

Accepted Manuscript

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PII: S0925-8388(14)01899-4
DOI: <http://dx.doi.org/10.1016/j.jallcom.2014.08.044>
Reference: JALCOM 31897

To appear in: *Journal of Alloys and Compounds*

Received Date: 24 May 2014
Revised Date: 23 July 2014
Accepted Date: 5 August 2014

Please cite this article as: L. Niu, S-H. Chang, X. Tong, G. Li, Z. Shi, Analysis of characteristics of vanadate conversion coating on the surface of magnesium alloy, *Journal of Alloys and Compounds* (2014), doi: <http://dx.doi.org/10.1016/j.jallcom.2014.08.044>

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1 **Analysis of characteristics of vanadate conversion coating** 2 **on the surface of magnesium alloy**

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9 **Abstract**

10 The vanadate conversion coating (VCC) was formed on the surface of magnesium
11 (Mg) alloy in vanadium phosphate solution, as well as the cathode electrophoresis and
12 bake-curing treatments of the conversion coating proceeded. According to the addition of
13 vanadate in the solution, the conversion coating is refined crystalline and possesses low weight
14 loss during electrophoresis and bake-curing treatment processes. Besides, when the content of
15 NaVO₃ is 4g/L in vanadate solution, not only the microstructure of conversion coating is the
16 most refined, but also the adhesion and corrosion resistance of electrophoretic paint coating
17 (EPC) is the best. On the other hand, the "rare earth phosphating VS low-temperature
18 electrophoresis" technique is suitable for Mg alloy coatings. As seen in scanning electron
19 microscope (SEM), the VCC reveals three-dimensional net structure, which provides a well
20 underlayer for the adhesion between electrophoretic paint and the samples.

21 **Keywords:** magnesium alloy, conversion coating, electrophoresis, vanadate

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