

Supplementary Data

Immobilization of Phosphomolybdic Acid nanoparticles on Imidazole Functionalized $\text{Fe}_3\text{O}_4@\text{SiO}_2$: A novel and reusable nanocatalysts for one-pot synthesis of Biginelli-type 3,4-dihydropyrimidin-2-(1H)-ones/ thiones under solvent-free conditions

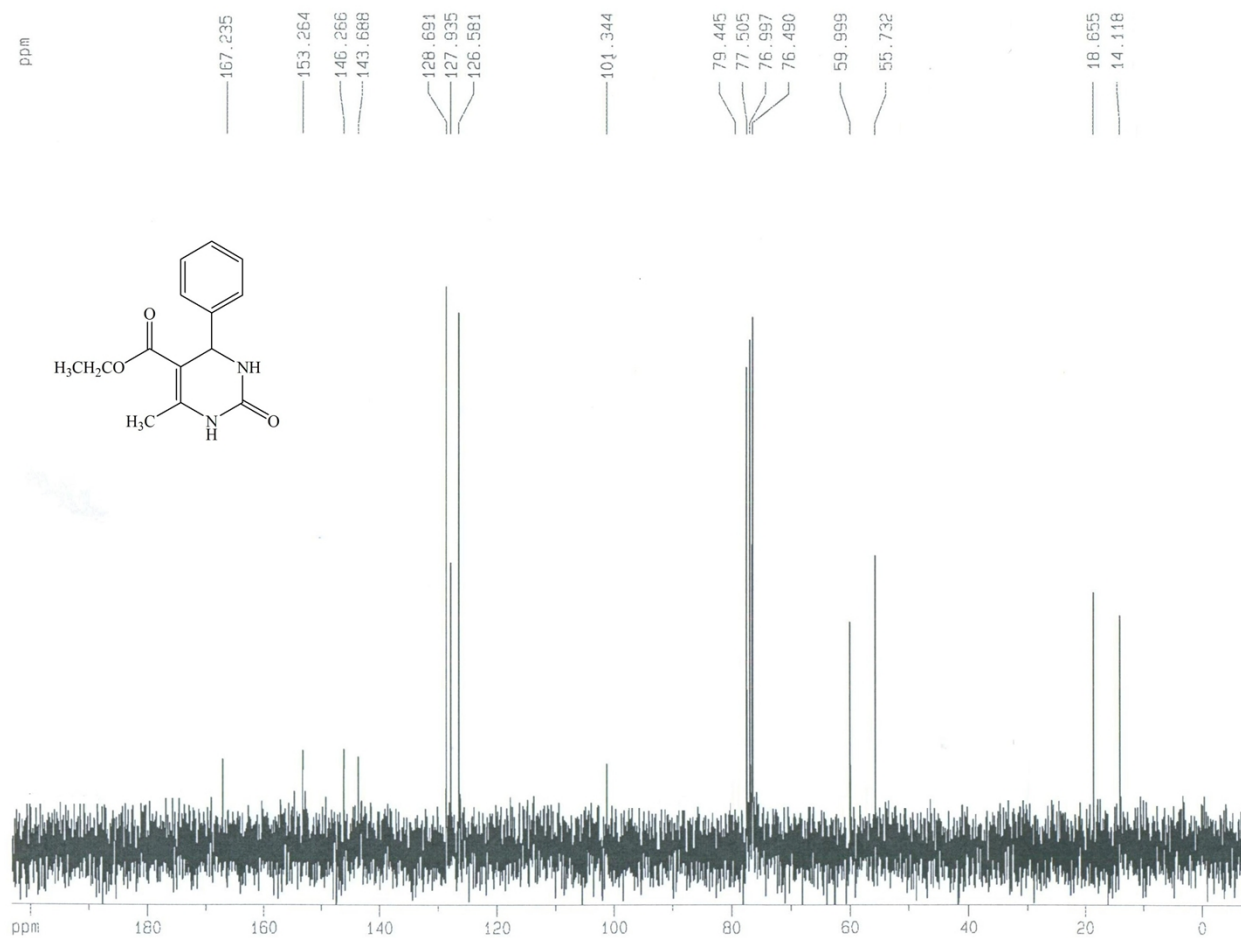
Esmailpour Mohsen^{(1)*}, Javidi Jaber^{(2)*}

Ethyl-6-methyl-2-oxo-4-phenyl-1,2,3,4-tetrahydropyrimidine-5-carboxylate
(Table2, entry 1)

¹H-NMR (250 MHz, CDCl₃)

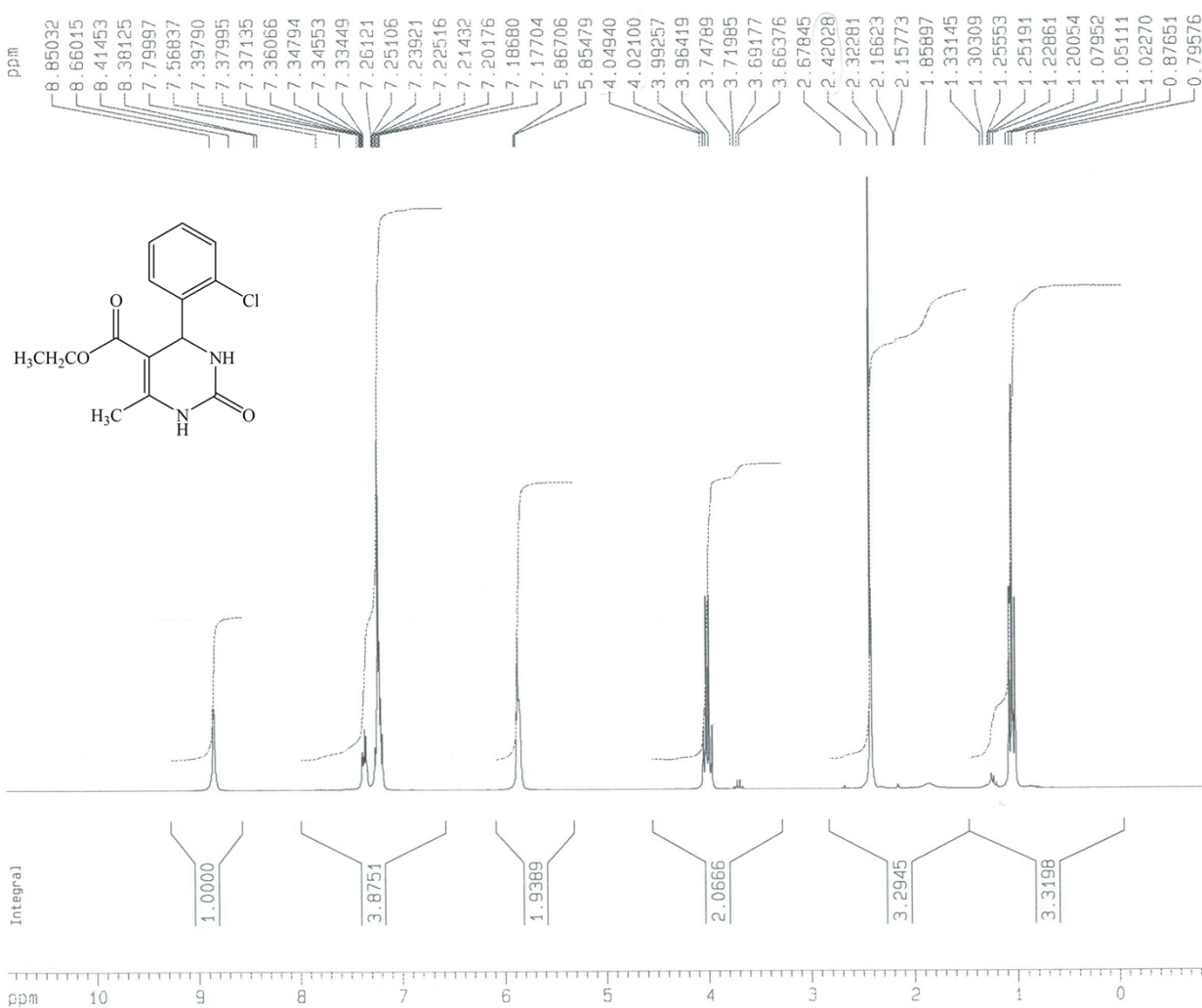


^{13}C -NMR (62.9 MHz, CDCl_3)

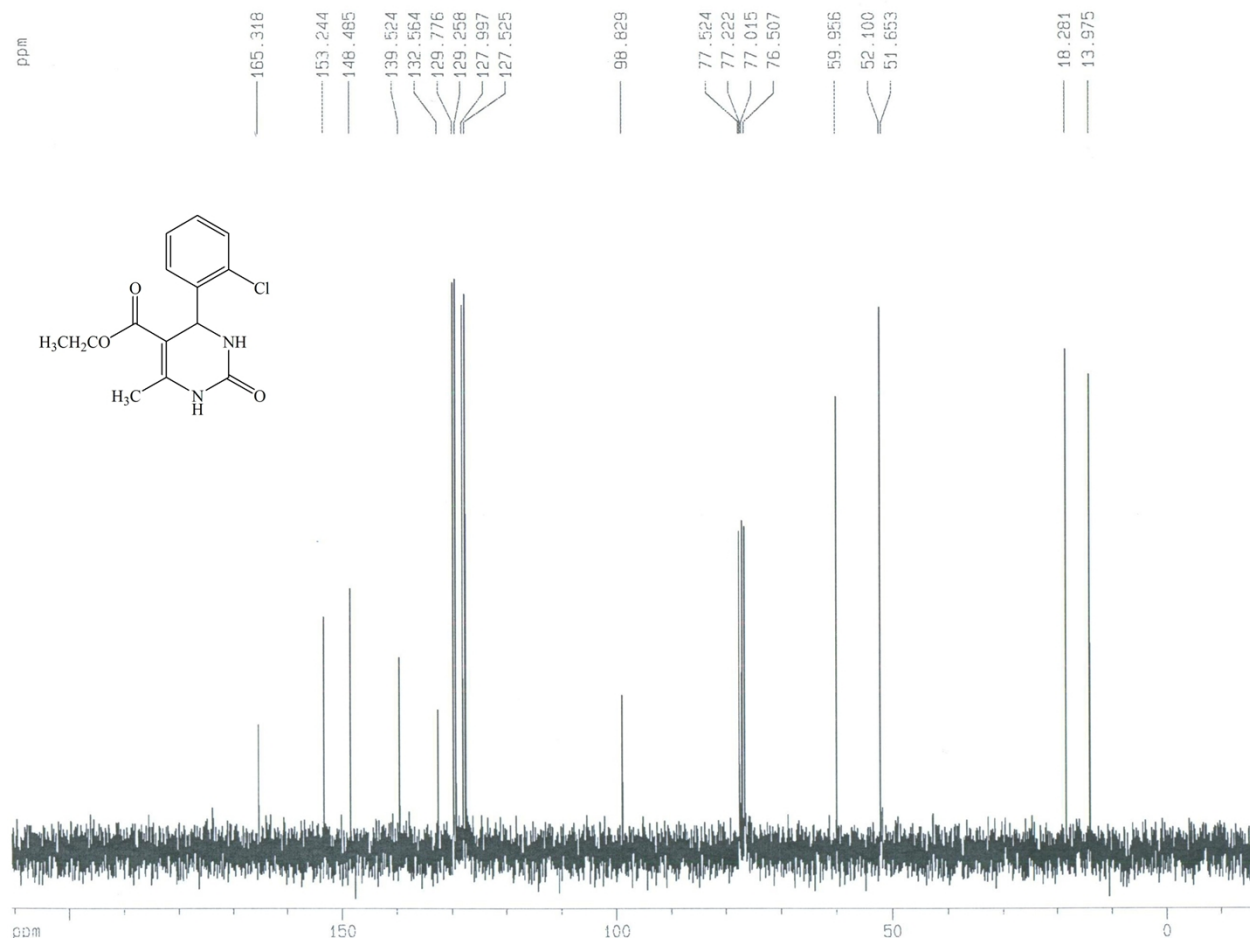


Ethyl 4-(2-chlorophenyl)-6-methyl-2-oxo-1,2,3,4-tetrahydropyrimidine-5-carboxylate (Table 2, entry 3)

¹H-NMR (250 MHz, CDCl₃)

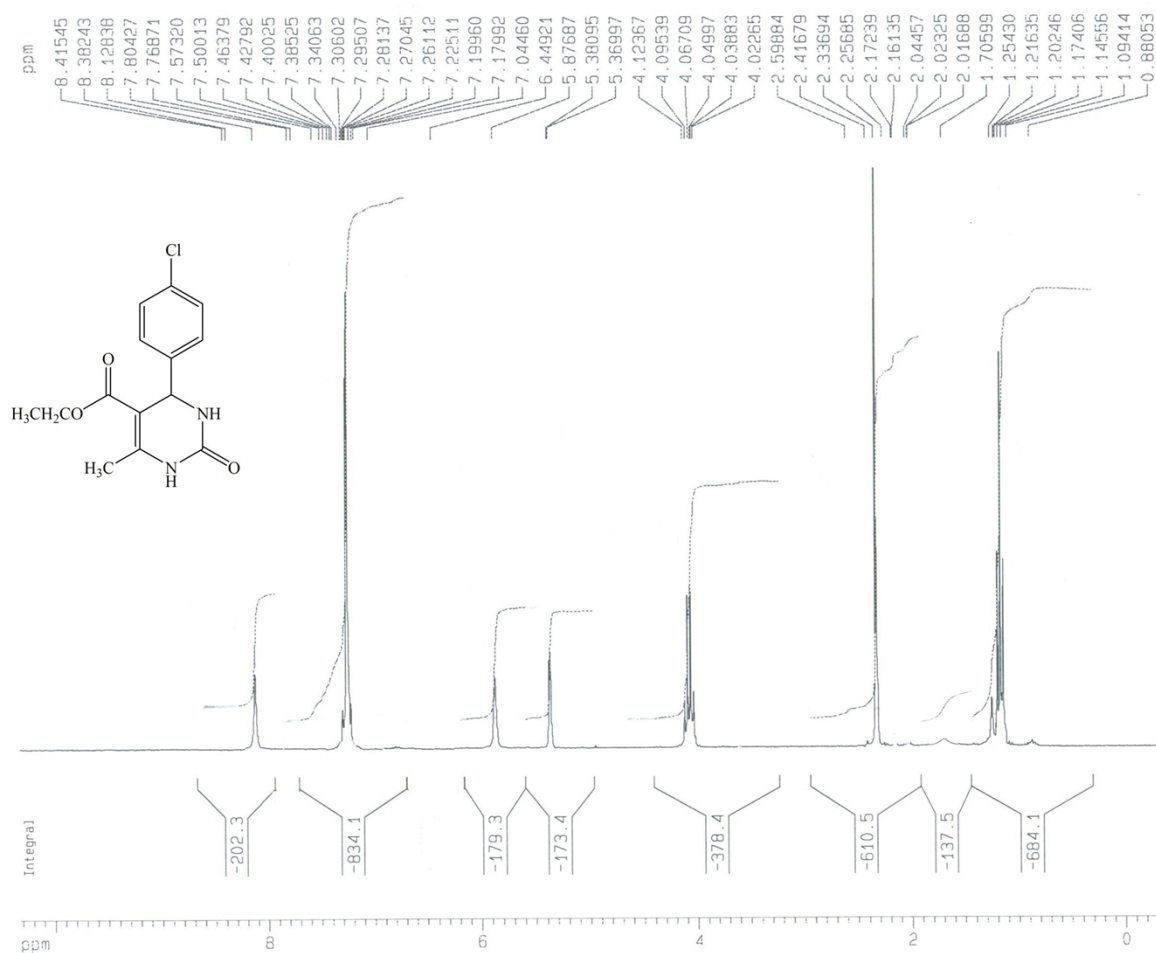


^{13}C -NMR (62.9 MHz, CDCl_3)

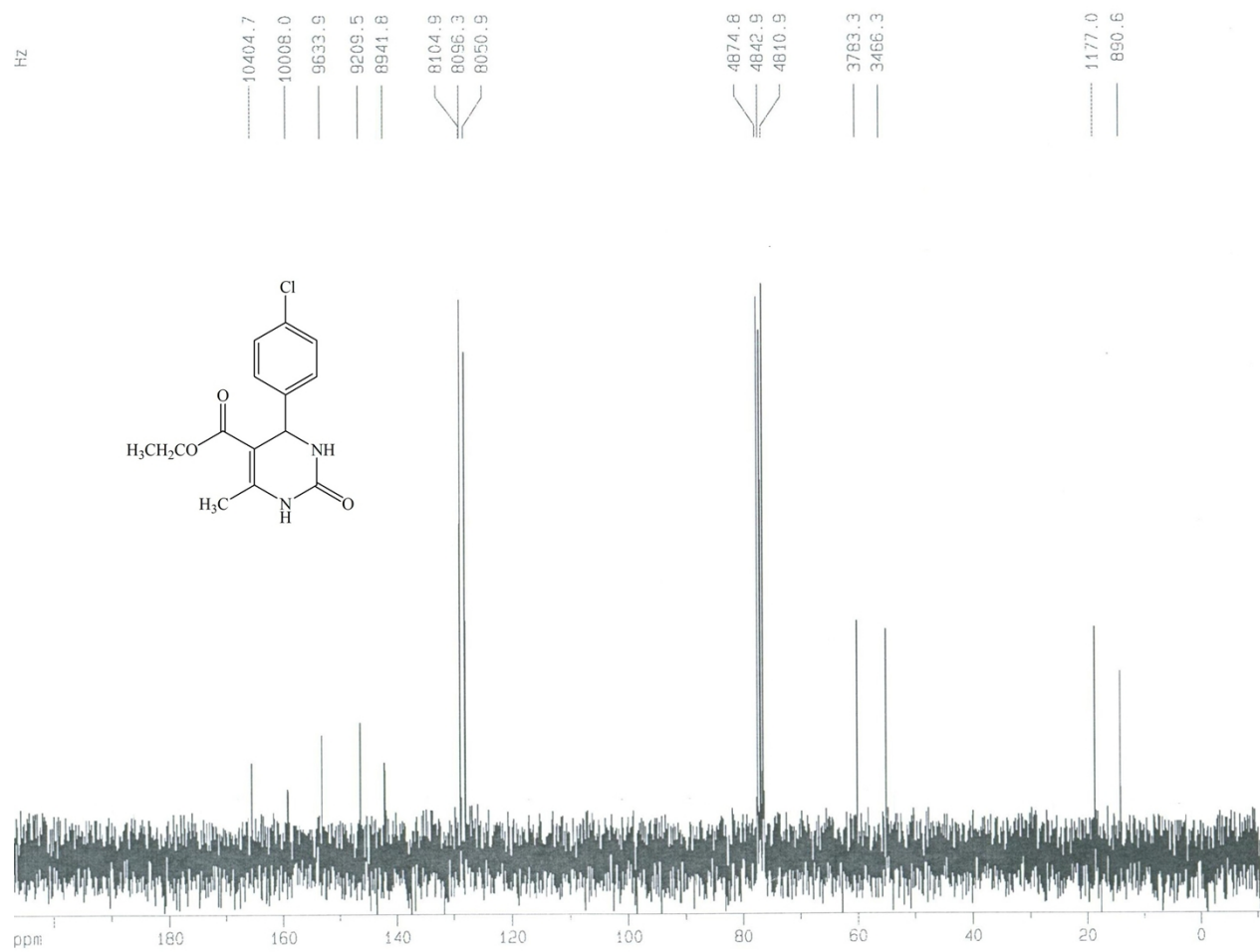


Ethyl 4-(4-chlorophenyl)-6-methyl-2-oxo-1,2,3,4-tetrahydropyrimidine-5-carboxylate (Table 2, entry 4)

¹H-NMR (250 MHz, CDCl₃)

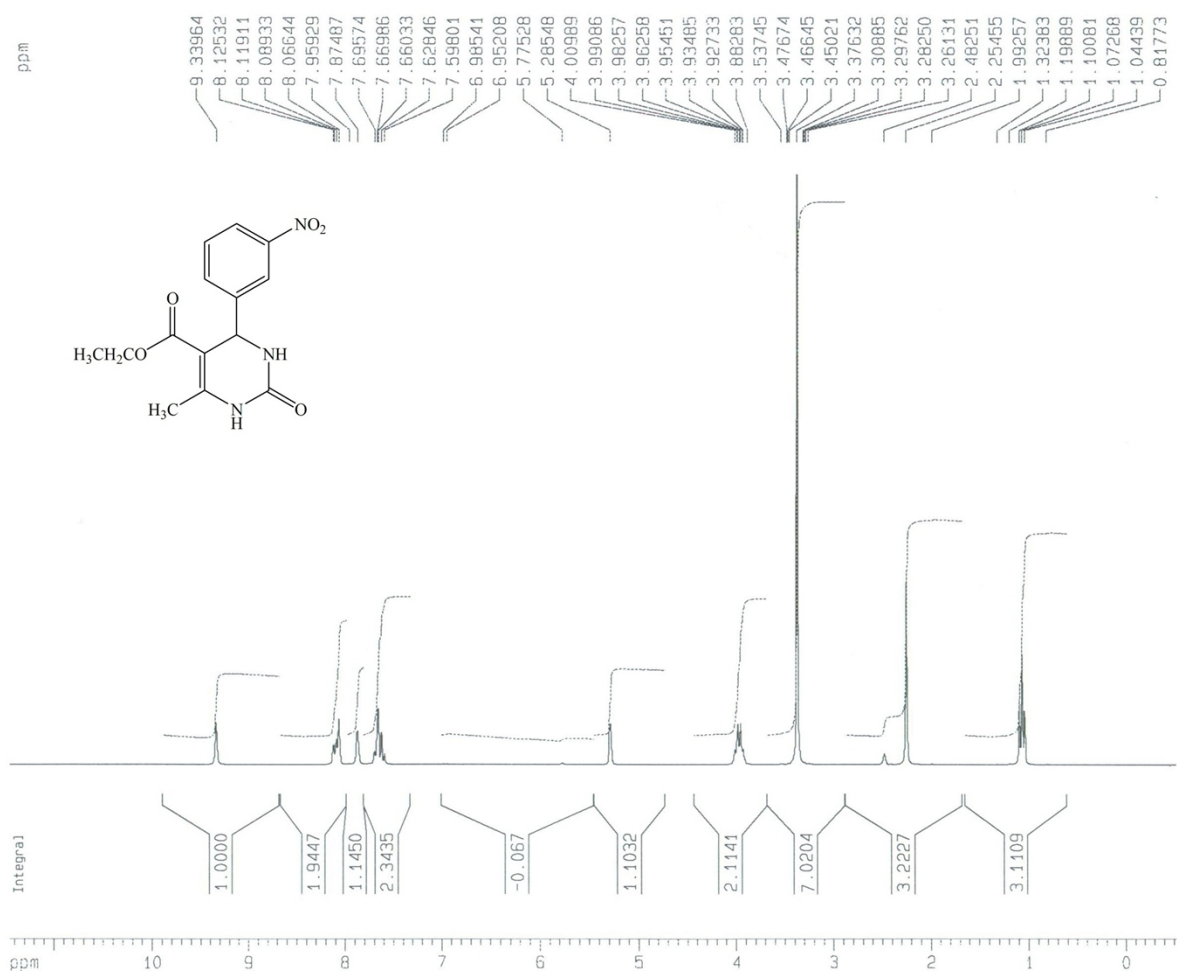


^{13}C -NMR (62.9 MHz, CDCl_3)

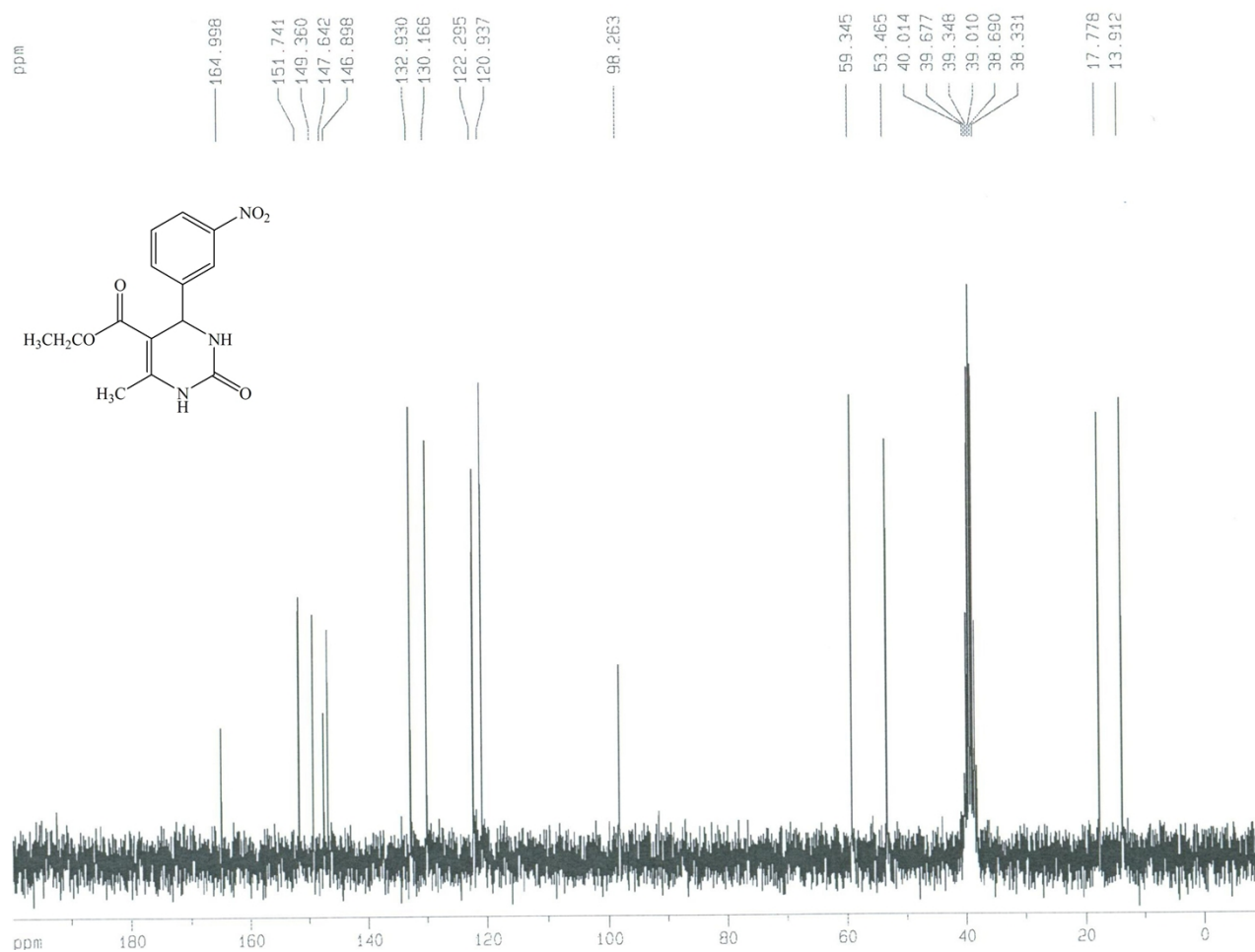


Ethyl 6-methyl-4-(3-nitrophenyl)-2-oxo-1,2,3,4-tetrahydropyrimidine-5-carboxylate (Table 2, entry 6)

$^1\text{H-NMR}$ (250 MHz, $\text{DMSO-}d_6$)

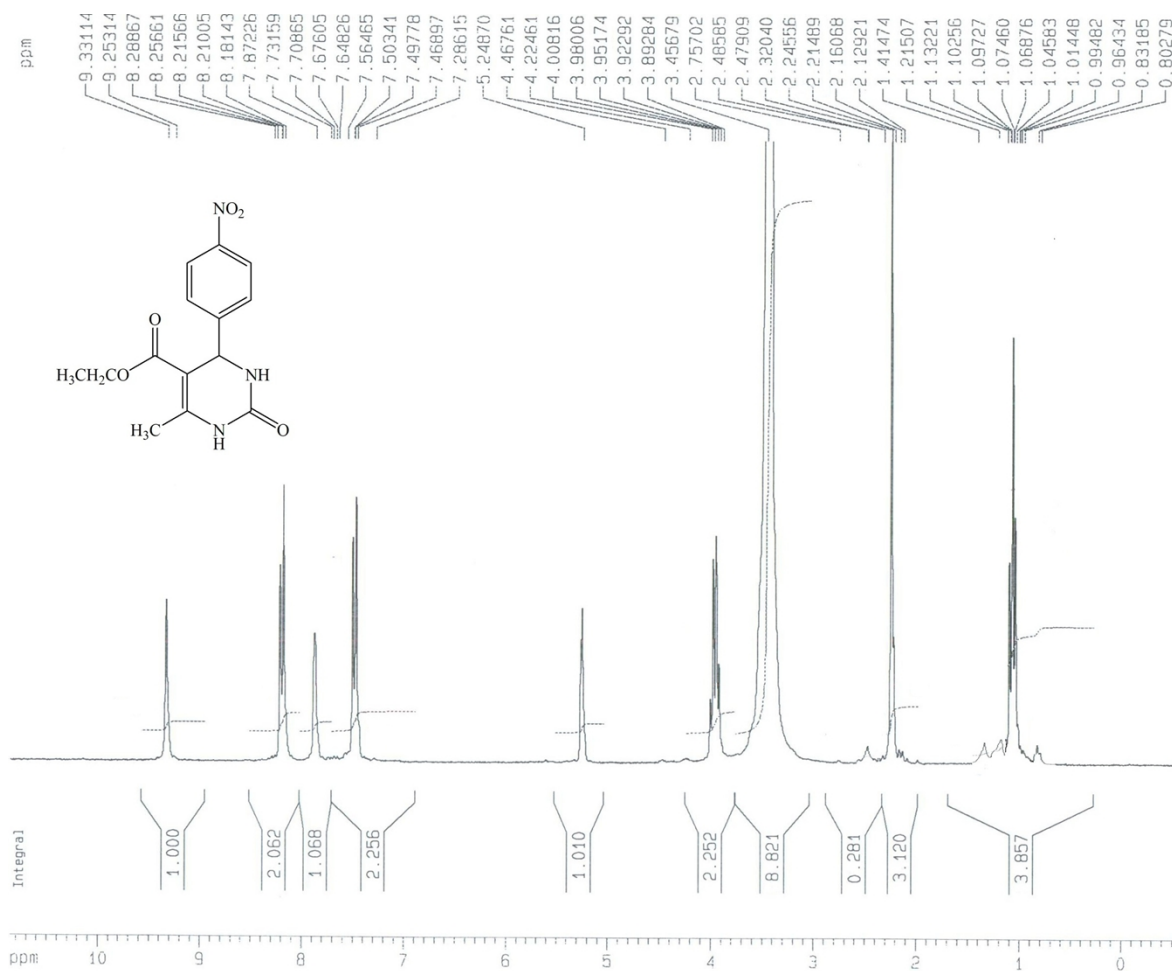


^{13}C -NMR (62.9 MHz, $\text{DMSO}-d_6$)

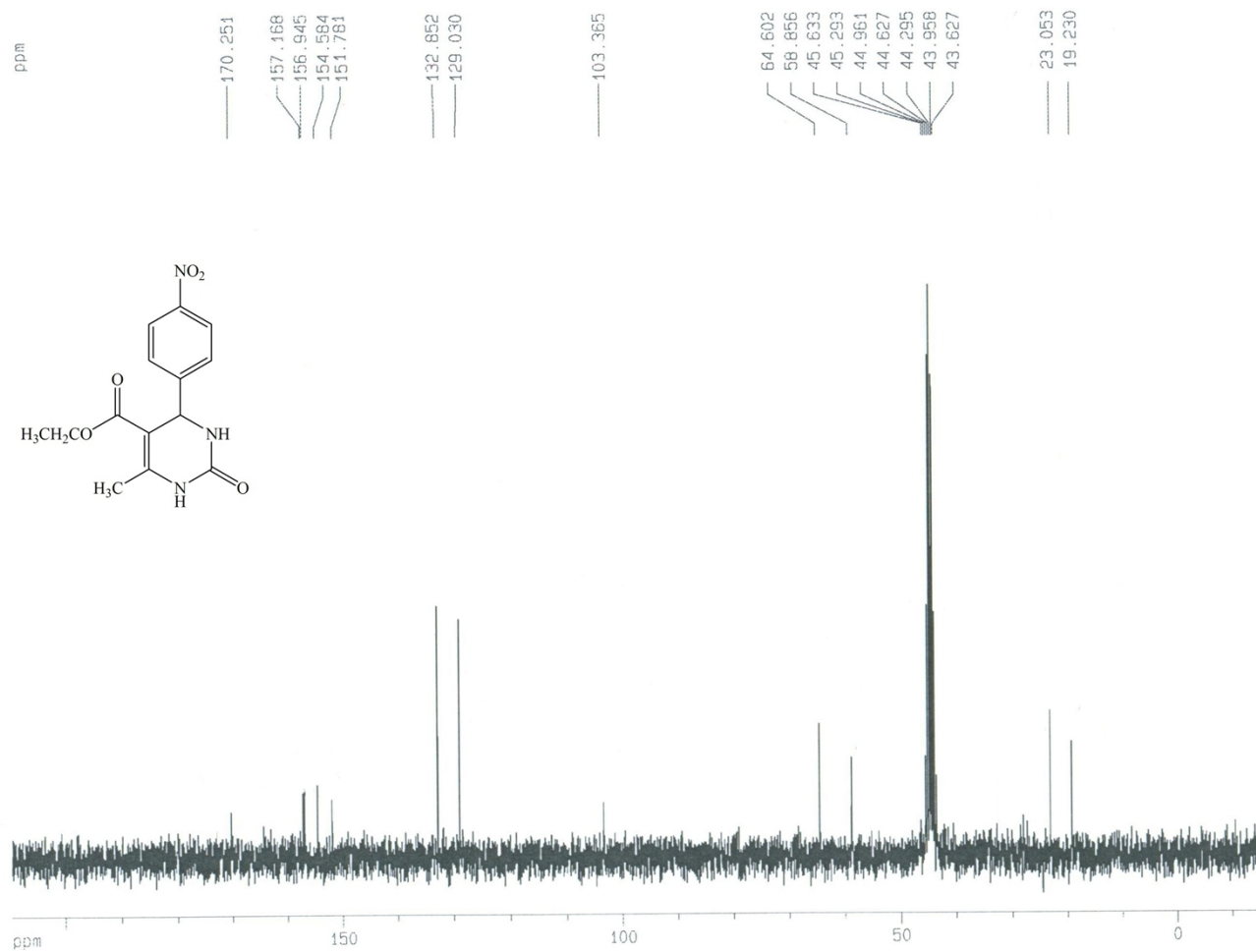


Ethyl 6-methyl-4-(4-nitrophenyl)-2-oxo-1,2,3,4-tetrahydropyrimidine-5-carboxylate (Table 2, entry 7)

¹H-NMR (250 MHz, DMSO-*d*₆)

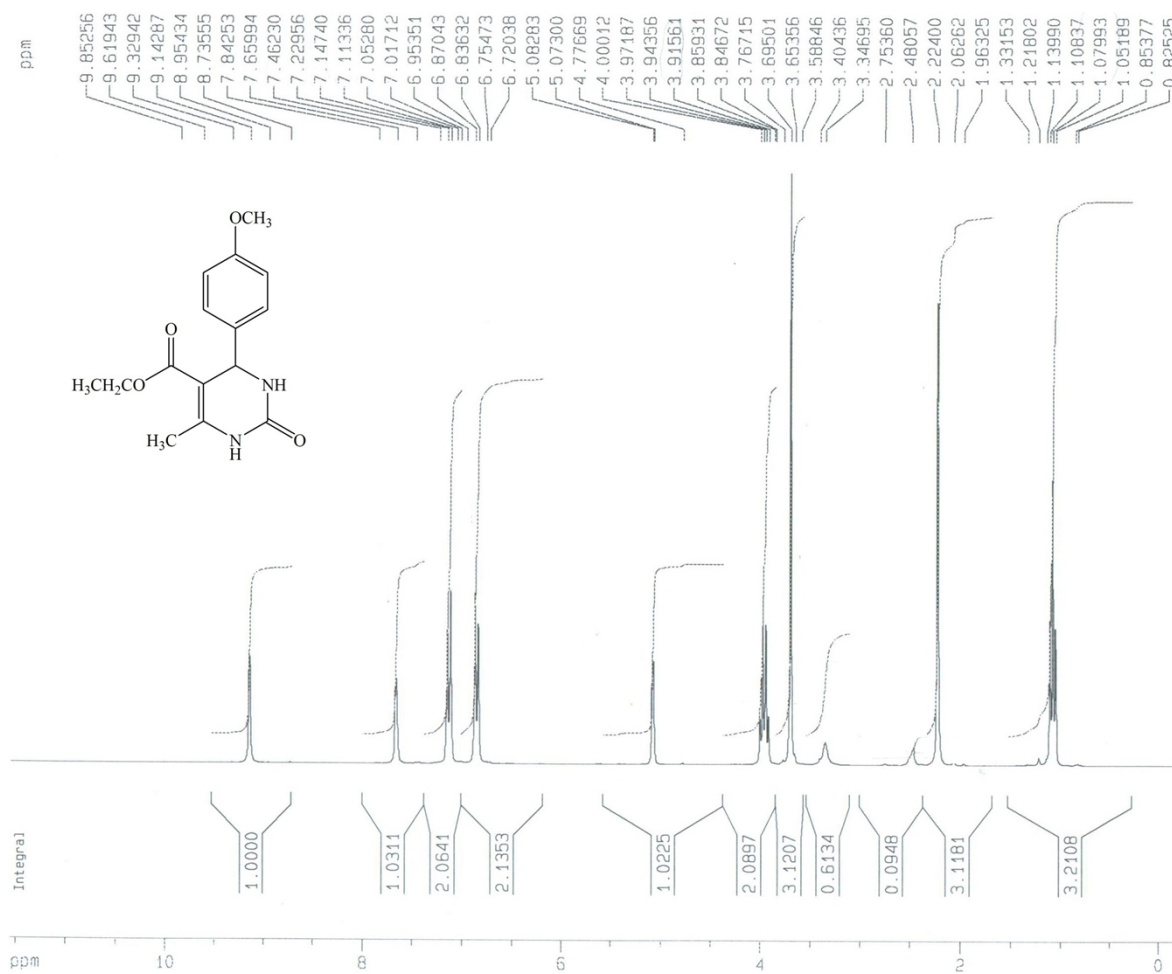


^{13}C -NMR (62.9 MHz, CDCl_3)

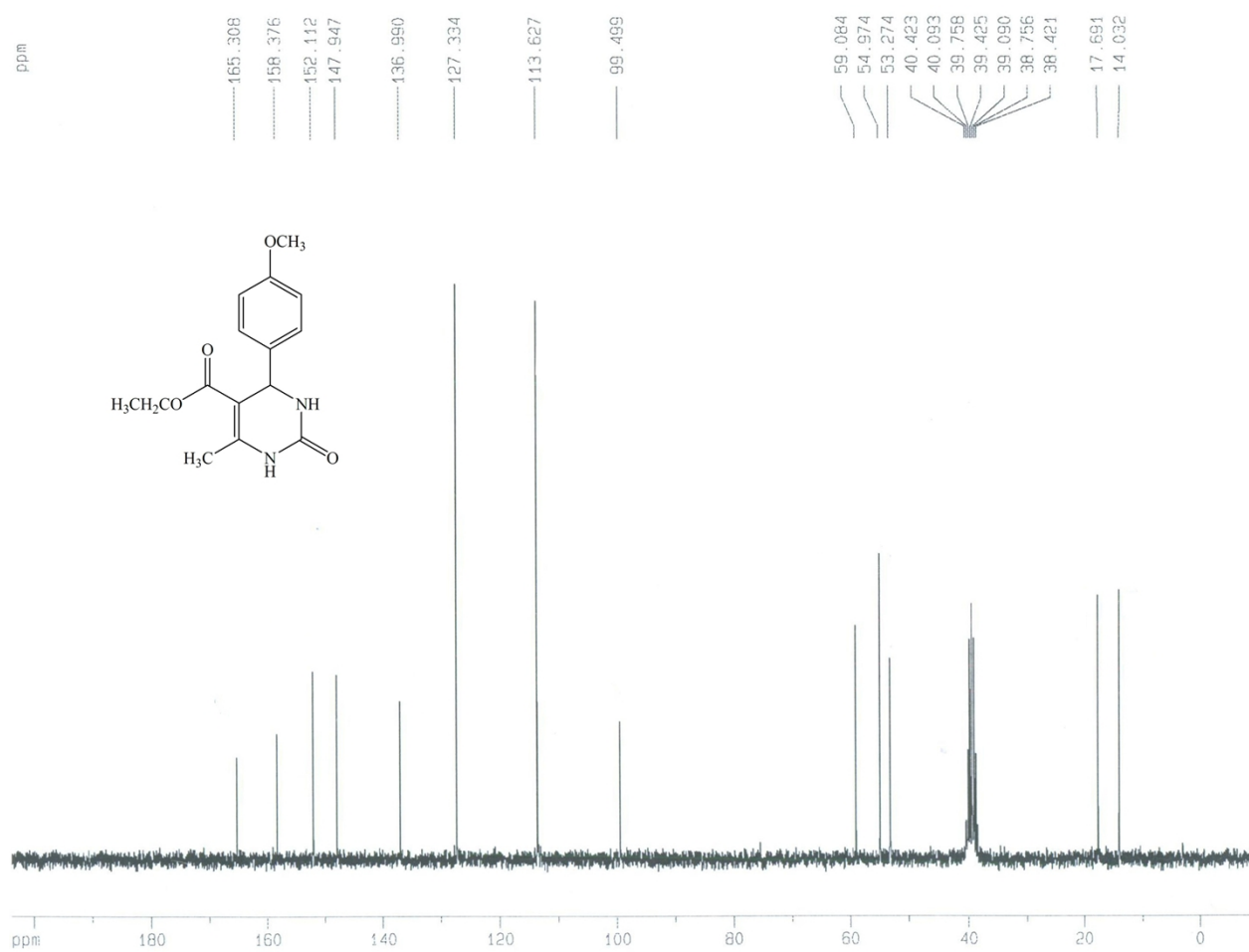


Ethyl 4-(4-methoxyphenyl)-6-methyl-2-oxo-1,2,3,4-tetrahydropyrimidine-5-carboxylate (Table 2, entry 10)

¹H-NMR (250 MHz, DMSO-*d*₆)

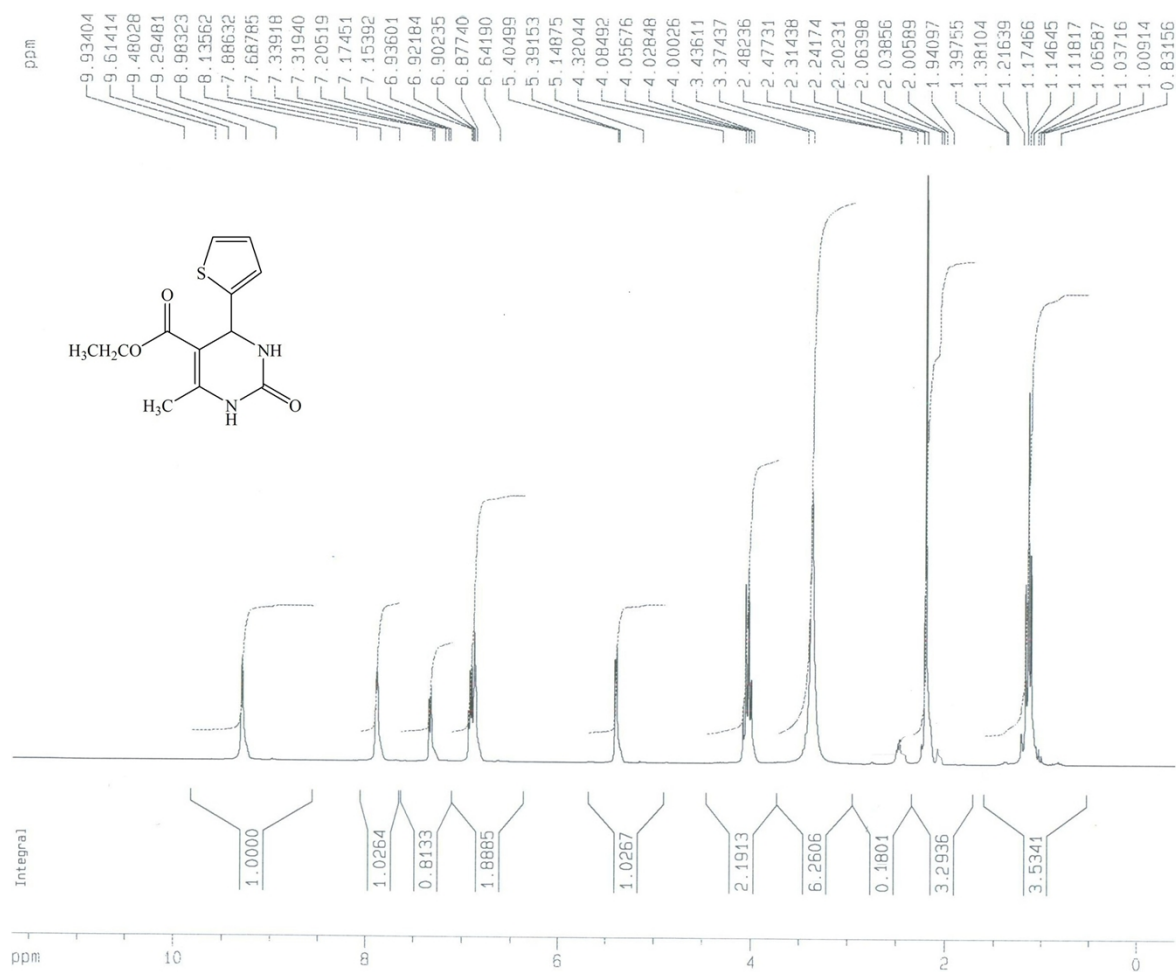


^{13}C -NMR (62.9 MHz, $\text{DMSO-}d_6$)

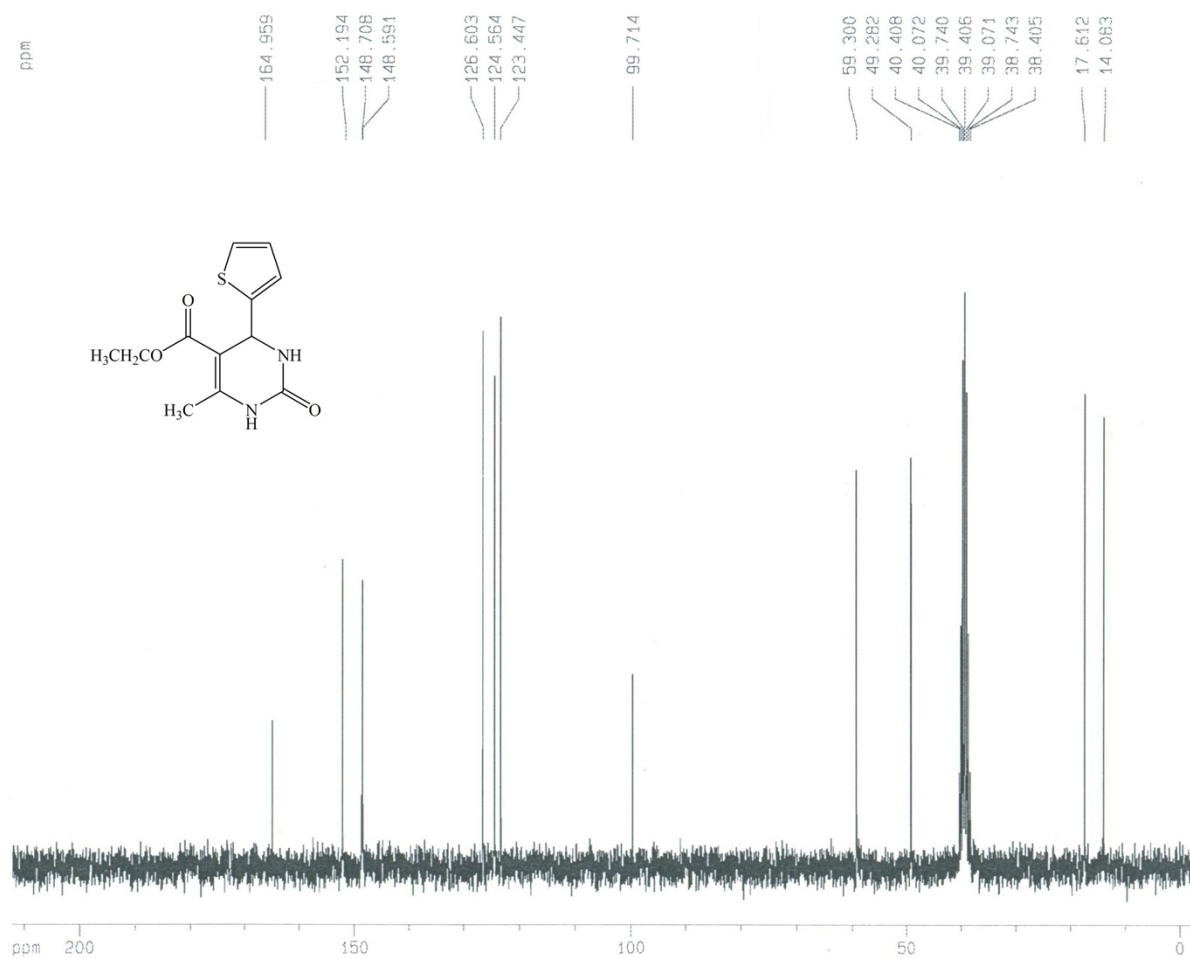


Ethyl 6-methyl-2-oxo-4-(thiophen-2-yl)-1,2,3,4-tetrahydropyrimidine-5-carboxylate (Table 2, entry 12)

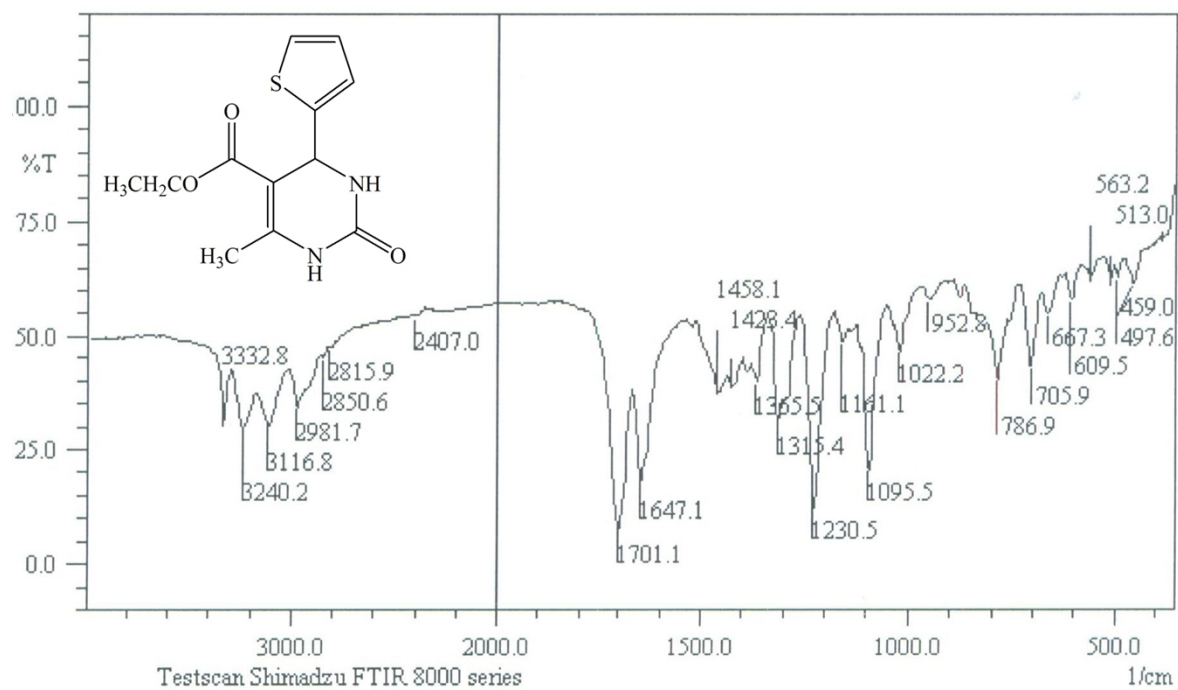
$^1\text{H-NMR}$ (250 MHz, $\text{DMSO-}d_6$)



^{13}C -NMR (62.9 MHz, $\text{DMSO}-d_6$)

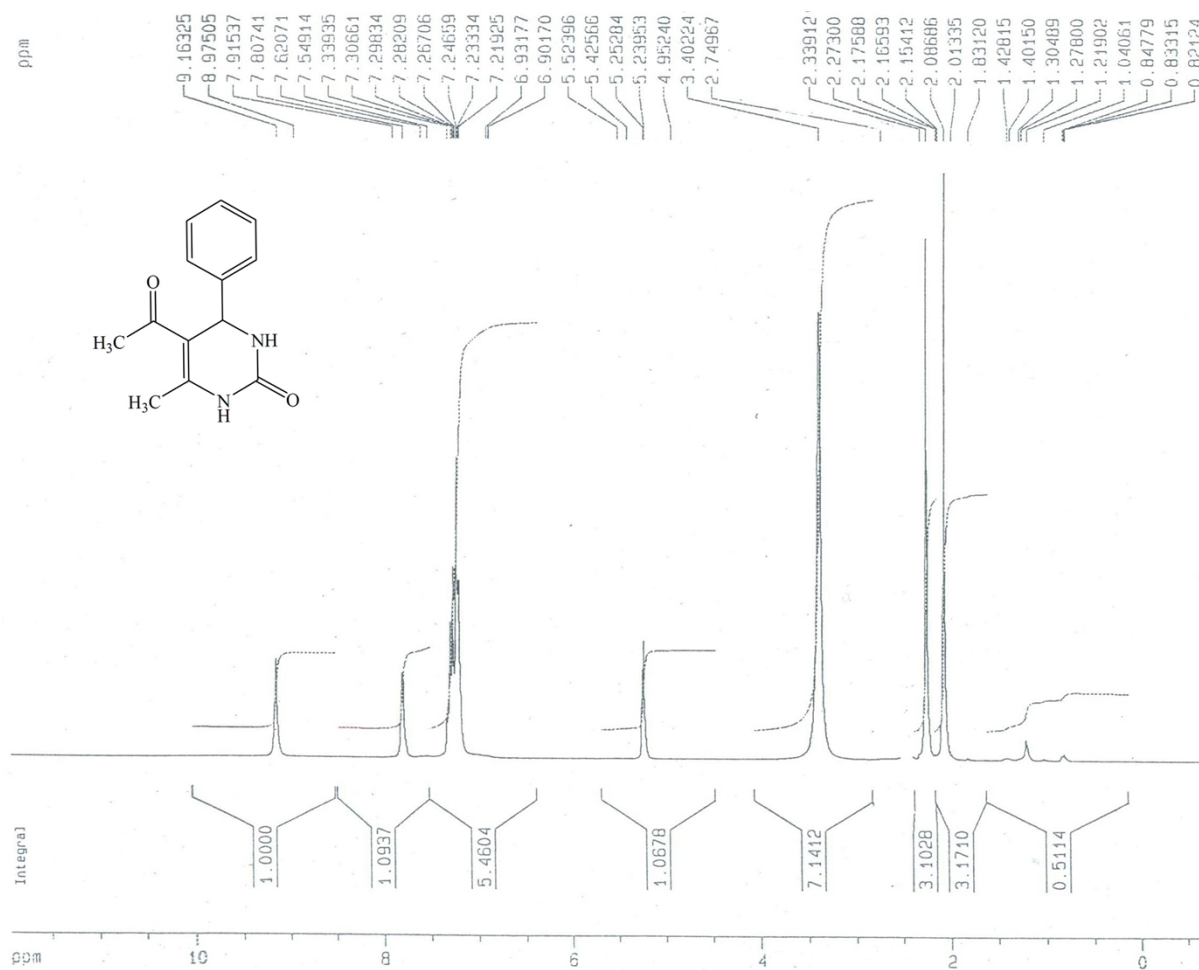


FT-IR

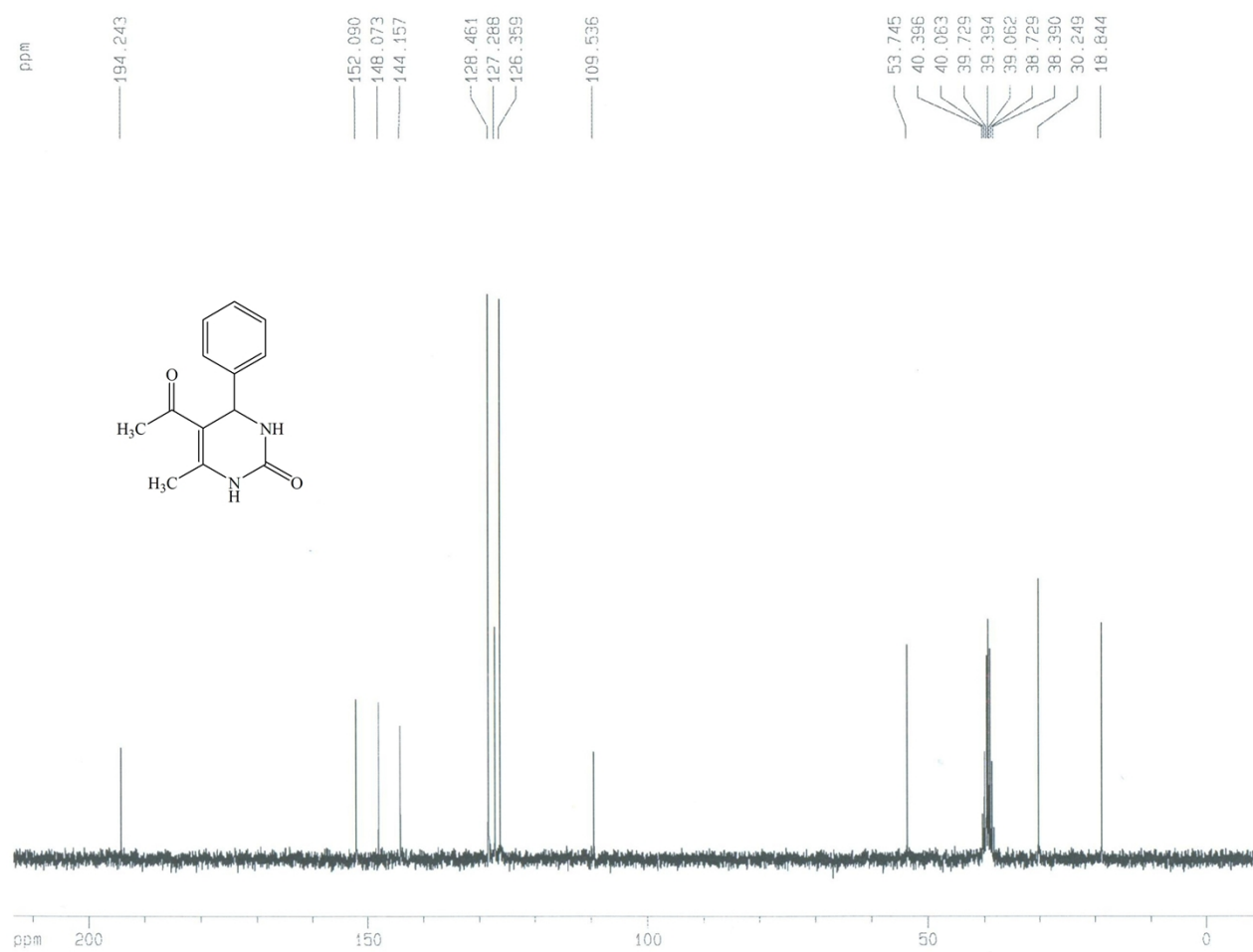


5-Acetyl-6-methyl-4-phenyl-3,4-dihydropyrimidin-2(1*H*)-one (Table 2, entry 15)

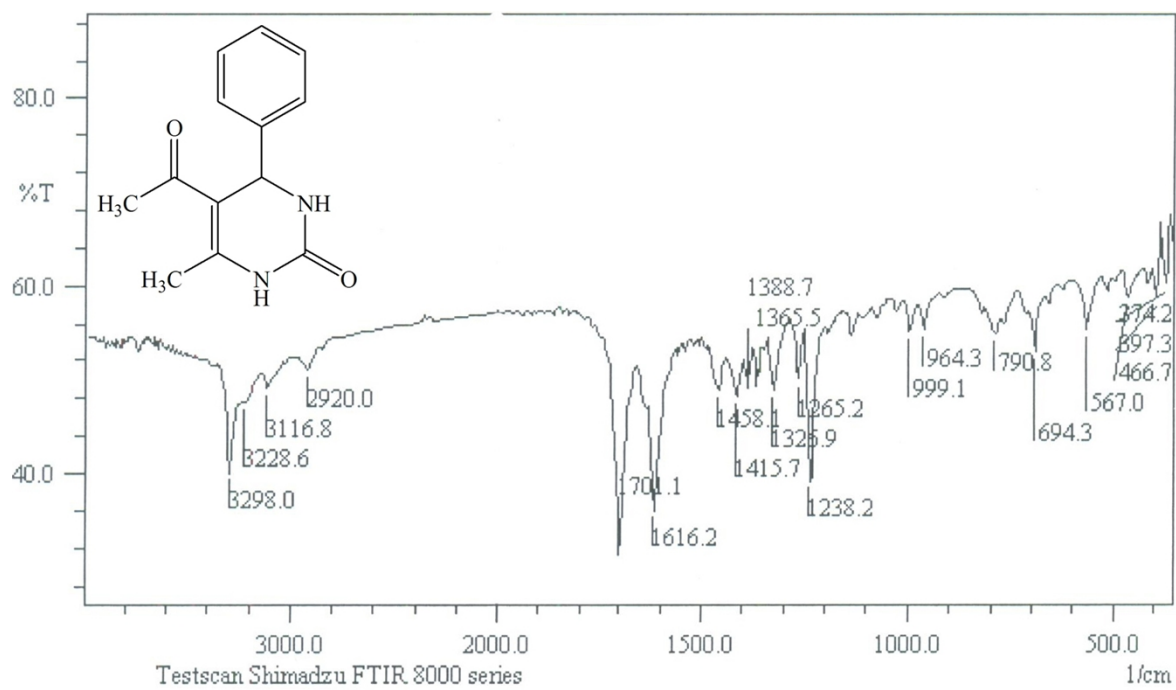
¹H-NMR (250 MHz, DMSO-*d*₆)



^{13}C -NMR (62.9 MHz, DMSO- d_6)

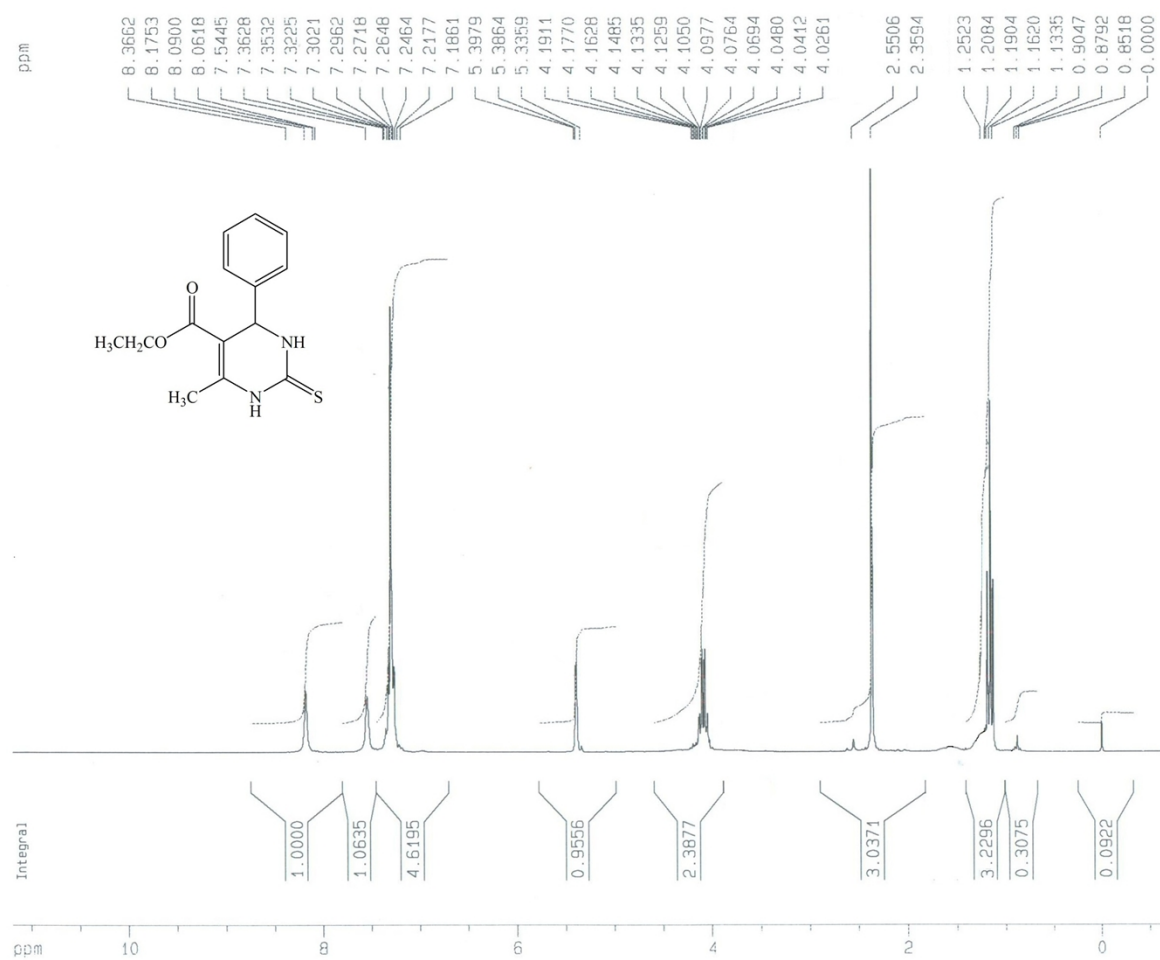


FT-IR

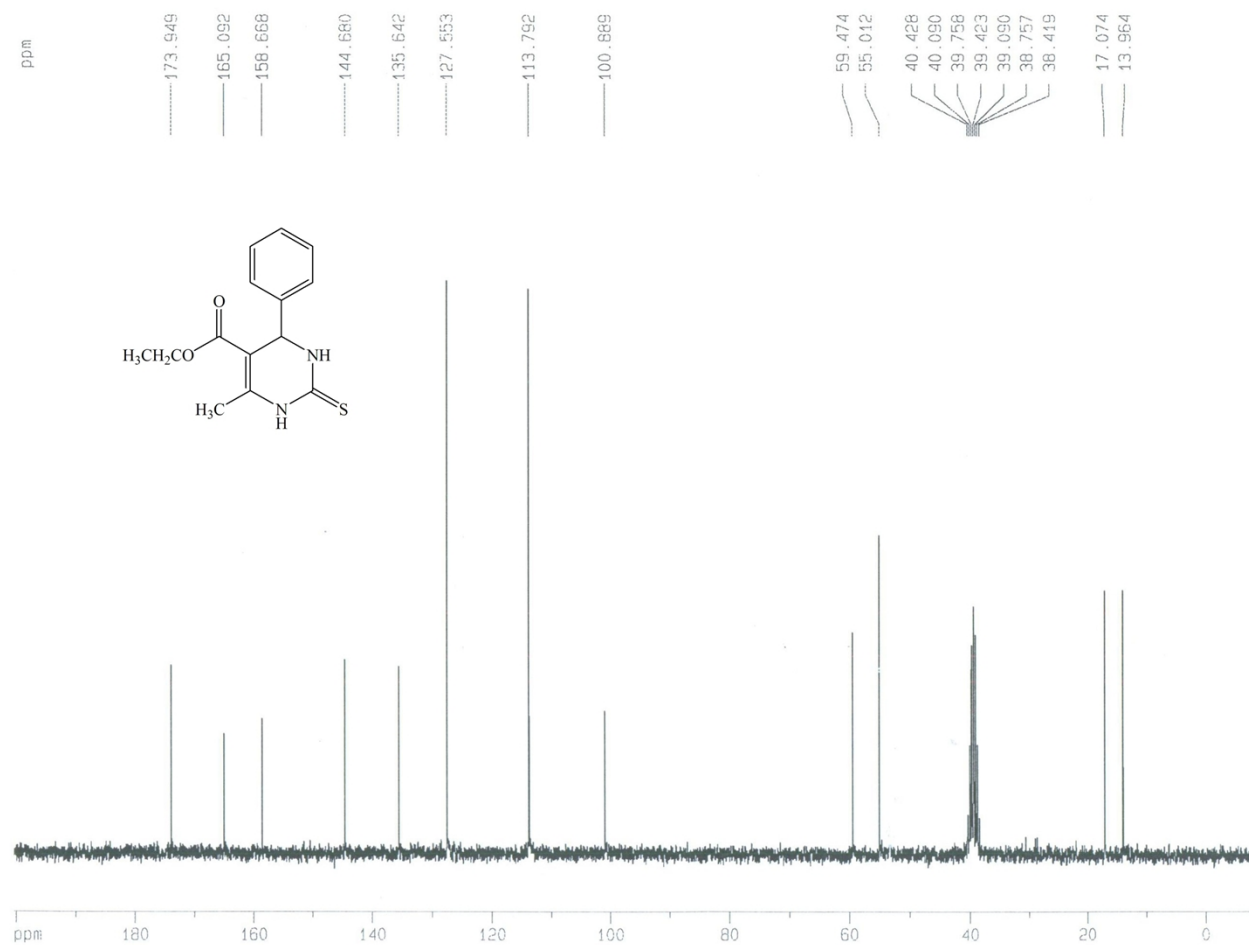


Ethyl 6-methyl-4-phenyl-2-thioxo-1,2,3,4-tetrahydropyrimidine-5-carboxylate
(Table 2, entry 16)

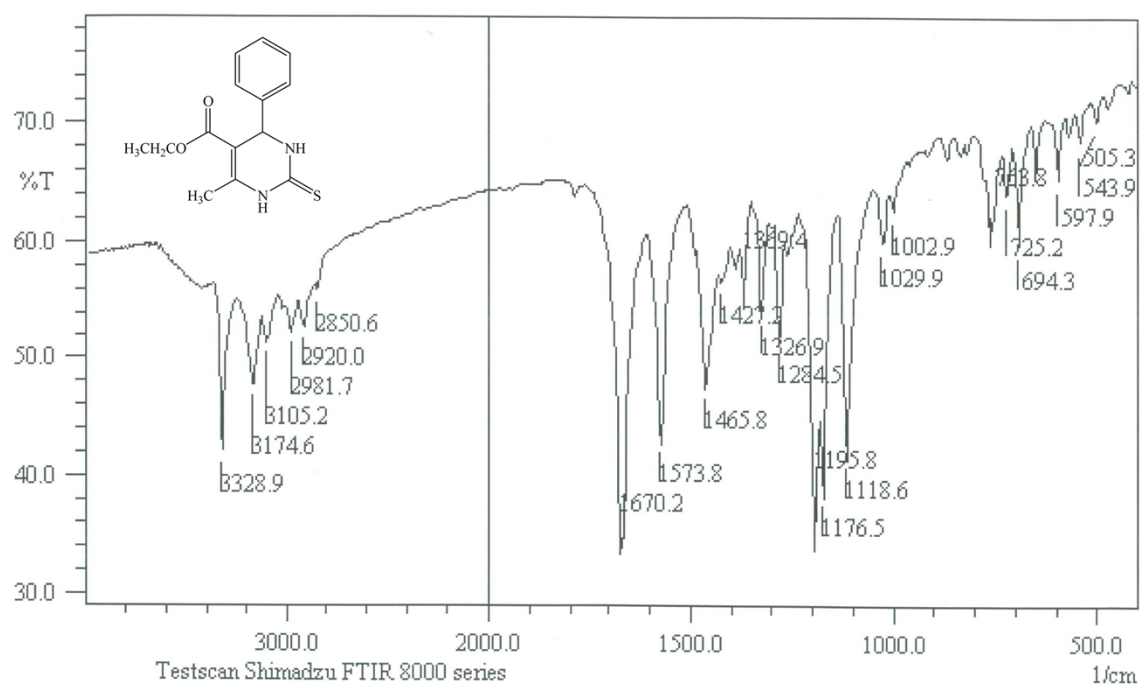
¹H-NMR (250 MHz, DMSO-*d*₆)



^{13}C -NMR (62.9 MHz, DMSO- d_6)

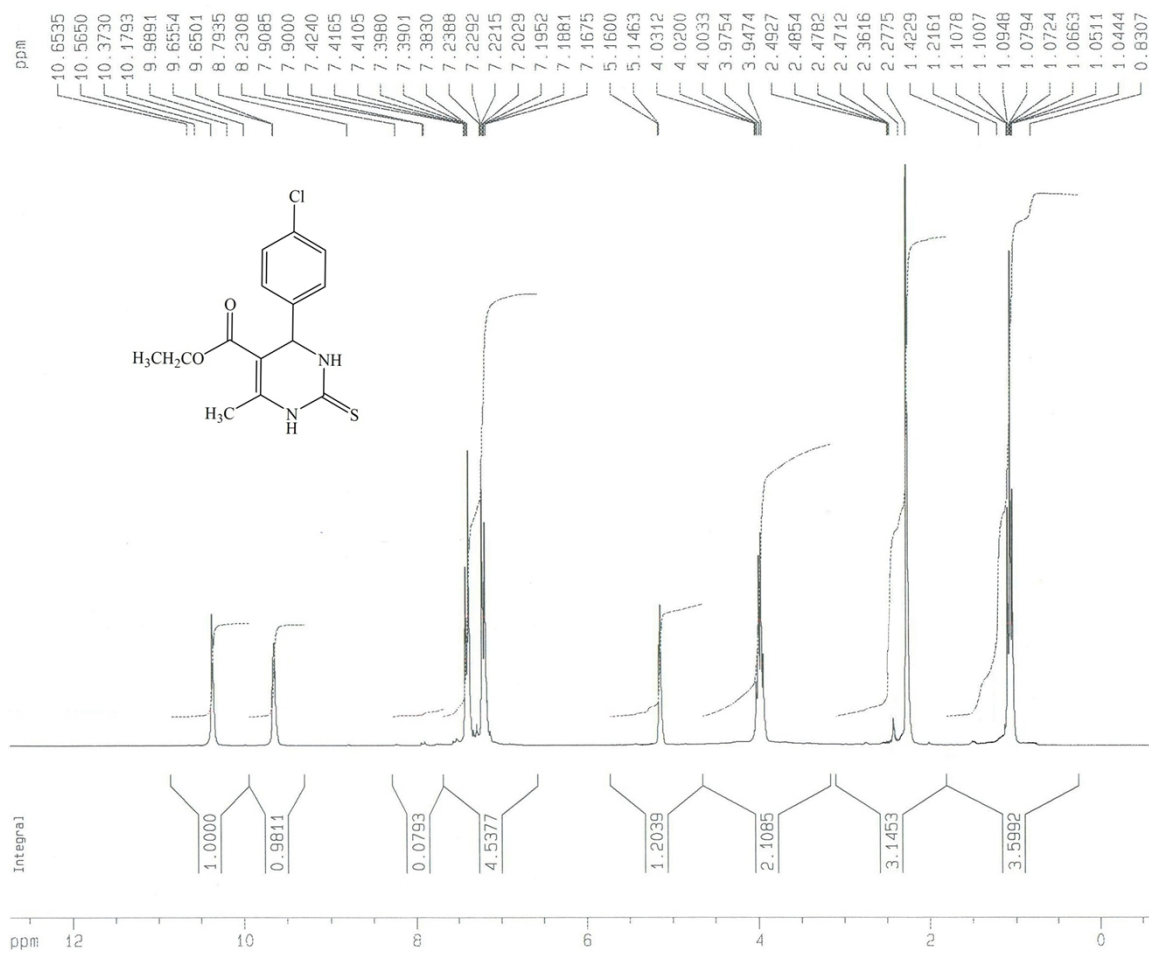


FT-IR

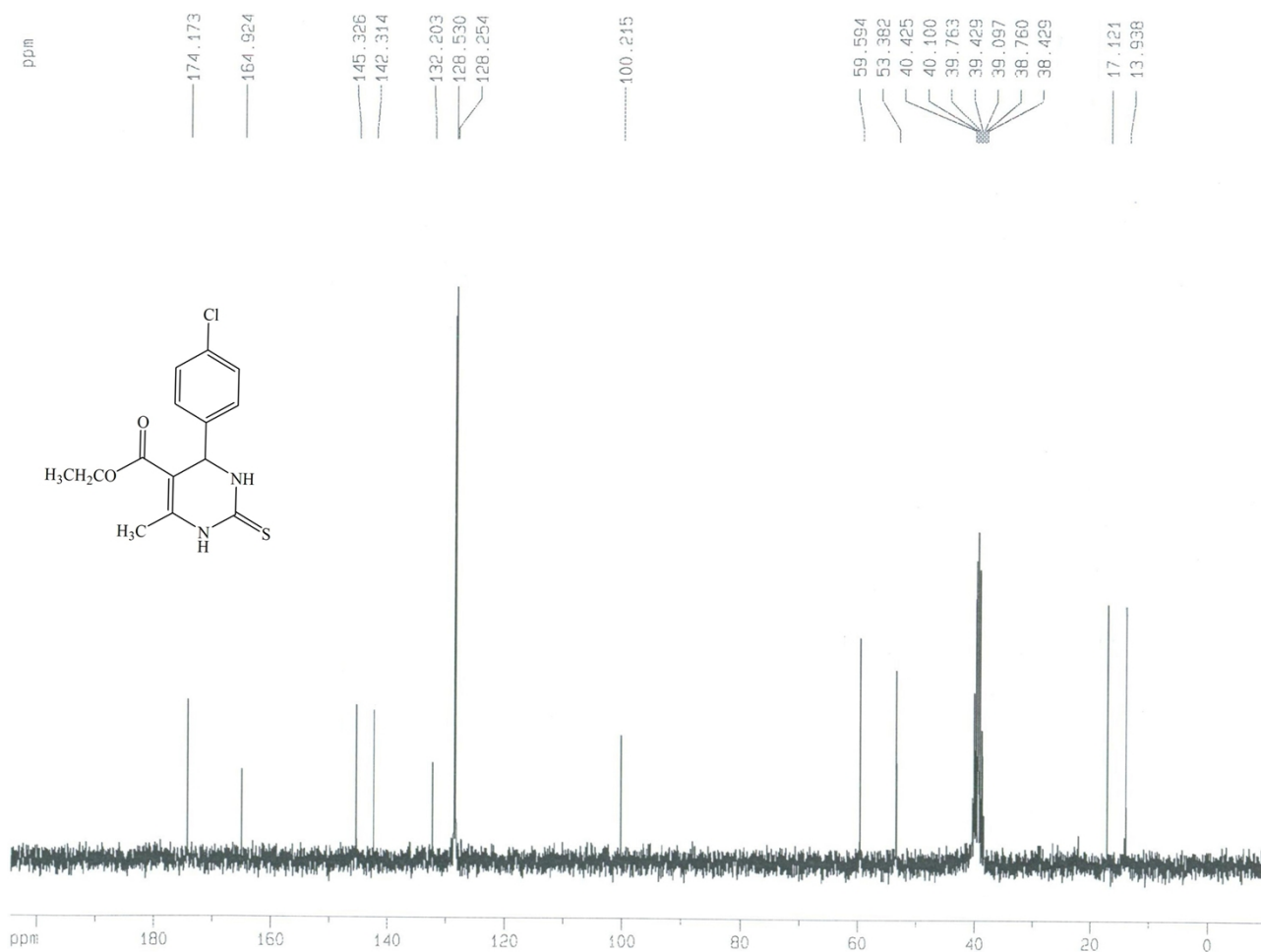


Ethyl 4-(4-chlorophenyl)-6-methyl-2-thioxo-1,2,3,4-tetrahydropyrimidine-5-carboxylate (Table 2, entry 17)

¹H-NMR (250 MHz, DMSO-*d*₆)



^{13}C -NMR (62.9 MHz, $\text{DMSO}-d_6$)

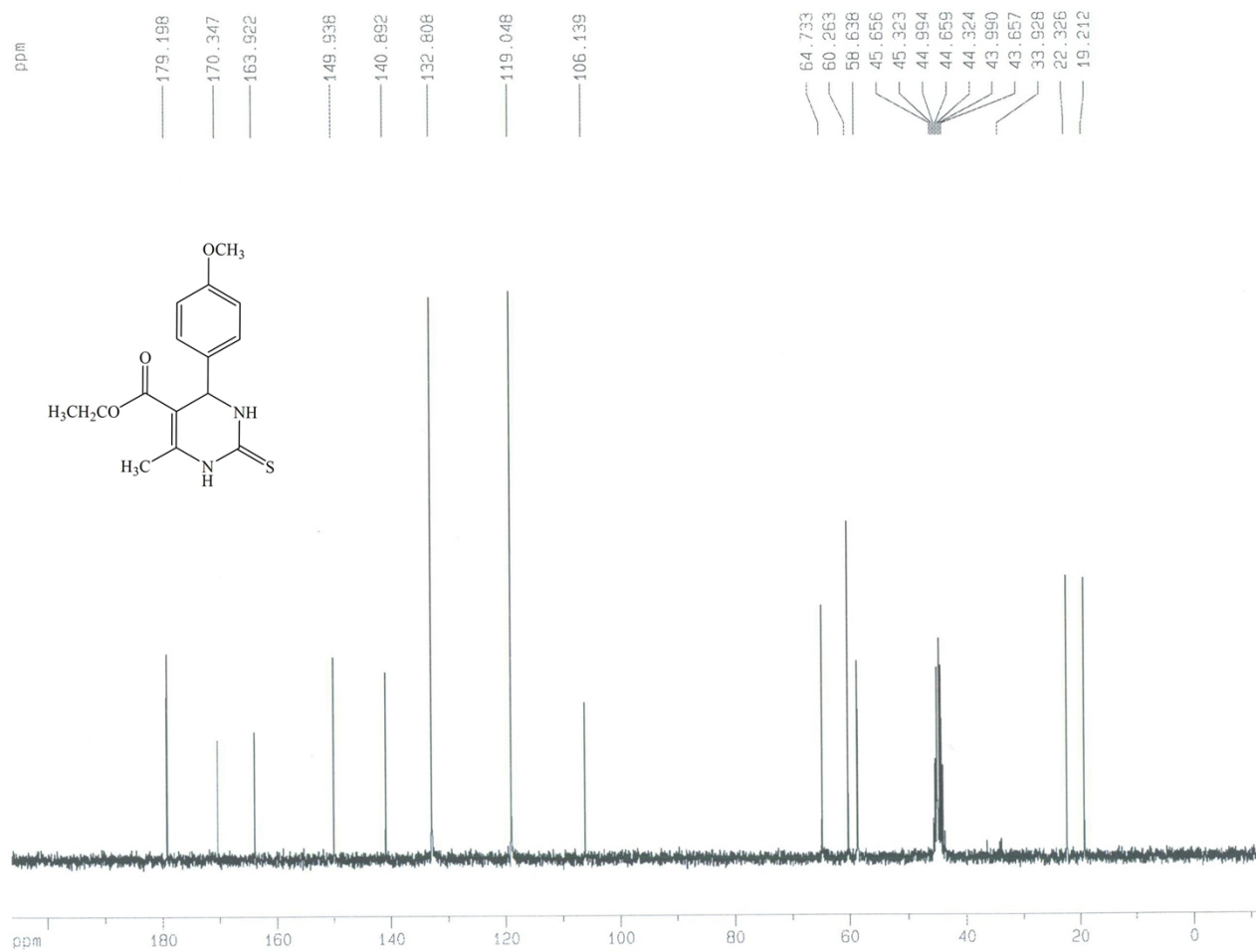


Ethyl 4-(4-methoxyphenyl)-6-methyl-2-thioxo-1,2,3,4-tetrahydropyrimidin-5-carboxylate (Table 2, entry 19)

¹H-NMR (250 MHz, DMSO-*d*₆)



^{13}C -NMR (62.9 MHz, $\text{DMSO}-d_6$)



FT-IR

