

Solution Growth of Titanium Nitride Nanowires for Implantation Application

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Abstract : The synthesis and characterization of one dimensional nanostructure such as nanowires has received considerable attention. Much effort has concentrated on TiN material especially in the biological field due to its useful and unique properties in this field. Therefore, for the purpose of this project, synthesis of Titanium Nitride (TiN) nanowires (NWs) will be presented. They will be synthesised by growing titanium dioxide (Ti) NWs in an aqueous solution at low temperatures under atmospheric pressure. Then the grown nanowires will undergo a 'Nitrodation process' in which results in the formation of TiN NWs. The structure, morphology and composition of the grown nanowires will be characterized using Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), X-ray Diffraction (XRD) and Cyclic Voltammetry (CV). Obtaining TiN NWs is a challenging task since it has not been formulated before, as far as we acknowledge. This might be due to the fact that nitriding Ti NWs can be difficult in terms of optimizing experimental parameters.

Keywords : nanowires, dissolution-growth, nucleation, PECVD, deposition, spin coating, scanning electron microscopic analysis, cyclic voltammetry analysis

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