Supporting Information for:

Regiodivergent synthesis of sulfone-tethered lactam-lactones bearing four contiguous stereocenters

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2. Experimental Section

All experiments involving air and moisture-sensitive reagents were carried out under an inert atmosphere of nitrogen and using freshly distilled solvents. 2-MeTHF was distilled from sodium benzophenone ketyl. Column chromatography was performed on silica gel (230-400 mesh). Thin-layer chromatography (TLC) was performed using Silicycle SiliaplateTM glass backed plates (250 µm thickness, 60 Å porosity, F-254 indicator) and visualized using UV (254 nm) or CAM, *p*-anisaldehyde, or $KMnO_4$ stain. All reported temperatures were internal to a reaction vessel. Unless otherwise indicated, ^1H, ^{13}C, and DEPT-135 spectra were acquired using $CDCl_3$ as solvent, at room temperature. Chemical shifts are quoted in parts per million (ppm). HRMS-EI^+ data were obtained using either electronspray ionization (ESI) or electron impact (EI) techniques. High-resolution ESI was obtained on an LTQ-FT (ion trap; analyzed using Excalibur). High resolution EI was obtained on an Autospec (magnetic sector; analyzed using MassLynx). Brine solutions are saturated solutions of aqueous sodium chloride. Phenylsuccinic anhydride was obtained from Fisher Scientific. The 1,3-azadienes were prepared as previously reported by us.[1]

General Procedure A: Sulfonyllactonization: An oven-dried vial equipped with a Teflon-coated magnetic stir bar was charged with tetrakis(acetonitrile)copper(I) hexafluorophosphate (37 mg, 0.10 mmol, 10 mol%), the aryl sulfonyl chloride (1.1 mmol, 1.1 equiv), DMAP (1.1 equiv), and alkenoic acid **1** (1.0 mmol, 1.0 equiv). The reaction tube was sealed with a septum screw-cap and connected to a Schlenk line through a needle. The reaction tube was then briefly evacuated and backfilled with argon (for total of three times). Anhydrous 2-MeTHF (10 mL) was added to the tube via syringe and the argon pressure was removed. The reaction mixture was stirred at room temperature for 12 h (TLC and GC-MS monitoring). The reaction mixture was diluted with saturated aqueous sodium bicarbonate solution (20 mL) and ethyl acetate (20 mL). The aqueous layer was separated and extracted with ethyl acetate (20 mL × 3). The combined organic layers was dried over Na_2SO_4, filtered, and concentrated *in vacuo.* The crude residue was analyzed by ^1H NMR spectroscopy and GC-MS to determine the diastereomeric ratio. Purification by flash column chromatography on silica gel afforded the pure sulfone-tethered lactam-lactones.

General Procedure B: Desulfonylation: To a well-stirred solution of sulfone **2** (0.5 mmol) in dry MeOH (10 mL) was added Mg turnings (5.0 mmol, 10 equiv) and $NiBr_2$ (10 mol%) at 0 °C under

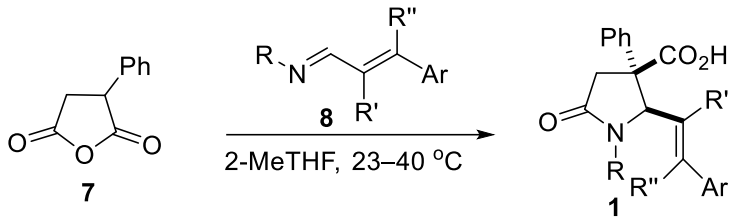
Ar. The mixture was stirred at ambient temperature for 3 h prior to the addition of another portion of Mg turnings (5.0 mmol, 10 equiv) and dry MeOH (10 mL). Stirring was continued for another 6 h (TLC and GC-MS monitoring). Upon completion, the reaction mixture was filtered through celite and the residue was washed thoroughly with MeOH. The filtrate was concentrated under reduced pressure and dissolved in EtOAc. The solution was washed with a saturated solution of aqueous NH_4Cl, dried over anhydrous Na_2SO_4, filtered, and concentrated under reduced pressure to give the crude desulfonylated product. Purification by flash column chromatography on silica gel afforded the pure lactam-lactone.

General Procedure C: Reduction of Sulfones to thioethers: An oven-dried 5-mL screw-capped sealed tube equipped with a magnetic stir bar was charged with $B(C_6F_5)_3$ (10 mol%), Et_3SiH (20 equiv), and the sulfone-tethered lactam-lactone (0.50 mmol), under an argon atmosphere. The tube was sealed properly and transferred to an oil bath thermostatted at 85 °C. After 12 h (TLC and GC-MS monitoring), the reaction was cooled to room temperature and passed through a small plug of silica gel using EtOAc. The crude material was dried (Na_2SO_4) and filtered, and the solvent was removed under reduced pressure. The mixture was then subjected to high vacuum at 70 °C until the unreacted hydrosilane was removed from the system. The residue was purified further by flash column chromatography (silica gel, hexanes/EtOAc 90:10 to 50:50) to afford the desired thioether-tethered lactam-lactones.

General Procedure D: Reductive desulfonylative cross-coupling with aryl bromides: To a solution of $CoBr_2$ (22 mg, 0.10 mmol, 10 mol%), *bis*-1,2- diphenylphosphinopropane (41.2 mg, 0.10 mmol, 10 mol%), and manganese powder (165 mg, 3 mmol, 3 equiv) in 2-MeTHF (5 mL) was added bromobenzene (2 mmol, 2 equiv) at 40 ºC. A solution of the sulfone (1 mmol, 1 equiv) in 2-MeTHF (5 mL) was added slowly (2 mL/h). After completion (as judged by TLC and GC-MS), the reaction mixture was treated with a mild acid such as 10% H_3PO_4 (aq) and extracted with EtOAc. The combined organic layers were dried over $MgSO_4$, filtered and concentrated under reduced pressure to afford the desired coupling product as an oil. Purification was carried out by flash column chromatography on silica, eluting with Hexanes/EtOAc.

Synthesis of the lactam acids

General Procedure A: Reaction of 1,3-azadienes[1] with anhydride 5: A 20 mL screw-cap vial was flame-dried, evacuated and flushed with nitrogen. A solution of 1,3-azadiene **8** (5.0 mL, 0.10 M in freshly distilled 2-MeTHF) was added to the vial at room temperature followed by anhydride **7** (5 mmol, 1.0 equiv). The contents were placed in a pre-heated oil bath thermostatted 40 °C. After complete consumption of the 1,3-azadiene (as judged by TLC and NMR), the mixture/suspension was cooled to room temperature and washed several times with petroleum ether, then concentrated under reduced pressure to afford the lactam acid.

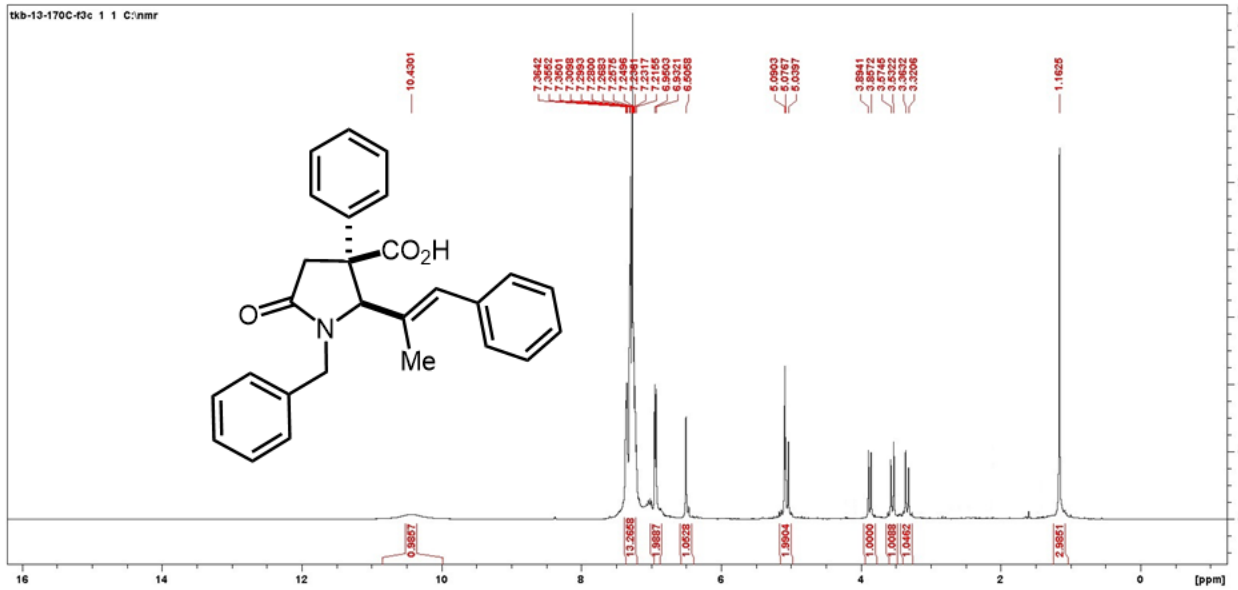


Some of the compounds were characterized as the methyl ester for ease of purification as isolation.

Representative characterization data are shown below. Some compounds were advanced to the sulfonyllactonization without extensive characterization.

Compound 1e

Prepared in 5.0 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/acetone (50:50 to 0:100). Oily substance. Yield = 1726 mg, 84%, 95:5 dr. ^{1}H NMR (400 MHz, $CDCl_3$) δ 10.43 (s, 1H), 7.36 – 7.21 (m, 13H), 6.94 (d, *J* = 7.8 Hz, 2H), 6.51 (s, 1H), 5.09 – 5.03 (m, 2H), 3.88 (d, *J* = 14.8 Hz, 1H), 3.55 (d, *J* = 17.0 Hz, 1H), 3.34 (d, *J* = 17.0 Hz, 1H), 1.16 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 176.86, 173.02, 136.56, 135.98, 135.62, 133.22, 128.82, 128.54, 128.51, 128.17, 128.14, 128.11, 127.95, 127.92, 127.75, 127.03, 72.17, 55.85, 45.26, 38.33, 13.26. FTIR (KBr): 3105.8, 2950.6, 1710.3, 1660.5, 1595.7, 1510.7, 1462.8, 1434.7, 1412.6, 1340.5, 1301.1, 1270.8, 1234.9, 1179.9, 1109.4, 1034.1. HRMS calc for $C_{27}H_{25}NO_3$ 411.1134, found 411.1139.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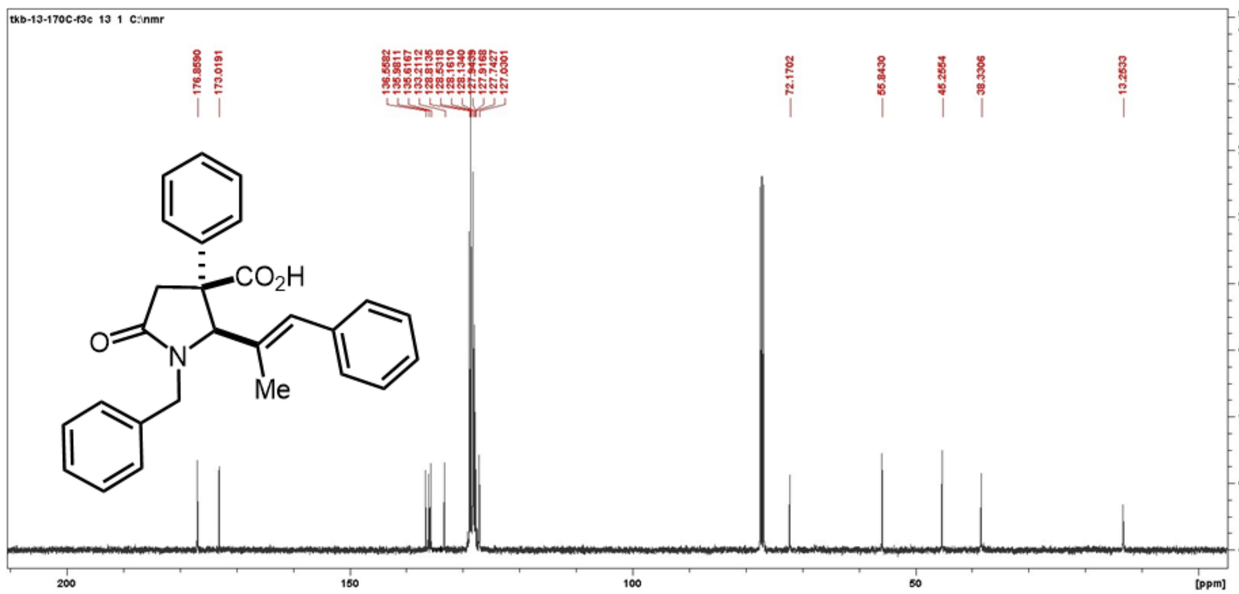
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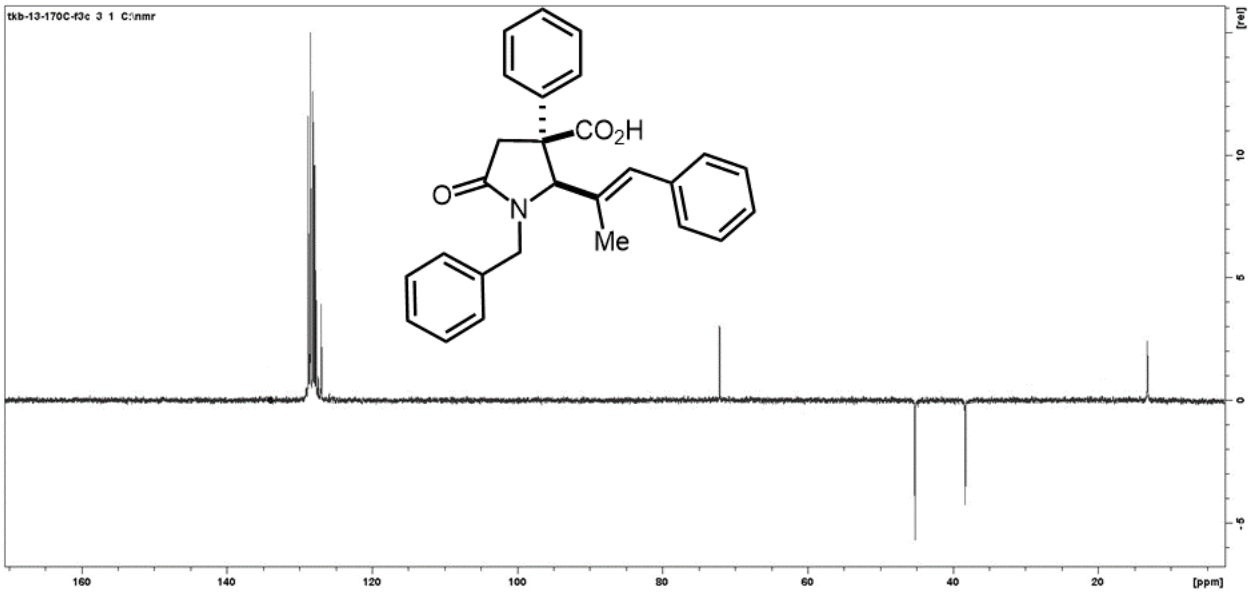
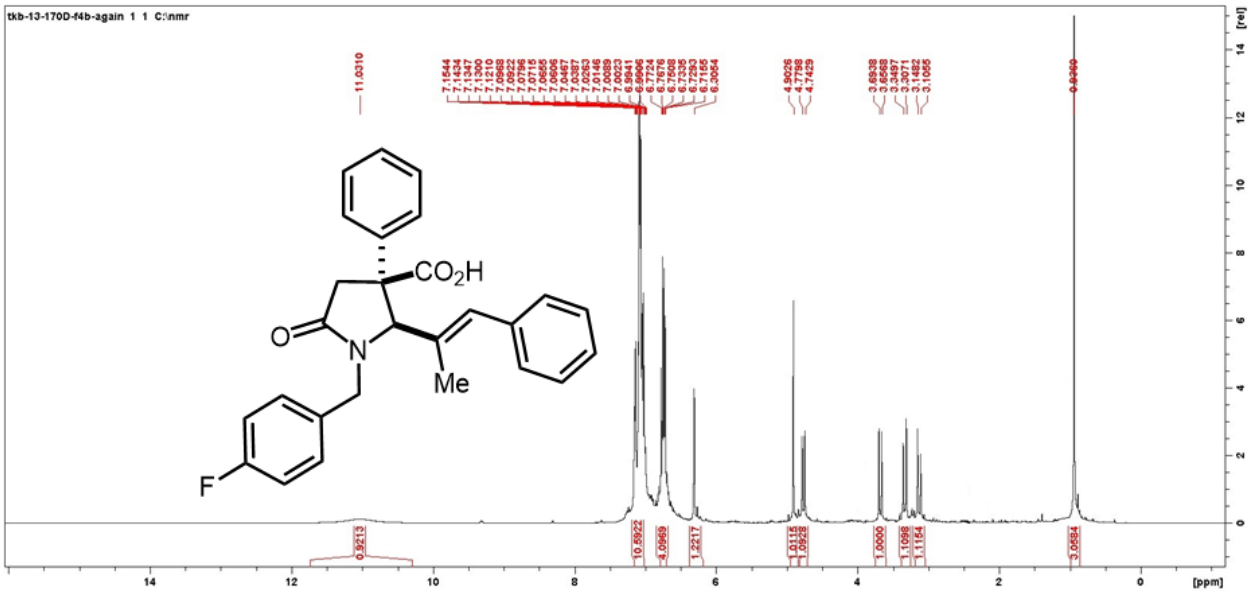
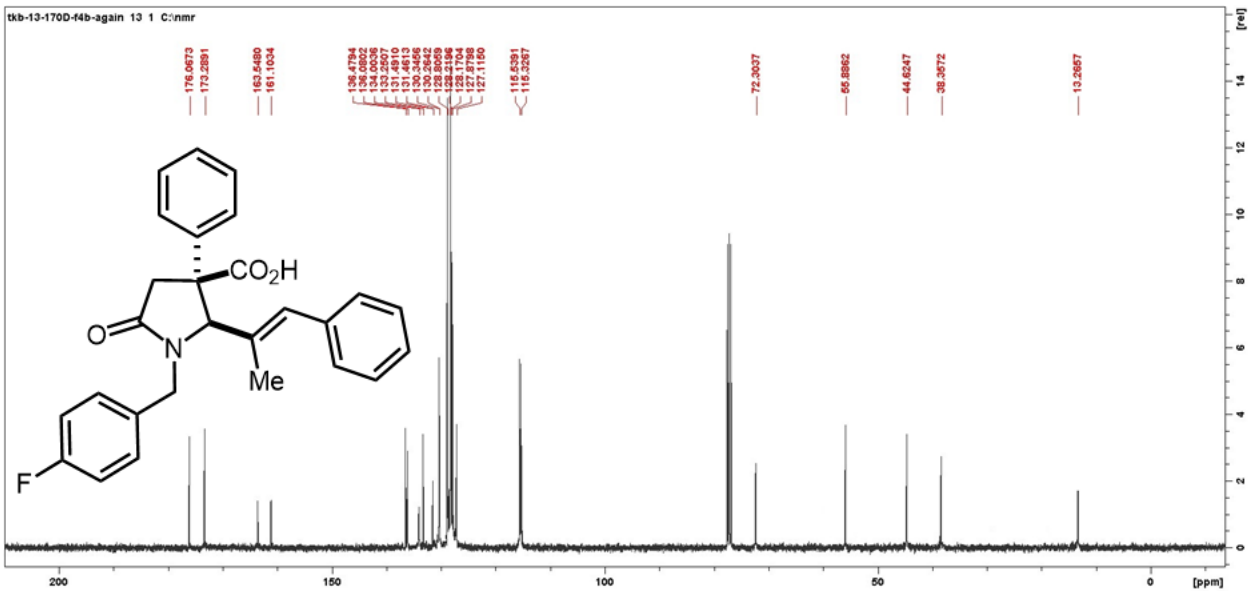


Compound 1f

Prepared in 1.0 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/acetone (50:50 to 0:100). Oily substance. Yield = 343.2 mg, 80%, 95:5 dr. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.03 (s, 1H), 7.15 – 6.99 (m, 10H), 6.77 – 6.71 (m, 4H), 6.31 (s, 1H), 4.90 (s, 1H), 4.76 (d, *J* = 14.8 Hz, 1H), 3.68 (d, *J* = 14.8 Hz, 1H), 3.33 (d, *J* = 17.1 Hz, 1H), 3.13 (d, *J* = 17.1 Hz, 1H), 0.94 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 176.1, 173.3, 163.6, 161.1, 136.5, 136.1, 133.2, 131.5, 130.4, 130.3, 128.8, 128.2, 127.9, 127.1, 115.5, 115.3, 72.3, 55.9, 44.6, 38.4, 13.3. HRMS calc for $C_{27}H_{24}FNO_3$ 429.1740, found 429.1744.

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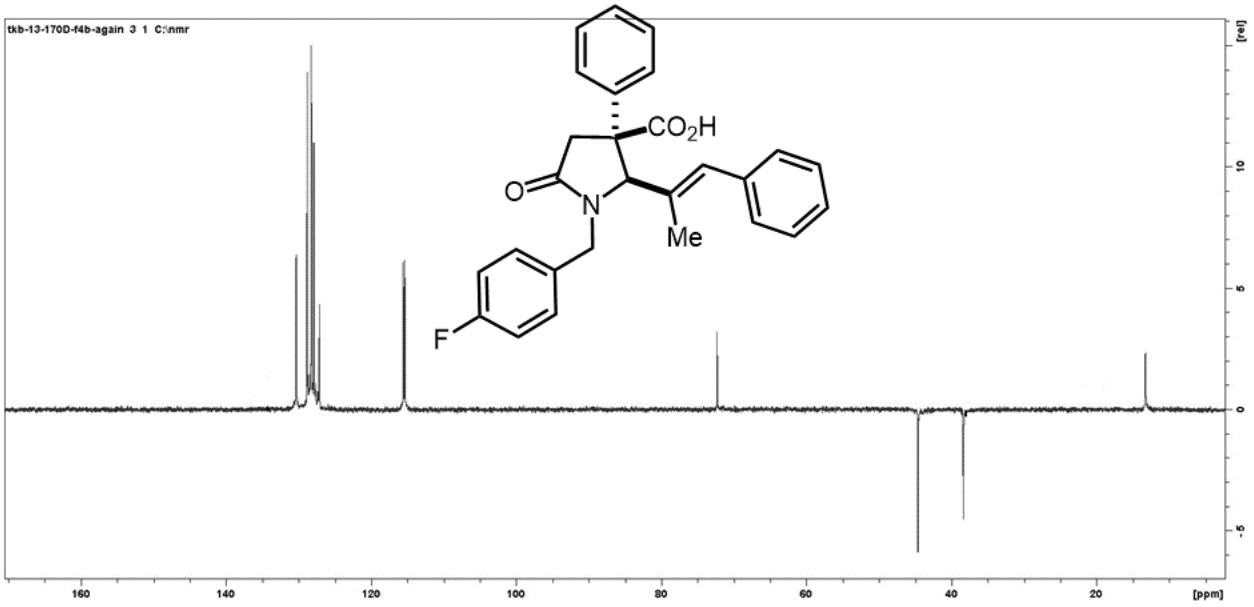
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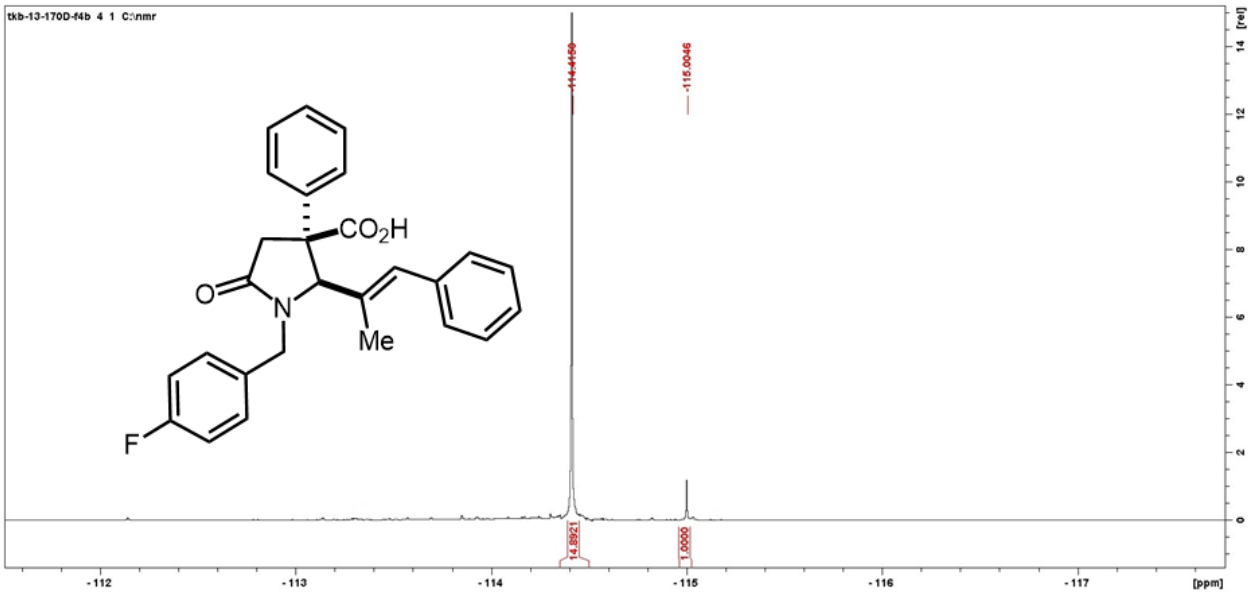
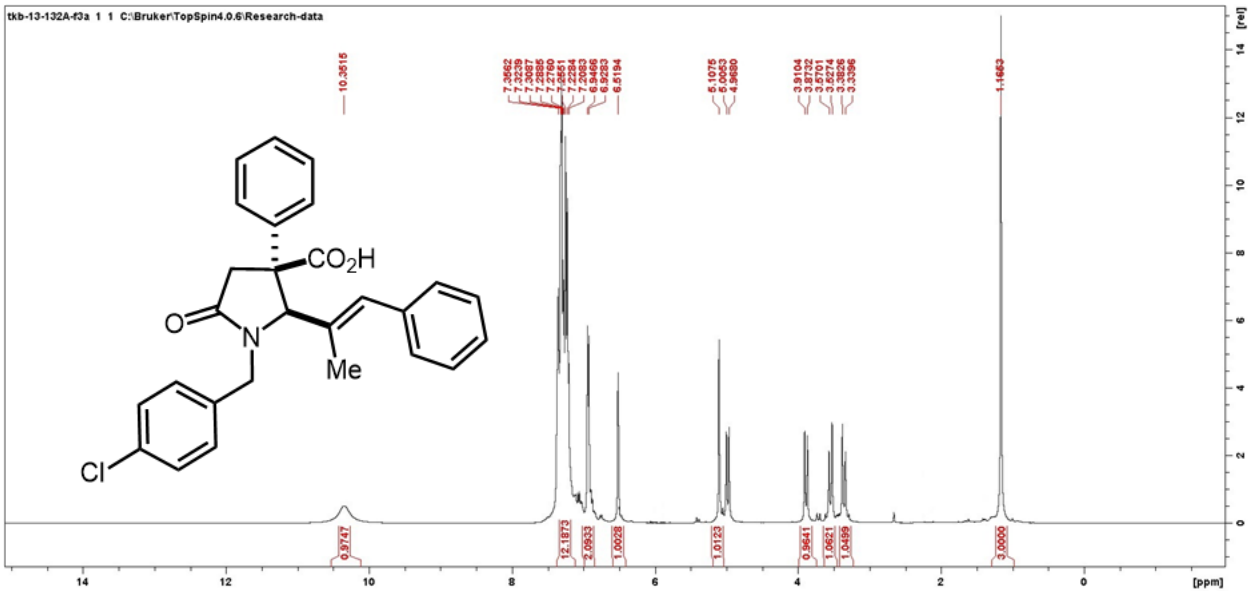


Compound 1g

Prepared in 1.0 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/acetone (50:50 to 0:100). Oily substance. Yield = 364.9 mg, 82%, 95:5 dr. ^{1}H NMR (400 MHz, $CDCl_3$) δ 10.35 (s, 1H), 7.35 – 7.20 (m, 12H), 6.94 (d, *J* = 7.6 Hz, 2H), 6.52 (s, 1H), 5.11 (s, 1H), 4.98 (d, *J* = 14.9 Hz, 1H), 3.90 (d, *J* = 14.9 Hz, 1H), 3.55 (d, *J* = 17.1 Hz, 1H), 3.36 (d, *J* = 17.1 Hz, 1H), 1.16 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 176.3, 173.4, 136.4, 136.0, 134.2, 133.6, 133.1, 130.0, 128.8, 128.7, 128.2, 128.0, 127.9, 127.1, 72.4, 55.9, 44.7, 38.3, 13.3. FTIR (KBr): 3007.5, 2951.9, 1764.3, 1707.5, 1678.7, 1601.0, 1539.9, 1511.3, 1464.4, 1435.3, 1414.9, 1369.5, 1286.5, 1268.5, 1246.0, 1197.2, 1154.7, 1121.6, 1033.6, 978.8, 907.1, 829.2. HRMS calc for $C_{27}H_{24}ClNO_3$ 445.1445, found 445.1441.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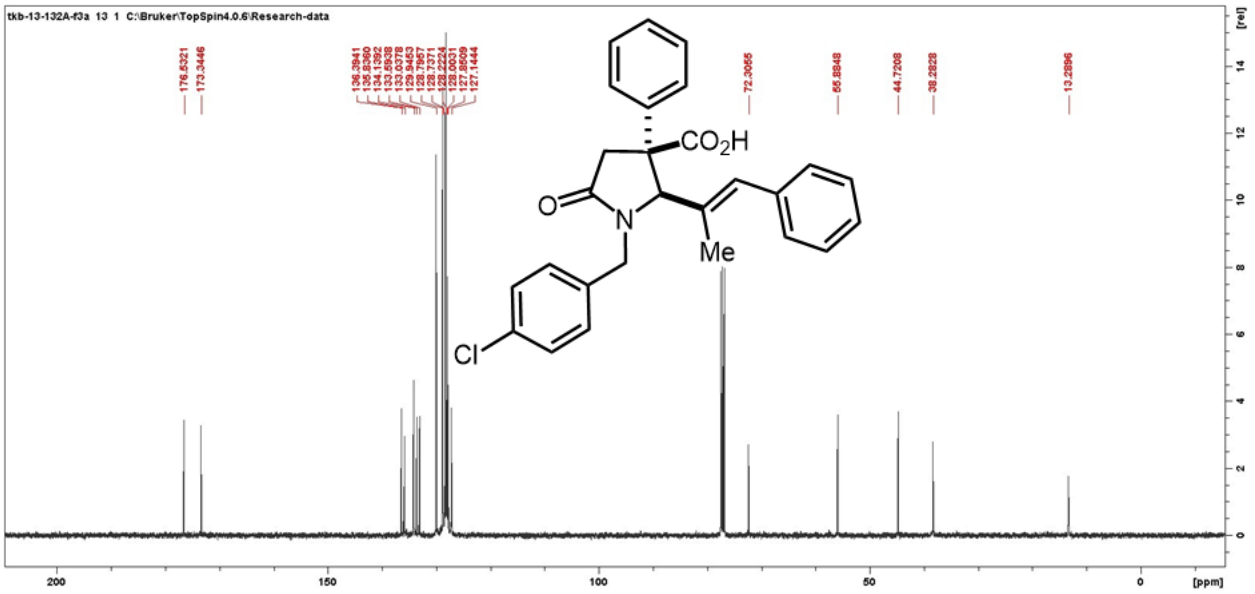
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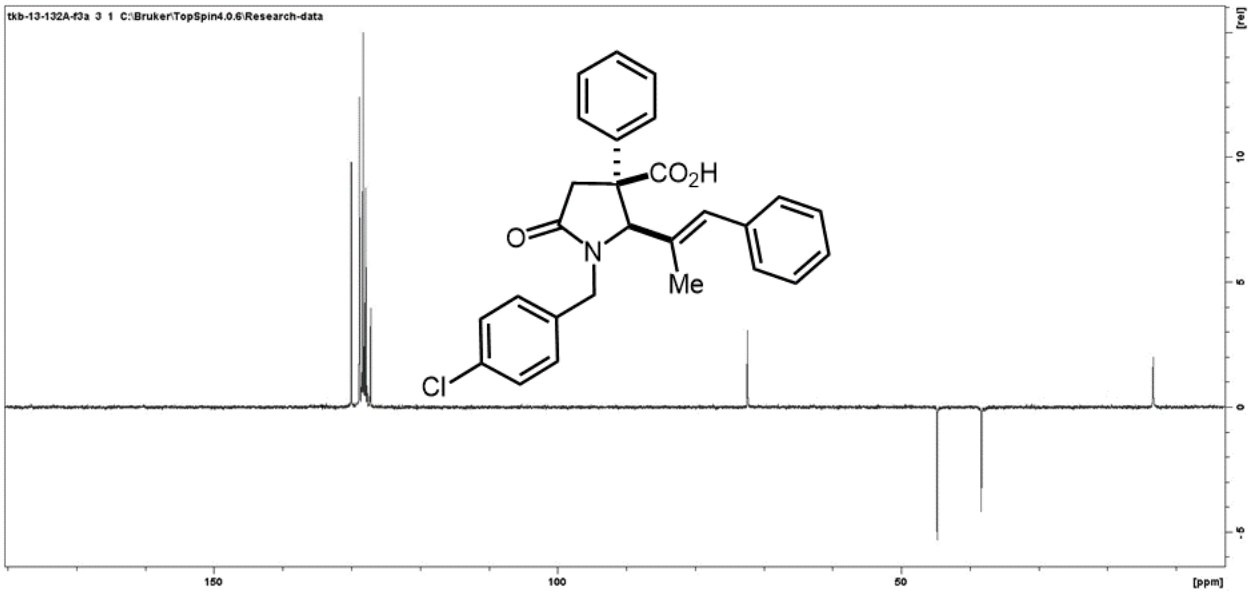
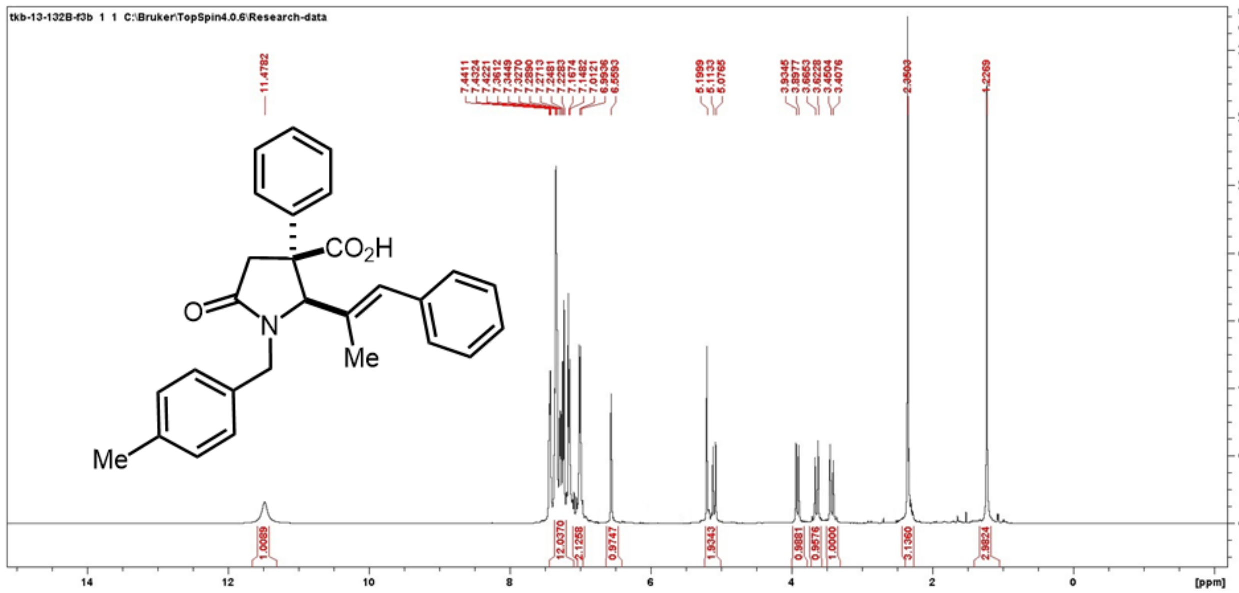


Compound 1h

Prepared in 2.0 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/acetone (50:50 to 0:100). Oily substance. Yield = 748 mg, 88%, 95:5 dr. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.48 (s, 1H), 7.44 – 7.22 (m, 12H), 7.16 (d, *J* = 7.8 Hz, 2H), 6.56 (s, 1H), 5.20 (s, 1H), 5.10 (d, *J* = 14.8 Hz, 1H), 3.92 (d, *J* = 14.8 Hz, 1H), 3.64 (d, *J* = 17.2 Hz, 1H), 3.43 (d, *J* = 17.2 Hz, 1H), 2.35 (s, 3H), 1.23 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 176.5, 173.5, 137.4, 136.7, 136.2, 133.3, 132.4, 129.3, 128.9, 128.6, 128.2, 128.2, 128.0, 127.9, 127.1, 72.3, 55.9, 45.2, 38.5, 21.2. FTIR (KBr): 3105.8, 2950.6, 1710.3, 1660.5, 1595.7, 1510.7, 1462.8, 1434.7, 1412.6, 1340.5, 1301.1, 1270.8, 1234.9, 1179.9, 1109.4, 1034.1, 976.2, 915.2, 865.5. HRMS calc for $C_{28}H_{27}NO_3$ 425.1991, found 425.1997.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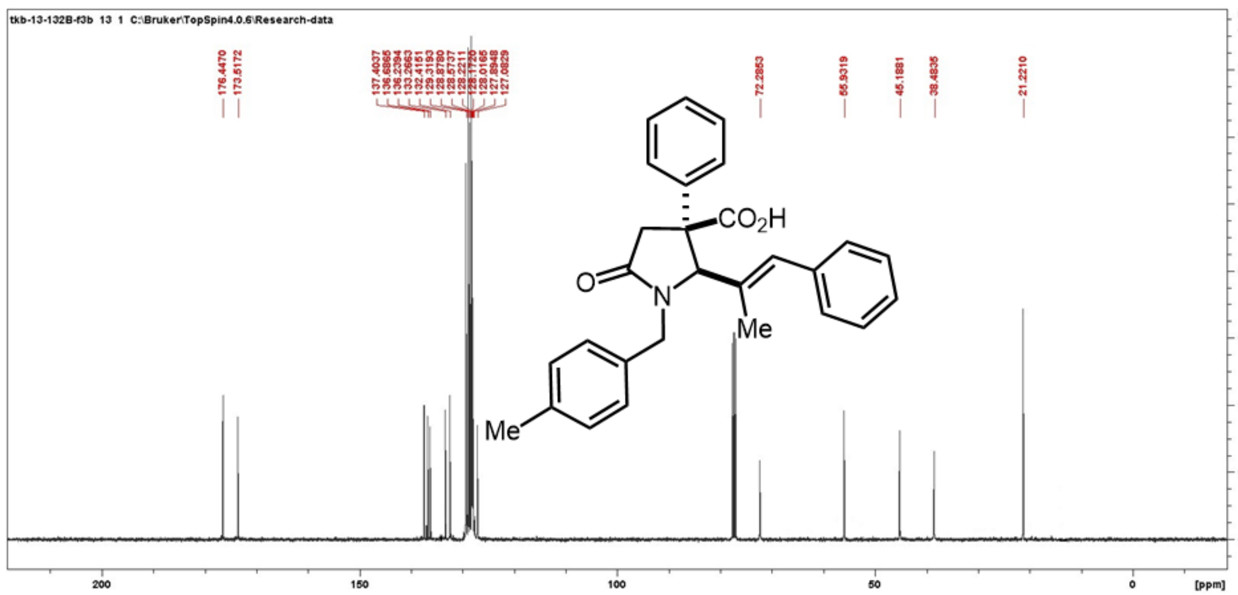
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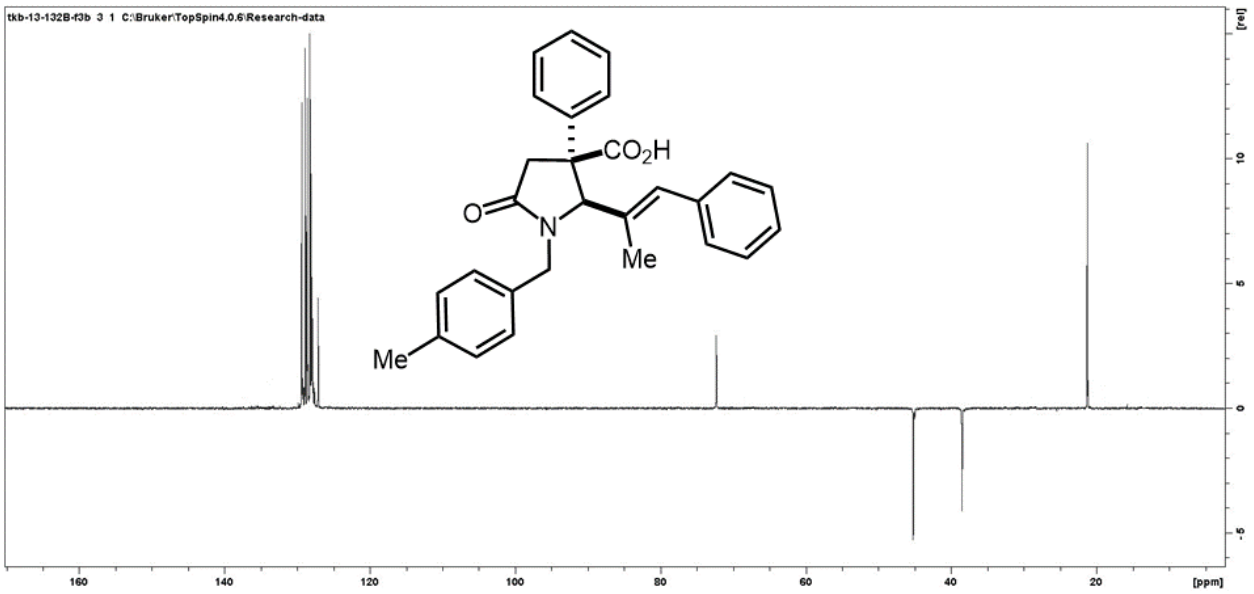
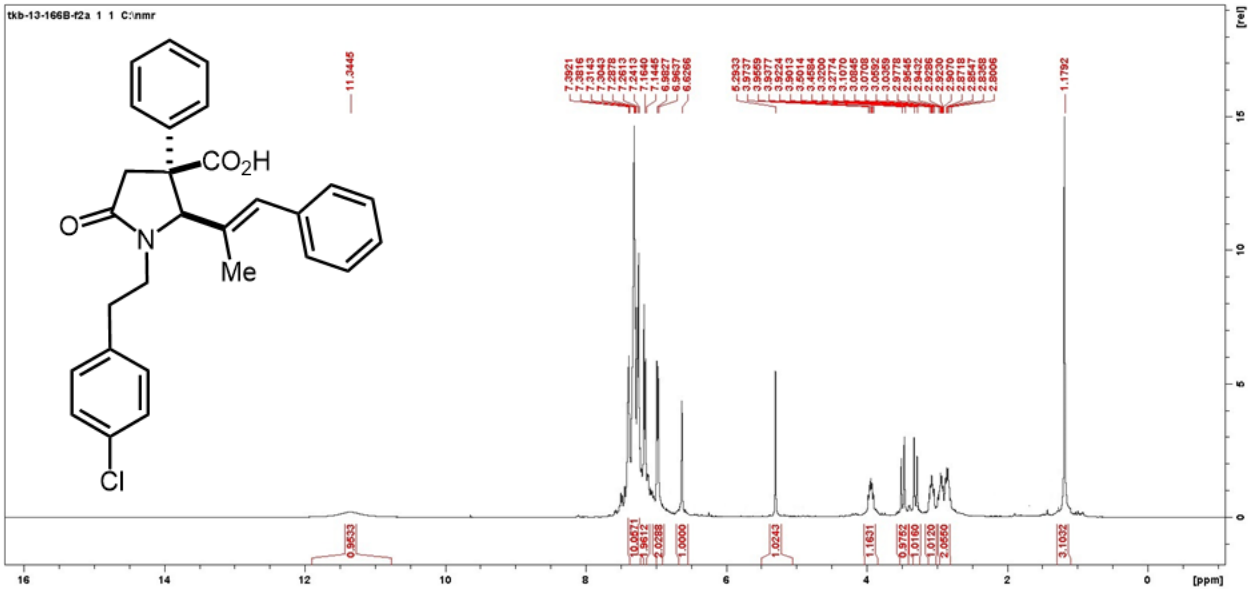
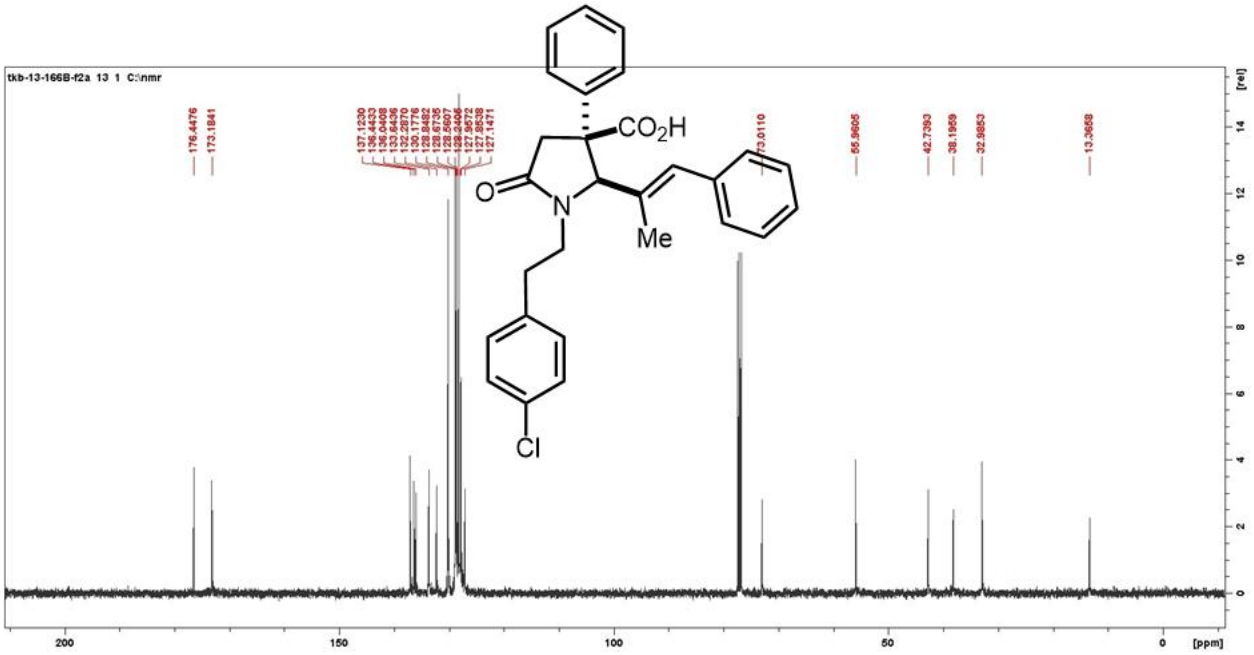
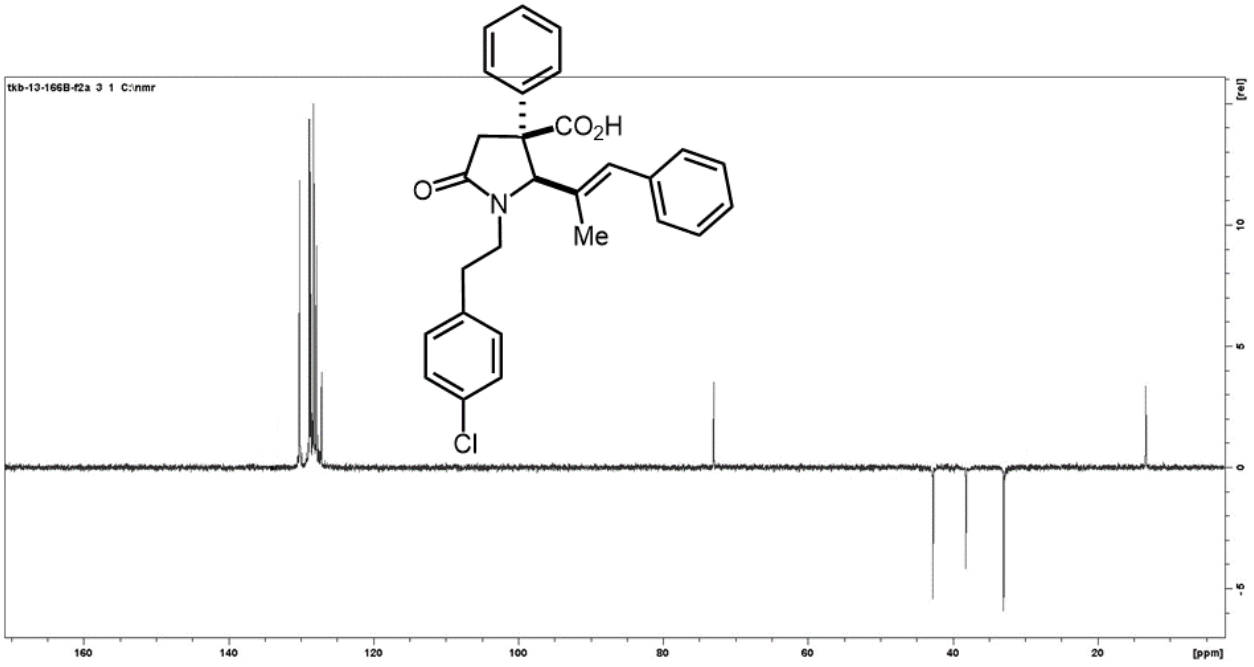


Compound 1i

Prepared in 1.0 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/acetone (50:50 to 0:100). Yield = 362.6 mg, 79%, 95:5 dr. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.34 (s, 1H), 7.39 – 7.14 (m, 12H), 6.97 (d, *J* = 7.3 Hz, 2H), 6.63 (s, 1H), 5.29 (s, 1H), 3.94 (ddd, *J* = 14.8, 9.3, 6.4 Hz, 1H), 3.48 (d, *J* = 17.3 Hz, 1H), 3.30 (d, *J* = 17.0 Hz, 1H), 3.07 (ddd, *J* = 14.3, 9.3, 5.9 Hz, 1H), 2.94 (ddd, *J* = 14.9, 9.2, 6.0 Hz, 1H), 2.84 (ddd, *J* = 14.2, 9.1, 6.3 Hz, 1H), 1.18 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 176.5, 173.2, 137.1, 136.4, 136.0, 133.6, 132.3, 130.2, 128.9, 128.7, 128.2, 128.2, 128.0, 127.9, 127.1, 73.0, 55.9, 42.7, 38.2, 33.0, 13.4. HRMS calc for $C_{28}H_{26}ClNO_3$ 459.1601, found 459.1608.



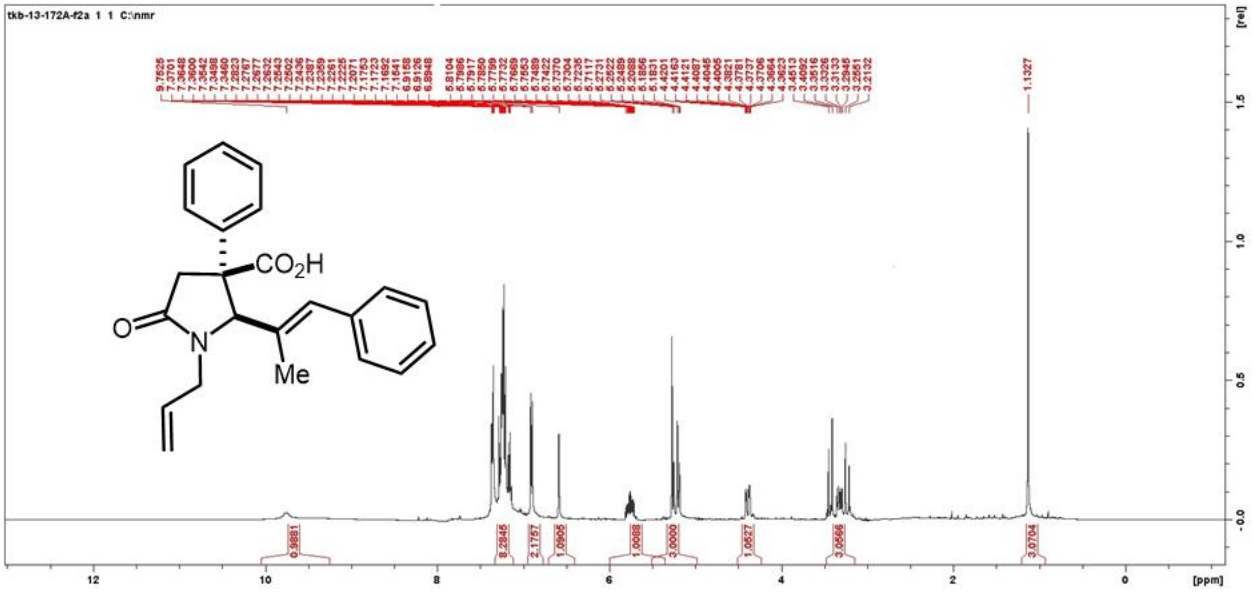


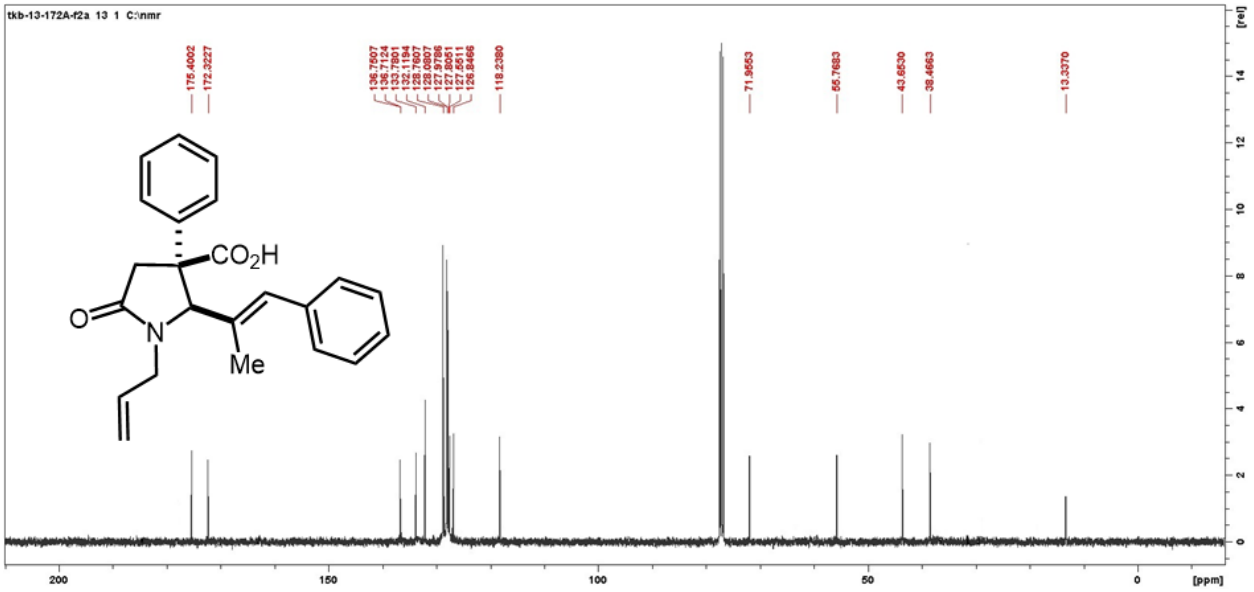


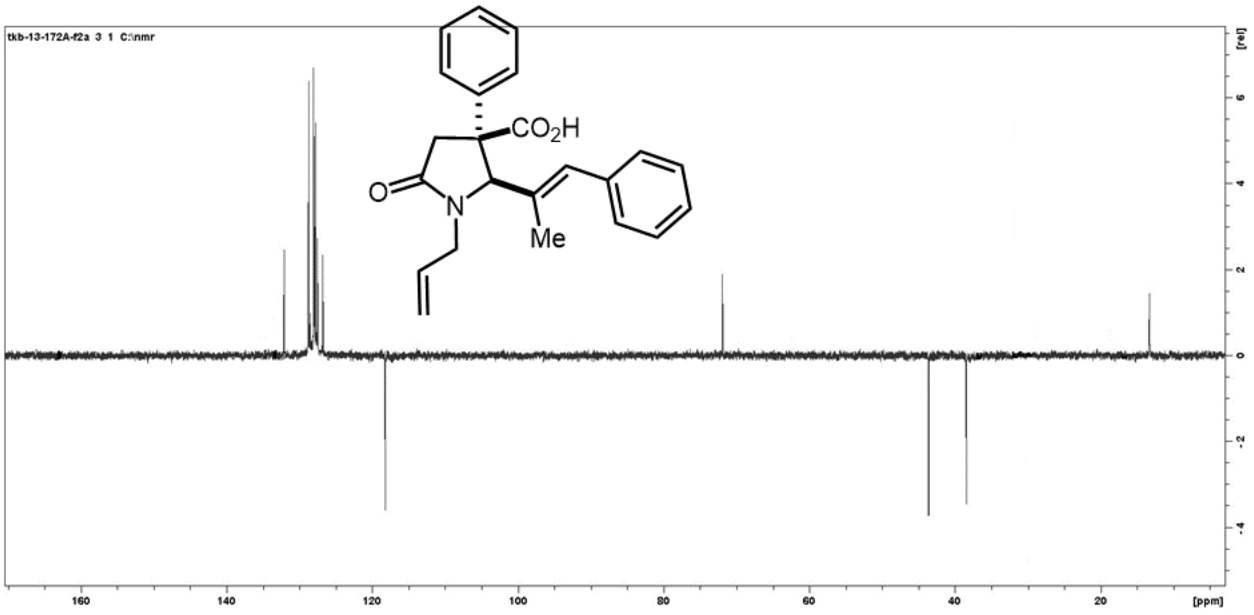
Compound 1j

Prepared in 3.0 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/acetone (50:50 to 0:100). Yield = 921.7 mg, 85%, 95:5 dr. ^{1}H NMR (400 MHz, $CDCl_3$) δ 9.75 (s, 1H), 7.37 – 7.15 (m, 2H), 6.92 – 6.89 (m, 2H), 6.59 (s, 1H), 5.76 (dddd, *J* = 17.5, 10.1, 7.5, 4.7 Hz, 1H), 5.27 – 5.18 (m, 3H), 4.39 (ddt, *J* = 15.3, 4.8, 1.8 Hz, 1H), 3.45 – 3.21 (m, 3H), 1.13 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 175.4, 172.3, 136.7, 133.8, 132.1,

128.8, 128.1, 128.0, 127.8, 127.5, 126.8, 118.2, 71.9, 55.8, 43.7, 38.5, 13.3. HRMS calc for $C_{23}H_{23}NO_3$ 361.1678, found 361.1685.

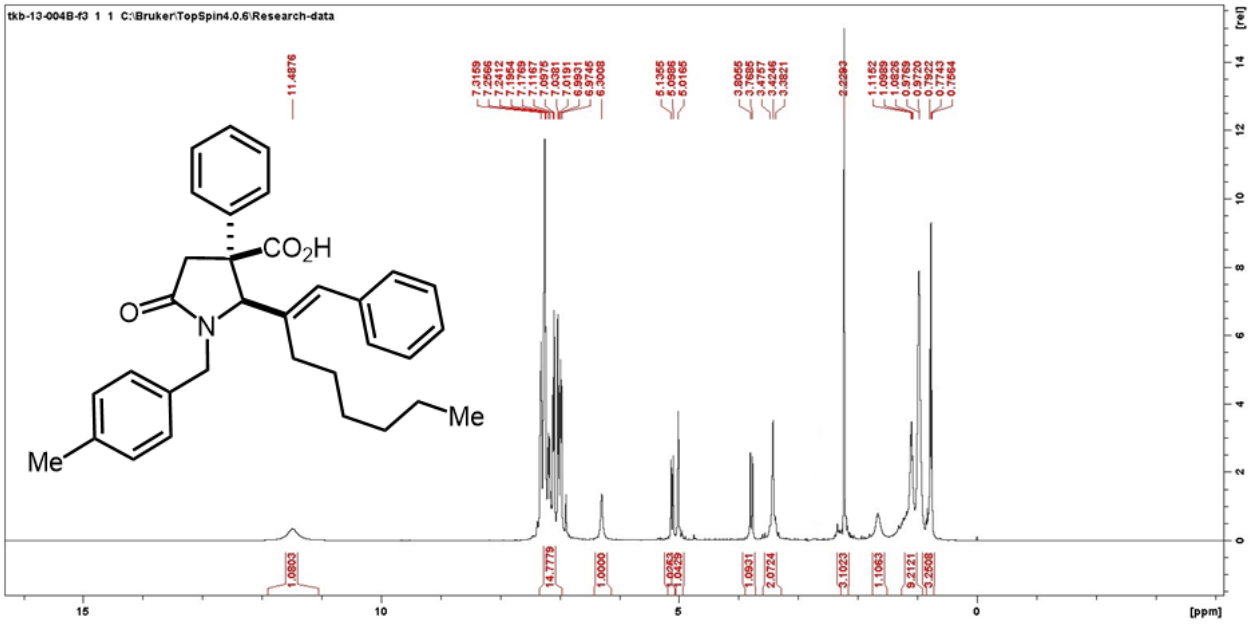


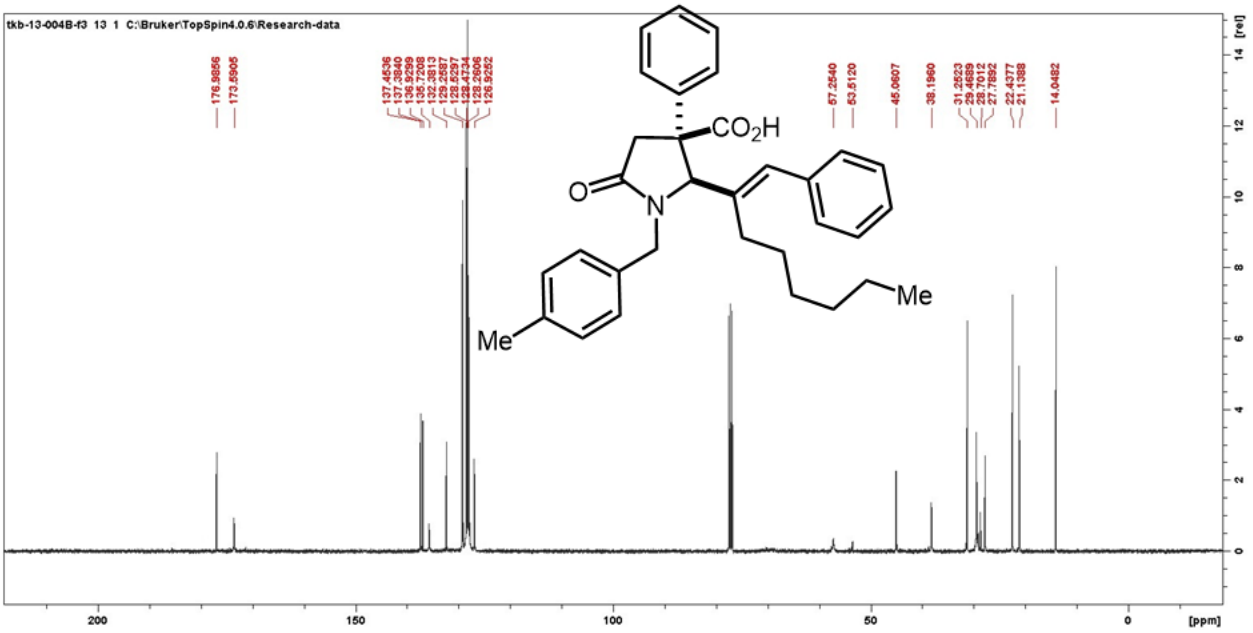


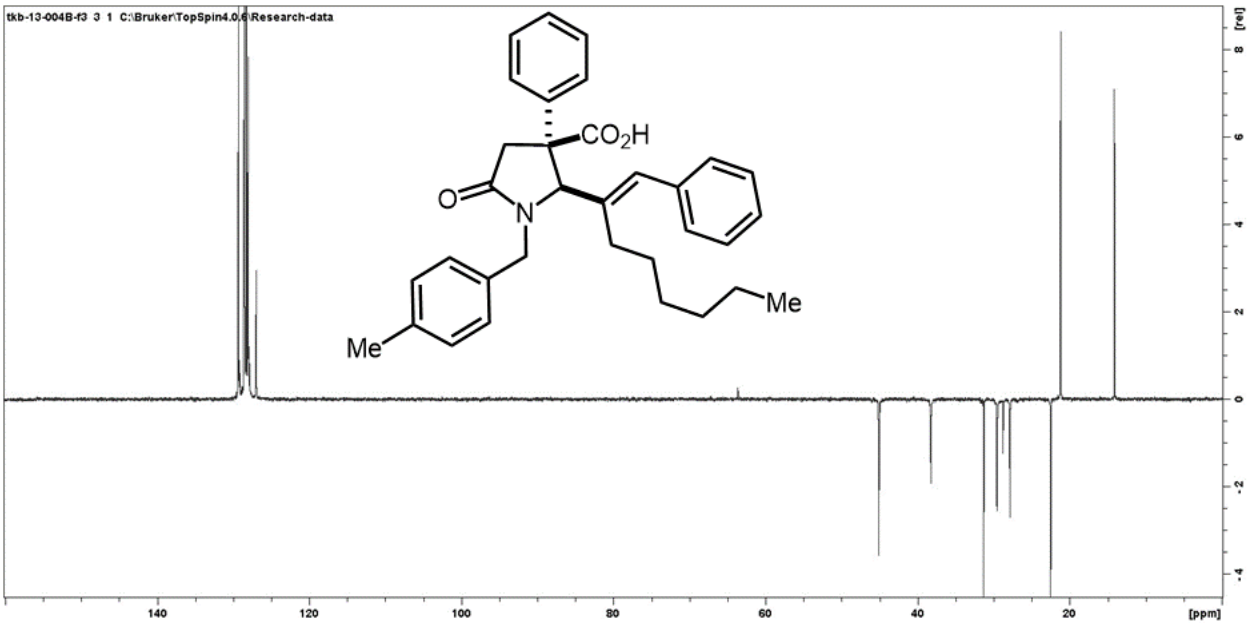


Compound 1k

Prepared in 1.0 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/acetone (50:50 to 0:100). Yield = 381.2 mg, 77%, 90:10 dr. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.49 (s, 1H), 7.32 – 6.97 (m, 14H), 6.30 (s, 1H), 5.12 (d, J = 14.7 Hz, 1H), 5.02 (s, 1H), 3.79 (d, J = 14.8 Hz, 1H), 3.47 – 3.38 (m, 2H), 2.23 (s, 3H), 1.11 (h, J = 7.3 Hz, 1H), 1.09 – 0.97 (m, 9H), 0.77 (t, J = 7.2 Hz, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 177.0, 173.6, 137.5, 137.4, 136.9, 132.4, 129.3, 128.5, 128.3, 128.2, 127.9, 126.9, 57.2, 53.5, 45.1, 38.2, 31.3, 29.5, 29.4, 27.8, 22.4, 21.1, 14.0. HRMS calc for $C_{33}H_{37}NO_3$ 495.2773, found 495.2779.





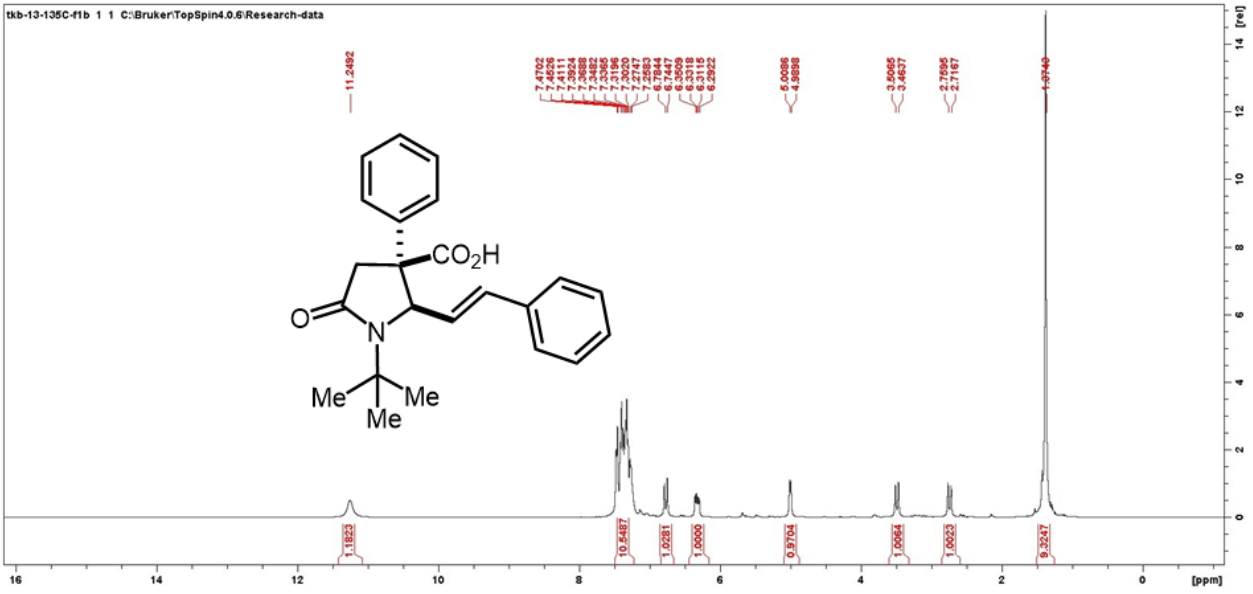


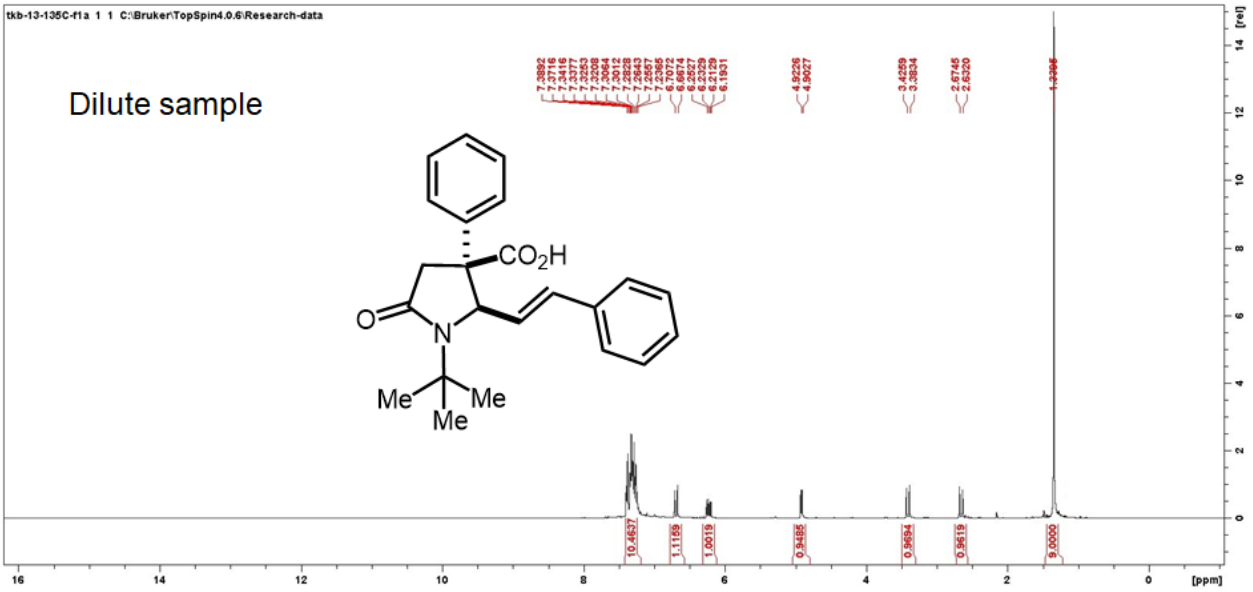
Compound 1l

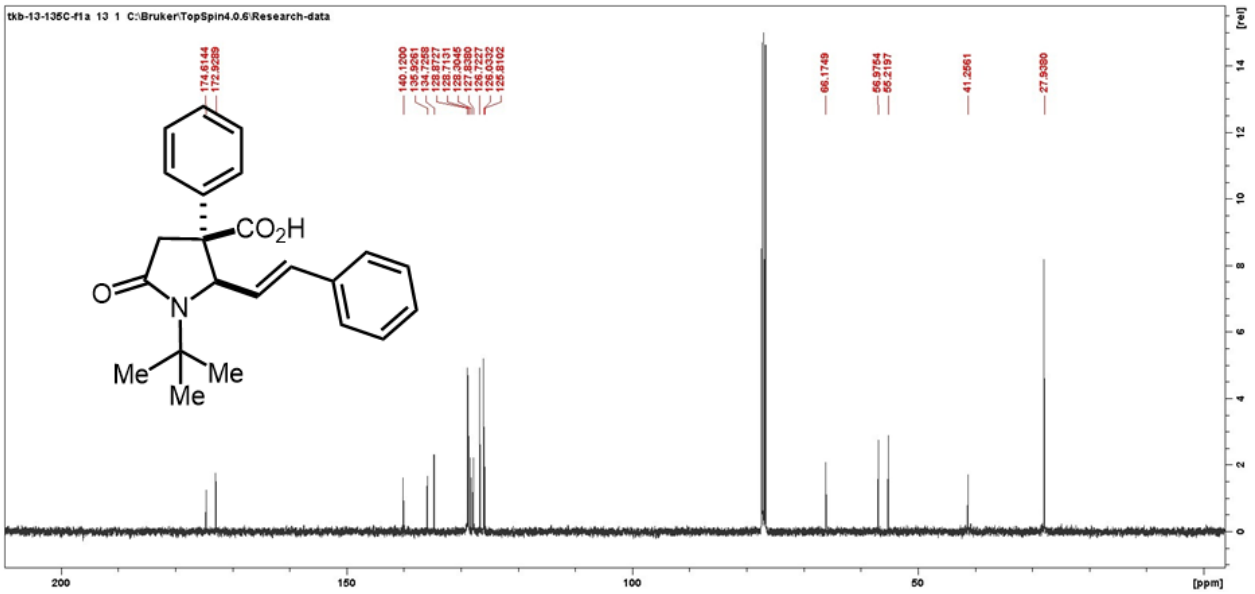
Prepared in 5.0 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/acetone (50:50 to 0:100). Yield = 1452 mg, 80%, 95:5 dr. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.25 (s, 1H), 7.38 – 7.24 (m, 10H), 6.69 (d, *J* = 15.9 Hz, 1H), 6.22 (dd, *J* = 15.9, 7.9 Hz, 1H), 4.91 (d, *J* = 7.9 Hz, 1H), 3.41 (d, *J* = 17.0 Hz, 1H), 2.65 (d, *J* = 17.0 Hz, 1H), 1.34 (s,

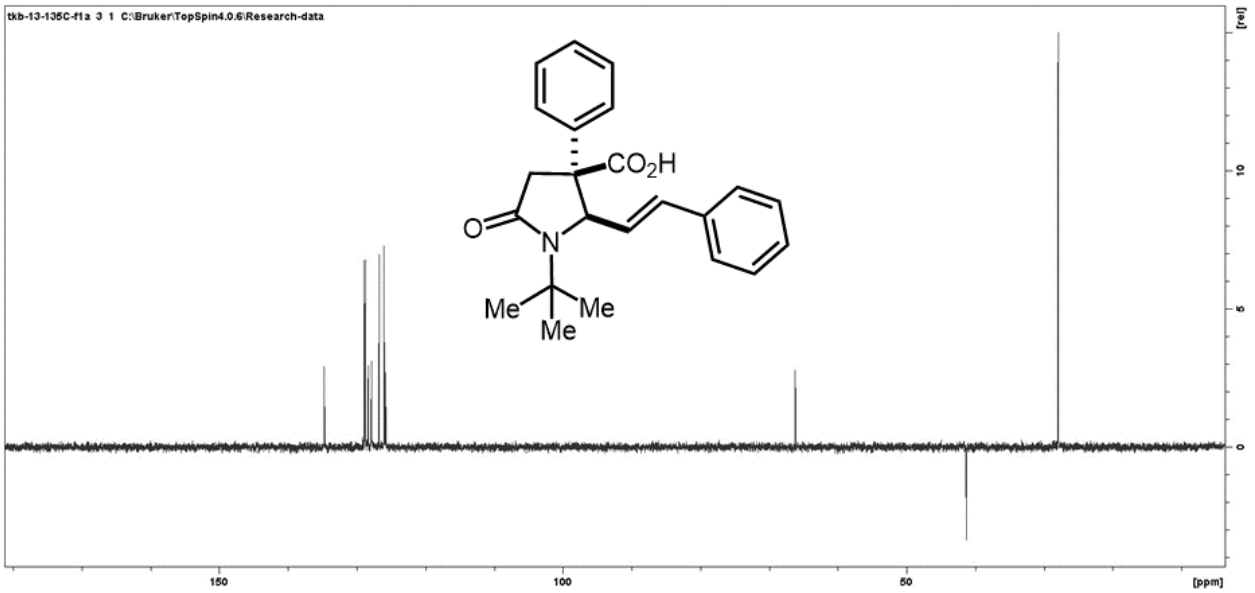
9H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.6, 172.9, 140.1, 135.9, 134.7, 128.9, 128.7, 128.3, 127.8, 126.7, 126.0, 125.8, 66.2, 57.0, 55.2, 41.3, 27.9. FTIR (KBr): 2972.9, 1721.1, 1667.7, 1628.3, 1495.3, 1448.2, 1395.1, 1364.2, 1202.9, 1141.9, 965.6, 741.3, 692.1. HRMS calc for $C_{23}H_{25}NO_3$ 363.1834, found 363.1841.

Concentrated sample (carboxyl proton visible)





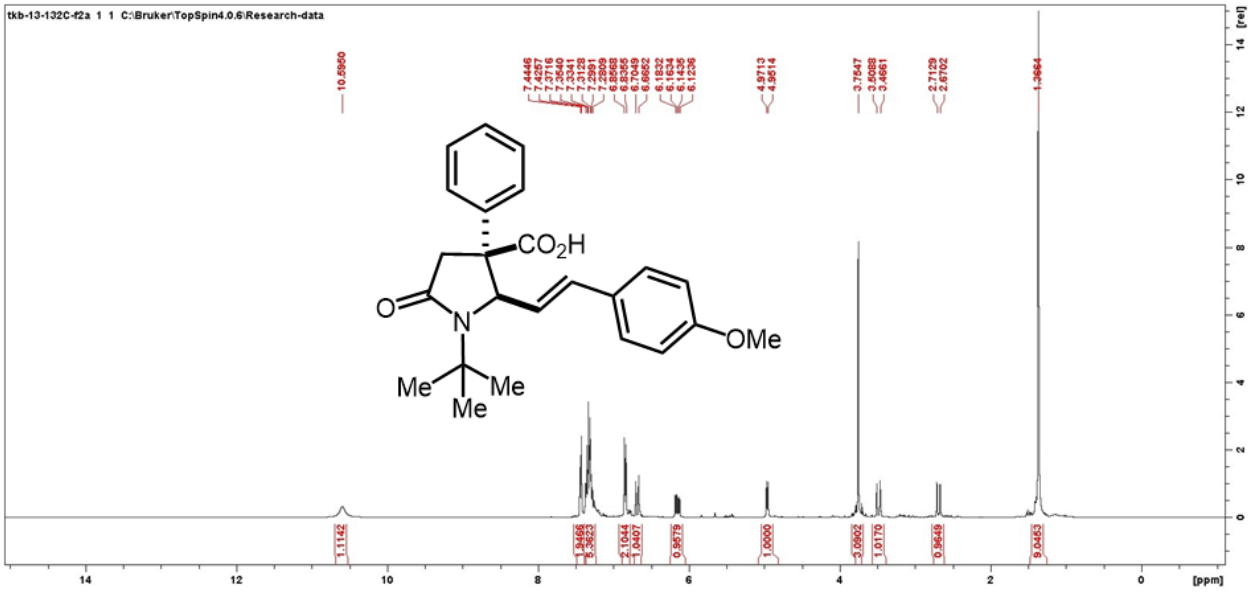


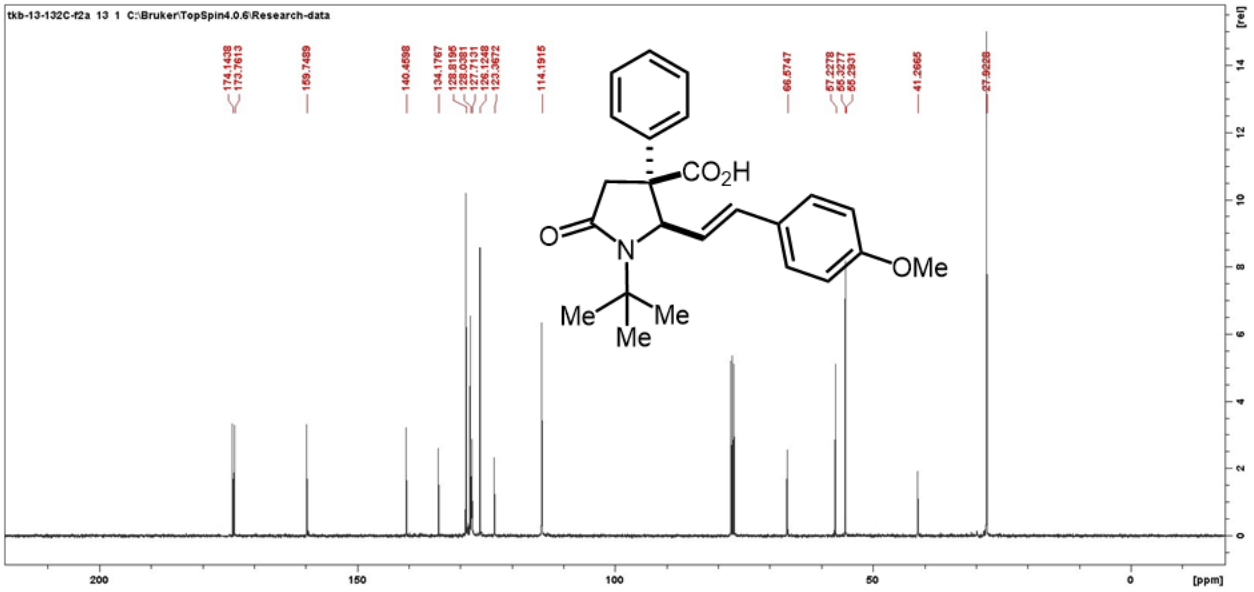


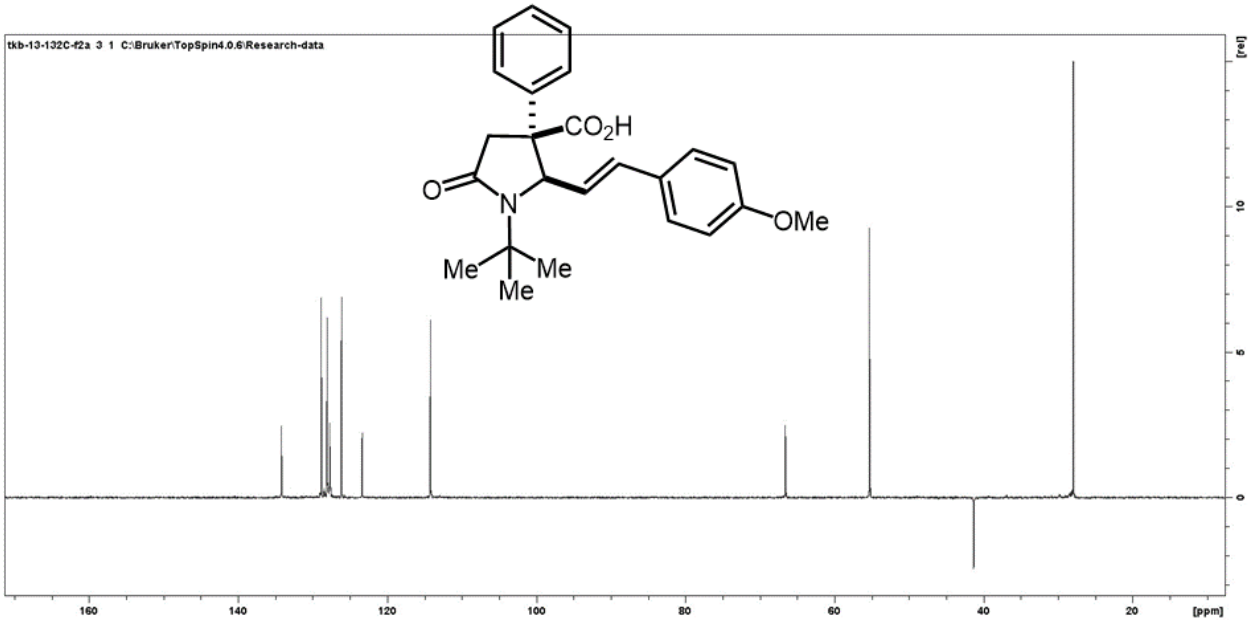
Compound 1m

Prepared in 5.0 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/acetone (50:50 to 0:100). Yield = 1633 mg, 83%, 95:5 dr. ^{1}H NMR (400 MHz, $CDCl_3$) δ 10.60 (s, 1H), 7.44 (d, *J* = 8.5 Hz, 2H), 7.40 – 7.31 (m, 5H), 6.85 (d, *J* = 8.3 Hz, 2H), 6.69 (d, *J* = 15.9 Hz, 1H), 6.15 (dd, *J* = 15.9, 7.9 Hz, 1H), 4.96 (d, *J* = 7.9 Hz, 1H), 3.76 (s, 3H), 3.49 (d, *J* = 17.1 Hz, 1H), 2.69 (d, *J* = 17.1 Hz, 1H), 1.37 (s, 9H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.2, 173.8, 159.8, 140.5, 134.2, 128.8, 128.0, 127.7, 126.1, 123.4, 114.2, 66.6, 57.2,

55.3, 55.3, 41.3, 27.9. FTIR (KBr): 2970.2, 2934.6, 2912.8, 2836.5, 1721.4, 1631.8, 1510.6, 1395.7, 1247.4, 1031.3, 830.5, 698.9. HRMS calc for $C_{24}H_{27}NO_4$ 393.1940, found 393.1944.







Compound 1a.ester

Prepared in 1.0 mmol scale using **General Procedures A** and **B.** Purification: Flash chromatography on silica eluting with hexane/acetone (50:50 to 0:100). Yield = 311.6 mg, 83%, 80:20 dr. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.41 – 7.27 (m, 8H), 6.99 – 6.90 (m, 2H), 6.64 (s, 1H), 5.13 (s, 1H), 3.56 (s, 3H), 3.30 – 3.12 (m, 2H), 2.45 – 2.33 (m, 1H), 1.26 (s, 3H), 0.97 – 0.80 (m, 3H), 0.69 – 0.58 (m, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.2, 173.2, 136.8, 136.1, 134.1, 132.4, 128.9, 128.3, 128.2, 127.9, 127.5, 126.9, 125.3, 76.9, 73.9, 73.6, 56.4, 53.4, 52.6, 38.8, 24.7, 24.5, 14.2, 7.2, 6.7, 4.6, 4.4. FTIR (KBr): 2984.1, 1723.4, 1669.4, 1608.2, 1511.1, 1431.8, 1414.7, 1344.9, 1298.4, 1135.3, 1031.8, 996.7, 702.4. HRMS calc for $C_{24}H_{25}NO_3$ 375.1834, found 375.1838.

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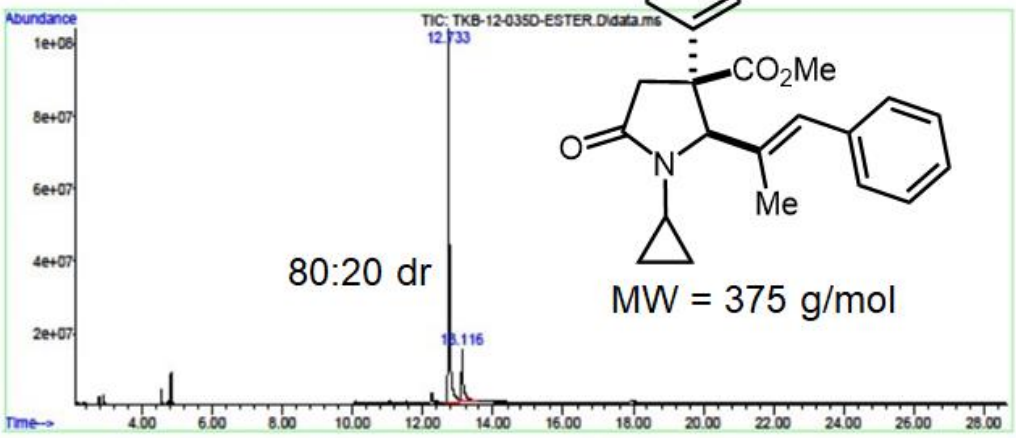
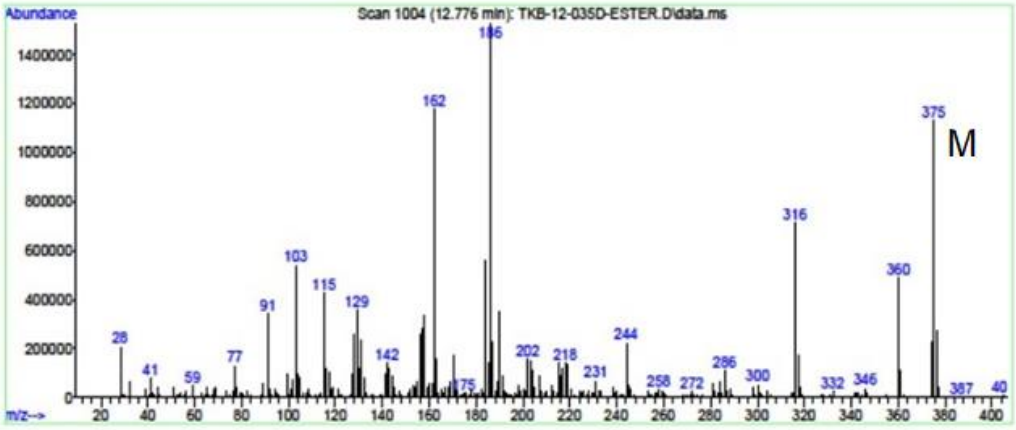
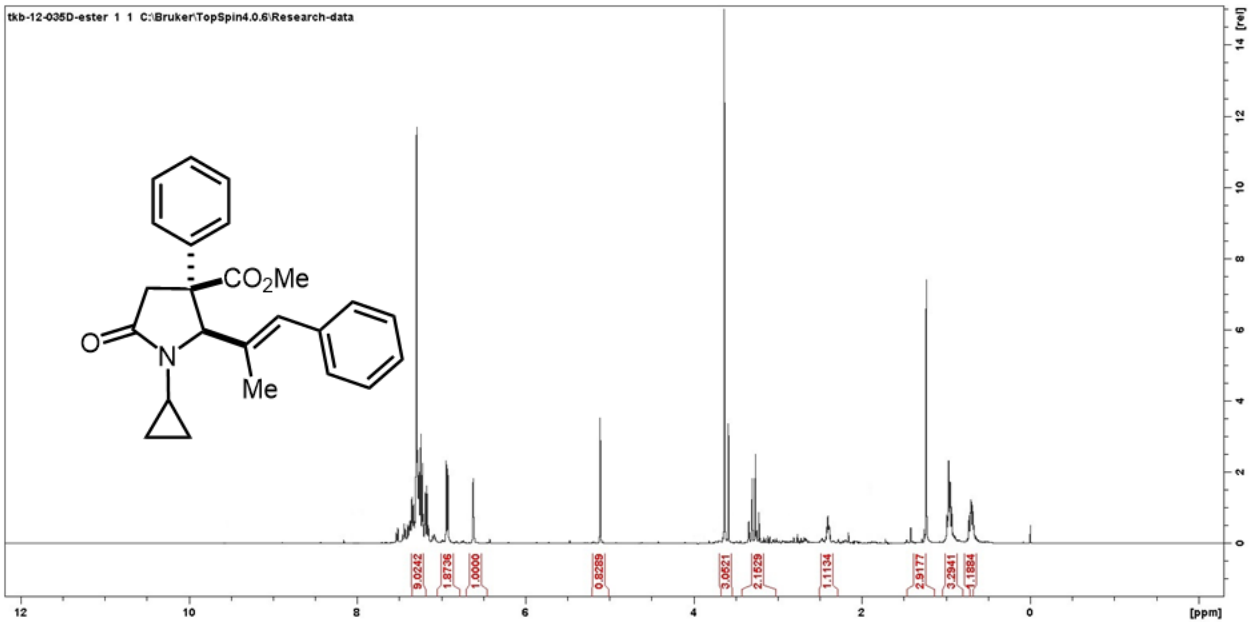
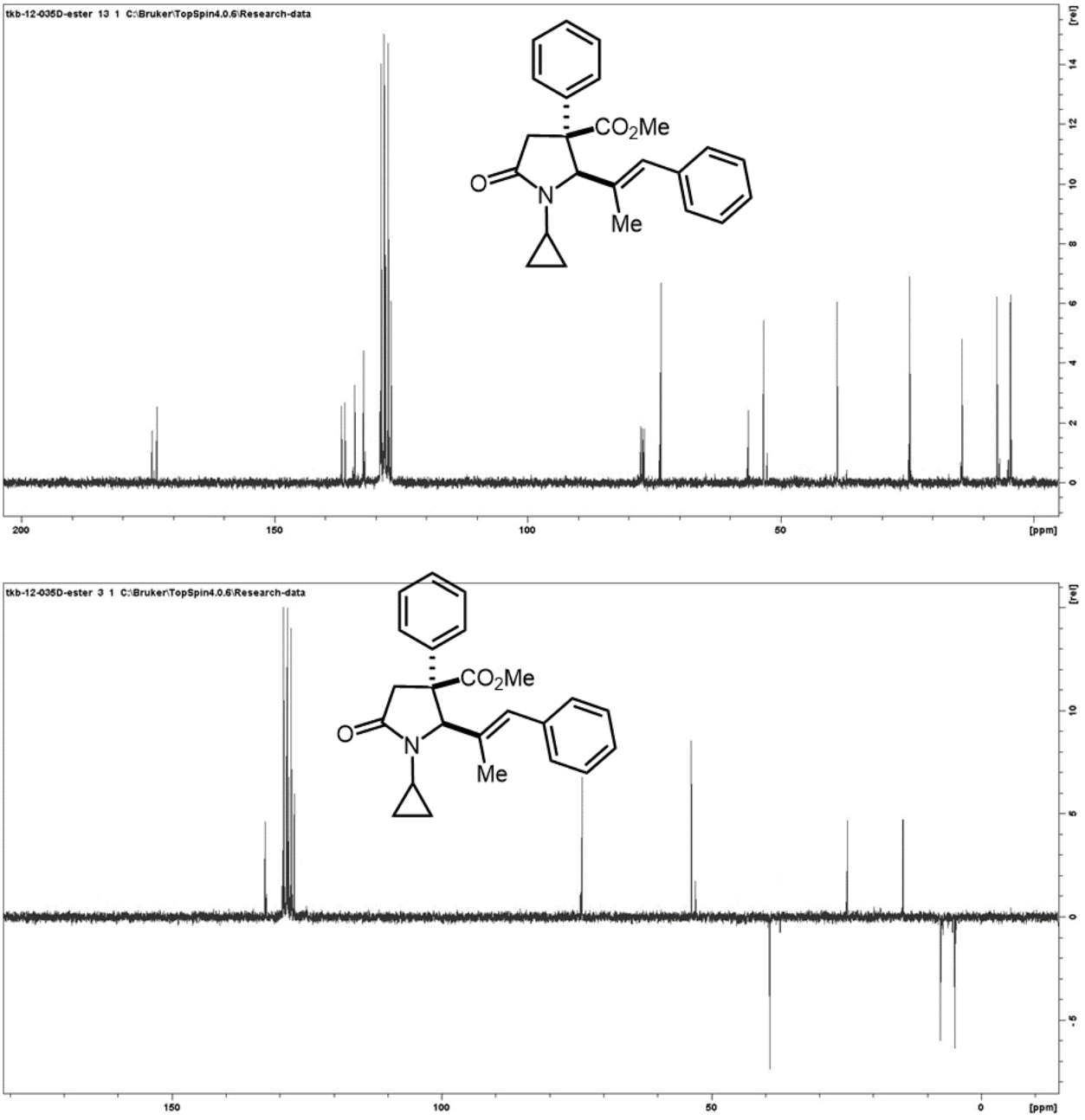




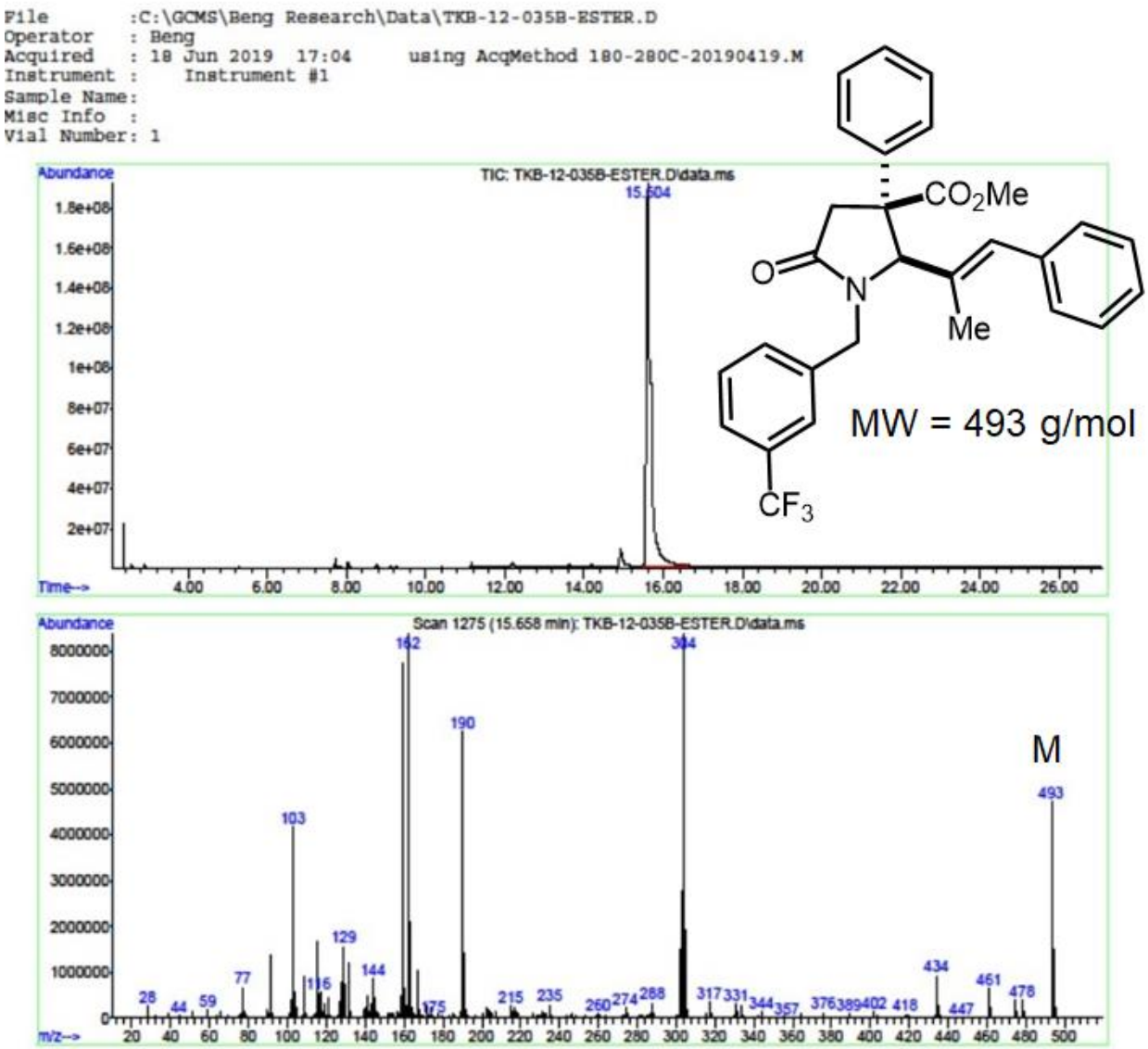


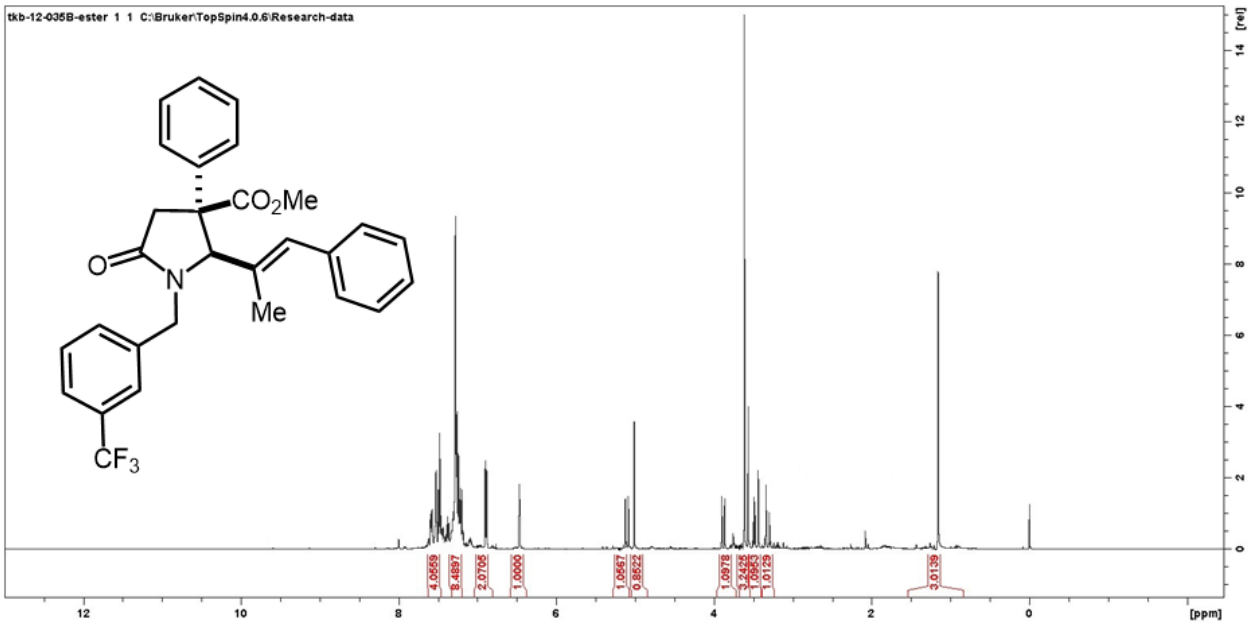


Compound 1g.ester

Prepared in 1.0 mmol scale using **General Procedures A** and **B.** Purification: Flash chromatography on silica eluting with hexane/acetone (50:50 to 0:100). Yield = 429.3 mg, 87%, 95:5 dr. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.64 – 7.44 (m, 4H), 7.37 – 7.26 (m, 8H), 6.84 (dd, *J* = 7.0, 1.8 Hz, 2H), 6.52 (s, 1H), 5.23 (d, *J* = 15.0 Hz, 1H), 5.06 (s, 1H), 3.83 (d, *J* = 15.0 Hz, 1H), 3.67 (s, 3H), 3.54 (d, *J* = 5.8 Hz, 1H), 3.47 (d, *J* = 5.8 Hz, 1H), 1.21 (s, 3H). ^{13}C NMR (101 MHz,

$CDCl_3$) δ 173.9, 172.4, 137.2, 136.3, 135.9, 133.1, 131.9, 129.2, 129.1, 129.0, 128.9, 128.5, 128.3, 128.0, 127.7, 127.5, 127.2, 125.4, 125.1, 124.7, 124.7, 119.7, 72.1, 56.1, 53.4, 44.6, 38.2, 13.4. FTIR (KBr): 2932.4, 1721.5, 1666.3, 1606.9, 1511.0, 1448.5, 1414.7, 1384.9, 1357.4, 1298.7, 1247.5, 1179.3, 1135.9, 1031.8, 995.8, 831.0, 750.2, 694.7. HRMS calc for $C_{29}H_{26}F_3NO_3$ 493.1865, found 493.1872.

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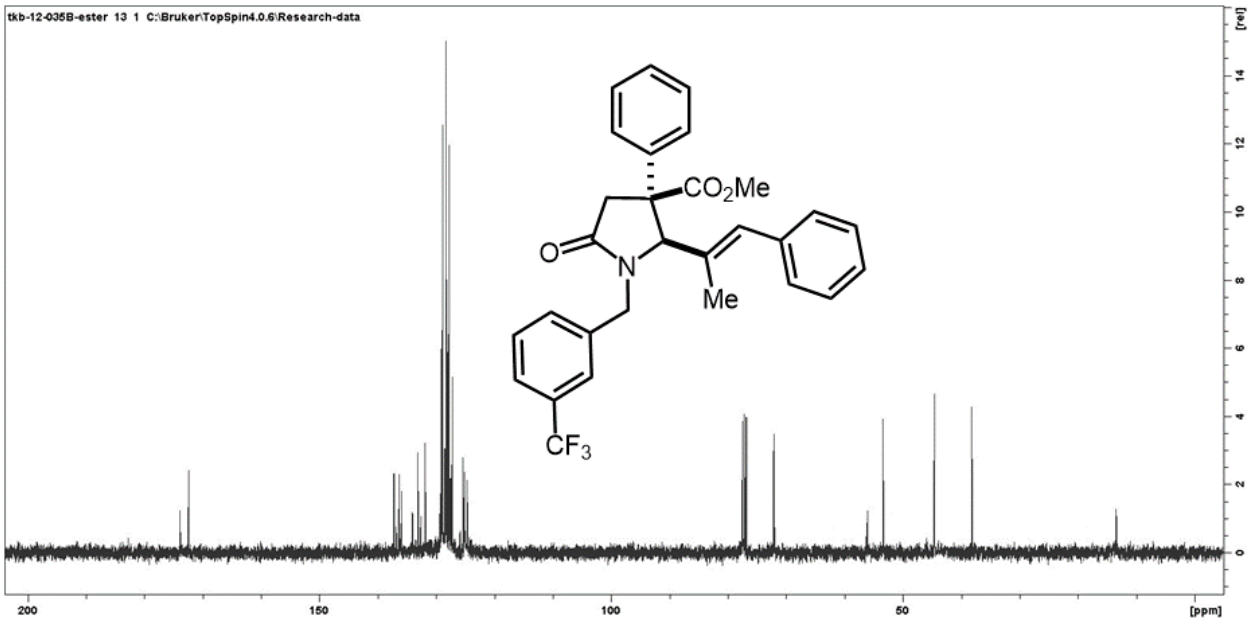
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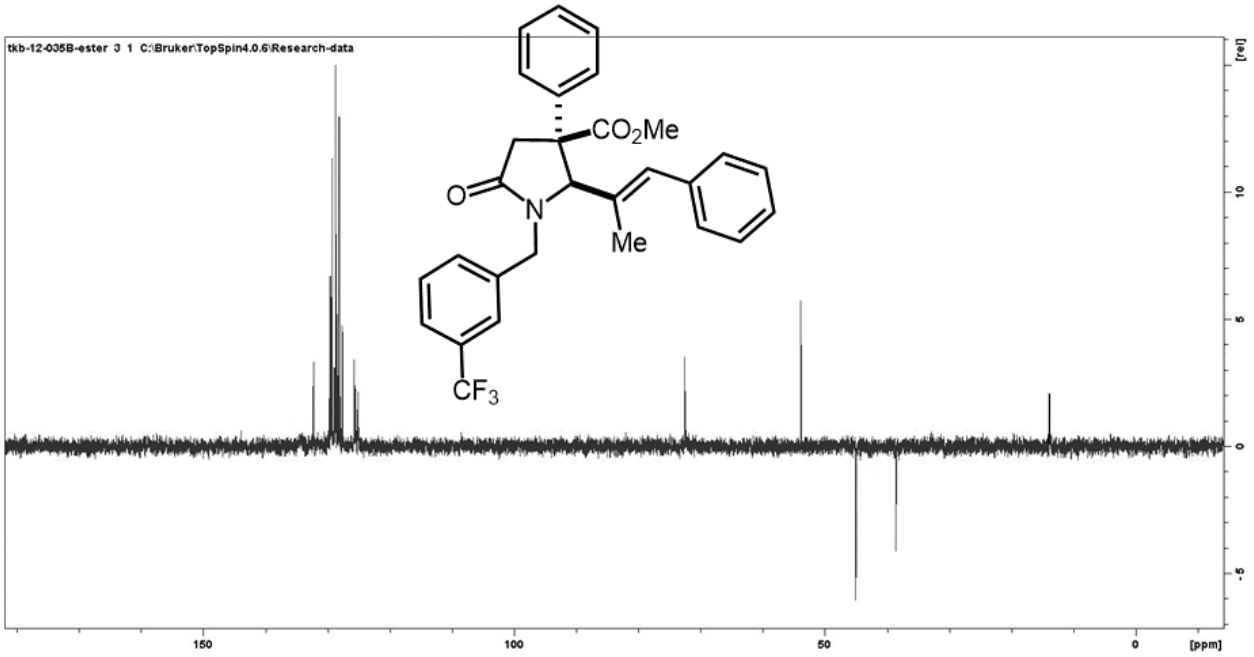
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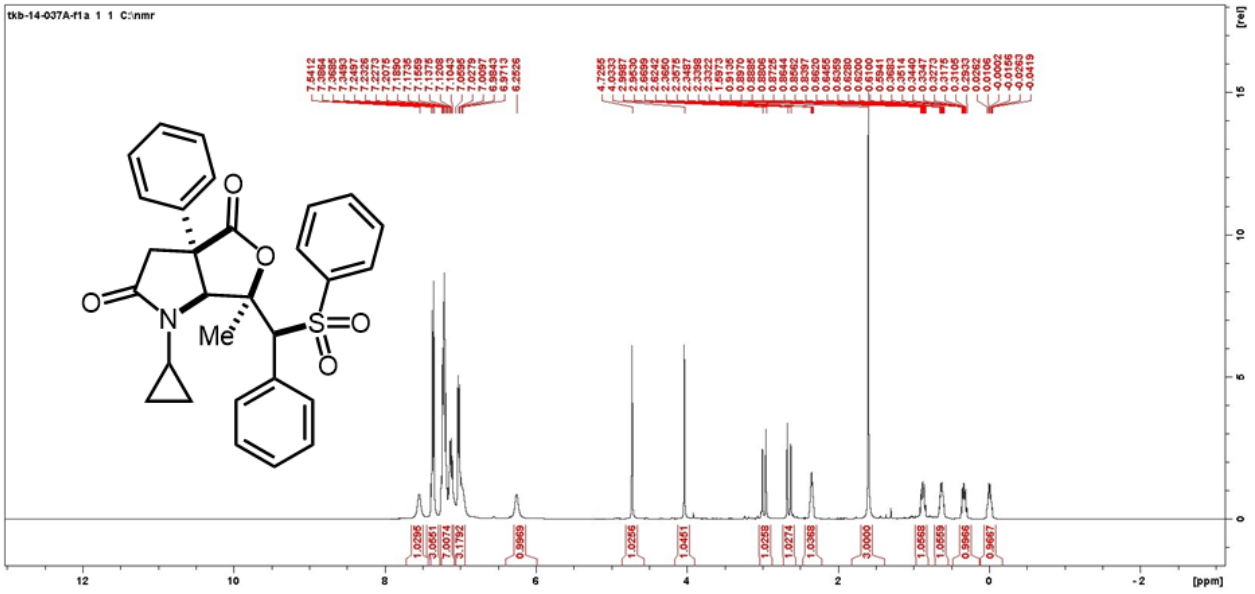
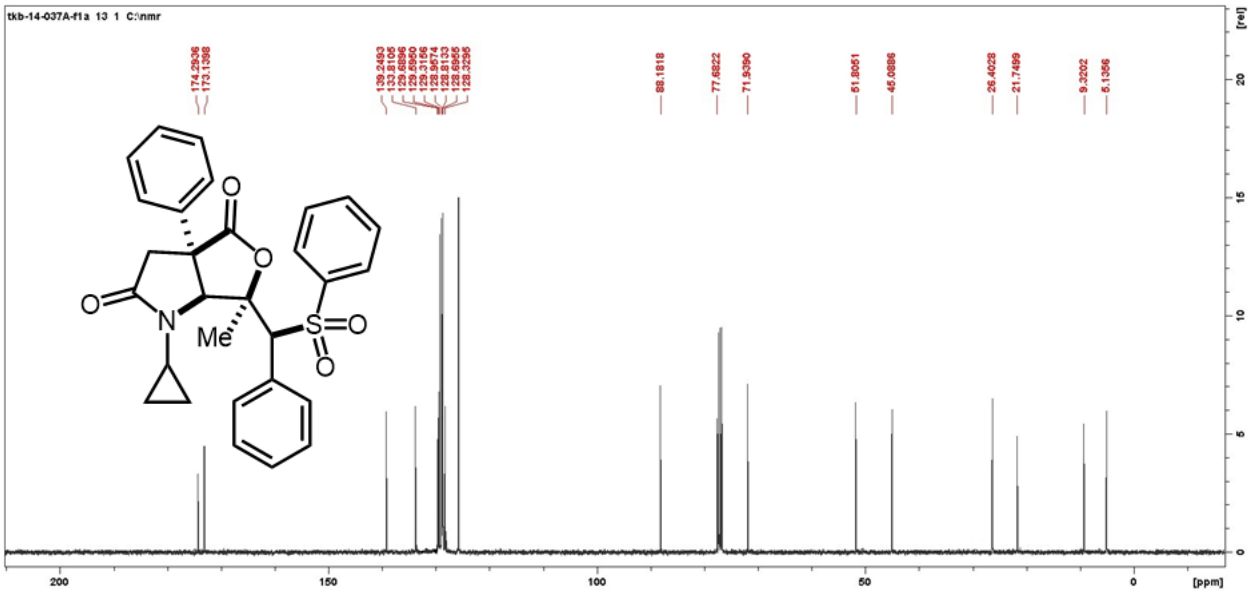
Compound 2a

Prepared in 1.0 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (50:50). Yellowish oil. Yield = 400.8 mg, 80%, 95:5 dr (*syn:anti*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.54 (s, 1H), 7.28 – 7.19 (m, 3H), 7.23 – 7.12 (m, 7H), 7.00 – 6.97 (m, 3H), 6.25 (s, 1H), 4.73 (s, 1H), 4.03 (s, 1H), 3.00 (d, *J* = 14.8 Hz, 1H), 2.67 (d, *J* = 14.8 Hz, 1H), 2.35 (tt, *J* = 7.4, 4.1 Hz, 1H), 1.60 (s, 3H), 0.88 (dq, *J* = 9.9, 6.6 Hz, 1H), 0.63 (dtd, *J* = 10.6, 6.5, 3.9 Hz, 1H), 0.33 (dq, *J* = 9.9, 6.8 Hz, 1H), 0.00 (dq, *J* = 9.9, 6.8 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.3, 173.1, 139.2, 133.8, 129.7, 129.6, 129.3, 128.9, 128.8, 128.7, 128.3, 125.8, 88.2, 77.7, 71.9, 51.8, 45.1, 26.4, 21.8, 9.3, 5.1. FTIR (KBr): 2965.4, 1727.5, 1696.3, 1604.9, 1511.0, 1448.5, 1414.7, 1384.9, 1357.4, 1298.7, 1247.5, 1179.3, 1135.9, 1031.8, 905.8, 839.0. **HRMS-EI^{+}** (*m/z*): calc for $C_{29}H_{27}NO_5S$ $[M]^{+}$ 501.1610, found 501.1618.

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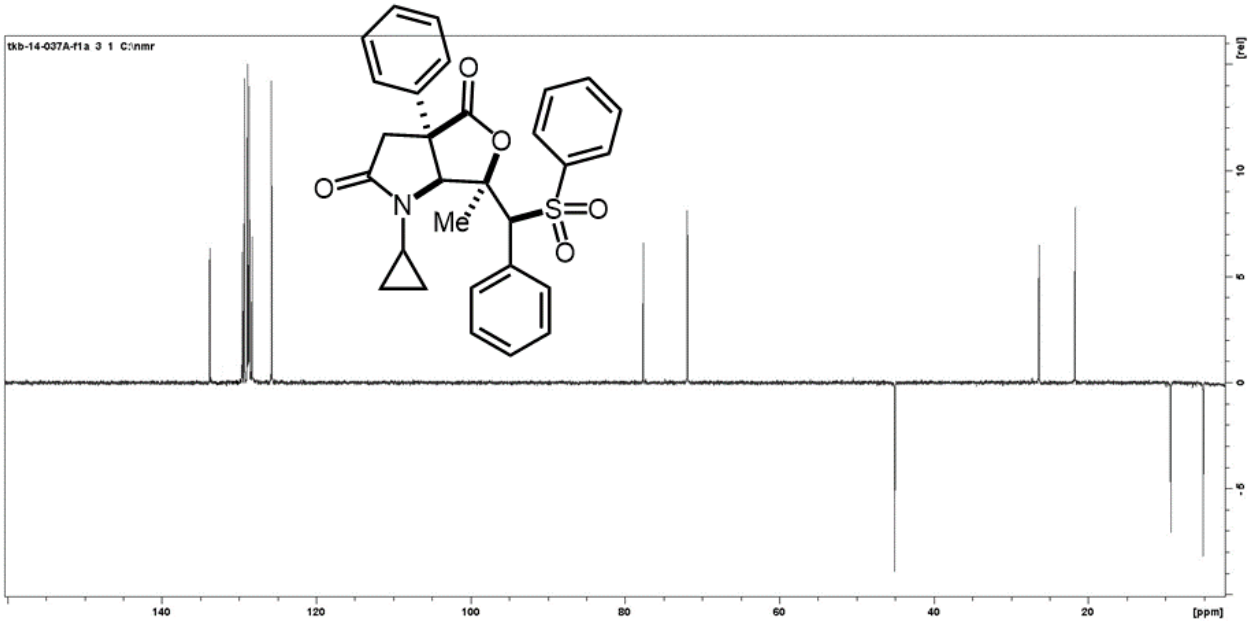
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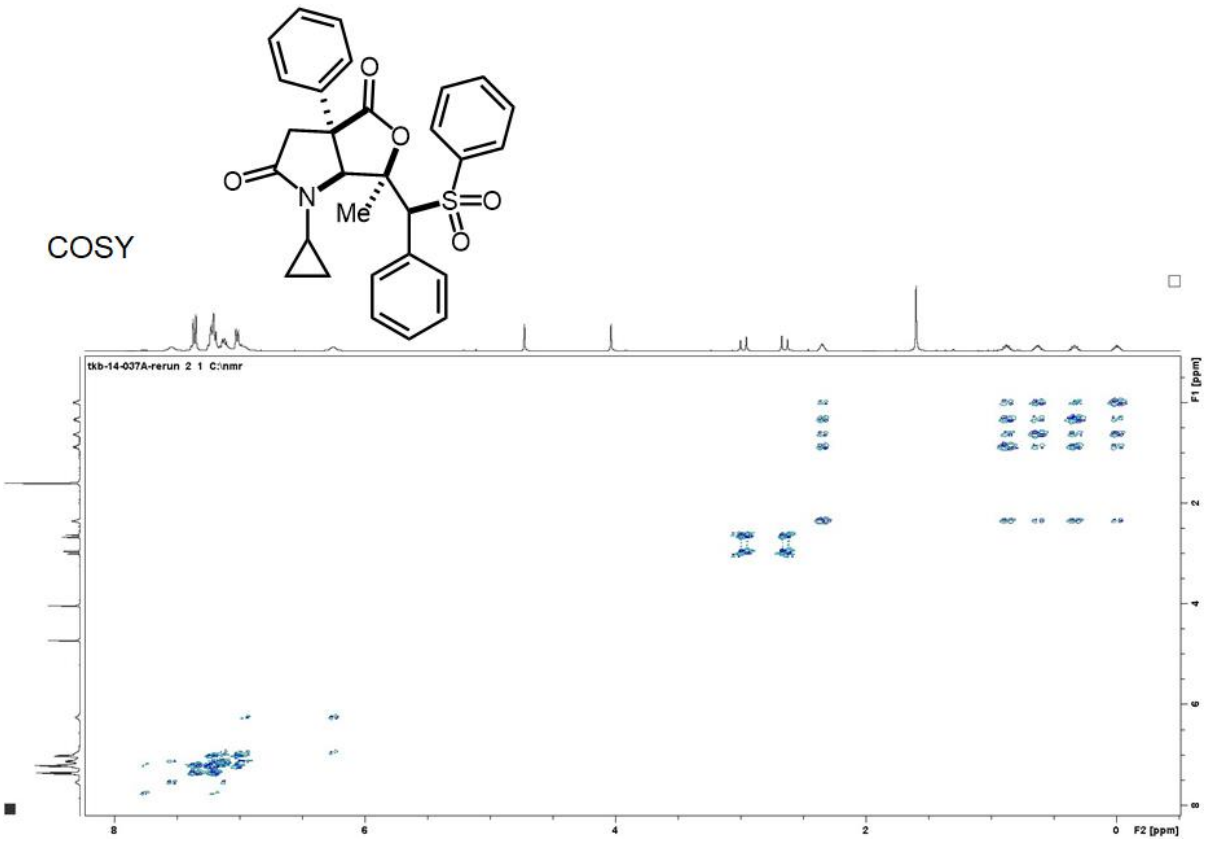
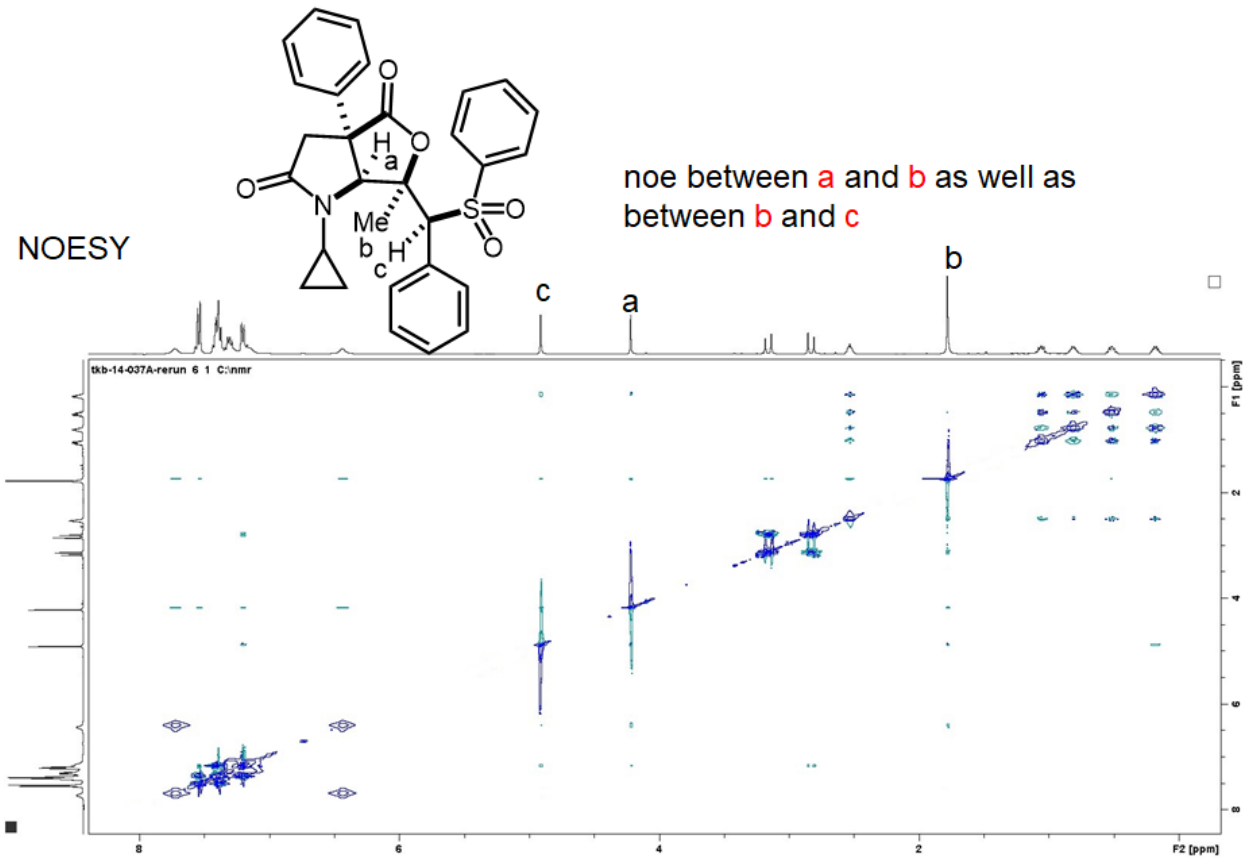


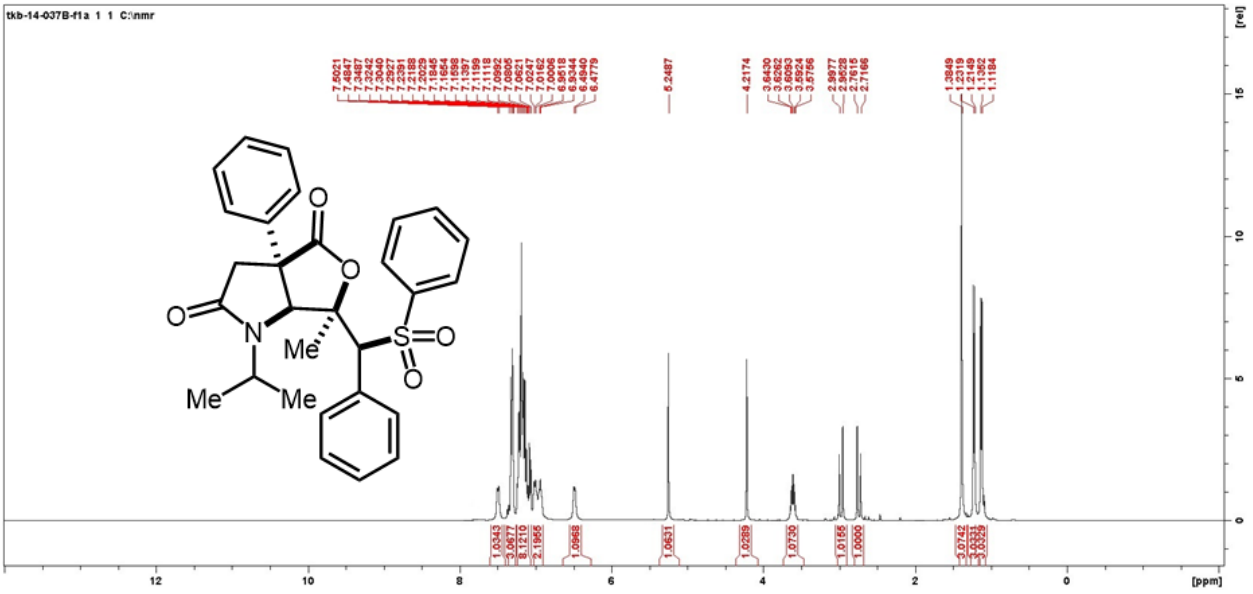
NOESY

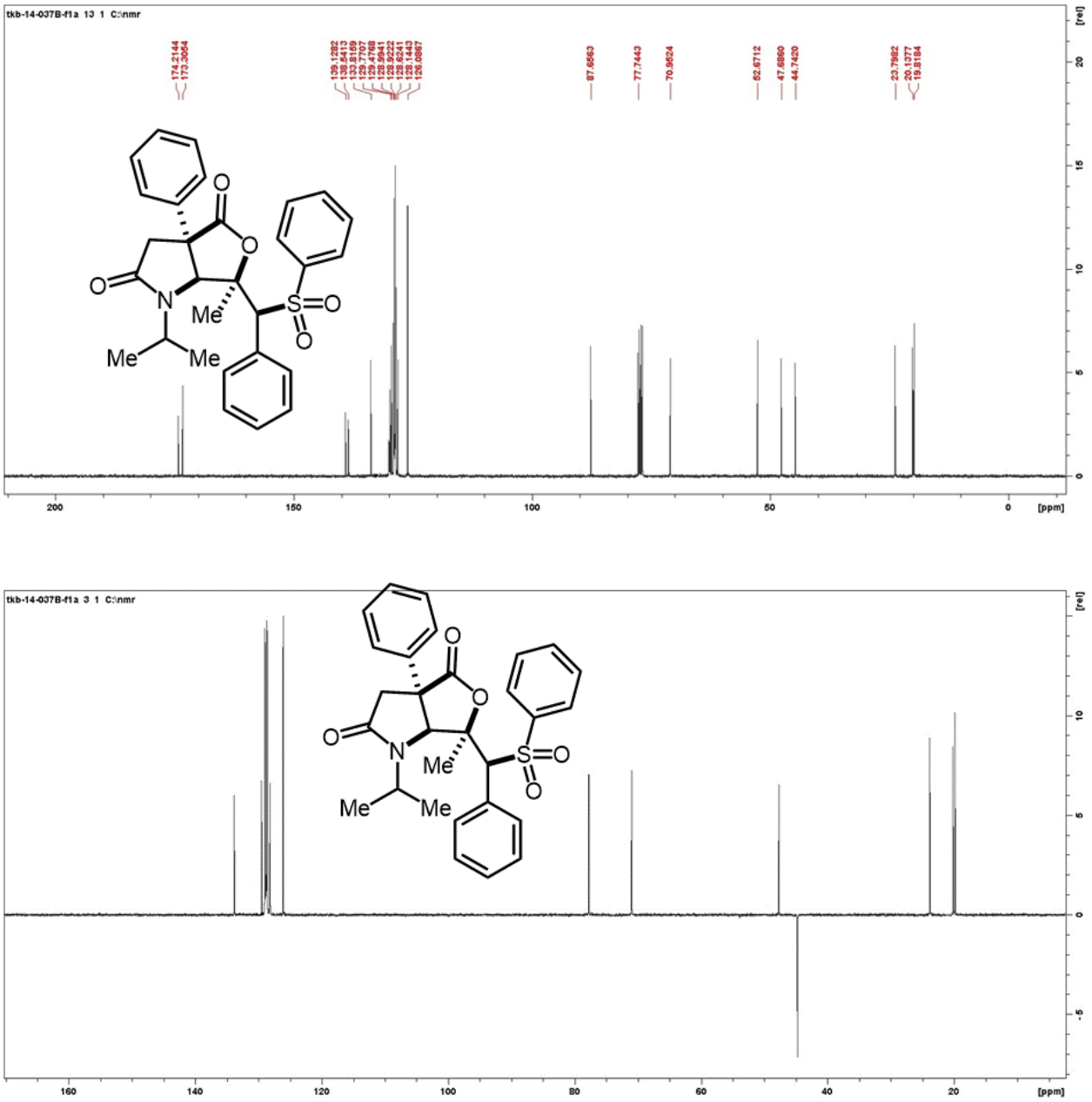
noe between a and b as well as between b and c



Compound 2b

Prepared in 1.0 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (50:50). Yellowish oil. Yield = 428.1 mg, 85%, 95:5 dr (*syn:anti*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.49 (d, J = 8.0 Hz, 1H), 7.48 – 6.93 (m, 13H), 6.49 (d, J = 7.6 Hz, 1H), 5.25 (s, 1H), 4.22 (s, 1H), 3.61 (hept, J = 6.9 Hz, 1H), 2.98 (d, J = 18.0 Hz, 1H), 2.74 (d, J = 18.0 Hz, 1H), 1.38 (s, 3H), 1.22 (d, J = 6.8 Hz, 3H), 1.13 (d, J = 6.8 Hz, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.2, 173.3, 139.1, 138.5, 133.8, 129.8, 129.5, 129.0, 128.9, 128.6, 128.1, 126.1, 87.7, 77.8, 71.1, 52.8, 47.7, 44.7, 23.8, 20.1, 19.8. FTIR (KBr): 2984.1, 1733.5, 1654.3, 1606.9, 1511.0, 1448.5, 1414.7, 1384.9, 1357.4, 1299.7, 1242.5, 1179.3, 1031.8, 994.9, 823.7, 735.2. **HRMS-EI**$^{+}$ (*m/z*): calc for $C_{29}H_{29}NO_5S$ $[M]^{+}$ 503.1766, found 503.1772.

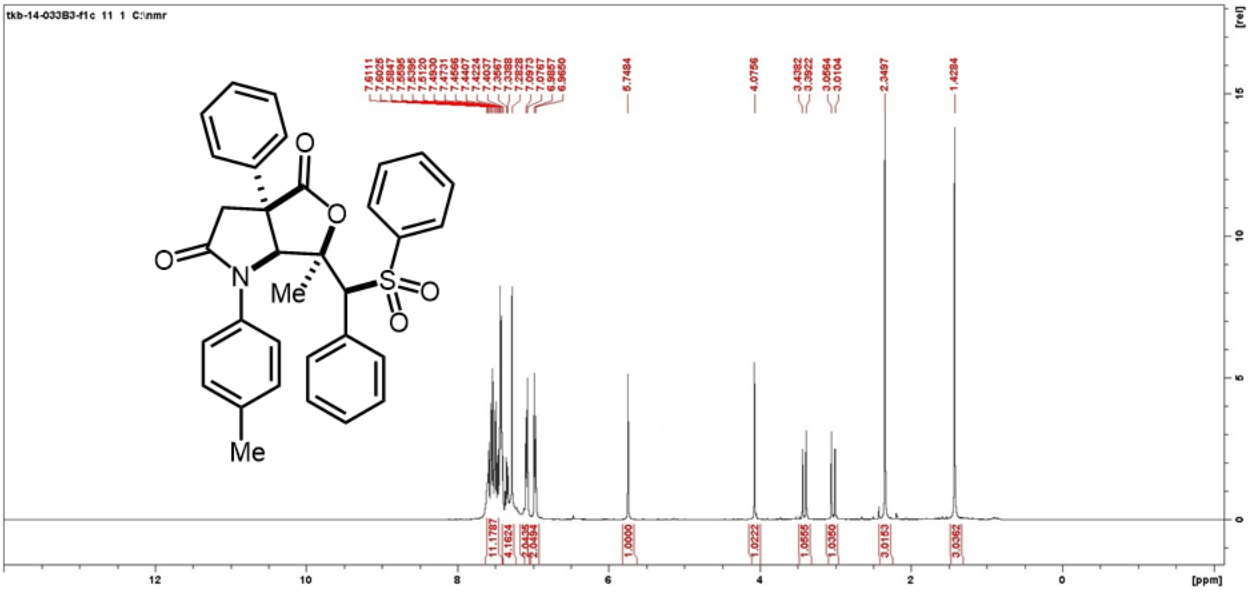


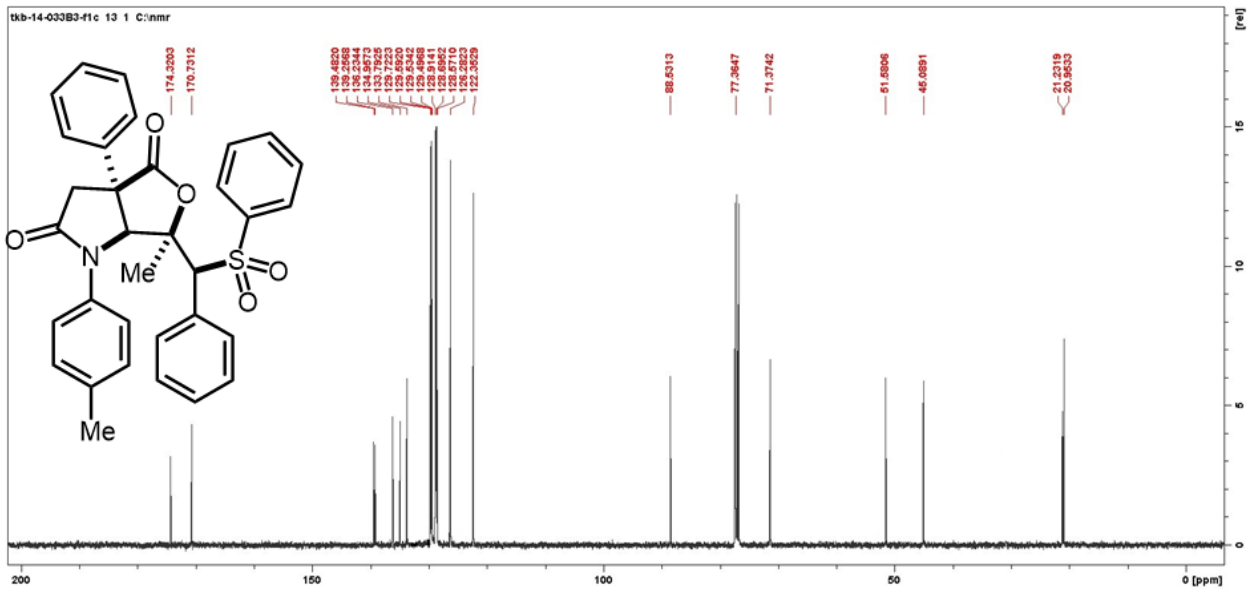


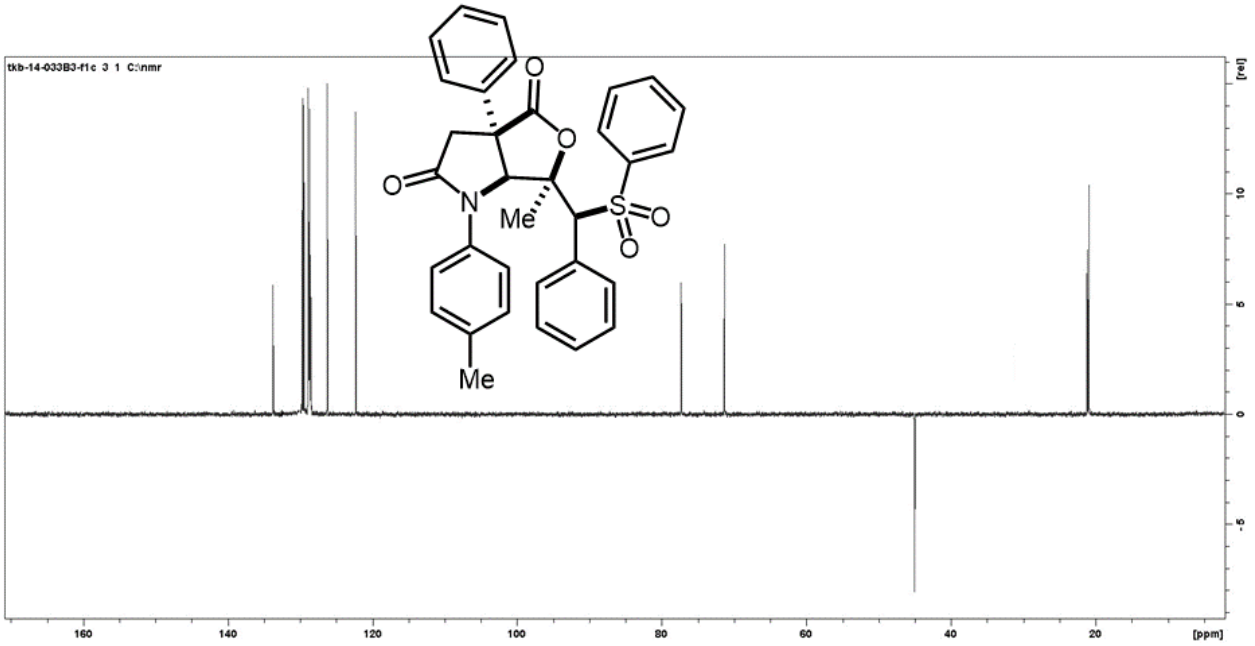
Compound 2c

Prepared in 0.5 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (40:60). Yellowish oil. Yield = 226.2 mg, 82%, 95:5 dr (*syn:anti*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.61 – 7.28 (m, 15H), 7.06 (d, *J* = 8.1 Hz, 2H), 6.94 (d, *J* = 8.1 Hz, 2H), 5.69 (s, 1H), 4.06 (s, 1H), 3.41 (d, *J* = 17.1 Hz, 1H), 3.02 (d, *J* = 17.1 Hz, 1H), 2.32 (s, 3H), 1.43 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.3, 170.7, 139.5, 139.3, 136.2, 134.9, 133.8, 129.7, 129.6, 129.5, 128.9, 128.7, 128.6, 126.3, 122.4, 88.5, 77.4, 71.4, 51.6, 45.1, 21.2, 21.0. FTIR (KBr): 2939.4, 1723.5, 1696.3, 1604.9, 1511.0, 1448.5, 1414.7, 1384.9, 1357.4,

1298.7, 1247.5, 1179.3, 1135.9, 1031.8, 985.8, 833.0. **HRMS-EI**$^+$ (*m/z*): calc for $C_{33}H_{29}NO_5S$ $[M]^+$ 551.1766, found 551.1769.

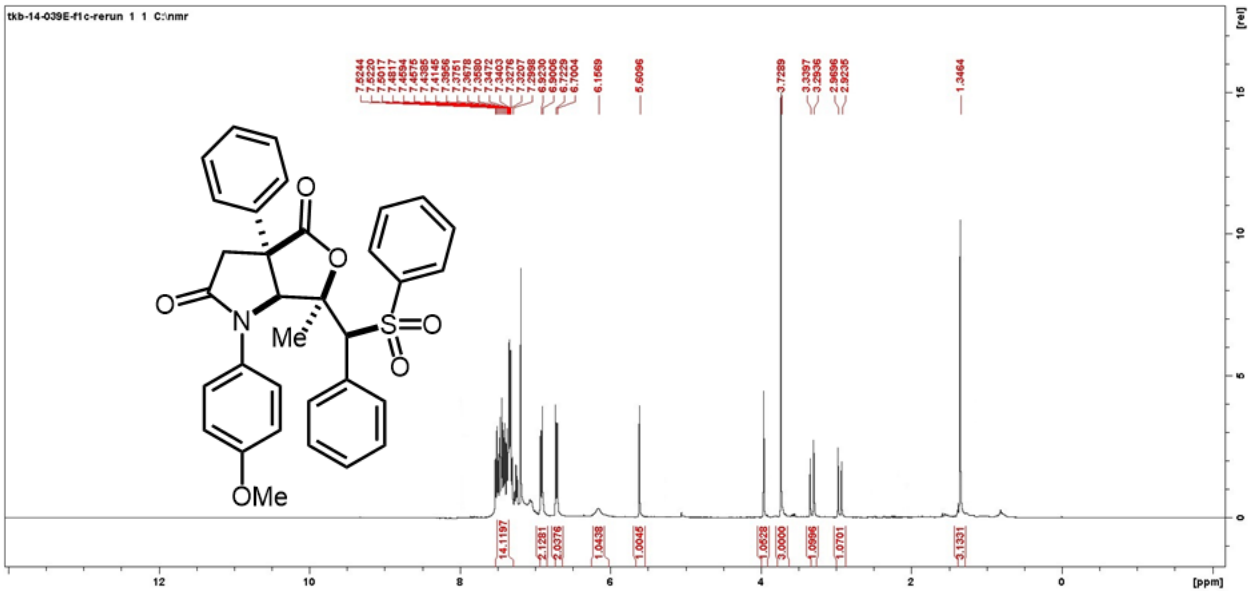






Compound 2d

Prepared in 0.5 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (25:75). Yellowish oil. Yield = 244.1 mg, 86%, 95:5 dr (*syn:anti*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.52 – 7.29 (m, 14H), 6.92 (d, 2H), 6.71 (d, 2H), 6.16 (s, 1H), 5.61 (s, 1H), 3.96 (s, 1H), 3.73 (s, 3H), 3.30 (d, J = 18.2 Hz, 1H), 2.94 (d, J = 18.2 Hz, 1H), 1.35 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.2, 170.8, 157.7, 134.7, 133.8, 131.0, 130.2, 129.8, 129.6, 129.5, 129.4, 128.9, 128.6, 128.5, 128.2, 126.2, 124.0, 114.4, 88.4, 77.6, 71.7, 55.5, 51.5, 45.0, 21.4. FTIR (KBr): 2985.4, 1737.5, 1691.2, 1644.9, 1511.0, 1448.5, 1414.7, 1384.9, 1357.4, 1298.7, 1247.5, 1179.3, 1002.8, 925.8, 791.0. **HRMS-EI^{+}** (*m/z*): calc for $C_{33}H_{29}NO_6S$ $[M]^{+}$ 567.1716, found 567.1722.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6.7229
6.7004
6.1569
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3.7289
3.3397
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2.9896
2.8235
1.3464
14.1197
2.1281
2.0376
1.0438
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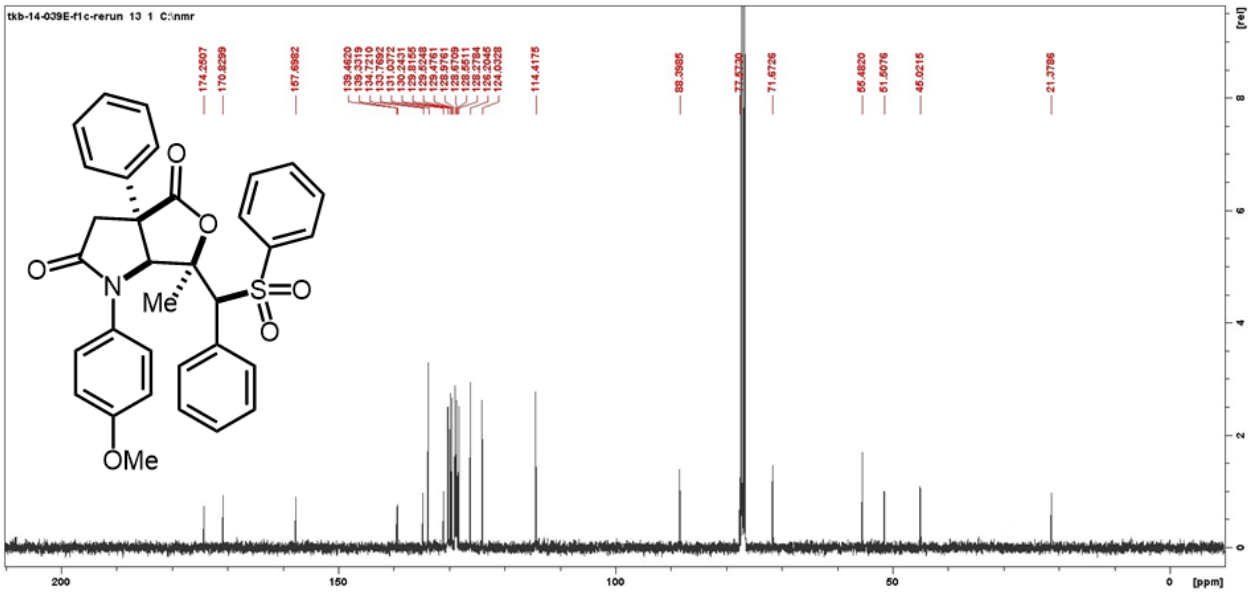
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129.5545
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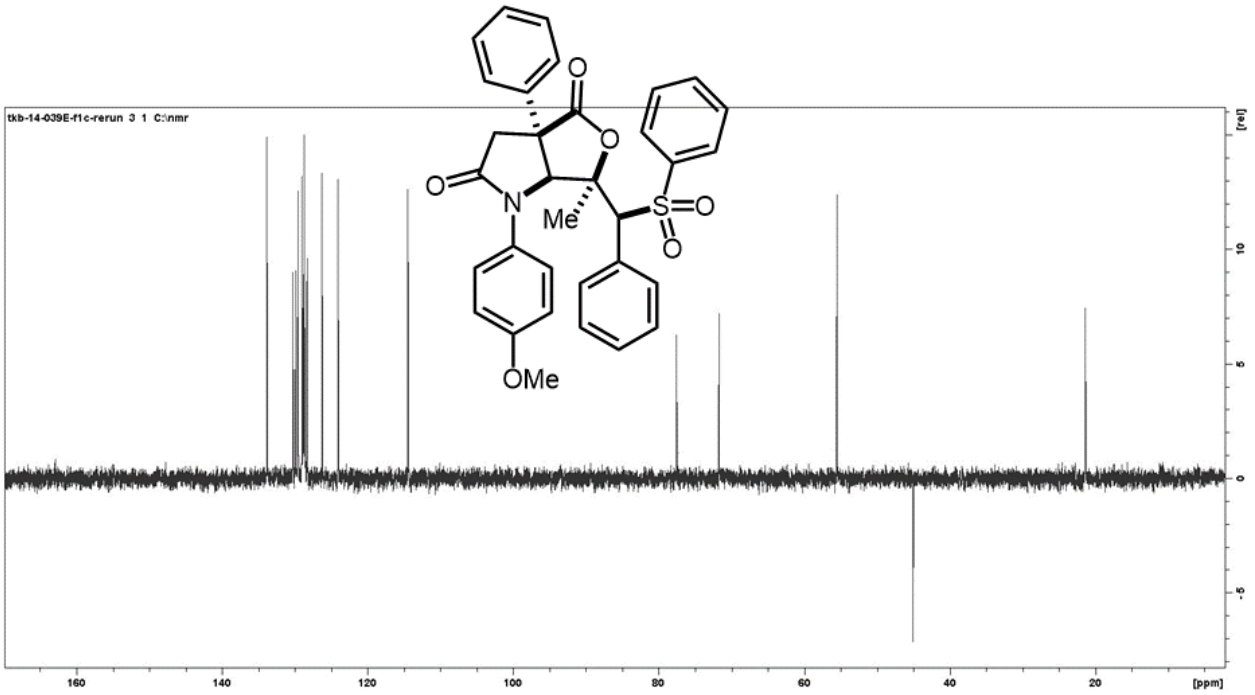
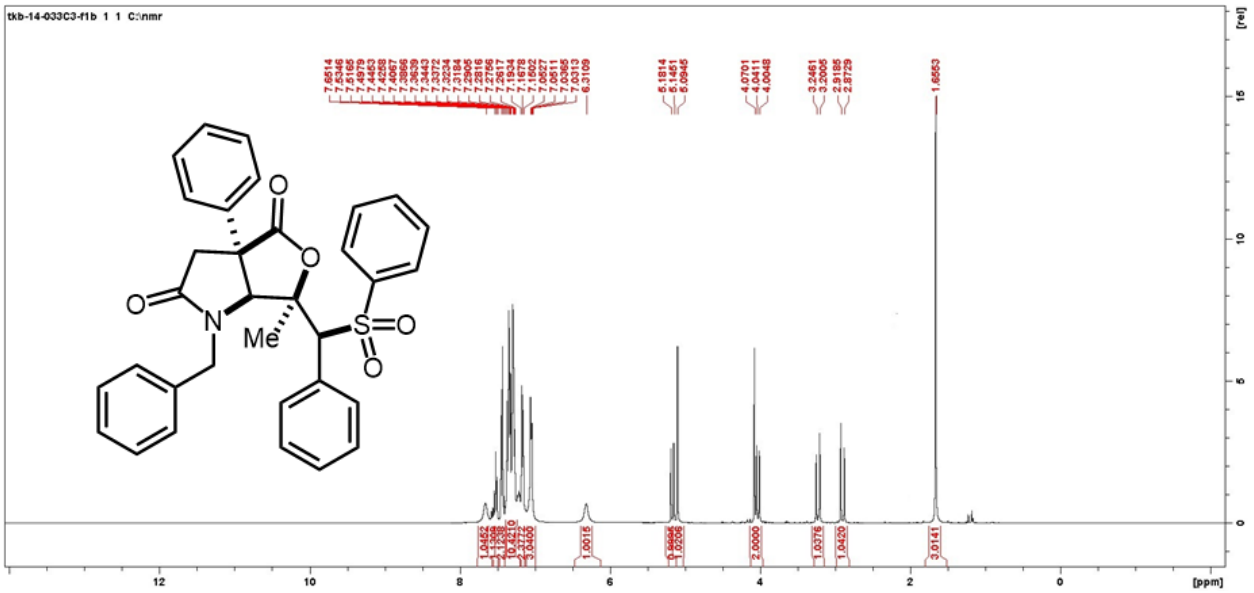


Compound 2e

Prepared in 0.50 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (25:75). Yellowish oil. Yield = 242.7 mg, 88%, 95:5 dr (*syn:anti*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.65 (s, 1H), 7.60 – 7.48 (m, 1H), 7.47 – 7.36 (m, 2H), 7.40 – 7.21 (m, 10H), 7.24 – 7.11 (m, 2H), 7.04 (dd, *J* = 7.3, 2.2 Hz, 3H), 6.31 (s, 1H), 5.16 (d, *J* = 14.6 Hz, 1H), 5.09 (s, 1H), 4.07 (s, 1H), 4.02 (d, *J* = 14.6 Hz, 1H), 3.20 (d, *J* = 18.6 Hz, 1H), 2.92 (d, *J* = 18.6 Hz, 1H), 1.66 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.1, 173.0, 139.0, 135.1, 133.8, 129.5, 129.0, 128.9, 128.8, 128.6, 128.4, 128.1, 125.9, 87.7, 77.4, 69.9, 52.0, 47.5, 44.9, 22.4. FTIR (KBr): 2972.9, 2932.8, 1638.2, 1449.1, 1364.7, 1290.2, 1270.3, 1247.8, 1206.5, 1179.9, 1131.1, 1071.4, 994.4, 924.8, 881.7. **HRMS-EI^{+}** (*m/z*): calc for $C_{33}H_{29}NO_5S$ $[M]^{+}$ 551.1766, found 551.1763.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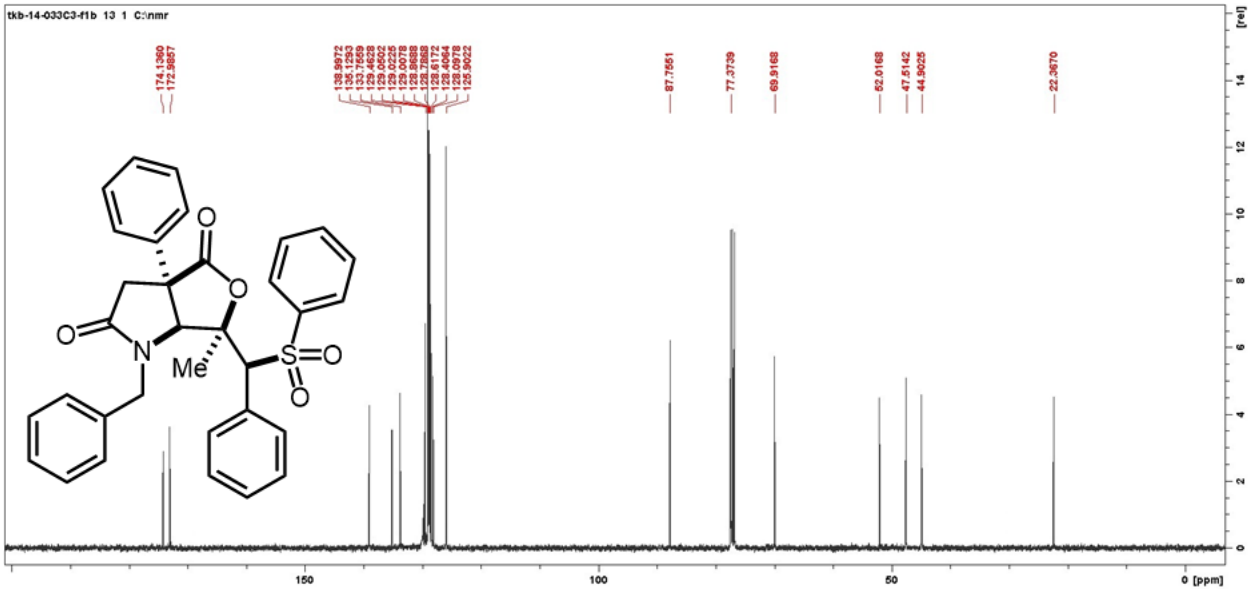
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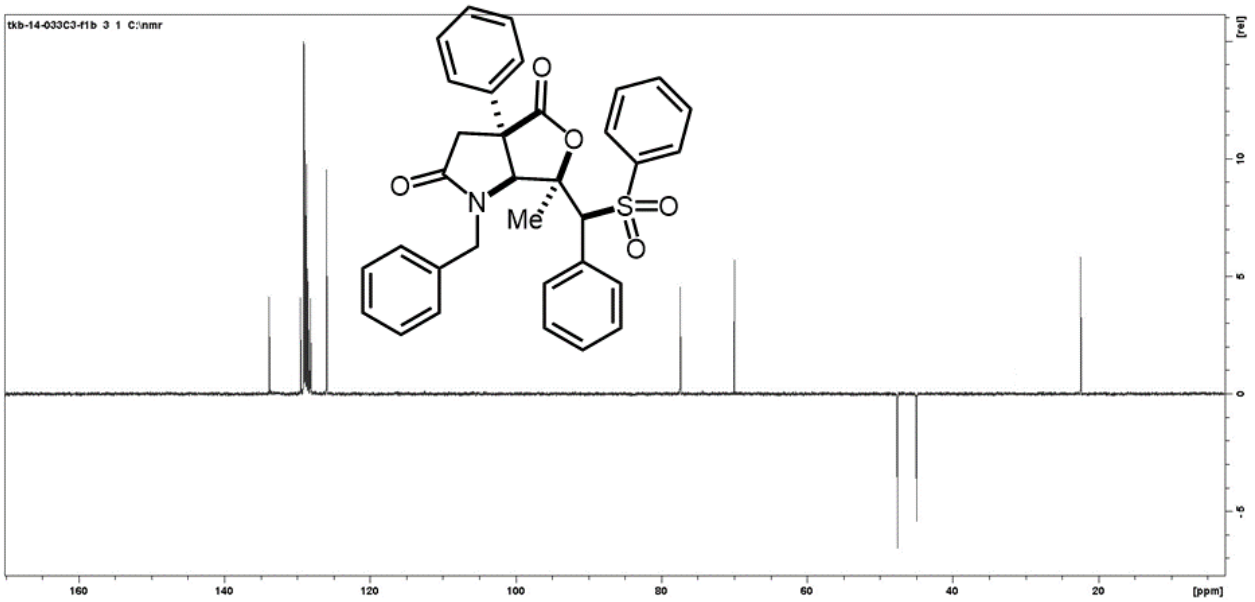
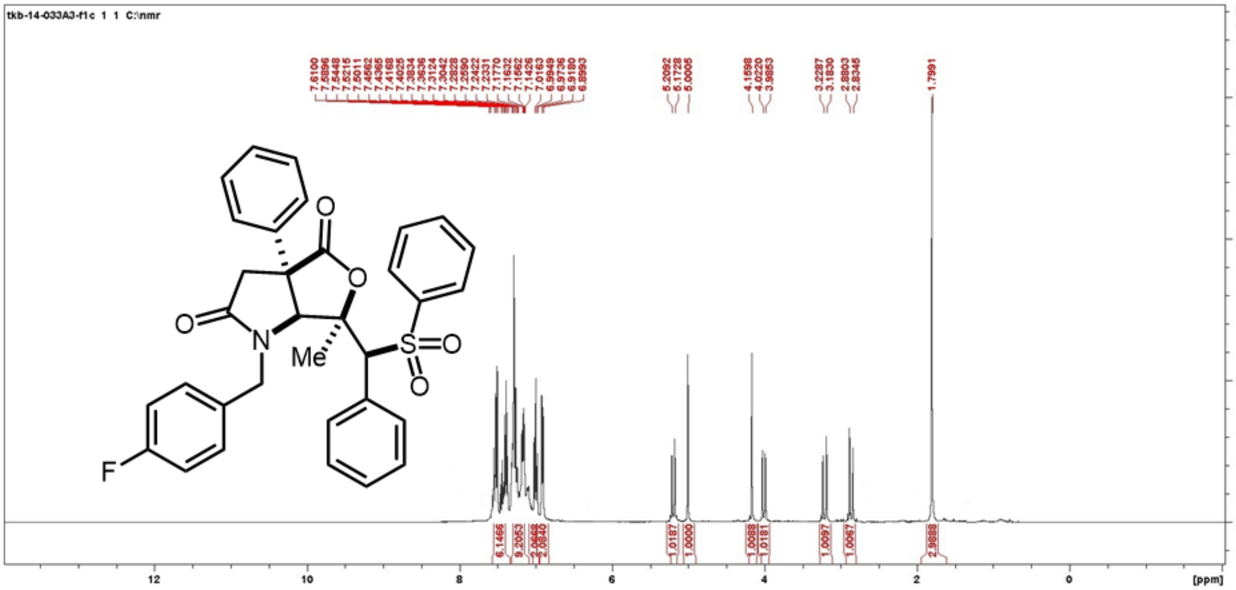


Compound 2f

Prepared in 0.50 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (50:50). Yellowish oil. Yield = 239.2 mg, 84%, 95:5 dr (*syn:anti*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.66 – 7.04 (m, 15H), 7.00 (d, J = 8.5 Hz, 2H), 6.91 (dd, J = 7.3, 1.9 Hz, 2H), 5.18 (d, J = 14.7 Hz, 1H), 5.00 (s, 1H), 4.16 (s, 1H), 4.00 (d, J = 14.7 Hz, 1H), 3.20 (d, J = 18.3 Hz, 1H), 2.86 (d, J = 18.3 Hz, 1H), 1.80 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.0, 172.9, 163.8, 161.3, 139.0, 138.9, 133.8, 131.2, 130.8, 130.7, 129.5, 129.3, 129.1, 128.9, 128.8, 128.7, 128.2, 125.7, 115.9, 115.7, 87.8, 77.4, 69.7, 52.0, 46.4, 44.8, 22.4. FTIR (KBr): 2994.1, 1763.4, 1669.4, 1608.2, 1511.1, 1431.8, 1414.7, 1344.9, 1298.4, 1135.3, 1031.8, 996.7, 706.4. **HRMS-EI^{+}** (*m/z*): calc for $C_{33}H_{28}FNO_5S$ $[M]^{+}$ 569.1672, found 569.1677.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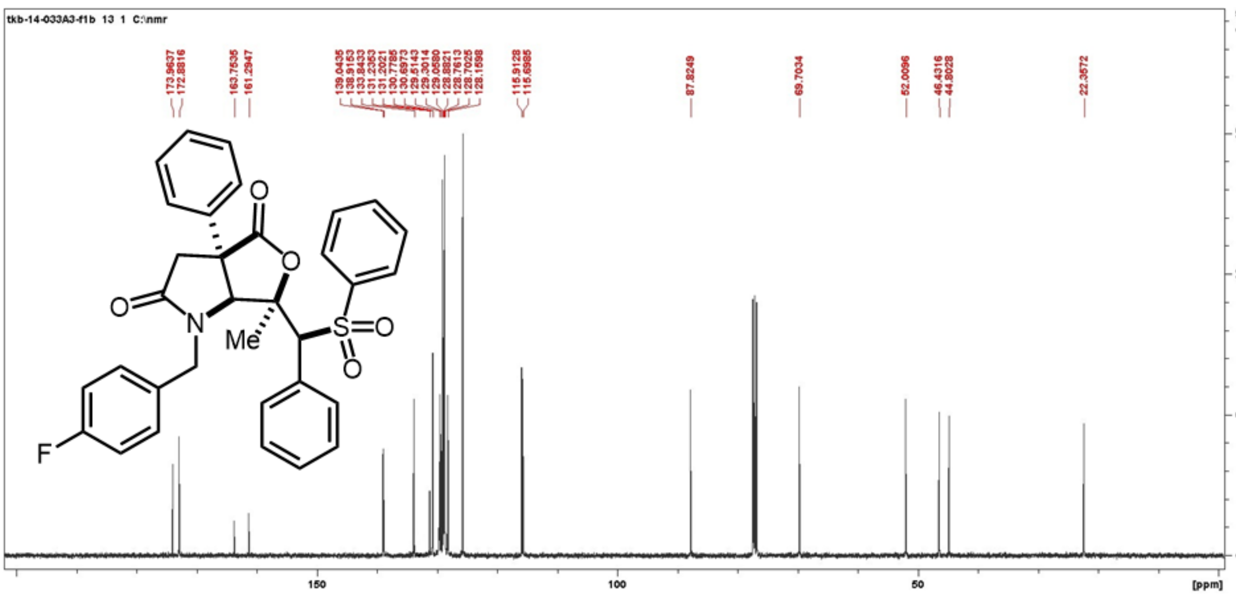
[ppm]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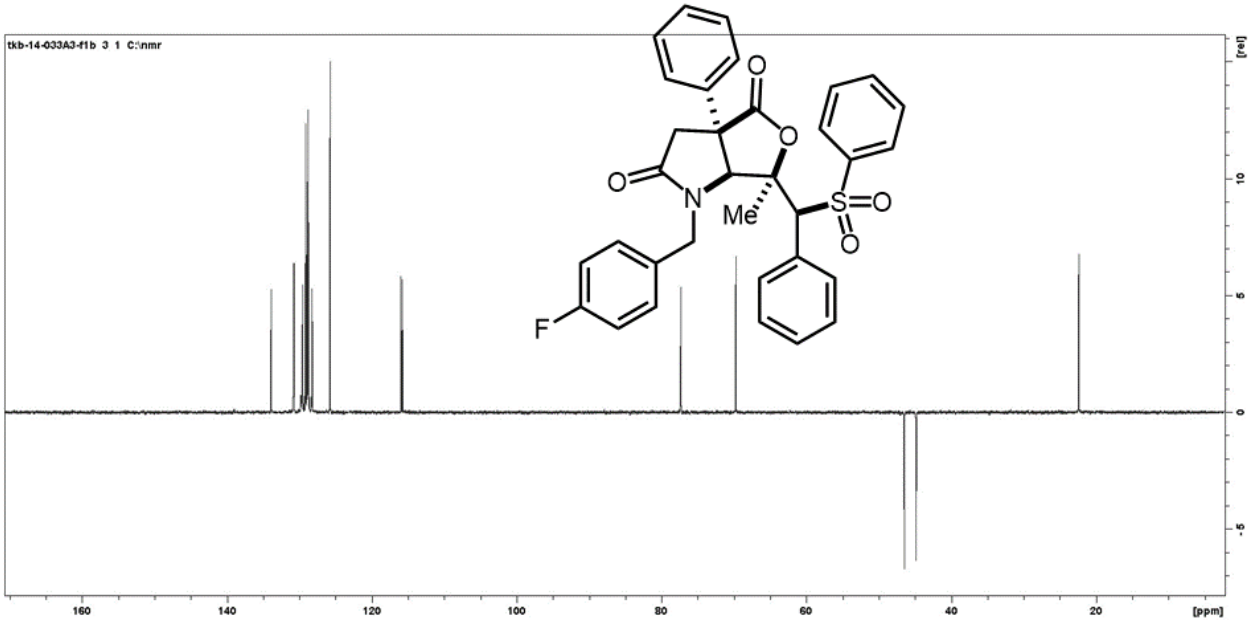
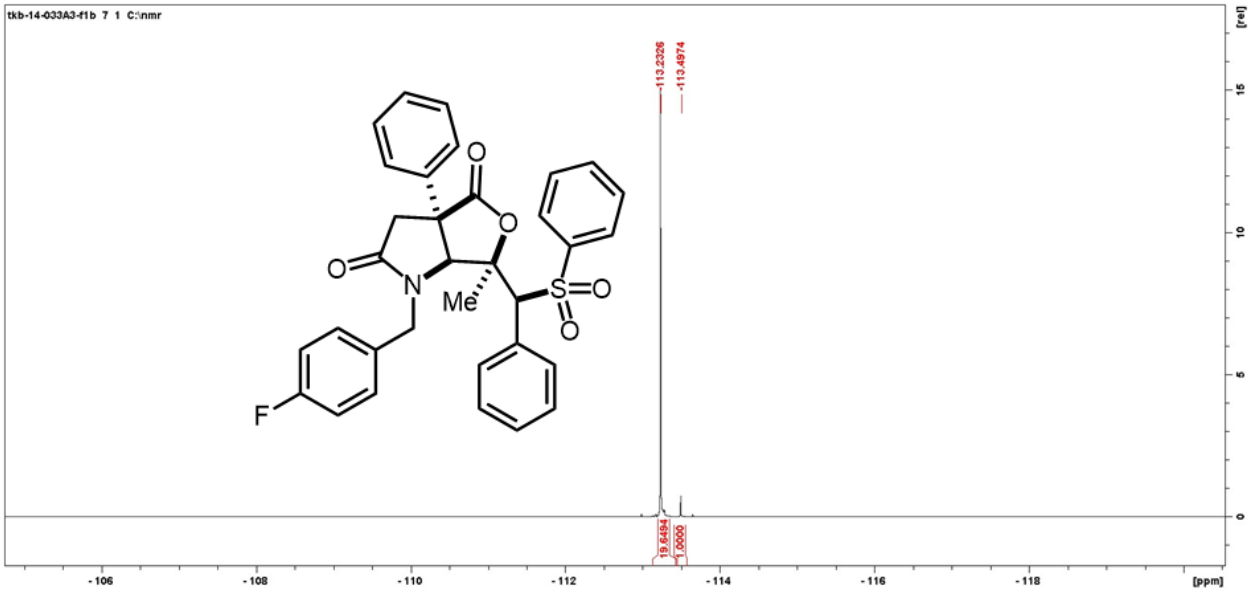


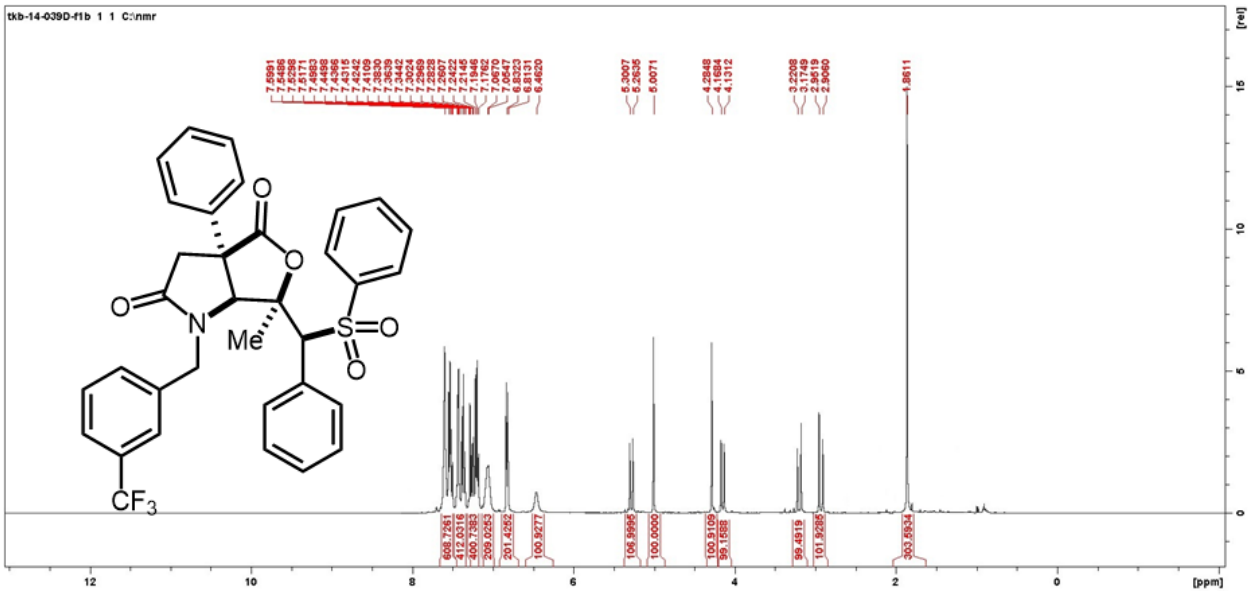
^{19}F NMR

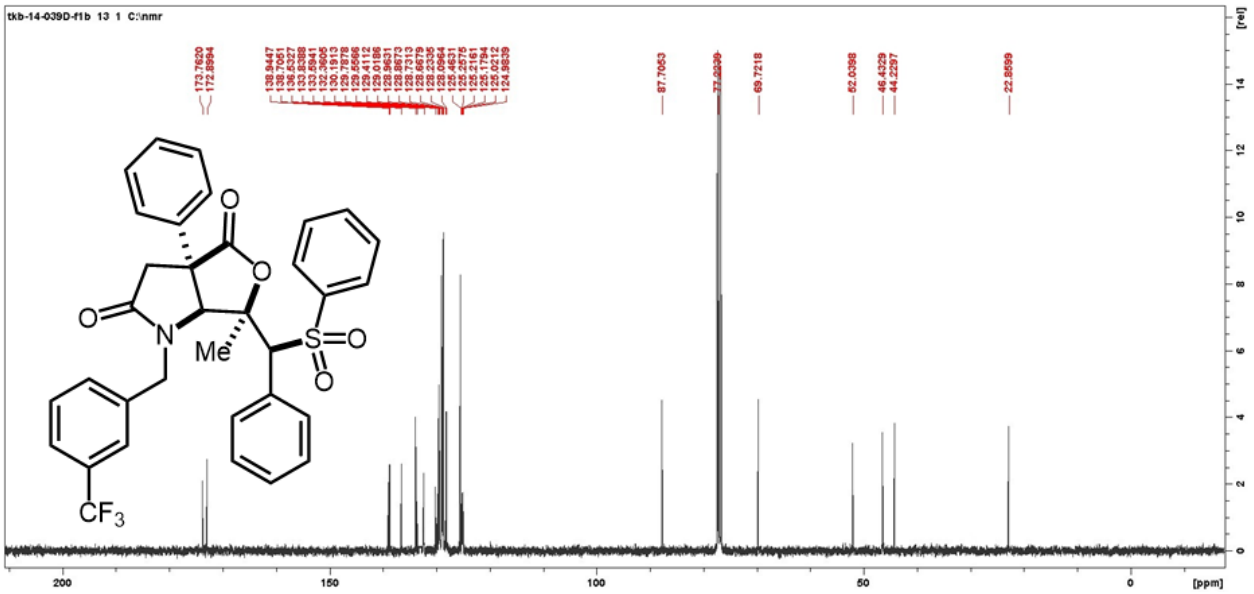


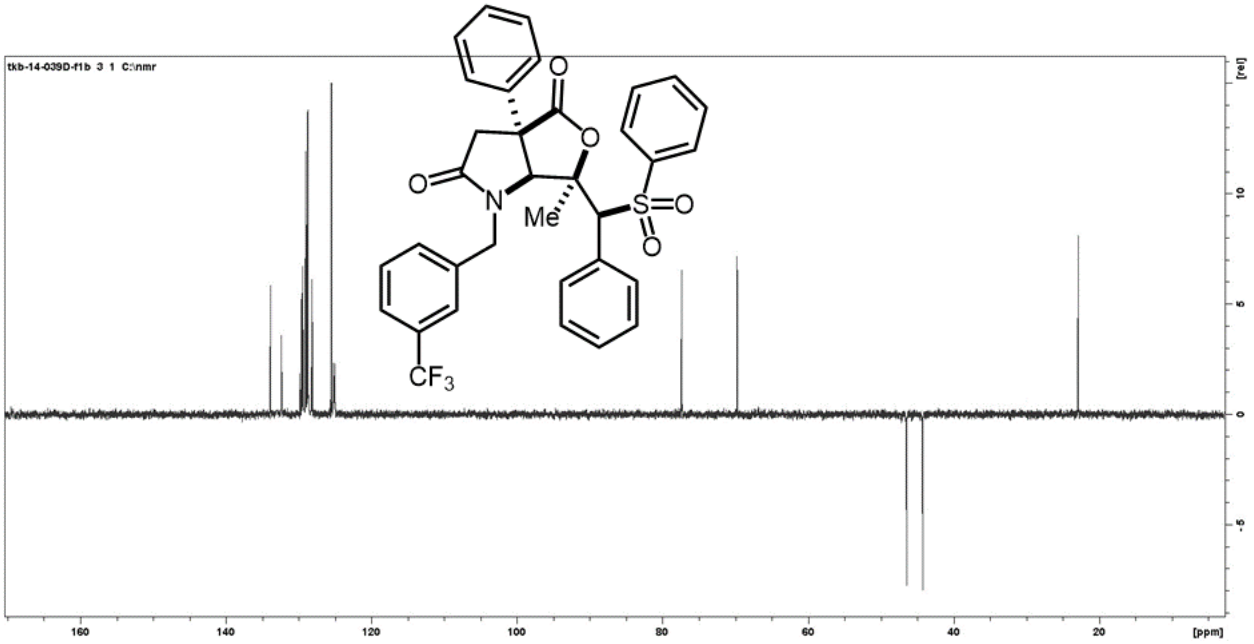
Compound 2g

Prepared in 0.50 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (60:40). Yellowish oil. Yield = 250.9 mg, 81%, 95:5 dr (*syn:anti*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.60 – 7.49 (m, 6H), 7.45 – 7.41 (m, 4H), 7.38 – 7.24 (m, 4H), 7.21 – 7.18 (m, 2H), 6.82 (dd, *J* = 7.5, 1.9 Hz, 2H), 6.46 (s, 1H), 5.28 (d, *J* = 14.9 Hz, 1H), 5.01 (s, 1H), 4.29 (s, 1H), 4.15 (d, *J* = 14.9 Hz, 1H), 3.20 (d, *J* = 17.9 Hz, 1H), 2.93 (d, *J* =

17.9 Hz, 1H), 1.86 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 173.8, 172.9, 138.9, 138.7, 136.5, 133.8, 133.6, 132.4, 130.2, 129.8, 129.6, 129.4, 129.0, 128.9, 128.7, 128.2, 128.1, 125.5, 125.2, 125.0, 87.8, 77.4, 69.7, 52.0, 46.4, 44.2, 22.9. FTIR (KBr): 3057.1, 2924.0, 1764.2, 1666.3, 1494.3, 1361.2, 1225.6, 1180.2, 1091.7, 1032.3, 996.4, 775.4. **HRMS-EI$^+$** (*m/z*): calc for $C_{34}H_{28}F_3NO_5S$ $[M]^+$ 619.1640, found 619.1649.



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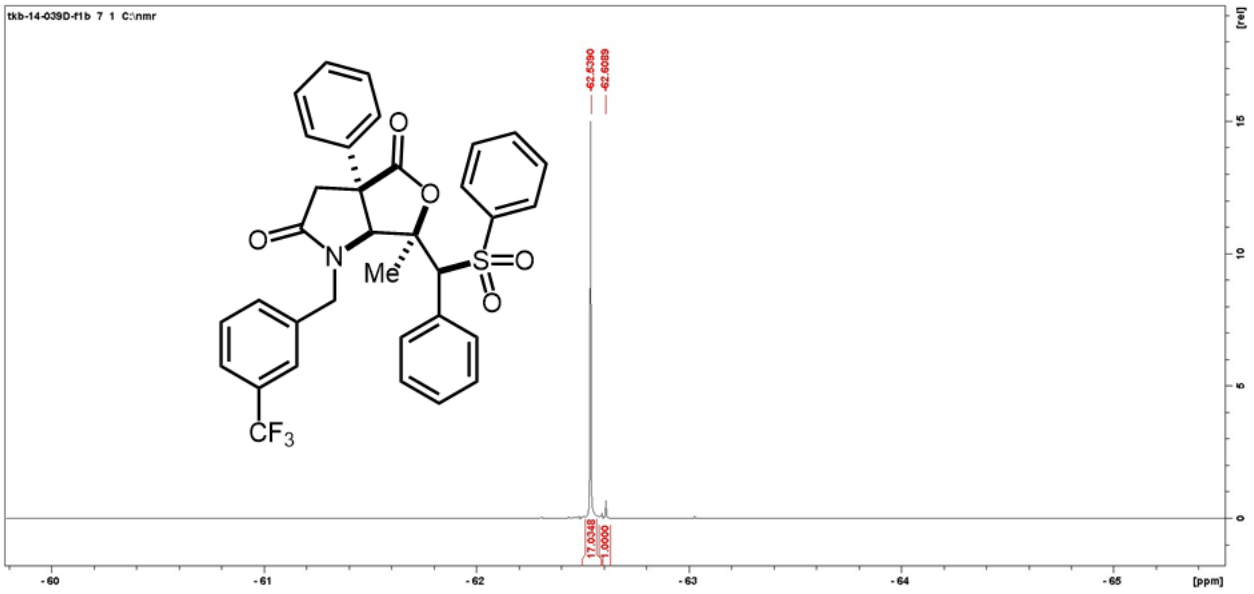
^{19}F NMR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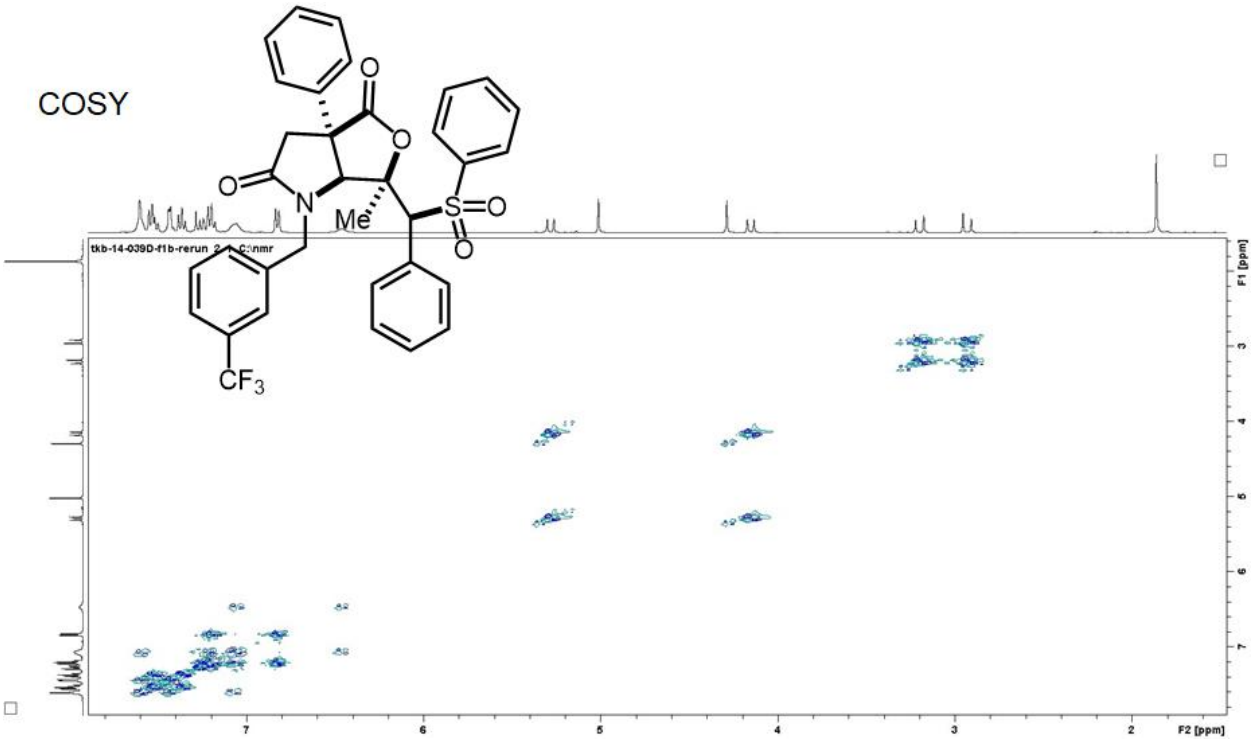
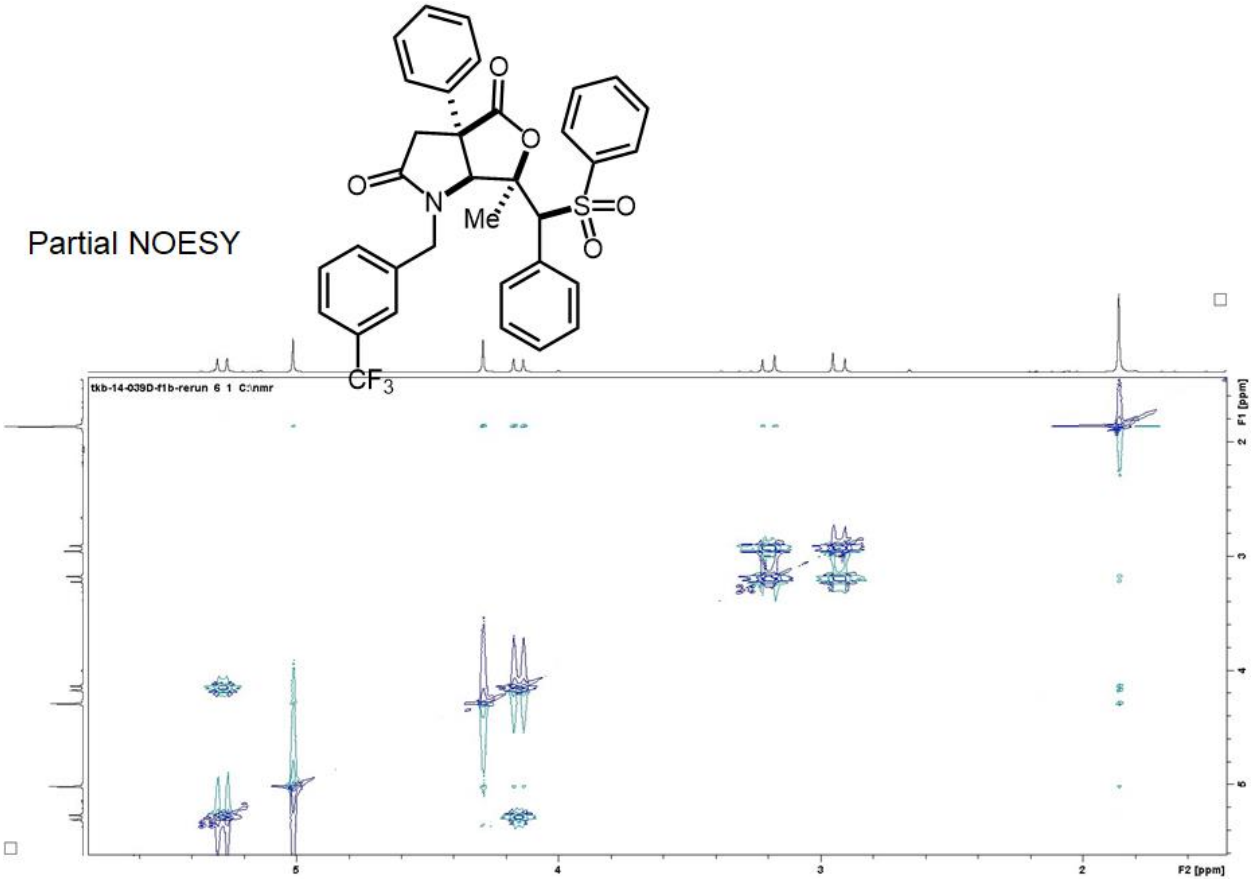
COSY

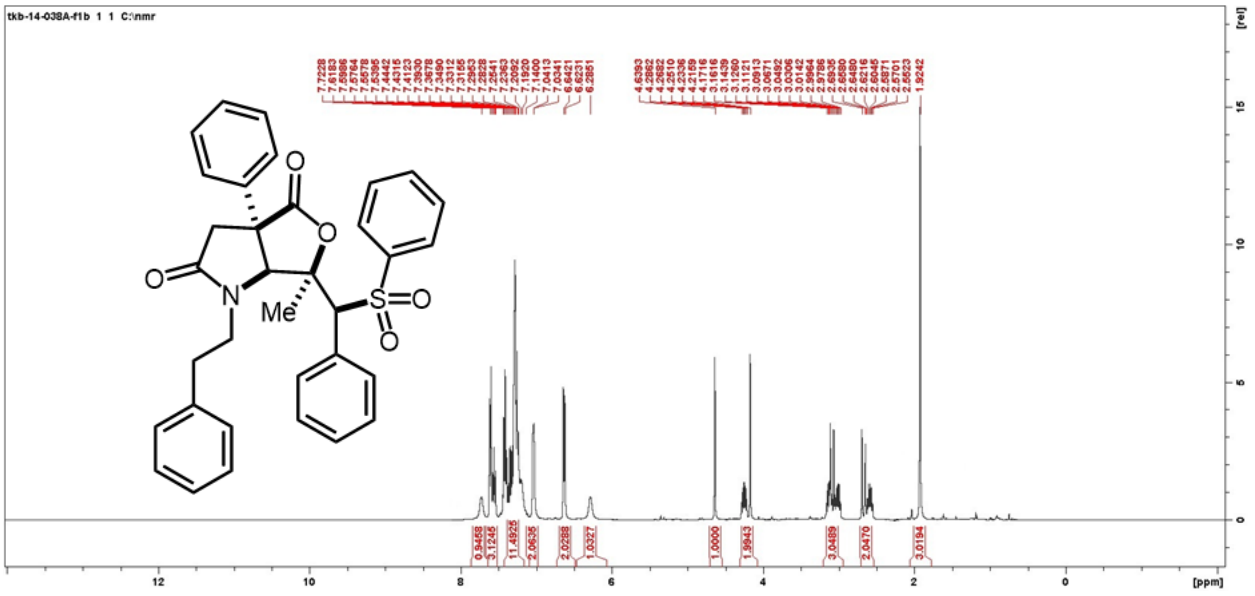


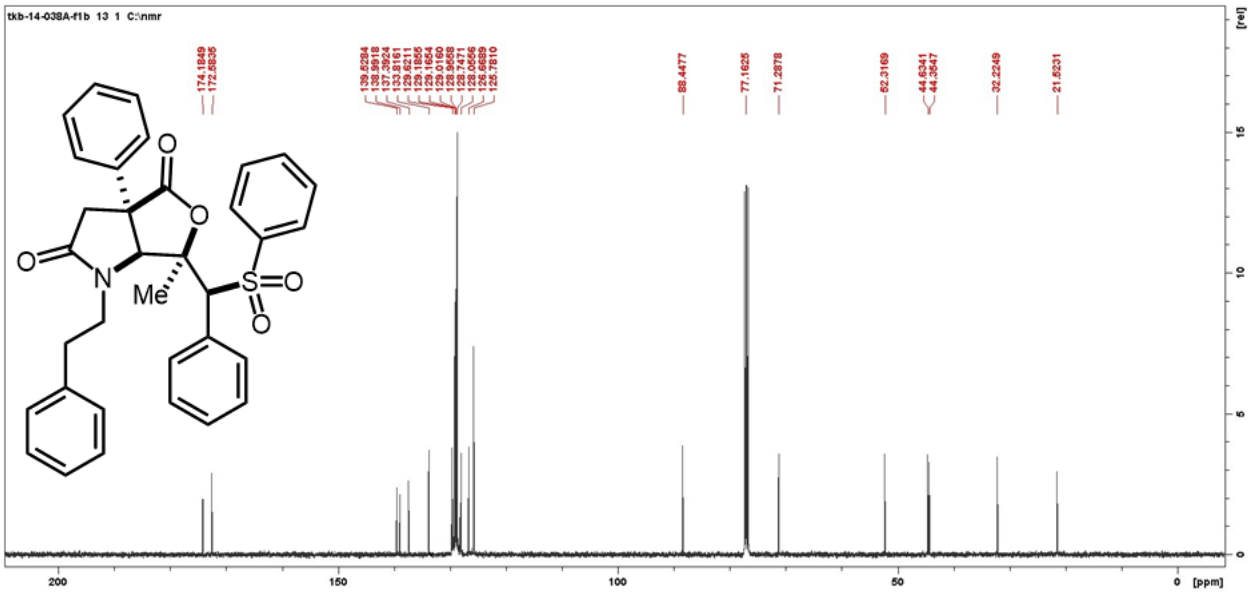
Partial NOESY

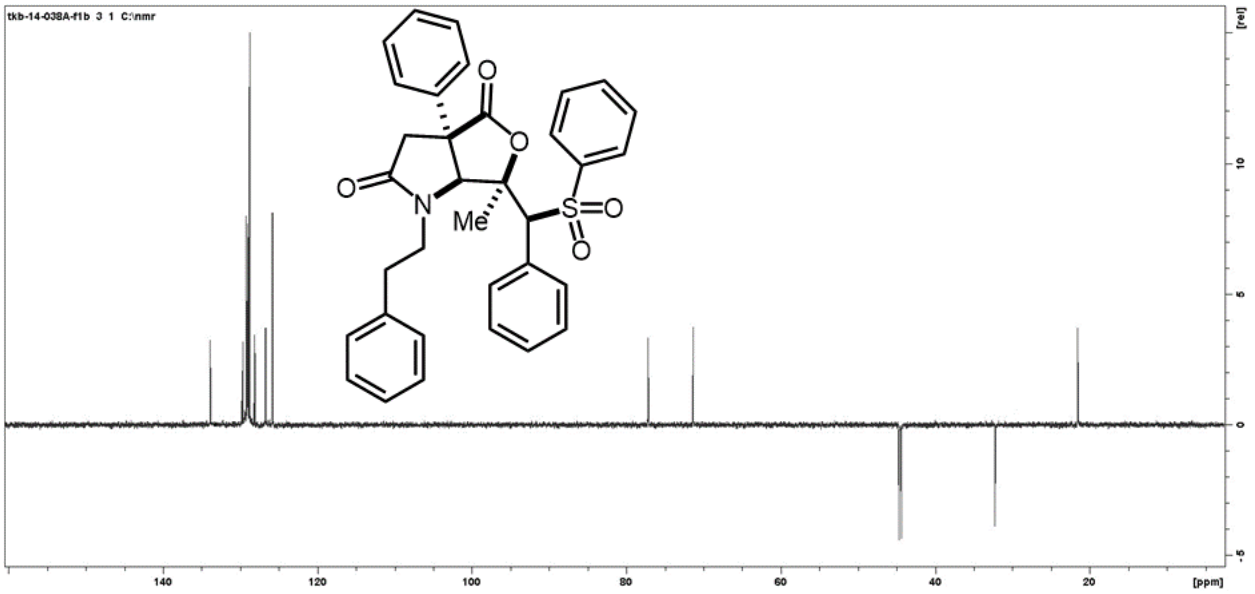


Compound 2h

Prepared in 0.50 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (50:50). Amorphous solid. Yield = 226.3 mg, 80%, 95:5 dr (*syn:anti*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.73 (s, 1H), 7.61 – 7.54 (m, 3H), 7.44 – 7.14 (m, 11H), 7.04 (dd, *J* = 6.5, 3.0 Hz, 2H), 6.63 (d, *J* = 7.6 Hz, 2H), 6.29 (s, 1H), 4.64 (s, 1H), 4.25 (dt, *J* = 14.0, 7.1 Hz, 1H), 4.17 (s, 1H), 3.16 – 2.97 (m, 3H), 2.72 – 2.53 (m, 2H), 1.92 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.2, 172.6, 139.5, 139.0, 137.4, 133.8, 129.6, 129.2, 129.0, 128.9, 128.8, 128.7, 128.1, 126.7, 125.8, 88.4, 77.2, 71.3, 52.3, 44.6, 44.4, 32.2, 21.5. FTIR (KBr): 2998.4, 2924.0, 1734.2, 1668.3, 1474.3, 1452.8, 1361.9, 1342.0, 1205.6, 1144.2, 1081.7, 1038.3, 986.4, 705.2. **HRMS-EI**$^{+}$ (*m/z*): calc for $C_{34}H_{31}NO_5S$ $[M]^{+}$ 565.1923, found 565.1927.



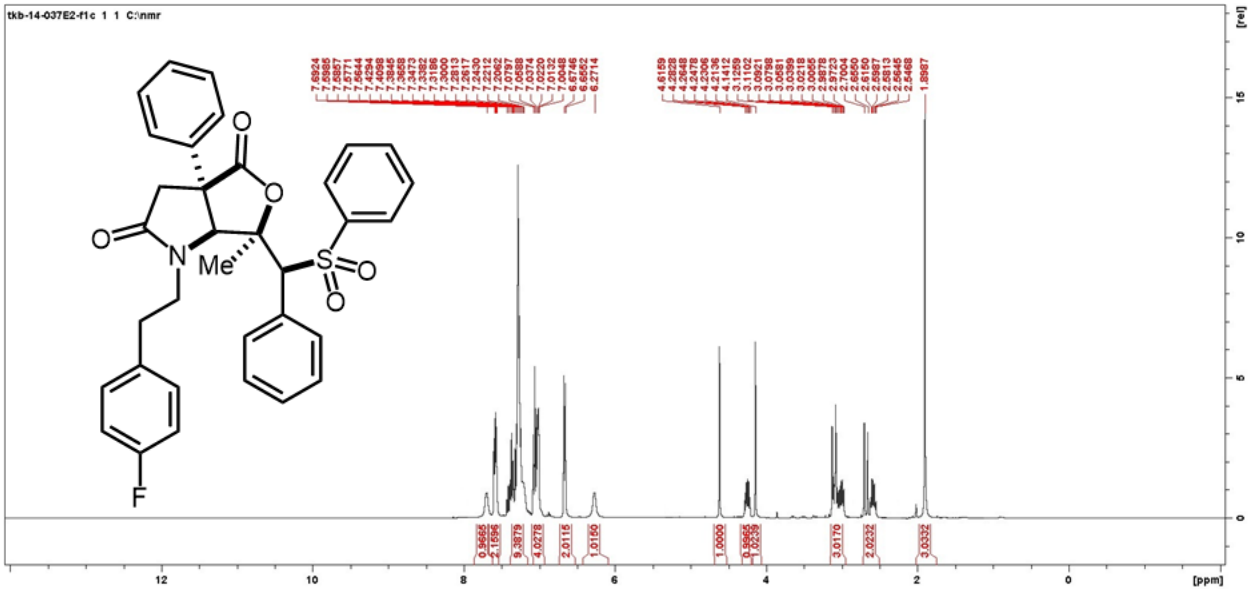


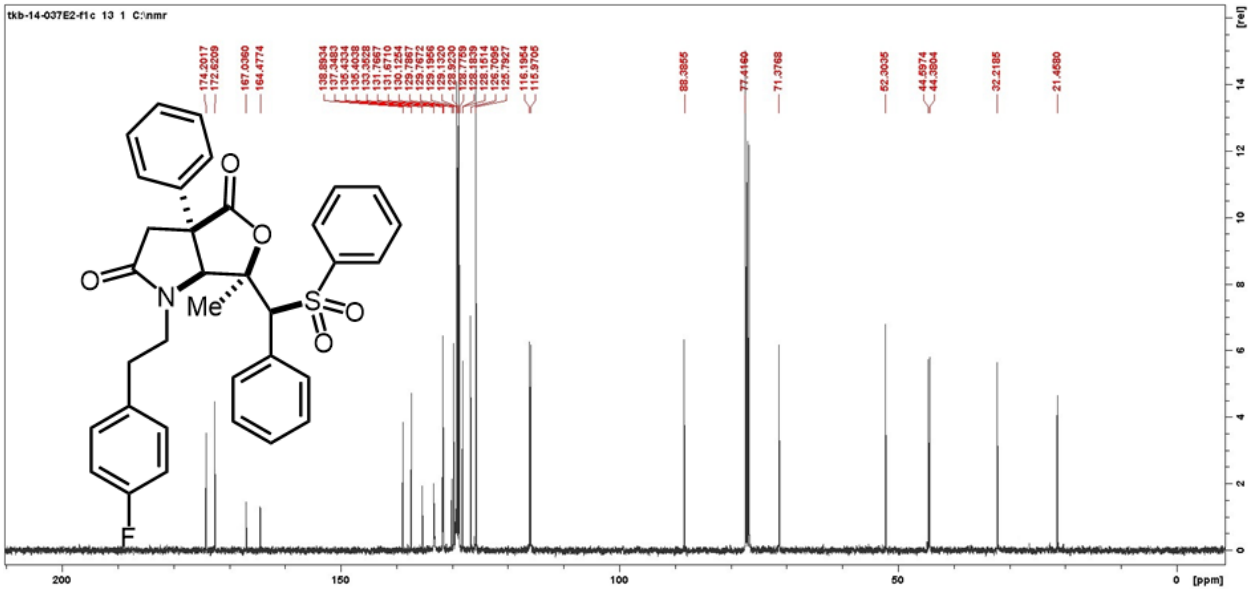


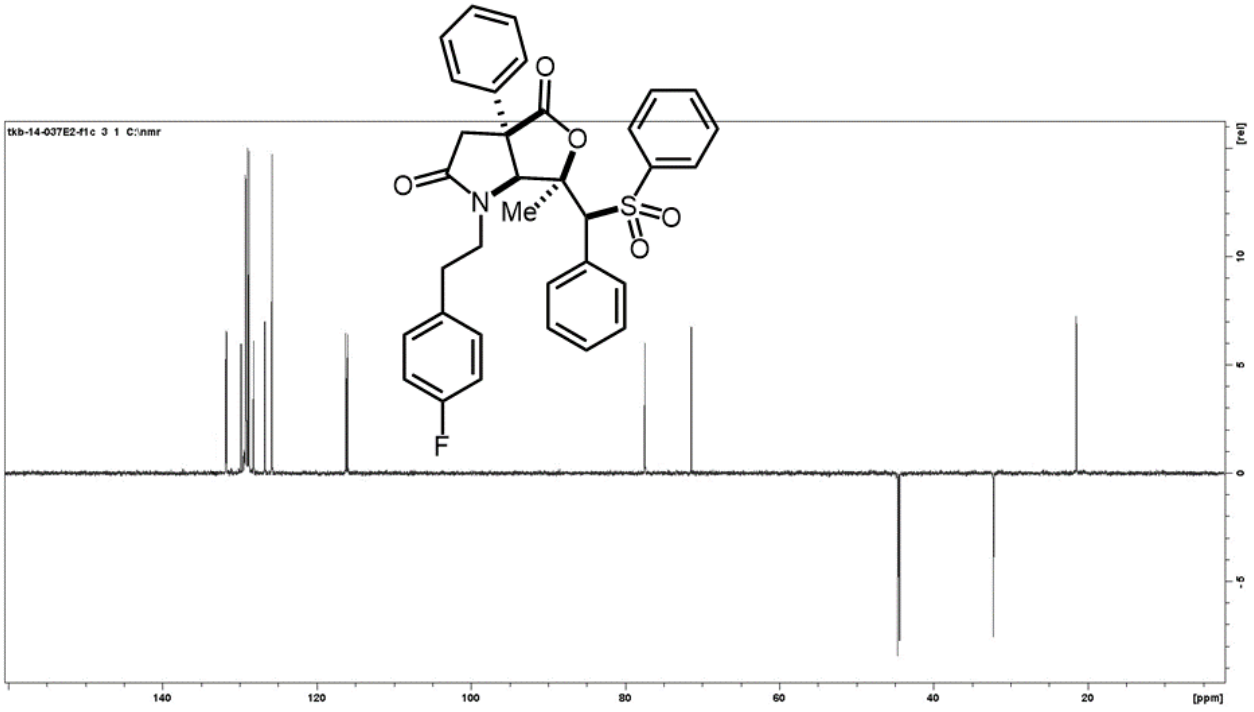
Compound 2i

Prepared in 0.50 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (50:50). Amorphous solid. Yield = 245.2 mg, 84%, 95:5 dr (*syn:anti*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.70 (d, J = 8.0 Hz, 1H), 7.58 (dt, J = 8.6, 4.4 Hz, 2H), 7.42 – 7.21 (m, 9H), 7.08 – 7.00 (m, 4H), 6.67 (d, J = 7.5 Hz, 2H), 6.31 – 6.24 (m, 1H), 4.62 (s, 1H), 4.25 (dt, J = 13.8, 7.0 Hz, 1H), 4.14 (s, 1H), 3.12 – 2.97 (m, 3H), 2.70 – 2.55 (m, 2H), 1.90 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.2, 172.6, 167.0, 164.5, 138.9, 137.3, 135.4, 135.4, 133.4, 131.8, 131.7, 130.1, 129.8, 129.2, 129.1, 128.9, 128.8, 128.2, 128.1, 126.7, 125.8, 116.2,

116.0, 88.4, 77.4, 71.4, 52.3, 44.6, 44.4, 32.2, 21.5. **HRMS-EI$^+$** (*m/z*): calc for $C_{34}H_{30}FNO_5S$ $[M]^+$ 583.1829, found 583.1833.



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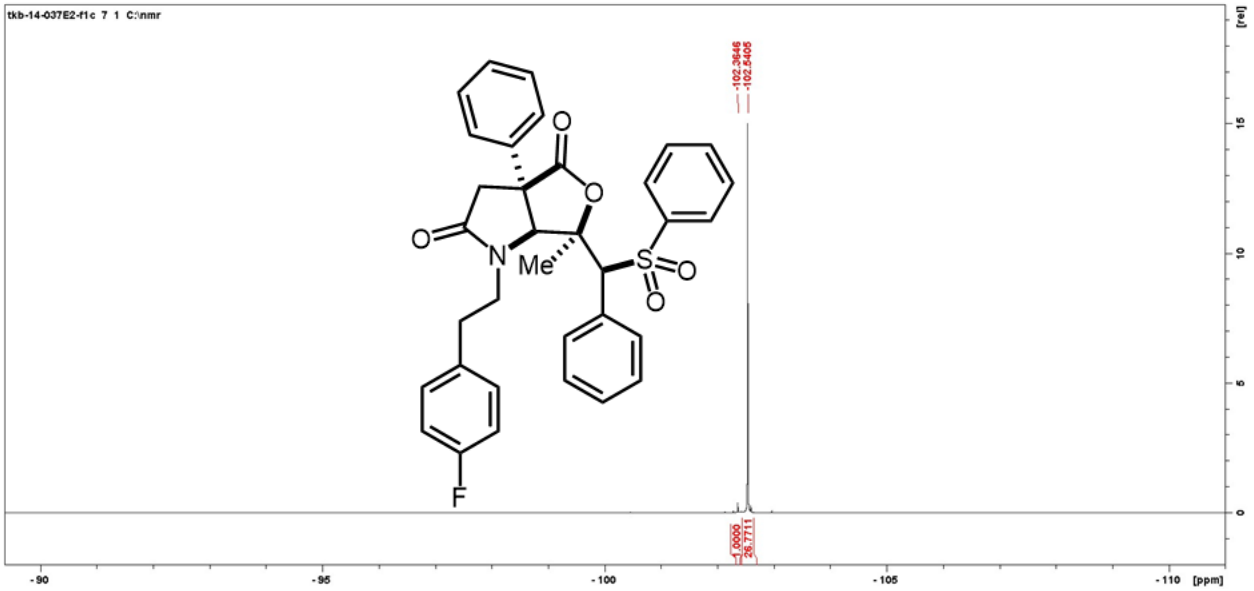
^{19}F NMR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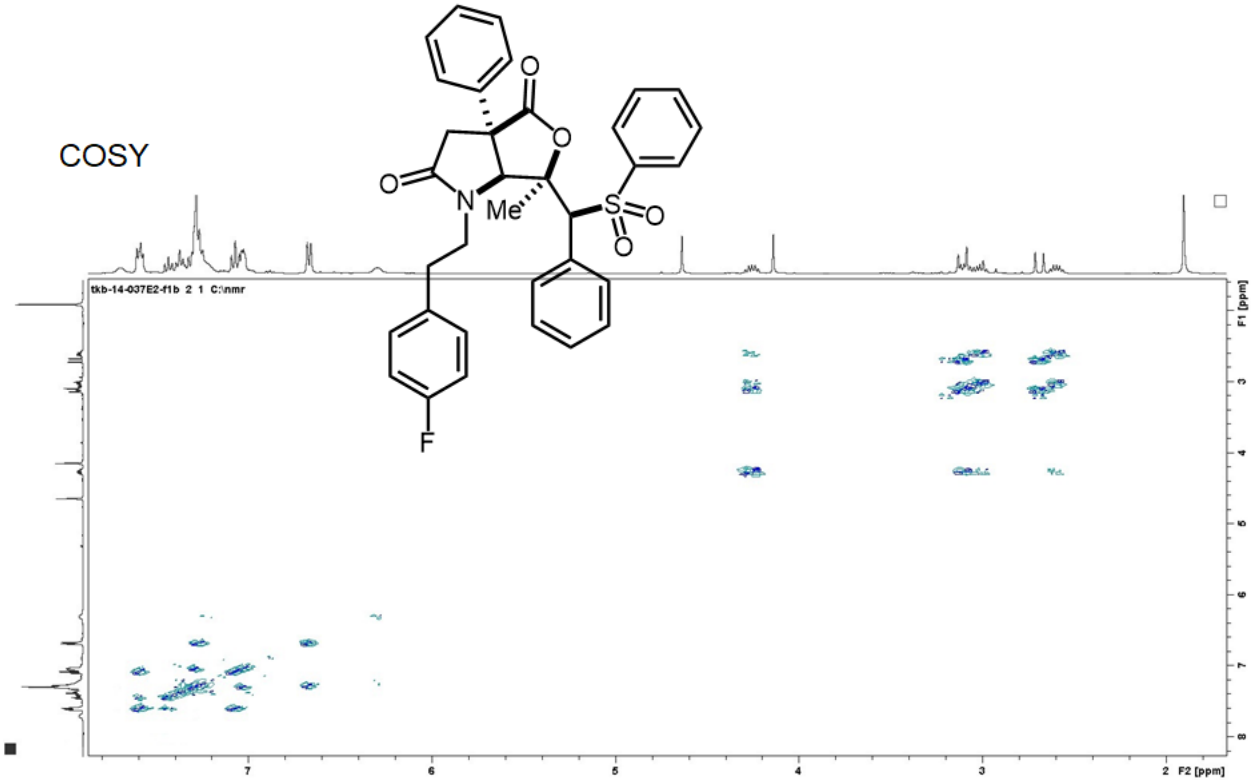
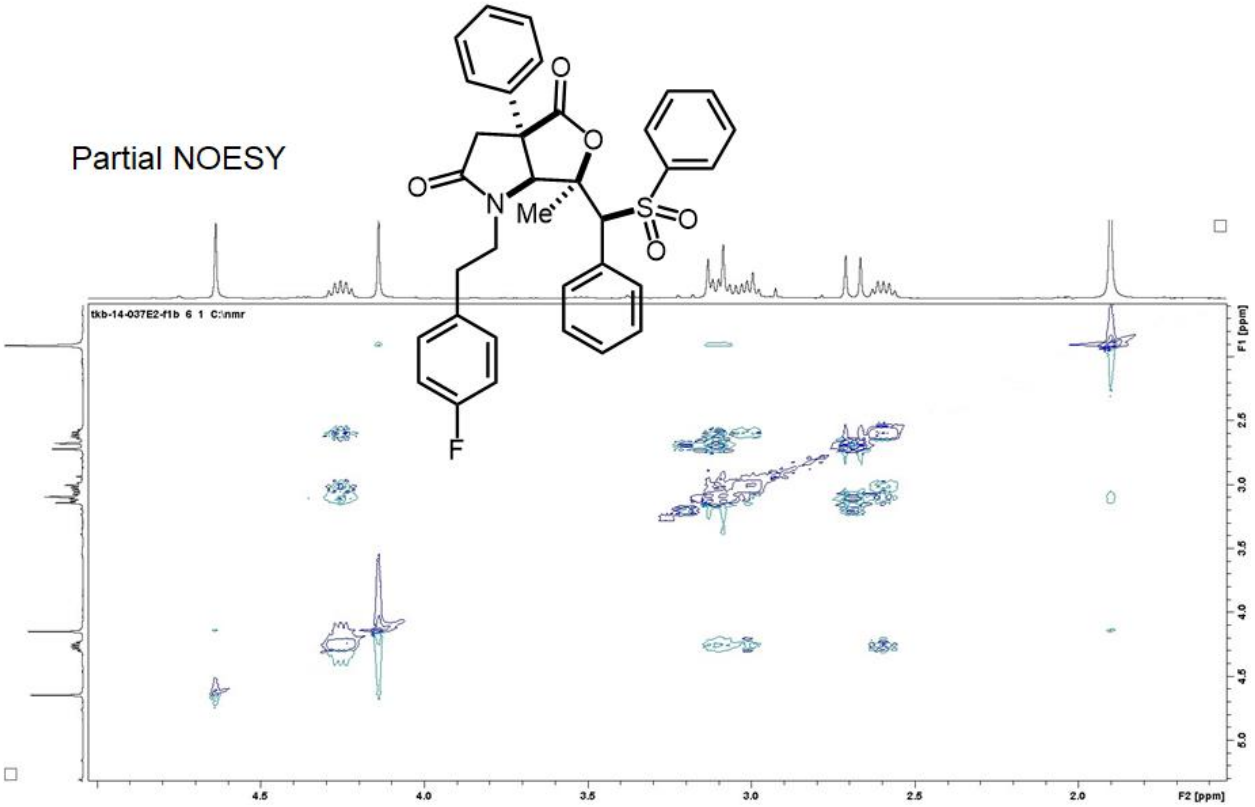
COSY

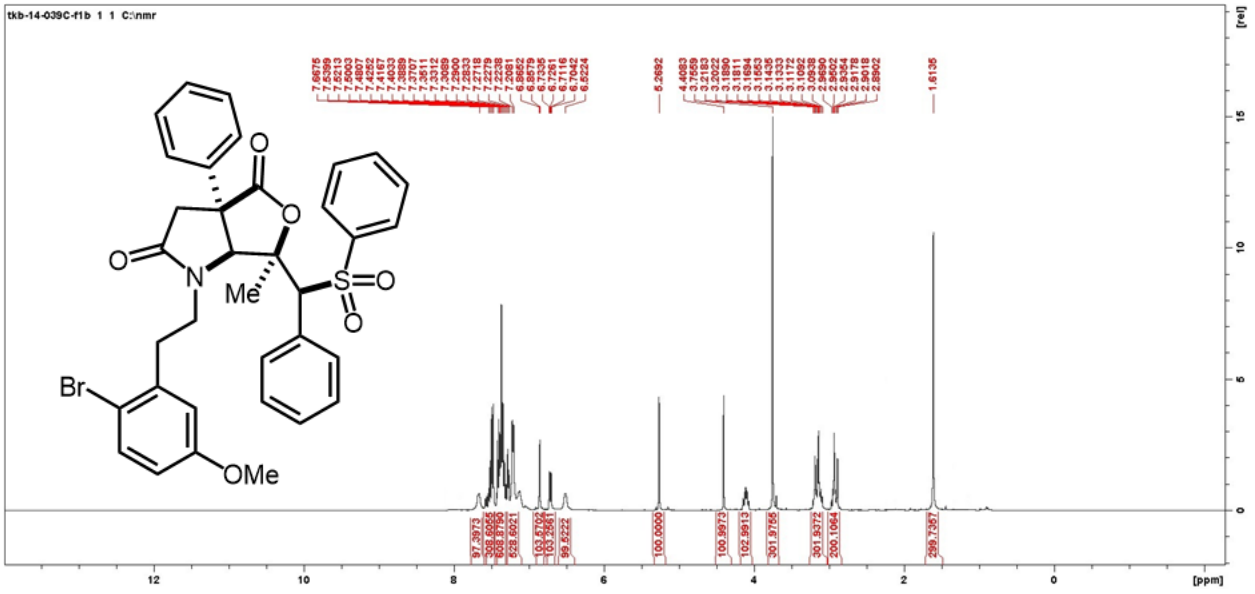


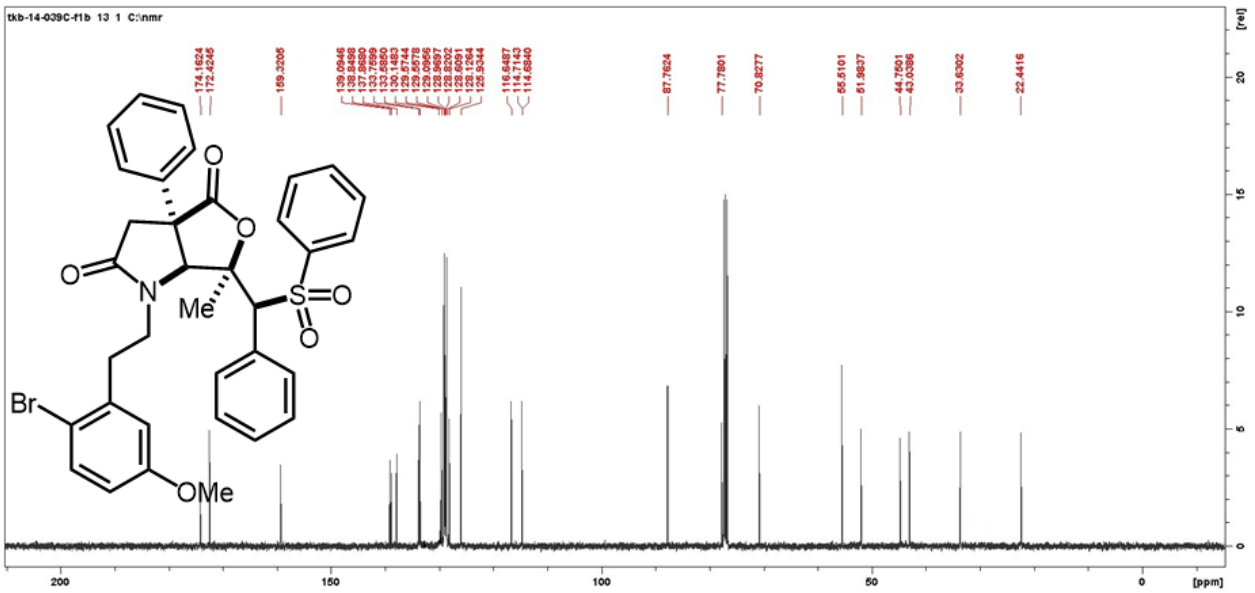
Partial NOESY

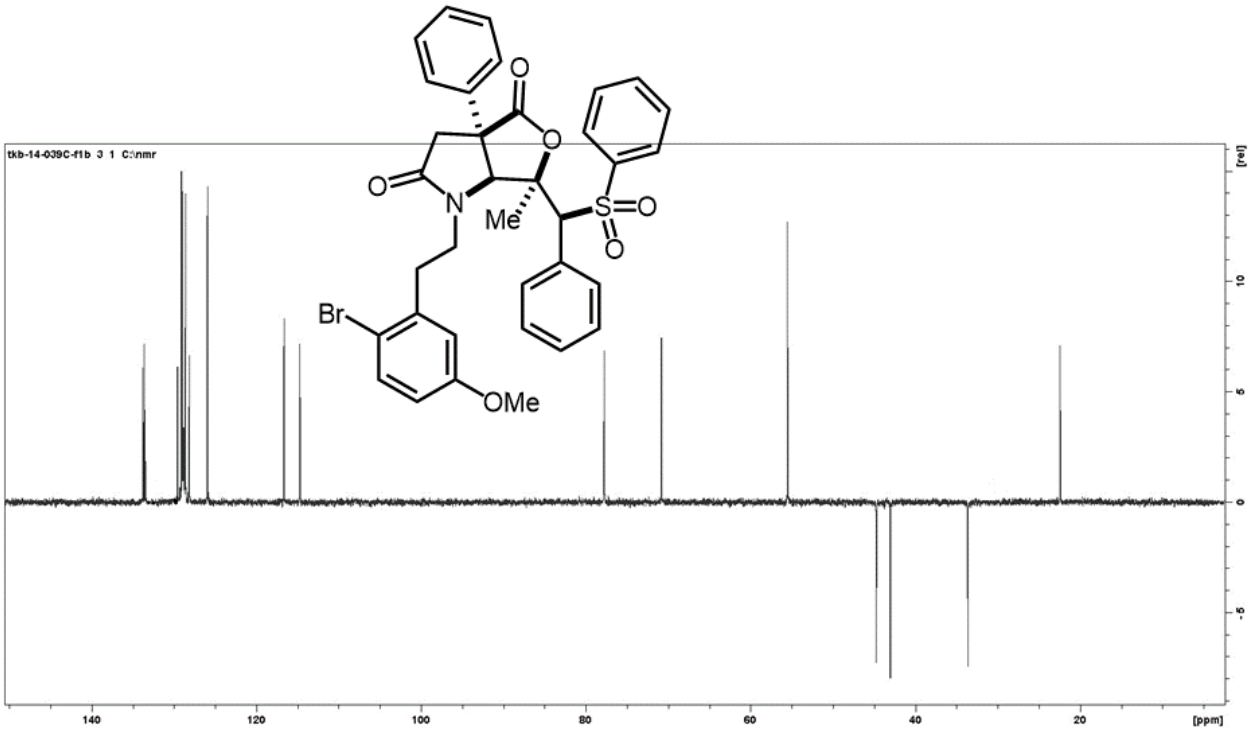


Compound 2j

Prepared in 0.50 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (35:65). Amorphous solid. Yield = 283.3 mg, 84%, 95:5 dr (*syn:anti*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.67 (d, *J* = 7.7 Hz, 1H), 7.54 – 7.21 (m, 14H), 6.86 (s, *J* = 3.0 Hz, 1H), 6.72 (dd, *J* = 8.8, 3.0 Hz, 1H), 6.52 (d, *J* = 7.7 Hz, 1H), 5.27 (s, 1H), 4.41 (s, 1H), 4.11 (tt, *J* = 11.6, 5.2 Hz, 1H), 3.76 (s, 3H), 3.24 – 3.07 (m, 3H), 2.99 – 2.87 (m, 2H), 1.61 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.2, 172.4, 159.3, 139.1, 138.8, 137.9, 133.8, 133.6, 130.1, 129.8, 129.6, 129.6, 129.1, 129.0, 128.8, 128.6, 128.2, 128.1, 125.9, 116.6, 114.7, 114.7, 87.8, 77.8, 70.8, 55.5, 52.0, 44.7, 43.0, 33.6, 22.4. FTIR (KBr): 2994.1, 1763.4, 1669.4, 1608.2, 1511.1, 1431.8, 1414.7, 1344.9, 1298.4, 1135.3, 1031.8, 996.7, 706.4. **HRMS-EI^{+}** (*m/z*): calc for $C_{35}H_{32}BrNO_6S$ $[M]^{+}$ 673.1134, found 673.1138.



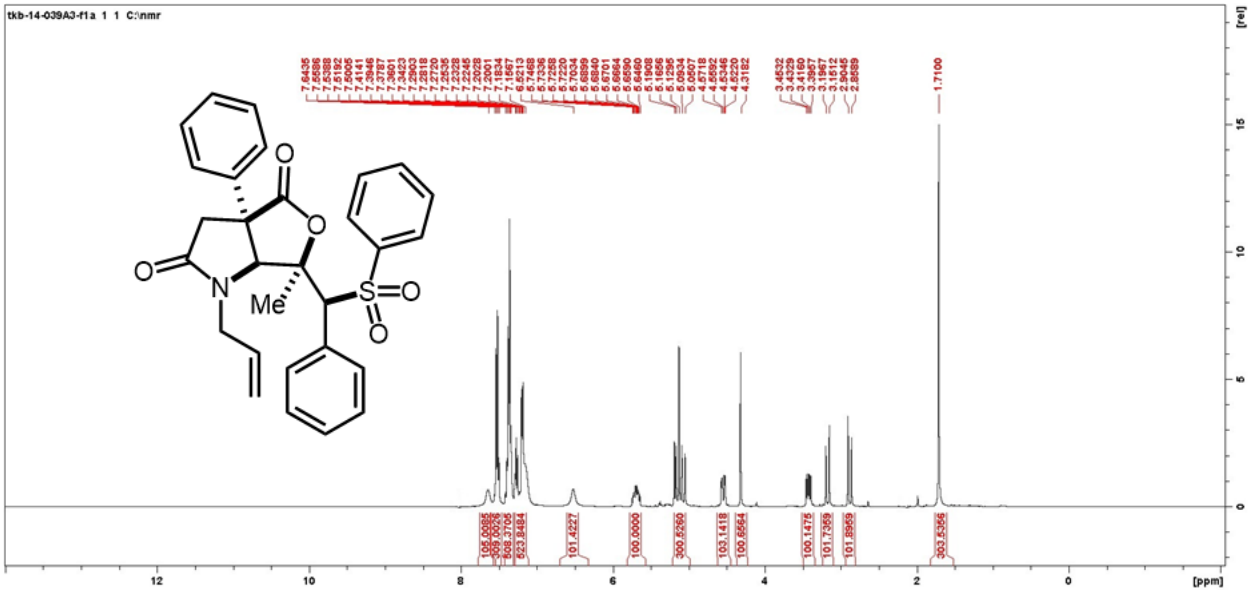


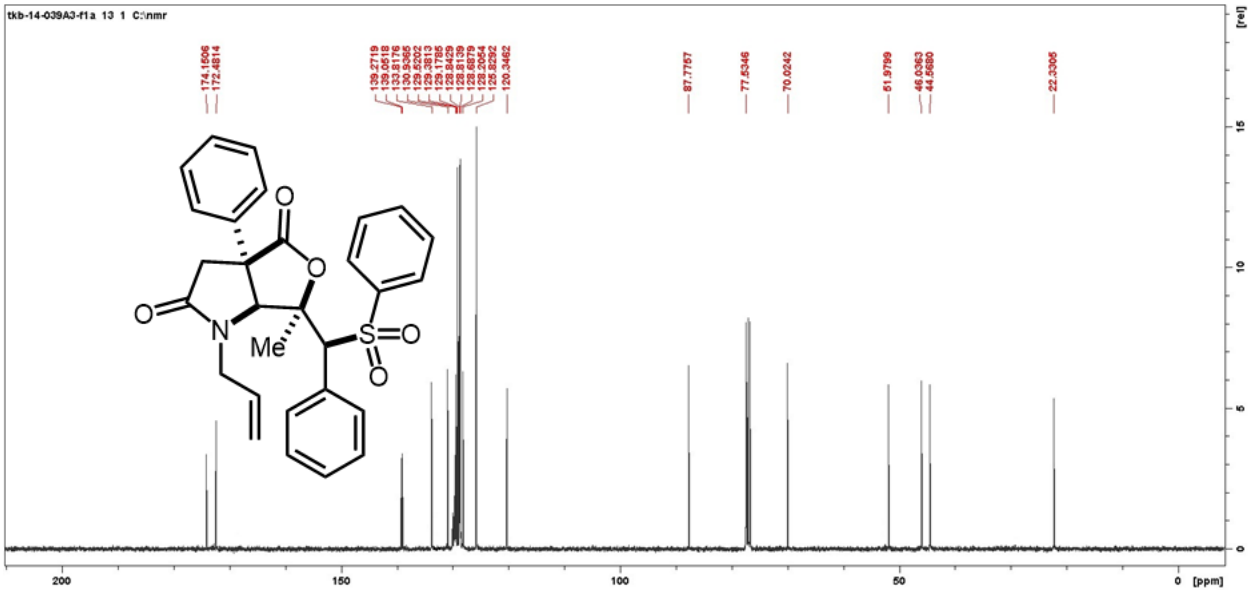


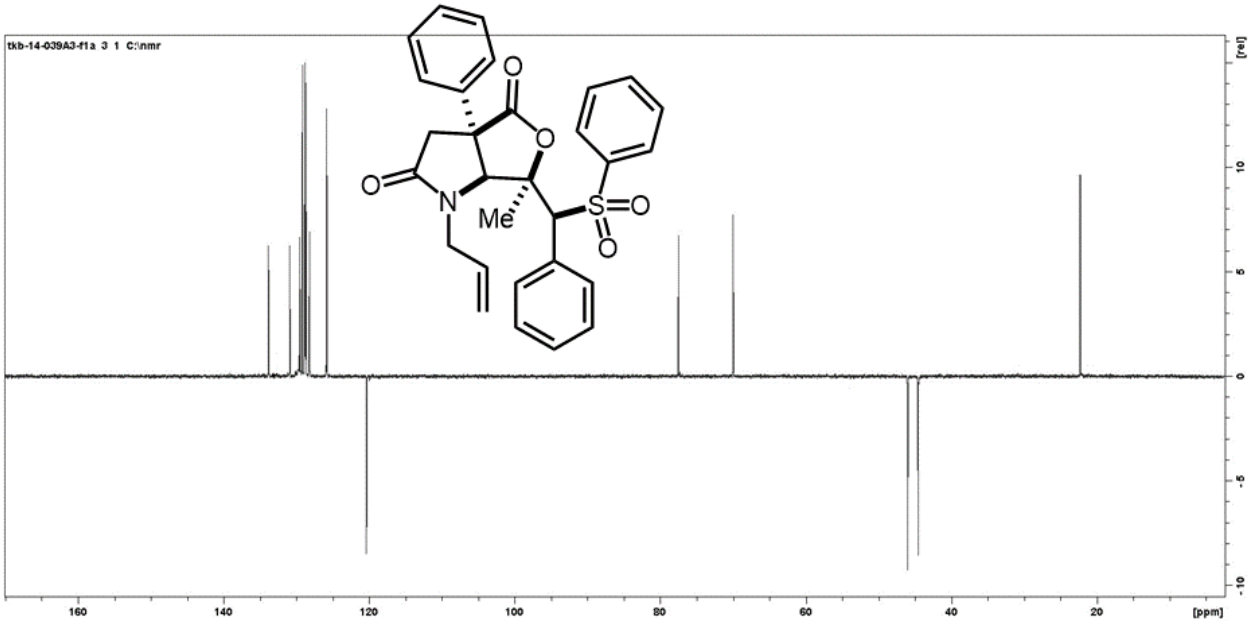
Compound 2k

Prepared in 1.00 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (35:65). Pale yellow oil. Yield = 436.4 mg, 87%, 95:5 dr (*syn:anti*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.64 (s, 1H), 7.56 – 7.50 (m, 3H), 7.41 – 7.34 (m, 5H), 7.29 – 7.16 (m, 5H), 6.52 (s, 1H), 5.70 (dddd, *J* = 17.7, 9.8, 8.1, 5.2 Hz, 1H), 5.19 – 5.05 (m, 3H), 4.55 (dd, *J* = 14.9, 5.2 Hz, 1H), 4.32 (s, 1H), 3.42 (dd, *J* = 14.9, 8.1 Hz, 1H), 3.15 (d, *J* = 18.2 Hz,

1H), 2.90 (d, J = 18.2 Hz, 1H), 1.71 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.1, 172.5, 139.3, 139.1, 133.8, 130.9, 129.5, 129.4, 129.2, 128.8, 128.8, 128.7, 128.2, 125.8, 120.3, 87.8, 77.5, 70.0, 52.0, 46.0, 44.6, 22.3. FTIR (KBr): 3020.0, 2834.3, 1724.9, 1646.3, 1474.3, 1452.8, 1361.9, 1342.0, 1205.6, 1140.2, 1077.7, 996.4, 766.2. **HRMS-EI$^+$** (m/z): calc for $C_{29}H_{27}NO_5S$ $[M]^+$ 501.1610, found 501.1614.

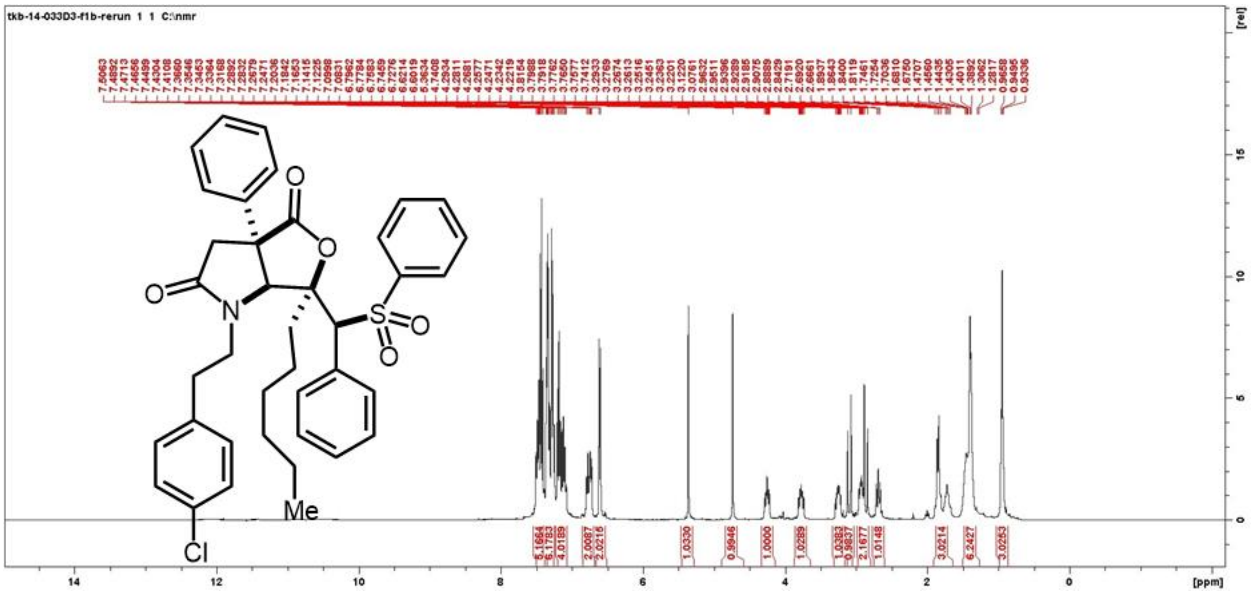






Compound 2l

Prepared in 0.50 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (60:40). Pale yellow oil. Yield = 191.0 mg, 57%, 95:5 dr (*syn:anti*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.52 – 7.08 (m, 15H), 6.77 (dt, *J* = 20.6, 7.1 Hz, 2H), 6.61 (d, *J* = 7.8 Hz, 2H), 5.36 (s, 1H), 4.74 (s, 1H), 4.26 (ddd, *J* = 14.4, 10.0, 4.9 Hz, 1H), 3.78 (ddd, *J* = 13.9, 9.6, 6.4 Hz, 1H), 3.26 (ddd, *J* = 12.9, 10.0, 6.3 Hz, 1H), 3.10 (d, *J* = 18.1 Hz, 1H), 3.05 – 2.85 (m, 2H), 2.69 (dd, *J* = 11.7, 9.6 Hz, 1H), 1.77 – 1.65 (m, 3H), 1.52 – 1.43 (m, 6H), 0.94 (t, *J* = 8.1 Hz, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 173.8, 173.0, 139.3, 136.4, 132.4, 131.2, 130.7, 130.2, 130.2, 129.8, 129.3, 129.3, 129.0, 128.8, 128.7, 128.3, 128.1, 127.7, 127.4, 125.1, 89.4, 71.7, 69.8, 51.6, 44.7, 44.6, 36.3, 32.4, 31.7, 29.6, 24.0, 22.6, 14.0. **HRMS-EI^{+}** (*m/z*): calc for $C_{39}H_{40}ClNO_5S$ $[M]^{+}$ 669.2316, found 669.2321.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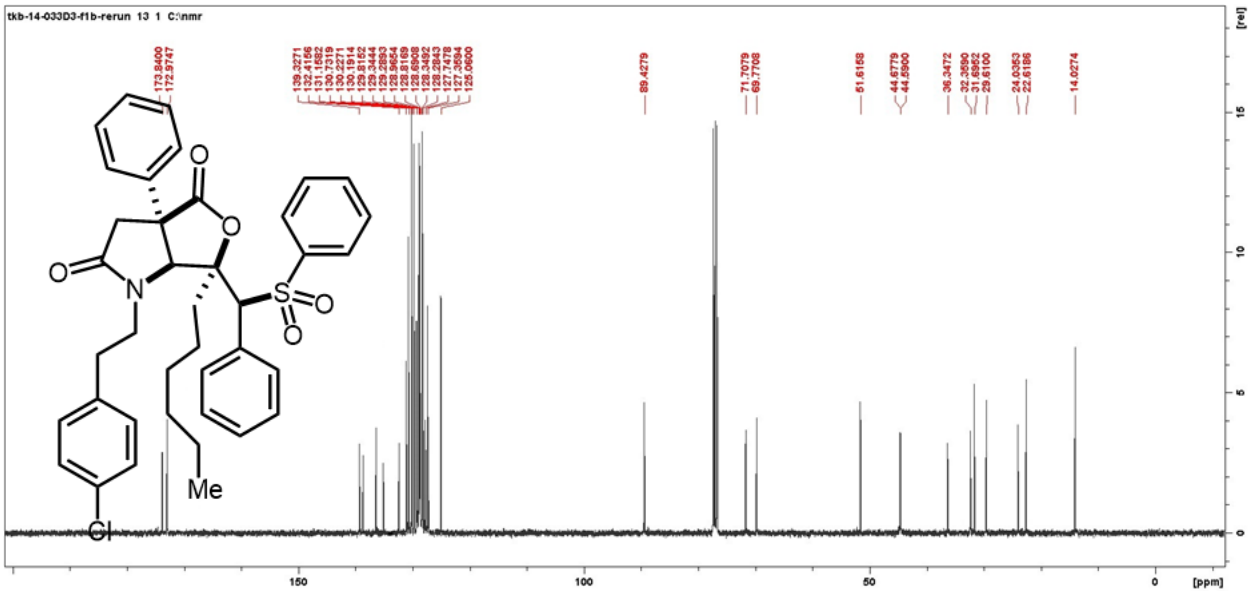
[ppm]
[rel]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Me
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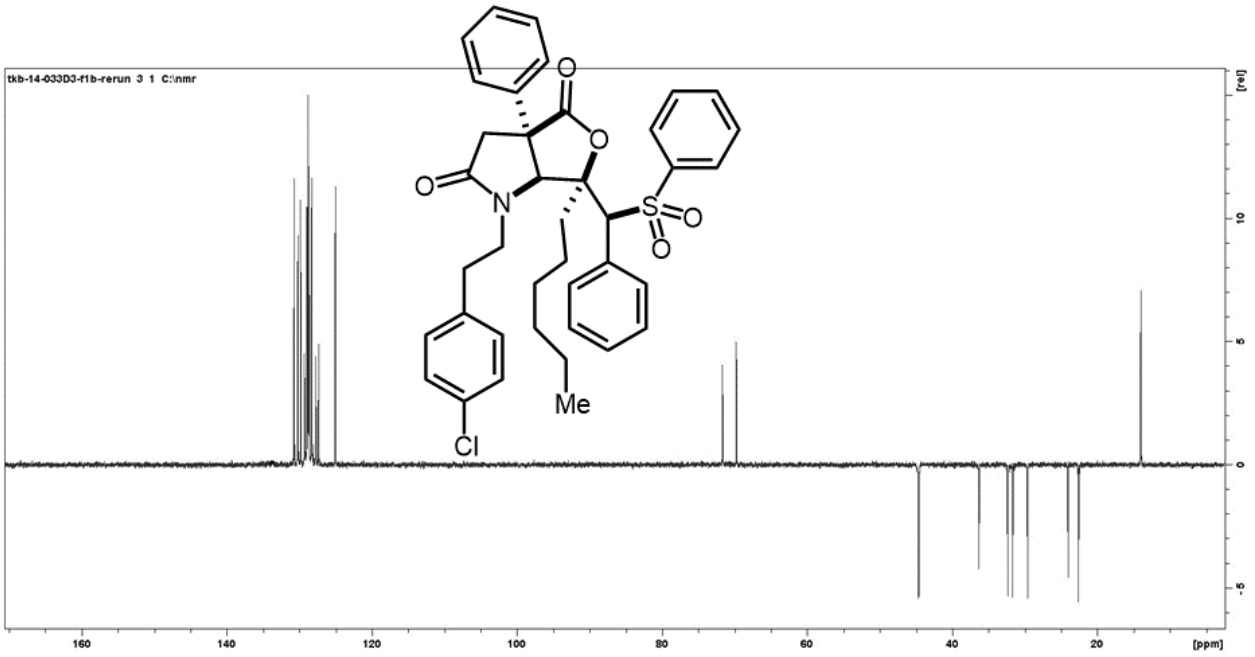
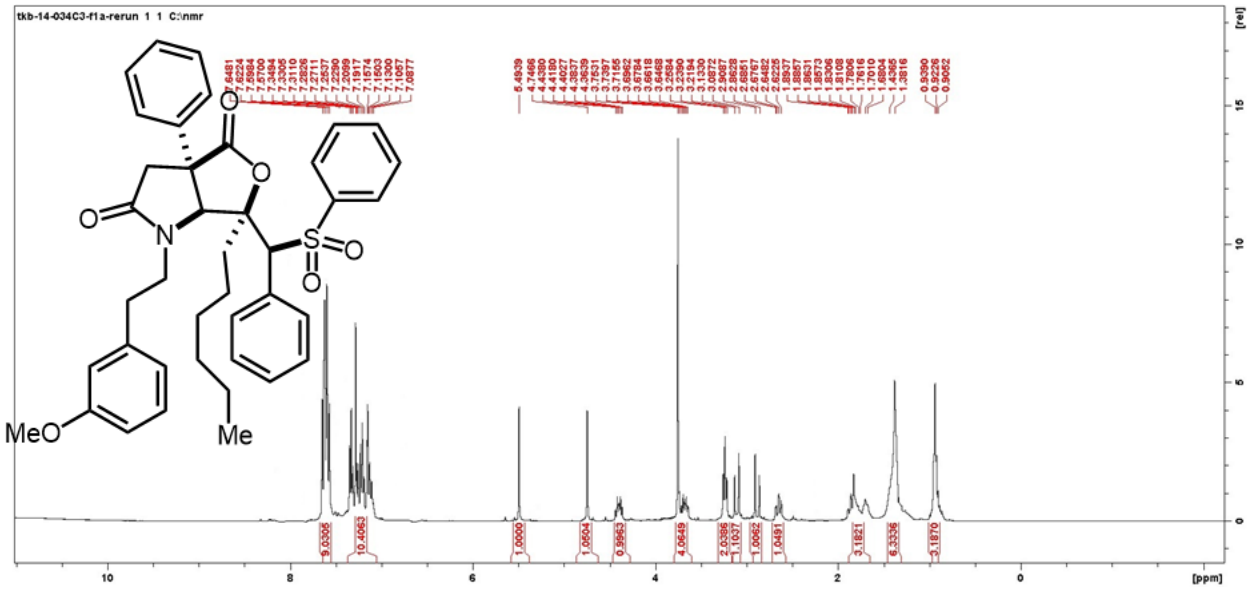


Compound 2m

Prepared in 0.50 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (50:50). Yellowish oil. Yield = 179.8 mg, 54%, 95:5 dr (*syn:anti*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.67 – 7.53 (m, 9H), 7.34 – 7.06 (m, 10H), 5.49 (s, 1H), 4.75 (s, 1H), 4.40 (dt, *J* = 13.4, 8.0 Hz, 1H), 3.75 (s, 3H), 3.69 (dd, *J* = 14.3, 7.2 Hz, 1H), 3.24 (t, *J* = 7.9 Hz, 2H), 3.11 (d, *J* = 18.3 Hz, 1H), 2.91 (d, *J* = 18.3 Hz, 1H), 2.71 – 2.60 (m, 1H), 1.86 – 1.64 (m, 3H), 1.47 – 1.32 (m, 6H), 0.93 (t, *J* = 6.5 Hz, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 173.9, 172.8, 159.1, 139.4, 138.8, 138.3, 131.0, 130.3, 130.2, 129.8, 129.4, 129.0, 128.8, 128.3, 127.4, 125.1, 116.0, 115.3, 114.8, 89.4, 72.0, 69.4, 55.4, 51.5, 44.8, 43.1, 36.2, 33.2, 31.7, 29.6, 24.0, 22.6, 14.0. **HRMS-EI^{+}** (*m/z*): calc for $C_{40}H_{43}NO_6S$ $[M]^{+}$ 665.2811, found 665.2817.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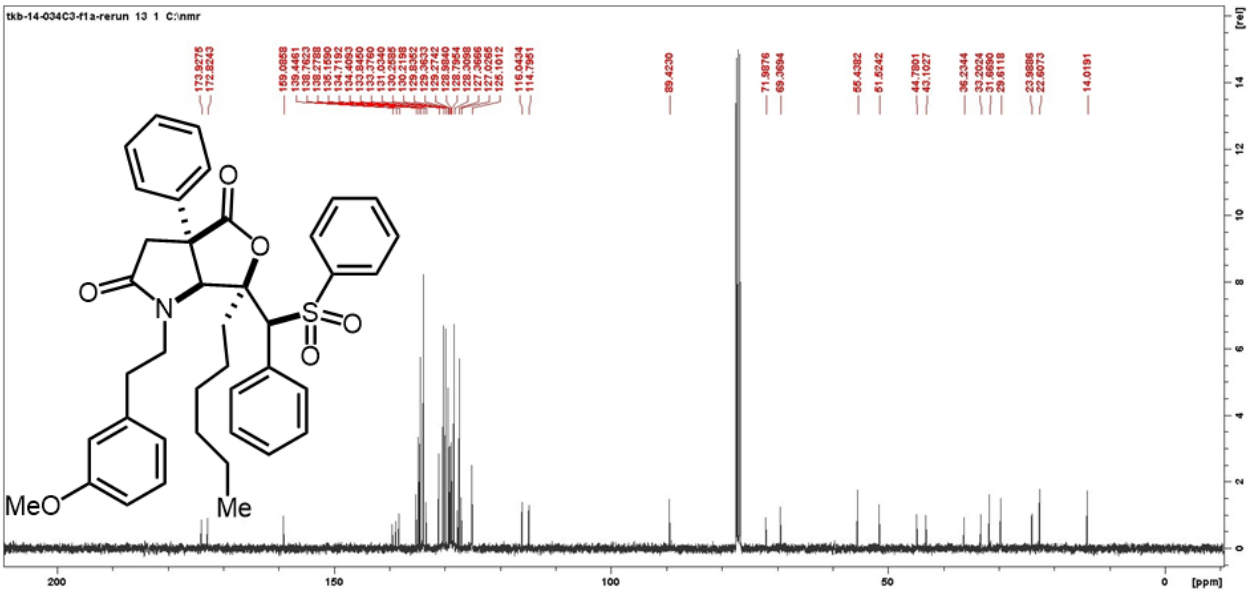
Me
[ppm]
[rel]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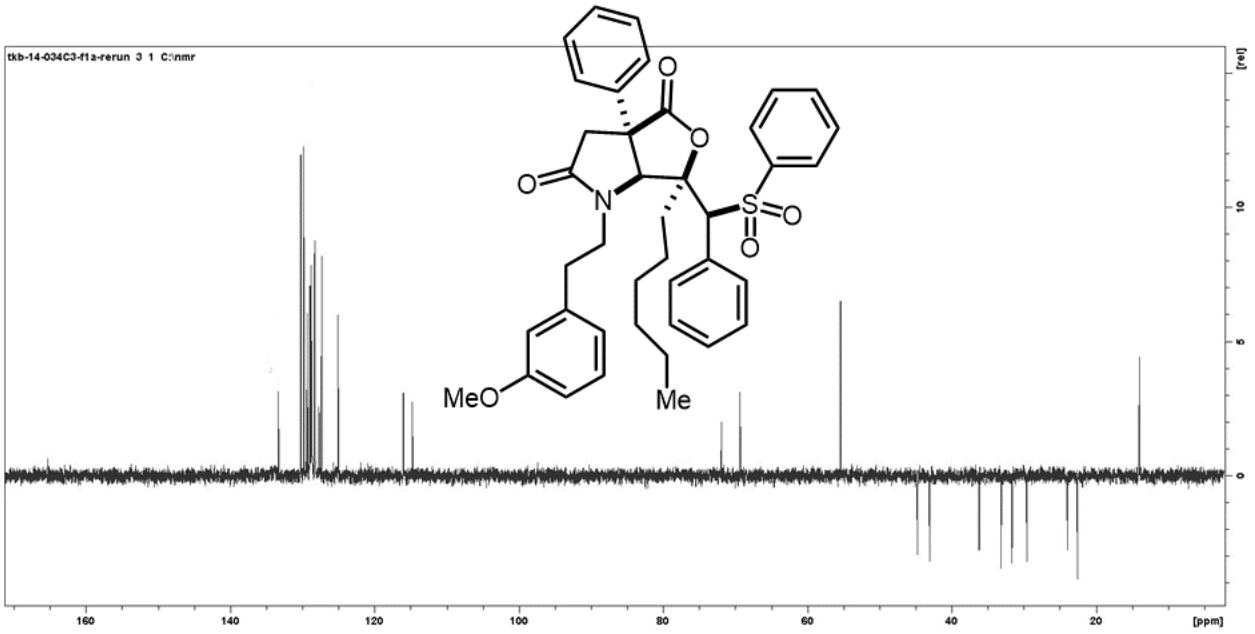
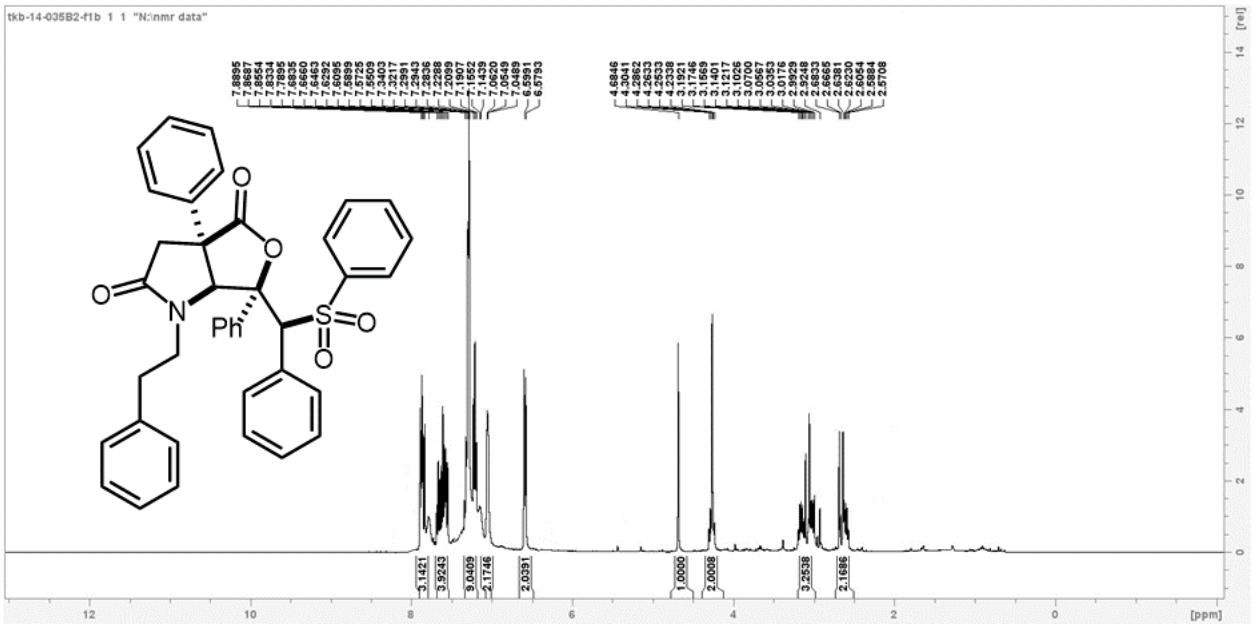


Compound 2n

Prepared in 0.50 mmol scale using **General Procedure A.** Yield = 0.00 mg, 0%. The alkenoic acid was recovered.

Compound 2o

Prepared in 0.50 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (50:50). Powdery substance. Yield = 153.8 mg, 49%, 95:5 dr (*syn:anti*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.89 – 7.75 (m, 3H), 7.65 – 7.53 (m, 4H), 7.53 – 7.32 (m, 9H), 7.05 (dd, *J* = 6.5, 3.0 Hz, 2H), 6.59 (d, *J* = 7.6 Hz, 2H), 4.68 (s, 1H), 4.31 – 4.24 (m, 2H), 3.20 – 2.99 (m, 3H), 2.69 – 2.57 (m, 2H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.2, 172.7, 138.9, 137.4, 136.4, 135.2, 134.6, 133.6, 131.8, 131.3, 130.8, 130.2, 129.8, 129.6, 129.5, 129.4, 129.2, 129.1, 129.0, 128.9, 128.8, 128.3, 128.0, 127.9, 127.7, 126.7, 125.8, 123.2, 88.5, 77.2, 71.3, 52.3, 44.7, 44.4, 32.2. **HRMS-EI$^+$** (*m/z*): calc for $C_{39}H_{33}NO_5S$ $[M]^+$ 627.2079, found 627.2086.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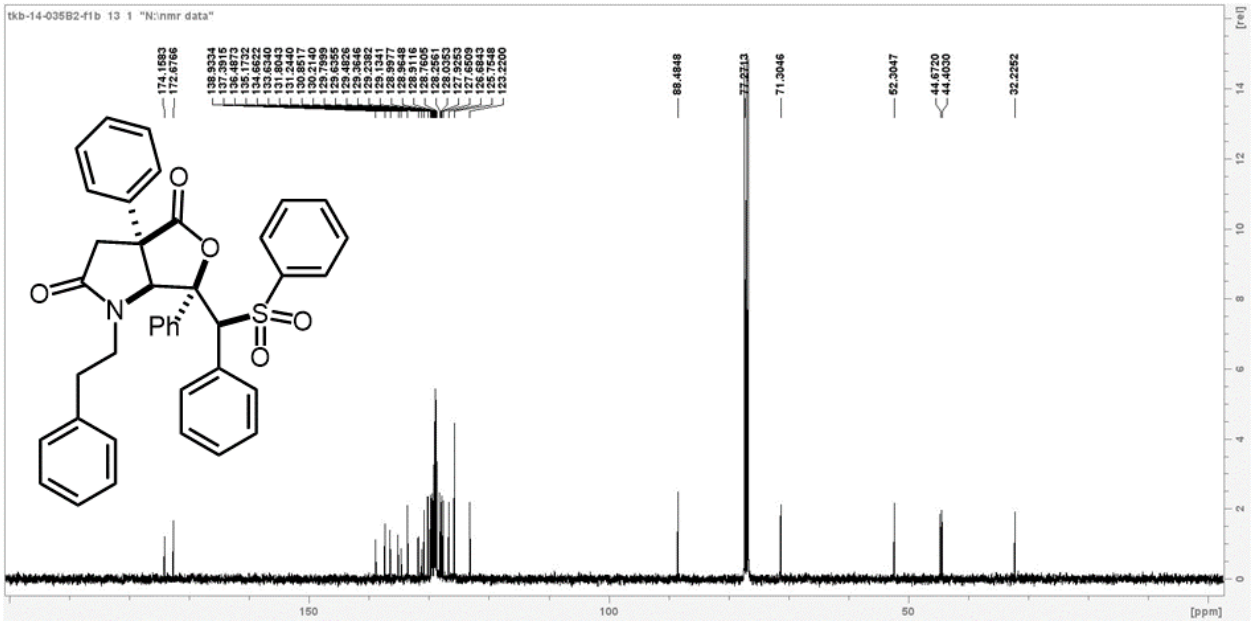
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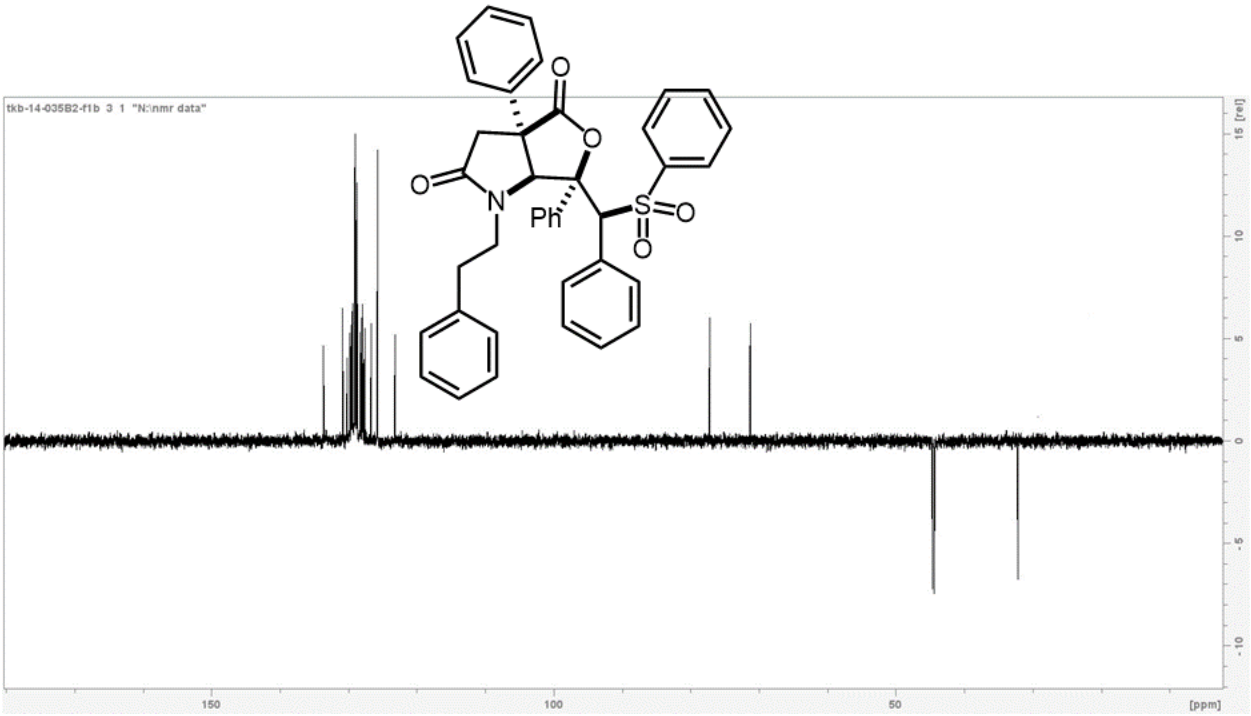
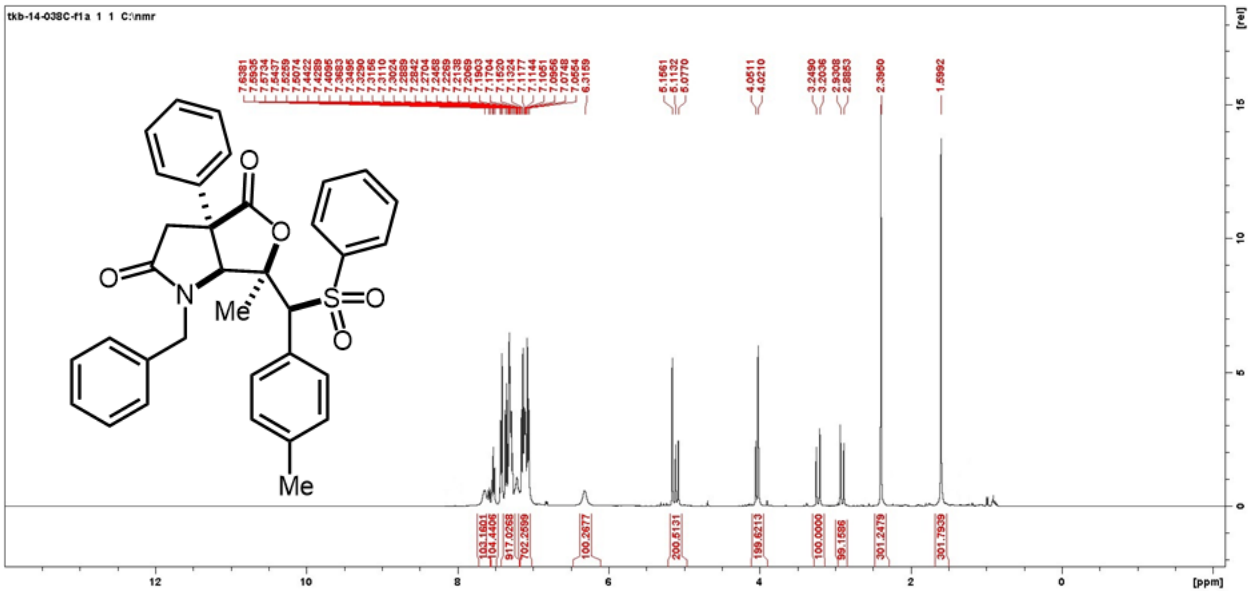


Compound 2p

Prepared in 0.50 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (50:50). Yellowish oil. Yield = 226.3 mg, 80%, 95:5 dr (*syn:anti*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.64 – 7.50 (m, 2H), 7.44 – 7.17 (m, 9H), 7.15 – 7.05 (m, 7H), 6.32 (s, 1H), 5.16 (s, 1H), 5.10 (d, J = 14.5 Hz, 1H), 4.07 – 3.99 (m, 2H), 3.20 (d, J = 18.5 Hz, 1H), 2.93 (d, J = 14.5 Hz, 1H), 2.40 (s, 3H), 1.60 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.2, 173.0, 139.1, 139.0, 138.2, 133.7, 132.0, 129.7, 129.6, 129.4, 129.1, 129.0, 128.9, 128.6, 128.1, 125.9, 87.7, 77.4, 69.9, 52.0, 47.3, 45.0, 22.5, 21.2. **HRMS-EI$^+$** (*m/z*): calc for $C_{34}H_{31}NO_5S$ $[M]^+$ 565.1923, found 565.1926.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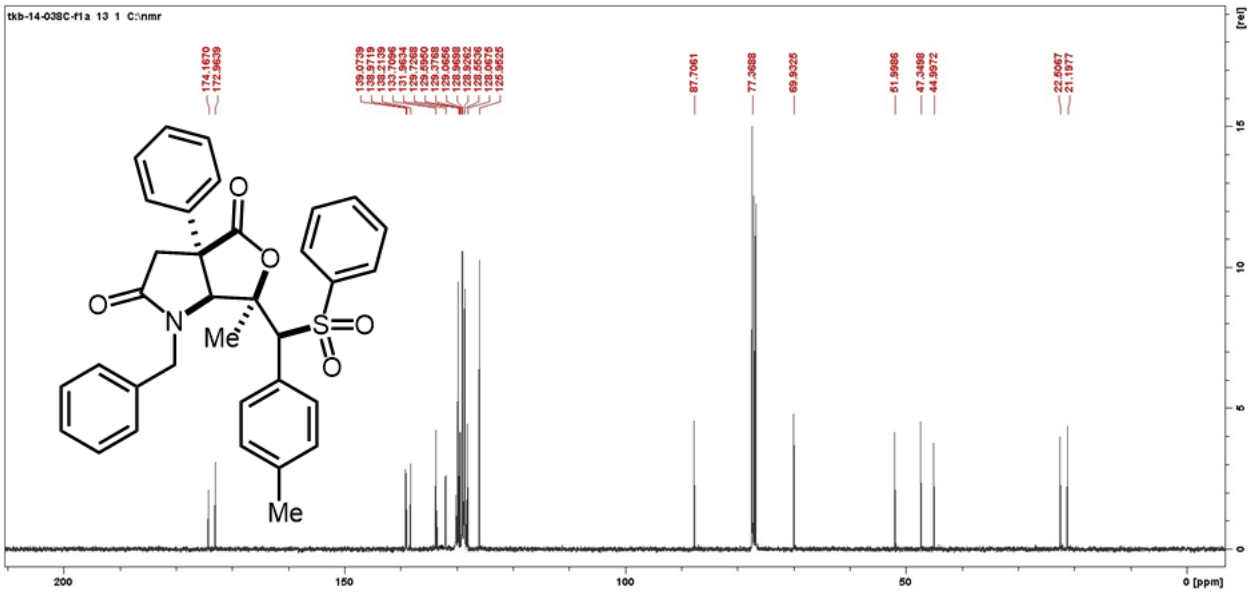
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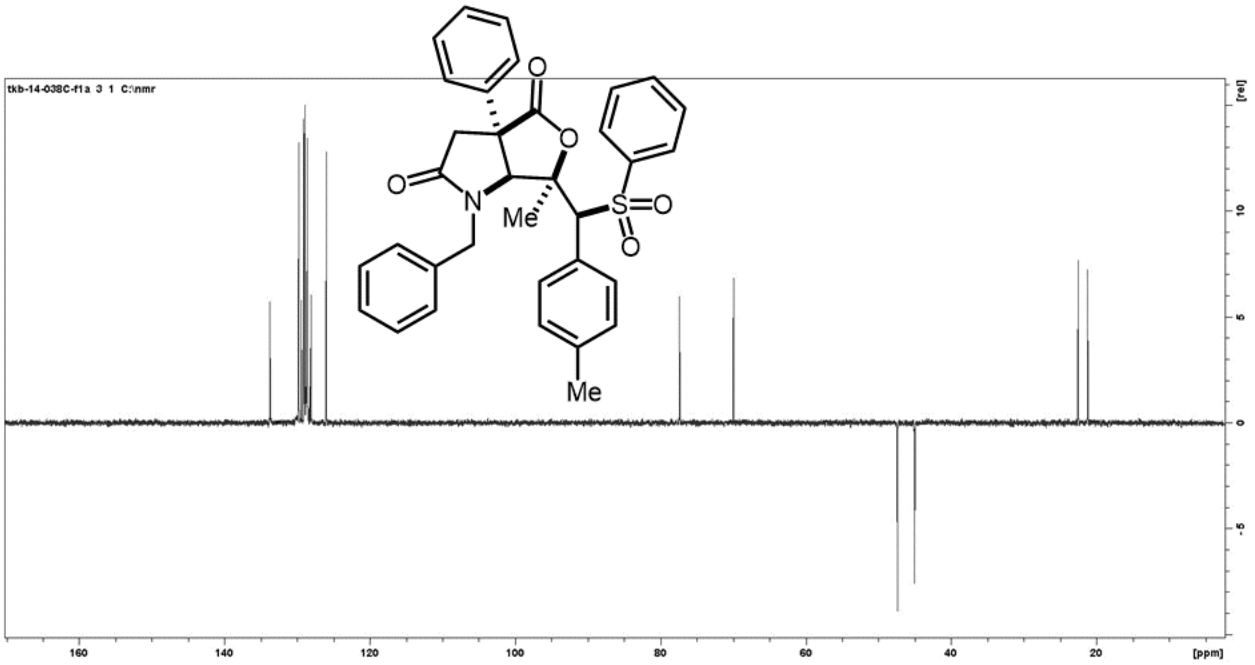
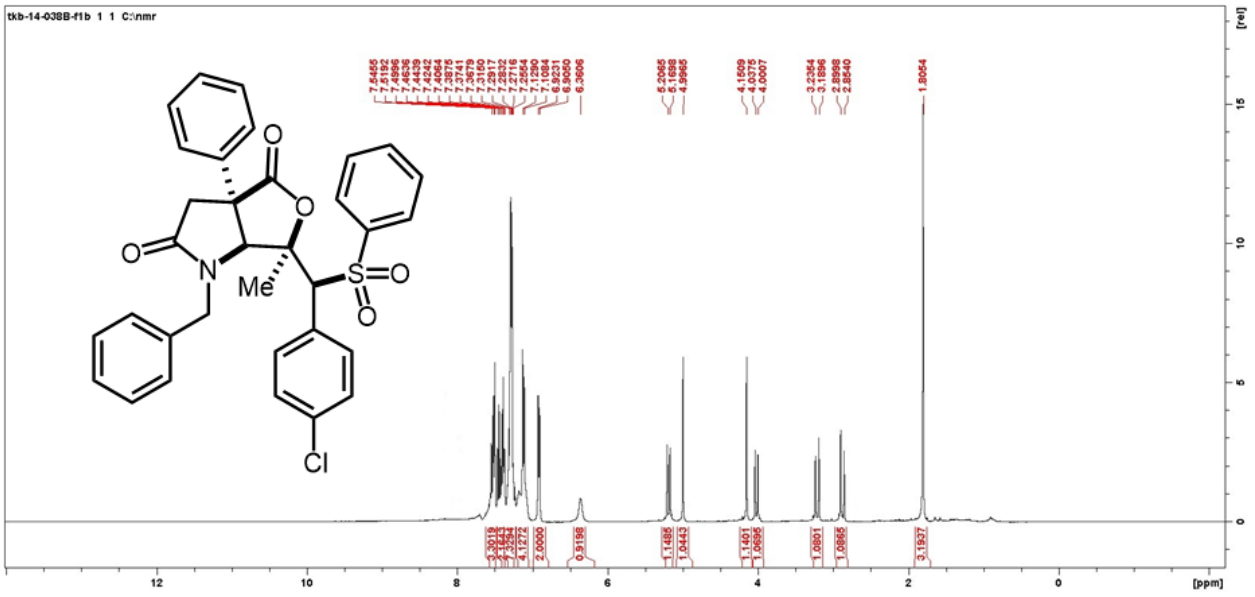


Compound 2q

Prepared in 0.50 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (50:50). Amorphous solid. Yield = 228.5 mg, 78%, 95:5 dr (*syn:anti*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.54 – 7.10 (m, 16H), 6.91 (dd, *J* = 8.2, 1.6 Hz, 2H), 6.36 (s, 1H), 5.19 (d, *J* = 14.8 Hz, 1H), 5.00 (s, 1H), 4.15 (s, 1H), 4.02 (d, *J* = 14.8 Hz, 1H), 3.19 (d, *J* = 18.3 Hz, 1H), 2.90 (d, *J* = 18.3 Hz, 1H), 1.80 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 173.9, 173.1, 134.7, 133.8, 133.8, 130.3, 130.2, 129.8, 129.5, 129.2, 129.1, 128.9, 128.8, 128.7, 128.3, 128.2, 125.7, 87.8, 77.3, 69.8, 52.1, 46.5, 44.7, 22.5. **HRMS-EI^{+}** (*m/z*): calc for $C_{33}H_{28}ClNO_5S$ $[M]^{+}$ 585.1377, found 585.1374.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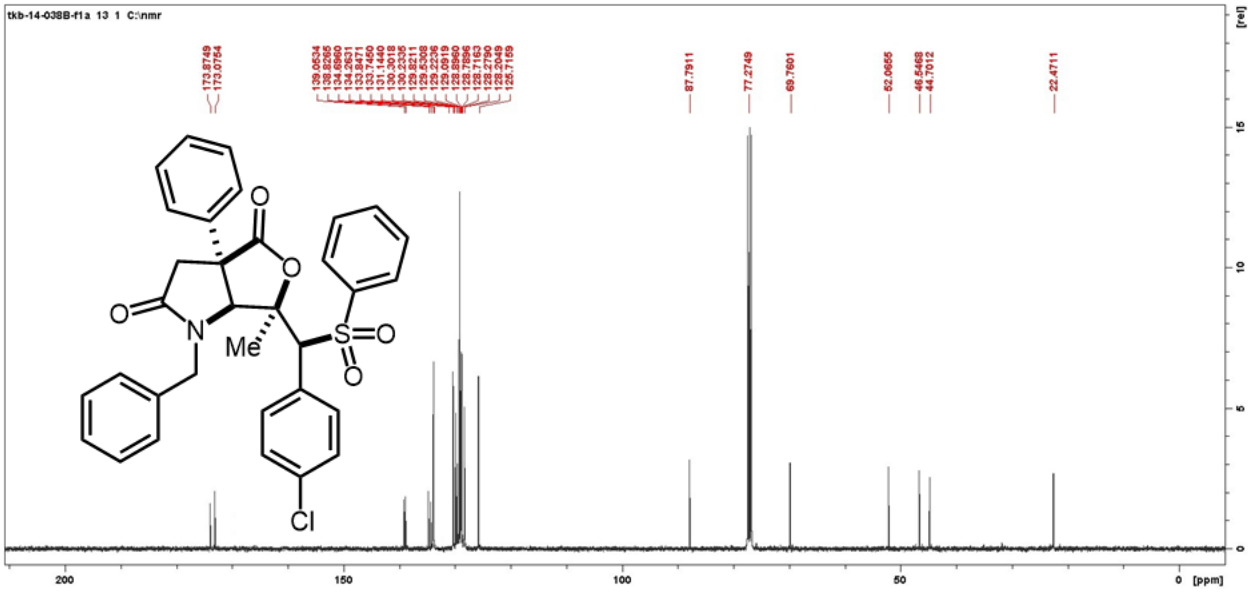
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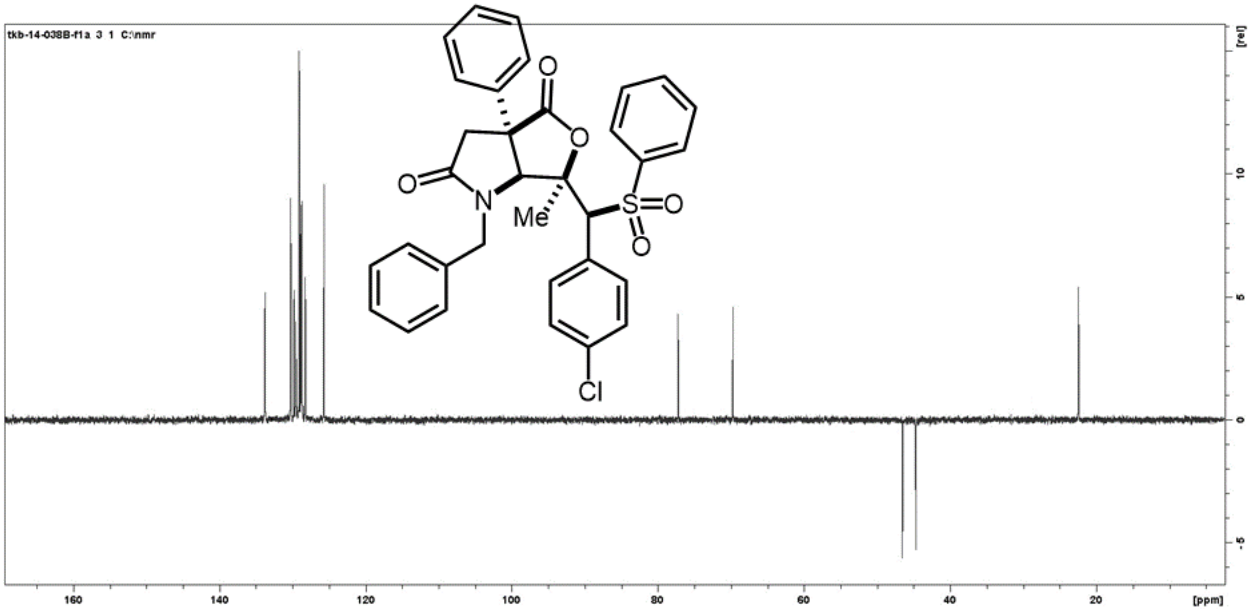
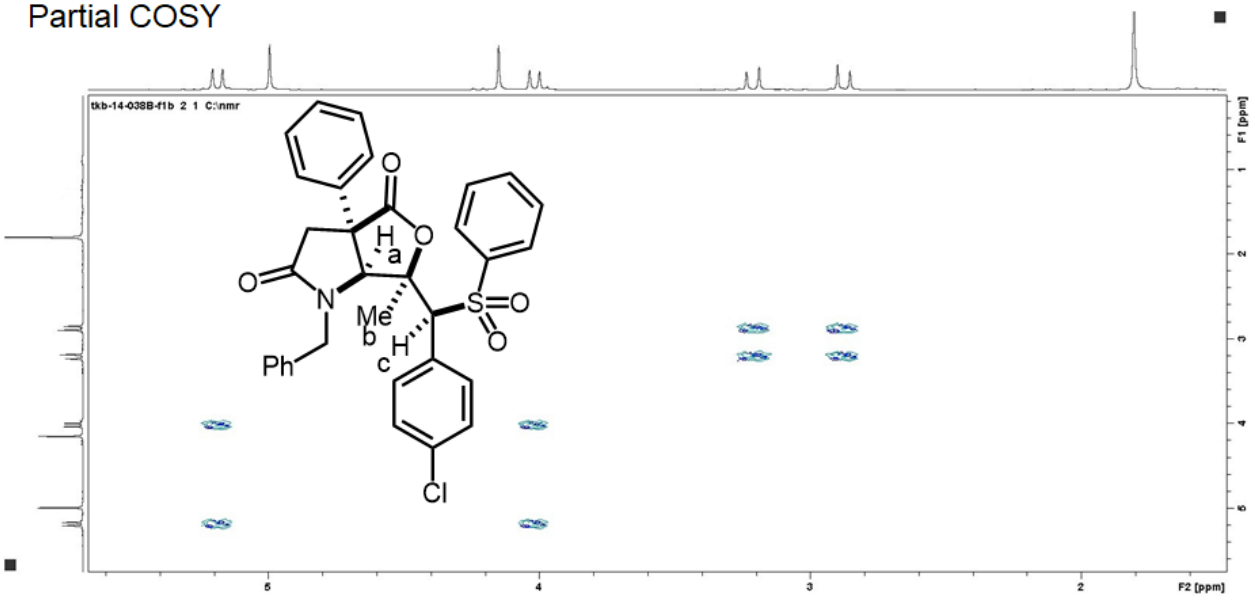
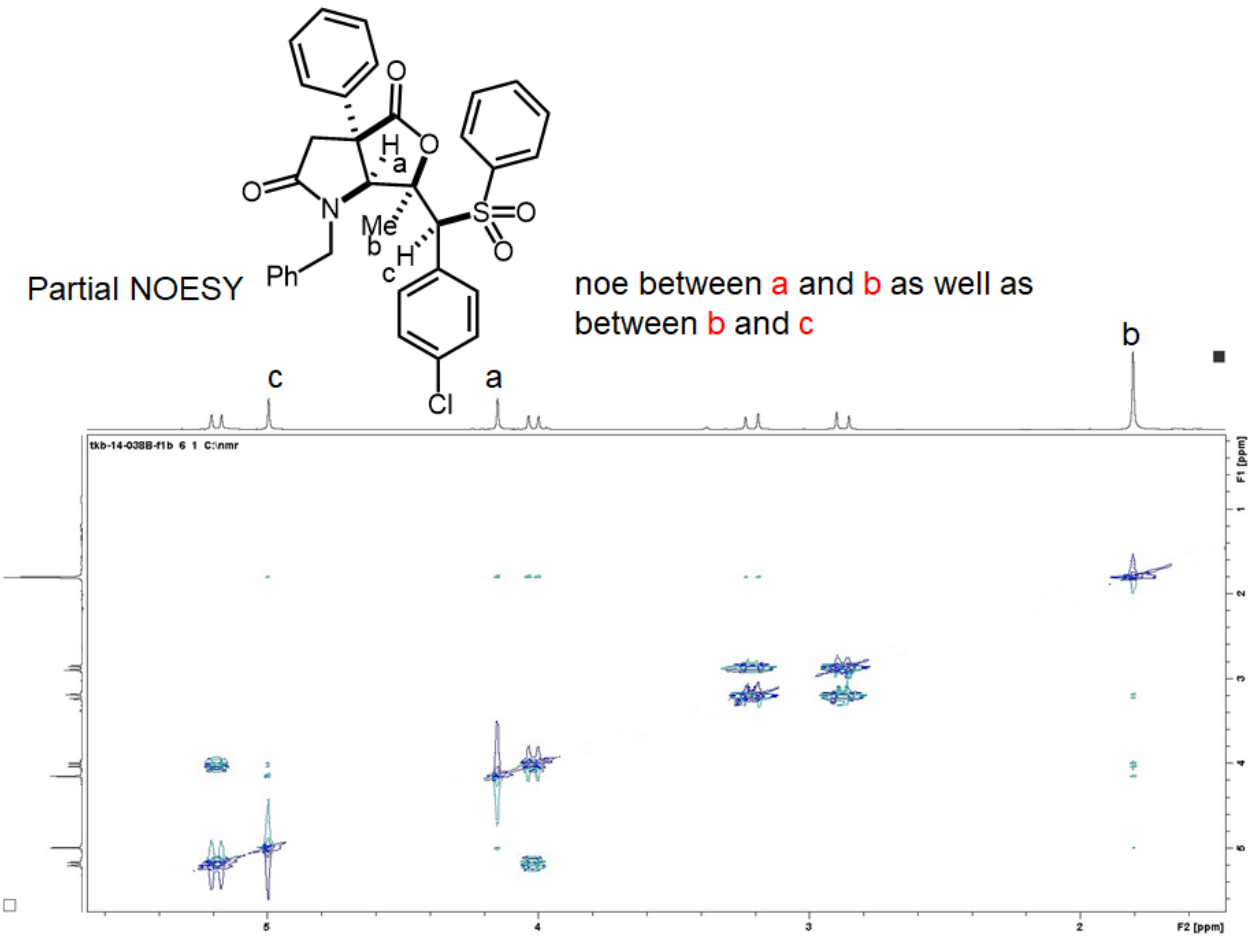


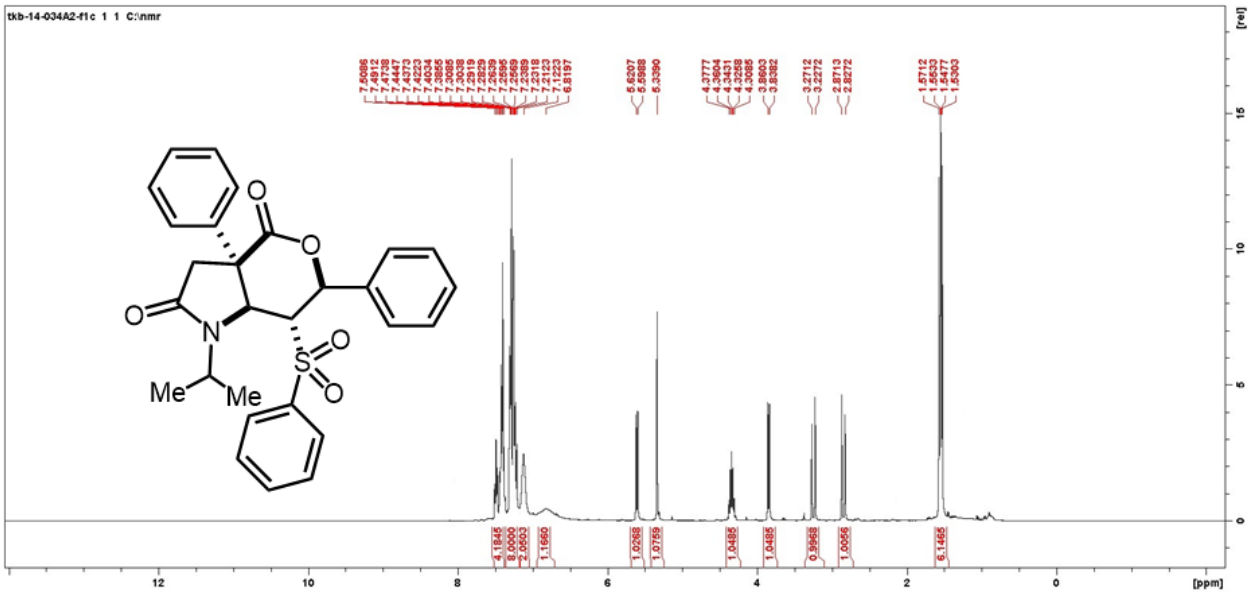
Partial COSY





Compound 3a

Prepared in 0.50 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (50:50). Greenish-yellow oil. Yield = 210.5 mg, 86%, 95:5 dr (*anti:syn*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.51 – 7.38 (m, 4H), 7.30 – 7.21 (m, 8H), 7.13 (d, J = 7.9 Hz, 2H), 6.82 (s, 1H), 5.61 (d, J = 8.8 Hz, 1H), 5.34 (s, 1H), 4.34 (hept, J = 7.0 Hz, 1H), 3.85 (d, J = 8.8 Hz, 1H), 3.25 (d, J = 17.6 Hz, 1H), 2.85 (d, J = 17.6 Hz, 1H), 1.55 (dd, J = 9.4, 6.9 Hz, 6H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 176.0, 171.2, 137.1, 136.7, 134.1, 133.5, 130.2, 129.8, 129.5, 129.4, 128.8, 128.7, 128.5, 128.4, 128.2, 126.2, 78.3, 71.8, 68.9, 52.3, 46.4, 44.5, 20.8, 20.0. **HRMS-EI^{+}** (*m/z*): calc for $C_{28}H_{27}NO_5S$ $[M]^{+}$ 489.1610, found 489.1615.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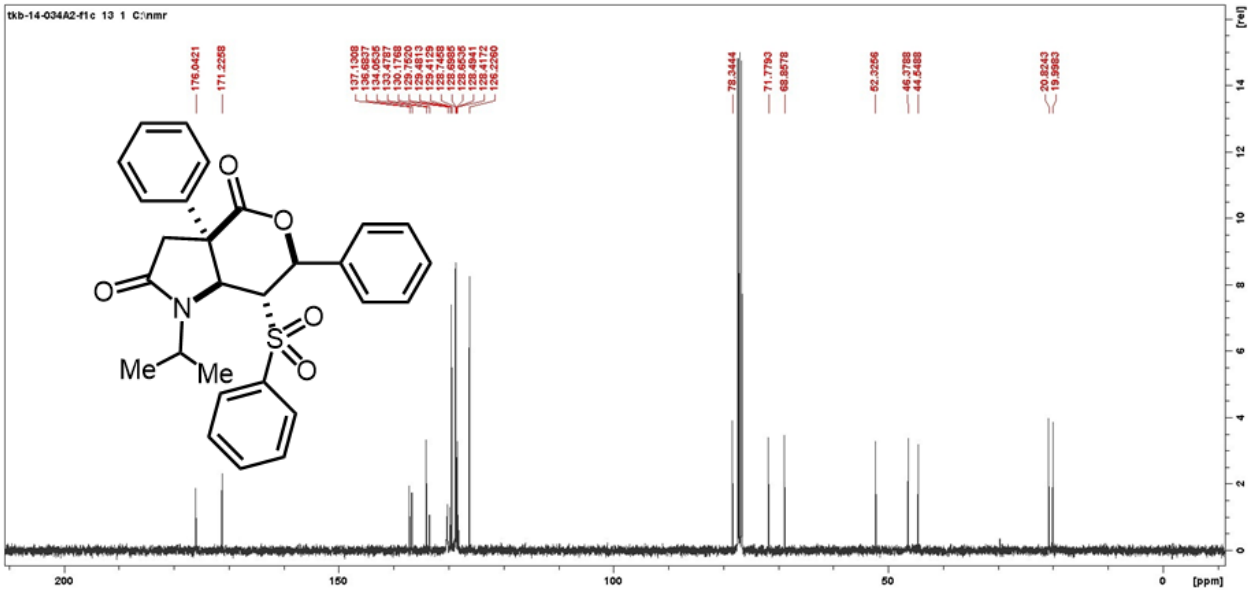
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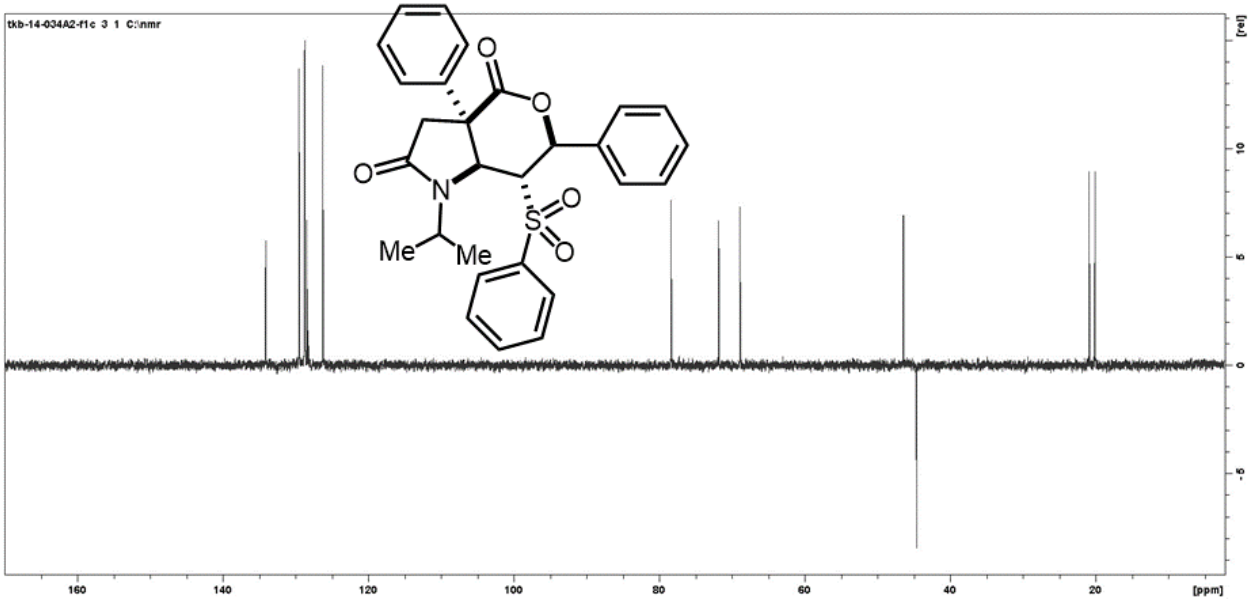
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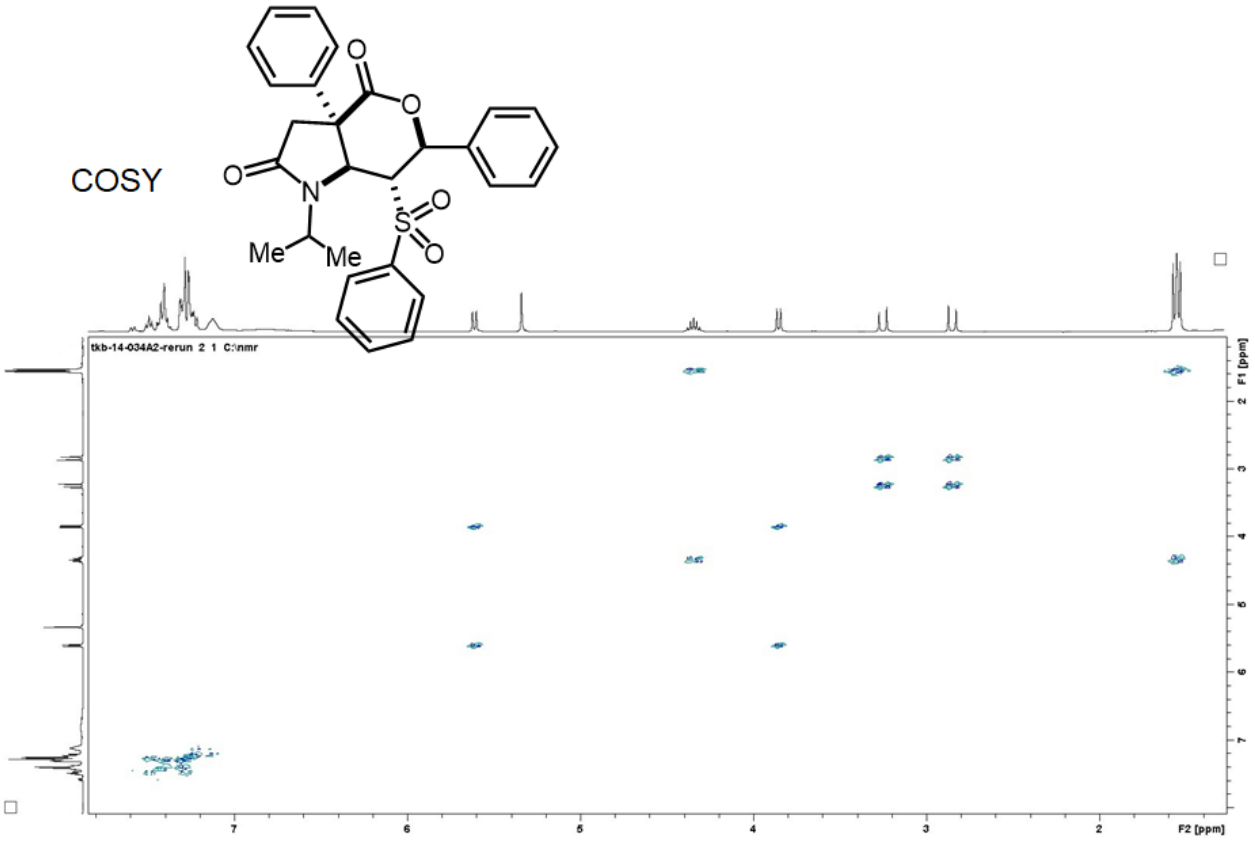
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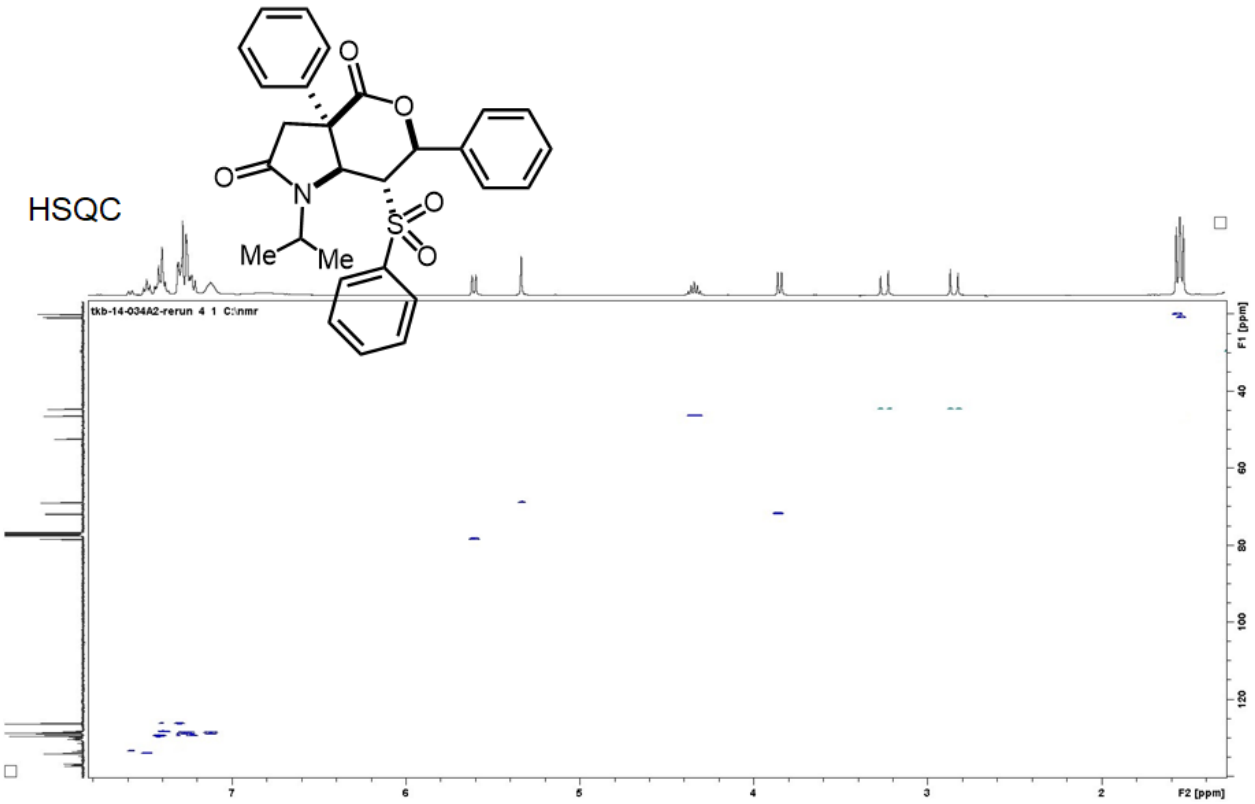
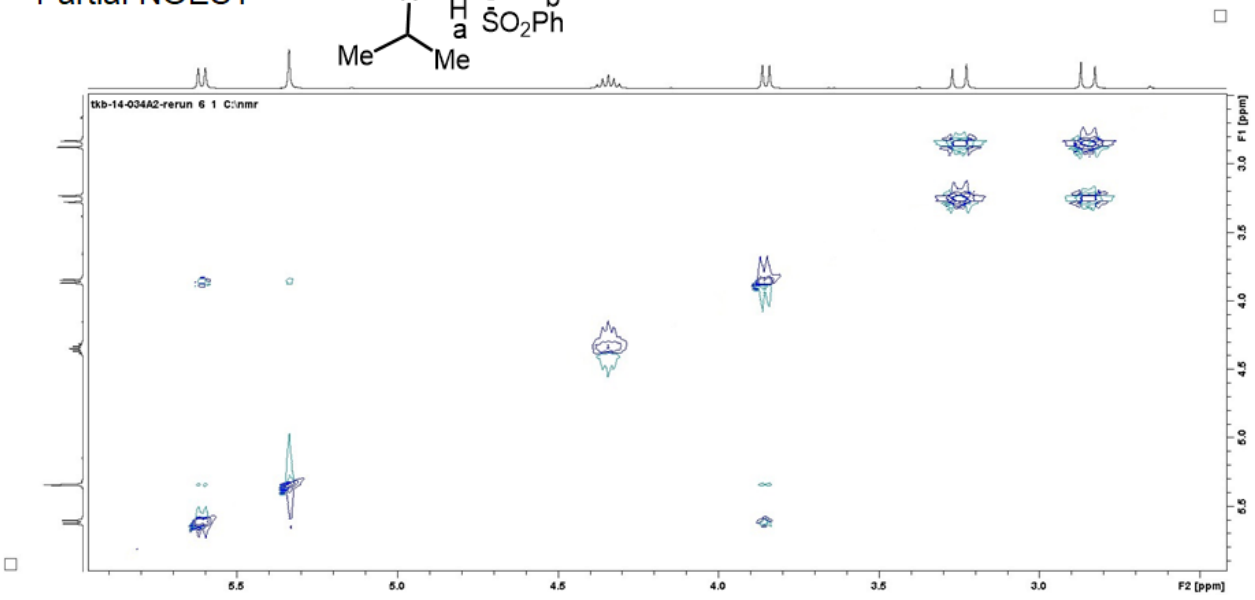
F2 [ppm]

HSQC

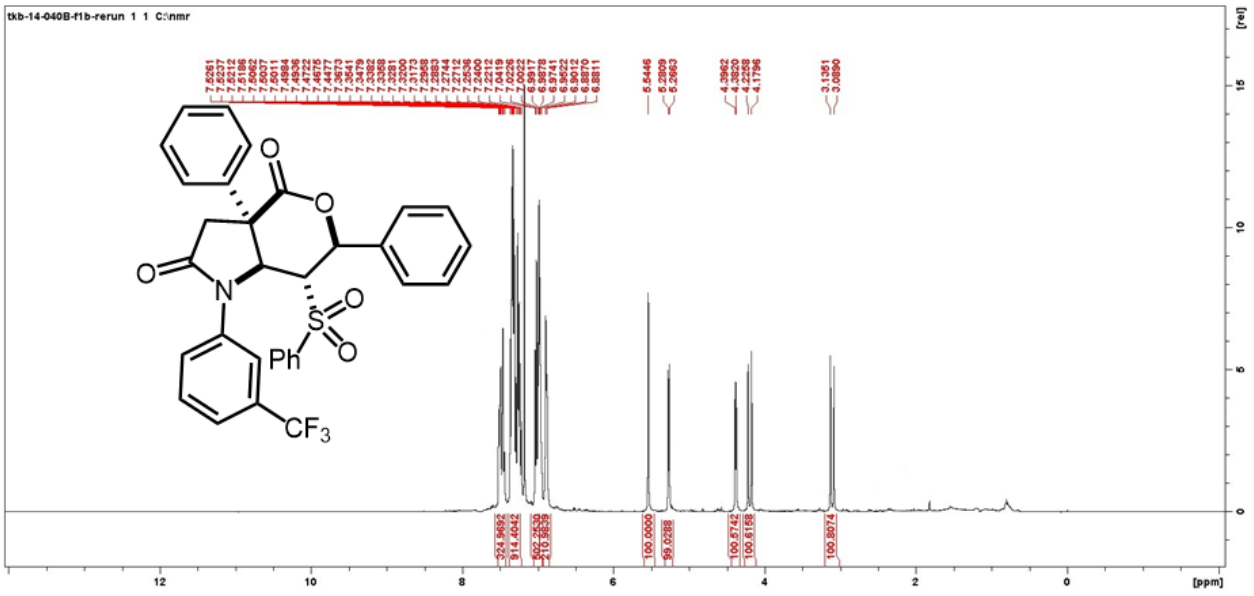


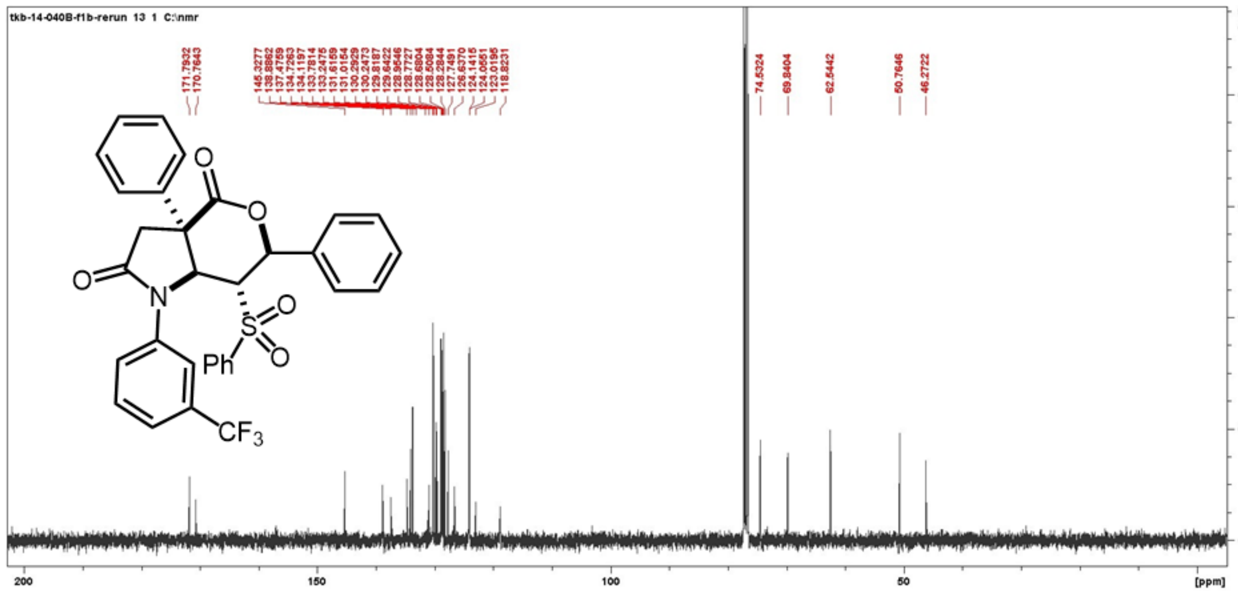
Partial NOESY



Compound 3b

Prepared in 0.50 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (50:50). Greenish-yellow oil. Yield = 363.3 mg, 89%, 95:5 dr (*anti:syn*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.53 – 7.45 (m, 3H), 7.37 – 7.22 (m, 9H), 7.06 – 6.95 (m, 5H), 6.90 – 6.88 (m, 2H), 5.55 (s, 1H), 5.27 (d, J = 5.9 Hz, 1H), 4.39 (dd, J = 5.9, 1.1 Hz, 1H), 4.20 (d, J = 17.1 Hz, 1H), 3.11 (d, J = 17.1 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 170.77, 169.90, 145.33, 138.89, 137.48, 134.73, 134.12, 133.79, 133.25, 131.02, 130.30, 130.25, 129.82, 129.65, 128.96, 128.78, 128.68, 128.51, 128.29, 127.75, 126.64, 124.15, 124.06, 123.02, 118.83, 74.54, 69.84, 62.55, 50.77, 46.28. **HRMS-EI^{+}** (*m/z*): calc for $C_{32}H_{24}F_3NO_5S$ $[M]^{+}$ 591.1327, found 591.1333.

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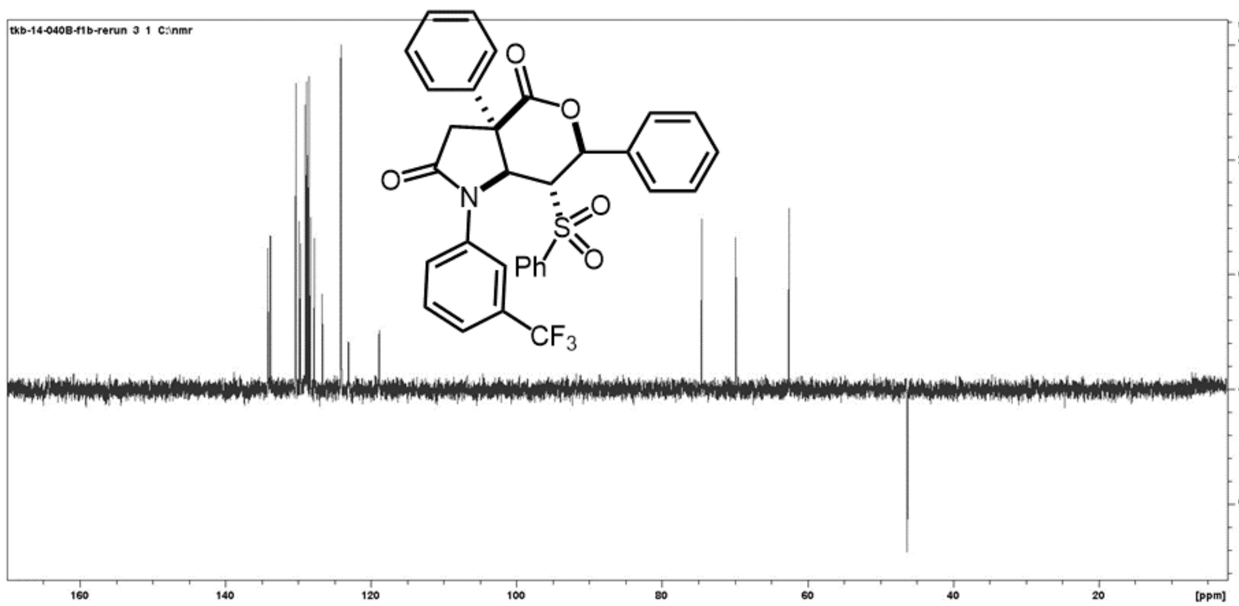
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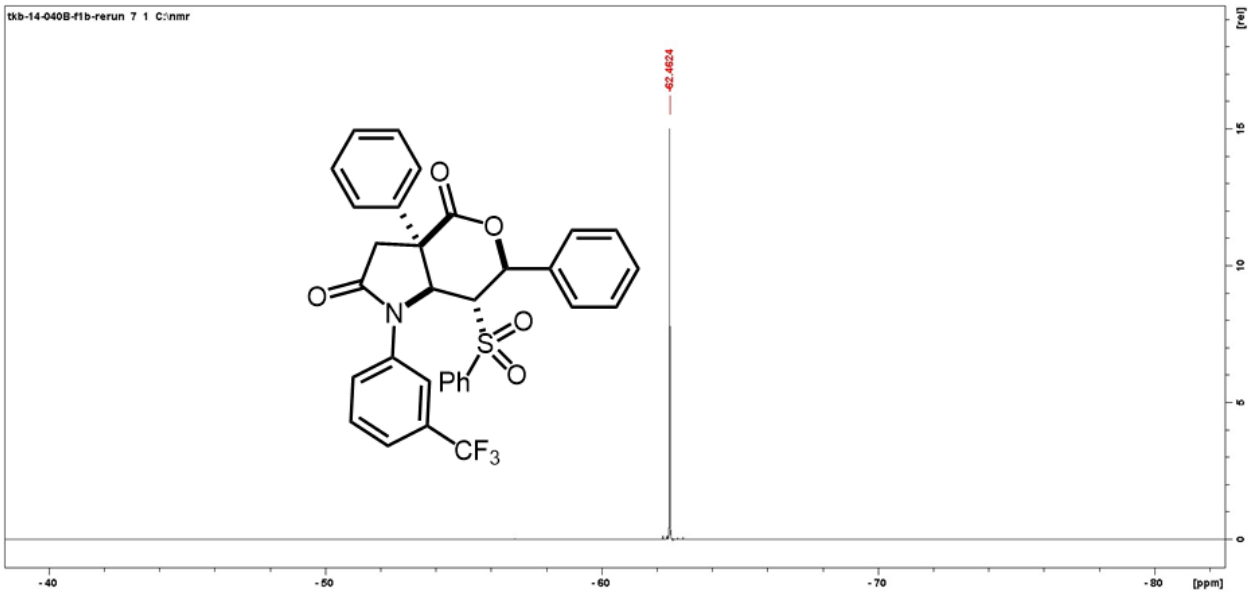
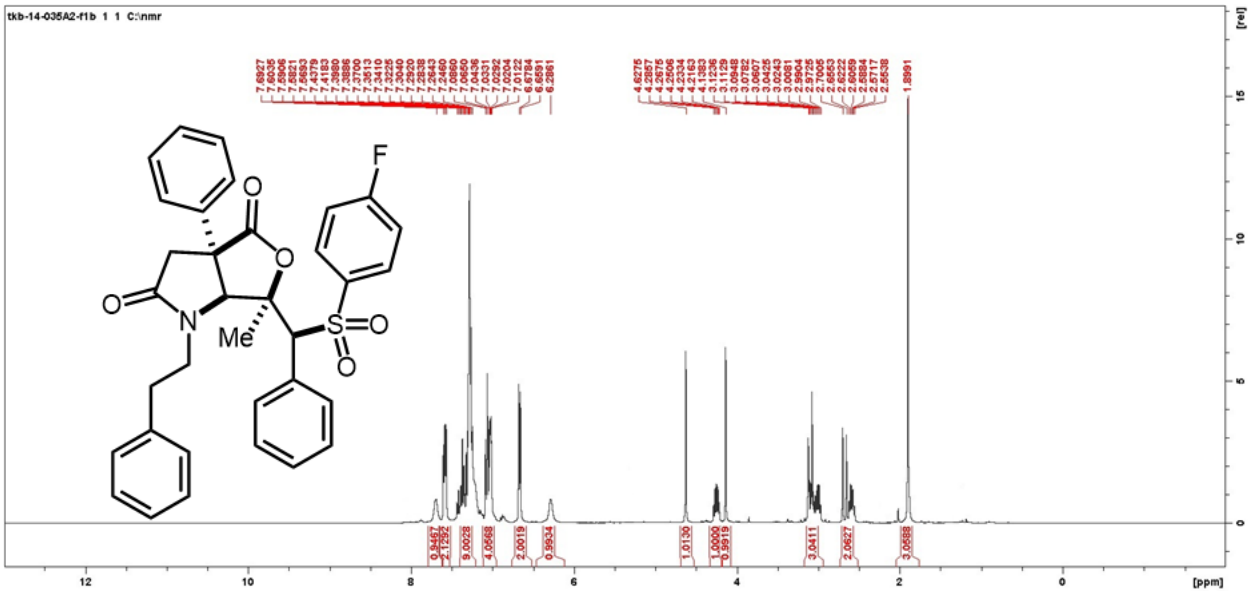


Scope of sulfonylating agent

Compound 2r

Prepared in 0.50 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (75:25). Yellowish oil. Yield = 259.7 mg, 89%, 95:5 dr (*syn:anti*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.70 (d, *J* = 7.9 Hz, 1H), 7.59 (dd, *J* = 8.6, 5.1 Hz, 2H), 7.46 – 7.17 (m, 9H), 7.11 – 6.97 (m, 4H), 6.67 (d, *J* = 7.4 Hz, 2H), 6.28 (br. s, 1H), 4.63 (s, 1H), 4.25 (dt, *J* = 13.8, 7.1 Hz, 1H), 4.14 (s, 1H), 3.15 – 2.95 (m, 3H), 2.68 – 2.53 (m, 2H), 1.90 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.2, 172.6, 167.0, 164.5, 138.9, 137.4, 135.4, 133.4, 131.8, 131.7, 130.1, 129.8, 129.2, 129.1, 128.9, 128.8, 128.2, 128.1, 126.7, 125.8, 116.2, 116.0, 88.4, 77.5, 71.3, 52.3, 44.6, 44.4, 32.2, 21.5. **HRMS-EI^{+}** (*m/z*): calc for $C_{34}H_{30}FNO_5S$ $[M]^{+}$ 583.1829, found 583.1833.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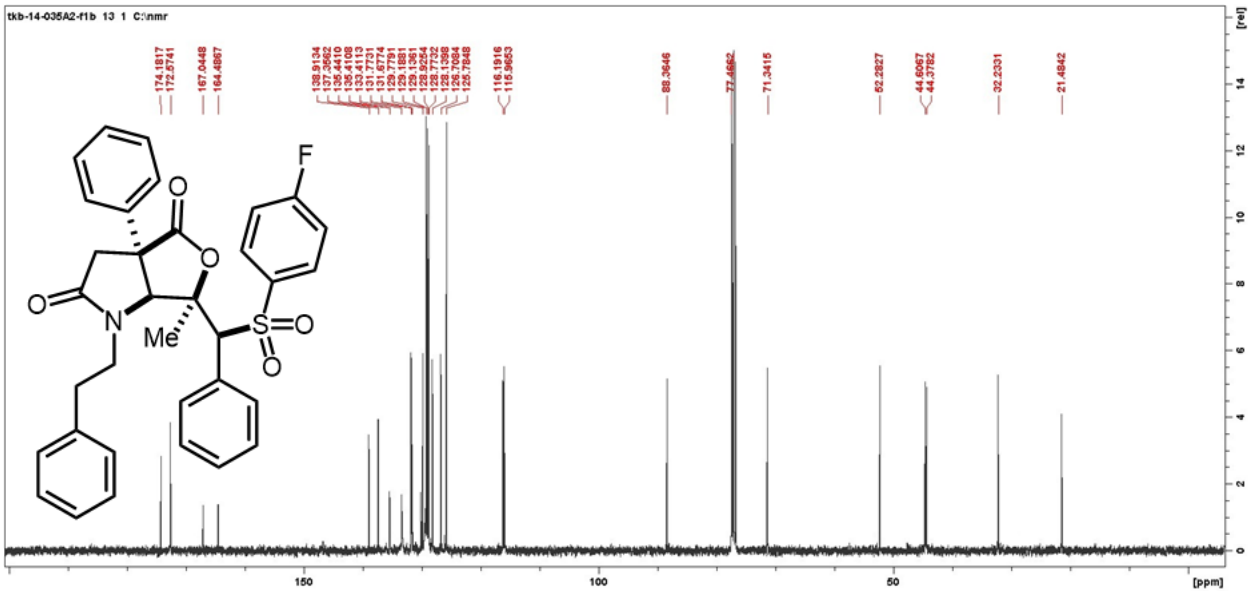
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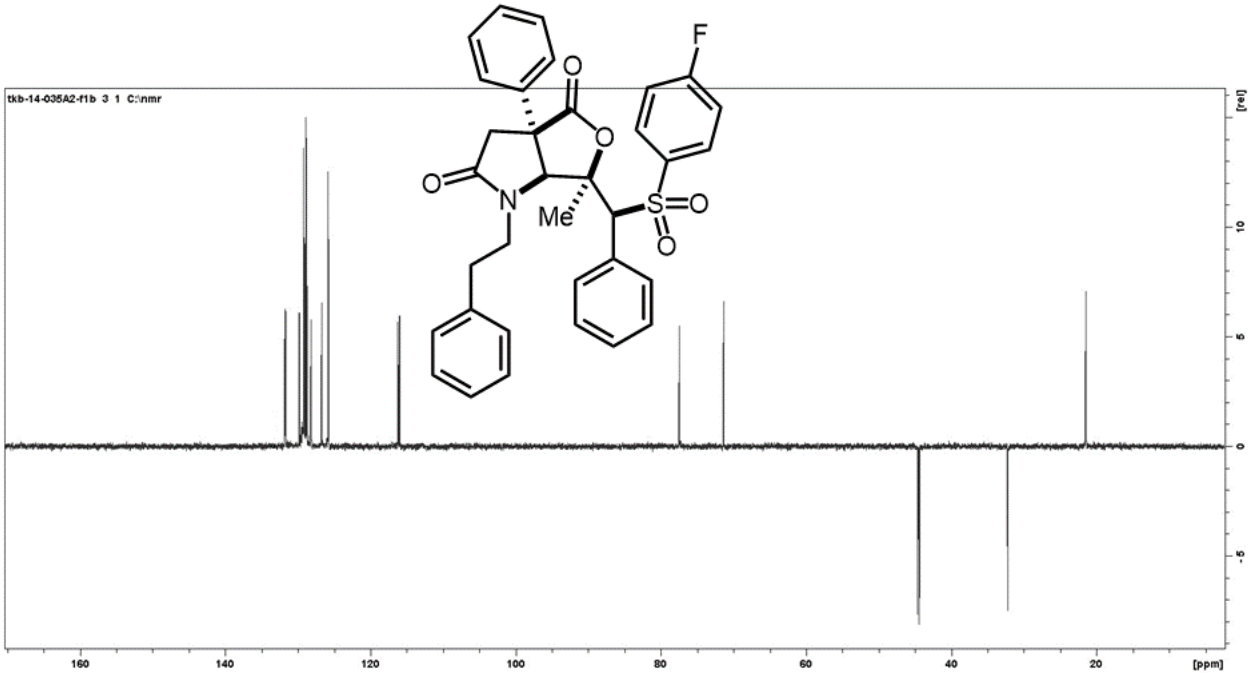
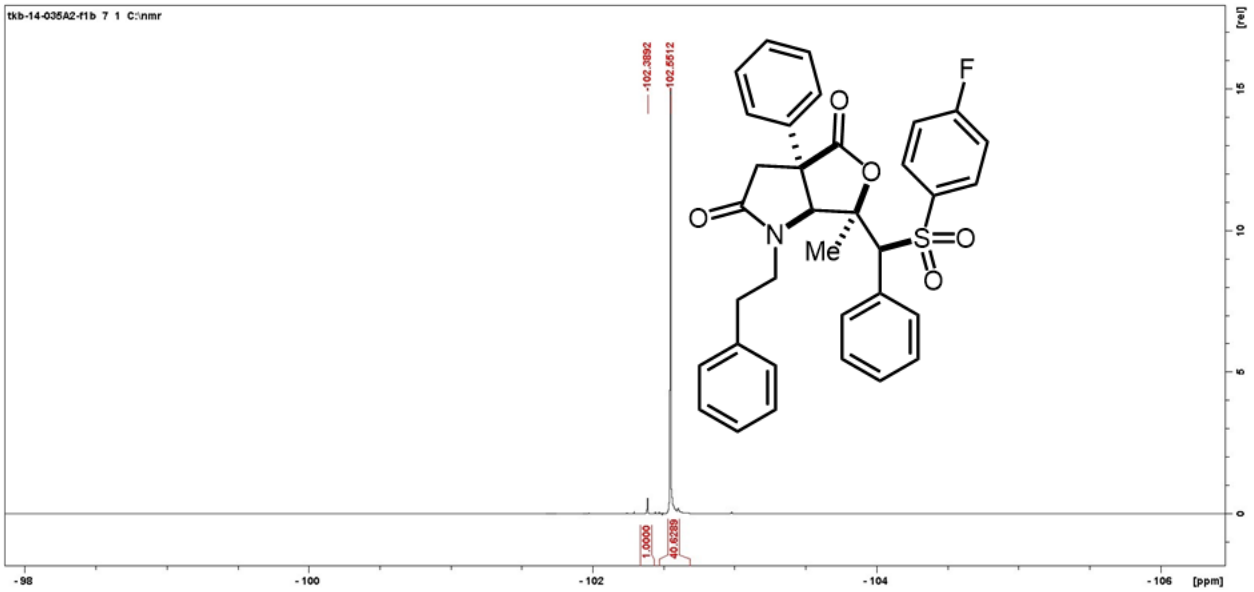


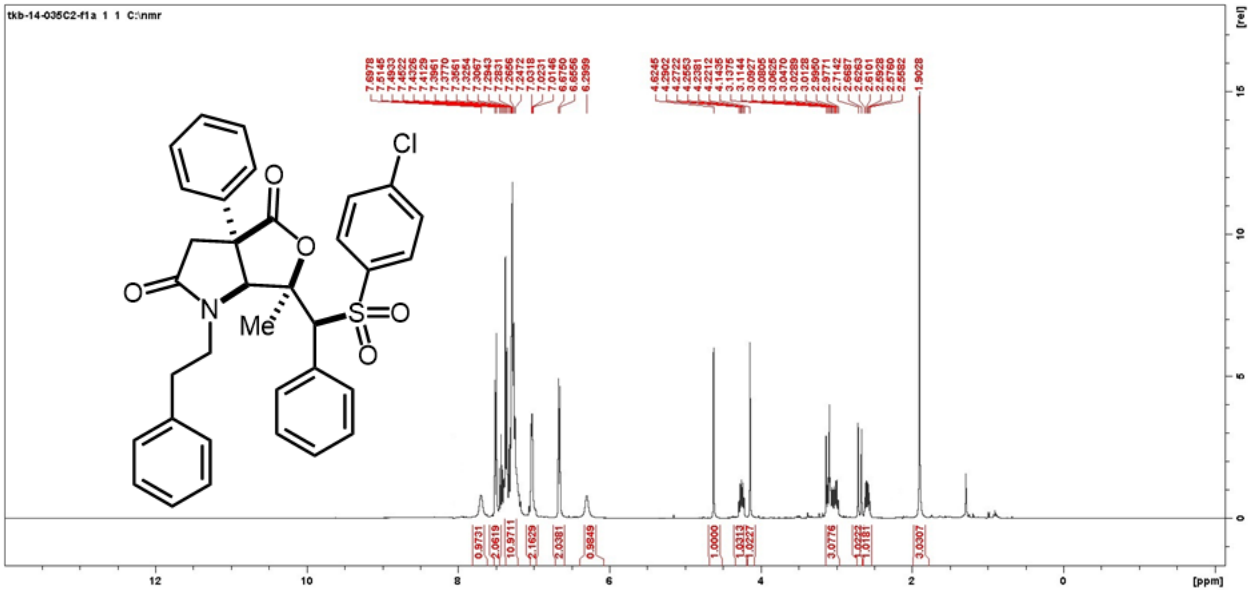
^{19}F NMR

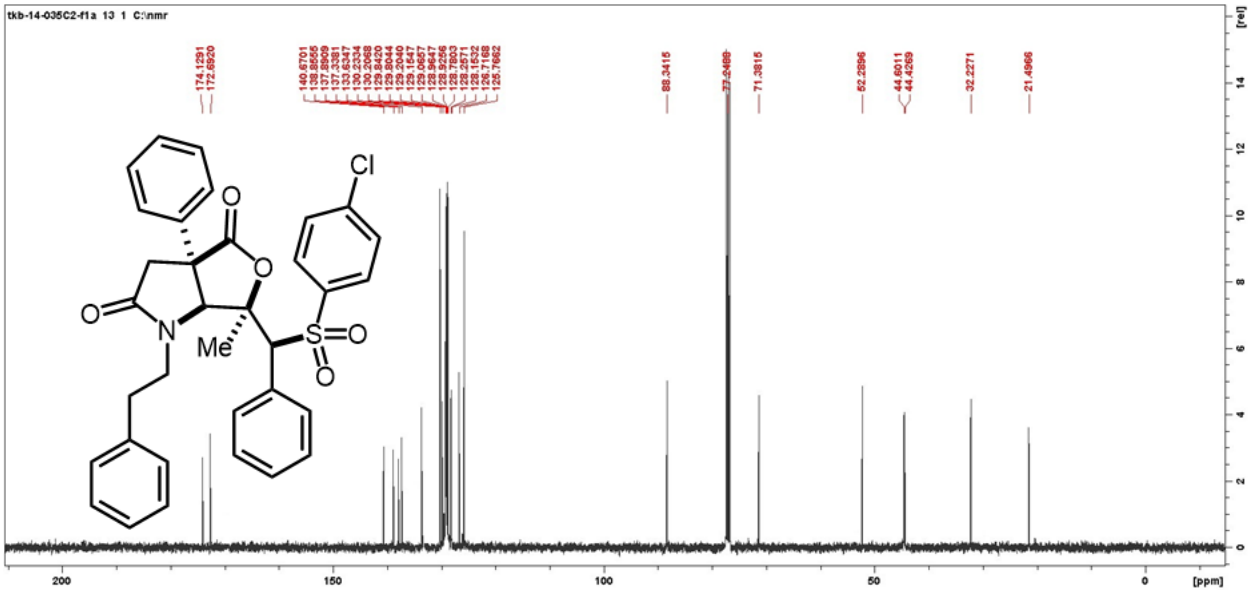


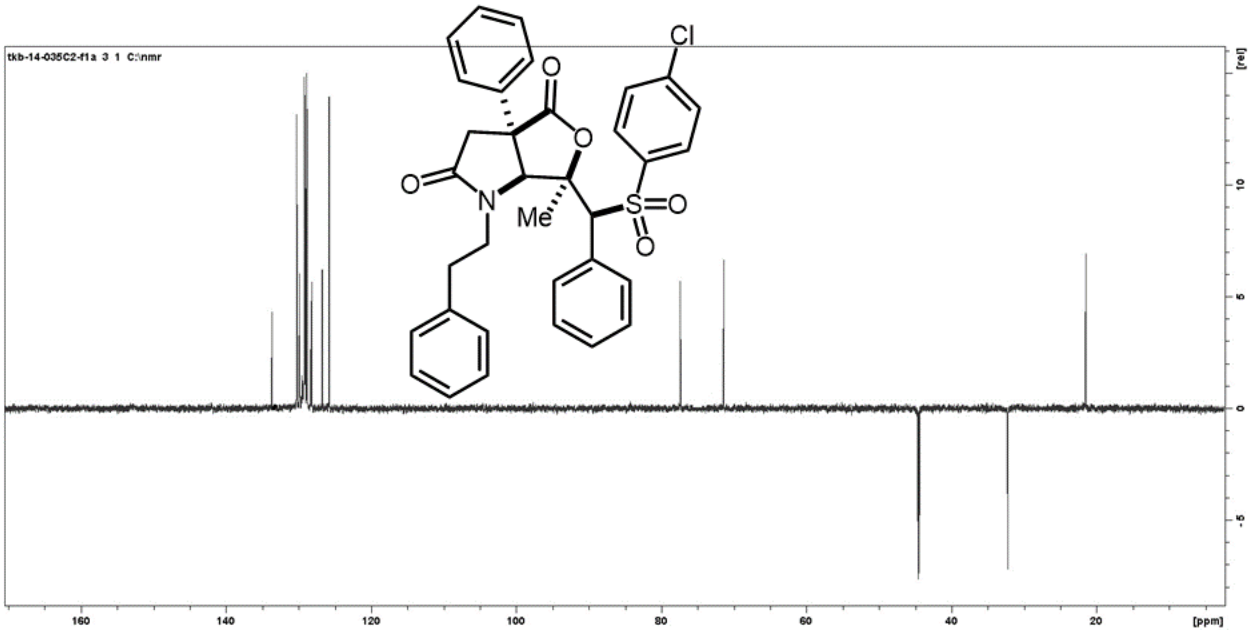
Compound 2s

Prepared in 0.50 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (60:40). Yellowish oil. Yield = 258.1 mg, 86%, 95:5 dr (*syn:anti*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.70 (s, 1H), 7.54 – 7.22 (m, 13H), 7.09 – 6.95 (m, 2H),

6.67 (d, J = 7.5 Hz, 2H), 6.32 – 6.27 (m, 1H), 4.62 (s, 1H), 4.26 (dt, J = 13.7, 7.0 Hz, 1H), 4.14 (s, 1H), 3.16 – 2.95 (m, 3H), 2.71 (d, J = 18.5 Hz, 1H), 2.67 – 2.56 (m, 1H), 1.90 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.1, 172.7, 140.7, 138.9, 137.9, 137.3, 134.7, 133.6, 130.2, 130.2, 129.8, 129.8, 129.2, 129.1, 129.0, 128.9, 128.8, 128.3, 128.2, 126.7, 125.8, 88.3, 77.4, 71.4, 52.3, 44.6, 44.4, 32.2, 21.5. **HRMS-EI**$^+$ (*m/z*): calc for $C_{34}H_{30}ClNO_5S$ $[M]^+$ 599.1533, found 599.1536.

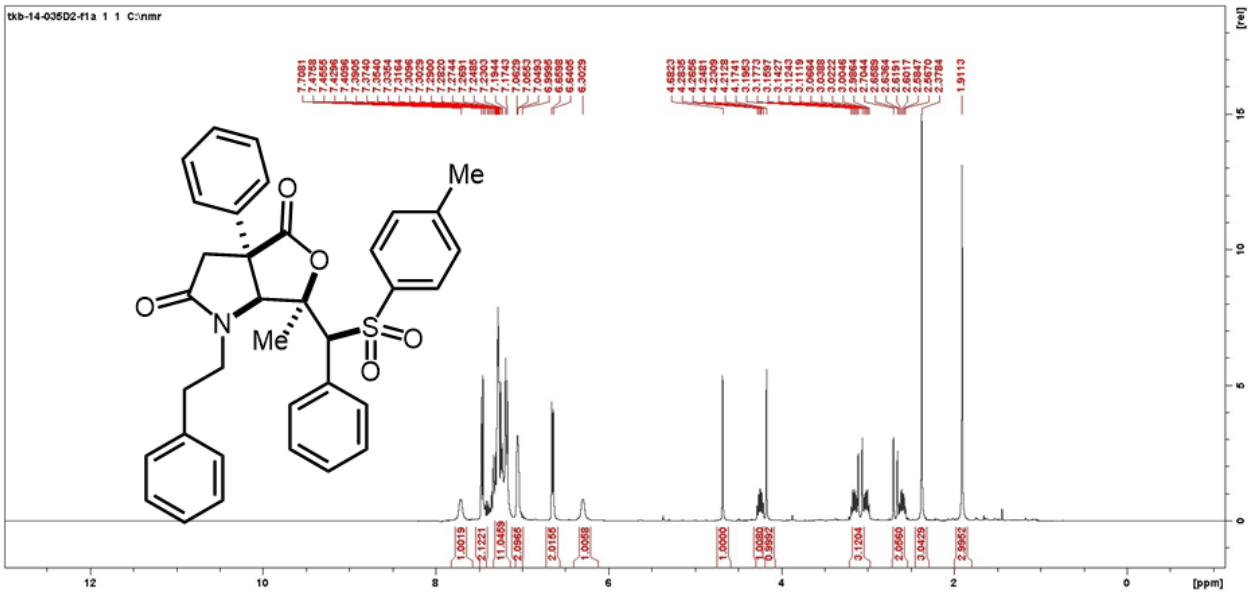






Compound 2t

Prepared in 0.50 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (50:50). Yellowish oil. Yield = 240.6 mg, 83%, 95:5 dr (*syn:anti*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.71 (d, *J* = 7.9 Hz, 1H), 7.47 (d, *J* = 8.1 Hz, 2H), 7.46 – 7.26 (m, 11H), 7.18 (d, *J* = 8.0 Hz, 2H), 6.65 (dd, *J* = 7.6, 1.9 Hz, 2H), 6.30 (d, *J* = 7.2 Hz, 1H), 4.69 (s, 1H), 4.25 (ddd, *J* = 14.1, 8.0, 6.4 Hz, 1H), 4.18 (s, 1H), 3.22 – 2.96 (m, 3H), 2.68 – 2.55 (m, 2H), 2.38 (s, 3H), 1.91 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.3, 172.6, 144.9, 139.0, 137.4, 136.6, 129.5, 129.4, 129.4, 129.1, 129.0, 128.9, 128.8, 128.7, 128.0, 126.7, 125.8, 88.5, 77.3, 71.2, 52.3, 44.6, 44.3, 32.3, 21.6. **HRMS-EI^{+}** (*m/z*): calc for $C_{35}H_{33}NO_5S$ $[M]^{+}$ 579.2079, found 579.2084.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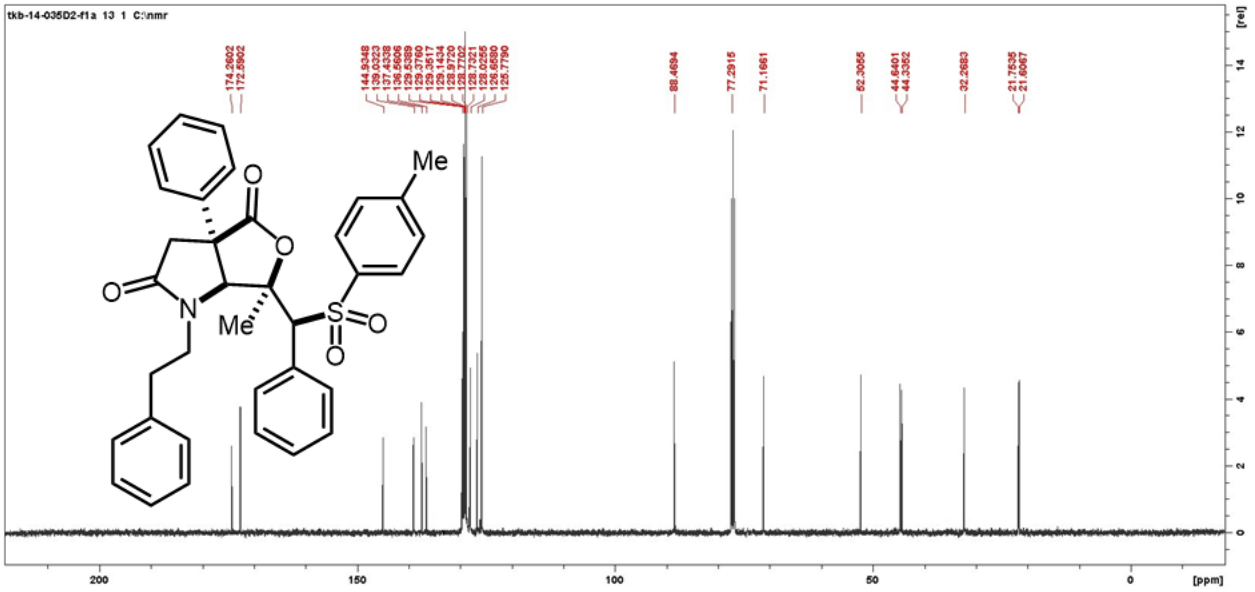
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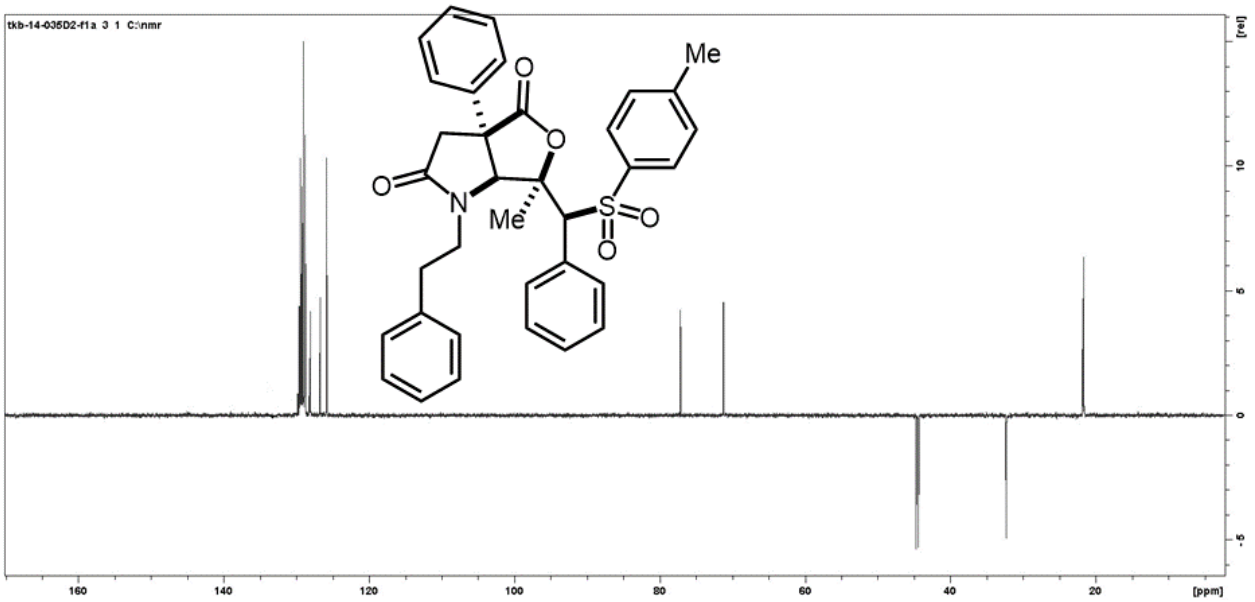
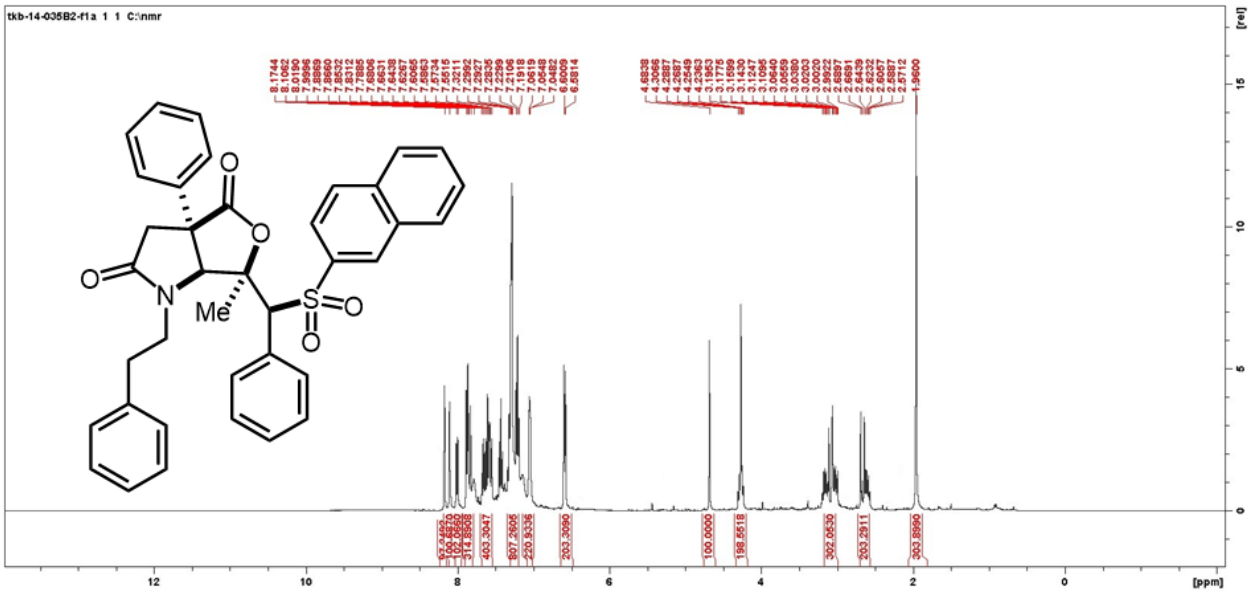


Compound 2u

Prepared in 0.50 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (50:50). Yellowish oil. Yield = 218.6 mg, 71%, 95:5 dr (*syn:anti*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.17 (d, *J* = 1.9 Hz, 1H), 8.10 (q, *J* = 3.3 Hz, 1H), 8.01 (d, *J* = 7.7 Hz, 1H), 7.91 – 7.75 (m, 3H), 7.65 – 7.53 (m, 4H), 7.53 – 7.32 (m, 8H), 7.05 (dd, *J* = 6.5, 3.0 Hz, 2H), 6.59 (d, *J* = 7.6 Hz, 2H), 4.68 (s, 1H), 4.31 – 4.24 (m, 2H), 3.20 – 2.99 (m, 3H), 2.69 – 2.57 (m, 2H), 1.96 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.2, 172.7, 138.9, 137.4, 136.4, 135.2, 134.6, 133.6, 131.8, 131.3, 130.8, 130.2, 129.8, 129.6, 129.5, 129.4, 129.2, 129.1, 129.0, 128.9, 128.8, 128.3, 128.0, 127.9, 127.7, 126.7, 125.8, 123.2, 88.5, 77.2, 71.3, 52.3, 44.7, 44.4, 32.2, 21.6. **HRMS-EI^{+}** (*m/z*): calc for $C_{38}H_{33}NO_5S$ $[M]^{+}$ 615.2079, found 615.2086.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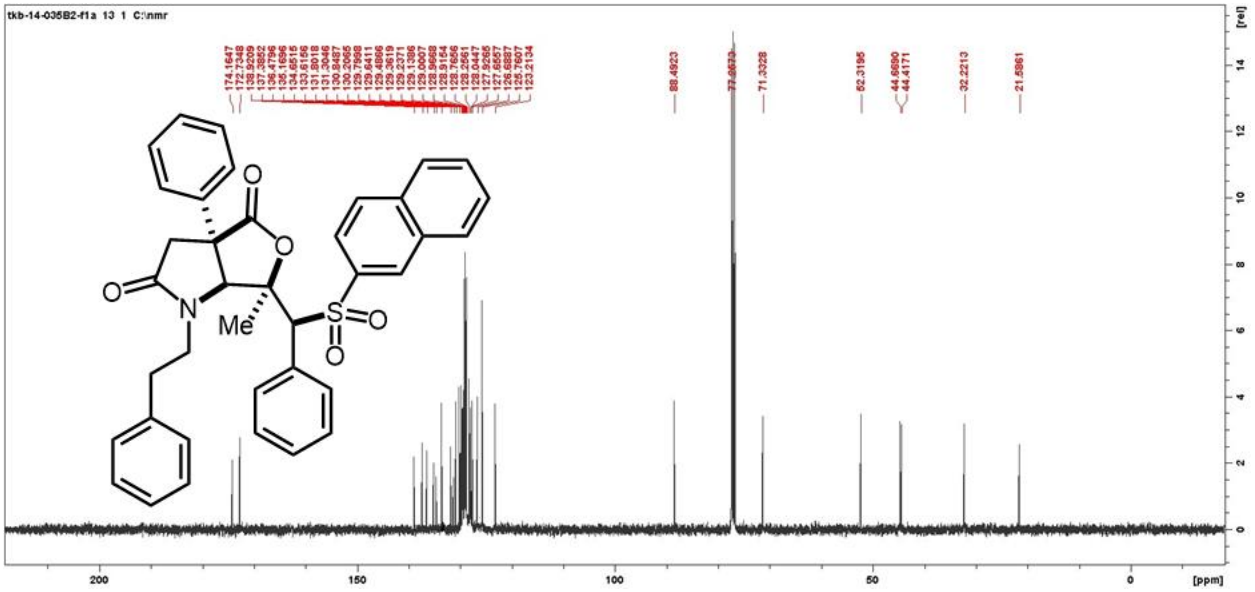
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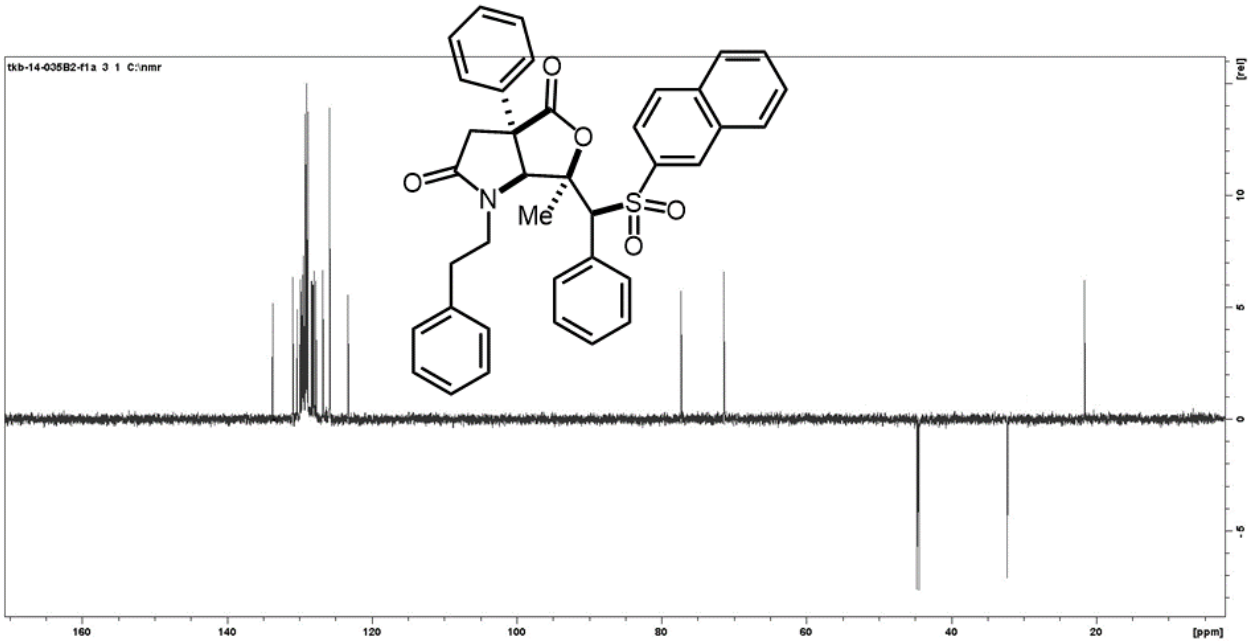
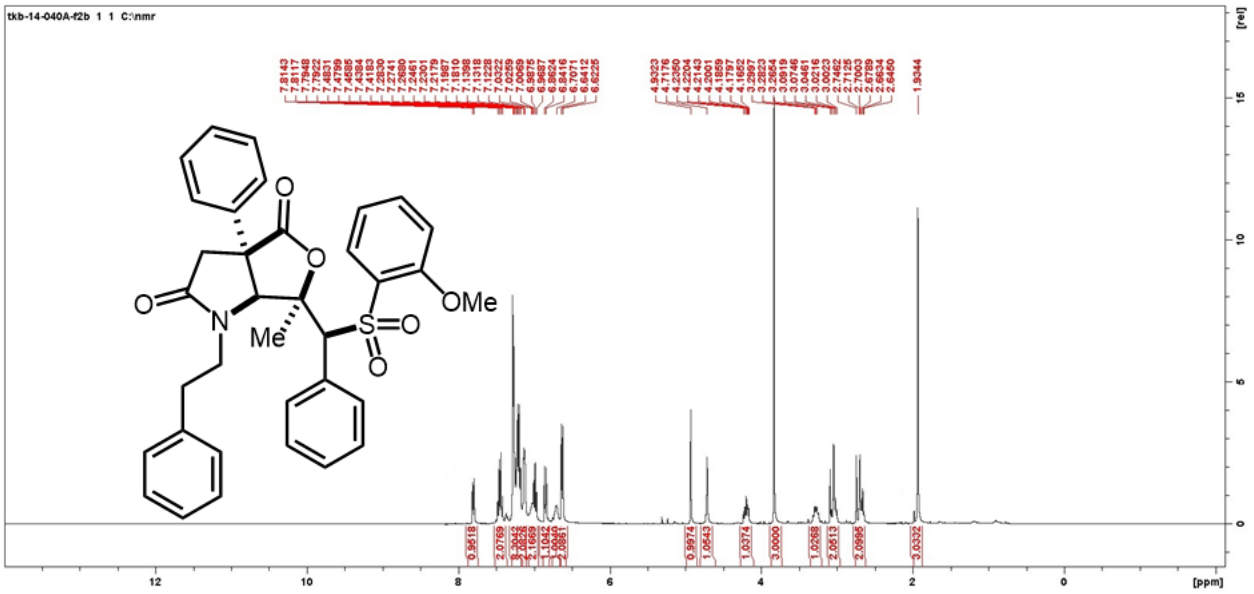


Compound 2v

Prepared in 0.50 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (50:50). Amorphous solid. Yield = 232.3 mg, 78%, 95:5 dr (*syn:anti*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.80 (dd, *J* = 7.9, 1.7 Hz, 1H), 7.48 – 7.41 (m, 2H), 7.28 – 7.18 (m, 10H), 7.16 – 7.09 (m, 2H), 6.85 (d, *J* = 8.4 Hz, 1H), 6.71 (s, 1H), 6.63 (dd, *J* = 7.5, 1.7 Hz, 2H), 4.93 (s, 1H), 4.72 (s, 1H), 4.20 (ddd, *J* = 14.0, 8.5, 5.7 Hz, 1H), 3.83 (s, 3H), 3.28 (dt, *J* = 14.7, 7.7 Hz, 1H), 3.11 – 2.98 (m, 2H), 2.77 – 2.62 (m, 2H), 1.93 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.4, 172.4, 156.6, 139.1, 137.7, 135.6, 133.6, 130.2, 130.2, 129.8, 129.4, 129.1, 129.0, 128.9, 128.7, 128.6, 128.3, 127.7, 126.6, 125.4, 120.7, 112.3, 88.3, 75.2, 70.9, 56.3, 52.1, 44.8, 44.5, 32.4, 22.0. **HRMS-EI^{+}** (*m/z*): calc for $C_{35}H_{33}NO_6S$ $[M]^{+}$ 595.2029, found 595.2033.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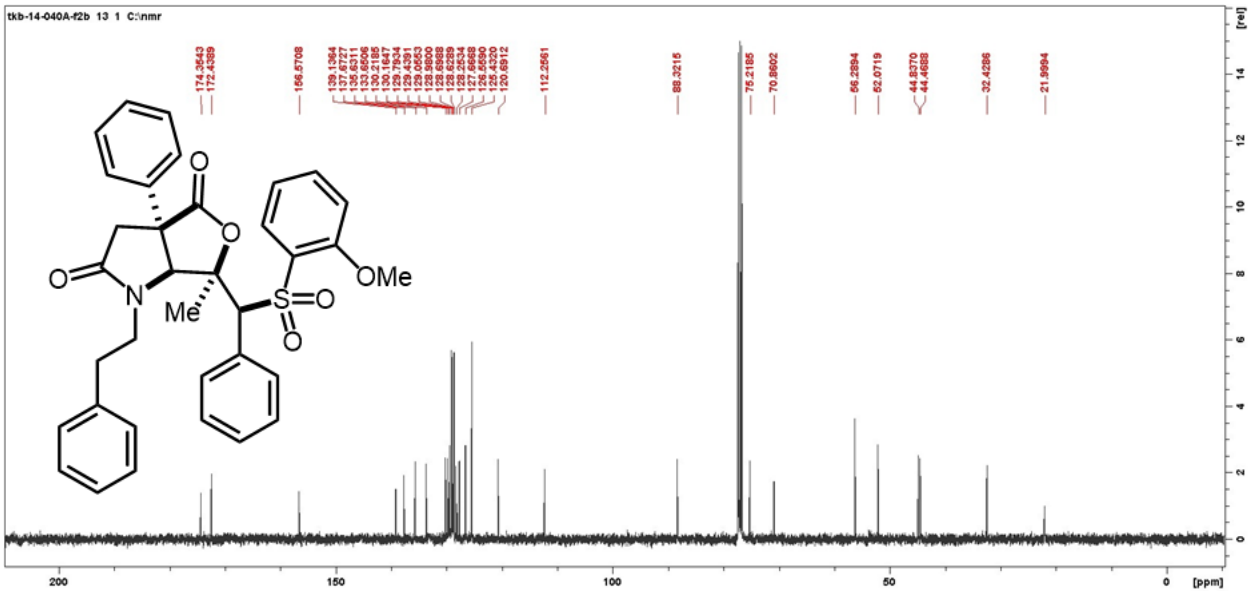
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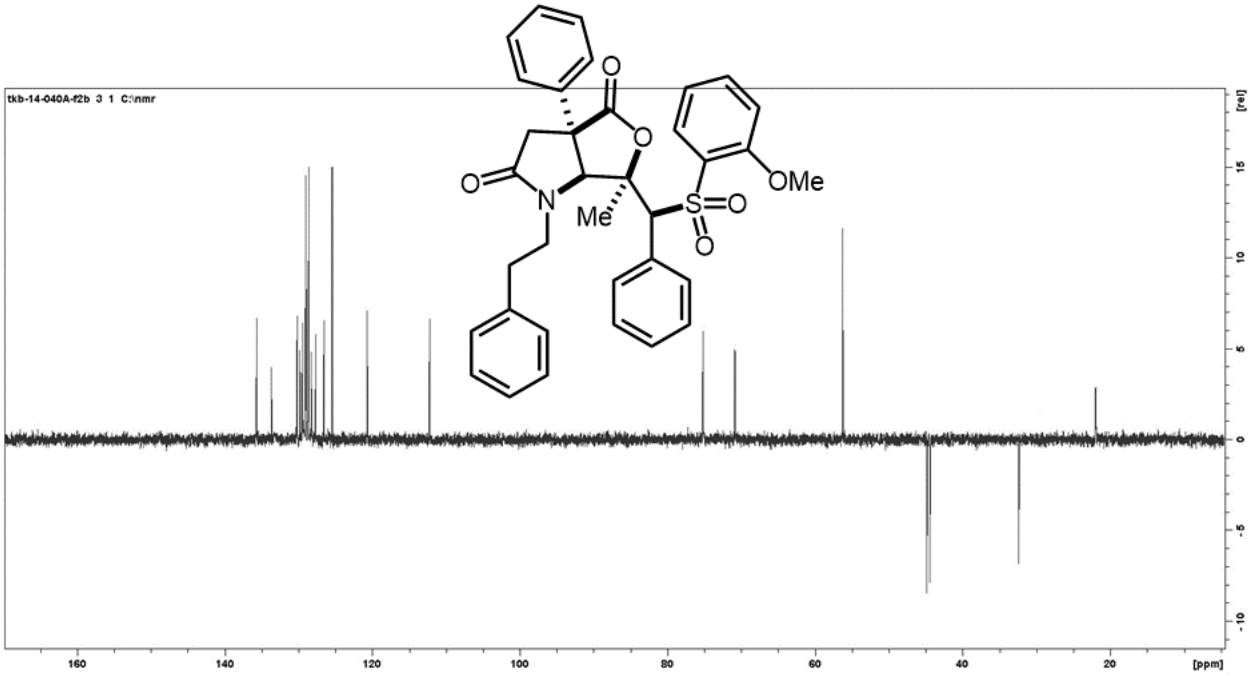
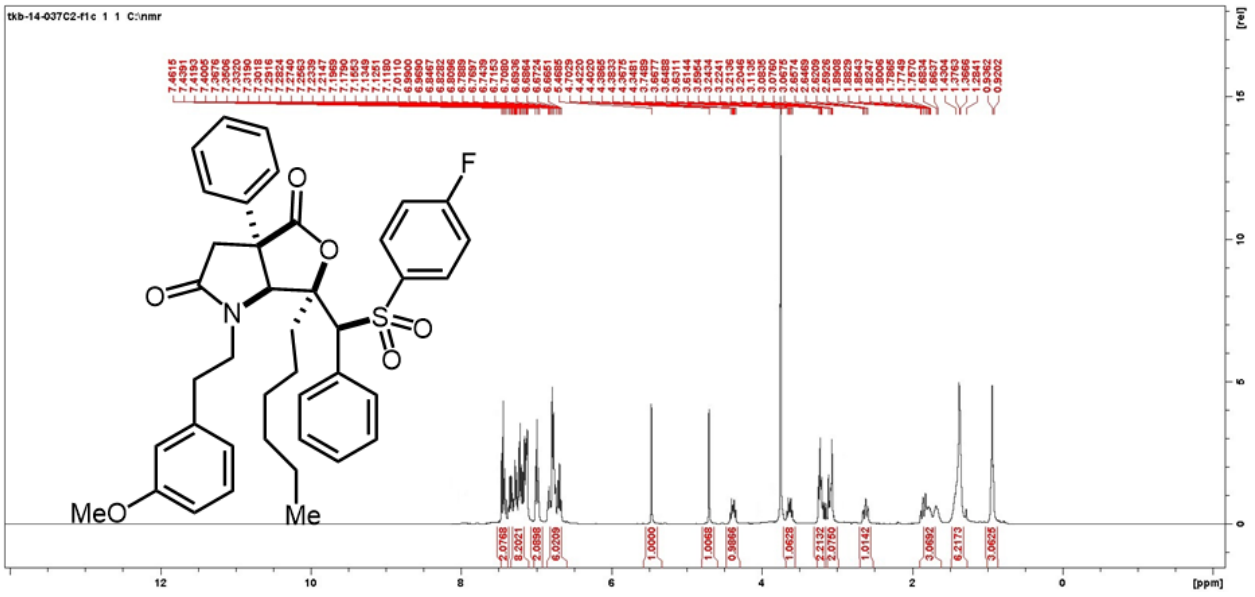


Compound 2w

Prepared in 0.50 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (50:50). Greenish-yellow oil. Yield = 205.1 mg, 60%, 95:5 dr (*syn:anti*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.48 – 7.27 (m, 2H), 7.26 – 7.10 (m, 8H), 6.99 (t, *J* = 8.4 Hz, 2H), 6.81 – 6.64 (m, 6H), 5.47 (s, 1H), 4.70 (s, 1H), 4.39 (dt, *J* = 13.4, 7.9 Hz, 1H), 3.75 (s, 3H), 3.63 (dt, *J* = 14.3, 7.6 Hz, 1H), 3.27 – 3.00 (m, 4H), 2.62 (td, *J* = 12.7, 3.9 Hz, 1H), 1.89 – 1.66 (m, 3H), 1.43 – 1.37 (m, 6H), 0.93 (t, *J* = 7.4 Hz, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 173.8, 172.5, 166.9, 164.4, 159.1, 139.5, 138.3, 133.5, 133.4, 131.4, 131.3, 130.2, 129.8, 129.4, 129.1, 129.0, 128.9, 128.8, 128.3, 128.2, 127.8, 127.4, 125.1, 116.6, 116.3, 116.1, 116.0, 115.3, 114.7, 114.2, 89.4, 72.5, 69.3, 55.4, 51.5, 44.8, 43.1, 36.2, 33.2, 31.6, 29.6, 23.9, 22.6, 14.0. **HRMS-EI^{+}** (*m/z*): calc for $C_{40}H_{42}FNO_6S$ $[M]^+$ 683.2717, found 683.2722.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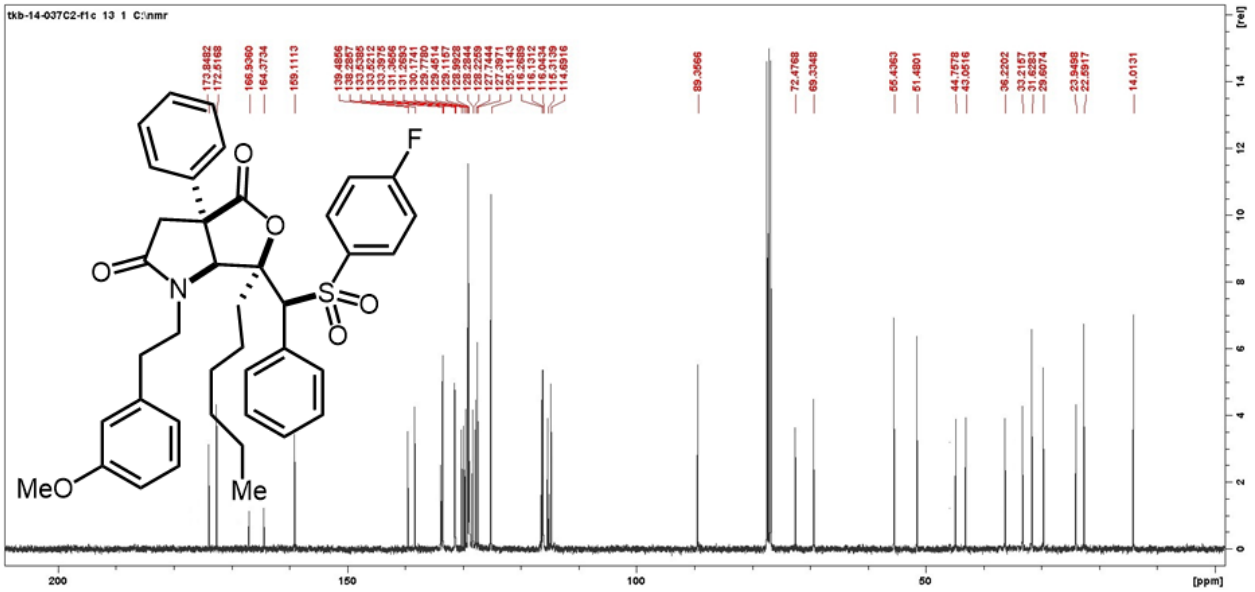
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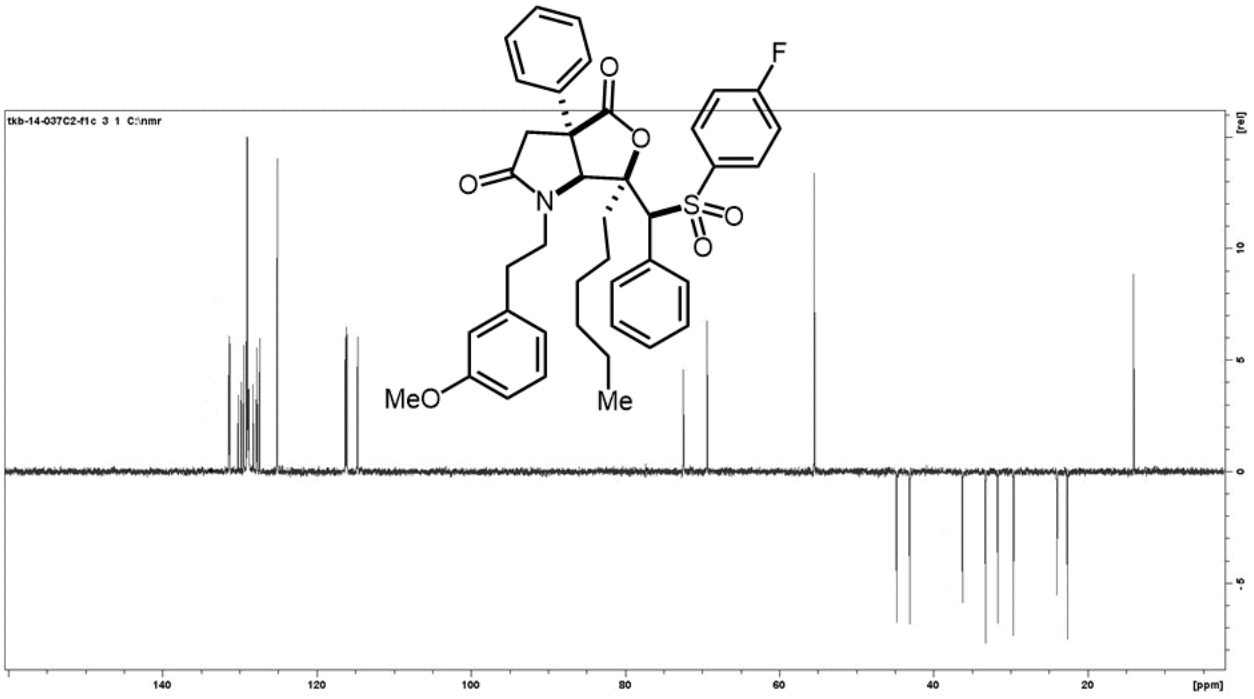
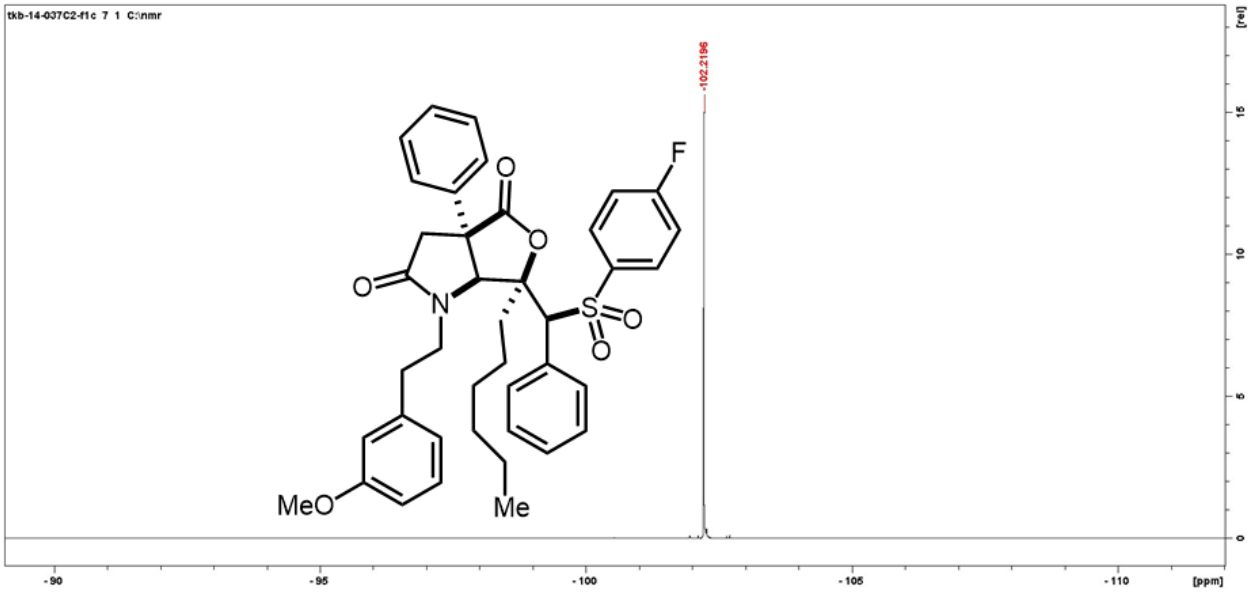


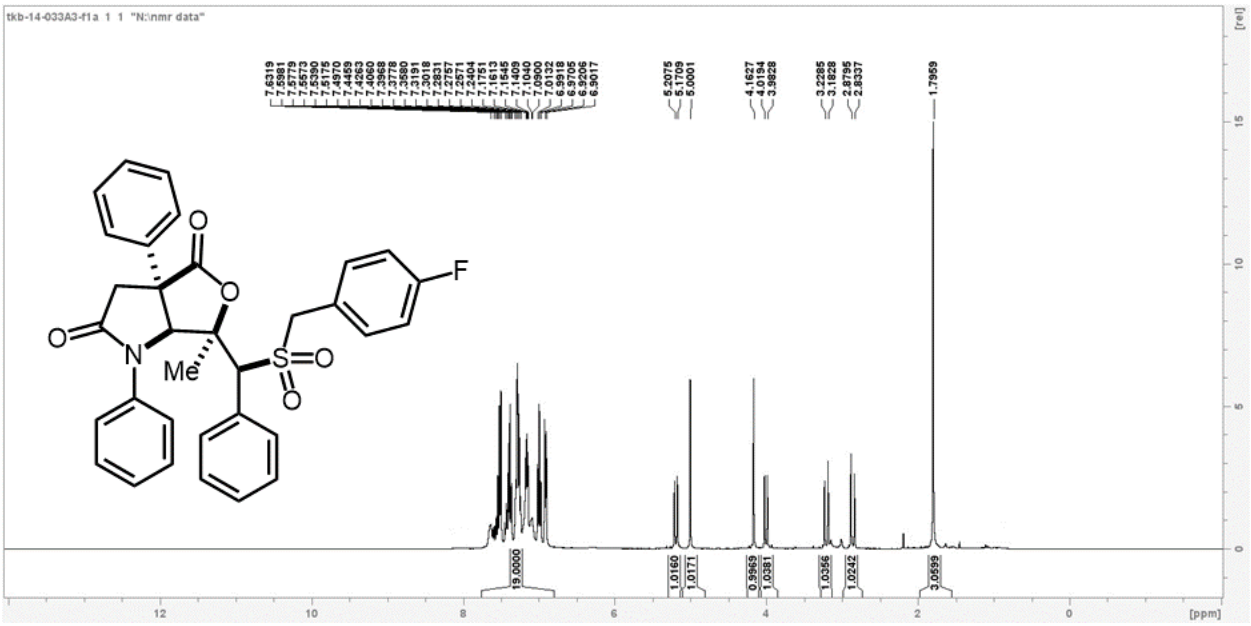
^{19}F NMR

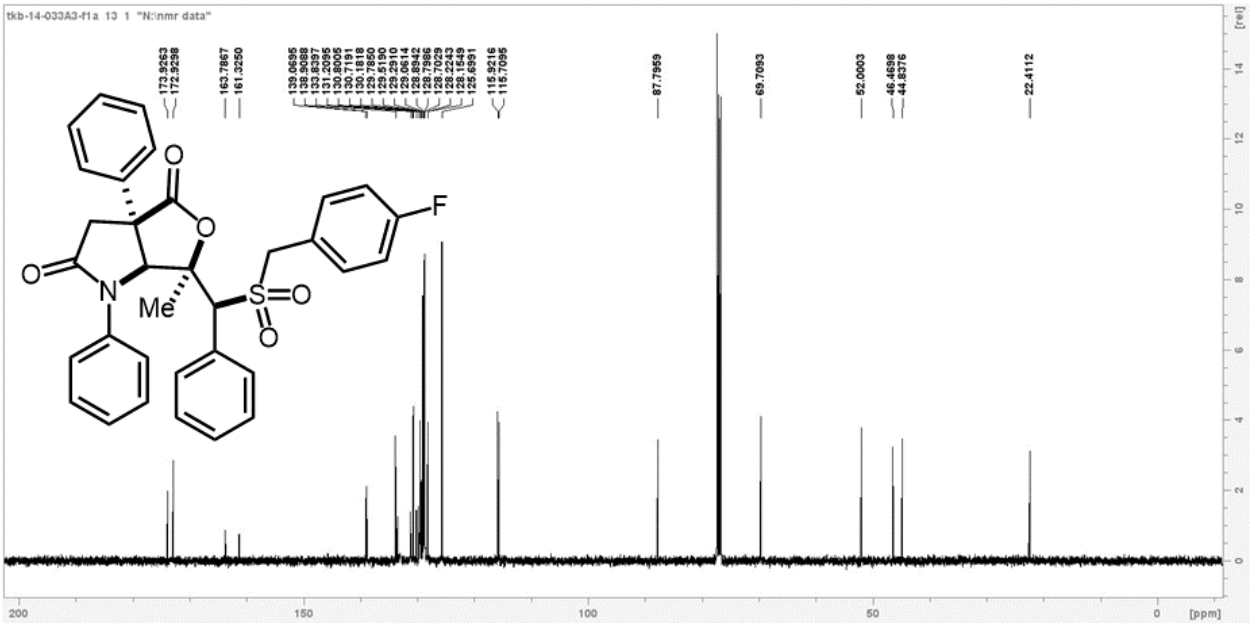


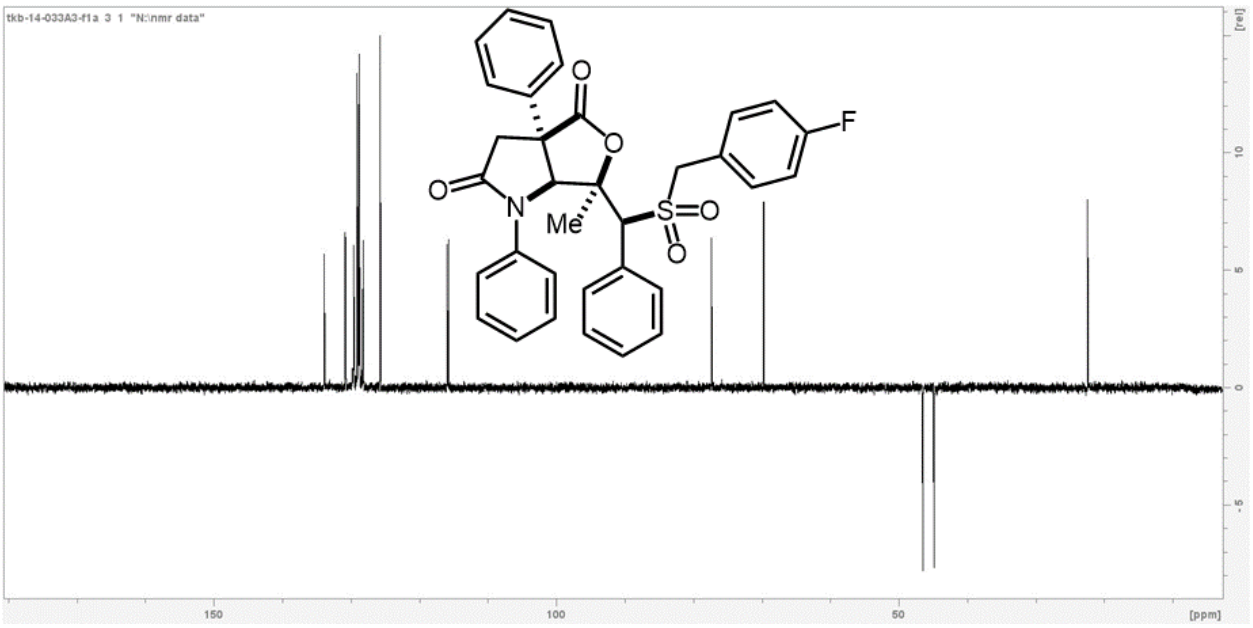
Compound 2x

Prepared in 0.50 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (50:50). Greenish-yellow oil. Yield = 216.2 mg, 76%, 95:5 dr (*syn:anti*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.66 – 7.04 (m, 15H), 7.00 (d, J = 8.5 Hz, 2H), 6.91 (dd,

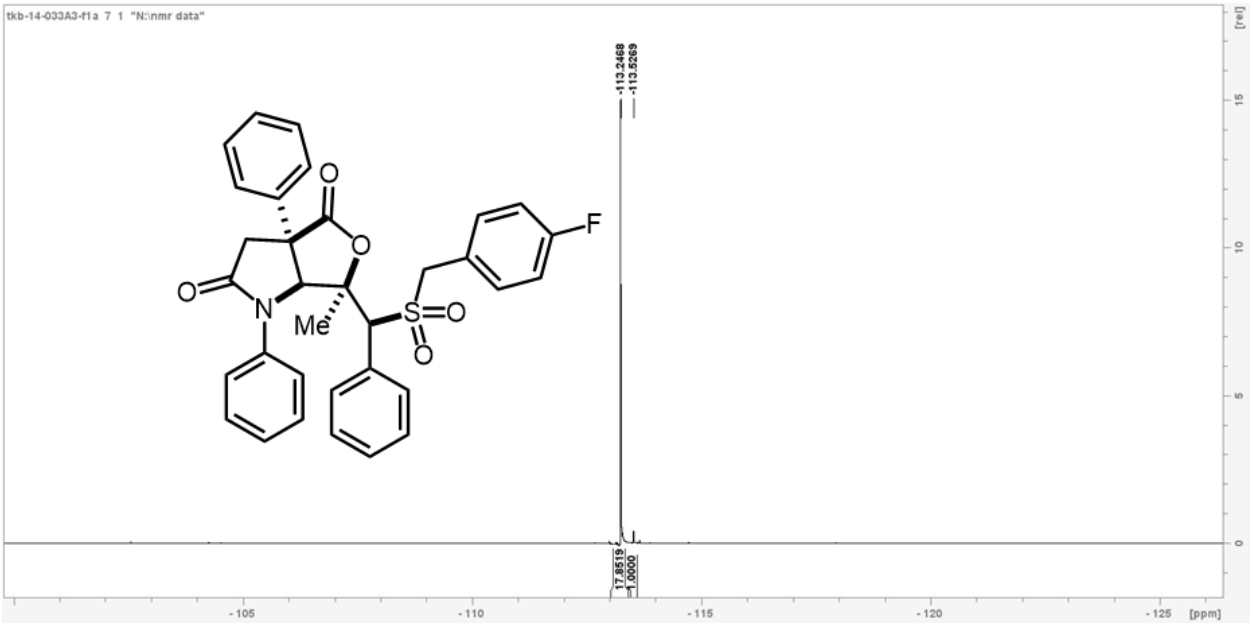
J = 7.3, 1.9 Hz, 2H), 5.18 (d, *J* = 14.7 Hz, 1H), 5.00 (s, 1H), 4.16 (s, 1H), 4.00 (d, *J* = 14.7 Hz, 1H), 3.20 (d, *J* = 18.3 Hz, 1H), 2.86 (d, *J* = 18.3 Hz, 1H), 1.80 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.0, 172.9, 163.8, 161.3, 139.0, 138.9, 133.8, 131.2, 130.8, 130.7, 129.5, 129.3, 129.1, 128.9, 128.8, 128.7, 128.2, 125.7, 115.9, 115.7, 87.8, 77.4, 69.7, 52.0, 46.4, 44.8, 22.4. **HRMS-EI$^+$** (*m/z*): calc for $C_{33}H_{28}FNO_5S$ $[M]^+$ 569.1672, found 569.1679.







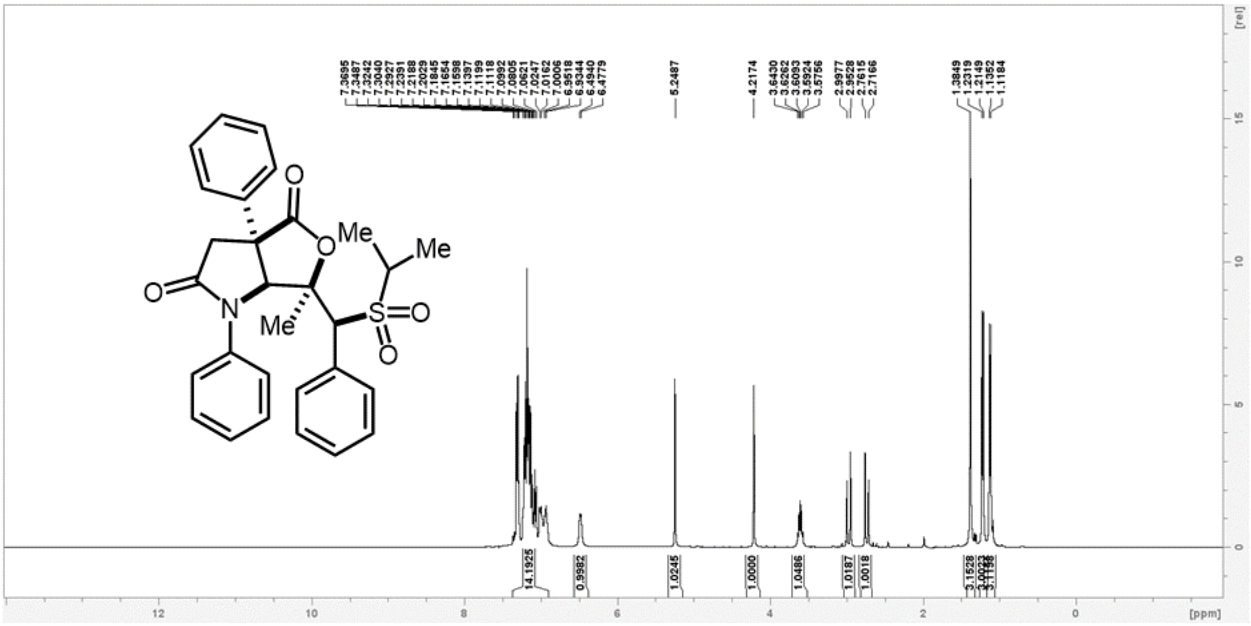
^{19}F NMR

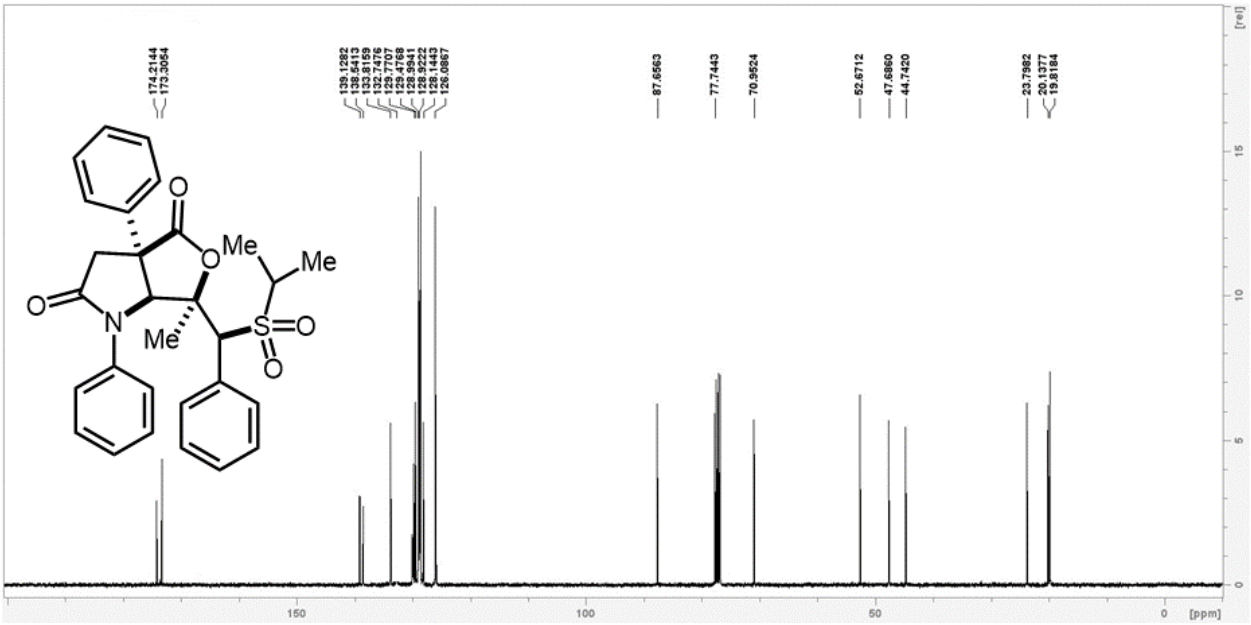


Compound 2y

Prepared in 0.5 mmol scale using **General Procedure A.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (35:65). Amorphous solid. Yield = 173.7, 69%, 95:5 dr (*syn:anti*). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.48 – 6.93 (m, 14H), 6.49 (d, J = 7.6 Hz, 1H), 5.25 (s, 1H), 4.22 (s, 1H), 3.61 (hept, J = 6.9 Hz, 1H), 2.98 (d, J = 18.0 Hz, 1H), 2.74 (d, J = 18.0 Hz, 1H),

1.38 (s, 3H), 1.22 (d, J = 6.8 Hz, 3H), 1.13 (d, J = 6.8 Hz, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.2, 173.3, 139.1, 138.5, 133.8, 129.8, 129.5, 129.0, 128.9, 128.6, 128.1, 126.1, 87.7, 77.8, 71.1, 52.8, 47.7, 44.7, 23.8, 20.1, 19.8. **HRMS-EI$^+$** (*m/z*): calc for $C_{29}H_{29}NO_5S$ $[M]^+$ 503.1766, found 503.1769.






O
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Me
Me
O
N
Me
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O
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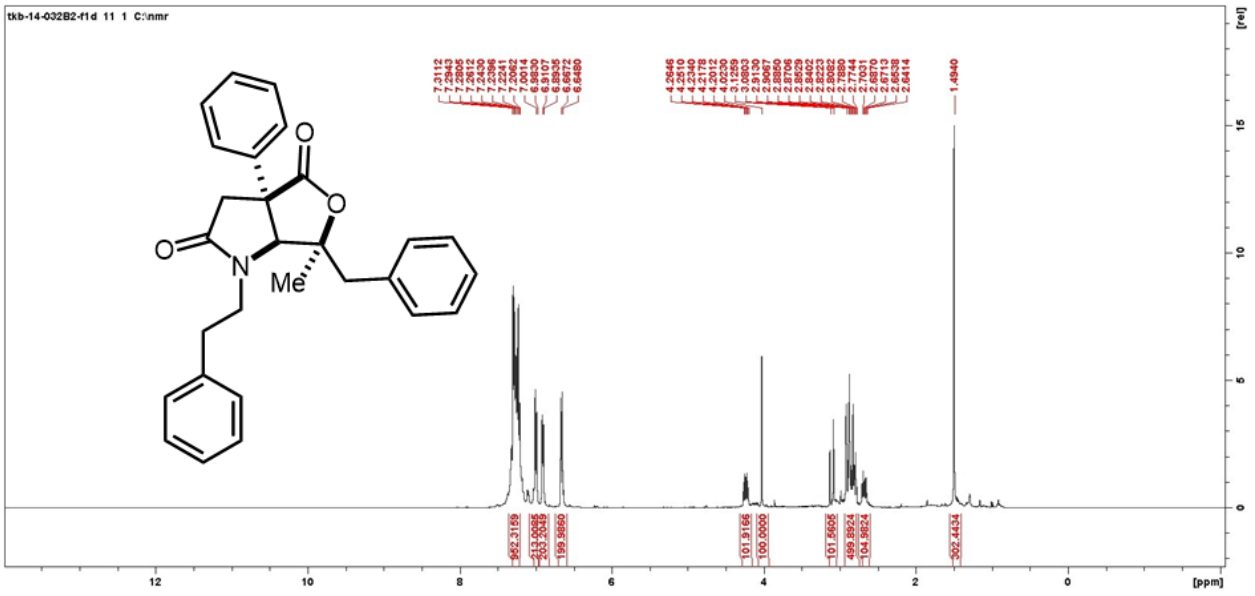
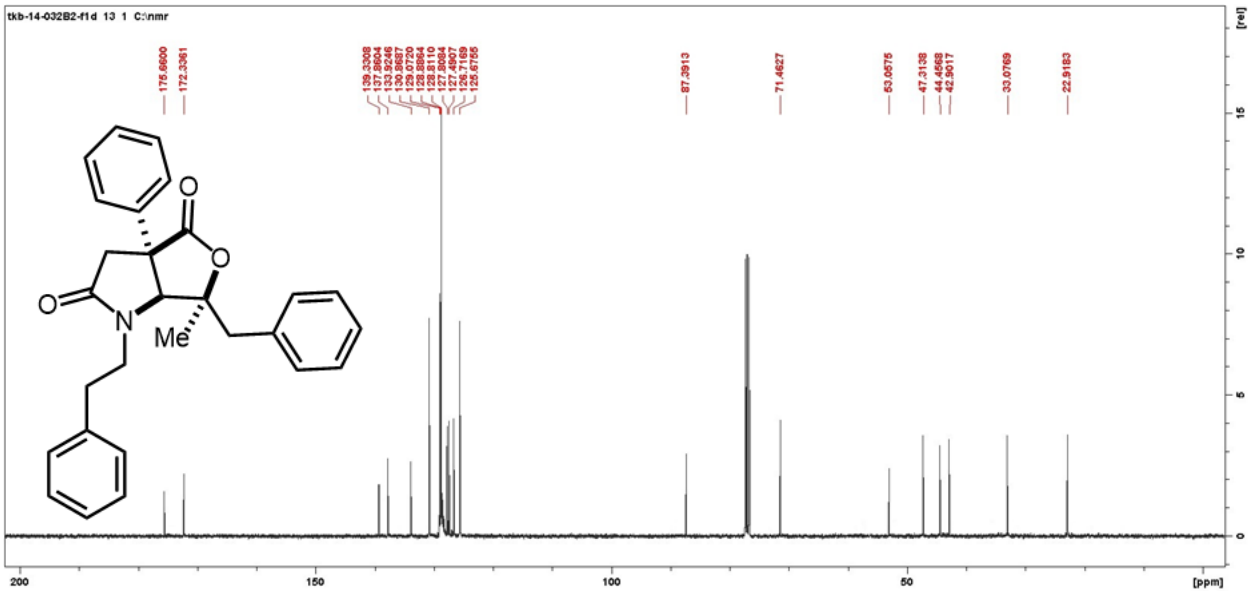
120
100
80
60
40
20
[ppm]

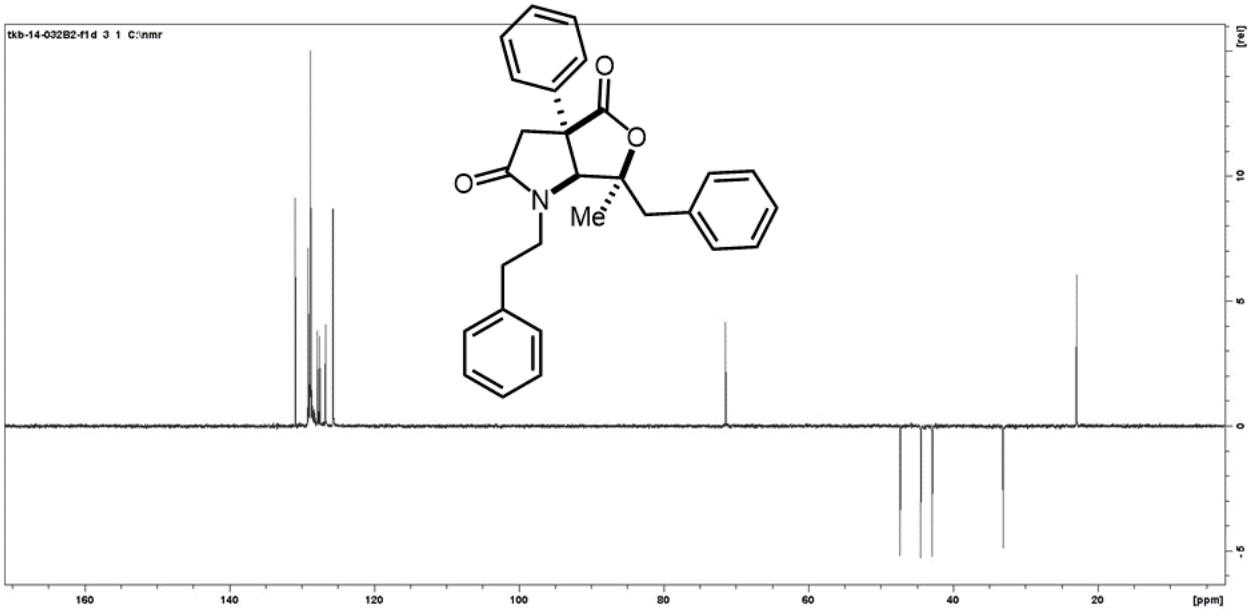
Desulfonylation

Compound 4a

Prepared in 0.50 mmol scale using **General Procedure B.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (75:25). Yellowish oil. Yield = 200 mg, 94%. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.31 – 7.21 (m, 9H), 7.00 – 6.98 (m, 2H), 6.91 – 6.89 (m, 2H), 6.65 (dd, *J* = 7.7, 1.9 Hz, 2H), 4.23 (dt, *J* = 13.2, 6.0 Hz, 1H), 4.02 (s, 1H), 3.08 (d, *J* = 17.7 Hz, 1H), 2.99 – 2.74 (m, 5H), 2.66 (qd, *J* = 12.7, 7.0 Hz, 1H), 1.49 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 175.7, 172.3, 139.3, 137.9, 133.9, 130.9, 129.1, 128.8, 128.7, 127.8, 127.5, 126.7, 125.7, 87.4, 71.5, 53.1, 47.3, 44.5, 42.9, 33.1, 22.9. **HRMS-EI^{+}** (*m/z*): calc for $C_{28}H_{27}NO_3$ $[M]^{+}$ 425.1991, found 425.1995.



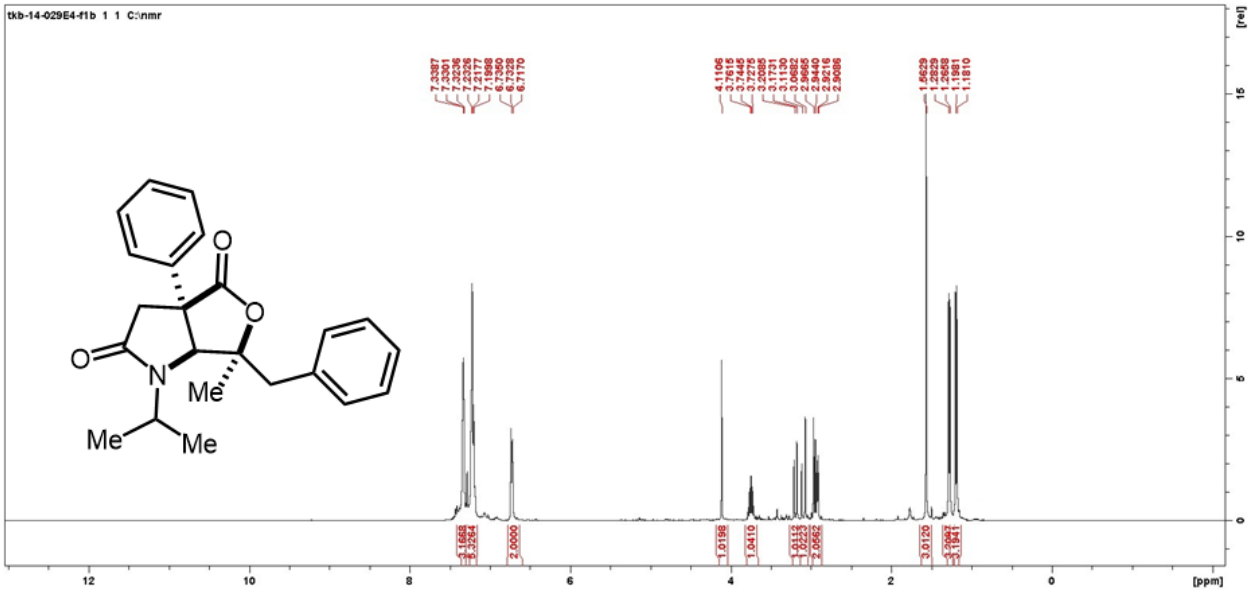


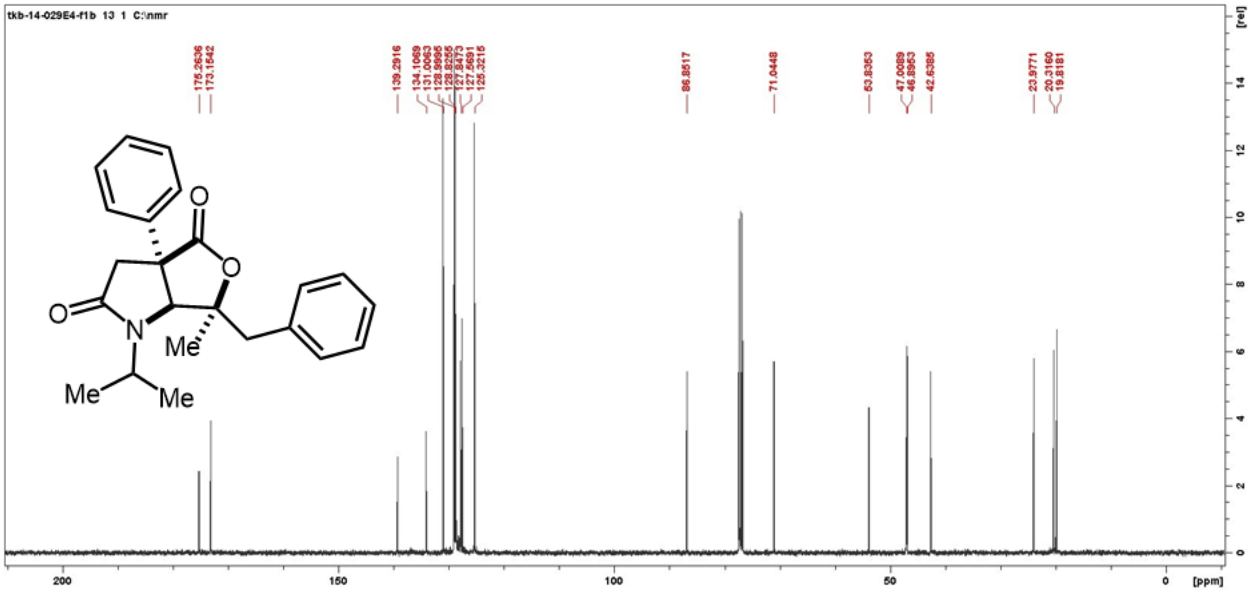


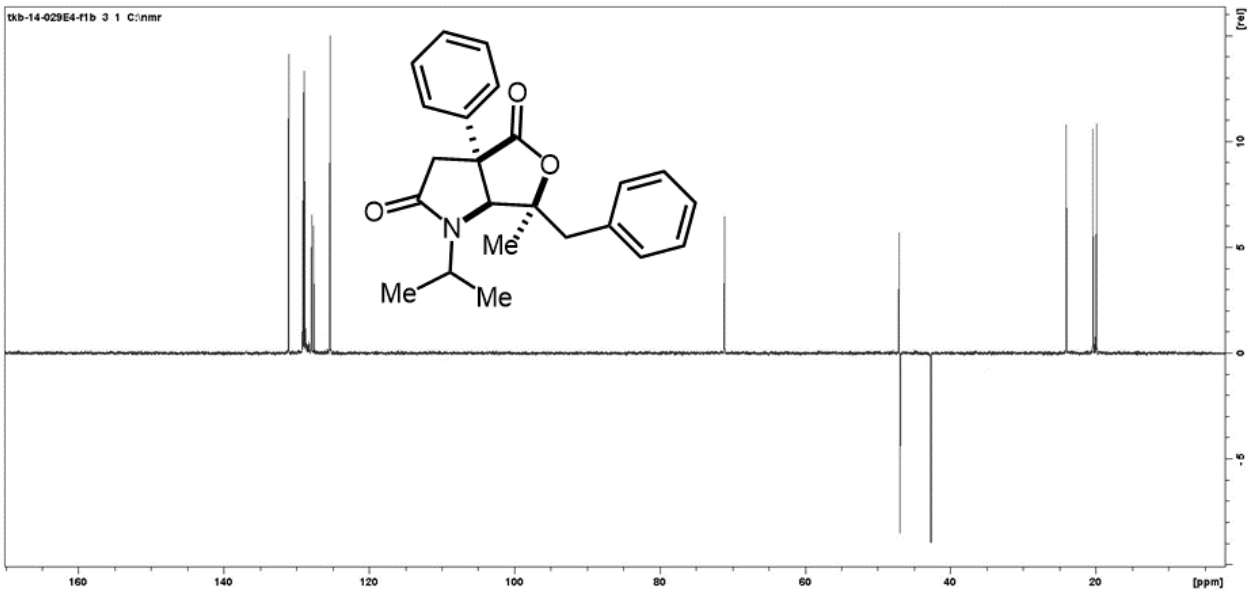
Compound 4b

Prepared in 0.50 mmol scale using **General Procedure B.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (50:50). Yellowish oil. Yield = 165.4 mg, 91%. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.34 – 7.32 (m, 3H), 7.23 – 7.20 (m, 5H), 6.72 (dd, *J* = 7.5, 2.0 Hz, 2H), 4.11 (s, 1H), 3.74 (hept, *J* = 6.9 Hz, 1H), 3.19 (d, *J* = 17.9 Hz, 1H), 3.09 (d, *J* = 17.9 Hz, 1H), 2.99 – 2.87 (m, 2H), 1.56 (s, 3H), 1.27 (d, *J* = 6.8 Hz, 3H), 1.19 (d, *J* = 6.9 Hz, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 175.3, 173.1, 139.3, 134.1, 131.0, 129.0, 128.8, 127.9, 127.6, 125.3, 86.9, 71.0, 53.8,

47.0, 46.9, 42.6, 23.9, 20.3, 19.8. **HRMS-EI$^+$** (*m/z*): calc for $C_{23}H_{25}NO_3$ $[M]^+$ 363.1834, found 363.1838.



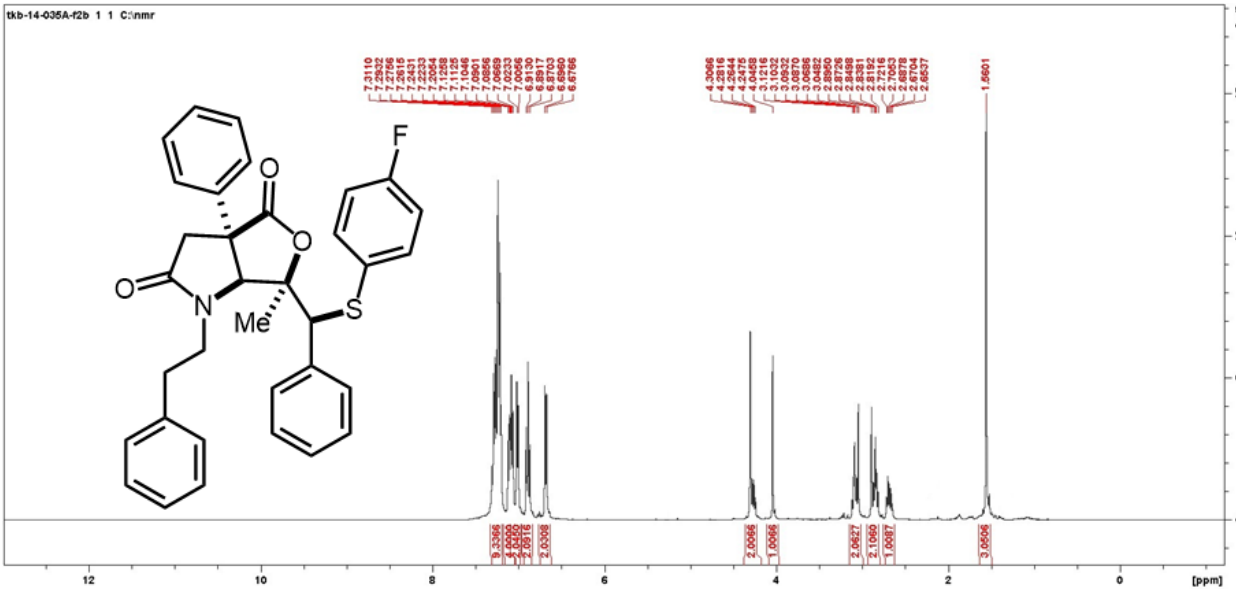


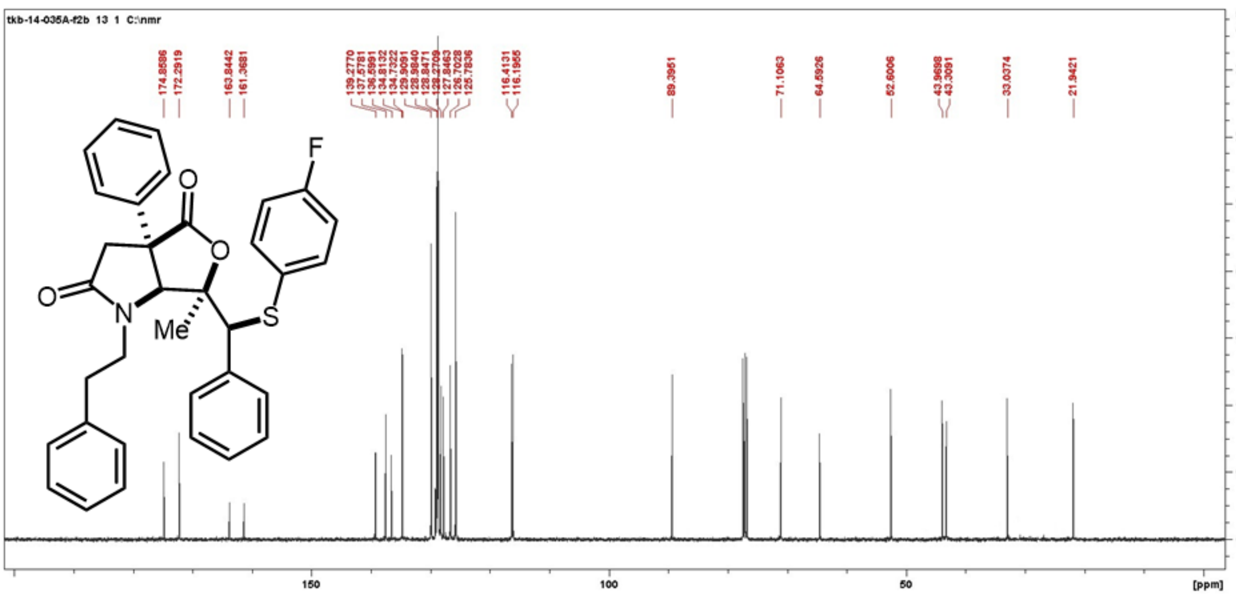


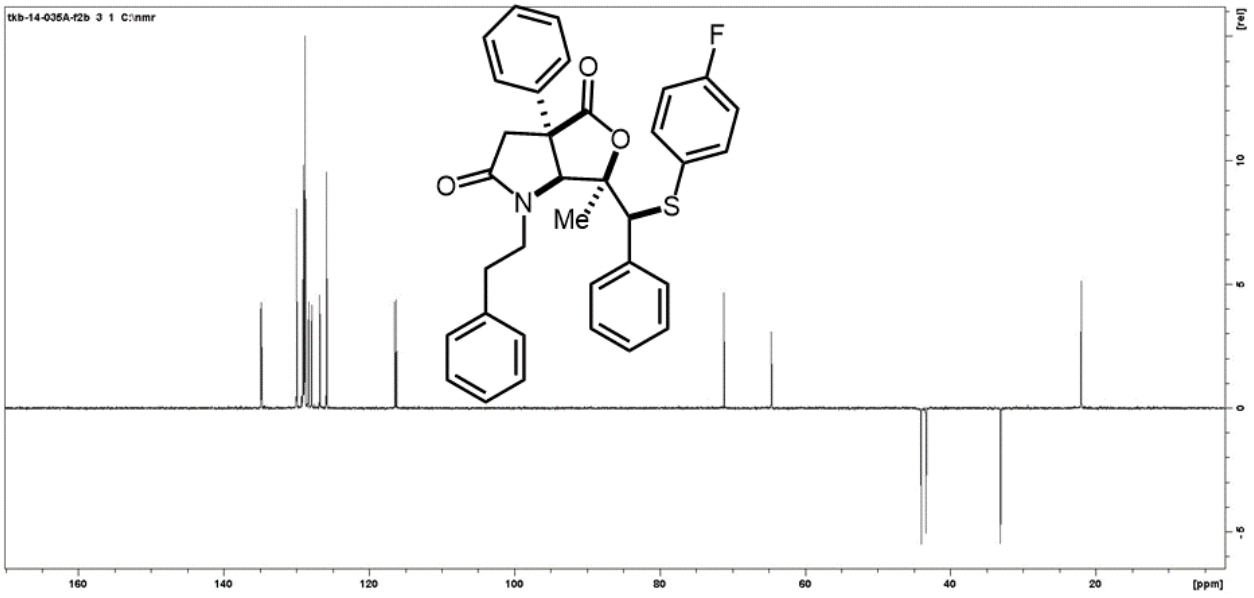
Reduction

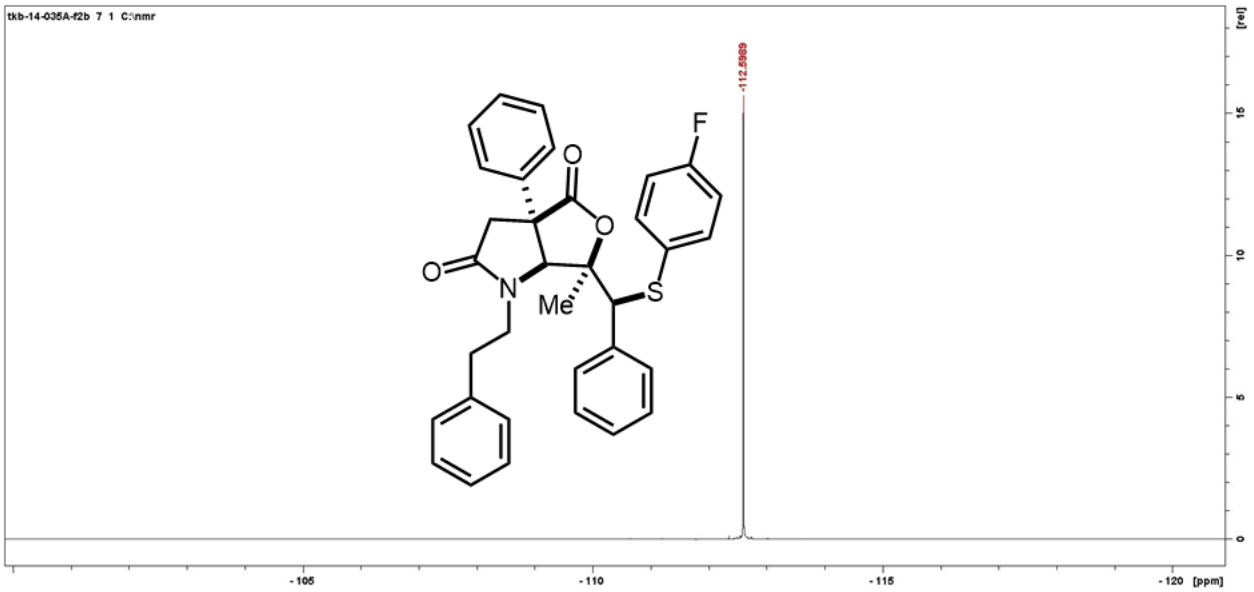
Compound 5a

Prepared in 0.50 mmol scale using **General Procedure C.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (50:50). Yellowish oil. Yield = 237.2 mg, 86%. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.35 – 7.18 (m, 9H), 7.15 – 6.96 (m, 6H), 6.89 (t, *J* = 8.5 Hz, 2H), 6.69 (d, *J* = 7.8 Hz, 2H), 4.31 (s, 1H), 4.28 (dt, *J* = 13.8, 6.9 Hz, 1H), 4.05 (s, 1H), 3.14 – 3.01 (m, 2H), 2.93 – 2.78 (m, 2H), 2.69 (dt, *J* = 13.8, 6.7 Hz, 1H), 1.56 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.9, 172.3, 163.8, 161.4, 139.3, 137.6, 136.6, 134.8, 134.7, 129.9, 129.0, 128.8, 128.7, 128.3, 127.9, 126.7, 125.8, 116.4, 116.2, 89.4, 71.1, 64.6, 52.6, 44.0, 43.3, 33.0, 22.0. **HRMS-EI$^+$** (*m/z*): calc for $C_{34}H_{30}FNO_3S$ $[M]^+$ 551.1930, found 551.1937.





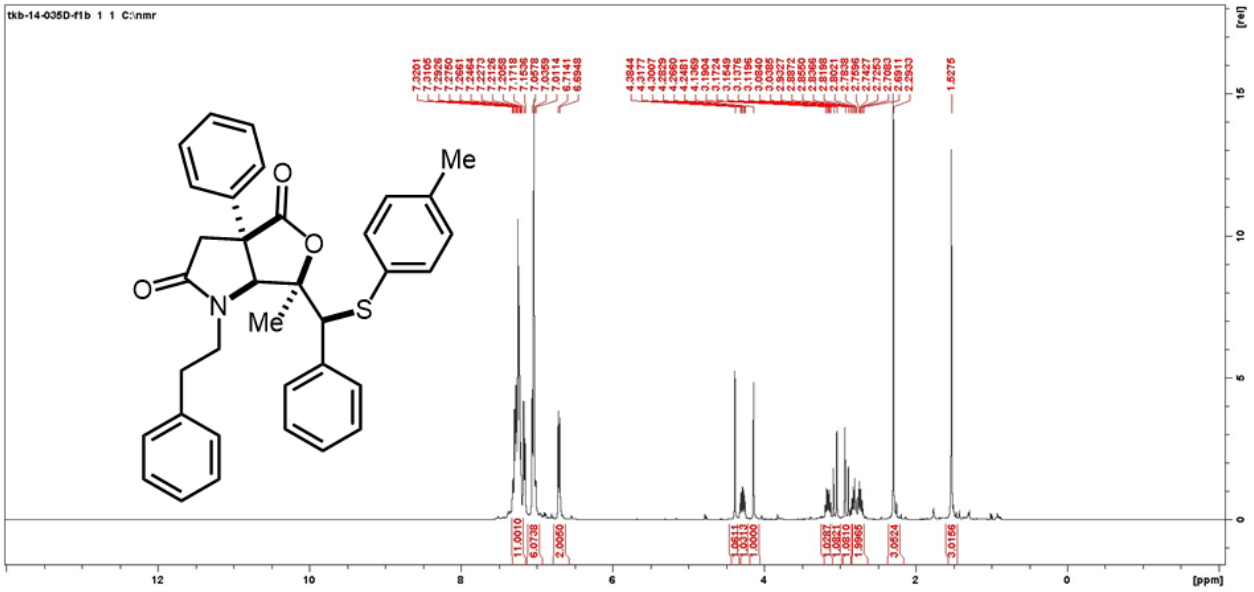


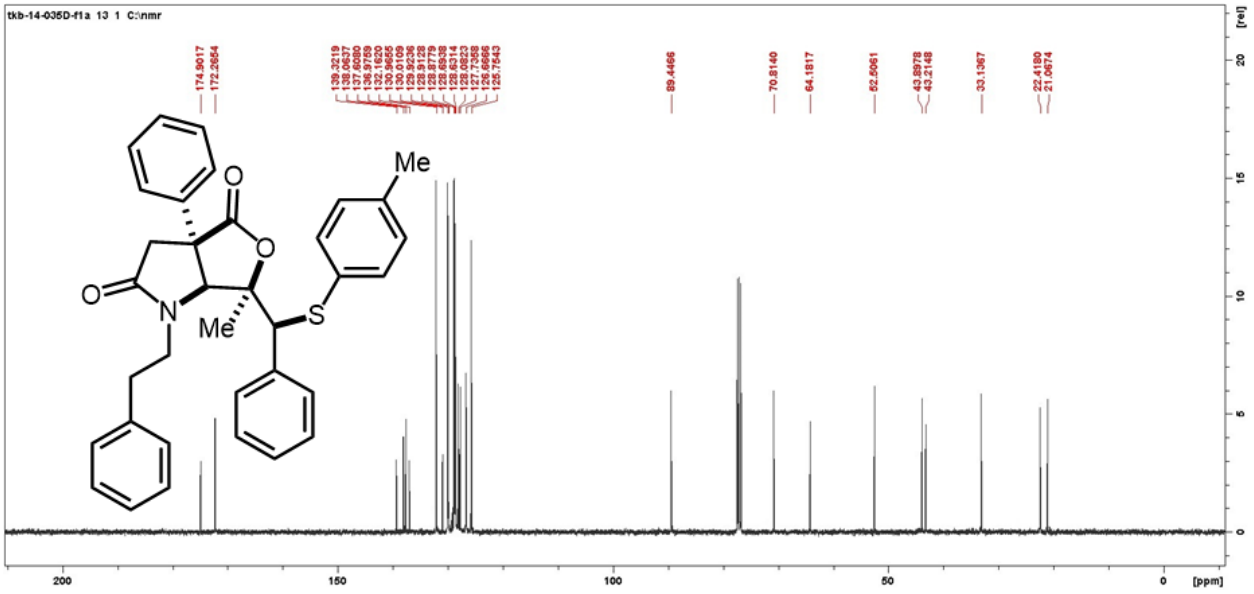


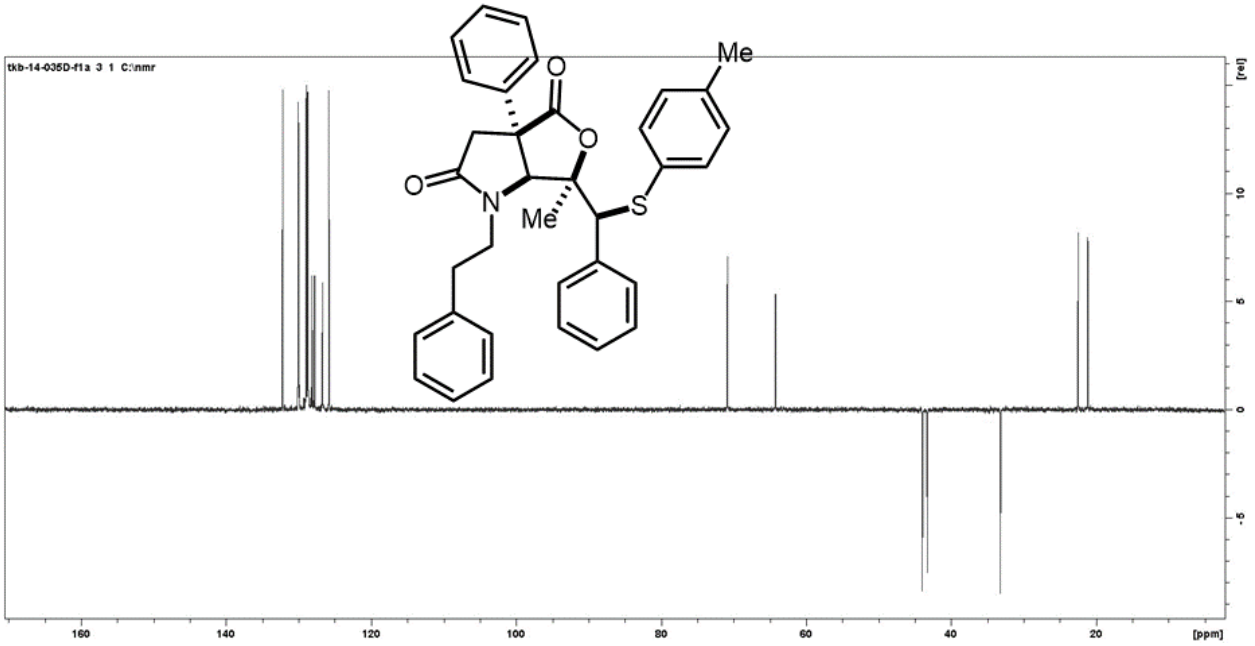
Compound 5b

Prepared in 0.50 mmol scale using **General Procedure C.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (50:50). Yellowish oil. Yield = 221.8 mg, 81%. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.32 – 7.20 (m, 11H), 7.17 – 7.01 (m, 6H), 6.70 (d, *J* = 7.7 Hz, 2H), 4.38 (s, 1H), 4.28 (dt, *J* = 14.0, 7.0 Hz, 1H), 4.14 (s, 1H), 3.21 – 3.06 (m, 2H), 2.96 – 2.67 (m, 3H), 2.29 (s, 3H), 1.53 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.9, 172.3, 139.3, 138.1, 137.6, 137.0, 132.2, 131.0, 130.0, 129.9, 128.9, 128.9, 128.7, 128.6, 128.1, 127.7, 126.7, 125.8, 89.4, 70.8, 64.2, 52.5,

43.9, 43.2, 33.1, 22.4, 21.1. **HRMS-EI**$^+$ (*m/z*): calc for $C_{35}H_{33}NO_3S$ $[M]^+$ 547.2181, found 547.2185.



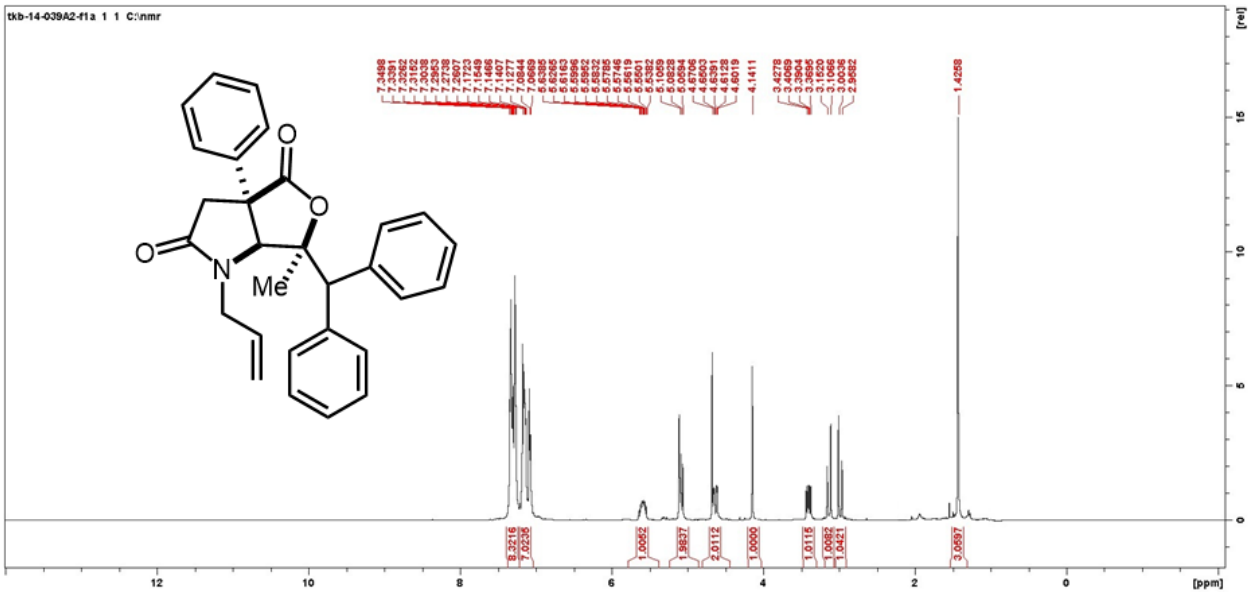




Desulfonative cross-coupling

Compound 6a

Prepared in 0.50 mmol scale using **General Procedure D.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (50:50). Greenish-yellow oil. Yield = 172.8 mg, 79%. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.34 – 7.06 (m, 15H), 5.66 – 5.52 (m, 1H), 5.13 – 5.04 (m, 2H), 4.69 – 4.56 (m, 2H), 4.14 (s, 1H), 3.40 (dd, *J* = 15.0, 8.4 Hz, 1H), 3.13 (d, *J* = 18.1 Hz, 1H), 3.00 (d, *J* = 18.1 Hz, 1H), 1.43 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.7, 172.1, 139.6, 137.5, 134.6, 131.9, 131.0, 129.7, 129.1, 129.0, 128.6, 128.1, 128.0, 127.8, 125.7, 120.2, 89.0, 69.9, 64.3, 52.2, 45.4, 43.5, 22.5. **HRMS-EI^{+}** (*m/z*): calc for $C_{29}H_{27}NO_3$ $[M]^{+}$ 437.1991, found 437.1995.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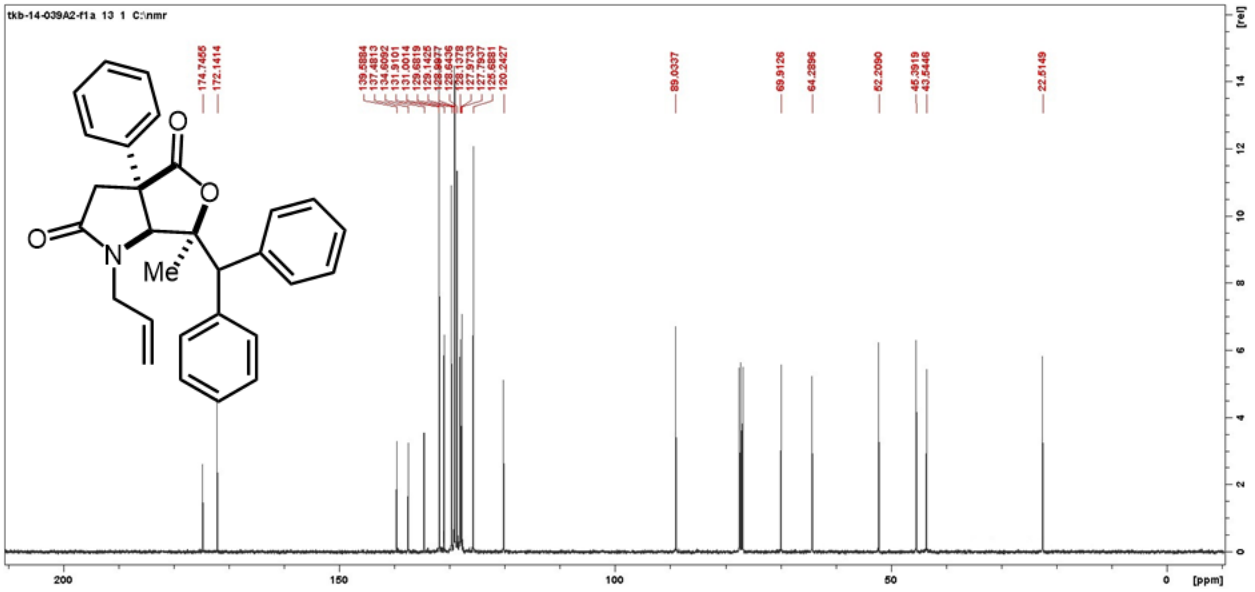
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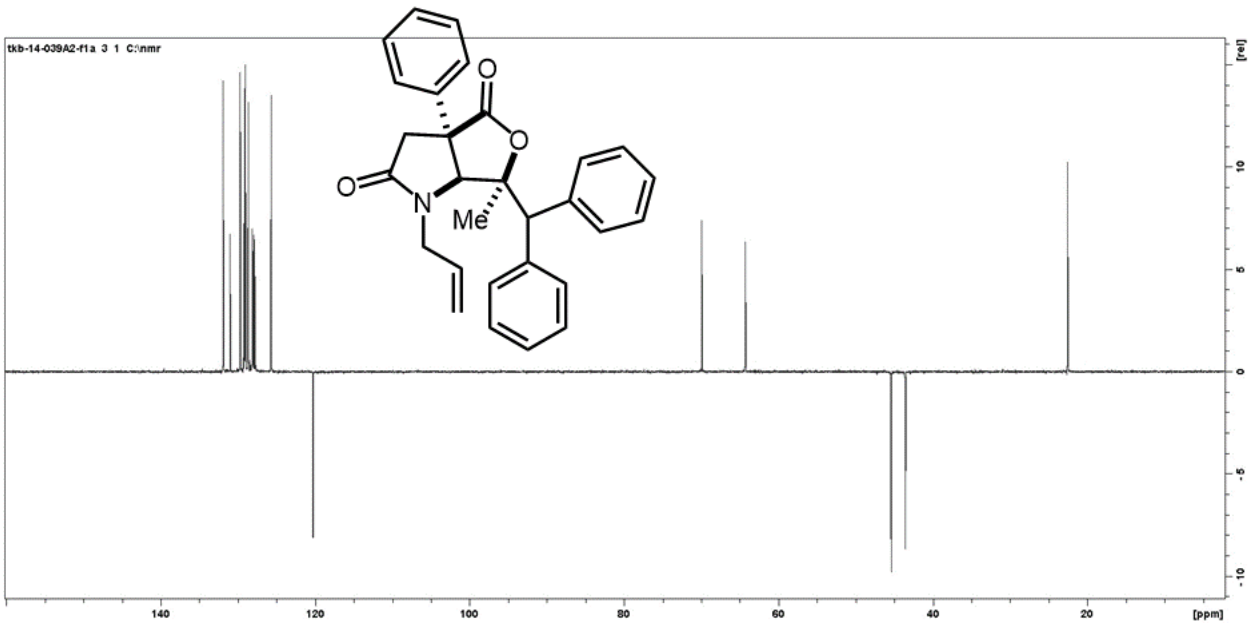
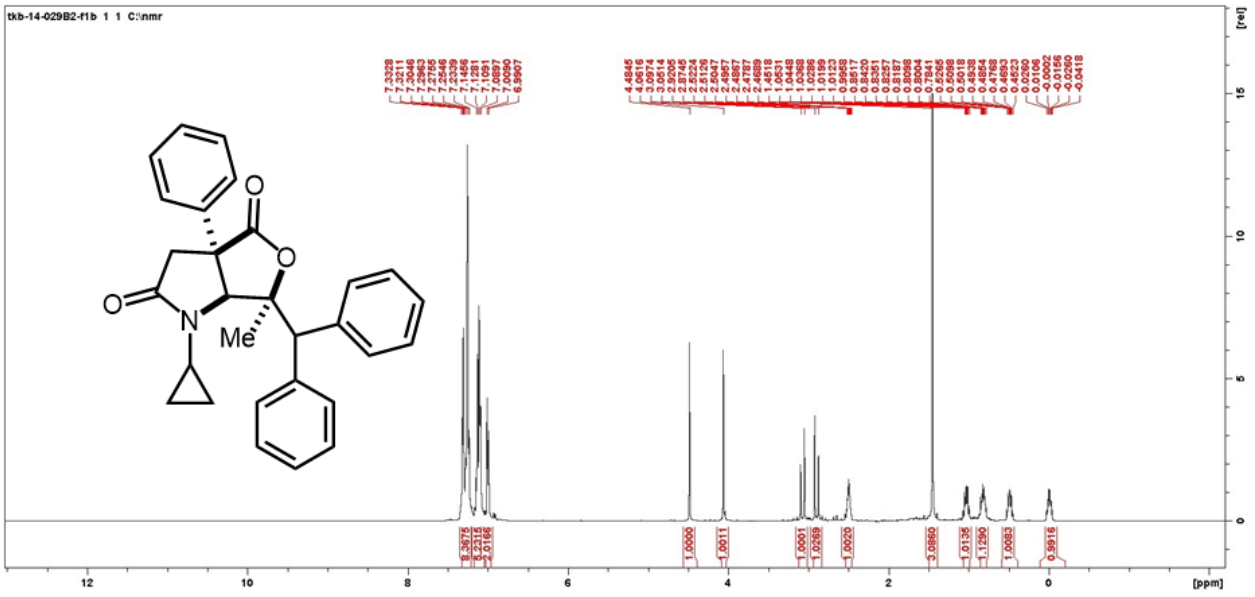


Compound 6b

Prepared in 0.50 mmol scale using **General Procedure D.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (60:40). Greenish-yellow oil. Yield = 164.1 mg, 75%. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.33 – 7.23 (m, 8H), 7.19 – 7.04 (m, 5H), 7.00 (dd, *J* = 7.6, 1.8 Hz, 2H), 4.48 (s, 1H), 4.06 (s, 1H), 3.05 (d, *J* = 18.4 Hz, 1H), 2.92 (d, *J* = 18.4 Hz, 1H), 2.50 (tt, *J* = 7.3, 3.9 Hz, 1H), 1.45 (s, 3H), 1.03 (dq, *J* = 9.6, 6.5 Hz, 1H), 0.82 (dtd, *J* = 10.5, 6.5, 3.7 Hz, 1H), 0.49 (dq, *J* = 9.8, 6.7 Hz, 1H), 0.00 (dq, *J* = 9.8, 6.7 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.8, 173.0, 139.8, 137.9, 135.1, 131.9, 129.5, 129.2, 129.1, 128.7, 128.1, 128.0, 127.8, 125.5, 89.4, 72.4, 64.8, 51.8, 44.3, 25.8, 22.5, 9.2, 5.1. **HRMS-EI^{+}** (*m/z*): calc for $C_{29}H_{27}NO_3$ $[M]^{+}$ 437.1991, found 437.1995.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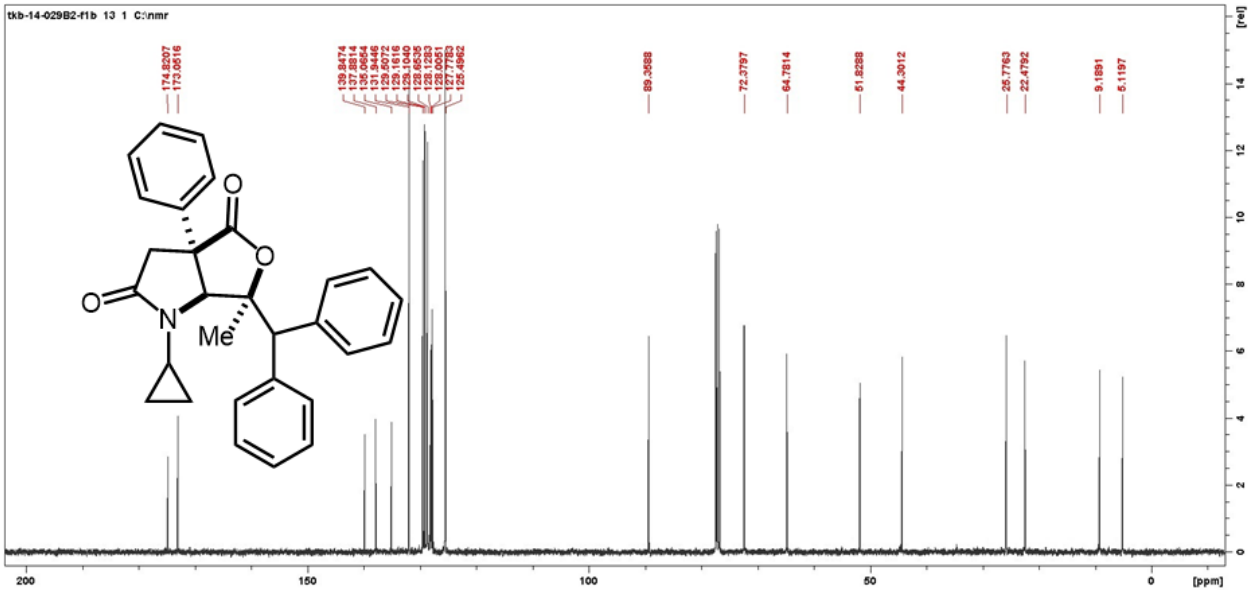
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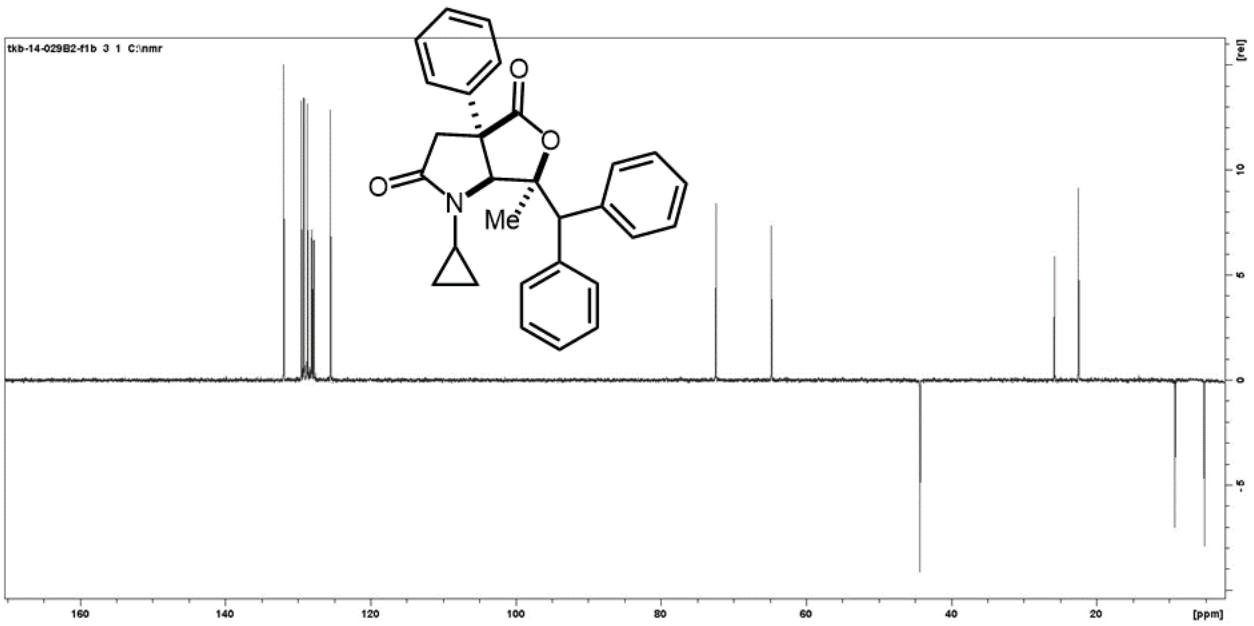
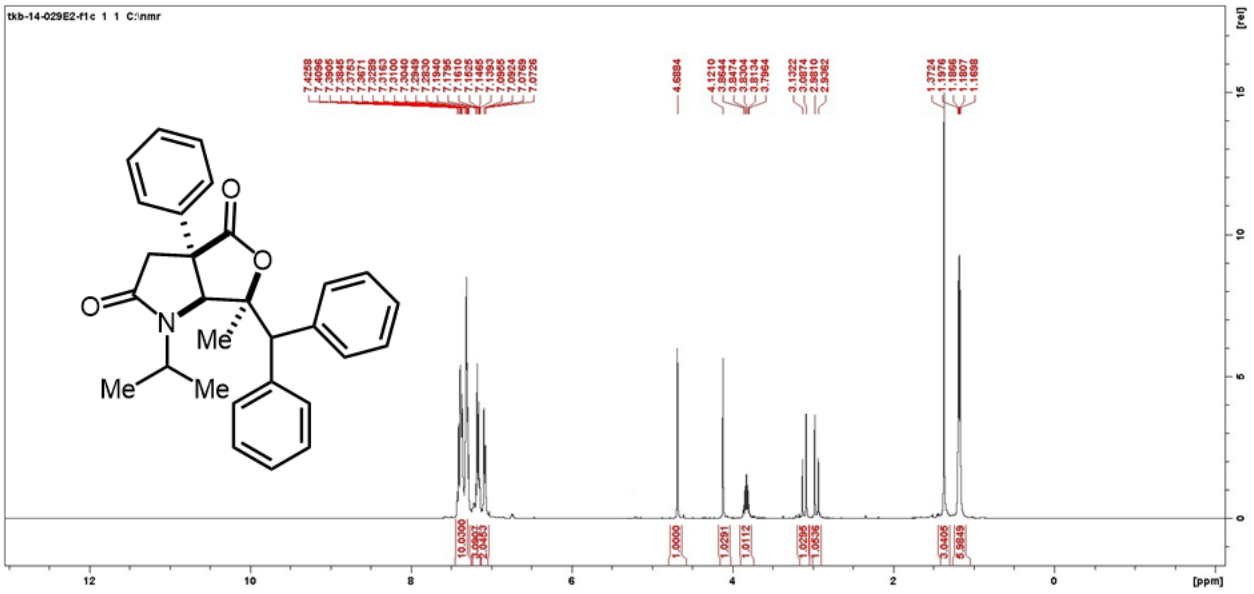
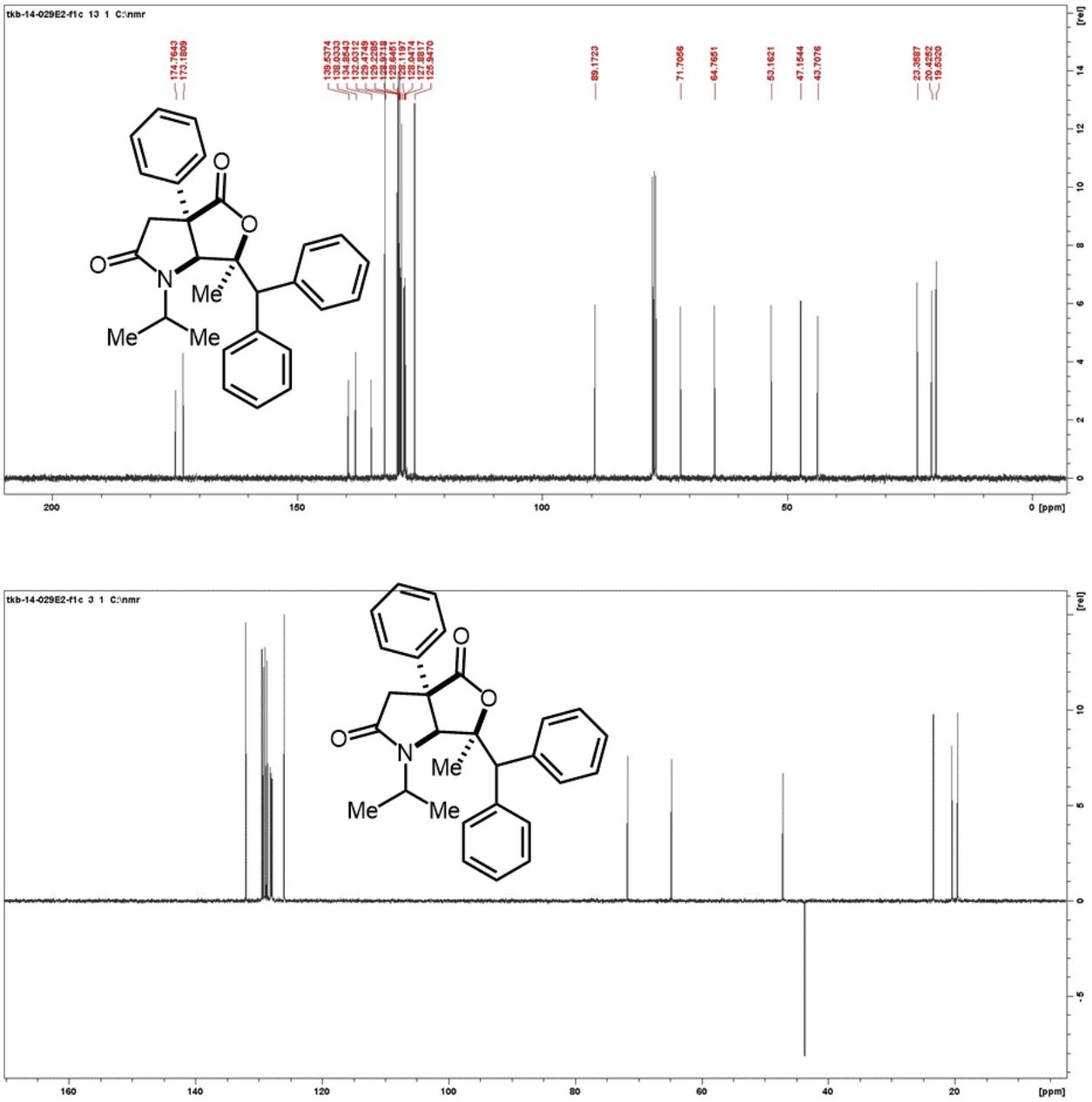


Compound 6c

Prepared in 0.50 mmol scale using **General Procedure D.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (50:50). Yellowish oil. Yield = 175.8 mg, 80%. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.43 – 7.37 (m, 10H), 7.33 – 7.28 (m, 3H), 7.19 – 7.07 (m, 2H), 4.69 (s, 1H), 4.12 (s, 1H), 3.83 (hept, *J* = 6.8 Hz, 1H), 3.11 (d, *J* = 17.9 Hz, 1H), 2.96 (d, *J* = 17.9 Hz, 1H), 1.37 (s, 3H), 1.18 (dd, *J* = 6.8, 4.3 Hz, 6H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.8, 173.2, 139.5, 138.0, 134.9, 132.0, 129.5, 129.2, 129.0, 128.6, 128.1, 128.0, 127.9, 125.9, 89.2, 71.7, 64.8, 53.2, 47.2, 43.7, 23.4, 20.4, 19.5. **HRMS-EI^{+}** (*m/z*): calc for $C_{29}H_{29}NO_3$ $[M]^{+}$ 439.2147, found 439.2153.

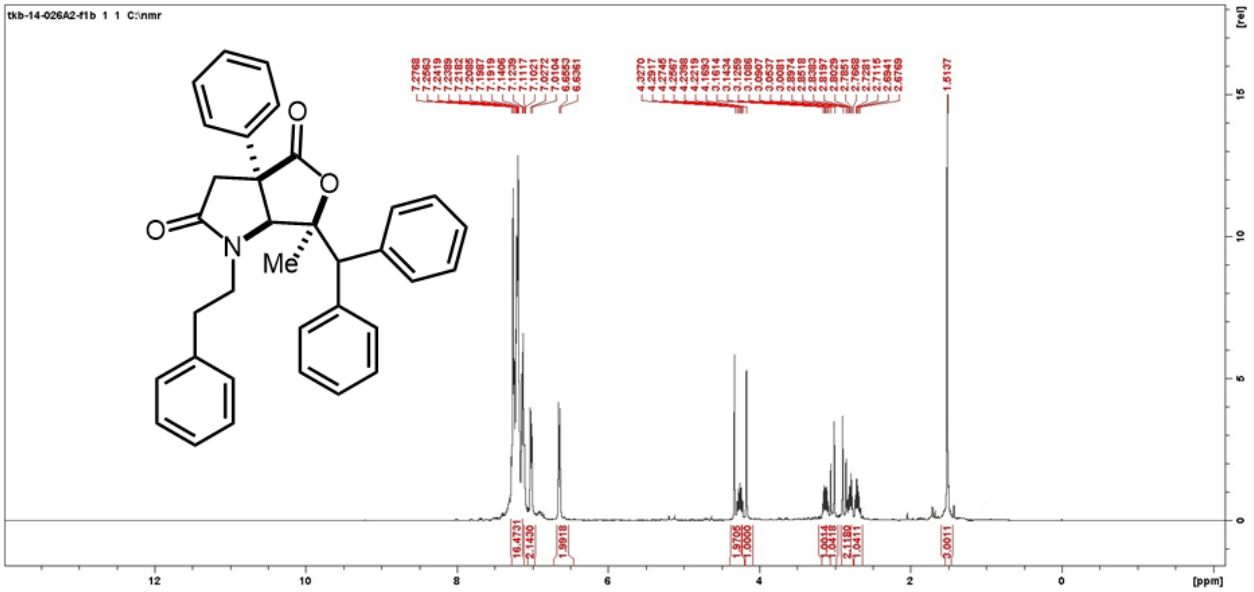


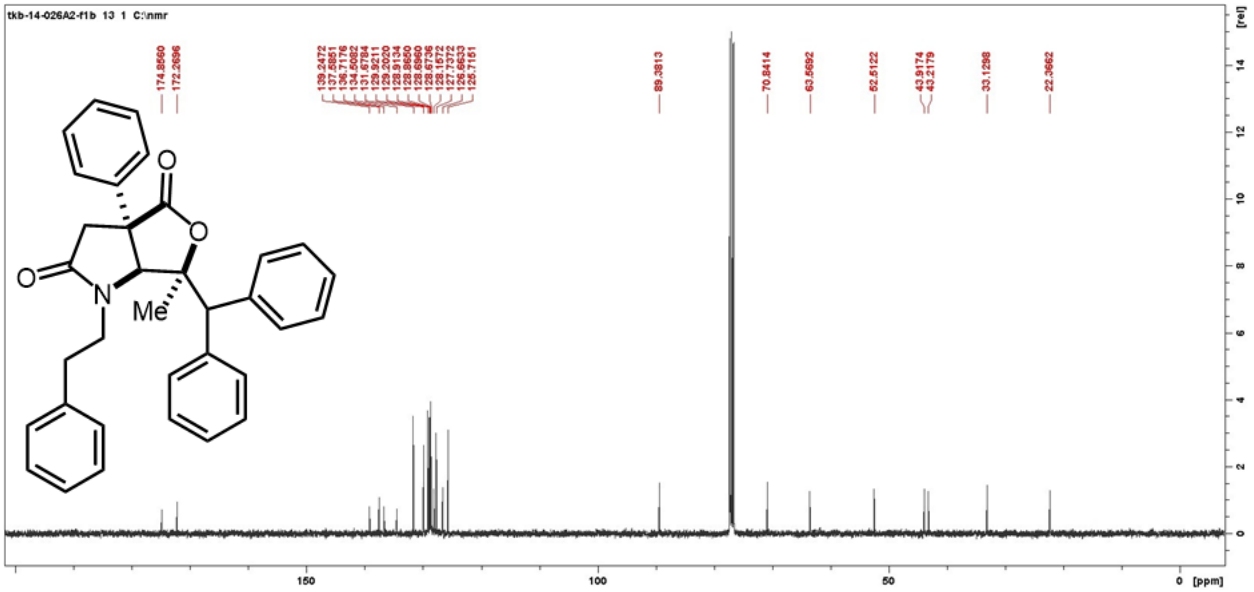


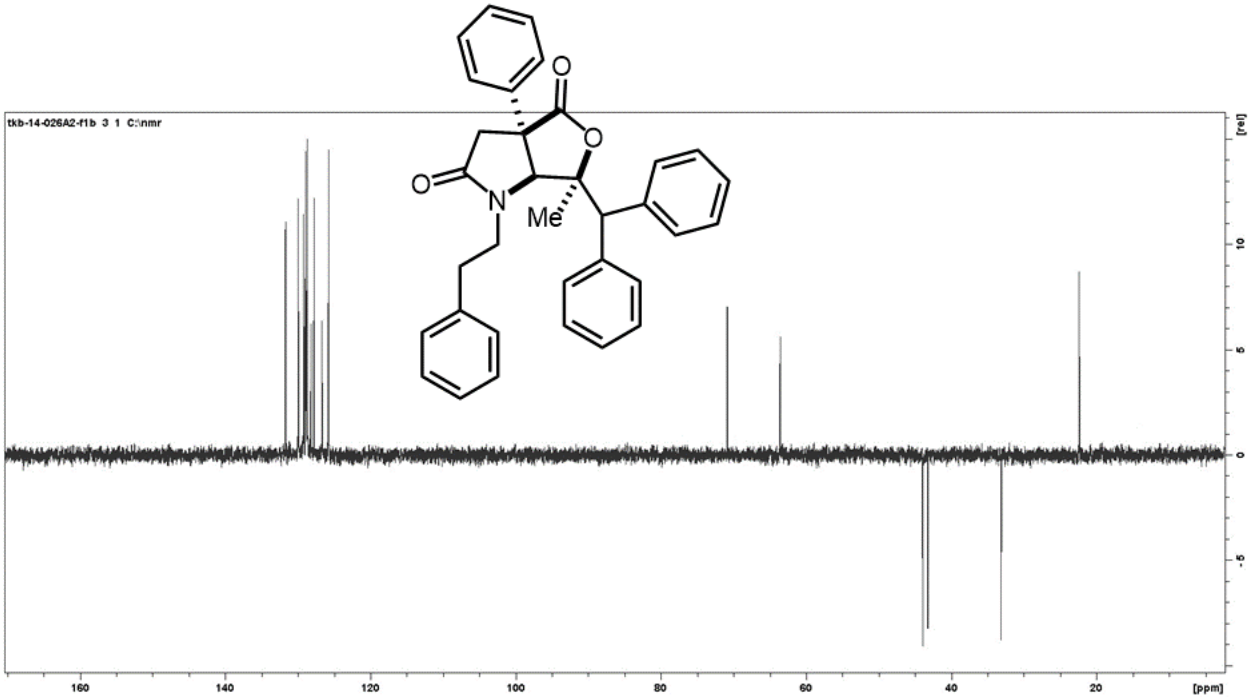
Compound 6d

Prepared in 0.50 mmol scale using **General Procedure D.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (35:65). Yellowish oil. Yield = 208.2 mg, 83%. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.28 – 7.19 (m, 16H), 7.14 – 7.01 (m, 2H), 6.64 (dd, *J* = 7.6, 1.9 Hz, 2H), 4.33 (s, 1H), 4.28 – 4.20 (m, 1H), 4.17 (s, 1H), 3.18 – 3.02 (m, 1H), 3.01 (d, *J* = 18.6 Hz, 1H), 2.90 (d, *J* = 18.6 Hz, 1H), 2.87 – 2.61 (m, 2H), 1.51 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.9, 172.3, 139.2, 137.6, 136.7, 134.5, 131.7, 129.9, 129.2, 128.9, 128.8, 128.7, 128.2, 127.7, 126.7, 125.7,

89.4, 70.8, 63.6, 52.5, 43.9, 43.2, 33.1, 22.4. **HRMS-EI**$^{+}$ (*m/z*): calc for $C_{34}H_{31}NO_3$ $[M]^{+}$ 501.2304, found 501.2307.

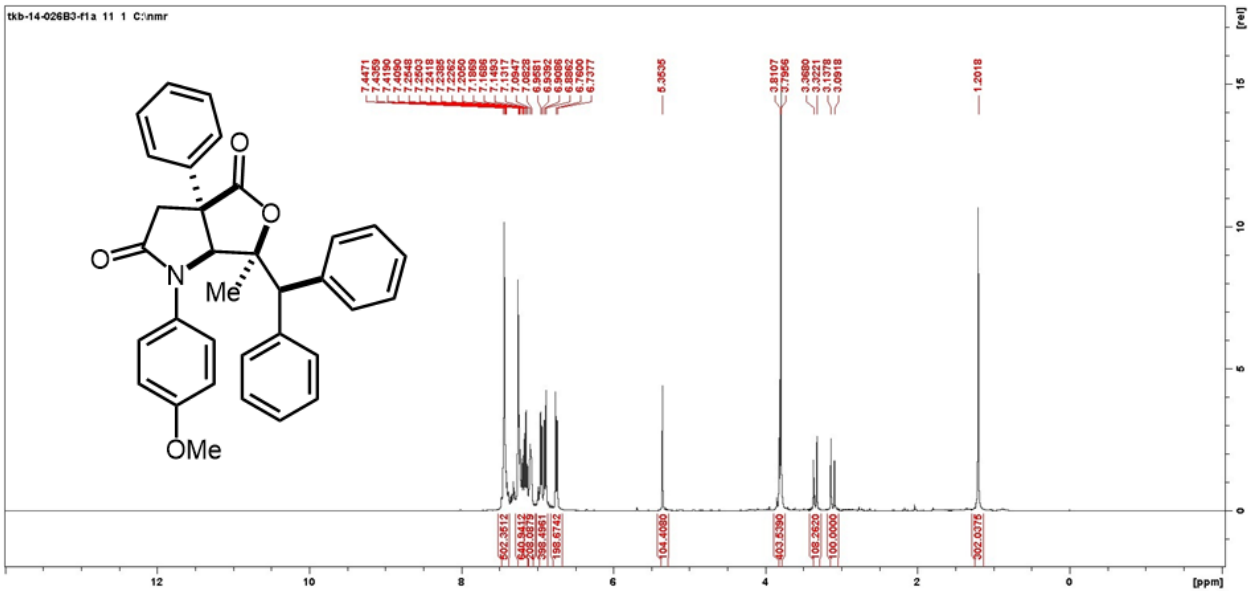






Compound 6e

Prepared in 0.50 mmol scale using **General Procedure D.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (50:50). Amorphous solid. Yield = 193.8 mg, 77%. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.45 – 7.41 (m, 5H), 7.25 – 7.08 (m, 8H), 6.96 – 6.89 (m, 4H), 6.75 (d, *J* = 8.1 Hz, 2H), 5.35 (s, 1H), 3.81-3.79 (m, 4H), 3.35 (d, *J* = 18.3 Hz, 1H), 3.12 (d, *J* = 18.3 Hz, 1H), 1.20 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.8, 170.8, 157.6, 140.1, 138.1, 135.4, 132.1, 130.1, 129.3, 129.2, 128.6, 128.2, 128.0, 127.8, 125.9, 124.2, 114.4, 89.8, 72.3, 65.1, 55.5, 51.3, 44.6, 22.0. **HRMS-EI^{+}** (*m/z*): calc for $C_{33}H_{29}NO_4$ $[M]^{+}$ 503.2097, found 503.2093.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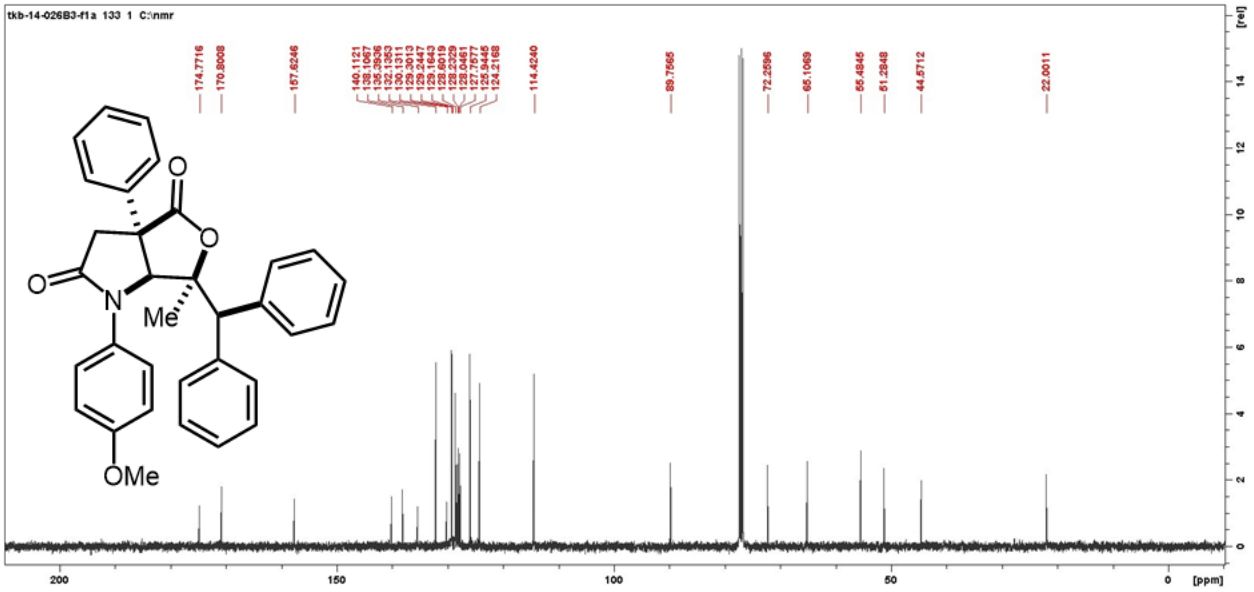
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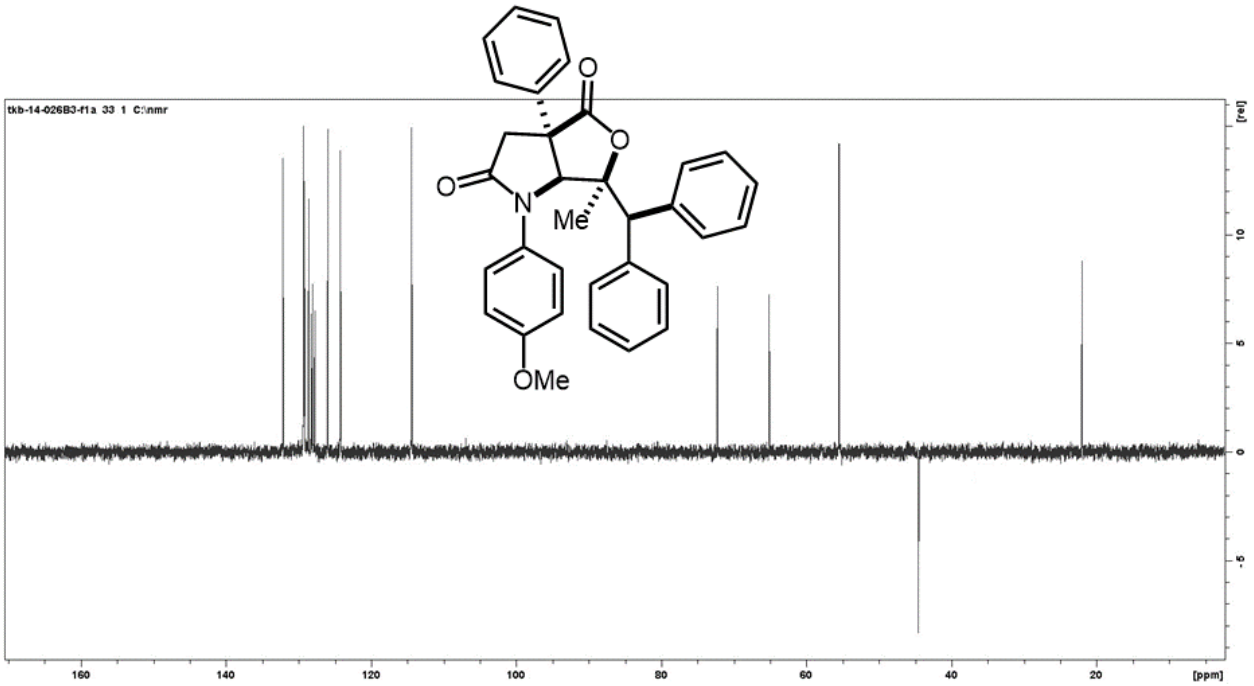
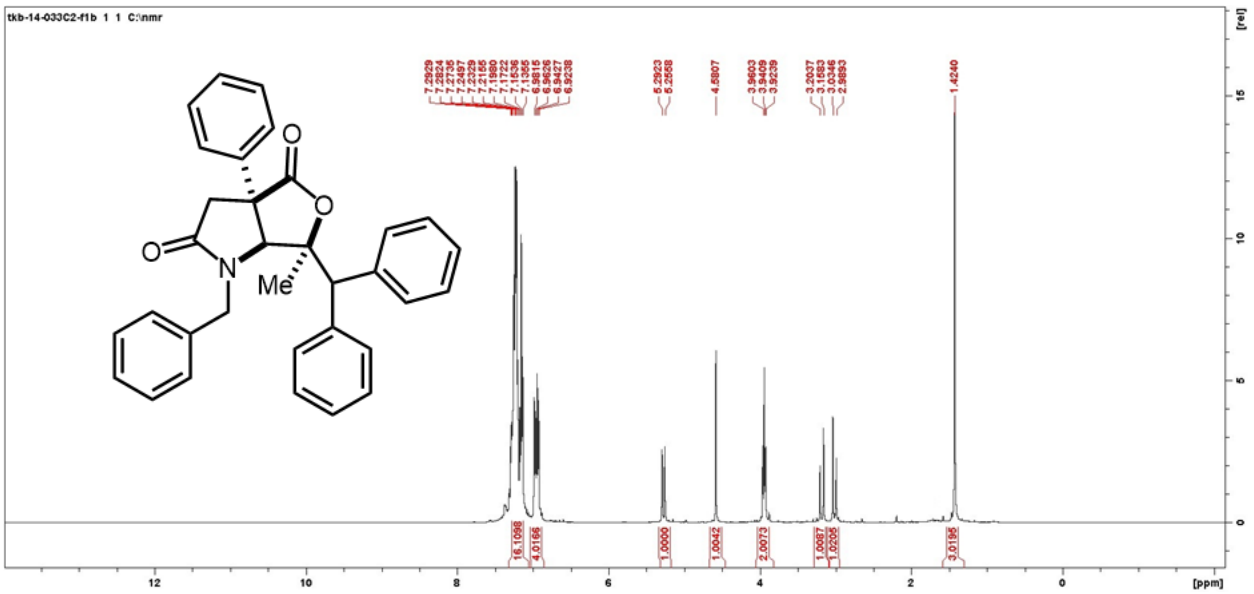
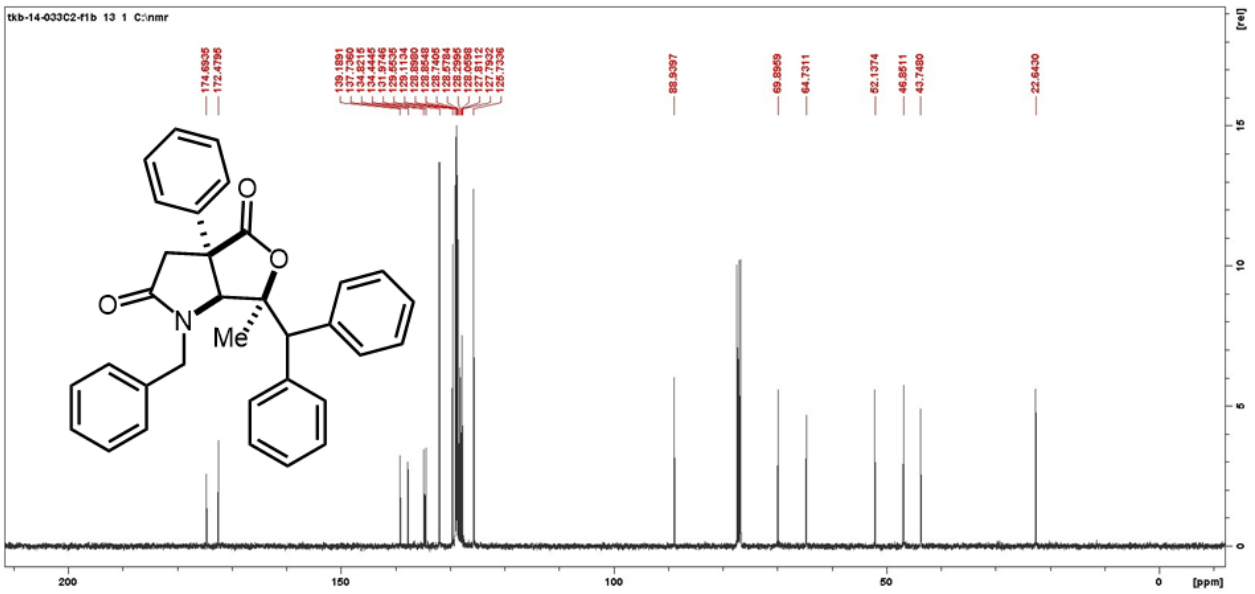
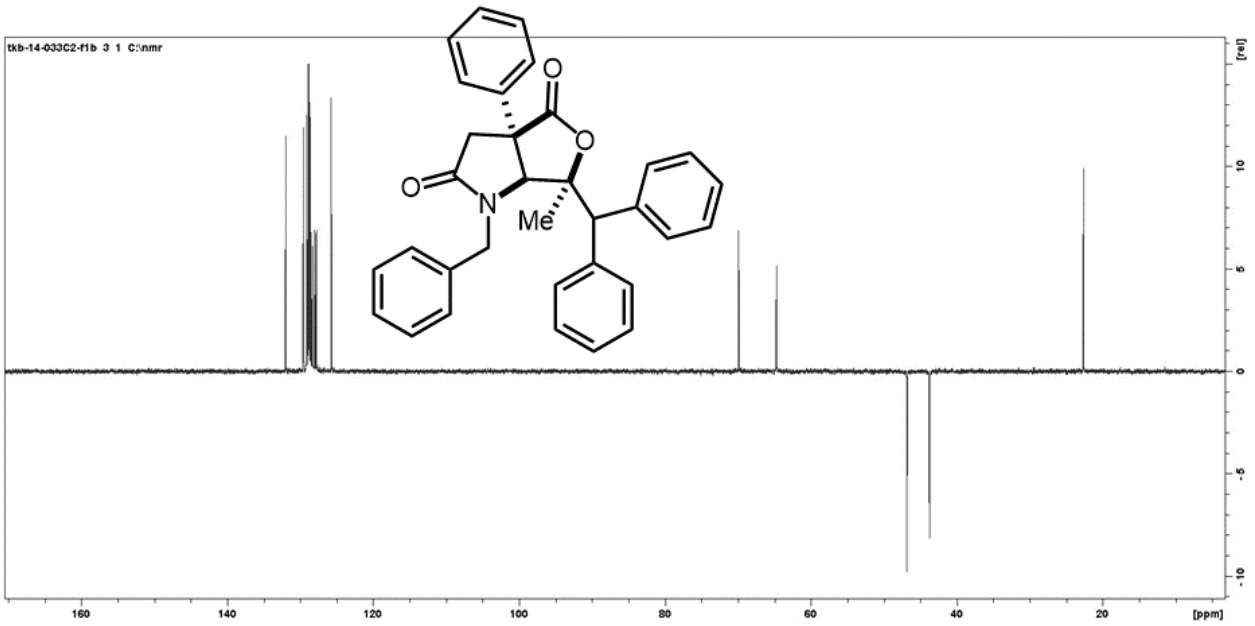


Compound 6f

Prepared in 0.50 mmol scale using **General Procedure D.** Purification: Flash chromatography on silica eluting with hexane/EtOAc (60:40). Amorphous solid. Yield = 199.9 mg, 82%. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.29 – 7.13 (m, 14H), 6.98 – 6.92 (m, 4H), 5.27 (d, J = 14.6 Hz, 1H), 4.58 (s, 1H), 3.96 – 3.92 (m, 2H), 3.16 (d, J = 18.3 Hz, 1H), 3.03 (d, J = 18.3 Hz, 1H), 1.42 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 174.7, 172.5, 139.2, 137.7, 134.8, 134.4, 131.9, 129.6, 129.1, 128.9, 128.9, 128.7, 128.6, 128.3, 128.1, 127.8, 127.8, 125.7, 88.9, 69.9, 64.7, 52.1, 46.8, 43.7, 22.6. **HRMS-EI$^+$** (*m/z*): calc for $C_{33}H_{29}NO_3$ $[M]^+$ 487.2147, found 487.2153.







References

(1) H. Braunstein, S. Langevin, M. Khim, J. Adamson, K. Hovenkotter, L. Kotlarz, B. Mansker and T. K. Beng, *Org. Biomol. Chem.*, 2016, **14**, 8864-8872;