

Alkali-activated materials: advances on accelerated and long-term durability assessment and methodologies—a short review

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Abstract

Developments in material testing have brought about the invention of some durability assessment methodologies for alkali-activated materials. This study reported advances in accelerated and long-term durability assessment and methodologies for alkali-activated composites (AAC). For both alkali-activated materials (AAM) and ordinary Portland cement (OPC)-based composites, the common methods such as increased acid concentration, standard non-accelerated test, wetting and drying cycling, brushing were assessed. The study assessed common methods: increased acid concentration, standard non-accelerated test, wetting and drying cycling, and brushing. The discussion also identified the limitations associated with the accelerated and long-term durability assessment in AAM composite. Some limitations include concrete pore solution concentration, precursor type, and admixture. In AAMs, pore size is within ranges $> 1 \mu\text{m}$ and $< 20 \text{ nm}$, which is an indication of insignificant porosity. Also, the compressive strength coefficient of AAM mortars was better than the cement mortar after 75 cycles. Finally, the study revealed the most appropriate mechanism for measuring the durability of AAM composite, which could be well utilized in the construction field.