Biohydrogen and methane production by co-digestion of cassava stillage and excess sludge under thermophilic condition - DTU Orbit (24/12/2018)

Biohydrogen and methane production by co-digestion of cassava stillage and excess sludge under thermophilic condition

Thermophilic anaerobic hydrogen and methane production by co-digestion of cassava stillage (CS) and excess sludge (ES) was investigated in this study. The improved hydrogen and subsequent methane production were observed by co-digestion of CS with certain amount of ES in batch experiments. Compared with one phase anaerobic digestion, two phase anaerobic digestion offered an attractive alternative with more abundant biogas production and energy yield, e.g., the total energy yield in two phase obtained at VSCS/VSES of 3:1 was 25% higher than the value of one phase. Results from continuous experiments further demonstrated that VSCS/VSES of 3:1 was optimal for hydrogen production with the highest hydrogen yield of 74 mL/g total VS added, the balanced nutrient condition with C/N ratio of 1.5 g carbohydrate–COD/g protein–COD or 11.9 g C/g N might be the main reason for such enhancement. VSCS/VSES of 3:1 was also optimal for continuous methane production considering the higher methane yield of 350 mL/g total VS added and the lower propionate concentration in the effluent.

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