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Abstract

Biogas Production by Co-digestion of Tomato's Plant Wastes and Manure

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Abstract: The accumulation of organic waste from agricultural activities is a global issue, because the no controlled degradation is a source of infection and contamination of water, soil and air. Also Due to the shortage of energy resources, are being carried out projects aimed to obtain alternative energy; one of this is the production of biogas from agro-industrial wastes. The study of the anaerobic digestion process using tomato crop residues in co-digestion with cow and pig manure is presented here; considering different experimental conditions: C:N ratios of 12/1 and 20/1, with or without initial pH adjustment at 7.5, and amount of manure (20 and 50%), to generate fuel biogas (with more than 45% methane). Were performed batch anaerobic digesters at a mesophilic temperature; it was monitoring the pH, total solids (TS) and volatile solids (VS), as an indirect way of consumption of organic matter. The methane content in biogas and volatile fatty acids (VFA) in digestate were determined by gas chromatography (GC). The highest production of fuel biogas was obtained from the co-digestion of tomato crop residues with 50% cow manure, initial pH adjusted to 7.5 and the C:N adjusted at 20/1; the methane yield for this treatment was 72.93 L/kg volatile solids consumed with a methane content higher than 45% in the most of the process. In the treatments with pig manure only the modification of the C/N relation produce a increment of the methane yield.

Keywords: biogas, methane, co-digestion, tomato's plant wastes, manure.

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