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## Valorization of exhausted sugar beet cossettes by successive hydrolysis and two fermentations for the production of bio-products

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### Abstract

Exhausted sugar beet cossettes (ESBC) show an enormous potential as a source of sugars for the production of bio-products. Enzyme hydrolysis with the combined effect of mainly cellulases, xylanases and pectinases, turned out to be very efficient, obtaining almost double the concentration of sugars measured with the sole action of Celluclast® and  $\beta$ -glucosidase, and increasing 5 times the hydrolysis rate. As the sole pretreatment, ESBC soaked in the hydrolysis buffer were autoclaved, avoiding the application of severe conventional biomass pretreatments. Moreover, a promising alternative for the complete utilization of glucose, xylose, arabinose, mannose and maltose contained in ESBC is proposed in this paper. It consists of sequential fermentation of sugars released in the hydrolysis step to produce bioethanol and lactic acid as main bio-products. Compared to separate fermentations, with this strategy glucose and hemicellulose derived sugars were completely consumed and the 44 % of pectin derived sugars.

Keywords: Bioethanol; lactic acid; sugar beet cossettes; enzyme hydrolysis; fermentation.

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