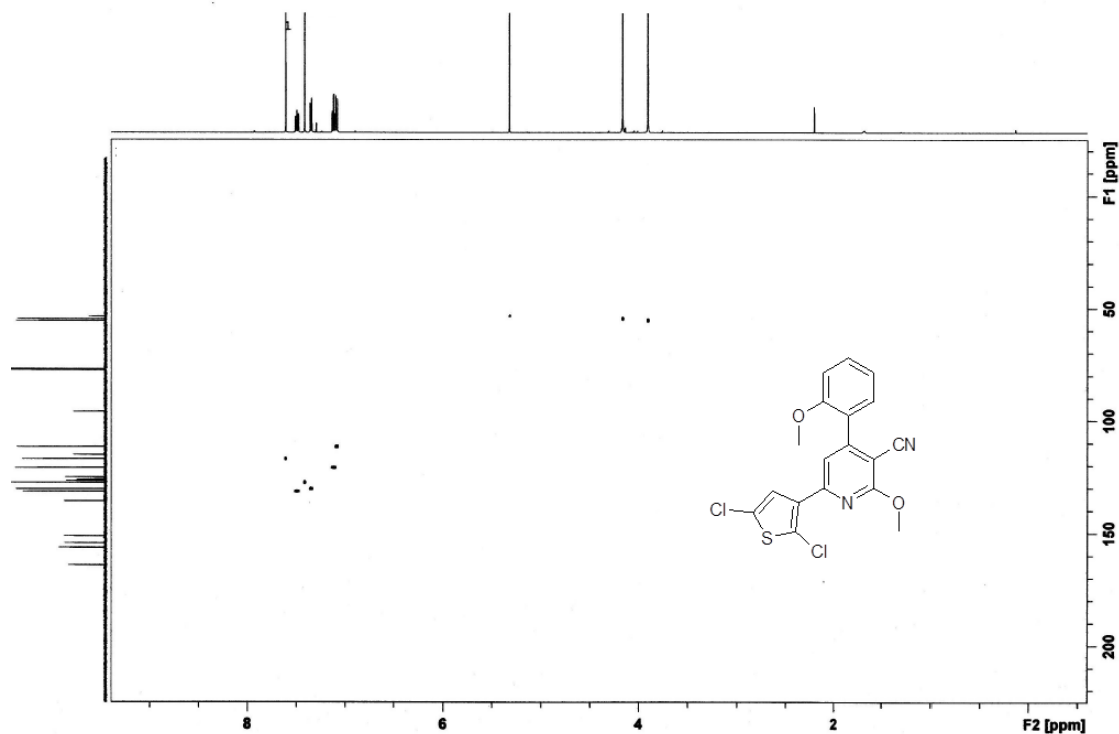




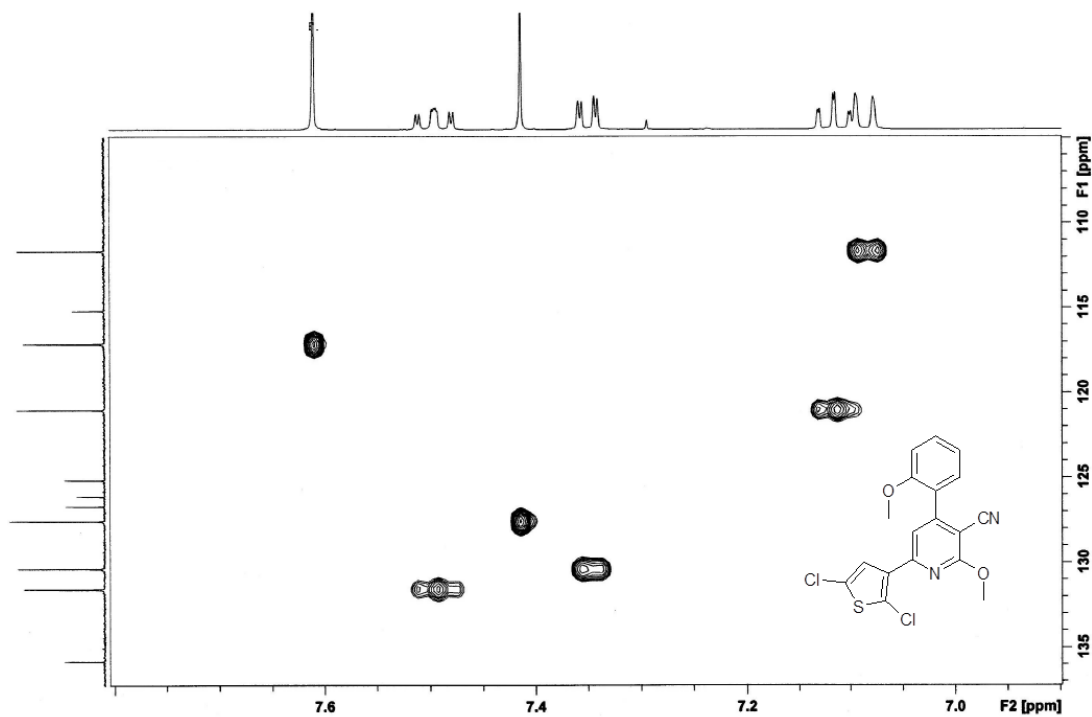
**S 41:**  $^{13}\text{C}$  NMR spectrum ( $\text{CDCl}_3$ , 125MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(2-methoxyphenyl)pyridine-3-carbonitrile (**5e**).



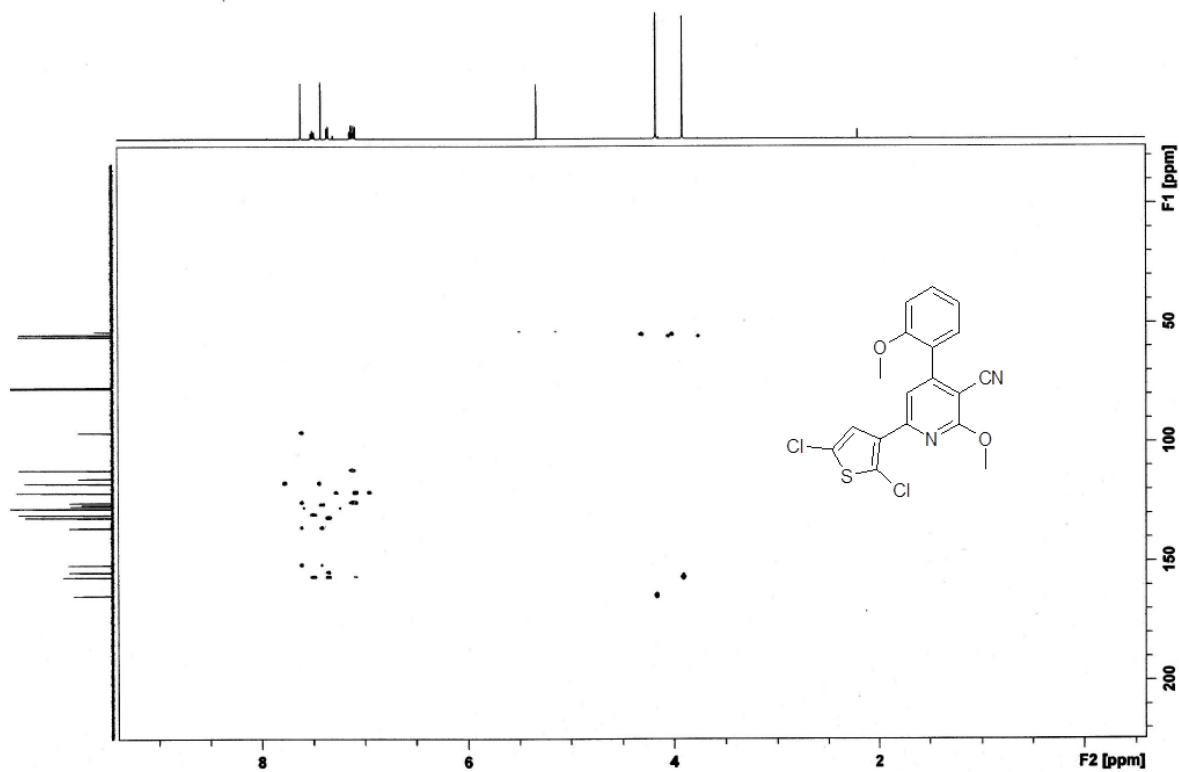
**S 42:** H,H COSY spectrum ( $\text{CDCl}_3$ , 300 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(2-methoxyphenyl)pyridine-3-carbonitrile (**5e**).



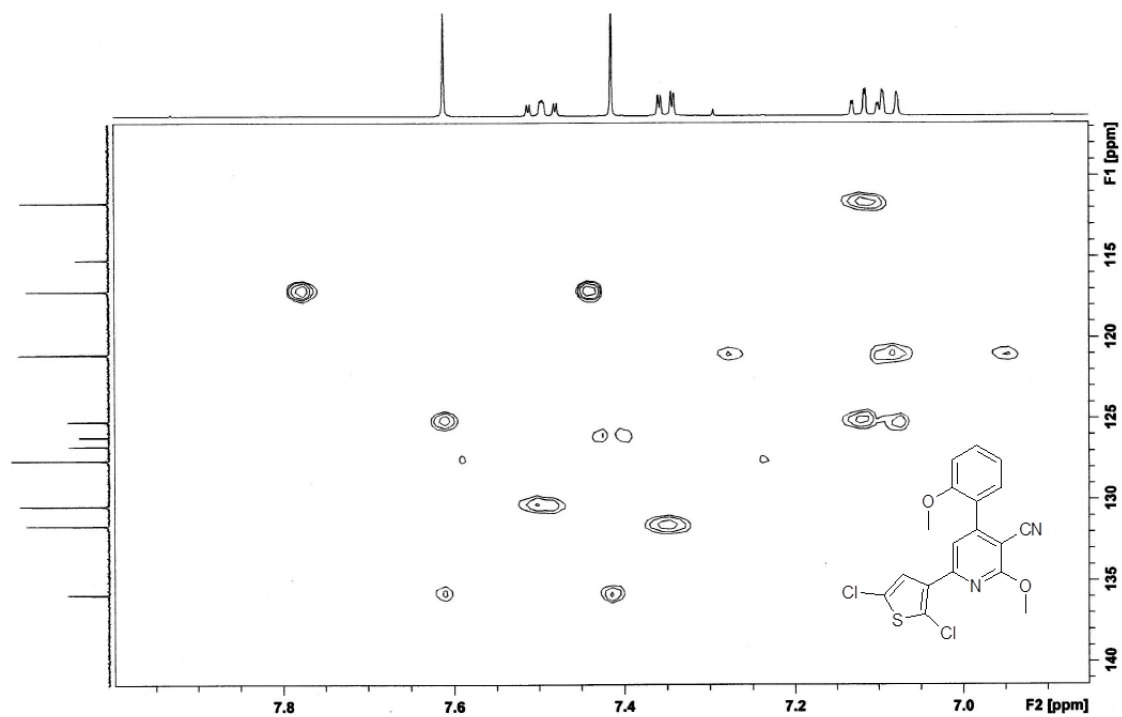
S 43: HSQC spectrum (CDCl<sub>3</sub>, 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(2-methoxyphenyl)pyridine-3-carbonitrile (5e).



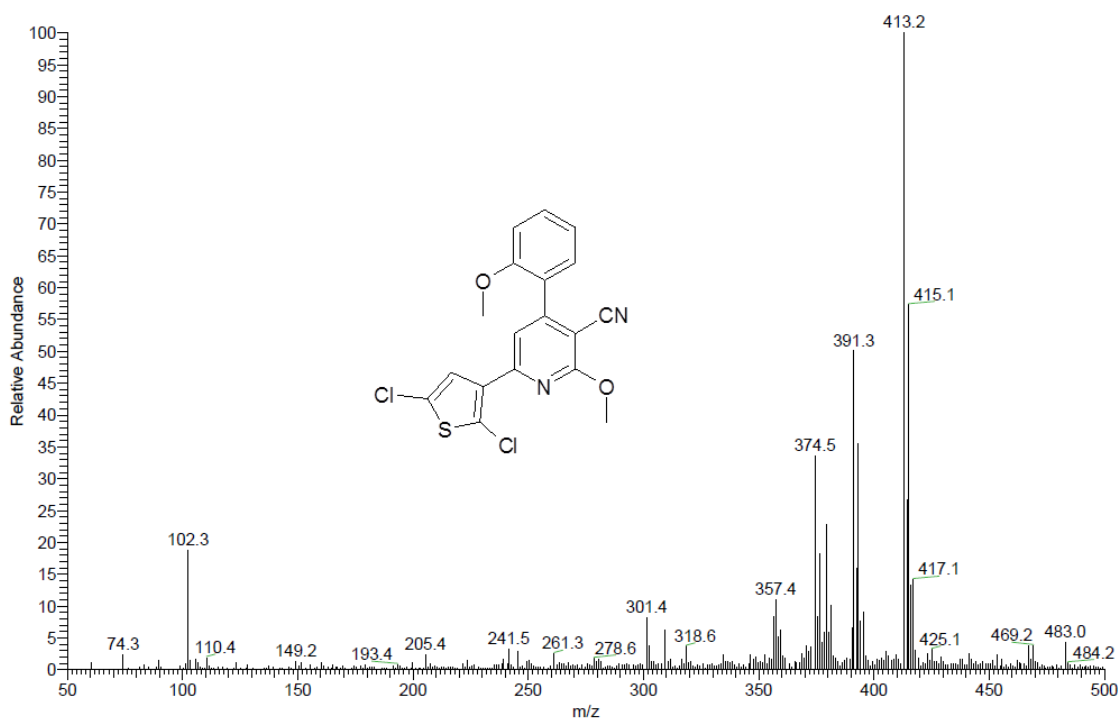
S 44: HSQC spectrum (CDCl<sub>3</sub>, 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(2-methoxyphenyl)pyridine-3-carbonitrile (5e).



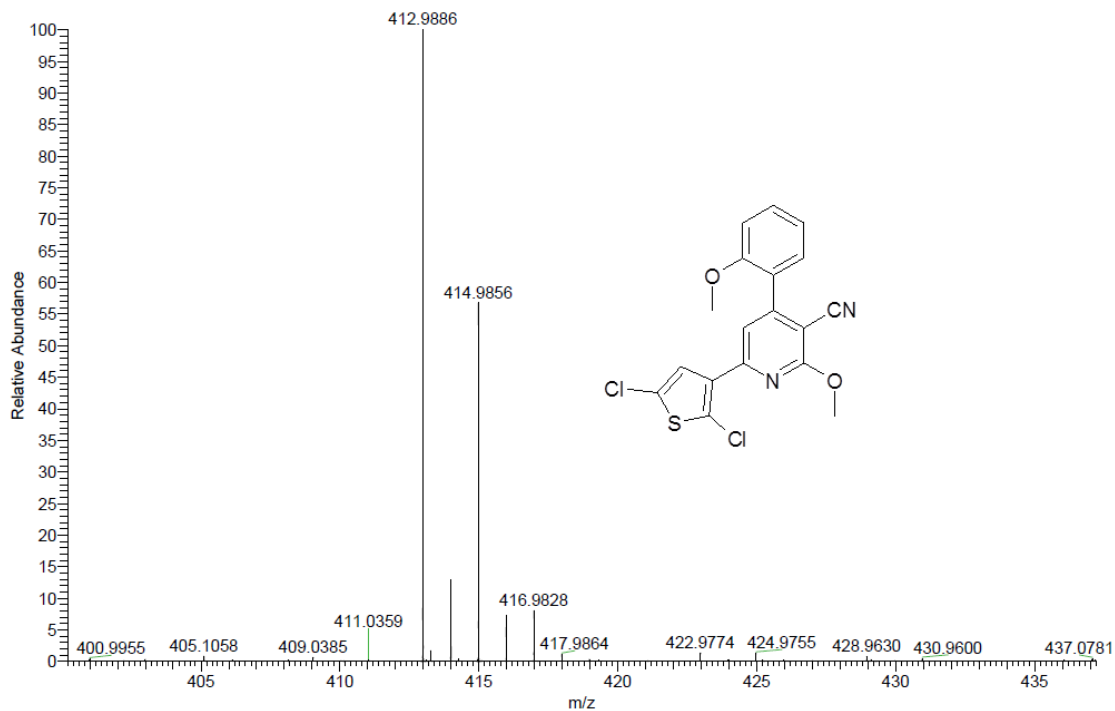
S 45: HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(2-methoxyphenyl)pyridine-3-carbonitrile (**5e**).



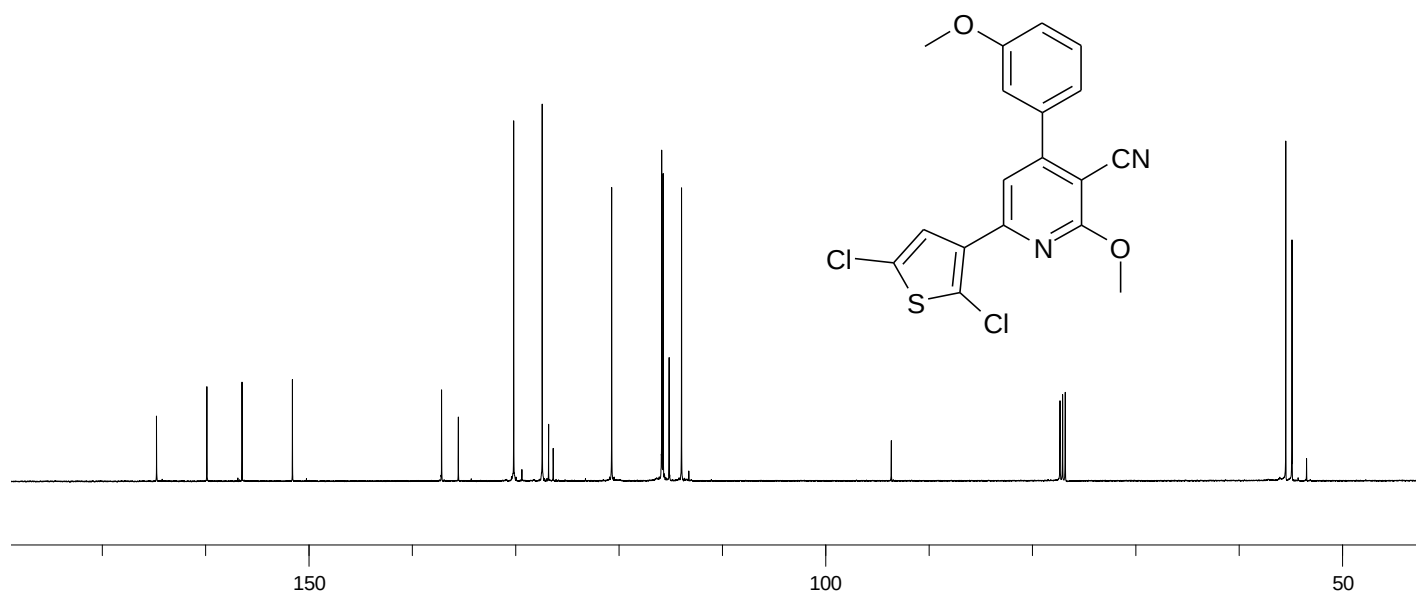
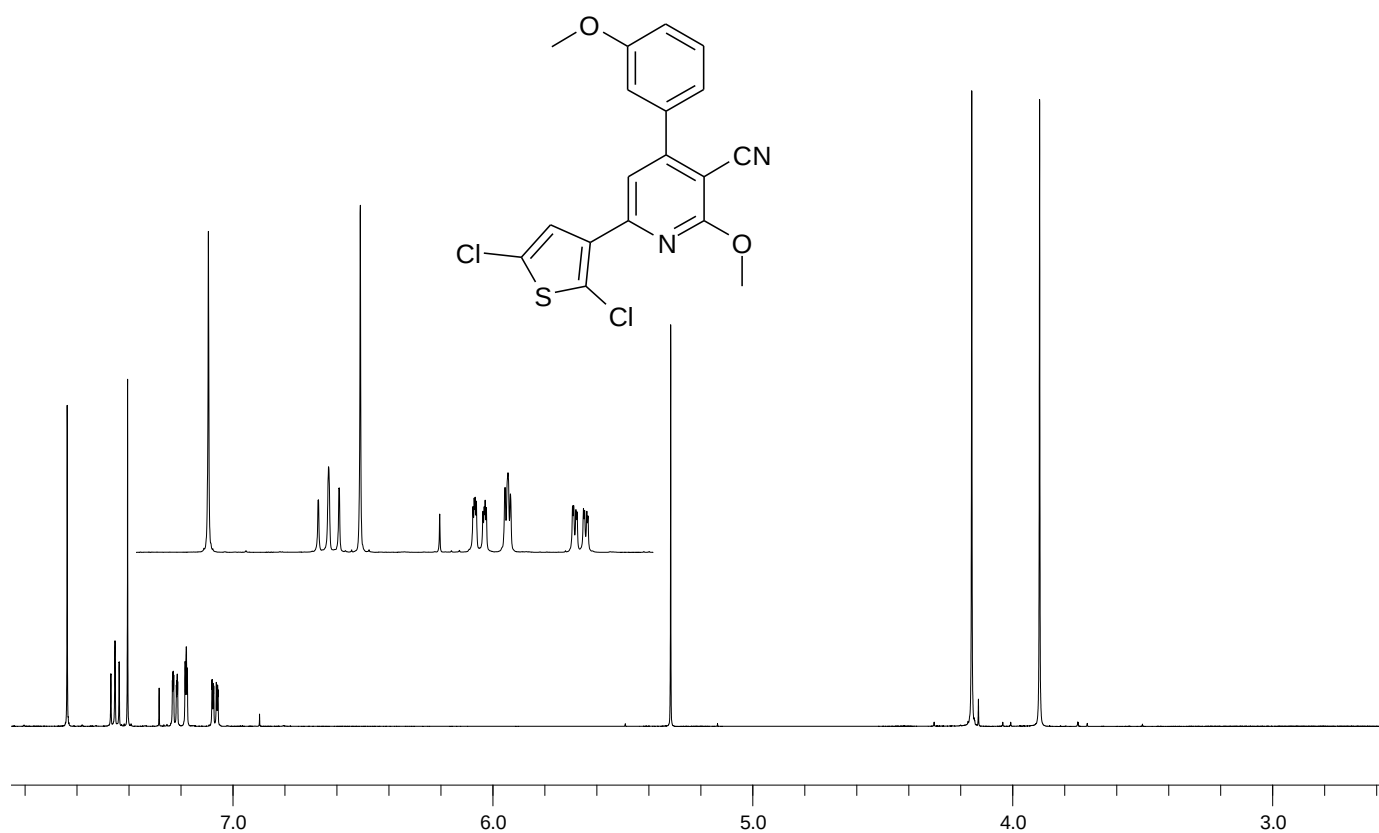
S 46: HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(2-methoxyphenyl)pyridine-3-carbonitrile (**5e**).

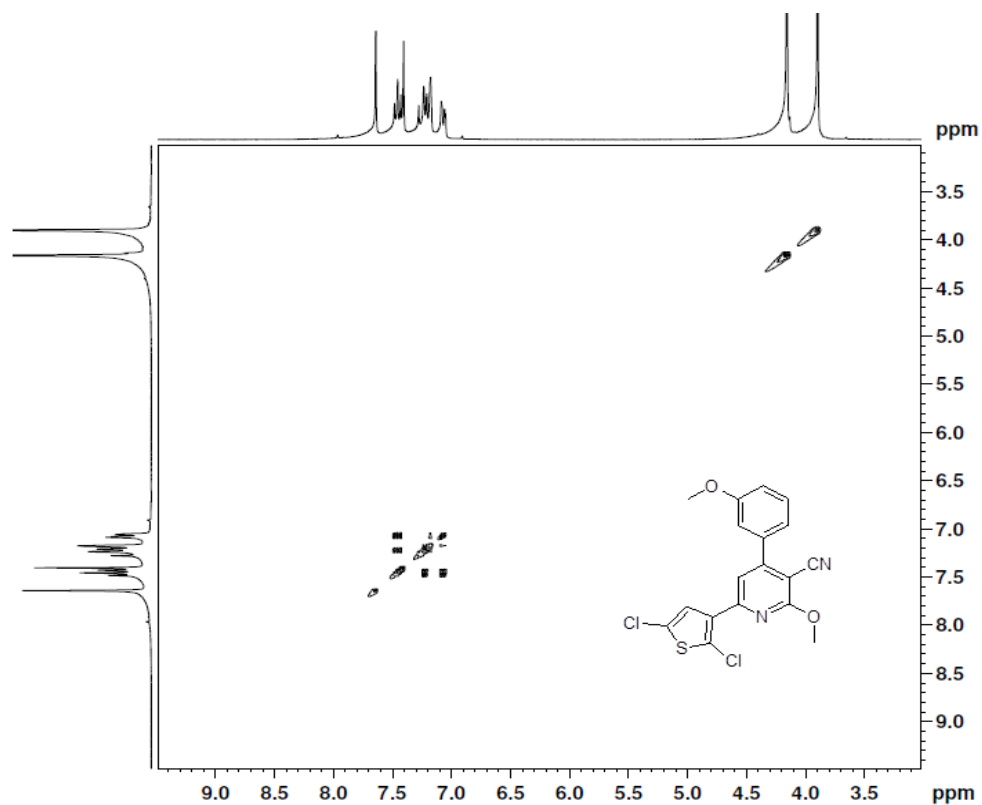


**S 47:** ESI mass spectrum of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(2-methoxyphenyl)pyridine-3-carbonitrile (**5e**).

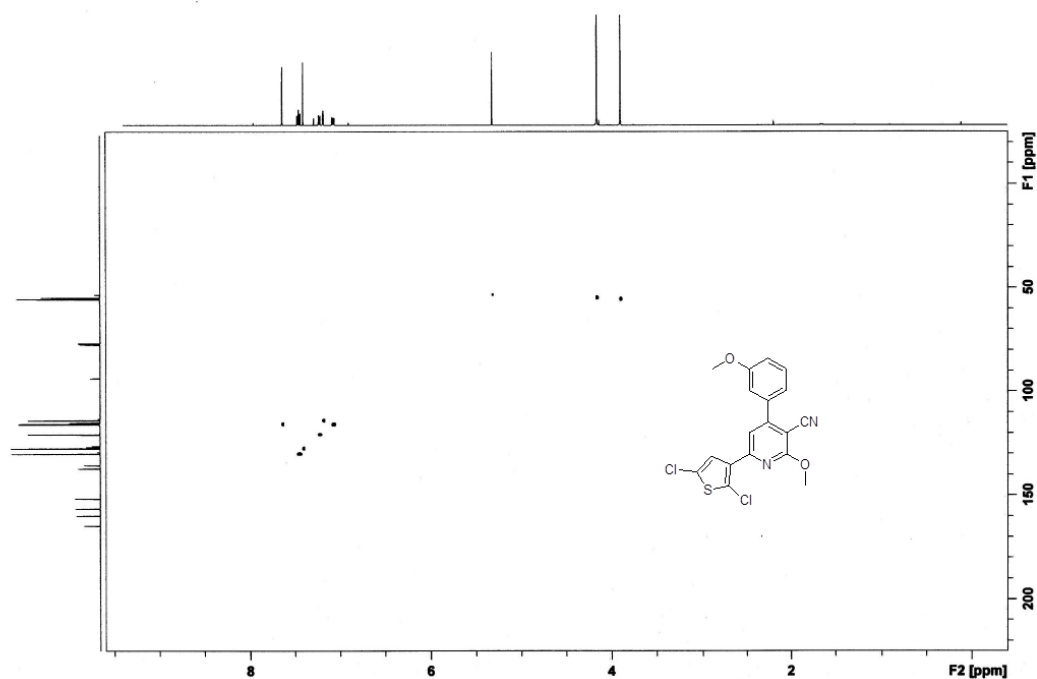


**S 48:** ESI mass spectrum of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(2-methoxyphenyl)pyridine-3-carbonitrile (**5e**).

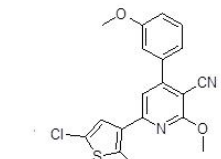
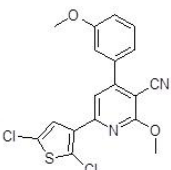




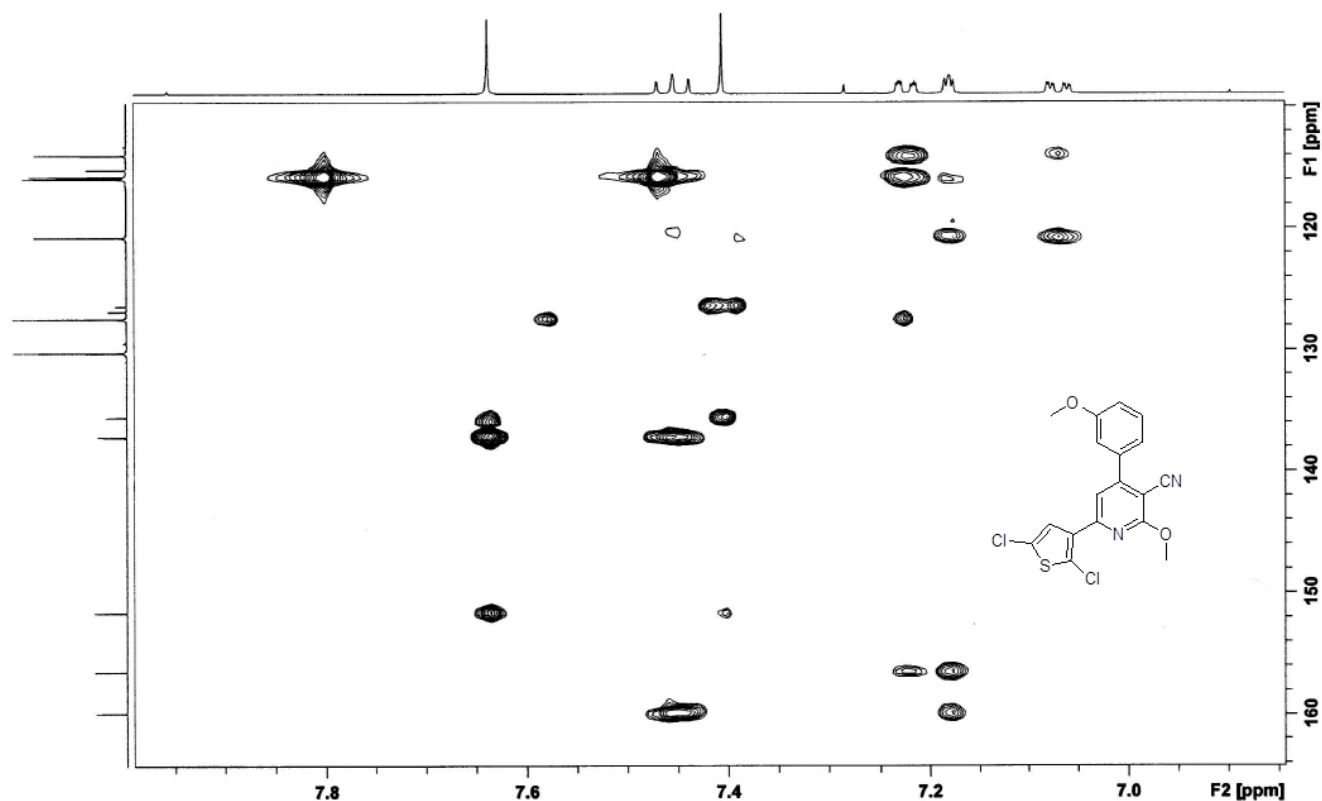
**S 51:**  $^1\text{H}$ , $^1\text{H}$  COSY spectrum ( $\text{CDCl}_3$ , 300 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(3-methoxyphenyl)pyridine-3-carbonitrile (**5f**).



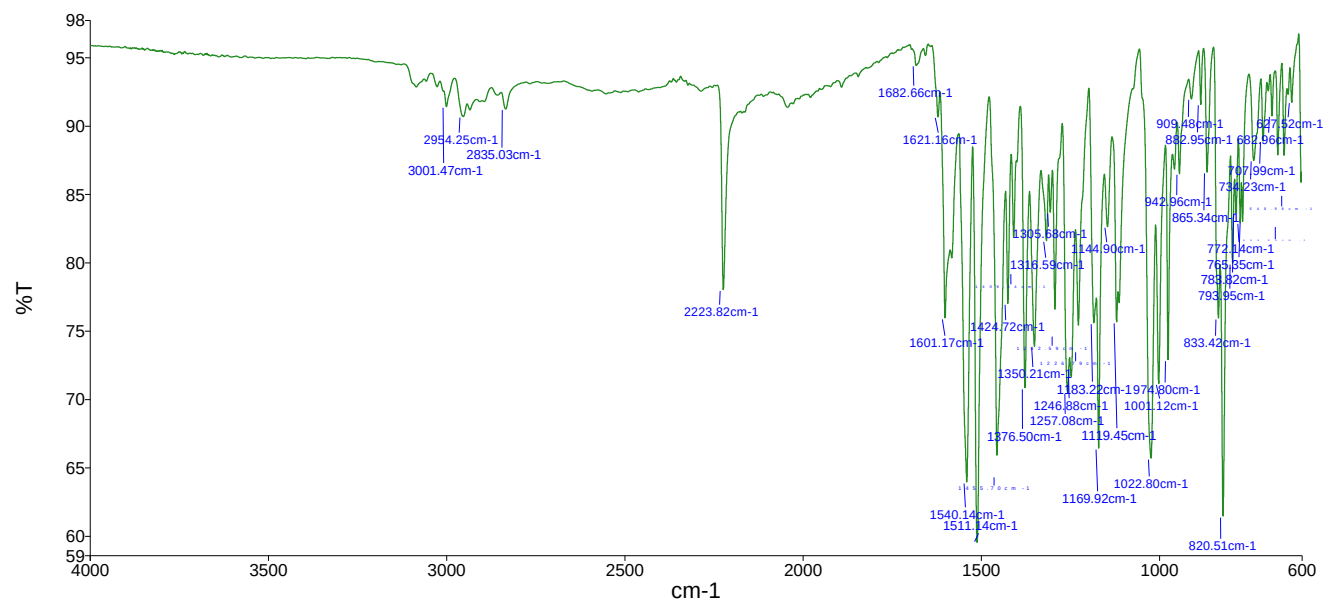
**S 52:** HSQC spectrum ( $\text{CDCl}_3$ , 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(3-methoxyphenyl)pyridine-3-carbonitrile (**5f**).

COc1cc(C#N)c(C2=CC=C(OC)C=C2)c(C3=CC=C(Cl)C=C3Cl)n1COc1cc(C#N)c(C2=CC=C(OC)C=C2)c(C3=CC=C(Cl)C=C3Cl)n1

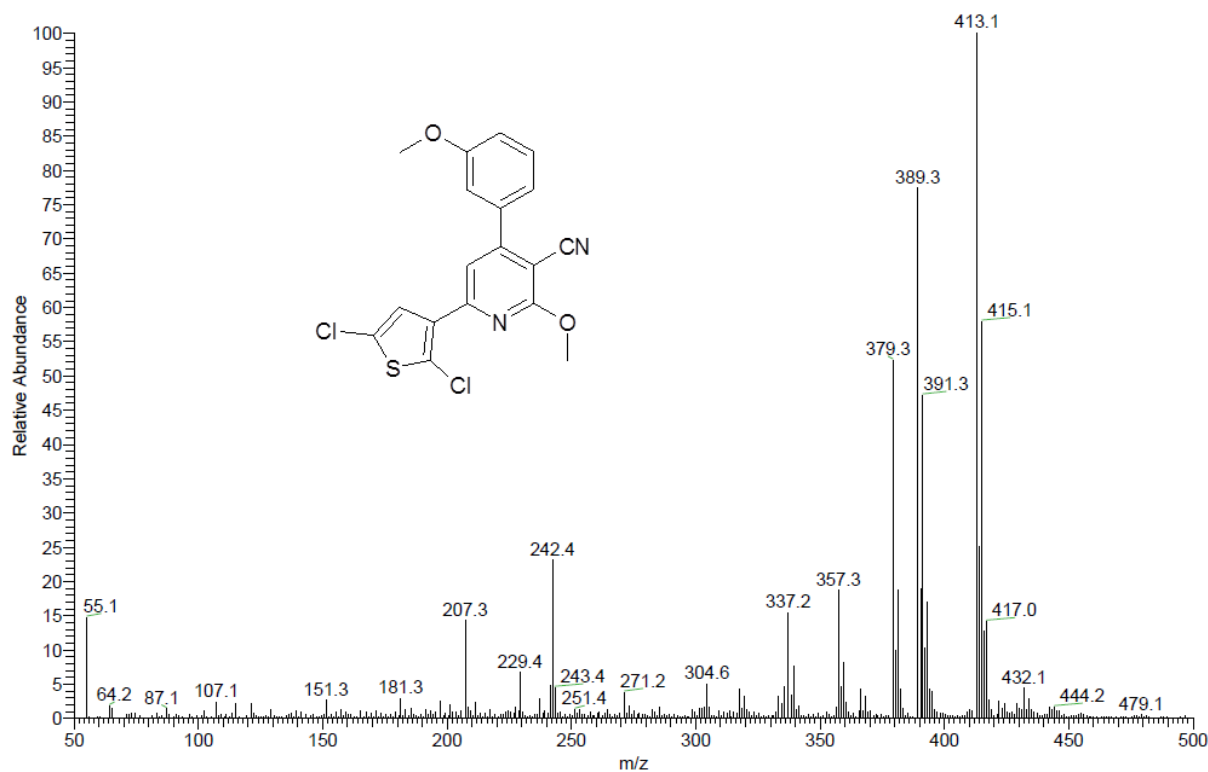




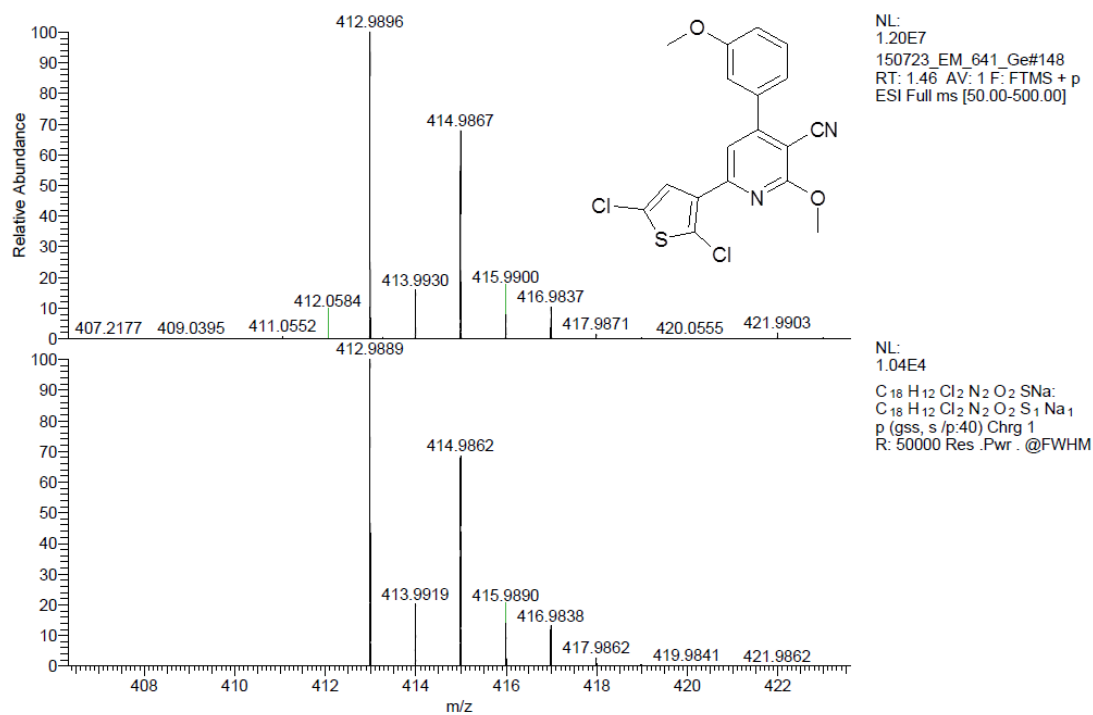
**S 55:** HMBC spectrum ( $\text{CDCl}_3$ , 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(3-methoxyphenyl)pyridine-3-carbonitrile (**5f**).



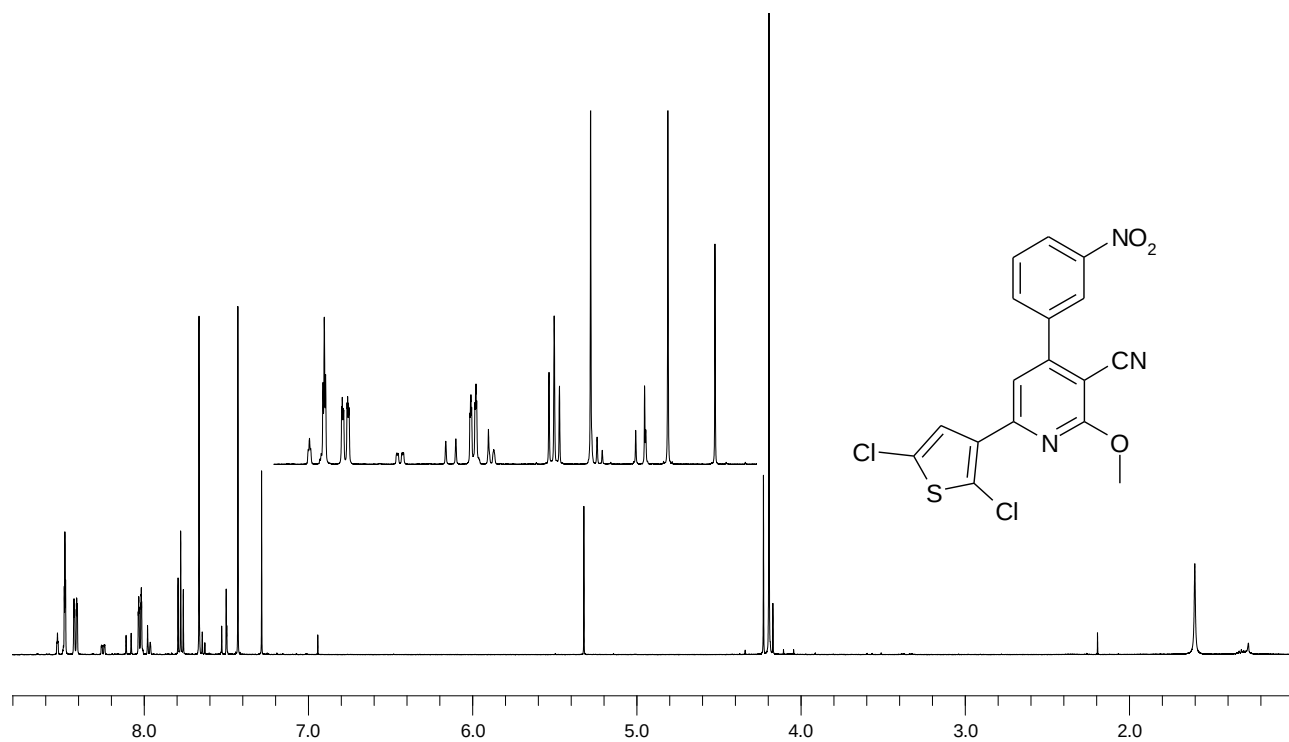
**S 56:** IR spectrum of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(3-methoxyphenyl)pyridine-3-carbonitrile (**5f**).



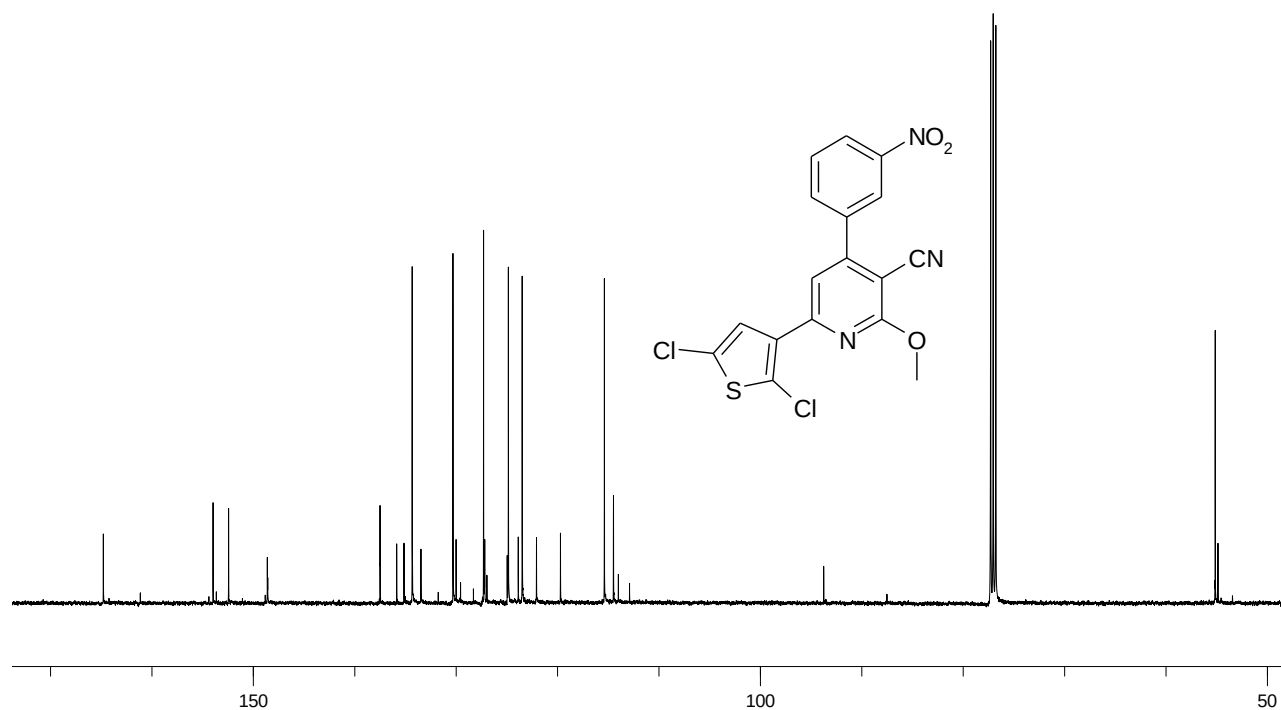
**S 57:** ESI mass spectrum of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(3-methoxyphenyl)pyridine-3-carbonitrile (**5f**).



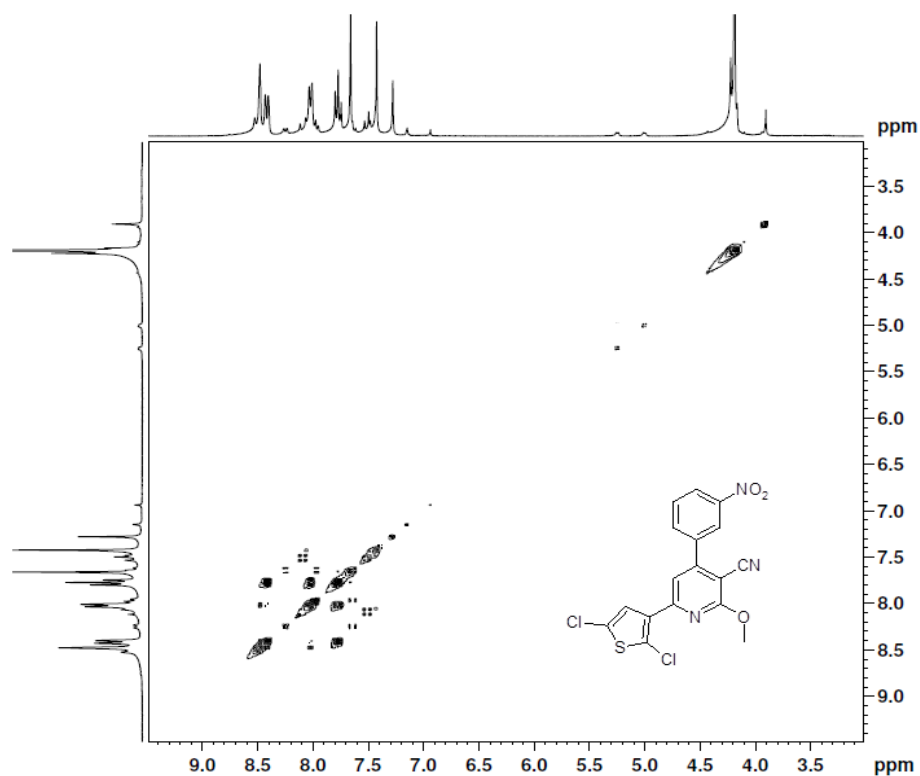
**S 58:** HRESI mass spectrum of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(3-methoxyphenyl)pyridine-3-carbonitrile (**5f**).



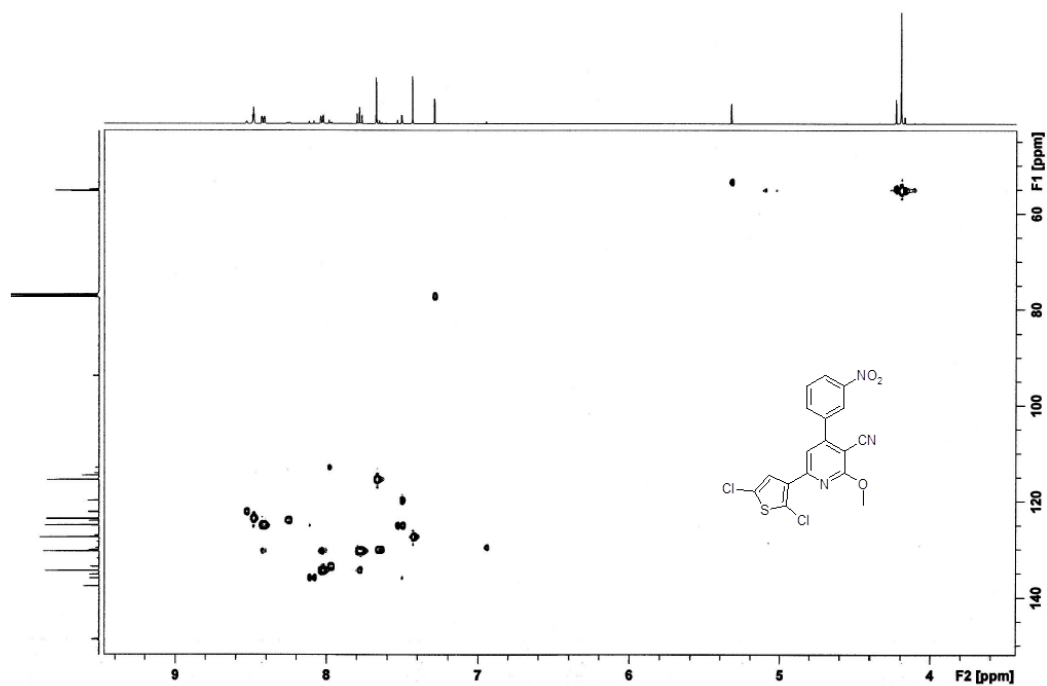
**S 59:**  $^1\text{H}$  NMR spectrum ( $\text{CDCl}_3$ , 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(3-nitrophenyl)pyridine-3-carbonitrile (**5g**).



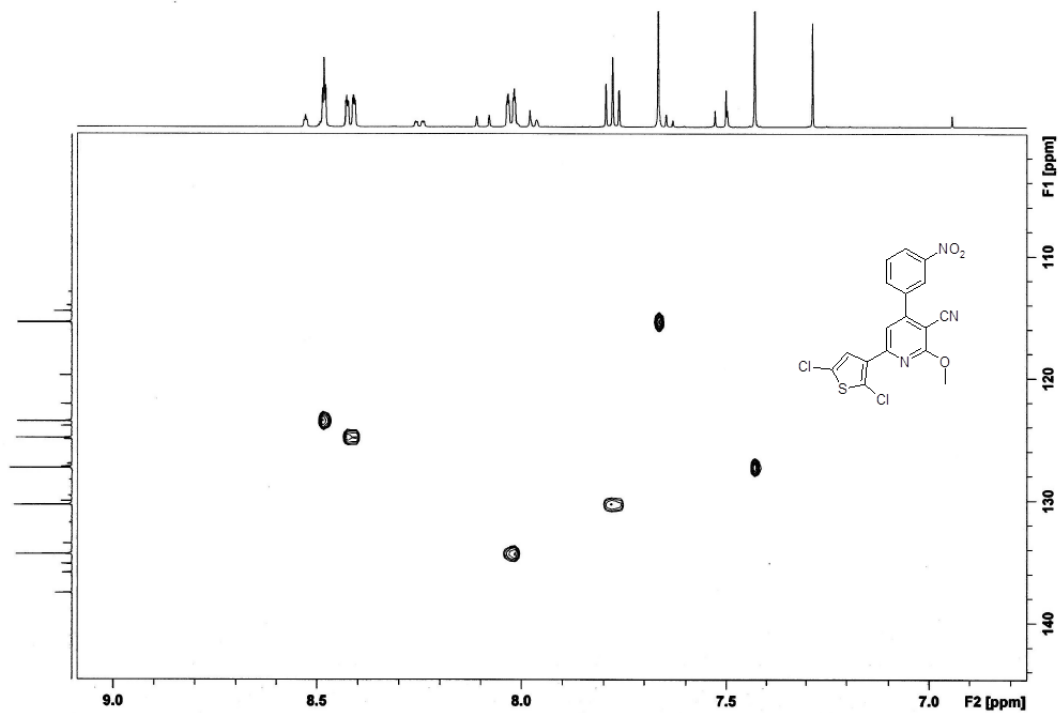
**S 60:**  $^{13}\text{C}$  NMR spectrum ( $\text{CDCl}_3$ , 125MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(3-nitrophenyl)pyridine-3-carbonitrile (**5g**).



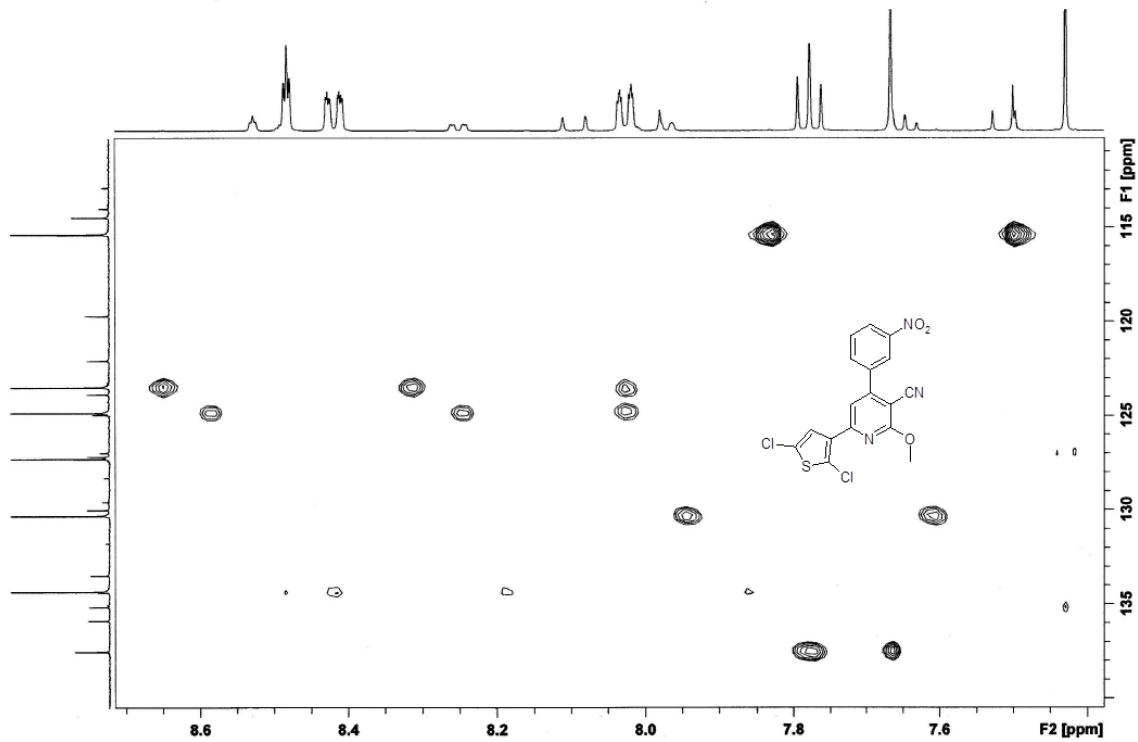
**S 61:** H,H COSY spectrum (CDCl<sub>3</sub>, 300 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(3-nitrophenyl)pyridine-3-carbonitrile (**5g**).



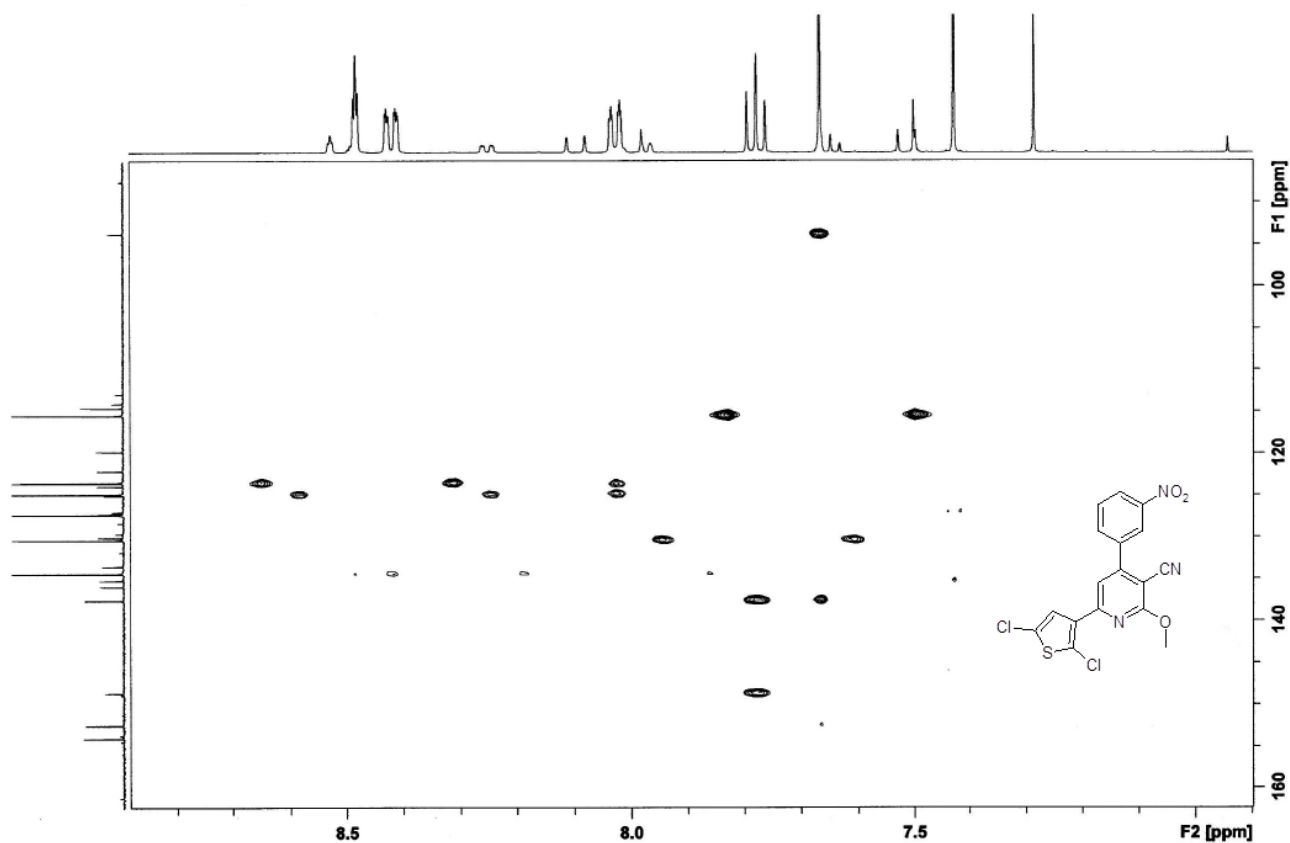
**S 62:** HSQC: spectrum (CDCl<sub>3</sub>, 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(3-nitrophenyl)pyridine-3-carbonitrile (**5g**).



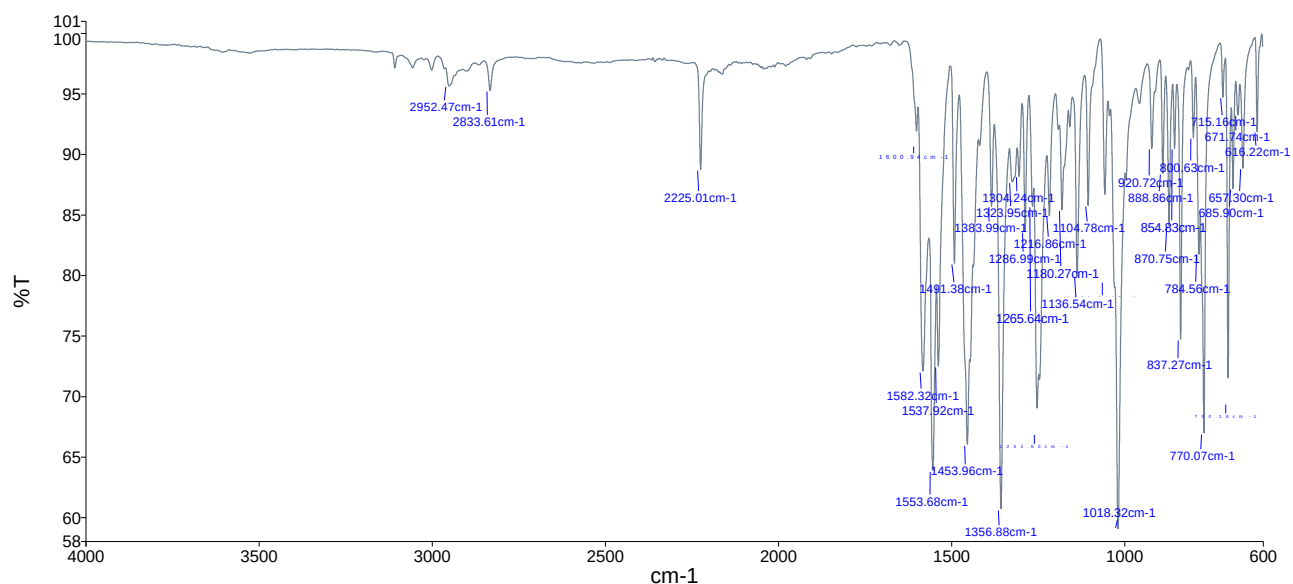
**S 63:** HSQC spectrum (CDCl<sub>3</sub>, 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(3-nitrophenyl)pyridine-3-carbonitrile (**5g**).



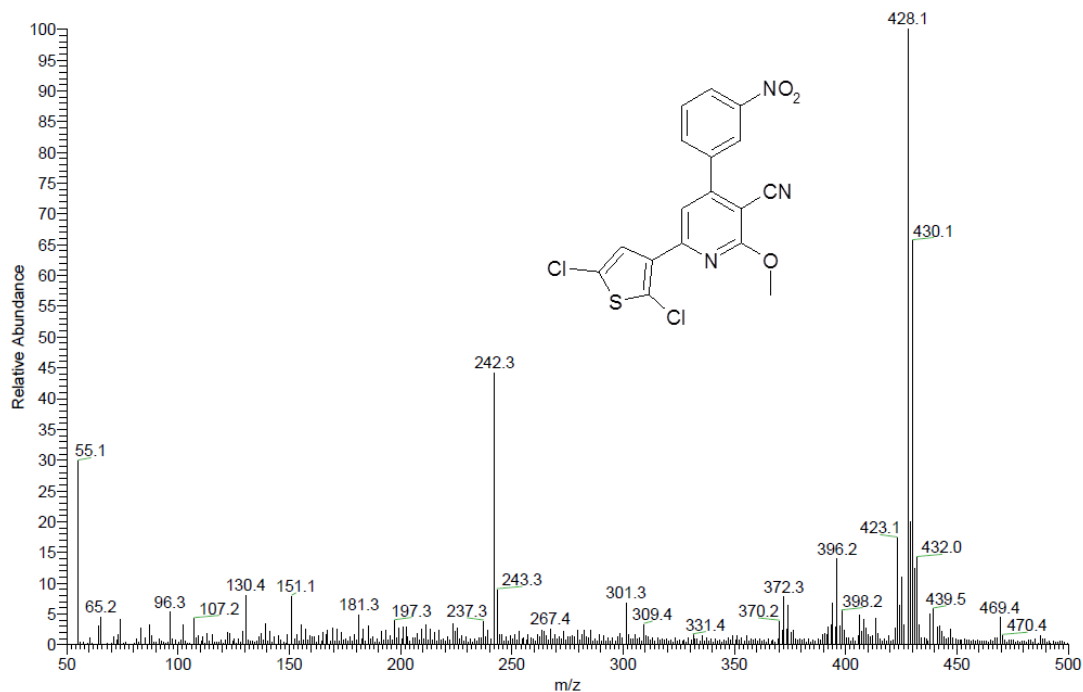
**S 64:** HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(3-nitrophenyl)pyridine-3-carbonitrile (**5g**).



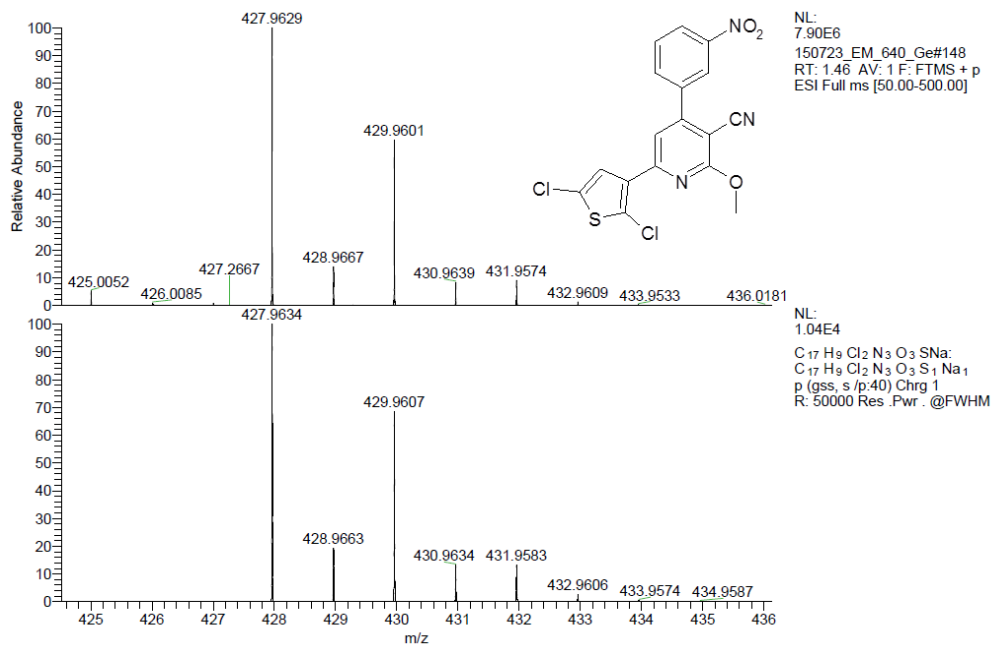
**S 65:** HMBC spectrum ( $\text{CDCl}_3$ , 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(3-nitrophenyl)pyridine-3-carbonitrile (**5g**).



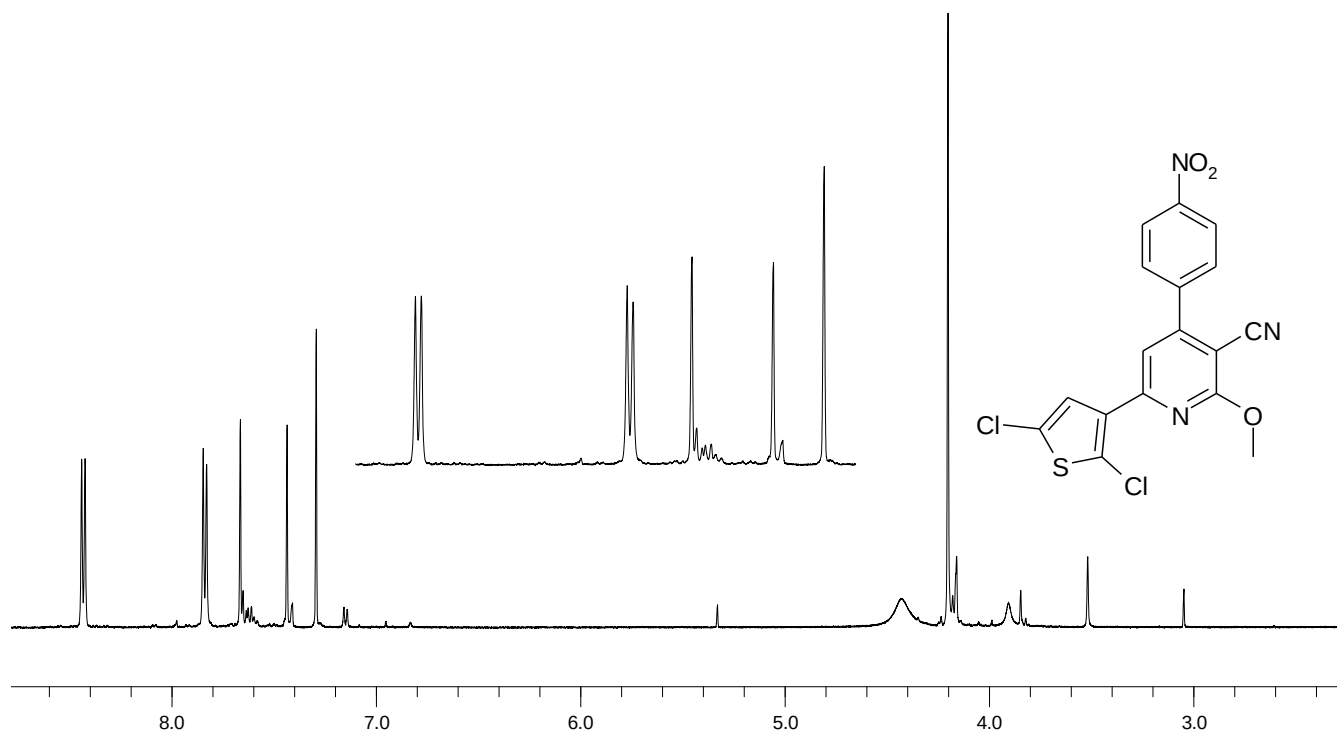
**S 66:** IR spectrum of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(3-nitrophenyl)pyridine-3-carbonitrile (**5g**).



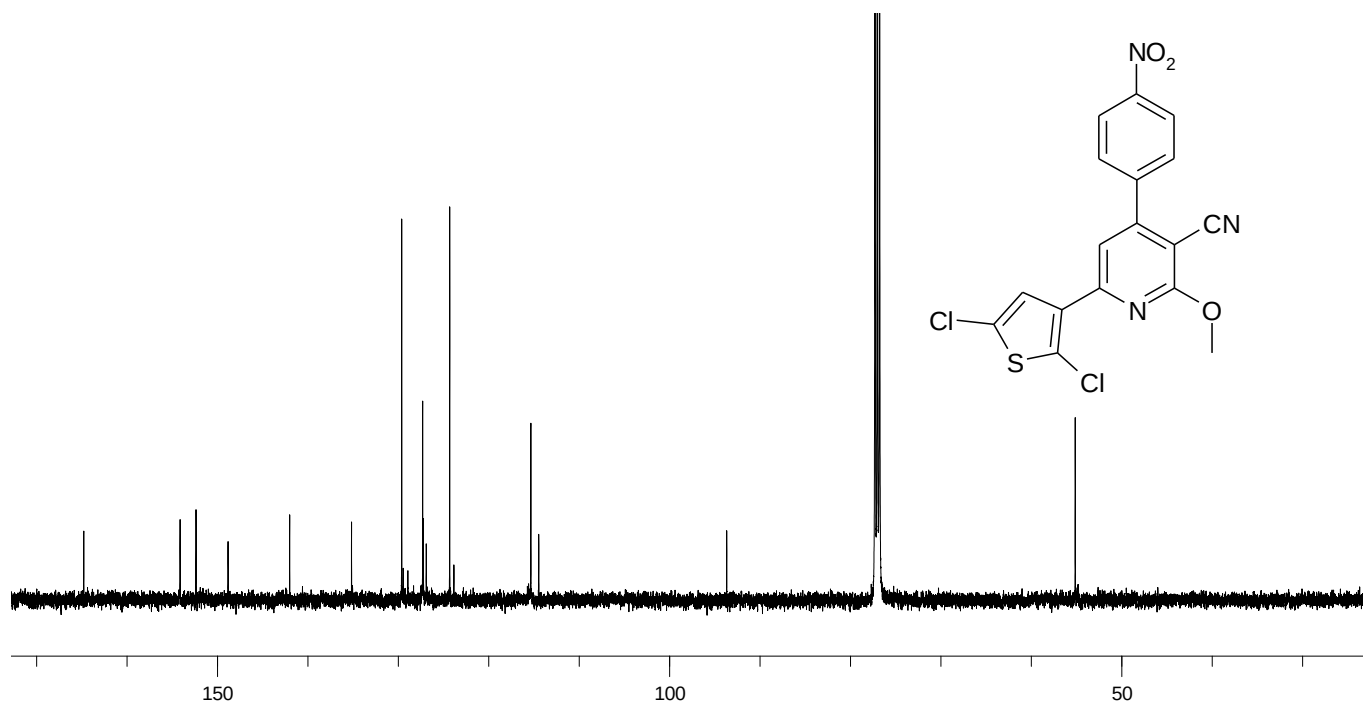
**S 67:** ESI mass spectrum of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(3-nitrophenyl)pyridine-3-carbonitrile (5g).



**S 68:** HRESI mass spectrum of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(3-nitrophenyl)pyridine-3-carbonitrile (5g).

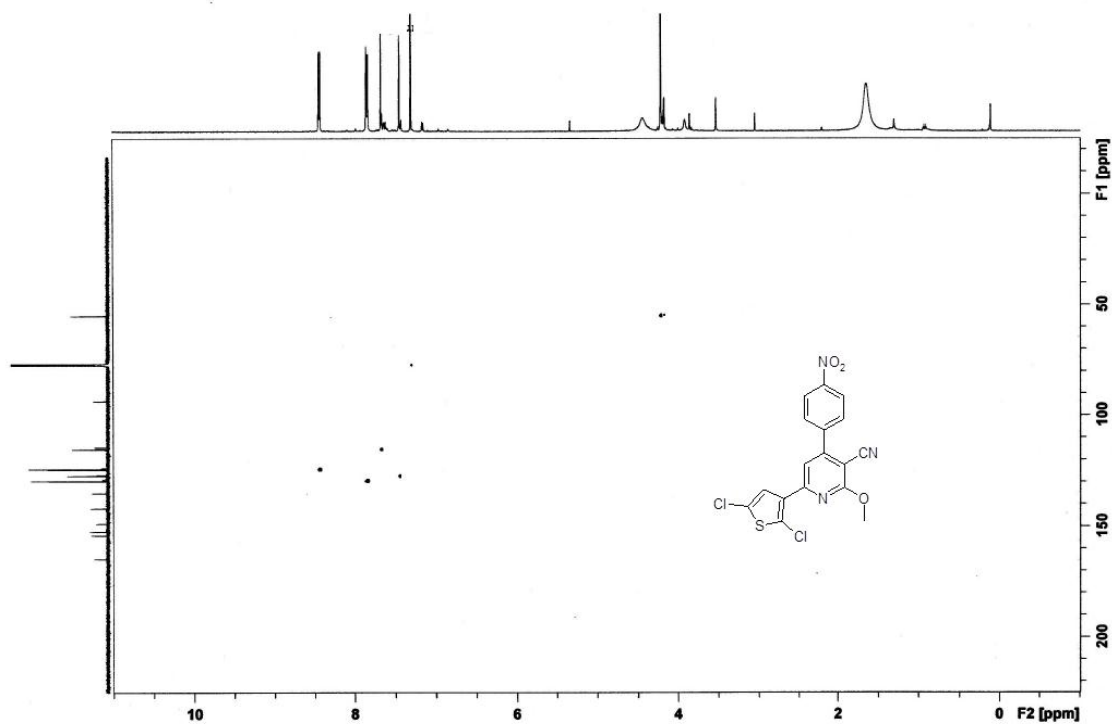


**S 69:**  $^1\text{H}$  NMR spectrum ( $\text{CDCl}_3$ , 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(4-nitrophenyl)pyridine-3-carbonitrile (**5h**).

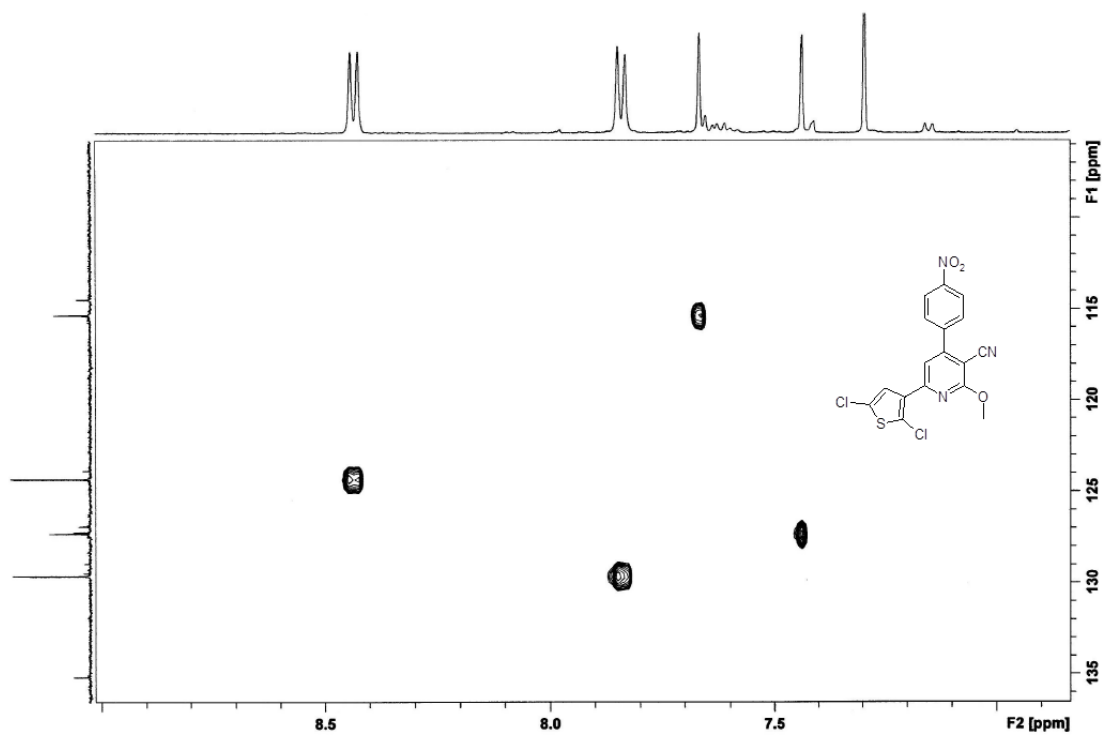


**S 70:**  $^{13}\text{C}$  NMR spectrum ( $\text{CDCl}_3$ , 125 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(4-nitrophenyl)pyridine-3-carbonitrile (**5h**).

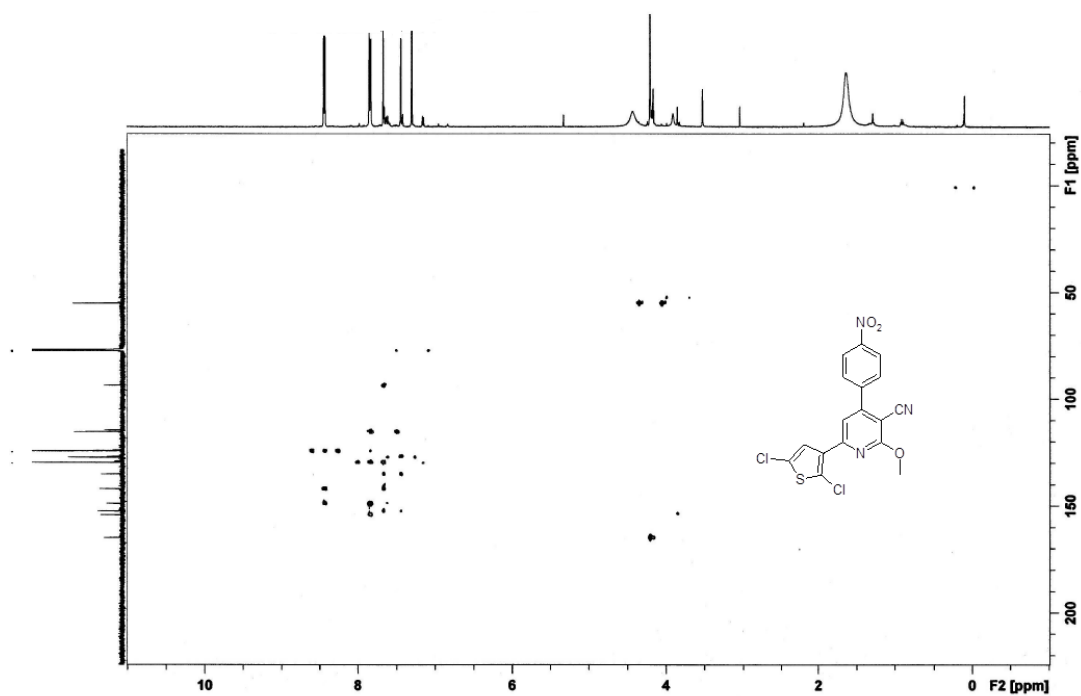




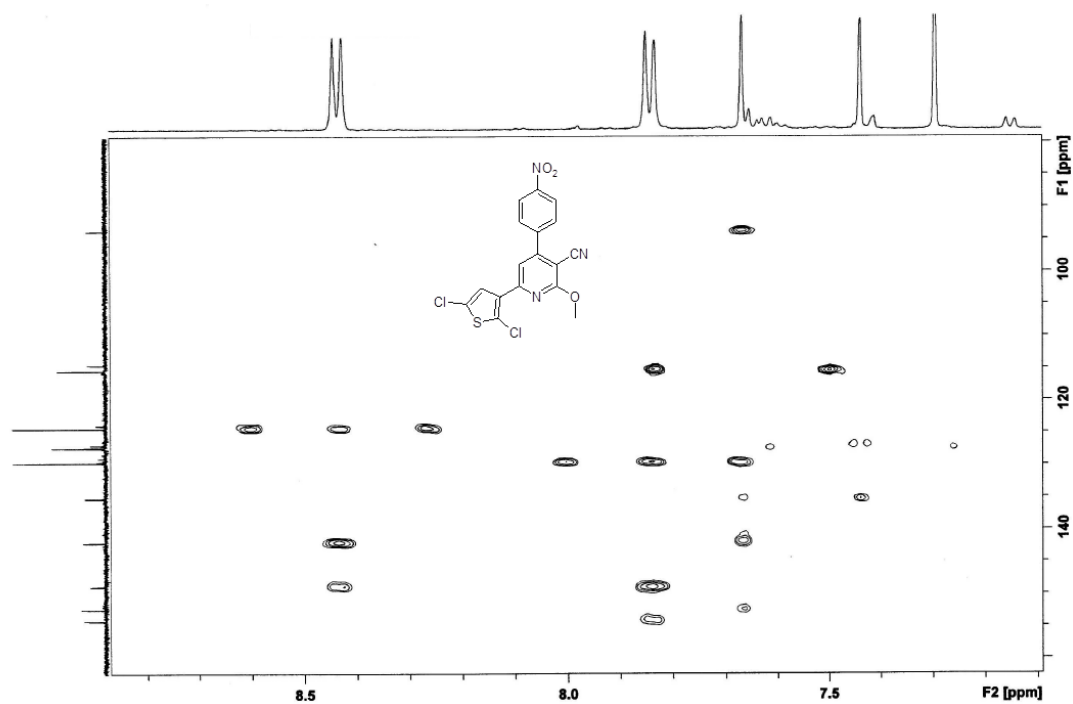
S 71: HSQC spectrum (CDCl<sub>3</sub>, 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(4-nitrophenyl)pyridine-3-carbonitrile (**5h**).



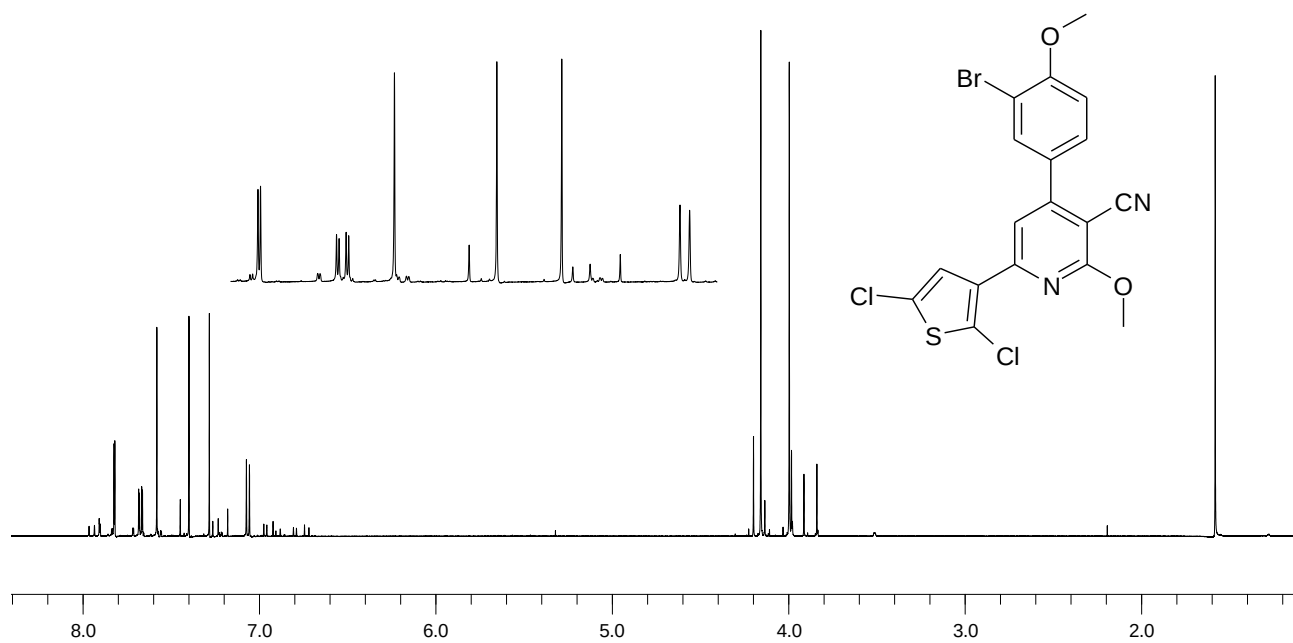
S 72: HSQC spectrum (CDCl<sub>3</sub>, 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(4-nitrophenyl)pyridine-3-carbonitrile (**5h**).



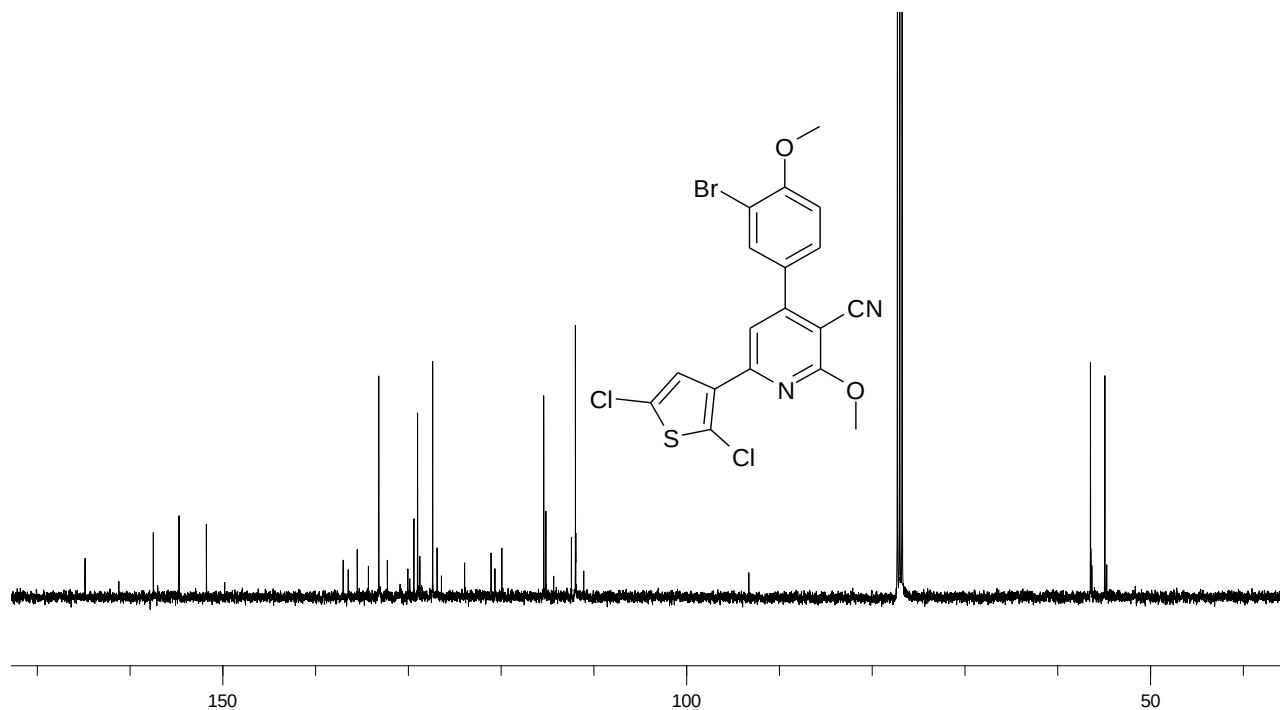
S 73: HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(4-nitrophenyl)pyridine-3-carbonitrile (**5h**).



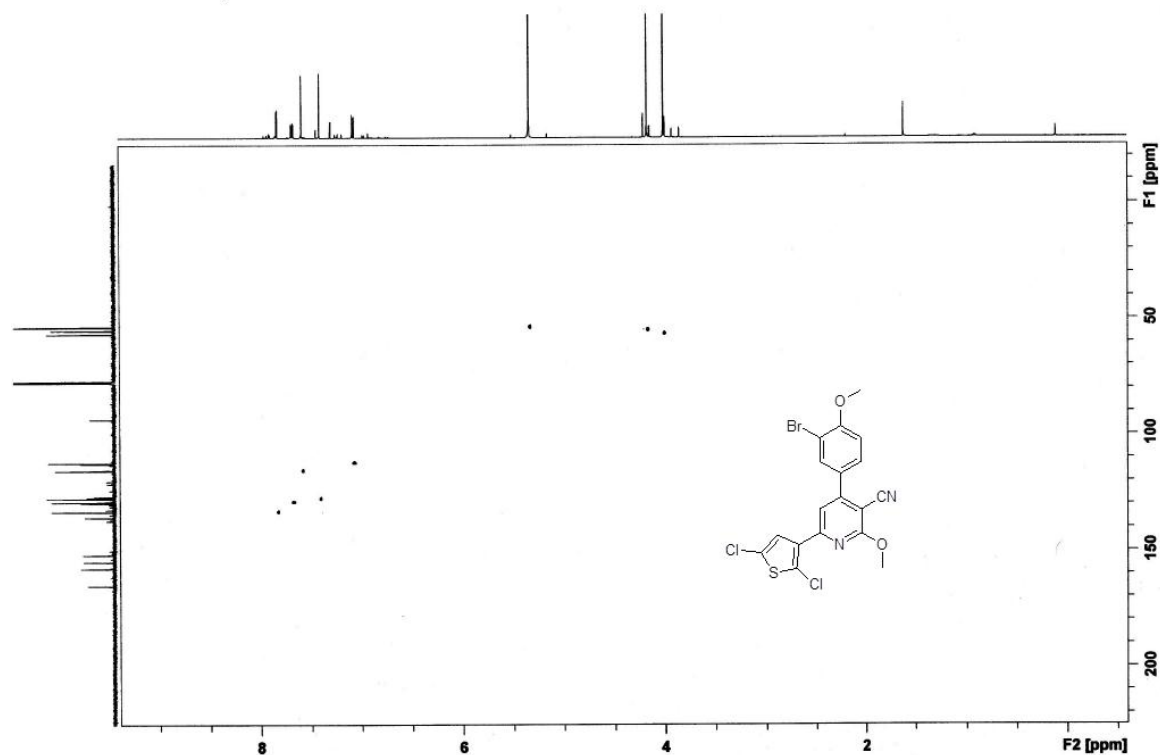
S 74: HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 6-(2,5-dichlorothiophen-3-yl)-2-methoxy-4-(4-nitrophenyl)pyridine-3-carbonitrile (**5h**).



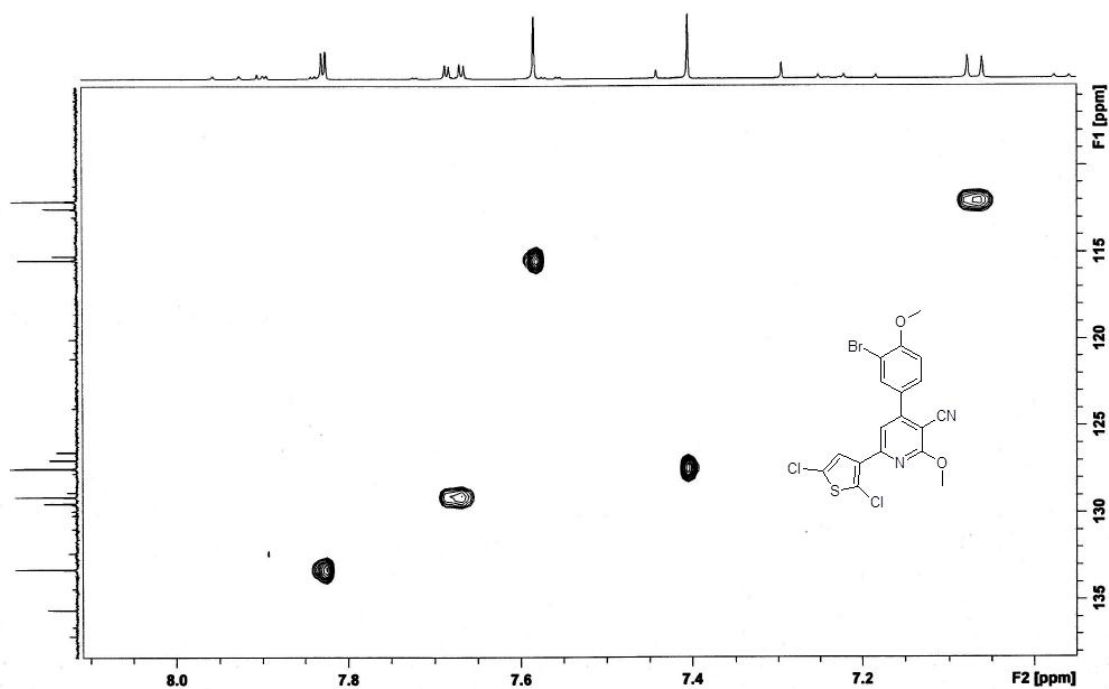
**S 75:**  $^1\text{H}$  NMR spectrum ( $\text{CDCl}_3$ , 500 MHz) of 4-(3-bromo-4-methoxyphenyl)-6-(2,5-dichlorothiophen-3-yl)-2-methoxypyridine-3-carbonitrile (**5i**).



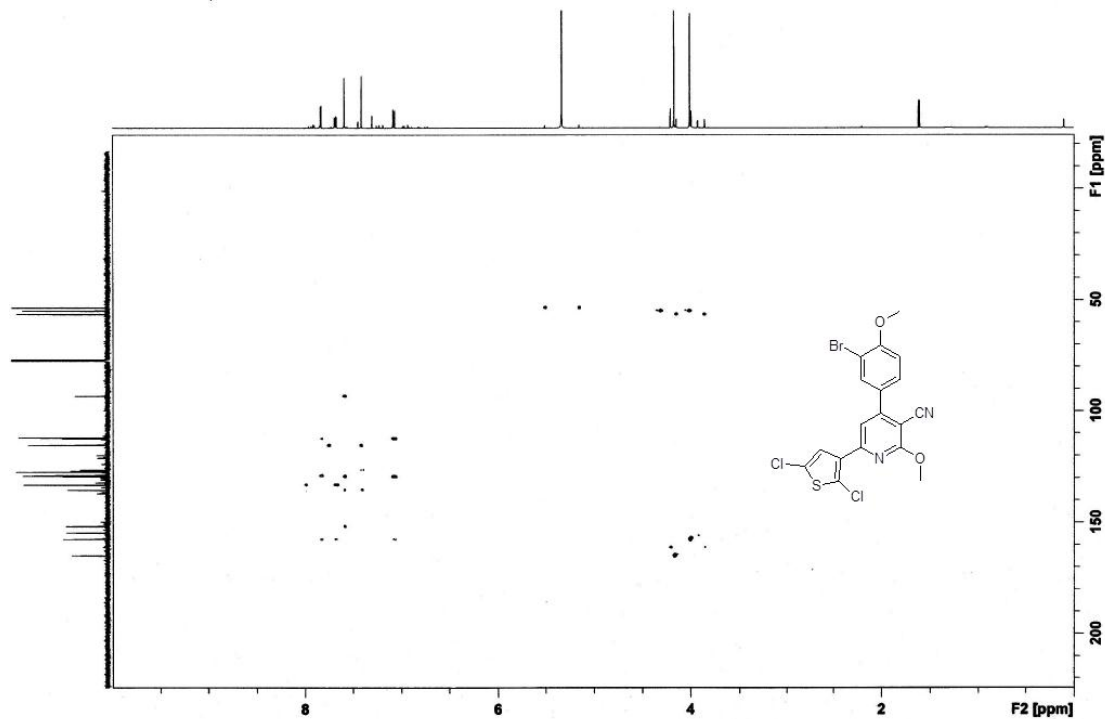
**S 76:**  $^{13}\text{C}$  NMR spectrum ( $\text{CDCl}_3$ , 125 MHz) of 4-(3-bromo-4-methoxyphenyl)-6-(2,5-dichlorothiophen-3-yl)-2-methoxypyridine-3-carbonitrile (**5i**).



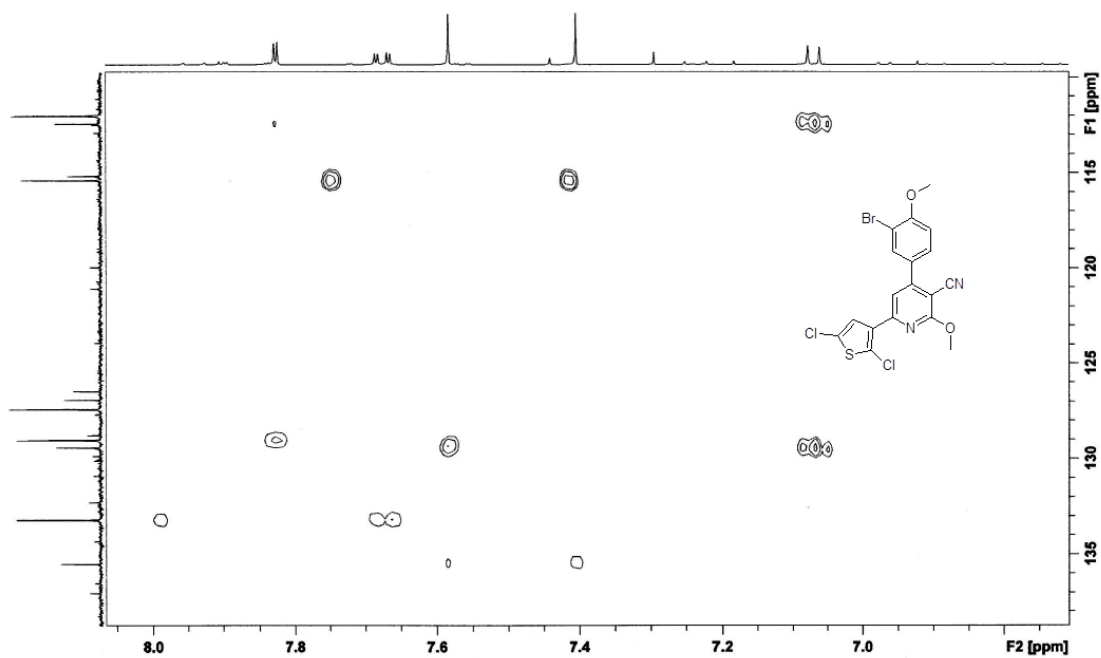
S 77: HSQC spectrum (CDCl<sub>3</sub>, 500 MHz) of 4-(3-bromo-4-methoxyphenyl)-6-(2,5-dichlorothiophen-3-yl)-2-methoxypyridine-3-carbonitrile (**5i**).



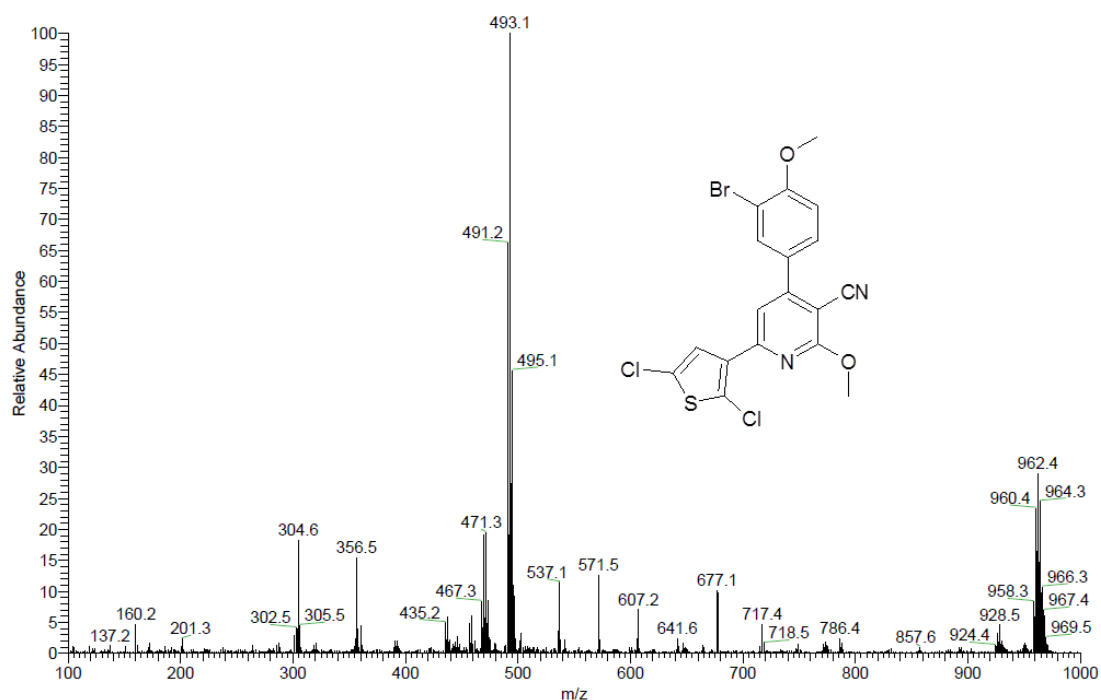
S 78: HSQC spectrum (CDCl<sub>3</sub>, 500 MHz) of 4-(3-bromo-4-methoxyphenyl)-6-(2,5-dichlorothiophen-3-yl)-2-methoxypyridine-3-carbonitrile (**5i**).



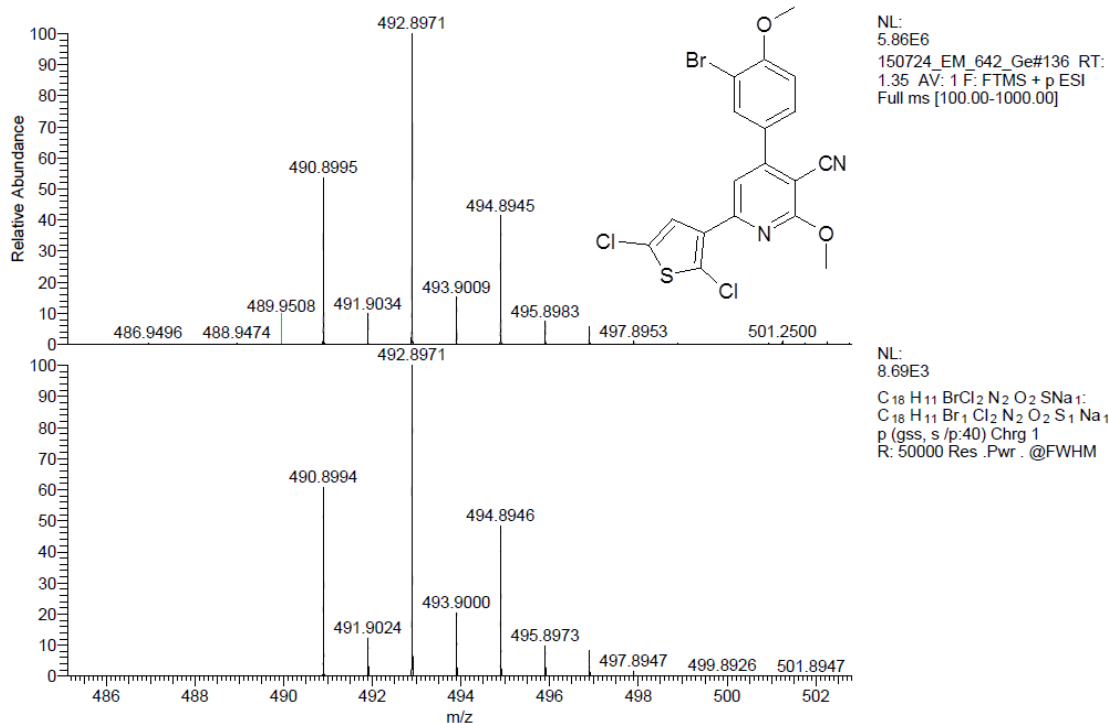
**S 79:** HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 4-(3-bromo-4-methoxyphenyl)-6-(2,5-dichlorothiophen-3-yl)-2-methoxypyridine-3-carbonitrile (**5i**).



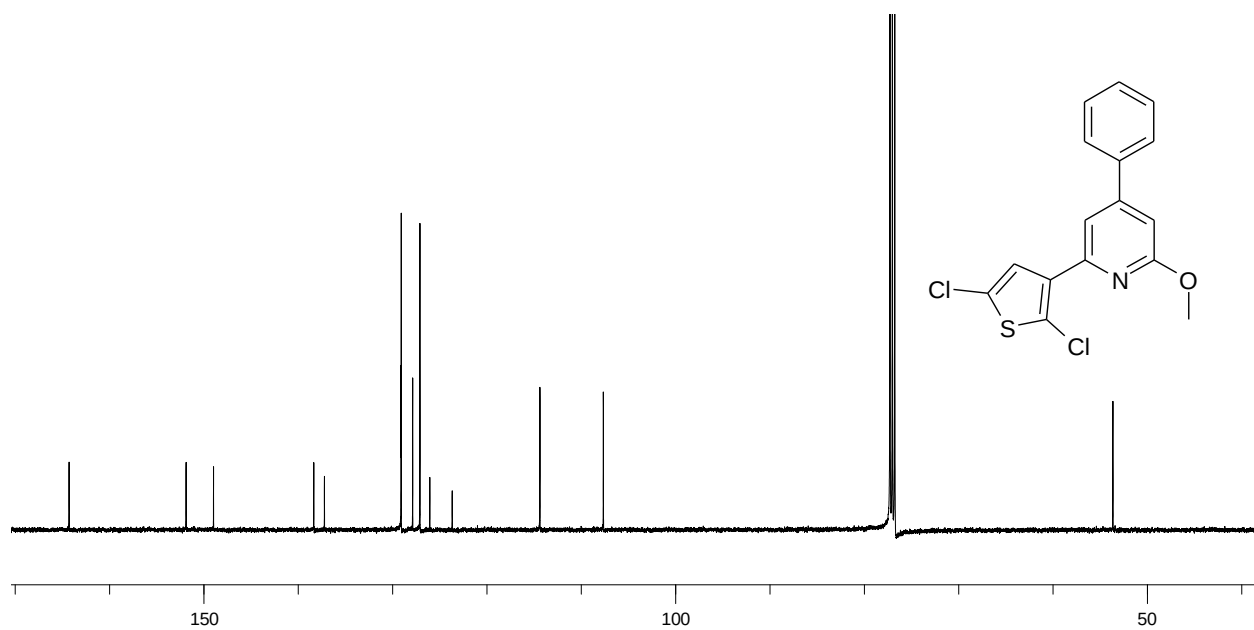
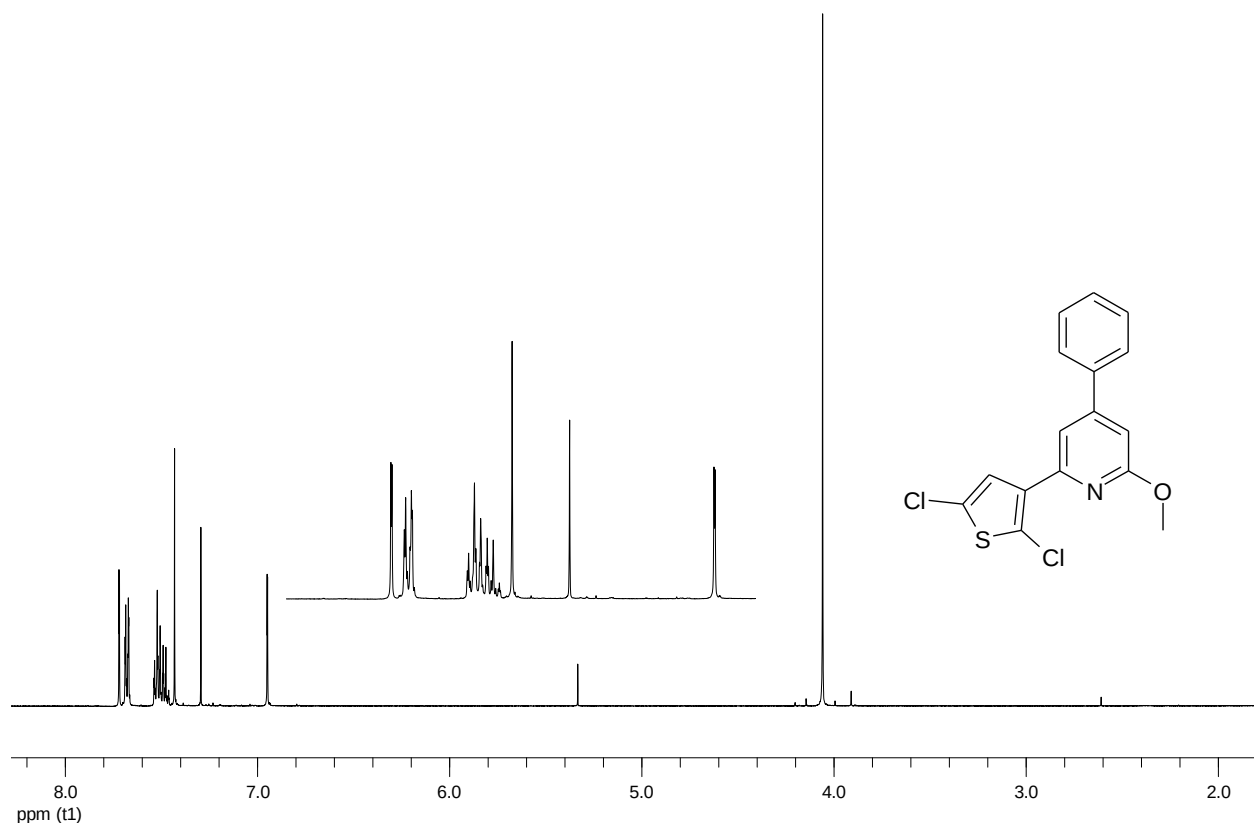
**S 80:** HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 4-(3-bromo-4-methoxyphenyl)-6-(2,5-dichlorothiophen-3-yl)-2-methoxypyridine-3-carbonitrile (**5i**).

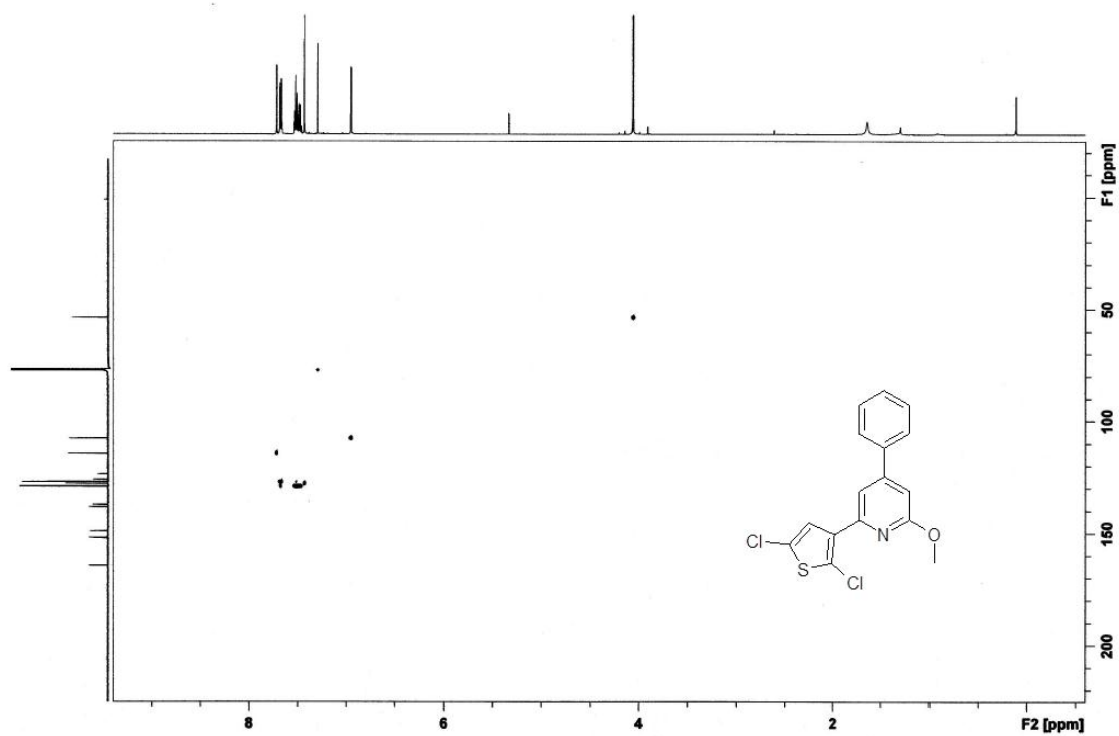


**S 81:** ESI mass spectrum of 4-(3-bromo-4-methoxyphenyl)-6-(2,5-dichlorothiophen-3-yl)-2-methoxypyridine-3-carbonitrile (**5i**).

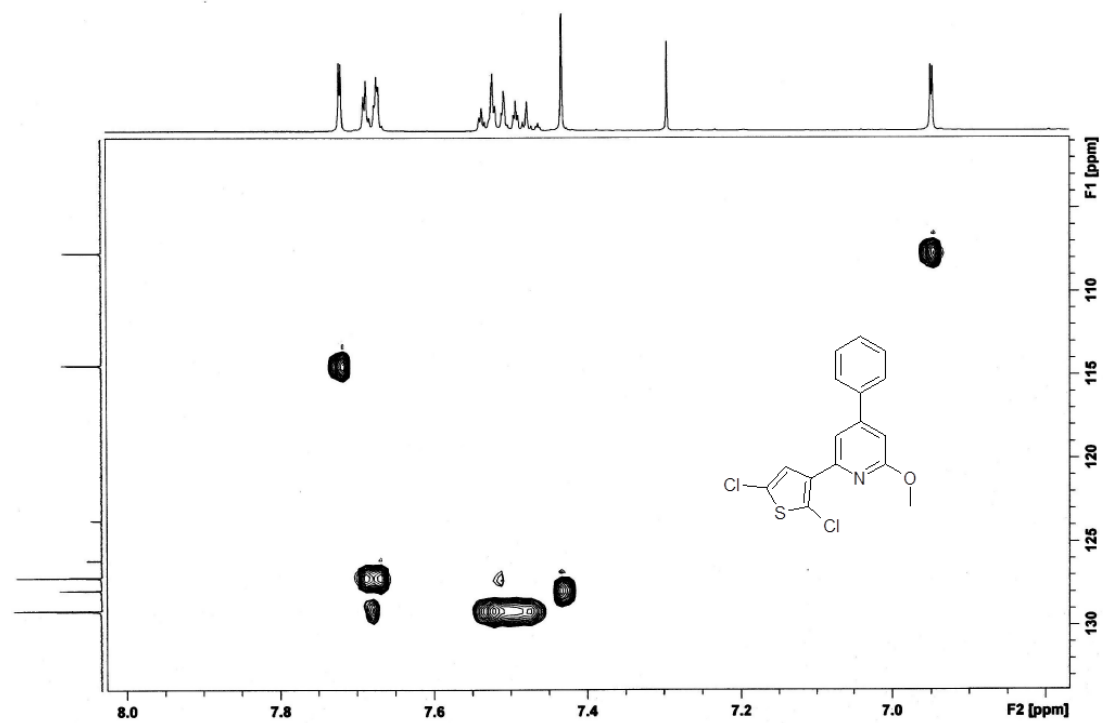


**S 82:** HRESI mass spectrum of 4-(3-bromo-4-methoxyphenyl)-6-(2,5-dichlorothiophen-3-yl)-2-methoxypyridine-3-carbonitrile (**5i**).



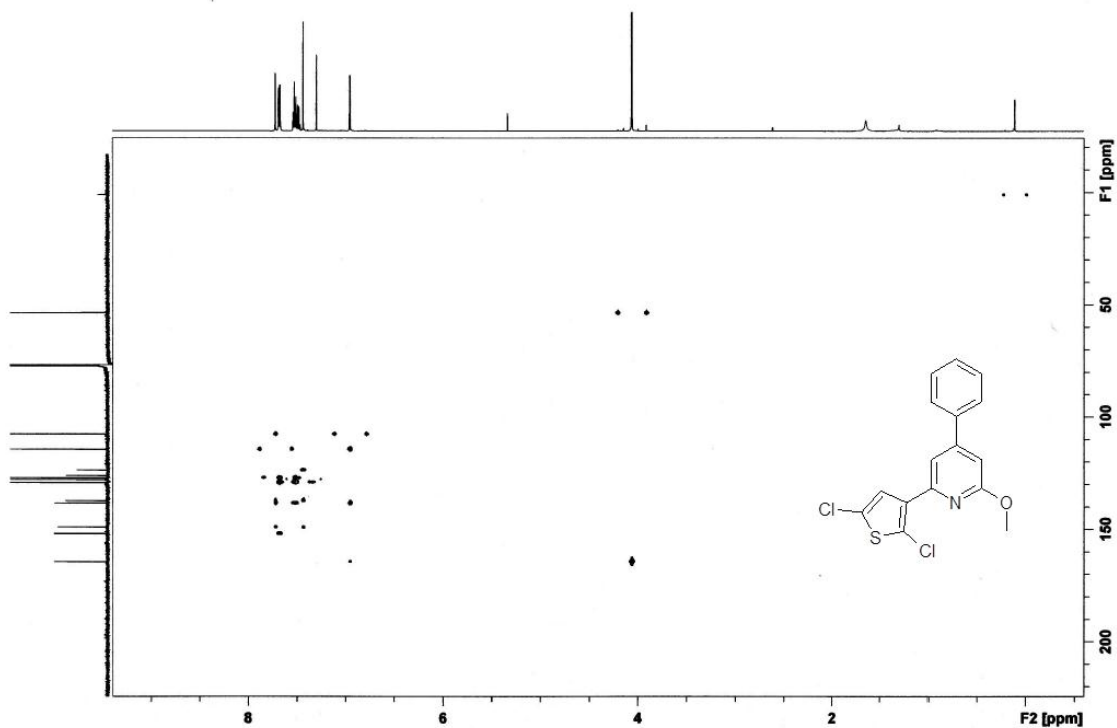


**S 85:** HSQC spectrum (CDCl<sub>3</sub>, 500 MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-phenylpyridine (**6a**).

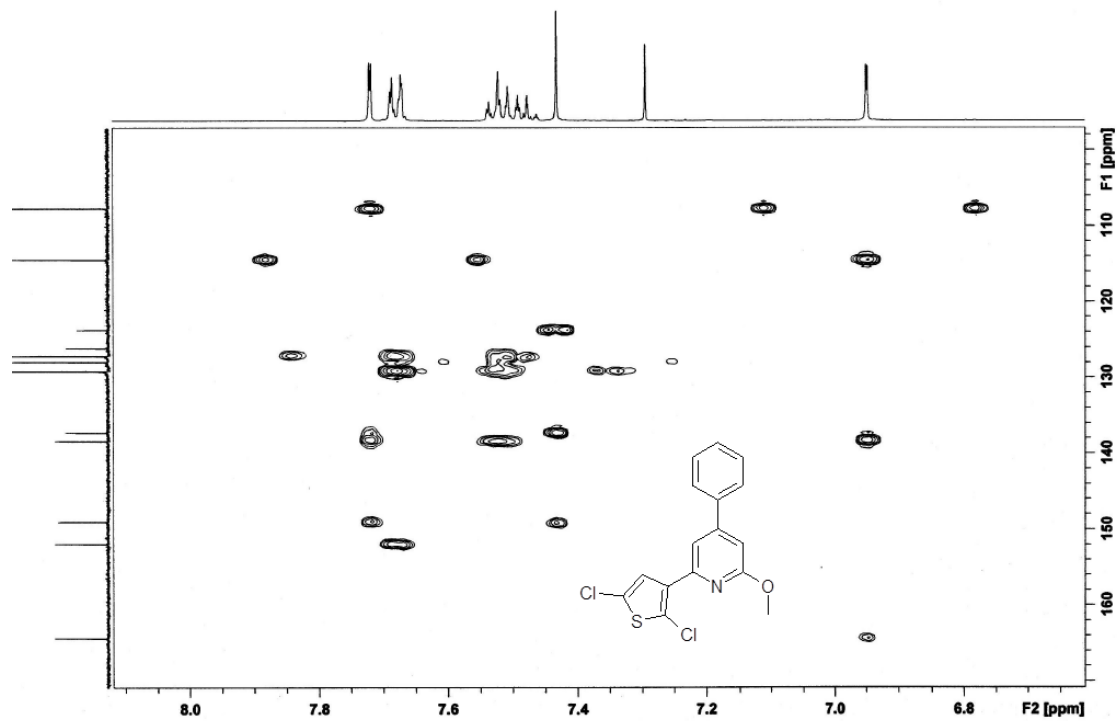


**S 86:** HSQC spectrum (CDCl<sub>3</sub>, 500 MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-phenylpyridine (**6a**).

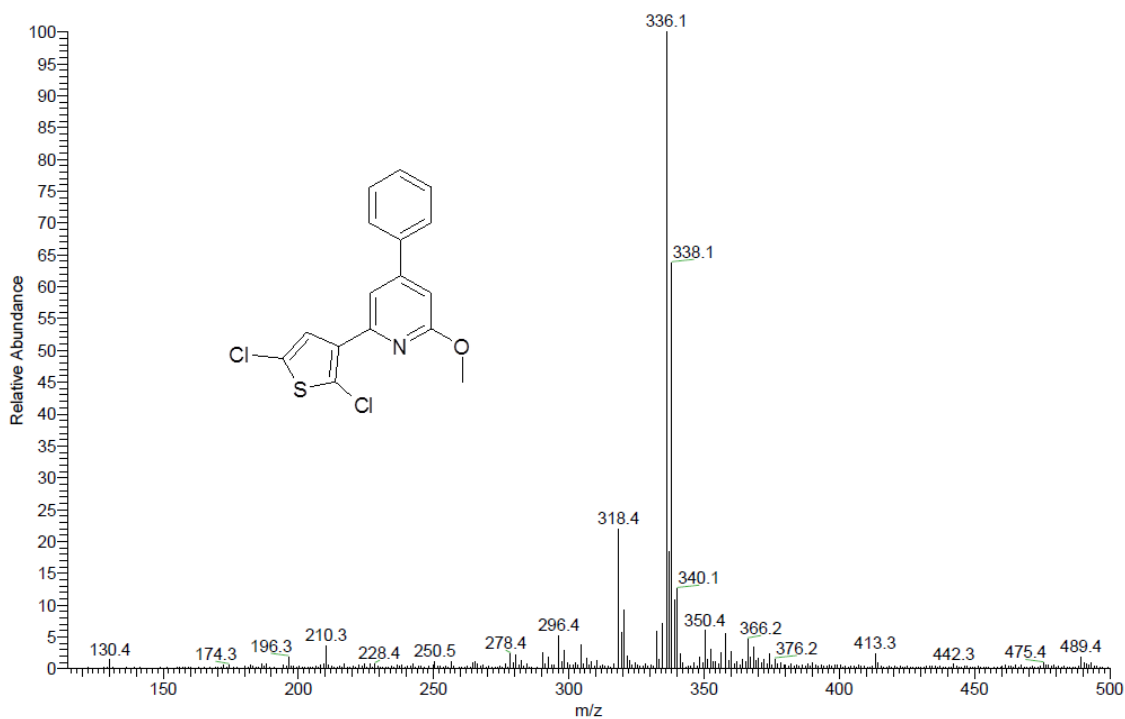




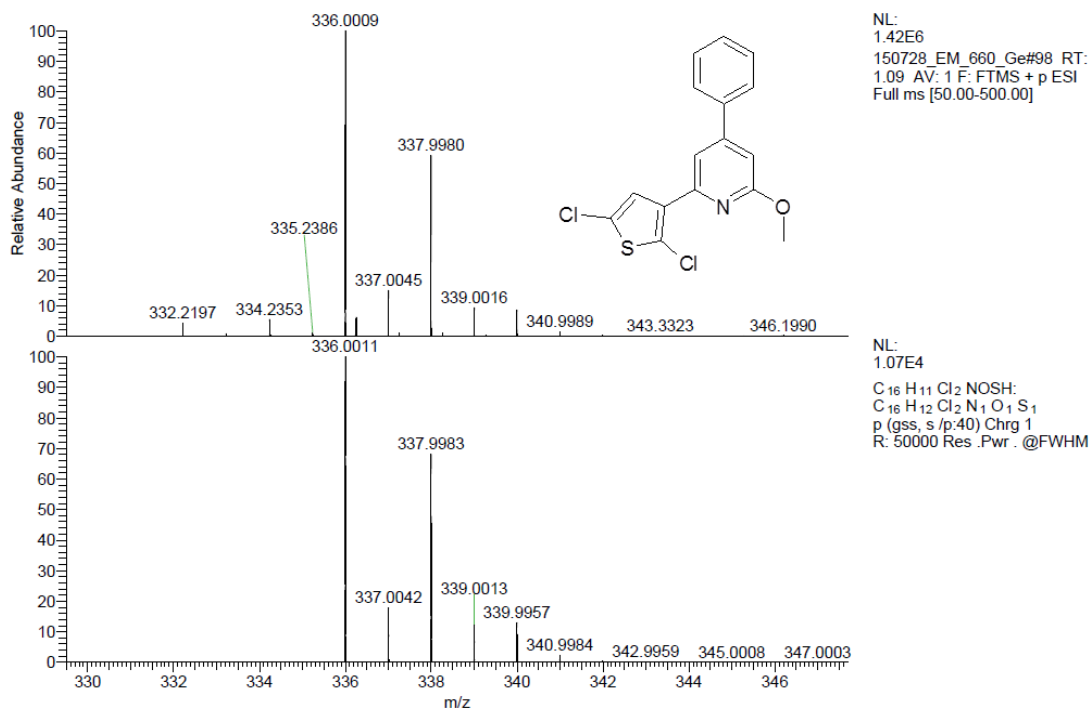
S 87: HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-phenylpyridine (**6a**).



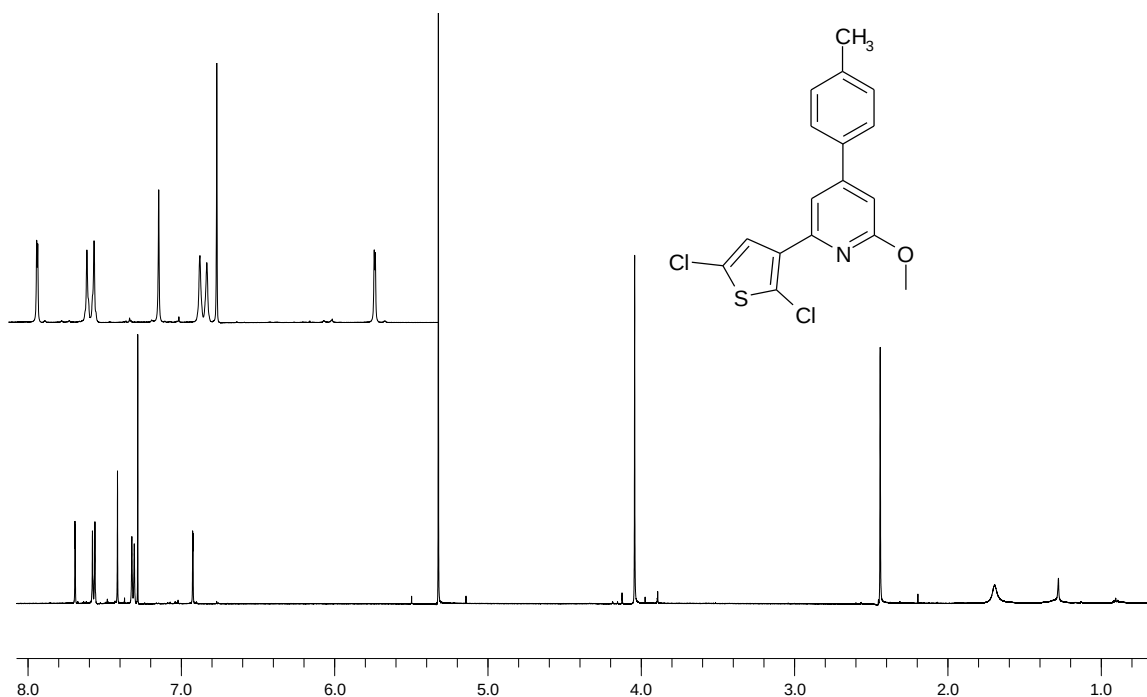
S 88: HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-phenylpyridine (**6a**).



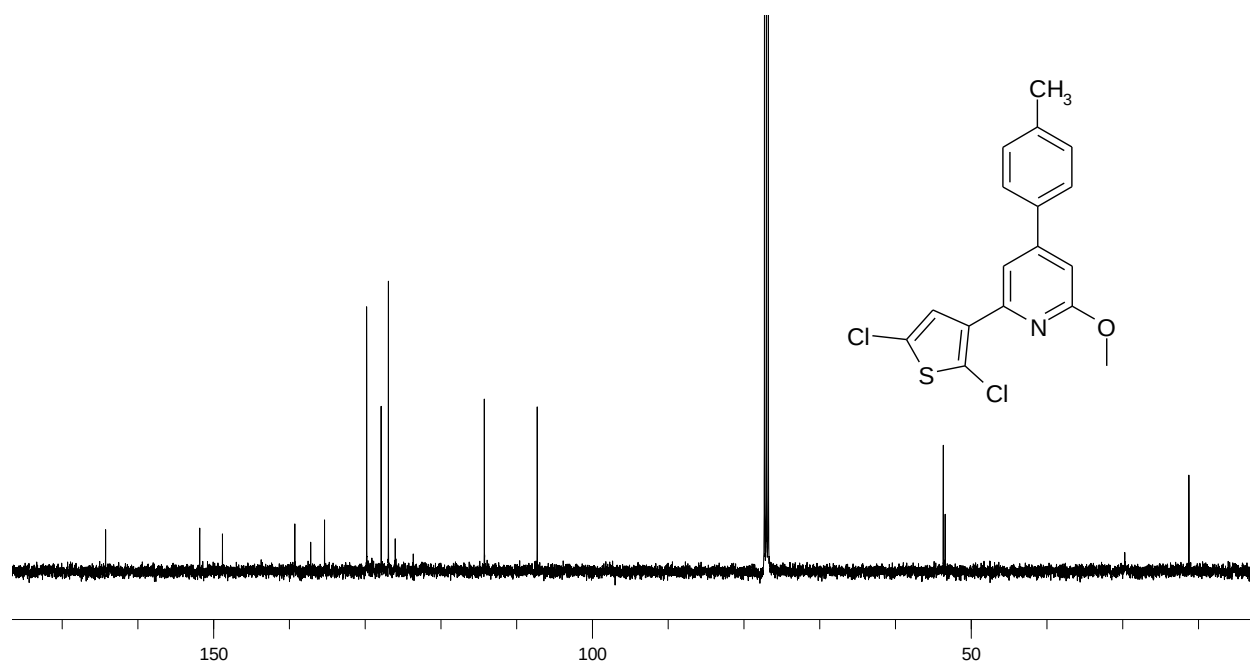
**S 89:** ESI mass spectrum of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-phenylpyridine (**6a**).



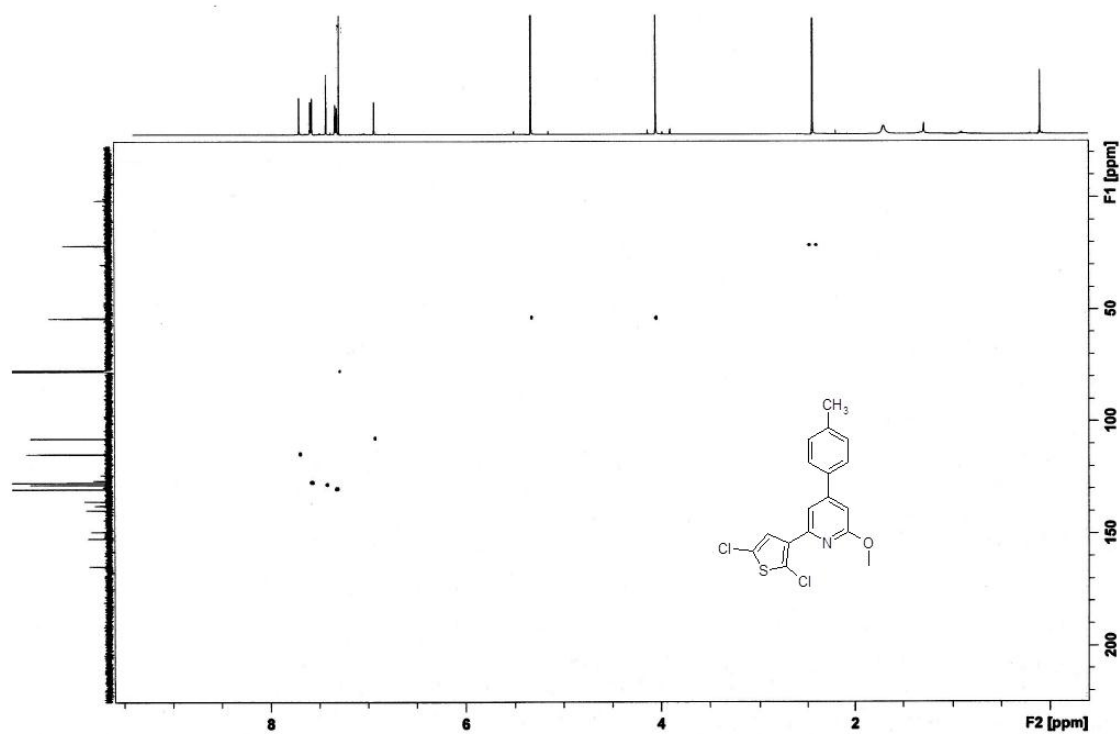
**S 90:** HRESI mass spectrum of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-phenylpyridine (**6a**).



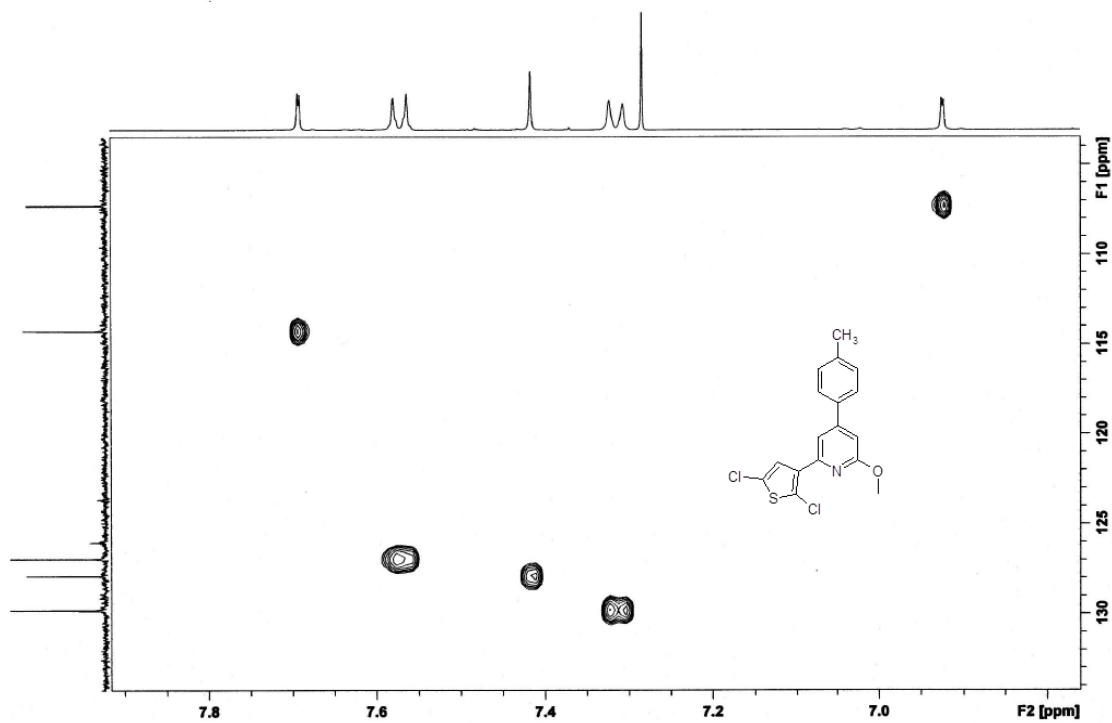
**S 91:**  $^1\text{H}$  NMR spectrum ( $\text{CDCl}_3$ , 500 MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-p-tolylpyridine (**6b**).



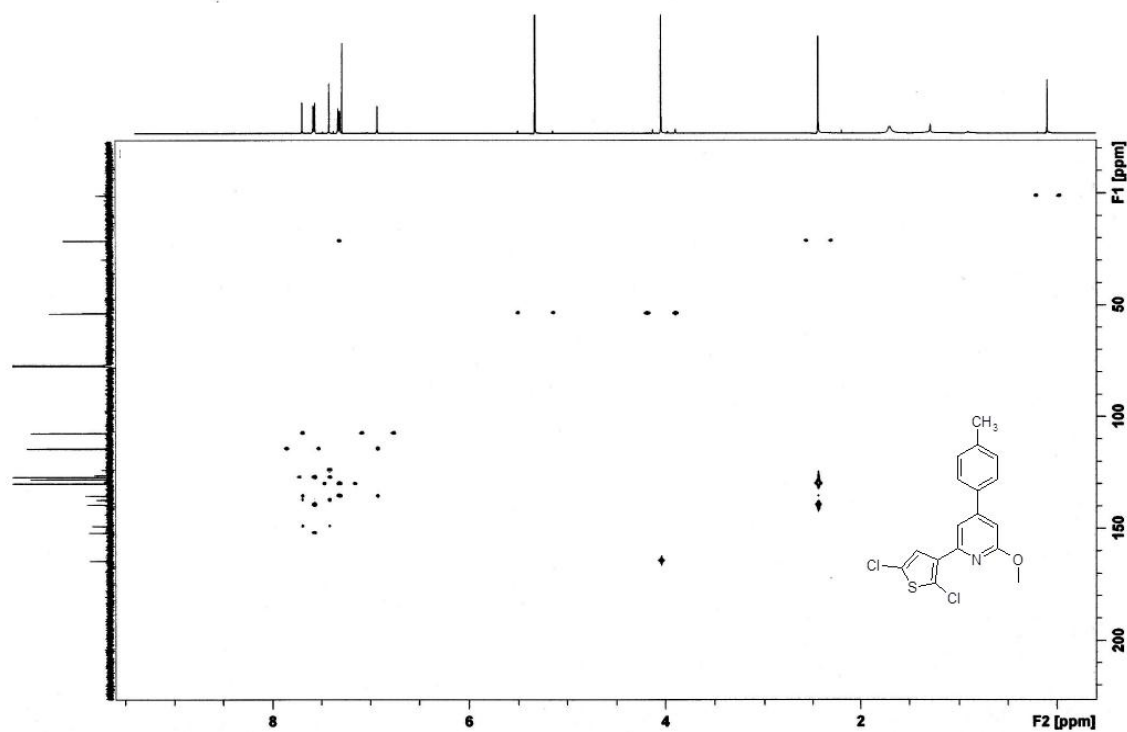
**S 92:**  $^{13}\text{C}$  NMR spectrum ( $\text{CDCl}_3$ , 125MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-p-tolylpyridine (**6b**).



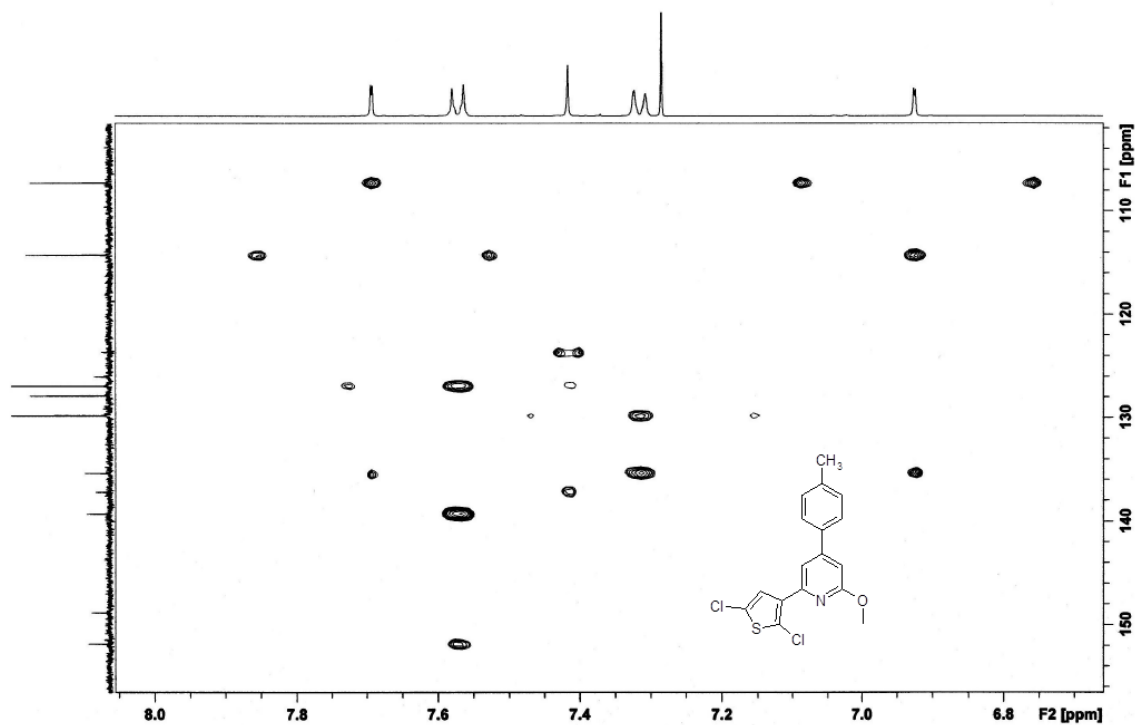
**S 93:** HSQC spectrum (CDCl<sub>3</sub>, 500 MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-p-tolylpyridine (**6b**).



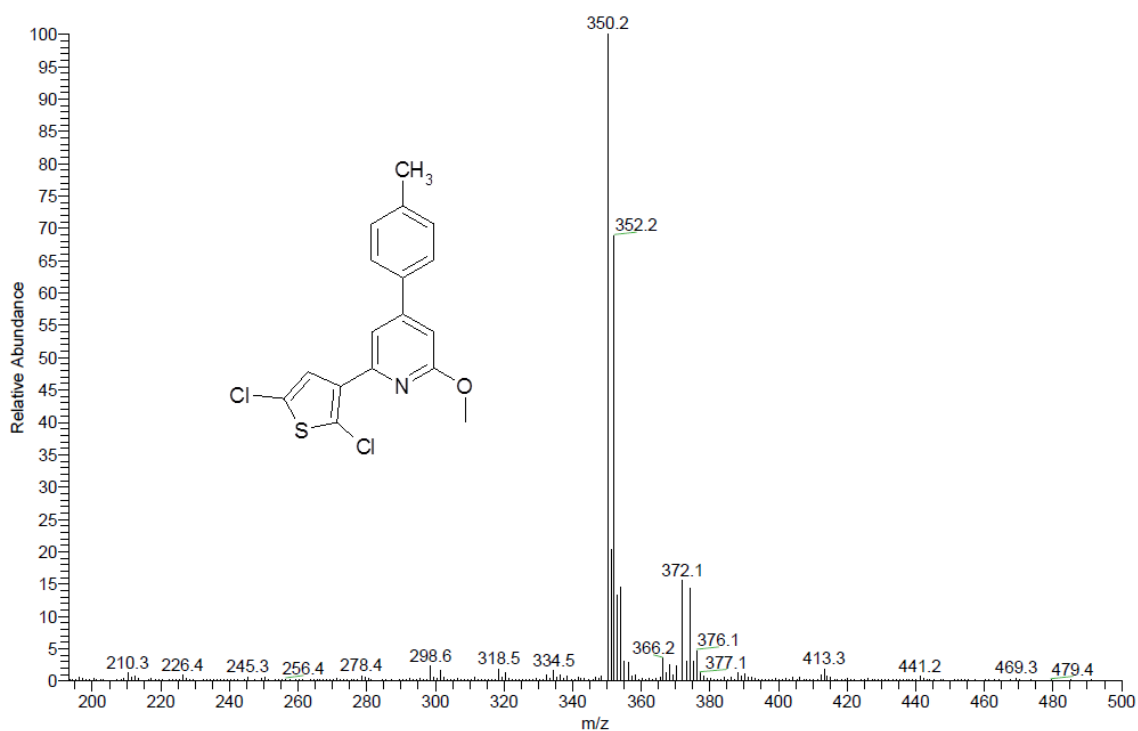
**S 94:** HSQC spectrum (CDCl<sub>3</sub>, 500 MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-p-tolylpyridine (**6b**).



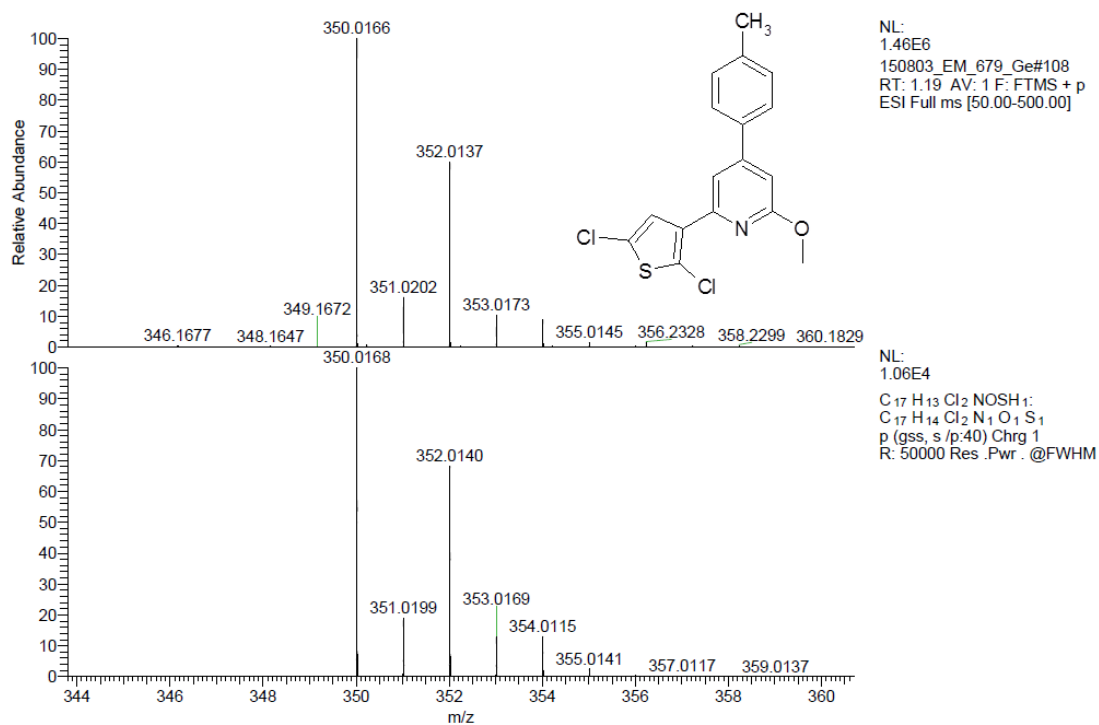
**S 95:** HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-p-tolylpyridine (**6b**).



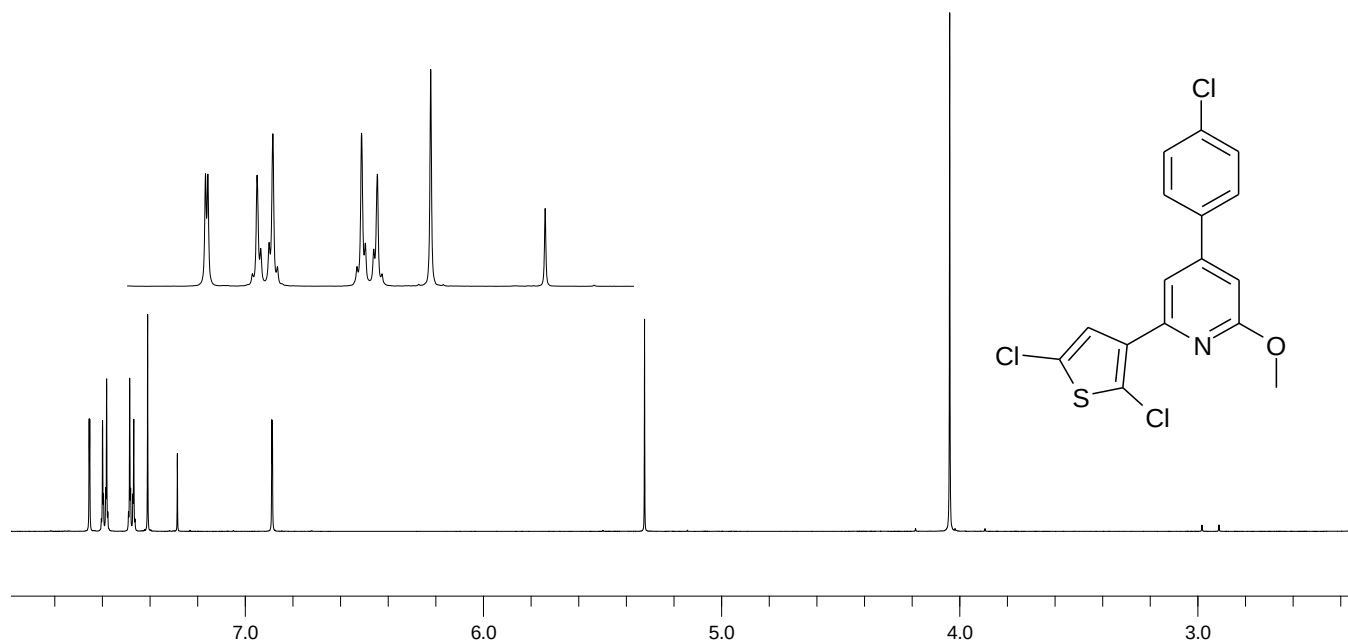
**S 96:** HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-p-tolylpyridine (**6b**).



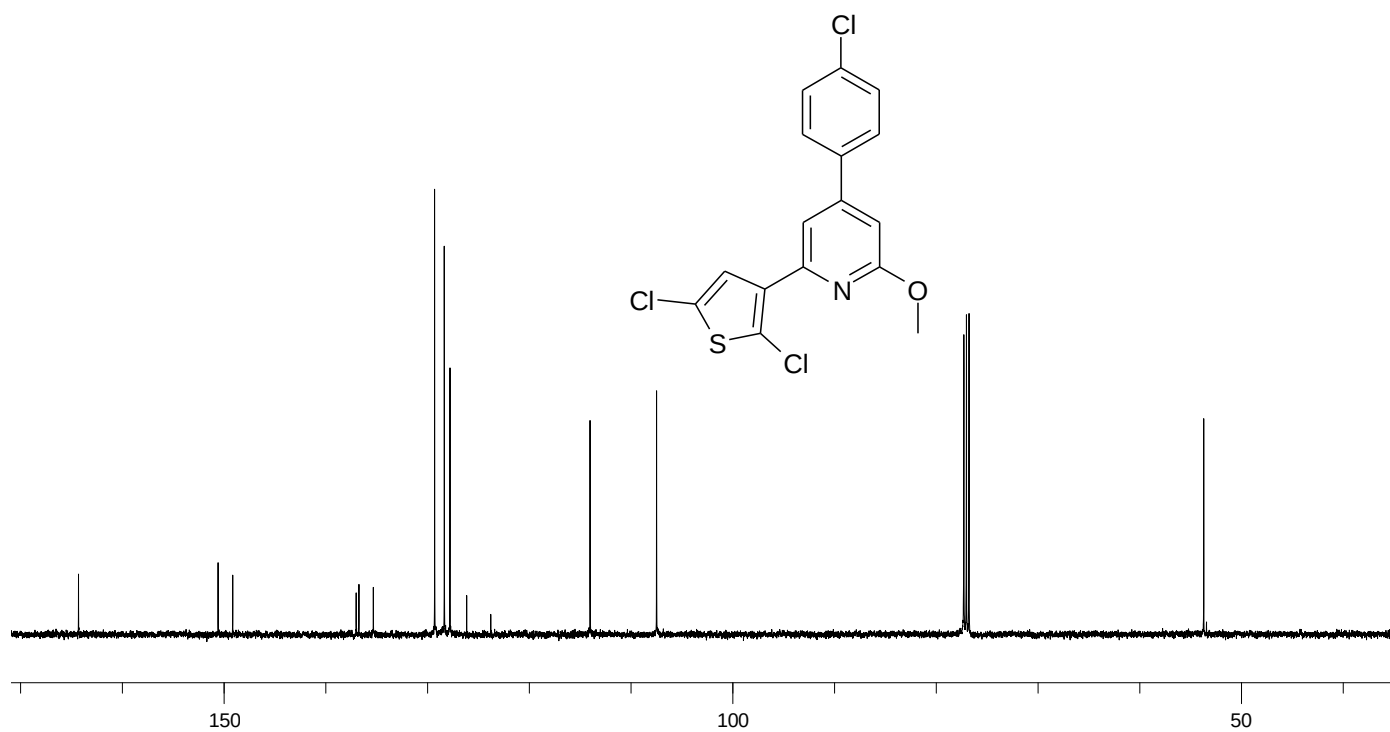
**S 97:** ESI mass spectrum of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-p-tolylpyridine (**6b**).



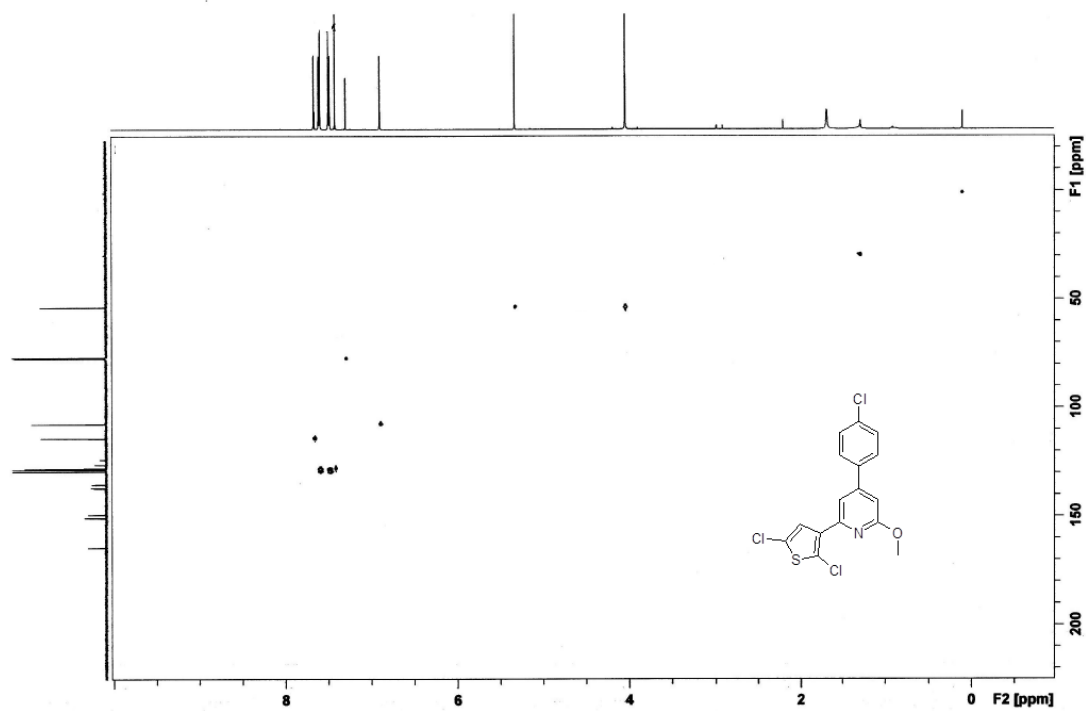
**S 98:** HRESI mass spectrum of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-p-tolylpyridine (**6b**).



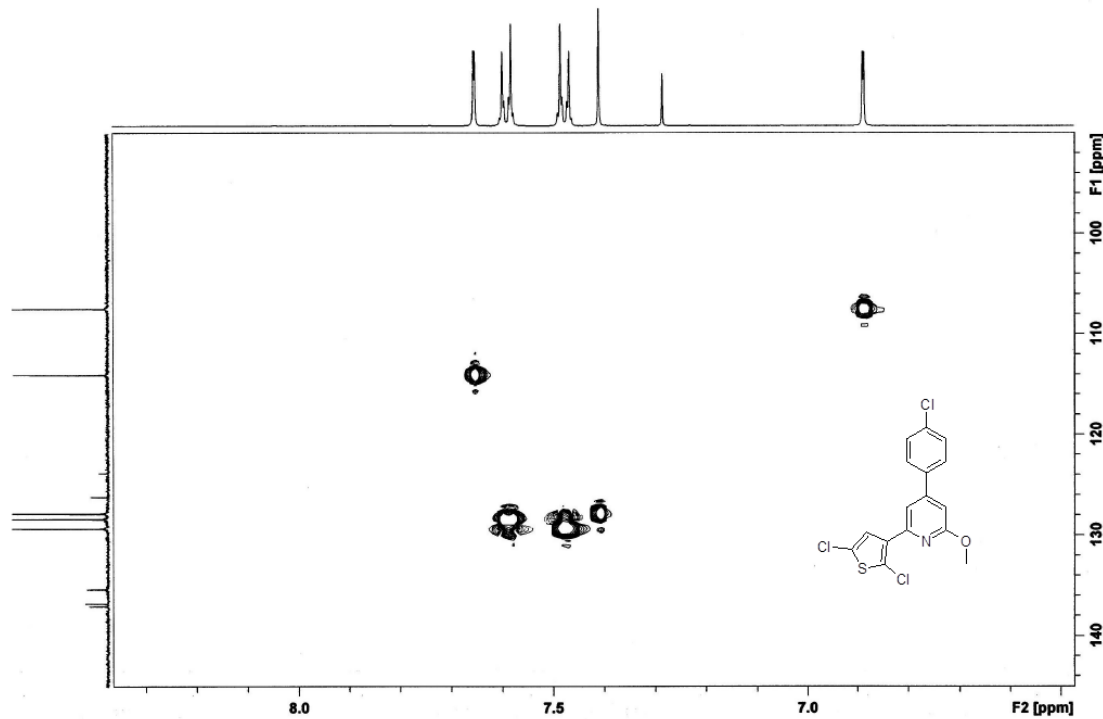
**S 99:** <sup>1</sup>H NMR spectrum (CDCl<sub>3</sub>, 500 MHz) of 4-(4-chlorophenyl)-2-(2,5-dichlorothiophen-3-yl)-6-methoxypyridine (**6c**).



**S 100:** <sup>13</sup>C NMR spectrum (CDCl<sub>3</sub>, 125 MHz) of 4-(4-chlorophenyl)-2-(2,5-dichlorothiophen-3-yl)-6-methoxypyridine (**6c**).

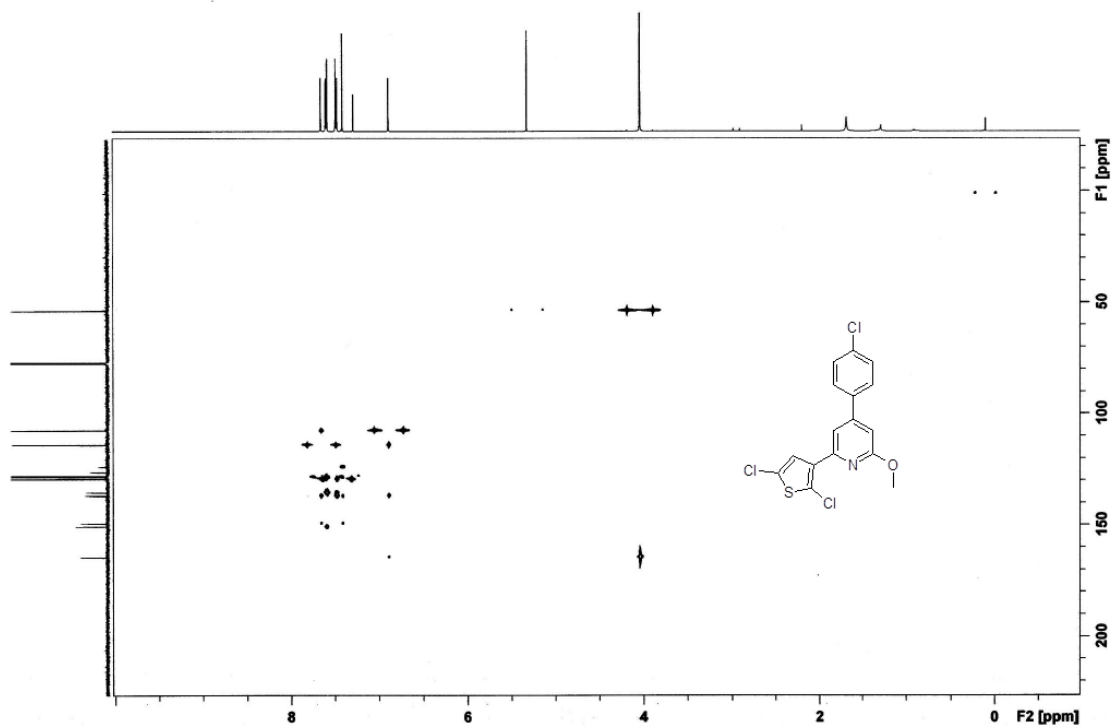


**S 101:** HSQC spectrum (CDCl<sub>3</sub>, 500 MHz) of 4-(4-chlorophenyl)-2-(2,5-dichlorothiophen-3-yl)-6-methoxypyridine (**6c**).

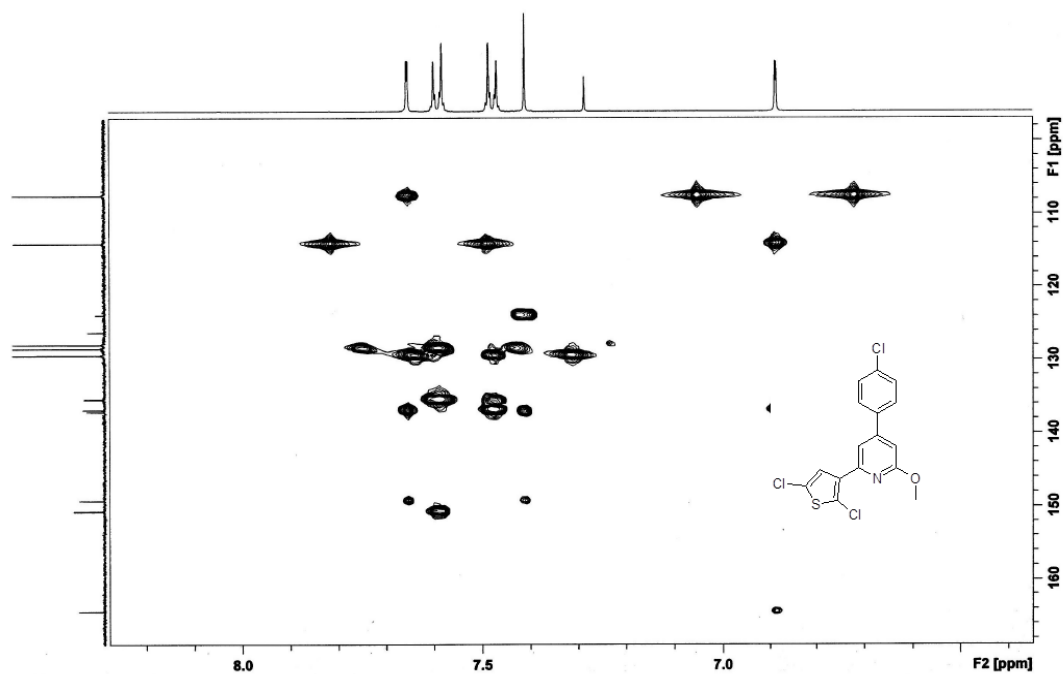


**S 102:** HSQC spectrum (CDCl<sub>3</sub>, 500 MHz) of 4-(4-chlorophenyl)-2-(2,5-dichlorothiophen-3-yl)-6-methoxypyridine (**6c**).

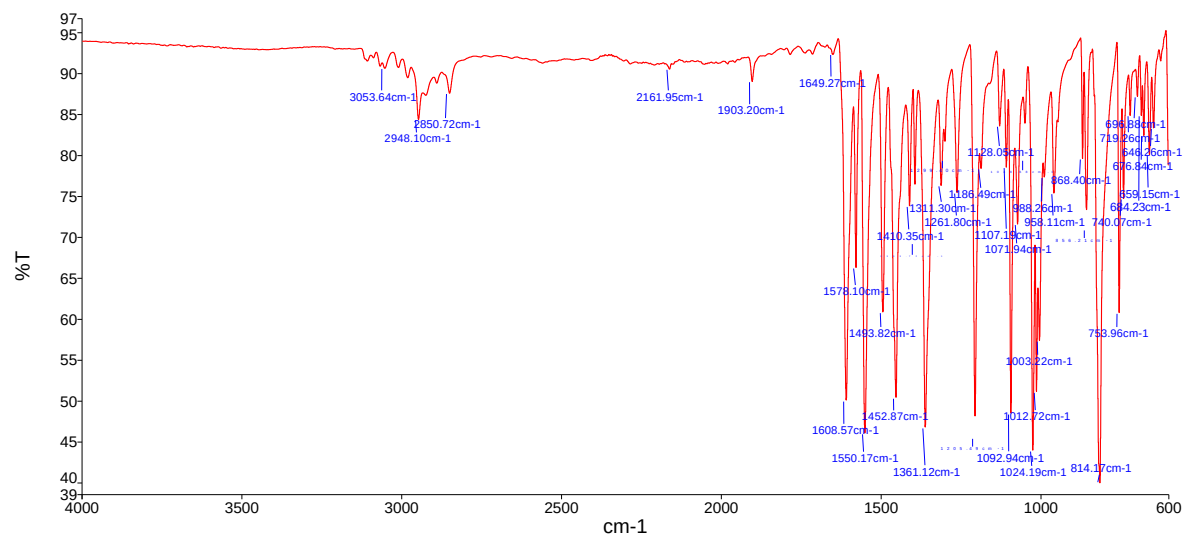




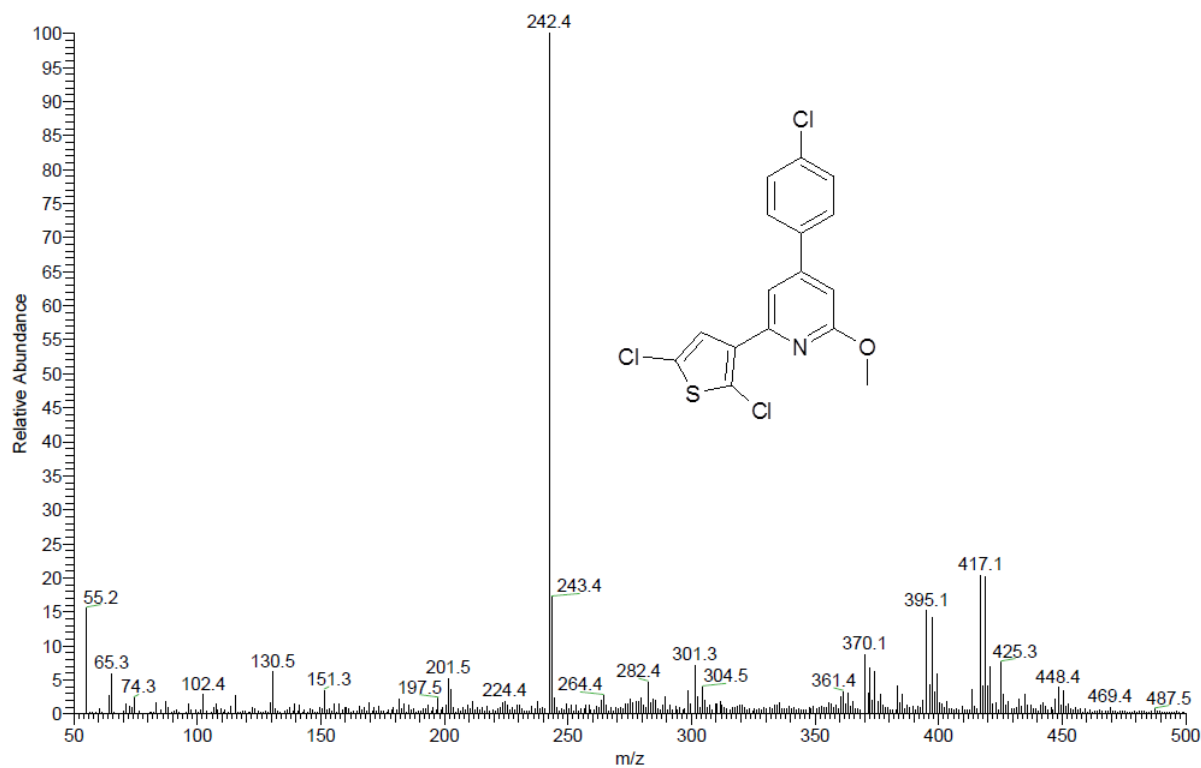
**S 103:** HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 4-(4-chlorophenyl)-2-(2,5-dichlorothiophen-3-yl)-6-methoxypyridine (**6c**).



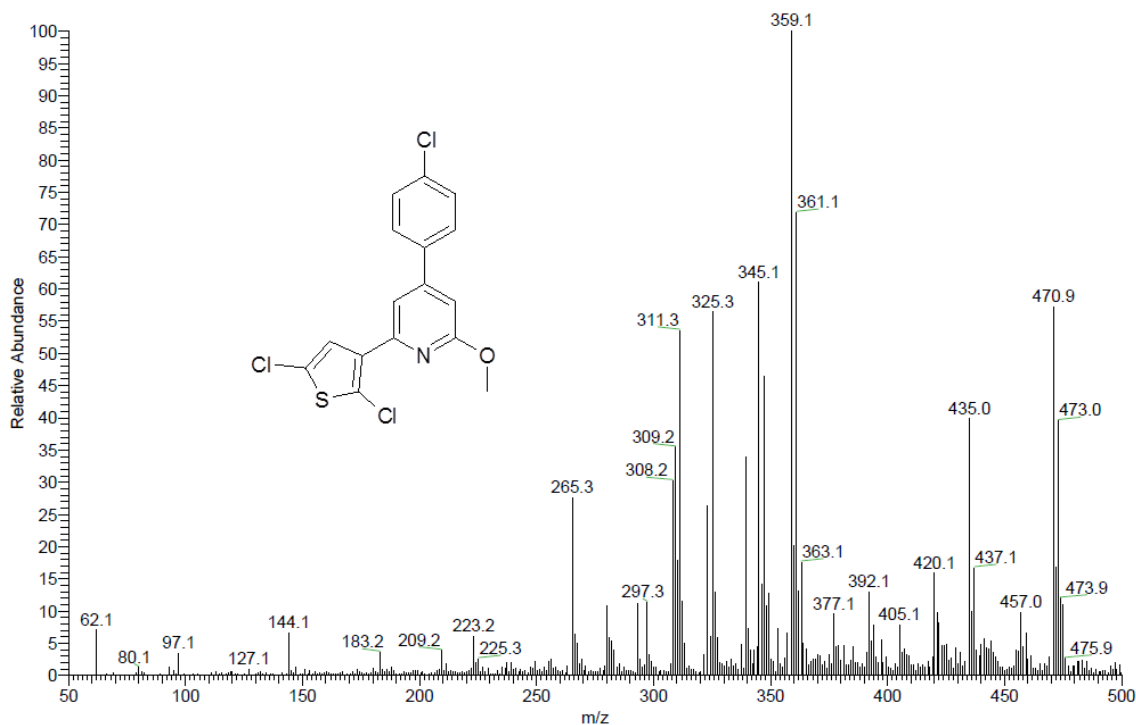
**S 104:** HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 4-(4-chlorophenyl)-2-(2,5-dichlorothiophen-3-yl)-6-methoxypyridine (**6c**).



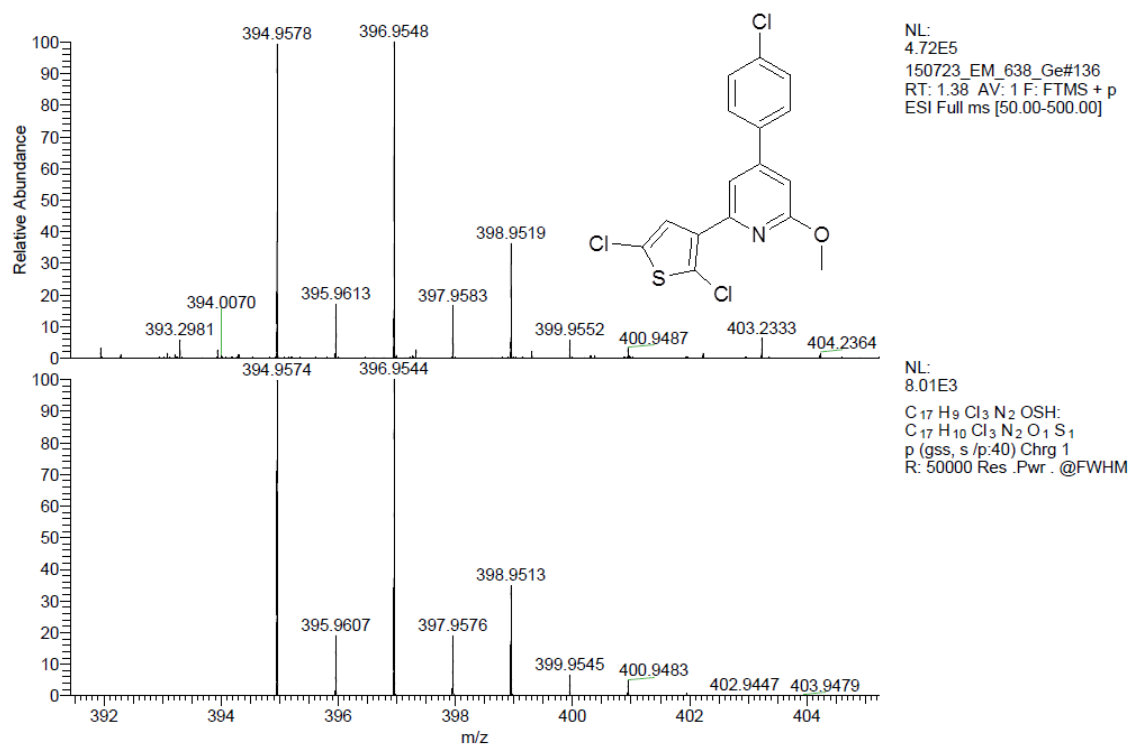
**S 105:** IR spectrum of 4-(4-chlorophenyl)-2-(2,5-dichlorothiophen-3-yl)-6-methoxypyridine (6c).



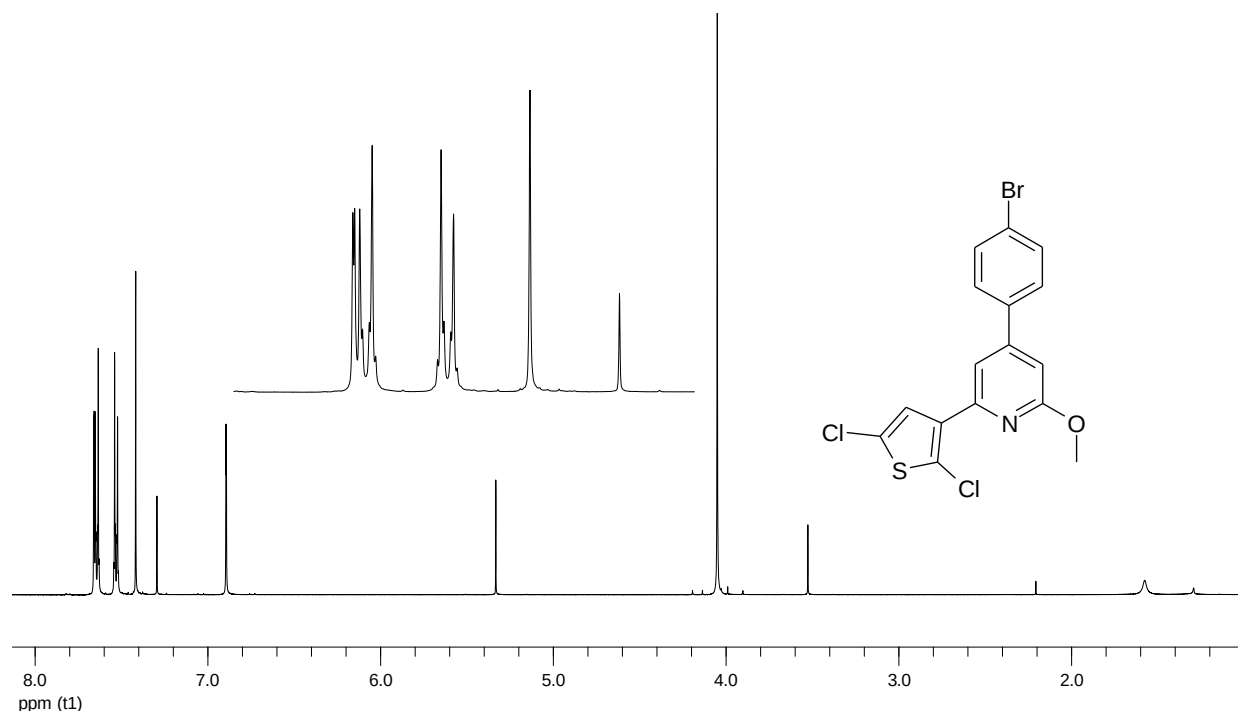
**S 106:** ESI mass spectrum of 4-(4-chlorophenyl)-2-(2,5-dichlorothiophen-3-yl)-6-methoxypyridine (6c).



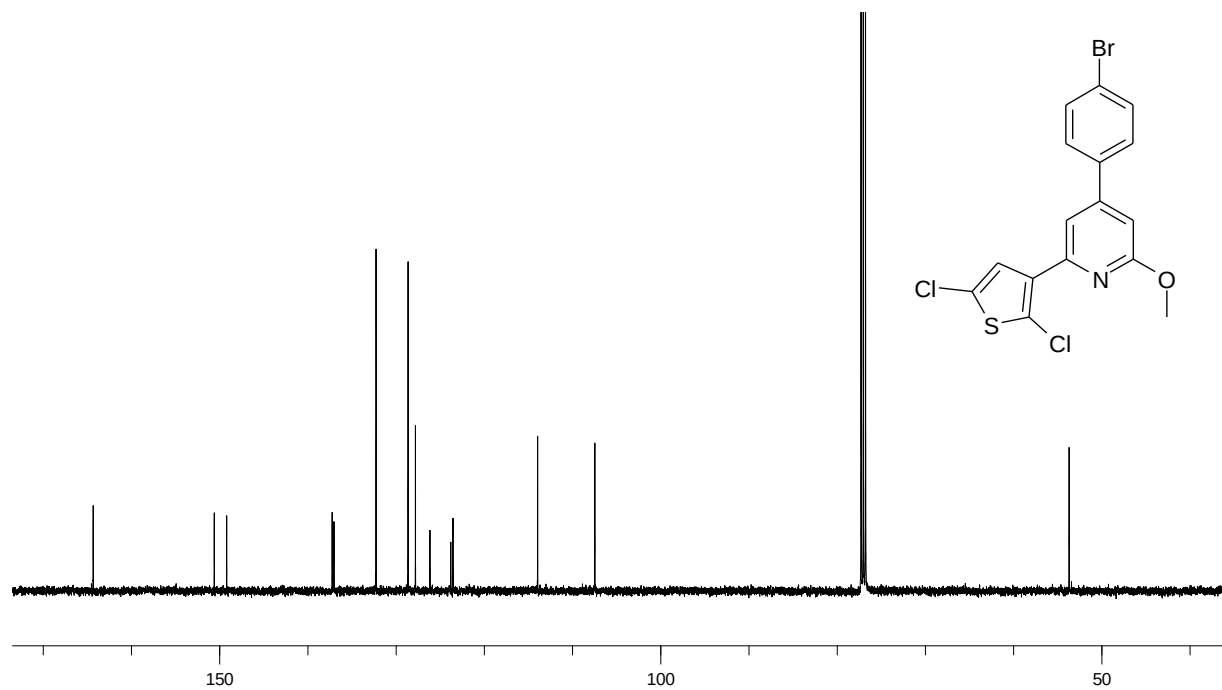
**S 107:** ESI mass spectrum of 4-(4-chlorophenyl)-2-(2,5-dichlorothiophen-3-yl)-6-methoxypyridine (**6c**).



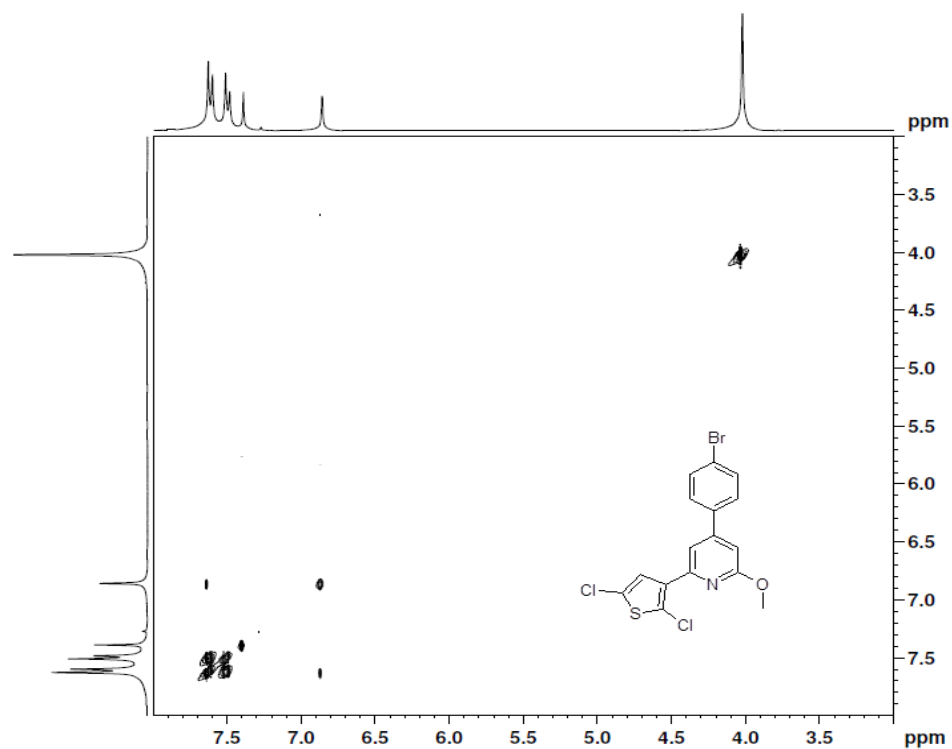
**S 108:** HRESI mass spectrum of 4-(4-chlorophenyl)-2-(2,5-dichlorothiophen-3-yl)-6-methoxypyridine (**6c**).



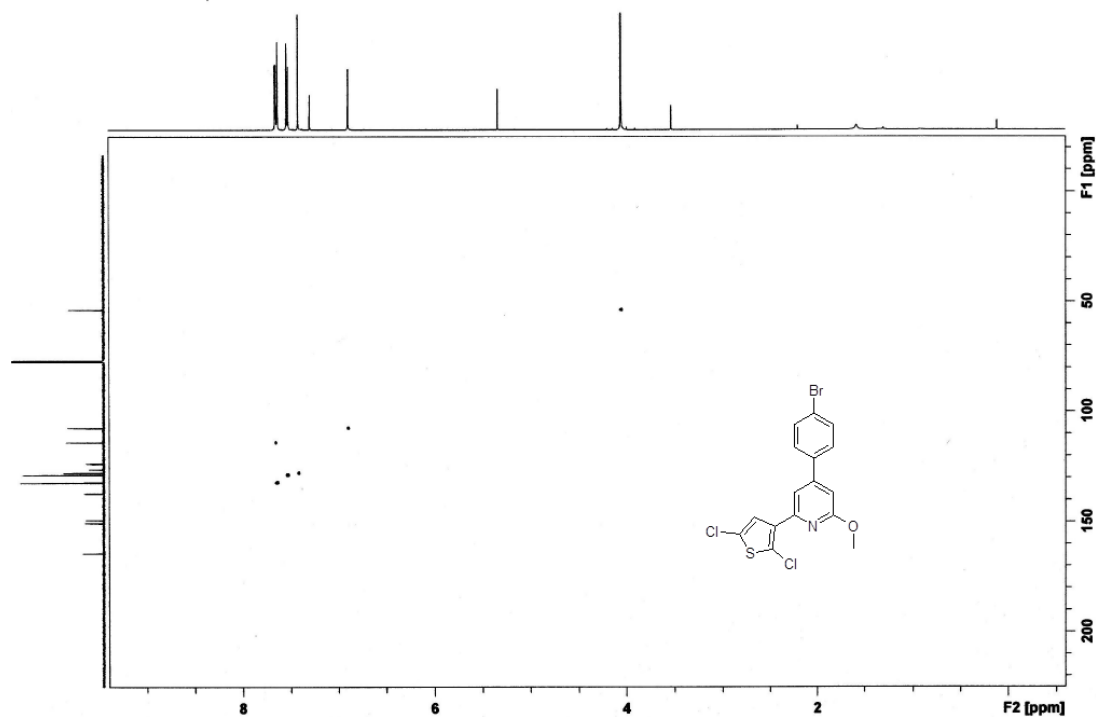
**S 109:** <sup>1</sup>H NMR spectrum (CDCl<sub>3</sub>, 500 MHz) of 4-(4-bromophenyl)-2-(2,5-dichlorothiophen-3-yl)-6-methoxypyridine (**6d**).



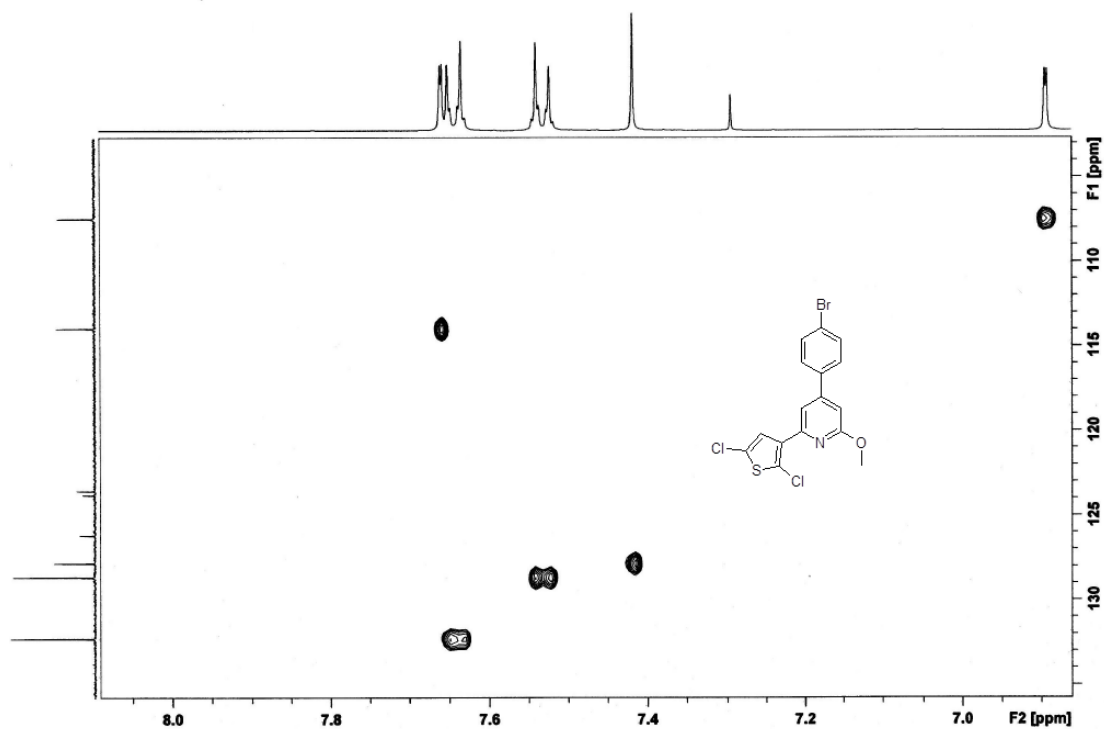
**S 110:** <sup>13</sup>C NMR spectrum (CDCl<sub>3</sub>, 125 MHz) of 4-(4-bromophenyl)-2-(2,5-dichlorothiophen-3-yl)-6-methoxypyridine (**6d**).



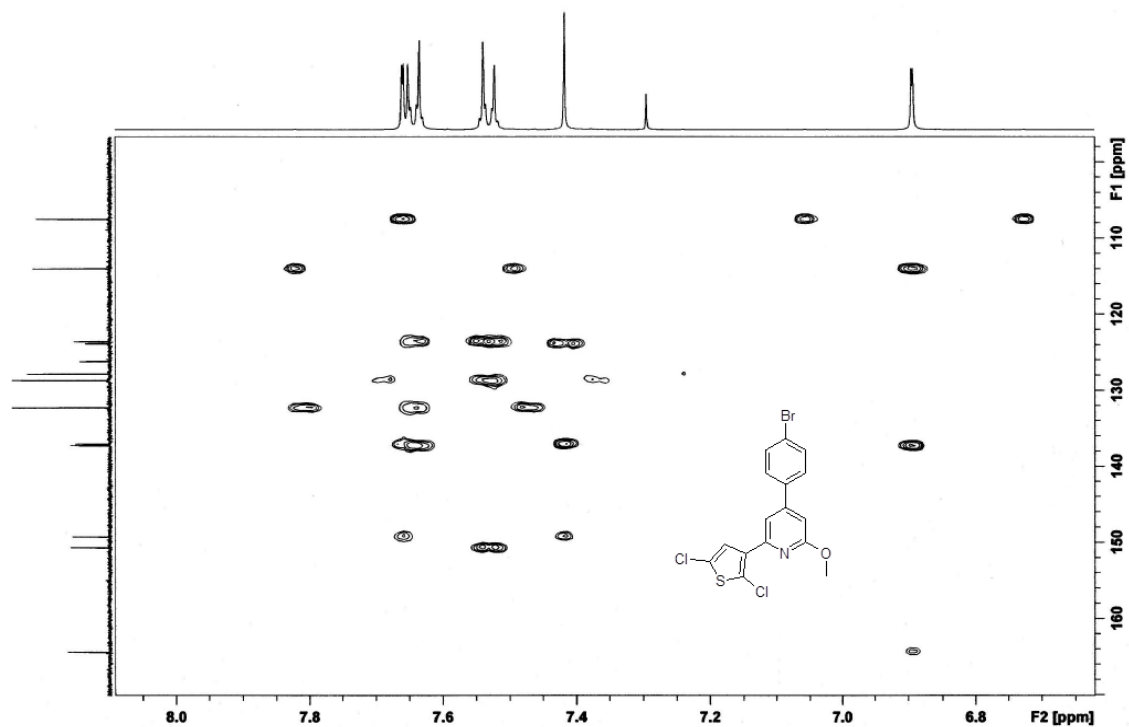
**S 111:** H,H COSY spectrum (CDCl<sub>3</sub>, 300 MHz) of 4-(4-bromophenyl)-2-(2,5-dichlorothiophen-3-yl)-6-methoxypyridine (**6d**).



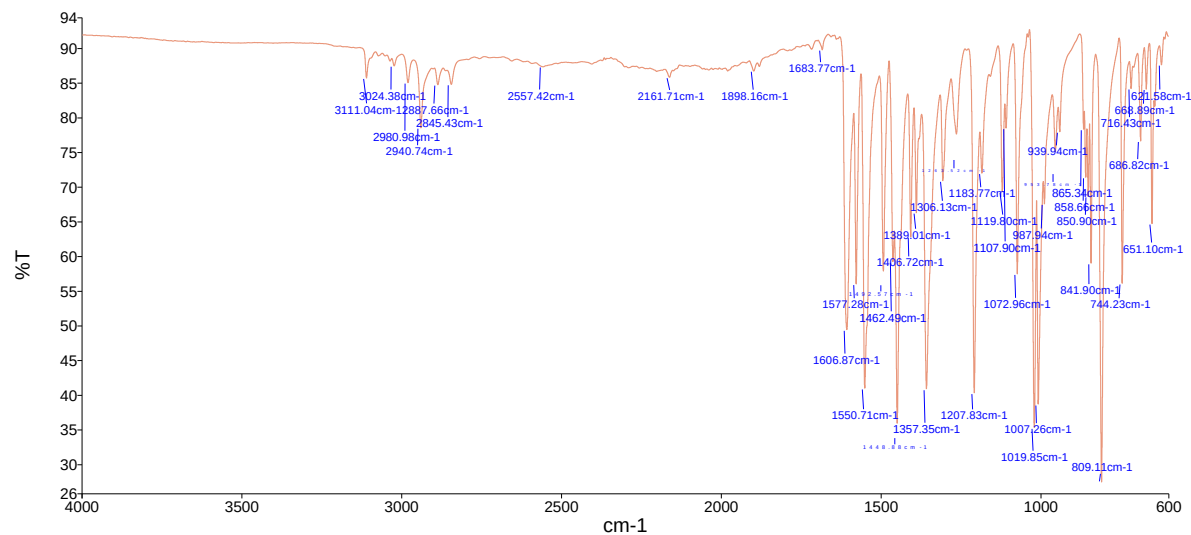
**S 112:** HSQC spectrum (CDCl<sub>3</sub>, 500 MHz) of 4-(4-bromophenyl)-2-(2,5-dichlorothiophen-3-yl)-6-methoxypyridine (**6d**).



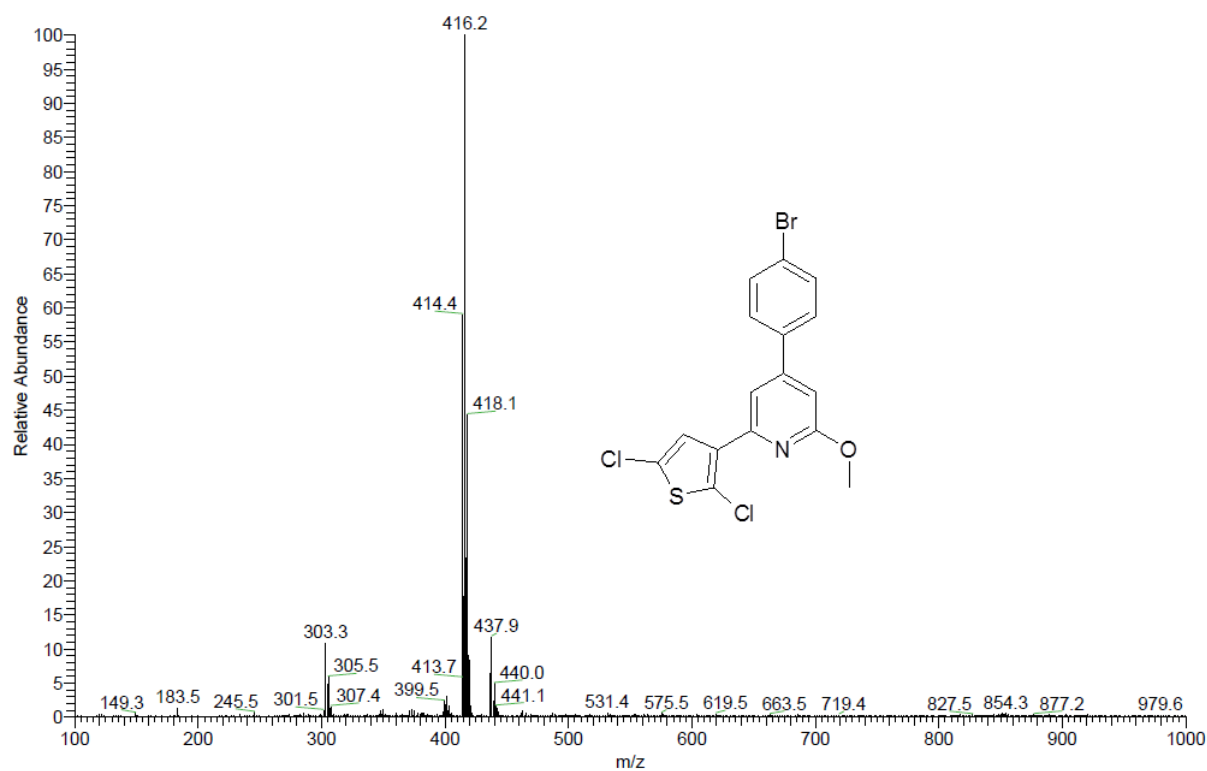
**S 113:** HSQC spectrum (CDCl<sub>3</sub>, 500 MHz) of 4-(4-bromophenyl)-2-(2,5-dichlorothiophen-3-yl)-6-methoxypyridine (**6d**).



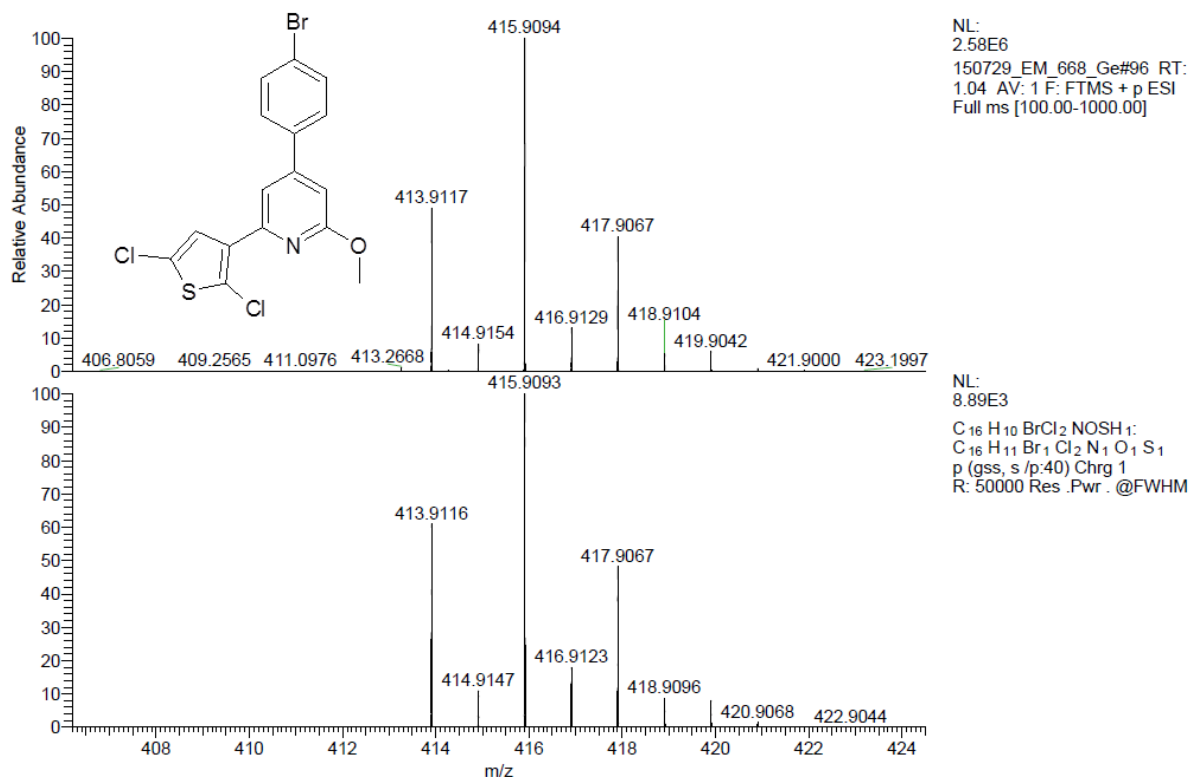
**S 114:** HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 4-(4-bromophenyl)-2-(2,5-dichlorothiophen-3-yl)-6-methoxypyridine (**6d**).



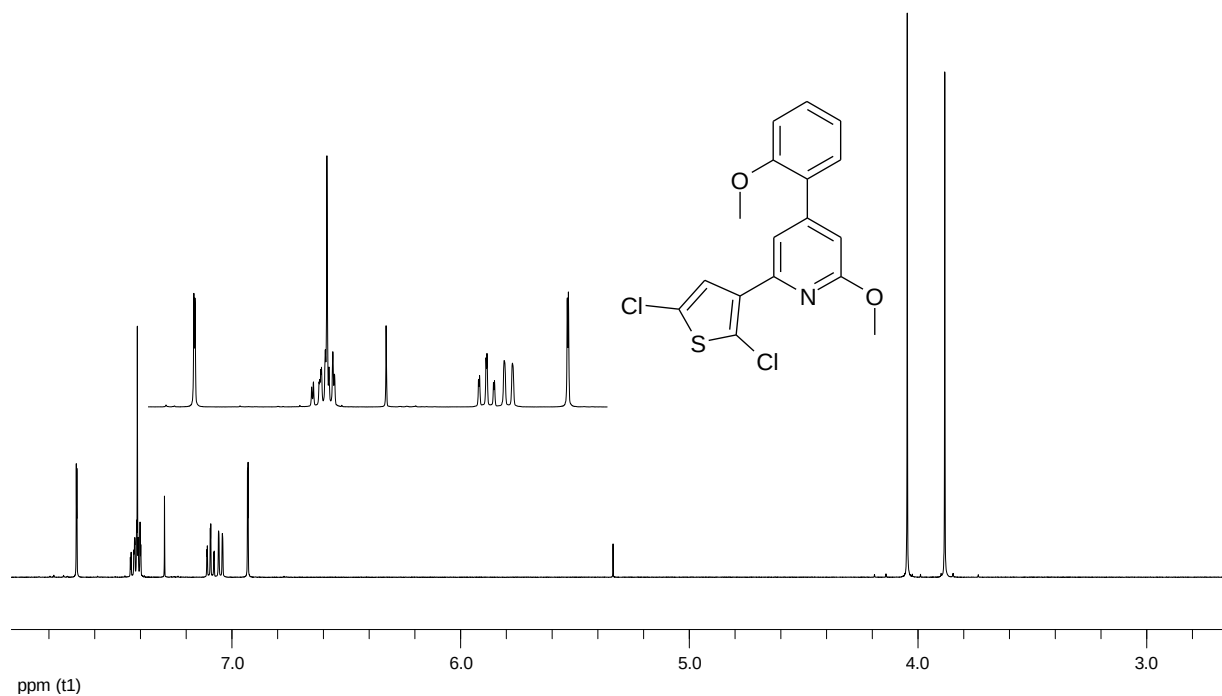
**S 115:** IR spectrum of 4-(4-bromophenyl)-2-(2,5-dichlorothiophen-3-yl)-6-methoxypyridine (**6d**).



**S 116:** ESI mass spectrum of 4-(4-bromophenyl)-2-(2,5-dichlorothiophen-3-yl)-6-methoxypyridine (**6d**).

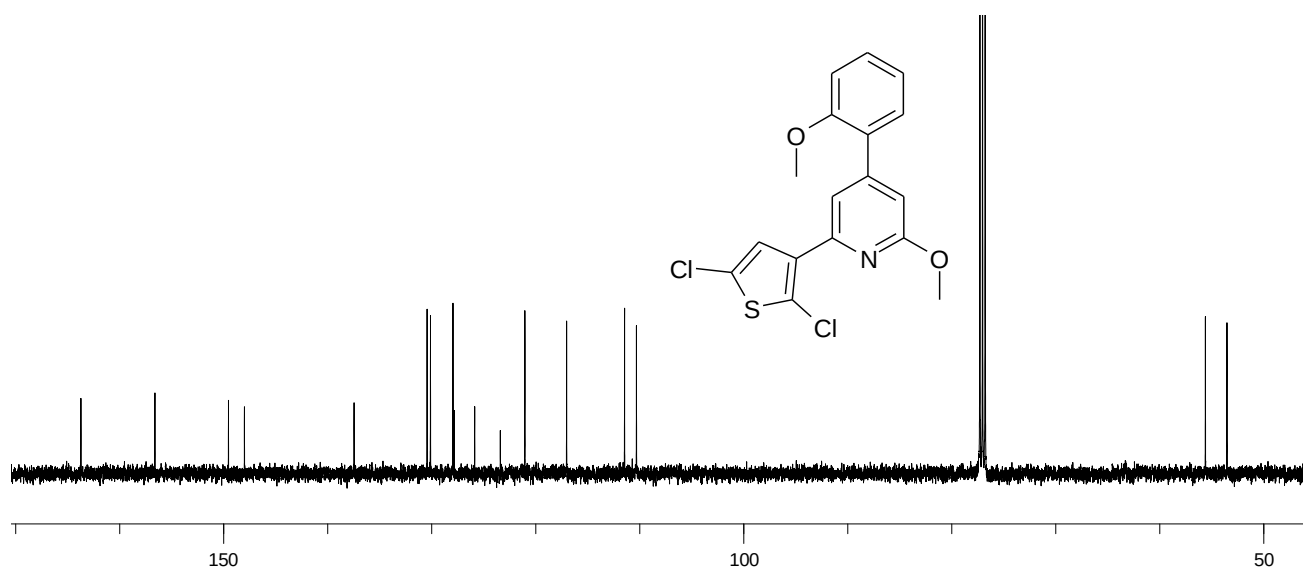


**S 117:** HRESI mass spectrum of 4-(4-bromophenyl)-2-(2,5-dichlorothiophen-3-yl)-6-methoxypyridine (**6d**).

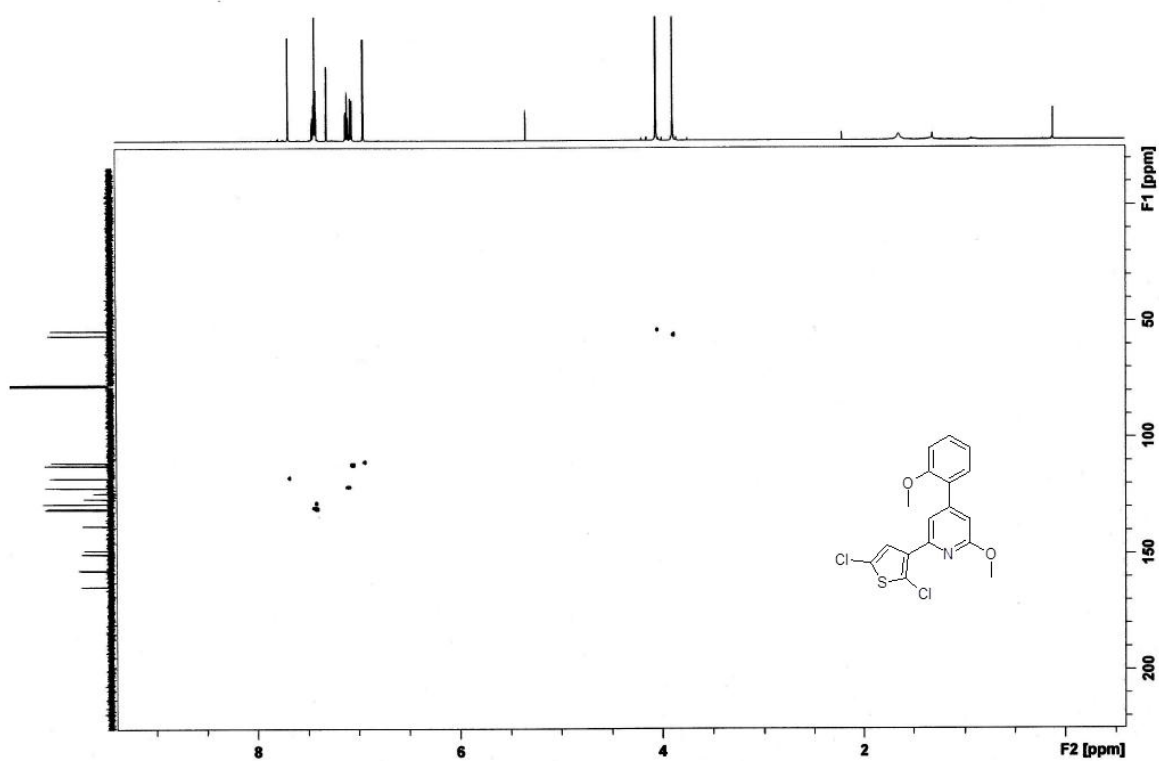


**S 118:** <sup>1</sup>H NMR spectrum (CDCl<sub>3</sub>, 500 MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-(2-methoxyphenyl)pyridine (**6e**).

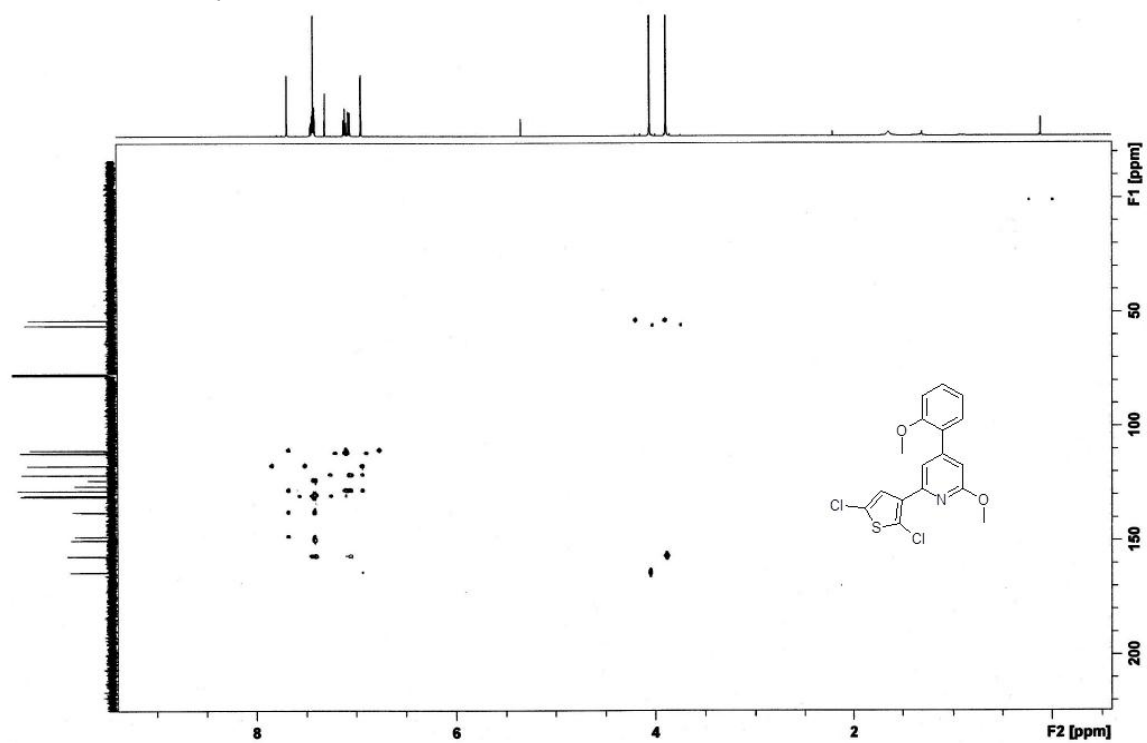




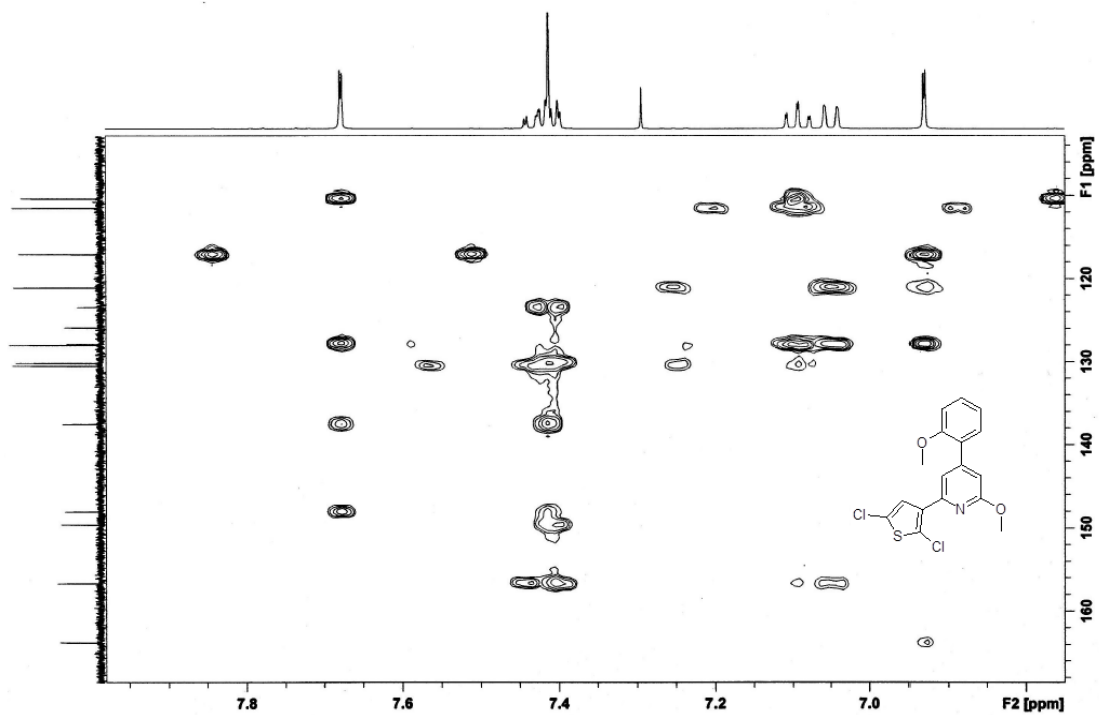
**S 119:**  $^{13}\text{C}$  NMR spectrum ( $\text{CDCl}_3$ , 125MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-(2-methoxyphenyl)pyridine (**6e**).



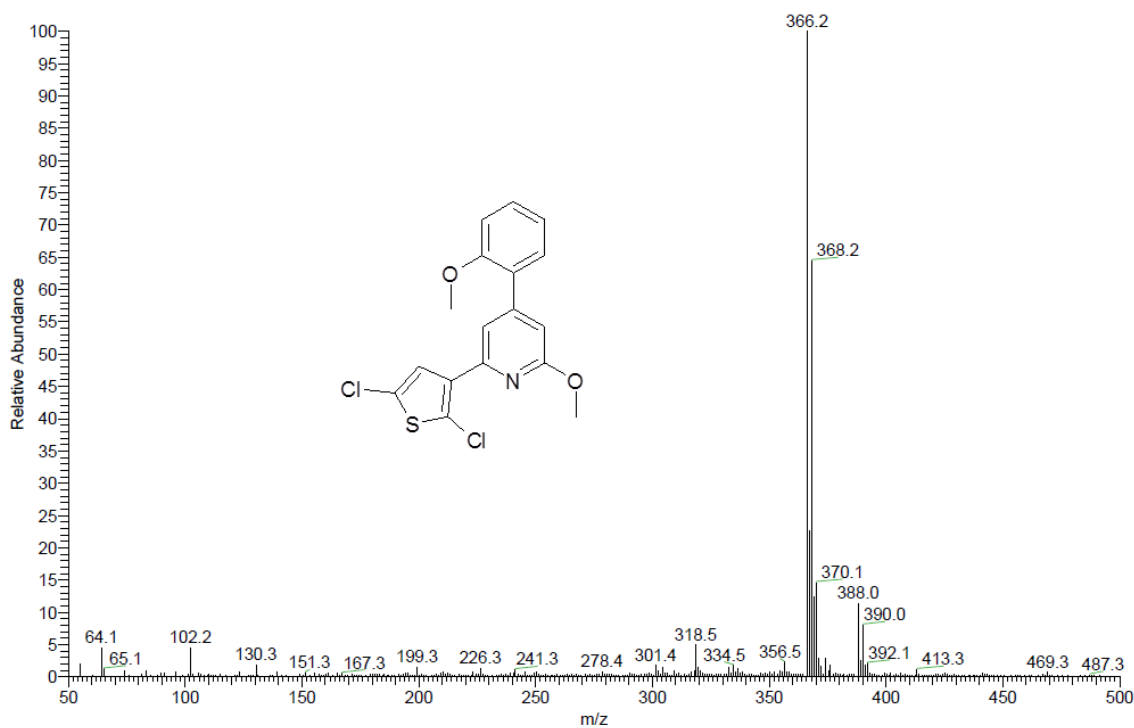
**S 120:** HSQC spectrum ( $\text{CDCl}_3$ , 500 MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-(2-methoxyphenyl)pyridine (**6e**).



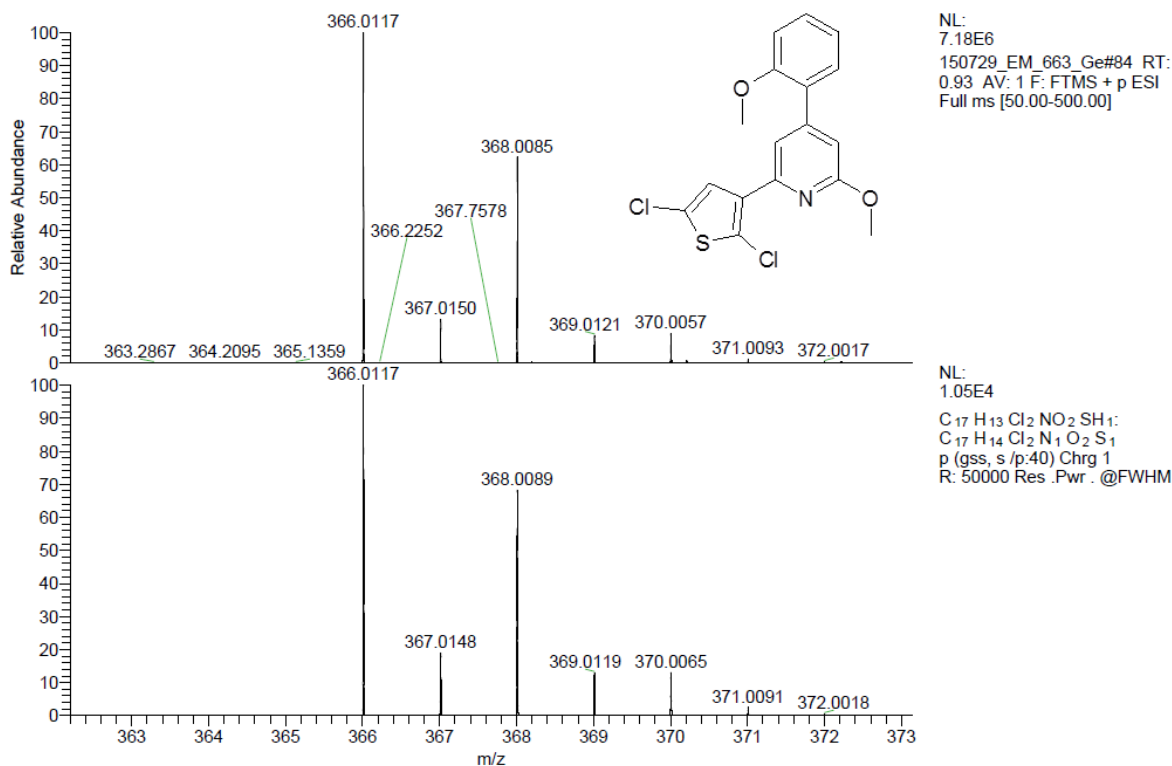
S 121: HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-(2-methoxyphenyl)pyridine (**6e**).



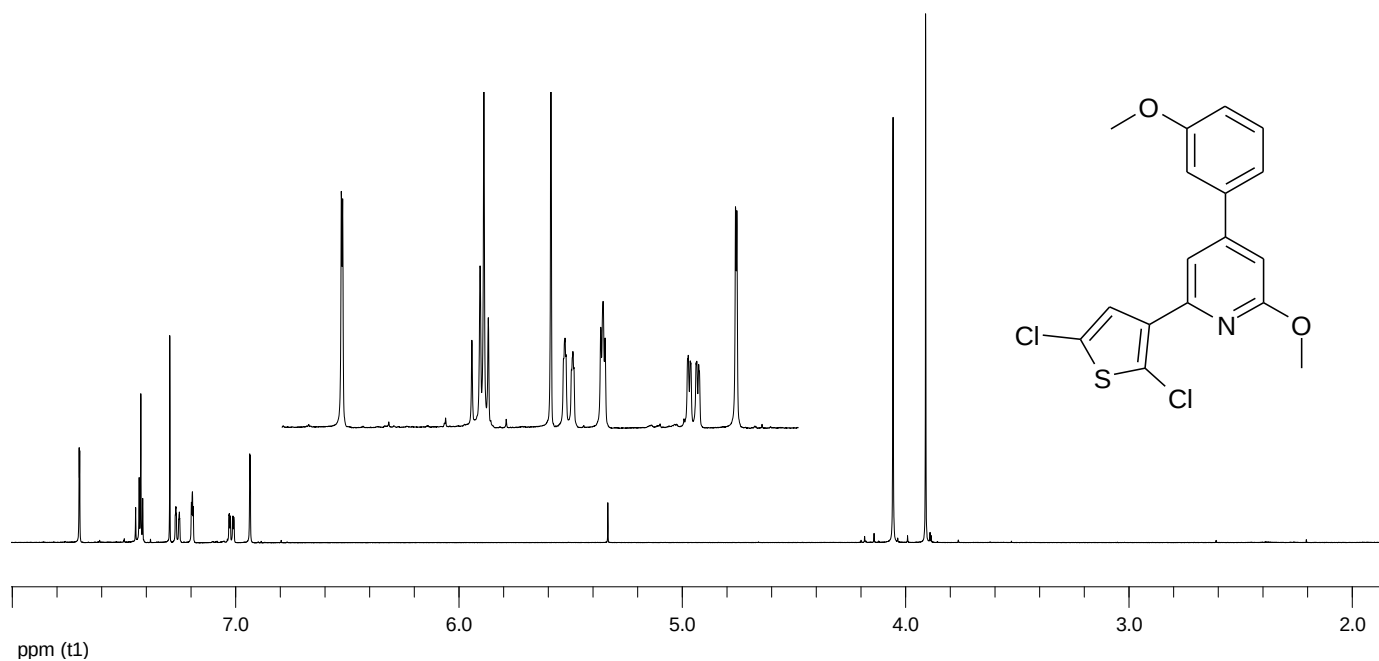
S 122: HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-(2-methoxyphenyl)pyridine (**6e**).



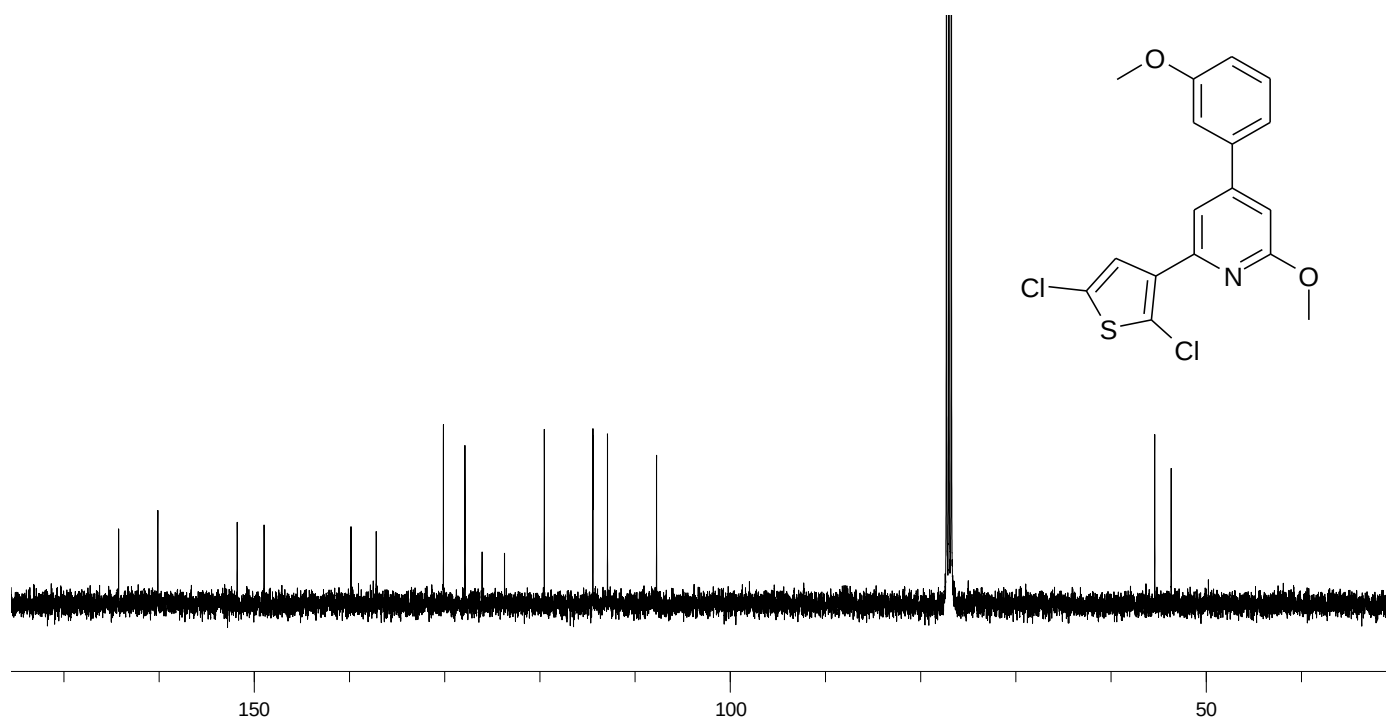
**S 123:** ESI mass spectrum of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-(2-methoxyphenyl)pyridine (**6e**).



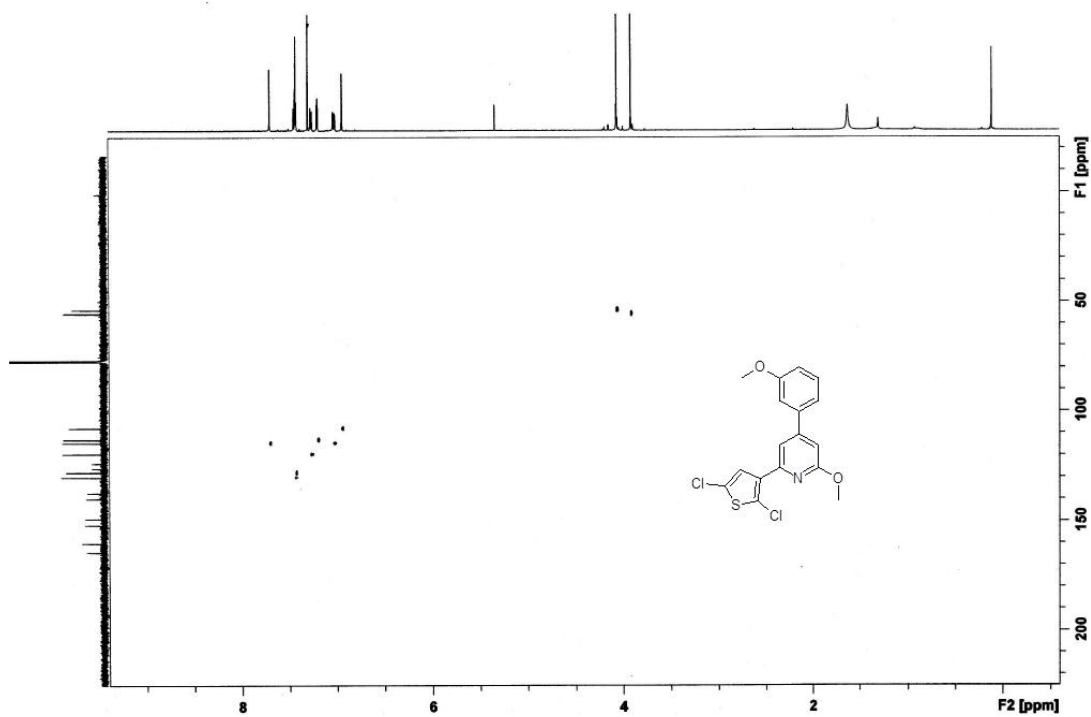
**S 124:** HRESI mass spectrum of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-(2-methoxyphenyl)pyridine (**6e**).



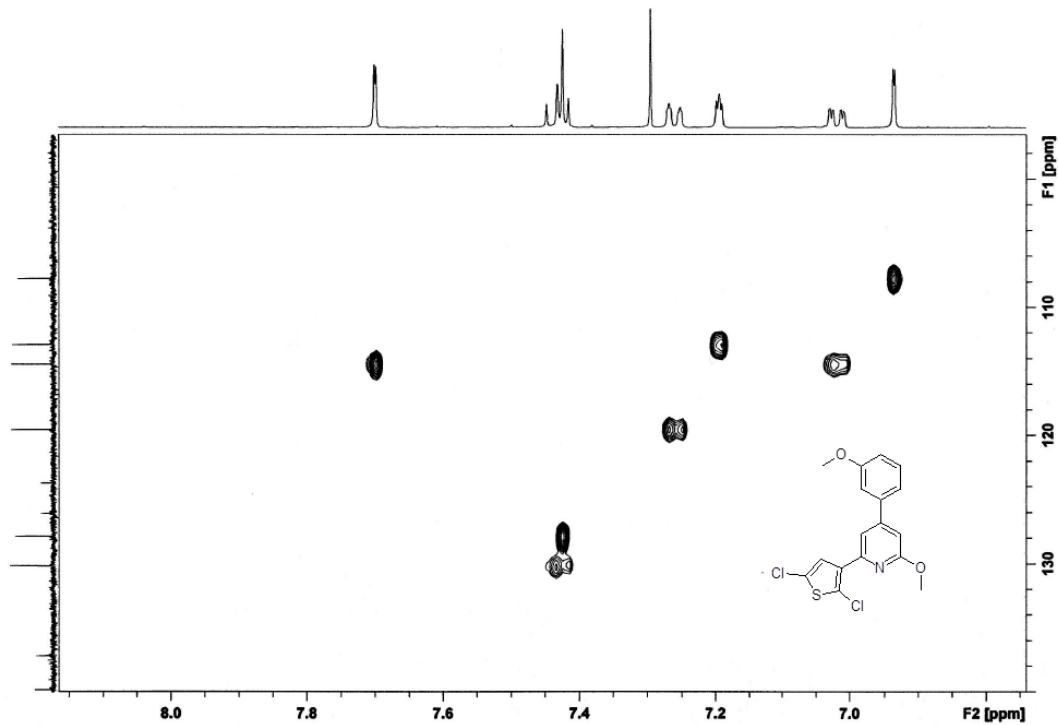
**S 125:**  $^1\text{H}$  NMR spectrum ( $\text{CDCl}_3$ , 500 MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-(3-methoxyphenyl)pyridine (**6f**).



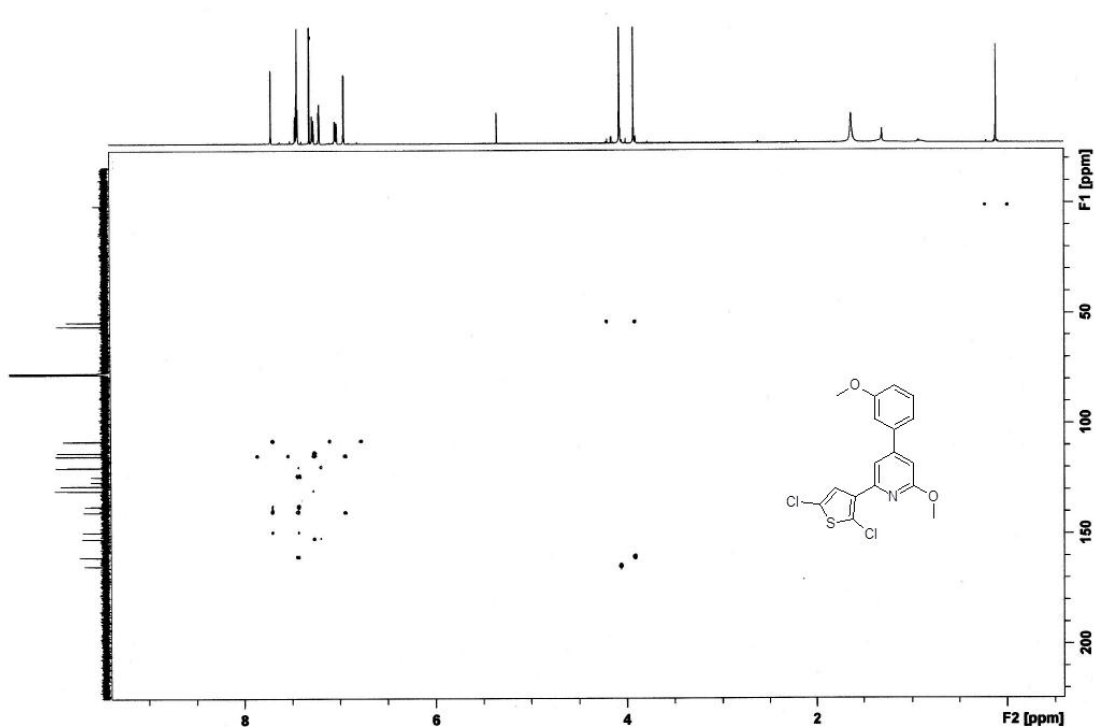
**S 126:**  $^{13}\text{C}$  NMR spectrum ( $\text{CDCl}_3$ , 125MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-(3-methoxyphenyl)pyridine (**6f**).



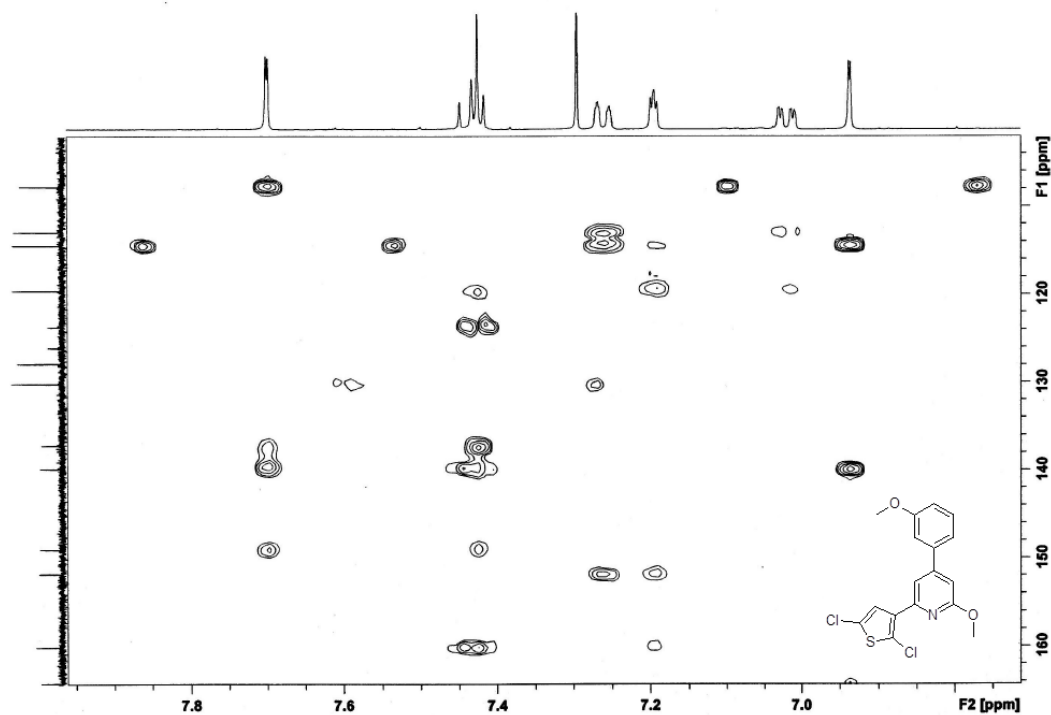
S 127: HSQC spectrum (CDCl<sub>3</sub>, 500 MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-(3-methoxyphenyl)pyridine (**6f**).



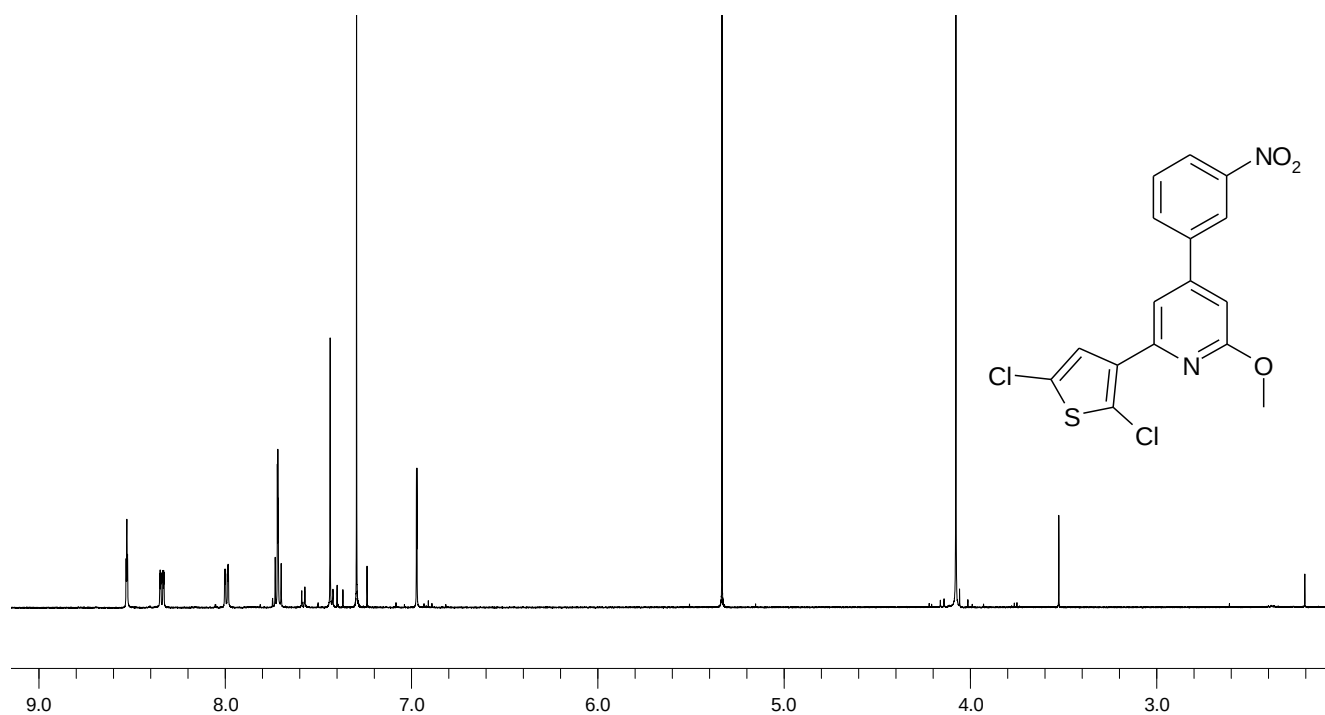
S 128: HSQC spectrum (CDCl<sub>3</sub>, 500 MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-(3-methoxyphenyl)pyridine (**6f**).



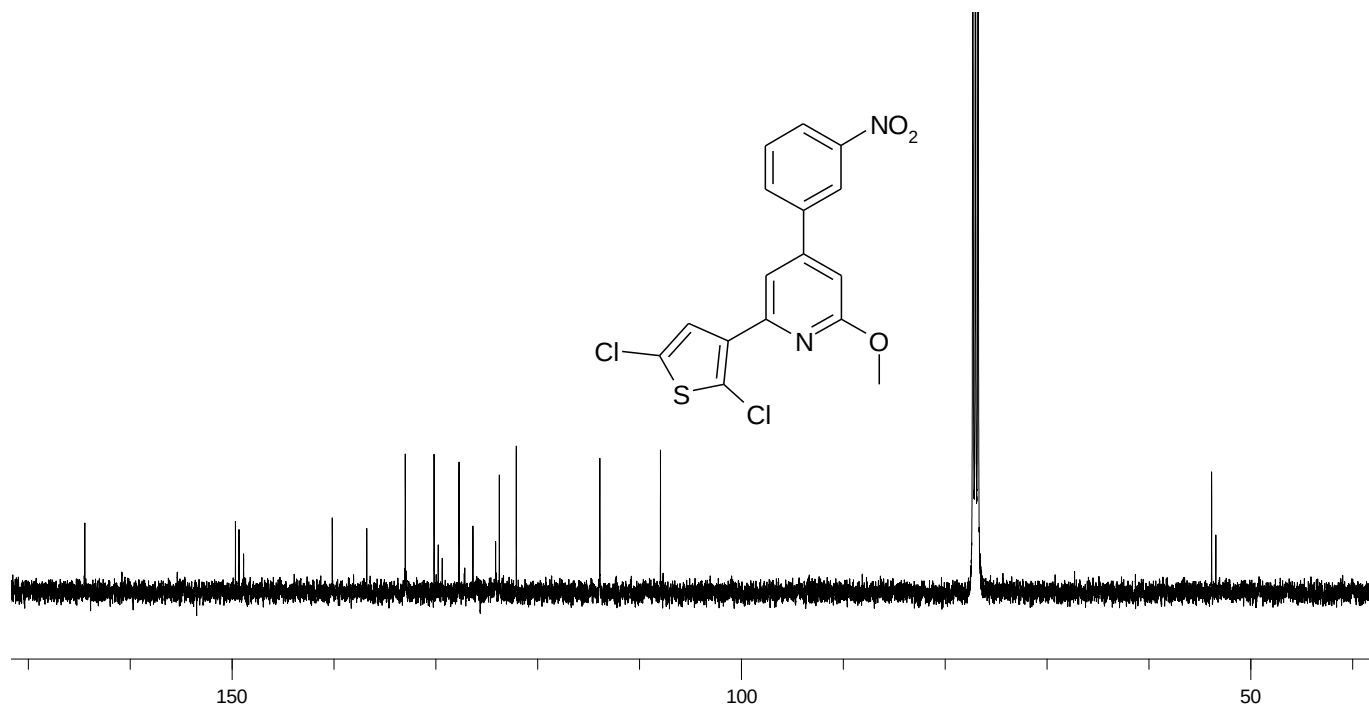
**S 129:** HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-(3-methoxyphenyl)pyridine (**6f**).



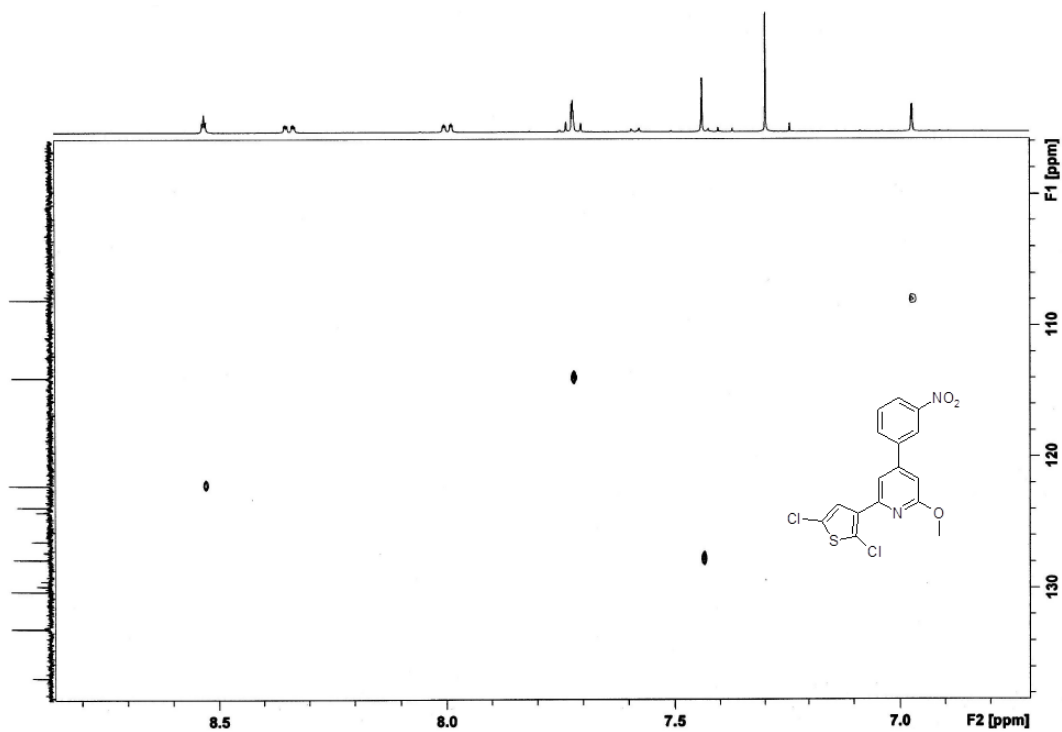
**S 130:** HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-(3-methoxyphenyl)pyridine (**6f**).



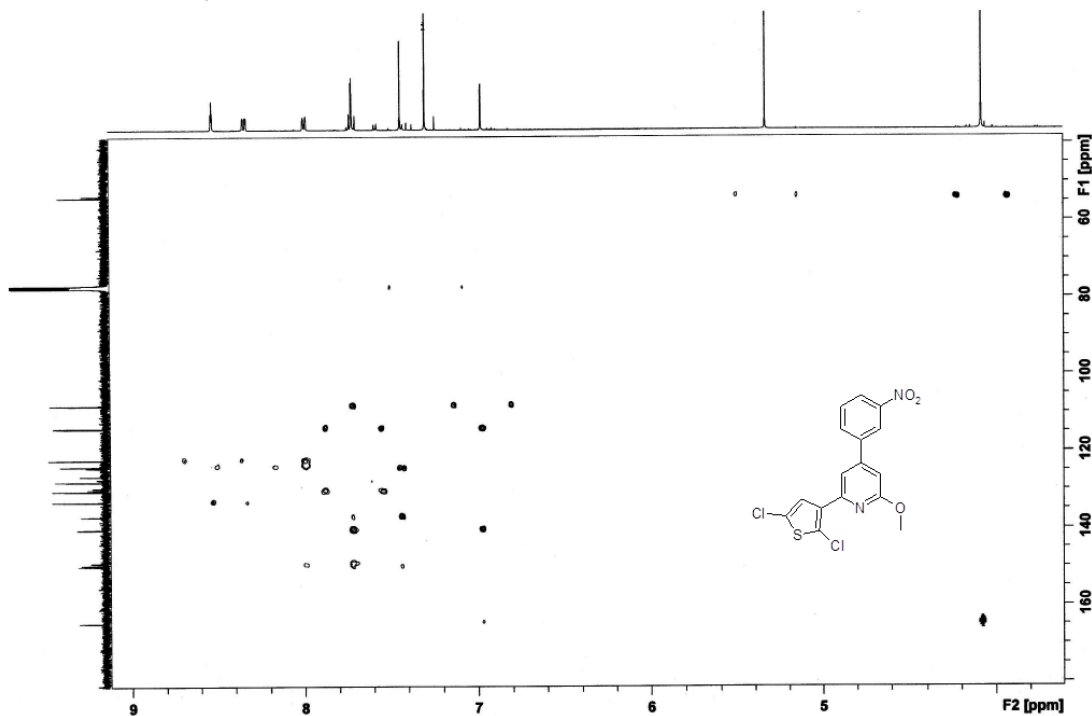
**S 131:**  $^1\text{H}$  NMR spectrum ( $\text{CDCl}_3$ , 500 MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-(3-nitrophenyl)pyridine (**6g**).



**S 132:**  $^{13}\text{C}$  NMR spectrum ( $\text{CDCl}_3$ , 125MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-(3-nitrophenyl)pyridine (**6g**).

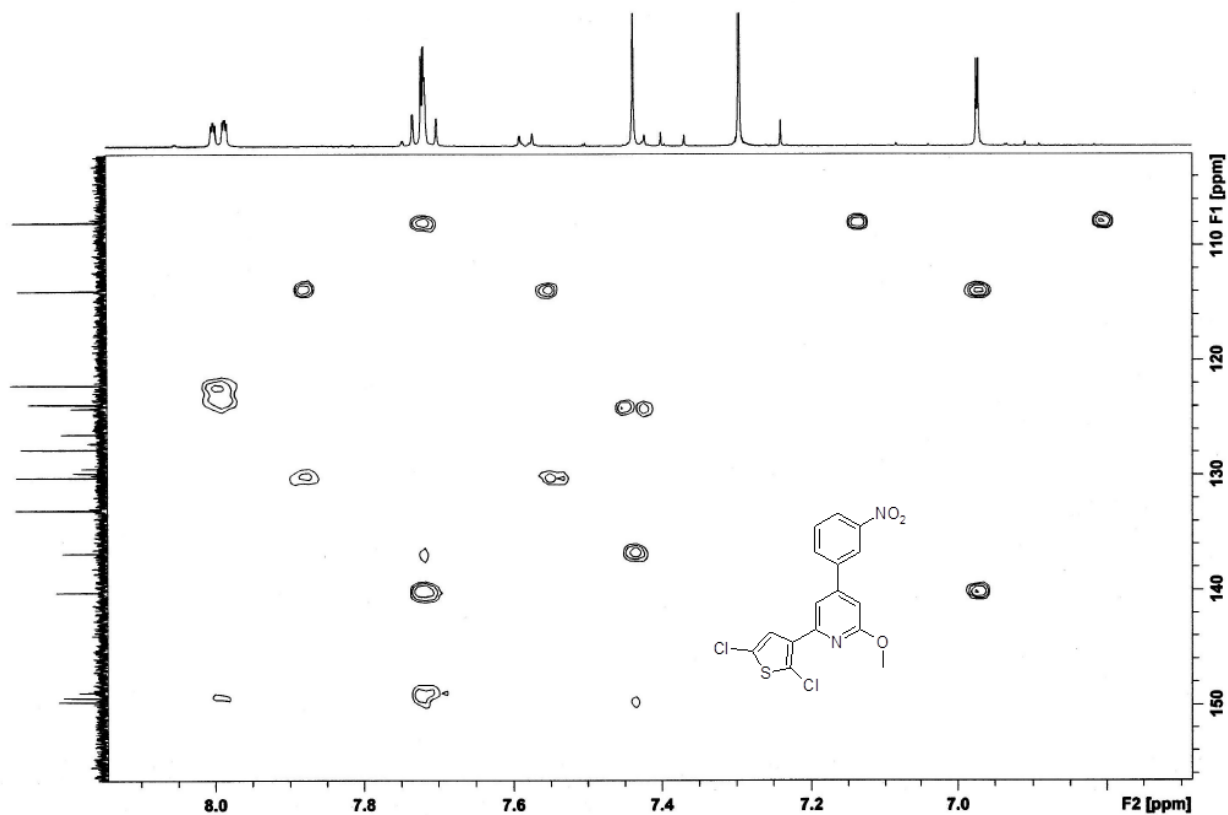


S 133: HSQC spectrum (CDCl<sub>3</sub>, 500 MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-(3-nitrophenyl)pyridine (**6g**).

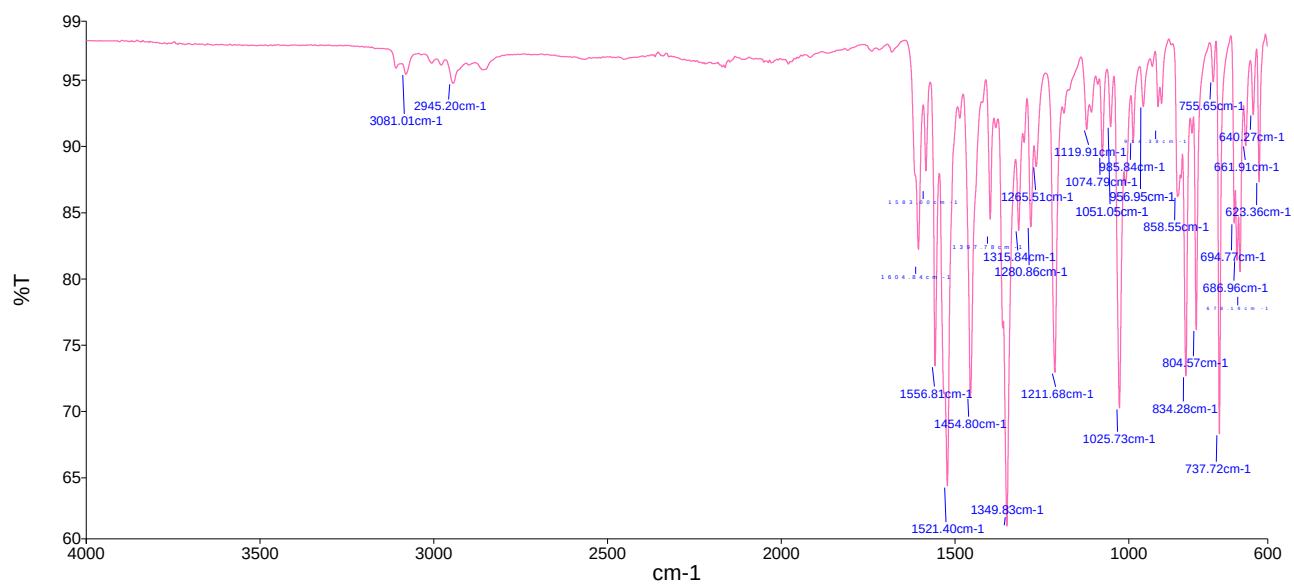


S 134: HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-(3-nitrophenyl)pyridine (**6g**).

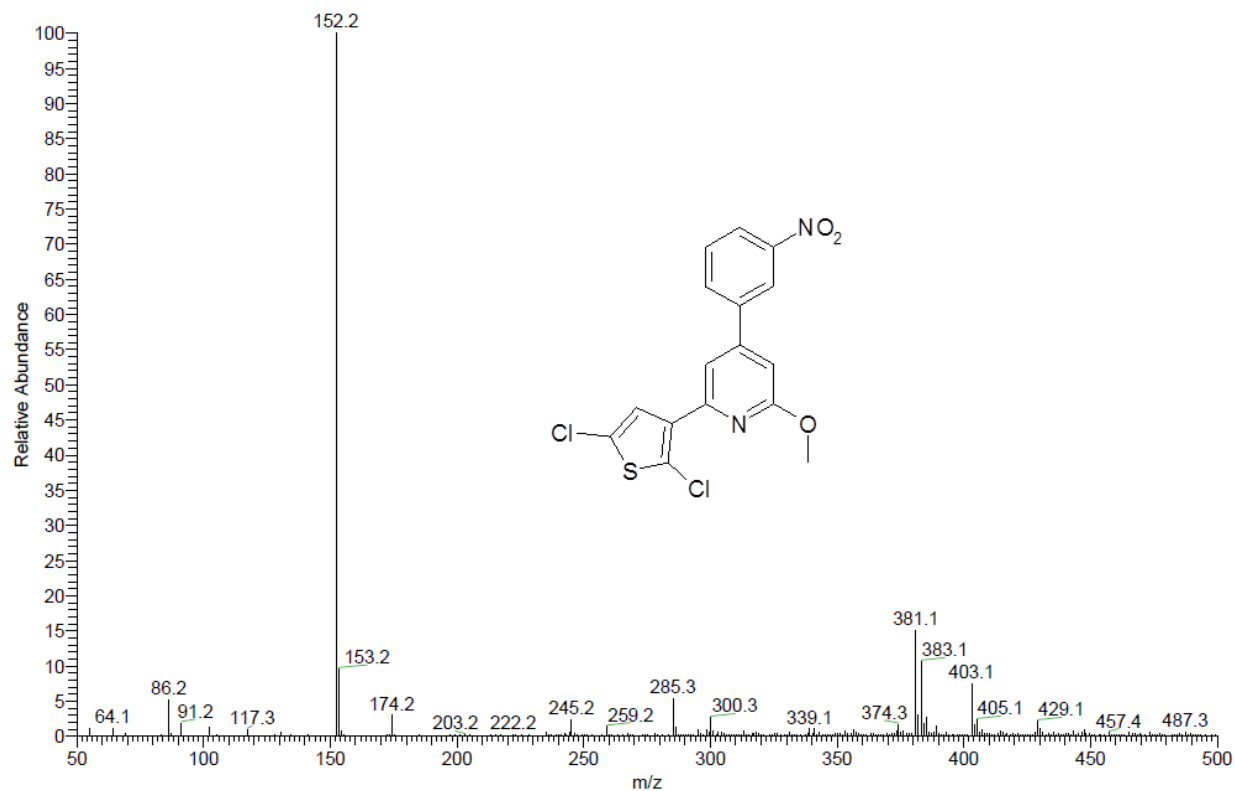




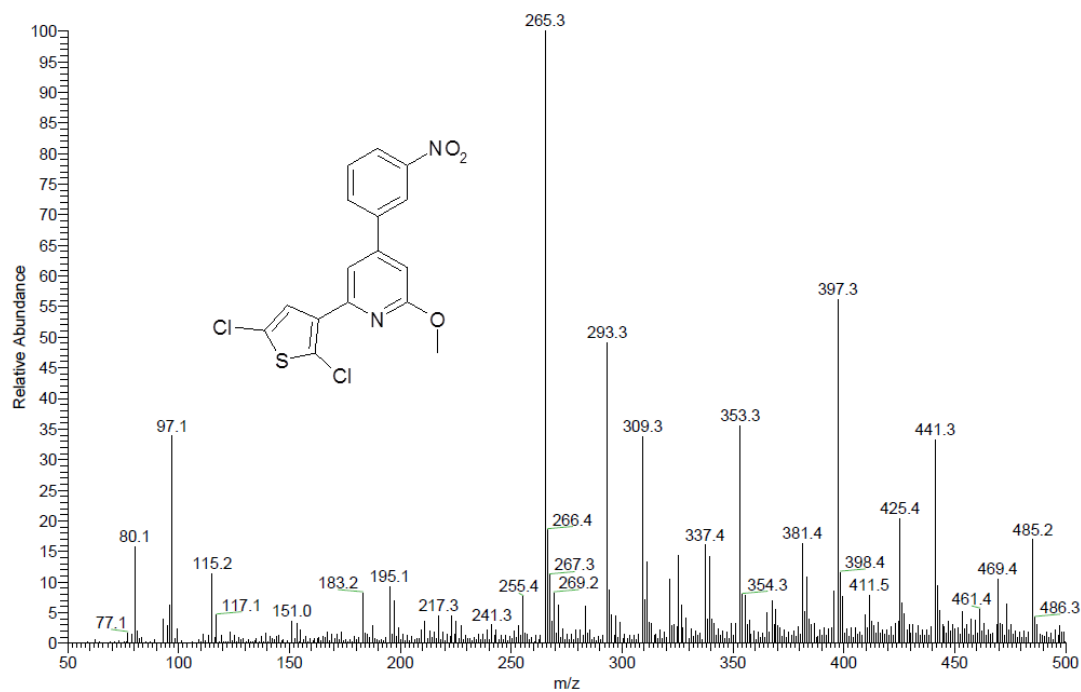
S 135: HMBC spectrum (CDCl<sub>3</sub>, 500 MHz) of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-(3-nitrophenyl)pyridine (**6g**).



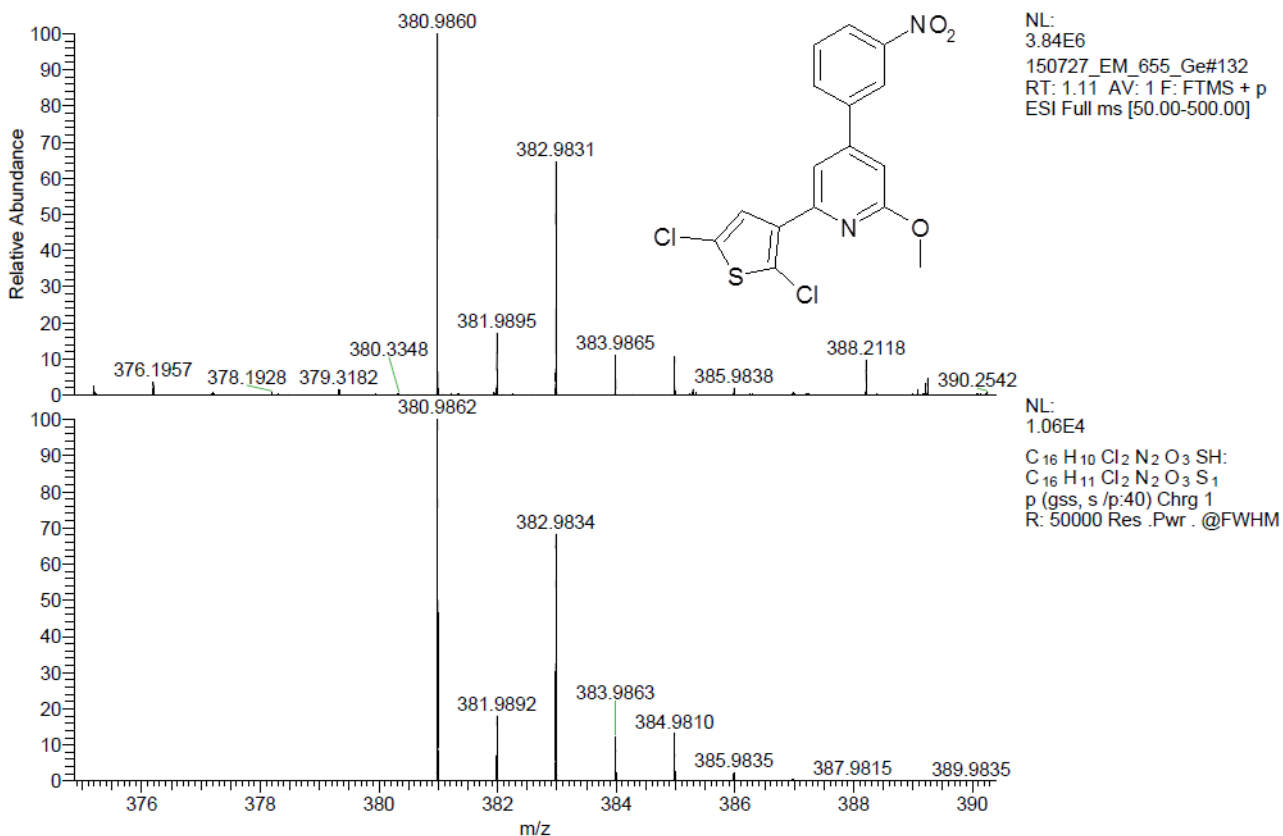
S 136: IR spectrum of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-(3-nitrophenyl)pyridine (**6g**).



**S 137:** ESI mass spectrum of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-(3-nitrophenyl)pyridine (**6g**).



**S 138:** ESI mass spectrum of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-(3-nitrophenyl)pyridine (**6g**).



**S 139:** HRESI mass spectrum of 2-(2,5-dichlorothiophen-3-yl)-6-methoxy-4-(3-nitrophenyl)pyridine (**6g**).