

Anaerobic co-digestion of food waste and palm oil mill effluent for phosphorus recovery: effect of reduction of total solids, volatile solids and cations

Abstract

Food waste (FW) and palm oil mill effluent (POME) with significant nutrients contents were successfully digested anaerobically for phosphorus recovery. Anaerobic co-digestion is a treatment that can enhance the reduction of total solid and volatile solid before disposed onto landfill. The presence of sodium and potassium ions may affect phosphorus recovery efficiency either by stimulating the phosphorus release or stabilizing the polyphosphate compounds. Dilution of sodium and potassium ions also can be achieved through this treatment method. The experiment was performed under different composition of FW and POME. The optimum mixing of FW and POME at ratio 70:30 showed the highest solid waste and volatile solid reductions which values were 45% and 41%, respectively. Further study on cations reduction was investigated and the results found that co-digestion process was able to reduce potassium and sodium ions concentration at 85.8% and 92.2%, respectively. The ions reduction may contribute to phosphorus recovery which achieved as high as 247% recovery