

// TOTAL SUSPENDED PARTICULATE; CONDENSATION

NUCLEI AND THEIR SIZE DISTRIBUTION

IN NAIROBI //

BY

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## SUMMARY

The aim of the present study was to look into the levels of particulate pollution in the city of Nairobi. No previous measurements have been undertaken before and this study is aimed at being a first step towards future sampling of various pollutants in the city. Nairobi is a fast growing city and so is the number of industries in the city with potential impact on air quality. This fact has an important implication as concerns the level of air pollutants in the city.

The available particulate measuring equipment were employed in the study. The high volume sampler measured the Total Suspended Particulates while the small particle detector, type CN, was used to determine the concentration and size distribution of the condensation nuclei. There were five stations chosen for the study. The Industrial area and four residential estates. The Industrial area was the main station since early times industrial emissions have been known to be associated with high particulate concentrations. Shaurimoyo and Nairobi South C were chosen for their proximity to the Industrial area, while Woodley and BuruBuru served as background locations which were free from the influence of any major particulate sources. The condensation

nuclei were determined from November 1981 to July 1982 in all the stations, while the TSP was determined from February to September 1982 in the Industrial area, while only four months data was available for the other stations.

The mean condensation nuclei concentration in the Industrial area is  $121,000 \text{ CN/cm}^3$  while in the residential estates the average vary from  $55,000 \text{ CN/cm}^3$  in the Nairobi South C to  $46,000 \text{ CN/cm}^3$  in Woodley. The Total Suspended Particulate concentration vary from  $252 \mu\text{g/m}^3$  in the Industrial area to  $100 \mu\text{g/m}^3$  in Nairobi South C and  $80 \mu\text{g/m}^3$  in BuruBuru during the period of study. The high concentration values in the Industrial area is evidence that the Industrial area is a major prolific source of particulate pollution in the city of Nairobi, with the concentrations decreasing with increasing distance away from the Industrial area. There is monthly variation in concentrations. Meteorological parameters were found to affect the particulate concentrations as months characterized by light windspeeds and variable wind directions recorded higher concentrations than the months characterized by relatively ~~high~~ frequency of strong winds. The condensation nuclei was found to be a good indicator of industrial pollution in the city.

On size analysis, no appreciable difference was detected in the five size range:-  $1 \times 10^{-7}$ ,  $1.5 \times 10^{-7}$ ,  $5 \times 10^{-7}$ ,  $1.3 \times 10^{-6}$ , and  $1.3 \times 10^{-5}$  cm radius - on a month to month basis. The analysis for the months of



November, December and January are presented. The results indicate that a large part of the particles in the entire range considered tend to be washed out by rain.