

Composting of oil palm biomass: Fourier transform-infrared and thermogravimetry analyses

ABSTRACT

This study investigates the effects of composting conditions on the chemical characteristics of compost from oil palm biomass. Three samples each of empty fruit bunches (EFB), palm oil mill effluent (POME) and compost were collected from three compost plants in Malaysia. The plants employed open windrow composting system. The Fourier transform-infrared spectra and thermogravimetry analysis were used to analyse the samples. It was found that composting resulted in the loss of aliphatic structures by formation of aromatic structures. This led to a stronger intramolecular bond and subsequently increased the stability of compost. The results of the study showed that the use of shredded EFB for composting is the most efficient way to produce compost. It required 55% less amount of time as compared to untreated EFB and 60% less amount of time as compared to treatment without addition of microbes.

Keyword: Biodegradation; Empty fruit bunches; Fourier transform-infrared spectroscopy; Palm oil mill effluent; Thermogravimetry analysis