

# ***Introduction***

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## INTRODUCTION

Increasing global competition in textiles has created many challenges for dyers and finishers. The growth in technical textiles and in their end-uses has generated many opportunities for the application of innovative finishes. Novel finishes of high added value for apparel fabrics are also be greatly appreciated by a more discerning and demanding consumer market. Textile finishing personnel and companies must be active in keeping abreast of the development in finishing that are emerging globally, in order to survive and prosper in this very competitive and cost-conscious sector of the textile industry. The future of the textile finishing depends upon rapid adoption of high performance, high added value finishes that provides innovative and novelty to the consumer and in seeking out new end-uses and market for such finishes says Shetty (2005).

Nanotechnology (Nano means dwarf) is increasingly gathering worldwide attention because it is widely perceived as offering huge potential in a wide range of end uses. The unique and new properties of nano material have attracted not only scientists and researchers but also industries, due to their huge economical potential. Nanotechnology is an emerging, highly interdisciplinary field promising bright future with special, ability to manipulate structural materials on the level of individual atoms and molecules. Kathirvelu (2010) states nanotechnology is an umbrella term covering a wide range of technologies concerned with structures and processes on the nanometer (nanometer=nm, nm is one-billionth of a meter ( $10^{-9}$ ) scale. Nanotechnology creates structures that have excellent properties by controlling atoms and molecules, functional materials, devices and system on the Nanometer scale by involving precise placement of individual atoms (around 0.1-100 nm, one nanometer is one millionth of a meter). Nanotechnology brings new functions and properties to develop new products and applications in the industrial fields such as chemistry, medical technology, automobile, textile industry, environmental industry and biotechnology where nano scale is so important. Although the meaning and the structure of the nanotechnology is very complex, it takes great part in our daily life.

Wong (2006) says nanotechnology has a great role in textile industry. Textile fabrics are one of the best platforms for deploying nanotechnology. Particularly Fibers made for optimal substrates where a large surface area is present for a given weight or volume of fabric. The synergy between Nanotechnology and the textile industry judiciously exploits this property of large interfacial area and the drastic change of energetic experienced by macromolecules or supramolecular clusters in the vicinity of a fiber when going from a wet state to dry state. Nano spray drying is gaining more and more attention as a gentle, single-step, continuous and scalable drying process which converts liquids into dry powders.

Cotton accounts for half the world's consumption of fibers and is likely to remain Owing too many of its innate properties and for economical reasons. Cotton is made of long chains of natural cellulose containing carbon, hydrogen and oxygen otherwise known as polysaccharides. The length of the chains determines the ultimate strength of the fiber. The unique physical and aesthetic properties of the fiber, combined with its natural generation and biodegradability, are reasons for its universal appeal and popularity. Chemical treatments such as Proban<sup>9</sup> and Pyrovatex<sup>10</sup> are two examples of durable finishes that can be applied to make cotton fire retardant. High moisture absorbency, high wet modulus and good handle are some of the more important properties of cotton fiber states Miraftab (2000)

The challenges faced by the finishing industry have intensified in the last one decade, with finishers facing with the new task of striving to survive in this global and highly competitive market. Consumers demand more durability, more functionality from their clothing. Today consumers insist for odor control, freshness, high performance and comfort says sivaramakrishnan (2007)

Today in the era of eco friendly environment, it becomes very important for human beings to live in a world of hygiene and freshness. The awareness of being healthy and hygienic for consumers has increased the demand for antimicrobial textiles. According to Chakraborty the promotion of healthier and physically active life style has paved the way for significant developments in imparting antimicrobial

finishes to cotton. Cotton is susceptible to bacterial attack as bacteria causes some fiber damage, and unpleasant odors and a slick, slimy feel on cotton. The unpleasant odor of human perspiration is caused by substances like carboxylic acid, aldehydes and amines of polymer linkages present in microbial enzymes which can easily affect the cotton fabrics necessitate the use of antimicrobial finishes.

Mosquito repellent textile is one of the revolutionary ideas in the textile field by providing the much-needed features of driving away mosquitoes, especially in the tropical areas. It protects the human beings from the bite of mosquitoes and thereby Promising safety from the mosquito-borne diseases, such as malaria, dengue fever, Nile fever, dengue hemorrhagic fever, chicken gunia and filariasis, are serious public health problems in tropical regions explains Sumitra (2012).

Fragrance finishes in textile product is one of the process which enhances the value of fabric by adding varies fragrance to it. The world market is constantly changing and so the demand of consumers is also increaseing. Everyone desires for continuous change .i.e. something different and unique reveals Vasanthakumar (2012). The effective change has to be implemented in the market by this extensive analysis, fragrance finishing is considered as emerging area and which has tumble down the textile industry with lively value added finish by incorporating different fragrance on the fabric, leading to the production of fragranced fabrics delivers Mendapara (2005).

The Eucalyptus is cultivated all over the world, the leaves from young trees are blue-green with a silvery bloom, were as the mature leaves are longer, pointed, tough and glossy green. Nearly all Eucalyptus is evergreen. Unlike other species of the myrtle family, Eucalyptus leaves are covered with oil glands. The copious oils produced by this plant an important feature of this genus.

*Hemidesmus indicus* (Indian sarsaparilla) is an important herb. The root is bitter, astringent, aromatic, and refrigerant. These are useful in vitiated conditions of pitta, burning sensation, leprosy, skin diseases. The root extract is bacteriostatic against *Mycobacterium leprae* Putsfroh Prajapati (2009).

The name Sandalwood is derived from the Sanskrit word '*chandana*'. It has always been valued for its fragrance and its resistance to insects and which grew to be a vital accessory in Hindu rituals. Sandalwood oil is extracted from the bark of the sandalwood trees. Sandalwood smells similar to other wood scents, except it has a bright and fresh edge with few natural analogues. When used in smaller proportions in a scent, it is an excellent fixative to enhance the head space of other fragrances.

The major drawback of existing method is lack durability. Nano finishing improves the durability of the fabric due to its larger surface area of the nano particles and it has high surface energy.

Home textiles are one of the important segments of the global textile industry. The basic textile products are given value added finishes using for home textiles. Although they are categorized as home textiles their usage is not restricted to homes but also to commercial premises such as hotels, hospitals, hostels, institutes, and offices and includes products such as bedspreads, bed covers, quilts, rugs, pillow covers, carpets, towel, curtains, tablecloth etc.

Pillow covers are widely used to shield cushion, pillows and duvets from dust. Pillow cases which are mostly used in places such as Boarding schools, colleges, general guest house in institutions, special sick room for in colleges needs special finishes such as antimicrobial, fragrance, and mosquito repellent finishes because large number of people tend to use the same bed and pillows.

The Nano finished pillow case would prevent the penetration of micro organisms inside the pillow. It liberates pleasant fragrance to induce sleep and also protect from mosquitoes.

## **Objectives**

The following are the objectives of the study

- Extraction of bio active compounds from *Eucalyptus globulus* (Eucalyptus leaves), *Santalum album* (Sandalwood) and *Hemidesmus indicus* (Sarsaparilla)
- Conversion of bio active compounds into Nano particles,
- Application of Nano particles into selected cotton fabric
- Evaluation of multi-functional properties of Nano finished cotton fabric.
- To develop the pillow case using Nano finished cotton fabric.