SPECIATION OF THE PARTICULATE ORGANIC MATTER IN THREE REMOTE AREAS

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Total particulate matter was collected as part of three programs between 1999 and 2001 (EAAS in Finland, ESOMPTE in Marseille/Fos and POVA in french alpine valleys). The speciation of the particulate organic matter (POM) was performed by Gas Chromatography or HPLC coupled with a mass spectrometer.
13 organic families were identified in the 245 samples collected. The presence of some functional groups (- COOH; - OH and - CHO) and the carbon chain length are used in order to identify the sources of the particulate pollutants and the physicochemical behaviour during the long range atmospheric transport of the aerosol. The composition of the POM differs depending on the season (the secondary fraction reaches 27 % in summer and only 6% in winter) and on the remoteness of the sources.
Alkanes are always the most abundant compounds. Polycyclic aromatic hydrocarbons, alcohols, esters, carboxylic acids and monoaromatic hydrocarbons are present in significant abundance. Some alkenes, aldehydes, ether oxydes, ketones and halocompounds are also found. Alcohols are more abundant in aerosols collected close to marine sites. Long carbon chain esters are mostly found in aerosols collected in high density vegetation areas and relatively high concentrations of PAH are measured in aerosols collected close to highly populated areas. These three families are good geochemical tracers, respectively of marine, biogenic and anthropic sources.