Design, synthesis and antitumor activity of tetrahydro-β-carbolin-3-carbonylhydrazide derivatives

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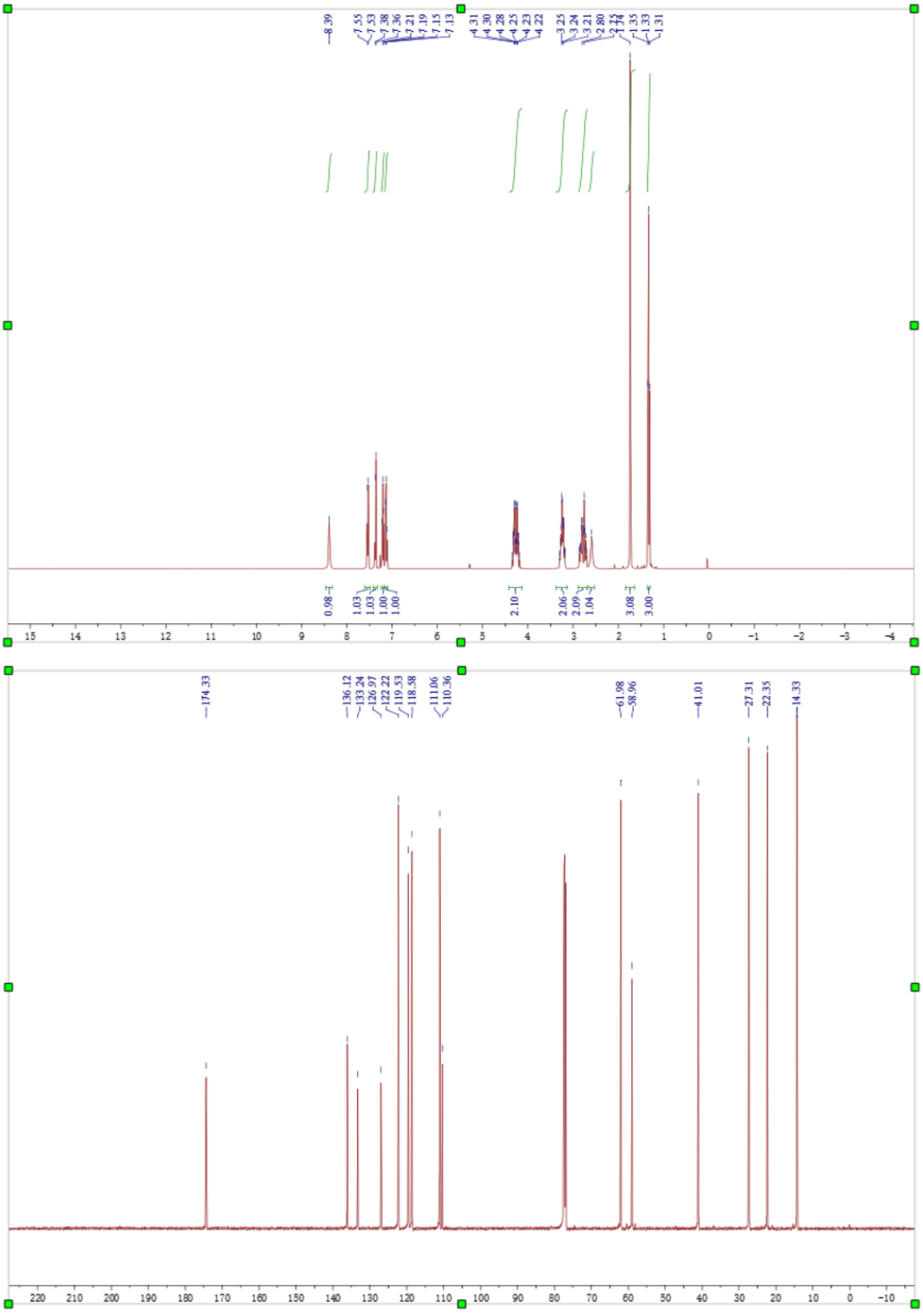
Table of Contents

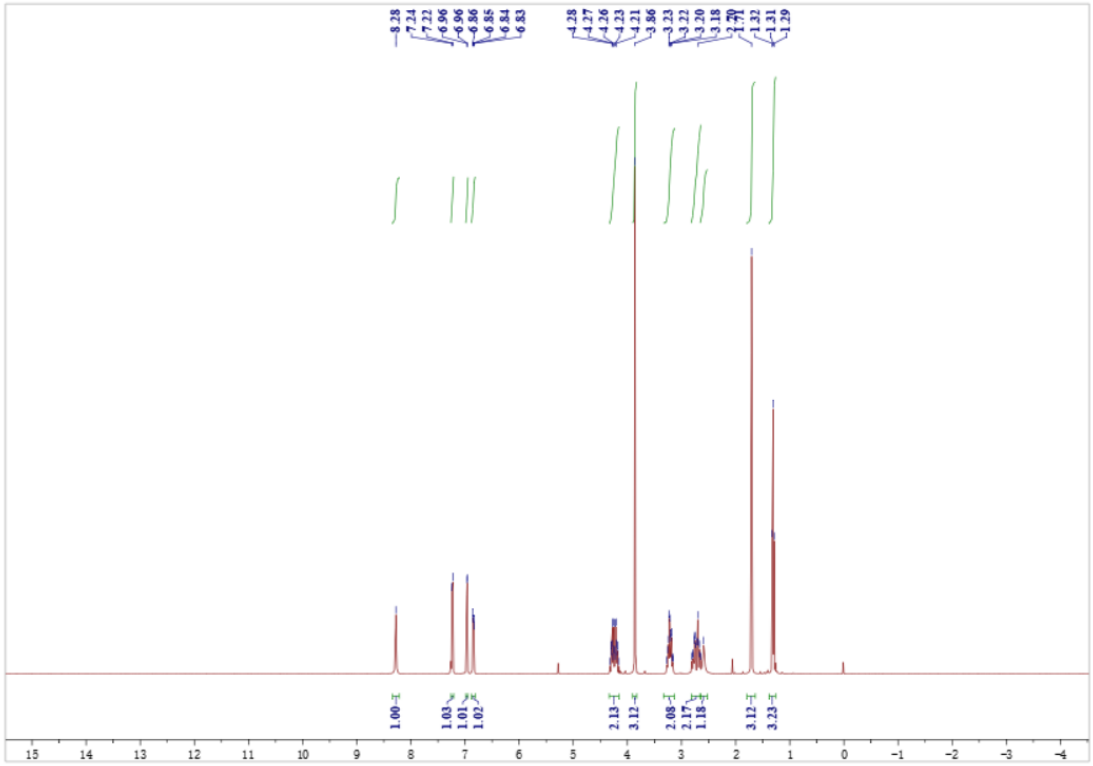
1. ^{1}H and ^{13}C NMR of compound (**2**~**34**) …...……...……...……...…S2
3. Immunoblot grayscale figture…….……..……...…….…….……....S35

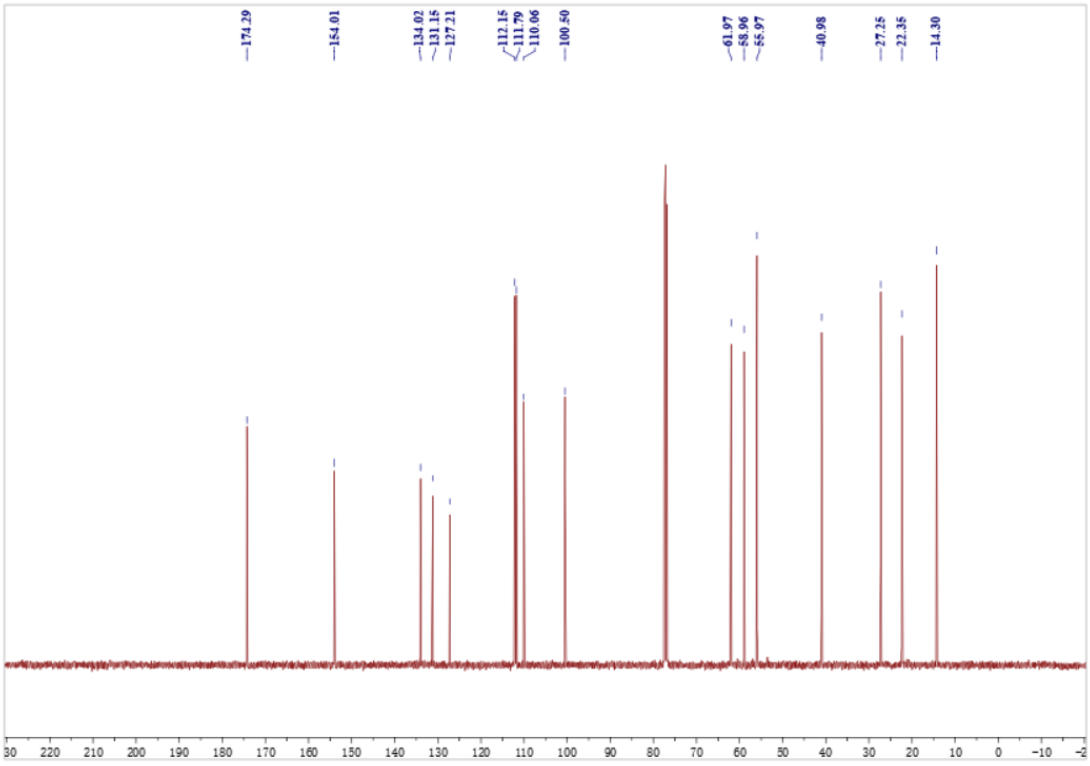
1.^{1}H and ^{13}C NMR of compound (2-34)

Ethyl(S)-1-methyl-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxyla (**2**):

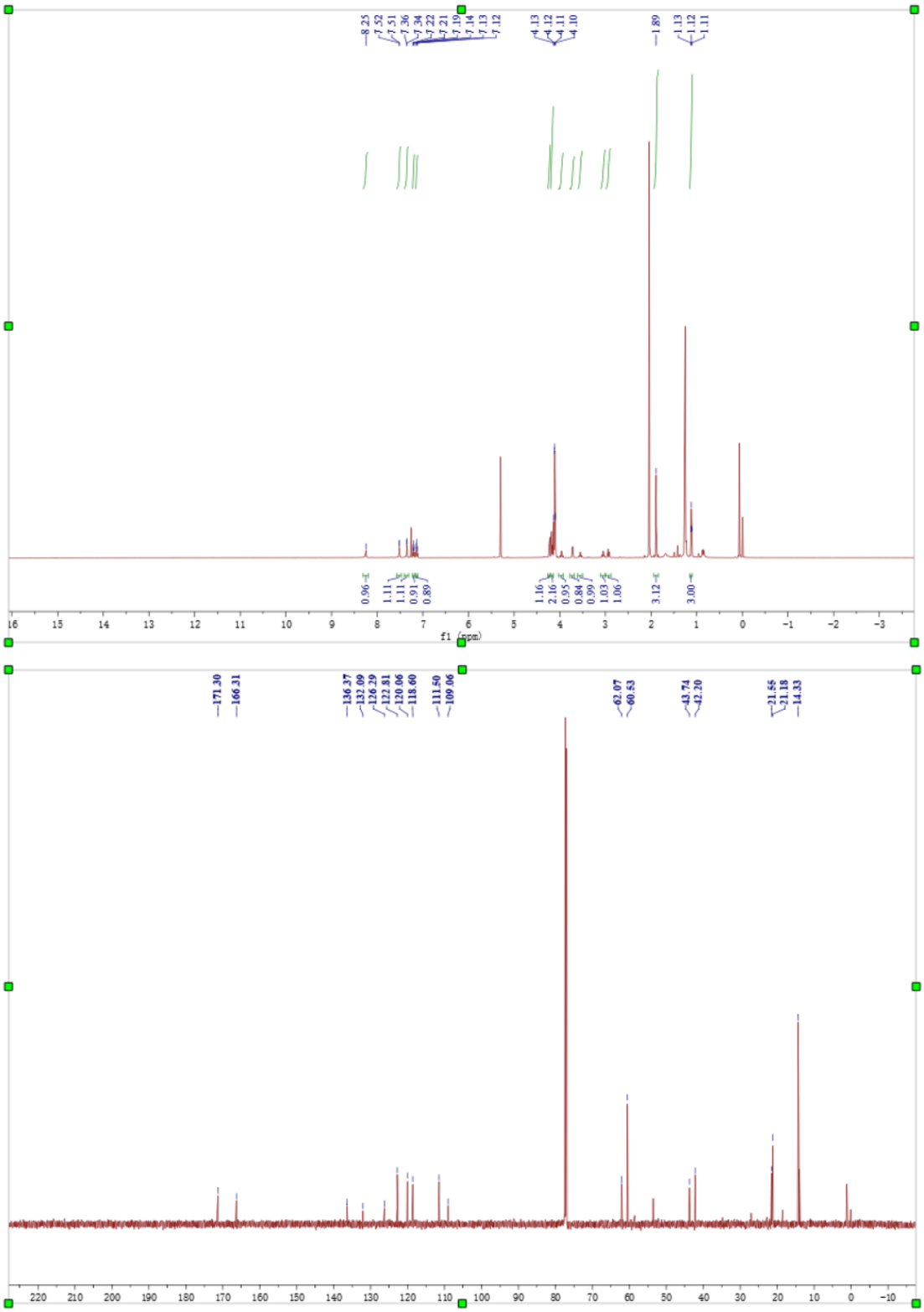


Ethyl(S)-6-methoxy-1-methyl-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**3**):

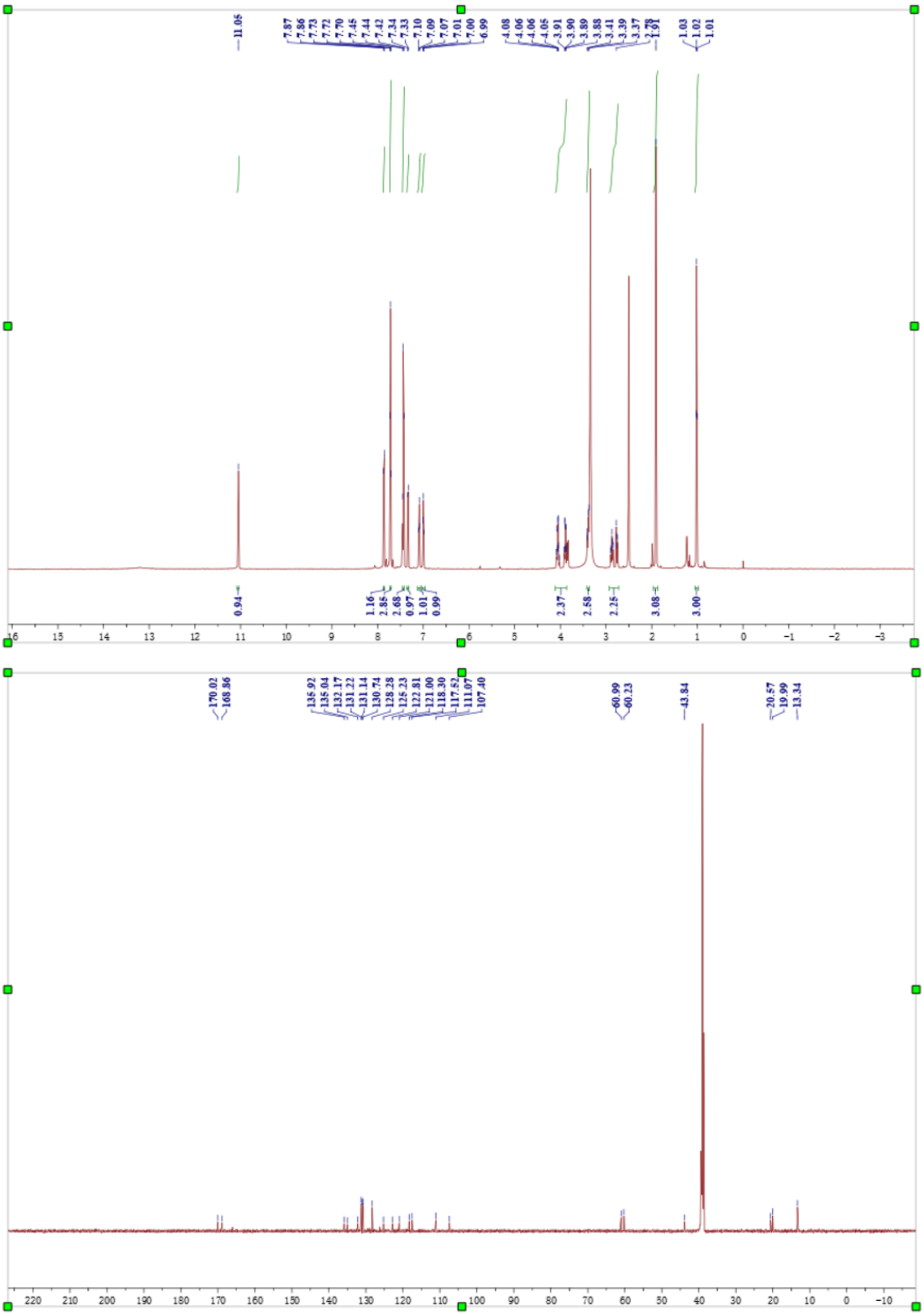




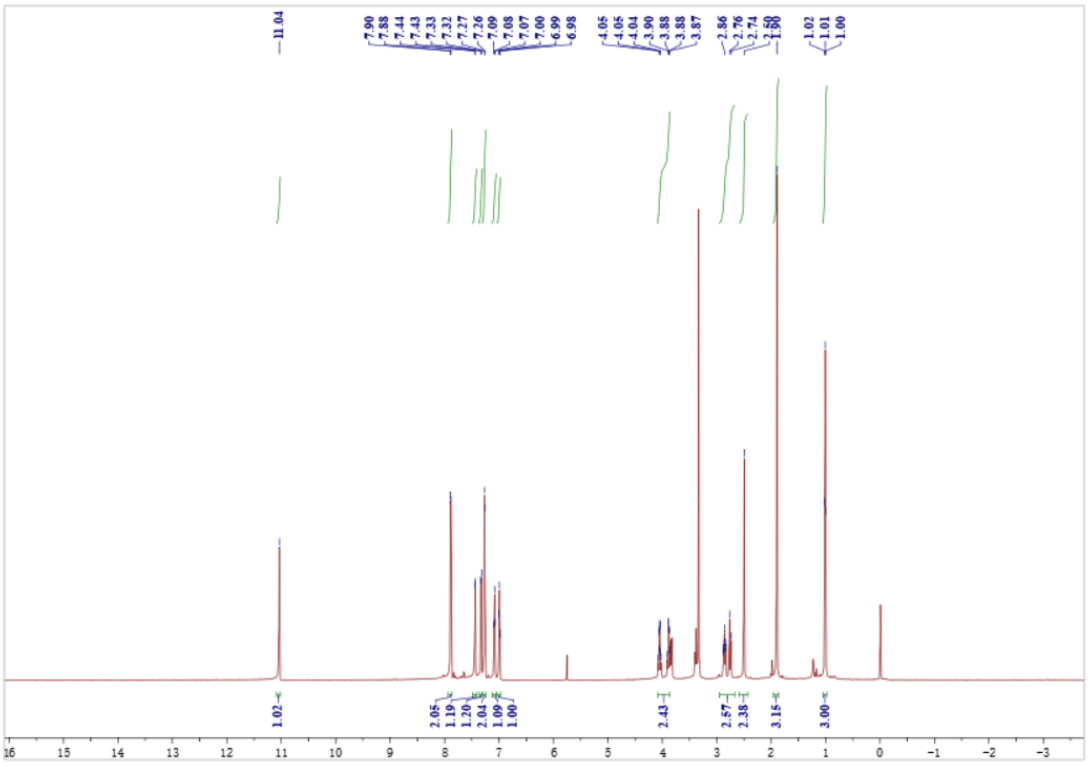
Ethyl(S)-2-(2-chloroacetyl)-1-methyl-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**4**):

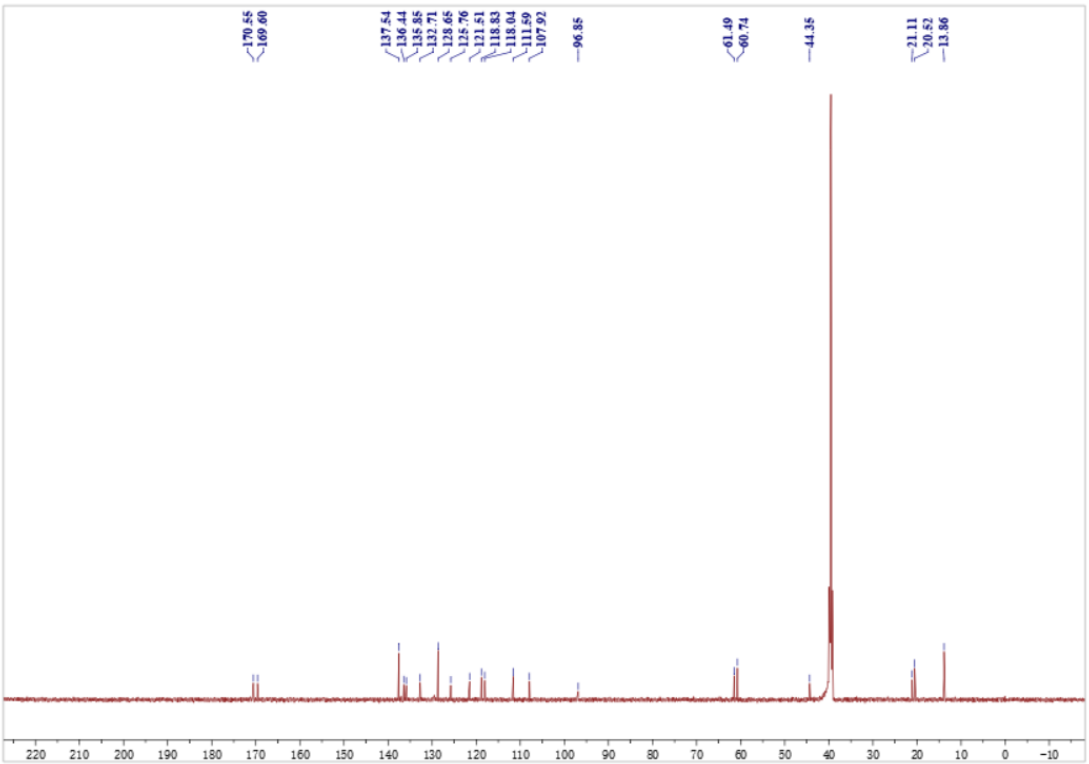


Ethyl(S)-2-(4-bromobenzoyl)-1-methyl-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**5**):

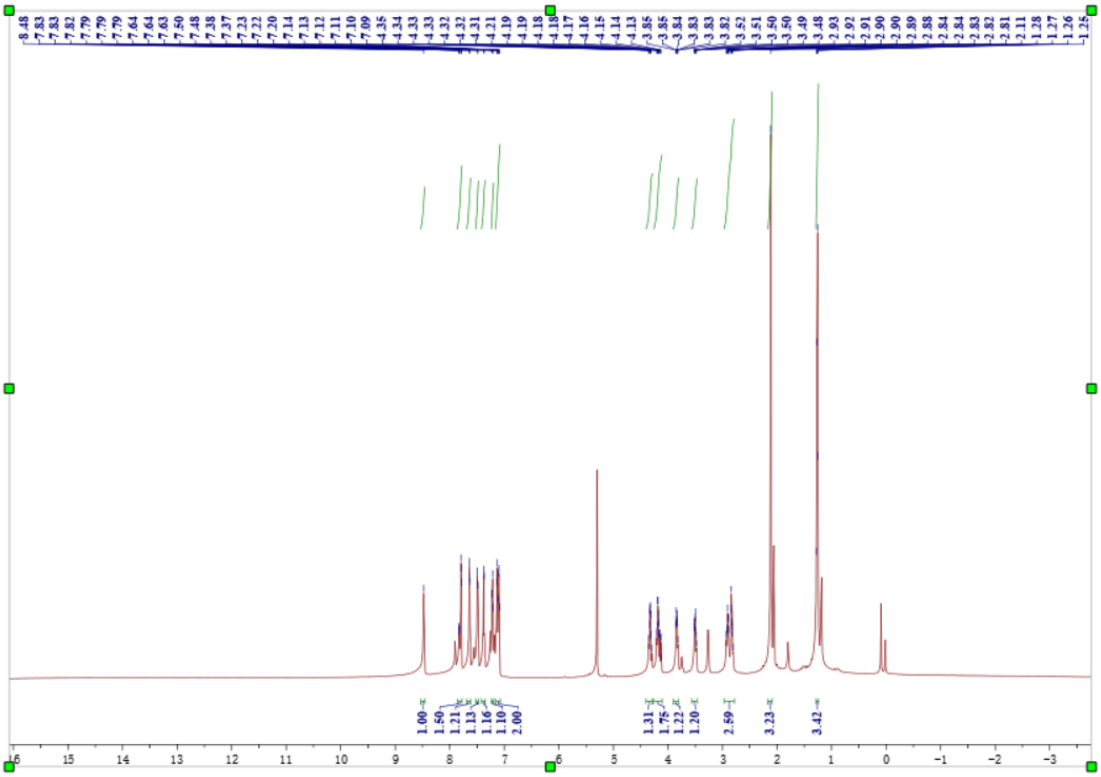


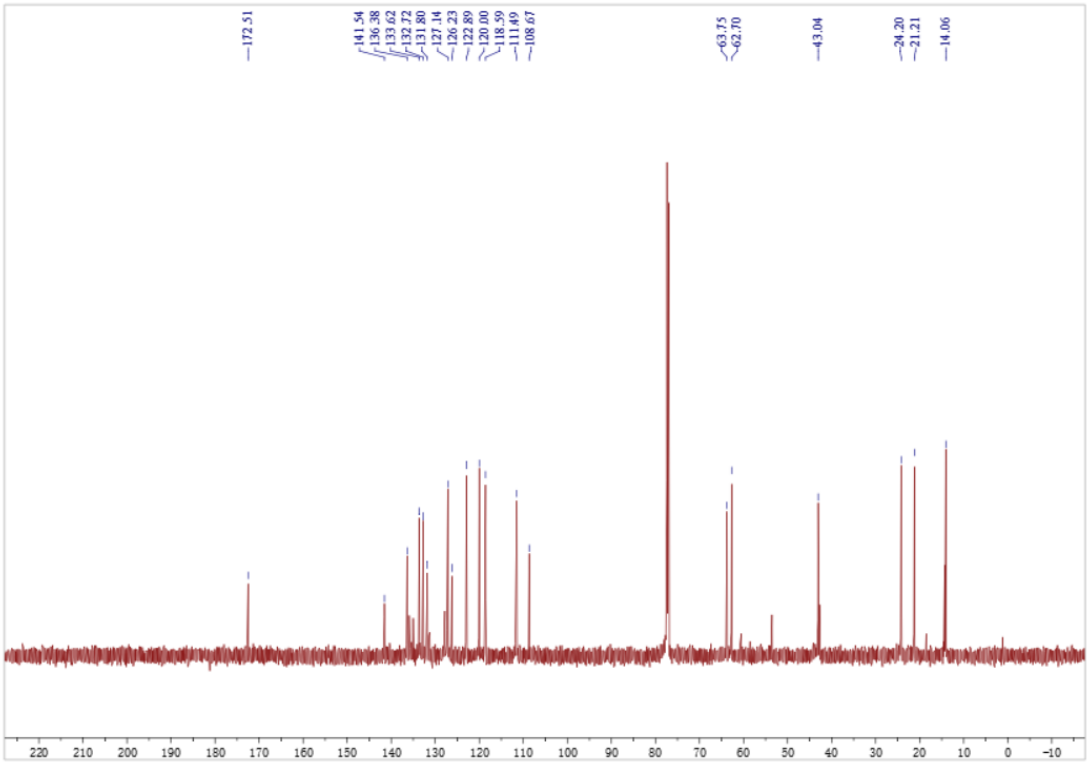
Ethyl(S)-2-(4-iodobenzoyl)-1-methyl-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**6**):



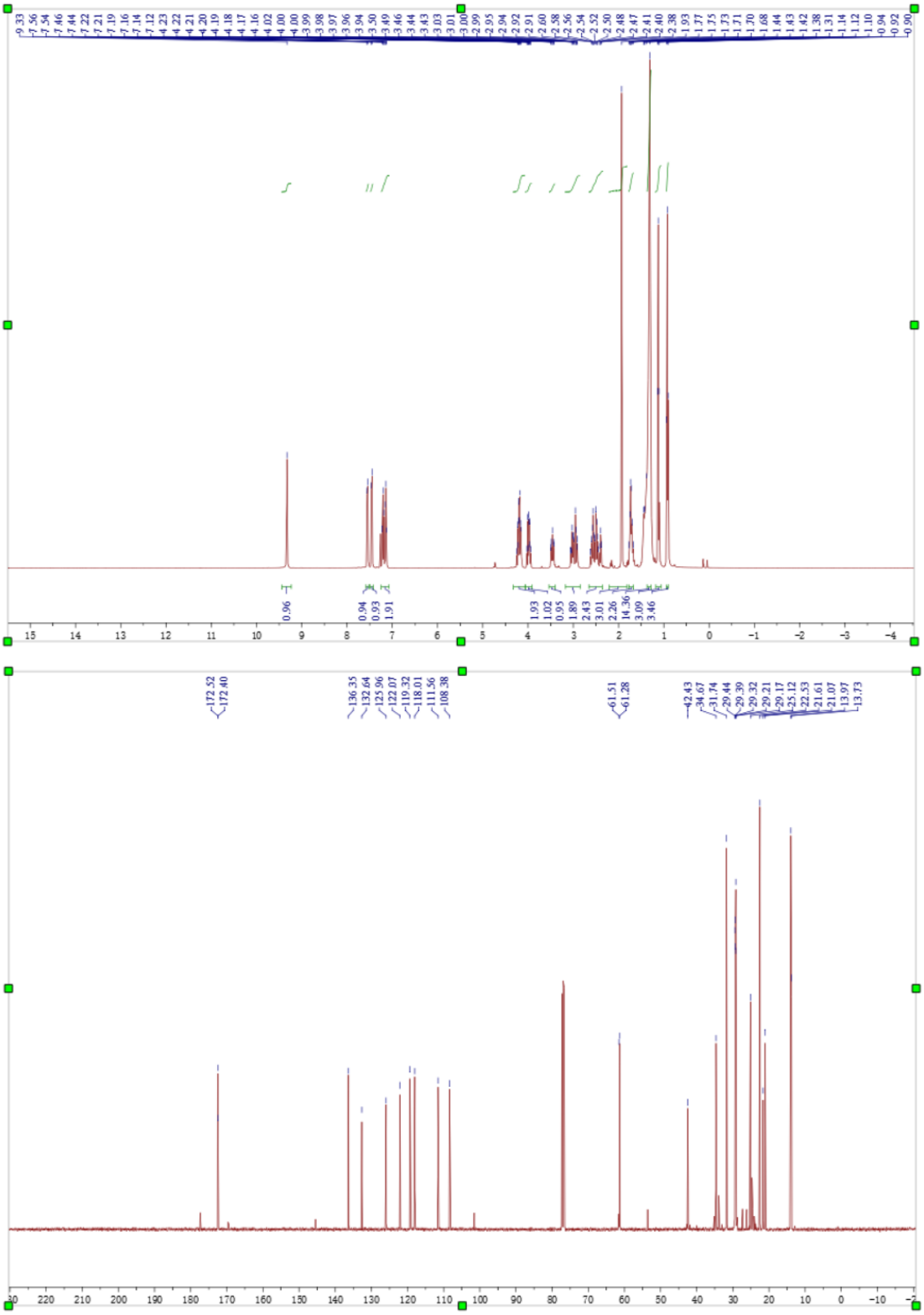


Ethyl(S)-1-methyl-2-(thiophen-2-ylsulfonyl)-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**7**):

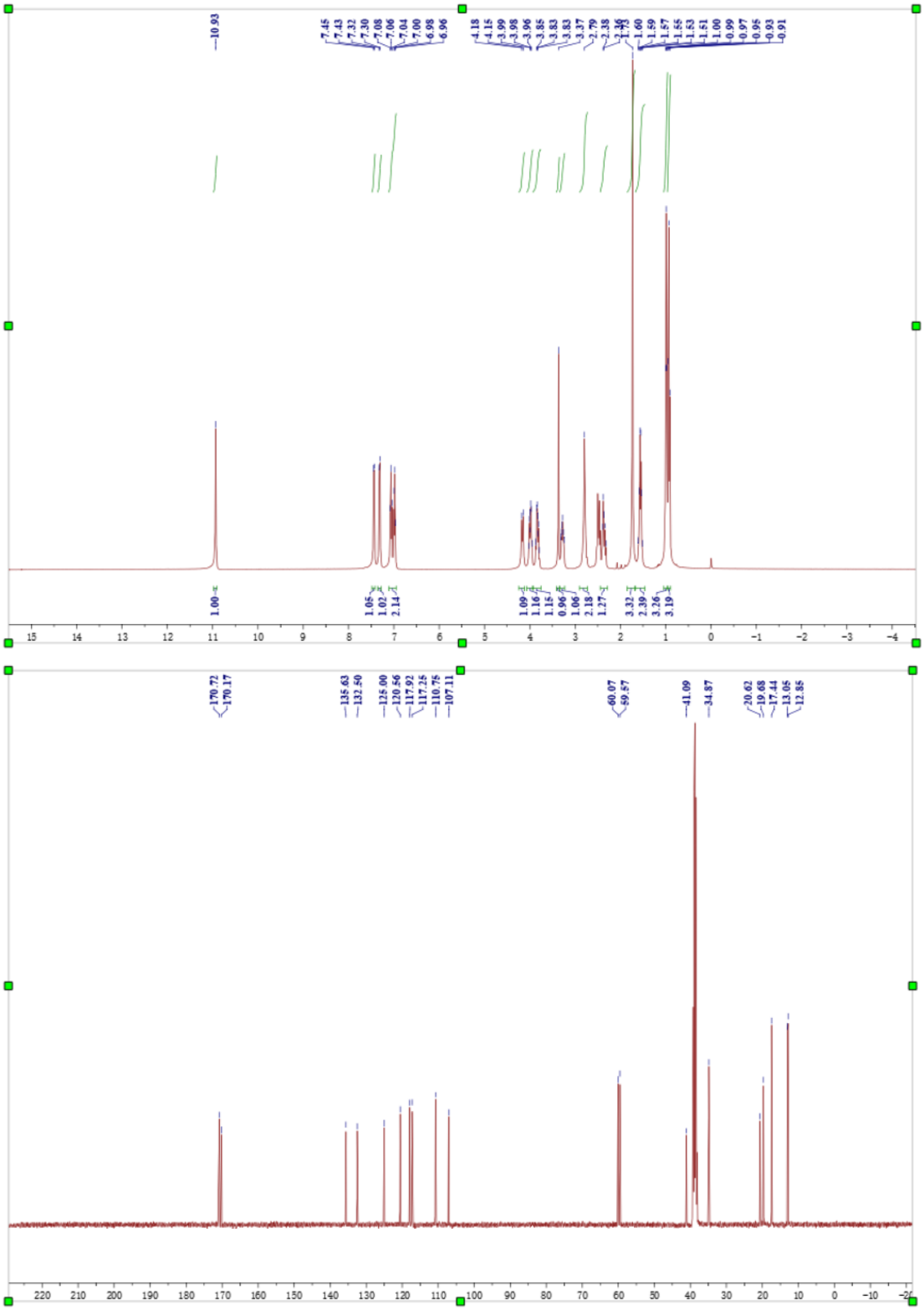




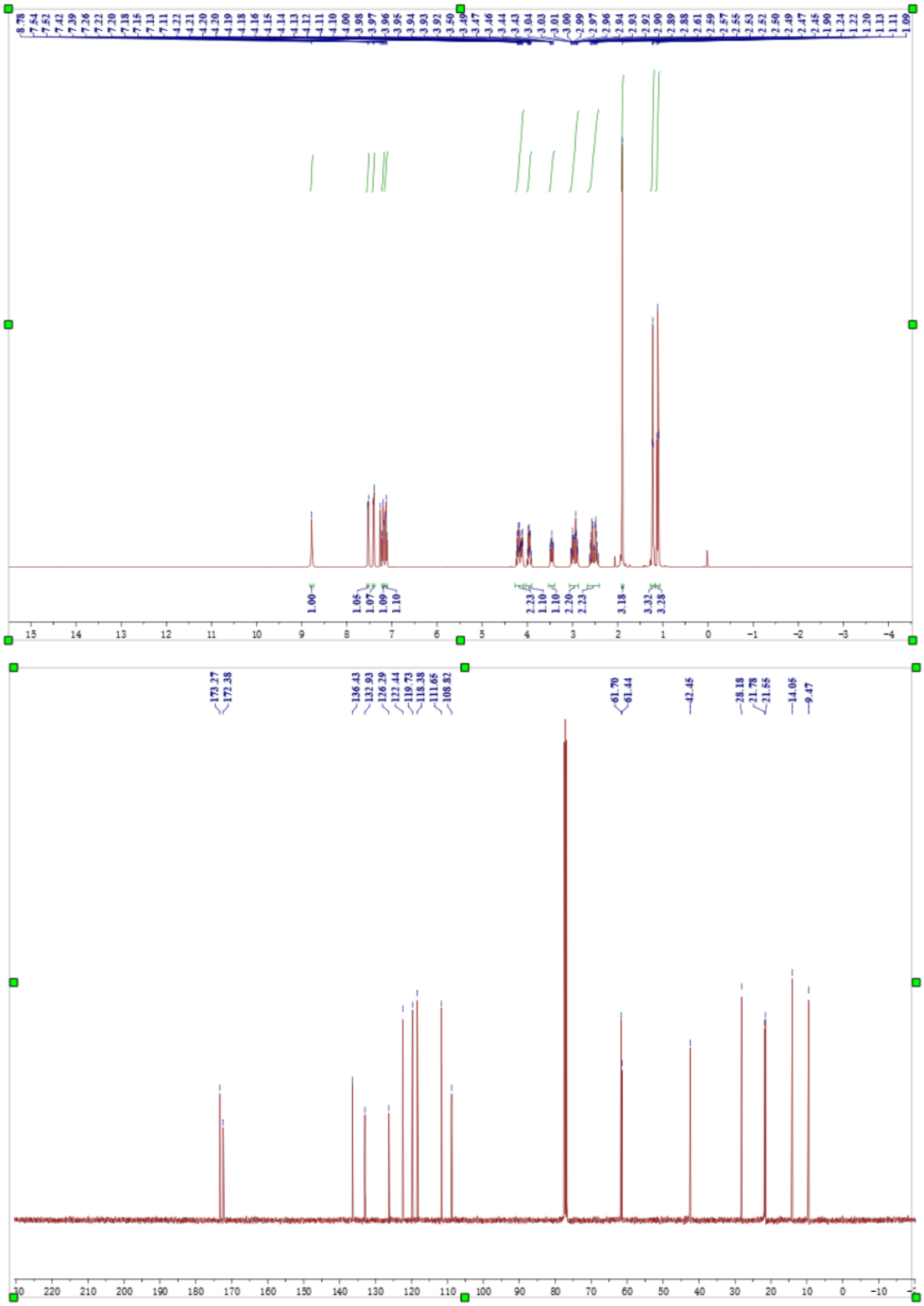
Ethyl(S)-1-methyl-2-undecanoyl-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**8**):



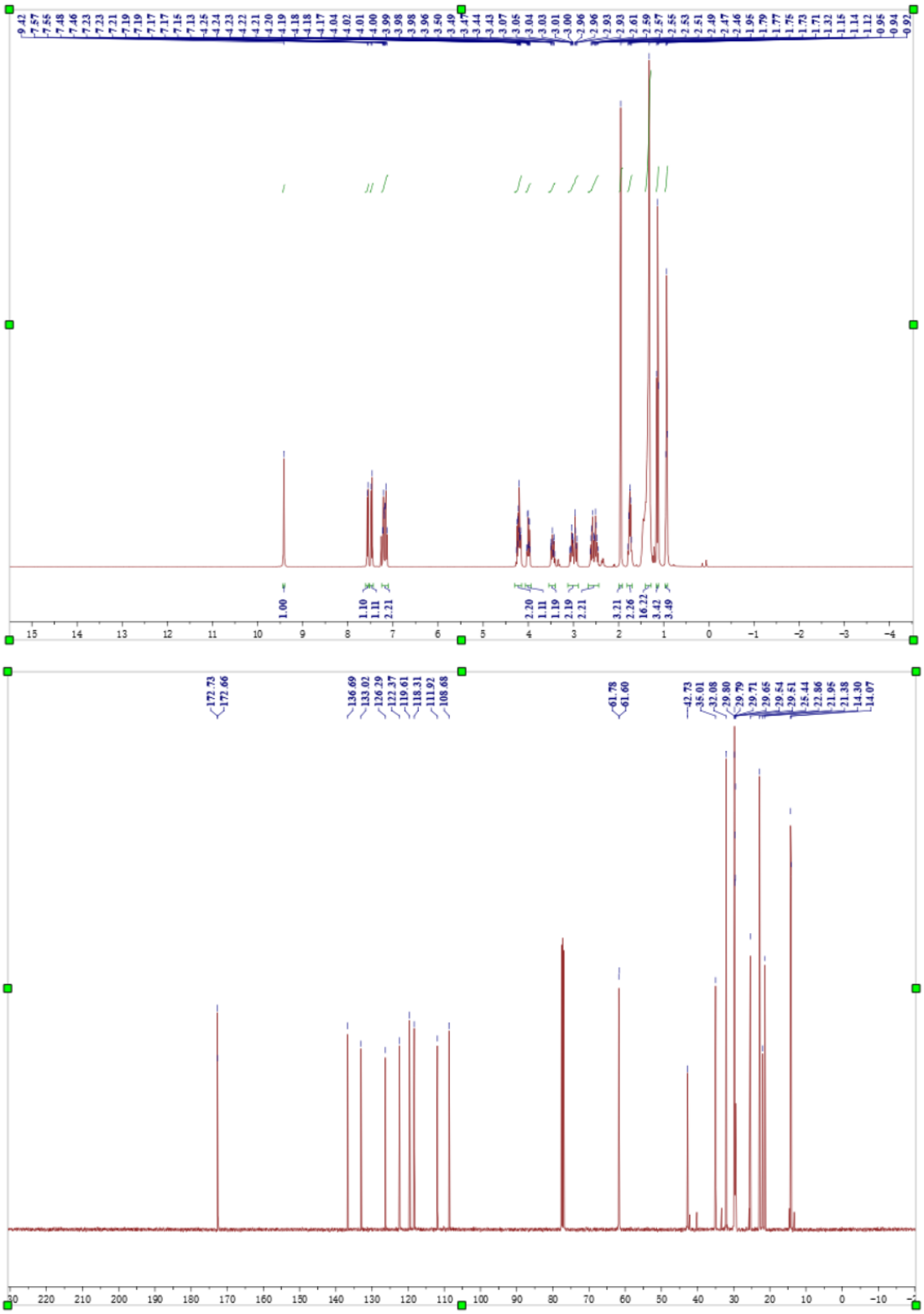
Ethyl(S)-2-butyryl-1-methyl-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**9**):



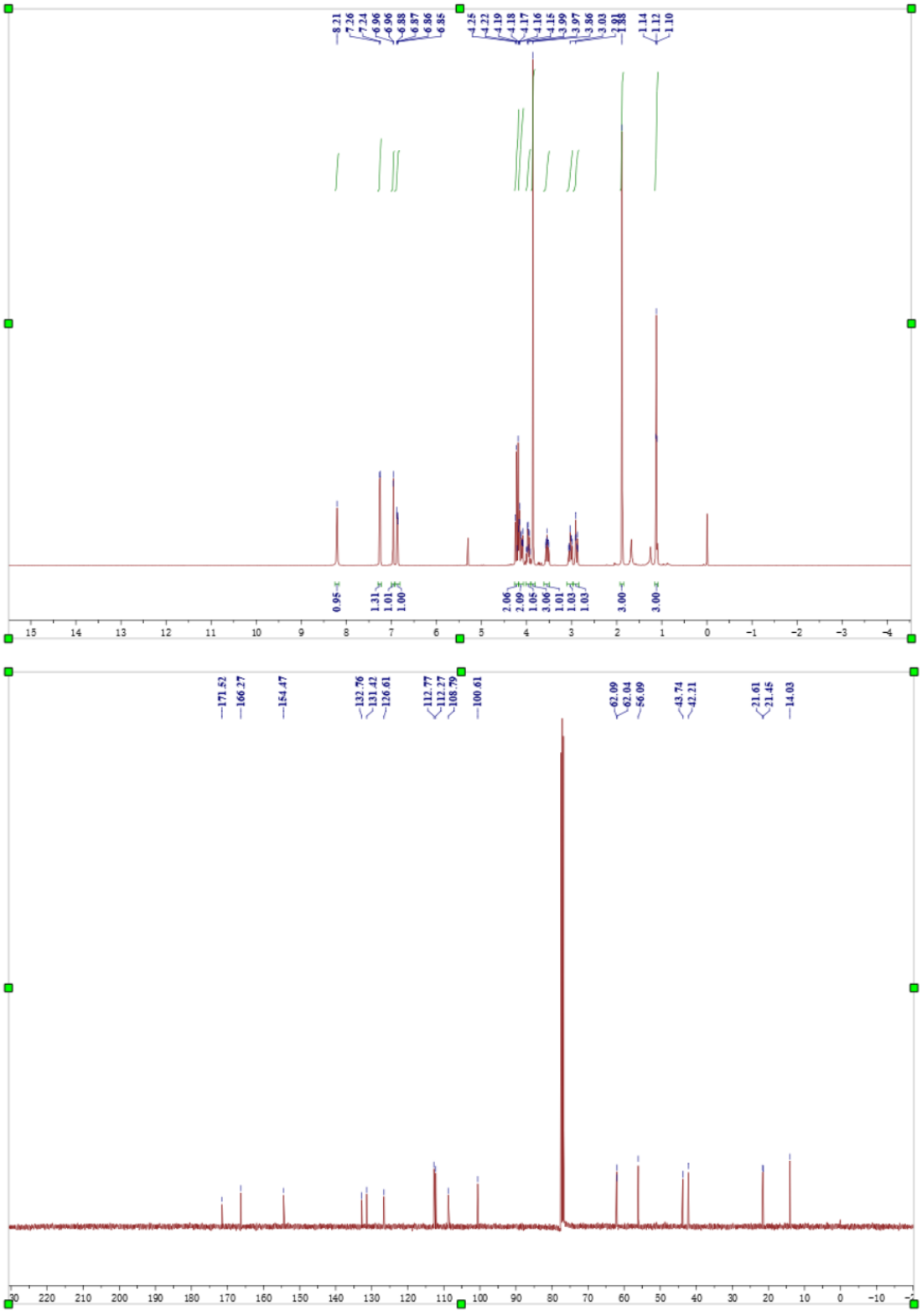
Ethyl(S)-1-methyl-2-propionyl-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**10**):



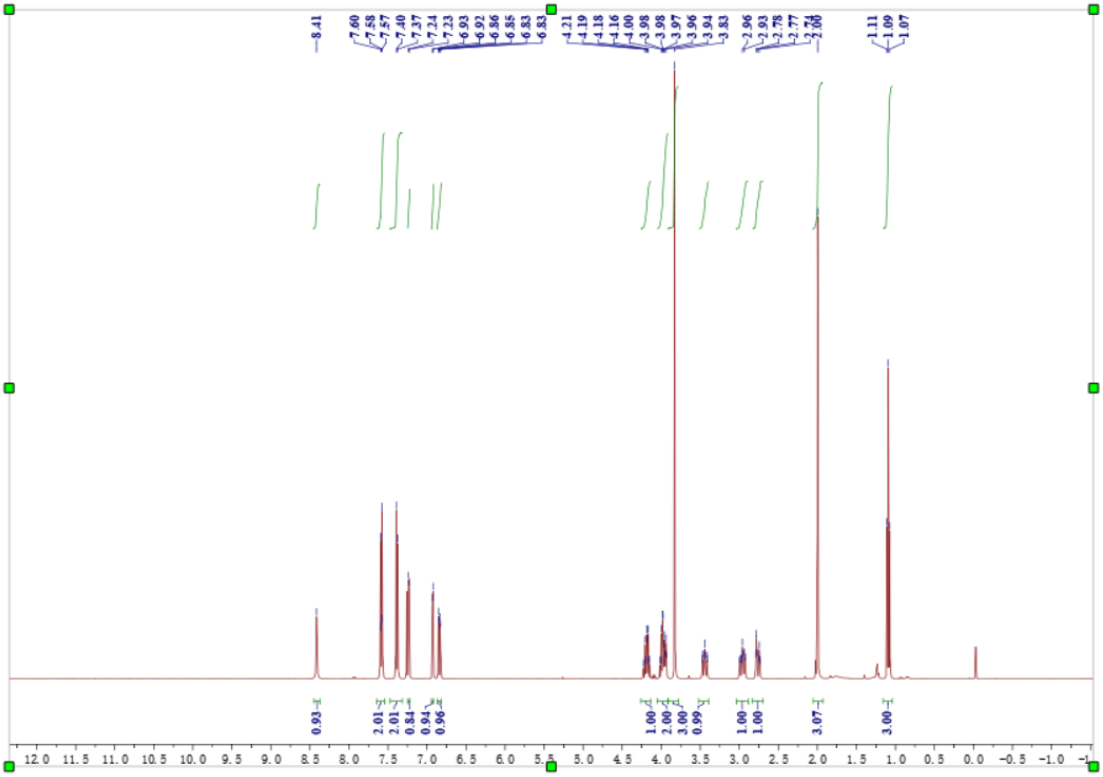
Ethyl(S)-2-dodecanoyl-1-methyl-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**11**):

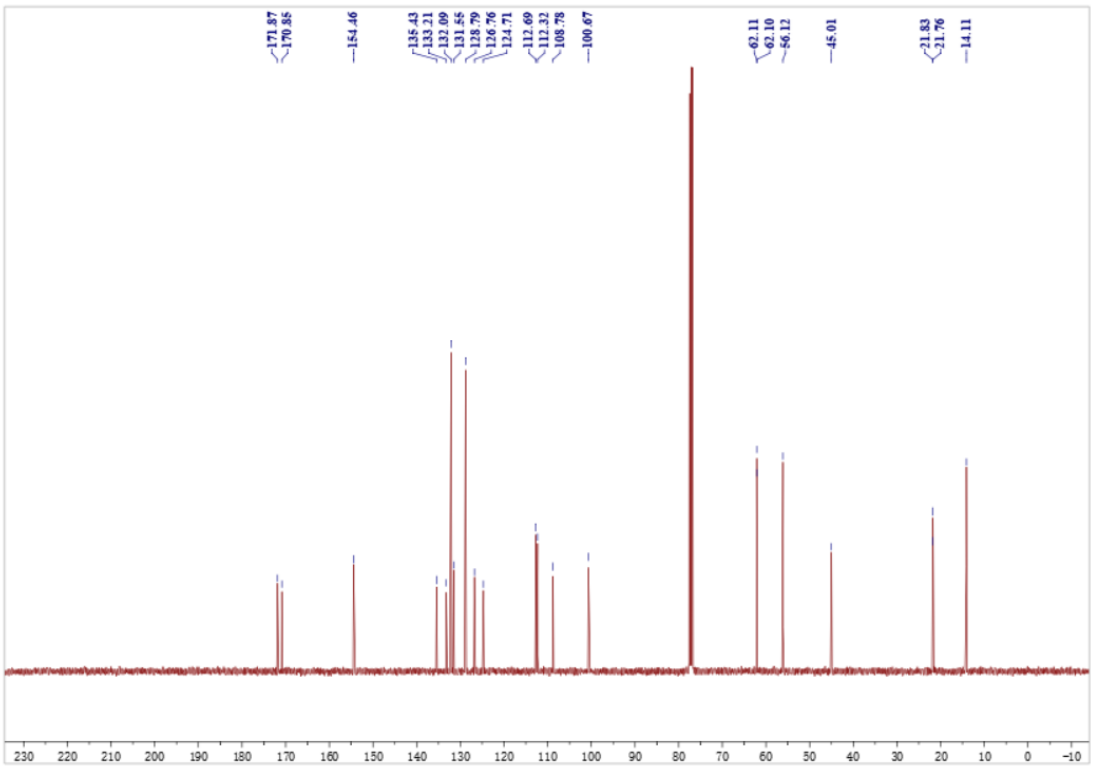


Ethyl(S)-2-(2-chloroacetyl)-6-methoxy-1-methyl-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**12**):

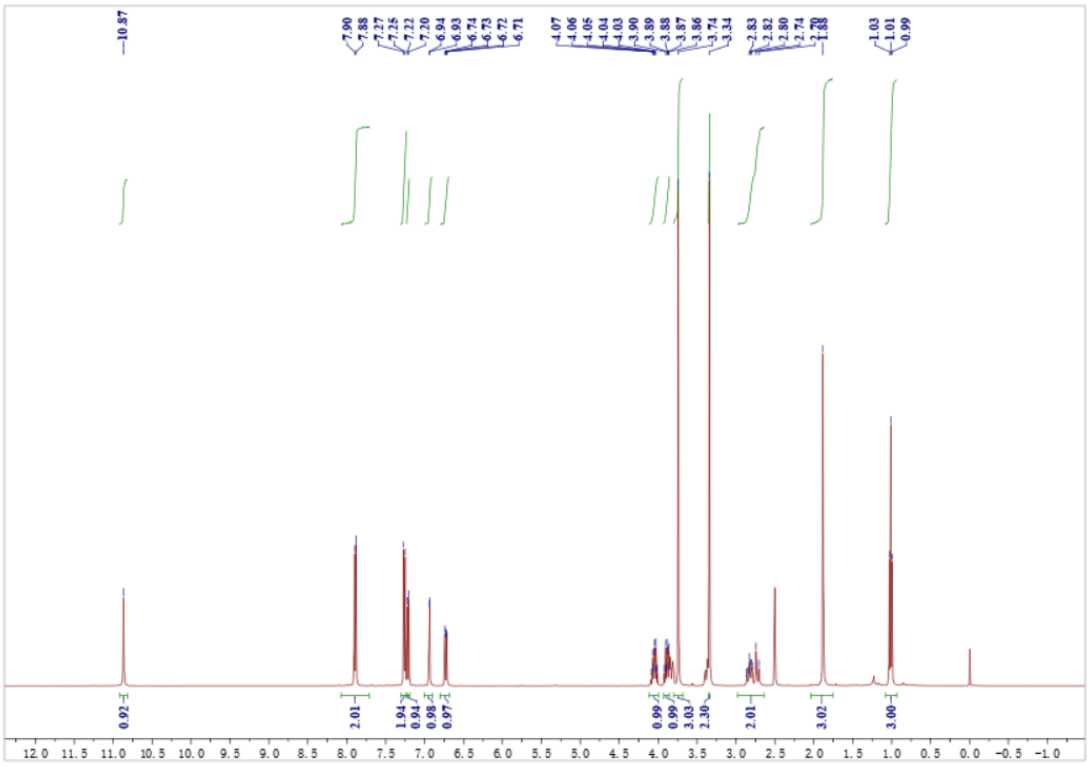


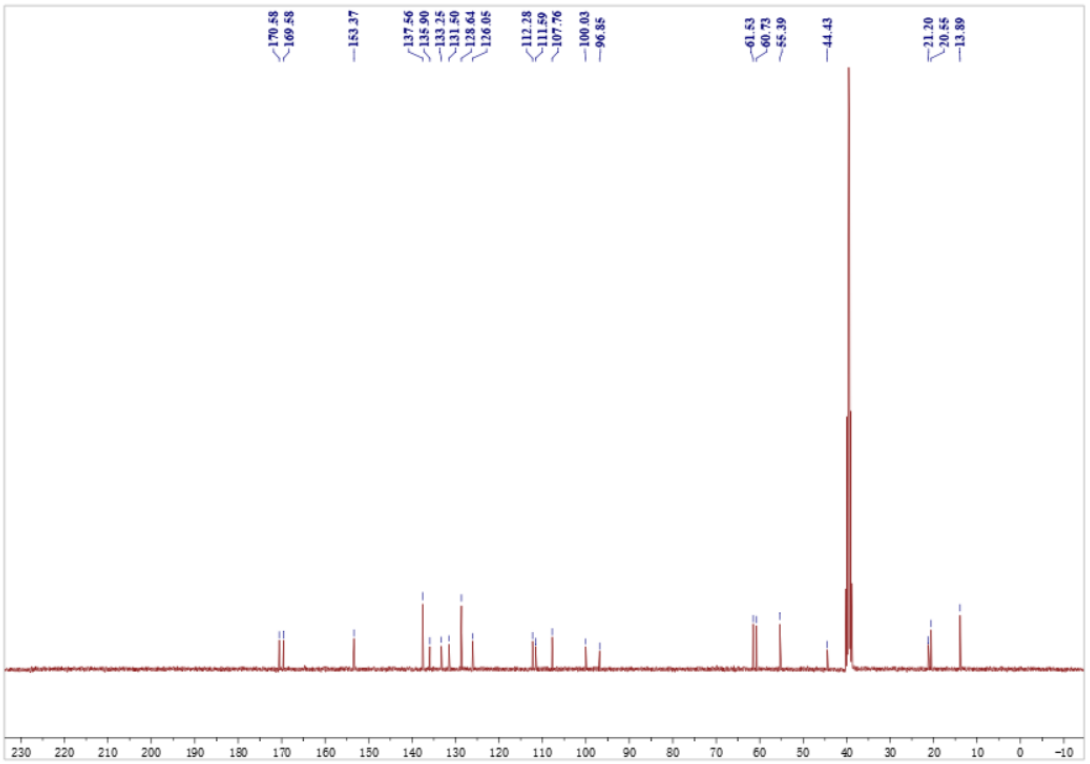
Ethyl(S)-2-(4-bromobenzoyl)-6-methoxy-1-methyl-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**13**):



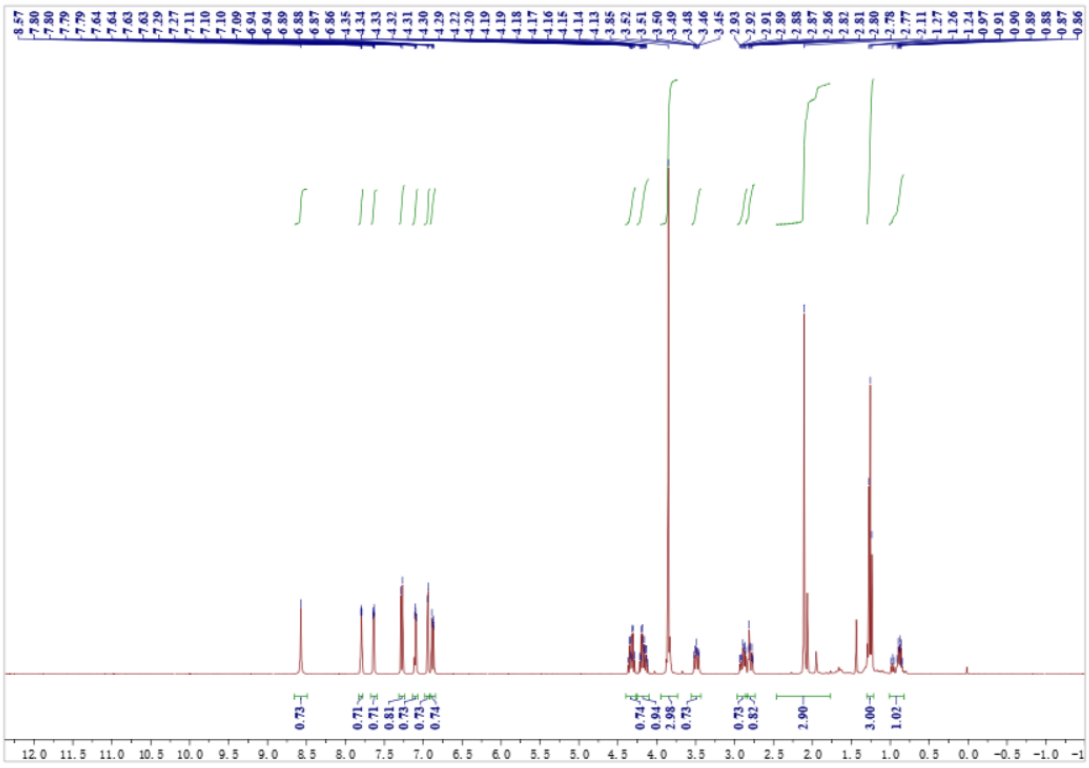


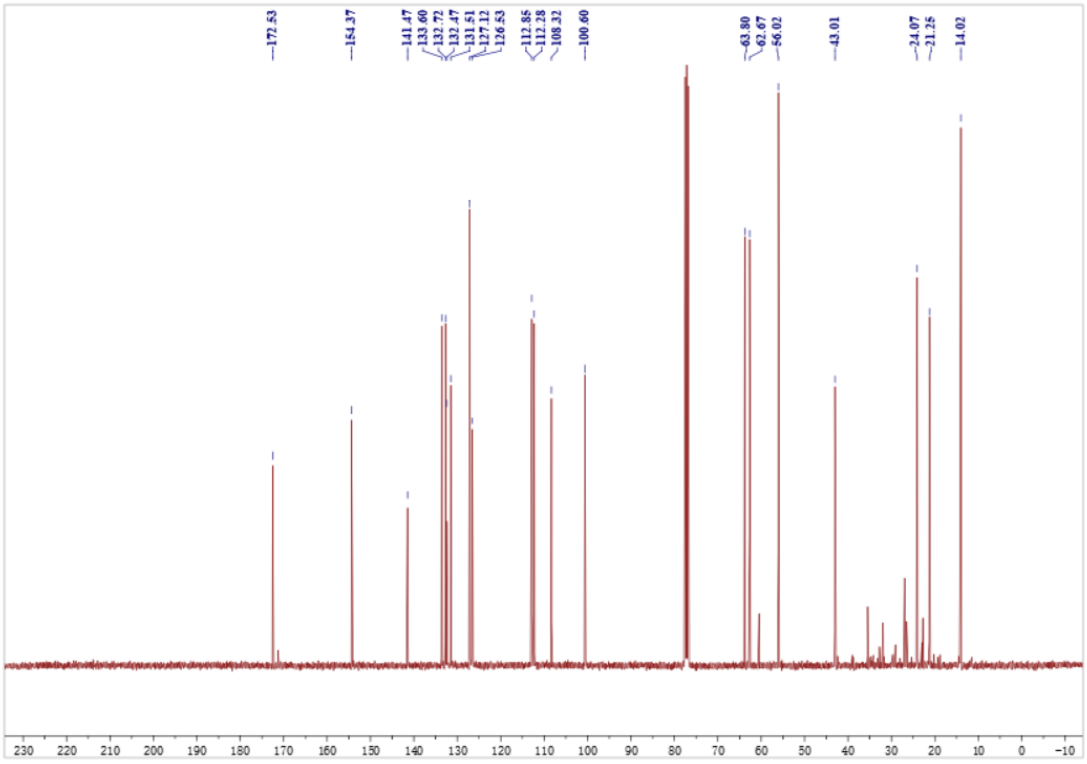
Ethyl(S)-2-(4-iodobenzoyl)-6-methoxy-1-methyl-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**14**):



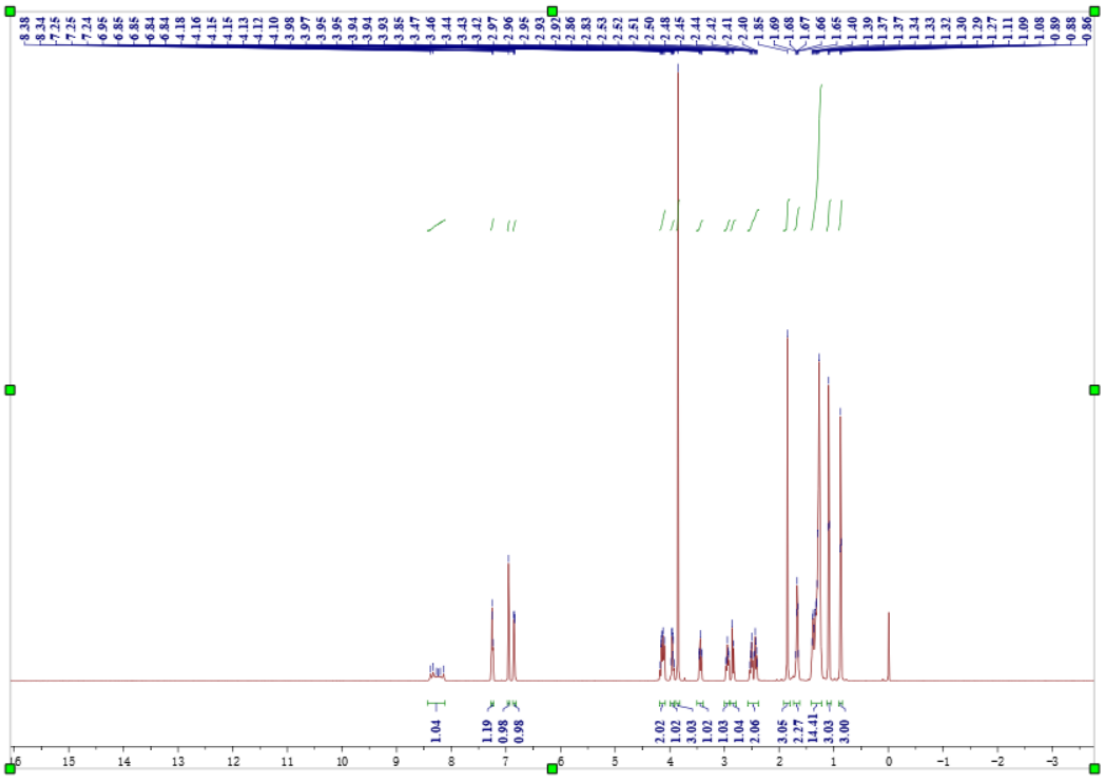


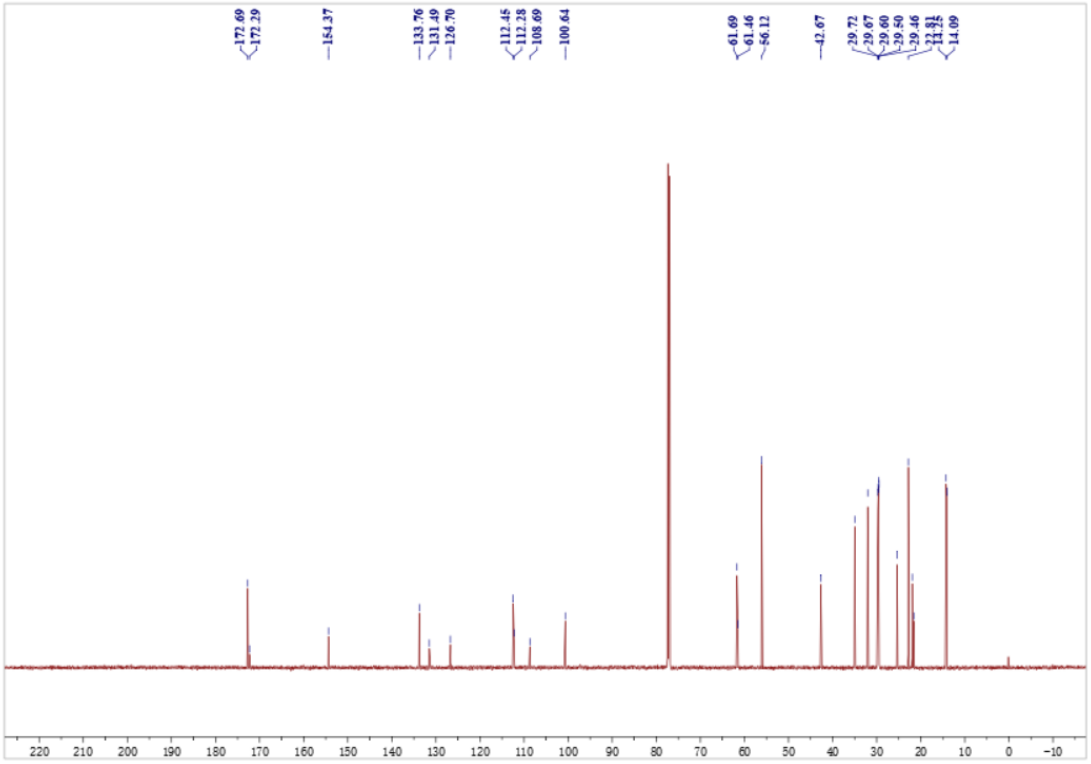
Ethyl(S)-6-methoxy-1-methyl-2-(thiophen-2-ylsulfonyl)-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**15**):



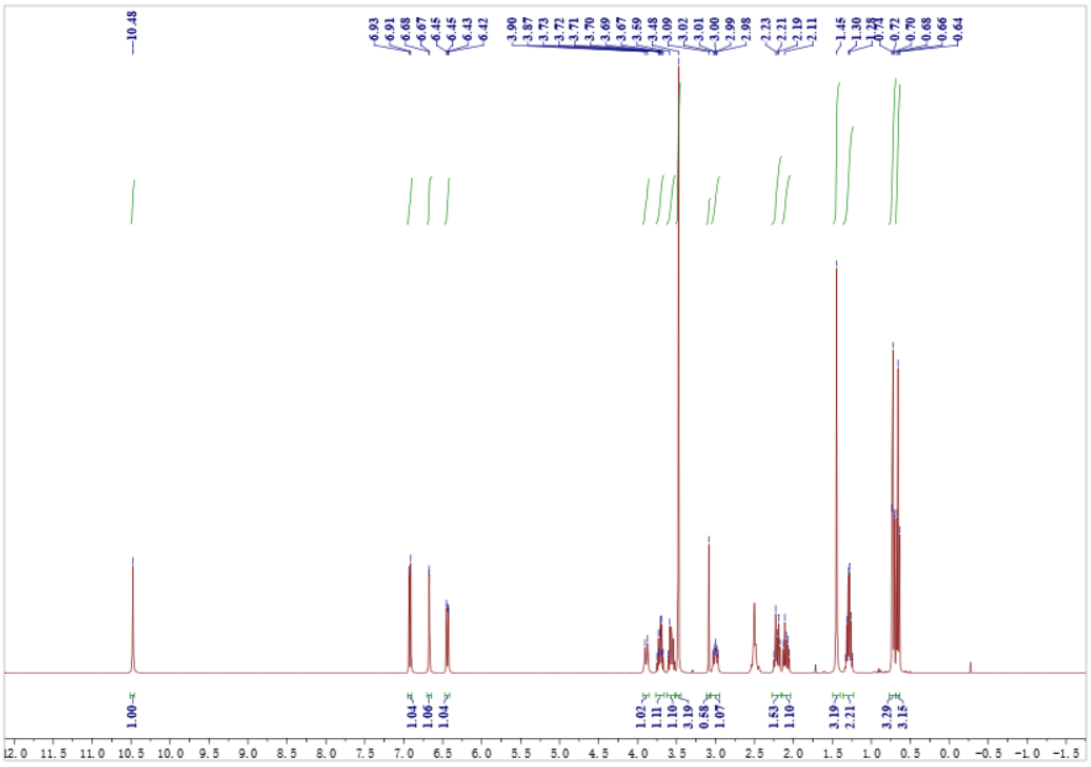


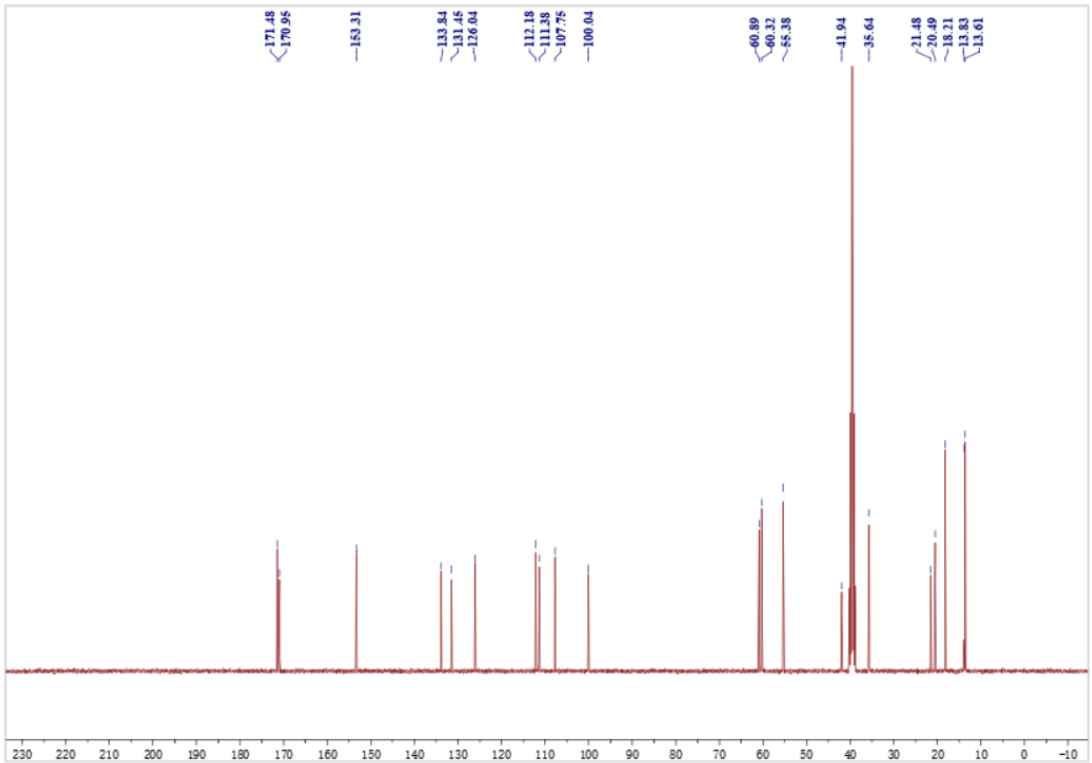
Ethyl(S)-6-methoxy-1-methyl-2-undecanoyl-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**16**):



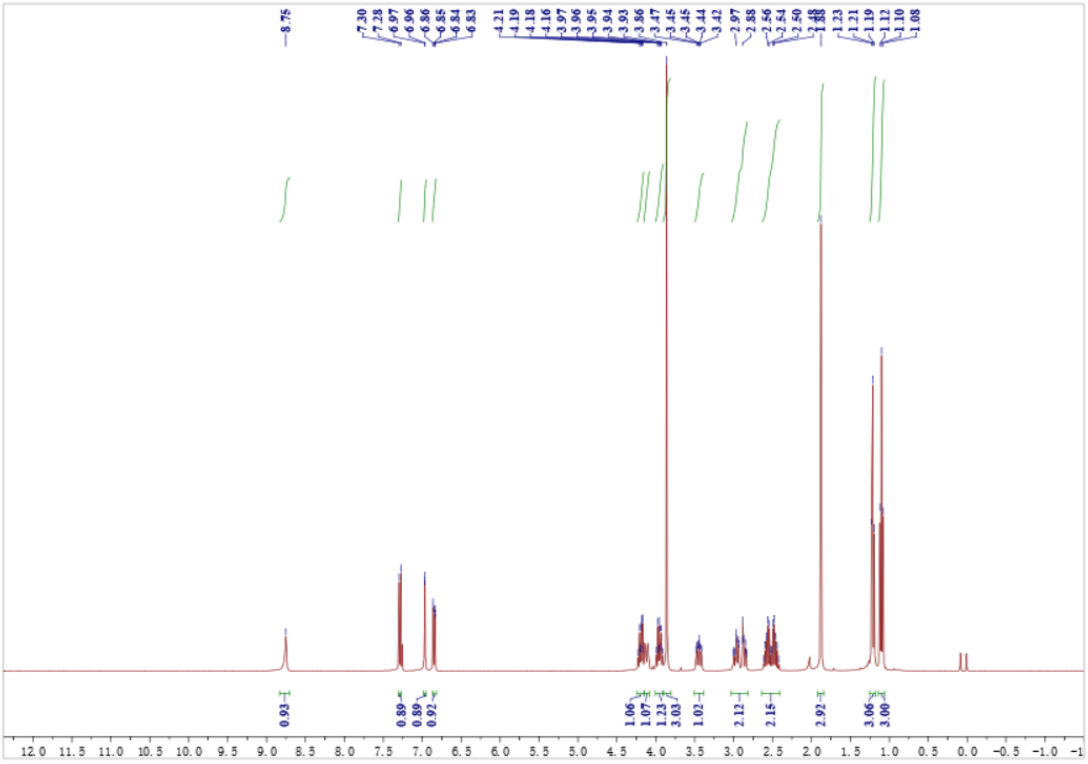


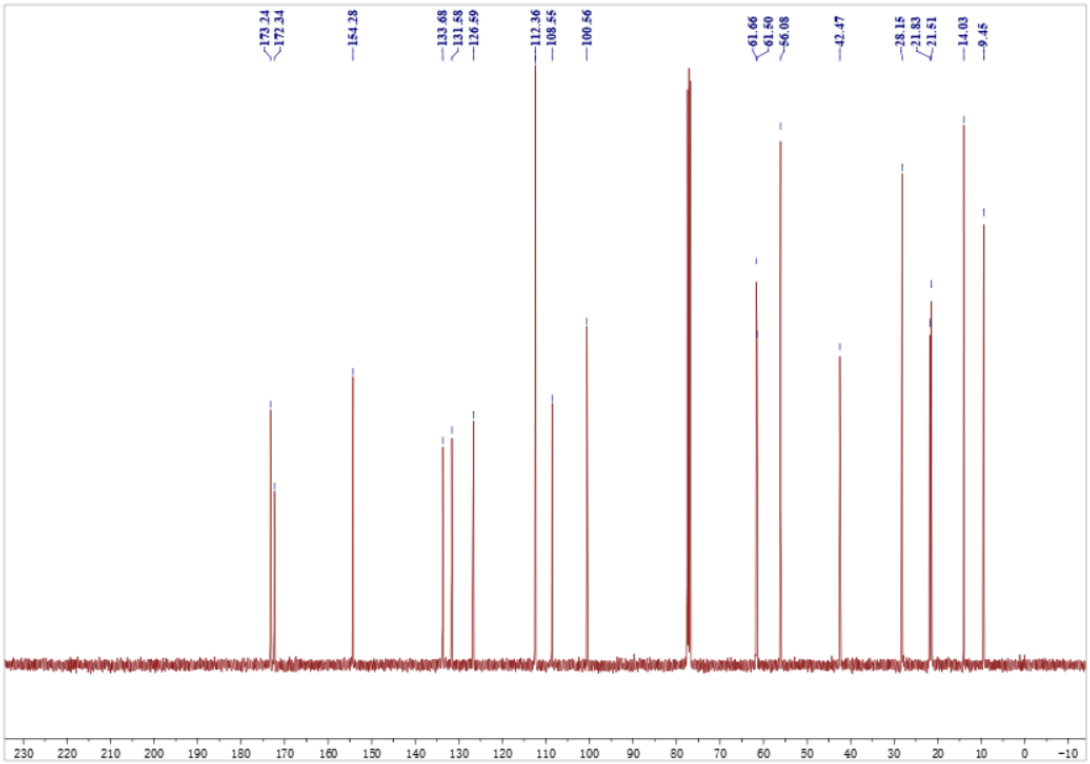
Ethyl(S)-2-butyryl-6-methoxy-1-methyl-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**17**):



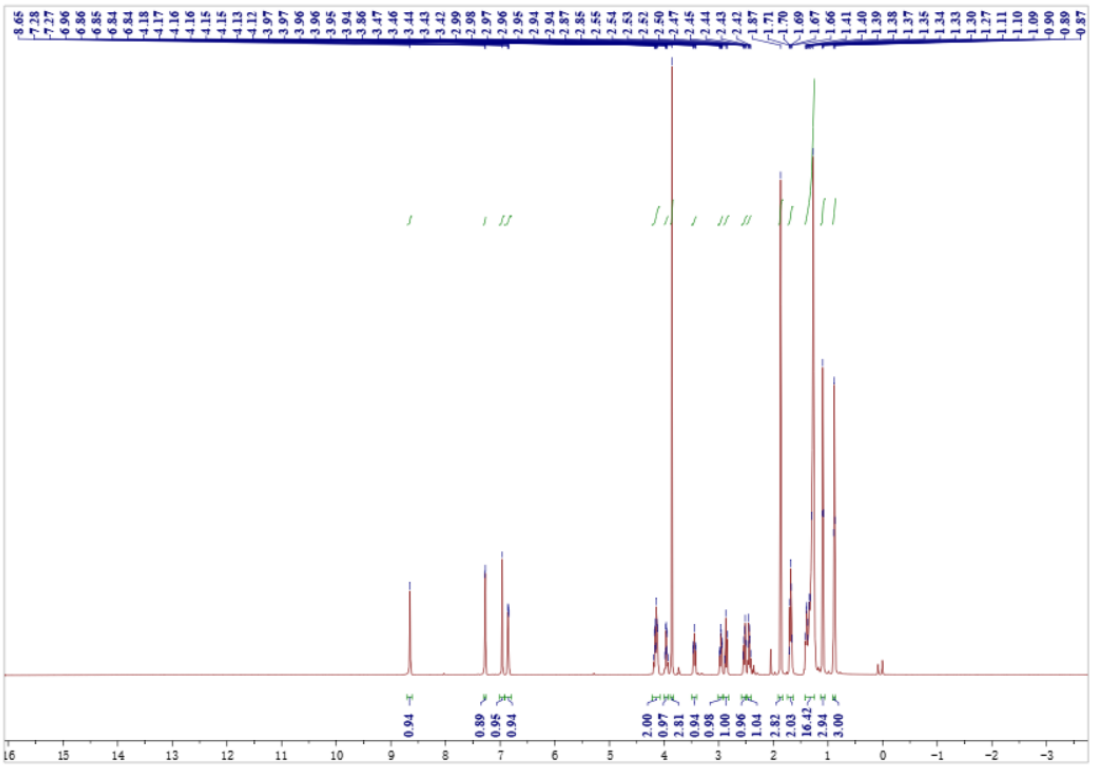


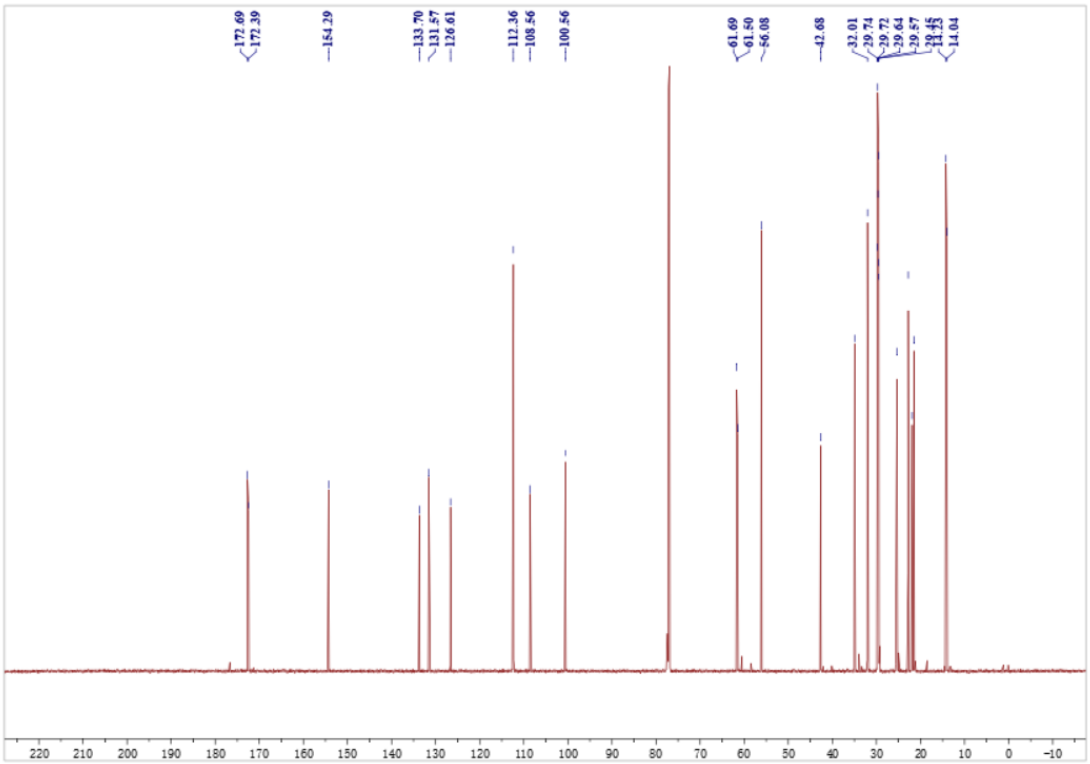
Ethyl(S)-6-methoxy-1-methyl-2-propionyl-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**18**):



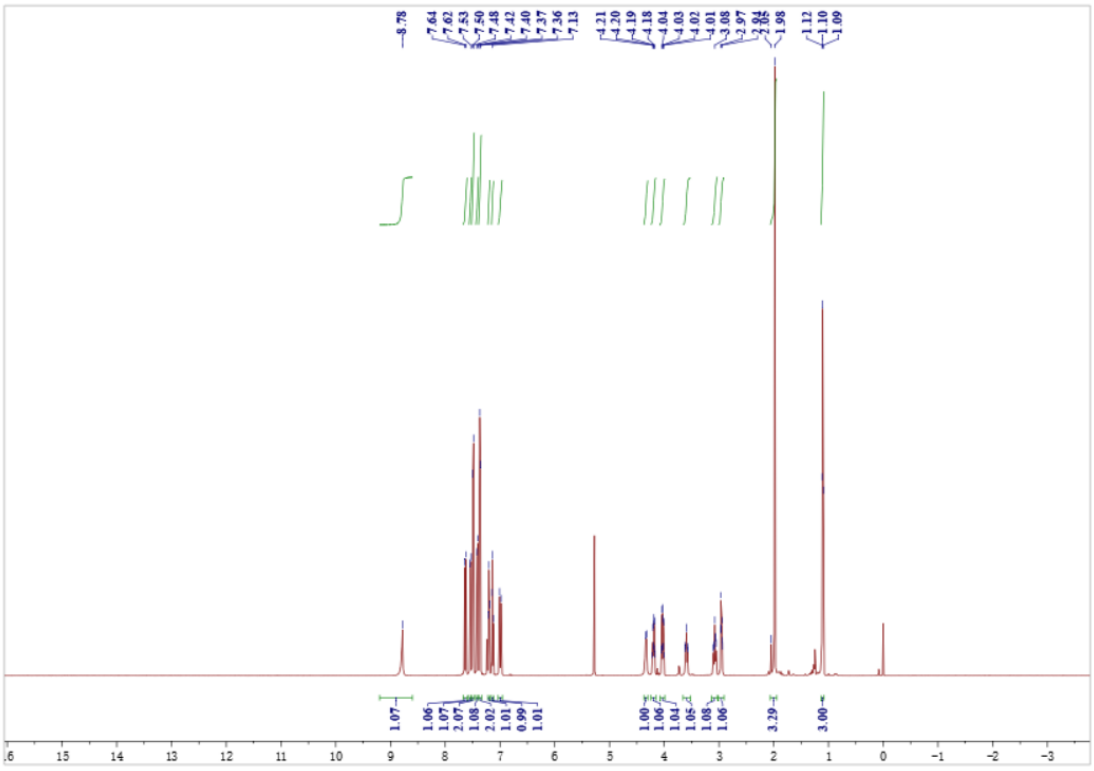


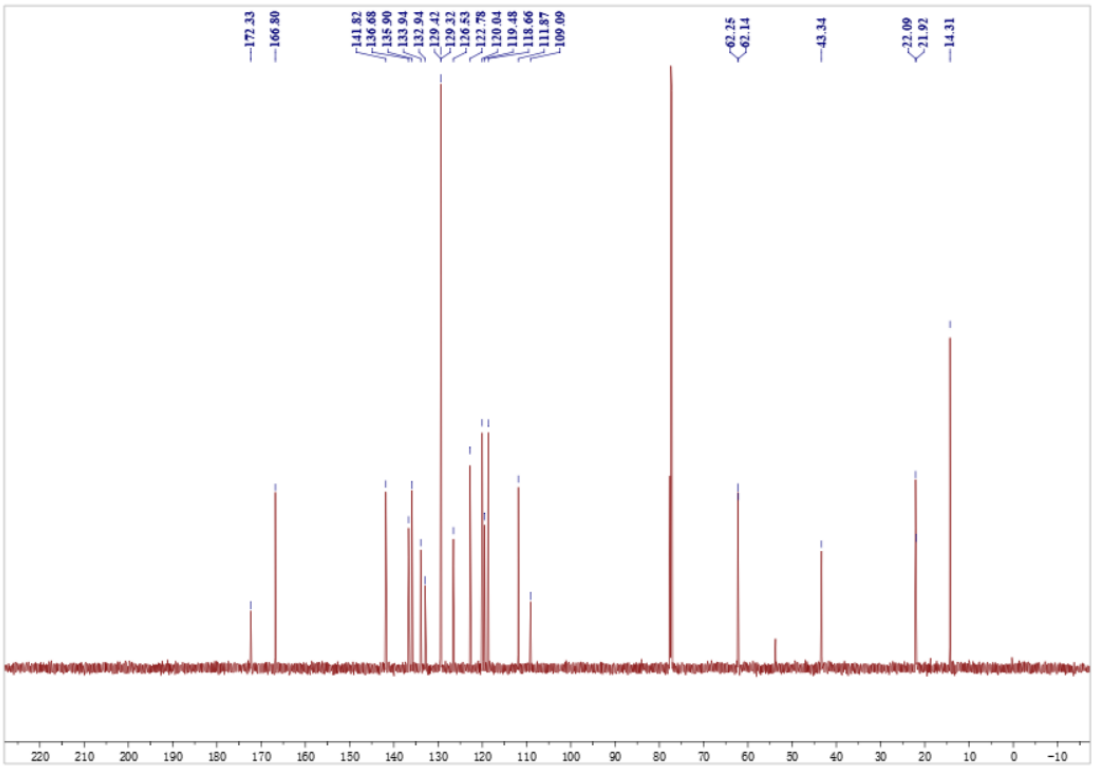
Ethyl(S)-2-dodecanoyl-6-methoxy-1-methyl-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**19**):



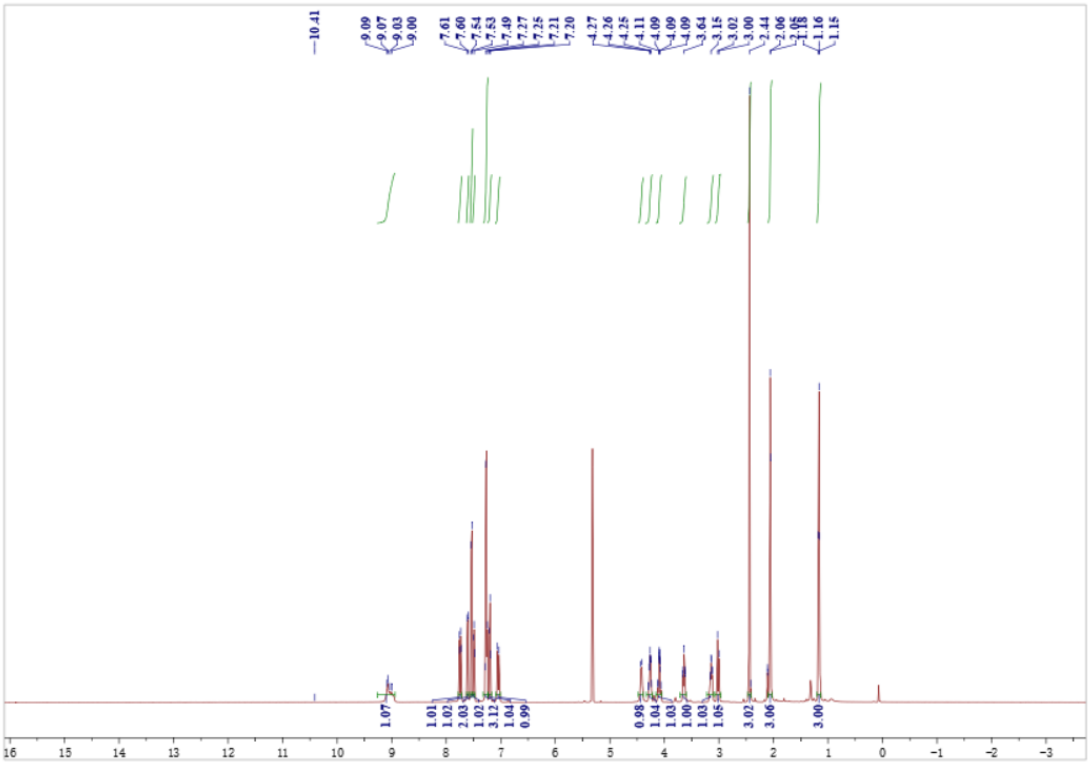


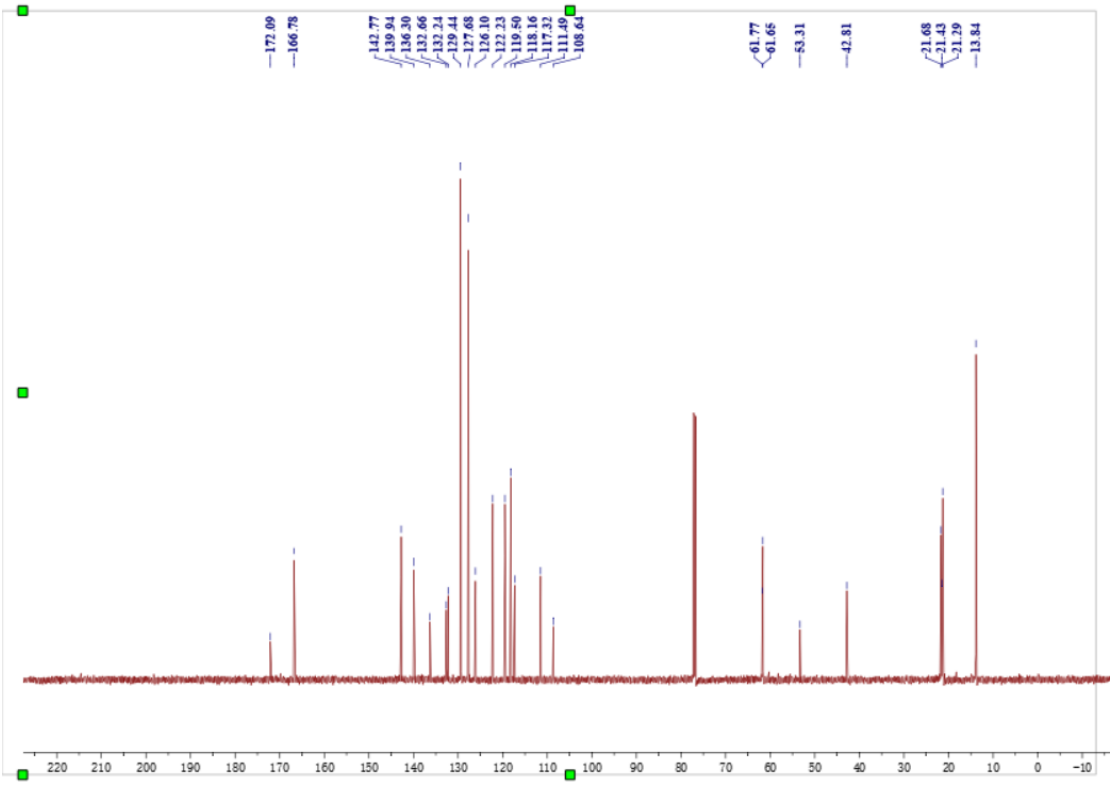
Ethyl(S,E)-2-(3-(4-chlorophenyl)acryloyl)-1-methyl-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**20**):



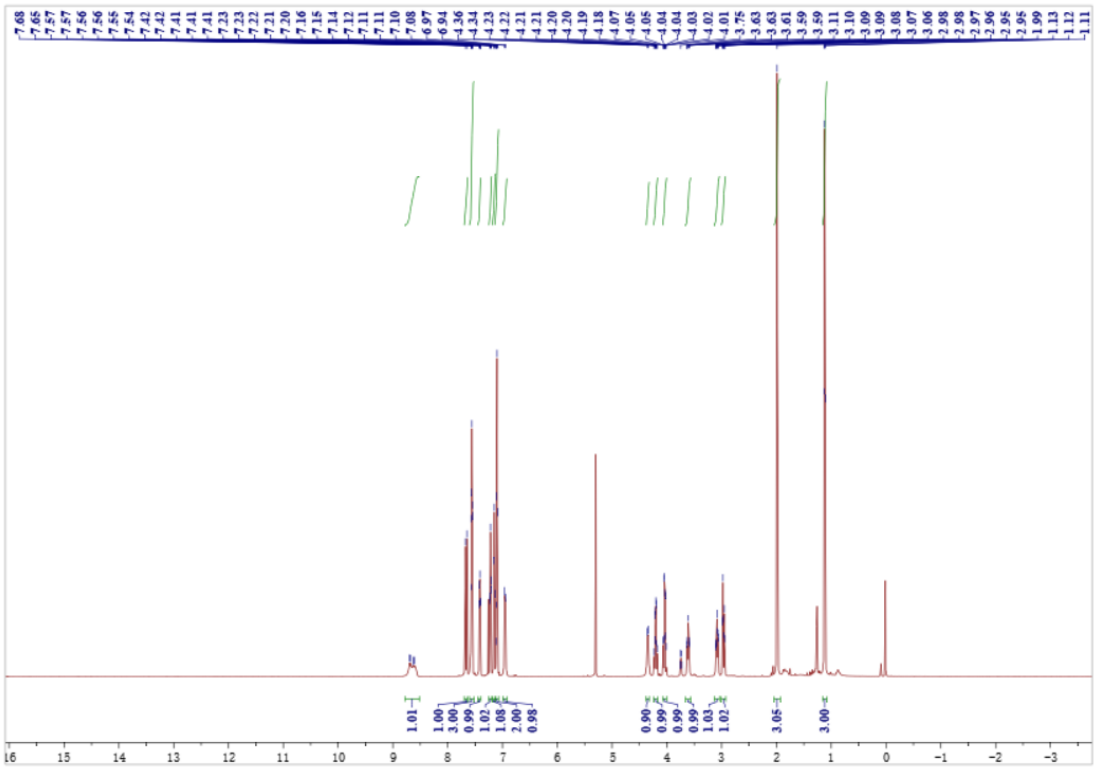


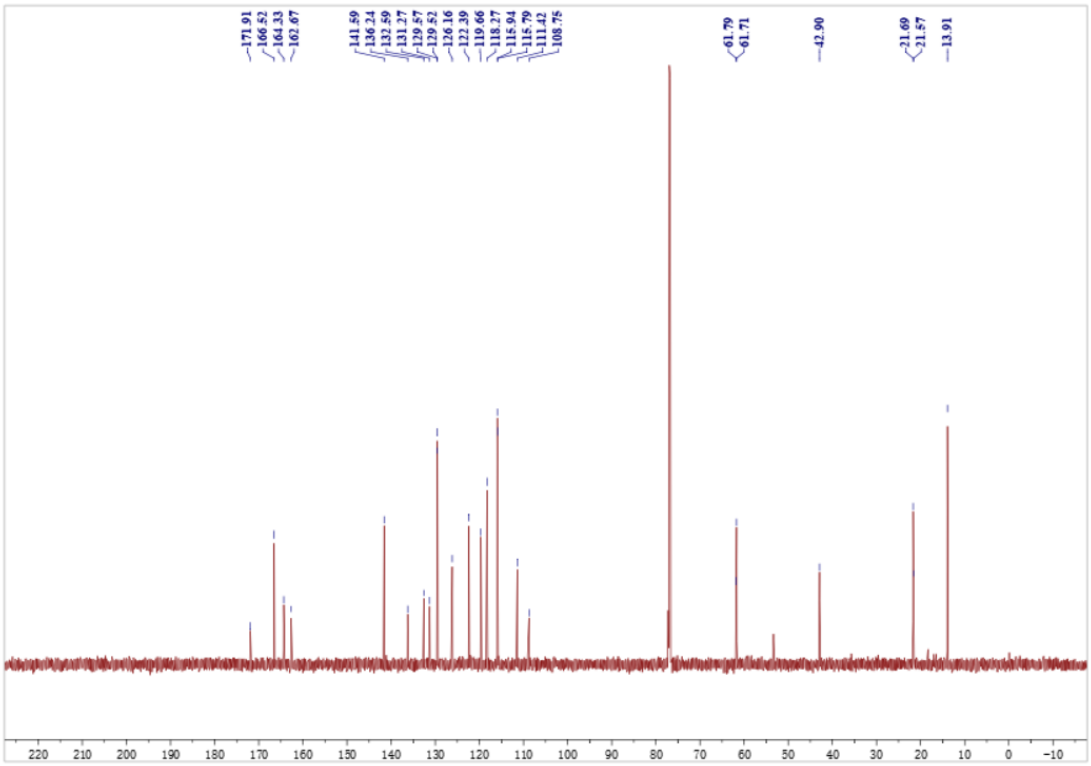
Ethyl(S,E)-1-methyl-2-(3-(p-tolyl)acryloyl)-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**21**):



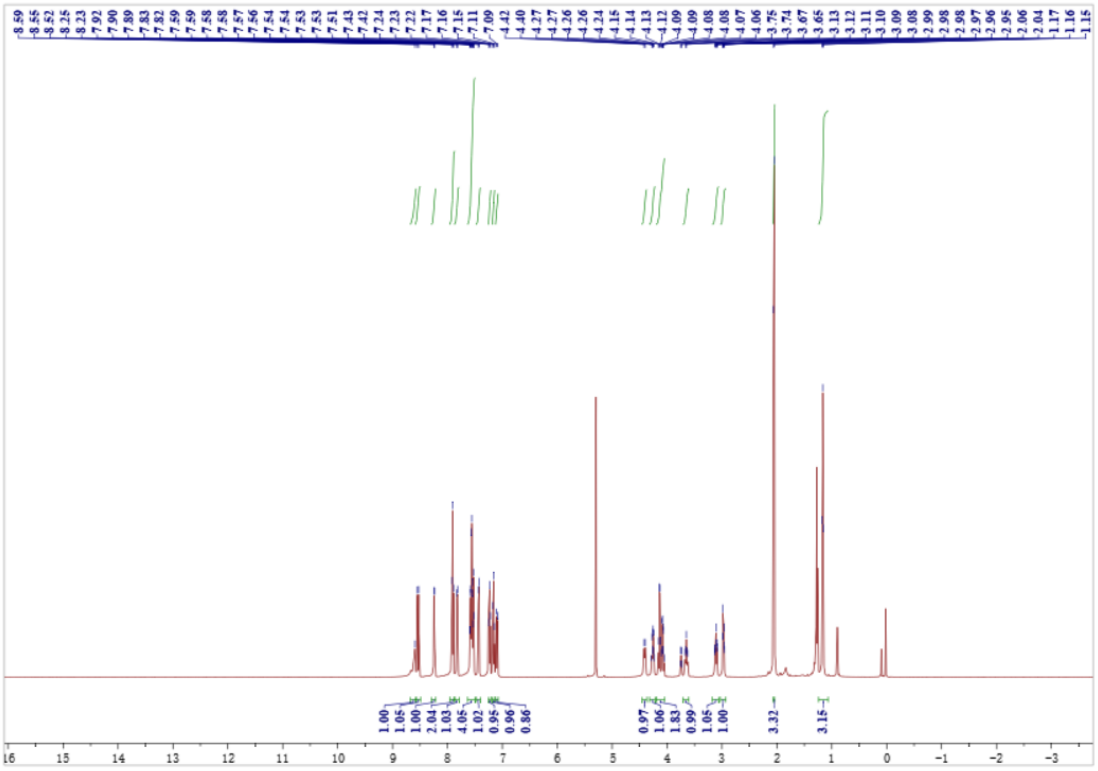


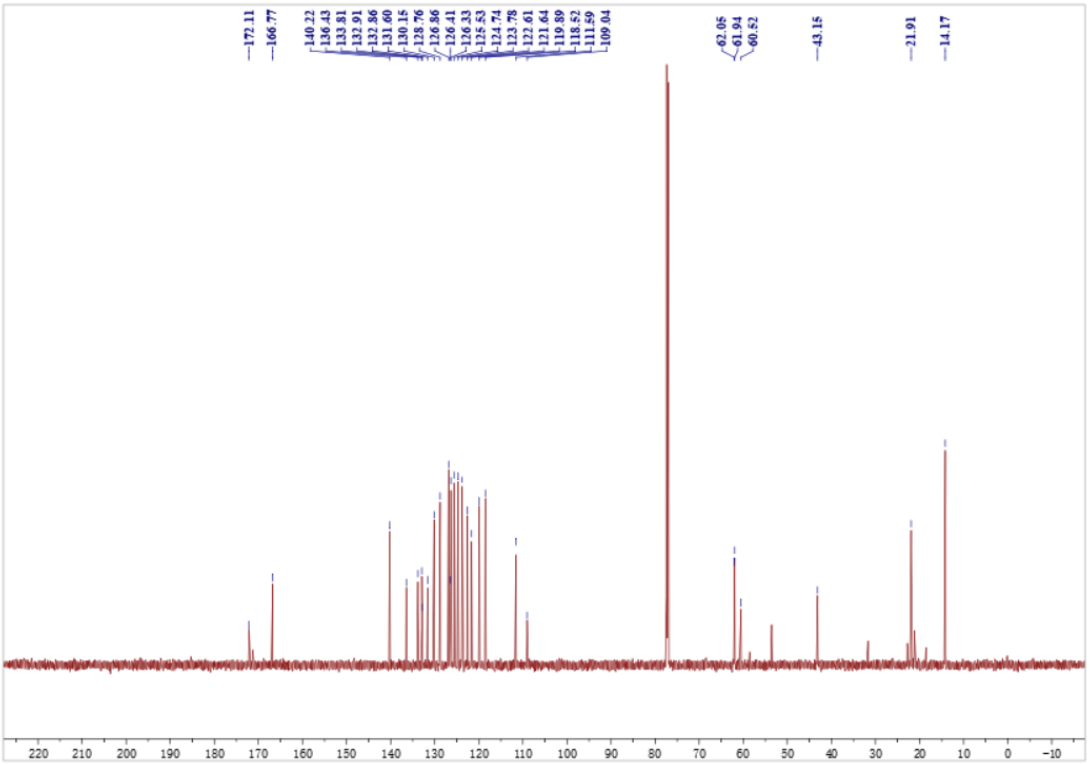
Ethyl(S,E)-2-(3-(4-fluorophenyl)acryloyl)-1-methyl-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate)(**22**):



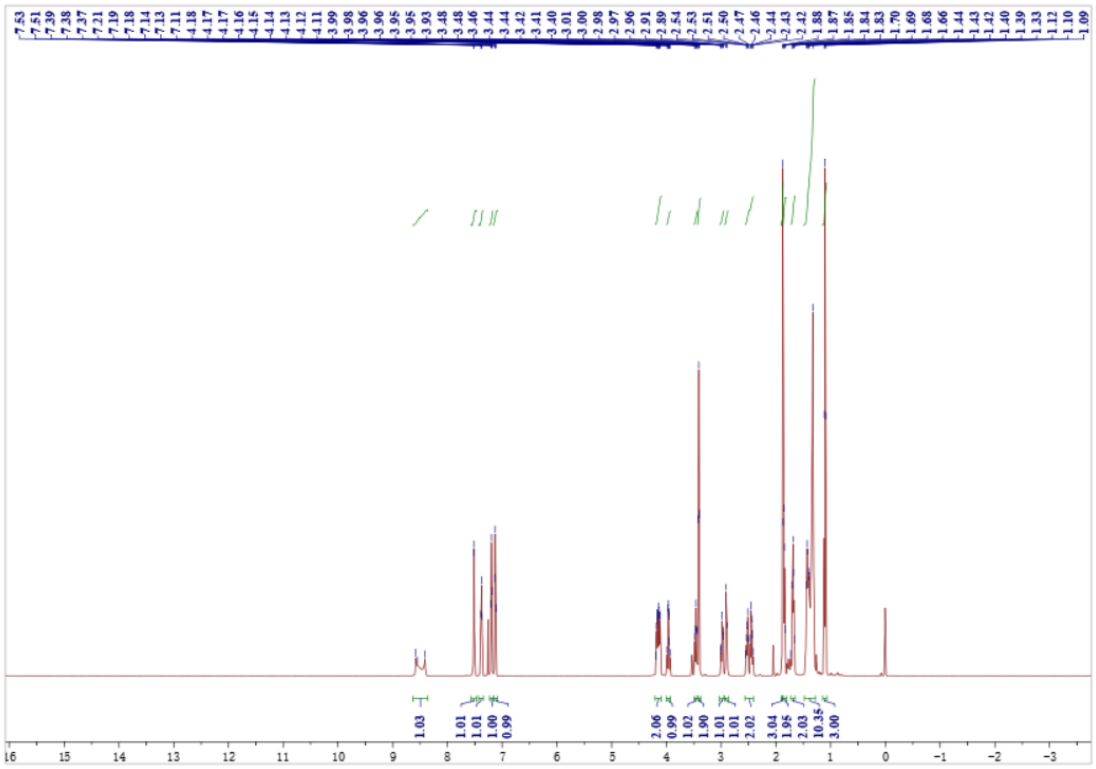


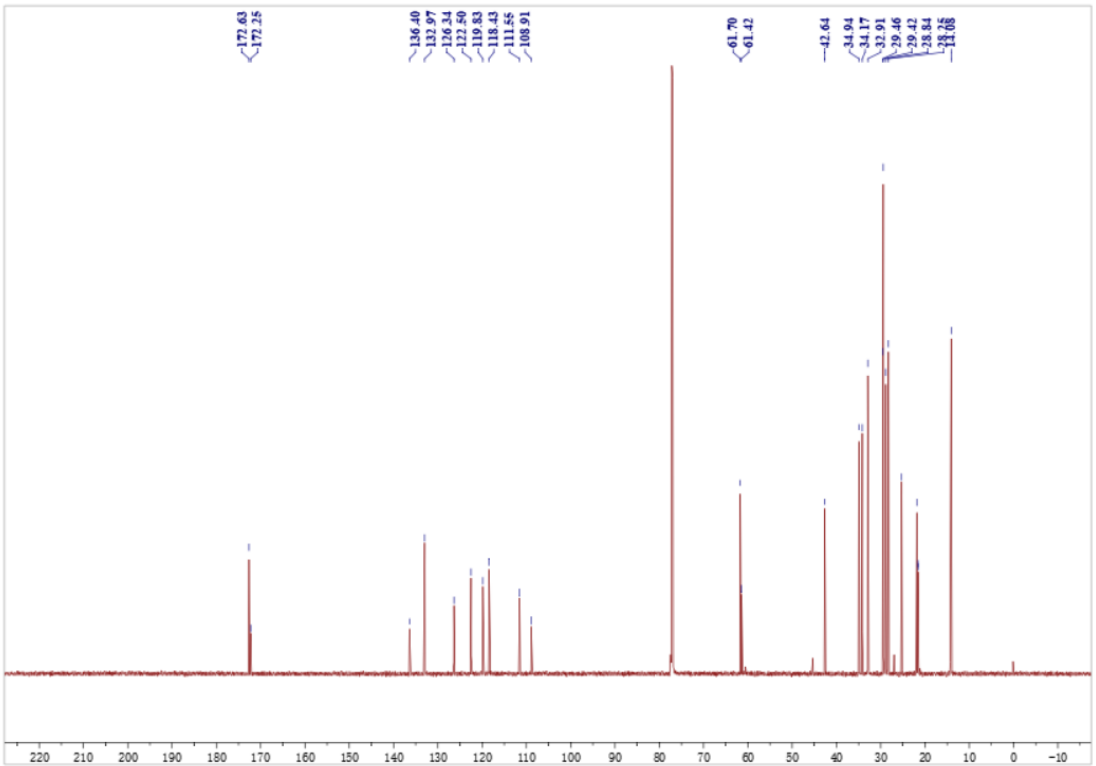
Ethyl(S,E)-1-methyl-2-(3-(naphthalen-2-yl)acryloyl)-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**23**):



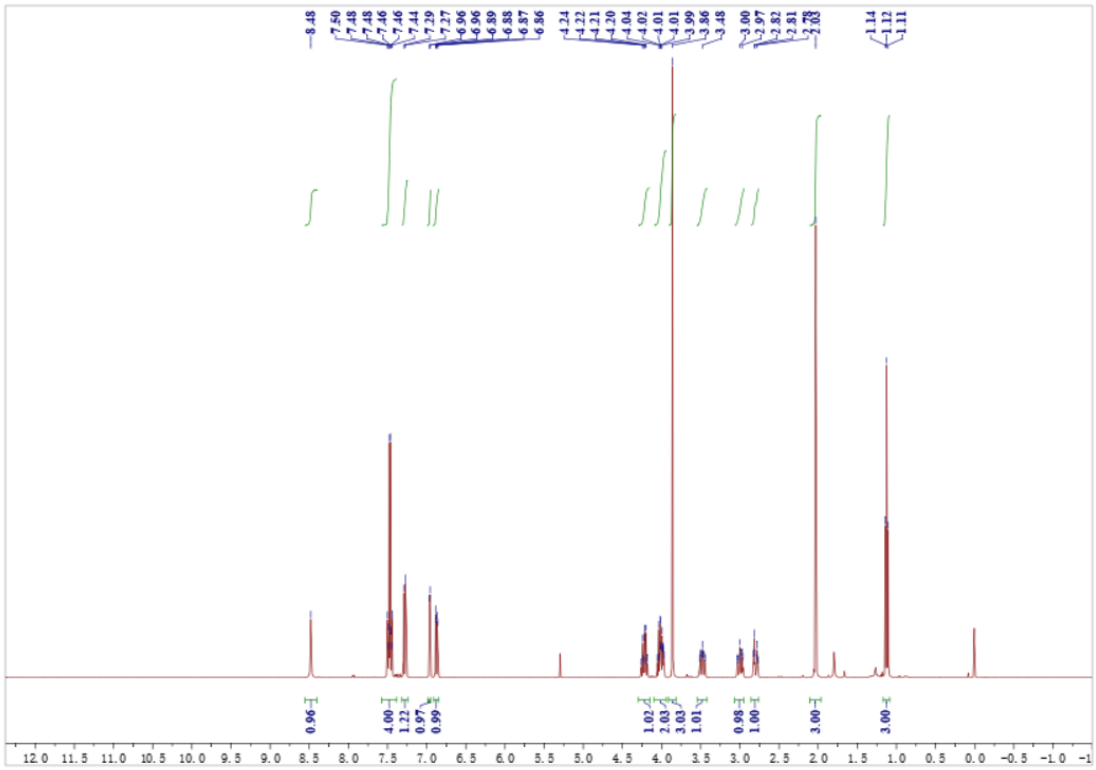


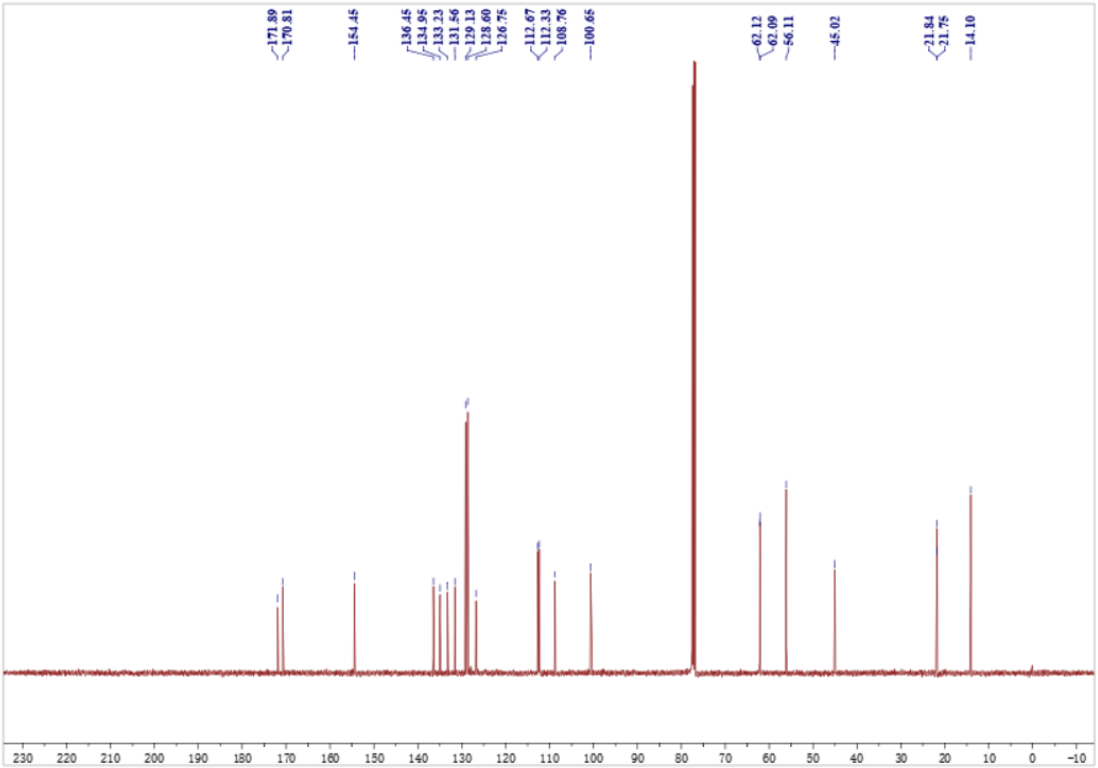
Ethyl(S)-2-(10-bromodecanoyl)-1-methyl-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**24**):



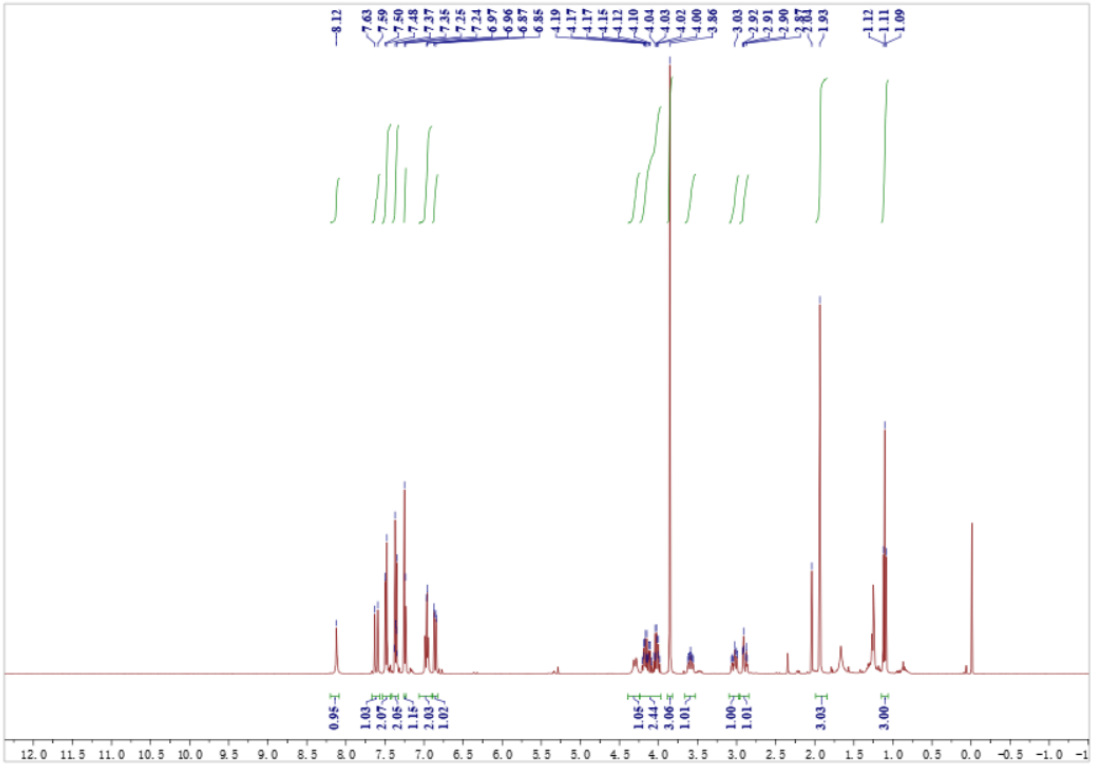


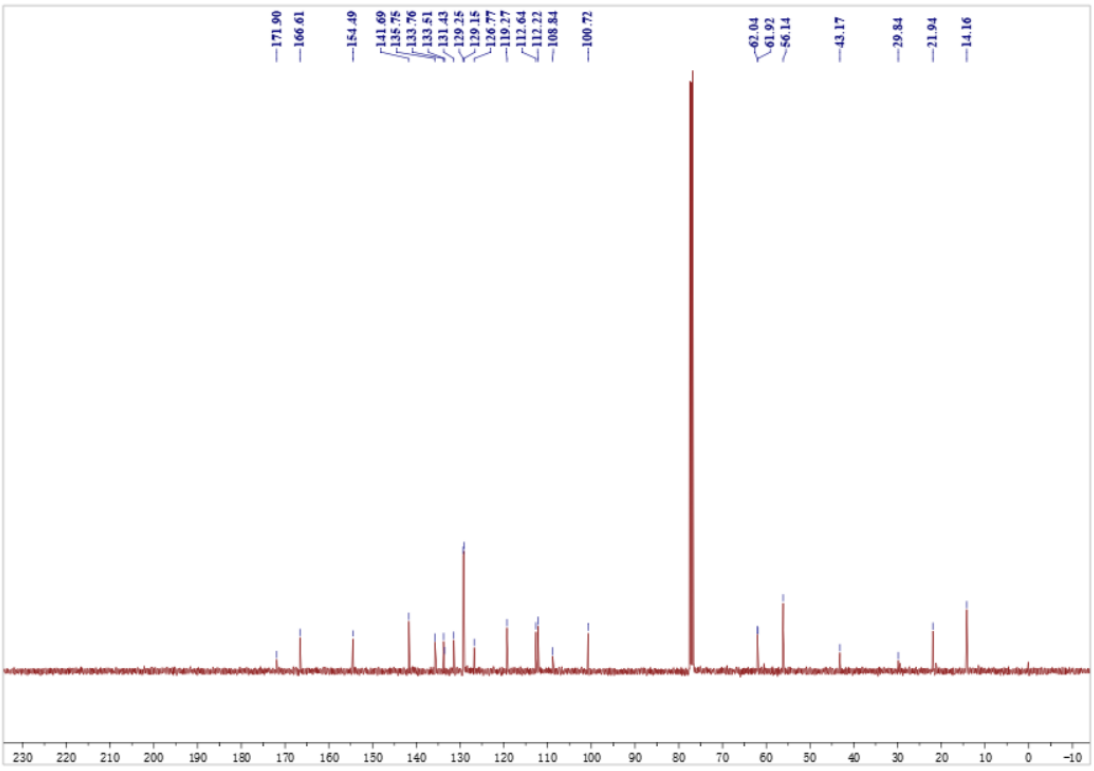
Ethyl(S)-2-(4-chlorobenzoyl)-6-methoxy-1-methyl-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**25**):



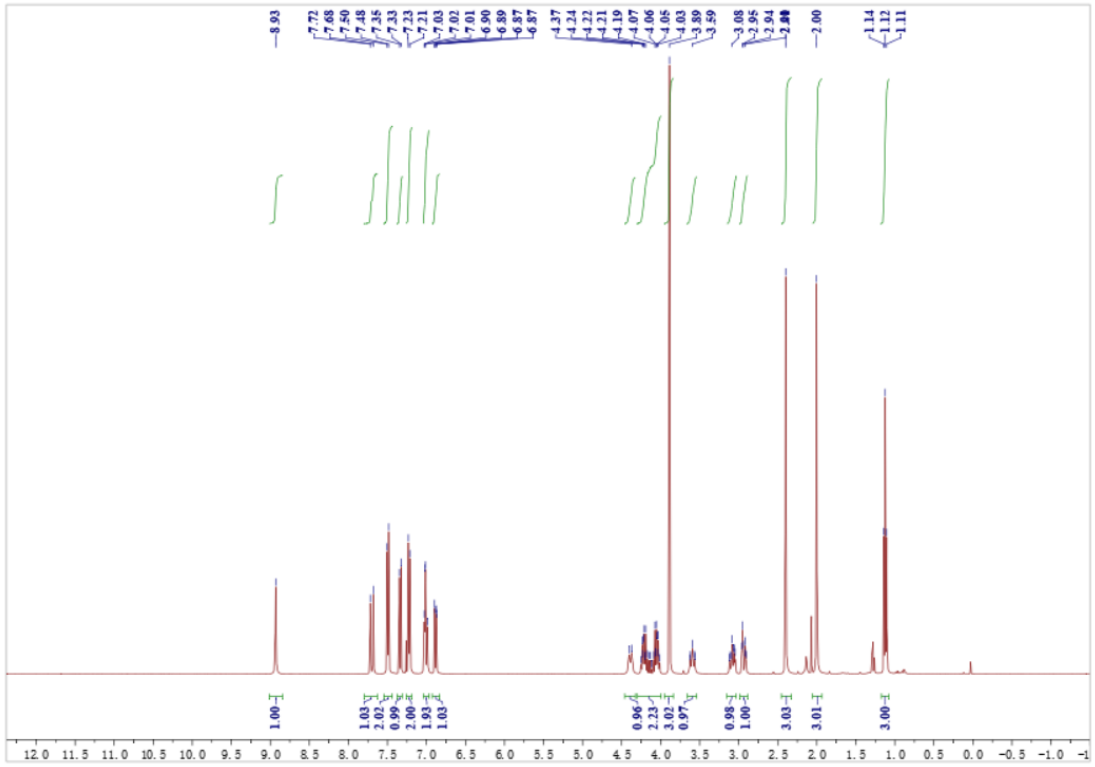


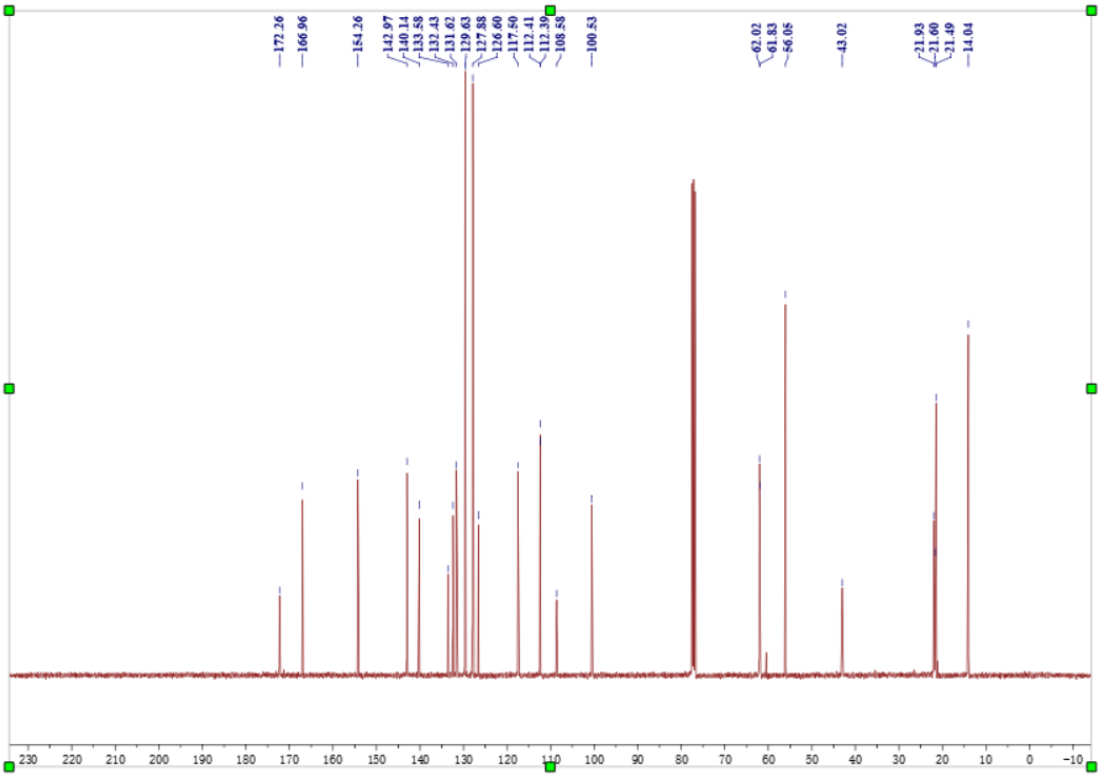
Ethyl(S,E)-2-(3-(4-chlorophenyl)acryloyl)-6-methoxy-1-methyl-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**26**):



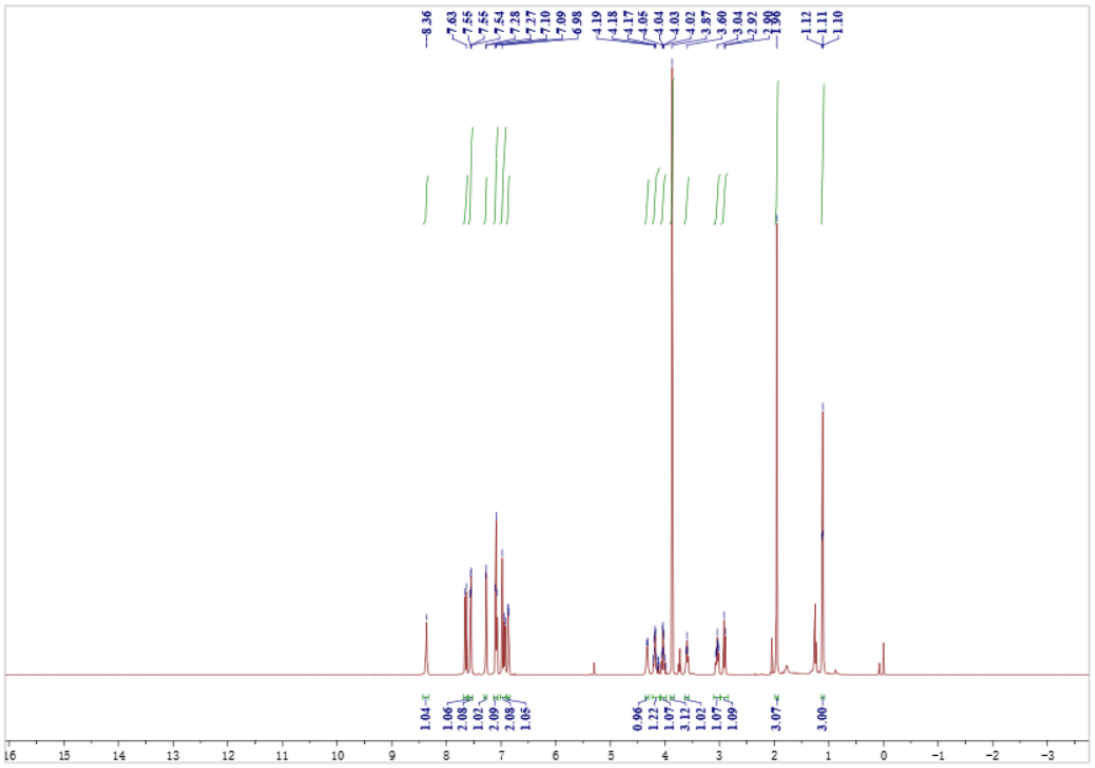


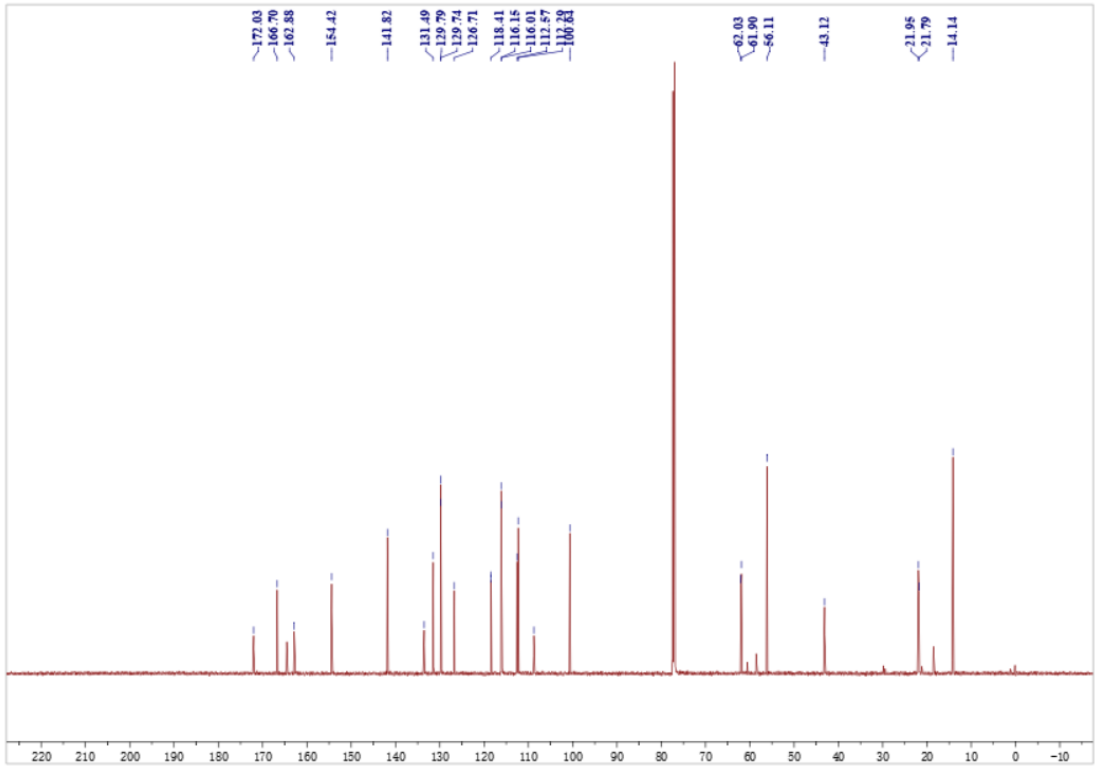
Ethyl(S,E)-6-methoxy-1-methyl-2-(3-(p-tolyl)acryloyl)-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**27**):



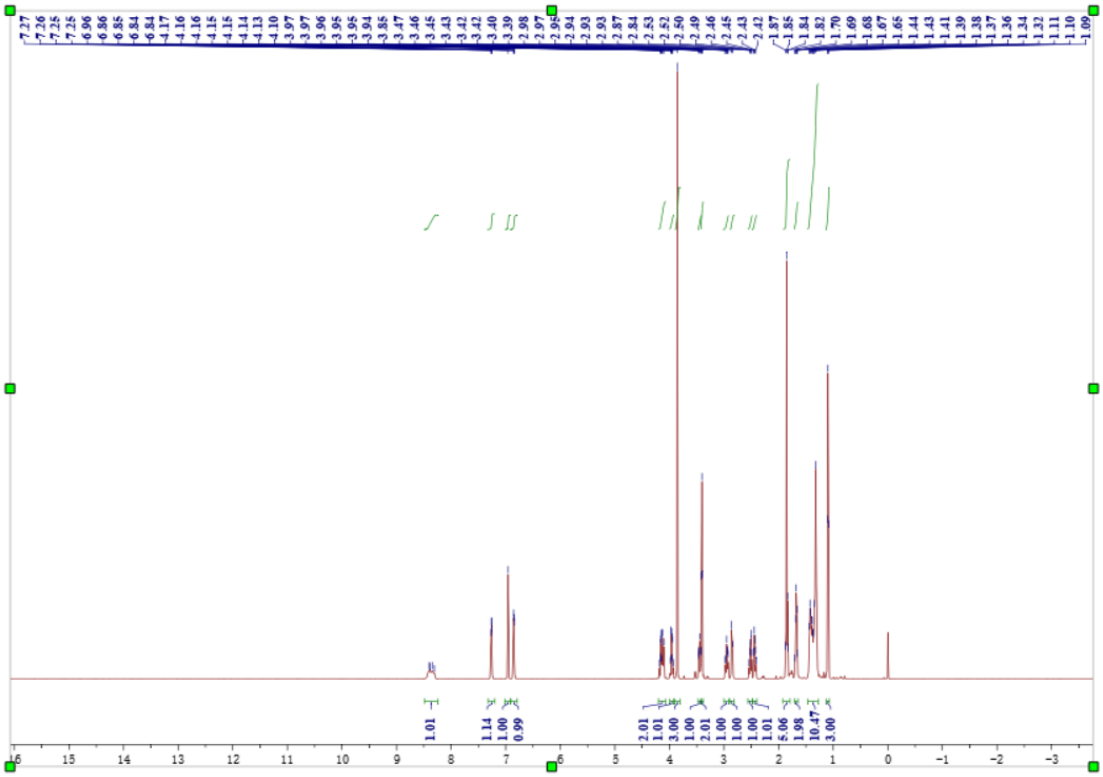


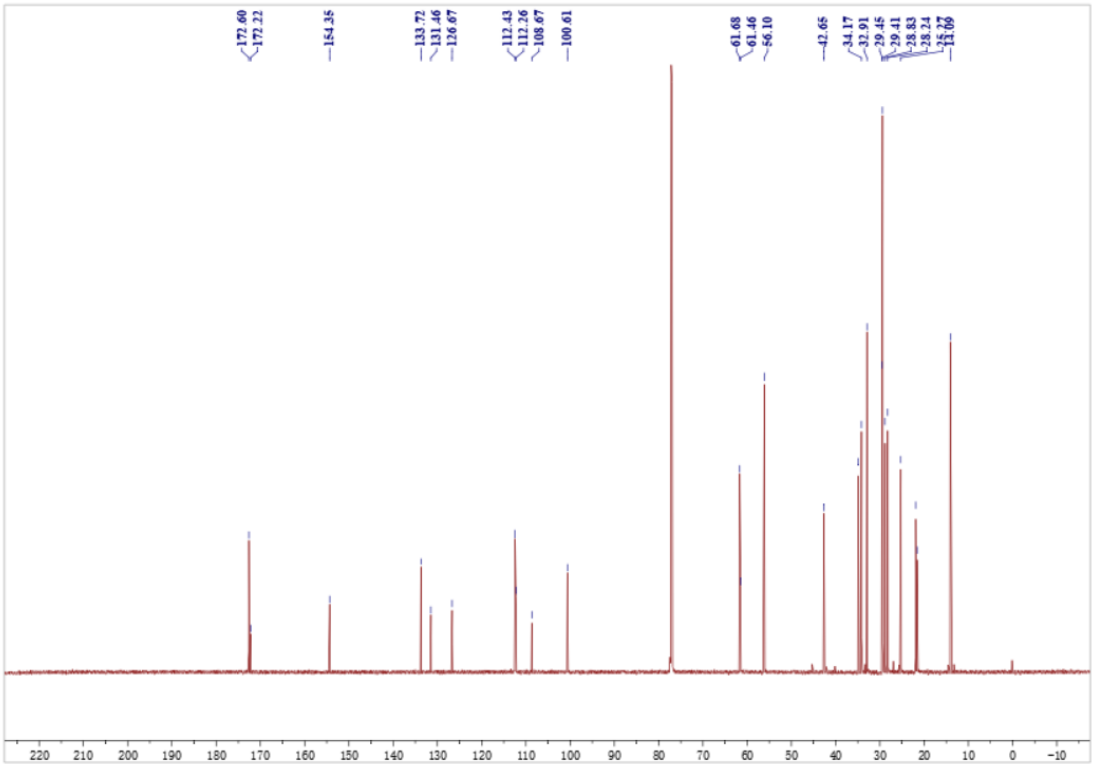
Ethyl(S,E)-2-(3-(4-fluorophenyl)acryloyl)-6-methoxy-1-methyl-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylat
e (**28**):



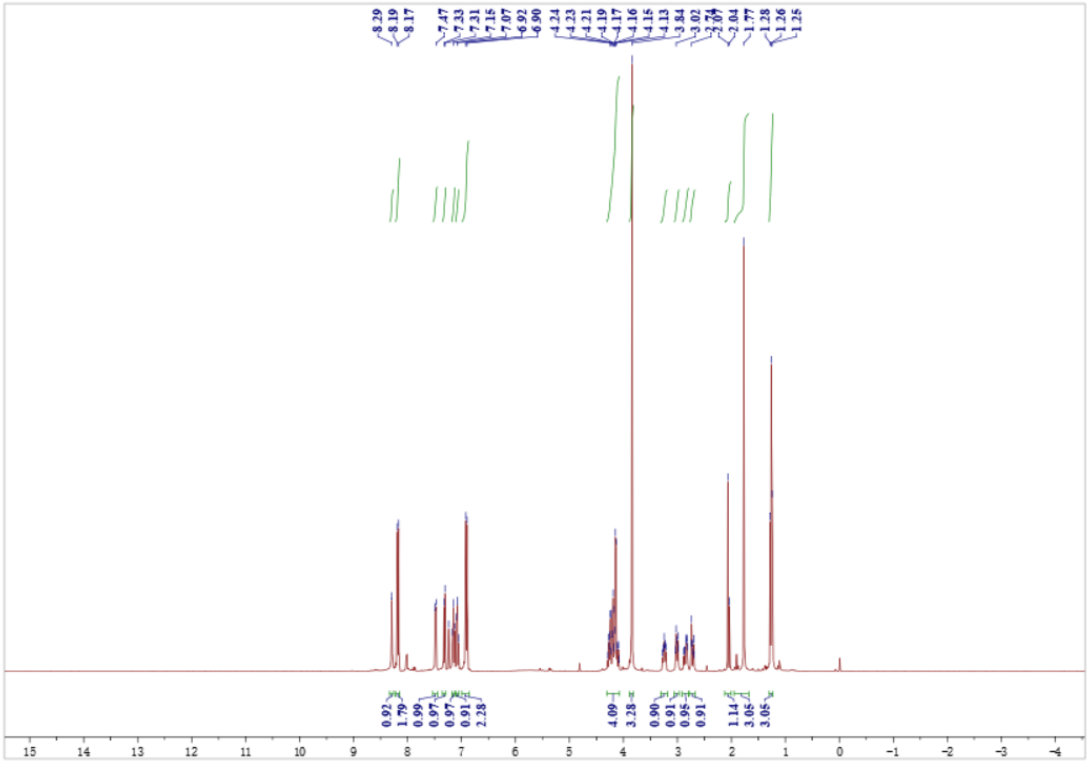


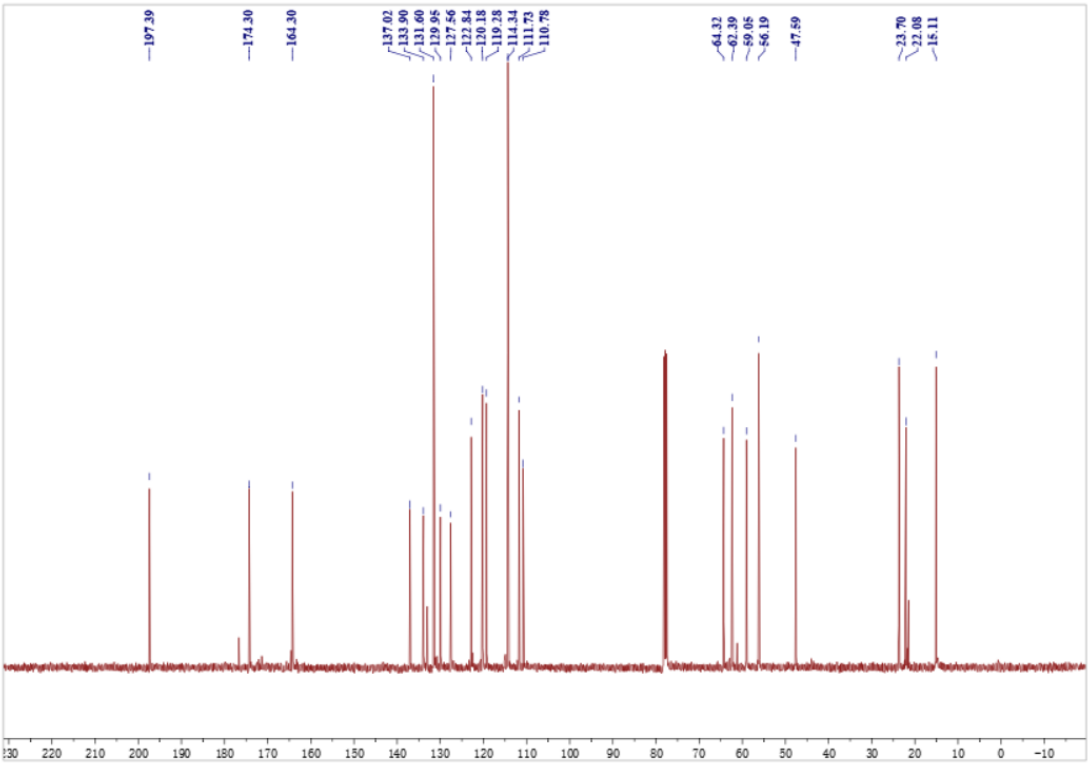
Ethyl(S)-2-(10-bromodecanoyl)-6-methoxy-1-methyl-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**29**):



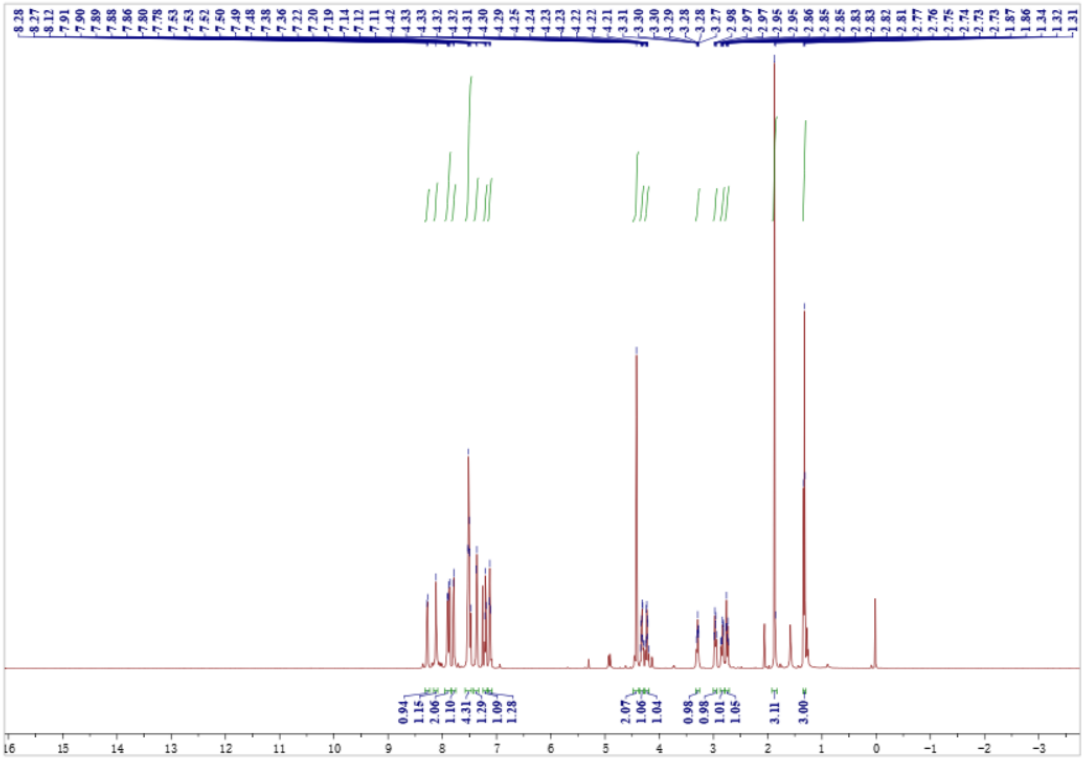


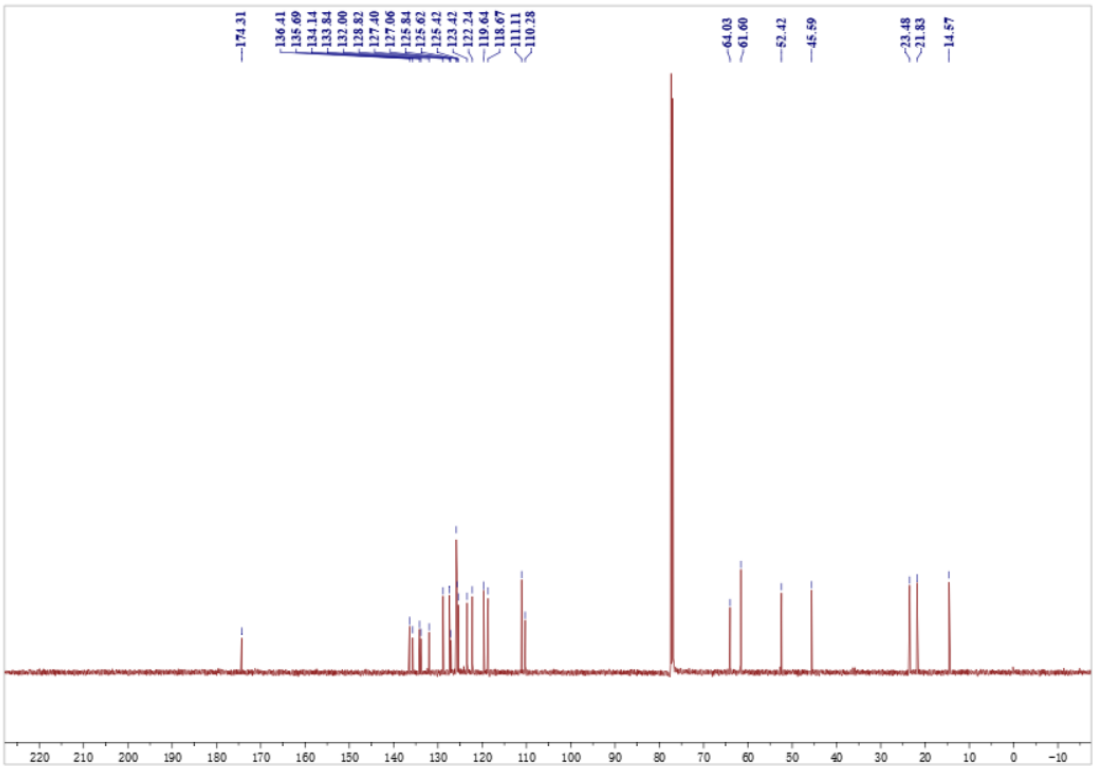
Ethyl(S)-2-(2-(4-methoxyphenyl)-2-oxoethyl)-1-methyl-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**30**):



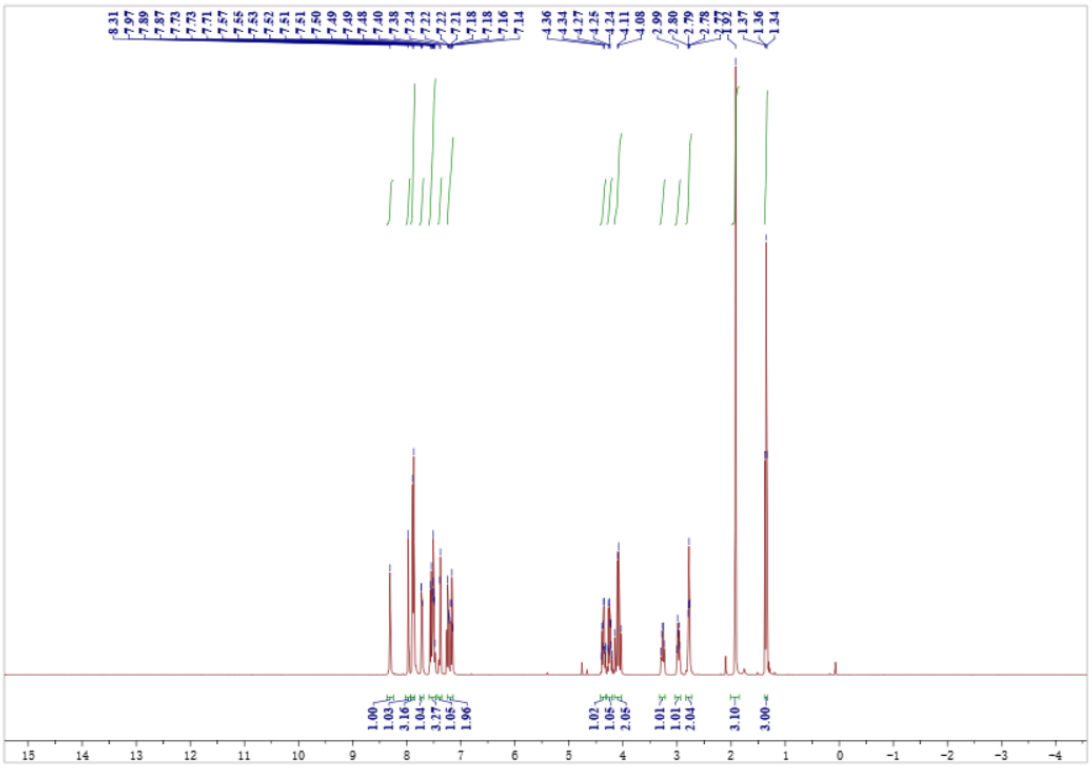


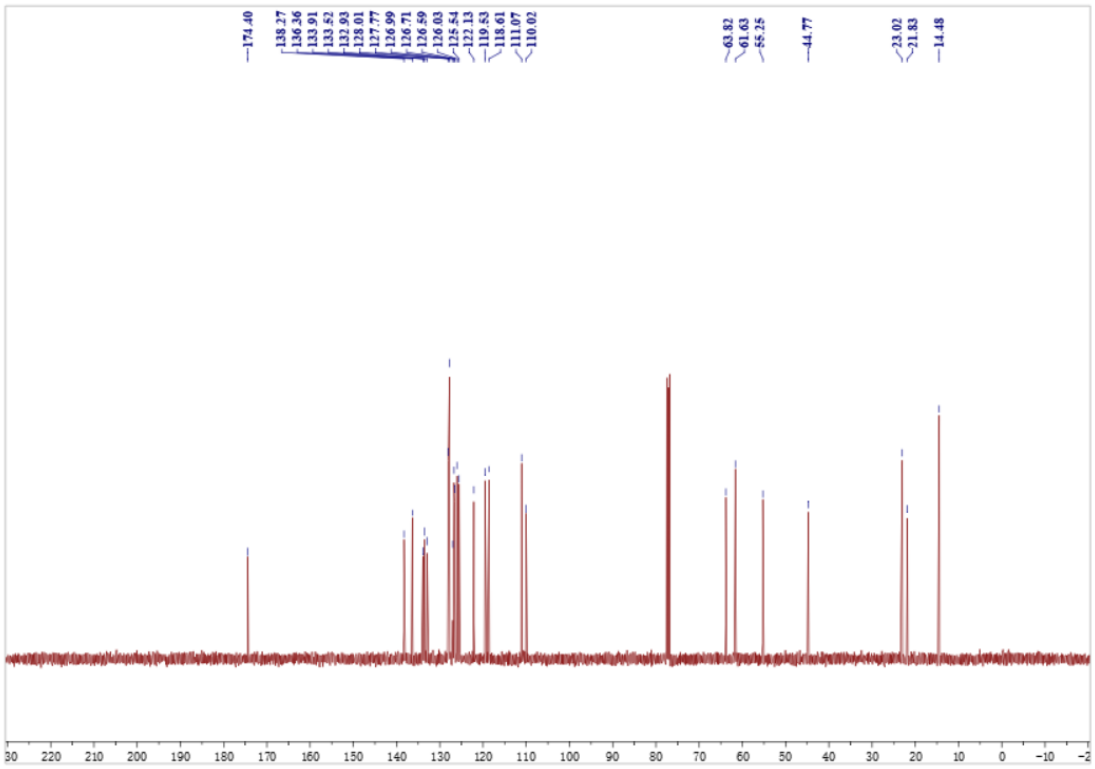
Ethyl(S)-1-methyl-2-(naphthalen-1-ylmethyl)-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**31**):



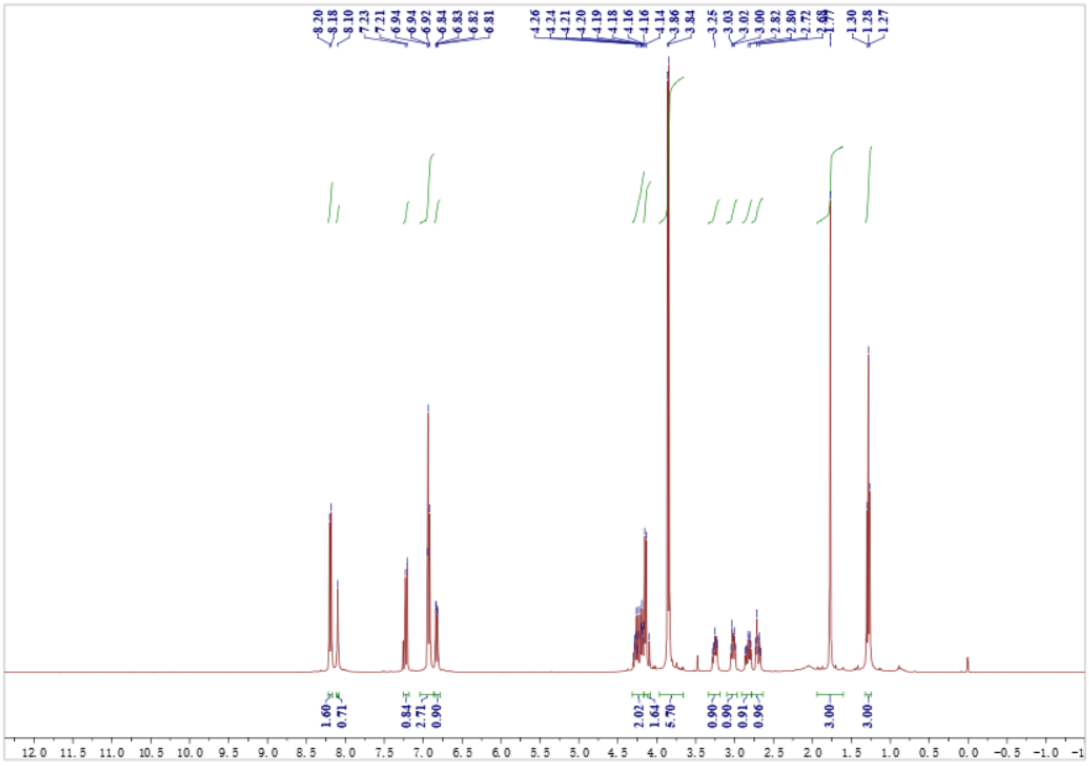


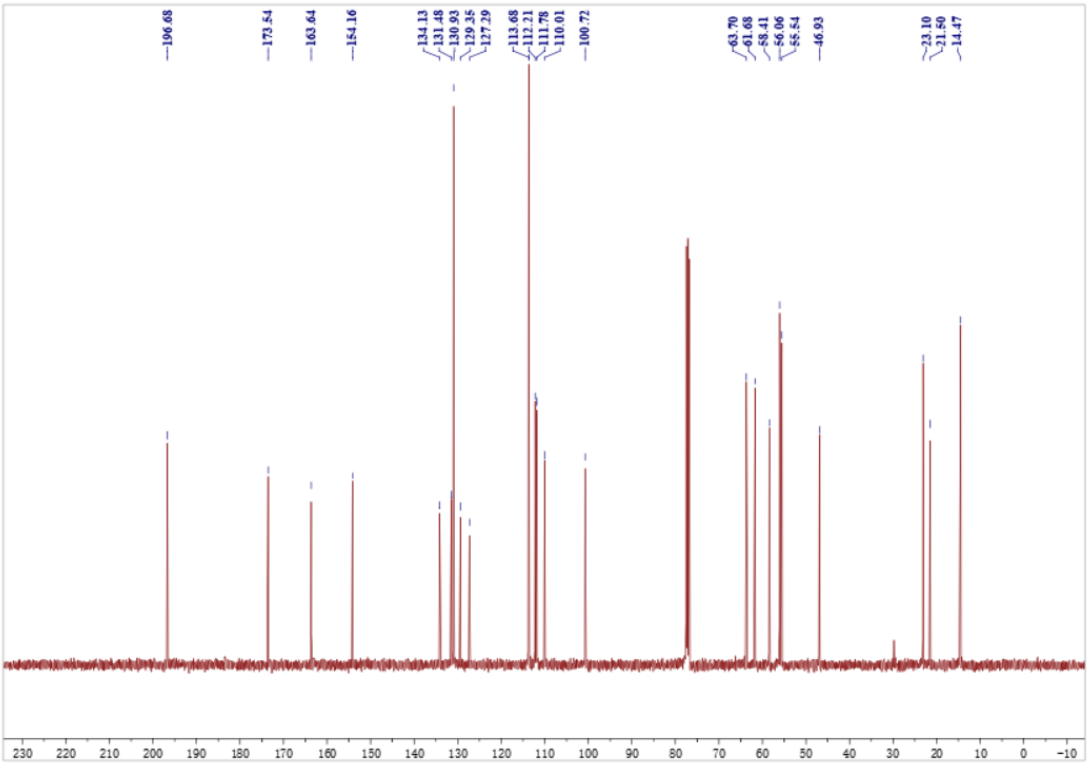
Ethyl(S)-1-methyl-2-(naphthalen-2-ylmethyl)-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**32**):





Ethyl(S)-6-methoxy-2-(2-(4-methoxyphenyl)-2-oxoethyl)-1-methyl-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**33**):





Ethyl(S)-6-methoxy-1-methyl-2-(naphthalen-2-ylmethyl)-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole-1-carboxylate (**34**):

