Chiral Brønsted Acid Catalyzed Allylboration of Aldehydes


** Allylboration of Aldehydes **

![Chemical structure](image)

**Significance:** A highly enantioselective allylboration of aldehydes catalyzed by the chiral Brønsted acid (R)-TRIP is reported by the authors. This transformation shows a broad substrate scope: aryl, heteroaryl, \( \alpha,\beta \)-unsaturated and aliphatic aldehydes can all be efficiently allylated. Furthermore, the crotylboration of benzaldehyde also proceeded smoothly with high diastereo- and enantioselectivity in the presence of this acid catalyst.

**Comment:** Simple starting materials and a commercially available catalyst make this protocol a useful and efficient method for the synthesis of enantioenriched homoallylic alcohols. A transition state where the boronate is activated by protonation of the boronate oxygen with a chiral phosphoric acid is proposed by the authors. To confirm this activation model, further mechanistic investigation may be required.

**Selected examples:**

- PhOH
  - 99% yield, er = 99:1
- PhCHO
  - 94% yield, er = 98:2
- PhCHO
  - 98% yield, er = 95:5
- PhCHO with (E)-boronate: 96% yield (anti), er = 98:2
- PhCHO with (Z)-boronate: 95% yield (syn), er = 97:3