International Journal of ChemTech Research
CODEN (USA): IJCRGG, ISSN: 0974-4290, ISSN(Online):2455-9555
Vol.10 No.10, pp 27-34, 2017

Study of Decomposition Pattern duringAerobic Composting of Municipal Solid Waste by Physico-chemical and Spectroscopic methods

Manohara B.[1]* and Belagali S.L.[1],Ragothama S.[2]

[1]Department of Studies in Environmental Science,University of Mysore, Manasagangothri, Mysore-570 006, Karnataka, India
[2]NMR ResearchCentre,Indian Institute of Science, Bangalore, 560 012, Karnataka, India

Abstract : Composting process is one of the traditional waste management phenomena thatproduce a useful product of economic importance. This paper is concerned with structural changes at 10, 20, 30, 40, 50 and 60 days old composting samples (both municipal and pilot). From the results it was observed that pH was tending to neutral towards the 60th day of composting process. Electrical conductivity, organic carbon, moisture content, chloride,total soluble solids, sodium, potassium, carbonates, bicarbonates, alkalinity, available nitrogen, phosphorous and heavy metals were showing decreasing trend at the later stages. Solid state ^{13}C NMR spectra revealed depletion in alkyl-C, O-alkyl-C region, whereas aromatic-C concentration dominated at 60th day. FTIR spectra indicated intense peaks at 1500–1800 cm^{-1} and weak absorptions at 2800–3200 cm^{-1} region towards the 60th day of composting. X-ray diffraction spectra indicated decomposition of complex molecules into smaller fragments.
Keywords : Solid waste, Aerobic composting, Physico-chemical characteristics, FTIR, ^{13}C NMR, X-ray diffraction.

*****