

## Accepted Manuscript

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PII: S0257-8972(17)30273-6  
DOI: doi: [10.1016/j.surfcoat.2017.03.034](https://doi.org/10.1016/j.surfcoat.2017.03.034)  
Reference: SCT 22203  
To appear in: *Surface & Coatings Technology*  
Received date: 10 October 2016  
Revised date: 23 February 2017  
Accepted date: 15 March 2017

Please cite this article as: Cuilian Wen, Xiaozhang Zhan, Xiaogui Huang, Feng Xu, Lijin Luo, Chengsen Xia, Characterization and corrosion properties of hydroxyapatite/graphene oxide bio-composite coating on magnesium alloy by one-step micro-arc oxidation method. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Sct(2017), doi: [10.1016/j.surfcoat.2017.03.034](https://doi.org/10.1016/j.surfcoat.2017.03.034)

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**Characterization and corrosion properties of hydroxyapatite/graphene oxide bio-composite coating on magnesium alloy by one-step micro-arc oxidation method**

Cuilian Wen<sup>1,\*</sup>, Xiaozhang Zhan<sup>1</sup>, Xiaogui Huang<sup>1</sup>, Feng Xu<sup>1,\*</sup>, Lijin Luo<sup>2</sup>, Chengsen Xia<sup>1</sup>

<sup>1</sup> *College of Materials Science and Engineering, Fuzhou University, and Key Laboratory of Eco-materials Advanced Technology (Fuzhou University), Fujian Province University, Fuzhou 350116, P. R. China*

<sup>2</sup> *Fujian Provincial Key Laboratory of Screening for Novel Microbial Products, Fujian Institute of Microbiology, Fuzhou 350007, P. R. China*

**ABSTRACT**

A biodegradable hydroxyapatite/graphene oxide bio-composite (HA/GO) coating has been fabricated on magnesium (Mg) alloy by a convenient one-step method of micro-arc oxidation (MAO) for biodegradable implants. The microstructure and phase constituents of the obtained powders and coatings were characterized by XRD, SEM, TEM, FT-IR, XPS and the corrosion resistance in vitro has been investigated by electrochemical measurements in simulated body fluid (SBF). The results suggested that HA/GO powder has been successfully prepared and filled into the discharging pores of the coating during MAO process. The electrochemical measurements in SBF indicated that the corrosion current of Mg substrate has been significantly decreased by the HA/GO coating. Furthermore the EIS measurement suggested that the HA/GO coating more effectively inhibited the Mg substrate from corrosion compared to pure MAO coating. These results suggested that HA/GO coating on Mg alloy could be a promising candidate for biomedical application.

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\* Corresponding author: [clwen@fzu.edu.cn](mailto:clwen@fzu.edu.cn) (C. Wen), [xufeng.mater@fzu.edu.cn](mailto:xufeng.mater@fzu.edu.cn) (F. Xu).

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