# TOWARDS DETECTION AND IDENTIFICATION OF LEAD IN AEROSOL SAMPLES COLLECTED IN AN URBAN AREA IN AMMAN, JORDAN

## H. SA'ADEH

Department of Physics, The University of Jordan, Amman, Jordan

## M. CHIARI

INFN, Division of Florence, Florence, Italy

#### S. POLLASTRI, G. AQUILANTI

Elettra-Sincrotrone Trieste, Trieste, Italy

Air pollution is considered one of the most challenging environmental issues, as it has harmful effects on the ecological system and human health. These effects are mainly attributed to particulate matter (PM) properties like the particle size and chemical composition. Over the last few years the University of Jordan, Amman, Jordan, has been interested in studying the characteristic features of atmospheric aerosols in the framework of the International Atomic Energy Agency (IAEA) regional technical cooperation projects (IAEA TC projects RAS0072, RAS0076, and RAS0078) for ARASIA member states [1, 2]. Within the scope of these projects, aerosol samples have been collected on Teflon filters on a sequential basis (24 hr-sampling, 2-3 times a week). The elemental composition has been determined using particle-induced X-ray emission (PIXE) technique, either under vacuum using the PIXE-RBS beamline in the University of Jordan Van de Graaff Accelerator (JUVAC) [1] in Amman, Jordan, or using the external beam PIXE setup of the Tandetron accelerator of INFN-LABEC laboratory in Florence, Italy [2, 3].

Most recently, using the IAEA X-ray spectrometry (IAEAXspe) endstation [4] at the XRF beamline of Elettra-Sincrotrone Trieste in Italy, we have obtained further insights into the characteristic features of atmospheric aerosol samples collected from Jordan. The oxidation state of selected elements have been investigated using X-ray absorption near-edge structure (XANES) technique. The oxidation state of an element gives important information about its toxicity and environmental activity.

Of particular interest to us is lead, one of the harmful traces in Jordan aerosols, due to its ecotoxicity and human toxic potential. Lead (Pb) is a carcinogenic element, often comes from gasoline related to automobile and vehicular sources. The results obtained by PIXE analysis of aerosol samples from Amman [2, 3] clearly show that there is non-negligible emission of lead into the atmosphere, but they give limited or no information about its chemical state. In this contribution we review the elemental composition of aerosol samples from Amman obtained by PIXE, and we report on the first XANES results, which provide further insights about the chemical structure of Pb.

#### REFERENCES

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