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Author: Hanane ZADRI , Nadia TEBBAL, Zine El Abidine RAHMOUNI , Mekki MAZA ,

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Affiliation: Geomaterials Development Laboratory, Civil Engineering Department, Faculty of Technology, M'sila University, M'sila 28000, Algeria

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Effect of Activator Chemistry on the Strength Development of Blast Furnace Slag Geopolymer Systems: review

ZADRI Hanane[*1], TEBBAL Nadia [2], RAHMOUNI Zine el Abidine[3] and MAZA Mekki [4]

[1 3 4]Geomaterials Development Laboratory, Civil Engineering Department, Faculty of Technology, M'sila University, M'sila 28000, Algeria
[2] Institute of Technical Urban Management, Geomaterials Development Laboratory, M'sila University, M'sila 28000, Algeria

*Corresponding author: hanane.zadri@univ-msila.dz

ABSTRACT

The increasing production of Portland cement (PC), over 4 billion tons annually, poses environmental challenges due to high energy demands, fossil fuel use, and CO_2 emissions. Alkali-activated materials (AAMs), or geopolymers, offer a promising alternative thanks to their low carbon footprint, ambient curing, and good mechanical performance. Blast furnace slag (BFS), widely available and cost-effective, is a commonly used precursor. Many studies have investigated its use alone or with materials like metakaolin, fly ash, or recycled glass. However, the results vary due to differences in activator types, concentrations, and curing conditions. This review examines how activator types affect the mechanical performance of slag-based binders, aiming to identify optimal, sustainable formulations.

***Keywords**: Alkali-activated materials (AAMs); Geopolymers; Blast furnace slag (BFS); Alkaline activators; Mechanical properties.*