



Mass and elemental composition of PM_{2,5} and PM₁₀ at two urban sites in the west coast of Iberian Peninsula.

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The particulate matter concentration and composition (coarse and fine fractions) were studied in two urban areas, Oporto and Coimbra, in the west coast of Iberian Peninsula. At each site the samples were collected with two instruments: a High Volume sampler with PM₁₀ inlet and an impaction plate, and a Gent stacked- filter unit (SFU) in order to obtain two segregated size fractions, coarse fraction (size diameter between 2,5 – 10 μm) and fine fraction (size diameter < 2,5 μm). Quartz filters were used with the High Volume sampler and polycarbonate filters with 8 μm and 0,45 μm of pore diameter with the Gent SFU respectively. The two samplers were daily operated side-by-side with a commercial PM10 beta gauge monitor during summer 2006 and winter 2007, at each city. The samples were collected (\sim 30 samples in each season), in simultaneous days at both sites.

The samples of each instrument were weighted to obtain PM mass concentration of coarse and fine particulate fraction respectively. The samples collected on quartz filters were then used to analyse the organic and element carbon content in coarse and fine fractions by a thermo-optical method. The fractions collected in polycarbonate filters were divided in two parts, one half filter was used to quantify the aqueous extractable soluble ions by ion chromatography and atomic absorption spectrometry, and the other half was used to elemental analysis by ICP and PIXE (more than 30 elements).

Inter comparison of simultaneous PM₁₀ mass concentration measured with three different instruments at Coimbra and Oporto sites exhibit different correlations among them and show variation with season. The elemental composition, EC and OC, and soluble ions concentrations of fine and coarse aerosol fractions, together with meteorological and air quality monitoring data from local urban stations were investigated in order to clarify the sources and processes responsible for the particle levels observed in each site .

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