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Determination of Chromium in Wastewater, Drinking water and Soil Contaminated by Tanneries, Sialkot (Pakistan)

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An investigation was carried out for the assessment of concentration of total chromium and its species: Cr (III) and Cr (IV) in soil, drinking water and effluent of tanneries of Sialkot distributed in ten clusters. 120 samples consisting of 40 samples each of topsoil, drinking water, and composite wastewater were collected from the selected tannery clusters.

Speciation analysis in water samples was followed by chelation extraction, acid digestion and atomic absorption spectrophotometric run. Soil samples were studies for Cr (III) and Cr (VI) by UV-Visible Spectrophotometer at 427 and 540 nm, respectively. The maximum concentration of total Chromium, Cr (III) and Cr (VI) in waste water, and drinking water and soil was found to be in range of Cr: 31.87 mg/l, 2.49 mg/l, and 9.12 mg/kg, Cr (III): 11.94 mg/l, 0.69, and 9.06 mg/kg, and Cr (VI):23.56 mg/l, 3.00 mg/l and 10.59 mg/kg, respectively. The concentrations of chromium contents are above the National Environmental Standards of Pakistan. It was also found that pH above 6 lead to higher concentration of Cr (VI) due to oxidizing behavior. The study recommends the treatment of wastewater before being discharged.