Low pressure Berner cascade Impactor was used as an aerosol sampler to determine the mass concentration and mass size distribution of atmospheric aerosols. The impactor contains eight size fractionating stages and operates at a flow rate of 1.7 m^3/h. Total particulate suspended matter has been sampled with high volume samplers (Sierra Impactor) operating at a flow of about 78 m^3/h . With knowing the impactor flow rate (Q) we can calculate the mass concentration(C) as in Eq (1) Atomic Absorption Spectroscopy and Wavelength Dispersive X-Ray Fluorescence were used for the elemental analysis of aerosol particles.

$$C = \frac{m}{Q.t} \ldots\ldots\ldots \mu g/m^3 \qquad (1)$$

Mass size distributions of the investigated elements are bi-modal log normal size distribution according to the accumulation and coarse modes. The highest concentration is obtained for Fe (176.25 ng/m^3) followed by Mn (24.25 ng/m^3) and K (5.80 ng/m^3).

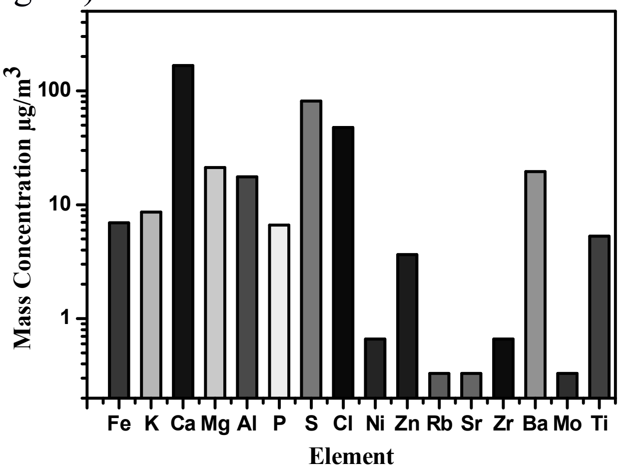

Figure (2): Mass concentration of elements in TSP collected by Sierra sampler.

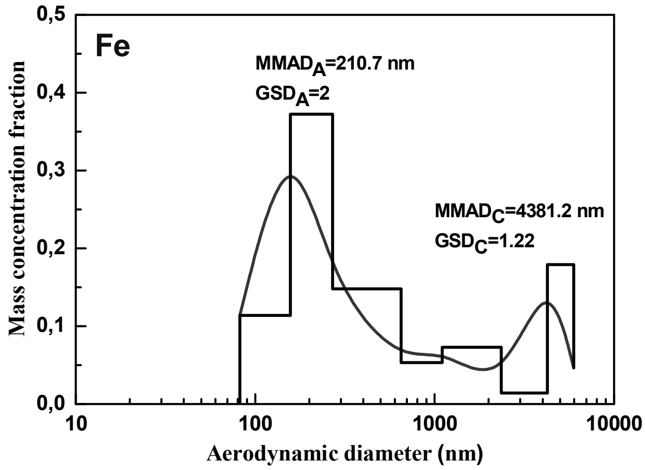

Figure (2): Mass ssize distribution of Fe .

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PROBLEMS OF METROLOGICAL SUPPORT RADON MEASUREMENTS

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Radon is known to be the major component of natural irradiation of the population in addition to several studies had shown that ^{222}Rn is the most important human radiological hazard [1]. Therefore, sensitive metrology of ^{222}Rn and its progeny is necessary to determine the behavior, exposure and biological effects of these nuclides accurately. Improving radon metrology is necessary for the traceability of secondary measurements of radon concentration in air. Accordingly, there is a question about the problem of metrology assurance of the radon measurements. All equipments have degrees of metrology weaknesses. Beside that low representativeness in sampling can be extra value to all the instrumental errors. Unfortunately, the possibility of checking equipment is not available permanently. Therefore, there is a necessity to develop metrology approaches for measuring *Equilibrium Equivalent Concentration* of radon EEC_{Rn} using available equipment and understandable ways to interpret the data.

The most preferable standard methods for determination Rn progeny are alpha radiometry and alpha spectrometry. Therefore, creation of primary standard source needs another independent method for examination Rn progeny. In such case, extra correction for more accuracy in the assessment of Rn progeny with alpha radiometry must be consider, so we should check this correction with other independent method as gamma spectrometry which use for determination the precision Rn progeny. This more precisely method helps to get rid of the self-absorption in filters. In addition, gamma spectrometry reduces errors associated with the alpha radiometers calibration with ^{239}Pu (alpha energy nearly a half times less than ^{214}Po detected energy).

For any standard there is not only systematic error but also random errors is considerable. Random error is mainly associated with the estimation of the count rate, but systematic error is associated with the error of polynomial efficiency. One of this error is due to a shift in the equilibrium radon box. It has only range 2-3%. By using aerosol filter AFA-RMP-20 type we can get this error in collecting Rn progeny. In the same way, aerosols collection efficiency of this filter should be estimated. Finally, data processing is performed with Kuznets method [2].

The present paper defines EEC_{Rn} with measuring gamma activity of ^{214}Bi (609.3 Kev) in AFA-RMP-20 filter using HPGe detector. Estimated efficiency of ^{214}Bi line is (0.00865±3%) the uncertainty of net count is (3 to 5 %). The average concentration of ^{214}Bi was found 10686±5% Bq/m^3. On the other hand, by using alpha radiometry we obtained radon concentration with activity 9317.5±30% Bq/m^3.This measuring prototype of EEC_{Rn} can be used as non-government standard with known errors.

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