

Supplementary Material

Design and synthesis of novel thiazole–benzimidazole hybrids as antimicrobial agents

Sateesh Kuna,^{a,b} Kotaiah Kandula,^a Nagaraju Myakala,^a Vishnu Thumma,^c and A. K. D. Bhavani*^a

^aDepartment of Chemistry, University College of Science, Osmania University, Hyderabad, 500007, Telangana, India

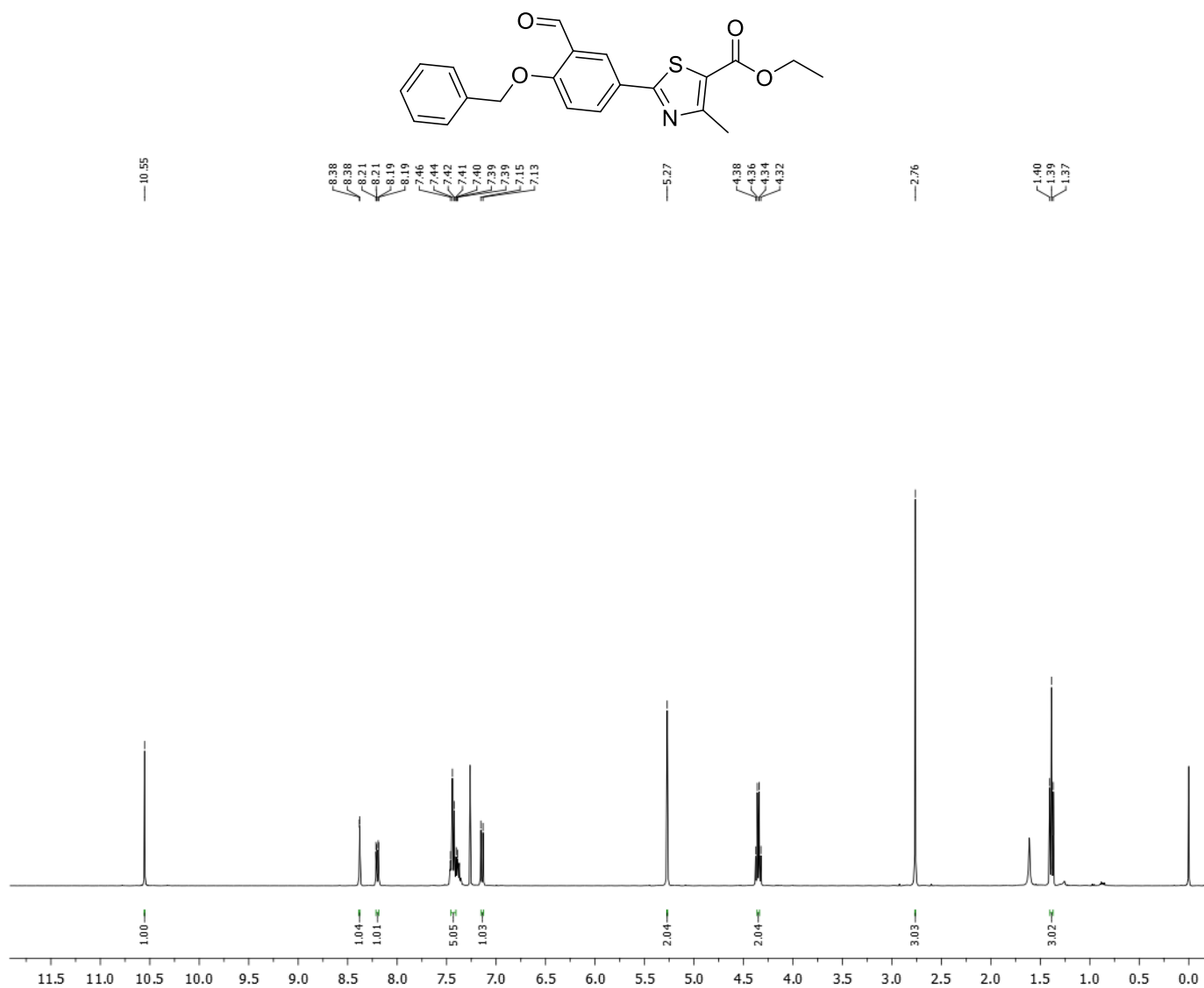
^bGeethanjali College of Engineering and Technology, Cheeryal, Keesara, Medchal, 501301, Telangana, India

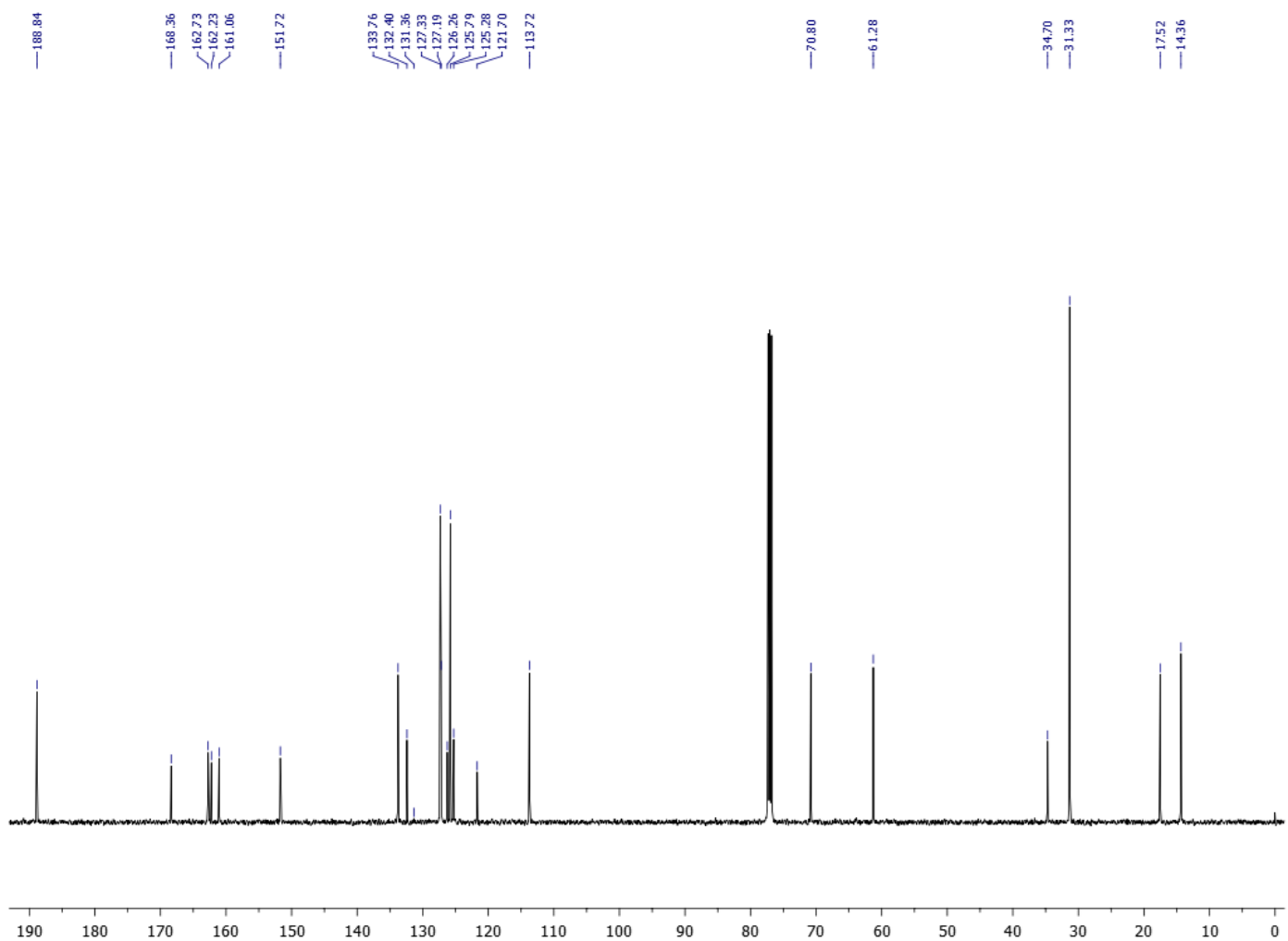
^cDepartment of Sciences and Humanities, Matrusri Engineering College, Saidabad, Hyderabad, 500059, Telangana, India

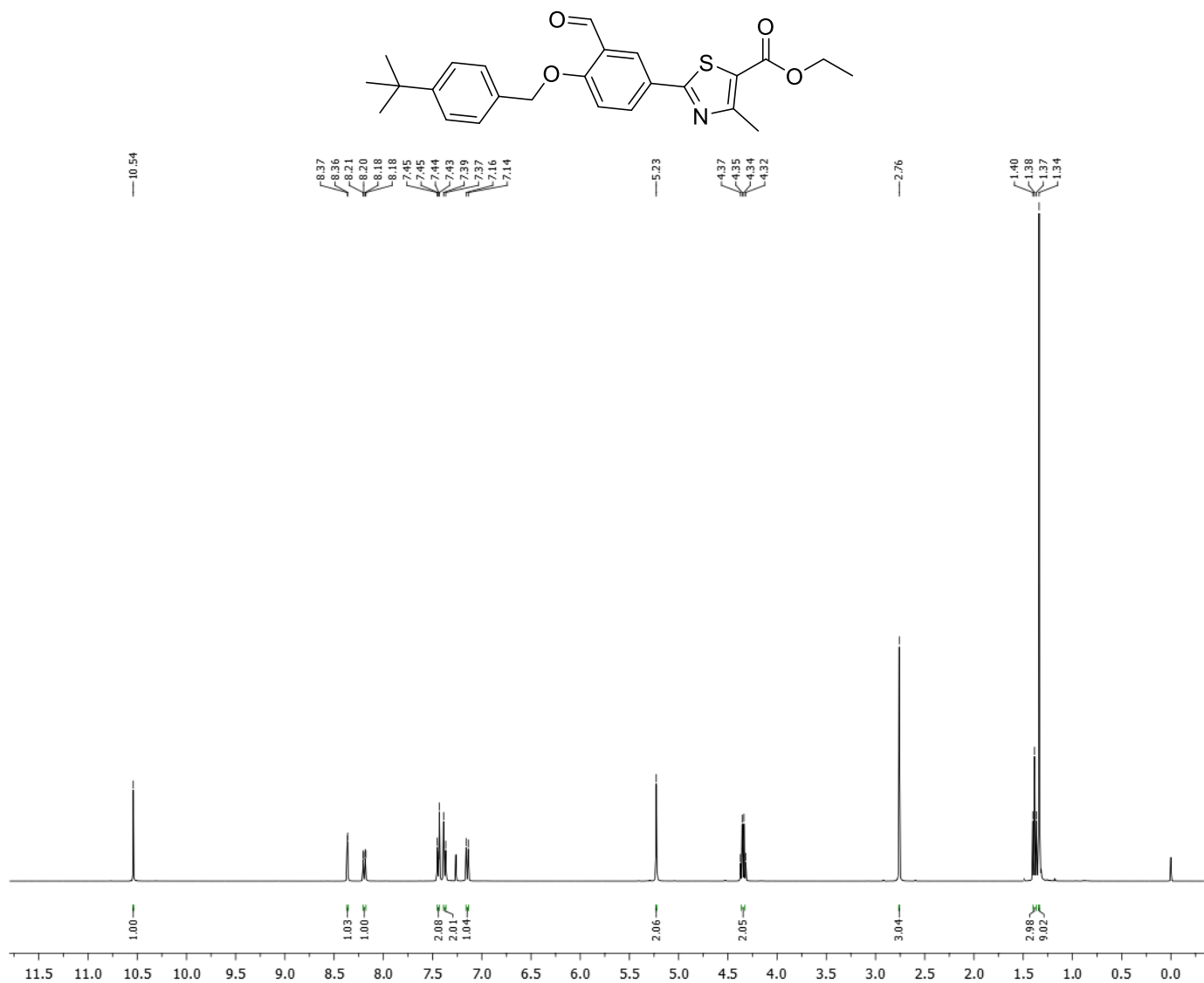
Email: durgabhavani237@gmail.com

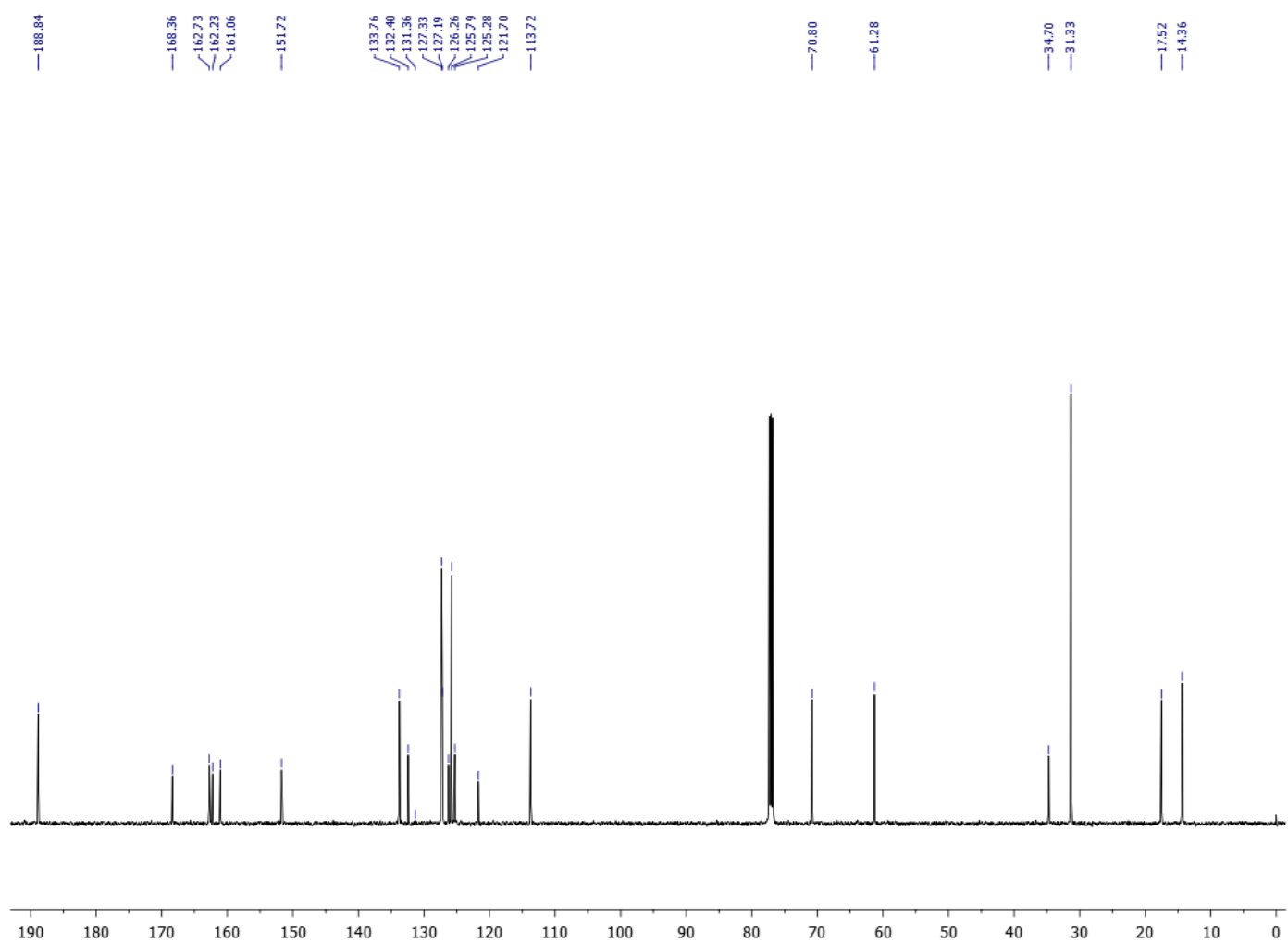
Table of Contents

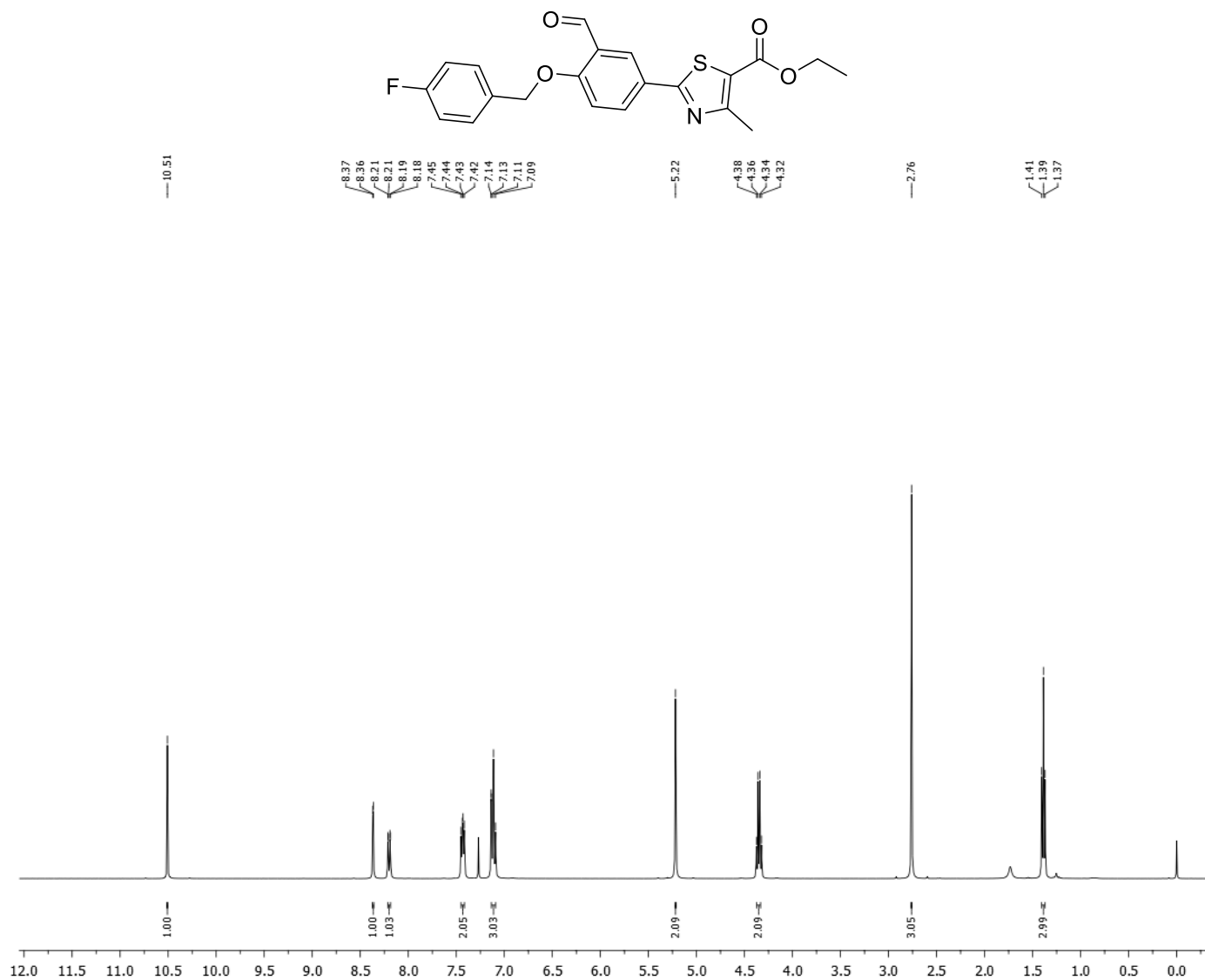
Spectral Copies.....	S2
----------------------	----

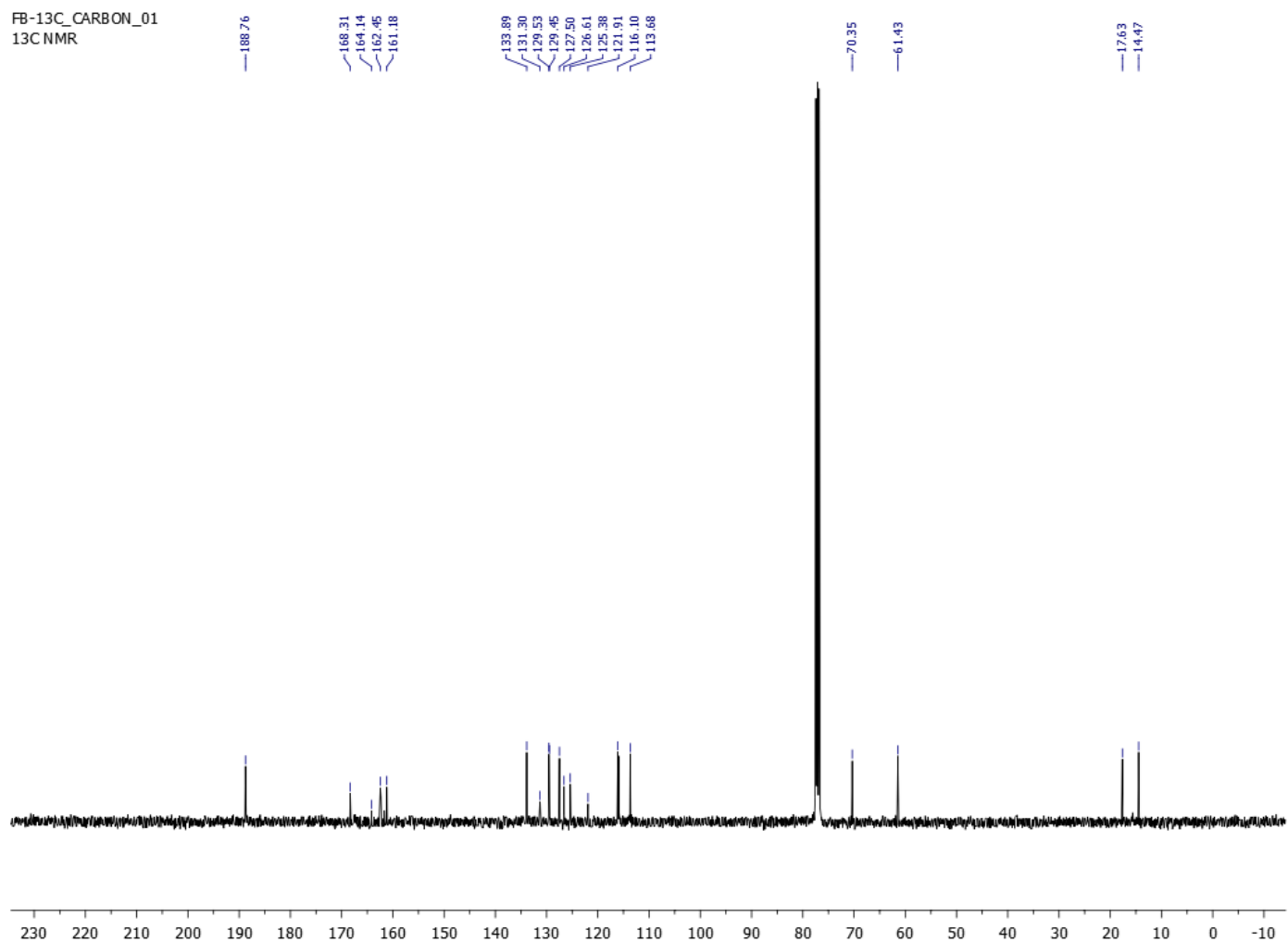
¹H NMR of Ethyl 2-(4-(benzyloxy)-3-formylphenyl)-4-methylthiazole-5-carboxylate (3a)**(Intermediate)**

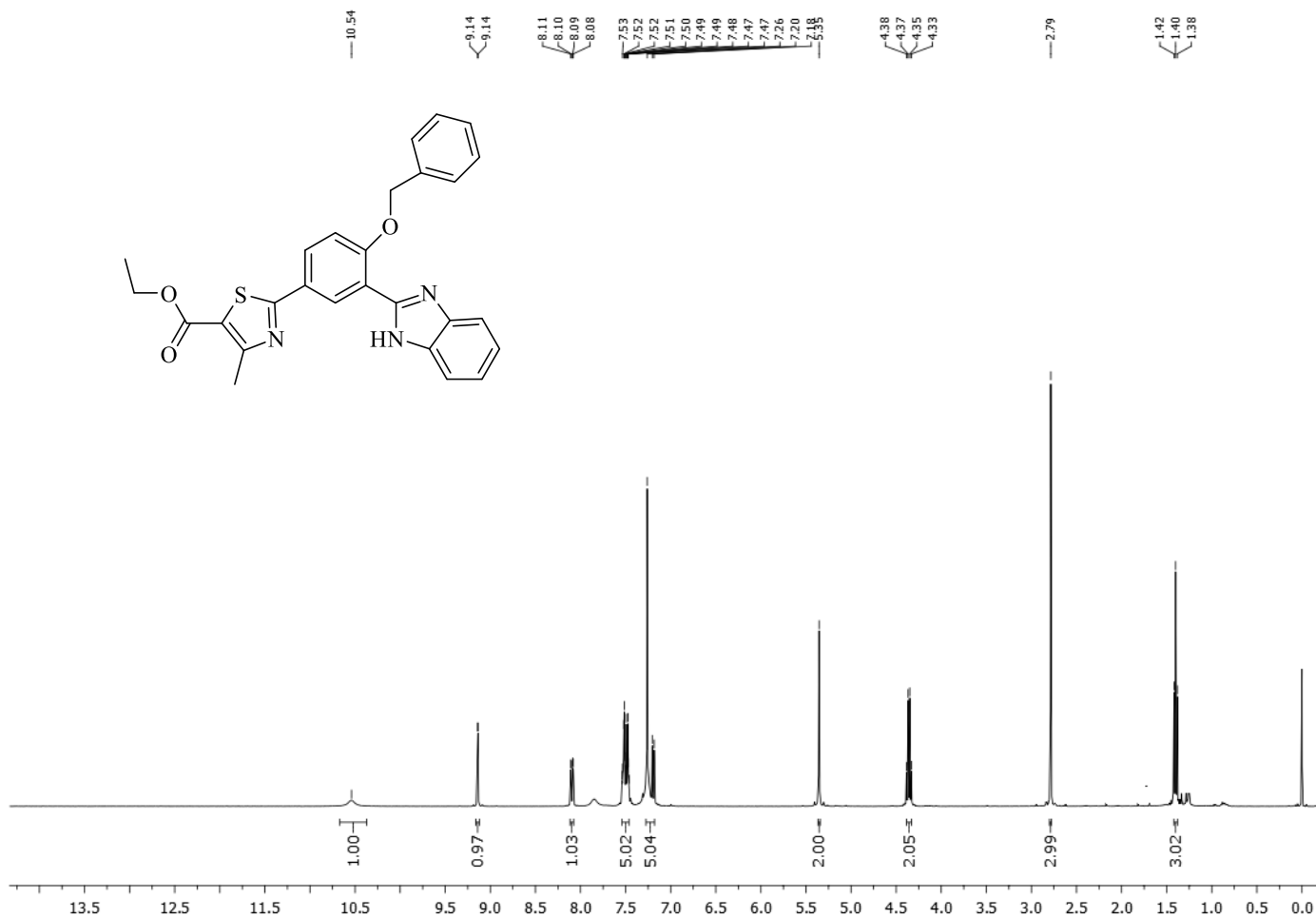
^{13}C NMR Ethyl 2-(4-(benzyloxy)-3-formylphenyl)-4-methylthiazole-5-carboxylate (3a)

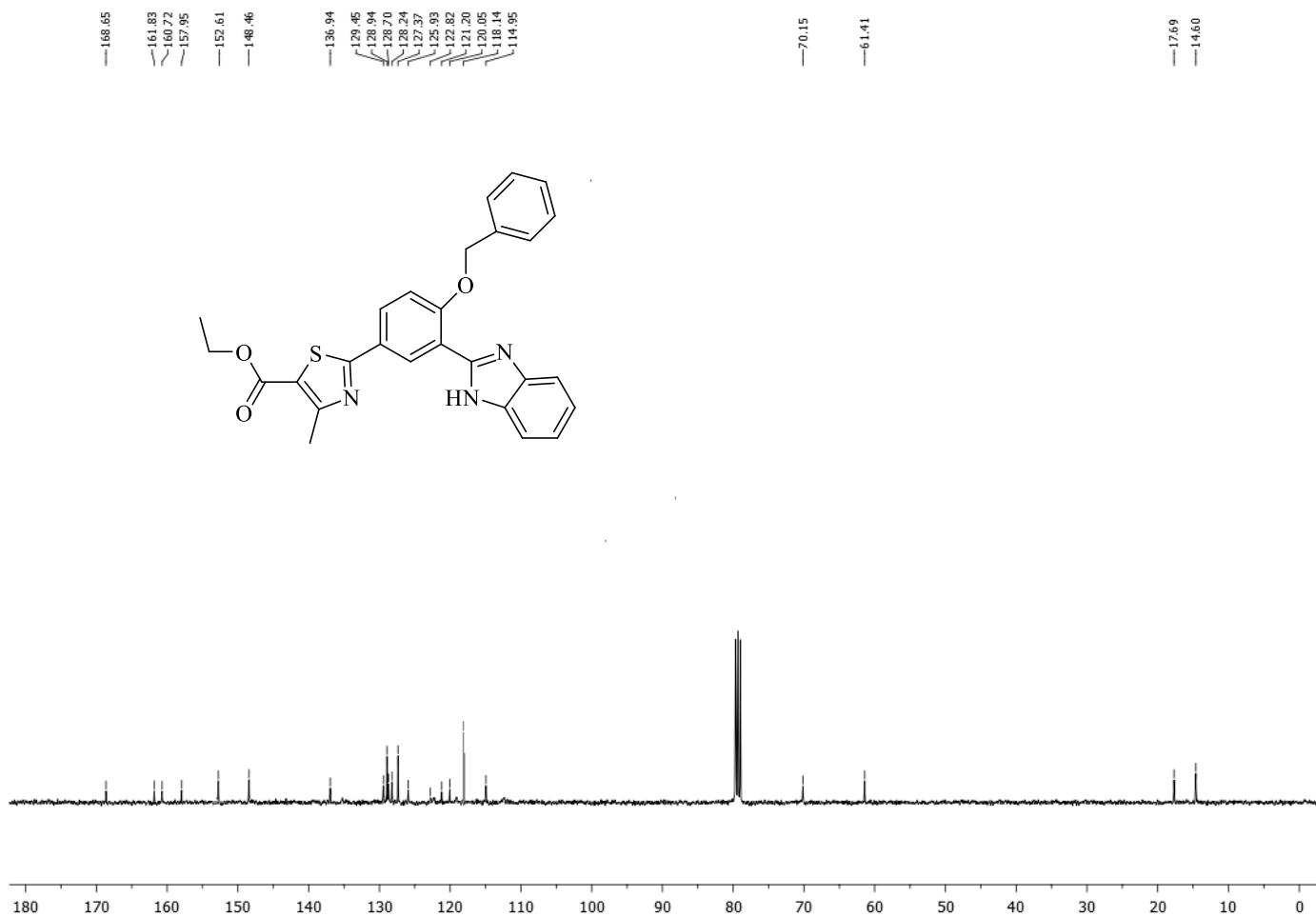
¹H NMR of Ethyl 2-(4-((4-(tert-butyl)benzyl)oxy)-3-formylphenyl)-4-methylthiazole-5-carboxylate (3b) (intermediate)

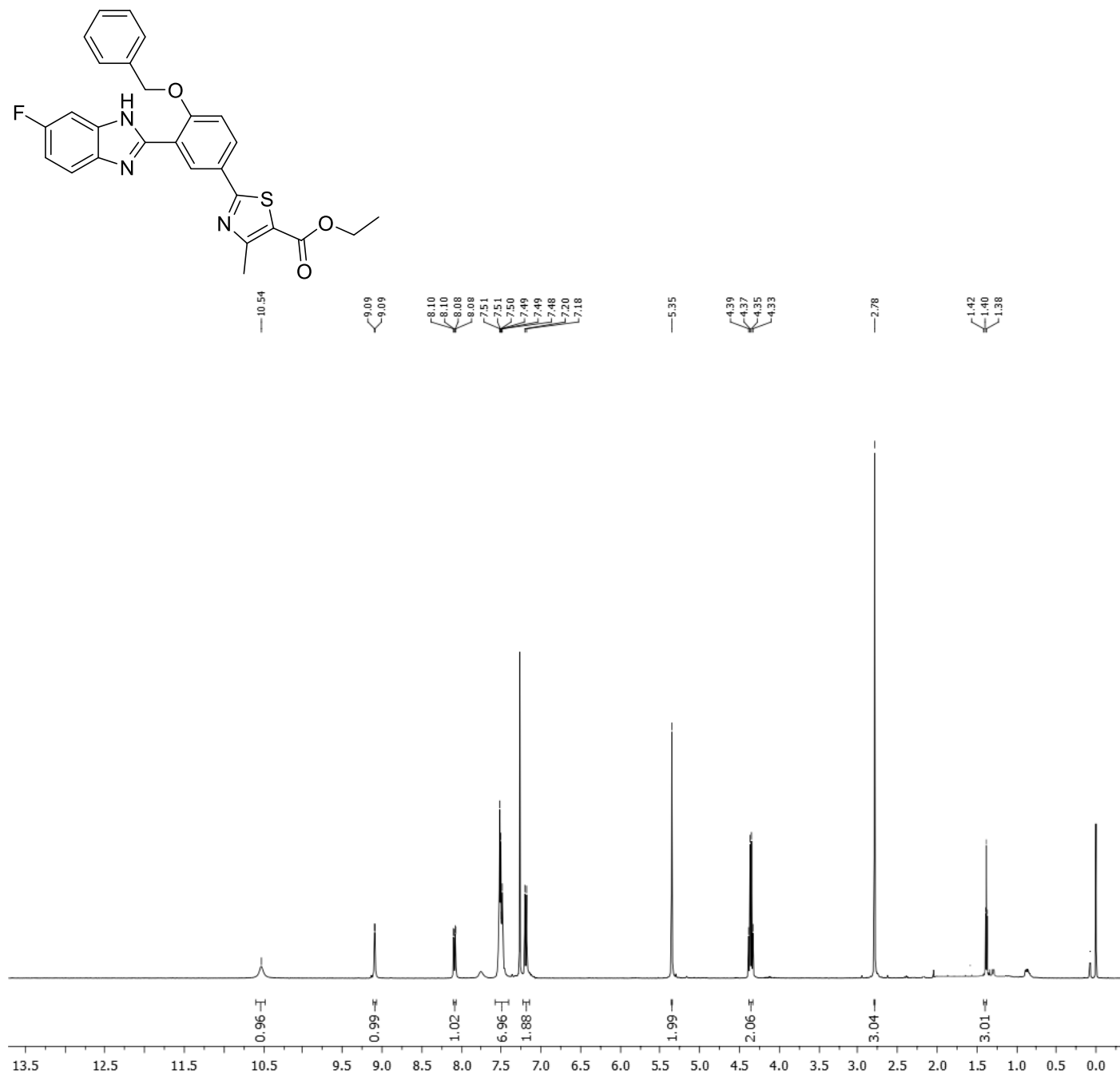
^{13}C NMR Ethyl 2-(4-((4-(tert-butyl)benzyl)oxy)-3-formylphenyl)-4-methylthiazole-5-carboxylate (3b)

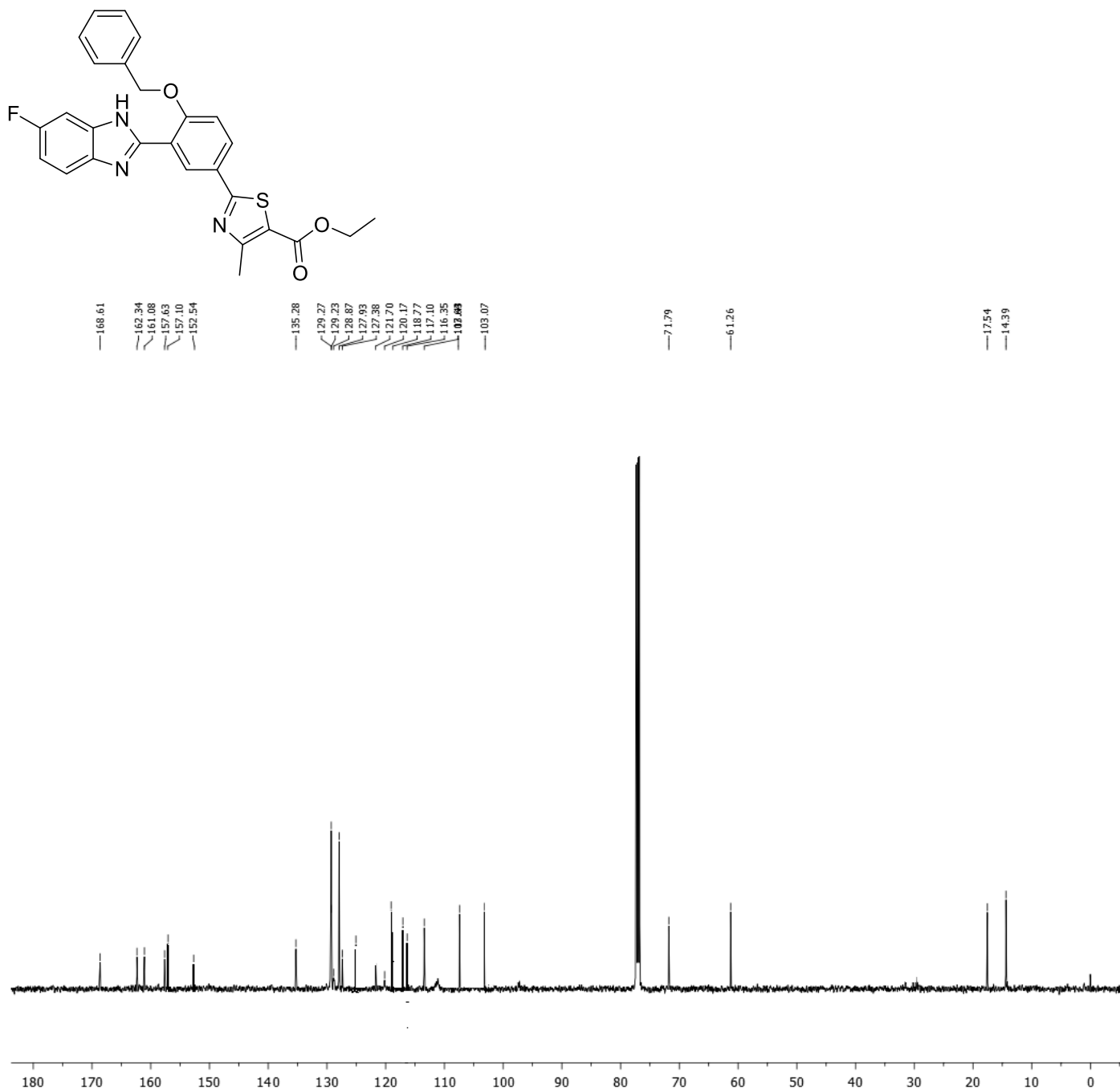
¹H NMR of ethyl 2-(4-((4-fluorobenzyl)oxy)-3-formylphenyl)-4-methylthiazole-5-carboxylate (intermediate) (3c)

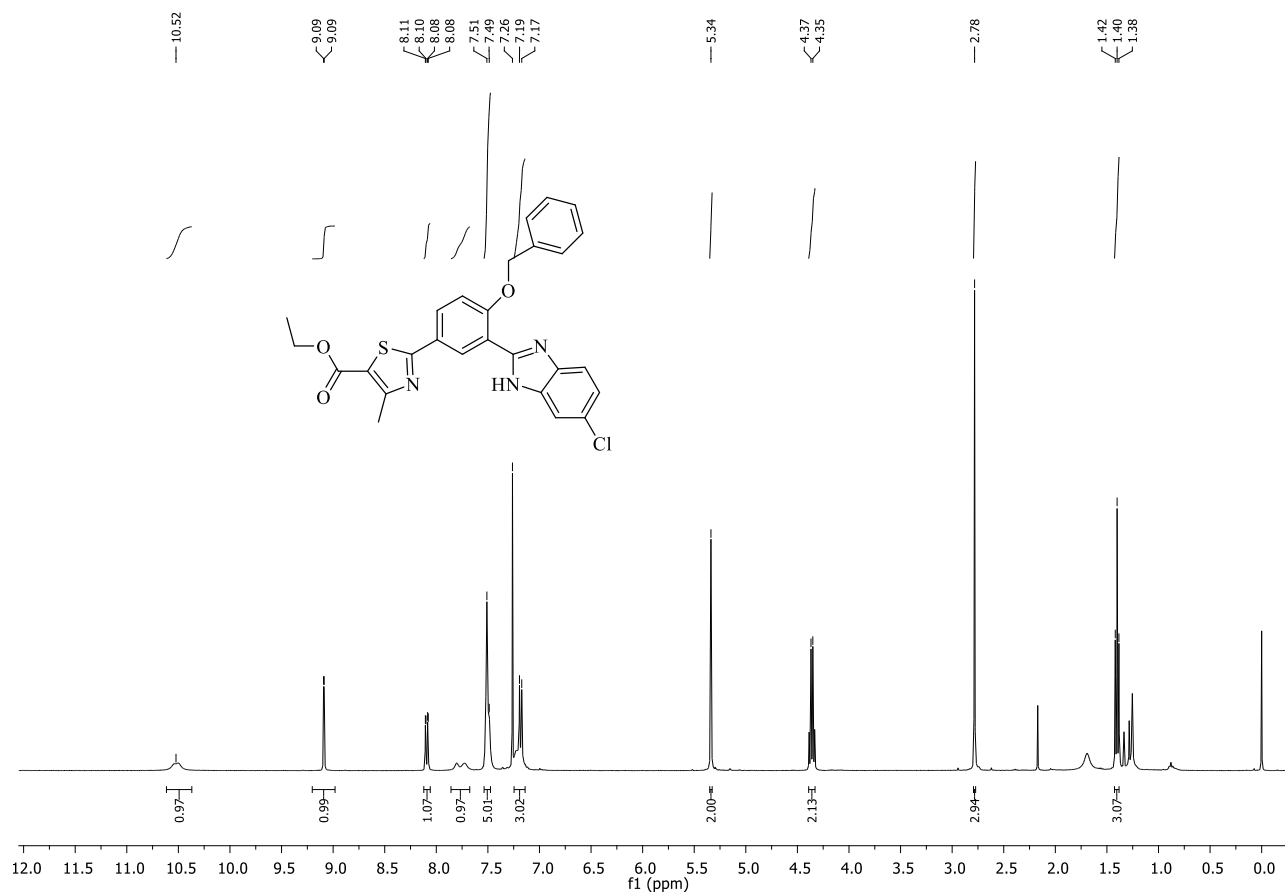
^{13}C NMR of ethyl 2-(4-((4-fluorobenzyl)oxy)-3-formylphenyl)-4-methylthiazole-5-carboxylate 3cFB-13C_CARBON_01
13C NMR

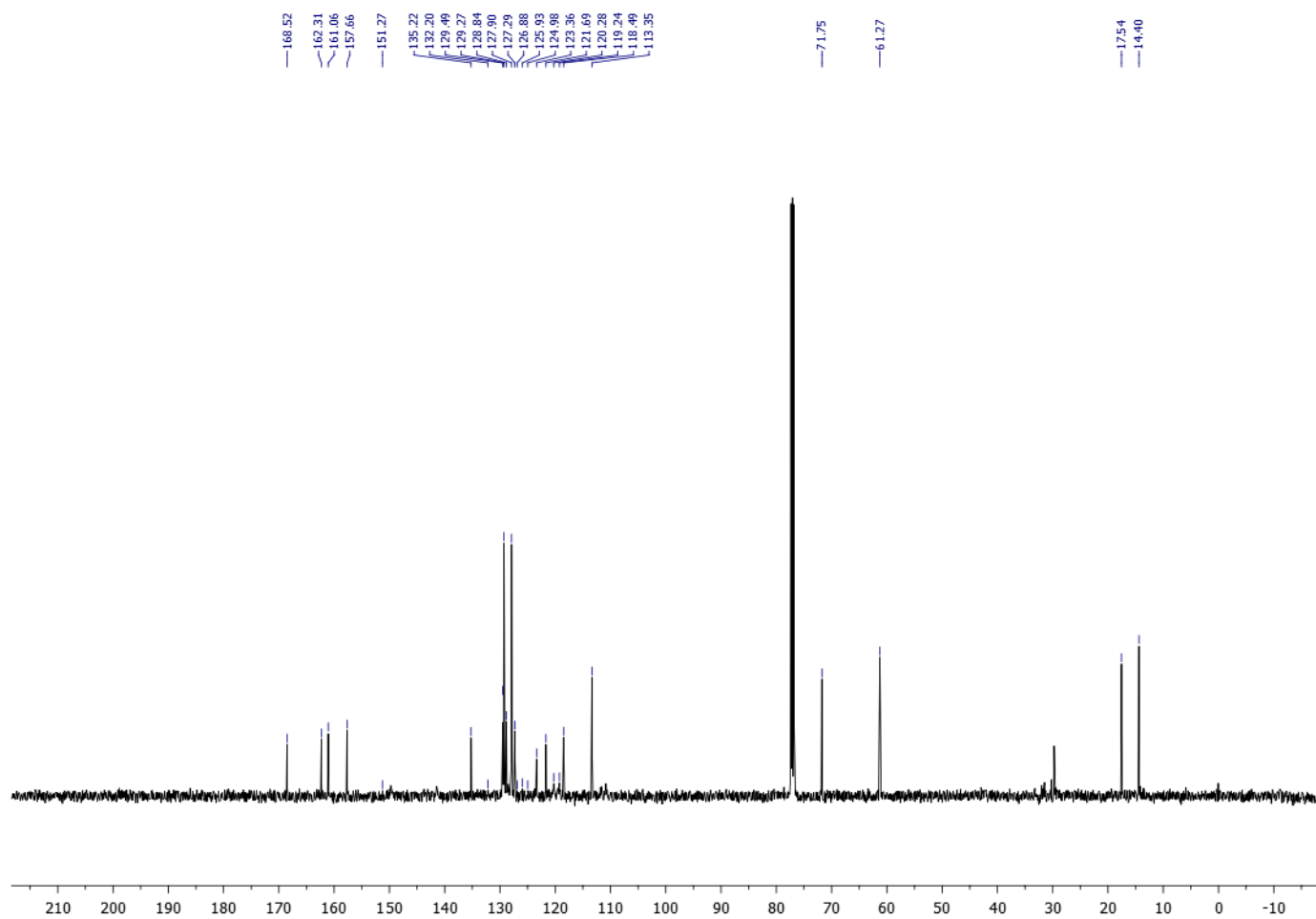
¹H NMR of Ethyl 2-(3-(1*H*-benzo[*d*]imidazol-2-yl)-4-(benzyloxy)phenyl)-4-methylthiazole-5-carboxylate (5a)

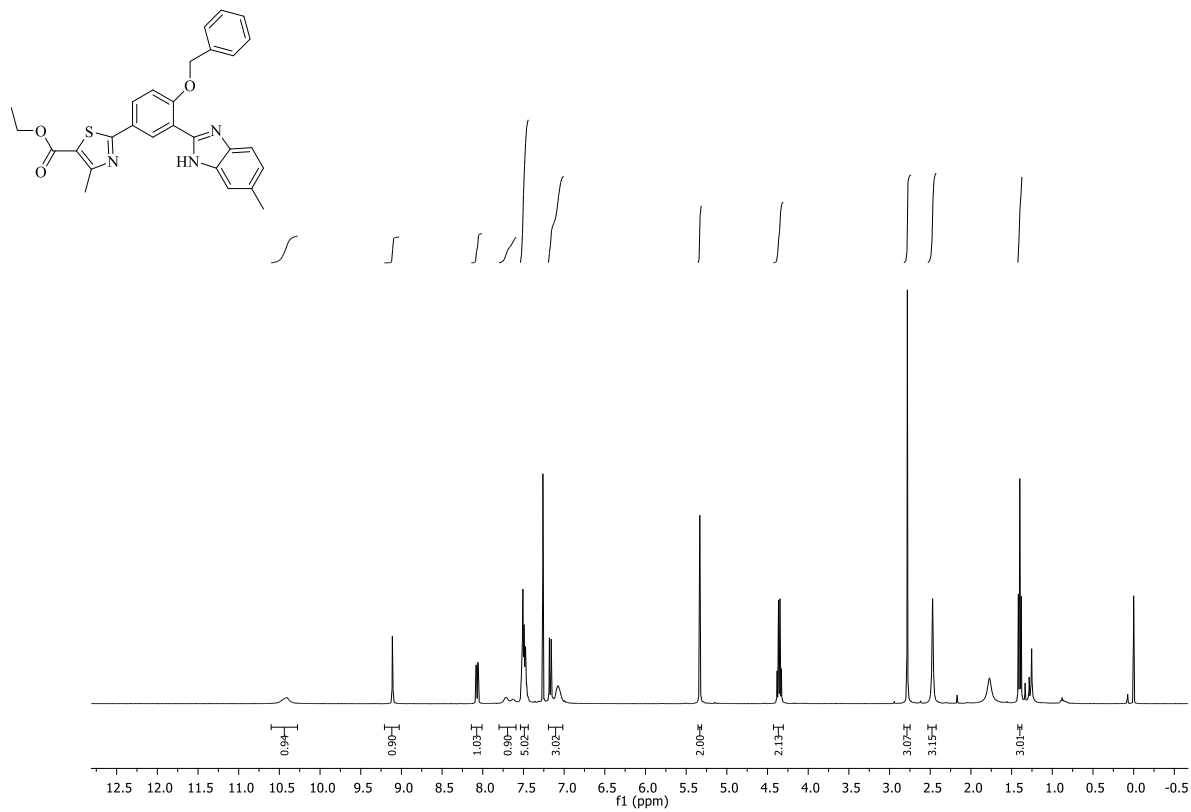
¹³C NMR of Ethyl 2-(3-(1*H*-benzo[*d*]imidazol-2-yl)-4-(benzyloxy)phenyl)-4-methylthiazole-5-carboxylate (5a)

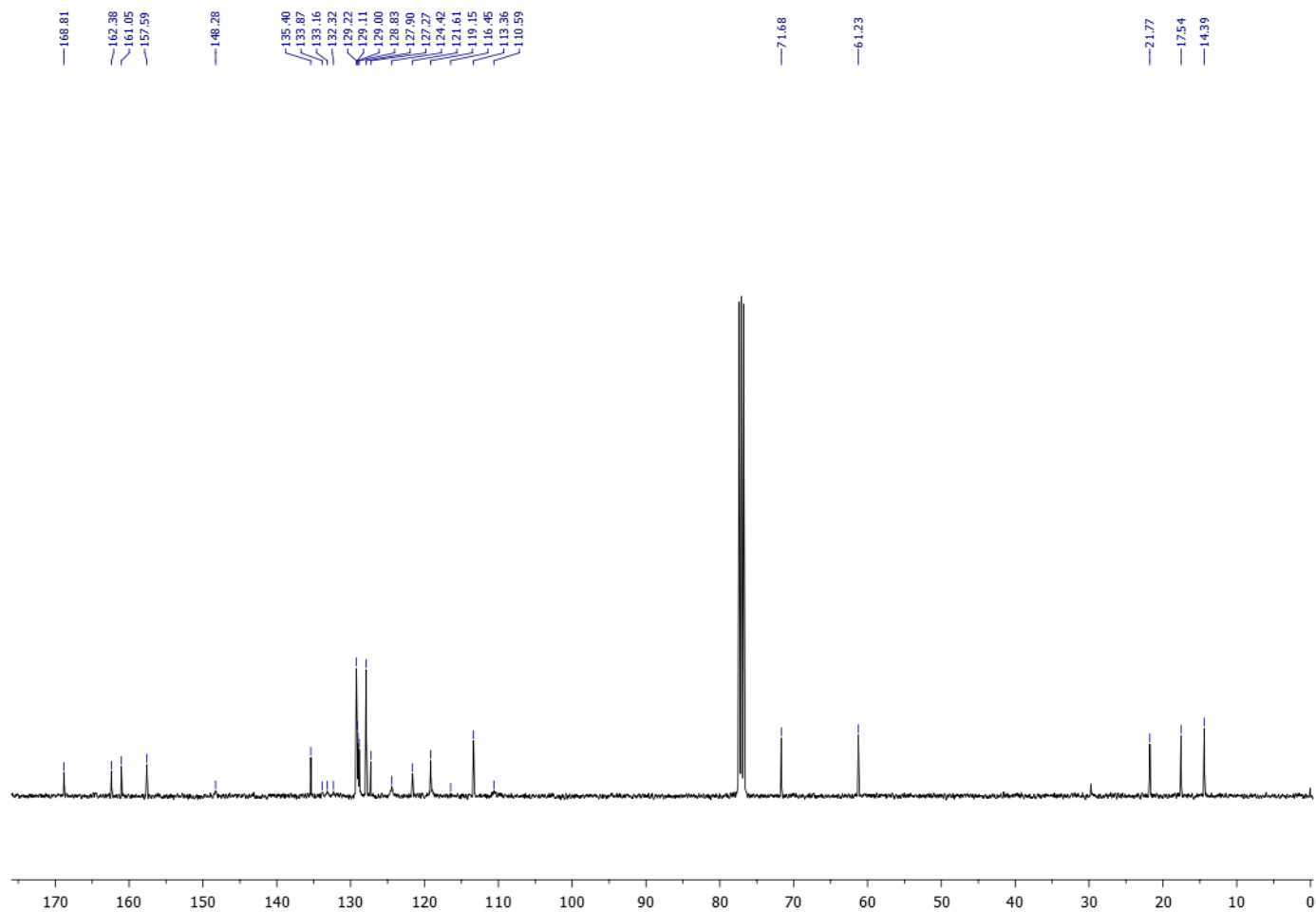
¹H NMR of Ethyl 2-(4-(benzyloxy)-3-(6-fluoro-1*H*-benzo[*d*]imidazol-2-yl)phenyl)-4-methylthiazole-5-carboxylate (5b)

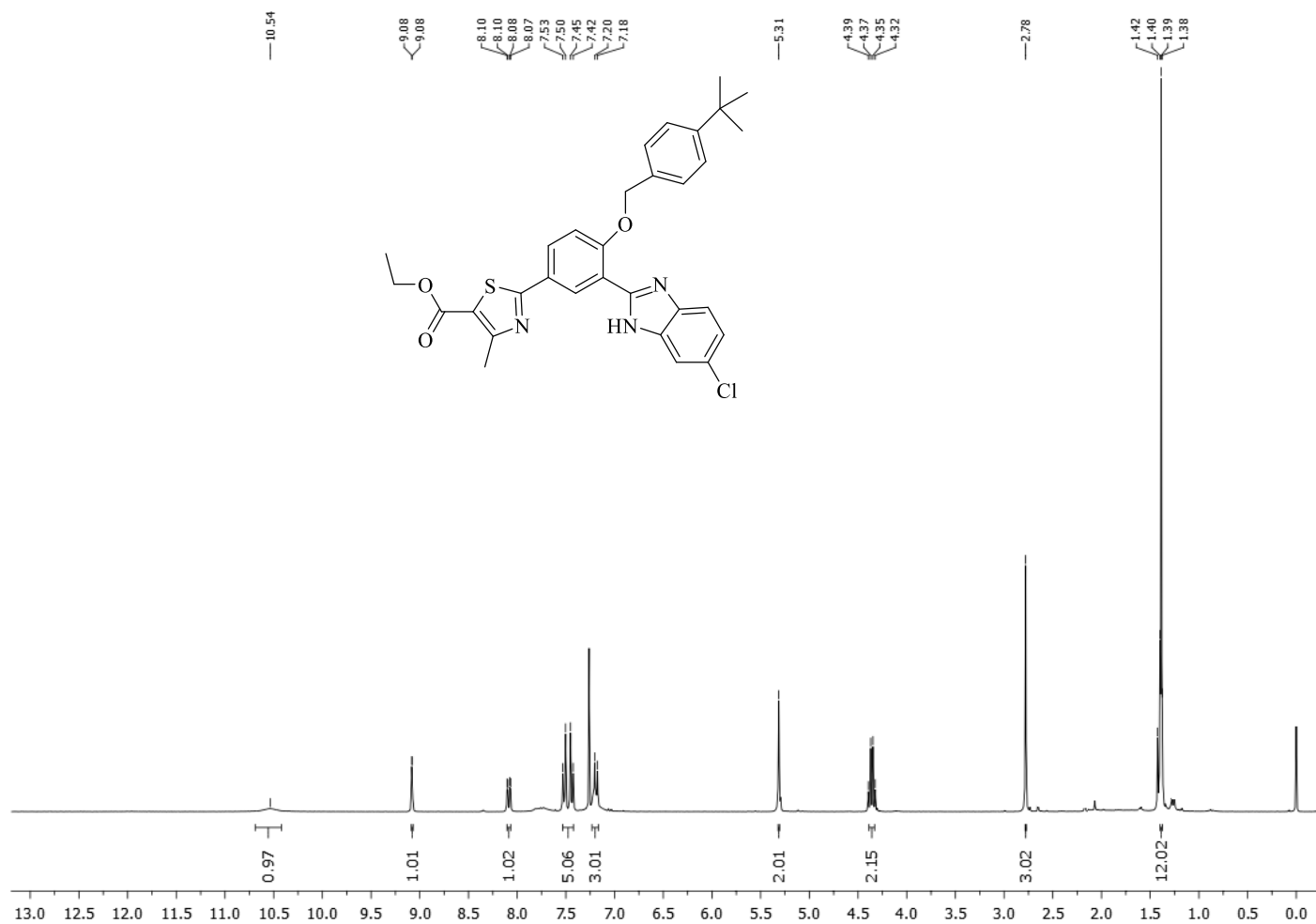
^{13}C NMR NMR of Ethyl 2-(4-(benzyloxy)-3-(6-fluoro-1*H*-benzo[*d*]imidazol-2-yl)phenyl)-4-methylthiazole-5-carboxylate (5b)

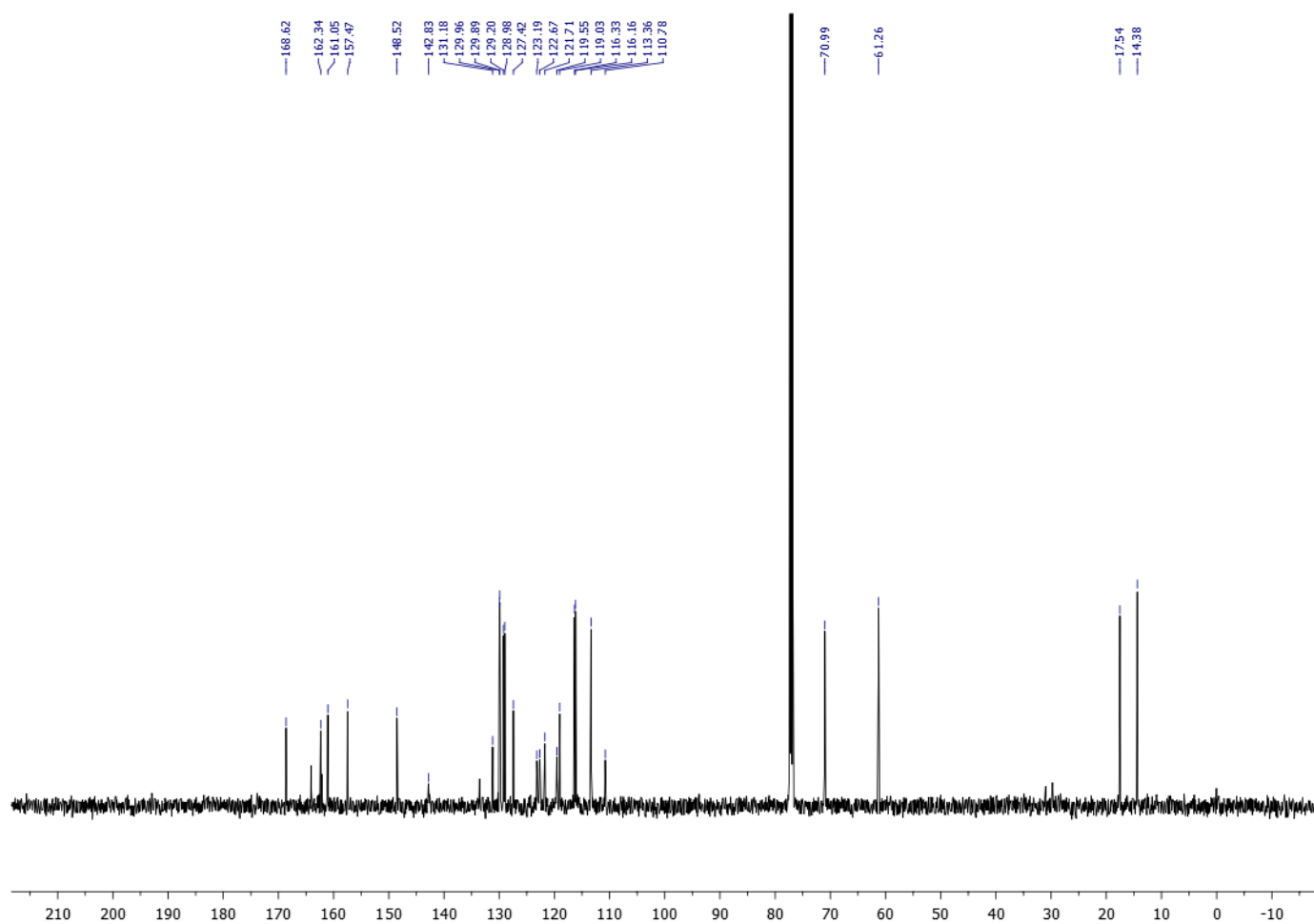
¹H NMR of Ethyl 2-(4-(benzyloxy)-3-(6-chloro-1*H*-benzo[*d*]imidazol-2-yl)phenyl)-4-methylthiazole-5-carboxylate (5c)

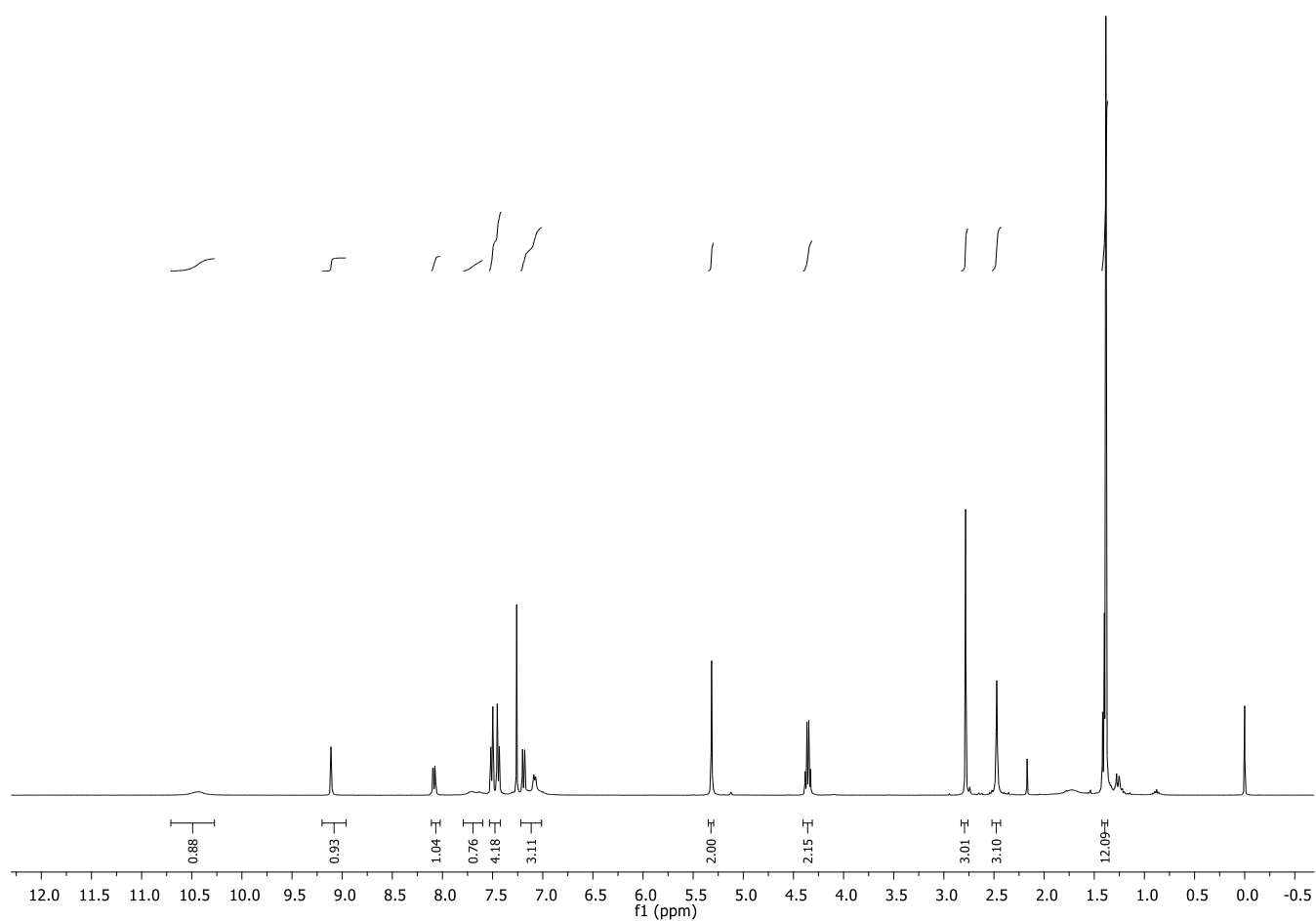
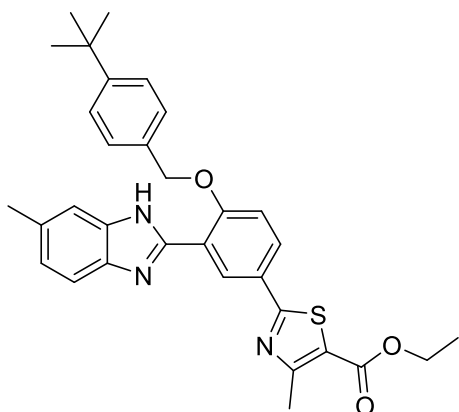
^{13}C NMR Ethyl 2-(4-(benzyloxy)-3-(6-chloro-1*H*-benzo[*d*]imidazol-2-yl)phenyl)-4-methylthiazole-5-carboxylate (5c)

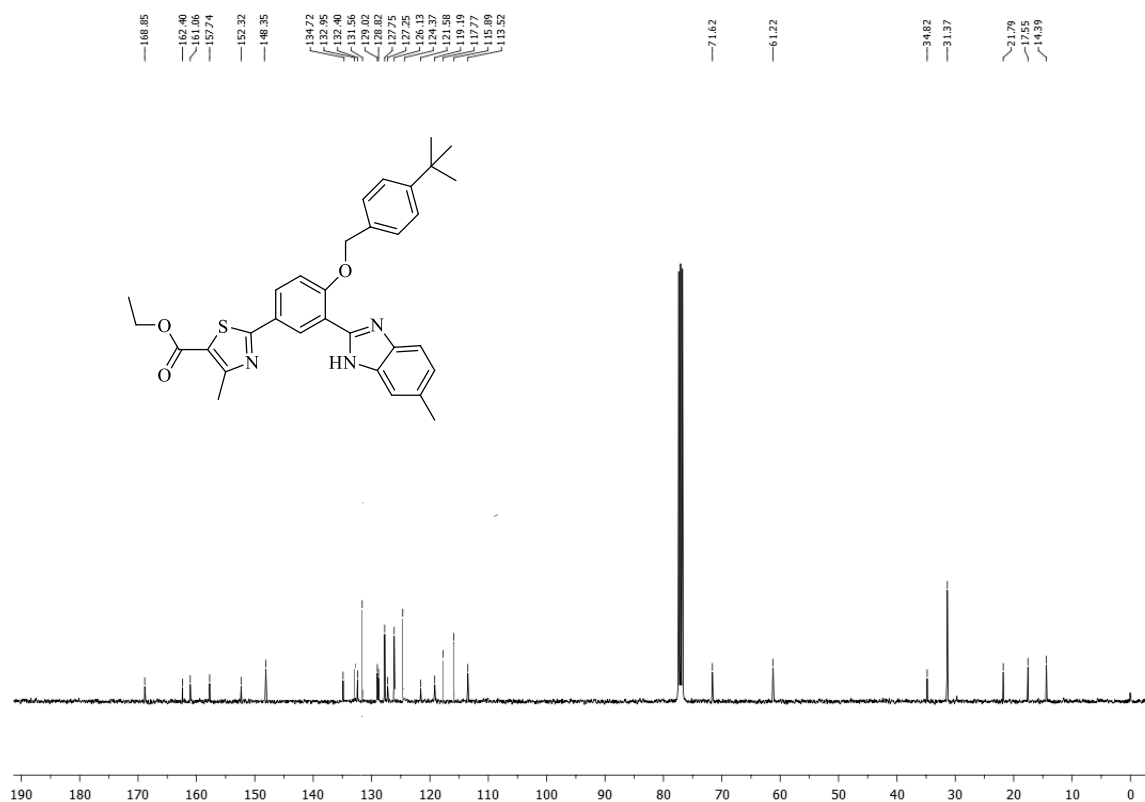
¹H NMR of Ethyl 2-(4-(benzyloxy)-3-(6-methyl-1*H*-benzo[*d*]imidazol-2-yl)phenyl)-4-methylthiazole-5-carboxylate (5d)

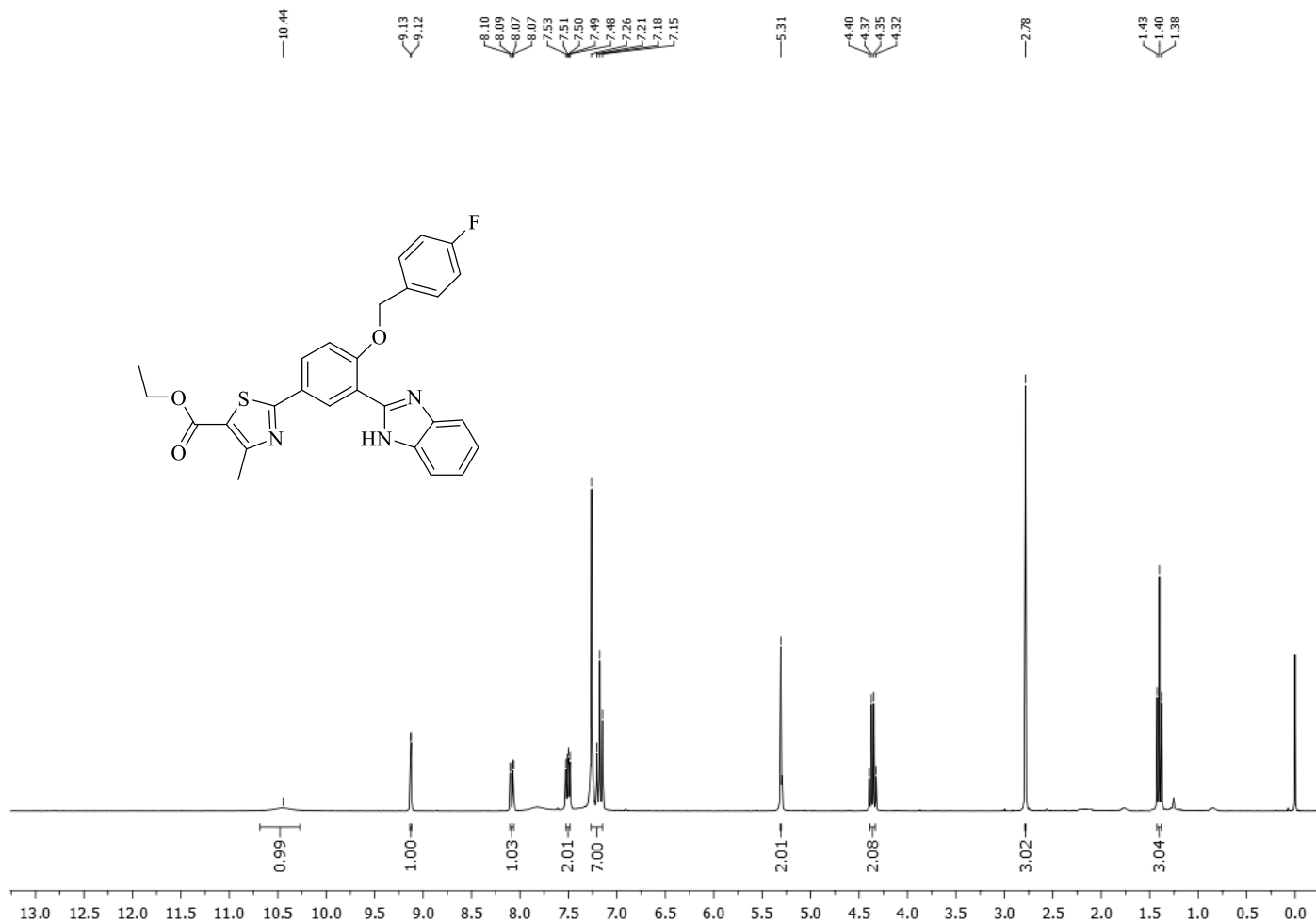
^{13}C NMR of Ethyl 2-(4-(benzyloxy)-3-(6-methyl-1*H*-benzo[*d*]imidazol-2-yl)phenyl)-4-methylthiazole-5-carboxylate (5d)

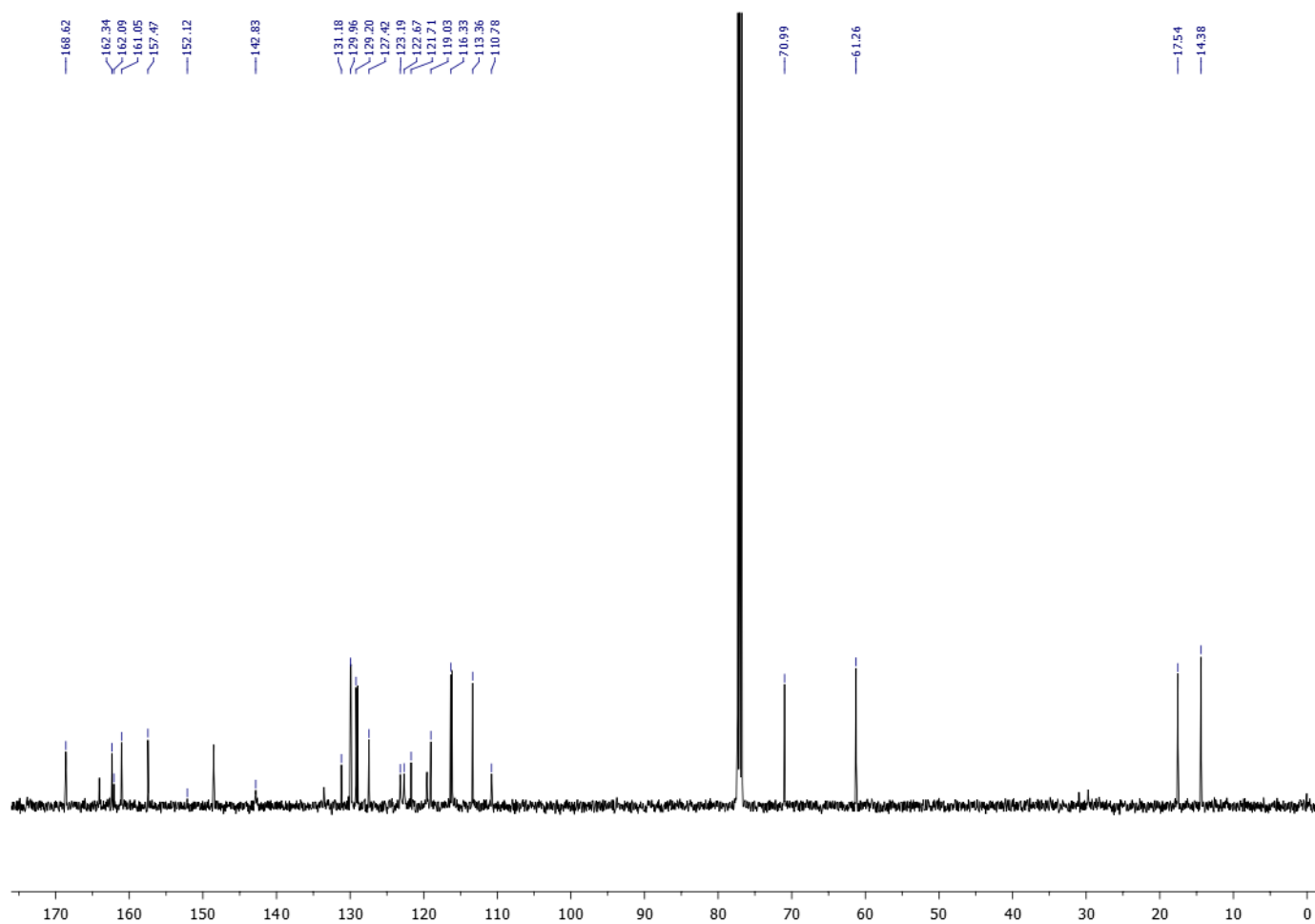
¹H NMR of Ethyl 2-(4-((4-(tert-butyl)benzyl)oxy)-3-(6-chloro-1H-benzo[d]imidazol-2-yl)phenyl)-4-methylthiazole-5-carboxylate (5e)

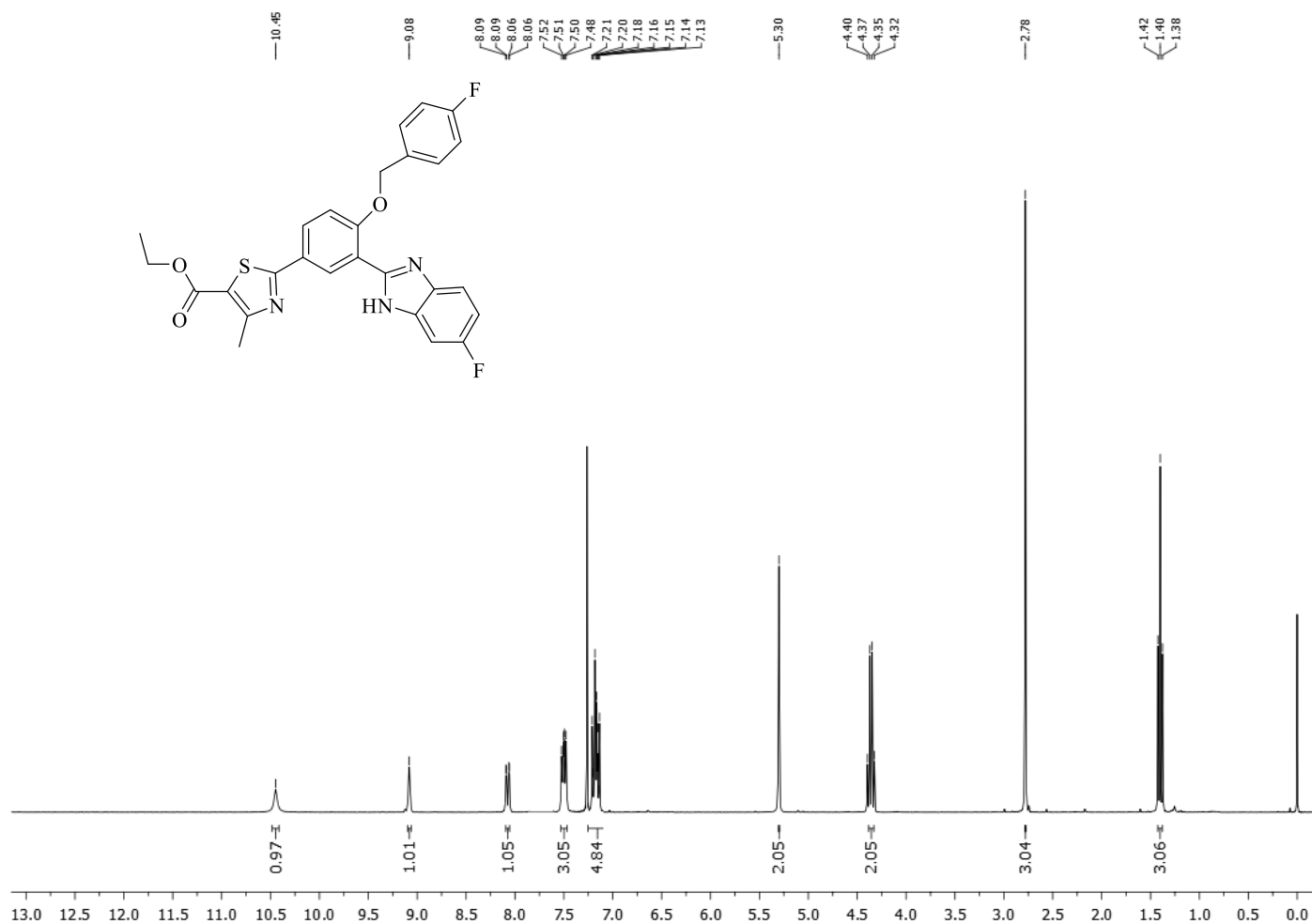
^{13}C NMR of Ethyl 2-(4-((4-(tert-butyl)benzyl)oxy)-3-(6-chloro-1H-benzo[d]imidazol-2-yl)phenyl)-4-methylthiazole-5-carboxylate(5e)

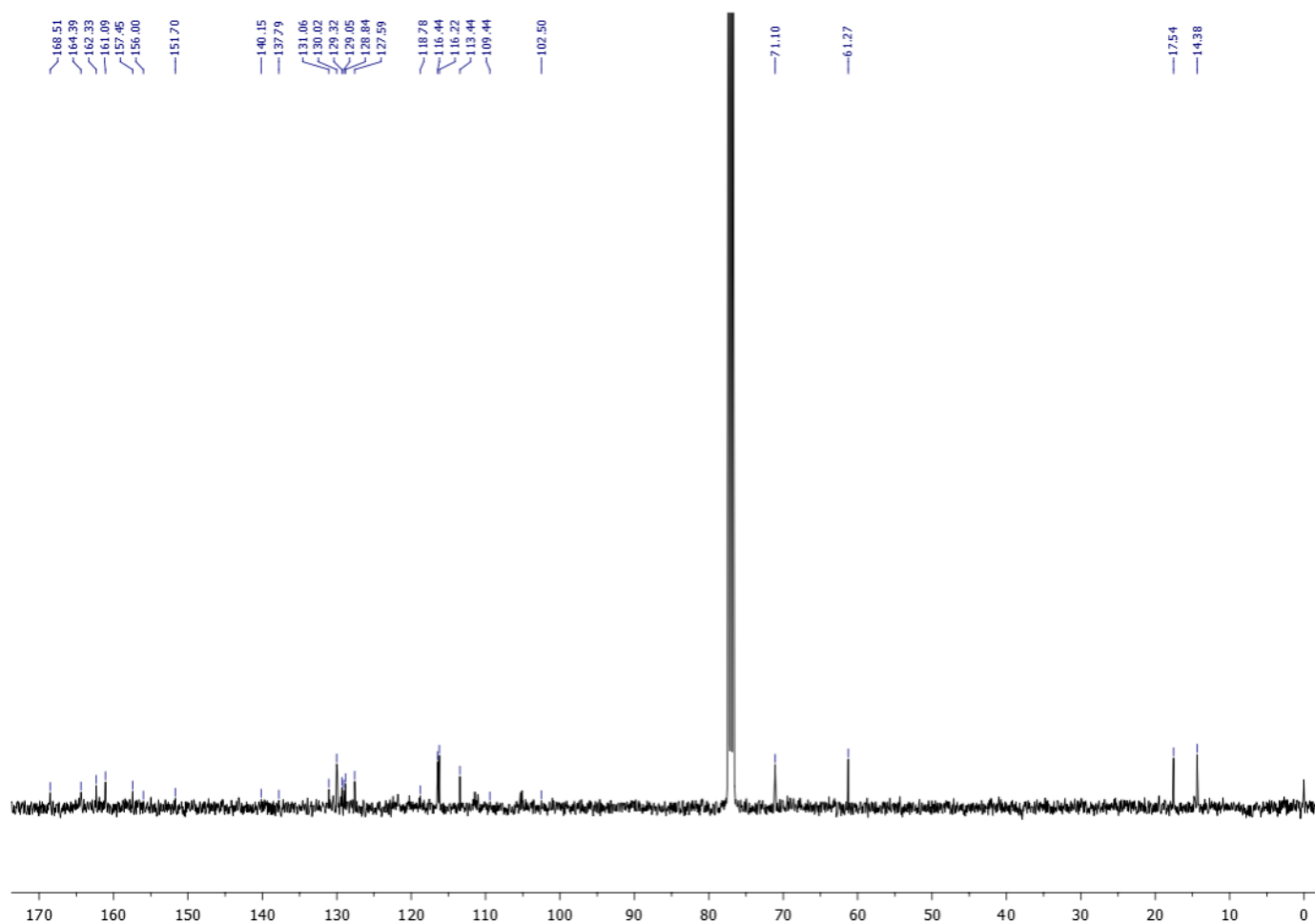
¹H NMR of Ethyl 2-(4-((4-(tert-butyl)benzyl)oxy)-3-(6-methyl-1*H*-benzo[*d*]imidazol-2-yl)phenyl)-4-methylthiazole-5-carboxylate (5f)

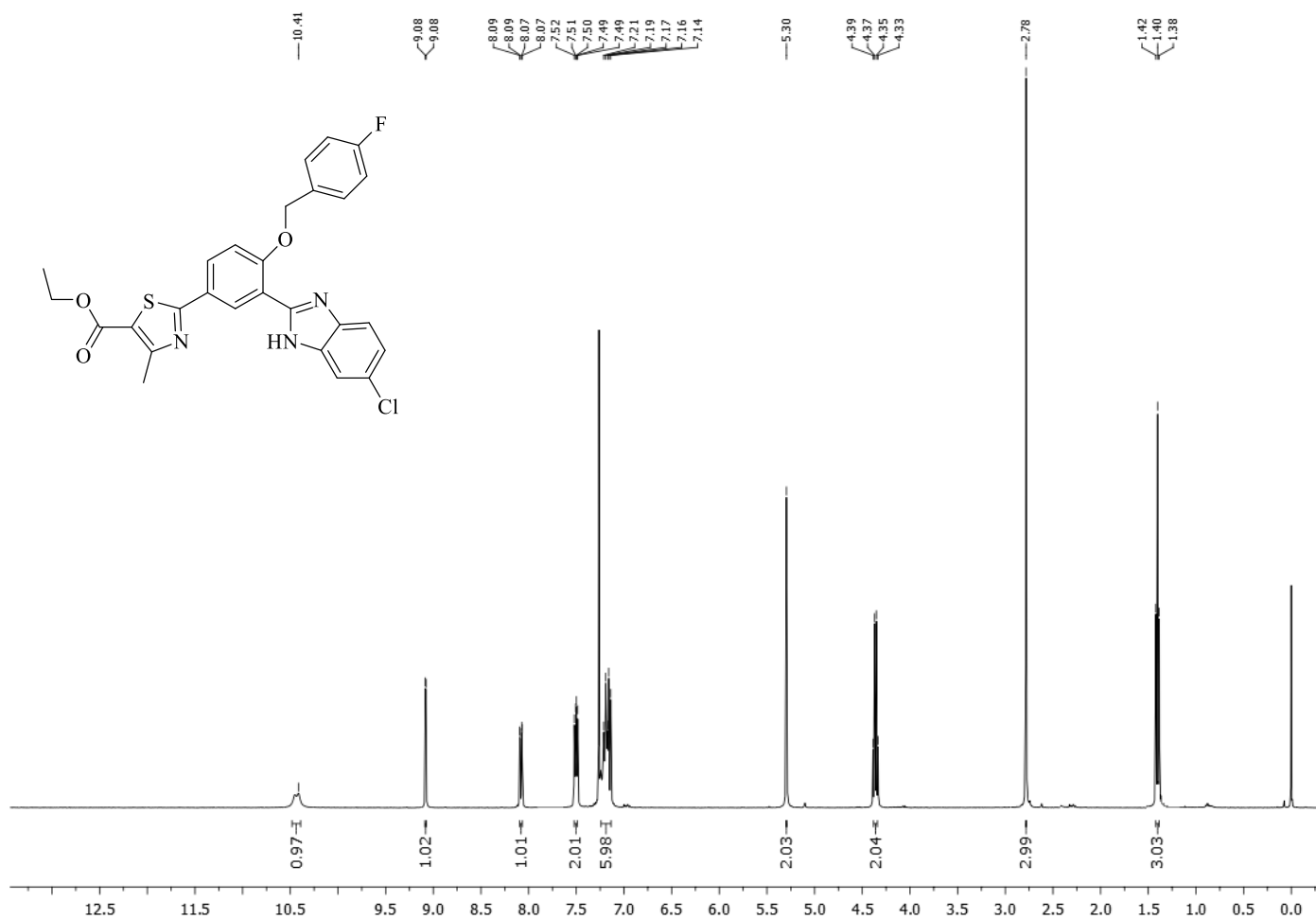
^{13}C NMR Ethyl 2-(4-((4-(tert-butyl)benzyl)oxy)-3-(6-methyl-1*H*-benzo[*d*]imidazol-2-yl)phenyl)-4-methylthiazole-5-carboxylate (5f)

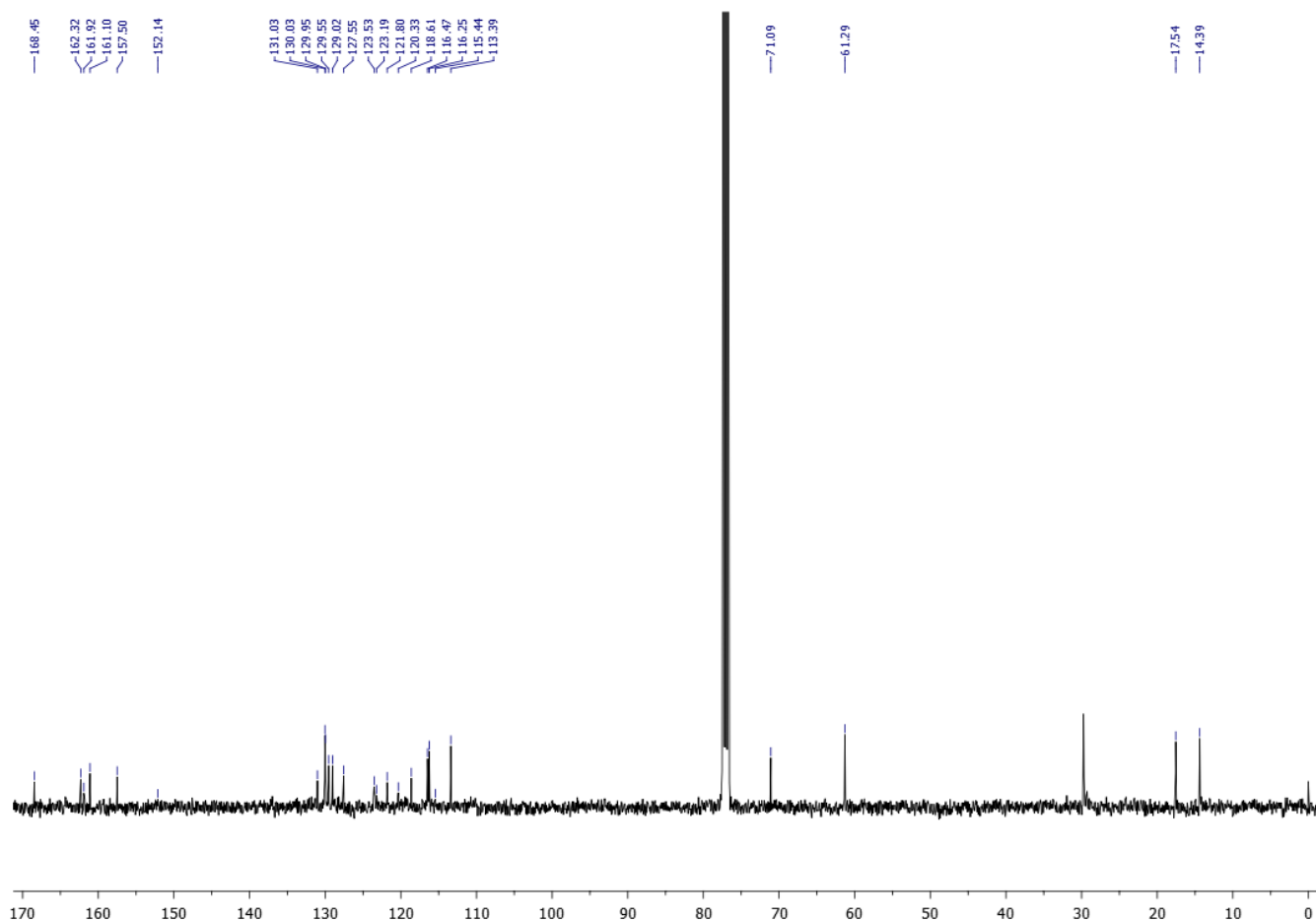
¹H NMR of Ethyl 2-(3-(1*H*-benzo[*d*]imidazol-2-yl)-4-((4-fluorobenzyl)oxy)phenyl)-4-methylthiazole-5-carboxylate (5g)

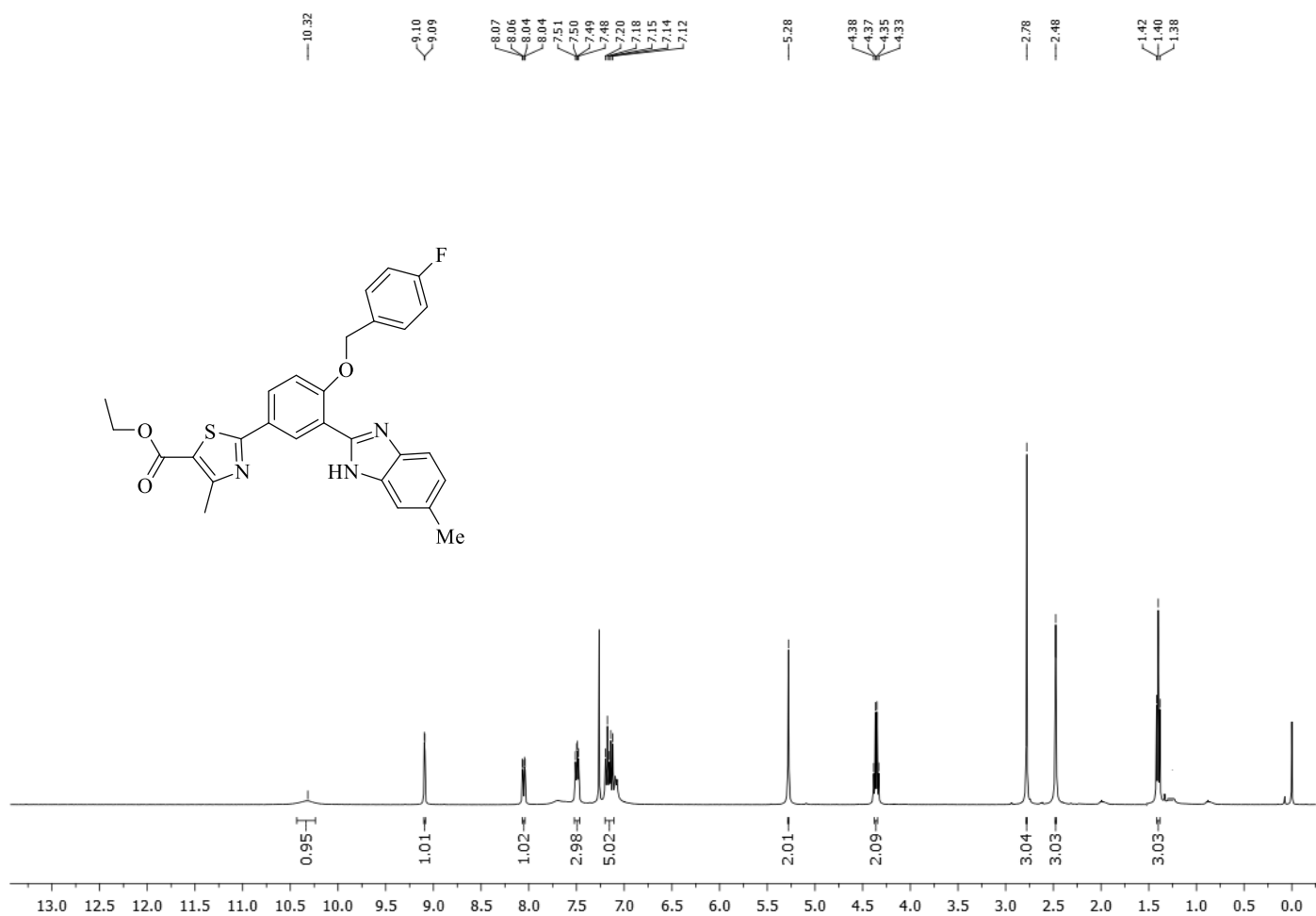
¹³C NMR of Ethyl 2-(3-(1*H*-benzo[*d*]imidazol-2-yl)-4-((4-fluorobenzyl)oxy)phenyl)-4-methylthiazole-5-carboxylate (5g)

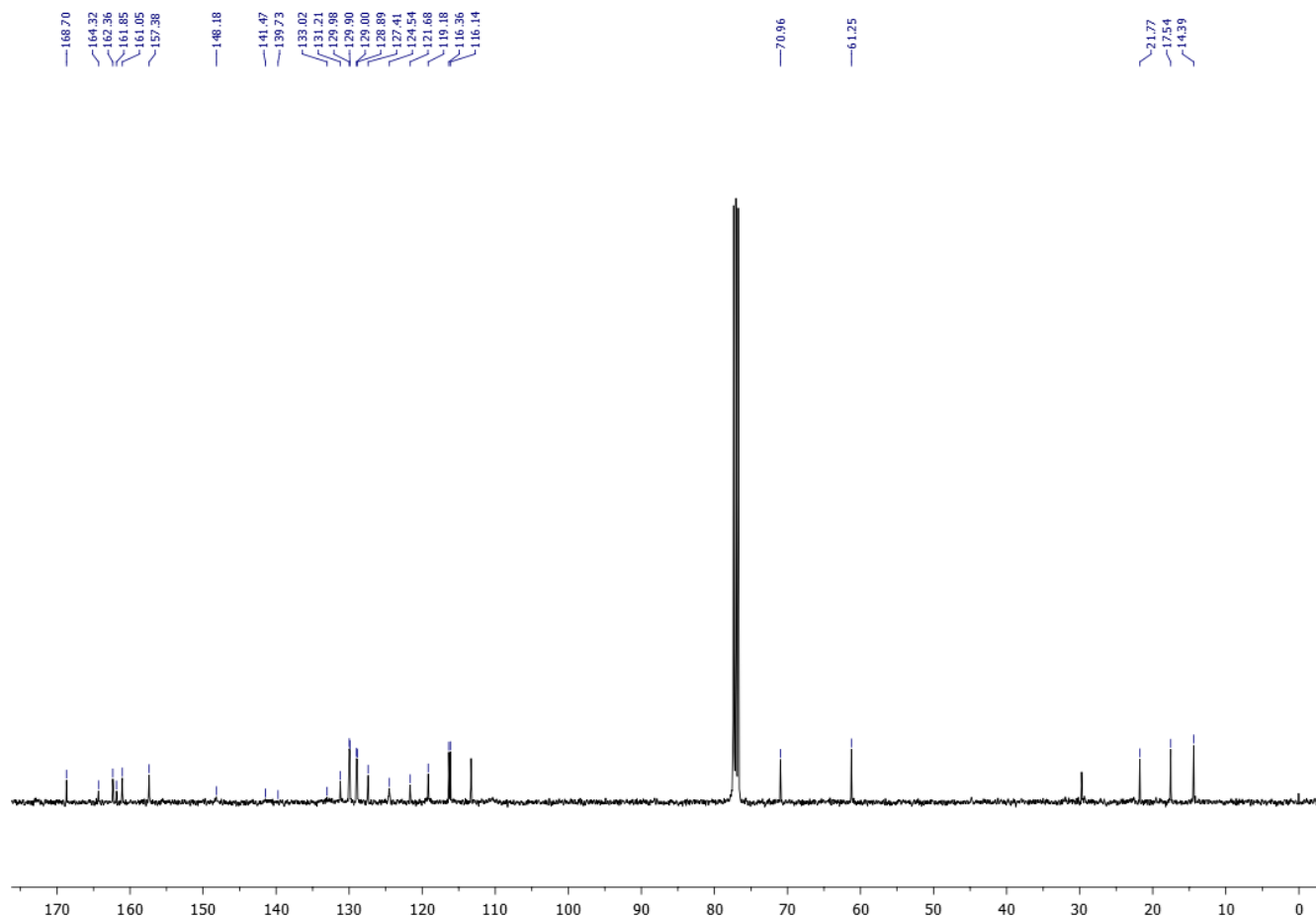
¹H NMR of Ethyl 2-(3-(6-fluoro-1*H*-benzo[*d*]imidazol-2-yl)-4-((4-fluorobenzyl)oxy)phenyl)-4-methylthiazole-5-carboxylate (5h).

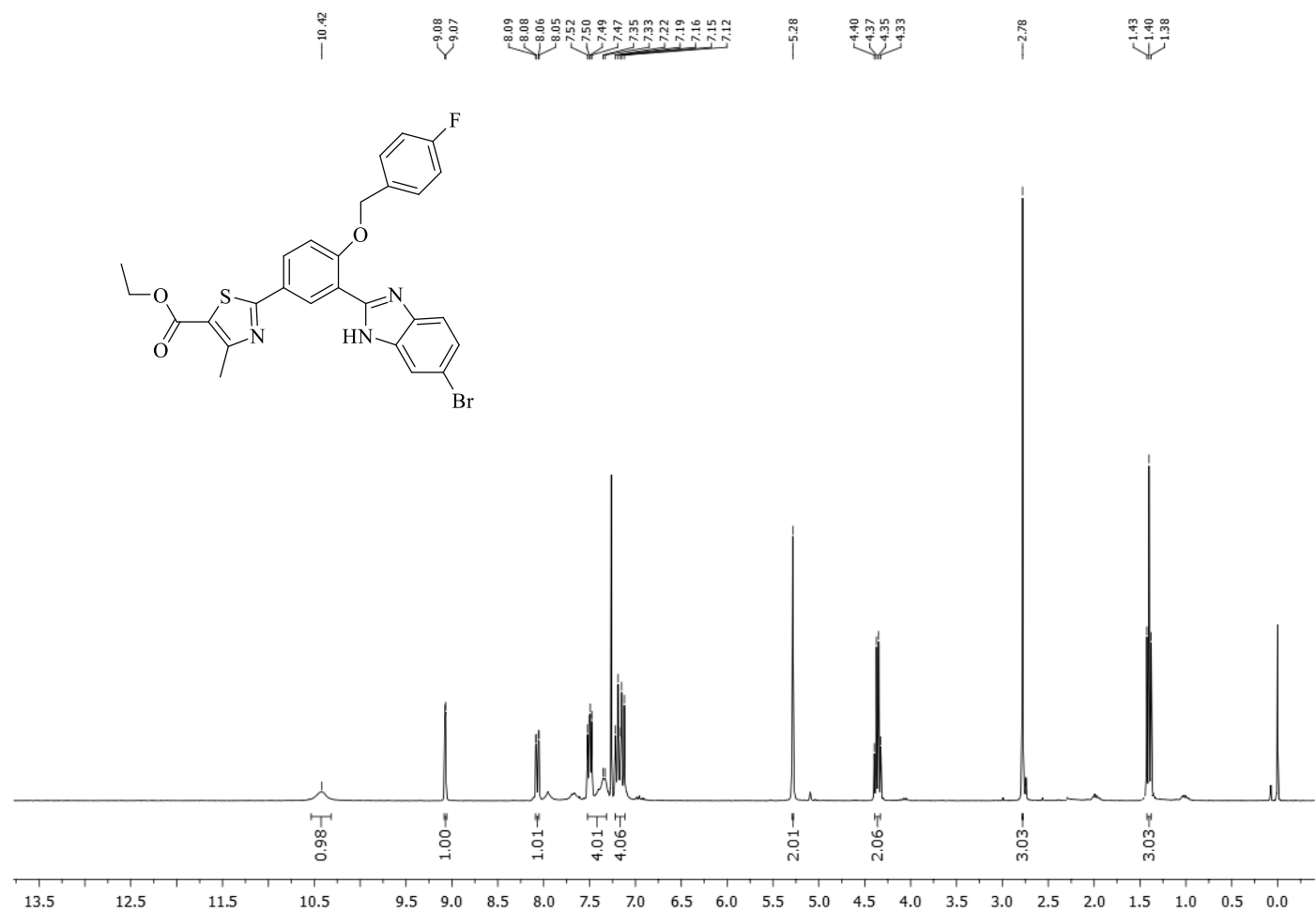
^{13}C NMR of Ethyl 2-(3-(6-fluoro-1*H*-benzo[*d*]imidazol-2-yl)-4-((fluorobenzyl)oxy)phenyl)-4-methylthiazole-5-carboxylate (5h)

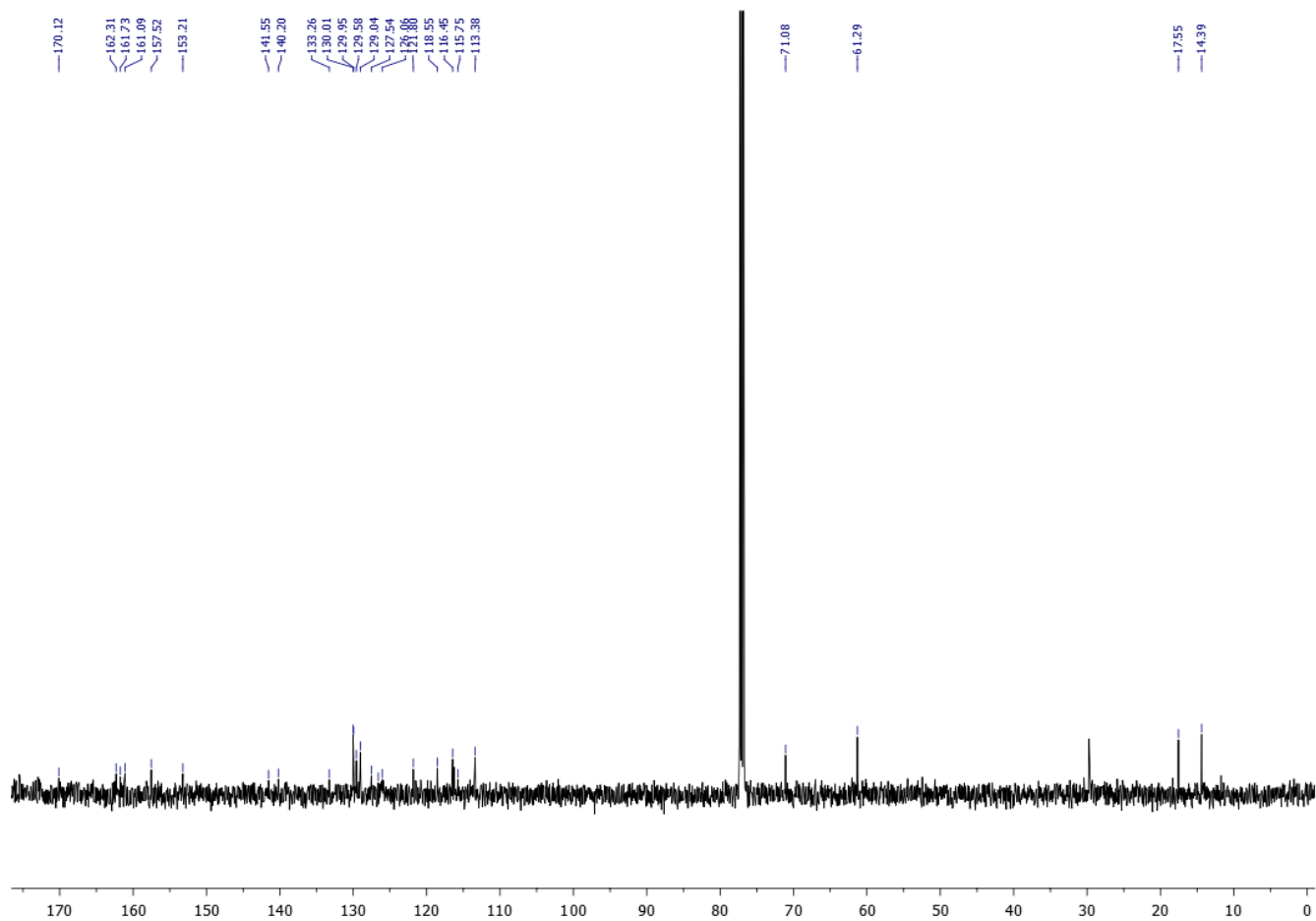
¹H NMR of Ethyl 2-(3-(6-chloro-1*H*-benzo[*d*]imidazol-2-yl)-4-((fluorobenzyl)oxy)phenyl)-4-methylthiazole-5-carboxylate (5i)

^{13}C NMR of Ethyl 2-(3-(6-chloro-1*H*-benzo[*d*]imidazol-2-yl)-((4-fluorobenzyl)oxy)phenyl)-4-methylthiazole-5-carboxylate (5i)

¹H NMR of Ethyl 2-(4-((4-fluorobenzyl)oxy)-3-(6-methyl-1*H*-benzo[*d*]imidazol-2-yl)phenyl)-4-methylthiazole-5-carboxylate (5j)

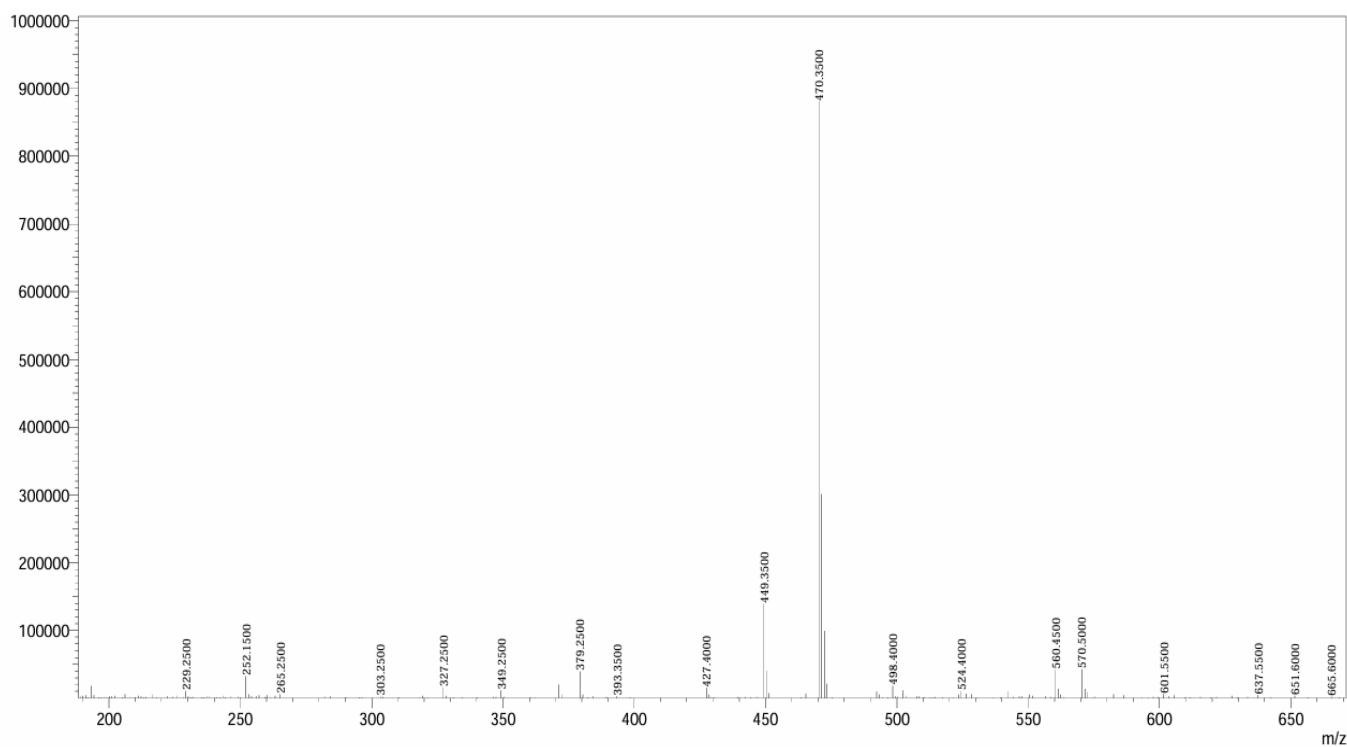
^{13}C NMR Ethyl 2-((4-fluorobenzyl)oxy)-3-(6-methyl-1*H*-benzo[*d*]imidazol-2-yl)phenyl)-4-methylthiazole-5-carboxylate (5j)

¹H NMR of Ethyl 2-(3-(6-bromo-1*H*-benzo[*d*]imidazol-2-yl)-4-((fluorobenzyl)oxy)phenyl)-4-methylthiazole-5-carboxylate (5k)

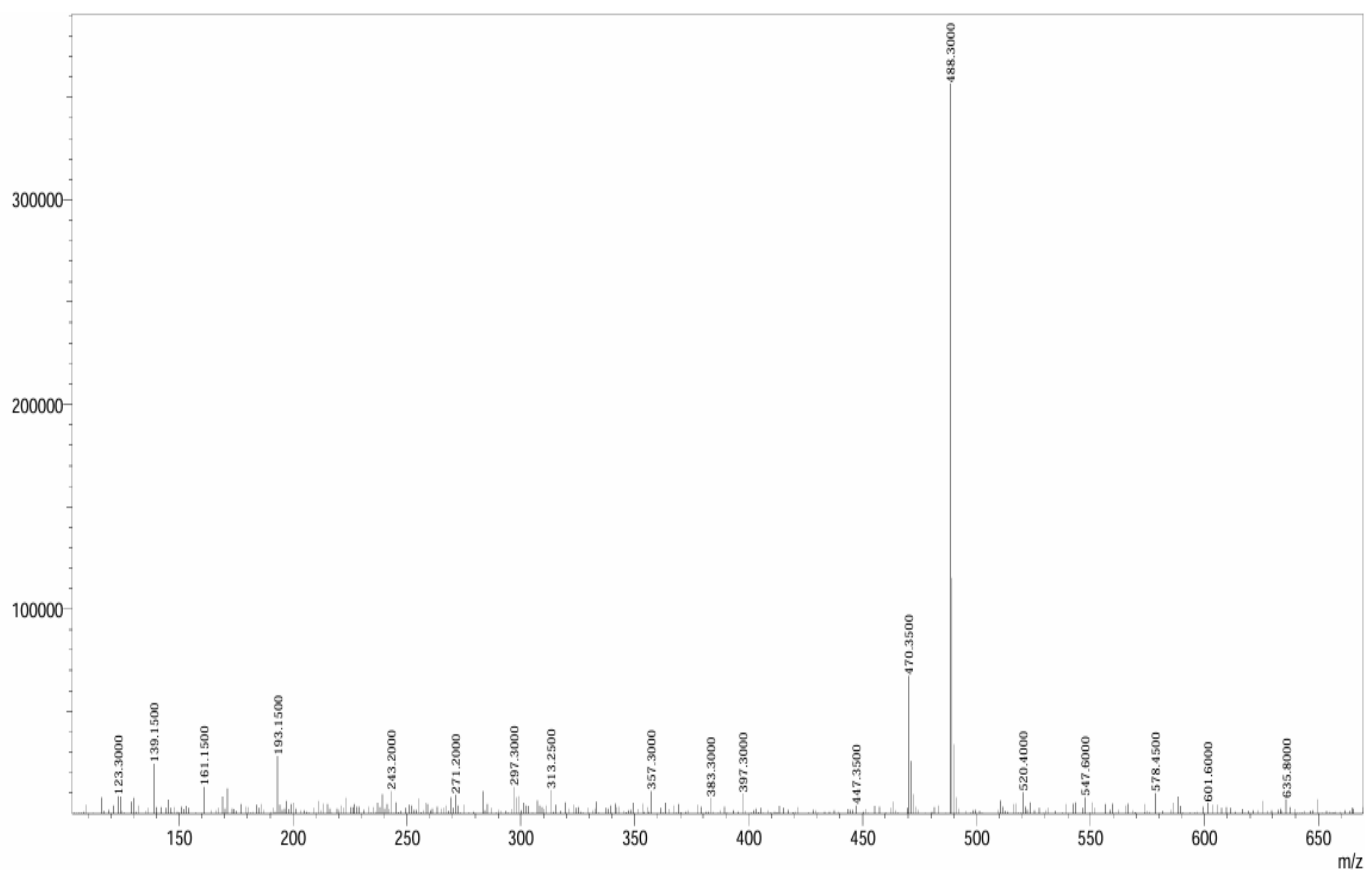
^{13}C NMR of Ethyl 2-(3-(6-bromo-1*H*-benzo[*d*]imidazol-2-yl)-4((fluorobenzyl)oxy)phenyl)-4-methylthiazole-5-carboxylate (5k)

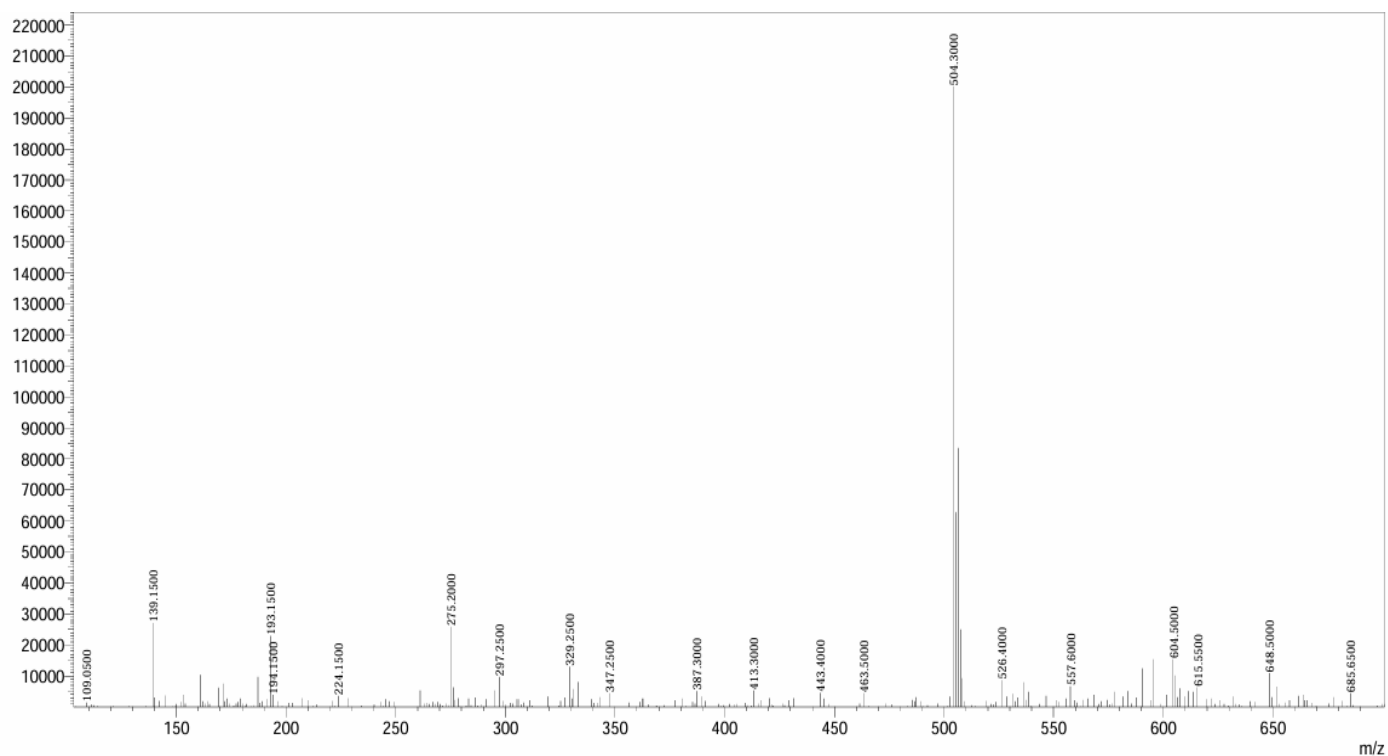
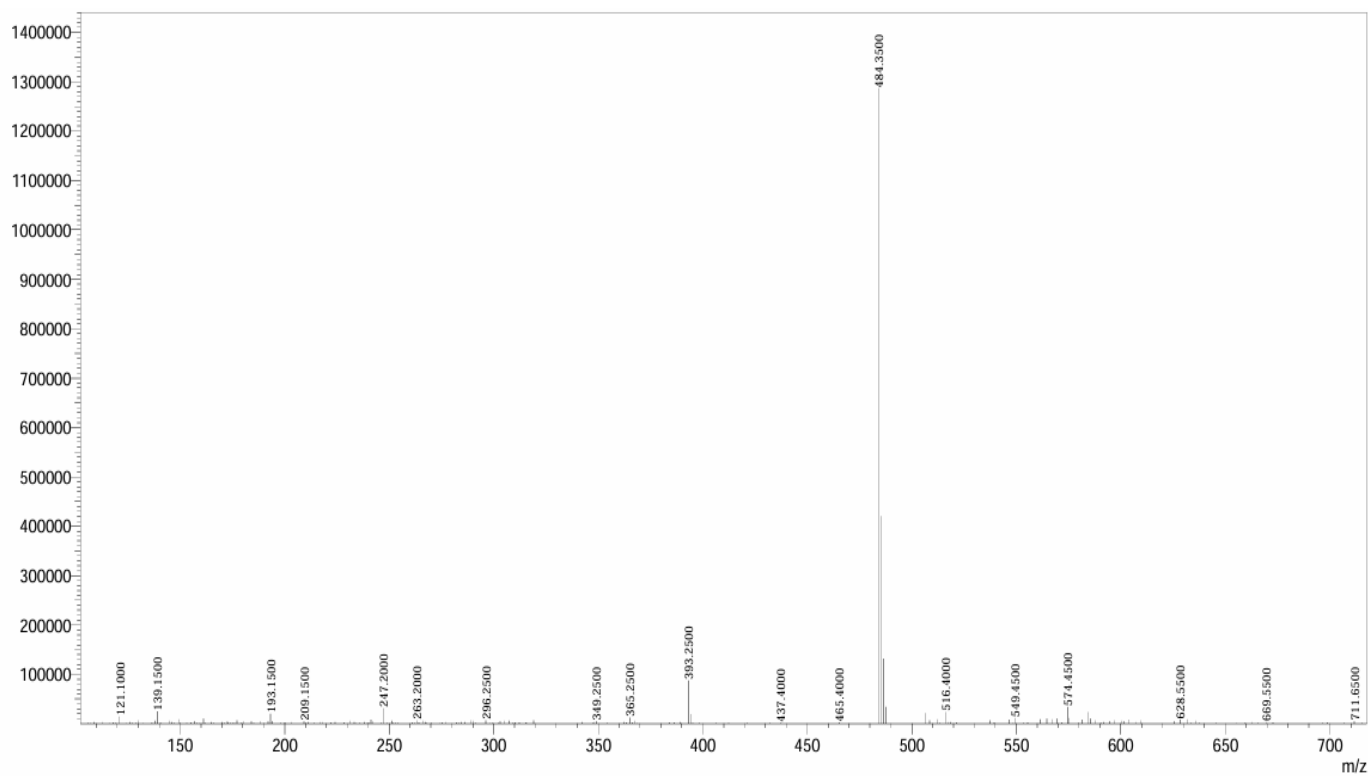
Mass Spectra

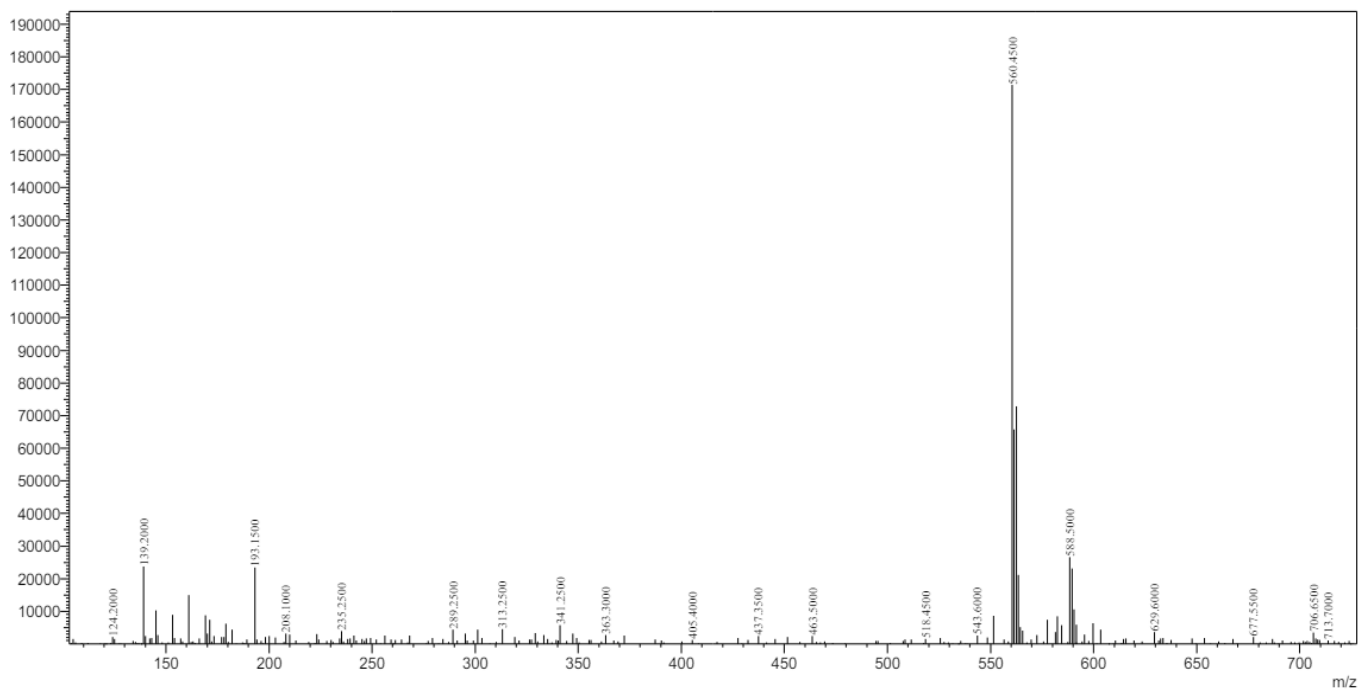
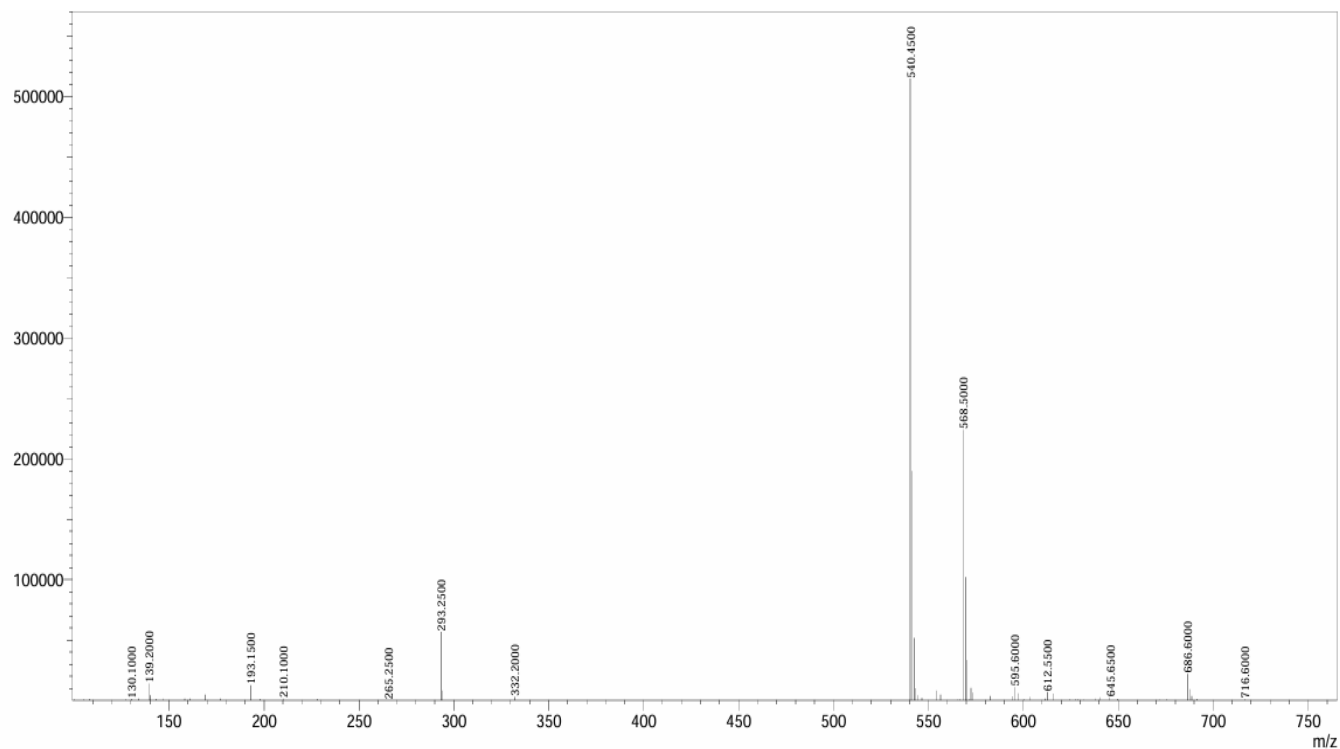
Ethyl 2-(3-(1H-benzo[d]imidazol-2-yl)-4-(benzyloxy)phenyl)-4-methylthiazole-5-carboxylate (5a)

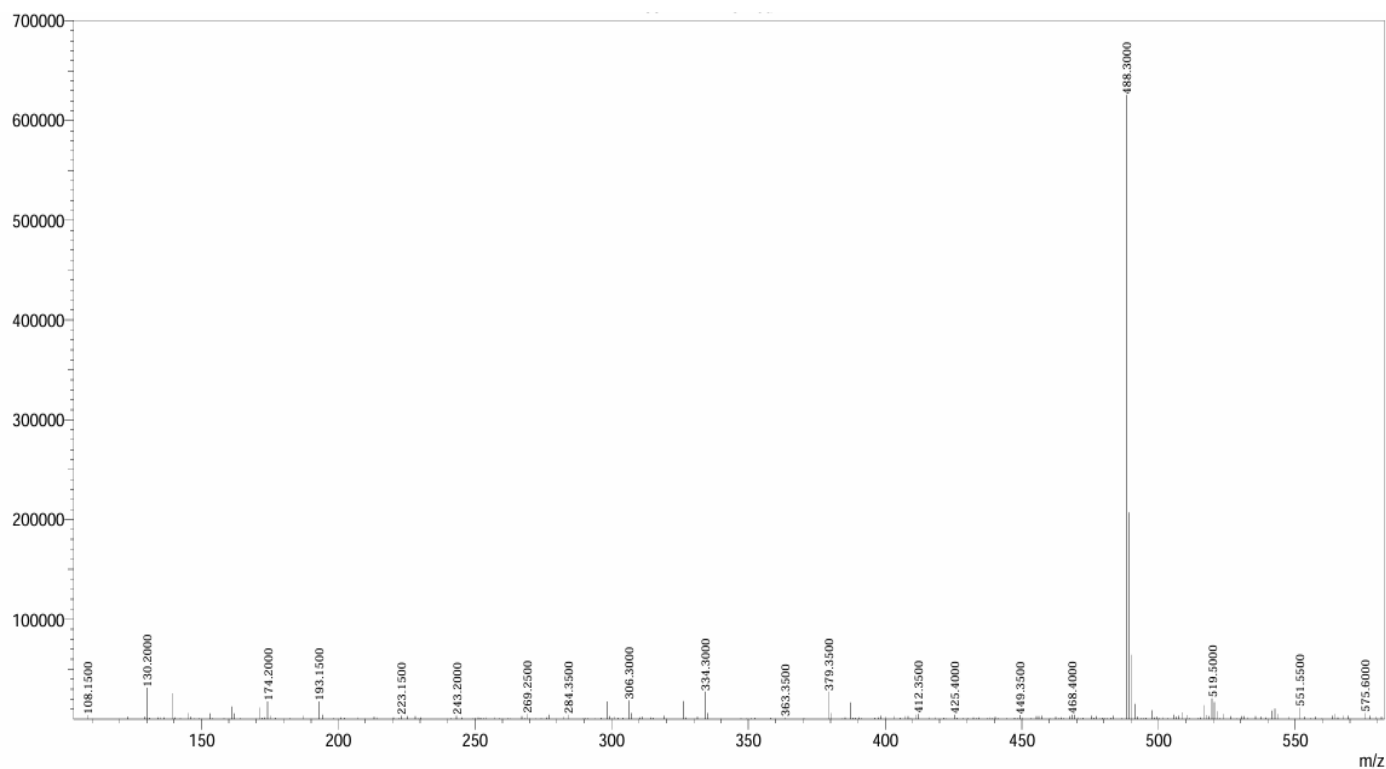
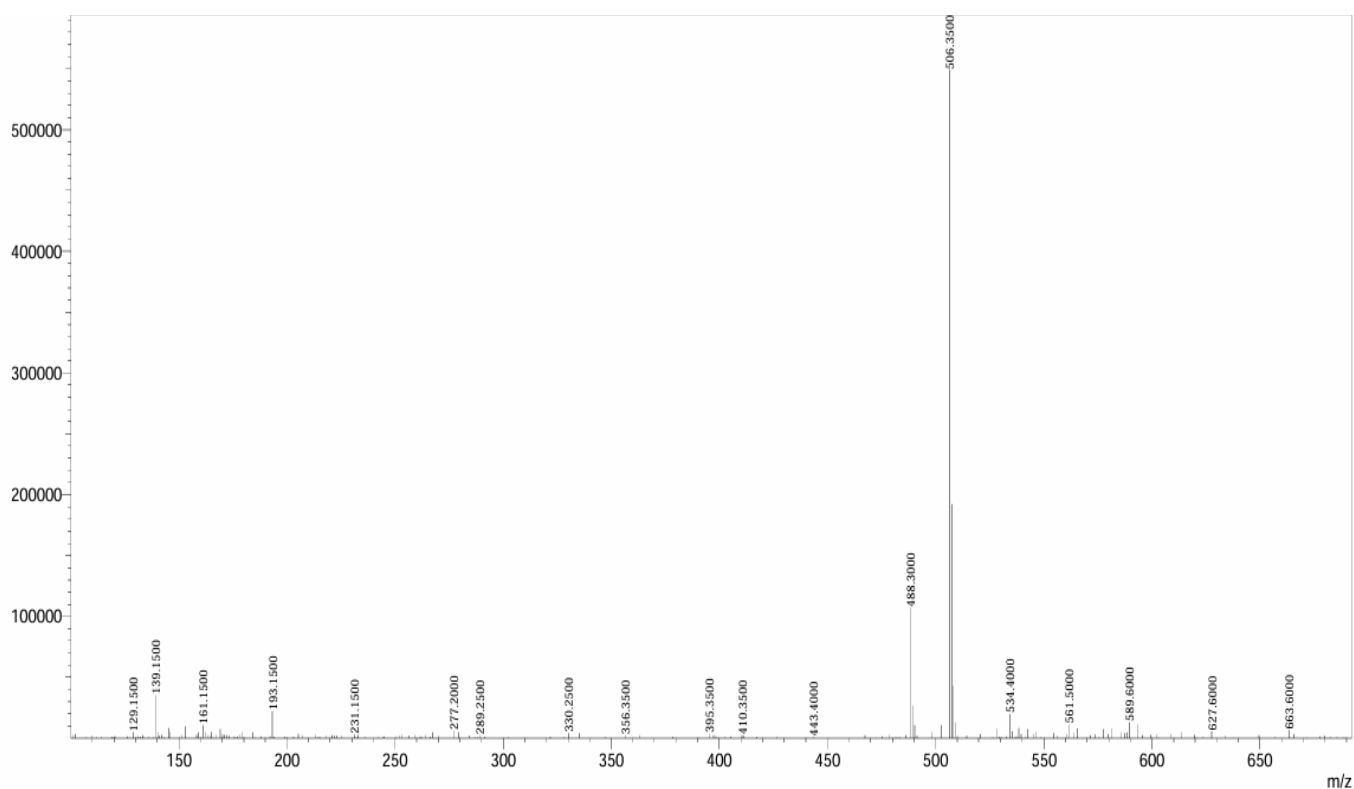


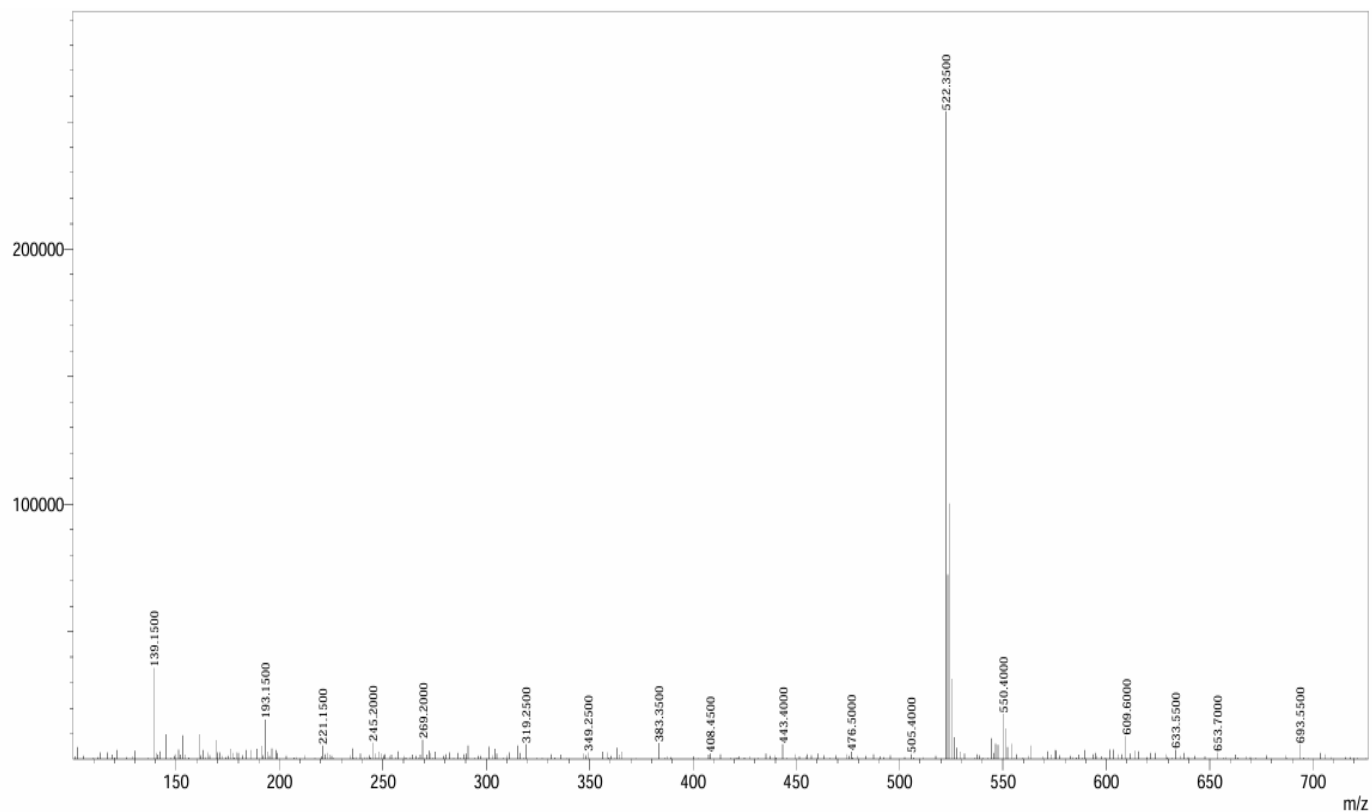
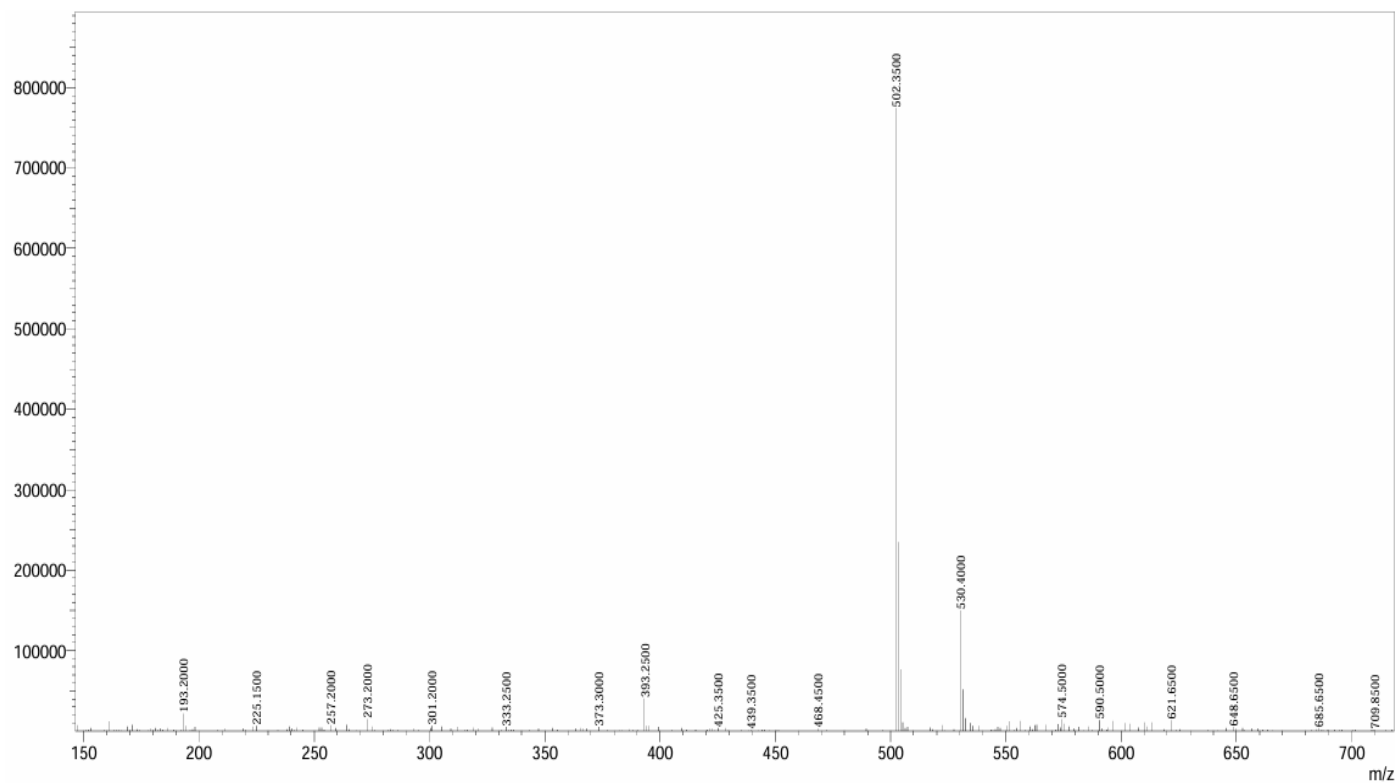
Ethyl 2-(4-(benzyloxy)-3-(6-fluoro-1H-benzo[d]imidazol-2-yl)phenyl)-4-methylthiazole-5-carboxylate (5b)



Ethyl 2-(4-(benzyloxy)-3-(6-chloro-1H-benzo[d]imidazol-2-yl)phenyl)-4-methylthiazole-5-carboxylate (5c)**ethyl 2-(4-(benzyloxy)-3-(6-methyl-1H-benzo[d]imidazol-2-yl)phenyl)-4-methylthiazole-5-carboxylate (5d)**

Ethyl 2-(4-((4-(tert-butyl)benzyl)oxy)-3-(6-chloro-1H-benzo[d]imidazol-2-yl)phenyl)-4-methylthiazole-5-carboxylate (5e)**Ethyl 2-(4-((4-(tert-butyl)benzyl)oxy)-3-(6-methyl-1H-benzo[d]imidazol-2-yl)phenyl)-4-methylthiazole-5-carboxylate (5f)**

Ethyl 2-(3-(1H-benzo[d]imidazol-2-yl)-4-((4-fluorobenzyl)oxy)phenyl)-4-methylthiazole-5-carboxylate (5g)**Ethyl 2-(3-(6-fluoro-1H-benzo[d]imidazol-2-yl)-4-((4-fluorobenzyl)oxy)phenyl)-4-methylthiazole-5-carboxylate (5h)**

Ethyl 2-(3-(6-chloro-1*H*-benzo[*d*]imidazol-2-yl)-4-((fluorobenzyl)oxy)phenyl)-4-methylthiazole-5-carboxylate (5i)**Ethyl 2-(4-((4-fluorobenzyl)oxy)-3-(6-methyl-1*H*-benzo[*d*]imidazol-2-yl)phenyl)-4-methylthiazole-5-carboxylate (5J)**

Ethyl 2-(3-(6-bromo-1*H*-benzo[*d*]imidazol-2-yl)-4-((fluorobenzyl)oxy)phenyl)-4-methylthiazole-5-carboxylate 5k