

## Characterization of nanoporous alumina films and photocatalytic properties

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**Abstract** – The Nanoporous Alumina Films (NAF) were synthesized by anodization, applied different voltages and electrolyte concentration, the result of this variations is different pore diameter and cell size. The NAF structural characterization has been by SEM and DRX. The films were probed in photocatalysts activity. Porous anodized films on aluminum that produce hexagonal ordering have attracted attention recently due to their high pore density and potential applications in the electronic and information storage industries, as well as their general use in nanotechnology

The nanostructured materials made up of grains or clusters in the nanometric range exhibit new optical properties of interest in many areas of application such as electroluminescent devices, optical and chemical sensors. For example, the particles of TiO<sub>2</sub> formed of nanosized particles in the anatase form show a very high efficiency photocatalytic activity due to their large internal surface [1]. Both the optical properties and the photocatalytic activity of TiO<sub>2</sub>; Also, porous alumina membrane (PAM) fabricated by two-step anodic oxidation of aluminum consists of highly ordered hexagonal arrays of straight, cylindrical nanopores. Although PAM was extensively used as a template to synthesize one-dimensional nanostructures with functional electronic characteristics, e.g., nanowires, it has only recently been employed to control optical properties because of we synthesized films depend strongly on the doping, size and the porosity of the films. We have prepared nanocrystalline films of Al<sub>2</sub>O<sub>3</sub> with TiO<sub>2</sub> doped by a decomposition method and have studied the structure and the spectroscopic properties of films.

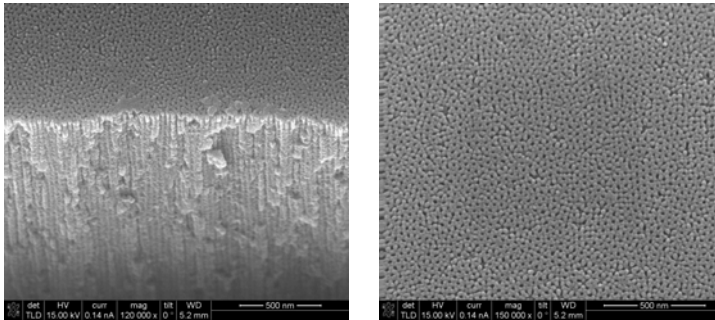


Figure 1: SEM micrographs

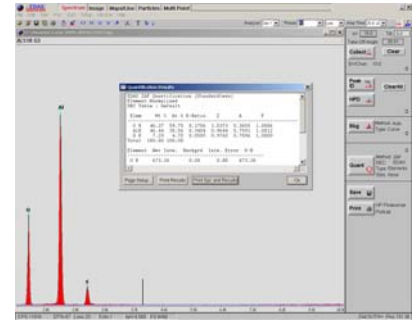


Figure 2:EDS.

### References

- [1] A. Matsuda, Y. Kotani, T. Kogure, M. Tatsumisago, and T. Minami, J. Am. Ceram. Soc., **83(1)** 229 (2000).