Sustainable Materials and Technology

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Sustainable Nanomaterials

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Contents

Exploration of Advances in Sustainable Nanomaterials in Textile Industries

Tahmeena Khan, Saman Raza, and Shashi Bala

Abstract The modern textile industry is observing a constant demand for novel and sustainable fabrics resulting in huge improvements in mechanical strength, texture and durability by infusing elements of nanotechnology. In recent times the advent of smart textiles has resulted from the combination of conventional materials with smart nanomaterials. Smart textiles or fabrics can adapt to different environmental conditions by altering their characteristic features accordingly. Nanotechnology is being explored to design sustainable fabrics which are infused with different properties like microbial and ultraviolet resistance, hydrophobic, etc. This chapter aims to explore the recent advances in the field of textile designing via the conjugation of nanotechnology. The advances which are of great utility such as the introduction and functionalization of nanomaterials in textiles and the development of smart and cost-effective, efficient and wearable fibres for the fashion industry, personal and healthcare are summarized in the chapter. Along with the benefits, drawbacks like the nanotoxicity of the fabricated textiles and the remedial strategies are also discussed.

Keywords Smart textile · Sustainability · Nanomaterials · Environment · Nanotoxicity

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