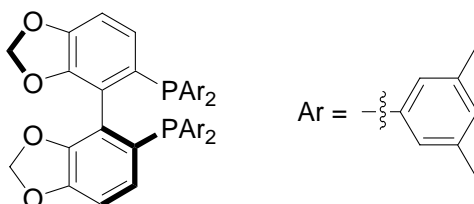


# Tech Note

## (S)-DM-SEGPHOS

### (S)-(-)-5,5'-Bis(3,5-dimethylphenylphosphino)-4,4'-bi-1,3-benzodioxole

CAS Number	210169-57-6
CASName	Phosphine, [(4S)-(4,4'-bi-1,3-benzodioxole)-5,5'-diyl]bis [3,5-dimethylphenyl]-
Formula	C <sub>46</sub> H <sub>44</sub> O <sub>4</sub> P <sub>2</sub>
Molecular Weight	722.81



#### Representative references:

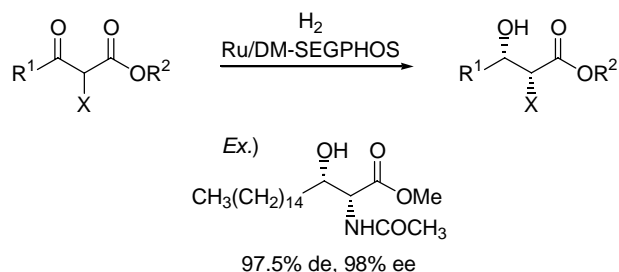
T. Saito, T. Yokozawa, T. Ishizaki, T. Moroi, N. Sayo, T. Miura, H. Kumobayashi, *Adv. Synth. Catal.*, 2001, 343, 264.

## Performance Examples and References:

DM-SEGPHOS has a slightly bulkier pendant group than SEGPHOS, which gives higher enantioselectivity in reductive amination of  $\beta$ -keto esters to  $\beta$ -amino acids. Replacing XyIBINAP with DM-SEGPHOS as ligand in Noyori's [RuX<sub>2</sub>(P<sup>^</sup>P)(N<sup>^</sup>N)] complex also could increase the enantioselectivity in difficult hydrogenations.

### 1. Ru catalyzed asymmetric hydrogenation

#### 1.1. Dynamic kinetic resolution



Sumi, K. *Topics Organomet. Chem.* 2004, 6, 63.

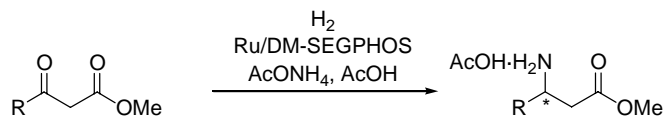


[finechemicals@takasago.com](mailto:finechemicals@takasago.com)

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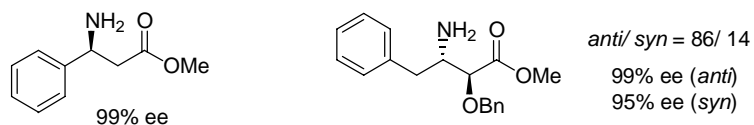
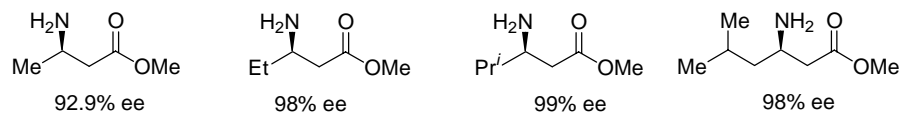
# Tech Note

## 1.2. Direct reductive amination of $\beta$ -keto esters



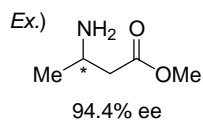
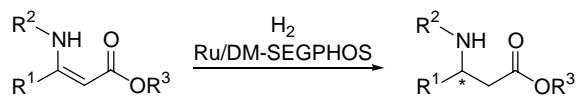
R = alkyl, aryl, heteroaryl

- Product List as AcOH salt -



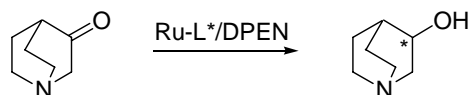
WO 2005/028419 A3, 2004.

## 1.3. Hydrogenation of enamino esters



US 2004/0023344 A1, 2003

## 1.4. Noyori-reduction



DM-SEGPHOS : 90.5% ee  
XylBINAP : 74.5% ee

JP 2006-63028A, 2006.

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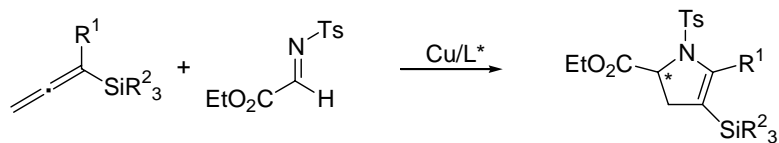
[finechemicals@takasago.com](mailto:finechemicals@takasago.com)

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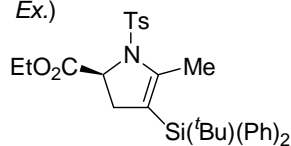
# Tech Note

## 2. Cu catalyzed asymmetric reaction

### [3+2] Cycloaddition



Ex.)



<b>(R)-DM-SEGPHOS</b>	<b>85% ee, 53%</b>
(R)-BINAP	58% ee, 48%
(R)-TolBINAP	57% ee, 67%
(R)-SEGPHOS	67% ee, 65%

Akiyama, T. *Org. Lett.* **2005**, *7*, 1051.



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