

Efficient one-pot synthesis of 3,4-Dihydropyrimidin-2(1H)-ones catalyzed by a new heterogeneous catalyst based on functionalized Na⁺-montmorillonite

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Synthesis of 3,4-Dihydropyrimidin-2(1H)-ones in the presence of Co@Imine-Na⁺-MMT

A mixture of aldehyde (1 mmol), ethyl acetoacetate (1 mmol), urea (1.2 mmol), and Co@Imine-Na⁺-MMT (8 mg) was stirred at 100 °C under solvent-free conditions. After the completion of the reaction (monitored by TLC), EtOH (10 mL) was added to the mixture, and the catalyst was filtered off. The pure product was achieved via recrystallization from ethanol. The structures of the products were characterized by the comparison of their melting points, and NMR spectroscopic data with those of the related literature.

3,4-Dihydro-5-etoxy carbonyl-4-(4-phenyl)-6-methyl-pyrimidine-2(1H)-one (4a): ¹H NMR (400 MHz, DMSO-d₆): δ 1.15 (t, *J*= 7.6 Hz, 3H, CH₃), 2.24 (s, 3H, CH₃), 4.06 (q, *J*= 7.6 Hz, 2H, CH₂), 5.25 (s, 1H, CH), 6.29 (s, 1H, NH), 7.28-7.59 (m, 5H, H-Aro), 9.66 (s, 1H, NH). ¹³C NMR (100 MHz, DMSO-d₆): δ 14.7, 18.3, 55.2, 61.6, 100.8, 127.5, 128.3, 129.9, 144.1, 145.2, 152.3, 166.5.

3,4-Dihydro-5-etoxy carbonyl-4-(2-nitrophenyl)-6-methyl-pyrimidine-2(1H)-one (4b): ¹H NMR (400 MHz, DMSO-d₆): δ 1.03 (t, *J*= 7.2 Hz, 3H, CH₃), 2.32 (s, 3H, CH₃), 3.92 (q, *J*= 8.0 Hz, 2H, CH₂), 5.51 (s, 1H, CH), 6.90-7.30 (m, 4H, H-Aro), 7.82 (s, 1H, NH), 9.17 (s, 1H, NH). ¹³C NMR (100 MHz, DMSO-d₆): δ 14.8, 17.3, 55.6, 60.8, 100.5, 112.9, 122.1, 130.7, 132.9, 134.9, 151.4, 155.8, 161.4, 166.4.

3,4-Dihydro-5-etoxy carbonyl-4-(3-nitrophenyl)-6-methyl-pyrimidine-2(1H)-one (4c): ¹H NMR (400 MHz, DMSO-d₆): δ 1.15 (t, *J*= 8.0 Hz, 3H, CH₃), 2.25 (s, 3H, CH₃), 4.04 (q, *J*= 8.0 Hz, 2H, CH₂), 5.17 (d, *J*= 2.8 Hz, 1H, CH), 6.83-7.26 (m, 4H, H-Aro), 7.85 (s, 1H, NH), 9.22 (s, 1H, NH). ¹³C NMR (100 MHz, DMSO-d₆): δ 15.4, 17.9, 52.8, 59.4, 100.6, 113.7, 121.8, 132.5, 142.4, 149.4, 149.9, 154.0, 161.6, 166.4.

3,4-Dihydro-5-etoxy carbonyl-4-(4-nitrophenyl)-6-methyl-pyrimidine-2(1H)-one (4d): ¹H NMR (400 MHz, DMSO-d₆): δ 1.13 (t, *J*= 8.0 Hz, 3H, CH₃), 2.30 (s, 3H, CH₃), 4.05 (q, *J*= 8.0 Hz, 2H, CH₂), 5.35 (d, *J*= 2.8 Hz, 1H, CH), 7.36 (d, *J*= 7.2 Hz, 2H, H-Aro), 7.93 (s, 1H, NH), 8.23 (d, *J*= 7.6 Hz, 2H, H-Aro), 9.37 (s, 1H, NH). ¹³C NMR (100 MHz, DMSO-d₆): δ 14.9, 19.3, 55.2, 61.4, 100.5, 123.8, 124.7, 126.9, 142.6, 150.8, 154.9, 166.8.

3,4-Dihydro-5-etoxy carbonyl-4-(2-chlorophenyl)-6-methyl-pyrimidine-2(1H)-one (4e): ¹H NMR (400 MHz, DMSO-d₆): δ 1.06 (t, *J*= 7.2 Hz, 3H, CH₃), 2.33 (s, 3H, CH₃), 3.97 (q, *J*= 6.8 Hz, 2H, CH₂), 5.22 (s, 1H, CH), 5.80 (s, 1H, NH), 6.91-7.14 (m, 4H, H-Aro), 9.27 (s, 1H, NH). ¹³C NMR (100 MHz, DMSO-d₆): δ 14.8, 17.3, 54.3, 60.7, 100.6, 112.8, 122.1, 127.5, 129.1, 131.8, 151.3, 155.9, 158.0, 166.4.

3,4-Dihydro-5-etoxy carbonyl-4-(3-chlorophenyl)-6-methyl-pyrimidine-2(1H)-one (4f): ¹H NMR (400 MHz, DMSO-d₆): δ 1.14 (t, *J*= 7.2 Hz, 3H, CH₃), 2.38 (s, 3H, CH₃), 4.03 (q, *J*= 7.6 Hz, 2H, CH₂), 5.20 (d, *J*= 2.8 Hz, 1H,

CH), 6.83-7.02(m, 4H, H-Aro), 7.84 (s, 1H, NH), 9.42 (s, 1H, NH). ¹³C NMR (100 MHz, DMSO-d₆): δ 14.9, 18.2, 54.3, 61.4, 100.8, 113.3, 113.8, 121.8, 131.5, 147.2, 149.4, 154.0, 161.6, 167.5.

3,4-Dihydro-5-etoxy-carbonyl-4-(4-chlorophenyl)-6-methyl-pyrimidine-2(1H)-one (4g): ¹H NMR (400 MHz, DMSO-d₆): δ 1.17 (t, *J* = 8.0 Hz, 3H, CH₃), 2.24(s, 3H, CH₃), 3.92 (q, *J* = 8.0 Hz, 2H, CH₂), 5.09 (d, *J* = 2.8 Hz, 1H, CH), 6.29 (s, 1H, NH), 6.88 (d, *J* = 8.0 Hz, 2H, H-Aro), 7.18 (d, *J* = 8.0 Hz, 2H, H-Aro), 9.76 (s, 1H, NH). ¹³C NMR (100 MHz, DMSO-d₆): δ 15.4, 18.5, 53.1, 60.1, 100.9, 122.9, 123.7, 125.8, 142.4, 150.3, 153.9, 167.4.

3,4-Dihydro-5-etoxy-carbonyl-4-(2,4-dichlorophenyl)-6-methyl-pyrimidine-2(1H)-one (4h): ¹H NMR (400 MHz, DMSO-d₆): δ 0.82 (t, *J* = 6.8 Hz, 3H, CH₃), 2.20 (s, 3H, CH₃), 4.10 (q, *J* = 6.8 Hz, 2H, CH₂), 5.36 (s, 1H, CH), 5.59 (s, 1H, NH), 7.37-7.56 (m, 3H, H-Aro), 8.70 (s, 1H, NH). ¹³C NMR (100 MHz, DMSO-d₆): δ 15.5, 18.7, 55.7, 60.0, 95.7, 128.5, 129.2, 130.1, 133.3, 134.0, 150.0, 156.1, 161.0, 165.8.

3,4-Dihydro-5-etoxy-carbonyl-4-(3,4-dichlorophenyl)-6-methyl-pyrimidine-2(1H)-one (4i): ¹H NMR (400 MHz, DMSO-d₆): δ 1.07 (t, *J* = 8.0 Hz, 3H, CH₃), 2.30(s, 3H, CH₃), 3.91 (q, *J* = 8.0 Hz, 2H, CH₂), 5.08 (d, *J* = 2.4 Hz, 1H, CH), 6.82-6.98 (m, 3H, H-Aro), 7.94 (s, 1H, NH), 9.14 (s, 1H, NH). ¹³C NMR (100 MHz, DMSO-d₆): δ 14.9, 18.2, 54.3, 61.4, 100.8, 113.3, 113.8, 121.8, 131.5, 147.2, 149.4, 154.0, 161.6, 167.5.

3,4-Dihydro-5-etoxy-carbonyl-4-(4-fluorophenyl)-6-methyl-pyrimidine-2(1H)-one (4j): ¹H NMR (400 MHz, DMSO-d₆): δ 1.13 (t, *J* = 6.8 Hz, 3H, CH₃), 2.27(s, 3H, CH₃), 4.03 (q, *J* = 8.0 Hz, 2H, CH₂), 5.23 (d, *J* = 2.8 Hz, 1H, CH), 7.10 (d, *J* = 8.0 Hz, 2H, H-Aro), 7.20 (d, *J* = 8.0 Hz, 2H, H-Aro), 7.84 (s, 1H, NH), 9.25 (s, 1H, NH). ¹³C NMR (100 MHz, DMSO-d₆): δ 14.4, 19.8, 54.3, 60.0, 100.5, 115.5, 129.4, 148.9, 156.2, 161.0, 162.1, 166.8.

3,4-Dihydro-5-etoxy-carbonyl-4-(4-trifluoromethylphenyl)-6-methyl-pyrimidine-2(1H)-one (4k): ¹H NMR (400 MHz, DMSO-d₆): δ 0.96 (t, *J* = 7.6 Hz, 3H, CH₃), 2.51 (s, 3H, CH₃), 3.89 (q, *J* = 7.6 Hz, 2H, CH₂), 5.52(d, *J* = 2.8 Hz, 1H, CH), 7.27 (d, *J* = 7.6 Hz, 2H, H-Aro), 7.47 (d, *J* = 7.6 Hz, 2H, H-Aro), 7.58 (s, 1H, NH), 9.39 (s, 1H, NH). ¹³C NMR (100 MHz, DMSO-d₆): δ 15.2, 18.9, 54.1, 60.1, 99.7, 118.0, 122.3, 129.2, 132.1, 144.1, 147.1, 152.9, 165.8.

3,4-Dihydro-5-etoxy-carbonyl-4-(3-bromophenyl)-6-methyl-pyrimidine-2(1H)-one (4l): ¹H NMR (400 MHz, DMSO-d₆): δ 1.10 (t, *J* = 6.4 Hz, 3H, CH₃), 2.25 (s, 3H, CH₃), 3.98-4.05 (m, 2H, CH₂), 5.21 (d, *J* = 2.8 Hz, 1H, CH), 5.59 (s, 1H, NH), 6.79-6.82 (m, 2H, H-Aro), 7.07-7.10 (m, 2H, H-Aro), 9.27 (s, 1H, NH). ¹³C NMR (100 MHz, DMSO-d₆): δ 14.4, 15.9, 54.5, 61.0, 99.3, 120.9, 125.0, 129.5, 131.5, 131.8, 145.5, 146.0, 162.5, 165.1.

3,4-Dihydro-5-etoxy-carbonyl-4-(2-hydroxyphenyl)-6-methyl-pyrimidine-2(1H)-one (4m): ¹H NMR (400 MHz, DMSO-d₆): δ 1.07 (t, *J* = 7.6 Hz, 3H, CH₃), 2.35 (s, 3H, CH₃), 4.07 (q, *J* = 7.6 Hz, 2H, CH₂), 5.55(s, 1H, CH), 6.91-7.15 (m, 4H, H-Aro), 7.58(s, 1H, NH), 9.35 (s, 1H, NH), 9.75 (s, 1H, OH). ¹³C NMR (100 MHz, DMSO-d₆): δ 14.5, 17.4, 55.8, 60.6, 100.6, 112.9, 121.8, 129.5, 131.7, 133.3, 151.9, 156.9, 159.0, 167.4.

3,4-Dihydro-5-etoxy-carbonyl-4-(4-hydroxyphenyl)-6-methyl-pyrimidine-2(1H)-one (4n): ¹H NMR (400 MHz, DMSO-d₆): δ 1.15 (t, *J* = 7.6 Hz, 3H, CH₃), 2.35 (s, 3H, CH₃), 4.02 (q, *J* = 7.6 Hz, 2H, CH₂), 5.09(s, 1H, CH), 6.83 (d, *J* = 7.6 Hz, 2H, H-Aro), 7.11 (d, *J* = 7.6 Hz, 2H, H-Aro), 7.85 (s, 1H, NH), 9.52 (s, 1H, NH), 9.74 (s, 1H, OH). ¹³C NMR (100 MHz, DMSO-d₆): δ 14.7, 18.3, 54.4, 60.3, 100.8, 115.5, 129.1, 138.3, 148.3, 153.9, 156.0, 166.7.

3,4-Dihydro-5-etoxy-carbonyl-4-(2-methoxyphenyl)-6-methyl-pyrimidine-2(1H)-one (4o): ¹H NMR (400 MHz, DMSO-d₆): δ 1.06 (t, *J* = 7.6 Hz, 3H, CH₃), 2.25 (s, 3H, CH₃), 3.84(s, 3H, OCH₃), 3.87(q, *J* = 6.8 Hz, 2H, CH₂),

5.49(s, 1H, CH), 6.30 (s, 1H, NH), 6.90-7.31(m, 4H, H-Aro), 9.15 (s, 1H, NH). ¹³C NMR (100 MHz, DMSO-d₆): δ 14.9, 18.7, 43.6, 56.9, 59.4, 95.8, 112.3, 122.7, 129.7, 129.9, 131.8, 149.9, 151.8, 157.7, 166.8.

3,4-Dihydro-5-etoxy carbonyl-4-(3-methoxyphenyl)-6-methyl-pyrimidine-2(1H)-one (4p): ¹H NMR (400 MHz, DMSO-d₆): δ 1.13 (t, *J*= 8.0 Hz, 3H, CH₃), 2.51 (s, 3H, CH₃), 3.91(s, 3H, OCH₃), 4.06 (q, *J*= 7.6 Hz, 2H, CH₂), 5.21(d, *J*= 2.8 Hz, 1H, CH), 6.82-7.17 (m, 4H, H-Aro), 7.30 (s, 1H, NH), 9.52 (s, 1H, NH). ¹³C NMR (100 MHz, DMSO-d₆): δ 14.4, 19.5, 50.3, 50.7, 60.8, 100.9, 113.7, 113.9, 121.0, 139.9, 143.0, 147.0, 153.9, 161.6, 167.5.

3,4-Dihydro-5-etoxy carbonyl-4-(4-methoxyphenyl)-6-methyl-pyrimidine-2(1H)-one (4q): ¹H NMR (400 MHz, DMSO-d₆): δ 1.14 (t, *J*= 7.2 Hz, 3H, CH₃), 2.25 (s, 3H, CH₃), 2.90(s, 3H, OCH₃), 3.46 (q, *J*= 7.6 Hz, 2H, CH₂), 5.12(s, 1H, CH), 6.91 (d, *J*= 6.8 Hz, 2H, H-Aro), 7.19 (d, *J*= 6.8 Hz, 2H, H-Aro), 7.76 (s, 1H, NH), 9.12 (s, 1H, NH). ¹³C NMR (100 MHz, DMSO-d₆): δ 14.8, 18.8, 56.5, 57.8, 66.8, 100.6, 114.7, 127.6, 138.6, 148.2, 154.8, 158.8, 166.9.

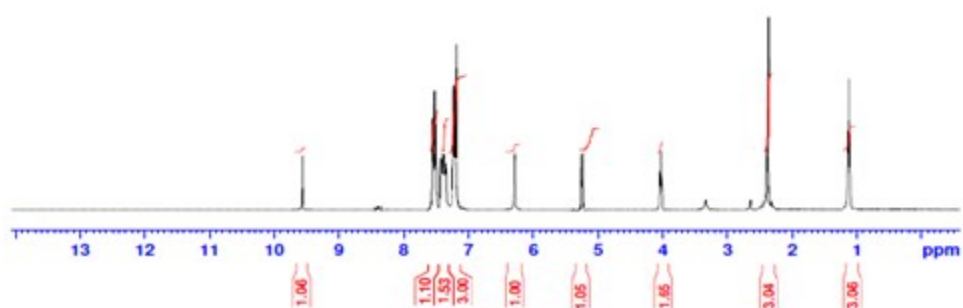
3,4-Dihydro-5-etoxy carbonyl-4-(3,4-dimethoxyphenyl)-6-methyl-pyrimidine-2(1H)-one (4r): ¹H NMR (400 MHz, DMSO-d₆): δ 1.15 (t, *J*= 6.8 Hz, 3H, CH₃), 2.30-2.31 (m, 6H, CH₃, OCH₃), 2.43 (s, 3H, OCH₃), 4.05 (q, *J*= 7.6 Hz, 2H, CH₂), 5.26(d, *J*= 2.8 Hz, 1H, CH), 6.97-7.15 (m, 3H, H-Aro), 7.89 (s, 1H, NH), 9.55 (s, 1H, NH). ¹³C NMR (100 MHz, DMSO-d₆): δ 15.8, 21.0, 50.8, 56.3, 56.8, 60.6, 100.6, 122.7, 128.9, 130.9, 136.8, 139.7, 144.9, 150.9, 154.4, 166.8.

3,4-Dihydro-5-etoxy carbonyl-4-(3-methoxy-4-hydroxyphenyl)-6-methyl-pyrimidine-2(1H)-one (4s): ¹H NMR (400 MHz, DMSO-d₆): δ 2.27 (s, 3H, CH₃), 3.55 (s, 3H, CH₃), 3.76 (s, 3H, CH₃), 3.99 (q, *J*= 8.0 Hz, 2H, CH₂), 5.06(d, *J*= 2.8 Hz, 1H, CH), 6.73-6.86 (m, 3H, H-Aro), 7.82 (s, 1H, NH), 8.22 (s, 1H, NH). ¹³C NMR (100 MHz, DMSO-d₆): δ 15.2, 18.9, 51.8, 56.8, 60.8, 100.3, 121.7, 128.9, 132.9, 136.7, 139.9, 144.9, 150.9, 152.1, 166.7.

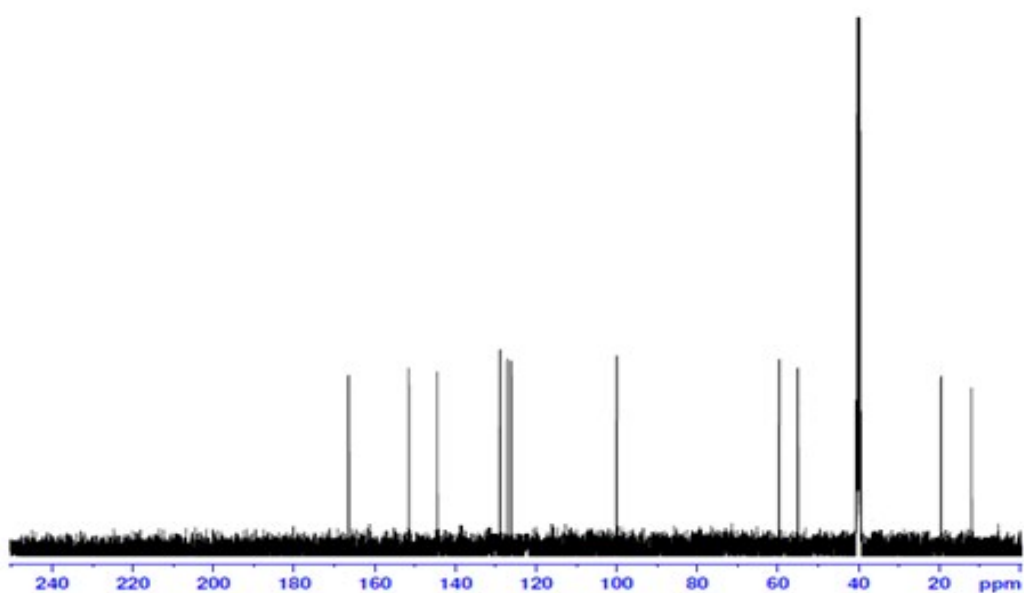
3,4-Dihydro-5-etoxy carbonyl-4-(4-p-tolyl)-6-methyl-pyrimidine-2(1H)-one (4t): ¹H NMR (400 MHz, DMSO-d₆): δ 1.16 (t, *J*= 7.6 Hz, 3H, CH₃), 2.32 (s, 3H, CH₃), 2.30 (s, 3H, CH₃), 4.07 (m, 2H, CH₂), 5.33(s, 1H, CH), 6.29 (s, 1H, NH), 6.87(d, *J*= 8.0 Hz, 2H, H-Aro), 7.17 (d, *J*= 7.6 Hz, 2H, H-Aro), 8.74 (s, 1H, NH). ¹³C NMR (100 MHz, DMSO-d₆): δ 14.8, 18.8, 22.8, 56.6, 66.7, 100.2, 115.0, 127.1, 138.7, 149.3, 155.4, 158.5, 166.3.

¹H and ¹³C NMR spectra of all compounds

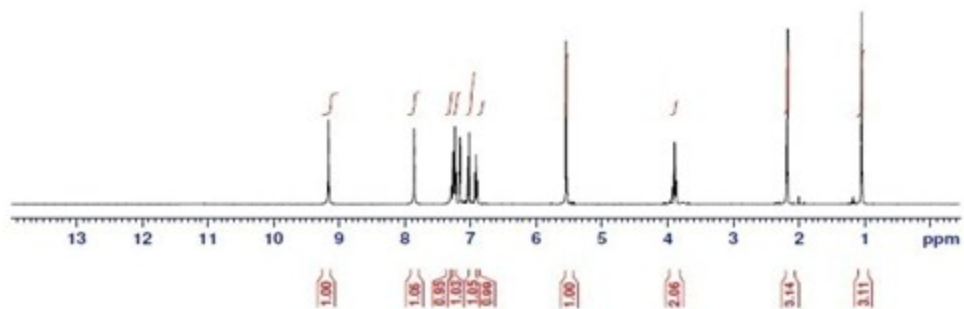
The ¹H NMR spectrum of 3,4-Dihydro-5-ethoxycarbonyl-4-(4-phenyl)-6-methyl-pyrimidine-2(1H)-one (4a):



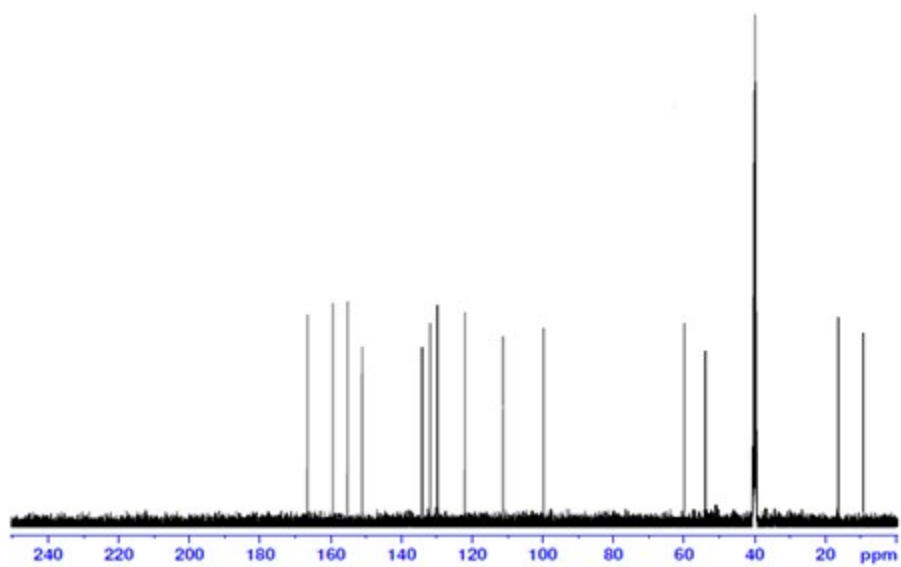
The ¹³C NMR spectrum of 3,4-Dihydro-5-ethoxycarbonyl-4-(4-phenyl)-6-methyl-pyrimidine-2(1H)-one (4a):



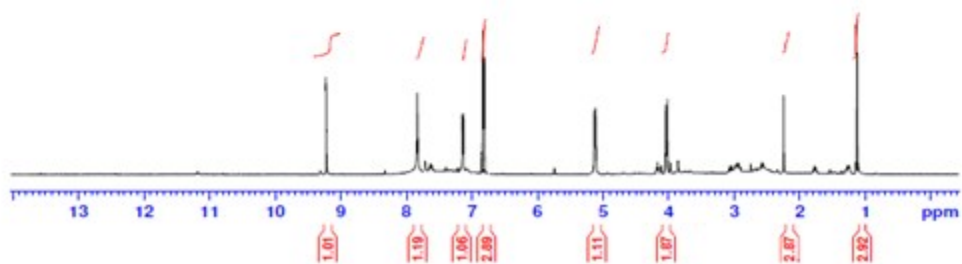
The ^1H NMR spectrum of 3,4-Dihydro-5-etoxy-carbonyl-4-(2-nitrophenyl)-6-methyl-pyrimidine-2(1H)-one (4b):



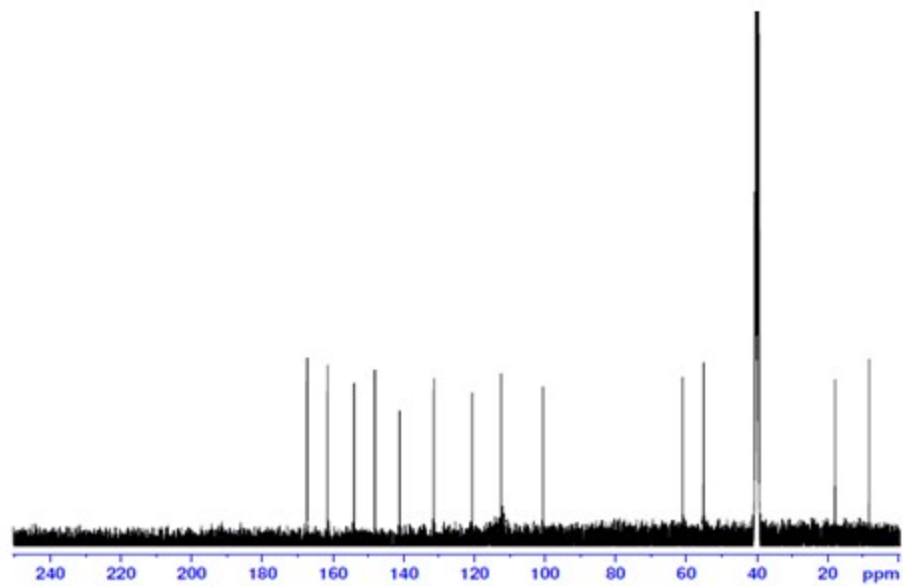
The ^{13}C NMR spectrum of 3,4-Dihydro-5-etoxy-carbonyl-4-(2-nitrophenyl)-6-methyl-pyrimidine-2(1H)-one (4b):



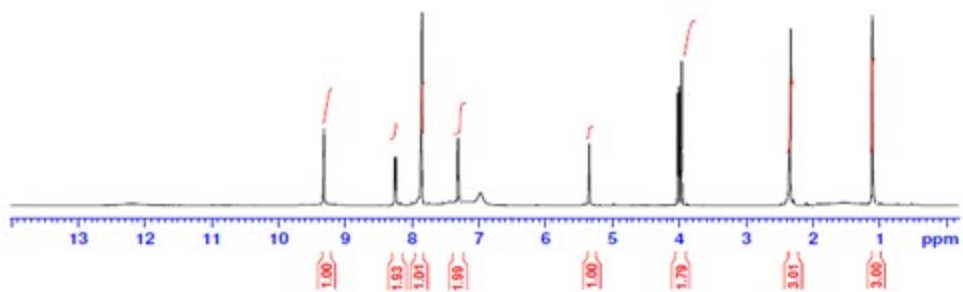
The ^1H NMR spectrum of 3,4-Dihydro-5-ethoxycarbonyl-4-(3-nitrophenyl)-6-methyl-pyrimidine-2(1H)-one (4c):



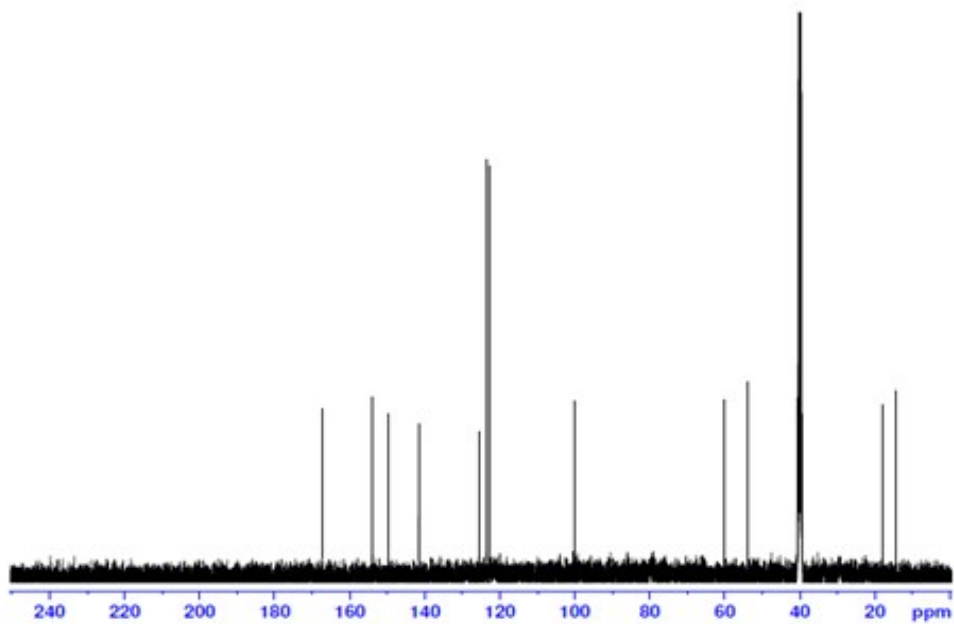
The ^{13}C NMR spectrum of 3,4-Dihydro-5-ethoxycarbonyl-4-(3-nitrophenyl)-6-methyl-pyrimidine-2(1H)-one (4c):



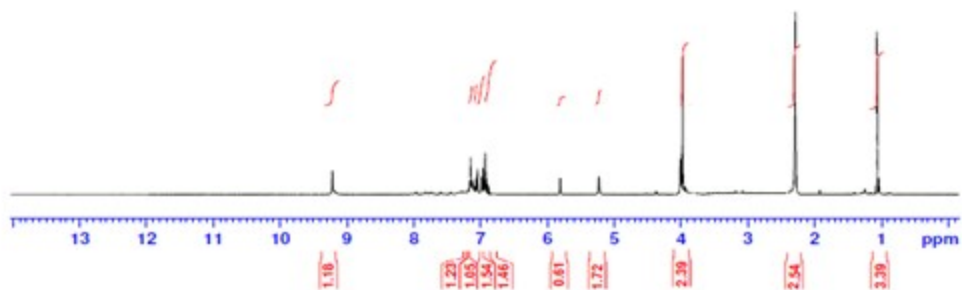
The ^1H NMR spectrum of 3,4-Dihydro-5-ethoxycarbonyl-4-(4-nitrophenyl)-6-methyl-pyrimidine-2(1H)-one (4d):



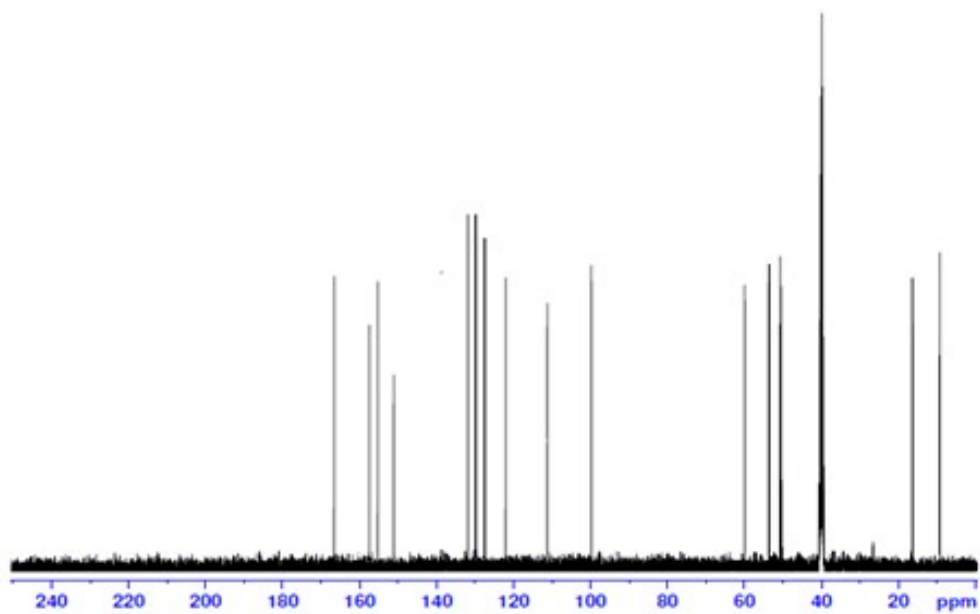
The ¹³C NMR spectrum of 3,4-Dihydro-5-ethoxycarbonyl-4-(4-nitrophenyl)-6-methyl-pyrimidine-2(1H)-one (4d):



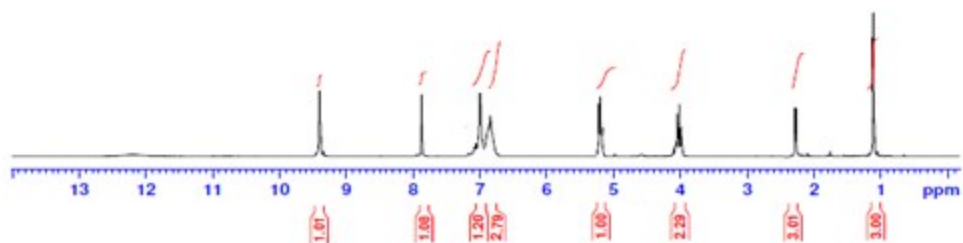
The ¹H NMR spectrum of 3,4-Dihydro-5-ethoxycarbonyl-4-(2-chlorophenyl)-6-methyl-pyrimidine-2(1H)-one (4e):



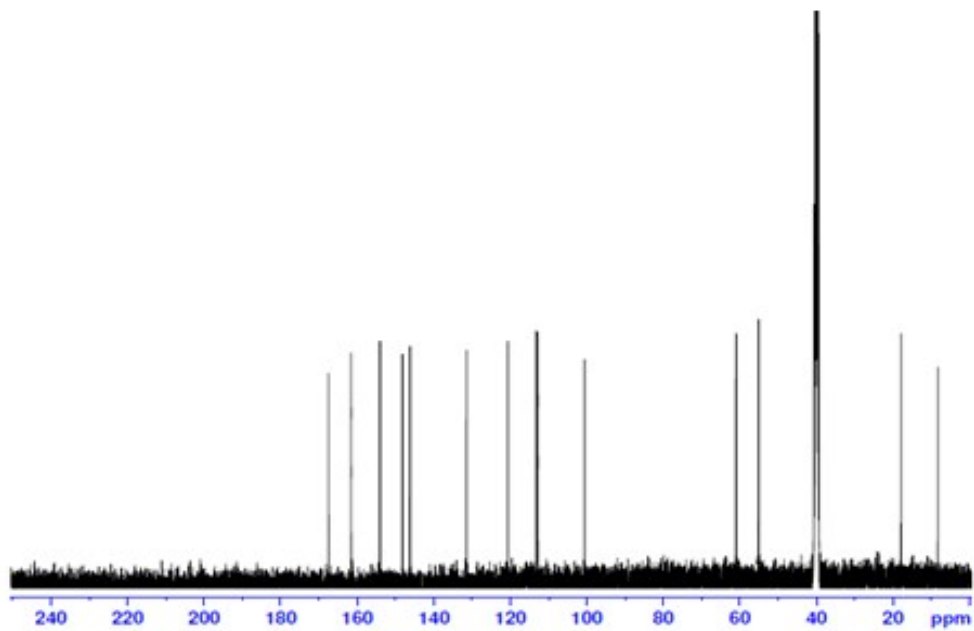
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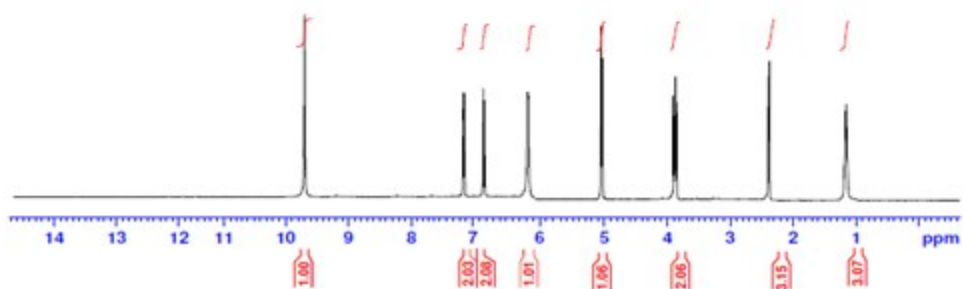
The ^1H NMR spectrum of 3,4-Dihydro-5-etoxy-carbonyl-4-(3-chlorophenyl)-6-methyl-pyrimidine-2(1H)-one (4f):



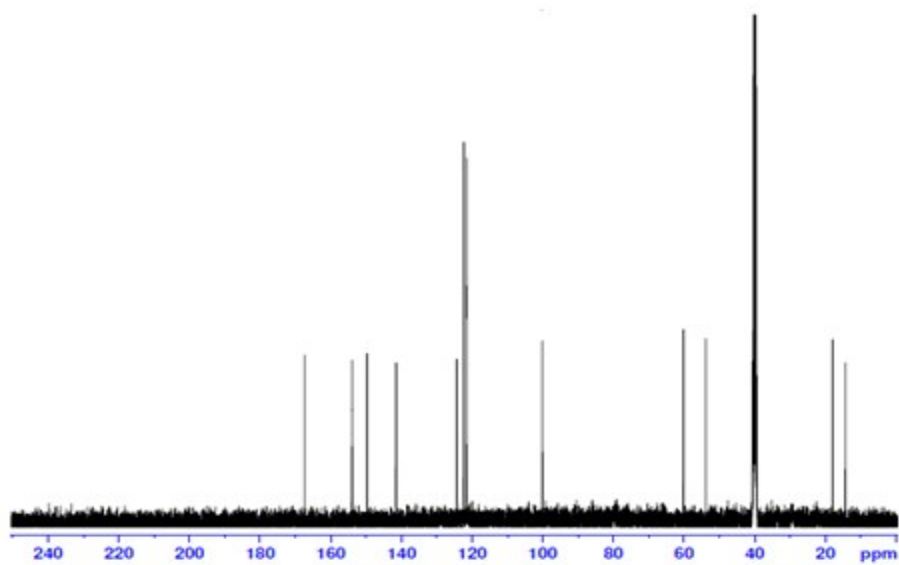
The ^{13}C NMR spectrum of 3,4-Dihydro-5-etoxy-carbonyl-4-(3-chlorophenyl)-6-methyl-pyrimidine-2(1H)-one (4f):



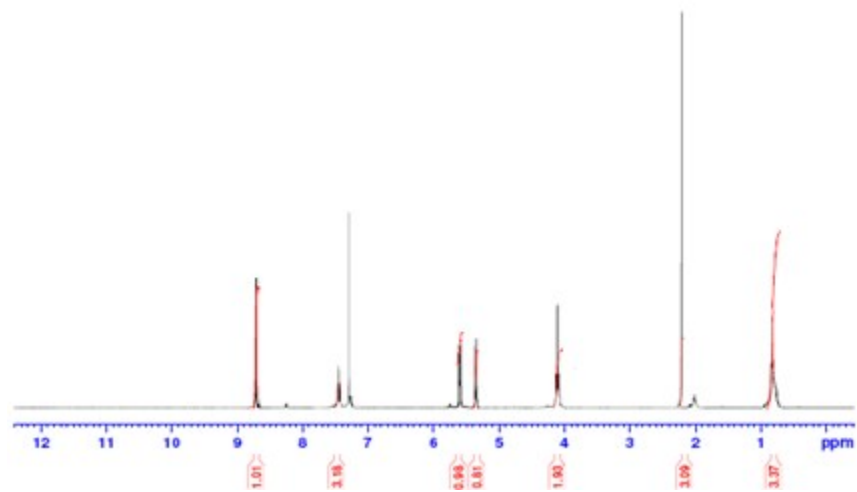
The ^1H NMR spectrum of 3,4-Dihydro-5-ethoxycarbonyl-4-(4-chlorophenyl)-6-methyl-pyrimidine-2(1H)-one (4g):



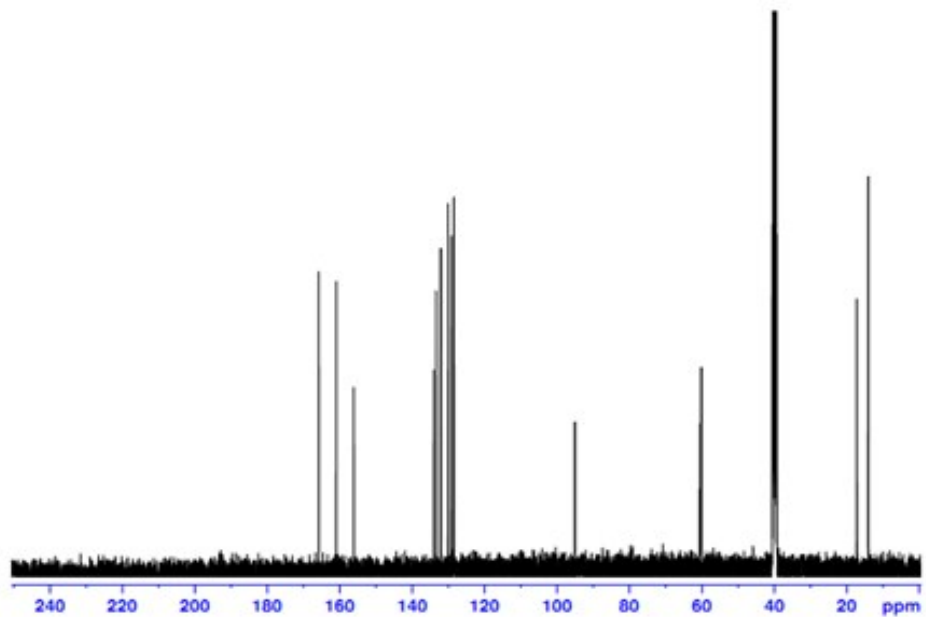
The ^{13}C NMR spectrum of 3,4-Dihydro-5-ethoxycarbonyl-4-(4-chlorophenyl)-6-methyl-pyrimidine-2(1H)-one (4g):



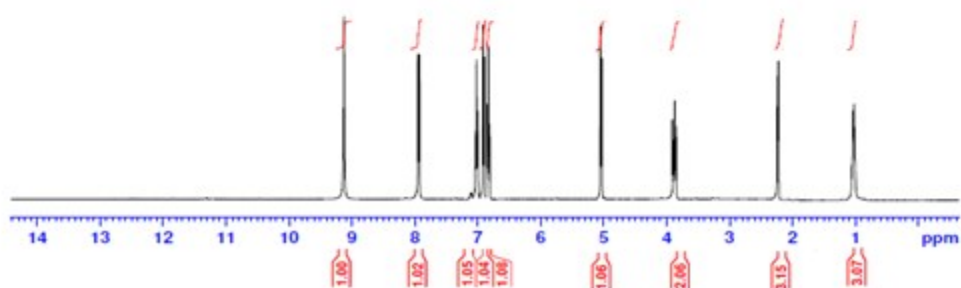
The ^1H NMR spectrum of 3,4-Dihydro-5-etoxy-carbonyl-4-(2,4-dichlorophenyl)-6-methyl-pyrimidine-2(1H)-one (4h):



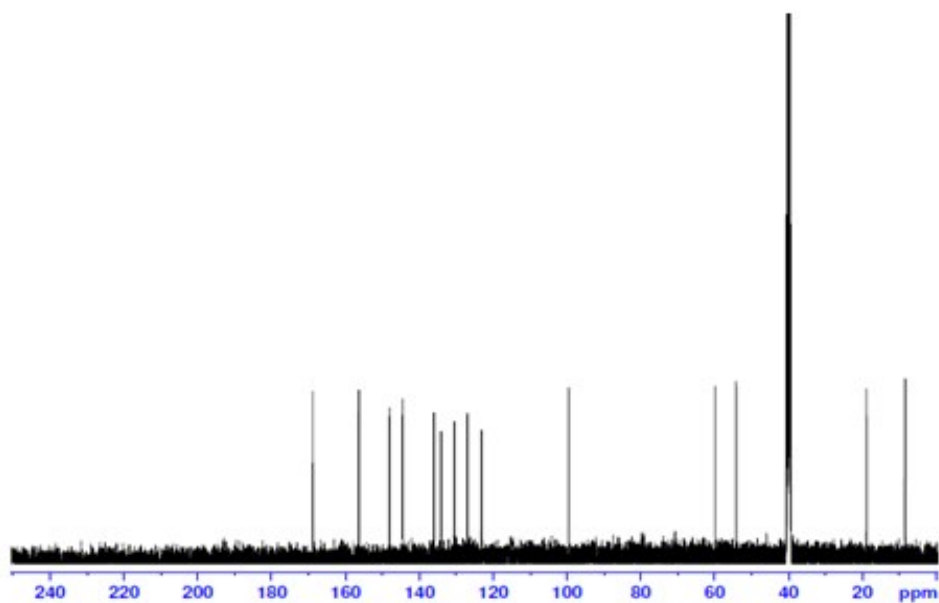
The ^{13}C NMR spectrum of 3,4-Dihydro-5-etoxy-carbonyl-4-(2,4-dichlorophenyl)-6-methyl-pyrimidine-2(1H)-one (4h):



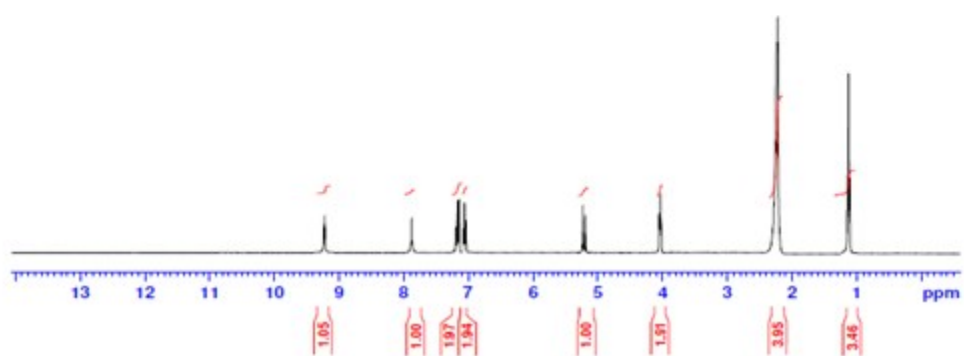
The ^1H NMR spectrum of 3,4-Dihydro-5-etoxy-carbonyl-4-(3,4-dichlorophenyl)-6-methyl-pyrimidine-2(1H)-one (4i):



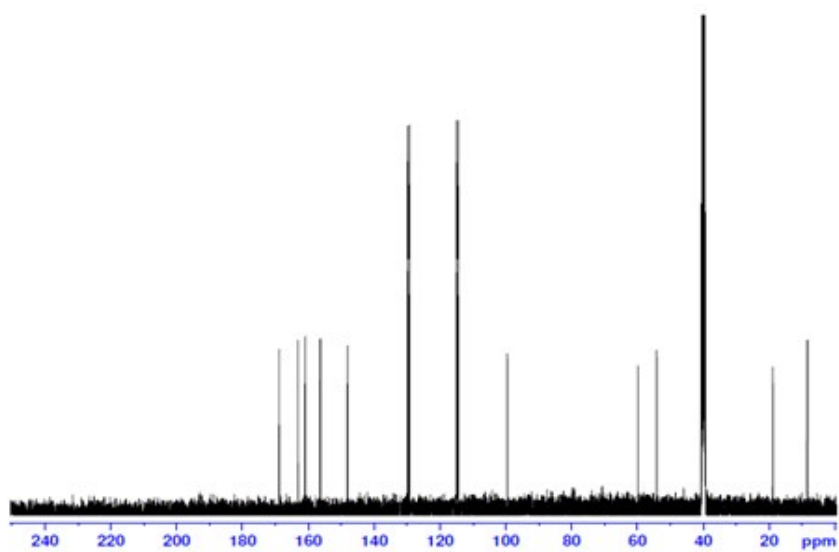
The ^{13}C NMR spectrum of 3,4-Dihydro-5-etoxy-carbonyl-4-(3,4-dichlorophenyl)-6-methyl-pyrimidine-2(1H)-one (4i):



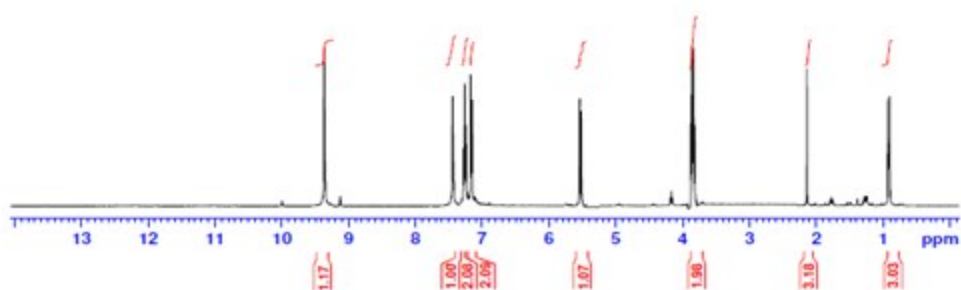
The ^1H NMR spectrum of 3,4-Dihydro-5-ethoxycarbonyl-4-(4-fluorophenyl)-6-methyl-pyrimidine-2(1H)-one (4j):



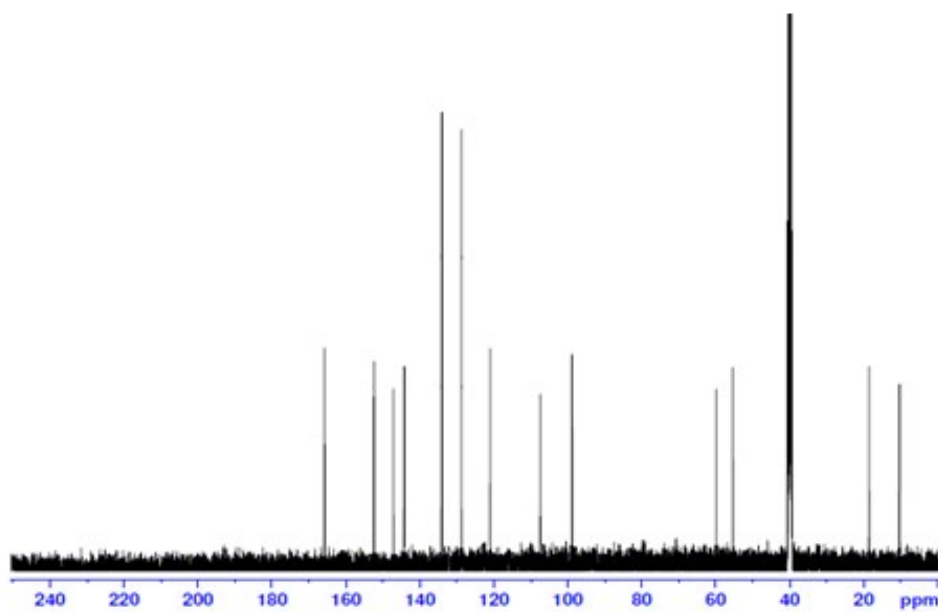
The ^{13}C NMR spectrum of 3,4-Dihydro-5-ethoxycarbonyl-4-(4-fluorophenyl)-6-methyl-pyrimidine-2(1H)-one (4j):



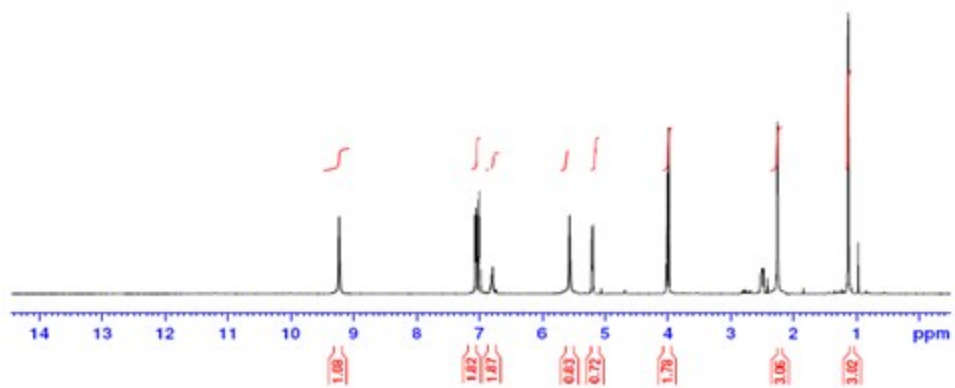
The ^1H NMR spectrum of 3,4-Dihydro-5-etoxy carbonyl-4-(4-trifluoromethylphenyl)-6-methyl-pyrimidine-2(1H)-one (4k):



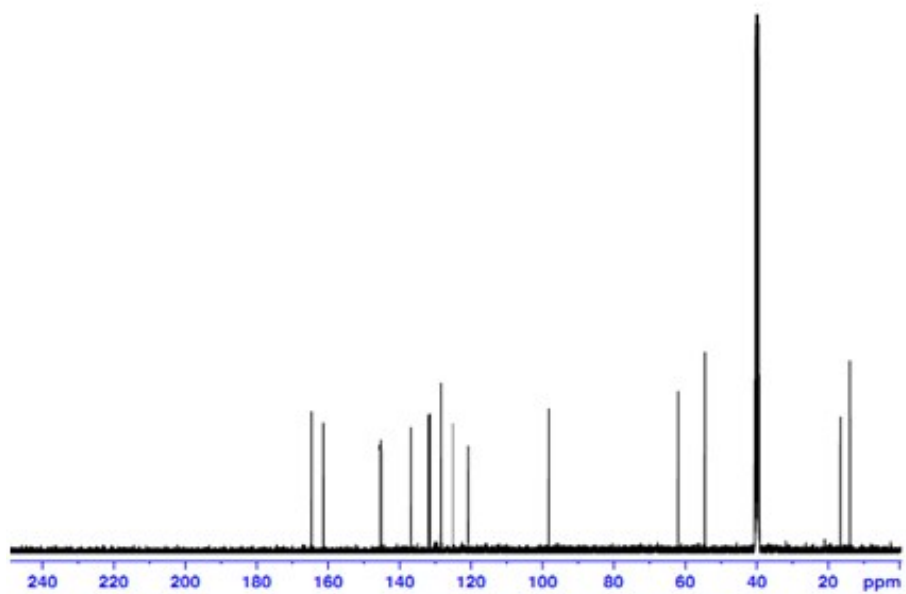
The ^{13}C NMR spectrum of 3,4-Dihydro-5-etoxy carbonyl-4-(4-trifluoromethylphenyl)-6-methyl-pyrimidine-2(1H)-one (4k):



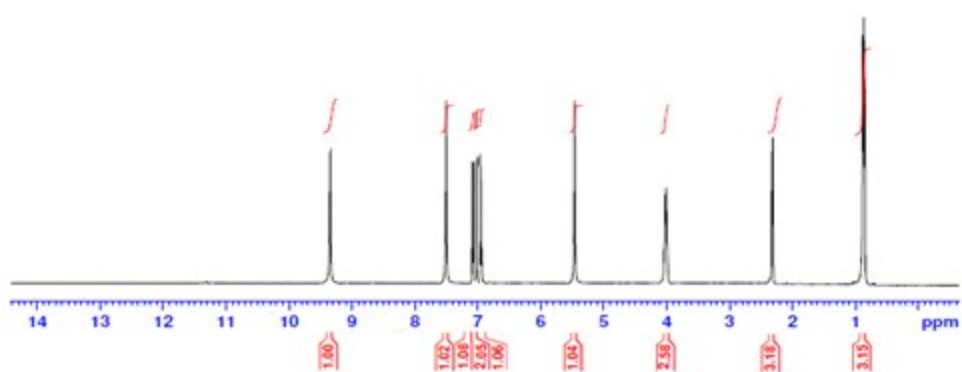
The ^1H NMR spectrum of 3,4-Dihydro-5-ethoxycarbonyl-4-(3-bromophenyl)-6-methyl-pyrimidine-2(1H)-one (4l):



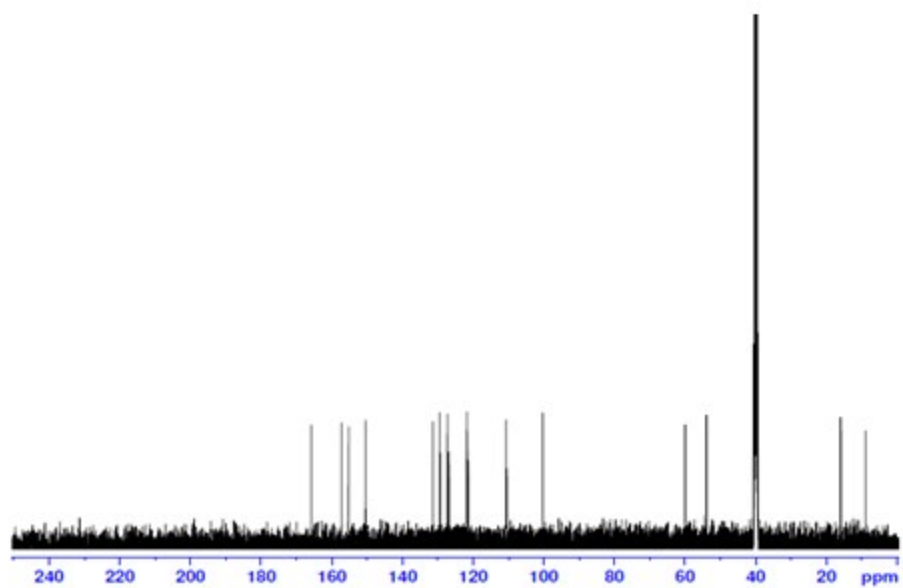
The ^{13}C NMR spectrum of 3,4-Dihydro-5-ethoxycarbonyl-4-(3-bromophenyl)-6-methyl-pyrimidine-2(1H)-one (4l):



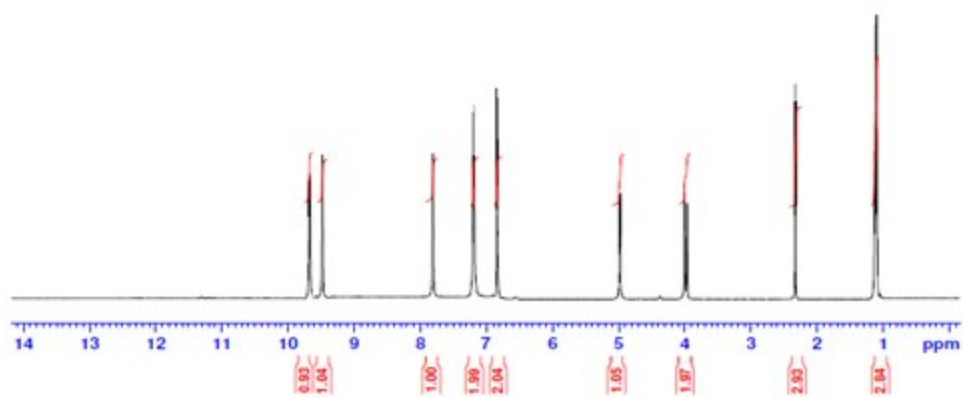
The ^1H NMR spectrum of 3,4-Dihydro-5-ethoxycarbonyl-4-(2-hydroxyphenyl)-6-methyl-pyrimidine-2(1H)-one (4m):



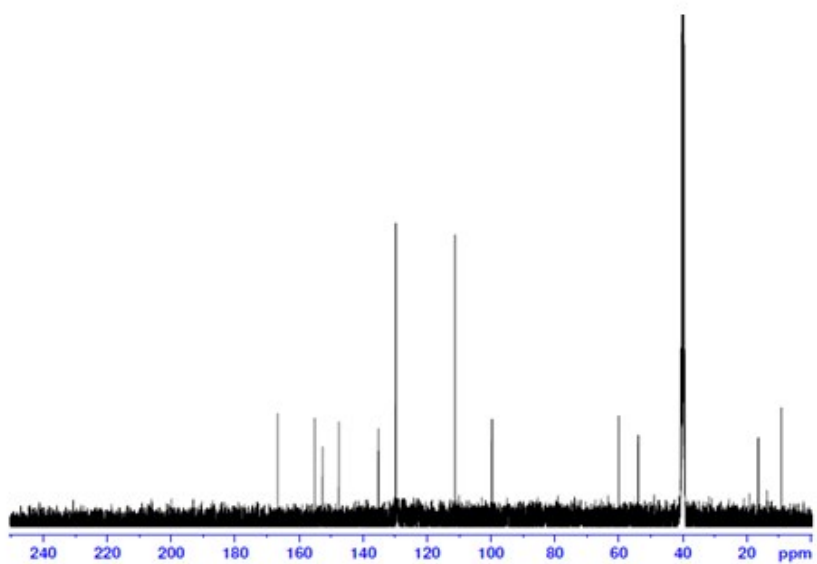
The ^{13}C NMR spectrum of 3,4-Dihydro-5-ethoxycarbonyl-4-(2-hydroxyphenyl)-6-methyl-pyrimidine-2(1H)-one (4m):



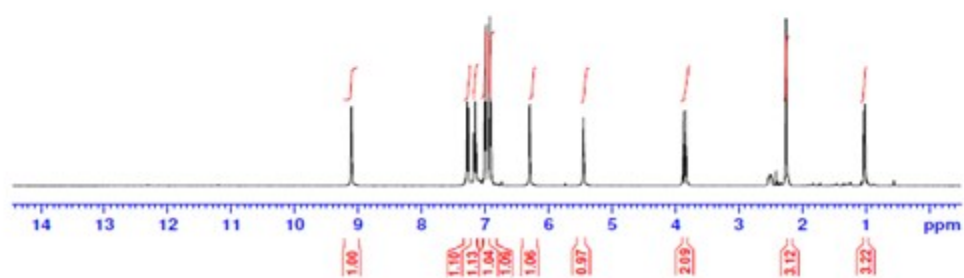
The ^1H NMR spectrum of 3,4-Dihydro-5-etoxy-carbonyl-4-(4-hydroxyphenyl)-6-methyl-pyrimidine-2(1H)-one (4n):



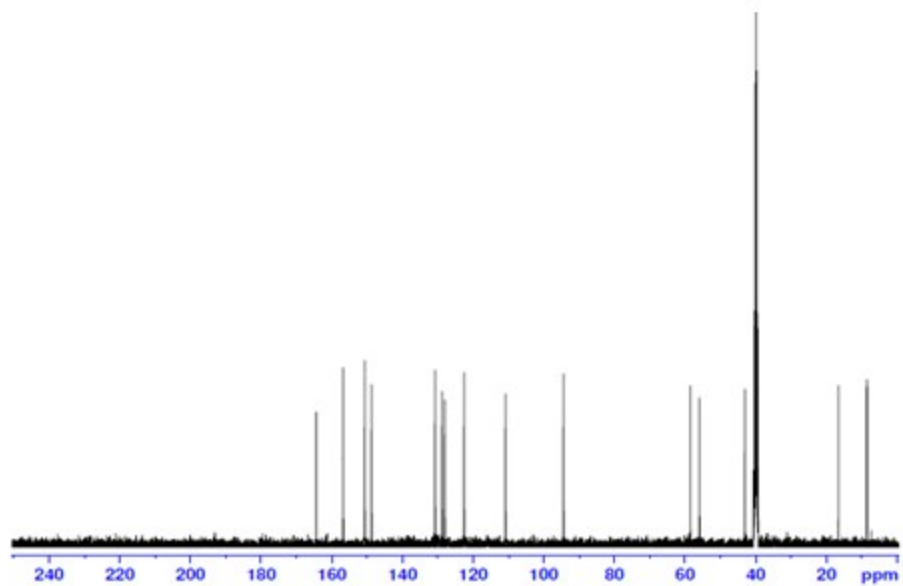
The ^{13}C NMR spectrum of 3,4-Dihydro-5-etoxy-carbonyl-4-(4-hydroxyphenyl)-6-methyl-pyrimidine-2(1H)-one (4n):



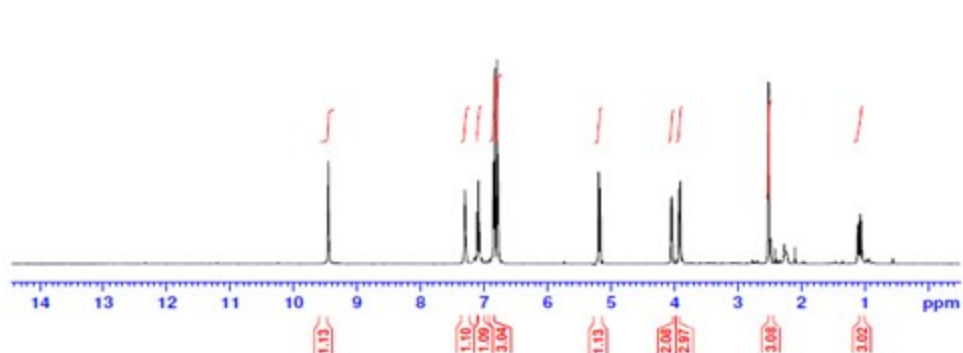
The ^1H NMR spectrum of 3,4-Dihydro-5-etoxy-carbonyl-4-(2-methoxyphenyl)-6-methyl-pyrimidine-2(1H)-one (4o):



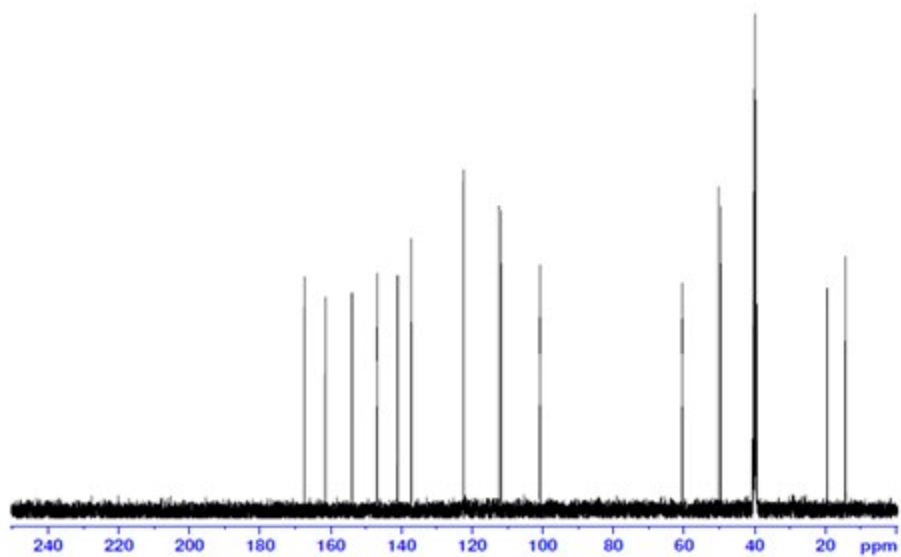
The ^{13}C NMR spectrum of 3,4-Dihydro-5-etoxy-carbonyl-4-(2-methoxyphenyl)-6-methyl-pyrimidine-2(1H)-one (4o):



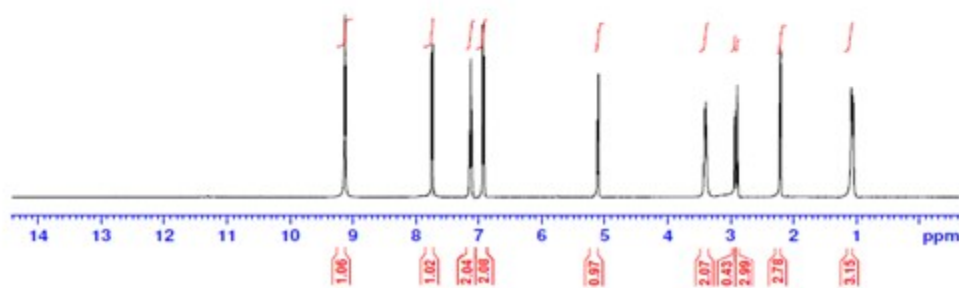
The ^1H NMR spectrum of 3,4-Dihydro-5-etoxy-carbonyl-4-(3-methoxyphenyl)-6-methyl-pyrimidine-2(1H)-one (4p):



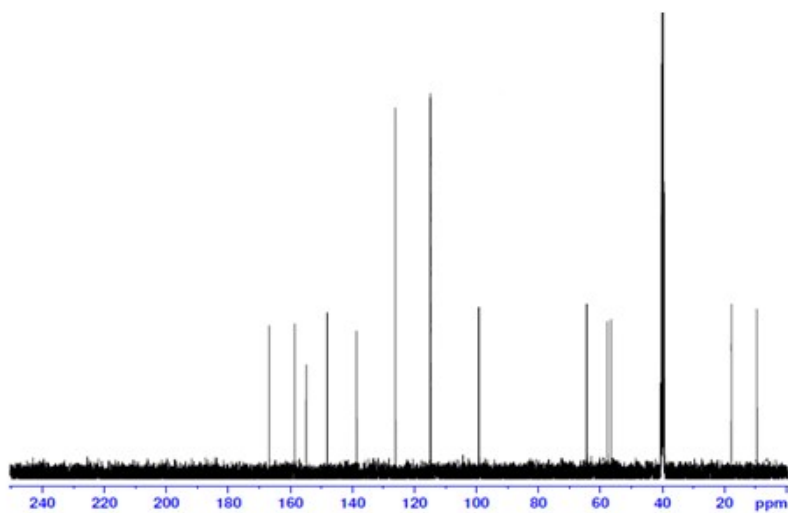
The ^{13}C NMR spectrum of 3,4-Dihydro-5-etoxy-carbonyl-4-(3-methoxyphenyl)-6-methyl-pyrimidine-2(1H)-one (4p):



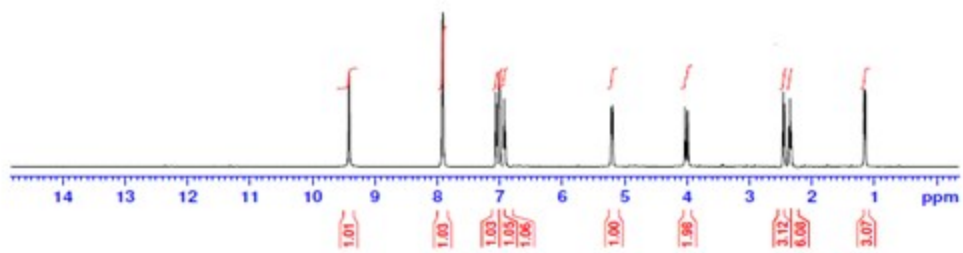
The ^1H NMR spectrum of 3,4-Dihydro-5-etoxy carbonyl-4-(4-methoxyphenyl)-6-methyl-pyrimidine-2(1H)-one (4q):



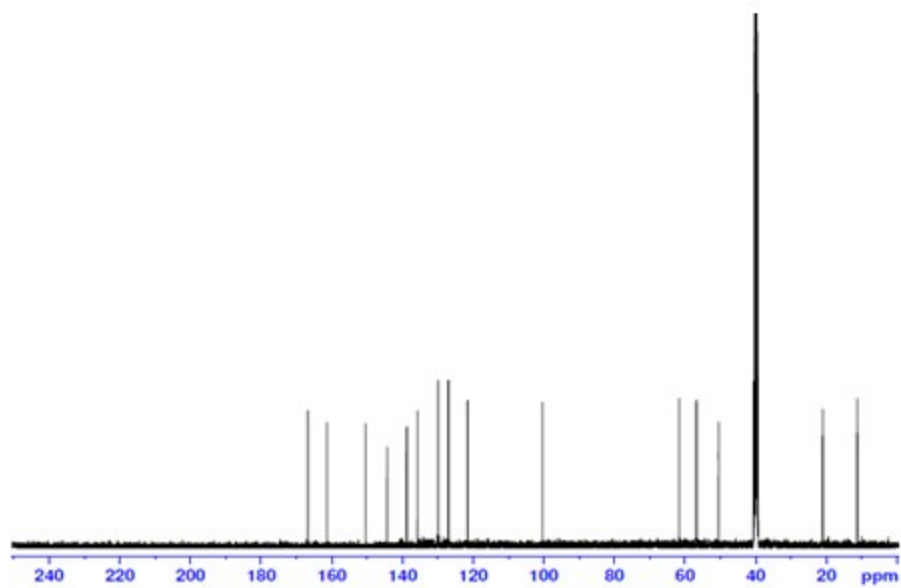
The ^{13}C NMR spectrum of 3,4-Dihydro-5-etoxy carbonyl-4-(4-methoxyphenyl)-6-methyl-pyrimidine-2(1H)-one (4q):



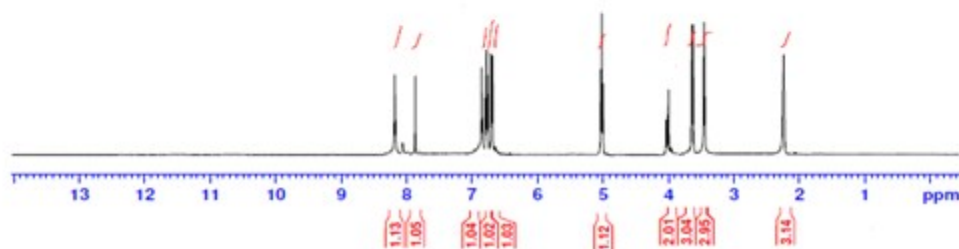
The ^1H NMR spectrum of 3,4-Dihydro-5-etoxy carbonyl-4-(3,4-dimethoxyphenyl)-6-methyl-pyrimidine-2(1H)-one (4r):



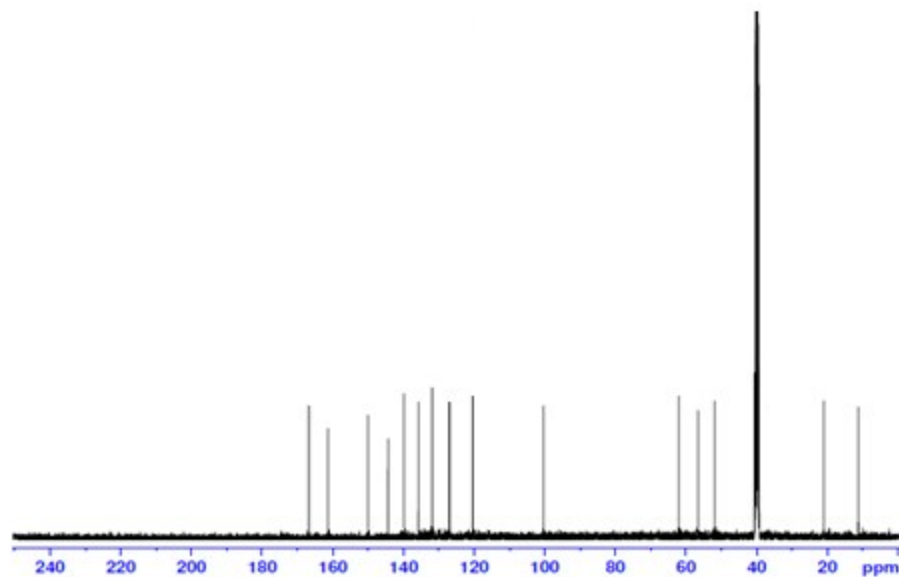
The ^{13}C NMR spectrum of 3,4-Dihydro-5-ethoxycarbonyl-4-(3,4-dimethoxyphenyl)-6-methyl-pyrimidine-2(1H)-one (4r):



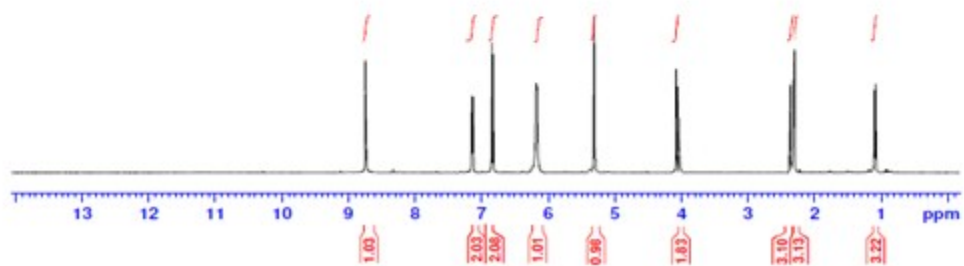
The ^1H NMR spectrum of 3,4-Dihydro-5-etoxy-carbonyl-4-(3-methoxy-4-hydroxyphenyl)-6-methyl-pyrimidine-2(1H)-one (4s):



The ^{13}C NMR spectrum of 3,4-Dihydro-5-etoxy-carbonyl-4-(3-methoxy-4-hydroxyphenyl)-6-methyl-pyrimidine-2(1H)-one (4s):



The ^1H NMR spectrum of 3,4-Dihydro-5-etoxy-carbonyl-4-(4-p-tolyl)-6-methyl-pyrimidine-2(1H)-one (4t):



The ^{13}C NMR spectrum of 3,4-Dihydro-5-etoxy-carbonyl-4-(4-p-tolyl)-6-methyl-pyrimidine-2(1H)-one (4t):

