Geophysical Research Abstracts
Vol. 17, EGU2015-12895, 2015
EGU General Assembly 2015

Concentration of trace elements in fine and coarse aerosol over the Mediterranean basin during the Urania 2011 and 2012 cruise campaigns

Naim Malaj (1), Ivano Ammoscato (2), Virginia Andreoli (2), Mariantonia Bencardino (2), Franco Cofone (2), Ugo Cosentino (3), Valentino Mannarino (2), Andrea Piazzalunga (3), Nicola Pirrone (2), Demetrio Pitea (3), Alessandro Servidio (2), Massimiliano Vardè (2), and Francesca Sprovieri (2)

(1) Dipartimento di Scienze Ambiente e Territorio e Scienze della Terra, Università di Milano-Bicocca, Via Pietro Bucci, 87036, Rende, Italia., (2) CNR - Istituto sull'Inquinamento Atmosferico, UOS di Rende, Polifunzionale UNICAL, 87036, Rende, Italia, (3) Dipartimento di Scienze Ambiente e Territorio e Scienze della Terra, Università di Milano-Bicocca, Piazza della Scienza 1, 20126, Milano, Italia

The almost unique geographic position as well as meteo-climatic characteristics of the Mediterranean basin surrounded by several anthropogenic and natural pollution sources, delineate it as one of the most polluted area. The intense maritime traffic and the industries of developed countries bordering the basin have been indicated as the major impact factors amongst the anthropogenic pollution sources while biomass burning, volcanoes fumes and frequent Saharan dust events represent the principal pollution coming from natural fonts. Land generated pollutants transported via air masses into marine atmosphere exert their impact on aquatic ecosystem, air quality and global climate. Although land-based air pollution monitoring sites are diffused through the Mediterranean countries, those regarding the atmospheric aerosol measured directly at sea surface are limited, leading to a scarce availability of the information. In order to fill this gap and to have more insights into the atmospheric dynamical and chemical mechanisms leading to high surface aerosol levels, the Institute of Atmospheric Pollution of the National Research Council (CNR-IIA) has started regular ship borne measurements over the Mediterranean Sea since 2000[1]. In this context, here we report the results obtained during two cruise campaigns performed in two distinct routs and periods: i) Urania 2011 made within the Tyrrhenian Sea during the fall season, and ii) Urania 2012 performed during summer within the Eastern sector of the Mediterranean sea basin. Fine ($PM_{2.5}$) and coarse ($PM_{2.5-10}$) particles were collected on PTFE membrane filters (Advantec MFS) and their mass concentrations were determined gravimetrically. Successively, all the filters were digested with a mixture of HNO_3/H_2O_2 in an open vessel digestion system (DigiPrep-MS, SCP SCIENCE, Canada) and analyzed by ICP-MS for the determination of the following elements: Be, Na, Mg, Al, K, Ca, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Mo, Ag, Cd, Sb, Ba, Tl, Pb, Th, and U. The method was previously optimized and assessed for suitable recovery levels (100 ± 15) on NIST SRM-1648a Urban Particulate Matter. Results regarding the mass concentration ($PM_{2.5}$ and $PM_{2.5-10}$), the content and the distribution of the analyzed elements over both PM fractions will be discussed taking into account different meteorological and sampling conditions.

References

1. M. Bencardino, N. Pirrone and F. Sprovieri, *Environ. Sci. Pollut. Res.,* 2014, 21:4044–4062.