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Uranium Ores Elemental Composition Determination by X-Ray Fluorescence Expess-Method

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Specifics of measurements of elemental composition of uranium ores, which have natural radioactivity, using Wavelength Dispersive X-ray Fluorescence spectrometer S 8 Tiger were examined in the work. It is shown that own radioactivity of uranium ores, resulting from presence in them Pb, Bi, Po, Th, Pa, Ra and U isotopes and can influence on the results of determination of certain elements’ content.

The model of correction by intensity with empirical α-coefficients is proposed to use for matrix effects correction during analysis of content of P, S, Mg, Al, Si, K, Ca. It is shown, that such approach, in comparison with standard software Spectra Plus of spectrometer S 8 Tiger, allows reduce relative error of measurements in 10-100 times.

An analysis of possible spectral interferences of analytical lines of studied elements and additionally discovered in X-ray spectra peaks of Ba, Ni, Sr and Pb was done. It is shown, that using appropriate matrix effects correction the influence of spectral overlaps may be neglected.

Keywords: uranium ore, radioactivity, X-ray fluorescence analysis, elemental composition, matrix effects