

Biocatalytic Biodiesel Production- Is That Possible?

Gündüz Güzel, Xuebing Xu, Molecular Biology Institute, Aarhus University

Aarhus, Denmark

Conventional chemical (catalytic) processes of biodiesel production are energy-consuming and non-environmentally friendly. A relatively new and promising method of biodiesel production is via enzymatic transesterification with lipase as the catalyst. Biocatalytic, lipase-catalyzed, biodiesel production does not have such disadvantages. Detailed analysis and comprehension of this way of synthesis and all of its handling related processes may outcome an industrially feasible and sustainable bioprocess technology. Actually, there are some drawbacks to engineering these processes which can be classified as the primary and the secondary: Expensive and non-robust biocatalysts (immobilized enzymes), immiscibility of reaction substrates, and destabilization of biocatalyst due to polar acyl acceptors are categorized primary obstacles. While, biocatalyst inactivation due to by-product (glycerol) and some other feedstock impurities; effect of water content on catalyst activity; relatively slower reaction rates; and low product conversions/yields are the secondary ones. This poster aims at achieving and presenting probable solutions on the main drawbacks and critical aspects of enzymatic biodiesel production, placing particular emphasis on the type and quality of the feedstock and its future availability, and on some of the primary obstacles. As a final point, some suggestions were given on how to debottleneck such limitations for the industrialization of the next generation biodiesel production processes.