



Contribution ID: 183

Type: Poster

PS3-02 The Influence of Attenuation Properties of Different Materials on the Results of X-Ray Fluorescence Analysis

Thursday, October 9, 2014 5:00 PM (1h 30m)

The availability of right reference sample with certified concentrations of all elements of interest often becomes a problem in the SRXRF analysis because of a wide range of objects with different matrices and varieties of element content to analyze. In this case, the mass attenuation coefficients of characteristic radiation in matrices to analyze can be applied to absorption correction, and thus reference samples with attenuation properties different from those of sample to analyze can be used. This expands the range of reference samples and thus increases the number of elements that can be analyzed quantitatively. Information about mass attenuation coefficients of reference samples and those to analyze extends the possibilities of SRXRF analysis and often becomes an essential requirement for obtaining reliable data. In this work the X-ray mass attenuation coefficients for energy of 7-12 keV were measured in biological (mussel and oyster tissues, blood, hair, liver, and cabbage leaves) and geological (Baikal sludge, soil, and alaskite granite) samples. The measurements were carried out at the EXAFS Station of Siberian Synchrotron Radiation Center at the VEPP-3 storage ring (Budker Institute of Nuclear Physics, Novosibirsk, Russia). Obtained experimental mass attenuation coefficients were used to estimate the influence of absorption to the analysis results. SRXRF analysis was carried at the Experimental Station of SRXRF analysis of the VEPP-3 storage ring.

The results of quantitative SRXRF analysis corrected with mass attenuation coefficients for some standard reference materials with different attenuation properties are given in this work.

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Session Classification: Poster Session