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ECO-FRIENDLY PRODUCTION OF CHEMICALS 1. IMPROVEMENT OF ENZYMATIC PRODUCTION OF ACETOPHENONE BY DIRECT EXTRACTION

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Abstract

Acetophenone can be enzymatically produced by conversion of methylbenzylamine using transaminase. The enzymatic process is strongly affected by the product inhibition, thus requiring the acetophenone removal from the media during its synthesis. In this purpose, the individual and selective extraction of acetophenone and methylbenzylamine with the biocompatible solvent n-heptane containing 1-octanol, D2EHPA or TOA has been analyzed at three values of pH (5, 7, and 9). Regardless of the solvent used and pH-value, the highest efficiency has been reached for extraction of acetophenone, the difference between the extraction yields of acetophenone and methylbenzylamine being amplified during the separation of these compounds from their mixture. On the basis of the experimental selectivity factors and taking into consideration both the possible loss of substrate from the media and the pH required for enzymatic reaction, pH = 7, it has been concluded that the optimum solvent combination is the mixture between n-heptane and 1-octanol. This solvent mixture allowed reaching high selectivity factor of 315, corresponding to the extraction yield of acetophenone of 94.5 % and of methylbenzylamine of only 0.3 %.

Key words: acetophenone, extraction, methylbenzylamine, 1-octanol, selectivity factor

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