

SYNTHESIS of ALUMINA TEMPLATES (AAO) for the PREPARATION OF METAL NANOWIRES AND CARBON NANOTUBES

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Template assisted synthesis has proven to be a low cost and effective method for preparing nanostructured materials such nanowires and nanotubes. Aluminium anodic oxide (AAO) is one of the most commonly used templates. Its main characteristic is the geometry of the self-organized pores: parallel channels with a high aspect ratio, which pattern the surface of the membrane in a hexagonal array. Aspects like thickness, diameter and interpore-spacing can be tuned by controlling the experimental conditions of the anodizing process of the aluminium. Through this mechanism one can gain control of size of the materials synthesized inside the template pores.

We hereby present new results achieved by means of improving the experimental conditions for AAO synthesis with ordered pores. These membranes have also been used as templates to prepare different types of nanomaterials [1-2]. Recently we have explored the preparation of AAO grown directly on silicon substrates. Nickel and Cobalt Nanowires were grown by means an electrochemical methods. Modifying the different electrochemical potentials and pH of the base solution, we can act upon the crystalline structure of the resulting products [3-4]. These particular templates can also be used for the synthesis of carbon nanotubes (CNTs) by means of chemical vapour deposition (CVD), without the use of catalyst particles. The resulting tubes have a very narrow diameter distribution consistent with the geometry of the pores.

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