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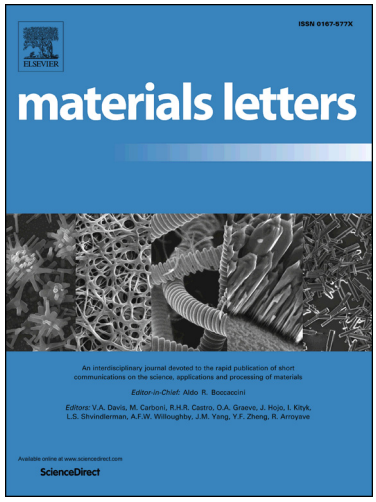

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Sodium silicate insulating foam reinforced with acid-treated fly ash

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Abstract

A set of insulating foams based on sodium silicate were prepared using acid-treated fly ash as an additive. It was found that the HCl-treated fly ash was able to remove the undesirable transition/alkali metal impurities up to 74%. Furthermore, the effect of the fly ash amount and modulus (SiO_2/Na_2O mole ratio) on the thermal conductivity, density, and compressive strength of the product was evaluated. The insulating foam prepared using 12.5 wt% acid-treated fly ash and modulus of 1.8 exhibited a low thermal conductivity of 0.0428 W/m·K, density of 156.3 kg/m^3, and high compressive strength of 1.12 MPa.

Keywords: Insulation foam; Sodium silicate; Acid-treated fly ash; Thermal conductivity; Compressive strength.