ELEMENTAL CHARACTERIZATION OF PM_{2.5} AEROSOL SAMPLES IN FOUR MIDEASTERN CITIES AND SOURCE APPORTIONMENT INVESTIGATION

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This work is a part of a study conducted among several Arab countries in West Asia, under an IAEA regional technical cooperation project, dealing with air pollution in ARASIA region (Arab countries in Asia). Since atmospheric particulate matter PM10 and PM2.5 are trans-boundary and can effectively contribute to air pollution in certain localized areas, it was proposed to investigate and evaluate atmospheric particulate matter APM, in particular PM2.5, in a regional context. In a first phase, some preliminary results were obtained based only on a moderate number of samples from few participating countries [1]. In the second phase of the project, a large sampling campaign was performed, more countries were involved and, consequently, many samples are collected for a better investigation of PM2.5 aerosol samples in the region (elemental composition, total mass, black carbon and consequent pollution sources). Particle Induced X-ray Emission PIXE technique was performed, using 3 MeV proton beam, to determine the elemental composition of the PM_{2.5} particulate matter (from Na to Pb) that are collected for 24 hours on Teflon filters at the rate of twice per week, during the period 2018-2020. It concerns samples from Baghdad, Beirut, Doha and Kuwait City, where the different characteristics of their PM_{2.5} will be compared and discussed, highlighting their source apportionment.

[1] M. Roumie, & al., "Evaluation and mapping of PM2.5 atmospheric aerosols in Arasia region using PIXE and gravimetric measurements," Nuclear Inst. and Methods in Physics Research B 371, pp. 381-386 (2016).