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## Preliminary purification of volatile fatty acids in a digestate from acidogenic fermentation by electrocoagulation

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### Abstract

This study investigated for the first time the use of electrocoagulation (EC) in the batch mode with aluminum or iron electrodes for the preliminary purification of volatile fatty acids (VFA) in a digestate from acidogenic fermentation. The respective influences of electrolysis time, electrode material, current density, inter-electrode distance and initial pH (pH<sub>i</sub>) on the efficiency of the process were investigated. Experimental results showed that VFA were totally found in the liquid phase at the end of EC in all cases, while EC removed efficiently (> 80%) solids and other soluble compounds including nitrogenous and phosphorous species. Reduction of EC operating cost was achieved by working at the lowest current density (9.3 mA/cm<sup>2</sup>) and at the lowest inter-electrode distance (1.0 cm), independently from pH<sub>i</sub>. Operating costs were evaluated to be 0.26 ± 0.03 and 1.07 ± 0.04 US \$/m<sup>3</sup> with iron or aluminum electrodes, respectively.

*Keywords: Electrocoagulation; digestate; preliminary purification; volatile fatty acids; soluble or solid compounds*

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