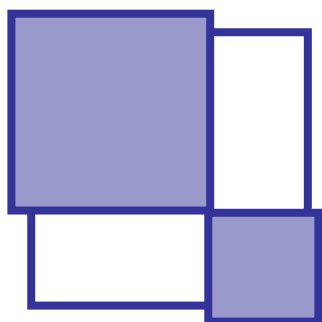


RUCY™

Highly Efficient Catalysts
for Producing Chiral Alcohols



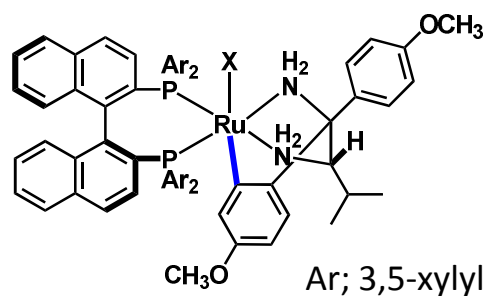
RUCY™-XylBINAP will be launched into market in August

Takasago International Corporation
Fine Chemicals Division



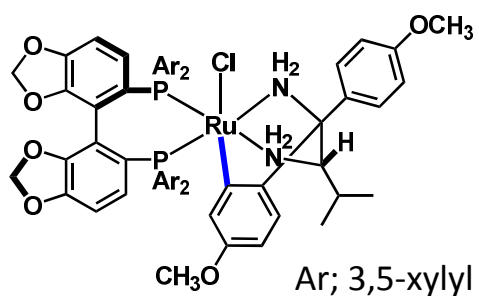
RUCY™; Ruthenabicycle catalysts

RUCY™



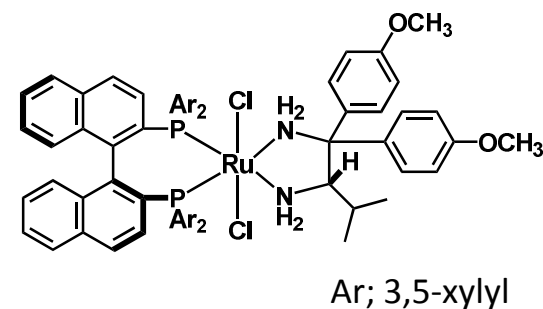
1a; X = Cl, RUCY™-XylBINAP

1b; X = OTf



1c; RUCY™-DM-SEGPHOS

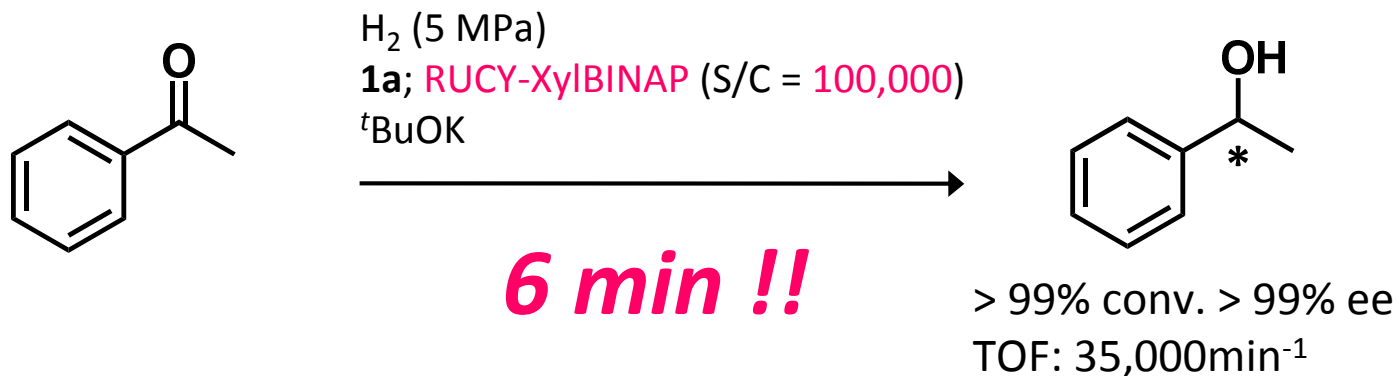
Conventional Pre-catalyst*



2a; *trans*-RuCl₂[xylbinap][daipen]

J. Am. Chem. Soc.* **1998, *1201*, 13529-13530

Highly efficient Asymmetric Hydrogenation



Catalyst Loading; S/C = **100,000**

- a) Reduction of catalyst cost
- b) Reduction of Ru metal residue in product
- Ru/ Product = **8.3** ppm

50%

Compared to Conventional

Turnover Frequency; TOF = **35,000** min⁻¹

- a) Reduction of reaction time
- b) Reduction of energy cost

×50

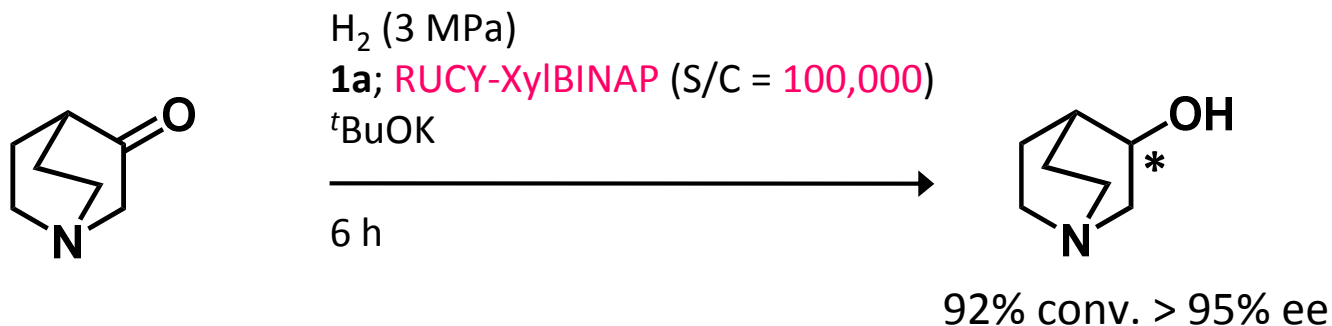
Compared to Conventional

Conventional technology;

Complex **2a**; *trans*-RuCl₂[(S)-xylbinap][(S)-daipen], S/C = 50,000, 120min;

> 99% conv. 98% ee, TOF: 700min⁻¹

Highly efficient Asymmetric Hydrogenation



Turnover Number; TON = **92,000**

- a) Reduction of catalyst cost
- b) Reduction of Ru metal residue in product
 - Ru/ Product; **8.1** ppm

×9

Compared to Conventional

Enantioselectivity; **95%** ee

- a) Removing additional process for optical purity improvement
- b) Improvement of total yield; > **25%**

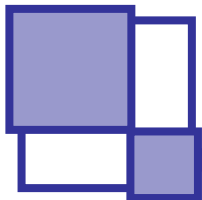
Conventional

86% ee

Conventional technology;

Complex **2a**; *trans*-RuCl₂[(S)-xylbinap][(S)-daipen], S/C = 20,000;

50% conv. 86% ee, TON: 10,000



For more information

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