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## **A study on the surface anodization of Mg alloy by plasma generation in liquid phase**

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Magnesium and its alloys are known to have the smallest density among the practical metals, and to have strength properties comparable to aluminum some ferrous materials. Thus, they used as engineering materials when light weight and high strength are necessary.

Because of its poor mechanical properties and corrosion resistance, magnesium was used mainly as a non-structural materials in the past. so, process together with surface modification techniques including ion implantation and annealing have solved the corrosion problem of magnesium and its alloys to some extent. But their corrosion protection are still limited because of their inherent high chemical reactivity. Therefore proper surface treatments are required further to produce protective films, which play an essential role in the corrosion protection of magnesium and its alloys.

In this study, anodized magnesium film was synthesized on AZ31 by anodizing for corrosion resistance and isolating character.

we have characterized using X-ray diffraction(XRD), second electron microscopy(SEM) to obtain information on the coated surface. Mechanical properties of anodized film were evaluated by Nano indenter. The corrosion characteristics of anodized films were first investigated by a potentio dynamic polarization test and next by electrochemical impedance spectroscopy(EIS) in a 0.32g NaCl (1 liter).