Supplementary Information

High yielding alkylations of unactivated sp$^3$ and sp$^2$ centres with alkyl-9-BBN reagents using an NHC-based catalyst: Pd-PEPPSI-IPr

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General Experimental

All reagents were purchased from commercial sources and were used without further purification, unless indicated otherwise. 1,4-Dioxane was purchased from Fluka, stored over 4Å molecular sieves, and handled under Argon. Tetrahydrofuran (THF) was distilled from sodium benzo phenone ketyl radical prior to use. All reaction vials (screw-cap threaded, caps attached, 17 × 60 mm) were purchased from Fischer Scientific. CDCl₃ was purchased from Cambridge Isotope Laboratories. Thin layer chromatography (TLC) was performed on Whatman 60 F₂₅₄ glass plates and were visualized using UV light (254nm) and/or potassium permanganate. Column chromatography purifications were carried out using the flash technique on Silicycle silica gel 60 (230-400 mesh). NMR spectra were recorded on a Bruker 400 AV spectrometer. The chemical shifts (δ) for ¹H are given in ppm are referenced to the residual proton signal of the deuterated solvent. The chemical shifts (δ) for ¹³C are referenced relative to the signal from the carbon of the deuterated solvent. ¹³C APT spectra represent a positive set of peaks (indicated by (+)) for quaternary carbons as well as carbon atoms with even number of protons and a negative set of peaks (indicated by (-)) for carbon atoms with odd number of protons. Gas chromatography was performed on Varian Series GC/MS/MS 4000 System.
Synthetic Procedures

General Procedure for Hydroboration

Procedure to make 10 mL of a 1.3 M solution: In air, 9-BBN dimer (7.15 mmol, 1.74 g) was weighed into a flask equipped with a stir bar, sealed with a septum and purged with argon (3×). To this, 5 mL of anhydrous 1,4-dioxane was added, followed by the olefin (13 mmol). More 1,4-dioxane was added as required to deliver a final concentration of 1.3 M based on olefin (10 mL in total). The hydroboration was usually stirred overnight, resulting in a clear, homogeneous solution.

General Procedure for Cross-Coupling

In air, potassium phosphate monohydrate (1.6 mmol, 369 mg) and Pd-PEPPSI-IPr [(1,3-Diisopropylimidazol-2-ylidene)(3-chloropyridyl)palladium(II) dichloride] (0.04 mmol, 27 mg) were weighed into a 3 mL screw-cap threaded vial that was sealed with a septum and purged with argon (3×). With stirring, 1.25 mL of the previously prepared 1.3 M solution of alkyl-9-BBN in 1,4-dioxane (1.6 mmol) was added, followed by the alkyl bromide or aryl bromide/chloride (1.0 mmol). If the electrophile was a solid, it was introduced into the vial prior to purging with argon. The reaction was stirred for 16 hours at room temperature to generally give a dark brown viscous mixture, which was then diluted with 1.5 mL of CH₂Cl₂ and filtered through a plug of silica gel using CH₂Cl₂ as the eluent. The filtrate was concentrated in vacuo and the residue purified via silica gel flash chromatography. NOTE: For the optimization study (Table 1), 100 uL of undecane was added at the same time as 3-bromo-1-phenylpropane. After 16 hours, 100 uL of the reaction mixture were removed via syringe and passed through a plug of silica gel using
distilled hexane as the eluent to produce a final volume of 2 mL. From this, 40 uL was removed via syringe and added to a vial containing 2 mL of distilled hexane, and was subsequently analyzed by GC-MS.

**Compound Data**

![Chemical Reaction](attachment:chemical_formula.png)

1-Methoxy-4-(6-phenylhexyl)benzene (2). Following the general procedure, 246 mg of 2 (92% yield) was isolated ($R_f = 0.4$, step gradient, two column volumes of 10% CH$_2$Cl$_2$ in pentane followed by 20% CH$_2$Cl$_2$ in pentane) as a colourless oil. $^1$H NMR (400 MHz, CDCl$_3$): $\delta$ 7.32-7.26 (m, 2H), 7.22-7.15 (m, 3H), 7.10 (d, $J = 8.4$ Hz, 2H), 6.84 (d, $J = 8.8$ Hz, 2H), 3.81 (s, 3H), 2.62 (t, $J = 8.0$ Hz, 2H), 2.56 (t, $J = 8.0$ Hz, 2H), 1.70-1.55 (m, 4H), 1.45-1.35 (m, 4H). $^{13}$C NMR (100 MHz, CDCl$_3$): $\delta$ 157.6 (+), 142.9 (+), 135.0 (+), 129.3 (-), 128.4 (-), 128.3 (-), 125.6 (-), 113.7 (-), 55.3 (-), 36.0 (+), 35.0 (+), 31.7 (+), 31.5 (+), 29.2 (+), 29.1 (+). Anal. Calcd. for C$_{19}$H$_{24}$O: C, 85.03; H, 9.01. Found: C, 85.14; H, 8.75.
Methyl 2-(6-(cyclohex-3-enyl)hexyl)isoindoline-1,3-dione (3). Following the general procedure, 268 mg of 3 (86% yield) was isolated ($R_f = 0.5$, 60% CH$_2$Cl$_2$ in pentane) as a white solid (m.p. 52-54°C). $^1$H NMR (400 MHz, CDCl$_3$): $\delta$ 7.90-7.80 (m, 2H), 7.75-7.65 (m, 2H), 6.70-6.60 (m, 2H), 3.68 (t, $J = 7.2$ Hz, 2H), 2.12-1.98 (m, 3H), 1.80-1.40 (m, 5H), 1.40-1.10 (m, 9H). $^{13}$C NMR (100 MHz, CDCl$_3$): $\delta$ 168.5 (+), 133.8 (-), 132.2 (+), 127.0 (-), 126.7 (-), 123.1 (-), 38.0 (+), 36.6 (+), 33.4 (-), 31.9 (+), 29.4 (+), 28.9 (+), 28.6 (+), 26.9 (+), 26.7 (+), 25.3 (+). Anal. Calcd. for C$_{20}$H$_{25}$NO$_2$: C, 77.14; H, 8.09; N, 4.50. Found: C, 77.57; H, 8.12; N, 4.61.

tert-Butyl(9-(4-methoxyphenyl)nonyloxy)dimethylsilane (4). Following the general procedure, 258 mg of 4 (71% yield) was isolated ($R_f = 0.5$, step gradient, two column volumes of 10% CH$_2$Cl$_2$ in pentane followed by 20% CH$_2$Cl$_2$ in pentane) as a colourless oil. $^1$H NMR (400 MHz, CDCl$_3$): $\delta$ 7.11 (d, $J = 8.4$ Hz, 2H), 6.84 (d, $J = 8.4$ Hz, 2H), 3.81 (s, 3H), 3.60 (t, $J = 7.6$ Hz, 2H), 2.56 (t, $J = 7.6$ Hz, 2H), 1.55-1.45 (m, 4H), 1.40-1.25 (m, 10H), 0.92 (s, 9H), 0.07 (s, 6H). $^{13}$C NMR (100 MHz, CDCl$_3$): $\delta$ 157.6 (+), 135.0 (+), 129.2 (-), 113.6 (-), 63.3 (+), 55.2 (-), 35.0 (+), 32.9 (+), 31.8 (+), 29.6 (+), 29.5 (+), 29.3 (+), 26.0 (-), 25.8 (+), 18.4 (+), -5.3 (-). Anal. Calcd. for C$_{22}$H$_{40}$O$_2$Si: C, 72.47; H, 11.06. Found: C, 72.12; H, 11.33.
Methyl 15-(1,3-dioxoisooindolin-2-yl)pentadecanoate (5). Following the general procedure, 5 was collected (Rf = 0.3, 80% CH₂Cl₂ in pentane) along with a volatile impurity, which was removed by heating the mixture to 60°C in vacuo overnight, ultimately providing 324 mg of 5 (81% yield) as a white solid (m.p. 62-63°C). ¹H NMR (400 MHz, CDCl₃): δ 7.85-7.78 (m, 2H), 7.72-7.65 (m, 2H), 3.70-3.60 (m, 5H), 2.28 (t, J = 7.6 Hz, 2H), 1.70-1.50 (m, 4H), 1.40-1.15 (m, 20H). ¹³C NMR (100 MHz, CDCl₃): δ 174.3 (+), 168.4 (+), 133.8 (-), 132.1 (+), 123.1 (-), 51.4 (-), 38.0 (+), 34.1 (+), 29.5 (+), 29.4 (+), 29.2 (+), 29.1 (+), 28.6 (+), 26.8 (+), 24.9 (+). Overlapping peaks in the methylene region account for the remaining ¹³C resonances. Anal. Calcd. for C₂₄H₃₅NO₄: C, 71.79; H, 8.79; N, 3.16. Found: C, 71.97; H, 8.72; N, 3.16.

Methyl 7-(cyclohex-3-enyl)heptanoate (6). Following the general procedure, 138 mg of 6 (62% yield) was isolated (Rf = 0.3, step gradient, two column of 20% CH₂Cl₂ in pentane followed by 40% CH₂Cl₂ in pentane) as a colourless oil. ¹H NMR (400 MHz, CDCl₃): δ 5.67-5.50 (m, 2H), 3.65 (s, 3H), 2.29 (t, J = 7.2 Hz, 2H), 2.10-1.95 (m, 3H), 1.75-1.55 (m, 4H), 1.55-1.42 (m, 1H), 1.40-1.10 (m, 9H). ¹³C NMR (100 MHz, CDCl₃): δ 174.2 (+), 127.0 (-), 126.6 (-), 51.4 (-), 36.6 (+), 34.0 (+), 33.4 (-), 31.9 (+), 29.5 (+), 29.1 (+), 28.9 (+), 26.7 (+), 25.3 (+), 24.9 (+). HRMS m/e calcd. for C₁₄H₂₄O₂ (M⁺) 244.1776, found: 244.1766. ¹H and ¹³C spectra are include to attest sample purity.
Methyl 3,3-dimethyldec-9-enoate (7). Following the general procedure, 172 mg of 7 (81% yield) was isolated (R_f = 0.4, 20% CH_2Cl_2 in pentane) as a colourless oil. \(^1\)H NMR (400 MHz, CDCl\(_3\)): \(\delta\) 5.90-5.75 (m, 1H), 5.05-4.90 (m, 2H), 3.65 (s, 3H), 2.20 (s, 2H), 2.04 (q, \(J = 6.8\) Hz, 2H), 1.45-1.35 (m, 2H), 1.30-1.22 (m, 6H), 0.98 (s, 6H). \(^13\)C NMR (100 MHz, CDCl\(_3\)): \(\delta\) 172.8 (+), 139.1 (-), 114.2 (+), 51.0 (-), 45.8 (+), 42.2 (+), 33.8 (+), 33.2 (+), 29.8 (+), 28.9 (+), 27.2 (-), 23.9 (+). HRMS m/e calcd. for C\(_{13}\)H\(_{24}\)O\(_2\) (M\(^+\)) 212.1776, found: 212.1770. \(^1\)H and \(^{13}\)C spectra are included to attest sample purity.

Methyl 16-cyano-16-methylheptadecanoate (8). Following the general procedure, 8 was collected (R_f = 0.4, 60% CH_2Cl_2 in pentane) along with a volatile impurity, which was removed by heating the mixture to 50°C in vacuo overnight, ultimately providing 235 mg of 8 (73% yield) as a white solid (m.p. 32-34°C). \(^1\)H NMR (400 MHz, CDCl\(_3\)): \(\delta\) 3.69 (s, 3H), 2.32 (t, \(J = 7.2\) Hz, 2H), 1.70-1.45 (m, 6H), 1.40-1.20 (m, 26H). \(^{13}\)C NMR (100 MHz, CDCl\(_3\)): \(\delta\) 174.3 (+), 125.3 (+), 51.4 (-), 41.1 (+), 34.1 (+), 32.4 (+), 29.6 (+), 29.6 (+), 29.5 (+), 29.4 (+), 29.4 (+), 29.2 (+), 29.1 (+), 26.7 (-), 25.2 (+), 24.9 (+). Overlapping peaks in the methylene region account for the remaining \(^{13}\)C resonances. Anal. Calcd. for C\(_{20}\)H\(_{37}\)NO\(_2\) : C, 74.25; H, 11.53. Found: C, 74.40; H, 11.45.

2,2-dimethyl-10-(5-methylfuran-2-yl)undecane-nitrile (9). Following the general procedure, 226 mg of 9 (82% yield) was isolated (R_f = 0.4, step gradient, two column volumes of 20%
CH$_2$Cl$_2$ in pentane followed by 40 % CH$_2$Cl$_2$ in pentane) as a colourless oil. $^1$H NMR (400 MHz, CDCl$_3$): $\delta$ 5.84 (s, 2H), 2.75 (quin., $J = 6.8$ Hz, 1H), 2.27 (s, 3H), 1.72-1.60 (m, 1H), 1.58-1.40 (m, 5H), 1.40-1.25 (m, 14H), 1.22 (d, $J = 6.8$ Hz, 3H). $^{13}$C NMR (100 MHz, CDCl$_3$): $\delta$ 159.1 (+), 149.8 (+), 125.2 (+), 105.5 (-), 103.8 (-), 41.1 (+), 35.7 (+), 33.1 (-), 32.4 (+), 29.6 (+), 29.5 (+), 29.3 (+), 27.1 (+), 26.7 (-), 25.2 (+), 19.2 (-), 13.5 (-).

Anal. Calcd. for C$_{18}$H$_{29}$NO : C, 78.49; H, 10.61. Found: C, 78.35; H, 10.80.

Methyl 11-(4-hydroxy-3,5-dimethylphenyl)undecanoate (10). Following the general procedure, 237 mg of 10 (74% yield) was isolated (R$_f$ = 0.5, CH$_2$Cl$_2$) as a white solid (m.p. 66-68°C). $^1$H NMR (400 MHz, CDCl$_3$): $\delta$ 6.81 (s, 2H), 4.51 (s, 1H), 3.69 (s, 3H), 2.48 (t, $J = 7.6$ Hz, 2H), 2.33 (t, $J = 7.6$ Hz, 2H), 2.25 (s, 6H), 1.70-1.50 (m, 4H), 1.40-1.20 (m, 12H). $^{13}$C NMR (100 MHz, CDCl$_3$): $\delta$ 174.5 (+), 150.1 (+), 134.5 (+), 128.4 (-), 122.8 (+), 51.5 (-), 35.1 (+), 34.1 (+), 31.9 (+), 29.5 (+), 29.4 (+), 29.4 (+), 29.3 (+), 29.2 (+), 25.0 (+), 16.0 (-). Overlapping peaks in the methylene region account for the remaining $^{13}$C resonances. Anal. Calcd. for C$_{20}$H$_{32}$O$_3$ : C, 74.96; H, 10.06. Found: C, 75.02; H, 10.34.
**tert-Butyl 5-(5-methoxy-3,3-dimethyl-5-oxopentyl)-1H-indole-1-carboxylate (11).** Following the general procedure, 316 mg of 11 (88% yield) was isolated (R_f = 0.4, 80% CH_2Cl_2 in pentane) as a colourless, viscous oil. ¹H NMR (400 MHz, CDCl_3): δ 8.07 (br. d, J = 6.4 Hz, 1H), 7.59 (d, J = 2.4 Hz, 1H), 7.40 (s, 1H), 7.18 (d, J = 8.4 Hz, 1H), 6.53 (d, J = 3.6 Hz, 1H), 3.71 (s, 3H), 2.80-2.70 (m, 2H), 2.34 (s, 2H), 1.75-1.65 (m, 2H), 1.70 (s, 9H), 1.12 (s, 6H). ¹³C NMR (100 MHz, CDCl_3): δ 172.7 (+), 149.8 (+), 137.3 (+), 133.5 (+), 130.8 (+), 126.0 (-), 124.9 (-), 120.2 (-), 115.0 (-), 107.1 (-), 83.4 (+), 51.2 (-), 45.7 (+), 45.0 (+), 33.5 (+), 30.6 (+), 28.2 (-), 27.4 (-). Anal. Calcd. for C_{21}H_{29}NO_{4}: C, 70.17; H, 8.13. Found: C, 69.93; H, 8.40.

**2-(5-(Benzo[b]thiophen-3-yl)pentan-2-yl)-5-methylfuran (12).** Following the general procedure, 220 mg of 12 (77% yield) was isolated (R_f = 0.3, pentane) as a colourless, viscous oil. ¹H NMR (400 MHz, CDCl_3): δ 7.93 (d, J = 7.6 Hz, 1H), 7.81 (d, J = 7.6 Hz, 1H), 7.50-7.40 (m, 2H), 7.13 (s, 1H), 5.94 (s, 2H), 2.98-2.88 (m, 3H), 2.35 (s, 3H), 1.95-1.80 (m, 3H), 1.80-1.68 (m, 1H), 1.16 (d, J = 7.2 Hz, 3H). ¹³C NMR (100 MHz, CDCl_3): δ 158.7 (+), 150.1 (+), 140.5 (+), 139.2 (+), 137.0 (+), 124.1 (-), 123.8 (-), 122.9 (-), 121.8 (-), 121.0 (-), 105.7 (-), 104.2 (-), 35.8 (+), 33.1 (-), 28.6 (+), 26.7 (+), 19.4 (-), 13.6 (-). Anal. Calcd. for C_{18}H_{20}OS: C, 76.01; H, 7.09. Found: C, 75.76; H, 7.21.
Methyl 5-(6-methoxypyridin-2-yl)-3,3-dimethylpentanoate (13). Following the general procedure, 13 was collected (R_f = 0.2, 80% CH_2Cl_2 in pentane) along with a volatile impurity, which was removed by heating the mixture to 60°C _in vacuo _overnight, ultimately providing 223 mg of 13 (89% yield) as a colourless, viscous oil. ^1H NMR (400 MHz, CDCl_3): δ 7.45 (t, J = 7.6 Hz, 1H), 6.71 (d, J = 7.2 Hz, 1H), 6.52 (d, J = 8 Hz, 1H), 3.91 (s, 3H), 3.66 (s, 3H), 2.72-2.65 (m, 2H), 2.29 (s, 2H), 1.80-1.70 (m, 2H), 1.08 (s, 6H). ^13C NMR (100 MHz, CDCl_3): δ 172.7 (+), 163.6 (+), 160.4 (+), 138.7 (-), 114.9 (-), 107.1 (-), 53.1 (-), 51.1 (-), 45.8 (+), 41.7 (+), 33.3 (+), 32.8 (+), 27.2 (-). Anal. Calcd. for C_{14}H_{21}NO_3: C, 66.91; H, 8.42. Found: C, 66.63; H, 8.62.

Methyl 3,3-dimethyl-5-(thiophen-3-yl)pentanoate (14). Following the general procedure, 179 mg of 14 (79% yield) was isolated (R_f = 0.3, 10% diethyl ether in pentane) as a colourless oil. ^1H NMR (400 MHz, CDCl_3): δ 7.30-7.20 (m, 1H), 7.00-6.95 (m, 2H), 3.69 (s, 3H), 2.70-2.62 (m, 2H), 2.31 (s, 2H), 1.75-1.65 (m, 2H), 1.09 (s, 6H). ^13C NMR (100 MHz, CDCl_3): δ 172.6 (+), 143.0 (+), 128.3 (-), 125.3 (-), 119.7 (-), 51.2 (-), 45.7 (+), 42.9 (+), 33.3 (+), 27.3 (-), 25.1 (+). Anal. Calcd. for C_{12}H_{18}O_2S: C, 63.68; H, 8.02. Found: C, 63.34; H, 8.32.

3-(2-(Cyclohex-3-enyl)ethyl)aniline (15). Following the general procedure, 15 was collected (R_f = 0.3, step gradient, two column volumes of 15% diethyl ether in pentane followed by 25% diethyl ether in pentane) along with a volatile impurity, which was removed by heating the mixture to
40°C in vacuo overnight, ultimately providing 153 mg of 15 (76% yield) as a light brown, viscous oil. Note: Compound decomposes in air. It is recommended that it is stored under argon and away from light. $^1$H NMR (400 MHz, CDCl$_3$): $\delta$ 7.13 (t, $J = 7.6$ Hz, 1H), 6.67 (d, $J = 7.2$ Hz, 1H), 6.60-6.52 (m, 2H), 5.80-5.68 (m, 2H), 3.65 (br. s, 2H), 2.63 (t, $J = 7.6$ Hz, 2H), 2.30-2.00 (m, 3H), 1.90-1.55 (m, 5H), 1.40-1.25 (m, 1H). $^{13}$C NMR (100 MHz, CDCl$_3$): $\delta$ 146.4 (+), 144.3 (+), 129.2 (-), 127.1 (-), 126.6 (-), 118.8 (-), 115.3 (-), 112.6 (-), 38.5 (+), 33.3 (+), 33.2 (-), 31.9 (+), 28.9 (+), 25.3 (+). HRMS m/e calcd. for C$_{14}$H$_{19}$N (M$^+$) 201.1517, found: 201.1515. Anal. Calcd. for C$_{14}$H$_{19}$N : C, 83.53; H, 9.51. Found: C, 83.24; H, 9.78.

3-(3-(4-Methoxyphenyl)propyl)thiophene (16). Following the general procedure, 205 mg of 16 (88% yield) was isolated (R$_f$ = 0.4, 20% CH$_2$Cl$_2$ in pentane) as a colourless, viscous oil. $^1$H NMR (400 MHz, CDCl$_3$): $\delta$ 7.30-7.26 (m, 1H), 7.15 (d, $J = 8.4$ Hz, 2H), 7.00-6.95 (m, 2H), 6.88 (d, $J = 8.0$ Hz, 2H), 3.84 (s, 3H), 2.70 (t, $J = 7.6$ Hz, 2H), 2.65 (t, $J = 7.6$ Hz, 2H), 1.98 (quin., $J = 7.6$ Hz, 2H). $^{13}$C NMR (100 MHz, CDCl$_3$): $\delta$ 157.7 (+), 142.7 (+), 134.3 (+), 129.3 (-), 128.2 (-), 125.2 (-), 120.0 (-), 113.7 (-), 55.3 (-), 34.5 (+), 32.3 (+), 29.7 (+). Anal. Calcd. for C$_{14}$H$_{16}$OS : C, 72.37; H, 6.94. Found: C, 71.91; H, 7.11.

Methyl 11-(2-(5-formylfuran-2-yl)phenyl)undecanoate (17). Following the general procedure, 246 mg of 17 (58% yield) was isolated (R$_f$ = 0.5, CH$_2$Cl$_2$) as an amorphous, yellow solid. $^1$H NMR (400 MHz, CDCl$_3$): $\delta$ 9.70 (s, 1H), 7.70 (d, $J = 7.6$ Hz, 1H), 7.40-7.25 (m, 4H),
6.71 (d, J = 3.2 Hz, 1H), 3.69 (s, 3H), 2.86 (t, J = 7.6 Hz, 2H), 2.32 (t, J = 7.6 Hz, 2H),
1.70-1.55 (m, 4H), 1.45-1.20 (m, 12H). $^1$C NMR (100 MHz, CDCl$_3$): $\delta$ 177.3 (-), 174.3 (+), 159.7 (+), 151.9 (+), 141.2 (+), 130.5 (-), 129.6 (-), 129.0 (-), 128.1 (+), 126.1 (-),
110.8 (-), 51.4 (-), 34.3 (+), 34.1 (+), 31.1 (+), 29.6 (+), 29.5 (+), 29.4 (+), 29.4 (+), 29.2 (+), 29.1 (+), 24.9 (+). Overlapping peaks in the aromatic region account for the remaining $^1$C resonances. Anal. Calcd. for C$_{23}$H$_{30}$O$_4$: C, 74.56; H, 8.16. Found: C, 74.49; H, 8.43.

4-Methyl-2-(4-(5-methylfuran-2-yl)pentyl)quinoline (18).

Following the general procedure, 208 mg of 18 (71% yield) was isolated (R$_f$ = 0.5, CH$_2$Cl$_2$) as a colourless, viscous oil.

$^1$H NMR (400 MHz, CDCl$_3$): $\delta$ 8.05 (d, J = 8.4 Hz, 1H), 7.96 (d, J = 8.4 Hz, 1H), 7.69 (t, J = 7.2 Hz, 1H), 7.52 (t, J = 7.2 Hz, 1H), 7.14 (s, 1H), 5.85 (s, 2H), 2.94 (t, J = 7.6 Hz, 2H), 2.82 (q, J = 6.8 Hz, 1H), 2.69 (s, 3H), 2.27 (s, 3H), 1.90-1.75 (m, 3H), 1.70-1.55 (m, 1H), 1.24 (d, J = 6.8 Hz, 3H). $^1$C NMR (100 MHz, CDCl$_3$): $\delta$ 162.5 (+), 158.7 (+), 150.0 (+), 147.7 (+), 144.2 (+), 129.3 (-), 129.0 (-), 126.8 (+), 125.4 (-), 123.6 (-), 122.0 (-), 105.5 (-), 104.0 (-), 39.2 (+), 35.7 (+), 33.1 (-), 27.7 (+), 19.2 (-), 18.7 (-), 13.6 (-). Anal. Calcd. for C$_{20}$H$_{23}$NO: C, 81.87; H, 7.90. Found: C, 81.88; H, 8.13.

Reference

(1) 9-borabicyclo[3.3.1]nonane dimer (9-BBN dimer) was prepared according to the following procedure: Soderquist, J.A.; Negron, A. Org. Synth. 1992, 70, 169-76.