

Effect of Zinc Oxide Nanoparticles along with Sodium Hydroxide on Self-Cleaning and Antibacterial Properties of Polyethylene Terephthalate

Authors : Mohammad Mirjalili, Maryam Mohammadi, Loghman Karimi

Abstract : In this study, synthesis of zinc oxide nanoparticles was carried out along with the hydrolysis of Polyethylene terephthalate using sodium hydroxide to increase the surface activity and enhance the nanoparticles adsorption. The polyester fabrics were treated with zinc acetate and sodium hydroxide at ultrasound bath, resulting in the formation of ZnO nanospheres. The presence of zinc oxide on the surface of the polyethylene terephthalate was confirmed by scanning electron microscopy (SEM) and energy dispersive X-ray spectroscopy (EDS). The self-cleaning property of treated polyethylene terephthalate was evaluated through discoloring methylene blue stain under sunlight irradiation. The antibacterial activities of the samples against two common pathogenic bacteria including *Escherichia coli* and *Staphylococcus aureus* were also assessed. The results indicated that the photocatalytic and antibacterial activities of the ultrasound treated polyethylene terephthalate improved significantly.

Keywords : zinc oxide, polyethylene terephthalate, self-cleaning, antibacterial

Conference Title : ICMET 2017 : International Conference on Materials Engineering and Technology

Conference Location : Stockholm, Sweden

Conference Dates : July 13-14, 2017