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# Anaerobic Digestion of Antibiotic Residue in Combination with Hydrothermal Pretreatment for Biogas

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**Abstract:** Antibiotic residues are difficult to be treated or utilized because of their high water content and residual antibiotics. This article is devoted to investigating the possibility of biogas production from cephalosporin C residue (CPCAR), one typical antibiotic residue, via anaerobic digestion in combination with hydrothermal pretreatment (HTPT). The results from the bench-scale experiments showed that the combination of HTPT and anaerobic digestion can provide a viable way to convert CPCAR into biogas, and the biogas and methane yields reached 290 and 200 ml·(g TS)<sup>-1</sup>, respectively. This article further evaluated the proposed technology in terms of energy balance and technical feasibility based on theoretical calculation using the data from a pilot HTPT test. It was shown that the process is totally self-sufficient in energy and its main challenging problem of ammonia inhibition can be solved via ammonia stripping.

**Keywords:** Hydrothermal treatment; Anaerobic digestion; Biomass waste; Antibiotic residue; Biogas.

## 1. Introduction

Fermentative residues from bio-fermentation processes producing medicines generally consist of mycelia and fermentative substrates, as a kind of typical process wastes from light

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