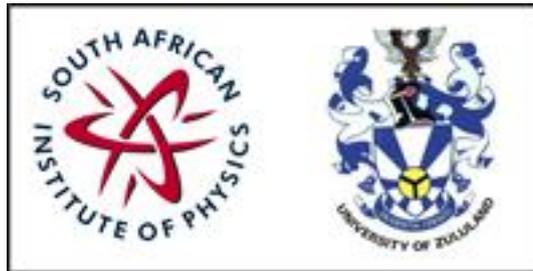


SAIP2013



Contribution ID : 126

Performance monitoring of a Field-Batch Biogas Digester fed with agricultural wastes at different mixing ratios

Wednesday 10 Jul 2013 at 17:40 (01h00')

Abstract :

Biogas technology converts organic wastes into biogas, which consists of about 80% methane. The digester effluent after digestion can be used as manure. The co-digestion of cow dung, donkey dung, goat dung and horse dung at different mixing ratios was investigated. The investigation was carried out using a 1 m³ field batch biogas digester. The co-digestion of 25% cow dung and 25% donkey dung with 25% horse dung and 25% donkey dung produced the highest total biogas yield of 6.96 m³. However, the co-digestion of 37.5% cow dung and 37.5% donkey dung with 12.5% horse dung and 12.5% goat dung produced a total biogas yield of 6.3 m³. In addition, the co-digestion of 12.5% cow dung and 12.5% donkey dung with 37.5% horse dung and 37.5% goat dung produced the least total biogas yield of 5.82 m³. The substrates were analyzed for total solids, volatile solids, total alkalinity and calorific value before they were co-digested at different mixing ratios. The ammonia-nitrogen for all the mixtures was within the expected range (150 to 1000 mg/L) for optimum methane production while the pH values ranged from 6.8-8.1 for all co-digestion trials. The mixture of 25% cow dung and 25% donkey dung co-digested with 25% goat dung and 25% horse dung produced the biogas yield with the highest methane yield of 70% than the other mixing ratios.

Award :

Yes

Level :

PhD

Supervisor :

Dr G Makaka GMakaka@ufh.ac.za University of Fort Hare

Paper :

Yes

Primary authors : Mr. MUKUMBA, Patrick (university io Fort Hare Physics Department)

Co-authors : Dr. MAKAKA, Golden (University of Fort Hare) ; Dr. MAMPHELI, Sampson (University of Fort Hare)

Presenter : Mr. MUKUMBA, Patrick (university io Fort Hare Physics Department)

Session classification : Poster2

Track classification : Track F - Applied Physics

Type : Poster Presentation