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## Methane potential of acetate-rich waste water and the effect of lignin presence

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The pulp and paper industry is an energy and water intensive industry. It generates an average of 13 to 30 m<sup>3</sup> of water per ton of produced paper. Usually these effluents are collected together and treated in an activated sludge plant, overlooking its potential energy recovery. The aim of this study is to assess the methane potential of the co-digestion of two streams of a pulp mill and moreover evaluate the effects after hydrotalcite (double layered hydroxides) addition. Substrate A was condensate effluent originating from the evaporators; this effluent is characterized by having low volatile solids (VS) but high acetic acid content providing readily degradable material for methane production. Substrate B was effluent from the fiber channel circulation, characterized by high Chemical Oxygen Demand (COD) and lignin content. Different mixtures of both substrates were evaluated simulating the current volume conditions of the mill. Measurements' were taken following the Biochemical Methane Potential (BMP) test procedure. Results demonstrated an exponential decay in methane production when the fraction of lignin was increased. However the lowest methane yield observed (539 mL CH4/gVS) is still above the average yield of common pulping effluents found in the literature. Lignin presence has a detrimental effect on the methane production resulting in a 52% decrease in production when the fraction of lignin is increased by 1.2%. The addition of Fe-Zn-Mg-Al hydrotalcite (HT) presented a positive effect on methane potential increasing production up to 16% as well as higher COD reductions and faster production rate.

## **Biography**

Lourdes Maria Rodriguez Chiang has received a double degree of MSc in Chemical Technology from KTH, Sweden and University of Bologna. Her previous experiences involve environmental consultancy and managing operation of waste water treatment plants. She is a PhD candidate under the SELECT+Erasmus Mundus Joint Doctoral Program. Her research at Aalto University in Finland and UPC in Spain focuses on assessing and improving the methane yield in biogas from the anaerobic digestion of pulping effluents in order to increase energy recovery and reduce waste.

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