Asymmetric hydrogenation of maleic acid diesters and anhydrides

ID 2815368
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Year 2014
Title Asymmetric hydrogenation of maleic acid diesters and anhydrides
Journal Angewandte Chemie International Edition
Volume 53
Number 21
Pages / **Article-Number** 5385-8
Keywords asymmetric catalysis, hydrogenation, iridium, N, Pligands, synthetic methods
Asymmetric hydrogenation of maleic and fumaric acid derivatives with iridium catalysts based on N,Pligands provides an efficient route to chiral enantioenriched succinates. A new catalyst derived from a 2,6-difluorophenyl-substituted pyridine-phosphinite ligand was developed and enables the conversion of a wide range of 2-alkyl and 2-arylmaleic acid diesters into the corresponding succinates in high enantiomeric purity. Mixtures of cis/trans substrates can be hydrogenated in an enantioconvergent fashion with high enantioselectivity, and further enhances the scope of this transformation. The products are valuable chiral building blocks with a structural motif found in many bioactive compounds, such as metalloproteinase inhibitors.
Publisher Wiley
ISSN/ISBN 1433-7851 ; 1521-3773
edoc-URL http://edoc.unibas.ch/dok/A6337605
Full Text on edoc No;
Digital Object Identifier DOI 10.1002/anie.201402034
PubMed ID http://www.ncbi.nlm.nih.gov/pubmed/24711207
ISI-Number WOS:000335809200024
Document type (ISI) Journal Article