



Application of sand–soil–rice husk filter for removal of heavy metals from industrial wastewater

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Water pollution due to industrial and domestic wastewater, toxic heavy metals and unsuitable management for rubbish dumping has adversely affected people health. Among different techniques for removal of heavy metals from wastewaters, filtration is a suitable process. In order to investigate the removal or reduction of chromium, zinc, copper and nickel from industrial wastewater by a sand–non calcareous soil–rice husk filter and its frequency in continuous times, this experiment was conducted at a greenhouse in a completely randomized design with nine treatments (nine pore volumes) and four replicates. P.V.C tubes (columns) with 66.5 cm height and 10 cm diameter was chosen and were filled from down to top by coarse sand, fine sand, non calcareous soil, rice husk and coarse sand. Then, industrial wastewater was added to this filter and 30 ml of leachate was collected and transferred to the laboratory for measurement of heavy metals by atomic absorption spectroscopy technique. Used industrial waste water was contained 185.7, 570.9, 2.1 and 1.2, mg/l Cr, Zn, Cu and Ni, respectively. The results showed that in all pore volumes, adsorption of Cu and Cr occurred. This filter also adsorbed Zn in all pore volumes however its sorption capacity reduced gradually. At first pore volume, adsorption of Ni was not observed, however after that, the metal adsorption was recorded up to the fifth pore volume. Generally, it seems that the application of sand– non calcareous soil–rice husk filter was effective and therefore, could be advisable for the removal of studied heavy metals from industrial waste water.

Keyword: Waste water, heavy metals, Filtration, adsorption, sand, soil and Rice husk

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