S. Handa, K. Nagawa, Y. Sohtome, S. Matsunaga,* M. Shibasaki* (The University of Tokyo, Japan)

A Heterobimetallic Pd/La/Schiff Base Complex for anti-Selective Catalytic Asymmetric Nitroaldol Reactions and Applications to Short Syntheses of β-Adrenoceptor Agonists


Pd/La Complex for anti-Selective Catalytic Asymmetric Nitroaldol Reactions

**Significance:** A limited number of reports describe the anti-selective synthesis of chiral β-amino alcohols. This report describes the design of a simple and efficient catalyst with a broad substrate scope and practical applicability. The authors nicely demonstrate the short syntheses of two β-adrenoceptor agonists.

**Comment:** Typically the methods for the synthesis of anti-selective chiral β-amino alcohols require the activation of nitroalkanes to silylnitronates. The authors avoid this activation using their heterobimetallic catalysts extensively studied in their laboratory. This report states that palladium and lanthanum efficiently and selectively produce the desired anti-products in moderate to excellent yields.

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**Synthesis of heterobimetallic catalyst**

![Chemical structure diagram]

1) Pd(OAc)$_2$
2) La(O-i-Pr)$_3$

4-bromophenol

**Substrate scope**

R = aryl, alkyl
R' = Me, Et

**Short synthesis**

OH

R CH$_2$NO$_2$

Pd/La/ligand (10 mol%)
4-bromophenol (10 mol%)

THF–xylene, −40 °C

72–92% ee

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