Synthesis of the α-Aminophosphonic Acid Analogues of Cysteine and Serine with High Enantiomeric Excess

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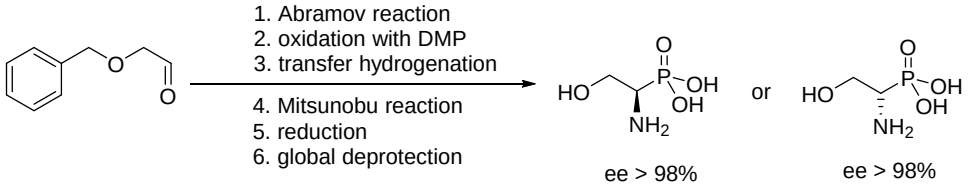
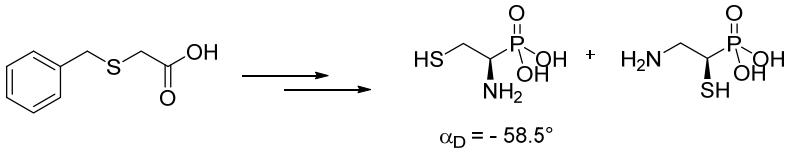
The outstanding ability of aminophosphonic acids to mimic the tetrahedral transition state of a variety of enzymatic reactions, while being far more stable, makes them highly potent enzyme inhibitors.[1]



Scheme 1. General synthetic strategy for the synthesis of phosphaserine.

Currently there is a variety of enzymatic and chemical strategies for the synthesis of chiral α-aminophosphonates. However, these suffer from considerable drawbacks. Thus, we aim at developing a robust and readily reproducible strategy for the synthesis of α-chiral phosphonates of high ee.



Scheme 2. Synthesis of phosphacysteine and isophosphacysteine.

Phosphaserine and phosphacysteine, as well as a structural isomer of phosphacysteine were synthesized successfully applying the outlined strategy with high enantiomeric excess (ee > 98%).

[1] M. Ordóñez, J. L. Viveros-Ceballos, C. Cativiela, A. Arizpe, *Curr. Org. Synth.* **2012**, *9*, 310-341.