Dynamic Kinetic Resolution Approach: Synthesis of Axially Chiral Biaryls

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Atroposelective Synthesis of Axially Chiral Biaryls by Palladium-Catalyzed Asymmetric C–H Olefination Enabled by a Transient Chiral Auxiliary


Dynamic Kinetic Resolution Approach: Synthesis of Axially Chiral Biaryls

**Mechanism:**

The approach relies on using tert-leucine as an inexpensive chiral auxiliary to allow selective C–H insertion into the favored atropisomer. Rotation is locked by a terminating Heck reaction.

**Selected examples:**

- 90% yield, 99% ee
- 83% yield, 97% ee
- 42% yield, 99% ee

* Substrates substituted at both the 6- and 2'-positions have restricted rotation; thus, products are formed by kinetic resolution.

**Significance:** Shi and co-workers report a protocol to access axially chiral biaryl systems by dynamic kinetic resolution. The approach relies on using tert-leucine as an inexpensive chiral auxiliary to allow selective C–H insertion into the favored atropisomer. Rotation is locked by a terminating Heck reaction.

**Comment:** The products are delivered in excellent yields and enantioselectivity. The reaction displays great scalability and is performed on up to 5 mmol. Additionally, both enantiomers can be accessed by simply using the amino acid of opposite chirality. The authors found that if the substrates are substituted at both the 6- and 2'-positions, the reaction does not exhibit dynamic reversibility and hence a maximum of 50% yield can be achieved in such cases.

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SYNFACS 2017, 13(07), 0707  Published online: 19.06.2017

DOI: 10.1055/s-0036-1590600; Reg-No.: L06617SF