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Carbon-Doped TiO2 Nanofibers Prepared by Electrospinning

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Abstract : C-doped TiO2 nanofibers were prepared by electrospinning successfully. Different amounts of carbon were added into the nanofibers by using chitosan, aiming to shift the wave length that is required to excite the photocatalyst from ultraviolet light to visible light. Different amounts of carbon and different atmosphere fibers were calcined at 500oC, and the optical characteristic of C-doped TiO2 nanofibers had been changed. characterizes of nanofibers were identified by X-Ray Diffraction (XRD), Field Emission Scanning Electron Microscope (FE-SEM), UV-vis, Atomic Force Microscope (AFM), and Fourier Transform Infrared Spectroscopy (FTIR). The XRD is used to identify the phase composition of nanofibers. The morphology of nanofibers were explored by FE-SEM and AFM. Optical characteristics of absorption were measured by UV-Vis. Three dimension surface images of C-doped TiO2 nanofibers revealed different effects of processing. The results of XRD showed that the phase of C-doped TiO2 nanofibers transformed to rutile phase and anatase phase successfully. The results of AFM showed that the surface morphology of nanofibers became smooth after high temperature treatment. Images from FE-SEM revealed the average size of nanofibers. UV-vis results showed that the band-gap of TiO2 were reduced. Finally, we found out C-doped TiO2 nanofibers can change countenance of nanofiber and make it smoother.

Keywords : carbon, TiO2, chitosan, electrospinning
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