# Engineering properties of self-compacting concrete incorporating coal bottom ash (CBA) as sustainable materials for green concrete: a review

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**ABSTRACT**

Over the past two decades, concrete has been frequently employed in the construction sector because of its features. The development of massive concrete buildings with more complicated geometries and dense reinforcing has been growing progressively. Moreover, there is an increased need for improving the current practices of concrete technology to create new forms of concrete with better qualities, which encouraged scholars to advance further investigations in this area of research. Consequently, an innovative type of concrete called Self-Compacting Concrete (SCC) has been improved. Simultaneously, one key challenge, confronted by the civil engineering sector, is how to go more environmentally friendly. Using reused waste materials, e.g., coal bottom ash (CBA), is one of the carefully utilized techniques in construction and building applications. The CBA's pozzolanic characteristic with high silica and its useful pozzolanic capabilities have effectively turned CBA into a beneficial substitute in self-compacting concrete. Therefore, CBA has been successfully employed in producing SCC. Research into CBA function in SCC production not only contributes to increasing its use but also helps decrease the cost of landfills and provides a clean, sustainable, and environmental solution by conserving energy and reducing the depletion of natural resources. In this study, an overview of previous studies on CBA's physical and chemical characteristics has been thoroughly presented. Moreover, the impact of CBA on the self-compacting concrete's fresh and mechanical properties is discussed. Results indicated that using up to 10% CBA in SCC as sand replacement resulted in improved fresh and hardened properties.

**KEYWORDS**

Concrete; incorporating coal bottom ash; green concrete; CBA

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