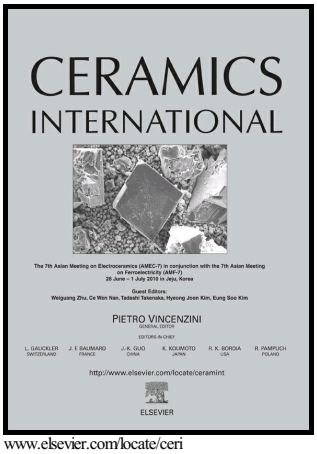
Hot corrosion behavior of $BaLa_2Ti_3O_{10}$ exposed to calcium-magnesium-alumina-silicate at elevated temperatures

Jianxing Yu, Caimei Wang, Lei Guo, Yang Yu, Fuxing Ye, Muyu Li, Huakun Wang, Zhenglong Yang



www.elsevier.com/locate/ceri

PII: S0272-8842(18)30573-X
DOI: https://doi.org/10.1016/j.ceramint.2018.03.021
Reference: CERI17658

To appear in: *Ceramics International*

Received date: 14 January 2018
Revised date: 3 March 2018
Accepted date: 4 March 2018

Cite this article as: Jianxing Yu, Caimei Wang, Lei Guo, Yang Yu, Fuxing Ye, Muyu Li, Huakun Wang and Zhenglong Yang, Hot corrosion behavior of $BaLa_2Ti_3O_{10}$ exposed to calcium-magnesium-alumina-silicate at elevated temperatures, *Ceramics International,* https://doi.org/10.1016/j.ceramint.2018.03.021

Hot corrosion behavior of $BaLa_2Ti_3O_{10}$ exposed to calcium-magnesium-alumina-silicate at elevated temperatures

Jianxing Yu[a,b], Caimei Wang[a,b*], Lei Guo[b,c], Yang Yu[a,b], Fuxing Ye[c], Muyu Li [a], Huakun Wang[a,b], Zhenglong Yang[a,b]

[a]State Key Laboratory of Hydraulic Engineering Simulation and Safety, Tianjin University, Tianjin 300072, China;
[b]Collaborative Innovation Center for Advanced Ship and Deep-Sea Exploration, Shanghai 200240, China
[c]Tianjin Key Laboratory of Advanced Joining Technology, Tianjin University, No. 92, Weijin Road, Tianjin 300072, China

[*]**Corresponding author.** Caimei Wang Tel.: +86 22 2789 1968; fax: +86 22 2740 3841. wang_cm@tju.edu.cn

Abstract

Calcium-magnesium-alumina-silicate (CMAS) attack has been regarded as one of the significant failure mechanisms for thermal barrier coatings (TBCs). In this study, CMAS corrosion behavior of $BaLa_2Ti_3O_{10}$, a novel TBC material, is investigated at 1300 °C and 1350 °C for 0.5 h, 4 h, 12 h and 24 h. Results reveal that $BaLa_2Ti_3O_{10}$ has high resistance to molten CMAS infiltration, attributable to the formation of a dense reaction layer. X-ray diffraction, scanning electron microscope, energy dispersive spectroscope, transmission electron microscope confirm that the layer consists of apatite, celsian and perovskite phases. With increased corrosion duration, the layer retains good phase stability and the thickness increases. The formation of