

Thin Anodic Alumina Films

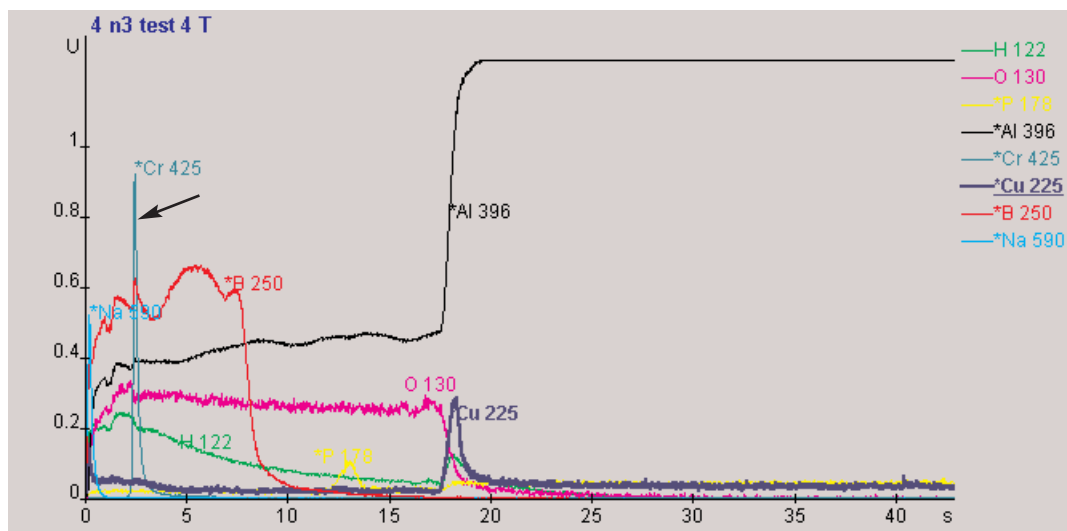
The anodic oxidation of aluminium in suitable electrolyte solutions forms a barrier anodic oxide film less than 1 μm thick. Such films are of commercial importance in the dielectric layers of electrolytic capacitors or in the fabrication of thin film electronic devices. The films contain small quantities of species derived from the electrolyte solutions, and these significantly affect the chemical, physical and electrical properties of the films. They are therefore also of considerable scientific interest.

The figure below shows the GD-OES depth profile of an anodised aluminium surface proposed now by JY as a reference sample. The sample is an electropo-

lished, mirror-finished, high purity aluminium, anodised at a constant current density of 5 mA cm^{-2} at 20 C in $0.1\text{M Na}_2\text{CrO}_4$ solution to 120 V, then rinsed in distilled water and warm air dried. The film is amorphous and highly uniform in thickness and microscopically flat. Inside the film, 19 nm from the surface, is an extremely narrow dark band about 2-3 nm thick. This band contains about 10 at. % Cr_2O_3 .



The TEM view of an ultra microtome section of the sample shows the narrow band and the uniform film structure.



Key point : RF-GD-OES can analyze thin films with excellent depth resolution