Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Supporting information

The novel Nickel-catalyzed synthesis of thioesters, esters, and amides from aryl iodides in the presence of chromium hexacarbonyl

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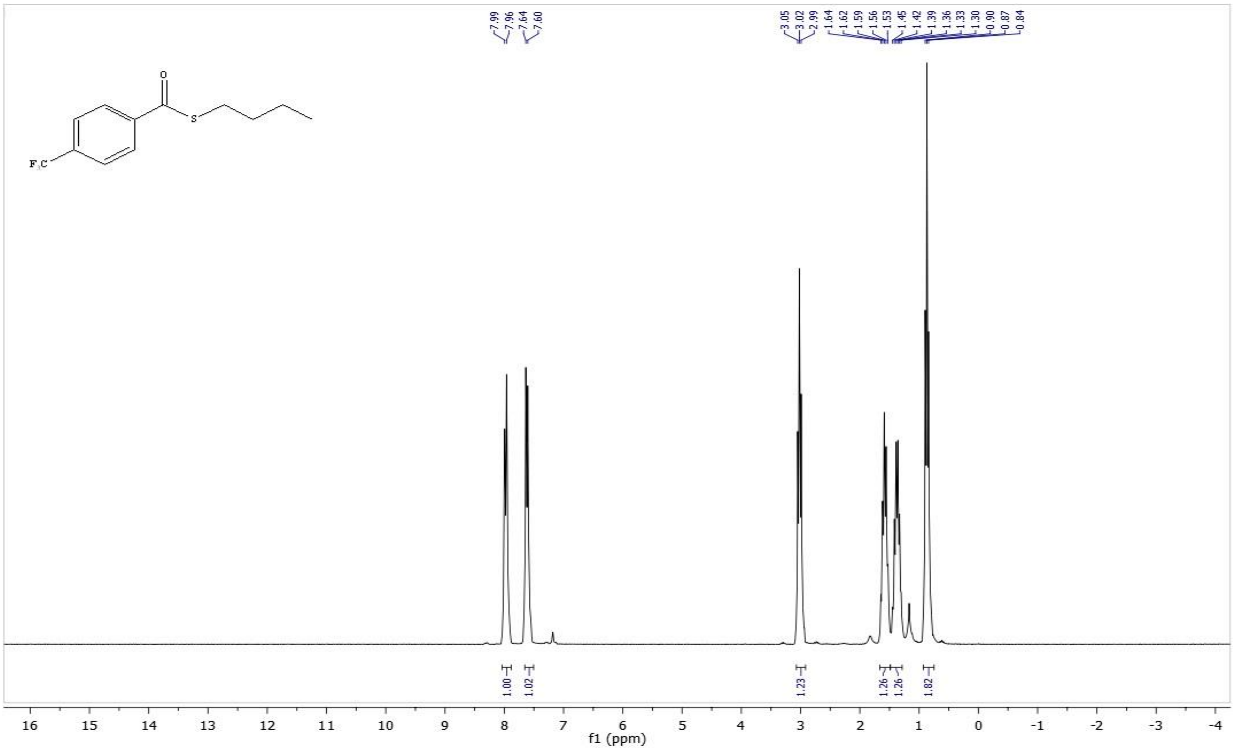
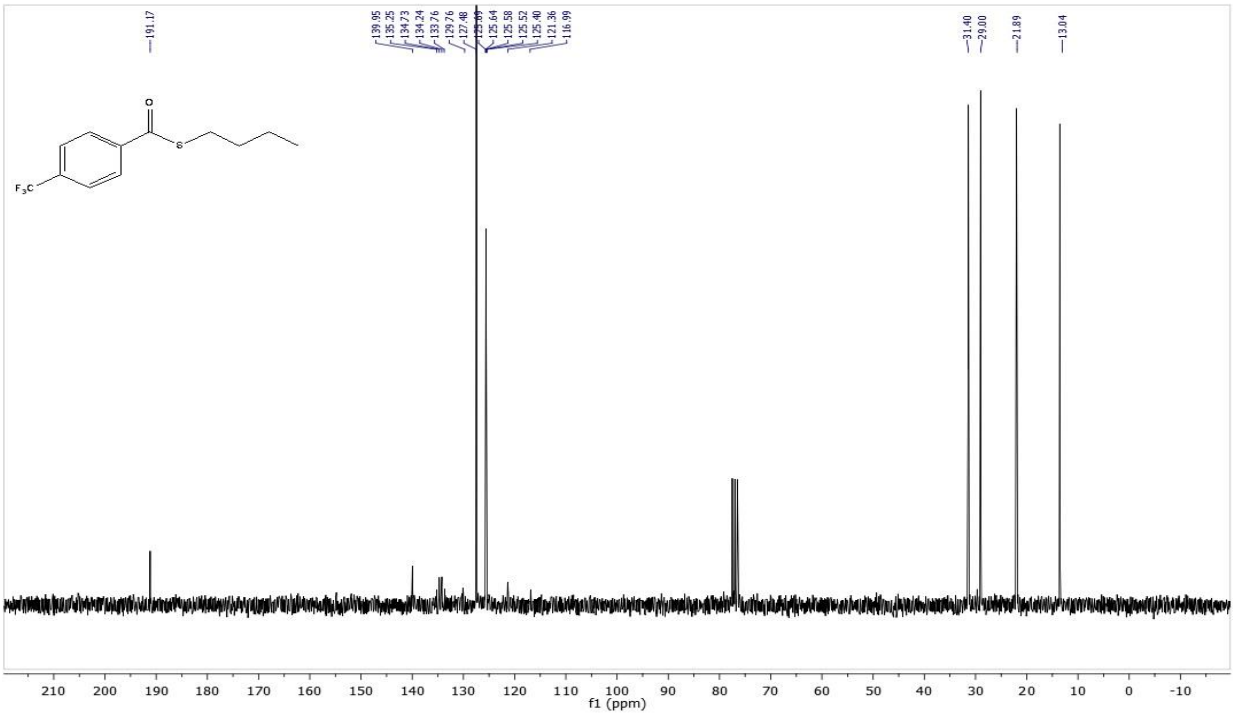
Content…….. Page

NMR spectra of thioesters:

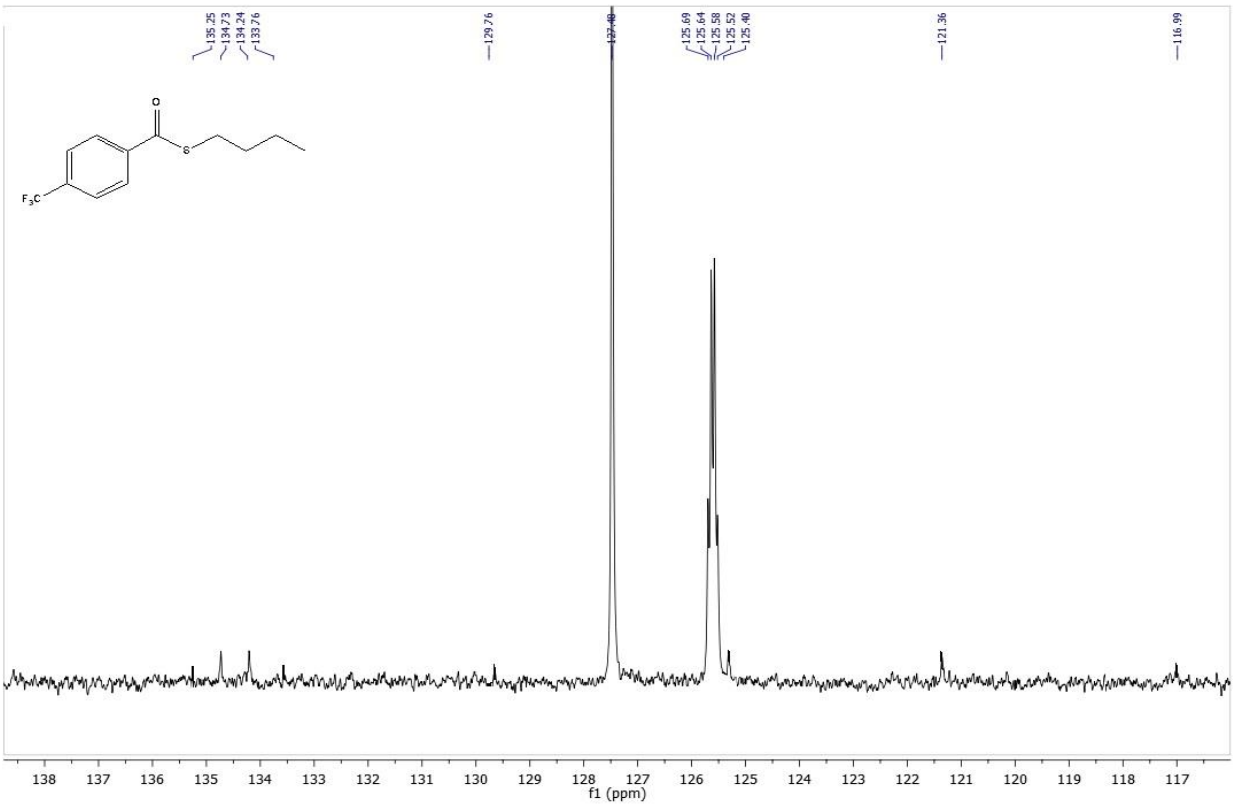
^{1}H-NMR (250 MHz, $CDCl_3$) of *S*-butyl 4-(trifluoromethyl)benzothioate (**3ea'**)



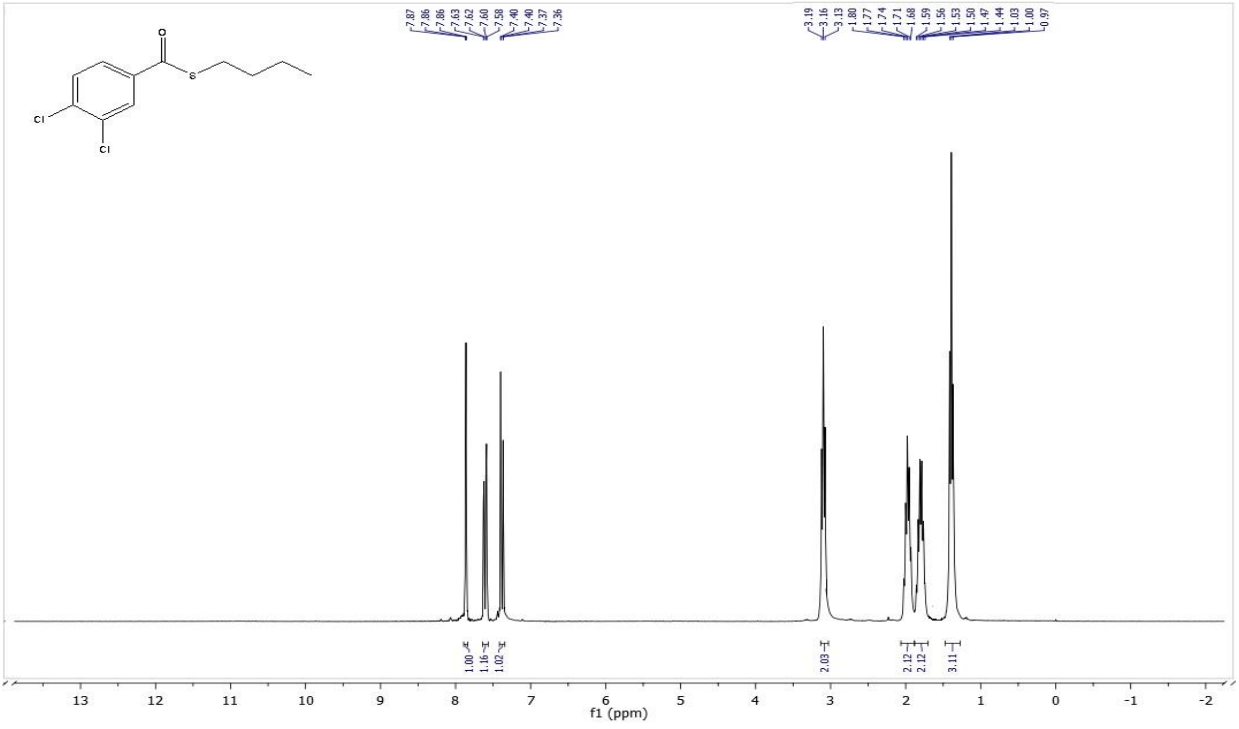
^{13}C-NMR (62.9 MHz, $CDCl_3$) of *S*-butyl 4-(trifluoromethyl)benzothioate (**3ea'**)



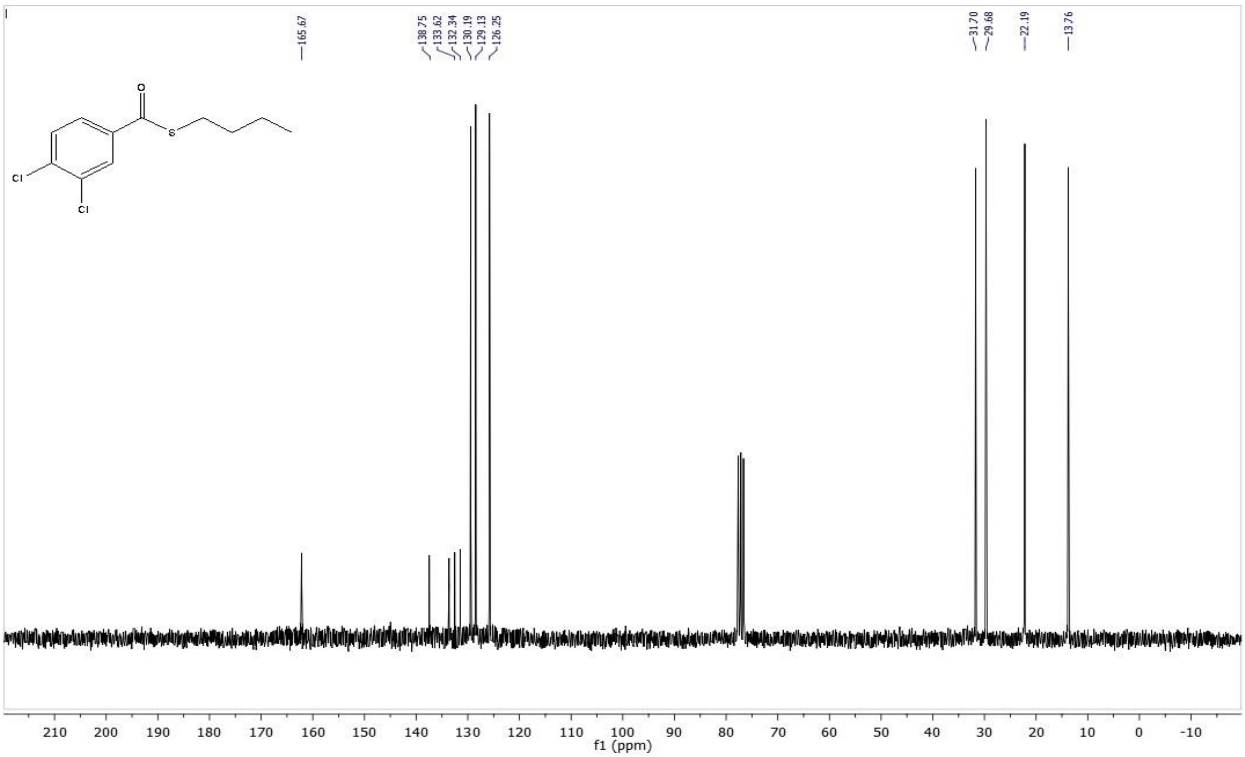
Expansion of ^{13}C-NMR (62.9 MHz, $CDCl_3$) of *S*-butyl 4-(trifluoromethyl)benzothioate (**3ea'**)



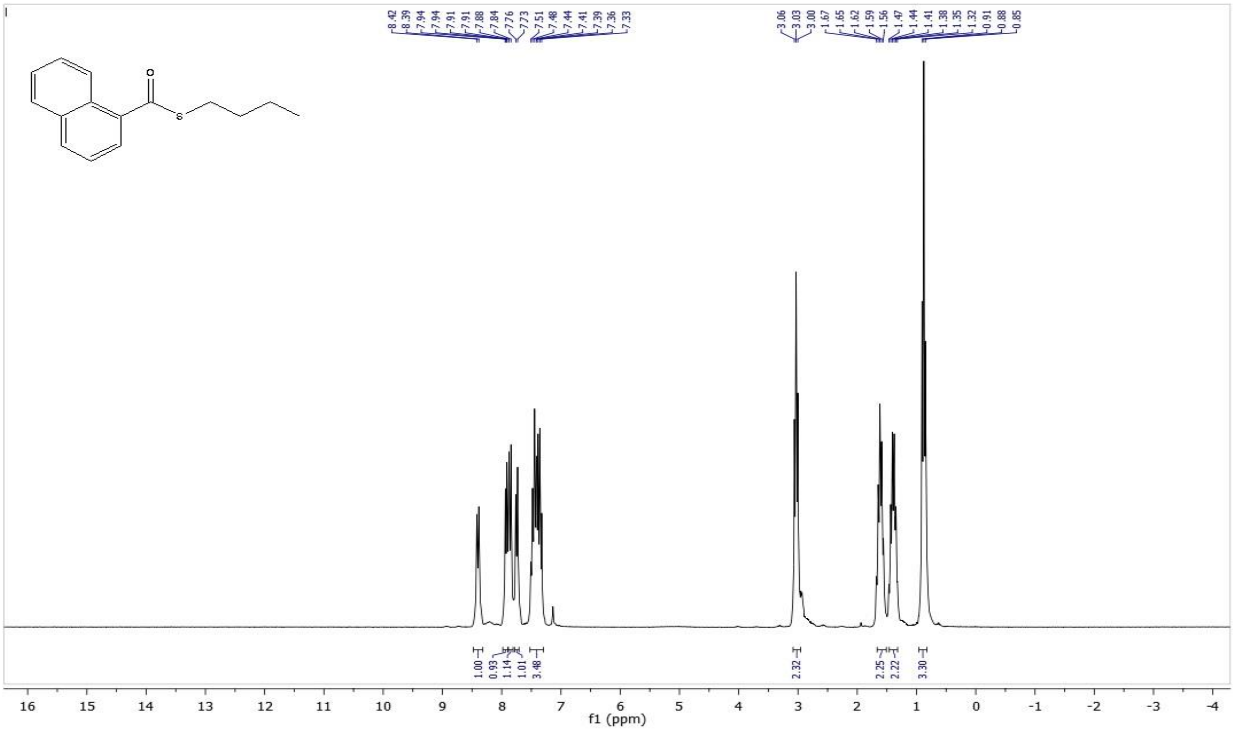
^{1}H-NMR (350 MHz, $CDCl_3$) of *S*-butyl 3,4-dichlorobenzothioate (**3fa'**)



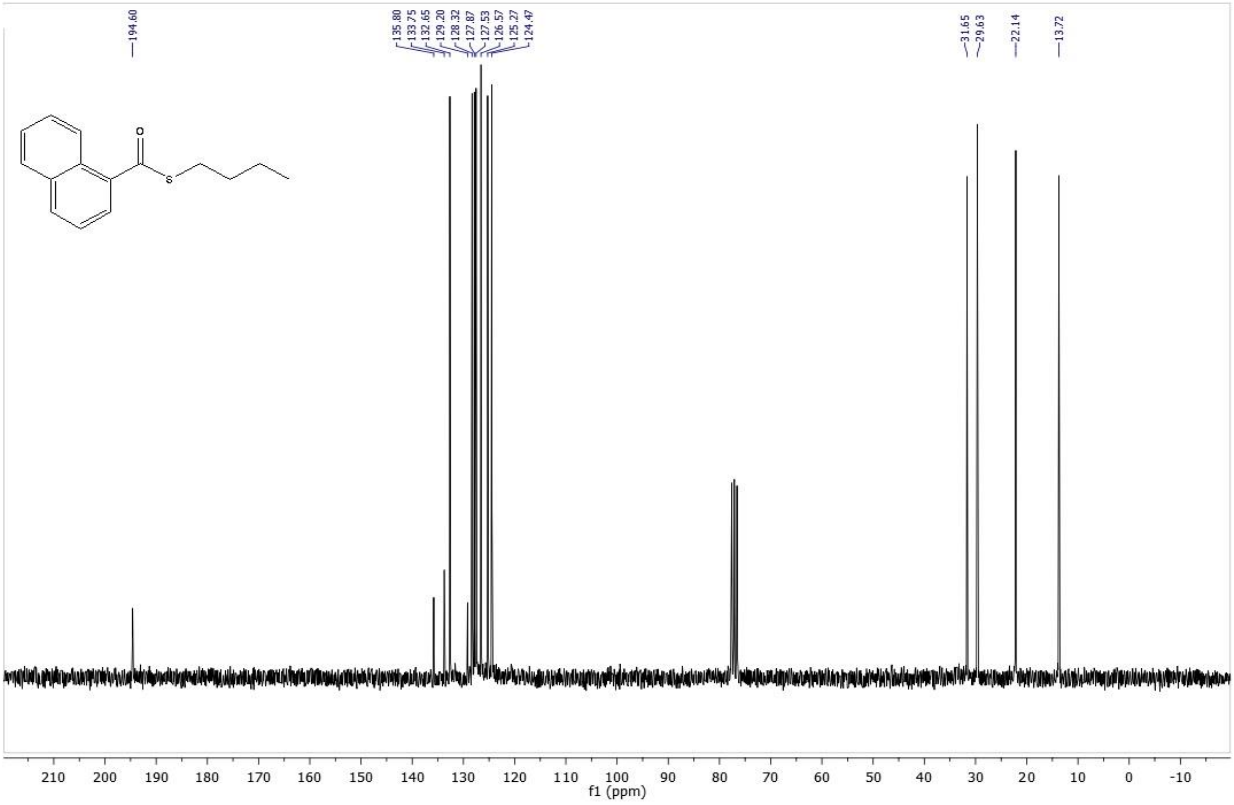
^{13}C-NMR (62.9 MHz, $CDCl_3$) of *S*-butyl 3,4-dichlorobenzothioate (**3fa'**)



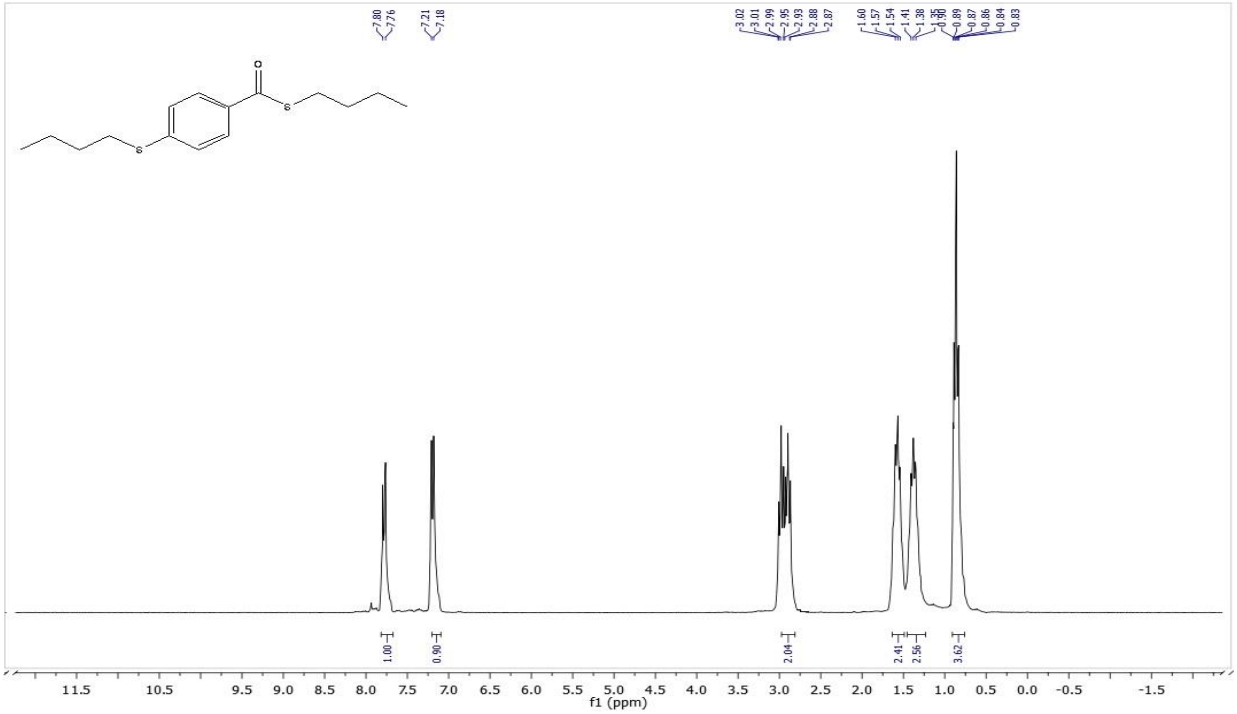
^{1}H-NMR (350 MHz, $CDCl_3$) of *S*-butyl naphthalene-1-carbothioate (**3ga'**)



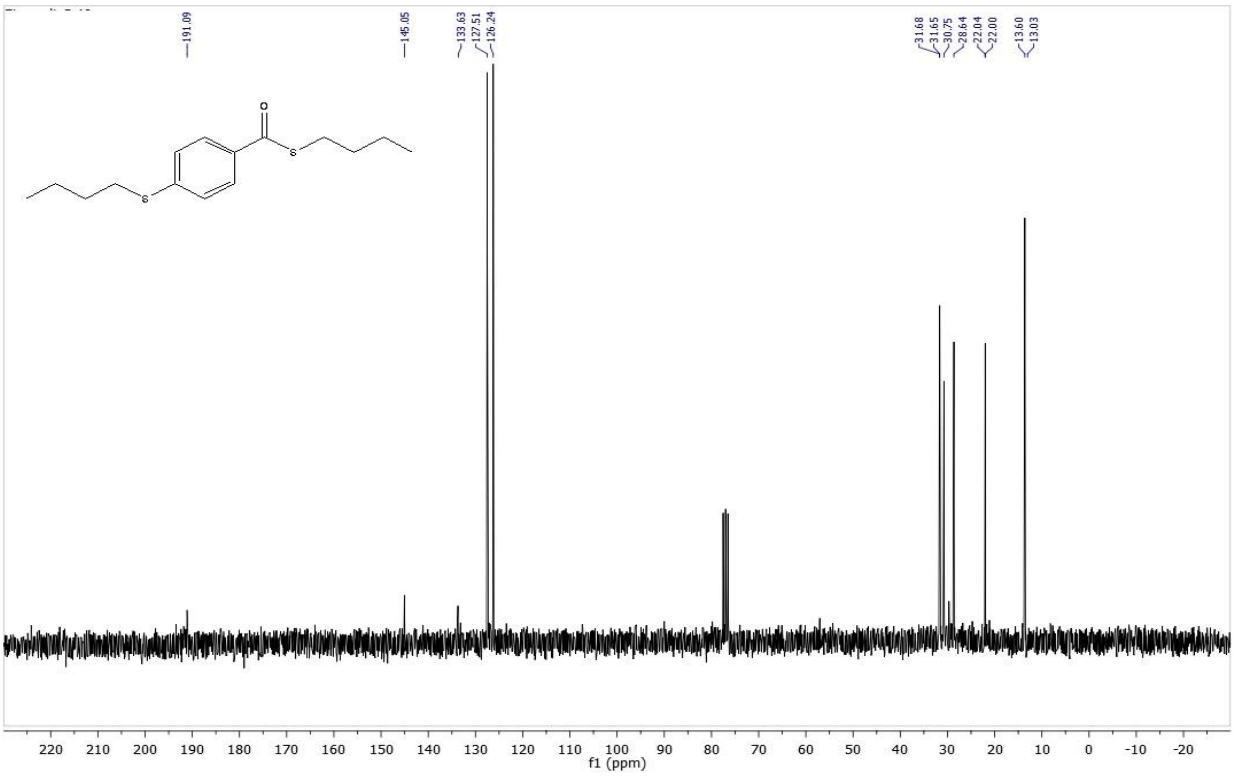
^{13}C-NMR (62.9 MHz, $CDCl_3$) of *S*- of *S*-butyl naphthalene-1-carbothioate (**3ga'**)



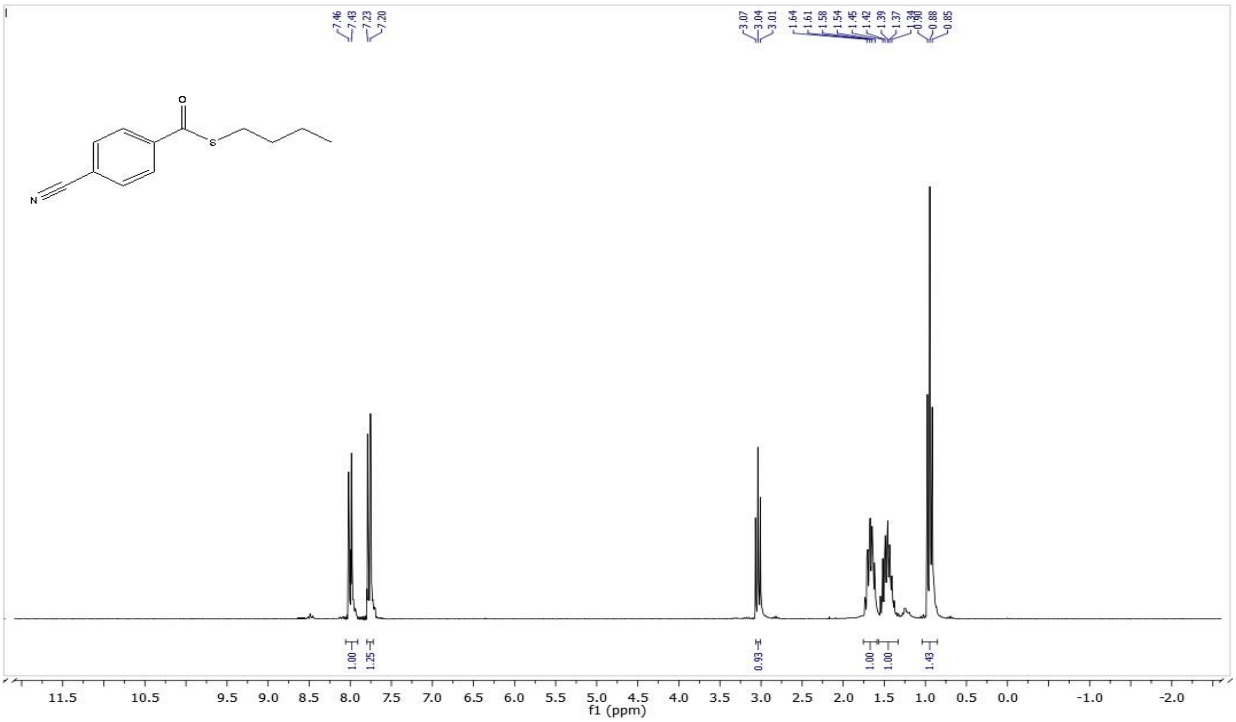
^{1}H-NMR (250 MHz, $CDCl_3$) of *S*-butyl 4-(butylthio)benzothioate (**3ha'**)



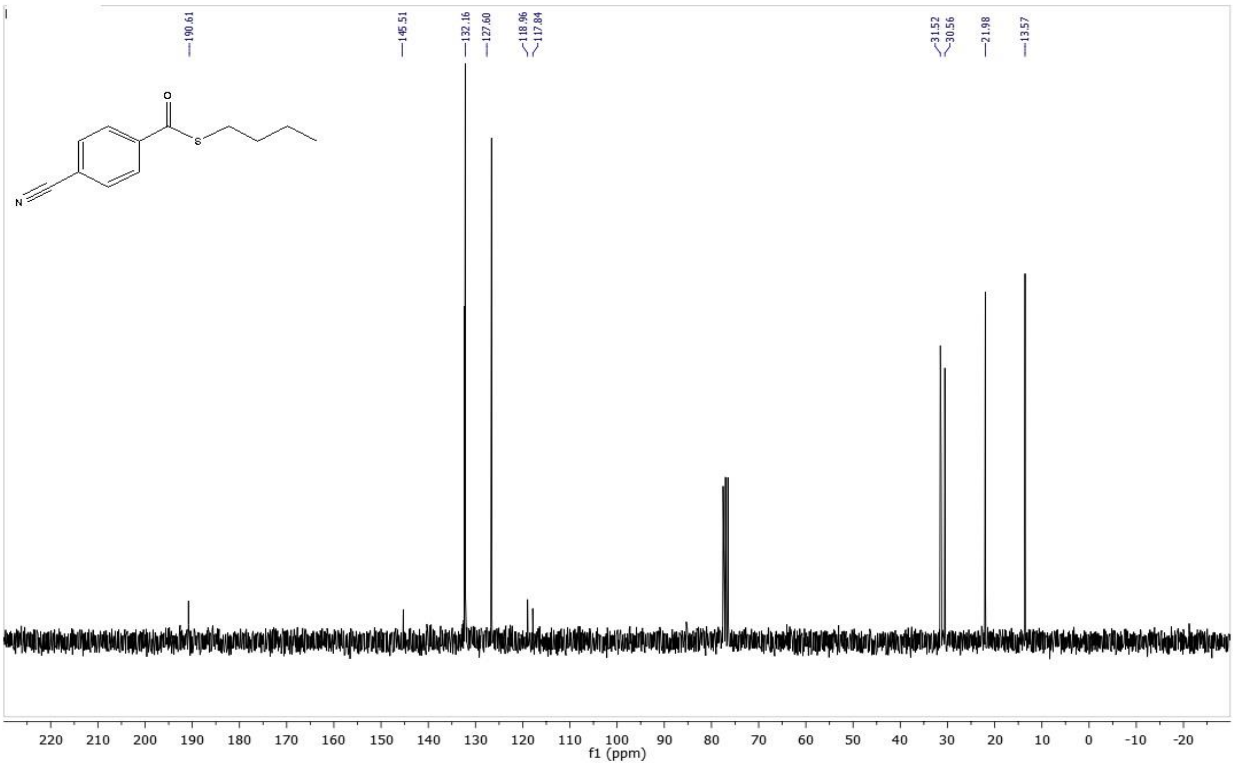
^{13}C-NMR (62.9 MHz, $CDCl_3$) of *S*-butyl 4-(butylthio)benzothioate (**3ha'**)



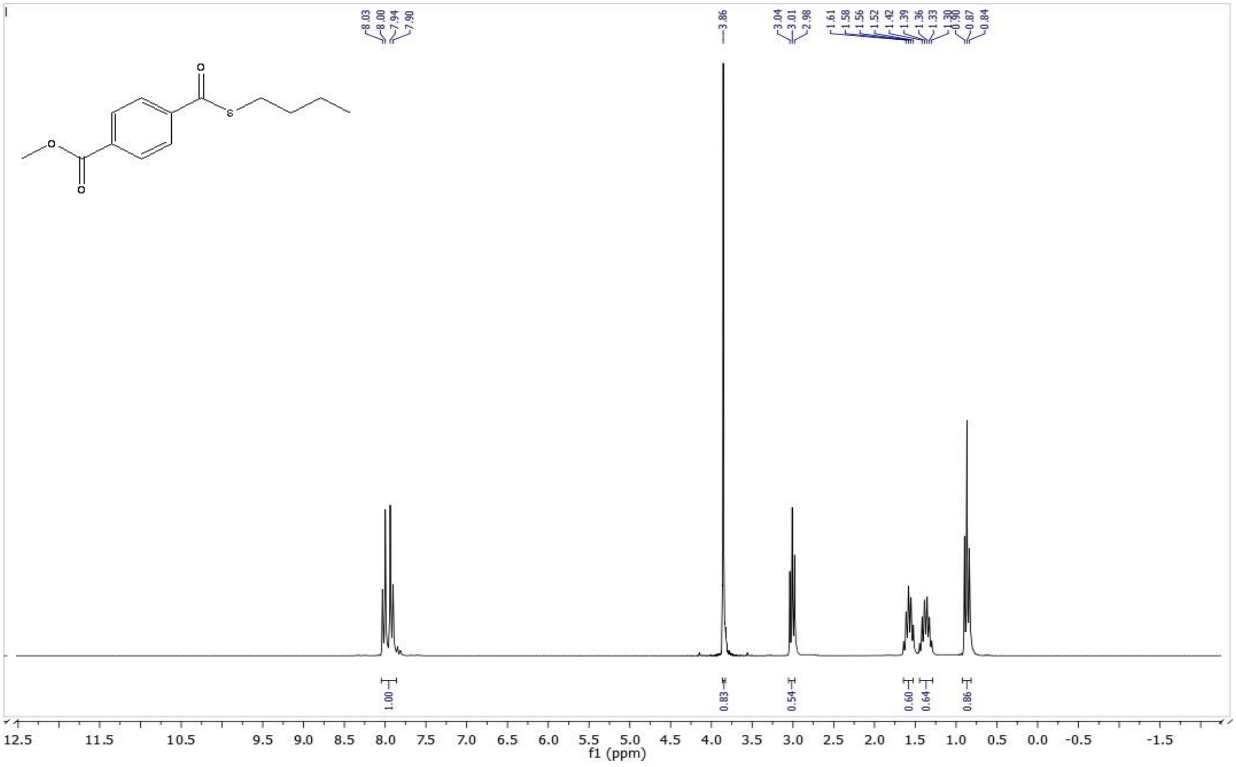
^{1}H-NMR (250 MHz, $CDCl_3$) of *S*-butyl 4-cyanobenzothioate (**3ia'**)



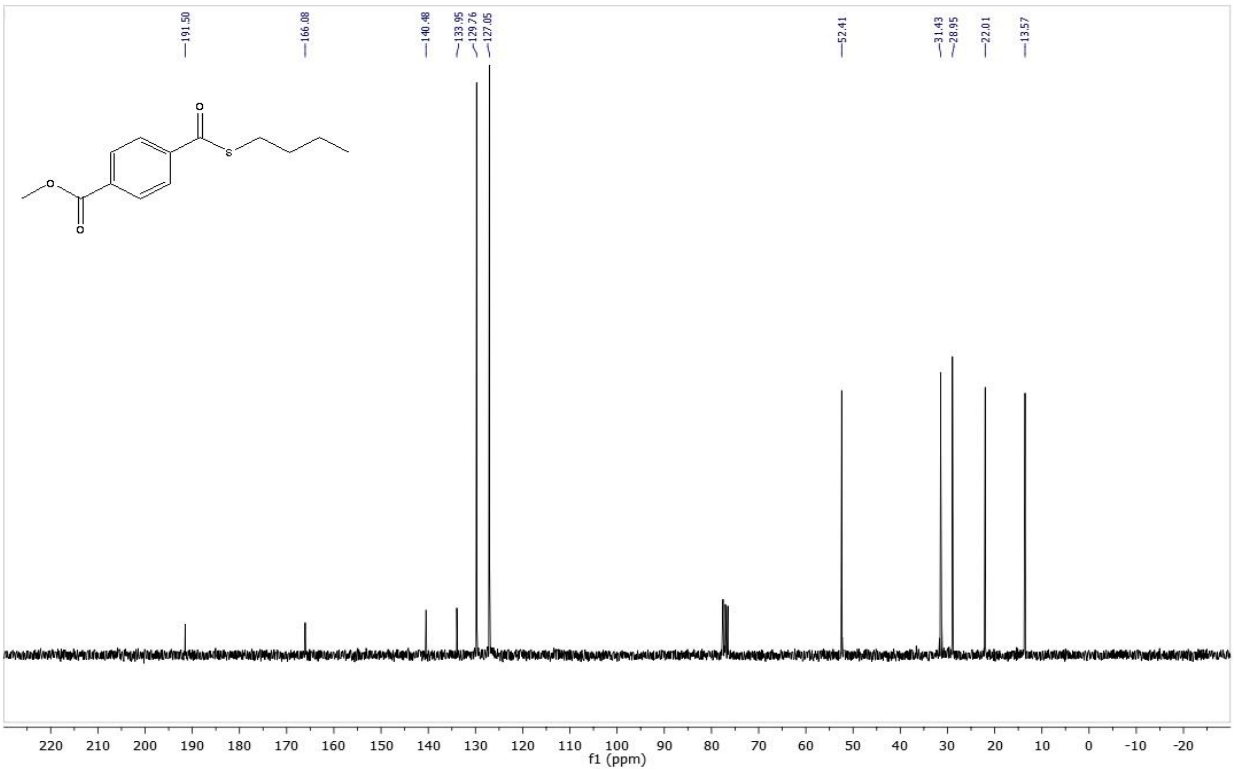
^{13}C-NMR (62.9 MHz, $CDCl_3$) of *S*-butyl 4-cyanobenzothioate (**3ia'**)



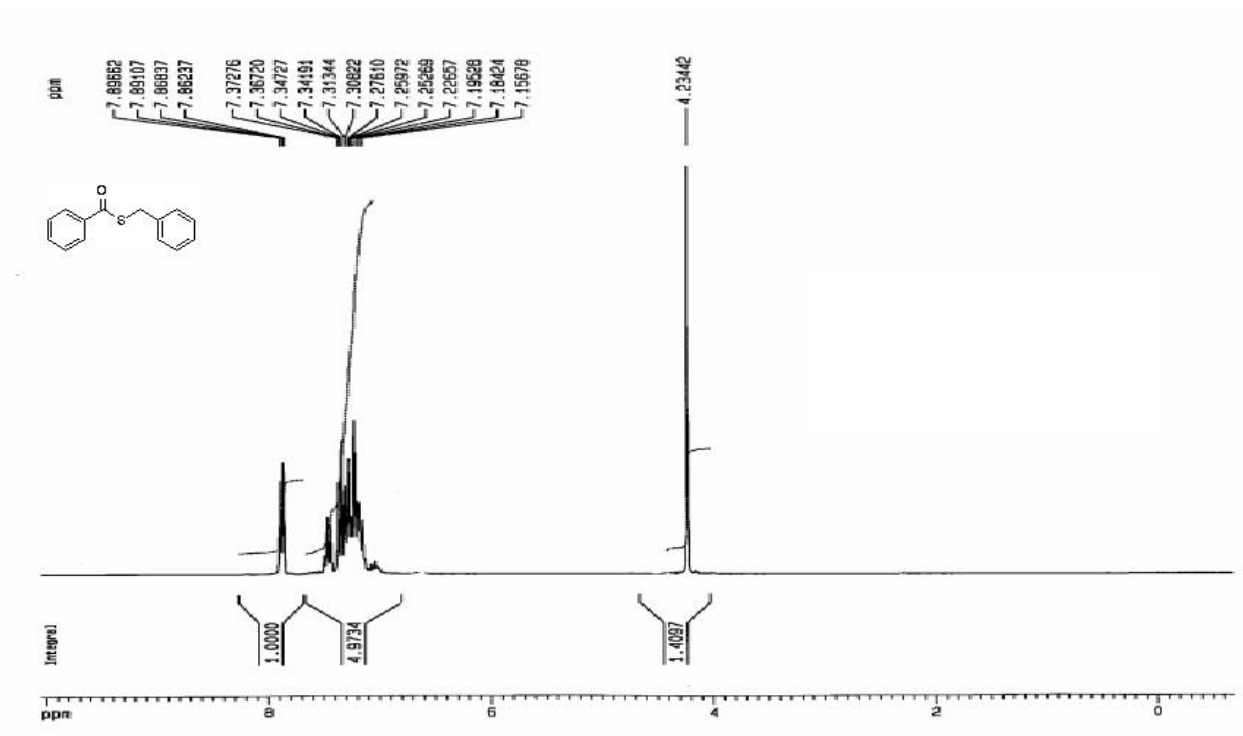
^{1}H-NMR (250 MHz, $CDCl_3$) of methyl 4-((butylthio)carbonyl)benzoate (**3ja'**)



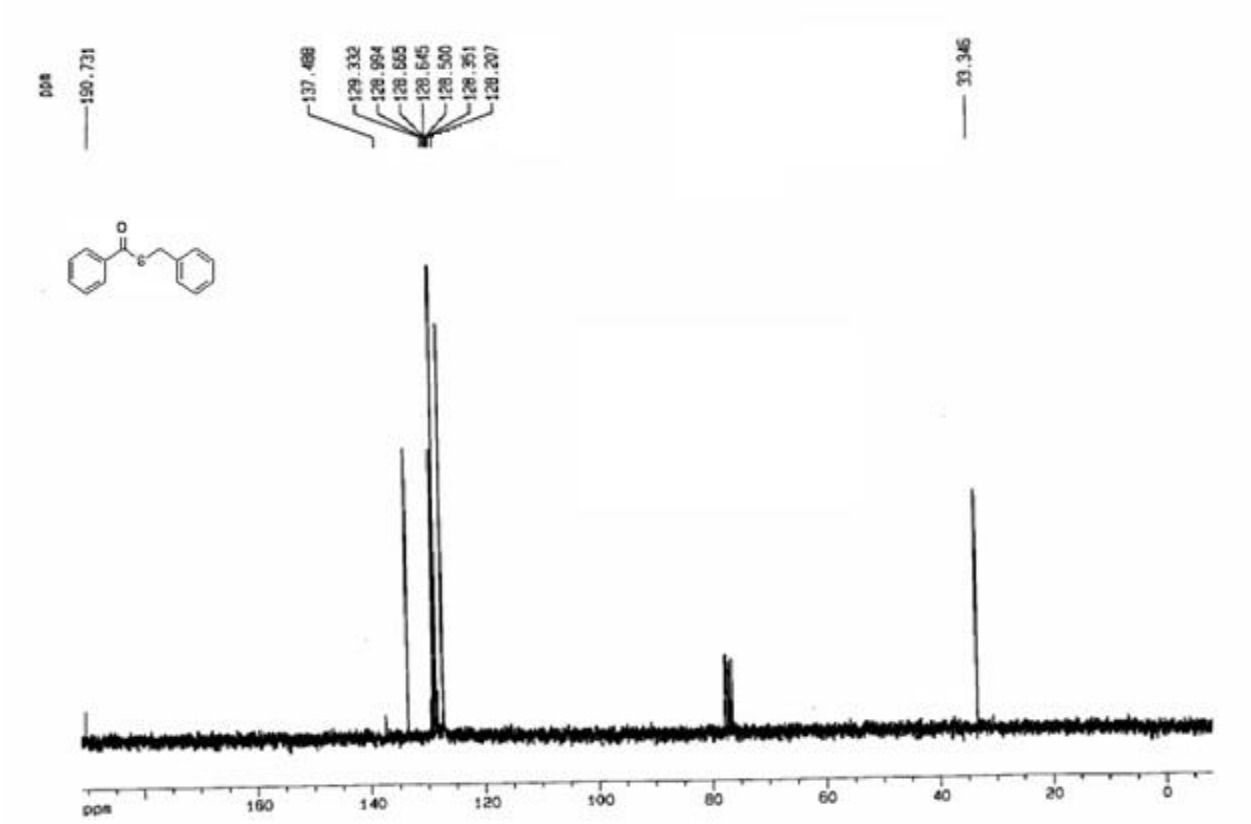
^{13}C-NMR (62.9 MHz, $CDCl_3$) of methyl 4-((butylthio)carbonyl)benzoate (**3ja'**)



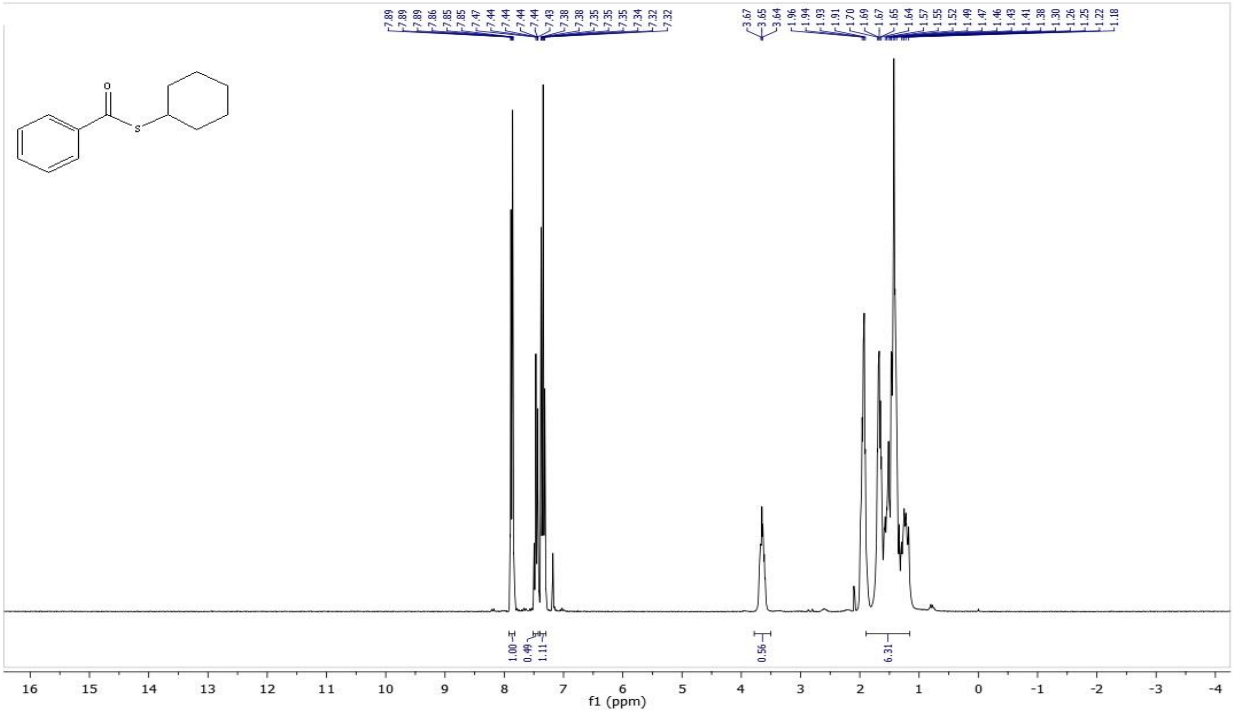
^{1}H-NMR (250 MHz, $CDCl_3$) of *S*-benzyl benzothioate (**3ab'**)



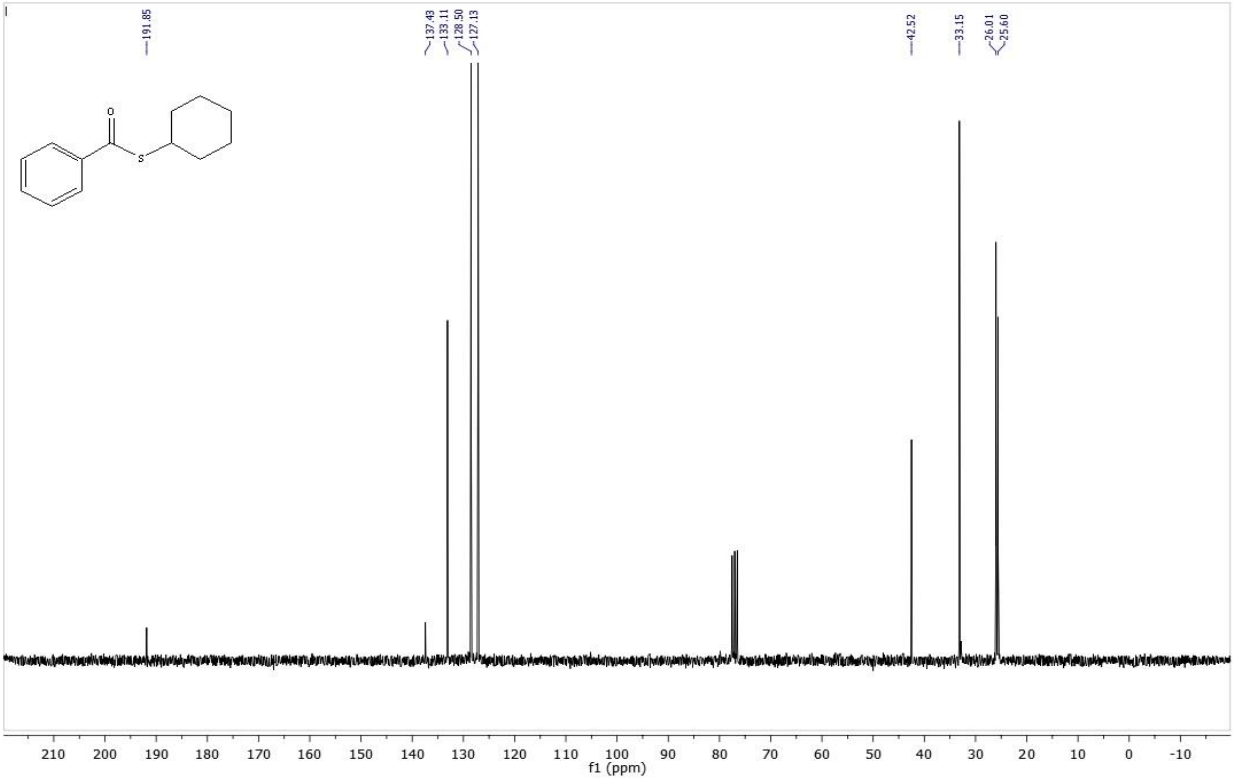
^{13}C-NMR (62.9 MHz, $CDCl_3$) of *S*-benzyl benzothioate (**3ab'**)



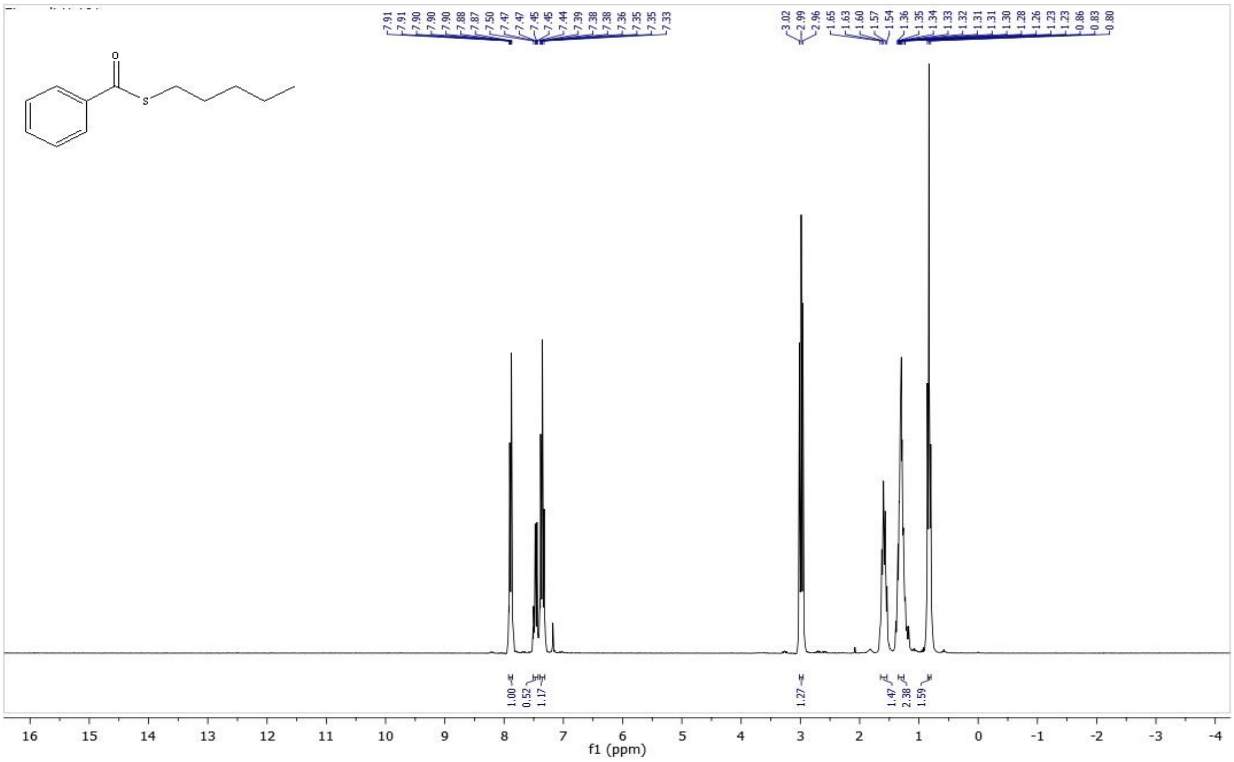
^{1}H-NMR (250 MHz, $CDCl_3$) of *S*-cyclohexyl benzothioate (**3ac'**)



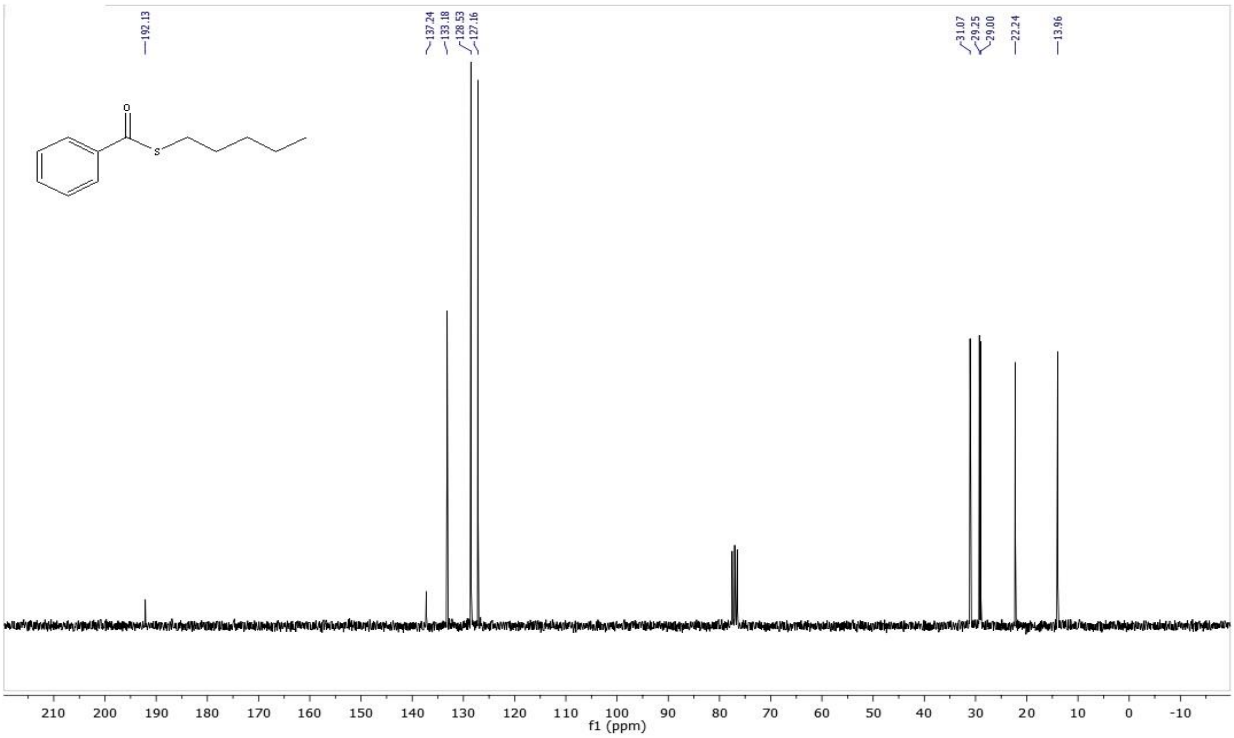
^{13}C-NMR (62.9 MHz, $CDCl_3$) of *S*-cyclohexyl benzothioate (**3ac'**)



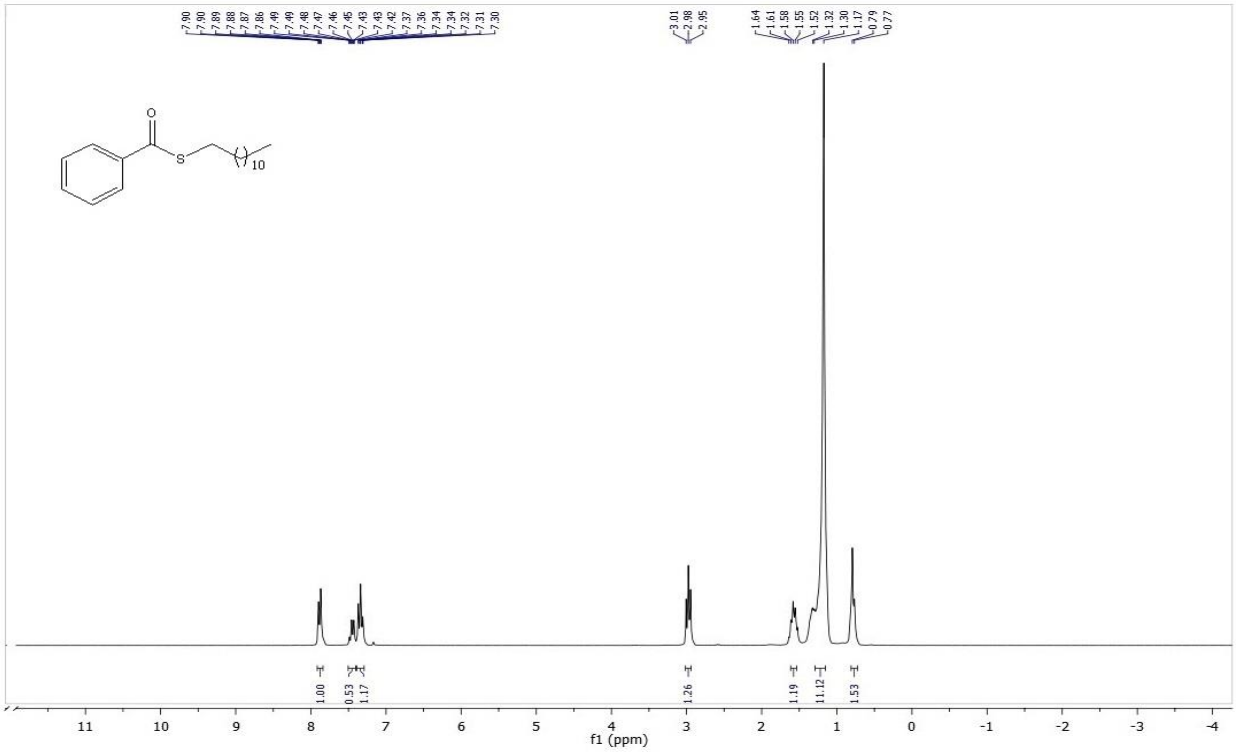
^{1}H-NMR (250 MHz, $CDCl_3$) of *S*-pentyl benzothioate (**3ad'**)



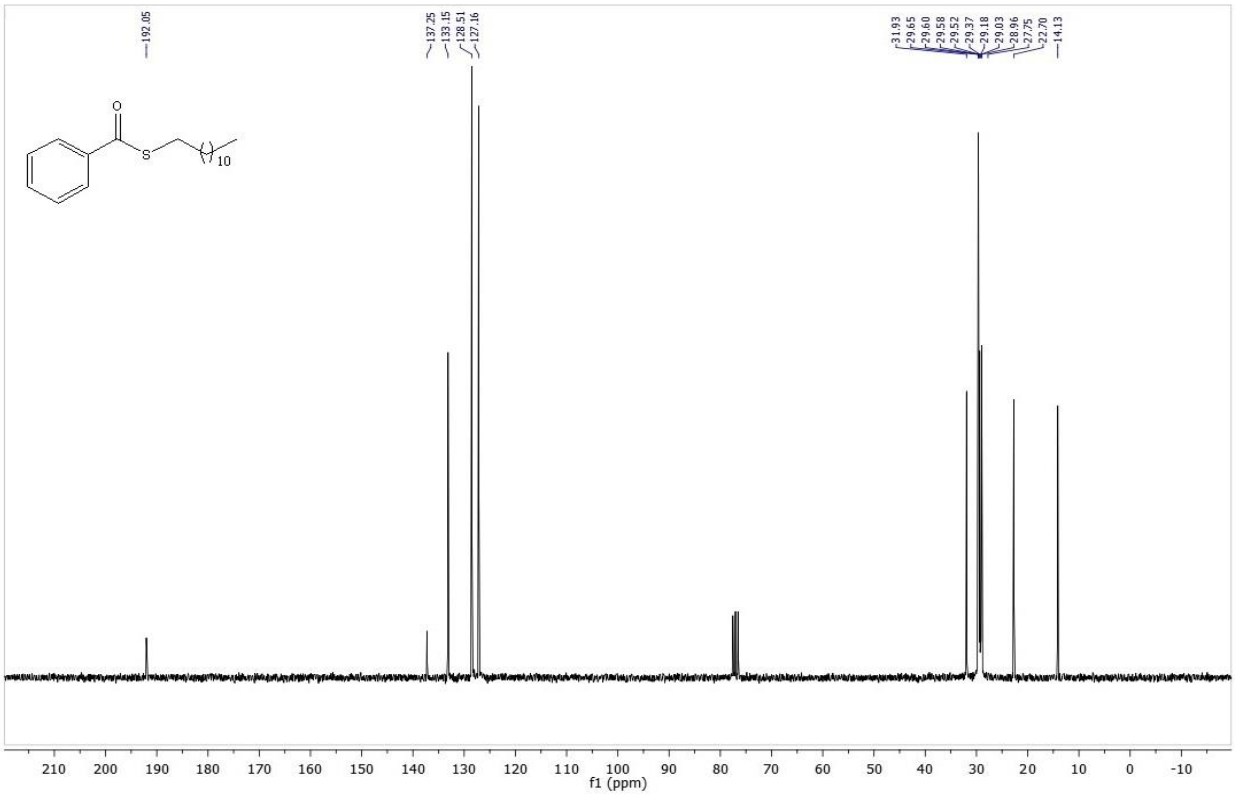
^{13}C-NMR (62.9 MHz, $CDCl_3$) of *S*-pentyl benzothioate (**3ad'**)



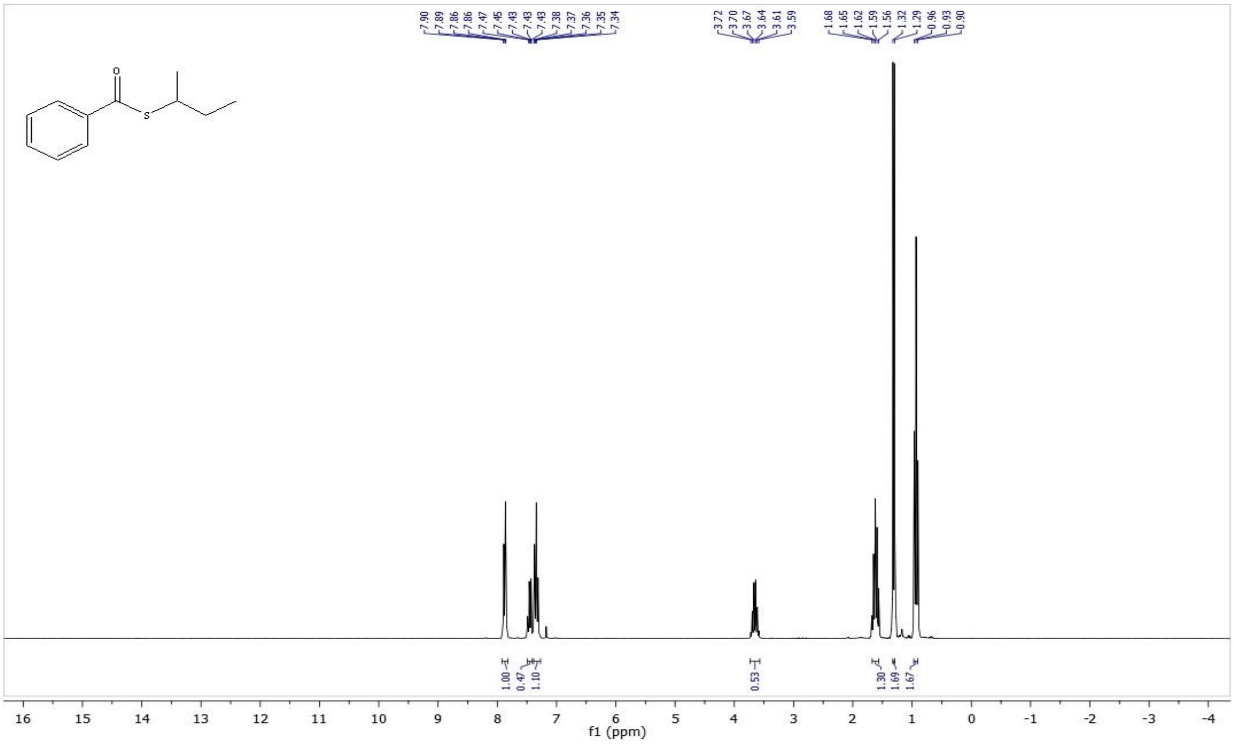
^{1}H-NMR (250 MHz, $CDCl_3$) of *S*-dodecyl benzothioate (**3ae'**)



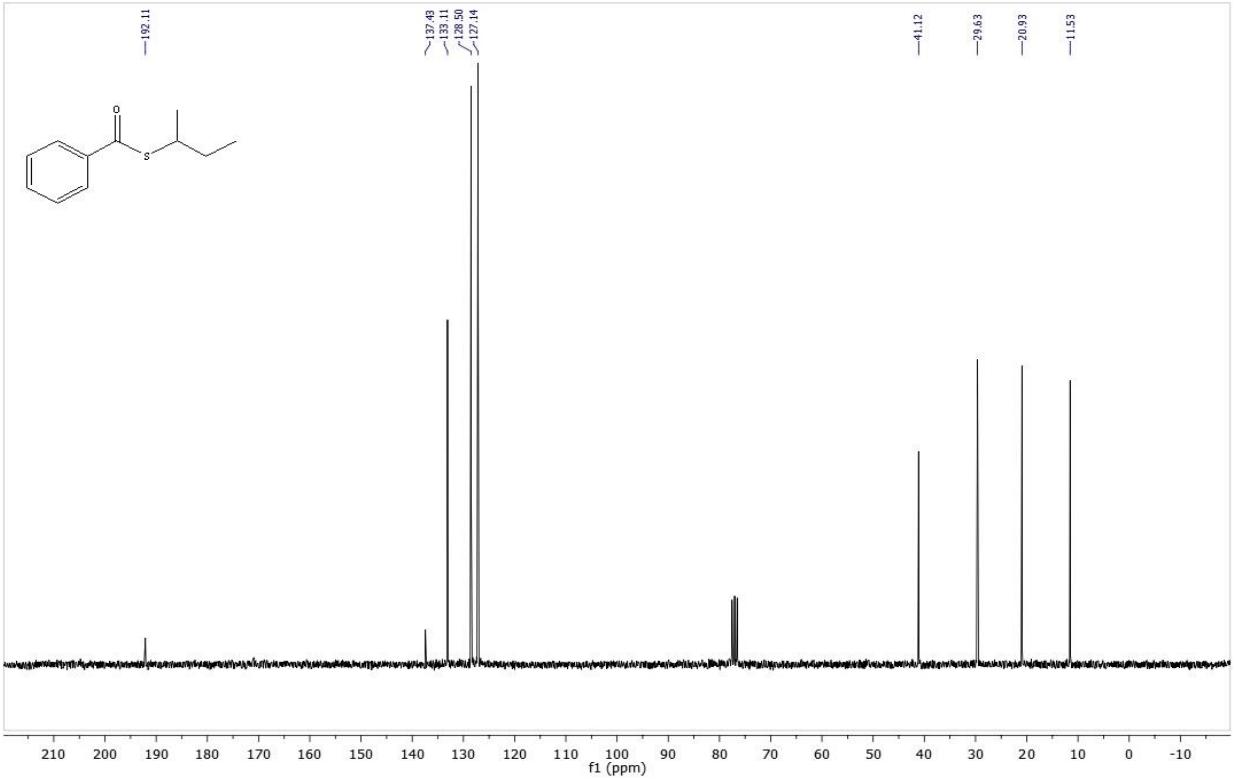
^{13}C-NMR (62.9 MHz, $CDCl_3$) of *S*-dodecyl benzothioate (**3ae'**)



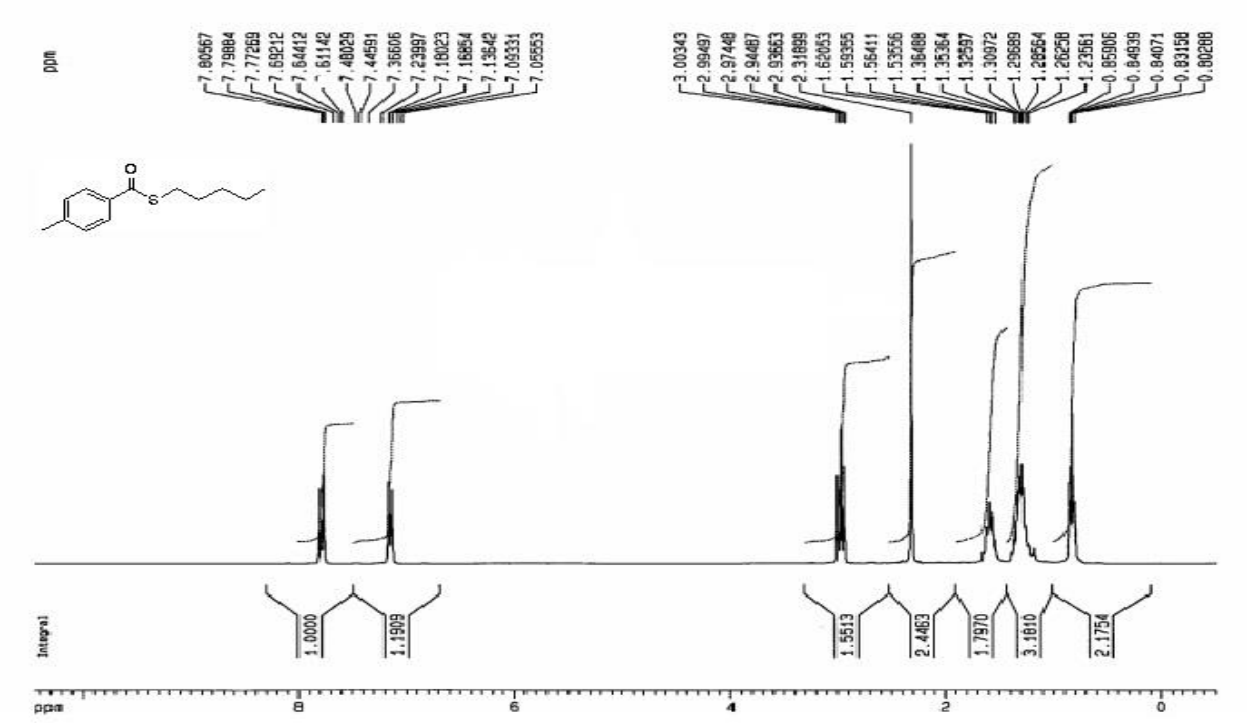
^{1}H-NMR (250 MHz, $CDCl_3$) of *S*-(*sec*-butyl) benzothioate (**3af'**)



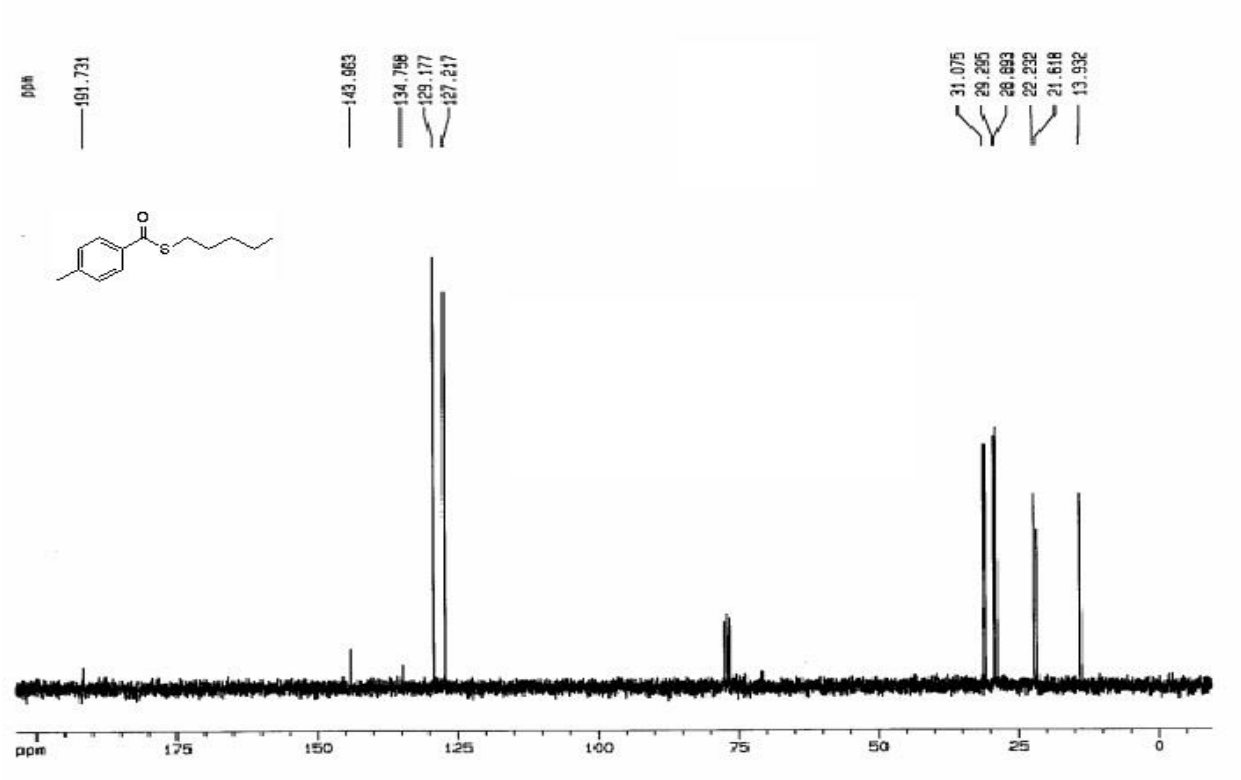
^{13}C-NMR (62.9 MHz, $CDCl_3$) of *S*-(*sec*-butyl) benzothioate (**3af'**)



^{1}H-NMR (250 MHz, $CDCl_3$) of *S*-pentyl 4-methylbenzothioate (**3bd'**)

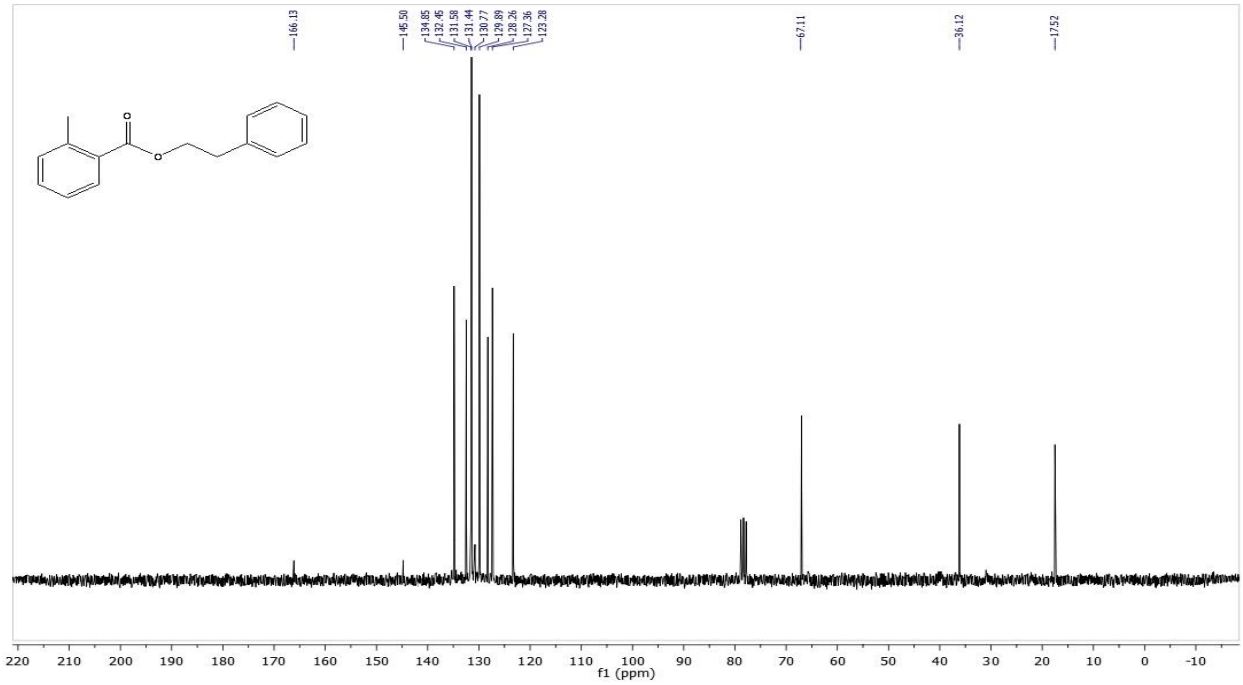


^{13}C-NMR (62.9 MHz, $CDCl_3$) of *S*-pentyl4-methyl benzothioate (**3bd'**)

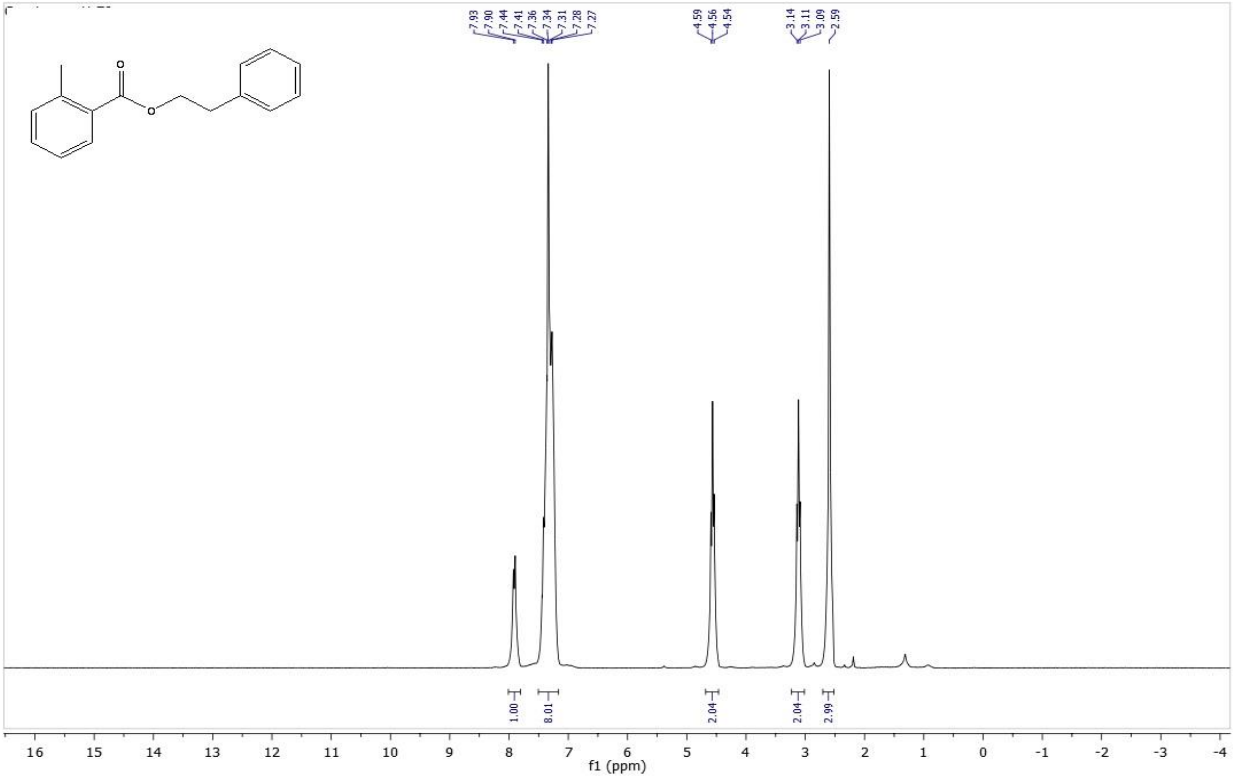


NMR spectra of esters:

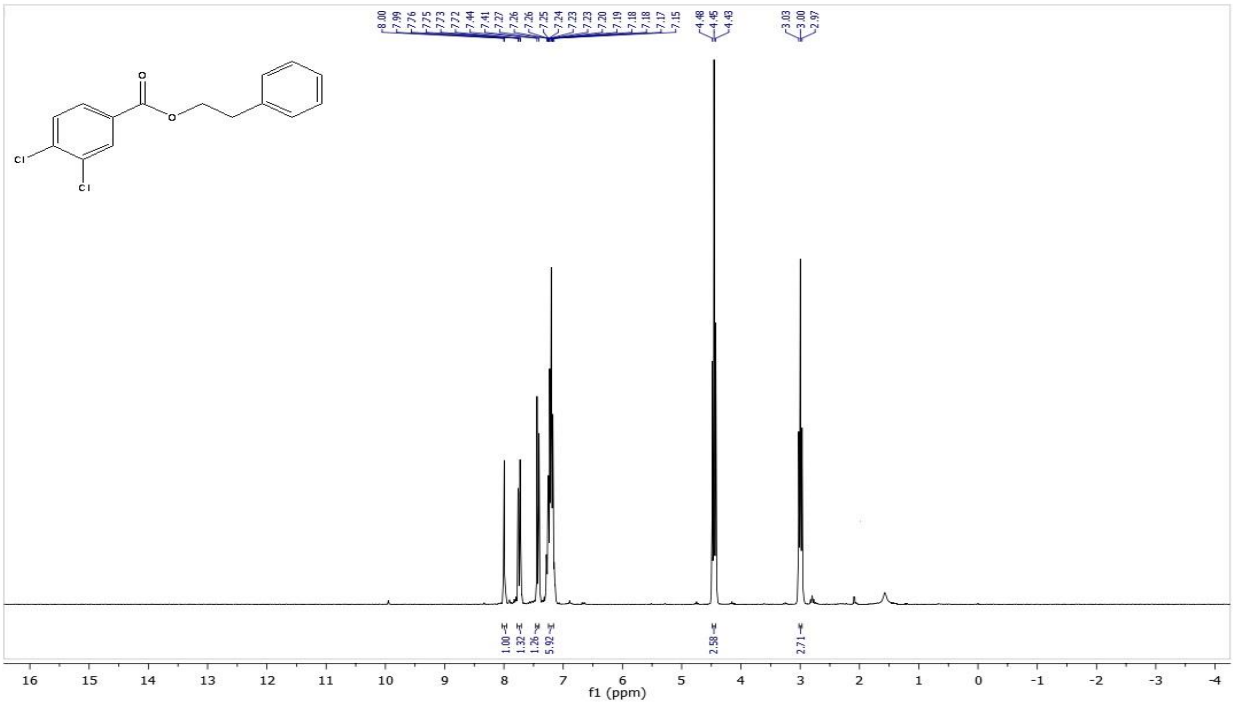
^{1}H-NMR (250 MHz, $CDCl_3$) of phenethyl 2-methylbenzoate (**6da'**)



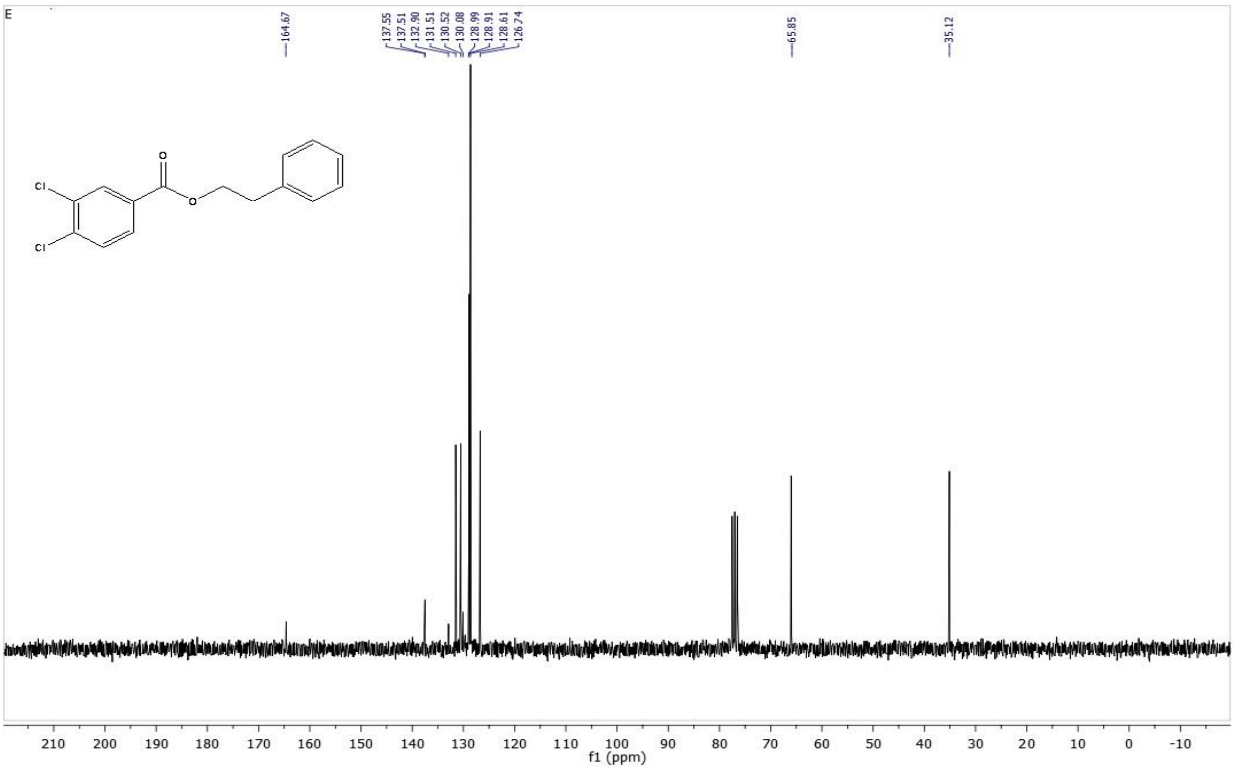
^{13}C-NMR (62.9 MHz, $CDCl_3$) of phenethyl 2-methylbenzoate (**6da'**)



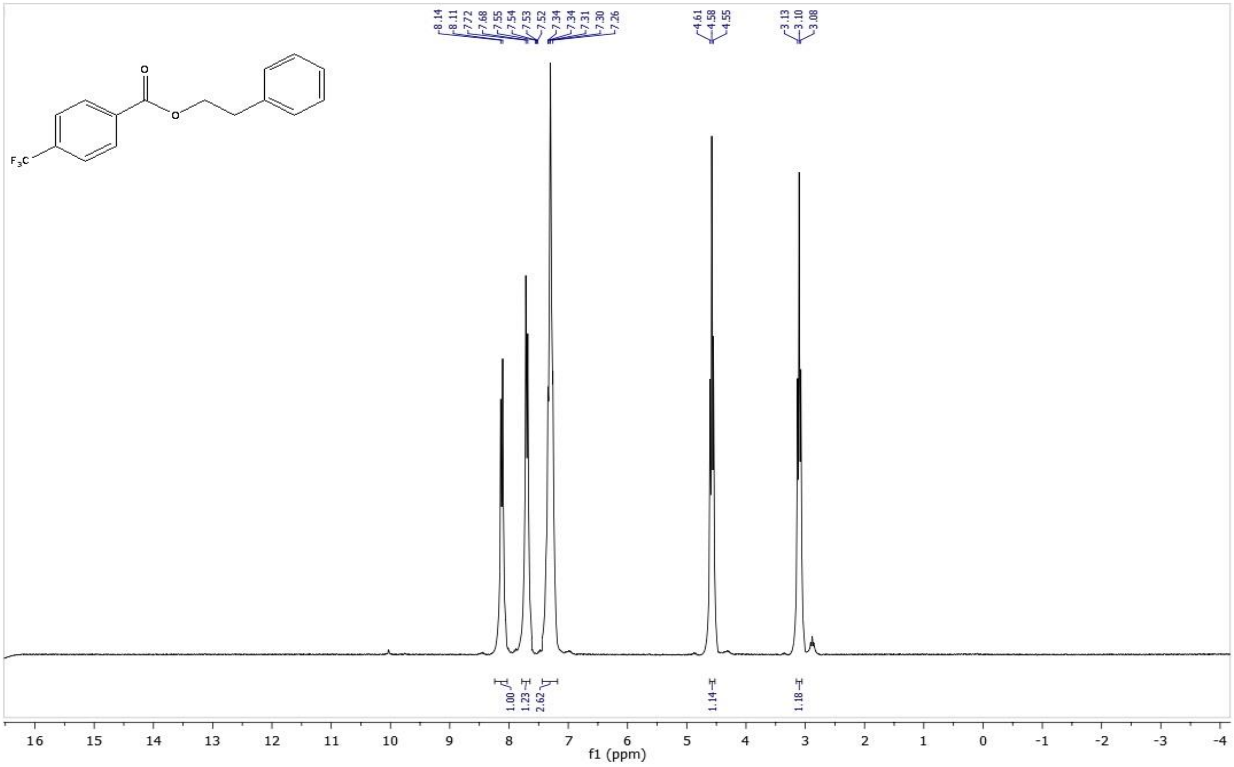
^{1}H-NMR (250 MHz, $CDCl_3$) of phenethyl 3,4-dichlorobenzoate (**6ea'**)



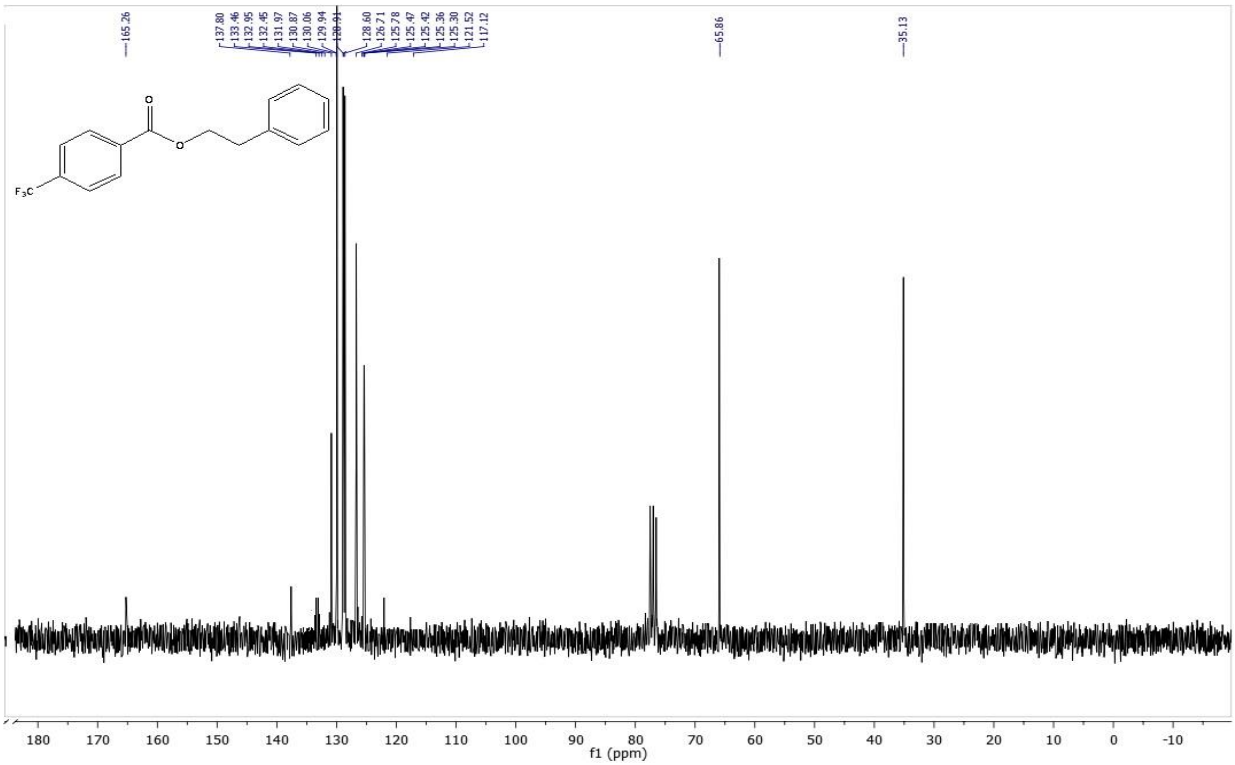
^{13}C-NMR (62.9 MHz, $CDCl_3$) of phenethyl 3,4-dichlorobenzoate (**6ea'**)



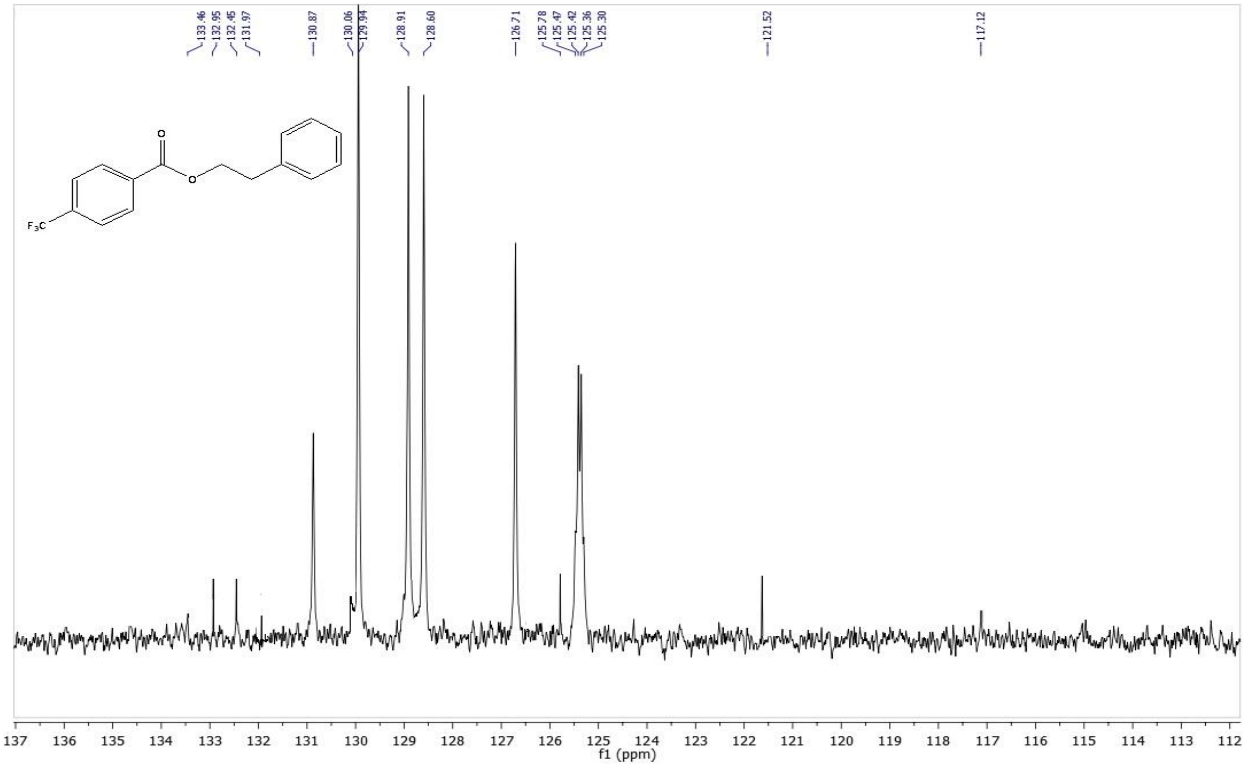
^{1}H-NMR (250 MHz, $CDCl_3$) of phenethyl 4-(trifluoromethyl)benzoate (**6fa'**)



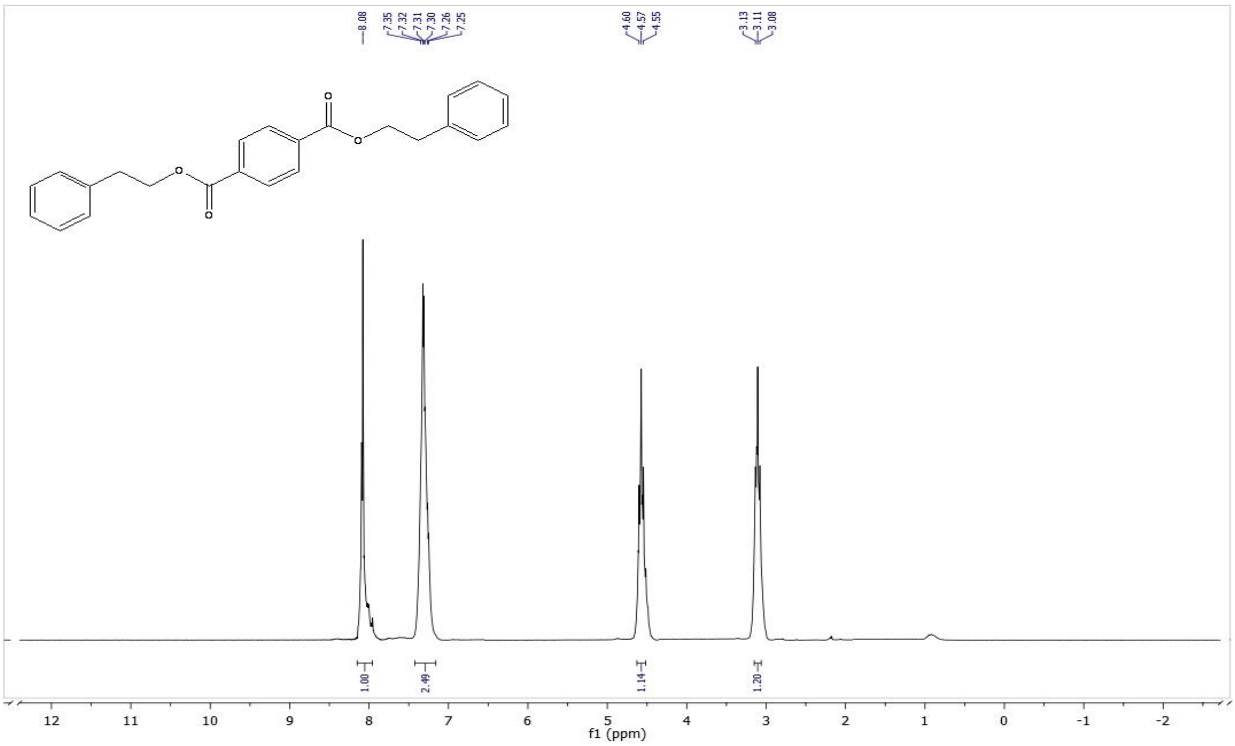
^{13}C-NMR (62.9 MHz, $CDCl_3$) of phenethyl 4-(trifluoromethyl)benzoate (**6fa'**)



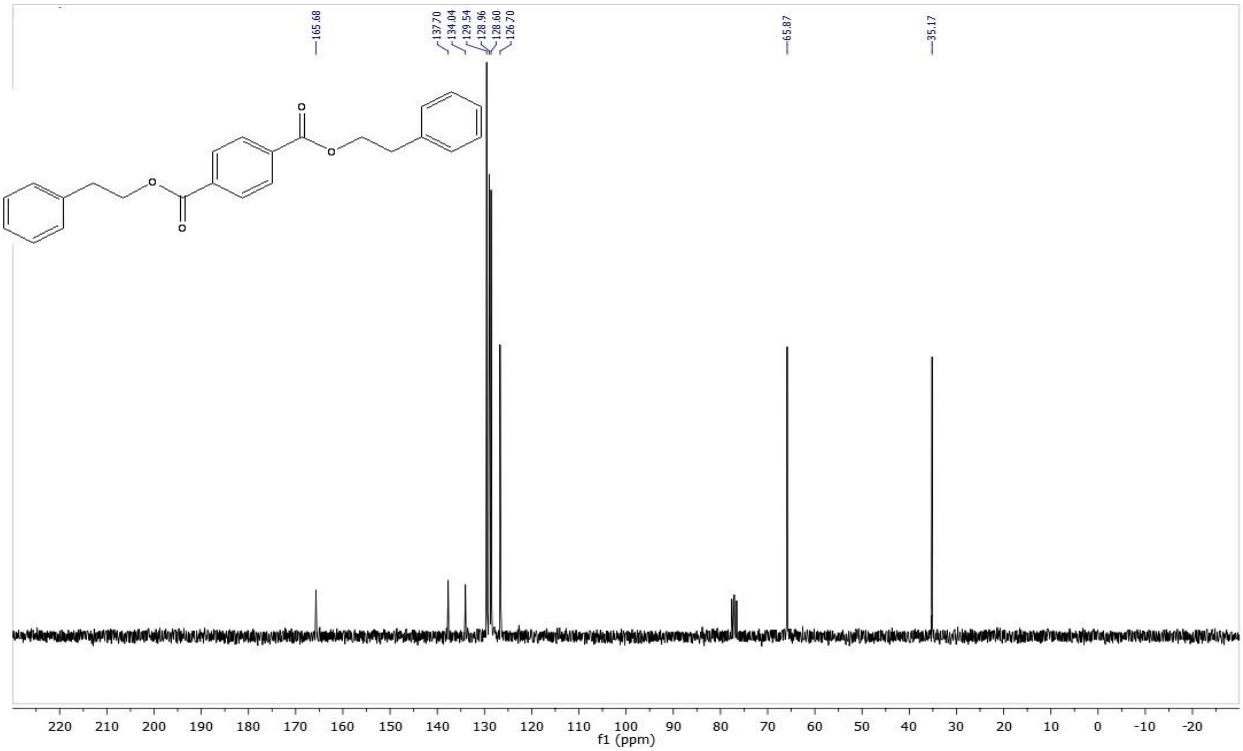
Expansion of ^{13}C-NMR (62.9 MHz, $CDCl_3$) of phenethyl 4-(trifluoromethyl)benzoate (**6fa'**)



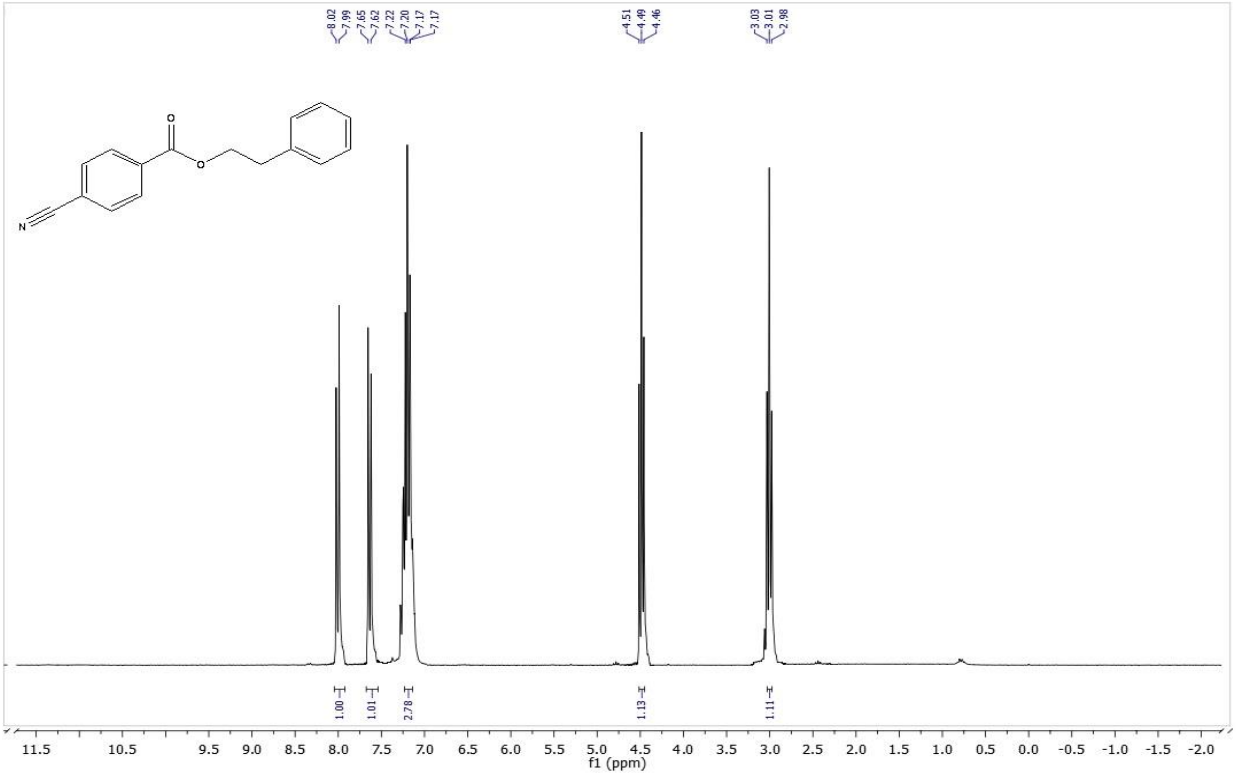
^{1}H-NMR (250 MHz, $CDCl_3$) of diphenethyl terephthalate (**6ha'**)



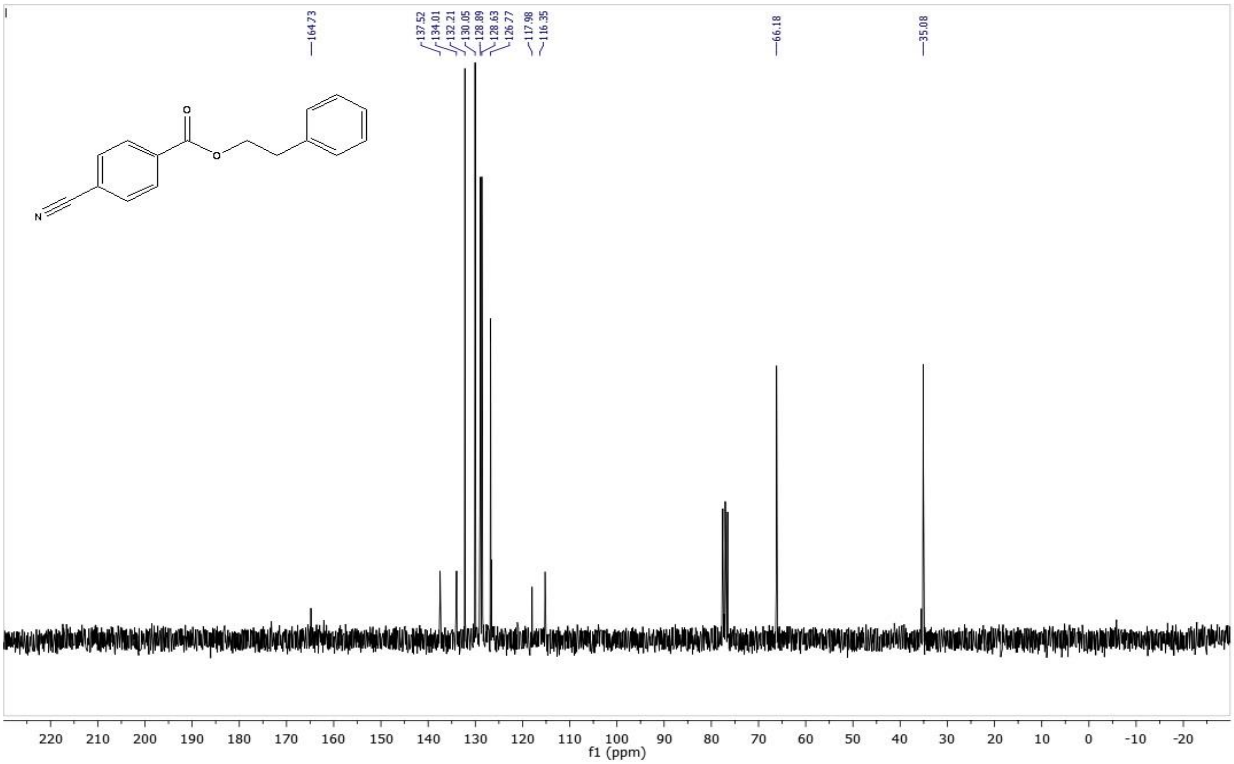
^{13}C-NMR (62.9 MHz, $CDCl_3$) of diphenethyl terephthalate (**6ha'**)



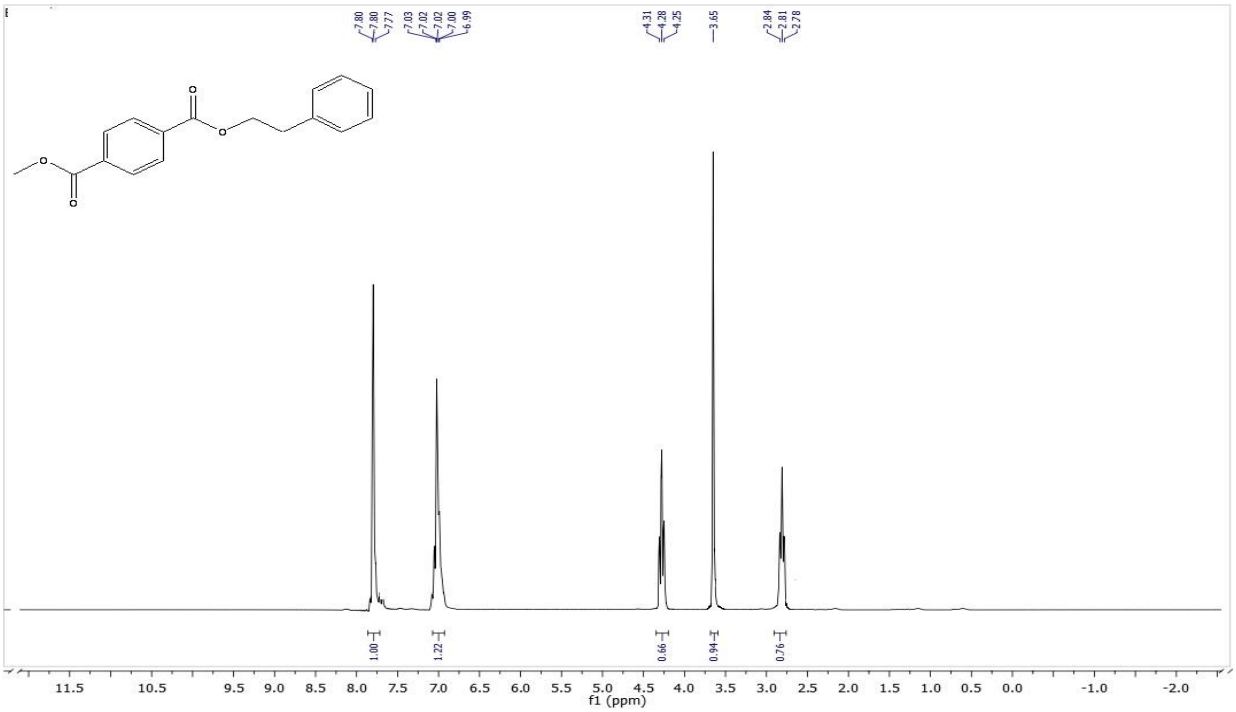
^{1}H-NMR (250 MHz, $CDCl_3$) of phenethyl 4-cyanobenzoate (**6ia'**)



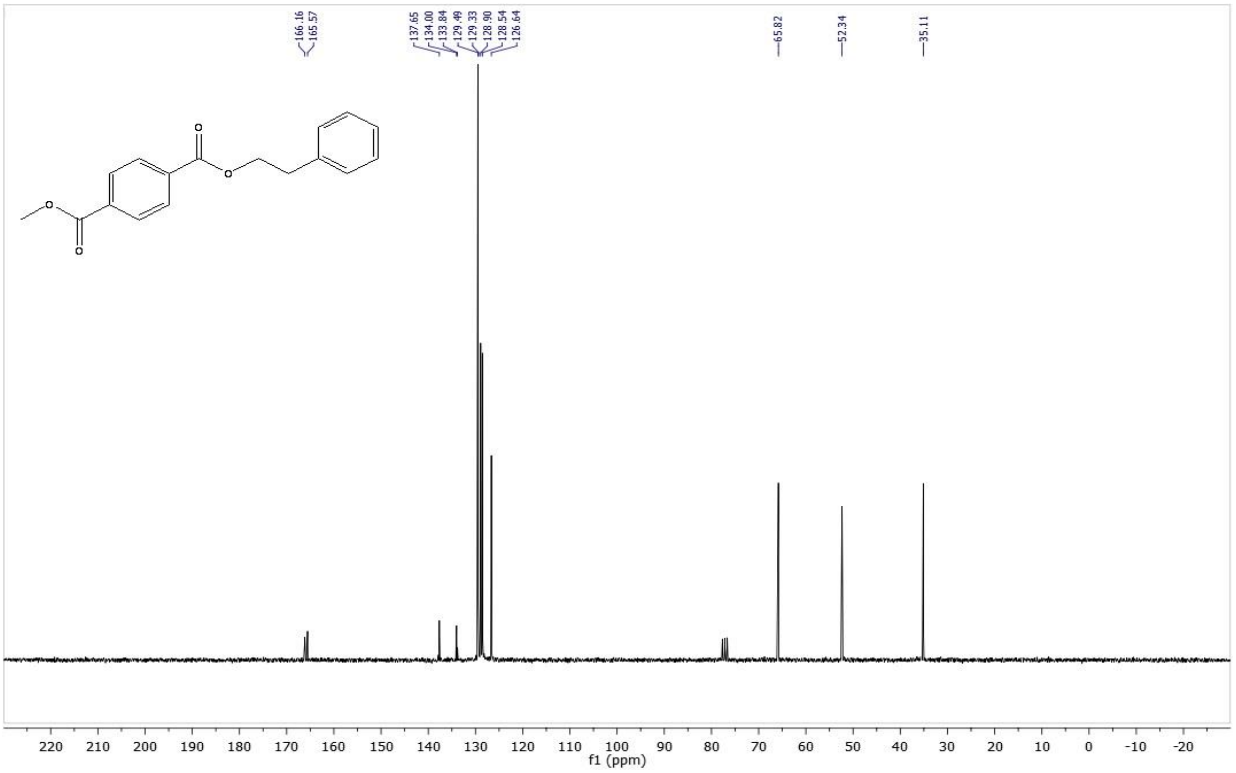
^{13}C-NMR (62.9 MHz, $CDCl_3$) of phenethyl 4-cyanobenzoate (**6ia'**)



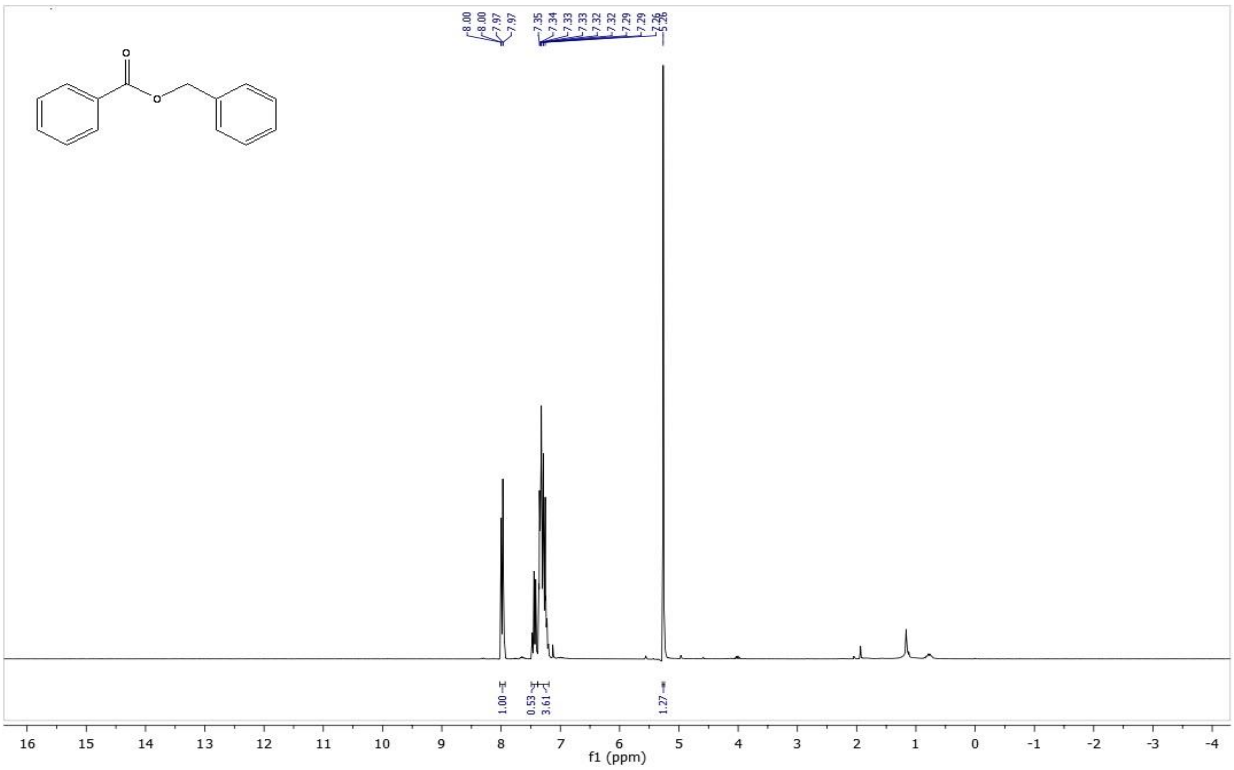
^{1}H-NMR (250 MHz, $CDCl_3$) of methyl phenethyl terephthalate (**6ja'**)



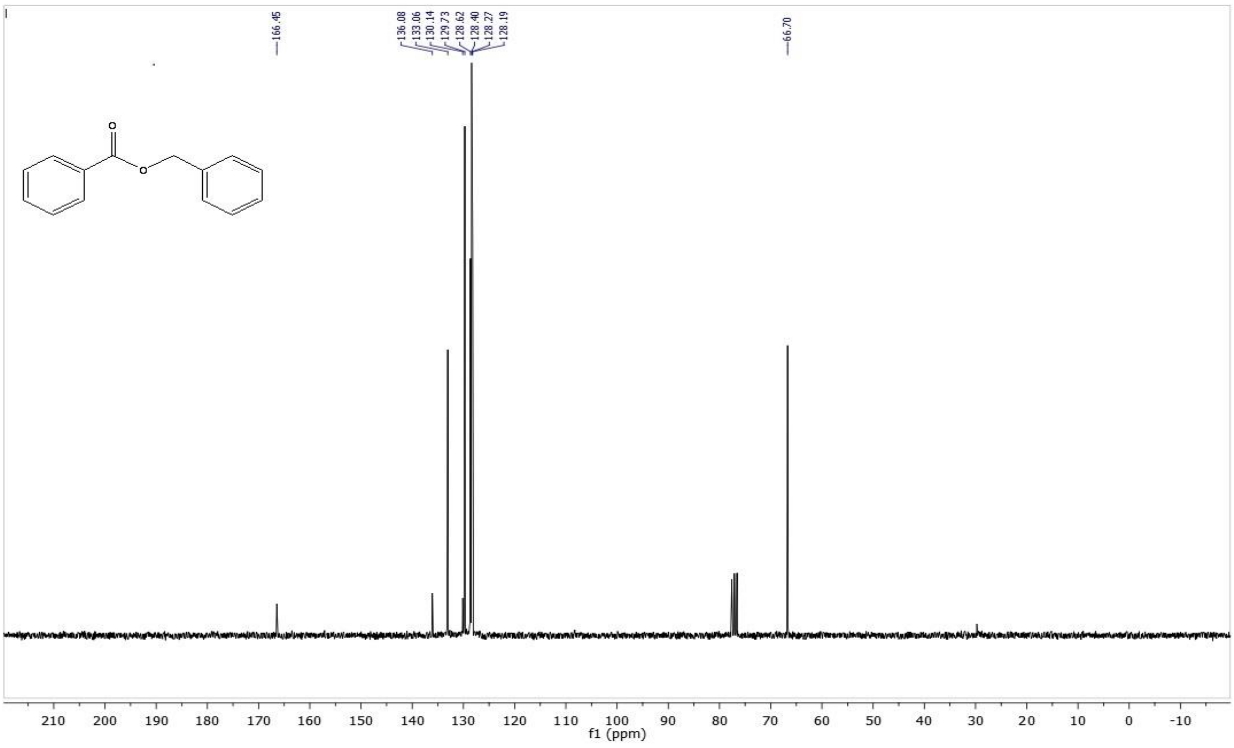
^{13}C-NMR (62.9 MHz, $CDCl_3$) of methyl phenethyl terephthalate (**6ja'**)



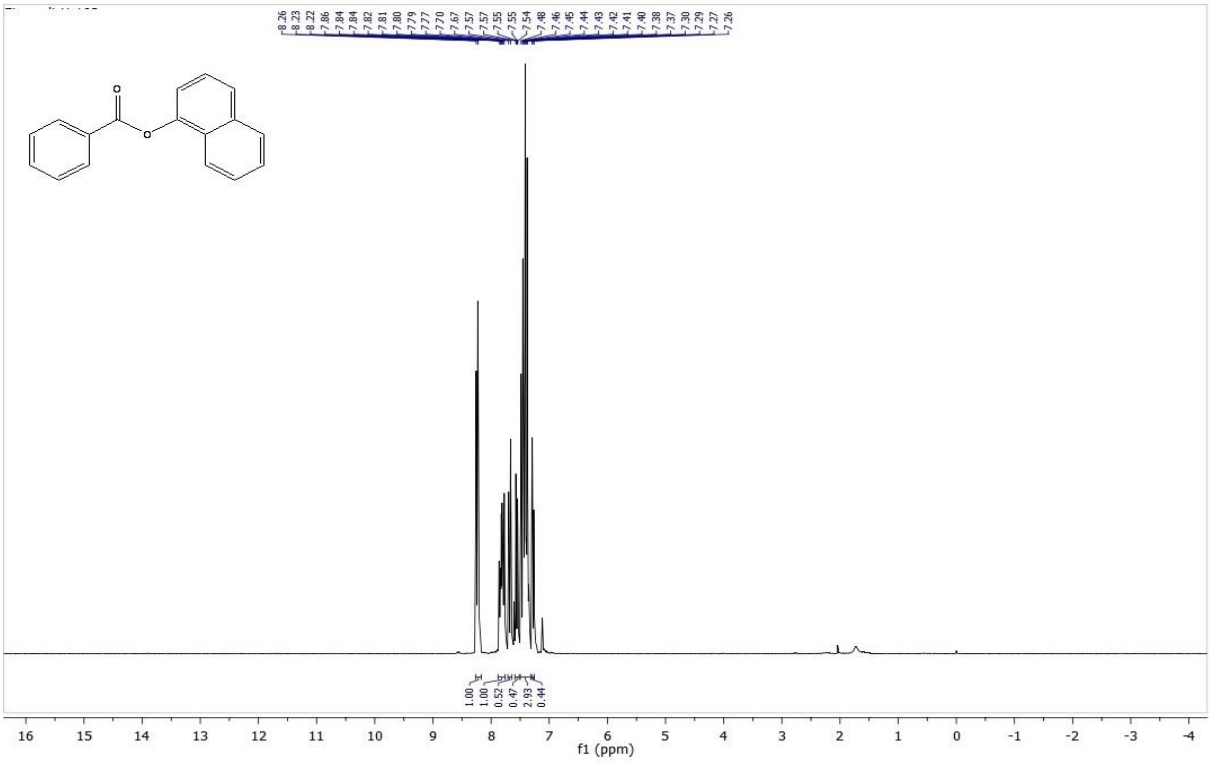
^{1}H-NMR (250 MHz, $CDCl_3$) of benzyl benzoate (**6ad'**)



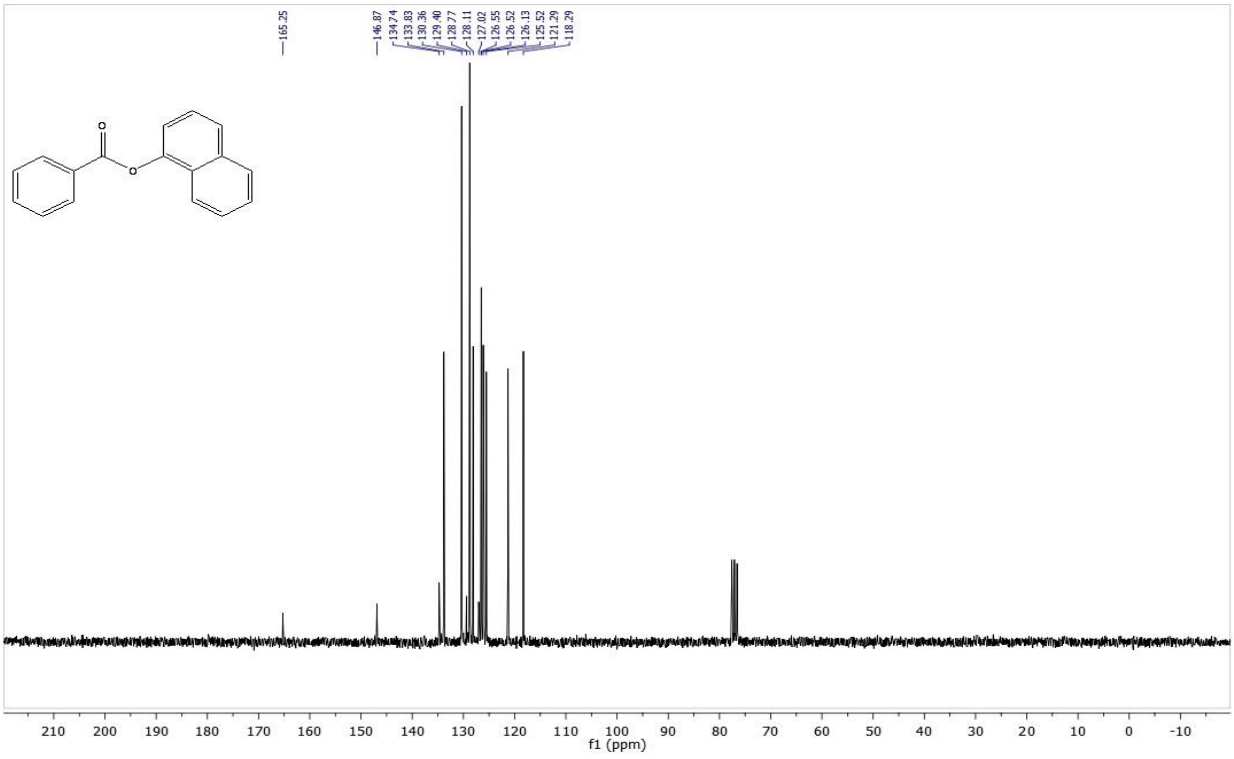
^{13}C-NMR (62.9 MHz, $CDCl_3$) of benzyl benzoate (**6ad'**)



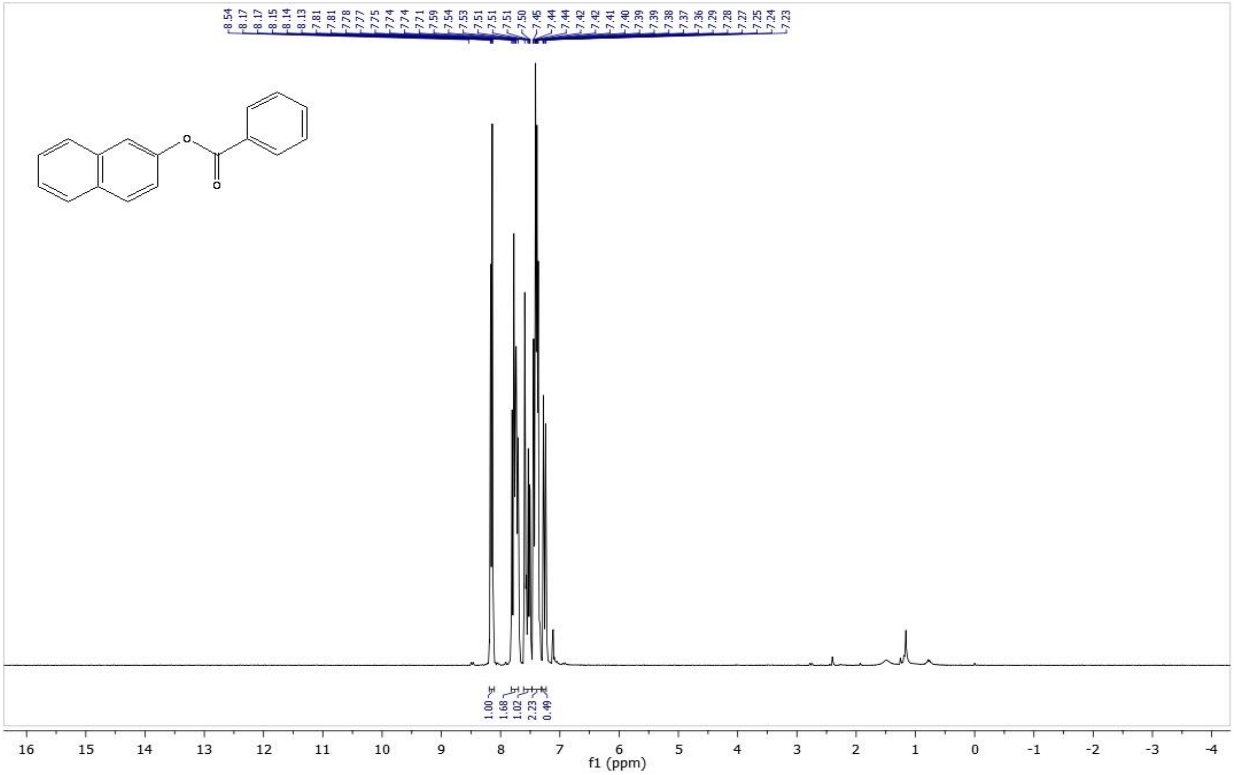
^{1}H-NMR (250 MHz, $CDCl_3$) of naphthalen-1-yl benzoate (**6af'**)



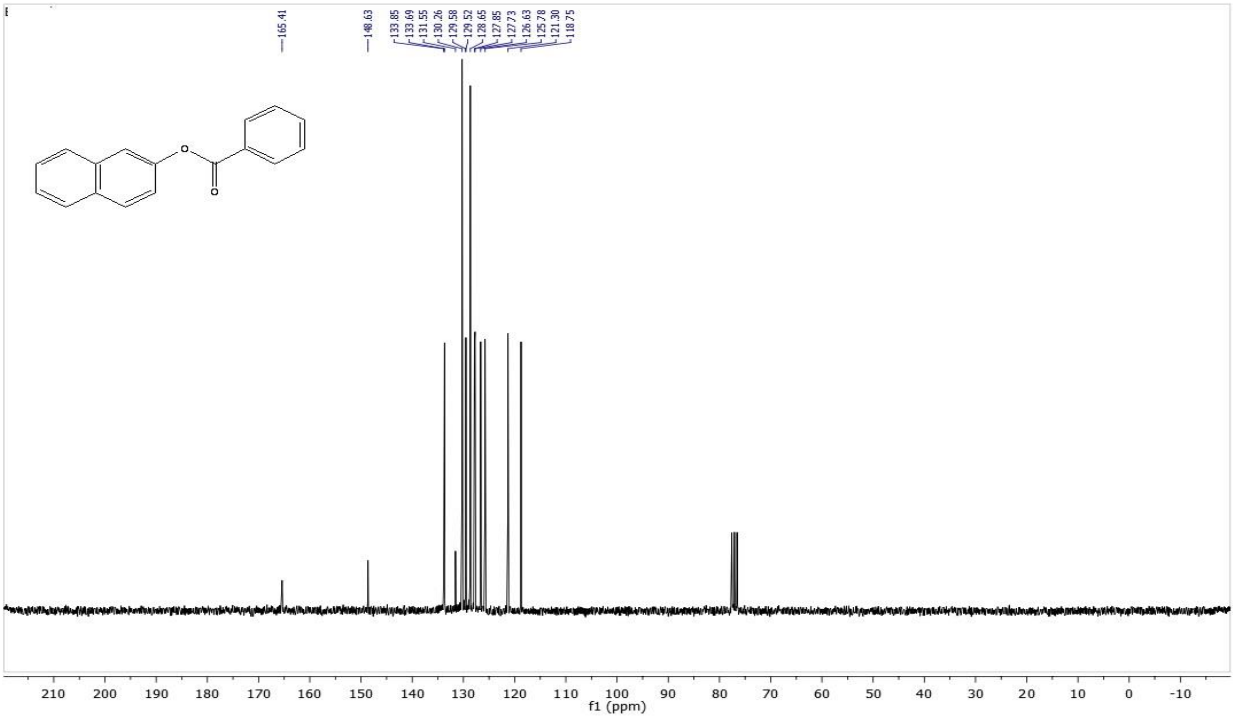
^{13}C-NMR (62.9 MHz, $CDCl_3$) of naphthalen-1-yl benzoate (**6af'**)



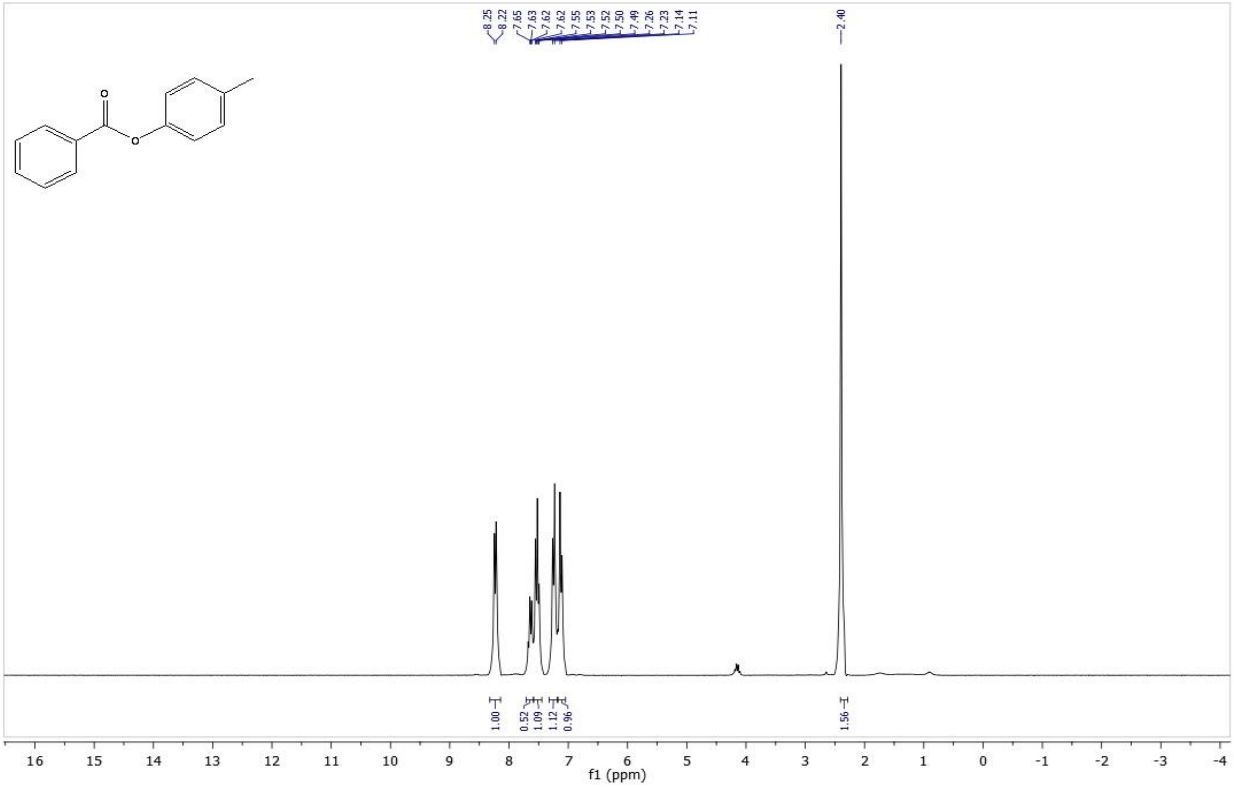
^{1}H-NMR (250 MHz, $CDCl_3$) of naphthalen-2-yl benzoate (**6ag'**)



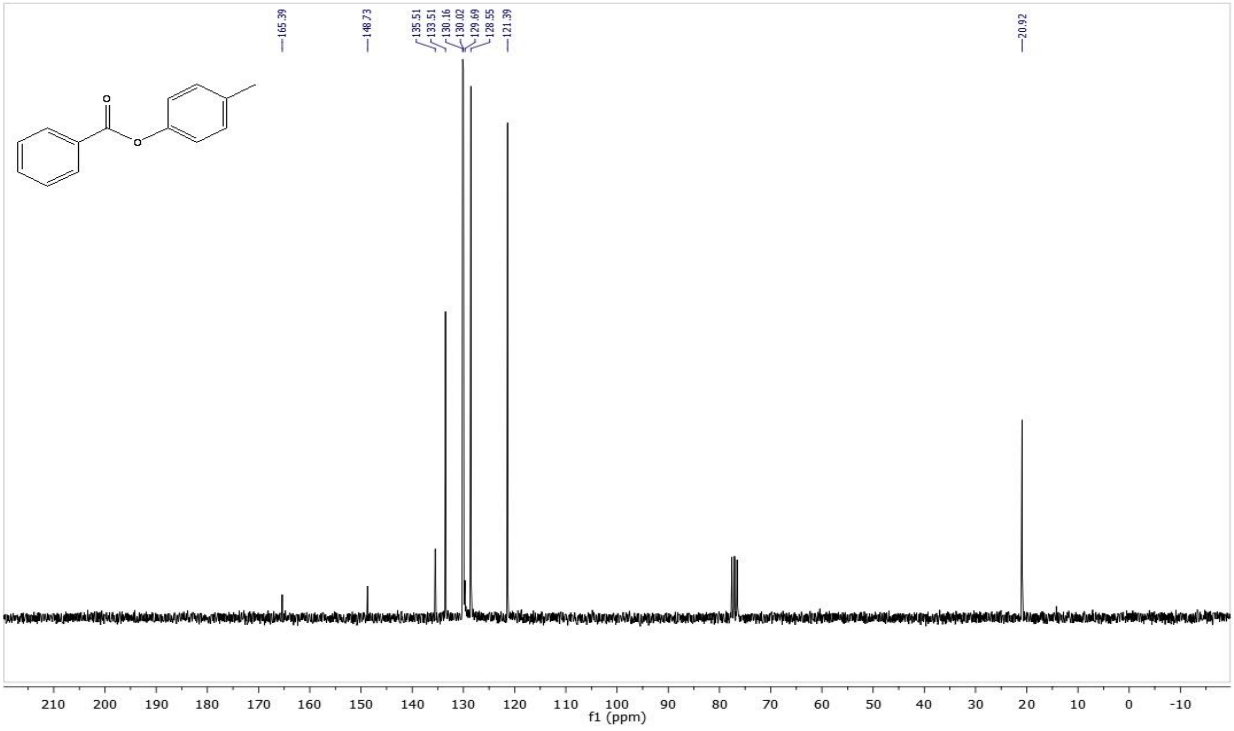
^{13}C-NMR (62.9 MHz, $CDCl_3$) of naphthalen-2-yl benzoate (**6ag'**)



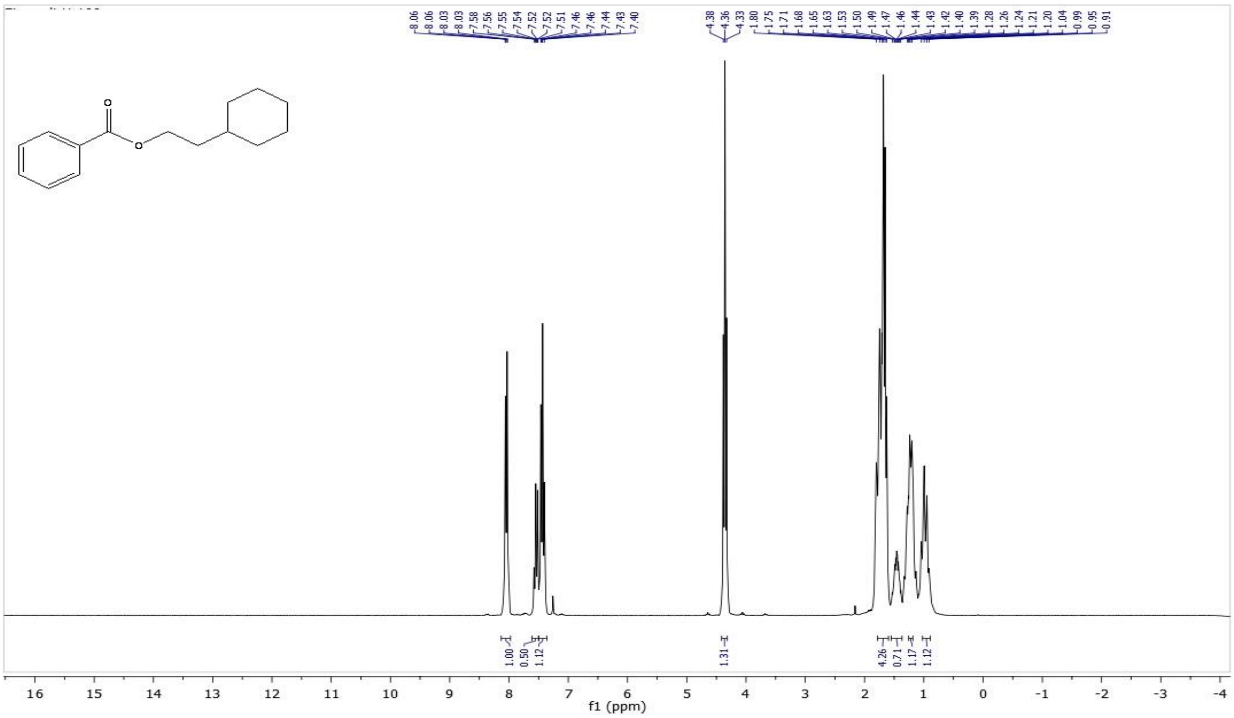
^{1}H-NMR (250 MHz, $CDCl_3$) of *p*-tolyl benzoate (**6ah'**)



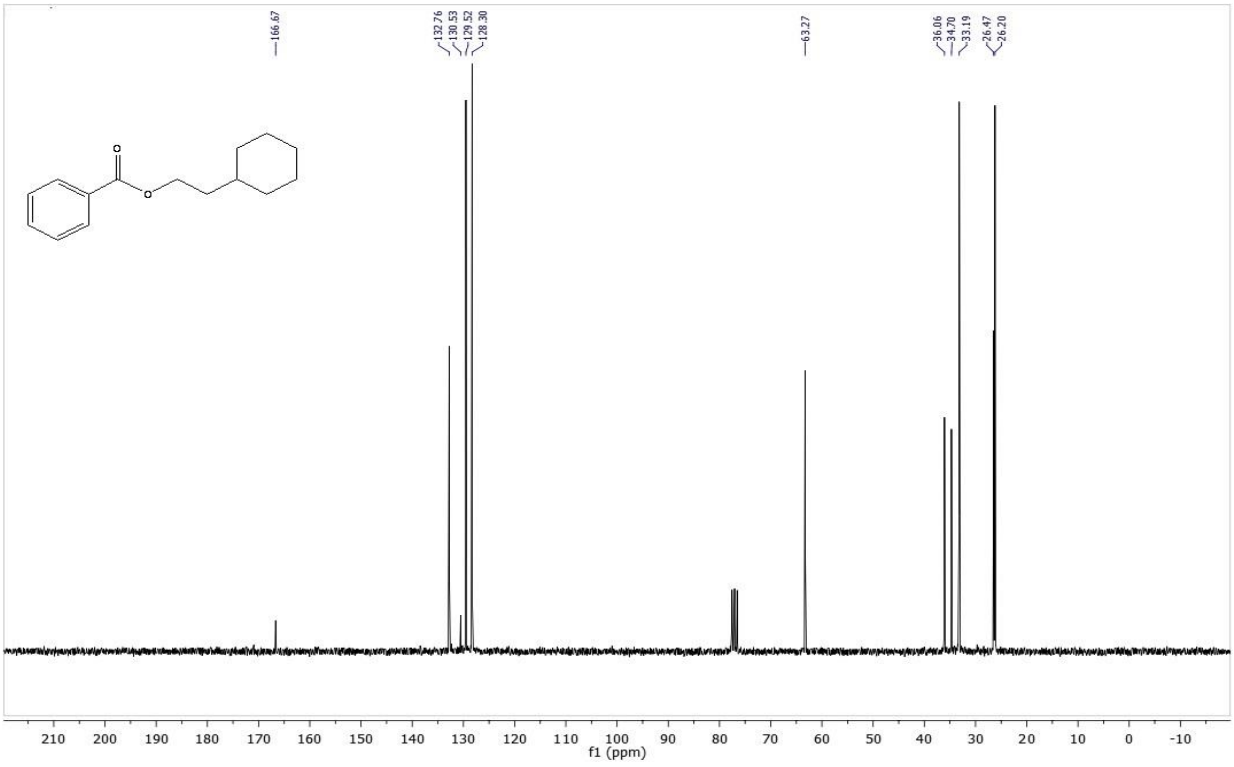
^{13}C-NMR (62.9 MHz, $CDCl_3$) of *p*-tolyl benzoate (**6ah'**)



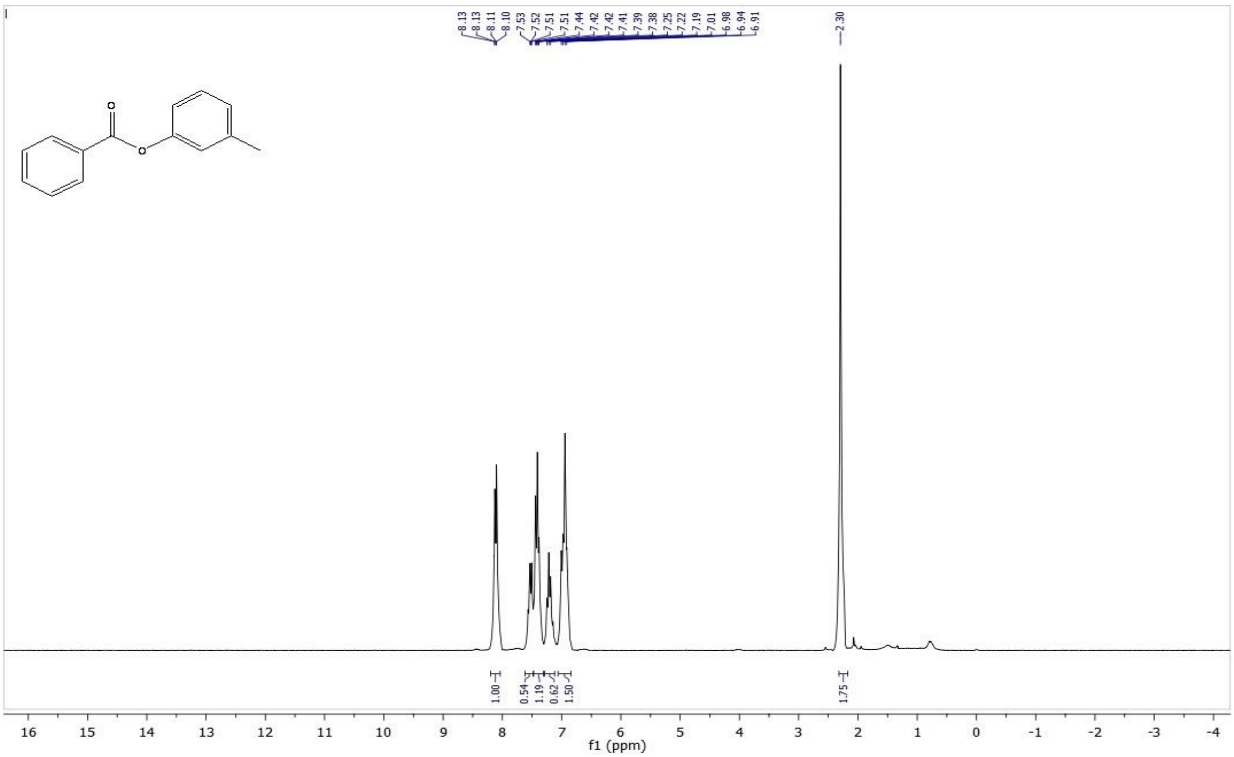
^{1}H-NMR (250 MHz, $CDCl_3$) of 2-cyclohexylethyl benzoate (**6aj'**)



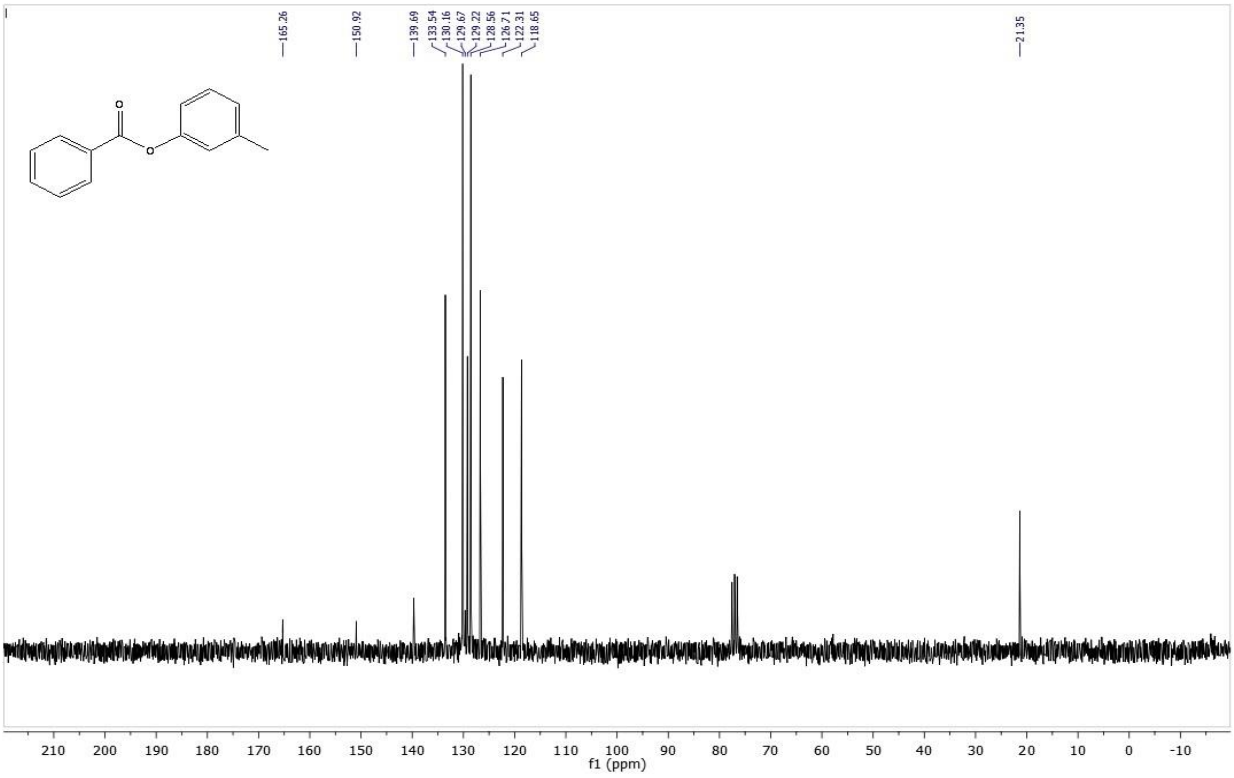
^{13}C-NMR (62.9 MHz, $CDCl_3$) of 2-cyclohexylethyl benzoate (**6aj'**)



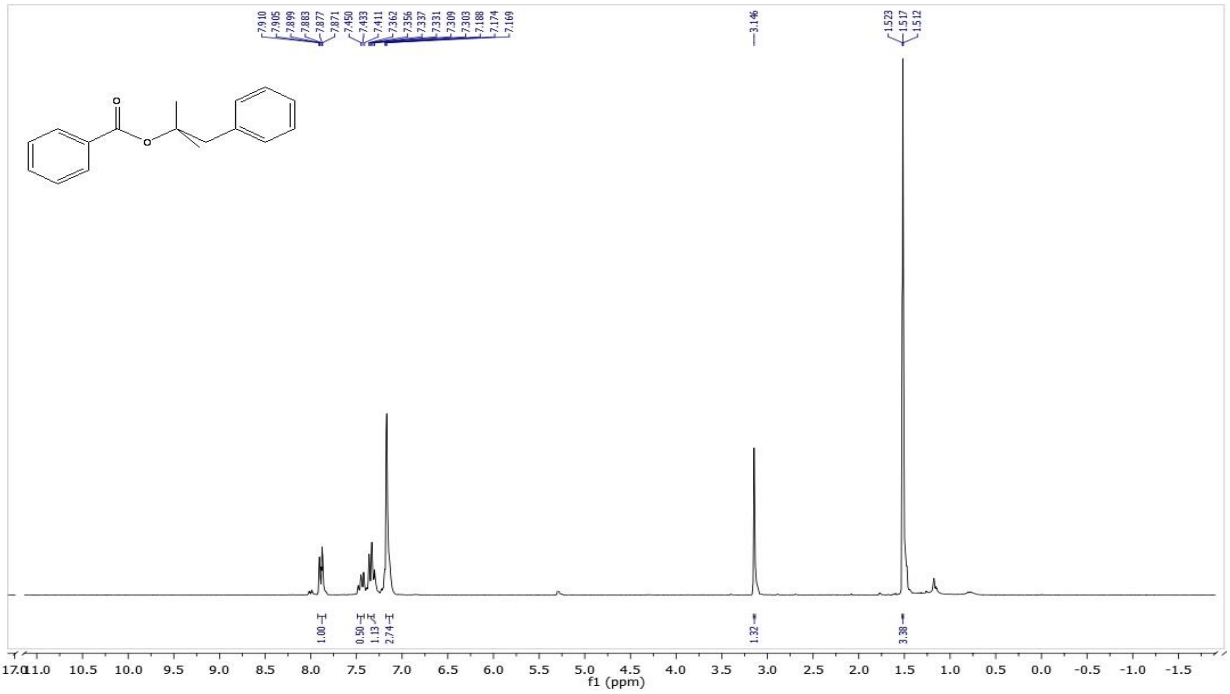
^{1}H-NMR (250 MHz, $CDCl_3$) of *m*-tolyl benzoate (**6ak'**)



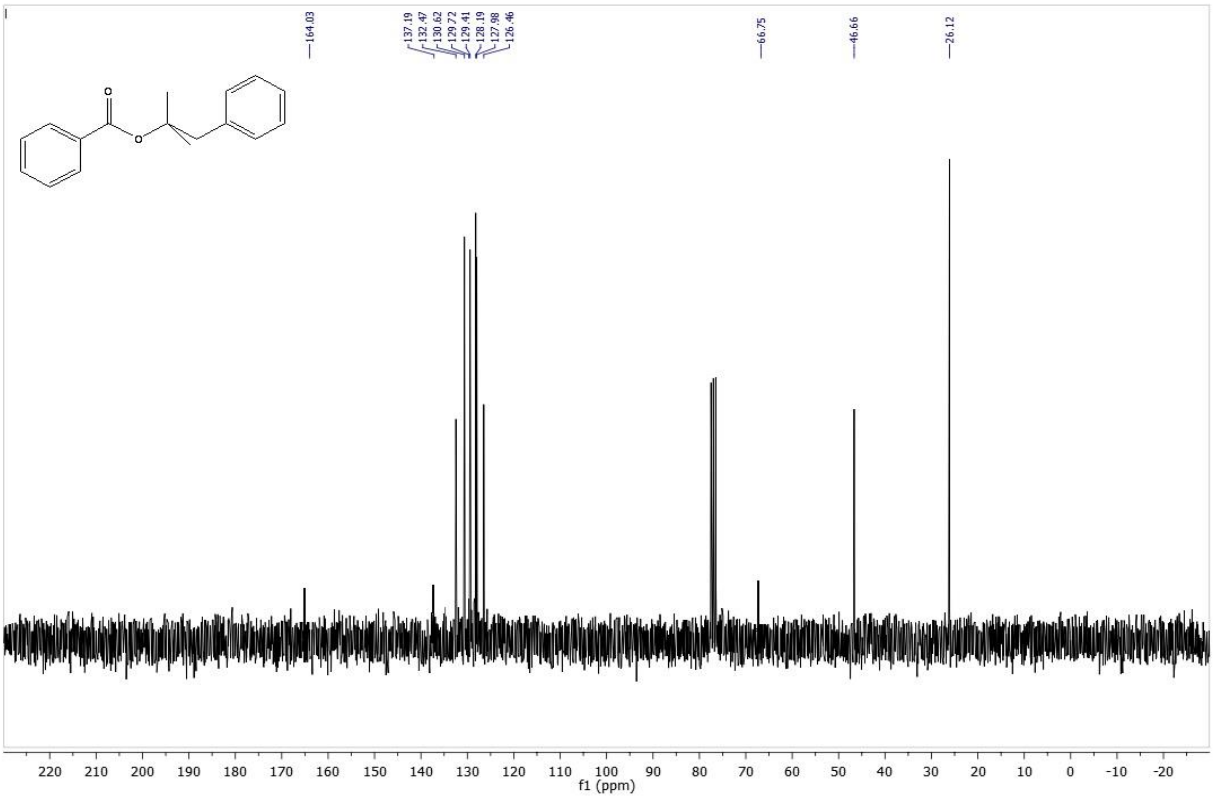
^{13}C-NMR (62.9 MHz, $CDCl_3$) of *m*-tolyl benzoate (**6ak'**)



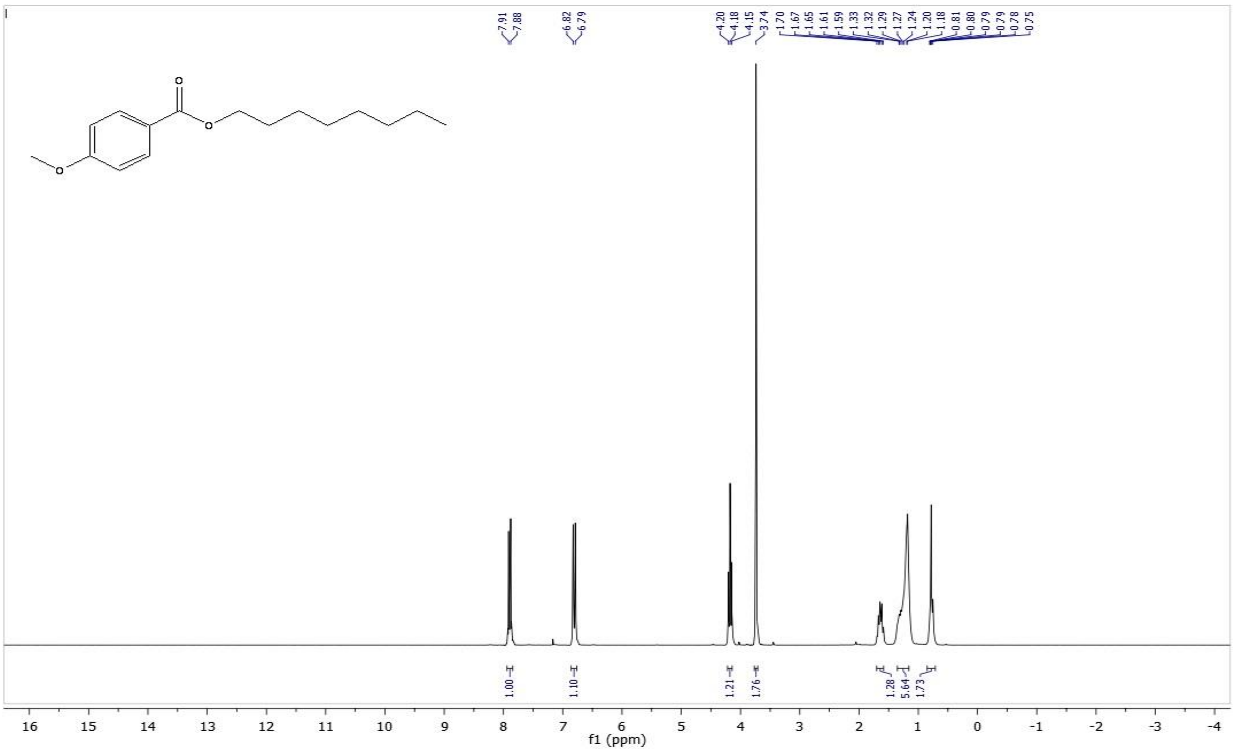
^{1}H-NMR (250 MHz, $CDCl_3$) of 2-methyl-1-phenylpropan-2-yl benzoate (**6al'**)



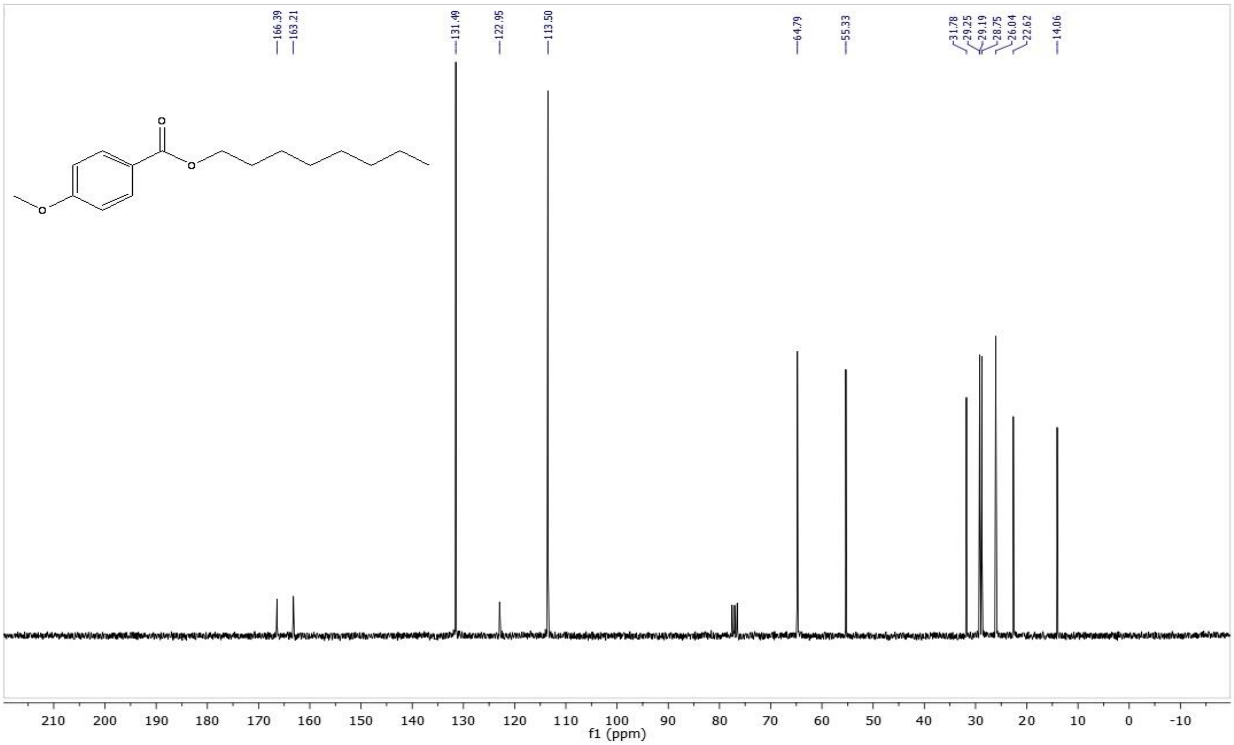
^{13}C-NMR (62.9 MHz, $CDCl_3$) of 2-methyl-1-phenylpropan-2-yl benzoate (**6al'**)



^{1}H-NMR (250 MHz, $CDCl_3$) of octyl 4-methoxybenzoate (**6cm'**)

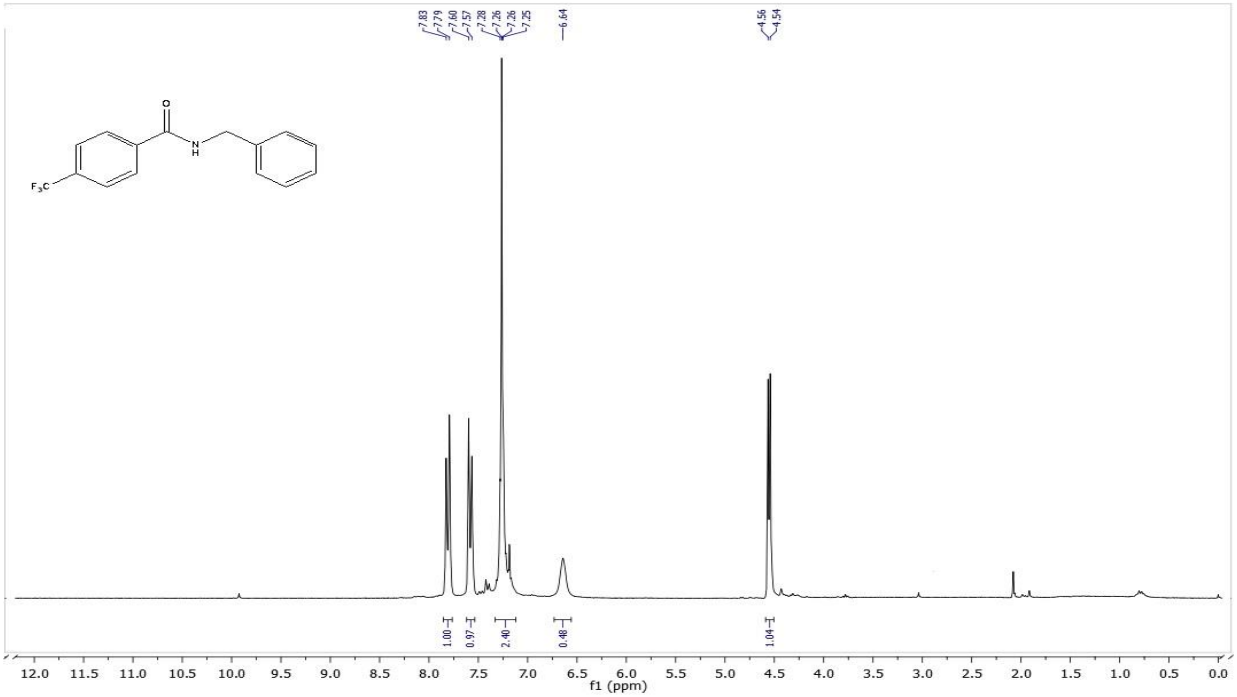


^{13}C-NMR (62.9 MHz, $CDCl_3$) of octyl 4-methoxybenzoate (**6cm'**)

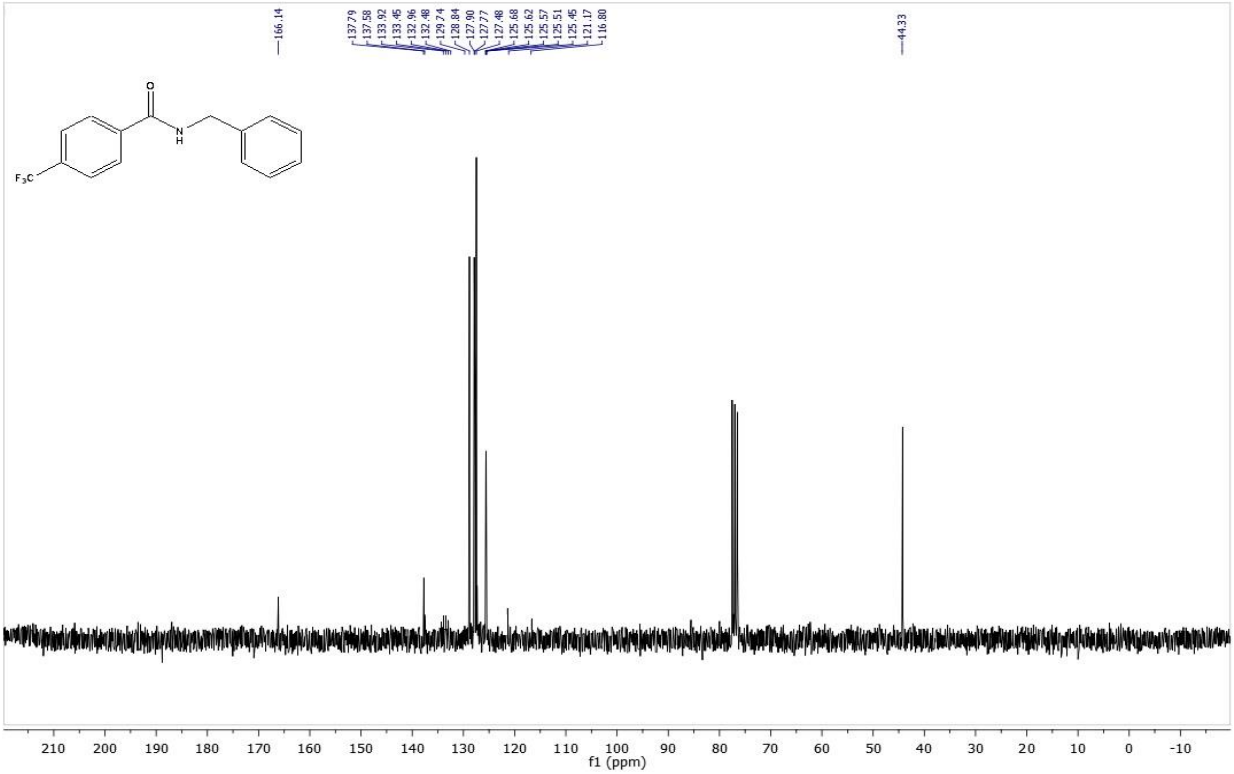


NMR spectra of amides:

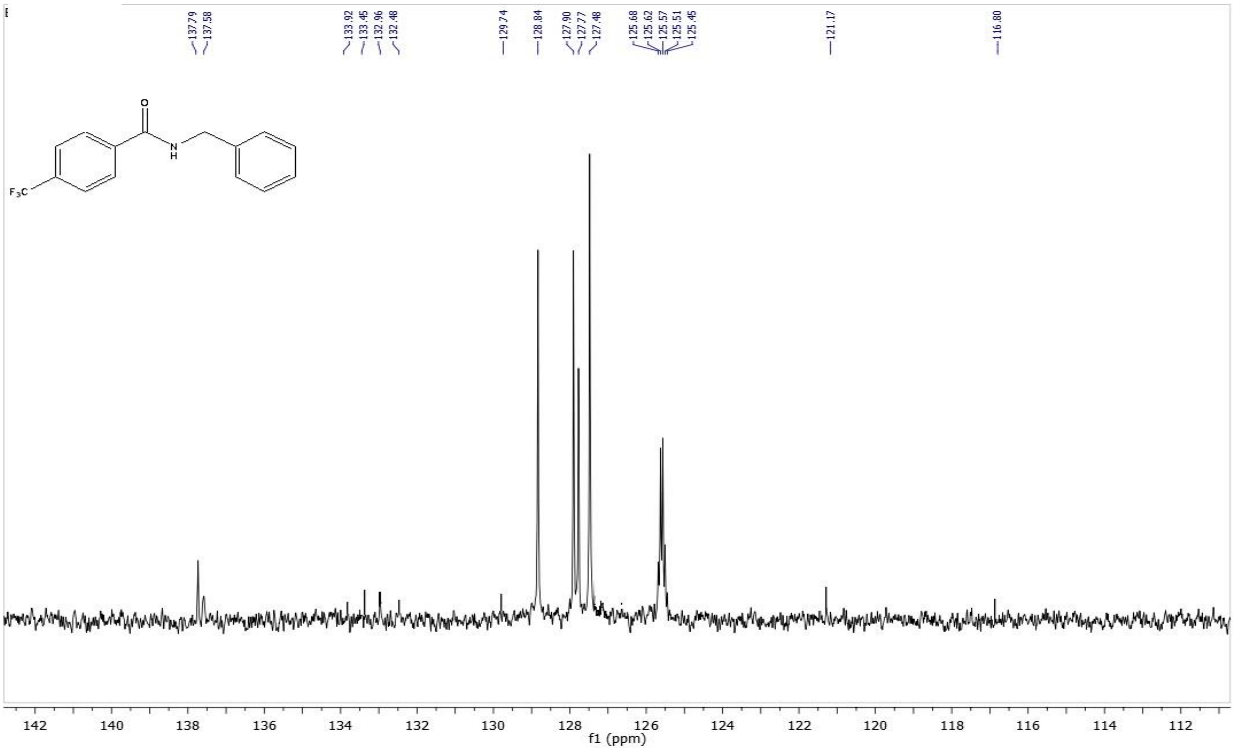
^{1}H-NMR (250 MHz, $CDCl_3$) of *N*-benzyl-4-(trifluoromethyl)benzamide (**8fa'**)



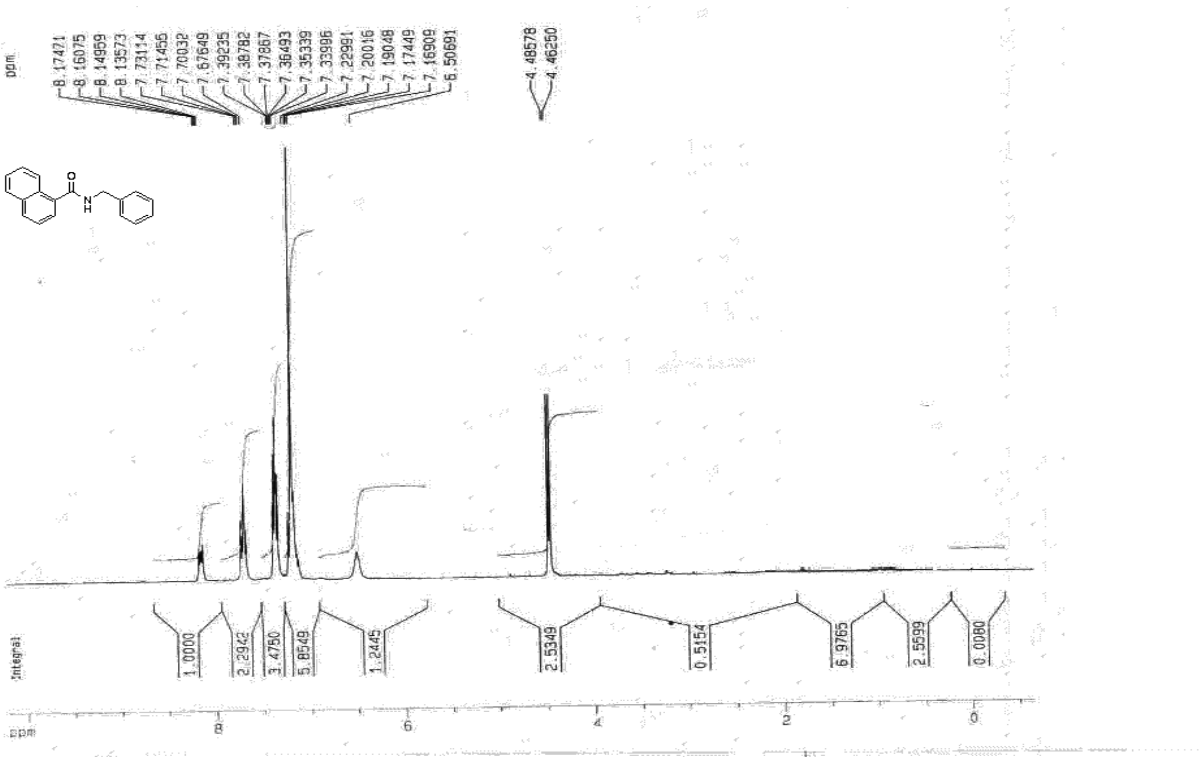
^{13}C-NMR (62.9 MHz, $CDCl_3$) of *N*-benzyl-4-(trifluoromethyl)benzamide (**8fa'**)



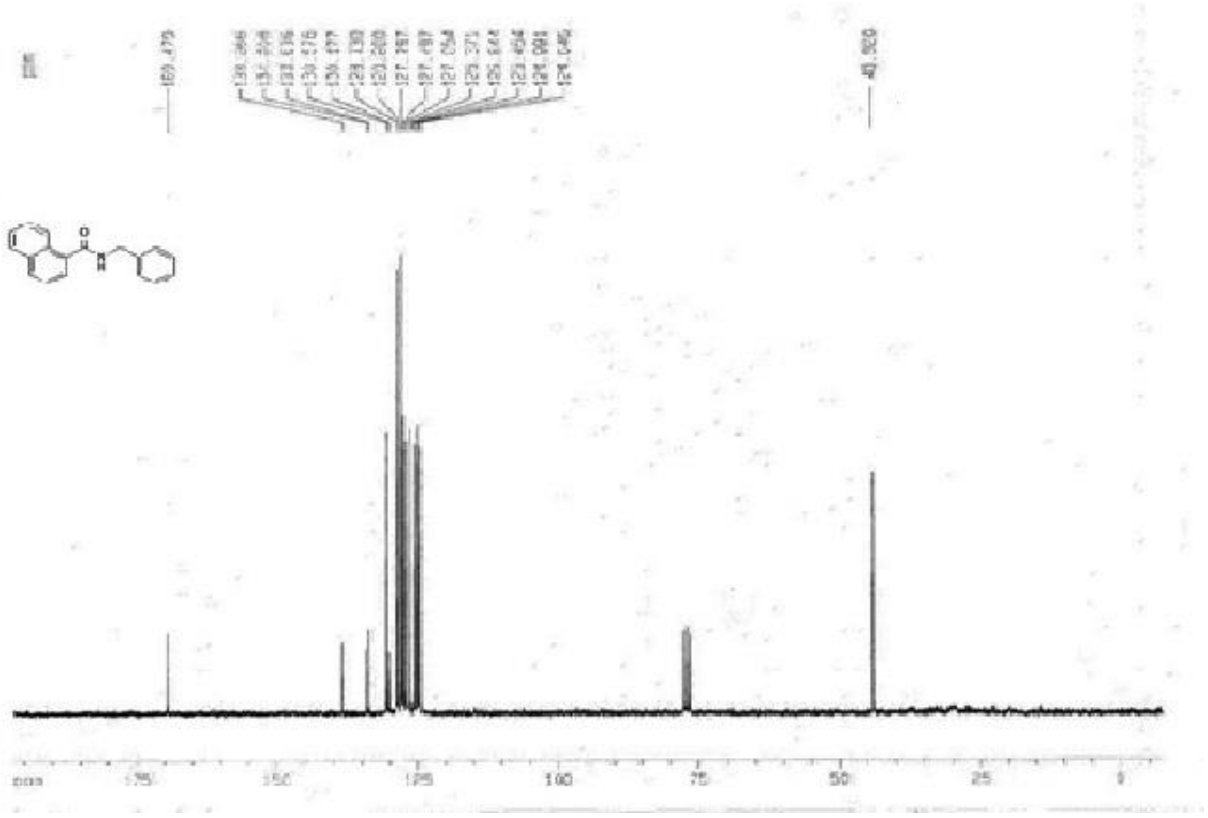
Expansion of ^{13}C-NMR (62.9 MHz, $CDCl_3$) of *N*-benzyl-4-(trifluoromethyl)benzamide (**8fa'**)



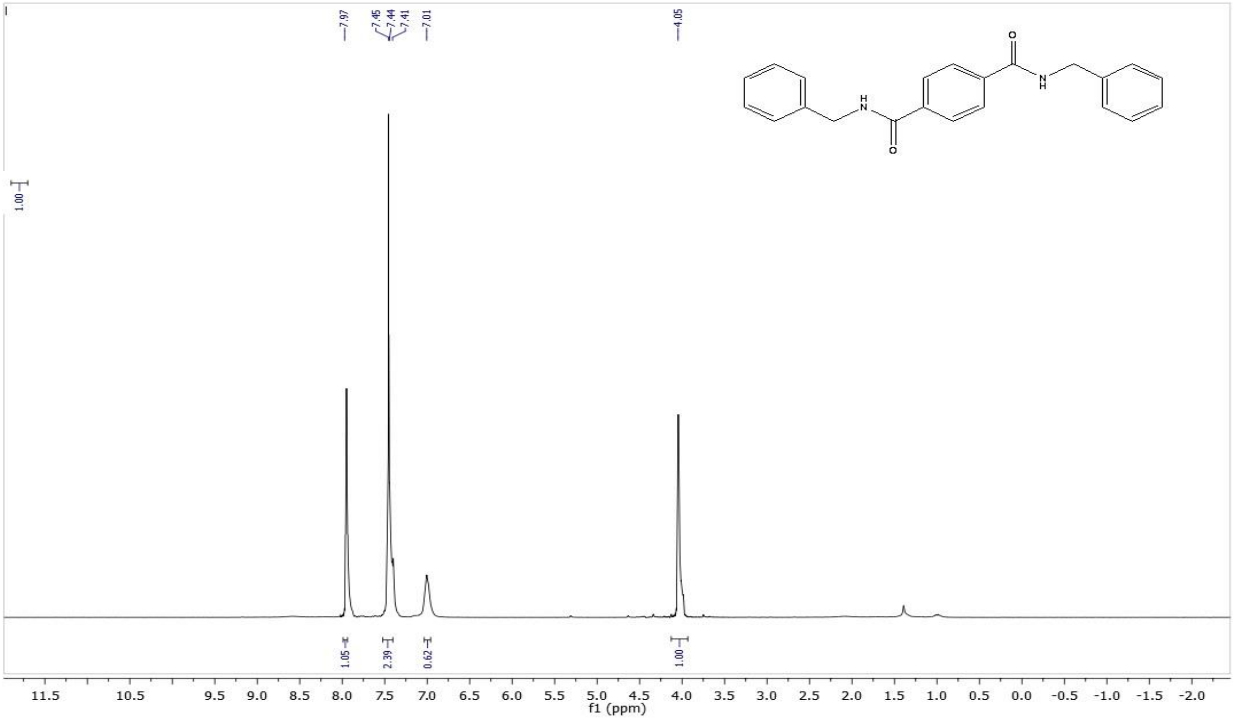
^{1}H-NMR (250 MHz, $CDCl_3$) of *N*-benzyl-1-naphthamide (**8ga'**)



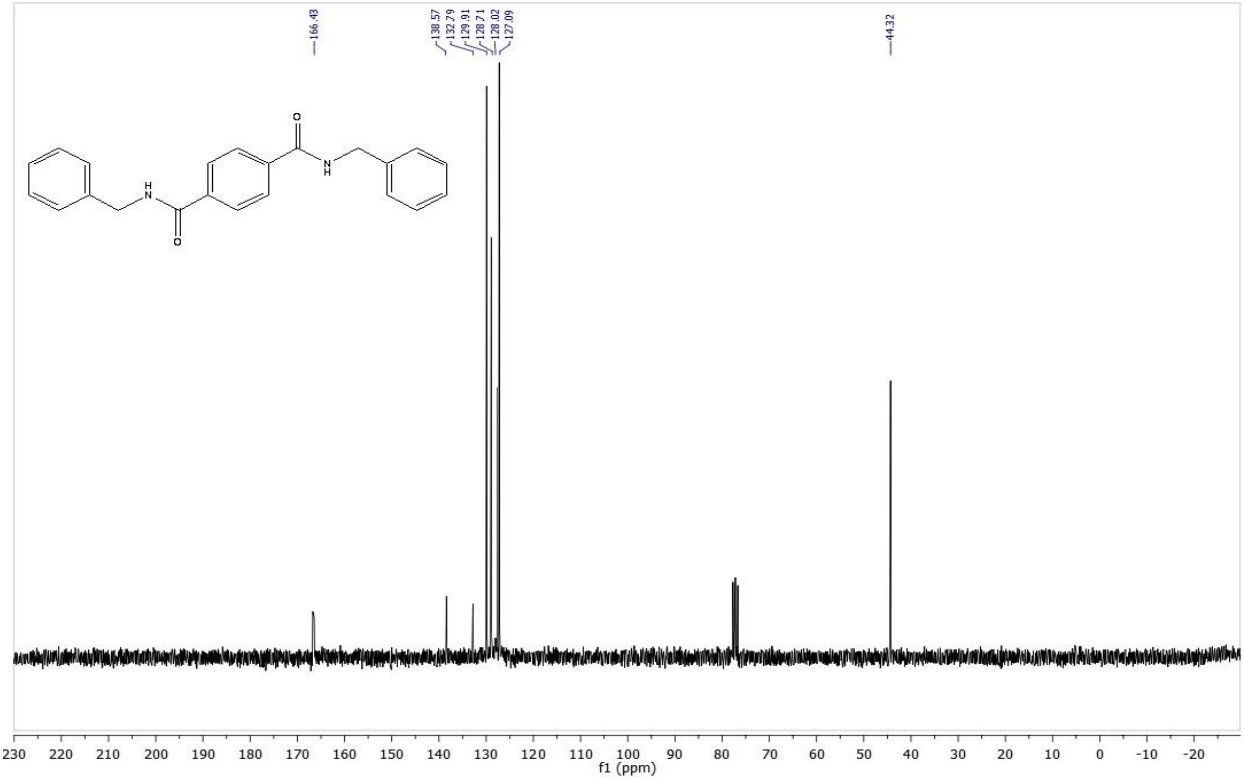
^{13}C-NMR (62.9 MHz, $CDCl_3$) of *N*-benzyl-1-naphthamide (**8ga'**)



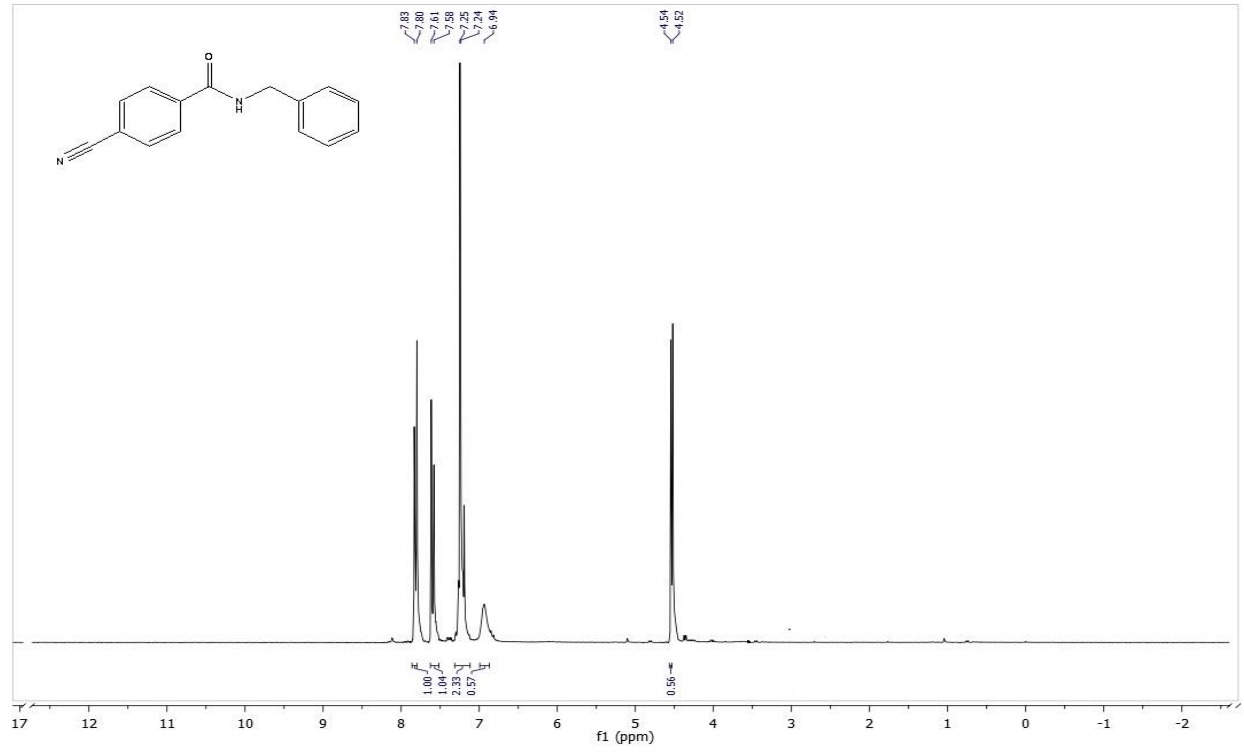
^{1}H-NMR (250 MHz, $CDCl_3$) of N^1,N^4-dibenzylterephthalamide (**8ha'**)



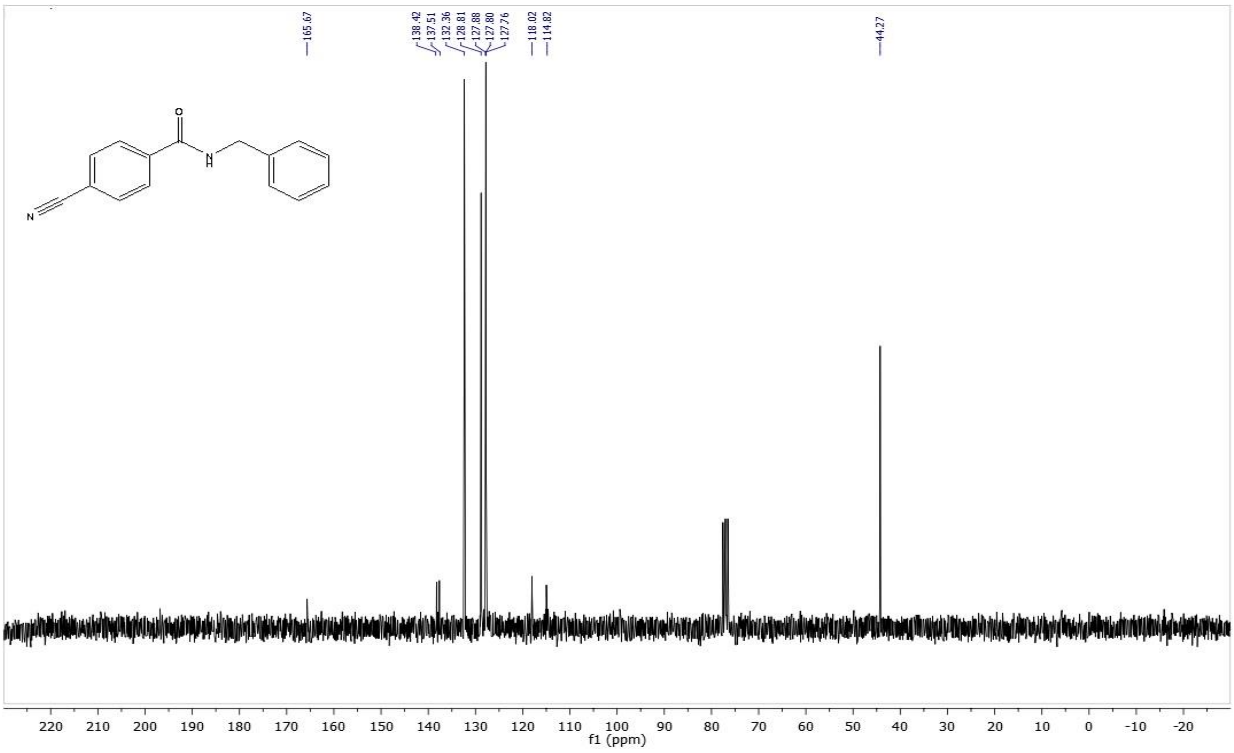
^{13}C-NMR (62.9 MHz, $CDCl_3$) of N^1,N^4-dibenzylterephthalamide (**8ha'**)



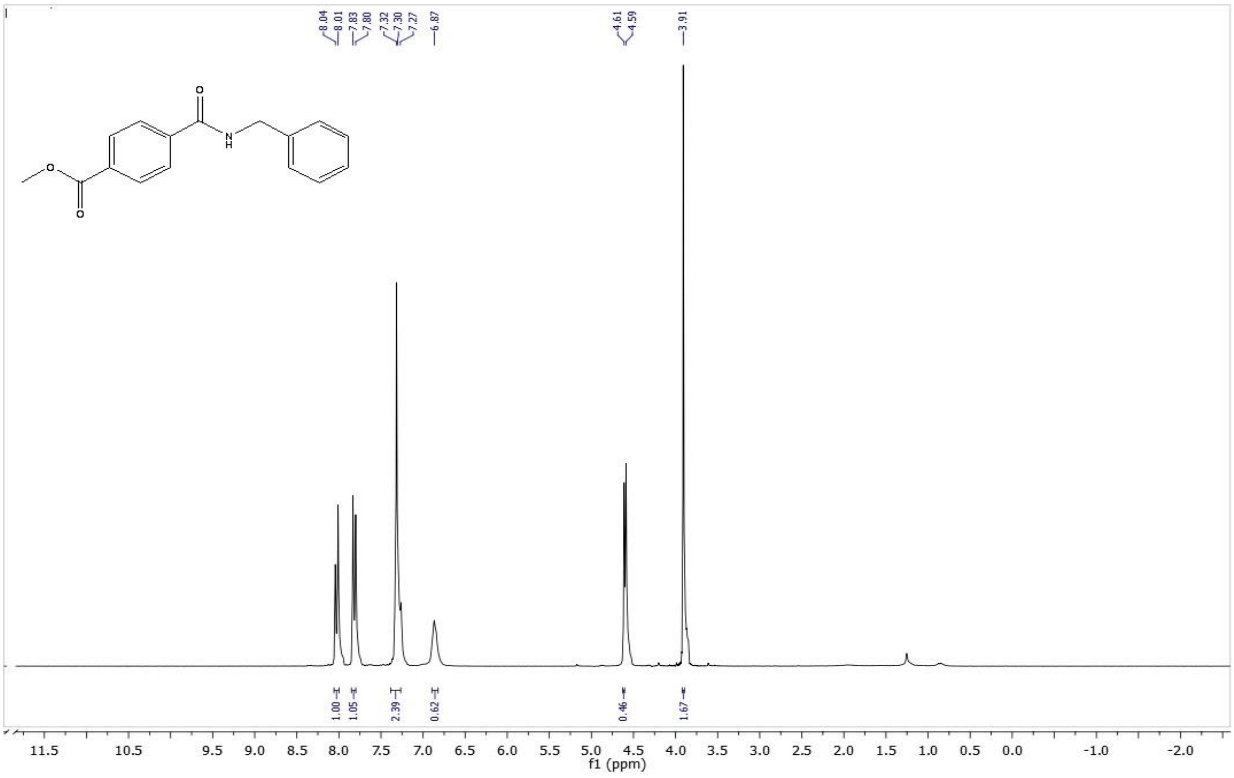
^{1}H-NMR (250 MHz, $CDCl_3$) of *N*-benzyl-4-cyanobenzamide (**8ia'**)



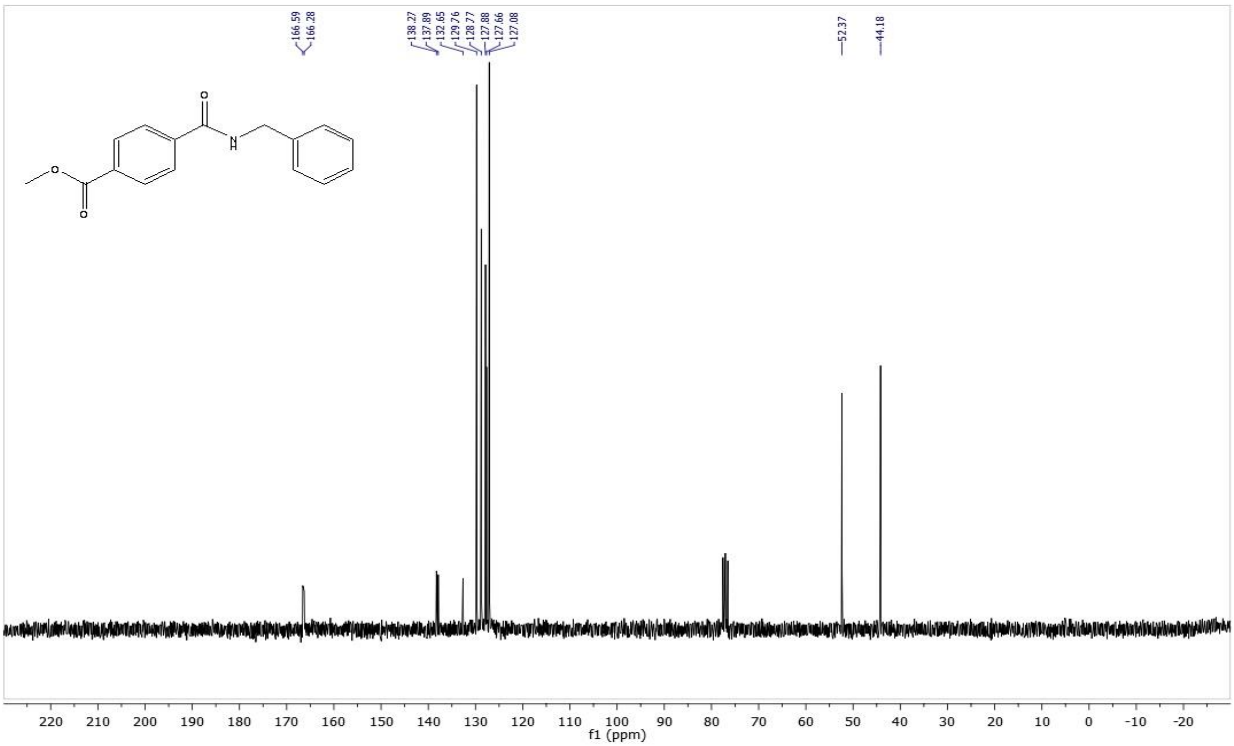
^{13}C-NMR (62.9 MHz, $CDCl_3$) of *N*-benzyl-4-cyanobenzamide (**8ia'**)



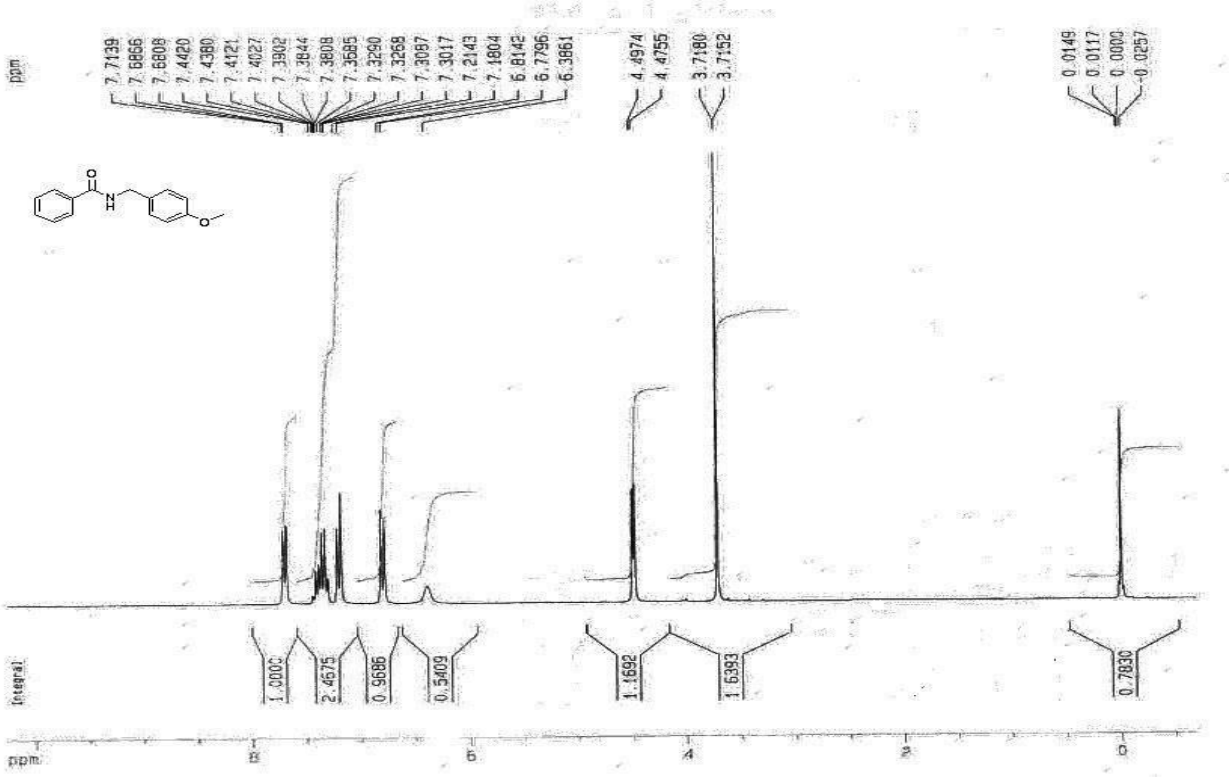
^{1}H-NMR (250 MHz, $CDCl_3$) of methyl 4-(benzylcarbamoyl)benzoate (**8ja'**)



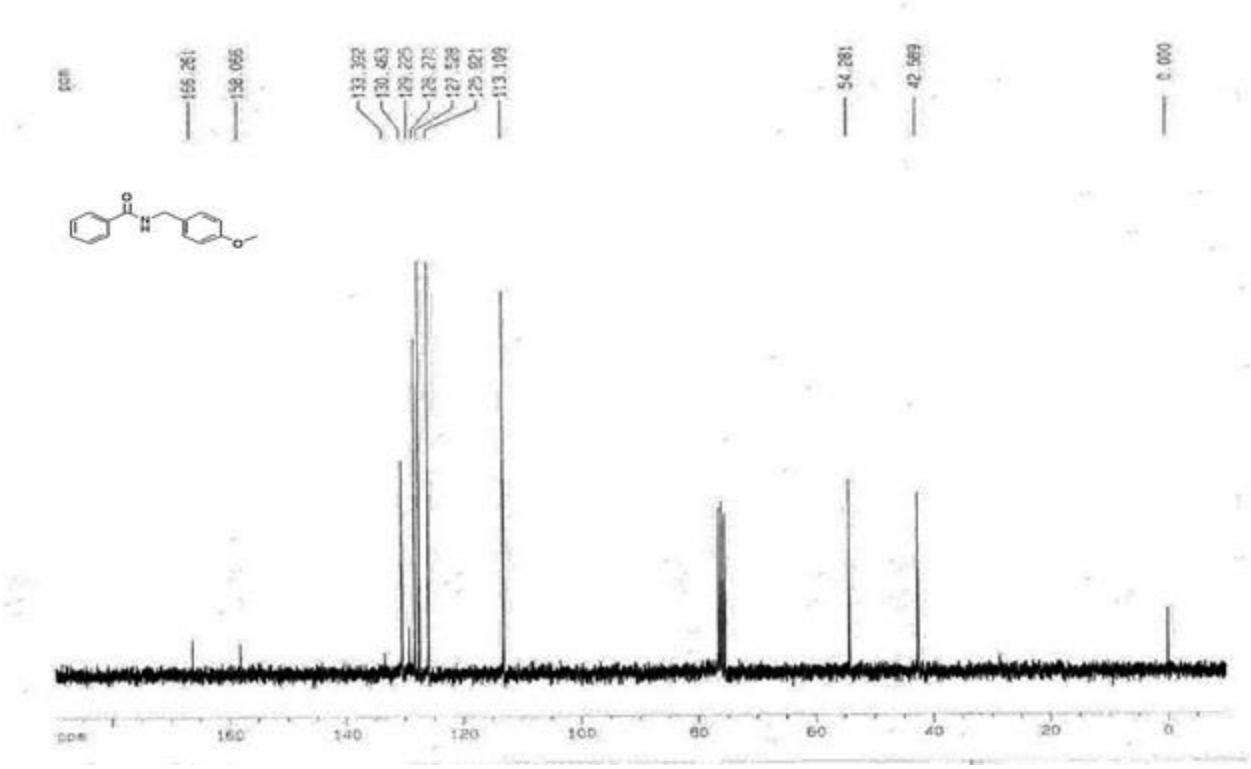
^{13}C-NMR (62.9 MHz, $CDCl_3$) of methyl 4-(benzylcarbamoyl)benzoate (**8ja'**)



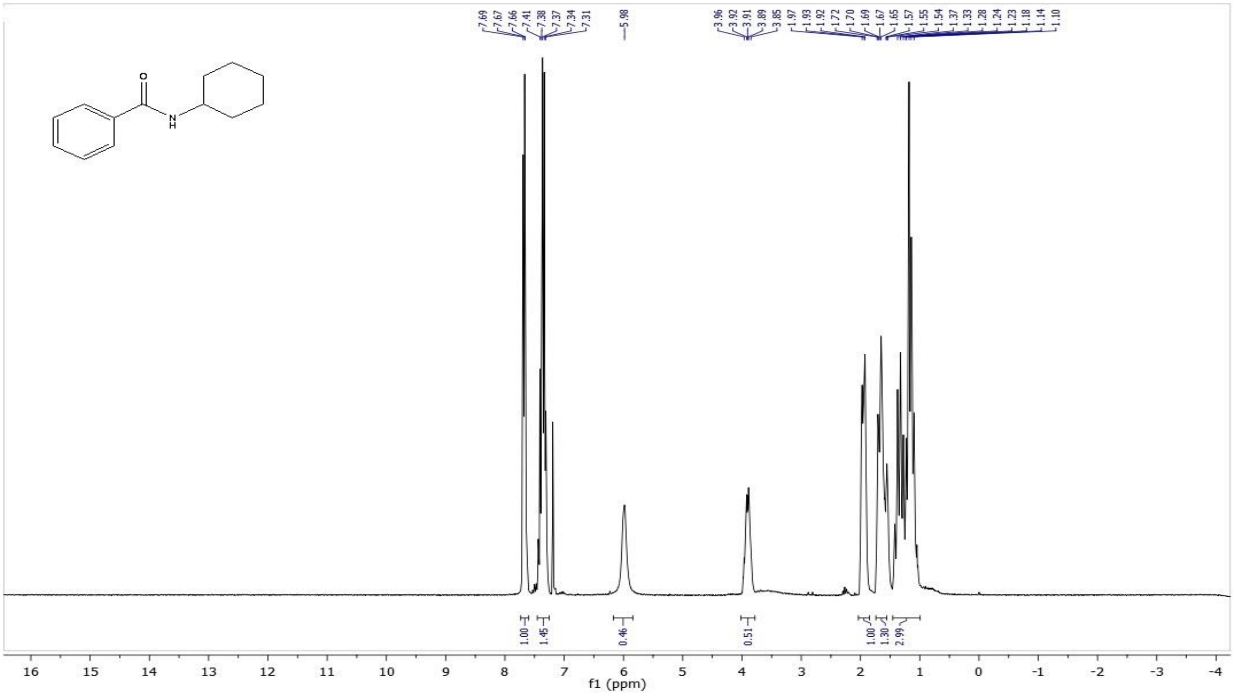
^{1}H-NMR (250 MHz, $CDCl_3$) of *N*-(4-methoxybenzyl) benzamide (**8ab'**)



^{1}H-NMR (62.9 MHz, $CDCl_3$) of *N*-(4-methoxybenzyl) benzamide (**8ab'**)



^{1}H-NMR (250 MHz, $CDCl_3$) of *N*-cyclohexyl benzamide (**8ac'**)



^{13}C-NMR (62.9 MHz, $CDCl_3$) of *N*-cyclohexyl benzamide (**8ac'**)