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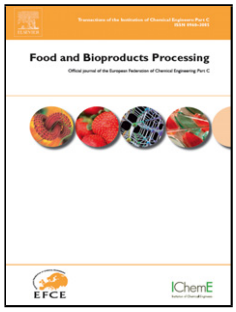

Title: Synergistic positive effect of organic acids on the inhibitory effect of phenolic compounds on Acetone-Butanol-Ethanol (ABE) production

Authors: Carolina Bellido, Susana Lucas, Gerardo González-Benito, M.Teresa García-Cubero, Mónica Coca

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Synergistic positive effect of organic acids on the inhibitory effect of phenolic compounds on Acetone-Butanol-Ethanol (ABE) production

Carolina Bellido, Susana Lucas, Gerardo González-Benito, M. Teresa García-Cubero, Mónica Coca*

Department of Chemical Engineering and Environmental Technology,

University of Valladolid, Dr. Mergelina s/n, 47011 Valladolid, Spain

* Corresponding author. Tel.: +34 983 18 45 95; fax: +34 983 42 36 16. E-mail address: monica@iq.uva.es (Mónica Coca Sanz).

Highlights

- ABE fermentation by *Clostridium beijerinckii* of molasses
- Phenolic compounds inhibited ABE fermentation at low concentrations
- Inhibition by phenolics could be overcome through organic acids addition
- Beet molasses more favourable for ABE fermentation than cane molasses
- Complete inhibition for molasses concentrations higher than 80 g/L

Abstract

The synergistic effect of potential inhibitory compounds (organic acids and phenolic compounds) on ABE fermentation was studied with model media containing sucrose and real media prepared from beet and cane sugar refining molasses.

The presence of phenolic compounds inhibited ABE fermentation at concentrations as low as 0.5 g/L for gallic acid and 0.1 g/L for catechin. The co-presence of organic acids (2.2 g/L acetic, 1.8 g/L lactic and 0.6 g/L formic) showed a synergistic positive effect that can counteract the inhibitory character of phenolics. This effect was significantly higher at low phenolic concentrations. This means that the inhibitory effect of phenolic compounds on ABE production with *Clostridium beijerinckii* could be overcome by the presence of organic acids at low concentration in fermentation media.