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An Analysis of Sulfur Trioxide in Aggregates for Concrete Using an ASTM Standard for Portland Cement

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It is well-known that sulfates in concrete can reduce the long term durability of concrete. Sulfates most notably contribute to the problem of sulfate attack, which causes cracking and deterioration of concrete. Some aggregates can contain these sulfates and so can contribute to a reduction in durability. However, there is currently no standard test methodology to determine the sulfate content in the aggregates used to produce Portland cement concrete. The purpose of this research is to apply the current American Society for Testing and Materials (ASTM) standard for analyzing the sulfur trioxide content in Portland cement to measure the sulfur trioxide content in several different aggregates. It needs to be determined whether the ASTM test methodology for cement can be applied to testing aggregate and whether the data retrieved from the tests are meaningful. The ASTM standard being followed in this study is C 144-11B Standard Test Methods for Chemical Analysis of Hydraulic Cement, Section 17.1 in particular. The current phase of this research involves a blind study of 27 aggregate samples, each being tested two times. The results from the testing include the percentage of sulfur trioxide in the sample.

Information about the Author:

Sarah Brunsvold is currently a junior civil engineering major. She became interested in participating in this research because she is interested in materials engineering. She is interested in the mechanics and performance of concrete as a structural material because it has a large impact in all civil engineering careers.

Faculty Sponsor: Dr. John Schemmel

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