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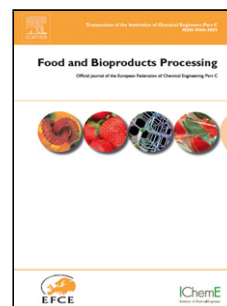
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One-dimensional spatial model for self-heating in compost piles: investigating effects of moisture and air flow

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Abstract

This paper considers the self-heating process which occurs within a compost pile using a one-dimensional spatially-dependent model incorporating terms that account for self-heating due to both biological and oxidation mechanisms. As the moisture content within a compost pile and the air flow through it are the two crucial factors in the degradation process, we use a model which incorporates four mass-balance equations, namely, energy, oxygen, vapour and liquid water concentrations, to investigate the behaviour of a compost pile when these two factors interact. Analyses of different initial water contents and air-flow velocities within a compost pile show that they can determine the efficiency of the biodegradation process. For an intermediate water content range and air-flow

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