

Correction to “Asymmetric Reduction of *tert*-Butanesulfinyl Ketimines by N-Heterocyclic Carbene Boranes”

Tao Liu, Ling-yan Chen, and Zhihua Sun*

J. Org. Chem. 2015, 80 (22), 11441–11446. DOI: 10.1021/acs.joc.5b02084

Page 11444. We regret that there were unintentional nomenclature errors in the title of the compounds. The first “R” in the names of compound 7a–r should be changed to “S” as follows:

(S)-2-Methyl-N-((R)-1-phenylethyl)propane-2-sulfinamide (7a)¹⁵. A colorless oil (50.6 mg, 90%). ¹H NMR (400 MHz, CDCl₃) δ 7.30–7.36 (m, 5H), 4.57 (m, 1H), 3.46 (s, 1H), 1.53 (d, J = 6.4 Hz, 3H), 1.26 (s, 9H). ¹³C NMR (100 MHz, CDCl₃) δ 144.1, 128.7, 127.8, 126.6, 55.5, 54.0, 22.8, 22.6.

(S)-2-Methyl-N-((R)-1-*p*-tolylethyl)propane-2-sulfinamide (7b). A colorless oil (52.0 mg, 87%). ¹H NMR (400 MHz, CDCl₃) δ 7.26 (d, J = 8.0 Hz, 2H), 7.17 (d, J = 7.6 Hz, 2H), 4.54 (m, 1H), 3.42 (s, 1H), 2.36 (s, 3H), 1.51 (d, J = 6.8 Hz, 3H), 1.25 (s, 9H). ¹³C NMR (100 MHz, CDCl₃) δ 114.2, 137.5, 129.4, 126.5, 55.4, 53.7, 22.7, 22.6, 21.1. HRMS (ESI-TOF) *m/z*: [M + H]⁺ calcd for C₁₃H₂₁NOS 240.1417, found 240.1427.

(S)-N-((R)-1-(4-Methoxyphenyl)ethyl)-2-methylpropane-2-sulfinamide (7c)¹⁵. A colorless oil (56.1 mg, 88%). ¹H NMR (400 MHz, CDCl₃) δ 7.29 (d, J = 7.6 Hz, 2H), 6.90 (d, J = 8.8 Hz, 2H), 4.53 (m, 1H), 3.82 (s, 3H), 3.43 (s, 1H), 1.51 (d, J = 6.4 Hz, 3H), 1.25 (s, 9H). ¹³C NMR (100 MHz, CDCl₃) δ 159.2, 136.2, 127.7, 114.1, 55.4, 55.3, 53.4, 22.7, 22.6.

(S)-N-((R)-1-(4-Chlorophenyl)ethyl)-2-methylpropane-2-sulfinamide (7d)¹⁶. A colorless oil (57.8 mg, 89%). ¹H NMR (400 MHz, CDCl₃) δ 7.26–7.38 (m, 4H), 4.53 (m, 1H), 3.41 (s, 1H), 1.50 (d, J = 6.8 Hz, 3H), 1.25 (s, 9H). ¹³C NMR (100 MHz, CDCl₃) δ 142.5, 133.5, 128.9, 128.0, 55.6, 53.5, 22.8, 22.6. HRMS (ESI-TOF) *m/z*: [M + H]⁺ calcd for C₁₂H₁₈ClNOS 260.0870, found 260.0880.

(S)-2-Methyl-N-((R)-1-(4-(trifluoromethyl)phenyl)ethyl)propane-2-sulfinamide (7e)¹⁵. A colorless oil (60.1 mg, 82%). ¹H NMR (400 MHz, CDCl₃) δ 7.63 (d, J = 8.4 Hz, 2H), δ 7.49 (d, J = 8.4 Hz, 2H), 4.62 (m, 1H), 3.47 (d, J = 2.0 Hz, 1H), 1.55 (d, J = 6.4 Hz, 3H), 1.26 (s, 9H). ¹³C NMR (100 MHz, CDCl₃) δ 148.0, 127.0, 125.7, 125.7, 55.7, 53.9, 22.9, 22.5.

(S)-N-((R)-1-(4-Cyanophenyl)ethyl)-2-methylpropane-2-sulfinamide (7f)¹⁵. A colorless oil (59.5 mg, 95%). ¹H NMR (400 MHz, CDCl₃) δ 7.62 (d, J = 8.4 Hz, 2H), 7.47 (d, J = 8.4 Hz, 2H), 4.58 (m, 1H), 3.59 (d, J = 3.6 Hz, 1H), 1.51 (d, J = 6.4 Hz, 3H), 1.22 (s, 9H). ¹³C NMR (100 MHz, CDCl₃) δ 149.3, 132.6, 127.4, 118.6, 111.6, 55.8, 54.1, 22.9, 22.5.

(S)-N-((R)-1-(3-Fluorophenyl)ethyl)-2-methylpropane-2-sulfinamide (7g). A colorless oil (52.3 mg, 86%). ¹H NMR (400 MHz, CDCl₃) δ 6.97–7.28 (m, 4H), 4.56 (m, 1H), 3.48 (s, 1H), 1.52 (d, J = 6.8 Hz, 3H), 1.26 (s, 9H). ¹³C NMR (100 MHz, CDCl₃) δ 163.0 (d, J = 245.0 Hz), 146.7 (d, J = 7.0 Hz), 130.3 (d, J = 8.0 Hz), 122.3 (d, J = 3.0 Hz), 114.7 (d, J = 21.0

Hz), 113.4 (d, J = 22.0 Hz), 55.6, 53.6, 22.8, 22.6. HRMS (ESI-TOF) *m/z*: [M + H]⁺ calcd for C₁₂H₁₈FNOS 244.1166, found 244.1174.

(S)-2-Methyl-N-((R)-1-phenylpropyl)propane-2-sulfinamide (7h)¹⁵. A colorless oil (50.9 mg, 85%)[>] ¹H NMR (400 MHz, CDCl₃) δ 7.30–7.36 (m, 5H), 4.31 (m, 1H), 3.41 (s, 1H), 1.80 (m, 2H), 1.25 (s, 9H), 0.81 (t, J = 14.8 Hz, 3H). ¹³C NMR (100 MHz, CDCl₃) δ 142.3, 128.6, 127.8, 127.3, 60.4, 55.7, 29.4, 22.6, 22.5.

(S)-N-((R)-1-(4-Methoxyphenyl)-2,2-dimethylpropyl)-2-methylpropane-2-sulfinamide (7i). A colorless oil (55.8 mg, 75%). ¹H NMR (400 MHz, CDCl₃) δ 7.96 (d, J = 8.4 Hz, 2H), 6.85 (d, J = 8.4 Hz, 2H), 3.81 (d, J = 8.0 Hz, 1H), 3.60 (s, 3H), 3.11 (s, 1H), 1.24 (s, 9H), 0.95 (s, 9H). ¹³C NMR (100 MHz, CDCl₃) δ 159.0, 130.6, 129.2, 113.0, 66.5, 55.8, 55.1, 36.3, 26.7, 22.6. HRMS (ESI-TOF) *m/z*: [M + H]⁺ calcd for C₁₆H₂₇NO₂S 298.1835, found 298.1828.

(S)-N-((R)-1-(2-Hydroxyphenyl) (phenyl)methyl)-2-methylpropane-2-sulfinamide (7j)¹⁹. A colorless oil (39.4 mg, 52%). ¹H NMR (400 MHz, CDCl₃) δ 6.73–7.43 (m, 9H), 5.82 (d, J = 4.8 Hz, 1H), 5.06 (d, J = 4.8 Hz, 1H), 1.32 (s, 9H). ¹³C NMR (100 MHz, CDCl₃) δ 155.1, 140.5, 129.1, 128.9, 128.4, 128.3, 127.5, 127.5, 119.3, 116.5, 60.2, 56.3, 22.8.

(S)-N-((R)-1-(2-Methoxyphenyl) (phenyl)methyl)-2-methylpropane-2-sulfinamide (7k)²⁰. A colorless oil (38.9 mg, 49%). ¹H NMR (400 MHz, CDCl₃) δ 6.73–7.43 (m, 9H), 5.81 (d, J = 4.4 Hz, 1H), 5.20 (d, J = 4.4 Hz, 1H), 1.32 (s, 9H). ¹³C NMR (100 MHz, CDCl₃) δ 156.6, 141.2, 130.8, 128.9, 128.5, 128.2, 128.0, 128.0, 127.5, 127.3, 57.4, 55.9, 55.5, 22.7.

(S)-2-Methyl-N-((R)-1-(pyridin-2-yl)ethyl)propane-2-sulfinamide (7l)²¹. A colorless oil (49.2 mg, 74%). ¹H NMR (400 MHz, CDCl₃) δ 8.60 (d, J = 4.8 Hz, 1H), δ 7.68 (m, 1H), 7.30 (m, 1H), 7.19 (m, 1H), 4.85 (d, J = 4.4 Hz, 1H), 4.64 (m, 1H), 1.52 (d, J = 6.8 Hz, 3H), 1.27 (s, 9H). ¹³C NMR (100 MHz, CDCl₃) δ 161.9, 149.0, 136.8, 122.3, 121.0, 55.6, 55.2, 23.4, 22.7.

(S)-N-((R)-1-(Furan-2-yl)ethyl)-2-methylpropane-2-sulfinamide (7m)¹⁶. A colorless oil (48.4 mg, 90%). ¹H NMR (400 MHz, CDCl₃) δ 7.38 (t, J = 3.6 Hz, 1H), 6.27–6.34 (m, 2H), 4.59 (m, 1H), 3.59 (d, J = 4.0 Hz, 1H), 1.62 (d, J = 6.8 Hz, 3H), 1.23 (s, 9H). ¹³C NMR (100 MHz, CDCl₃) δ 156.0, 142.0, 110.2, 106.1, 55.7, 48.6, 22.5, 20.2. HRMS (ESI-TOF) *m/z*: [M + H]⁺ calcd for C₁₀H₁₇NO₂S 216.1053, found 216.1059.

(S)-N-((S)-2-Chloro-1-(4-chlorophenyl)ethyl)-2-methylpropane-2-sulfinamide (7n)²². A colorless oil (66.2 mg, 90%). ¹H NMR (400 MHz, CDCl₃) δ 7.28–7.38 (m, 4H), 4.68 (m, 1H), 3.87 (d, J = 5.6 Hz, 2H), 3.84 (s, 1H), 1.25 (s, 9H).

Published: January 29, 2016

^{13}C NMR (100 MHz, CDCl_3) δ 137.5, 134.4, 129.0, 128.8, 67.9, 58.9, 48.3, 22.6.

(S)-2-Methyl-N-((R)-1,2,3,4-tetrahydronaphthalen-1-yl)propane-2-sulfinamide (7o)¹⁵. A white solid (50.3 mg, 80%), mp: 116 °C. ^1H NMR (400 MHz, CDCl_3) δ 7.11–7.48 (m, 4H), 4.60 (m, 1H), 3.26 (s, 1H), 2.80 (m, 1H), 1.81–2.06 (m, 4H), 1.24 (s, 9H). ^{13}C NMR (100 MHz, CDCl_3) δ 137.7, 137.0, 129.7, 129.2, 127.6, 126.6, 55.4, 52.8, 30.6, 29.1, 22.7, 18.2.

(S)-N-((R)-3,3-Dimethylbutan-2-yl)-2-methylpropane-2-sulfinamide (7p)¹⁵. A colorless oil (43.6 mg, 85%). ^1H NMR (400 MHz, CDCl_3) δ 3.27 (s, 1H), 3.12 (m, 1H), 1.21 (s, 9H), 1.13 (d, $J = 6.4$ Hz, 3H), 0.92 (s, 9H). ^{13}C NMR (100 MHz, CDCl_3) δ 59.0, 55.4, 34.4, 26.1, 22.6, 15.9.

(S)-2-Methyl-N-((R)-4-phenylbutan-2-yl)propane-2-sulfinamide (7q)¹⁵. A colorless oil (52.6 mg, 83%). ^1H NMR (400 MHz, CDCl_3) δ 7.31 (d, $J = 7.6$ Hz, 2H), 7.21 (m, 3H), 3.43 (m, 1H), 3.16 (d, $J = 4.4$ Hz, 1H), 2.72 (m, 2H), 1.79–1.95 (m, 2H), 1.23 (d, $J = 6.4$ Hz, 3H), 1.20 (s, 9H). ^{13}C NMR (100 MHz, CDCl_3) δ 141.5, 128.5, 128.4, 126.0, 55.3, 51.1, 39.9, 32.1, 22.5, 21.7.

(S)-N-((S,E)-1,3-Diphenylallyl)-2-methylpropane-2-sulfinamide (7r)²³. A white solid (47.8 mg, 61%), mp: 107–109 °C. ^1H NMR (400 MHz, CDCl_3) δ 7.30–7.46 (m, 10H), 6.67 (m, 1H), 6.43 (m, 1H), 5.18 (d, $J = 7.6$ Hz, 1H), 3.63 (s, 1H), 1.26 (s, 9H). ^{13}C NMR (100 MHz, CDCl_3) δ 140.5, 133.0, 128.7, 128.6, 128.5, 128.5, 128.4, 128.4, 128.0, 127.4, 126.4, 126.1, 40.4, 30.2, 22.7.

Page 11445. As “[α]_D25 + 22.8 (c 0.75, CH_2Cl_2)” was the optical rotation of the corresponding free amine of **8c**, it was not suitable to be placed in the data of **8c**. The data part of **8c** should be rewritten as “(R)-1-(4-methoxyphenyl)ethanamine hydrochloride (**8c**)¹⁸: a yellow solid (31.9 mg, 85%). mp: 152–155 °C. ^1H NMR (400 MHz, CDCl_3) δ 8.61 (s, 2H), 7.42 (d, $J = 8.4$ Hz, 2H), 6.89 (d, $J = 8.4$ Hz, 2H), 4.33 (s, 1H), 3.81 (s, 3H), 1.65 (d, $J = 6.8$ Hz, 3H). ^{13}C NMR (100 MHz, CDCl_3) δ 159.9, 129.7, 128.3, 114.4, 55.2, 51.3, 20.5.”

P11443. “[α]_D25 + 22.8 (c 0.75, CH_2Cl_2)” should be added to the footnote of Table 3 as follows:

^aUnless otherwise noted, all reactions were carried out using **6** (0.25 mmol), NHC-BH₃ (0.25 mmol), and TsOH (0.125 mmol) in MeOH (1.0 mL) at –10 °C for 4 h. ^bIsolated yield. ^cDetermined by ^1H NMR analysis of unpurified reaction mixtures. ^d CH_2Cl_2 was used as the solvent without TsOH for 8 h. ^e CH_2Cl_2 was used as the solvent for 8 h. ^fToluene was used as the solvent. ^gThe absolute configuration was determined by comparison of the optical rotation with the known compounds (corresponding free amine), [α]_D25 + 22.8 (c 0.75, CH_2Cl_2) {literature²⁴ [α]_D20 + 23.5 (c 0.9, CHCl_3 , 95% ee)}.”