Chiral Triarylmethanes via an Enantiospecific Palladium-Catalyzed Cross-Coupling

Significance: Recently, enantioselective cross-couplings have received increased attention due to their potential for easily constructing valuable chiral molecules. However, when compared to non-enantioselective variants, there are only a limited number of reports which describe desirable levels of selectivities. The group of Crudden reports a novel route towards valuable chiral triarylmethanes via a stereospecific Suzuki cross-coupling.

Comment: The authors utilize chiral dibenzylic boronic esters (synthesis described) and aryl iodides to stereospecifically access chiral triarylmethanes using the inexpensive palladium pre-catalyst Pd(PPh3)4. A range of chiral boronic esters are synthesized from the benzyl carbamates with good to excellent enantiomeric ratios, which are easily converted into the target products with up to 100% stereospecificity.

Selected examples:

- Ac
  - MeO
  - Cl
  - CHO
  - MeO

  - 80% yield, er = 86:14
  - 83% yield, er = 89:11
  - 66% yield, er = 90:10
  - 69% yield, er = 90:10

- Ac
  - MeO
  - Cl
  - MeO
  - MeO

  - 62% yield, er = 87:13
  - 61% yield, er = 86:14
  - 80% yield, er = 87:13

Synthesis of enantioenriched dibenzylic boronic esters:

1. L1, BuLi, Et2O, –78 °C
2. MgBr2 ⋅ Et2O, reflux
3. MeO

51% yield, er = 93:7

Category: Metal-Catalyzed Asymmetric Synthesis and Stereoselective Reactions

Key words: Suzuki reaction triarylmethanes enantiospecificity