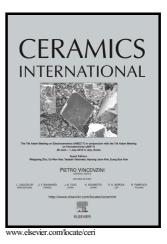
# Author's Accepted Manuscript

Highly Porous Fibrous Mullite Ceramic Membrane with Interconnected Pores for High Performance Dust Removal

Zhaxi Cuo, Haidi Liu, Feng Zhao, Weiman Li, Shengpan Peng, Yunfa Chen



 PII:
 S0272-8842(18)30837-X

 DOI:
 https://doi.org/10.1016/j.ceramint.2018.03.259

 Reference:
 CERI17896

To appear in: Ceramics International

Received date:2 January 2018Revised date:28 March 2018Accepted date:28 March 2018

Cite this article as: Zhaxi Cuo, Haidi Liu, Feng Zhao, Weiman Li, Shengpan Peng and Yunfa Chen, Highly Porous Fibrous Mullite Ceramic Membrane with Interconnected Pores for High Performance Dust Removal, *Ceramics International*, https://doi.org/10.1016/j.ceramint.2018.03.259

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**

## Highly Porous Fibrous Mullite Ceramic Membrane with Interconnected Pores

#### for High Performance Dust Removal

Zhaxi Cuo<sup>a,b</sup>, Haidi Liu<sup>a</sup>, Feng Zhao<sup>a</sup>, Weiman Li<sup>a</sup>, Shengpan Peng<sup>a,b</sup>, Yunfa Chen<sub>a,c\*</sub>

<sup>a</sup>State Key Laboratory of Multi-phase Complex Systems, Institute of Process Engineering, Chinese Academy of Sciences, Beijing 100190, China

<sup>b</sup> University of Chinese Academy of Sciences, No. 19A Yuquan Road, Beijing 100049, China

<sup>c</sup> CAS Center for Excellence in Urban Atmospheric Environment, Xiamen 361021, China

\* Corresponding author. E-mail address: chenyf@ipe.ac.cn.

#### ABSTRACT

Porous fibrous mullite ceramic membranes with different content of fibers were successfully fabricated by molding method for dust removal. The properties of the samples, such as microstructure, porosity, bulk density and mechanical behavior were analyzed. Owing to the highly porous three-dimensional structure of ceramic membranes, all the samples exhibited low density (lower than 0.64 g/cm<sup>3</sup>), high porosity (higher than 73%), low linear shrinkage (lower than 1.0%) and low thermal conductivity (lower than 0.165 W/mK). Significantly, the as-prepared porous ceramic membrane possessed of enhanced dust removal efficiency with almost 100% for 3-10  $\mu$ m, 97% for 1.0  $\mu$ m, 87% for 0.5  $\mu$ m and 82% for 0.3  $\mu$ m dust particles in diameter from dust-laden air passed through the test module. Moreover, the pressure drop was lower than 80 Pa when the airflow linear velocity reached 1.25 m • min<sup>-1</sup>. The results indicated that the ceramic membranes prepared in this work were promising high

Download English Version:

# https://daneshyari.com/en/article/7887297

Download Persian Version:

https://daneshyari.com/article/7887297

Daneshyari.com