Direct, Facile Aldehyde and Ketone α -Selenenylation Reactions Promoted by L-Prolinamide and Pyrrolidine Sulfonamide Organocatalysts

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General. All reactions were performed under aerobic atmosphere. Commercial, anhydrous (HPLC grade) CH_2Cl_2 was used directly for reactions without further purification. HPLC grade EtOAc and hexanes were used for column chromatography. Column chromatography was performed with silica gel (230-400 mesh size). TLC plates with F_{254} indicator were used for monitoring reactions. The combined organic layers were dried over MgSO_4 . Solvents were evaporated under reduced pressure. All yields given refer to as isolated yields. ^1H NMR was recorded on a 500 MHz and ^{13}C on a 125 MHz spectrometer. HRMS experiment was performed on a high resolution magnetic sector spectrometer. Tetramethylsilane (TMS) was used as a reference for ^1H NMR experiments. Data for ^1H are reported as follows: chemical shift (ppm), and multiplicity (s = singlet, d = doublet, t = triplet, q = quartet, m = multiplet). Data for ^{13}C NMR are reported as ppm.

General Procedure A for α -Selenenylation of Aldehyde (Table 3, Entries 1-10): To a vial containing aldehyde (0.25 mmol), 0.5 mL of anhydrous CH_2Cl_2 and catalyst L-prolinamide **1** (0.005 mmol) was added *N*-(phenylseleno)phthalimide (0.3 mmol) at room temperature. After 10 min, reaction mixture was treated with water (5 mL), then the solution was extracted with ethyl acetate (3×5 mL). The combined extracts were dried over MgSO_4 , filtered, and concentrated *in vacuo*. The resulting residue was then purified by silica gel chromatography, eluting with EtOAc/Hexane to afford a clear oil.

2-(Phenylseleno)propanal:¹ The reaction was carried out following the general procedure to provide a clear oil (45 mg, 81%). ^1H NMR (500 MHz, CDCl_3): δ 9.45 (d, 1H, $J = 3.0$ Hz), 7.51 (d, 2H, $J = 7.0$ Hz), 7.35 (t, 1H, $J = 7.5$ Hz), 7.29 (t, 2H, $J = 7.5$ Hz), 3.71 (dq, 1H, $J = 7.0, 3.0$ Hz), 1.46 (d, 3H, $J = 7.0$ Hz); ^{13}C NMR (125 MHz, CDCl_3): δ 193.7, 136.3, 129.5, 129.1, 125.9, 46.8, 13.6. HRMS (EI) calcd for $\text{C}_9\text{H}_{10}\text{OSe}$ (M^+) 213.9891, obsd 213.9909.

2-(Phenylseleno)butyraldehyde:¹ The reaction was carried out following the general procedure to provide a clear oil (49 mg, 83%). ^1H NMR (500 MHz, CDCl_3): δ 9.41 (d, 1H, $J = 3.5$ Hz), 7.51 (d, 2H, $J = 7.0$ Hz), 7.34 (t, 1H, $J = 7.5$ Hz), 7.28 (t, 2H, $J = 7.5$ Hz), 3.71 (dt, 1H, $J = 7.5, 3.5$ Hz), 1.91-1.83 (m, 1H), 1.75-1.58 (m, 1H), 1.08 (t, 3H, $J = 7.5$ Hz); ^{13}C NMR (125 MHz, CDCl_3): δ 193.3, 136.1, 129.5, 129.0, 126.1, 54.9, 21.3, 12.8. HRMS (EI) calcd for $\text{C}_{10}\text{H}_{12}\text{OSe}$ (M^+) 228.0048, obsd 228.0065.

2-(Phenylseleno)pentanal:¹ The reaction was carried out following the general procedure to provide a clear oil (53 mg, 85%). ^1H NMR (500 MHz, CDCl_3): δ 9.39 (d, 1H, $J = 3.5$ Hz), 7.51 (d, 2H, $J = 7.0$ Hz), 7.33 (t, 1H, $J = 7.5$ Hz), 7.28 (t, 2H, $J = 7.5$ Hz), 3.61 (dt, 1H, $J = 7.5, 3.5$ Hz), 1.79-1.78 (m, 1H), 1.70-1.67 (m, 1H), 1.65-1.42 (m, 2H), 0.95 (t, 3H, $J = 7.5$ Hz); ^{13}C NMR (125 MHz, CDCl_3): δ 193.3, 136.0, 129.5, 129.0, 126.2, 52.9, 29.9, 21.4, 13.9. HRMS (EI) calcd for $\text{C}_{11}\text{H}_{14}\text{OSe}$ (M^+) 242.0204, obsd 242.0191.

3-Methyl-2-(Phenylseleno)butyraldehyde:¹ The reaction was carried out following the general procedure to provide a clear oil (55 mg, 88%). ¹H NMR (500 MHz, CDCl₃): δ 9.36 (d, 1H, *J* = 5.0 Hz), 7.51 (d, 2H, *J* = 7.0 Hz), 7.32 (t, 1H, *J* = 7.5 Hz), 7.28 (t, 2H, *J* = 7.5 Hz), 3.61 (dd, 1H, *J* = 9.0, 5.0 Hz), 2.12-2.05 (m, 1H), 1.20 (d, 3H, *J* = 6.5 Hz), 1.09 (d, 3H, *J* = 7.0 Hz); ¹³C NMR (125 MHz, CDCl₃): δ 192.8, 135.6, 129.5, 128.8, 127.0, 62.1, 27.4, 21.5, 21.3. HRMS (EI) calcd for C₁₁H₁₄OSe (M⁺) 242.0204, obsd 242.0191.

2-(Phenylseleno)hexanal:¹ The reaction was carried out following the general procedure to provide a clear oil (50 mg, 78%). ¹H NMR (500 MHz, CDCl₃): δ 9.38 (d, 1H, *J* = 3.5 Hz), 7.50 (d, 2H, *J* = 7.0 Hz), 7.33 (t, 1H, *J* = 7.0 Hz), 7.28 (t, 2H, *J* = 7.5 Hz), 3.61 (dt, 1H, *J* = 7.5, 3.5 Hz), 1.87-1.80 (m, 1H), 1.71-1.64 (m, 1H), 1.54-1.48 (m, 1H), 1.43-1.30 (m, 3H), 0.90 (t, 3H, *J* = 7.5 Hz); ¹³C NMR (125 MHz, CDCl₃): δ 193.3, 136.0, 129.5, 129.0, 126.2, 53.1, 30.3, 27.6, 22.6, 14.1. HRMS (EI) calcd for C₁₂H₁₆OSe (M⁺) 256.0361, obsd 256.0323.

2-(Phenylseleno)heptanal:² The reaction was carried out following the general procedure to provide a clear oil (58 mg, 86%). ¹H NMR (500 MHz, CDCl₃): δ 9.38 (d, 1H, *J* = 4.0 Hz), 7.50 (dd, 2H, *J* = 8.0, 1.0 Hz), 7.35-7.26 (m, 3H), 3.60 (dt, 1H, *J* = 7.0, 4.0 Hz), 1.86-1.80 (m, 1H), 1.78-1.63 (m, 1H), 1.55-1.45 (m, 1H), 1.46-1.36 (m, 1H), 1.35-1.26 (m, 4H), 0.89 (t, 3H, *J* = 7.0 Hz); ¹³C NMR (125 MHz, CDCl₃): δ 193.3, 136.0, 129.5, 129.0, 126.0, 53.2, 31.6, 27.9, 27.8, 22.6, 14.1. HRMS (EI) calcd for C₁₃H₁₈OSe (M⁺) 270.0517, obsd 270.0527.

2-(Phenylseleno)octanal:³ The reaction was carried out following the general procedure to provide a clear oil (67 mg, 95%). ¹H NMR (500 MHz, CDCl₃): δ 9.38 (d, 1H, *J* = 3.5 Hz), 7.50 (d, 2H, *J* = 7.5 Hz), 7.33 (t, 1H, *J* = 7.5 Hz), 7.28 (t, 2H, *J* = 7.5 Hz), 3.60 (dt, 1H, *J* = 7.0, 3.5 Hz), 1.86-1.79 (m, 1H), 1.71-1.66 (m, 1H), 1.58-1.47 (m, 1H), 1.45-1.25 (m, 7H), 0.88 (t, 3H, *J* = 7.0 Hz); ¹³C NMR (125 MHz, CDCl₃): δ 193.3, 136.0, 129.5, 129.0, 126.2, 53.2, 31.8, 29.1, 28.1, 27.9, 22.7, 14.2. HRMS (EI) calcd for C₁₄H₂₀OSe (M⁺) 284.0674, obsd 284.0685.

2-(Phenylseleno)nonanal: The reaction was carried out following the general procedure to provide a clear oil (67 mg, 91%). ¹H NMR (500 MHz, CDCl₃): δ 9.38 (d, 1H, *J* = 4.0 Hz), 7.50

(d, 2H, $J = 7.0$ Hz), 7.33 (t, 1H, $J = 7.5$ Hz), 7.28 (t, 2H, $J = 7.0$ Hz), 3.60 (dt, 1H, $J = 7.0, 3.5$ Hz), 1.86-1.79 (m, 1H), 1.71-1.64 (m, 1H), 1.57-1.47 (m, 1H), 1.43-1.36 (m, 1H), 1.35-1.26 (m., 8H), 0.88 (t, 3H, $J = 7.0$ Hz); ^{13}C NMR (125 MHz, CDCl_3): δ 193.3, 136.0, 129.5, 129.0, 126.2, 53.2, 31.9, 29.4, 29.2, 28.2, 27.8, 22.8, 14.3. HRMS (EI) calcd for $\text{C}_{15}\text{H}_{22}\text{OSe}$ (M^+) 298.0830, obsd 298.0807.

2-(Phenylseleno)decanal:⁴ The reaction was carried out following the general procedure to provide a clear oil (67 mg, 84%). ^1H NMR (500 MHz, CDCl_3): δ 9.38 (d, 1H, $J = 4.0$ Hz), 7.50 (d, 2H, $J = 7.0$ Hz), 7.33 (t, 1H, $J = 7.5$ Hz), 7.28 (t, 2H, $J = 7.5$ Hz), 3.60 (dt, 1H, $J = 7.0, 4.0$ Hz), 1.86-1.79 (m, 1H), 1.71-1.64 (m, 1H), 1.57-1.47 (m, 1H), 1.43-1.37 (m, 1H), 1.31-1.25 (m., 10H), 0.88 (t, 3H, $J = 7.0$ Hz); ^{13}C NMR (125 MHz, CDCl_3): δ 193.3, 136.0, 129.5, 129.0, 126.2, 53.2, 32.0, 29.5, 29.4, 29.3, 28.2, 27.8, 22.8, 14.3. HRMS (EI) calcd for $\text{C}_{16}\text{H}_{24}\text{OSe}$ (M^+) 312.0987, obsd 312.0974.

3-Phenyl-2-(Phenylseleno)propionaldehyde:¹ The reaction was carried out following the general procedure to provide a clear oil (60 mg, 80%). ^1H NMR (500 MHz, CDCl_3): δ 9.47 (d, 1H, $J = 4.0$ Hz), 7.49 (d, 2H, $J = 7.5$ Hz), 7.35 (t, 1H, $J = 7.0$ Hz), 7.31-7.19 (m, 7H), 3.90-3.87 (m, 1H), 3.23 (dd, 1H, $J = 14.0, 8.0$ Hz), 3.00 (dd, 1H, $J = 14.0, 6.5$ Hz); ^{13}C NMR (125 MHz, CDCl_3): δ 129.4, 138.5, 136.3, 129.6, 129.2, 128.8, 127.1, 126.0, 53.7, 34.3. HRMS (EI) calcd for $\text{C}_{15}\text{H}_{14}\text{OSe}$ (M^+) 290.0204, obsd 290.0183.

General Procedure B for α -Selenenylation of Aldehyde (Table 3, Entries 11 and 12): To a vial containing an aldehyde (0.25 mmol), and 0.5 mL of anhydrous CH_2Cl_2 was added catalyst L-prolinamide **I** (0.005 mmol) at room temperature. The mixture was vigorously stirred for 0.5 h in the presence of 4Å molecule sieves (40 mg). Then *N*-(phenylseleno)phthalimide (0.3 mmol) was added. After 0.5 h, the molecule sieves were removed by filtrating paper and then the filtrate was treated with water (5 mL), the solution was extracted with ethyl acetate (3×5 mL). The combined extracts were dried over MgSO_4 , filtered, and concentrated *in vacuo*. The resulting residue was then purified by silica gel chromatography, eluting with EtOAc/Hexane (1/40) to provide a clear oil.

2-Methyl-2-(Phenylseleno)propionaldehyde:⁵ The reaction was carried out following the general procedure to provide a clear oil (45 mg, 76%). ^1H NMR (500 MHz, CDCl_3): δ 9.26 (s, 1H), 7.49 (d, 2H, $J = 7.0$ Hz), 7.39 (t, 1H, $J = 7.5$ Hz), 7.30 (t, 2H, $J = 8.0$ Hz), 1.44 (s, 6H); ^{13}C NMR (125 MHz, CDCl_3): δ 193.7, 138.0, 129.7, 129.3, 126.3, 53.6, 21.7. HRMS (EI) calcd for $\text{C}_{10}\text{H}_{12}\text{OSe}$ (M^+) 228.0048, obsd 228.0065.

1-(Phenylseleno)cyclohexanecarbaldehyde:¹ The reaction was carried out following the general procedure to provide a clear oil (56 mg, 81%). ¹H NMR (500 MHz, CDCl₃): δ 9.18 (s, 1H), 7.47 (d, 2H, *J* = 7.0 Hz), 7.37 (t, 1H, *J* = 7.5 Hz), 7.30 (t, 2H, *J* = 7.5 Hz), 1.92-1.88 (m, 2H), 1.76-1.71 (m, 4H), 1.56-1.53 (m, 1H), 1.45-1.23 (m, 3H); ¹³C NMR (125 MHz, CDCl₃): δ 192.8, 138.1, 129.6, 129.2, 125.2, 59.9, 30.9, 25.7, 24.2. HRMS (EI) calcd for C₁₃H₁₆OSe (M⁺) 268.0361, obsd 268.0336.

General Procedure for α-Selenenylation of Ketones (Table 6, entries 1-14): To a vial containing ketone (0.3 mmol), and 1.0 mL of anhydrous CH₂Cl₂ was added catalyst pyrrolidine trifluoromethanesulfonamide **I** (0.03 mmol) at room temperature. The mixture was vigorously stirred for 1 hr before *N*-(phenylseleno)phthalimide (0.3 mmol) was added. After 16-48 h, the reaction mixture was treated with water (10 mL), and then the solution was extracted with ethyl acetate (3 × 10 mL). The combined extracts were dried over MgSO₄, filtered, and concentrated *in vacuo*. The resulting residue was then purified by silica gel chromatography and fractions were collected and concentrated *in vacuo* to provide a clear oil.

1-(Phenylselanyl)propan-2-one:⁵ The title compound was prepared according to the general procedure in 69% yield. ¹H NMR (500 MHz, CDCl₃): δ 7.55-7.50 (m, 2H), 7.26-7.31 (m, 3H), 3.59 (s, 2H), 2.27 (s, 3H); ¹³C NMR (125 MHz, CDCl₃): δ 203.7, 33.5, 129.6, 128.9, 128.2, 37.0, 28.2; HRMS (EI) calcd for C₉H₁₀OSe (M⁺) 213.9891, obsd 213.9909.

2-(Phenylselanyl)pentan-3-one:⁵ The title compound was prepared according to the general procedure in 61% yield. ¹H NMR (500 MHz, CDCl₃): δ 7.52 (dd, 2H, *J* = 8.0, 1.0 Hz), 7.37-7.25 (m, 3H), 3.81 (q, 1H, *J* = 7.0 Hz), 2.78 (dq, 1H, *J* = 17.5, 7.0 Hz), 2.50 (dq, 1H, *J* = 17.5, 7.0 Hz), 1.48 (d, 3H, *J* = 7.0 Hz), 1.08 (t, 3H, *J* = 7.5 Hz); ¹³C NMR (125 MHz, CDCl₃): δ 207.9, 136.0, 129.4, 128.9, 127.4, 45.3, 33.2, 16.7, 8.6; HRMS (EI) calcd for C₁₁H₁₄OSe (M⁺) 242.0204, obsd 242.0191.

3-(Phenylselanyl)heptan-4-one:⁶ The title compound was prepared according to the general procedure in 58% yield. ¹H NMR (500 MHz, CDCl₃): δ 7.51 (dd, 2H, *J* = 7.5, 1.0 Hz), 7.35-7.25 (m, 3H), 3.56 (t, 1H, *J* = 7.5 Hz), 2.63 (dt, 1H, *J* = 16.5, 7.5 Hz), 2.49 (dq, 1H, *J* = 16.5, 7.0 Hz), 1.91-1.85 (m, 1H), 1.76-1.70 (m, 1H), 1.65-1.58 (m, 1H), 0.98(d, 3H, = 7.5 Hz), 0.91 (t, 3H, *J* = 7.5 Hz); ¹³C NMR (125 MHz, CDCl₃): δ 206.6, 135.8, 129.3, 128.7, 127.6, 53.7, 42.6, 23.9, 17.8, 13.9, 13.0; HRMS (EI) calcd for C₁₃H₁₈OSe (M⁺) 270.0517, obsd 270.0520.

4-Methyl-1-(phenylselanyl)pentan-2-one: The title compound was prepared according to the general procedure in 62% yield. ¹H NMR (500 MHz, CDCl₃): δ 7.53 (dd, 2H, *J* = 6.0, 3.0 Hz), 7.29-7.26 (m, 3H), 3.58 (s, 2H), 2.46 (d, 2H, *J* = 7.0 Hz), 2.13-2.08 (m, 1H), 0.89 (d, 6H, *J* = 6.5 Hz); ¹³C NMR (125 MHz, CDCl₃): δ 205.6, 133.5, 129.5, 129.1, 128.1, 49.9, 36.6, 24.9, 22.7; HRMS (EI) calcd for C₁₂H₁₆OSe (M⁺) 256.0361, obsd 256.0323.

1-(Phenylselanyl)hex-5-en-2-one:⁷ The title compound was prepared according to the general procedure in 63% yield. ¹H NMR (500 MHz, CDCl₃): δ 7.53 (dd, 2H, *J* = 6.0, 2.0 Hz), 7.35-7.26 (m, 3H), 5.80-5.73 (m, 1H), 5.02-4.90 (m, 2H), 3.59 (s, 2H), 2.68 (t, 2H, *J* = 7.0 Hz), 2.33-2.29 (m, 2H); ¹³C NMR (125 MHz, CDCl₃): δ 205.1, 137.1, 136.1, 133.6, 129.5, 128.2, 115.6, 40.0, 36.3, 28.2; HRMS (EI) calcd for C₁₂H₁₄OSe (M⁺) 254.0204, obsd 254.0280.

1-Phenyl-2-(phenylselanyl)ethanone:⁸ The title compound was prepared according to the general procedure in 81% yield. ¹H NMR (500 MHz, CDCl₃): δ 7.88 (dd, 2H, *J* = 8.0, 1.0 Hz), 7.56-7.52 (m, 3H), 7.42 (t, 2H, *J* = 7.5 Hz), 7.29-7.24 (m, 3H), 4.17 (s, 2H); ¹³C NMR (125 MHz, CDCl₃): δ 195.1, 135.6, 134.2, 133.5, 129.4, 129.2, 128.9, 128.8, 128.3, 32.9; HRMS (EI) calcd for C₁₄H₁₂OSe (M⁺) 276.0048, obsd 276.0064.

2-(Phenylselanyl)cyclopentanone:⁵ The title compound was prepared according to the general procedure in 78% yield. ¹H NMR (500 MHz, CDCl₃): δ 7.51 (dd, 2H, *J* = 6.5, 1.5 Hz), 7.34-7.26 (m, 3H), 3.75 (t, 1H, *J* = 7.5 Hz), 2.36-2.28 (m, 2H), 2.22-2.15 (m, 1H), 2.08-1.89 (m, 3H); ¹³C NMR (125 MHz, CDCl₃): δ 214.7, 135.5, 129.3, 128.6, 128.0, 46.6, 36.5, 30.9, 21.1; HRMS (EI) calcd for C₁₁H₁₂OSe (M⁺) 240.0048, obsd 240.0062.

2,2-Dimethyl-5-(phenylselanyl)cyclopentanone: The title compound was prepared according to the general procedure in 67% yield. ^1H NMR (500 MHz, CDCl_3): δ 7.61 (dd, 2H, $J = 6.0, 1.0$ Hz), 7.34-7.26 (m, 3H), 3.83 (dd, 1H, $J = 7.5, 5.0$ Hz), 2.32-2.25 (m, 1H), 1.96-1.89 (m, 2H), 1.78-1.73 (m, 1H), 1.03 (s, 3H), 1.02 (s, 3H); ^{13}C NMR (125 MHz, CDCl_3): δ 218.2, 135.6, 129.0, 128.4, 127.9, 45.9, 44.3, 36.6, 27.0, 25.2, 24.4; HRMS (EI) calcd for $\text{C}_{13}\text{H}_{16}\text{OSe}$ (M^+) 268.0361, obsd 268.0343.

2-(Phenylselanyl)cyclohexanone⁸: The title compound was prepared according to the general procedure in 80% yield. ^1H NMR (500 MHz, CDCl_3): δ 7.55 (dd, 2H, $J = 6.5, 1.5$ Hz), 7.31-7.26 (m, 3H), 3.91 (t, 1H, $J = 5.0$ Hz), 2.95 (m, 1H), 2.36-2.28 (m, 1H), 2.27-2.15 (m, 2H), 2.00-1.95 (m, 1H), 1.89-1.69 (m, 3H), ; ^{13}C NMR (125 MHz, CDCl_3): δ 208.1, 134.8, 129.4, 128.8, 128.3, 51.8, 38.7, 34.2, 27.1, 23.1; HRMS (EI) calcd for $\text{C}_{12}\text{H}_{14}\text{OSe}$ (M^+) 254.0204, obsd 254.0122.

Tetrahydro-3-(phenylselanyl)pyran-4-one: The title compound was prepared according to the general procedure in 79% yield. ^1H NMR (500 MHz, CDCl_3): δ 7.54 (dd, 2H, $J = 9.5, 2.0$ Hz), 7.33-7.26 (m, 3H), 4.16-4.03 (m, 3H), 3.96-3.89 (m, 2H), 3.14-3.09 (m, 1H), 2.51-2.47 (m, 1H); ^{13}C NMR (125 MHz, CDCl_3): δ 203.2, 135.0, 129.5, 128.6, 127.8, 73.2, 68.5, 51.3, 40.5; HRMS (EI) calcd for $\text{C}_{11}\text{H}_{12}\text{O}_2\text{Se}$ (M^+) 255.9997, obsd 255.9974.

1-Methyl-3-(phenylselanyl)piperidin-4-one: The title compound was prepared according to the general procedure in 76% yield. ^1H NMR (500 MHz, CDCl_3): δ 7.54 (dd, 2H, $J = 9.0, 2.0$ Hz), 7.29-7.25 (m, 3H), 3.76 (brs, 1H), 3.33-3.27 (m, 1H), 3.17-3.14 (m, 1H), 2.97-2.88 (m, 2H), 2.50-2.45 (m, 1H), 2.38 (s, 3H), 2.37-2.32 (m, 1H); ^{13}C NMR (125 MHz, CDCl_3): δ 205.3, 134.2, 129.5, 129.4, 128.1, 61.8, 55.7, 50.3, 45.9, 37.7; HRMS (EI) calcd for $\text{C}_{12}\text{H}_{15}\text{NOSe}$ (M^+) 269.0313, obsd 269.0341.

1-Ethylene ketal-3-(phenylselanyl)cyclohexanedin-4-one:⁹ The title compound was prepared

according to the general procedure in 85% yield. ^1H NMR (500 MHz, CDCl_3): δ 7.54 (dd, 2H, J = 5.0, 2.0 Hz), 7.28-7.25 (m, 3H), 4.07-3.98 (m, 5H), 3.18-3.12 (m, 1H), 2.50-2.42 (m, 2H), 2.32 (dd, 1H, J = 14.5, 6.5 Hz), 2.04 (t, 2H, J = 7.0 Hz); ^{13}C NMR (125 MHz, CDCl_3): δ 206.4, 134.5, 129.8, 129.3, 128.2, 107.0, 65.1, 64.9, 48.0, 41.0, 35.3, 34.6; HRMS (EI) calcd for $\text{C}_{14}\text{H}_{16}\text{O}_3\text{Se}$ (M^+) 312.0259, obsd 312.0260.

6-(Phenylselanyl)cyclohex-2-enone:¹⁰ The title compound was prepared according to the general procedure in 63% yield. ^1H NMR (500 MHz, CDCl_3): δ 7.60 (d, 2H, J = 7.0 Hz), 7.33-7.26 (m, 3H), 6.93-6.90 (m, 1H), 6.03 (d, 1H, J = 10.0 Hz), 4.03 (t, 1H, J = 5.0 Hz), 2.60-2.53 (m, 1H), 2.40-2.16 (m, 3H); ^{13}C NMR (125 MHz, CDCl_3): δ 195.3, 149.4, 135.6, 129.3, 128.6, 128.5, 127.8, 48.0, 29.3, 24.0; HRMS (EI) calcd for $\text{C}_{12}\text{H}_{12}\text{OSe}$ (M^+) 252.0048, obsd 252.0043.

2-(Phenylselanyl)cycloheptanone:⁹ The title compound was prepared according to the general procedure in 59% yield. ^1H NMR (500 MHz, CDCl_3): δ 7.54 (dd, 2H, J = 6.0, 2.0 Hz), 7.32-7.26 (m, 3H), 3.80 (dd, 1H, J = 11.0, 5.5 Hz), 2.77-2.71 (m, 1H), 2.41-2.37 (m, 1H), 2.32-2.26 (m, 1H), 1.95-1.87 (m, 2H), 1.85-1.80 (m, 1H), 1.67-1.60 (m, 1H), 1.51-1.35 (m, 2H), 1.33-1.21 (m, 1H); ^{13}C NMR (125 MHz, CDCl_3): δ 209.5, 135.2, 129.3, 128.6, 128.5, 52.5, 40.1, 30.7, 30.4, 28.2, 25.9; HRMS (EI) calcd for $\text{C}_{13}\text{H}_{16}\text{OSe}$ (M^+) 268.0361, obsd 268.0342.

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