

PARTICLE SIZE DISTRIBUTION OF TRACE ELEMENTS IN THE MEDITERRANEAN BOUNDARY LAYER

F. Sprovieri, M. Bencardino, G. Guerini, N. Pirrone
CNR-IIA Institute for Atmospheric Pollution, Rende, Italy

The present work represents the first study carried out to assess the major particulate trace element concentrations in the MBL of the Mediterranean sea region with continuous hourly samples over multiple weeks in order to characterize their background levels and spatial and temporal variation. Several cruises were carried out during the last years. Ambient concentrations of particulate Fe, Zn, Pb, Hg, Ni, Cr and Cd have been performed, in different weather conditions over the Mediterranean sea, in particular, within two intensive seasonal cruise campaigns, during summer 2003, from 4th to 27th of August and during spring 2004, from 17th of March to 5th of April, aboard *Urania* ship of the Italian CNR. Suspended particle concentrations were collected by a Manual Dichotomous Sampler, on 370mm Teflon filters, over a 24-hour sampling period at a flow rate of 1,67 L min⁻¹ and about 15 L p.m. respectively, for a total operational flow rate of 16,7 L min⁻¹ for particle trace elements “fine” and “coarse” size fraction (PM₁₀ and PM_{2.5}); The study of the granulometric distribution of trace elements in the atmospheric particulate needs an analytical technique that combines characteristics such as instrumental multi-element capability, high sensitivity, precision and accuracy and reproducibility at different concentration ranges. Atomic Absorption Spectroscopy (AAS) has been used for the determination of the great part of the elements while Graphite Furnace Atomic Absorption Spectroscopy (GF-AAS) has been employed for the determination of lead, nickel, cadmium and mercury. Experimental details and results are discussed.