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Porosity, mechanical and insulating properties of geopolymer foams using vegetable oil as the stabilizing agent

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Abstract

Geopolymer foams, as a potential eco-friendly building materials, are increasingly being discussed in the literature. This study reports the synthesis and characterization of geopolymer foams using hydrogen peroxide (H_2O_2) solution as pore-forming agent and oil as the stabilizing agent. The geopolymer foams with low bulk densities ($0.37<\rho_b<0.74$ g/cm^3), low thermal conductivities ($0.11<\lambda<0.17$ W/(m.K)), high porosity (66<p<83 vol%), and acceptable compressive strength ($0.3<\sigma<11.6$ MPa) were successfully fabricated at appropriate conditions. Factors that influence the insulating, mechanical, porous, and microstructural properties were investigated. It was found that the content of the stabilizing