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Characterization of dust fallout around the city of Tshwane in South Africa

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The aim of the study was to characterize dust fallout in urban and sub-urban areas around Tshwane. The dust fallout samples were collected at five different sites following the internationally accepted standard procedure for collection and analysis, the American Standard for Testing Methods (ASTM-1982). Passive single buckets containing ¾ of distilled water and 10.0 ml of sodium hypochlorite (NaClO) solution, hoisted at a height of about 2.5 m were exposed from March - June 2013 and were collected every month end for laboratory analysis using Inductively Coupled Plasma - Mass Spectrometry (ICP - MS) and Scanning Electron Microscope - Energy Dispersive X- ray (SEM - EDX). A total of twenty (20) dust fallout samples were digested through heating on a hotplate with 5.0 ml of 70% HNO_3 and 2.0 ml of 30% H_2O_2. The elemental concentrations measured using ICP - MS decreased in the following order: Fe>Ca>Al>Mg>P>S>Mn>K>Cu>Na>Zn>Pb>Cr>Ni>V>Co>Mo. Four (4) particle groups (quartz/silica, alumino silicates, industrial and biological particles) were identified with the SEM - EDX method of analysis. The particles ranged from 4 to 100 µm in diameter sizes and their morphologies included agglomerate and irregular.

Biography

Shadung J Moja is currently teaching and supervising M&D research projects within the Department of Environmental Sciences (DES) at the University of South Africa (UNISA). His Master's and Doctoral degrees are in Analytical Chemistry and Environmental Management respectively. He has served the academia for more than 16 years at 6 different Universities. He also has 4 years of industrial chemistry experience and more than 3 years of consulting in air quality and waste management. He has published 15 peer reviewed articles.

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