Supporting Information

Cu-Mediated Sulfonyl Radical-Enabled 5-*exo*-*trig* Cyclization of Alkenyl Aldehydes: Access to Sulfonylmethyl 1*H*-Indenes

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1. X-ray structure of compound 3l

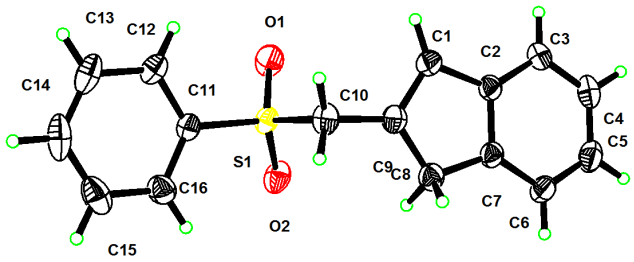


Figure S1. ORTEP drawing of 3l showing thermal ellipsoids at the 50% probability level

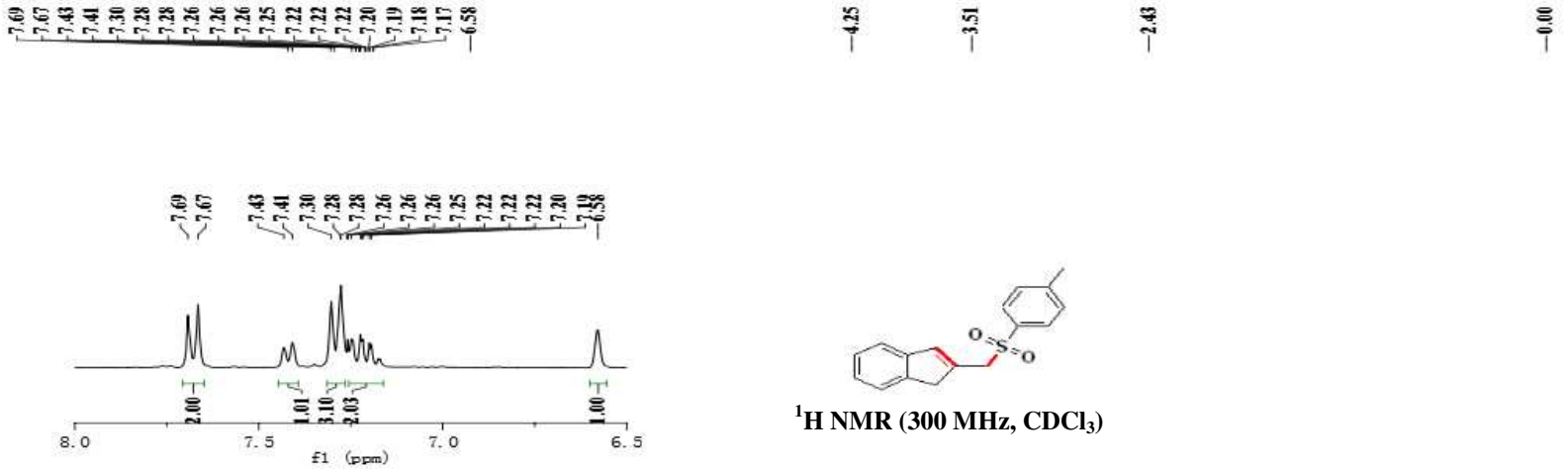
Table S1. Crystal data and structure refinement for 3l

CCDC No.	**1829188**
Empirical formula	$C_{16}H_{14}O_2S$
Formula weight	270.33
Temperature/K	296.15
Crystal system	monoclinic
Space group	$P2_1/n$
a/Å	8.299(3)
b/Å	10.924(4)
c/Å	14.783(5)
α/°	90
β/°	98.016(8)
γ/°	90
Volume/Å^3	1327.1(8)
Z	4
ρ_{calc}g/cm^3	1.353
μ/mm^{-1}	0.238
F(000)	568.0
Crystal size/mm^3	0.28 × 0.15 × 0.12
Radiation	MoKα (λ = 0.71073)
2Θ range for data collection/°	4.652 to 53.038

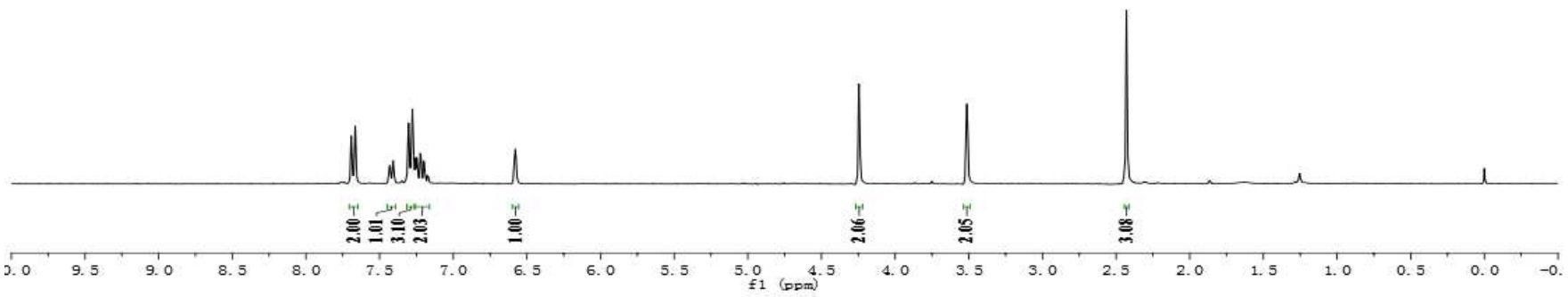
Index ranges	$-10 \leq h \leq 10$, $-13 \leq k \leq 12$, $-18 \leq l \leq 18$
Reflections collected	9223
Independent reflections	2656 [R_{int} = 0.0332, R_{sigma} = 0.0352]
Data/restraints/parameters	2656/0/172
Goodness-of-fit on F^2	1.071
Final R indexes [I>=2σ (I)]	R_1 = 0.0466, wR_2 = 0.1361
Final R indexes [all data]	R_1 = 0.0562, wR_2 = 0.1457
Largest diff. peak/hole / e $Å^{-3}$	0.34/-0.37

2. Copies of NMR Spectra Data

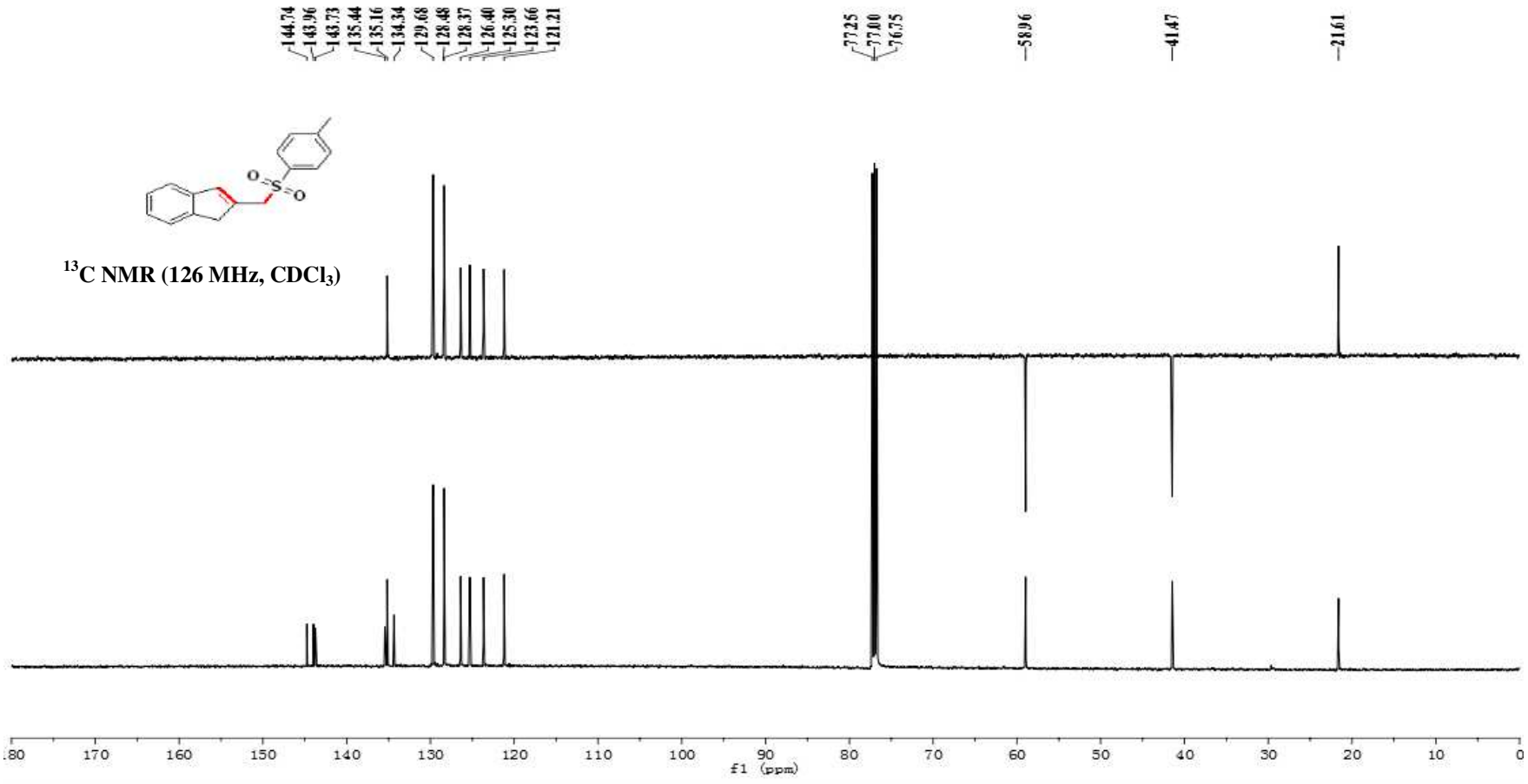
2-(Tosylmethyl)-1*H*-indene (3a)



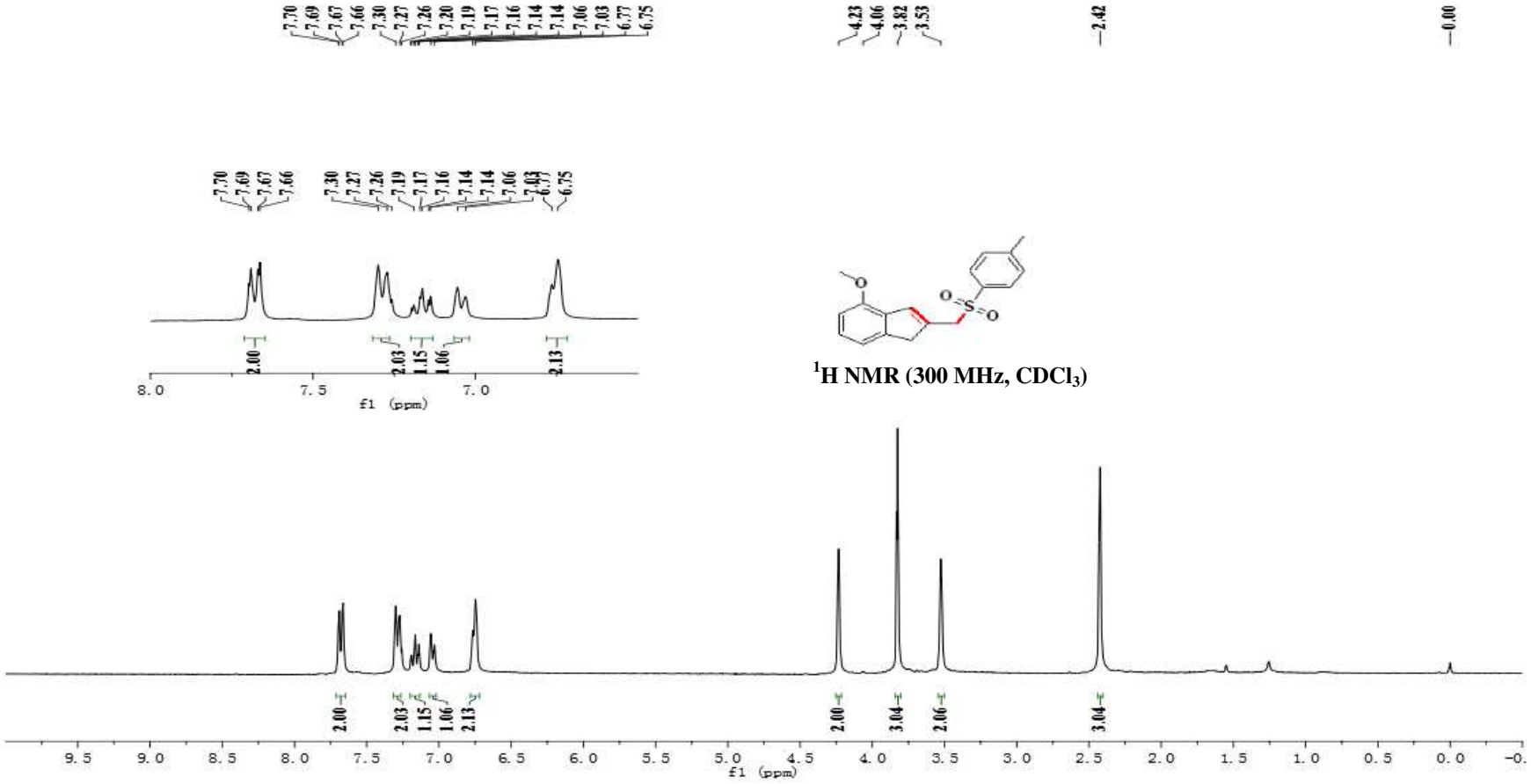
^{1}H NMR (300 MHz, $CDCl_3$)



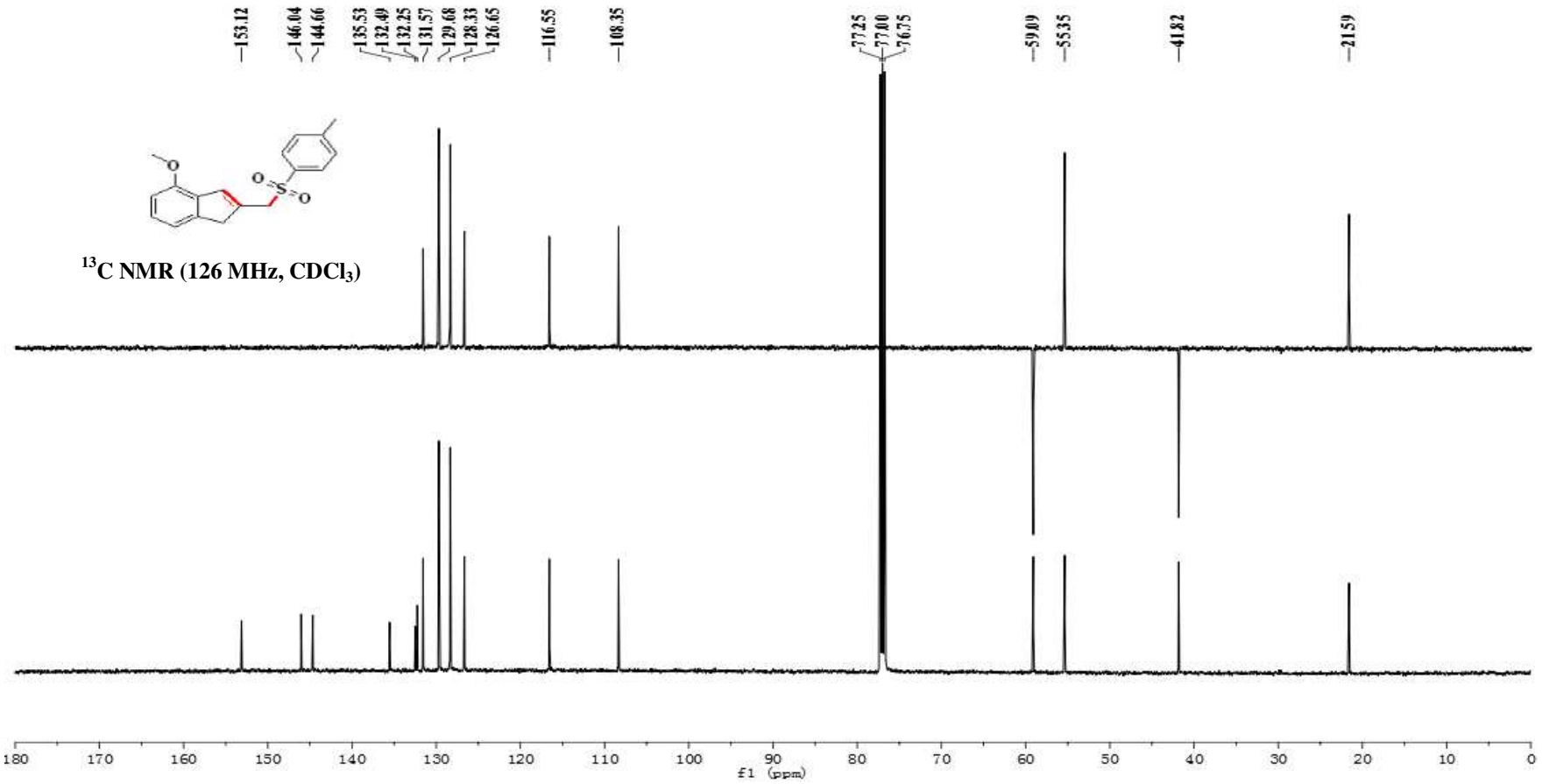
2-(Tosylmethyl)-1*H*-indene (3a)



4-Methoxy-2-(tosylmethyl)-1*H*-indene (3b)

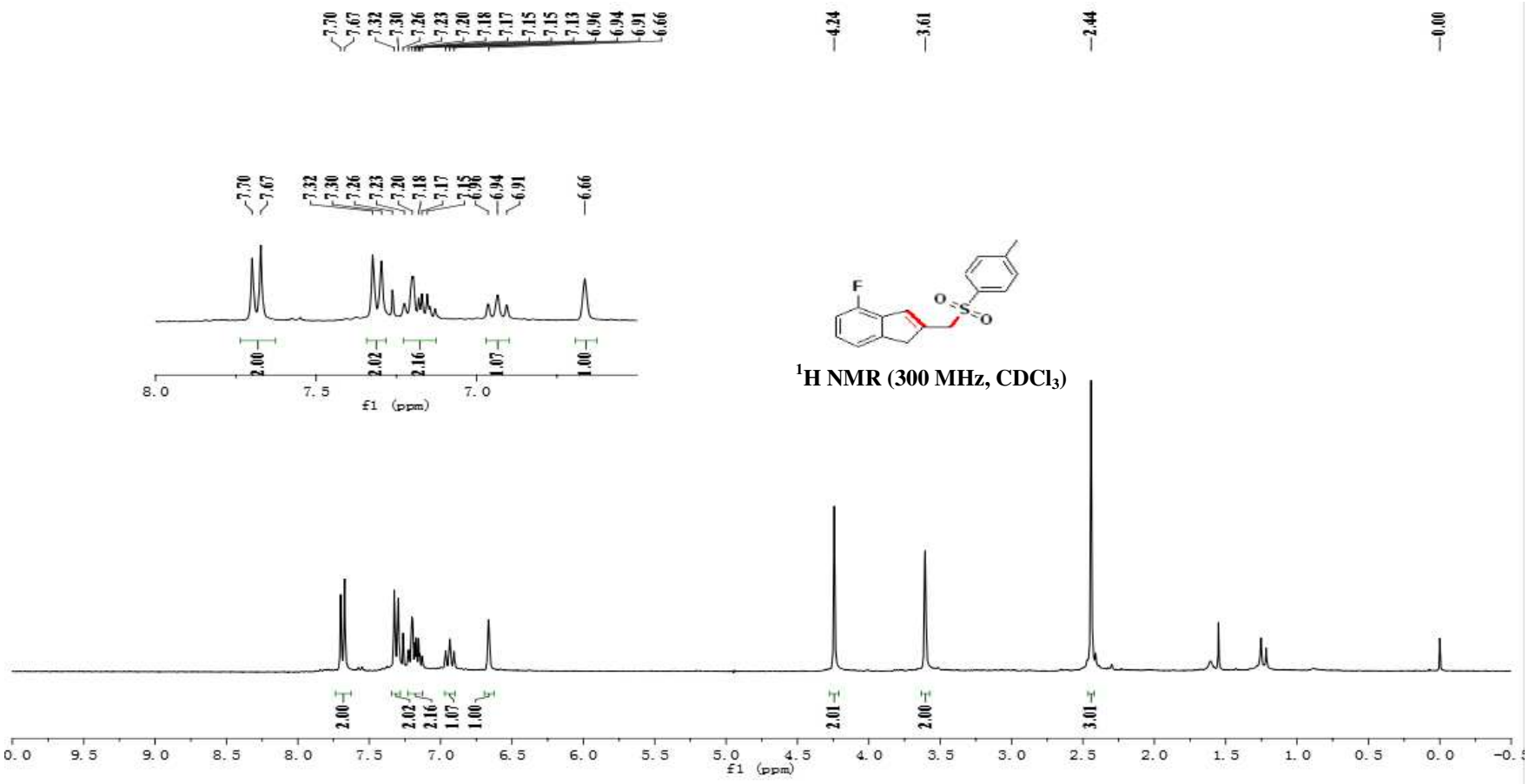


4-Methoxy-2-(tosylmethyl)-1*H*-indene (3b)



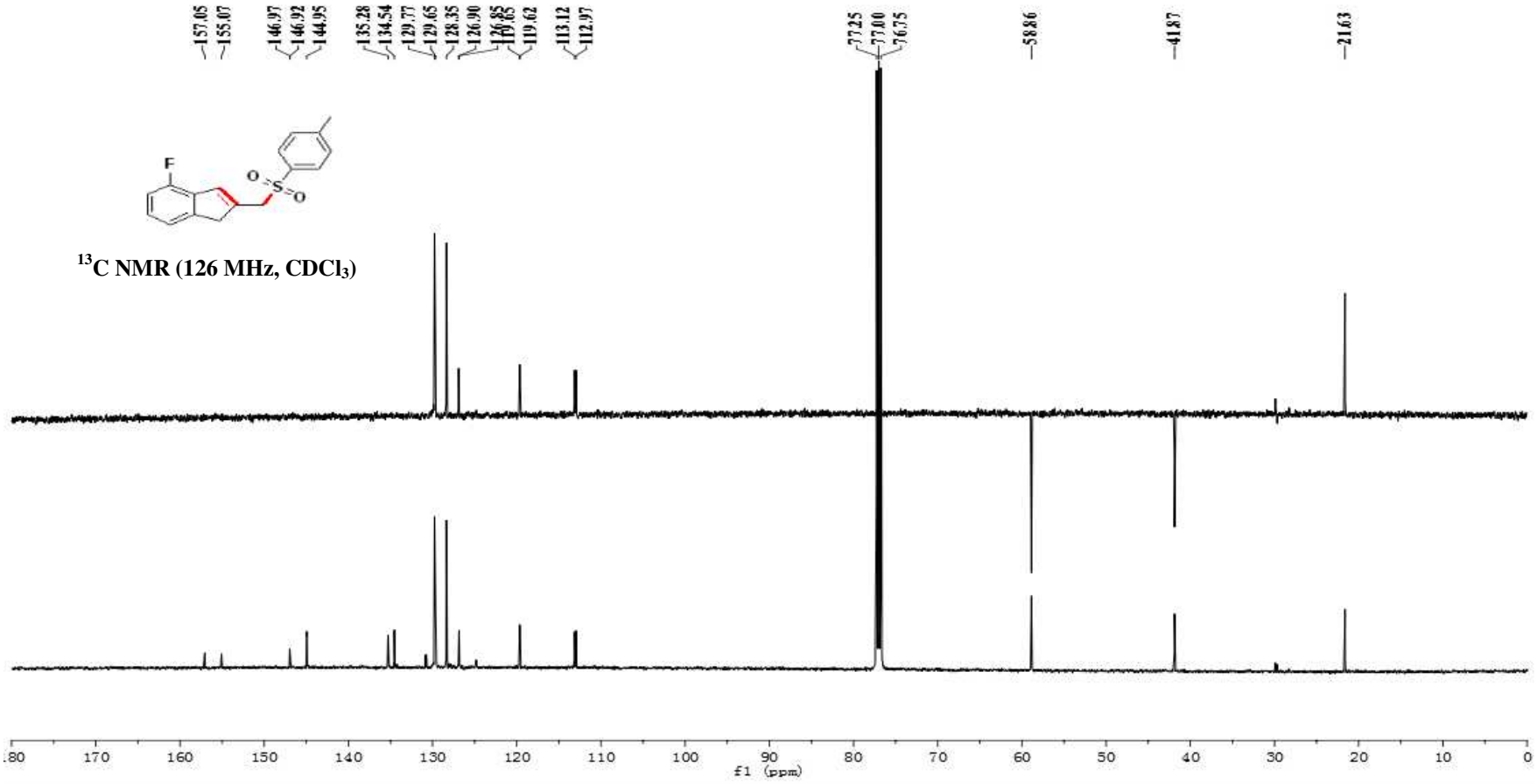
^{13}C NMR (126 MHz, $CDCl_3$)

4-Fluoro-2-(tosylmethyl)-1*H*-indene (3c)



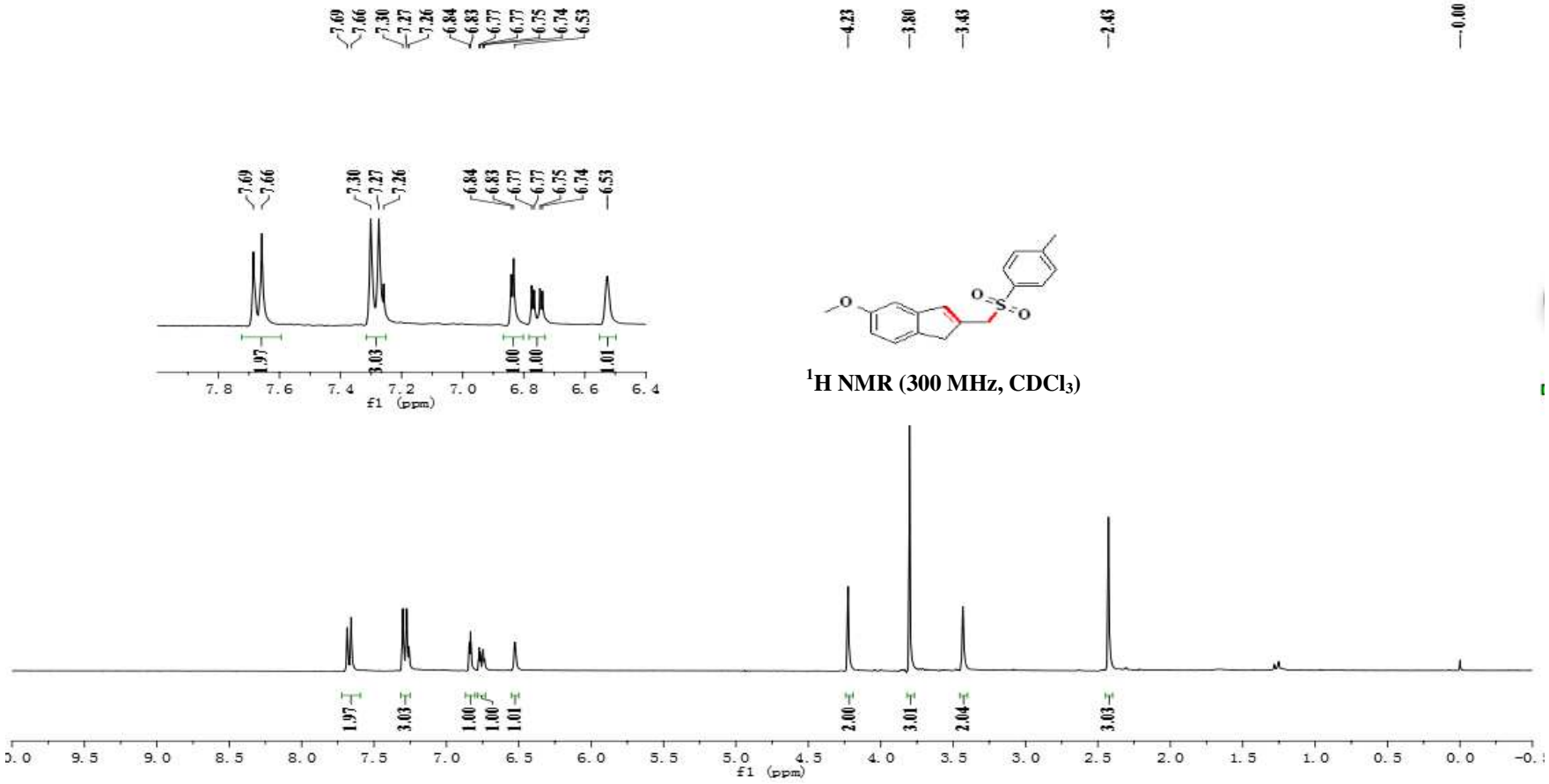
^{1}H NMR (300 MHz, $CDCl_3$)

4-Fluoro-2-(tosylmethyl)-1*H*-indene (3c)



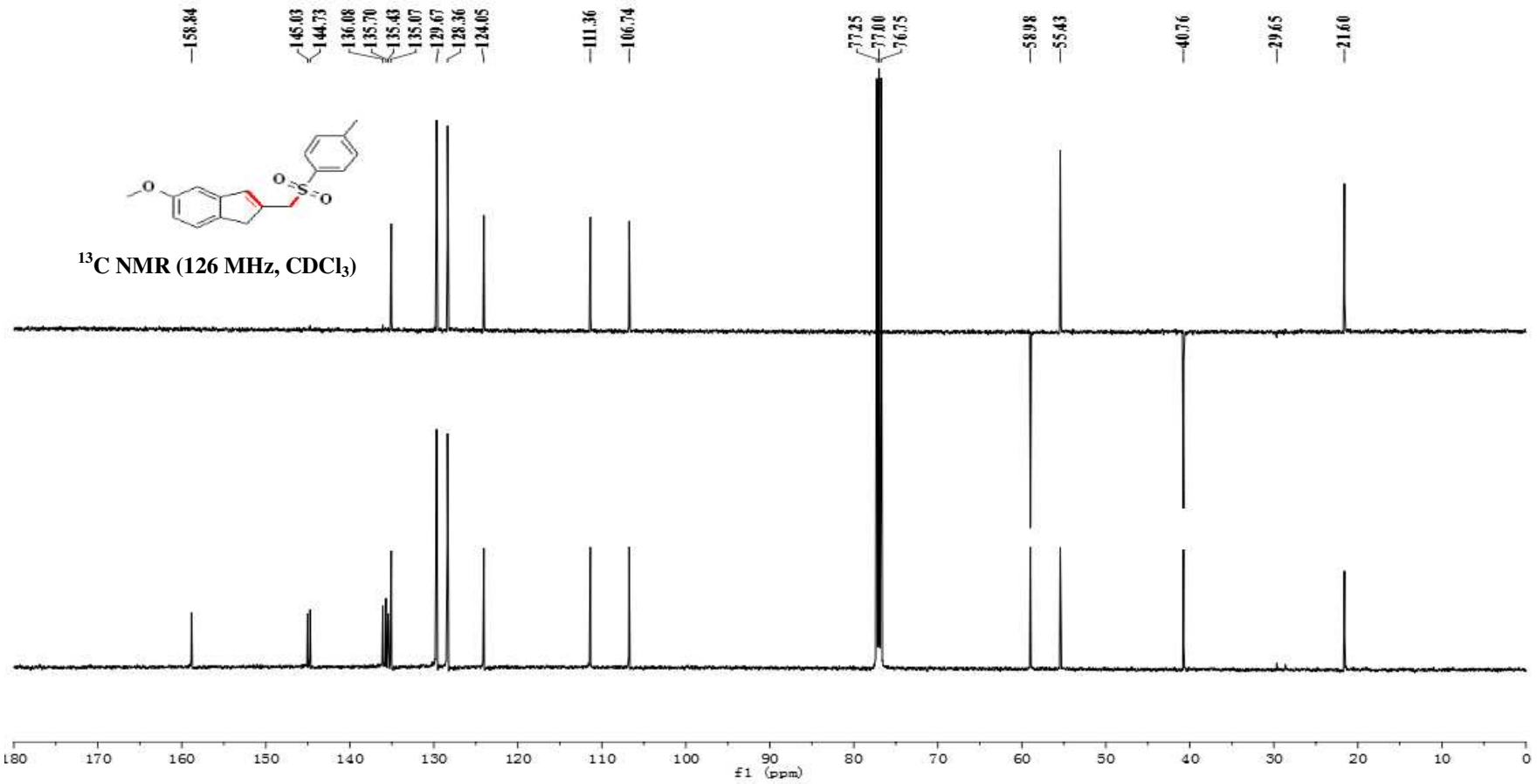
^{13}C NMR (126 MHz, $CDCl_3$)

5-Methoxy-2-(tosylmethyl)-1*H*-indene (3d)



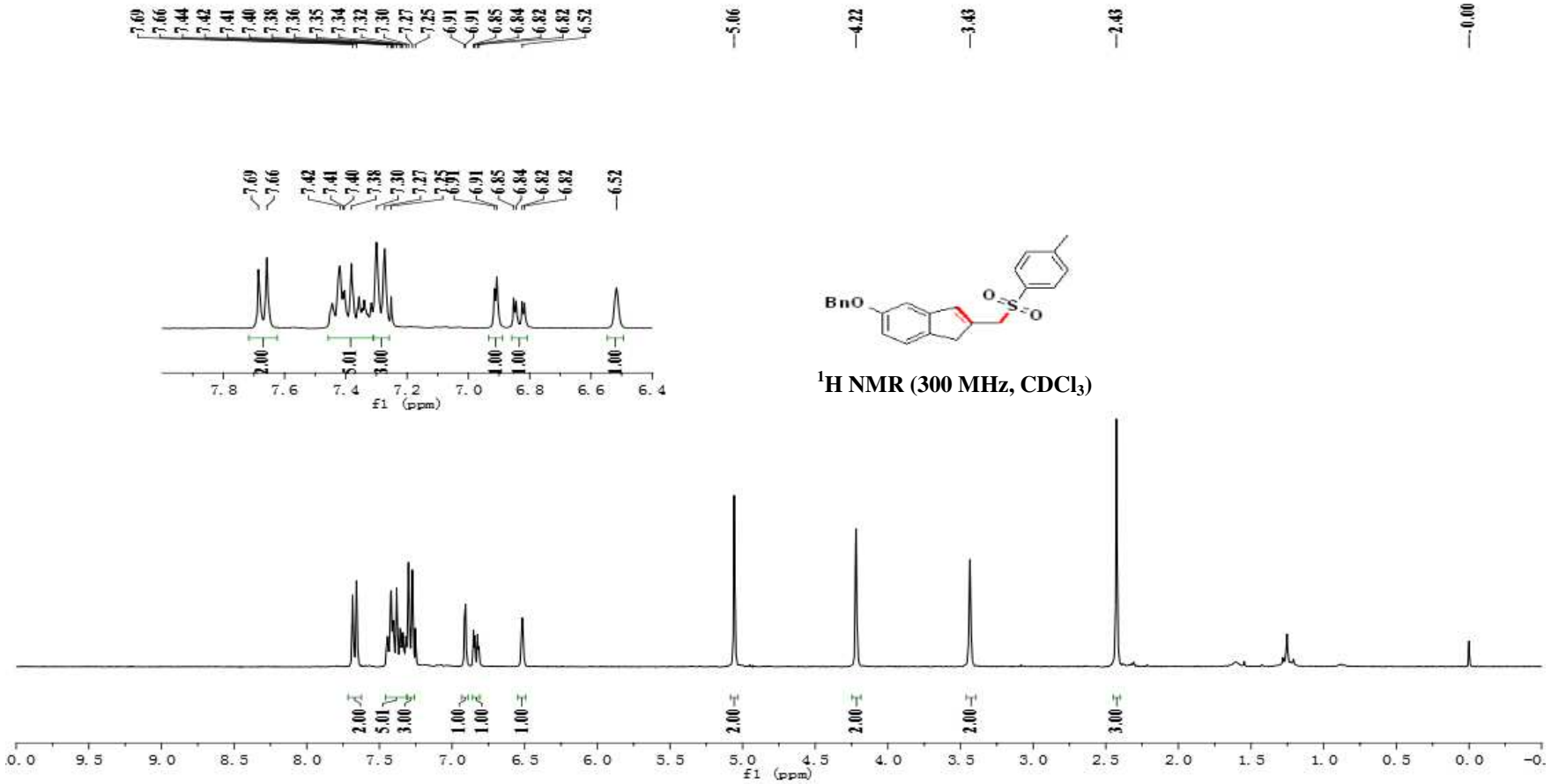
^{1}H NMR (300 MHz, $CDCl_3$)

5-Methoxy-2-(tosylmethyl)-1*H*-indene (3d)



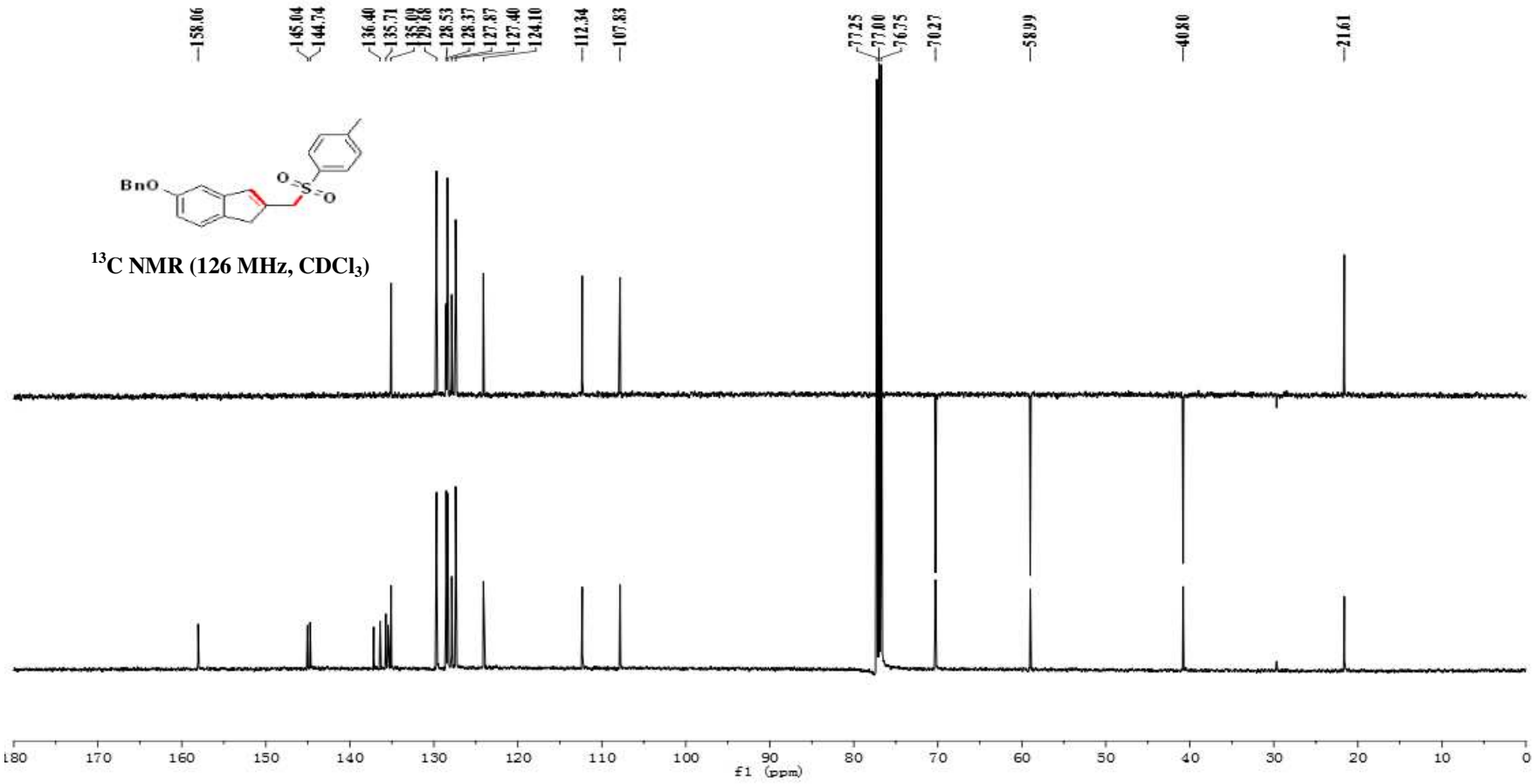
^{13}C NMR (126 MHz, $CDCl_3$)

5-(Benzyloxy)-2-(tosylmethyl)-1*H*-indene (3e)



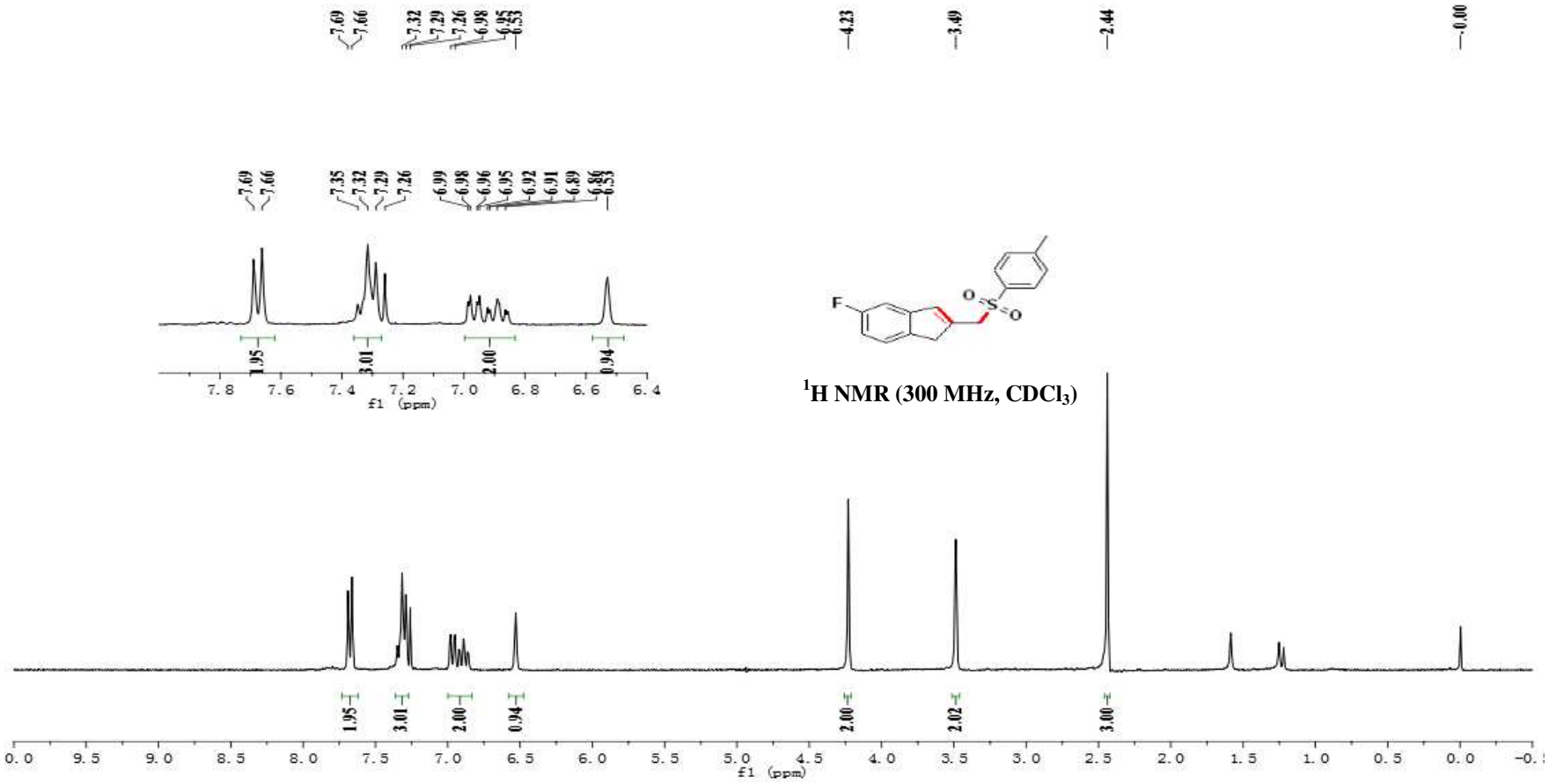
^{1}H NMR (300 MHz, $CDCl_3$)

5-(Benzyloxy)-2-(tosylmethyl)-1*H*-indene (3e)

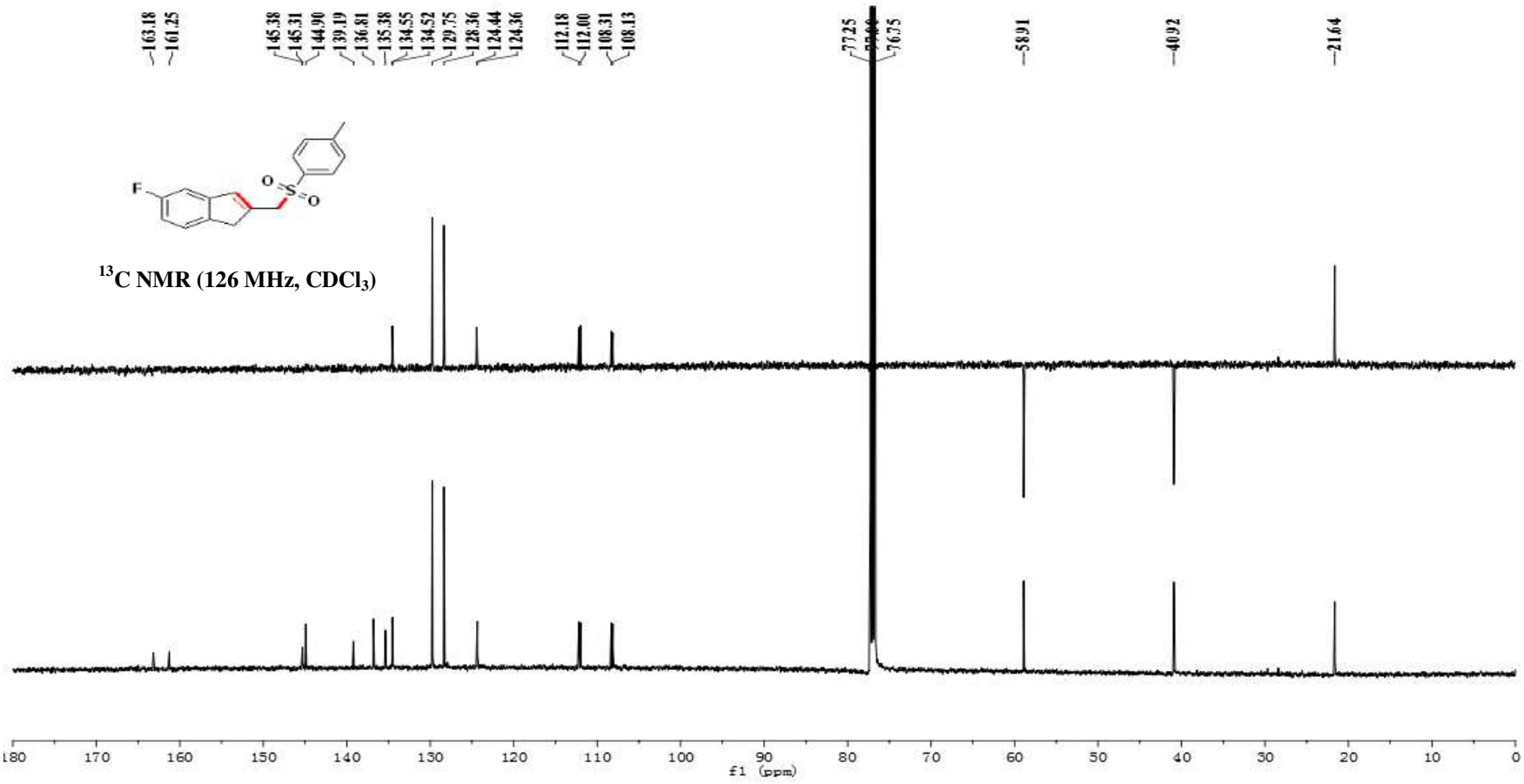


^{13}C NMR (126 MHz, $CDCl_3$)

5-Fluoro-2-(tosylmethyl)-1*H*-indene (3f)

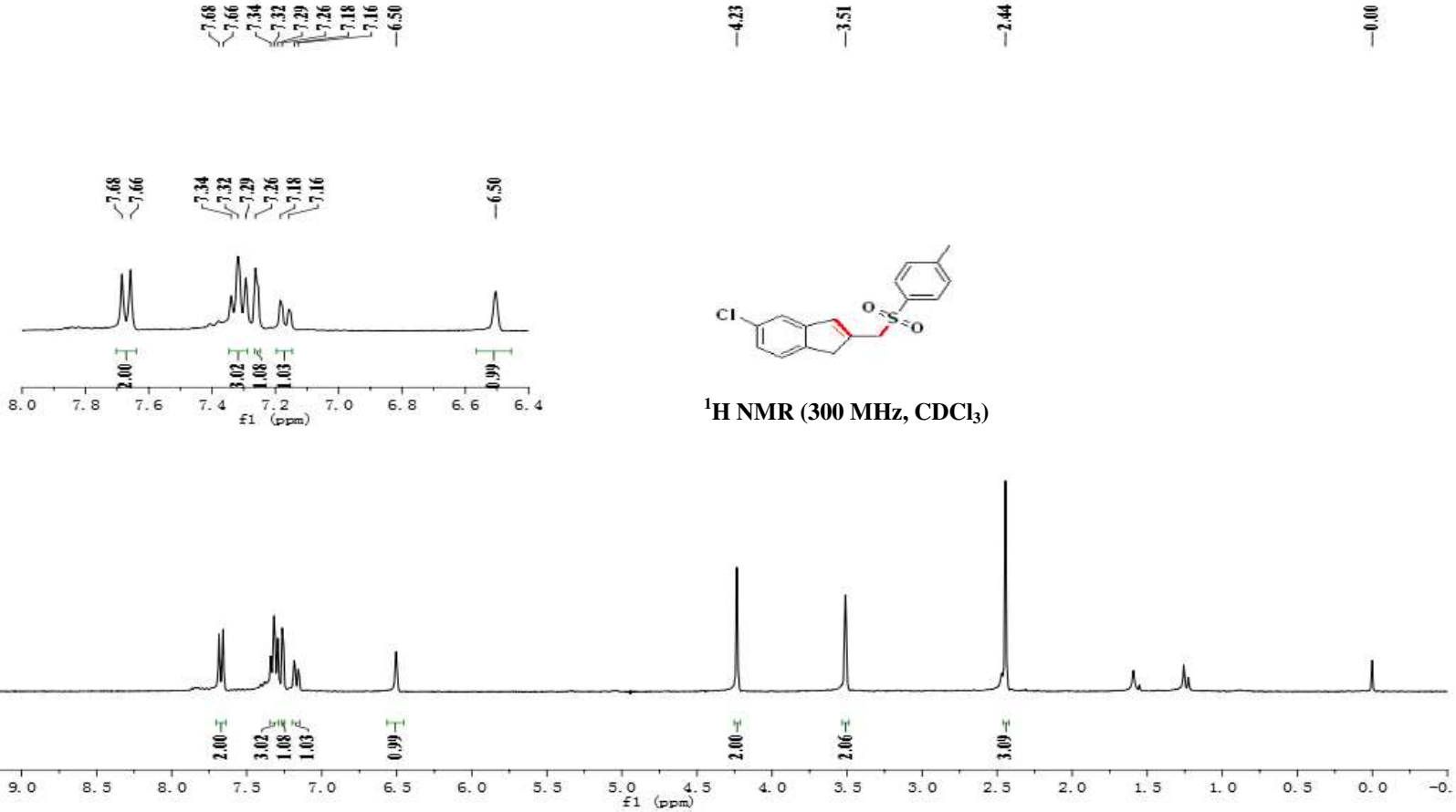


5-Fluoro-2-(tosylmethyl)-1*H*-indene (3f)



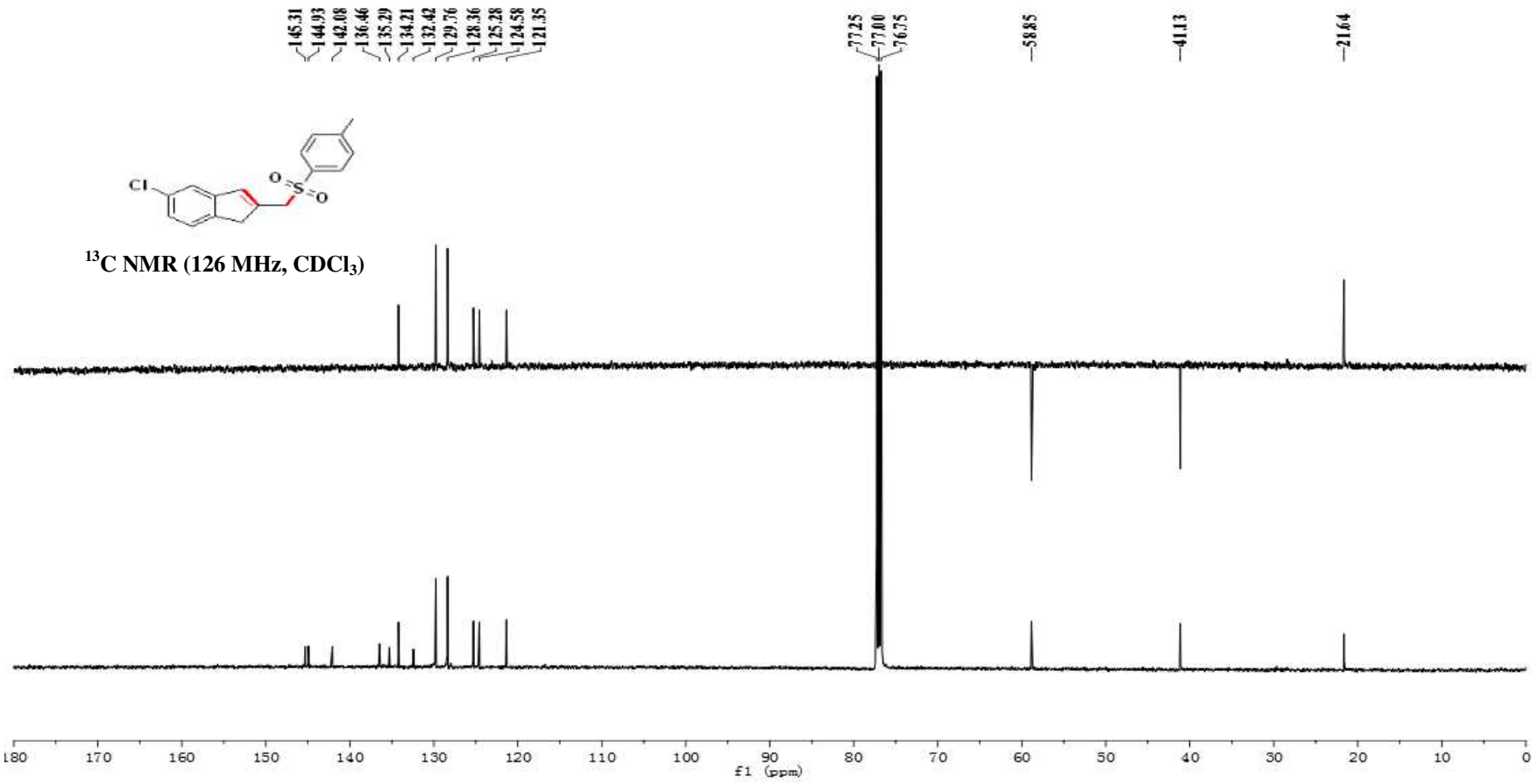
^{13}C NMR (126 MHz, $CDCl_3$)

5-Chloro-2-(tosylmethyl)-1*H*-indene (3g)



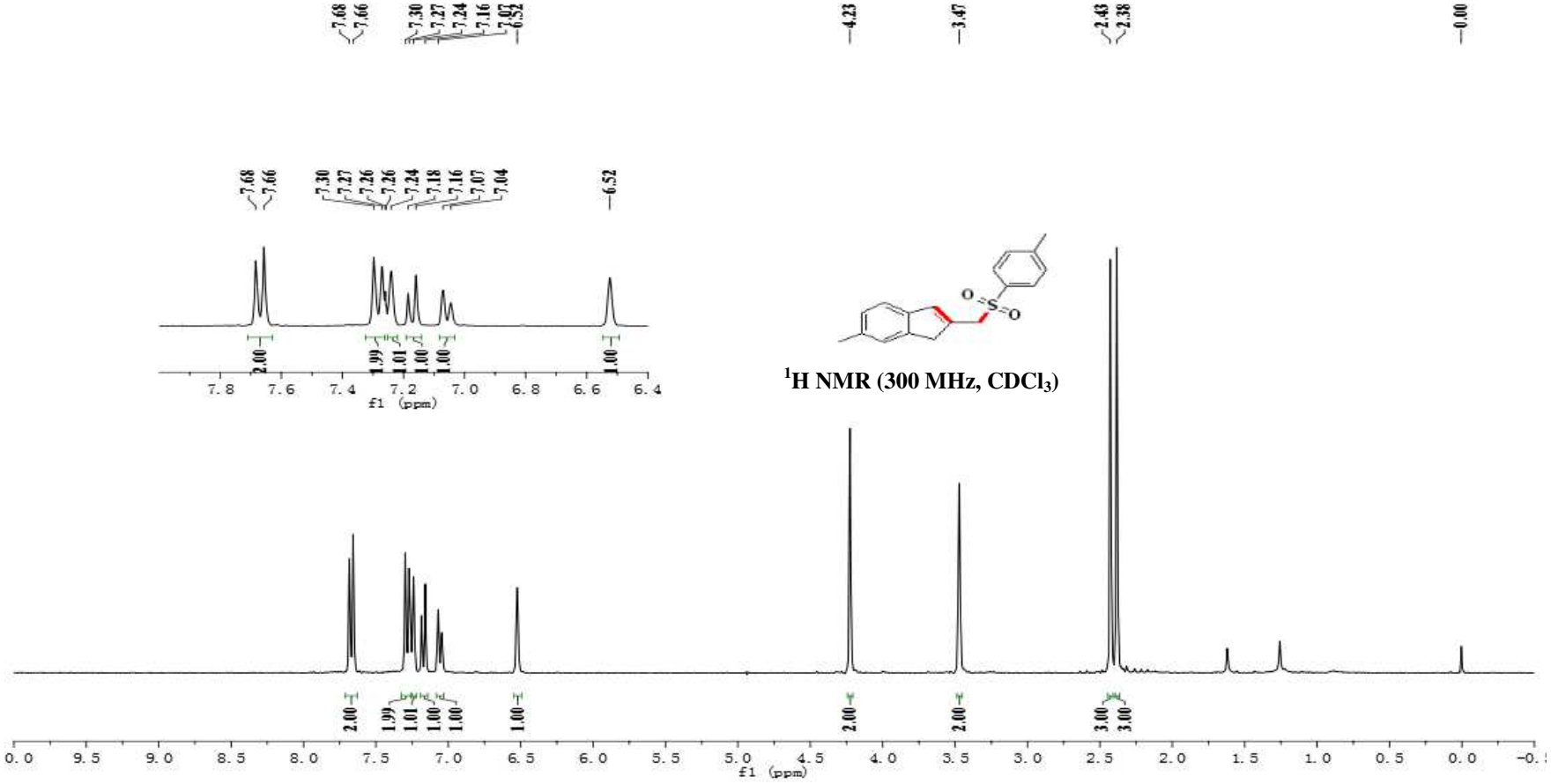
^{1}H NMR (300 MHz, $CDCl_3$)

5-Chloro-2-(tosylmethyl)-1*H*-indene (3g)



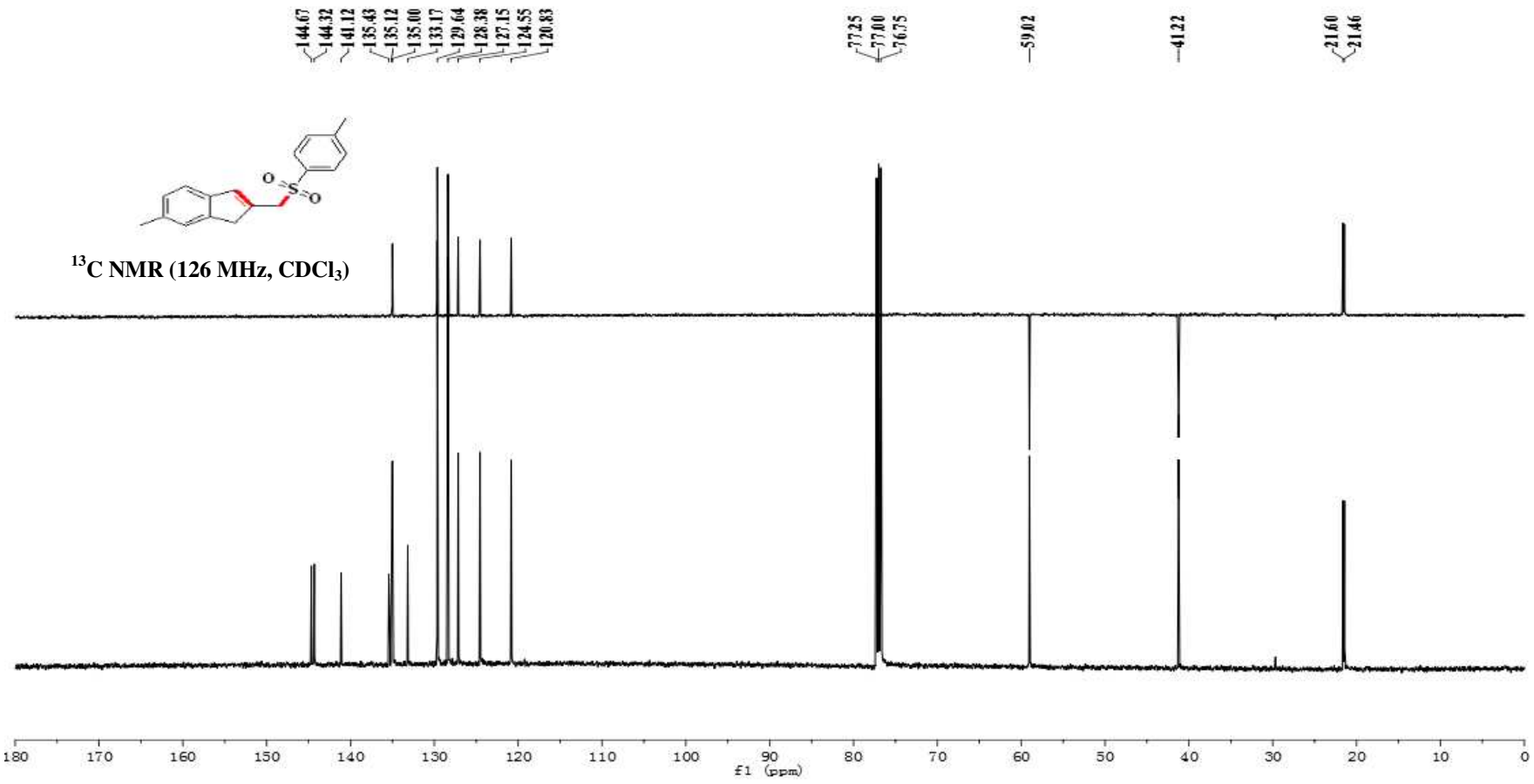
^{13}C NMR (126 MHz, $CDCl_3$)

6-Methyl-2-(tosylmethyl)-1*H*-indene (3h)



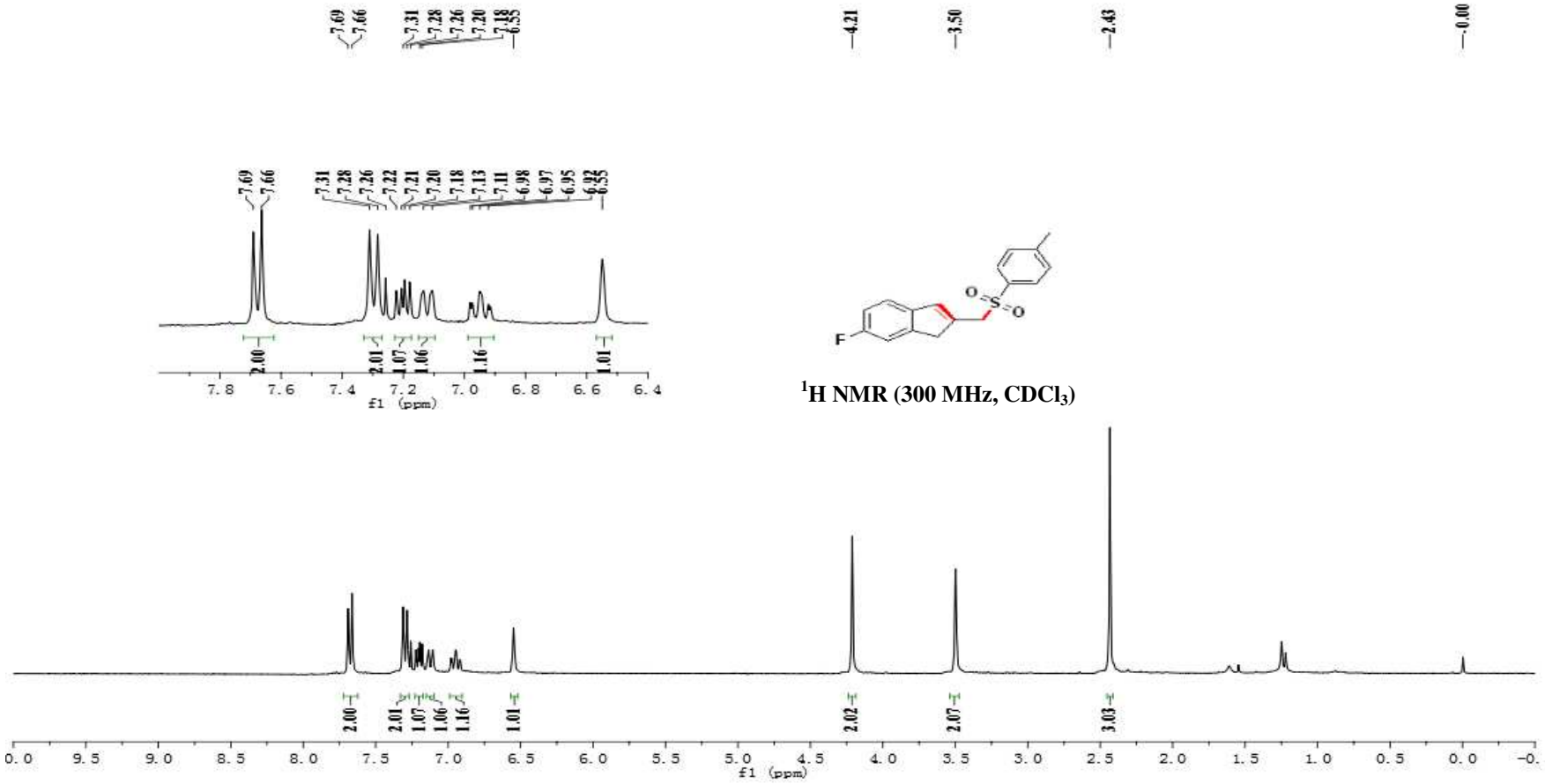
^{1}H NMR (300 MHz, $CDCl_3$)

6-Methyl-2-(tosylmethyl)-1*H*-indene (3h)



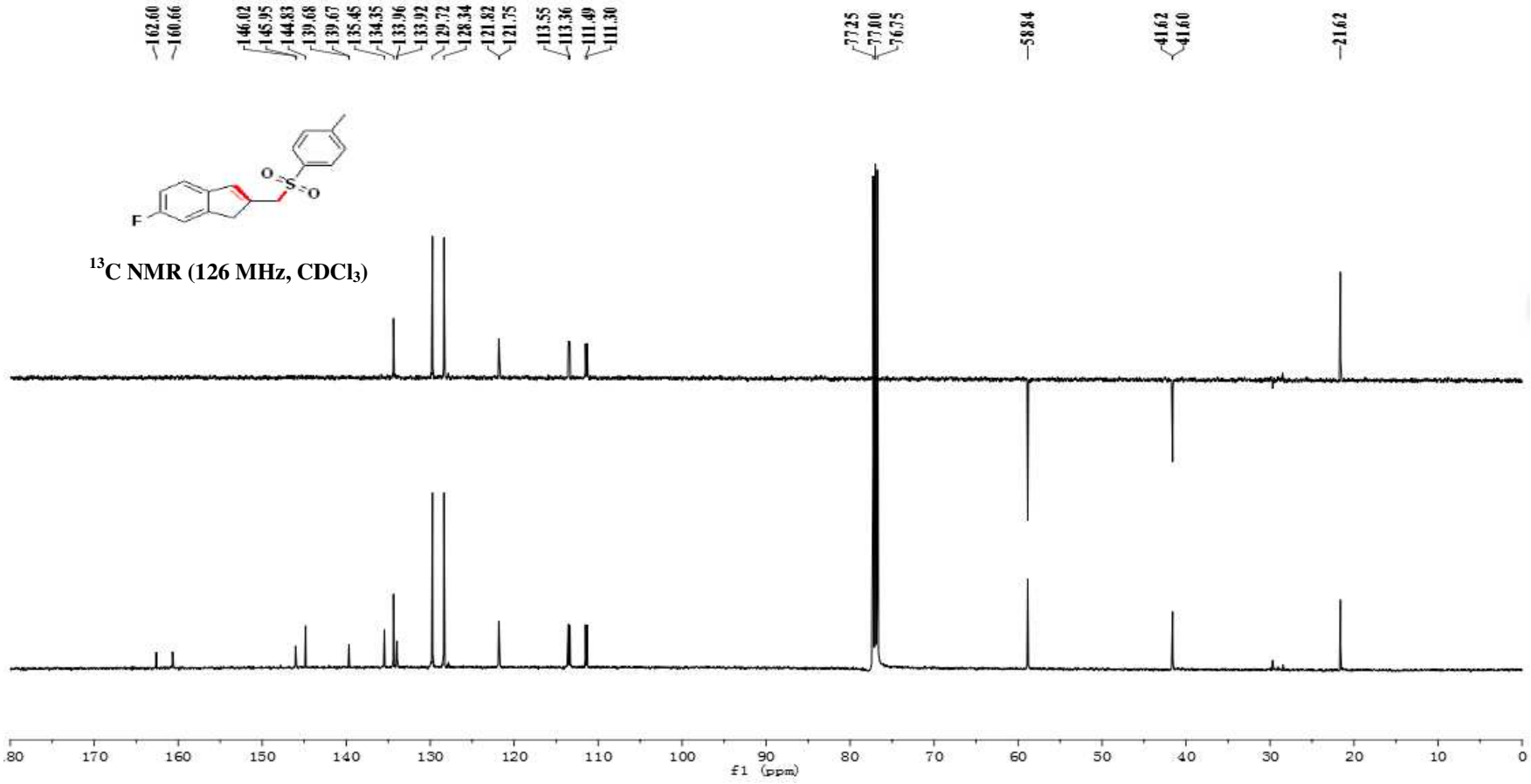
^{13}C NMR (126 MHz, $CDCl_3$)

6-Fluoro-2-(tosylmethyl)-1*H*-indene (3i)



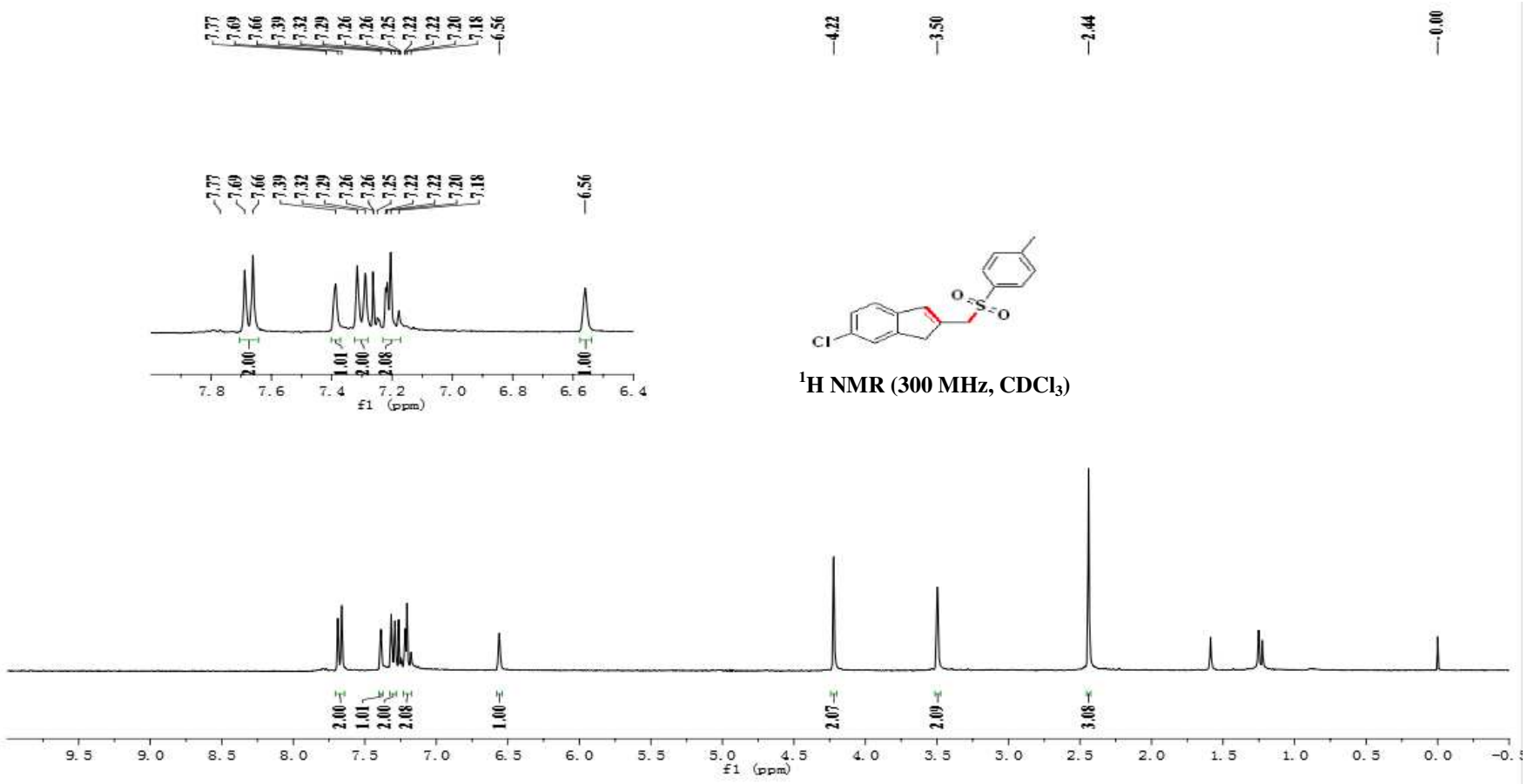
^{1}H NMR (300 MHz, $CDCl_3$)

6-Fluoro-2-(tosylmethyl)-1*H*-indene (3i)



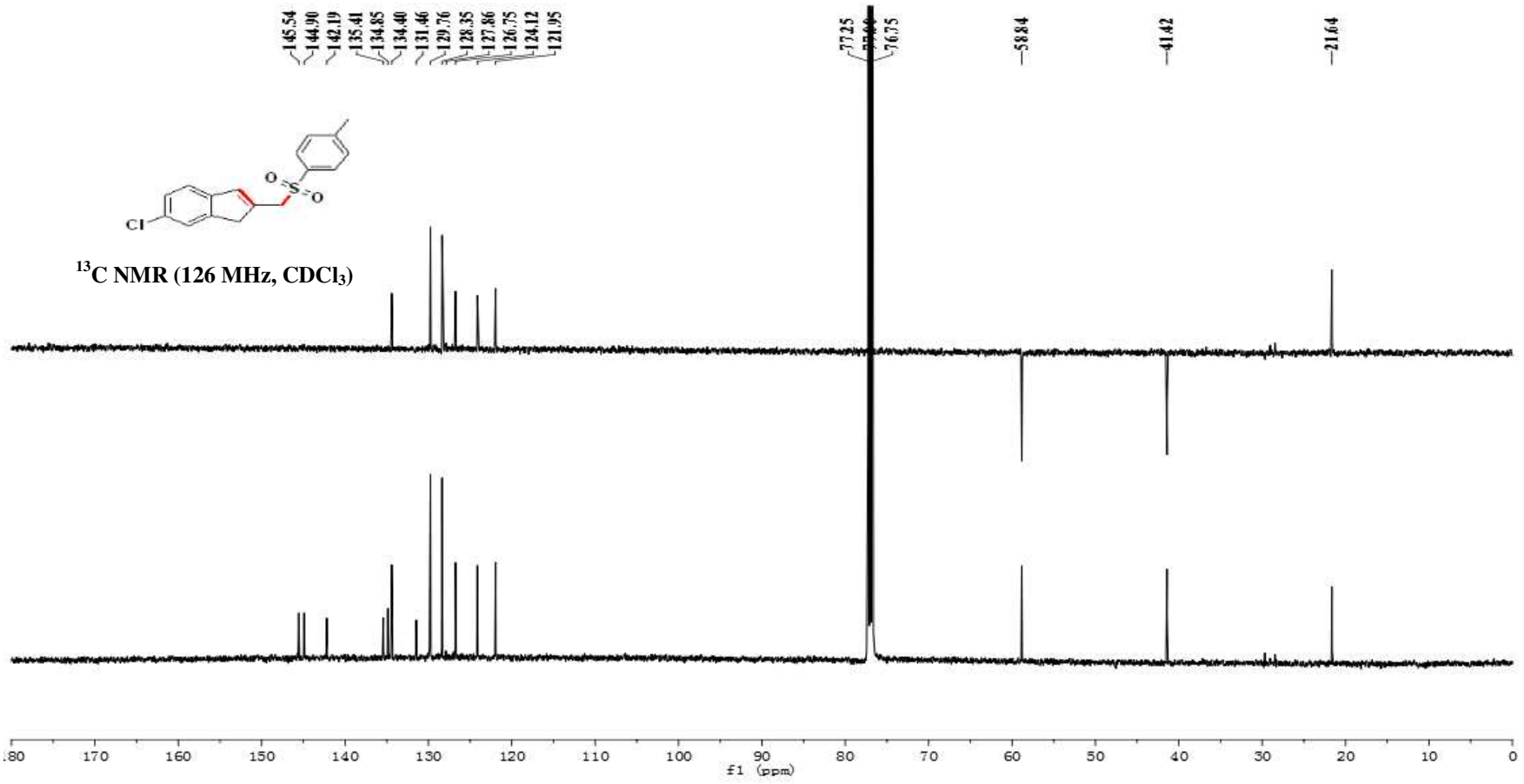
^{13}C NMR (126 MHz, $CDCl_3$)

6-Chloro-2-(tosylmethyl)-1*H*-indene (3j)



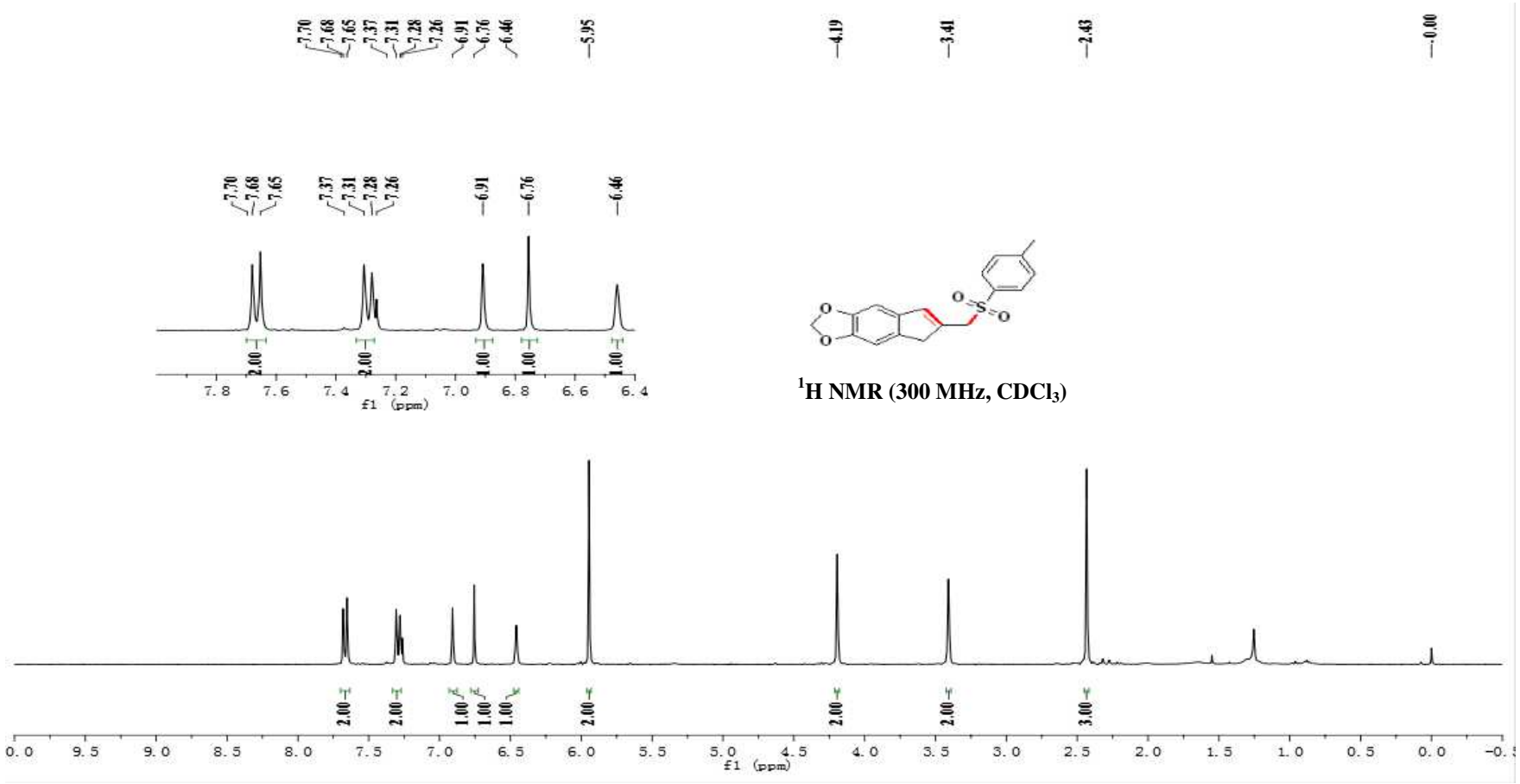
^{1}H NMR (300 MHz, $CDCl_3$)

6-Chloro-2-(tosylmethyl)-1*H*-indene (3j)



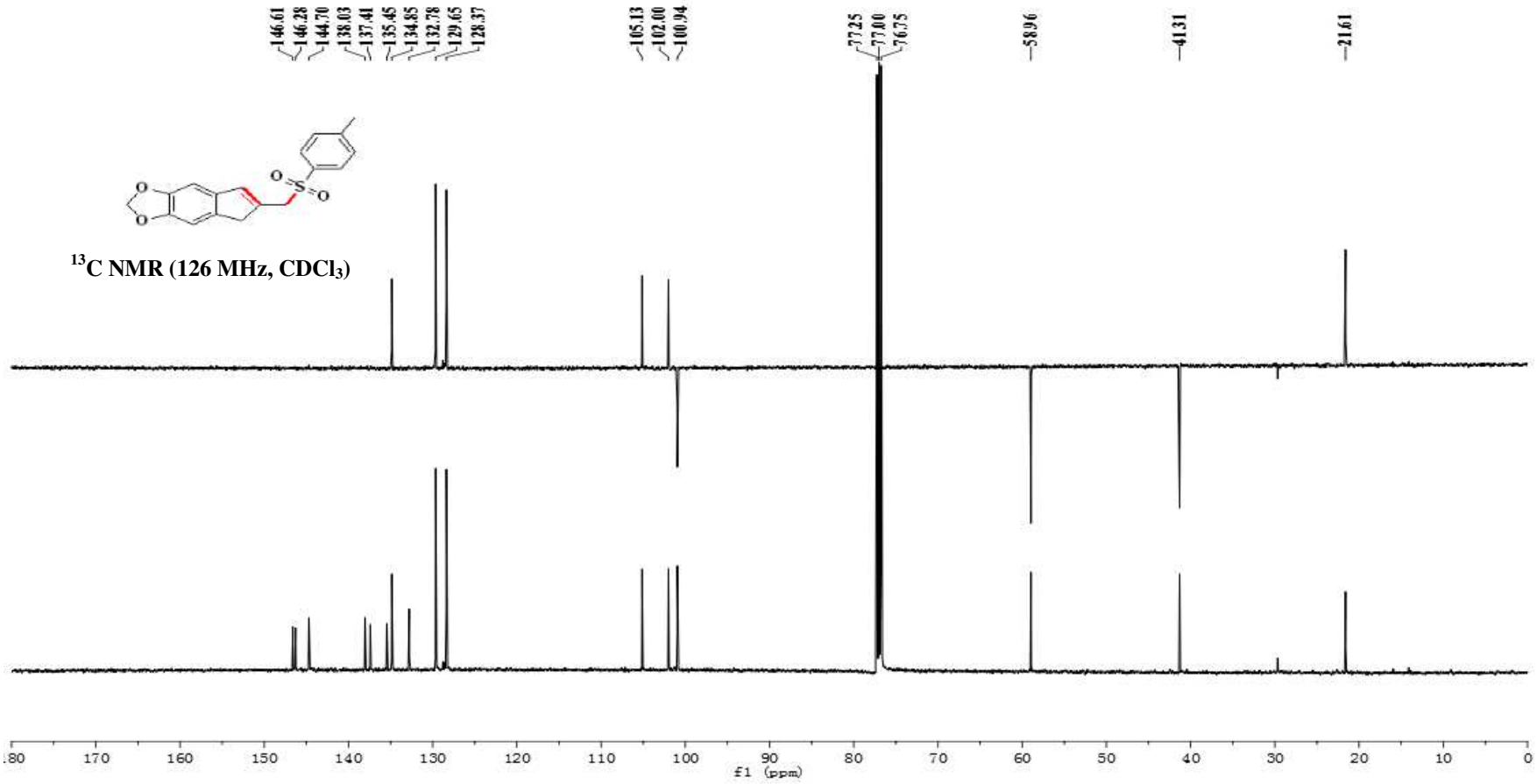
^{13}C NMR (126 MHz, $CDCl_3$)

6-(Tosylmethyl)-5*H*-indeno[5,6-*d*][1,3]dioxole (3k)



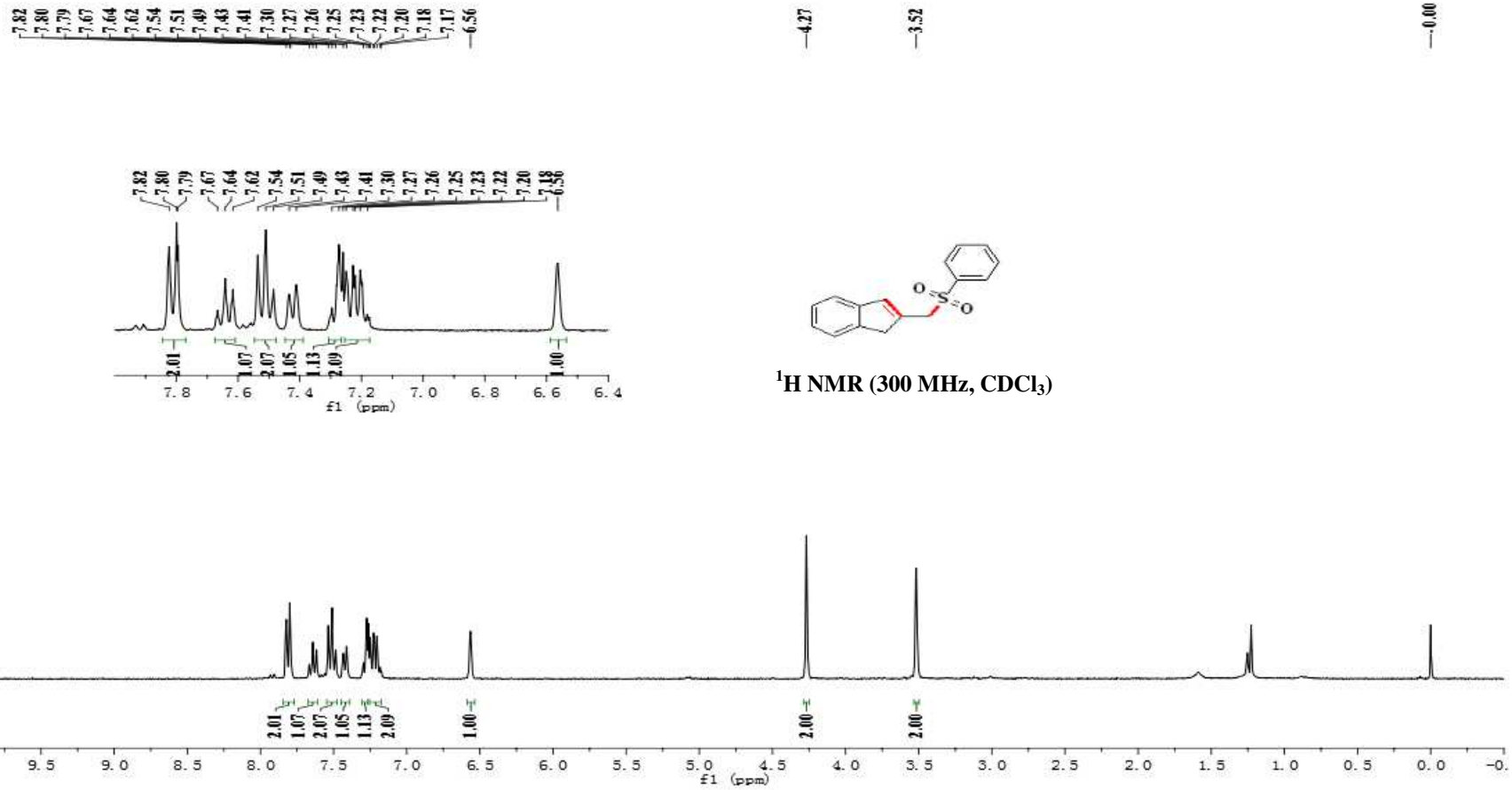
^{1}H NMR (300 MHz, $CDCl_3$)

6-(Tosylmethyl)-5*H*-indeno[5,6-*d*][1,3]dioxole (3k)



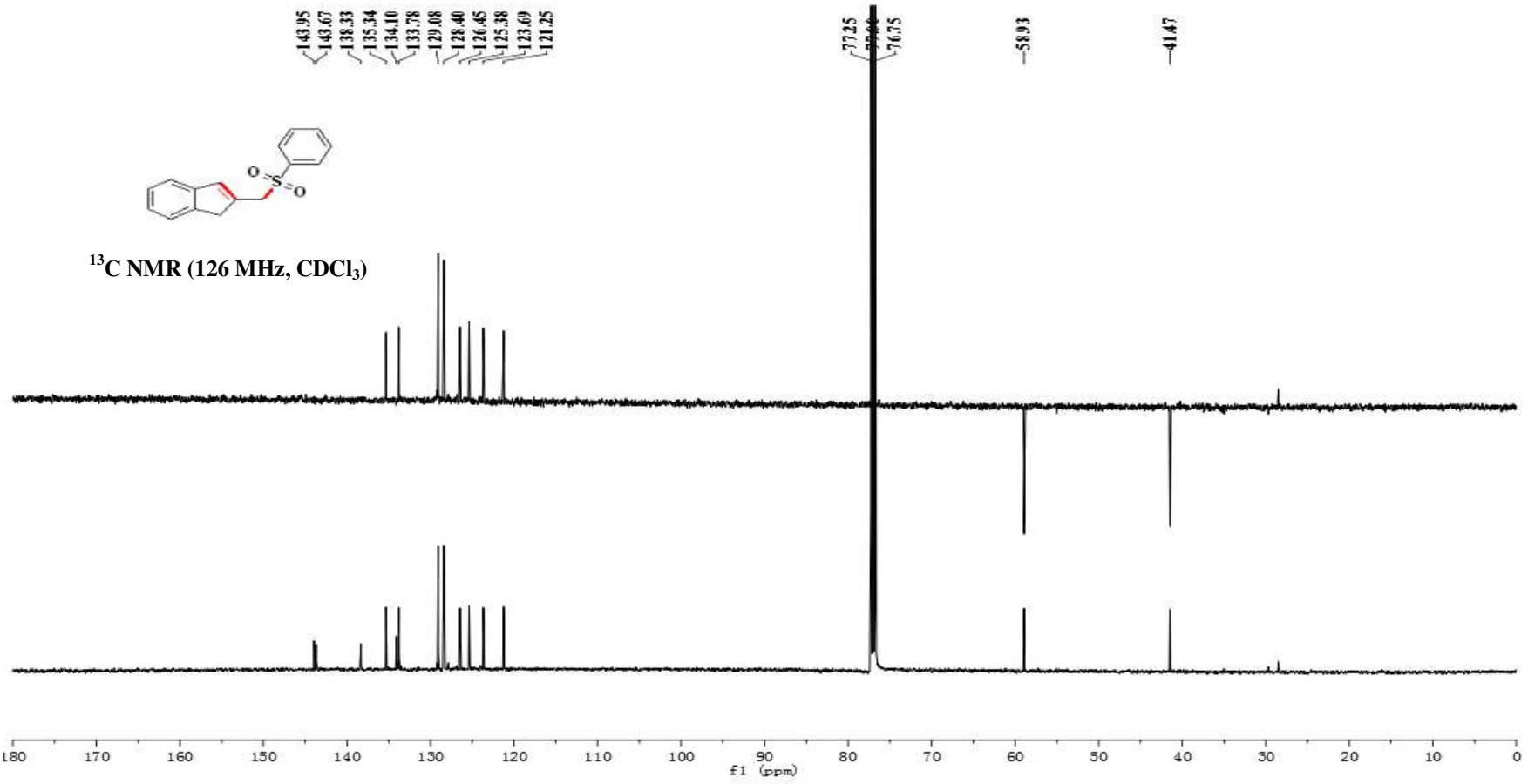
^{13}C NMR (126 MHz, $CDCl_3$)

2-((Phenylsulfonyl)methyl)-1*H*-indene (3l)



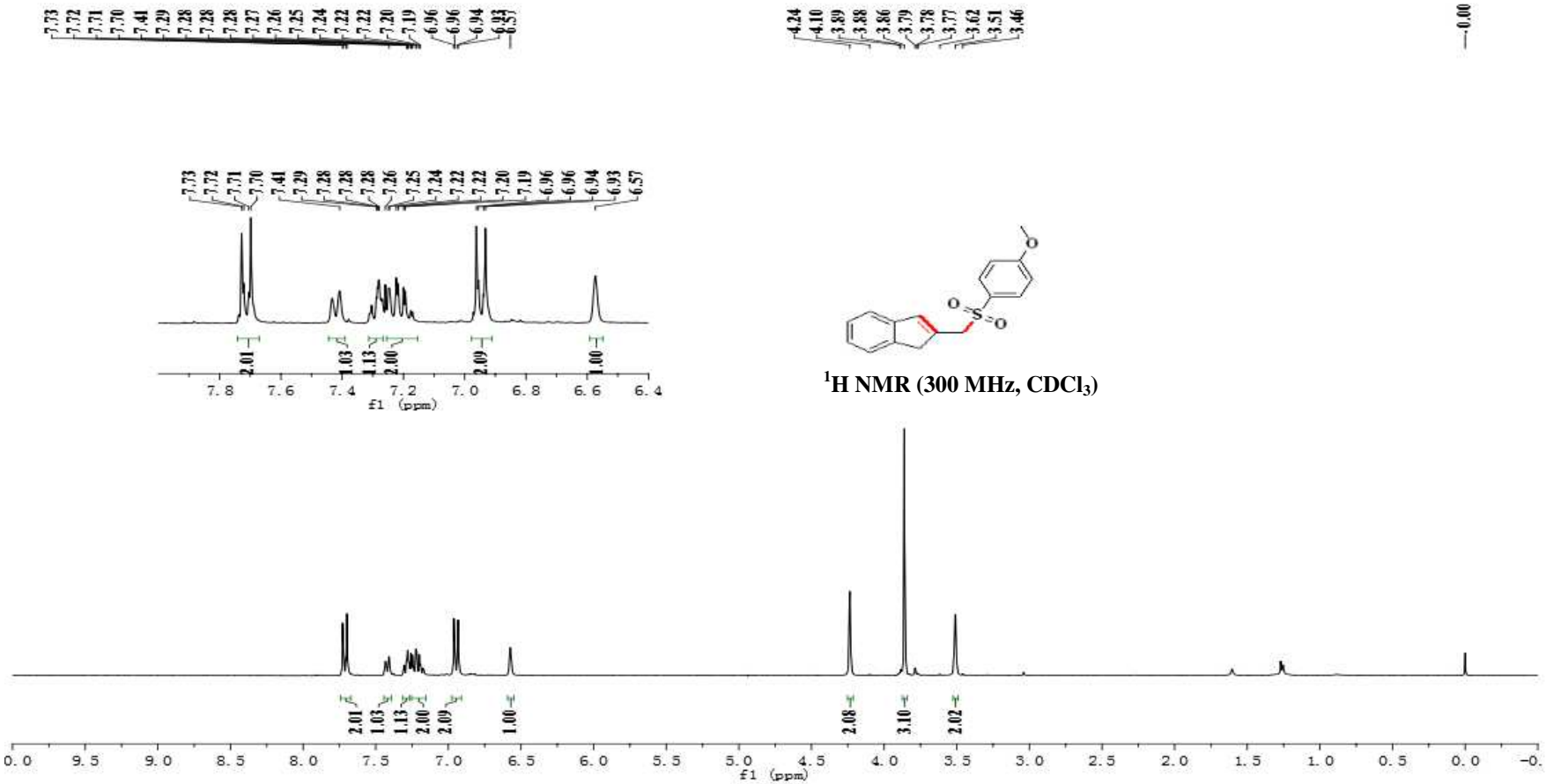
^{1}H NMR (300 MHz, $CDCl_3$)

2-((Phenylsulfonyl)methyl)-1*H*-indene (3l)



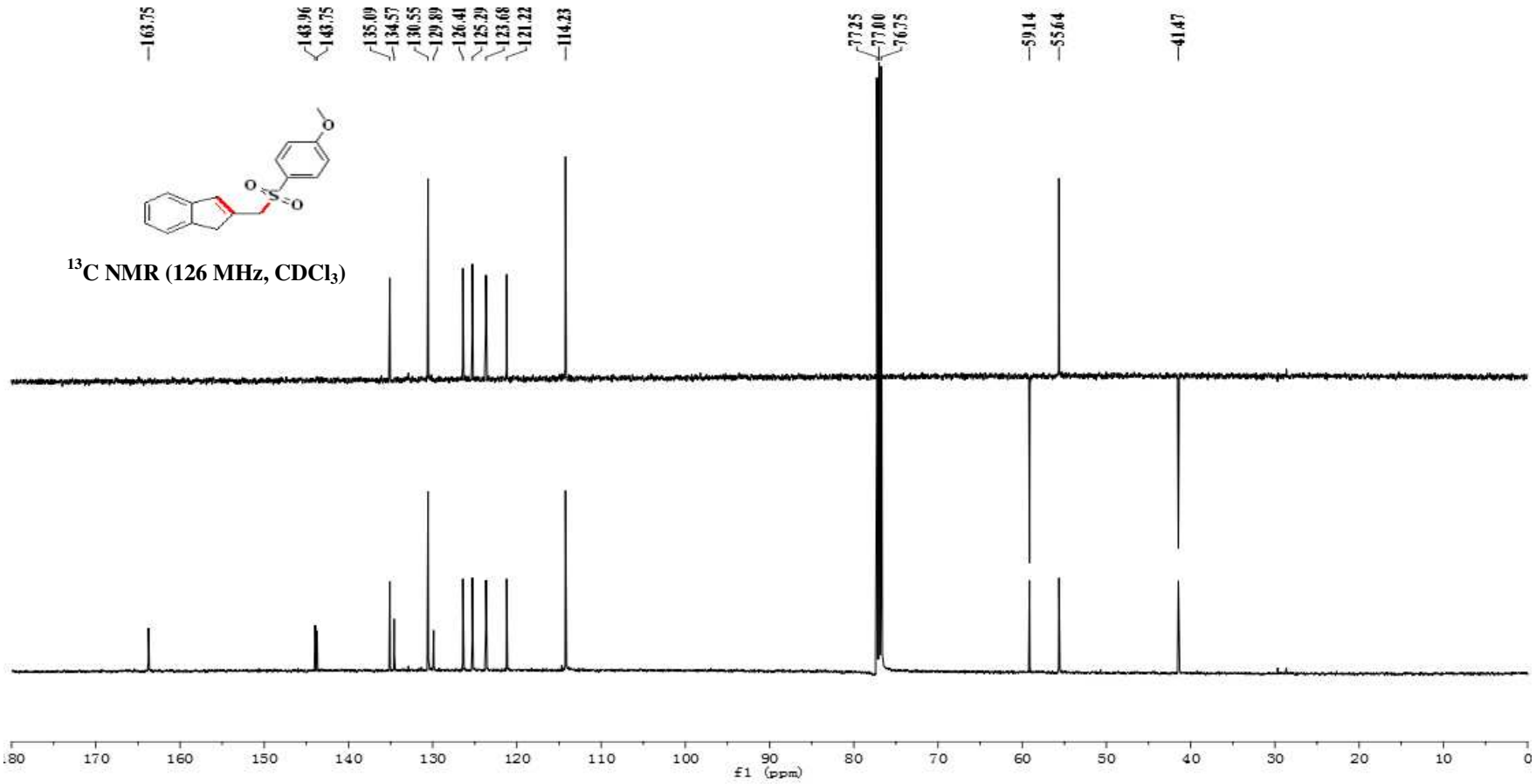
^{13}C NMR (126 MHz, $CDCl_3$)

2-(((4-Methoxyphenyl)sulfonyl)methyl)-1*H*-indene (3m)



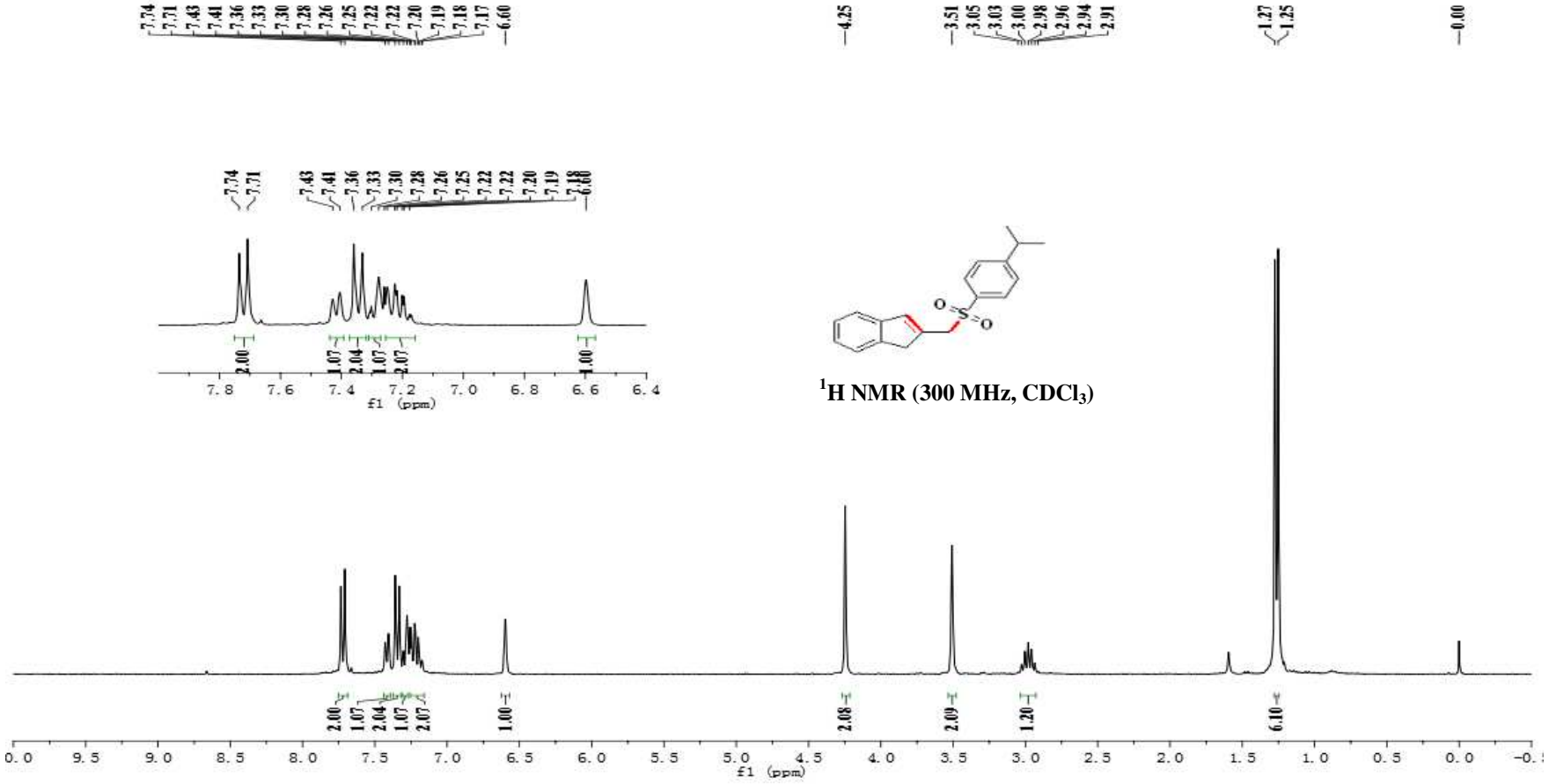
^{1}H NMR (300 MHz, $CDCl_3$)

2-(((4-Methoxyphenyl)sulfonyl)methyl)-1*H*-indene (3m)



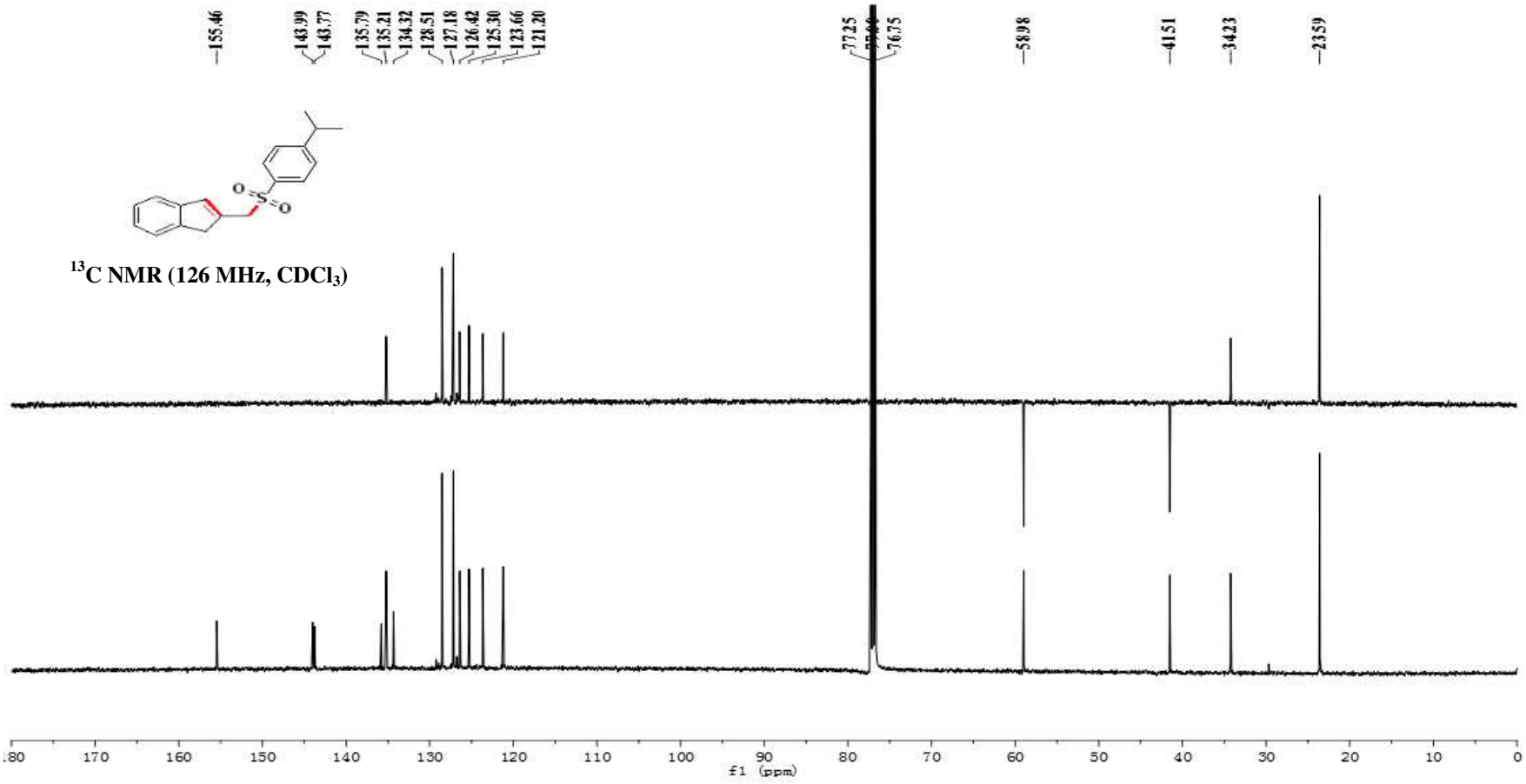
^{13}C NMR (126 MHz, $CDCl_3$)

2-(((4-Isopropylphenyl)sulfonyl)methyl)-1*H*-indene (3n)



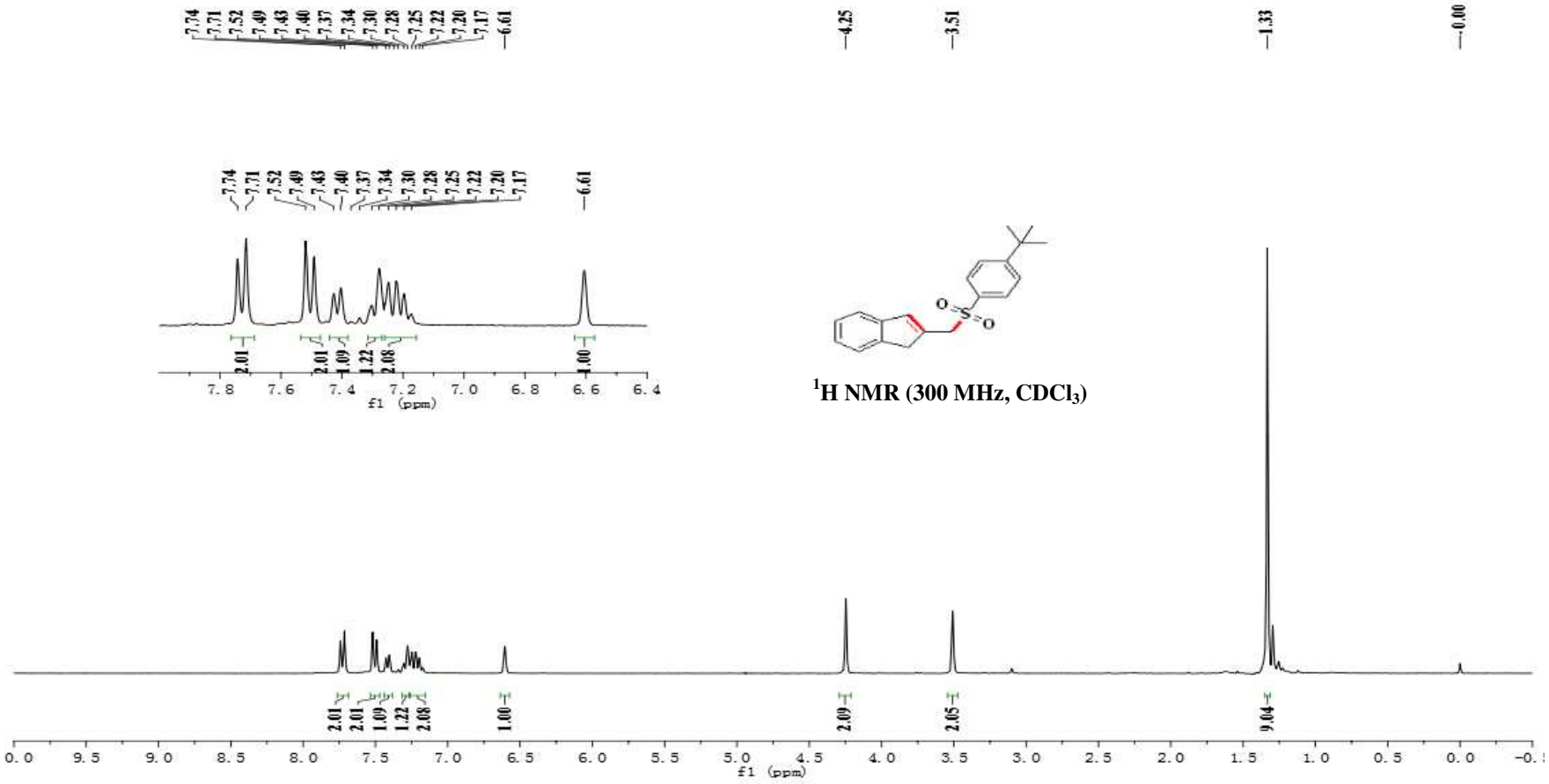
^{1}H NMR (300 MHz, $CDCl_3$)

2-(((4-Isopropylphenyl)sulfonyl)methyl)-1*H*-indene (3n)



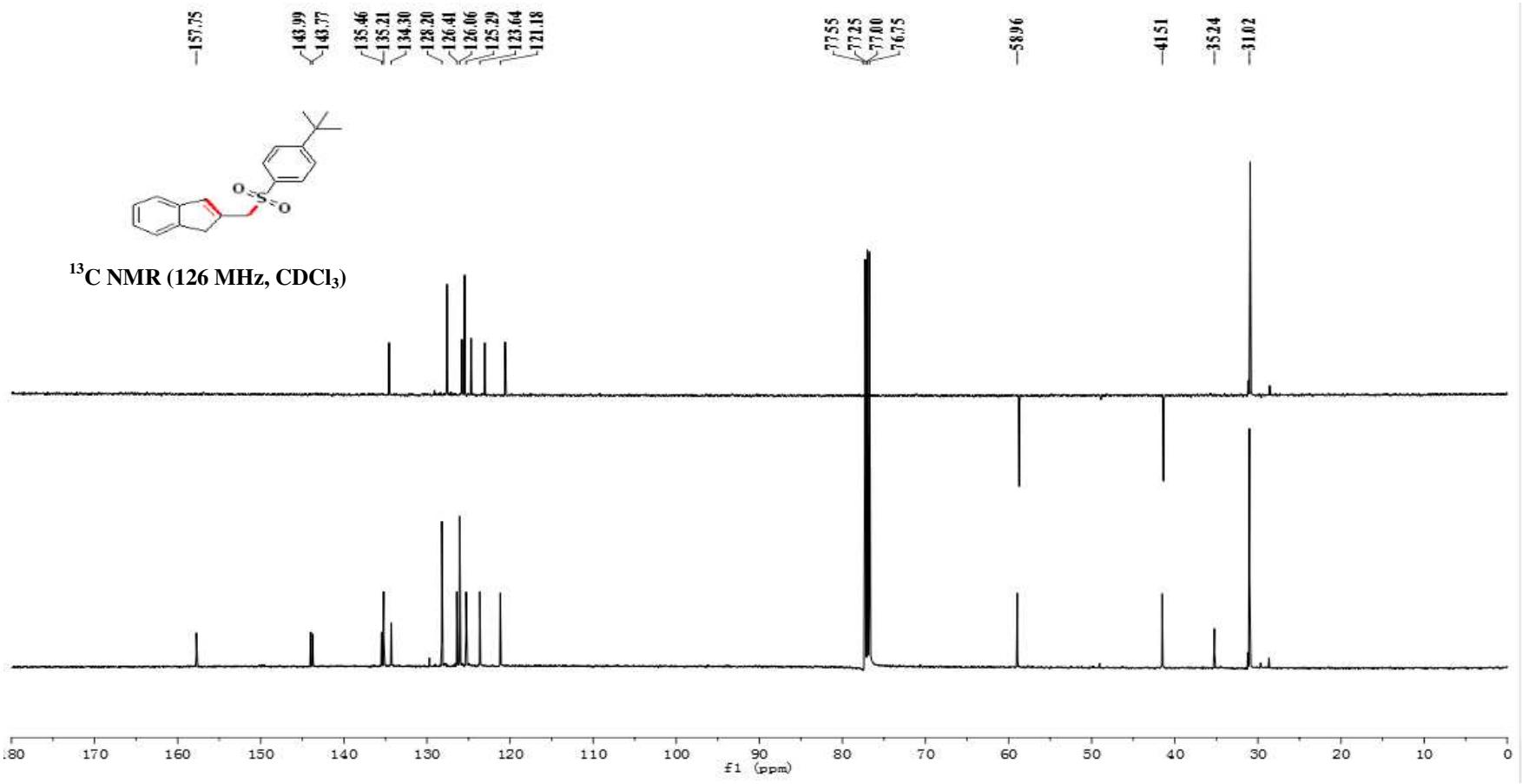
^{13}C NMR (126 MHz, $CDCl_3$)

2-(((4-(*tert*-Butyl)phenyl)sulfonyl)methyl)-1*H*-indene (3o)



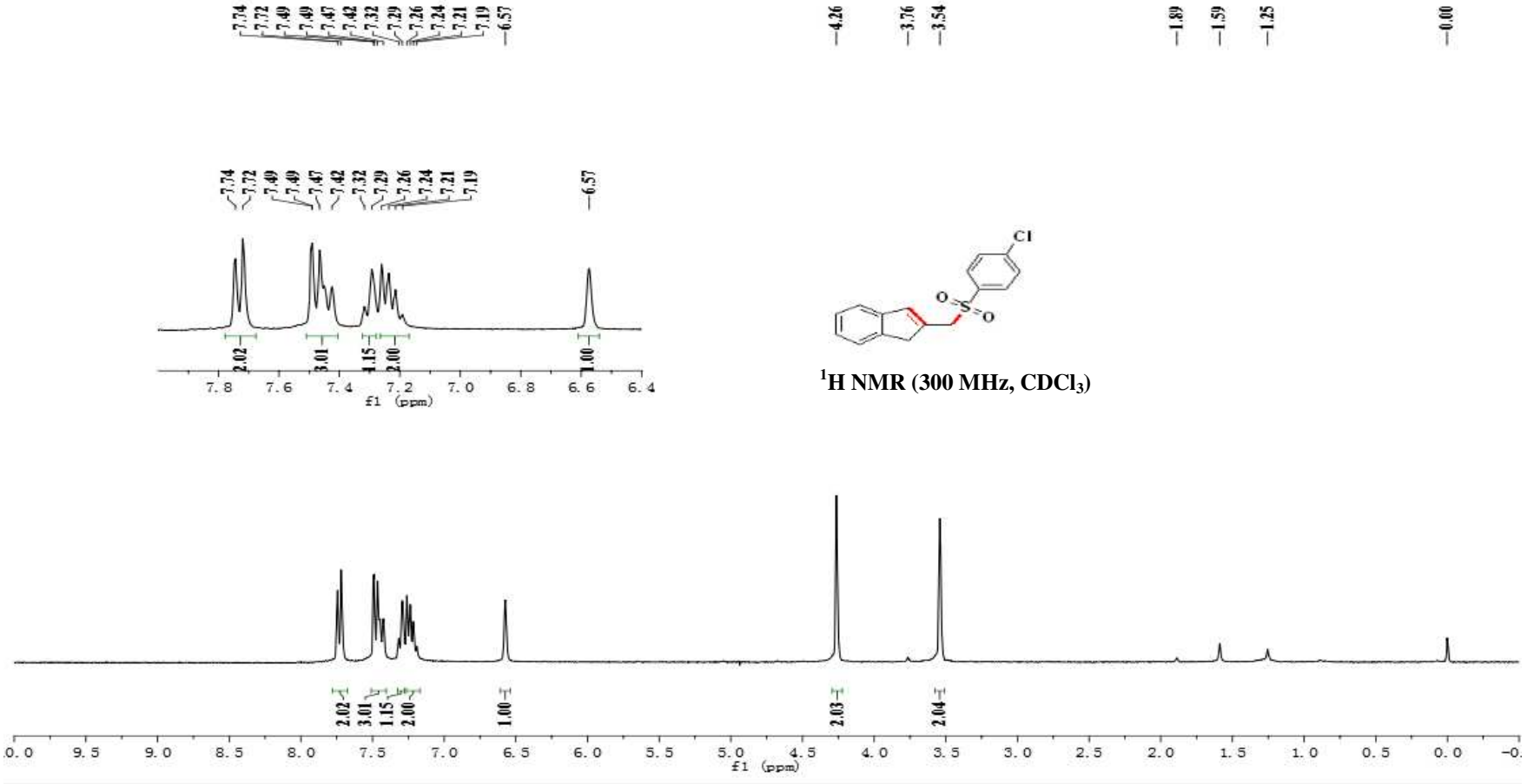
^{1}H NMR (300 MHz, $CDCl_3$)

2-(((4-(*tert*-Butyl)phenyl)sulfonyl)methyl)-1*H*-indene (3o)



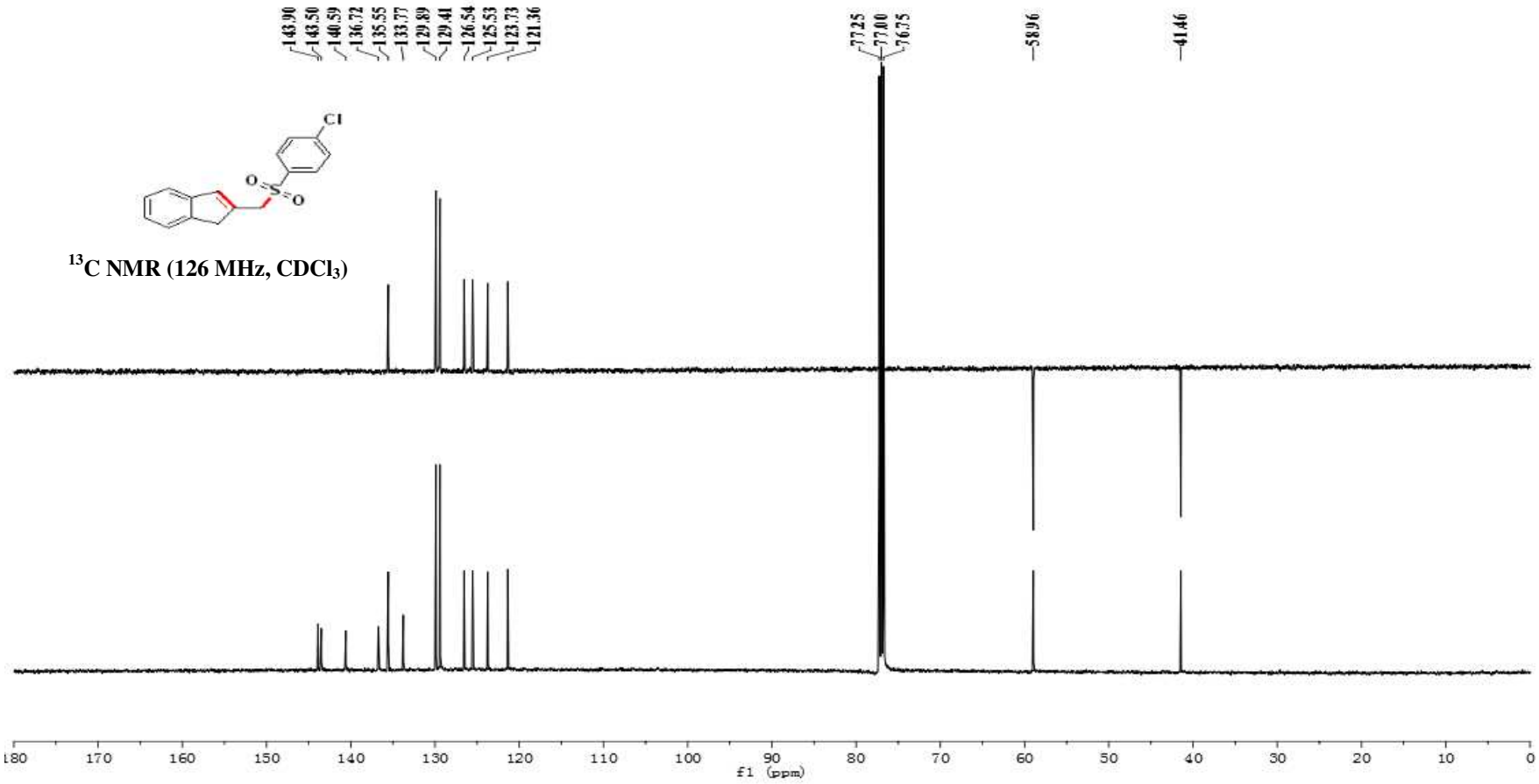
^{13}C NMR (126 MHz, $CDCl_3$)

2-(((4-Chlorophenyl)sulfonyl)methyl)-1*H*-indene (3p)



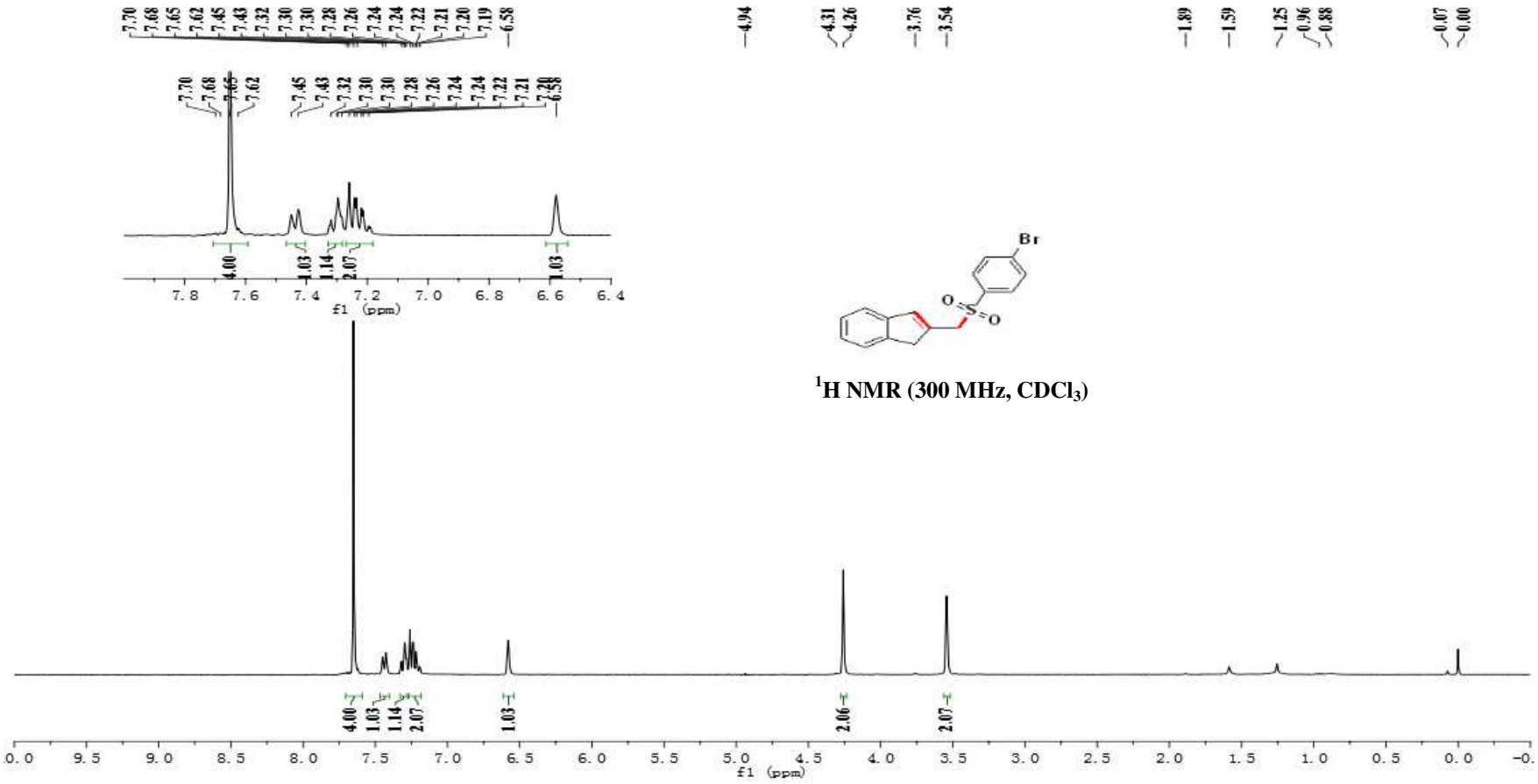
^{1}H NMR (300 MHz, $CDCl_3$)

2-(((4-Chlorophenyl)sulfonyl)methyl)-1*H*-indene (3p)



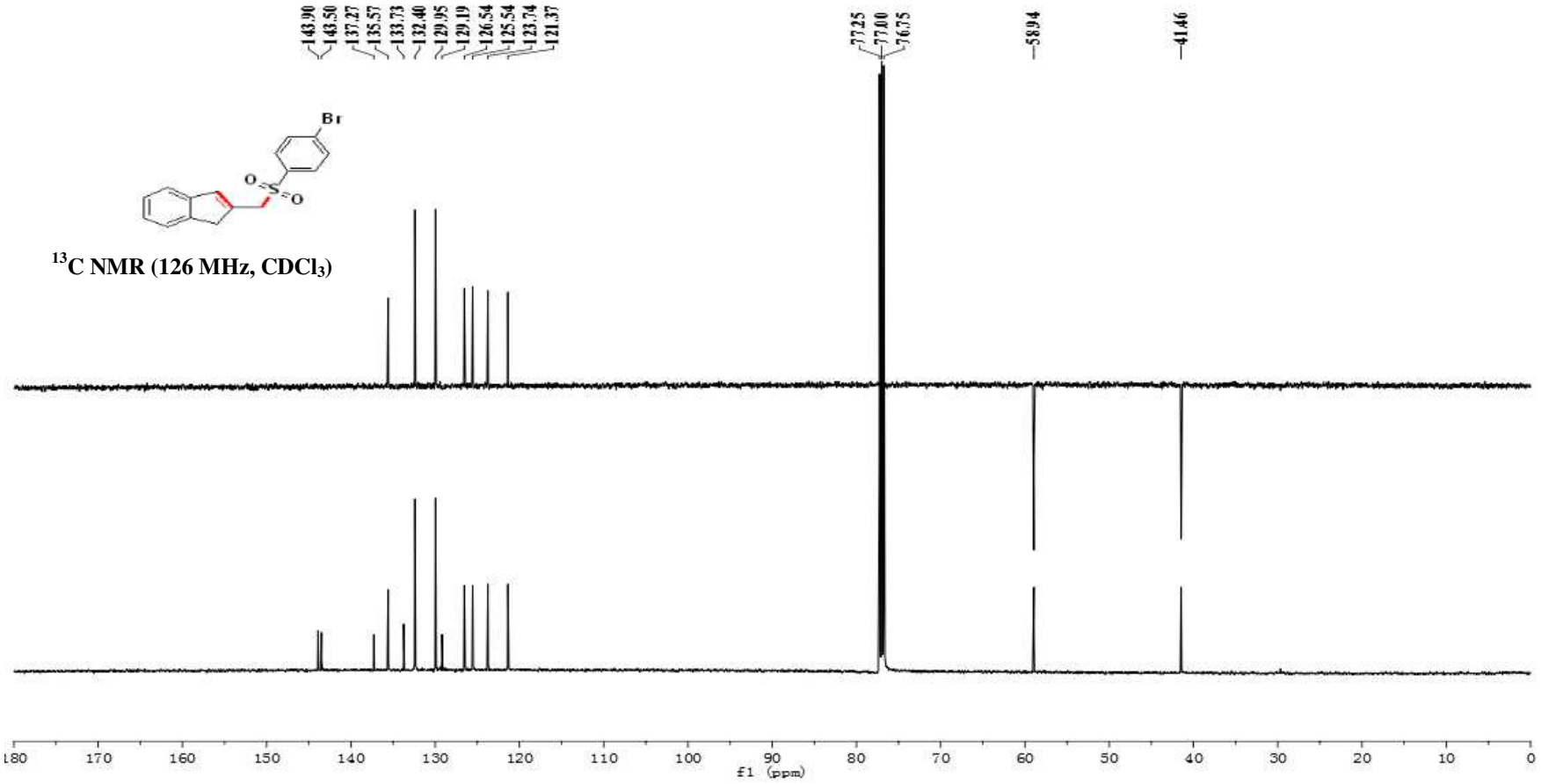
^{13}C NMR (126 MHz, $CDCl_3$)

2-(((4-Bromophenyl)sulfonyl)methyl)-1*H*-indene (3q)



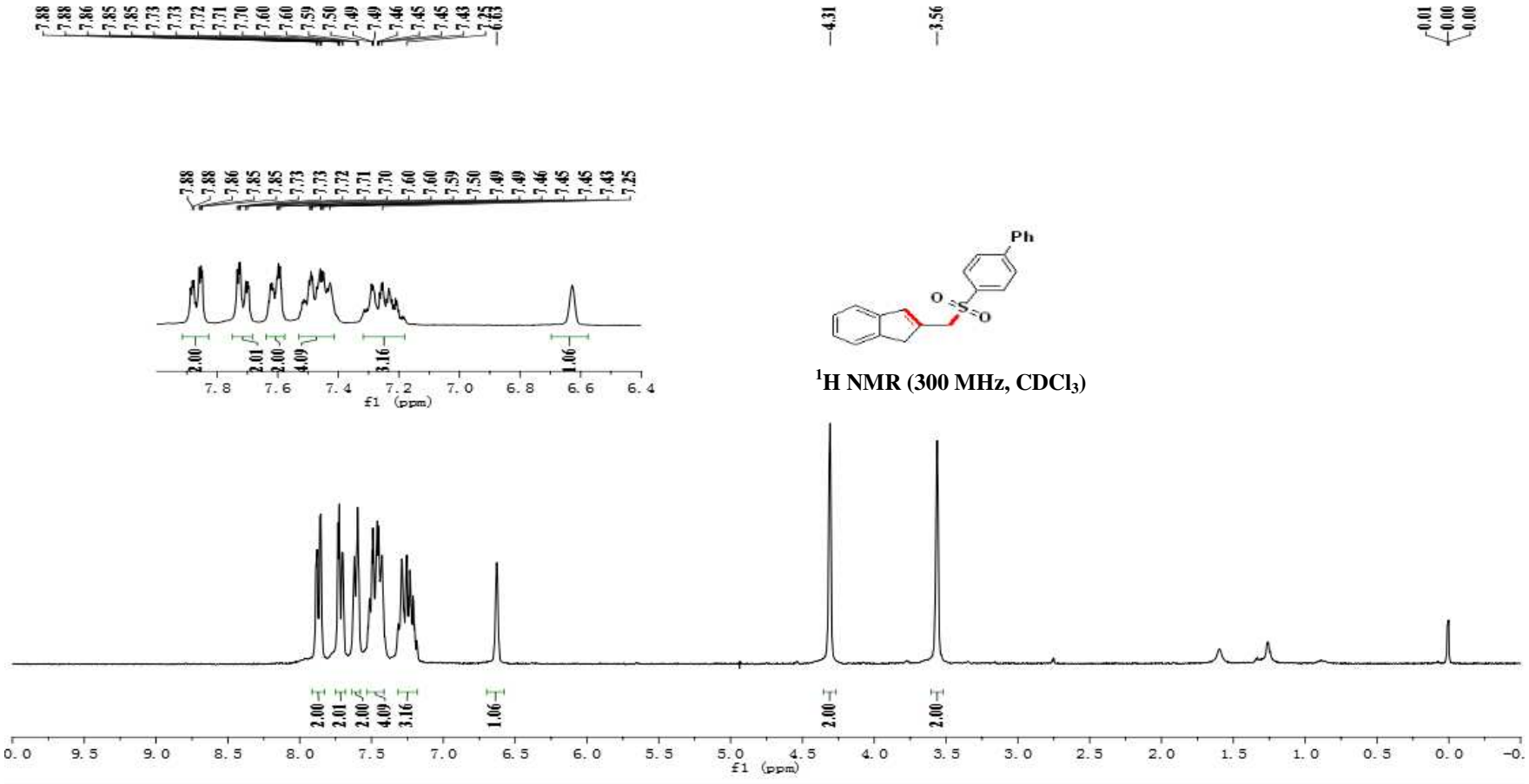
^{1}H NMR (300 MHz, $CDCl_3$)

2-(((4-Bromophenyl)sulfonyl)methyl)-1*H*-indene (3q)



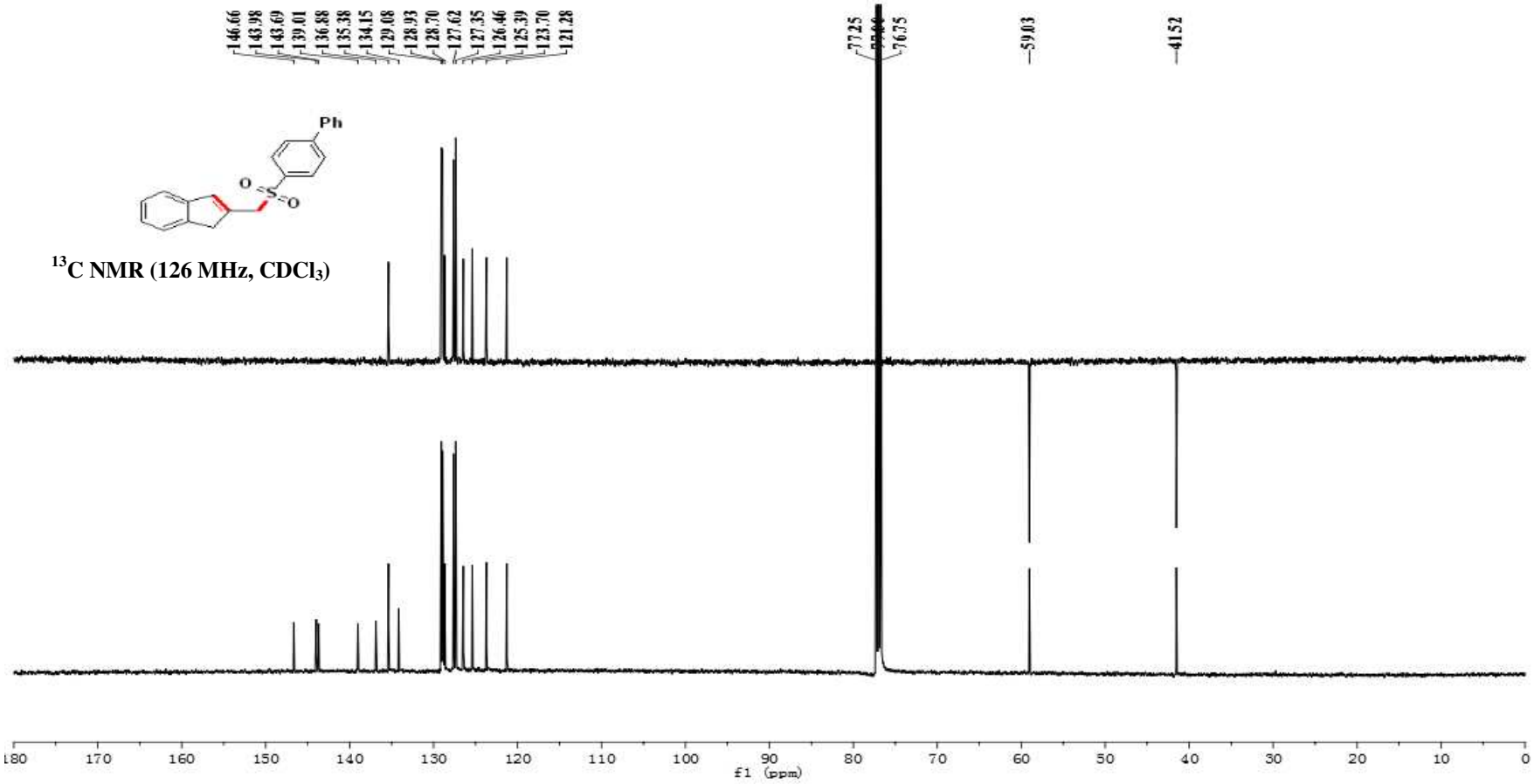
^{13}C NMR (126 MHz, $CDCl_3$)

2-(([1,1'-biphenyl]-4-ylsulfonyl)methyl)-1*H*-indene (3r)



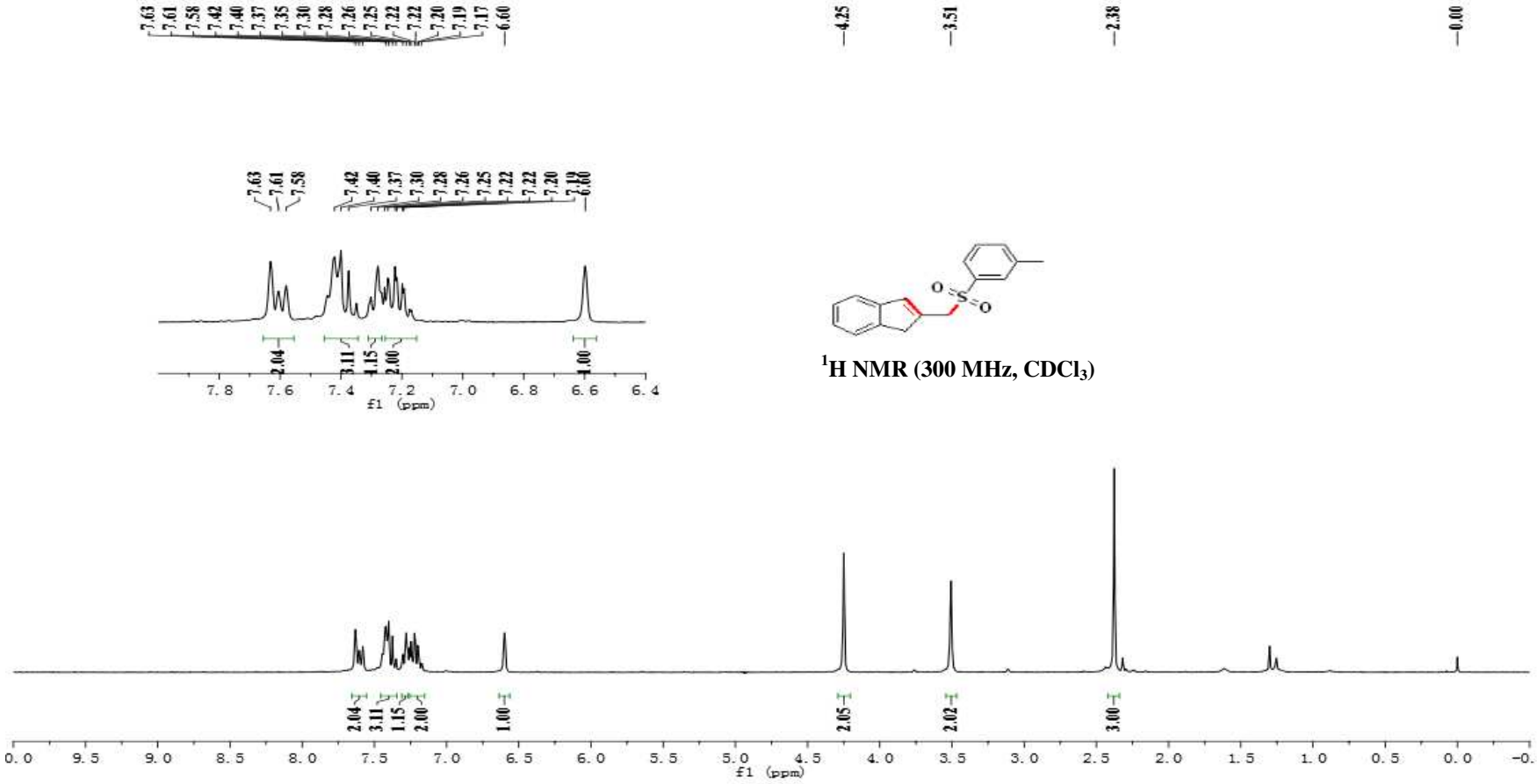
^{1}H NMR (300 MHz, $CDCl_3$)

2-(([1,1'-biphenyl]-4-ylsulfonyl)methyl)-1*H*-indene (3r)



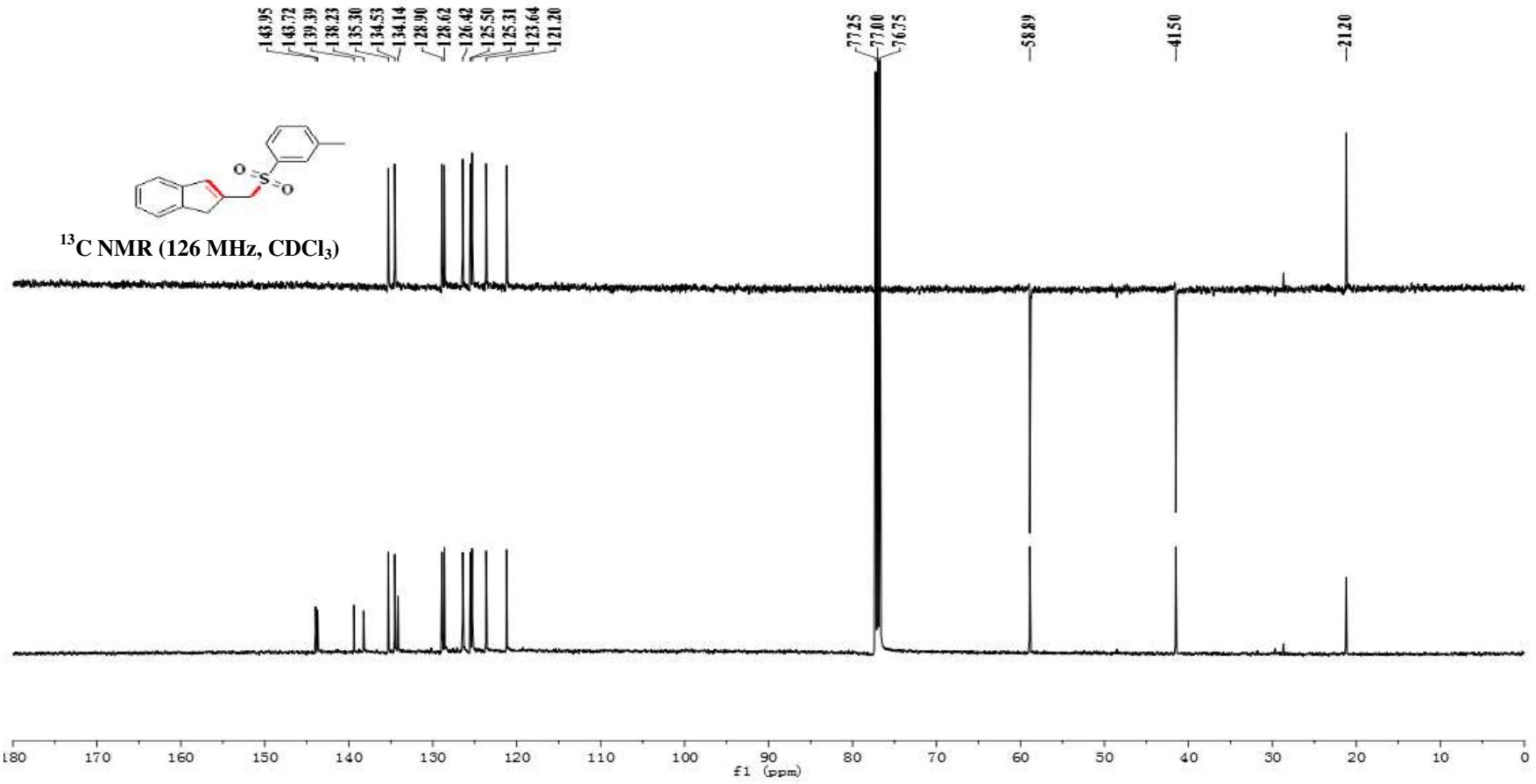
^{13}C NMR (126 MHz, $CDCl_3$)

2-((*m*-Tolylsulfonyl)methyl)-1*H*-indene (3s)



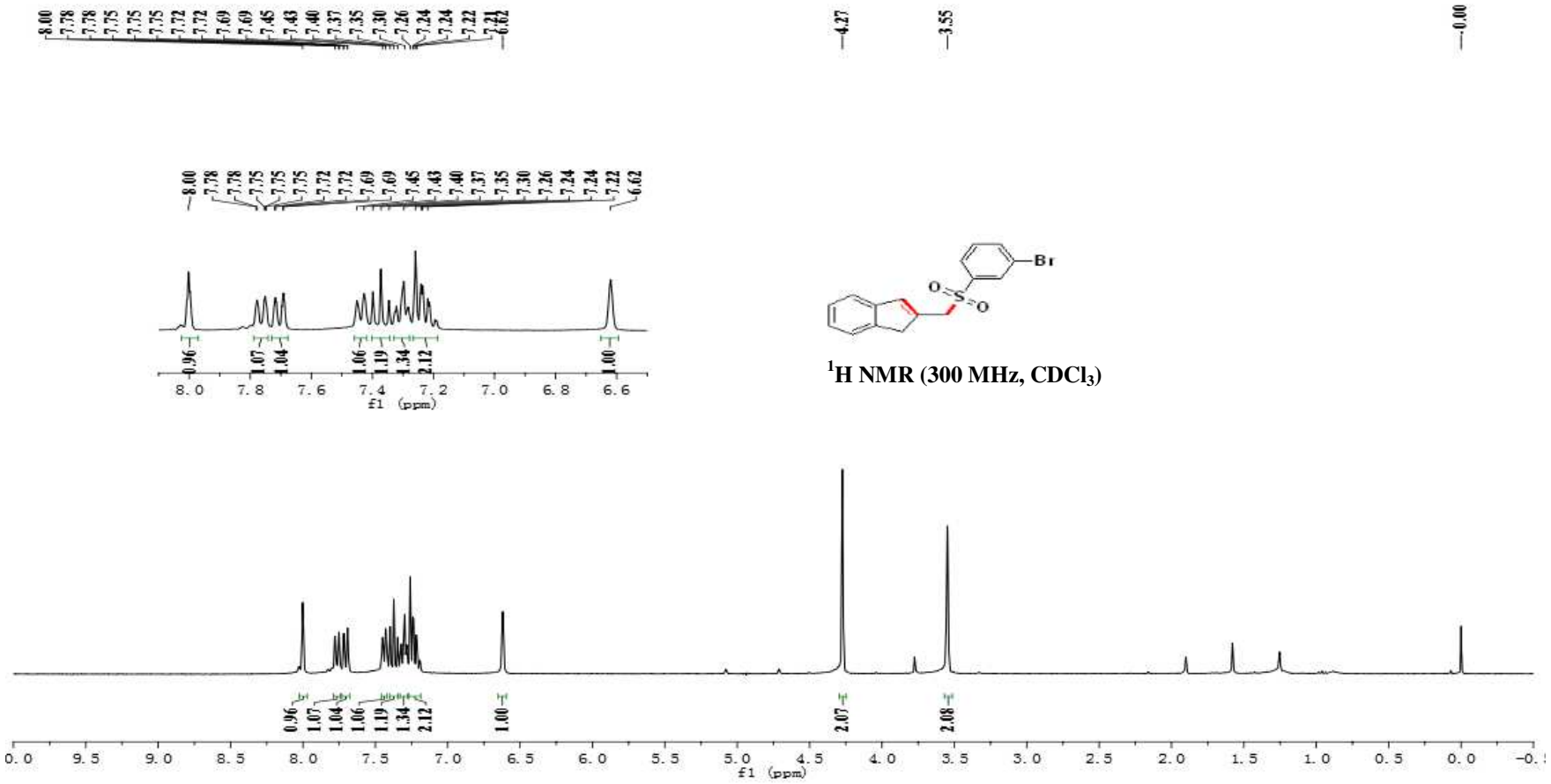
^{1}H NMR (300 MHz, $CDCl_3$)

2-((*m*-Tolylsulfonyl)methyl)-1*H*-indene (3s)

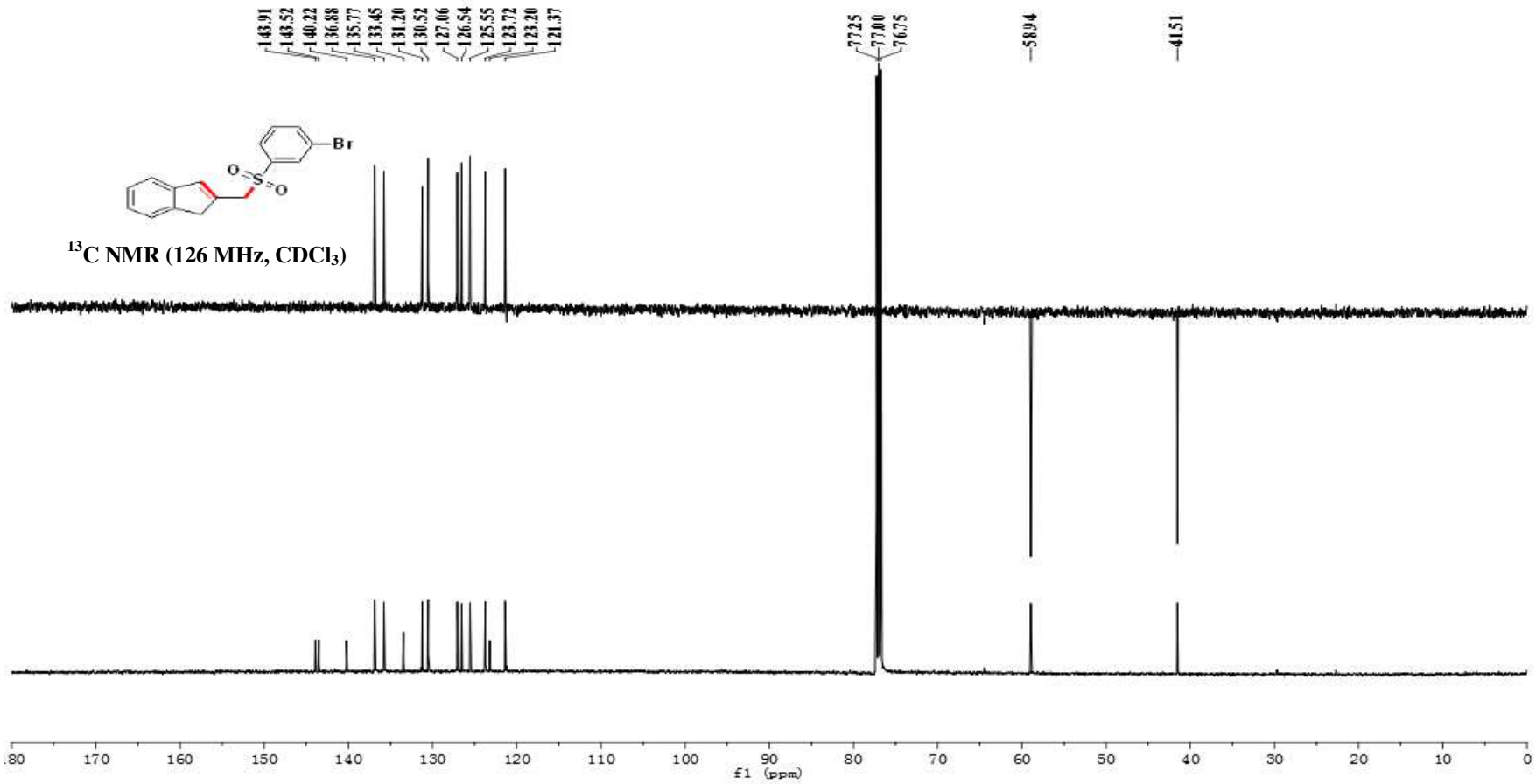


^{13}C NMR (126 MHz, $CDCl_3$)

2-(((3-Bromophenyl)sulfonyl)methyl)-1*H*-indene (3t)

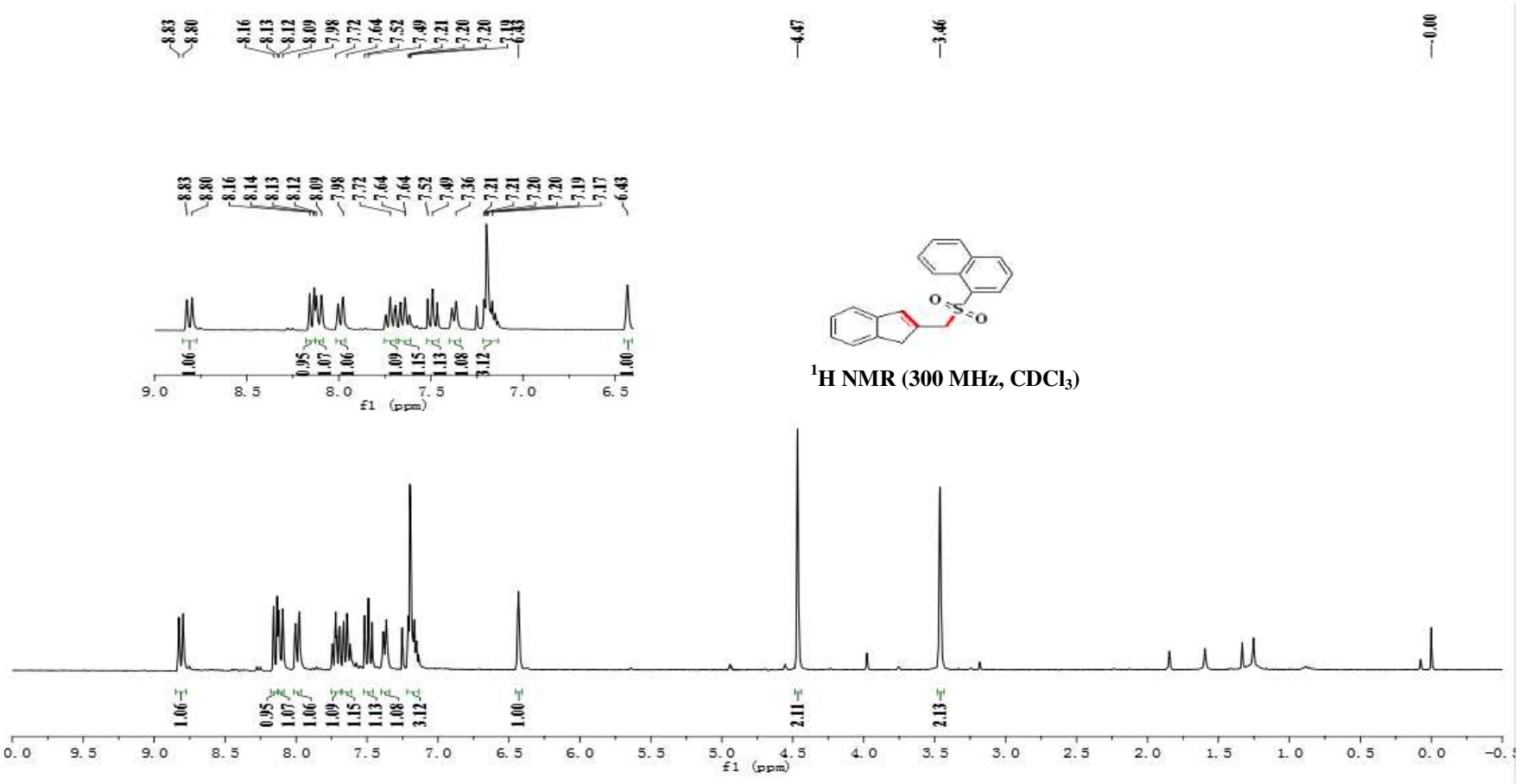


2-(((3-Bromophenyl)sulfonyl)methyl)-1*H*-indene (3t)



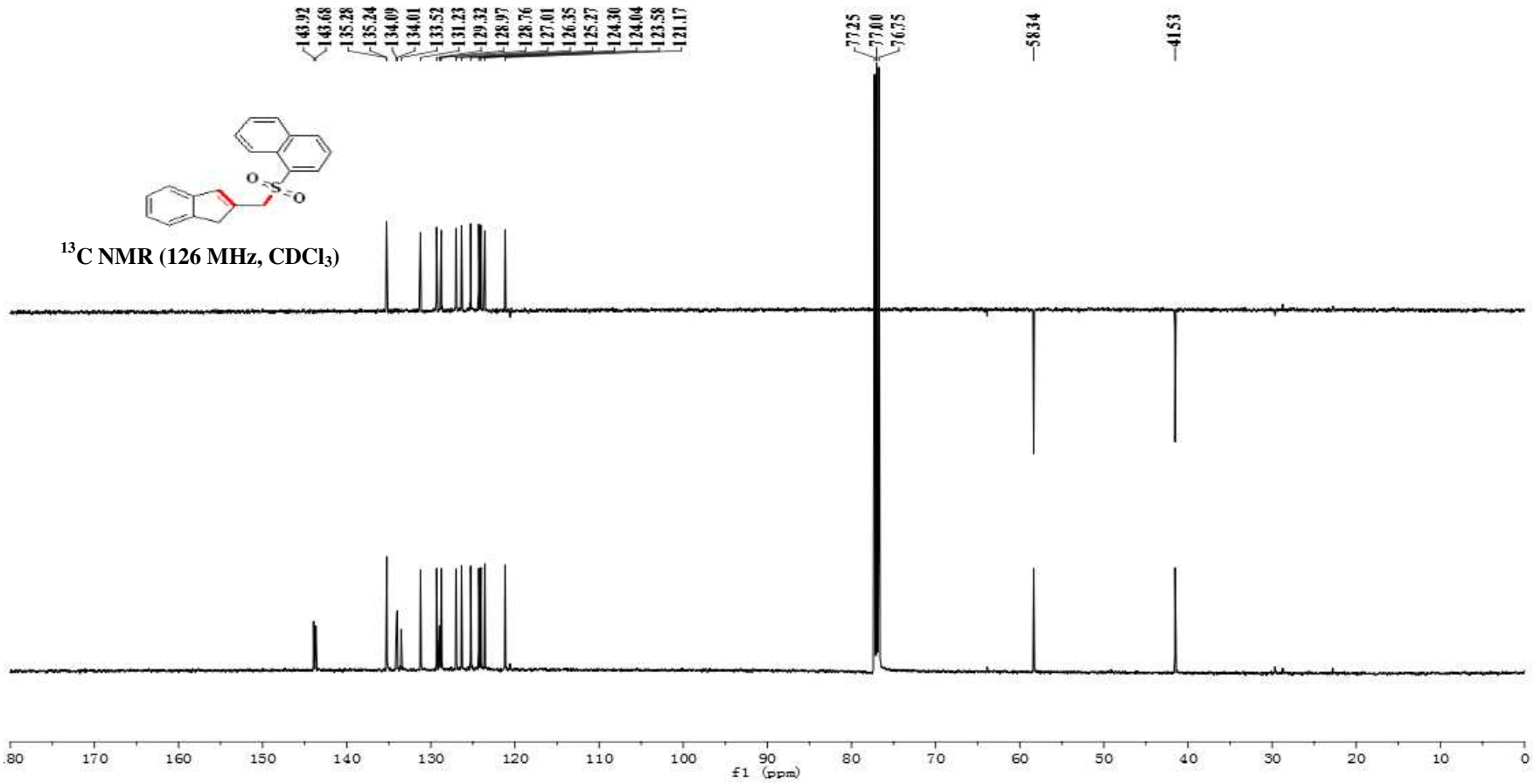
^{13}C NMR (126 MHz, $CDCl_3$)

1-(((1*H*-Inden-2-yl)methyl)sulfonyl)naphthalene (3u)



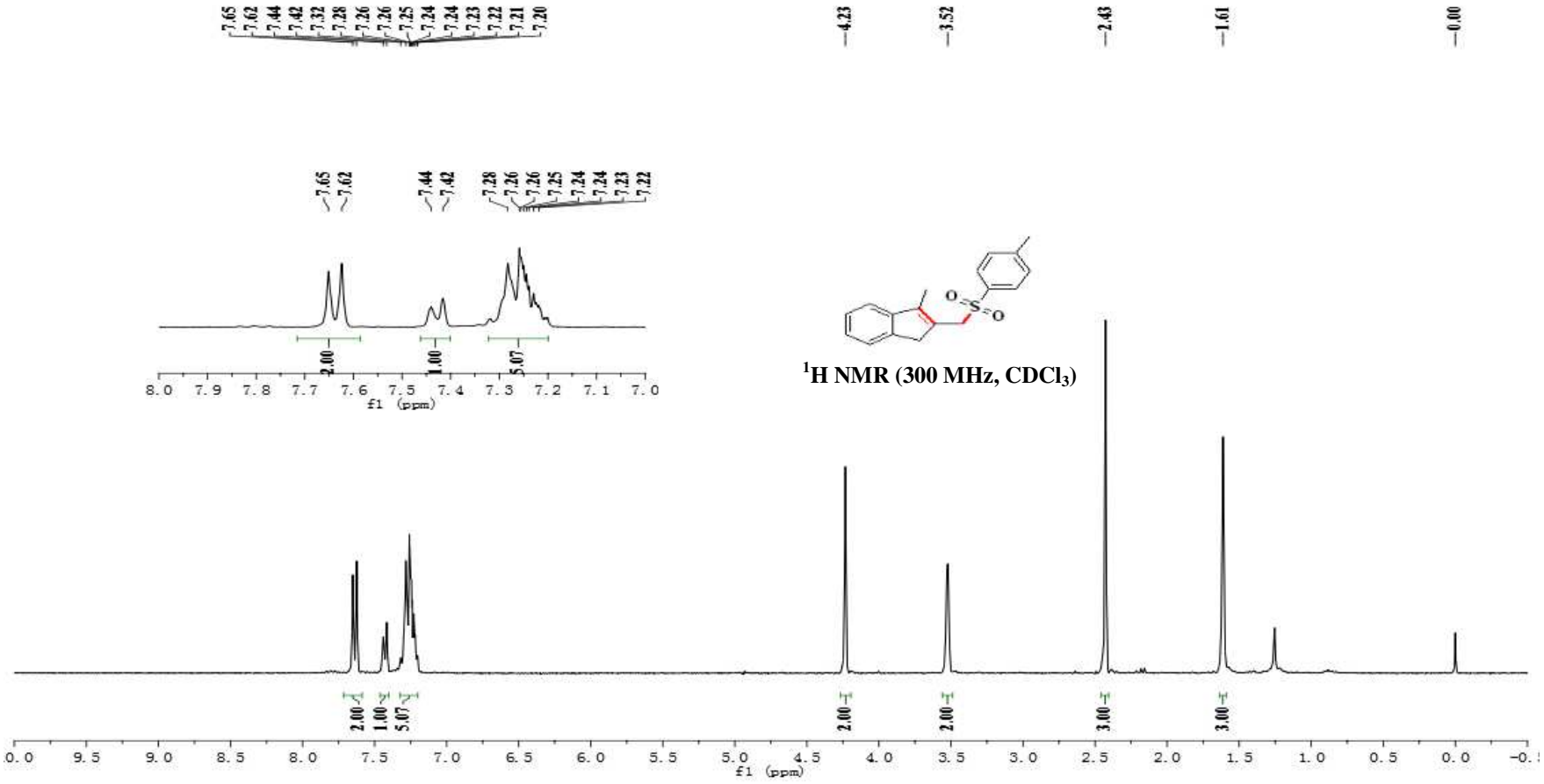
^{1}H NMR (300 MHz, $CDCl_3$)

1-(((1*H*-Inden-2-yl)methyl)sulfonyl)naphthalene (3u)



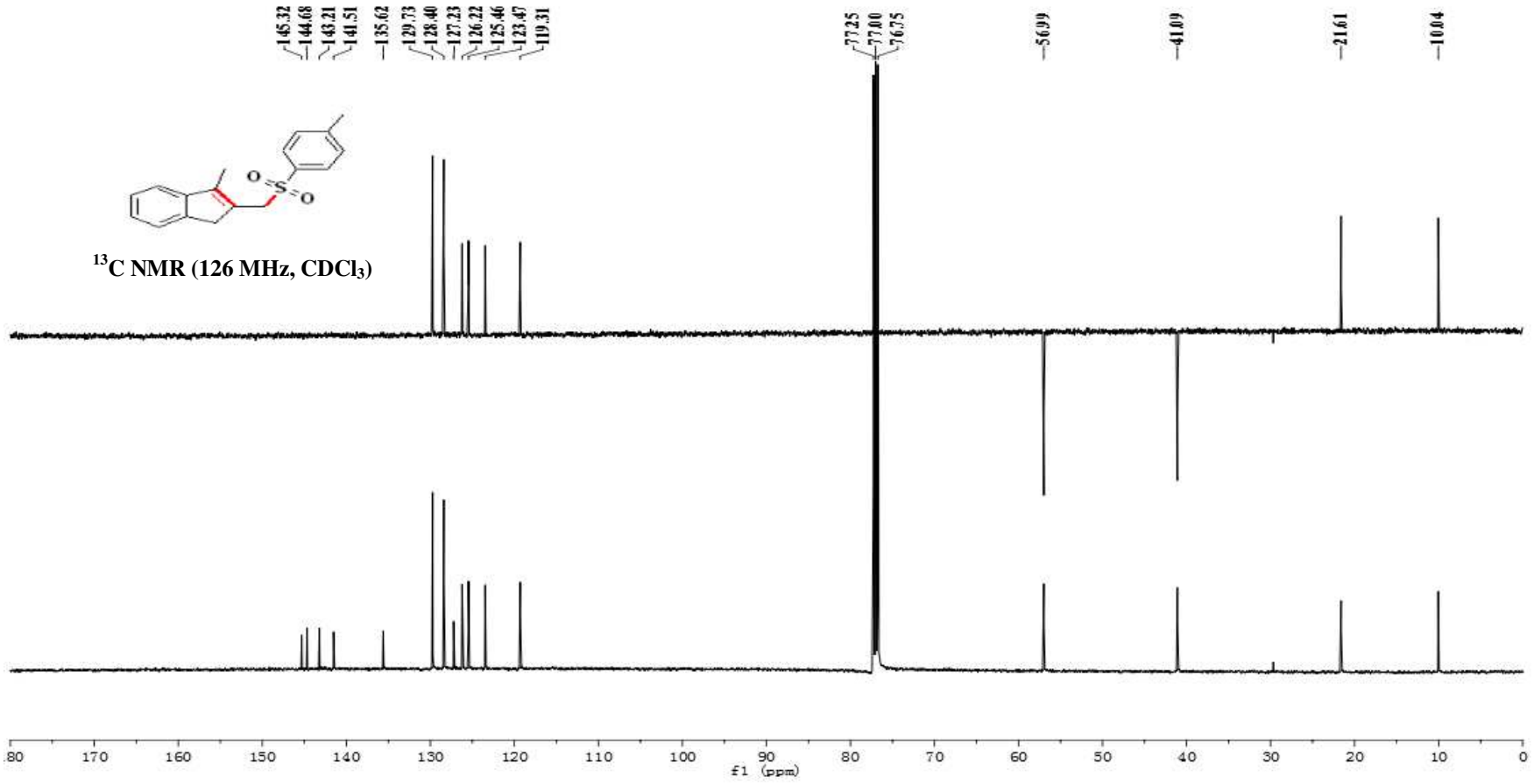
^{13}C NMR (126 MHz, $CDCl_3$)

3-Methyl-2-(tosylmethyl)-1*H*-indene (5a)



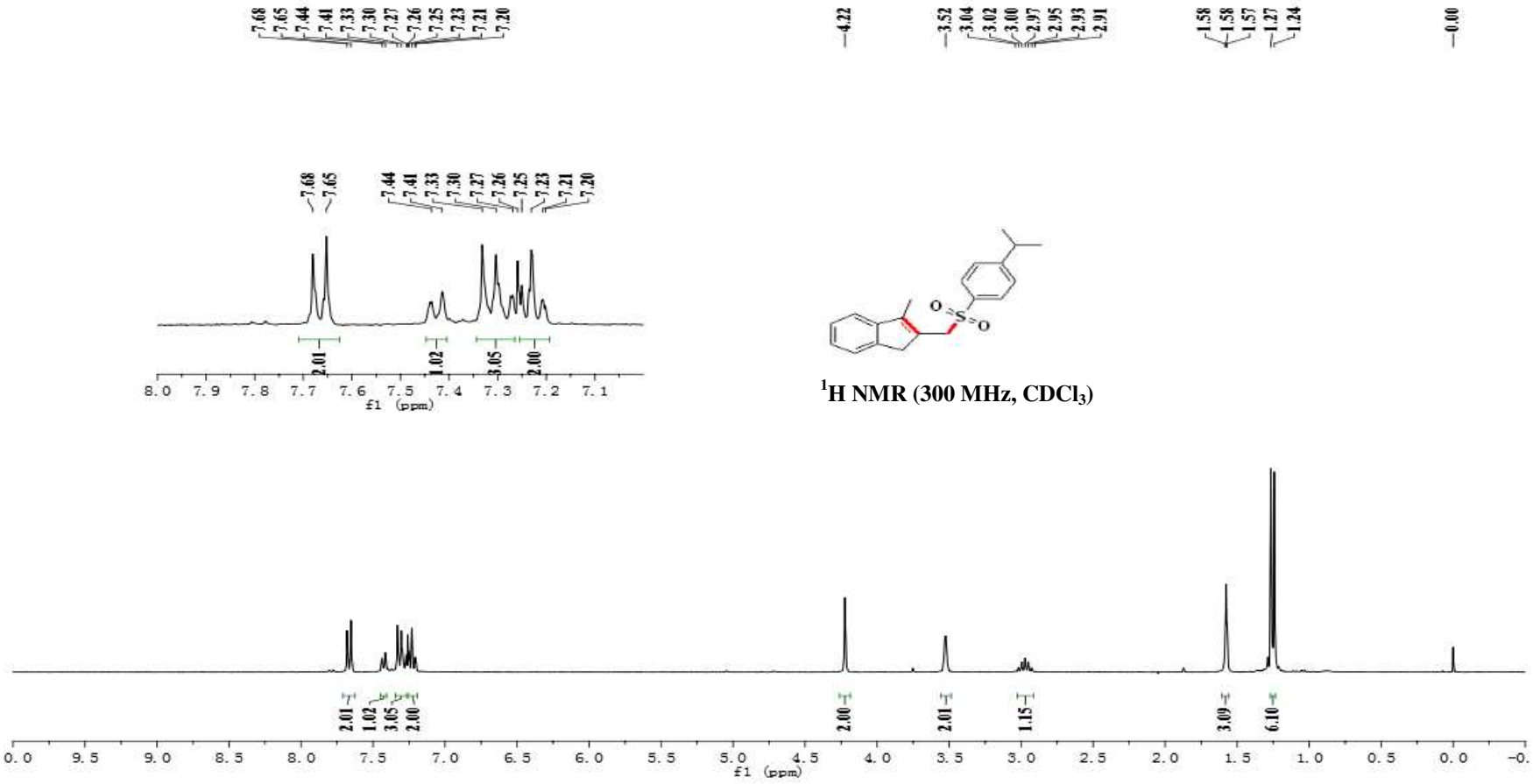
^{1}H NMR (300 MHz, $CDCl_3$)

3-Methyl-2-(tosylmethyl)-1*H*-indene (5a)



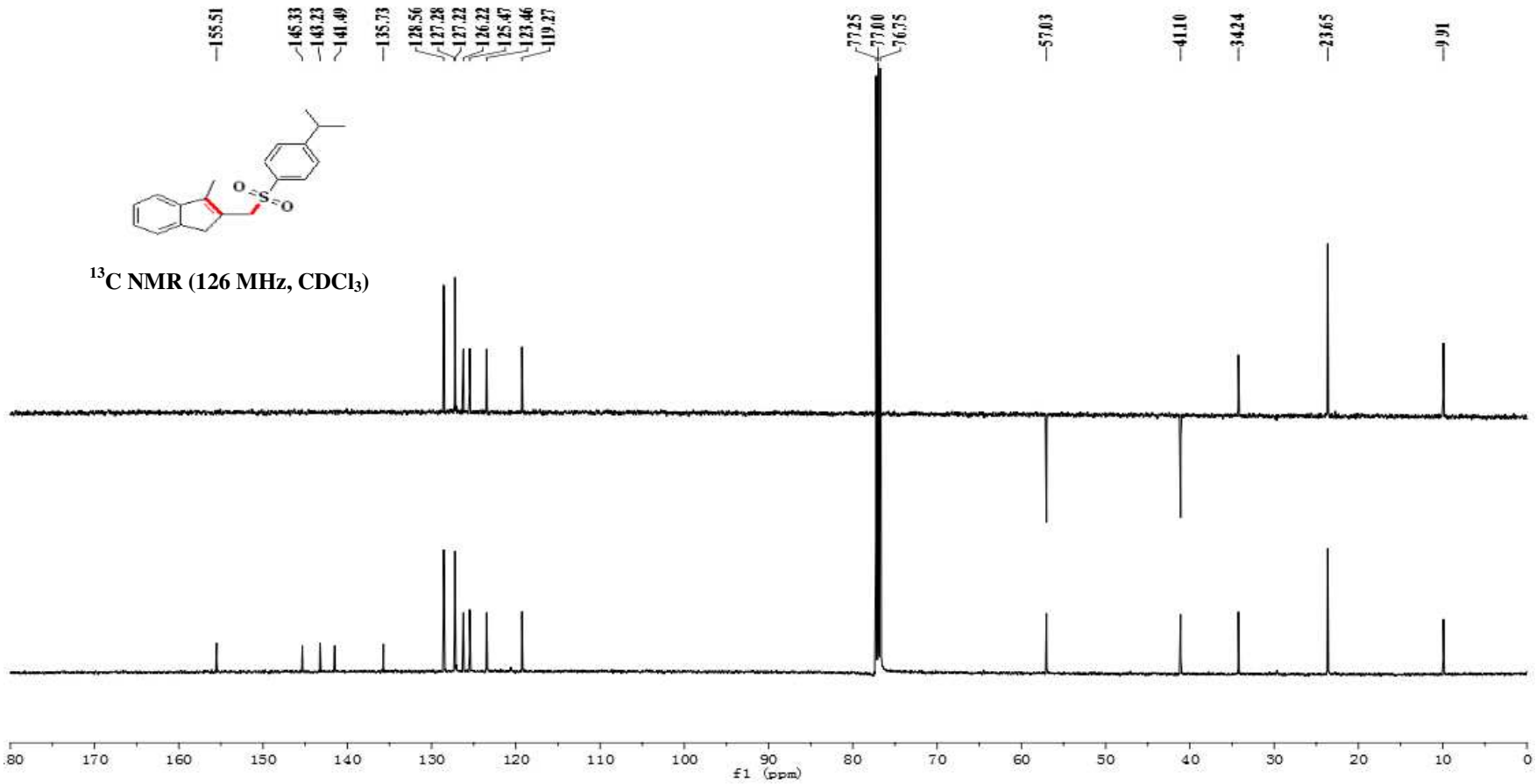
^{13}C NMR (126 MHz, $CDCl_3$)

2-(((4-isopropylphenyl)sulfonyl)methyl)-3-methyl-1*H*-indene (5b)



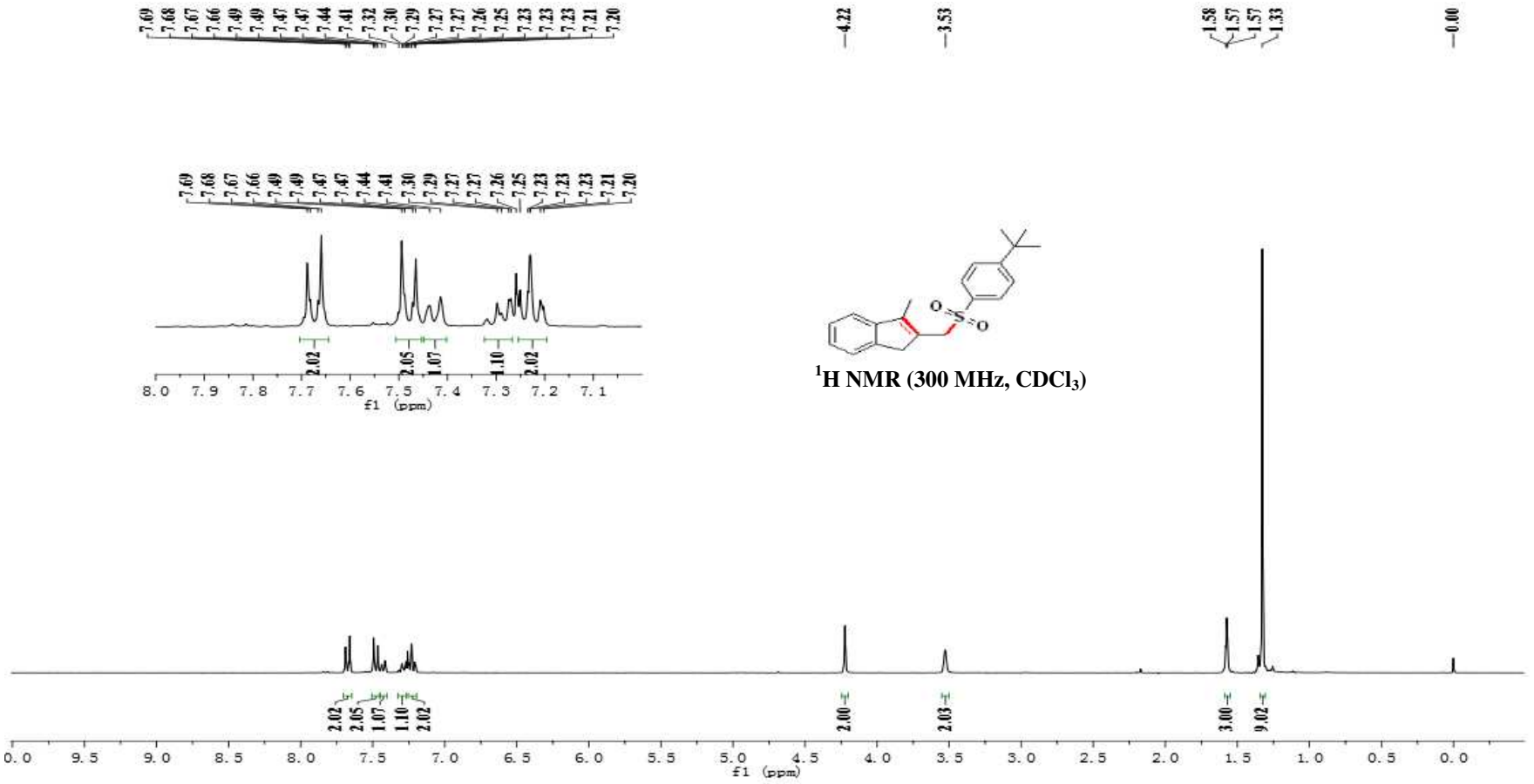
^{1}H NMR (300 MHz, $CDCl_3$)

2-(((4-isopropylphenyl)sulfonyl)methyl)-3-methyl-1*H*-indene (5b)



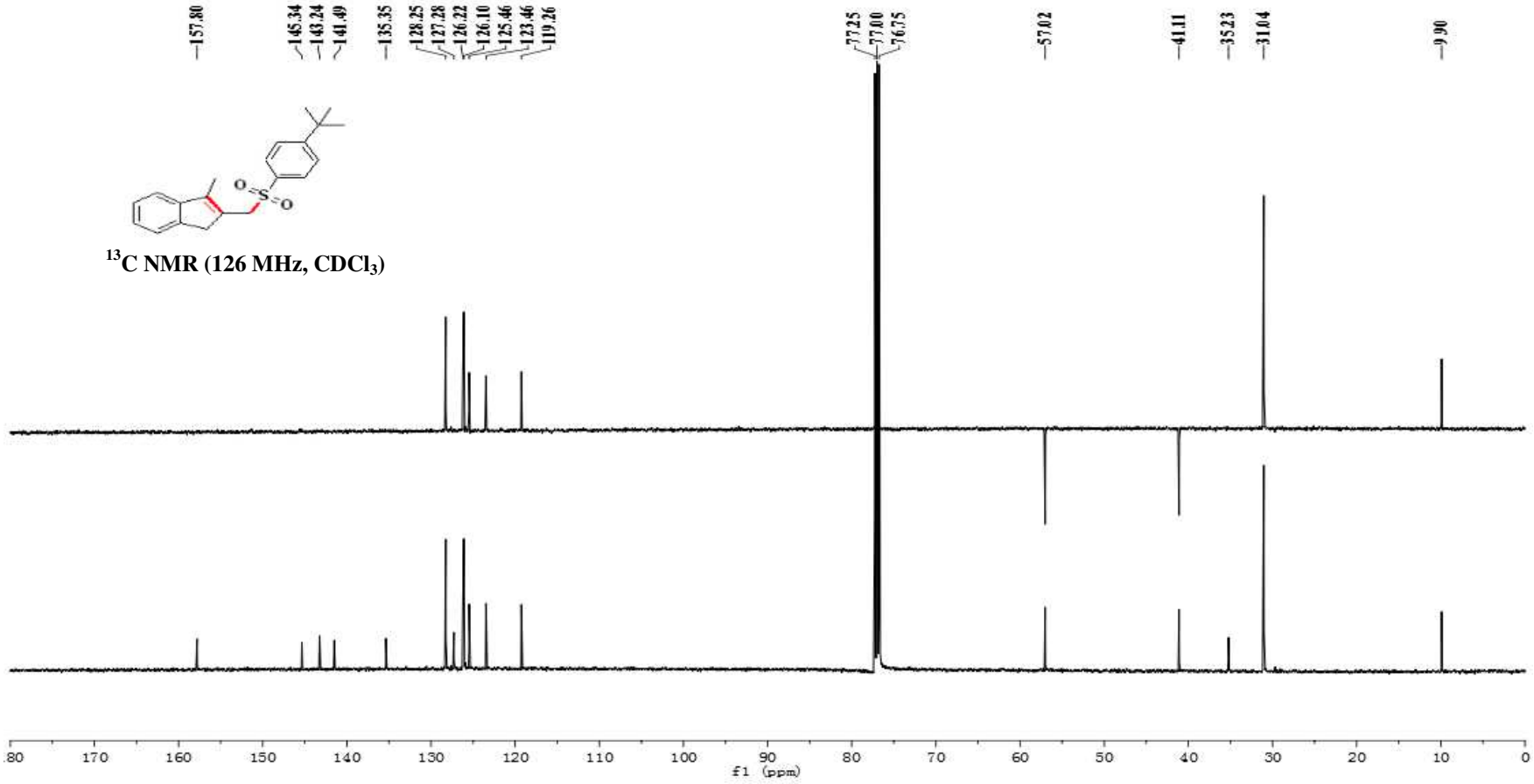
^{13}C NMR (126 MHz, $CDCl_3$)

2-(((4-(*tert*-Butyl)phenyl)sulfonyl)methyl)-3-methyl-1*H*-indene (5c)



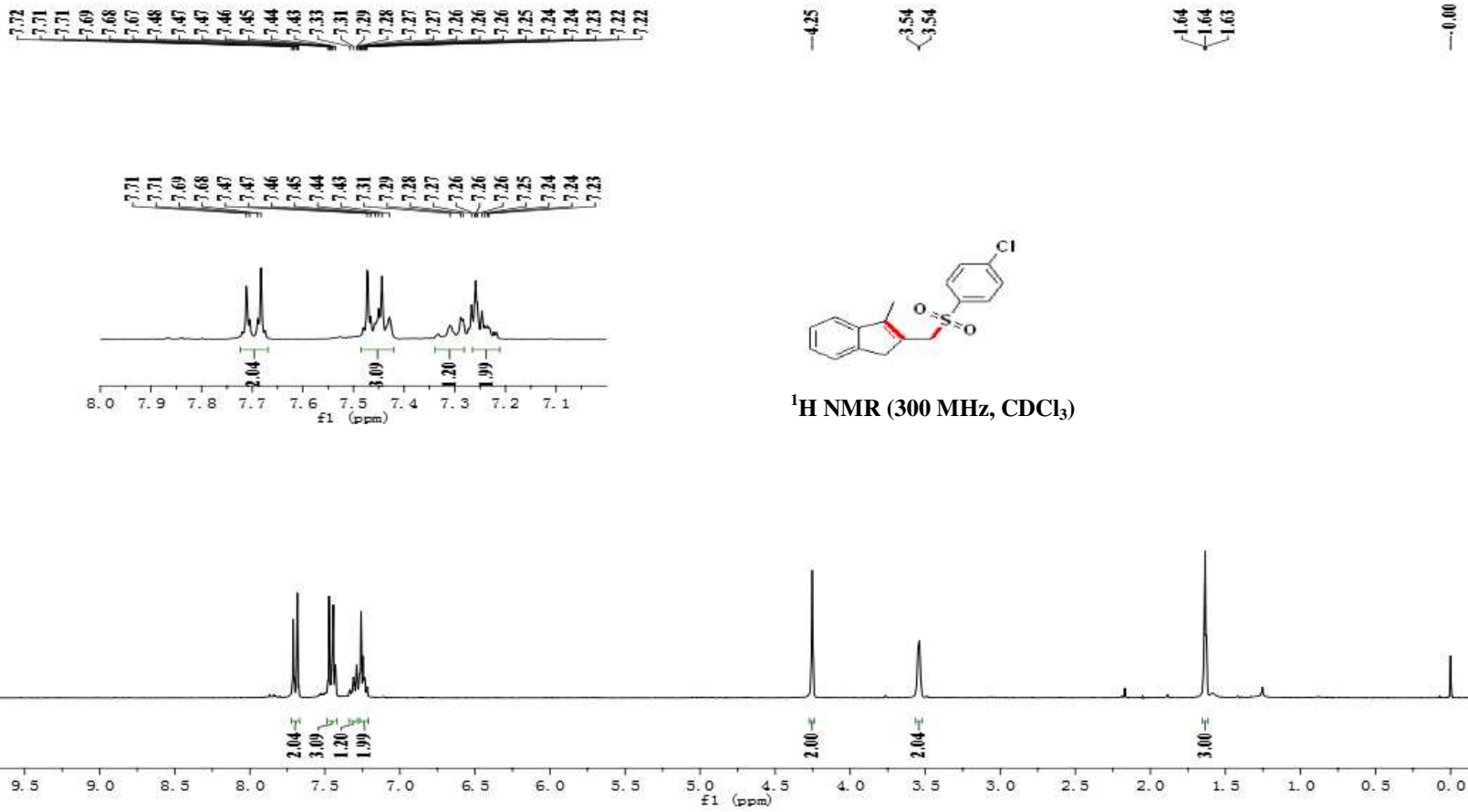
^{1}H NMR (300 MHz, $CDCl_3$)

2-(((4-(*tert*-Butyl)phenyl)sulfonyl)methyl)-3-methyl-1*H*-indene (5c)



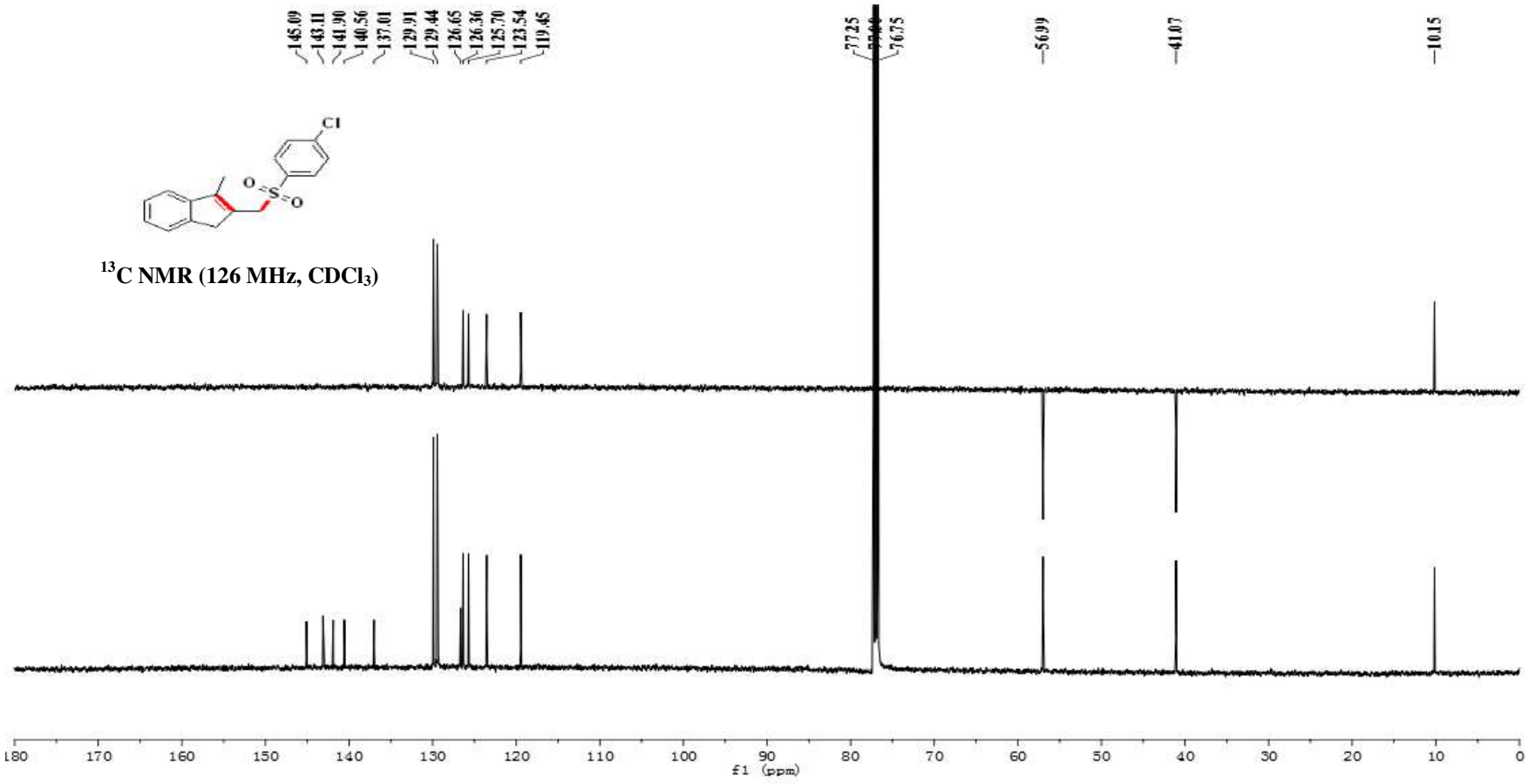
^{13}C NMR (126 MHz, $CDCl_3$)

2-(((4-Chlorophenyl)sulfonyl)methyl)-3-methyl-1*H*-indene (5d)



^{1}H NMR (300 MHz, $CDCl_3$)

2-(((4-Chlorophenyl)sulfonyl)methyl)-3-methyl-1*H*-indene (5d)



^{13}C NMR (126 MHz, $CDCl_3$)