

عنوان مقاله:

Assessment of Fly Ash-Rice Straw Ash-Laterite Soil Based Geopolymer Mortar Durability

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خلاصه مقاله:

Geopolymer is an inorganic form of alumina-silica that is synthesized through materials containing lots of silica (Si) and alumina (Al) originating from nature or from industrial by-products. The geopolymer binder is a two-component inorganic system consisting of solid components that have sufficient amounts of  $\text{SiO}_2$  and  $\text{Al}_2\text{O}_3$  to form compounds such as fly ash, rice straw ash, pozzolan, laterite soil, slag, etc. This study aims to analyze the compressive strength, chemical compositions, and geopolymerization process of geopolymers produced from fly ash, rice straw ash, and lateritic soil bound with an alkaline activator, sodium hydroxide (NaOH), with a concentration of 12 M. The durability of the geopolymer mortar was determined by soaking for 3, 7, and 28 days using water curing and sulphate curing (Sodium Sulphate,  $\text{Na}_2\text{SO}_4$ , and Sulfuric Acid,  $\text{H}_2\text{SO}_4$ ). The results showed that sodium hydroxide (NaOH) can release silica and alumina in the amorphous phase and can be used as a binder for geopolymer mortar made from straw ash, fly ash, and laterite soil without using oven heat, according to compressive strength, chemical compositions, and the geopolymerization process. The results of this study can be used to support the use of waste materials (fly ash and laterite soil) and local materials (straw ash) as geopolymer mortar-forming materials. Furthermore, it can aid in the development of eco-friendly (environmentally friendly) national infrastructure by eliminating the need for oven heat to initiate the polymerization reaction. However, this research can also be developed to increase the compressive strength of geopolymer mortar, which resembles that of conventional concrete in general. Doi: 10.28991/CEJ-2023-09-06-012 Full Text: PDF

کلمات کلیدی:

Fly Ash; Rice Straw Ash; Laterite Soil; Geopolymer; Durability

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