**Pd(CH₃CN)₂Cl₂-Catalyzed Oxidative Heterodimerization Reaction of
2,3-Allenamides and 1,2-Allenyl Ketones: An Efficient Synthesis of
4-(Furan-3'-yl)-2(5*H*)furanimines**

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Supporting Information

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5,5-Dimethyl-4-(5'-phenylfuran-3'-yl)-N-(4''-methylbenzenesulfonyl)-2(5H)-furanimine (Z-3ab):

Condition A: A solution of **1a** (135 mg, 0.509 mmol), **2b** (339 mg, 2.35 mmol), and Pd(CH₃CN)₂Cl₂ (6 mg, 0.0232 mmol) in 6 mL of CH₃CN was stirred at 30°C for 3 hours to afford 125 mg (60%) of **Z-3ab**.

Condition B: A solution of **1a** (66 mg, 0.249 mmol), **2b** (72 mg, 0.50 mmol), Pd(CH₃CN)₂Cl₂ (0.65 mg, 0.0025 mmol), and benzoquinone (34 mg, 0.315 mmol) in 1.5 mL of CH₃CN was stirred at 31 °C for 5 hours to afford 76 mg (75%) of **Z-3ab**.

¹H NMR (300 MHz, CDCl₃): δ 7.91 (d, *J* = 8.4 Hz, 2 H), 7.78 (bs, 1 H), 7.69 (d, *J* = 7.5 Hz, 2 H), 7.50-7.28 (m, 6 H), 6.90 (bs, 1 H), 2.40 (s, 3 H), 1.67 (s, 6 H); ¹³C NMR (75.4 MHz, CDCl₃): δ 21.4, 26.2, 90.1, 103.3, 110.9, 118.3, 124.1, 126.8, 128.6, 128.8, 128.9, 129.2, 138.6, 142.5, 143.0, 156.0, 164.3, 173.6; EIMS: *m/z* (%) 407 (M⁺, 73.28), 91 (100); IR (neat): 3115, 1601, 1520, 1489 cm⁻¹; HRMS: calcd for C₂₃H₂₁NO₄S [M⁺], 407.1191; found, 407.1172.

5,5-Dimethyl-4-(5'-benzylfuran-3'-yl)-N-(4''-methylbenzenesulfonyl)-2(5H)-furanimine (Z-3ac):

Condition B: A solution of **1a** (66 mg, 0.249 mmol), **2c** (79 mg, 0.50 mmol), Pd(CH₃CN)₂Cl₂ (0.65 mg, 0.0025 mmol), and benzoquinone (28 mg, 0.259 mmol) in 1.5 mL of CH₃CN was stirred at 35 °C for 3 hours to afford 66 mg (63%) of **Z-3ac**. ¹H NMR (300 MHz, CDCl₃): δ 7.86 (d, *J* = 8.1 Hz, 2 H), 7.65 (bs, 1 H), 7.39-7.20 (m, 7 H), 7.07 (bs, 1 H), 6.26 (bs, 1 H), 3.97 (s, 2 H), 2.38 (s, 3 H), 1.59 (s, 6 H); ¹³C NMR

(75.4 MHz, CDCl₃): δ 21.4, 26.2, 34.1, 90.0, 105.3, 110.4, 117.2, 126.7, 126.9, 128.57, 128.60, 129.1, 136.4, 138.6, 142.3, 142.9, 157.3, 164.5, 173.7; EIMS: m/z (%) 421 (M^+ , 9.09), 91 (100); IR (neat): 3029, 2924, 1604, 1522, 1496, 1455 cm⁻¹; HRMS: calcd for C₂₄H₂₄NO₄S⁺ [M^+ +1], 422.1421; found, 422.1415.

5,5-Dimethyl-4-(5'-butylfuran-3'-yl)-N-(4''-methylbenzenesulfonyl)-2(5H)-furanimine (Z-3ad):

Condition A: A solution of **1a** (65 mg, 0.245 mmol), **2d** (153 mg, 1.234 mmol), and Pd(CH₃CN)₂Cl₂ (3 mg, 0.0116 mmol) in 3 mL of CH₃CN was stirred at 25°C for 1 hour to afford 60 mg (63%) of **Z-3ad**.

Condition B: A solution of **1a** (67 mg, 0.251 mmol), **2d** (64 mg, 0.520 mmol), Pd(CH₃CN)₂Cl₂ (0.65 mg, 0.0025 mmol), and benzoquinone (30 mg, 0.315 mmol) in 1.5 mL of CH₃CN was stirred at 40 °C for 1.5 hours to afford 67 mg (69%) of **Z-3ad**.

¹H NMR (300 MHz, CDCl₃): δ 7.79 (d, J = 8.1 Hz, 2 H), 7.54 (bs, 1 H), 7.19 (d, J = 8.1 Hz, 2 H), 7.00 (bs, 1 H), 6.17 (s, 1 H), 2.55 (t, J = 7.8 Hz, 2 H), 2.31 (s, 3 H), 1.62-1.42 (m, 8 H), 1.38-1.20 (m, 2 H), 0.85 (t, J = 7.5 Hz, 3 H); ¹³C NMR (75.4 MHz, CDCl₃): δ 13.6, 21.4, 22.0, 26.3, 27.3, 29.5, 90.1, 104.0, 110.3, 117.2, 126.8, 129.2, 138.8, 141.7, 143.0, 159.2, 164.9, 173.8; EIMS: m/z (%) 387 (M^+ , 6.59), 43 (100); IR (neat): 2932, 1600, 1522 cm⁻¹; HRMS: calcd for C₂₁H₂₅NO₄S [M^+], 387.1504; found, 387.1472.

5,5-Dimethyl-4-(5'-phenylfuran-3'-yl)-N-benzyl-2(5H)furanimine (Z-3bb):

Condition C, workup B: A solution of **1b** (50 mg, 0.249 mmol), **2b** (108 mg, 0.75 mmol), Pd(CH₃CN)₂Cl₂ (0.65 mg, 0.0025 mmol), and benzoquinone (29 mg, 0.269 mmol) in 1.5 mL of HOAc was stirred at 35 °C for 2 hours to afford 48 mg (56%) of **Z-3bb**. ¹H NMR (300 MHz, CDCl₃): δ 7.70 (d, *J* = 7.5 Hz, 2 H), 7.61 (s, 1 H), 7.48-7.20 (m, 8 H), 6.78 (s, 1 H), 6.22 (s, 1 H), 4.60 (s, 2 H), 1.66 (s, 6 H); ¹³C NMR (75.4 MHz, CDCl₃): δ 26.9, 51.3, 89.2, 103.9, 117.0, 119.3, 124.1, 126.3, 127.9, 128.2, 128.3, 128.8, 129.7, 139.8, 141.1, 154.0, 155.3, 162.6; EIMS: *m/z* (%) 343 (M⁺, 54.96), 238 (100); IR (neat): 2980, 1675, 1633 cm⁻¹; HRMS: calcd for C₂₃H₂₁NO₂ [M⁺], 343.1572; found, 343.1599.

5,5-Dimethyl-4-(5'-benzylfuran-3'-yl)-N-benzyl-2(5H)furanimine (Z-3bc):

Condition C, workup B: A solution of **1b** (50 mg, 0.249 mmol), **2c** (79 mg, 0.50 mmol), Pd(CH₃CN)₂Cl₂ (0.65 mg, 0.0025 mmol), and benzoquinone (28 mg, 0.259 mmol) in 1.5 mL of HOAc was stirred at 35 °C for 2 hours to afford 72 mg (81%) of **Z-3bc**. ¹H NMR (300 MHz, CDCl₃): δ 7.45 (s, 1 H), 7.40-7.18 (m, 10 H), 6.18 (s, 1 H), 6.08 (s, 1 H), 4.55 (s, 2 H), 3.97 (s, 2 H), 1.59 (s, 6 H); ¹³C NMR (75.4 MHz, CDCl₃): δ 27.0, 34.3, 51.2, 89.1, 105.7, 116.5, 118.2, 126.3, 126.8, 127.9, 128.3, 128.6, 128.7, 137.1, 139.6, 141.1, 154.3, 156.2, 162.7; EIMS: *m/z* (%) 357 (M⁺, 47.63), 91 (100); IR (neat): 3062, 2981, 1677, 1634, 1599, 1495, 1453 cm⁻¹; HRMS: calcd for C₂₄H₂₃NO₂ [M⁺], 357.1729; found, 357.1763.

5,5-Dimethyl-4-(5'-butylfuran-3'-yl)-N-benzyl-2(5H)furanimine (Z-3bd):

Condition C, workup B: A solution of **1b** (50 mg, 0.249 mmol), **2d** (63 mg, 0.508 mmol), Pd(CH₃CN)₂Cl₂ (0.65 mg, 0.0025 mmol), and benzoquinone (30 mg, 0.278 mmol) in 2 mL of HOAc was stirred at 33 °C for 10 hours to afford 61 mg (76%) of **Z-3bd**. ¹H NMR (300 MHz, CDCl₃): δ 7.43 (s, 1 H), 7.40-7.18 (m, 5 H), 6.14 (s, 1 H), 6.09 (s, 1 H), 4.56 (s, 2 H), 2.62 (t, *J* = 7.5 Hz, 2 H), 1.70-1.56 (m, 8 H), 1.44-1.30 (m, 2 H), 0.94 (t, *J* = 7.5 Hz, 3 H); ¹³C NMR (75.4 MHz, CDCl₃): δ 13.7, 22.1, 26.9, 27.4, 29.8, 51.1, 89.2, 104.2, 116.1, 117.9, 126.3, 127.8, 128.2, 138.9, 141.1, 154.6, 158.1, 162.9; EIMS: *m/z* (%) 323 (M⁺, 48.91), 218 (100); IR (neat): 2931, 1678, 1634, 1140 cm⁻¹; HRMS: calcd for C₂₁H₂₆NO₂⁺ [M⁺+1], 324.1958; found, 324.2001.

5,5-Dimethy-4-(5'-heptylfuran-3'-yl)-N-benzyl-2(5H)furanimine (Z-3be):

Condition C, workup B: A solution of **1b** (50 mg, 0.249 mmol), **2e** (84 mg, 0.50 mmol), Pd(CH₃CN)₂Cl₂ (0.65 mg, 0.0025 mmol), and benzoquinone (28 mg, 0.259 mmol) in 2 mL of HOAc was stirred at 35 °C for 17 hours to afford 58 mg (64%) of **Z-3be**. ¹H NMR (300 MHz, CDCl₃): δ 7.43 (s, 1 H), 7.40-7.18 (m, 5 H), 6.14 (s, 1 H), 6.09 (s, 1 H), 4.56 (s, 2 H), 2.61 (t, *J* = 7.5 Hz, 2 H), 1.70-1.58 (m, 8 H), 1.40-1.23 (m, 8 H), 0.88 (t, *J* = 7.2 Hz, 3 H); ¹³C NMR (75.4 MHz, CDCl₃): δ 14.0, 22.6, 27.0, 27.71, 27.74, 28.9, 29.0, 31.7, 51.2, 89.1, 104.2, 116.2, 117.9, 126.3, 127.8, 128.2, 138.9, 141.2, 154.5, 158.2, 162.8; EIMS: *m/z* (%) 365 (M⁺, 16.54), 43 (100); IR (neat): 2928, 1680, 1634, 1453, 1140 cm⁻¹; HRMS: calcd for C₂₄H₃₂NO₂⁺ [M⁺+1], 366.2428; found, 366.2429.

5,5-Dimethyl-4-(5'-methylfuran-3'-yl)-2(5H)furanimine (Z-3ca):

Condition C, workup A: A solution of **1c** (33 mg, 0.30 mmol), **2a** (123 mg, 1.50 mmol), Pd(CH₃CN)₂Cl₂ (0.78 mg, 0.0030 mmol), and benzoquinone (35 mg, 0.324 mmol) in 1.5 mL of HOAc was stirred at 50 °C for 6 hours to afford 46 mg (81%) of **Z-3ca**. ¹H NMR (300 MHz, CDCl₃): δ 7.45 (s, 1 H), 6.17 (s, 1 H), 6.05 (s, 1 H), 2.32 (s, 3 H), 1.58 (s, 6 H); ¹³C NMR (75.4 MHz, CDCl₃): δ 13.3, 26.6, 89.6, 105.0, 114.2, 117.8, 139.8, 154.0, 157.7, 171.0; EIMS: *m/z* (%) 191 (M⁺, 100); IR (neat): 1668, 1606, 1138 cm⁻¹; HRMS: calcd for C₁₁H₁₃NO₂ [M⁺], 191.0946; found, 191.0932.

5,5-Dimethyl-4-(5'-phenylfuran-3'-yl)-2(5H)furanimine (Z-3cb):

Condition C, workup A: A solution of **1c** (33 mg, 0.30 mmol), **2b** (86 mg, 0.60 mmol), Pd(CH₃CN)₂Cl₂ (0.78 mg, 0.0030 mmol), and benzoquinone (37 mg, 0.343 mmol) in 1.5 mL of HOAc was stirred at 31 °C for 11 hours to afford 42 mg (55%) of **Z-3cb**. ¹H NMR (300 MHz, CDCl₃): δ 7.69 (d, *J* = 7.2 Hz, 2 H), 7.63 (s, 1 H), 7.45-7.20 (m, 4 H), 6.81 (s, 1 H), 6.34 (s, 1 H), 1.62 (s, 6 H); ¹³C NMR (75.4 MHz, CDCl₃): δ 26.6, 89.5, 103.8, 115.2, 118.9, 124.1, 128.4, 128.8, 129.5, 140.5, 155.5, 157.0, 170.6; EIMS: *m/z* (%) 253 (M⁺, 96.22), 43 (100); IR (neat): 2982, 1660, 1634, 1152 cm⁻¹; HRMS: calcd for C₁₆H₁₆NO₂⁺ [M⁺+1], 254.1176; found, 254.1178.

5,5-Dimethyl-4-(5'-benzylfuran-3'-yl)-2(5H)furanimine (Z-3cc):

Condition C, workup A: A solution of **1c** (45 mg, 0.40 mmol), **2c** (126 mg, 0.80 mmol), Pd(CH₃CN)₂Cl₂ (1 mg, 0.0039 mmol), and benzoquinone (46 mg, 0.426

mmol) in 2 mL of CH₃CN/HOAc = 1:1 was stirred at 32 °C for 5 hours to afford 77 mg (71%) of **Z-3cc**. ¹H NMR (300 MHz, CDCl₃): δ 8.36 (s, 1 H), 7.50 (s, 1 H), 7.36-7.20 (m, 5 H), 6.22 (s, 1 H), 6.21 (s, 1 H), 3.95 (s, 2 H), 1.56 (s, 6 H); ¹³C NMR (75.4 MHz, CDCl₃): δ 26.7, 34.3, 88.9, 105.7, 115.1, 117.9, 126.9, 128.66, 128.69, 137.0, 140.1, 156.5, 156.7, 170.3; EIMS: *m/z* (%) 267 (M⁺, 100); IR (neat): 1666, 1634, 1598, 1138 cm⁻¹; HRMS: calcd for C₁₇H₁₇NO₂ [M⁺], 267.1259; found, 267.1304.

5,5-Dimethyl-4-(5'-butylfuran-3'-yl)-2(5H)furanimine (Z-3cd) and 5,5,5',5'-tetramethyl-4-(5'H-furanon-3'-yl)- 2(5H)furanimine (Z-4cc):

Condition C, workup A: A solution of **1c** (33 mg, 0.30 mmol), **2d** (73 mg, 0.589 mmol), Pd(CH₃CN)₂Cl₂ (0.78 mg, 0.0030 mmol), and benzoquinone (34 mg, 0.315 mmol) in 1.5 mL of HOAc was stirred at 30 °C for 6.5 hours to afford 53 mg (76%) of **Z-3cd** and 5 mg (15%) of **Z-4cc**.

Z-3cd: liquid, ¹H NMR (300 MHz, CDCl₃): δ 7.85 (bs, 1 H), 7.49 (s, 1 H), 6.21 (s, 1 H), 6.20 (s, 1 H), 2.63 (t, *J* = 7.5 Hz, 2 H), 1.67-1.58 (m, 8 H), 1.44-1.31 (m, 2 H), 0.95 (t, *J* = 7.5 Hz, 3 H); ¹³C NMR (75.4 MHz, CDCl₃): δ 13.6, 22.1, 26.6, 27.3, 29.7, 89.6, 104.1, 114.1, 117.5, 139.7, 157.8, 158.4, 171.0; EIMS: *m/z* (%) 233 (M⁺, 89.57), 190 (100); IR (neat): 2933, 1666, 1600, 1531, 1140 cm⁻¹; HRMS: calcd for C₁₄H₁₉NO₂ [M⁺], 233.1416; found, 233.1389.

Z-4cc: Solid, M.p. 197-199 °C (chloroform); ¹H NMR (300 MHz, CDCl₃): δ 6.36 (s, 1H), 6.09 (s, 1 H), 1.63 (s, 6 H), 1.59 (s, 6 H); ¹³C NMR (75.4 MHz, CDCl₃): δ 26.2,

26.4, 87.5, 90.2, 119.1, 125.0, 152.2, 160.2, 167.9, 170.1; EIMS: m/z (%) 221 (M^+ , 27.77), 43 (100); IR (KBr): 1736, 1661 cm^{-1} ; HRMS: calcd for $\text{C}_{12}\text{H}_{16}\text{NO}_3^+$ [M^++1], 222.1125; found, 222.1131.

5,5-Dimethyl-4-(5'-heptylfuran-3'-yl)-2(5H)furanimine (Z-3ce):

Condition C, workup A: A solution of **1c** (33 mg, 0.30 mmol), **2e** (101 mg, 0.608 mmol), $\text{Pd}(\text{CH}_3\text{CN})_2\text{Cl}_2$ (0.78 mg, 0.0030 mmol), and benzoquinone (34 mg, 0.315 mmol) in 2 mL of HOAc was stirred at 35 °C for 5 hours to afford 48 mg (59%) of **Z-3ce**. ^1H NMR (300 MHz, CDCl_3): δ 8.88 (bs, 1 H), 7.50 (s, 1 H), 6.24 (s, 1 H), 6.20 (s, 1 H), 2.62 (t, $J = 7.8$ Hz, 2 H), 1.70-1.55 (m, 8 H), 1.40-1.22 (m, 8 H), 0.89 (t, $J = 6.6$ Hz, 3 H); ^{13}C NMR (75.4 MHz, CDCl_3): δ 14.0, 22.5, 26.6, 27.6, 27.7, 28.9, 29.0, 31.6, 90.1, 104.1, 113.7, 117.4, 139.8, 158.3, 158.5, 171.3; EIMS: m/z (%) 275 (M^+ , 19.76), 43 (100); IR (neat): 2929, 1668, 1139 cm^{-1} ; HRMS: calcd for $\text{C}_{17}\text{H}_{26}\text{NO}_2^+$ [M^++1], 276.1958; found, 276.1952.

5,5-Dimethyl-4-(5'-methylfuran-3'-yl)-N-butyl-2(5H)furanimine (Z-3da):

Condition C, workup A: A solution of **1d** (50 mg, 0.299 mmol), **2a** (50 mg, 0.610 mmol), $\text{Pd}(\text{CH}_3\text{CN})_2\text{Cl}_2$ (0.78 mg, 0.0030 mmol), and benzoquinone (36 mg, 0.333 mmol) in 1.5 mL of HOAc was stirred at 25 °C for 4 hours to afford 50 mg (68%) of **Z-3da**. ^1H NMR (300 MHz, CDCl_3): δ 7.38 (s, 1 H), 6.11 (s, 1 H), 6.01 (s, 1 H), 3.30 (t, $J = 6.9$ Hz, 2 H), 2.29 (s, 3 H), 1.65-1.55 (m, 8 H), 1.45-1.33 (m, 2 H), 0.91 (t, $J = 7.2$ Hz, 3 H); ^{13}C NMR (75.4 MHz, CDCl_3): δ 13.3, 13.9, 20.5, 26.8, 32.7, 46.1, 89.9,

105.1, 115.2, 118.0, 139.3, 153.9, 155.3, 163.9; EIMS: m/z (%) 247 (M^+ , 31.65), 176 (100); IR (neat): 2931, 1677, 1635, 1606, 1139 cm^{-1} ; HRMS: calcd for $\text{C}_{15}\text{H}_{22}\text{NO}_2^+$ [M^++1], 248.1645; found, 248.1637.

4-(5'-Methylfuran-3'-yl)-5,5-pentamethylene-2(5H)furanimine (Z-3ea):

Condition C, workup A: A solution of **1e** (45 mg, 0.298 mmol), **2a** (51 mg, 0.622 mmol), $\text{Pd}(\text{CH}_3\text{CN})_2\text{Cl}_2$ (0.78 mg, 0.0030 mmol), and benzoquinone (35 mg, 0.324 mmol) in 2 mL of HOAc was stirred at 30 °C for 5.5 hours to afford 55 mg (80%) of **Z-3ea**. ^1H NMR (300 MHz, CDCl_3): δ 8.14 (bs, 1 H), 7.50 (s, 1 H), 6.17 (s, 1 H), 6.16 (s, 1 H), 2.28 (s, 3 H), 1.90-1.68 (m, 9 H), 1.35-1.15 (m, 1 H); ^{13}C NMR (75.4 MHz, CDCl_3): δ 13.2, 22.1, 24.7, 35.2, 91.7, 105.2, 114.2, 117.9, 139.9, 153.8, 158.3, 171.5; EIMS: m/z (%) 231 (M^+ , 95.11), 84 (100); IR (neat): 2936, 1660, 1604, 1531, 1142 cm^{-1} ; HRMS: calcd for $\text{C}_{14}\text{H}_{18}\text{NO}_2^{+1}$ [M^++1], 232.1332; found, 232.1345.

4-(5'-Butylfuran-3'-yl)-5,5-pentamethylene-2(5H)furanimine (Z-3ed):

Condition C, workup A: A solution of **1e** (45 mg, 0.298 mmol), **2d** (75 mg, 0.605 mmol), $\text{Pd}(\text{CH}_3\text{CN})_2\text{Cl}_2$ (0.78 mg, 0.0030 mmol), and benzoquinone (34 mg, 0.315 mmol) in 1.5 mL of HOAc was stirred at 30 °C for 6.5 hours to afford 57 mg (70%) of **Z-3ed**. ^1H NMR (300 MHz, CDCl_3): δ 7.51 (s, 1 H), 6.15 (s, 1 H), 6.05 (s, 1 H), 4.75 (br, 1 H), 2.62 (t, $J = 7.5$ Hz, 2 H), 1.90-1.59 (m, 11 H), 1.43-1.20 (m, 3 H), 0.94 (t, $J = 7.2$ Hz, 3 H); ^{13}C NMR (75.4 MHz, CDCl_3): δ 13.6, 22.0, 22.1, 24.7, 27.3, 29.7, 35.2, 91.9, 104.3, 113.9, 117.6, 139.8, 158.2, 158.6, 171.6; EIMS: m/z (%) 273 (M^+ ,

100); IR (neat): 2932, 2862, 1664, 1631, 1599, 1141 cm^{-1} ; HRMS: calcd for $\text{C}_{17}\text{H}_{23}\text{NO}_2$ [M^+], 273.1729; found, 273.1703.

5-Methyl-5-ethyl-4-(5'-methylfuran-3'-yl)-N-benzyl-2(5H)furanimine (Z-3fa):

Condition C, workup A: A solution of **1f** (54 mg, 0.251 mmol), **2a** (42 mg, 0.512 mmol), $\text{Pd}(\text{CH}_3\text{CN})_2\text{Cl}_2$ (0.65 mg, 0.0025 mmol), and benzoquinone (28 mg, 0.263 mmol) in 2 mL of HOAc was stirred at 35 °C for 4 hours to afford 51 mg (69%) of **Z-3fa**. ^1H NMR (300 MHz, CDCl_3): δ 7.43-7.15 (m, 6 H), 6.25 (s, 1 H), 6.16 (t, J = 1.2 Hz, 1 H), 4.57 (s, 2 H), 2.30 (d, J = 3.3 Hz, 3 H), 2.02-1.90 (m, 1 H), 1.90-1.72 (m, 1 H), 1.57 (s, 3 H), 0.73 (t, J = 7.2 Hz, 3 H); ^{13}C NMR (75.4 MHz, CDCl_3): δ 7.4, 13.2, 25.9, 32.0, 50.7, 92.3, 105.0, 116.9, 118.1, 126.4, 127.9, 128.2, 139.0, 140.5, 153.4, 153.8, 164.3; EIMS: m/z (%) 295 (M^+ , 66.97), 91 (100); IR (neat): 2975, 1677, 1634, 1605, 1140 cm^{-1} ; HRMS: calcd for $\text{C}_{19}\text{H}_{22}\text{NO}_2^+$ [M^++1], 296.1645; found, 296.1651.

5-Methyl-5-ethyl-4-(5'-butylfuran-3'-yl)-N-benzyl-2(5H)furanimine (Z-3fd):

Condition C, workup B: A solution of **1f** (54 mg, 0.251 mmol), **2d** (64 mg, 0.516 mmol), $\text{Pd}(\text{CH}_3\text{CN})_2\text{Cl}_2$ (0.65 mg, 0.0025 mmol), and benzoquinone (28 mg, 0.263 mmol) in 2 mL of HOAc was stirred at 35 °C for 3 hours to afford 53 mg (63%) of **Z-3fd**. ^1H NMR (300 MHz, CDCl_3): δ 7.38-7.10 (m, 6 H), 6.08 (s, 1 H), 6.06 (s, 1 H), 4.49 (s, 2 H), 2.53 (t, J = 7.5 Hz, 2 H), 1.98-1.82 (m, 1 H), 1.81-1.68 (m, 1 H), 1.61-1.50 (m, 2 H), 1.51 (s, 3 H), 1.40-1.22 (m, 2 H), 0.86 (t, J = 7.2 Hz, 3 H), 0.68 (s,

$J = 6.9$ Hz, 3 H); ^{13}C NMR (75.4 MHz, CDCl_3): δ 7.5, 13.7, 22.2, 26.0, 27.4, 29.8, 32.1, 51.1, 91.8, 104.1, 117.4, 118.0, 126.3, 127.9, 128.2, 138.7, 141.1, 152.8, 158.1, 163.5; EIMS: m/z (%) 337 (M^+ , 77.96), 232 (100); IR (neat): 2931, 1677, 1634, 1600, 1454, 1138 cm^{-1} ; HRMS: calcd for $\text{C}_{22}\text{H}_{28}\text{NO}_2^+$ [$\text{M}^+ + 1$], 338.2115; found, 338.2108.