

# Bioavailability of Heavy Metals on Textile Sludge Application to Soil

**K Anand Kumar, P Prabhu Prasadini, G Ramachandra Rao and G Kishore Babu**  
Department of Environmental Sciences, APGC, ANGRAU, Lam, Guntur, A.P.

## ABSTRACT

An incubation experiment was conducted with textile sludge obtained from NSL Textiles, Guntur district of Andhra Pradesh in the Department of Environmental Sciences, ANGRAU, Lam, Guntur. Study was carried out with 3 numbers of such sets, for sampling at 15, 30 and 45 days of incubation for estimation of heavy metals in soil. The sludge contained 37.6, 22.6, 4.5 and 106.6 ppm of Ni, Pb, Cd and Cr, respectively. The analysis of the incubation study data revealed that the variation among the treatments and among the incubation intervals was statistically significant. The interaction effect was found to be non-significant except in case of nickel. Over sludge treatments, the mean available Pb, Ni, Cd and Cr values were found to decrease from 15 to 45 days of incubation which might be due to formation of complexes with time of decomposition of sludge. The available Pb, Ni, Cr and Cd content in soils were significantly higher in all sludge treatments compared to control. The lead values were significantly higher by 0.28, 0.25 and 0.31 ppm with the application of untreated sludge @ 3, 5 and 10 t ha<sup>-1</sup> respectively over control (2.74 ppm). The increase in Ni, Cd and Cr in soil with increased doses of sludge @ 3, 5 and 10 t ha<sup>-1</sup> was also significant. Mean DTPA extractable heavy metals of the soil across the sludge treatments and incubation intervals followed the order: Pb (2.92 ppm) > Cr (0.725 ppm) > Ni (0.4 ppm) > Cd (0.062 ppm). Broadly, it was noticed that the untreated sludge applied treatments recorded the highest values of toxic heavy metals in soil followed by decomposed/treated sludge treatments.

**Key words:** *Bioavailability, Heavy metals, Textile sludge*