

Spectrochemical analysis of soil around leather tanning industry using laser induced breakdown spectroscopy

ABSTRACT

We report the use of laser induced breakdown spectroscopy (LIBS) to determine the chromium contamination of soil due to effluents from leather tanning industry in Kasur District of Punjab ($+ 31^{\circ} 6' 23.21''$, $+ 74^{\circ} 27' 16.29''$) in Pakistan. Calibration curves were constructed by indigenously prepared standard sample and fitting of curves by linear regression. The limit of detection (LOD) was found to be 23.71 mg kg⁻¹. It has been found that the concentration of chromium in the soil is up to 839 mg kg⁻¹ in vicinity of effluent drain and 1829 mg kg⁻¹ in the area of old stagnant pool, which is much higher than the safe limits. Qualitative detection of other elements like Na, Cl, Fe, P, and Si was done from LIBS spectra. The leaching of soil contaminants due to seepage of industrial effluents from deteriorating brick lined drains in horizontal direction has also been observed.

Keyword: Chromium contamination; In-situ analysis; On-line environmental monitoring system; Quantification of chromium.