

Lipase – catalyzed formation of pentyl nonanoate using screened immobilized lipase from *Rhizomucor meihei*

ABSTRACT

Bio-catalysis has attracted the special attention of industrial flavour producers in the production of valuable ester compounds. In this study, the synthesis of pentyl nonanoate ester (a short chain ester with fruity aroma) was carried out with a commercial immobilized lipase from *Rhizomucor meihei* Lipozyme (RMIM) as biocatalyst in the esterification reaction between nonanoic acid and pentanol. Various reaction parameters such as enzyme concentration, substrate concentration, reaction temperature and reaction time in solvent-free system were screened to enhance the ester formation with the best yield. A maximum yield for pentyl nonanoate (86.08 %) in a solvent-free system was obtained within 150 min, at a reaction temperature of 45 OC, molar ratio of 1:9 M, amount of enzyme of 0.2 g, water addition of 0.2 % v/v and shaking speed of 150 rpm. This work suggests that pentyl nonanoate ester can be produced in a very high yield and in a short period by lipase-catalysed reactions of nonanoic acid and pentanol, using immobilized lipase from RMIM (lipase from *Rhizomucor miehei* immobilized on anionic exchange support).

Keyword: Pentyl nonanoate; Immobilized enzyme (RMIM); Solvent free system