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Effect of composting on the thermal decomposition behavior and kinetic parameters of pig manure-derived solid waste

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Abstract

In this work, the influence of composting on the thermal decomposition behavior and decomposition kinetics of pig manure-derived solid wastes was analyzed using thermogravimetry. Wheat straw, biochar, zeolite, and wood vinegar were added to pig manure during composting. The composting was done in the 130 L PVC reactors with 100 L effective volume for 50 days. The activation energy of pyrolysis of samples before and after composting was calculated using Friedman's method, while the pre-exponential factor was calculated using Kissinger's equation. It was observed that composting decreased the volatile content of the all the samples. The additives when added together in pig manure lead to a reduction in the activation energy of decomposition, advocating the presence of simpler compounds in the compost material in comparison with the complex feedstock.

Keywords: Pig manure; Composting; Decomposition; Kinetics

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