A Study of the Properties of Locomotive Slags for the Purpose of their Utilization in Structure of Composite Materials for Strengthening Roadbed of Railways

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Abstract: This article presents the results of experimental studies of the characteristics, chemical composition and structural features of locomotive slags accumulated as a result of the operation of a retro train plying the Circum-Baikal Railway (Slyudyanka station, Irkutsk region), with the aim of their utilization in composite materials to strengthening roadbed of railway track. The X-ray fluorescence analysis revealed the presence of toxic elements in the sample of locomotive slag, the concentrations of which exceed the maximum concentration limit by 10–48 times. It was revealed that locomotive slag belongs to the category of non-porous. The index of the specific effective activity of natural radionuclides A_{eff} (^{226}Ra, ^{232}Th, ^{40}K) was within acceptable values and was (242 ± 25) Bq/kg, which allows the use of locomotive slag in construction without restrictions. It is shown that steam locomotive slag is related to inert materials by its hydraulic properties, which will require its modification with various additives.