

Accepted Manuscript

Electroless deposition and characterization of a double-layered Ni-B/Ni-P coating on AZ91D Mg alloy from eco-friendly fluoride-free baths

Jun Zhang, Zhi-Hui Xie, Hong Chen, Chao Hu, Linxin Li, Bonian Hu, Zhengwei Song, Dalong Yan, Gang Yu



PII: S0257-8972(18)30231-7
DOI: doi:[10.1016/j.surfcoat.2018.02.105](https://doi.org/10.1016/j.surfcoat.2018.02.105)
Reference: SCT 23176
To appear in: *Surface & Coatings Technology*
Received date: 27 November 2017
Revised date: 26 February 2018
Accepted date: 27 February 2018

Please cite this article as: Jun Zhang, Zhi-Hui Xie, Hong Chen, Chao Hu, Linxin Li, Bonian Hu, Zhengwei Song, Dalong Yan, Gang Yu , Electroless deposition and characterization of a double-layered Ni-B/Ni-P coating on AZ91D Mg alloy from eco-friendly fluoride-free baths. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Sct(2017), doi:[10.1016/j.surfcoat.2018.02.105](https://doi.org/10.1016/j.surfcoat.2018.02.105)

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.

Electroless deposition and characterization of a double-layered Ni-B/Ni-P coating on AZ91D Mg alloy from eco-friendly fluoride-free baths

Jun Zhang^a, Zhi-Hui Xie^{b, *}, Hong Chen^c, Chao Hu^a, Linxin Li^b, Bonian Hu^d, Zhengwei Song^a, Dalong Yan^a, and Gang Yu^{a, **}

^a*State Key Laboratory of Chemo/Biosensing and Chemometrics, College of Chemistry and Chemical Engineering, Hunan University, Changsha 410082, P.R. China*

^b*Chemical Synthesis and Pollution Control Key Laboratory of Sichuan Province, College of Chemistry and Chemical Engineering, China West Normal University, Nanchong 637002, P.R. China*

^c*School of Materials Science and Energy engineering, Foshan University, Foshan 528000, P.R. China*

^d*Department of Materials and Chemical Engineering, Hunan Institute of Technology, Hengyang 421008, P.R. China*

Abstract: Electroless Ni deposition has attracted much interest in surface modification of Mg alloy owing to its good performance, especially in corrosion inhibition. In this work, an electroless double-layered Ni-B/Ni-P coating on AZ91D Mg alloy was fabricated successfully by plating of a Ni-B layer as primer and a Ni-P layer as outer layer from eco-friendly fluoride-free plating baths. The morphology, composition, and phase structure of the coatings were characterized by scanning electron microscopy (SEM), energy dispersive spectrometer (EDS) and X-ray photoelectron spectroscopy (XPS), and X-ray diffractometer (XRD), respectively. Several different electrochemical techniques such as linear sweep voltammetry, chronoamperometry, and electrochemical impedance spectroscopies (EIS) were used to analyze the deposition process and demonstrate the enhancement of corrosion inhibition of the Ni-B/Ni-P duplex coating. In addition, compared with Mg alloy and a single Ni-P coating, the new-designed duplex coating also exhibits a remarkable enhancement in micro-hardness.

Keywords: Mg alloy; electroless; fluoride-free bath; corrosion; double layer

* Corresponding authors. Tel./fax: +86 817 256 8081, Email address: zhxie@cwnu.edu.cn (Z.-H. Xie);

** Tel.: +86 731 8882 2275; fax: +86 731 8471 3642, Email address: yuganghnu@hnu.edu.cn (G. Yu).

Download English Version:

<https://daneshyari.com/en/article/8023975>

Download Persian Version:

<https://daneshyari.com/article/8023975>

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