

**Diastereoselective synthesis of spiro[benzo[d]pyrrolo[2,1-b]thiazole-3,3'-
indolines] via cycloaddition reaction of *N*-phenacylbenzothiazolium bromides
and 3-methyleneoxindoles**

Guo-Liang Shen, Jing Sun, Chao-Guo Yan*

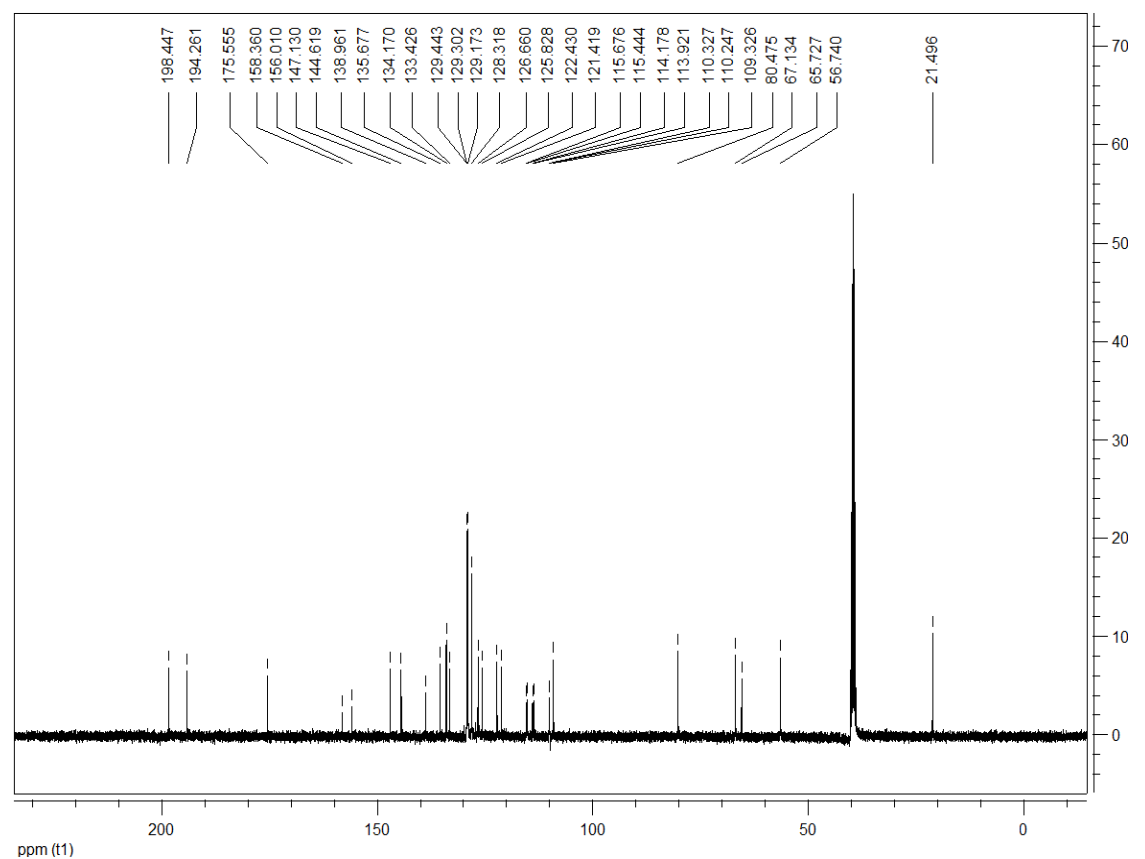
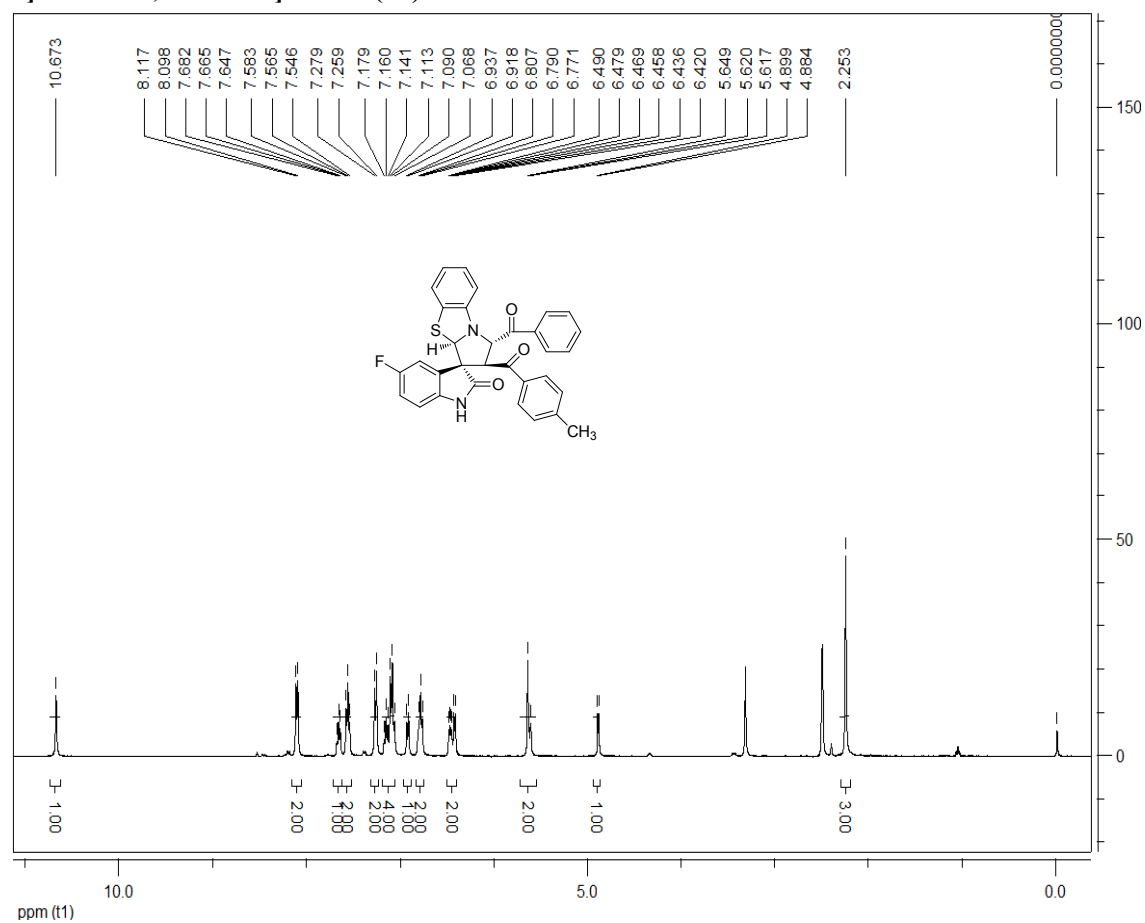
Supporting Information

¹H and ¹³C NMR spectra of all new compounds

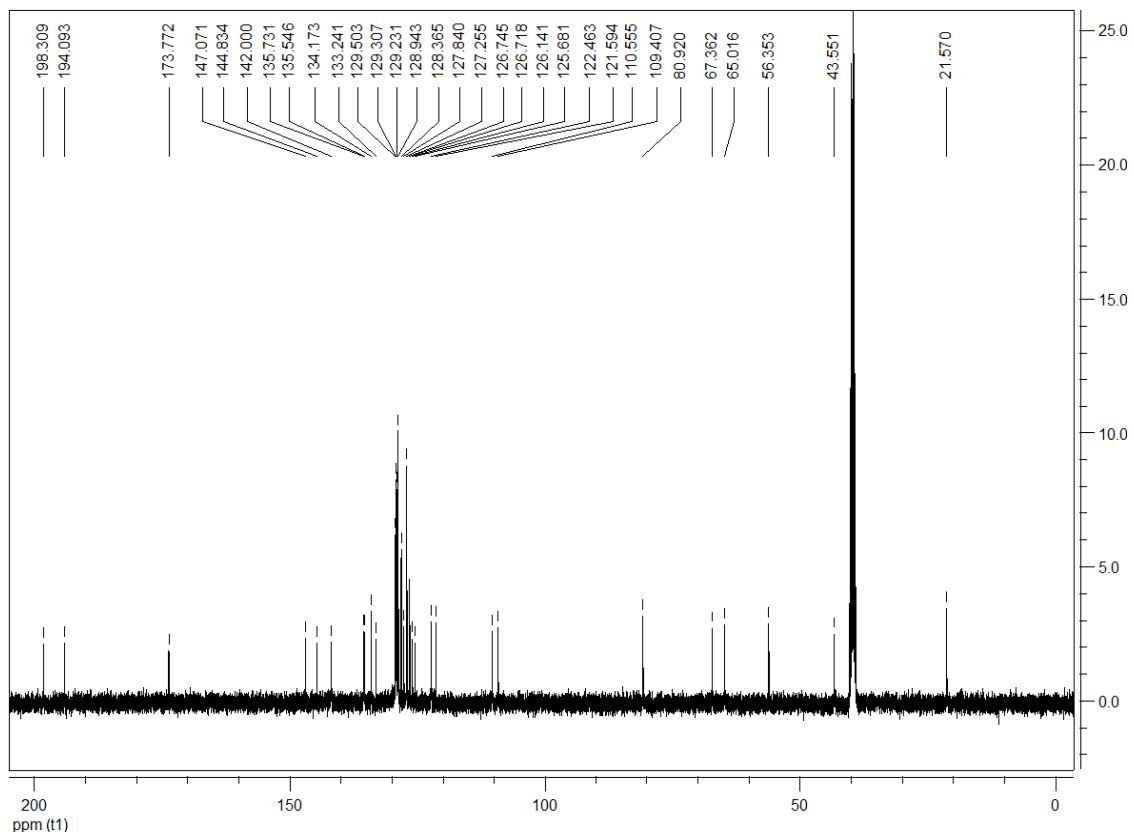
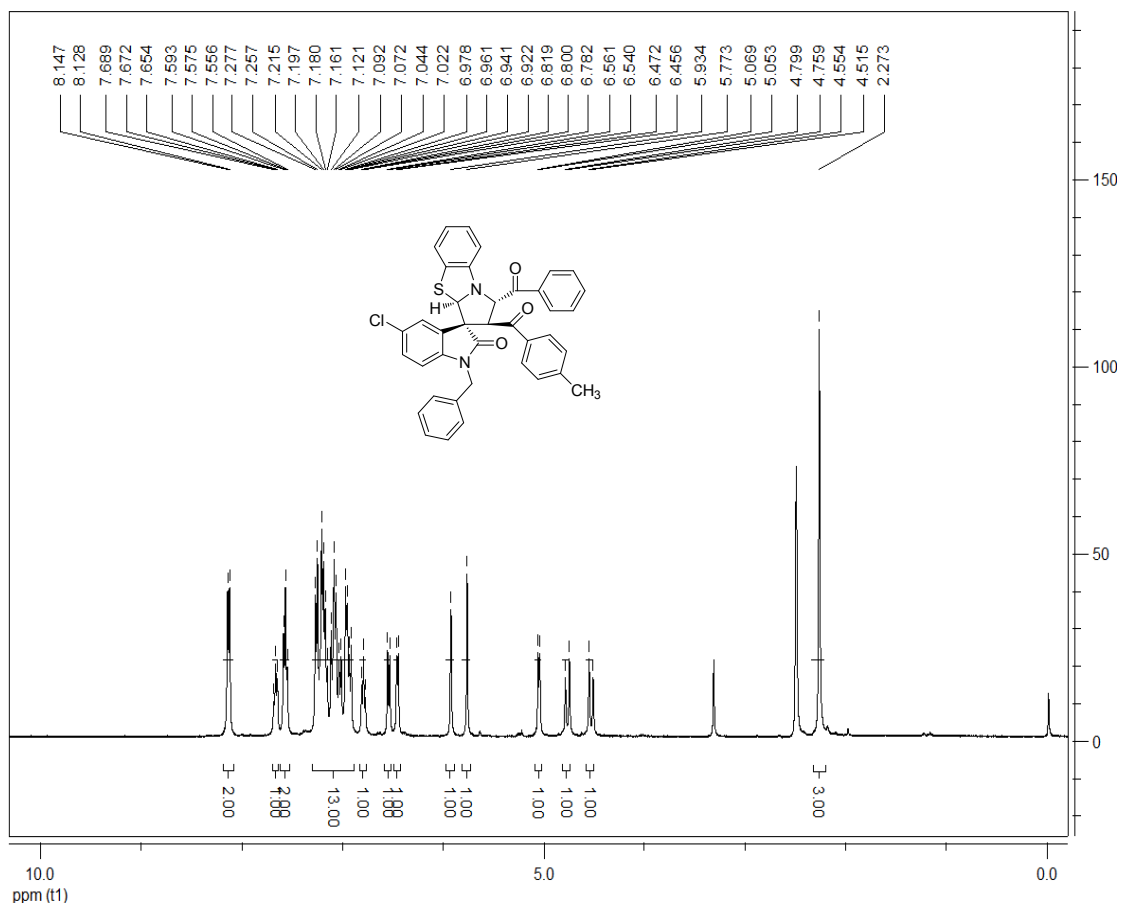
2-28

Crystallographic data **3e** (CCDC 1410551), **3l** (CCDC 1410552), **3n** (CCDC 1410553), **3q** (CCDC 1410554), **4d** (CCDC 1410555), **4e** (CCDC 1410556), and **5b** (CCDC 1410557) have been deposited at the Cambridge Crystallographic Database Centre.

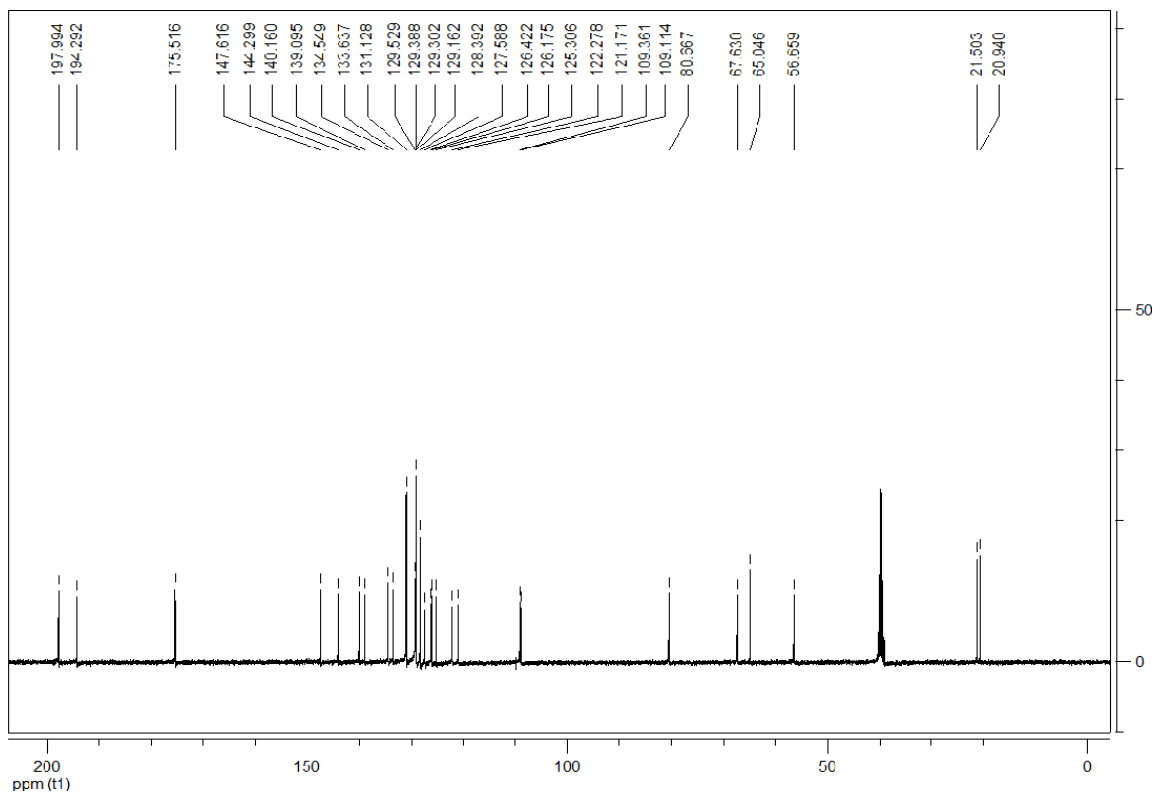
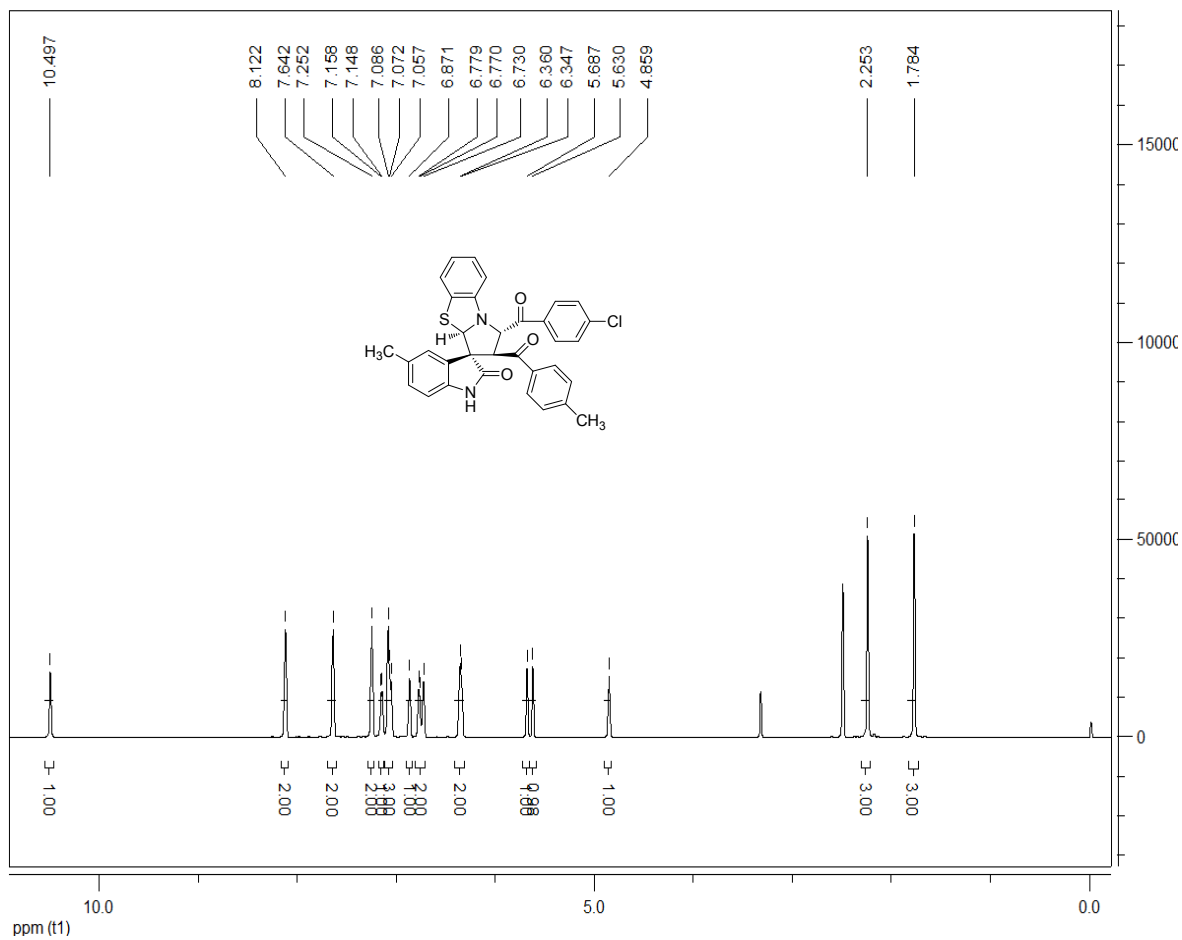
1-benzoyl-5'-fluoro-2-(4-methylbenzoyl)-2,3a-dihydro-1H-spiro[benzo[d]pyrrolo[2,1-b]thiazole-3,3'-indolin]-2'-one (3b):



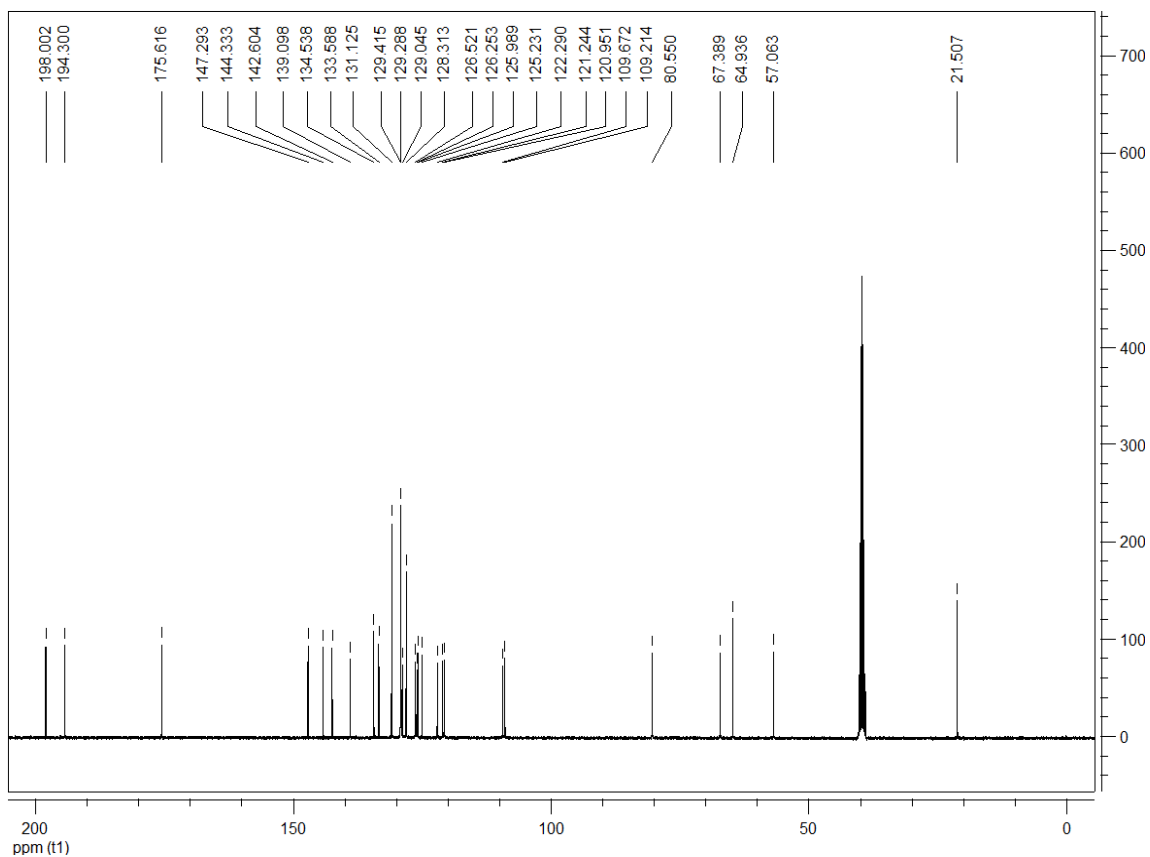
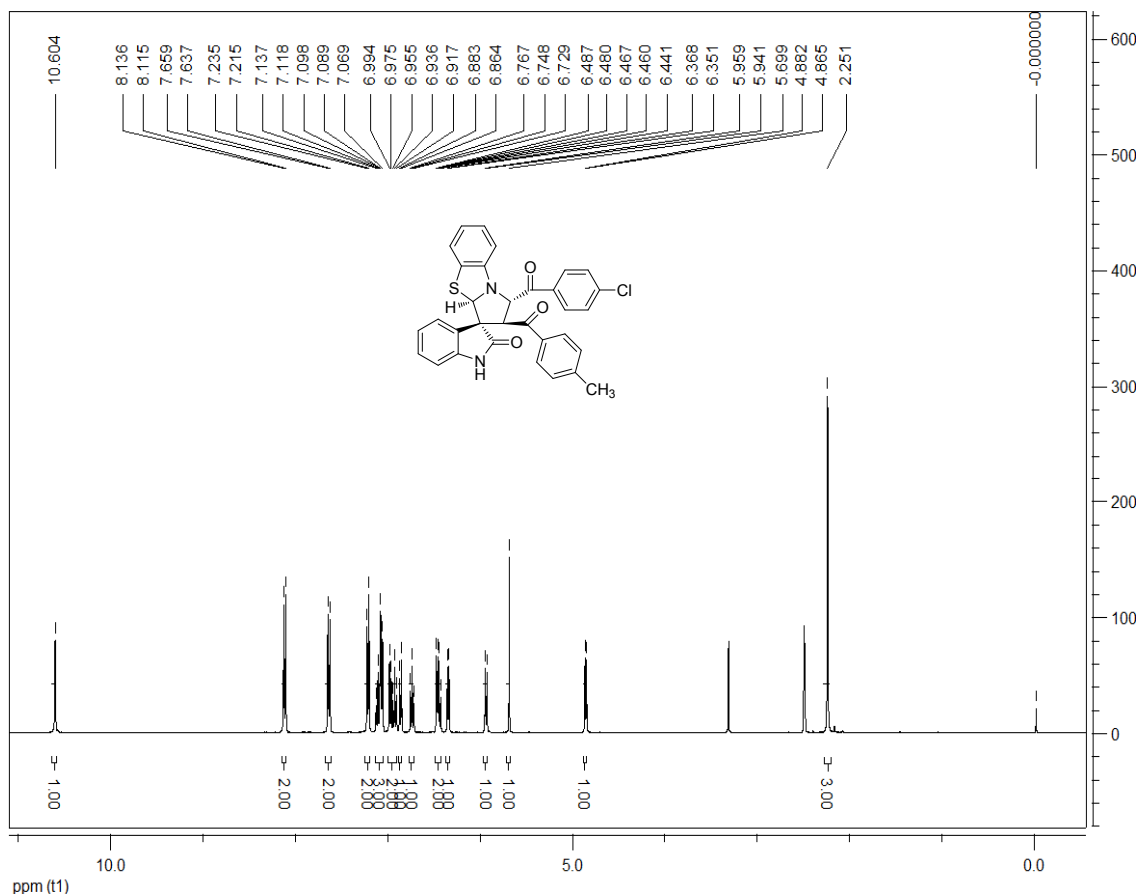
1-benzoyl-1'-benzyl-5'-chloro-2-(4-methylbenzoyl)-2,3a-dihydro-1H-spiro[benzo[d]pyrrolo[2,1-b]thiazole-3,3'-indolin]-2'-one (3c):



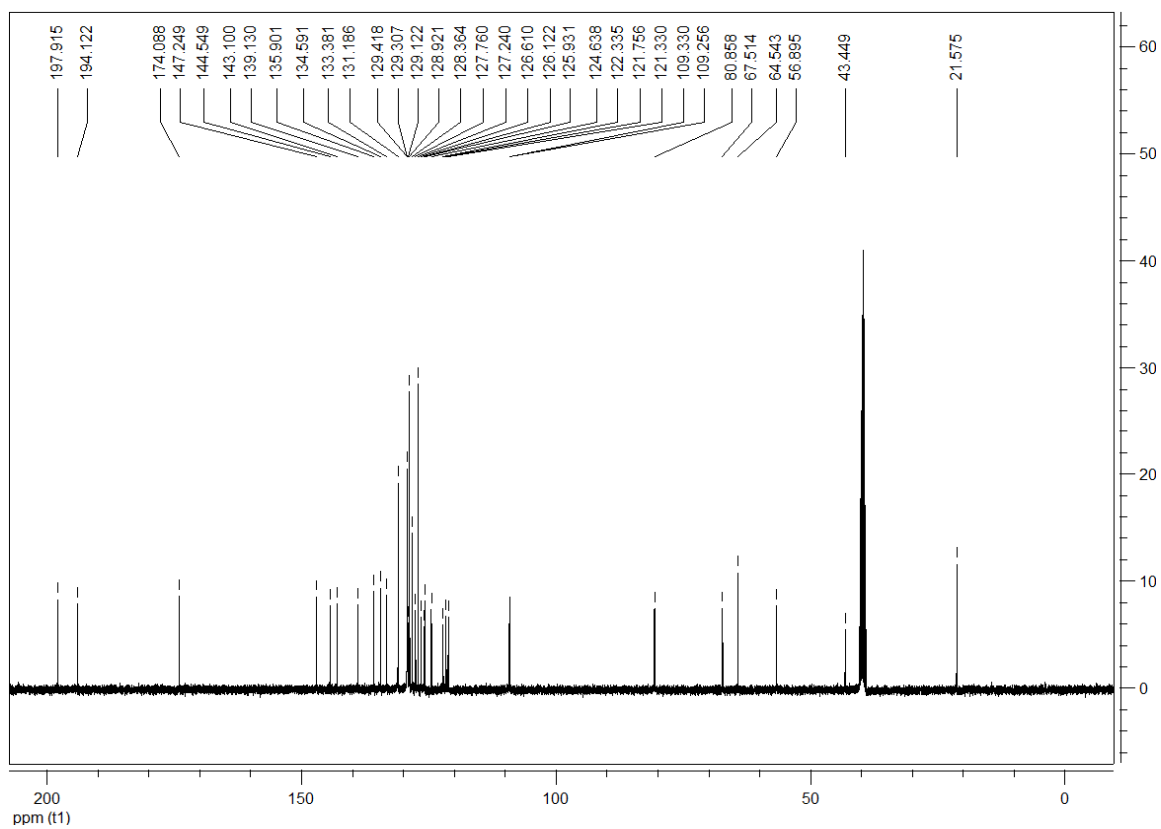
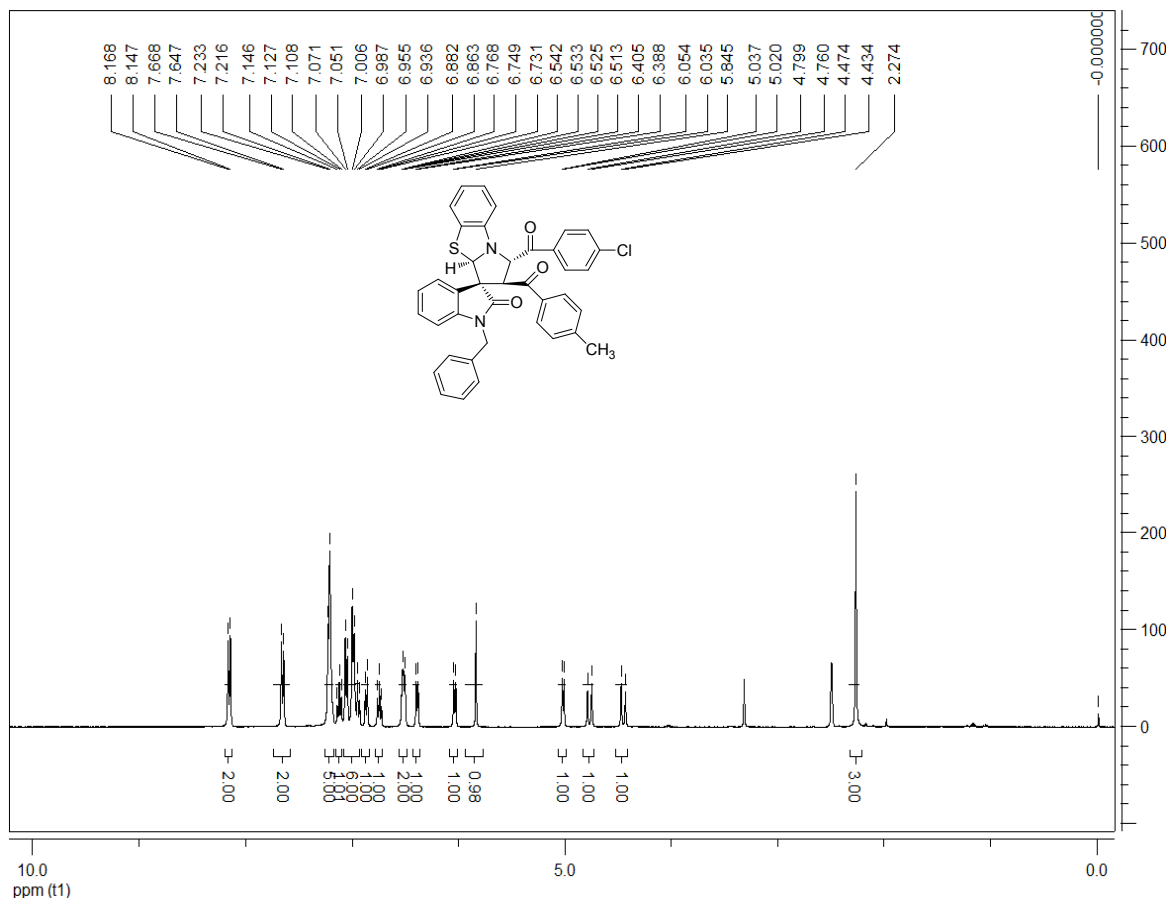
1-(4-chlorobenzoyl)-5'-methyl-2-(4-methylbenzoyl)-2,3a-dihydro-1H-spiro[benzo[d]pyrrolo[2,1-b]thiazole-3,3'-indolin]-2'-one (3e):



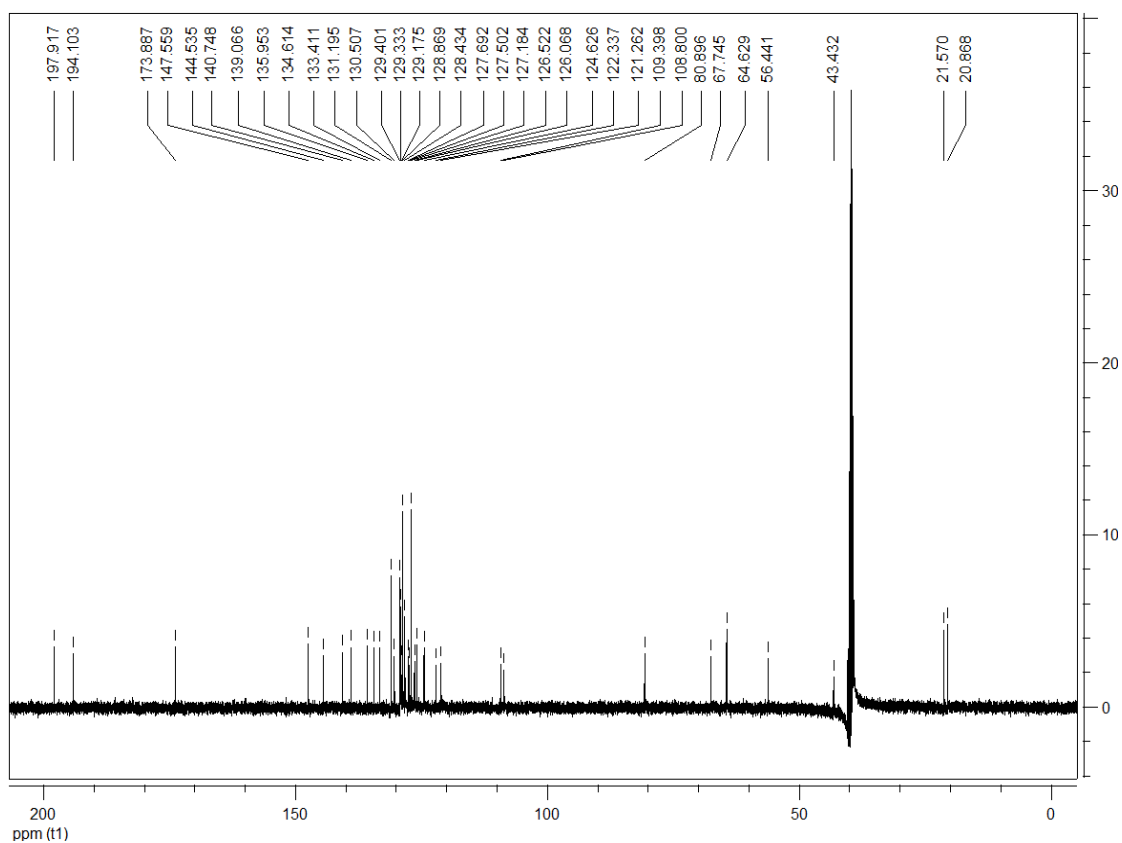
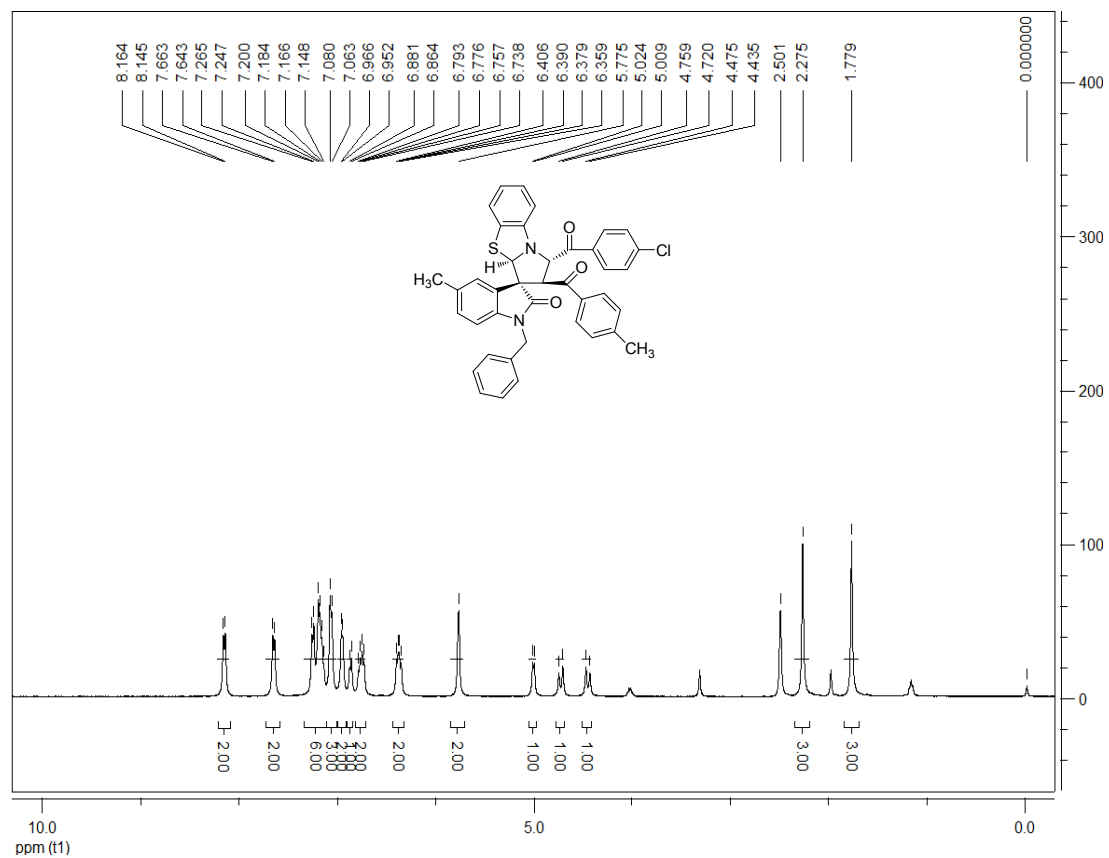
1-(4-chlorobenzoyl)-2-(4-methylbenzoyl)-2,3a-dihydro-1H-spiro[benzo[d]pyrrolo[2,1-b]thiazole-3,3'-indolin]-2'-one (3f):



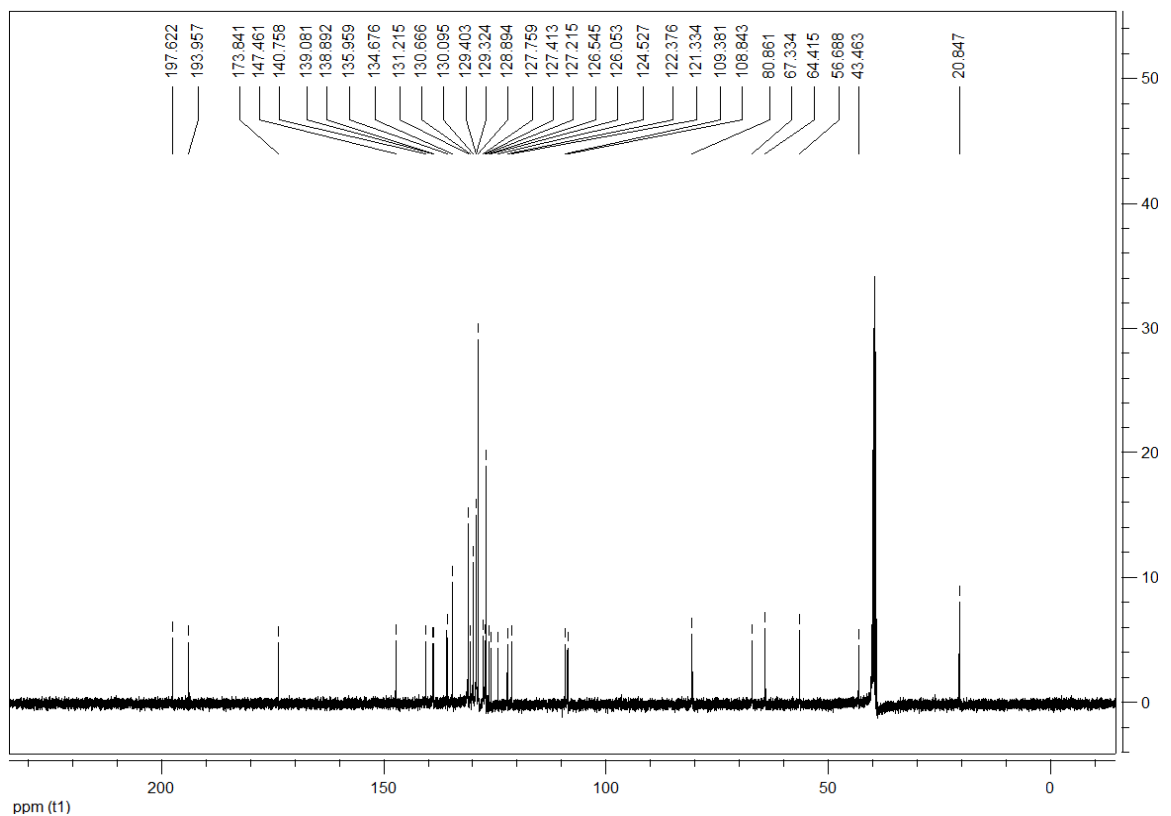
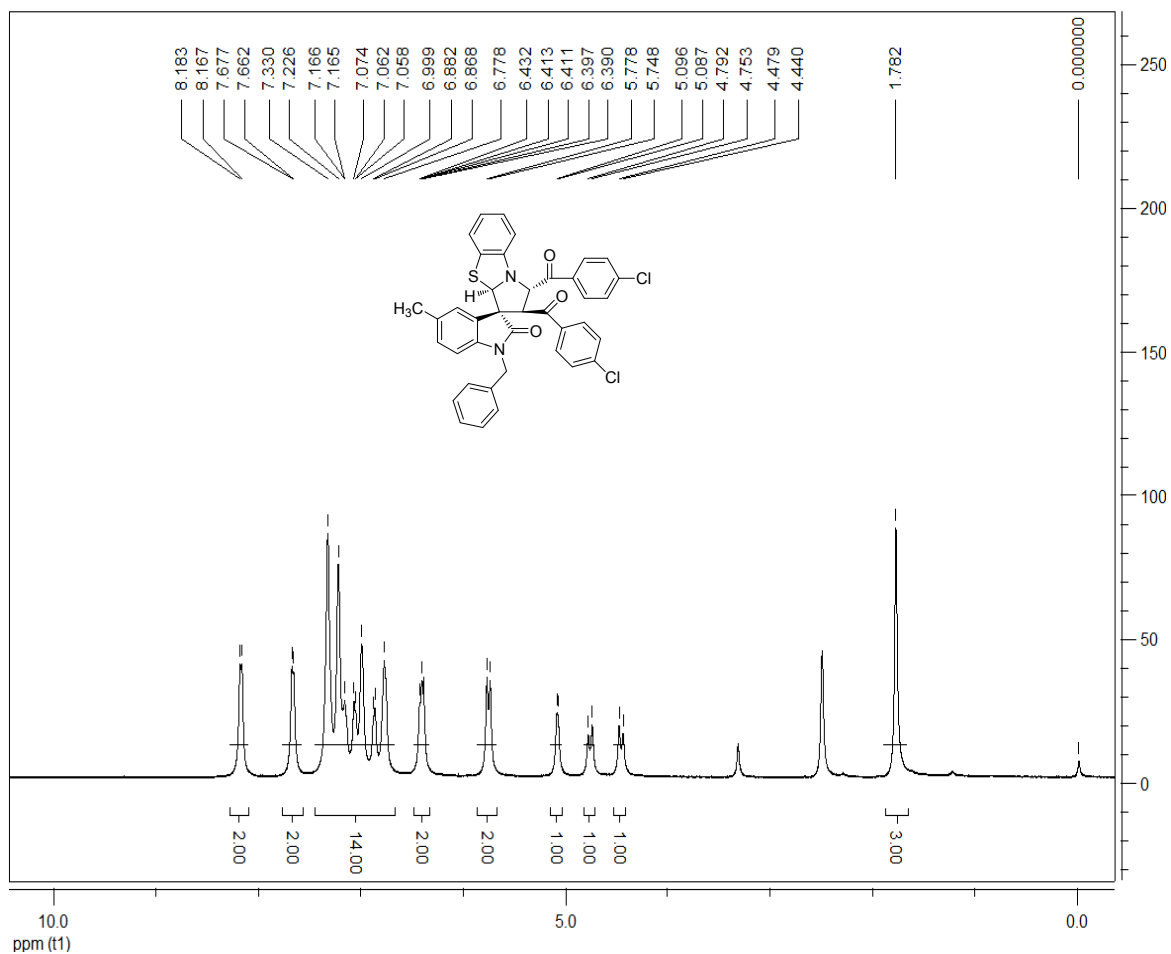
1'-benzyl-1-(4-chlorobenzoyl)-2-(4-methylbenzoyl)-2,3a-dihydro-1H-spiro[benzo[d]pyrrolo[2,1-b]thiazole-3,3'-indolin]-2'-one (3h):



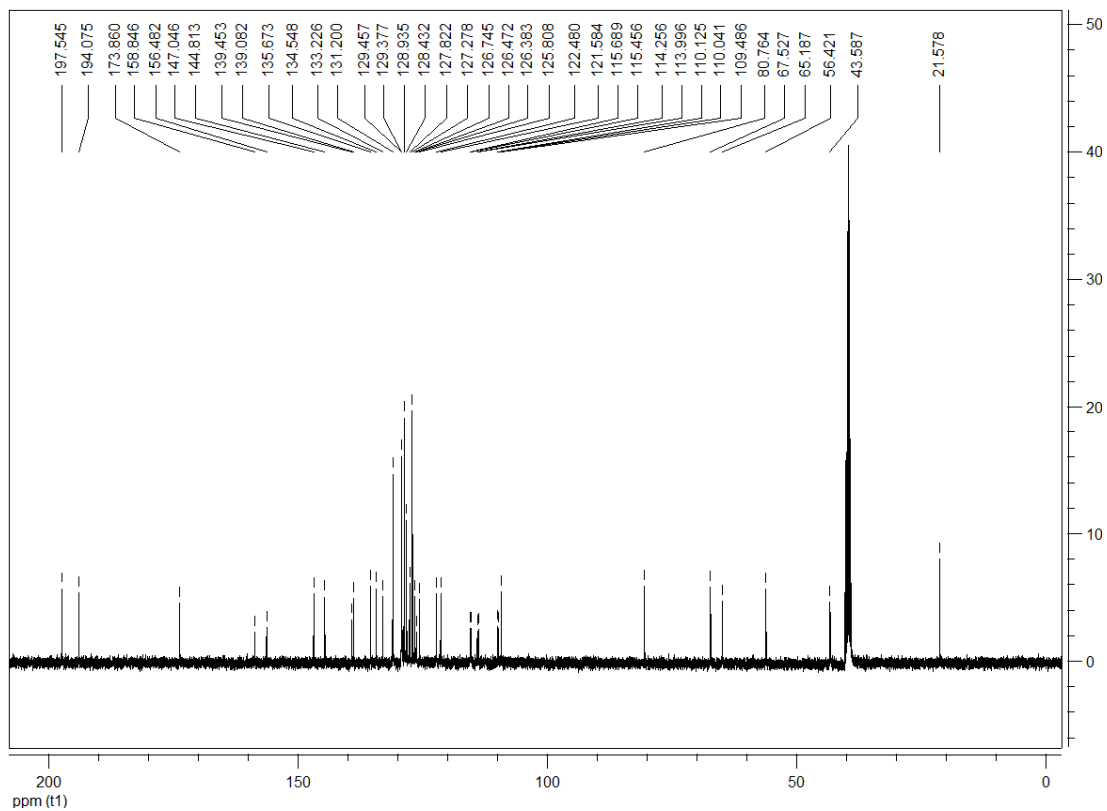
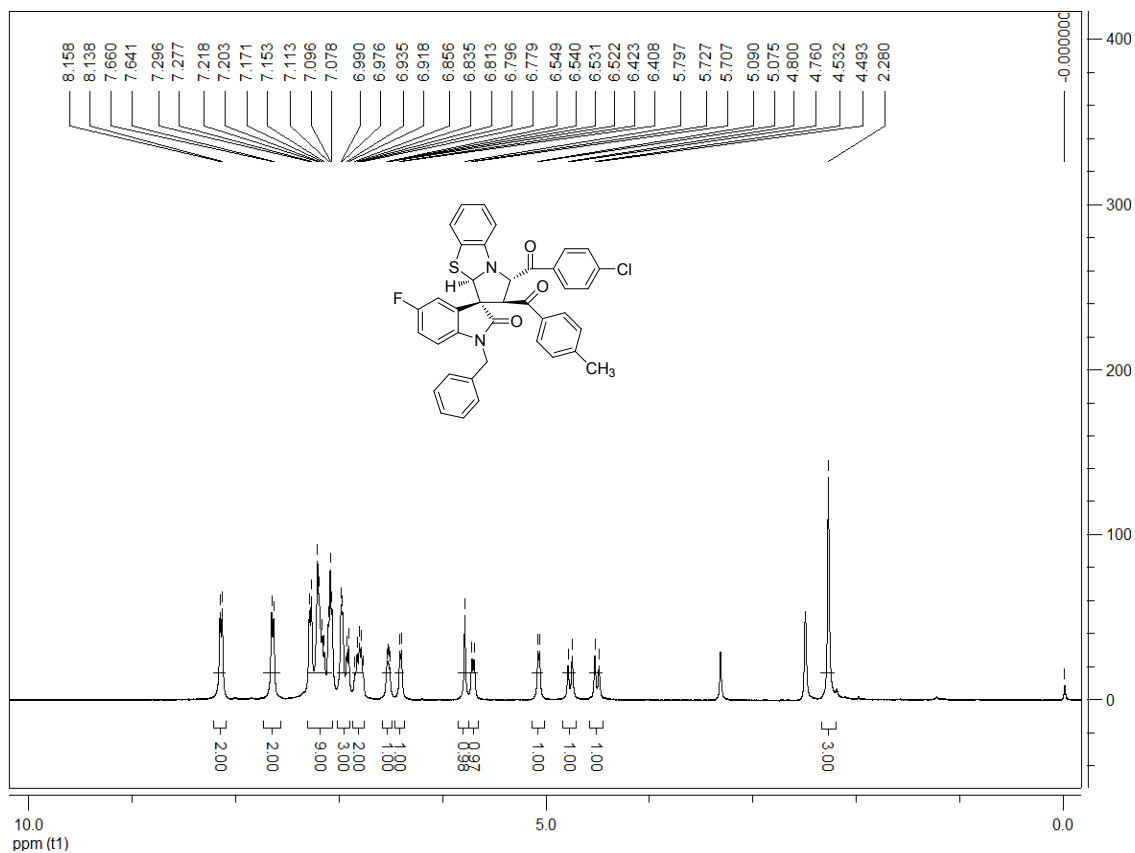
1'-benzyl-1-(4-chlorobenzoyl)-5'-methyl-2-(4-methylbenzoyl)-2,3a-dihydro-1H-spiro[benzo[d]pyrrolo[2,1-b]thiazole-3,3'-indolin]-2'-one (3i):



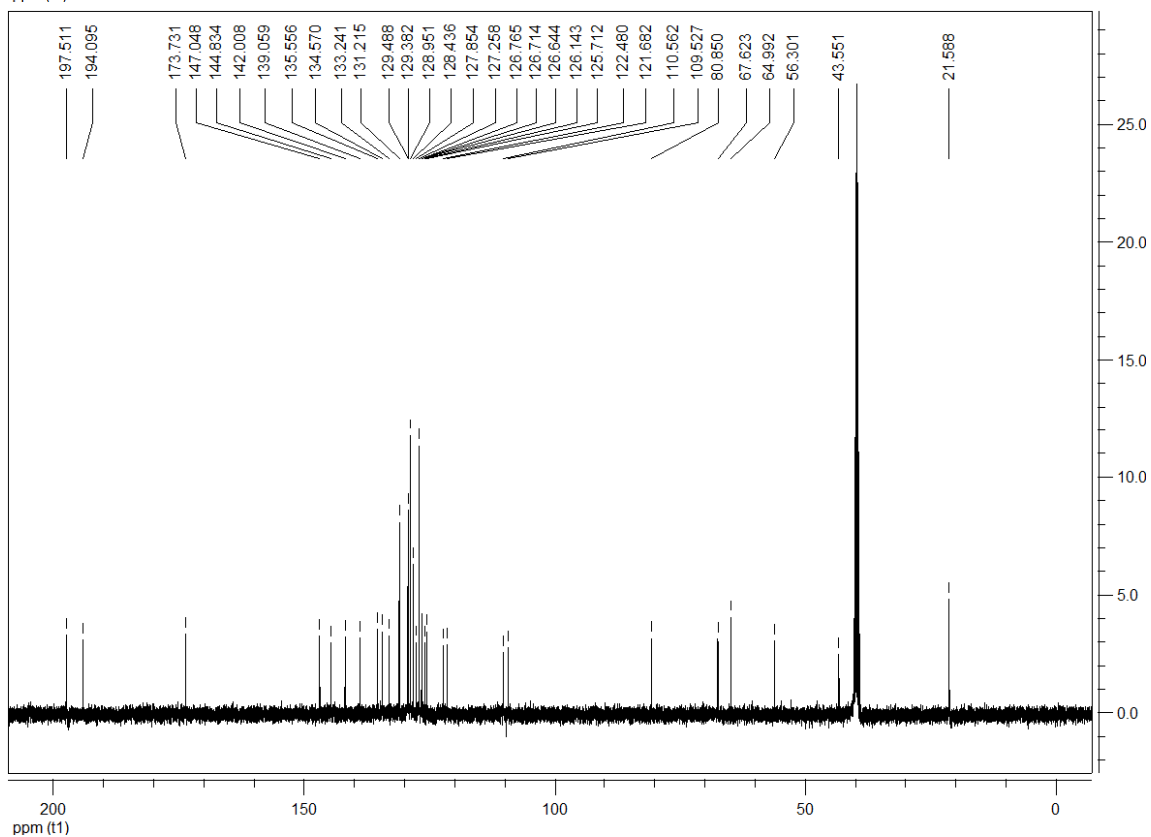
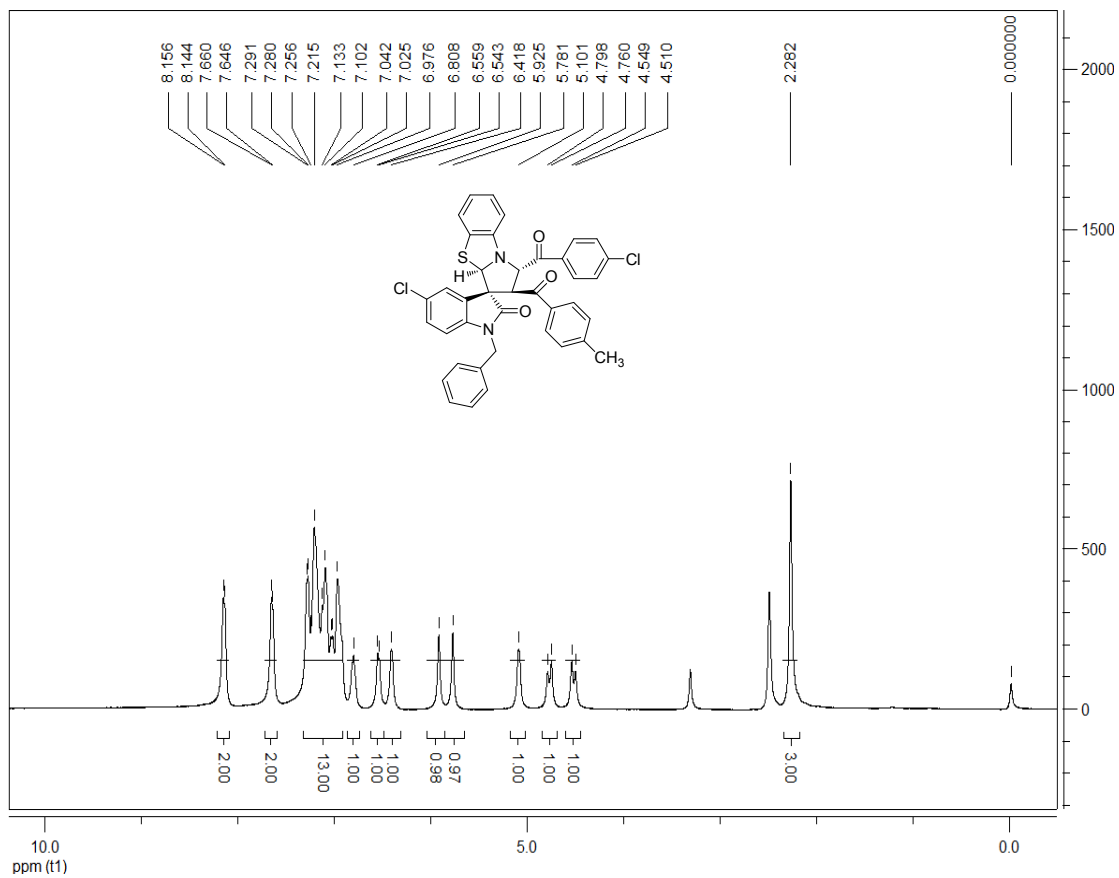
1'-benzyl-5'-methyl-2'-oxo-2,3a-dihydro-1H-spiro[benzo[d]pyrrolo[2,1-b]thiazole-3,3'-indoline]-1,2-diyl)bis((4-chlorophenyl)methanone) (3j):



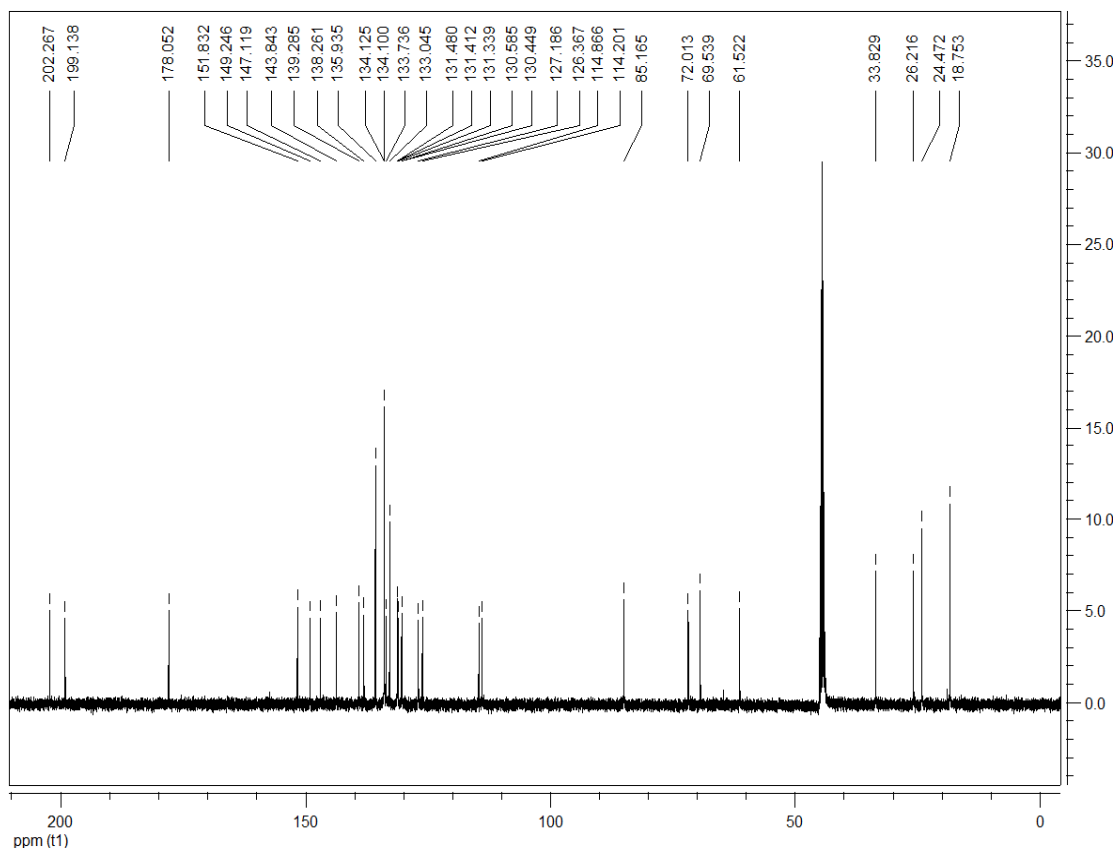
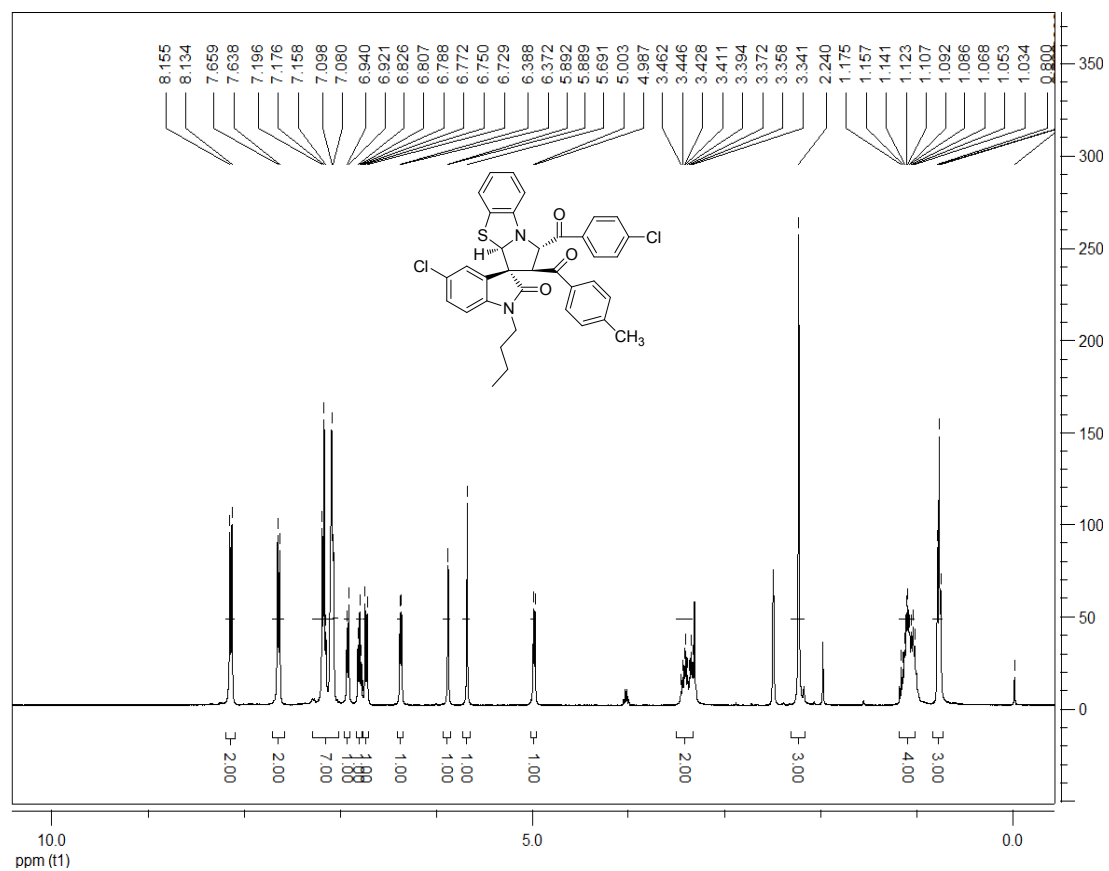
1'-benzyl-1-(4-chlorobenzoyl)-5'-fluoro-2-(4-methylbenzoyl)-2,3a-dihydro-1H-spiro[benzo[d]pyrrolo[2,1-b]thiazole-3,3'-indolin]-2'-one (3k):



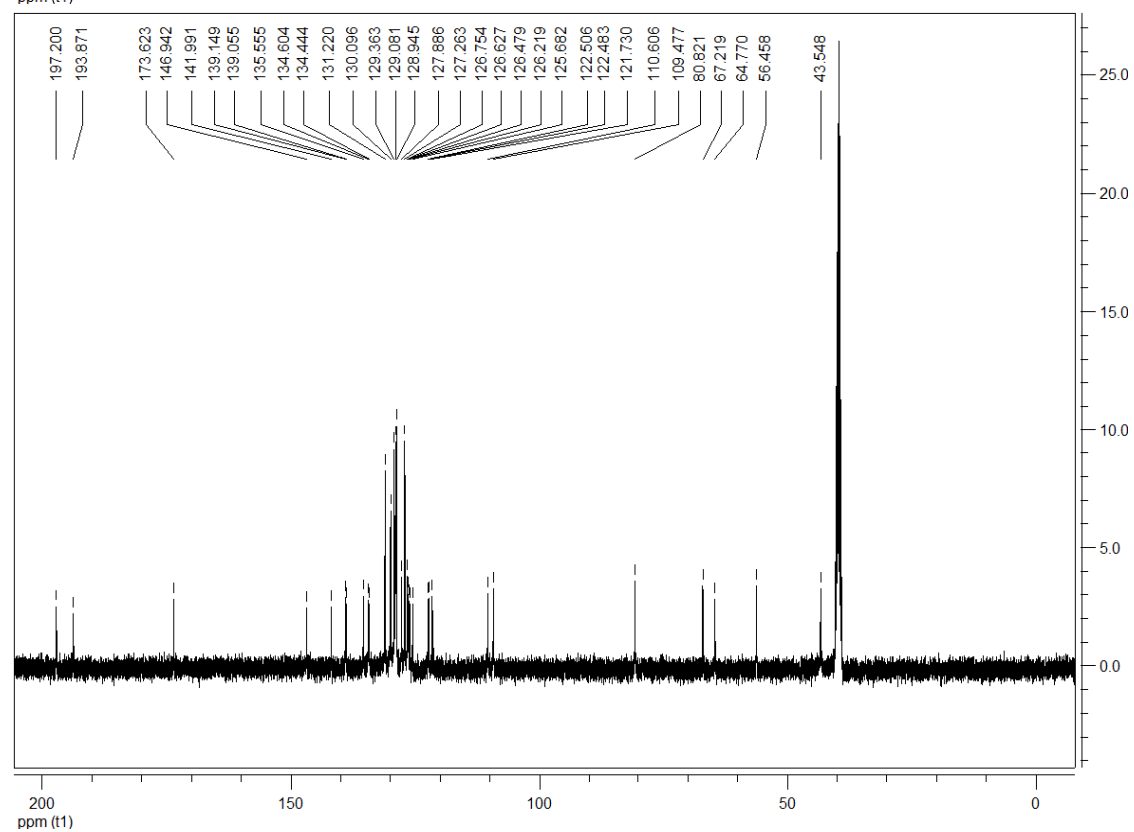
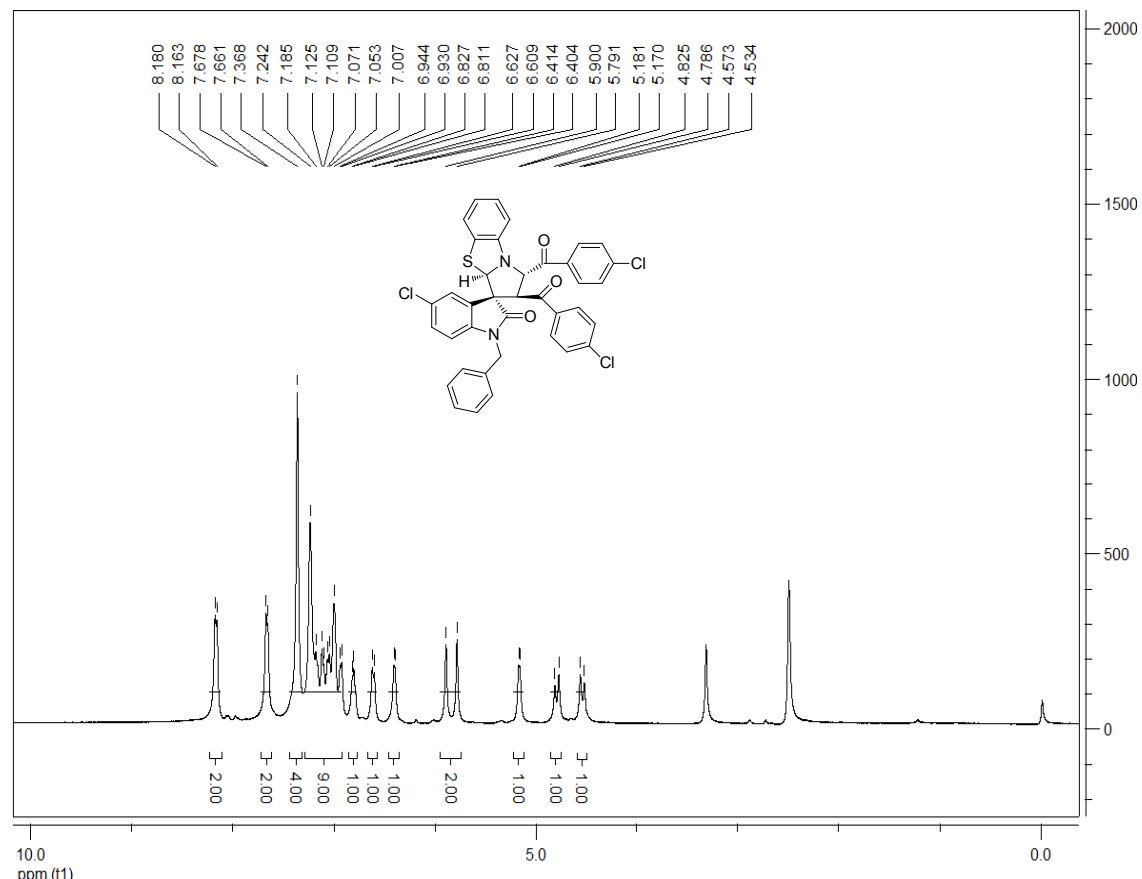
1'-benzyl-5'-chloro-1-(4-chlorobenzoyl)-2-(4-methylbenzoyl)-2,3a-dihydro-1H-spiro[benzo[d]pyrrolo[2,1-b]thiazole-3,3'-indolin]-2'-one (31):



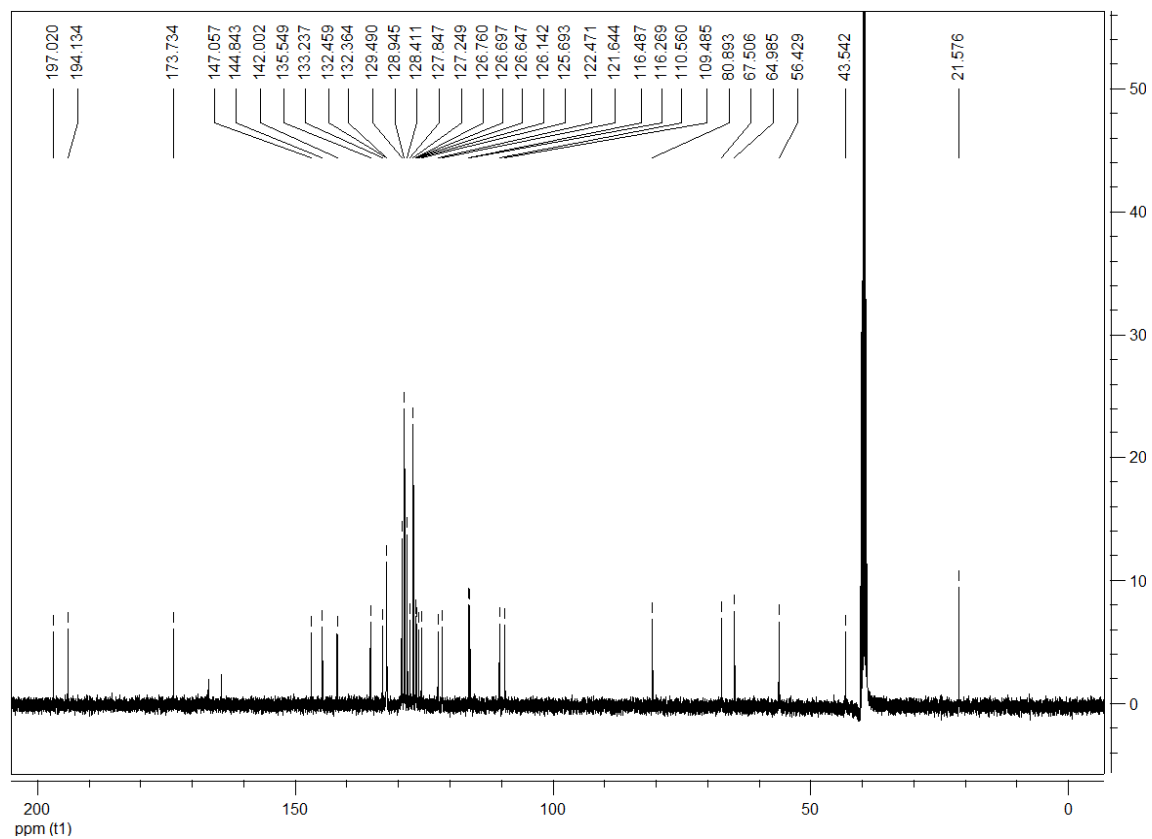
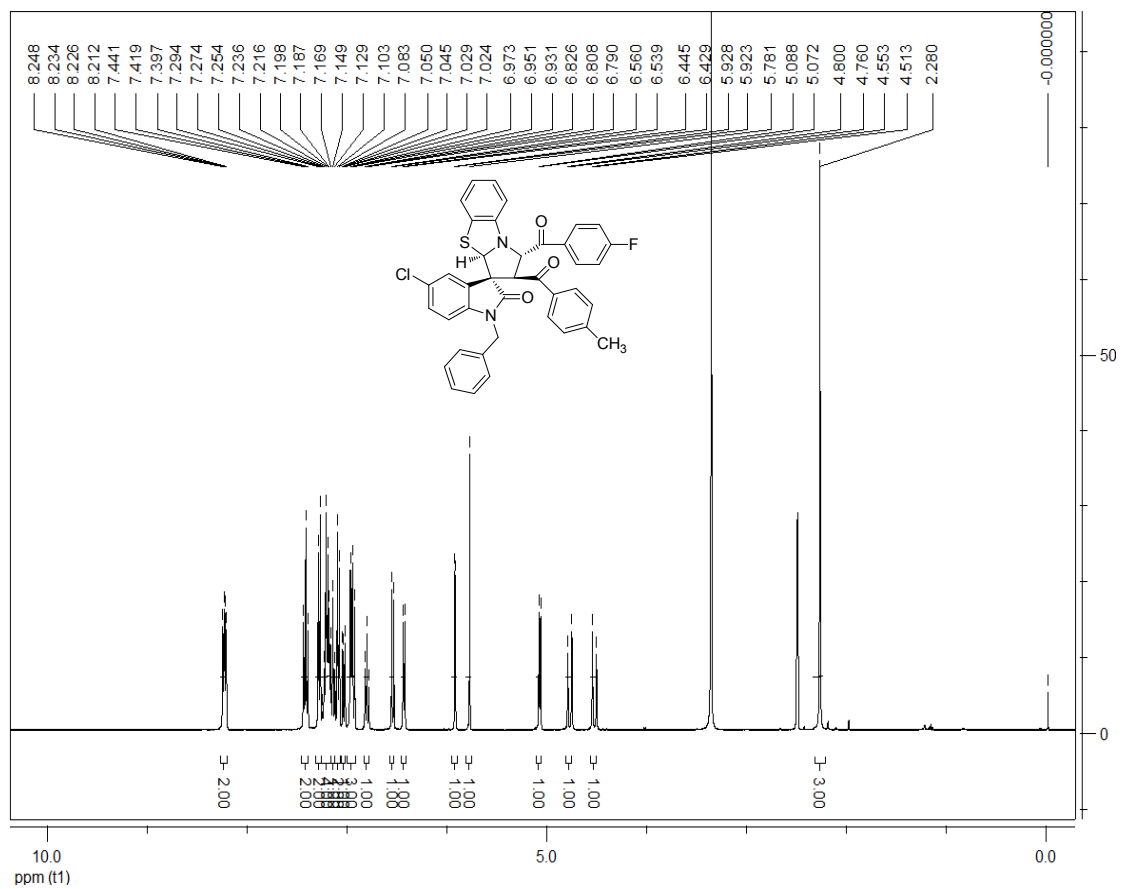
1'-butyl-5'-chloro-1-(4-chlorobenzoyl)-2-(4-methylbenzoyl)-2,3a-dihydro-1H-spiro[benzo[d]pyrrolo[2,1-b]thiazole-3,3'-indolin]-2'-one (3m):



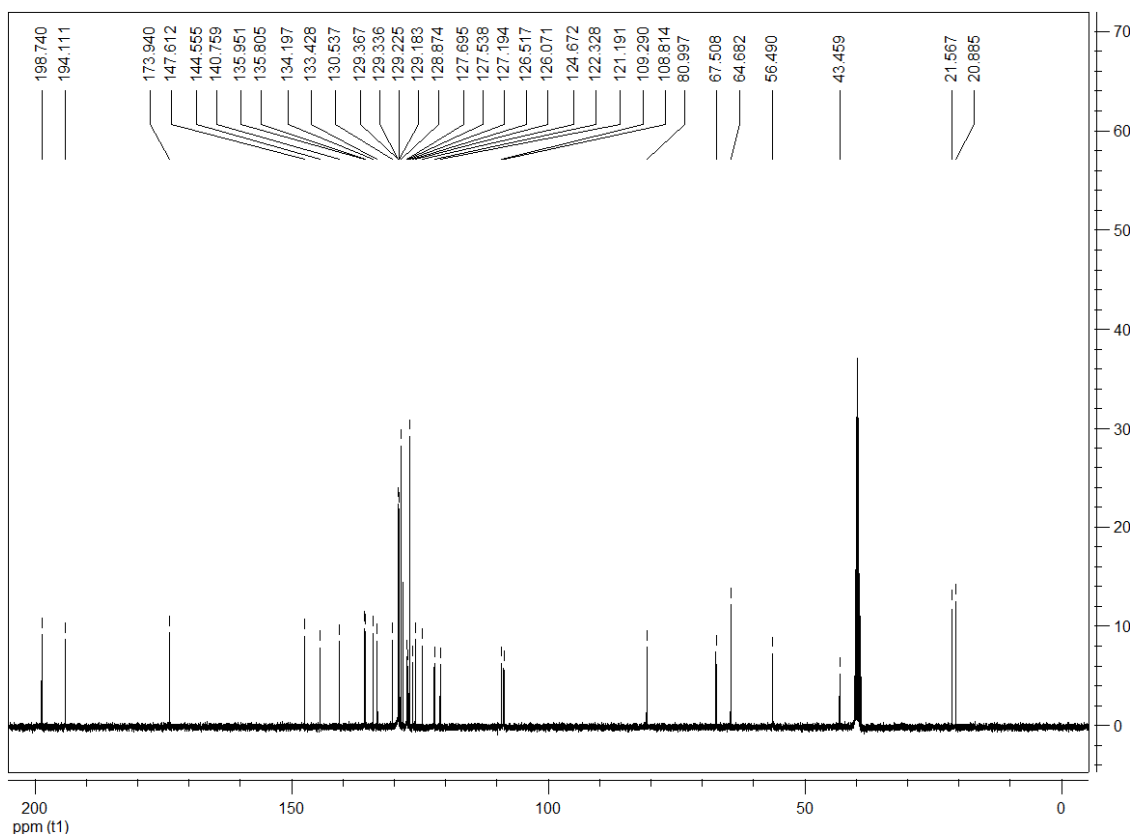
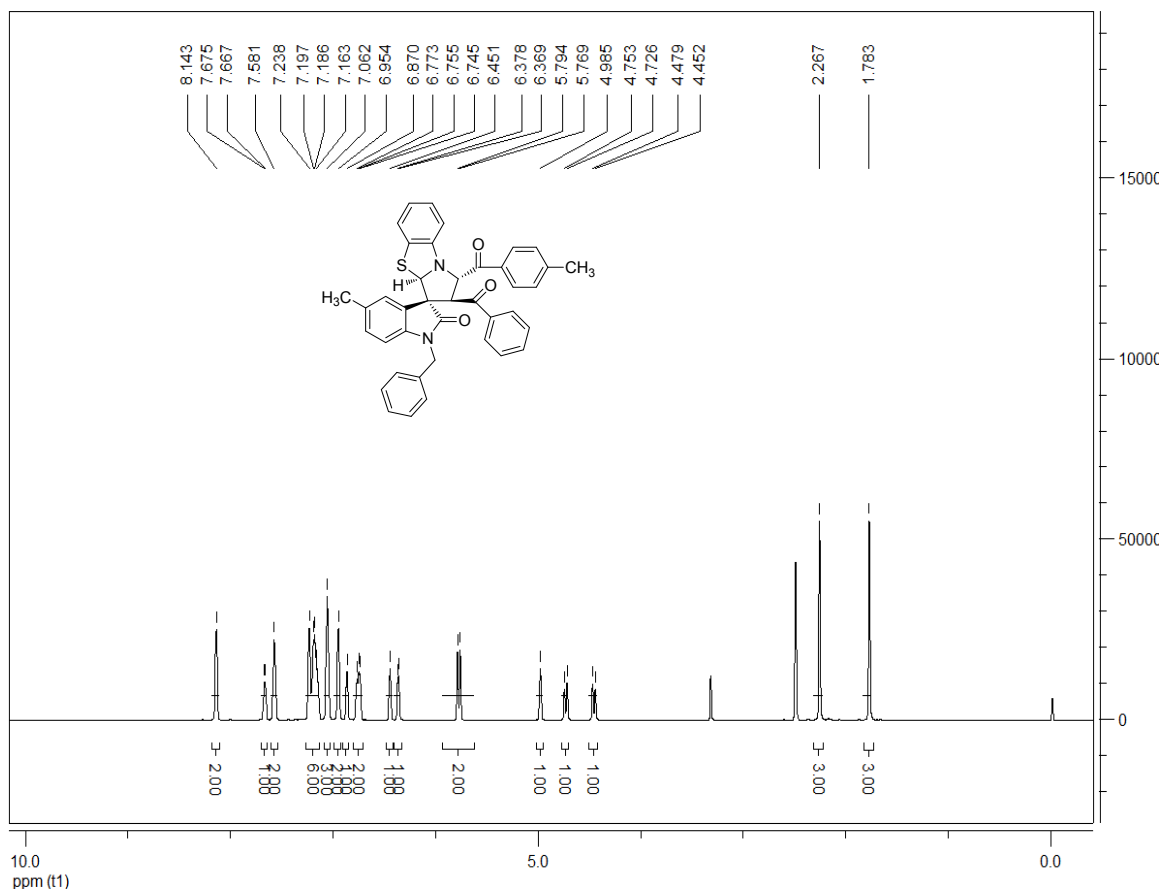
1'-benzyl-5'-chloro-2'-oxo-2,3a-dihydro-1H-spiro[benzo[d]pyrrolo[2,1-b]thiazole-3,3'-indoline]-1,2-diy]bis((4-chlorophenyl)methanone) (3n):



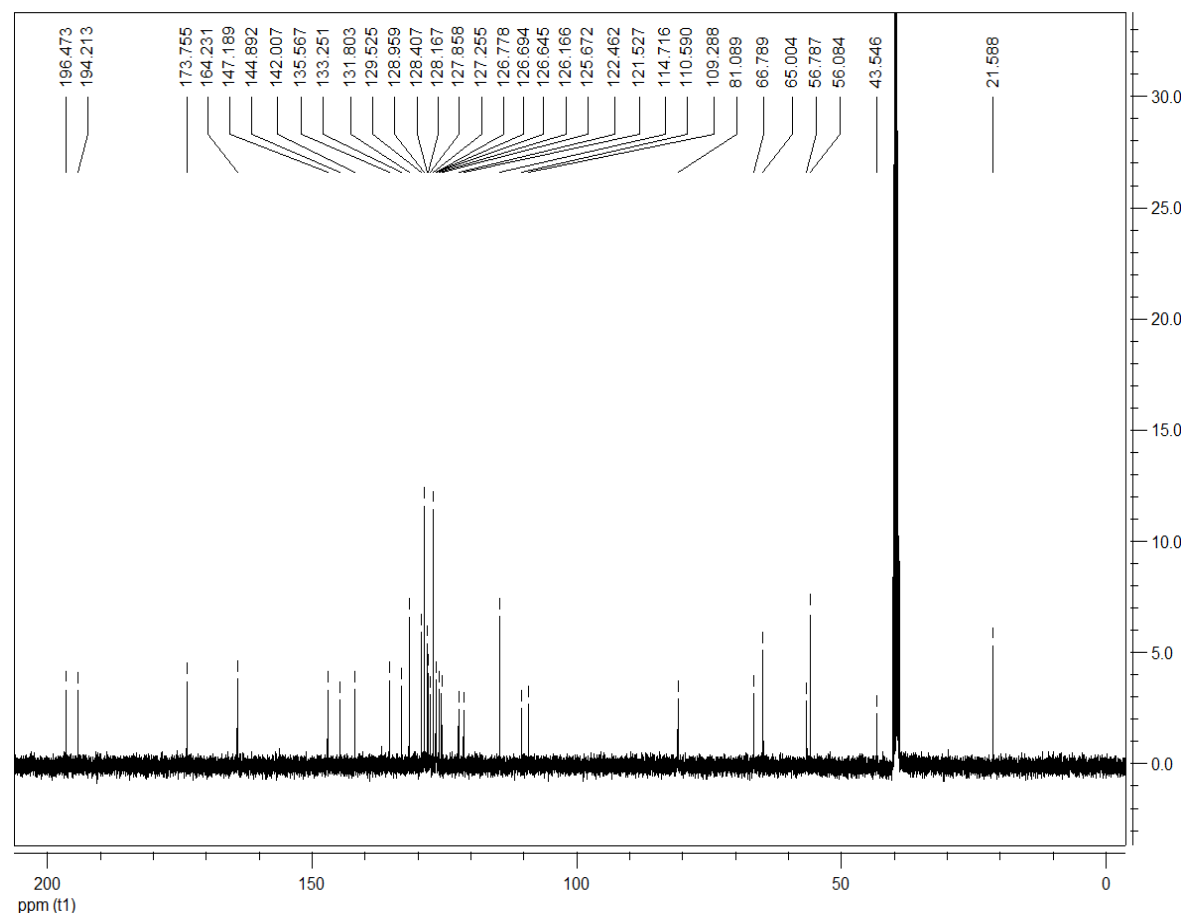
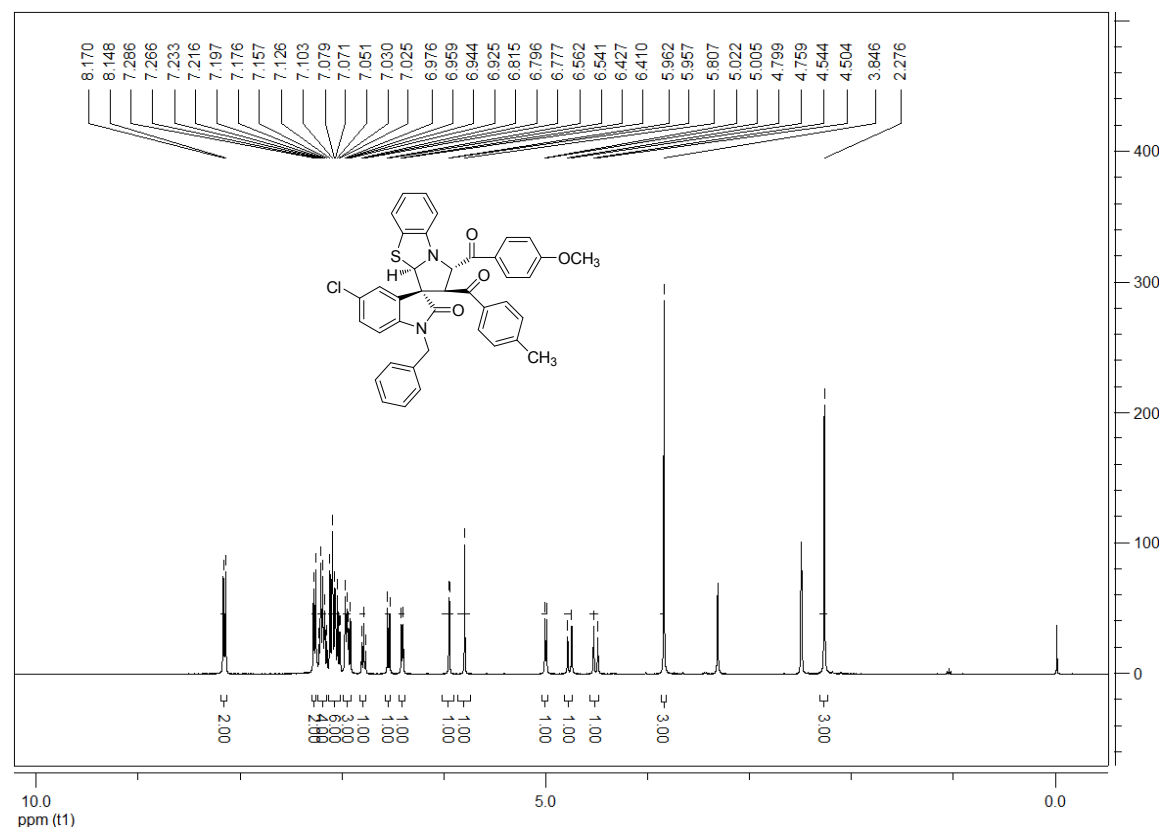
1'-benzyl-5'-chloro-1-(4-fluorobenzoyl)-2-(4-methylbenzoyl)-2,3a-dihydro-1H-spiro[benzo[d]pyrrolo[2,1-b]thiazole-3,3'-indolin]-2'-one (3o):



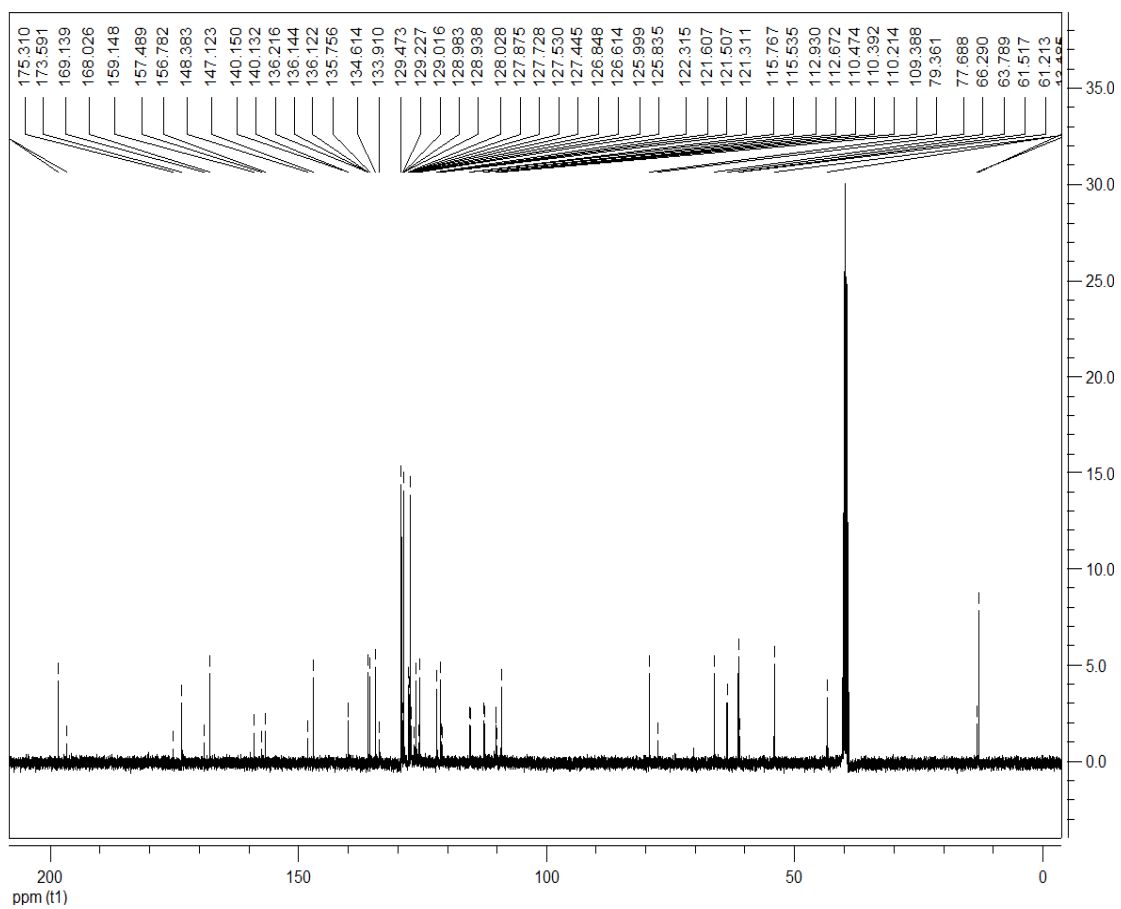
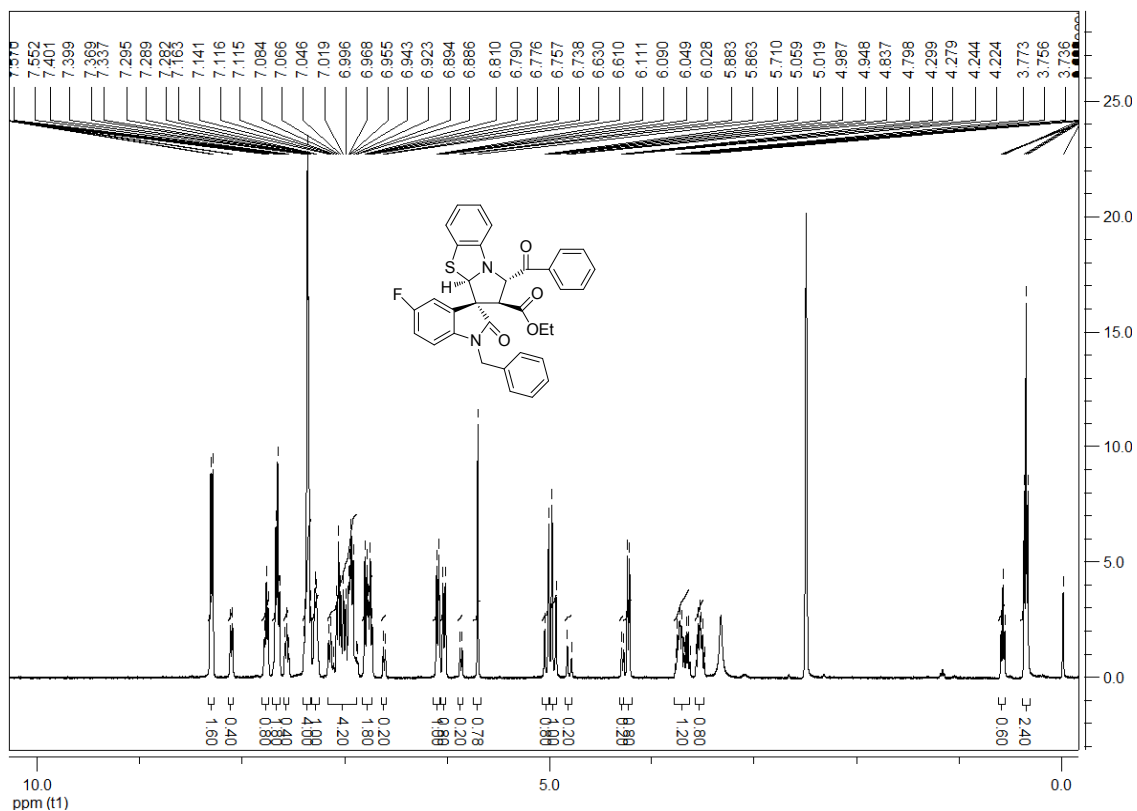
2-benzoyl-1'-benzyl-5'-methyl-1-(4-methylbenzoyl)-2,3a-dihydro-1H-spiro[benzo[d]pyrrolo[2,1-b]thiazole-3,3'-indolin]-2'-one (3p):



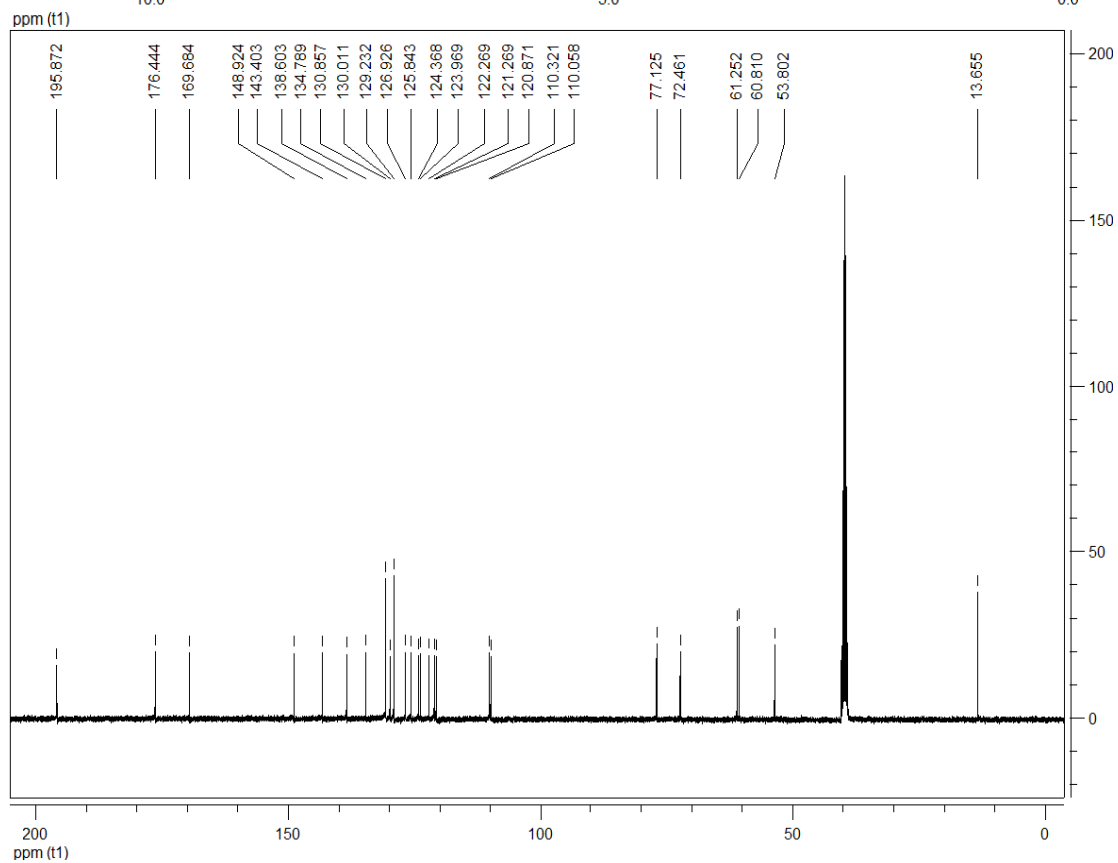
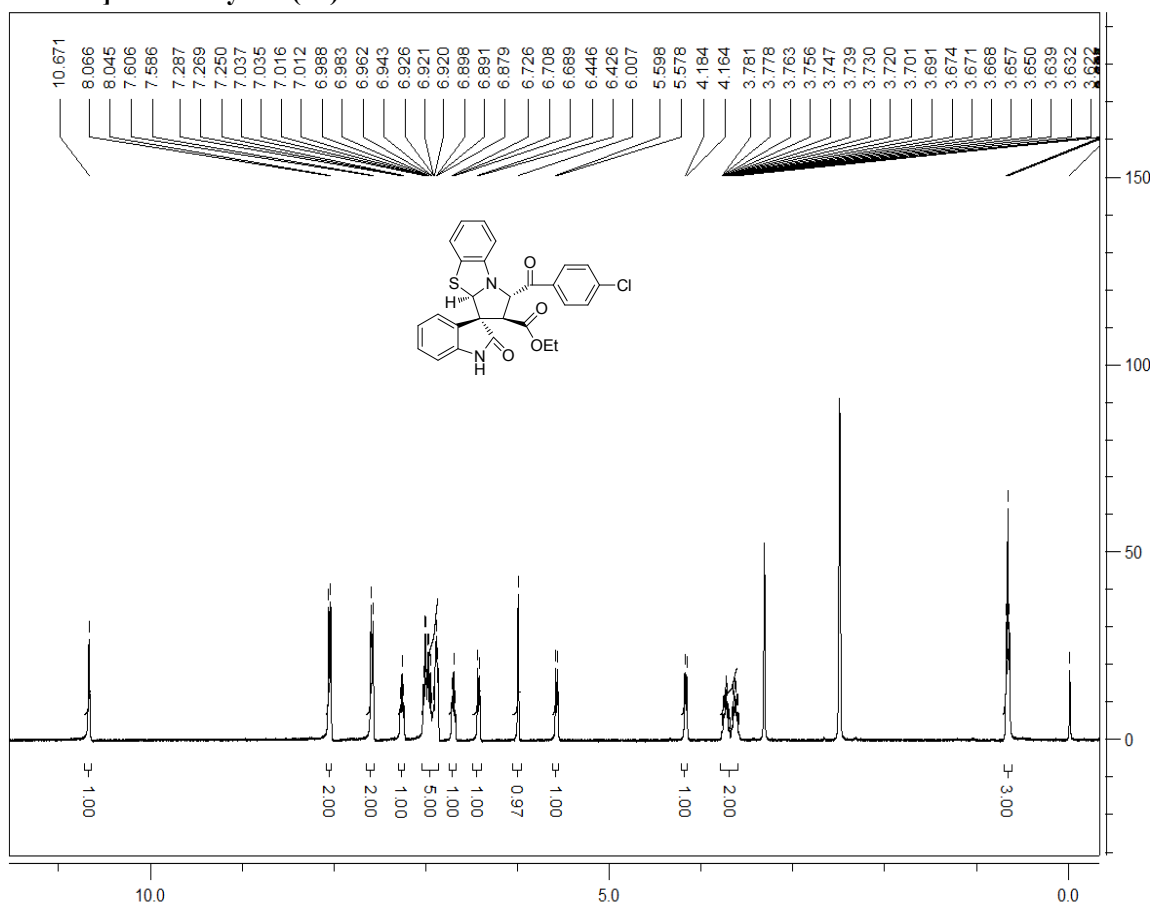
1'-benzyl-5'-chloro-1-(4-methoxybenzoyl)-2-(4-methylbenzoyl)-2,3a-dihydro-1H-spiro[benzo[d]pyrrolo[2,1-b]thiazole-3,3'-indolin]-2'-one (3q):



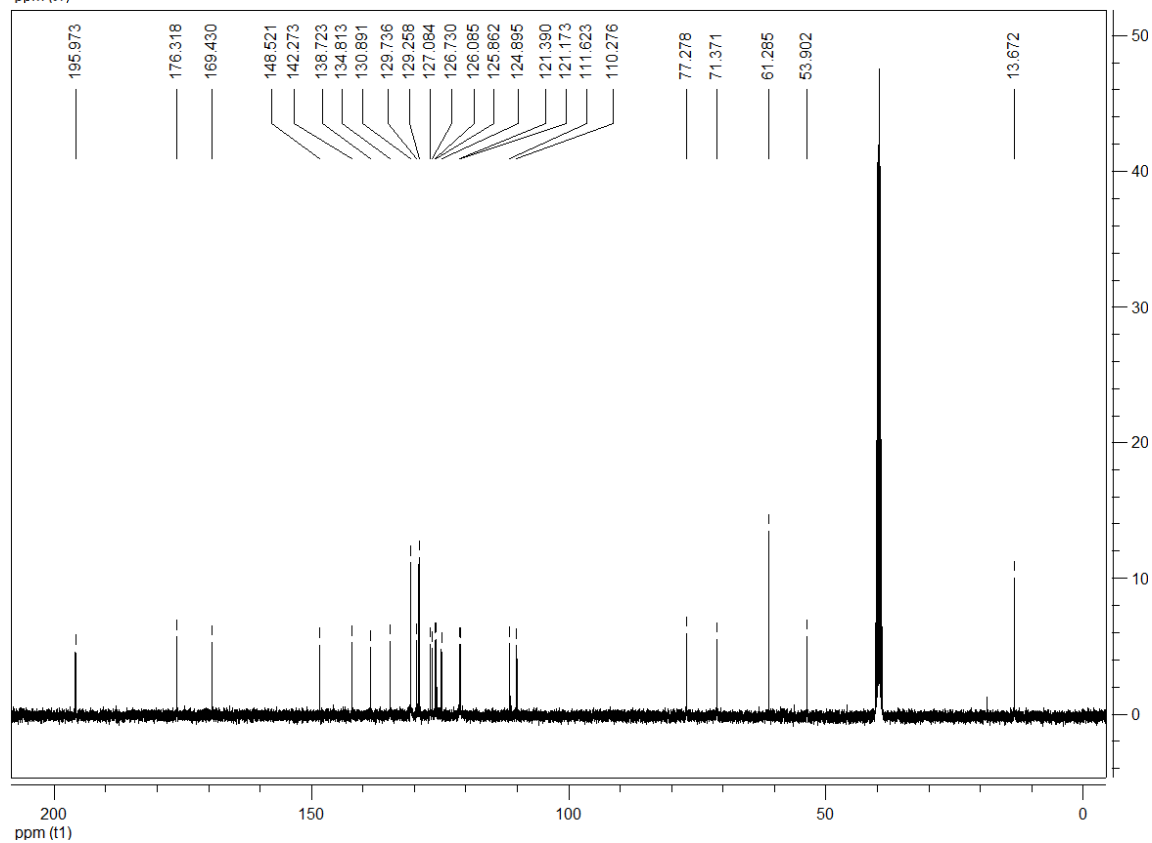
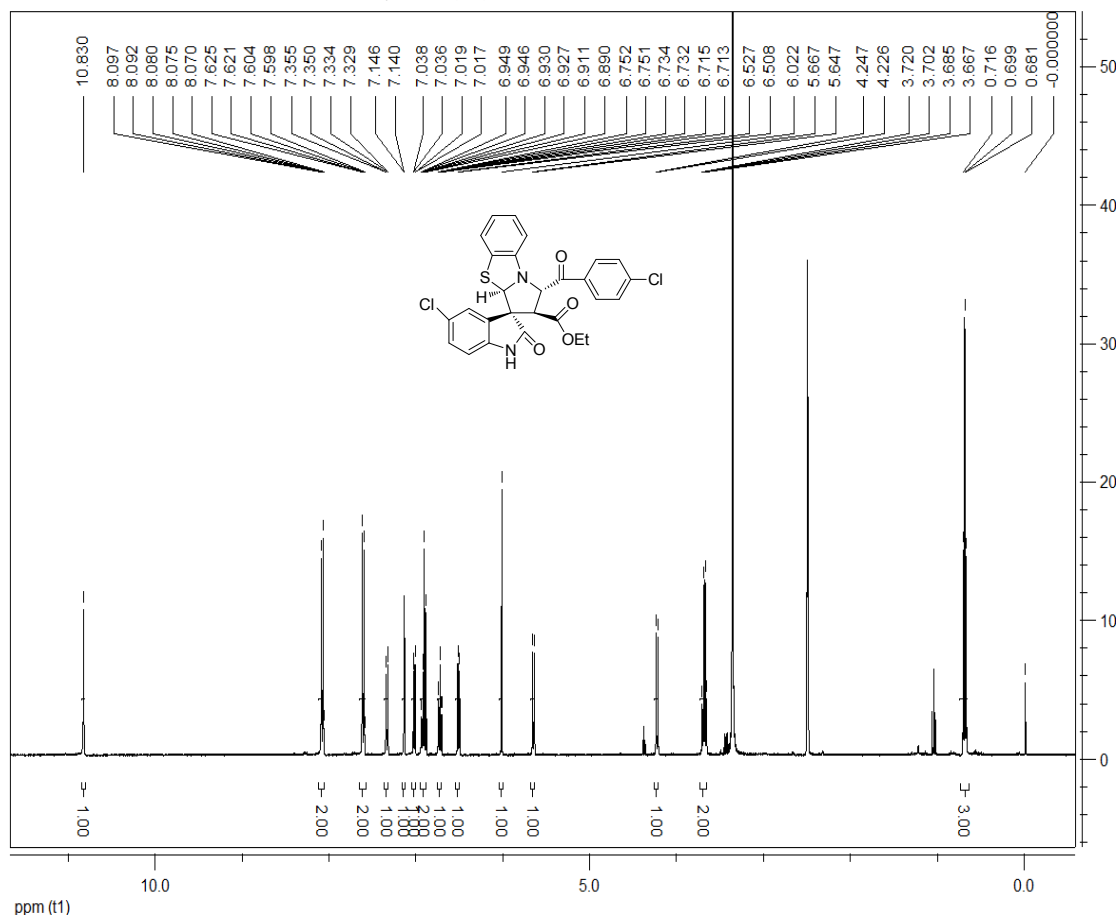
Ethyl 1-benzoyl-1'-benzyl-5'-fluoro-2'-oxo-2,3a-dihydro-1H-spiro[benzo[d]pyrrolo[2,1-b]-thiazole-3,3'-indoline]-2-carboxylate (4a):



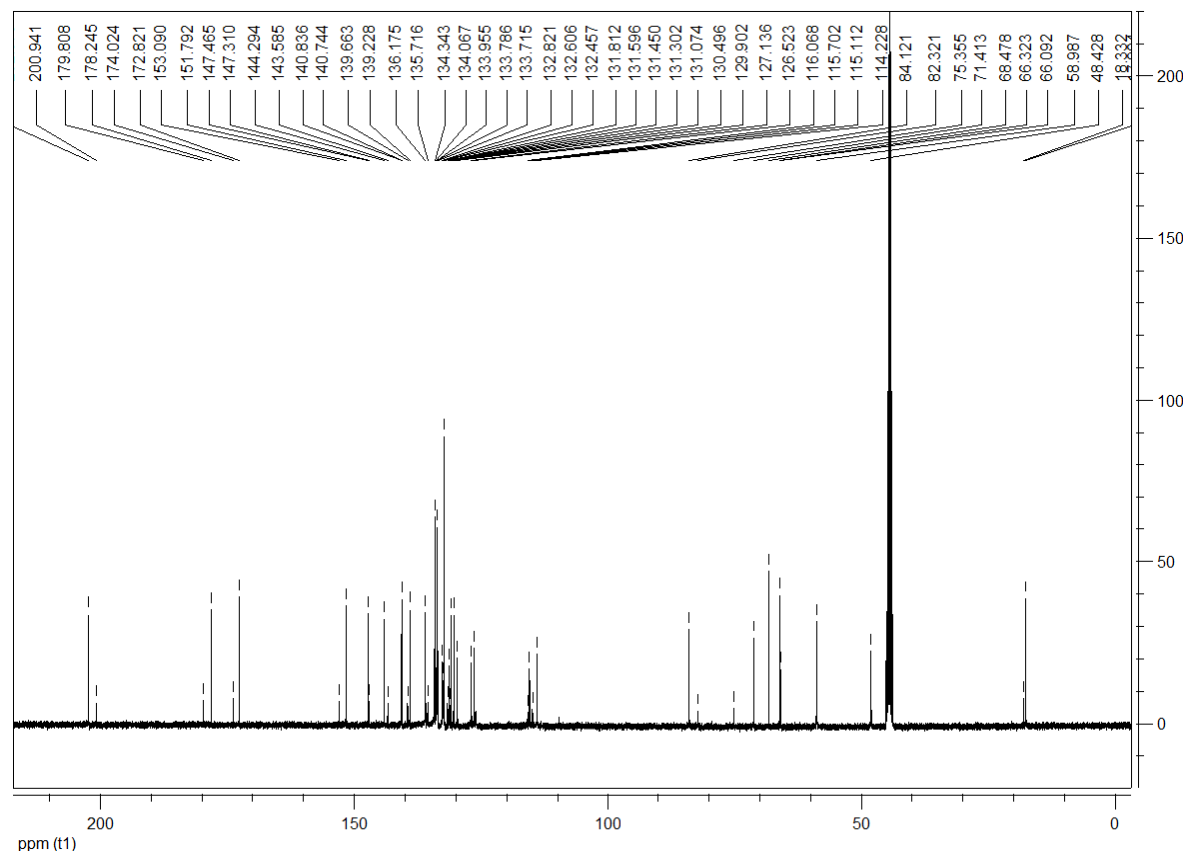
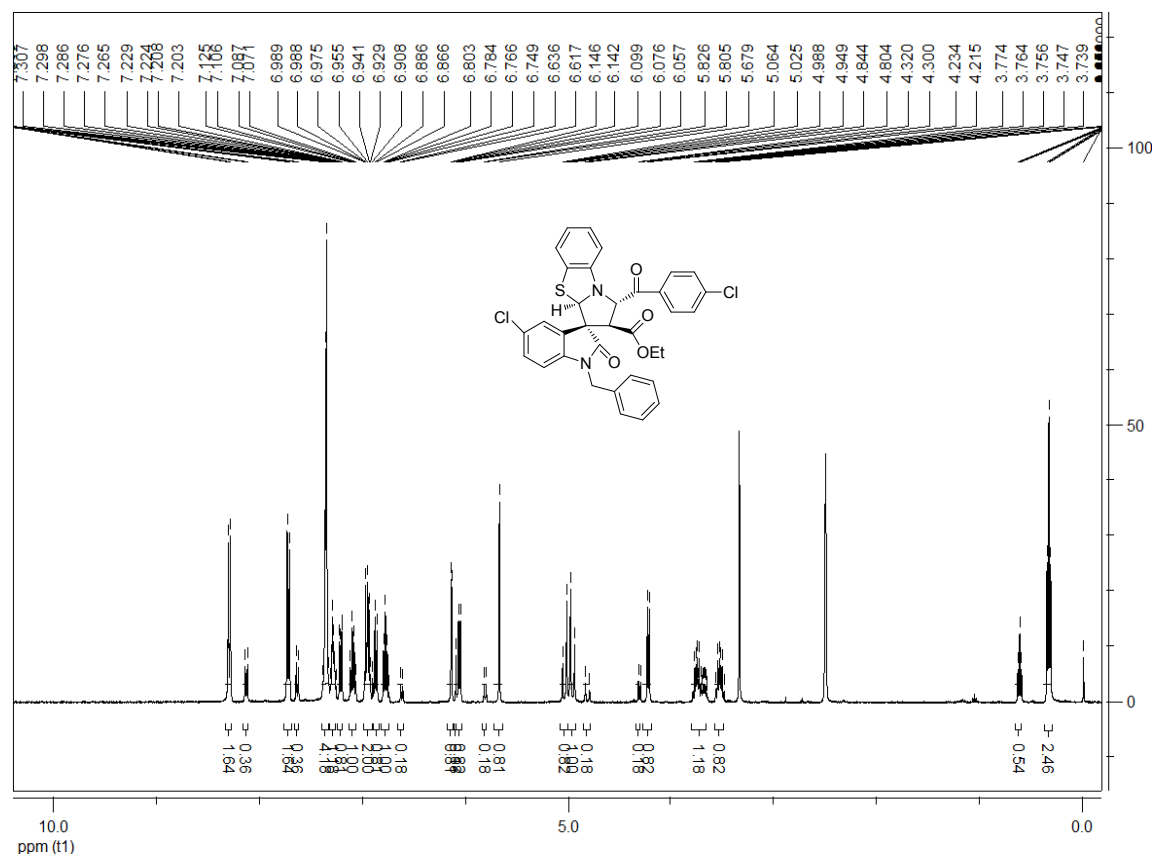
Ethyl 1-(4-chlorobenzoyl)-2'-oxo-2,3a-dihydro-1H-spiro[benzo[d]pyrrolo[2,1-b]thiazole-3,3'-indoline]-2-carboxylate (4b):



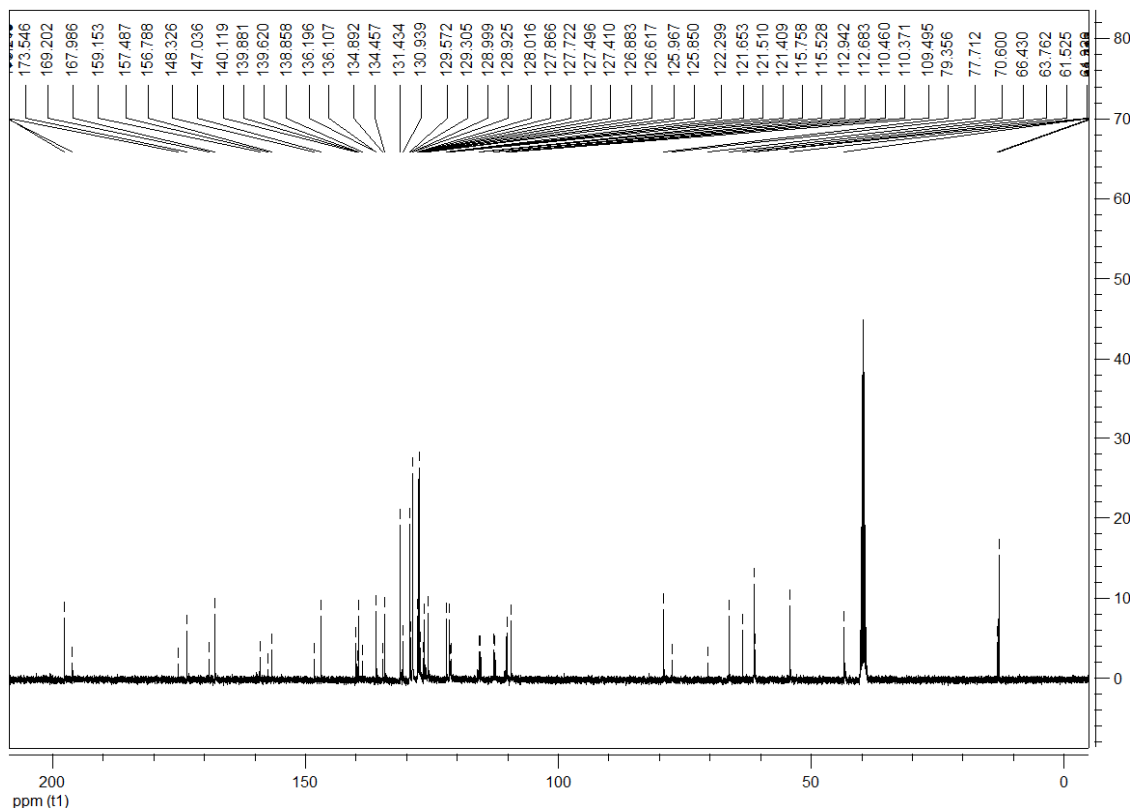
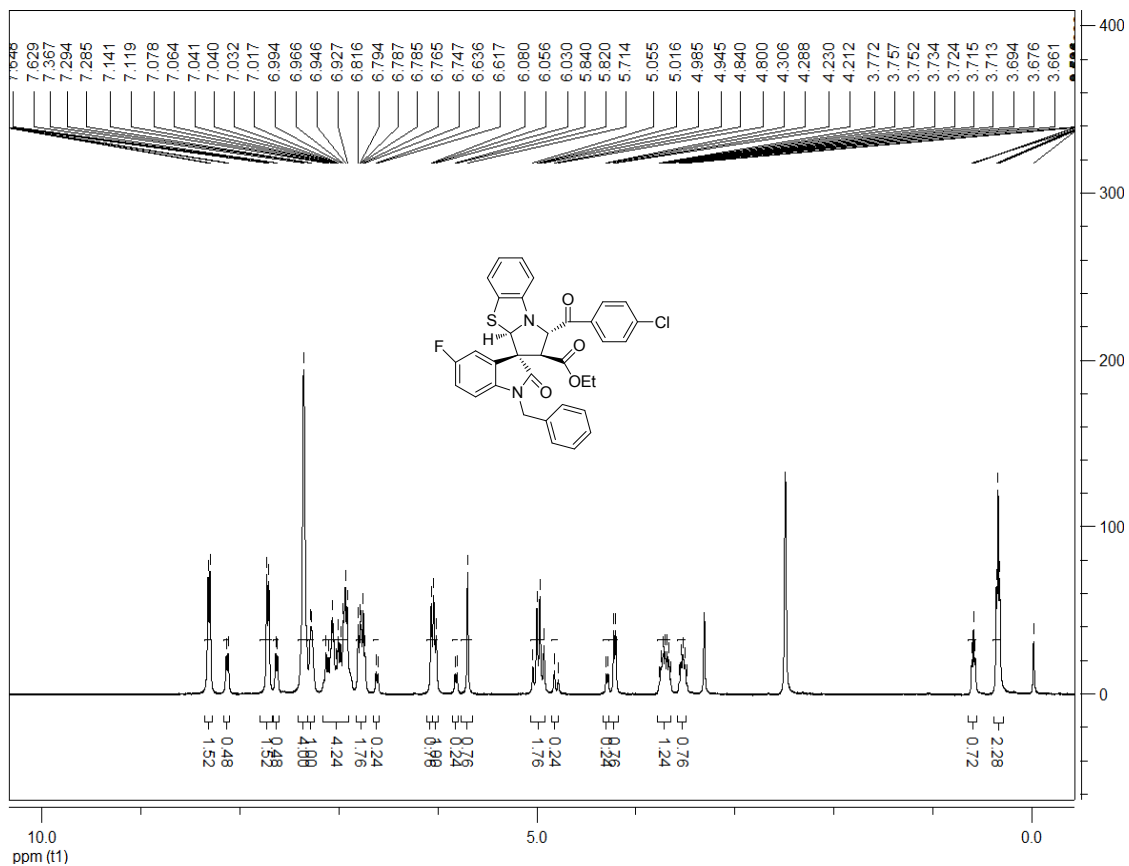
Ethyl 5'-chloro-1-(4-chlorobenzoyl)-2'-oxo-2,3a-dihydro-1H-spiro[benzo[d]pyrrolo[2,1-b]-thiazole-3,3'-indoline]-2-carboxylate (4c):



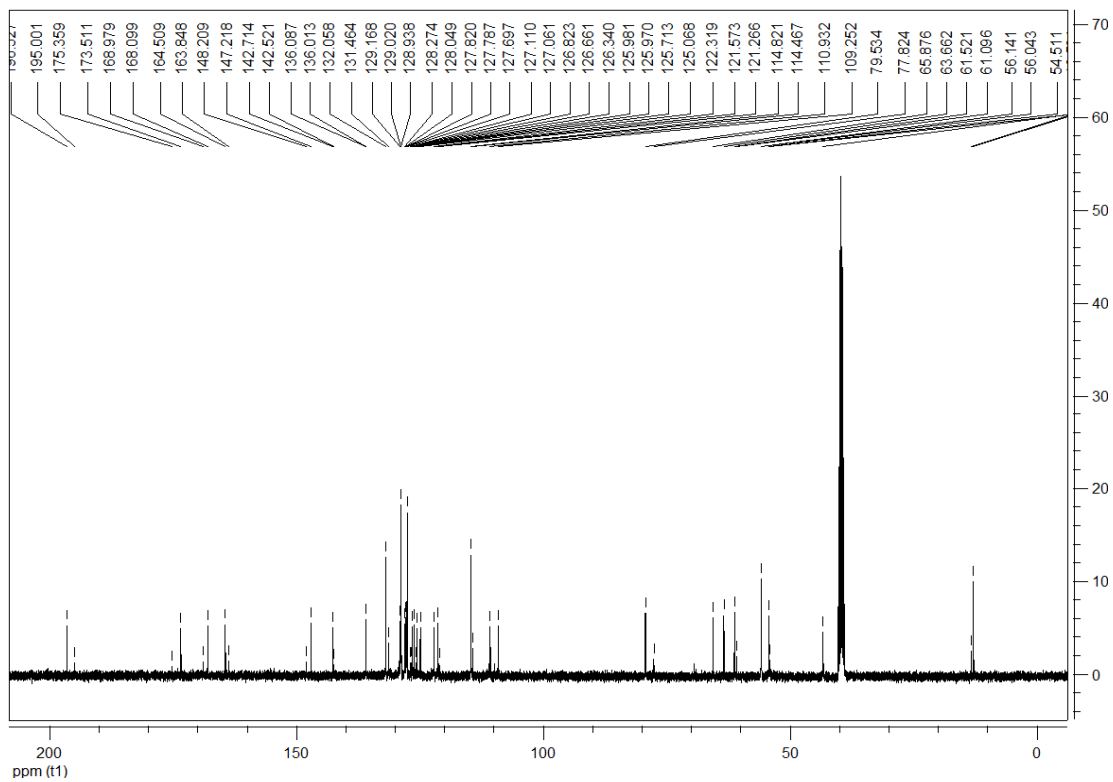
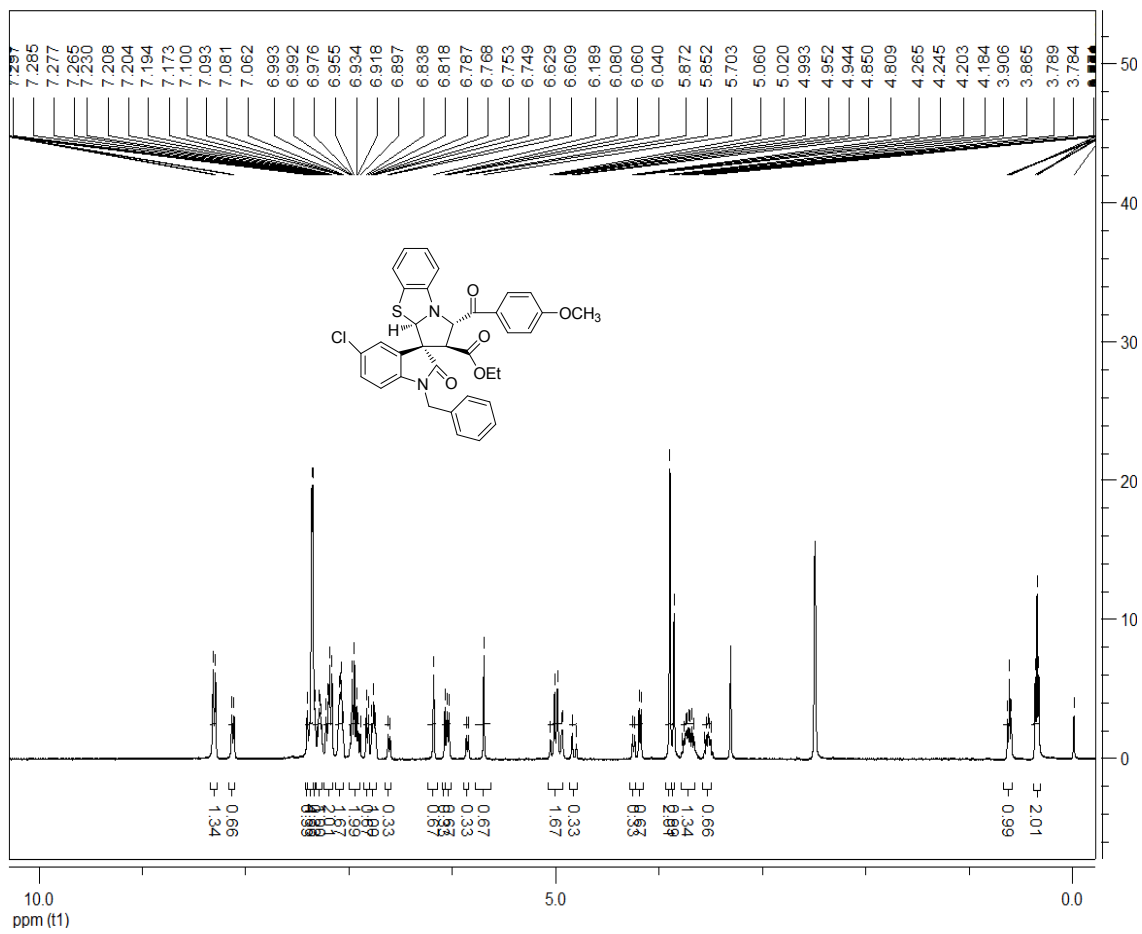
Ethyl 1'-benzyl-1-(4-chlorobenzoyl)-5'-chloro-2'-oxo-2,3a-dihydro-1H-spiro[benzo[d]-pyrrolo[2,1-b]thiazole-3,3'-indoline]-2-carboxylate (4d):



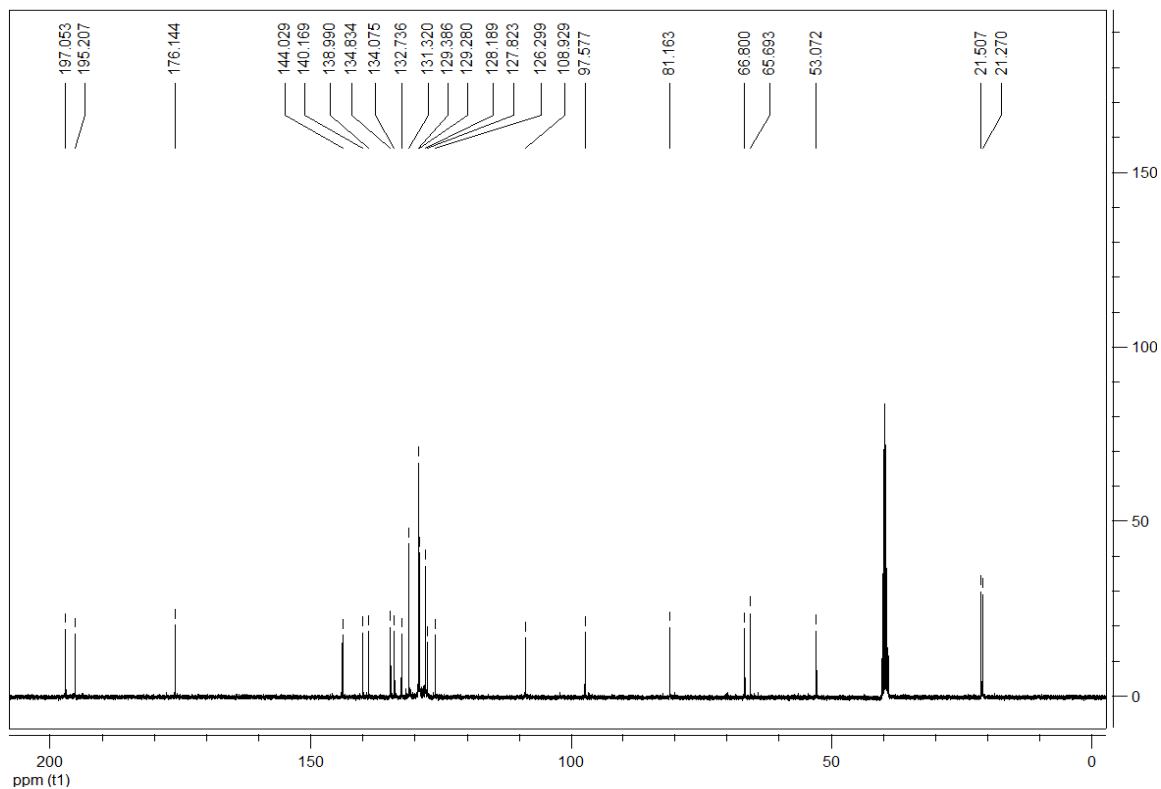
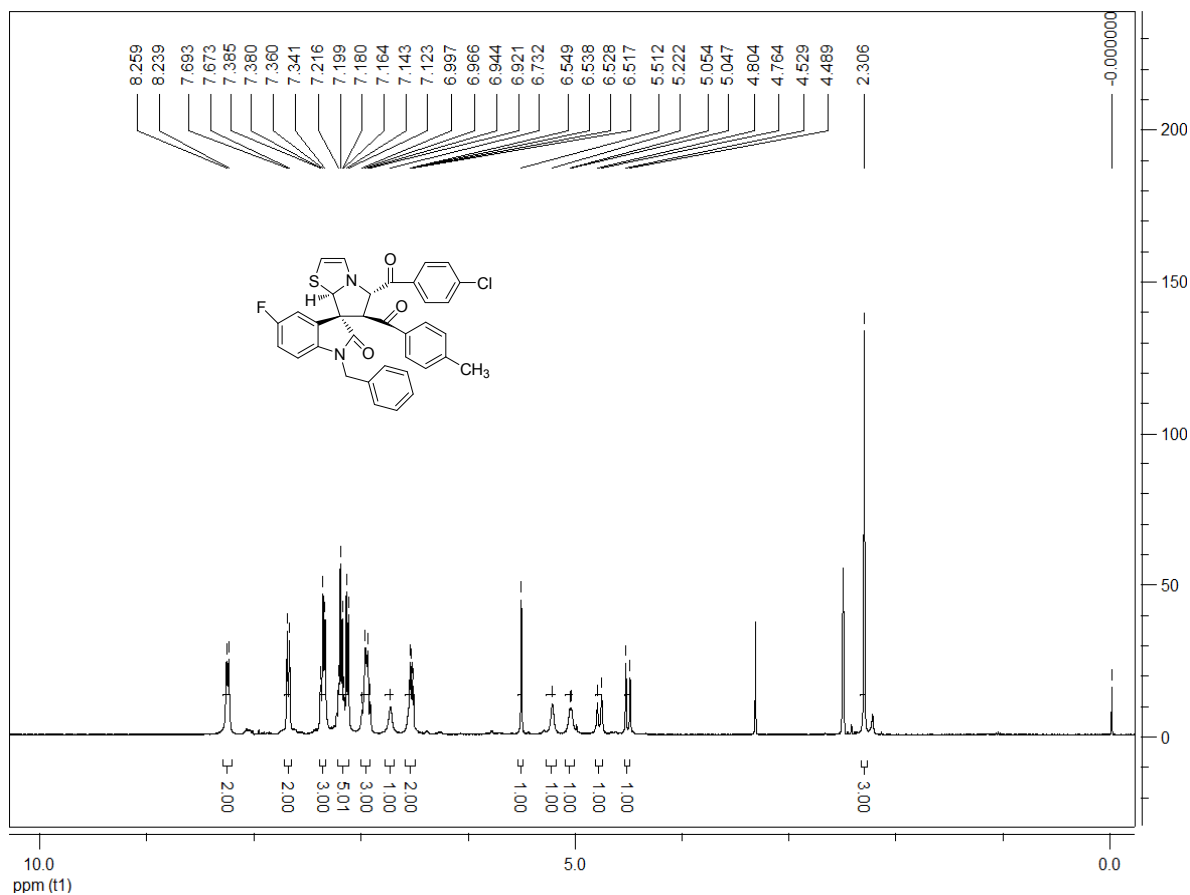
Ethyl 1'-benzyl-1-(4-chlorobenzoyl)-5'-fluoro-2'-oxo-2,3a-dihydro-1H-spiro[benzo[d]-pyrrolo[2,1-b]thiazole-3,3'-indoline]-2-carboxylate (4e):



Ethyl 1'-benzyl-5'-chloro-1-(4-methoxybenzoyl)-2'-oxo-2,3a-dihydro-1H-spiro[benzo[d]-pyrrolo[2,1-b]thiazole-3,3'-indoline]-2-carboxylate (4f):



1-benzyl-5'-(4-chlorobenzoyl)-5-fluoro-6'-(4-methylbenzoyl)-6',7a'-dihydro-5'H-spiro[indoline-3,7'-pyrrolo[2,1-b]thiazol]-2-one (5a):



1-benzyl-5-chloro-5'-(4-chlorobenzoyl)-6'-(4-methylbenzoyl)-6',7a'-dihydro-5'H-spiro[indoline-3,7'-pyrrolo[2,1-b]thiazol]-2-one (5b):

