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论文

纳米TiO_2改性蚕丝丝素蛋白膜的研究

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摘要 用溶胶凝胶法制备纳米TiO_2改性再生蚕丝丝素蛋白膜. 该丝素膜机械强度提高, 在水中溶失率下降. UV、AFM、SEM测试的结果表明, 丝素中纳米TiO_2粒径约为80 nm, 纳米粒子在丝素膜中分布均匀; XRD、FTIR测试结果表明, 纳米TiO_2的加入, 可使改性丝素膜的结晶结构从Silk Ⅰ向Silk Ⅱ转化, 其结晶度也随之提高; TGA测试表明改性丝素膜的热转变温度比纯丝素膜有所改变.

关键词 蚕丝丝素蛋白 纳米TiO_2 晶型

分类号

STUDIES ON NANO-TiO_2 MODIFIED SILK FIBROIN COMPOSITE FILMS

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Abstract With the sol-gel method,the regenerated SF(silk fibroin) / nano—TiO_2 composite films were prepared. Comparod to the pure silk fibroin films,the mechanical strength of these regenerated SF / nano-TiO_2 composite films were increased and the loss percentage of SF / nano-TiO_2 composite films in aqueous solution were decreased. By using UV,AFM and SEM,these films were characterized. The experimental results reveal that the diameter of nano—TiO particles in films was about 80nm. The nano—TiO_2 particles were well dispersed in the regenerated silk fibroin. It was found that the crystal structure of the composite films changed from typical Silk I to typical Silk Ⅱ.Furthermore,the crystallinity of the composite films was obviously improved. Through the TGA,it was demonstrated that the heat transition temperature of composite films was also changed.

Key words Silk fibroin Nano-TiO_2 Crystal form

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