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“CLEANER PRODUCTION INITIATIVES AND CHALLENGES FOR A SUSTAINABLE WORLD”

Metal Removal in a Sewage Treatment System by Slow filter

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Abstract

The survey aimed to measure the degree of heavy metal removal in a pilot wastewater treatment by slow sand filtration using the technique Synchrotron Radiation Total of X-Ray Reflection Fluorescence (SR-TXRF). The slow sand filtration is a relatively simple process where the removal of chemical residues in organic and biological materials occurs through the passage of sewage by means of textural differences. The filter consists of a filter with sand and gravel of different sizes in order of decreasing porosity. The use of slow sand filtration has great relevance to conservation of water resources. The pilot treatment system was installed in the experimental field of Agricultural Engineering College, UNICAMP, consisting of barrels (60 L) containing sand and gravel with different particle sizes. Samples were collected weekly for 16 weeks. The samples were collected in the influent and effluent system, detected the following chemicals: P, S, Cl, K, Cr, Mn, Fe, Zn in almost all samples. The maximum concentration of Fe was 5,66 mg.L⁻¹ input and 1,54 mg.L⁻¹ in output, while for the Zn concentration was 1,68 mg.L⁻¹ and 0,73 mg.L⁻¹ input and output, respectively. For the element Cr values were 0,250 mg.L⁻¹ in input while the output was 0,11 mg.L⁻¹. For the K variations in input and output were 41,80 and 28,40 mg.L⁻¹, respectively, showing an efficiency of 78,10% na the removal of this element. Thus it was concluded that the removal efficiency was high for most elements detected, which proved the feasibility of this technology for the removal of metals present in domestic sewage.

Keywords: *Slow sand filtration, metals, total reflection, environment.*

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