

NATURAL AND ANTHROPOGENIC SOURCES OF CARBONACEOUS MATERIAL IN ATMOSPHERE

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The carbonaceous material sources in atmosphere are related to natural and anthropogenic activities. The natural sources are volcanic eruptions, fires, stone erosions, long-range particulate mass transport, etc. Expecially in urban areas, the most important sources of carbonaceous material are the combustion processes. The carbonaceous material is constituted by a complex mixture of substances containing carbon atoms and it is classified in two main fractions, black carbon (BC) and organic carbon (OC). Black carbon, also known as elemental carbon (EC), has a graphitic-like structure and is essentially a primary pollutant emitted directly during the incomplete combustion of fossil and carbonaceous fuels. Organic carbon (OC), which is a mixture of hydrocarbons and oxygenated compounds, has both primary and secondary origin. The carbonaceous material (TC), which is the sum of OC and EC, has a significant impact on visibility and climate because it is the most absorbing species for sunlight in atmosphere. The TC particles are transporters of toxic compounds into human respiratory system; further, they are responsible for external building and monument surface soiling. In this paper we present TC, EC and OC concentrations in urban areas (Rome and Catania, Italy) and we discuss the influence of the meteorological conditions on the temporal-spatial distributions of the aerosol concentrations. The EC and OC concentrations trends are compared with other pollutant trends for identifying the primary and secondary formation of TC.