

SUSTAINABLE ALKALI BINDERS: WASTE ACTIVATING WASTES

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Alkaline binders usually requires two main components, namely the solid precursor, rich in alumina and silica (preferably in an amorphous state); and the activator solution, based on an alkali metal (usually sodium or potassium). The role of the precursor is commonly assumed by a residue, usually fly ash or blast furnace slag with significant economic and environmental benefits. However the activator is frequently prepared with first grade commercial reagents (usually sodium or potassium hydroxide and sodium or potassium silicate), which significantly increases the financial costs and severely dilutes the environmental initial advantages, due to the high CO₂-eq released during the production of the reagents. These drawbacks associated with the activator severely hinder the wide spreading of this technology severely making the development of low cost activators a major research target. Therefore, a strong expectation regarding the application of industrial residues as the main (or even the sole) constituent of the activators – and not just as the precursor – is rapidly growing. The aim of the present paper is thus to analyse the potential application of some by-products, in this case from the aluminium foundry industry, as the alkali activator of two different precursors: fly ash type F (FA) and blast furnace slag (BFS).