

Reliable metal deposition into TiO₂ nanotubes for interdigitated electrode structures

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We present a new strategy to completely and homogeneously fill TiO₂ nanotubes with metal by electrodeposition. The presentation will discuss key steps to fabricate leakage free interdigitated electrode configurations. We use an optimized protocol that leads to uniform deposition into the TiO₂ nanotubes and presents leakage spots. We reach nearly 100 % filling of the tubes with metals, including Ag, Cu, Au and Pt, that all yield, operated as interdigitated electrodes, well defined electrical properties of the metal oxide junctions. It can be expected that these strategies are successful for virtually any n-type nanotubular material and cathodic deposition. The principles demonstrated are a requirement to construct any form of interdigitated electrode device, such as solid state sensors or solar cell devices.