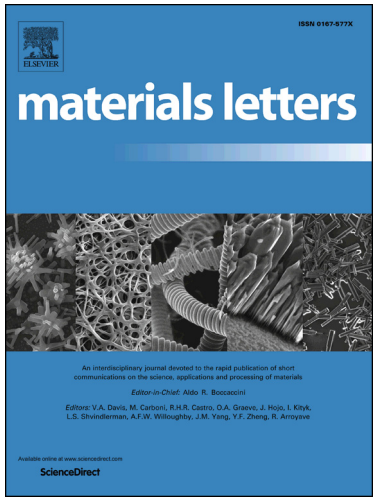

Coating formed by SiBCN single source precursor via UV-photopolymerization

Weiqi He, Lixin Chen, Fei Peng

PII: S0167-577X(17)30898-4
DOI: http://dx.doi.org/10.1016/j.matlet.2017.06.016
Reference: MLBLUE 22728

To appear in: *Materials Letters*

Received Date: 28 March 2017
Revised Date: 31 May 2017
Accepted Date: 3 June 2017

Please cite this article as: W. He, L. Chen, F. Peng, Coating formed by SiBCN single source precursor via UV-photopolymerization, *Materials Letters* (2017), doi: http://dx.doi.org/10.1016/j.matlet.2017.06.016

Coating formed by SiBCN single source precursor via UV-photopolymerization

Weiqi He[1], Lixin Chen[1]*, Fei Peng[1]

[1]Department of Applied Chemistry, School of Natural and Applied Sciences, Northwestern Polytechnical University, Xi'an 710072, P.R. China

*Correspondence: E-mail: lixin@nwpu.edu.cn

Abstract: Polymer derivedSiBCNceramcis (PDCs) exhibit many excellent properties such as high-temperature stability and oxygen resistance. In this work, the SiBCN-containingUV-curable single source precursor a-TSEBwas used as the starting material to prepare ceramic coating. The ceramic coating was prepared via spin coating, UV-polymerization and pyrolysis.The viscosity of the precursor was tested which is fluctuated around 57.75 mPa·s, means that the viscosity is low enough to coat on the surface of substrate. SEM micrographs showed that the compacted coatings are formed without any penetrating cracks or holes on samples and the interface bonding performance is good.

Key words:Ceramic coating, PDCs, SiBCN single source precursor, UV-photopolymerization

1. Introduction

SiBCN ceramics have attracted great interests for their remarkably high temperature stability, creep resistance and stability in oxygen.[1-3] Combine with its high hardness, low compressive stress, good adherence, transparency in the visible spectral region, and controllable electrical conductivity, the SiBCN ceramics can be used as protective coating, particularly suitable in high-temperature applications.[4-14] The so-called 'polymer route'(polymer derived ceramics, PDCs) thatceramicsare prepared by thermolysis of polymeric precursors at elevated temperatureis appropriate in preparing ceramic coating the sintering temperature could be reduced.[15,16] In this article, we choose single source precursor to be the starting material because the single source precursor has already contain all cationswhichare fixed to the bridging