

Supplementary Material

Synthesis of Novel Methyl 7- [(Hetero)Arylamino]Thieno[2,3-*b*]Pyrazine-6- Carboxylates and Antitumor Activity Evaluation: Effects in Human Tumor Cells growth, Cell Cycle Analysis, Apoptosis and Toxicity in Non-tumor Cells

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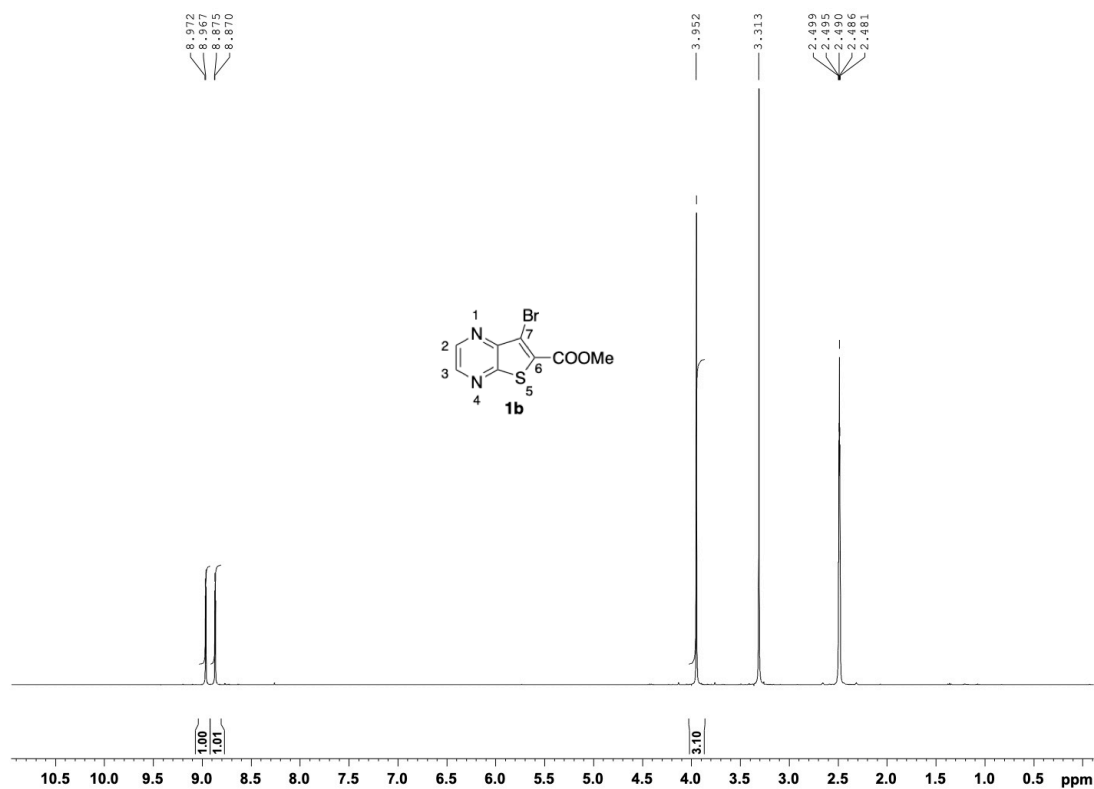
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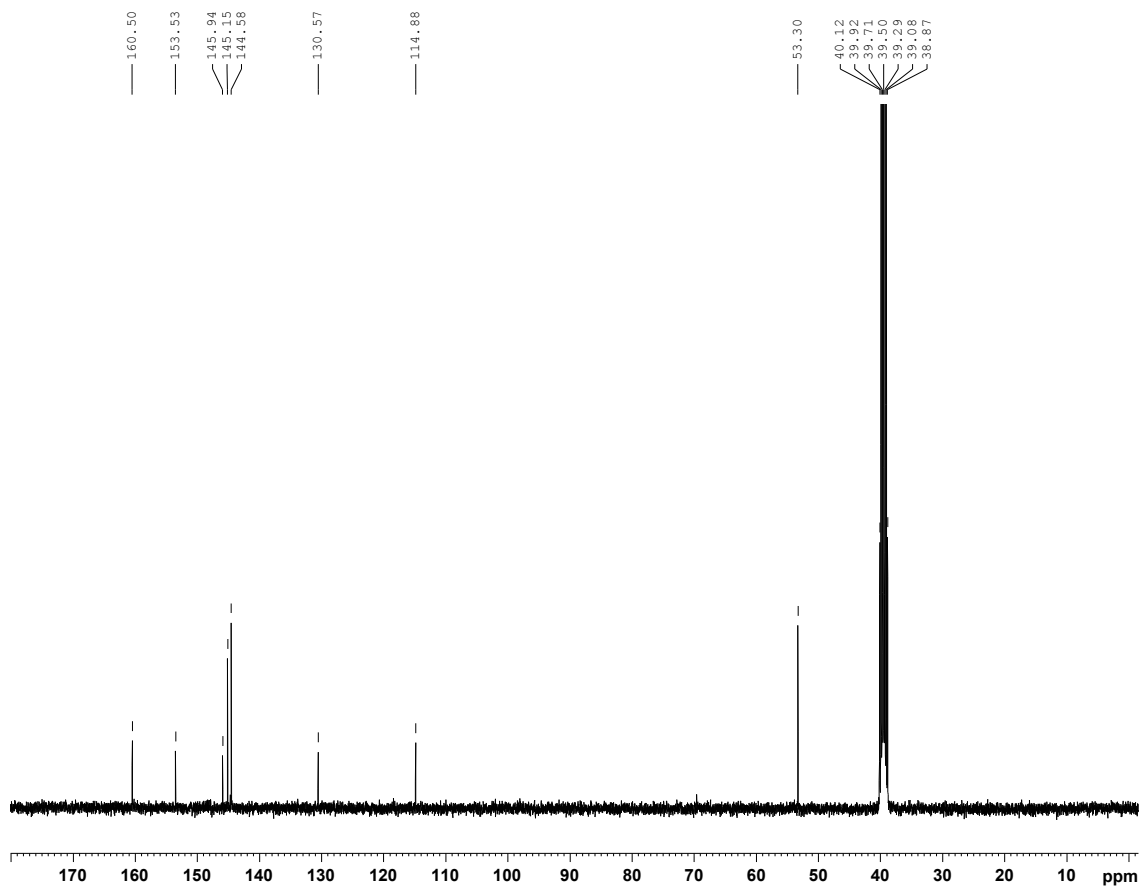
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Methyl 7-bromothiemo[2,3-*b*]pyrazine-6-carboxylate **1b**

^1H NMR (DMSO- d_6 , 400 MHz) of compound **1b**

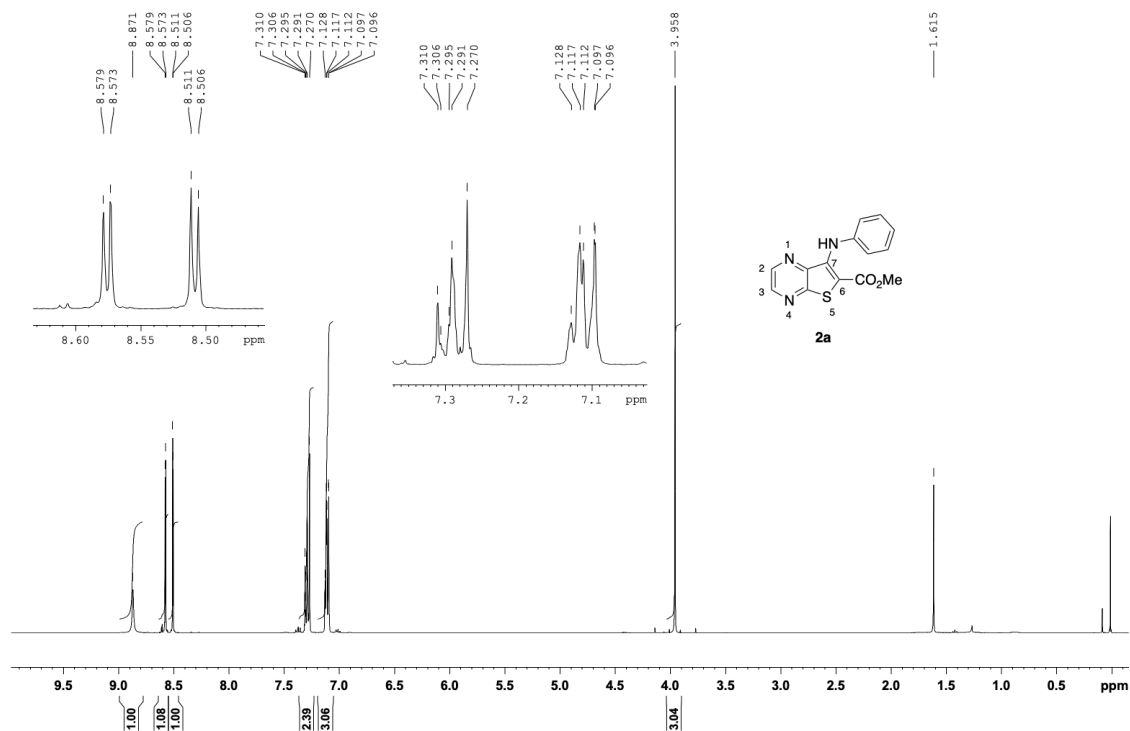


^{13}C NMR (DMSO- d_6 , 100.6 MHz) of compound **1b**

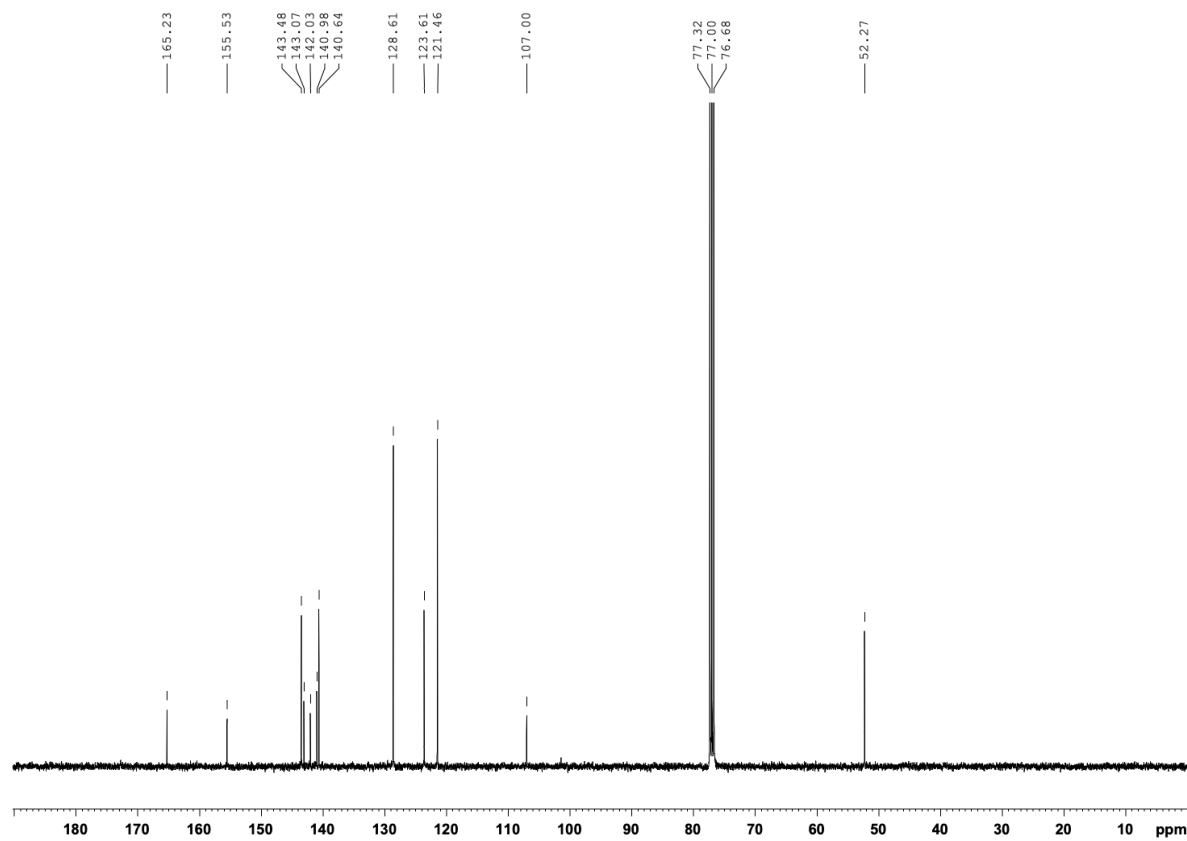


Methyl 7-(phenylamino)thieno[2,3-*b*]pyrazine-6-carboxylate 2a

^1H NMR (CDCl_3 , 400 MHz) of compound 2a

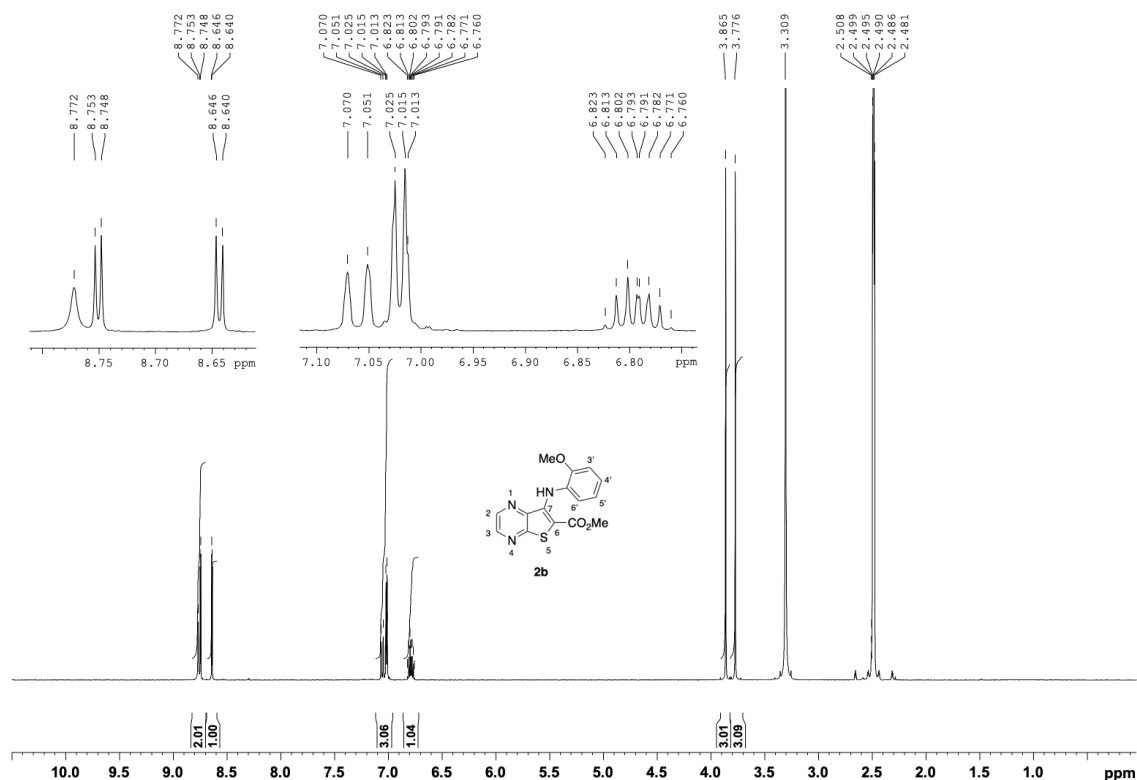


^{13}C NMR (CDCl_3 , 100.6 MHz) of compound 2a

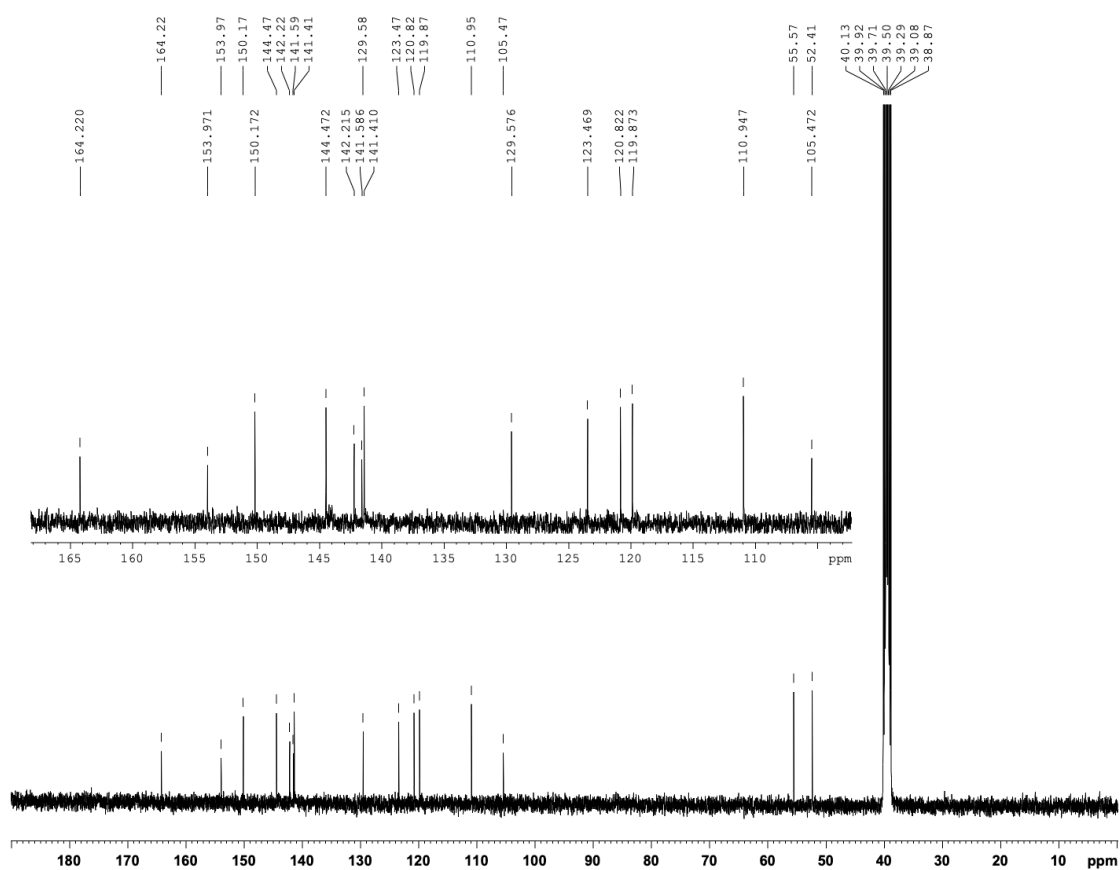


Methyl 7-[(2-methoxyphenyl)amino]thieno[2,3-*b*]pyrazine-6-carboxylate **2b**

^1H NMR (DMSO- d_6 , 400 MHz) of compound **2b**

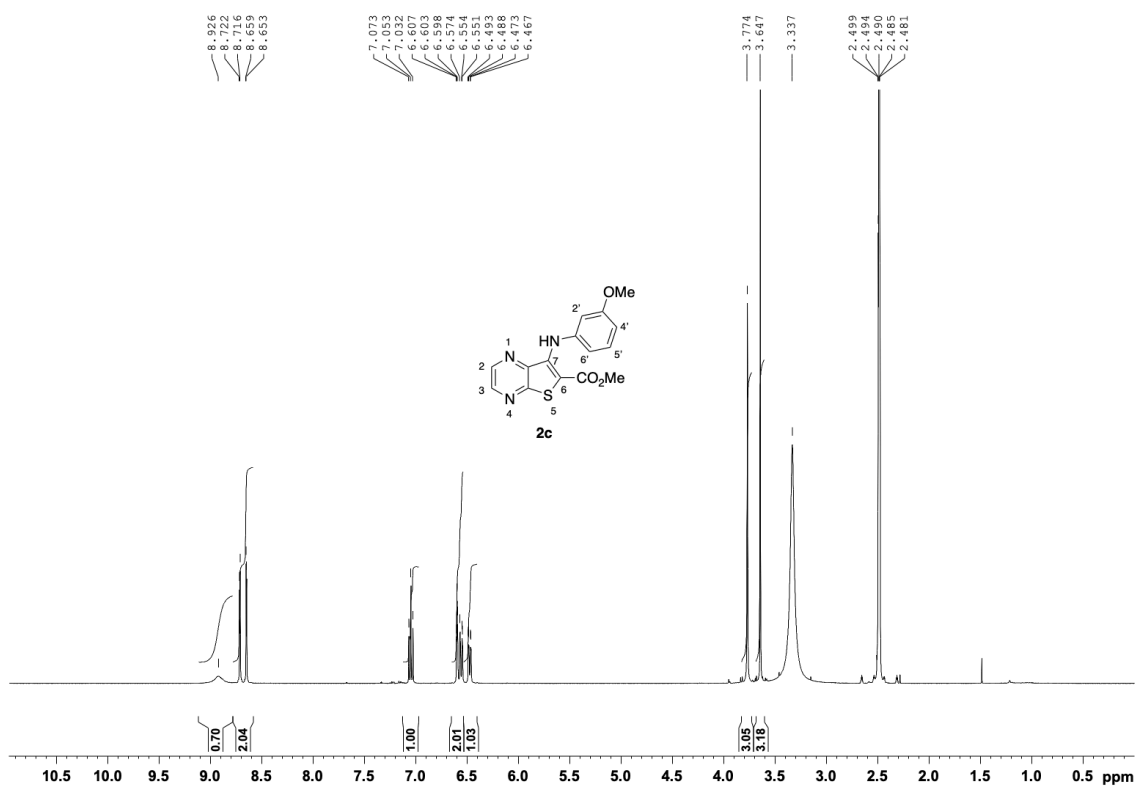


^{13}C NMR (DMSO- d_6 , 100.6 MHz) of compound **2b**

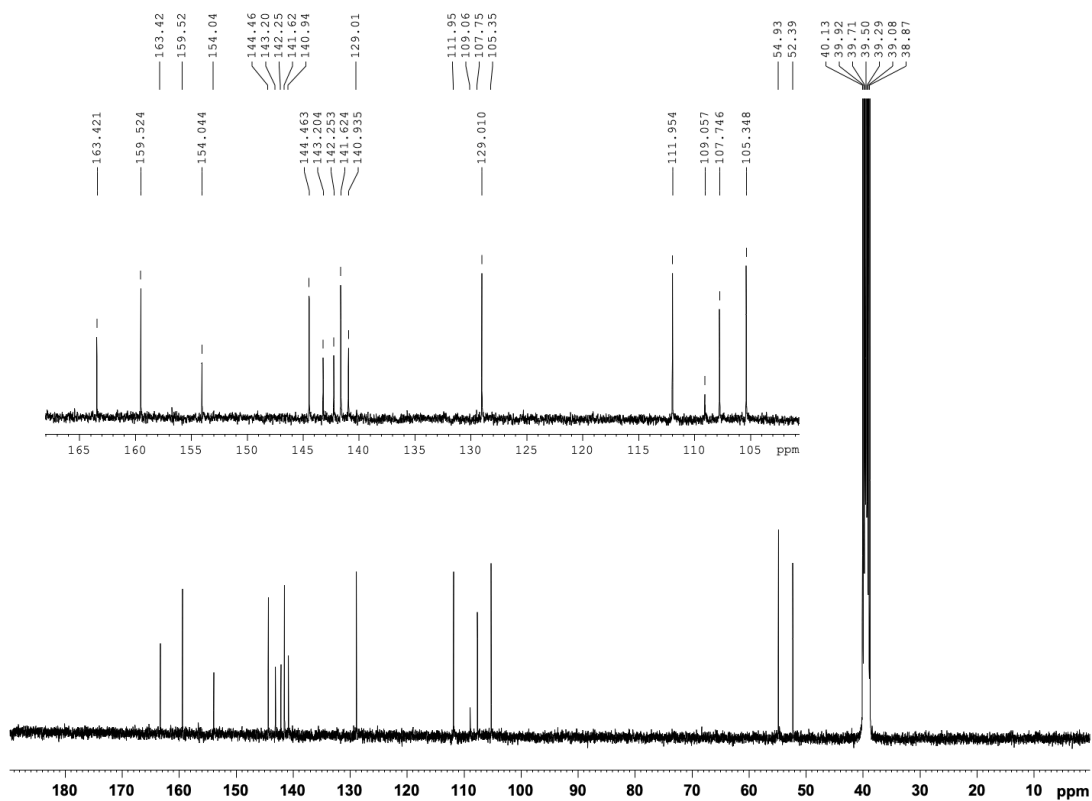


Methyl 7-[(3-methoxyphenyl)amino]thieno[2,3-*b*]pyrazine-6-carboxylate **2c**

^1H NMR (DMSO- d_6 , 400 MHz) of compound **2c**

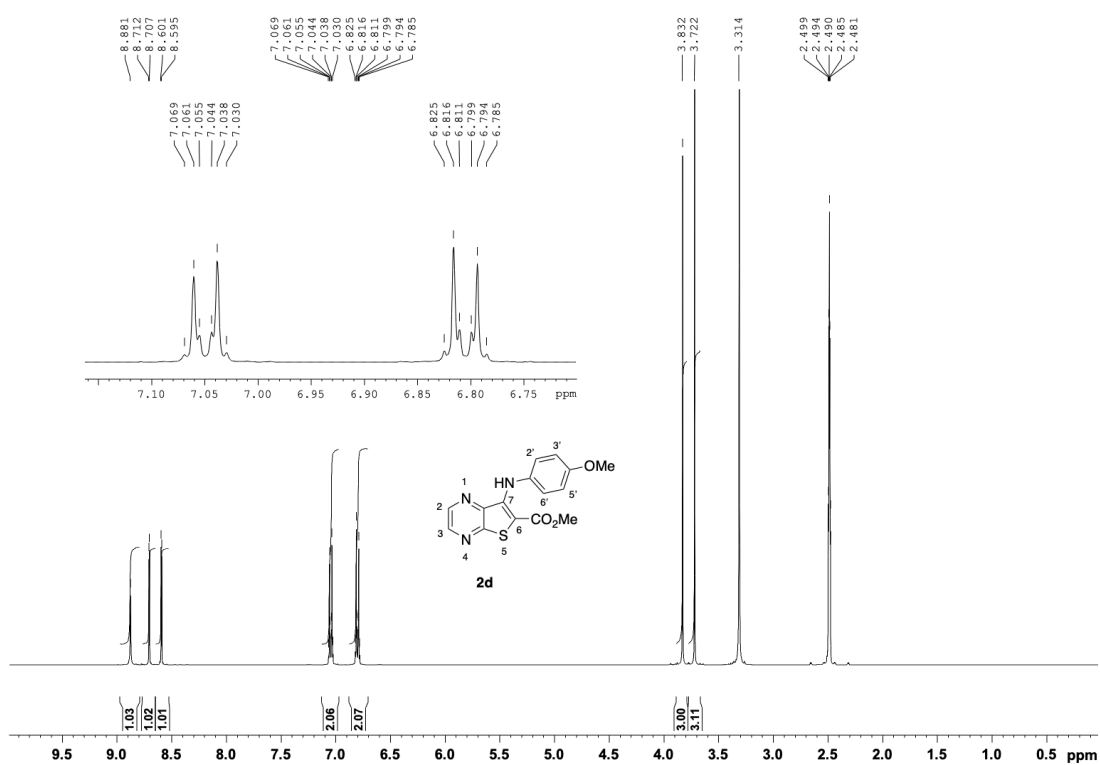


^{13}C NMR (DMSO- d_6 , 100.6 MHz) of compound **2c**

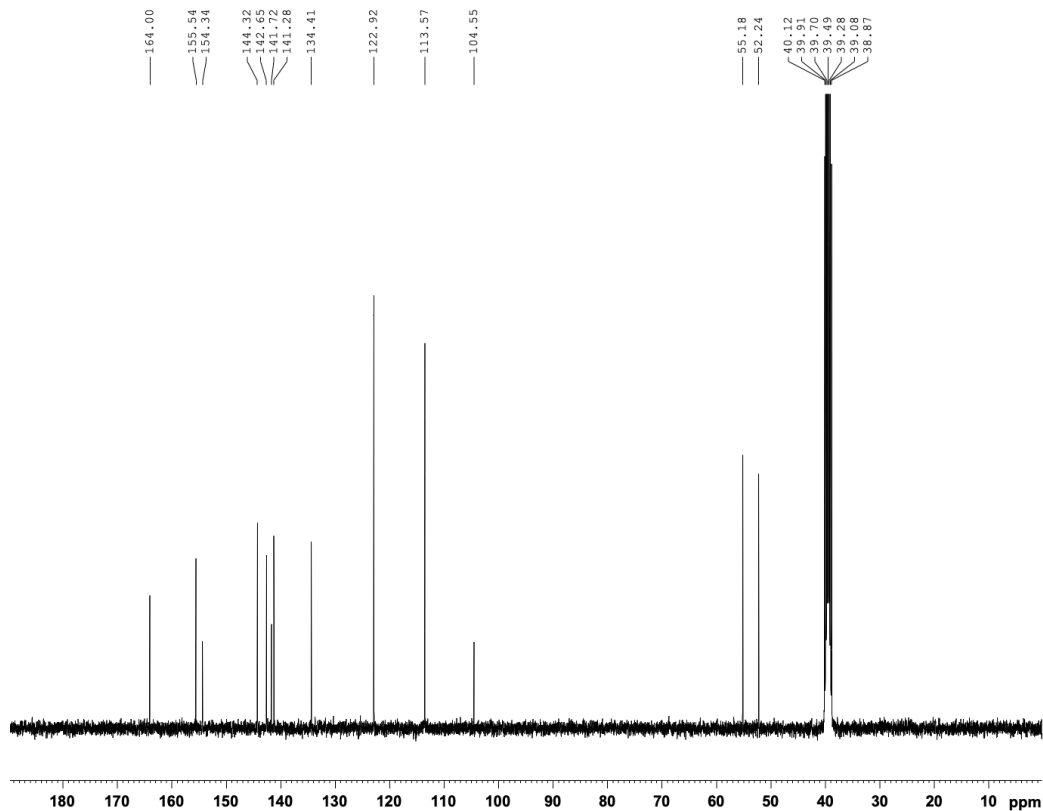


Methyl 7-[(4-methoxyphenyl)amino]thieno[2,3-*b*]pyrazine-6-carboxylate **2d**

^1H NMR (DMSO- d_6 , 400 MHz) of compound **2d**

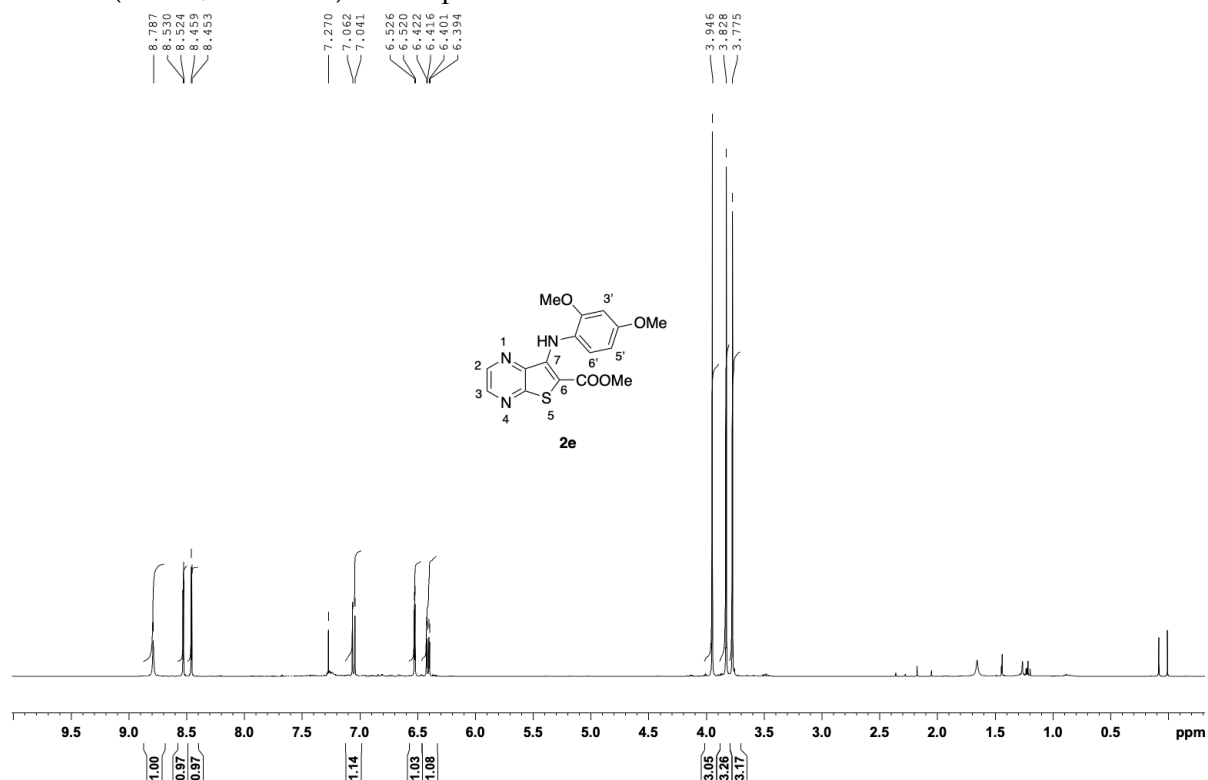


^{13}C NMR (DMSO- d_6 , 100.6 MHz) of compound **2d**

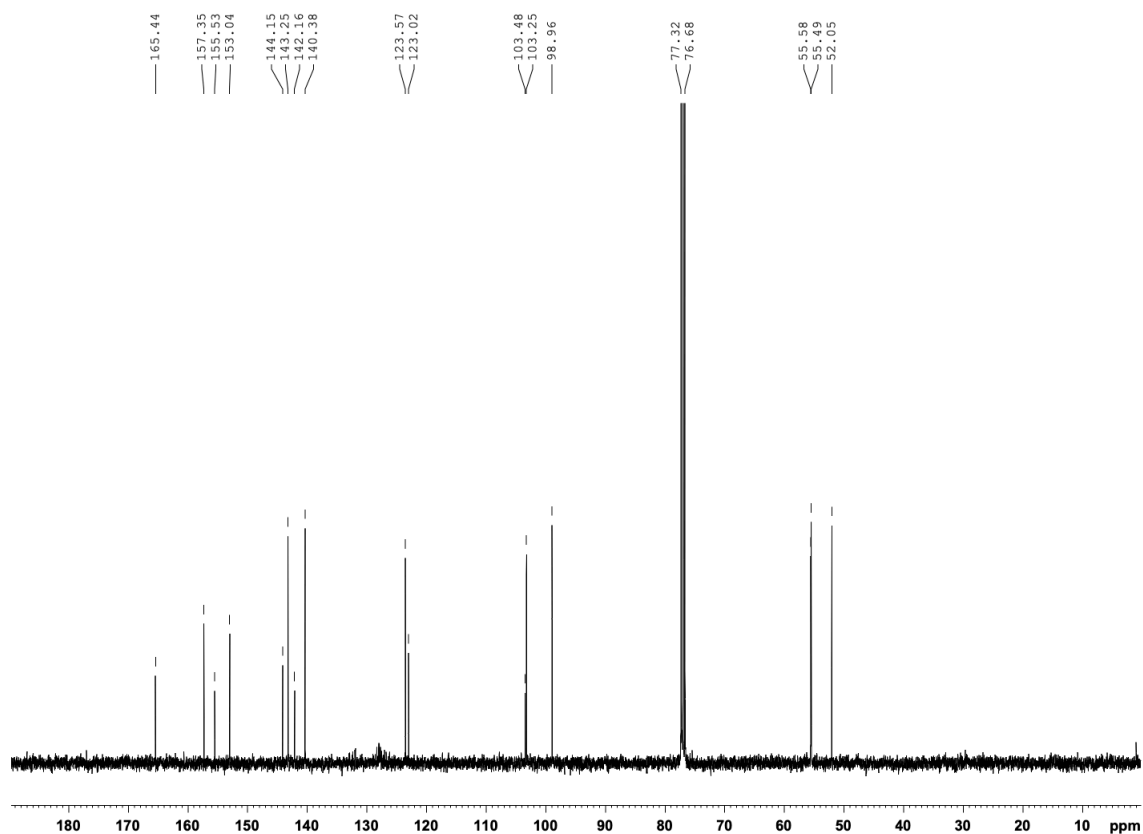


Methyl 7-[(2,4-dimethoxyphenyl)amino]thieno[2,3-*b*]pyrazine-6-carboxylate 2e

^1H NMR (CDCl_3 , 400 MHz) of compound 2e

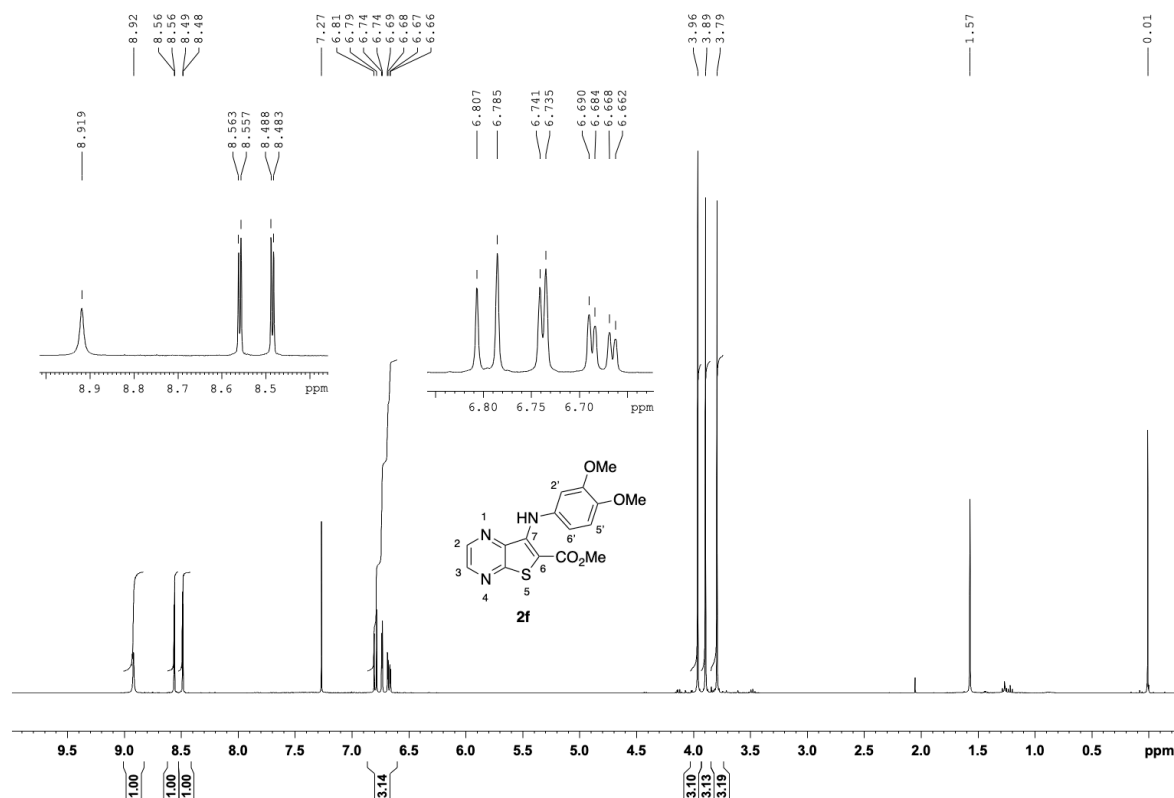


^{13}C NMR (CDCl_3 , 100.6 MHz) of compound 2e

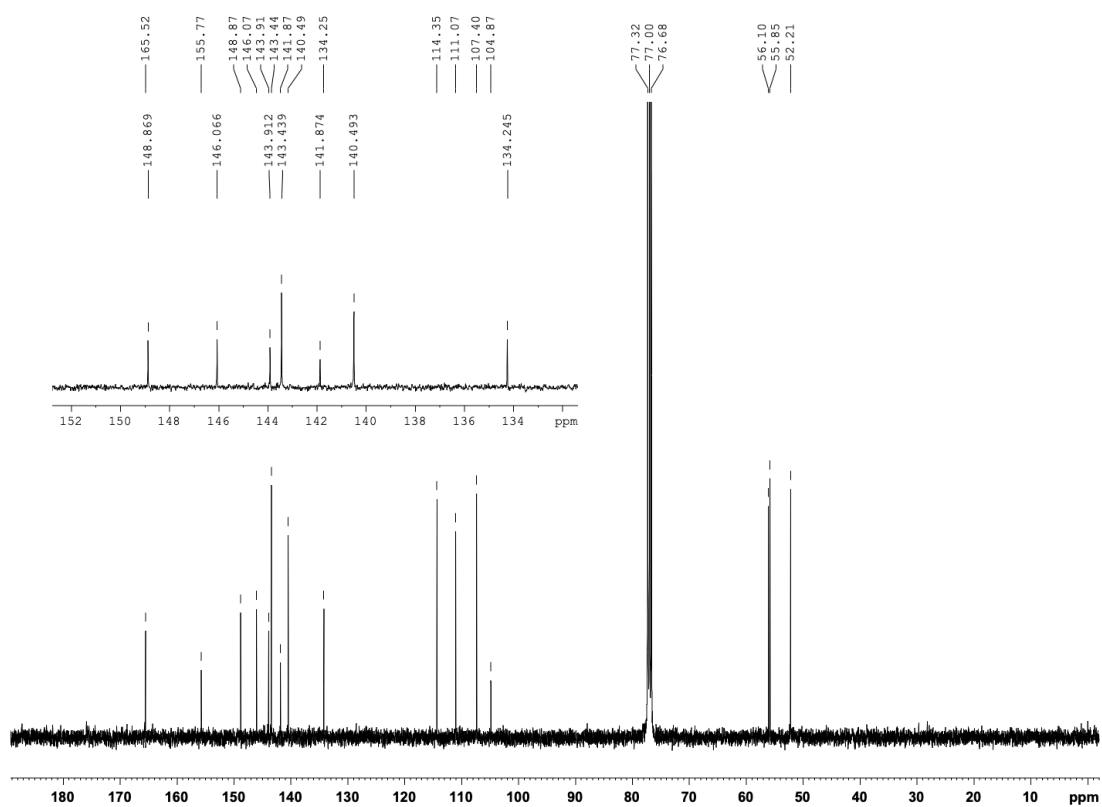


Methyl 7-[(3,4-dimethoxyphenyl)amino]thieno[2,3-*b*]pyrazine-6-carboxylate **2f**

^1H NMR (CDCl_3 , 400 MHz) of compound **2f**

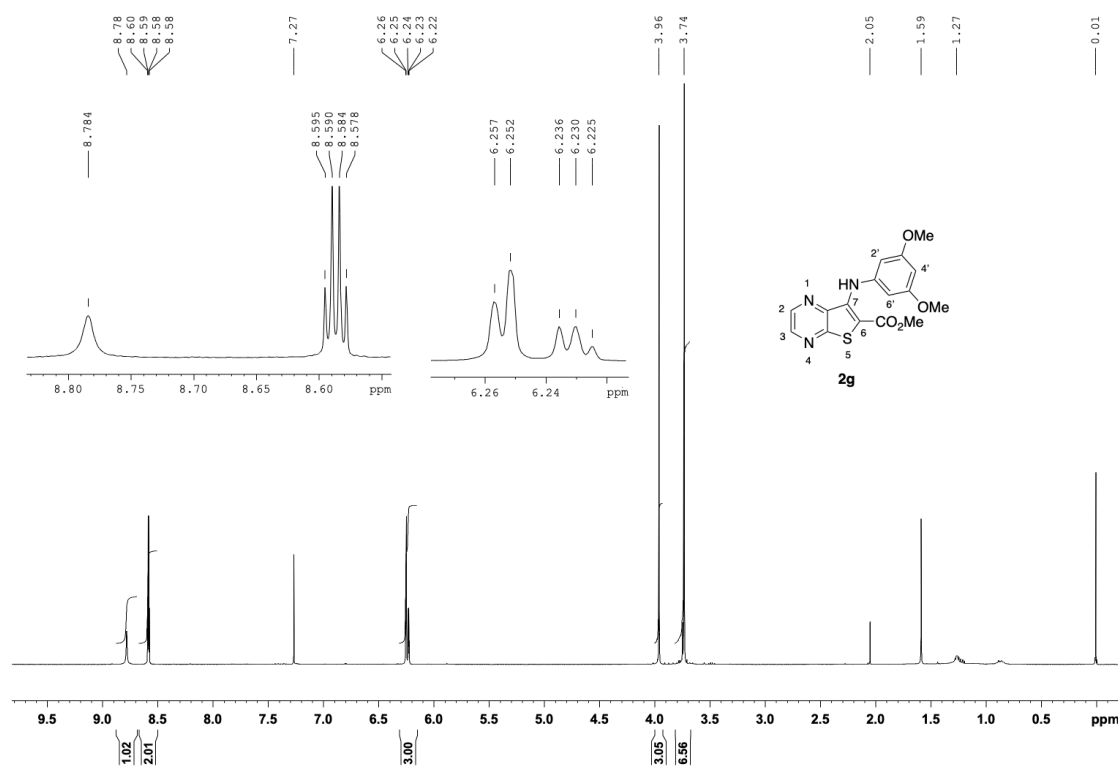


^{13}C NMR (CDCl_3 , 100.6 MHz) of compound **2f**

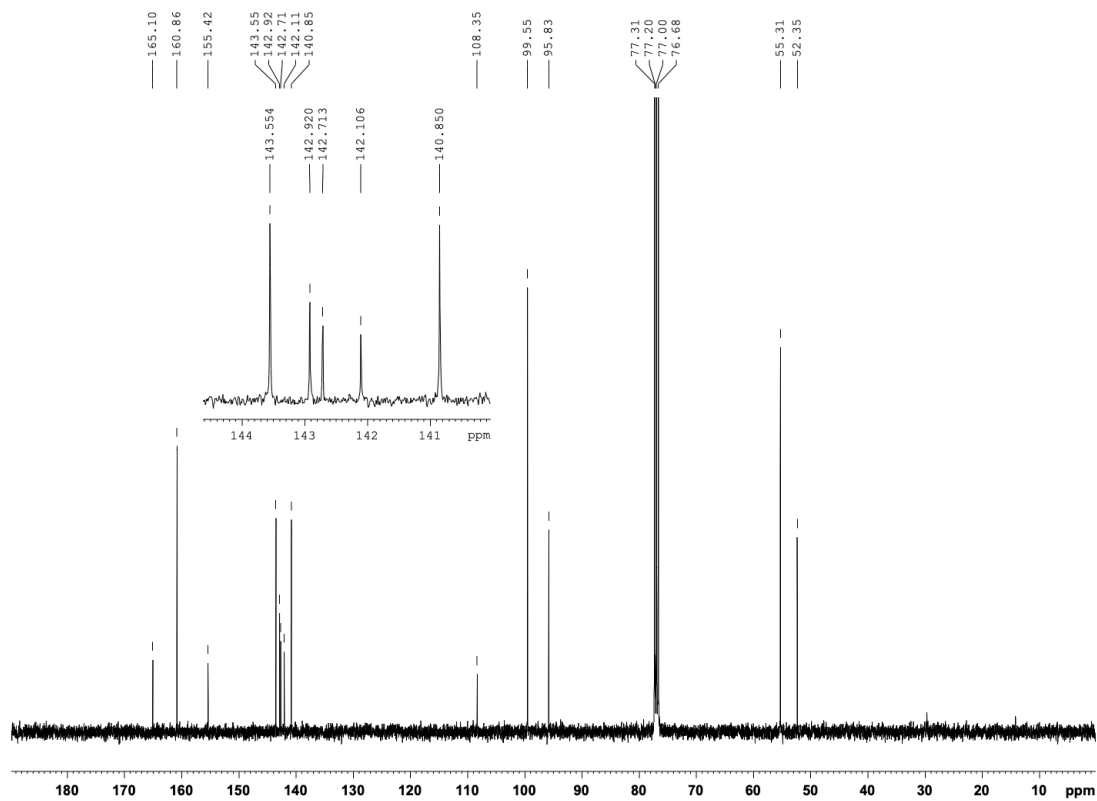


Methyl 7-[(3,5-dimethoxyphenyl)amino]thieno[2,3-*b*]pyrazine-6-carboxylate **2g**

^1H NMR (CDCl_3 , 400 MHz) of compound **2g**

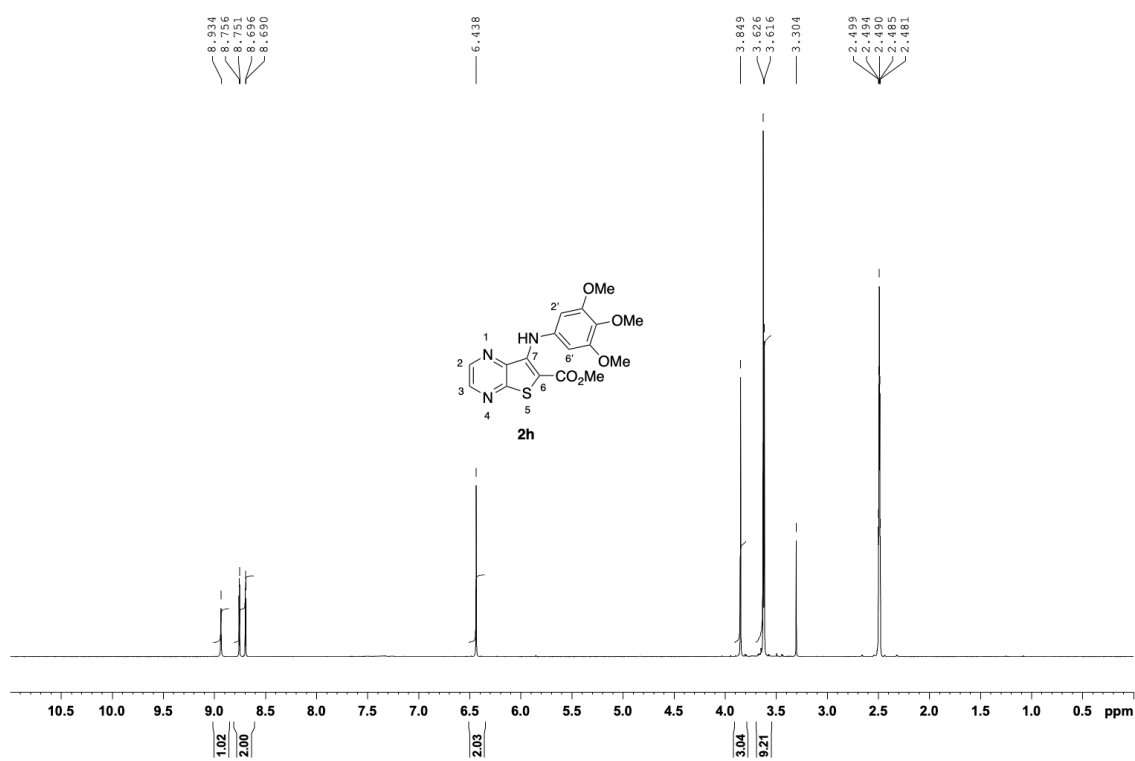


^{13}C NMR (CDCl_3 , 100.6 MHz) of compound **2g**

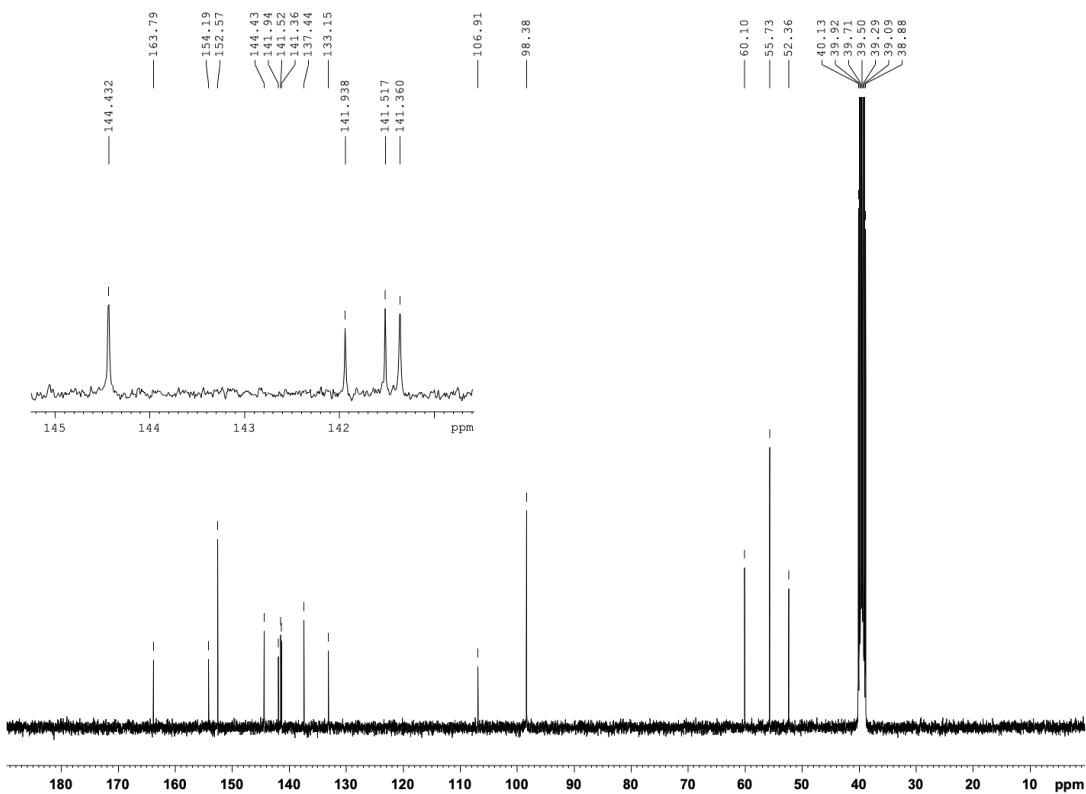


Methyl 7-[(3,4,5-trimethoxyphenyl)amino]thieno[2,3-*b*]pyrazine-6-carboxylate 2h

^1H NMR (DMSO- d_6 , 400 MHz) of compound **2h**

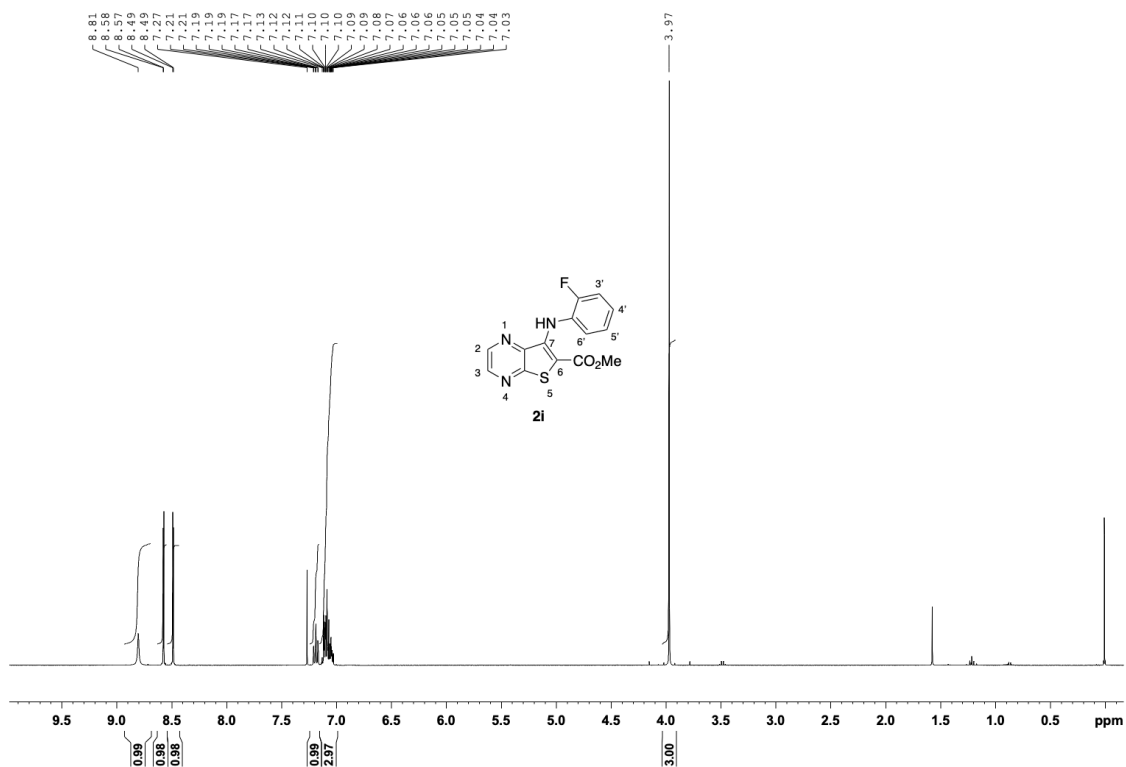


^{13}C NMR (DMSO- d_6 , 100.6 MHz) of compound **2h**

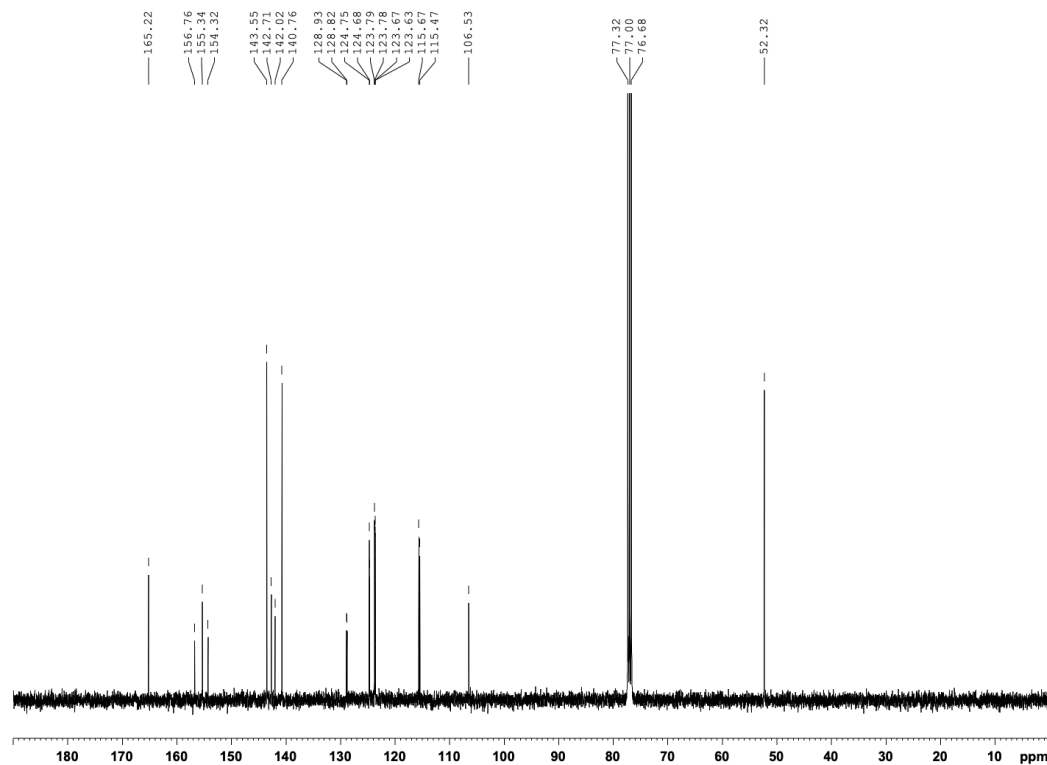


Methyl 7-[(2-fluorophenyl)amino]thieno[2,3-*b*]pyrazine-6-carboxylate **2i**

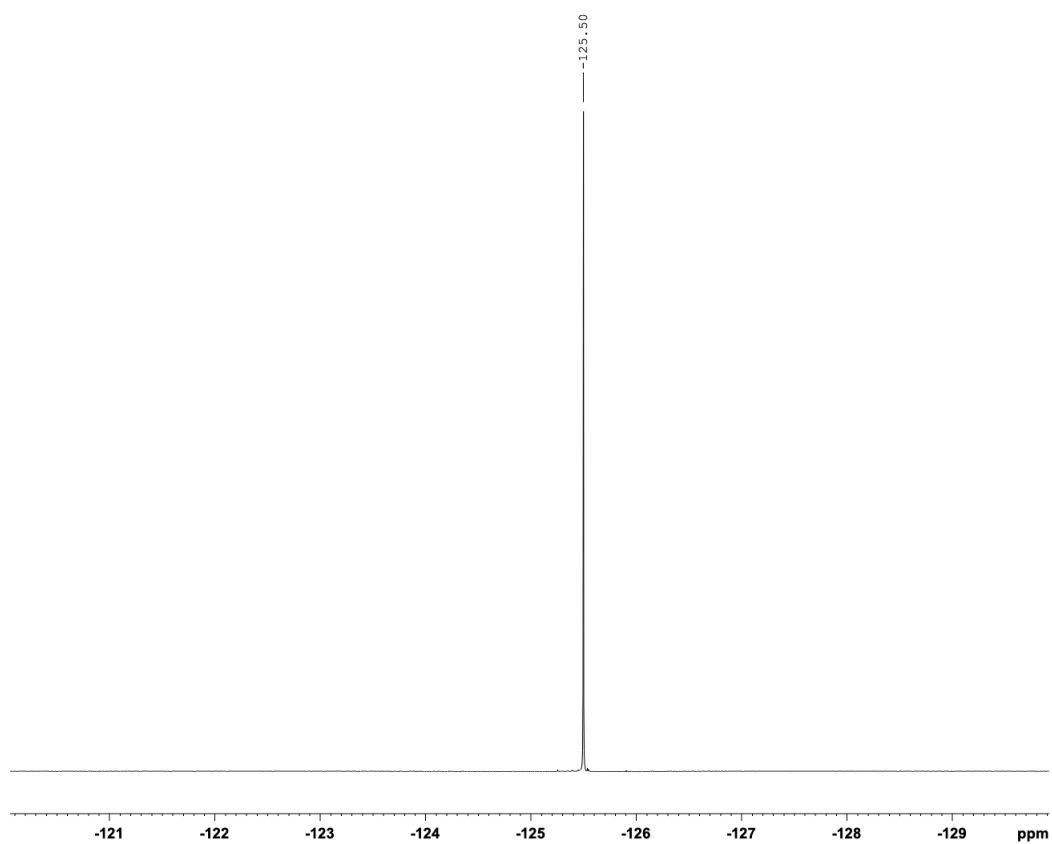
^1H NMR (CDCl_3 , 400 MHz) of compound **2i**



^{13}C NMR (CDCl_3 , 100.6 MHz) of compound **2i**

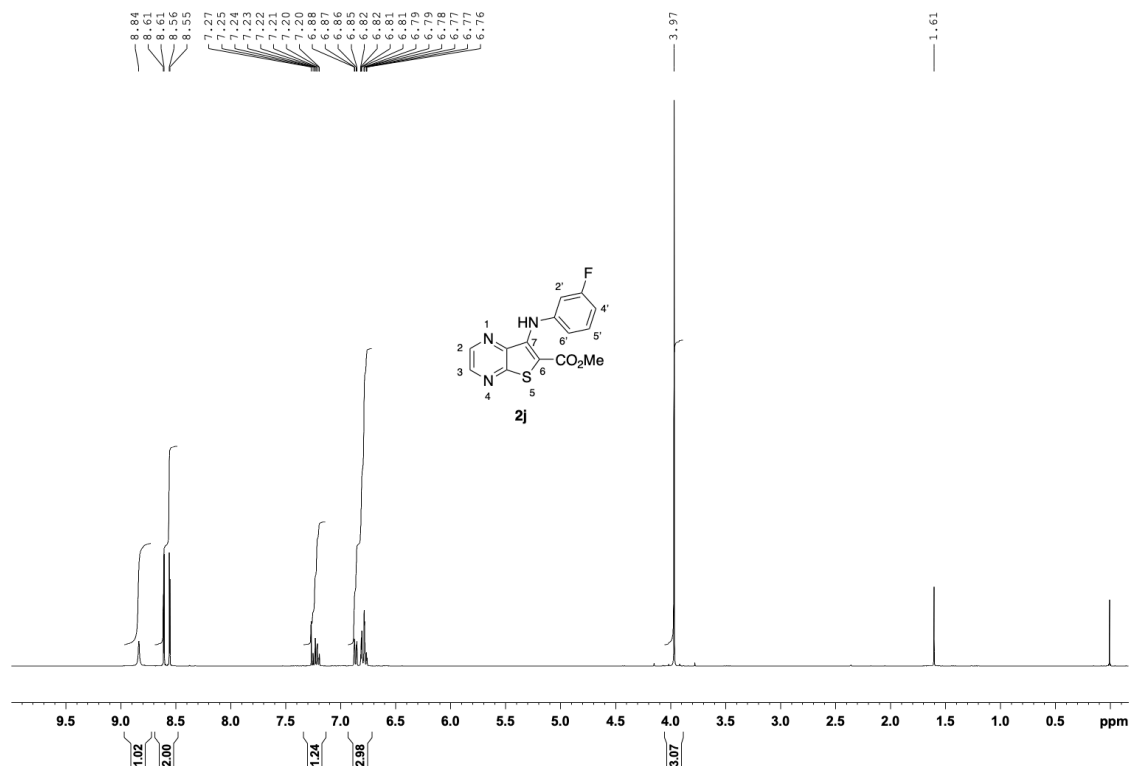


^{19}F NMR (CDCl_3 , 376.48 MHz) of compound **2i**

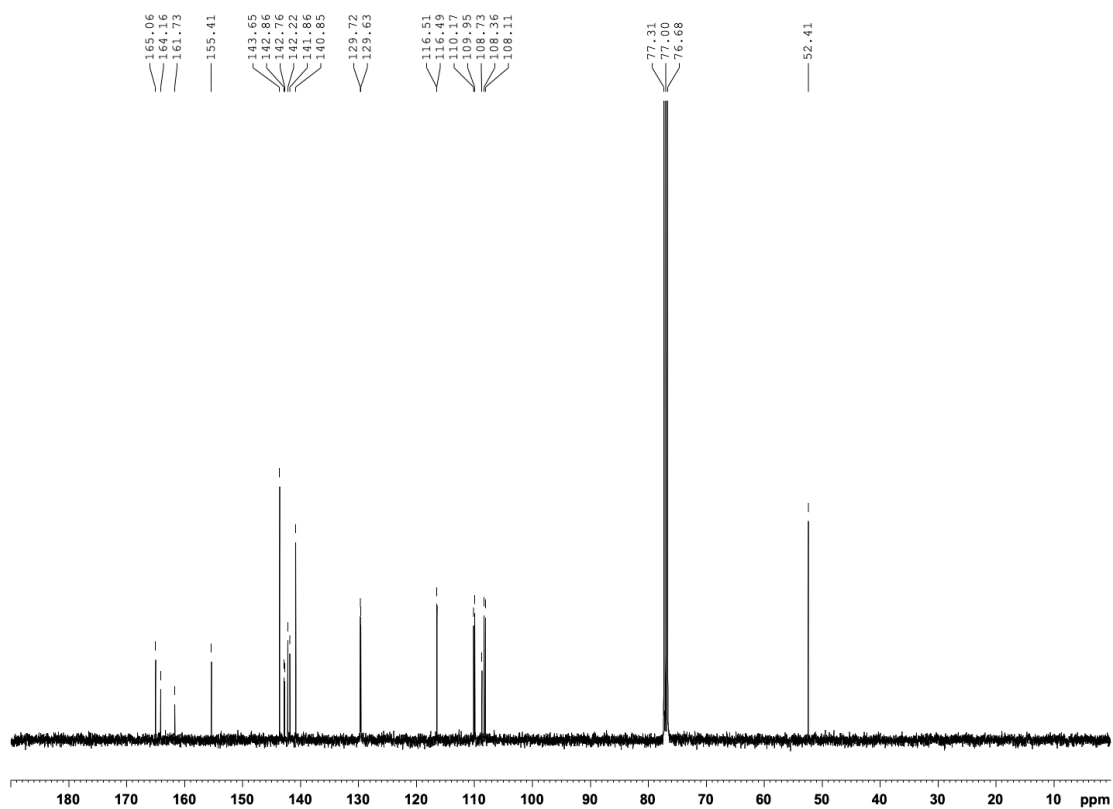


Methyl 7-[(3-fluorophenyl)amino]thieno[2,3-*b*]pyrazine-6-carboxylate 2j

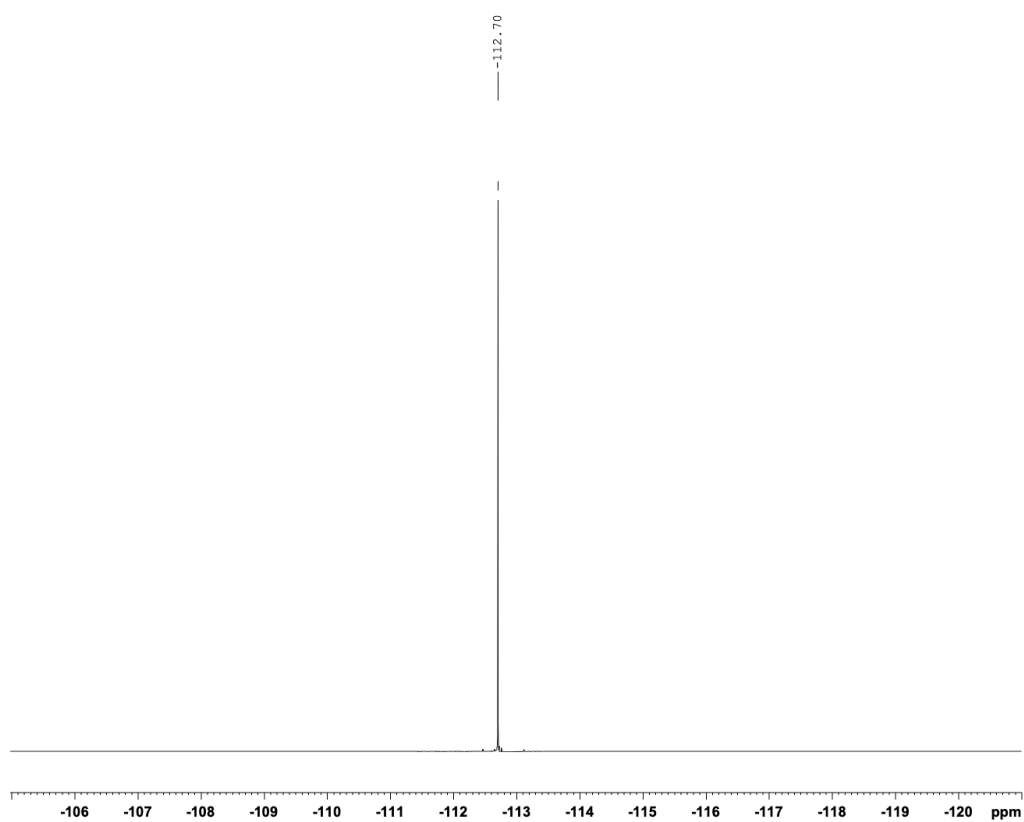
^1H NMR (CDCl_3 , 400 MHz) of compound 2j



^{13}C NMR (CDCl_3 , 100.6 MHz) of compound 2j

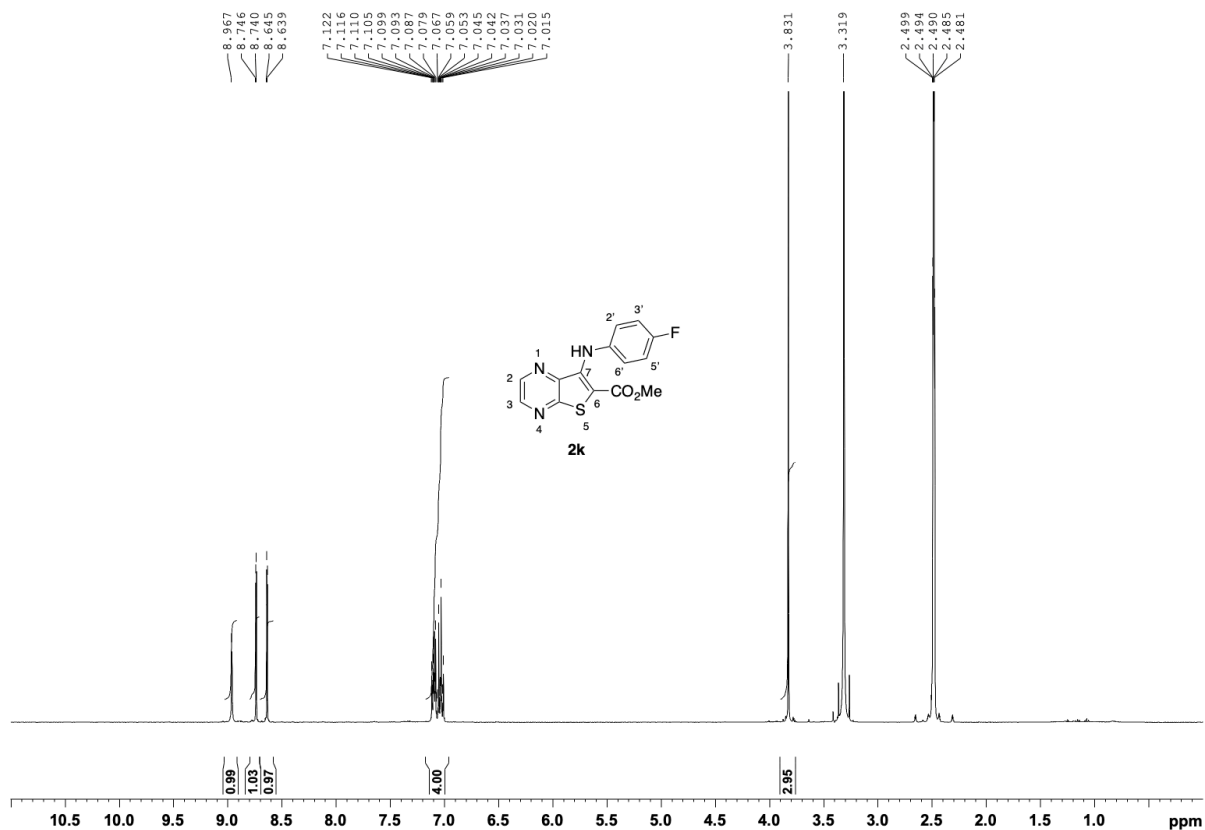


^{19}F NMR (CDCl_3 , 376.48 MHz) of compound **2j**

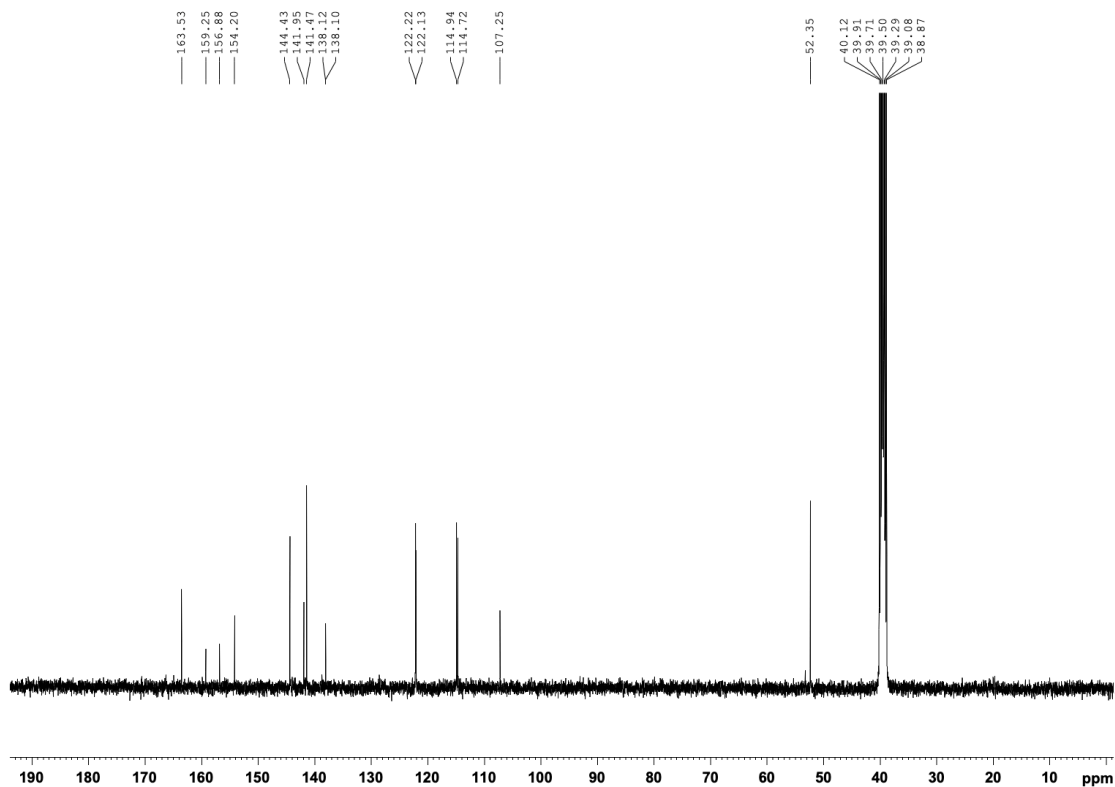


Methyl 7-[(4-fluorophenyl)amino]thieno[2,3-*b*]pyrazine-6-carboxylate 2k

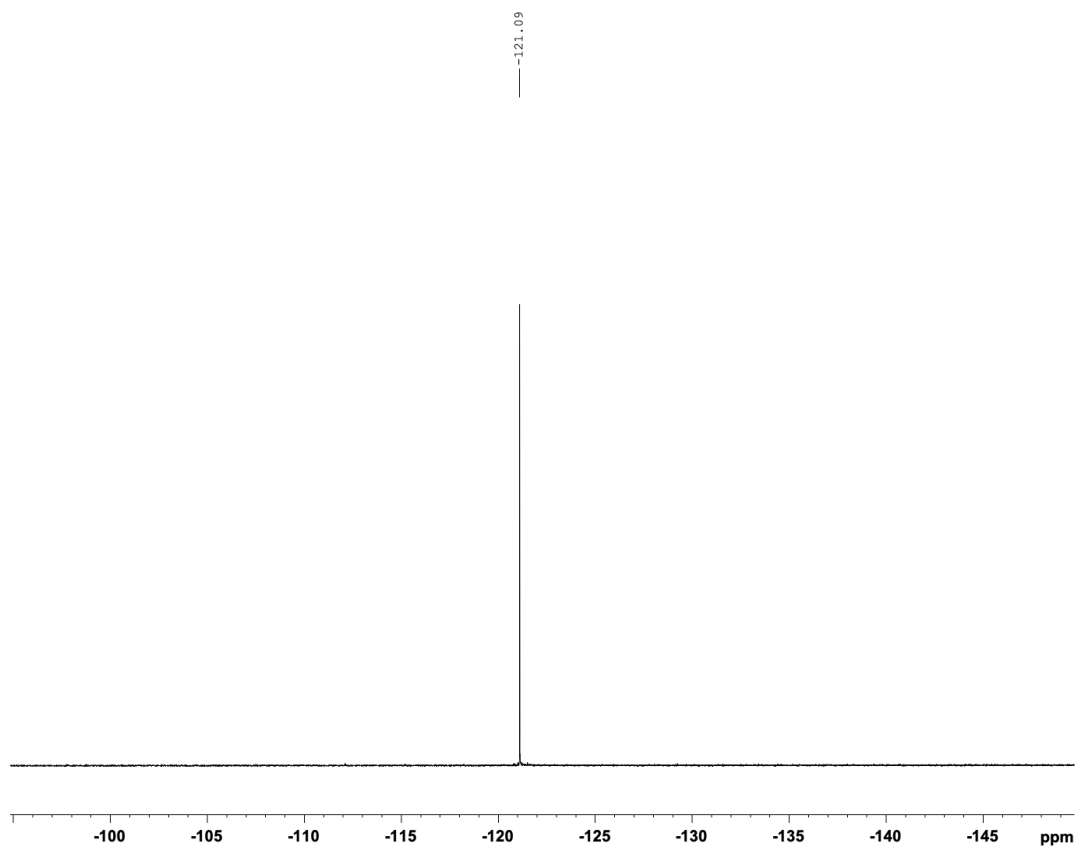
^1H NMR (DMSO- d_6 , 400 MHz) of compound 2k



^{13}C NMR (DMSO- d_6 , 100.6 MHz) of compound 2k

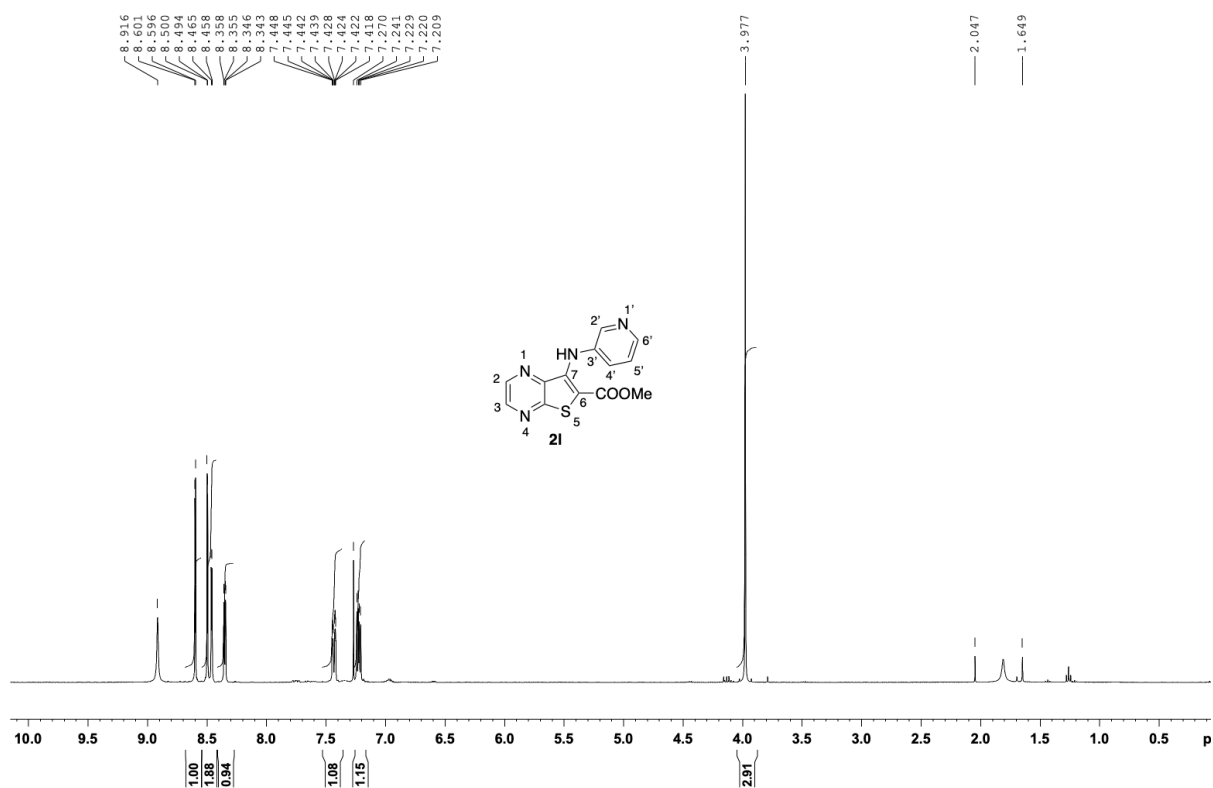


^{19}F NMR ($\text{DMSO-}d_6$, 376.48 MHz) of compound **2k**

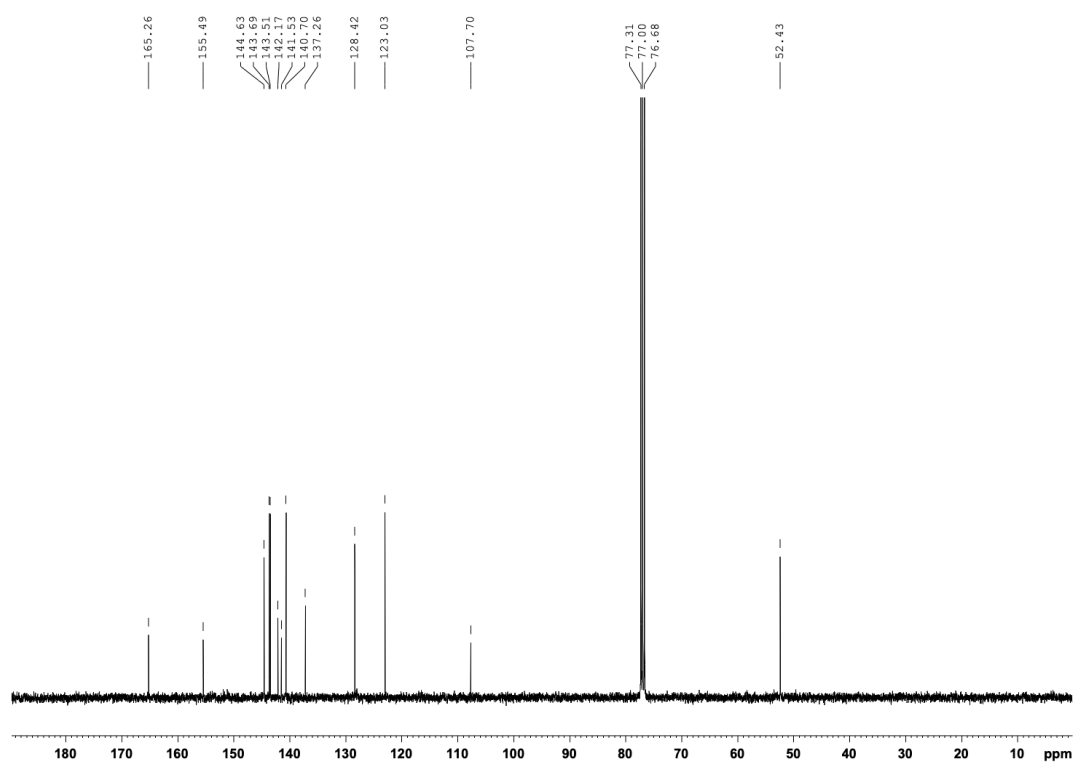


Methyl 7-(pyridin-3-ylamino)thieno[2,3-*b*]pyrazine-6-carboxylate 2l

^1H NMR (CDCl_3 , 400 MHz) of compound 2l

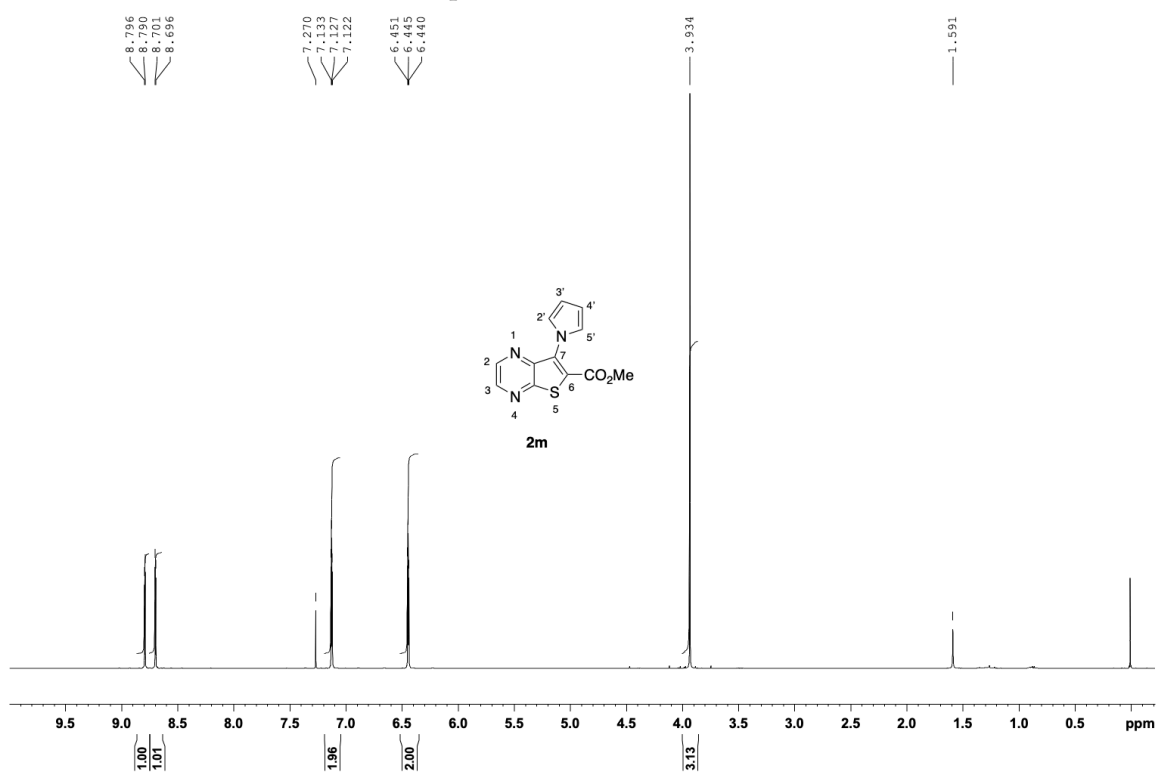


^{13}C NMR (CDCl_3 , 100.6 MHz) of compound 2l

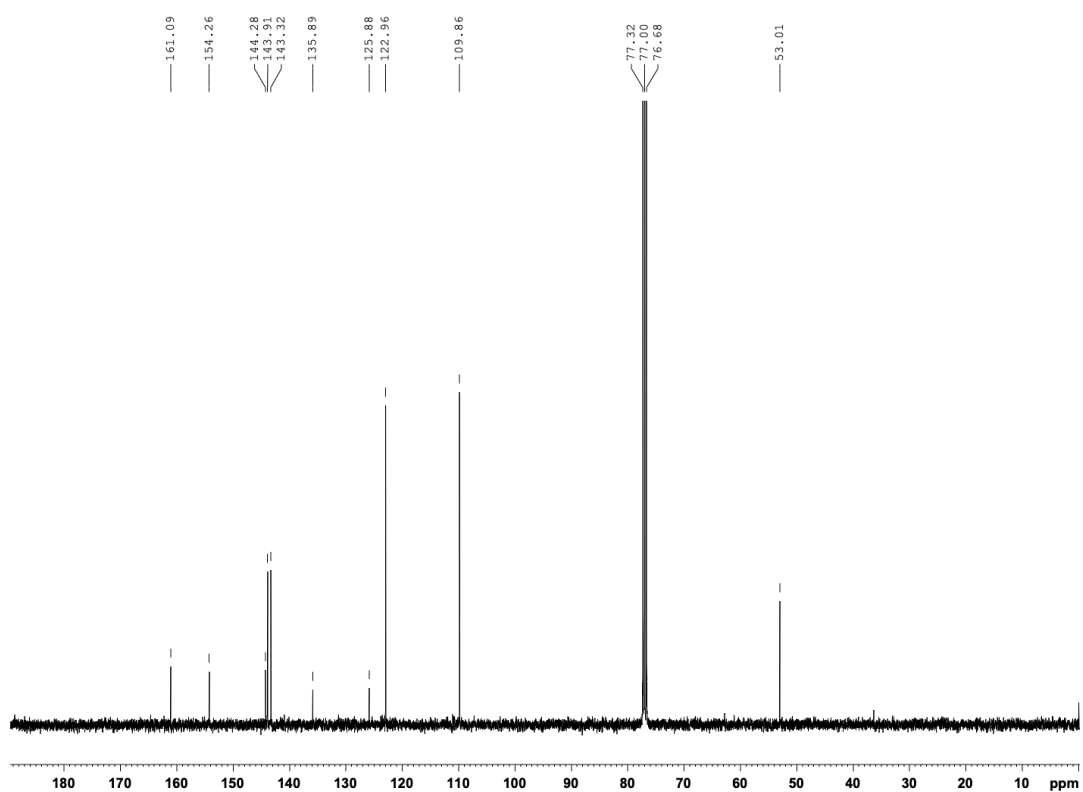


Methyl 7-(1*H*-pyrrol-1-yl)thieno[2,3-*b*]pyrazine-6-carboxylate **2m**

¹H NMR (CDCl₃, 400 MHz) of compound **2m**

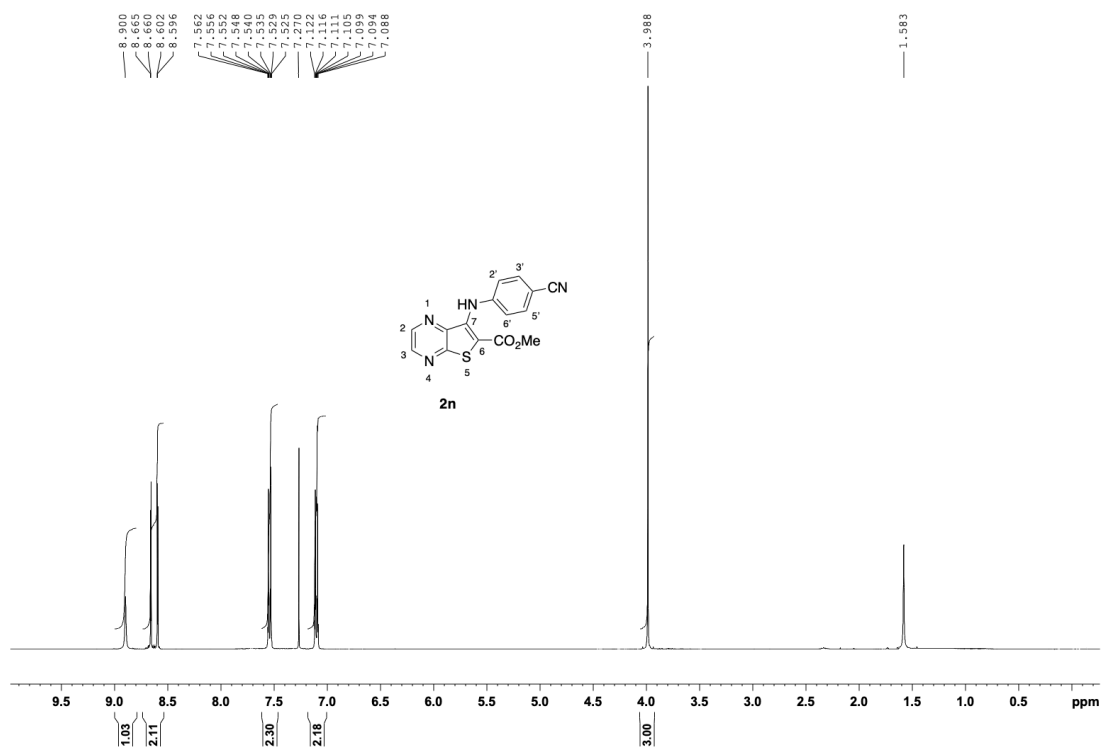


¹³C NMR (CDCl₃, 100.6 MHz) of compound **2m**

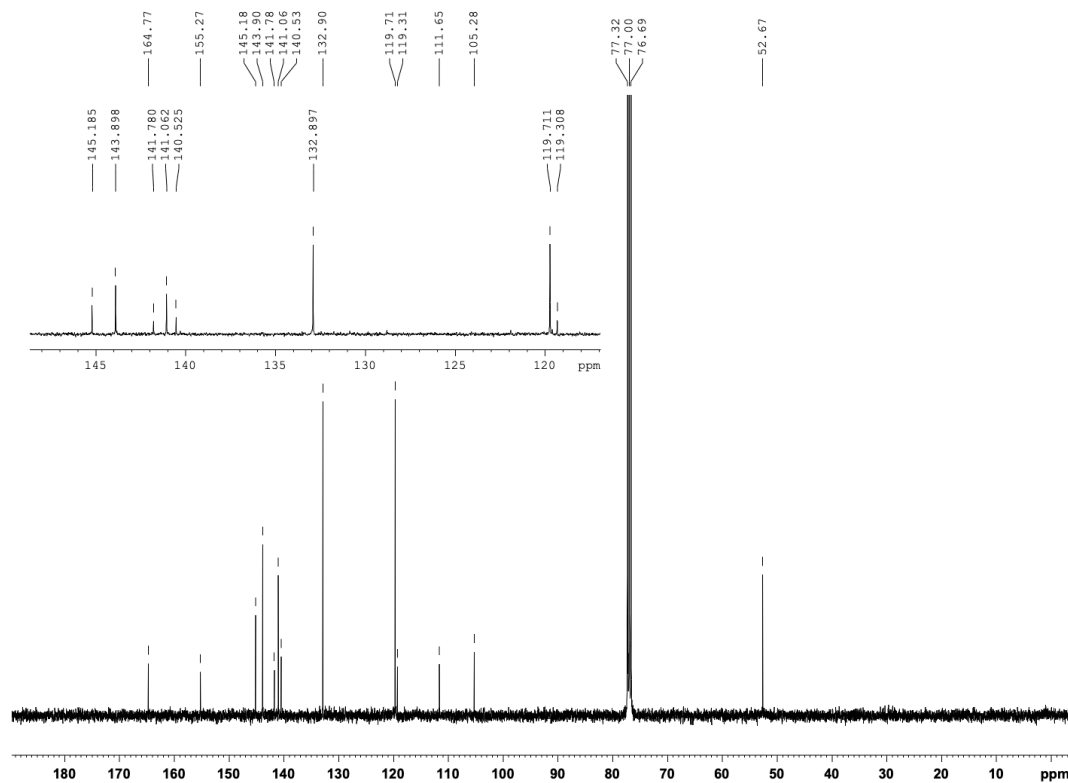


Methyl 7-[(4-cyanophenyl)amino]thieno[2,3-*b*]pyrazine-6-carboxylate **2n**

^1H NMR (CDCl_3 , 400 MHz) of compound **2n**

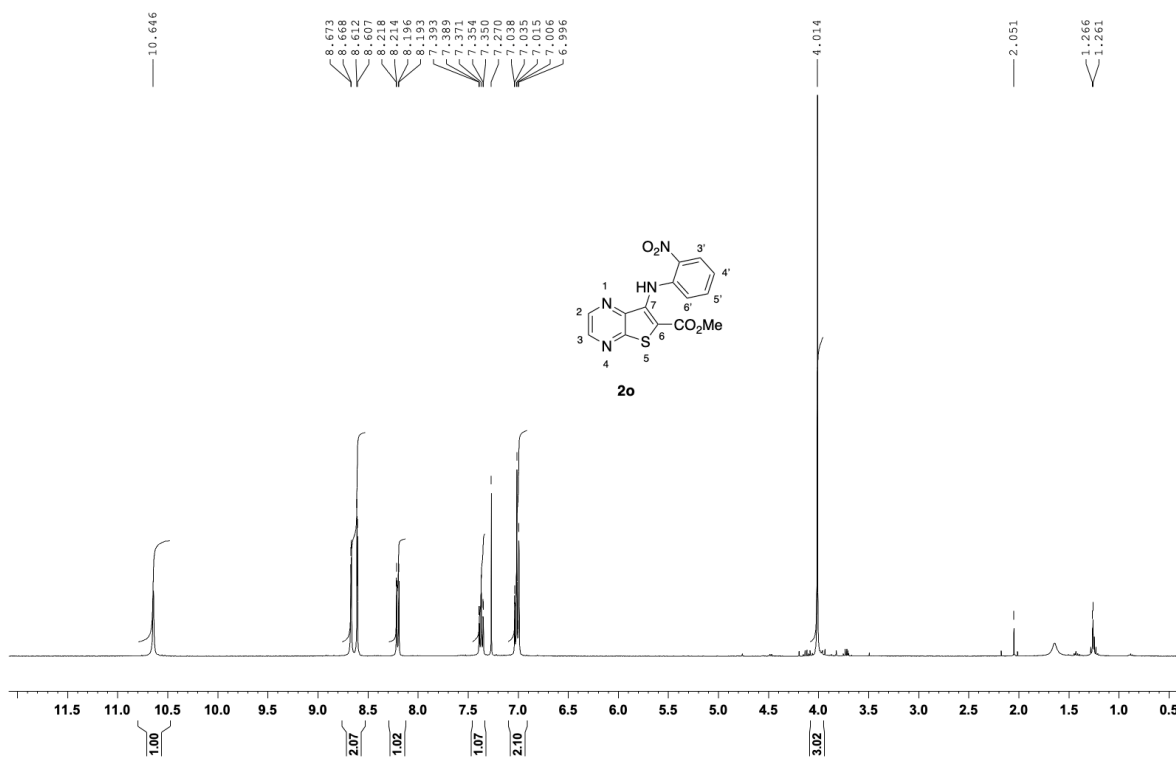


^{13}C NMR (CDCl_3 , 100.6 MHz) of compound **2n**



Methyl 7-[(2-nitrophenyl)amino]thieno[2,3-*b*]pyrazine-6-carboxylate **2o**

^1H NMR (CDCl_3 , 400 MHz) of compound **2o**



^{13}C NMR (CDCl_3 , 100.6 MHz) of compound **2o**

