322

CHEMICAL COMPOSITION OF SIZE-SEGREGATED WINTER AND SUMMER AEROSOL AT DOME C (CENTRAL EAST ANTARCTICA).

R. Udisti[1], S. Becagli[1], E. Castellano[1], O. Cerri[1], F. Lucarelli[2], A. Mannini[1], F. Marino[3], A. Morganti[1], S. Nava[2], E. Salvietti[1], M. Severi[1], R. Traversi[1]

[1]Chemistry Dept. - University of Florence, Sesto Fiorentino (Florence), Italy, [2]Physics Dept. - University of Florence, Sesto Fiorentino (Florence), Italy, [3]DISAT - University of Milano-Bicocca, Milano, Italy

Owing to the absence of local sources, atmospheric particles reaching inner areas of Antarctic represent a global background aerosol supplied by natural sources and delivered by long-range transport. Changes in aerosol load and chemical composition reflects changes in source intensity and/or transport efficiency and pathways, providing a powerful tool in pointing out climatic and environmental changes. A correct interpretation of today's processes leading aerosols over Antarctica allows a reliable reconstruction of the composition of past atmospheres and atmospheric processes from aerosol components measured in ice cores. In order to obtain a chemical characterization of aerosol reaching today the inner part of Antarctica, where deep ice cores were drilled, an all-year-round aerosol sampling campaign was accomplished from November 2004 to January 2006 (2004/05 summer field and following winter-over) at Dome C (central East Antarctica - 75° 06' S; 123° 23' E; 3233 m a.s.l.), where the EPICA-DC ice core was recently drilled. Aerosol sampling was carried out by using several devices (including filter sandwiches, a low volume pre-selected cut-off sampler and a multi-stage impactor) at different time resolution (from 2-3 days to one week).

Here we report the first results so far never obtained of the chemical composition of winter aerosol at Dome C. Atmospheric concentrations of chemical parameters, commonly used as climatic and environmental markers (e.g., Na, Ca, sulphate, MSA), were discussed as a function of the size-classes of the collected particles and atmosphere/snow transfer functions were calculated for selected compounds by a comparison with the composition of superficial snow. Uptake processes (mainly from the hoar fragile structure) and re-emission processes (post-depositional effects) were also enlightened for components not irreversibly fixed in the snow layers (particularly for chloride, nitrate and MSA). Changes in atmospheric load and composition were discussed as a function of seasonality of sources and transport processes. The effect of different solar irradiation on the composition of superficial snow was also investigated by night/day samplings.