

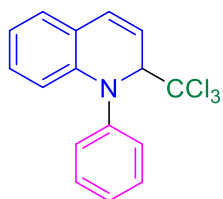
**THREE-COMPONENT REACTION OF ARYNES, QUINOLINES, AND
CHLOROFORM:**

TWO-STEP SYNTHESIS OF 2-QUINOLINONES FROM QUINOLINES

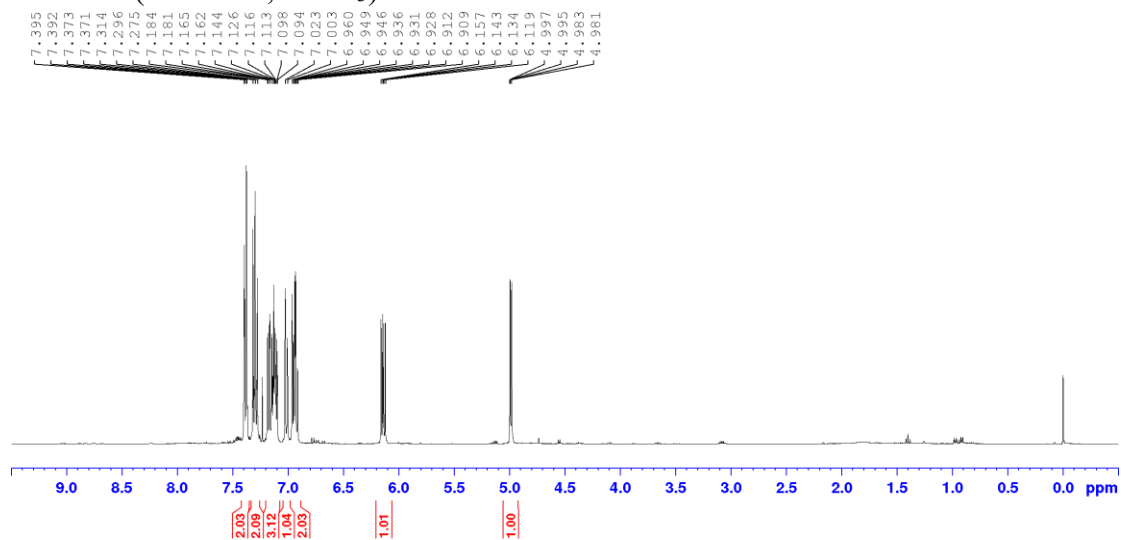
Kentaro Okuma, Yuxuan Qu, and N. Nagahora
Department of Chemistry, Fukuoka university, Jonan-ku,
Fukuoka 814-0180, Japan

¹H NMR and ¹³C NMR chart

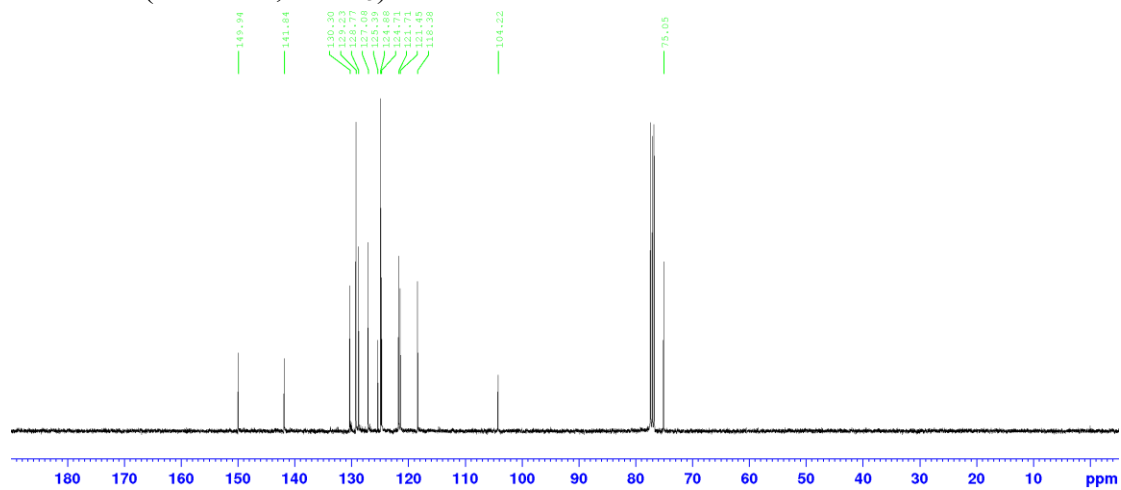
^1H NMR and ^{13}C NMR of the products
1-phenyl-2-(trichloromethyl)-1,2-dihydroquinoline **3a**



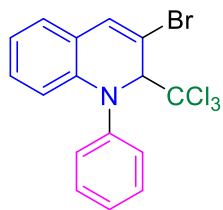
^1H NMR (400 MHz, CDCl_3) **3a**



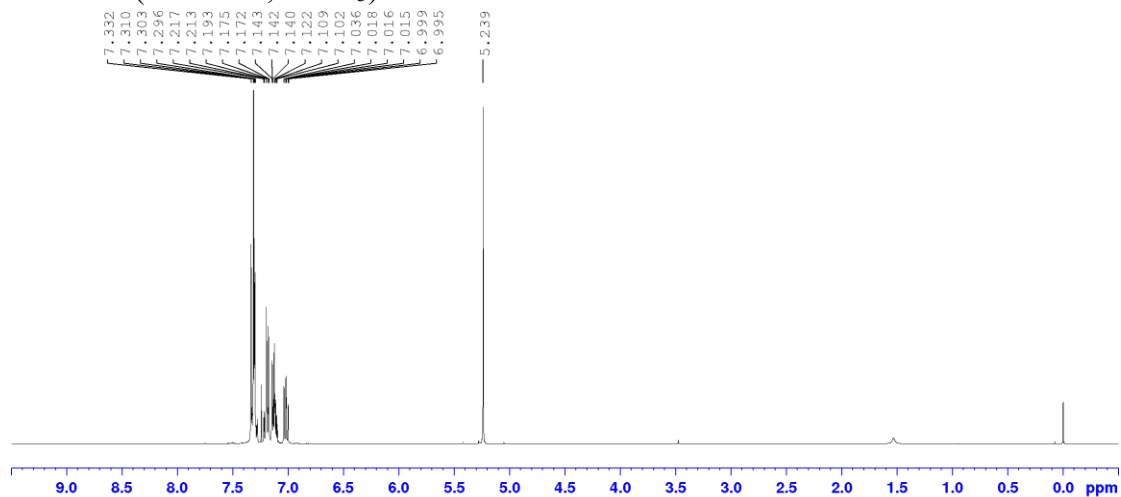
^{13}C NMR (101 MHz, CDCl_3) **3a**



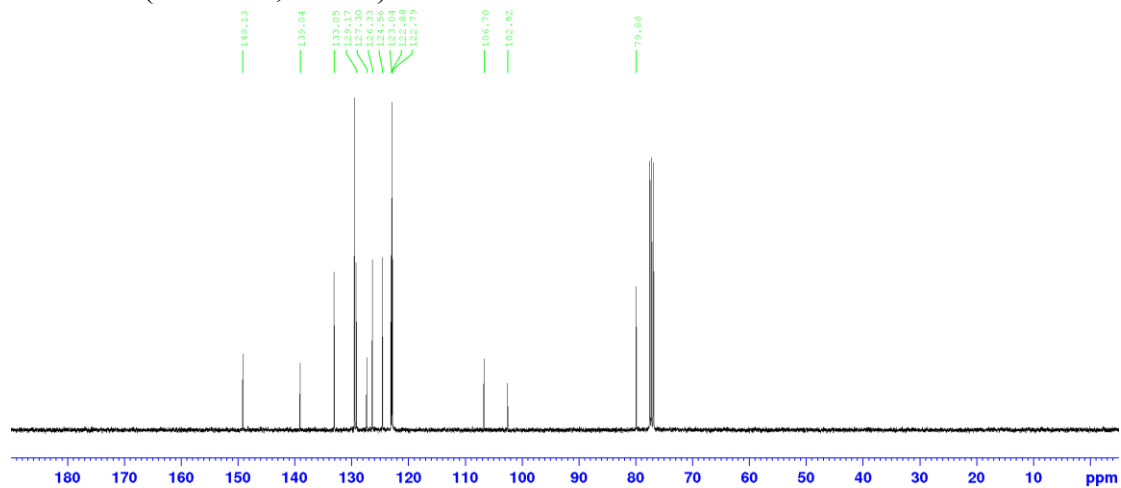
3-bromo-1-phenyl-2-(trichloromethyl)-1,2-dihydroquinoline **3b**



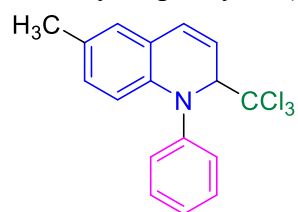
^1H NMR (400 MHz, CDCl_3) **3b**



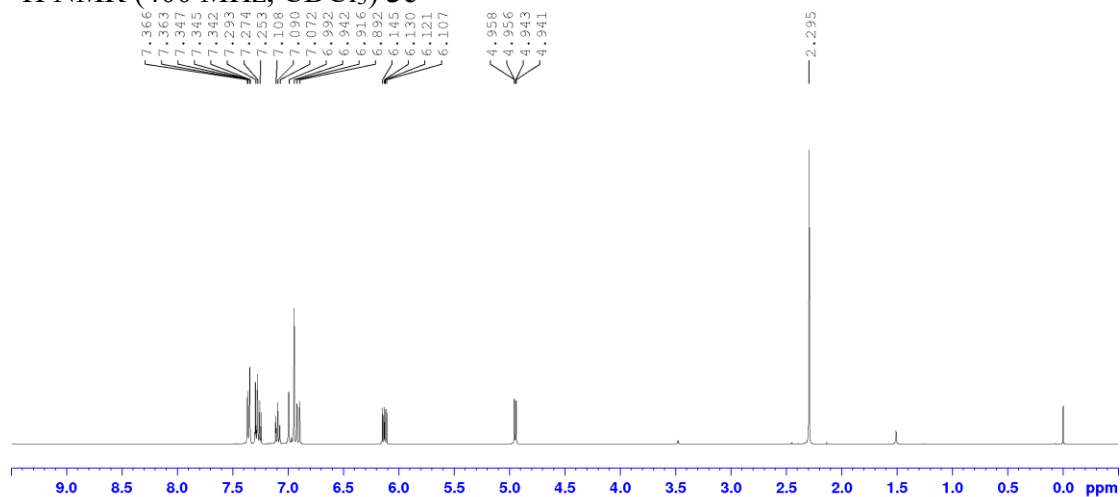
^{13}C NMR (101 MHz, CDCl_3) **3b**



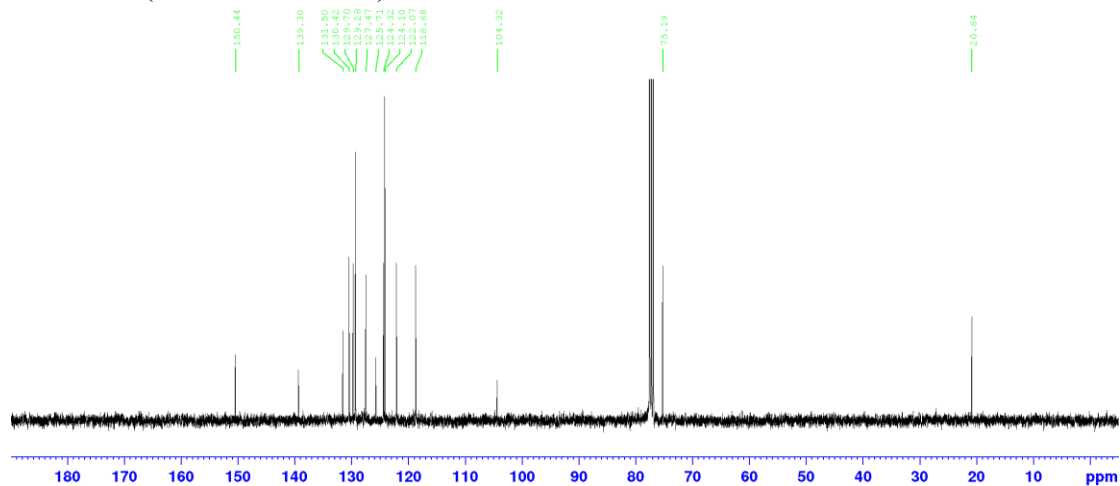
6-methyl-1-phenyl-2-(trichloromethyl)-1,2-dihydroquinoline **3c**



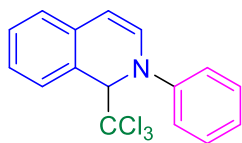
$^1\text{H NMR}$ (400 MHz, CDCl_3) **3c**



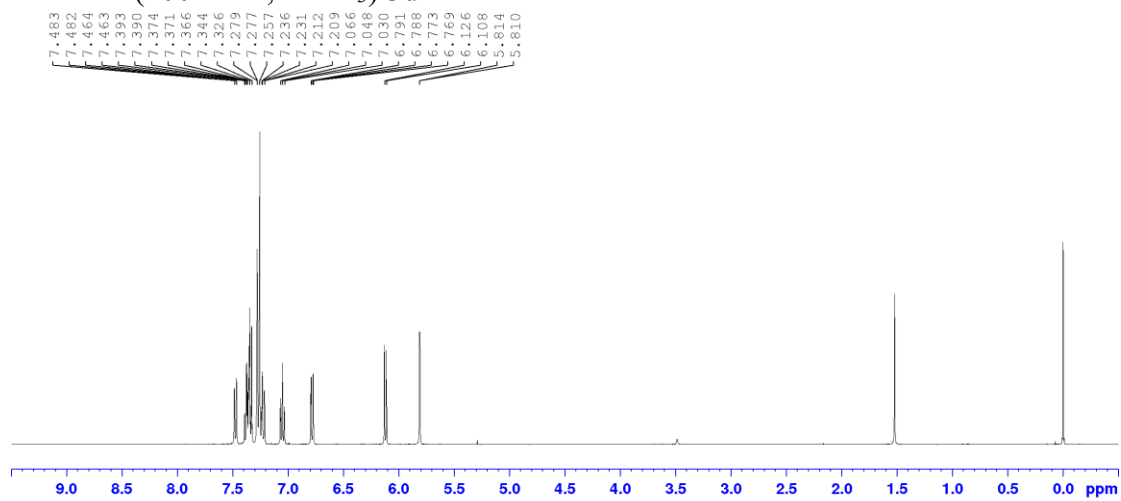
$^{13}\text{C NMR}$ (101 MHz, CDCl_3) **3c**



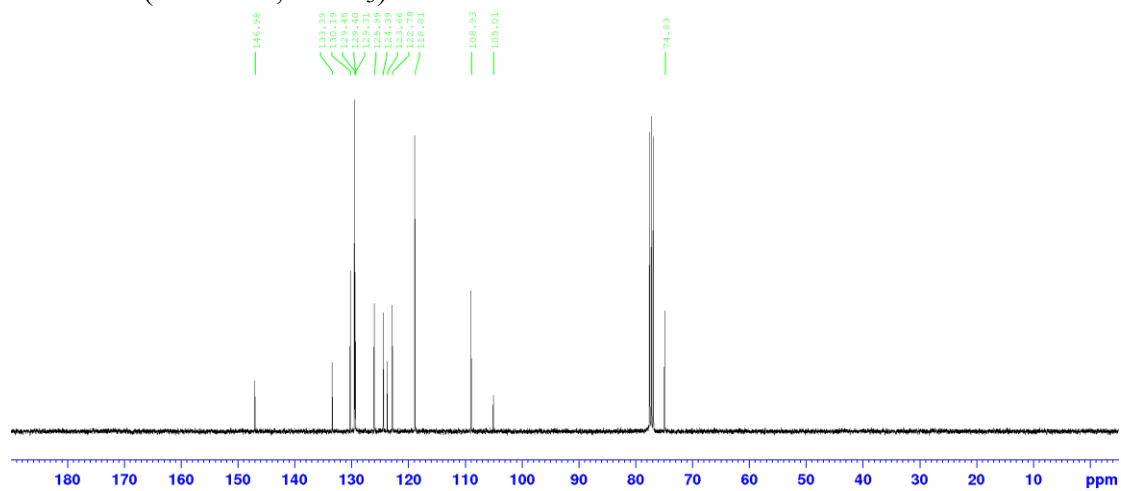
2-phenyl-1-(trichloromethyl)-1,2-dihydroisoquinoline **3d**



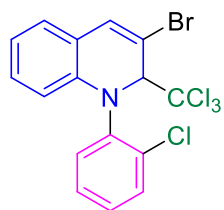
¹H NMR (400 MHz, CDCl₃) **3d**



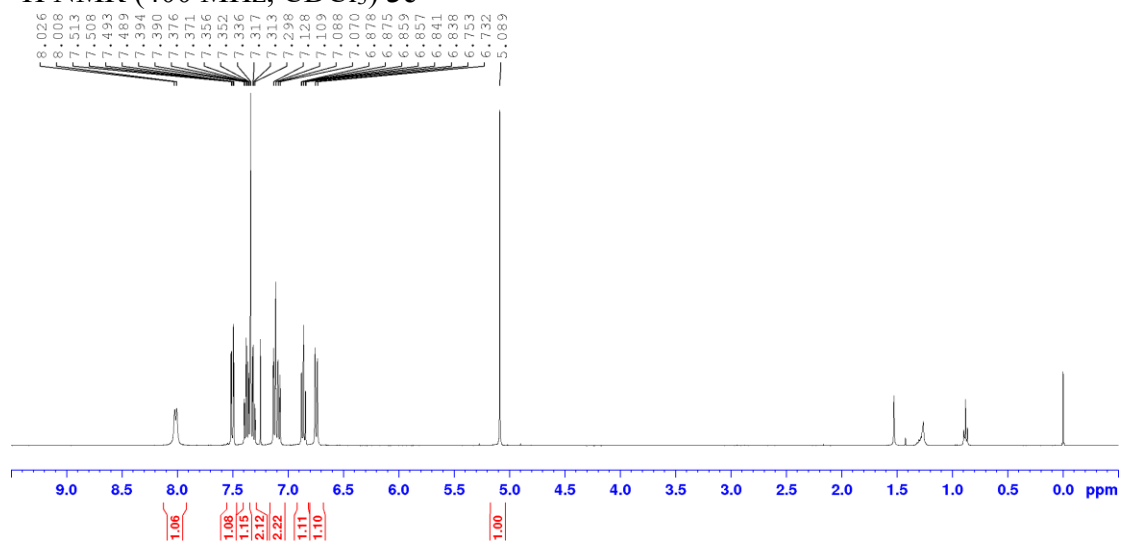
¹³C NMR (101 MHz, CDCl₃) **3d**



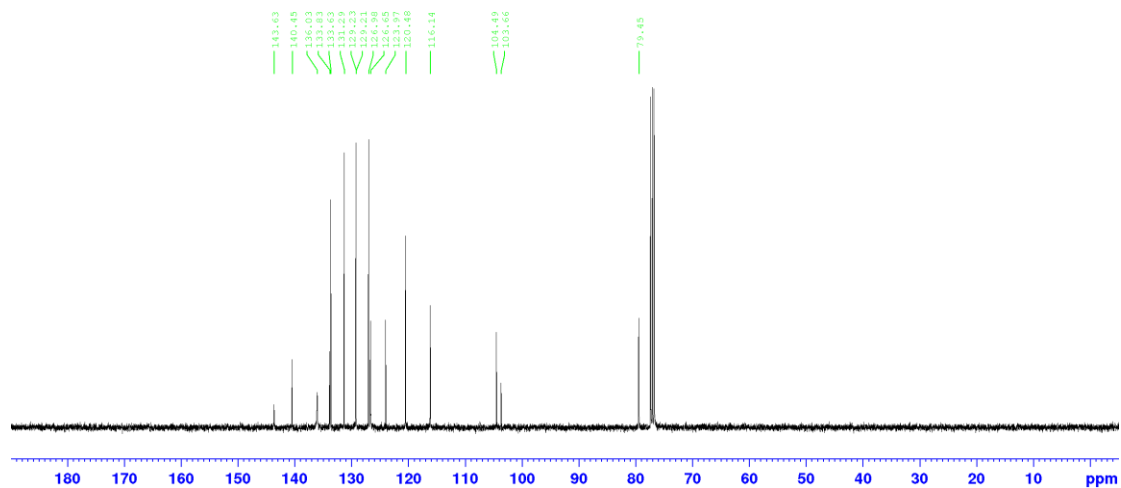
1-(2-chlorophenyl)-2-trichloromethyl-1,2-dihydroquinoline **3e**



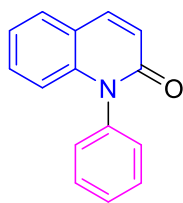
^1H NMR (400 MHz, CDCl_3) **3e**



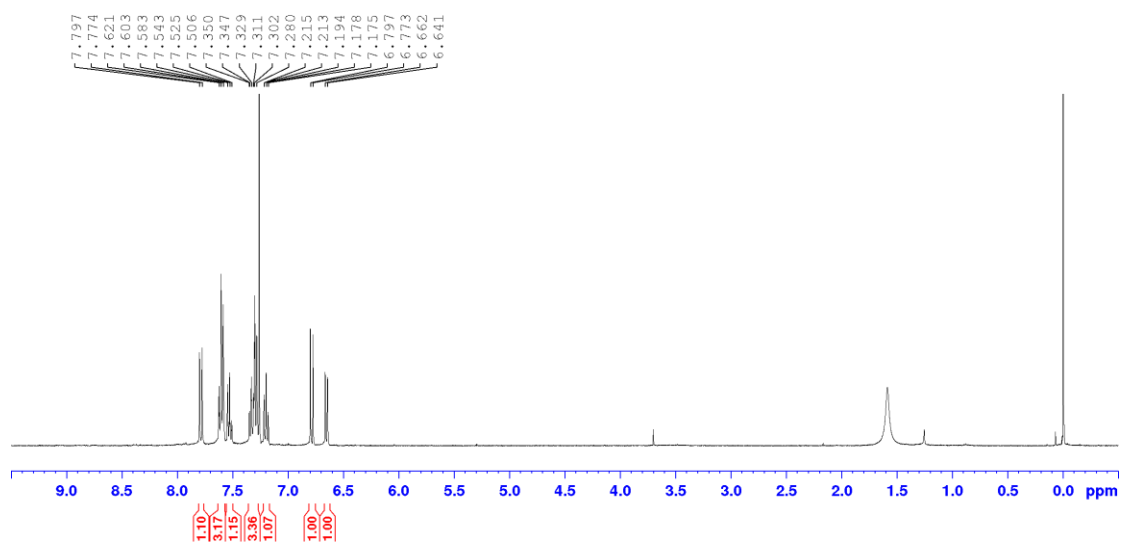
^{13}C NMR (101 MHz, CDCl_3) **3e**



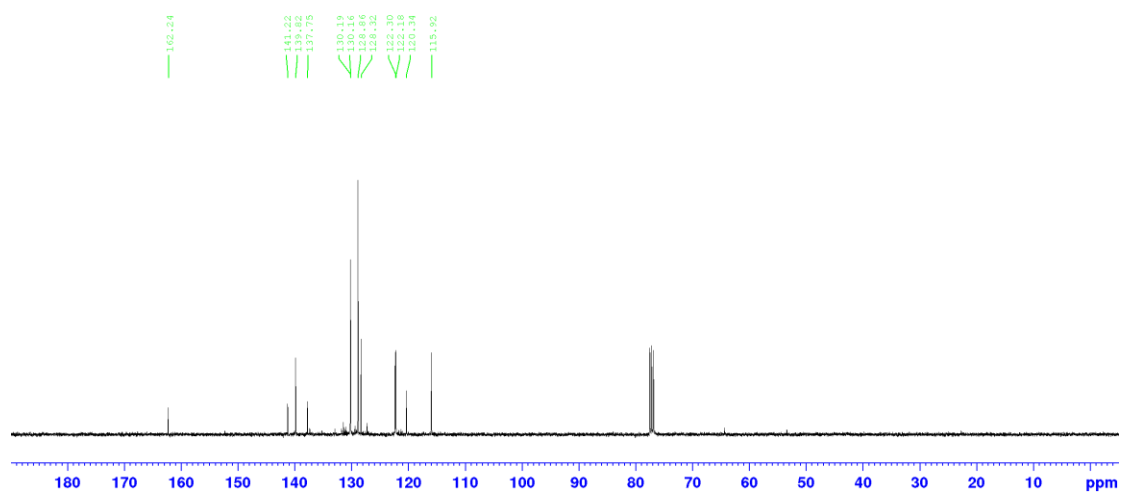
1-phenyl-2-quinolinone **4a**



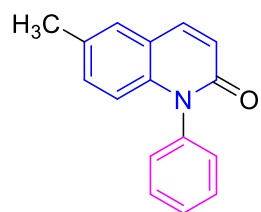
¹H NMR (400 MHz, CDCl₃) **4a**



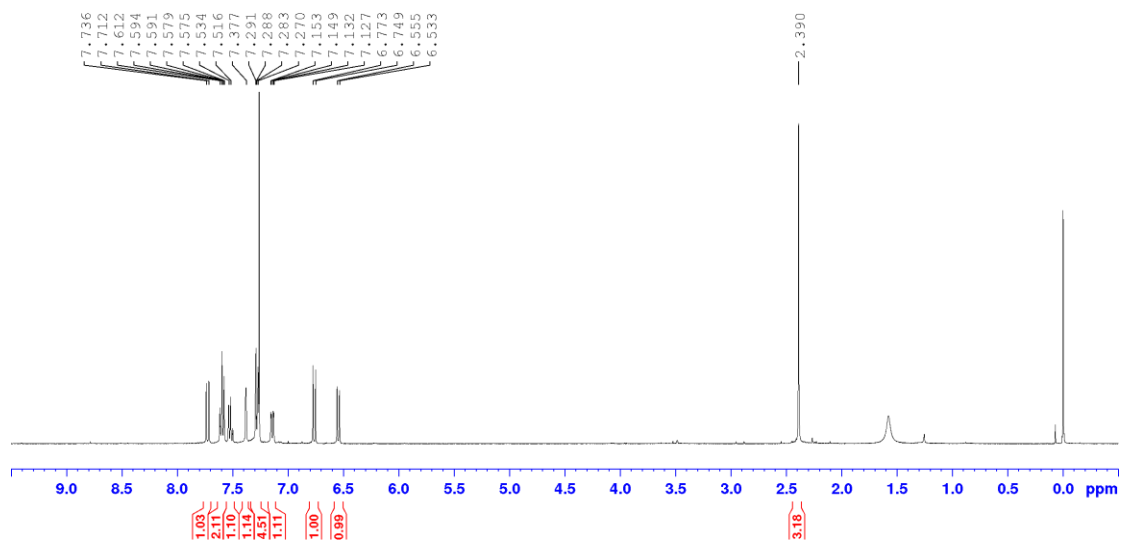
¹³C NMR (101 MHz, CDCl₃) **4a**



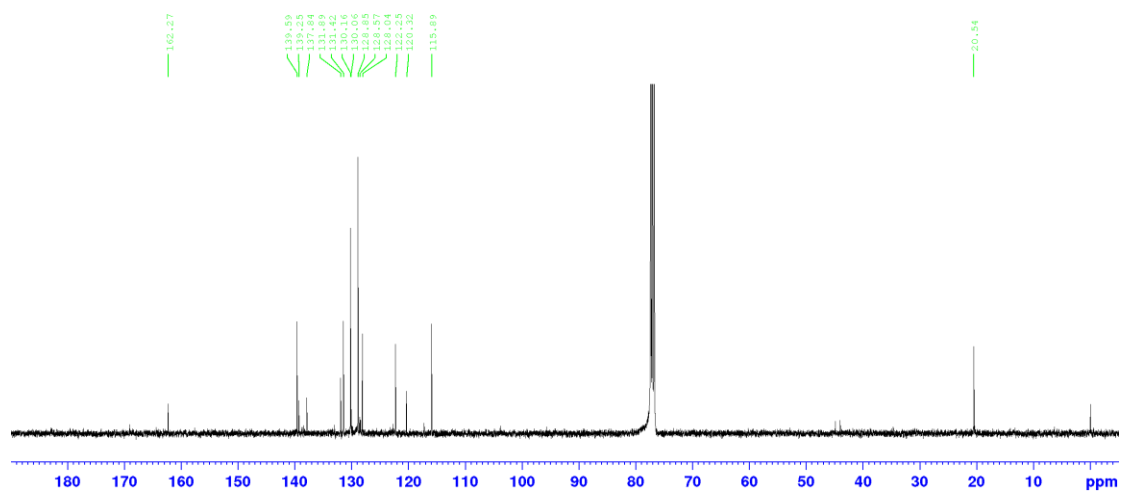
6-methyl-1-phenylquinolin-2(1H)-one **4c**



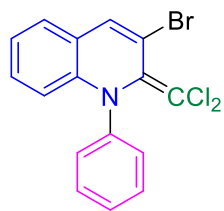
^1H NMR (400 MHz, CDCl_3) **4c**



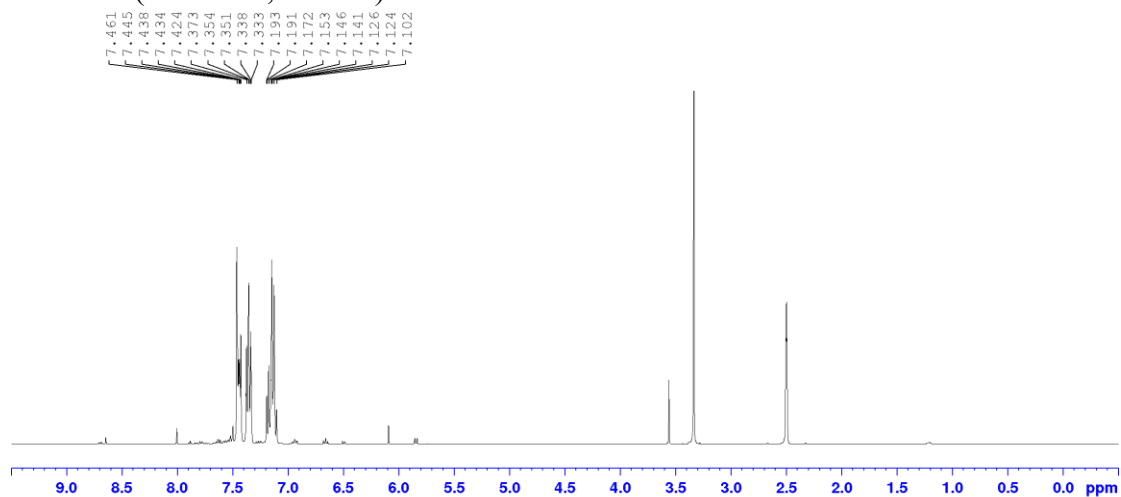
^{13}C NMR (101 MHz, CDCl_3) **4c**



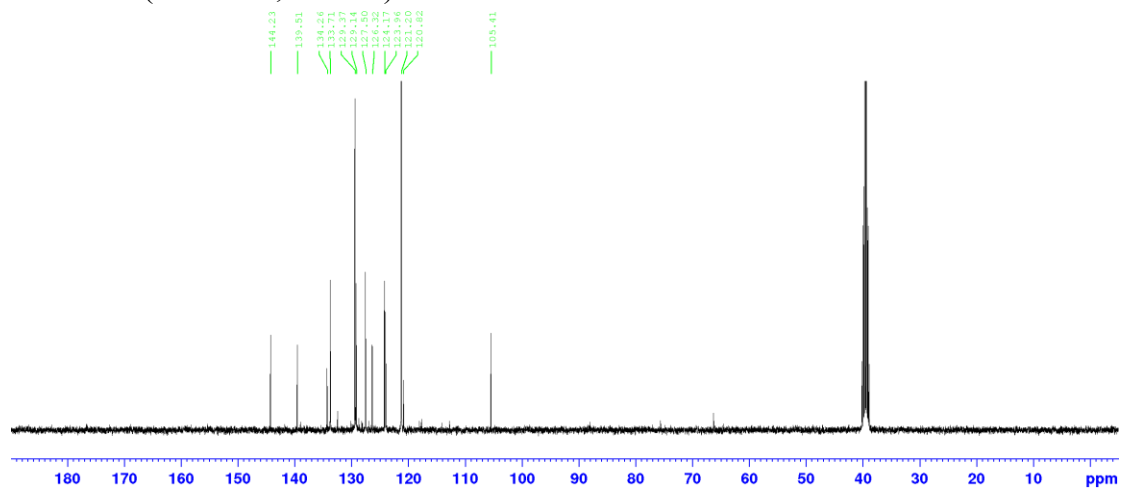
3-bromo-2-(dichloromethylene)-1-phenyl-1,2-dihydroquinoline **5b**



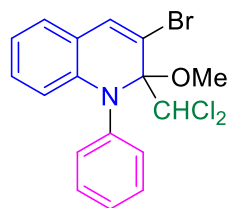
^1H NMR (400 MHz, DMSO) **5b**



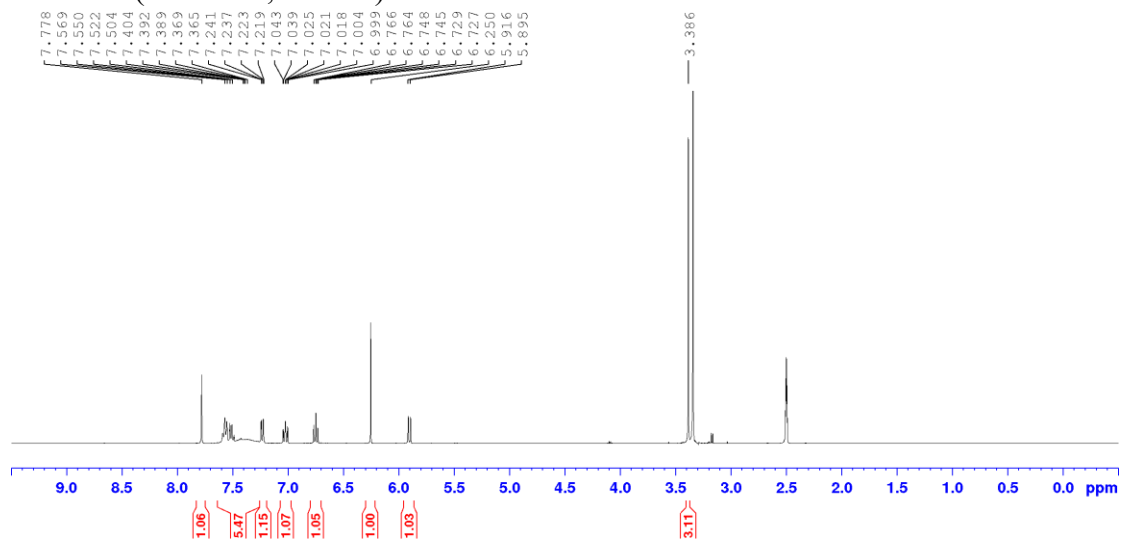
^{13}C NMR (101 MHz, DMSO) **5b**



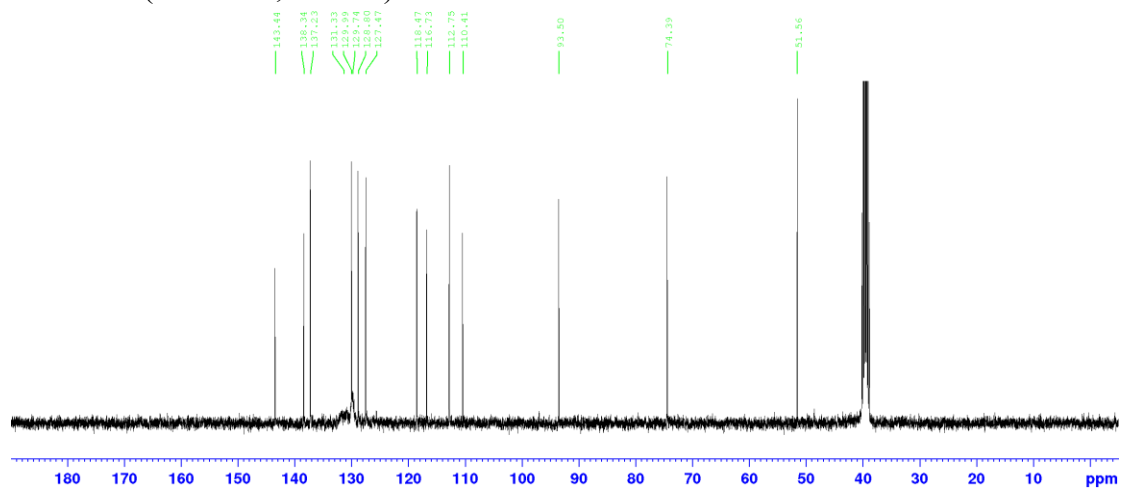
3-bromo-2-(dichloromethyl)-2-methoxy-1-phenyl-1,2-dihydroquinoline **6**



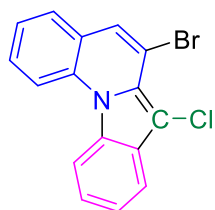
^1H NMR (400 MHz, DMSO) **6**



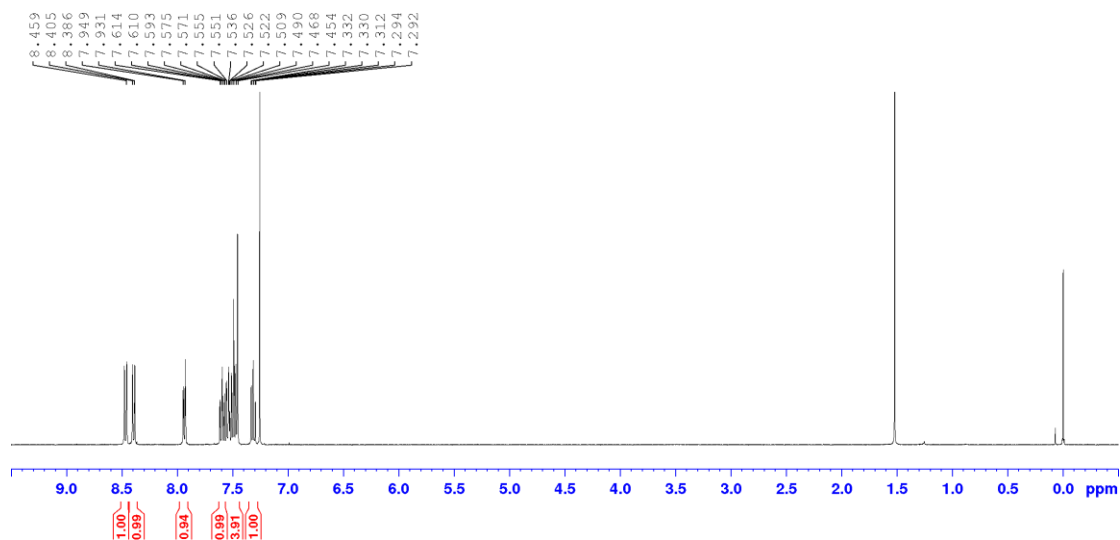
^{13}C NMR (101 MHz, DMSO) **6**



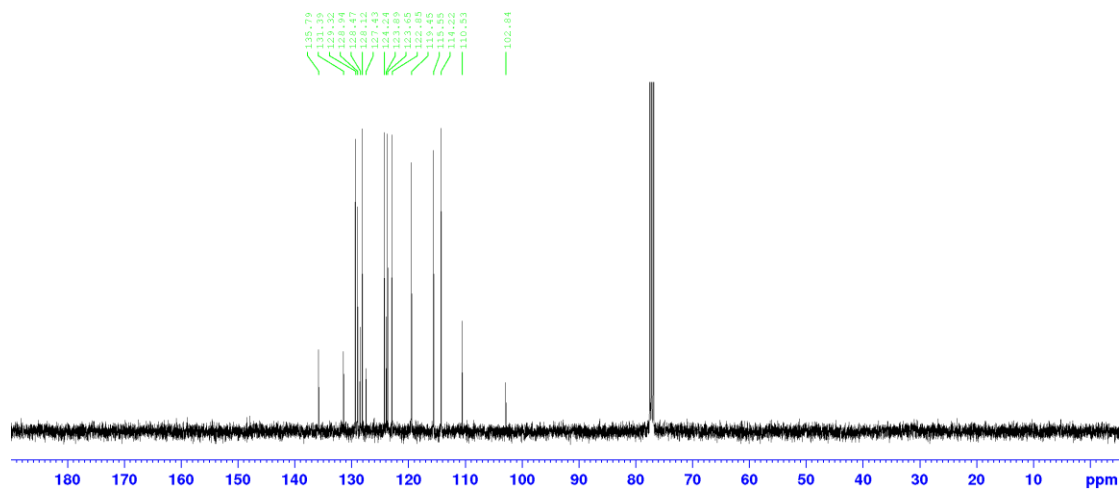
6-bromo-7-chloroindolo[1,2-a]quinolone 7



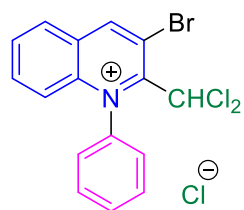
^1H NMR (400 MHz, CDCl_3) 7



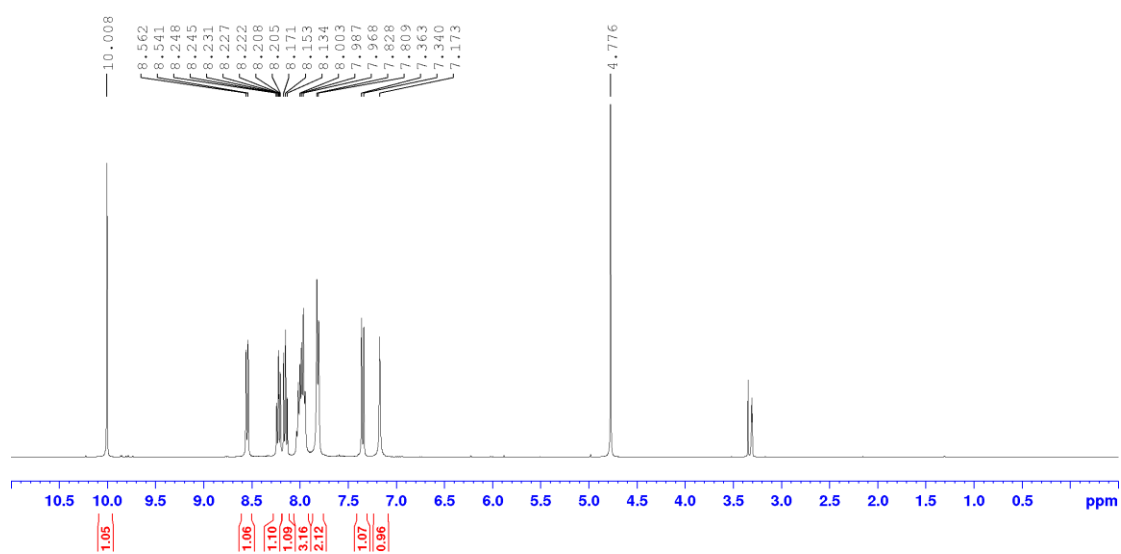
^{13}C NMR (101 MHz, CDCl_3) 7



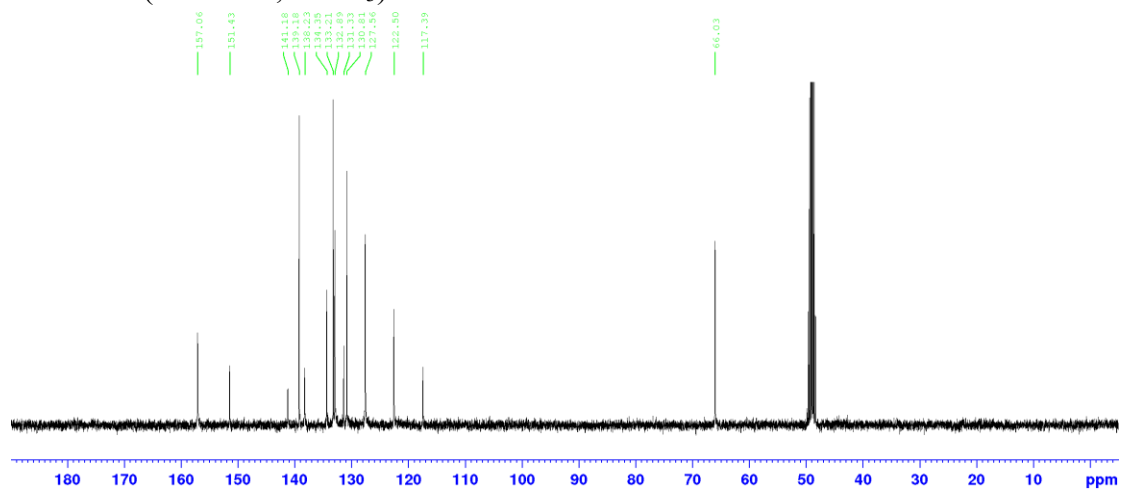
3-bromo-2-(dichloromethyl)-1-phenylquinolin-1-ium chloride **8**



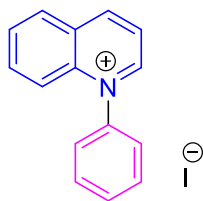
¹H NMR (400 MHz, CDCl₃) **8**



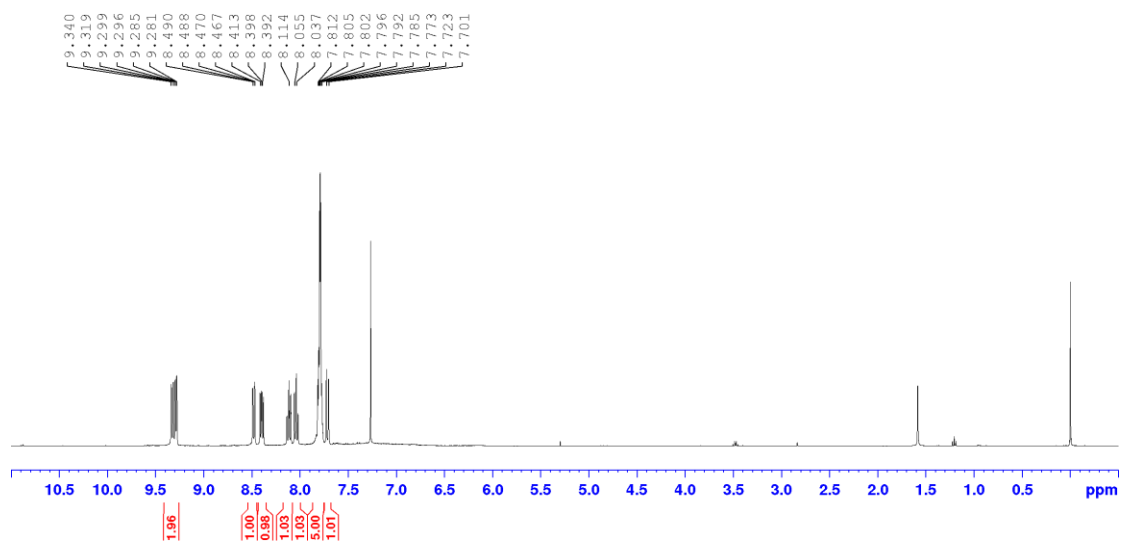
¹³C NMR (101 MHz, CDCl₃) **8**



1-phenylquinolin-1-ium iodide **9**



^1H NMR (400 MHz, CDCl_3) **9**



^{13}C NMR (101 MHz, CDCl_3) **9**

