

# INFLUENCE OF RADIATION EFFECT ON THE MEASUREMENT RELATIVE INTENSITY IN X – RAY EMISSION SPECTROMETRY

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It has been observed that standard samples, such as iron ore, sinters, mixture for sinter and blast furnace slag pressed into briquet with boric acid (ratio 1 : 3) diminished their wear resistance after radiation. Also, the measured intensities of analytical lines  $\text{CaK}_\alpha$ ,  $\text{SiK}_\alpha$  and  $\text{FeK}_\alpha$  showed the deviation concerning the accuracy and reproducibility of measurement. To explain those deviations an investigation was undertaken to find out how to the measured intensities were affected by radiation effect. The model samples were used. They were prepared with calcite, quartz boric acid and scale (mixture of iron compounds, more than 90 %  $\text{Fe}_3\text{O}_4$ ). The components were ground and separated in fractions of different grain size by sieve. Parts of separated fractions were irradiated for 30, 60, 90 and 120 minutes in the Philips semi – automatic x – ray spectrometer (Au . anode, 20 mA/ 45 KV). Irradiated samples of boric acid were examined by sieve analysis, and each fraction was again subjected to irradiated and sieve analysis. The samples of different grain size: calcite, quartz, scale and boric acid were homogenized (ratio 1 : 1) and briquetted using a Spex Al – holder. Measurement of analytical lines of  $\text{CaK}_\alpha$ ,  $\text{SiK}_\alpha$ ,  $\text{FeK}_\alpha$  were made on a Philips sequential semi automatic x – ray spectrometer. Secondary electron micrographs of non – irradiated boric acid were taken on scanning electron microscope.

The values of the measured relative intensities and sieve analysis were treated mathematically. The analysis showed that differences in the accuracy and reproducibility of measurement of the relative intensities of analytical lines of  $\text{CaK}_\alpha$ ,  $\text{SiK}_\alpha$ ,  $\text{FeK}_\alpha$  were due to the heterogeneity effect<sup>2</sup> as results of radiation effect on the binder boric acid<sup>3</sup>.

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