

## ABSTRACT

A porous anodic aluminium oxide (AAO) thin film on aluminium was prepared in a mixed electrolyte of phosphoric acid and acetic acid solution. The growth and morphology of the film were investigated. During the anodizing process, the growth of AAO thin film is strictly influence by the anodizing parameter. The anodizing process was done by varying the anodizing voltage at 70 V to 130 V. The constant temperature of 10 °C to 15 °C was applied and the anodizing process was done in the solution of H<sub>3</sub>PO<sub>4</sub> and CH<sub>3</sub>COOH (H<sub>3</sub>PO<sub>4</sub>:CH<sub>3</sub>COOH). The results indicate that the growth rate of AAO thin film increased with increasing the anodizing voltage. Morphology of the AAO thin film was examined by scanning electron microscope (SEM). Result shows that higher anodizing voltage led to the larger pore diameter. The pores also uniformly distributed on the substrate surface when the anodizing voltage reached to 130 V. From this study, the optimum parameters to obtain nanoporous AAO thin film with H<sub>3</sub>PO<sub>4</sub> and CH<sub>3</sub>COOH solution can be known. The anodizing voltage should be in the range of 70 – 130 V in order to produce pores below 100 nm in size.

**Keywords:** Aluminium, Anodizing, Anodic Aluminum Oxide, Phosphoric Acid, Acetic Acid, Growth Kinetic, Pore Diameter.