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论文

# 纳米Ag-$SiO_2$聚氨酯抗菌性能评价

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摘要：

目的 比较7种纳米Ag-$SiO_2$含量不同的聚氨酯材料的抗菌性能。方法 制备含纳米Ag-$SiO_2$质量分数为0%、0.5%、1.0%、1.5%、2.0%、2.5%、5.0%的7种聚氨酯材料;选用金黄色葡萄球菌与大肠埃希菌为受试菌种,使用贴膜法测定各样品中的活菌数,并计算出各样品的抗菌率,对各样品的抗菌性能进行评级。使用含纳米Ag-$SiO_2$质量分数为1.0%、2.5%的聚氨酯材料进行抑菌圈实验,分别测定1、3、7 d的抑菌圈直径,测定材料的抗菌持久性。结果 含纳米Ag-$SiO_2$质量分数为0.5%、1.0%、1.5%、2.0%、2.5%、5.0%的聚氨酯材料对金黄色葡萄球菌与大肠埃希菌的抗菌率均>90%,并且随着纳米Ag-$SiO_2$含量的增高,抗菌率逐渐增高;1、3、7 d材料抑菌圈直径差异无统计学意义(P>0.05)。结论 纳米Ag-$SiO_2$含量增高,抗菌作用增强,且具有较持久的抗菌性,可以作为理想的抗菌材料应用于生活与医疗。

关键词： 纳米Ag-$SiO_2$ 聚氨酯 抗菌性能 贴膜法 抑菌圈

# Antibacterial property of nanoAg-$SiO_2$ polyurethane

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Abstract:

Objective To compare antibacterial property of seven kinds of polyurethane materials with different content of nanoAg-$SiO_2$.Methods Materials with nanoAg-$SiO_2$ at dose of 0%,0.5%,1.0%,1.5%,2.0%,2.5%,and 5.0% were prepared.*Staphylococcus aureus* and *Escherichia coli* were adopted as test strains.Sticking film method was used to determine living bacterium number and to calculate antibacterial rate.The antibacterial property of the materials was ranked.Bacteriostatic ring experiment with nanoAg-$SiO_2$ content of 1.0% and 2.5% was conducted simultaneously.The diameter of bacteriostatic ring was determined on 1,3 and 7 day of the test to determine antibacterial persistence of the materials.Results Antibacterial rates of polyurethane materials with nanoAg-$SiO_2$ content of 0.5%,1.0%,1.5%,2.0%,2.5%,and 5.0% for *Staphylococcus aureus* and *Escherichia coli* were all more than 90%.Antibacterial rate of the materials increased with the increment of nanoAg-$SiO_2$ concentration.Bacteriostatic ring diameters on 1,3,and 7 day of the test show ed no obvious difference(P > 0.05).Conclusion All polyurethane materials with nanoAg-$SiO_2$ content of 0.5%,1.0%,1.5%,2.0%,2.5%,and 5.0% have antibacterial property and lasting resistance to bacterial and could be used as antibacterial material in daily life and medical practice.

Keywords: nanoAg-$SiO_2$ polyurethane antibacterial property sticking film method bacteriostatic ring

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