

On the morphological and chemical characteristics of airborne particles in industrial area in Greece

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In this study an attempt is made in order to be investigated some morphological and chemical characteristics of airborne particles PM₁₀ and PM_{2.5}. These particles were collected in rural and urban area, within and far from mining and power station (PS) operations in northern Greece.

For this purpose a great number of filters that capture airborne particles (PM₁₀ and PM_{2.5}) were collected over a year's period, in two different areas in north-western Greece. In the village Klitos, a rural area near opencast mines and power station operations and in the urban area of Kozani, in a distance of about 10 - 15 km far from mines and PS. The samples were collected by Andersen Reference Ambient Air Sampler (RAAS) and dichotomous sampler with a PM₁₀ inlet probe for the collection of particles in the PM_{2.5} and PM₁₀ size range for gravimetric analysis, by passing air through a 37 mm GFF filter.

Before sampling, the filters were equilibrated to constant temperature and relative humidity conditions and weighed. After sampling, the filters were equilibrated to constant temperature and humidity conditions and weighed. The concentration was calculated by dividing the weight of the particulates captured on the filters by the volume of air (at ambient conditions) that passed through the sampler.

The characterisation of individual airborne particles trapped into GFF filters were analysed by Scanning Electron Microscopy (SEM) coupled with Energy Dispersive Spectra X-ray Analysis (EDS X-ray), in order to determine their morphological and chemical characteristics. Characteristic SEM images of airborne particles are presented in this study.

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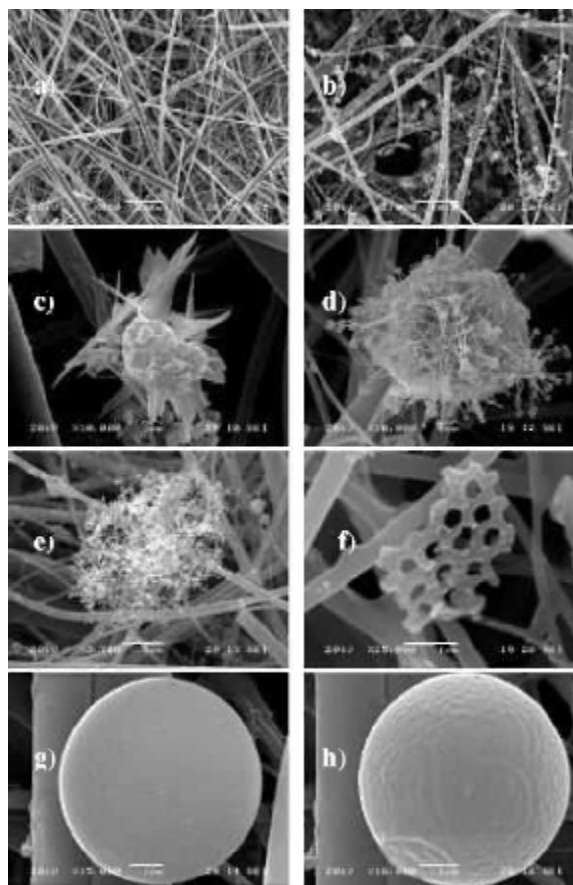


Figure 1. SEM images. Typical views of a) clean filter, b), c), d), e), f) various agglomerates and aggregates of airborne particles in different magnifications, g), h) spherical fly ash-airborne particles with a diameter less than 10 μm .