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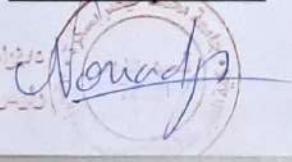
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Alkali-activation of aluminosilicate materials on geopolymmerization

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Alkali-activation of aluminosilicate materials on geopolymers

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Abstract

Alkaline activation of aluminosilicate materials is a fundamental step in the geopolymers manufacturing process. Alkaline activators are used to accelerate the dissolution of the aluminosilicate source and the formation of aluminosilicate gels (initiating the geopolymers reaction). Commonly used alkaline activators are sodium or potassium hydroxide. Depending on the nature of the raw material used, amorphous substances (gels) may be formed. Several variables influence the alkaline activation process: the type and composition of the raw materials, the nature and concentration of the activator, the temperature and the curing time. When the aluminosilicate raw material comes into contact with the alkaline solution, an amorphous to semi-crystalline matrix (geopolymers) is formed through a chemical process known as geopolymers. The transformation of a solid aluminosilicate source into a geopolymers matrix can be summarized in three steps: dissolution of the amorphous aluminosilicate source in the alkaline solution creates a supersaturated solution of SiO_2 and Al_2O_3 . This is followed by the formation of large networks by polycondensation and the increase of the gel network. The result is a three-dimensional geopolymers matrix with good mechanical strength, high resistance to chemical attack and resistance to high temperatures.

Keywords: alkaline activation, geopolymers, aluminosilicate materials, geopolymers.

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