

Electronic Supplementary Information

Acid-Mediated Transformation of Spirocyclopropyl Oxetanes: A Facile Approach to Spirocyclopropyl Butenolides and γ -Butyrolactones

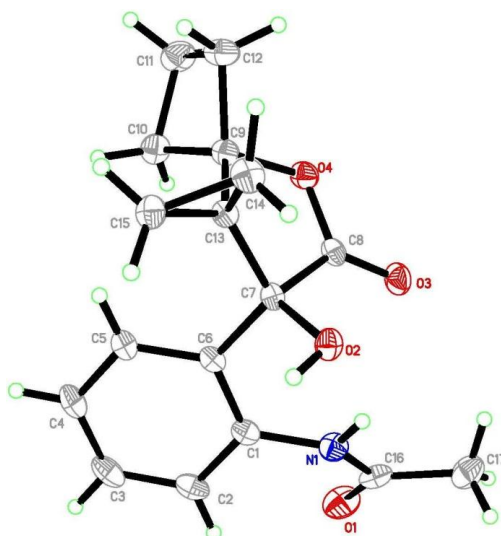
Dong-Dong Wu, Cheng-Mei Huang, Yi-Han Wu, Hoong-Kun Fun, Jian-Hua Xu and Yan Zhang*

Table 1 Optimization on the condition for the transformation from **1a** to **2**.

Entry	Equiv of HCl	Temperature	Time (hr)	Products and yields ^a
1	0.1	r.t.	0.5	- ^b
2	1	r.t.	0.5	- ^b
3	10	r.t.	0.5	- ^c
4	10	r.t.	24	2 (78%)
5	100	r.t.	0.5	2 (80%)

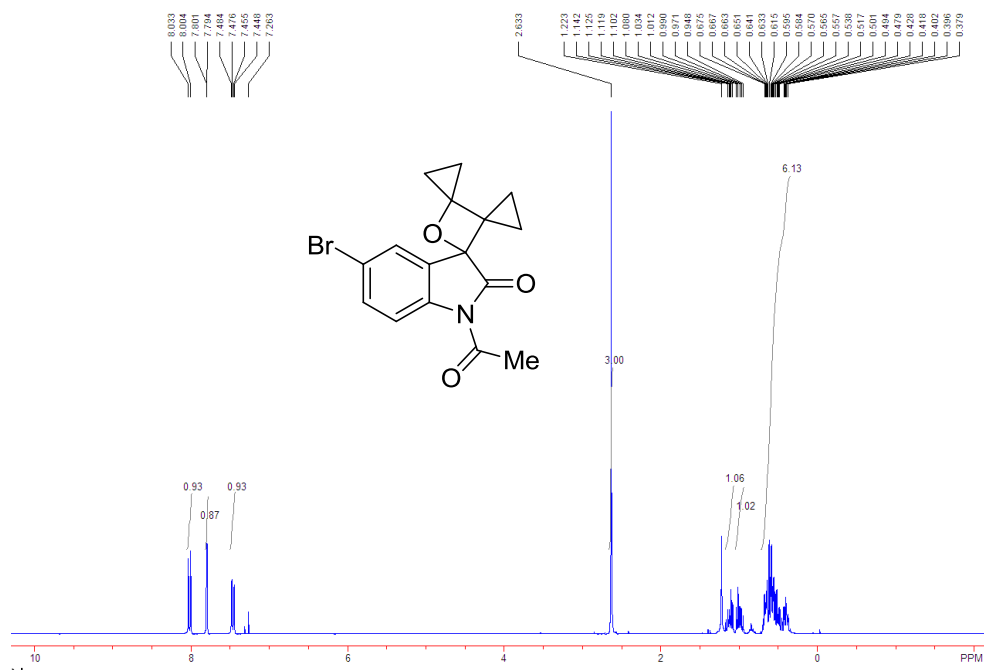
^a Isolated yield. ^b Almost no reaction. ^c Complex mixture

Crystal structure of compound **17**

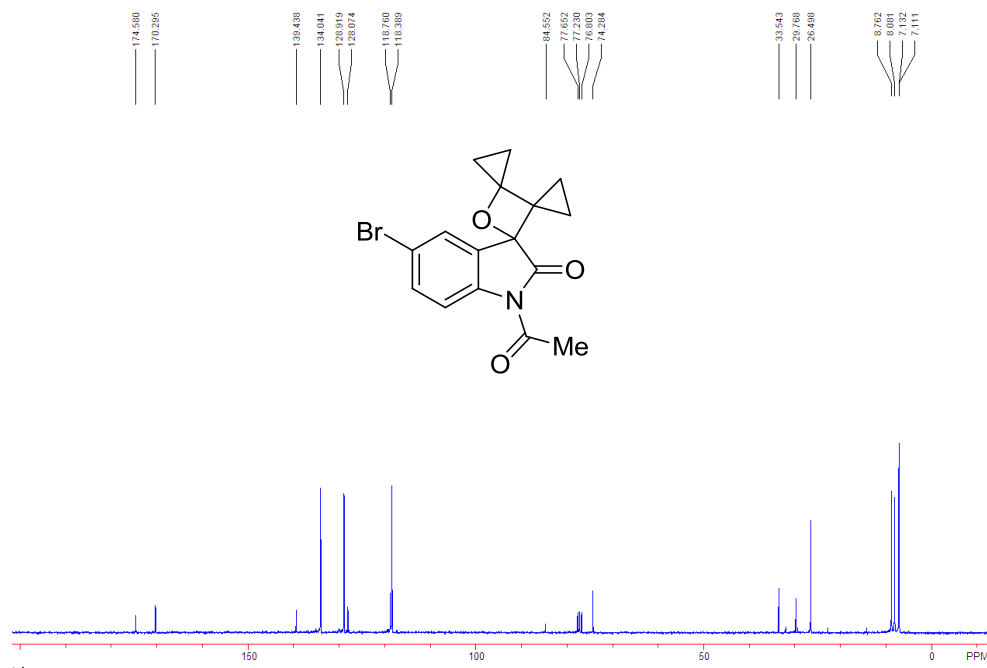


Copies of ^1H NMR and ^{13}C NMR spectra of all new compounds

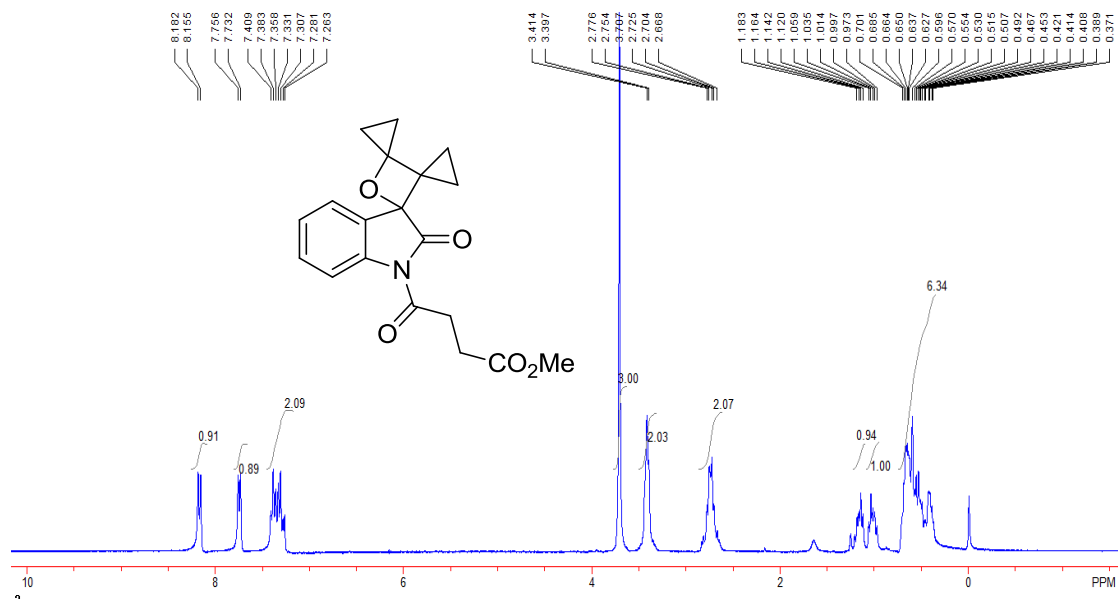
1c- ^1H NMR(CDCl_3)



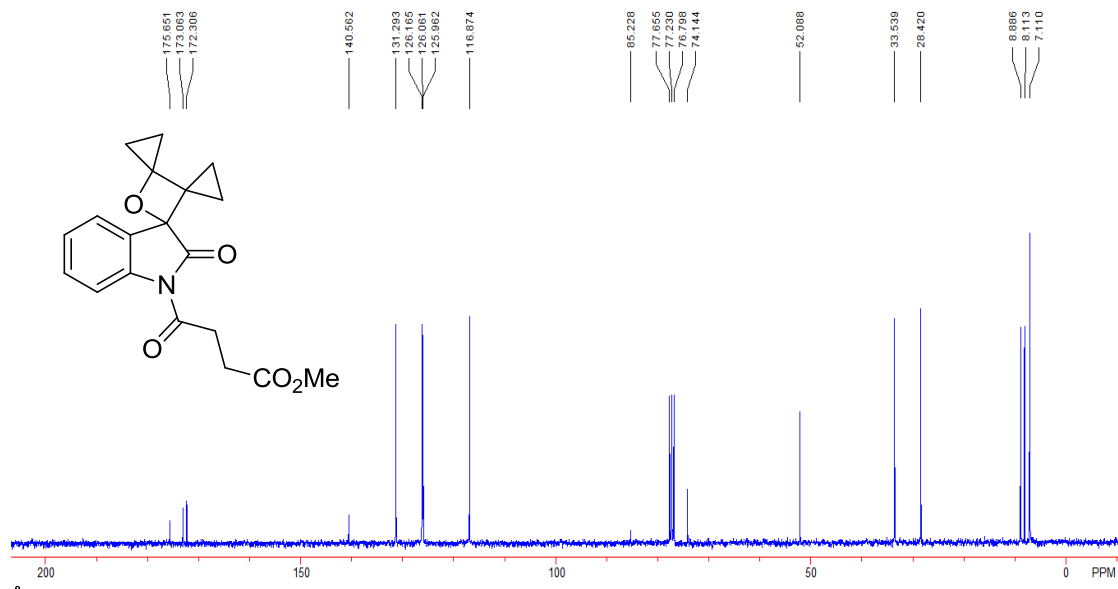
1c- ^{13}C NMR(CDCl_3)



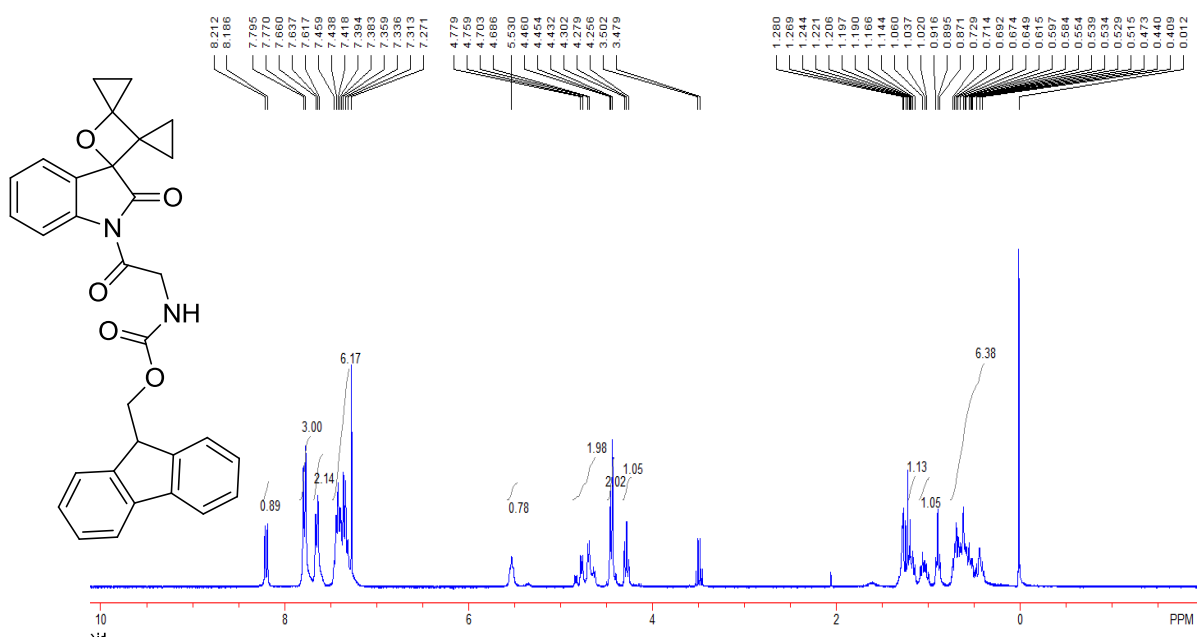
1d-¹H NMR(CDCl₃)



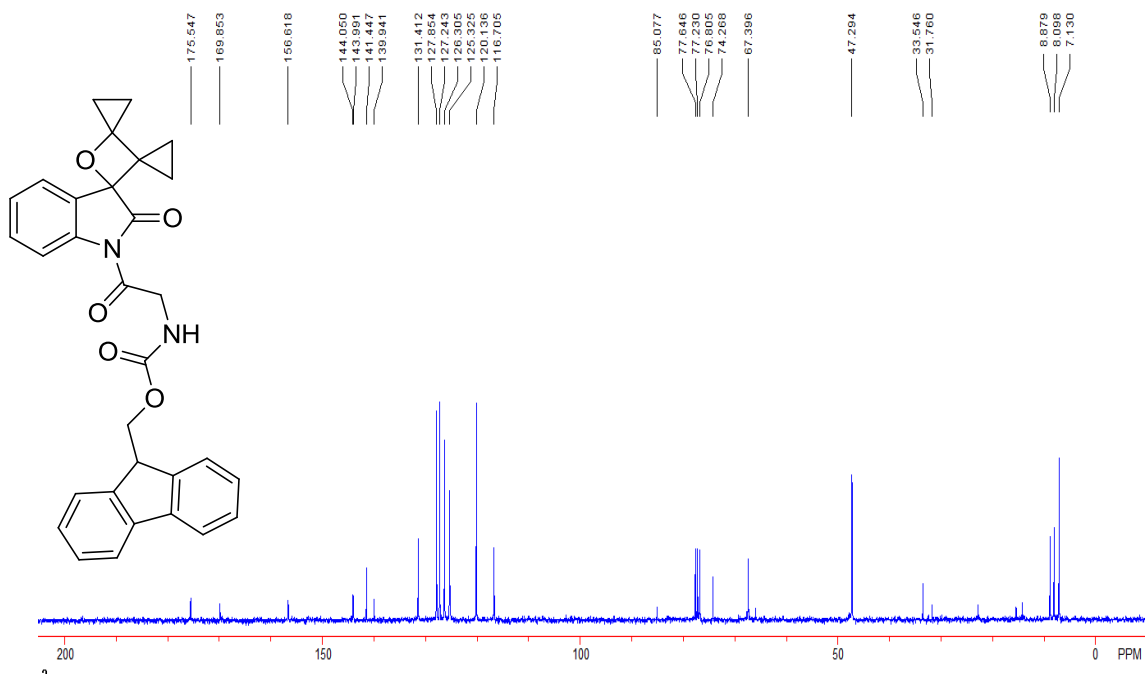
1d-¹³C NMR(CDCl₃)



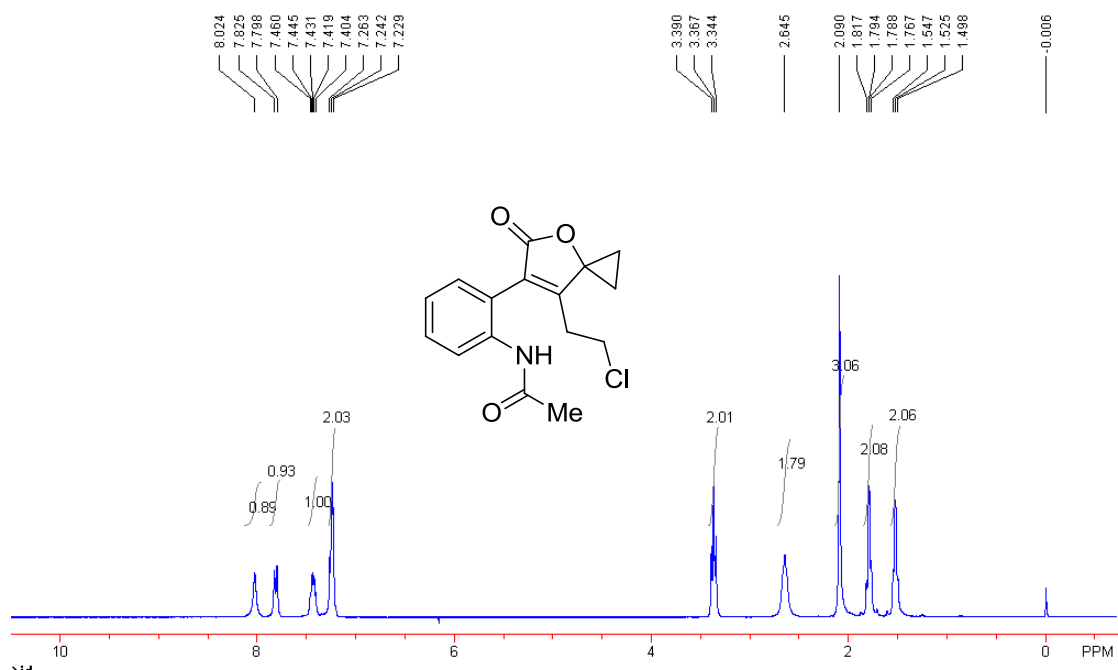
1e-¹H NMR(CDCl₃)



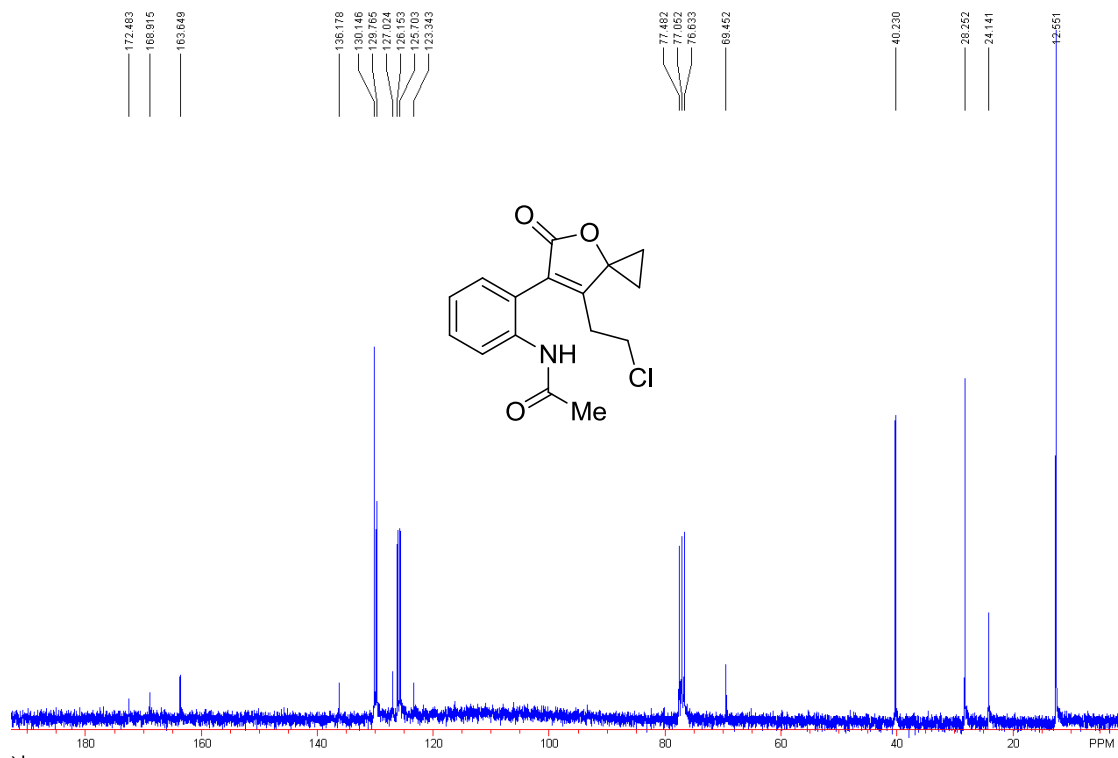
1e-¹³C NMR(CDCl₃)



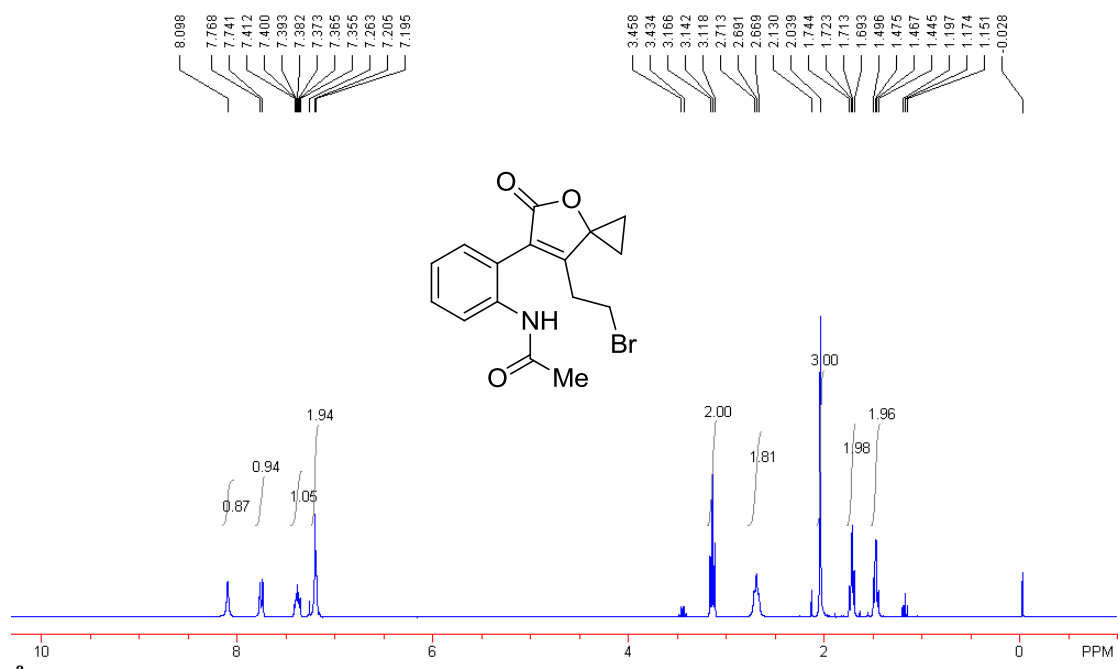
2-¹H NMR(CDCl₃)



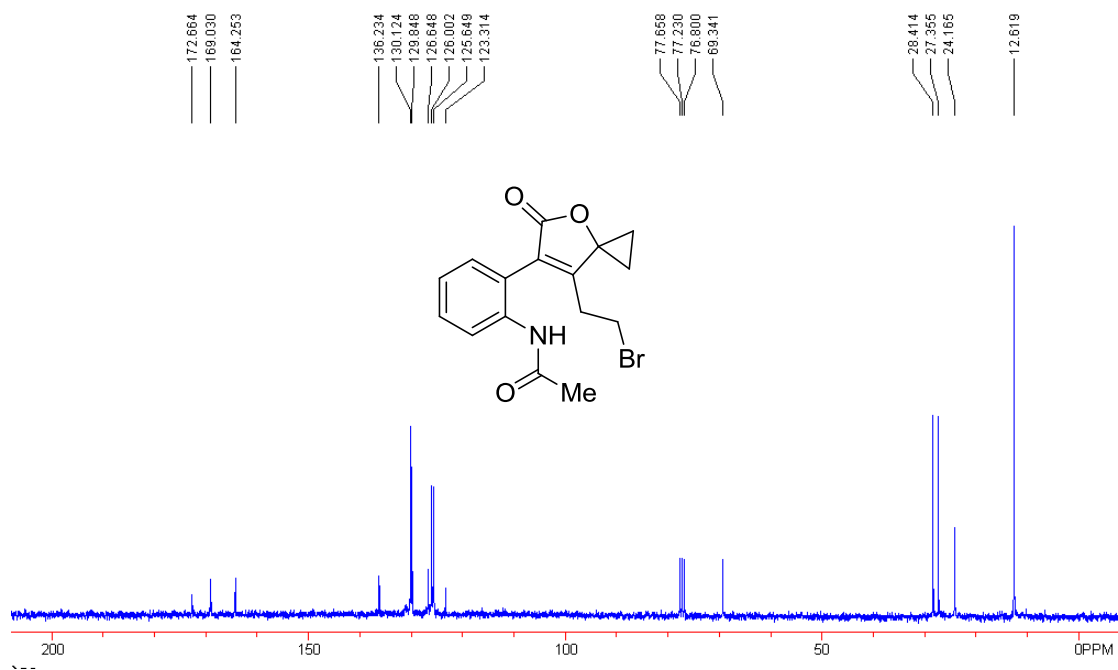
2-¹³C NMR(CDCl₃)



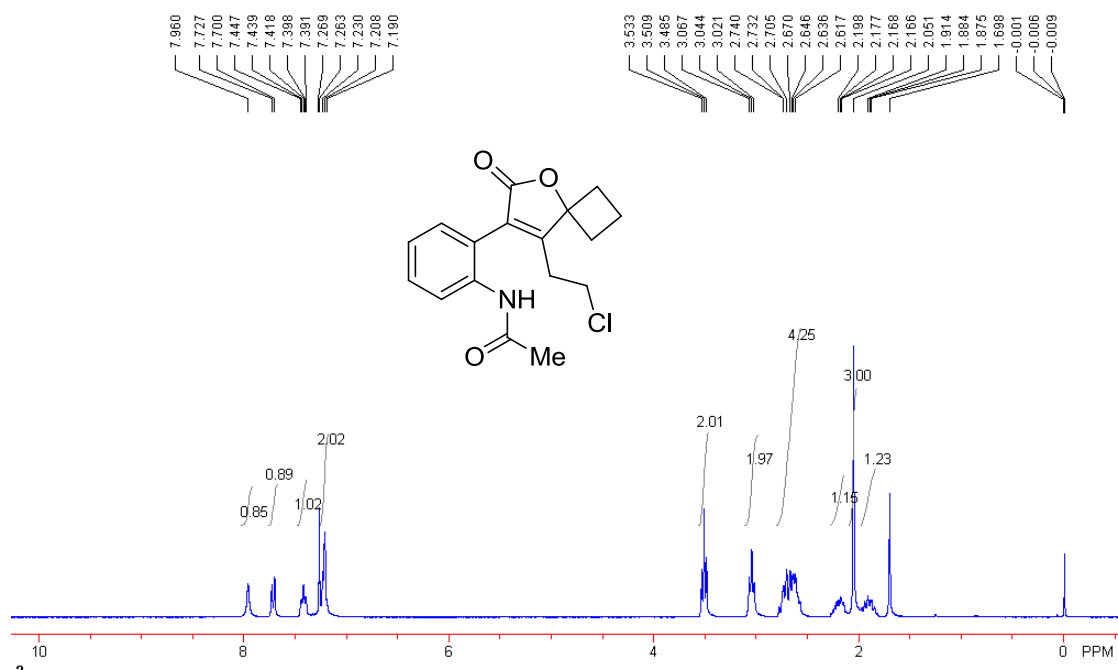
^1H NMR(CDCl_3)



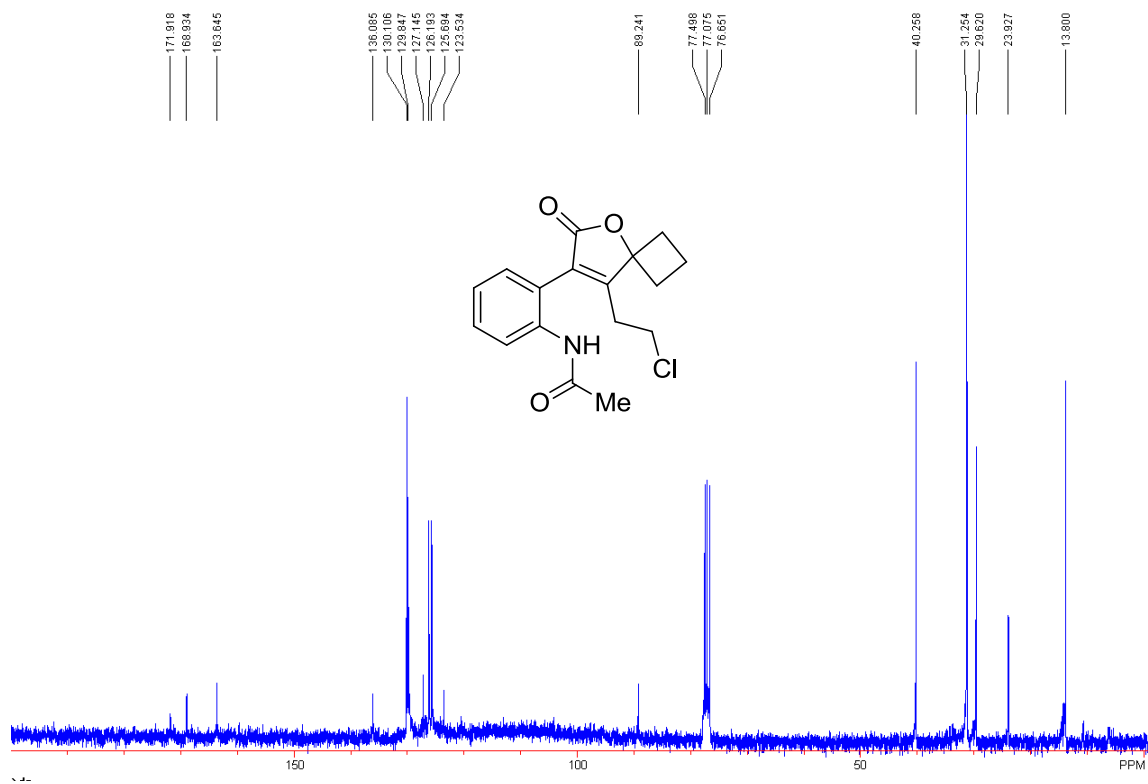
^{13}C NMR(CDCl_3)



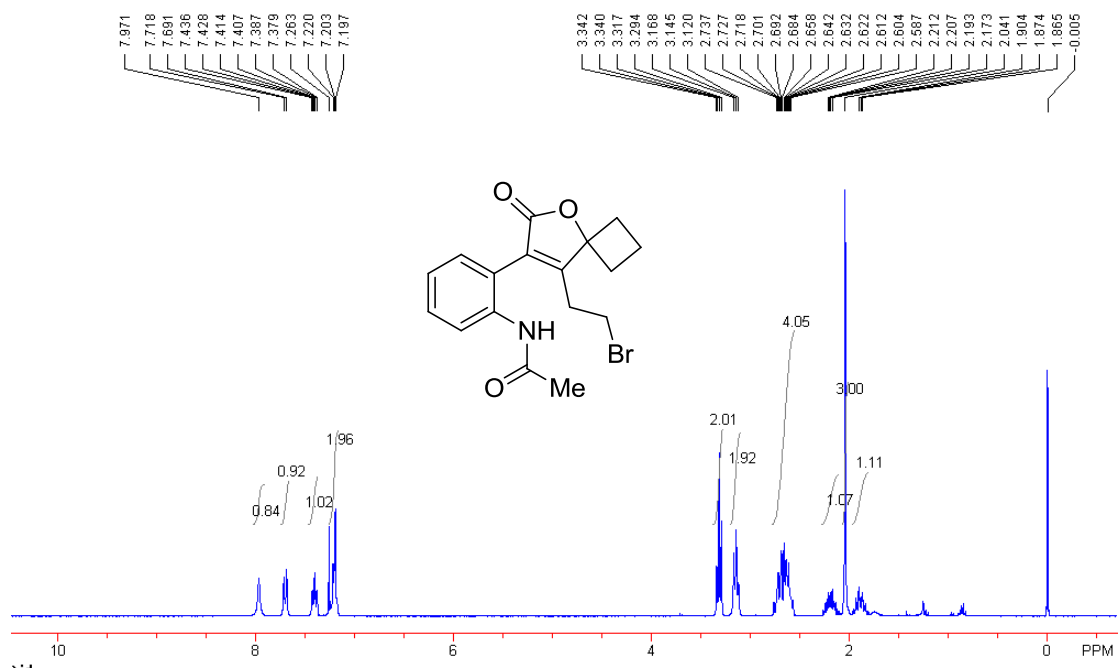
4-¹H NMR(CDCl₃)



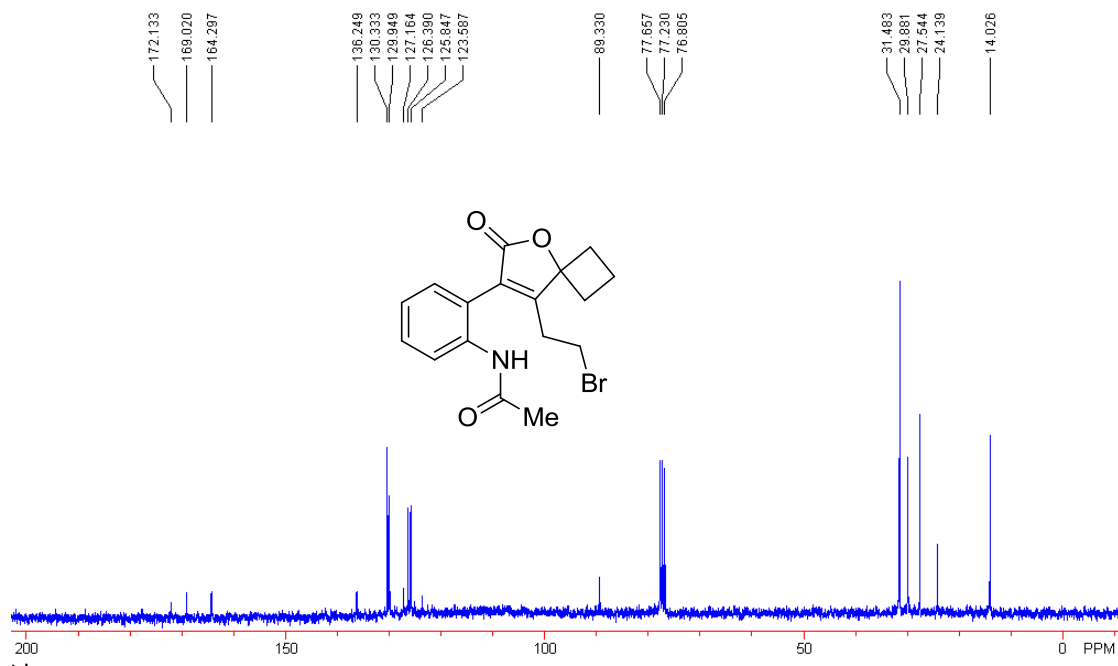
4-¹³C NMR(CDCl₃)



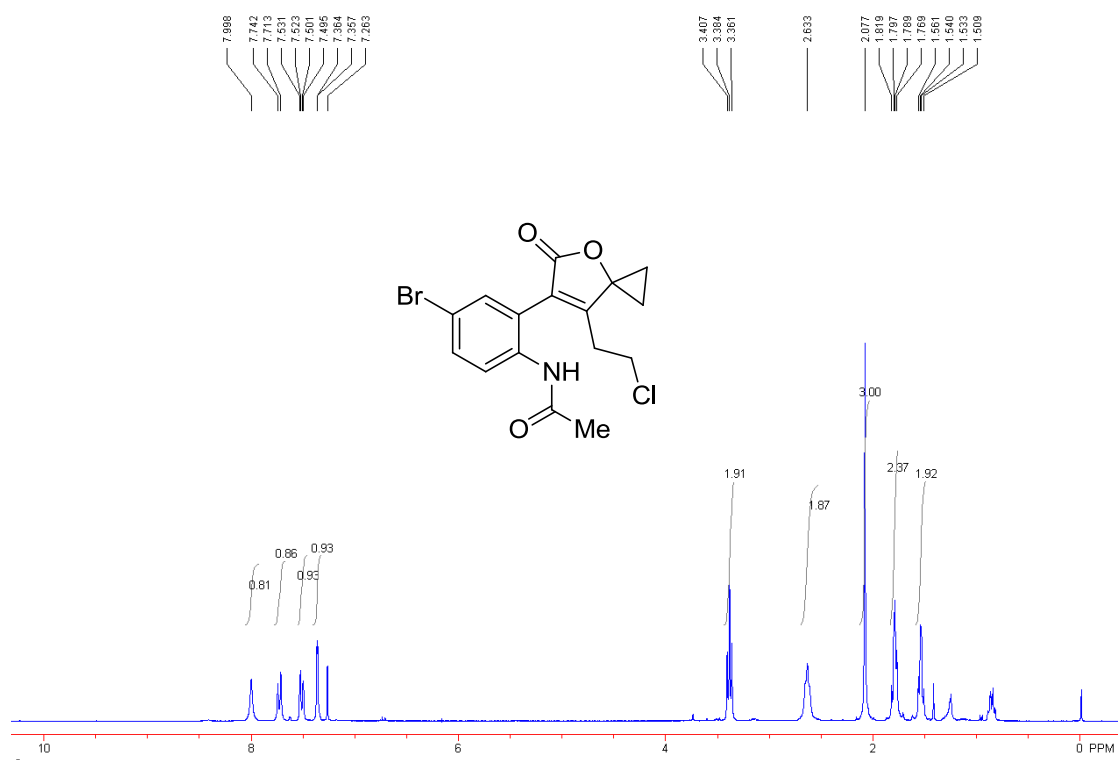
5-¹H NMR(CDCl₃)



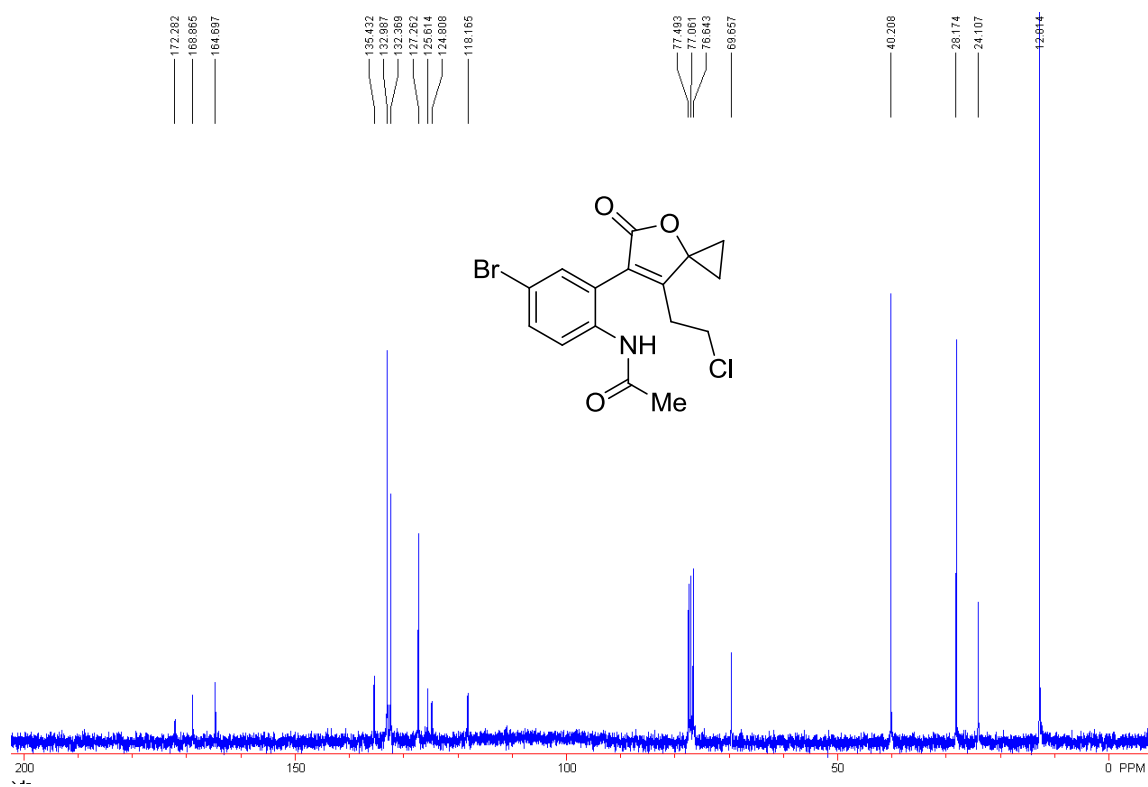
5-¹³C NMR(CDCl₃)



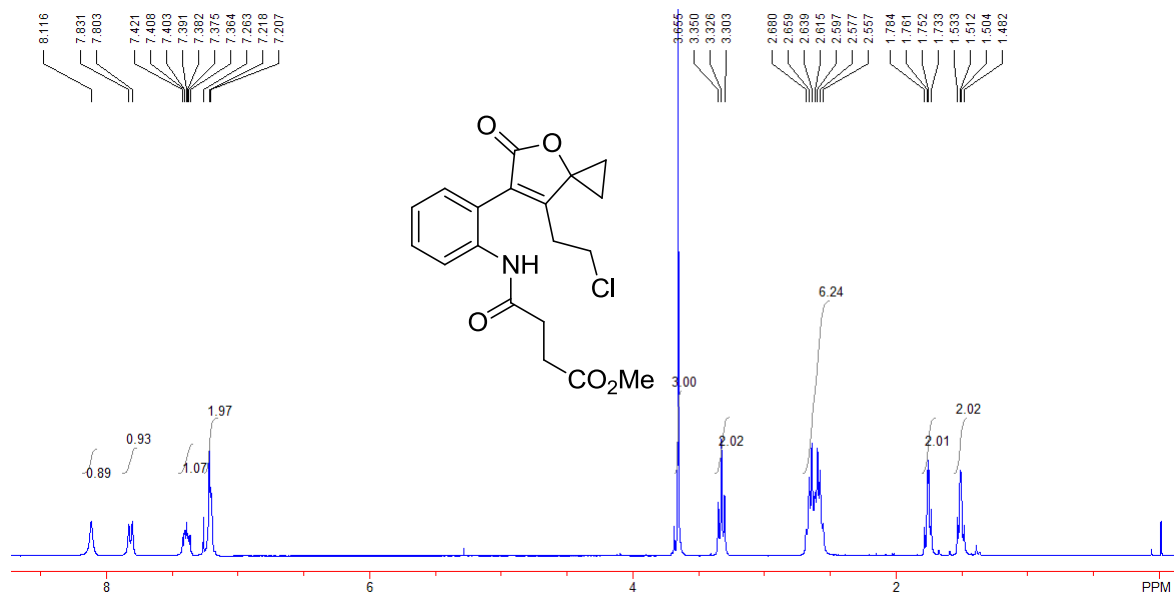
6-¹H NMR(CDCl₃)



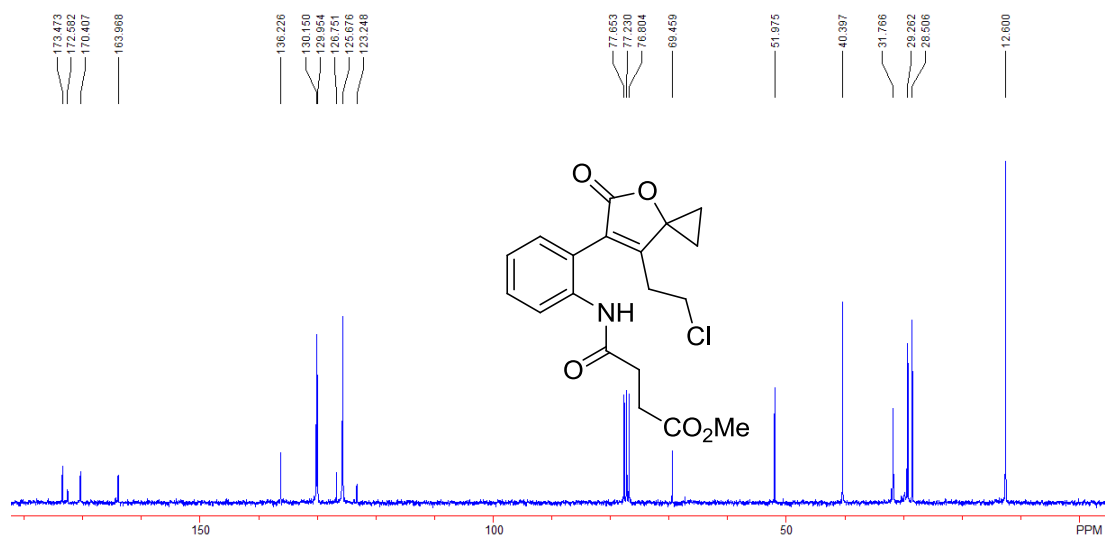
6-¹³C NMR(CDCl₃)



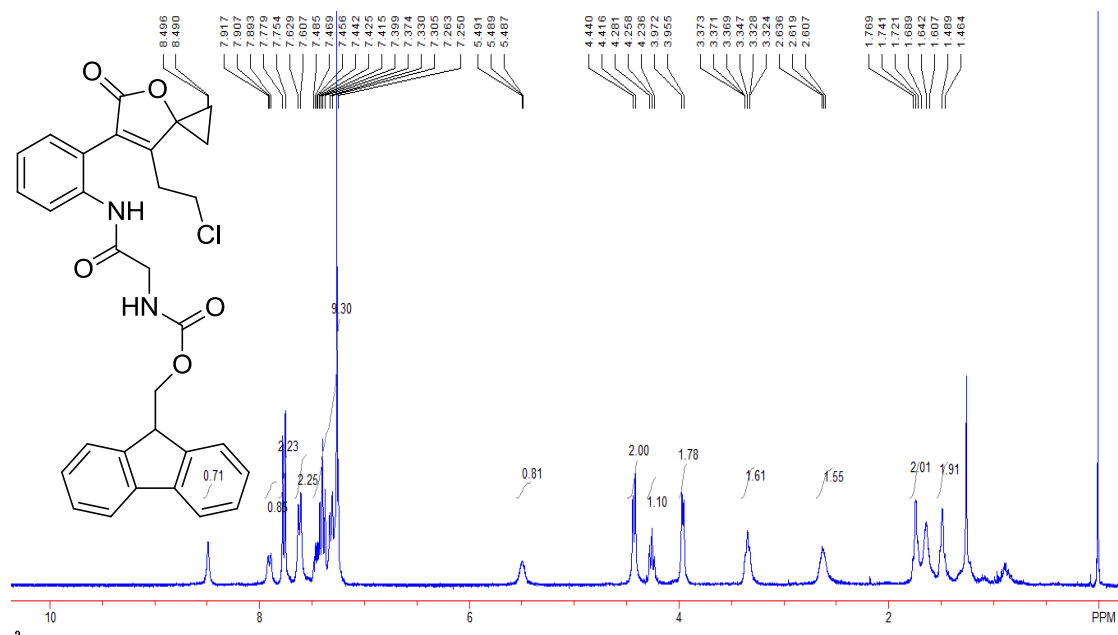
7-¹H NMR(CDCl₃)



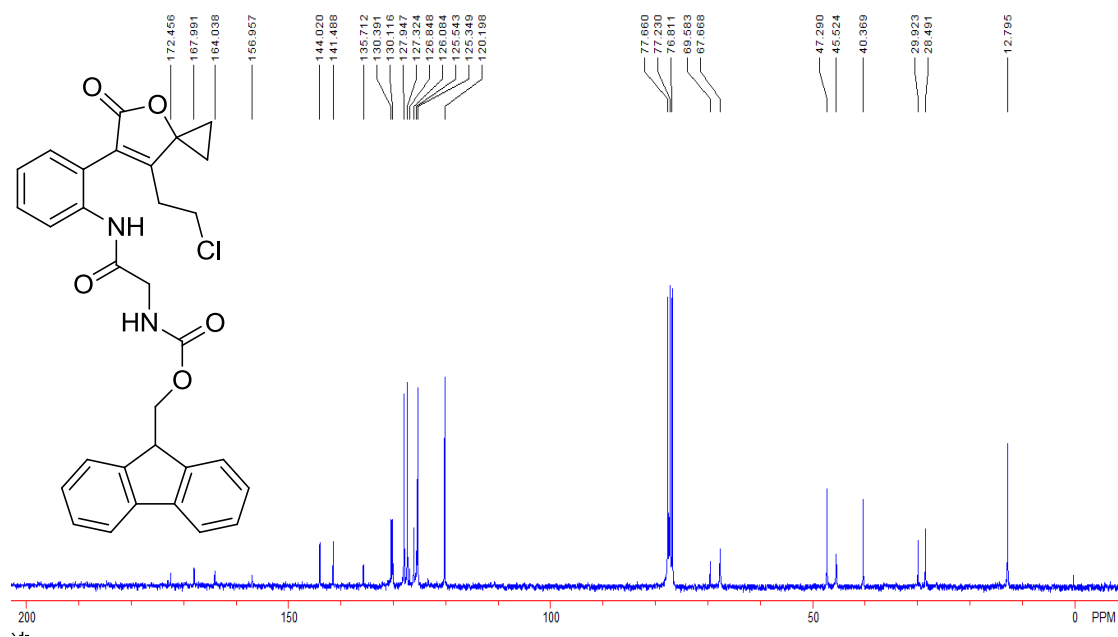
7-¹³C NMR(CDCl₃)



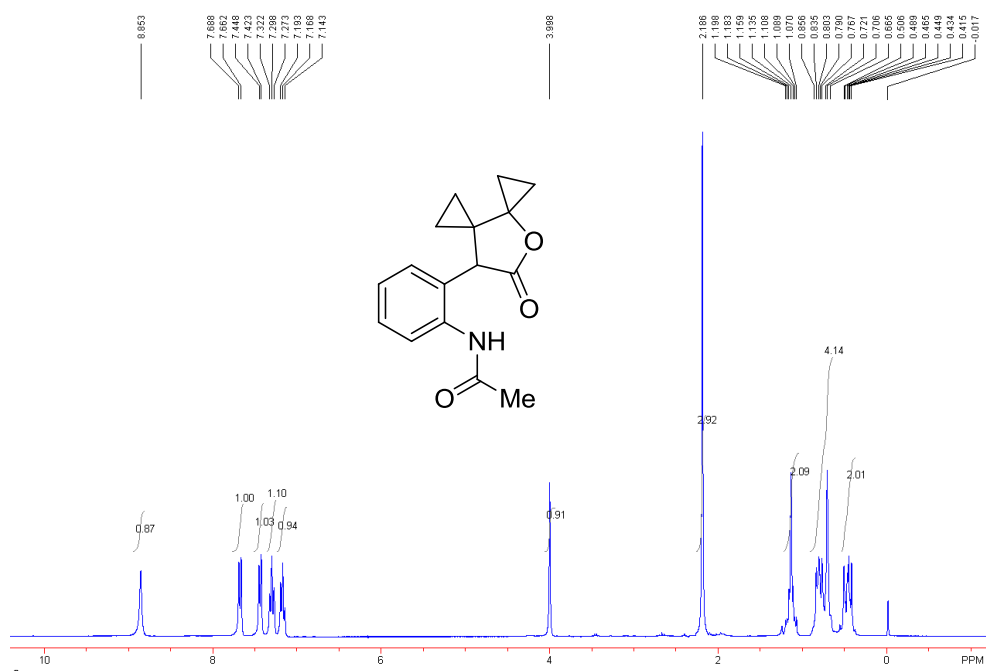
8-¹H NMR(CDCl₃)



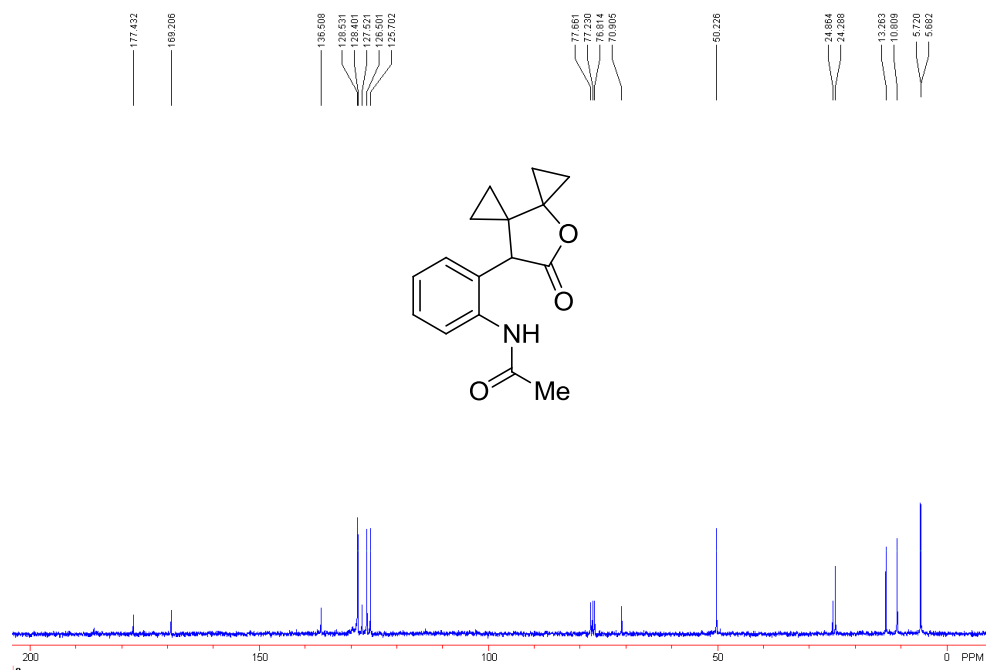
8-¹³C NMR(CDCl₃)



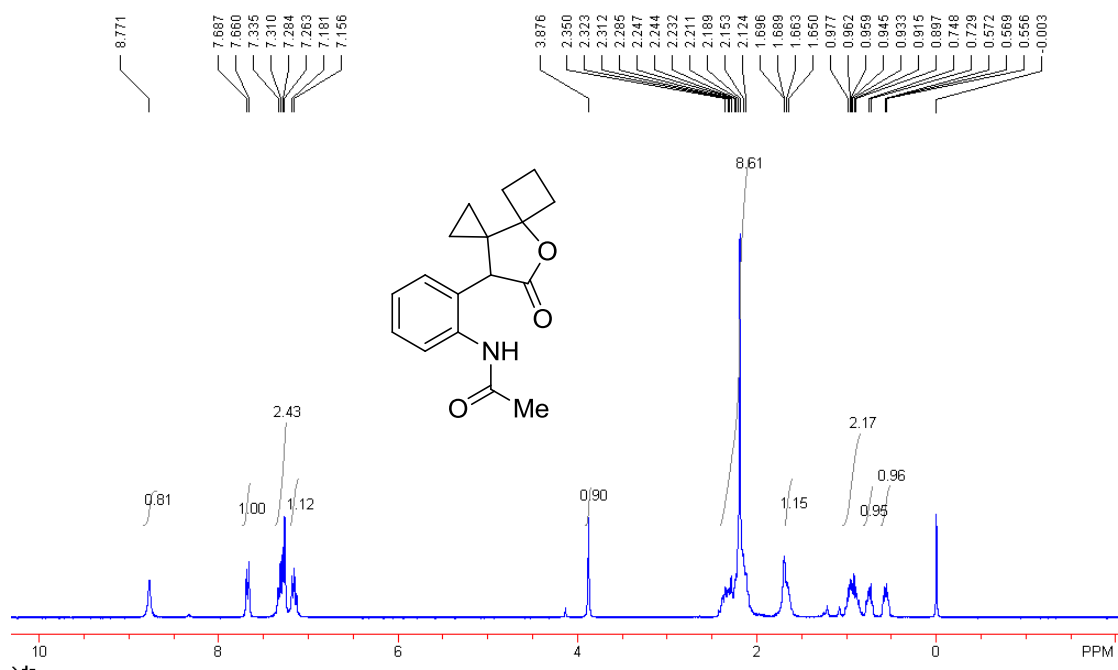
9-¹H NMR(CDCl₃)



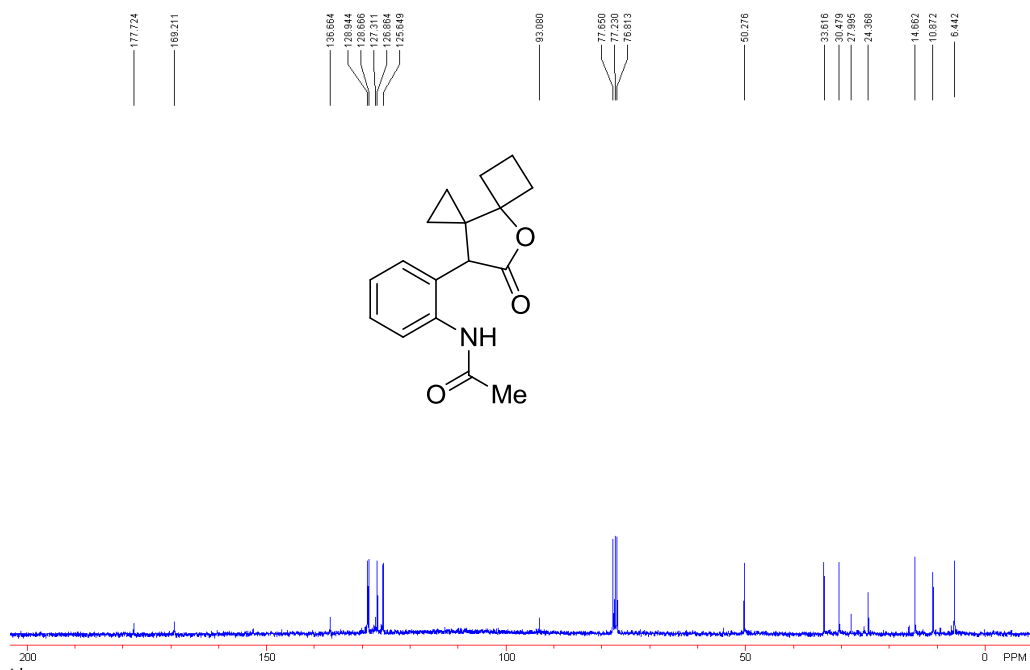
9-¹³C NMR(CDCl₃)



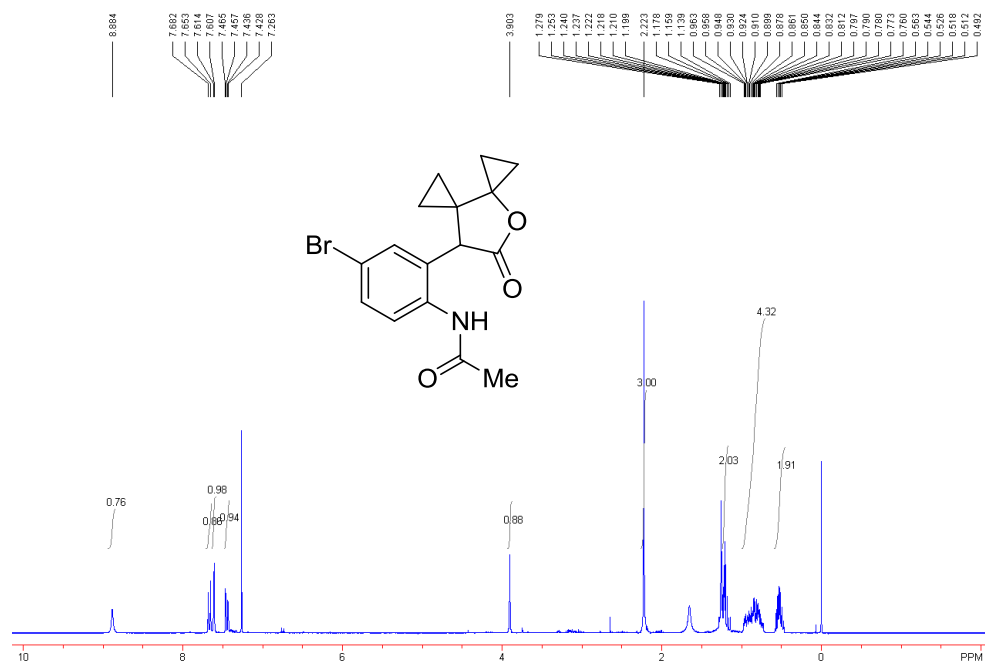
^{1}H NMR(CDCl_3)



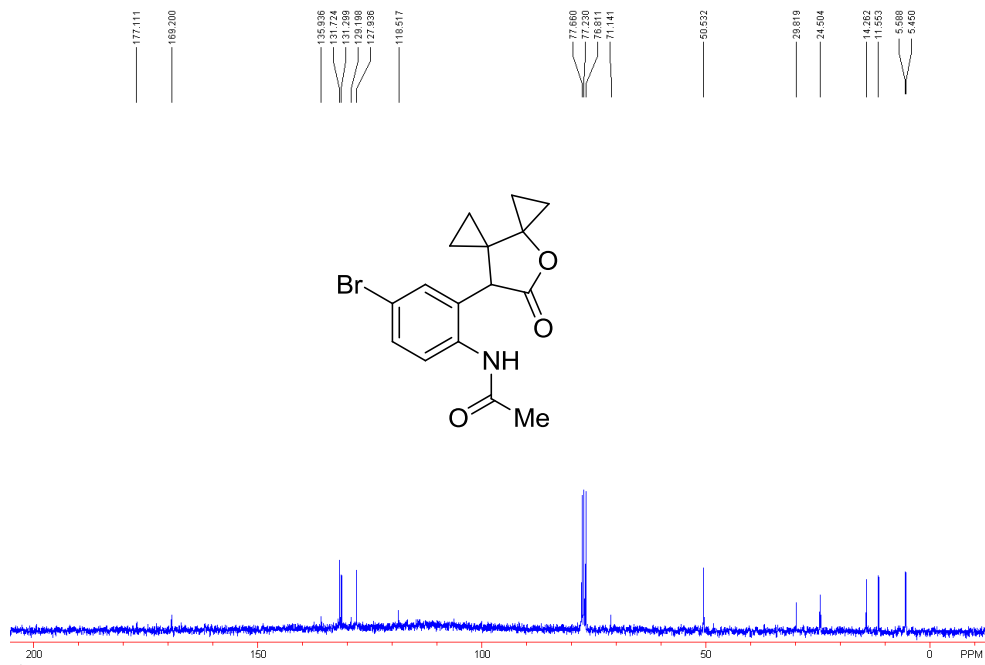
^{13}C NMR(CDCl_3)



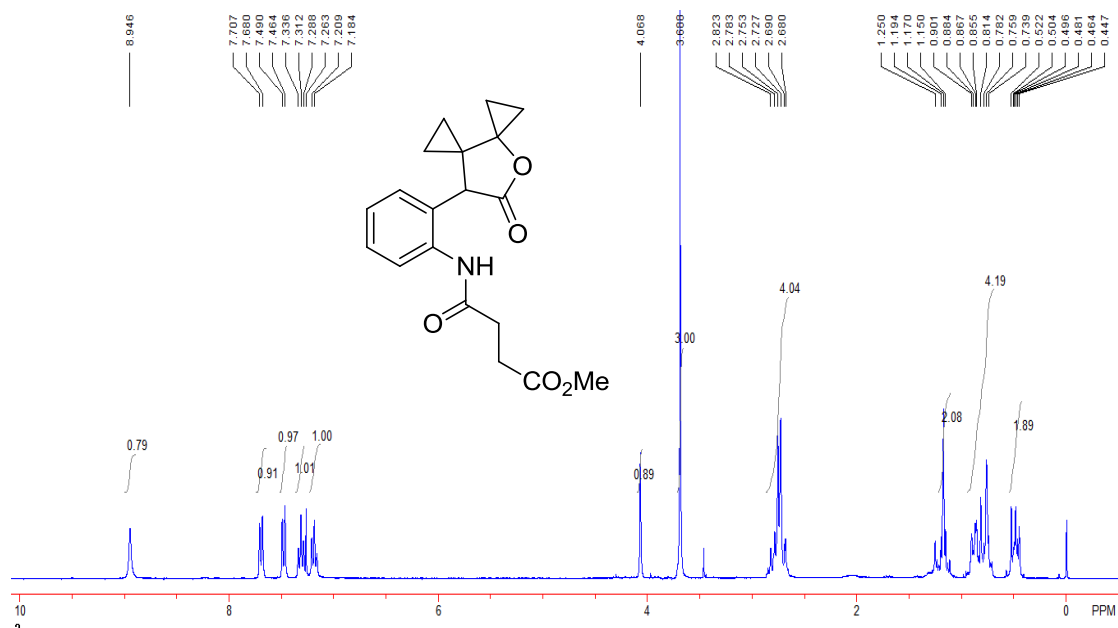
11-¹H NMR(CDCl₃)



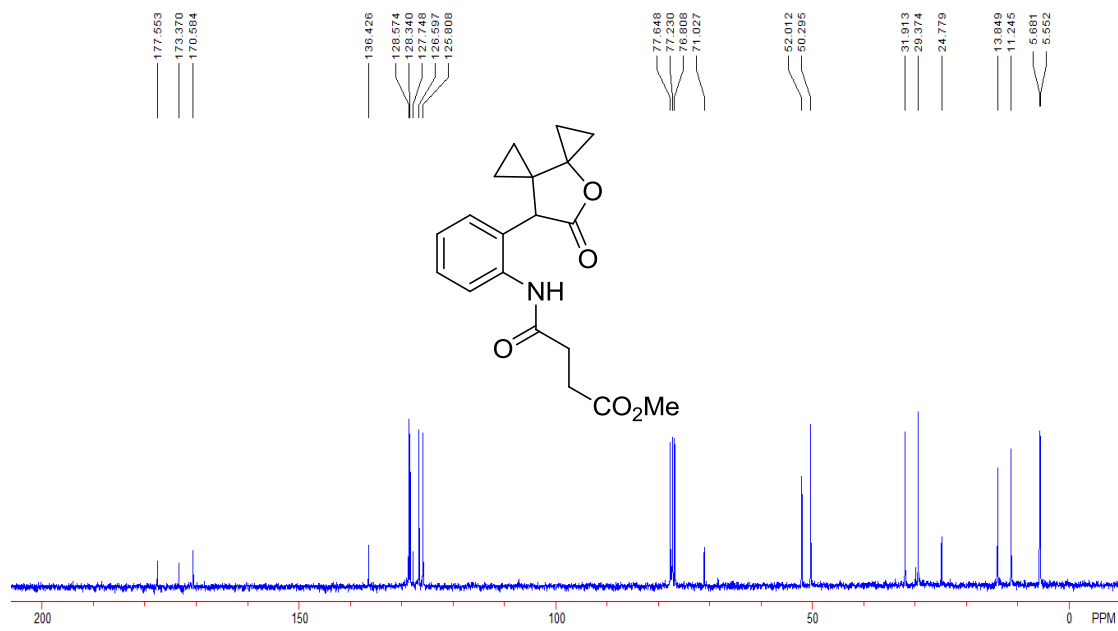
11-¹³C NMR(CDCl₃)



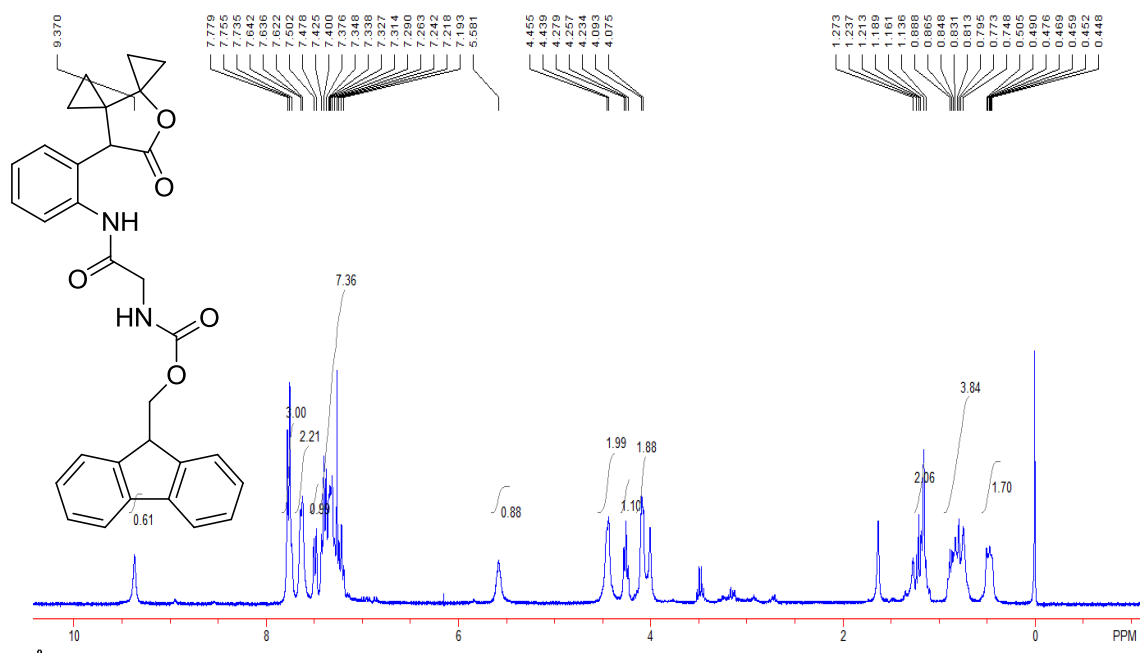
12-¹H NMR(CDCl₃)



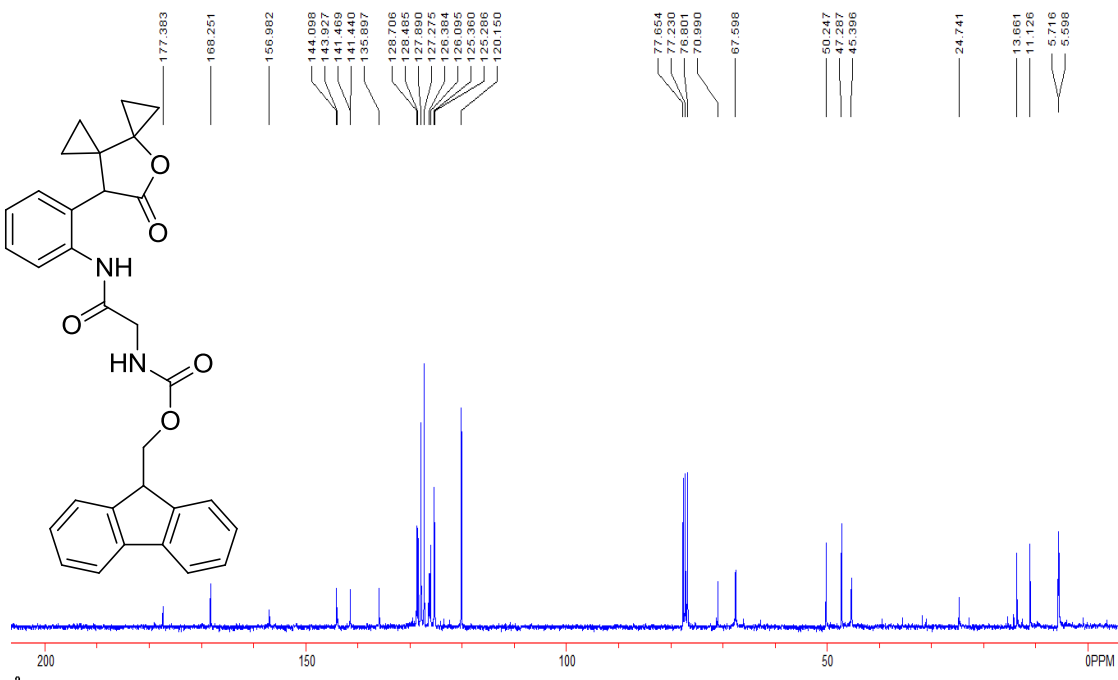
12-¹³C NMR(CDCl₃)



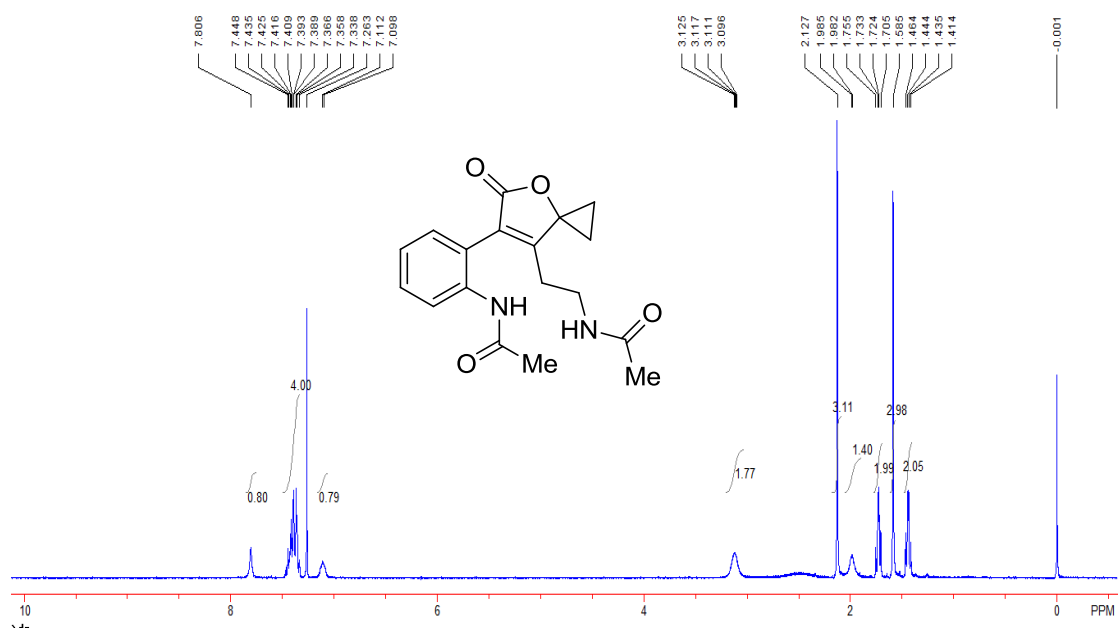
^{13}C NMR(CDCl₃)



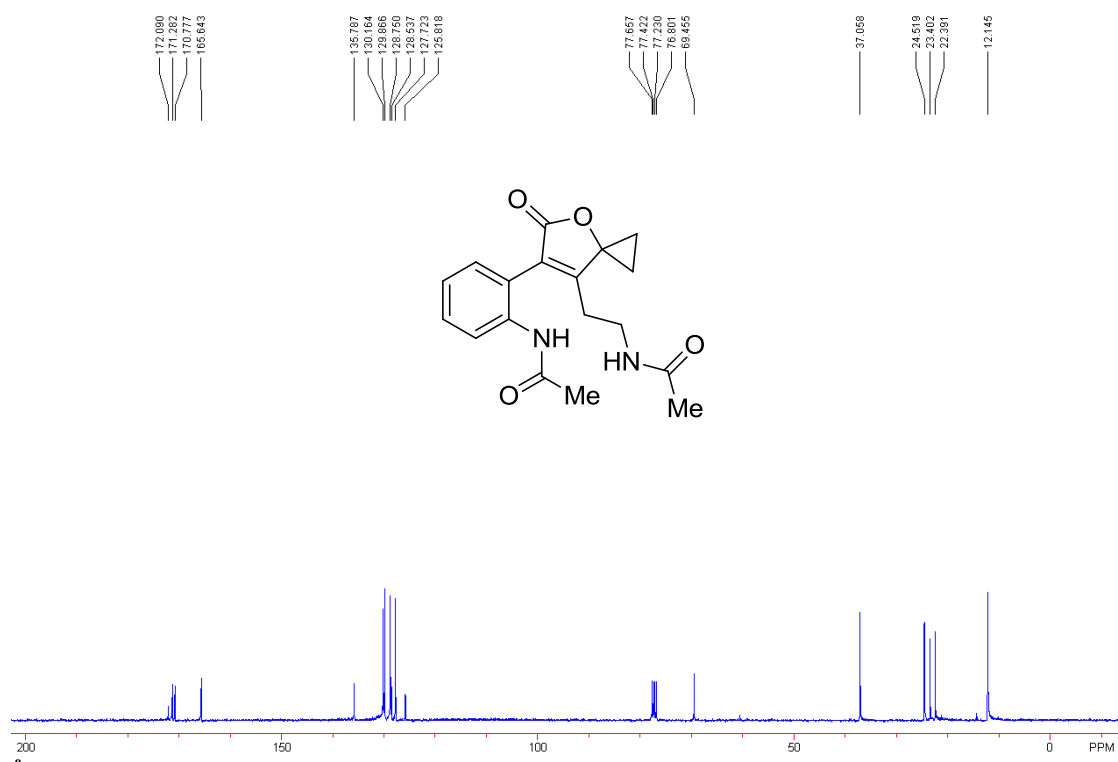
^{13}C NMR(CDCl₃)



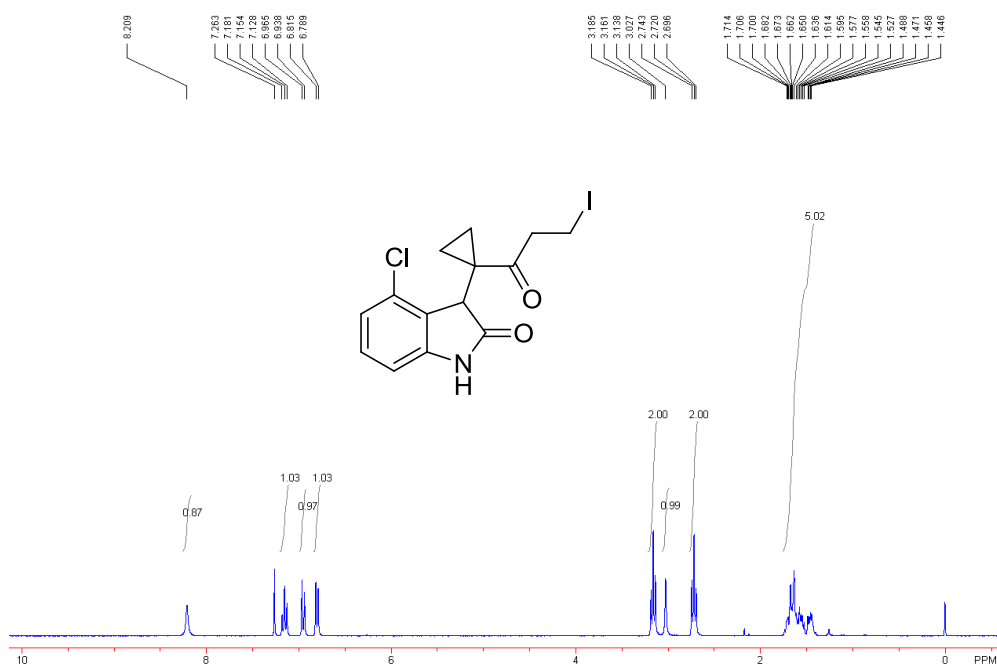
14-¹H NMR(CDCl₃)



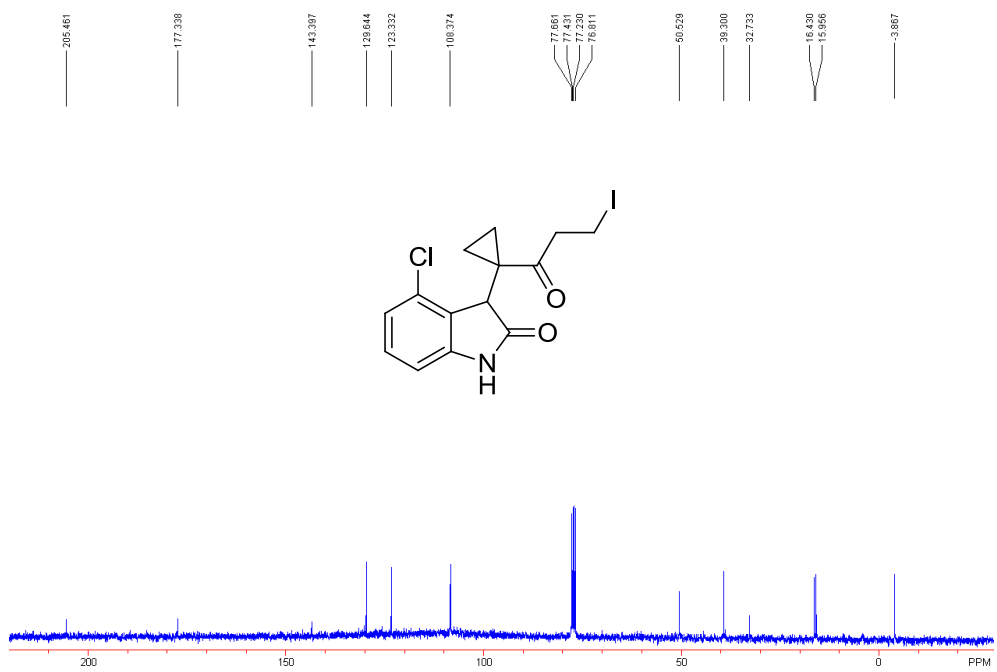
14-¹³C NMR(CDCl₃)



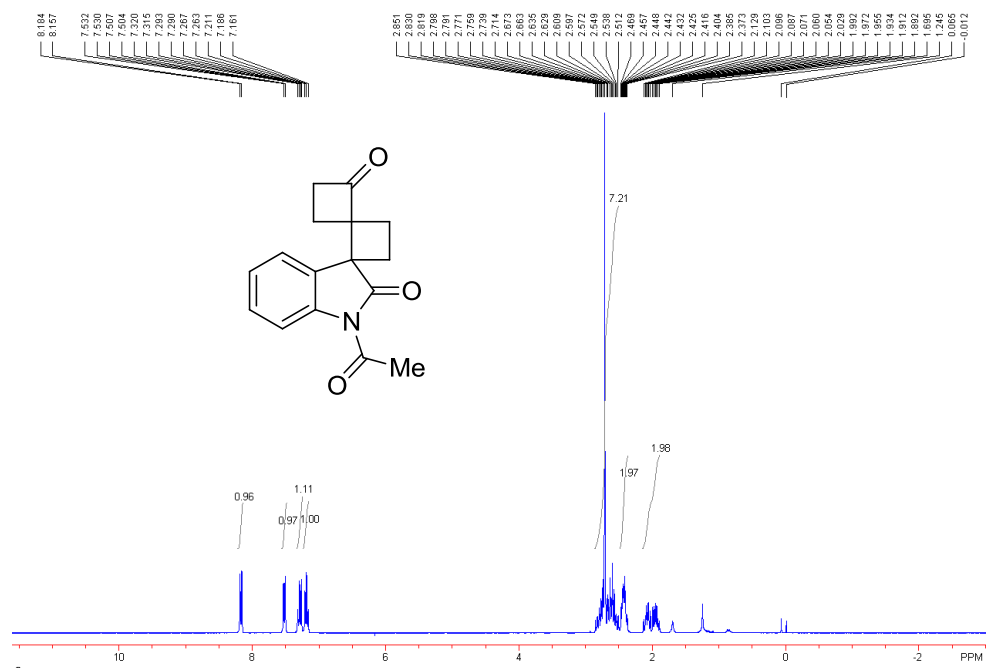
15-¹H NMR(CDCl₃)



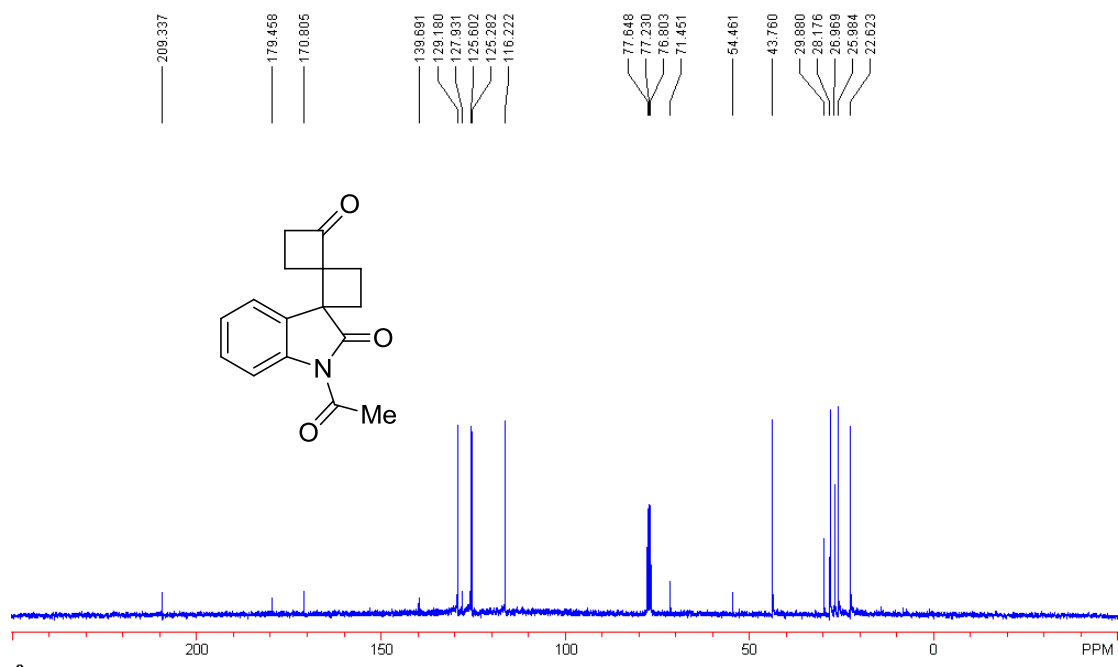
15-¹³C NMR(CDCl₃)



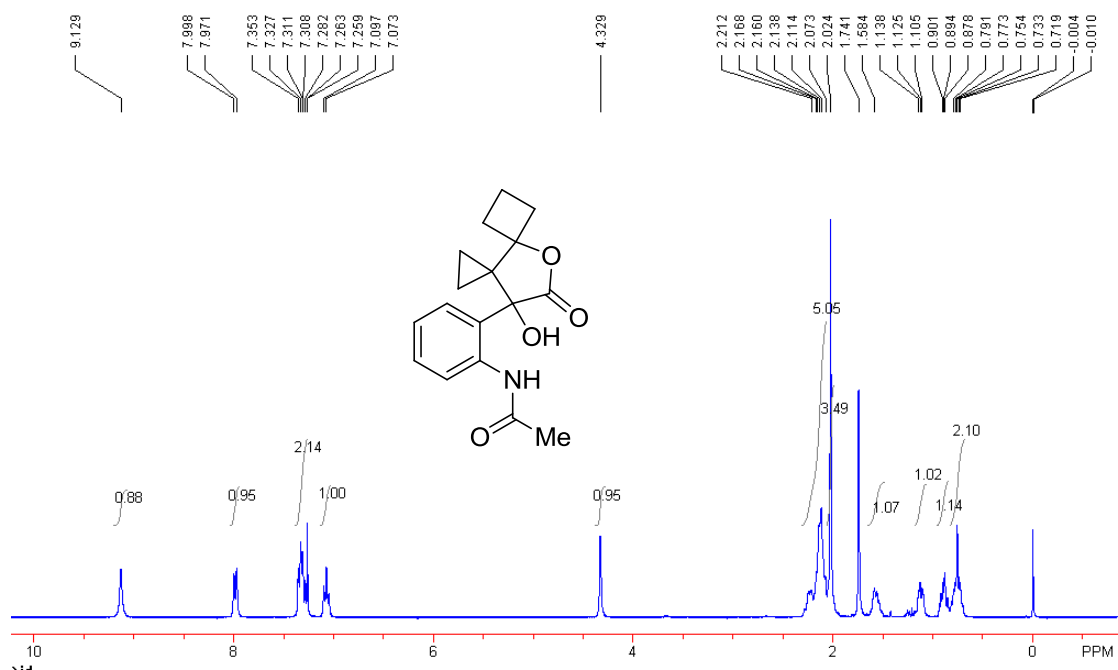
16-¹H NMR(CDCl₃)



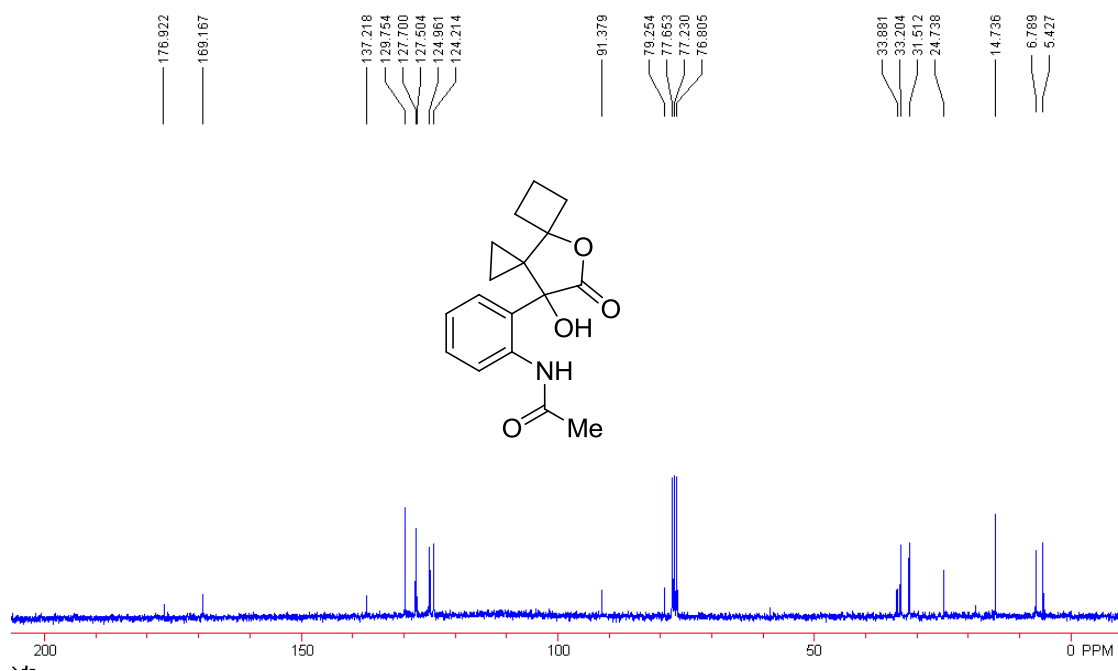
16-¹³C NMR(CDCl₃)



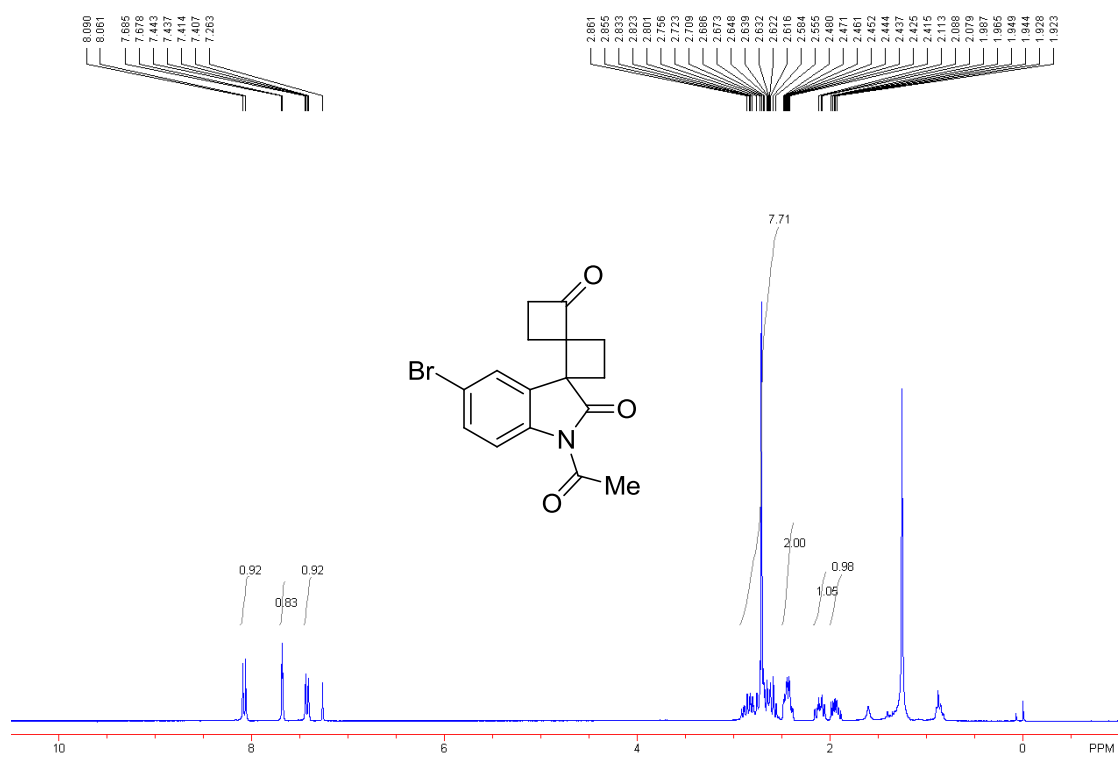
$^{17}\text{-}^1\text{H NMR}(\text{CDCl}_3)$



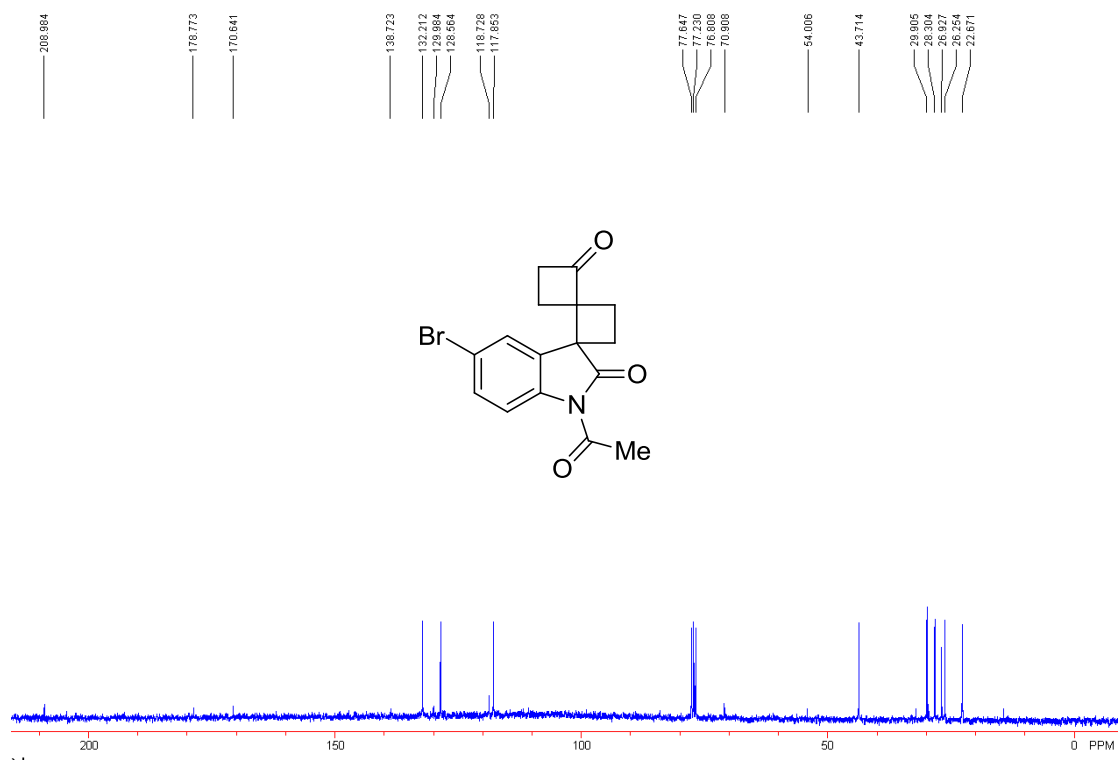
$^{17}\text{-}^{13}\text{C NMR}(\text{CDCl}_3)$



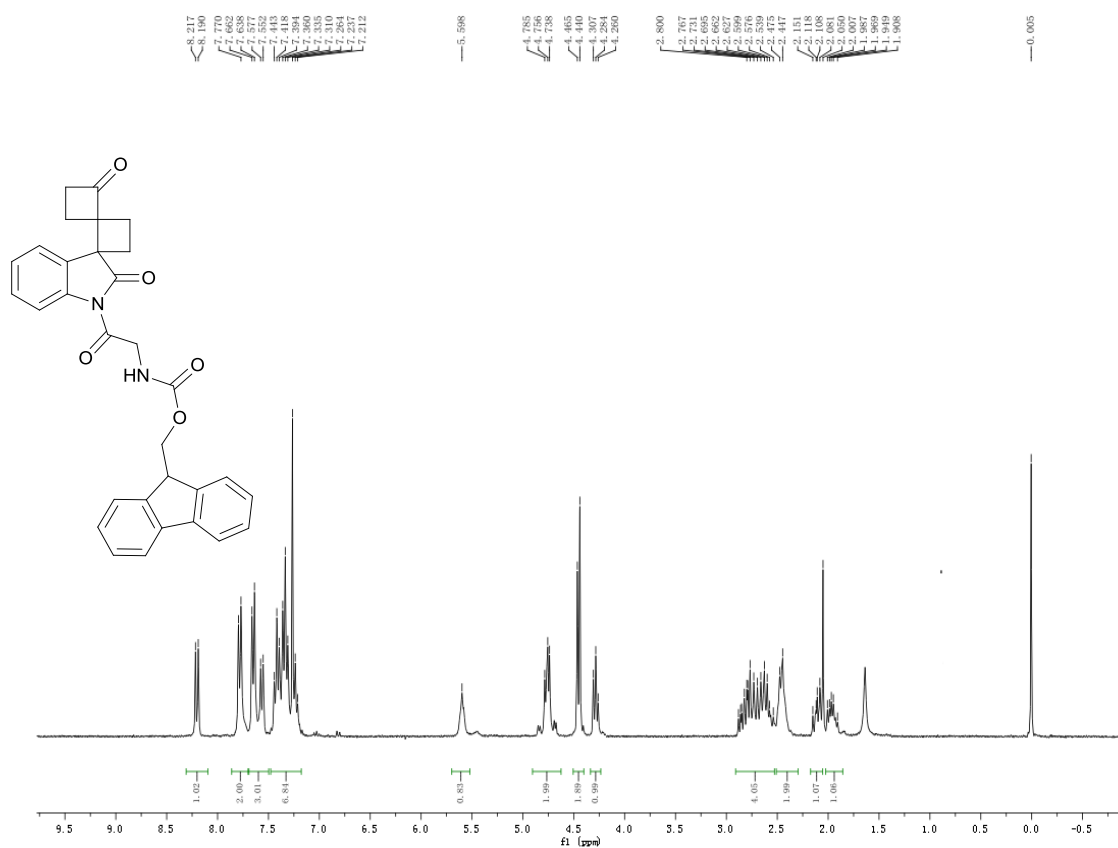
16c-¹H NMR(CDCl₃)



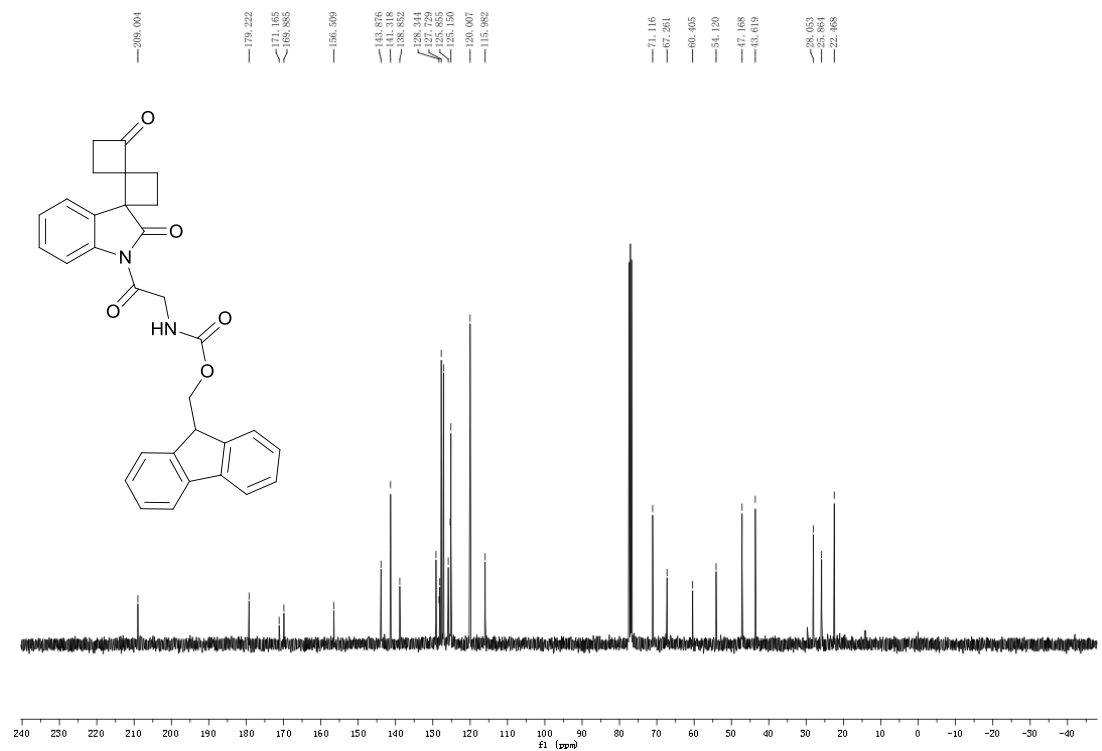
16c-¹³C NMR(CDCl₃)



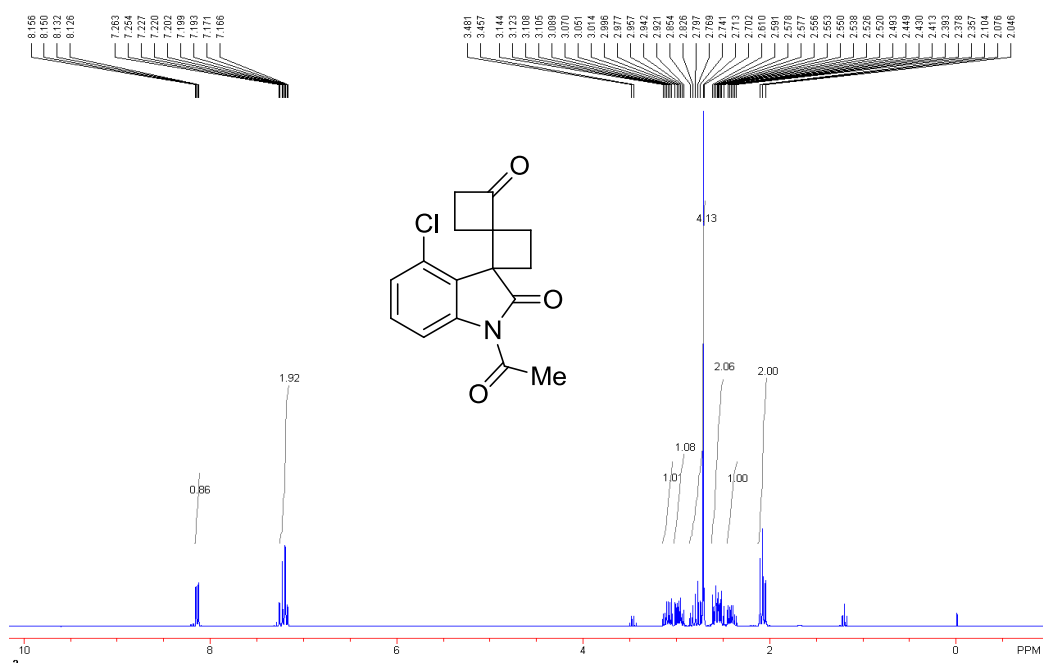
16e-¹H NMR(CDCl₃)



16e-¹³C NMR(CDCl₃)



16f-¹H NMR(CDCl₃)



16f-¹³C NMR(CDCl₃)

