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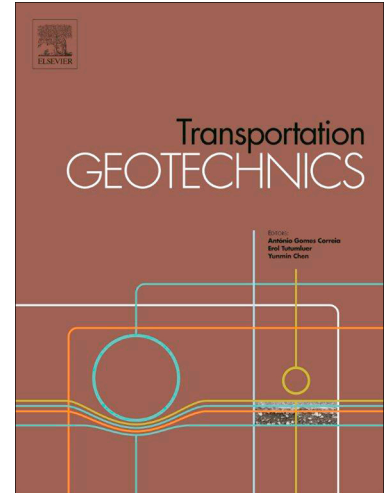
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Technical and Environmental Evaluation of Metallurgical Slags as Aggregate for Sustainable Pavement Layer Applications

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ABSTRACT

The paper examines physical, mechanical and chemical properties of slags, by-products of the metal industry, and evaluates their suitability for use as aggregates in pavement layers for the sustainability to be achieved in road construction. Samples of both metallurgical slags (steel and ferrochromium slags) and natural aggregates (limestone, basalt, and boulder) were obtained to determine their physical, mechanical, chemical properties through laboratory testing. Leaching tests and Inductive Coupled Argon Plasma Mass Spectrometry analyses were also conducted on the slags to determine whether they posed any detrimental effects on the environment. In addition, scanning electron microscope was utilized to determine the surface roughness of aggregates. The slag properties determined were compared to certain limits provided in the Highway Technical Specifications (HTS) and Waste Disposal Regulations (WDR) of Turkey. In conclusion, physical and mechanical properties of slags satisfied the HTS requirements and leaching test results showed that the slags studied were inert materials based on WDR. Therefore, not only economic and environmental but also technical benefits can be provided by utilizing slags in pavement construction as a sustainable alternative.

Keywords: *metallurgical slags, characterization, sustainability, environmental effect, recycling, pavement,*

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