

## In-situ construction of three-dimensional titania network on Ti foil toward enhanced performance of flexible dye-sensitized solar cells - DTU Orbit (09/11/2017)

### In-situ construction of three-dimensional titania network on Ti foil toward enhanced performance of flexible dye-sensitized solar cells

Three-dimensional titania network was in-situ constructed on Ti foil via sequential acid and hydrogen peroxide treatments. The titania network was pure anatase phase and homogeneously covered on the titanium grain surface, which largely enhanced the roughness of the Ti foil. The as-received Ti foil and the treated one were used as the flexible substrates of DSSCs, and energy conversion efficiencies of 3.74% and 4.98% were obtained, respectively. Such remarkable increment can be ascribed to the good electrical contact between the nanocrystalline TiO<sub>2</sub> and the Ti foil, the improved electron percolation pathways and recombination inhibition of electrons in Ti substrate with triiodide ions in electrolyte. Flexible DSSCs based on the treated Ti foil showed relatively good mechanical stability, which exhibited 97.3% retention of the initial efficiency after twenty consecutive bending.

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