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Economic assessment of biodiesel production from wastewater sludge

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Abstract

Currently, there are mainly two pathways of the biodiesel production from wastewater sludge including 1) directly extracting the lipid in sludge and then converting the lipid to biodiesel through trans-esterification, and 2) employing sludge as medium to cultivate oleaginous microorganism to accumulate lipid and then transferring the lipid to biodiesel. So far, the study was still in research stage and its cost feasibility was not yet investigated. In this study, biodiesel production from wastewater sludge was designed and the cost was estimated with SuperPro Designer. With consideration of converting the lipid in raw sludge to biodiesel, the unit production cost was 0.67 US \$/kg biodiesel (0.59 US \$/L biodiesel). When the sludge was used as medium to grow oleaginous microorganism to accumulate lipid for producing biodiesel, the unit production cost was 1.08 US \$/kg biodiesel (0.94 US \$/L biodiesel). The study showed that sludge has great potential in biodiesel production.

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