Epoxidation of Heptene by Chloroperoxidase* and Hydrogen Peroxide

B. H. Davison, C. Cheng, M. Rodriguez and A. P. Borole

Chemical Technology Division
Oak Ridge National Laboratory
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Oak Ridge, TN 37831-6226

A. Mulchandani
University of California-Riverside, Chemical and Environmental Engineering,
College of Engineering, Bourns Hall, Riverside, CA, 92521

Daleik Vaughan
Tuskeegee University

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Epoxides are important building blocks in organic synthesis. The development of practical methods for epoxidation of olefins present challenges for biocatalysis. Peroxidases can perform epoxidation under mild conditions but their application in organic synthesis is hampered by the limited solubility of organic reactants in aqueous medium. Cis-3-heptene was used as a model alkene for reaction with chloroperoxidase (CPO) and hydrogen peroxide. We have developed an experimental protocol to allow more accurate mass closure. Hydrogen peroxide is a cosubstrate which must be added in small quantities to prevent enzyme denaturation as well. We will also present data on the use in organic solvents of glucose oxidase as a model system to generate hydrogen peroxide in situ for epoxidation reactions.