Multiple hazardous elements in nanoparticulate matter from a Caribbean industrialized atmosphere

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Abstract

Modern microscopy studies are capable of revealing ultra-fine particles (UFPs) and nanoparticles (NPs) that are produced in the processes related to traffic vehicular, industrial, metropolitan, and marine aerosol dry deposition in the coastal zones. Especially, secondary aerosol passages complexes categories of NPs and UFPs, which can be accumulated on construction compounds and by dry deposition, encourages multiples monuments deterioration routes. The advanced electron microscopies method is one of the most utilized in environmental studies. Between the different industrial areas in the world, the Caribbean area is the most relevant symbols of air quality due to climatic conditions with strong winds, but this study shows that regionally the most industrialized region does not have an adequate air quality. In the present work, electron microscopy analyses are used to describe of the extent of ultra-fine particle and nanoparticles in walls in contact to weathering. Numerous phases were recognized by advanced mineralogy methods. Thanks to the new analytical procedure it was feasible to understand NPs and UFPs; the occurrence of potential hazardous elements (PHEs), most of them as minerals but also combined in multiple accumulations with Al–Cr–Fe–K–Mg–Pb–Si–Ti–Zn amorphous; and carbonaceous phases.

Keywords

Air quality, Ocean nanoparticles, Advanced characterization, Caribbean industrial pollution