

# Author's Accepted Manuscript

Electrophoretic deposition of fiber  
hydroxyapatite/titania nanocomposite coatings

Morteza Farrokhi-Rad



www.elsevier.com/locate/ceri

PII: S0272-8842(17)32160-0  
DOI: <https://doi.org/10.1016/j.ceramint.2017.09.221>  
Reference: CER116392

To appear in: *Ceramics International*

Received date: 5 July 2017  
Revised date: 6 September 2017  
Accepted date: 27 September 2017

Cite this article as: Morteza Farrokhi-Rad, Electrophoretic deposition of fiber hydroxyapatite/titania nanocomposite coatings, *Ceramics International*, <https://doi.org/10.1016/j.ceramint.2017.09.221>

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.

# Electrophoretic deposition of fiber hydroxyapatite/titania nanocomposite coatings

Morteza Farrokhi-Rad<sup>a\*</sup>

<sup>a</sup>Department of Materials Engineering, Faculty of Engineering, Azarbaijan Shahid Madani University, P.O.Box : 53751-71379, Tabriz, Iran

\*Corresponding author: Tel./fax: +98 4134327566,

E-mail addresses: m.farrokhi.rad@azaruniv.edu, morteza\_farrokhi\_rad@yahoo.com

## Abstract

Hydroxyapatite/titania nanocomposite coatings were electrophoretically deposited from ethanolic suspensions of titania and fiber shaped hydroxyapatite (FHA) nanoparticles. Triethanolamine (TEA) was used to enhance the colloidal stability of particles in suspensions. Electrophoretic deposition (EPD) was performed using the suspensions with different concentrations (wt%) of titania/FHA particles. EPD rate decreased more rapidly with time for suspensions with higher wt% of FHA due to the higher voltage drop over the deposits shaped from them. Stacking of long FHA particles on the substrate during EPD resulted in the formation of coarse pores in the deposits. It was found that titania nanoparticles can more efficiently infiltrate through and fill the pores in TEA containing suspensions due to the stronger electrostatic repulsion force between pore walls (FHA) and titania nanoparticles in them. The coatings deposited from the suspensions with 50 wt% of FHA or more did not crack during drying due to the significant reinforcement action provided by high wt% of FHA in them.

Download English Version:

<https://daneshyari.com/en/article/7889191>

Download Persian Version:

<https://daneshyari.com/article/7889191>

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