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Impact of Sahara dust transport on Cape Verde atmospheric element particles

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Abstract

The objectives of this study were to (1) conduct an elemental characterization of airborne particles sampled in Cape Verde and (2) assess the influence of Sahara desert on local suspended particles. Particulate matter (PM₁₀) was collected in Praia city (14°94'N; 23°49'W) with a low-volume sampler in order to characterize its chemical composition by k₀-INAA. The filter samples were first weighed and subsequently irradiated at the Portuguese Research Reactor. Results showed that PM₁₀ concentrations in Cape Verde markedly exceeded the health-based air quality standards defined by the European Union (EU), World Health Organization (WHO), and U.S. Environmental Protection Agency (EPA), in part due to the influence of Sahara dust transport. The PM₁₀ composition was characterized essentially by high concentrations of elements originating from the soil (K, Sm, Co, Fe, Sc, Rb, Cr, Ce, and Ba) and sea (Na), and low concentrations of anthropogenic elements (As, Zn, and Sb). In addition, the high concentrations of PM measured in Cape Verde suggest that health

of the population may be less affected compared with other sites where PM₁₀ concentrations are lower but more enriched with toxic elements.

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