Extreme Heating of Alumina Barrier Layer During High Electric Field Anodization of Aluminum

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**Abstract:** The temperature of alumina barrier layer during a high electric field anodization of aluminum (the current density more than 50mA/cm2)2) has been studied by analyzing the aluminum film resistance. In the case of Joule heat power density to be larger than 20W/cm2, the temperature inside the barrier layer can exceed 660∘C, which leads to the local melting of aluminum. Scanning electron microscopy has shown the location of molten aluminum droplets and their movement during the anodization process.

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