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Determination of carbon/nitrogen ratio and heavy metals in bulking agents used for sewage composting

Alidadi, H.^a, Najafpoor, A.A.^a, Parvaresh, A.^b^a Department of Environmental Health, Faculty of Health, Mashhad University of Medical Sciences, Iran^b Department of Environmental Health, Faculty of Public Health, Isfahan University of Medical Sciences, Iran

Abstract

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Improving the soil quality with organic matter and N, P and K contents are some of sewage sludge benefits. Adjusting carbonaceous materials such as plant wastes to dewatered sludge compost results in increasing the moisture content and improving C/N ratio. This study was conducted for three months in 2005, in Laboratory of Chemistry of Water and Wastewater in the School of Public Health of Isfahan University of Medical Science, to determine the C/N ratio and heavy metals concentration of bulking agents in sawdust, leaves, rice hulls and dewatered sewage sludge. Dewatered sludge was collected from Isfahan sewage treatment plant. Sawdust was collected from sawmills. Leaves were collected from municipality of Isfahan and rice hull from rice mills, then in samples determined C/N ratio and heavy metal according to standard methods. The results showed that concentrations of chromium and cadmium in the mixture of dewatered sewage sludge and bulking agents were lower than those of the standard level. Means of cobalt ($115.44 \text{ mg kg}^{-1}$), nickel (57.44 mg kg^{-1}) and zinc ($273.48 \text{ mg kg}^{-1}$) concentrations were maximum in dewatered sludge but mean concentration of cobalt (25.66 mg kg^{-1}) in rice hull samples and mean zinc (8.99 mg kg^{-1}) and nickel (5.106 mg kg^{-1}) concentrations in sawdust samples were minimum. The optimal conditions sewage sludge composting, each kilogram of sludge needs 350 g of saw dust, 470 g of leaves and 388 g of rice hull. Amount of heavy metals present in the bulking agents is lower than the amount mentioned for the compost. © 2007 Asian Network for Scientific Information.

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Author keywords

Bulking agents; C/N ratio; Dewatered sludge; Heavy metals

Indexed Keywords

EMTREE drug terms: carbon; cobalt; heavy metal; nickel; nitrogen; trace element; zinc

EMTREE medical terms: article; bioremediation; chemistry; Iran; isolation and purification; methodology; sewage; soil; waste management; water management; water pollutant

MeSH: Biodegradation, Environmental; Carbon; Cobalt; Iran; Metals, Heavy; Nickel; Nitrogen; Sewage; Soil; Trace Elements; Waste Management; Water Pollutants; Water Purification; Zinc
Medline is the source for the MeSH terms of this document.

Chemicals and CAS Registry Numbers: carbon, 7440-44-0; cobalt, 7440-48-4; nickel, 7440-02-0; nitrogen, 7727-37-9; zinc, 7440-66-6; Carbon, 7440-44-0; Cobalt, 7440-48-4; Metals, Heavy; Nickel, 7440-02-0; Nitrogen, 7727-37-9; Sewage; Soil; Trace Elements; Water Pollutants; Zinc, 7440-66-6

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