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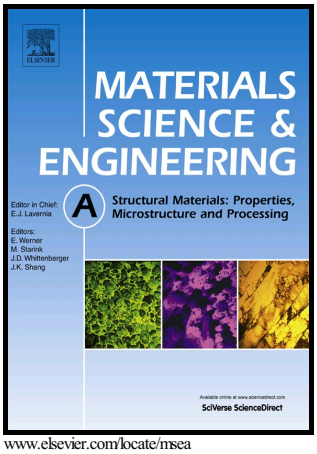

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PII: S0921-5093(17)31299-6
DOI: https://doi.org/10.1016/j.msea.2017.09.130
Reference: MSA35597

To appear in: *Materials Science & Engineering A*

Received date: 12 July 2017
Revised date: 29 September 2017
Accepted date: 30 September 2017

Cite this article as: Jiaan Liu, Shouquan Shi, Zhaobin Zheng, Kuo Huang and Yuying Yan, Characterization and Compressive Properties of Ni/Mg Hybrid Foams, *Materials Science & Engineering A*, https://doi.org/10.1016/j.msea.2017.09.130

Characterization and Compressive Properties of Ni/Mg Hybrid Foams

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Abstract: In this study, Ni/Mg hybrid foams were fabricated by depositing electroless Ni-P coatings on open-cell Mg foams. The microstructure, composition and phases of Ni-P coatings were observed and analyzed by scanning electron microscopy (SEM), energy-dispersive X-ray spectroscopy (EDS) and X-ray diffraction (XRD), respectively. The compressive properties of the Ni/Mg hybrid foams were evaluated by compressive tests. The results show that the compressive strength, specific strength and energy absorption capacity of open-cell Mg foams are improved by electroless plating. However, compared with open-cell Mg foams, the Ni/Mg hybrid foams exhibit more brittleness characteristics. It was found that the different compressive properties between the Mg foams and Ni/Mg hybrid foams were attributed to the diverse failure mechanisms confirmed by fractography observation.

Keywords: Mg foams; hybrid foams; electroless plating; compressive property;

1. Introduction

Metal foams have many excellent properties, such as light weight, high specific strength, good thermal conductivity, good sound absorption, excellent heat insulation, high damping property, high energy absorption capacity and other characteristics [1-7].

Recently, Mg foams gained wide attention. The fabrication route for the Mg foams can be roughly divided into melting foaming method, replication casting method, investment casting method and powder metallurgy method [8-12]. Some studies

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