

# Accepted Manuscript

Improved corrosion resistance and biocompatibility of biodegradable magnesium alloy by coating graphite carbon nitride ( $g-C_3N_4$ )

Guoqiang Yang, Taijun Chen, Bo Feng, Jie Weng, Ke Duan, Jianxin Wang, Xiaobo Lu



PII: S0925-8388(18)33069-X

DOI: [10.1016/j.jallcom.2018.08.180](https://doi.org/10.1016/j.jallcom.2018.08.180)

Reference: JALCOM 47268

To appear in: *Journal of Alloys and Compounds*

Received Date: 19 June 2018

Revised Date: 17 August 2018

Accepted Date: 19 August 2018

Please cite this article as: G. Yang, T. Chen, B. Feng, J. Weng, K. Duan, J. Wang, X. Lu, Improved corrosion resistance and biocompatibility of biodegradable magnesium alloy by coating graphite carbon nitride ( $g-C_3N_4$ ), *Journal of Alloys and Compounds* (2018), doi: 10.1016/j.jallcom.2018.08.180.

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 proof before it is published in its final 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.

Improved Corrosion Resistance and Biocompatibility of Biodegradable Magnesium Alloy by Coating Graphite carbon nitride (g-C<sub>3</sub>N<sub>4</sub>)

Guoqiang Yang<sup>a</sup>, Taijun Chen<sup>a</sup>, Bo Feng<sup>a</sup>, Jie Weng<sup>a</sup>, Ke Duan<sup>a</sup>, Jianxin Wang<sup>a,\*</sup> and Xiaobo Lu<sup>b,\*</sup>

<sup>a</sup>Key Laboratory of Advanced Technologies of Materials, Ministry of Education, School of Materials Science and Engineering, Southwest Jiaotong University, Chengdu 610031, P.R. China

<sup>b</sup>Department of Bone and Joint Surgery, Affiliated Hospital of Southwest Medical University, Luzhou, Sichuan, 646000

### Abstract

In this study, one-step chemical vapor deposition method (OS-CVD) using urea as a precursor was used to deposit carbon nitride (g-C<sub>3</sub>N<sub>4</sub>) film on the magnesium alloy. The material composition and characteristic functional groups of the as-prepared films were characterized by using X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), energy dispersive spectroscopy (EDS) and X-ray photoelectron spectroscopy (XPS). The surface morphology of the carbon nitride film on the magnesium alloy was observed by using a scanning electron microscope (SEM) and an atomic force microscope (AFM). The corrosion resistance of magnesium alloy was investigated via an electrochemical method and an immersion test. The biocompatibility and hemolysis rate of graphitic carbon nitride films were studied via *in vitro* cellular experiments and *in vivo* animal experiments. The results indicated that the corrosion resistance and biocompatibility of AZ31B Mg alloy was significantly improved by g-C<sub>3</sub>N<sub>4</sub> coating.

---

\*Correspondence to: J. Wang; E-mail: [jwang@swjtu.edu.cn](mailto:jwang@swjtu.edu.cn) or X. Lu; E-mail: [lux90366@126.com](mailto:lux90366@126.com).

Download English Version:

<https://daneshyari.com/en/article/10128728>

Download Persian Version:

<https://daneshyari.com/article/10128728>

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