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Bih-Show Lou, Jyh-Wei Lee, Chuan-Ming Tseng, Yi-Yuan Lin, Chien-An Yen



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## Mechanical property and corrosion resistance evaluation of AZ31 magnesium alloys by plasma electrolytic oxidation treatment: effect of MoS<sub>2</sub> particle addition

Bih-Show Lou<sup>1,2</sup>, Jyh-Wei Lee<sup>3,4,5\*</sup>, Chuan-Ming Tseng<sup>3</sup>, Yi-Yuan Lin<sup>3</sup>, Chien-An Yen<sup>3</sup>

<sup>1</sup>Chemistry Division, Center of General Education, Chang Gung University, Taoyuan, Taiwan

<sup>2</sup>Department of Nuclear Medicine and Molecular Imaging Center, Chang Gung Memorial Hospital, Taoyuan, Taiwan

<sup>3</sup>Department of Materials Engineering, Ming Chi University of Technology, New Taipei City, Taiwan

<sup>4</sup>Center for Thin Film Technologies and Applications, Ming Chi University of Technology, New Taipei City, Taiwan

<sup>5</sup>College of Engineering, Chang Gung University, Taoyuan, Taiwan

\* Corresponding author

### Abstract

Magnesium alloys have been used in a wide range of lightweight applications in industries such as aerospace, automotive, and personal computing due to their high strength to weight ratio; however, high chemical reactivity, poor corrosion and wear resistance limit their widespread uses in many fields. The plasma electrolytic oxidation (PEO) process can produce a protective oxide layer on the magnesium alloy to improve the mechanical properties that limit more widespread application of magnesium alloys. In this work, molybdenum disulphide (MoS<sub>2</sub>) nanoparticles in concentrations ranging from 0 to 10 g/L were added into the PEO electrolyte. The aim of this study is to investigate the influence of incorporating MoS<sub>2</sub> nanoparticles on the microstructure, phase, as well as short- and long-term corrosion resistance, and other mechanical properties of PEO grown oxides. While the MgAl<sub>2</sub>O<sub>4</sub> phase was formed for all PEO grown oxide, the addition of MoS<sub>2</sub>

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