Regioselective and Diastereoselective Allylic Amination using Chlorosulfonyl Isocyanate. A Novel Asymmetric Synthesis of Unsaturated Aromatic 1,2-Amino Alcohols

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Contents

General Methods	S4
General procedure for the preparation of (4 <i>S</i>)-(<i>E</i>)-4- <i>tert</i> -butyldimethylsilyloxy-1-methoxy-1-phenylpent-2-ene (3b)	S5
(4 <i>S</i>)-(<i>E</i>)-1-Methoxy-1-phenyl-4-(trimethylsilyloxy)pent-2-ene (3a)	S6
(4 <i>S</i>)-(<i>E</i>)-1-Methoxy-1-phenyl-4-(triisopropylsilyloxy)pent-2-ene (3c)	S6
(4 <i>S</i>)-(<i>E</i>)-4- <i>tert</i> -Butyldiphenylsilyloxy-1-methoxy-1-phenylpent-2-ene (3d)	S6
(4 <i>S</i>)-(<i>E</i>)-4-Acetoxy-1-methoxy-1-phenylpent-2-ene (3e)	S6
(4 <i>S</i>)-(<i>E</i>)-1,4-Dimethoxy-1-phenylpent-2-ene (3f)	S7
(4 <i>S</i>)-(<i>E</i>)-4- <i>tert</i> -Butyldimethylsilyloxy-1-methoxy-1-phenylhex-2-ene (3g)	S7
(4 <i>S</i>)-(<i>E</i>)-1-Methoxy-1-phenyl-4-(triisopropylsilyloxy)hex-2-ene (3h)	S7
(4 <i>S</i>)-(<i>E</i>)-4- <i>tert</i> -Butyldimethylsilyloxy-1-methoxy-5-methyl-1-phenylhex-2-ene (3i)	S7
(4 <i>S</i>)-(<i>E</i>)-1-Methoxy-5-methyl-1-phenyl-4-(triisopropylsilyloxy)hex-2-ene (3j)	S8
(4 <i>R</i>)-(<i>E</i>)-4- <i>tert</i> -Butyldimethylsilyloxy-1,4-diphenyl-1-methoxybut-2-ene (3k)	S8

(4 <i>R</i>)-(E)-1,4-Diphenyl-1-methoxy-4-(triisopropylsilyloxy)but-2-ene (3l)	S8
(4 <i>S</i>)-(E)-1-Methoxy-4-(triisopropylsilyloxy)pent-2-ene (3m)	S8
(5 <i>S</i>)-(E)-2-Methoxy-5-(triisopropylsilyloxy)hex-2-ene (3n)	S9
(2 <i>S</i>)-(E)-5-Methoxy-2-(triisopropylsilyloxy)hept-3-ene (3o)	S9
(2 <i>S</i>)-(E)-5-Methoxy-6-methyl-2-(triisopropylsilyloxy)hept-3-ene (3p)	S9
(2 <i>S</i>)-(E)-5-Methoxy-6-phenyl-2-(triisopropylsilyloxy)hex-3-ene (3q)	S9
(2 <i>S</i>)-(E)-6,6-Dimethyl-5-methoxy-2-(triisopropylsilyloxy)hept-3-ene (3r)	S10
(4 <i>S</i>)-(E)-1-(2-Mesityl)-1-methoxy-4-(triisopropylsilyloxy)pent-2-ene (3s)	S10
(4 <i>S</i>)-(E)-1-Benzoyloxy-1-phenyl-4-(triisopropylsilyloxy)pent-2-ene (3t)	S10
General procedure for the reaction of ether with CSI	S11
(1 <i>R</i> ,2 <i>S</i>)-Methyl <i>N</i> -[2- <i>tert</i> -butyldimethylsilyloxy-1-((<i>E</i>)-2-phenylethenyl)propyl]carbamate (4b) and	
(1 <i>S</i> ,2 <i>S</i>)-methyl <i>N</i> -[2- <i>tert</i> -butyldimethylsilyloxy-1-((<i>E</i>)-2-phenylethenyl)propyl]carbamate (5b)	S11
(4 <i>S</i>)-Methyl <i>N</i> -[1-phenyl-1-(<i>E</i>)-(4- <i>tert</i> -butyldimethylsilyloxypent-2-enyl)]carbamate (7b)	S11
(1 <i>R</i> ,2 <i>S</i>)-Methyl <i>N</i> -[1-((<i>E</i>)-2-phenylethenyl)-2-(triisopropylsilyloxy)propyl]carbamate (4c) and	
(1 <i>S</i> ,2 <i>S</i>)-methyl <i>N</i> -[1-((<i>E</i>)-2-phenylethenyl)-2-(triisopropylsilyloxy)propyl]carbamate (5c)	S12
(1 <i>R</i> ,2 <i>S</i>)-Methyl <i>N</i> -[2- <i>tert</i> -butyldimethylsilyloxy-2-phenyl-1-((<i>E</i>)-2-phenylethenyl)ethyl] carbamate (4k)	S12
(1 <i>R</i> ,2 <i>S</i>)-Methyl <i>N</i> -[2-phenyl-2-triisopropylsilyloxy-1-((<i>E</i>)-2-phenylethenyl)ethyl]carbamate (4l)	S13
(1 <i>R</i> ,2 <i>S</i>)-Methyl <i>N</i> -[1-ethenyl-2-(triisopropylsilyloxy)propyl]carbamate (4m) and	
(4 <i>S</i>)-methyl <i>N</i> -[4-(triisopropylsilyloxy)pent-2-enyl]carbamate (7m)	S13
(1 <i>R</i> ,2 <i>S</i>)-Methyl <i>N</i> -[1-((<i>E</i>)-prop-1-enyl)-2-(triisopropylsilyloxy)propyl]carbamate (4n) and	
(4 <i>S</i>)-methyl <i>N</i> -[1-methyl-4-(triisopropylsilyloxy)pent-2-enyl]carbamate (7n)	S14
(1 <i>R</i> ,2 <i>S</i>)-Methyl <i>N</i> -[1-((<i>E</i>)-but-1-enyl)-2-(triisopropylsilyloxy)propyl]carbamate (4o) and	
(4 <i>S</i>)-methyl <i>N</i> -[1-ethyl-4-(triisopropylsilyloxy)pent-2-enyl]carbamate (7o)	S14
(1 <i>R</i> ,2 <i>S</i>)-Methyl <i>N</i> -[1-((<i>E</i>)-3-methylbut-1-enyl)-2-(triisopropylsilyloxy)propyl]carbamate (4p) and	

(4 <i>S</i>)-methyl <i>N</i> -[1-isopropyl-4-(triisopropylsilyloxy)pent-2-enyl]carbamate (7p)	S15
(1 <i>R</i> ,2 <i>S</i>)-Methyl <i>N</i> -[1-((<i>E</i>)-3-phenylprop-1-enyl)-2-(triisopropylsilyloxy)propyl]carbamate (4q) and	
(4 <i>S</i>)-methyl <i>N</i> -[1-benzyl-4-(triisopropylsilyloxy)pent-2-enyl]carbamate (7q)	S15
(1 <i>R</i> ,2 <i>S</i>)-Methyl <i>N</i> -[1-((<i>E</i>)-3,3-dimethylbut-1-enyl)-2-(triisopropylsilyloxy)propyl]carbamate (4r),	
(1 <i>S</i> ,2 <i>S</i>)-methyl <i>N</i> -[1-((<i>E</i>)-3,3-dimethylbut-1-enyl)-2-(triisopropylsilyloxy)propyl]carbamate (5r) and	
(4 <i>S</i>)-methyl <i>N</i> -[1-(<i>tert</i> -butyl)-4-(triisopropylsilyloxy)pent-2-enyl]carbamate (7r)	S16
(1 <i>R</i> ,2 <i>S</i>)-Methyl <i>N</i> -[1-((<i>E</i>)-2-(2-mesityl)ethenyl)-2-(triisopropylsilyloxy)propyl]carbamate (4s)	S16
(1 <i>R</i> ,2 <i>S</i>)-Benzyl <i>N</i> -[1-((<i>E</i>)-2-phenylethenyl)-2-(triisopropylsilyloxy)propyl]carbamate (4t) and	
(1 <i>S</i> ,2 <i>S</i>)-benzyl <i>N</i> -[1-((<i>E</i>)-2-phenylethenyl)-2-(triisopropylsilyloxy)propyl]carbamate (5t)	S17
(1 <i>R</i> ,2 <i>S</i>)-Methyl <i>N</i> -[2-hydroxy-1-((<i>E</i>)-2-phenylethenyl)propyl]carbamate (8a) and	
(1 <i>S</i> ,2 <i>S</i>)-methyl <i>N</i> -[2-hydroxy-1-((<i>E</i>)-2-phenylethenyl)propyl]carbamate (9a)	S17
(1 <i>R</i> ,2 <i>S</i>)-Methyl <i>N</i> -[2-hydroxy-1-((<i>E</i>)-2-phenylethenyl)butyl]carbamate (8b) and	
(1 <i>S</i> ,2 <i>S</i>)-methyl <i>N</i> -[2-hydroxy-1-((<i>E</i>)-2-phenylethenyl)butyl]carbamate (9b)	S18
(1 <i>R</i> ,2 <i>S</i>)-Methyl <i>N</i> -[2-hydroxy-3-methyl-1-((<i>E</i>)-2-phenylethenyl)butyl]carbamate (8c)	S18
 General procedure for the synthesis of oxazolidinone	S19
(4 <i>R</i> ,5 <i>S</i>)-5-Methyl-4-((<i>E</i>)-2-phenylethenyl)-1,3-oxazolidin-2-one (6a) and	
(4 <i>S</i> ,5 <i>S</i>)-5-methyl-4-((<i>E</i>)-2-phenylethenyl)-1,3-oxazolidin-2-one (6b)	S19
(4 <i>R</i> ,5 <i>S</i>)-5-Phenyl-4-((<i>E</i>)-2-phenylethenyl)-1,3-oxazolidin-2-one (6c)	S20
 ¹ H NMR spectra for 3b	S21
¹³ C NMR spectra for 3b	S22
¹ H NMR spectra for 4b and 5b	S23
¹³ C NMR spectra for 4b and 5b	S24
¹ H NMR spectra for 3c	S25
¹³ C NMR spectra for 3c	S26

¹ H NMR spectra for 4c and 5c	S27
¹³ C NMR spectra for 4c and 5c	S28
¹ H NMR spectra for 3k	S29
¹³ C NMR spectra for 3k	S30
¹ H NMR spectra for 4k	S31
¹³ C NMR spectra for 4k	S32
¹ H NMR spectra for 3m	S33
¹³ C NMR spectra for 3m	S34
¹ H NMR spectra for 4m and 5m	S35
¹³ C NMR spectra for 4m and 5m	S36
¹ H NMR spectra for 3s	S37
¹³ C NMR spectra for 3s	S38
¹ H NMR spectra for 4s	S39
¹³ C NMR spectra for 4s	S40
¹ H NMR spectra for 6a	S41
¹³ C NMR spectra for 6a	S42

General Methods. Commercially available reagents were used without additional purification, unless otherwise stated. All anhydrous solvents were distilled over CaH₂ or P₂O₅ or Na/benzophenone prior to reaction. All reactions were performed under an inert atmosphere of nitrogen or argon. Melting points were not corrected. Nuclear magnetic resonance spectra (¹H and ¹³C NMR) were recorded on 500 MHz spectrometer for CDCl₃ solutions and chemical shifts are reported as parts per million (ppm) relative to, respectively, residual CHCl₃ δ_H (7.26 ppm) and CDCl₃ δ_C (77.0 ppm) as internal standards. Resonance patterns are reported with the notations s (singlet), d (doublet), t (triplet), q (quartet), and m (multiplet). In addition, the notation br is used to indicate a broad signal. Coupling constants (*J*) are reported in hertz (Hz). IR spectra are reported as cm⁻¹. Thin layer chromatography was carried out using plates coated with

Kieselgel 60F₂₅₄ (Merck). For flash column chromatography, Kieselgel 60 (230-400 mesh) was used. High-resolution mass spectra (HRMS) were recorded using the chemical ionization (CI) method.

General procedure for the preparation of (4S)-(E)-4-*tert*-butyldimethylsilyloxy-1-methoxy-1-phenylpent-2-ene (3b). To a solution of methyl (4S)-(E)-4-*tert*-butyldimethylsilyloxy-2-pentenoate^{17c} (2.8 mmol) in benzene (8 mL) was added DIBAL-H (5.6 mmol, 1.5 M in toluene) at 0°C. The reaction mixture was stirred at 0°C for 1 h, and saturated NH₄Cl solution was added, then extracted with EtOAc. The organic layer was washed with 1 N HCl, H₂O, brine, and dried over MgSO₄, and concentrated in vacuo. The residue was used for further manipulation without purification. To a solution of (COCl)₂ (3.1 mmol) in CH₂Cl₂ (8 mL) was added DMSO (6.2 mmol) at -78°C, and the mixture was stirred at -70°C for 15 min. The solution of the oil obtained above in CH₂Cl₂ (2 mL) was added, and the mixture was stirred at -70°C for 30 min. Triethylamine (14.0 mmol) was added at -70°C, and stirred at -70°C for 30 min. EtOAc was added, then washed with saturated NaHCO₃ solution. The organic layer was dried over MgSO₄, and concentrated in vacuo. The residue was dissolved in Et₂O (7 mL), and PhMgBr (3.1 mmol, 3.0 M in Et₂O) was added at -78°C. The mixture was stirred at -78°C for 1 h and 0°C for 1 h, then saturated NH₄Cl solution was added, and extracted with Et₂O. The organic layer was dried over MgSO₄, and concentrated in vacuo. The residue was dissolved in THF (7 mL), then NaH (3.1 mmol) and MeI (4.2 mmol) was added. The mixture was stirred at 45°C for 1 h, and H₂O was added, then extracted with Et₂O. The organic layer was dried over MgSO₄, and concentrated. The residue was purified by column chromatography (Hexane/EtOAc = 30:1) to afford (4S)-(E)-4-*tert*-butyldimethylsilyloxy-1-methoxy-1-phenylpent-2-ene (**3b**) as a colorless oil in total 76.0% yield. ¹H NMR (500MHz, CDCl₃): δ 0.00 (s, 1.2H), 0.01 (s, 1.2H), 0.02 (s, 1.8H), 0.04 (s, 1.8H), 0.86 (s, 3.6H), 0.88 (s, 5.4H), 1.21 (d, 1.8H, *J* = 6.0 Hz), 1.22 (d, 1.2H, *J* = 6.0 Hz), 3.31 (s, 1.2H), 3.33 (s, 1.8H), 4.32 (dq, 1H, *J* = 6.0, 5.0 Hz), 4.61 (d, 1H, *J* = 6.0 Hz), 5.68–5.73 (m, 2H), 7.25–7.35 (m, 5H); ¹³C NMR (125MHz, CDCl₃): δ -4.1, -3.9, 18.9, 18.9, 25.1, 25.2, 26.6, 56.9, 57.0, 69.4, 69.5, 84.4, 84.5, 127.4, 127.5, 128.2, 129.1, 129.6, 129.7, 137.9, 141.8, 141.9; IR (CH₂Cl₂): 2929, 2857, 1472, 1361, 1254, 1149, 1095 cm⁻¹; HRMS (CI) calcd for C₁₈H₃₀O₂Si-H (M-H)⁺ 305.1937. Found: 305.1924.

Compound 3a. ^1H NMR (500MHz, CDCl_3): δ 0.05 (s, 4H), 0.09 (s, 5H), 1.21 (d, 1.7H, $J = 6.0$ Hz), 1.23 (d, 1.3H, $J = 6.0$ Hz), 3.31 (s, 1.3H), 3.32 (s, 1.7H), 4.31 (dq, 1H, $J = 6.0, 6.0$ Hz), 4.61 (d, 1H, $J = 6.0$ Hz), 5.66–5.73 (m, 2H), 7.25–7.36 (m, 5H); ^{13}C NMR (125MHz, CDCl_3): δ 0.8, 0.9, 25.0, 25.1, 56.9, 57.1, 69.1, 69.2, 84.4, 84.5, 127.5, 128.2, 129.1, 129.9, 130.0, 137.5, 137.6, 141.8, 141.9; IR (CH_2Cl_2): 2974, 2930, 2822, 1507, 1453, 1367, 1190, 1144, 1086 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{15}\text{H}_{24}\text{O}_2\text{Si-H}$ (M-H) $^+$ 263.1467. Found: 263.1480.

Compound 3c. ^1H NMR (500MHz, CDCl_3): δ 1.00–1.10 (m, 21H), 1.27 (d, 1.8H, $J = 6.0$ Hz), 1.29 (d, 1.2H, $J = 6.0$ Hz), 3.34 (s, 1.2H), 3.35 (s, 1.8H), 4.43 (dq, 1H, $J = 6.0, 6.0$ Hz), 4.64 (d, 1H, $J = 6.0$ Hz), 5.72–5.78 (m, 2H), 7.27–7.37 (m, 5H); ^{13}C NMR (125MHz, CDCl_3): δ 12.9, 13.00, 18.7, 18.8, 25.6, 25.7, 56.9, 57.1, 69.5, 69.6, 84.5, 84.7, 127.4, 127.5, 128.1, 128.2, 129.0, 129.5, 129.6, 138.2, 138.3, 141.9, 142.0; IR (CH_2Cl_2): 2943, 2866, 1493, 1464, 1367, 1246, 1189, 1150, 1094 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{21}\text{H}_{36}\text{O}_2\text{Si-H}$ (M-H) $^+$ 347.2406. Found: 347.2410.

Compound 3d. ^1H NMR (500MHz, CDCl_3): δ 1.02 (s, 3.6H), 1.04 (s, 5.4H), 1.14 (d, 1.8H, $J = 6.5$ Hz), 1.18 (d, 1.2H, $J = 6.5$ Hz), 3.26 (s, 1.8H), 3.27 (s, 1.2H), 4.29 (dq, 1H, $J = 6.5, 6.5$ Hz), 4.54 (d, 0.4H, $J = 6.5$ Hz), 4.55 (d, 0.6H, $J = 6.5$ Hz), 5.55 (dd, 0.4H, $J = 16.0, 6.5$ Hz), 5.64 (dd, 0.6H, $J = 16.0, 6.5$ Hz), 5.74 (dd, 1H, $J = 16.0, 6.0$ Hz), 7.22–7.40 (m, 10H), 7.57–7.66 (m, 5H); ^{13}C NMR (125MHz, CDCl_3): δ 19.4, 19.5, 24.5, 24.6, 27.1, 27.2, 56.4, 56.5, 69.8, 69.9, 83.9, 84.1, 126.9, 127.0, 127.6, 127.7, 128.6, 129.5, 129.6, 129.7, 129.8, 134.4, 134.6, 136.1, 136.9, 137.1, 141.4, 141.5; IR (CH_2Cl_2): 2930, 2891, 2857, 2819, 1472, 1427, 1367, 1189, 1147, 1111 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{28}\text{H}_{34}\text{O}_2\text{Si-H}$ (M-H) $^+$ 429.2250. Found: 429.2253.

Compound 3e. ^1H NMR (500MHz, CDCl_3): δ 1.30 (d, 1.8H, $J = 6.0$ Hz), 1.31 (d, 1.2H, $J = 6.0$ Hz), 2.03 (s, 3H), 3.30 (s, 3H), 4.62 (d, 0.4H, $J = 6.0$ Hz), 4.63 (d, 0.6H, $J = 6.0$ Hz), 5.38 (dq, 1H, $J = 6.0, 6.0$ Hz), 5.71–5.79 (m, 2H), 7.26–7.37 (m, 5H); ^{13}C NMR (125MHz, CDCl_3): δ 20.8, 20.9, 22.0, 57.1, 70.7, 70.8, 84.0, 84.1, 127.6, 128.5, 129.2, 132.1, 132.4, 132.7, 132.8, 141.2, 141.3, 170.9; IR (CH_2Cl_2): 2981, 2935, 2822, 1738, 1452, 1371, 1241, 1094 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{14}\text{H}_{18}\text{O}_3\text{-H}$ (M-H) $^+$ 233.1178. Found: 233.1183.

Compound 3f. ^1H NMR (500MHz, CDCl_3): δ 1.22 (d, 1.8H, $J = 6.5$ Hz), 1.25 (d, 1.2H, $J = 6.5$ Hz), 3.22 (s, 1.2H), 3.28 (s, 1.8H), 3.33 (s, 1.8H), 3.34 (s, 1.2H), 3.73–3.76 (m, 1H), 4.64 (d, 0.6H, $J = 7.0$ Hz), 4.65 (d, 0.4H, $J = 7.0$ Hz), 5.62 (dd, 1H, $J = 16.0, 7.0$ Hz), 5.74 (dd, 1H, $J = 16.0, 7.0$ Hz), 7.27–7.37 (m, 5H); ^{13}C NMR (125MHz, CDCl_3): δ 21.9, 22.0, 56.7, 56.8, 57.1, 78.1, 84.3, 84.4, 127.5, 128.4, 129.2, 133.3, 134.7, 134.8, 141.6, 141.7; IR (CH_2Cl_2): 2921, 2853, 1451, 1383, 1250, 1100, 1037 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{13}\text{H}_{18}\text{O}_2\text{-H (M-H)}^+$ 205.1229. Found: 205.1233.

Compound 3g. ^1H NMR (500MHz, CDCl_3): δ 0.00 (s, 1.5H), 0.04 (s, 1.5H), 0.05 (s, 1.5H), 0.08 (s, 1.5H), 0.89 (t, 1.5H, $J = 7.5$ Hz), 0.92 (t, 1.5H, $J = 7.5$ Hz), 0.93 (s, 4.5H), 0.94 (s, 4.5H), 1.56 (dq, 1H, $J = 7.5, 6.0$ Hz), 3.37 (s, 1.5H), 3.39 (s, 1.5H), 4.11 (dt, 1H, $J = 6.0, 5.0$ Hz), 4.67 (d, 0.5H, $J = 5.5$ Hz), 4.68 (d, 0.5H, $J = 5.5$ Hz), 5.71–5.75 (m, 2H), 7.25–7.39 (m, 5H); ^{13}C NMR (125MHz, CDCl_3): δ -4.1, -3.7, 10.3, 10.4, 18.9, 19.0, 26.5, 26.6, 31.8, 56.9, 57.1, 74.7, 74.8, 84.5, 84.6, 127.4, 128.2, 129.1, 130.8, 130.9, 136.6, 136.7, 141.9, 142.1; IR (CH_2Cl_2): 2958, 2929, 2821, 1493, 1463, 1361, 1254, 1189, 1095 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{19}\text{H}_{32}\text{O}_2\text{Si-H (M-H)}^+$ 319.2093. Found: 319.2095.

Compound 3h. ^1H NMR (500MHz, CDCl_3): δ 0.83 (t, 1.5H, $J = 7.5$ Hz), 0.88 (t, 1.5H, $J = 7.5$ Hz), 0.99–1.07 (m, 21H), 1.56 (dq, 0.5H, $J = 7.5, 7.0$ Hz), 1.60 (dq, 0.5H, $J = 7.5, 7.0$ Hz), 3.33 (s, 1.5H), 3.35 (s, 1.5H), 4.20 (dt, 1H, $J = 7.0, 5.5$ Hz), 4.63 (d, 0.5H, $J = 6.0$ Hz), 4.64 (d, 0.5H, $J = 6.0$ Hz), 5.65–5.71 (m, 2H), 7.26–7.34 (m, 5H); ^{13}C NMR (125MHz, CDCl_3): δ 9.7, 9.8, 13.0, 13.1, 18.7, 18.8, 31.9, 32.0, 57.0, 57.1, 74.7, 74.9, 84.6, 84.8, 127.3, 127.4, 128.1, 128.2, 129.0, 129.1, 131.1, 131.2, 136.5, 136.6, 142.0, 142.1; IR (CH_2Cl_2): 2941, 2866, 1463, 1364, 1094, 1013 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{22}\text{H}_{38}\text{O}_2\text{Si-H (M-H)}^+$ 361.2563. Found: 361.2569.

Compound 3i. ^1H NMR (500MHz, CDCl_3): δ -0.10 (s, 0.9H), -0.04 (s, 2.1H), -0.02 (s, 0.9H), -0.01 (s, 2.1H), 0.82 (d, 1.8H, $J = 7.0$ Hz), 0.84 (s, 2.7H), 0.85 (d, 4.2H, $J = 7.0$ Hz), 0.87 (s, 6.3H), 1.67 (dq, 1H, $J = 7.0, 6.0$ Hz), 3.34 (s, 0.9H), 3.35 (s, 2.1H), 3.86 (dd, 1H, $J = 6.0, 6.0$ Hz), 4.63 (d, 0.3H, $J = 6.0$ Hz), 4.64 (d, 0.7H, $J = 6.0$ Hz), 5.63–5.68 (m, 2H), 7.26–7.34 (m, 5H); ^{13}C NMR (125MHz, CDCl_3): δ -4.2, -3.5, 18.6, 18.7, 19.0, 19.1, 26.5, 26.6, 35.4, 35.5, 56.9, 57.1, 78.3, 78.6, 84.6, 84.7, 127.3, 127.4, 127.1, 127.2, 129.0,

131.8, 131.9, 135.1, 135.2, 142.0, 142.2; IR (CH₂Cl₂): 2957, 2929, 2857, 1471, 1362, 1255, 1099, 1056 cm⁻¹;
 HRMS (CI) calcd for C₂₀H₃₄O₂Si-H (M-H)⁺ 333.2250. Found: 333.2256.

Compound 3j. ¹H NMR (500MHz, CDCl₃): δ 0.82 (d, 1.8H, *J* = 6.5 Hz), 0.84 (d, 1.8H, *J* = 6.5 Hz), 0.88 (d, 1.2H, *J* = 6.5 Hz), 0.89 (d, 1.2H, *J* = 6.5 Hz), 0.96–1.04 (m, 21H), 1.77 (dq, 1H, *J* = 6.5, 6.0 Hz), 3.34 (s, 1.2H), 3.35 (s, 1.8H), 4.06 (dd, 0.4H, *J* = 6.0, 6.0 Hz), 4.08 (dd, 0.6H, *J* = 6.0, 6.0 Hz), 4.61 (d, 0.4H, *J* = 6.0 Hz), 4.64 (d, 0.6H, *J* = 6.0 Hz), 5.63–5.68 (m, 2H), 7.26–7.35 (m, 5H); ¹³C NMR (125MHz, CDCl₃): δ 13.1, 13.2, 17.7, 17.9, 18.8, 19.2, 35.8, 35.9, 56.9, 57.1, 78.4, 78.8, 84.8, 84.9, 127.3, 127.4, 128.1, 128.2, 128.9, 129.0, 132.3, 134.2, 134.3, 141.9, 142.2; IR (CH₂Cl₂): 2943, 2866, 1464, 1382, 1367, 1189, 1099, 1061 cm⁻¹;
 HRMS (CI) calcd for C₂₃H₄₀O₂Si-H (M-H)⁺ 375.2719. Found: 375.2719.

Compound 3k. ¹H NMR (500MHz, CDCl₃): δ -0.03 (s, 1.5H), -0.01 (s, 1.5H), 0.00 (s, 1.5H), 0.06 (s, 1.5H), 0.88 (s, 4.5H), 0.91 (s, 4.5H), 3.30 (s, 1.5H), 3.32 (s, 1.5H), 4.64 (d, 1H, *J* = 5.5 Hz), 5.21 (d, 0.5H, *J* = 5.0 Hz), 5.22 (d, 0.5H, *J* = 5.0 Hz), 5.82 (dd, 1H, *J* = 16.0, 5.0 Hz), 5.84 (dd, 1H, *J* = 16.0, 5.5 Hz), 7.22–7.36 (m, 10H); ¹³C NMR (125MHz, CDCl₃): δ -4.2, -4.1, 19.0, 19.1, 26.5, 26.6, 57.0, 57.1, 75.6, 75.7, 84.3, 84.4, 126.6, 126.7, 127.5, 127.7, 128.3, 128.9, 129.1, 130.5, 130.7, 136.5, 136.7, 141.7, 141.8, 144.4, 144.5; IR (CH₂Cl₂): 2950, 2897, 1487, 1449, 1250, 1185, 1099, 1058 cm⁻¹; HRMS (CI) calcd for C₂₃H₃₂O₂Si-H (M-H)⁺ 367.2093. Found: 367.2090.

Compound 3l. ¹H NMR (500MHz, CDCl₃): δ 0.93–1.12 (m, 21H), 3.26 (s, 1.2H), 3.29 (s, 1.8H), 4.61 (d, 0.4H, *J* = 5.0 Hz), 4.62 (d, 0.6H, *J* = 5.0 Hz), 5.28 (d, 0.6H, *J* = 5.0 Hz), 5.29 (d, 0.4H, *J* = 5.0 Hz), 5.83 (dd, 1H, *J* = 15.0, 5.0 Hz), 5.84 (dd, 1H, *J* = 15.0, 5.0 Hz), 7.20–7.37 (m, 10H); ¹³C NMR (125MHz, CDCl₃): δ 12.9, 13.0, 18.6, 18.7, 56.9, 57.1, 75.8, 75.9, 84.3, 84.5, 126.7, 126.8, 127.5, 127.7, 128.2, 128.3, 128.9, 129.0, 129.1, 129.9, 130.2, 137.0, 137.2, 141.7, 141.8, 144.8, 144.9; IR (CH₂Cl₂): 2943, 2866, 1492, 1452, 1249, 1189, 1101, 1069 cm⁻¹; HRMS (CI) calcd for C₂₆H₃₈O₂Si-H (M-H)⁺ 409.2563. Found: 409.2561.

Compound 3m. ¹H NMR (500MHz, CDCl₃): δ 1.03–1.10 (m, 21H), 1.25 (d, 3H, *J* = 6.5 Hz), 3.33 (s, 3H), 3.92 (d, 2H, *J* = 6.5 Hz), 4.42 (dq, 1H, *J* = 6.5, 6.0 Hz), 5.70 (dd, 1H, *J* = 16.5, 6.0 Hz), 5.75 (dt, 1H, *J* = 16.5, 6.5 Hz); ¹³C NMR (125MHz, CDCl₃): δ 13.0, 18.8, 25.5, 58.5, 69.3, 73.4, 125.1, 139.1; IR (CH₂Cl₂): 2924,

2854, 1464, 1378, 1260, 1094 cm^{-1} ; $[\alpha]_{\text{D}} -4.7$ ($c=0.25$, CHCl_3 , 25°C); HRMS (CI) calcd for $\text{C}_{15}\text{H}_{32}\text{O}_2\text{Si}+\text{H}$ ($\text{M}+\text{H})^+$ 273.2250. Found: 273.2260.

Compound 3n. ^1H NMR (500MHz, CDCl_3): δ 1.01–1.10 (m, 21H), 1.21 (d, 1.5H, $J = 6.5$ Hz), 1.22 (d, 1.5H, $J = 6.5$ Hz), 1.24 (d, 1.5H, $J = 6.5$ Hz), 1.25 (d, 1.5H, $J = 6.5$ Hz), 3.24 (s, 1.5H), 3.26 (s, 1.5H), 3.70 (dq, 1H, $J = 6.5$, 6.5 Hz), 4.40 (dq, 1H, $J = 6.5$, 6.0 Hz), 5.46 (dd, 0.5H, $J = 15.5$, 6.5 Hz), 5.49 (dd, 0.5H, $J = 15.5$, 6.5 Hz), 5.66 (dd, 0.5H, $J = 15.5$, 6.0 Hz), 5.67 (dd, 0.5H, $J = 15.5$, 6.0 Hz); ^{13}C NMR (125MHz, CDCl_3): δ 12.9, 13.0, 18.8, 22.1, 22.2, 25.7, 25.8, 56.5, 56.6, 69.4, 69.5, 78.2, 78.3, 130.6, 138.0, 138.1; IR (CH_2Cl_2): 2943, 2892, 2867, 1464, 1369, 1265, 1199, 1130, 1112, 1094 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{16}\text{H}_{34}\text{O}_2\text{Si}+\text{H}$ ($\text{M}+\text{H})^+$ 287.2406. Found: 287.2411.

Compound 3o. ^1H NMR (500MHz, CDCl_3): δ 0.84 (t, 1.5H, $J = 7.0$ Hz), 0.87 (t, 1.5H, $J = 7.0$ Hz), 1.00–1.09 (m, 21H), 1.22 (d, 1.5H, $J = 6.0$ Hz), 1.24 (d, 1.5H, $J = 6.0$ Hz), 1.46 (ddq, 1H, $J = 14.0$, 7.0, 6.0 Hz), 1.58 (ddq, 1H, $J = 14.0$, 7.0, 6.0 Hz), 3.22 (s, 1.5H), 3.25 (s, 1.5H), 3.42 (dt, 1H, $J = 6.5$, 6.0 Hz), 4.41 (dq, 1H, $J = 6.0$, 6.0 Hz), 5.38 (dd, 0.5H, $J = 15.5$, 6.5 Hz), 5.40 (dd, 0.5H, $J = 15.5$, 6.5 Hz), 5.65 (dd, 0.5H, $J = 15.5$, 6.0 Hz), 5.67 (dd, 0.5H, $J = 15.5$, 6.0 Hz); ^{13}C NMR (125MHz, CDCl_3): δ 10.3, 10.4, 13.1, 13.2, 18.7, 18.3, 25.9, 26.0, 29.1, 29.2, 56.6, 56.7, 69.4, 69.5, 84.1, 84.2, 129.1, 129.2, 139.3; IR (CH_2Cl_2): 2943, 2867, 1464, 1368, 1122, 1092, 1025 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{17}\text{H}_{36}\text{O}_2\text{Si}-\text{H}$ ($\text{M}-\text{H})^+$ 299.2407. Found: 299.2407.

Compound 3p. ^1H NMR (500MHz, CDCl_3): δ 0.83 (d, 1.5H, $J = 6.5$ Hz), 0.85 (d, 1.5H, $J = 6.5$ Hz), 0.90 (d, 1.5H, $J = 6.5$ Hz), 0.91 (d, 1.5H, $J = 6.5$ Hz), 1.04–1.07 (m, 21H), 1.25 (d, 1.5H, $J = 6.0$ Hz), 1.26 (d, 1.5H, $J = 6.0$ Hz), 1.72 (dq, 1H, $J = 7.0$, 6.5 Hz), 3.19 (dd, 0.5H, $J = 7.0$, 6.5 Hz), 3.19 (dd, 0.5H, $J = 7.0$, 6.5 Hz), 3.23 (s, 1.5H), 3.25 (s, 1.5H), 4.43 (dq, 1H, $J = 6.0$, 6.0 Hz), 5.43 (dd, 1H, $J = 15.5$, 6.5 Hz), 5.67 (dd, 1H, $J = 15.5$, 6.0 Hz); ^{13}C NMR (125MHz, CDCl_3): δ 13.0, 18.8, 18.9, 19.3, 19.4, 26.0, 26.1, 33.4, 33.5, 56.9, 57.0, 69.5, 69.6, 88.1, 88.3, 127.2, 127.4, 140.1, 140.2; IR (CH_2Cl_2): 2943, 2892, 2867, 1465, 1368, 1095, 1002 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{18}\text{H}_{38}\text{O}_2\text{Si}-\text{H}$ ($\text{M}-\text{H})^+$ 313.2563. Found: 313.2565.

Compound 3q. ^1H NMR (500MHz, CDCl_3): δ 1.01–1.11 (m, 21H), 1.16 (d, 1.8H, $J = 6.0$ Hz), 1.21 (d, 1.2H, $J = 6.0$ Hz), 2.71 (dd, 0.6H, $J = 13.0$, 7.0 Hz), 2.76 (dd, 0.4H, $J = 13.0$, 7.0 Hz), 2.91 (dd, 0.6H, $J =$

13.0, 7.0 Hz), 2.93 (dd, 0.4H, $J = 13.0, 7.0$ Hz), 3.23 (s, 1.2H), 3.26 (s, 1.8H), 3.77 (dt, 1H, $J = 7.0, 6.0$ Hz), 4.38 (dq, 1H, $J = 6.0, 6.0$ Hz), 5.44 (dd, 0.6H, $J = 15.5, 6.0$ Hz), 5.47 (dd, 0.4H, $J = 15.5, 6.0$ Hz), 5.57 (dd, 0.6H, $J = 15.5, 6.0$ Hz), 5.61 (dd, 0.4H, $J = 15.5, 6.0$ Hz), 7.17–7.21 (m, 3H), 7.25–7.28 (m, 2H); ^{13}C NMR (125MHz, CDCl_3): δ 12.9, 18.8, 25.8, 43.1, 43.2, 56.9, 57.0, 83.6, 83.7, 126.8, 128.4, 128.5, 128.8, 130.2, 130.3, 139.1, 139.2, 139.4, 139.6; IR (CH_2Cl_2): 2942, 2891, 2866, 1496, 1464, 1368, 1246, 1146, 1096 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{22}\text{H}_{38}\text{O}_2\text{Si-H (M-H)}^+$ 361.2563. Found: 361.2575.

Compound 3r. ^1H NMR (500MHz, CDCl_3): δ 0.85 (s, 4.5H), 0.86 (s, 4.5H), 1.03–1.08 (m, 21H), 1.25 (d, 1.5H, $J = 6.5$ Hz), 1.26 (d, 1.5H, $J = 6.5$ Hz), 3.06 (d, 0.5H, $J = 8.0$ Hz), 3.07 (d, 0.5H, $J = 8.0$ Hz), 3.22 (s, 1.5H), 3.23 (s, 1.5H), 4.45 (dq, 1H, $J = 6.5$ Hz, 6Hz), 5.44 (dd, 0.5H, $J = 15.5, 8.0$ Hz), 5.46 (dd, 0.5H, $J = 15.5, 8.0$ Hz), 5.65 (dd, 1H, $J = 15.5, 6.0$ Hz); ^{13}C NMR (125MHz, CDCl_3): δ 13.0, 18.7, 18.8, 26.1, 26.2, 26.7, 26.8, 35.4, 57.4, 57.5, 69.6, 69.7, 91.0, 91.2, 126.0, 126.3, 140.5, 140.7; IR (CH_2Cl_2): 2945, 2867, 1464, 1390, 1363, 1245, 1178, 1148, 1096 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{19}\text{H}_{40}\text{O}_2\text{Si-H (M-H)}^+$ 327.2720. Found: 327.2726.

Compound 3s. ^1H NMR (500MHz, CDCl_3): δ 1.00–1.09 (m, 21H), 1.20 (d, 1.5H, $J = 6.5$ Hz), 1.22 (d, 1.5H, $J = 6.5$ Hz), 2.55 (s, 1.5H), 2.56 (s, 1.5H), 2.31 (s, 3H), 2.32 (s, 3H), 3.21 (s, 1.5H), 3.22 (s, 1.5H), 4.39 (dq, 1H, $J = 6.5, 6.0$ Hz), 5.13 (d, 0.5H, $J = 5.5$ Hz), 5.15 (d, 0.5H, $J = 5.5$ Hz), 5.50 (dd, 0.5H, $J = 14.0, 5.5$ Hz), 5.57 (dd, 0.5H, $J = 14.0, 5.5$ Hz), 5.85 (dd, 0.5H, $J = 14.0, 6.5$ Hz), 5.88 (dd, 0.5H, $J = 14.0, 6.5$ Hz), 6.80 (s, 1H), 6.81 (s, 1H); ^{13}C NMR (125MHz, CDCl_3): δ 12.9, 13.0, 18.7, 18.8, 21.2, 21.5, 25.5, 25.6, 56.5, 56.6, 69.5, 69.6, 80.6, 80.7, 127.9, 128.1, 130.4, 130.5, 133.7, 136.8, 137.1, 137.2, 137.3, 137.5, 137.6; IR (CH_2Cl_2): 2925, 2866, 1463, 1367, 1244, 1149, 1094 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{24}\text{H}_{42}\text{O}_2\text{Si+H (M+H)}^+$ 391.3032. Found: 391.3044.

Compound 3t. ^1H NMR (500MHz, CDCl_3): δ 0.92–1.01 (m, 21H), 1.18 (d, 1.8H, $J = 6.5$ Hz), 1.20 (d, 1.2H, $J = 6.5$ Hz), 4.34 (dq, 1H, $J = 6.5, 5.0$ Hz), 4.44 (d, 1H, $J = 12.0$ Hz), 4.48 (d, 1H, $J = 12.0$ Hz), 4.75 (d, 1H, $J = 5.0$ Hz), 5.67–5.70 (m, 2H), 7.18–7.30 (m, 10H); ^{13}C NMR (125MHz, CDCl_3): δ 12.9, 13.0, 18.7, 18.8, 25.6, 69.6, 70.6, 70.7, 72.8, 81.7, 81.8, 127.5, 127.6, 128.1, 128.2, 128.3, 128.4, 129.0, 129.1, 126.7,

138.3, 138.5, 139.3, 139.5, 142.1; IR (CH₂Cl₂): 3029, 2943, 2865, 1495, 1454, 1367, 1149, 1091, 1067 cm⁻¹; HRMS (CI) calcd for C₂₇H₄₀O₂Si-H (M-H)⁺ 423.2719. Found: 423.2713.

General procedure for the reaction of ether with CSI. A suspension of Na₂CO₃ (6.75 mmol) in anhydrous CH₂Cl₂ (12 mL) was adjusted to -78°C or 20°C, then CSI (4.5 mmol) and ether (**3**) (3 mmol) was added under N₂. The reaction mixture was stirred at -78°C or 20°C, quenched with H₂O (10 mL) when the reaction was completed (TLC monitoring), then extracted with EtOAc (10 mL×2). The organic layer was added to an aqueous solution of Na₂SO₃ (25%) and KOH (10%), and the reaction mixture was stirred at room temperature for overnight. The organic layer was washed with H₂O and brine, dried over MgSO₄ and concentrated in vacuo. The residue was purified by column chromatography (Hexane/EtOAc) to afford carbamate.

(1*R*,2*S*)-Methyl *N*-[2-*tert*-butyldimethylsilyloxy-1-((*E*)-2-phenylethenyl)propyl]carbamate (4b**) and (1*S*,2*S*)-methyl *N*-[2-*tert*-butyldimethylsilyloxy-1-((*E*)-2-phenylethenyl)propyl]carbamate (**5b**).** The above general procedure was followed using **3b** (0.30 g, 0.68 mmol), Na₂CO₃ (0.23 g, 2.00 mmol) and CSI (0.13 mL, 1.47 mmol) in CH₂Cl₂ (4 mL) at -78°C. The reaction mixture was purified by column chromatography (Hexane/EtOAc = 6:1) to give 0.28 g (83%) inseparable mixture of **4b** and **5b** (6:2 : 1 ratio) as a colorless oil. Compound **4b**. ¹H NMR (500MHz, CDCl₃): δ 0.09 (s, 3H), 0.10 (s, 3H), 0.93 (s, 9H), 1.14 (d, 3H, *J* = 6.5 Hz), 3.69 (s, 3H), 4.00–4.05 (br, 1H), 4.14–4.19 (br, 1H), 5.04–5.10 (br, 1H), 6.17 (dd, 1H, *J* = 16.0, 8.0 Hz), 6.58 (d, 1H, *J* = 16.0 Hz), 7.23–7.39 (m, 5H); ¹³C NMR (125MHz, CDCl₃): δ -4.1, -3.5, 18.7, 21.3, 26.5, 52.8, 59.6, 71.2, 126.1, 127.1, 128.3, 129.2, 133.7, 137.6, 157.0; IR (CH₂Cl₂): 3324, 2954, 2929, 2856, 1713, 1503, 1462, 1255, 1099, 1056 cm⁻¹; HRMS (CI) calcd for C₁₉H₃₁NO₃Si+H (M+H)⁺ 350.2151. Found: 350.2157. Compound **5b**. ¹H NMR (500MHz, CDCl₃): δ 0.03 (s, 3H), 0.06 (s, 3H), 0.89 (s, 9H), 1.22 (d, 3H, *J* = 6.5 Hz), 3.72 (s, 3H), 3.98–4.04 (br, 1H), 4.17–4.23 (br, 1H), 5.10–5.16 (br, 1H), 6.16 (dd, 1H, *J* = 16.0, 8.0 Hz), 6.54 (d, 1H, *J* = 16.0 Hz), 7.23–7.39 (m, 5H).

(4*S*)-Methyl *N*-[1-phenyl-1-(*E*)-(4-*tert*-butyldimethylsilyloxypent-2-enyl)]carbamate (7b**).** The above general procedure was followed using **3b** (0.30 g, 0.68 mmol), Na₂CO₃ (0.23 g, 2.00 mmol) and CSI (0.13

mL, 1.47 mmol) in CHCl_3 (4 mL) at -60°C . The reaction mixture was purified by column chromatography (Hexane/EtOAc = 6:1) to give 0.26 g (77%) inseparable mixture of **4b** and **5b** (5.7 : 1 ratio) as a colorless oil and 30 mg (9%) of **7b** as a colorless oil. Compound **7b**. ^1H NMR (500MHz, CDCl_3): δ 0.01 (s, 0.9H), 0.02 (s, 0.9H), 0.03 (s, 2.1H), 0.04 (s, 2.1H), 0.86 (s, 2.7H), 0.89 (s, 6.3H), 1.21 (d, 2.1H, J = 6.5 Hz), 1.23 (d, 0.9H, J = 6.5 Hz), 3.67 (s, 3H), 4.34(dq, 1H, J = 6.5, 5.5 Hz), 5.01–5.07 (br, 1H), 5.30–5.37 (br, 1H), 5.64 (dd, 1H, J = 16.0, 5.5 Hz), 5.78 (dd, 1H, J = 16.0, 5.5 Hz), 7.25–7.37 (m, 5H); ^{13}C NMR (125MHz, CDCl_3): δ -4.0, -3.9, 18.9, 25.0, 25.1, 26.6, 26.7, 52.9, 56.7, 62.5, 89.2, 89.3, 126.9, 127.0, 127.6, 128.2, 129.3, 137.1, 141.9, 142.0, 156.9; IR (CH_2Cl_2): 3320, 2956, 2857, 1704, 1534, 1460, 1364, 1254, 1149, 1081 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{19}\text{H}_{31}\text{NO}_3\text{Si}+\text{H}$ ($\text{M}+\text{H}$) $^+$ 350.2151. Found: 350.2156.

Compounds 4c and 5c. The above general procedure was followed using **3c** (0.15 g, 0.43 mmol), Na_2CO_3 (0.10 g, 0.97 mmol) and CSI (56 μL , 0.65 mmol) in CH_2Cl_2 (2 mL) at -78°C . The reaction mixture was purified by column chromatography (Hexane/EtOAc = 10:1) to give 0.14 g (83%) inseparable mixture of **4c** and **5c** (4.5 : 1 ratio) as a colorless oil. Compound **4c**. ^1H NMR (500MHz, CDCl_3): δ 1.06–1.12 (m, 21H), 1.18 (d, 3H, J = 6.0 Hz), 3.67 (s, 3H), 4.15–4.25 (br, 2H), 5.14–5.20 (br, 1H), 6.21 (dd, 1H, J = 16.0, 7.5 Hz), 6.59 (d, 1H, J = 16.0 Hz), 7.22–7.38 (m, 5H); ^{13}C NMR (125MHz, CDCl_3): δ 13.3, 18.9, 21.2, 52.8, 59.9, 71.6, 126.2, 127.1, 128.3, 129.2, 133.6, 137.6, 157.1; IR (CH_2Cl_2): 3328, 2943, 2866, 1729, 1499, 1463, 1374, 1243, 1103, 1061 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{22}\text{H}_{37}\text{NO}_3\text{Si}+\text{H}$ ($\text{M}+\text{H}$) $^+$ 392.2621. Found: 392.2610. Compound **5c**. ^1H NMR (500MHz, CDCl_3): δ 1.03–1.10 (m, 21H), 1.24 (d, 3H, J = 6.0 Hz), 3.71 (s, 3H), 4.20–4.28 (br, 1H), 5.11–5.17 (br, 2H), 6.28 (dd, 1H, J = 16.0, 6.5 Hz), 6.56 (d, 1H, J = 16.0 Hz), 7.22–7.38 (m, 5H).

Compound 4k. The above general procedure was followed using **3k** (0.37 g, 1.01 mmol), Na_2CO_3 (0.25 g, 2.29 mmol) and CSI (0.14 mL, 1.51 mmol) in CH_2Cl_2 (4 mL) at -78°C . The reaction mixture was purified by column chromatography (Hexane/EtOAc = 10:1) to give 0.34 g (83%) of **4k** (> 99 ratio) as a colorless oil. ^1H NMR (500MHz, CDCl_3): δ -0.11 (s, 3H), 0.09 (s, 3H), 0.95 (s, 9H), 3.71 (s, 3H), 4.44–4.52 (br, 1H), 4.95–5.00 (br, 1H), 5.00–5.07 (br, 1H), 6.12 (dd, 1H, J = 16.0, 6.5 Hz), 6.33 (d, 1H, J = 16.0 Hz), 7.20–7.34 (m, 10H); ^{13}C NMR (125MHz, CDCl_3): δ -4.4, -3.9, 18.9, 26.6, 52.9, 60.2, 77.5, 125.8, 127.1, 127.2, 128.2,

128.3, 128.7, 129.1, 133.2, 137.6, 141.7, 157.0; IR (CH₂Cl₂): 3329, 2954, 2929, 2857, 1711, 1497, 1452, 1361, 1253, 1095 cm⁻¹; [α]_D +61.3 (*c*=1.0, CHCl₃, 24°C); HRMS (CI) calcd for C₂₄H₃₃NO₃Si+H (M+H)⁺ 412.2308. Found: 412.2303.

Compound 4l. The above general procedure was followed using **3l** (0.60 g, 1.46 mmol), Na₂CO₃ (0.35 g, 3.29 mmol) and CSI (0.19 mL, 2.19 mmol) in CH₂Cl₂ (6 mL) at -78°C. The reaction mixture was purified by column chromatography (Hexane/EtOAc = 10:1) to give 0.56 g (85%) of **4l** (98 : 2 ratio) as a colorless oil. ¹H NMR (500MHz, CDCl₃): δ 0.69–1.09 (m, 21H), 3.69 (s, 3H), 4.54–4.60 (br, 1H), 4.95–5.03 (br, 1H), 5.07–5.13 (br, 1H), 6.11 (dd, 1H, *J* = 16.0, 7.0 Hz), 6.34 (d, 1H, *J* = 16.0 Hz), 7.23–7.34 (m, 10H); ¹³C NMR (125MHz, CDCl₃): δ 13.1, 18.7, 52.9, 60.5, 78.1, 126.4, 127.1, 127.6, 128.2, 128.5, 128.6, 129.2, 132.8, 137.5, 141.6, 157.2; IR (CH₂Cl₂): 3327, 3027, 2944, 2866, 1729, 1504, 1463, 1365, 1245, 1103 cm⁻¹; [α]_D +41.5 (*c*=1.0, CHCl₃, 25°C); HRMS (CI) calcd for C₂₇H₃₉NO₃Si+H (M+H)⁺ 454.2777. Found: 454.2769.

Compounds 4m and 7m. The above general procedure was followed using **3m** (0.28 g, 1.03 mmol), Na₂CO₃ (0.25 g, 2.34 mmol) and CSI (0.13 mL, 1.54 mmol) in CH₂Cl₂ (4 mL) at 20°C. The reaction mixture was purified by column chromatography (Hexane/EtOAc = 10:1) to give 94 mg (29%) inseparable mixture of **4m** and **5m** (9.2 : 1 ratio) as a colorless oil and 0.15 g (45%) of **7m** as a colorless oil. Compound **4m**. ¹H NMR (500MHz, CDCl₃): δ 1.02–1.10 (m, 21H), 1.14 (d, 3H, *J* = 6.0 Hz), 3.66 (s, 3H), 4.03–4.10 (br, 1H), 4.11–4.17 (br, 1H), 5.07–5.15 (br, 1H), 5.20 (dd, 1H, *J* = 10.5, 1.5 Hz), 5.23 (dd, 1H, *J* = 17.0, 1.5 Hz), 5.83 (ddd, 1H, *J* = 17.0, 10.5, 5.5 Hz); ¹³C NMR (125MHz, CDCl₃): δ 12.6, 18.1, 20.2, 52.0, 59.6, 70.5, 117.5, 134.1, 156.5; IR (CH₂Cl₂): 3338, 2943, 2866, 1708, 1531, 1464, 1368, 1254, 1149, 1090 cm⁻¹; HRMS (CI) calcd for C₁₆H₃₃NO₃Si+H (M+H)⁺ 316.2308. Found: 316.2309. Compound **7m**. ¹H NMR (500MHz, CDCl₃): δ 1.02–1.09 (m, 21H), 1.23 (d, 3H, *J* = 6.5 Hz), 3.67 (s, 3H), 3.73–3.80 (br, 2H), 4.38 (dq, 1H, *J* = 6.5, 5.0 Hz), 4.63–4.69 (br, 1H), 5.61 (dd, 1H, *J* = 16.0, 5.0 Hz), 5.63 (dd, 1H, *J* = 16.0, 6.0 Hz); ¹³C NMR (125MHz, CDCl₃): δ 13.0, 18.7, 25.4, 30.4, 43.2, 52.8, 69.3, 125.1, 138.2, 157.5; IR (CH₂Cl₂): 3341, 2944, 2866, 1709, 1532, 1464, 1368, 1255, 1149, 1090 cm⁻¹; [α]_D -1.7 (*c*=1.0, CHCl₃, 25°C); HRMS (CI) calcd for C₁₆H₃₃NO₃Si+H (M+H)⁺ 316.2308. Found: 316.2303.

Compounds 4n and 7n. The above general procedure was followed using **3n** (0.30 g, 1.05 mmol), Na_2CO_3 (0.27 g, 2.36 mmol) and CSI (0.14 mL, 1.54 mmol) in CH_2Cl_2 (4 mL) at 20°C . The reaction mixture was purified by column chromatography (Hexane/EtOAc = 10:1) to give 45 mg (43%) inseparable mixture of **4n** and **5n** (9.2 : 1 ratio) as a colorless oil and 0.26 g (76%) of **7n** as a colorless oil. Compound **4n**. ^1H NMR (500MHz, CDCl_3): δ 0.97–1.10 (m, 21H), 1.17 (d, 3H, J = 6.5 Hz), 1.70 (d, 3H, J = 6.5 Hz), 3.65 (s, 3H), 3.98 (dd, 1H, J = 7.0, 6.0 Hz), 4.07 (dq, 1H, J = 6.5, 6.0 Hz), 5.00–5.07 (br, 1H), 5.43 (dd, 1H, J = 15.5, 7.0 Hz), 5.65 (dq, 1H, J = 15.5, 6.5 Hz); ^{13}C NMR (125MHz, CDCl_3): δ 12.9, 13.2, 18.4, 18.8, 21.0, 52.7, 59.8, 71.4, 127.5, 129.6, 157.1; IR (CH_2Cl_2): 3339, 2944, 2867, 1732, 1503, 1467, 1375, 1292, 1246, 1132, 1068 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{17}\text{H}_{35}\text{NO}_3\text{Si}+\text{H}$ ($\text{M}+\text{H}$) $^+$ 330.2464. Found: 330.2452. Compound **7n**. ^1H NMR (500MHz, CDCl_3): δ 0.98–1.09 (m, 21H), 1.19 (d, 3H, J = 6.0 Hz), 1.21 (d, 3H, J = 6.0 Hz), 3.65 (s, 3H), 4.23–4.29 (br, 1H), 4.37 (dq, 1H, J = 6.0, 6.0 Hz), 4.51–4.59 (br, 1H), 5.58 (dd, 1H, J = 16.0, 6.0 Hz), 5.61 (dd, 1H, J = 16.0, 6.0 Hz); ^{13}C NMR (125MHz, CDCl_3): δ 13.1, 13.2, 18.6, 18.7, 21.5, 21.8, 25.5, 25.6, 48.3, 48.4, 52.7, 69.3, 69.4, 130.4, 135.6, 135.7, 156.9; IR (CH_2Cl_2): 3325, 2944, 2867, 1704, 1533, 1463, 1368, 1254, 1152, 1092 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{17}\text{H}_{35}\text{NO}_3\text{Si}-\text{H}$ ($\text{M}-\text{H}$) $^+$ 328.2308. Found: 328.2315.

Compounds 4o and 7o. The above general procedure was followed using **3o** (0.45 g, 1.50 mmol), Na_2CO_3 (0.36 g, 3.37 mmol) and CSI (0.20 mL, 2.25 mmol) in CH_2Cl_2 (6 mL) at 20°C . The reaction mixture was purified by column chromatography (Hexane/EtOAc = 15:1) to give 62 mg (12%) inseparable mixture of **4o** and **5o** (9.4 : 1 ratio) as a colorless oil and 0.38 g (74%) of **7o** as a colorless oil. Compound **4o**. ^1H NMR (500MHz, CDCl_3): δ 0.96 (t, 3H, J = 6.5 Hz), 0.98–1.05 (m, 21H), 1.09 (d, 3H, J = 6.5 Hz), 2.03 (dq, 2H, J = 7.5, 6.5 Hz), 3.63 (s, 3H), 3.95–4.00 (br, 1H), 4.06 (dq, 1H, J = 6.5, 6.0 Hz), 4.95–5.04 (br, 1H), 5.39 (dd, 1H, J = 15.5, 7.5 Hz), 5.65 (dt, 1H, J = 15.5, 7.5 Hz); ^{13}C NMR (125MHz, CDCl_3): δ 13.1, 13.2, 13.9, 18.4, 18.8, 26.1, 52.6, 59.7, 71.5, 125.3, 136.4, 157.1; IR (CH_2Cl_2): 3335, 2944, 2867, 1731, 1682, 1503, 1463, 1373, 1244, 1136 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{18}\text{H}_{37}\text{NO}_3\text{Si}+\text{H}$ ($\text{M}+\text{H}$) $^+$ 344.2621. Found: 344.2632. Compound **7o**. ^1H NMR (500MHz, CDCl_3): δ 0.87 (t, 1.5H, J = 7.0 Hz), 0.88 (t, 1.5H, J = 7.0 Hz), 0.96–1.07 (m, 21H), 1.20 (d, 3H, J = 6.5 Hz), 1.48–1.55 (m, 2H), 3.63 (s, 1.5H), 3.64 (s, 1.5H), 4.00–4.10 (br, 1H), 4.36 (dq, 1H, J = 6.5, 6.0 Hz), 4.52–4.58 (br, 1H), 5.50 (dd, 1H, J = 16.0, 6.0 Hz), 5.62 (dt, 1H, J =

16.0, 5.0 Hz); ^{13}C NMR (125MHz, CDCl_3): δ 10.7, 10.8, 12.8, 12.9, 18.7, 25.6, 25.7, 29.0, 29.1, 52.7, 54.2, 69.4, 69.5, 129.1, 136.4, 136.5, 157.1; IR (CH_2Cl_2): 3324, 2944, 2867, 1703, 1535, 1463, 1367, 1242, 1193, 1091 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{18}\text{H}_{37}\text{NO}_3\text{Si-H}$ (M-H) $^+$ 342.2465. Found: 342.2452.

Compounds 4p and 7p. The above general procedure was followed using **3p** (0.30 g, 0.95 mmol), Na_2CO_3 (0.23 g, 2.15 mmol) and CSI (0.12 mL, 1.43 mmol) in CH_2Cl_2 (4 mL) at 20°C. The reaction mixture was purified by column chromatography (Hexane/EtOAc = 10:1) to give 48 mg (14%) inseparable mixture of **4p** and **5p** (7.7 : 1 ratio) as a colorless oil and 0.24 g (69%) of **7p** as a colorless oil. Compound **4p**. ^1H NMR (500MHz, CDCl_3): δ 0.97 (d, 3H, $J=7\text{Hz}$), 0.98 (d, 3H, $J=7.0\text{ Hz}$), 0.99–1.08 (m, 21H), 1.09 (d, 3H, $J=6.5\text{ Hz}$), 2.29 (dq, 1H, $J=7.0, 6.5\text{ Hz}$), 3.65 (s, 3H), 3.95–4.00 (br, 1H), 4.08 (dq, 1H, $J=6.5, 6.5\text{ Hz}$), 4.96–5.03 (br, 1H), 5.37 (dd, 1H, $J=15.5, 6.5\text{ Hz}$), 5.60 (dd, 1H, $J=15.5, 6.5\text{ Hz}$); ^{13}C NMR (125MHz, CDCl_3): δ 13.3, 18.8, 21.0, 22.9, 31.6, 52.7, 59.6, 71.6, 123.2, 141.7, 157.1; IR (CH_2Cl_2): 3341, 2959, 2867, 1732, 1504, 1464, 1373, 1247, 1134, 1104 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{19}\text{H}_{39}\text{NO}_3\text{Si+H}$ (M+H) $^+$ 358.2777. Found: 358.2765. Compound **7p**. ^1H NMR (500MHz, CDCl_3): δ 0.86 (d, 3H, $J=6.5\text{ Hz}$), 0.87 (d, 3H, $J=6.5\text{ Hz}$), 1.01–1.07 (m, 21H), 1.21 (d, 3H, $J=6.5\text{ Hz}$), 1.76 (dq, 1H, $J=6.5, 6.5\text{ Hz}$), 3.65 (s, 1.5H), 3.66 (s, 1.5H), 3.96–4.05 (br, 1H), 4.39 (dq, 1H, $J=6.5, 6.5\text{ Hz}$), 4.58–4.63 (br, 1H), 5.52 (dd, 1H, $J=15.5, 6.5\text{ Hz}$), 5.62 (dd, 1H, $J=15.5, 6.5\text{ Hz}$); ^{13}C NMR (125MHz, CDCl_3): δ 12.9, 18.7, 18.8, 19.2, 19.3, 25.8, 33.2, 33.3, 52.7, 58.2, 69.4, 69.5, 127.3, 127.4, 137.2, 137.3, 157.2; IR (CH_2Cl_2): 3326, 2960, 2867, 1703, 1536, 1464, 1368, 1246, 1193, 1093 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{19}\text{H}_{39}\text{NO}_3\text{Si-H}$ (M-H) $^+$ 356.2621. Found: 356.2615.

Compounds 4q and 7q. The above general procedure was followed using **3q** (0.08 g, 0.50 mmol), Na_2CO_3 (0.12 g, 1.12 mmol) and CSI (65 μL , 0.75 mmol) in CH_2Cl_2 (2 mL) at 20°C. The reaction mixture was purified by column chromatography (Hexane/EtOAc = 15:1) to give 24 mg (12%) inseparable mixture of **4q** and **5q** (7.5 : 1 ratio) as a colorless oil and 0.15 g (76%) of **7q** as a colorless oil. Compound **4q**. ^1H NMR (500MHz, CDCl_3): δ 0.97–1.10 (m, 21H), 1.12 (d, 3H, $J=6.5\text{ Hz}$), 3.38 (d, 2H, $J=6.5\text{ Hz}$), 3.65 (s, 3H), 4.00–4.06 (br, 1H), 4.09 (dq, 1H, $J=6.5, 6.5\text{ Hz}$), 5.01–5.07 (br, 1H), 5.50 (dd, 1H, $J=15.5, 7.5\text{ Hz}$), 5.79 (dd, 1H, $J=15.5, 6.5\text{ Hz}$), 7.14–7.19 (m, 3H), 7.25–7.28 (m, 2H); ^{13}C NMR (125MHz, CDCl_3): δ 12.9, 18.3, 20.7, 39.1, 52.3, 59.0, 71.1, 126.3, 127.5, 128.6, 128.8, 132.6, 140.4, 156.7; IR (CH_2Cl_2): 3321, 2943, 2866,

1703, 1533, 1463, 1256, 1193, 1148, 1089 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{23}\text{H}_{39}\text{NO}_3\text{Si}+\text{H}$ ($\text{M}+\text{H}$)⁺ 406.2777. Found: 406.2779. Compound **7q**. ^1H NMR (500MHz, CDCl_3): δ 0.98–1.05 (m, 21H), 1.16 (d, 1.8H, $J = 6.0$ Hz), 1.17 (d, 1.2H, $J = 6.0$ Hz), 2.76–2.84 (m, 2H), 3.61 (s, 1.2H), 3.63 (s, 1.8H), 4.35 (dq, 1H, $J = 6.5, 6.0$ Hz), 4.42–4.49 (br, 1H), 4.55–4.65 (br, 1H), 5.55 (dd, 1H, $J = 16.0, 6.5$ Hz), 5.56 (dd, 1H, $J = 16.0, 6.5$ Hz), 7.15–7.21 (m, 3H), 7.25–7.28 (m, 2H); ^{13}C NMR (125MHz, CDCl_3): δ 12.9, 13.1, 18.8, 25.6, 42.5, 52.7, 53.8, 69.2, 69.4, 127.2, 128.2, 128.3, 129.0, 130.2, 130.3, 136.7, 136.8, 137.9, 138.1, 156.9; IR (CH_2Cl_2): 3323, 2943, 2866, 1703, 1533, 1463, 1367, 1256, 1148, 1081 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{23}\text{H}_{39}\text{NO}_3\text{Si}-\text{H}$ ($\text{M}-\text{H}$)⁺ 404.2621. Found: 404.2622.

Compounds 4r, 5r and 7r. The above general procedure was followed using **3r** (0.20 g, 0.61 mmol), Na_2CO_3 (0.15 g, 1.37 mmol) and CSI (87 μL , 0.91 mmol) in CH_2Cl_2 (3 mL) at 20°C . The reaction mixture was purified by column chromatography (Hexane/EtOAc = 15:1) to give 50 mg (22%) inseparable mixture of **4r** and **5r** (5.6 : 1 ratio) as a colorless oil and 0.14 g (63%) **7r** as a colorless oil. Compound **4r**. ^1H NMR (500MHz, CDCl_3): δ 0.99 (s, 9H), 1.03–1.08 (m, 21H), 1.10 (d, 3H, $J = 6.5$ Hz), 3.65 (s, 3H), 3.93–4.00 (br, 1H), 4.08 (dq, 1H, $J = 7.5, 6.5$ Hz), 4.97–5.03 (br, 1H), 5.34 (dd, 1H, $J = 16.5, 7.5$ Hz), 5.67 (d, 1H, $J = 16.5$ Hz); ^{13}C NMR (125MHz, CDCl_3): δ 13.4, 18.8, 21.1, 30.2, 33.7, 52.6, 59.7, 71.7, 121.1, 145.4, 157.0; IR (CH_2Cl_2): 3341, 2959, 2867, 1733, 1504, 1464, 1364, 1251, 1145, 1101 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{20}\text{H}_{41}\text{NO}_3\text{Si}+\text{H}$ ($\text{M}+\text{H}$)⁺ 372.2934. Found: 372.2931. Compound **5r**. ^1H NMR (500MHz, CDCl_3): δ 0.98 (s, 9H), 1.04–1.08 (m, 21H), 1.16 (d, 3H, $J = 6.0$ Hz), 3.68 (s, 3H), 3.97–4.05 (br, 1H), 4.40–4.45 (br, 1H), 4.96–5.02 (br, 1H), 5.40 (dd, 1H, $J = 16.0, 7.5$ Hz), 5.62 (d, 1H, $J = 16.0$ Hz). Compound **7r**. ^1H NMR (500MHz, CDCl_3): δ 0.86 (s, 4.5H), 0.88 (s, 4.5H), 1.01–1.09 (m, 21H), 1.21 (d, 3H, $J = 6.0$ Hz), 3.65 (s, 1.5H), 3.66 (s, 1.5H), 3.91–3.99 (br, 1H), 4.40 (dq, 1H, $J = 6.0, 6.0$ Hz), 4.57–4.63 (br, 1H), 5.60–5.63 (m, 2H); ^{13}C NMR (125MHz, CDCl_3): δ 13.0, 18.7, 25.7, 25.8, 26.9, 35.2, 52.7, 61.6, 69.3, 69.5, 126.0, 137.8, 137.9, 157.3; IR (CH_2Cl_2): 3330, 2962, 2867, 1703, 1537, 1464, 1367, 1255, 1148, 1091 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{20}\text{H}_{41}\text{NO}_3\text{Si}+\text{H}$ ($\text{M}+\text{H}$)⁺ 372.2934. Found: 372.2925.

Compound 4s. The above general procedure was followed using **3s** (0.40 g, 1.02 mmol), Na_2CO_3 (0.24 g, 2.30 mmol) and CSI (0.13 mL, 1.54 mmol) in CH_2Cl_2 (4 mL) at -78°C . The reaction mixture was purified by

column chromatography (Hexane/EtOAc = 15:1) to give 0.36 g (82%) **4s** (98 : 2 ratio) as a colorless oil. ^1H NMR (500MHz, CDCl_3): δ 1.02–1.12 (m, 21H), 1.25 (d, 3H, J = 6.0 Hz), 2.27 (s, 9H), 3.69 (s, 3H), 4.17–4.25 (br, 1H), 4.25 (dq, 1H, J = 6.0, 6.0 Hz), 5.14–5.22 (br, 1H), 5.68 (dd, 1H, J = 16.0, 7.5 Hz), 6.54 (d, 1H, J = 16.0 Hz), 6.87 (s, 2H); ^{13}C NMR (125MHz, CDCl_3): δ 13.3, 18.8, 18.9, 21.6, 52.8, 60.5, 71.5, 129.2, 130.8, 131.5, 134.6, 136.6, 136.9, 157.1; IR (CH_2Cl_2): 3349, 2945, 2867, 1729, 1501, 1376, 1263, 1143, 1055 cm^{-1} ; $[\alpha]_{\text{D}} -43.5$ ($c=1.0$, CHCl_3 , 25°C); HRMS (CI) calcd for $\text{C}_{25}\text{H}_{43}\text{NO}_3\text{Si}+\text{H}$ ($\text{M}+\text{H}$) $^+$ 434.3090. Found: 434.3099.

Compounds 4t and 5t. The above general procedure was followed using **3t** (0.50 g, 1.18 mmol), Na_2CO_3 (0.28 g, 2.65 mmol) and CSI (0.15 mL, 1.77 mmol) in CH_2Cl_2 (7 mL) at -78°C . The reaction mixture was purified by column chromatography (Hexane/EtOAc = 10:1) to give 0.48 g (87%) inseparable mixture of **4t** and **5t** (4.0 : 1 ratio) as a colorless oil. Compound **4t**. ^1H NMR (500MHz, CDCl_3): δ 1.05–1.13 (m, 21H), 1.18 (d, 3H, J = 6 Hz), 4.15–4.23 (br, 1H), 4.23–4.29 (br, 1H), 5.07 (d, 1H, J = 12.0 Hz), 5.15 (d, 1H, J = 12.0 Hz), 5.20–5.27 (br, 2H), 6.22 (dd, 1H, J = 16.0, 7.5 Hz), 6.60 (d, 1H, J = 16.0 Hz), 7.24–7.37 (m, 10H); ^{13}C NMR (125MHz, CDCl_3): δ 13.3, 18.8, 21.2, 60.1, 67.3, 71.6, 126.2, 127.1, 128.3, 128.7, 129.2, 129.3, 131.6, 133.6, 137.6, 156.5; IR (CH_2Cl_2): 3328, 2943, 2866, 1711, 1498, 1464, 1381, 1296, 1216, 1139, 1102, 1051 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{28}\text{H}_{41}\text{NO}_3\text{Si}+\text{H}$ ($\text{M}+\text{H}$) $^+$ 468.2934. Found: 468.2941. Compound **5t**. ^1H NMR (500MHz, CDCl_3): δ 1.02–1.09 (m, 21H), 1.24 (d, 3H, J = 6.0 Hz), 4.31–4.37 (br, 1H), 4.40–4.45 (br, 1H), 5.09 (d, 1H, J = 12.0 Hz), 5.16 (d, 1H, J = 12.0 Hz), 5.35–5.40 (br, 1H), 6.30 (dd, 1H, J = 16.0, 7.0 Hz), 6.58 (d, 1H, J = 16.0 Hz), 7.24–7.37 (m, 10H).

(1*R*,2*S*)-Methyl *N*-[2-hydroxy-1-((*E*)-2-phenylethenyl)propyl]carbamate (8a) and (1*S*,2*S*)-methyl *N*-[2-hydroxy-1-((*E*)-2-phenylethenyl)propyl]carbamate (9a). The above general procedure was followed using **3a** (0.15 g, 0.57 mmol), Na_2CO_3 (0.14 g, 1.28 mmol) and CSI (74 μL , 0.85 mmol) in CH_2Cl_2 (2 mL) at -78°C . The residue was used for further manipulation without purification. To a solution of the residue in THF (2 mL) was added TBAF (0.85 mL, 0.85 mmol, 1.0 M in THF) at 0°C . The reaction mixture was stirred at 0°C for 5 h and saturated NH_4Cl solution was added, then extracted with EtOAc. The organic layer was dried over MgSO_4 , and concentrated in vacuo. The residue was purified by column chromatography

(Hexane/EtOAc = 1 : 1) to afford 74 mg (55%) inseparable mixture of **8a** and **9a** as a white solid.

Compound 8a. ^1H NMR (500MHz, CDCl_3): δ 1.21 (d, 3H, J = 6.5 Hz), 2.05–2.19 (br, 1H), 3.69 (s, 3H), 3.97–4.04 (br, 1H), 4.26–4.32 (br, 1H), 5.28 (br d, 1H, J = 8.0 Hz), 6.19 (dd, 1H, J = 15.5, 7.5 Hz), 6.61 (d, 1H, J = 15.5 Hz), 7.25–7.39 (m, 5H); ^{13}C NMR (125MHz, CDCl_3): δ 20.4, 53.1, 59.3, 70.7, 125.2, 127.2, 128.6, 129.3, 134.1, 137.1, 157.5; IR (CH_2Cl_2): 3411, 3350, 3027, 2974, 1703, 1529, 1450, 1253, 1194, 1090 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{13}\text{H}_{17}\text{NO}_3 + \text{H}$ ($\text{M} + \text{H}$) $^+$ 236.1287. Found: 236.1293. **Compound 9a.** ^1H NMR (500MHz, CDCl_3): δ 1.26 (d, 3H, J = 6.0 Hz), 2.07–2.15 (br, 1H), 3.73 (s, 3H), 3.95–4.01 (br, 1H), 4.28–4.32 (br, 1H), 5.17–5.22 (br, 1H), 6.18 (dd, 1H, J = 15.5, 7.0 Hz), 6.59 (d, 1H, J = 15.5 Hz), 7.23–7.38 (m, 5H).

Compounds 8b and 9b. The similar procedure for **8a** and **9a** was followed using **3g** (0.15 g, 0.47 mmol), Na_2CO_3 (0.11 g, 1.05 mmol) and CSI (61 μL , 0.70 mmol) in CH_2Cl_2 (2 mL) at -78°C ., then TBAF (0.70 mL, 0.70 mmol, 1.0 M in THF) in THF (2 mL). The reaction mixture was purified by column chromatography (Hexane/EtOAc = 2:1) to give 87 mg (75%) inseparable mixture of **8b** and **9b** as a white solid. **Compound 8b.** ^1H NMR (500MHz, CDCl_3): δ 0.91 (t, 3H, J = 7.0 Hz), 1.38 (dq, 2H, J = 7.5, 7.0 Hz), 2.12–2.20 (br, 1H), 3.58–3.63 (br, 1H), 3.61 (s, 3H), 4.24–4.29 (br, 1H), 5.39 (br d, 1H, J = 7.5 Hz), 6.11 (dd, 1H, J = 16.0, 7.0 Hz), 6.52 (d, 1H, J = 16.0 Hz), 7.14–7.31 (m, 5H); ^{13}C NMR (125MHz, CDCl_3): δ 10.8, 27.8, 52.9, 57.9, 73.0, 125.3, 127.2, 128.5, 129.3, 133.9, 137.2, 157.4; IR (CH_2Cl_2): 3416, 3349, 3204, 2962, 1696, 1527, 1451, 1255, 1096, 1053 cm^{-1} ; HRMS (CI) calcd for $\text{C}_{14}\text{H}_{19}\text{NO}_3 + \text{H}$ ($\text{M} + \text{H}$) $^+$ 250.1443. Found: 250.1447. **Compound 9b.** ^1H NMR (500MHz, CDCl_3): δ 0.90 (t, 3H, J = 7.5 Hz), 1.46 (dq, 2H, J = 7.5, 6.5 Hz), 1.76–1.83 (br, 1H), 3.58–3.62 (br, 1H), 3.62 (s, 3H), 4.20–4.25 (br, 1H), 5.23–5.29 (br, 1H), 6.22 (dd, 1H, J = 16.0, 7.0 Hz), 6.59 (d, 1H, J = 16.0 Hz), 7.15–7.29 (m, 5H).

Compound 8c. The similar procedure for **8a** and **9a** was followed using **3i** (0.20 g, 0.60 mmol), Na_2CO_3 (0.14 g, 1.35 mmol) and CSI (78 μL , 0.90 mmol) in CH_2Cl_2 (3 mL) at -78°C ., then TBAF (0.90 mL, 0.90 mmol, 1.0 M in THF) in THF (3 mL). The reaction mixture was purified by column chromatography (Hexane/EtOAc = 3:1) to give 0.11 g (68%) inseparable mixture of **8c** and **9c** as a white solid. ^1H NMR (500MHz, CDCl_3): δ 0.98 (d, 3H, J = 6.5 Hz), 1.01 (d, 3H, J = 6.5 Hz), 1.64–1.69 (m, 2H), 3.35 (br d, 1H, J =

6.5 Hz), 3.69 (s, 3H), 4.43–4.52 (br, 1H), 5.37–5.43 (br, 1H), 6.22 (dd, 1H, $J = 16.0, 7.0$ Hz), 6.64 (d, 1H, $J = 16.0$ Hz), 7.22–7.39 (m, 5H); ^{13}C NMR (125MHz, CDCl_3): δ 19.4, 19.8, 32.0, 52.9, 55.8, 80.3, 125.0, 127.2, 128.5, 129.3, 133.9, 137.2, 157.1; IR (CH_2Cl_2): 3410, 3337, 3027, 2961, 1699, 1513, 1451, 1308, 1249, 1125, 1058 cm^{-1} ; mp: 69–71°C; HRMS (CI) calcd for $\text{C}_{15}\text{H}_{21}\text{NO}_3 + \text{H}$ ($\text{M} + \text{H}$) $^+$ 264.1600. Found: 264.1590.

General procedure for the synthesis of oxazolidinone. To a solution of inseparable diastereoisomers of *N*-allylcarbamates (0.50 mmol) in THF (2 mL) was added TBAF (0.75 mmol, 1.0 M in THF) at 0°C. The reaction mixture was stirred at 0°C for 5 h and saturated NH_4Cl solution was added, then extracted with EtOAc (10 mL). The organic layer was dried over MgSO_4 , and concentrated in vacuo. The residue was used for further manipulation without purification. To a solution of the oil obtained above in THF (2 mL) was added NaH (0.75 mmol) at 0°C. The mixture was stirred at 0°C for 1 h and H_2O was added, then extracted with EtOAc (10 mL). The organic layer was washed with H_2O and brine, dried over MgSO_4 and concentrated in vacuo. The residue was purified by column chromatography (Hexane/ EtOAc).

(4*R*,5*S*)-5-Methyl-4-((*E*)-2-phenylethenyl)-1,3-oxazolidin-2-one (6a) and (4*S*,5*S*)-5-methyl-4-((*E*)-2-phenylethenyl)-1,3-oxazolidin-2-one (6b). The above general procedure was followed using inseparable mixture of **4b** and **5b** (0.18 g, 0.52 mmol) and TBAF (0.77 mL, 0.77 mmol, 1.0 M in THF) in THF (2 mL), then NaH (31 mg, 0.77 mmol, 60% in mineral oil) in THF (2 mL). The reaction mixture was purified by column chromatography (Hexane/EtOAc = 1:1) to give 78 mg (75%) of **6a** as a white solid and 13 mg (12%) of **6b** as a colorless oil. Compound **6a**. ^1H NMR (500MHz, CDCl_3): δ 1.35 (d, 3H, $J = 6.5$ Hz), 4.47 (dd, 1H, $J = 8.5, 7.5$ Hz), 4.88 (dq, 1H, $J = 7.72, 6.5$ Hz), 5.72–5.77 (br, 1H), 6.13 (dd, 1H, $J = 16.0, 8.5$ Hz), 6.60 (d, 1H, $J = 16.0$ Hz), 7.29–7.39 (m, 5H); ^{13}C NMR (125MHz, CDCl_3): δ 16.8, 59.1, 78.0, 124.6, 127.4, 129.2, 129.5, 135.1, 136.3, 159.8; IR (CH_2Cl_2): 3288, 2988, 1748, 1493, 1383, 1220, 1081 cm^{-1} ; mp: 105–108°C; $[\alpha]_{\text{D}} +21.4$ ($c=1.0$, CHCl_3 , 25°C); HRMS (FAB) calcd for $\text{C}_{12}\text{H}_{13}\text{NO}_2 + \text{Na}$ ($\text{M} + \text{Na}$) $^+$ 226.0844. Found: 226.0847. Compound **6b**. ^1H NMR (500MHz, CDCl_3): δ 1.49 (d, 3H, $J = 6.0$ Hz), 4.08 (dd, 1H, $J = 7.5, 7.5$ Hz), 4.43 (dq, 1H, $J = 7.36, 6.0$ Hz), 5.18–5.25 (br, 1H), 6.11 (dd, 1H, $J = 16.0, 7.5$ Hz), 6.63 (d, 1H, $J =$

16.0 Hz), 7.30–7.40 (m, 5H); ^{13}C NMR (125MHz, CDCl_3): δ 19.6, 63.4, 79.8, 126.5, 127.4, 129.3, 129.5, 135.0, 136.1, 159.1; IR (CH_2Cl_2): 3283, 2984, 1748, 1495, 1449, 1383, 1222, 1080 cm^{-1} ; $[\alpha]_{\text{D}} -28.3$ ($c=0.4$, CHCl_3 , 25°C); HRMS (FAB) calcd for $\text{C}_{12}\text{H}_{13}\text{NO}_2+\text{Na}$ ($\text{M}+\text{Na}$) $^+$ 226.0844. Found: 226.0851.

Compound 6c. The above general procedure was followed using **4k** (0.10 g, 0.24 mmol) and TBAF (0.36 mL, 0.36 mmol, 1.0 M in THF) in THF (1 mL), then NaH (15 mg, 0.36 mmol, 60% in mineral oil) in THF (1 mL). The reaction mixture was purified by column chromatography (Hexane/EtOAc = 1:1) to give 56 mg (87%) of **6c** as a white solid. ^1H NMR (500MHz, CDCl_3): δ 4.78 (dd, 1H, $J = 8.5, 8.0$ Hz), 5.51 (dd, 1H, $J = 16.0, 8.5$ Hz), 5.72–5.78 (br, 1H), 5.83 (d, 1H, $J = 8.0$ Hz), 6.49 (d, 1H, $J = 16.0$ Hz), 7.06–7.09 (m, 2H), 7.22–7.39 (m, 8H); ^{13}C NMR (125MHz, CDCl_3): δ 60.1, 81.9, 125.7, 126.9, 127.3, 128.9, 129.2, 129.3, 129.4, 134.4, 135.5, 136.3, 136.4, 159.6; IR (CH_2Cl_2): 3256, 2985, 1727, 1448, 1344, 1204, 1064, 1021 cm^{-1} ; mp: 196°C ; $[\alpha]_{\text{D}} +178.5$ ($c=1.0$, CHCl_3 , 24°C); HRMS (FAB) calcd for $\text{C}_{17}\text{H}_{15}\text{NO}_2+\text{Na}$ ($\text{M}+\text{Na}$) $^+$ 288.1000. Found: 288.1006.

CS140-13C

CS1141-2

CSI-187

Pulse Sequence: s2pu1

CSI-122

S29

S32

CSI-198-13C

CSI-225

CS1225-13C