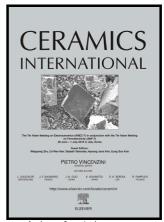
### Author's Accepted Manuscript

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

Jingkun Yuan, Peigang He, Xiaomin Liang, Dechang Jia, Lingyu Jia, Delong Cai, Zhihua Yang, Xiaoming Duan, Shengjin Wang, Yu Zhou



www.elsevier.com/locate/ceri

PII: S0272-8842(18)30493-0

DOI: https://doi.org/10.1016/j.ceramint.2018.02.179

Reference: CERI17581

To appear in: Ceramics International

Received date: 17 December 2017 Revised date: 5 February 2018 Accepted date: 23 February 2018

Cite this article as: Jingkun Yuan, Peigang He, Xiaomin Liang, Dechang Jia, Lingyu Jia, Delong Cai, Zhihua Yang, Xiaoming Duan, Shengjin Wang and Yu Zhou, Thermal evolution of lithium ion substituted cesium-based geopolymer under high temperature treatment, Part I: effects of holding temperature, *Ceramics International*, https://doi.org/10.1016/j.ceramint.2018.02.179

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

#### **ACCEPTED MANUSCRIPT**

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

Jingkun Yuan<sup>a, b</sup>, Peigang He<sup>a, b\*</sup>, Xiaomin Liang<sup>a, b</sup>, Dechang Jia<sup>a, b, c\*</sup>, Lingyu Jia<sup>a, b</sup>, Delong Cai<sup>a, b</sup>, Zhihua Yang<sup>a, b, c</sup>, Xiaoming Duan<sup>a, b, c</sup>, Shengjin Wang<sup>a</sup>, Yu Zhou<sup>a</sup>

<sup>a</sup>Institute for Advanced Ceramics, School of Materials Science and Engineering, Harbin Institute of Technology, Heilongjiang, Harbin, 150080

<sup>b</sup>Key Laboratory of Advanced Structure-Function Integrated Materials and Green Manufacturing Technology, Ministry of Industry and Information Technology, Heilongjiang, Harbin, 150080

<sup>c</sup>State Key Laboratory of Advanced Welding and Joining, Harbin Institute of Technology, Heilongjiang, Harbin, 150080

peiganghe@hit.edu.cn

dcjia@hit.edu.cn

\*Correspondent author: Peigang He, Dechang Jia. Address: School of Materials Science and Engineering, Harbin Institute of Technology, P. O. Box 433 Harbin 150001, P. R. China. Tel: +86 0451 86418792; Fax: +86 0451 86414291

#### **Abstract**

In this paper, a high temperature treatment procedure was designed to evaluate the effect of holding temperature on thermal evolution process of Li<sup>+</sup> substituted Cs-based geopolymer (Cs<sub>0.7</sub>Li<sub>0.3</sub>GP), including the thermal analysis, phase composition and microstructure evolution. With rising of holding temperature, amorphous unheated Cs<sub>0.7</sub>Li<sub>0.3</sub>GP gradually transformed into a multiphase system during the high temperature treatment process, which consisted of pollucite (CsAlSi<sub>2</sub>O<sub>6</sub>), spodumene (LiAlSi<sub>2</sub>O<sub>6</sub>) and amorphous glass phase. In the multiphase system, Cs<sup>+</sup> ions were in the form of pollucite grains, while Li<sup>+</sup> 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

#### Download English Version:

## https://daneshyari.com/en/article/7886826

Download Persian Version:

https://daneshyari.com/article/7886826

<u>Daneshyari.com</u>