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Publication date:
2013

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Citation (APA):

Pirrung, S., Lima Afonso Neto, W., Schwarze, D., Vogel, A., Woodley, J., & Tufvesson, P. (2013). Effect of critical process parameters on the synthesis of chiral amines. Poster session presented at 1st International Symposium on Transaminase Biocatalysis, Stockholm, Sweden.

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Effect of critical process parameters on the synthesis of chiral amines

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Developing a biocatalytic transferase process involves many challenges, and choices have to be made regarding several aspects. Primarily, the selection of the biocatalyst itself and which biocatalyst formulation to use, but also the choice of amine donor has a decisive impact not only on reaction equilibrium, the inhibition profiles for substrates and products but also on the possibilities for *in-situ* product removal (ISPR) and technologies for shifting the equilibrium. In a challenging process such as the synthesis of optically pure chiral amines using ω -transaminase, these decisions will have a major influence on the process. Understanding these parameters and their effect on the process for the different reaction systems is important as it will help engineers make the right choices during process design. In this study we have therefore carried out an in depth characterization of different process parameters involved in the production of two chiral amines (*S*-methylbenzylamine and 3-amino-1-phenylbutane) (Figure 1) to demonstrate the effects of such decisions.

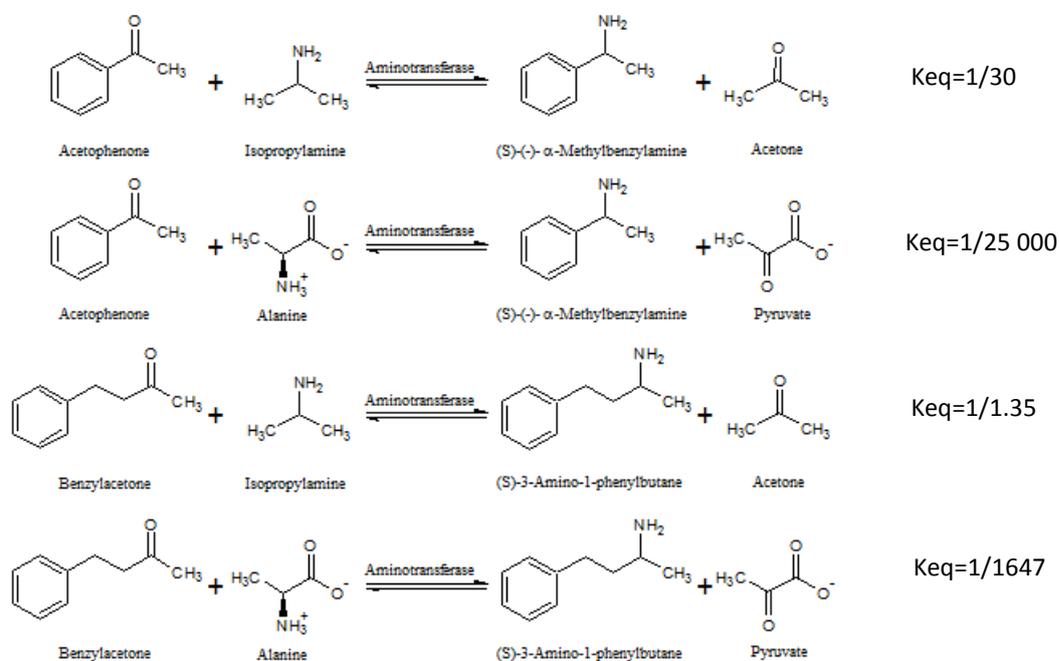


Figure 1: Overview of the reaction systems for production of *S*-methylbenzylamine and 3-amino-1-phenylbutane [1]

References:

[1] Tufvesson, P.; Jensen, J. S.; Kroutil, W.; Woodley, J. M., Experimental determination of thermodynamic equilibrium in biocatalytic transamination. *Biotechnol. Bioeng.* **2012**, 109, 2159-62