Secondary Amine-catalyzed Asymmetric Michael Addition of N-Boc-Protected Oxindoles to Maleimides

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Determination of the configuration:\textsuperscript{1}

NMR-Spectra and optical rotation reported in the literature:

(S, S)-8

$^1$H NMR (400 MHz, CDCl$_3$): $\delta$ = 7.81 (s, 1 H), 7.51-7.44 (m, 3 H), 7.33 (d, $J$ = 7.6 Hz, 1 H), 7.26-7.18 (m, 3 H), 7.13-6.98 (m, 4 H), 6.86 (dd, $J$ = 8.0, 1.4 Hz, 2 H), 6.69 (d, $J$ = 7.7 Hz, 1 H), 4.03 (d, $J$ = 13.3 Hz, 1 H), 3.67 (dd, $J$ = 9.3, 5.1 Hz, 1 H), 3.42 (d, $J$ = 13.3 Hz, 1 H), 2.92 (dd, $J$ = 18.4, 9.3 Hz, 1 H), 2.11 (dd, $J$ = 18.4, 5.1 Hz, 1 H) ppm.

$^{13}$C NMR (101 MHz, CDCl$_3$): $\delta$ = 178.3, 176.3, 174.3, 141.1, 135.0, 130.0, 129.5, 129.3, 128.9, 127.7, 126.7, 126.6, 124.6, 123.1, 110.2, 56.2, 44.4, 41.1, 31.6 ppm.

$[\alpha]_D^{20} = +147.4$ (c = 0.88, CHCl$_3$) (dr > 99:1, 93 % ee)

NMR-Spectra and optical rotation acquired in this protocol:

(S, S)-8

$^1$H NMR (400 MHz, CDCl$_3$): $\delta$ = 7.66 (brs, 1 H), 7.51-7.47 (m, 2 H), 7.42 (dt, $J$ = 7.2, 1.2 Hz, 1 H), 7.31 (d, $J$ = 7.6 Hz, 1 H), 7.24-7.22 (m, 2 H), 7.18 (dd, $J$ = 8.0, 1.2 Hz, 1 H), 7.09-6.98 (m, 4 H), 6.85 (dd, $J$ = 8.4, 1.2 Hz, 2 H), 6.67 (d, $J$ = 8.0 Hz, 1 H), 4.03 (d, $J$ = 13.2 Hz, 1 H), 3.67 (dd, $J$ = 9.2, 5.2 Hz, 1 H), 3.42 (d, $J$ = 13.2 Hz, 1 H), 2.92 (dd, $J$ = 18.4, 9.2 Hz, 1 H), 2.11 (dd, $J$ = 18.4, 5.2 Hz, 1 H) ppm.

$^{13}$C NMR (101 MHz, CDCl$_3$): $\delta$ = 178.2, 176.3, 174.3, 141.1, 135.1, 131.6, 130.0 (2 C), 129.5, 129.3 (2 C), 128.9, 127.7 (2 C), 127.0, 126.7, 126.6 (2 C), 124.6, 123.0, 110.1, 56.1, 44.4, 41.2, 31.7 ppm;

$[\alpha]_D^{20} = +261$ (c = 0.9, CHCl$_3$) (dr > 99:1, 86 % ee)

The NMR-spectra of compound 8 are almost identical to these very recently reported in the literature.\textsuperscript{1} In both cases 8 shows a strong positive optical rotation. Therefore, we assume that the compound 8 has the same relative and absolute configuration as reported in the literature.