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Experimental investigation on the influencing factors of preparing porous fly ash-based geopolymer for insulation material

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Abstract:

Preparing porous geopolymer for an insulation material was performed by a protein-assisted foaming and non-sintering method. Samples were produced by fly ash, sodium water glass, water and foam as original material, and the protein is used as foaming agent. The influences caused by the dosage (ratio of foam, water glass and water), and curing temperature on the properties were investigated to achieve the optimal performance. Porosity, bulk density, thermal conductivity, mechanical property and thermal evolution behaviors of the produced samples in this study were analyzed accordingly. It was known based on the experimental results that the optimal performance is achieved with a ratio of 35:35:5 for foam, sodium water glass and water under curing temperature of 55 °C, showing a porosity of 90.87%, bulk density of 235.5 kg/m³, thermal conductivity of 0.0564 W·m⁻¹·K⁻¹ and compressive strength of 0.51 MPa. The obtained research outcomes from this study not only solve the

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