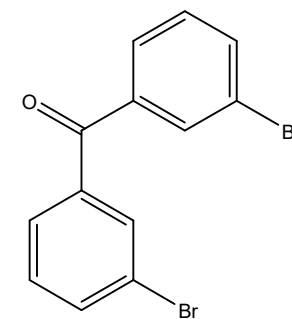
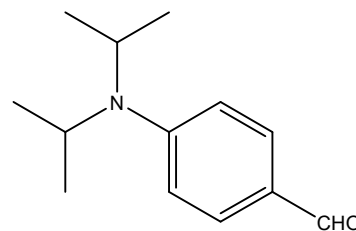
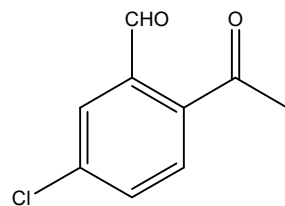
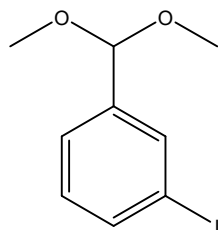
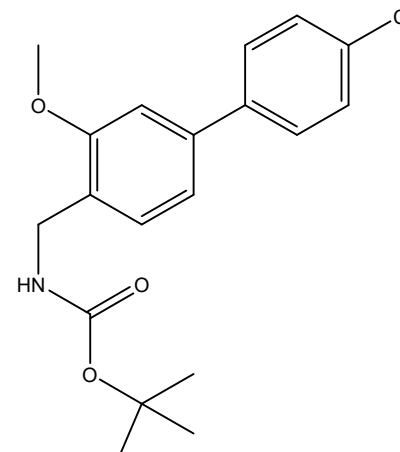
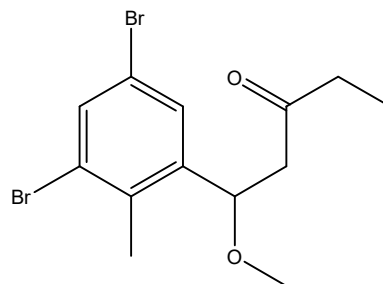
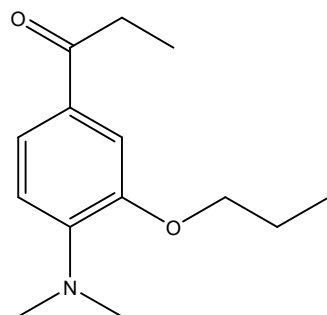
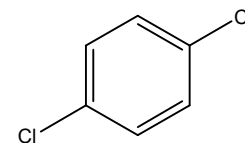
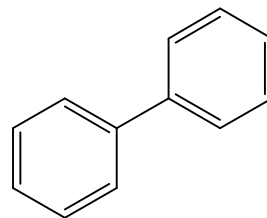
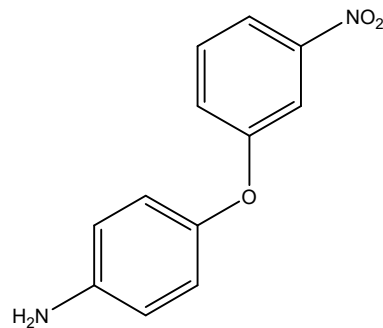
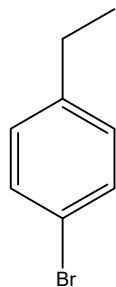


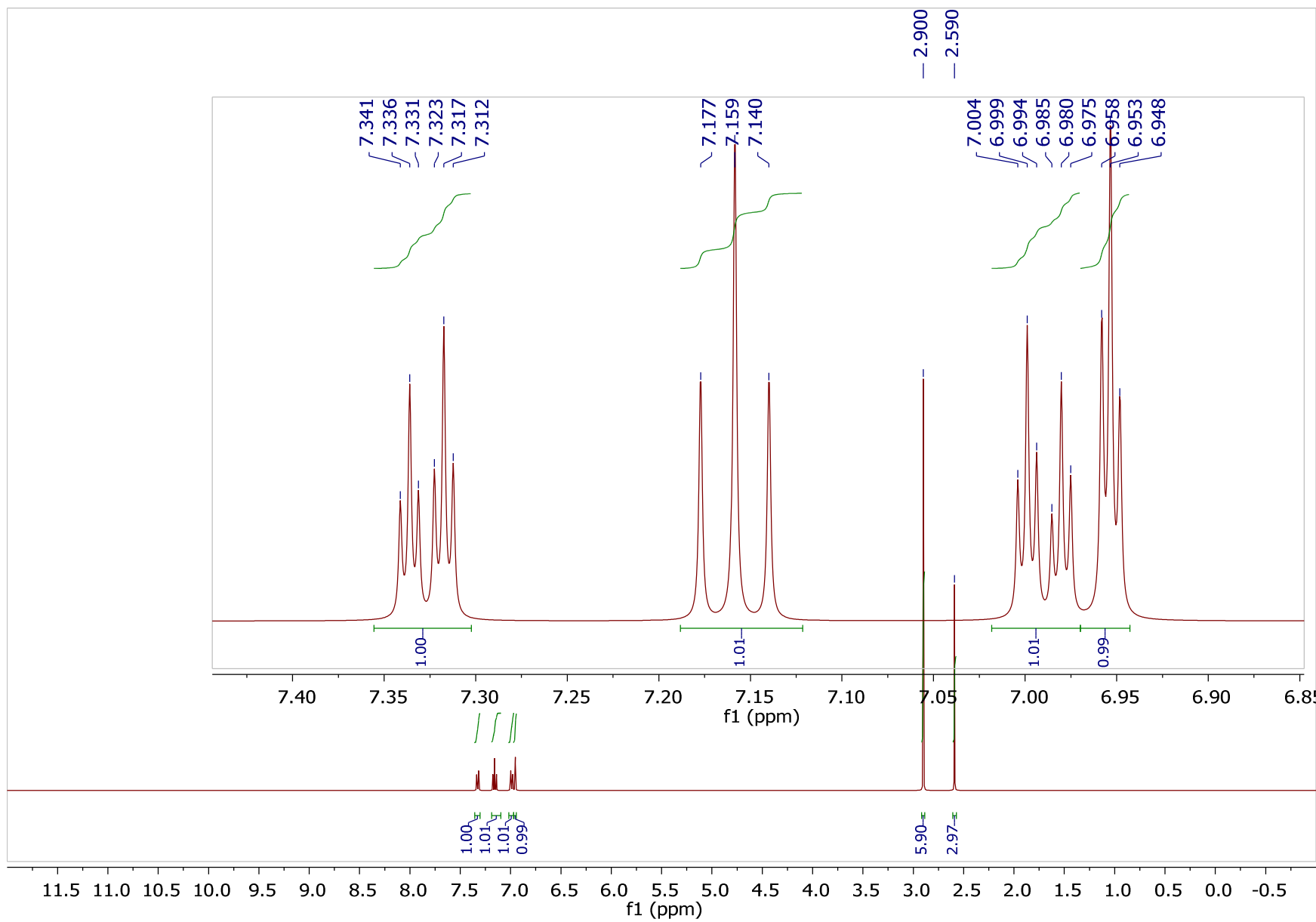
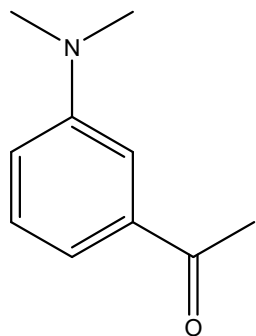
**Zadanie 1.** Narysuj przewidywane widma  $^1\text{H-NMR}$  dla następujących struktur



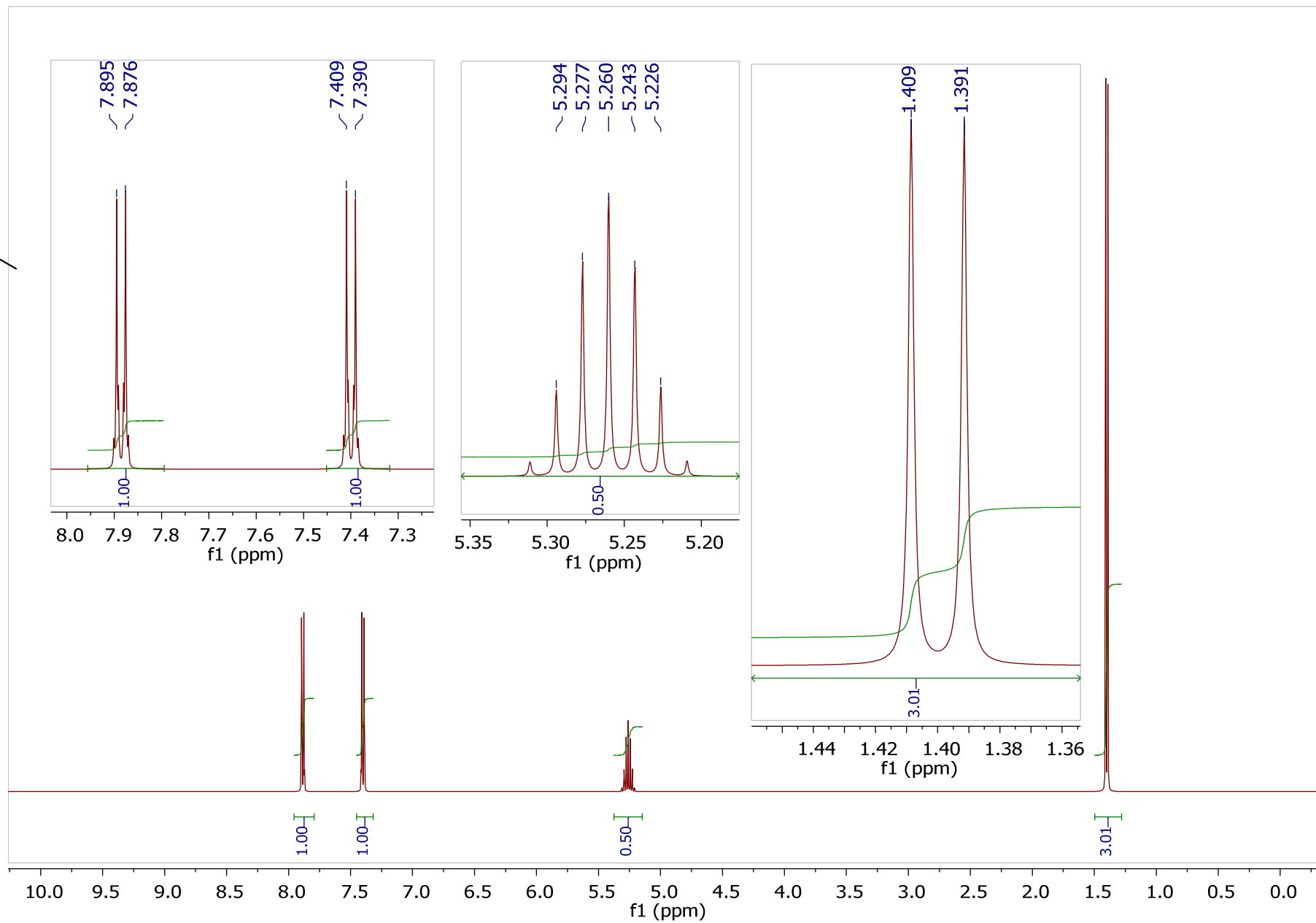
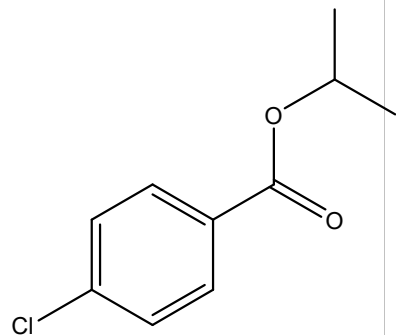
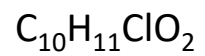
**Zadanie 2.** Na podstawie widma  $^1\text{H}$  NMR zmierzonego na aparacie Bruker 400 MHz ( $\text{CDCl}_3$ ) określ strukturę związku chemicznego.

(a)

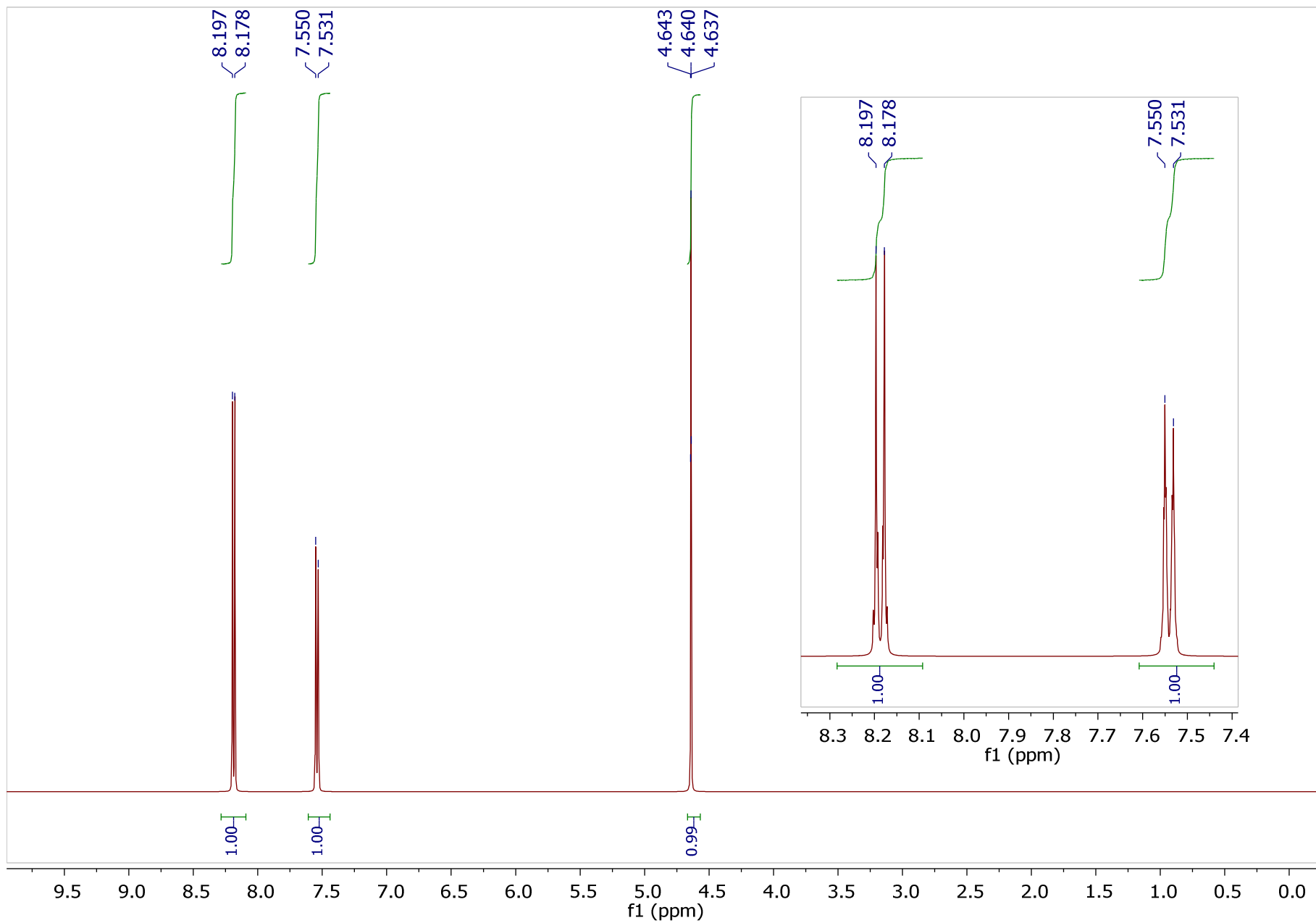
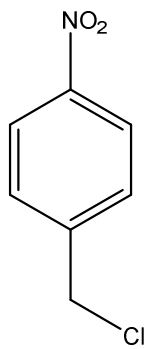
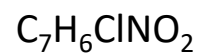
$C_{10}H_{13}NO$



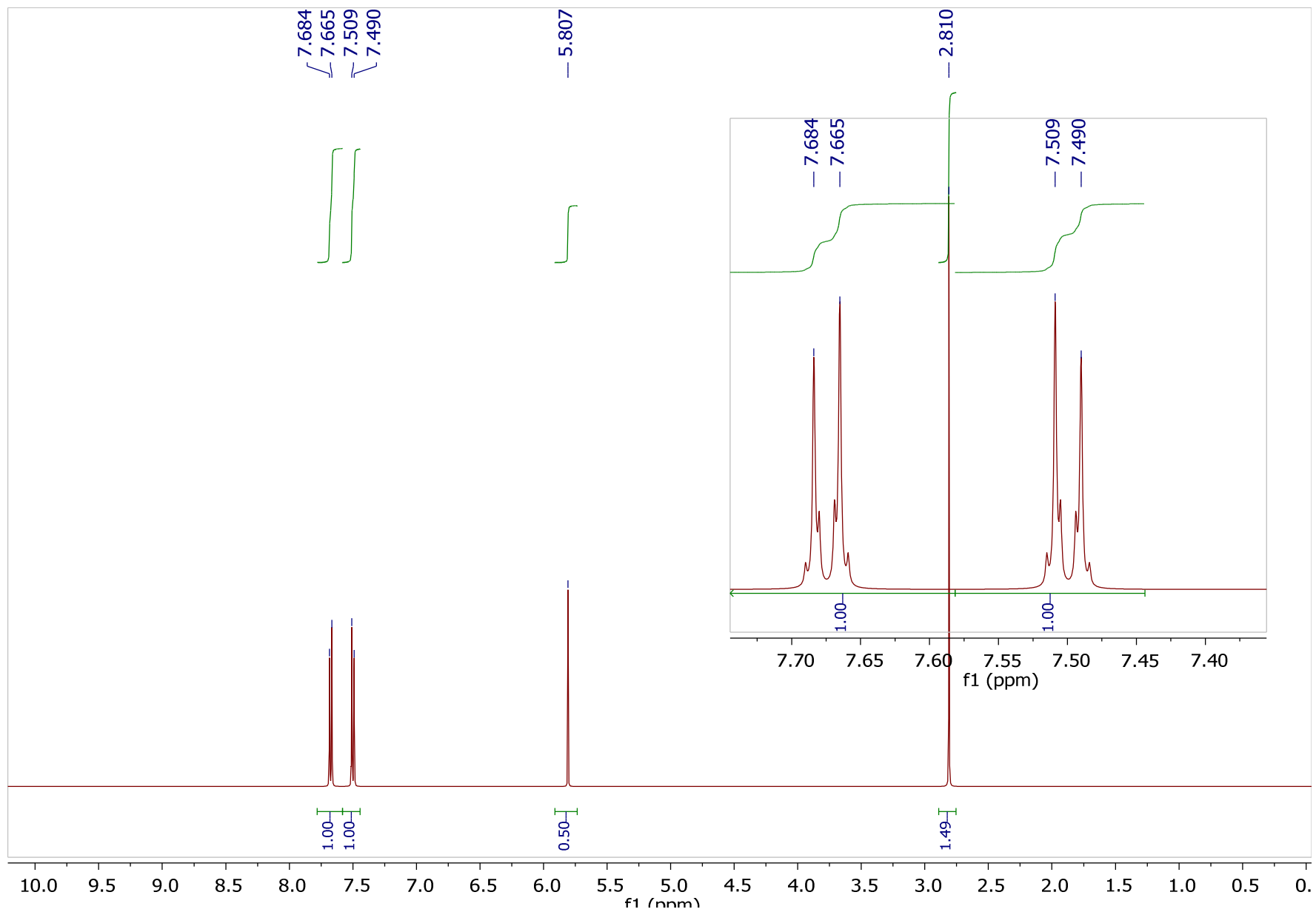
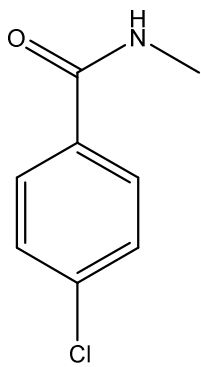
(b)



(c)

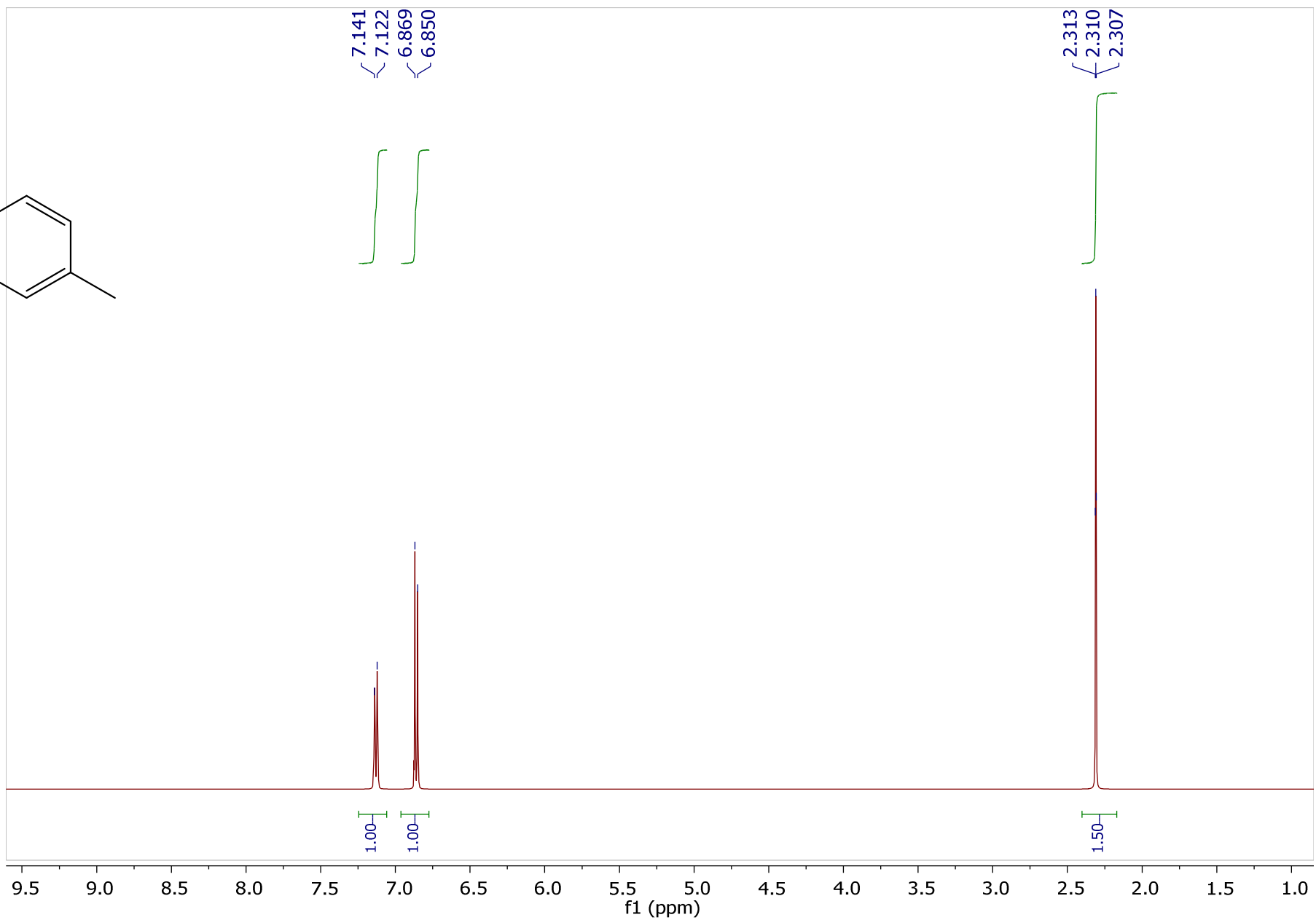
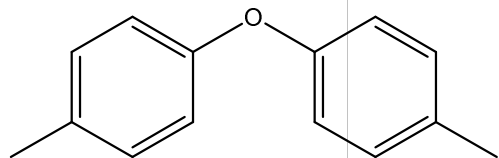


(d)

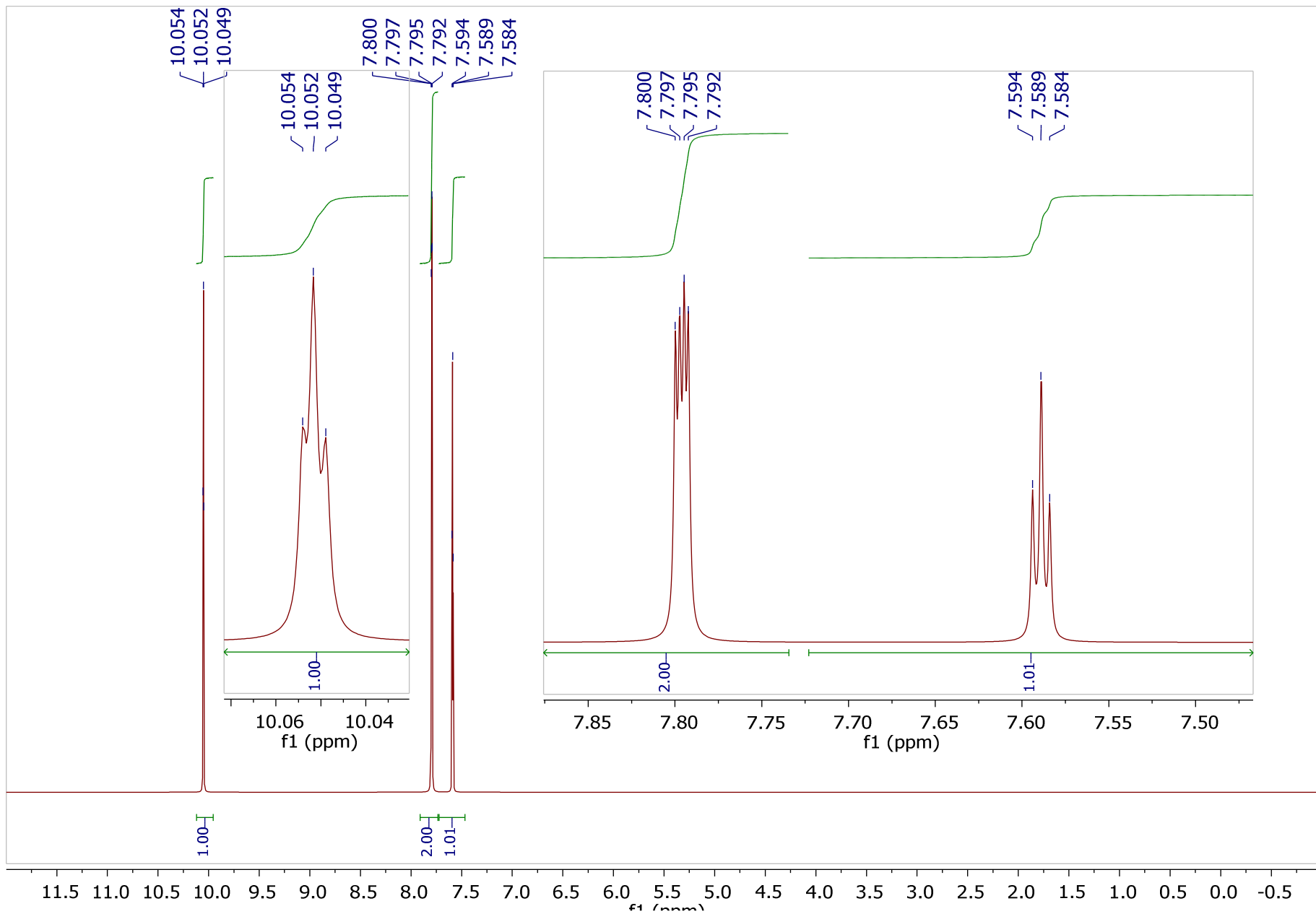
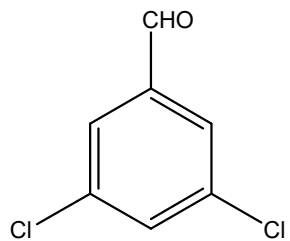
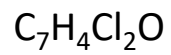


(e)

$C_{14}H_{14}O$

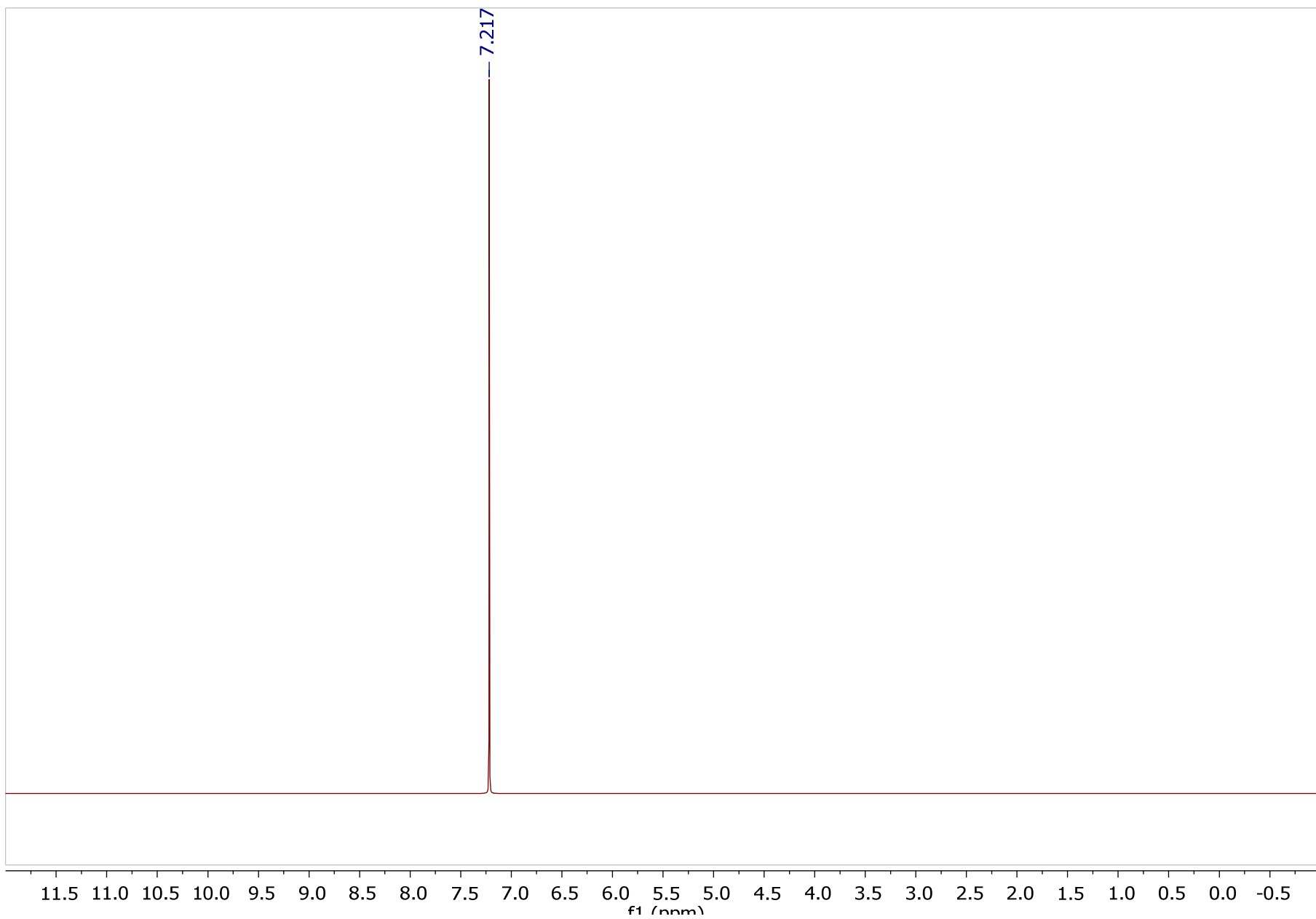
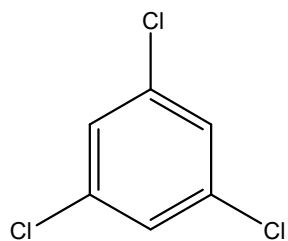
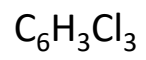


(f)

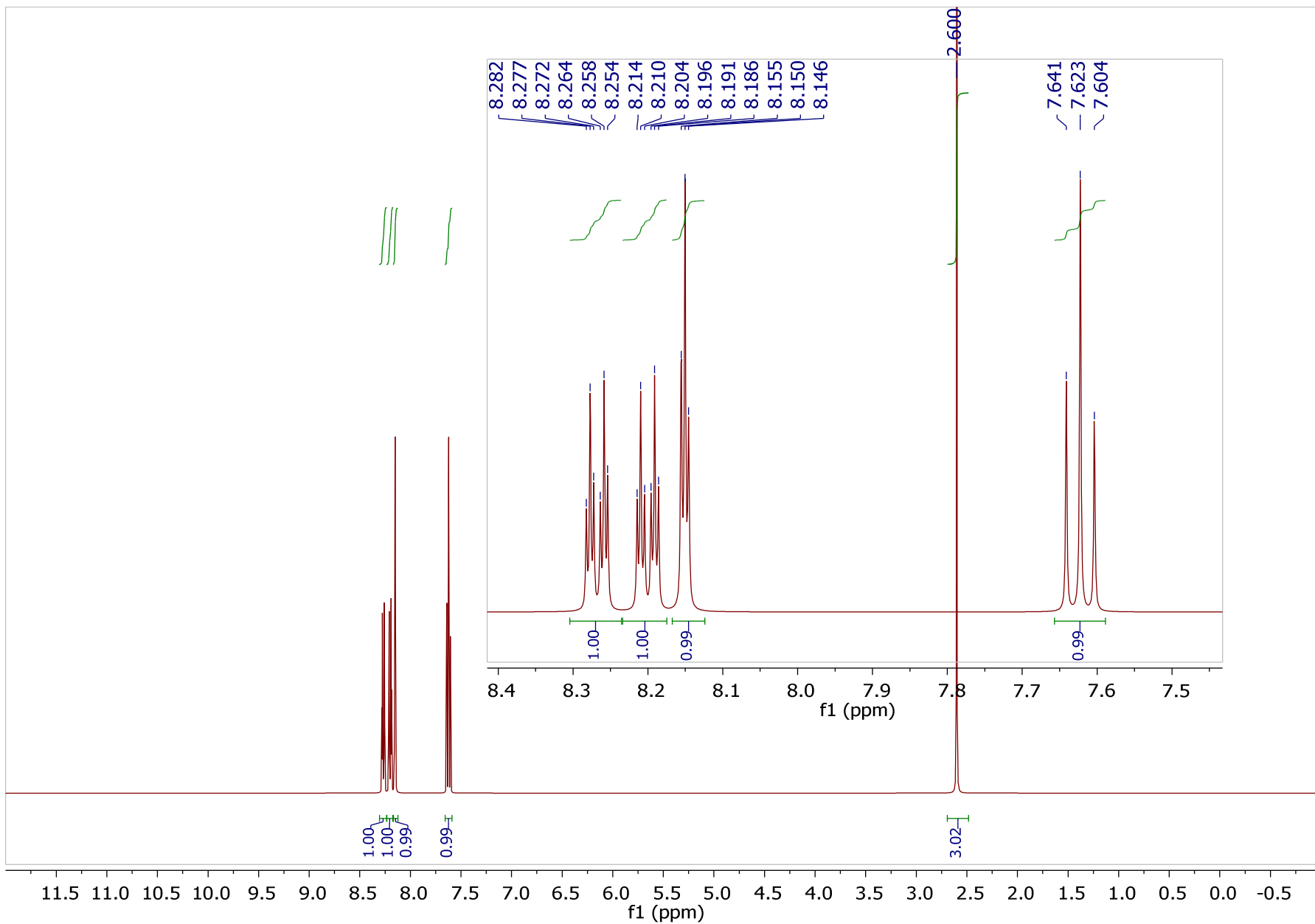
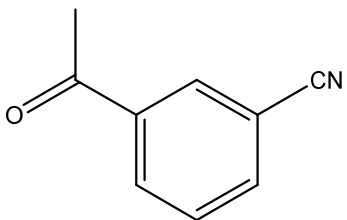
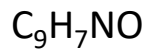




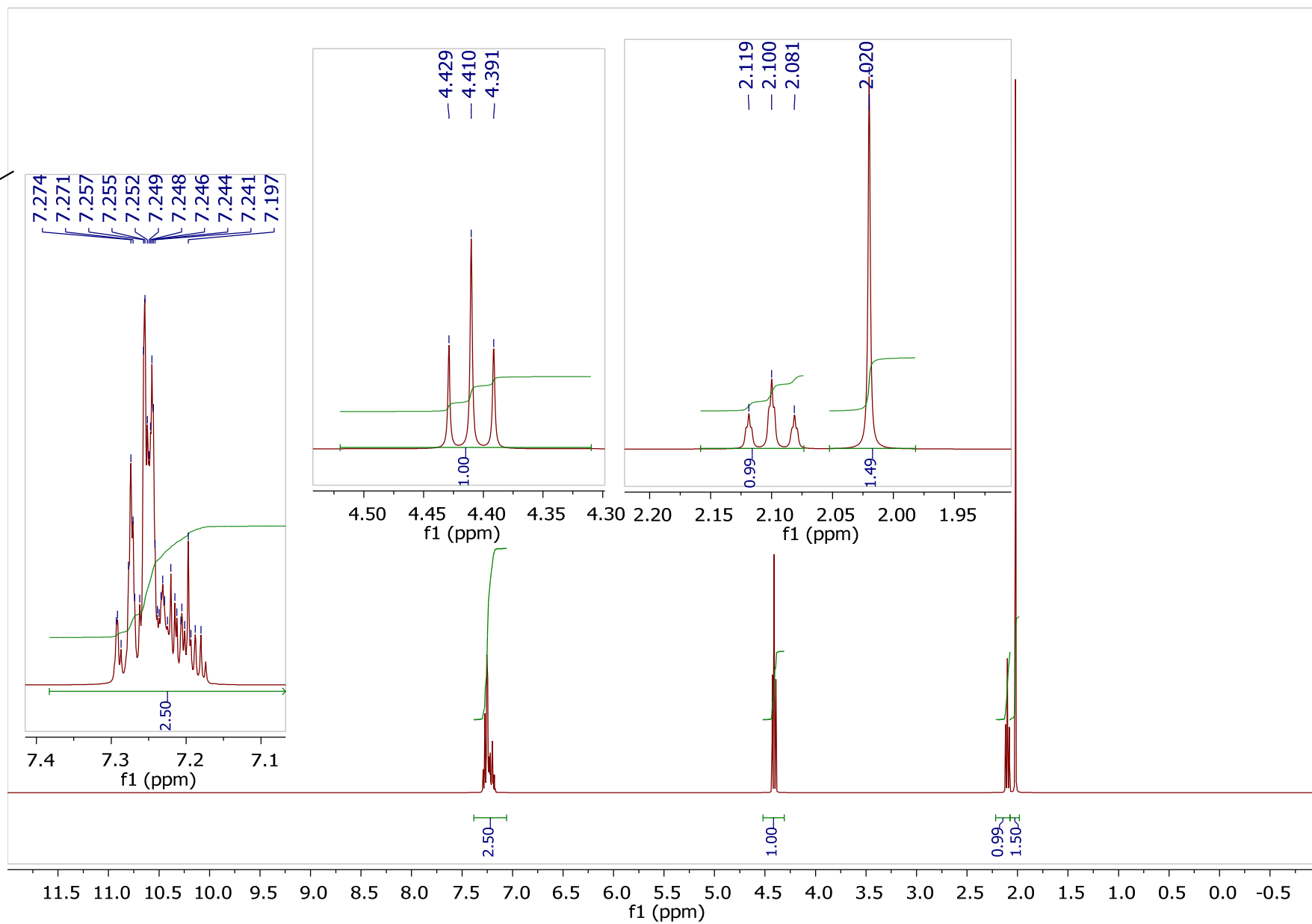
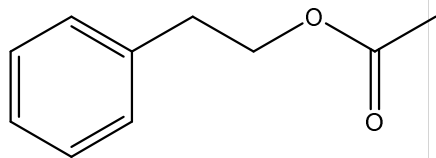
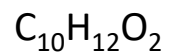
(g)



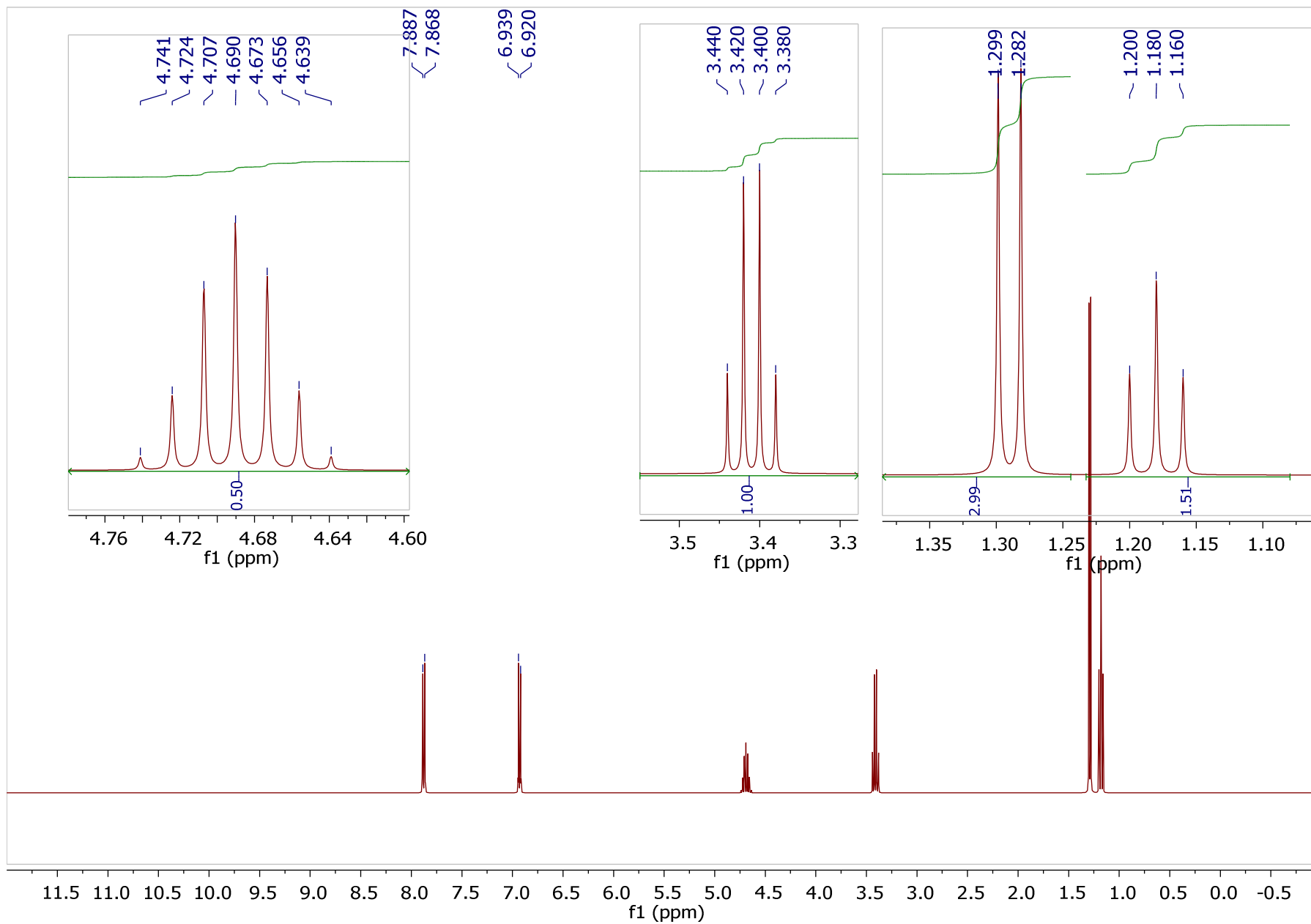
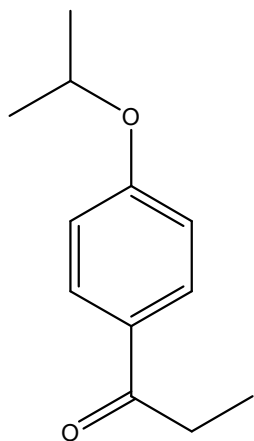
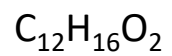
(h)



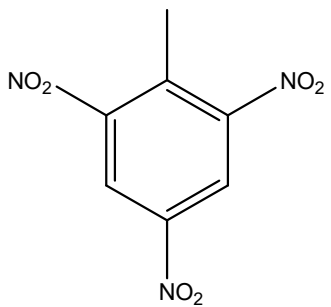
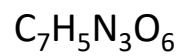
(i)



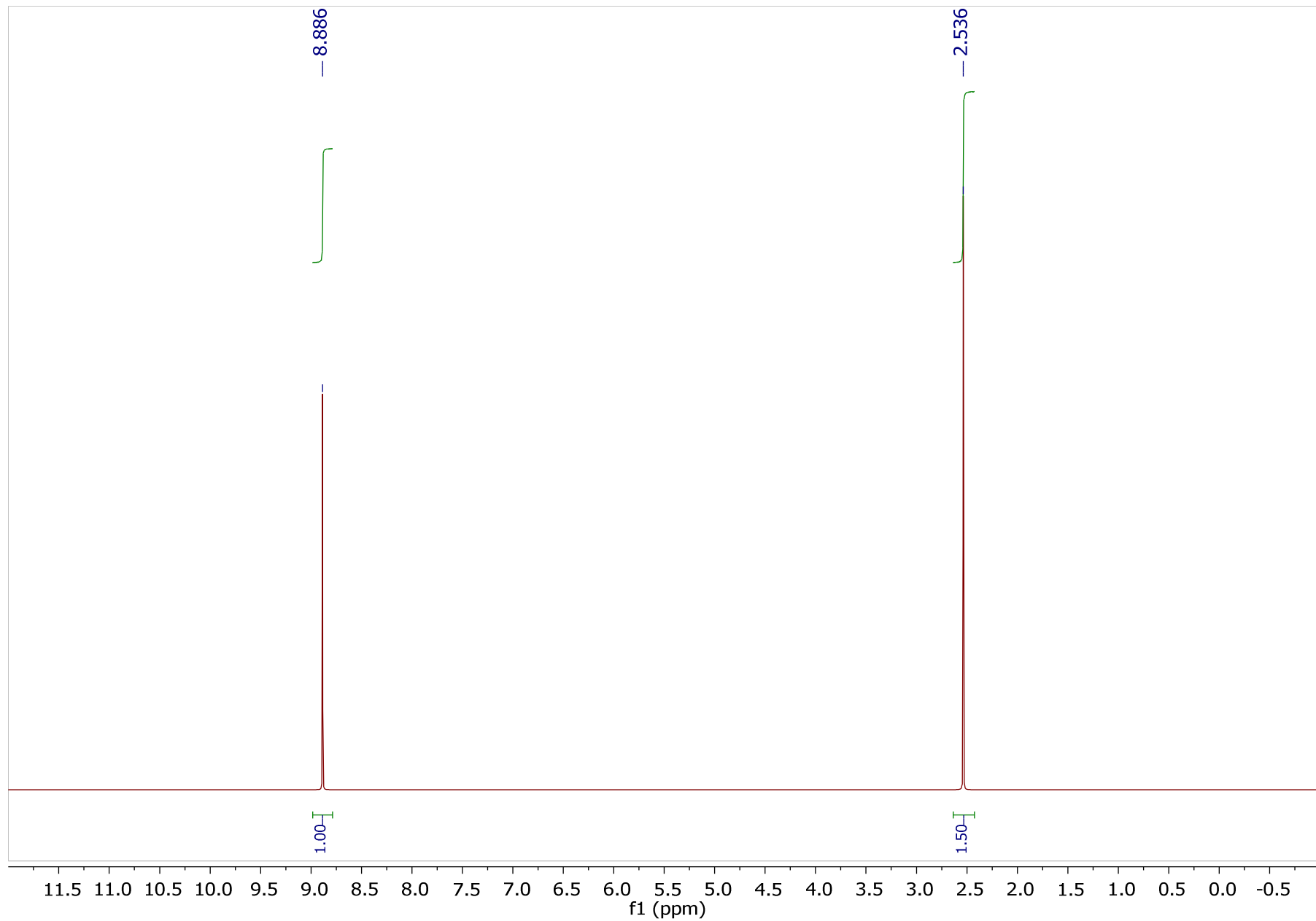
(j)



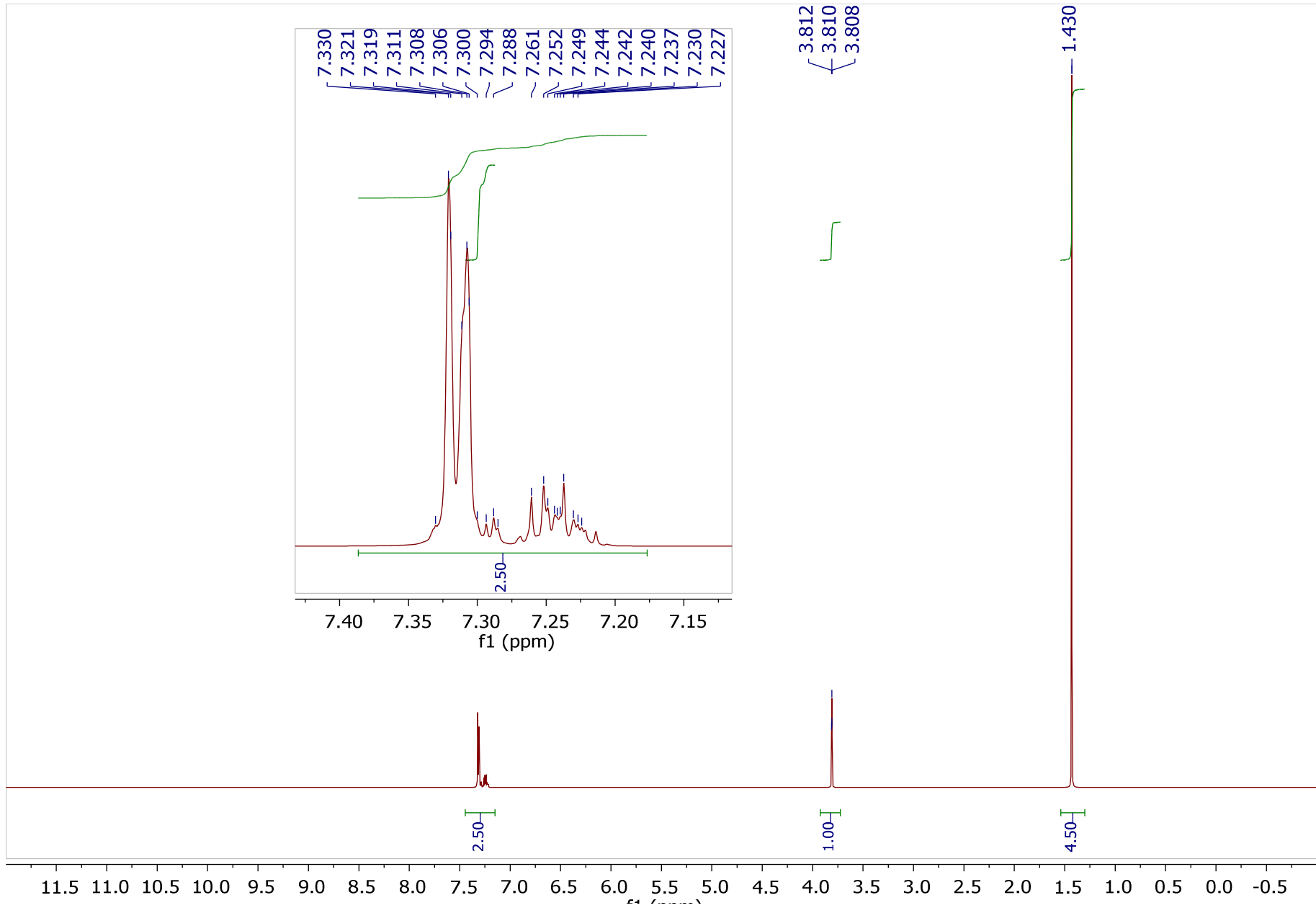
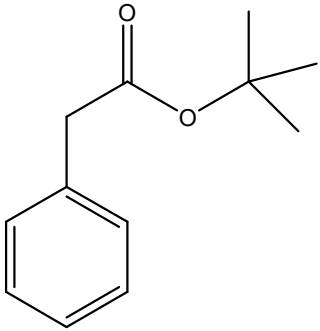
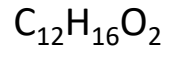
(k)



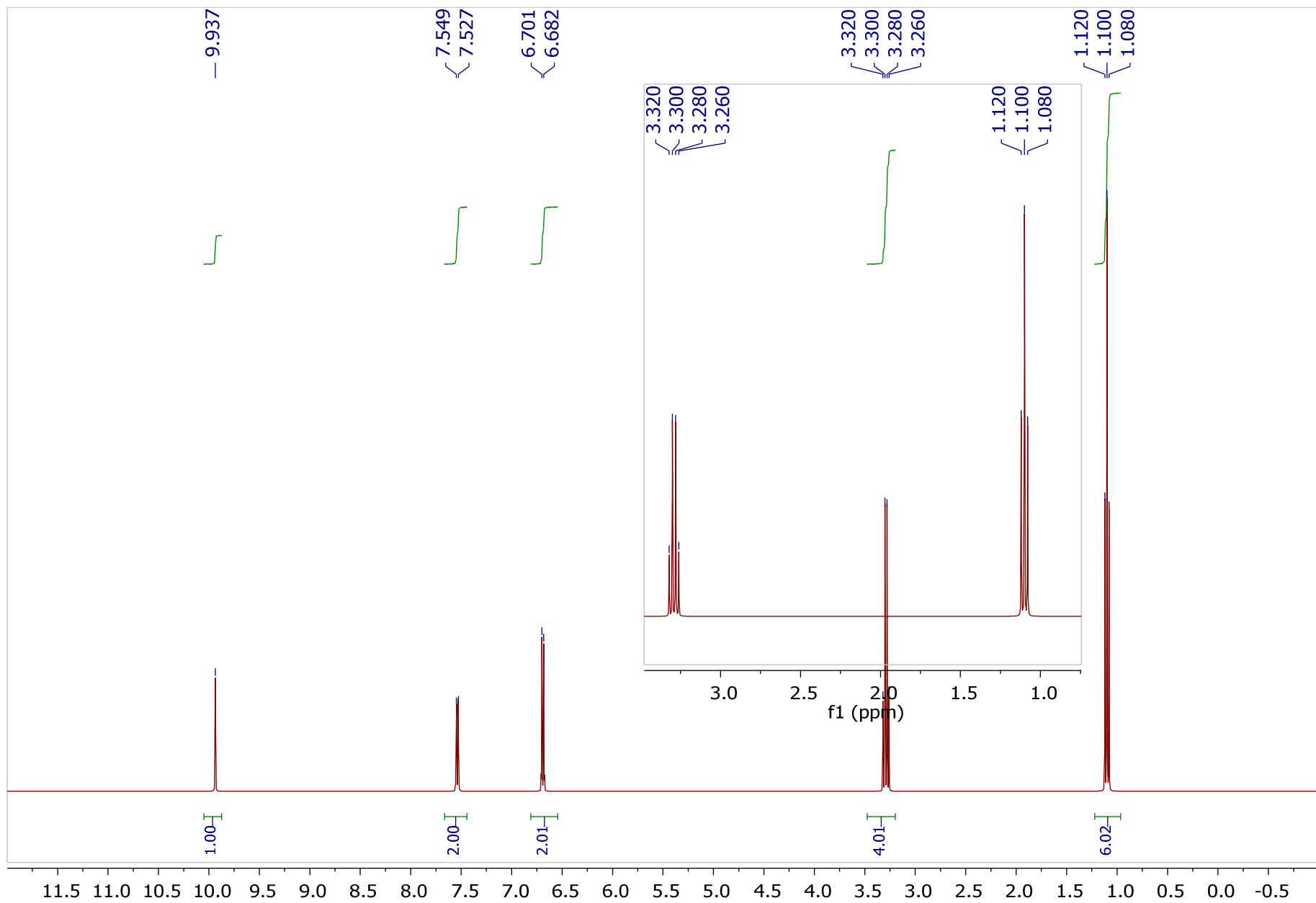
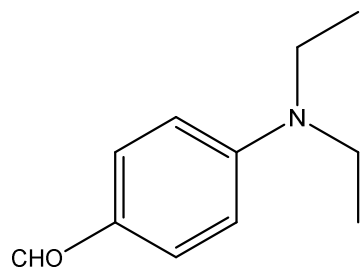
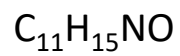
Związek ten jest wybuchowy



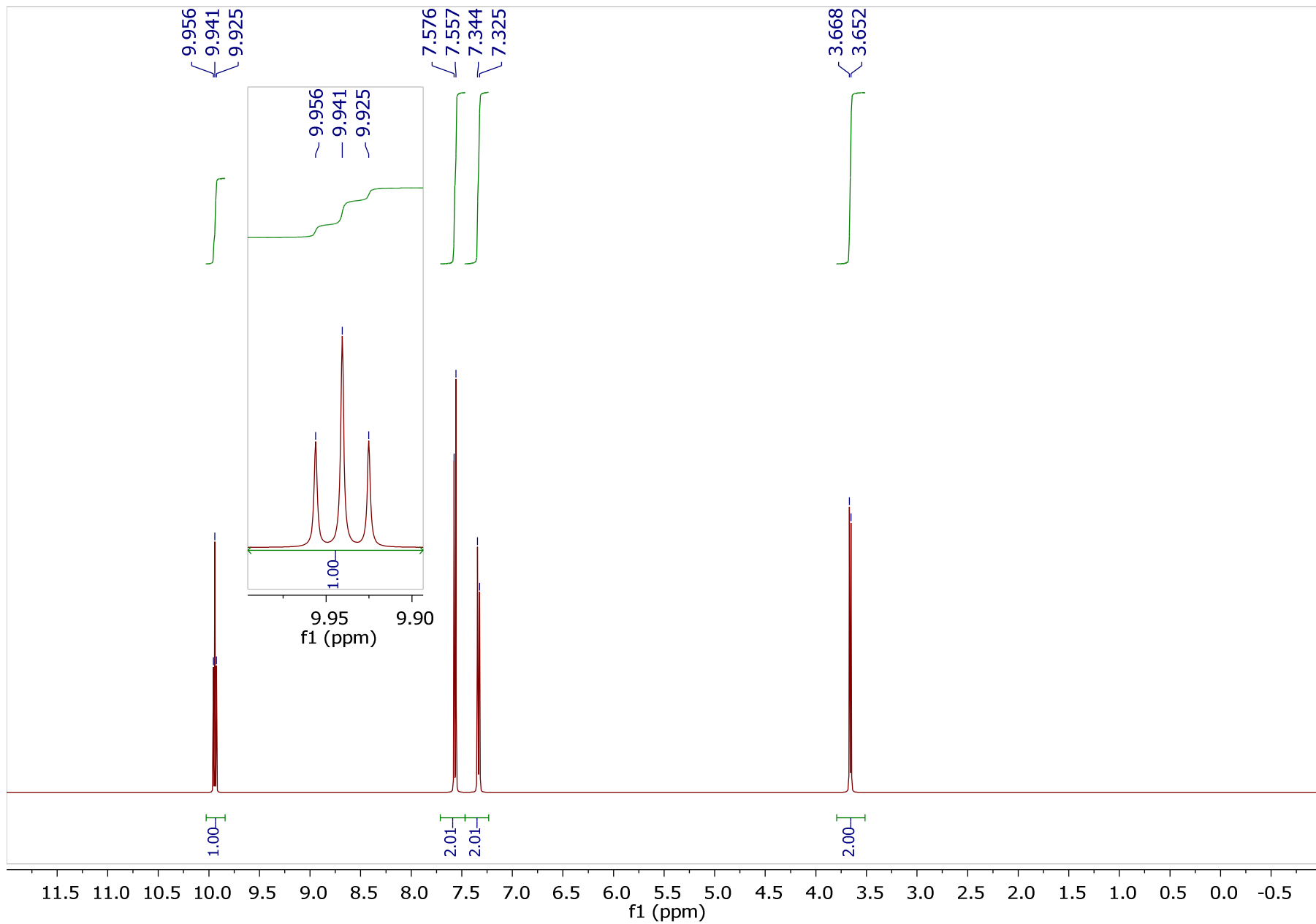
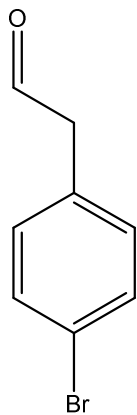
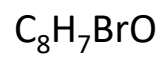
(I)



(m)

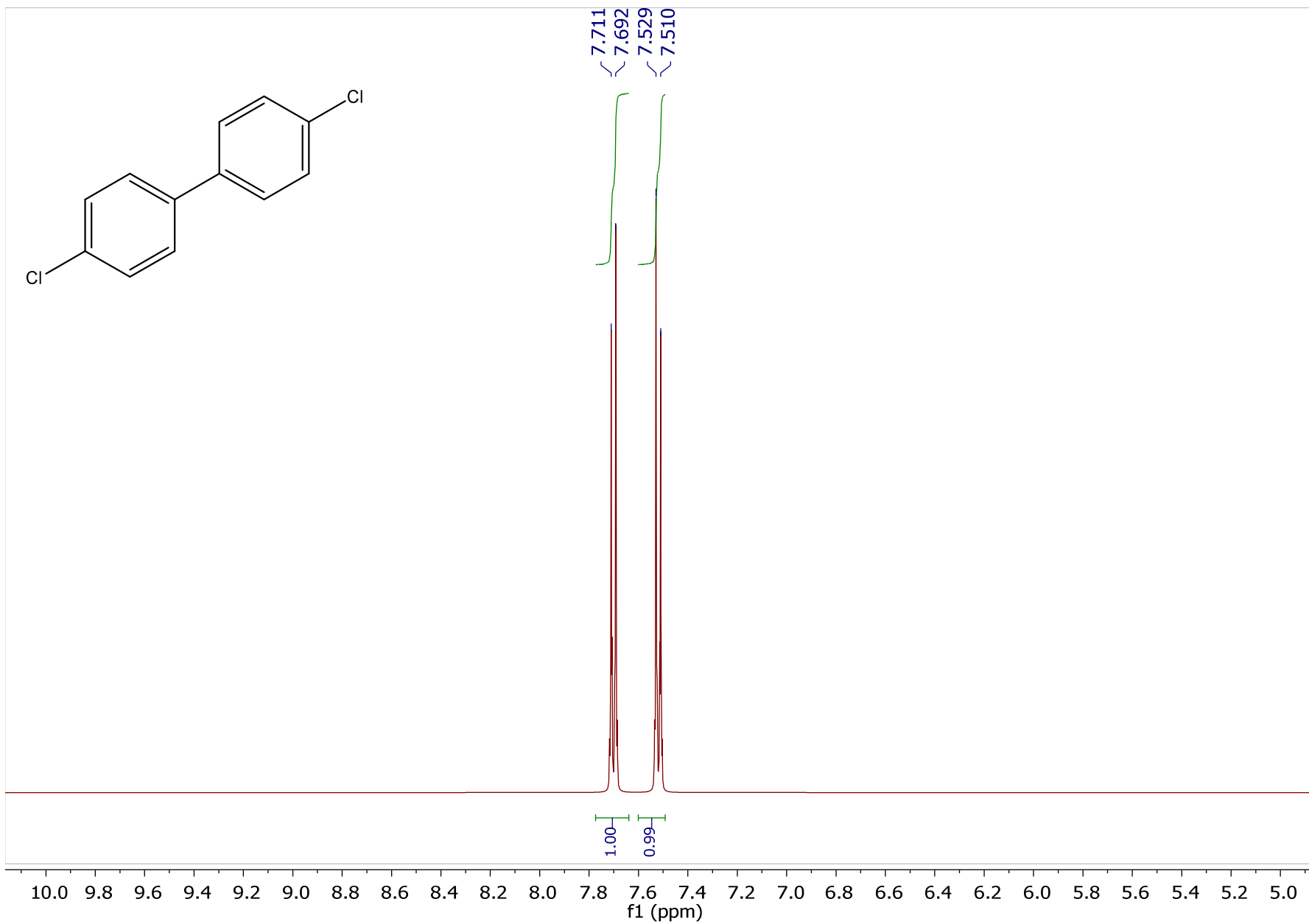
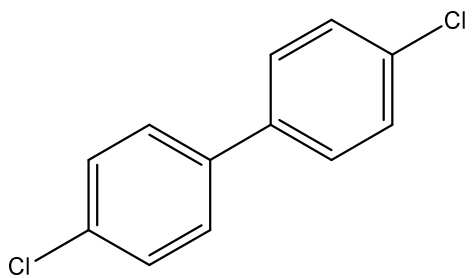
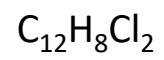


(n)

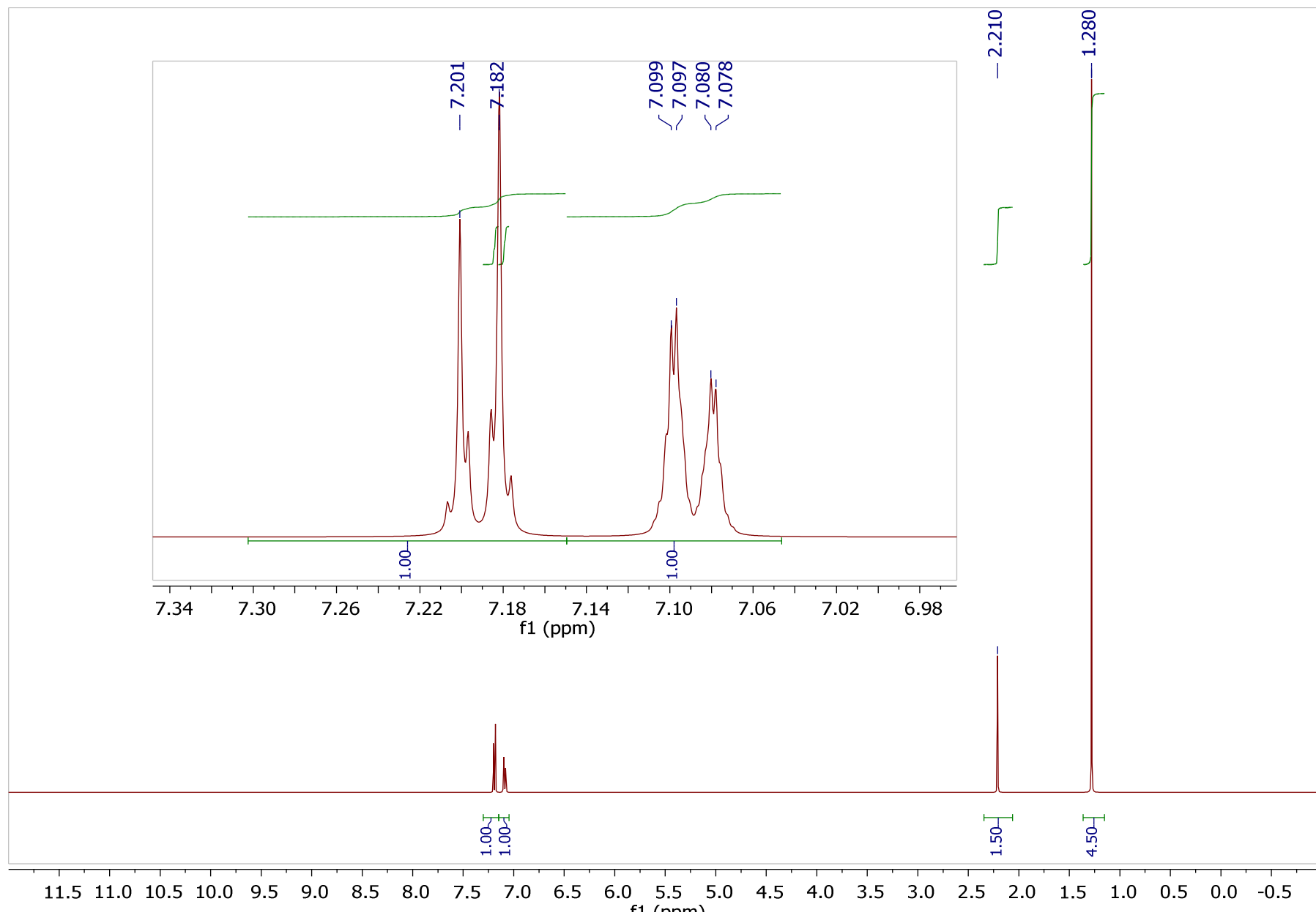
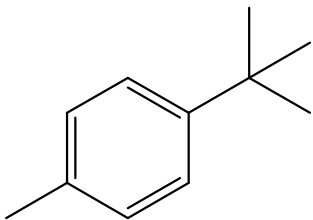
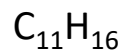




(o)

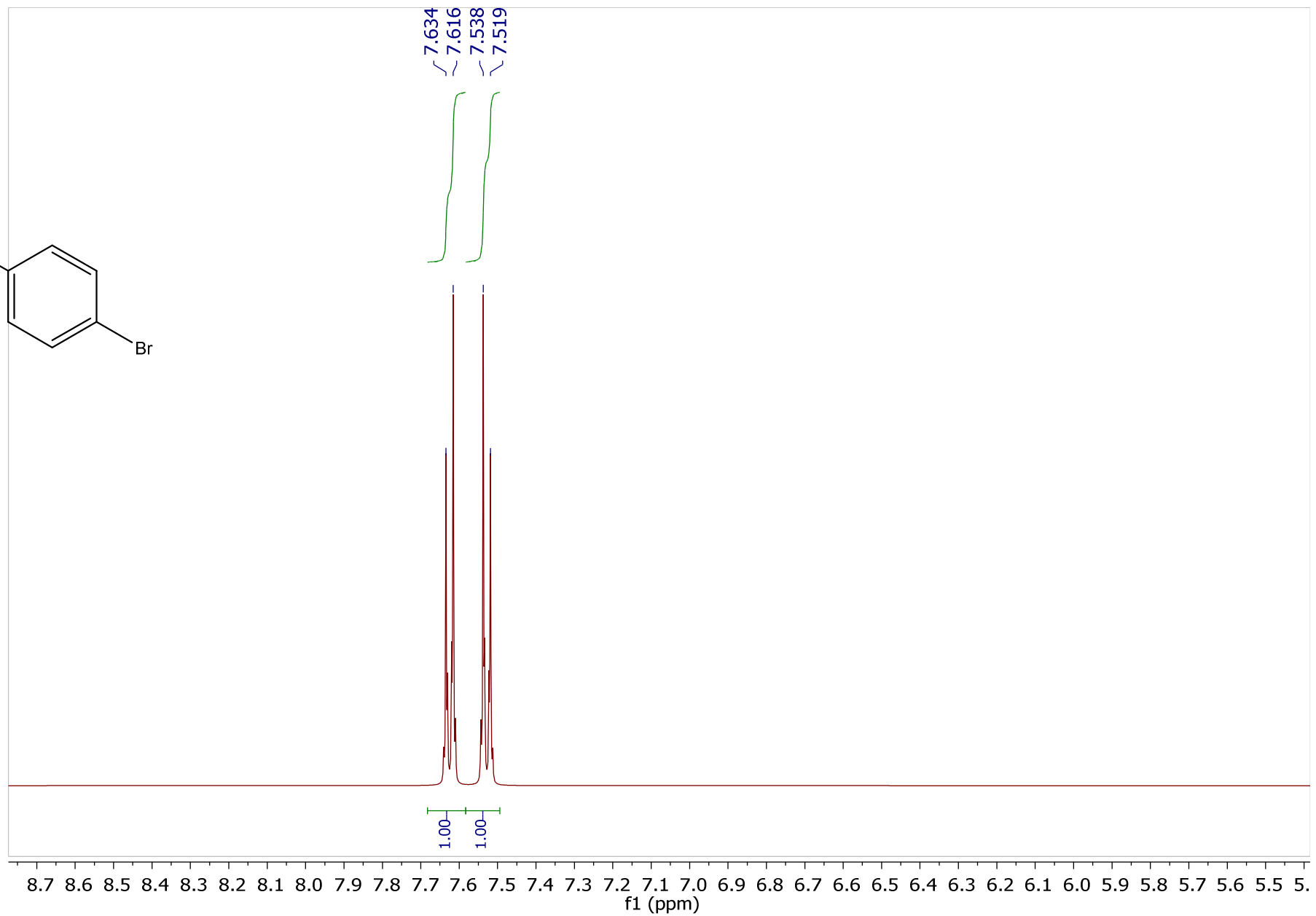
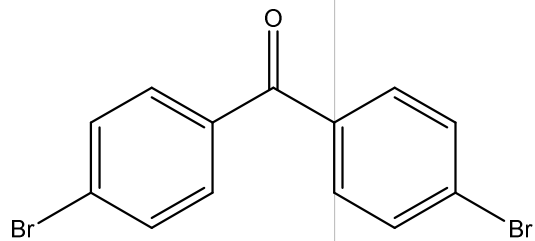


(p)

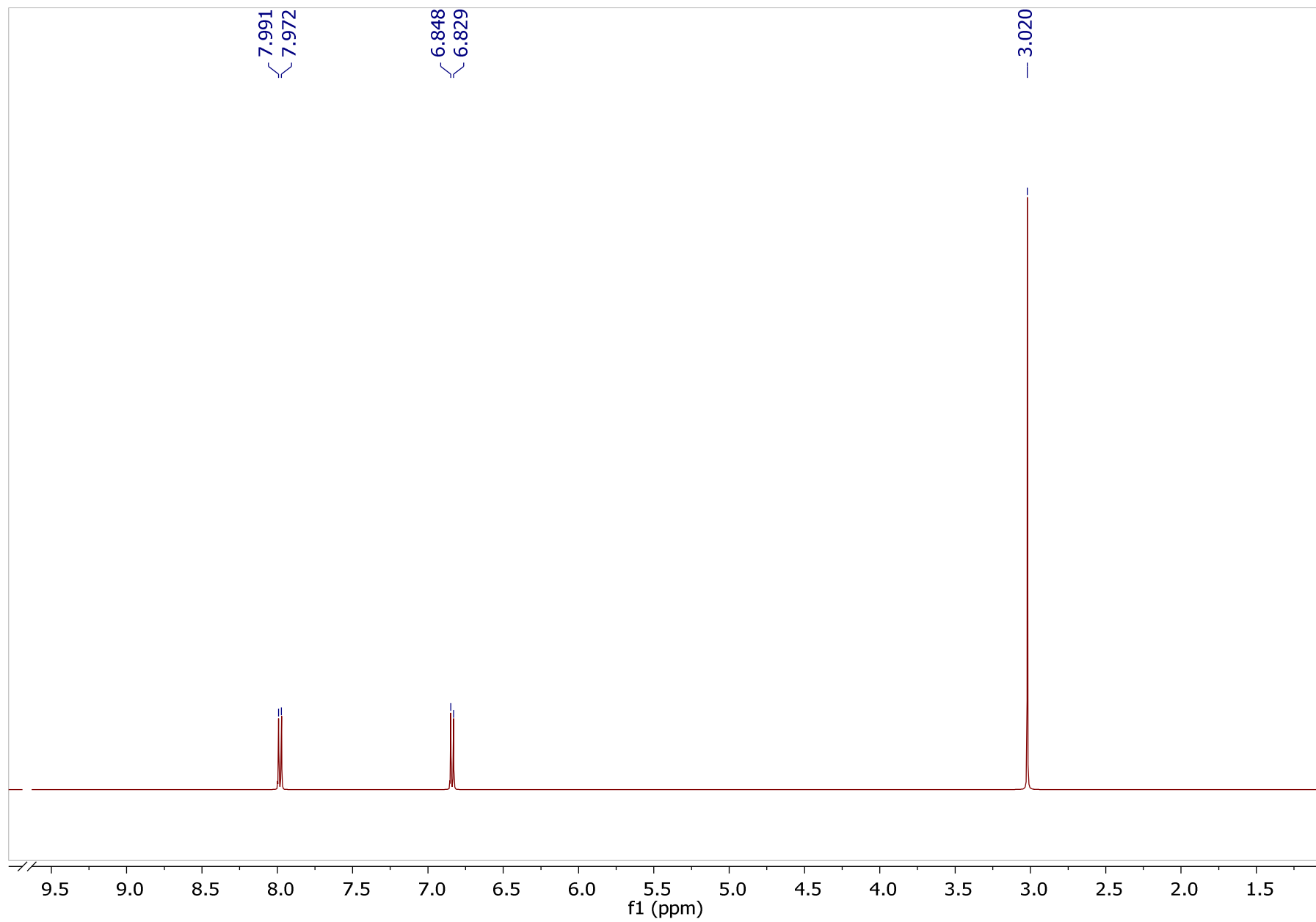
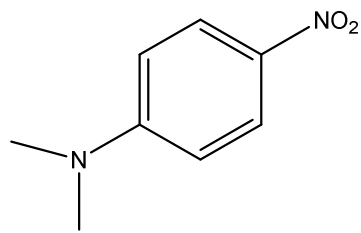
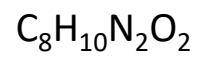


(r)

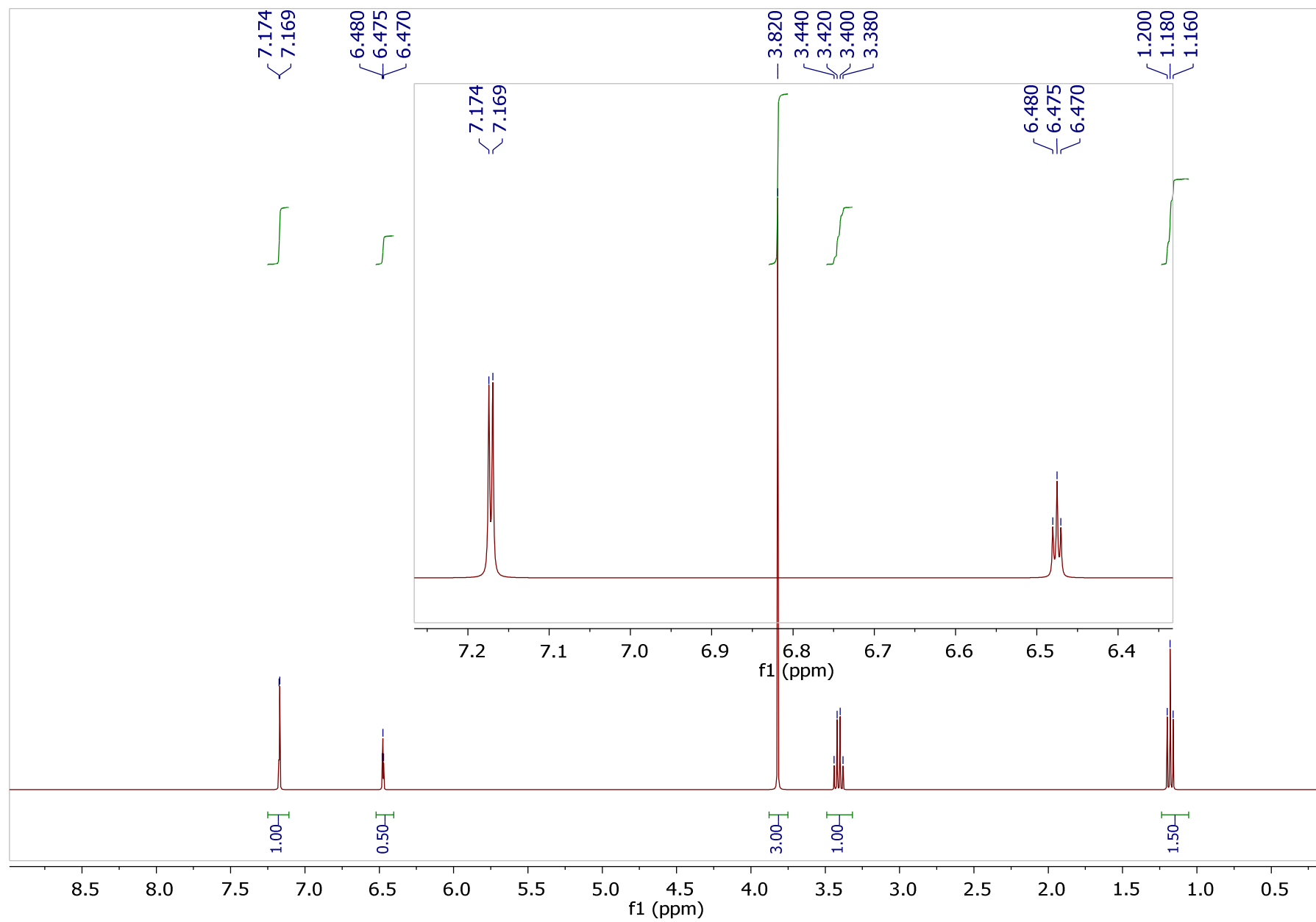
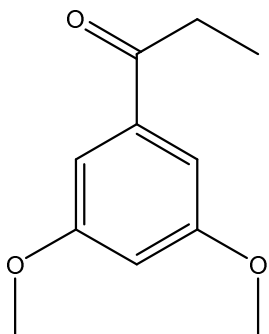
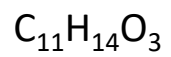
$C_{13}H_8Br_2O$



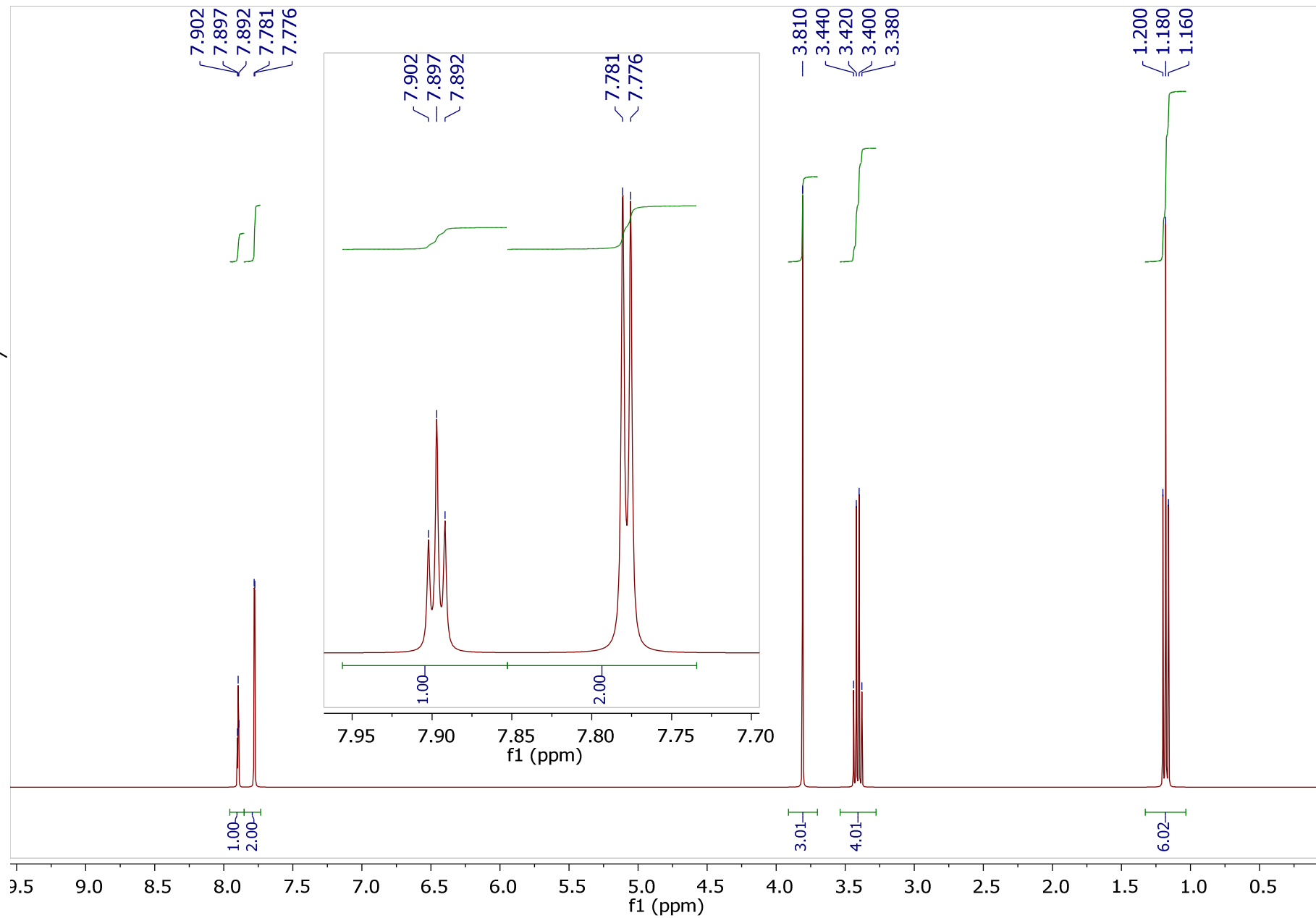
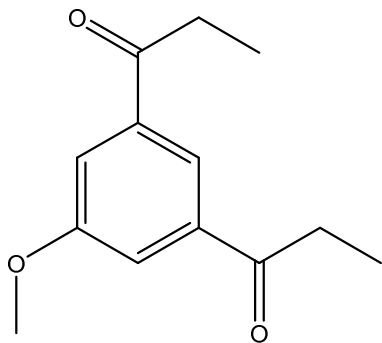
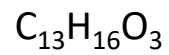
(s)



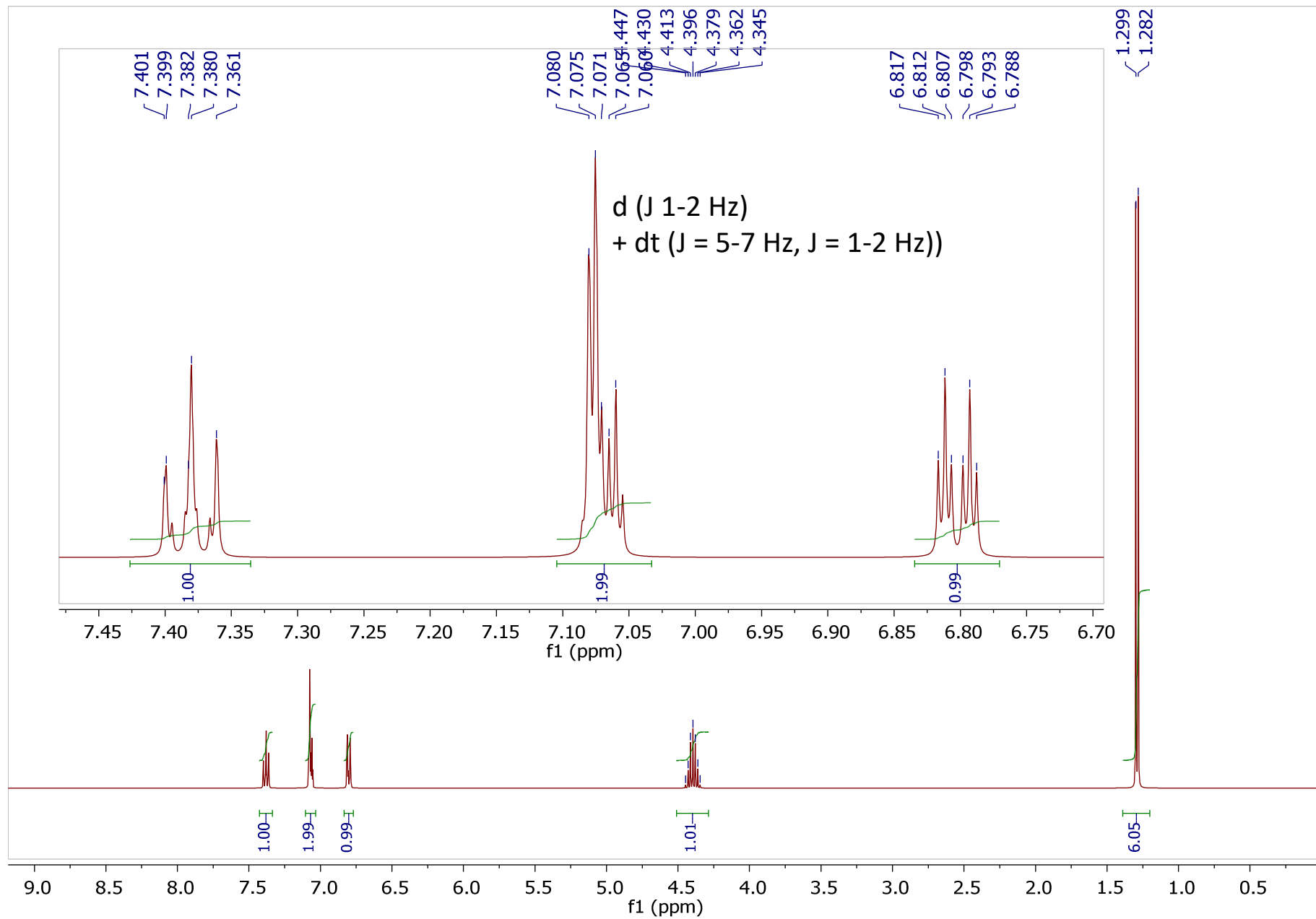
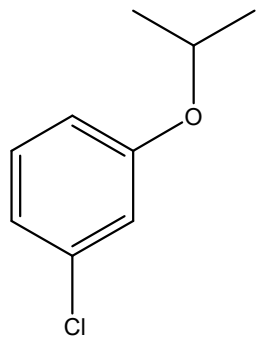
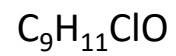
(t)



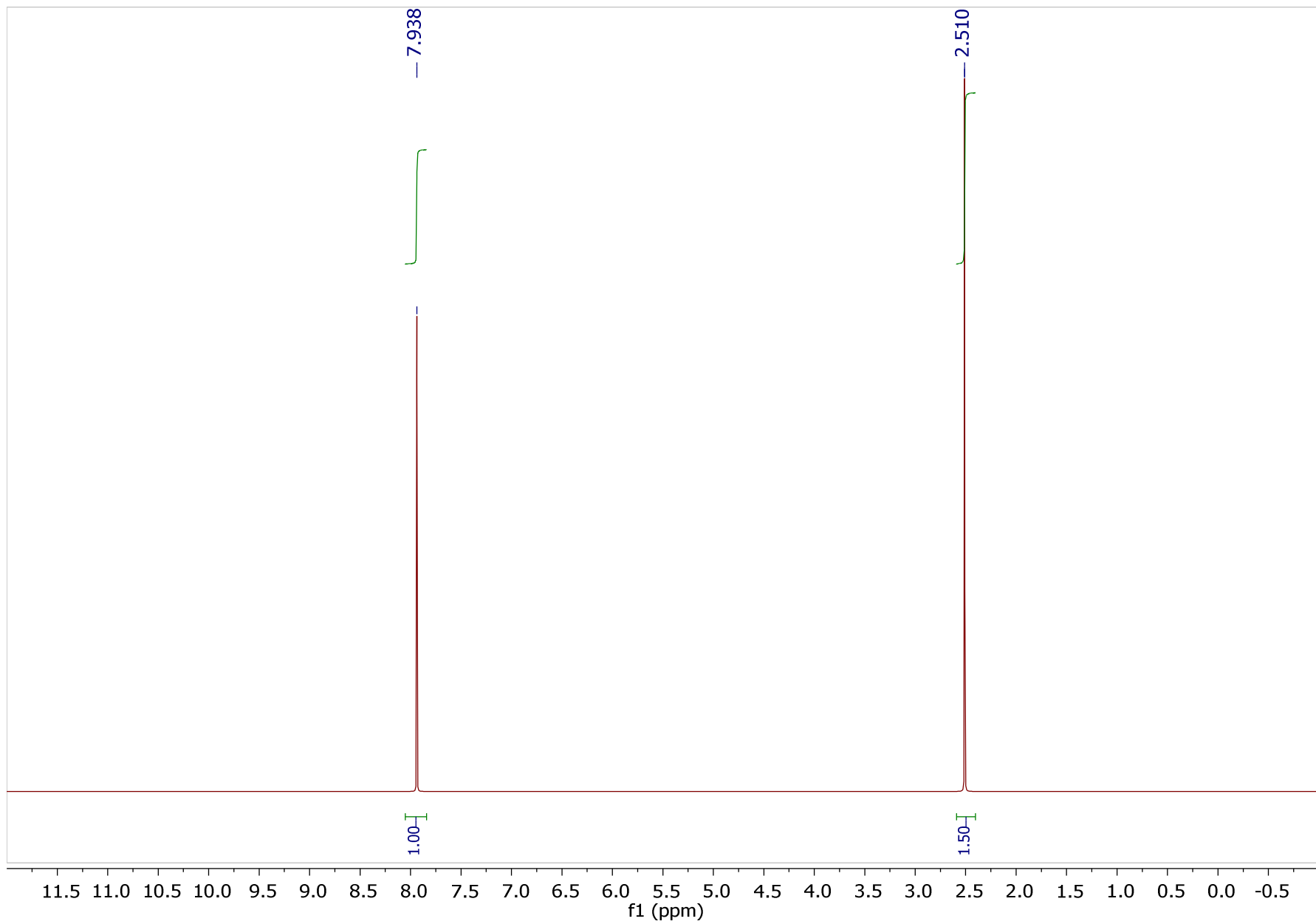
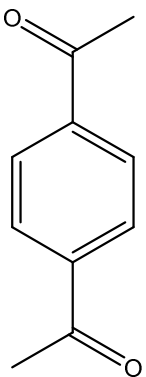
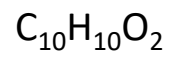
(u)



(w)

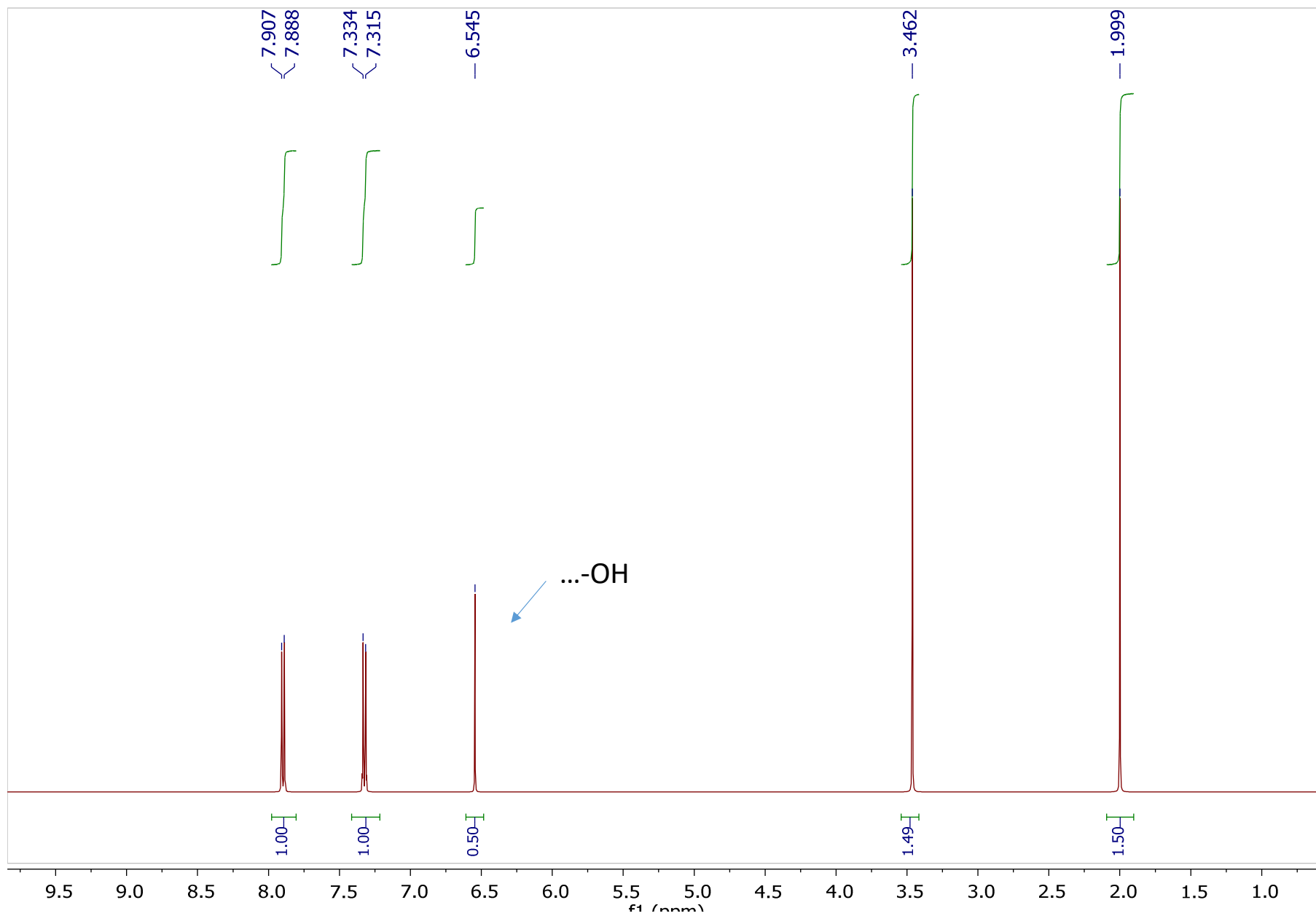
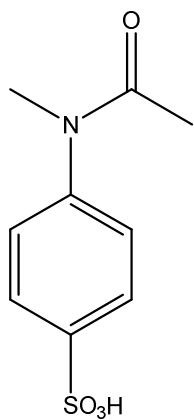
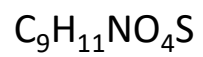


(x)

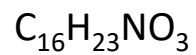




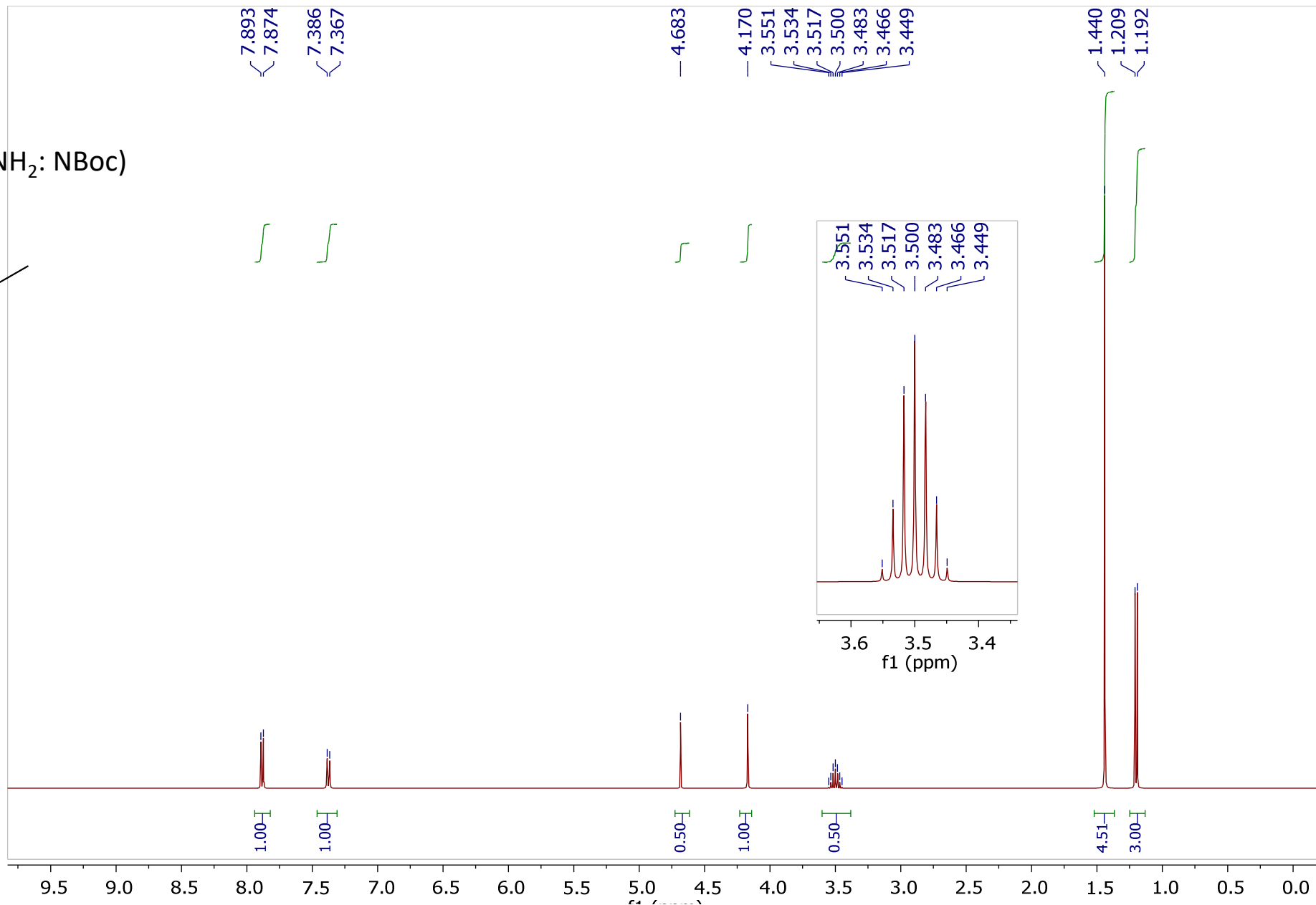
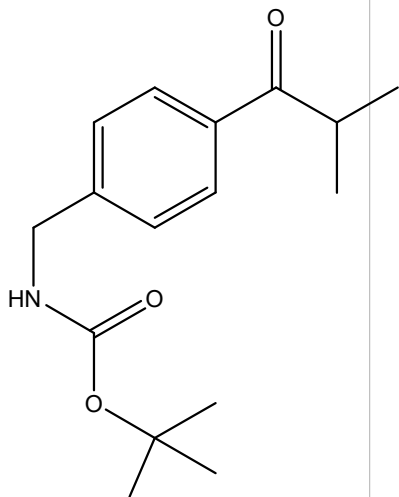
(y)



(z)

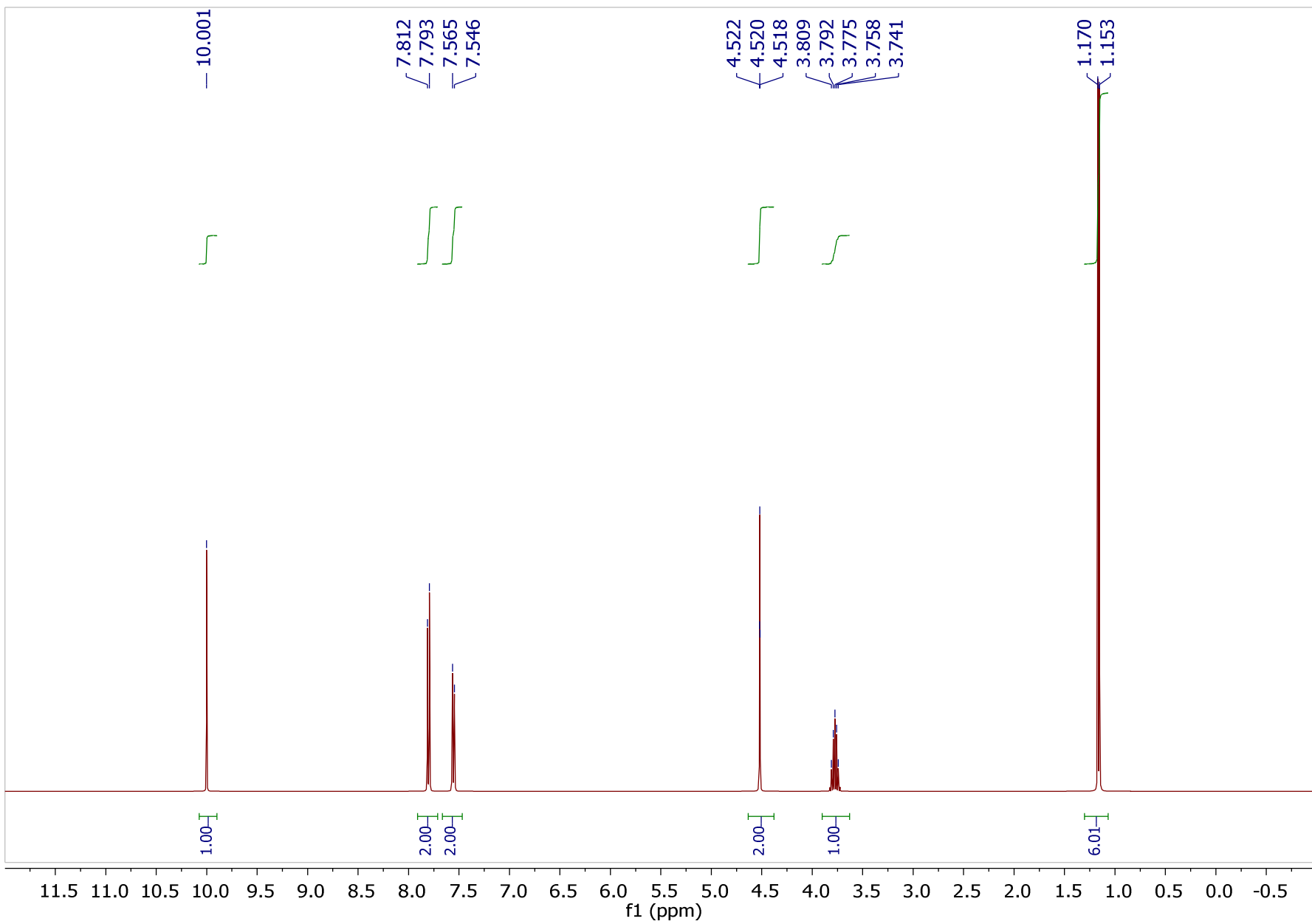
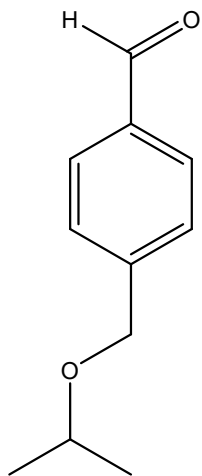


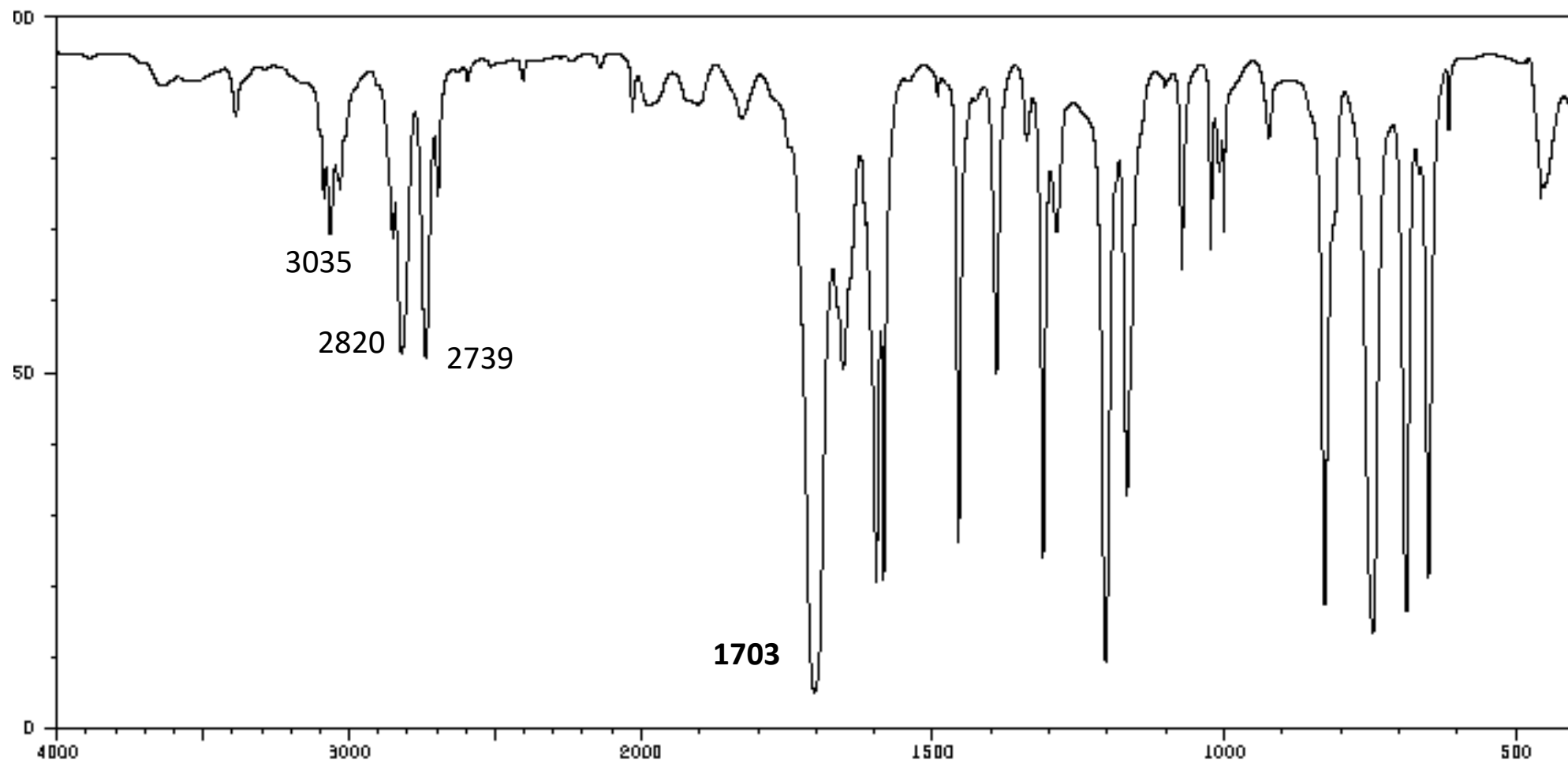
(zabezpieczenie  $NH_2$ : NBoc)



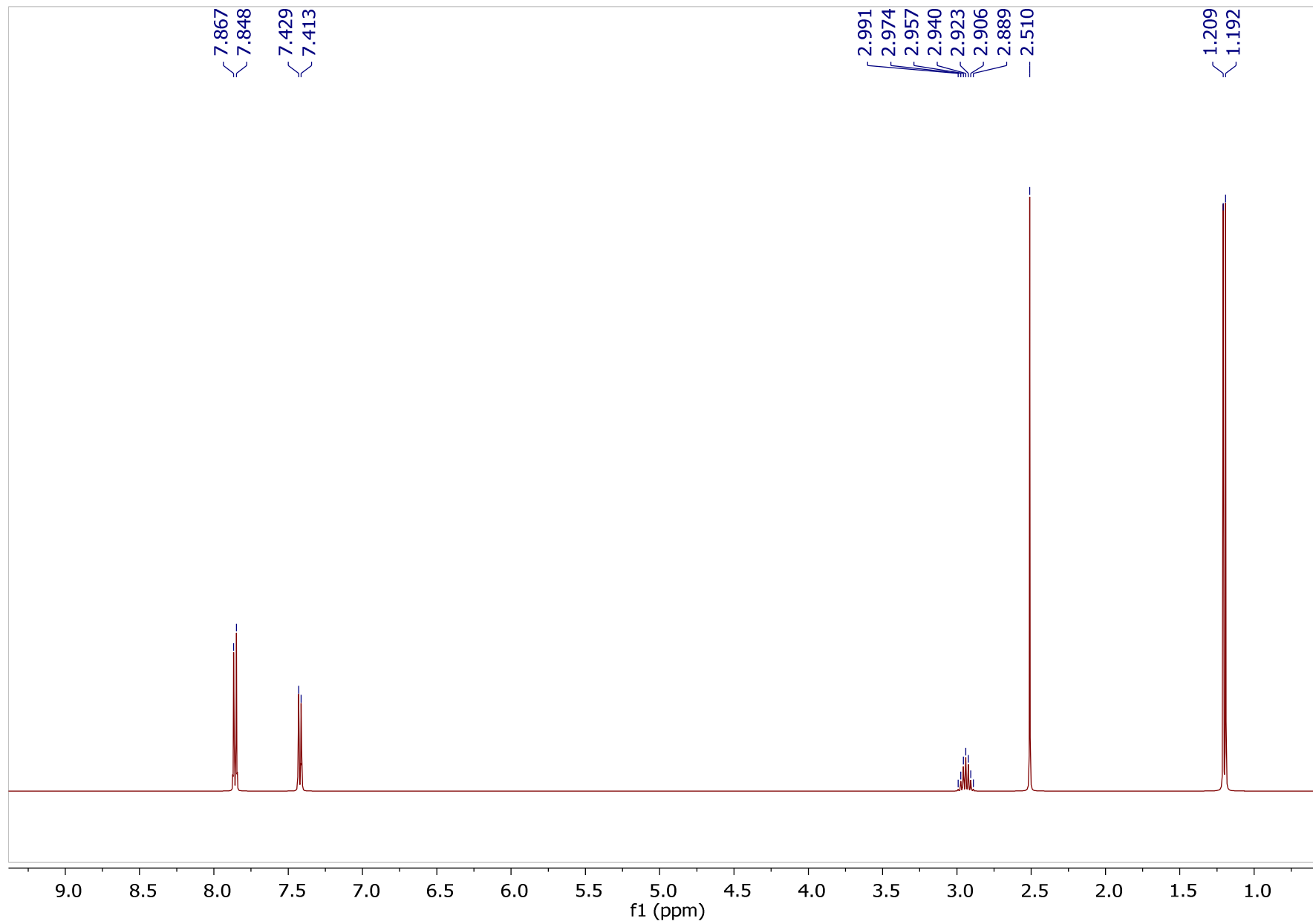
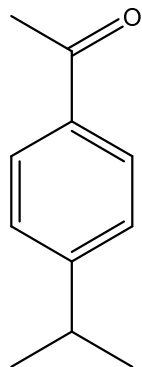
**Zadanie 3.** Na podstawie widm  $^1\text{H}$  NMR zmierzonych na aparacie Bruker 400 MHz ( $\text{CDCl}_3$ ) oraz widm IR określ strukturę związku chemicznego. (Tylko atomy z II okresu układu okresowego bez fluoru)

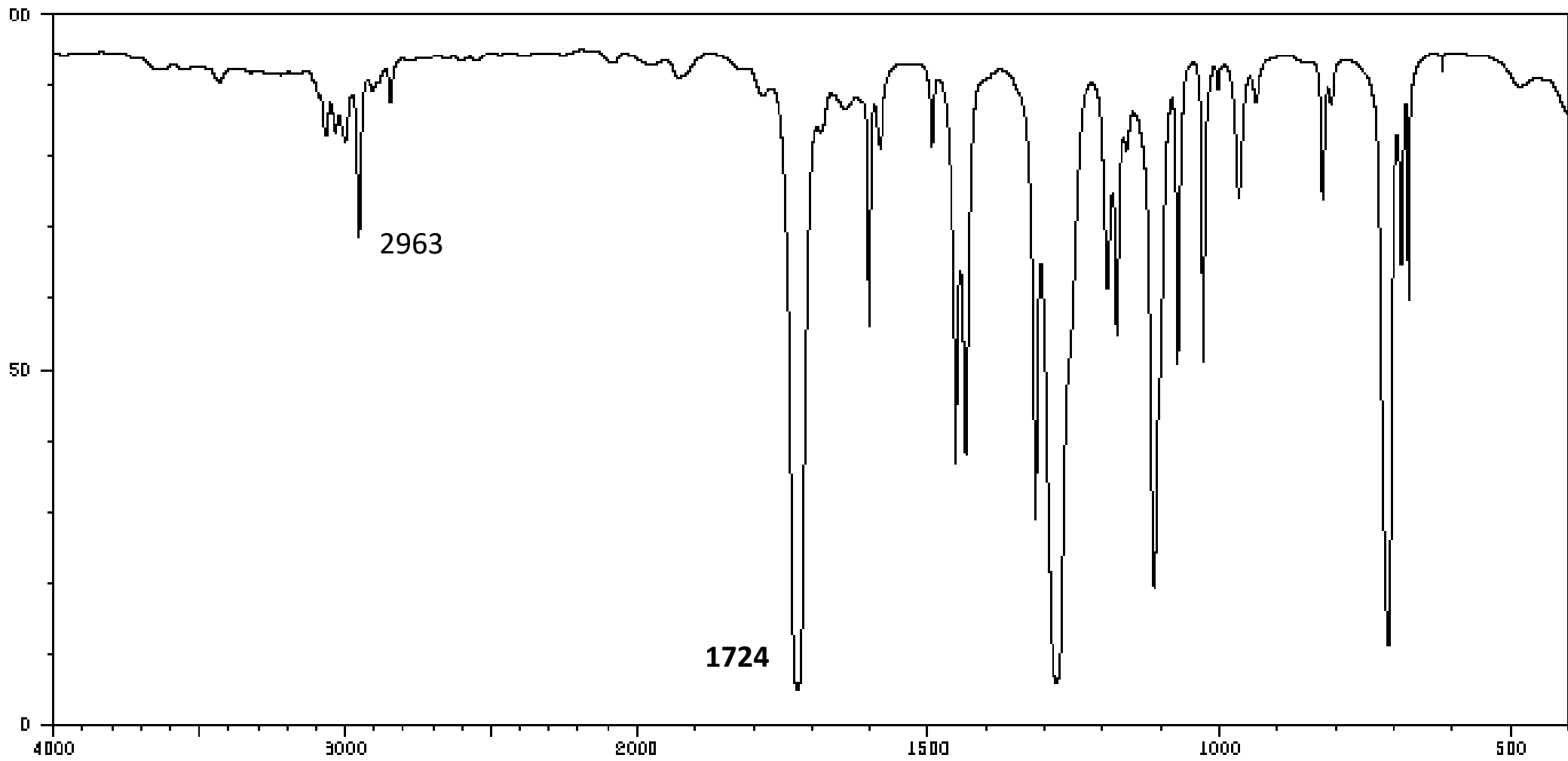
(a)



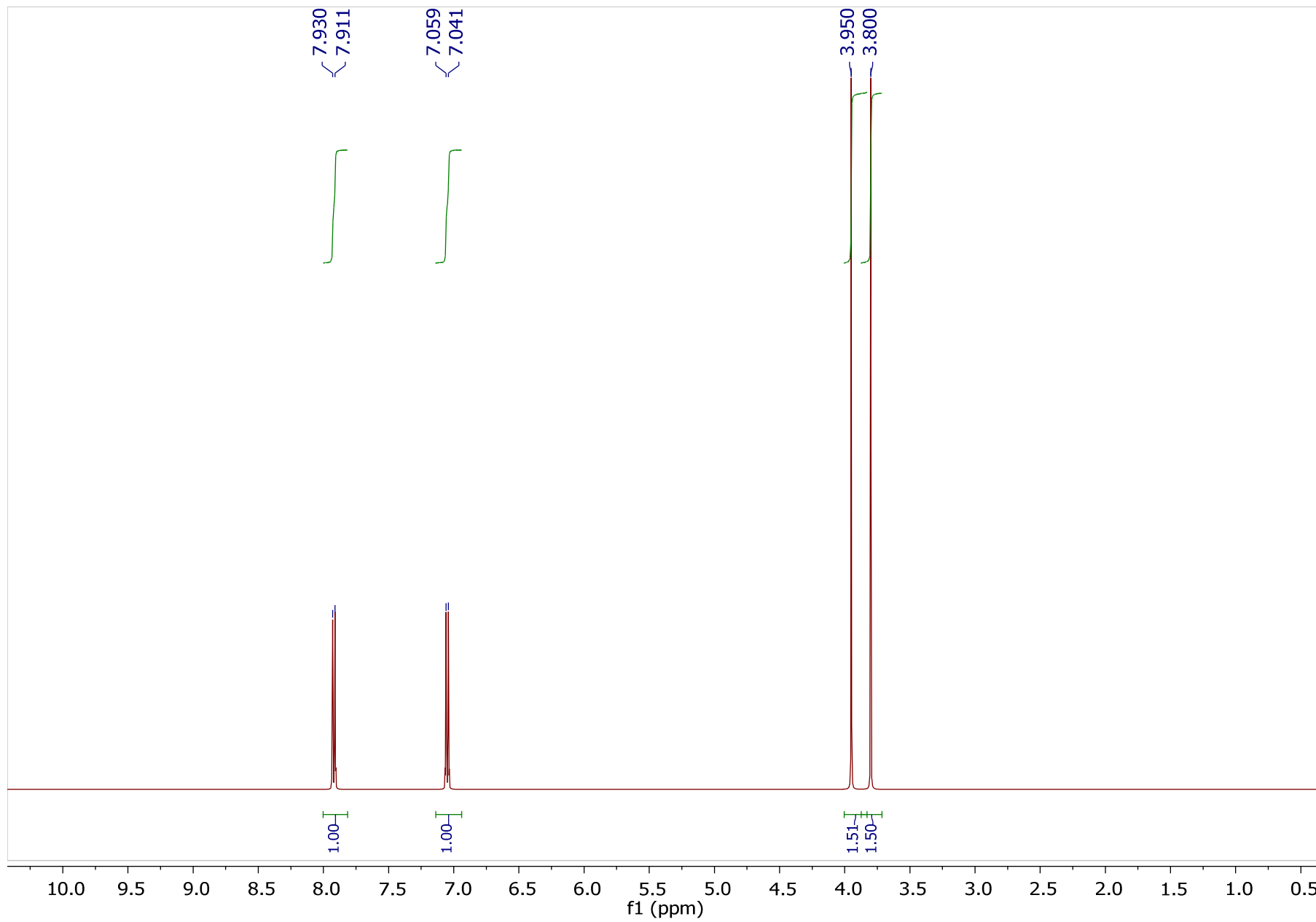
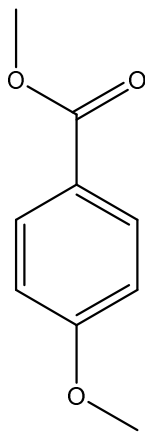


(b)

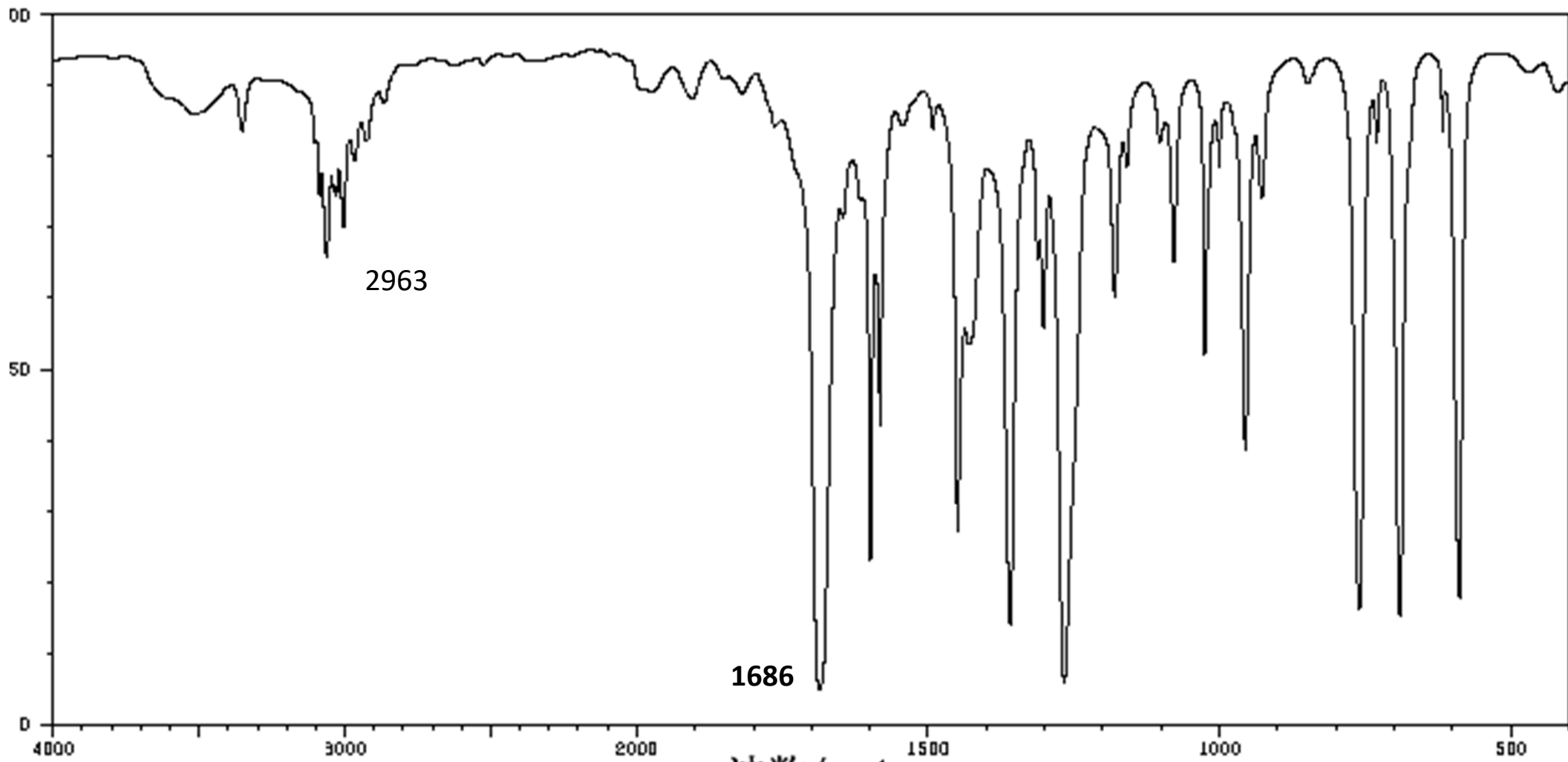




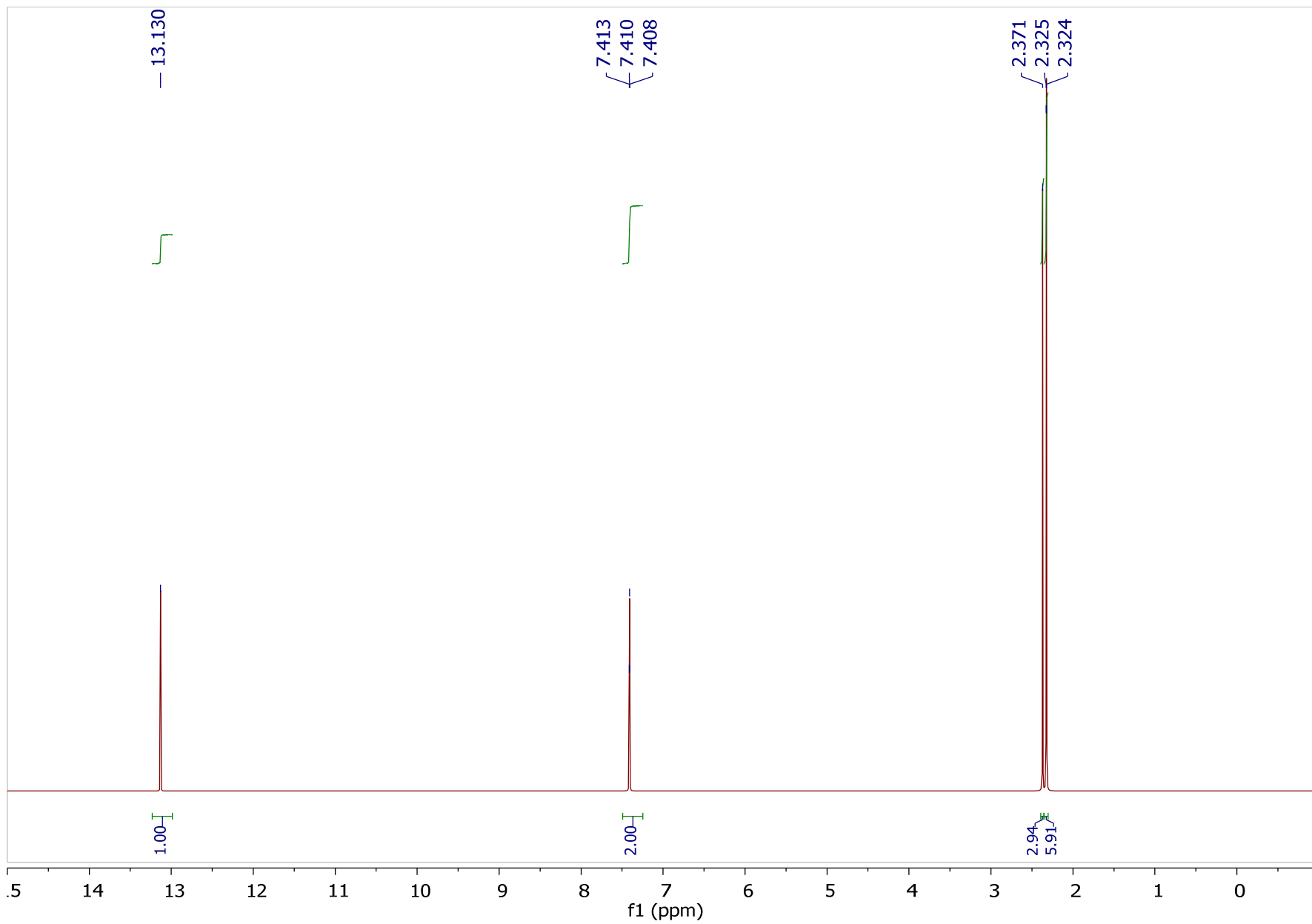
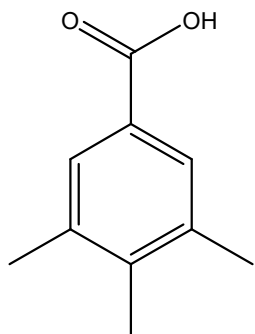
(c)

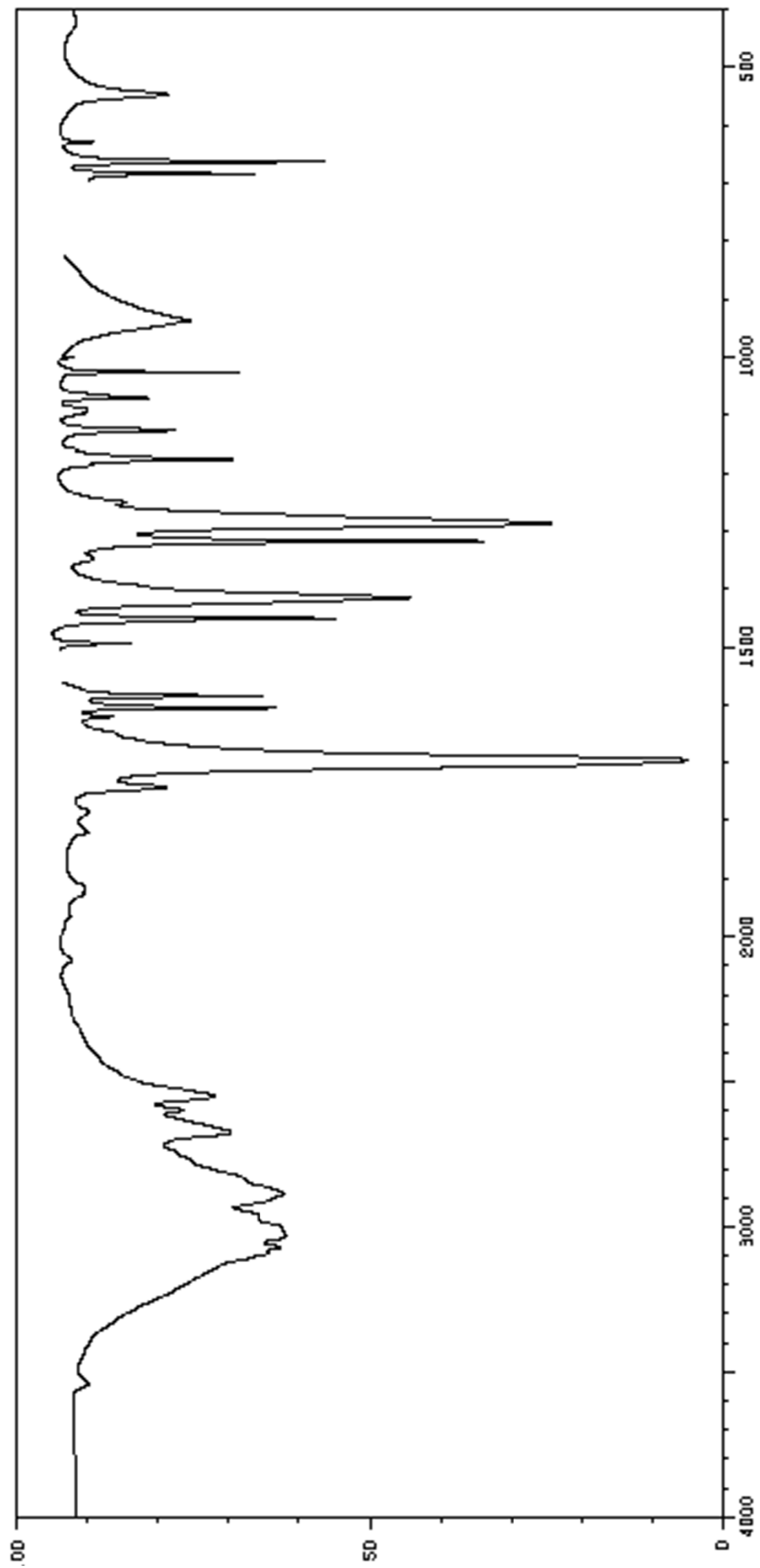




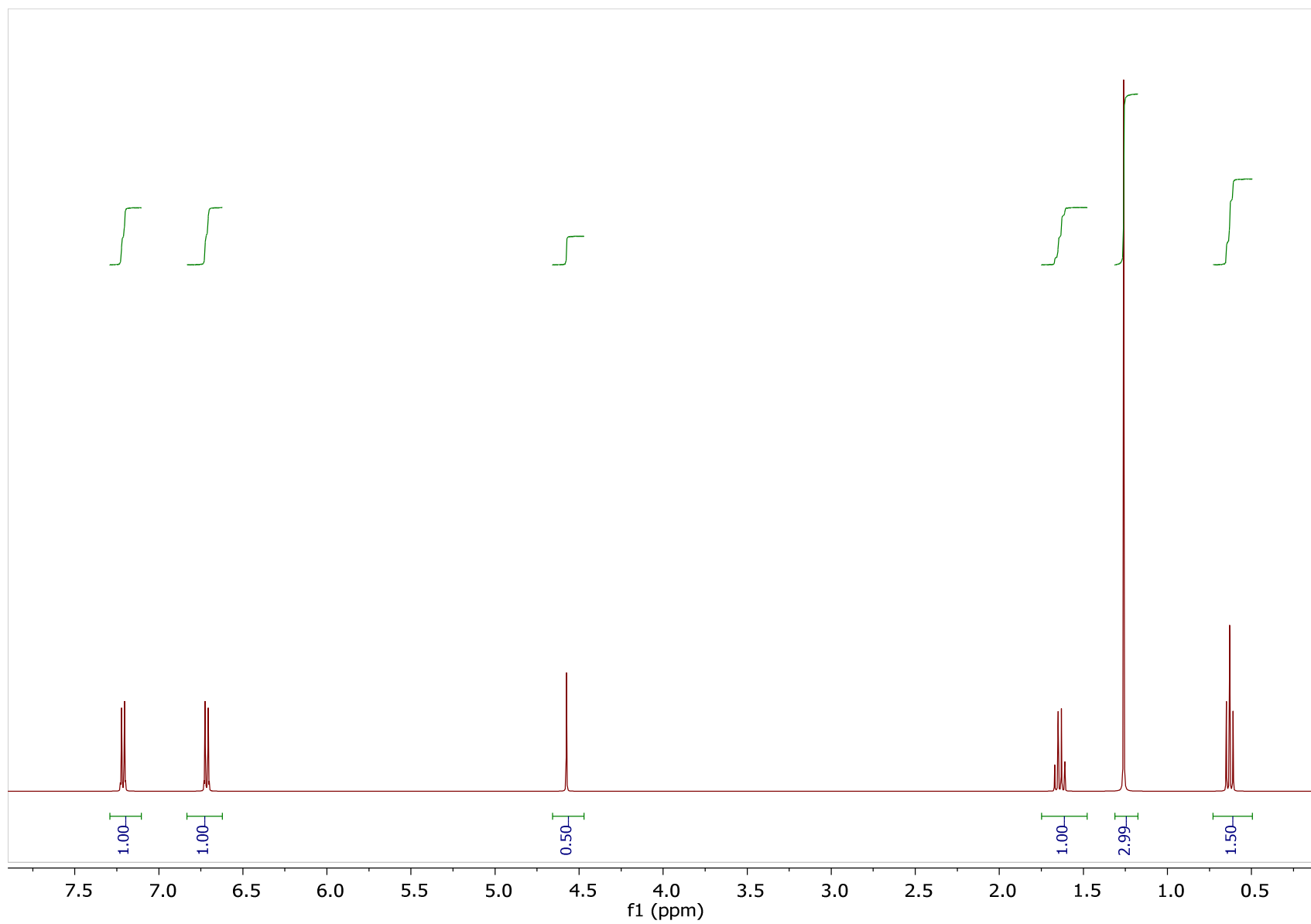
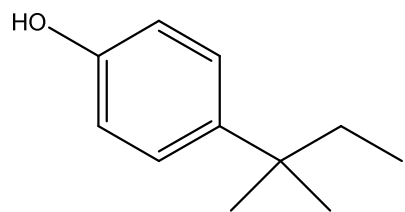


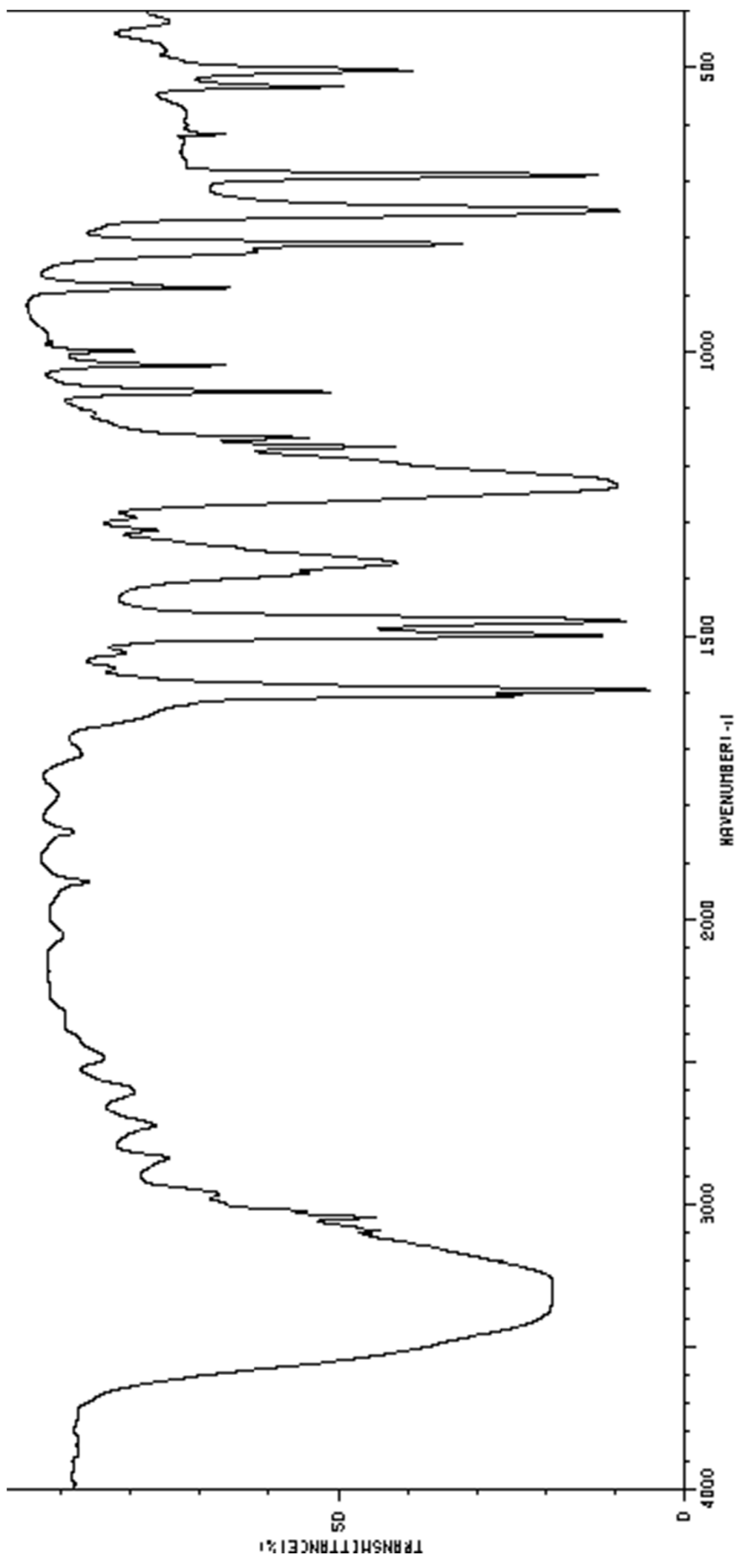
(d)





(e)





(f)

