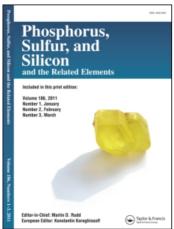
This article was downloaded by:

On: 28 January 2011

Access details: Access Details: Free Access

Publisher Taylor & Francis

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



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

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: http://www.informaworld.com/terms-and-conditions-of-access.pdf

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

Downloaded At: 14:54 28 January 2011

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.