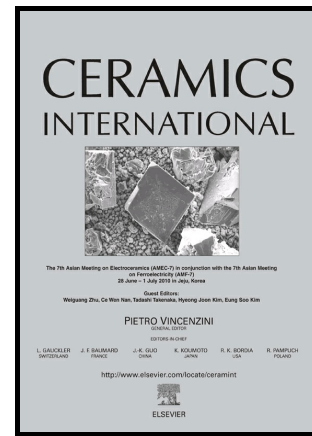


Author's Accepted Manuscript

A novel low cost method for the synthesis of ceramic nano silicon oxycarbide powder

Mohamad Reza Saadati, Ali Maleki, Behzad Niroumand, Ali Reza Allafchian



www.elsevier.com/locate/ceri

PII: S0272-8842(16)30023-2
DOI: <http://dx.doi.org/10.1016/j.ceramint.2016.02.079>
Reference: CER112270

To appear in: *Ceramics International*

Received date: 18 January 2016
Revised date: 13 February 2016
Accepted date: 13 February 2016

Cite this article as: Mohamad Reza Saadati, Ali Maleki, Behzad Niroumand and Ali Reza Allafchian, A novel low cost method for the synthesis of ceramic nano silicon oxycarbide powder, *Ceramics International*, <http://dx.doi.org/10.1016/j.ceramint.2016.02.079>

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

A novel low cost method for the synthesis of ceramic nano**Silicon Oxycarbide powder**

Mohamad Reza Saadati¹, Ali Maleki², Behzad Niroumand¹, Ali Reza Allafchian³

1- Department of Materials Engineering, Isfahan University of Technology, Isfahan, 84156-83111, Iran

2- Steel Institute, Isfahan University of Technology, Isfahan, 84156-83111, Iran

**3- Nanotechnology and Advanced Materials Institute, Isfahan University of Technology, Isfahan,
84156-83111, Iran**

Abstract

Although different methods have been used for manufacturing micro- Silicon Oxycarbide (SiOC) powder, there is no account of nano-SiOC synthesis in the literature. In this study, a novel low cost sol-gel method was used for the synthesis of nano-Silicon Oxycarbide (SiOC) powder. An organic-inorganic hybrid, i.e., a Tetraethyl Orthosilicate/Polydimethylsiloxane (TEOS/PDMS) mixture, was used as the starting material. The sol-gel technique was employed to cross-link the precursors using a base catalyst. Consequently, the gel was dried at 90°C for 24 hours. The dried gel was pyrolyzed in a two-step process in argon atmosphere. The synthesized powder was investigated using XRD, FTIR, TGA, FESEM and BET techniques. XRD and FTIR analyses identified the product to be SiOC. BET analysis showed a specific surface area of about 150 m²/g for the synthesized powder, thereby suggesting its nano-sized characteristics. FESEM studies further confirmed that the powder was nano-sized with an average particle size of about 50 nm. The proposed procedure could be, therefore, a simple low cost method for the synthesis of nano-SiOC powder.

Key words: A. Sol-gel processes, B. X-ray methods, B. Electron microscopy, D. Silicon Oxycarbide

Download English Version:

<https://daneshyari.com/en/article/10624207>

Download Persian Version:

<https://daneshyari.com/article/10624207>

[Daneshyari.com](https://daneshyari.com)