

# Investigation of Alkali Activated Slag Reinforced with Wood Fibers

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Alkali-activated materials (AAMs) are well known alternatives to ordinary Portland cement (OPC) in order to limit CO<sub>2</sub> emissions and reduce the environmental impact. There are large amounts of industrial by-products, with varied aluminum and silicon compounds, which can be recycled in these materials. Binding materials based on AAMs, are much more ecologically friendly than Portland cement binders. The main properties of AAMs are similar to the properties of OPC, but mechanical or durability properties can even be improved. In spite of the encouraging properties of AAMs, these materials are classified as quasi-brittle materials and typically demonstrate poor flexural strength. Different types of reinforced fibers were used to increase the flexural strength of AAMs. The incorporation of steel, polypropylene, polyvinyl alcohol, sheet-like carbon and basalt fibers improved the mechanical and durability properties such as resistance against sulphates, acid resistance, water absorption and related properties. These fibers were incorporated in the AAM, to strengthen the material. In this research ground granulated blast furnace slag is used as precursor and wood fiber are used for the reinforcement of AAMs. Wood fiber was included at 0%, 0.5%, 1.0%, 3.0% and 5.0 % by slag mass. The alkali activator considered was sodium hydroxide solution. According to literature, wood fibers improve the properties of alkali activated materials. The produced specimen were characterized by using scanning electron microscopy (SEM), X-ray diffraction analysis (XRD) and mechanical properties with reference to compressive and flexural strength. The results of the study showed that alkali-activated material produced from alkali-activated slag reinforced with wood fiber has a great potential as a construction material.