Characterization of Heavy Metals in Effluent of Textile Industry in Hardwar

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Abstract: Present study was made to assess the heavy metal concentrations in untreated and treated effluent samples collected from Rishabh Valvleen, a textile industry situated in Bahadarabad, Hardwar. The effluents were analyzed for metallic properties. The effluent showed increased chromium concentration from the recommended norms of textile effluent discharged on ground (CPCB, 2001). The values of metals namely Cr, Cd, Fe, Mn and Cu were noted to be decrease by 78.43%, 66.66%, 54.11%, 39.82% and 100%, respectively, after treatment. [Researcher. 2010;2(8):34-35]. (ISSN: 1553-9865).

Keywords: textile industry; heavy metals; effluent.

1. Introduction

Heavy metal contamination occurs in aqueous waste of many industries which is ultimately disposed to land or in water courses. Since most of the heavy metals are non-degradable into non-toxic end-products, their concentrations must be reduced to acceptable levels before discharging them into the environment.

2. Material and Mathods

Untreated and treated effluent samples were collected during 2005-07, from reservoir and clarifier of effluent treatment plant, respectively and preserved by concentrated HNO_3. Samples were filtered through Whatman No. 42 filter paper. The metals viz. Pb, Cd, Ni, Mn, Fe, Cu were determined by using Atomic Absorption Spectrometer (Perkin Elmer 3110).Hexavalent chromium was analyzed by diphenyl carbazide (DPC) method (APHA, 1998).

3. Results and Discussion

The concentration of chromium in treated effluent was found to be 78.43% less as compared to untreated effluent (Figure-1). Similar values of chromium (0.255 to 0.149 mg/l) were reported in the effluent samples collected from textile industries in Nigeria (Ugoji and Aboaba, 2004). Lead was not found in the effluent samples. The values of Cd were 66.66% higher in untreated effluent than the treated one. Similarly, Ni was not detected in the effluent samples collected, during present study. However, the concentration of Ni was 0.13 mg/l in the wastewater collected from small scale cotton textile industries (Pathe *et al.* 2001). The value for Iron was 1.70 ± 0.017 mg/l in untreated effluent samples and 0.78 ± 0.03 mg/l in treated samples. A relatively higher value of 0.45 to 2.14 mg/l for iron was reported in the effluent samples of textile industries in Nigeria (Yusuff and Sonibare, 2004). While, slightly higher values of 4.39 ± 0.09 mg/l was observed in effluent samples of common effluent treatment plant (Pathe *et al.* 2001).

The distribution of Mn was reported 0.570 ± 0.005 mg/l and 0.343 ± 0.0067 mg/l for untreated and treated effluent samples, respectively. Mn was found to have decreased by 39.82% in the treated effluent as compared to untreated. Slightly higher values of 0.3 to 1.65 mg/l of Mn were observed in Nigeria (Yusuff and Sonibare, 2004). The copper content was 0.011 ± 0.0035 mg/l for untreated effluent sample with 100% removal, after treatment. It is thus clear that if effluent treatment plant works effectively, then the effluent can be converted into a product with safer amounts of heavy metals, provided specific removal methods are followed for different metals.

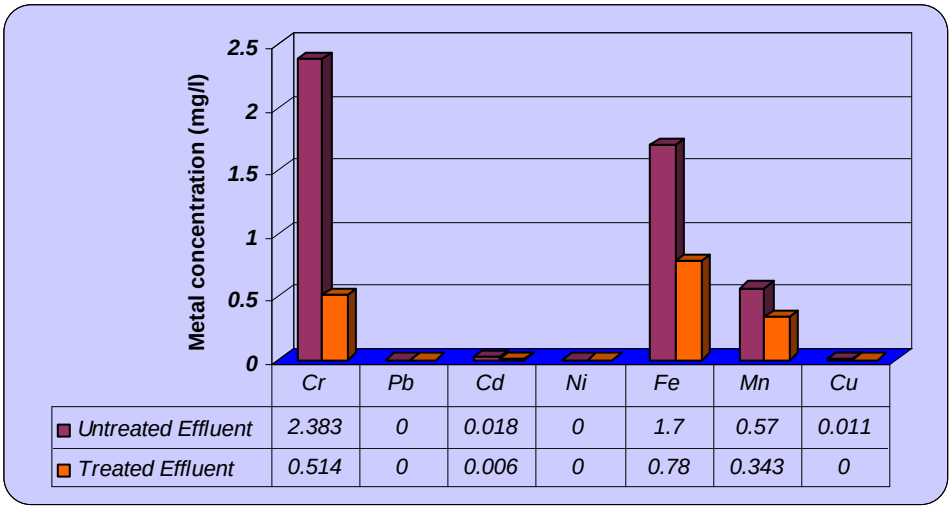

Figure. 1. Chemical parameters of textile industry effluents.

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