Supporting Information for

Ag(I)-Catalyzed Intramolecular Transannulation of Enynone Tethered Donor-Acceptor Cyclopropanes: A New Synthesis of 2,3-Dihydronaphtho[1,2-b]furans

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1. General methods

All the reactions were performed in an oven-dried glassware under argon atmosphere. Solvents were dried using standard methods. Unless otherwise stated, all the commercial reagents were used as received. The progress of the reaction was monitored by thin layer chromatography (Merck Silica gel 60 F-254, precoated plates on alumina). Column chromatographic purifications were performed on Merck silica gel (100-200 mesh). Melting points were recorded on a digital melting point apparatus and are uncorrected. $^1$H-NMR spectra were recorded on Bruker Avance III FT-NMR spectrometers at 400 MHz or 500 MHz and $^{13}$C-NMR spectra were recorded at 101 MHz, 126 MHz. $^1$H-NMR chemical shifts reported in ppm relative to the TMS ($\delta = 0$) and are abbreviated as follows: s (singlet), d (doublet), t (triplet), q (quartet), m (multiplet), br (broad). $^{13}$C-NMR chemical shifts reported in ppm relative to the residual CDCl$_3$ signal ($\delta = 77.16$). IR spectra recorded on a Perkin-Elmer FT-IR spectrometer. HRMS data obtained on a Bruker micro TOF-QII or Agilent 5975C high-resolution mass spectrometers.

2. Synthesis of enynone tethered donor-acceptor cyclopropanes 5

\[ S1a-i \xrightarrow{NaH, DMSO, 0 ^\circ C - rt} S2a-i \]

\[ S1a: Ar = tolly \]
\[ S1b: Ar = phenyl \]
\[ S1c: Ar = 1-naphthyl \]
\[ S1d: Ar = (2-methoxy)phenyl \]
\[ S1e: Ar = (4-methoxy)phenyl \]
\[ S1f: Ar = (3,4-dimethoxy)phenyl \]
\[ S1g: Ar = (4-chloro)phenyl \]
\[ S1h: Ar = (3-nitro)phenyl \]
\[ S1i: Ar = (4-nitro)phenyl \]

Iodochalcones $S1a-i$ were prepared by aldol condensation of 2-iodoacetophenones with aryaldehydes.

**General procedure 1. Cyclopropanation of chalcones S1:** To a dry 100 ml round bottom flask charged with sodium hydride (3.3 mmol, 1.1 eq) under argon atmosphere was added anhydrous DMSO (20 ml). The suspension was stirred at 0°C and trimethylsulfoxonium iodide (24 mmol, 8 eq) was slowly added to the contents. After bubbles were ceased (~20 min), a solution of chalcone $S1$ (3 mmol, 1 eq) in anhydrous DMSO (10 mL) was added dropwise over 20 min. The contents were allowed to attain room temperature over 30 min for the completion of the reaction as judged by TLC. The reaction mixture was cooled to 0°C and quenched by slow addition of ice cold water. The contents were extracted with ethyl acetate and the organic phase was successively washed with water, brine and dried over anhydrous sodium sulphate. The solvent was evaporated on a rotavapor and the resulting crude product was purified by silica gel column chromatography (elution with 0-5% EtOAc/Hexanes, unless otherwise stated) to give cyclopropyl ketone $S2$.

**General procedure 2. Sonogashira coupling of S2:** To a 25 mL oven dried round bottom flask under argon atmosphere was added PdCl$_2$(PPh$_3$)$_2$ (20 mg, 0.029 mmol), CuI (11 mg, 0.058 mmol) and 3 mL of Et$_3$N. The contents were stirred at
room temperature for 5 min. To reaction flask a premixed solution of 2-iodocyclopropyl ketone S2 (2.87 mmol) and alkyne (3.44 mmol) in 5 mL THF was added. The reaction was continued for 1 h and quenched with a saturated solution of NH₄Cl (3 ml). The contents were extracted with ethyl acetate and the combined organic phase was washed with brine and dried over anhydrous Na₂SO₄. Solvent was evaporated on a rotavapor and the crude product was purified by silica gel column chromatography (eluent: 97:3 hexane:EtOAc) to afford S2.

(2-iodophenyl)((1S*,2S*)-2-(p-tolyl)cyclopropyl)methanone (S2a): Following general procedure-1, cyclopropanation of S1a gave S2a as a viscous liquid (91% yield, 0.988g); Rf = 0.5 (9.5:0.5 hexanes:EtOAc); FT IR (neat): 1681, 1390, 1213 cm⁻¹; ¹H NMR (500 MHz, CDCl₃) δ 7.89 (dd, J = 7.9, 0.9 Hz, 1H), 7.44 (dd, J = 7.7, 1.7 Hz, 1H), 7.38 (td, J = 7.5, 1.0 Hz, 1H), 7.12 – 7.08 (m, 3H), 7.06-7.04 (m, 2H), 2.79 – 2.75 (m, 1H), 2.62 – 2.58 (m, 1H), 2.32 (s, 3H), 1.99 – 1.96 (m, 1H), 1.62 – 1.57 (m, 1H); ¹³C NMR (125 MHz, CDCl₃) δ 203.0, 145.4, 140.4, 136.9, 136.5, 131.7, 129.3, 128.6, 128.2, 126.2, 91.4, 33.1, 31.9, 21.2, 20.8; HRMS (APCI, m/z): calc. for C₁₇H₁₆IO [M+H]⁺ 363.0233, found 363.0240.

(2-iodophenyl)((1S*,2S*)-2-phenylcyclopropyl)methanone (S2b): Following general procedure-1, cyclopropanation of S1b gave S2b as a viscous liquid (93% yield, 0.970g); Rf = 0.5 (9.5:0.5 hexanes:EtOAc); FT IR (neat): 1683, 1593, 1377 cm⁻¹; ¹H NMR (400 MHz, CDCl₃) δ 7.90 (d, J = 7.8 Hz, 1H), 7.44 – 7.36 (m, 2H), 7.8 (t, J = 7.0 Hz, 2H), 7.21 (dd, J = 14.6, 7.7 Hz, 1H), 7.16 (d, J = 7.4 Hz, 2H), 7.10 (t, J = 6.2 Hz, 1H), 2.86 – 2.76 (m, 1H), 2.67 – 2.60 (m, 1H), 2.03 – 1.96 (m, 1H), 1.64 – 1.58 (m, 1H); ¹³C NMR (100 MHz, CDCl₃) δ 202.9, 145.4, 140.4, 136.9, 136.5, 131.8, 128.7, 128.6, 128.2, 126.8, 126.3, 91.4, 33.1, 32.0, 21.0; HRMS (ESI, m/z): calc. for C₁₆H₁₃INO [M+Na]⁺ 370.9903.

(2-iodophenyl)((1S*,2S*)-2-(naphthalen-1-yl)cyclopropyl)methanone (S2c): Following general procedure-1, cyclopropanation of S1c gave S2c as a viscous liquid (85% yield, 1.013g); Rf = 0.45 (9:1 hexanes:EtOAc); FT IR (neat): 1680, 1492, 1231 cm⁻¹; ¹H NMR (400 MHz, CDCl₃) δ 8.22 (d, J = 8.2 Hz, 1H), 7.91 (d, J = 7.9 Hz, 1H), 7.84 (d, J = 7.4 Hz, 1H), 7.74 (d, J = 8.2 Hz, 1H), 7.57 – 7.45 (m, 3H), 7.37 (q, J = 7.2 Hz, 2H), 7.28 (d, J = 7.0 Hz, 1H), 7.09 (td, J = 7.8, 1.2 Hz, 1H), 3.41 – 3.32 (m, 1H), 2.66 – 2.56 (m, 1H), 2.10 – 2.00 (m, 1H), 1.85 – 1.75 (m, 1H); ¹³C NMR (101 MHz, CDCl₃) δ
(2-iodophenyl)((1S*,2S*)-2-(2-methoxyphenyl)cyclopropyl)methanone (S2d): Following general procedure-1, cyclopropanation of S1d gave S2d as a viscous liquid (83% yield, 0.941 g); Rf = 0.5 (9:1 hexanes:EtOAc); FT IR (neat): 1681, 1515, 1249 cm⁻¹; ¹H NMR (500 MHz, CDCl₃) δ 7.89 (d, J = 7.9 Hz, 1H), 7.53 (d, J = 7.6 Hz, 1H), 7.37 (t, J = 7.5 Hz, 1H), 7.19 (t, J = 7.8 Hz, 1H), 7.08 (t, J = 7.5 Hz, 1H), 6.99 (d, J = 7.4 Hz, 1H), 6.87 (t, J = 7.6 Hz, 1H), 6.84 (d, J = 8.2 Hz, 1H), 3.80 (s, 3H), 3.00 – 2.88 (m, 1H), 2.56 – 2.44 (m, 1H), 1.97 – 1.91 (m, 1H), 1.65 – 1.59 (m, 1H); ¹³C NMR (125 MHz, CDCl₃) δ 203.3, 158.5, 145.4, 140.4, 131.5, 128.6, 128.2, 127.9, 126.3, 120.5, 110.4, 91.4, 55.4, 31.5, 27.4, 18.6; HRMS (ESI, m/z): Calc. for C₁₇H₁₆INO [M+H]^+ 379.0173, found 379.0189.

(2-iodophenyl)((1S*,2S*)-2-(4-methoxyphenyl)cyclopropyl)methanone (S2e): Following general procedure-1, cyclopropanation of S1e gave S2e as a white solid (83% yield, 0.941 g); Rf = 0.5 (9:1 hexanes:EtOAc); m. p. = 75 - 77 °C; FT-IR (neat): 1681, 1515, 1249 cm⁻¹; ¹H NMR (500 MHz, CDCl₃) δ 7.90 (dd, J = 7.9, 0.8 Hz, 1H), 7.44 (dd, J = 7.7, 1.8 Hz, 1H), 7.39 (td, J = 7.5, 1.0 Hz, 1H), 7.13 – 7.09 (m, 3H), 6.85 – 6.83 (m, 2H), 3.79 (s, 3H), 2.79 – 2.75 (m, 1H), 2.58 – 2.56 (m, 1H), 1.98 – 1.95 (m, 1H), 1.59 – 1.55 (m, 1H); ¹³C NMR (125 MHz, CDCl₃) δ 203.1, 158.6, 145.5, 140.5, 132.0, 131.7, 128.6, 128.2, 127.5, 114.1, 91.4, 55.5, 33.1, 31.7, 20.7; HRMS (ESI, m/z): Calc. for C₁₇H₁₆IO₂ [M+H]^+ 379.0173, found 379.0189.

((1S*,2S*)-2-(3,4-dimethoxyphenyl)cyclopropyl)(2-iodophenyl)methanone (S2f): Following general procedure-1, cyclopropanation of S1f gave S2f as a white solid (72% yield, 0.881 g); Rf = 0.45 (8:2 hexane:EtOAc); m. p. = 80 - 82 °C; FT-IR (neat): 1682, 1519, 1238 cm⁻¹; ¹H NMR (500 MHz, CDCl₃) δ 7.90 – 7.86 (m, 1H), 7.44 (dd, J = 7.7, 1.7 Hz, 1H), 7.38 (td, J = 7.6, 0.9 Hz, 1H), 7.10 (td, J = 7.7, 1.7 Hz, 1H), 6.79 (d, J = 7.9 Hz, 1H), 6.73 – 6.67 (m, 2H), 3.86 (s, 3H), 3.84 (s, 3H), 2.80 – 2.73 (m, 1H), 2.62 – 2.55 (m, 1H), 1.98 – 1.92 (m, 1H), 1.62 – 1.54 (m, 1H); ¹³C NMR (125 MHz, CDCl₃) δ
((JS\textsuperscript{a},2S\textsuperscript{b})-2-(4-chlorophenyl)cyclopropyl)(2-iodophenyl)methanone (S2g): Following general procedure-1, cyclopropanation of S1g gave S2g as a viscous liquid (78% yield, 0.891 g); R\textsubscript{f} = 0.5 (9:1 hexane:EtOAc); FT IR (neat): 1681, 1523, 1324 cm\textsuperscript{-1}; \textsuperscript{1}H NMR (500 MHz, CDCl\textsubscript{3}) \(\delta\) 7.90 (dd, \(J = 8.0, 0.7\) Hz, 1H), 7.44 - 7.38 (m, 2H), 7.27 - 7.24 (m, 2H), 7.14 - 7.11 (m, 1H), 7.10 - 7.07 (m, 2H), 2.79 - 2.75 (m, 1H), 2.63 - 2.60 (m, 1H), 2.00 - 1.97 (m, 1H), 1.59 - 1.55 (m, 1H); \textsuperscript{13}C NMR (125 MHz, CDCl\textsubscript{3}) \(\delta\) 202.7, 145.3, 140.5, 138.5, 132.5, 131.9, 128.8, 128.6, 128.2, 127.7, 91.4, 33.0, 31.2, 21.0; HRMS (APCI, m/z): Calc. for C\textsubscript{16}H\textsubscript{13}ClIO\textsubscript{3} [M+H]\textsuperscript{+} 382.9686, found 382.9694.

((JS\textsuperscript{a},2S\textsuperscript{b})-2-(3-nitrophenyl)cyclopropyl)methanone (S2h): Following general procedure-1, cyclopropanation of S1h gave S2h as a viscous liquid (82% yield, 0.966g); R\textsubscript{f} = 0.5 (9:1 hexanes: EtOAc); FT IR (neat): 1682, 1531, 1349 cm\textsuperscript{-1}; \textsuperscript{1}H NMR (500 MHz, CDCl\textsubscript{3}) \(\delta\) 8.08 (ddd, \(J = 8.1, 2.2, 1.1\) Hz, 1H), 7.99 (t, \(J = 1.9\) Hz, 1H), 7.91 (d, \(J = 7.8\) Hz, 1H), 7.54 (d, \(J = 7.8\) Hz, 1H), 7.49 - 7.41 (m, 3H), 7.15 (ddd, \(J = 7.9, 7.1, 2.1\) Hz, 1H), 2.93 - 2.89 (m, 1H), 2.76 - 2.73 (m, 1H), 2.07 - 2.03 (m, 1H), 1.69 - 1.66 (m, 1H); \textsuperscript{13}C NMR (125 MHz, CDCl\textsubscript{3}) \(\delta\) 202.2, 148.6, 145.0, 142.3, 140.5, 133.0, 132.1, 129.6, 128.7, 128.3, 121.8, 120.8, 91.4, 32.9, 30.6, 21.2; HRMS (ESI, m/z): Calc. for C\textsubscript{16}H\textsubscript{12}INaO\textsubscript{3} [M+Na]\textsuperscript{+} 415.9754, found 415.9765.

((2-iodophenyl)((JS\textsuperscript{a},2S\textsuperscript{b})-2-(4-nitrophenyl)cyclopropyl)methanone (S2i): Following general procedure-1, cyclopropanation of S1i gave S2i as a white solid (83% yield, 0.978g); R\textsubscript{f} = 0.45 (9:1 hexanes: EtOAc); m. p. = 102 - 104 °C; FT IR (neat): 1682, 1530, 1348 cm\textsuperscript{-1}; \textsuperscript{1}H NMR (500 MHz, CDCl\textsubscript{3}) \(\delta\) 8.16 (dd, \(J = 8.7, 1.7\) Hz, 2H), 7.92 (d, \(J = 8.0\) Hz, 1H), 7.45 - 7.41 (m, 2H), 7.30 (d, \(J = 8.8\) Hz, 2H), 7.17 - 7.13 (m, 1H), 2.91 - 2.87 (m, 1H), 2.78 - 2.75 (m, 1H), 2.10 - 2.07 (m, 1H), 1.69 - 1.64 (m, 1H); \textsuperscript{13}C NMR (125 MHz, CDCl\textsubscript{3}) \(\delta\) 202.1, 148.0, 146.8, 145.0, 140.5, 132.1, 128.7, 128.4, 126.9, 124.0, 91.4, 33.5, 31.0, 21.8; HRMS (ESI, m/z): Calc. for C\textsubscript{16}H\textsubscript{13}INaO\textsubscript{3} [M+Na]\textsuperscript{+} 415.9754, found 415.9765.
(2-(phenylethynyl)phenyl)((1S*,2S*)-2-(p-tolyl)cyclopropyl)methanone (5a): Following general procedure-2, Sonogashira coupling of S2a with phenylacetylene gave 5a as a white solid (74% yield, 0.713g); Rf = 0.5 (9.5:0.5 hexanes: EtOAc); m. p. = 60 - 62 °C; FT IR (neat): 2215, 1668, 1391, 1209cm⁻¹; ¹H NMR (400 MHz, CDCl₃) δ 7.65 (d, J = 7.6 Hz, 1H), 7.60 (d, J = 7.6 Hz, 1H), 7.45 (t, J = 7.5 Hz, 1H), 7.38 (t, J = 7.5 Hz, 1H), 7.33 – 7.22 (m, 5H), 7.00 – 6.9 (m, 4H), 3.20 – 3.11 (m, 1H), 2.85 – 2.75 (m, 1H), 2.27 (s, 3H), 1.96 – 1.86 (m, 1H), 1.57 – 1.49 (m, 1H); ¹³C NMR (100 MHz, CDCl₃) δ 202.1, 141.9, 137.4, 136.1, 133.8, 131.7, 131.0, 129.3, 128.5, 128.4, 128.3, 126.1, 122.9, 121.6, 95.2, 87.9, 32.8, 30.8, 21.5, 21.1; HRMS (ESI, m/z): Calc. for C₂₅H₂₁O [M+H]⁺ 337.1580, found 337.1587.

((1S*,2S*)-2-phenylcyclopropyl)(2-phenylethynyl)phenyl)methanone (5b): Following general procedure-2, Sonogashira coupling of S2b with phenylacetylene gave 5b as a white solid (79% yield, 0.730g); Rf = 0.43 (9.5:0.5 hexanes: EtOAc); m. p. = 67 - 68 °C; FT IR (neat): 2202, 1671, 1524, 1245 cm⁻¹; ¹H NMR (400 MHz, CDCl₃) δ 7.66 (dd, J = 7.7, 1.1 Hz, 1H), 7.62 (dd, J = 7.7, 1.1 Hz, 1H), 7.46 (d, J = 7.5 Hz, 1H), 7.38 (t, J = 7.5 Hz, 1H), 7.31 – 7.24 (m, 5H), 7.22 - 7.19 (m, 2H), 7.17 - 7.11 (m, 3H), 2.86 - 2.81 (m, 1H), 1.95 - 1.90 (m, 1H), 1.58 - 1.54 (m, 1H); ¹³C NMR (100 MHz, CDCl₃) δ 202.0, 141.9, 140.5, 133.8, 131.6, 131.0, 128.6, 128.6, 128.4, 128.4, 126.2, 122.9, 121.5, 95.2, 87.9, 32.8, 30.8, 21.7; HRMS (ESI, m/z): Calc. for C₂₄H₁₈ONa [M+Na]⁺ 345.1212, found 345.1250.

(2-(hex-1-yn-1-yl)phenyl)((1S*,2S*)-2-phenylcyclopropyl)methanone (5c): Following general procedure-2, Sonogashira coupling of S2b with 1-hexyne gave 5c as a liquid (72% yield, 0.624g); Rf = 0.35 (9.5:0.5 hexanes: EtOAc); FT IR (neat): 2228, 1670, 1396, 1209 cm⁻¹; ¹H NMR (500 MHz, CDCl₃) δ 7.57 (dd, J = 7.7, 1.3 Hz, 1H), 7.46 (d, J = 7.7 Hz, 1H), 7.38 (td, J = 7.5, 1.4 Hz, 1H), 7.33 – 7.26 (m, 3H), 7.22 – 7.17 (m, 1H), 7.16 – 7.12 (m, 2H), 3.20 - 3.13 (m, 1H), 2.79 - 2.71 (m, 1H), 1.99 - 1.89 (m, 3H), 1.53 - 1.48 (m, 1H), 1.42 - 1.29 (m, 4H), 0.88 (t, J = 7.1 Hz, 3H); ¹³C NMR (125 MHz, CDCl₃) δ 202.6, 142.0, 140.9, 133.8, 130.9, 128.6, 128.2, 127.7, 126.5, 126.1, 122.5, 97.3, 79.0, 33.1, 31.1, 30.7, 22.2, 21.5, 19.0, 13.7; HRMS (ESI, m/z): Calc. for C₂₂H₂₁O [M-H]⁻ 301.1591, found 301.1587.
((1S*,2S*)-2-phenylcyclopropyl)(2-(p-tolylethynyl)phenyl)methanone (5d): Following general procedure-2, Sonogashira coupling of S2b with tolylacetylene gave 5d as a white solid (84% yield, 0.810g); Rf = 0.5 (9.5:0.5 hexanes: EtOAc); m. p. = 108 - 110 °C; FT IR (neat): 2213, 1671, 1396, 1209 cm⁻¹; ¹H NMR (400 MHz, CDCl₃) δ 7.64 (d, J = 6.6 Hz, 1H), 7.60 (d, J = 7.4 Hz, 1H), 7.44 (t, J = 7.4 Hz, 1H), 7.36 (t, J = 7.5 Hz, 1H), 7.25 – 7.14 (m, 5H), 7.14 – 7.04 (m, 4H), 3.25 - 3.16 (m, 1H), 2.89 - 2.79 (m, 1H), 2.34 (s, 3H), 1.98 - 1.87 (m, 1H), 1.59 - 1.51 (m, 1H); ¹³C NMR (100 MHz, CDCl₃) δ 202.1, 141.8, 140.5, 138.8, 133.7, 131.5, 129.2, 128.6, 128.3, 128.2, 126.5, 126.2, 121.8, 119.8, 95.5, 87.4, 32.8, 30.7, 21.6; HRMS (ESI, m/z): Calc. for C₂₅H₂₀NaO [M+Na]⁺ 359.1406, found 359.1397.

(2-(naphthalen-1-ylethynyl)phenyl)((1S*,2S*)-2-phenylcyclopropyl)methanone (5e): Following general procedure-2, Sonogashira coupling of S2b with naphthylacetylene gave 5e as a viscous liquid (88% yield, 0.939g); Rf = 0.45 (9.5:0.5 hexanes: EtOAc); FT IR (neat): 2214, 1672, 1456, 1235 cm⁻¹; ¹H NMR (400 MHz, CDCl₃) δ 8.42 (d, J = 8.2 Hz, 1H), 7.83 (dd, J = 12.2, 8.2 Hz, 2H), 7.77 – 7.67 (m, 2H), 7.60 – 7.48 (m, 4H), 7.41 – 7.34 (m, 2H), 7.11 – 7.03 (m, 5H), 3.21 - 3.17 (m, 1H), 2.85 - 2.80 (m, 1H), 1.99 - 1.95 (m, 1H), 1.56 - 1.51 (m, 1H); ¹³C NMR (100 MHz, CDCl₃) δ 201.9, 141.9, 140.4, 134.0, 133.4, 133.3, 131.1, 130.7, 129.2, 128.5, 128.5, 128.4, 128.4, 127.0, 126.6, 126.5, 126.4, 126.1, 125.4, 121.7, 120.6, 93.3, 92.8, 32.9, 31.1, 21.5; HRMS (APCI, m/z): Calc. for C₂₈H₂₁O [M+H]⁺ 373.1582, found 373.1587.

(2-((3,4-dimethoxyphenyl)ethynyl)phenyl)((1S*,2S*)-2-phenylcyclopropyl)methanone (5f): Following general procedure-2, Sonogashira coupling of S2b with 3,4-dimethoxyphenylacetylene gave 5f as a viscous liquid (86% yield, 0.942g); Rf = 0.35 (8:2 hexanes: EtOAc); FT-IR (neat): 2215, 1670, 1574, 1214 cm⁻¹; ¹H NMR (500 MHz, CDCl₃) δ 7.66
(dd, J = 7.8, 1.0 Hz, 1H), 7.61 (dd, J = 7.7, 0.8 Hz, 1H), 7.45 (td, J = 7.6, 1.3 Hz, 1H), 7.37 (td, J = 7.6, 1.2 Hz, 1H), 7.20 - 7.17 (m, 2H), 7.16 - 7.13 (m, 1H), 7.12 - 7.09 (m, 2H), 6.93 - 6.91 (m, 1H), 6.77 - 6.76 (m, 1H), 3.90 (s, 3H), 3.86 (s, 3H), 3.23 - 3.16 (m, 1H), 2.85 - 2.80 (m, 1H), 1.96 - 1.90 (m, 1H), 1.57 - 1.52 (m, 1H); $^{13}$C NMR (125 MHz, CDCl$_3$) δ 202.1, 149.8, 148.7, 141.8, 140.5, 133.6, 131.1, 128.5, 128.4, 128.2, 126.6, 126.2, 125.1, 121.8, 115.1, 114.2, 111.1, 95.4, 86.7, 56.0, 32.6, 30.7, 21.6; HRMS (ESI, m/z): Calc. for C$_{26}$H$_{23}$O$_3$ [M+H]$^+$ 383.1661, found 383.1642.

((1S*,2S*)-2-(napthalene-1-yl)cyclopropyl)(2-(phenylethynyl)phenyl)methanone (5g): Following general procedure-2, Sonogashira coupling of S2c with phenylacetylene gave 5g as a viscous liquid (88% yield, 0.940g); R$_f$ = 0.4 (9.5:0.5 hexanes: EtOAc); FT IR (neat): 2211, 1670, 1458, 1232 cm$^{-1}$; $^1$H NMR (400MHz, CDCl$_3$) δ 8.21 - 8.18 (m, 1H), 7.82 - 7.80 (m, 1H), 7.77 (dd, J = 7.7, 1 Hz, 1H), 7.70 (d, J = 7.8 Hz, 1H), 7.63 (dd, J = 7.6, 1 Hz, 1H), 7.49 - 7.39 (m, 4H), 7.33 - 7.21 (m, 7H), 3.41 - 3.35 (m, 1H), 3.19 - 3.14 (m, 1H), 2.04 - 2.00 (m, 1H), 1.79 - 1.74 (m, 1H); $^{13}$C NMR (100MHz, CDCl$_3$) δ 202.3, 141.9, 136.1, 133.9, 133.7, 133.1, 131.6, 131.1, 128.6, 128.4, 127.6, 126.3, 125.9, 125.4, 124.1, 123.6, 122.8, 121.6, 95.0, 88.0, 30.9, 28.4, 19.7; HRMS (ESI, m/z): Calc. for C$_{28}$H$_{21}$O$_2$ [M+H]$^+$ 373.1597, found 373.1587.

((1S*,2S*)-2-(naphthalen-1-yl)cyclopropyl)(2-(p-tolylethynyl)phenyl)methanone (5h): Following general procedure-2, Sonogashira coupling of S2c with p-tolylacetylene gave 5h as a viscous liquid (76% yield, 0.841g); R$_f$ = 0.4 (9.5:0.5 hexanes: EtOAc); FT IR (neat): 2214, 1674, 1355, 1210 cm$^{-1}$; $^1$H NMR (500 MHz, CDCl$_3$) δ 8.22 - 8.18 (m, 1H), 7.80 - 7.77 (m, 1H), 7.75 (dd, J = 7.7, 1.2 Hz, 1H), 7.69 (d, J = 8.0 Hz, 1H), 7.60 (d, J = 7.7 Hz, 1H), 7.45-7.42 (m, 3H), 7.37 (t, J = 7.6 Hz, 1H), 7.32 - 7.25 (m, 2H), 7.19-7.17 (m, 2H), 7.03 (d, J = 7.6Hz, 2H), 3.41 - 3.34 (m, 1H), 3.18-3.14 (m, 1H), 2.32 (s, 3H), 2.03-2.00 (m, 1H), 1.78 - 1.74 (m, 1H); $^{13}$C NMR (125 MHz, CDCl$_3$) δ 202.4, 141.9, 138.8, 136.1, 133.8, 133.6, 133.1, 131.5, 131.1, 129.2, 128.6, 128.3, 128.2, 127.6, 126.3, 126.0, 125.40, 124.1, 123.6, 121.8, 119.8, 95.3, 87.5, 30.9, 28.40, 21.6, 19.7; HRMS (ESI, m/z): Calc. for C$_{29}$H$_{23}$O$_2$ [M+H]$^+$ 387.1729, found 387.1743.
2-((3,4-dimethoxyphenyl)ethynyl)phenyl)((1S*,2S*)-2-(naphthalen-1-yl)cyclopropyl)methanone (5i): Following general procedure-2, Sonogashira coupling of S2c with 3,4-dimethoxyphenylacetylene gave 5i as a white solid (87% yield, 1.079 g); Rf = 0.35 (8:2 hexanes: EtOAc); m. p. = 90 - 92 °C; FT IR (neat): 2201, 1672, 1514, 1249 cm⁻¹; ¹H NMR (500 MHz, CDCl₃) δ 8.22 – 8.17 (m, 1H), 7.82 – 7.77 (m, 1H), 7.75 (dd, J = 7.7, 0.9 Hz, 1H), 7.70 – 7.67 (m, 1H), 7.63 – 7.60 (m, 1H), 7.48 – 7.42 (m, 3H), 7.39 (td, J = 7.6, 1.2 Hz, 1H), 7.32 – 7.24 (m, 2H), 6.90 (dd, J = 8.3, 1.8 Hz, 1H), 6.85 (d, J = 1.7 Hz, 1H), 6.71 (d, J = 8.3 Hz, 1H), 3.88 (s, 3H), 3.77 (s, 3H), 3.75 - 3.60 (m, 1H), 3.20 - 3.15 (m, 1H), 2.05 - 2.00 (m, 1H), 1.77 - 1.72 (m, 1H); ¹³C NMR (125 MHz, CDCl₃) δ 202.4, 149.8, 148.6, 141.9, 136.1, 133.6, 133.6, 133.0, 131.1, 128.6, 128.3, 128.1, 127.6, 126.3, 125.9, 125.3, 125.0, 124.0, 123.6, 121.8, 115.1, 114.1, 111.0, 95.2, 86.7, 56.0, 55.9, 30.8, 28.3, 19.8; HRMS (ESI, m/z): Calc. for C₃₀H₂₅O₃ [M+H]⁺ 433.1789, found 433.1798.

((1S*,2S*)-2-(2-methoxyphenyl)cyclopropyl)(2-(p-tolylethynyl)phenyl)methanone (5j): Following general procedure-2, Sonogashira coupling of S2d with p-tolylacetylene gave 5j as a white solid (80% yield, 0.840 g); Rf = 0.5 (8.5:1.5 hexanes: EtOAc); m. p. = 69 – 70 °C; FT IR (neat): 2215, 1674, 1494, 1248 cm⁻¹; ¹H NMR (400 MHz, CDCl₃) δ 7.69 (d, J = 7.6 Hz, 1H), 7.59 (d, J = 7.5 Hz, 1H), 7.42 (td, J = 7.5, 1.3 Hz, 1H), 7.36 (td, J = 7.5, 1.0 Hz, 1H), 7.26 (d, J = 7.9 Hz, 2H), 7.18 – 7.11 (m, 1H), 7.09 (d, J = 7.9 Hz, 2H), 6.95 (d, J = 7.0 Hz, 1H), 6.81 (t, J = 7.5 Hz, 1H), 6.77 (d, J = 8.2 Hz, 1H), 3.72 (s, 3H), 3.11 – 3.04 (m, 1H), 3.04 – 2.96 (m, 1H), 2.35 (s, 3H), 1.94 – 1.87 (m, 1H), 1.63 – 1.56 (m, 1H); ¹³C NMR (100 MHz, CDCl₃) δ 202.6, 158.5, 142.3, 138.8, 133.6, 131.6, 130.8, 129.2, 128.8, 128.3, 128.1, 127.6, 126.1, 121.6, 120.5, 120.0, 110.5, 95.1, 87.5, 55.4, 31.3, 26.3, 21.7, 19.4; HRMS (ESI, m/z): Calc. for C₂₆H₂₃O₂ [M+H]⁺ 367.1713, found 367.1693.
Following general procedure-2, Sonogashira coupling of S2e with 1-naphthylacetylene gave 5k as a viscous liquid (78% yield, 0.900g); Rf = 0.4 (9:1 hexanes: EtOAc); FT IR (neat): 2212, 1671, 1545, 1256 cm⁻¹; ¹H NMR (500 MHz, CDCl₃) δ 8.49 – 8.44 (m, 1H), 7.89 (d, J = 8.2 Hz, 1H), 7.86 (d, J = 8.2 Hz, 1H), 7.78 (t, J = 7.7 Hz, 2H), 7.63 (t, J = 7.7 Hz, 1H), 7.59 – 7.50 (series of m, 3H), 7.47 (td, J = 7.6, 1.2 Hz, 1H), 7.41 (t, J = 7.7 Hz, 1H), 6.99 (d, J = 7.2 Hz, 2H), 6.64 (d, J = 6.9 Hz, 2H), 3.73 (s, 3H), 3.21 – 3.18 (m, 1H) 2.89 – 2.82 (m, 1H), 2.02 – 1.98 (m, 1H), 1.57 – 1.51 (m, 1H).

Following general procedure-2, Sonogashira coupling of S2f with phenylacetylene gave 5l as a white solid (81% yield, 0.888g); Rf = 0.35 (8:2 hexanes: EtOAc); m.p. = 111 – 113 °C; FT IR (neat): 2215, 1668, 1519, 1259 cm⁻¹; ¹H NMR (500 MHz, CDCl₃) δ 7.68 (dd, J = 7.8, 1.1 Hz, 1H), 7.62 (d, J = 7.7 Hz, 1H), 7.49-7.43 (m, 1H), 7.42 – 7.36 (m, 1H), 7.32 – 7.27 (m, 1H), 7.25 (m, 4H), 6.69 – 6.61 (m, 3H), 3.81 (s, 3H), 3.74 (s, 3H), 3.22 – 3.15 (m, 1H), 2.82 – 2.78 (m, 1H), 1.93 - 1.86 (m, 1H), 1.56 - 1.51 (m, 1H); ¹³C NMR (125 MHz, CDCl₃) δ 202.0, 149.0, 147.9, 141.8, 133.9, 133.0, 131.6, 131.1, 128.7, 128.5, 128.4, 122.8, 121.6, 117.9, 111.3, 109.9, 95.3, 87.9, 56.0, 55.99, 55.85, 32.8, 30.9, 21.5; HRMS (ESI, m/z): Calc. for C₂₉H₂₃O₂ [M+H]\(^{+}\) 403.1691, found 403.1693.

Following general procedure-2, Sonogashira coupling of S2g with phenylacetylene gave 5m as a white solid (85% yield, 0.868g); Rf = 0.4 (9.5:0.5 hexanes: EtOAc); m. p. = 79 - 81 °C; FT IR (neat): 2215, 1670, 1493, 1210 cm⁻¹; ¹H NMR (500 MHz, CDCl₃) δ 7.65 (d, J = 7.7 Hz, 1H), 7.61 (d, J = 7.6 Hz, 1H), 7.46 (dd, J = 7.5, 1.2 Hz, 1H), 7.40 (td, J = 7.6, 0.9 Hz, 1H), 7.34 - 7.30 (m, 1H), 7.28 - 7.23 (m, 2H), 7.23-7.18 (m, 2H), 7.10 (d, J = 8.4 Hz, 2H), 7.00 (d, J = 8.4 Hz, 2H), 3.23 – 3.18 (m, 1H), 2.83 - 2.76 (m, 1H), 1.95 - 1.87 (m, 1H), 1.53 – 1.46 (m, 1H); ¹³C NMR (125 MHz, CDCl₃) δ 201.8, 141.6, 139.0, 133.9, 132.2, 131.5, 131.2, 128.7, 128.7, 128.5, 128.4, 127.5, 122.6, 121.6, 95.5, 87.7, 32.8, 30.1, 21.7; HRMS (ESI, m/z): Calc. for C₂₆H₂₁ClO [M+H]\(^{+}\) 383.1656, found 383.1642.
(1S*,2S*)-2-(3-nitrophenyl)cyclopropyl)(2-(phenylethynyl)phenyl)methanone (5n): Following general procedure-2, Sonogashira coupling of S2h with phenylacetylene gave 5n as a brown solid (76% yield, 0.800g); Rf = 0.45 (9:1 hexanes: EtOAc); m. p. = 103 - 102 °C; FT IR (neat): 2211, 1671, 1530, 1350 cm⁻¹; ¹H NMR (400 MHz, CDCl₃) δ 7.66 (d, J = 7.6 Hz, 1H), 7.61 (d, J = 7.4 Hz, 1H), 7.45 (t, J = 7.5 Hz, 1H), 7.32 - 7.22 (m, 2H), 6.72 (d, J = 8.5 Hz, 2H), 3.74 (s, 3H), 3.20 – 3.10 (m, 1H), 2.85 – 2.75 (m, 1H), 1.93 – 1.87 (m, 1H), 1.54 – 1.48 (m, 1H); ¹³C NMR (100 MHz, CDCl₃) δ 201.2, 148.4, 142.8, 141.4, 133.9, 132.5, 131.4, 129.3, 128.7, 128.6, 128.5, 128.4, 122.5, 121.7, 121.5, 120.5, 95.5, 87.6, 32.9, 29.7, 21.8; HRMS (ESI, m/z): Calc. for C₂₄H₁₈NO₃ [M+H]⁺ 368.1282, found 368.1281.

(1S*,2S*)-2-(4-nitrophenyl)cyclopropyl)(2-(phenylethynyl)phenyl)methanone (5p): Following general procedure-2, Sonogashira coupling of S2i with phenylacetylene gave 5p as a yellow solid (77% yield, 0.811g); Rf = 0.45 (9:1 hexanes: EtOAc); m. p. = 108 - 110 °C; FT IR (neat): 2215, 1670, 1530, 1350 cm⁻¹; ¹H NMR (500 MHz, CDCl₃) δ 7.88 - 7.84 (m, 2H), 7.67 (dd, J = 7.8, 1.1 Hz, 1H), 7.60 (dd, J = 7.7, 0.9 Hz, 1H), 7.48 (td, J = 7.6, 1.4 Hz, 1H), 7.43 - 7.39 (m, 2H), 7.30 - 7.25 (m, 1H), 7.09 (d, J = 8.1 Hz, 2H), 7.00 (d, J = 7.9 Hz, 2H), 3.36 (ddd, J = 8.4, 5.3, 4.1 Hz, 1H), 2.88 (ddd, J = 9.0, 6.5, 4.1 Hz, 1H), 2.34 (s, 3H), 1.99 (ddd, J = 9.4, 5.3, 4.3 Hz, 1H), 1.56 (ddd, J = 8.3, 6.5, 4.3 Hz, 1H); ¹³C NMR (125 MHz, CDCl₃) δ 201.5, 148.4, 142.9, 141.4, 139.1, 133.9, 132.5, 131.4, 131.2, 129.3, 128.7, 128.5, 128.4, 121.9, 121.4, 120.6, 119.4, 95.9, 87.0, 33.0, 29.8, 21.9, 21.6; HRMS (APCI, m/z): Calc. for C₂₅H₂₀NO₃ [M+H]⁺ 382.1420, found 382.1438.
EtOAc; m. p. = 106 - 108 °C; FT IR (neat); 2215, 1671, 1531, 1349 cm⁻¹; ¹H NMR (400 MHz, CDCl₃) δ 7.89 (d, J = 8.7 Hz, 2H), 7.67 (dd, J = 7.7, 1.1 Hz, 1H), 7.61 (dd, J = 7.6, 0.7 Hz, 1H), 7.49 (td, J = 7.5, 1.4 Hz, 1H), 7.42 (td, J = 7.6, 1.2 Hz, 1H), 7.30 – 7.22 (m, 1H), 7.22 – 7.10 (m, 6H), 3.38 - 3.36 (m, 1H), 2.89 - 2.84 (m, 1H), 2.05 - 2.00 (m, 1H), 1.60 - 1.55 (m, 1H); ¹³C NMR (100 MHz, CDCl₃) δ 201.2, 148.5, 146.5, 141.3, 134.0, 131.5, 131.3, 128.8, 128.7, 128.6, 128.3, 126.5, 123.8, 122.4, 121.7, 95.6, 87.5, 33.6, 30.2, 22.2; HRMS (APCI, m/z): Calc. for C₂₄H₁₈NO₃ [M+H]+ 368.1289, found 368.1281.

3. Synthesis of 2,3-dihydronaphtho[1,2-b]furans 6

Preliminary study on transannulation

1-phenyl-2-(2-((1S*,2S*)-2-(p-tolyl)cyclopropanecarbonyl)phenyl)ethanone (7a): To a solution of (2-(phenylethynyl)phenyl)cyclopropyl ketone 5a (0.31 mmol) in dry toluene (1.5 mL) was added AgOTf (0.03 mmol, 10 mol %) and the mixture was stirred under argon at 80 °C. After 5 h, TLC analysis indicated complete consumption of the starting material and formation of two products. Solvent was evaporated under reduced pressure and the crude mixture was purified by flash column chromatography. Elution with ethyl acetate/hexanes (4:96) gave 2,3-dihydronaphtho[1,2-b]furan 6a (45% yield, 0.047g) as a white solid. Continued elution with ethyl acetate/hexanes (5:95) gave the hydrated product 7a (36% yield, 0.037g) as a viscous liquid.

7a: Rᵣ = 0.3 (8:2 hexanes:EtOAc); FT IR (neat): 1680, 1670, 1579, 1336 cm⁻¹; ¹H NMR (400 MHz, CDCl₃) δ 8.01 (d, J = 7.2 Hz, 2H), 7.83 (d, J = 7.6 Hz, 1H), 7.56 (t, J = 7.4 Hz, 1H), 7.48 - 7.42 (m, 3H), 7.35 (t, J = 8.1 Hz, 1H), 7.23 (d, J = 7.9 Hz, 1H), 7.10 - 7.03 (m, 4H), 4.62 (ABq, J = 17.2 Hz, 2H), 2.75 - 2.70 (m, 1H), 2.56 - 2.51 (m, 1H), 2.31 (s, 3H), 1.80 - 1.75 (m, 1H), 1.48 - 1.44 (m, 1H); ¹³C NMR (100 MHz, CDCl₃) δ 202.1, 197.4, 139.0, 137.5, 137.2, 136.3, 134.3, 133.1, 132.6, 131.6, 129.4, 129.3, 128.7, 128.4, 127.2, 126.3, 44.0, 32.1, 30.5, 21.2, 19.3; HRMS (ESI, m/z): Calc. for C₂₉H₂₇O₅ [M+H]+ 355.1702, found 355.1693.

Independently, reaction of hydrated product 7a with 10 mol% AgOTf in toluene at 80 °C for 4 h furnished 6a (80% yield, 0.030g).

(R*)-4-phenyl-2-(p-tolyl)-2,3-dihydronaphtho[1,2-b]furan (6a): Rᵣ = 0.5 (9.5:0.5 hexane:EtOAc); m.p. 156 °C; FT IR (neat): 1595, 1461, 1031 cm⁻¹; ¹H NMR (500 MHz, CDCl₃) δ 8.06 - 8.04 (m, 1H), 7.86 - 7.84 (m, 1H), 7.54 (dd, J = 8.2, 1.2 Hz, 2H), 7.46 (s, 1H), 7.45 - 7.43 (m, 2H), 7.42 (t, J = 6.2 Hz, 2H), 7.35 (d, J = 8.0 Hz, 2H), 7.34 - 7.32 (m, 1H), 7.17 (d, J = 7.9 Hz, 2H), 5.97 - 5.92 (m, 1H), 3.85 (dd, J = 15.5, 9.6 Hz, 1H), 3.45 (dd, J = 15.5, 8.2 Hz, 1H), 2.34 (s, 3H); ¹³C NMR
(125 MHz, CDCl$_3$) δ 155.6, 140.8, 139.4, 137.9, 137.1, 134.5, 129.5, 128.6, 128.4, 128.1, 127.4, 126.3, 125.9, 125.4, 121.8, 120.0, 119.9, 118.3, 85.0, 39.7, 21.3. HRMS (ESI, m/z): Calc. for C$_{28}$H$_{21}$O [M+H]$^+$ 337.1590, found 337.1587.

**General procedure for transannulation of 5**

**General procedure 3:** To a solution of cyclopropyl ketone 5 (0.3 mmol) in toluene (1.5 mL) was added AgOTf (0.06 mmol, 20 mol %) and H$_2$O (0.6 mmol). The mixture was stirred at 100 °C for 14 h. After completion of the reaction (as indicated by TLC), solvent was evaporated under reduced pressure and the crude material was purified by flash column chromatography (elucent: EtOAc/hexanes, 4:96) to give the desired product 6.

(R$^*$)-2,4-diphenyl-2,3-dihyronaphtho[1,2-b]furan (6b): Sticky solid (79% yield, 0.076g); R$_f$ = 0.5 (9.5:0.5 hexanes: EtOAc); FT IR (neat): 1593, 1391, 1033 cm$^{-1}$; $^1$H NMR (400 MHz, CDCl$_3$) δ 8.11 (dd, $J = 5.4, 4.2$ Hz, 1H), 7.98 – 7.85 (m, 1H), 7.62 – 7.55 (m, 2H), 7.54 – 7.44 (m, 7H), 7.44 – 7.32 (m, 4H), 6.11 – 5.94 (m, 1H), 3.93 (dd, $J = 15.5, 9.7$ Hz, 1H), 3.50 (dd, $J = 15.5, 8.1$ Hz, 1H); $^{13}$C NMR (100 MHz, CDCl$_3$) δ 155.5, 142.4, 140.6, 137.1, 134.6, 128.8, 128.6, 128.4, 128.1, 128.1, 127.4, 126.4, 125.9, 125.5, 121.8, 120.1, 119.8, 118.2, 84.9, 39.8; HRMS (ESI, m/z): Calc. for C$_{24}$H$_{19}$O [M+H]$^+$ 323.1423, found 323.1430.

(R$^*$)-4-butyl-2-phenyl-2,3-dihyronaphtho[1,2-b]furan (6c): Sticky solid (78% yield, 0.070g); R$_f$ = 0.5 (9.5:0.5 hexanes: EtOAc); FT IR (neat): 1591, 1358, 1059 cm$^{-1}$; $^1$H NMR (500 MHz, CDCl$_3$) δ 7.97 (d, $J = 7.9$ Hz, 1H), 7.75 (d, $J =$
The structure of 6c was further confirmed by 2D NMR spectroscopy as follows.

**HSQCGP:** 7.97 (d, J = 7.9 Hz, 1H) / 121.7; 7.75 (d, J = 7.8 Hz, 1H) / 127.5; 7.45 (d, J = 7.6 Hz, 2H) / 125.9; 7.40 - 7.36 (m, 2H) / 124.6 and 125.86; 7.36 (d, J = 7.5 Hz, 2H) / 128.8; 7.33 - 7.28 (m, 1H) / 128.1, 7.20 (s, 1H) / 119.0; 5.97 (m, 1H) / 84.7; 3.77 (dd, J = 15.3, 9.9 Hz, 1H) / 38.6; 3.30 (dd, J = 15.3, 8.0 Hz, 1H) / 38.6; 2.67 (t, J = 7.8 Hz, 2H) / 33.8; 1.63 (m, 2H) / 32.3; 1.39 (m, 2H) / 22.7; 0.93 (t, J = 7.3 Hz, 3H) / 14.1.

**HMBCGP:** 7.97 (d, J = 7.9 Hz, 1H) / 125.86, 134.6, 154.9 (weak); 7.75 (d, J = 7.8 Hz, 1H) / 119.0, 119.1, 124.6; 7.45 (d, J = 7.6 Hz, 2H) / 84.7, 125.9 (other ortho carbon), 128.1; 7.40 - 7.36 (m, 1H) / 119.1, 127.5, 134.6 (weak); 7.36 (d, J = 7.5 Hz, 2H) / 128.8, 142.7; 7.33 - 7.28 (m, 1H) / 125.9; 7.20 (s, 1H) / 33.8, 119.1, 127.5, 134.6, 154.9 (weak); 5.97 (m, 1H) / 125.9; 3.77 (dd, J = 15.3, 9.9 Hz, 1H) / 84.7 (weak), 119.4, 142.7, 154.9; 3.30 (dd, J = 15.3, 8.0 Hz, 1H) / 84.7, 119.0, 142.7, 154.9; 2.67 (t, J = 7.8 Hz, 2H) / 22.7, 32.3, 119.0, 137.8; 1.63 (m, 2H) / 14.1, 22.7, 33.8, 137.8; 1.39 (m, 2H) / 14.1, 33.8; 0.93 (t, J = 7.3 Hz, 3H) / 22.7, 32.3;

**COSYPHPR:** 7.97 (d) / 7.40 - 7.34 (m); 7.75 (d) / 7.42 - 7.36 (m); 7.45 (d) / 7.36 (m) / 7.75 (d); 7.40 - 7.34 (m) / 7.97 (d); 7.36 (m) / 7.45 (d); 7.33 - 7.28 (m) / 7.36 (d); 7.20 (s, 1H) / none; 5.97 (m) / 3.77 (dd), 3.30 (dd); 3.77 (dd / 5.97(m), 3.30 (dd); 3.30 (dd) / 5.97 (m), 3.77 (dd); 2.67 (t) / 1.63 (m); 1.63 (m) / 2.66 (m); 1.39 (m); 1.39 (m) / 1.63 (m); 0.93 (m) / 0.93 (m)

**NOESYPHPR** (key nOe’s: 7.75 (d) / 7.20 (s); 7.45 (d) / 5.97, 3.77 (dd), 3.30 (dd); 7.20 (s) / 2.67 (t), 1.63 (m), 1.39 (m); 5.97 (m) / 7.45 (d); 3.77 (dd) / 7.45 (d), 2.67 (t), 1.63 (m), 1.39 (m); 3.30 (dd) / 7.45, 2.67 (t), 1.63 (m), 1.39 (m).
(R*)-2-phenyl-4-(p-tolyl)-2,3-dihyronaphtho[1,2-b]furan (6d): White solid (82% yield, 0.083g); Rf = 0.6 (9:1 hexanes: EtOAc); m. p. = 111 - 113 °C; FT IR (neat): 1594, 1390, 1033 cm⁻¹; ¹H NMR (400 MHz, CDCl₃) δ 7.98 - 7.95 (m, 1H), 7.76 - 7.74 (m, 1H), 7.40 - 7.32 (m, 7H), 7.27 (t, J = 7.3 Hz, 2H), 7.23 - 7.19 (m, 1H), 7.15 (d, J = 8.1 Hz, 2H), 5.88 (t, J = 8.9 Hz, 1H), 3.78 (dd, J = 15.5, 9.7 Hz, 1H), 3.36 (dd, J = 15.5, 8.1 Hz, 1H), 2.30 (s, 3H); ¹³C NMR (100 MHz, CDCl₃) δ 155.5, 142.4, 137.8, 137.2, 134.6, 129.3, 128.8, 128.3, 128.1, 128.0, 126.3, 125.8, 121.8, 119.9, 119.7, 118.2, 84.9, 39.8, 21.3; HRMS (ESI, m/z): Calc. for C₂₅H₂₀O [M]⁺ 336.1504, found 336.1509.

(R*)-4-(naphthalen-1-yl)-2-phenyl-2,3-dihyronaphtho[1,2-b]furan (6e): Sticky solid (67% yield, 1:1 rotamers, 0.075g); Rf = 0.5 (9.5:0.5 hexanes: EtOAc); FT IR (neat): 1593, 1377, 1072 cm⁻¹; ¹H NMR (500 MHz, CDCl₃) δ 8.12 (d, J = 7.6 Hz, 1H), 7.93 - 7.73 (m, 3.5H), 7.60 - 7.35 (m, 9H), 7.35 - 7.22 (m, 3.5H), 6.03 - 5.83 (m, 1H), 3.52 - 3.42 (m, 1H), 3.12 - 3.01 (m, 1H); ¹³C NMR (125 MHz, CDCl₃) δ 155.0, 154.9, 142.4, 142.3, 138.6, 136.0, 134.4, 133.8, 131.6, 128.7, 128.5, 128.4, 128.1, 128.0, 128.0, 126.8, 126.3, 126.3, 126.2, 126.2, 126.0, 125.9, 125.7, 125.5, 125.5, 121.8, 121.5, 120.1, 120.1, 119.9, 84.9, 84.9, 77.4, 77.2, 76.9, 39.3, 39.0; HRMS (APCI, m/z): Calc. for C₂₈H₂₁O [M+H]⁺ 373.1570, found 373.1587.

(R*)-4-(3,4-dimethoxyphenyl)-2-phenyl-2,3-dihyronaphtho[1,2-b]furan (6f): White solid (69% yield, 0.079g); Rf = 0.5 (8:2 hexanes: EtOAc); m. p. = 152 - 154 °C; FT IR (neat): 1596, 1388, 1028 cm⁻¹; ¹H NMR (500 MHz, CDCl₃) δ 8.14 - 8.06 (m, 1H), 7.93 - 7.85 (m, 1H), 7.54 - 7.46 (m, 5H), 7.41 (dd, J = 8.1, 6.8 Hz, 2H), 7.35 (ddd, J = 7.3, 3.7, 1.2 Hz, 1H),
7.12 (dt, J = 6.3, 2.0 Hz, 2H), 6.97 (d, J = 8.1 Hz, 1H), 6.08 – 5.98 (m, 1H), 3.963 (s, 3H), 3.959 (s, 3H), 3.93 (dd, J = 15.4, 10.0 Hz, 1H), 3.49 (dd, J = 15.4, 10.0 Hz, 1H); 13C NMR (125 MHz, CDCl3) δ 155.5, 149.0, 148.61, 142.3, 136.9, 134.5, 133.5, 128.8, 128.1, 127.9, 126.4, 125.8, 125.3, 121.8, 120.8, 119.6, 119.6, 118.1, 111.8, 111.3, 84.9, 56.1, 56.1, 39.9; HRMS (ESI, m/z): Calc. for C26H23O3 [M+H]+ 383.1654, found 383.1642.

(R*)-2-(napthalen-1-yl)-4-phenyl-2,3-dihydropyran[1,2-b]furan (6g): White solid (72% yield, 0.080g); Rf = 0.5 (9.5:0.5 hexanes: EtOAc); m. p. = 103 - 105 °C; FT IR (neat): 1599, 1465, 1034 cm⁻¹; 1H NMR (500 MHz, CDCl3) δ 8.19 – 8.14 (m, 1H), 7.99 – 7.94 (m, 1H), 7.93 – 7.86 (m, 2H), 7.81 (d, J = 8.2 Hz, 1H), 7.74 (d, J = 7.2 Hz, 1H), 7.55–7.48 (m, 7H), 7.46 – 7.43 (m, 1H), 7.40 (t, J = 7.5 Hz, 2H), 7.34 – 7.30 (m, 1H), 6.68 (dd, J = 9.8, 8.0 Hz, 1H), 4.12 (dd, J = 15.5, 10.0 Hz, 1H), 3.51 (dd, J = 15.5, 7.8 Hz, 1H); 13C NMR (126 MHz, CDCl3) δ 155.5, 140.7, 137.8, 137.3, 134.6, 134.1, 130.2, 129.2, 128.6, 128.4, 128.2, 127.4, 126.44, 126.42, 125.8, 125.7, 125.6, 123.3, 122.8, 121.8, 120.2, 119.9, 118.3, 110.4, 82.9, 39.4, HRMS (APCI, m/z): Calc. for C28H21O [M+H]+ 373.1582, found 373.1587.

(R*)-2-(napthalen-1-yl)-4-(p-tolyl)-2,3-dihydropyran[1,2-b]furan (6h): Sticky solid (62% yield, 0.072g); Rf = 0.45 (9.5:0.5 hexanes: EtOAc); FT IR (neat): 1595, 1377, 1084 cm⁻¹; 1H NMR (400 MHz, CDCl3) δ 8.19 – 8.12 (m, 1H), 8.00 – 7.93 (m, 1H), 7.94 – 7.85 (m, 2H), 7.80 (d, J = 8.2 Hz, 1H), 7.74 (d, J = 7.1 Hz, 1H), 7.55 – 7.47 (m, 3H), 7.49 (d, J = 9.5 Hz, 2H), 7.43 – 7.42 (m, 1H), 7.40 (d, J = 8.1 Hz, 1H), 7.20 (d, J = 7.9 Hz, 2H), 6.67 (dd, J = 9.5, 8.2 Hz, 1H), 4.11 (dd, J = 15.5, 10.0 Hz, 1H), 3.50 (dd, J = 15.5, 7.8 Hz, 1H), 2.37 (s, 2H); 13C NMR (101 MHz, CDCl3) δ 155.3, 137.7, 137.6, 137.1, 134.5, 134.0, 129.8, 129.2, 129.1, 128.3, 128.2, 128.0, 126.3, 126.2, 125.7, 125.5, 125.3, 123.2, 122.6, 121.7, 119.9, 119.7, 118.2, 82.7, 39.4, 21.1; HRMS (ESI, m/z): Calc. for C29H25O [M+H]+ 387.1742, found 387.1743.
(\(R^*\))-4-(3,4-dimethoxyphenyl)-2-(naphthalen-1-yl)-2,3-dihydropthal[1,2-b]furan (6i): White solid (83% yield, 0.107g); \(R_f = 0.5\) (7:3 hexanes:EtOAc); m. p. = 107 - 109 °C; FT IR (neat): 1583, 1458, 1027 cm\(^{-1}\); \(^1\)H NMR (500 MHz, CDCl\(_3\)) \(\delta\) 8.18 – 8.13 (m, 1H), 7.99 – 7.95 (m, 1H), 7.93 – 7.87 (m, 2H), 7.81 (d, \(J = 8.2\) Hz, 1H), 7.75 (d, \(J = 7.1\) Hz, 1H), 7.55 – 7.49 (m, 6H), 7.07 – 7.03 (m, 2H), 6.89 (d, \(J = 8.5\) Hz, 1H), 6.67 (dd, \(J = 9.6, 8.2\) Hz, 1H), 4.11 (dd, \(J = 15.4, 10.0\) Hz, 1H), 3.89 (s, 3H), 3.88 (s, 3H), 3.50 (dd, \(J = 15.4, 7.9\) Hz, 1H); \(^{13}\)C NMR (125 MHz, CDCl\(_3\)) \(\delta\) 155.5, 149.1, 148.7, 137.8, 137.2, 134.6, 134.2, 134.1, 133.5, 130.0, 129.5, 128.5, 128.1, 126.5, 124.5, 125.9, 125.7, 125.5, 123.3, 122.8, 121.8, 120.8, 119.8, 118.3, 112.0, 111.4, 82.9, 56.2, 39.5; HRMS (ESI, \(m/z\)): Calc. for \(C_{30}H_{25}O_3\)[M+H]\(^+\) 433.1793, found 433.1798.

(R\(^*\))-2-(2-methoxyphenyl)-4-(p-tolyl)-2,3-dihydropthal[1,2-b]furan (6j): White solid (87% yield, 0.095g); \(R_f = 0.5\) (9.5:0.5 hexanes:EtOAc); m. p. = 110 - 112 °C; FT-IR (neat): 1600, 1463, 1029 cm\(^{-1}\); \(^1\)H NMR (500 MHz, CDCl\(_3\)) \(\delta\) 8.13 – 8.08 (m, 1H), 7.31 – 7.27 (m, 1H), 7.51 (dd, \(J = 7.6, 1.1\) Hz, 1H), 7.48 – 7.41 (m, 5H), 7.28 – 7.21 (m, 3H), 6.92 (t, \(J = 7.5\), 1H), 6.89 (d, \(J = 8.2\) Hz, 1H), 6.27 (dd, \(J = 9.7, 7.5\) Hz, 1H), 3.96 (dd, \(J = 15.6, 9.8\) Hz, 1H), 3.84 (s, 3H), 3.26 (dd, \(J = 15.6, 7.4\) Hz, 1H), 2.39 (s, 3H); \(^{13}\)C NMR (126 MHz, CDCl\(_3\)) \(\delta\) 155.9, 155.5, 138.0, 137.2, 137.1, 134.4, 131.1, 129.3, 128.6, 128.3, 128.1, 126.1, 125.7, 125.2, 121.8, 120.7, 119.7, 118.6, 110.3, 80.2, 55.5, 38.8, 21.3; HRMS (ESI, \(m/z\)): Calc. for \(C_{28}H_{22}O_2\)[M+H]\(^+\) 367.1614, found 367.1693.

(R\(^*\))-2-(4-methoxyphenyl)-4-(naphthalen-1-yl)-2,3-dihydropthal[1,2-b]furan (6k): Sticky solid (62% yield, 1:1 rotamers, 0.074g); \(R_f = 0.5\) (9.5:0.5 hexanes: EtOAc); FT IR (neat): 1599, 1260, 1031 cm\(^{-1}\); \(^1\)H NMR (400 MHz, CDCl\(_3\)) \(\delta\)
8.14 – 8.08 (m, 1H), 7.91 – 7.76 (m, 3H), 7.62 – 7.29 (Series of m, 10H), 6.87 – 6.83 (m, 2H), 5.93 – 5.86 (m, 1H), 3.77 (s, 1.5H), 3.76 (s, 1.5H), 3.46 – 3.38 (m, 1H), 3.11 – 3.02 (m, 1H); \(^{13}\)C NMR (100 MHz, CDCl\(_3\)) \(\delta\) 159.5, 154.9, 154.9, 138.6, 136.0, 136.0, 134.4, 134.3, 133.8, 133.8, 131.7, 128.5, 128.4, 128.1, 128.0, 127.3, 126.8, 126.8, 126.3, 126.3, 126.2, 126.2, 125.97, 125.94, 125.5, 121.8, 121.4, 120.3, 120.3, 119.9, 114.1, 84.9, 84.88, 77.5, 77.2, 76.8, 55.4, 39.1, 38.8; HRMS (ESI, \(m/z\)): Calc. for C\(_{29}\)H\(_{23}\)O\(_2\) [M+H\(^+\)] 403.1701, found 403.1693.

**DDQ oxidation of 6k:**

Upon aromatization of 1:1 rotameric mixture of 6k with DDQ, naphthofuran S3 was obtained in high yield.

\[
\text{OMe} \quad \text{OMe} \\
\begin{array}{c}
\begin{array}{c} \text{6k} \\
(1:1 \text{ diastereomeric rotamers)}
\end{array}
\end{array}
\quad \text{DDQ}
\quad \text{Toluene, rt, 3 h}
\quad \begin{array}{c}
\begin{array}{c} \text{OMe} \\
\begin{array}{c} \text{S3} \\
\text{Single product}
\end{array}
\end{array}
\end{array}
\]

\(2-(4\text{-methoxyphenyl})-4-(naphthalen-1-yl)naphtho[1,2-b]furan (S3):\) To a solution of 6k (0.12 mmol) in toluene (1.5mL), DDQ was added (0.19 mmol) and stirred at room temperature. After 3 h, solvent was evaporated under vacuum and the crude reaction mixture was purified by a silica gel column using 2% EtOAc/Hexanes as the eluent to furnish naphthofuran S3 as a white solid (98% yield, 0.047g). \(R_f = 0.55\) (9.5:0.5 Hexanes: EtOAC); m. p. = 132 - 134 °C; FT.IR (neat): 1614, 1515, 1249, 1044 cm\(^{-1}\); \(^1\)H NMR (400 MHz, CDCl\(_3\)) \(\delta\) 8.47 (d, \(J = 8.2\) Hz, 1H), 8.02 - 7.93 (m 3H), 7.85 (d, \(J = 8.5\) Hz, 1H), 7.79 (d, \(J = 8.8\) Hz, 2H), 7.75 (s, 1H), 7.67 - 7.60 (m, 3H), 7.53 (t, \(J = 7.5\) Hz, 2H), 7.40 (dd, \(J = 11.3, 4.0\) Hz, 1H), 6.95 (d, \(J = 8.8\) Hz, 2H), 6.65 (s, 1H), 3.85 (s, 3H); \(^{13}\)C NMR (100 MHz, CDCl\(_3\)) \(\delta\) 159.9, 155.7, 149.8, 138.1, 134.0, 132.5, 132.0, 131.5, 128.7, 128.4, 128.2, 127.6, 126.6, 126.5, 126.3, 124.4, 123.7, 120.8, 120.1, 114.4, 101.1, 55.5; HRMS (ESI, \(m/z\)): Calc. for C\(_{29}\)H\(_{21}\)O\(_2\) [M+H\(^+\)] 401.1526, found 401.1536.

\(\text{(R*)-2-(3,4-dimethoxyphenyl)-4-phenyl-2,3-dihydnaphtho[1,2-b]furan (6l):}\) Following general procedure-3, 6l furnished 6l as a sticky solid (85% yield, 0.097g); \(R_f = 0.5\) (8:2 hexanes: EtOAc); FT IR (neat): 1611, 1515, 1266, 1032 cm\(^{-1}\).
$^1$H NMR (500 MHz, CDCl$_3$) $\delta$ 8.09 (d, $J = 7.0$ Hz, 1H), 7.89 (d, $J = 8.1$ Hz, 1H), 7.59 (d, $J = 7.7$ Hz, 2H), 7.52 - 7.46 (m, 5H), 7.40 (t, $J = 7.3$ Hz, 1H), 7.07 - 7.03 (m, 2H), 6.90 (d, $J = 8.0$ Hz, 1H), 5.96 (t, $J = 9.1$ Hz, 1H), 3.91 (s, 3H), 3.90 (s, 3H), 3.86 (dd, $J = 15.9$, 9.8 Hz, 1H), 3.52 (dd, $J = 15.4$, 8.6 Hz, 1H); $^{13}$C NMR (125 MHz, CDCl$_3$) $\delta$ 155.5, 149.4, 149.1, 140.7, 137.1, 134.6, 134.5, 128.7, 128.4, 128.1, 127.5, 126.4, 125.5, 121.8, 120.1, 119.8, 118.6, 118.5, 111.3, 109.2, 85.3, 56.1, 56.1, 39.7; HRMS (ESI, m/z): Calc. for C$_{26}$H$_{23}$O$_3$ [M+H]$^+$ 383.1623, found 383.1642.

(R*)-2-(4-chlorophenyl)-4-phenyl-2,3-dihydronaphtho[1,2-b]furan (6m): Following general procedure-3, 5m furnished 6m as a white solid (73% yield, 0.078g); R$_f$ = 0.5 (9.5:0.5 hexanes: EtOAc); m. p. = 79 - 81 °C; FT IR: 1594, 1520, 1346 cm$^{-1}$; $^1$H NMR (400 MHz, CDCl$_3$) $\delta$ 8.09 – 8.02 (m, 1H), 7.90 – 7.83 (m, 1H), 7.56 – 7.51 (m, 2H), 7.50 – 7.30 (series of m, 10H), 5.95 (dd, $J = 9.2$, 8.4 Hz, 1H), 3.88 (dd, $J = 15.5$, 9.7 Hz, 1H), 3.40 (dd, $J = 15.5$, 8.0 Hz, 1H); $^{13}$C NMR (100 MHz, CDCl$_3$) $\delta$ 155.3, 140.9, 140.6, 137.1, 134.6, 133.8, 128.9, 128.7, 128.4, 128.1, 127.5, 127.2, 126.4, 125.6, 121.7, 120.3, 119.7, 117.9, 84.1, 39.7; HRMS (APCI m/z): Calc. for C$_{24}$H$_{18}$ClO [M+H]$^+$ 357.1031, found 357.1041.

(R*)-2-(3-nitrophenyl)-4-phenyl-2,3-dihydronaphtho[1,2-b]furan (6n): Following general procedure-3, 5n furnished 6n as a sticky solid (93% yield, 0.102g); R$_f$ = 0.5 (9:1 hexanes: EtOAc); FT IR (neat): 1593, 1531, 1347 cm$^{-1}$; $^1$H NMR (400 MHz, CDCl$_3$) $\delta$ 8.34 (s, 1H), 8.17 (dd, $J = 8.2$, 1.2 Hz, 1H), 8.07 (dd, $J = 5.9$, 3.6 Hz, 1H), 7.92 – 7.84 (m, 1H), 7.81 (d, $J = 7.7$ Hz, 1H), 7.58 – 7.41 (m, 8H), 7.37 (t, $J = 7.3$ Hz, 1H), 6.12 – 6.06 (m, 1H), 4.00 (dd, $J = 15.5$, 9.8 Hz, 1H), 3.43 (dd, $J = 15.5$, 7.9 Hz, 1H); $^{13}$C NMR (100 MHz, CDCl$_3$) $\delta$ 155.1, 148.7, 144.6, 140.5, 137.0, 134.7, 131.8, 129.9, 128.6, 128.4, 128.2, 127.6, 126.6, 125.8, 123.1, 121.6, 121.0, 120.8, 119.8, 117.5, 83.4, 39.7; HRMS (APCI, m/z): Calc. for C$_{24}$H$_{18}$NO$_3$ [M+H]$^+$ 368.1266, found 368.1281.
(R*)-2-(3-nitrophenyl)-4-(p-tolyl)-2,3-dihydroptho[1,2-b]furan (6o): Following general procedure-3, 5o furnished 6o as a white solid (75% yield, 0.085g); Rf = 0.5 (9:1 hexanes: EtOAc); m. p. = 110 – 112 °C; FT IR (neat): 1531, 1348, 1080 cm\(^{-1}\); \(^1\)H NMR (500 MHz, CDCl\(_3\)) \(\delta\) 8.36 (s, 1H), 8.20 (dd, \(J = 8.2, 1.3\) Hz, 1H), 8.10 (dd, \(J = 6.1, 3.4\) Hz, 1H), 7.90 (dt, \(J = 6.8, 3.5\) Hz, 1H), 7.83 (d, \(J = 7.7\) Hz, 1H), 7.57 (t, \(J = 8.0\) Hz, 1H), 7.54 – 7.50 (m, 3H), 7.46 (d, \(J = 8.0\) Hz, 2H), 7.29 (d, \(J = 7.9\) Hz, 2H), 6.15 – 6.05 (m, 1H), 4.02 (dd, \(J = 15.4, 9.8\) Hz, 1H), 3.46 (dd, \(J = 15.4, 7.8\) Hz, 1H), 2.44 (s, 3H); \(^{13}\)C NMR (125 MHz, CDCl\(_3\)) \(\delta\) 155.0, 148.6, 144.6, 137.5, 137.4, 136.9, 134.6, 131.8, 129.9, 129.4, 128.2, 128.1, 126.6, 125.7, 123.0, 121.5, 120.9, 120.5, 119.6, 117.5, 83.3, 39.7, 21.3; HRMS (APCI, \(m/z\)): Calc. for C\(_{25}\)H\(_{20}\)NO\(_3\) [M+H]\(^+\) 382.1435, found 382.1438.

(\(R^*\))-2-(4-nitrophenyl)-4-phenyl-2,3-dihydroptho[1,2-b]furan (6p): Following general procedure-3, 12o furnished 13o as a white solid (80% yield, 0.088g); Rf = 0.5 (9:1 hexanes: EtOAc); m. p. = 138 – 139 °C; FT IR (neat): 1594, 1520, 1346 cm\(^{-1}\); \(^1\)H NMR (500 MHz, CDCl\(_3\)) \(\delta\) 8.21 (d, \(J = 8.7\) Hz, 2H), 8.10 – 8.02 (m, 1H), 7.90 – 7.85 (m, 1H), 7.60 (d, \(J = 8.7\) Hz, 2H), 7.53 – 7.47 (m, 5H), 7.44 (t, \(J = 7.6\) Hz, 2H), 7.38 -7.34 (m, 1H), 6.07 (dd, \(J = 9.7, 7.8\) Hz, 1H), 3.98 (dd, \(J = 15.4, 9.9\) Hz, 1H), 3.38 (dd, \(J = 15.4, 7.6\) Hz, 1H); \(^{13}\)C NMR (125 MHz, CDCl\(_3\)) \(\delta\) 155.0, 149.7, 147.6, 136.9, 134.6, 131.8, 129.9, 129.4, 128.2, 128.1, 126.6, 125.7, 123.0, 128.3, 128.2, 127.6, 126.6, 126.4, 125.8, 124.1, 121.5, 120.7, 119.7, 117.4, 83.4, 39.6; HRMS (APCI, \(m/z\)): Calc. for C\(_{24}\)H\(_{16}\)NO\(_3\) [M-H]\(^-\) 366.1230, found 366.1125.
4. NMR Spectra

$^1$H and $^{13}$C NMR spectra of S2a
$^1$H and $^{13}$C NMR spectra of S2b
$^1$H and $^{13}$C NMR spectra of S2c
$^1$H and $^13$C NMR spectra of S2d
$^1$H and $^{13}$C NMR spectra of S2e
$\text{s}^{26}$

$\text{H and } ^{13}\text{C NMR spectra of S2f}$
$^1$H and $^{13}$C NMR spectra of S2g
$^1$H and $^{13}$C NMR spectra of S2h
H and $^{13}$C NMR spectra of S2i
$^1$H and $^{13}$C NMR spectra of 5a
$^{1}H$ and $^{13}C$ NMR spectra of 5b
$^1$H and $^{13}$C NMR spectra of 5d
$^1$H and $^{13}$C NMR spectra of 5e
$^1$H and $^{13}$C NMR spectra of 5f
$^1$H and $^{13}$C NMR spectra of 5g
$^1$H and $^{13}$C NMR spectra of 5h
$^1$H and $^{13}$C NMR spectra of 5i
$^1$H and $^{13}$C NMR spectra of 5j
$^1$H and $^{13}$C NMR spectra of 5k
$^{1}H$ and $^{13}C$ NMR spectra of 5l
$^1$H and $^{13}$C NMR spectra of 5m
\[ \text{H and C NMR spectra of 5n} \]
$^1$H and $^{13}$C NMR spectra of 5o
$^{1}H$ and $^{13}C$ NMR spectra of 5p
$^1$H and $^{13}$C NMR spectra of 7a
$^1$H and $^{13}$C NMR spectra of 6a
$^1$H and $^{13}$C NMR spectra of 6b
$^{1}H$ and $^{13}C$ NMR spectrum of 6c
DEPT-135 NMR spectrum of 6c
HSQCGP NMR spectrum of 6c
HMBCGP NMR spectrum of 6c
HMBCGP and COSY NMR spectrum of 6c
NOESY NMR spectrum of 6c
NOESY NMR spectrum of 6c
$^1$H and $^{13}$C NMR spectra of 6d
$^1$H and $^{13}$C NMR spectra of 6e
$^1$H and $^{13}$C NMR spectra of 6f
$^1$H and $^{13}$C NMR spectra of 6g
$^1$H and $^{13}$C NMR spectra of 6h
$^1$H and $^{13}$C NMR spectra of 6i
$^1$H and $^{13}$C NMR spectra of 6j
$^{1}H$ and $^{13}C$ NMR spectra of 6k
$^1$H and $^{13}$C NMR spectra of S3
DEPT-135 NMR spectrum of S3
$^1$H and $^{13}$C NMR spectra of 6l
$^1$H and $^{13}$C NMR spectra of 6m
$^1$H and $^{13}$C NMR spectra of 6n
$^1$H and $^{13}$C NMR spectra of 6o
$^1$H and $^{13}$C NMR spectra of $6p$