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Abstract

Nonwoven materials: Key for infectious disease control

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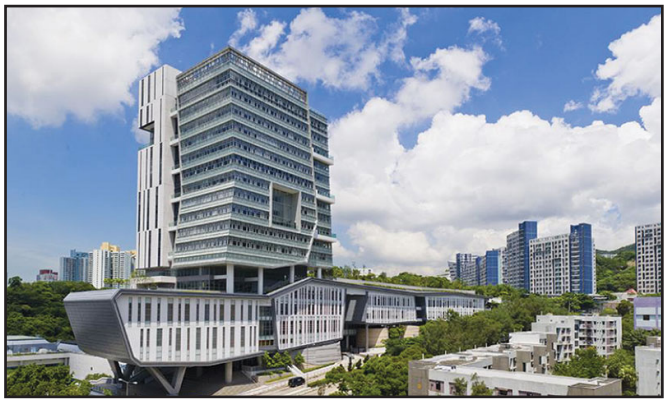
Abstract:
Nonwovens as the forefront of personal protective wearable materials, hold significant capability for airborne, waterborn and pathogen-based disease control, which is evidenced by the facemask and protective garments extensively and exceptionally used in this COVID-19. Spunbonding and meltblowing are the key approaches to fabricate nonwoven materials in such applications. We will present on the processing mechanisms, functions and principles of such nonwoven fabrics for combating aerosol and droplets generated bacterial and viral attacks. The filtration efficiency of meltblown nonwoven materials makes them uniquely suitable for infectious disease control. We will also stress the necessity of spunbond materials to enhance the performance and function of the SMS (Spunbond-Meltblown-Spunbond) based composite nonwoven healthcare protective textiles. Moreover, this presentation will discuss theoretical and experimental strategies of developing personal protective textiles using nonwoven materials for infectious disease control. In addition, we will also demonstrate our work on antimicrobial activity of nonwoven and functional nanofibrous materials, which will make a promising insight for future development of nonwoven protective materials with antiviral and antibacterial function.

Biography:

Professor Jinlian Hu, from the City University of Hong Kong, received education in Textile Engineering and Materials with PhD from Manchester University, MEng, Donghua University and BEng, Wuhan Textile University. She is a pioneer, sustained and distinguished academic leader with world-wide impact in shape memory polymers for various applications including biomaterials, medical and healthcare and textiles. Recently she has established the laboratory of Wearable Materials for Healthcare in City University of Hong Kong. This lab



focuses on unearthing scientific principles and providing solutions to key problems in Healthcare of Wearable Materials in four major areas: Traditional Chinese medical therapies and their materials, energy materials and healthcare, personal protective materials as well as spider silks and their relatives as biomaterials. From the discoveries and models of basic research, applied investigation, product developments and standardization are envisaged, which can produce societal as well economic impact in addition to scientific advances.

Recent Publications:

1. A Spider‐Capture‐Silk‐Like Fiber with Extremely High‐Volume Directional Water Collection, Advanced Functional Materials, 2020.
2. Tea-polyphenol treated skin collagen owns coalesced adaptive-hydration, tensile strength and shape-memory property, International Journal of Biological Macromolecules Volume 158, 1 September 2020, Pages 1-8, 2020
3. Zhu, Y., J. Hu, and K-W. Yeung. "Effect of soft segment crystallization and hard segment physical cross-link on shape memory function in antibacterial segmented polyurethane ionomers." Acta biomaterialia 5.9 (2009): 3346-3357.