Study of Synthesis and Application of Titanium Dioxide (Tio2) Nanoparticles on Polyester/Cotton (P/C) Textiles for Imparting Multifunctional Properties.

Supervisor: Dr.R.Murugan **Candidate: Mr.A.Sivakumar**

In this work, titanium dioxide (TiO2) nanoparticles have been prepared through bottom-up chemical reaction method using sol-gel technique with various starting materials such as Titanium tetraisopropoxide (TTIP), Tetrabutyl orthotitanate (TBOT) and Titanium tetraethoxide (TTE). Nanoparticles prepared using these precursors have also been further subjected to modifications using the modifier of (3-Aminopropyl) triethoxysilane and the cross-linker hydrogen silicone oil. The unmodified and modified nanoparticles (Tu1, Tu2, Tu3, Tm1, Tm2 & Tm3) were applied on a selected textile substrate of Polyester / Cotton (P/C) fabric for imparting functional properties of the TiO2 nanoparticles such as photocatalytic activity, UV protection properties, antimicrobial and soil release properties. Other physical testing of textiles such as fabric areal density, thickness, crease recovery, drape coefficient, tensile strength, tearing strength, elongation, air permeability and whiteness index have also been studied as an effect of the treatment. The functional properties of the nano TiO2 treated fabrics such as, photocatalytic activity, UV protection property, antimicrobial and soil release property have been enhanced due to the nanoparticles treatment.