

A Study on Antimicrobial Efficacy of Nano Silver Containing Textile

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ABSTRACT

*Antimicrobial activity of nano silver containing cotton fabric was examined on various kinds of microbes. The antibacterial effect was evaluated by an AATCC 200 test, a quantitative method. The results showed that the finished fabric exhibited excellent inhibitory efficacy on *Staphylococcus aureus*, *Escherichia coli*, *Staphylococcus aureus methicillin resistance strain (MRSA)* and *Pseudomonas aeruginosa*. The silver nanoparticles on the surface of textile fibers were investigated by scanning electron microscope.*

Key words: Silver, Nanoparticles, Antimicrobial activity, Cotton

INTRODUCTION

Silver is known as a disinfectant for centuries and widely used in the treatment of clinical diseases, including newborn eye prophylaxis, topical burn wounds, orthopaedic infections (Klasen, 2000). Presently, silver is an excellent candidate for antimicrobial finishes in textile sector (Yeo et al., 2003; Lee et al., 2003). When silver metal has a size of nano level, the high specific surface areas and high fraction of surface atoms of silver nanoparticles will lead to high antimicrobial activity comparing to bulk silver metal.

In textile goods, especially those consist of cotton fiber, provide large surface area with excellent environment to promote the bacterial growth. This often leads to objectionable odor, dermal infection, product deterioration, allergic responses, and other related diseases. There are many types of microorganisms which cause public health concern. Some important examples include Methicillin Resistant *Staphylococcus aureus* (MRSA), *Klebsiella pneumoniae*, *Staphylococcus epidermidis*, *Pseudomonas aeruginosa*, and *Enterococcus faecalis* are common pathogens in wound infections (Wright et al., 1998). Therefore, antimicrobial finishing should be necessary features of protective textile materials, especially in some high-risk environments, such as medical applications.

The purpose of this study is to examine the antibacterial activity of silver nanoparticles containing cotton fabric against *Staphylococcus aureus*, *Staphylococcus aureus methicillin resistance strain (MRSA)*, *Escherichia coli* and *Pseudo-*