INTEGRATION OF AEROTITANIA MICROTUBES IN UV PHOTODETECTORS

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Abstract

In the past yers, a new class of porous materials known as aero-materials has gained attention for their unique properties. Similar to aerogels in structure but obtained by different methods, aero-materials are typically synthesized by growing materials on sacrificial templates, avoiding the liquid phase. After removing the template, the material retains the shape of the substrate, resulting in an extremely porous and ultra-lightweight structure with special properties [1,2].

Aerotitania represent a 3D nanoarchitecture based on interconnected hollow microtetrapods based on Titanium dioxide (TiO_2). The material was synthesized using the Atomi Layer Deposition technique, by depositing ultrathin TiO_2 layers onto a sacrificial template consisting of an interconnected network of ZnO microtetrapods [3].

In this research, it is demonstrate a simple method to integrate aerotitania on a sensor platform based on interconnected electrods by using spin coalting technique. The sensitivity of the aero-titania sensor was measured through dynamic current and resistance responses to the alternation of UV illumination. The responsivity value was calculated, showing that it is directly influenced by the optical power and the thickness of aero-TiO_2 layer.

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