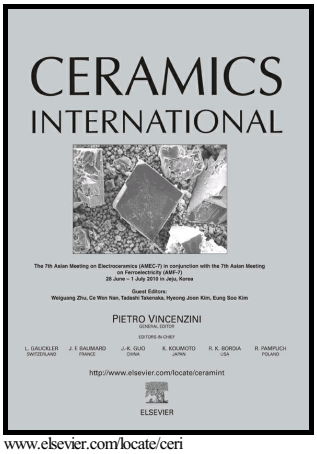

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Thermal evolution of lithium ion substituted cesium-based geopolymer under high temperature treatment, Part I: effects of holding temperature

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Abstract

In this paper, a high temperature treatment procedure was designed to evaluate the effect of holding temperature on thermal evolution process of Li^+ substituted Cs-based geopolymer ($Cs_{0.7}Li_{0.3}GP$), including the thermal analysis, phase composition and microstructure evolution. With rising of holding temperature, amorphous unheated $Cs_{0.7}Li_{0.3}GP$ gradually transformed into a multiphase system during the high temperature treatment process, which consisted of pollucite ($CsAlSi_2O_6$), spodumene ($LiAlSi_2O_6$) and amorphous glass phase. In the multiphase system, Cs^+ ions were in the form of pollucite grains, while Li^+ ions were in the form of spodumene nanocrystallines distributed in amorphous matrix. The pollucite grains gradually coarsened with rise in holding temperature, and the densification of the resulting products were also improved synchronously, which were related to the presence of