

## **Morphology and dimensions controlled of Titania nanotubes in mixed organic-inorganic electrolyte**

### **ABSTRACT**

The formation of self-organized and highly ordered Titania nanotubes was achieved by anodisation of Ti in a mixture of water-ethylene glycol electrolyte. Control over the dimensions and morphology of nanotubes was successfully established by changing the anodisation voltage, the ammonium fluoride (NH<sub>4</sub>F) concentration and the anodisation time. A threshold voltage of 5 V is required for nanotube formation. Collapsed tubes were formed by applying electrochemical etching at high fluoride concentration. This study also showed that the nanotube lengths ranging from 0.5 to 2.6  $\mu\text{m}$  could be formed by controlling the voltage applied and fluoride concentration with preferred growth along the c-axis.

**Keyword:** Anodic oxidation; Dimensions; Ethylene glycol; Morphology; Nanotubes.