Synthesis of β-Substituted Cyclic Enones via Phosphonium Salt-activated, Palladium-catalyzed Cross-coupling of Cyclic 1,3-Diones

Shyh-Ming Yang,* Gee-Hong Kuo, Michael D. Gaul, William V. Murray

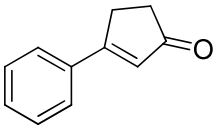
Cardiovascular and Metabolism Research, Janssen Research and Development, LLC, Welsh & McKean Roads, Spring House, PA 19477, United States

Contents

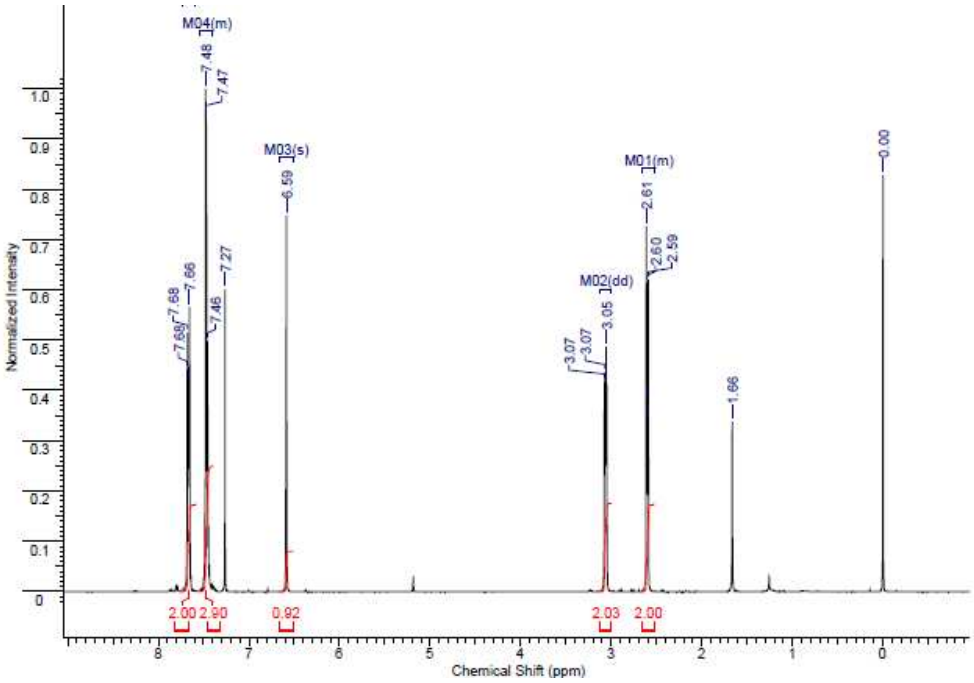
A. ^{1}H NMR and ^{13}C NMR ……..……..2-22

A. ^{1}H NMR and ^{13}C NMR

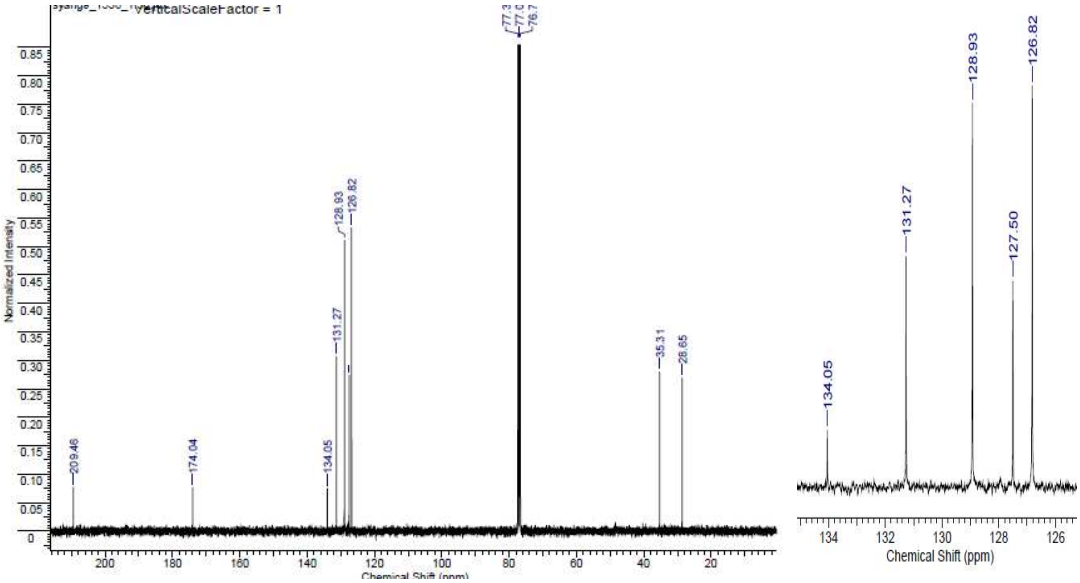
^{1}H NMR of **2a** ($CDCl_3$, 400 MHz)



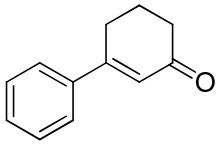
2a



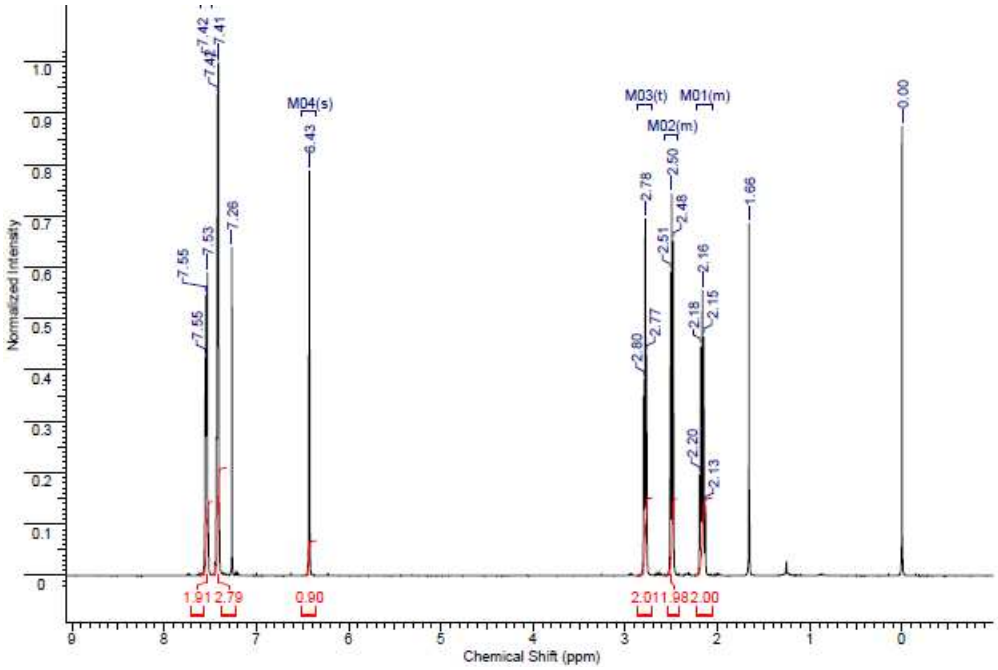
^{13}C NMR of **2a** ($CDCl_3$, 100 MHz)



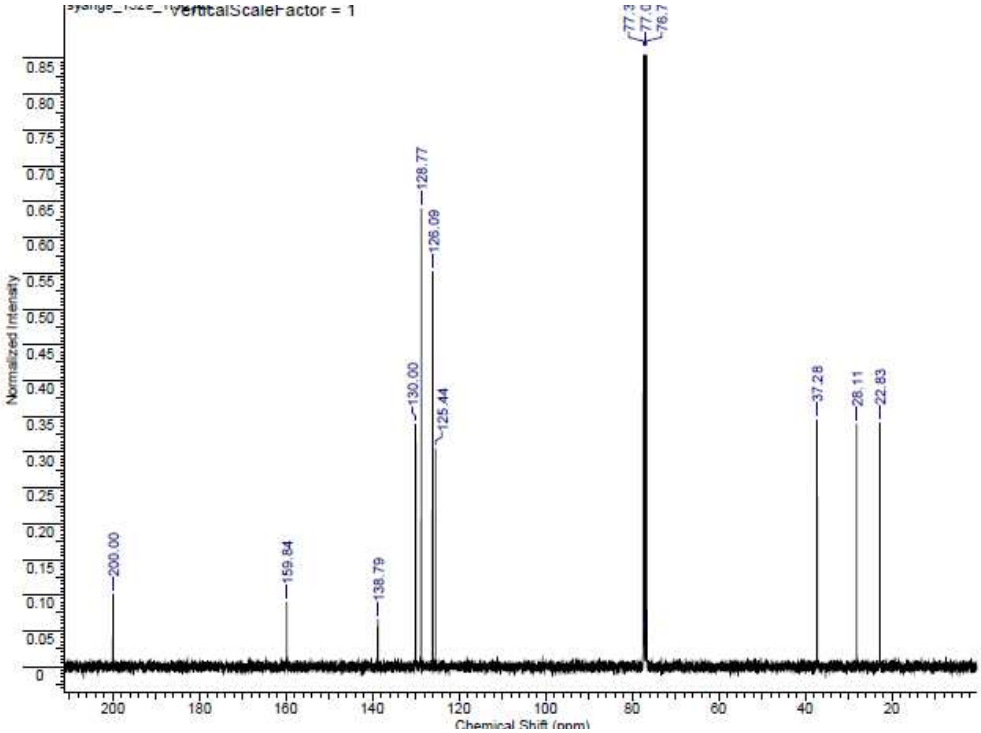
^{1}H NMR of **2b** ($CDCl_3$, 400 MHz)



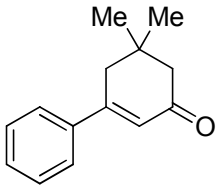
2b



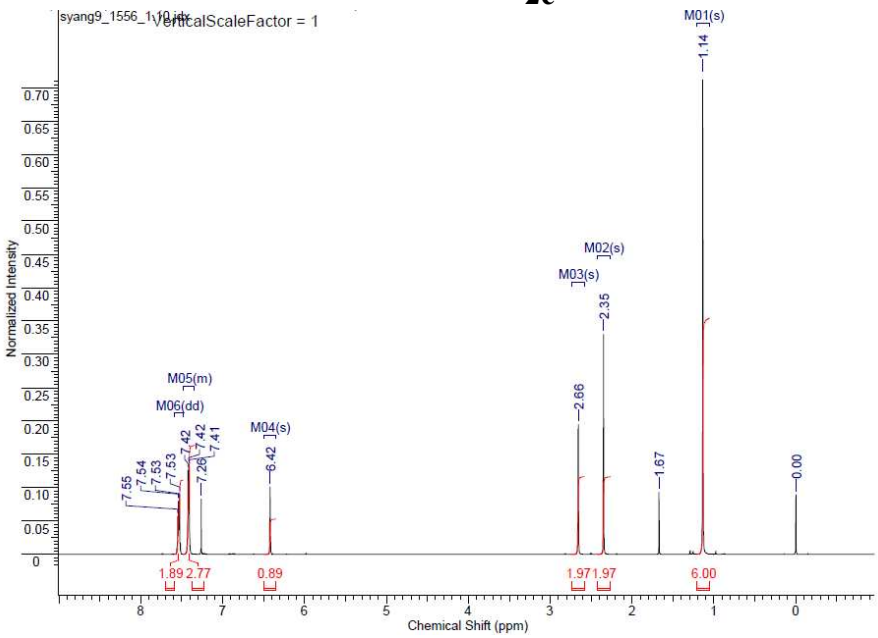
^{13}C NMR of **2b** ($CDCl_3$, 100 MHz)



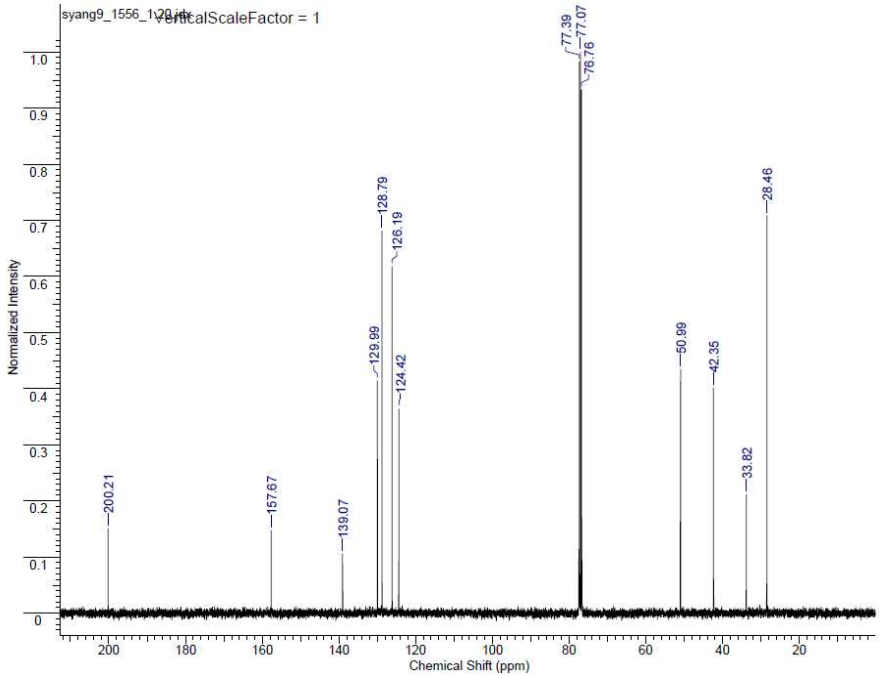
^{1}H NMR of **2c** ($CDCl_3$, 400 MHz)



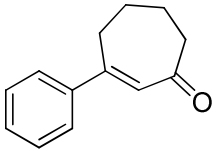
2c



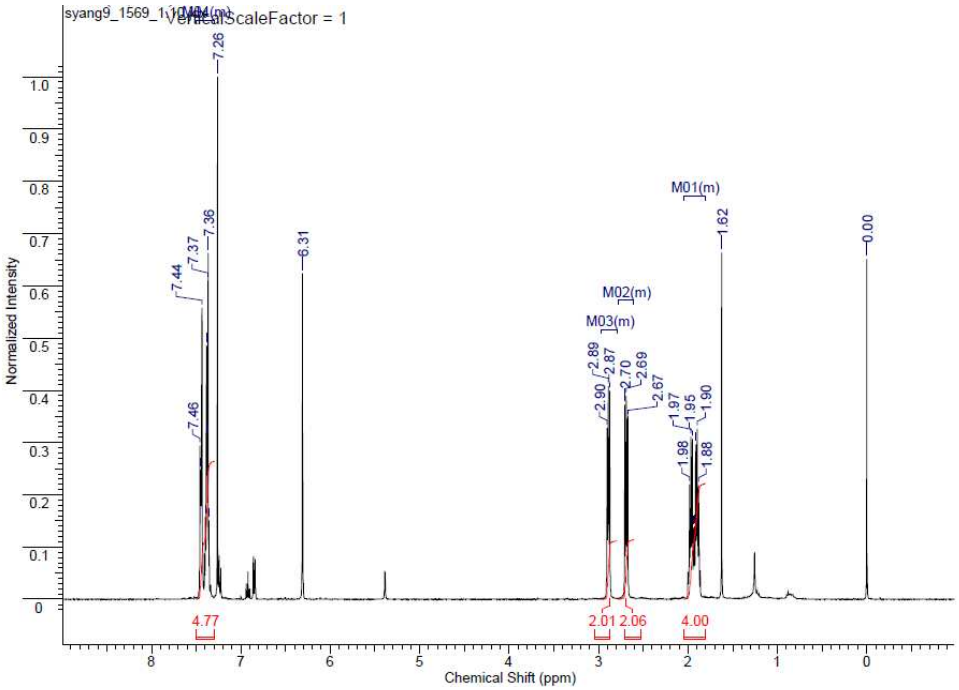
^{13}C NMR of **2c** ($CDCl_3$, 100 MHz)



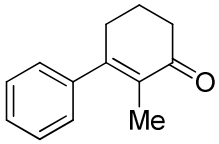
^{1}H NMR of **2d** ($CDCl_3$, 400 MHz) (ca. 85% purity)



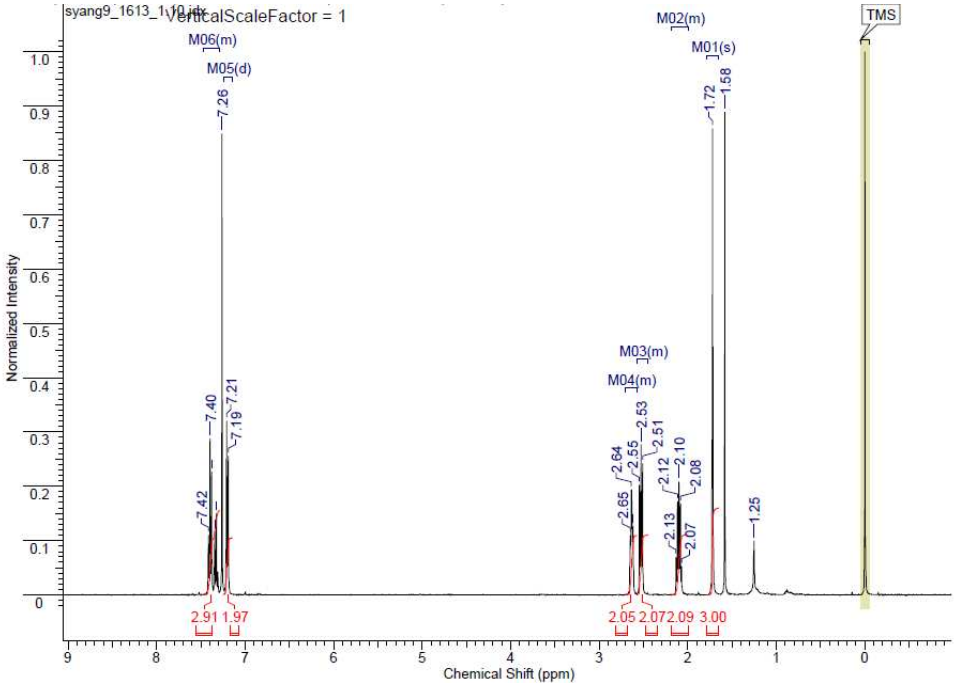
2d



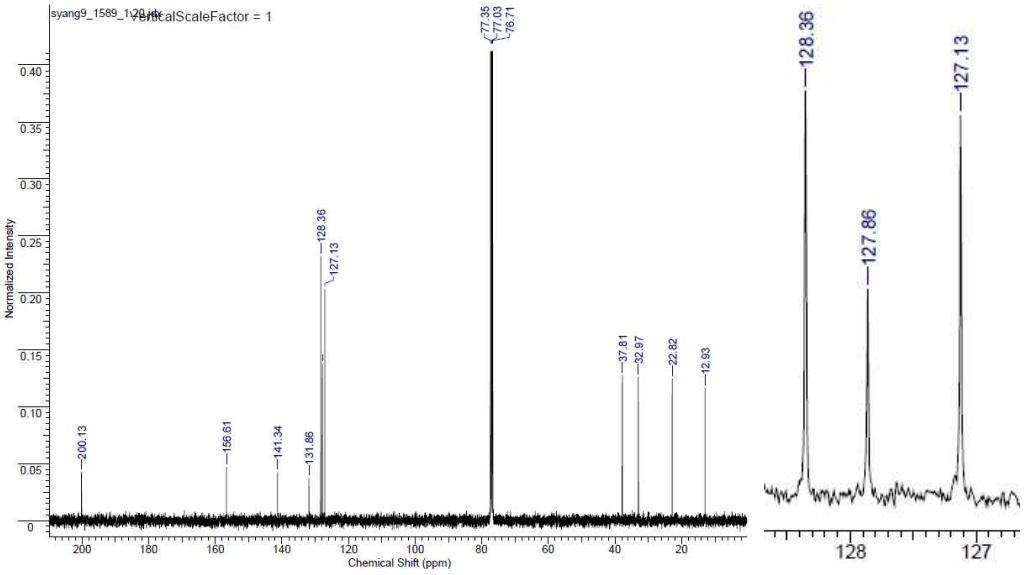
^{1}H NMR of **2e** ($CDCl_3$, 400 MHz)



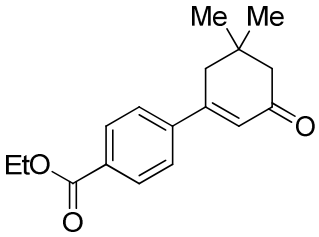
2e



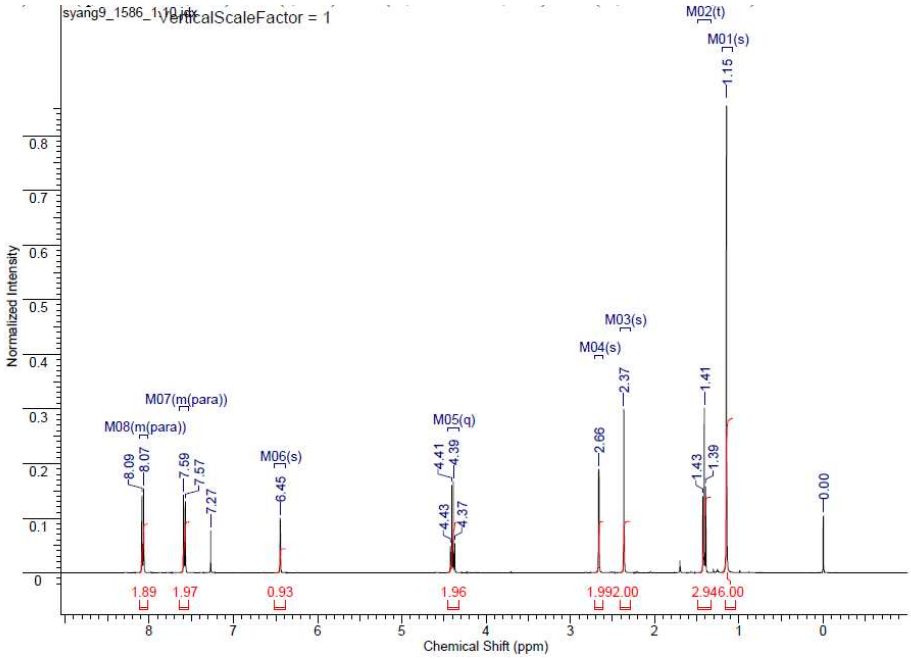
^{13}C NMR of **2e** ($CDCl_3$, 100 MHz)



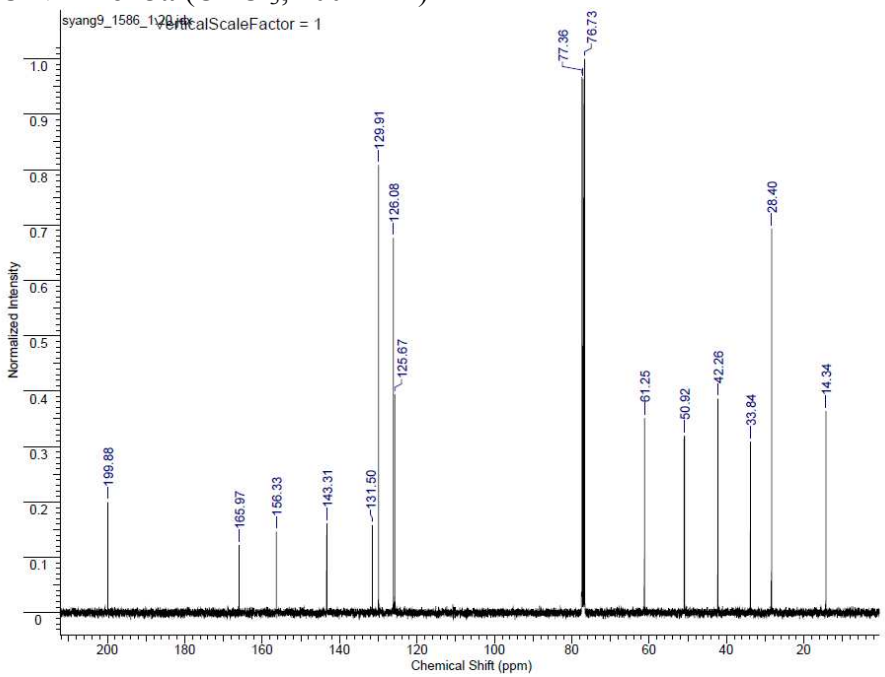
^{1}H NMR of **3a** ($CDCl_3$, 400 MHz)



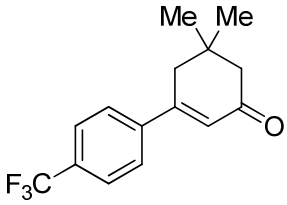
3a



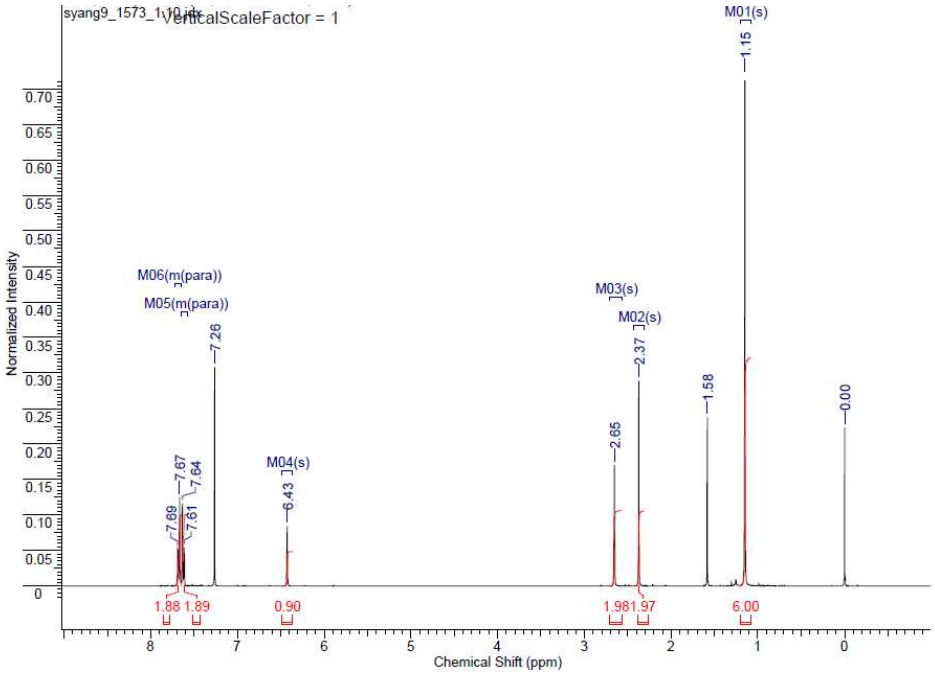
^{13}C NMR of **3a** ($CDCl_3$, 100 MHz)



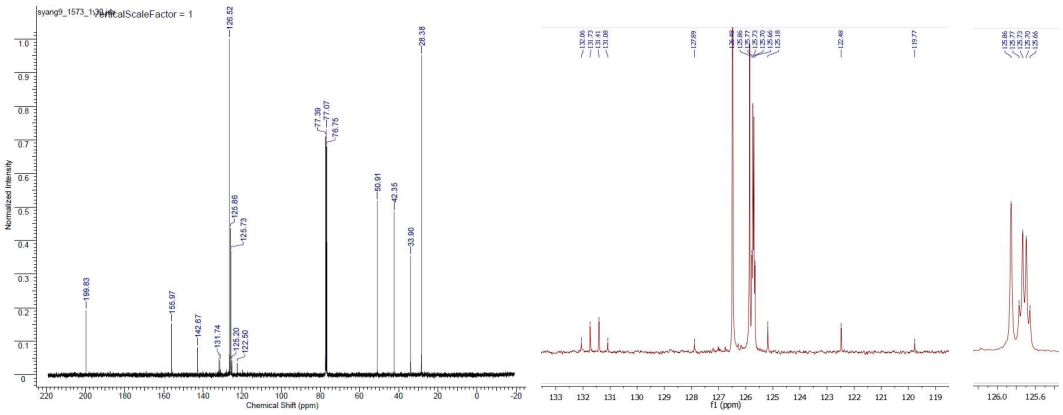
^{1}H NMR of **3b** ($CDCl_3$, 400 MHz)



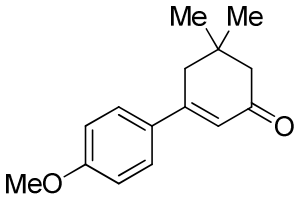
3b



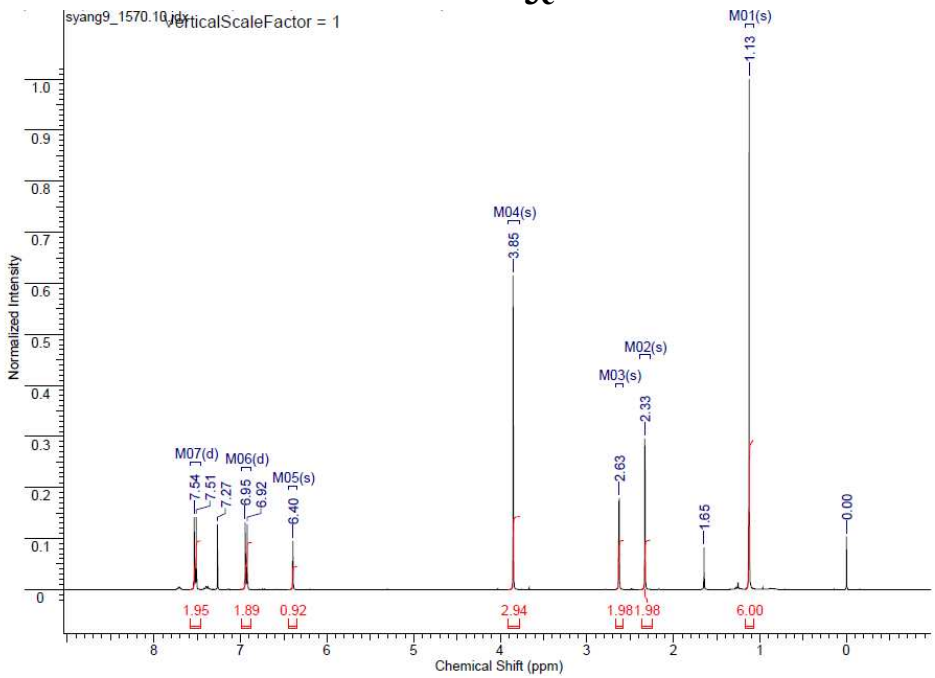
^{13}C NMR of **3b** ($CDCl_3$, 100 MHz)



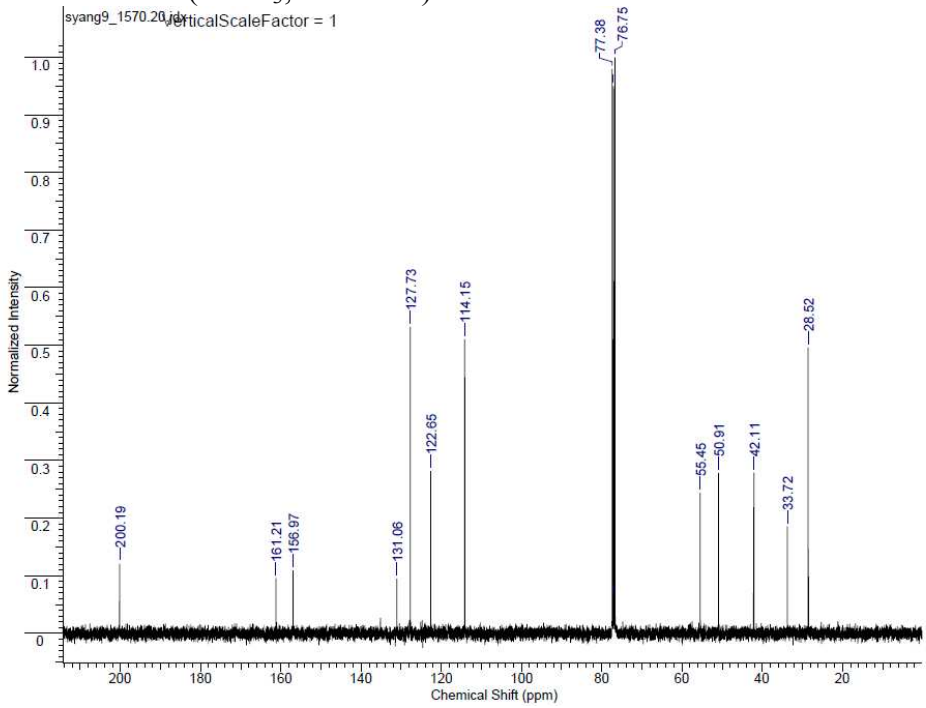
^{1}H NMR of **3c** ($CDCl_3$, 400 MHz)



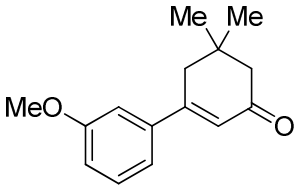
3c



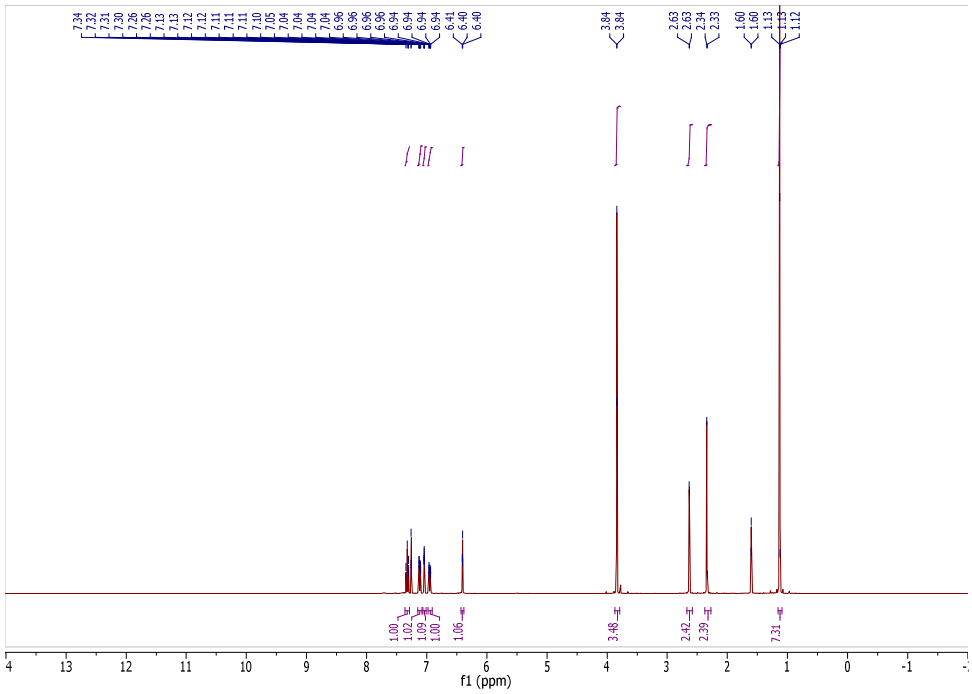
^{13}C NMR of **3c** ($CDCl_3$, 100 MHz)



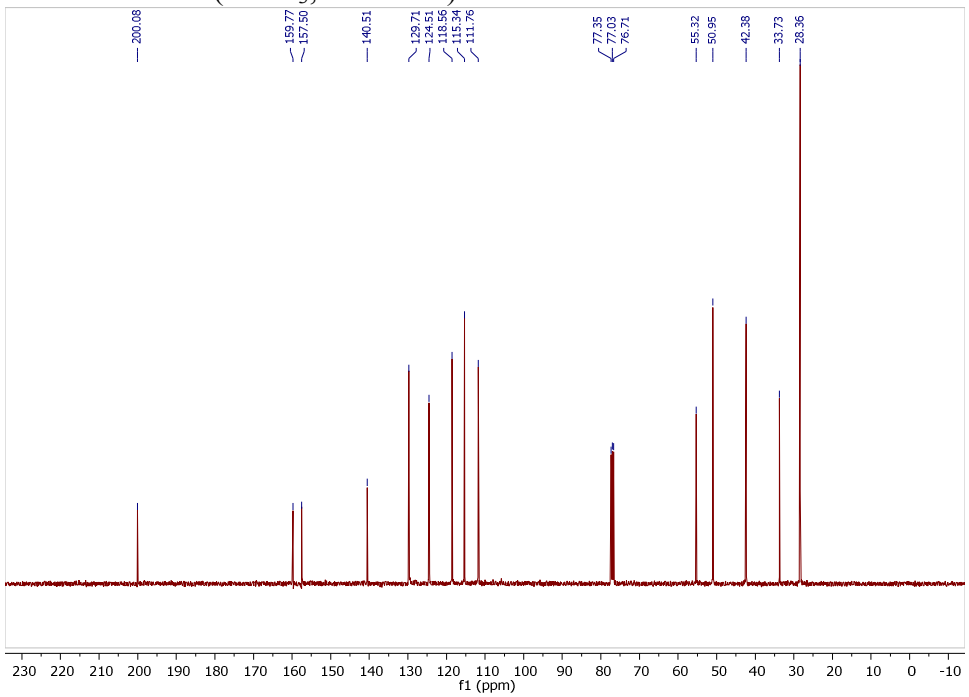
^{1}H NMR of **3d** ($CDCl_3$, 400 MHz)



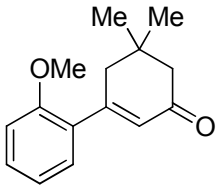
3d



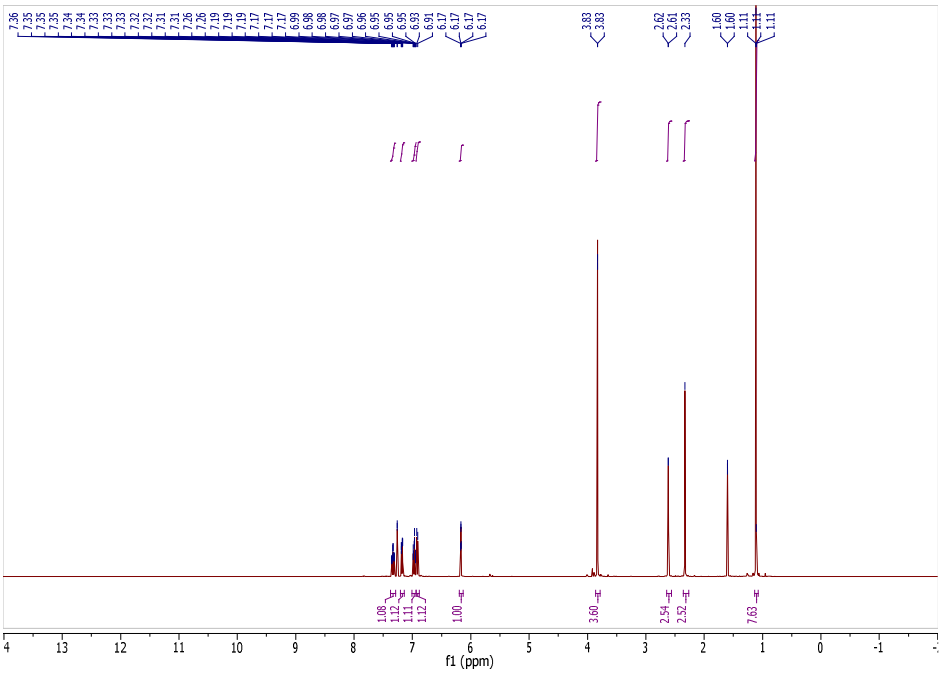
^{13}C NMR of **3d** ($CDCl_3$, 100 MHz)



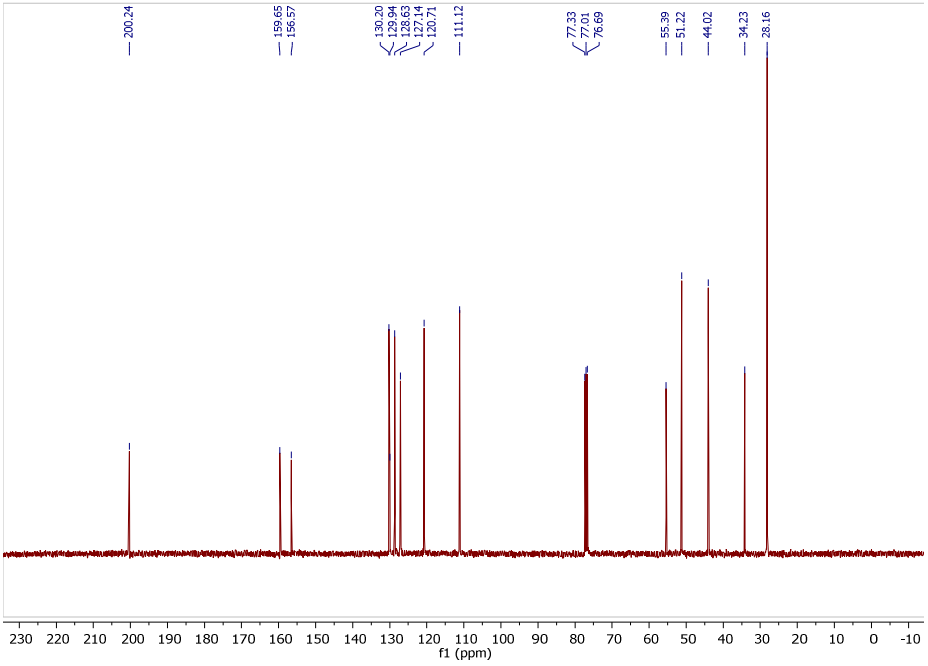
^{1}H NMR of **3e** ($CDCl_3$, 400 MHz)



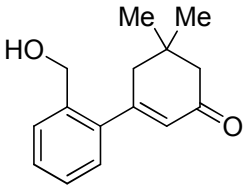
3e



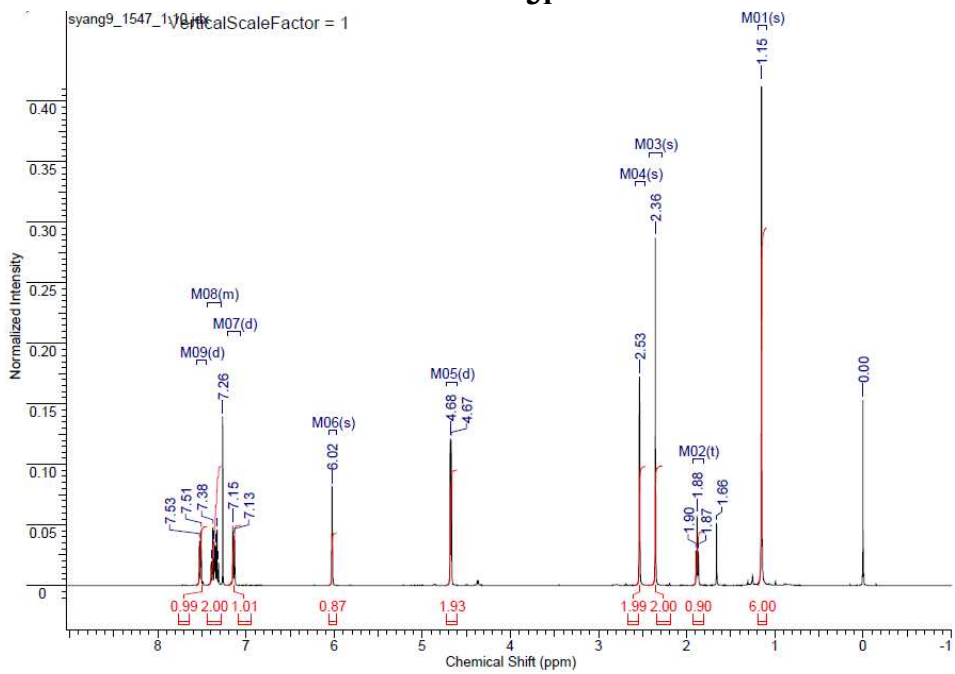
^{13}C NMR of **3e** ($CDCl_3$, 100 MHz)



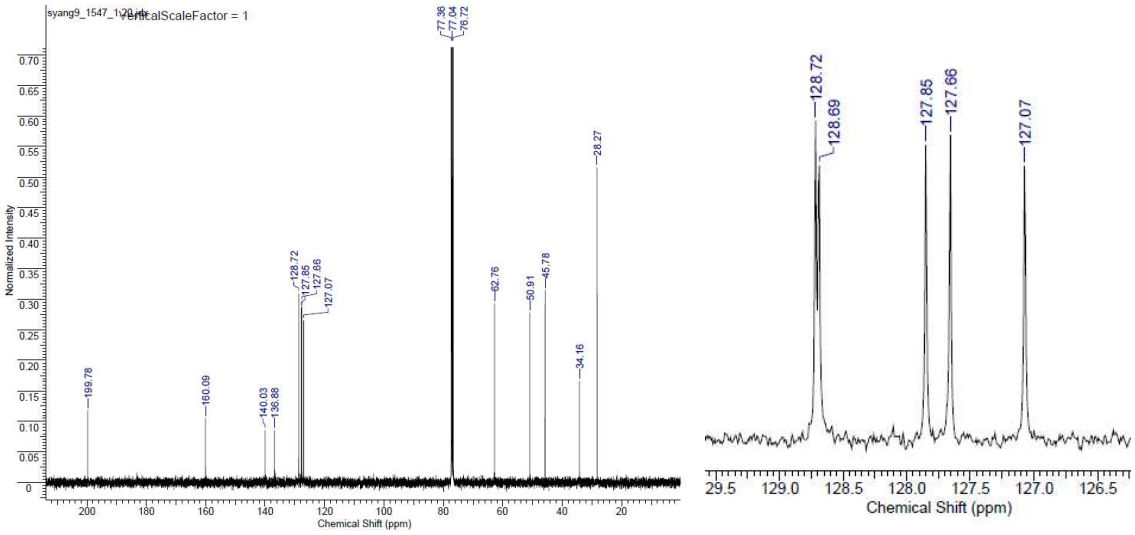
^{1}H NMR of **3f** ($CDCl_3$, 400 MHz)



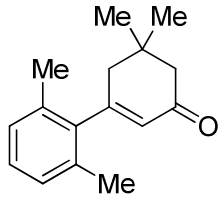
3f



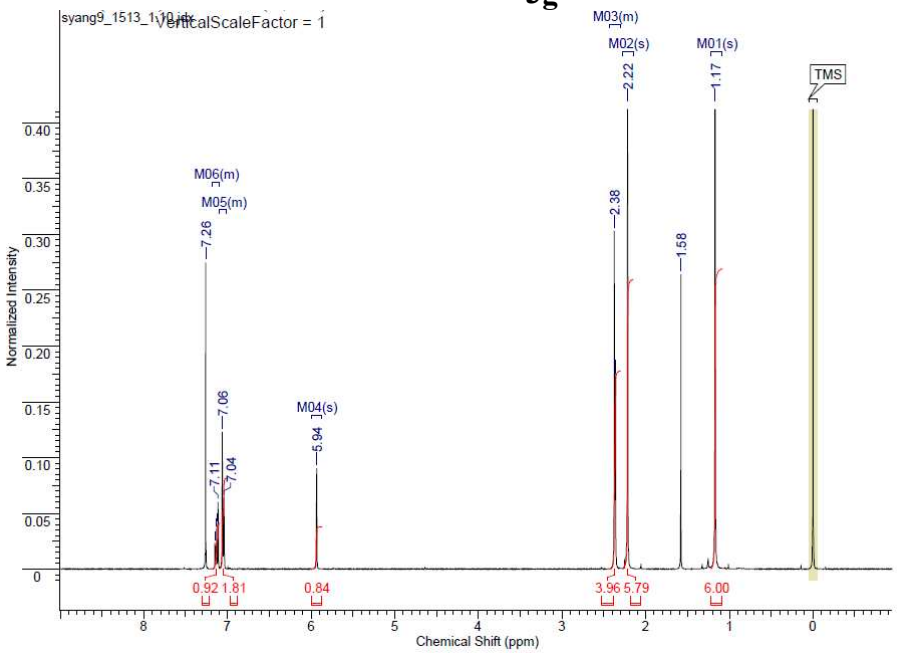
^{13}C NMR of **3f** ($CDCl_3$, 100 MHz)



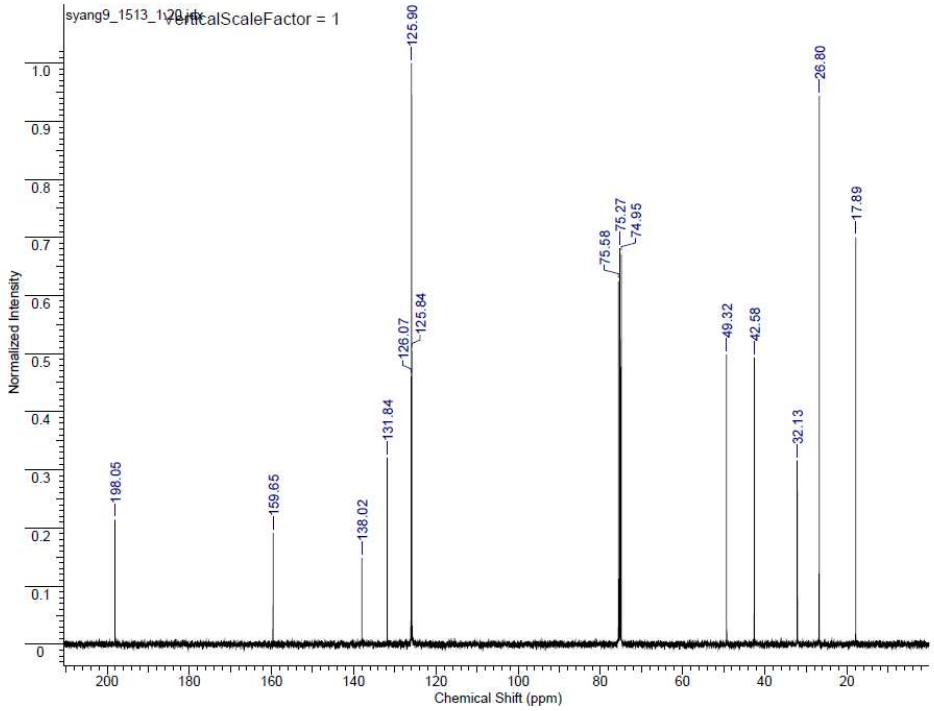
^{1}H NMR of **3g** ($CDCl_3$, 400 MHz)



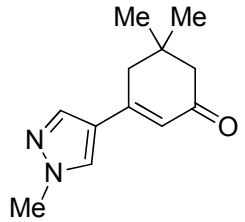
3g



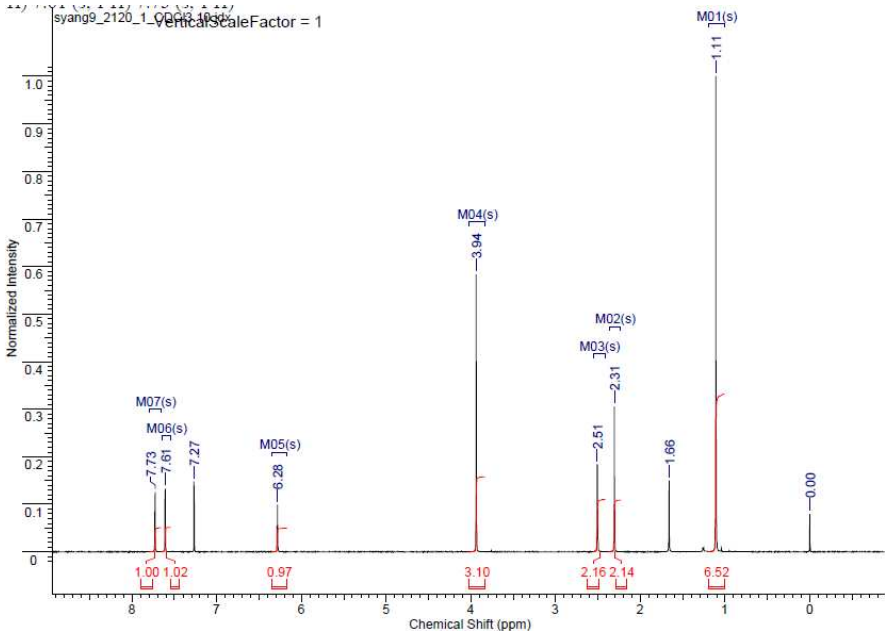
^{13}C NMR of **3g** ($CDCl_3$, 100 MHz)



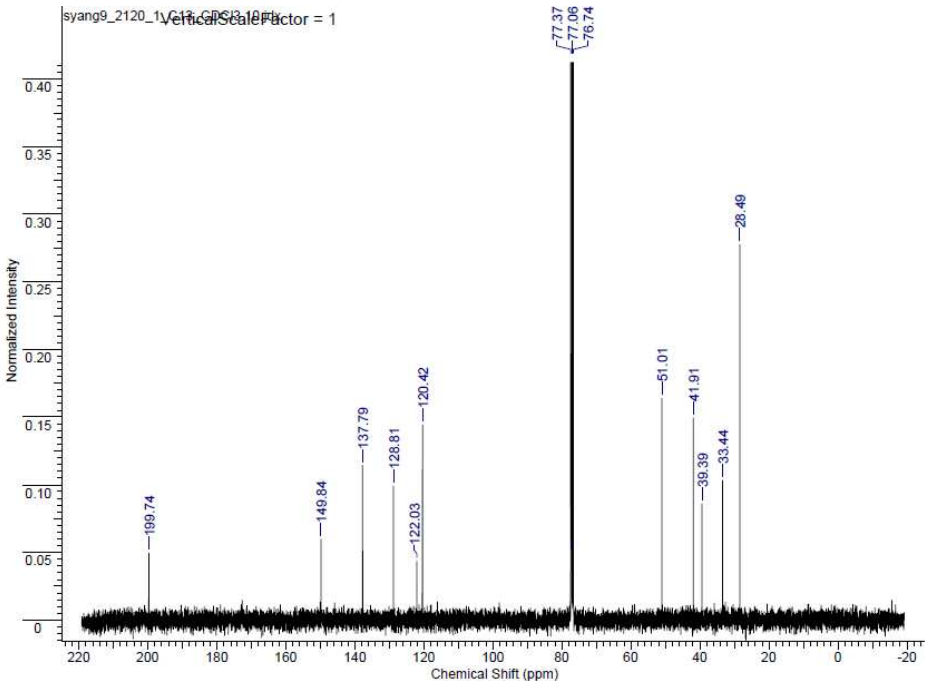
^{1}H NMR of **3h** ($CDCl_3$, 400 MHz)



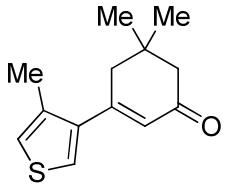
3h



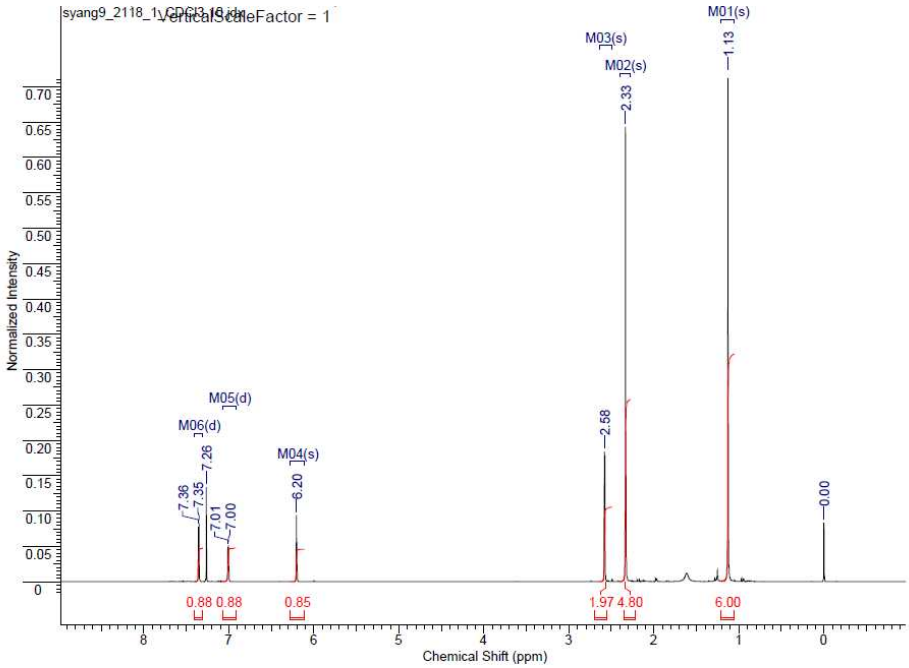
^{13}C NMR of **3h** ($CDCl_3$, 100 MHz)



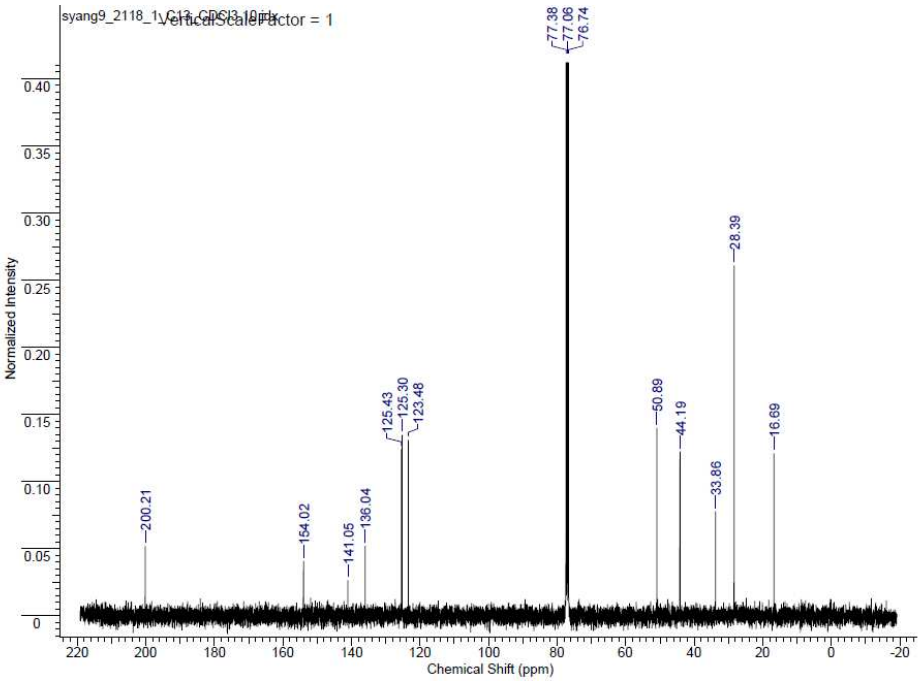
^{1}H NMR of **3i** ($CDCl_3$, 400 MHz)



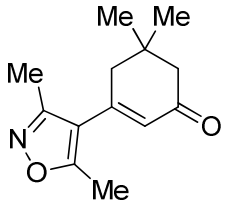
3i



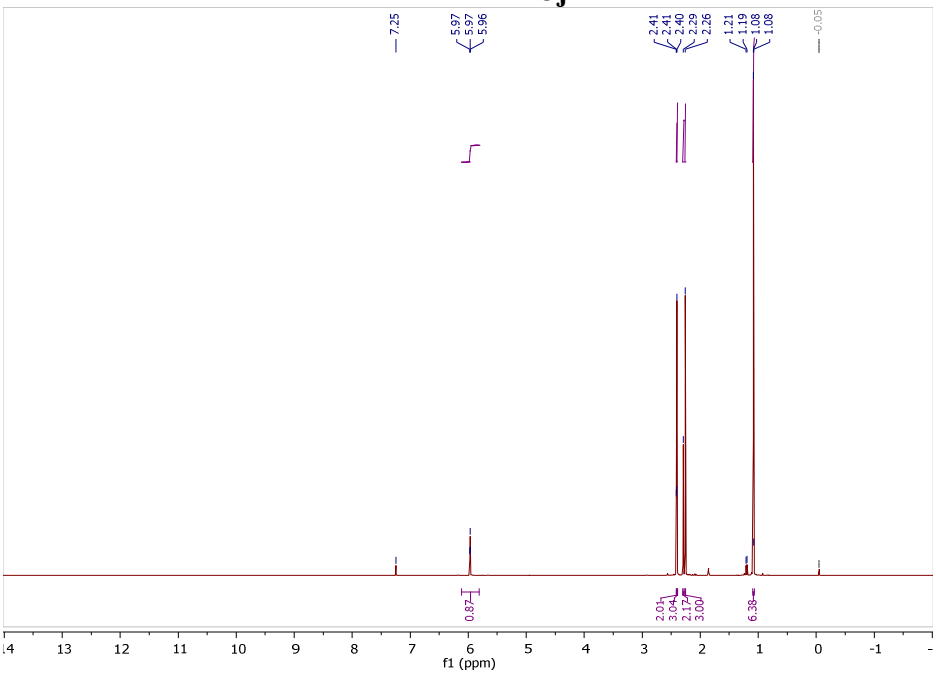
^{13}C NMR of **3i** ($CDCl_3$, 100 MHz)



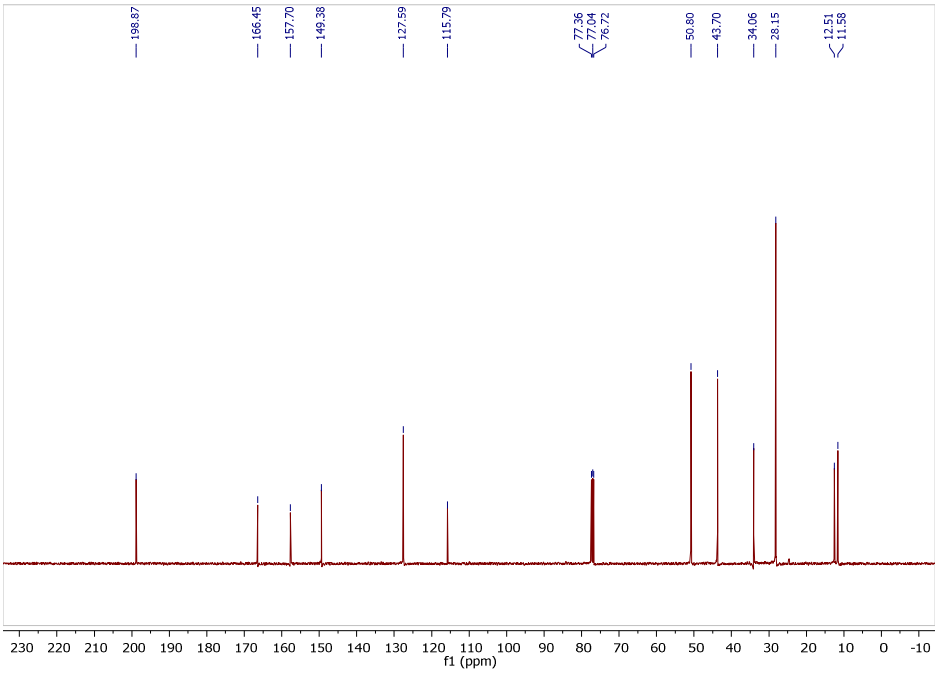
^{1}H NMR of **3j** ($CDCl_3$, 400 MHz)



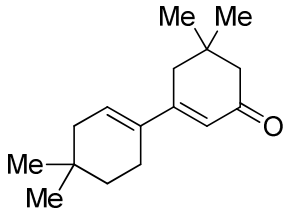
3j



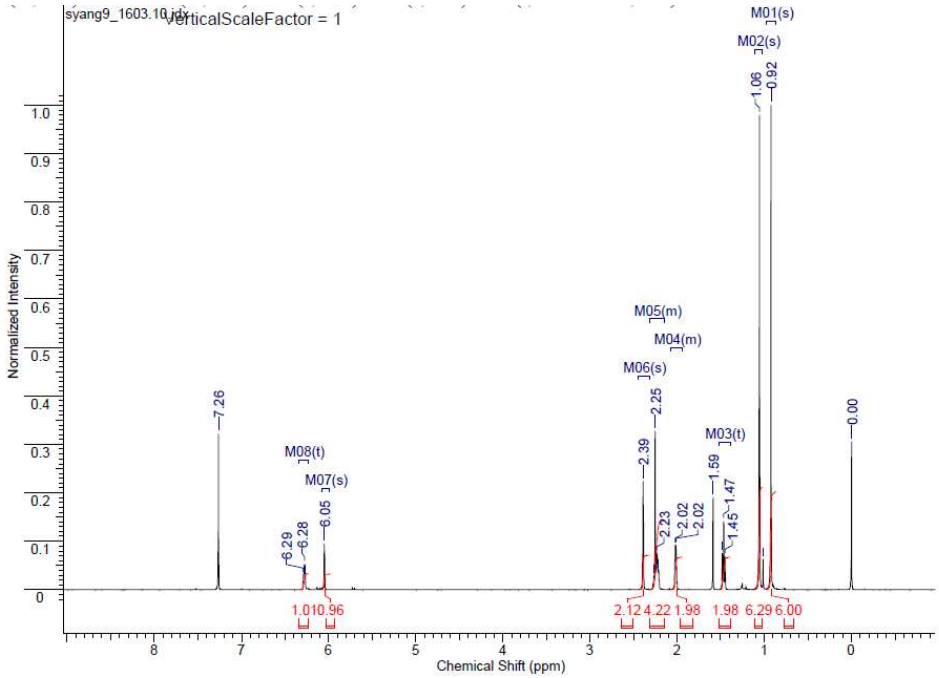
^{13}C NMR of **3j** ($CDCl_3$, 100 MHz)



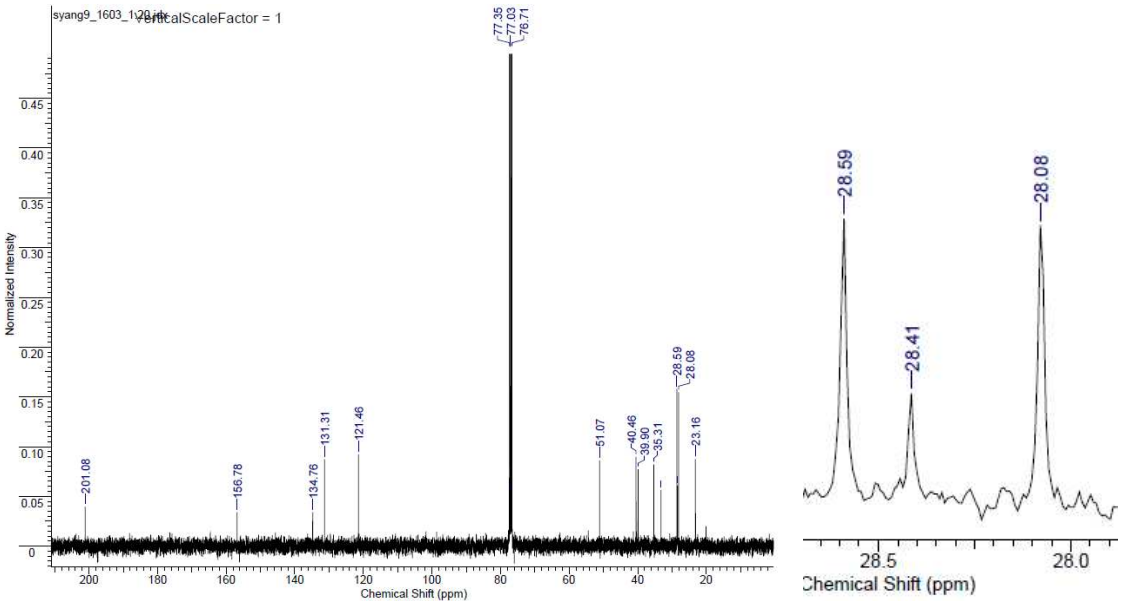
^{1}H NMR of **3k** ($CDCl_3$, 400 MHz)



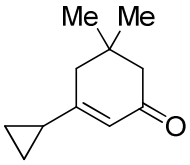
3k



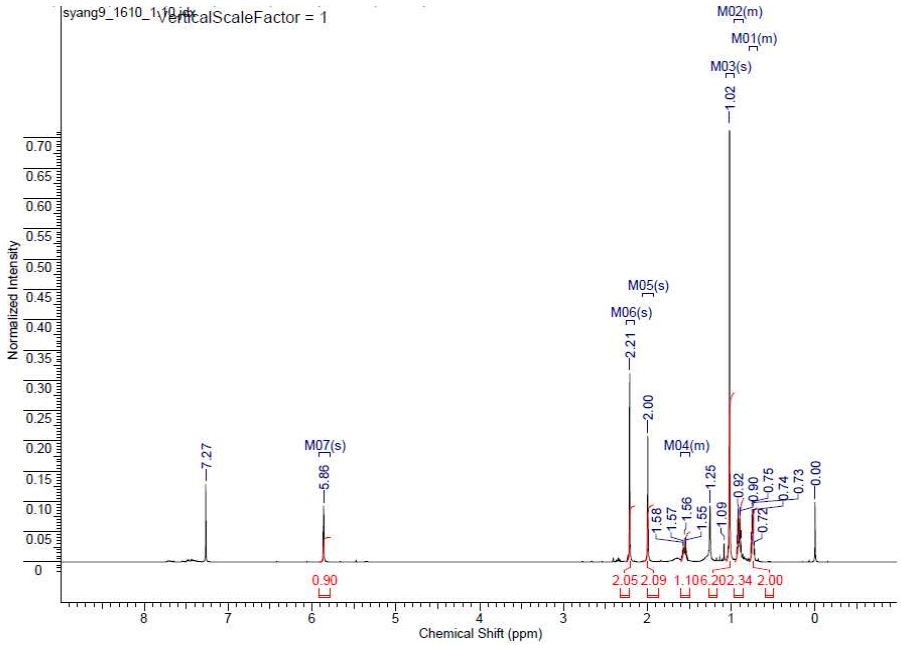
^{13}C NMR of **3k** ($CDCl_3$, 100 MHz)



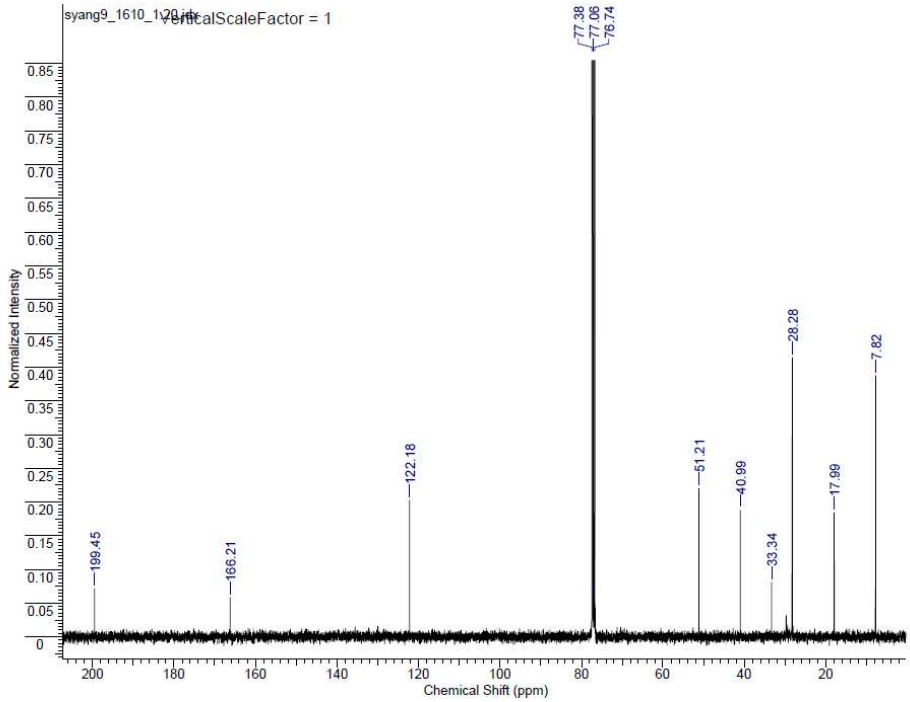
^{1}H NMR of **3l** ($CDCl_3$, 400 MHz)



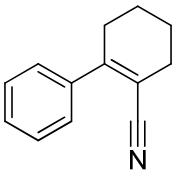
3l



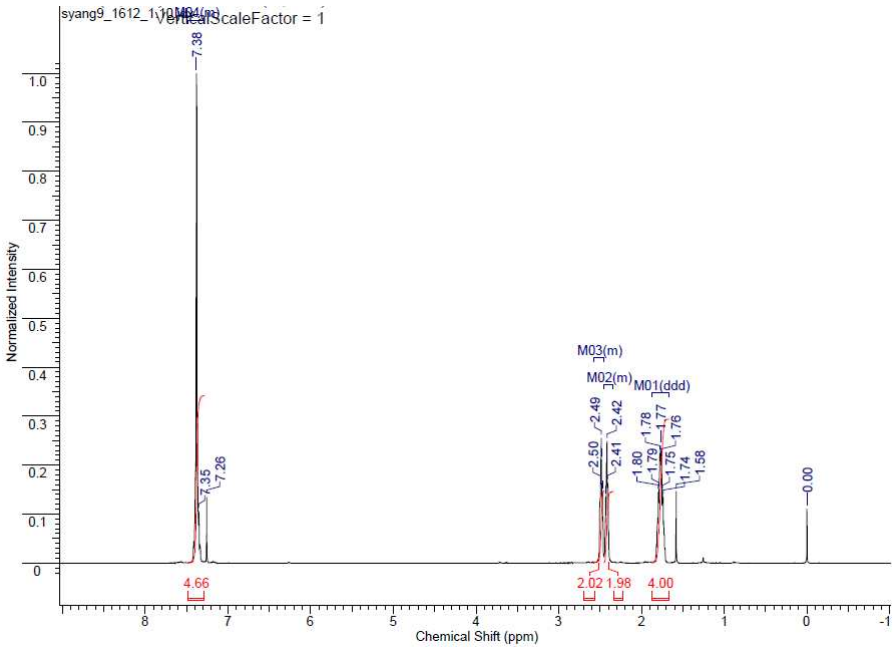
^{13}C NMR of **3l** ($CDCl_3$, 100 MHz)



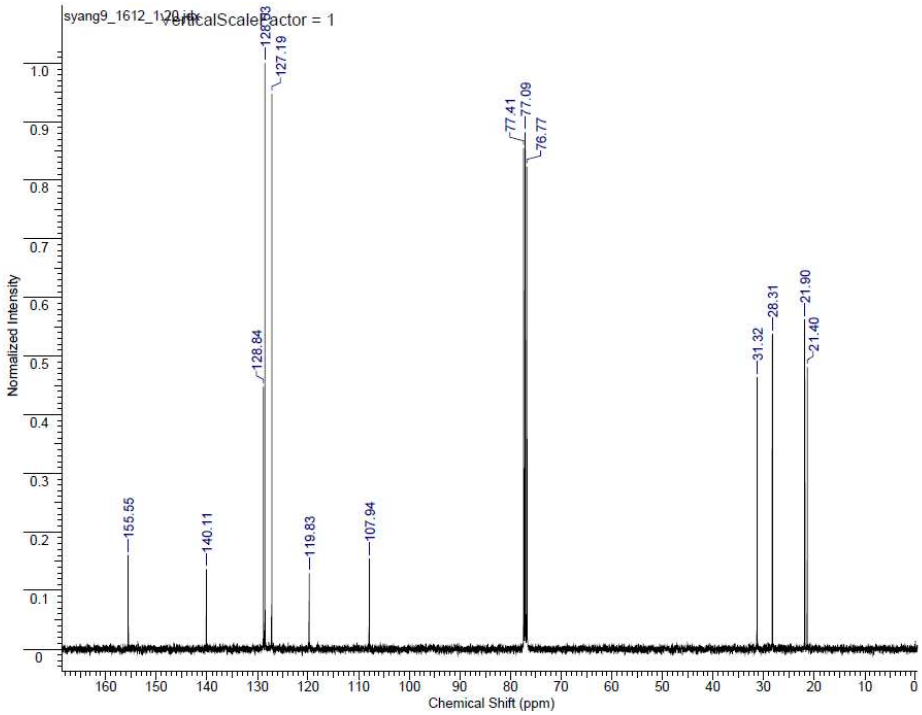
^{1}H NMR of **5** ($CDCl_3$, 400 MHz)



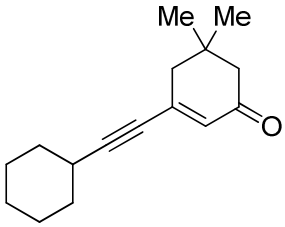
5



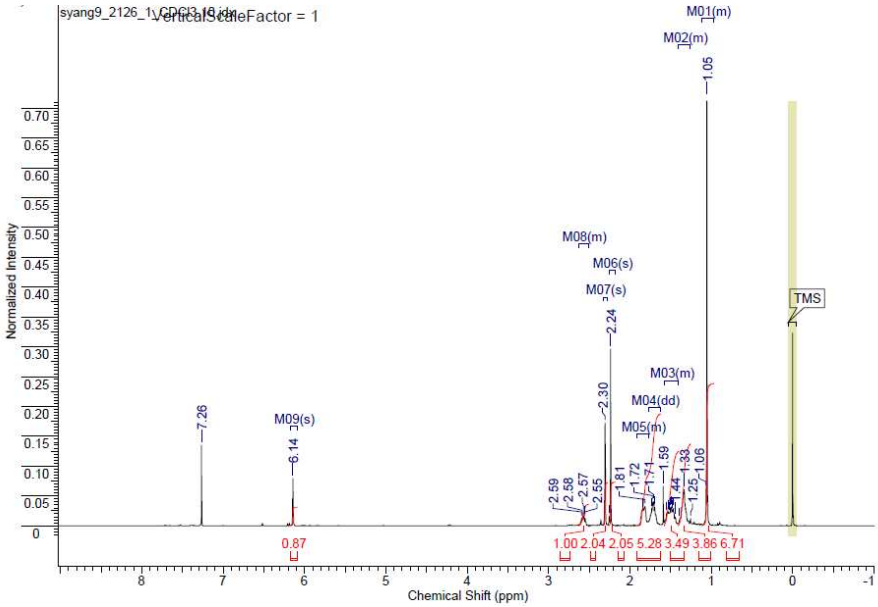
^{13}C NMR of **5** ($CDCl_3$, 100 MHz)



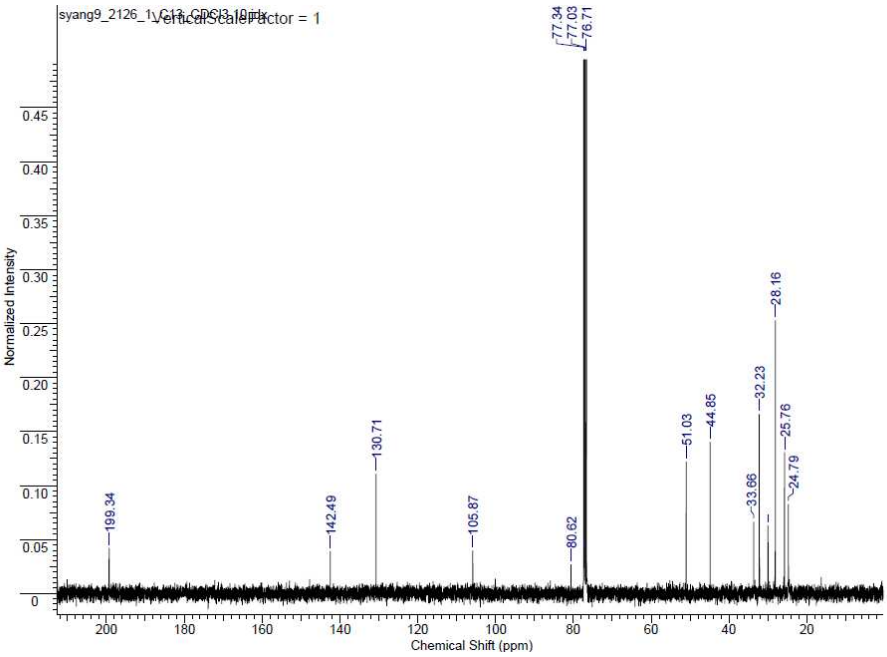
^{1}H NMR of **6a** ($CDCl_3$, 400 MHz)



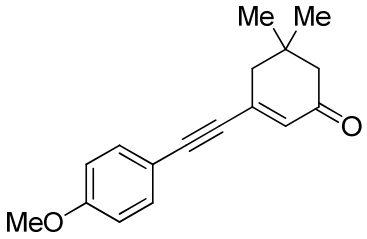
6a



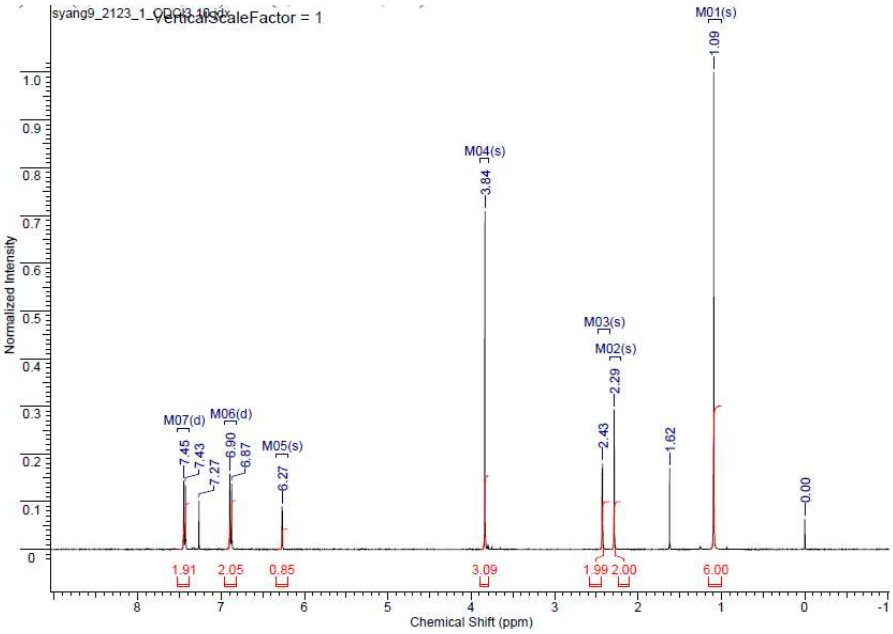
^{13}C NMR of **6a** ($CDCl_3$, 100 MHz)



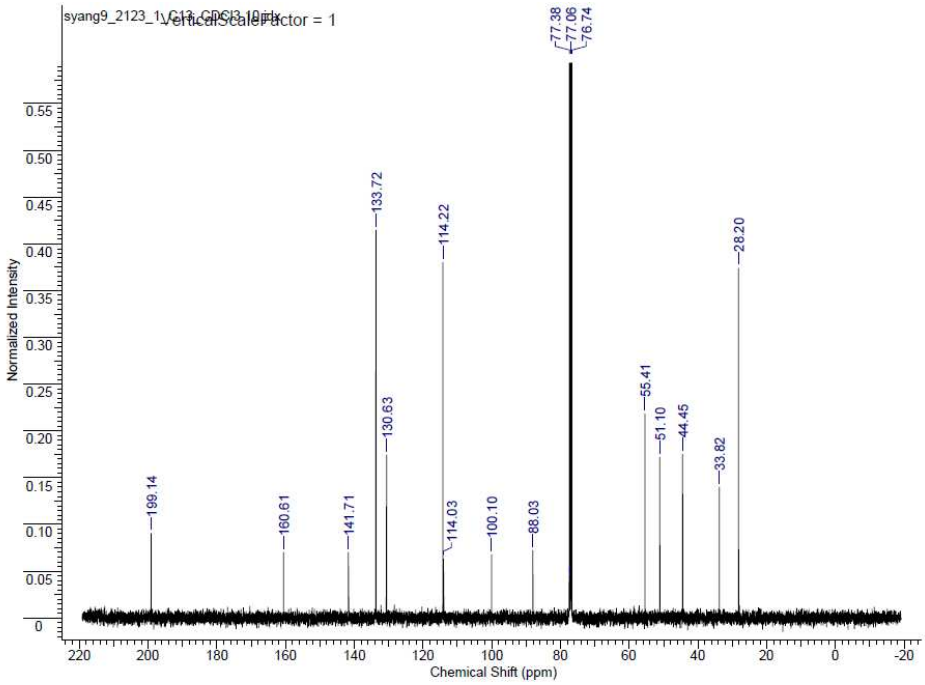
^{1}H NMR of **6b** ($CDCl_3$, 400 MHz)



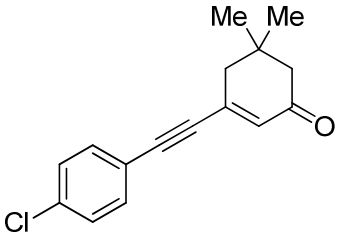
6b



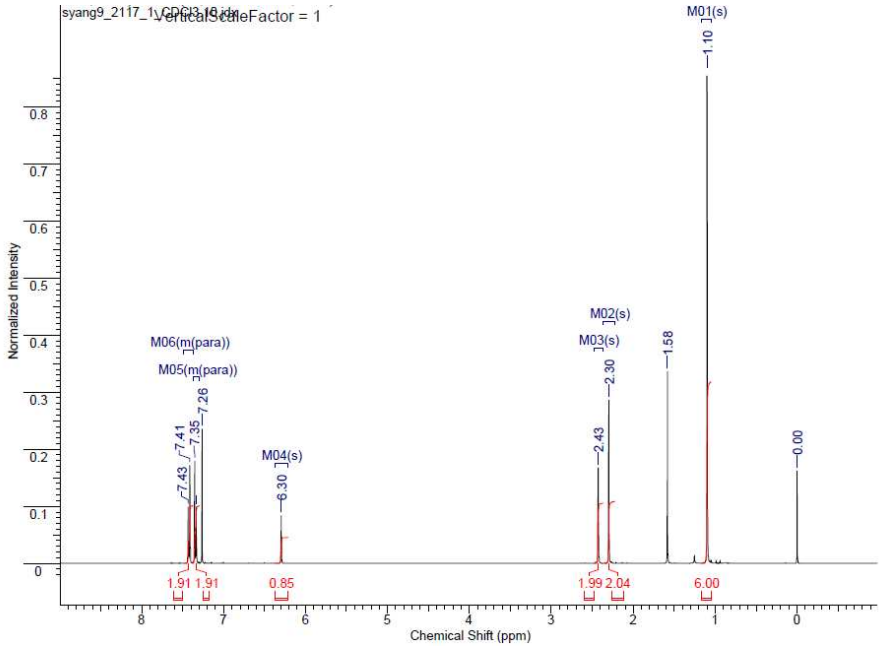
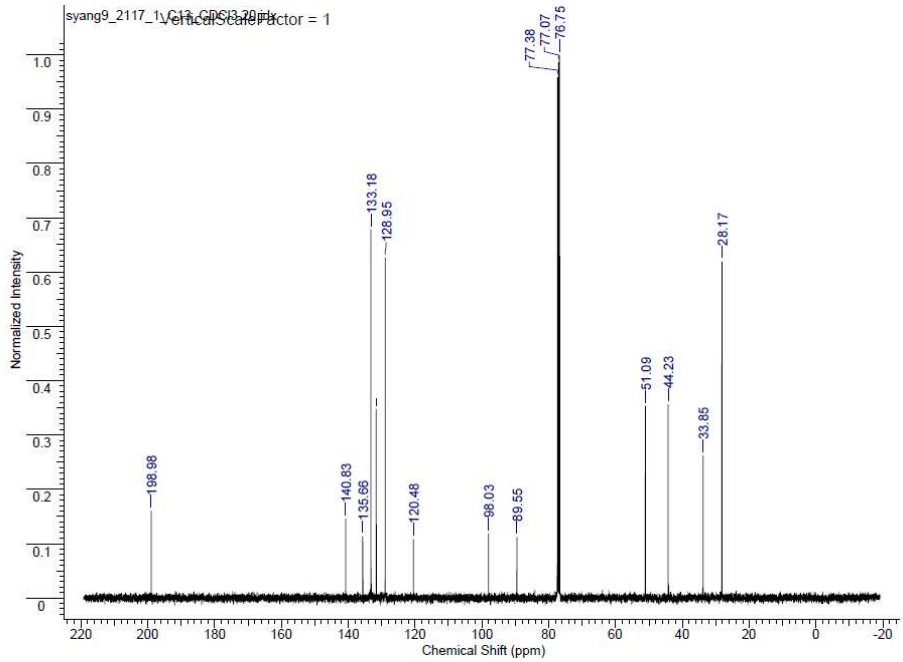
^{13}C NMR of **6b** ($CDCl_3$, 100 MHz)



^{1}H NMR of **6c** ($CDCl_3$, 400 MHz)



6c



^{13}C NMR of **6c** ($CDCl_3$, 100 MHz)