

Identification of heavy metals in particulate matter PM10 of traffic area, Cheras, Malaysia

ABSTRACT

This study was initiated to determine the heavy metals in particulate matter (PM10) in three sampling sites with different traffic density: high (CH), medium (CM) and low density (CL) density traffic, PM10 Samples were collected from June to July 2014 during the southwest monsoon using a high volume sampler. The results showed that the PM10 mean levels were significantly higher in CH and CM (207.63 and 164.92 $\mu\text{g}/\text{m}^3$) than the CL (90.09 $\mu\text{g}/\text{m}^3$). The mean quantity of heavy metals in PM10 was in the order Ba>Zn>Pb>Mn > Cr > As. The highest level of these heavy metals was recorded at CH followed by CM and CL except the mean level of As, which was recorded as being higher compared to CH. Based on the correlation and enrichment analyses, the heavy metals could be divided into two source emissions in the study area – Crustal and non-crustal. Among the heavy metals, As, Pb, Zn and Ba were found to be highly enriched in the atmospheric particulate matter, Cr showed a high EF in low density. Therefore, they were visibly affected by non-crustal sources (vehicular emission sources). In contrast, the EF calculated for Cr was lower in high and medium density suggesting chiefly crustal origin sources. This clearly indicates that traffic density is the main source in the study areas.

Keyword: Air pollution; Particulate matter; Heavy metals; Correlation; Enrichment factor