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Review Article

Aerobic Composting - A Short Review

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ABSTRACT

The treatment of solid waste can be carried out by various methods like sanitary landfill, composting and incineration. Aerobic and anaerobic digestion methods have their own advantages and disadvantages. Aerobic method needs diffusion of air through waste. Also sizeable amount of sludge is produced in aerobic method. Aerobic methods are most common in the waste treatment because of simplicity and effective treatment. The studies reveal that it is important to achieve an optimal system for processing organic waste.

Key words: Aerobic composting, anaerobic composting, decomposition, degradation.

INTRODUCTION

Treatment of waste water and solid waste is one of the major problems faced by modern civilization. The conventional wastewater treatment plant contains primary, secondary and tertiary treatment methods. Biological methods are highly efficient for domestic wastewater because of its high BOD to COD ratio. Activated sludge process and trickling filters are commonly used treatment methods. [1-6] Adsorption is also effective for removal of organic matter. [7,8] Membrane separation methods can be used as an advanced treatment method. [9,10] The treatment of solid waste can be carried out by various methods like sanitary landfill, composting and incineration. Aerobic and anaerobic digestion methods have their own advantages and disadvantages. [11,12] Aerobic method needs pumping and bubbling of air. Also sizeable amount of sludge is produced in aerobic method. Aerobic methods are most common in the waste treatment because of simplicity and effective treatment. In this review paper attempt is done to review some recent studies and researches carried out on aerobic composting.

REVIEW ON AEROBIC COMPOSTING

Narkhede et. al. studied changes in parameters like pH, temperature, moisture content, organic carbon, volatile solids during aerobic composting. [13] In their experimentation, they used a box model composter made up of wood. They observed that the temperature increased from the first day itself. It reached 60 degree Celsius on day 25. At the end of process, it dropped down to 28 degree Celsius. It took 35 days to reach the constant temperature conditions. They also observed that the moisture content was unstable during the process. They concluded that combined aerobic composting was acceptable alternative. Buyukgungor and Gurl studied the treatment of waste by using biological methods. [14] In their studies, they discussed the aerobic treatment methods such as activated sludge process, trickling filters and rotating biological contactors. Cosic et.al. initiated research to characterize the

biodegradability of leachate from composting tobacco waste. [15] They carried out investigation in batch reactor with different initial concentrations of leachate. According to them, use of activated sludge is an effective way of treating leachate with high concentrations of organics. Wadkar et.al. prepared a cylindrical reactor for aerobic thermophilic composting of municipal solid waste. [16] They studied characteristics of the sludge like pH, moisture content, temperature, C/N ratio and volume reduction. Their studies indicated that the values of these parameters were within the desired limits and compost was suitable for ornamental plants. Alleman and Mitchell carried out investigation on the initial treatment of all biodegradable solid wastes. [17] They evaluated operational parameters to optimize solids degradation and resource recovery. Jereb discussed waste management of biodegradable waste. [18] According to him, it is important to achieve an optimal system for processing organic waste. This can be accomplished by regulating and speeding up natural biological processes. According to him, all kind of organic fraction of municipal solid waste can be treated by composting. They observed that most common methods are composting, anaerobic decomposition and fermentation. Saveyn and Eder provided a possible technical proposal on end-of-waste criteria for biodegradable waste. [19] They explored possibilities for recovering biodegradable waste though composting and/or digestion. Ghaly et.al. carried out a review on textile effluents. [20] According to him presence of toxic metals can affect efficient growth of microorganisms. Also the process requires a long retention time. Font et. al. carried out studies on main types of VOC emitted in organic waste treatment facilities. [21] In their investigation, they also studied the methods used to detect and quantify these compounds. According to Asnani, solid waste management is one among the basic essential services provided by municipal authorities. [22] He observed that many times, the system applied is unscientific, outdated and inefficient. According to him, improvement in soil texture and augmenting of micronutrient deficiencies are main advantages of composting. According to studies carried out by Hamer, one of the main concerns from public health point of view is safety and acceptability of many widely used solid waste management practices. [23] They discussed waste management practices such as disposal, treatment, reduction, recycling, segregation and modification.

CONCLUSION

The treatment of solid waste can be carried out by various methods like sanitary landfill, composting and incineration. Aerobic and anaerobic digestion methods have their own advantages and disadvantages. Aerobic method needs air for oxidation of organic matter. Also sizeable amount of sludge is produced in aerobic method. Aerobic methods are most common in the waste treatment because of simplicity and effective treatment.

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