Accepted Manuscript

Title: Thermo – mechanical properties of SPS produced thermal barrier coatings containing pure and alloyed $MoSi_2$ particles

Authors: Justyna Kulczyk-Malecka, Xun Zhang, James Carr, Franck Nozahic, Claude Estournès, Daniel Monceau, Alexandra L. Carabat, Willem G. Sloof, Sybrand van der Zwaag, Philip J. Withers, Ping Xiao

PII: S0955-2219(18)30265-6
DOI: https://doi.org/10.1016/j.jeurceramsoc.2018.04.053
Reference: JECS 11863

To appear in: *Journal of the European Ceramic Society*

Received date: 29-9-2017
Revised date: 11-4-2018
Accepted date: 23-4-2018

Please cite this article as: Kulczyk-Malecka J, Zhang X, Carr J, Nozahic F, Estournès C, Monceau D, Carabat AL, Sloof WG, der Zwaag Sv, Withers PJ, Xiao P, Thermo – mechanical properties of SPS produced thermal barrier coatings containing pure and alloyed $MoSi_2$ particles, *Journal of the European Ceramic Society* (2010), https://doi.org/10.1016/j.jeurceramsoc.2018.04.053

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 proof before it is published in its final 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

"Thermo – mechanical properties of SPS produced thermal barrier coatings containing pure and alloyed $MoSi_2$ particles"

Justyna Kulczyk-Malecka[a*], Xun Zhang[a], James Carr[a], Franck Nozahic[b], Claude Estournès[c], Daniel Monceau[b], , Alexandra L. Carabat[d], Willem G. Sloof[d], Sybrand van der Zwaag[e], Philip J. Withers[a], Ping Xiao[a]

[a] School of Materials, The University of Manchester, M13 9PL, UK

[b] Université de Toulouse, CIRIMAT, CNRS-INPT-UPS, ENSIACET 4, allée Emile Monso-BP 44362, 31030 Toulouse Cedex 4, France

[c] Université de Toulouse, CIRIMAT, CNRS-INPT-UPS, Université Paul-Sabatier, 118 route de Narbonne, F-31062 Toulouse cedex 9, France

[d] Department of Materials Science and Engineering, Delft University of Technology, Mekelweg 2, 2628 CD Delft, The Netherlands

[e] Faculty of Aerospace Engineering, Delft University of Technology, Kluyverweg 1, 2629 HS Delft, The Netherlands

*Corresponding author present address:
Surface Engineering Group, Manchester Metropolitan University, Manchester M1 5GD, UK
J.Kulczyk-Malecka@mmu.ac.uk
Tel: +441612471201

Abstract:

Yttria – partially stabilised zirconia (YPSZ) $MoSi_2$ composites have been designed to prolong the lifetime of the matrix by self – healing cracks during thermal cycling. The healing reaction at high temperatures is based on the decomposition of $MoSi_2$, leading to a volumetrically expanding reaction product, which seals the crack. In this work, coefficient of thermal expansion (CTE) and the fracture toughness of composites containing $MoSi_2$ particles, produced by spark plasma sintering (SPS) have been compared to conventional YPSZ. The CTE mismatch between YPSZ and $MoSi_2$ was found to be small, implying that thermally

ACCEPTED MANUSCRIPT

Download English Version:

https://daneshyari.com/en/article/7897842

Download Persian Version:

https://daneshyari.com/article/7897842

Daneshyari.com