



1 Mono-carboxylic acids on the East Antarctic Plateau : long term trends in relation with climatic changes

1.1 M. De Angelis (1), J.-R. Petit (1) and B. Delmonte (2)

(1) Laboratoire de Glaciologie et Geophysique de l'Environnement, Saint Martin d'Heres, France, (2) University Bicocca, Milano, Italy (ange@lgge.obs.ujf-grenoble.fr / Fax: +33 4-76-82-42-01 / Phone: +33 4-76-82-42-33)

In addition to sulfuric and nitric acids, carboxylic acids are now recognized as taking a significant part in the acidity of the troposphere where they have been found in gaseous and aqueous phases as well as on aerosol particles. Urban-polluted and remote marine or continental areas have been investigated in order to document the nature and relative importance of individual potential sources, among them anthropogenic processes, biomass or soil emission, biomass combustion and photochemical decomposition of organic precursors.

Under present climatic conditions, the East Antarctic plateau is largely influenced by aerosols and gases provided by the high latitude southern ocean, while input from remote continents became significant only during glacial time. Studying the temporal trends of mono-carboxylic acids over time periods including large changes in source areas and air mass trajectories, like observed when passing from glacial to interglacial conditions, were expected to provide useful information on their natural cycles.

Selected ice sections from the EDC (Dome Concordia, 75°06.10'S, 123°23.71'E) and EDML (Dronning Maud Land, 75°0.10'S, 0°4.07'E, in the Atlantic sector) deep ice cores were carefully decontaminated and analysed by ionic chromatography. Depth concentration profiles covering 250 and 50 kyrs (EDC and EDML ice cores, respectively) show a clear CH_3COO^- increase during glacial extrema and HCOO^- concentrations significantly lower under glacial conditions. However, change in methane air content cannot account for the timing of the HCOO^- decrease. HCOO^-

and CH_3COO^- geographical and temporal trends are discussed in relation with potential indicators of biogenic (NH_4^+ , CH_3SO_3^- , non volcanic and non sea-salt SO_4^{2-}) or primary (Na^+) marine production, as well as continental markers (non-sea-salt Ca^{2+} , insoluble particle mass and volume distribution measured on the same samples).