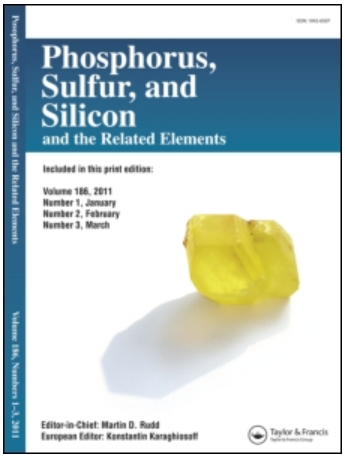

Phosphorus, Sulfur, and Silicon and the Related Elements

Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713618290

Reduction of Oxoalkylphosphonates by Microorganisms

Ewa Żymańczyk-Duda[a]; Barbara Lejczak[a]; Paweł Kafarski[a]
[a] Institute of Organic Chemsitry, Biochemistry and Biotechnology, Wroclaw University of Technology, Wroclaw, Poland

To cite this Article Żymańczyk-Duda, Ewa , Lejczak, Barbara and Kafarski, Paweł(1999) 'Reduction of Oxoalkylphosphonates by Microorganisms', Phosphorus, Sulfur, and Silicon and the Related Elements, 147: 1, 201
To link to this Article: DOI: 10.1080/10426509908053581
URL: http://dx.doi.org/10.1080/10426509908053581

Phosphorus, Sulfur and Silicon, 1999, Vol. 147, pp. 201-201
Reprints available directly from the publisher
Photocopying permitted by license only

Reduction of Oxoalkylphosphonates by Microorganisms

EWA ŻYMAŃCZYK-DUDA, BARBARA LEJCZAK and PAWEŁ KAFARSKI

Institute of Organic Chemistry, Biochemistry and Biotechnology, Wroclaw University of Technology, Wybrzeże Wyspiańskiego 27, 50–370 Wroclaw, Poland

Synthesis of enantiopure compounds is an important task because of the increasing interest in understanding the role which chirality plays in nature and of the increasing demand for such molecules in pharmaceutical and agrochemical industry. Microorganisms has been widely used for this purpose and particular their use in stereospecific reduction of aldehydes and ketones is well documented. Baker's yeast seems to be the most popular biocatalyst for the asymmetric reduction of carbonyl compounds. Its incredible ability to respond to new substrates gives the opportunity to uncover novel exploitable synthetic capacities. Thus, we studied the utility of this microorganism in enantioselective reductions of oxoalkylphosphonates.

The simplest procedure considers biotransformations under aerobic conditions and proved to be effective in many cases. Thus, baker's yeast were found to be efficient and versatile catalyst for the reduction of diethyl β- and γ-oxoalkylphosphonates. Stereoselectivity of the reduction strongly depended on the chemical structure of the starting oxoalkylphosphonate. Thus, in some cases the activation of yeast was required for the proper catalysis, while in other cases anaerobic conditions of biotransformation should be used. Biotransformations of α-oxoalkylphosphonates can not be carried out in aqueous solutions because of chemical instability of substrates. In this case the use of lyophilized baker's yeast in biphasic system appeared to be the method of choice.

The biocatalytic potency of baker's yeast was then compared with those of other fungi, namely *Aspergillus niger* and *Scopularopsis* sp.