

Immobilization of oxidoreductases on textile carrier materials  
and their potential use in modern biotechnology

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The economical use of often high-priced enzymes in chemical synthesis can be improved by the immobilization of the catalyst on a suitable carrier. Particularly some synthetic or natural textile fiber materials such as polyester, polyamide or viscose are well-suited carrier materials, which are comparatively inexpensive. The flexibility of the textile media allows the use in reactors of any geometry and a fast and residue-free removal after the end of each reaction. Enzymatically catalyzed reactions combine a number of advantages compared to conventional chemical processes. For instance enzymes can be used at moderate temperatures, generally in the pH ranges close to neutral and stay unchanged after the reaction. Therefore, often very small quantities are enough for a sufficiently high implementation rate. Other advantages are their high substrate selectivity, their biodegradability and their mostly safe and easy handling. Here, we present various methods for the permanent immobilization of oxidoreductases (peroxidases and laccases) on textile carrier materials and their potential application, e.g., in the gentle enzymatic degradation of food colors (e.g.  $\beta$ -carotene, norbixin) in whey from cheese dairy, the synthesis of natural flavors and the degradation of micropollutants in sewage water. Beyond, we provide information on the activity of the immobilized enzymes in repeated and continuous use.