

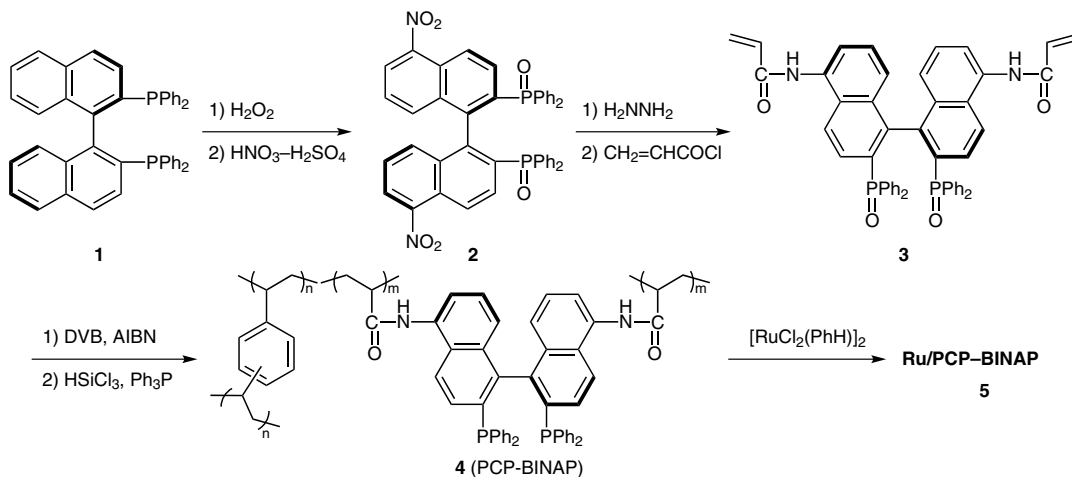
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Mesoporous Cross-Linked Polymer Copolymerized with Chiral BINAP Ligand Coordinated to a Ruthenium Species as an Efficient Heterogeneous Catalyst for Asymmetric Hydrogenation

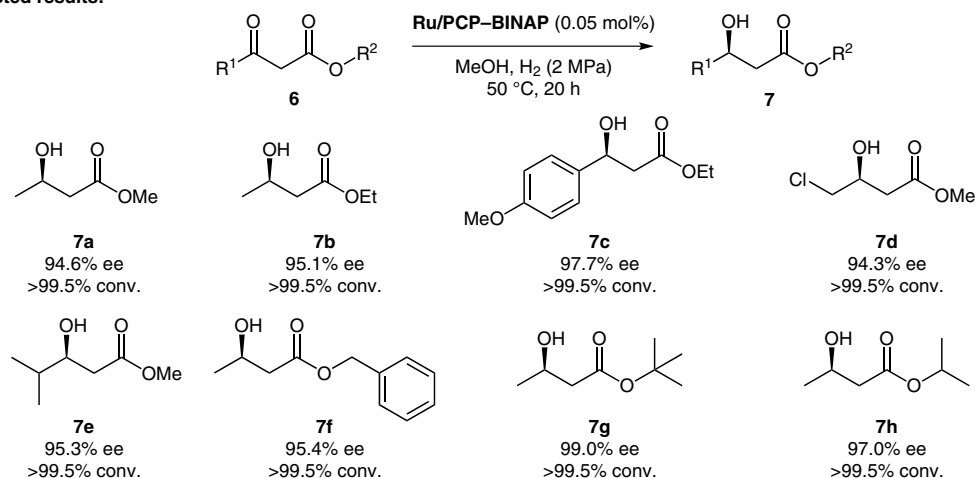
*Chem. Commun.* **2012**, 48, 10505–10507.

## Asymmetric Hydrogenation Using Polymer-Supported BINAP

### Preparation of chiral Ru/PCP–BINAP 5:



### Selected results:



**Significance:** A polymeric BINAP–ruthenium complex (Ru/PCP–BINAP) was prepared by treatment of  $[\text{RuCl}_2(\text{PhH})_2]$  with the mesoporous cross-linked polymeric (*R*)-BINAP ligand **4**. Ru/PCP–BINAP catalyzed the asymmetric hydrogenation of  $\beta$ -keto esters under hydrogen (2 MPa) to give the corresponding  $\beta$ -hydroxy esters **7a–h** in >99.5% conversion with 94.3–99.0% ee.

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**Comment:** Ru/PCP–BINAP was readily recovered and reused six times without significant loss of its catalytic ability (1<sup>st</sup> reuse: >99.5% conversion, 94.3% ee, 6<sup>th</sup> reuse: >99.5% conversion, 95.3% ee).