

## Author's Accepted Manuscript

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PII: S2352-7102(17)30838-0  
DOI: <https://doi.org/10.1016/j.jobee.2018.08.015>  
Reference: JOBE567

To appear in: *Journal of Building Engineering*

Received date: 29 December 2017  
Revised date: 22 July 2018  
Accepted date: 17 August 2018

Cite this article as: Kiachehr Behfarnia and Mohammad Shahbaz, The effect of elevated temperature on the residual tensile strength and physical properties of the alkali-activated slag concrete, *Journal of Building Engineering*, <https://doi.org/10.1016/j.jobee.2018.08.015>

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# The effect of elevated temperature on the residual tensile strength and physical properties of the alkali-activated slag concrete

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## Abstract

Assessment of alkali-activated slag (AAS) concrete as a green alternative to normal concrete is an effort to pave the way for the sustainable development. In this study, the AAS concrete specimens, after 7, 28 and 90 days of wet curing, were exposed to the temperatures of 20, 200, 400, 600, and 800°C, and the effect of temperature on their residual tensile strength and mass loss was assessed. Specimens of the normal concrete were also cast and tested to compare their performance with that of the AAS concrete. According to the results, the residual tensile strength of the AAS concrete at high temperatures was noticeably higher than that of normal concrete. Scanning electron microscope (SEM) images were obtained from the specimens to observe the changes in the micro-structure of the AAS and normal concrete in response to heating. Also, the change in the structure of the pores of the AAS concrete was investigated by employing mercury intrusion porosimetry (MIP).

**Keywords:** Alkali-activated; concrete; slag; tensile strength; mass loss.

## 1. Introduction

Nowadays, production of the environment-friendly green concrete is of great interest in order to reduce the normal Portland cement consumption and its respective negative impacts.

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