

Abstract:

Suspended particulate matter samples were collected in a sub-urban area in Nairobi over a 12 month period at two different heights above ground using a “Gent” SFU sampler. A total of 126 sets of duplicate fine and coarse particulate matter samples were collected. The samples were analysed by energy dispersive x-ray fluorescence (EDXRF) and atomic absorption spectroscopy (AAS) for up to 10 elements. It was found that 66% of the samples collected at two metres and 50% of the samples collected at four metres height exceeded the WHO 24 guideline of $70\mu\text{g m}^{-3}$. Reduction in concentration of between 30 to 74 % for Ca, Ti, Zr and Fe were observed both in coarse and fine particulate matter fractions at the higher height. The elements Cu, Zn, Pb and Br represented 0.5 to 1.1 % of the total coarse particulate matter at both heights. Higher proportions of 1.5 to 3.5 % were observed at both heights in the fine particulate matter fraction. High enrichment factors were observed for Cu (10.8 - 228.3), Zn (12.4 - 124.6), Pb (59.4 - 1967) and Br (152.5 - 3038.7) at both heights suggesting anthropogenic activities such as industrial, urban refuse burning, residential and vehicular emissions could be the major contributors. Pb and Br were mainly from the vehicular emissions as indicated by the strong correlations ($r > 0.593$) and the Br/Pb ratios (0.307 to 0.339).