

Electronic Supplementary Information (ESI)

For

Barton esters for initiator-free radical cyclisation with heteroaromatic substitution

Robert Coyle, Karen Fahey and Fawaz Aldabbagh*

School of Chemistry, National University of Ireland Galway, University Road, Galway, Ireland

E-mail: Fawaz.Aldabbagh@nuigalway.ie

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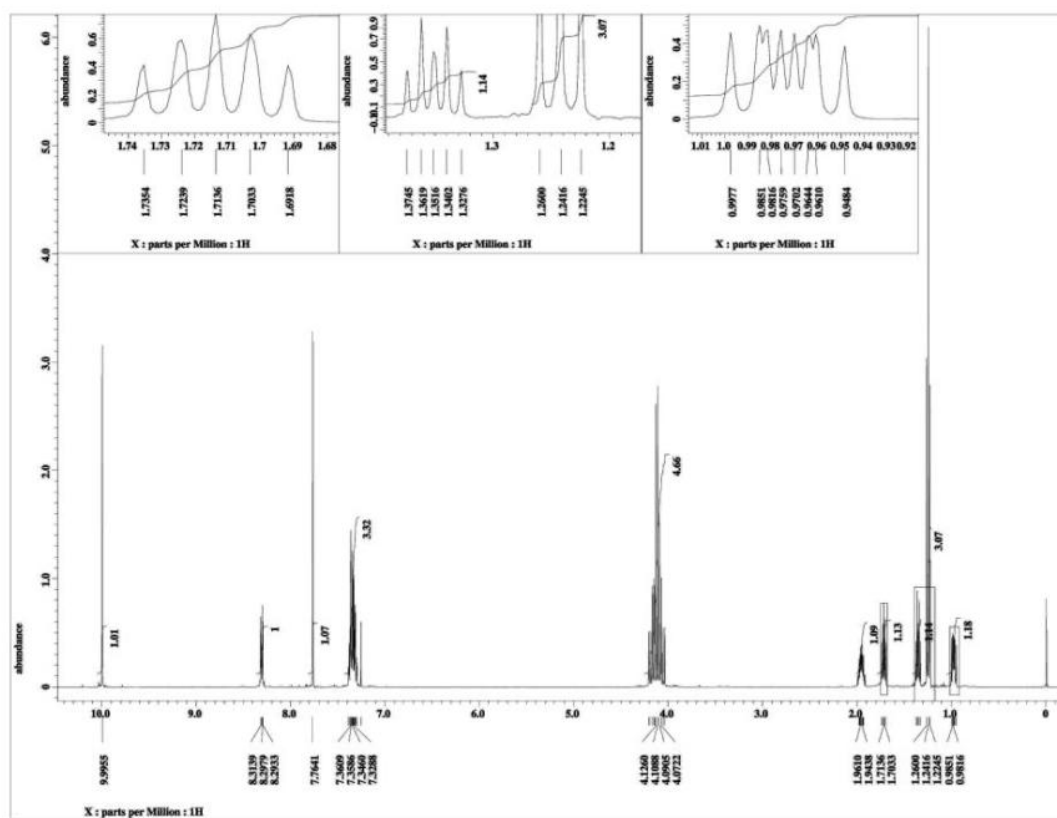
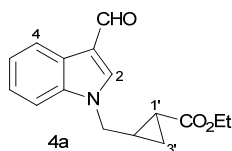
¹H and ¹³C NMR Spectra;

Compound 4a	S4
Compound 4b	S6
Compound 4e	S8
Compound 4f	S10
Compound 4h	S12
Compound 4i	S14
Compound 4j	S16
Compound 4c	S18
Compound 4g	S20
Compound 4k	S22
Compound 4d	S24
Compound 1a	S26
Compound 1b	S28
Compound 1c	S30
Compound 1d	S32
Compound 1e	S34
Compound 1f	S36
Compound 1g	S38
Compound 1h	S40
Compound 1i	S42
Compound 1j	S44
Compound 1k	S46
Compound 2a	S48
Compound 3a	S50
Compound 2b	S52
Compound 3b	S54
Compound 2c	S56
Compound 3d	S58
Compound 2e	S60
Compound 2f	S62
Compound 2g	S64
Compound 2h	S66
Compound 2i	S68
Compound 2j	S70
Compound 3j	S72
Compound 2k	S74
Compound 3k	S76
Compound 5a	S78
Compound 5b	S80
Compound 5c	S82
Compound 5d	S84

Compound 5e	S86
Compound 5f	S88
Compound 5g	S90
Compound 6a	S92
Compound 6b	S94
Compound 6c	S96
Compound 6d	S98
Compound 6e	S100
Compound 6f	S102
Compound 6g	S104
Compound 7a	S106
Compound 8a	S108
Compound 7b	S110
Compound 7c	S112
Compound 7d	S114
Compound 7e	S116
Compound 7f	S118
Compound 8f	S120
Compound 7g	S122
Compound 8g	S124

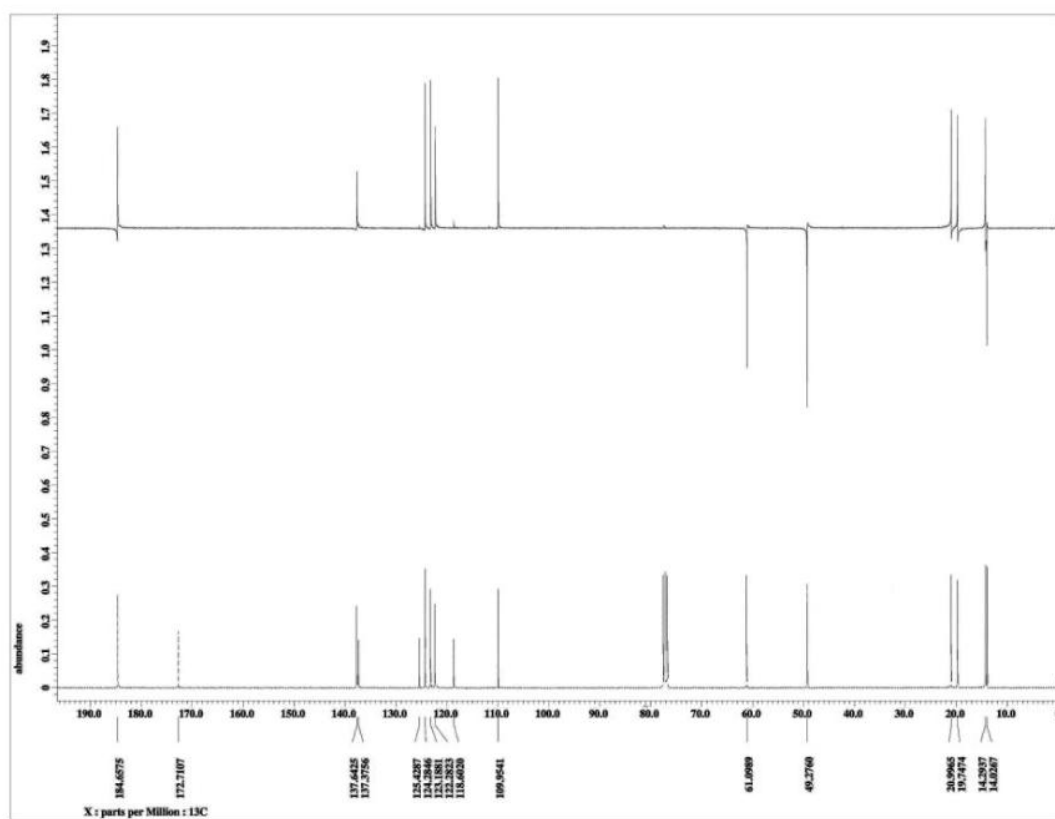
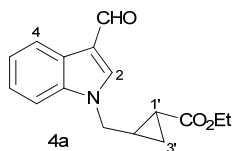
Ethyl trans-2'-[(3-formyl-1H-indol-1-yl)methyl]cyclopropanecarboxylate (4a).

^1H NMR, 400 MHz, CDCl_3



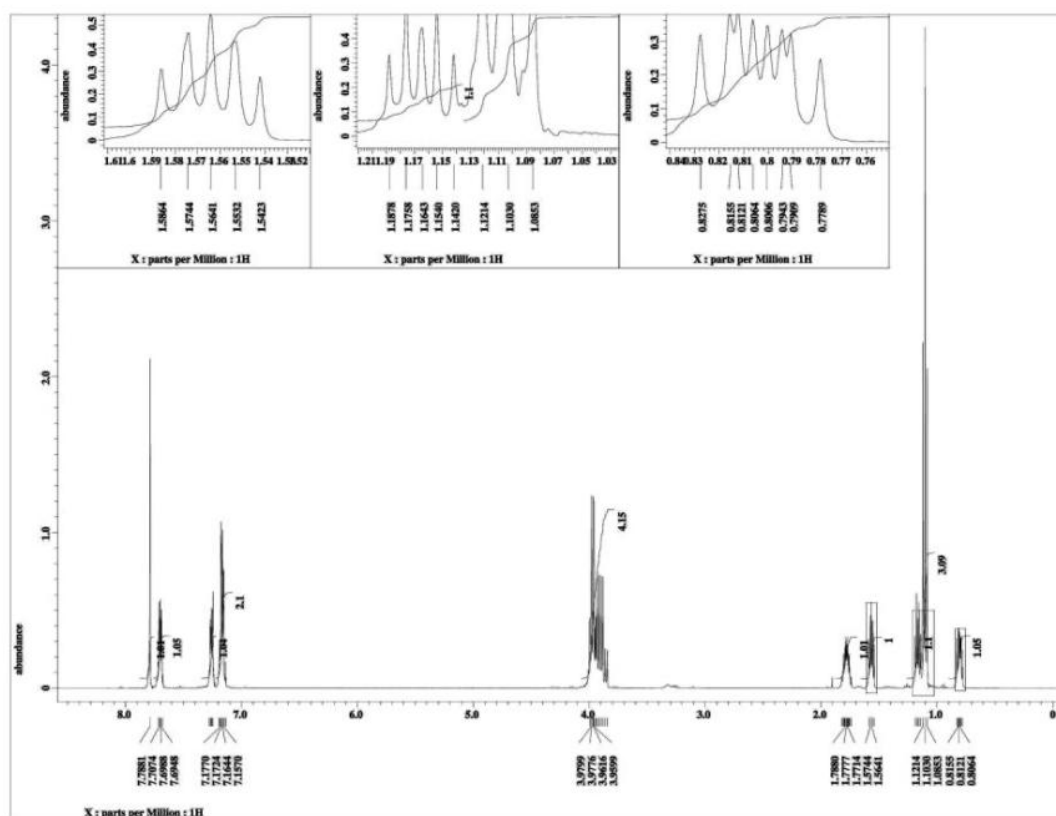
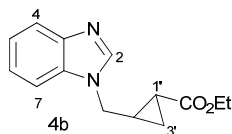
Ethyl trans-2'-[(3-formyl-1H-indol-1-yl)methyl]cyclopropanecarboxylate (4a).

¹³C NMR, 100 MHz, CDCl₃



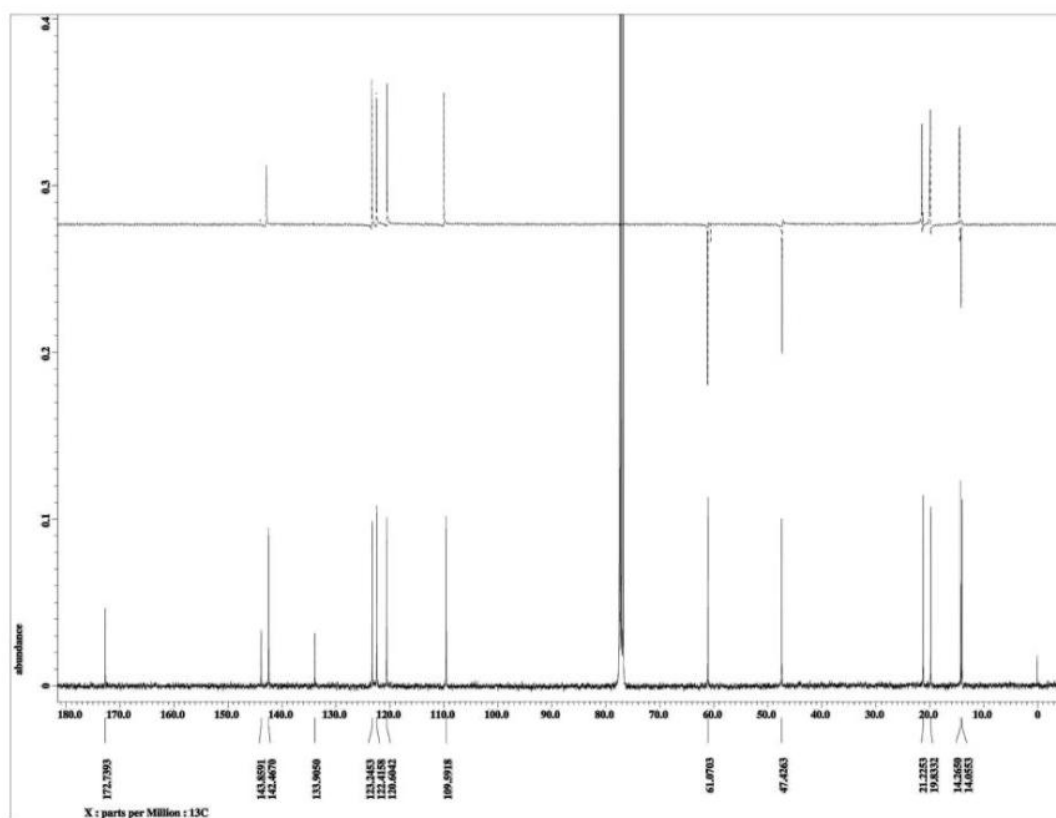
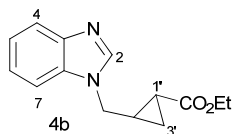
Ethyl trans-2'-(1H-benzimidazol-1-ylmethyl)cyclopropanecarboxylate (4b).

¹H NMR, 400 MHz, CDCl₃



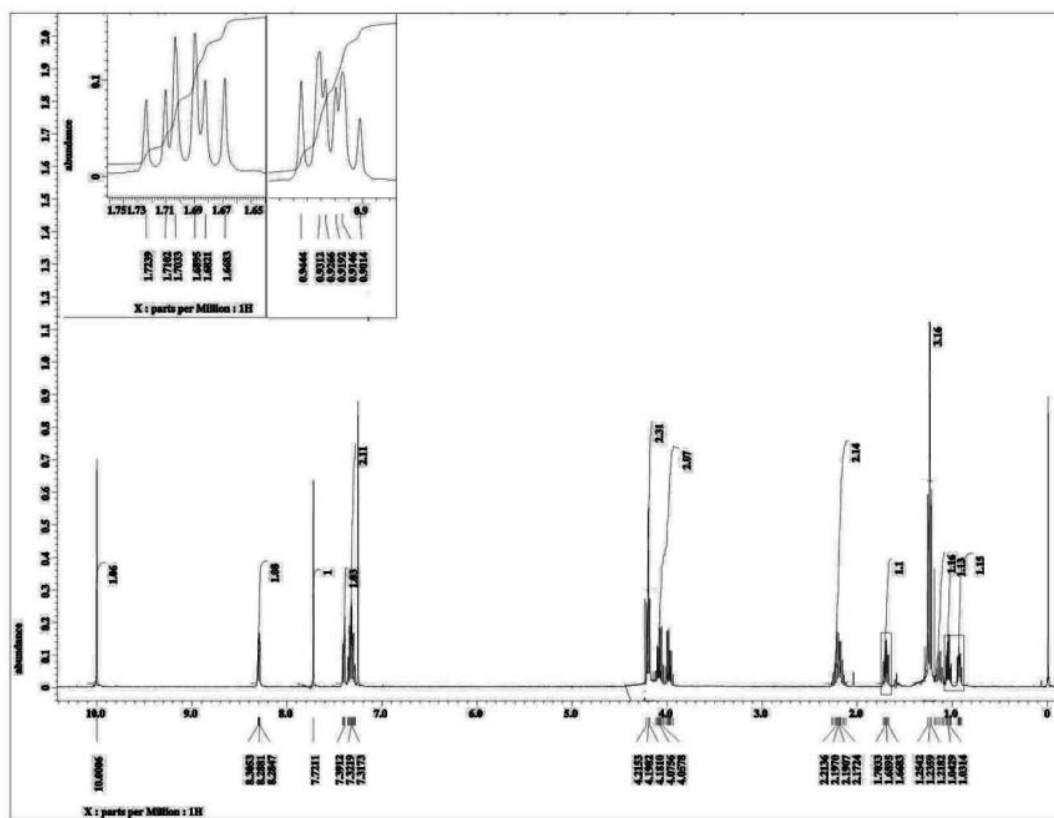
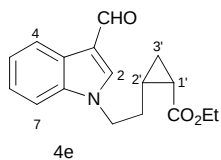
Ethyl trans-2'-(1H-benzimidazol-1-ylmethyl)cyclopropanecarboxylate (4b).

^{13}C NMR, 100 MHz, CDCl_3



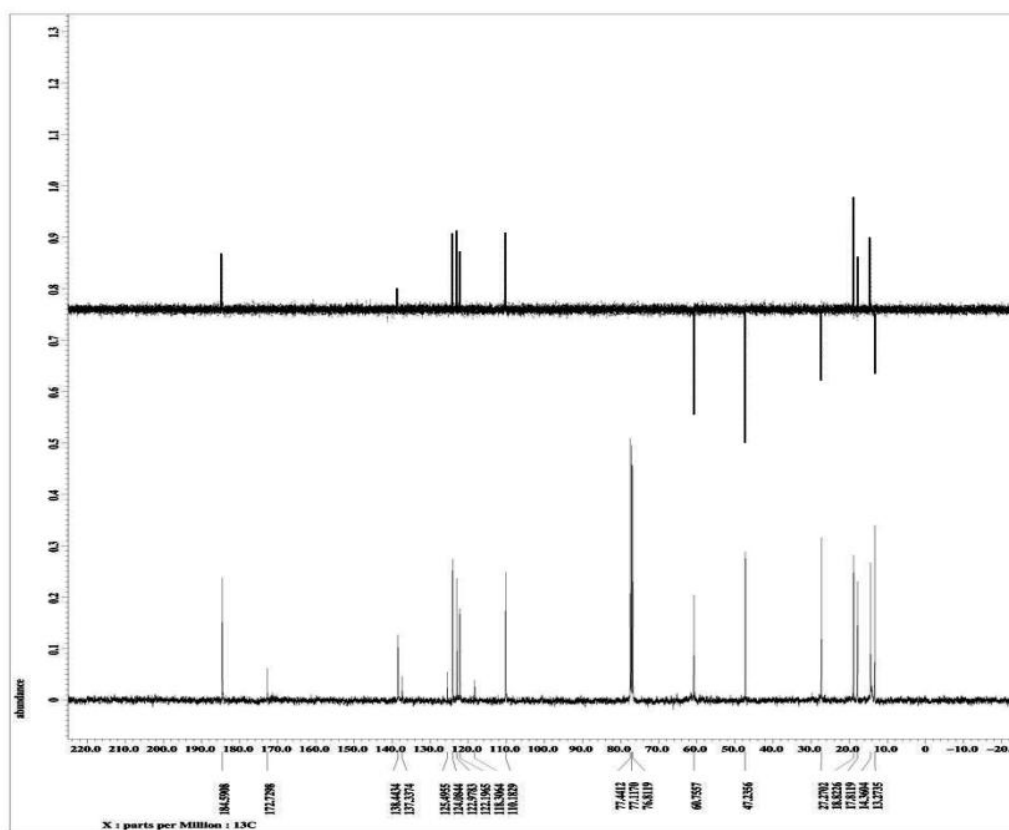
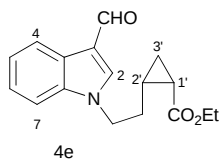
Ethyl cis-2'-[2-(3-formyl-1H-indol-1-yl)ethyl]cyclopropanecarboxylate (4e).

¹H NMR, 400 MHz, CDCl₃



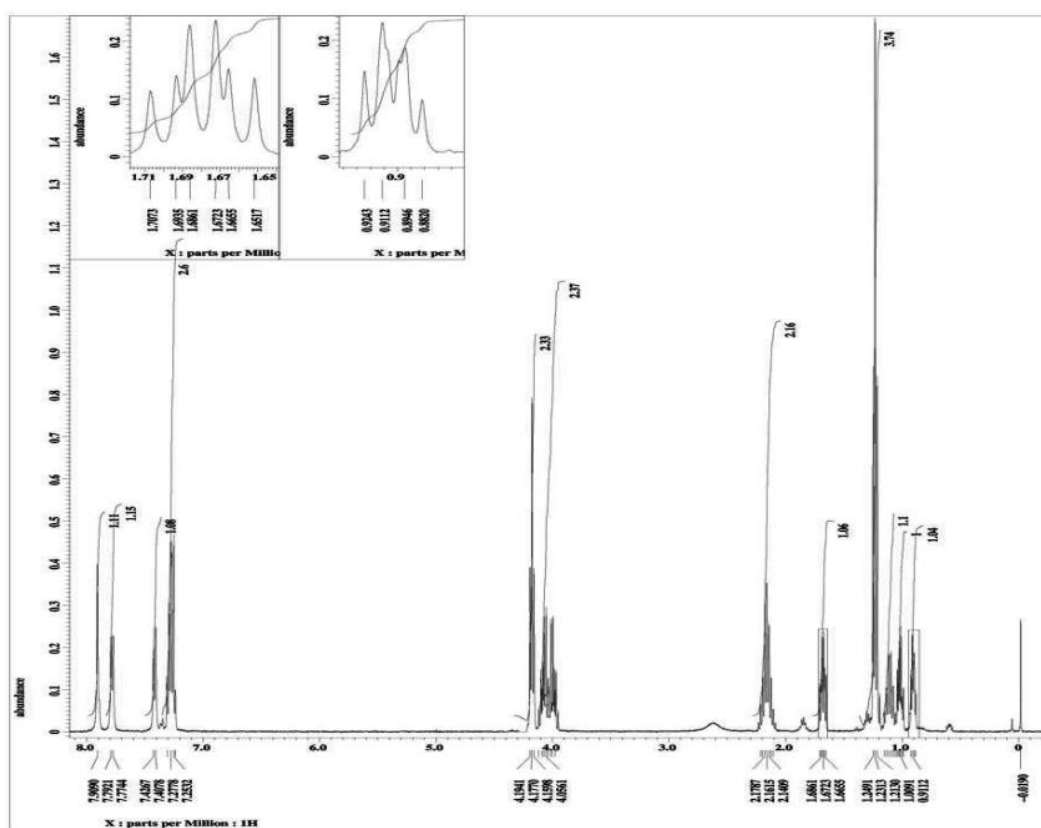
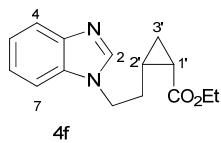
Ethyl cis-2'-[2-(3-formyl-1H-indol-1-yl)ethyl]cyclopropanecarboxylate (4e).

^{13}C NMR, 100 MHz, CDCl_3



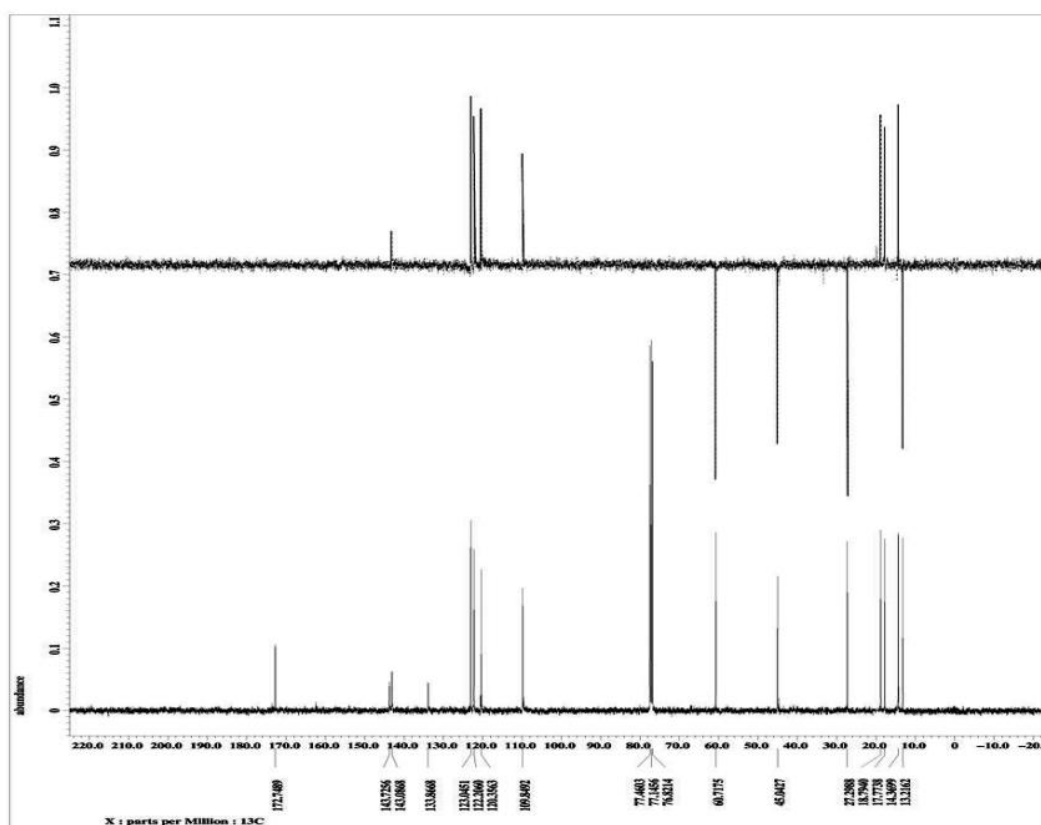
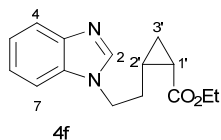
Ethyl cis-2'-[2-(1H-benzimidazol-1-yl)ethyl]cyclopropanecarboxylate (4f).

¹H NMR, 400 MHz, CDCl₃



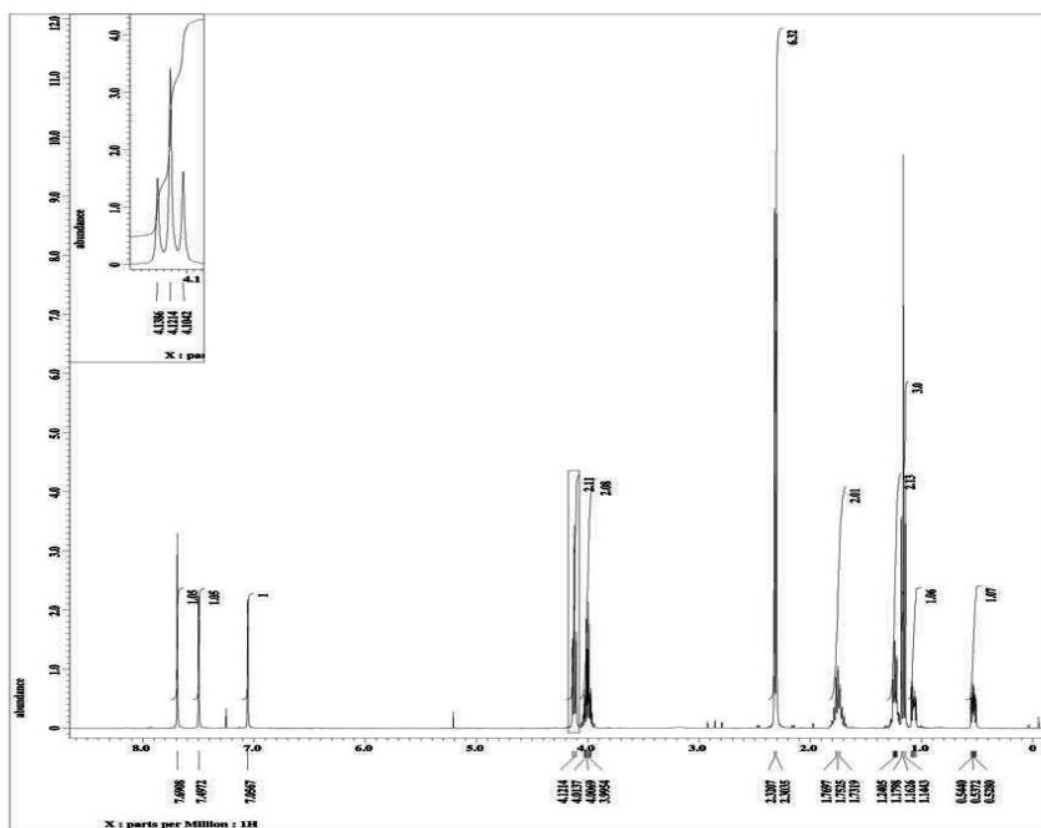
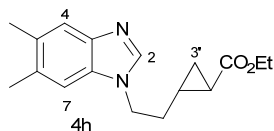
Ethyl cis-2'-[2-(1H-benzimidazol-1-yl)ethyl]cyclopropanecarboxylate (4f).

^{13}C NMR, 100 MHz, CDCl_3



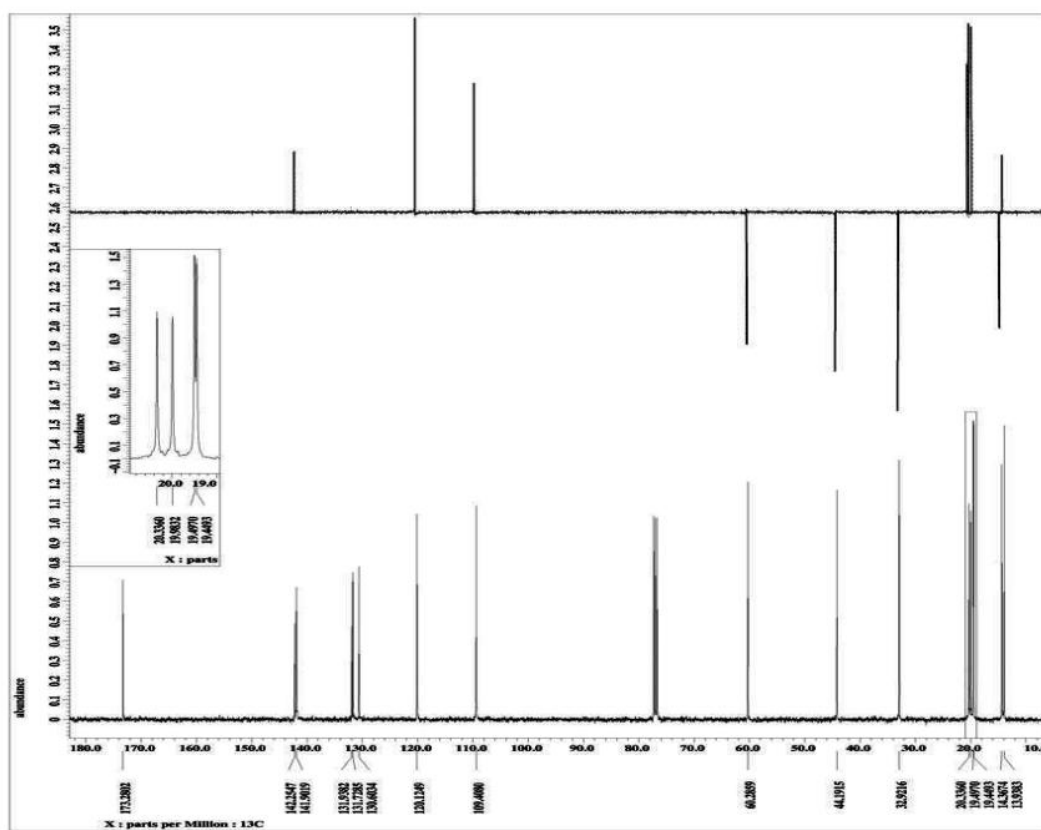
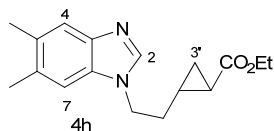
Ethy trans-2'-[2-(5,6-dimethyl-1H-benzimidazol-1-yl)ethyl]cyclopropanecarboxylate (4h).

¹H NMR, 400 MHz, CDCl₃



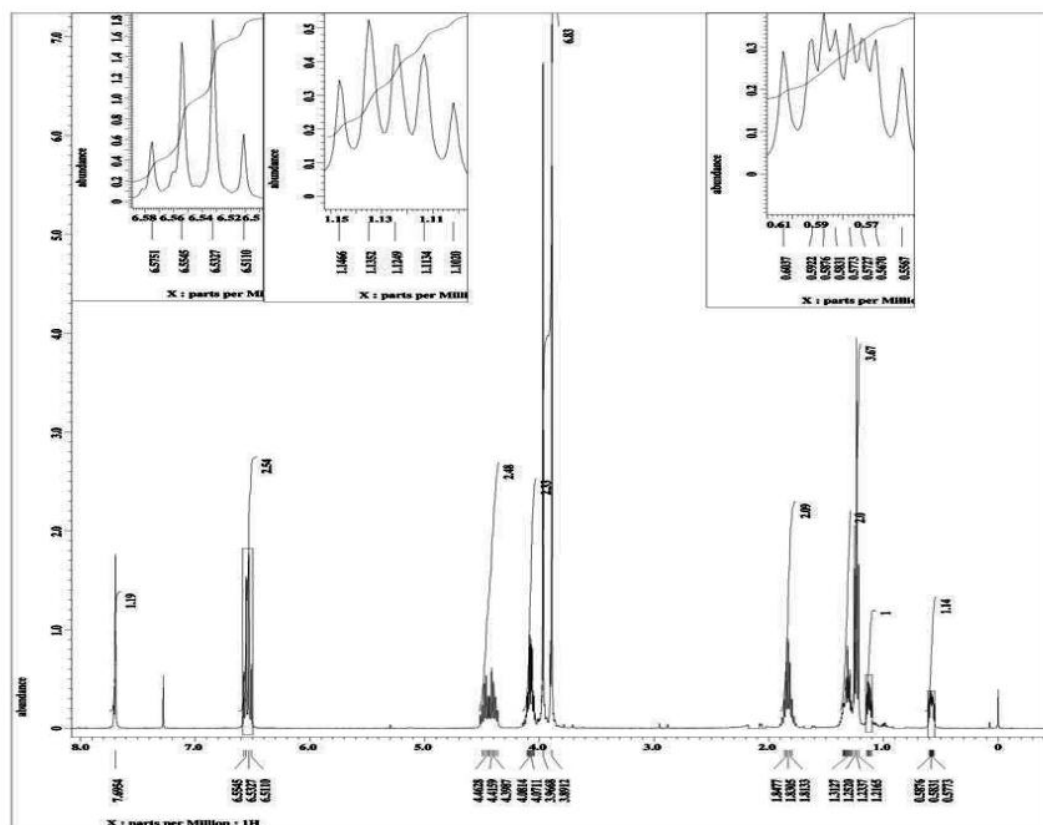
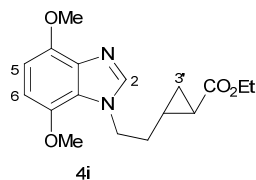
Ethyl trans-2'-[2-(5,6-dimethyl-1H-benzimidazol-1-yl)ethyl]cyclopropanecarboxylate (4h).

¹³C NMR, 100 MHz, CDCl₃



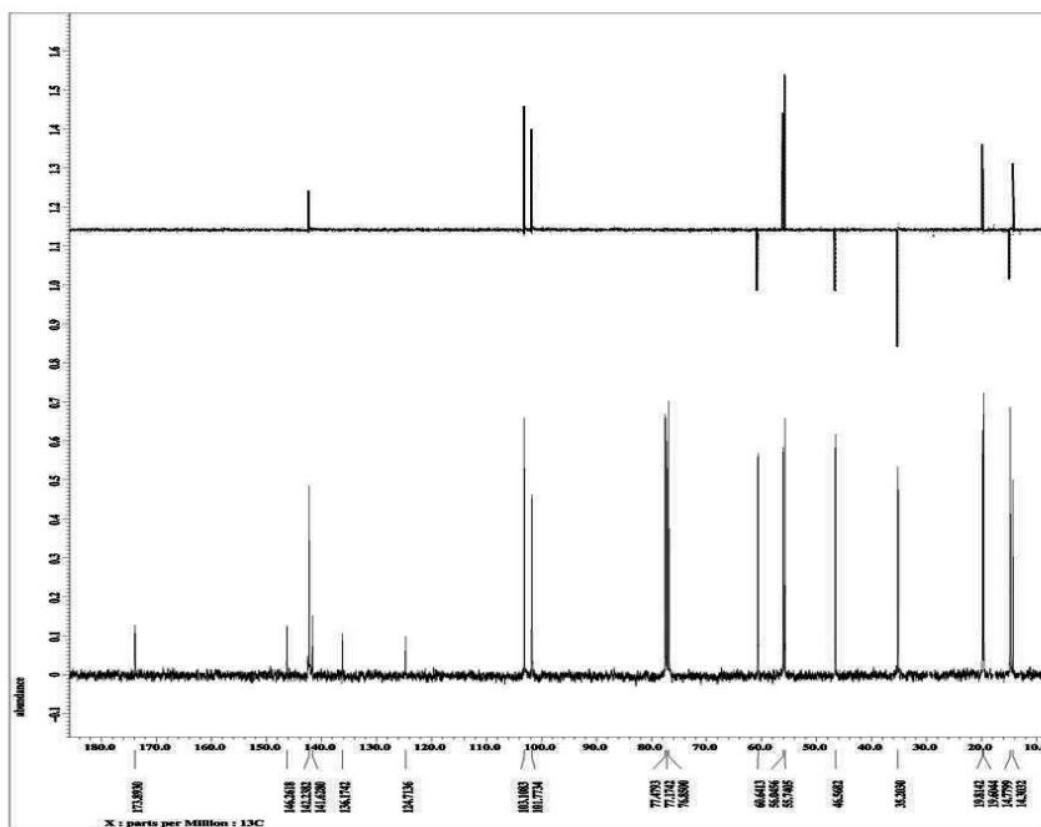
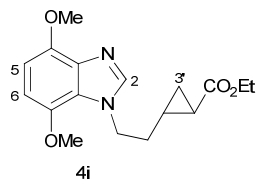
Ethyl trans-2'-[2-(4,7-dimethoxy-1H-benzimidazol-1-yl)ethyl]cyclopropanecarboxylate (4i).

¹H NMR, 400 MHz, CDCl₃



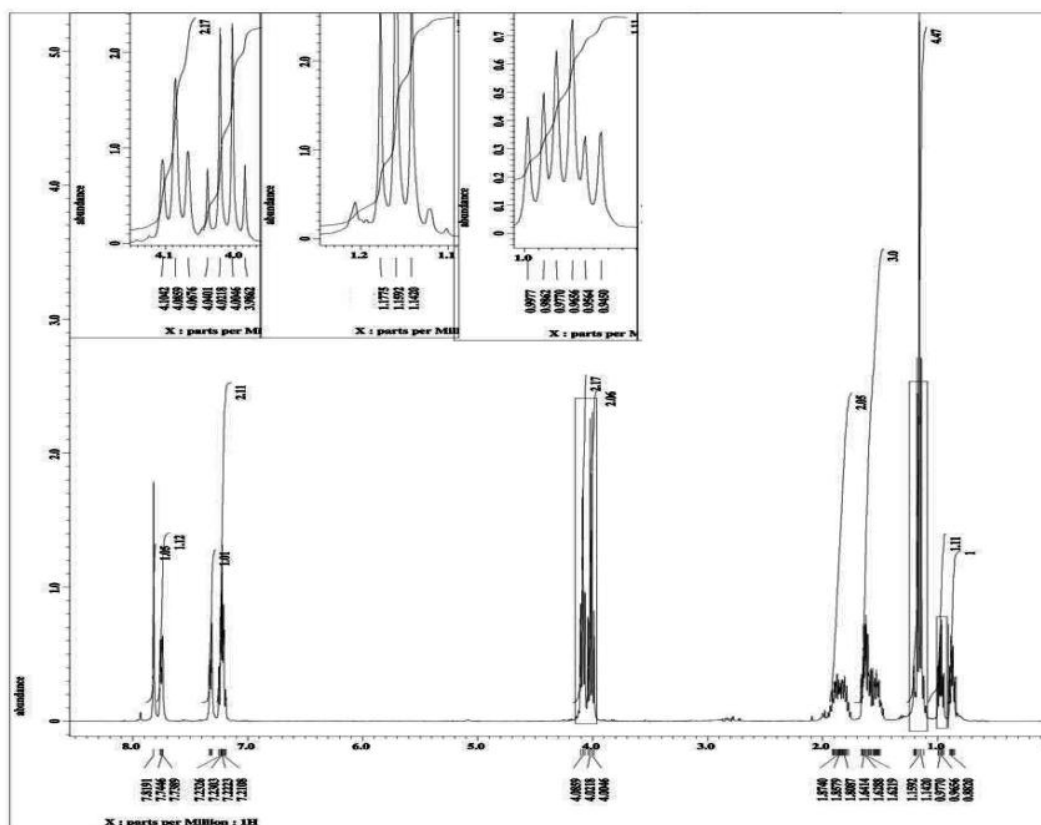
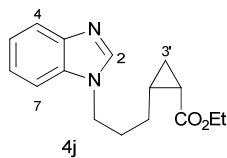
Ethyl trans-2'-[2-(4,7-dimethoxy-1H-benzimidazol-1-yl)ethyl]cyclopropanecarboxylate (4i).

^{13}C NMR, 100 MHz, CDCl_3



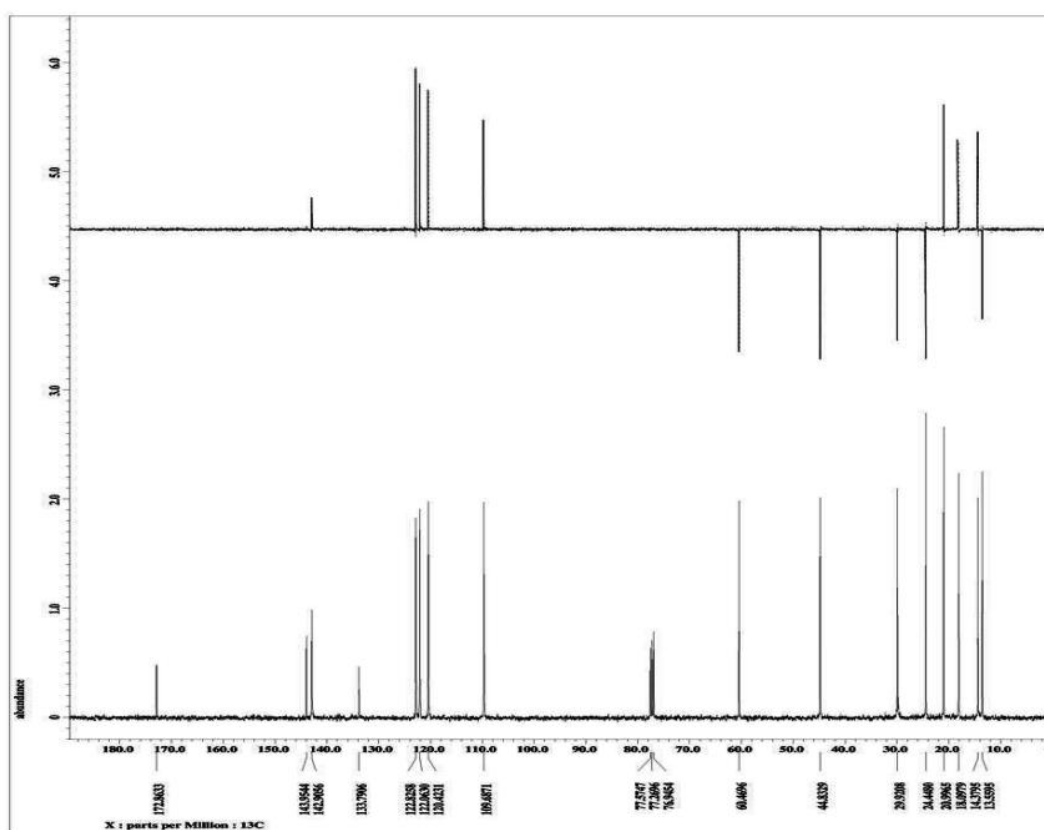
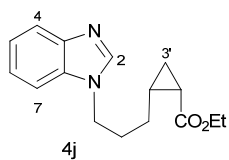
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¹H NMR, 400 MHz, CDCl₃



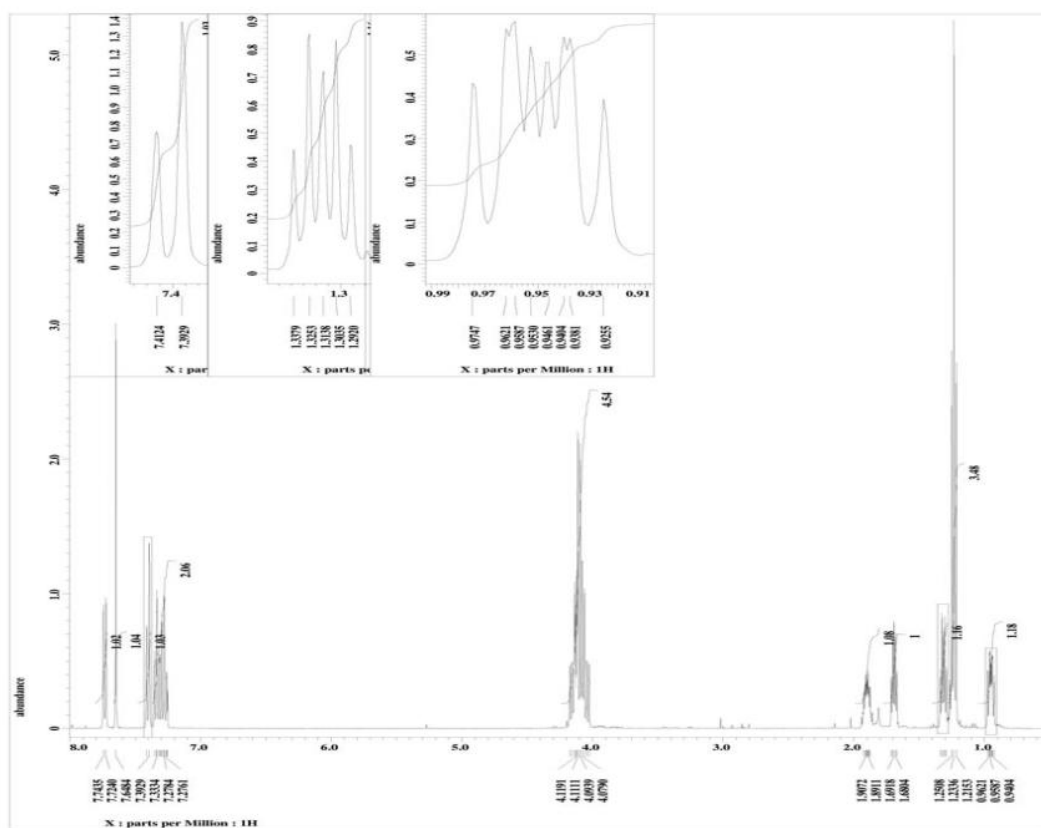
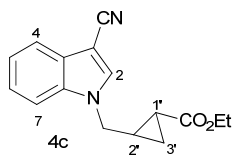
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^{13}C NMR, 100 MHz, CDCl_3



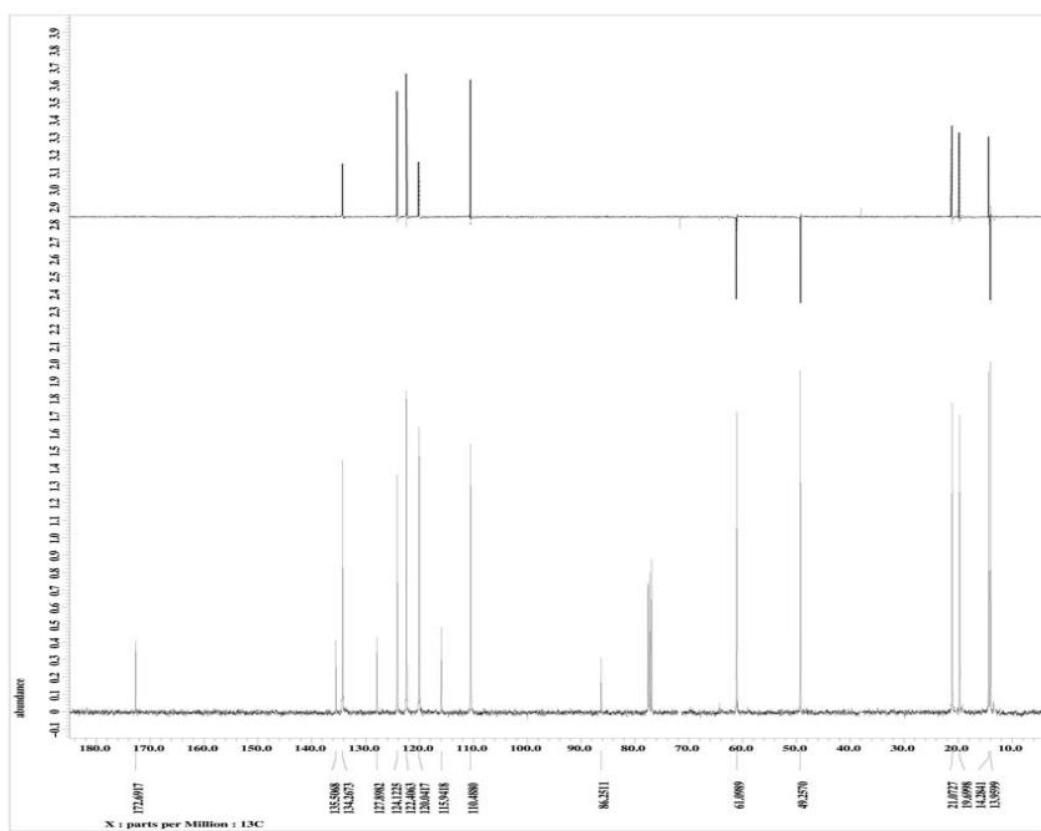
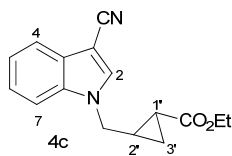
Ethyl trans-2'-[(3-cyano-1H-indol-1-yl)methyl]cyclopropanecarboxylate (4c).

¹H NMR, 400 MHz, CDCl₃



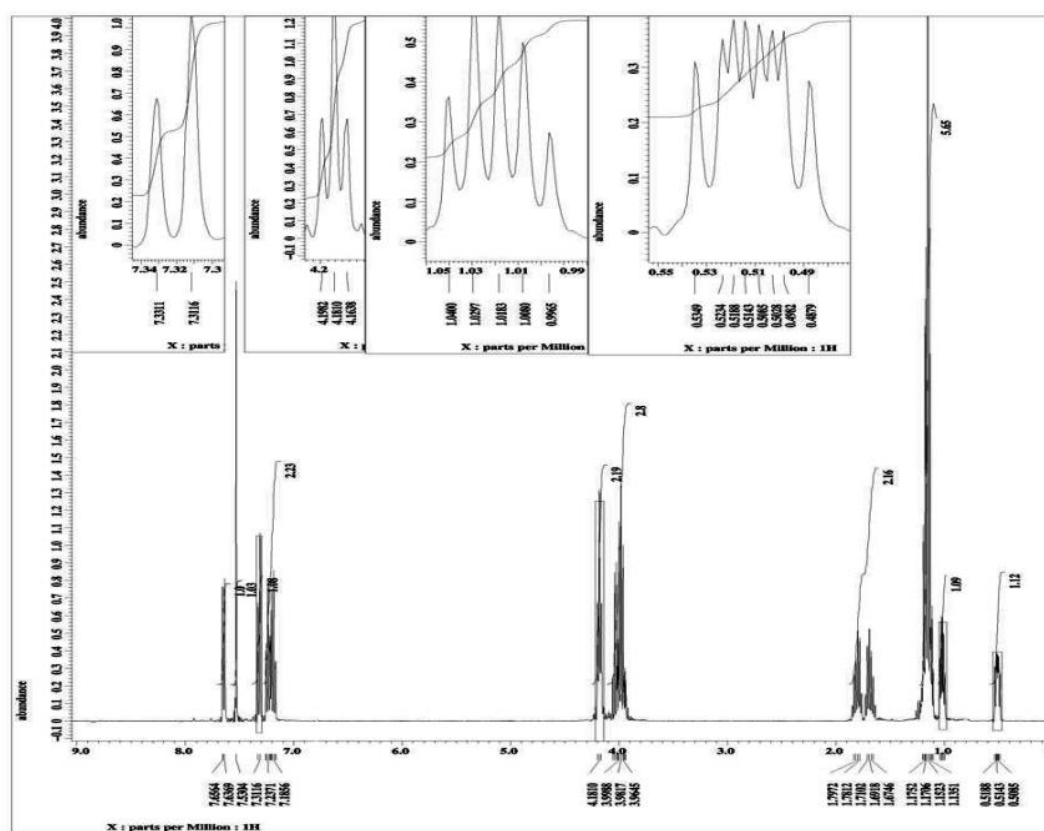
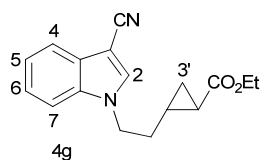
Ethyl trans-2'-[(3-cyano-1H-indol-1-yl)methyl]cyclopropanecarboxylate (4c).

^{13}C NMR, 100 MHz, CDCl_3



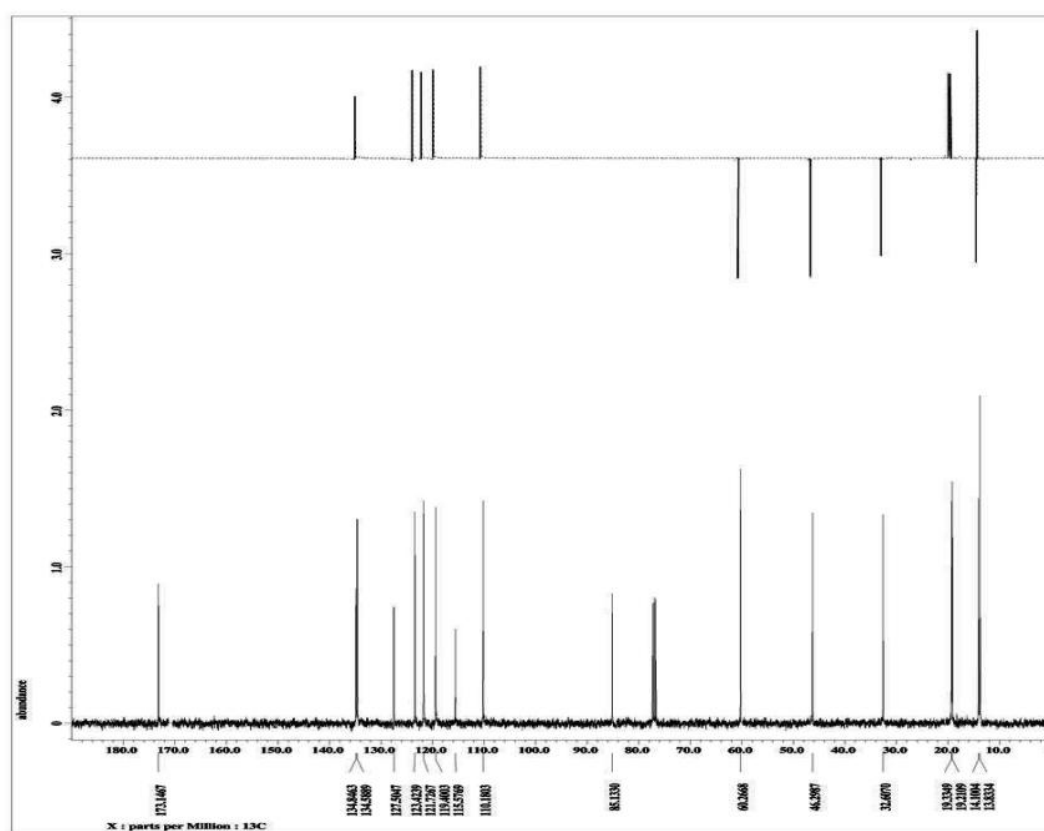
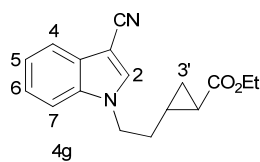
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¹H NMR, 400 MHz, CDCl₃



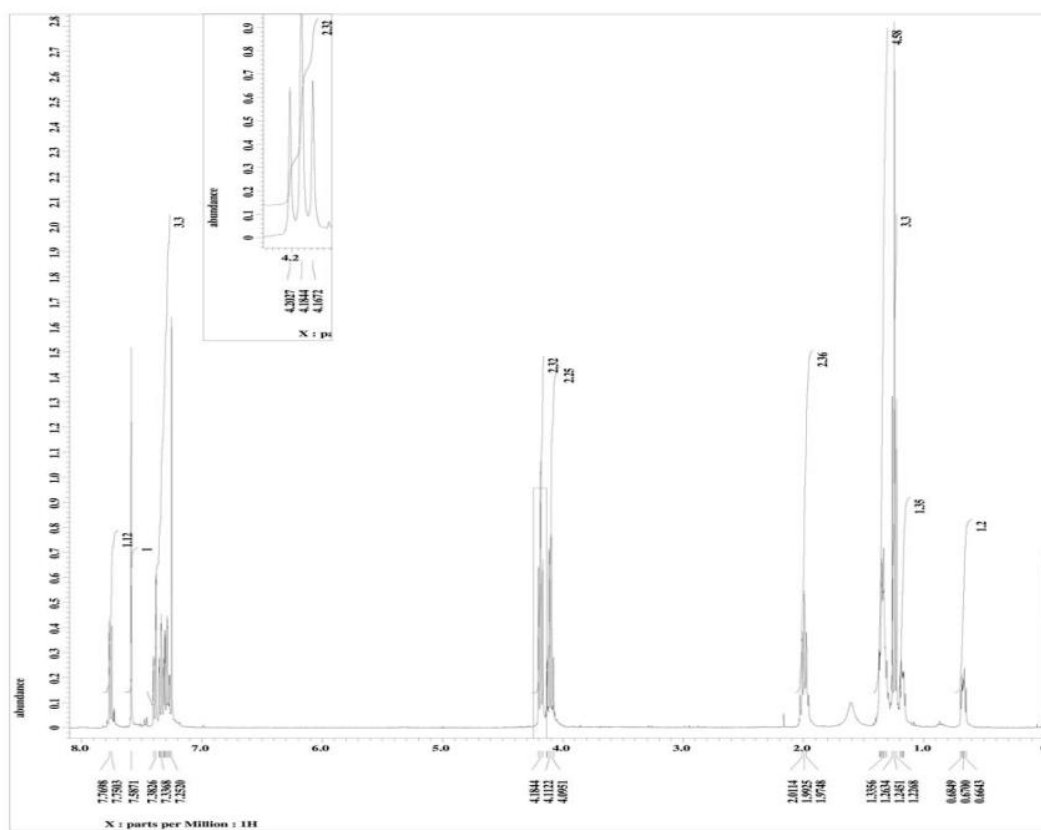
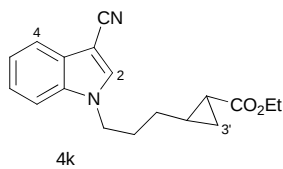
Ethyl trans-2'-[2-(3-cyano-1H-indol-1-yl)ethyl]cyclopropanecarboxylate (4g).

^{13}C NMR, 100 MHz, CDCl_3



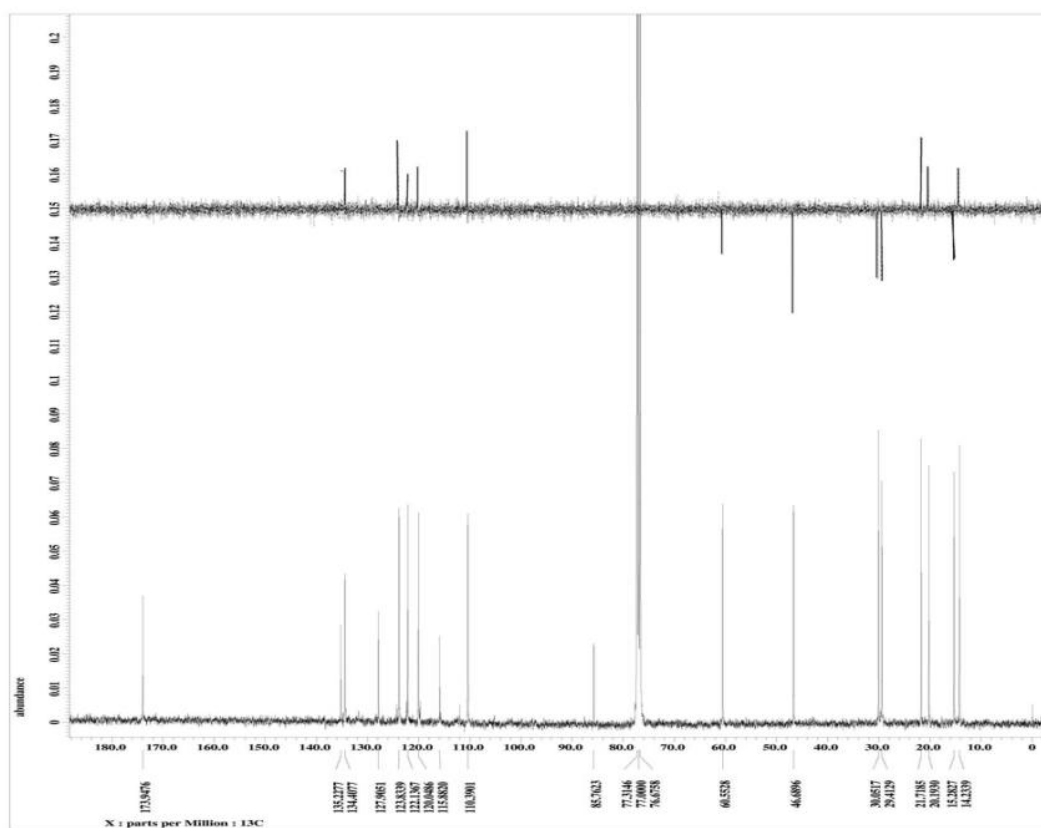
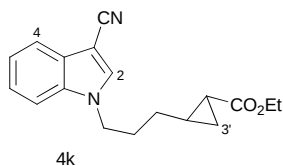
Ethyl trans-2'-[3-(3-cyano-1H-indol-1-yl)propyl]cyclopropanecarboxylate (4k).

¹H NMR, 400 MHz, CDCl₃



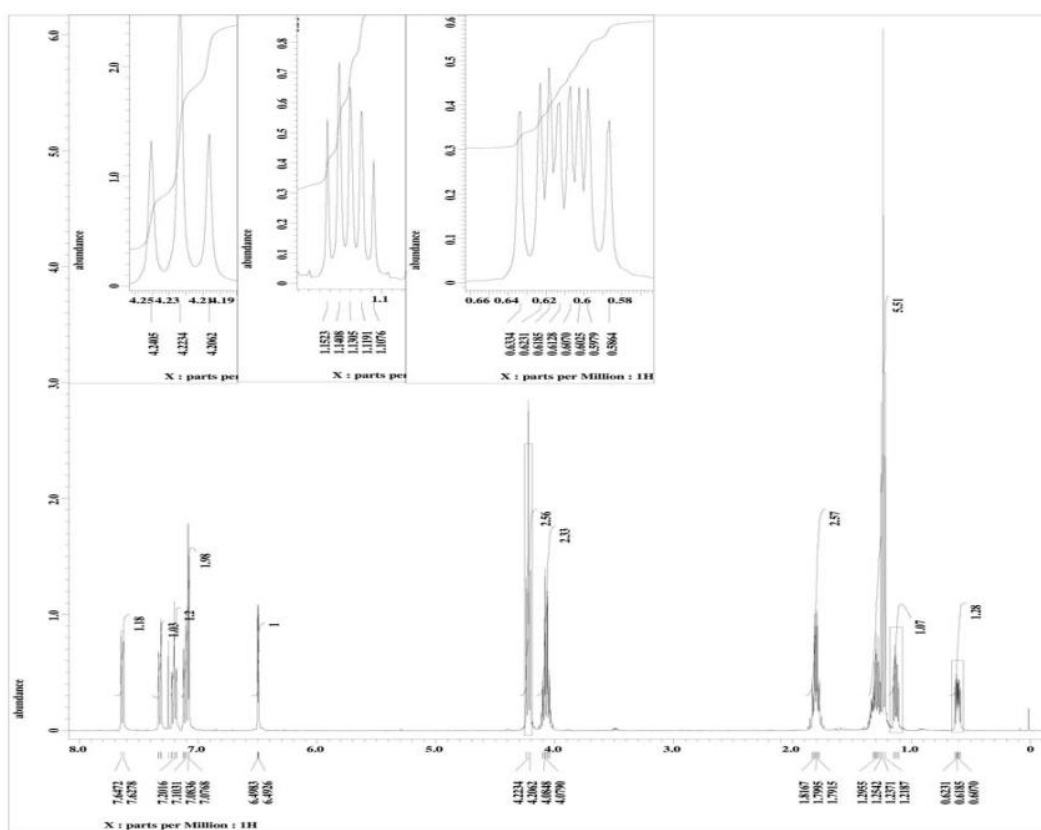
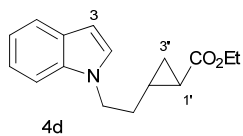
Ethyl trans-2'-[3-(3-cyano-1H-indol-1-yl)propyl]cyclopropanecarboxylate (4k).

^{13}C NMR, 100 MHz, CDCl_3



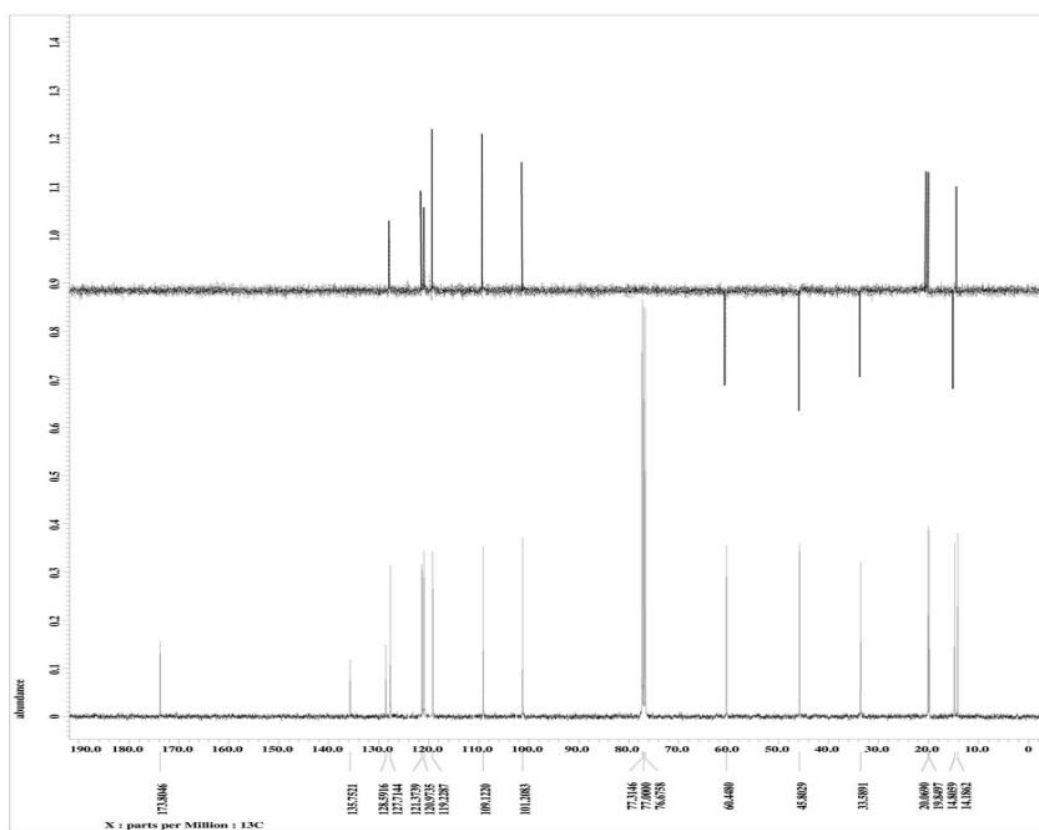
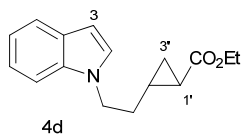
Ethyl trans-2'-[2-(1H-indol-1-yl)ethyl]cyclopropanecarboxylate (4d).

¹H NMR, 400 MHz, CDCl₃



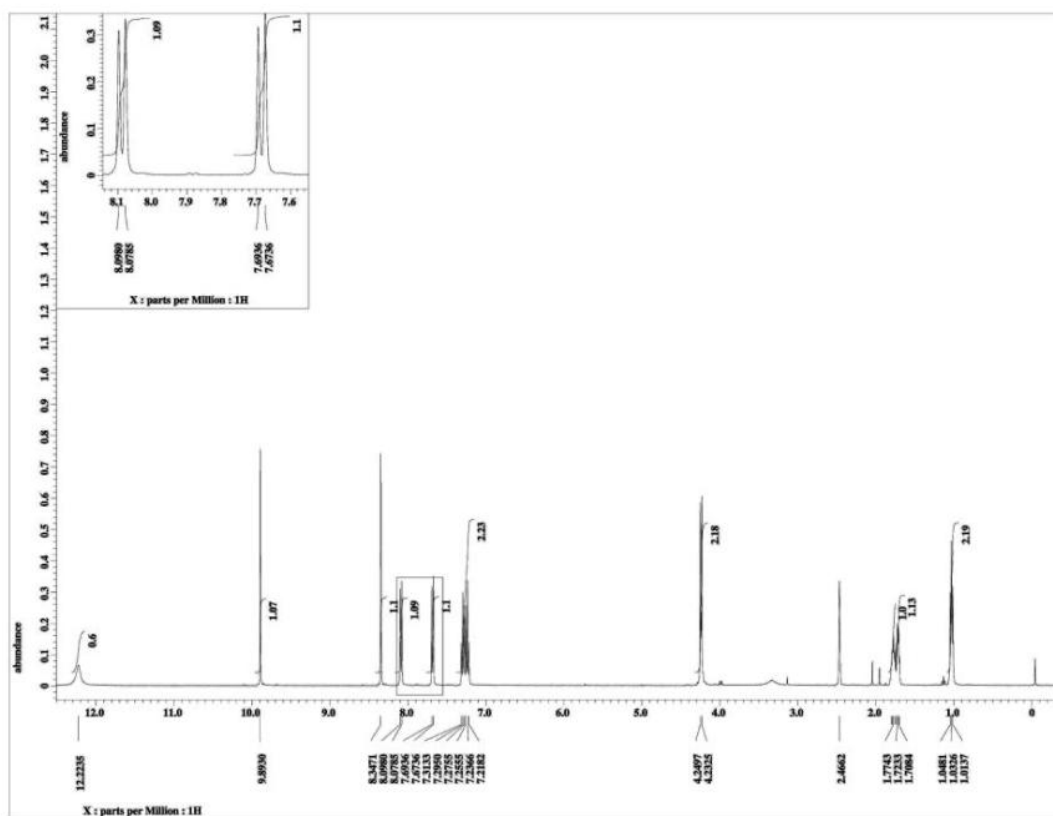
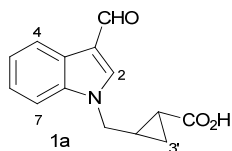
Ethyl trans-2'-[2-(1H-indol-1-yl)ethyl]cyclopropanecarboxylate (4d).

^{13}C NMR, 100 MHz, CDCl_3



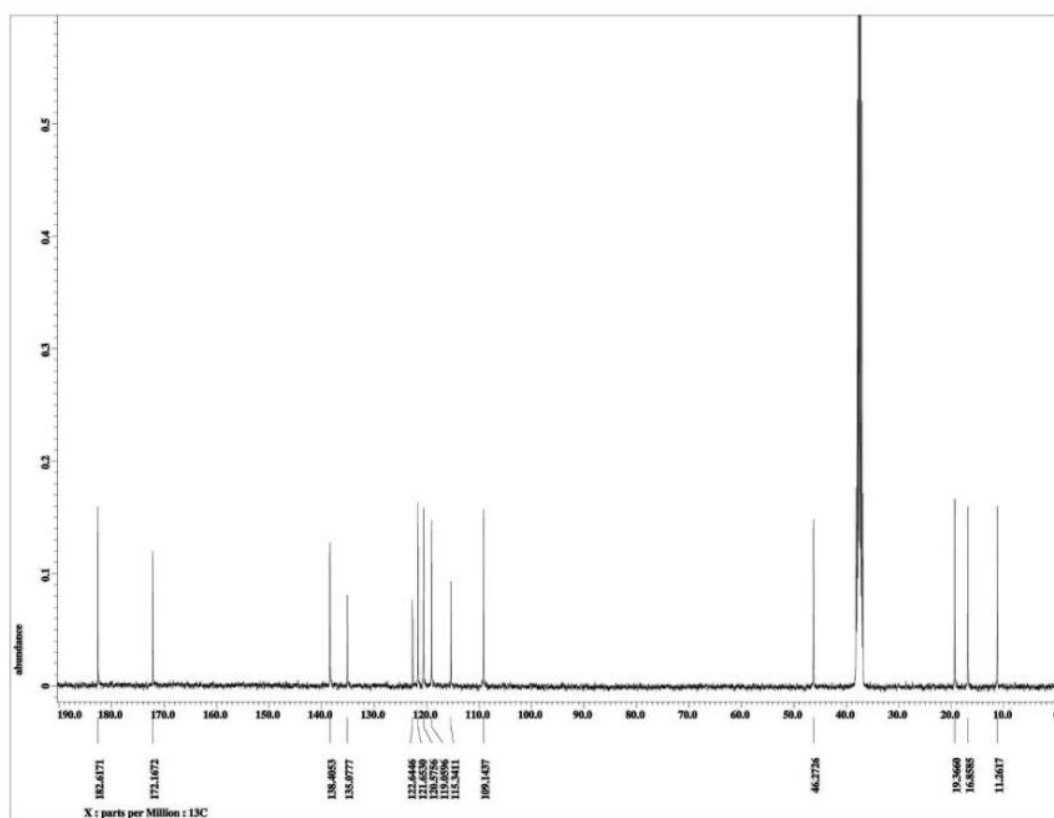
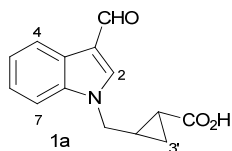
2'-[(3-Formyl-1H-indol-1-yl)methyl]-trans-cyclopropanecarboxylic acid (1a).

¹H NMR, 400 MHz, DMSO-*d*₆



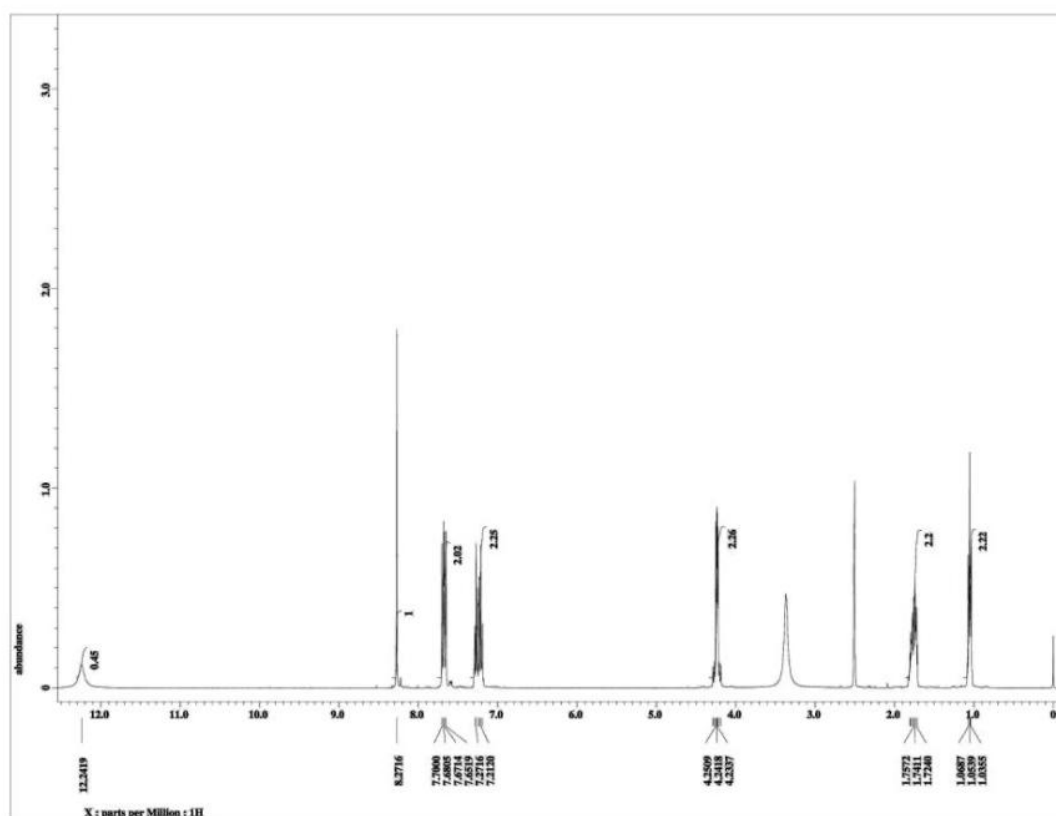
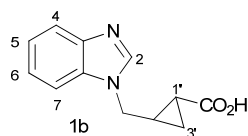
2'-[(3-Formyl-1H-indol-1-yl)methyl]-trans-cyclopropanecarboxylic acid (1a).

¹³C NMR, 100 MHz, DMSO-*d*₆



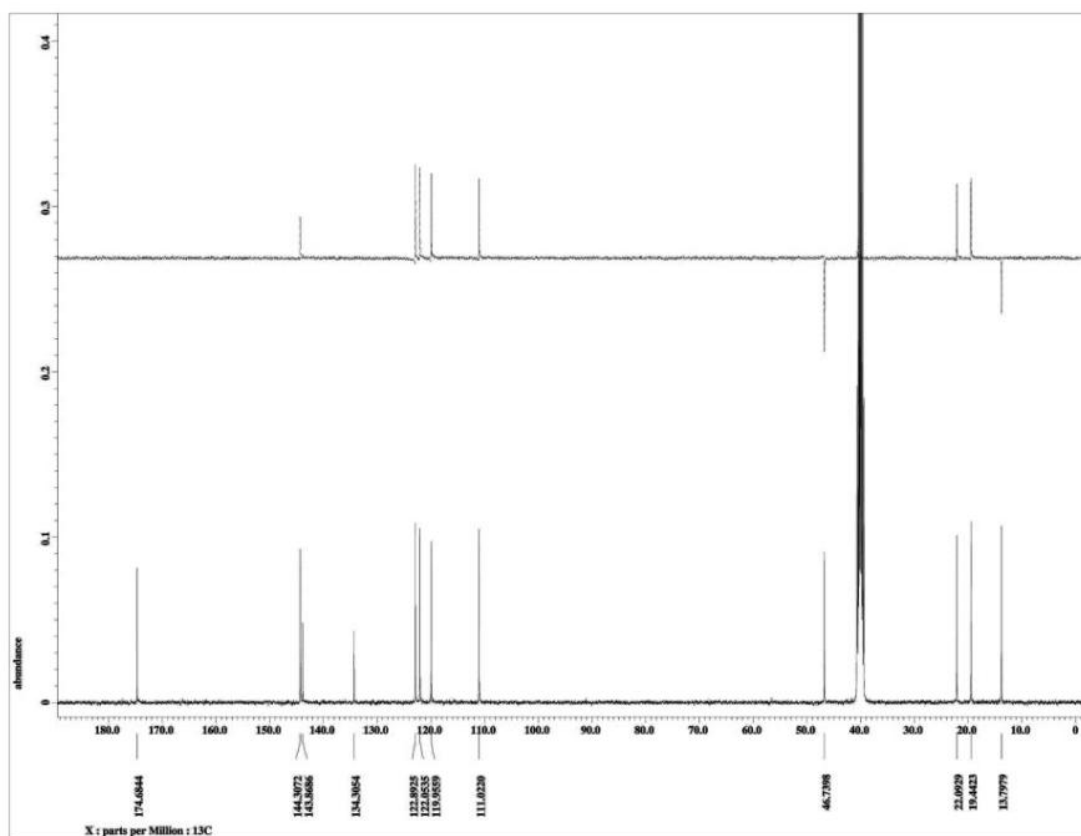
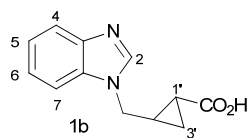
2'-(1H-benzimidazol-1-ylmethyl)-trans-cyclopropanecarboxylic acid (1b).

¹H NMR, 400 MHz, DMSO-*d*₆



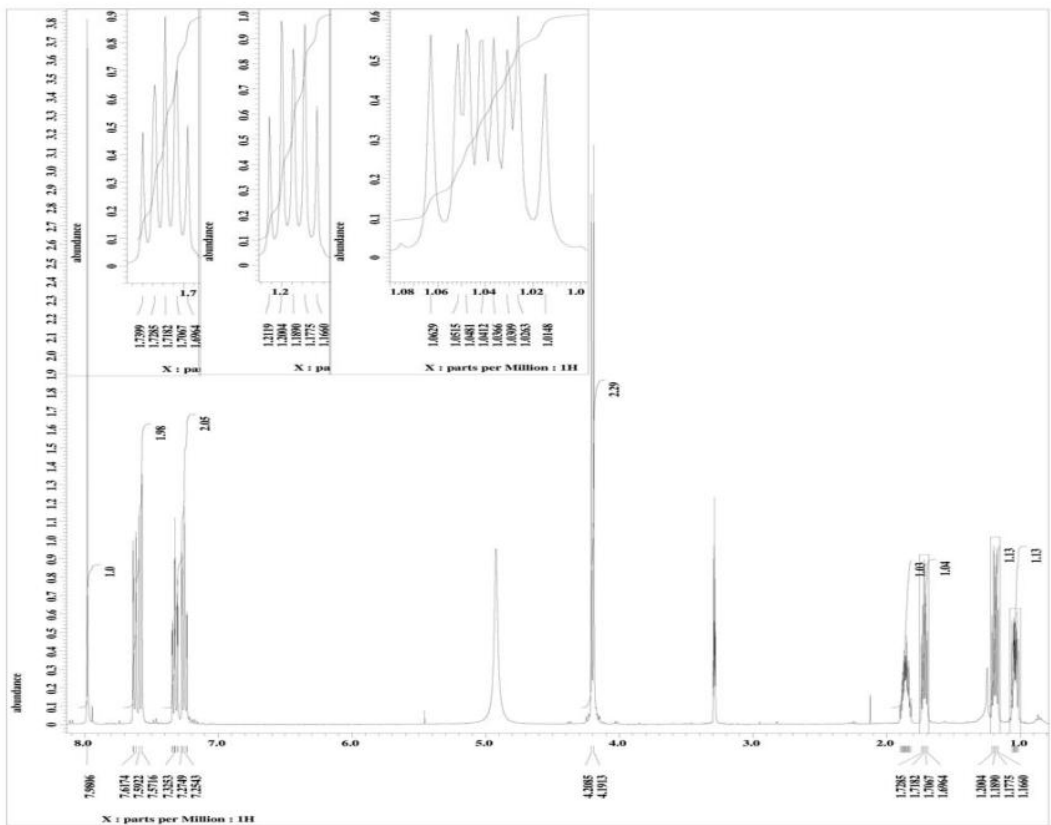
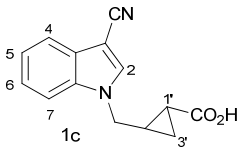
2'-(1H-benzimidazol-1-ylmethyl)-trans-cyclopropanecarboxylic acid (1b).

^{13}C NMR, 100 MHz, $\text{DMSO}-d_6$



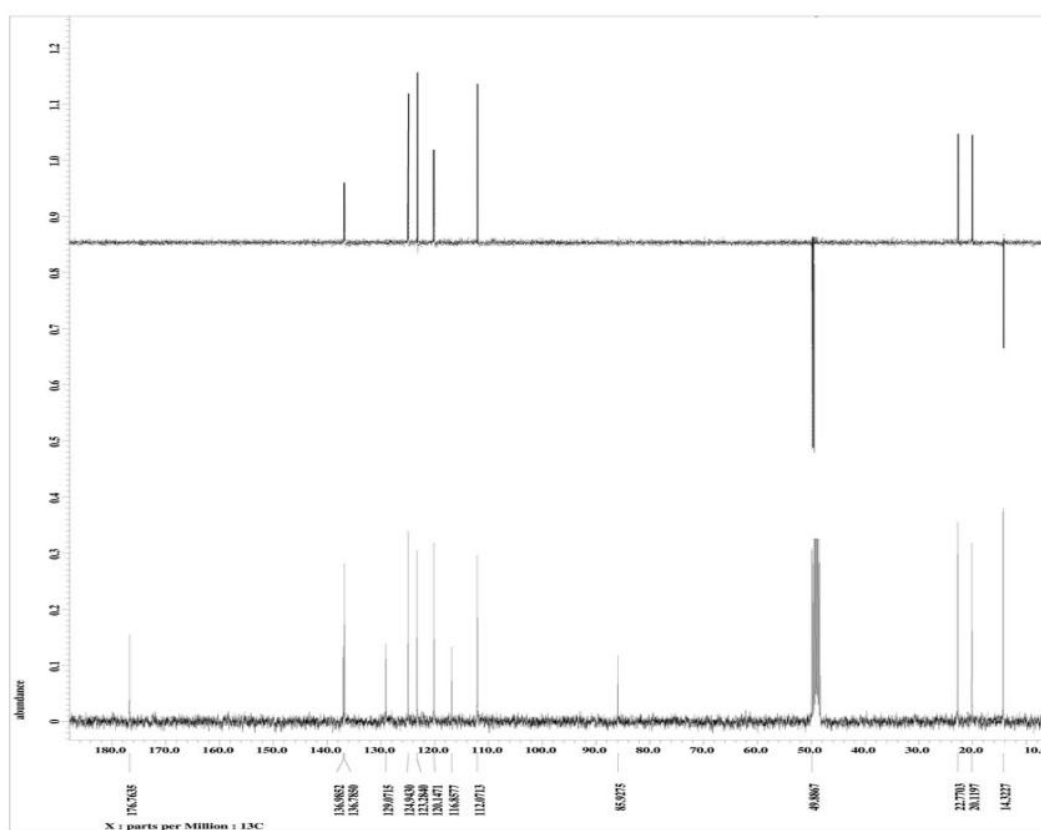
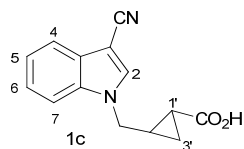
2'-[(3-Cyano-1H-indol-1-yl)methyl]-trans-cyclopropanecarboxylic acid (1c).

¹H NMR, 400 MHz, MeOH-*d*₄



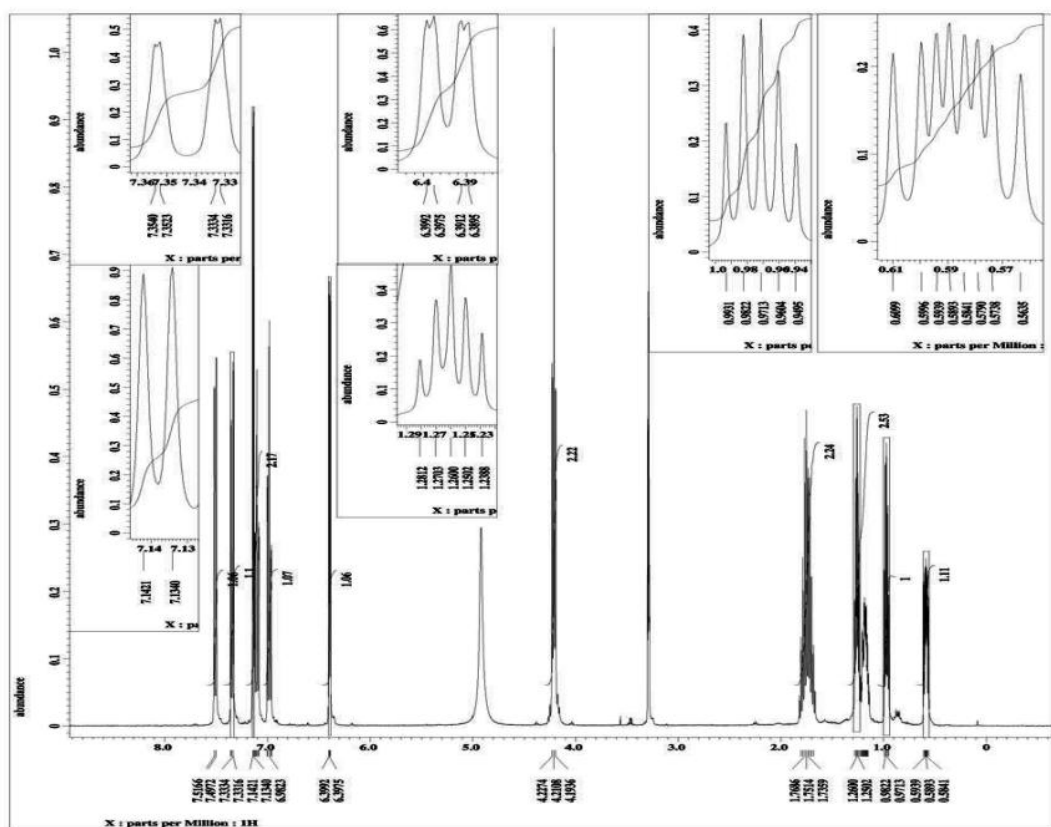
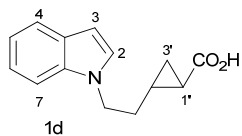
2'-[(3-Cyano-1H-indol-1-yl)methyl]-trans-cyclopropanecarboxylic acid (1c).

¹³C NMR, 100 MHz, MeOH-*d*₄



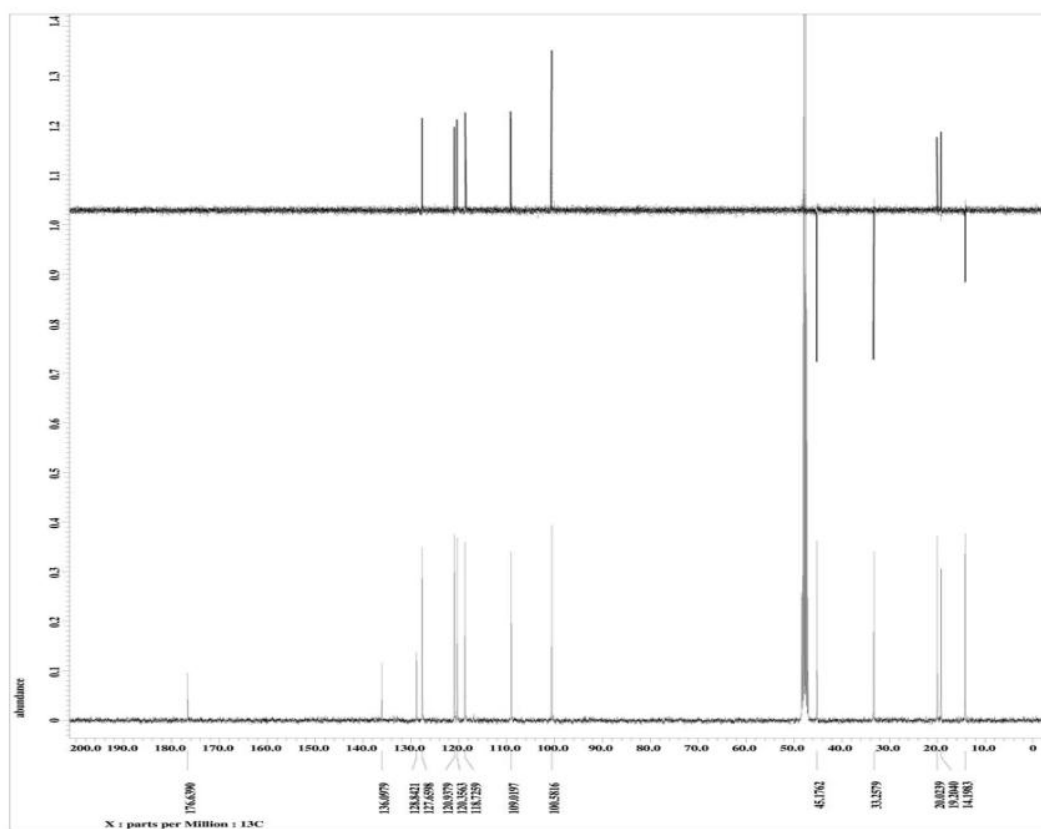
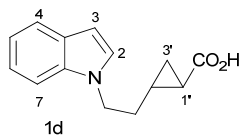
2'-[2-(1H-indol-1-yl)ethyl]-trans-cyclopropanecarboxylic acid (1d).

¹H NMR, 400 MHz, MeOH-*d*₄



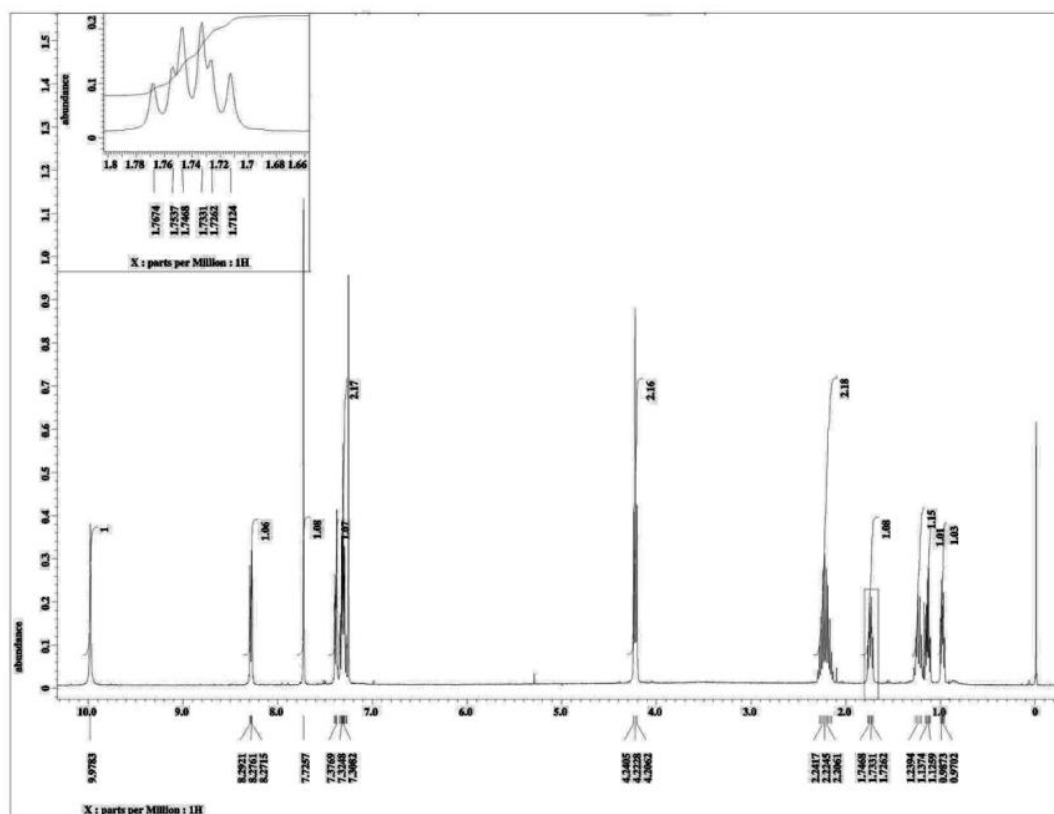
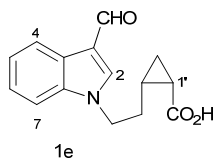
2'-[2-(1H-indol-1-yl)ethyl]-trans-cyclopropanecarboxylic acid (1d).

¹³C NMR, 100 MHz, MeOH-*d*₄



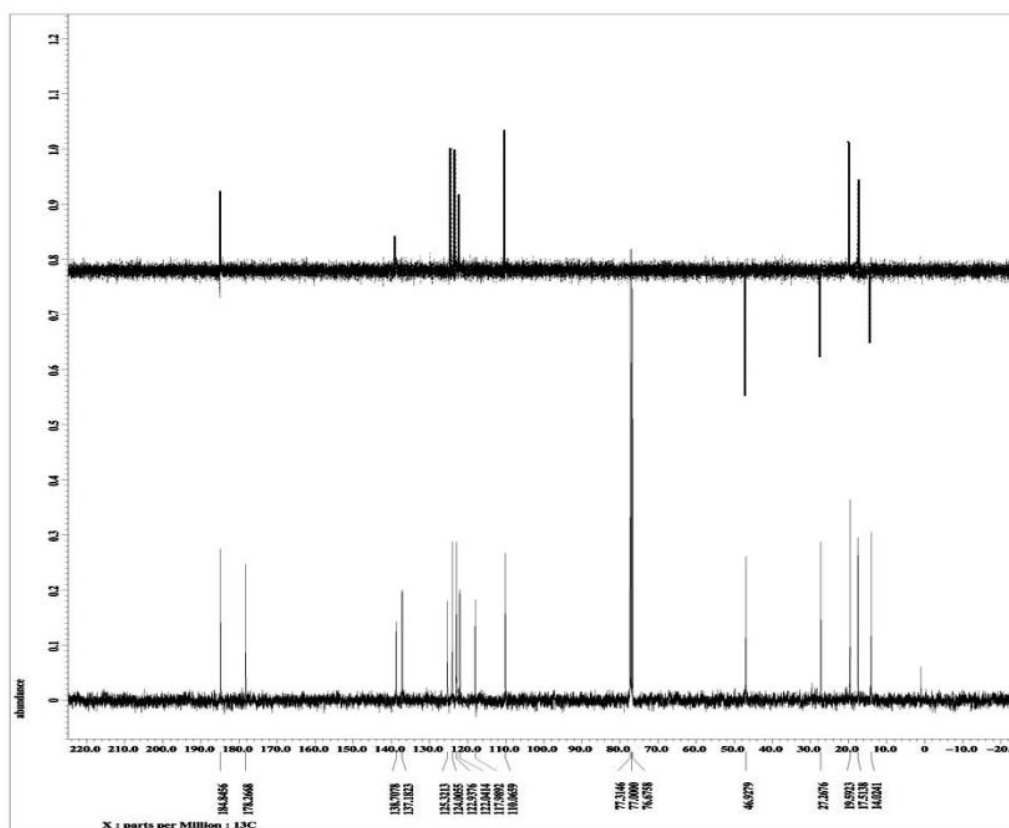
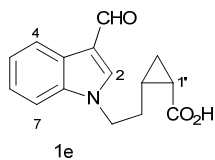
2'-[2-(3-Formyl-1H-indol-1-yl)ethyl]-cis-cyclopropanecarboxylic acid (1e).

¹H NMR, 400 MHz, CDCl₃



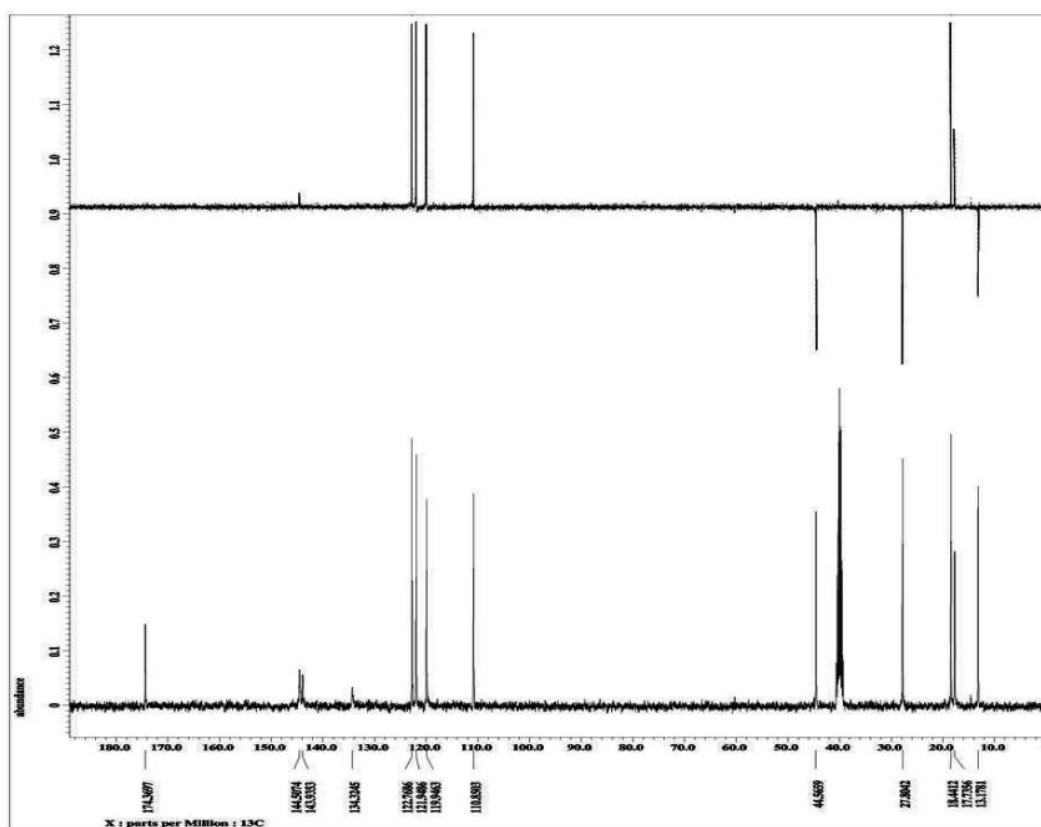
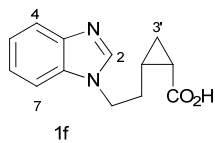
2'-[2-(3-Formyl-1H-indol-1-yl)ethyl]-cis-cyclopropanecarboxylic acid (1e).

¹³C NMR, 100 MHz, CDCl₃



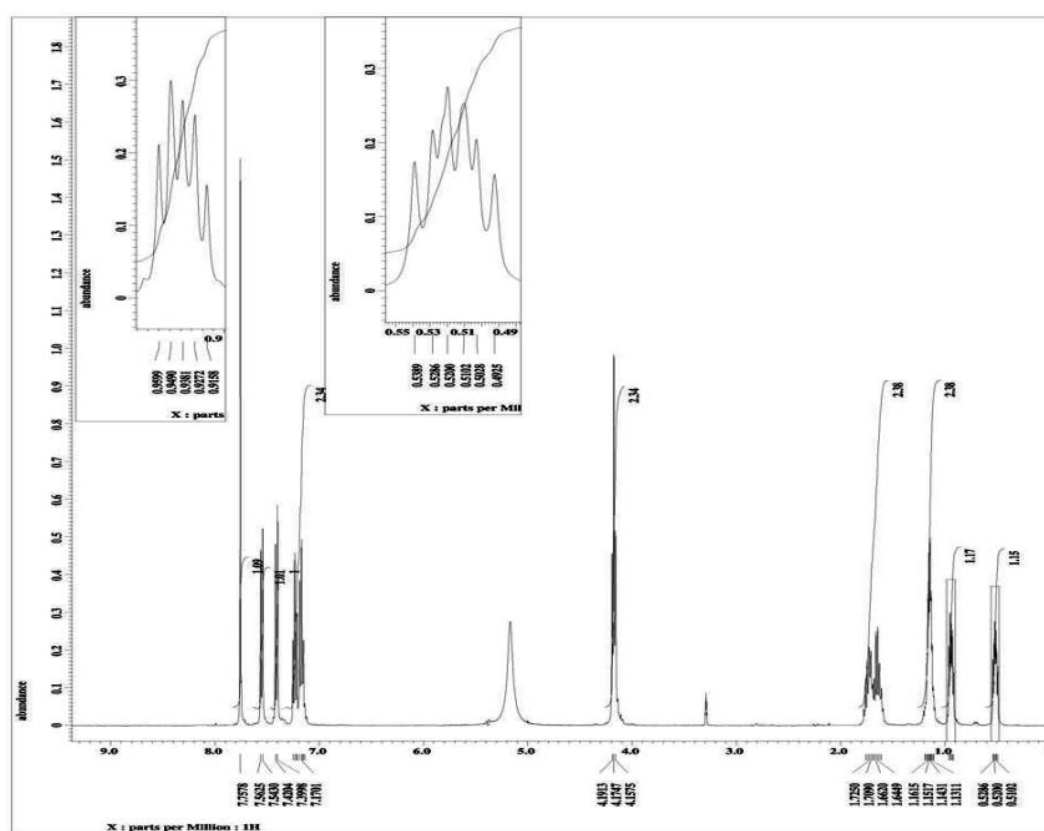
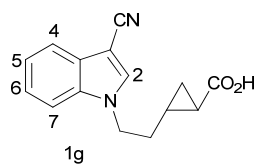
2'-[2-(1H-benzimidazol-1-yl)ethyl]-cis-cyclopropanecarboxylic acid (1f).

^{13}C NMR, 100 MHz, DMSO- d_6



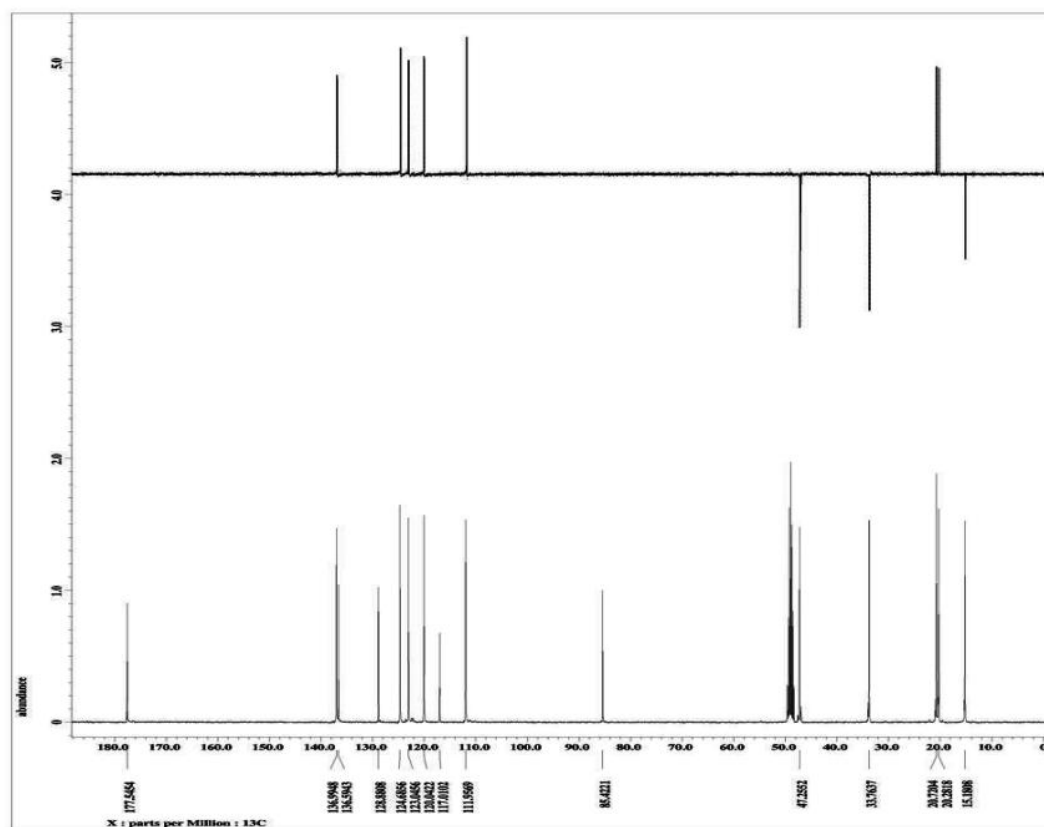
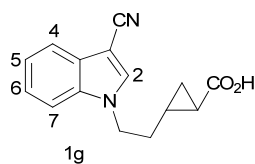
2'-[2-(3-cyano-1H-indol-1-yl)ethyl]-trans-cyclopropanecarboxylic acid (1g).

¹H NMR, 400 MHz, MeOH-*d*₄



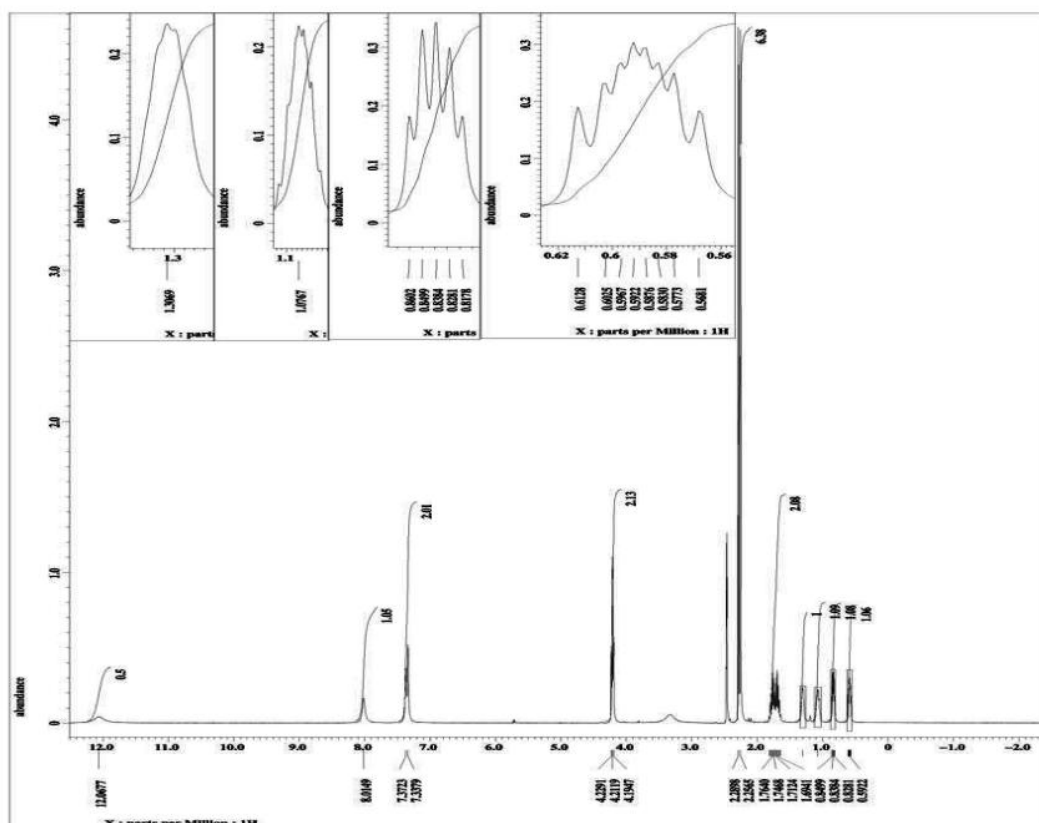
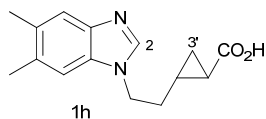
2'-[2-(3-cyano-1H-indol-1-yl)ethyl]-trans-cyclopropanecarboxylic acid (1g).

^{13}C NMR, 100 MHz, $\text{MeOH-}d_4$



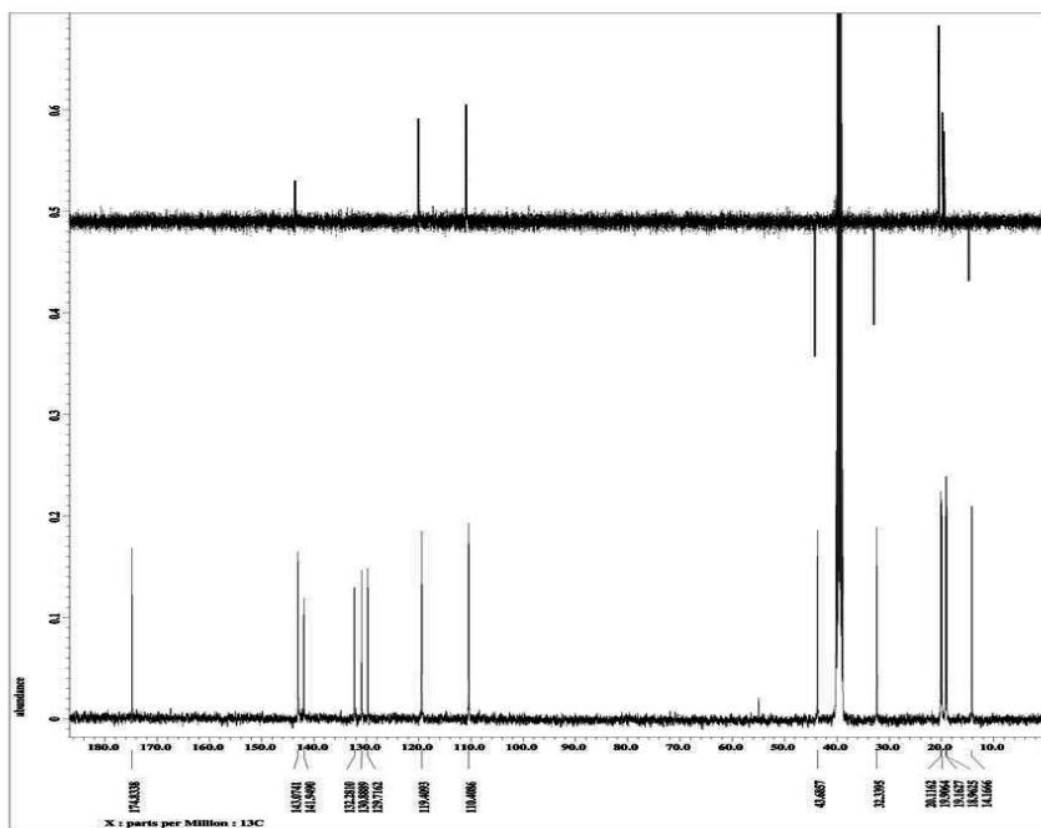
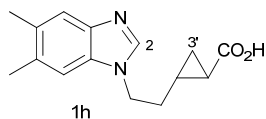
2'-[2-(5,6-Dimethyl-1H-benzimidazol-1-yl)ethyl]-trans-cyclopropanecarboxylic acid (1h).

¹H NMR, 400 MHz, DMSO-*d*₆



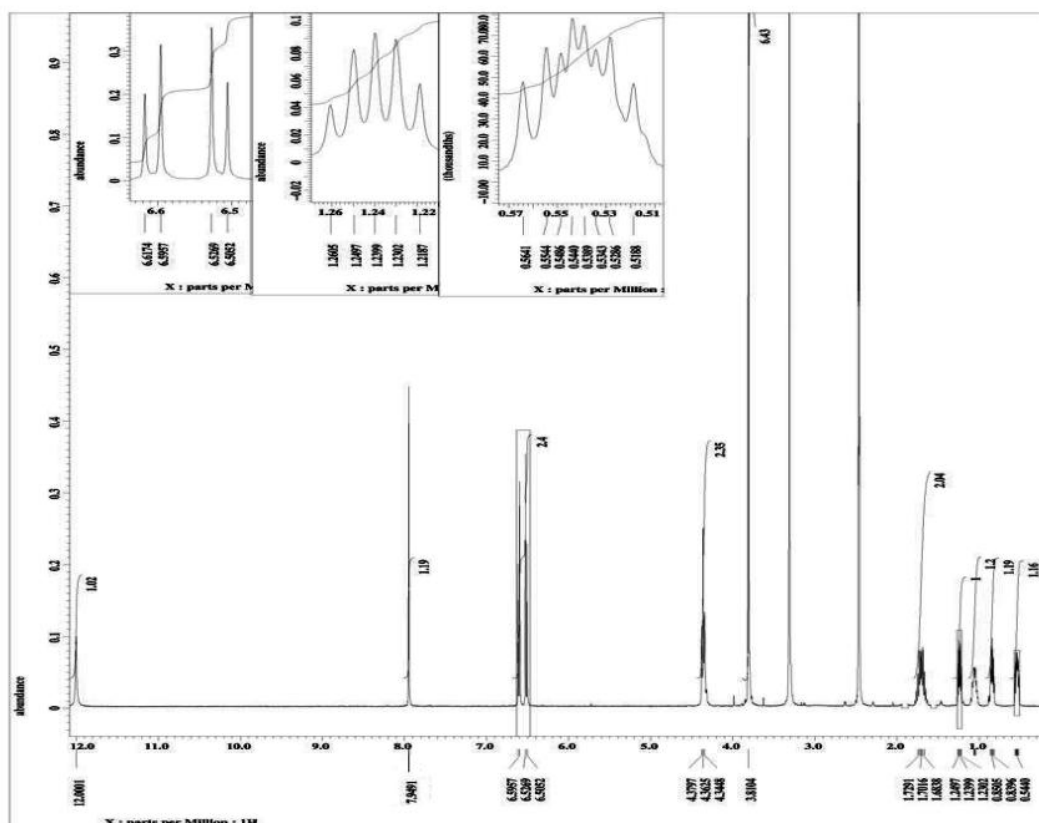
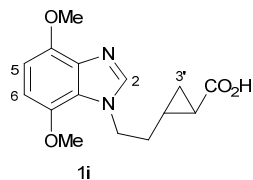
2'-[2-(5,6-Dimethyl-1H-benzimidazol-1-yl)ethyl]-trans-cyclopropanecarboxylic acid (1h).

¹³C NMR, 100 MHz, DMSO-*d*₆



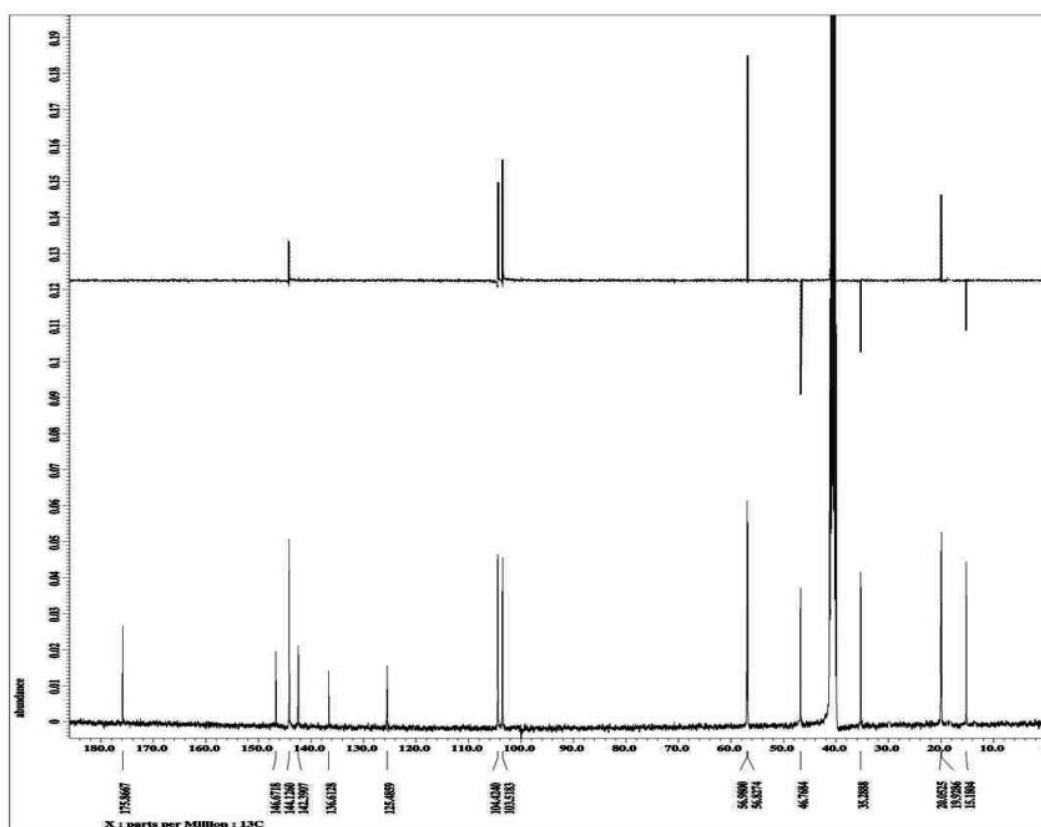
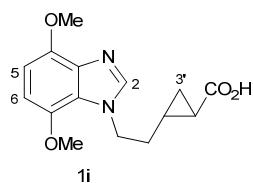
2'-[2-(4,7-Dimethoxy-1H-benzimidazol-1-yl)ethyl]-trans-cyclopropanecarboxylic acid (1i).

¹H NMR, 400 MHz, DMSO-*d*₆



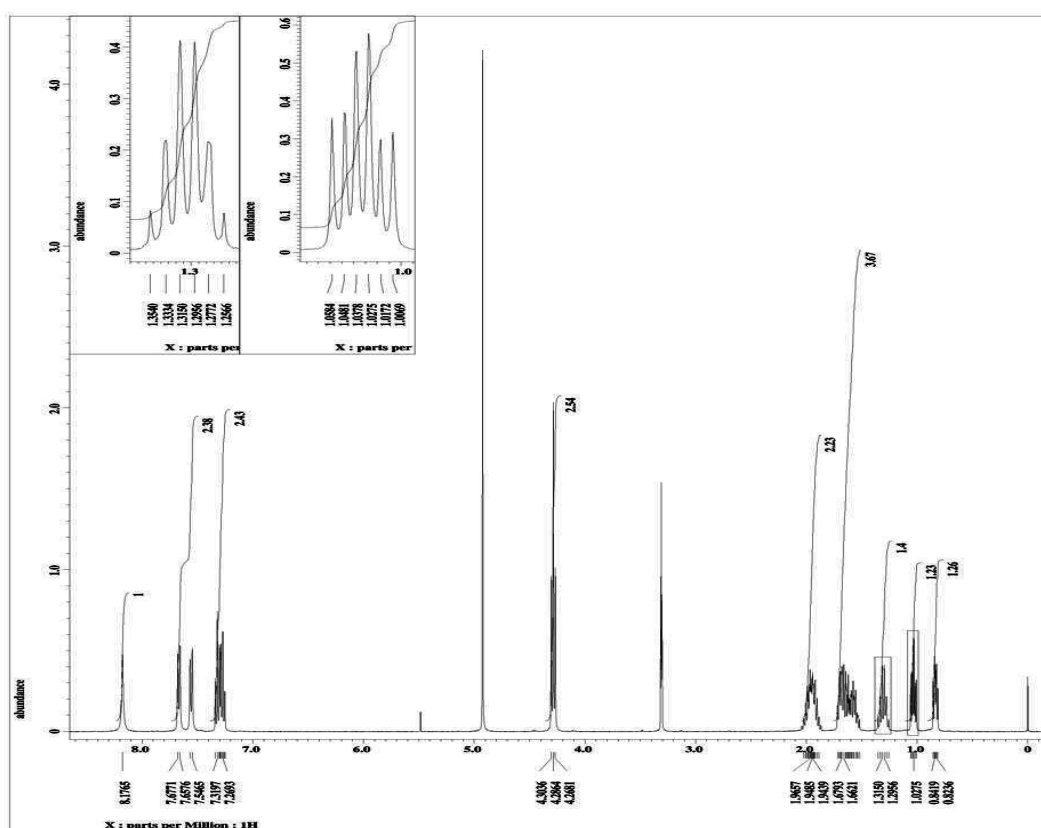
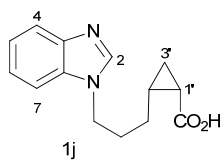
2'-[2-(4,7-Dimethoxy-1H-benzimidazol-1-yl)ethyl]-trans-cyclopropanecarboxylic acid (1i).

¹³C NMR, 100 MHz, DMSO-*d*₆



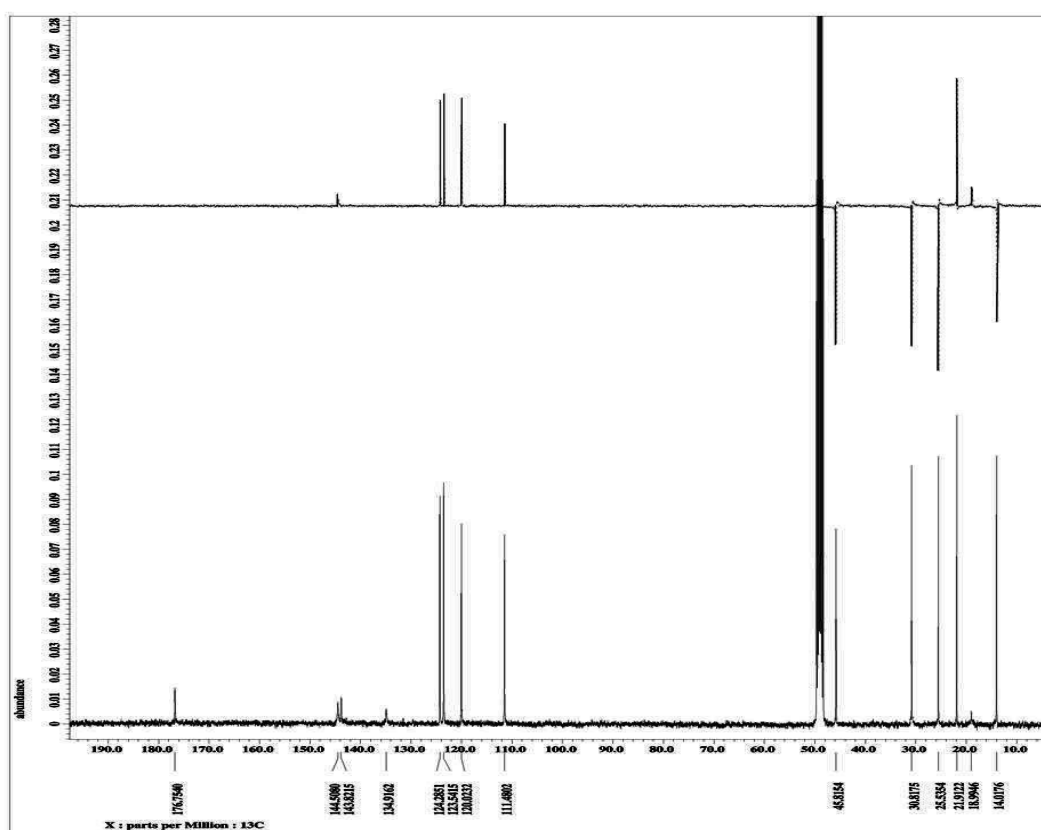
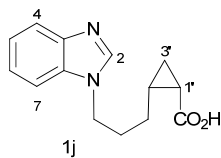
2'-[3-(1H-benzimidazol-1-yl)propyl]-cis-cyclopropanecarboxylic acid (1j).

¹H NMR, 400 MHz, MeOH-*d*₄



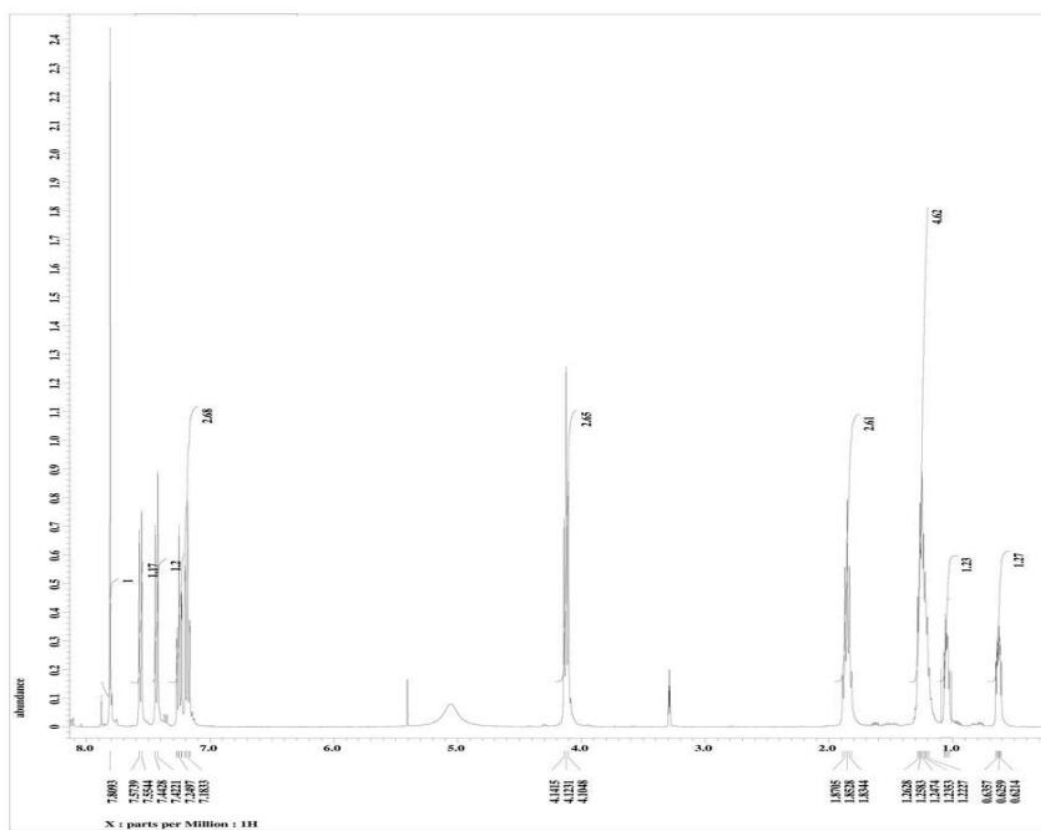
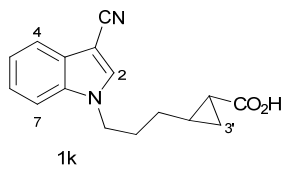
2'-[3-(1H-benzimidazol-1-yl)propyl]-cis-cyclopropanecarboxylic acid (1j).

^{13}C NMR, 100 MHz, $\text{MeOH}-d_4$



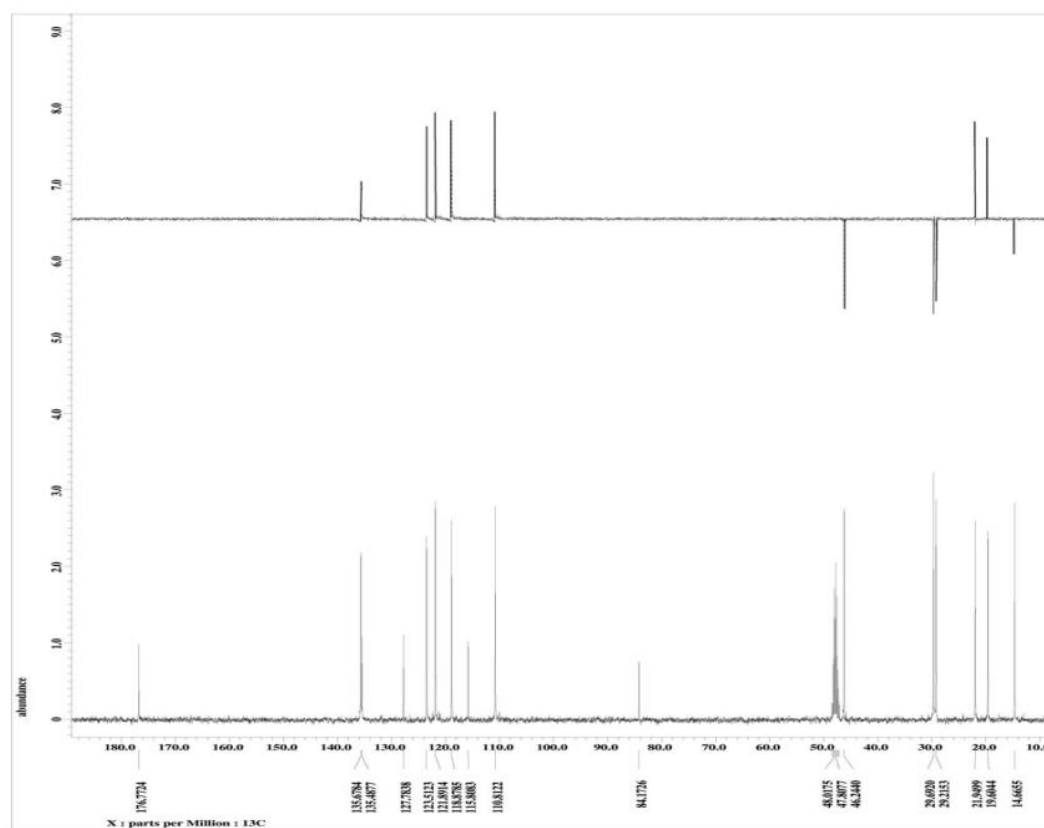
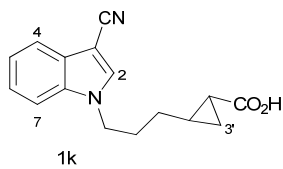
2'-[3-(3-Cyano-1H-indol-1-yl)propyl]-trans-cyclopropanecarboxylic acid (1k).

¹H NMR, 400 MHz, MeOH-*d*₄



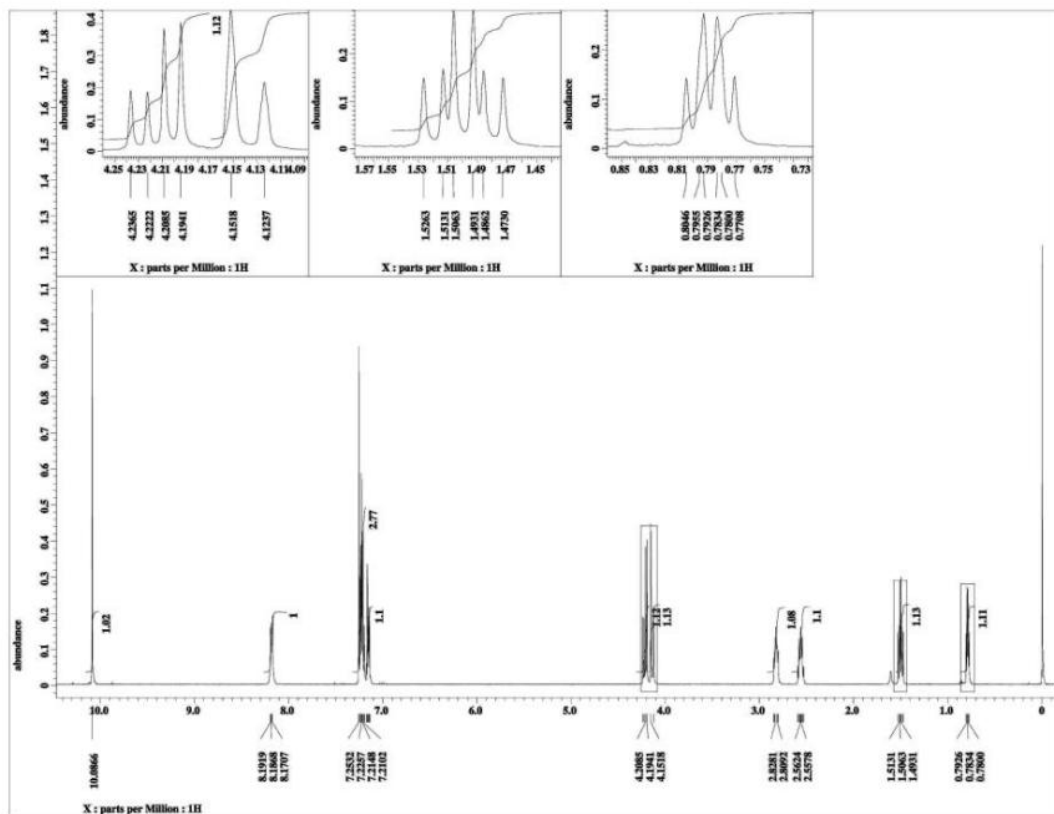
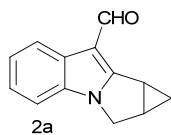
2'-[3-(3-Cyano-1H-indol-1-yl)propyl]-trans-cyclopropanecarboxylic acid (1k).

¹³C NMR, 100 MHz, MeOH-*d*₄



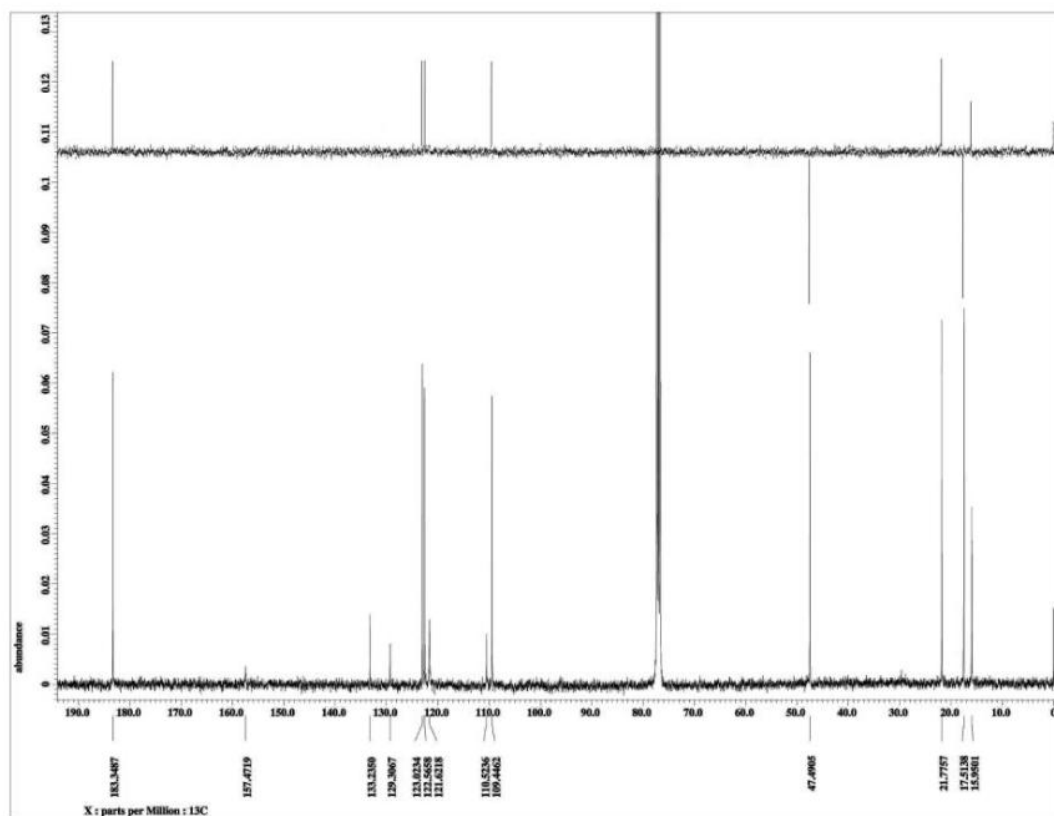
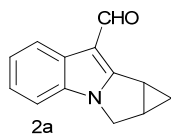
1,1a,2,8b-Tetrahydrocyclopropa[3,4]pyrrolo[1,2-a]indole-8-carbaldehyde (2a).

¹H NMR, 400 MHz, CDCl₃



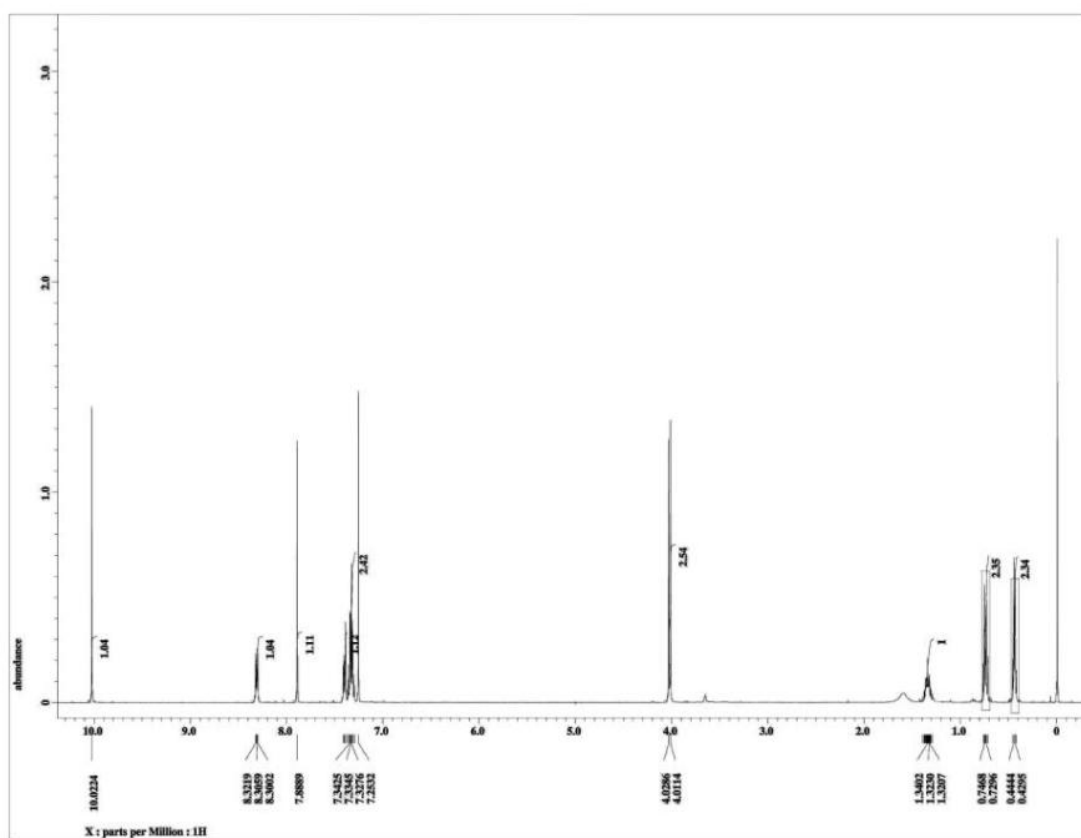
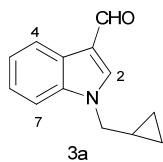
1,1a,2,8b-Tetrahydrocyclopropa[3,4]pyrrolo[1,2-a]indole-8-carbaldehyde (2a).

¹³C NMR, 100 MHz, CDCl₃



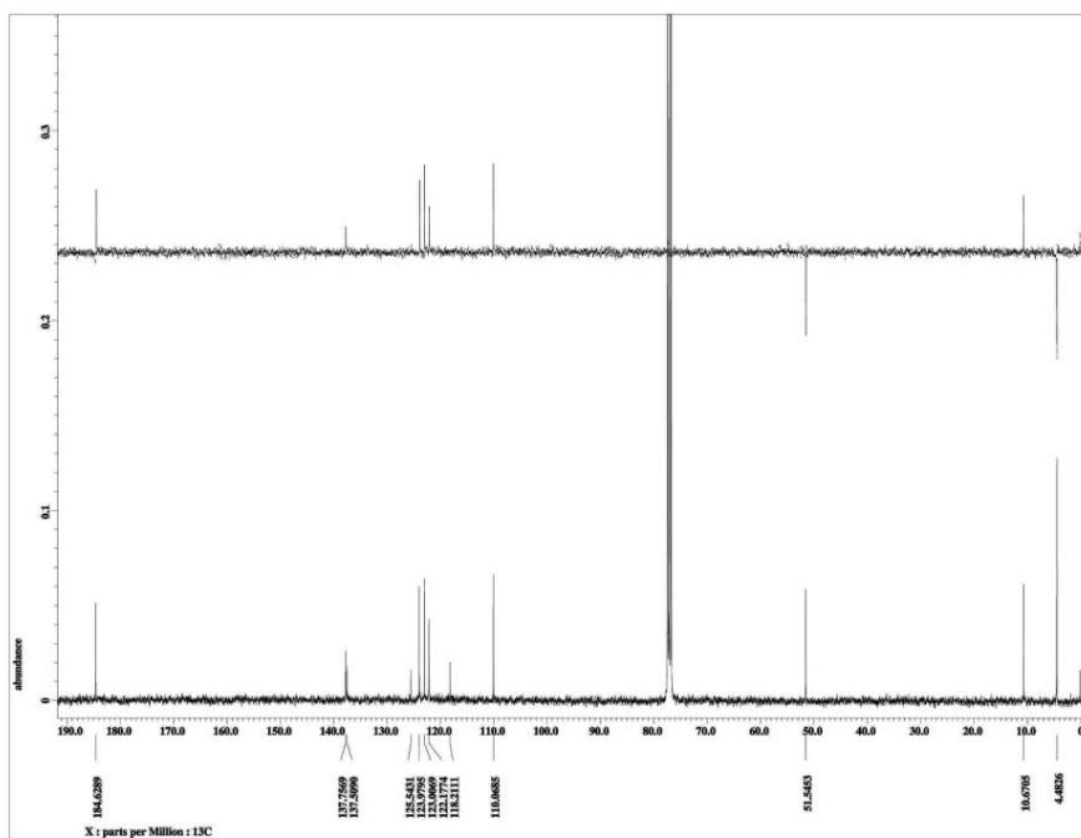
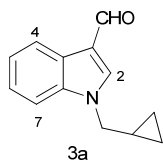
1-(Cyclopropylmethyl)-1H-indole-3-carbaldehyde (3a).

¹H NMR, 400 MHz, CDCl₃



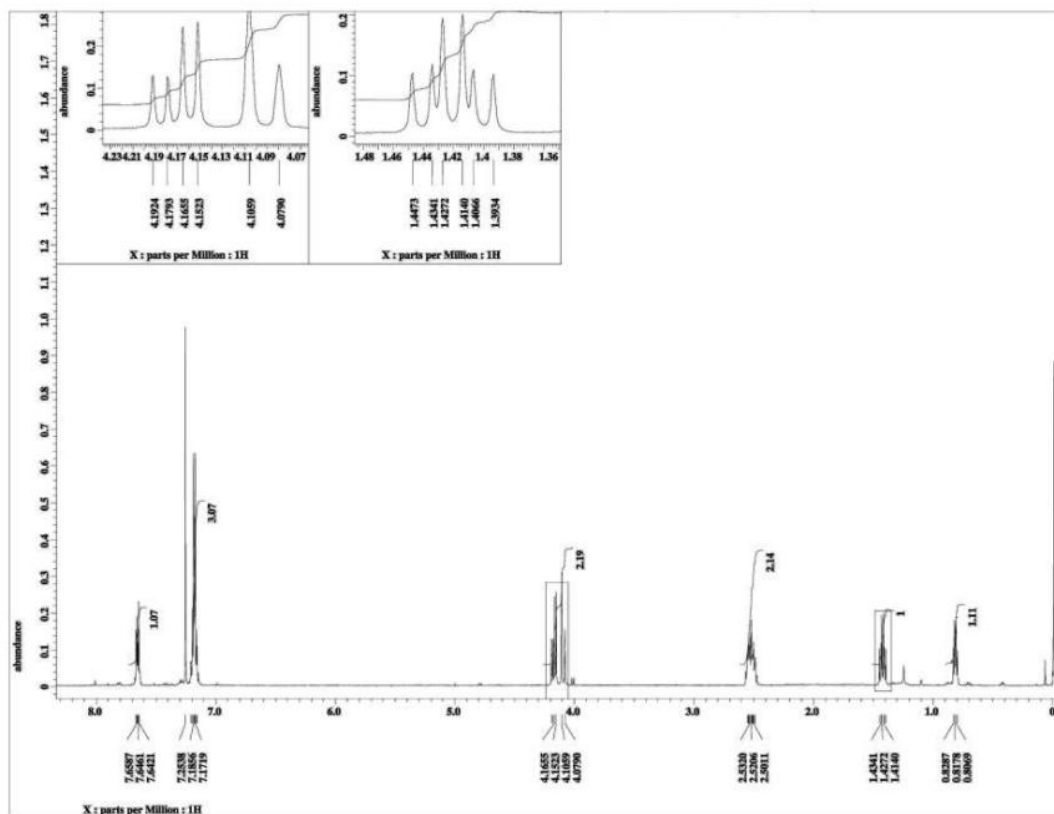
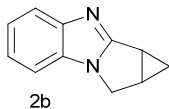
1-(Cyclopropylmethyl)-1H-indole-3-carbaldehyde (3a).

^{13}C NMR, 100 MHz, CDCl_3



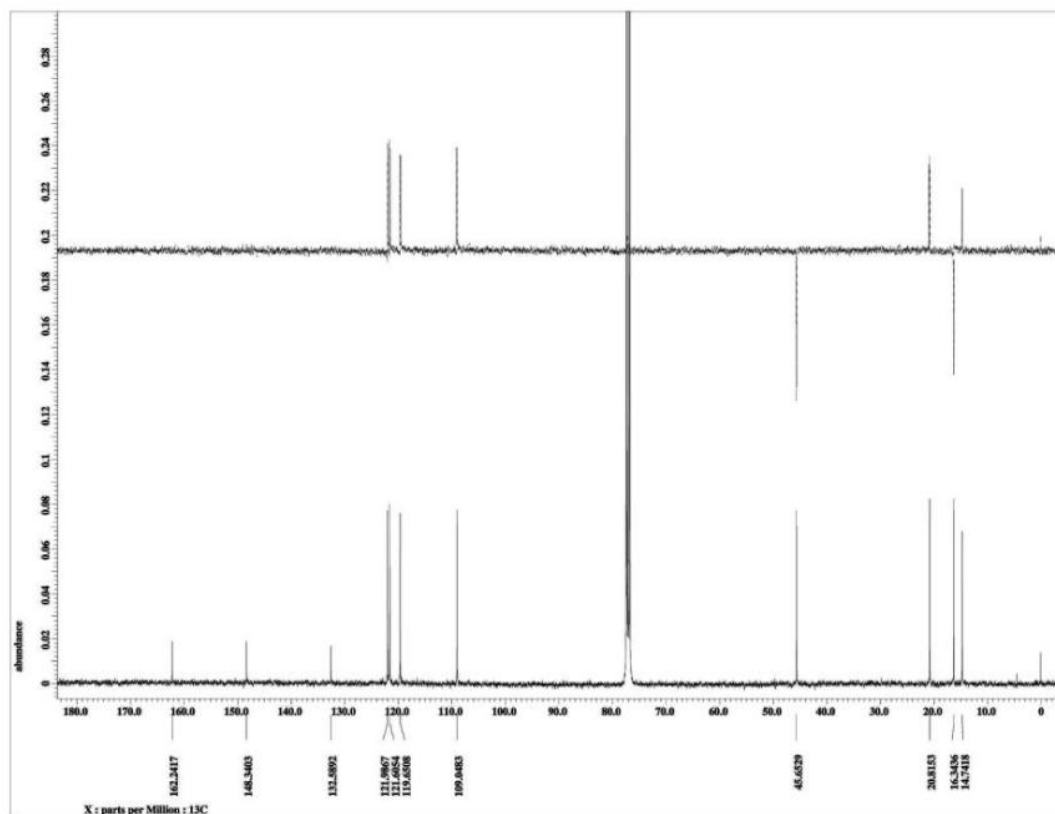
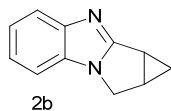
1,1a,8,8a-Tetrahydrocyclopropa[3,4]pyrrolo[1,2-a]benzimidazole (2b).

¹H NMR, 400 MHz, CDCl₃



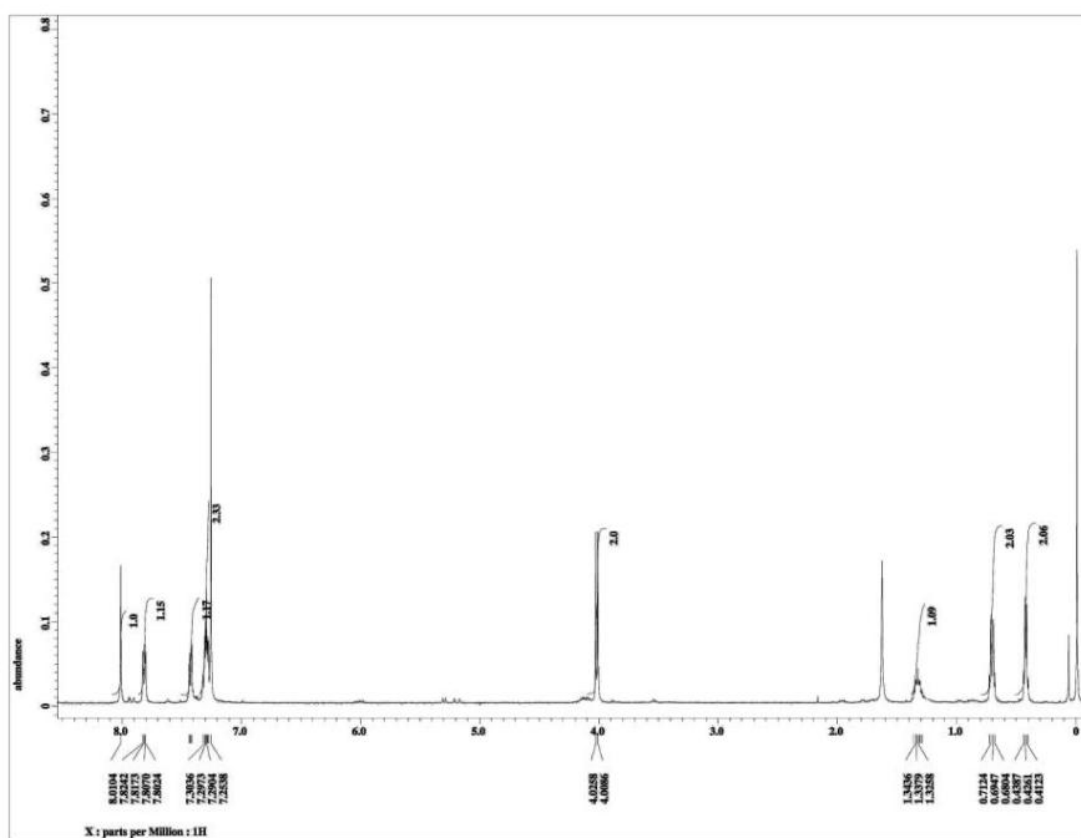
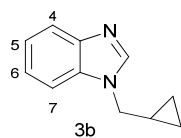
1,1a,8,8a-Tetrahydrocyclopropa[3,4]pyrrolo[1,2-a]benzimidazole (2b).

¹³C NMR, 100 MHz, CDCl₃



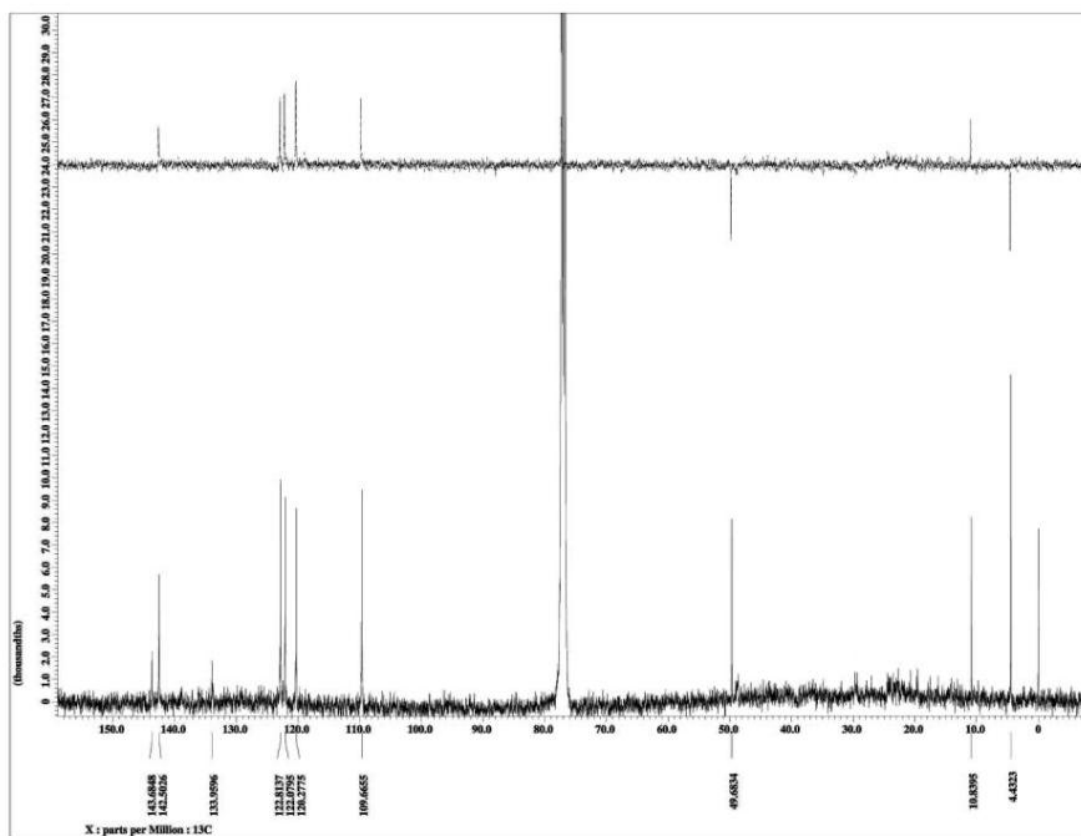
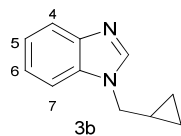
1-(Cyclopropylmethyl)-1H-benzimidazole (3b).

¹H NMR, 400 MHz, CDCl₃



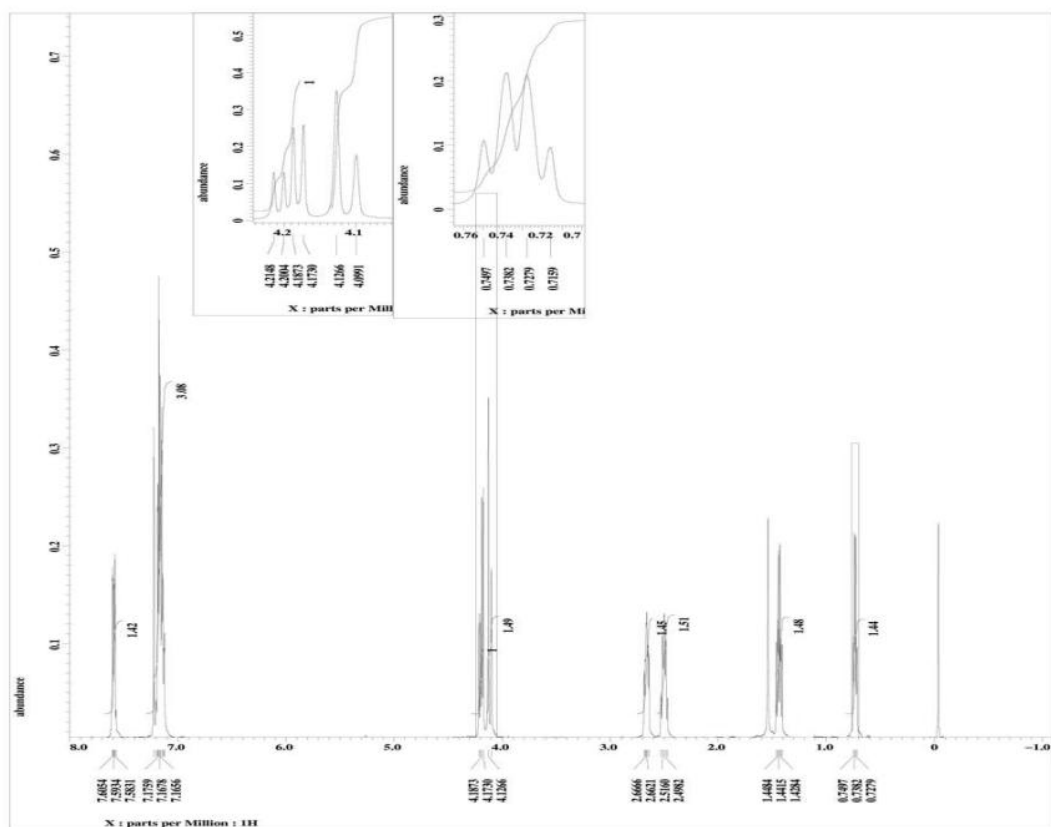
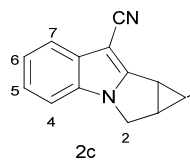
1-(Cyclopropylmethyl)-1H-benzimidazole (3b).

^{13}C NMR, 100 MHz, CDCl_3



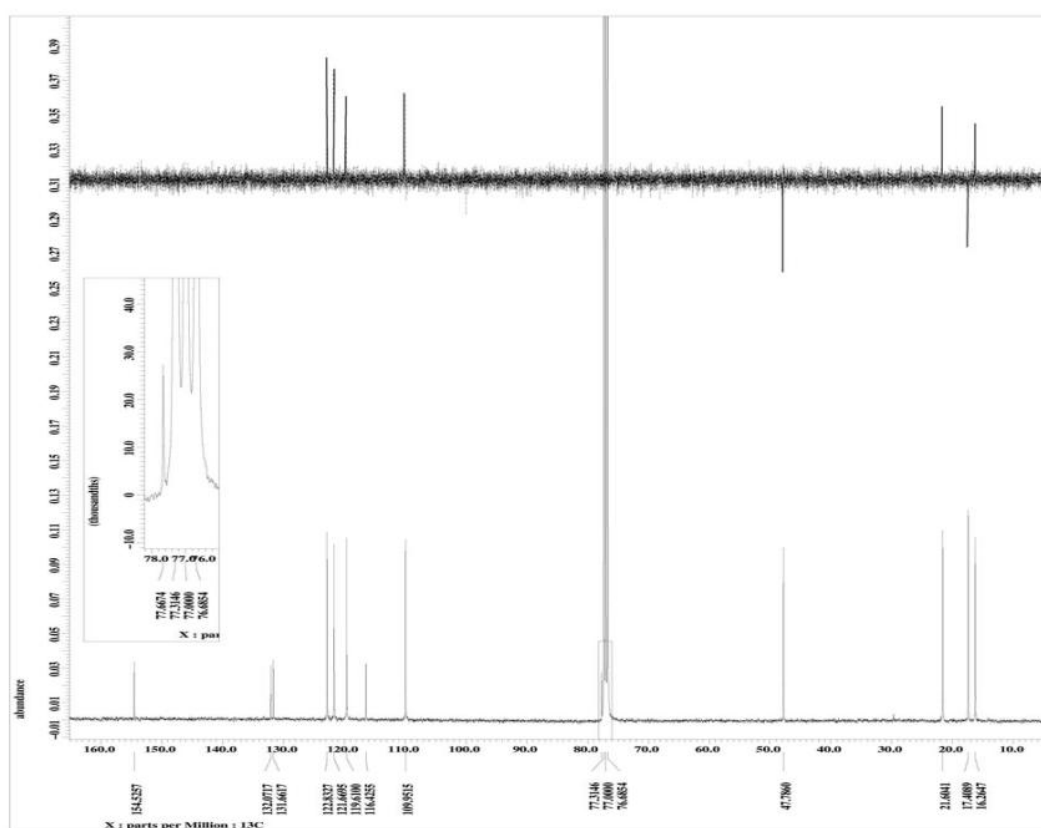
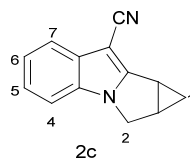
1,1a,2,8b-Tetrahydrocyclopropa[3,4]pyrrolo[1,2-a]indole-8-carbonitrile (2c).

¹H NMR, 400 MHz, CDCl₃



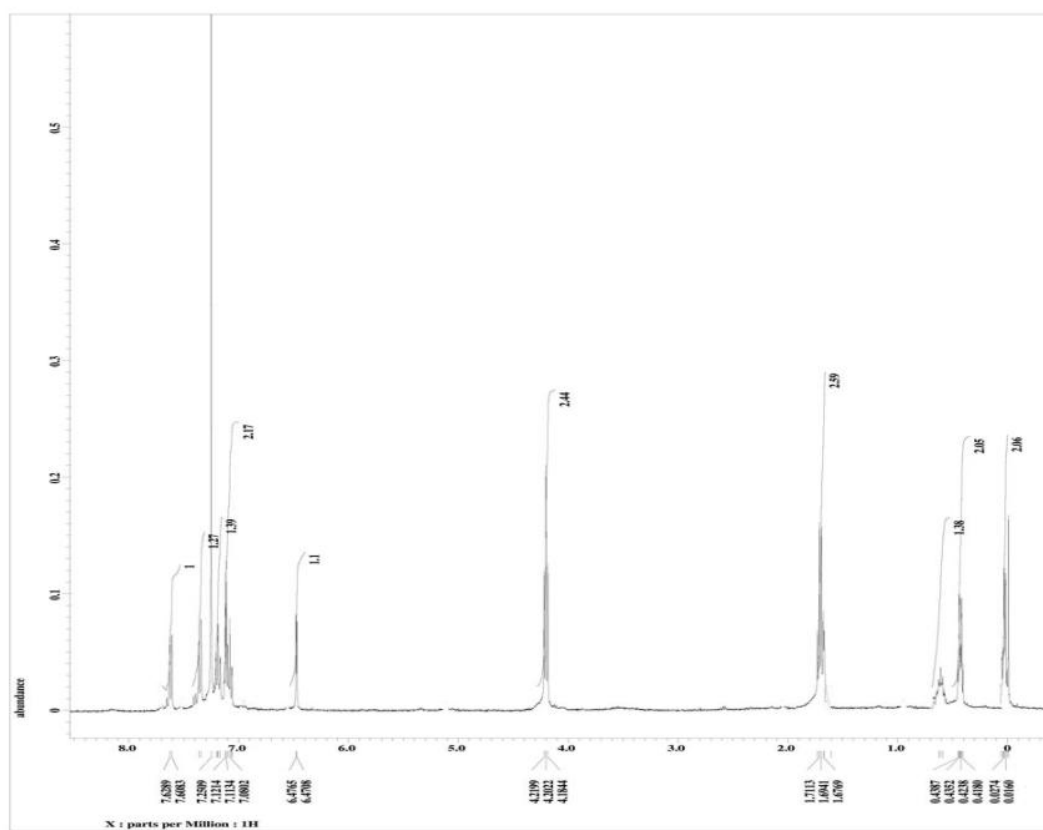
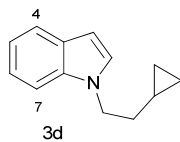
1,1a,2,8b-Tetrahydrocyclopropa[3,4]pyrrolo[1,2-a]indole-8-carbonitrile (2c).

¹³C NMR, 100 MHz, CDCl₃



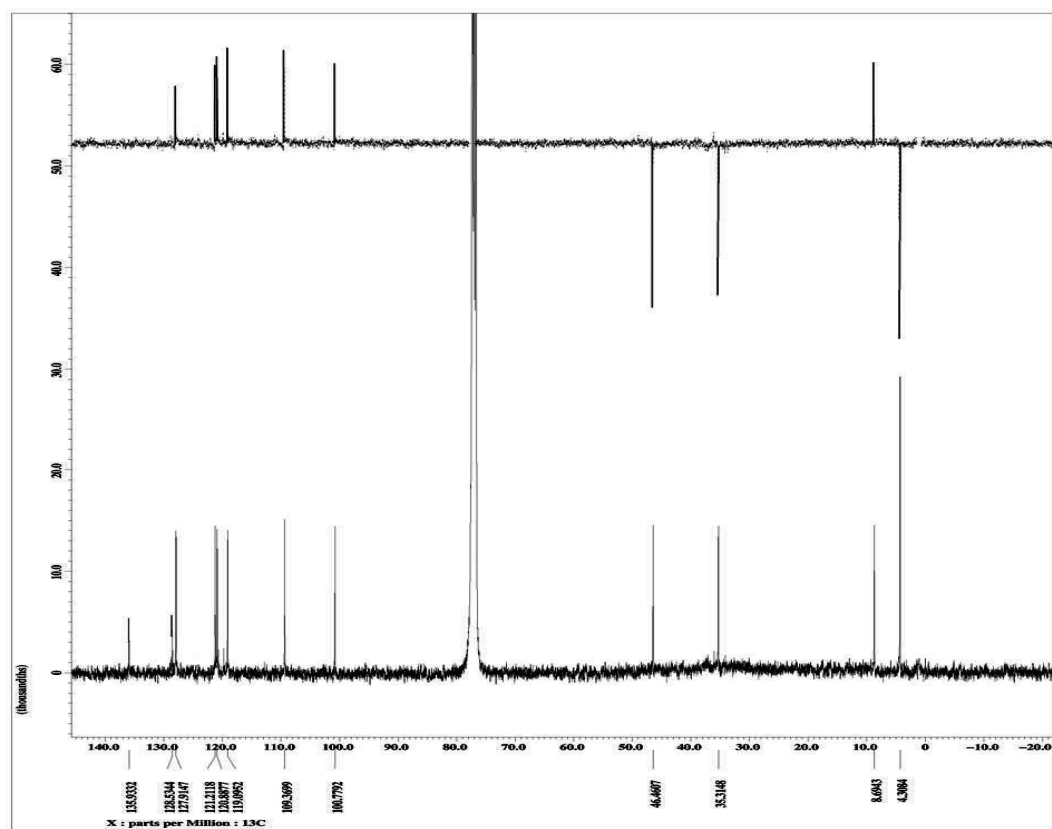
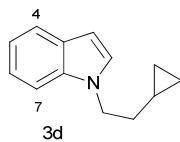
1-(2-Cyclopropylethyl)-1H-indole (3d).

¹H NMR, 400 MHz, CDCl₃



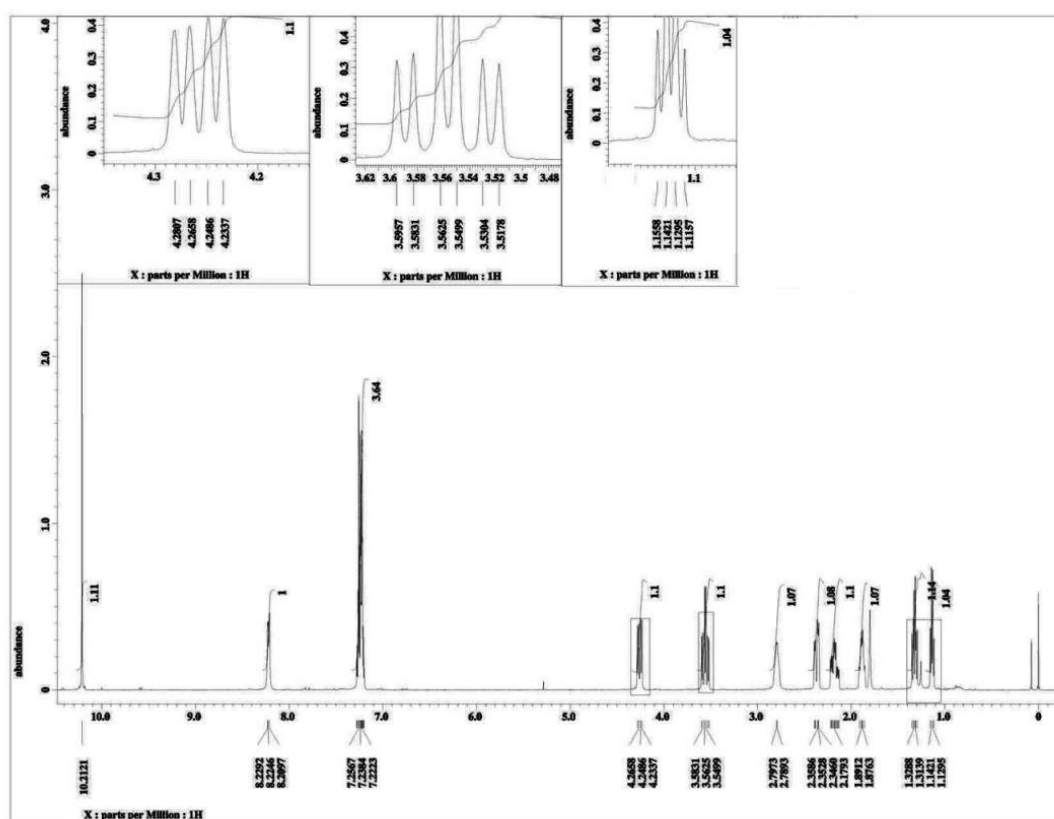
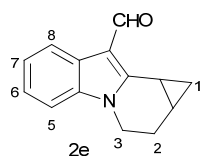
1-(2-Cyclopropylethyl)-1H-indole (3d).

^{13}C NMR, 100 MHz, CDCl_3



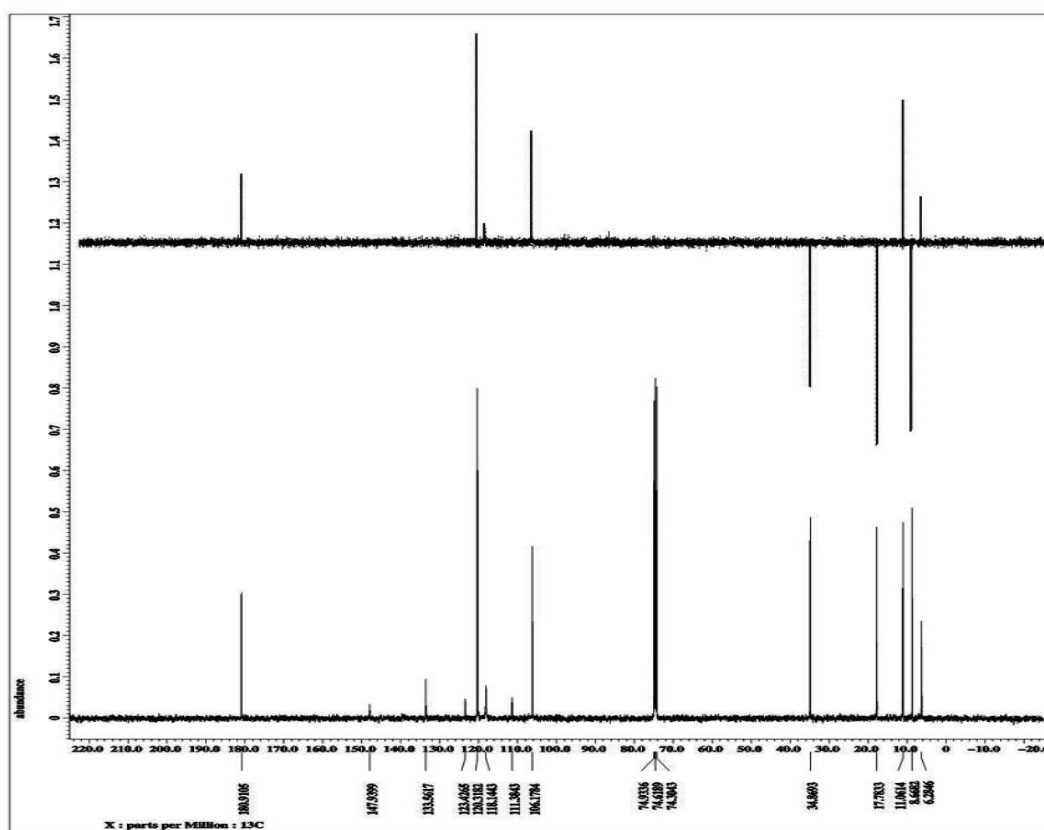
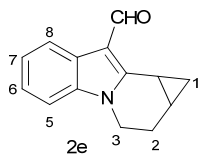
1a,2,3,9b-Tetrahydro-1H-cyclopropa[3,4]pyrido[1,2-a]indole-9-carbaldehyde (2e).

¹H NMR, 400 MHz, CDCl₃



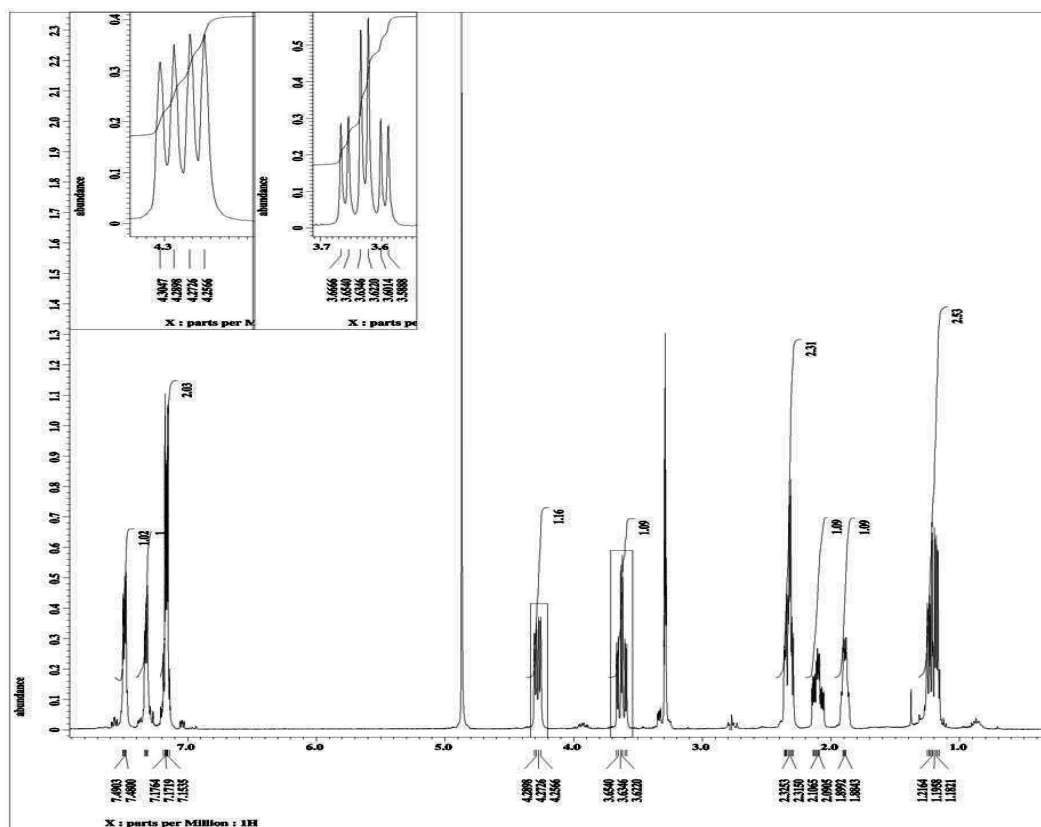
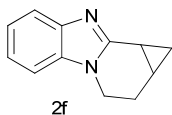
1a,2,3,9b-Tetrahydro-1H-cyclopropa[3,4]pyrido[1,2-a]indole-9-carbaldehyde (2e).

^{13}C NMR, 100 MHz, CDCl_3



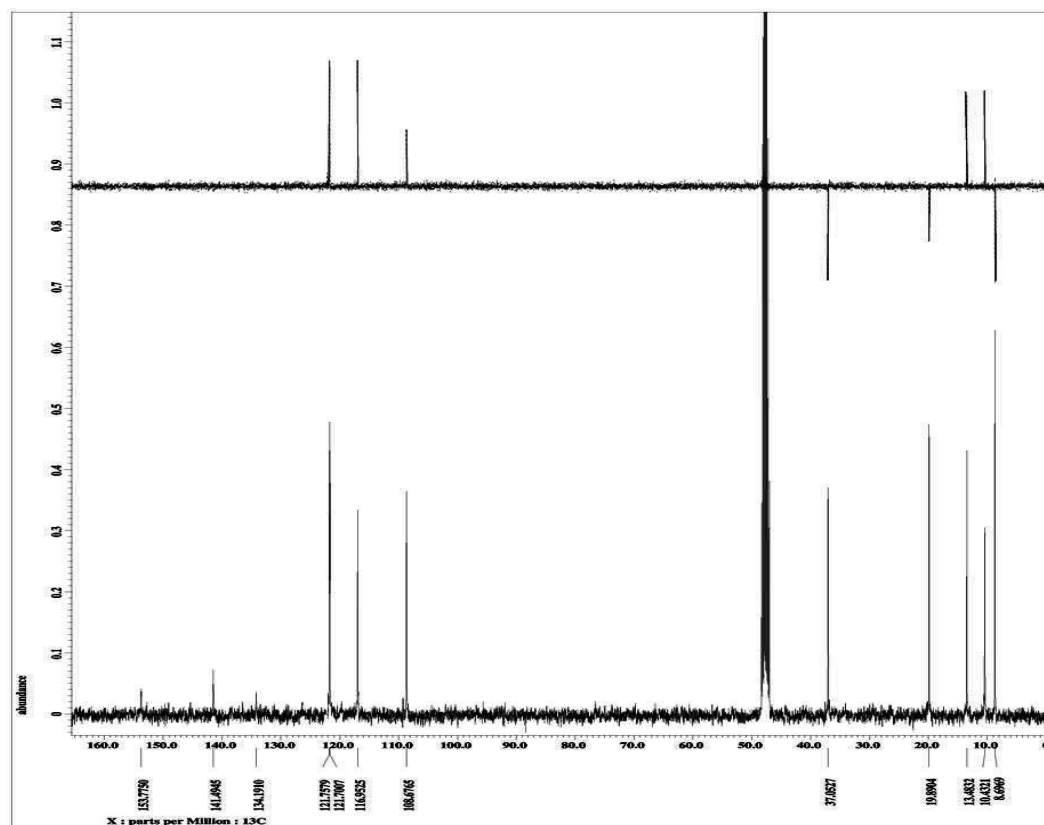
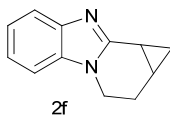
1a,2,3,9b-Tetrahydro-1H-cyclopropa[3,4]pyrido[1,2-a]benzimidazole (2f).

¹H NMR, 400 MHz, MeOH-*d*₄

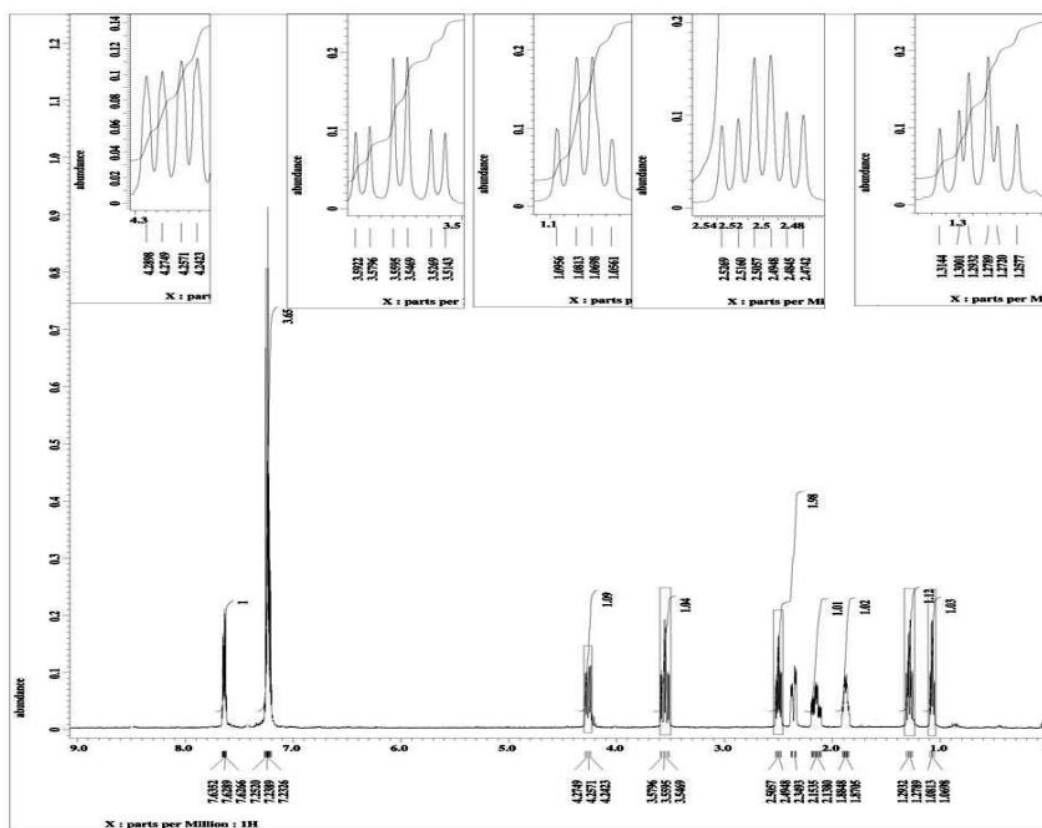
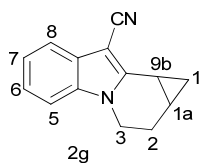


1a,2,3,9b-Tetrahydro-1H-cyclopropa[3,4]pyrido[1,2-a]benzimidazole (2f).

¹³C NMR, 100 MHz, MeOH-*d*₄

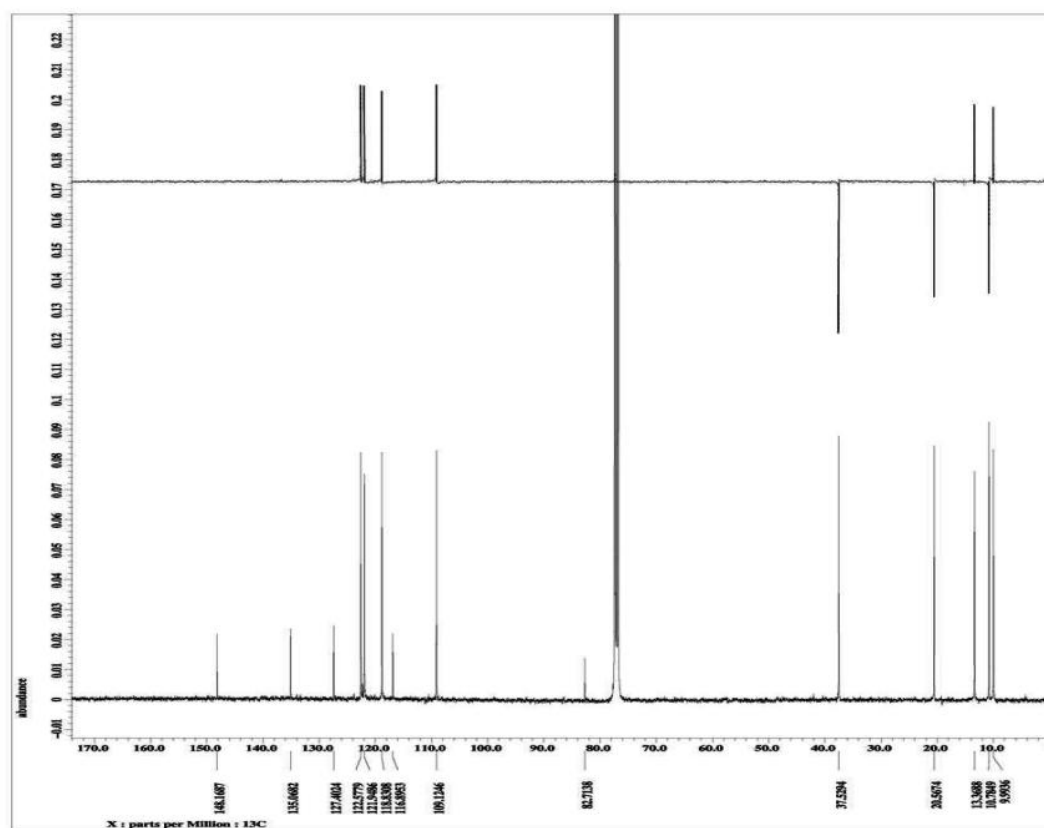
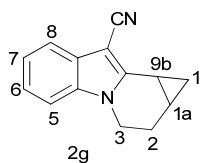


1a,2,3,9b-Tetrahydro-1H-cyclopropa[3,4]pyrido[1,2-a]indole-9-carbonitrile (2g).

 ^1H NMR, 400 MHz, CDCl_3 

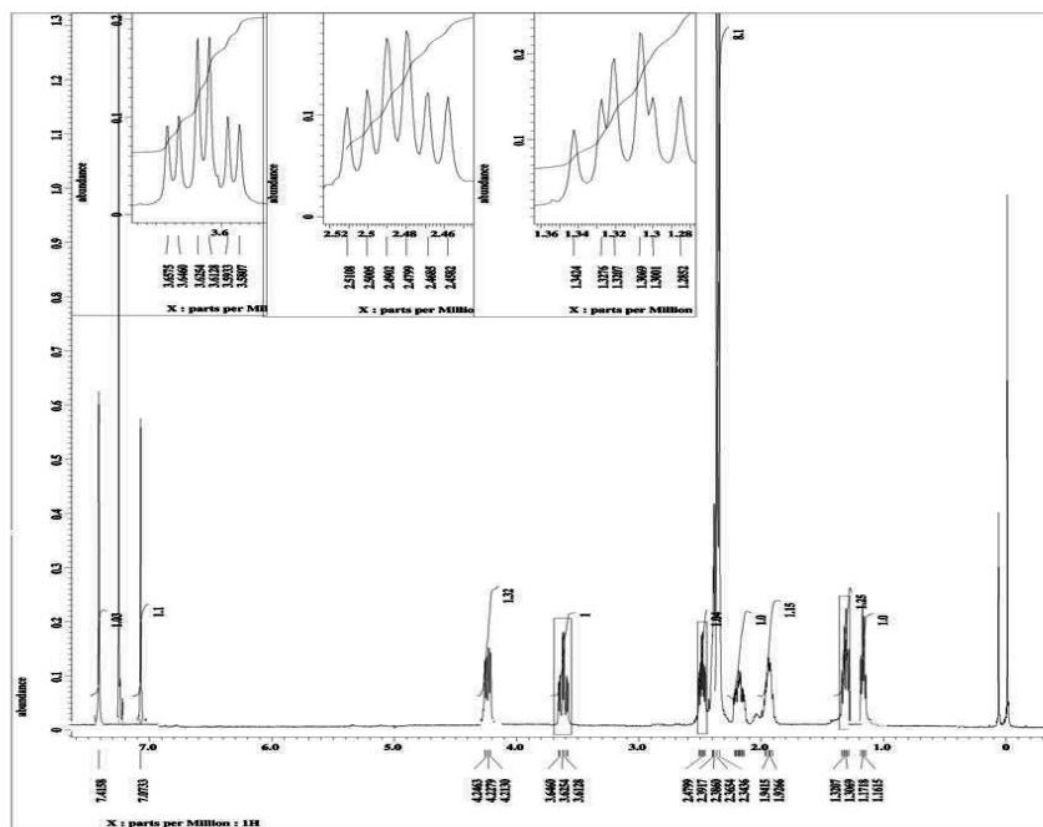
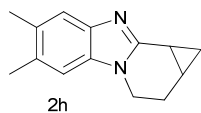
1a,2,3,9b-Tetrahydro-1H-cyclopropa[3,4]pyrido[1,2-a]indole-9-carbonitrile (2g).

^{13}C NMR, 100 MHz, CDCl_3



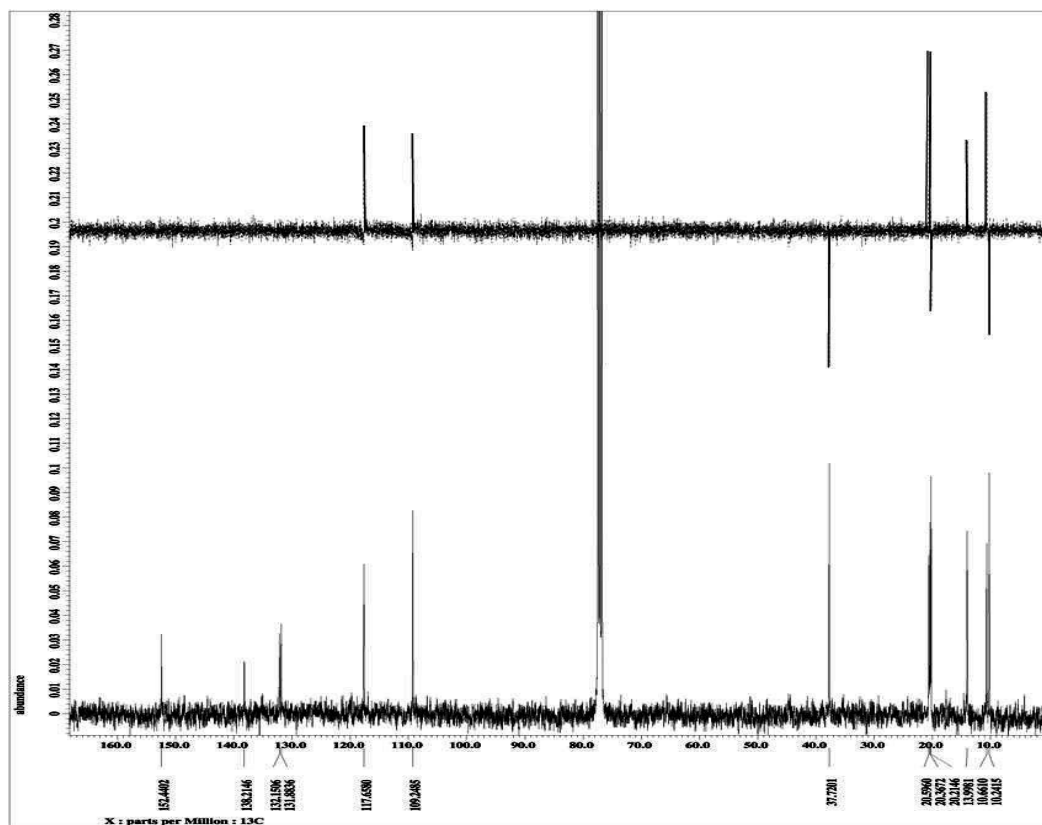
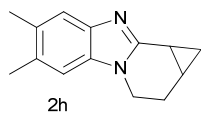
6,7-Dimethyl-1a,2,3,9b-tetrahydro-1H-cyclopropa[3,4]pyrido[1,2-a]benzimidazole (2h).

¹H NMR, 400 MHz, CDCl₃

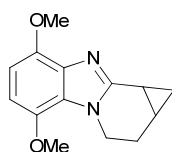


6,7-Dimethyl-1a,2,3,9b-tetrahydro-1H-cyclopropa[3,4]pyrido[1,2-a]benzimidazole (2h).

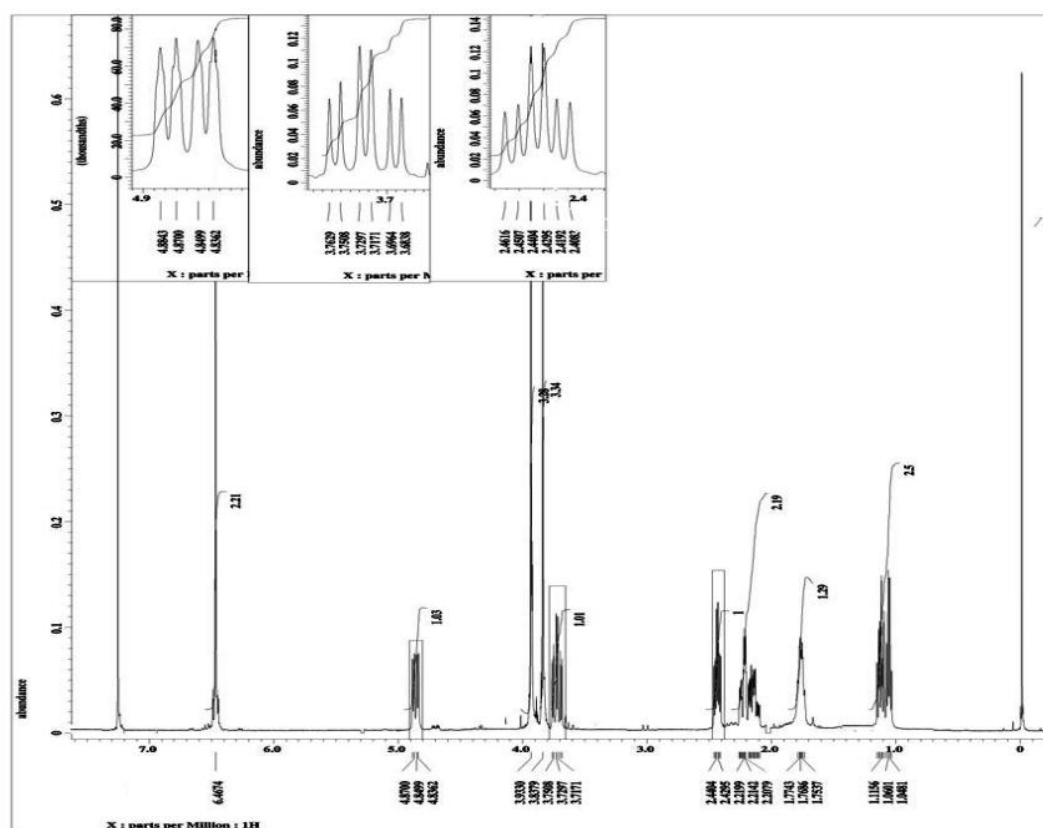
¹³C NMR, 100 MHz, CDCl₃



5,8-Dimethoxy-1a,2,3,9b-tetrahydro-1H-cyclopropa[3,4]pyrido[1,2-a]benzimidazole (2i).

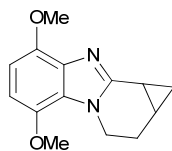
 ^1H NMR, 400 MHz, CDCl_3 

2i

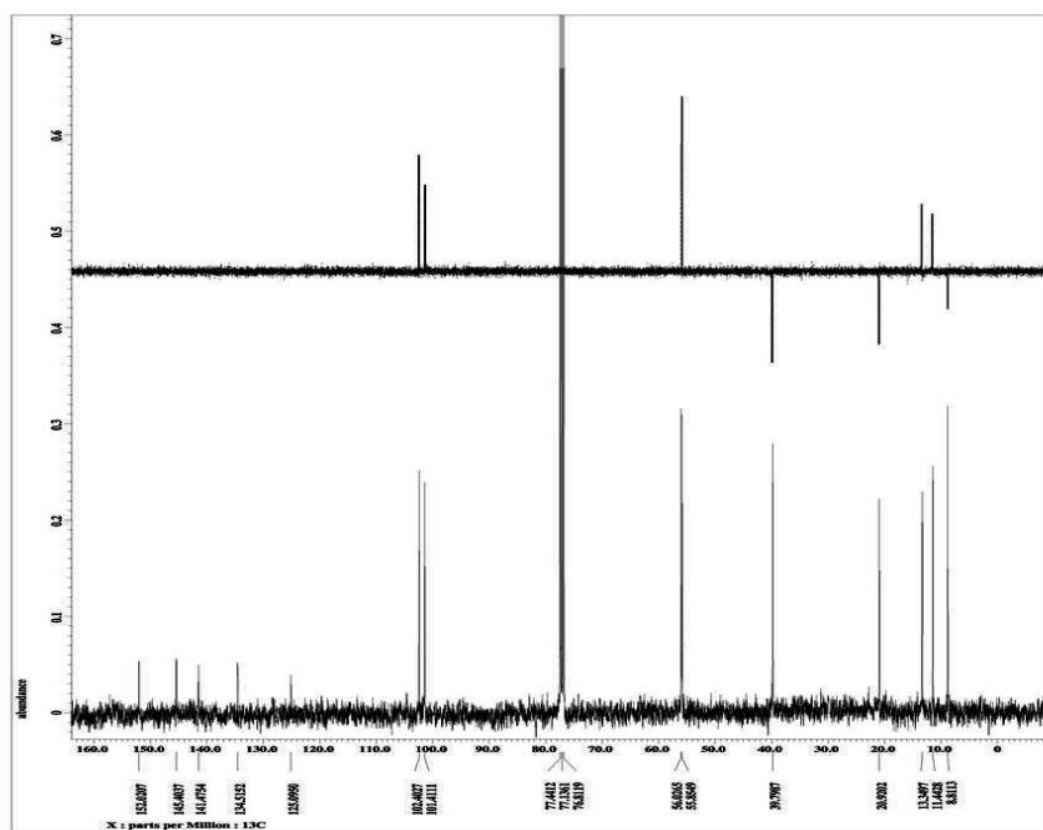


5,8-Dimethoxy-1a,2,3,9b-tetrahydro-1H-cyclopropa[3,4]pyrido[1,2-a]benzimidazole (2i).

¹³C NMR, 100 MHz, CDCl₃

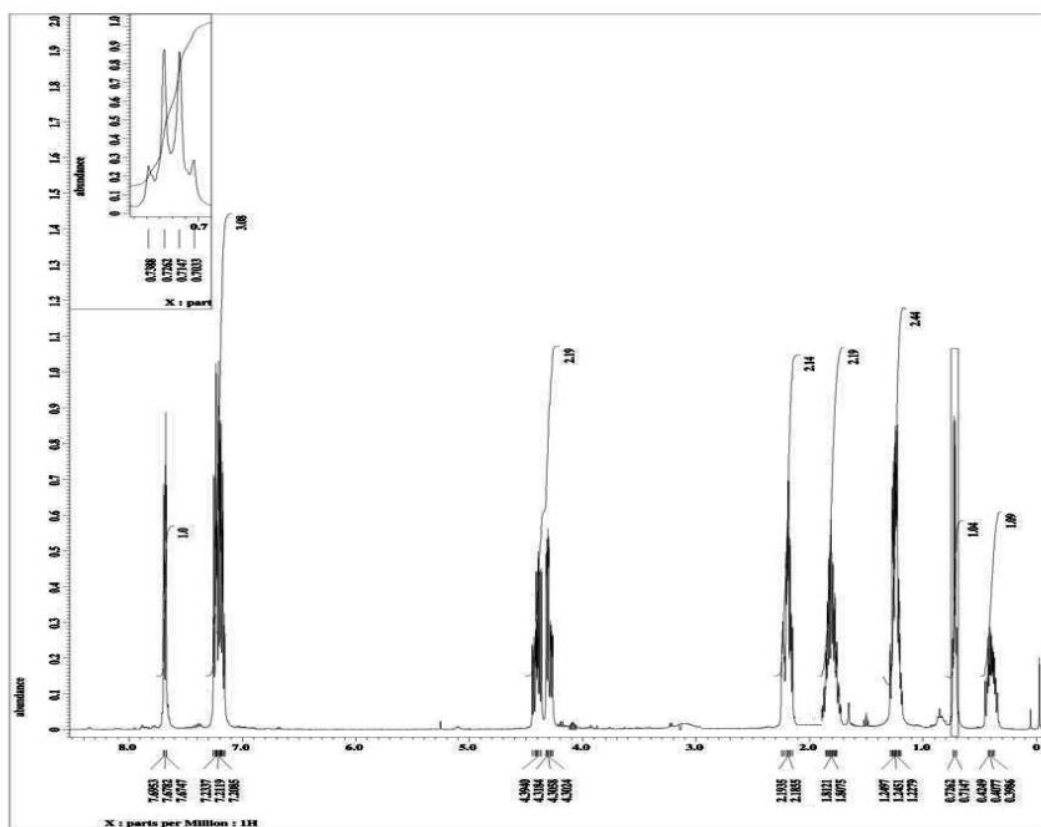
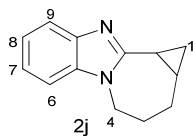


2i



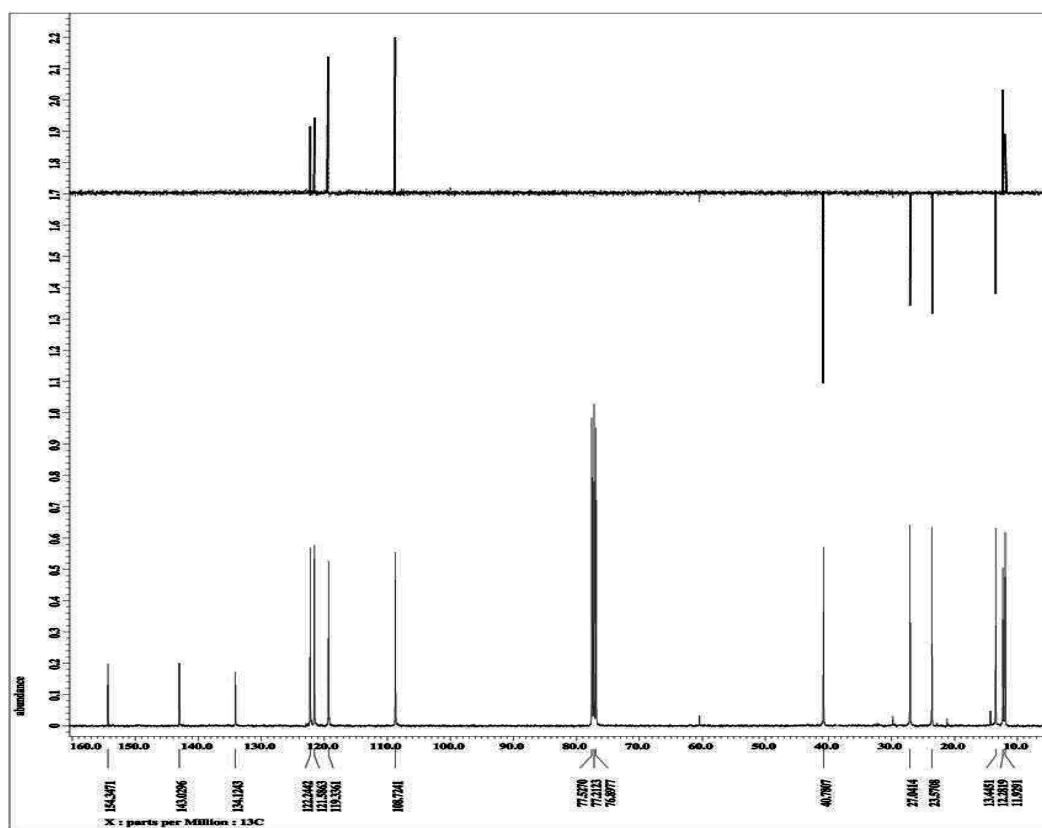
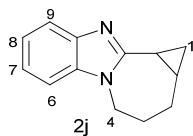
1,1a,2,3,4,10b-Hexahydrocyclopropa[3,4]azepino[1,2-a]benzimidazole (2j).

¹H NMR, 400 MHz, CDCl₃



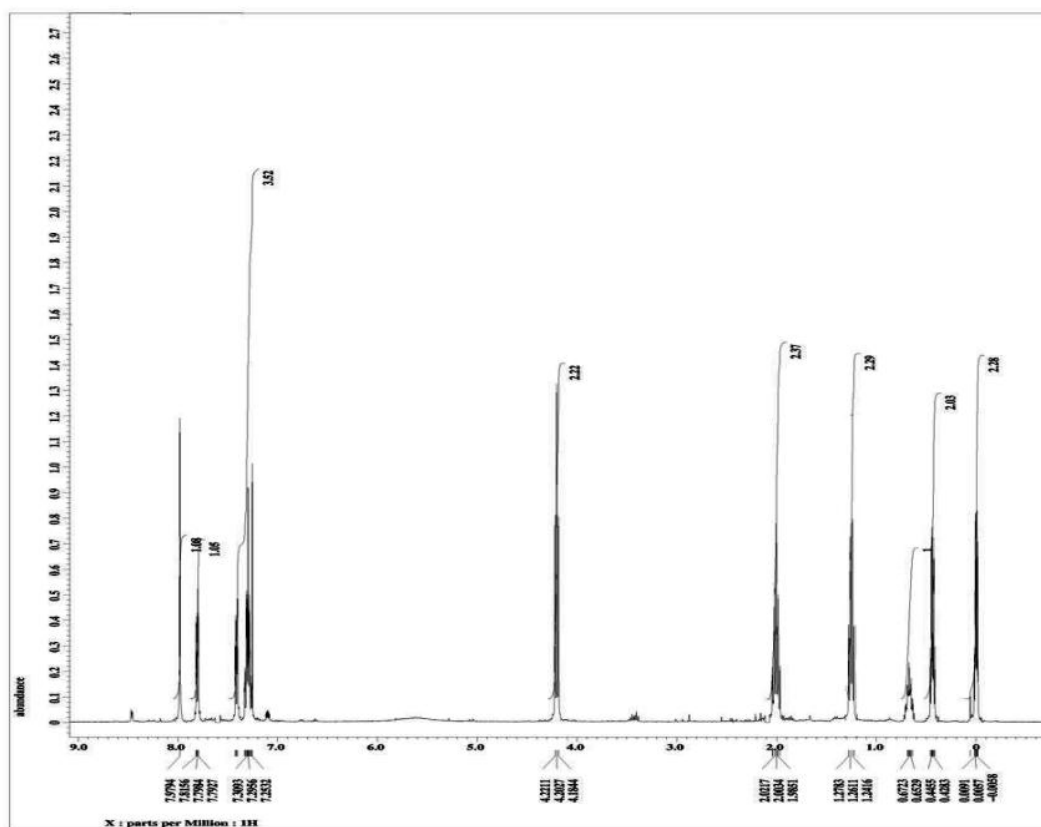
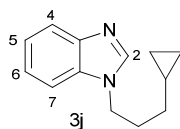
1,1a,2,3,4,10b-Hexahydrocyclopropa[3,4]azepino[1,2-a]benzimidazole (2j).

^{13}C NMR, 100 MHz, CDCl_3



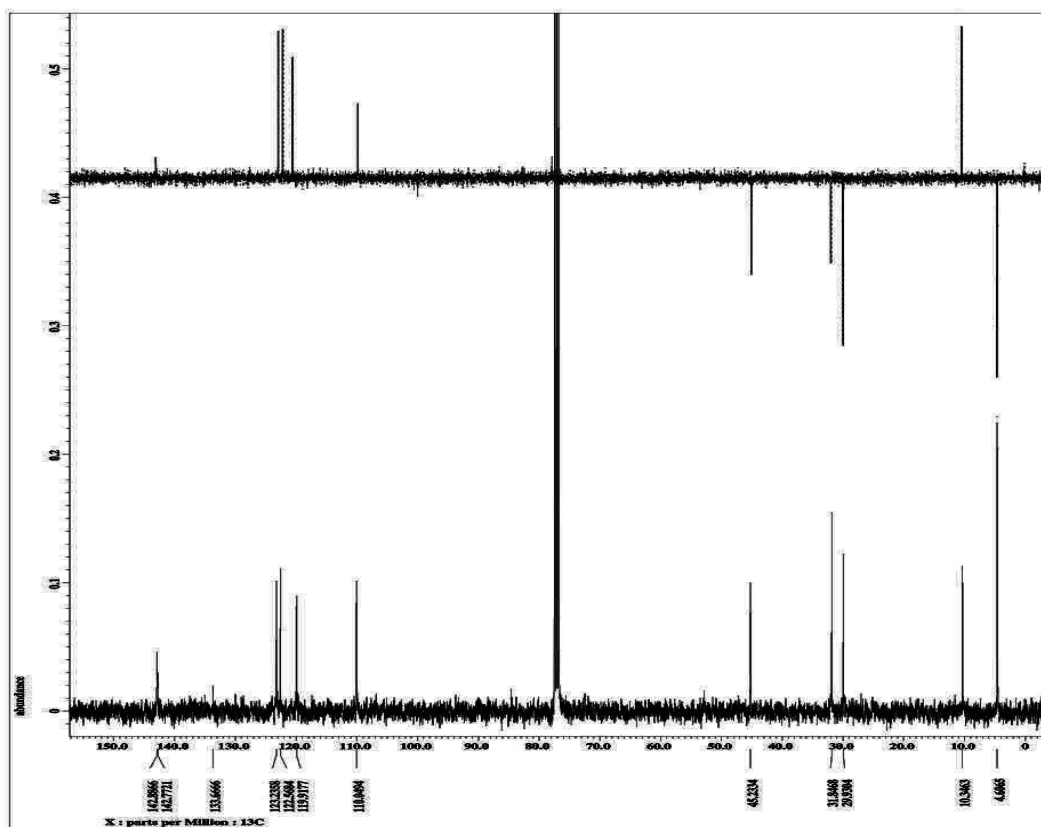
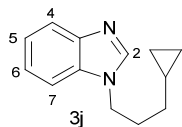
1-(3-Cyclopropylpropyl)-1H-benzimidazole (3j).

¹H NMR, 400 MHz, CDCl₃



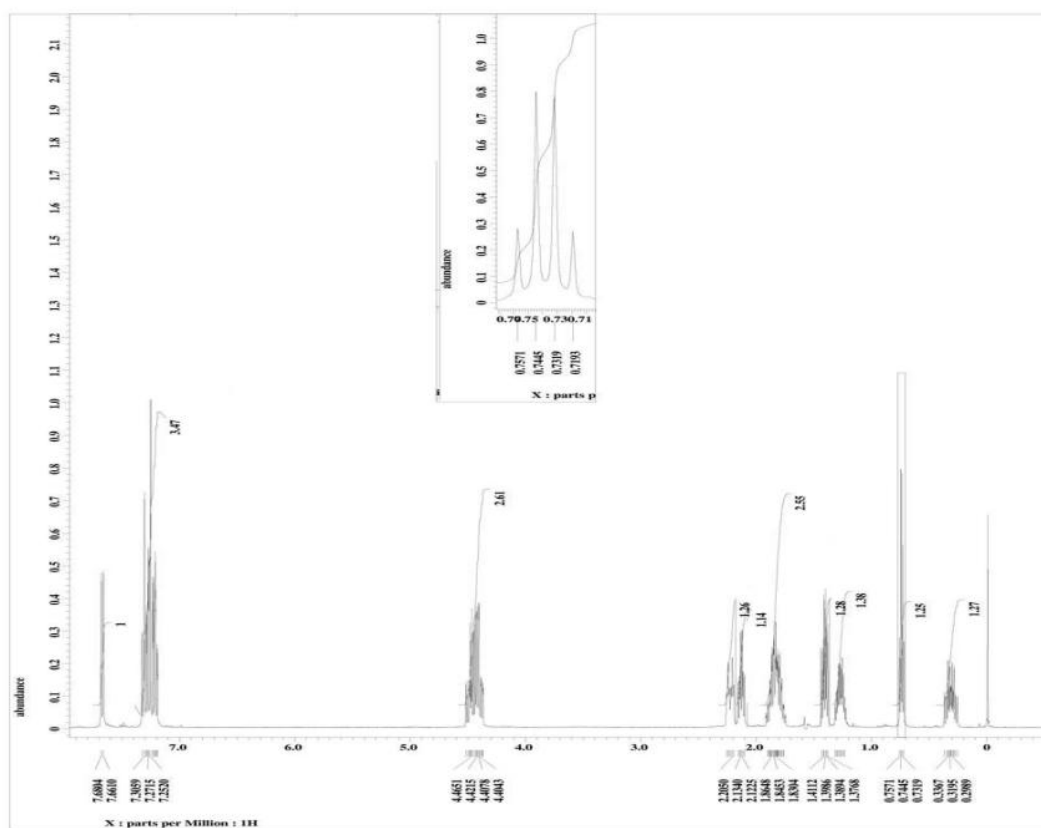
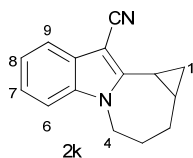
1-(3-Cyclopropylpropyl)-1H-benzimidazole (3j).

^{13}C NMR, 100 MHz, CDCl_3



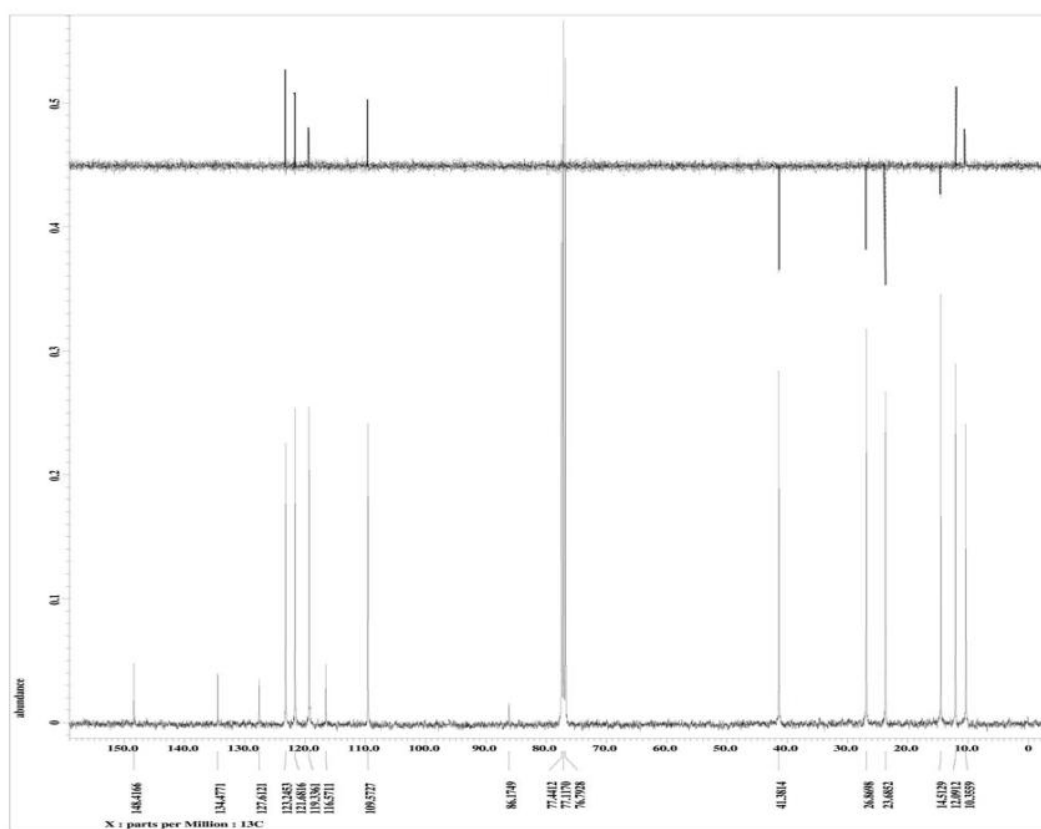
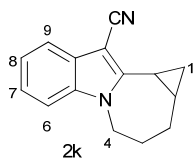
1,1a,2,3,4,10b-Hexahydrocyclopropa[3,4]azepino[1,2-a]indole-10-carbonitrile (2k).

¹H NMR, 400 MHz, CDCl₃



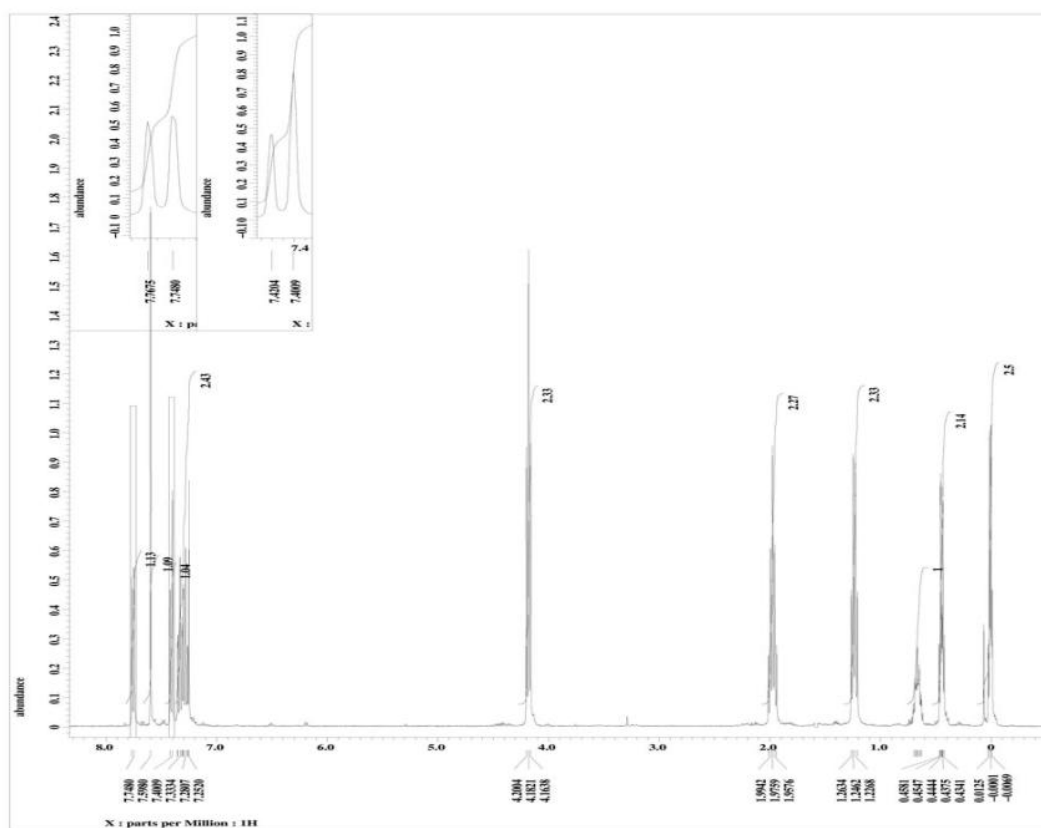
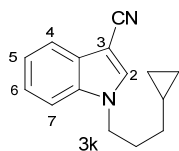
1,1a,2,3,4,10b-Hexahydrocyclopropa[3,4]azepino[1,2-a]indole-10-carbonitrile (2k).

¹³C NMR, 100 MHz, CDCl₃



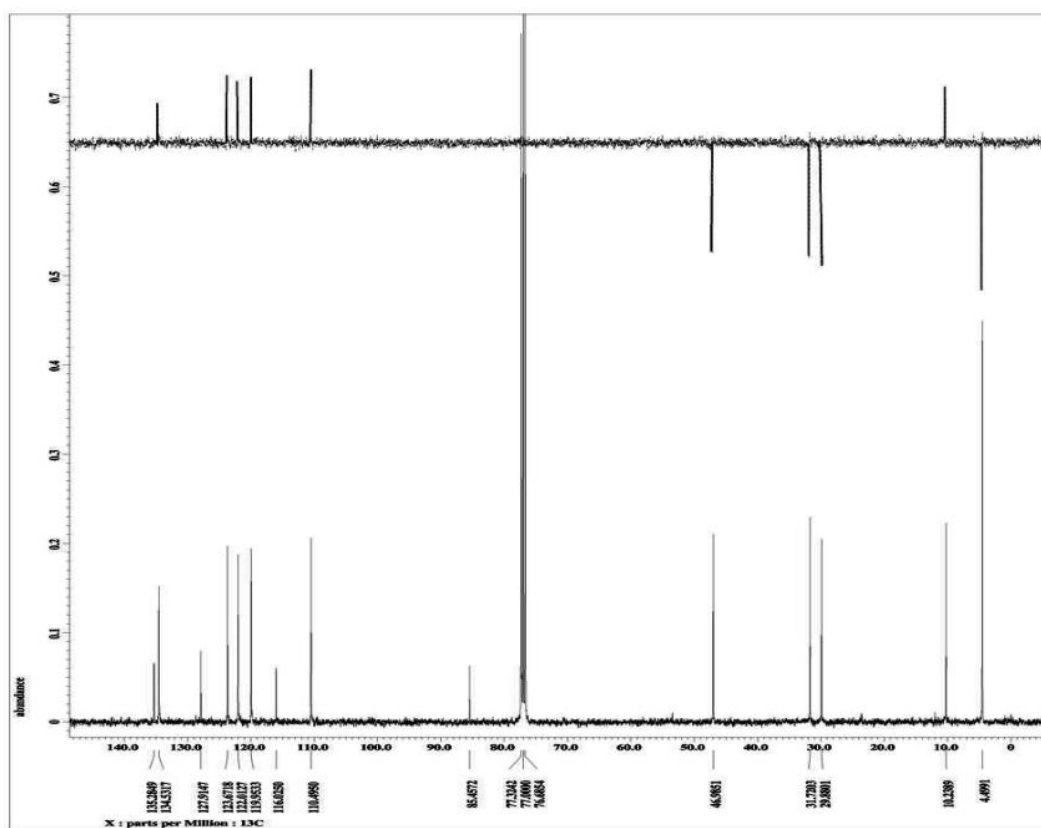
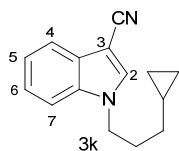
1-(3-Cyclopropylpropyl)-1H-indole-3-carbonitrile (3k).

¹H NMR, 400 MHz, CDCl₃



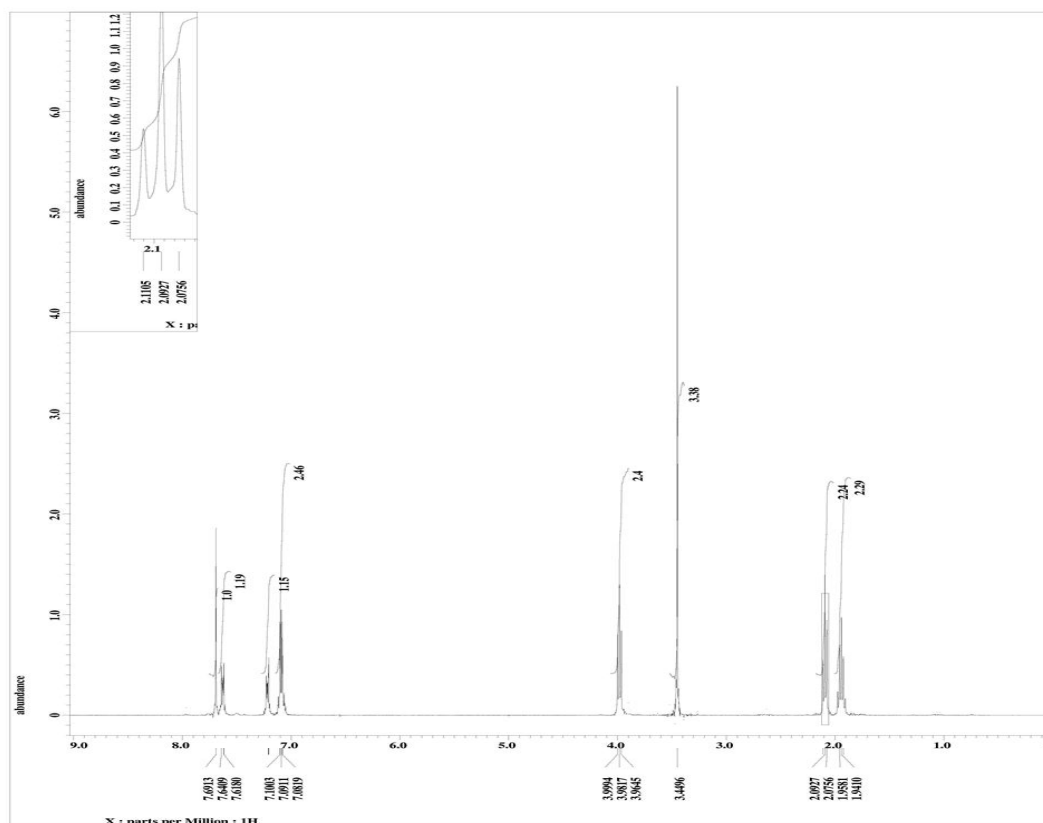
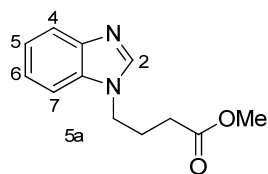
1-(3-Cyclopropylpropyl)-1H-indole-3-carbonitrile (3k).

^{13}C NMR, 100 MHz, CDCl_3



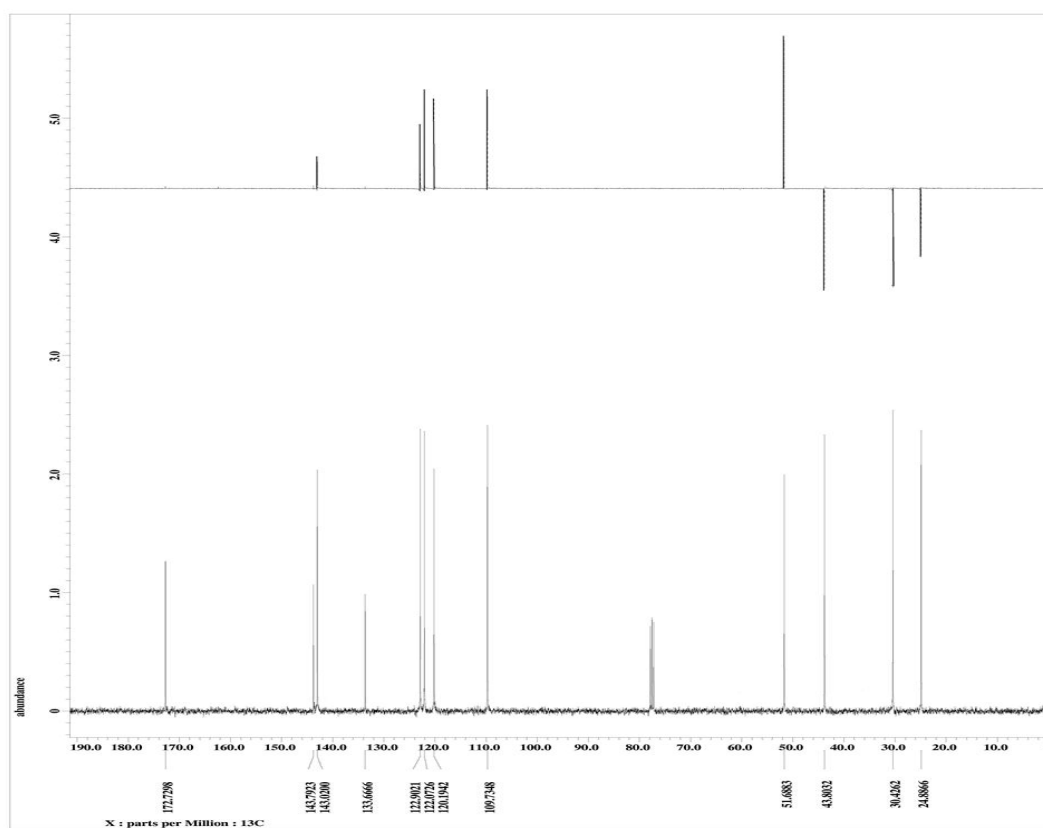
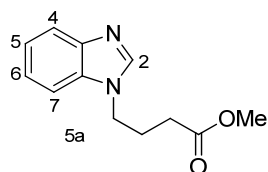
Methyl 4-(1H-benzimidazol-1-yl)butanoate (5a).

¹H NMR, 400 MHz, CDCl₃



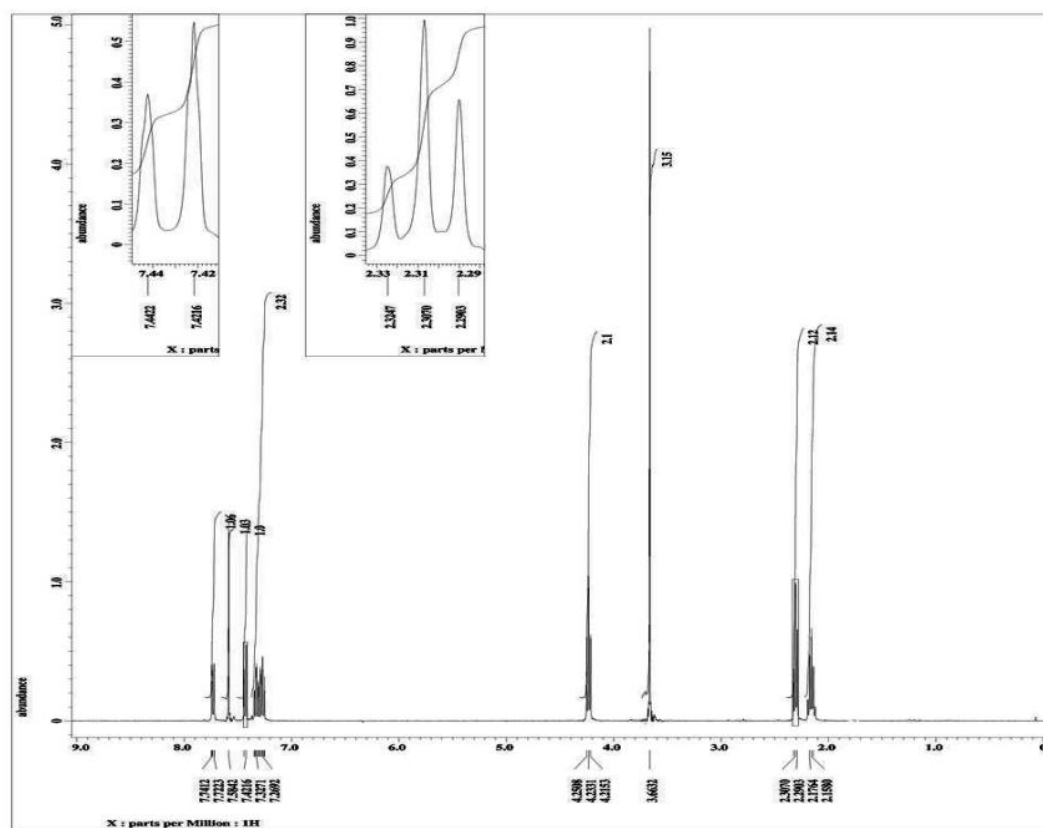
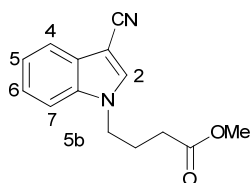
Methyl 4-(1H-benzimidazol-1-yl)butanoate (5a).

¹³C NMR, 100 MHz, CDCl₃



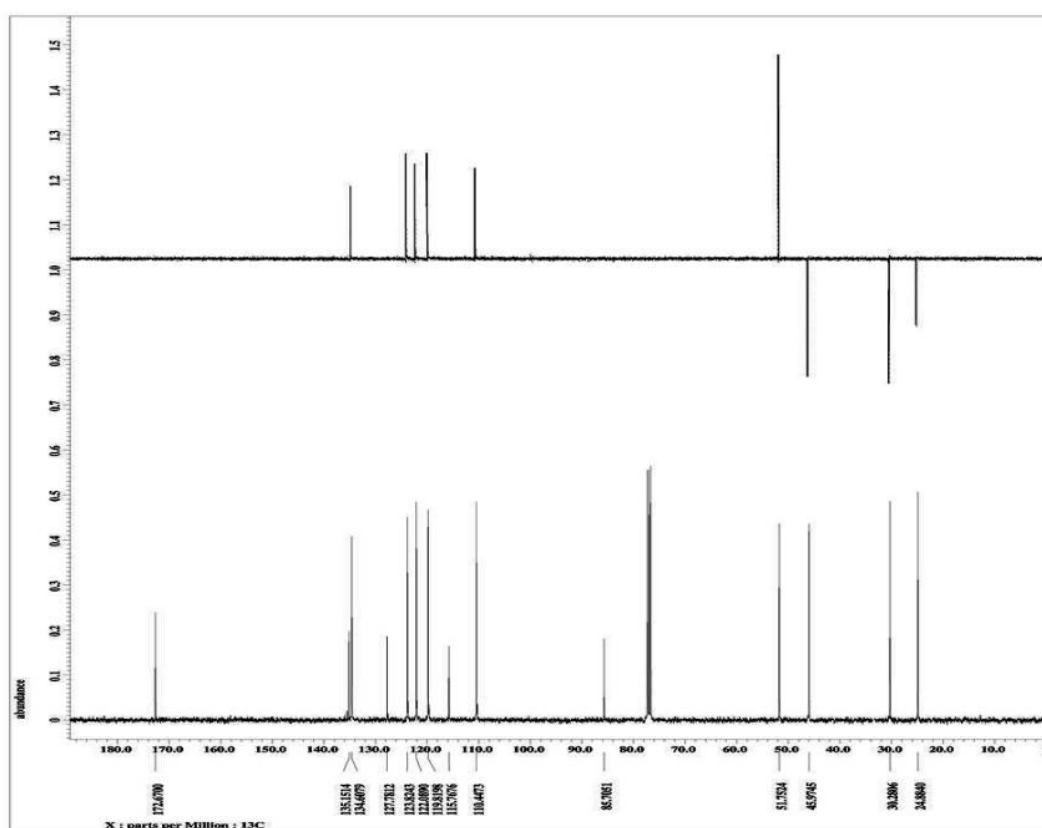
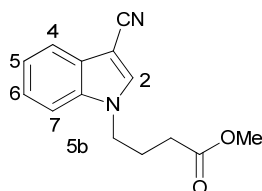
Methyl 4-(3-cyano-1H-indol-1-yl)butanoate (5b).

¹H NMR, 400 MHz, CDCl₃



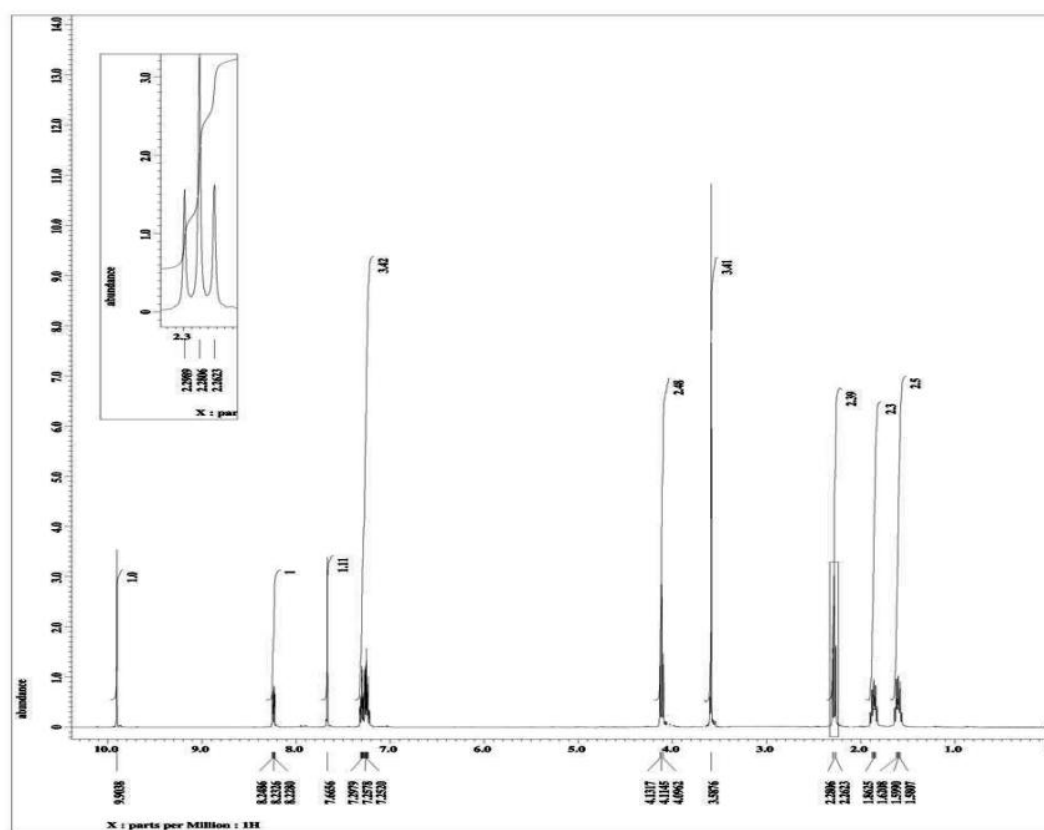
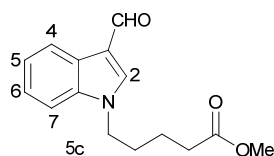
Methyl 4-(3-cyano-1H-indol-1-yl)butanoate (5b).

^{13}C NMR, 100 MHz, CDCl_3



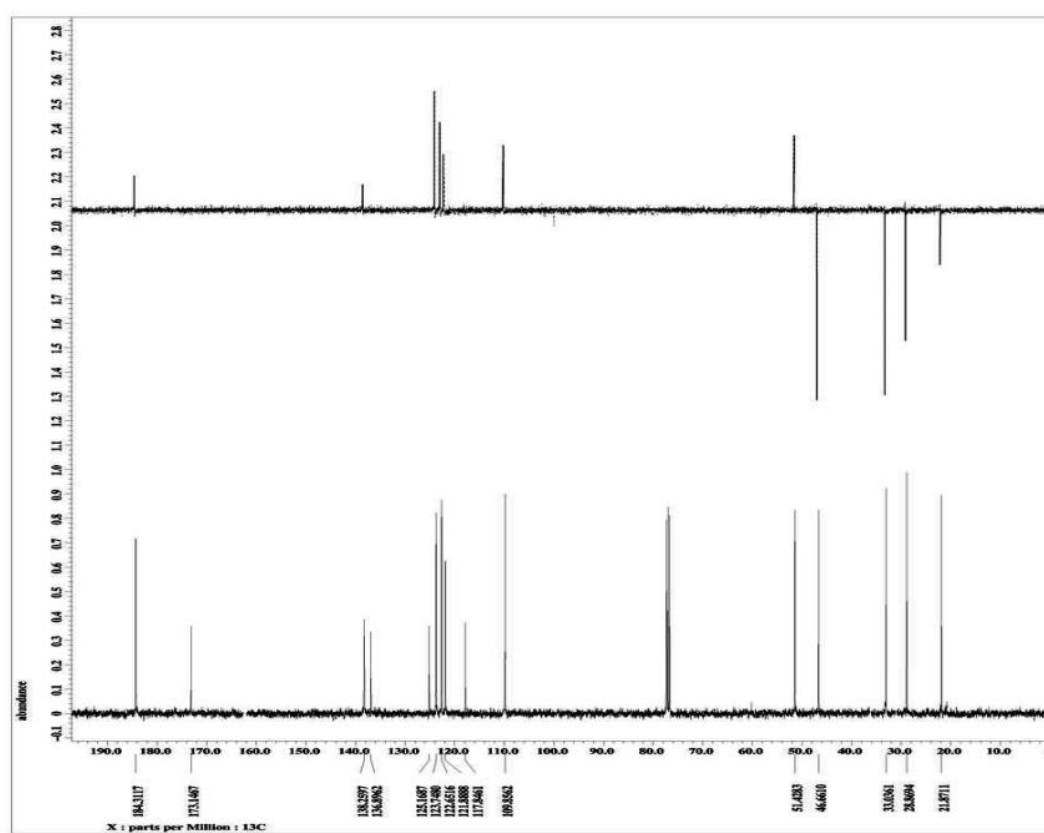
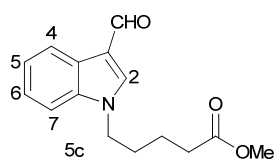
Methyl 5-(3-formyl-1H-indol-1-yl)pentanoate (5c).

¹H NMR, 400 MHz, CDCl₃



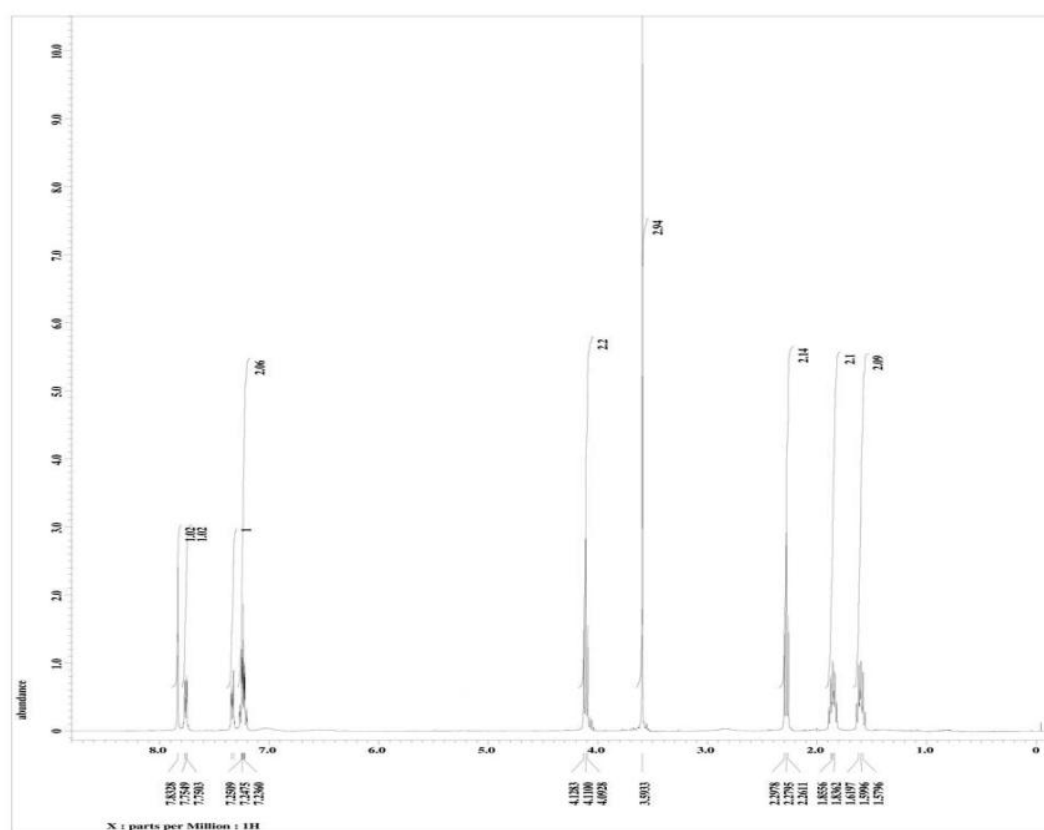
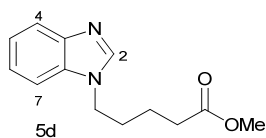
Methyl 5-(3-formyl-1H-indol-1-yl)pentanoate (5c).

^{13}C NMR, 100 MHz, CDCl_3



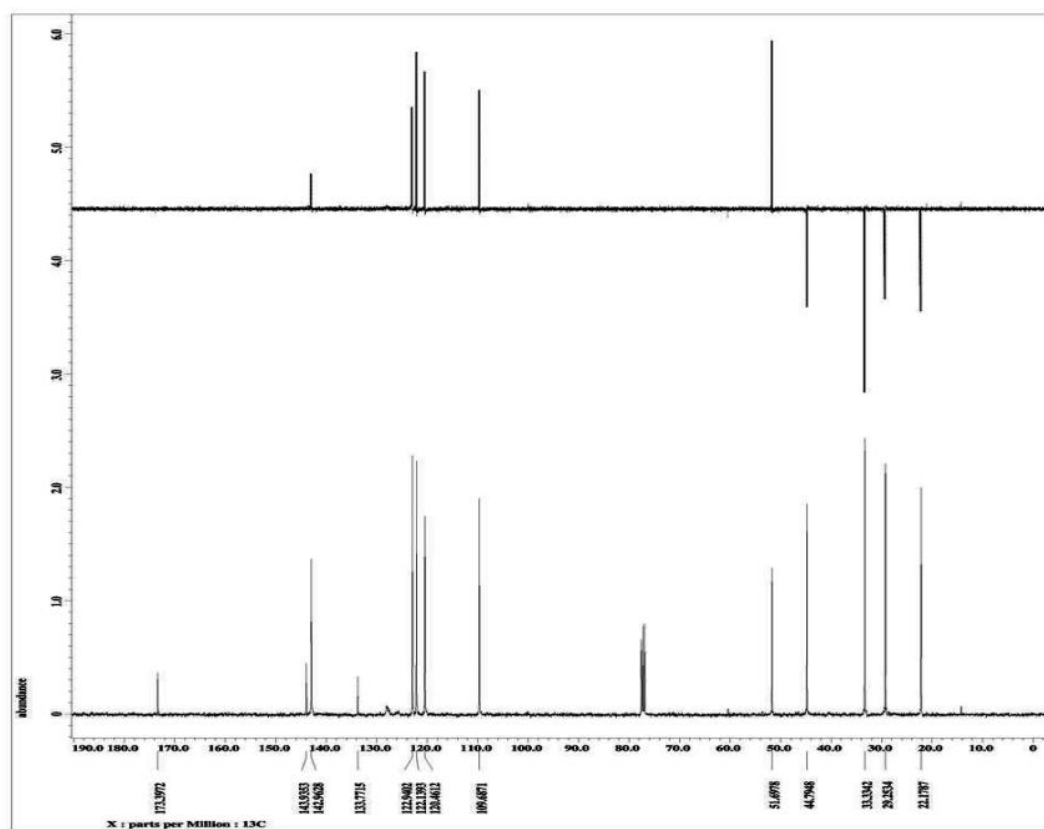
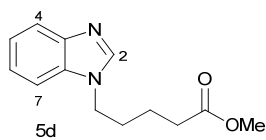
Methyl 5-(1H-benzimidazol-1-yl)pentanoate (5d).

¹H NMR, 400 MHz, CDCl₃



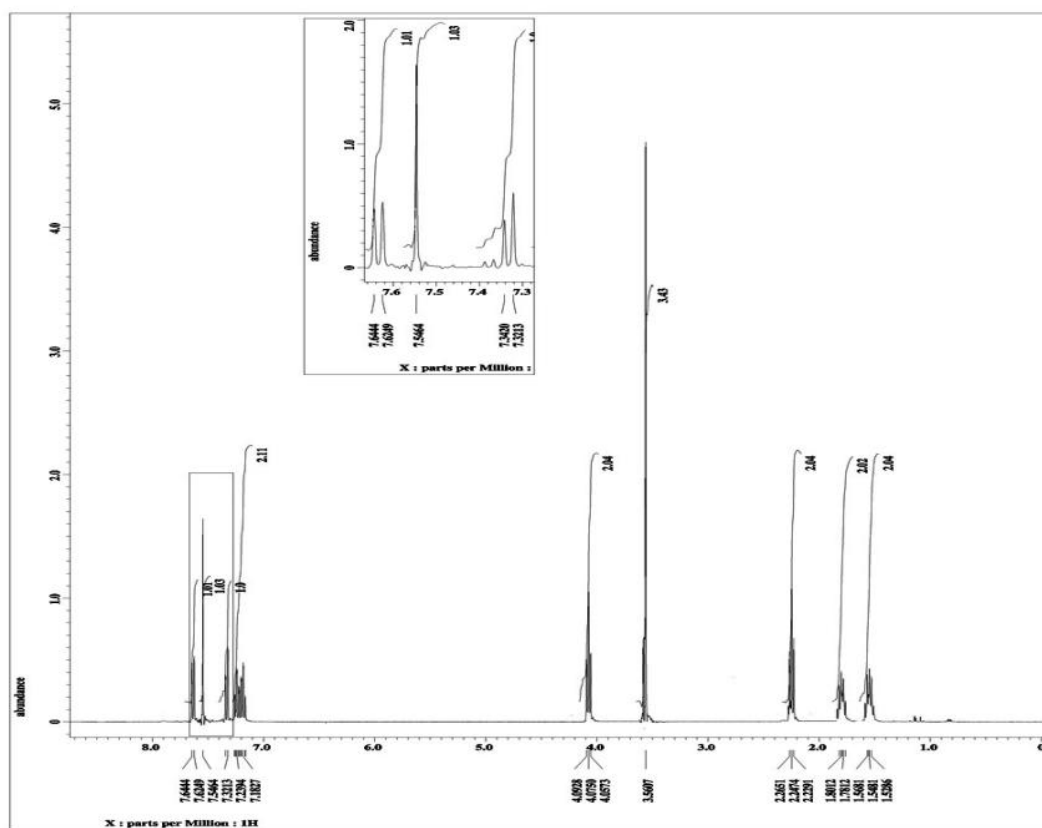
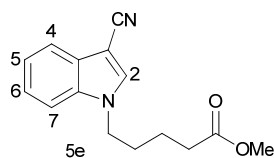
Methyl 5-(1H-benzimidazol-1-yl)pentanoate (5d).

¹³C NMR, 100 MHz, CDCl₃



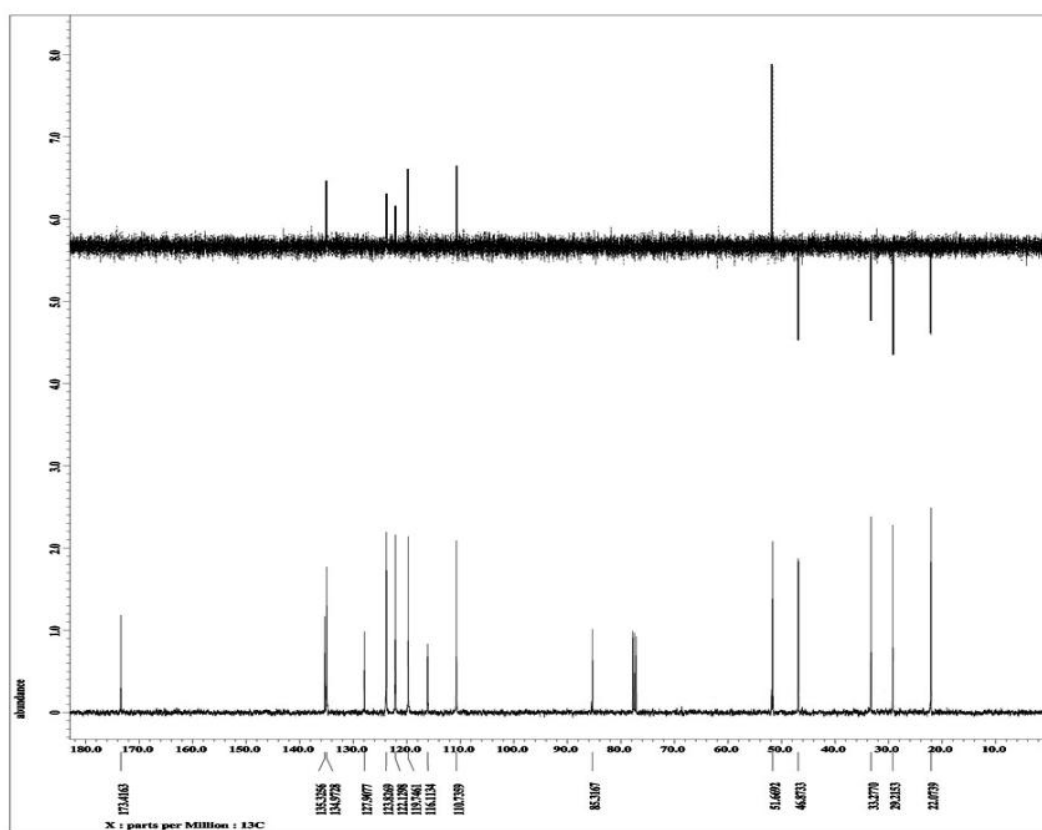
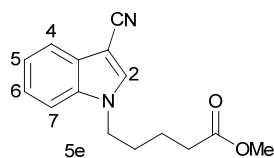
Methyl 5-(3-cyano-1H-indol-1-yl)pentanoate (5e).

¹H NMR, 400 MHz, CDCl₃



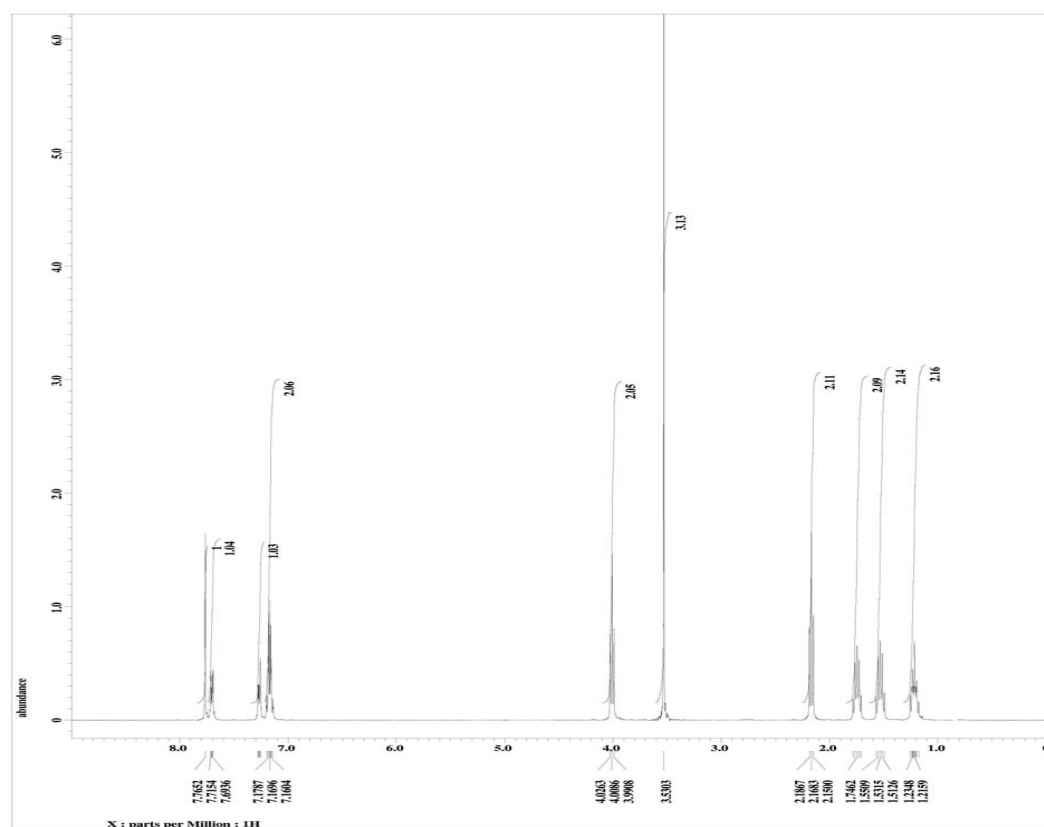
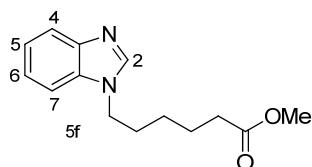
Methyl 5-(3-cyano-1H-indol-1-yl)pentanoate (5e).

¹³C NMR, 100 MHz, CDCl₃



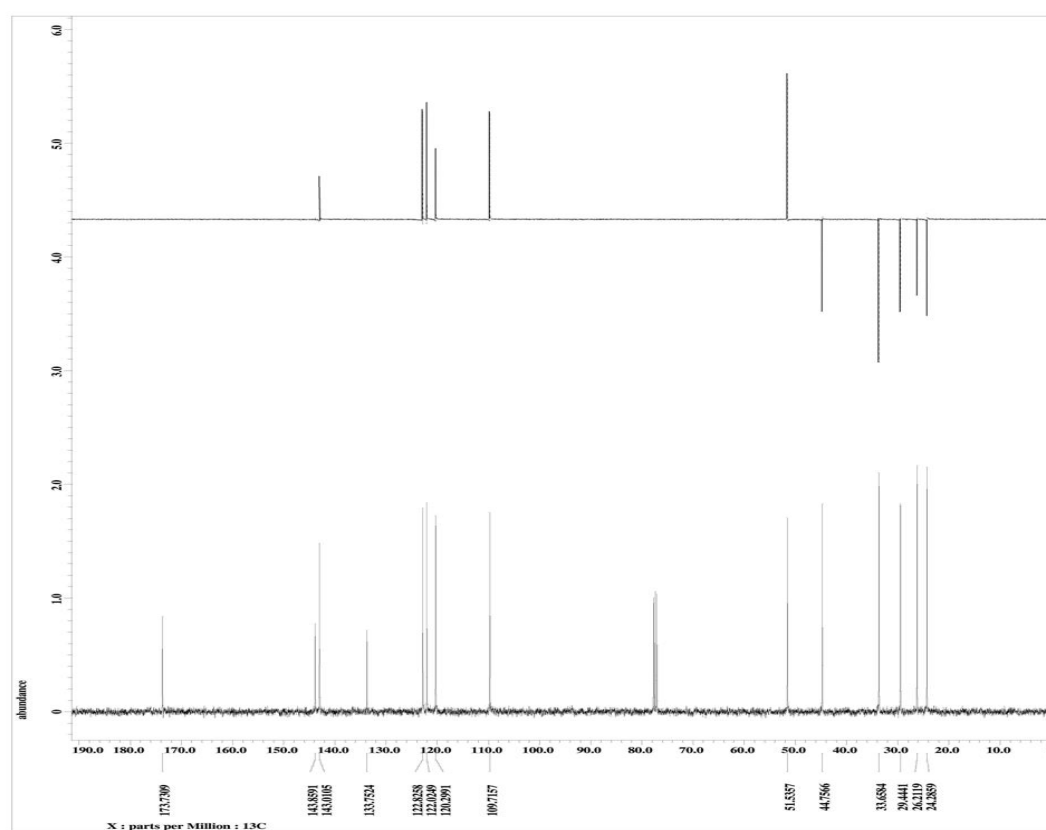
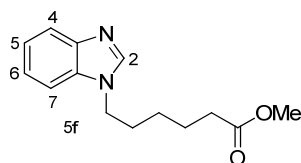
Methyl 6-(1H-benzimidazol-1-yl)hexanoate (5f).

¹H NMR, 400 MHz, CDCl₃



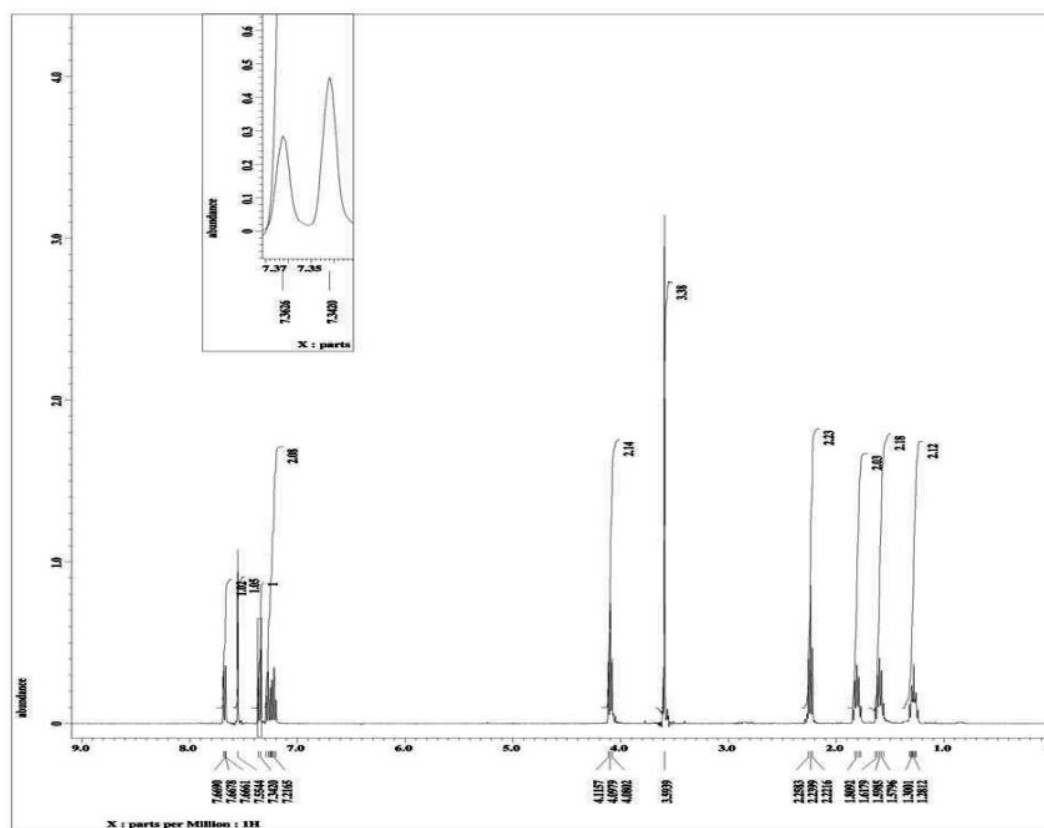
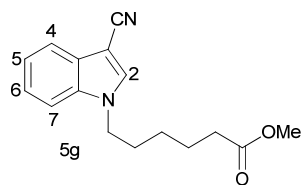
Methyl 6-(1H-benzimidazol-1-yl)hexanoate (5f).

^{13}C NMR, 100 MHz, CDCl_3



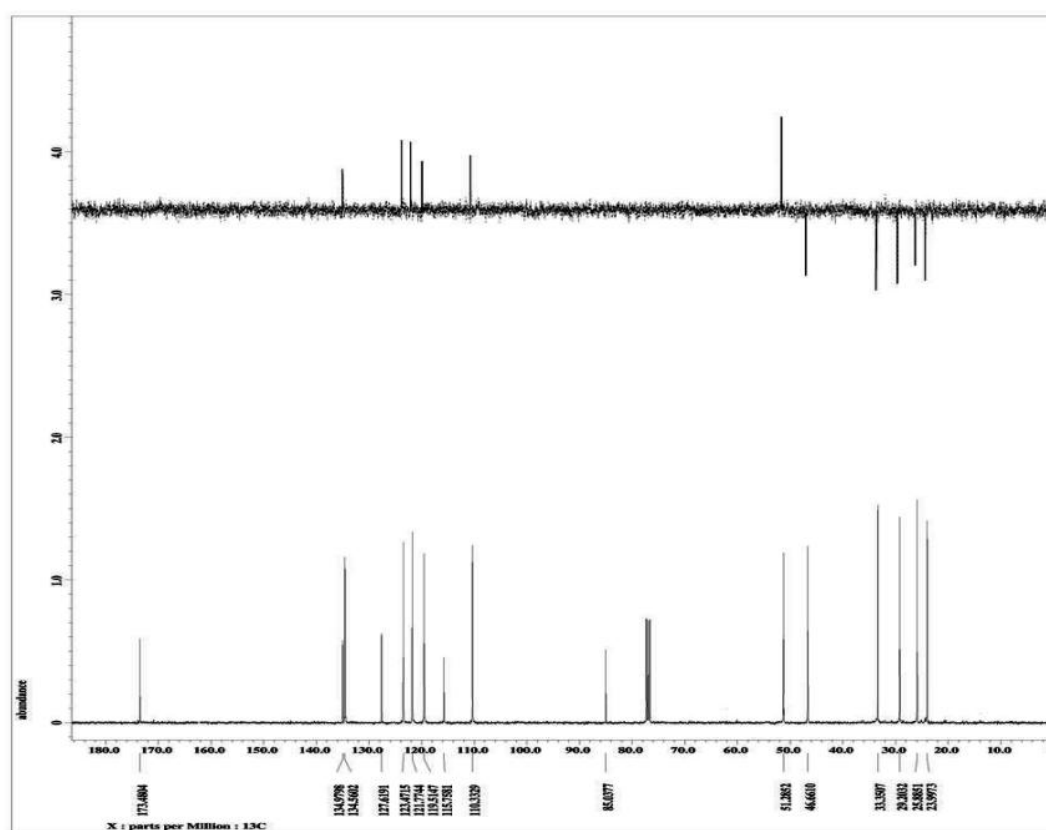
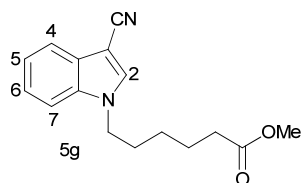
Methyl 6-(3-cyano-1H-indol-1-yl)hexanoate (5g).

¹H NMR, 400 MHz, CDCl₃



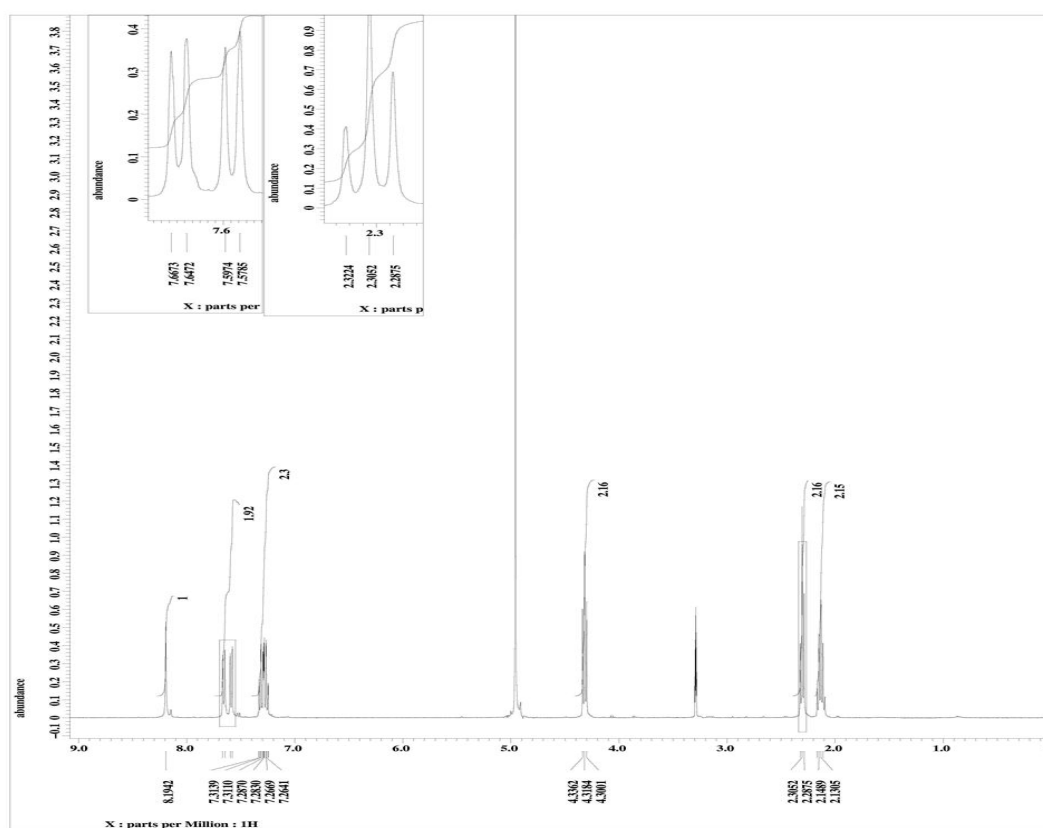
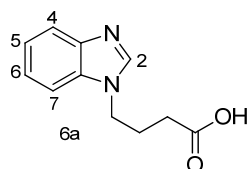
Methyl 6-(3-cyano-1H-indol-1-yl)hexanoate (5g).

¹³C NMR, 100 MHz, CDCl₃



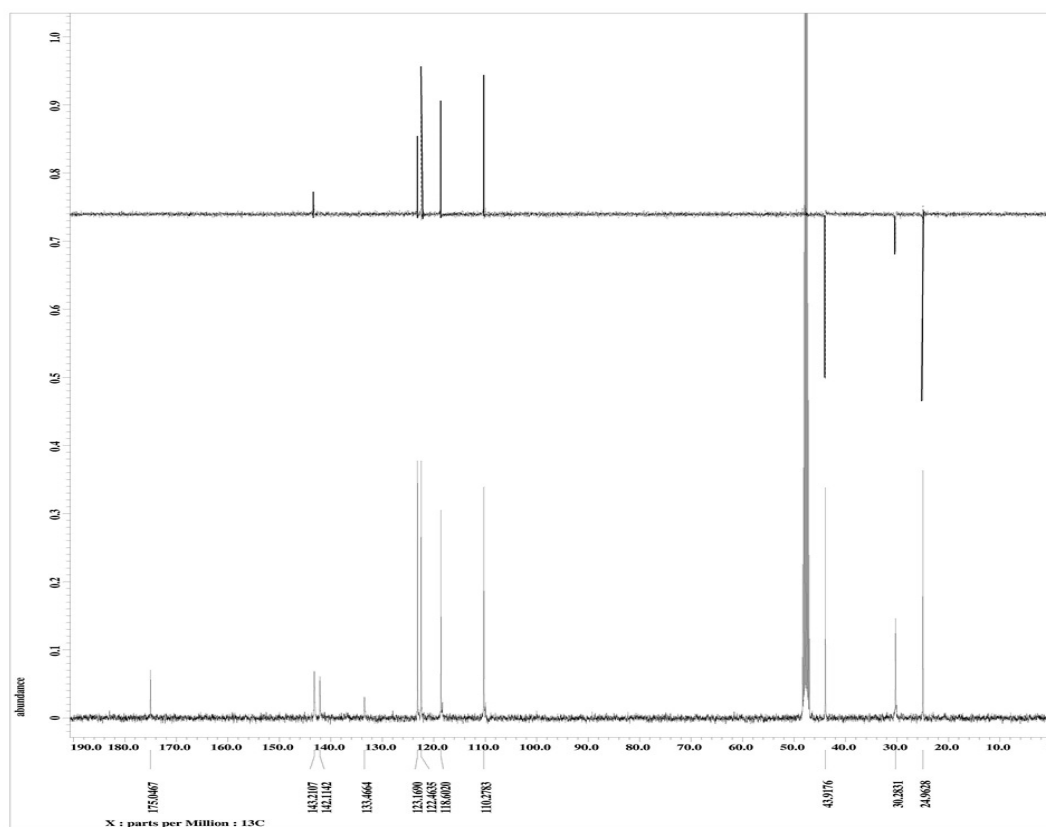
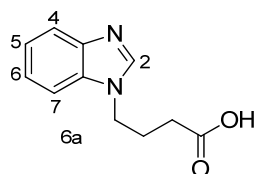
4-(1H-benzimidazol-1-yl)butanoic acid (6a).

¹H NMR, 400 MHz, MeOH-*d*₄



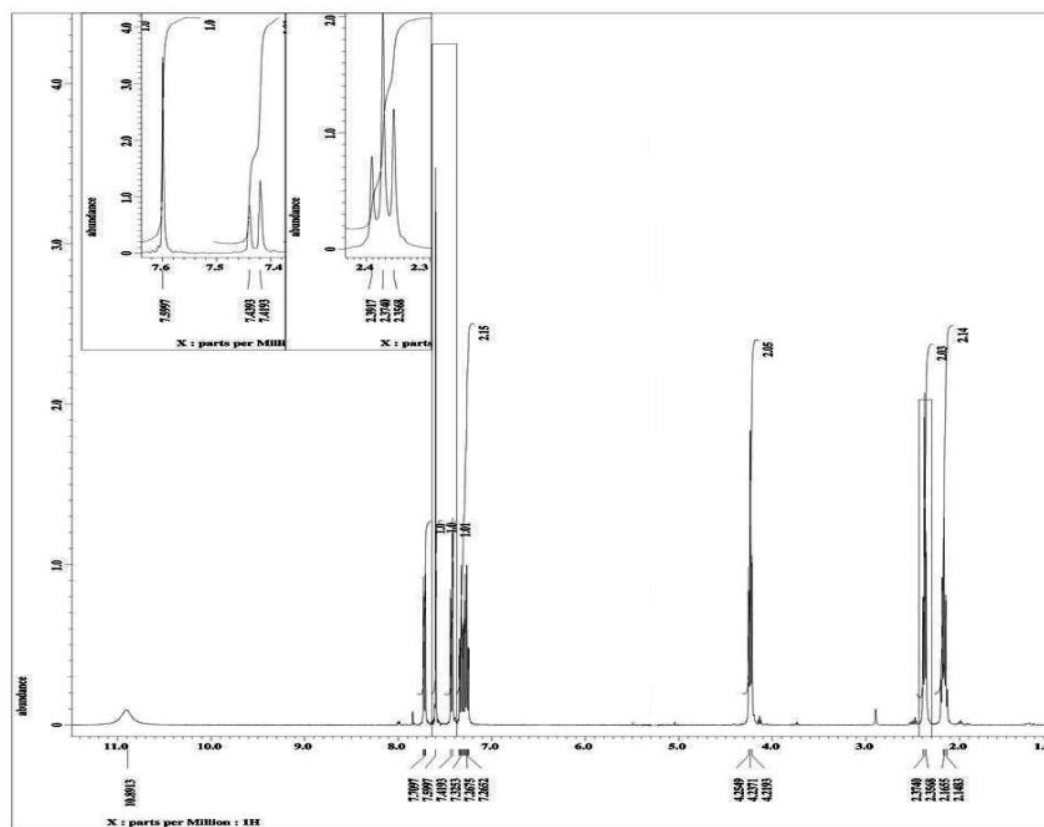
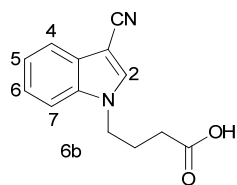
4-(1H-benzimidazol-1-yl)butanoic acid (6a).

¹³C NMR, 100 MHz, MeOH-*d*₄



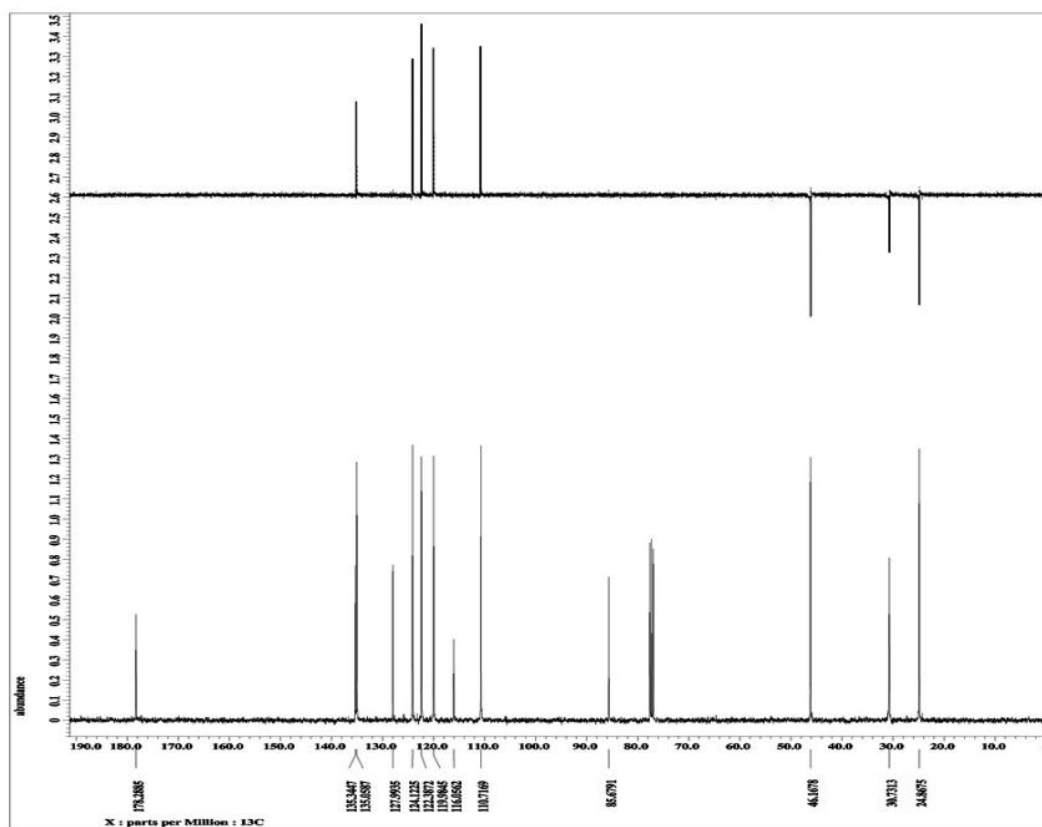
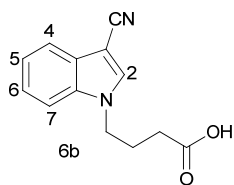
4-(3-Cyano-1H-indol-1-yl)butanoic acid (6b).

¹H NMR, 400 MHz, CDCl₃



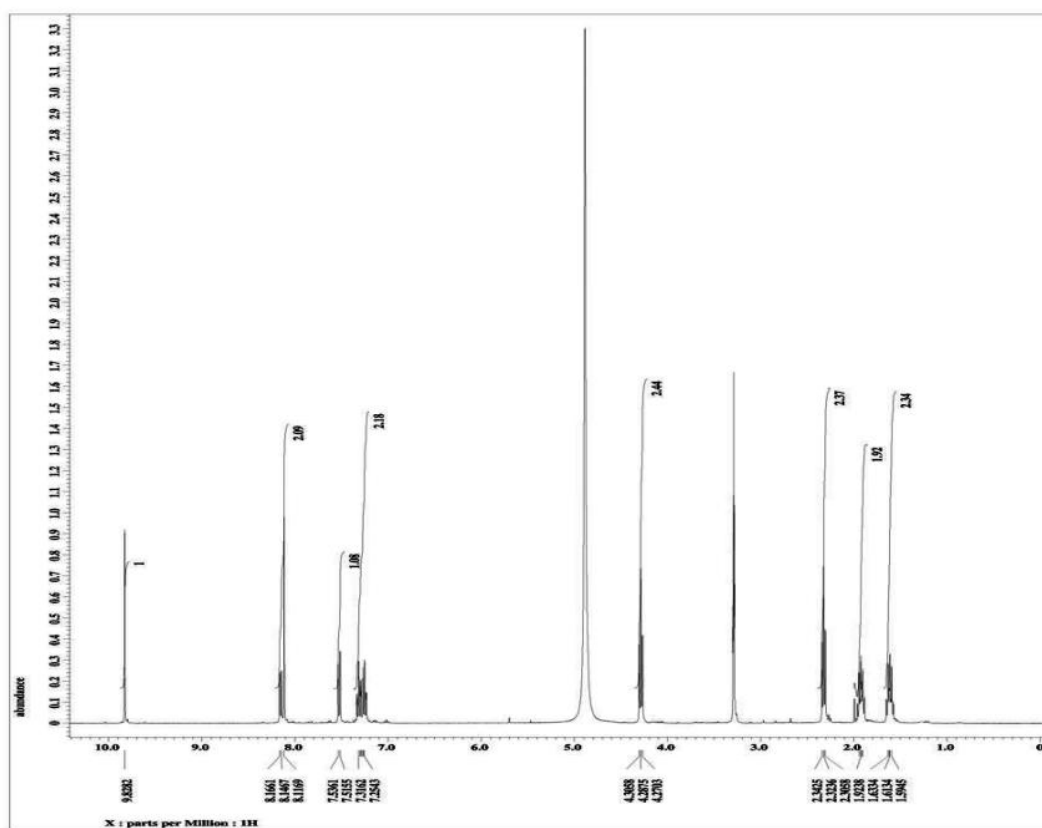
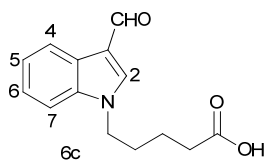
4-(3-Cyano-1H-indol-1-yl)butanoic acid (6b).

^{13}C NMR, 100 MHz, CDCl_3



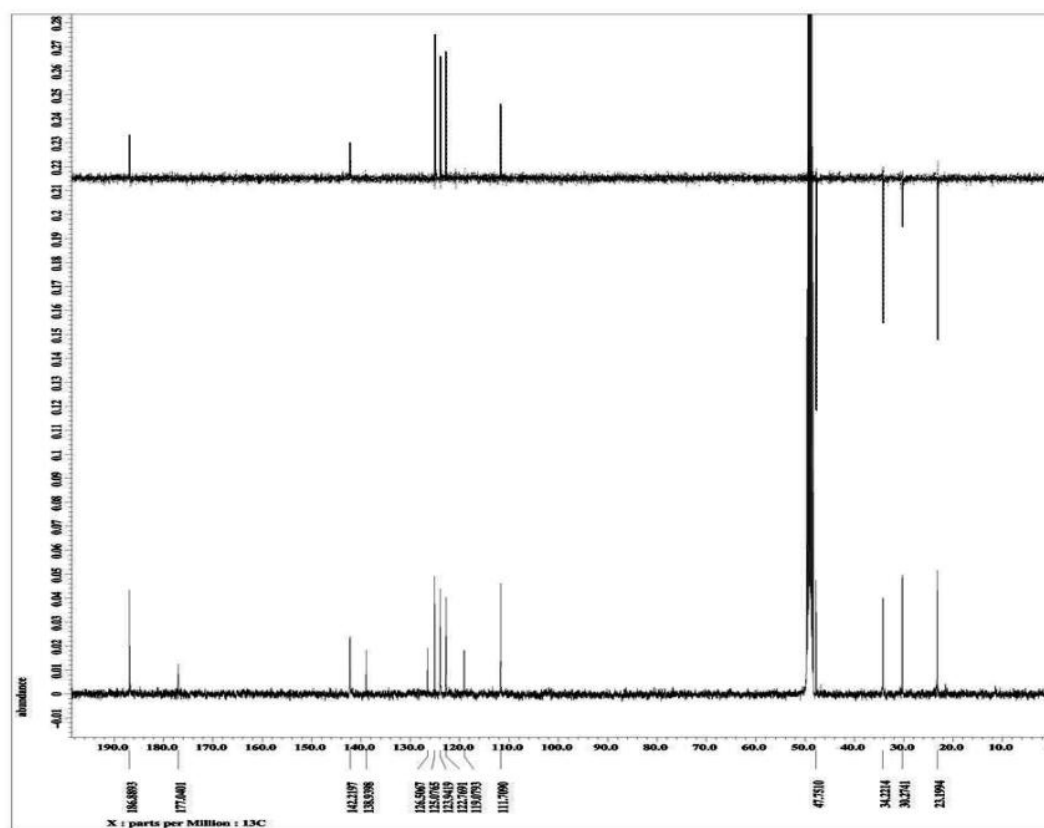
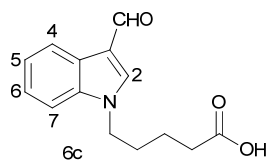
5-(3-Formyl-1H-indol-1-yl)pentanoic acid (6c).

¹H NMR, 400 MHz, MeOH-*d*₄



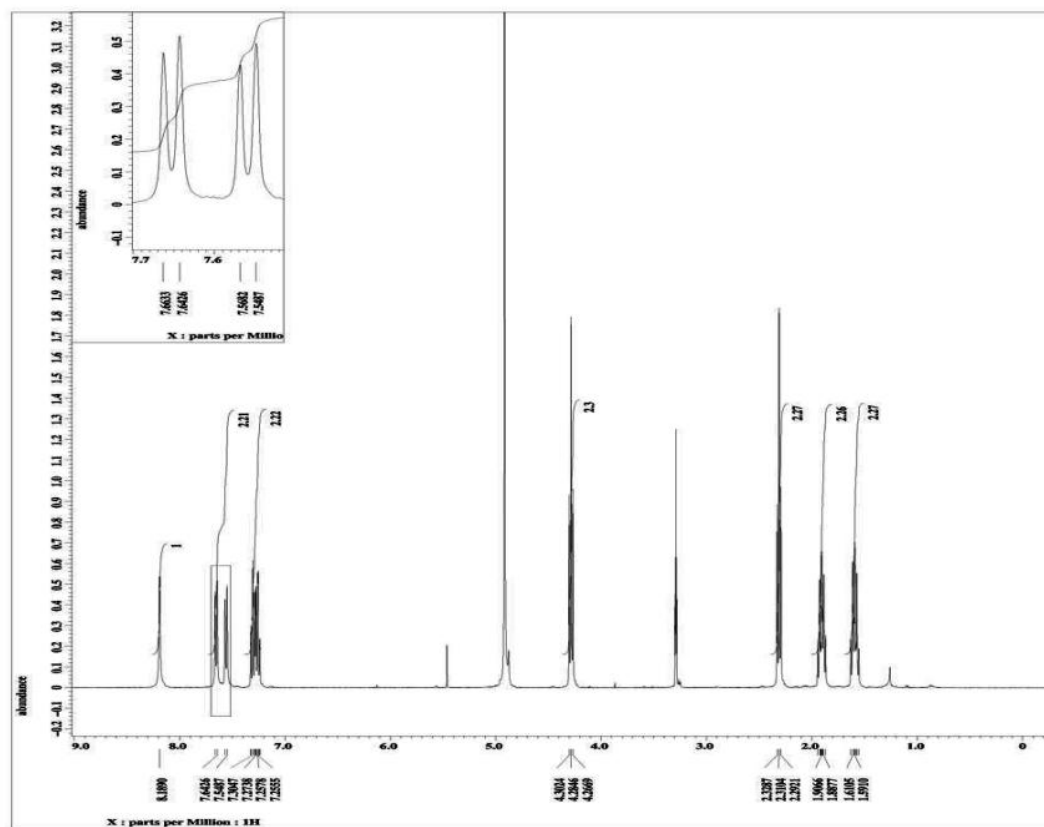
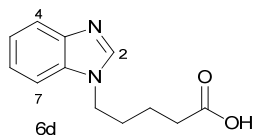
5-(3-Formyl-1H-indol-1-yl)pentanoic acid (6c).

¹³C NMR, 100 MHz, MeOH-*d*₄



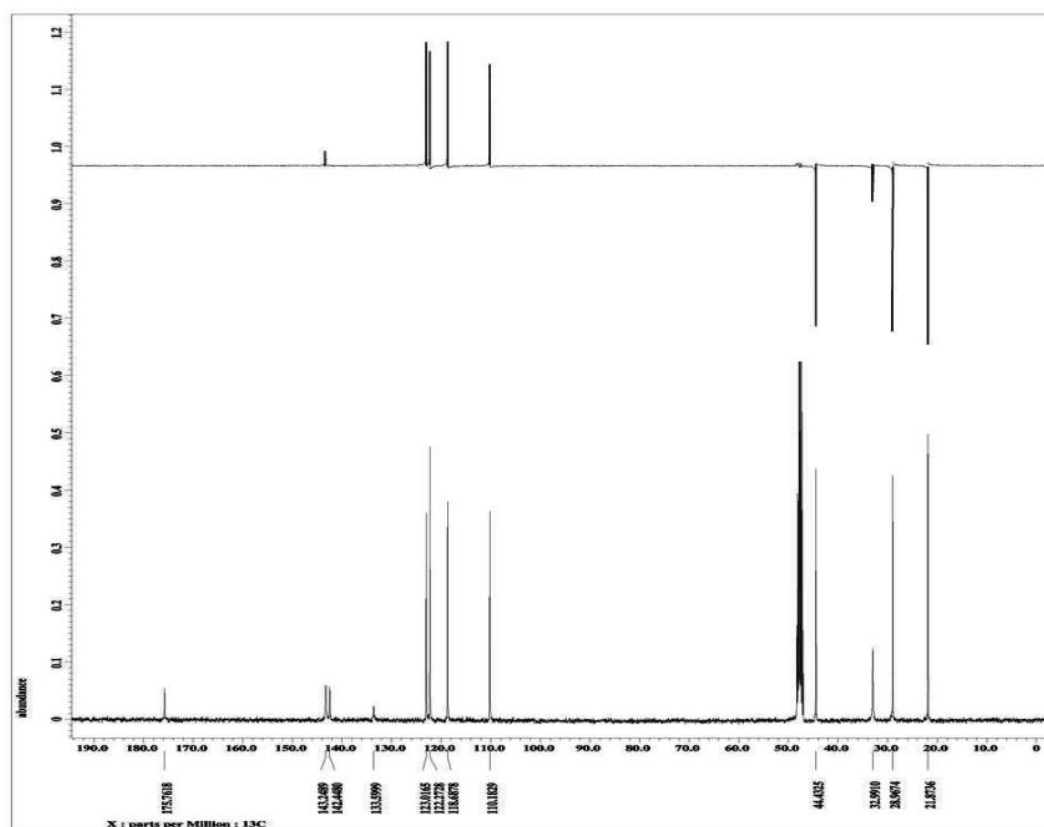
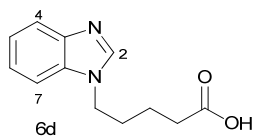
5-(1*H*-benzimidazol-1-yl)pentanoic acid (6d).

¹H NMR, 400 MHz, MeOH-*d*₄



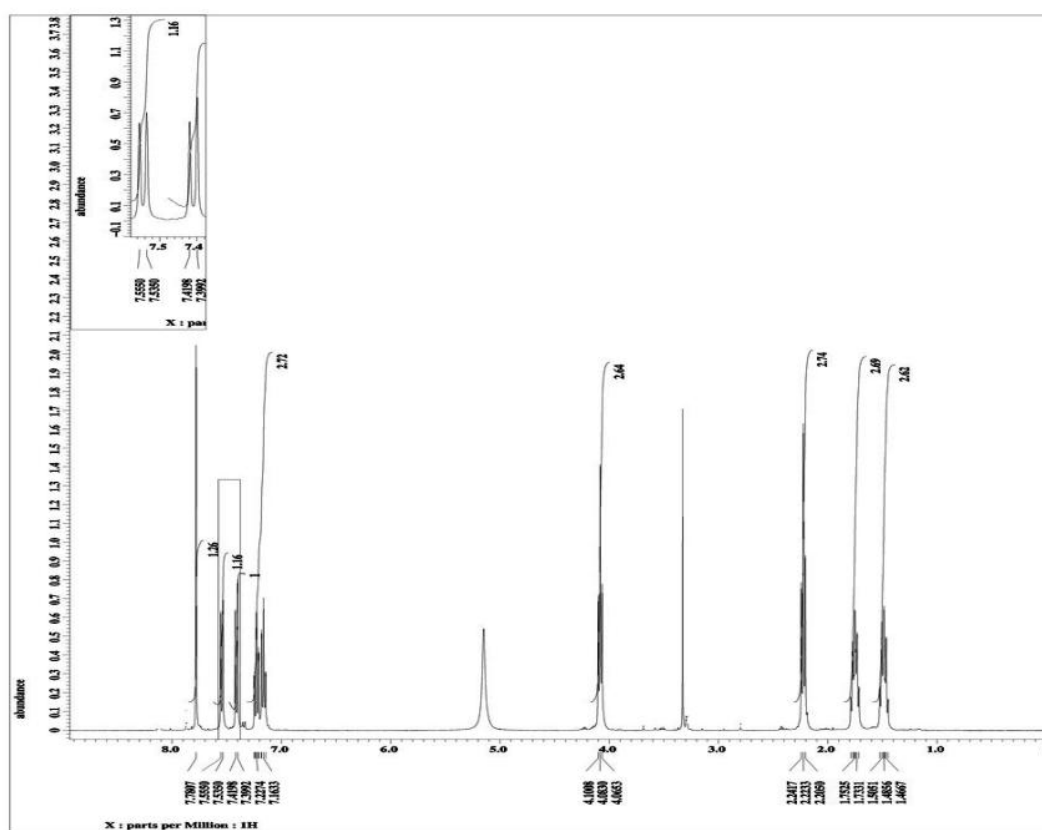
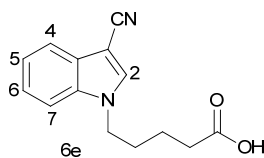
5-(1H-benzimidazol-1-yl)pentanoic acid (6d).

¹³C NMR, 100 MHz, MeOH-*d*₄



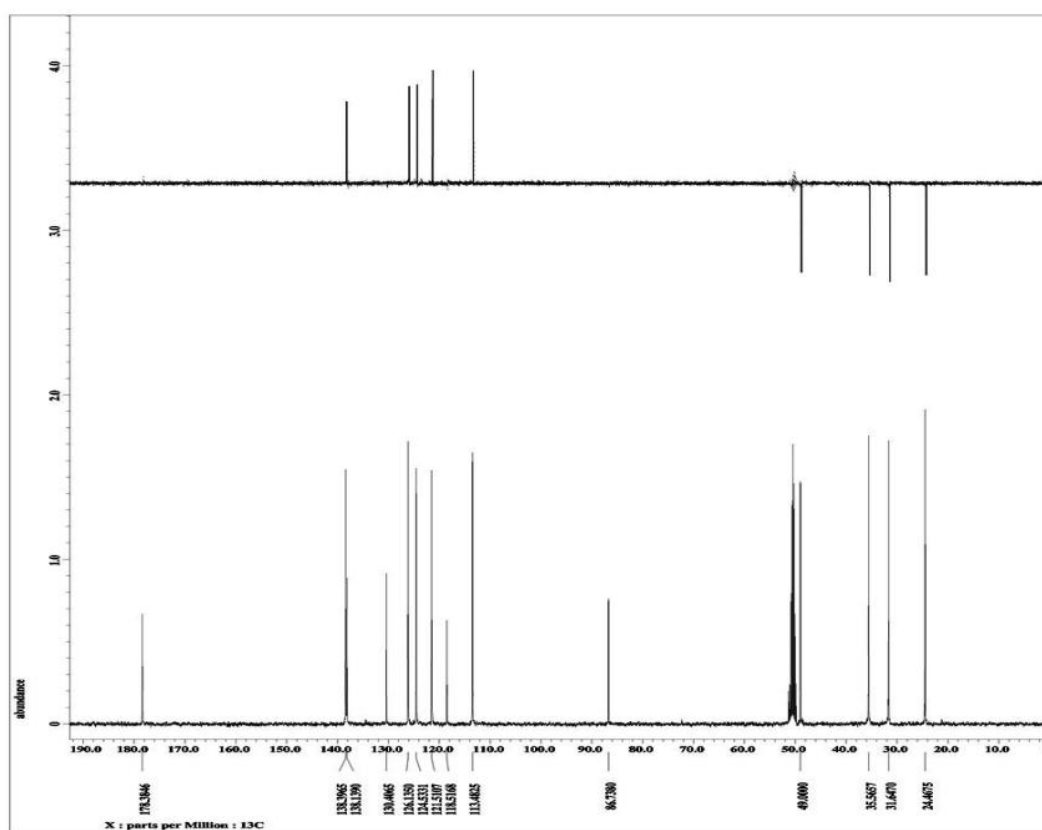
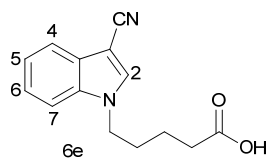
5-(3-Cyano-1H-indol-1-yl)pentanoic acid (6e).

^1H NMR, 400 MHz, $\text{MeOH-}d_4$



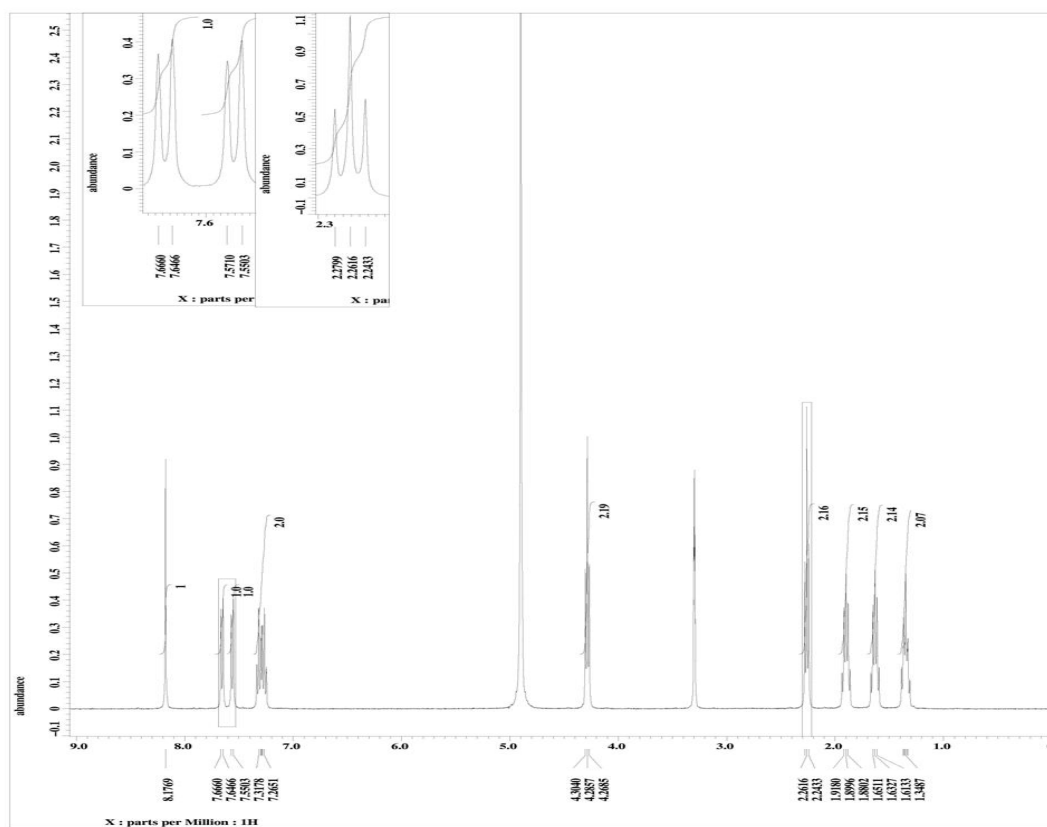
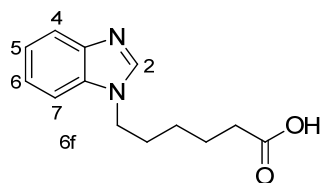
5-(3-Cyano-1H-indol-1-yl)pentanoic acid (6e).

¹³C NMR, 100 MHz, MeOH-d₄



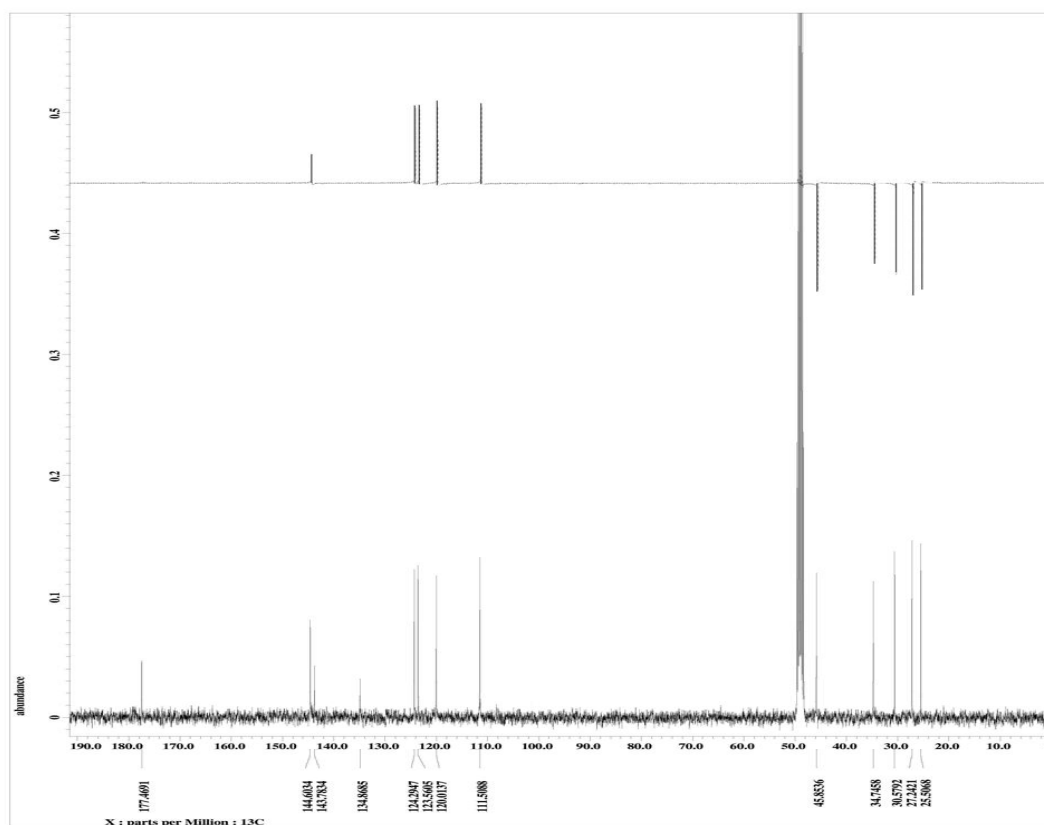
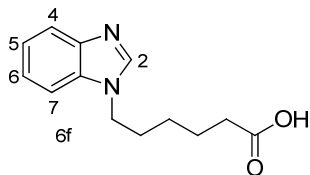
6-(1H-benzimidazol-1-yl)hexanoic acid (6f).

¹H NMR, 400 MHz, MeOH-*d*₄



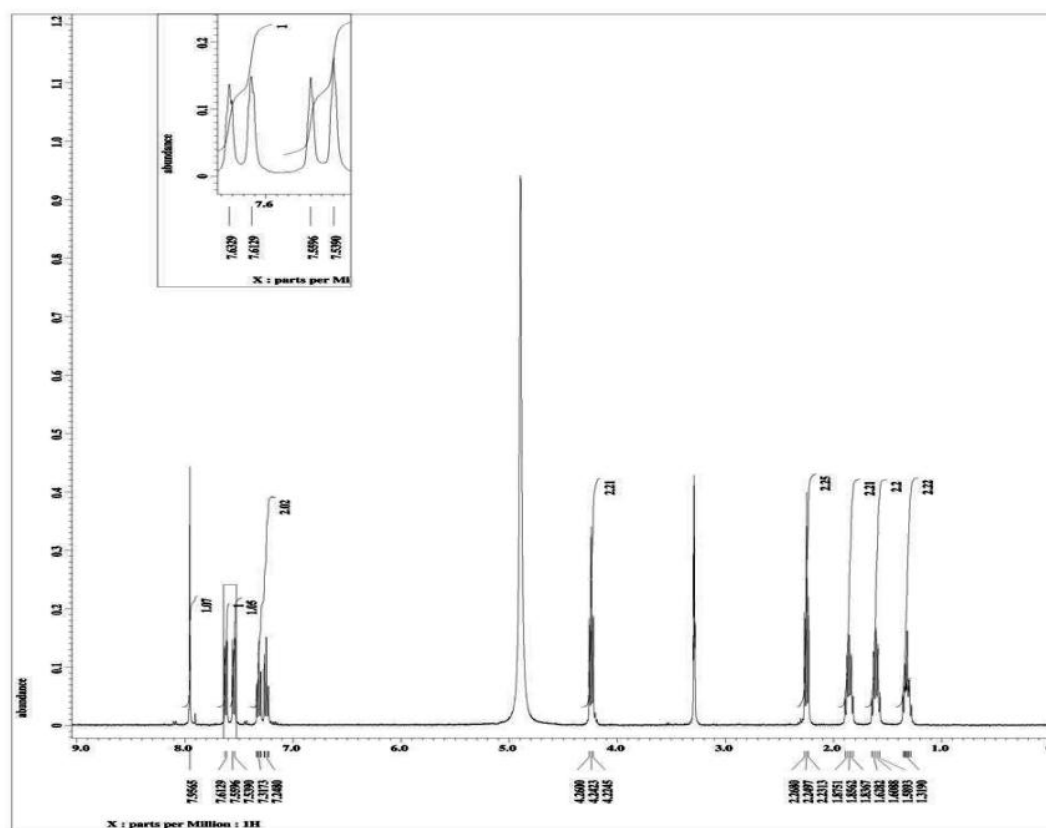
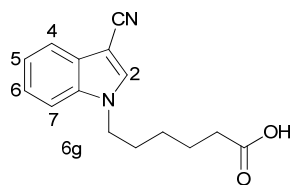
6-(1*H*-benzimidazol-1-yl)hexanoic acid (6f).

¹³C NMR, 100 MHz, MeOH-*d*₄



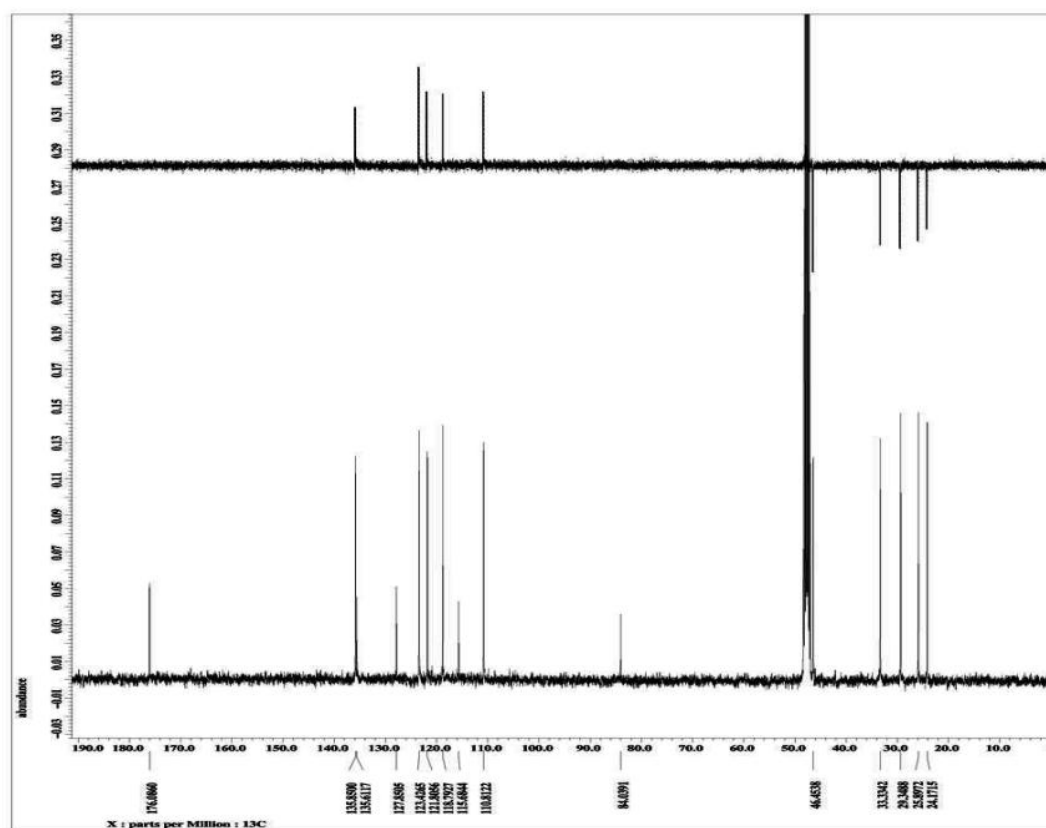
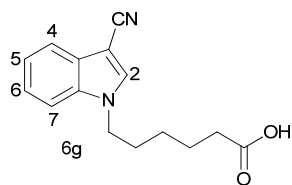
6-(3-Cyano-1H-indol-1-yl)hexanoic acid (6g).

¹H NMR, 400 MHz, MeOH-*d*₄



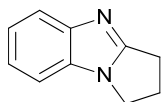
6-(3-Cyano-1H-indol-1-yl)hexanoic acid (6g).

^{13}C NMR, 100 MHz, $\text{MeOH-}d_4$

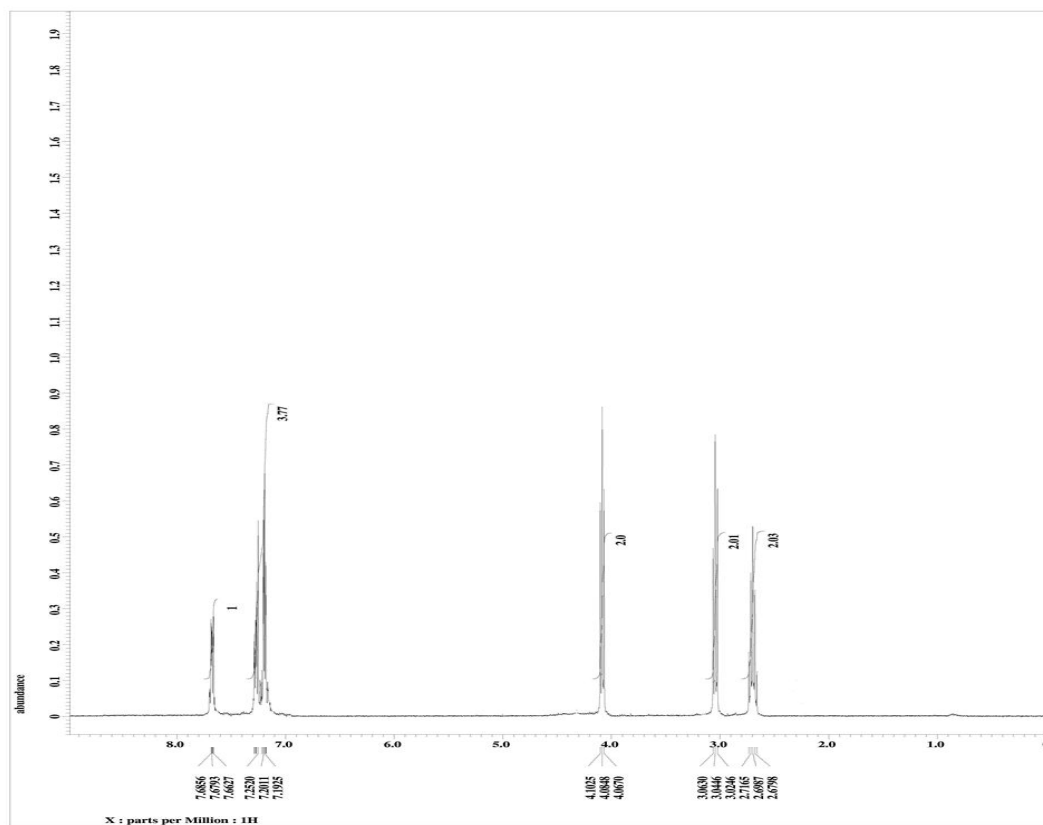


2,3-Dihydro-1H-pyrrolo[1,2-a]benzimidazole (7a).

¹H NMR, 400 MHz, CDCl₃

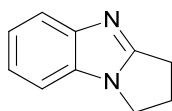


7a

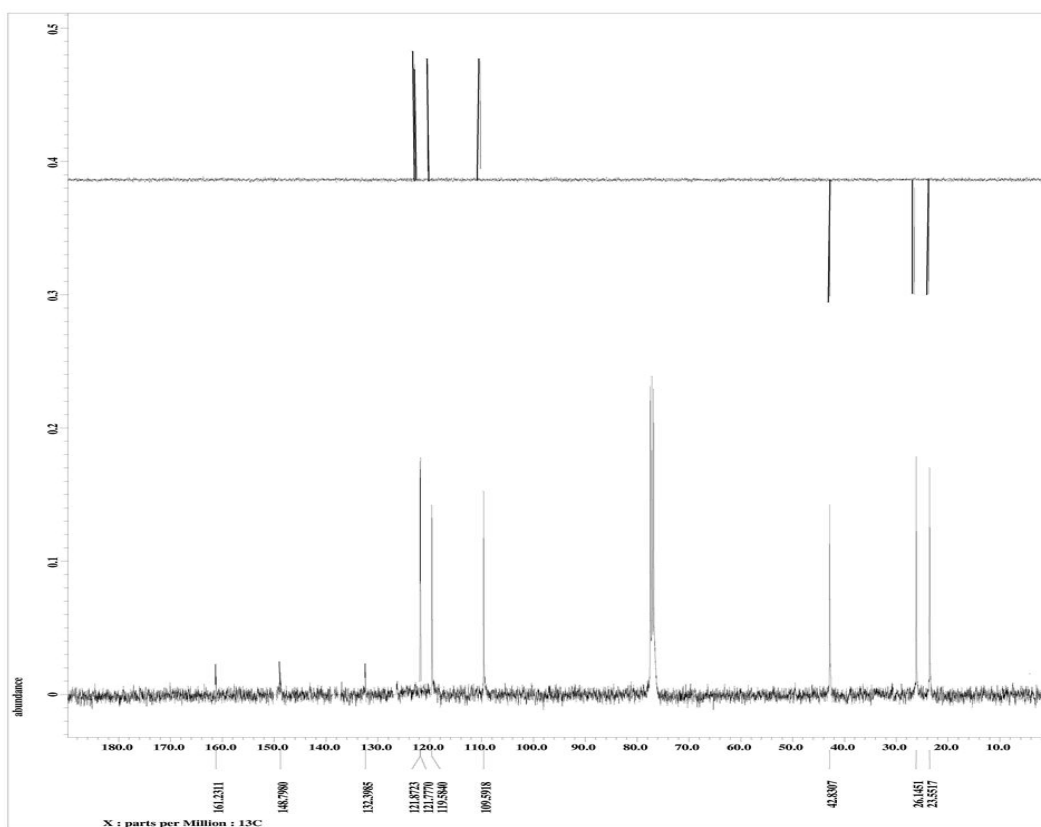


2,3-Dihydro-1H-pyrrolo[1,2-a]benzimidazole (7a).

^{13}C NMR, 100 MHz, CDCl_3

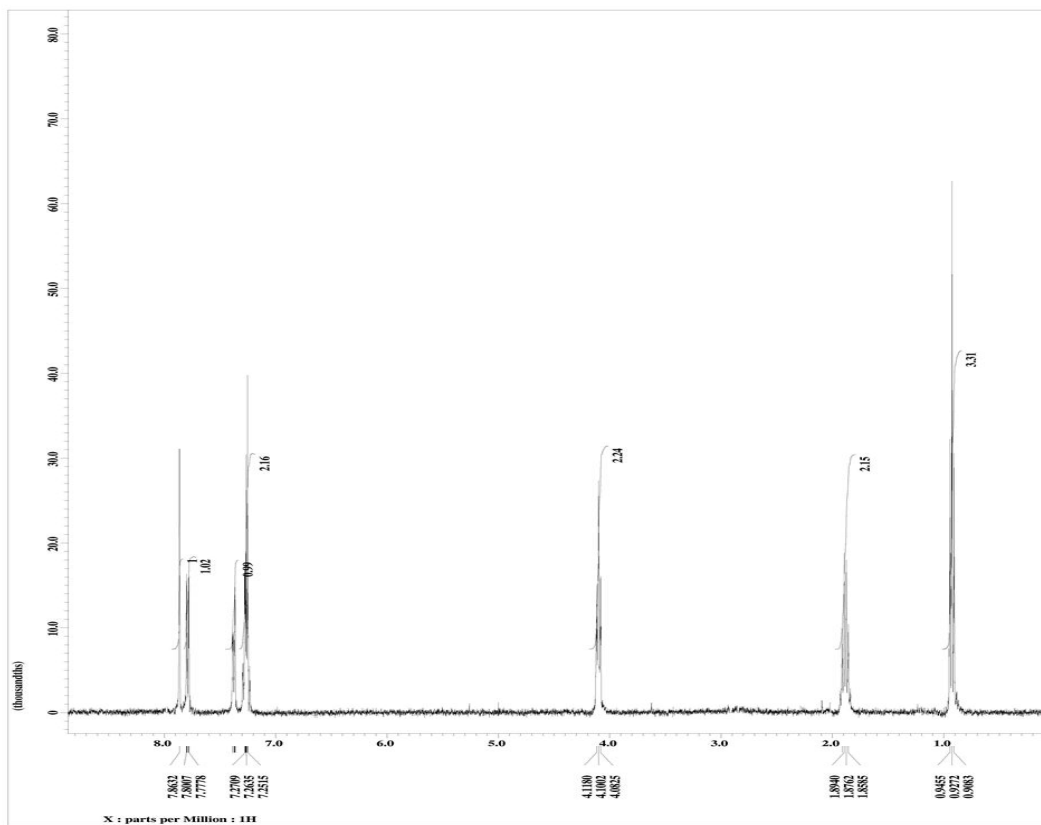
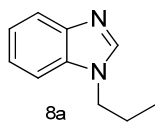


7a



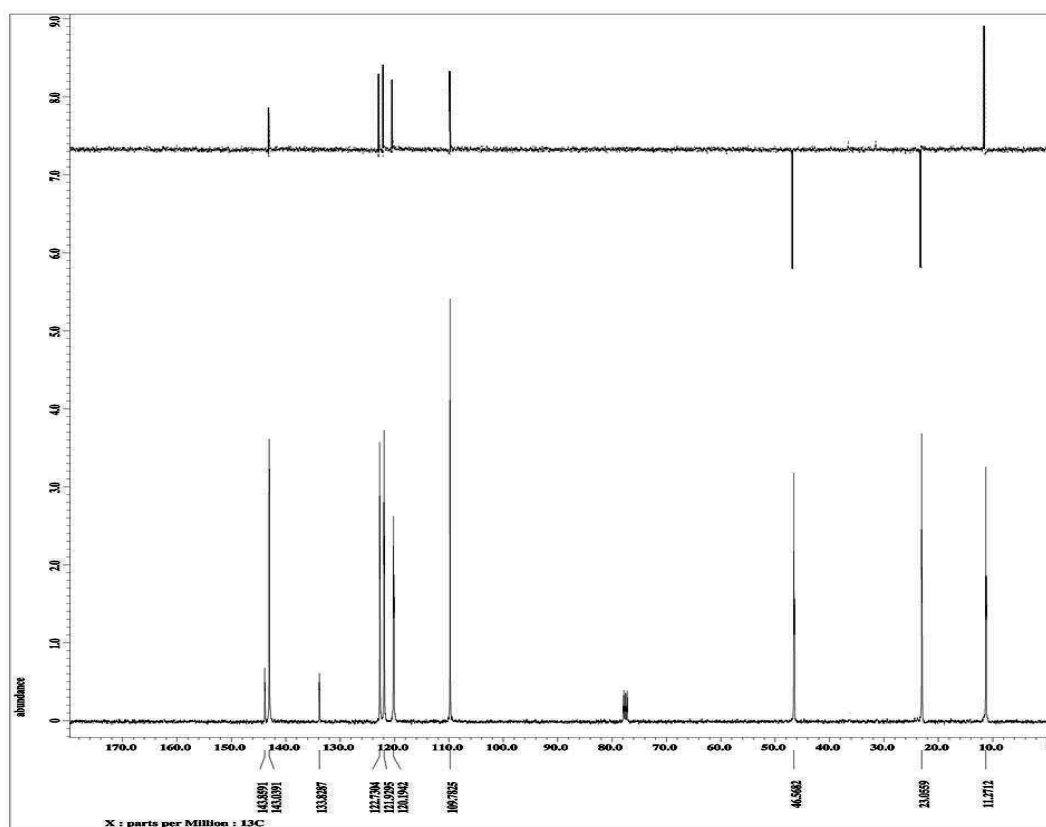
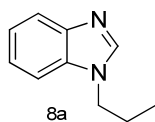
1-Propyl-1H-benzimidazole (8a).

¹H NMR, 400 MHz, CDCl₃



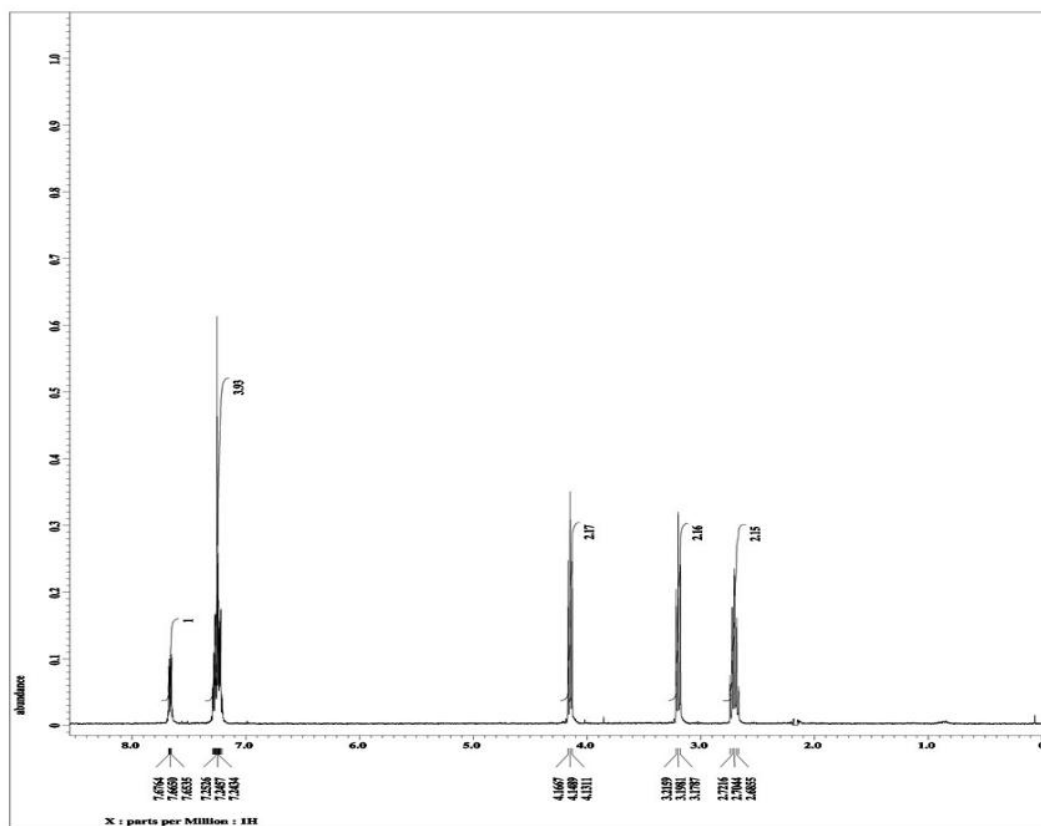
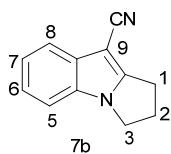
1-Propyl-1H-benzimidazole (8a).

^{13}C NMR, 100 MHz, CDCl_3



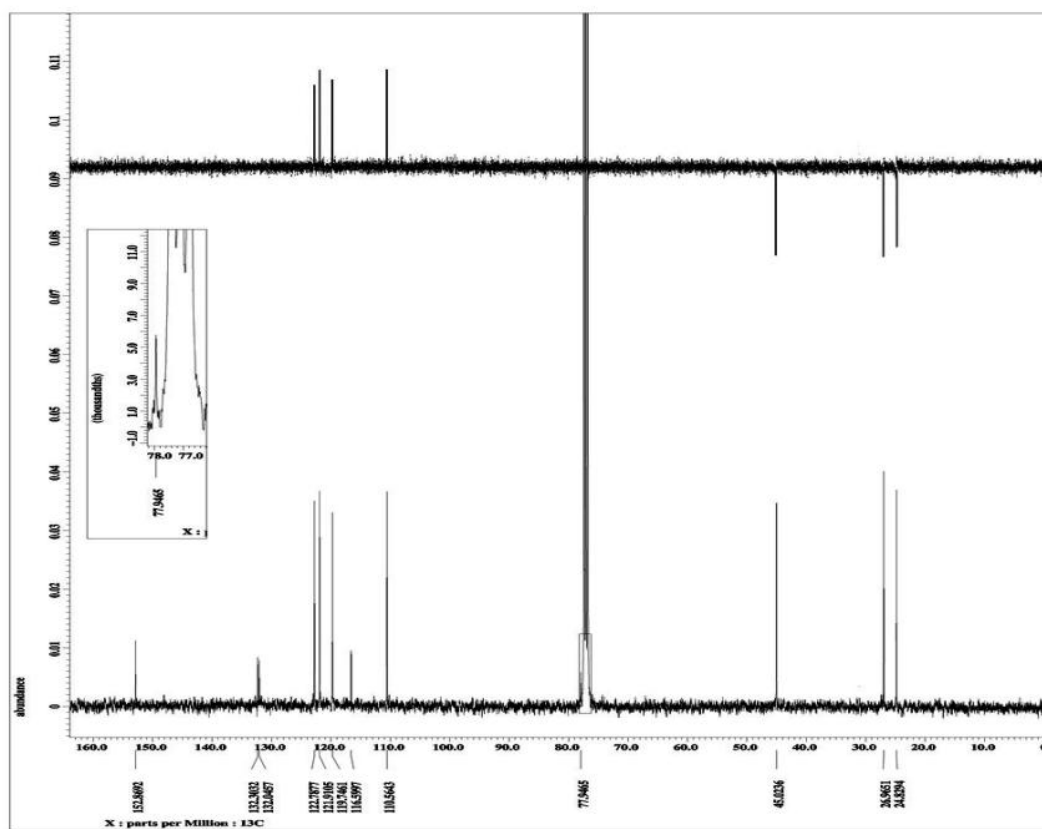
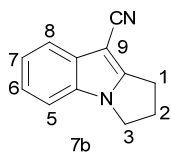
2,3-Dihydro-1H-pyrrolo[1,2-a]indole-9-carbonitrile (7b).

¹H NMR, 400 MHz, CDCl₃



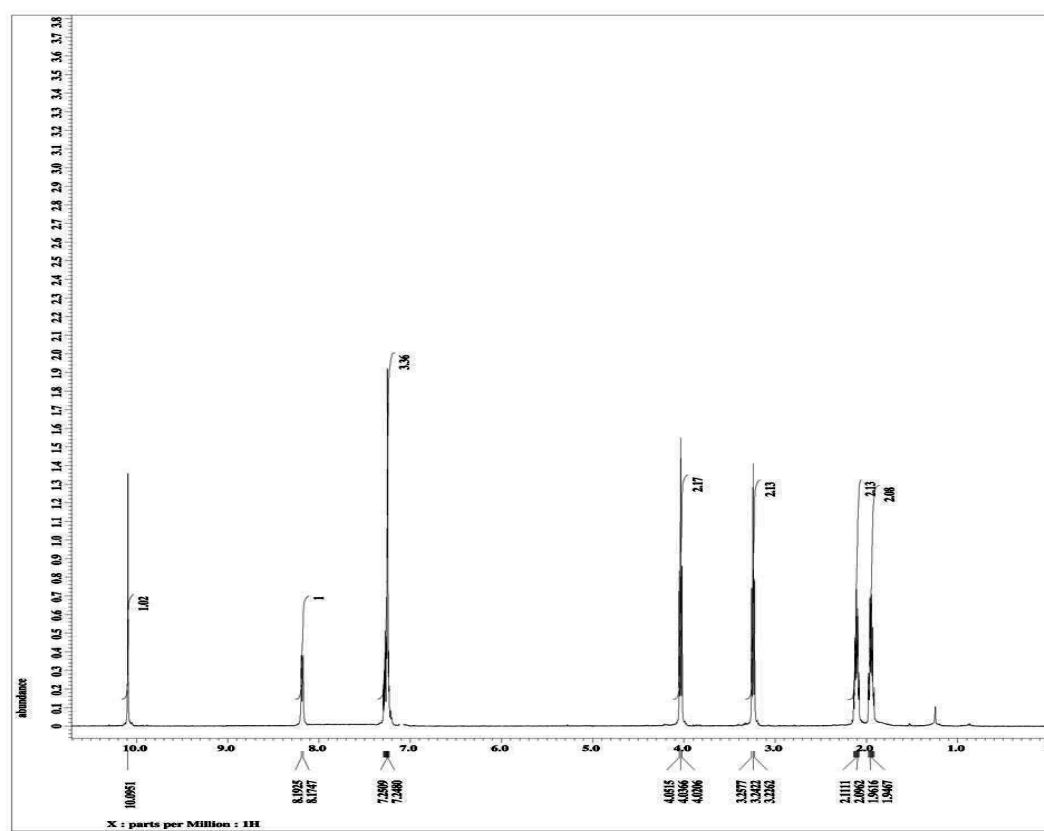
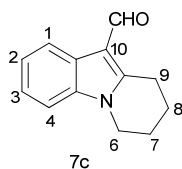
2,3-Dihydro-1H-pyrrolo[1,2-a]indole-9-carbonitrile (7b).

^{13}C NMR, 100 MHz, CDCl_3



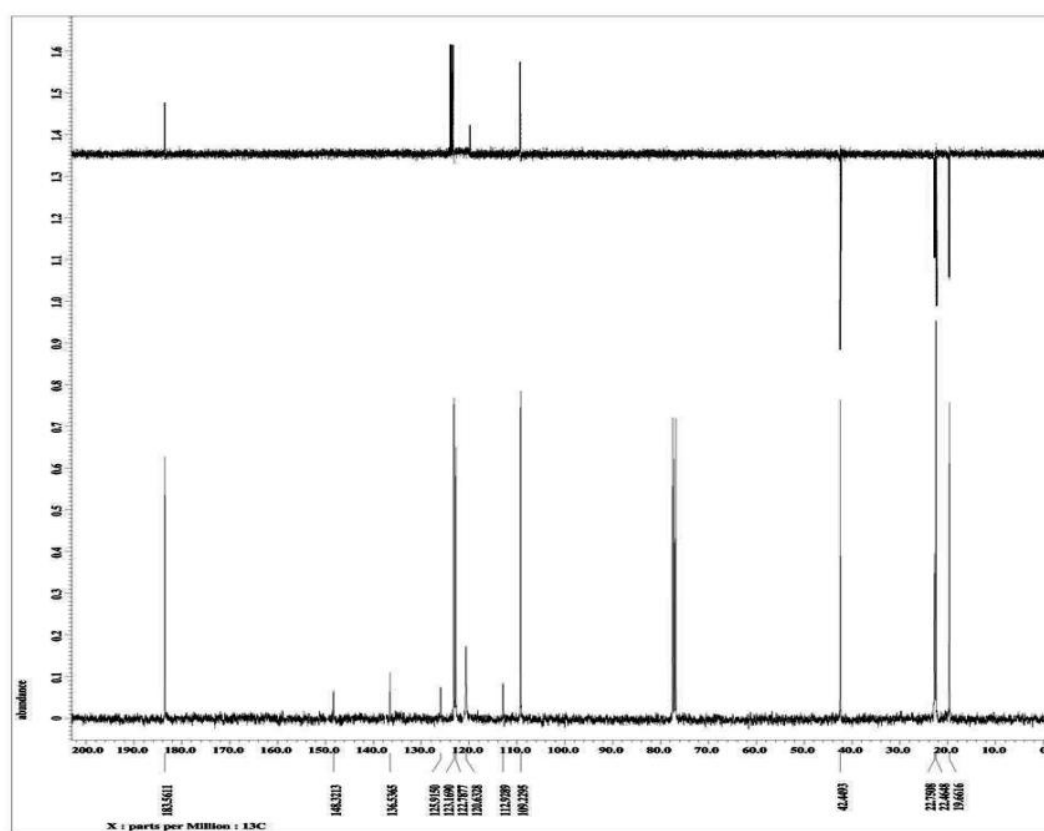
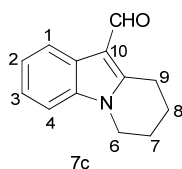
6,7,8,9-Tetrahydropyrido[1,2-a]indole-10-carbaldehyde (7c).

¹H NMR, 400 MHz, CDCl₃



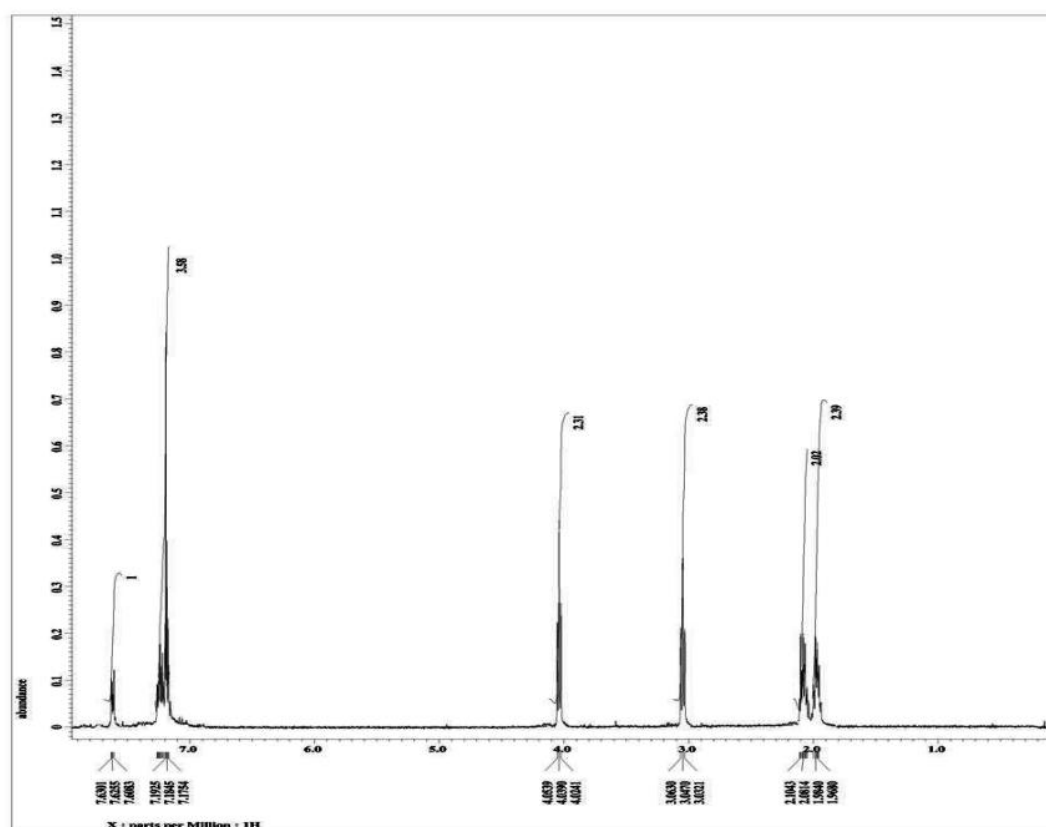
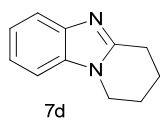
6,7,8,9-Tetrahydropyrido[1,2-a]indole-10-carbaldehyde (7c).

^{13}C NMR, 100 MHz, CDCl_3



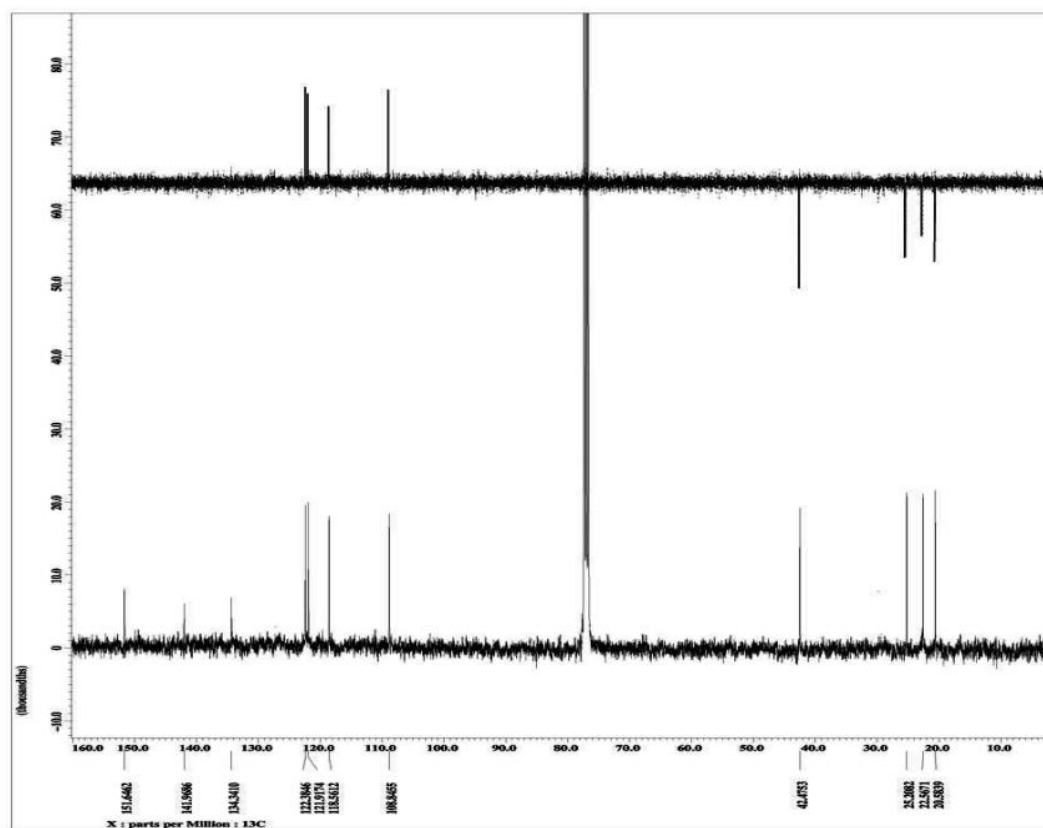
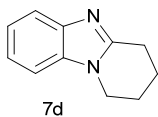
1,2,3,4-Tetrahydropyrido[1,2-a]benzimidazole (7d).

¹H NMR, 400 MHz, CDCl₃



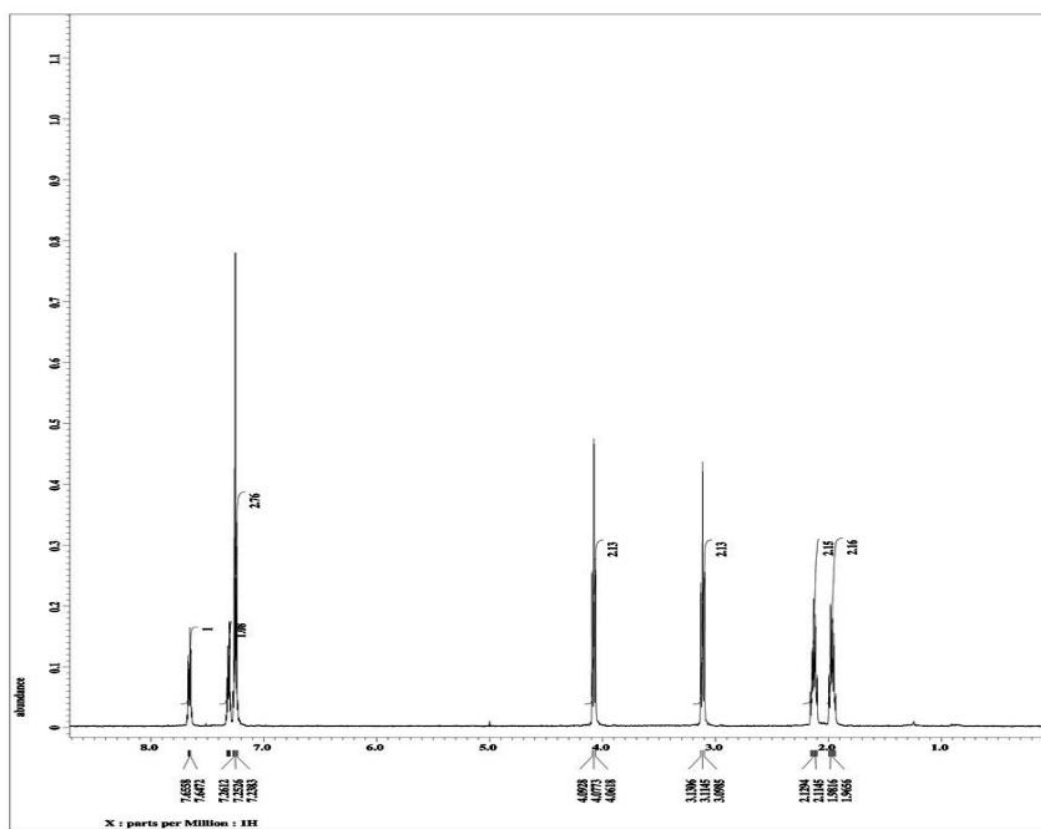
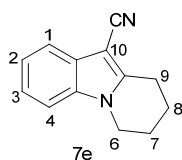
1,2,3,4-Tetrahydropyrido[1,2-a]benzimidazole (7d).

¹³C NMR, 100 MHz, CDCl₃



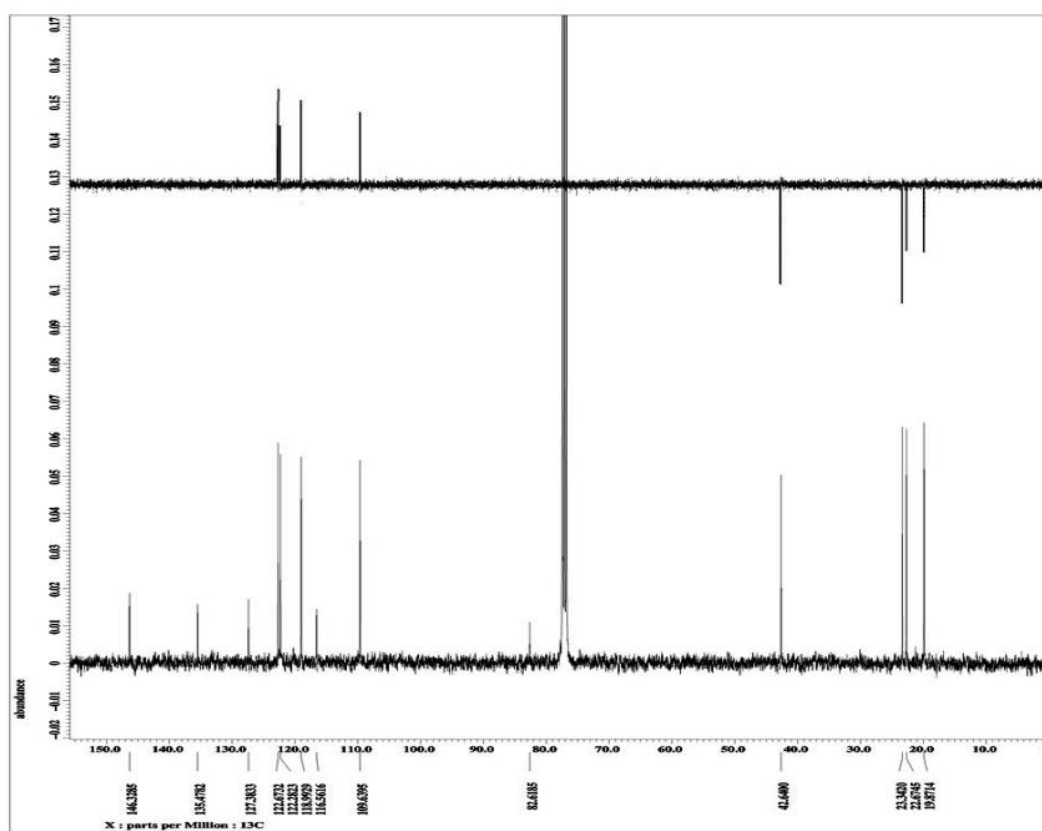
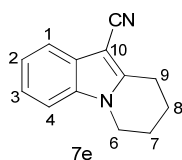
6,7,8,9-Tetrahydropyrido[1,2-a]indole-10-carbonitrile (7e).

¹H NMR, 400 MHz, CDCl₃



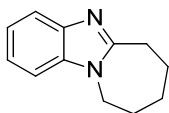
6,7,8,9-Tetrahydropyrido[1,2-a]indole-10-carbonitrile (7e).

^{13}C NMR, 100 MHz, CDCl_3

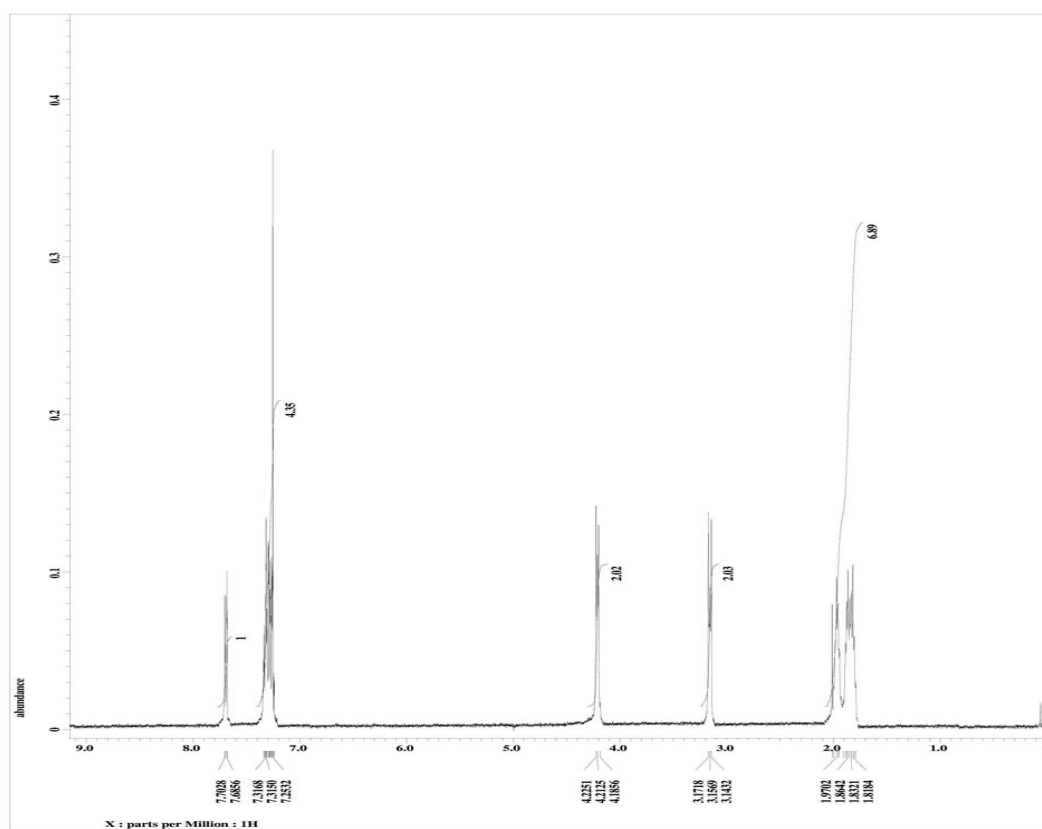


7,8,9,10-Tetrahydro-6H-azepino[1,2-a]benzimidazole (7f).

¹H NMR, 400 MHz, CDCl₃

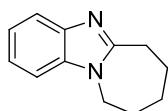


7f

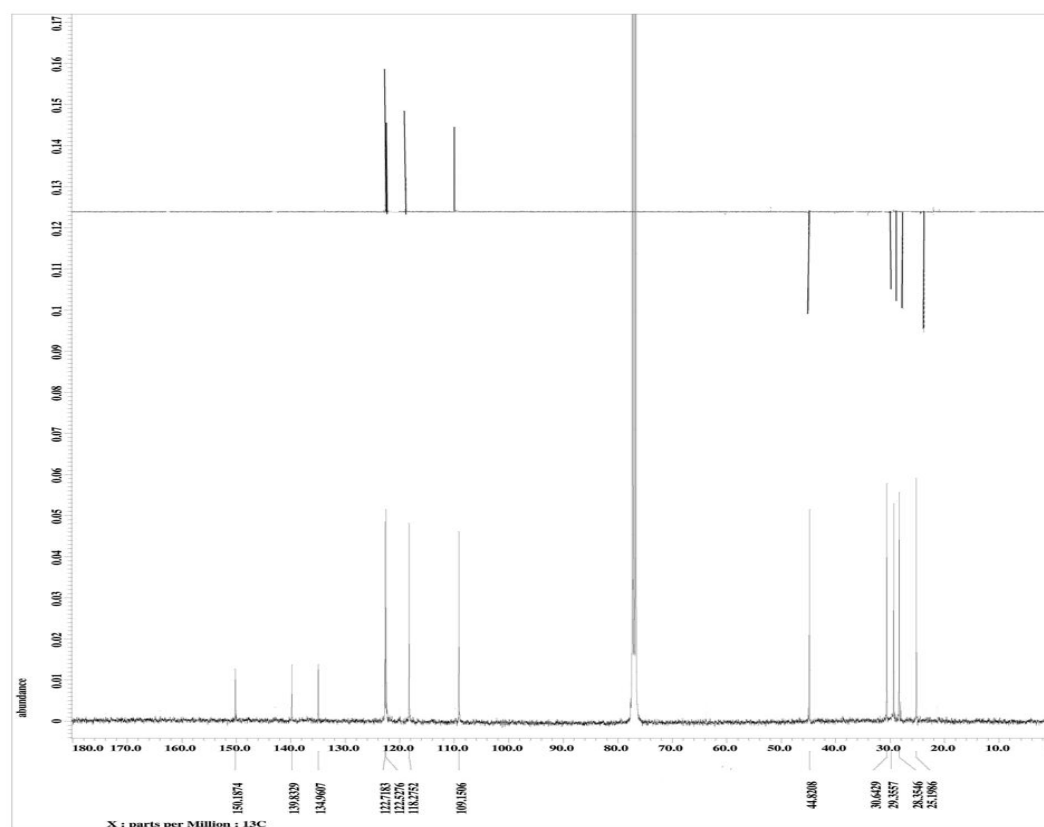


7,8,9,10-Tetrahydro-6H-azepino[1,2-a]benzimidazole (7f).

¹³C NMR, 100 MHz, CDCl₃

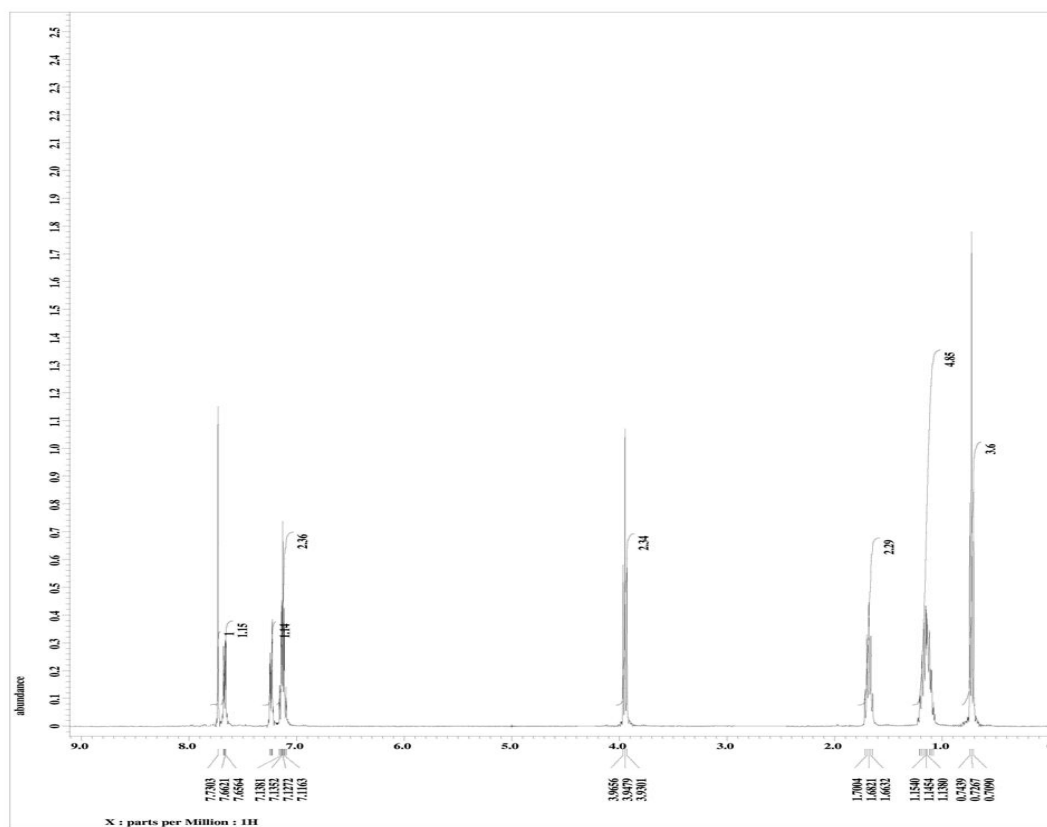
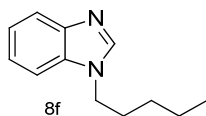


7f



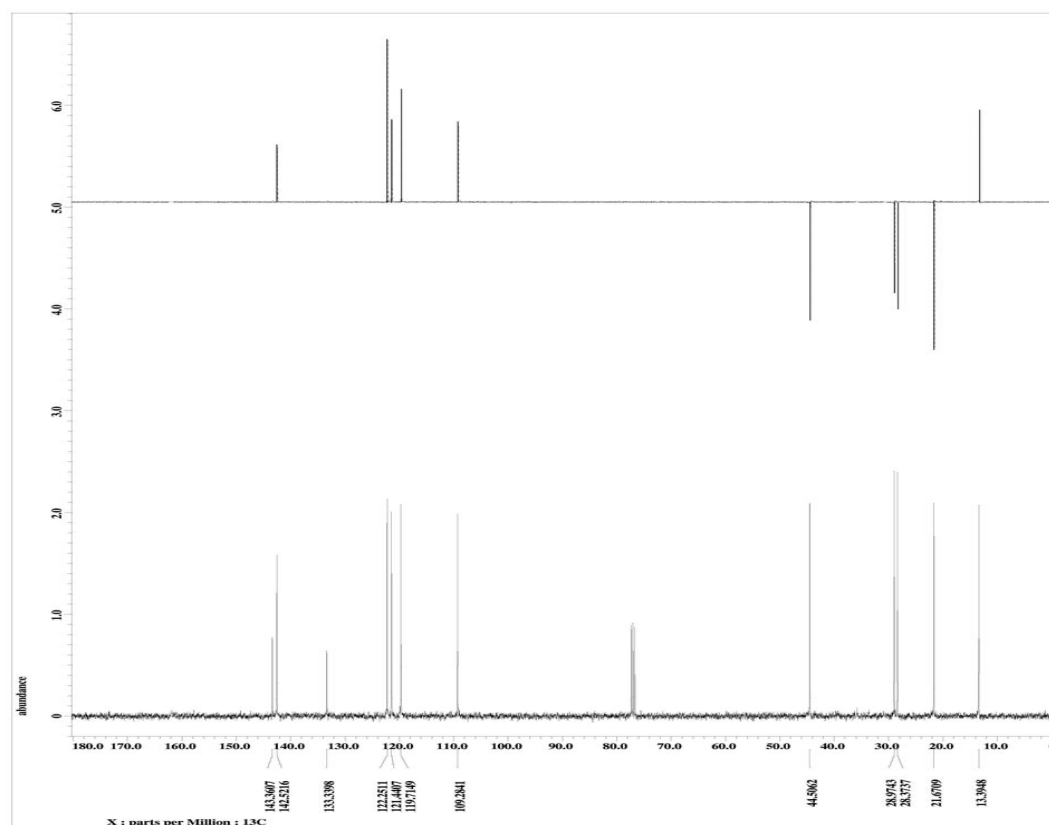
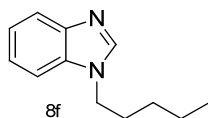
1-Pentyl-1H-benzimidazole (8f).

^1H NMR, 400 MHz, CDCl_3



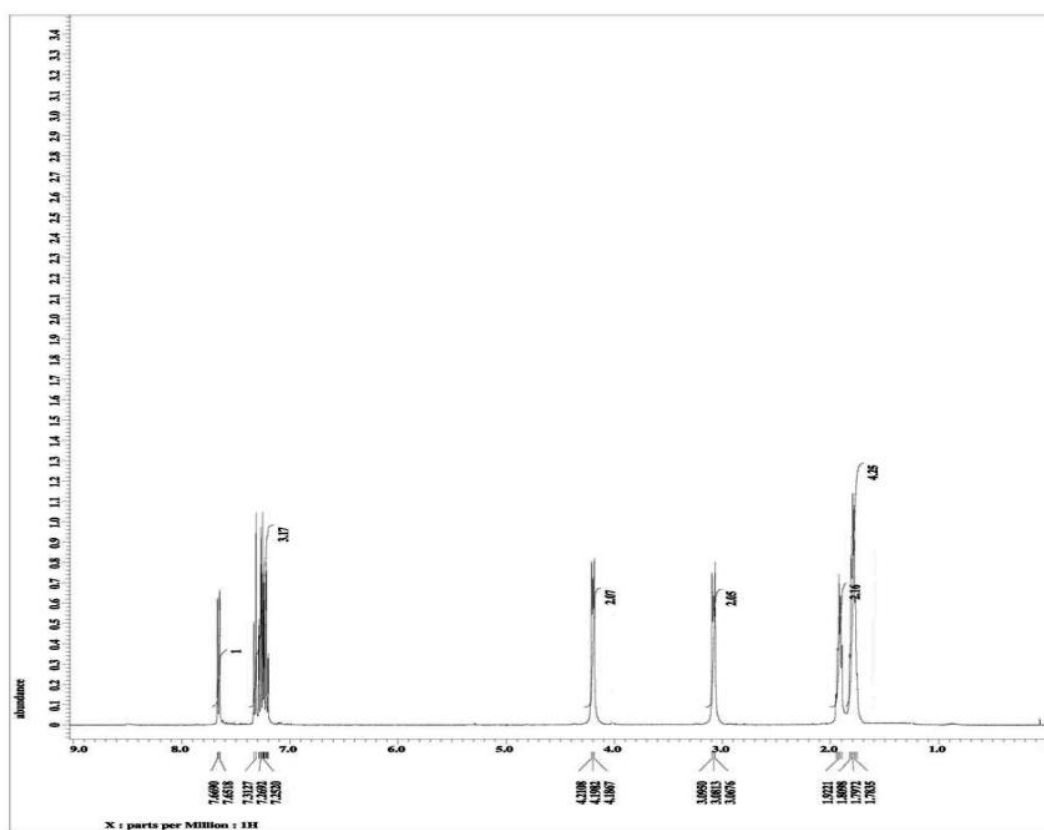
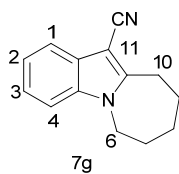
1-Pentyl-1H-benzimidazole (8f).

^{13}C NMR, 100 MHz, CDCl_3



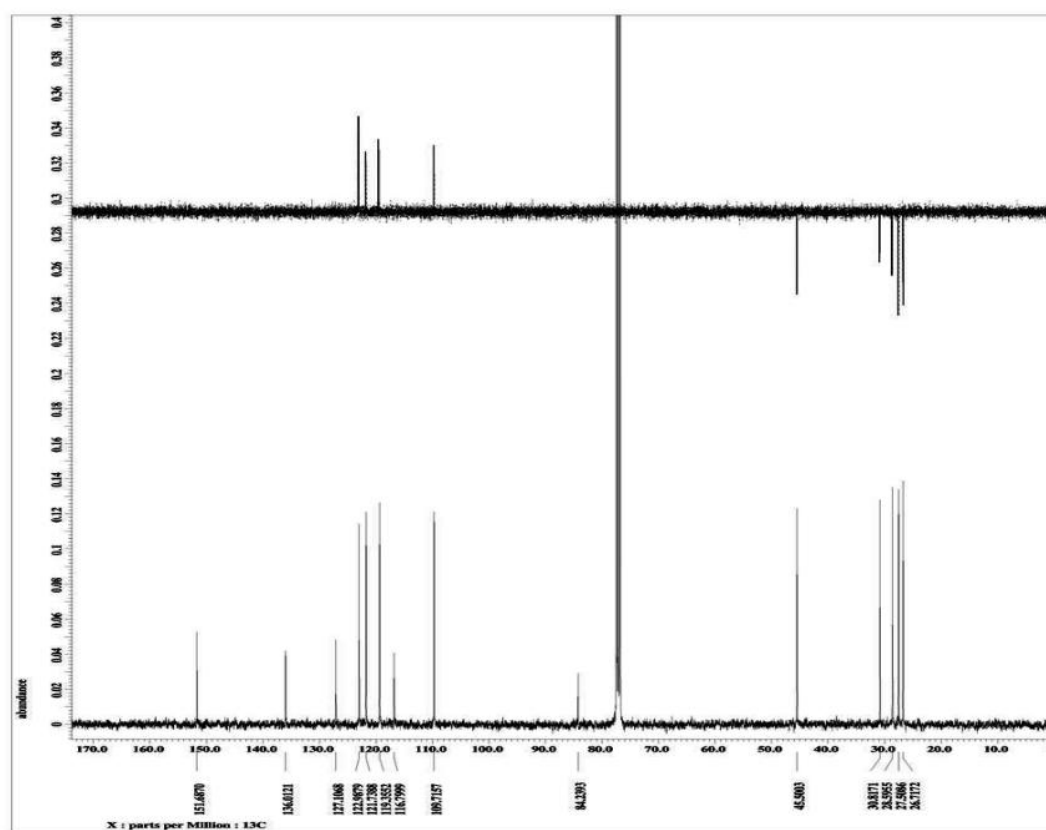
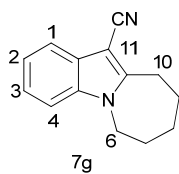
7,8,9,10-Tetrahydro-6H-azepino[1,2-a]indole-11-carbonitrile (7g).

¹H NMR, 400 MHz, CDCl₃



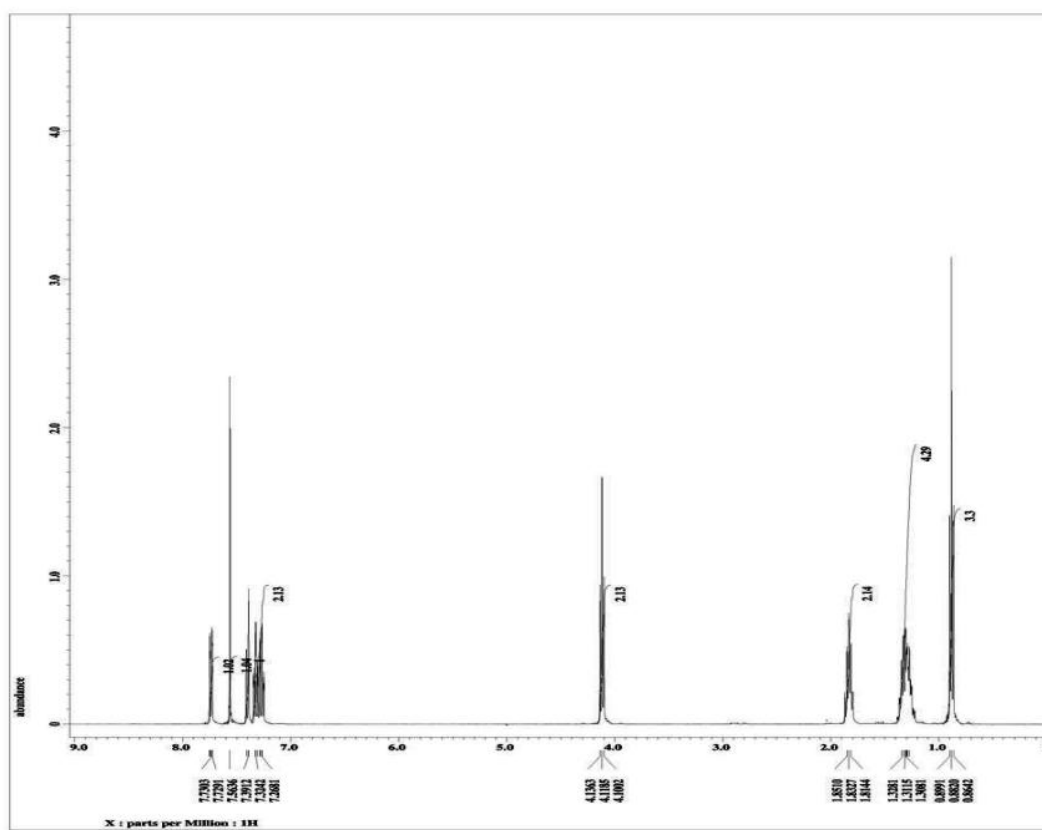
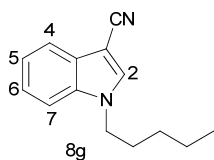
7,8,9,10-Tetrahydro-6H-azepino[1,2-a]indole-11-carbonitrile (7g).

^{13}C NMR, 100 MHz, CDCl_3



1-pentyl-1H-indole-3-carbonitrile (8g).

¹H NMR, 400 MHz, CDCl₃



1-pentyl-1H-indole-3-carbonitrile (8g).

^{13}C NMR, 100 MHz, CDCl_3

