DENEB®

DENEB® is an oxo-tethered ruthenium complex newly developed as a highly efficient asymmetric transfer hydrogenation catalyst. This high-performance catalyst exceeds the conventional RuCl(arene)(N-sulfonylated diamine) systems not only in activity but also in scope of substrates. DENEB® can produce remarkable improvement of catalytic activities and enantioselectivities in a wide range of substrates.

“DENEB” is a registered trademark or trademark of Takasago International Corporation in Japan and other countries.

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Touge, T. J. Am. Chem. Soc. 2016, 138, 10084–10087. doi.10.1021/jacs.6b05738
Touge, T. J. Am. Chem. Soc. 2019, 141, 41, 16354-16361. doi: 10.1021/jacs.9b07297
Tech Note

1 Asymmetric Transfer Hydrogenation of Ketones

Asymmetric Transfer Hydrogenation of Ketones

Touge, T. J. Am. Chem. Soc. 2011, 133, 14960. doi: 10.1021/ja207283t

2 Asymmetric Transfer Hydrogenation of Unsymmetrical Benzophenone

Asymmetric Transfer Hydrogenation of Unsymmetrical Benzophenone


3 Asymmetric Transfer Hydrogenation of Aryl N-Heteroaryl Ketones

Asymmetric Transfer Hydrogenation of Aryl N-Heteroaryl Ketones


4 Dynamic Kinetic Resolution (DKR) of Diketone

Dynamic Kinetic Resolution (DKR) of Diketone

5 Asymmetric Hydrogenation of Ketones

Asymmetric Hydrogenation of Ketones

6 Asymmetric Transfer Hydrogenation of α-Substituted Ketone

Asymmetric Transfer Hydrogenation of α-Substituted Ketone

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Takasago Fine Chemicals Division


7 Hydrogenation of γ-Butyrolactone

\[
\text{γ-Butyrolactone} + H_2 (5 \text{ MPa}) \xrightarrow{Ta-DENEB 2 \text{ mol%}} \text{β-Hydroxy γ-Butyrolactone}
\]

Touge, T. J. Am. Chem. Soc. 2011, 133, 14960. doi: 10.1021/ja207283t

8 syn-β-Hydroxy α-Dibenzylamino Esters via DKR Asymmetric Transfer Hydrogenation


9 Cascade Lactone Formation via DKR Driven by the Asymmetric Transfer Hydrogenation of Keto Acids


10 Applications

10.1 Asymmetric Synthesis of a Key Intermediate for the β2-Adrenergic Receptor Agonist


10.2 Asymmetric Synthesis of a Key Intermediate for the Omarigliptin (MK-3102)


10.3 Transfer Hydrogenation in Flow for the Synthesis of a Ceramide

100 L Vertical Pipes-in-series Reactor

EP2773611B, JP6048762B, WO2013065867A

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