

Full Length Research Paper

Determination of heavy metal pollutants in street dust of Yola, Adamawa State, Nigeria

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Contamination of the environment by heavy metals is a phenomenon of global importance today. When present in high concentrations in the environment, heavy metals may enter the food chain from soils and result in health hazards. This study is aimed at determining the elemental concentrations of heavy metal pollutants that may be present in street dust samples in Yola, Adamawa State, Nigeria. Dust samples were collected in mechanical workshops (MWK), motor parks (MPK), market areas (MKA), roundabouts/highways (RHW) and residential areas (RDA). The dust samples were digested using aqua regia digestion method and atomic absorption spectrophotometer was used for the elemental analysis. The variation in concentration of most of the heavy metals determined from different sites decreases in an order represented as MWK>MPK>MKA>RHW>RDA. The heavy metals showed a variation that indicated that Fe>>Zn>Pb>As>Cu>Ni>Cr>Cd. Iron had the highest concentration in all the sampling areas with range of 6460.00 ± 198 - 40500.00 ± 500 µg/g. The lowest value was observed for Cd with respective range of 0.43 ± 0.05 - 1.54 ± 0.06 µg/g. Cobalt and selenium were not detected in all the samples. Statistical analyses by ANOVA showed a significant difference (P < 0.05) between the elements determined. This suggested that, the heavy metal pollutants in the street dust samples of Yola did not originate from common anthropogenic sources. Probably automobile emission, welding of metal and exhaust from generators may have contributed as one of the major sources of these elements.

Key words: Metal pollution, dust, sampling sites, automobile emission, atomic absorption spectrophotometer, toxic substances, concentration.

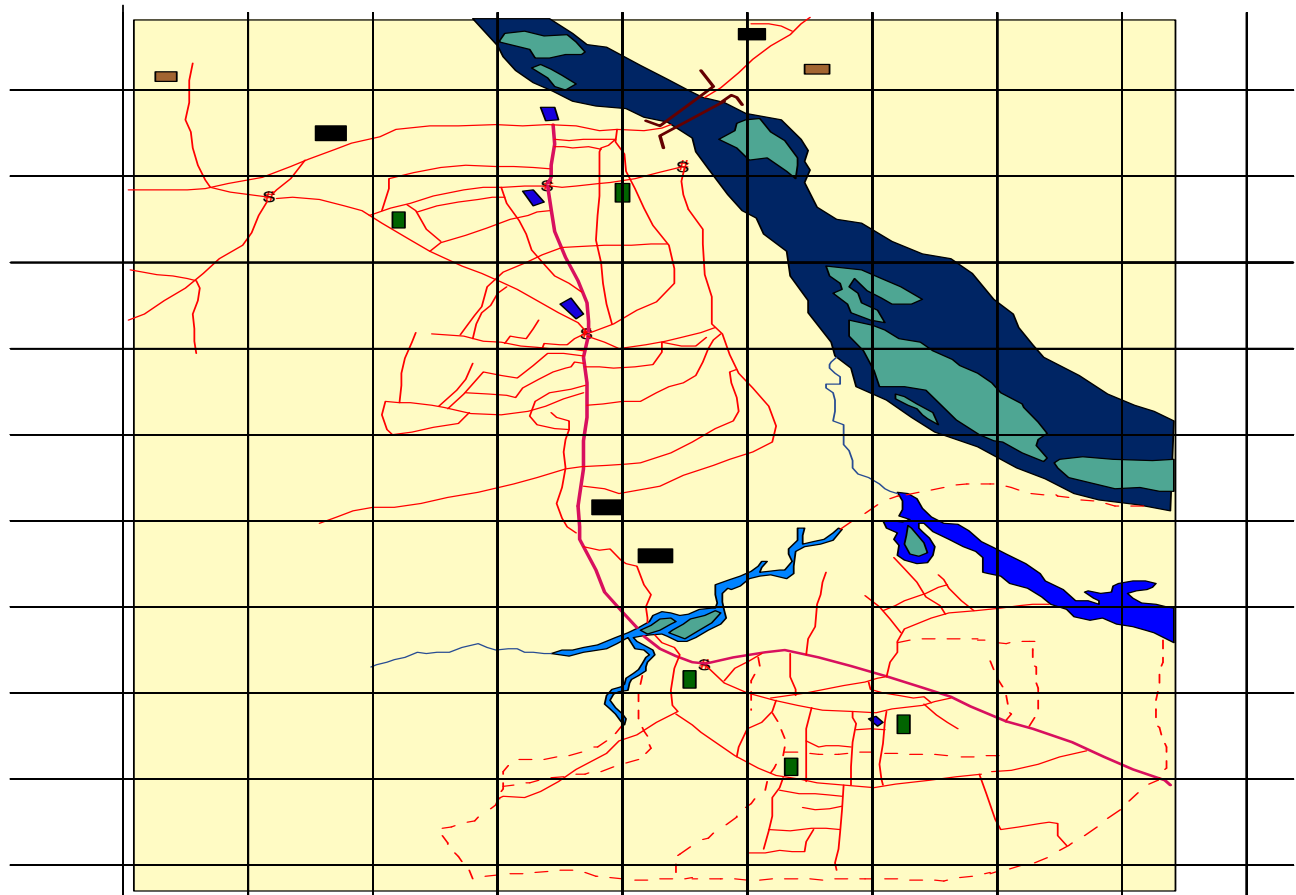
INTRODUCTION

Heavy metal pollutant in urban street dust has become a growing concern in recent years (Shinggu, et al, 2007). The contamination of the environment by heavy metals is a phenomenon of global importance today. This is because the accumulation of heavy metals in street dust is one major way through which heavy metals may find their way into soils and subsequently living tissues of plants, animals and human beings. Heavy metals can impair important biochemical processes posing a threat to human health, plant growth and animal life (Ward et al., 1977; Jarup, 2003 and Michalke 2003). The heavy metals can impair important biochemical processes

posing a threat to human health, plant growth and animal life (Silva et al, 2005 and Mashi, et al, 2005). In monitoring urban pollution, chemical and biological indicators are of interest since they provide information on the concentration and accumulation of heavy metals in the ecosystem (Campbell, 1976, Ramlan and Badri, 1989 and Alter, 1989). A range of metals and chemical compounds found in the street dust environment are harmful. Pollutants can attack specific sites or organs of the body and disease can develop as a consequence to such exposure (Archer and Barrett, 1976; Ayodele and Gaya, 1998).

Although there have been considerable number of studies on the concentration of heavy metals in street dust, the vast majority have been carried out in developed countries with long histories of industrialization (Jaradat and Momani, 1999). Very few studies have been

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- Secondary roads.shp
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