Production of glycidyl ethers by chemo-enzymatic epoxidation of allyl ethers - DTU Orbit (03/02/2019)

**Production of glycidyl ethers by chemo-enzymatic epoxidation of allyl ethers**

Production of glycidyl ethers is industrially carried out by reacting alcohols with epichlorhydrin, a potentially carcinogenic compound. This paper investigates a less hazardous alternative—that of a chemo-enzymatic process in which Candida antarctica lipase B catalysed generation of peracid from a carboxylic acid is followed by a Prileshajev epoxidation of the corresponding allyl ether. Trimethylolpropane monoallyl ether (TMPME) was used as a model substrate. A maximal epoxide product yield of 77% was achieved through the optimization of temperature, acid concentration and hydrogen peroxide concentration. Peracid formation was considerably faster than the subsequent epoxidation step, and accumulation of the peracid was found to be important to drive the epoxidation forward.

Keyword: Allyl ether, Glycidyl ether, Epoxidation, Peracid, Lipase

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