

Supporting Information

Formal [5 + 2] Cycloaddition of Vinylethylene Carbonates with Oxazol-5-(4*H*)-ones for Synthesis of 3,4-Dihydrooxepin-2(7*H*)-ones

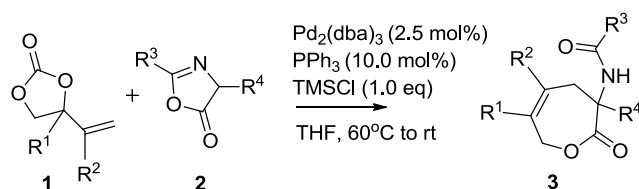
Table of Contents

1. General Information	S2
2. General Procedure for [5 + 2] Cycloaddition	S2
3. General Procedure for Asymmetric Catalytic [5 + 2] Cycloaddition	S2
4. Screening of Solvents	S3
5. Extension of Reaction Scope in the Presence of Et ₃ N.....	S4
6. Characterization.....	S5
7. ¹ H and ¹³ C NMR Spectra.....	S11
8. Copy of HPLC Spectra of Compound 3aa	S37
9. X-Ray Crystal Data of Compound 3ad	S38
10. References	S39

1. General Information

Proton (^1H) and carbon (^{13}C) NMR spectra were recorded on 400 MHz instrument (400 MHz for ^1H NMR, 100 MHz for ^{13}C NMR) and calibrated using tetramethylsilane (TMS) as internal reference. High resolution mass spectra (HRMS) were recorded under electrospray ionization (ESI) conditions. The melting point of compounds was determined by a melting point instrument. Flash column chromatography was performed on silica gel (0.035-0.070 mm) using compressed air. Thin layer chromatography (TLC) was carried out on 0.25 mm SDS silica gel coated glass plates (60F254). Eluted plates were visualized using a 254 nm UV lamp. Unless otherwise indicated, all reagents were commercially available and used without further purification. All solvents were distilled from the appropriate drying agents immediately before using. Substituted vinyl ethylene carbonates **1a-1j** were synthesized according to the reported procedures.¹ Oxazol-5-(4*H*)-ones **2a-2j** were prepared according to literature procedures.²

2. General Procedure for [5 + 2] Cycloaddition

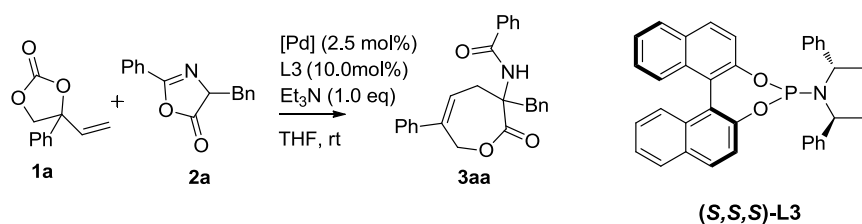


A mixture of vinyl ethylene carbonates **1** (1.0 equiv, 0.1 mmol), oxazol-5-(4*H*)-ones **2** (1.0 equiv, 0.1 mmol), $\text{Pd}_2(\text{dba})_3$ (2.5 mol%), PPh_3 (10.0 mol%) in THF (1.0 mL) was stirred at 60°C for 5 minutes. After that, TMSCl (1.0 equiv, 0.1 mmol) was added at rt, and the resulted reaction mixture continued to be stirred until the reaction was completed as indicated by TLC plate. The reaction mixture was concentrated under reduced pressure and the resulted crude products were purified by flash column chromatography on silica gel (petroleum ether / ethyl acetate/ CH_2Cl_2 = 10:1:10) to afford products **3** (67-99% yields).

3. General Procedure for Asymmetric Catalytic [5 + 2] Cycloaddition

A mixture of vinyl ethylene carbonate **1a** (1.0 equiv, 0.1 mmol), oxazol-5-(4*H*)-one **2a** (1.0 equiv, 0.1 mmol), Pd precatalyst (2.5 mol%), chiral ligand (10.0 mol%) and Et_3N (1.0 equiv, 0.1 mmol) was stirred in THF (1.0 mL) at rt until the reaction was completed indicated by TLC plate. The reaction mixture was concentrated under reduced pressure and the resulted crude product was purified by flash column chromatography on silica gel (petroleum ether / ethyl acetate/ CH_2Cl_2 = 10:1:10) to afford product **3aa**.

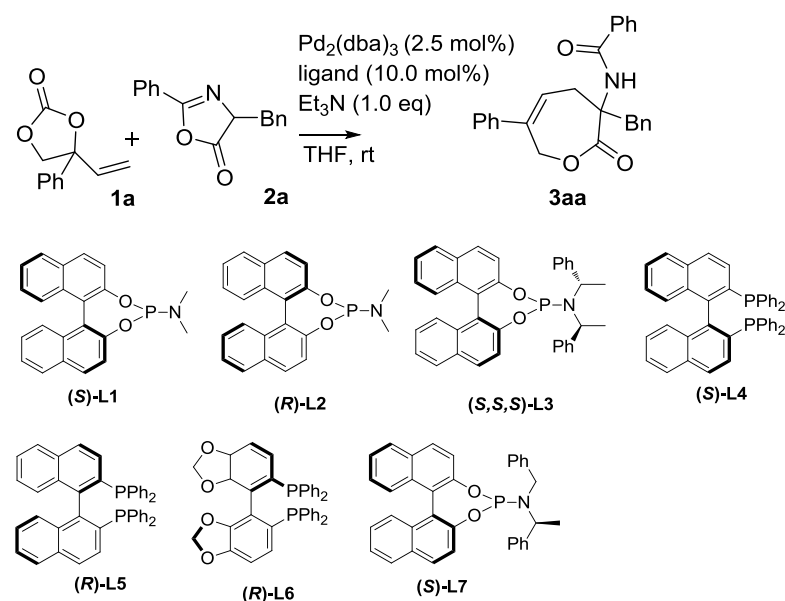
Table S1 Screening of Pd precatalysts^a



Entry	[Pd]	Time (h)	Yield ^b (%)	ee ^c
1	Pd(PPh ₃) ₄	2	21	5
2	Pd(OAc) ₂	2	25	19
3	Pd ₂ (dba) ₃	2	55	39
4	Pd(PPh ₃) ₂ Cl ₂	2	17	0
5	[Pd ₂ (dba) ₃] CHCl ₃	2	38	6

^a Reactions were carried out with **1a** (0.1 mmol), **2a** (0.1 mmol), [Pd] (2.5 mol%), **L3** (10.0 mol%), Et₃N (0.1 mmol) in THF (1.0 mL) at rt. ^b Isolated yield. ^c Determined by chiral HPLC analysis.

Table S2 Screening of chiral ligands^a

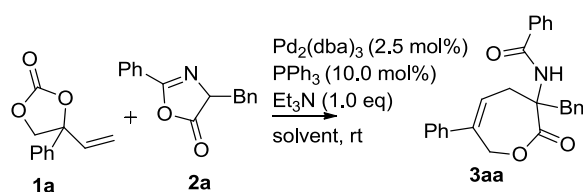


Entry	Ligand	Time (h)	Yield ^b (%)	ee ^c
1	L1	2	7	6
2	L2	2	25	9
3	L3	2	55	39
4	L4	2	43	9
5	L5	2	38	8
6	L6	2	5	13
7	L7	2	62	38

^a Reactions were carried out with **1a** (0.1 mmol), **2a** (0.1 mmol), Pd₂(dba)₃ (2.5 mol%), chiral ligand (10.0 mol%), Et₃N (0.1 mmol) in THF (1.0 mL) at rt. ^b Isolated chemical yield. ^c Determined by chiral HPLC analysis.

4. Screening of Solvents

A mixture of vinyl ethylene carbonate **1a** (1.0 equiv, 0.1 mmol), oxazol-5-(4H)-one **2a** (1.0 equiv, 0.1 mmol), Pd₂(dba)₃ (2.5 mol%), PPh₃ (10.0 mol%) and Et₃N (1.0 equiv, 0.1 mmol) in the specified solvent (1.0 mL) was stirred at rt until the reaction was completed indicated by TLC plate. The reaction mixture was concentrated under reduced pressure and the resulted crude products were purified by flash column chromatography on silica gel (petroleum ether / ethyl acetate/CH₂Cl₂ = 10:1:10) to afford product **3aa**.

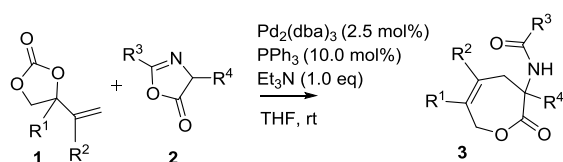
Table S3 Screening of Solvents^a

Entry	Solvent	Time (h)	Yield ^b (%)
1	DCM	4	trace
2	THF	4	75
3	Toluene	4	42
4	EtOH	4	trace
5	1,2-DCE	4	trace
6	CHCl ₃	4	trace

^a Reactions were carried out with **1a** (0.1 mmol), **2a** (0.1 mmol), Pd₂(dba)₃ (2.5 mol%), PPh₃ (10.0 mol%), Et₃N (0.1 mmol) in the specified solvent (1.0 mL) at rt. ^b Isolated yield.

5. Extension of Reaction Scope in the Presence of Et₃N

A mixture of vinyl ethylene carbonates **1** (1.0 equiv, 0.1 mmol), oxazol-5-(4*H*)-ones **2** (1.0 equiv, 0.1 mmol), Pd₂(dba)₃ (2.5 mol%), PPh₃ (10.0 mol%) and Et₃N (1.0 equiv, 0.1 mmol) in THF (1.0 mL) was stirred at room temperature. The reaction mixture was concentrated under reduced pressure and the crude products were purified by flash column chromatography on silica gel (petroleum ether / ethyl acetate/CH₂Cl₂ = 10:1:10) to afford products **3**.

Table S4 Extension of reaction scope^a

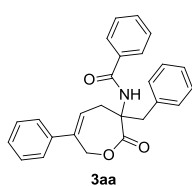
Entry	1 (R ¹ , R ²)	2 (R ³ , R ⁴)	3	Time (h)	Yield ^b (%)
1	1a (Ph, H)	2a (Ph, Bn)	3aa	3	75
2	1a (Ph, H)	2b (4-MeC ₆ H ₄ , Bn)	3ab	3	39
3	1a (Ph, H)	2c (4-BrC ₆ H ₄ , Bn)	3ac	3	51
4	1a (Ph, H)	2d (4-ClC ₆ H ₄ , Bn)	3ad	3	23
5	1a (Ph, H)	2f (3,4-di-ClC ₆ H ₃ , Bn)	3af	3	40
6	1a (Ph, H)	2g (Ph, Ph)	3ag	6	nr ^c
7	1a (Ph, H)	2h (Ph, H)	3ah	6	nr ^c
8	1b (4-BrC ₆ H ₄ , H)	2a (Ph, Bn)	3ba	3	15
9	1c (4-ClC ₆ H ₄ , H)	2a (Ph, Bn)	3ca	3	30
10	1d (4-FC ₆ H ₄ , H)	2a (Ph, Bn)	3da	3	43
11	1e (4-MeC ₆ H ₄ , H)	2a (Ph, Bn)	3ea	3	55

12	1f (4-OMeC ₆ H ₄ , H)	2a (Ph, Bn)	3fa	3	42
13	1g (3-ClC ₆ H ₄ , H)	2a (Ph, Bn)	3ga	3	32
14	1h (2-ClC ₆ H ₄ , H)	2a (Ph, Bn)	3ha	6	nr ^c
15	1i (Ph, Me)	2a (Ph, Bn)	3ia	6	nr ^c
16	1e (4-MeC ₆ H ₄ , H)	2b (4-MeC ₆ H ₄ , Bn)	3eb	3	31
17	1f (4-OMeC ₆ H ₄ , H)	2b (4-MeC ₆ H ₄ , Bn)	3fb	3	45

^aThe reaction mixture of **1** (0.1 mmol), **2** (0.1mmol), Pd₂(dba)₃ (2.5 mol%), PPh₃ (10.0 mol%) and Et₃N (0.1 mmol) was stirred at rt. in THF (1.0 mL). ^b Isolated yield. ^c No reaction.

6. Characterization

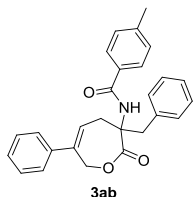
N-(3-benzyl-2-oxo-6-phenyl-2,3,4,7-tetrahydrooxepin-3-yl)benzamide (3aa): White solid, yield:



31.8 mg, 80%; M.P. = 172.8-173.9 °C; ¹H NMR (400 MHz, CDCl₃): δ 7.74 (d, *J* = 7.6 Hz, 2H), 7.55 (t, *J* = 6.8 Hz, 1H), 7.46-7.43 (m, 2H), 7.35-7.28 (m, 8H), 7.21 (d, *J* = 7.2 Hz, 2H), 6.71 (s, 1H), 6.08-6.06 (m, 1H), 5.47 (d, *J* = 15.6 Hz, 1H), 5.02 (d, *J* = 15.6 Hz, 1H), 3.67 (d, *J* = 14.0 Hz, 1H), 3.44 (d, *J* = 14.0 Hz, 1H), 3.13 (dd, *J* = 17.6, 5.6 Hz, 1H), 2.90 (d, *J* = 17.6 Hz, 1H) ppm; ¹³C NMR (100

MHz, CDCl₃): δ 172.5, 167.0, 140.1, 139.6, 135.3, 133.3, 132.2, 130.8, 128.8, 128.7, 128.6, 128.1, 127.4, 127.0, 126.0, 125.9, 69.0, 63.2, 41.2, 33.5 ppm; HRMS (ESI) calculated for C₂₆H₂₄NO₃[M + H]⁺: 398.1751, found 398.1750.

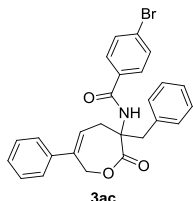
N-(3-benzyl-2-oxo-6-phenyl-2,3,4,7-tetrahydrooxepin-3-yl)-4-methylbenzamide (3ab): White



solid, yield: 27.5 mg, 67%; M.P. = 163.5-163.9 °C; ¹H NMR (400 MHz, CDCl₃): δ 7.65 (d, *J* = 8.0 Hz, 2H), 7.35-7.30 (m, 6H), 7.28-7.18 (m, 6H), 6.71 (s, 1H), 6.03 (d, *J* = 4.4 Hz, 1H), 5.45 (d, *J* = 15.6 Hz, 1H), 4.95 (d, *J* = 15.2 Hz, 1H), 3.69 (d, *J* = 14.0 Hz, 1H), 3.37 (d, *J* = 14.0 Hz, 1H), 3.08 (dd, *J* = 17.6, 5.6 Hz, 1H), 2.85 (d, *J* = 18.0 Hz, 1H), 2.41 (s, 3H) ppm; ¹³C NMR (100 MHz, CDCl₃): δ 172.3, 167.0,

142.8, 139.8, 139.7, 135.5, 130.9, 130.4, 129.5, 128.7, 128.6, 128.0, 127.3, 127.1, 126.1, 125.8, 68.9, 62.7, 41.3, 33.7, 21.5 ppm; HRMS (ESI) calculated for C₂₇H₂₆NO₃[M + H]⁺: 412.1907, found 412.1911.

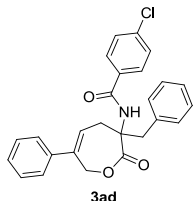
N-(3-benzyl-2-oxo-6-phenyl-2,3,4,7-tetrahydrooxepin-3-yl)-4-bromobenzamide (3ac): White



solid, yield: 36.5 mg, 77%; M.P. = 157.0-157.5 °C; ¹H NMR (400 MHz, CDCl₃): δ 7.58 (s, 4H), 7.37-7.28 (m, 8H), 7.18 (d, *J* = 6.4 Hz, 2H), 6.72 (s, 1H), 6.10 (t, *J* = 5.2 Hz, 1H), 5.43 (d, *J* = 15.2 Hz, 1H), 5.05 (d, *J* = 15.2 Hz, 1H), 3.62 (d, *J* = 14.0 Hz, 1H), 3.45 (d, *J* = 14.0 Hz, 1H), 3.16 (dd, *J* = 17.6, 5.6 Hz, 1H), 2.92 (dd, *J* = 17.2, 4.4 Hz, 1H) ppm; ¹³C NMR (100 MHz, CDCl₃): δ 172.5, 166.0, 140.1, 139.4,

135.2, 132.2, 132.1, 130.6, 128.8, 128.7, 128.6, 128.1, 127.5, 127.0, 126.1, 126.0, 69.0, 63.7, 41.1, 33.4 ppm; HRMS (ESI) calculated for C₂₆H₂₃BrNO₃ [M + H]⁺: 476.0856, found 476.0856.

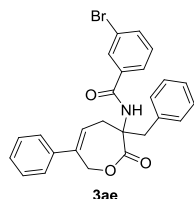
N-(3-benzyl-2-oxo-6-phenyl-2,3,4,7-tetrahydrooxepin-3-yl)-4-chlorobenzamide (3ad): White



solid, yield: 38.8 mg, 90%; M.P. = 104.8-105.6 °C; ¹H NMR (400 MHz, CDCl₃): δ 7.66 (d, *J* = 8.4 Hz, 2H), 7.41 (d, *J* = 8.4 Hz, 2H), 7.36-7.28 (m, 8H), 7.19 (d, *J* = 7.2 Hz, 2H), 6.72 (s, 1H), 6.10 (t, *J* = 5.2 Hz, 1H), 5.43 (d, *J* = 15.2 Hz, 1H), 5.05 (d, *J* = 15.6 Hz, 1H), 3.62 (d, *J* = 14.0 Hz, 1H), 3.46 (d, *J* = 14.4 Hz, 1H), 3.16 (dd, *J* = 17.6, 6.0 Hz, 1H), 2.92 (dd, *J* = 17.2, 4.0 Hz, 1H) ppm; ¹³C NMR (100 MHz,

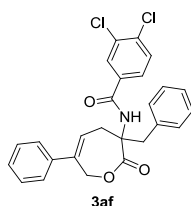
CDCl₃): δ 172.6, 165.9, 140.2, 139.4, 138.5, 135.2, 131.8, 130.6, 129.1, 128.7, 128.6, 128.5, 128.1, 127.5, 126.1, 126.0, 69.0, 63.7, 41.1, 33.4 ppm; HRMS (ESI) calculated for C₂₆H₂₃ClNO₃ [M + H]⁺: 432.1361, found 432.1358.

N-(3-benzyl-2-oxo-6-phenyl-2,3,4,7-tetrahydrooxepin-3-yl)-3-bromobenzamide (3ae): White



solid, yield: 33.4 mg, 70%; M.P. = 178.6-178.9 °C; ¹H NMR (400 MHz, CDCl₃): δ 7.87 (s, 1H), 7.65 (d, *J* = 7.6 Hz, 1H), 7.62 (d, *J* = 7.6 Hz, 1H), 7.35-7.28 (m, 9H), 7.19 (d, *J* = 7.2 Hz, 2H), 6.78 (s, 1H), 6.09 (t, *J* = 4.0 Hz, 1H), 5.42 (d, *J* = 15.6 Hz, 1H), 5.03 (d, *J* = 15.2 Hz, 1H), 3.62 (d, *J* = 14.0 Hz, 1H), 3.44 (d, *J* = 14.0 Hz, 1H), 3.15 (dd, *J* = 17.6, 5.6 Hz, 1H), 2.91 (d, *J* = 14.4 Hz, 1H) ppm; ¹³C NMR (100 MHz, CDCl₃): δ 172.5, 165.6, 140.0, 139.4, 135.4, 135.2, 135.1, 130.7, 130.4, 130.3, 128.8, 128.7, 128.1, 127.5, 126.1, 126.0, 125.5, 123.0, 69.0, 63.7, 41.1, 33.4 ppm; HRMS (ESI) calculated for C₂₆H₂₃BrNO₃ [M + H]⁺: 476.0856, found 476.0858.

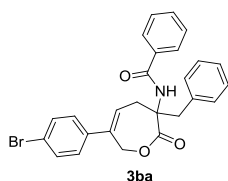
N-(3-benzyl-2-oxo-6-phenyl-2,3,4,7-tetrahydrooxepin-3-yl)-3,4-dichlorobenzamide (3af):



White solid, yield: 32.0 mg, 69%; M.P. = 171.5-172.1 °C; ¹H NMR (400 MHz, CDCl₃): δ 7.80 (s, 1H), 7.50 (s, 2H), 7.35-7.28 (m, 8H), 7.18 (d, *J* = 6.4 Hz, 2H), 6.83 (s, 1H), 6.11 (s, 1H), 5.39 (d, *J* = 15.2 Hz, 1H), 5.04 (d, *J* = 15.2 Hz, 1H), 3.59 (d, *J* = 14.0 Hz, 1H), 3.45 (d, *J* = 14.0 Hz, 1H), 3.17 (dd, *J* = 17.2, 5.2 Hz, 1H), 2.93 (d, *J* = 14.8 Hz, 1H) ppm; ¹³C NMR (100 MHz, CDCl₃): δ 172.5, 164.9, 139.9, 139.3, 136.7, 135.1, 133.4, 133.3, 130.8, 130.6, 129.3, 128.7, 128.1, 127.6,

126.2, 126.1, 126.0, 69.1, 64.0, 41.1, 33.3 ppm; HRMS (ESI) calculated for C₂₆H₂₂Cl₂NO₃ [M + H]⁺: 466.0971, found 466.0971.

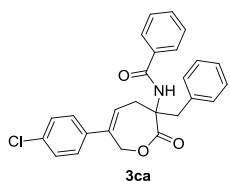
N-(3-benzyl-6-(4-bromophenyl)-2-oxo-2,3,4,7-tetrahydrooxepin-3-yl)benzamide (3ba): White



solid, yield: 43.0 mg, 91%; M.P. = 190.8-191.4 °C; ¹H NMR (400 MHz, CDCl₃): δ 7.73 (d, *J* = 7.6 Hz, 2H), 7.55 (t, *J* = 7.2 Hz, 1H), 7.45 (t, *J* = 8.0 Hz, 4H), 7.32-7.28 (m, 3H), 7.20-7.13 (m, 4H), 6.72 (s, 1H), 6.07 (s, 1H), 5.45 (d, *J* = 15.2 Hz, 1H), 4.92 (d, *J* = 15.2 Hz, 1H), 3.62 (d, *J* = 14.0 Hz, 1H), 3.40 (d, *J* = 14.0 Hz, 1H), 3.13 (dd, *J* = 17.6, 5.2 Hz, 1H), 2.84 (d, *J* = 15.6 Hz, 1H)

ppm; ¹³C NMR (100 MHz, CDCl₃): δ 172.4, 167.0, 139.1, 138.4, 135.2, 133.2, 132.3, 131.8, 130.8, 128.8, 128.7, 127.6, 127.5, 127.1, 126.9, 122.1, 68.4, 63.1, 41.5, 33.5 ppm; HRMS (ESI) calculated for C₂₆H₂₃BrNO₃ [M + H]⁺: 476.0856, found 476.0854.

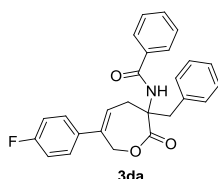
N-(3-benzyl-6-(4-chlorophenyl)-2-oxo-2,3,4,7-tetrahydrooxepin-3-yl)benzamide (3ca): White



solid, yield: 43.0 mg, 99%; M.P. = 202.0-202.9 °C; ¹H NMR (400 MHz, CDCl₃): δ 7.73 (d, *J* = 7.6 Hz, 2H), 7.56-7.53 (m, 1H), 7.44 (t, *J* = 7.2 Hz, 2H), 7.30-7.29 (m, 5H), 7.21-7.19 (m, 4H), 6.74 (s, 1H), 6.06 (s, 1H), 5.45 (d, *J* = 15.2 Hz, 1H), 4.92 (d, *J* = 15.2 Hz, 1H), 3.62 (d, *J* = 14.0 Hz, 1H), 3.39 (d, *J* = 14.0 Hz, 1H), 3.14 (dd, *J* = 17.6, 4.8 Hz, 1H), 2.85 (d, *J* = 16.8 Hz, 1H) ppm;

¹³C NMR (100 MHz, CDCl₃): δ 172.4, 167.0, 139.0, 138.0, 135.2, 134.0, 133.2, 132.3, 130.8, 128.9, 128.8, 128.7, 127.5, 127.3, 127.1, 126.8, 68.5, 63.1, 41.5, 33.5 ppm; HRMS (ESI) calculated for C₂₆H₂₃ClNO₃[M + H]⁺: 432.1361, found 432.1356.

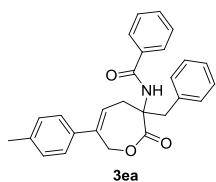
N-(3-benzyl-6-(4-fluorophenyl)-2-oxo-2,3,4,7-tetrahydrooxepin-3-yl)benzamide (3da): White



solid, yield: 35.0 mg, 84%; M.P. = 194.5-195.0 °C; ¹H NMR (400 MHz, CDCl₃): δ 7.74 (d, *J* = 7.2 Hz, 2H), 7.56-7.53 (m, 1H), 7.44 (t, *J* = 7.2 Hz, 2H), 7.32-7.28 (m, 3H), 7.26-7.23 (m, 2H), 7.20 (d, *J* = 4.0 Hz, 2H), 7.02 (t, *J* = 8.0 Hz, 2H), 6.74 (s, 1H), 6.02 (s, 1H), 5.45 (d, *J* = 15.2 Hz, 1H), 4.94 (d, *J* = 15.2 Hz, 1H),

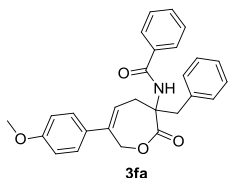
3.63 (d, $J = 14.0$ Hz, 1H), 3.41 (d, $J = 14.0$ Hz, 1H), 3.13 (dd, $J = 17.2, 4.4$ Hz, 1H), 2.86 (d, $J = 16.8$ Hz, 1H) ppm; ^{13}C NMR (100 MHz, CDCl_3): δ 172.4, 167.0, 162.5 (d, $J = 246.3$ Hz), 139.1, 135.7 (d, $J = 3.4$ Hz), 135.3, 133.2, 132.2, 130.8, 128.8, 128.7, 127.8 (d, $J = 8.0$ Hz), 127.4, 127.1, 126.2, 115.6 (d, $J = 21.5$ Hz), 68.8, 63.1, 41.4, 33.5 ppm; HRMS (ESI) calculated for $\text{C}_{26}\text{H}_{23}\text{FNO}_3$ $[\text{M} + \text{H}]^+$: 416.1656, found 416.1657.

***N*-(3-benzyl-2-oxo-6-(*p*-tolyl)-2,3,4,7-tetrahydrooxepin-3-yl)benzamide (3ea):** White solid,



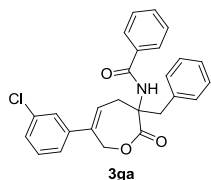
yield: 28.0 mg, 68%; M.P. = 193.3-194.1 °C; ^1H NMR (400 MHz, CDCl_3): δ 7.74 (d, $J = 7.6$ Hz, 2H), 7.54 (t, $J = 7.2$ Hz, 1H), 7.44 (t, $J = 7.2$ Hz, 2H), 7.33-7.28 (m, 3H), 7.21-7.14 (m, 6H), 6.72 (s, 1H), 6.04 (s, 1H), 5.44 (d, $J = 15.2$ Hz, 1H), 5.00 (d, $J = 15.2$ Hz, 1H), 3.67 (d, $J = 14.0$ Hz, 1H), 3.42 (d, $J = 14.0$ Hz, 1H), 3.11 (dd, $J = 17.6, 5.2$ Hz, 1H), 2.88 (d, $J = 16.4$ Hz, 1H), 2.35 (s, 3H) ppm; ^{13}C NMR (100 MHz, CDCl_3): δ 172.5, 167.0, 139.8, 138.0, 136.7, 135.4, 133.3, 132.2, 130.8, 129.4, 128.8, 128.6, 127.4, 127.1, 125.9, 125.0, 69.0, 63.1, 41.2, 33.5, 21.1 ppm; HRMS (ESI) calculated for $\text{C}_{27}\text{H}_{26}\text{NO}_3$ $[\text{M} + \text{H}]^+$: 412.1907, found 412.1901.

***N*-(3-benzyl-6-(4-methoxyphenyl)-2-oxo-2,3,4,7-tetrahydrooxepin-3-yl)benzamide (3fa):**



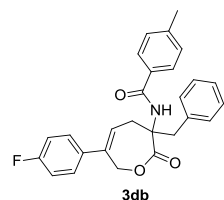
White solid, yield: 35.0 mg, 82%; M.P. = 199.2-200.3 °C; ^1H NMR (400 MHz, CDCl_3): δ 7.73 (d, $J = 7.6$ Hz, 2H), 7.54 (t, $J = 7.2$ Hz, 1H), 7.44 (t, $J = 7.2$ Hz, 2H), 7.32-7.28 (m, 3H), 7.23-7.19 (m, 4H), 6.87 (d, $J = 8.4$ Hz, 2H), 6.73 (s, 1H), 5.99 (s, 1H), 5.43 (d, $J = 15.2$ Hz, 1H), 4.98 (d, $J = 15.2$ Hz, 1H), 3.80 (s, 3H), 3.66 (d, $J = 14.0$ Hz, 1H), 3.41 (d, $J = 14.0$ Hz, 1H), 3.10 (dd, $J = 17.6, 5.6$ Hz, 1H), 2.86 (d, $J = 15.6$ Hz, 1H) ppm; ^{13}C NMR (100 MHz, CDCl_3): δ 172.5, 167.0, 159.6, 139.5, 135.4, 133.3, 132.2, 132.0, 130.8, 128.8, 128.6, 127.4, 127.2, 127.1, 124.4, 114.1, 69.0, 63.1, 55.3, 41.2, 33.5 ppm; HRMS (ESI) calculated for $\text{C}_{27}\text{H}_{26}\text{NO}_4$ $[\text{M} + \text{H}]^+$: 428.1856, found 428.1850.

***N*-(3-benzyl-6-(3-chlorophenyl)-2-oxo-2,3,4,7-tetrahydrooxepin-3-yl)benzamide (3ga):** White



solid, yield: 36.0 mg, 84%; M.P. = 202.0-202.1 °C; ^1H NMR (400 MHz, CDCl_3): δ 7.73 (d, $J = 7.6$ Hz, 2H), 7.55 (t, $J = 7.2$ Hz, 1H), 7.47-7.43 (m, 2H), 7.33-7.28 (m, 4H), 7.27-7.16 (m, 5H), 6.71 (s, 1H), 6.10 (s, 1H), 5.46 (d, $J = 14.8$ Hz, 1H), 4.95 (d, $J = 15.2$ Hz, 1H), 3.62 (d, $J = 13.6$ Hz, 1H), 3.43 (d, $J = 13.6$ Hz, 1H), 3.17 (dd, $J = 17.2, 5.2$ Hz, 1H), 2.87 (d, $J = 14.0$ Hz, 1H) ppm; ^{13}C NMR (100 MHz, CDCl_3): δ 172.4, 167.0, 141.3, 139.1, 135.1, 134.7, 133.2, 132.3, 130.8, 129.9, 128.8, 128.7, 128.1, 127.6, 127.5, 127.1, 126.3, 124.1, 68.4, 63.3, 41.6, 33.5 ppm; HRMS (ESI) calculated for $\text{C}_{26}\text{H}_{23}\text{ClNO}_3$ $[\text{M} + \text{H}]^+$: 432.1361, found 432.1356.

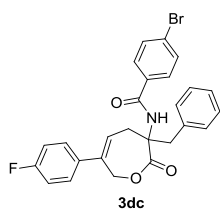
***N*-(3-benzyl-6-(4-fluorophenyl)-2-oxo-2,3,4,7-tetrahydrooxepin-3-yl)-4-methylbenzamide (3db):**



White solid, yield: 30.0 mg, 70%; M.P. = 196.8-197.4 °C; ^1H NMR (400 MHz, CDCl_3): δ 7.63 (d, $J = 7.6$ Hz, 2H), 7.32-7.28 (m, 3H), 7.26-7.18 (m, 6H), 7.02 (t, $J = 8.4$ Hz, 2H), 6.60 (s, 1H), 6.01 (t, $J = 4.0$ Hz, 1H), 5.44 (d, $J = 15.2$ Hz, 1H), 4.95 (d, $J = 15.2$ Hz, 1H), 3.64 (d, $J = 14.0$ Hz, 1H), 3.42 (d, $J = 14.0$ Hz, 1H), 3.11 (dd, $J = 17.6, 6.0$ Hz, 1H), 2.88-2.84 (m, 1H), 2.41 (s, 3H) ppm; ^{13}C NMR (100 MHz, CDCl_3): δ 172.4, 166.9, 162.5 (d, $J = 246.2$ Hz), 142.8, 139.2, 135.7 (d, $J = 3.2$ Hz), 135.3, 130.8, 130.4, 129.5, 128.6, 127.7 (d, $J = 8.0$ Hz), 127.4, 127.1, 126.1, 115.6 (d, $J = 21.5$ Hz), 68.8, 63.0, 41.4, 33.5, 21.5 ppm; HRMS (ESI) calculated for $\text{C}_{27}\text{H}_{25}\text{FNO}_3$ $[\text{M} + \text{H}]^+$: 430.1813, found 430.1806.

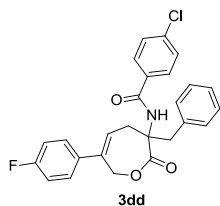
***N*-(3-benzyl-6-(4-fluorophenyl)-2-oxo-2,3,4,7-tetrahydrooxepin-3-yl)-4-bromobenzamide**

(3dc): White solid, yield: 47.0 mg, 95%; M.P. = 199.1-199.5 °C; ¹H NMR (400 MHz, CDCl₃): δ 7.58 (s, 4H), 7.32-7.29 (m, 3H), 7.28-7.17 (m, 4H), 7.03 (t, *J* = 8.4 Hz, 2H), 6.73 (s, 1H), 6.05 (t, *J* = 5.2 Hz, 1H), 5.41 (d, *J* = 15.2 Hz, 1H), 4.99 (d, *J* = 14.8 Hz, 1H), 3.58 (d, *J* = 14.0 Hz, 1H), 3.45 (d, *J* = 14.0 Hz, 1H), 3.17 (dd, *J* = 17.2, 5.6 Hz, 1H), 2.89 (dd, *J* = 17.2, 4.4 Hz, 1H) ppm; ¹³C NMR (100 MHz, CDCl₃): δ 172.5, 166.0, 162.6 (d, *J* = 246.5 Hz), 139.3, 135.5 (d, *J* = 3.2 Hz), 135.1, 132.2, 132.1, 130.6, 128.7, 128.6, 127.7 (d, *J* = 8.1 Hz), 127.5, 127.0, 126.3, 115.6 (d, *J* = 21.4 Hz), 68.9, 63.7, 41.3, 33.3 ppm; HRMS (ESI) calculated for C₂₆H₂₂BrFNO₃ [M + H]⁺: 494.0762, found 494.0766.



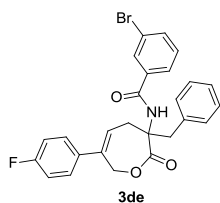
***N*-(3-benzyl-6-(4-fluorophenyl)-2-oxo-2,3,4,7-tetrahydrooxepin-3-yl)-4-chlorobenzamide**

(3dd): White solid, yield: 38.0 mg, 85%; M.P. = 199.8-200.4 °C; ¹H NMR (400 MHz, CDCl₃): δ 7.66 (d, *J* = 8.4 Hz, 2H), 7.42 (d, *J* = 8.4 Hz, 2H), 7.34-7.29 (m, 3H), 7.28-7.17 (m, 4H), 7.04 (t, *J* = 8.4 Hz, 2H), 6.71 (s, 1H), 6.05 (t, *J* = 5.2 Hz, 1H), 5.42 (d, *J* = 15.2 Hz, 1H), 5.00 (d, *J* = 15.2 Hz, 1H), 3.59 (d, *J* = 14.0 Hz, 1H), 3.45 (d, *J* = 14.0 Hz, 1H), 3.17 (dd, *J* = 17.6, 6.0 Hz, 1H), 2.89 (dd, *J* = 17.6, 5.2 Hz, 1H) ppm; ¹³C NMR (100 MHz, CDCl₃): δ 172.6, 165.9, 162.6 (d, *J* = 246.5 Hz), 139.4, 138.6, 135.4 (d, *J* = 3.2 Hz), 135.1, 131.8, 130.6, 129.1, 128.7, 128.4, 127.7 (d, *J* = 8.1 Hz), 127.5, 126.3, 115.7 (d, *J* = 21.4 Hz), 68.9, 63.8, 41.3, 33.3 ppm; HRMS (ESI) calculated for C₂₆H₂₂ClFNO₃ [M + H]⁺: 450.1267, found 450.1270.



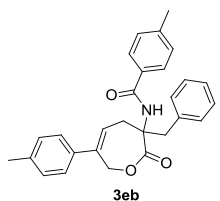
***N*-(3-benzyl-6-(4-fluorophenyl)-2-oxo-2,3,4,7-tetrahydrooxepin-3-yl)-3-bromobenzamide**

(3de): White solid, yield: 38.0 mg, 77%; M.P. = 181.6-182.4 °C; ¹H NMR (400 MHz, CDCl₃): δ 7.86 (s, 1H), 7.65 (d, *J* = 8.0 Hz, 1H), 7.61 (d, *J* = 7.6 Hz, 1H), 7.34-7.29 (m, 4H), 7.27-7.23 (m, 2H), 7.18 (d, *J* = 7.2 Hz, 2H), 7.03 (t, *J* = 8.4 Hz, 2H), 6.77 (s, 1H), 6.05 (t, *J* = 5.2 Hz, 1H), 5.40 (d, *J* = 15.2 Hz, 1H), 4.97 (d, *J* = 15.2 Hz, 1H), 3.59 (d, *J* = 14.0 Hz, 1H), 3.44 (d, *J* = 14.0 Hz, 1H), 3.16 (dd, *J* = 17.6, 6.0 Hz, 1H), 2.89 (dd, *J* = 17.2, 4.4 Hz, 1H) ppm; ¹³C NMR (100 MHz, CDCl₃): δ 172.5, 165.6, 162.6 (d, *J* = 246.3 Hz), 139.2, 135.5 (d, *J* = 3.3 Hz), 135.4, 135.1, 135.0, 130.6, 130.4, 130.3, 128.7, 127.7 (d, *J* = 8.0 Hz), 127.5, 126.3, 125.5, 123.0, 115.6 (d, *J* = 21.4 Hz), 68.9, 63.8, 41.3, 33.4 ppm; HRMS (ESI) calculated for C₂₆H₂₂BrFNO₃ [M + H]⁺: 494.0762, found 494.0766.



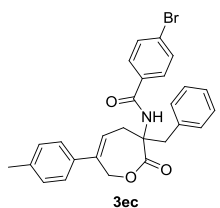
***N*-(3-benzyl-2-oxo-6-(*p*-tolyl)-2,3,4,7-tetrahydrooxepin-3-yl)-4-methylbenzamide (3eb):** White

solid, yield: 30.0 mg, 71%; M.P. = 187.3-187.9 °C; ¹H NMR (400 MHz, CDCl₃): δ 7.64 (d, *J* = 8.0 Hz, 2H), 7.32-7.28 (m, 3H), 7.24 (d, *J* = 7.6 Hz, 2H), 7.20-7.14 (m, 6H), 6.63 (s, 1H), 6.01 (s, 1H), 5.43 (d, *J* = 15.2 Hz, 1H), 4.98 (d, *J* = 15.6 Hz, 1H), 3.69 (d, *J* = 14.0 Hz, 1H), 3.38 (d, *J* = 14.0 Hz, 1H), 3.06 (dd, *J* = 17.6, 5.2 Hz, 1H), 2.85 (d, *J* = 16.4 Hz, 1H), 2.41 (s, 3H), 2.35 (s, 3H) ppm; ¹³C NMR (100 MHz, CDCl₃): δ 172.4, 166.9, 142.8, 139.6, 138.0, 136.8, 135.5, 130.9, 130.4, 129.5, 129.4, 128.6, 127.3, 127.1, 125.9, 124.9, 69.0, 62.8, 41.2, 33.6, 21.5, 21.1 ppm; HRMS (ESI) calculated for C₂₈H₂₈NO₃ [M + H]⁺: 426.2064, found 426.2056.



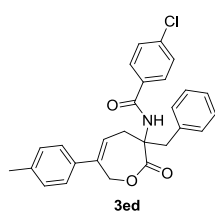
***N*-(3-benzyl-2-oxo-6-(*p*-tolyl)-2,3,4,7-tetrahydrooxepin-3-yl)-4-bromobenzamide (3ec):** White

solid, yield: 46.0 mg, 94%; M.P. = 209.0-209.9 °C; ¹H NMR (400 MHz, CDCl₃): δ 7.57 (s, 4H), 7.32-7.28 (m, 3H), 7.18-7.14 (m, 6H), 6.74 (s, 1H), 6.06 (t, *J* = 5.2 Hz, 1H), 5.40 (d, *J* = 15.2 Hz, 1H), 5.02 (d, *J* = 15.2 Hz, 1H), 3.62 (d, *J* = 14.0 Hz, 1H), 3.43 (d, *J* = 14.0 Hz, 1H), 3.13 (dd, *J* = 17.6, 5.6 Hz, 1H),



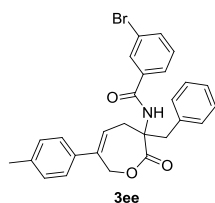
2.92-2.88 (m, 1H), 2.35 (s, 3H) ppm; ^{13}C NMR (100 MHz, CDCl_3): δ 172.6, 166.0, 139.9, 138.1, 136.5, 135.2, 132.3, 132.0, 130.7, 129.4, 128.7, 128.6, 127.5, 127.0, 125.9, 125.2, 69.1, 63.6, 41.0, 33.3, 21.1 ppm; HRMS (ESI) calculated for $\text{C}_{27}\text{H}_{25}\text{BrNO}_3$ $[\text{M} + \text{H}]^+$: 490.1012, found 490.1010.

***N*-(3-benzyl-2-oxo-6-(*p*-tolyl)-2,3,4,7-tetrahydrooxepin-3-yl)-4-chlorobenzamide (3ed):** White



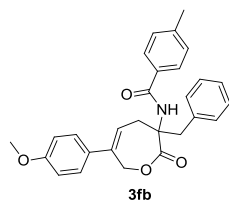
solid, yield: 35.0 mg, 79%; M.P. = 204.7-205.0 °C; ^1H NMR (400 MHz, CDCl_3): δ 7.66 (d, J = 8.4 Hz, 2H), 7.41 (d, J = 8.4 Hz, 2H), 7.33-7.28 (m, 3H), 7.18-7.15 (m, 6H), 6.72 (s, 1H), 6.06 (t, J = 5.2 Hz, 1H), 5.40 (d, J = 15.2 Hz, 1H), 5.03 (d, J = 15.2 Hz, 1H), 3.62 (d, J = 14.0 Hz, 1H), 3.43 (d, J = 14.0 Hz, 1H), 3.13 (dd, J = 17.6, 6.0 Hz, 1H), 2.90 (dd, J = 17.2, 4.0 Hz, 1H), 2.36 (s, 3H) ppm; ^{13}C NMR (100 MHz, CDCl_3): δ 172.6, 165.9, 139.9, 138.5, 138.1, 136.5, 135.2, 131.8, 130.7, 129.4, 129.1, 128.7, 128.5, 127.5, 125.9, 125.2, 69.1, 63.6, 41.0, 33.3, 21.1 ppm; HRMS (ESI) calculated for $\text{C}_{27}\text{H}_{25}\text{ClNO}_3$ $[\text{M} + \text{H}]^+$: 446.1517, found 446.1509.

***N*-(3-benzyl-2-oxo-6-(*p*-tolyl)-2,3,4,7-tetrahydrooxepin-3-yl)-3-bromobenzamide (3ee):** White



solid, yield: 37.5 mg, 77%; M.P. = 190.0-190.3 °C; ^1H NMR (400 MHz, CDCl_3): δ 7.87 (s, 1H), 7.65 (d, J = 7.6 Hz, 1H), 7.61 (d, J = 7.6 Hz, 1H), 7.34-7.28 (m, 4H), 7.20-7.15 (m, 6H), 6.74 (s, 1H), 6.07 (t, J = 5.2 Hz, 1H), 5.39 (d, J = 15.2 Hz, 1H), 5.04 (d, J = 15.2 Hz, 1H), 3.62 (d, J = 14.4 Hz, 1H), 3.45 (d, J = 14.0 Hz, 1H), 3.14 (dd, J = 17.6, 6.0 Hz, 1H), 2.92 (dd, J = 17.6, 4.8 Hz, 1H), 2.36 (s, 3H) ppm; ^{13}C NMR (100 MHz, CDCl_3): δ 172.5, 165.5, 139.9, 138.1, 136.5, 135.5, 135.2, 135.1, 130.7, 130.4, 130.3, 129.4, 128.7, 127.5, 125.9, 125.5, 125.2, 123.0, 69.1, 63.8, 41.0, 33.3, 21.1 ppm; HRMS (ESI) calculated for $\text{C}_{27}\text{H}_{25}\text{BrNO}_3$ $[\text{M} + \text{H}]^+$: 490.1012, found 490.1012.

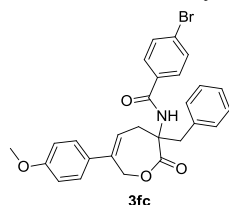
***N*-(3-benzyl-6-(4-methoxyphenyl)-2-oxo-2,3,4,7-tetrahydrooxepin-3-yl)-4-methylbenzamide (3fb):**



White solid, yield: 31.0 mg, 70%; M.P. = 184.6-185.5 °C; ^1H NMR (400 MHz, CDCl_3): δ 7.63 (d, J = 7.6 Hz, 2H), 7.32-7.28 (m, 3H), 7.25-7.18 (m, 6H), 6.87 (d, J = 8.4 Hz, 2H), 6.63 (s, 1H), 5.96 (s, 1H), 5.42 (d, J = 15.2 Hz, 1H), 4.97 (d, J = 15.6 Hz, 1H), 3.81 (s, 3H), 3.67 (d, J = 14.0 Hz, 1H), 3.39 (d, J = 14.0 Hz, 1H), 3.06 (dd, J = 17.6, 5.2 Hz, 1H), 2.84 (d, J = 17.2 Hz, 1H), 2.41 (s, 3H)

ppm; ^{13}C NMR (100 MHz, CDCl_3): δ 172.5, 166.9, 159.5, 142.8, 139.4, 135.5, 132.1, 130.9, 130.4, 129.5, 128.6, 127.3, 127.2, 127.1, 124.2, 114.1, 69.0, 62.8, 55.3, 41.2, 33.5, 21.5 ppm; HRMS (ESI) calculated for $\text{C}_{28}\text{H}_{28}\text{NO}_4$ $[\text{M} + \text{H}]^+$: 442.2013, found 442.2001.

***N*-(3-benzyl-6-(4-methoxyphenyl)-2-oxo-2,3,4,7-tetrahydrooxepin-3-yl)-4-bromobenzamide (3fc):** White solid, yield: 49.6 mg, 98%; M.P. = 139.0-139.4 °C; ^1H NMR (400 MHz, CDCl_3): δ 7.57 (s,

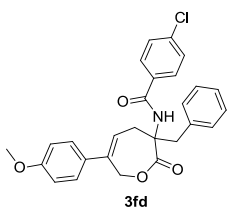


4H), 7.32-7.28 (m, 3H), 7.23-7.17 (m, 4H), 6.87 (d, J = 8.4 Hz, 2H), 6.74 (s, 1H), 6.00 (t, J = 5.2 Hz, 1H), 5.39 (d, J = 15.2 Hz, 1H), 5.01 (d, J = 15.6 Hz, 1H), 3.81 (s, 3H), 3.60 (d, J = 14.0 Hz, 1H), 3.42 (d, J = 14.0 Hz, 1H), 3.13 (dd, J = 17.6, 5.6 Hz, 1H), 2.87 (dd, J = 17.2, 4.4 Hz, 1H) ppm; ^{13}C NMR (100 MHz, CDCl_3): δ 172.6, 166.0, 159.6, 139.5, 135.0, 132.2, 132.0, 131.8, 130.7, 128.7, 128.6, 127.5, 127.2, 127.0, 124.4, 114.1, 69.0, 63.5, 55.4, 41.1, 33.3

ppm; HRMS (ESI) calculated for $\text{C}_{27}\text{H}_{25}\text{BrNO}_4$ $[\text{M} + \text{H}]^+$: 506.0961, found 506.0965.

***N*-(3-benzyl-6-(4-methoxyphenyl)-2-oxo-2,3,4,7-tetrahydrooxepin-3-yl)-4-chlorobenzamide (3fd):** White solid, yield: 46.0 mg, 99%; M.P. = 157.2-157.7 °C; ^1H NMR (400 MHz, CDCl_3): δ 7.65

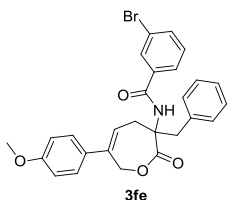
(d, J = 8.4 Hz, 2H), 7.40 (d, J = 8.4 Hz, 2H), 7.34-7.28 (m, 3H), 7.23-7.17 (m, 4H), 6.87 (d, J = 8.8 Hz, 2H), 6.75 (s, 1H), 6.00 (t, J = 4.8 Hz, 1H), 5.39 (d, J = 15.2 Hz, 1H), 5.00 (d, J = 15.2 Hz, 1H), 3.81 (s,



3H), 3.61 (d, $J = 14.0$ Hz, 1H), 3.42 (d, $J = 14.0$ Hz, 1H), 3.12 (dd, $J = 17.2, 5.6$ Hz, 1H), 2.87 (dd, $J = 17.2, 4.4$ Hz, 1H) ppm; ^{13}C NMR (100 MHz, CDCl_3): δ 172.6, 165.9, 159.6, 139.5, 138.5, 135.3, 131.8, 131.7, 130.7, 129.1, 128.7, 128.5, 127.5, 127.2, 124.4, 114.1, 69.0, 63.5, 55.3, 41.1, 33.3 ppm; HRMS (ESI) calculated for $\text{C}_{27}\text{H}_{25}\text{ClNO}_4$ $[\text{M} + \text{H}]^+$: 462.1467, found 462.1456.

***N*-(3-benzyl-6-(4-methoxyphenyl)-2-oxo-2,3,4,7-tetrahydrooxepin-3-yl)-3-bromobenzamide**

(3fe): White solid, yield: 49.0 mg, 97%; M.P. = 160.6-161.1 °C; ^1H NMR (400 MHz, CDCl_3): δ 7.86 (s,

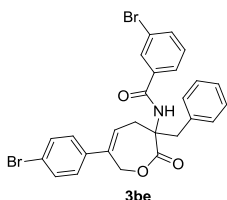


1H), 7.65 (d, $J = 8.0$ Hz, 1H), 7.60 (d, $J = 7.6$ Hz, 1H), 7.35-7.29 (m, 4H), 7.25-7.18 (m, 4H), 6.88 (d, $J = 8.8$ Hz, 2H), 6.72 (s, 1H), 6.02 (t, $J = 5.2$ Hz, 1H), 5.39 (d, $J = 15.2$ Hz, 1H), 5.03 (d, $J = 15.2$ Hz, 1H), 3.82 (s, 3H), 3.61 (d, $J = 14.0$ Hz, 1H), 3.46 (d, $J = 14.0$ Hz, 1H), 3.14 (dd, $J = 17.2, 6.0$ Hz, 1H), 2.90 (dd, $J = 17.6, 4.4$ Hz, 1H) ppm; ^{13}C NMR (100 MHz, CDCl_3): δ 172.6, 165.5, 159.6, 139.6, 135.5, 135.2, 135.1, 131.8, 130.6, 130.4, 130.3, 128.7,

127.5, 127.2, 125.5, 124.5, 123.0, 114.1, 69.1, 63.8, 55.3, 41.1, 33.3 ppm; HRMS (ESI) calculated for $\text{C}_{27}\text{H}_{25}\text{BrNO}_4$ $[\text{M} + \text{H}]^+$: 506.0961, found 506.0953.

***N*-(3-benzyl-6-(4-bromophenyl)-2-oxo-2,3,4,7-tetrahydrooxepin-3-yl)-3-bromobenzamide**

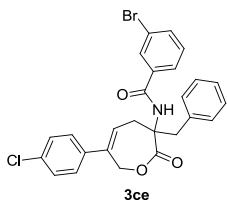
(3be): White solid, yield: 44.0 mg, 79%; M.P. = 200.5-201.4 °C; ^1H NMR (400 MHz, CDCl_3): δ 7.86 (s, 1H), 7.66 (d, $J = 6.4$ Hz, 1H), 7.61 (d, $J = 6.0$ Hz, 1H), 7.47 (d, $J = 6.8$ Hz, 2H), 7.31 (s, 4H), 7.16 (d, $J = 8.4$ Hz, 4H), 6.73 (s, 1H), 6.11 (s, 1H), 5.40 (d, $J = 14.8$ Hz, 1H), 4.98 (d, $J = 15.2$ Hz, 1H), 3.57 (d, $J = 13.2$ Hz, 1H), 3.46 (d, $J = 13.6$ Hz, 1H), 3.18 (d, $J = 14.0$ Hz, 1H), 2.90 (d, $J = 15.6$ Hz, 1H) ppm; ^{13}C NMR (100 MHz, CDCl_3): δ 172.5, 165.6, 139.2,



138.2, 135.4, 135.1, 135.0, 131.9, 130.6, 130.3, 128.8, 127.6, 127.5, 127.1, 125.5, 123.0, 122.2, 68.6, 63.9, 41.4, 33.4 ppm; HRMS (ESI) calculated for $\text{C}_{26}\text{H}_{22}\text{Br}_2\text{NO}_3$ $[\text{M} + \text{H}]^+$: 553.9961, found 553.9961.

***N*-(3-benzyl-6-(4-chlorophenyl)-2-oxo-2,3,4,7-tetrahydrooxepin-3-yl)-3-bromobenzamide**

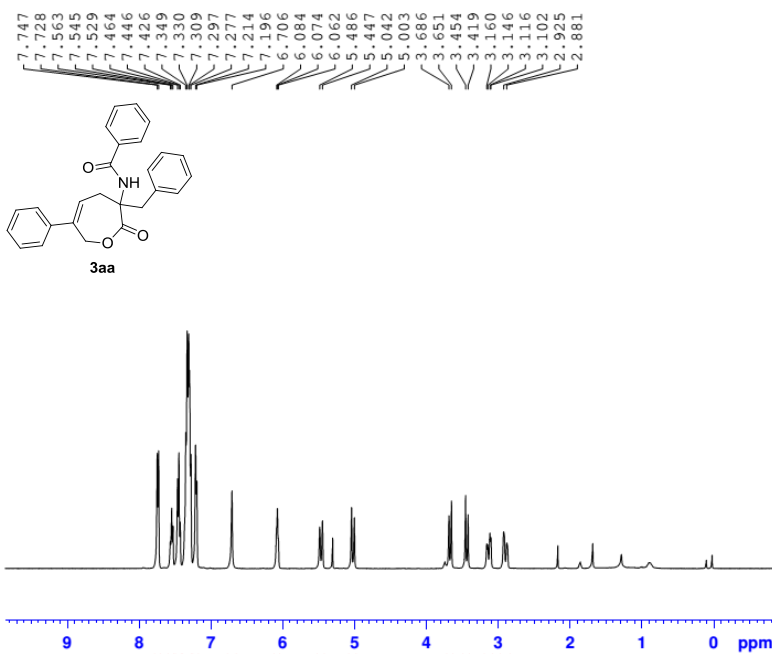
(3ce): White solid, yield: 38.0 mg, 75%; M.P. = 206.2-206.5 °C; ^1H NMR (400 MHz, CDCl_3): δ 7.86



(s, 1H), 7.66 (d, $J = 7.6$ Hz, 1H), 7.61 (d, $J = 7.6$ Hz, 1H), 7.33-7.28 (m, 6H), 7.23-7.18 (m, 4H), 6.73 (s, 1H), 6.10 (t, $J = 4.8$ Hz, 1H), 5.41 (d, $J = 15.2$ Hz, 1H), 4.99 (d, $J = 15.2$ Hz, 1H), 3.58 (d, $J = 14.0$ Hz, 1H), 3.46 (d, $J = 14.0$ Hz, 1H), 3.19 (dd, $J = 17.2, 6.0$ Hz, 1H), 2.91 (dd, $J = 16.8, 4.4$ Hz, 1H) ppm; ^{13}C NMR (100 MHz, CDCl_3): δ 172.5, 165.6, 139.2, 137.7, 135.4, 135.1, 135.0,

134.1, 130.6, 130.3, 128.9, 128.8, 127.6, 127.2, 127.0, 125.5, 123.0, 68.7, 64.0, 41.4, 33.3 ppm; HRMS (ESI) calculated for $\text{C}_{26}\text{H}_{22}\text{BrClNO}_3$ $[\text{M} + \text{H}]^+$: 510.0466, found 510.0458.

7. ¹H and ¹³C NMR spectra

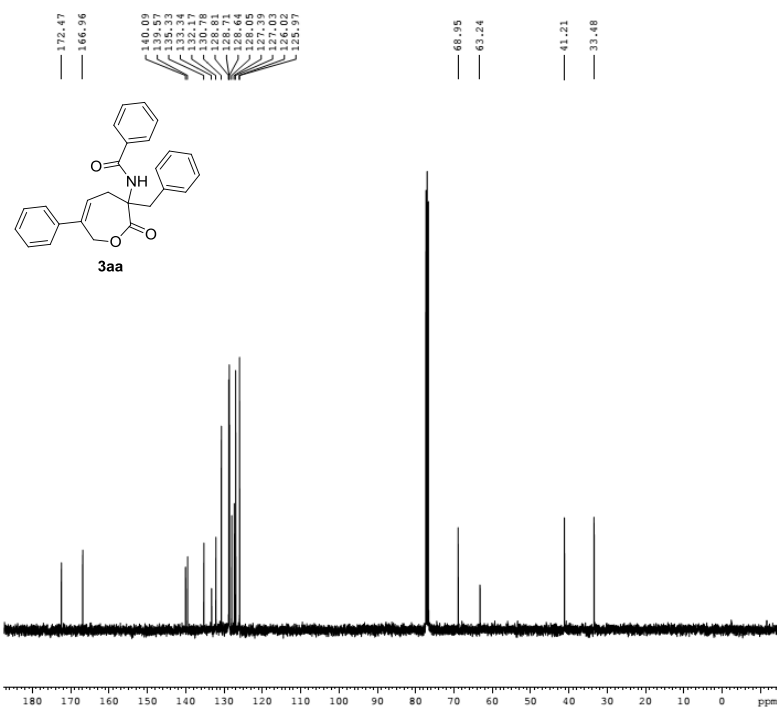


```

NAME          NMR
EXPNO         5855
PROCNO        1
Date_         20180422
Time          10.12
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            65536
SOLVENT       CDCl3
NS            16
DS            2
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ            3.9846387 sec
RG            128
DW            60.800 usec
DE            6.50 usec
TE            300.0 K
D1            1.0000000 sec
D11           1
TD0           1
    
```

```

----- CHANNEL f1 -----
NUC1          1H
P1            14.50 usec
PL1           -2.83 dB
PL1W          16.91636658 W
SFO1          400.1724712 MHz
SI            32768
SF            400.1700000 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00
    
```



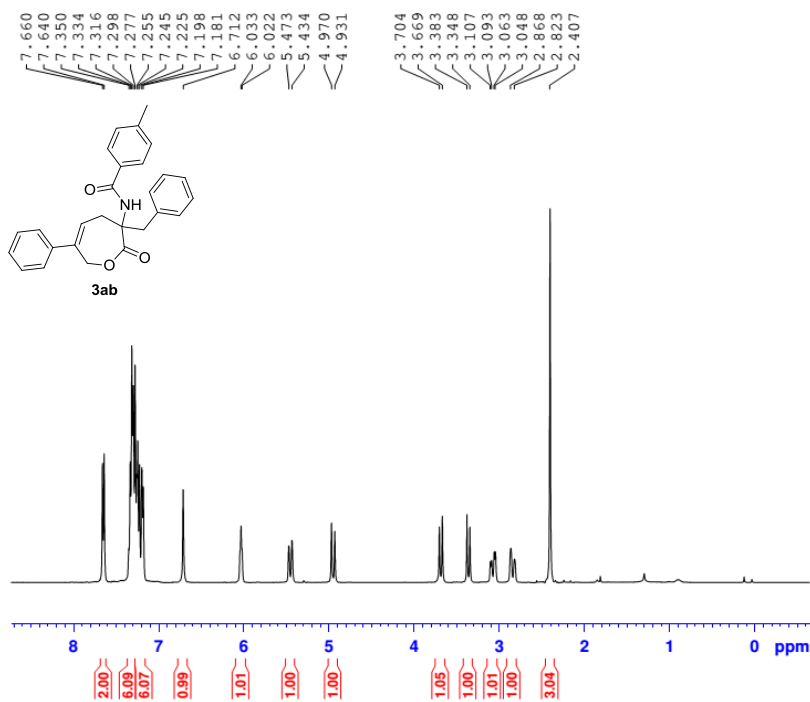
```

NAME          NMR
EXPNO         5856
PROCNO        1
Date_         20180421
Time          14.50
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            128
DS            4
SWH           24038.461 Hz
FIDRES        0.366798 Hz
AQ            1.3631988 sec
RG            2050
DW            20.800 usec
DE            6.50 usec
TE            300.0 K
D1            2.0000000 sec
D11           0.0300000 sec
TD0           1
    
```

```

----- CHANNEL f1 -----
NUC1          13C
P1            11.70 usec
PL1           -2.00 dB
PL1W          48.76812744 W
SFO1          100.6328888 MHz

----- CHANNEL f2 -----
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           -2.83 dB
PL12          12.00 dB
PL13          14.00 dB
PL2W          16.91636658 W
PL12W         0.55629748 W
PL13W         0.35100001 W
SFO2          400.1716007 MHz
SI            32768
SF            100.6228270 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
PC            1.40
    
```

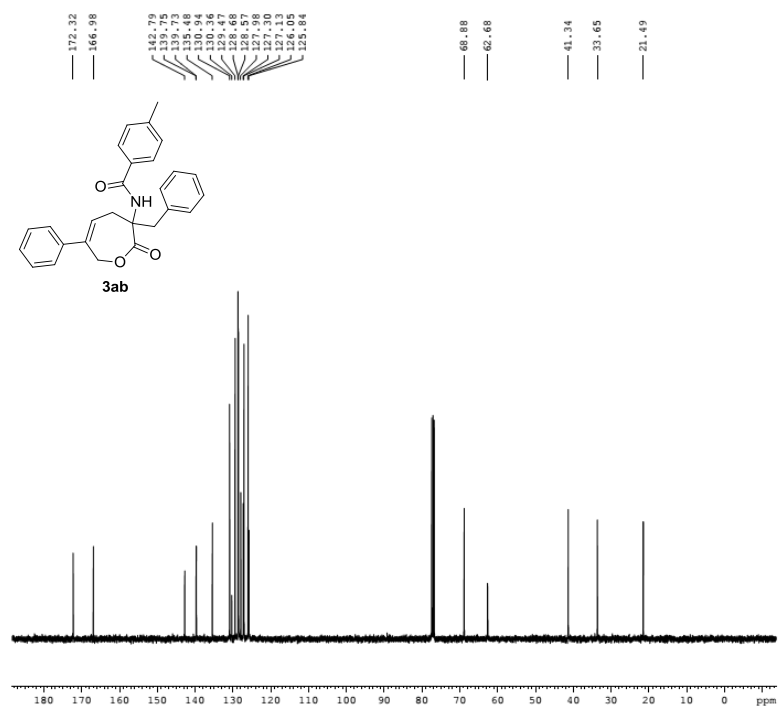


```

NAME          NMR
EXPNO         5843
PROCNO        1
Date_         20180417
Time         14.56
INSTRUM       spect
PROBHD        5 mm FABBO BB-
PULPROG       zg30
TD            65536
SOLVENT       CDCl3
NS            4
DS            0
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ            3.9846387 sec
RG            90.5
DW            60.800 usec
DE            6.50 usec
TE            300.0 K
D1            1.00000000 sec
D11           1
TD0           1
  
```

```

----- CHANNEL f1 -----
NUC1          1H
P1            14.50 usec
PL1           -2.83 dB
PL1W          16.91636658 W
SFO1          400.1724712 MHz
SI            32768
SF            400.1700000 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00
  
```



```

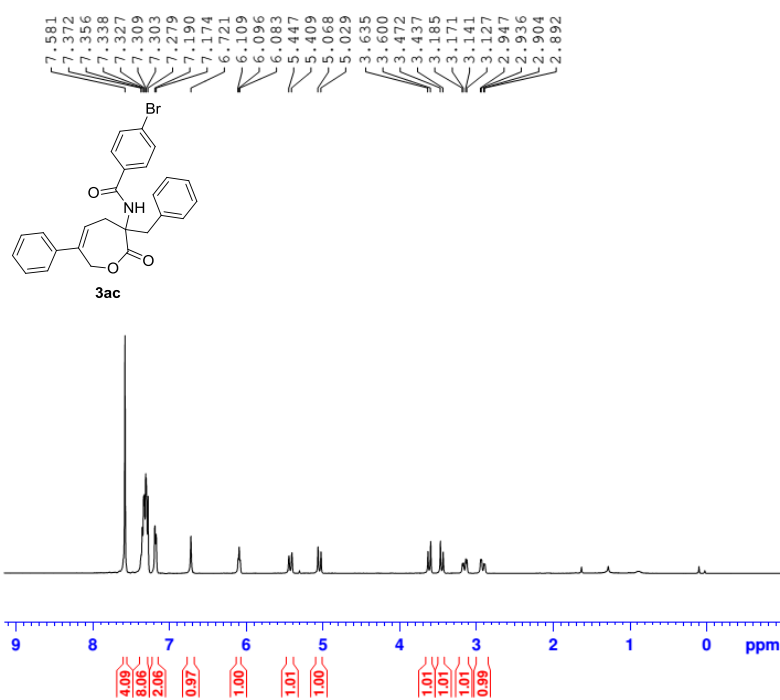
NAME          NMR
EXPNO         5844
PROCNO        1
Date_         20180417
Time         15.06
INSTRUM       spect
PROBHD        5 mm FABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            128
DS            4
SWH           24038.461 Hz
FIDRES        0.366798 Hz
AQ            1.3631988 sec
RG            2050
DW            20.800 usec
DE            6.50 usec
TE            300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0           1
  
```

```

----- CHANNEL f1 -----
NUC1          13C
P1            11.70 usec
PL1           -2.00 dB
PL1W          48.76812744 W
SFO1          100.6328888 MHz
  
```

```

----- CHANNEL f2 -----
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           -2.83 dB
PL12          12.00 dB
PL13          14.00 dB
PL2W          16.91636658 W
PL12W         0.55629748 W
PL13W         0.35100001 W
SFO2          400.1716007 MHz
SI            32768
SF            100.6228270 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
PC            1.40
  
```

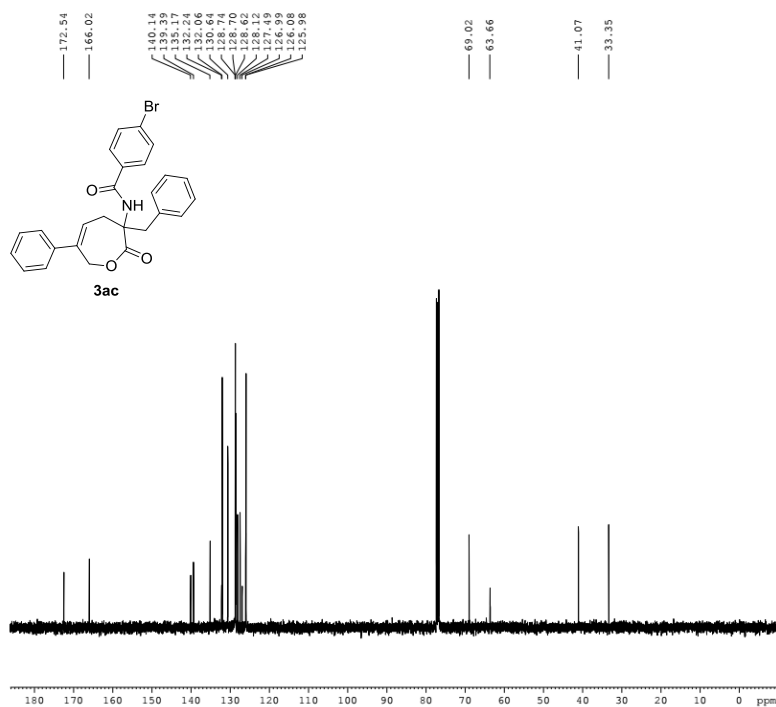


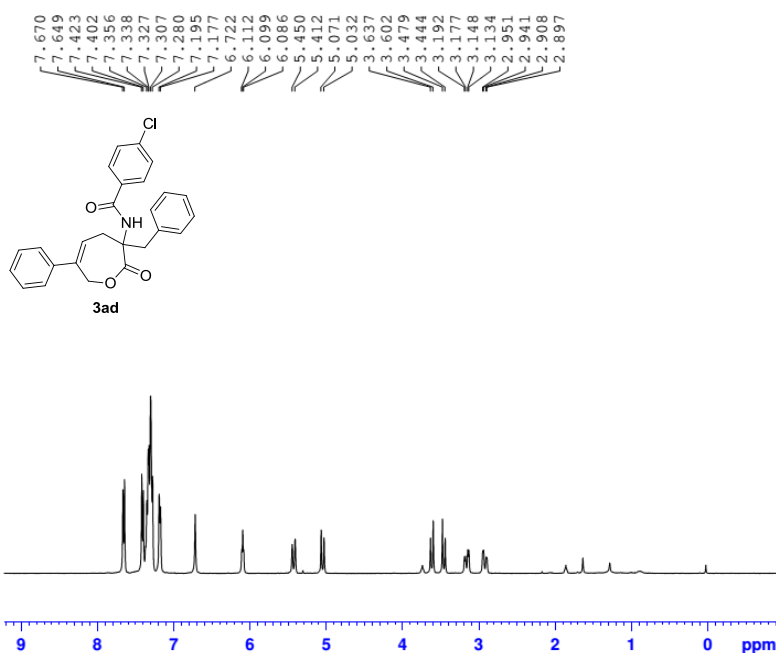
```

NAME          NMR
EXPNO         5839
PROCNO        1
Date_         20180414
Time         17.05
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            65536
SOLVENT       CDCl3
NS            4
DS            0
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ            3.9846387 sec
RG            128
DW            60.800 usec
DE            6.50 usec
TE            300.0 K
D1            1.00000000 sec
TD0           1
  
```

```

----- CHANNEL f1 -----
NUC1          1H
P1            14.50 usec
PL1           -2.83 dB
PL1W          16.91636658 W
SF01          400.1724712 MHz
SI            32768
SF            400.1700000 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00
  
```



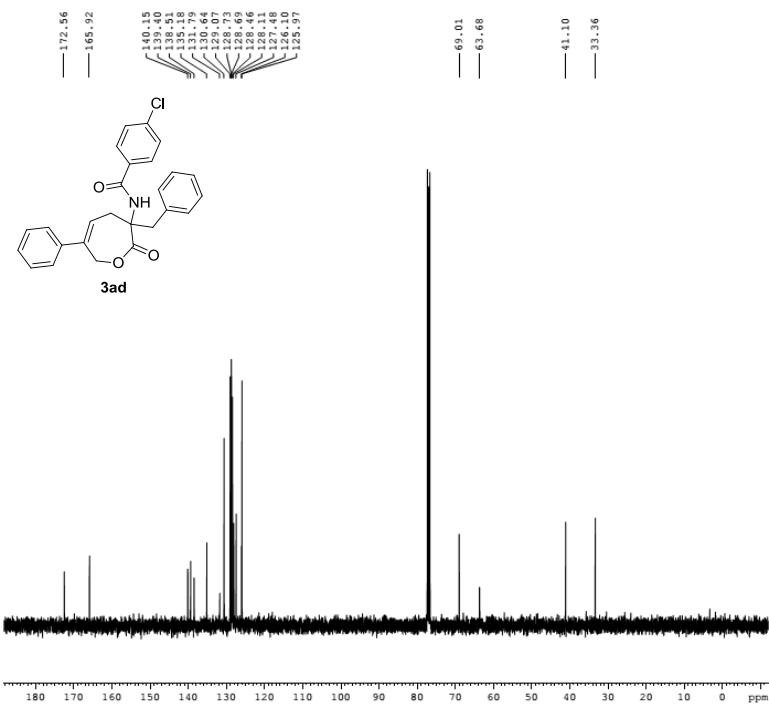


```

NAME          NMR
EXPNO         5879
PROCNO        1
Date_         20180430
Time         11.32
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            65536
SOLVENT       CDCl3
NS            4
DS            0
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ            3.9846387 sec
RG            144
DW            60.800 usec
DE            6.50 usec
TE            300.0 K
D1            1.00000000 sec
D11           1
TD0           1
  
```

```

----- CHANNEL f1 -----
NUC1          1H
P1            14.50 usec
PL1           -2.83 dB
PL1W          16.91636658 W
SFO1          400.1724712 MHz
SI            32768
SF            400.1700000 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00
  
```



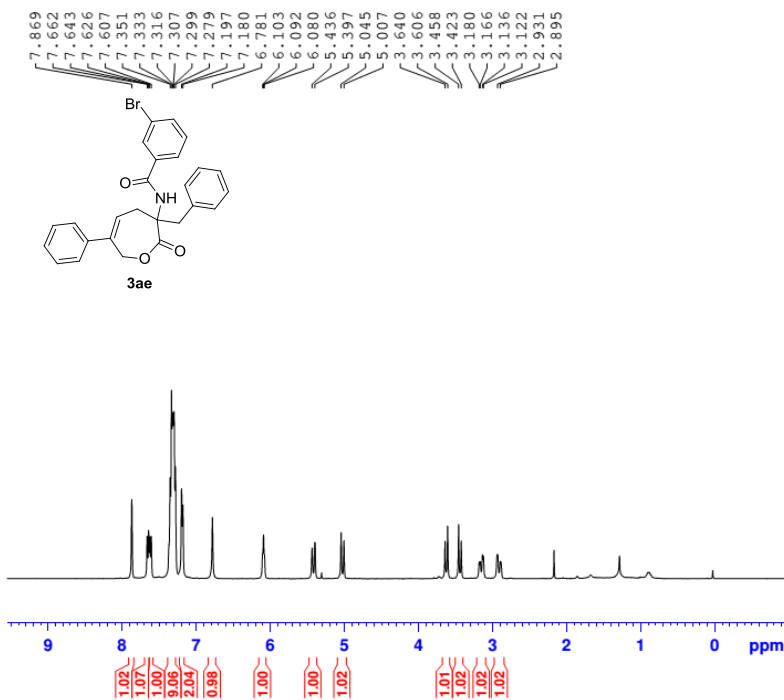
```

NAME          NMR
EXPNO         5880
PROCNO        1
Date_         20180430
Time         11.26
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            78
DS            0
SWH           24038.461 Hz
FIDRES        0.366798 Hz
AQ            1.3631988 sec
RG            2050
DW            20.800 usec
DE            6.50 usec
TE            300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0           1
  
```

```

----- CHANNEL f1 -----
NUC1          13C
P1            11.70 usec
PL1           -2.00 dB
PL1W          48.76812744 W
SFO1          100.6328888 MHz

----- CHANNEL f2 -----
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           -2.83 dB
PL12          12.00 dB
PL13          14.00 dB
PL2W          16.91636658 W
PL12W         0.55629748 W
PL13W         0.35100001 W
SFO2          400.1716007 MHz
SI            32768
SF            100.6228270 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
PC            1.40
  
```

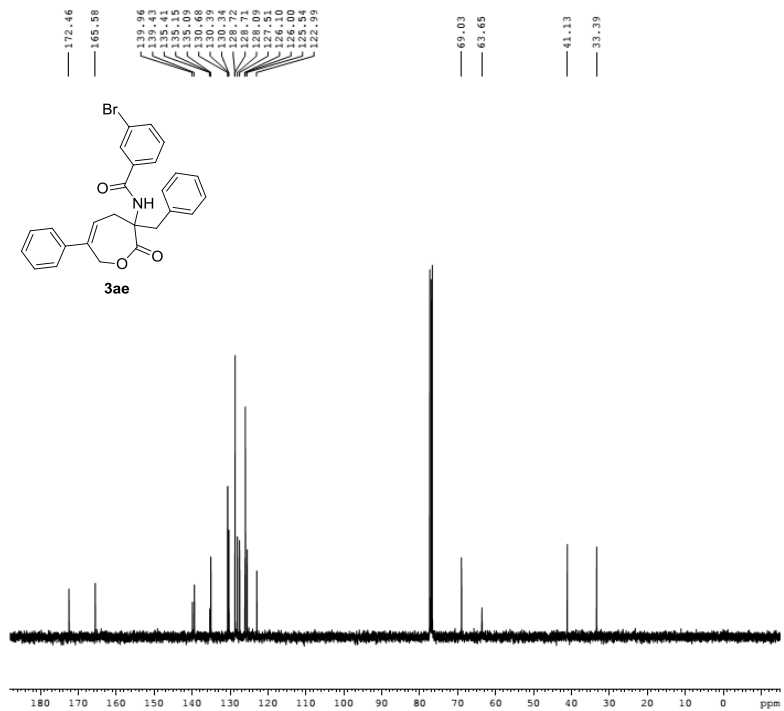


```

NAME          NMR
EXPNO         5865
PROCNO        1
Date_         20180426
Time          14.05
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            65536
SOLVENT       CDCl3
NS            4
DS            2
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ            3.9846397 sec
RG            144
DW            60.800 usec
DE            6.50 usec
TE            300.0 K
D1            1.00000000 sec
TD0           1
  
```

```

----- CHANNEL f1 -----
NUC1          1H
P1            14.50 usec
PL1           -2.83 dB
PL1W         16.9163658 W
SF01         400.1724712 MHz
SI            32768
SF           400.1700000 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00
  
```



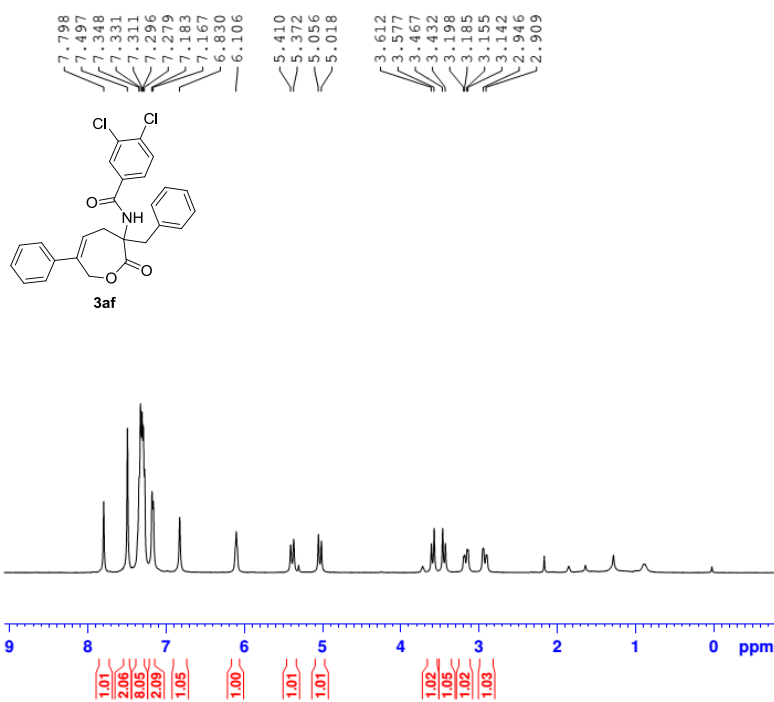
```

NAME          NMR
EXPNO         5866
PROCNO        1
Date_         20180426
Time          14.08
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            89
DS            4
SWH           24038.461 Hz
FIDRES        0.368798 Hz
AQ            1.3631988 sec
RG            2050
DW            20.800 usec
DE            6.50 usec
TE            300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0           1
  
```

```

----- CHANNEL f1 -----
NUC1          13C
P1            11.70 usec
PL1           -2.00 dB
PL1W         48.76812744 W
SF01         100.6328888 MHz

----- CHANNEL f2 -----
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           -2.83 dB
PL12         12.00 dB
PL13         14.00 dB
PL2W         16.9163658 W
PL12W        0.55629748 W
PL13W        0.35100001 W
SF02         400.1716007 MHz
SI            32768
SF           100.6228270 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
PC            1.40
  
```

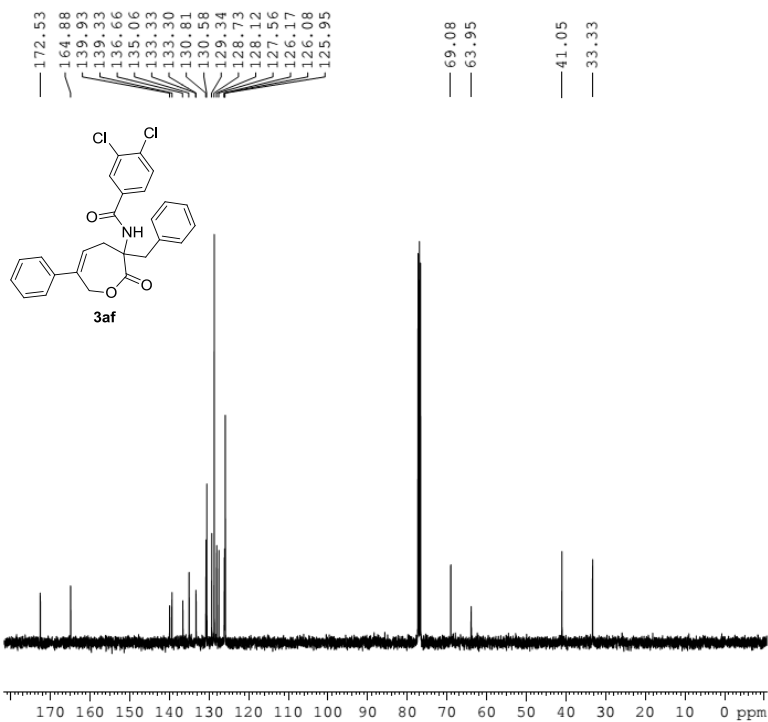


```

NAME          NMR
EXPNO         5853
PROCNO        1
Date_         20180421
Time_         11.19
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            65536
SOLVENT       CDCl3
NS            4
DS            0
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ            3.9846387 sec
RG            128
DW            60.800 usec
DE            6.50 usec
TE            300.0 K
D1            1.0000000 sec
D11           1
TD0           1
  
```

```

----- CHANNEL f1 -----
NUC1          1H
P1            14.50 usec
PL1           -2.83 dB
PL1W          16.91636658 W
SFO1          400.1724712 MHz
SI            32768
SF            400.1700000 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00
  
```



```

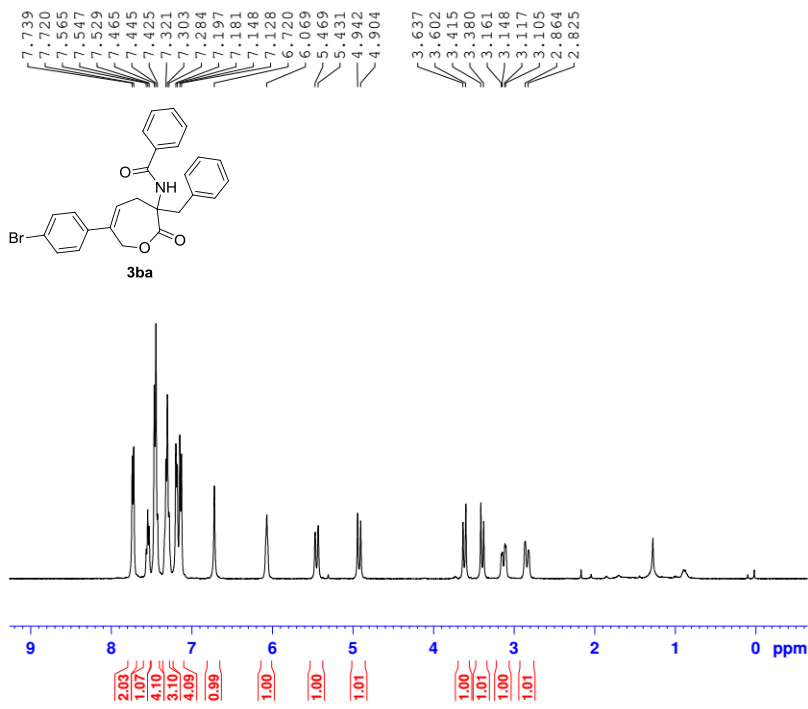
NAME          NMR
EXPNO         5854
PROCNO        1
Date_         20180421
Time_         11.29
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            128
DS            4
SWH           24038.461 Hz
FIDRES        0.366798 Hz
AQ            1.3631988 sec
RG            2050
DW            20.800 usec
DE            6.50 usec
TE            300.0 K
D1            2.0000000 sec
D11           0.0300000 sec
TD0           1
  
```

```

----- CHANNEL f1 -----
NUC1          13C
P1            11.70 usec
PL1           -2.00 dB
PL1W          48.76812744 W
SFO1          100.6328888 MHz
  
```

```

----- CHANNEL f2 -----
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           -2.83 dB
PL12          12.00 dB
PL13          14.00 dB
PL2W          16.91636658 W
PL12W         0.55629748 W
PL13W         0.35100001 W
SFO2          400.1716007 MHz
SI            32768
SF            100.6228270 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
PC            1.40
  
```

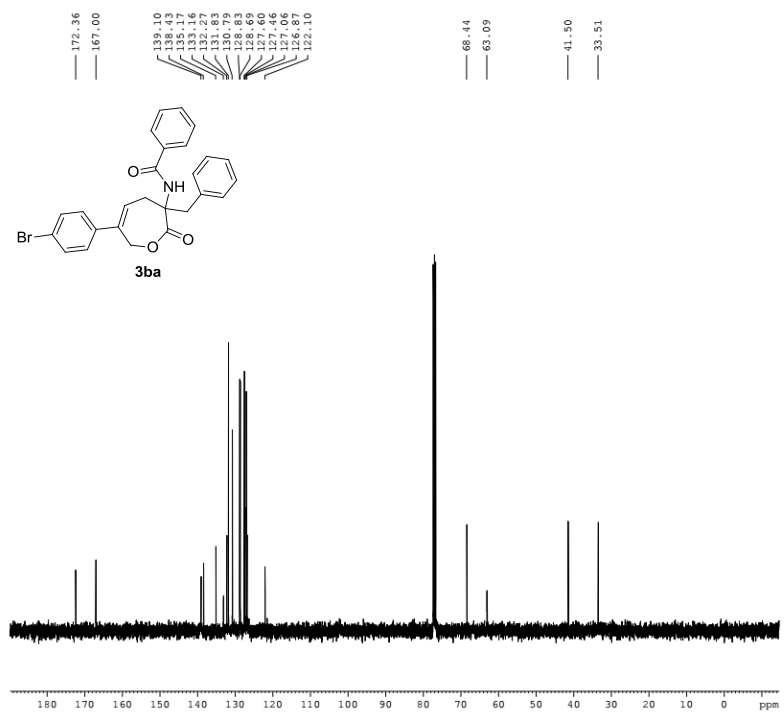



```

NAME          NMR
EXPNO         5835
PROCNO        1
Date_         20180413
Time         17.54
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            65536
SOLVENT       CDCl3
NS            4
DS            2
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ            3.9846387 sec
RG            128
DW            60.800 usec
DE            6.50 usec
TE            300.0 K
D1            1.0000000 sec
TD0           1
  
```

```

===== CHANNEL f1 =====
NUC1          1H
P1            14.50 usec
PL1           -2.83 dB
PL1W         16.91636658 W
SFO1         400.1724712 MHz
SI            32768
SF           400.1700000 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00
  
```



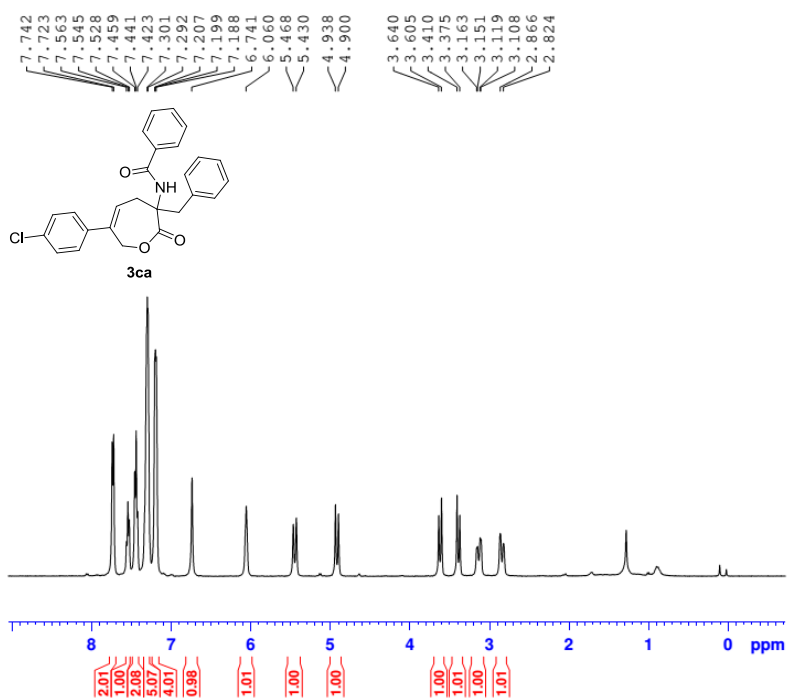
```

NAME          NMR
EXPNO         5836
PROCNO        1
Date_         20180413
Time         17.59
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            65
DS            4
SWH           24038.461 Hz
FIDRES        0.366798 Hz
AQ            1.3631988 sec
RG            2050
DW            20.800 usec
DE            6.50 usec
TE            300.0 K
D1            2.0000000 sec
D11           0.0300000 sec
TD0           1
  
```

```

===== CHANNEL f1 =====
NUC1          13C
P1            11.70 usec
PL1           -2.00 dB
PL1W         48.76812744 W
SFO1         100.6328888 MHz

===== CHANNEL f2 =====
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           -2.83 dB
PL12         12.00 dB
PL13         14.00 dB
PL2W         16.91636658 W
PL12W        0.55629748 W
PL13W        0.35100001 W
SFO2         400.1716007 MHz
SI            32768
SF           100.6228270 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
PC            1.40
  
```

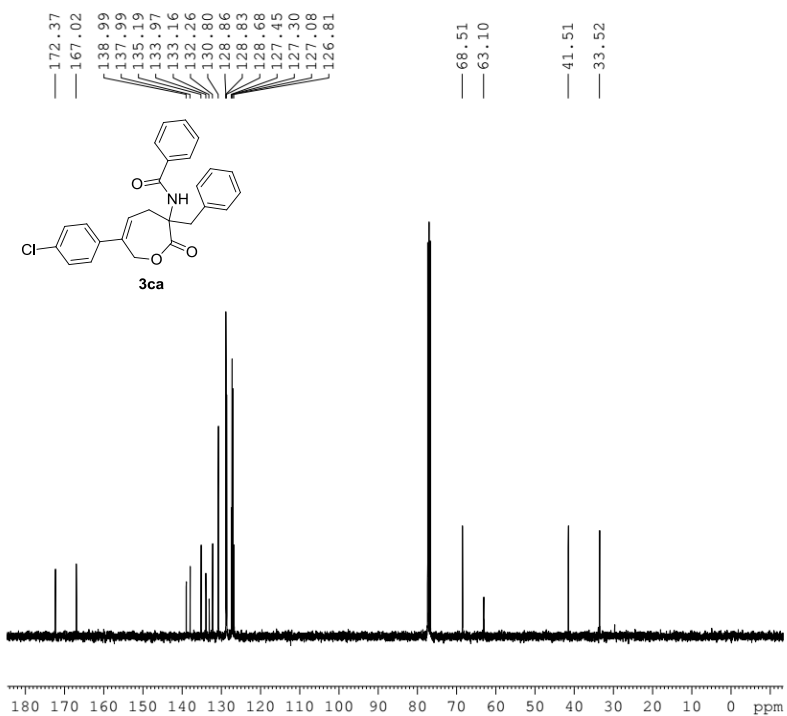


```

NAME          NMR
EXPNO         5833
PROCNO        1
Date_         20180413
Time         15.18
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            65536
SOLVENT       CDCl3
NS            4
DS            0
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ            3.9846397 sec
RG            144
DW            60.800 usec
DE            6.50 usec
TE            300.0 K
D1            1.00000000 sec
D11           1
TD0           1
  
```

```

----- CHANNEL f1 -----
NUC1          1H
P1            14.50 usec
PL1           -2.83 dB
PL1W         16.91636658 W
SFO1         400.1724712 MHz
SI            32768
SF           400.1700000 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00
  
```



```

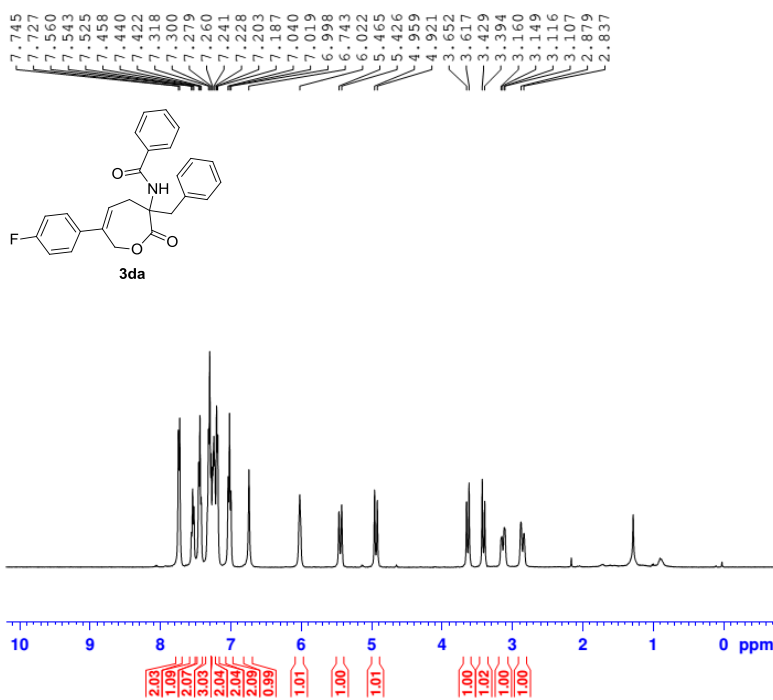
NAME          NMR
EXPNO         5834
PROCNO        1
Date_         20180413
Time         15.32
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            4
DS            4
SWH           24038.461 Hz
FIDRES        0.366798 Hz
AQ            1.3631988 sec
RG            2050
DW            20.800 usec
DE            6.50 usec
TE            300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
D12           1
TD0           1
  
```

```

----- CHANNEL f1 -----
NUC1          13C
P1            11.70 usec
PL1           -2.00 dB
PL1W         48.76817744 W
SFO1         100.6328888 MHz
  
```

```

----- CHANNEL f2 -----
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           -2.83 dB
PL12         12.00 dB
PL13         14.00 dB
PL2W         16.91636658 W
PL12W        0.55629748 W
PL13W        0.35100001 W
SFO2         400.1716007 MHz
SI            32768
SF           100.6228270 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
PC            1.40
  
```

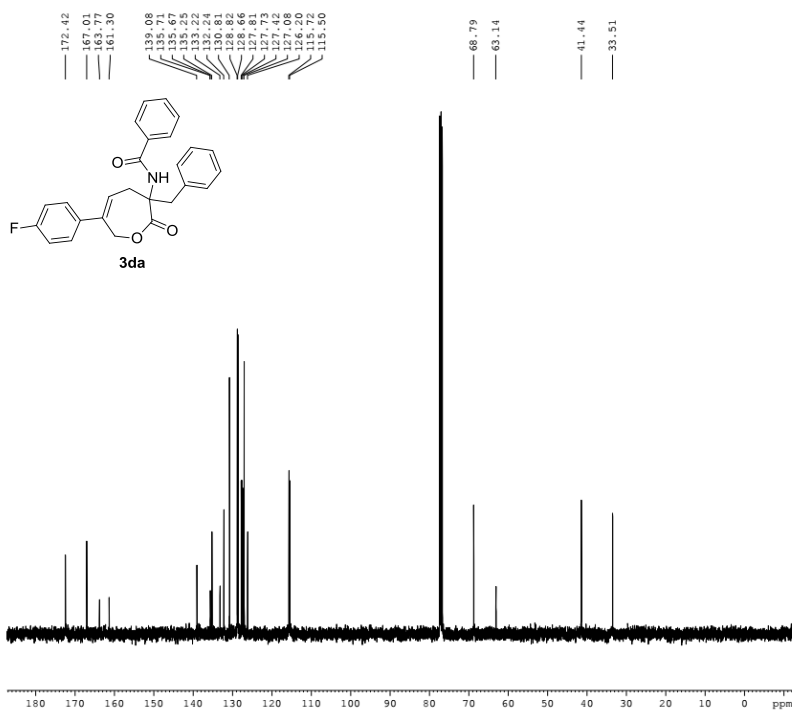


```

NAME          NMR
EXPNO         5819
PROCNO        1
Date_         20180412
Time         11.42
INSTRUM      spect
PROBHD       5 mm PABBO BB-
PULPROG      zg30
TD           65536
SOLVENT      CDCl3
NS           4
DS           0
SWH          8223.685 Hz
FIDRES       0.125483 Hz
AQ          3.9846387 sec
RG          144
DW          60.800 usec
DE          6.50 usec
TE          300.0 K
D1          1.00000000 sec
D11         1
D10         1
  
```

```

----- CHANNEL f1 -----
NUC1         1H
P1          14.50 usec
PL1         -2.83 dB
PL1W       16.91636658 W
SFO1       400.1724712 MHz
SI         32768
SF         400.1700000 MHz
WDW         EM
SSB         0
LB         0.30 Hz
GB         0
PC         1.00
  
```



```

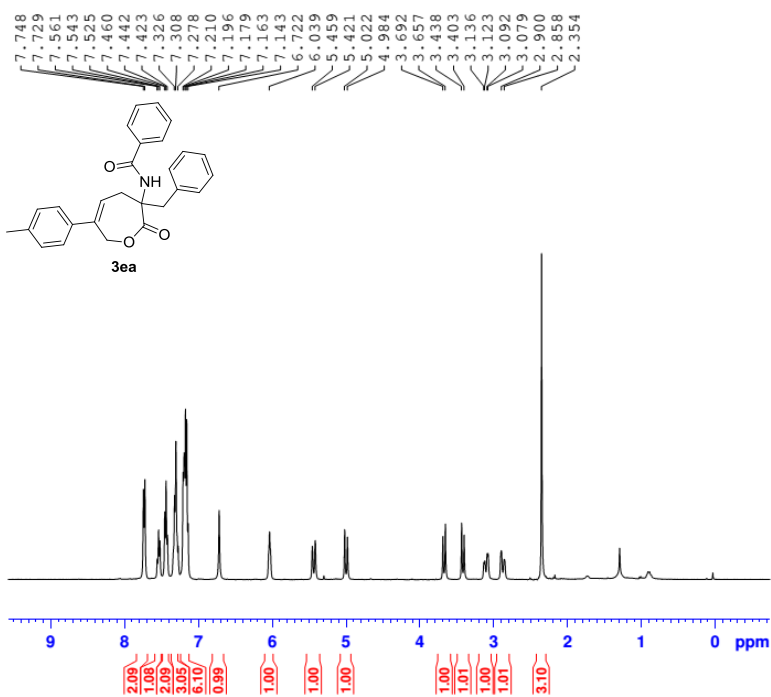
NAME          NMR
EXPNO         5820
PROCNO        1
Date_         20180412
Time         11.35
INSTRUM      spect
PROBHD       5 mm PABBO BB-
PULPROG      zgpg30
TD           65536
SOLVENT      CDCl3
NS           76
DS           4
SWH          24038.461 Hz
FIDRES       0.366798 Hz
AQ          1.3631988 sec
RG          2050
DW          20.800 usec
DE          6.50 usec
TE          300.0 K
D1          2.00000000 sec
D11         0.03000000 sec
D10         1
  
```

```

===== CHANNEL f1 =====
NUC1         13C
P1          11.70 usec
PL1         -2.00 dB
PL1W       48.76812744 W
SFO1       100.6328888 MHz
  
```

```

===== CHANNEL f2 =====
CPDPRG2     waltz16
NUC2         1H
FQPD2       80.00 usec
PL2         -2.83 dB
PL12       12.00 dB
PL13       14.00 dB
PL1W       16.91636658 W
PL12W      0.55629748 W
PL13W      0.35100001 W
SFO2       400.1716007 MHz
SI         32768
SF         100.6228270 MHz
WDW         EM
SSB         0
LB         1.00 Hz
GB         0
PC         1.40
  
```

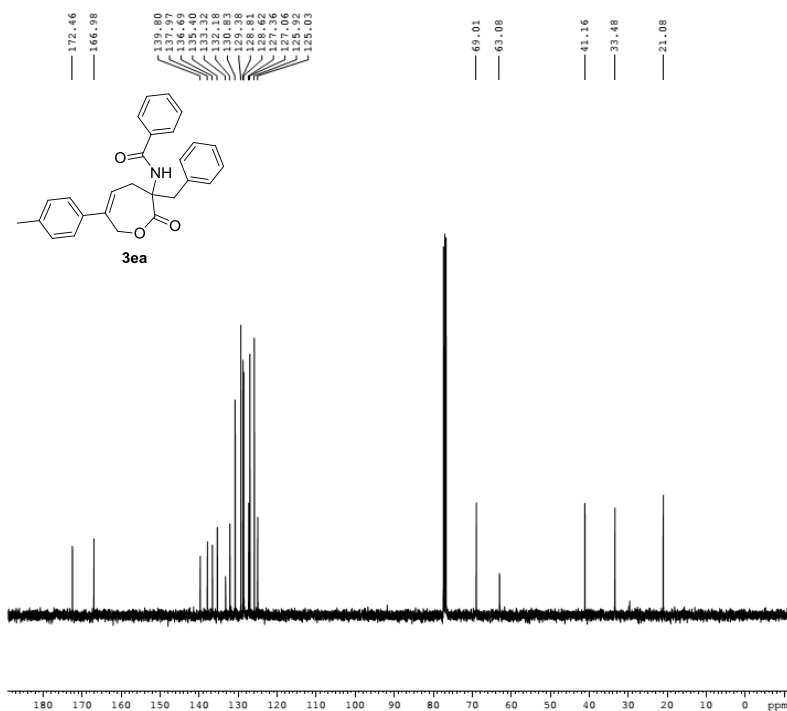


```

NAME          NMR
EXPNO         5842
PROCNO        1
Date_         20180417
Time          14.51
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            4
DS            0
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ            3.9846387 sec
RG            101
DW            60.800 usec
DE            6.50 usec
TE            300.0 K
D1            1.00000000 sec
TD0           1
  
```

```

----- CHANNEL f1 -----
NUC1          1H
P1            14.50 usec
PL1           -2.83 dB
PL1W          16.91636658 W
SFO1          400.1724712 MHz
SI            32768
SF            400.1700000 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00
  
```



```

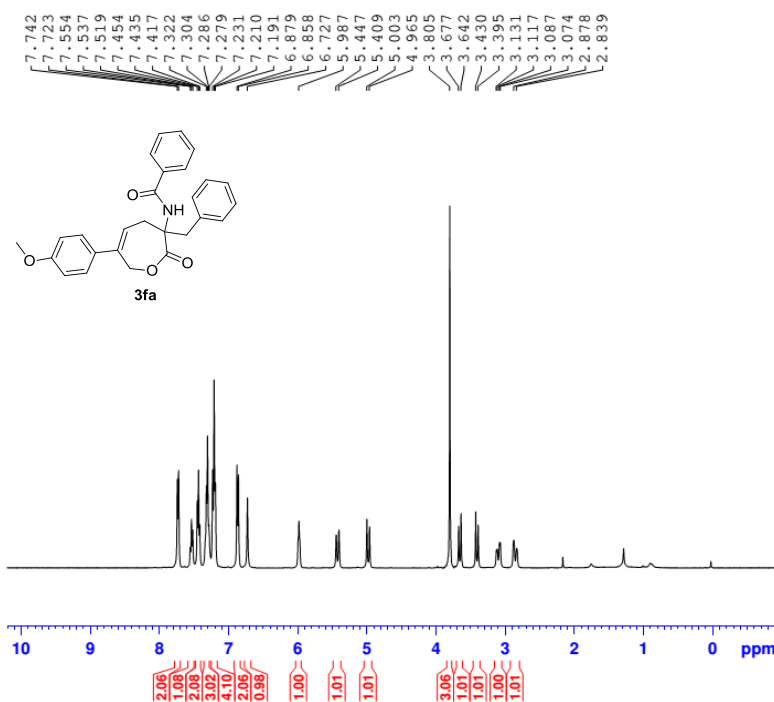
NAME          NMR
EXPNO         5841
PROCNO        1
Date_         20180417
Time          14.46
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            67
DS            4
SWH           24038.461 Hz
FIDRES        0.366798 Hz
AQ            1.3631988 sec
RG            2050
DW            20.800 usec
DE            6.50 usec
TE            300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0           1
  
```

```

----- CHANNEL f1 -----
NUC1          13C
P1            11.70 usec
PL1           -2.00 dB
PL1W          48.76812744 W
SFO1          100.6228888 MHz
  
```

```

----- CHANNEL f2 -----
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           -2.83 dB
PL12          12.00 dB
PL13          14.00 dB
PL2W          16.91636658 W
PL12W         0.55629748 W
PL13W         0.35100001 W
SFO2          400.1716007 MHz
SI            32768
SF            100.6228270 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
PC            1.40
  
```

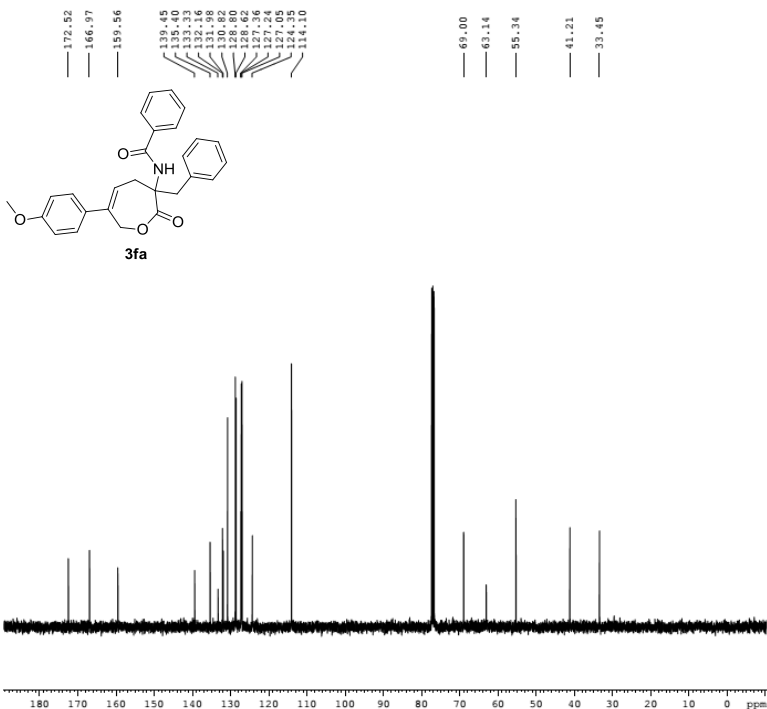


```

NAME      NMR
EXPNO     5849
PROCNO    1
Date_     20180419
Time      17.20
INSTRUM   spect
PROBHD    5 mm PABBO BB-
PULPROG   zg30
TD         65536
SOLVENT   CDCl3
NS         4
DS         0
SWH        8223.685 Hz
FIDRES     0.125483 Hz
AQ         3.9846387 sec
RG         128
DW         60.800 usec
DE         6.50 usec
TE         300.0 K
D1         1.00000000 sec
TD0        1
  
```

```

----- CHANNEL f1 -----
NUC1      1H
P1         14.50 usec
PL1        -2.83 dB
PL1W      16.91636658 W
SF01      400.1724712 MHz
SI         32768
SF         400.17000000 MHz
WDW        EM
SSB         0
LB         0.30 Hz
GB         0
PC         1.00
  
```



```

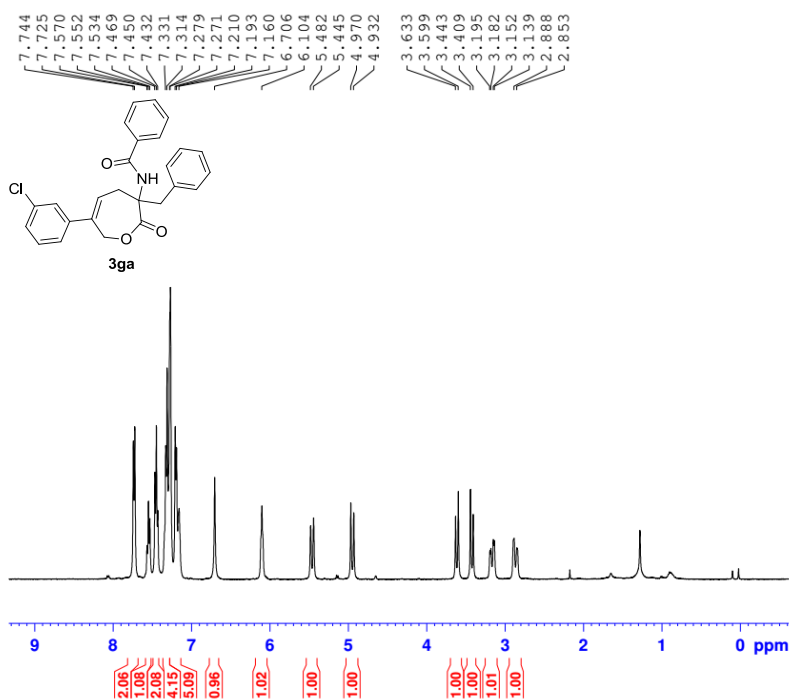
NAME      NMR
EXPNO     5850
PROCNO    1
Date_     20180419
Time      17.25
INSTRUM   spect
PROBHD    5 mm PABBO BB-
PULPROG   zgpg30
TD         65536
SOLVENT   CDCl3
NS         62
DS         4
SWH        24038.461 Hz
FIDRES     0.366798 Hz
AQ         1.3631988 sec
RG         2050
DW         20.800 usec
DE         6.50 usec
TE         300.0 K
D1         2.00000000 sec
D11        0.03000000 sec
TD0        1
  
```

```

----- CHANNEL f1 -----
NUC1      13C
P1         11.70 usec
PL1        -2.00 dB
PL1W      48.76812744 W
SF01      100.6328888 MHz
  
```

```

----- CHANNEL f2 -----
CPDPRG2   waltz16
NUC2      1H
PCPD2     80.00 usec
PL2        -2.83 dB
PL12      12.00 dB
PL13      14.00 dB
PL12W     16.91636658 W
PL12W     0.55629748 W
PL13W     0.35100001 W
SF02      400.1716007 MHz
SI         32768
SF         100.6228270 MHz
WDW        EM
SSB         0
LB         1.00 Hz
GB         0
PC         1.40
  
```

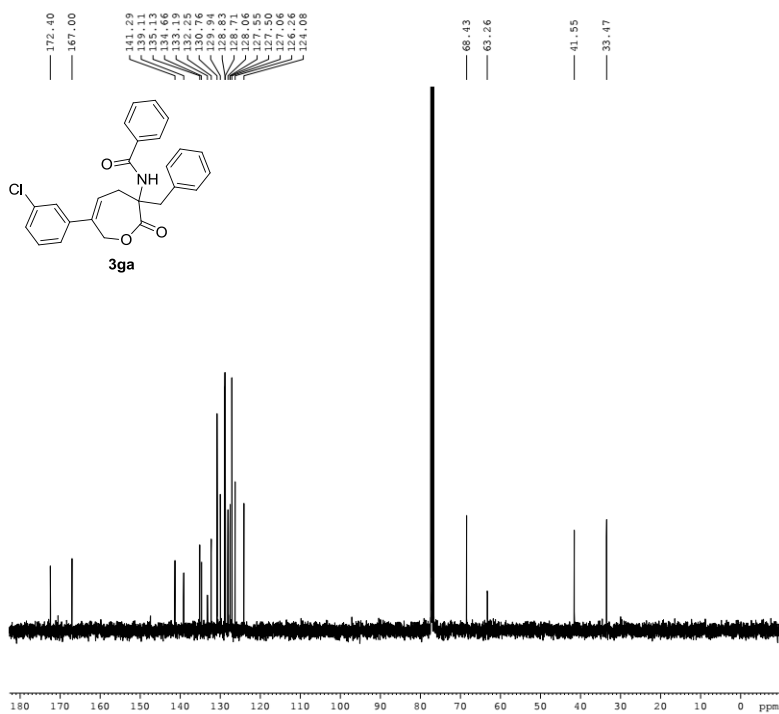


```

NAME          NMR
EXPNO         5815
PROCNO        1
Date_         20180412
Time          11.02
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            65536
SOLVENT       CDCl3
NS            4
DS            0
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ            3.9846387 sec
RG            144
DW            60.800 usec
DE            6.50 usec
TE            300.0 K
D1            1.00000000 sec
TD0           1

===== CHANNEL f1 =====
NUC1           1H
P1            14.50 usec
PL1           -2.83 dB
PL1W          16.91636658 W
SFO1          400.1724712 MHz
SI            32768
SF            400.1700000 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
FC            1.00

```



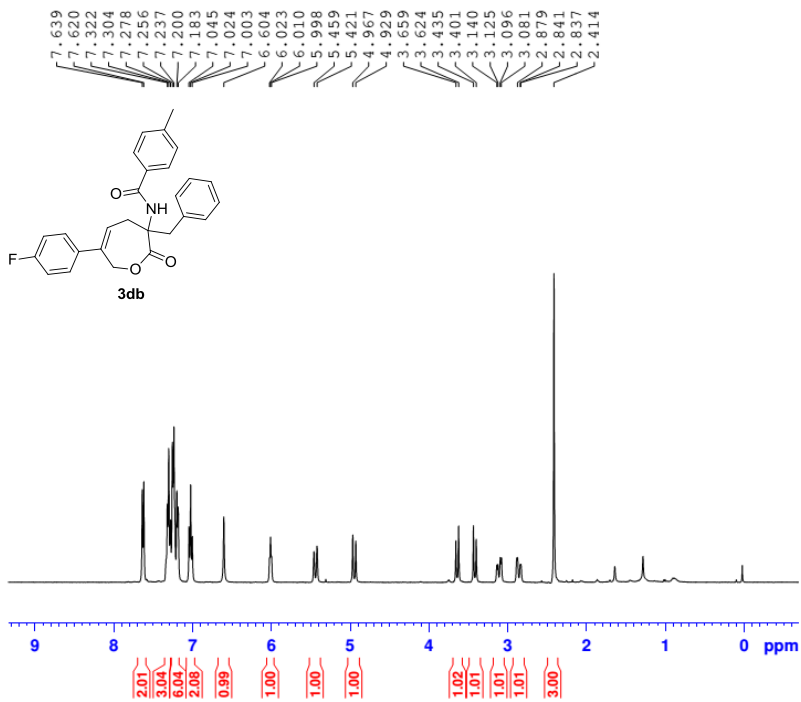
```

NAME          NMR
EXPNO         5816
PROCNO        1
Date_         20180412
Time          11.09
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            128
DS            4
SWH           24038.461 Hz
FIDRES        0.366798 Hz
AQ            1.3631988 sec
RG            2050
DW            20.800 usec
DE            6.50 usec
TE            300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0           1

===== CHANNEL f1 =====
NUC1           13C
P1            11.70 usec
PL1           -2.00 dB
PL1W          48.76812744 W
SFO1          100.6328888 MHz

===== CHANNEL f2 =====
CPDPRG2       waltz16
NUC2           1H
PCPD2         80.00 usec
PL2           -2.83 dB
PL12          12.00 dB
PL13          14.00 dB
PL2W          16.91636658 W
PL12W         0.55629748 W
PL13W         0.35100001 W
SFO2          400.1716007 MHz
SI            32768
SF            100.6228270 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
FC            1.40

```

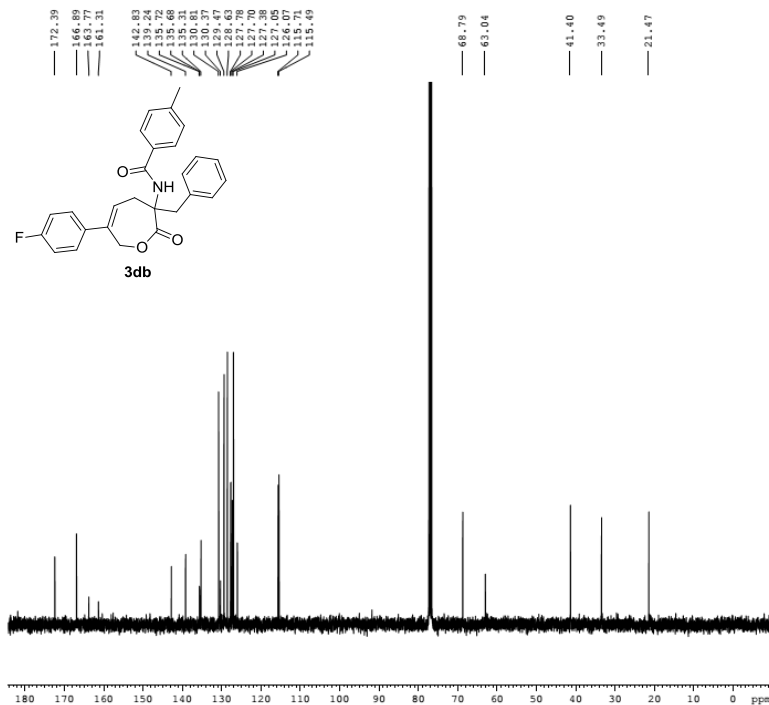


```

NAME          NMR
EXPNO         5867
PROCNO        1
Date_         20180426
Time          14.32
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            65536
SOLVENT       CDCl3
NS            4
DS            0
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ            3.9846387 sec
RG            144
DW            60.800 usec
DE            6.50 usec
TE            300.0 K
D1            1.00000000 sec
TD0           1
  
```

```

----- CHANNEL f1 -----
NUC1          1H
P1            14.50 usec
PL1           -2.83 dB
PL1W          16.91636658 W
SFO1          400.1724712 MHz
SI            32768
SF            400.1700000 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00
  
```



```

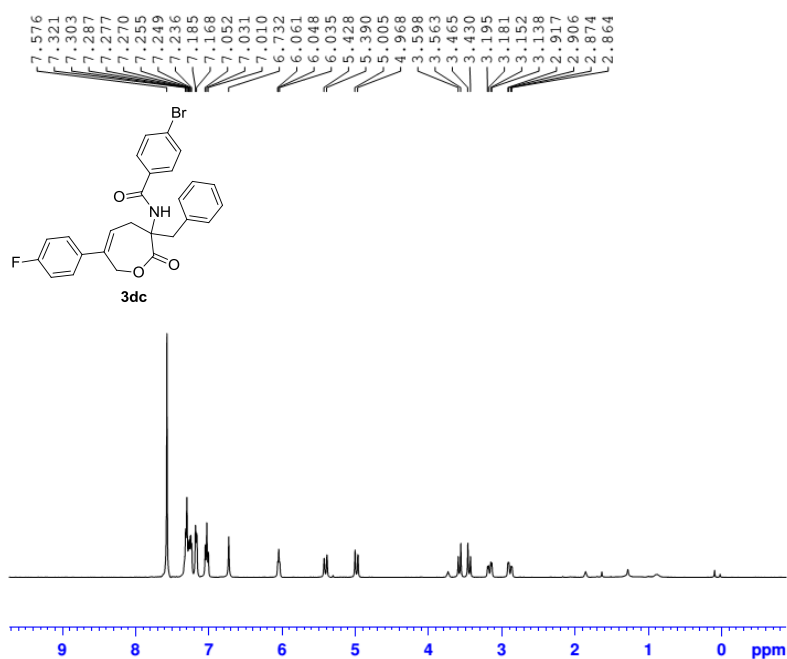
NAME          NMR
EXPNO         5868
PROCNO        1
Date_         20180426
Time          14.18
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            219
DS            0
SWH           24038.461 Hz
FIDRES        0.366798 Hz
AQ            1.3631988 sec
RG            2050
DW            20.800 usec
DE            6.50 usec
TE            300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0           1
  
```

```

----- CHANNEL f1 -----
NUC1          13C
P1            11.70 usec
PL1           -2.00 dB
PL1W          48.76812744 W
SFO1          100.6328888 MHz
  
```

```

----- CHANNEL f2 -----
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           -2.83 dB
PL12          12.00 dB
PL13          14.00 dB
PL2W          16.91636658 W
PL12W         0.55629748 W
PL13W         0.35100001 W
SFO2          400.1716007 MHz
SI            32768
SF            100.6228270 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
PC            1.40
  
```

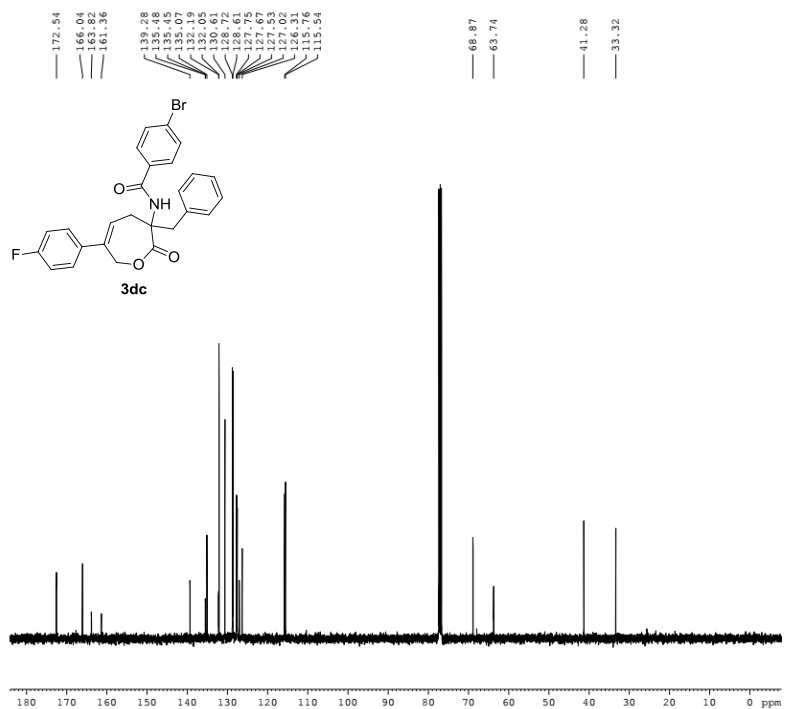


```

NAME          NMR
EXPNO         5824
PROCNO        1
Date_         20180413
Time         10.53
INSTRUM       spect
PROBHD        5 mm FAPBO BB-
PULPROG       zg30
TD            65536
SOLVENT       CDCl3
NS            4
DS            0
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ            3.9846387 sec
RG            144
DW            60.800 usec
DE            6.50 usec
TE            300.0 K
D1            1.00000000 sec
TD0           1
  
```

```

----- CHANNEL f1 -----
NUC1          1H
P1            14.50 usec
PL1           -2.83 dB
PL1W         16.91636658 W
SFO1         400.1724712 MHz
SI            32768
SF           400.1700000 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00
  
```



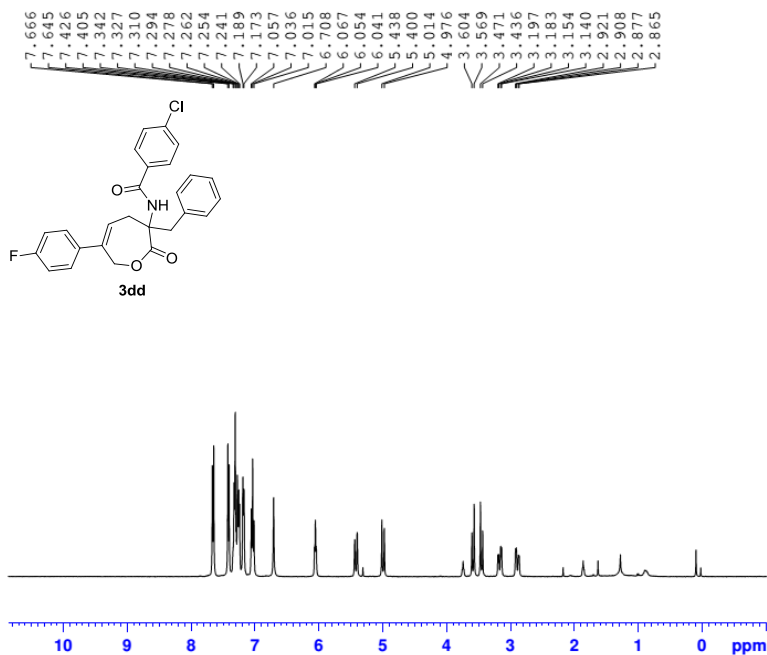
```

NAME          NMR
EXPNO         5825
PROCNO        1
Date_         20180413
Time         10.35
INSTRUM       spect
PROBHD        5 mm FAPBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            4
DS            4
SWH           24038.461 Hz
FIDRES        0.366798 Hz
AQ            1.3631988 sec
RG            2850
DW            20.800 usec
DE            6.50 usec
TE            300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0           1
  
```

```

===== CHANNEL f1 =====
NUC1          13C
P1            11.70 usec
PL1           -2.00 dB
PL1W         48.76812744 W
SFO1         100.6328888 MHz

===== CHANNEL f2 =====
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           -2.83 dB
PL12         12.00 dB
PL13         14.00 dB
PL2W         16.91636658 W
PL12W        0.55629748 W
PL13W        0.35100001 W
SFO2         400.1716007 MHz
SI            32768
SF           100.6228270 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
PC            1.40
  
```

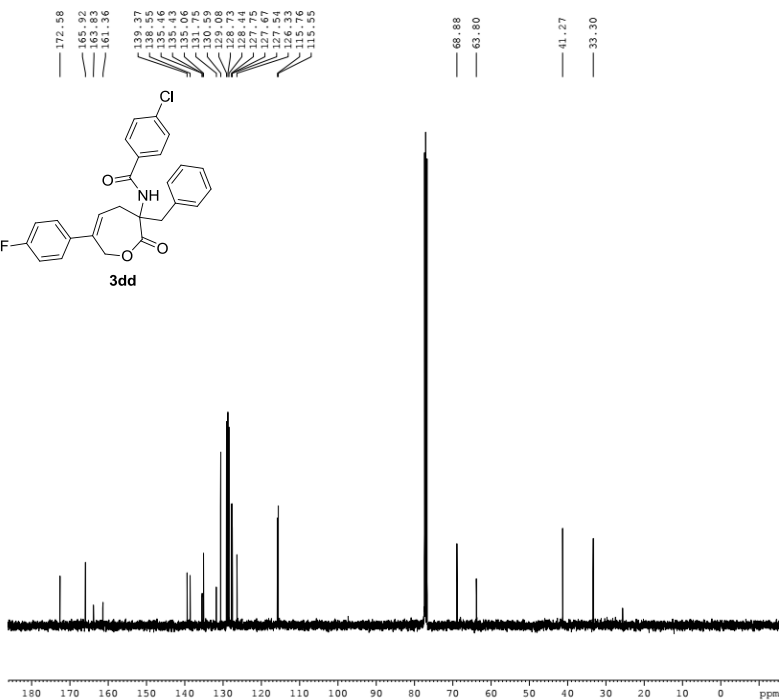



```

NAME          NMR
EXPNO         5826
PROCNO        1
Date_         20180413
Time          10.57
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            65536
SOLVENT       CDCl3
NS            4
DS            0
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ            3.9846387 sec
RG            144
DW            60.800 usec
DE            6.50 usec
TE            300.0 K
D1            1.00000000 sec
TD0           1
  
```

```

----- CHANNEL f1 -----
NUC1          1H
P1            14.50 usec
PL1           -2.83 dB
PL1W         16.91636658 W
SFO1         400.1724712 MHz
SI            32768
SF           400.1700000 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00
  
```



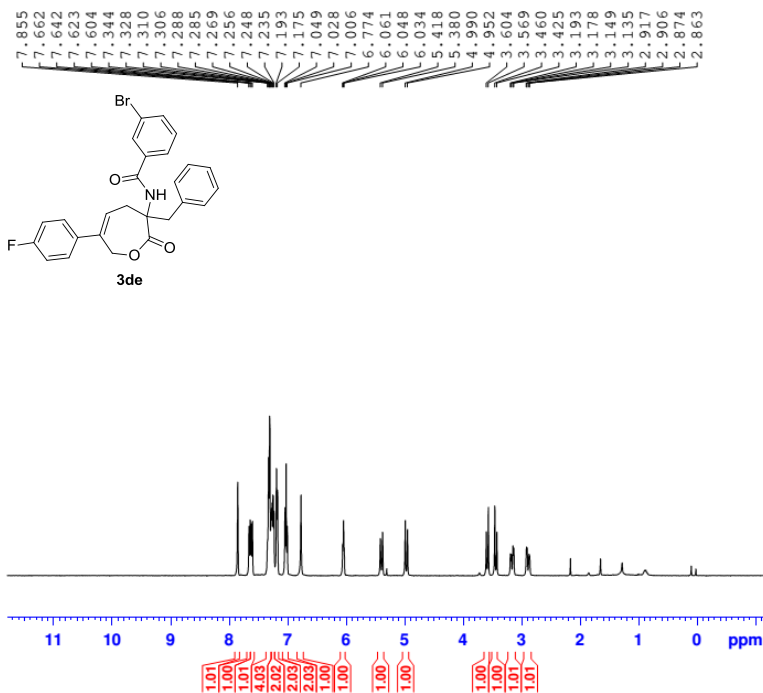
```

NAME          NMR
EXPNO         5827
PROCNO        1
Date_         20180413
Time          11.03
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            256
DS            4
SWH           24038.461 Hz
FIDRES        0.366798 Hz
AQ            1.3631988 sec
RG            2050
DW            20.800 usec
DE            6.50 usec
TE            300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0           1
  
```

```

===== CHANNEL f1 =====
NUC1          13C
P1            11.70 usec
PL1           -2.00 dB
PL1W         48.76812744 W
SFO1         100.6328888 MHz

===== CHANNEL f2 =====
CPDPRG2       waltz16
NUC2          1H
FCPD2         80.00 usec
PL2           -2.83 dB
PL12         12.00 dB
PL13         14.00 dB
PL2W         16.91636658 W
PL12W        0.55629748 W
PL13W        0.35100001 W
SFO2         400.1716007 MHz
SI            32768
SF           100.6228270 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
PC            1.40
  
```

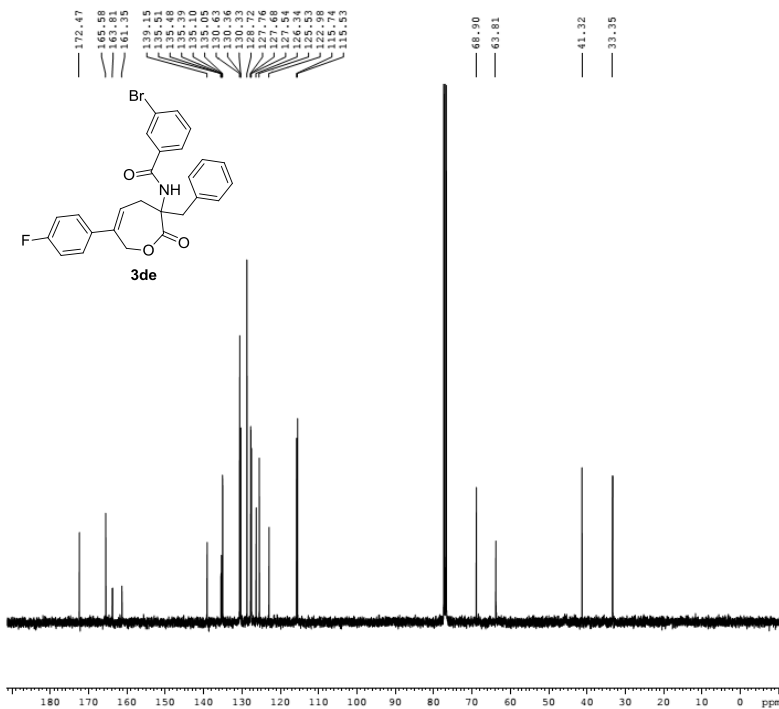


```

NAME          NMR
EXPNO         5851
PROCNO        1
Date_         20180419
Time         18.12
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            65536
SOLVENT       CDCl3
NS            4
DS            0
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ            3.9846387 sec
RG            128
DW            60.800 usec
DE            5.50 usec
TE            300.0 K
D1            1.00000000 sec
TD0           1
  
```

```

----- CHANNEL f1 -----
NUC1          1H
P1            14.50 usec
PL1          -2.83 dB
PL1W         16.91636658 W
SFO1         400.1724712 MHz
SI           32768
SF           400.1700000 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00
  
```



```

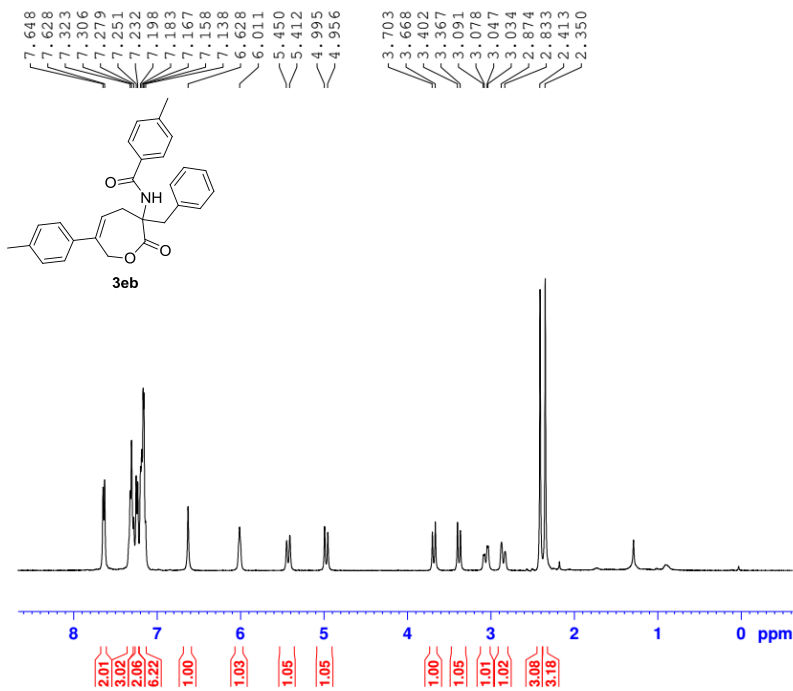
NAME          NMR
EXPNO         5852
PROCNO        1
Date_         20180419
Time         17.32
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            4
DS            4
SWH           24038.461 Hz
FIDRES        0.366798 Hz
AQ            1.3631988 sec
RG            2050
DW            20.800 usec
DE            6.50 usec
TE            300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0           1
  
```

```

----- CHANNEL f1 -----
NUC1          13C
P1            11.70 usec
PL1          -2.00 dB
PL1W         48.76812744 W
SFO1         100.6328888 MHz
  
```

```

----- CHANNEL f2 -----
CFDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2          -2.83 dB
PL12         12.00 dB
PL13         14.00 dB
PL2W         16.91636658 W
PL12W        0.55629748 W
PL13W        0.35100001 W
SFO2         400.1716007 MHz
SI           32768
SF           100.6228270 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
PC            1.40
  
```

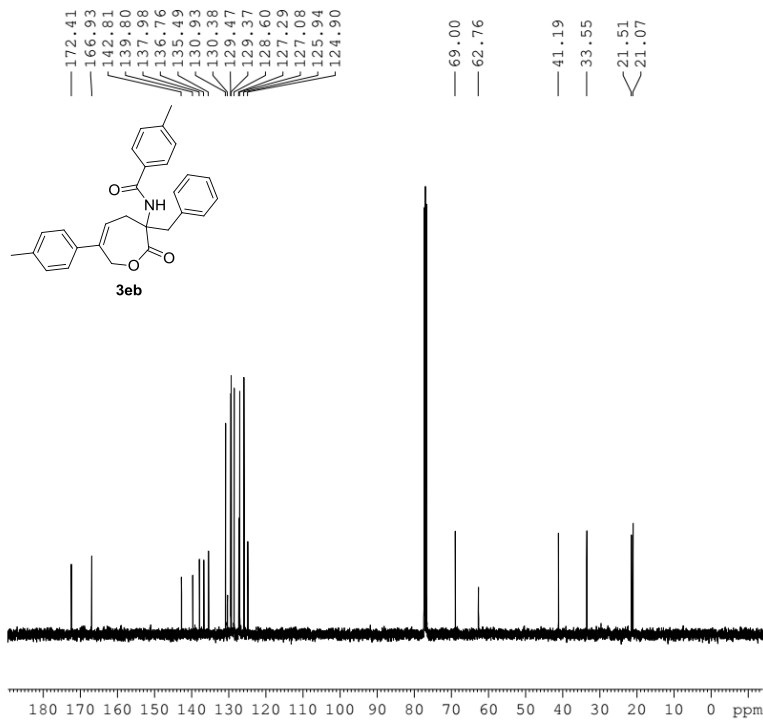


```

NAME          NMR
EXPNO         5813
PROCNO        1
Date_         20180410
Time          16.09
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            65536
SOLVENT       CDC13
NS            4
DS            2
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ            3.9846387 sec
RG            144
DW            60.800 usec
DE            6.50 usec
TE            300.0 K
D1            1.00000000 sec
TD0           1

===== CHANNEL f1 =====
NUC1          1H
P1            14.50 usec
PL1           -2.83 dB
PL1W         16.9163658 W
SF01         400.1724712 MHz
SI            32768
SF           400.1700000 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00

```



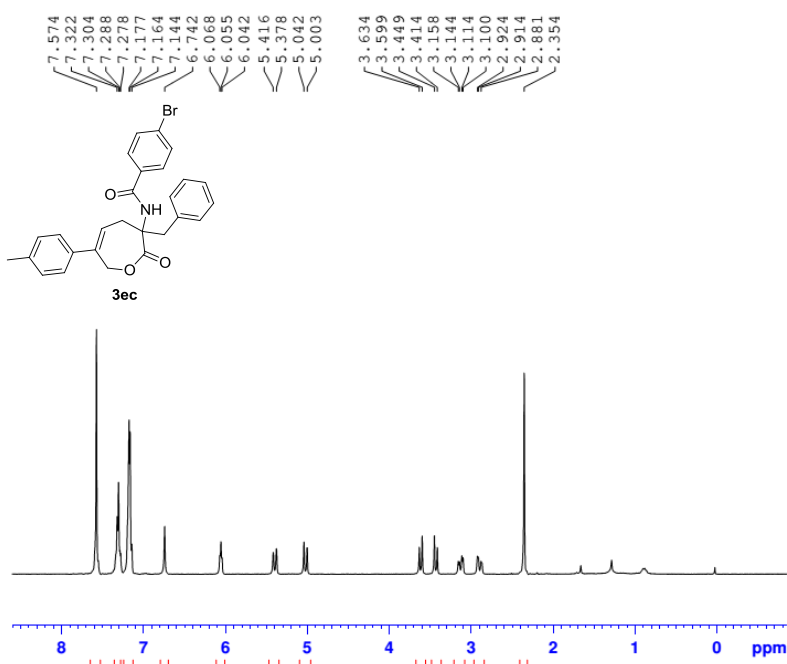
```

NAME          NMR
EXPNO         5814
PROCNO        1
Date_         20180410
Time          16.12
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       CDC13
NS            16
DS            4
SWH           24038.461 Hz
FIDRES        0.366798 Hz
AQ            1.3631988 sec
RG            2050
DW            20.800 usec
DE            6.50 usec
TE            300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0           1

===== CHANNEL f1 =====
NUC1          13C
P1            11.70 usec
PL1           -2.00 dB
PL1W         48.76812744 W
SF01         100.6328888 MHz

===== CHANNEL f2 =====
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           -2.83 dB
PL12         12.00 dB
PL13         14.00 dB
PL2W         16.9163658 W
PL12W        0.55629748 W
PL13W        0.35100001 W
SF02         400.1716007 MHz
SI            32768
SF           100.6228270 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
PC            1.40

```

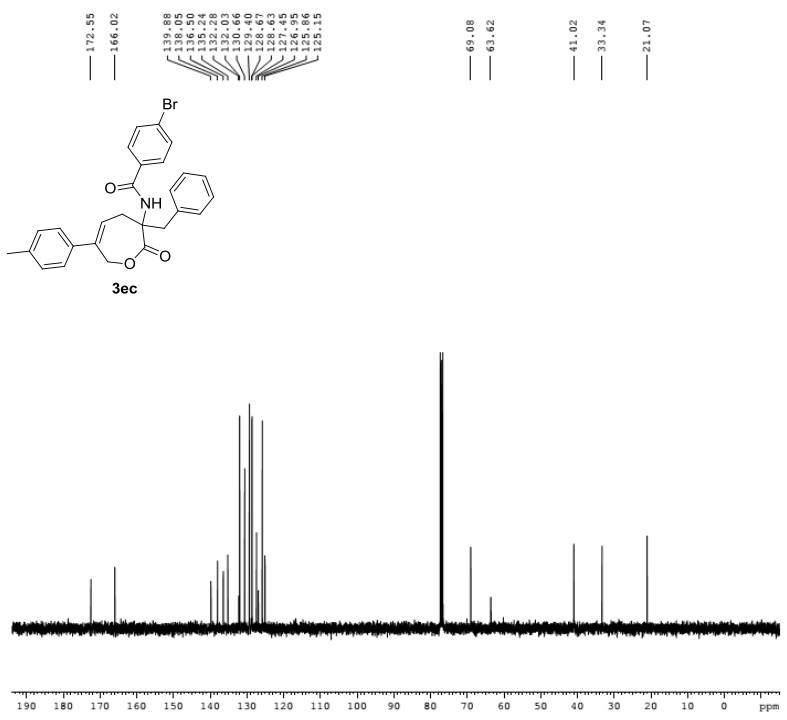


```

NAME          NMR
EXPNO         5885
PROCNO        1
Date_         20180430
Time          13.18
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            65536
SOLVENT       CDCl3
NS            3
DS            0
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ            3.9846387 sec
RG            144
DW            60.800 usec
DE            6.50 usec
TE            300.0 K
D1            1.00000000 sec
D0            1

----- CHANNEL f1 -----
NUC1          1H
P1            14.50 usec
PL1           -2.83 dB
PL1W          16.91636658 W
SFO1          400.1724712 MHz
SI            32768
SF            400.1700000 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00

```



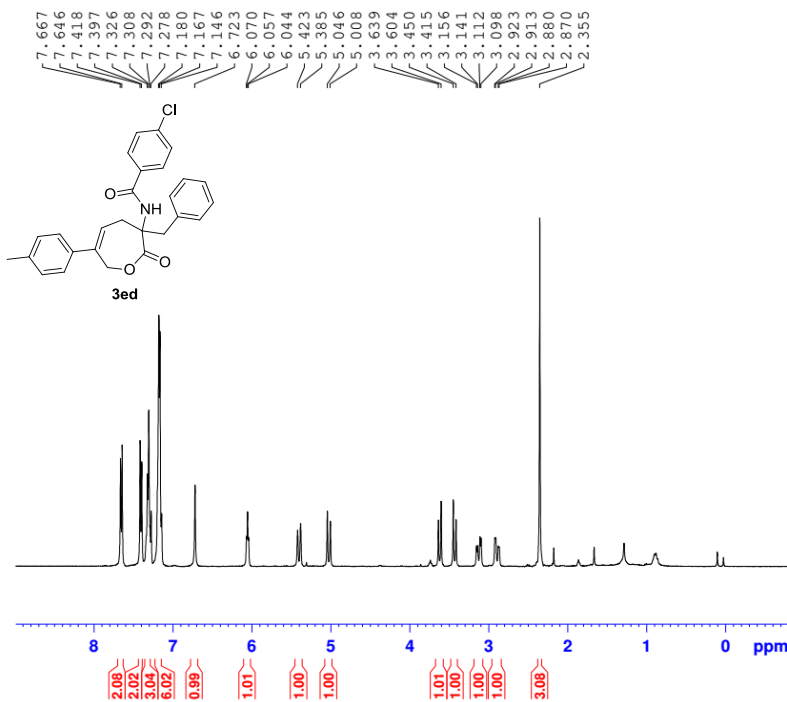
```

NAME          NMR
EXPNO         5886
PROCNO        1
Date_         20180430
Time          13.21
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            71
DS            4
SWH           24038.461 Hz
FIDRES        0.366798 Hz
AQ            1.3631988 sec
RG            2050
DW            20.800 usec
DE            6.50 usec
TE            300.0 K
D1            2.00000000 sec
D0            0.03000000 sec

----- CHANNEL f1 -----
NUC1          13C
P1            11.70 usec
PL1           -2.00 dB
PL1W          48.76812744 W
SFO1          100.6328888 MHz

----- CHANNEL f2 -----
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           -2.83 dB
PL12          12.00 dB
PL13          14.00 dB
PL2W          16.91636658 W
PL12W         0.55629748 W
PL13W         0.35100001 W
SFO2          400.1715007 MHz
SI            32768
SF            100.6228270 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
PC            1.40

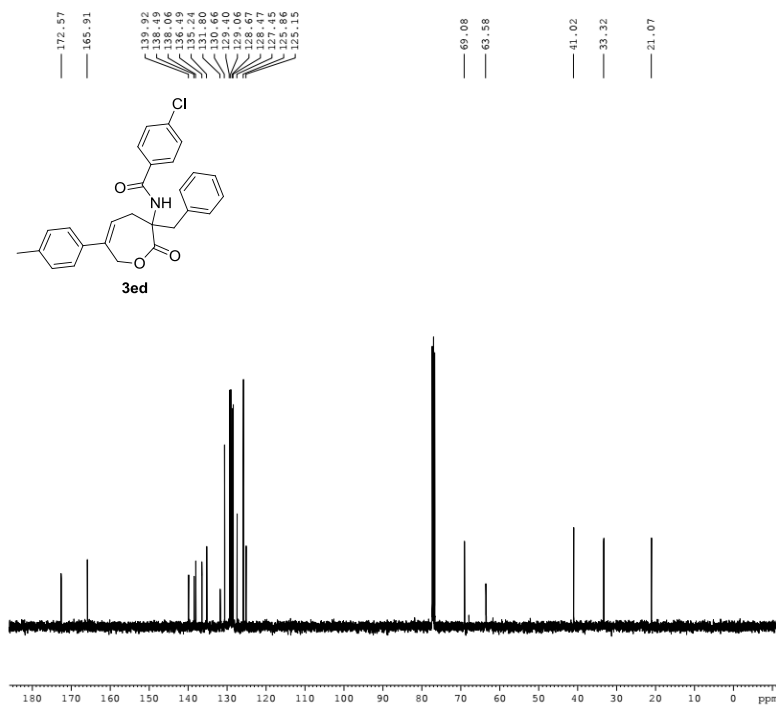
```



```

NAME          NMR
EXPNO         5828
PROCNO        1
Date_         20180413
Time          11.31
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            65536
SOLVENT       CDCl3
NS            4
DS            0
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ            3.9846387 sec
RG            144
DW            60.800 usec
DE            6.50 usec
TE            300.0 K
D1            1.0000000 sec
TD0           1

===== CHANNEL f1 =====
NUC1          1H
P1            14.50 usec
PL1           -2.83 dB
PL1W         16.91636658 W
SFO1         400.1724712 MHz
SI            32768
SF           400.1700000 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00
  
```

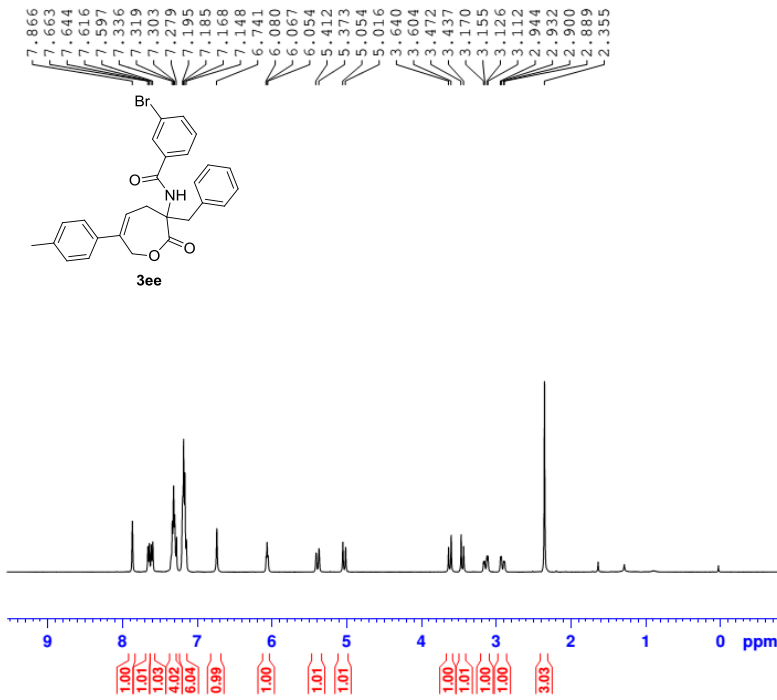


```

NAME          NMR
EXPNO         5829
PROCNO        1
Date_         20180413
Time          11.37
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            128
DS            4
SWH           24038.461 Hz
FIDRES        0.366798 Hz
AQ            1.3631988 sec
RG            2050
DW            20.800 usec
DE            6.50 usec
TE            300.0 K
D1            2.0000000 sec
D11           0.0300000 sec
TD0           1

===== CHANNEL f1 =====
NUC1          13C
P1            11.70 usec
PL1           -2.00 dB
PL1W         48.76812744 W
SFO1         100.6328888 MHz

===== CHANNEL f2 =====
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           -2.83 dB
PL12         12.00 dB
PL13         14.00 dB
PL2W         16.91636658 W
PL12W        0.55629748 W
PL13W        0.35100001 W
SFO2         400.1716007 MHz
SI            32768
SF           100.6228270 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
PC            1.40
  
```

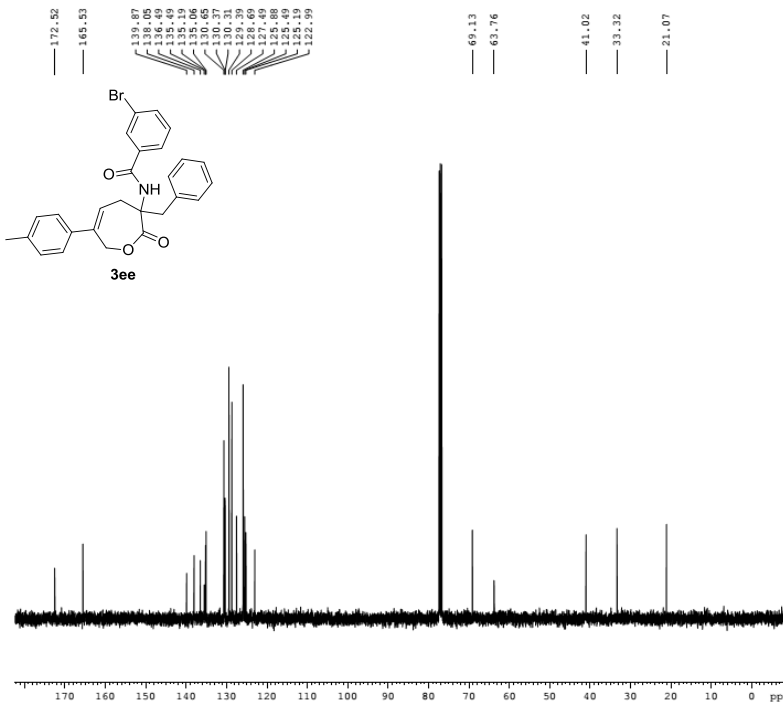


```

NAME          NMR
EXPNO         5877
PROCNO        1
Date_         20180430
Time          11.13
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            65536
SOLVENT       CDCl3
NS            3
DS            0
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ            3.9846387 sec
RG            144
DW            60.800 usec
DE            6.50 usec
TE            300.0 K
D1            1.00000000 sec
TD0           1
  
```

```

----- CHANNEL f1 -----
NUC1          1H
P1            14.50 usec
PL1           -2.83 dB
PL1W          16.91636658 W
SF01          400.1724712 MHz
SI            32768
SF            400.1700000 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00
  
```



```

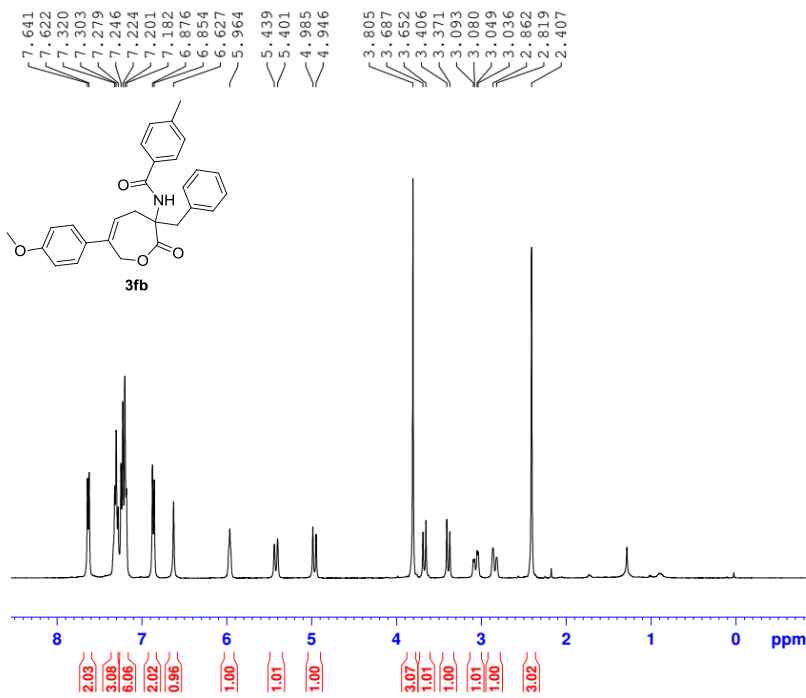
NAME          NMR
EXPNO         5878
PROCNO        1
Date_         20180430
Time          11.17
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            70
DS            4
SWH           24038.461 Hz
FIDRES        0.366798 Hz
AQ            1.3631988 sec
RG            2050
DW            20.800 usec
DE            6.50 usec
TE            300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0           1
  
```

```

----- CHANNEL f1 -----
NUC1          13C
P1            11.70 usec
PL1           -2.00 dB
PL1W          48.76812744 W
SF01          100.6328888 MHz
  
```

```

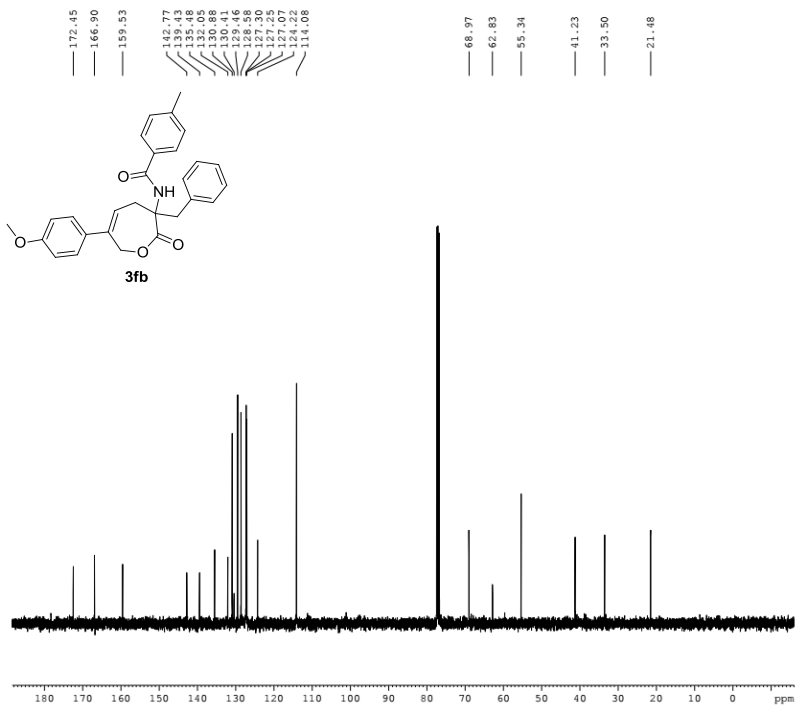
----- CHANNEL f2 -----
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           -2.83 dB
PL12          12.00 dB
PL13          14.00 dB
PL2W          16.91636658 W
PL12W         0.55629748 W
PL13W         0.35100001 W
SF02          400.1716007 MHz
SI            32768
SF            100.6228270 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
PC            1.40
  
```



```

NAME          NMR
EXPNO         5817
PROCNO        1
Date_         20180412
Time          11.22
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            65536
SOLVENT       CDCl3
NS            6
DS            2
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ            3.9846387 sec
RG            144
DW            60.800 usec
DE            6.50 usec
TE            300.0 K
D1            1.00000000 sec
TD0           1

===== CHANNEL f1 =====
NUC1          1H
P1            14.50 usec
PL1           -2.83 dB
PL1W         16.91636658 W
SF01         400.1724712 MHz
SI            32768
SF           400.1700000 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00
  
```

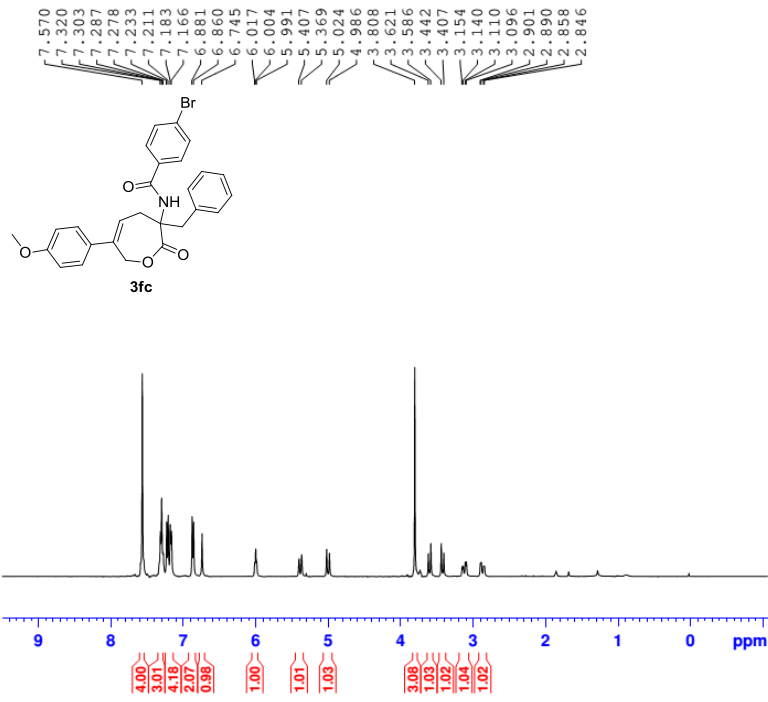


```

NAME          NMR
EXPNO         5818
PROCNO        1
Date_         20180412
Time          11.28
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            64
DS            4
SWH           24038.461 Hz
FIDRES        0.366798 Hz
AQ            1.3631988 sec
RG            2050
DW            20.800 usec
DE            6.50 usec
TE            300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0           1

===== CHANNEL f1 =====
NUC1          13C
P1            11.70 usec
PL1           -2.00 dB
PL1W         48.76812744 W
SF01         100.6328888 MHz

===== CHANNEL f2 =====
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           -2.83 dB
PL12         12.00 dB
PL13         14.00 dB
PL2W         16.91636658 W
PL12W        0.55629748 W
PL13W        0.351000001 W
SF02         400.1716007 MHz
SI            32768
SF           100.6228270 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
PC            1.40
  
```



```

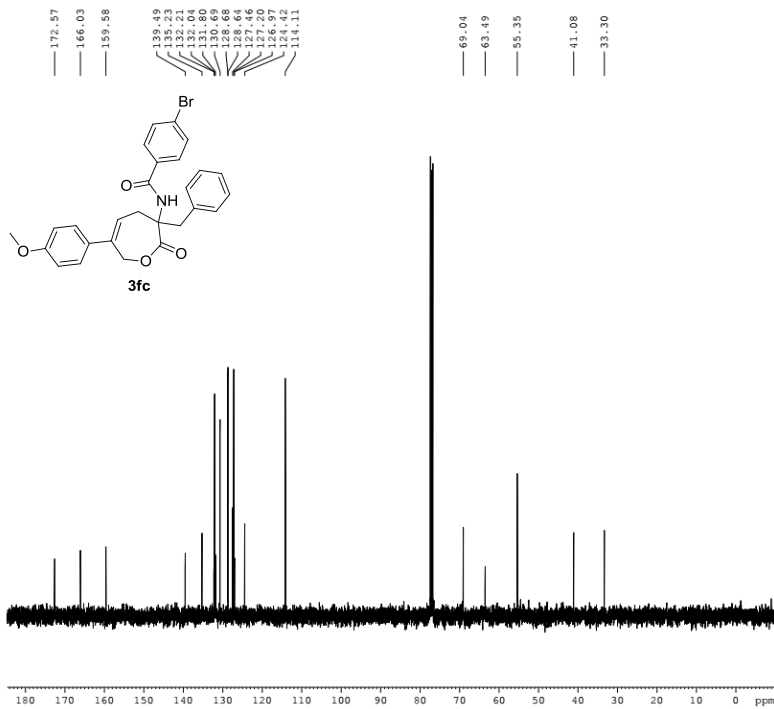
NAME          NMR
EXPNO         5810
PROCNO        1
Date_         20180410
Time          14.27
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            65536
SOLVENT       CDCl3
NS            4
DS            0
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ            3.9846397 sec
RG            144
DW            60.800 usec
DE            6.50 usec
TE            300.0 K
D1            1.00000000 sec
D10           1

```

```

----- CHANNEL f1 -----
NUC1          1H
P1            14.50 usec
PL1           -2.83 dB
PL1W          16.91636658 W
SF01          400.1724712 MHz
SI            32768
SF            400.1700000 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00

```



```

NAME          NMR
EXPNO         5809
PROCNO        1
Date_         20180410
Time          14.20
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            30
DS            4
SWH           24038.461 Hz
FIDRES        0.366798 Hz
AQ            1.3631988 sec
RG            2050
DW            20.800 usec
DE            6.50 usec
TE            300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
D10           1

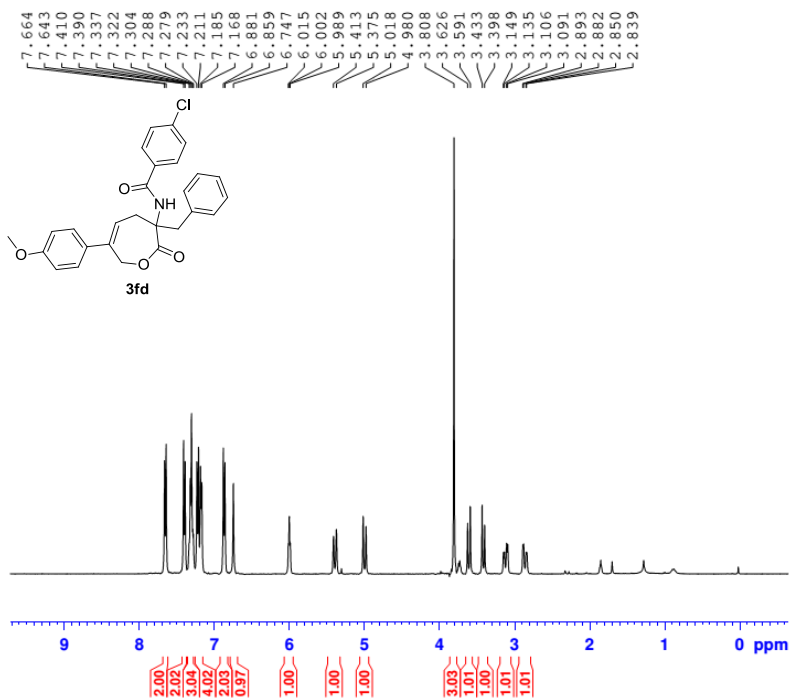
```

```

===== CHANNEL f1 =====
NUC1          13C
P1            11.70 usec
PL1           -2.00 dB
PL1W          48.76812744 W
SF01          100.6328888 MHz

===== CHANNEL f2 =====
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           -2.83 dB
PL12          12.00 dB
PL13          14.00 dB
PL2W          16.91636658 W
PL12W         0.55629748 W
PL13W         0.35100001 W
SF02          400.1716007 MHz
SI            32768
SF            100.6228270 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
PC            1.40

```

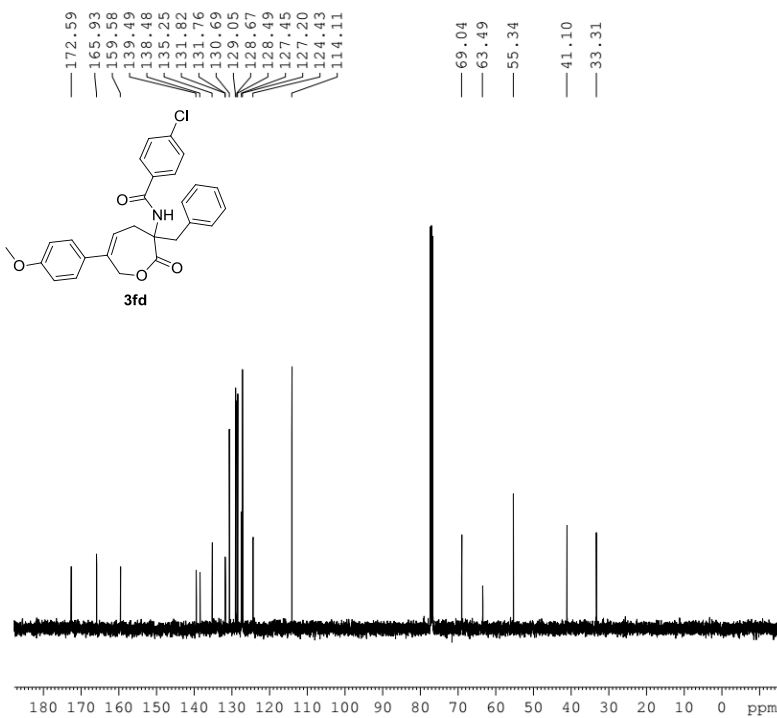



```

NAME          NMR
EXPNO         5811
PROCNO        1
Date_         20180410
Time          14.33
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            65536
SOLVENT       CDCl3
NS            4
DS            0
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ            3.9846387 sec
RG            144
DW            60.800 usec
DE            6.50 usec
TE            300.0 K
D1            1.00000000 sec
TD0           1

----- CHANNEL f1 -----
NUC1          1H
P1            14.50 usec
PL1           -2.83 dB
PL1W          16.91636658 W
SFOL          400.1724712 MHz
SI            32768
SF            400.1700000 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00

```



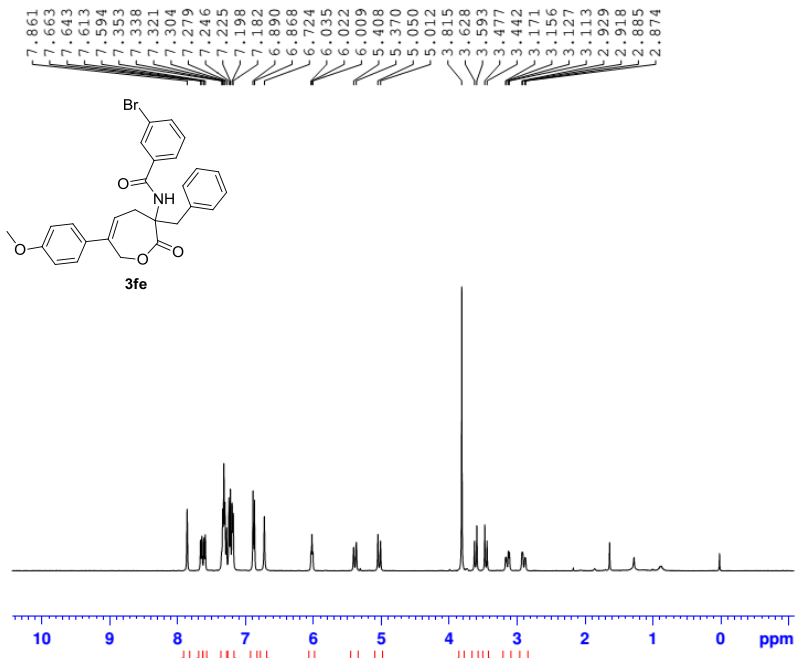
```

NAME          NMR
EXPNO         5812
PROCNO        1
Date_         20180410
Time          14.39
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            63
DS            4
SWH           24038.461 Hz
FIDRES        0.366798 Hz
AQ            1.3631988 sec
RG            2050
DW            20.800 usec
DE            6.50 usec
TE            300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0           1

===== CHANNEL f1 =====
NUC1          13C
P1            11.70 usec
PL1           -2.00 dB
PL1W          48.76812744 W
SFOL          100.6328888 MHz

===== CHANNEL f2 =====
PCPDPRG2     waltz16
NUC2          1H
PCPD2        80.00 usec
PL2           -2.83 dB
PL12         12.00 dB
PL13         14.00 dB
PL2W          16.91636658 W
PL12W         0.55629748 W
PL13W         0.35100001 W
SFOL          400.1716007 MHz
SI            32768
SF            100.6228270 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
PC            1.40

```

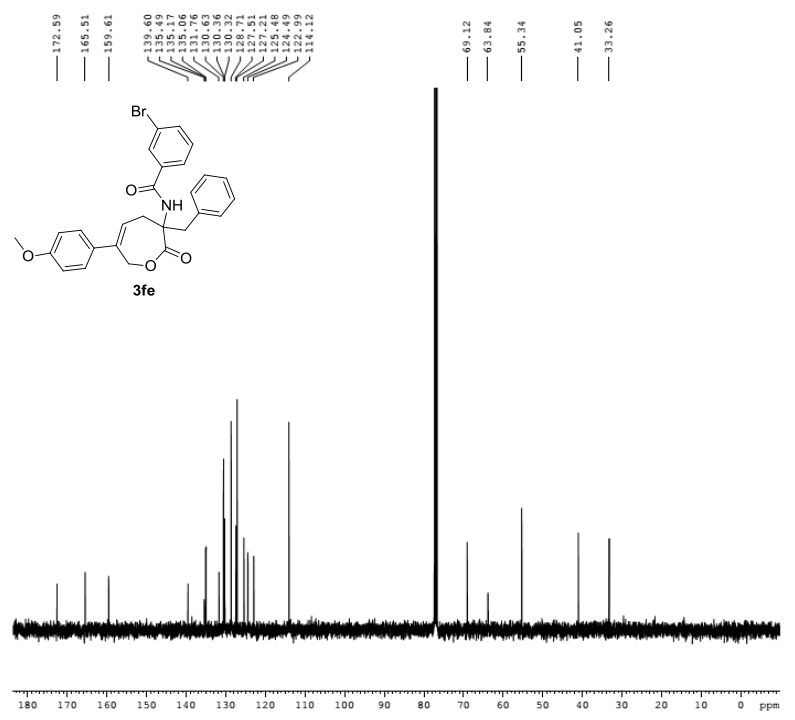


```

NAME          NMR
EXPNO         5869
PROCNO        1
Date_         20180426
Time         15.07
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            65536
SOLVENT       CDCl3
NS            4
DS            0
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ           3.9846387 sec
RG           144
DW           60.800 usec
DE           6.50 usec
TE           300.0 K
D1           1.00000000 sec
TD0          1

----- CHANNEL f1 -----
NUC1          1H
P1           14.50 usec
PL1          -2.83 dB
PL1W        16.91636658 W
SFO1        400.1724712 MHz
SI          32768
SF          400.1700000 MHz
WDW          EM
SSB          0
LB           0.30 Hz
GB           0
PC           1.00

```



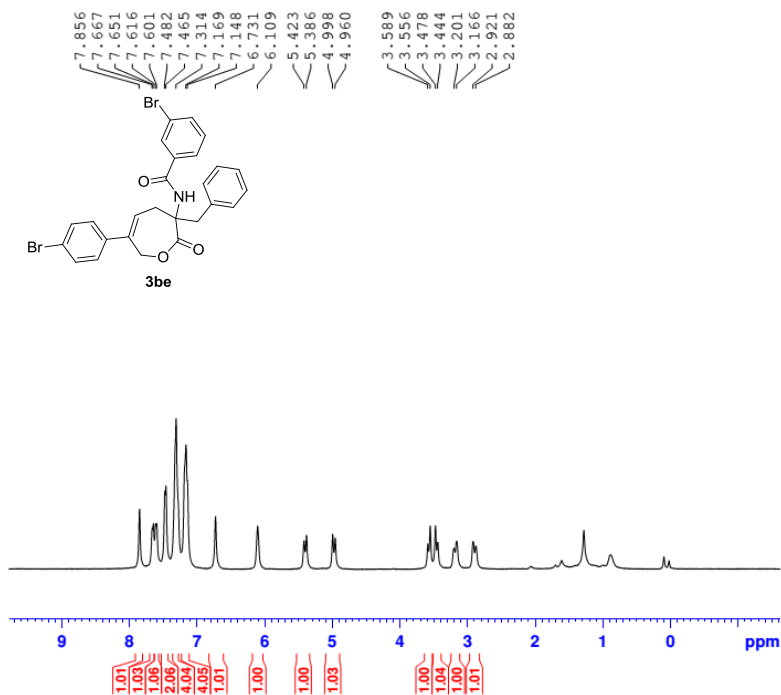
```

NAME          NMR
EXPNO         5870
PROCNO        1
Date_         20180426
Time         15.09
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            100
DS            4
SWH          24038.461 Hz
FIDRES        0.366798 Hz
AQ           1.3631988 sec
RG           2050
DW           20.800 usec
DE           6.50 usec
TE           300.0 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0          1

----- CHANNEL f1 -----
NUC1          13C
P1           11.70 usec
PL1          -2.00 dB
PL1W        48.7681744 W
SFO1        100.6328888 MHz

----- CHANNEL f2 -----
CPDPRG2       waltz16
NUC2          1H
PCPD2        80.00 usec
PL2          -2.83 dB
PL12        12.00 dB
PL13        14.00 dB
PL2W        16.91636658 W
PL12W       0.55629748 W
PL13W       0.35100001 W
SFO2        400.1716007 MHz
SI          32768
SF          100.6228270 MHz
WDW          EM
SSB          0
LB           1.00 Hz
GB           0
PC           1.40

```

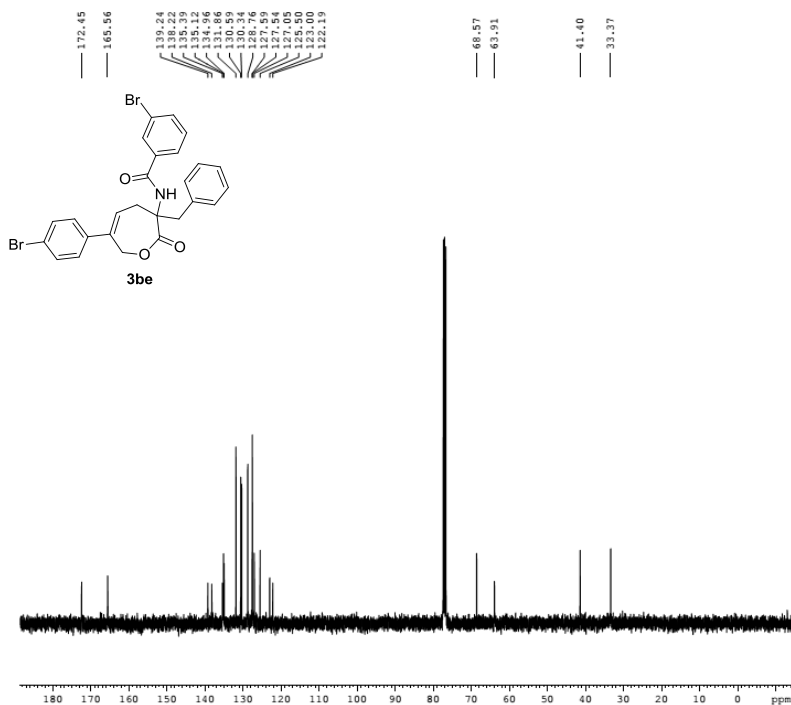


```

NAME          E-NMR
EXPNO         5883
PROCNO        1
Date_         20180430
Time         13.08
INSTRUM      spect
PROBHD       5 mm PABBO BB-
PULPROG      zg30
TD           65536
SOLVENT      CDCl3
NS           6
DS           0
SWH          8223.685 Hz
FIDRES       0.125483 Hz
AQ           3.9846387 sec
RG           144
DW           60.800 usec
DE           6.50 usec
TE           300.0 K
D1           1.00000000 sec
TD0          1

----- CHANNEL f1 -----
NUC1         1H
P1           14.50 usec
PL1         -2.83 dB
PL1W        16.91636658 W
SFO1        400.1724712 MHz
SI          32768
SF          400.1700000 MHz
WDW          EM
SSB          0
LB           0.30 Hz
GB           0
PC           1.00

```



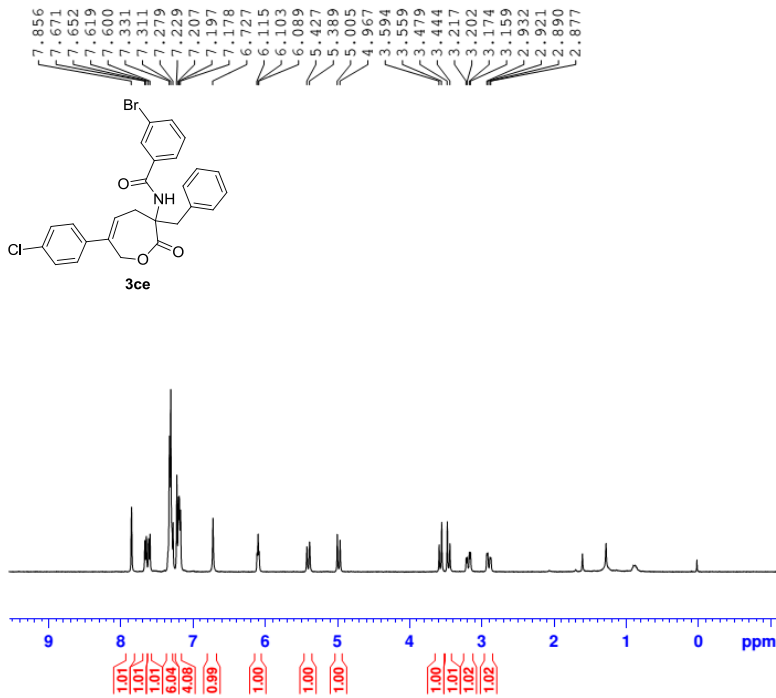
```

NAME          NMR
EXPNO         5884
PROCNO        1
Date_         20180430
Time         12.50
INSTRUM      spect
PROBHD       5 mm PABBO BB-
PULPROG      zgpg30
TD           65536
SOLVENT      CDCl3
NS           251
DS           4
SWH          24038.461 Hz
FIDRES       0.366798 Hz
AQ           1.3631988 sec
RG           2050
DW           20.800 usec
DE           6.50 usec
TE           300.0 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0          1

----- CHANNEL f1 -----
NUC1         13C
P1           11.70 usec
PL1         -2.00 dB
PL1W        48.76812744 W
SFO1        100.6328888 MHz

----- CHANNEL f2 -----
CPDPRG2      waltz16
NUC2         1H
PCPD2        80.00 usec
PL2         -2.83 dB
PL12        12.00 dB
PL13        14.00 dB
PL2W        16.91636658 W
PL12W       0.55629748 W
PL13W       0.35100001 W
SFO2        400.1716007 MHz
SI          32768
SF          100.6228270 MHz
WDW          EM
SSB          0
LB           1.00 Hz
GB           0
PC           1.40

```

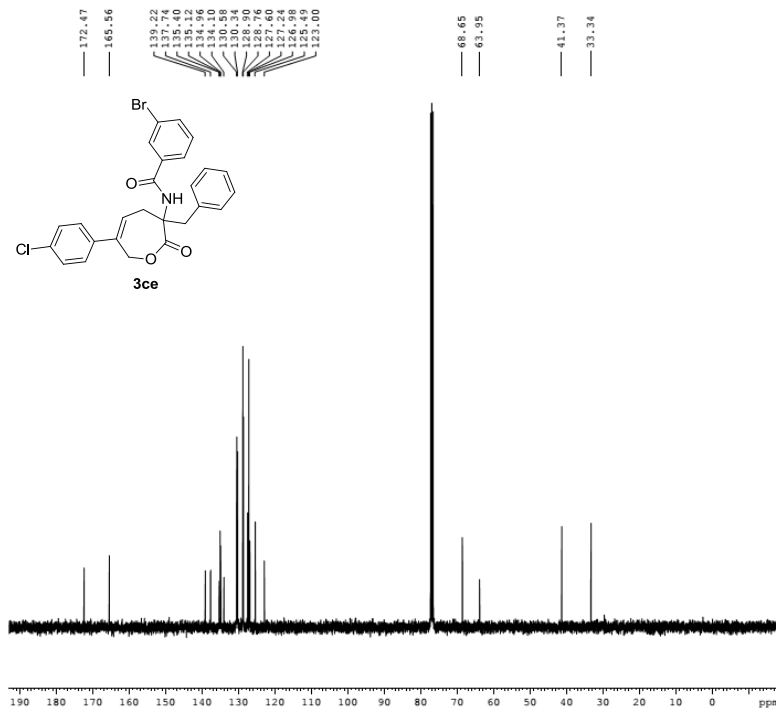


```

NAME      NMR
EXPNO     5881
PROCNO    1
Date_     20180430
Time      11.38
INSTRUM   spect
PROBHD    5 mm PABBO BB-
PULPROG   zg30
TD         65536
SOLVENT   CDCl3
NS         4
DS         0
SWH       8223.685 Hz
FIDRES    0.125483 Hz
AQ         3.9846387 sec
RG         4
DW         60.800 usec
DE         6.50 usec
TE         300.0 K
D1         1.0000000 sec
TD0        1

----- CHANNEL f1 -----
NUC1      1H
P1         14.50 usec
PL1        -2.83 dB
PL1W       16.91636658 W
SFO1      400.1724712 MHz
SI         32768
SF         400.1700000 MHz
WDW        EM
SSB        0
LB         0.30 Hz
GB         0
PC         1.00

```



```

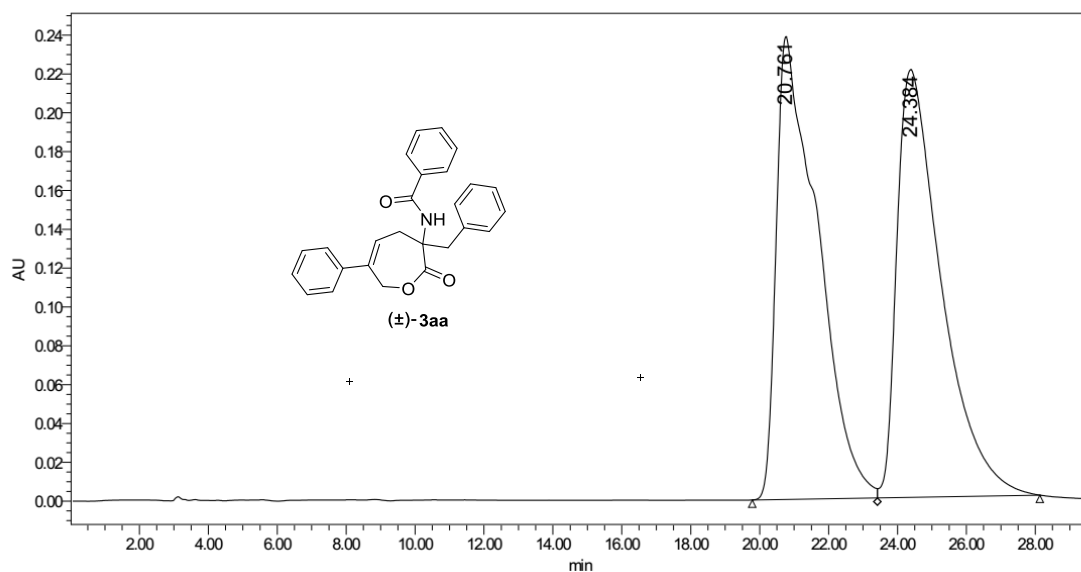
NAME      NMR
EXPNO     5882
PROCNO    1
Date_     20180430
Time      11.41
INSTRUM   spect
PROBHD    5 mm PABBO BB-
PULPROG   zgpg30
TD         65536
SOLVENT   CDCl3
NS         4
DS         4
SWH       24038.461 Hz
FIDRES    0.366798 Hz
AQ         1.3631988 sec
RG         2050
DW         20.800 usec
DE         6.50 usec
TE         300.0 K
D1         2.0000000 sec
D11        0.0300000 sec
TD0        1

----- CHANNEL f1 -----
NUC1      13C
P1         11.70 usec
PL1        -2.00 dB
PL1W       48.76812744 W
SFO1      100.6328888 MHz

----- CHANNEL f2 -----
CPDPRG2   waltz16
NUC2      1H
PCPD2     80.00 usec
PL2        -2.83 dB
PL12       12.00 dB
PL13       14.00 dB
PL2W       16.91636658 W
PL12W     0.55629748 W
PL13W     0.35100001 W
SFO2      400.1716007 MHz
SI         32768
SF         100.6228270 MHz
WDW        EM
SSB        0
LB         1.00 Hz
GB         0
PC         1.40

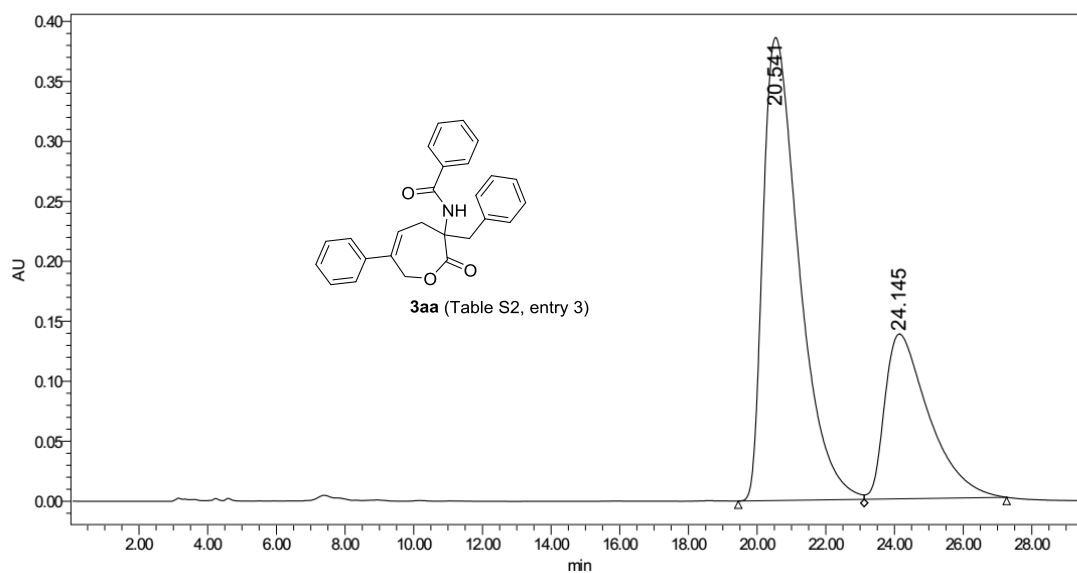
```

8. Copy of HPLC Spectra of Compound 3aa



<Column Performance Report>

entry	R.T	Area	%Area	Height
1	20.761	19839980	50.09	238276
2	24.384	19766027	49.91	220134



<Column Performance Report>

entry	R.T	Area	%Area	Height
1	20.541	28042686	69.56	385964
2	24.145	12274457	30.44	137383

9. X-Ray Crystal Data of Compound 3ad

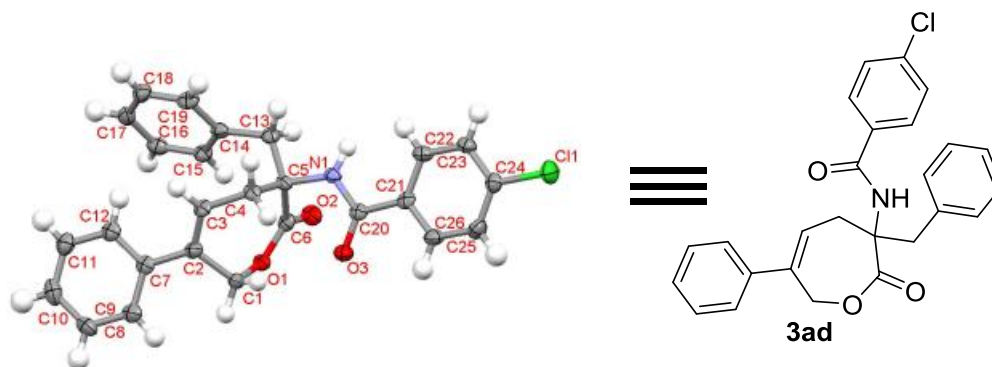


Figure S1 X-ray single crystal structure of **3ad** (with thermal ellipsoids shown at the 50% probability level)

Identification code	3ad	
Empirical formula	$C_{26}H_{22}ClNO_3$	
Formula weight	431.89	
Temperature	133.15 K	
Crystal system, space group	Triclinic, P-1	
Unit cell dimensions	a = 9.588(4) Å	alpha = 88.60(2) deg.
	b = 14.091(7) Å	beta = 78.027(16) deg.
	c = 15.915(7) Å	gamma = 88.20(3) deg.
Volume	2102.0(16) Å ³	
Z, Calculated density	4, 1.365 g/cm ³	
Absorption coefficient	0.211 mm ⁻¹	
F(000)	904.0	
Crystal size	0.2 × 0.18 × 0.14 mm ³	
Radiation	MoK α (λ = 0.71073)	
Theta range for data collection	6.028 to 50.038 deg.	
Index ranges	-11 ≤ h ≤ 11, -16 ≤ k ≤ 16, -18 ≤ l ≤ 18	

Reflections collected / uniqueIndependent reflections	20434 / 7111 [$R_{\text{int}} = 0.0834$, $R_{\text{sigma}} = 0.0770$]
Data / restraints / parameters	7111 / 2 / 567
Goodness-of-fit on F^2	1.112
Final R indices [$I > 2\sigma(I)$]	$R_1 = 0.0868$, $wR_2 = 0.2250$
R indices (all data)	$R_1 = 0.1070$, $wR_2 = 0.2348$
Largest diff. peak and hole	0.70/-0.33 e. \AA^{-3}

10. References

- (a) A. Khan, R. Zheng, Y. Kan, J. Ye, J. Xing and Y. J. Zhang, *Angew. Chem. Int. Ed.*, 2014, **53**, 6439; (b) L. Yang, A. Khan, R. Zheng, L. Y. Jin and Y. J. Zhang, *Org. Lett.*, 2015, **17**, 6230.
- (a) J. Marco-Martinez, S. Reboredo, M. Izquierdo, V. Marcos, J. L. Lopez, S. Filippone and N. Martin, *J. Am. Chem. Soc.*, 2014, **136**, 2897; (b) S. Dong, X. Liu, Y. Zhu, P. He, L. Lin and X. Feng, *J. Am. Chem. Soc.*, 2013, **135**, 10026; (c) W. R. C., S. Alexander, N. Dominik, S. S. r. M. M., H. Christine, B. Jonathan and S. P. R., *Angew. Chem. Int. Ed.*, 2016, **55**, 2719.