

ORGANIC COMPOUNDS AND HEAVY METALS IN THE ATMOSPHERE OF THE CITY OF CARACAS, VENEZUELA – I: ATMOSPHERIC PARTICLES

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Abstract. Aliphatic and aromatic hydrocarbons, fatty acids and heavy metals (Pb, Cu, Ni, Zn, Fe and Cd) were analyzed in atmospheric particulate matter in the city of Caracas, Venezuela. Samples were taken from 6 stations within the metropolitan area of Caracas, characterized as industrial (one), urban (two), suburban (two) and rural (one). In addition, the concentration and composition of the organic compounds was monitored over a 5 month period at an urban site to determine seasonal and temporal variabilities.

In general terms, the concentrations of pollutants decreased from industrial and urban sites to suburban to rural. A similar trend was observed for preliminary toxicity tests carried out on the particulate extracts. The concentration levels of most of the pollutants were high for the industrial and urban sites, and comparable with those of other major cities worldwide.

1. Introduction

Atmospheric pollution is of major public health concern in many large cities worldwide. However, in many cases only little attention has been given to this issue in developing countries. Such is the case for the city of Caracas, capital of Venezuela. Located in the Caracas Valley, the city stretches from East to West, bounded by the Cordillera de la Costa mountain range and El Avila National Park in the north and hills in the area to the south. The population of the metropolitan area of the city is approximately 3.5 to 4 million, with an accordingly large number of vehicles.

Most of the heavy industry has in recent years been forced out of the city, leaving only the western part as a major industrial area. The bulk of the pollution sources in the remaining part of the city are likely to be vehicle emissions. The low price of fuel combined with an inefficient public transportation system has led to a dramatic increase in the number of cars in the city. In addition the complete absence of vehicle emission control measures, particularly on buses and trucks, had made this the major source of atmospheric pollutants in Caracas. These emissions were found to exceed the daily average dispersion capacity of the Caracas atmosphere, resulting in elevated air pollution levels (Sanhueza *et al.*, 1982).

A review on earlier data on atmospheric pollutants in the Caracas valley appeared in 1979 (Ishizaki and Sanhueza, 1979). These authors concluded that the atmosphere

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