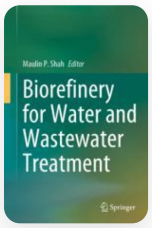
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Integration of Biogas Production from Wastewater as Value Generation in Biorefineries

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Biorefinery for Water and Wastewater Treatment

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Abstract

In recent decades, the high emission of greenhouse gases and fossil fuel uses has worsened environmental problems and strongly impacted society. The increased demand for renewable fuels is a result of this socio-environmental impact. According to this scenario, the use of municipal and industrial organic waste to generate renewable energy and fuels has become an attractive alternative. Biogas production can replace natural gas and fossil fuels and allows obtaining renewable energies and organic waste treatment simultaneously through a sustainable process. The anaerobic digestion (AD) pathway is used to produce biogas through a process with less emission of greenhouse gases. In this pathway, several microorganisms are responsible for the degradation of organic matter in low-oxygen conditions. Wastewater can be a source of carbohydrates, lipids, proteins, and organic matter to microorganisms to produce biogas by AD. The integration of biogas production from wastewater in biorefineries can be an alternative for industries to recover bioenergy and reduce biomass generation after treating these wastes. This

strategy can contribute obtaining a complete and self-sufficient bioprocess. This chapter focuses mainly on the effects of the main operational parameters of the process in the production of biogas, the interaction between microorganisms presents in the wastewater to benefit the AD process, challenges found in the biogas production from wastewater, and alternatives to overcome these barriers and achieve higher yields of this biofuel.

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