



EVALUATING ENVIRONMENTAL IMPACT OF NIGERIAN COMPOSTED WASTES USING LABORATORY EXTRACTION TEST

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Abstract

Composting is an option for biodegradable waste management in Nigeria, but there is no relatively simple, fast screening compliance procedure applied to allow reliable judgment of acceptability of the recycled waste materials for land use. This study, therefore, investigated the possibility of using water extractable metal fraction at different water to compost ratios (W/C); 50:1, 20:1, 10:1, 5:1 and 2:1, to evaluate the potential availability of Zn, Pb, Cu and Cd contained in 6 compost formulations via batch extraction procedure. The effect of turning during compost production, on the metal water solubility was also assessed. Metal concentration was determined using atomic absorption spectrometry, after acid digestion. Results showed that the percentages of water extractable metal fraction (PWE) varied from 2.43 to 34.11% for Cu, 1.6 to 23.33% for Cd, 0.76 to 20.88% for Pb and 0.01 to 7.11% for Zn and their correlations against W/C gave negative coefficients (-0.100 to -0.809). From the maximum value, PWE decreased in the order: Cu > Cd > Pb > Zn and for a rapid assessment of potential metal availability from these composts, W/C from 5:1 to 20:1 could be the best indicator. The factor of turning during the composting procedure did not appear to have played a significant role in the metal availability. Study contributes to the development of base knowledge necessary to define compost land application practices that are protective of soil and water quality in the country.

Key words: composting, environment, Nigeria, organic wastes, risk assessment

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