

TEMPORAL ANALYSIS OF NATURAL RADIONUCLIDES DEPOSITION AT MÁLAGA (2005-2016)

M. Pérez¹, S. Cañete⁴, M.C Dueñas², E. Gordo⁴, M. Cabello², E Liger³ and R. Ruiz-Cruces¹

¹ University of Malaga, Faculty of Medicine, Department of Radiology.

² University of Malaga, Faculty of Sciences, Department of Applied Physics I

³ Higher Technical School of Computer Engineering, Department of Applied Physics II,

⁴ SCAI, Central Research Facilities, University of Malaga, Spain

Presenting author email: scanete@uma.es

Atmospheric deposition of radionuclides has been investigated in many studies from the aspects of both radiation protection and geochemistry. The present study, carried out in the city of Málaga, in the south-east of Spain, focuses on the assessment of the bulk depositional fluxes of three natural radionuclides: ⁷Be (cosmogenic origin), and ²¹⁰Pb and ⁴⁰K (crustal origin). These three radionuclides are useful markers of particles arising from their respective sources. To obtain fundamental information of atmospheric transportation, sedimentation and geological process of particulate matter, a long-term monitoring of atmospheric deposition has been carried out in Málaga from January 2005-December 2016. Samples of bulk deposition were collected on a monthly basis on a stainless steel tray from January 2005 to December 2016. Afterwards, a volume of 6 L of the bulk deposition was reduced via evaporation to 1 L approximately and transferred to a Marinelli geometry container for gamma counting. Additionally, aerosols samples were collected weekly in cellulose membrane filters of 0.8µm pore size and 47mm diameter with an air sampler lodged in an all-weather sampling station, situated on the roof near the bulk rain collector. Gamma counting of the aerosols and bulk deposition samples was performed using an intrinsic germanium coaxial detector, Re-Ge-type (CANBERRA). This study describes the results and then discusses characteristics of atmospheric deposition of mentioned radionuclides with respect to seasonal variations and dependency on controlling factors. The depositional fluxes of all radionuclides showed a clear seasonal trend with summer minimum and high values in wintertime.

Keywords: bulk depositional fluxes, gamma spectrometry, atmospheric aerosols

Área temática:

Exposición a la radiación natural y NORM

Protección radiológica del medio ambiente