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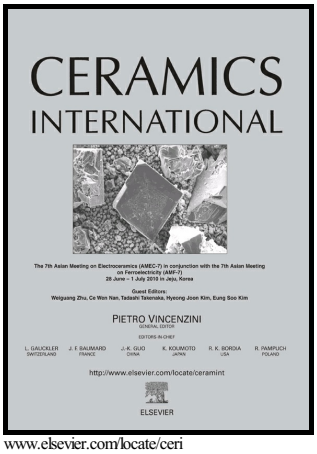

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A. Karthik[a*], K. Sudalaimani[b], C.T. Vijayakumar[c]

[a]Department of Civil Engineering, Kamaraj College of Engineering and Technology, S.P.G.C. Nagar, K. Vellakulam-625701, India

[b]Department of Civil Engineering, Thiagarajar College of Engineering, Madurai-625015, India

[c]Department of Polymer Technology, Kamaraj College of Engineering and Technology, S.P.G.C. Nagar, K. Vellakulam-625701, India

[*]Corresponding author: A. Karthik. Mobile: +91 9629666291, Fax: +91 4549 278172, Email ID: alagarkarthik@gmail.com

Abstract

The objective of this research was to understand the positive impact of bio-additives such as terminalia chebula and natural sugars (molasses/palm jaggery/honey) on the durability properties of coal fly ash-blast furnace slag (BFS) based geopolymer concrete under various chemical attacks. Various tests had been conducted by immersing specimens in 5% sulfuric acid, 5% sodium sulfate and 5% sodium chloride solution for different duration of 7, 14, 28, 56 and 90 days to determine the resistance of bio-additives added geopolymer concrete against chemical attacks. The durability was also related by mercury intrusion porosimetry to find out the porosity and pore size distribution. After 90 days of immersion, test results confirmed that bio-additives inclusion in coal fly ash-blast furnace slag based geopolymer concrete had undergone weight loss and compressive strength loss in the range of 2.82–3.91%, 9.67–12.05% under sulfuric acid attack, 0.38–0.68%, 2.15–2.95% under sodium sulfate attack and 0.28–0.51%, 0.83–1.33% under sodium chloride attack respectively.