

## **Determination of Reaction Rates and Activation Energy in Aerobic Composting Processes for Yard Waste**

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The reaction rates and activation energy in aerobic composting processes for yard waste were determined using specifically designed reactors. Different mixture ratios were fixed before the commencement of the process. The C/N ratio was found to be optimum for a mixture ratio of 1:6 containing one part of coir pith to six parts of other waste which included yard waste, yeast sludge, poultry yard waste and decomposing culture (Pleurotosis). The path of stabilization of the wastes was continuously monitored by observing various parameters such as temperature, pH, Electrical Conductivity, C.O.D, VS at regular time intervals. Kinetic analysis was done to determine the reaction rates and activation energy for the optimum mixture ratio under forced aeration condition. The results of the analysis clearly indicated that the temperature dependence of the reaction rates followed the Arrhenius equation. The temperature coefficients were also determined. The degradation of the organic fraction of the yard waste could be predicted using first order reaction model.

**Key words:** *Activation energy, temperature coefficient, reaction rate, C.O.D, forced aeration, volatile solids*