Synthesis of carbon nanotube-titania composite for application in a self-cleaning self-sterilizing diaper

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Abstrak

Carbon Nanotubes-Titania (CNT-TiO2) composite that coated on diaper have been synthesized and tested for the removal of ammonia (self-cleaning test) and Candida albicans fungi (self-sterilizing test) that cause odor and make Candidiasis disease, respectively. The composite was characterized by FTIR, FESEM-EDX, XRD, and UV-Vis DRS. XRD and UV-Vis DRS results showed that the CNT-TiO2 composite has a high crystalline and low band gap. The results of self-cleaning and self-sterilizing tests showed that the optimum composition of the composite was 1-3 % wt of CNT and 97-99% wt of TiO2. Acid treatment at pH 1 were accompanied by ultrasonic agitation is an appropriate conditions on the composite synthesis. Within 2 hours of testing the modified diapers, the optimum composite can remove ammonia and Candida albicans by 91 and 98 %, respectively. Based on the experiment results, ammonia and fungi on the modified diapers was able to be removed up to minimum standard to prevent odor and diaper rash