

New Chiral Solid Catalysts for Oxidation Reactions

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Enantiopure phosphonic acids and their derivatives are important compounds in medicinal and biological chemistry, and are needed for our research effort to prepare new catalysts for chiral oxidations. Several ways to synthesize chiral phosphonic acids have previously been described, but we have devised an alternative synthetic approach that employs air- and water- stable starting materials, uses an inexpensive and easily resolvable C₂-symmetric chiral auxiliary, and affords good yields and diastereoselectivities. In addition, the diastereomeric excess can easily be determined by NMR spectroscopy, and the diastereomers can be separated and the chiral auxiliary removed to afford enantiopure phosphonic acids. Although previous approaches produce both good yields and selectivities, many of the previously employed auxiliaries are either expensive, require several steps to prepare, are moisture sensitive, or use non C₂ symmetric ligands that result in the production of multiple diastereomers. This new approach has none of these drawbacks.

