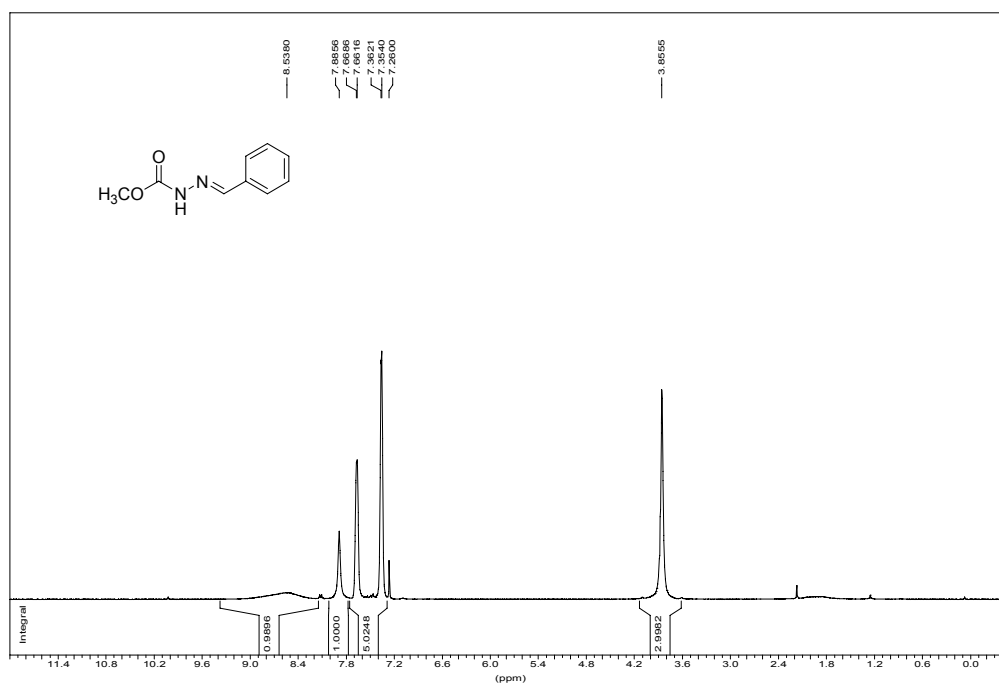
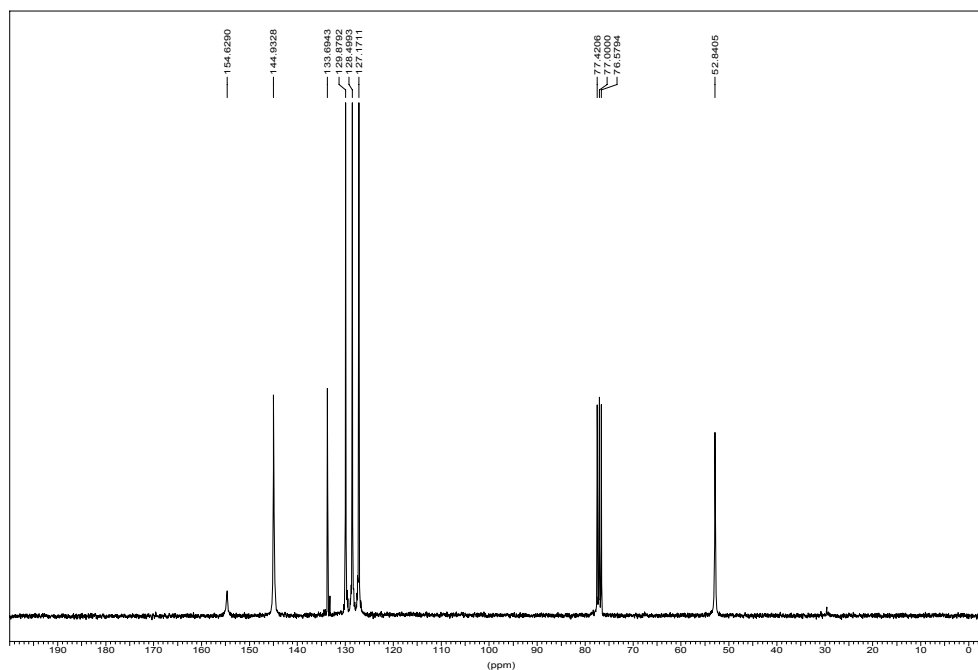


Methyl 3-benzylidenecarbazate¹ (3a): ¹H NMR (CDCl₃): δ 8.54 (s, *NH*, 1H), 7.89 (s, *CH*, 1H), 7.67-7.35 (m, *ArH*, 5H), 3.80-3.76 (s, *CH*₃, 3H); ¹³C NMR (CDCl₃): δ 154.6, 144.9, 133.7, 129.9, 128.5, 127.2, 52.8; Mass spectrum (EI) *m/z* 177.9 (*M*⁺) Exact mass calcd for C₉H₁₀N₂O₂: *m/z* 178.0742; found 178.0746.

¹H NMR of **3a**



¹³C NMR of **3a**

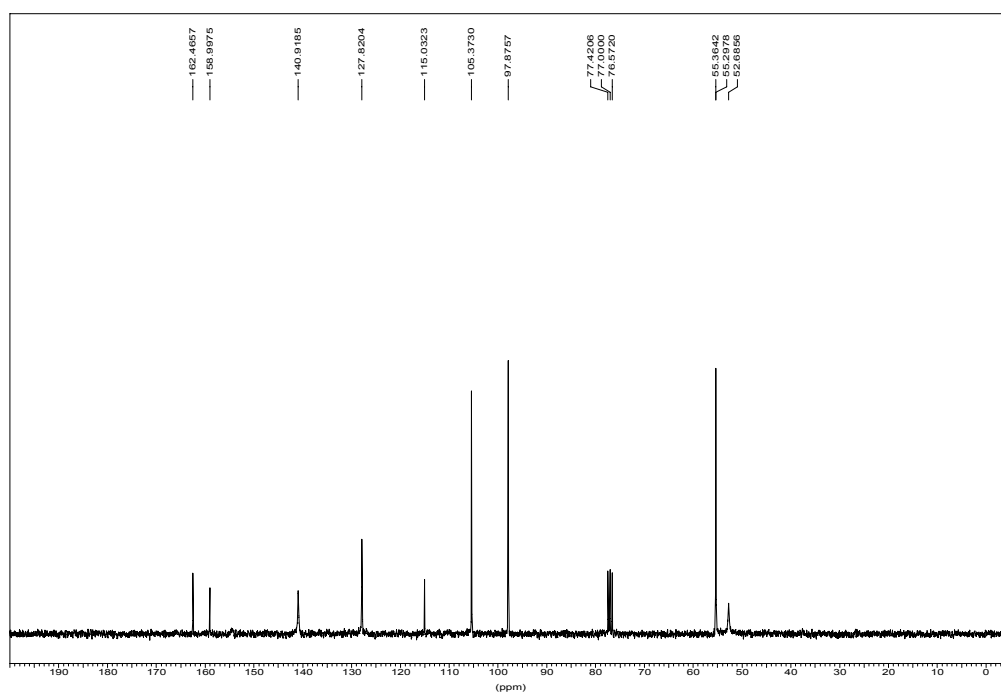


Methyl 3-(2,4-dimethoxybenzylidene)carbazate (3b): ^1H NMR (CDCl_3): δ 8.55 (s, *NH*, 1H), 8.16 (s, *CH*, 1H), 7.87-6.36 (m, *ArH*, 3H), 3.80-3.76 (m, *CH*₃ and *OCH*₃, 9H); ^{13}C NMR (CDCl_3): δ 162.5, 159.0, 140.9, 127.8, 115.0, 105.4, 97.9, 55.4, 55.3, 52.7; Mass spectrum (EI) m/z 238.2 (M^+) Exact mass calcd for $\text{C}_{11}\text{H}_{14}\text{N}_2\text{O}_4$: m/z 238.0954; found 238.0952.

^1H NMR of **3b**

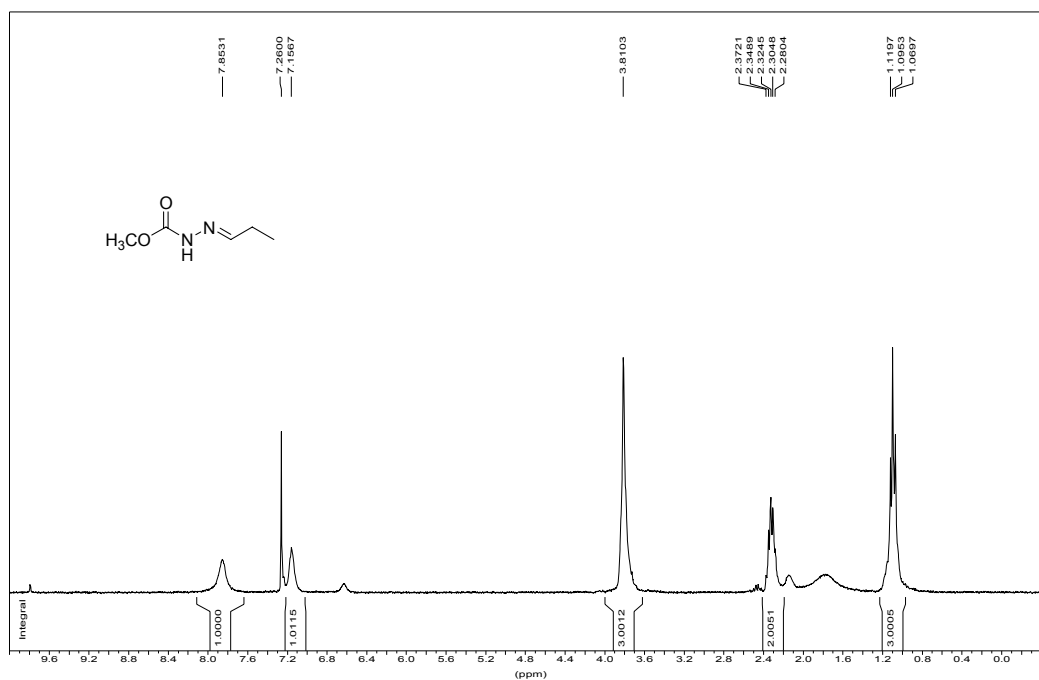


^{13}C NMR of **3b**

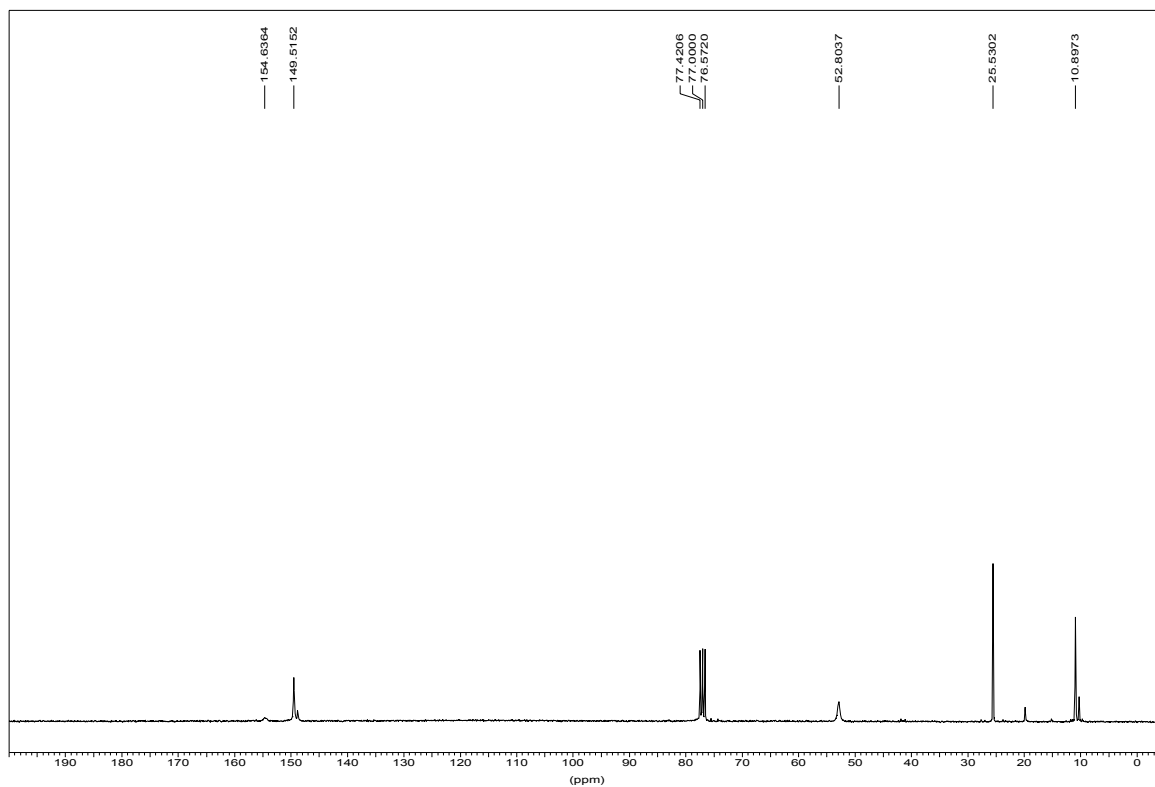


Methyl 3-propylenecarbazate (3c): ^1H NMR (CDCl_3): δ 7.85 (s, NH, 1H), 7.16 (s, CH, 1H), 3.81 (s, CH_3 , 3H), 2.37-2.28 (m, CH_2 , 2H), 1.12-1.07 (t, $J = 7.50$ Hz, CH_3CH_2 , 3H); ^{13}C NMR (CDCl_3): δ 154.6, 149.5, 52.8, 25.5, 10.9; Mass spectrum (EI) m/z 129.8 (M^+) Exact mass calcd for $\text{C}_5\text{H}_{10}\text{N}_2\text{O}_2$: m/z 130.0742; found 130.0741.

^1H NMR of 3c

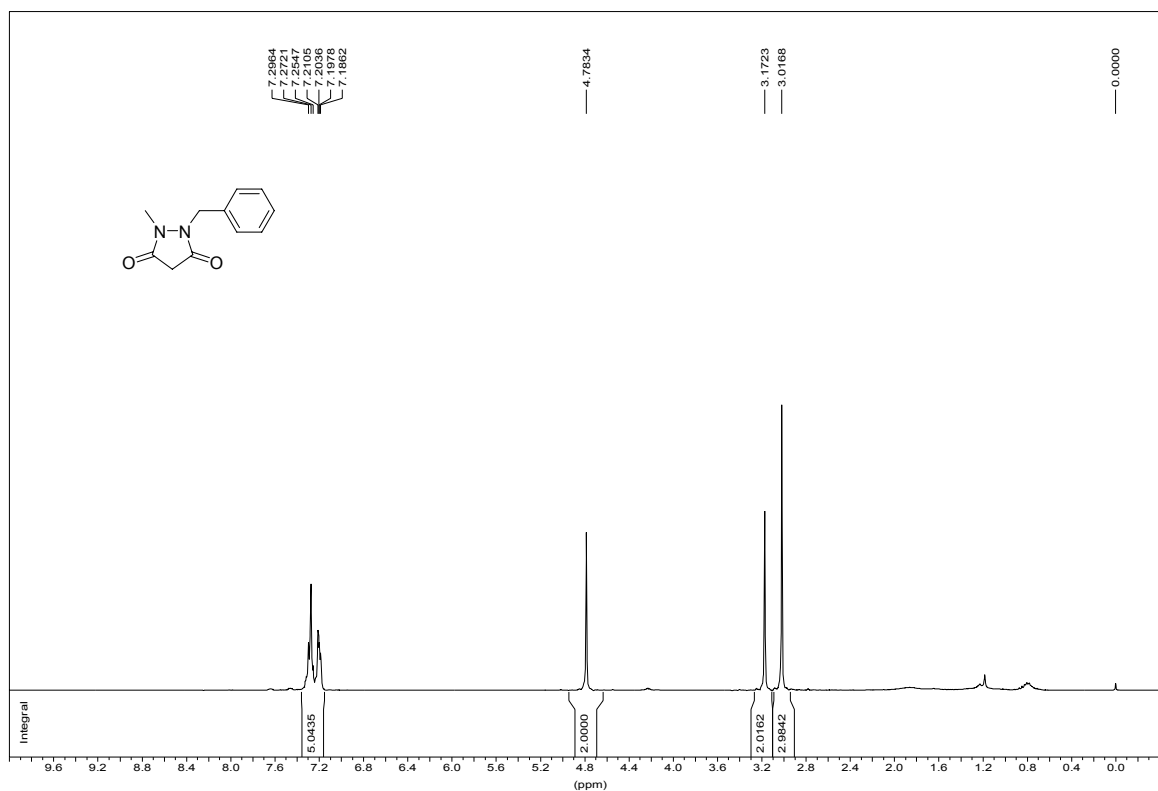


^{13}C NMR of 3c

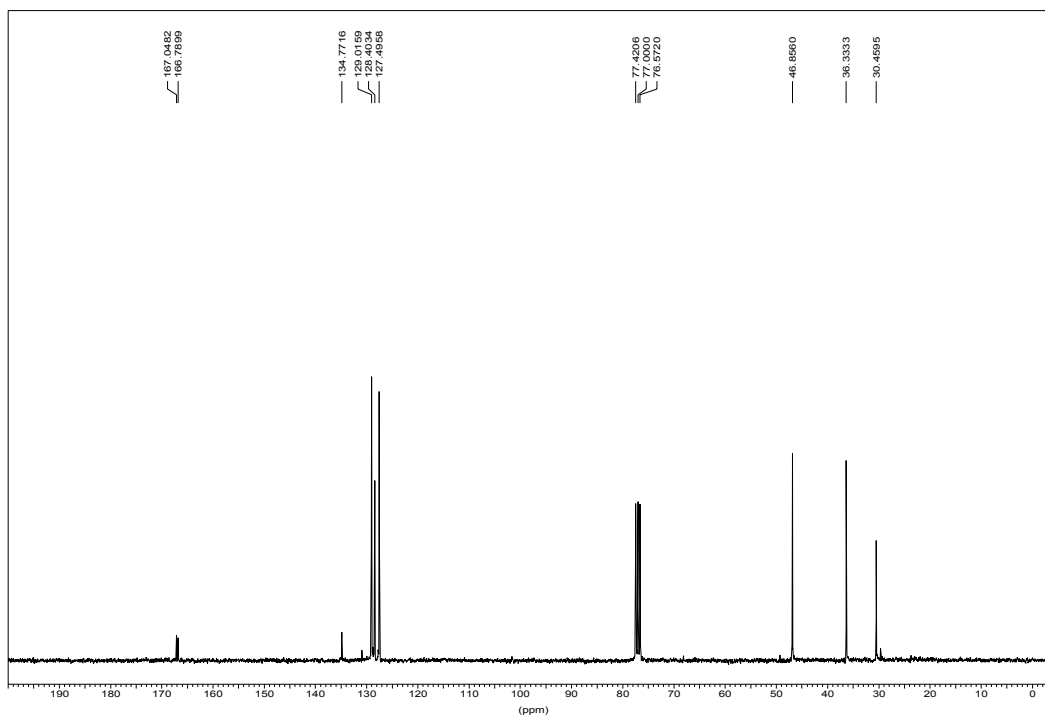


1-Benzyl-2-methylpyrazolidine-3,5-dione² (1a1). ¹H NMR (CDCl₃): δ 7.30-7.19 (m, *ArH*, 5H), 4.78 (s, *ArCH*₂, 2H), 3.17 (s, *CH*₂, 2H), 3.02 (s, *CH*₃, 3H); ¹³C NMR (CDCl₃): δ 167.0, 166.8, 134.8, 129.0, 128.4, 127.5, 46.9, 36.3, 30.5; Mass spectrum (EI) *m/z* 204.0 (*M*⁺) Exact mass calcd for C₁₁H₁₂N₂O₂: *m/z* 204.0899; found 204.0902.

¹H NMR of **1a1**

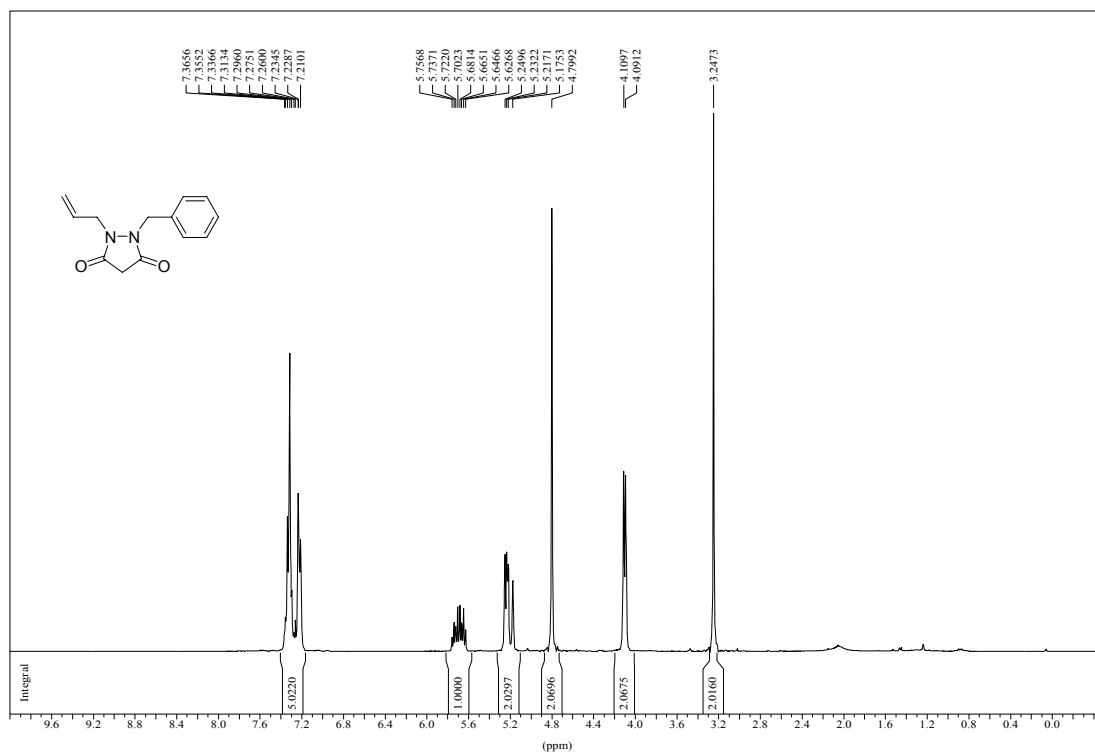


^{13}C NMR of **1a1**

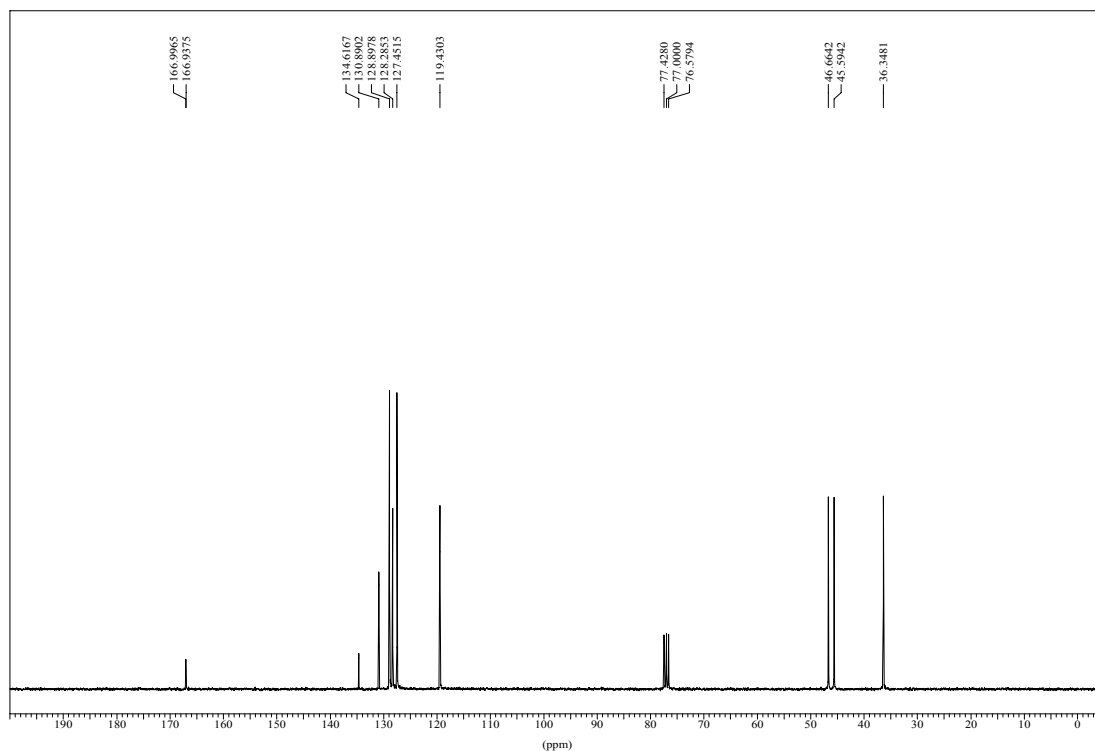


2-Allyl-1-benzylpyrazolidine-3,5-dione (1a2). ^1H NMR (CDCl₃): δ 7.37-7.21 (m, *ArH*, 5H), 5.76-5.63 (m, CH₂CHCH₂N, 1H), 5.25-5.18 (m, CH₂CHCH₂N, 2H), 4.80 (s, ArCH₂, 2H), 4.11-4.09 (d, *J* = 5.55 Hz, CH₂CHCH₂N, 2H), 3.25 (s, CH₂, 2H); ^{13}C NMR (CDCl₃): δ 167.0, 166.9, 134.6, 130.9, 128.9, 128.3, 127.5, 119.4, 46.7, 45.6, 36.3; Mass spectrum (EI) *m/z* 229.8 (*M*⁺) Exact mass calcd for C₁₃H₁₄N₂O₂: *m/z* 230.1055; found 230.1055.

^1H NMR of **1a2**

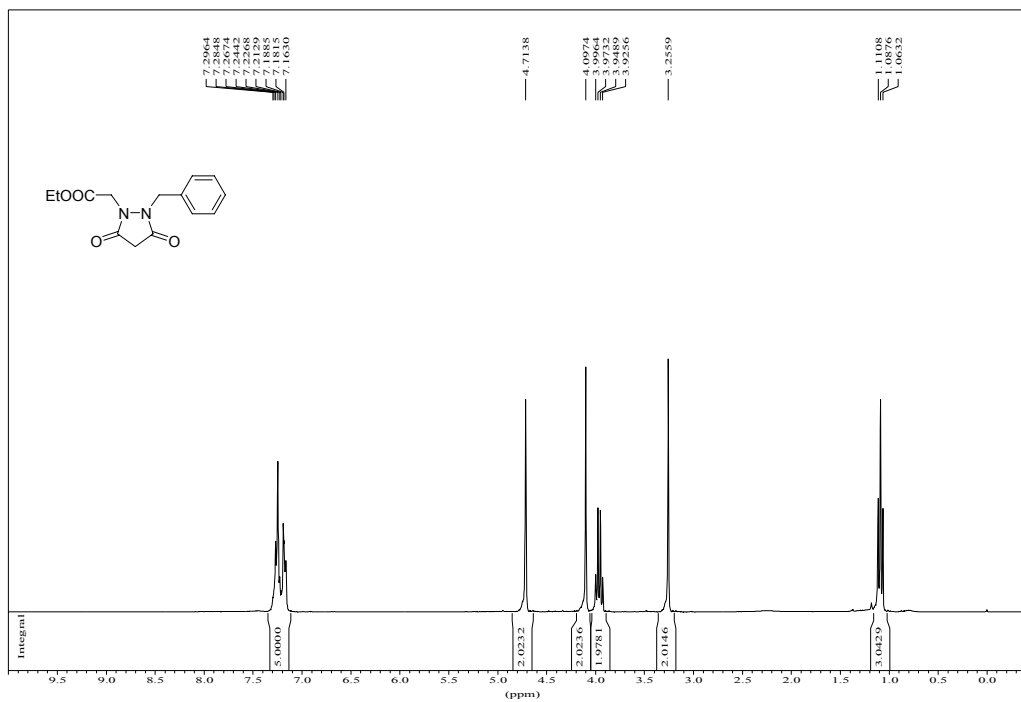


¹³C NMR of 1a2

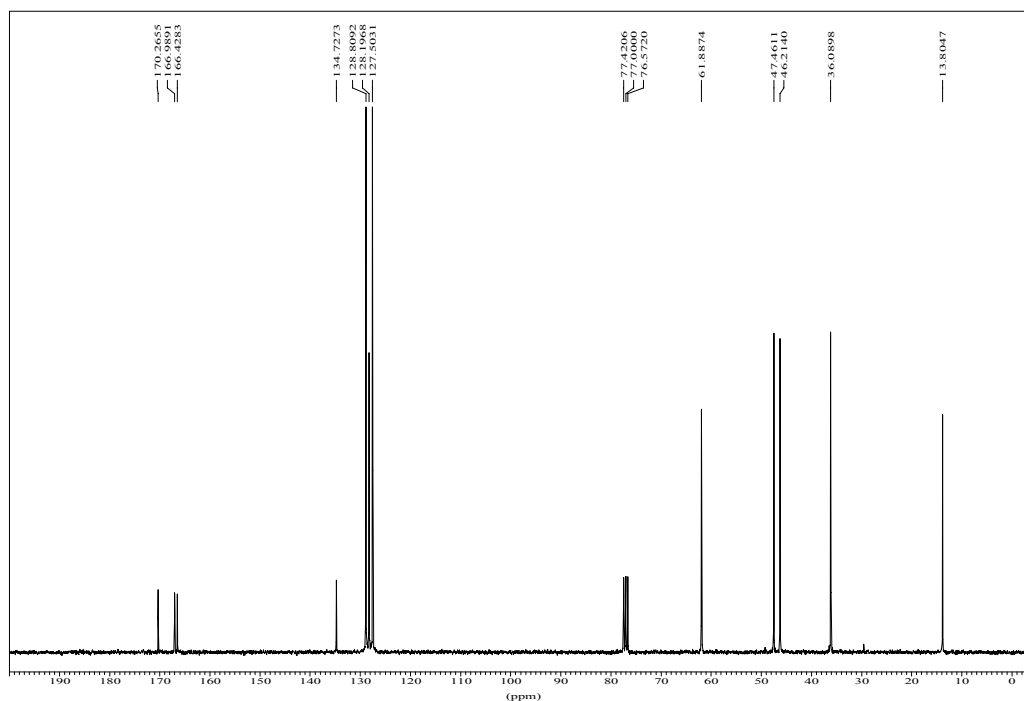


1-Benzyl-2-ethoxycarbonylmethylpyrazolidine-3,5-dione² (1a3). ¹H NMR (CDCl₃): δ 7.30-7.16 (m, *ArH*, 5H), 4.71 (s, *ArCH*₂, 2H), 4.10 (s, *CH*₂N, 2H), 4.00-3.93 (q, *J* = 7.08 Hz, *CH*₃*CH*₂, 2H), 3.26 (s, *CH*₂, 2H), 1.11-1.06 (t, *J* = 7.14 Hz, *CH*₃*CH*₂, 3H); ¹³C NMR (CDCl₃): δ 170.3, 167.0, 166.4, 134.7, 128.8, 128.2, 127.5, 61.9, 47.5, 46.2, 36.1, 13.8; Mass spectrum (EI) *m/z* 276.1 (*M*⁺) Exact mass calcd for C₁₄H₁₆N₂O₄: *m/z* 276.1110; found 276.1114.

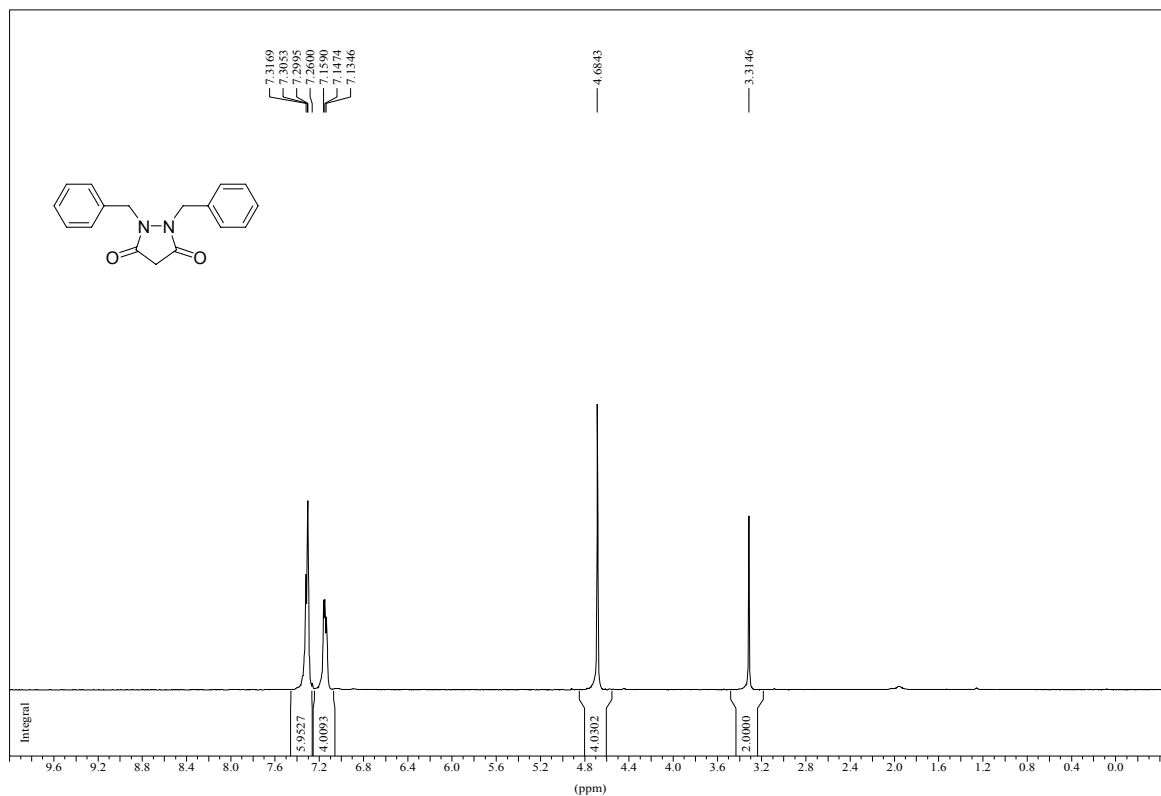
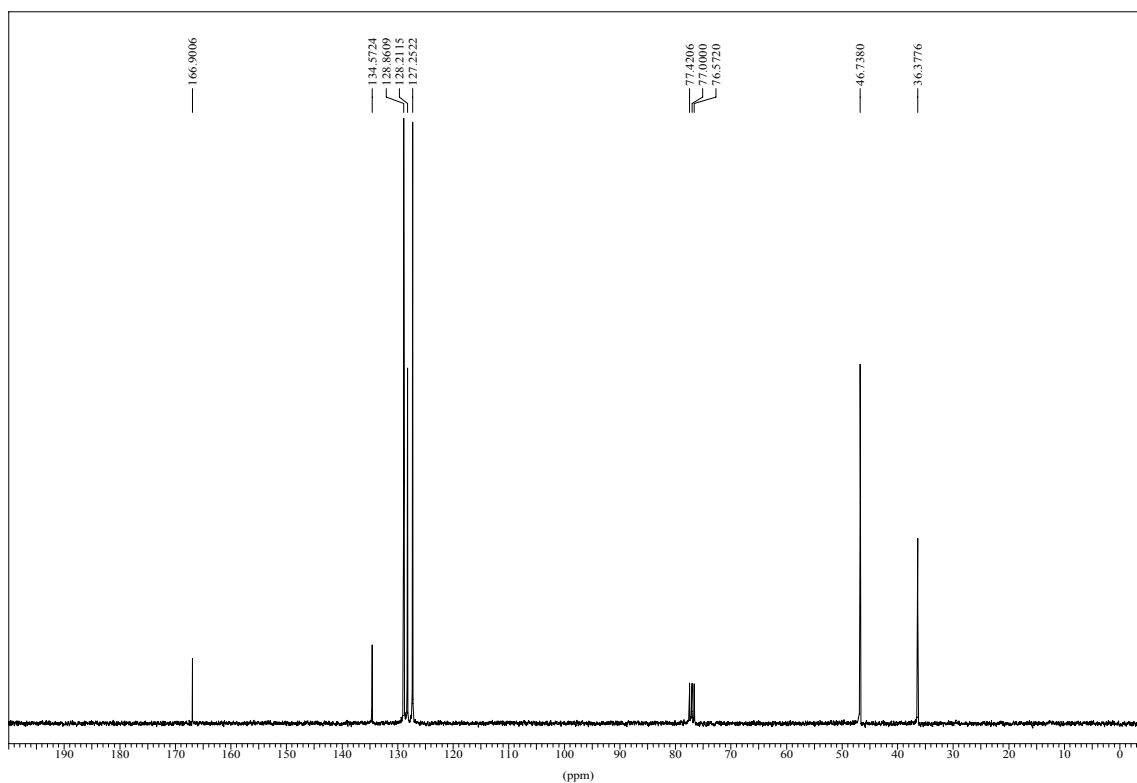
¹H NMR of 1a3



¹³C NMR of 1a3

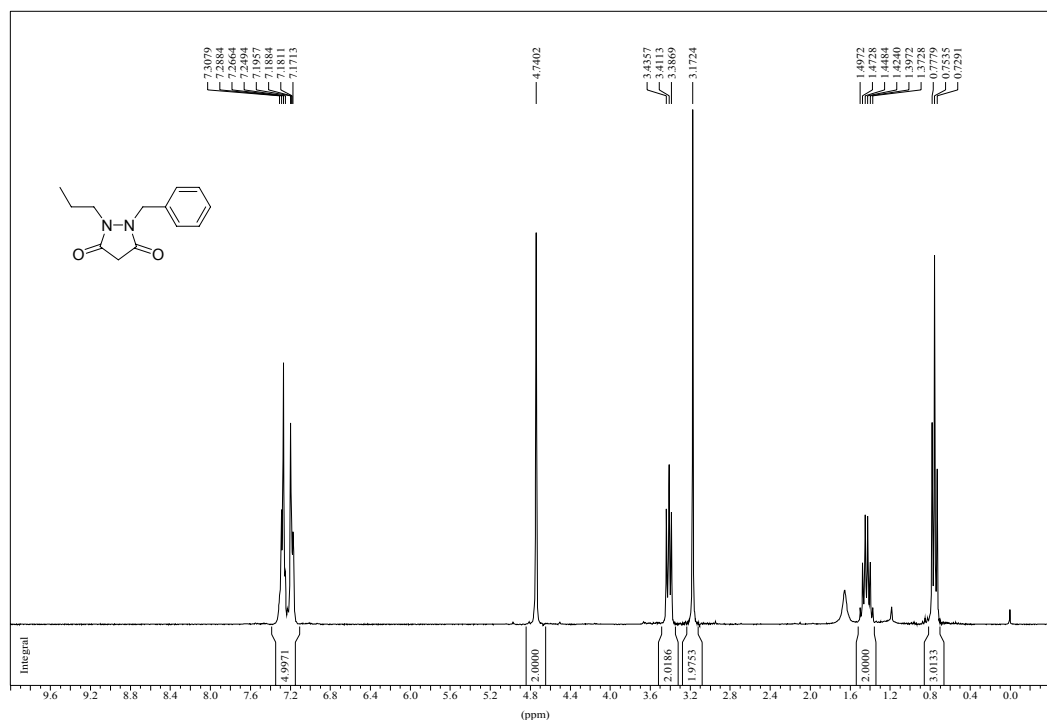
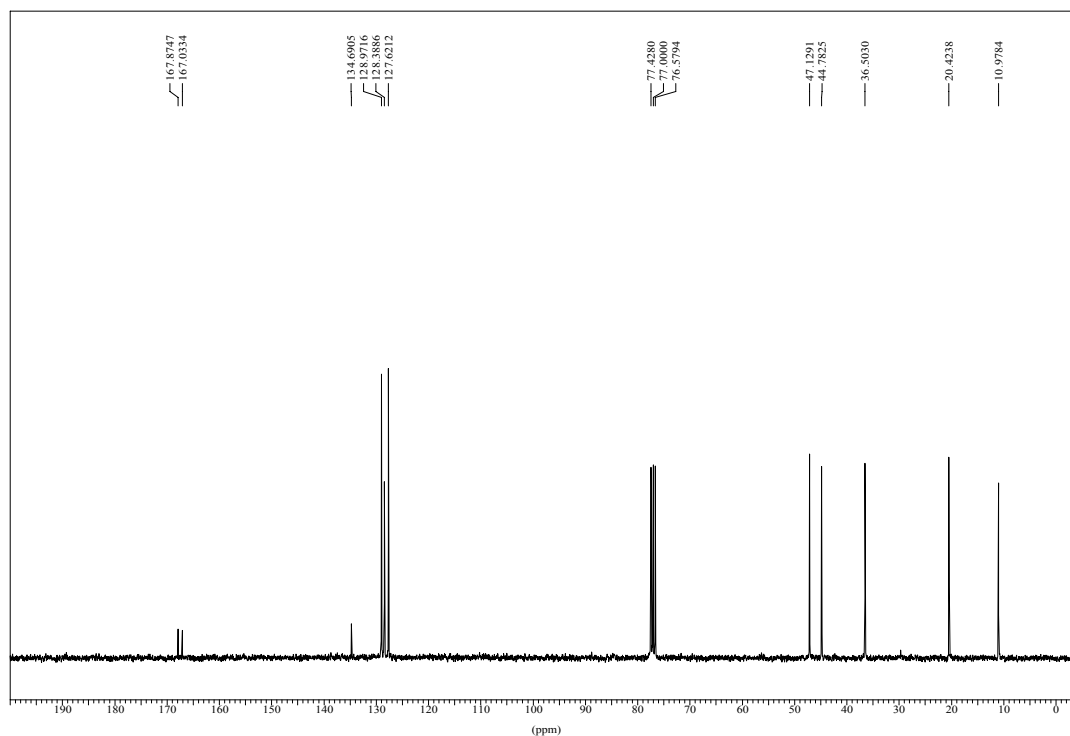


1,2-Dibenzylpyrazolidine-3,5-dione² (1a4). ¹H NMR (CDCl₃): δ 7.32-7.13 (m, *ArH*, 10H), 4.68 (s, *ArCH*₂, 4H), 3.31 (s, *CH*₂, 2H); ¹³C NMR (CDCl₃): δ 166.9, 134.6, 128.9, 128.2, 127.3, 46.7, 36.4; Mass spectrum (EI) *m/z* 280.1 (M⁺) Exact mass calcd for C₁₇H₁₆N₂O₂: *m/z* 280.1212; found 280.1219.

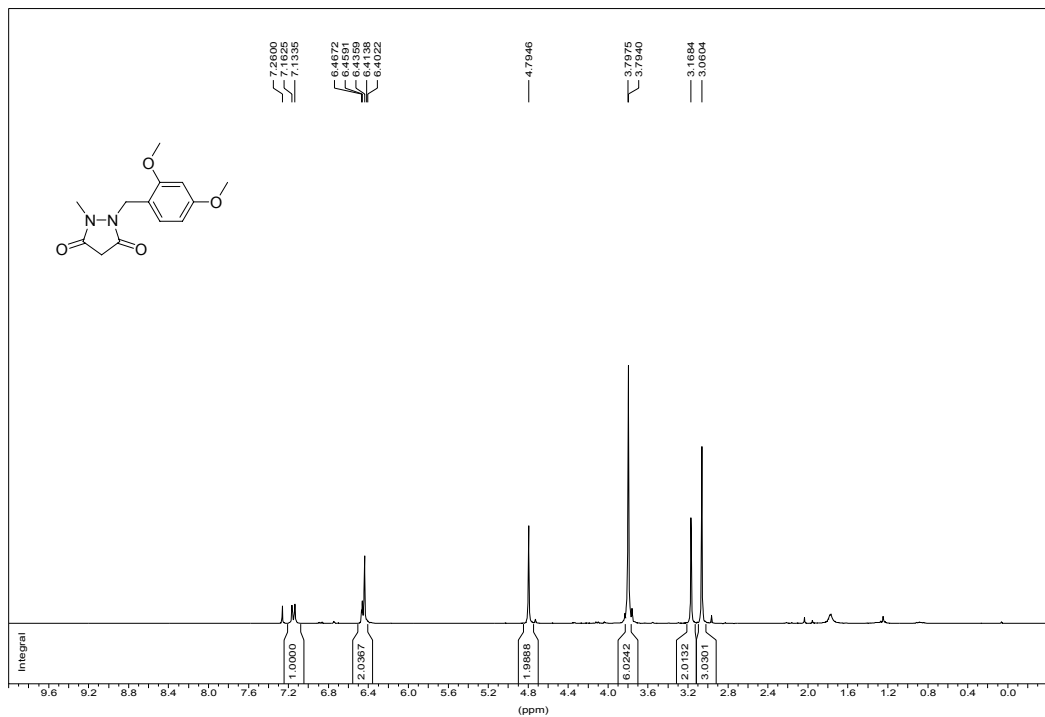
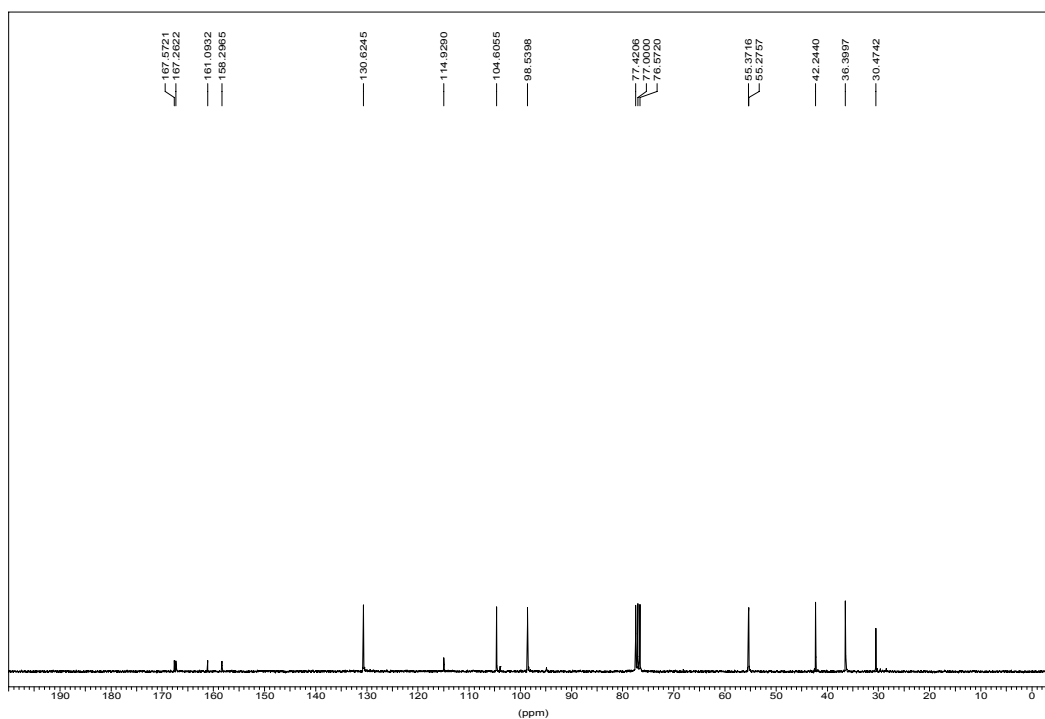
^1H NMR of **1a4** ^{13}C NMR of **1a4**

1-Benzyl-2-propylpyrazolidine-3,5-dione (1a5). ^1H NMR (CDCl_3): δ 7.31-7.17 (m, *ArH*, 5H), 4.74 (s, *ArCH}_2*, 2H), 3.44-3.39 (t, $J = 7.32$ Hz, $\text{CH}_3\text{CH}_2\text{CH}_2$, 2H), 3.17 (s, CH_2 , 2H), 1.50-1.37 (m, $\text{CH}_3\text{CH}_2\text{CH}_2$, 2H), 0.78-0.73 (t, $J = 7.32$ Hz, $\text{CH}_3\text{CH}_2\text{CH}_2$, 3H); ^{13}C NMR (CDCl_3): δ 167.9, 167.0,

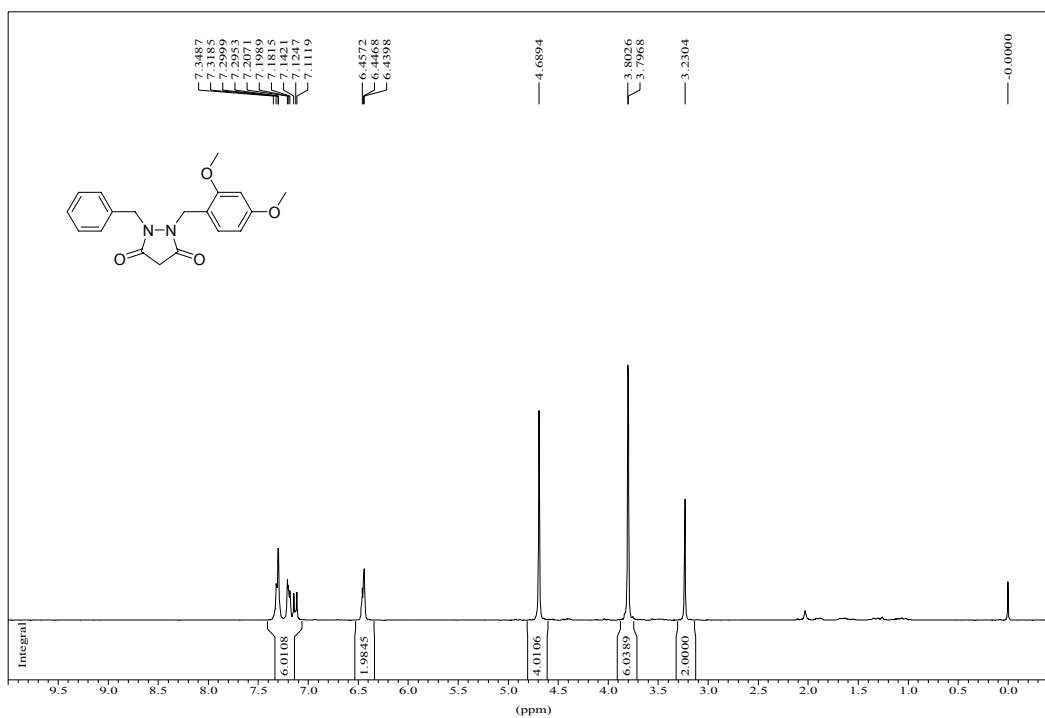
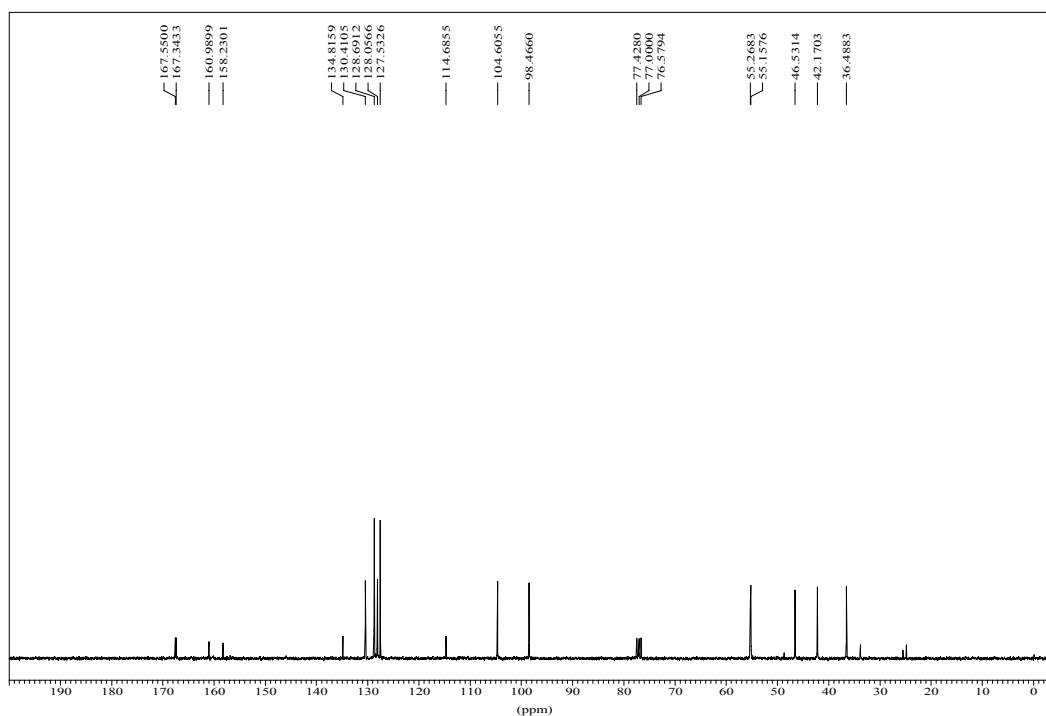
134.7, 129.0, 128.4, 127.6, 47.1, 44.8, 36.5, 20.4, 11.0; Mass spectrum (EI) m/z 232.0 (M^+) Exact mass calcd for $C_{13}H_{16}N_2O_2$: m/z 232.1212; found 232.1211.

 1H NMR of **1a5** ^{13}C NMR of **1a5**

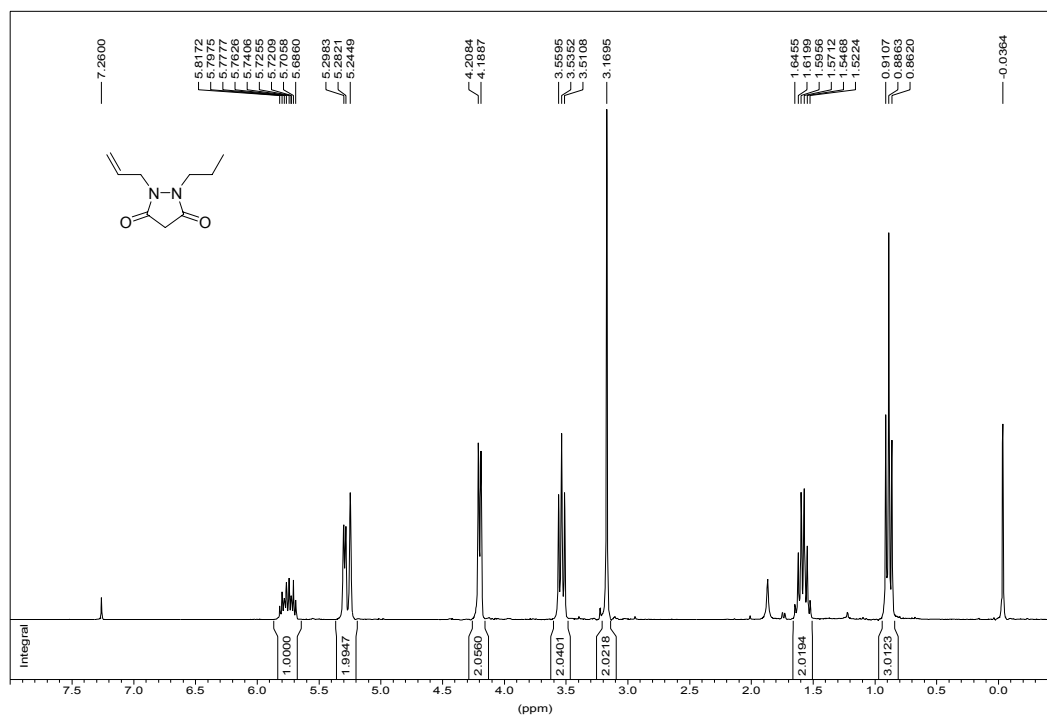
1-(2,4-Dimethoxybenzyl)-2-methylpyrazolidine-3,5-dione (1a6). 1H NMR ($CDCl_3$): δ 7.16-6.40 (m, *ArH*, 3H), 4.79 (s, *ArCH*₂, 2H), 3.80-3.79 (d, *OCH*₃, 6H), 3.17 (s, *CH*₂, 2H), 3.06 (s, *CH*₃, 3H); ^{13}C

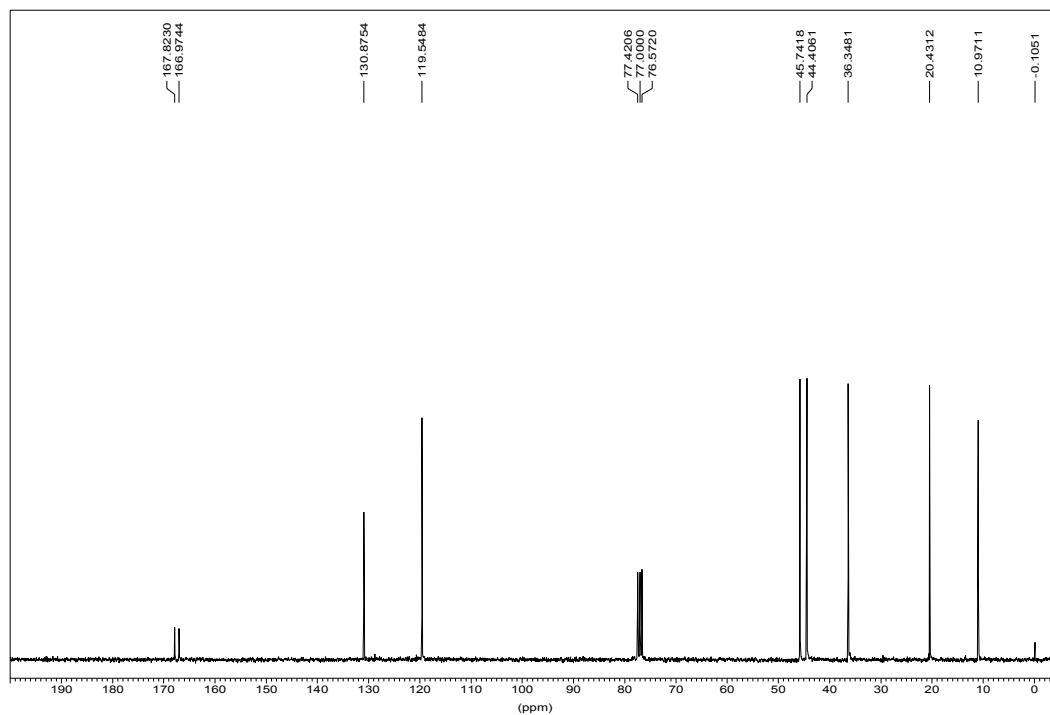
NMR (CDCl₃): δ 167.6, 167.3, 161.1, 158.3, 130.6, 114.9, 104.6, 98.5, 55.4, 55.3, 42.2, 36.4, 30.5;Mass spectrum (ESI) m/z 263.3 (M-H⁺) Exact mass calcd for C₁₃H₁₆N₂O₄: m/z 263.1032; found 263.1033.¹H NMR of **1a6**¹³C NMR of **1a6****2-Benzyl-1-(2,4-dimethoxybenzyl)pyrazolidine-3,5-dione (1a7)**. ¹H NMR (CDCl₃): δ 7.35-6.44 (m,

ArH, 8H), 4.69 (s, ArCH_2 , 4H), 3.80-3.80 (d, OCH_3 , 6H), 3.23 (s, CH_2 , 2H); ^{13}C NMR (CDCl_3): δ 167.6, 167.3, 161.0, 158.2, 134.8, 130.4, 128.7, 128.1, 127.5, 114.7, 104.6, 98.5, 55.3, 55.2, 46.5, 42.2, 36.5; Mass spectrum (ESI) m/z 363.2 ($\text{M}+\text{Na}^+$) Exact mass calcd for $\text{C}_{19}\text{H}_{20}\text{N}_2\text{O}_4 + \text{Na}$: m/z 363.1321; found 363.1310.

 ^1H NMR of **1a7** ^{13}C NMR of **1a7**

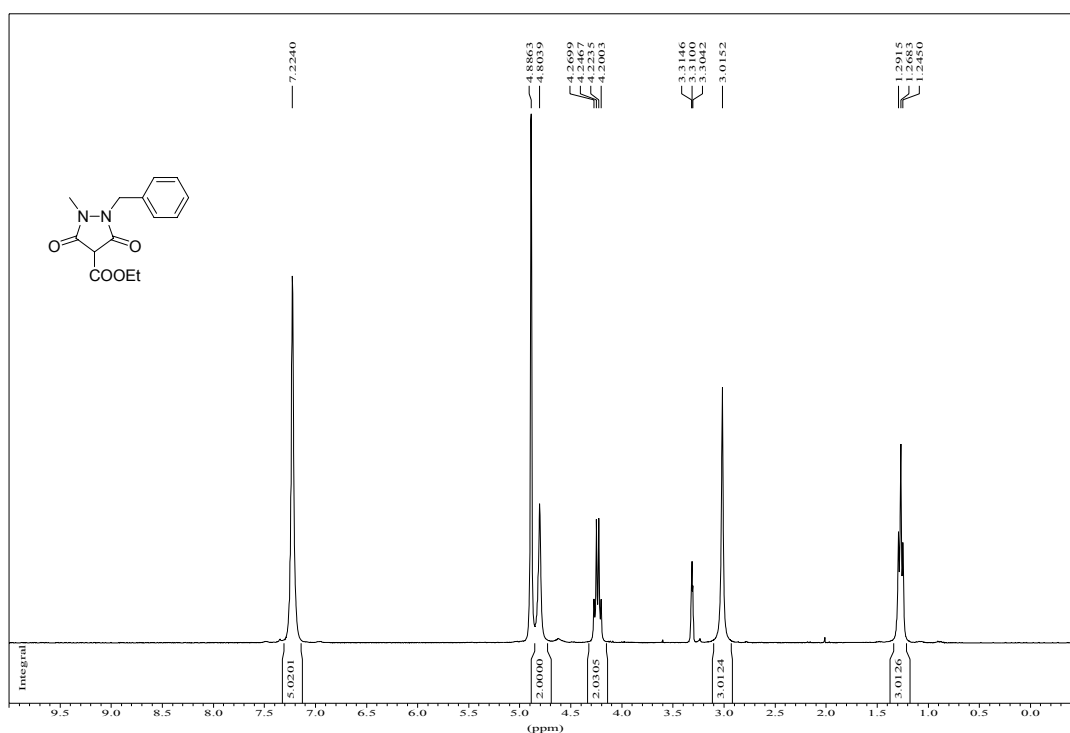
2-Allyl-1-propylpyrazolidine-3,5-dione (1a8). ^1H NMR (CDCl_3): δ 5.82-5.69 (m, $\text{CH}_2\text{CHCH}_2\text{N}$, 1H), 5.30-5.24 (m, $\text{CH}_2\text{CHCH}_2\text{N}$, 2H), 4.21-4.19 (d, $J = 5.91$ Hz, $\text{CH}_2\text{CHCH}_2\text{N}$, 2H), 3.56-3.51 (t, $J = 7.31$ Hz, $\text{CH}_3\text{CH}_2\text{CH}_2\text{N}$, 2H), 3.17 (s, CH_2 , 2H), 1.65-1.52 (m, $\text{CH}_3\text{CH}_2\text{CH}_2\text{N}$, 2H), 0.91-0.86 (t, $J = 7.31$ Hz, $\text{CH}_3\text{CH}_2\text{CH}_2\text{N}$, 3H); ^{13}C NMR (CDCl_3): δ 167.8, 167.0, 130.9, 119.5, 45.7, 44.4, 36.3, 20.4, 11.0; Mass spectrum (EI) m/z 182.0 (M^+) Exact mass calcd for $\text{C}_9\text{H}_{14}\text{N}_2\text{O}_2$: m/z 182.1055; found 182.1055.

 ^1H NMR of **1a8** ^{13}C NMR of **1a8**

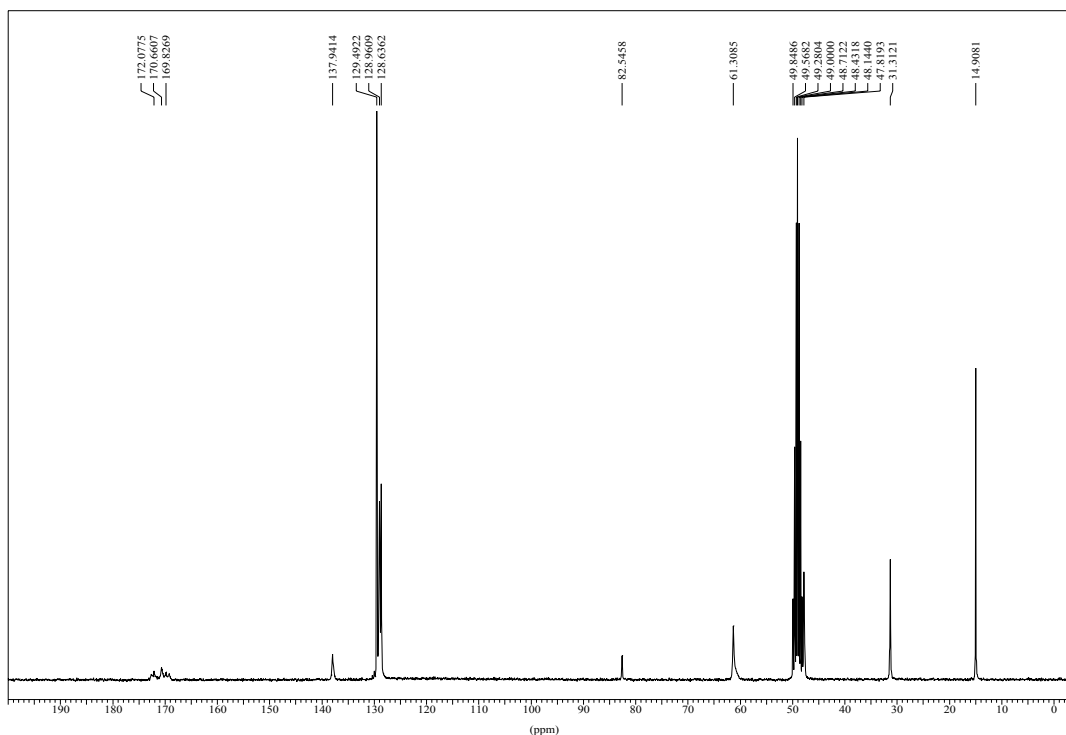


1-Benzyl-4-ethoxycarbonyl-2-methylpyrazolidine-3,5-dione (1a9). ^1H NMR (CD_3OD): δ 7.22 (s, *ArH*, 5H), 4.80 (s, *ArCH}_2*, 2H), 4.27-4.20 (q, $J = 6.96$ Hz, CH_3CH_2 , 2H), 3.02 (s, CH_3 , 3H), 1.29-1.25 (t, $J = 6.98$ Hz, CH_3CH_2 , 3H); ^{13}C NMR (CD_3OD): δ 172.1, 170.7, 169.8, 137.9, 129.5, 129.0, 128.6, 82.5, 61.3, 47.8, 31.3, 14.9; Mass spectrum (EI) m/z 276.0 (M^+) Exact mass calcd for $\text{C}_{14}\text{H}_{16}\text{N}_2\text{O}_4$: m/z 276.1110; found 276.1112.

^1H NMR of 1a9

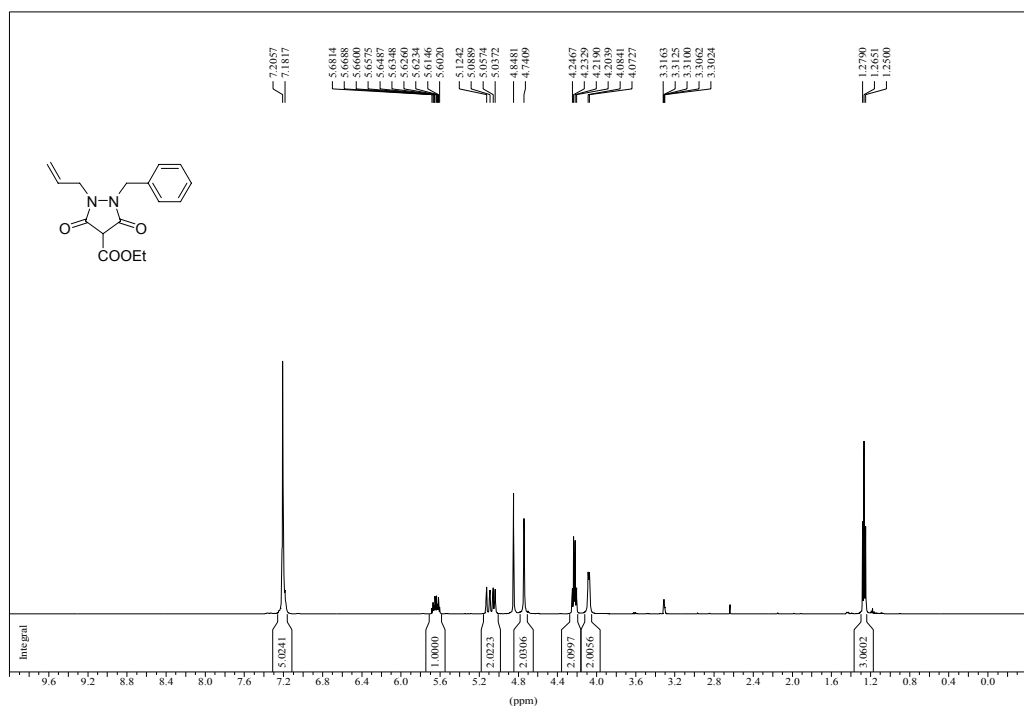


^{13}C NMR of 1a9

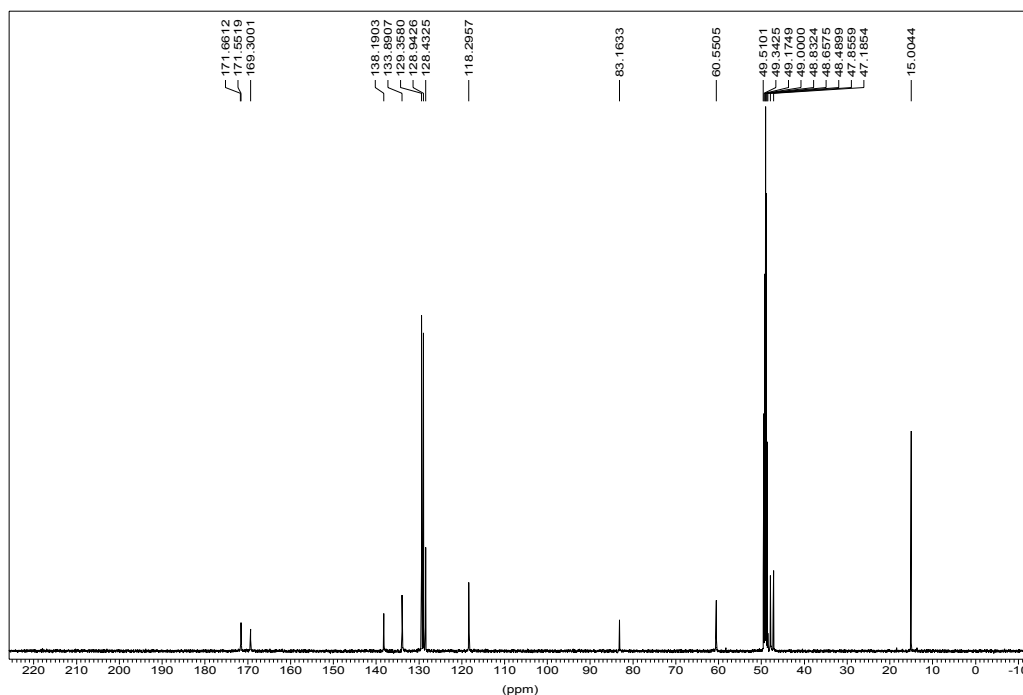


2-Allyl-1-benzyl-4-ethoxycarbonylpyrazolidine-3,5-dione (1a10). ^1H NMR (CD_3OD , 500 MHz): δ 7.21-7.18 (m, *ArH*, 5H), 5.68-5.60 (m, $\text{CH}_2\text{CHCH}_2\text{N}$, 1H), 5.12-5.04 (m, $\text{CH}_2\text{CHCH}_2\text{N}$, 2H), 4.74 (s, *ArCH}_2*, 2H), 4.25-4.20 (q, $J = 7.14$ Hz, CH_3CH_2 , 2H), 4.08-4.07 (d, $J = 5.70$ Hz, $\text{CH}_2\text{CHCH}_2\text{N}$, 2H), 1.28-1.25 (t, $J = 7.25$ Hz, CH_3CH_2 , 3H); ^{13}C NMR (CD_3OD , 126 MHz): δ 171.7, 171.6, 169.3, 138.2, 133.9, 129.4, 128.9, 128.4, 118.3, 83.2, 60.6, 47.9, 47.2, 15.0; Mass spectrum (ESI) m/z 325.2 ($\text{M}+\text{Na}^+$) Exact mass calcd for $\text{C}_{16}\text{H}_{18}\text{N}_2\text{O}_4 + \text{Na}$: m/z 325.1164; found 325.1172.

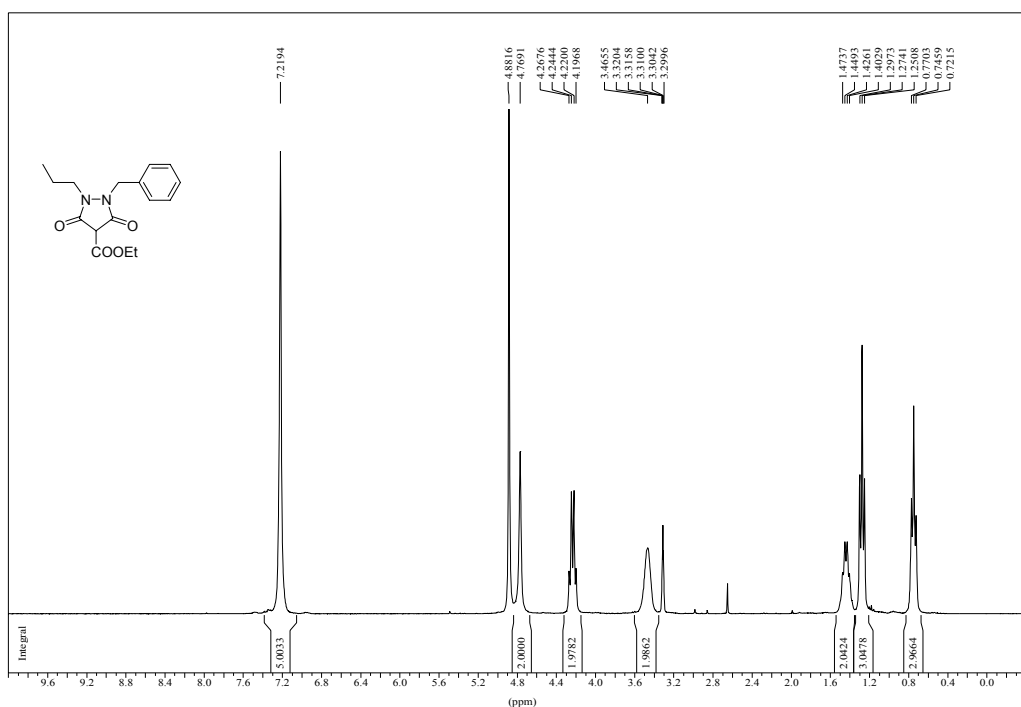
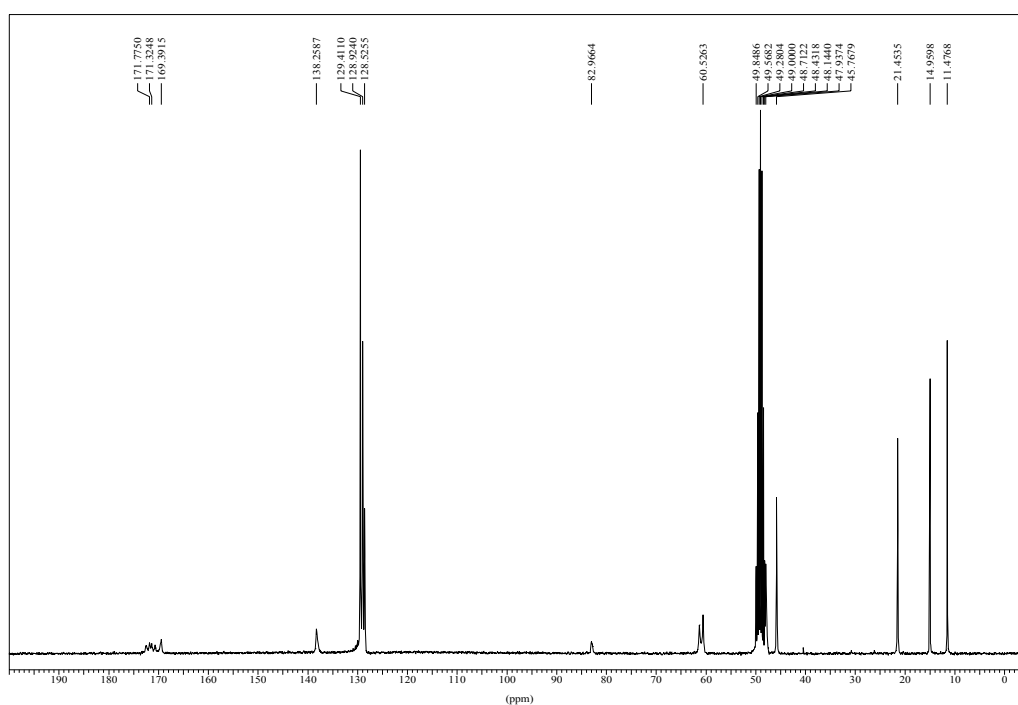
^1H NMR of **1a10**



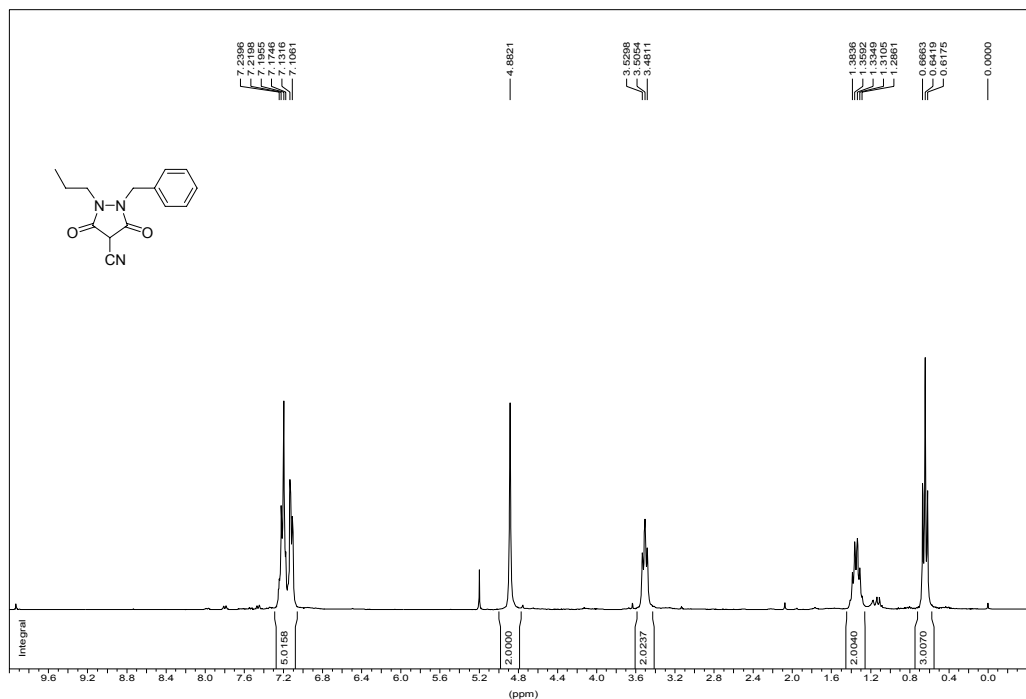
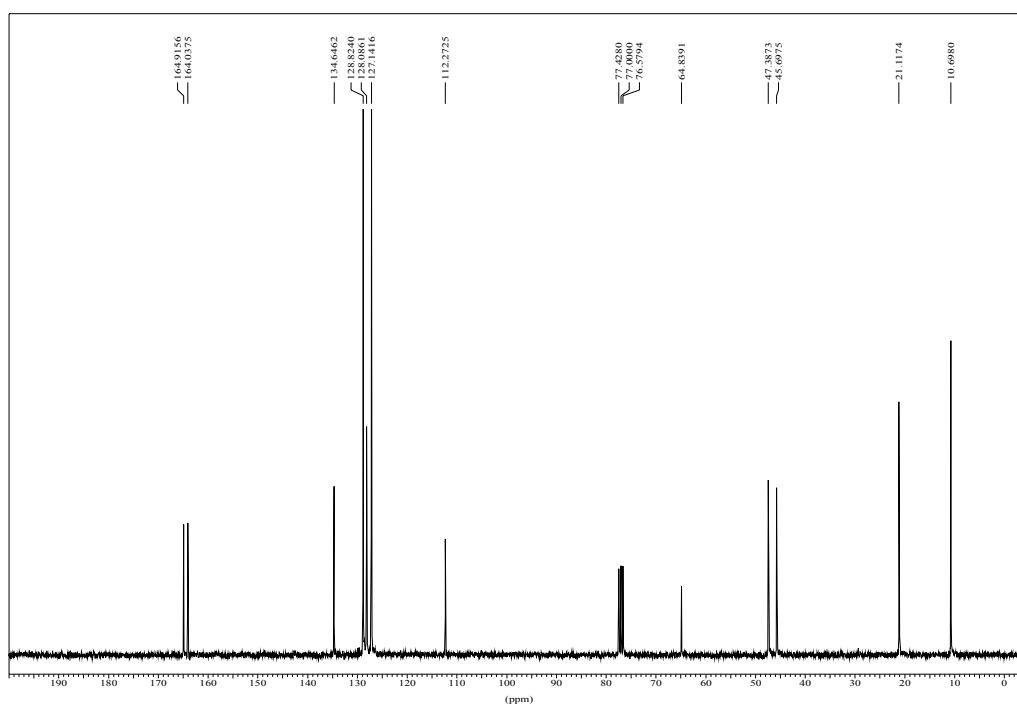
¹³C NMR of 1a10



1-Benzyl-4-ethoxycarbonyl-2-propylpyrazolidine-3,5-dione (1a11). ¹H NMR (CD₃OD): δ 7.22 (s, *ArH*, 5H), 4.77 (s, *ArCH*₂, 2H), 4.27-4.20 (q, *J* = 7.08 Hz, CH₃CH₂, 2H), 3.47 (s, CH₃CH₂CH₂N, 2H), 1.47-1.40 (m, CH₃CH₂CH₂N, 2H), 1.30-1.25 (t, *J* = 6.98 Hz, CH₃CH₂, 3H), 0.77-0.72 (t, *J* = 7.32 Hz, CH₃CH₂CH₂N, 3H); ¹³C NMR (CD₃OD): δ 171.8, 171.3, 169.4, 138.3, 129.4, 128.9, 128.5, 83.0, 60.5, 47.9, 45.8, 21.5, 15.0, 11.5; Mass spectrum (ESI) *m/z* 327.1 (M+Na⁺) Exact mass calcd for C₁₆H₂₀N₂O₄ + Na: *m/z* 327.1321; found 327.1334.

¹H NMR of **1a11**¹³C NMR of **1a11**

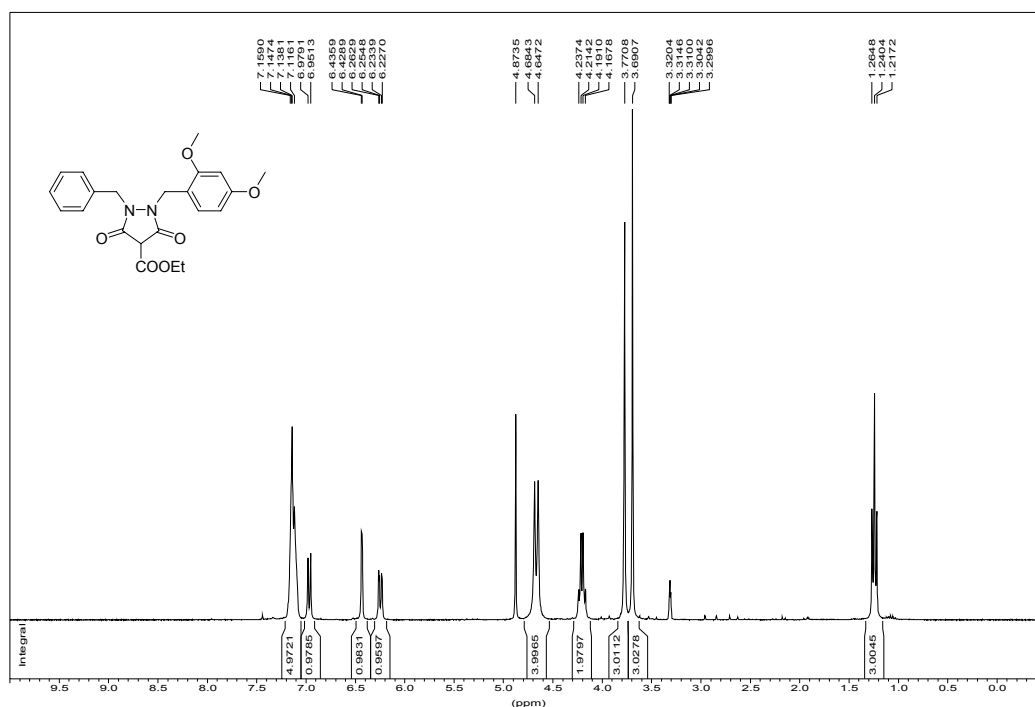
1-Benzyl-4-cyano-2-propylpyrazolidine-3,5-dione (1a12). ¹H NMR (CDCl₃): δ 7.24-7.11 (m, *ArH*, 5H), 4.88 (s, *ArCH*₂, 2H), 3.53-3.48 (t, *J* = 7.31 Hz, CH₃CH₂CH₂, 2H), 1.38-1.29 (m, CH₃CH₂CH₂, 2H), 0.67-0.62 (t, *J* = 7.32 Hz, CH₃CH₂CH₂, 3H); ¹³C NMR (CDCl₃): δ 164.9, 164.0, 134.6, 128.8, 128.1, 127.1, 112.3, 64.8, 47.4, 45.7, 21.1, 10.7; Mass spectrum (EI) *m/z* 257.0 (*M*⁺) Exact mass calcd for C₁₄H₁₅N₃O₂: *m/z* 257.1164; found 257.1162.

¹H NMR of **1a12**¹³C NMR of **1a12**

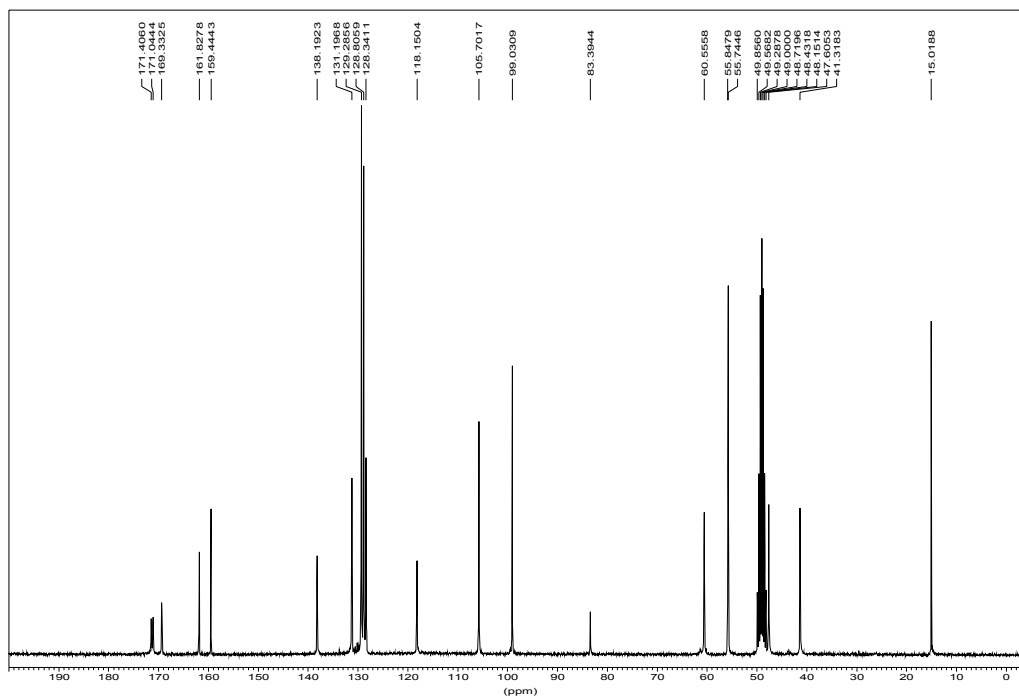
2-Benzyl-1-(2,4-dimethoxybenzyl)-4-ethoxycarbonylpyrazolidine-3,5-dione (1a13). ¹H NMR (CD₃OD): δ 7.16-6.23 (m, *ArH*, 8H), 4.68-4.65 (d, *ArCH*₂, 4H), 4.24-4.17 (q, *J* = 6.96 Hz, CH₃CH₂, 2H), 3.77 (s, OCH₃, 3H), 3.70 (s, OCH₃, 3H), 1.26-1.22 (t, *J* = 7.14 Hz, CH₃CH₂, 3H); ¹³C NMR (CD₃OD): δ 171.4, 171.0, 169.3, 161.8, 159.4, 138.2, 131.2, 129.3, 128.8, 128.3, 118.2, 105.7, 99.0, 83.4, 60.6, 55.8, 55.7, 47.6, 41.3, 15.0; Mass spectrum (ESI) *m/z* 411.2 (M-H⁺) Exact mass calcd for

$C_{22}H_{24}N_2O_6-H^+$: m/z 411.1556; found 411.1552.

1H NMR of **1a13**

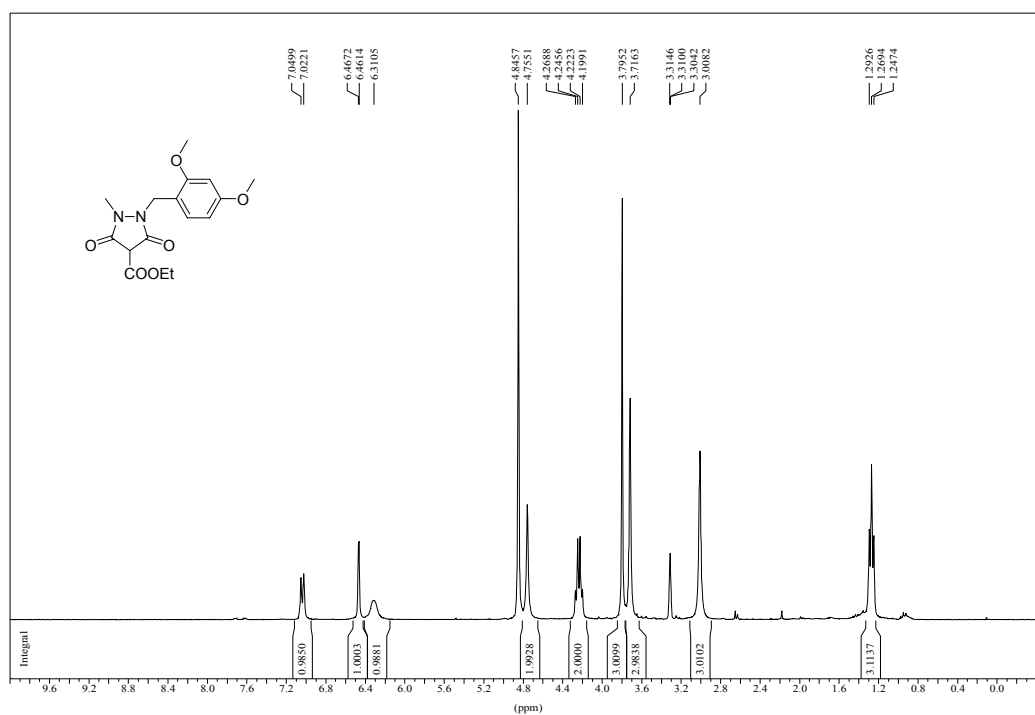
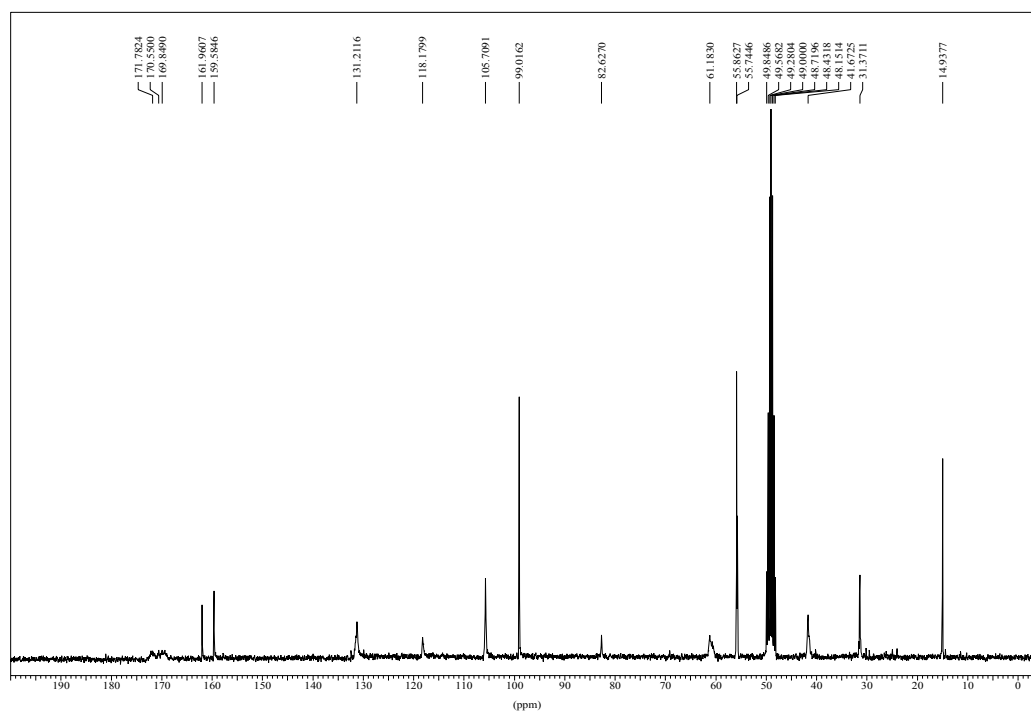


^{13}C NMR of **1a13**



1-(2,4-Dimethoxybenzyl)-4-ethoxycarbonyl-2-methylpyrazolidine-3,5-dione (1a14). 1H NMR (CD₃OD): δ 7.05-6.31 (m, *ArH*, 3H), 4.76 (s, *ArCH*₂, 2H), 4.27-4.20 (q, $J = 6.97$ Hz, *CH*₃*CH*₂, 2H), 3.80 (s, *OCH*₃, 3H), 3.71 (s, *OCH*₃, 3H), 3.01 (s, *CH*₃, 3H), 1.29-1.25 (t, $J = 6.78$ Hz, *CH*₃*CH*₂, 3H); ^{13}C NMR (CD₃OD): δ 171.8, 170.6, 169.8, 162.0, 159.6, 131.2, 118.2, 105.7, 99.0, 82.6, 61.2, 55.9,

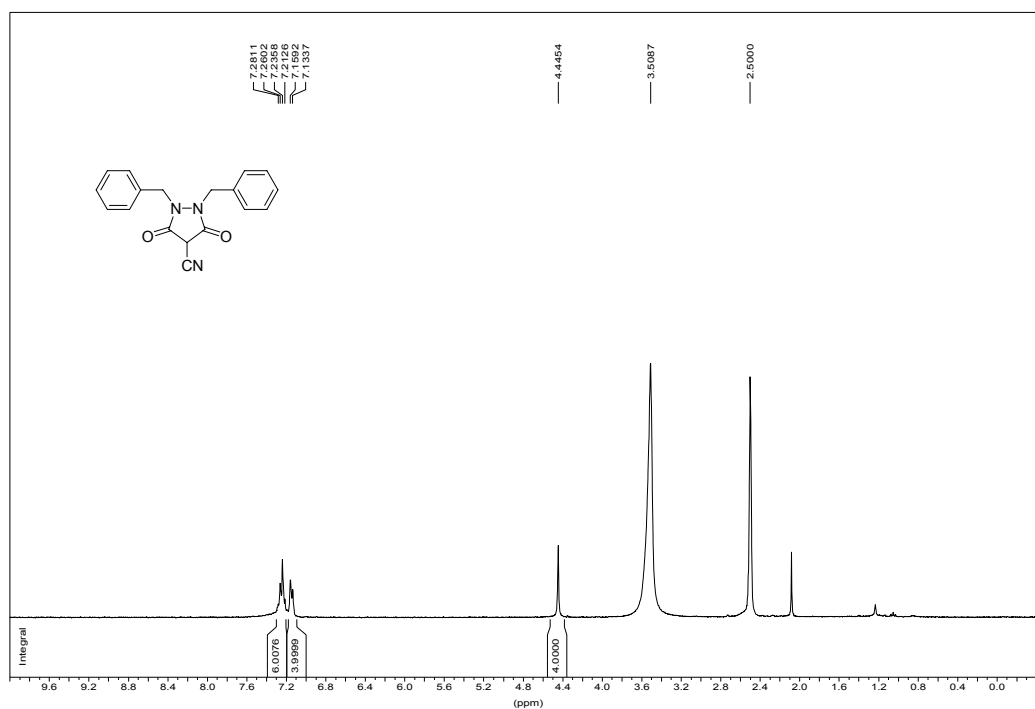
55.7, 41.7, 31.4, 14.9; Mass spectrum (ESI) m/z 335.4 ($M-H^+$) Exact mass calcd for $C_{16}H_{20}N_2O_6-H^+$: m/z 335.1243; found 335.1246.

 1H NMR of **1a14** ^{13}C NMR of **1a14**

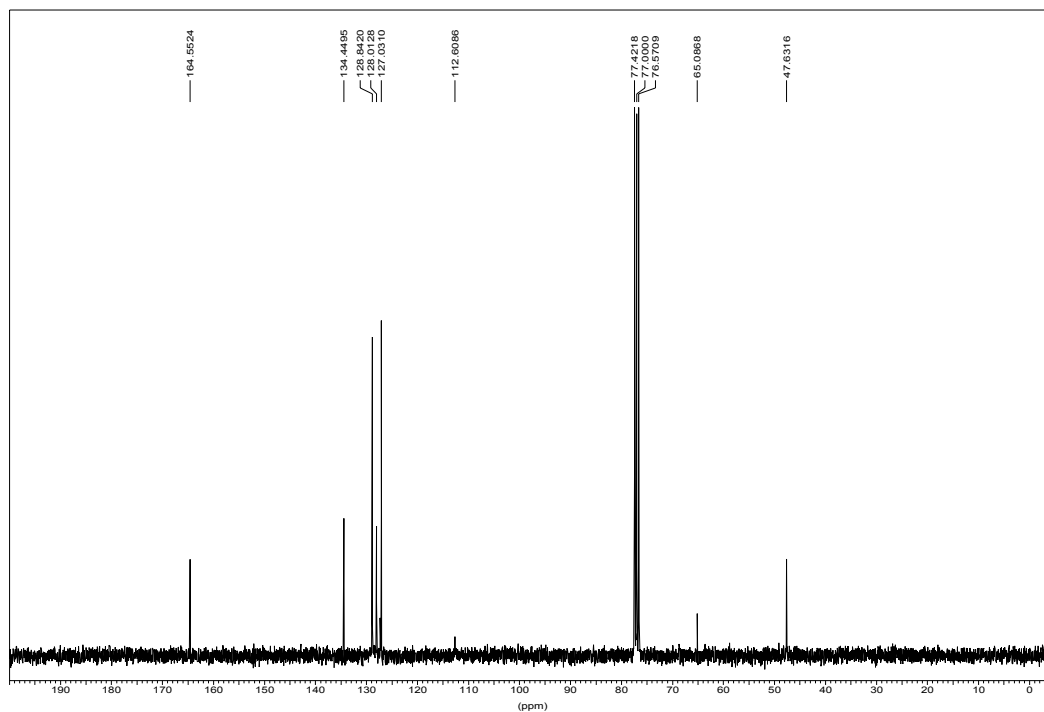
1,2-Dibenzyl-4-cyanopyrazolidine-3,5-dione (1a15). 1H NMR ($DMSO-d_6$): δ 7.28-7.13 (m, ArH , 10H), 4.45 (s, $ArCH_2$, 4H); ^{13}C NMR ($DMSO-d_6$): δ 164.6, 134.4, 128.8, 128.0, 127.0, 112.6, 65.1, 47.6; Mass spectrum (EI) m/z 305.0 (M^+) Exact mass calcd for $C_{18}H_{15}N_3O_2$: m/z 305.1164; found

305.1165.

^1H NMR of **1a15**



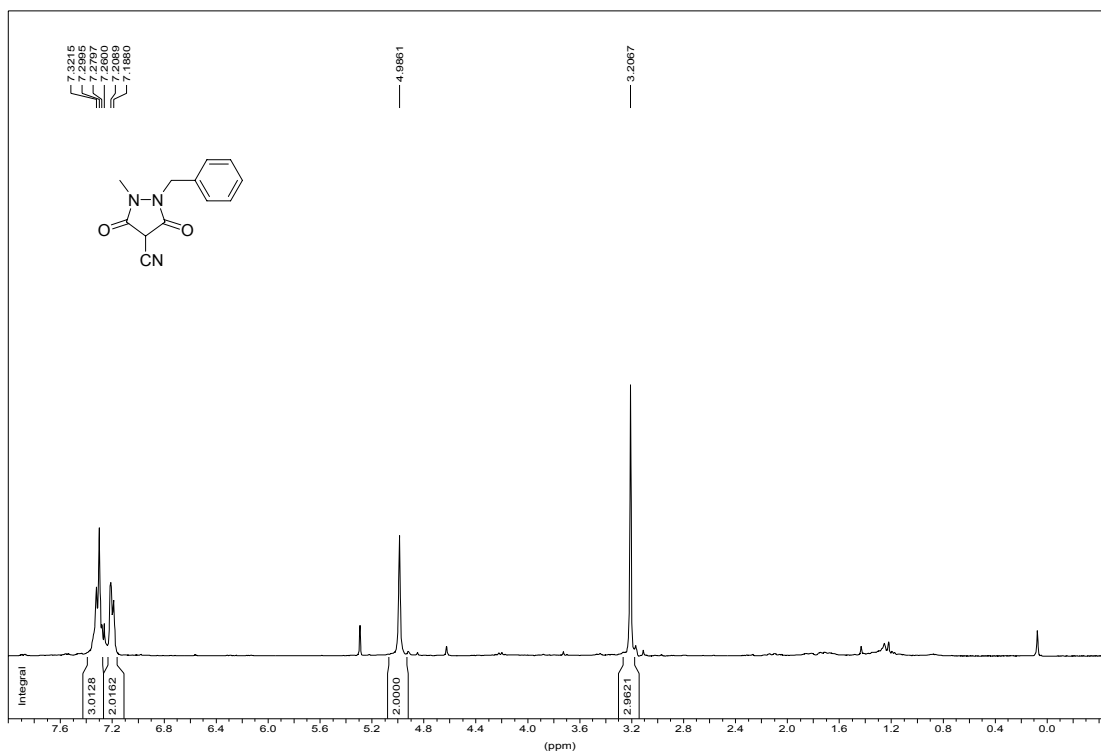
^{13}C NMR of **1a15**



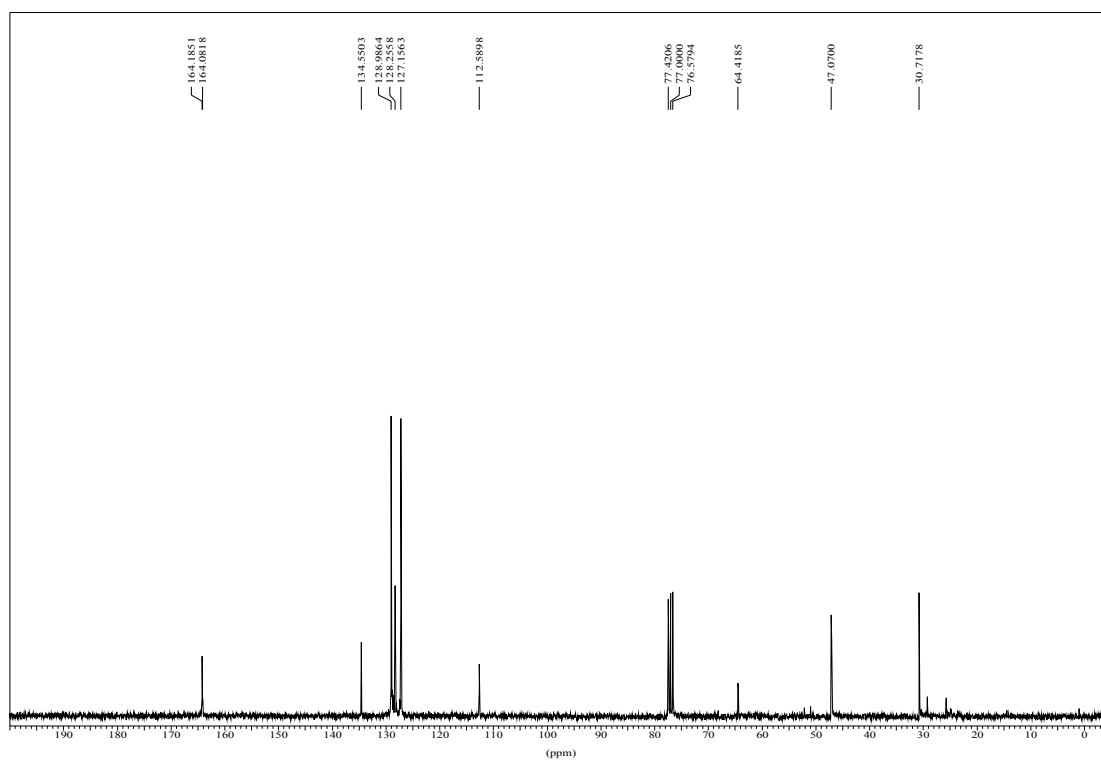
1-Benzyl-4-cyano-2-methylpyrazolidine-3,5-dione (1a16). ^1H NMR (CDCl_3): δ 7.32-7.19 (m, *ArH*,

5H), 4.99 (s, ArCH₂, 2H), 3.21 (s, CH₃, 3H); ¹³C NMR (CDCl₃): δ 164.2, 164.1, 134.6, 129.0, 128.3, 127.2, 112.6, 64.4, 47.1, 30.7; Mass spectrum (EI) m/z 229.0 (M⁺) Exact mass calcd for C₁₂H₁₁N₃O₂: m/z 229.0851; found 229.0818.

¹H NMR of **1a16**

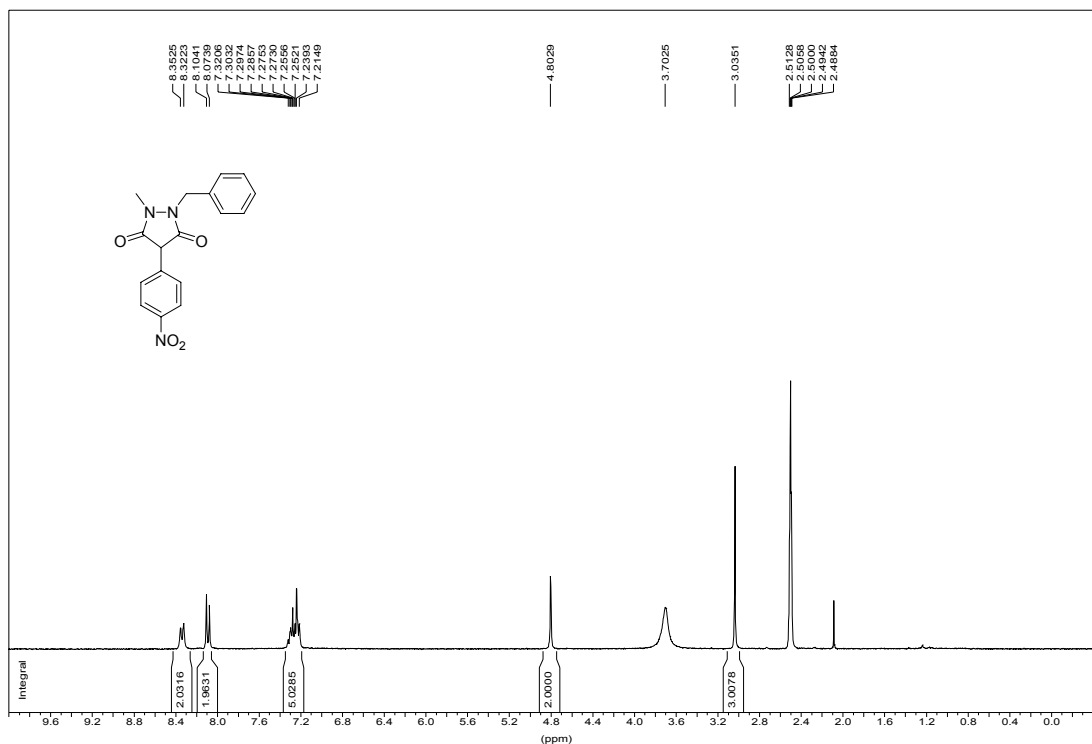


¹³C NMR of **1a16**

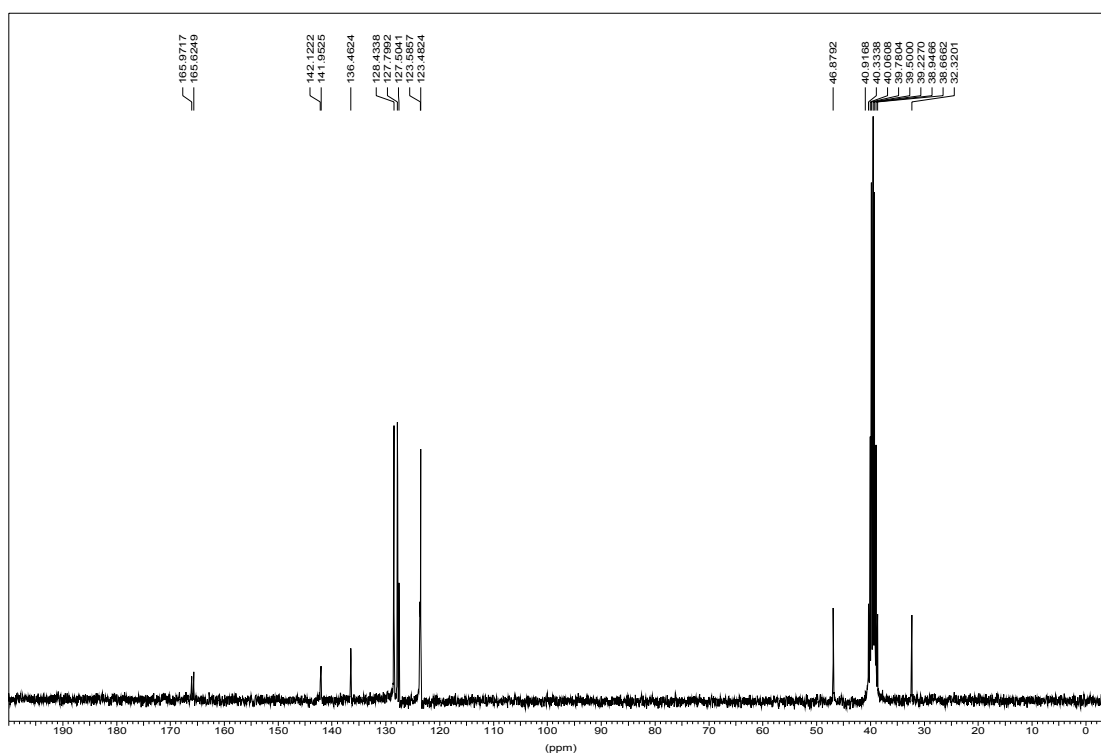


1-Benzyl-2-methyl-4-(4-nitrophenyl)pyrazolidine-3,5-dione (1a17). ^1H NMR (DMSO- d_6): δ 8.35-8.32 (d, $J = 9.06$ Hz, *ArH*, 2H), 8.10-8.07 (d, $J = 9.06$ Hz, *ArH*, 2H), 7.33-7.21 (m, *ArH*, 5H), 4.80 (s, *ArCH* $_2$, 2H), 3.04 (s, CH_3 , 3H); ^{13}C NMR (DMSO- d_6): δ 166.0, 165.6, 142.1, 141.9, 136.5, 128.4, 127.8, 127.5, 123.6, 123.5, 46.9, 40.9, 32.3; Mass spectrum (EI) m/z 325.1 (M^+) Exact mass calcd for $\text{C}_{17}\text{H}_{15}\text{N}_3\text{O}_4$: m/z 325.1063; found 325.1061.

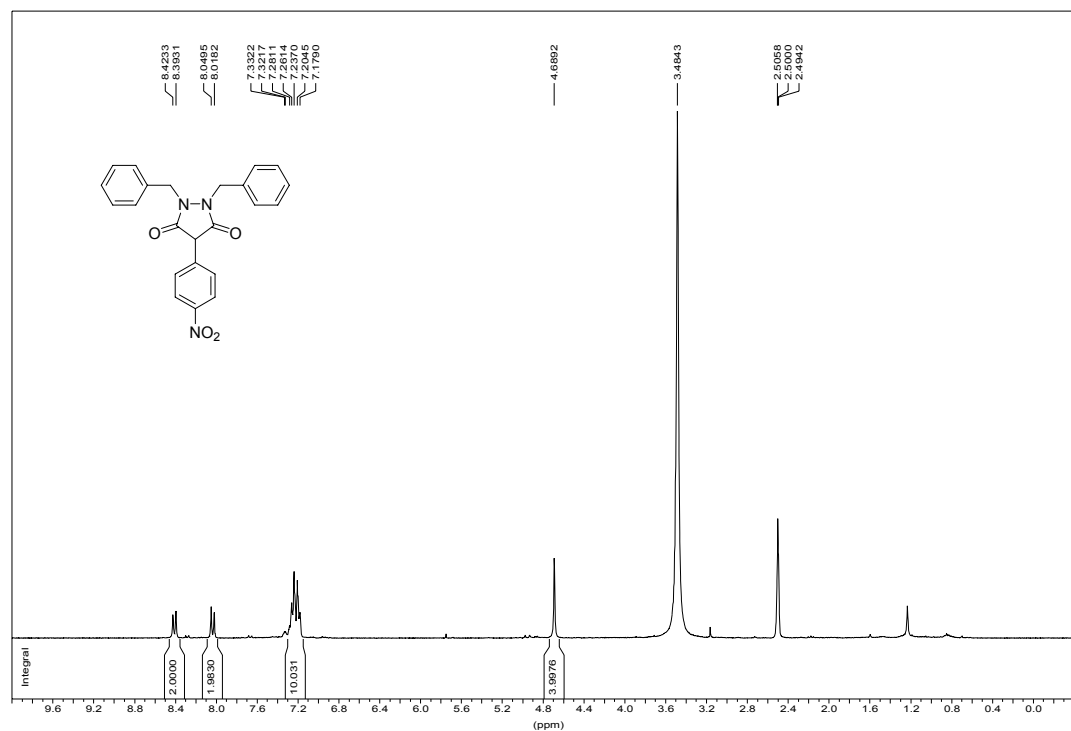
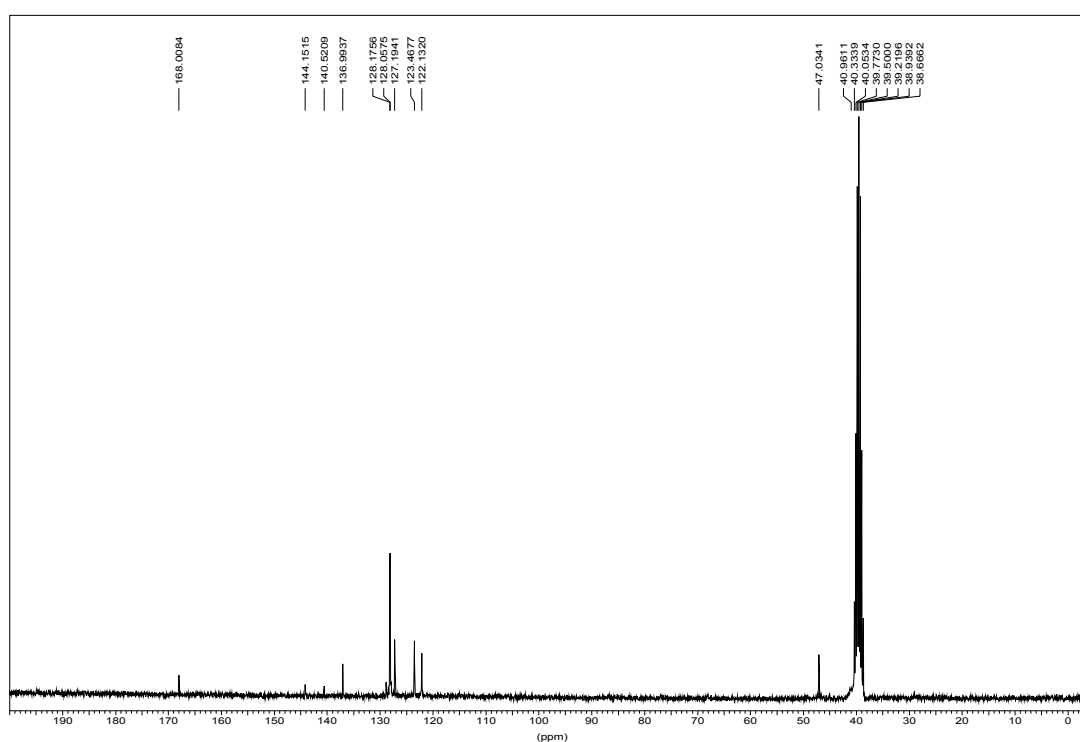
^1H NMR of **1a17**



^{13}C NMR of **1a17**

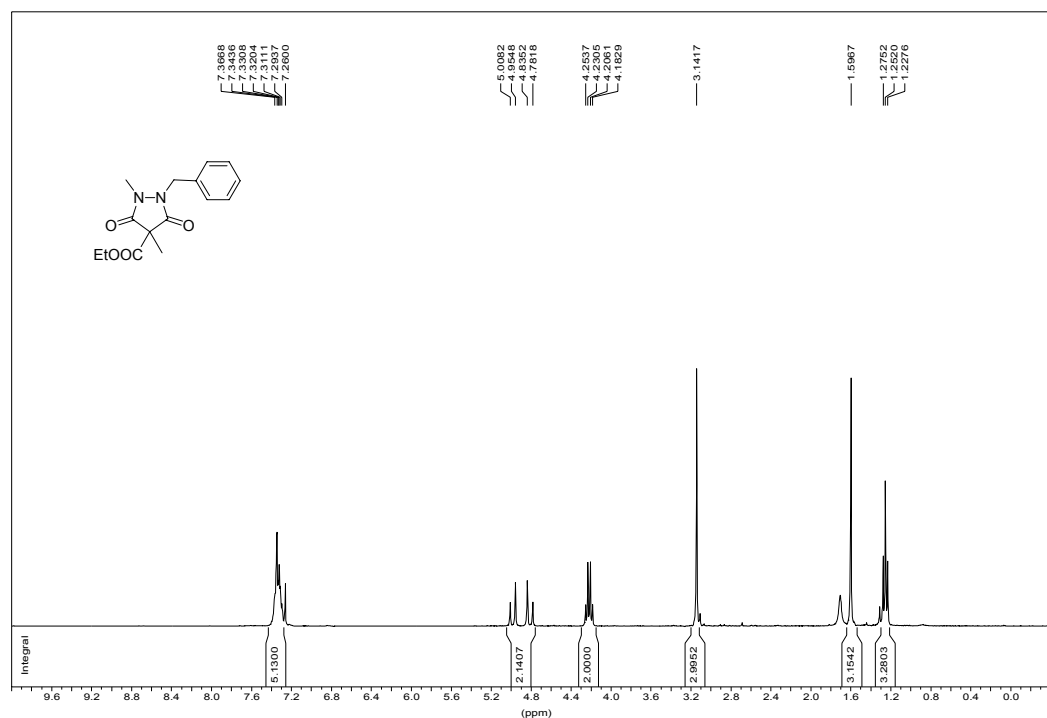


1,2-Dibenzyl-4-(4-nitrophenyl)pyrazolidine-3,5-dione (1a18). ^1H NMR (DMSO- d_6): δ 8.42-8.39 (d, $J = 9.06$ Hz, *ArH*, 2H), 8.05-8.02 (d, $J = 9.06$ Hz, *ArH*, 2H), 7.33-7.18 (m, *ArH*, 10H), 4.67 (s, *ArCH*₂, 4H); ^{13}C NMR (DMSO- d_6): δ 168.0, 144.2, 140.5, 137.0, 128.2, 128.1, 127.2, 123.5, 122.1, 47.0, 41.0; Mass spectrum (EI) m/z 401.1 (M^+) Exact mass calcd for $\text{C}_{23}\text{H}_{19}\text{N}_3\text{O}_4$: m/z 401.1376; found 401.1379.

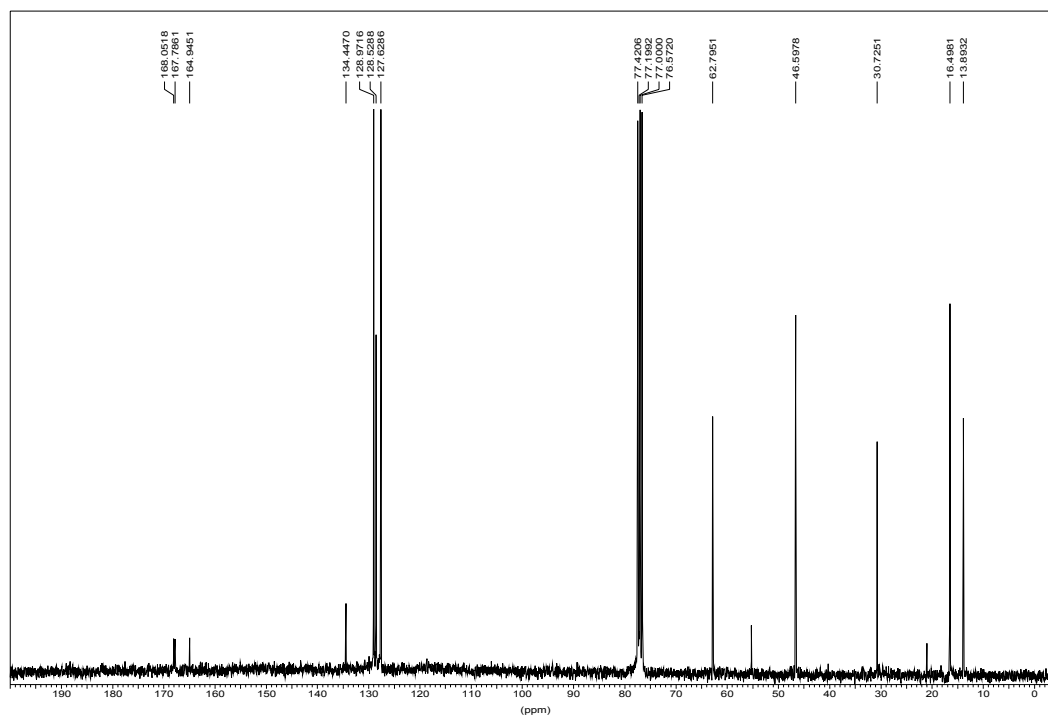
 ^1H NMR of **1a18** ^{13}C NMR of **1a18**

1-Benzyl-2,4-dimethyl-4-ethoxycarbonylpyrazolidine-3,5-dione (1b1). ^1H NMR (CDCl_3): δ 7.37-7.29 (m, *ArH*, 5H), 5.01-4.78 (m, *ArCH}_2*, 2H), 4.25-4.18 (q, $J = 7.08$ Hz, CH_3CH_2 , 2H), 3.14 (s, N_2CH_3 , 3H), 1.60 (s, CH_3 , 3H), 1.28-1.23 (t, $J = 7.14$ Hz, CH_3CH_2 , 3H); ^{13}C NMR (CDCl_3): δ 168.1, 167.8, 164.9, 134.4, 129.0, 128.5, 127.6, 77.2, 62.8, 46.6, 30.7, 16.5, 13.9; Mass spectrum (EI) m/z 290.1 (M^+) Exact mass calcd for $\text{C}_{15}\text{H}_{18}\text{N}_2\text{O}_4$: m/z 290.1267; found 290.1267.

^1H NMR of **1b1**

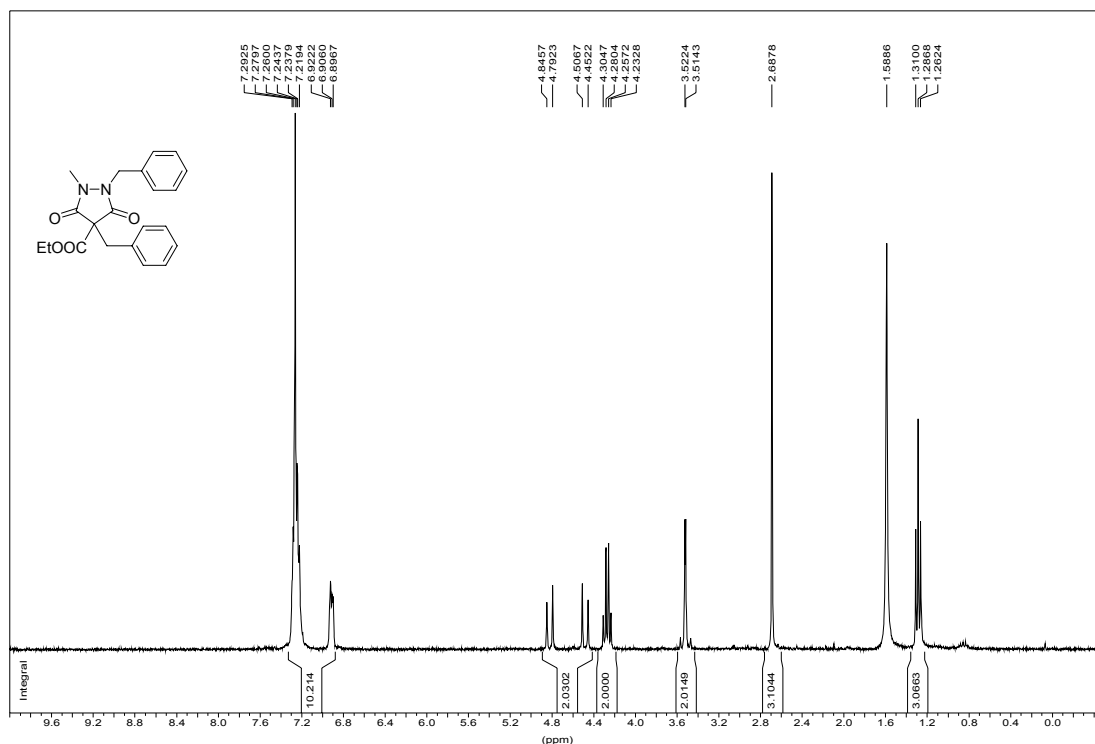


^{13}C NMR of **1b1**

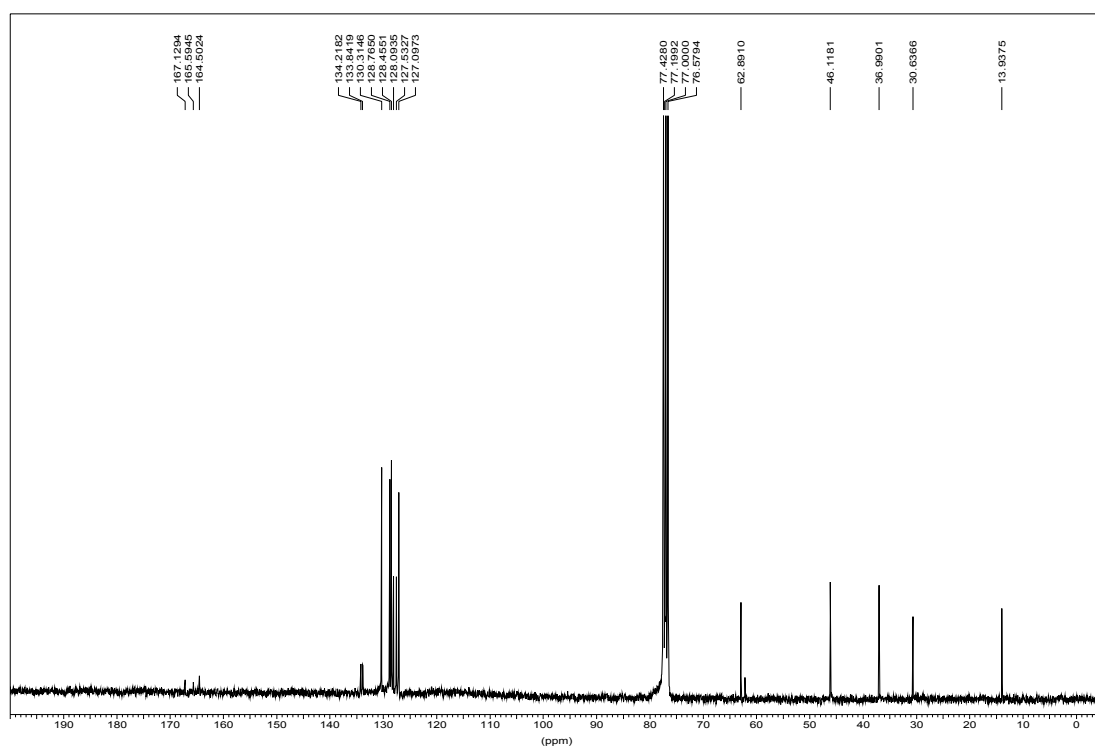


1,4-Dibenzyl-4-ethoxycarbonyl-2-methylpyrazolidine-3,5-dione (1b2). ^1H NMR (CDCl_3): δ 7.29-6.90 (m, *ArH*, 10H), 4.85-4.45 (m, *NCH*₂, 2H), 4.30-4.23 (q, $J = 7.19$ Hz, *CH*₃*CH*₂, 2H), 3.52-3.51 (d, $J = 2.43$ Hz, *ArCH*₂, 2H), 2.69 (s, *NCH*₃, 3H), 1.31-1.26 (t, $J = 7.14$ Hz, *CH*₃*CH*₂, 3H); ^{13}C NMR (CDCl_3): δ 167.1, 165.6, 164.5, 134.2, 133.8, 130.3, 128.7, 128.5, 128.1, 127.5, 127.1, 77.2, 62.9, 46.1, 37.0, 30.6, 13.9; Mass spectrum (EI) m/z 366.2 (M^+) Exact mass calcd for $\text{C}_{21}\text{H}_{22}\text{N}_2\text{O}_4$: m/z 366.1580; found 366.1580.

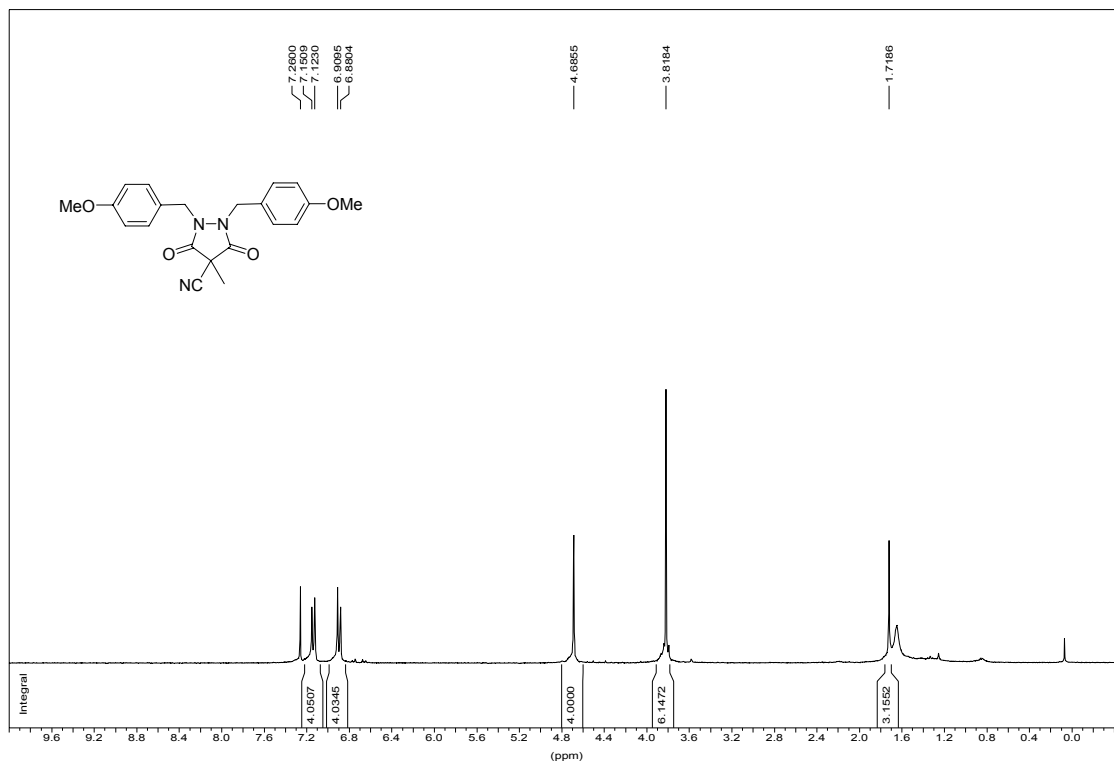
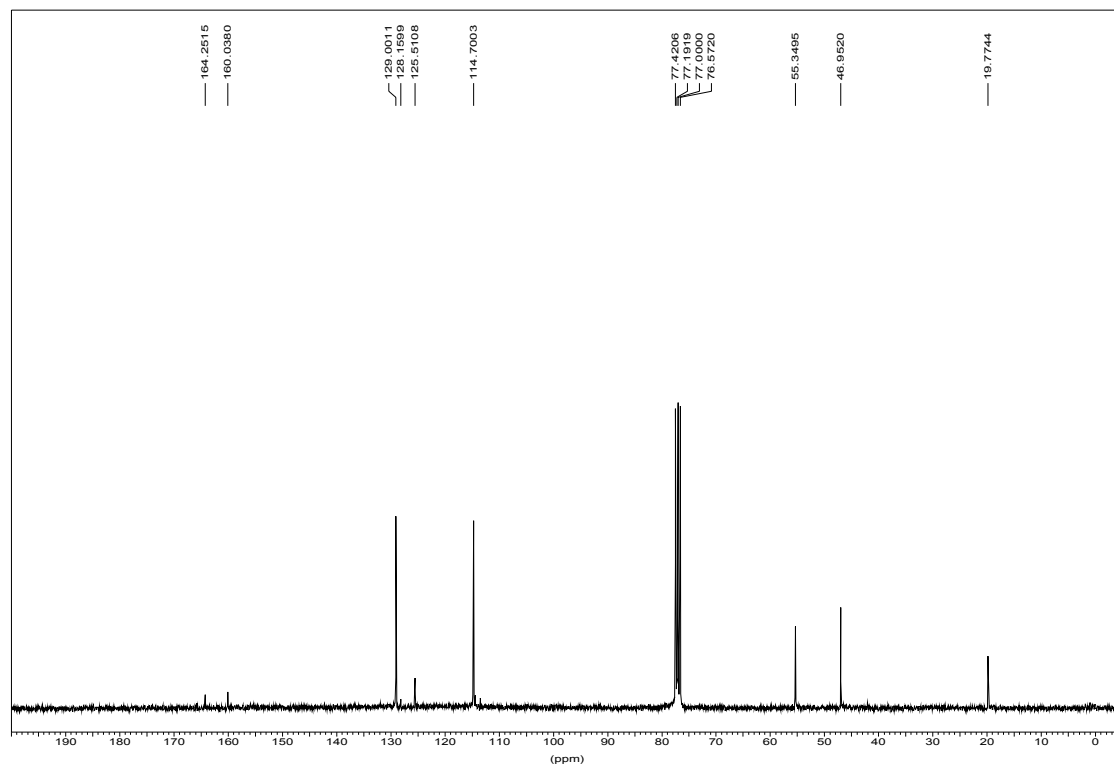
^1H NMR of **1b2**



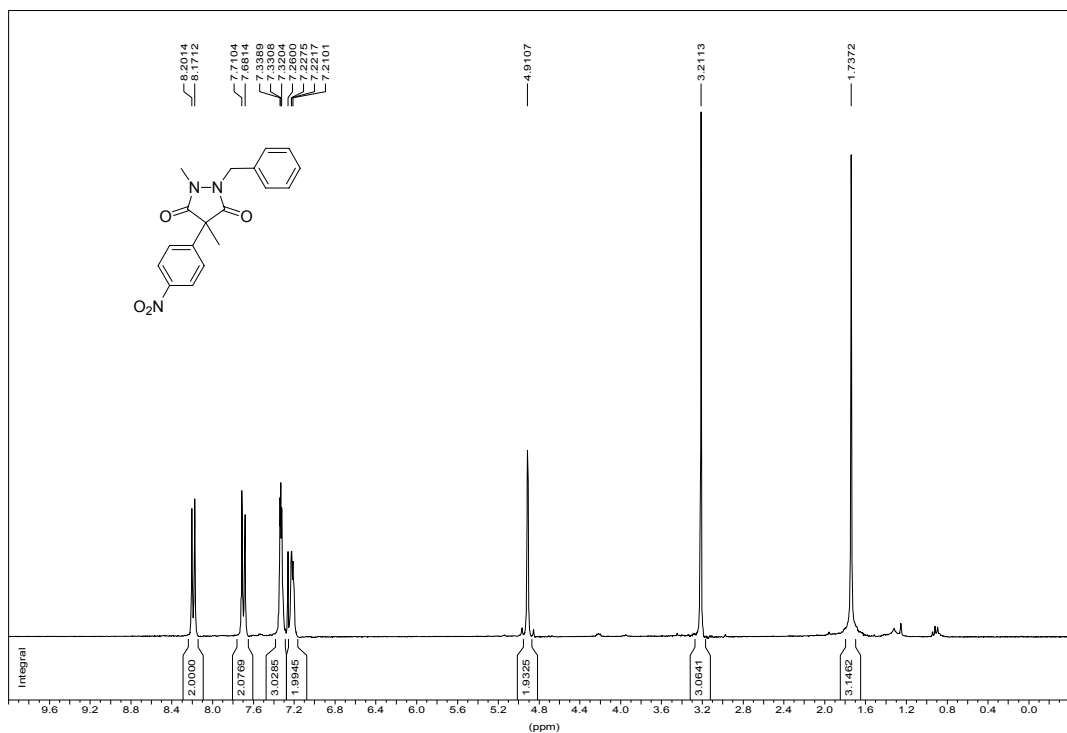
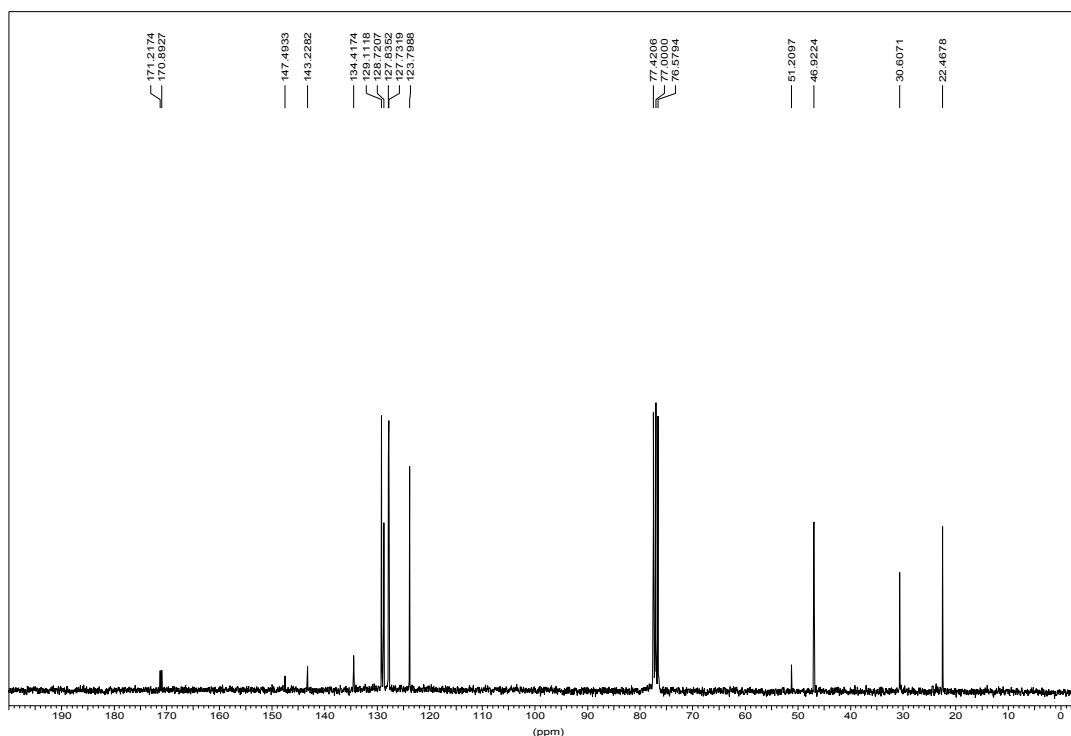
^{13}C NMR of **1b2**



4-Cyano-1,2-di(4-methoxybenzyl)-4-methylpyrazolidine-3,5-dione (1b3). ^1H NMR (CDCl_3): δ 7.15-6.88 (m, ArH , 8H), 4.69 (s, ArCH_2 , 4H), 3.82 (s, OCH_3 , 6H), 1.72 (s, CH_3 , 3H); ^{13}C NMR (CDCl_3): δ 164.3, 160.0, 129.0, 128.2, 125.5, 114.7, 77.2, 55.3, 47.0, 19.8; Mass spectrum (EI) m/z 380.4 (M^+) Exact mass calcd for $\text{C}_{21}\text{H}_{21}\text{N}_3\text{O}_4$: m/z 379.1532; found 379.1534.

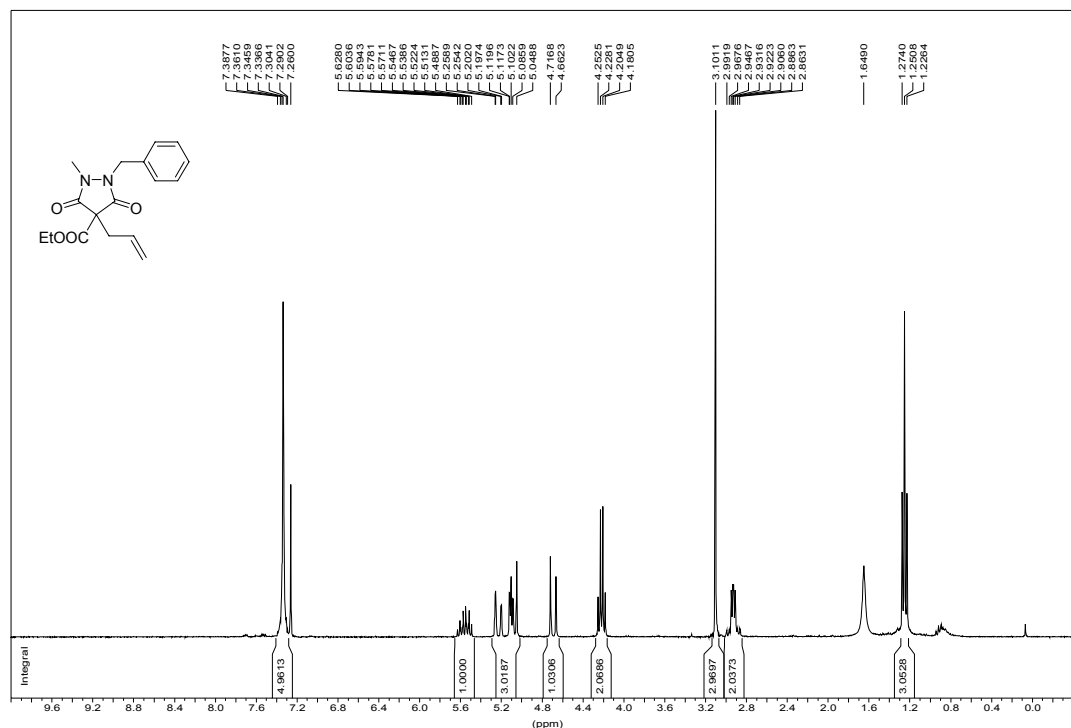
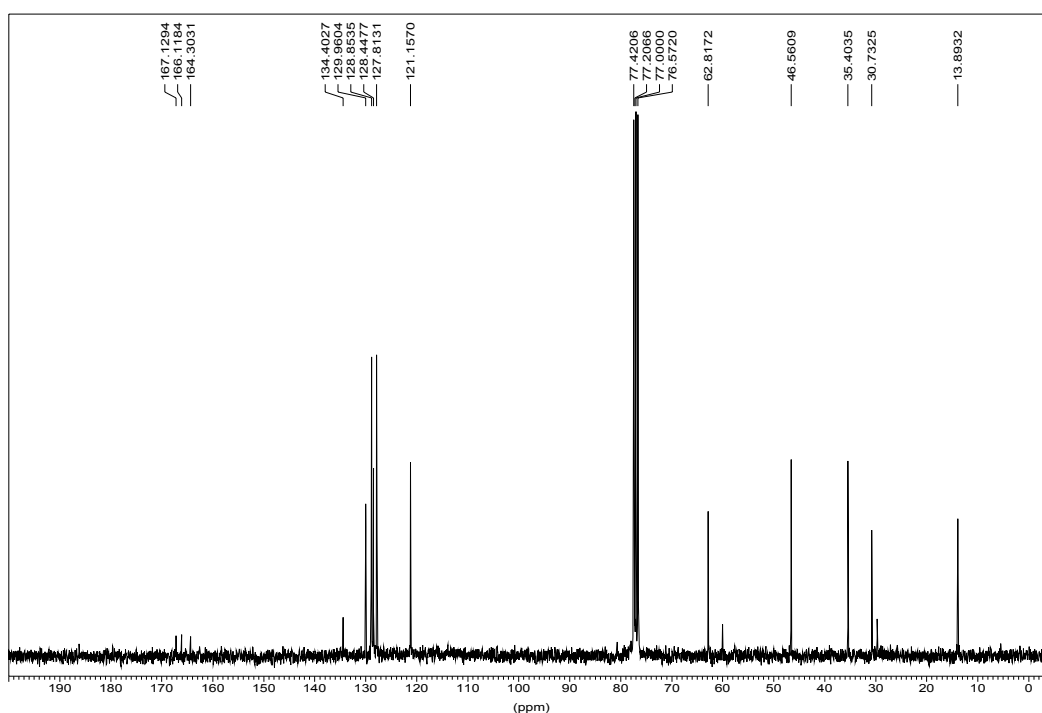
¹H NMR of **1b3**¹³C NMR of **1b3**

1-Benzyl-2,4-dimethyl-4-(4-nitrophenyl)pyrazolidine-3,5-dione (1b4). ¹H NMR (CDCl₃): δ 8.20-8.17 (d, *J* = 9.06 Hz, *ArH*, 2H), 7.71-7.68 (d, *J* = 8.70 Hz, *ArH*, 2H), 7.34-7.21 (m, *ArH*, 5H), 4.91 (s, *ArCH*₂, 2H), 3.21 (s, *NCH*₃, 3H), 1.73 (s, *CCH*₃, 3H); ¹³C NMR (CDCl₃): δ 171.2, 170.9, 147.5, 143.2, 134.4, 129.1, 128.7, 127.8, 127.7, 123.8, 51.2, 46.9, 30.6, 22.5; Mass spectrum (EI) *m/z* 339.1 (*M*⁺)

Exact mass calcd for C₁₈H₁₇N₃O₄: m/z 339.1219; found 339.1213.¹H NMR of **1b4**¹³C NMR of **1b4**

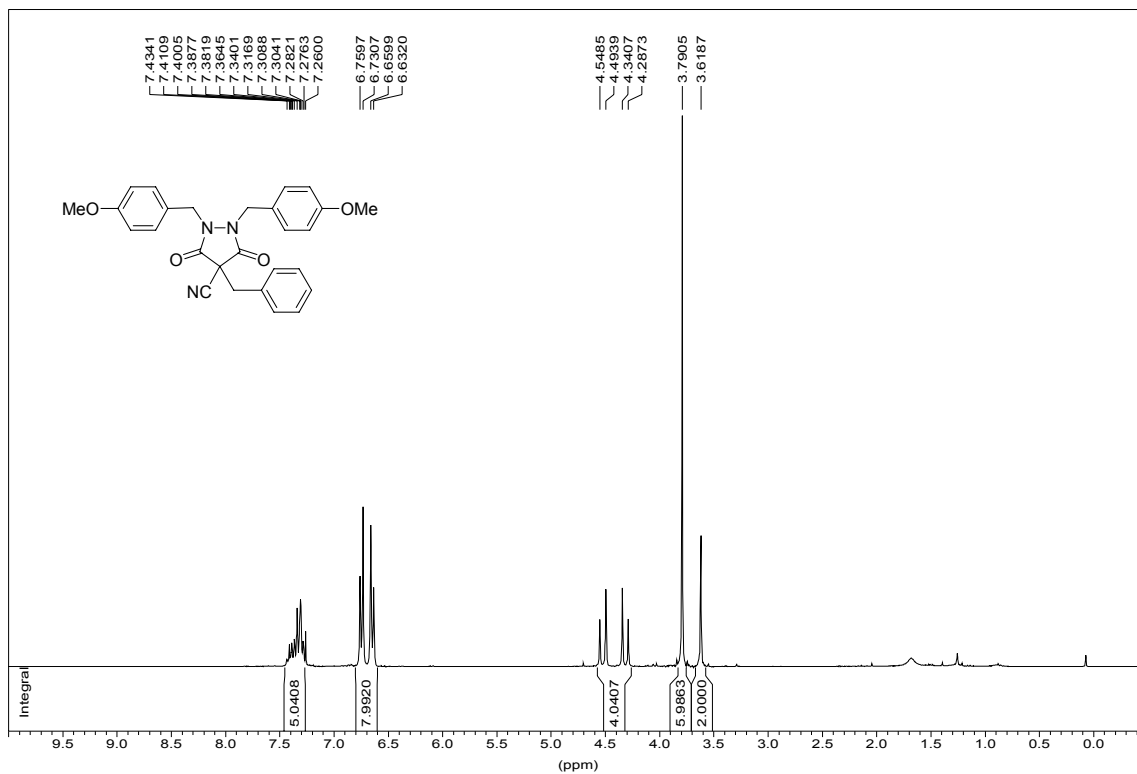
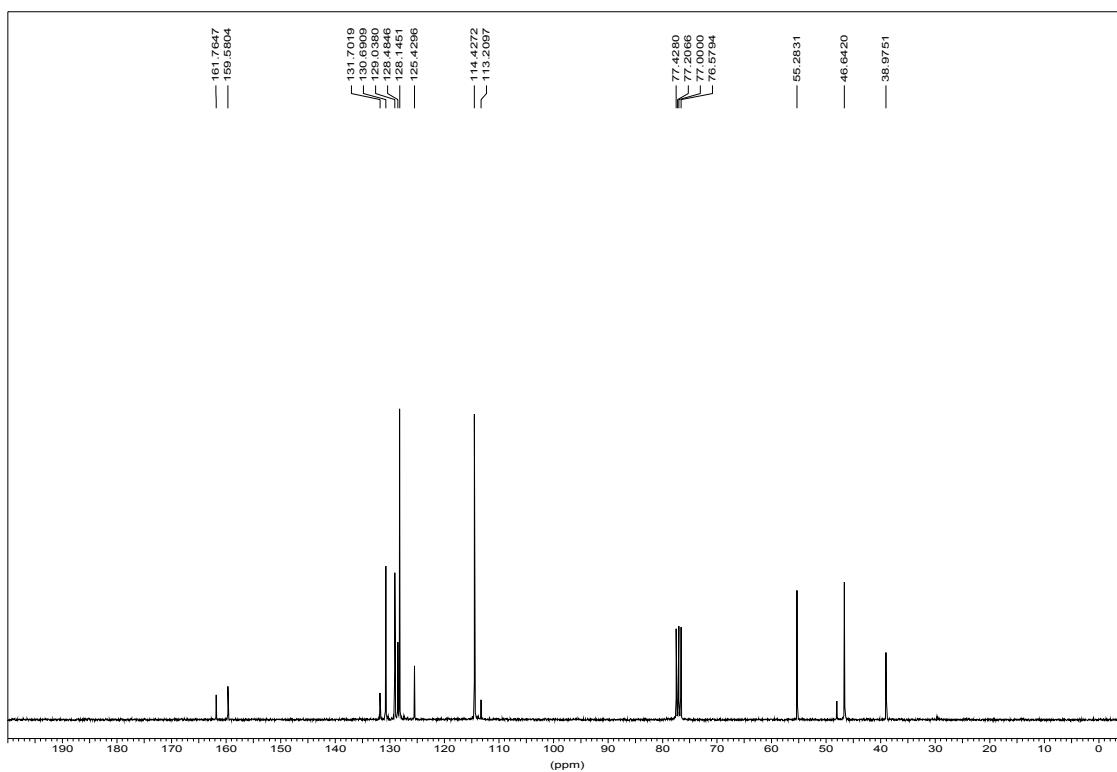
4-Allyl-1-benzyl-4-ethoxycarbonyl-2-methylpyrazolidine-3,5-dione (1b5). ¹H NMR (CDCl₃): δ 7.38-7.29 (m, *ArH*, 5H), 5.63-5.49 (m, CH₂CHCH₂C, 1H), 5.26-4.66 (m, *ArCH*₂, and CH₂CHCH₂, 4H), 4.25-4.18 (q, *J* = 7.20 Hz, CH₃CH₂, 2H), 3.10 (s, NCH₃, 3H), 2.99-2.86 (m, CH₂CHCH₂, 2H),

1.27-1.23 (t, $J = 7.14$ Hz, CH_3CH_2 , 3H); ^{13}C NMR (CDCl_3): δ 167.1, 166.1, 164.3, 134.4, 130.0, 128.9, 128.4, 127.8, 121.2, 77.21, 62.8, 46.6, 35.4, 30.7, 13.9; Mass spectrum (EI) m/z 316.1 (M^+)
Exact mass calcd for $\text{C}_{17}\text{H}_{20}\text{N}_2\text{O}_4$: m/z 316.1423; found 316.1421.

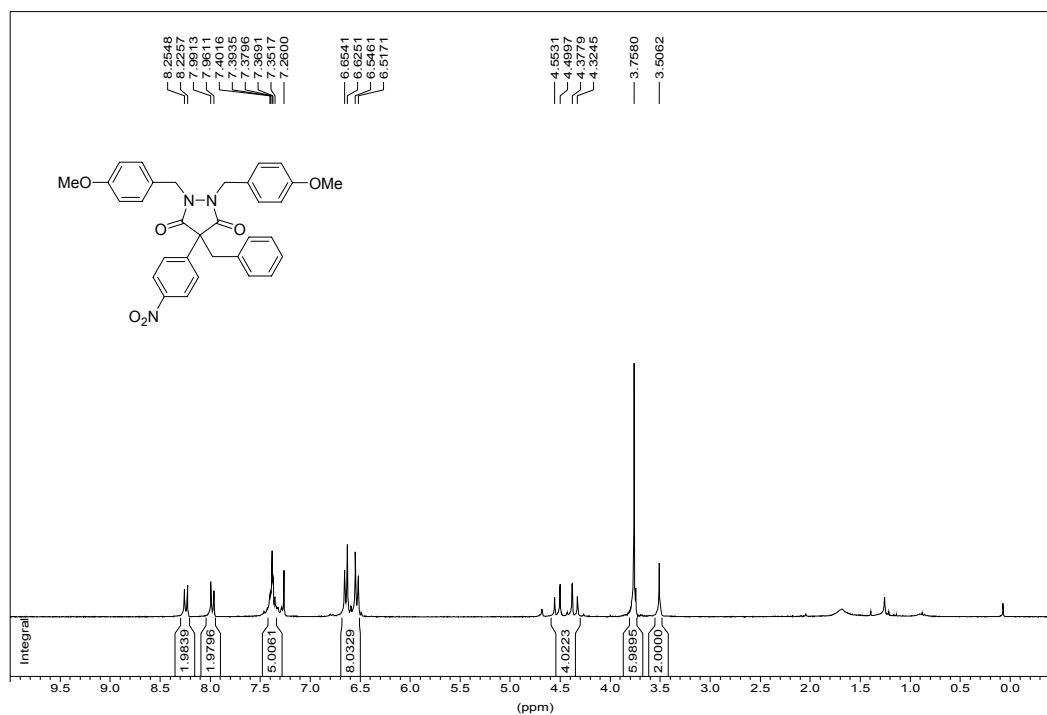
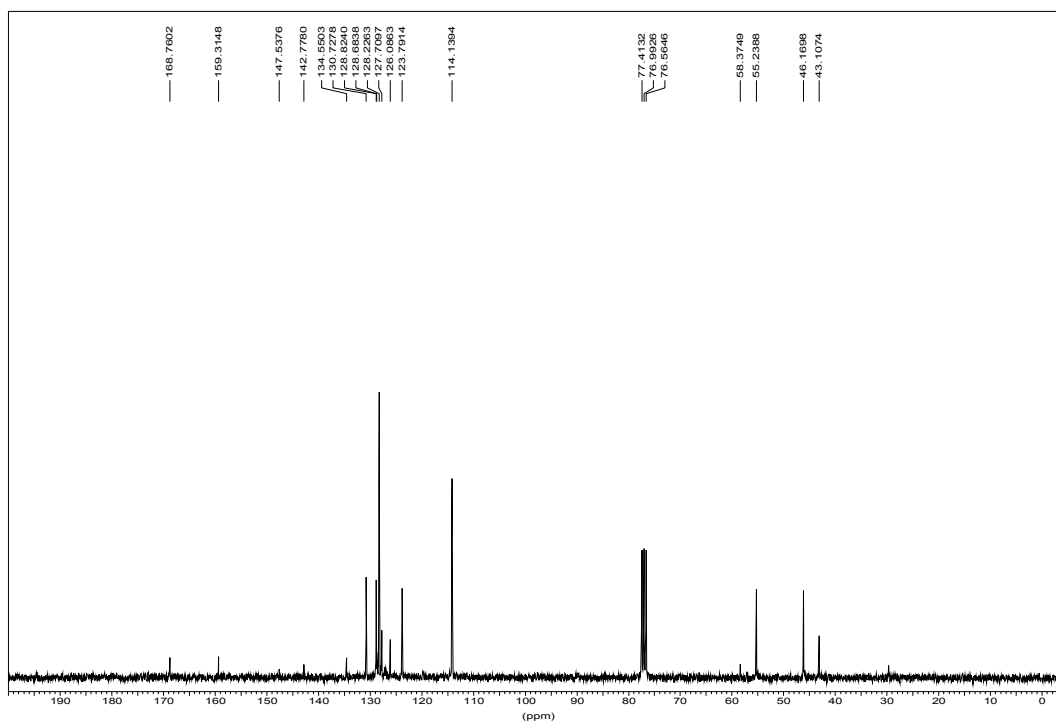
 ^1H NMR of **1b5** ^{13}C NMR of **1b5**

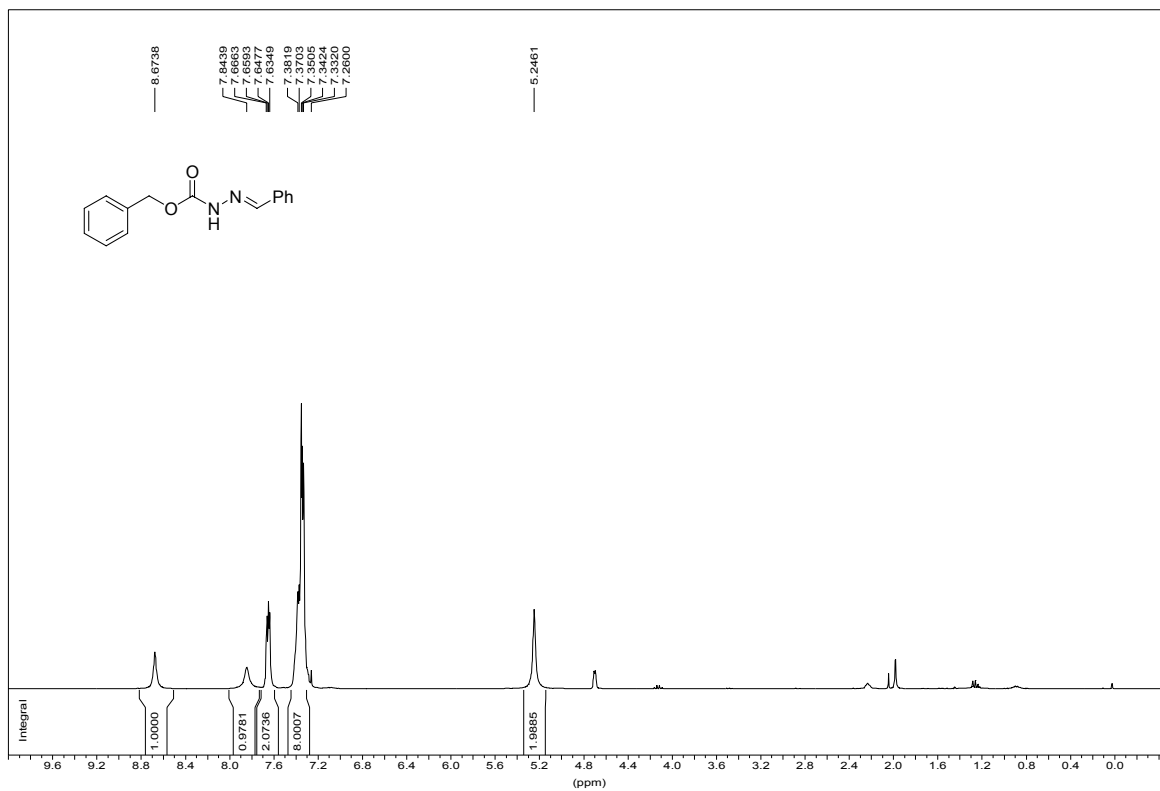
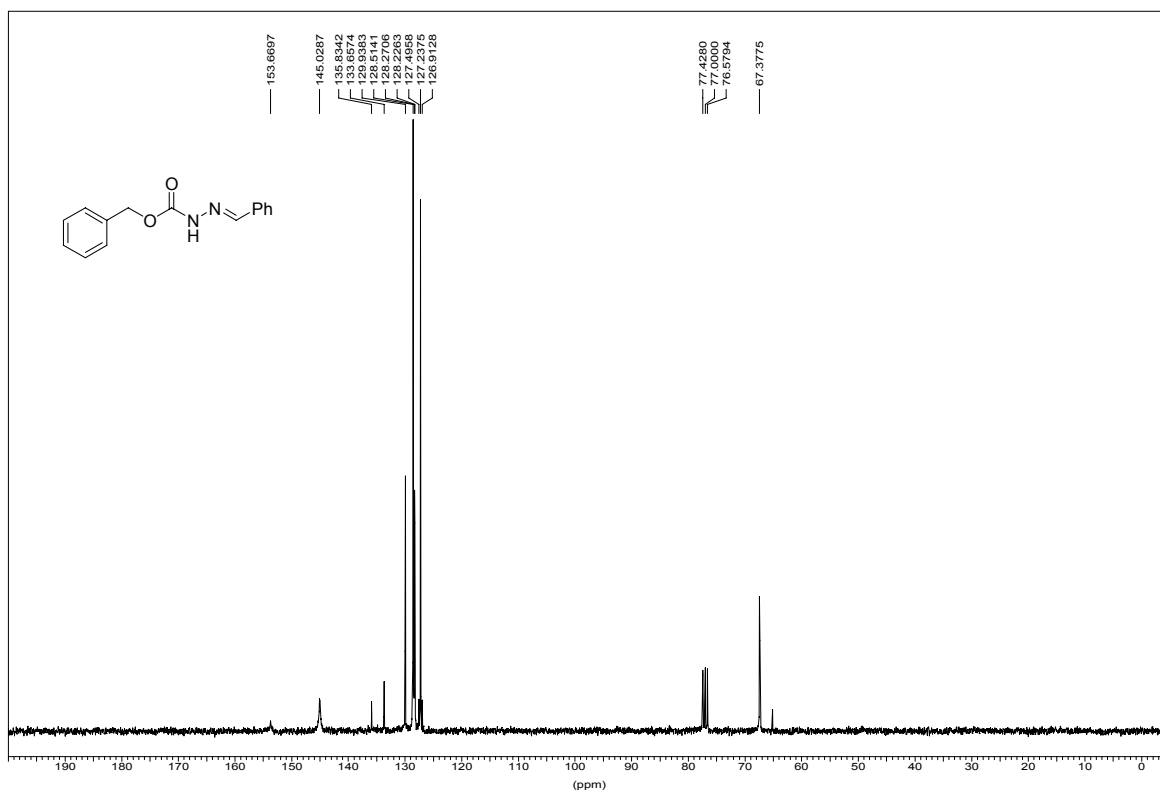
4-Benzyl-4-cyano-1,2-di(4-methoxybenzyl)pyrazolidine-3,5-dione (1b6). ^1H NMR (CDCl_3): δ 7.43-6.63 (m, ArH , 13H), 4.55-4.29 (m, NCH_2 , 4H), 3.79 (s, OCH_3 , 6H), 3.62 (s, ArCH_2 , 2H); ^{13}C

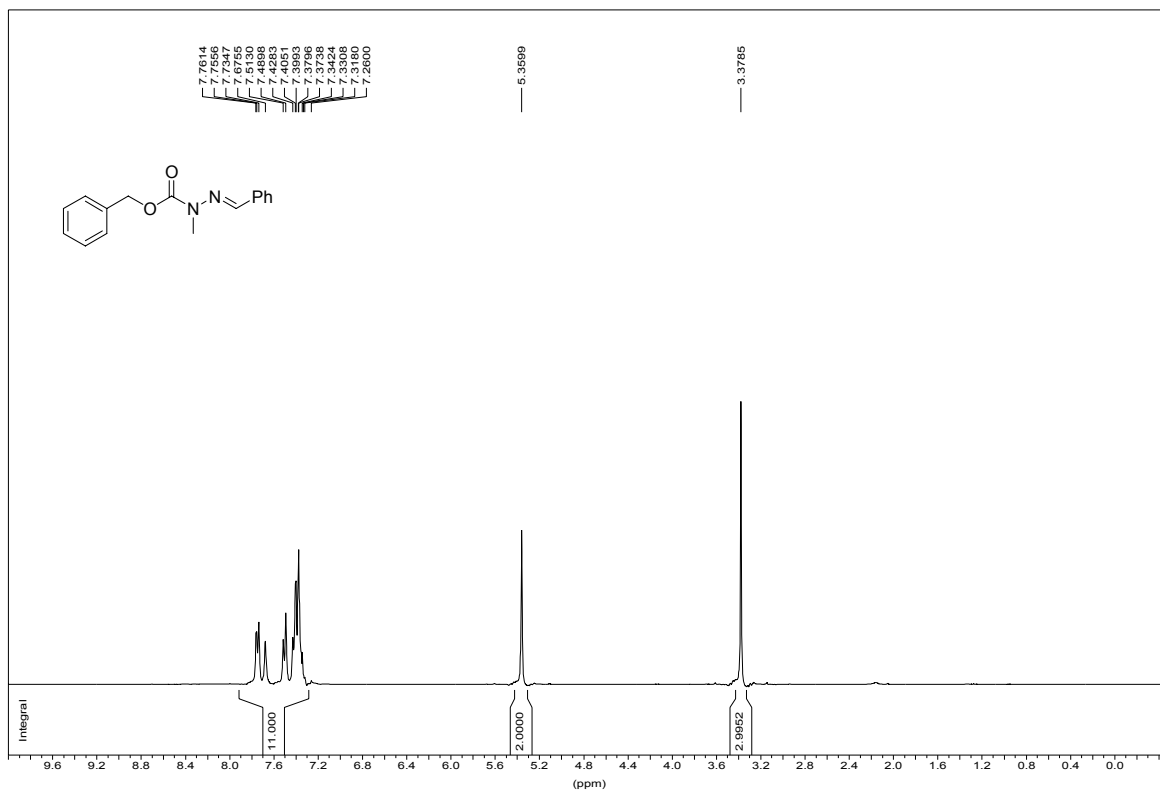
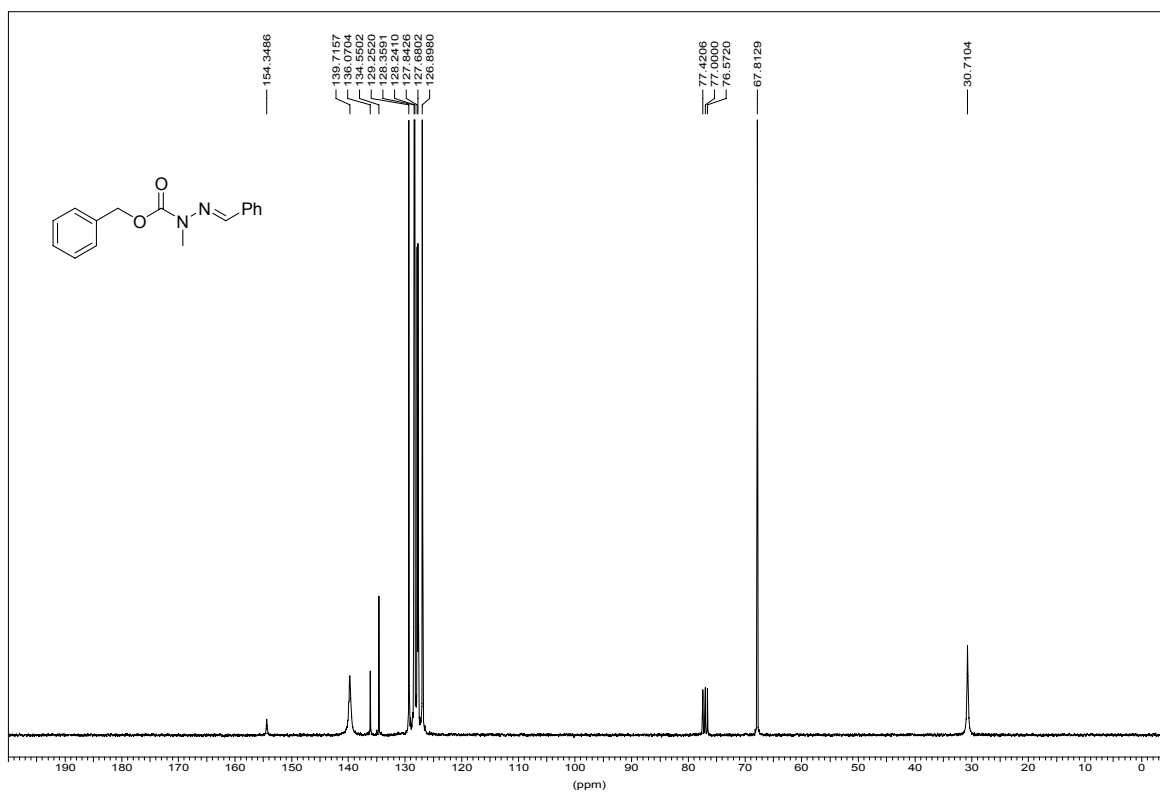
NMR (CDCl₃): δ 161.8, 159.6, 131.7, 130.7, 129.0, 128.5, 128.1, 125.4, 114.4, 113.2, 77.2, 55.3, 46.6, 38.8; Mass spectrum (EI) m/z 455.3 (M⁺) Exact mass calcd for C₂₇H₂₅N₃O₄: m/z 455.1845; found 455.1850.

¹H NMR of **1b6**¹³C NMR of **1b6**

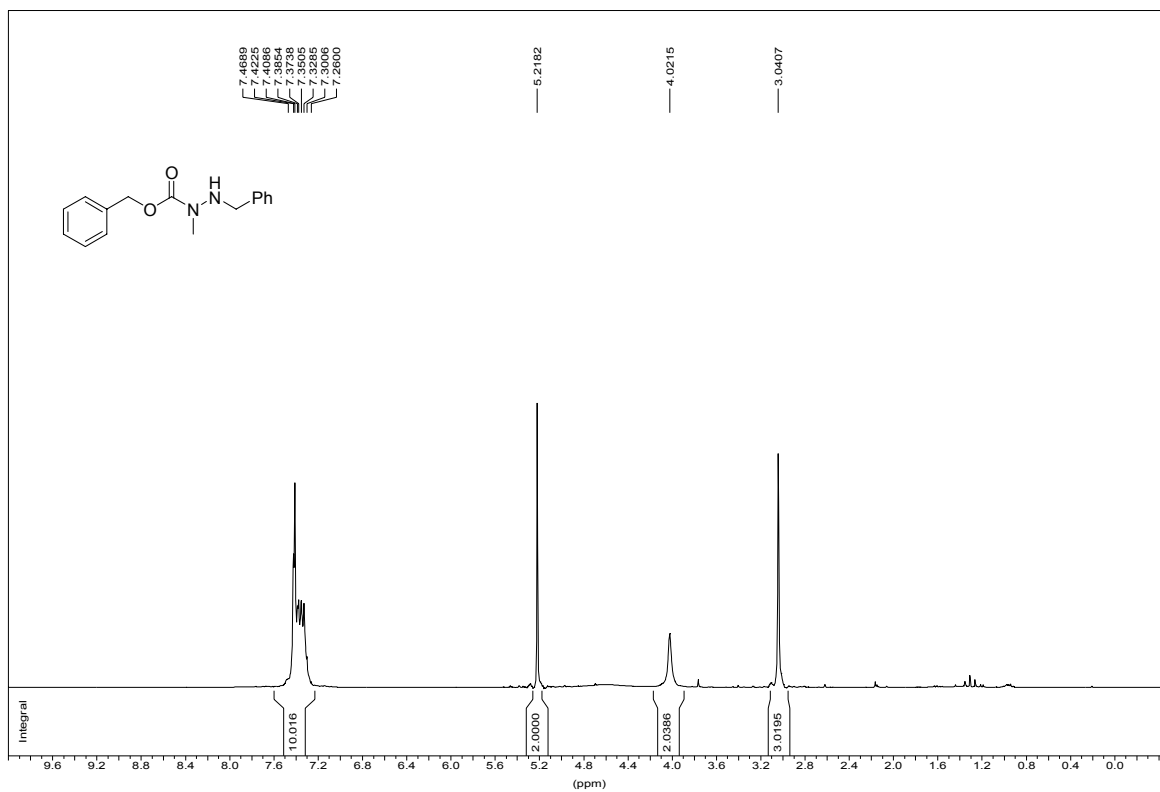
(CDCl₃): δ 8.25-8.23 (d, *J* = 8.73 Hz, *ArH*, 2H), 7.99-7.96 (d, *J* = 9.06 Hz, *ArH*, 2H), 7.40-7.35 (m, CCH₂*ArH*, 5H), 6.65-6.51 (NCH₂*ArH*, 8H), 4.55-4.32 (m, NCH₂, 4H), 3.76 (s, OCH₃, 6H), 3.51 (s, CCH₂, 2H); ¹³C NMR (CDCl₃): δ 168.8, 159.3, 147.5, 142.8, 134.6, 130.7, 128.8, 128.7, 128.2, 127.7, 126.1, 123.8, 114.1, 58.4, 55.2, 46.2, 43.1; Mass spectrum (EI) *m/z* 551.4 (M⁺) Exact mass calcd for C₃₂H₂₉N₃O₆: *m/z* 551.2056; found 551.2058.

¹H NMR of **1b7**¹³C NMR of **1b7**

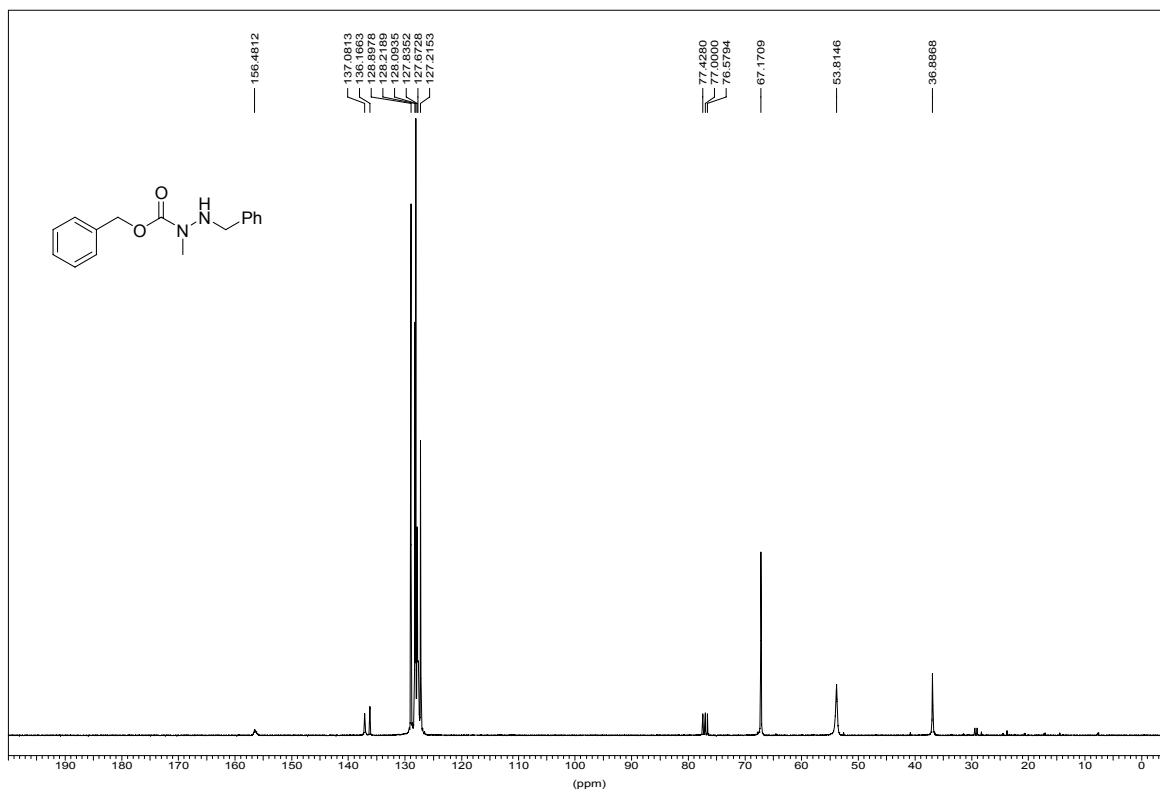
^1H NMR of **8** ^{13}C NMR of **8**

^1H NMR of **9** (R = CH₃) ^{13}C NMR of **9** (R = CH₃)

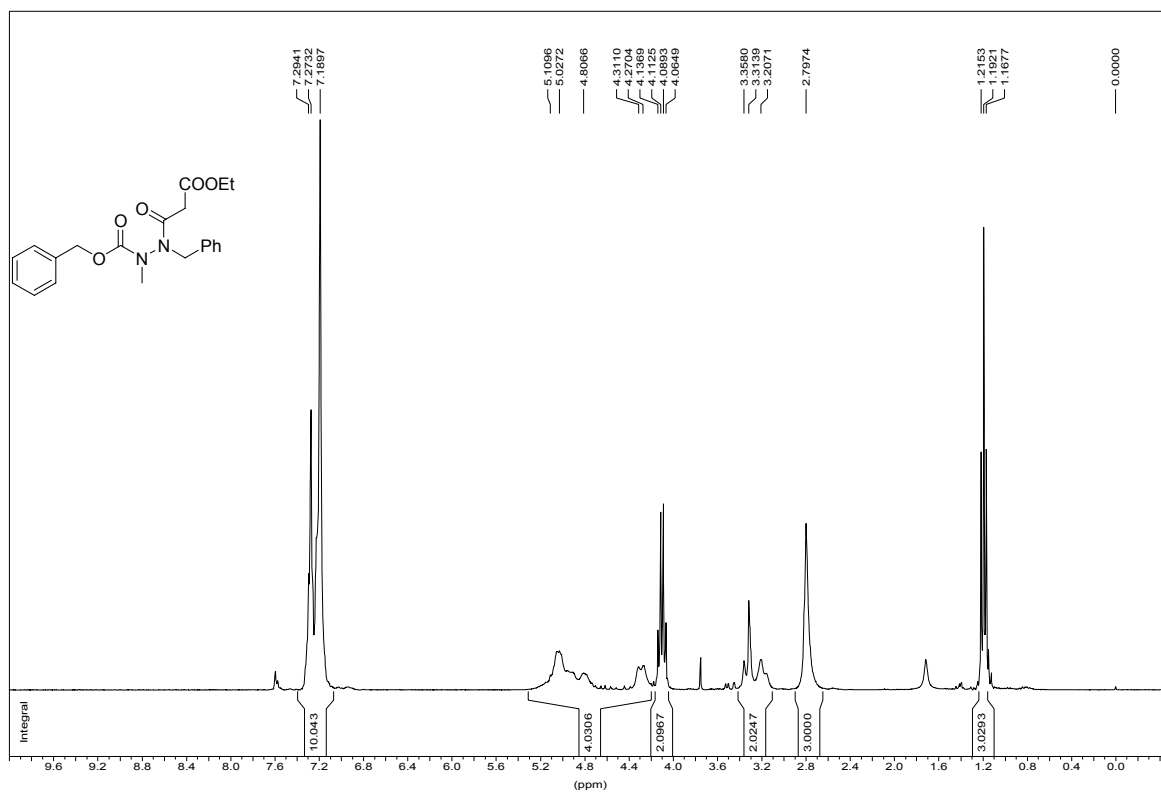
^1H NMR of **10**



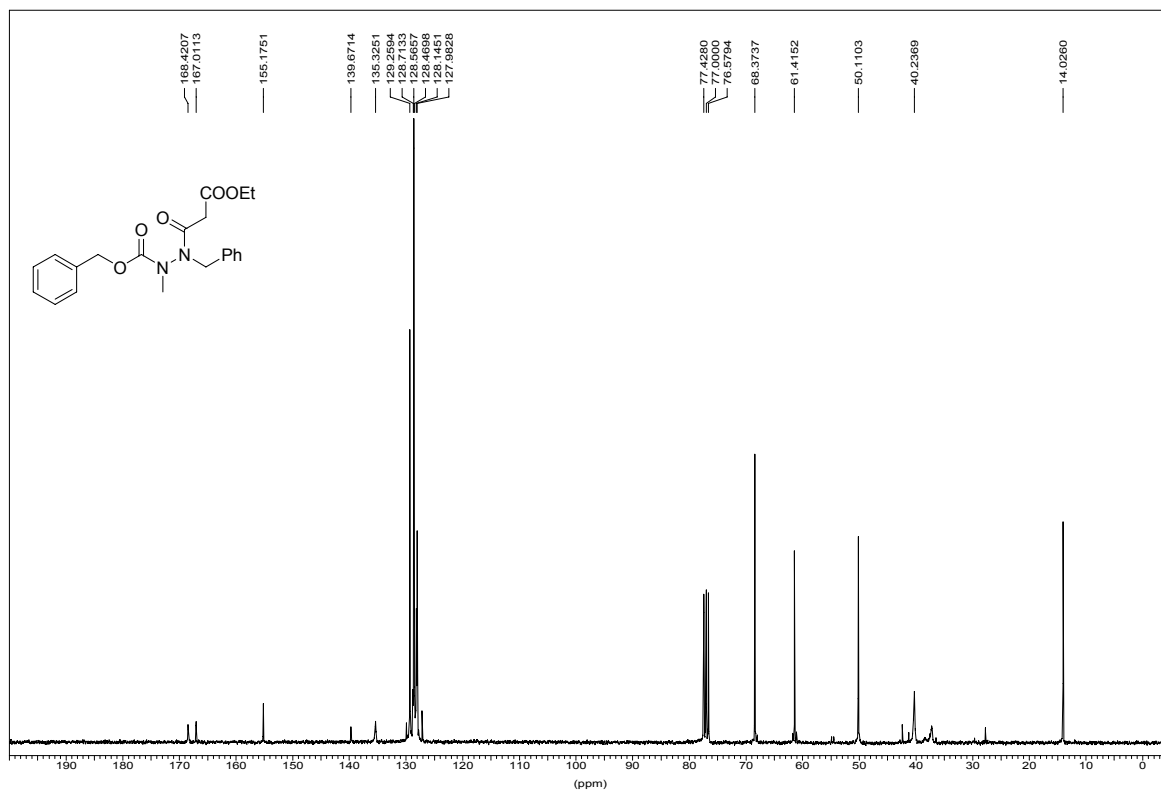
^{13}C NMR of **10**



^1H NMR of **11**



^{13}C NMR of **11**



References:

Supplementary Material (ESI) for Organic and Biomolecular Chemistry

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1. (a) S. M. Abdul Hai, *Pakistan J. Sci. Ind. Res.* **1974**, *17*, 59-64. (b) N. Matsumura, Y. Otsuji, E. Imoto, *Nippon Kagaku Kaishi* **1976**, 792-784.
2. G G. Lawton, C. J. Moody, C. J. Pearson, *J. Chem. Soc. Perkin Trans. 1*, **1987**, 885-897.