

***In situ* reactive extraction of itaconic acid during fermentation of *Aspergillus terreus*.**

Kreyenschulte D, Heyman B, Eggert A, Maßmann T, Kalvelage C, Kossack R, Regestein L, Jupke A, Büchs J. (2018) *In situ* reactive extraction of itaconic acid during fermentation of *Aspergillus terreus*. *Biochem Eng J* 135, 133-141.

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Abstract

As a promising value-added chemical from biomass, itaconic acid has great potential in the replacement of petrochemical-based materials and the production of versatile polymers. To integrate itaconic acid recovery in the fermentation process, the applicability of reactive extraction for in situ product removal was investigated. Initially, the biocompatibility of several solvents was assessed based on their influence on the respiratory activity of *A. terreus*. As a result, a mixture of the extractant trioctylamine and the diluent isopropyl myristate was chosen and reactive extraction was successfully integrated into the cultivation of *A. terreus* via solvent addition after 63 h. Thereby, the pH of the culture broth was increased and inhibition by undissociated itaconic acid was reduced. As a consequence, glucose consumption and product formation were considerably improved. In combination with an enhanced amount of glucose, either supplied initially or during the cultivation, this increased the total itaconic acid concentration from 70 to 105 g L⁻¹ referred to the absolute amount of itaconic acid divided by the volume of the aqueous culture broth. Simultaneously, volumetric productivity increased from 0.72 to 0.91 g L⁻¹ h⁻¹. With reactive extraction, therefore, a highly promising method for in situ removal of itaconic acid could be established.

Involved units

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doi: 10.1016/j.bej.2018.04.014