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Topic of the Speech:
Decoration of Carbon Nanocomposites on Textile for High Photothermal Conversion

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Professor Weilin Xu is a professor of Textiles Science and Engineering at the Wuhan Textile University. His research interests include textile materials, textile processing technology, dyeing and finishing, biomedical textiles and natural fiber materials. He hosted more than 20 research projects such as Major State Basic Research Development Program, the National Natural Science Fund of China, and the Supporting Projects of China et al.

The main achievements include 2 edited books, 104 SCI journal papers in ACS Nano, ACS Applied Materials Interface, Polymers et al., and 55 approved patents. Prof. Xu has won more than 20 research awards and honors, including the 1st Class National Award for Progress in Science & Technology, the 2nd National Award for Technological Invention, Distinguished Achievement Award in Fiber Science, Most Outstanding Contribution Award of Hubei Province, Prize for Scientific and Technological Innovation of HO LEUNG HO LEE FOUNDATION, and the 2011 China Textile Academy Award and so on.

ABSTRACT SUBMISSION

-For invited speaker only

Decoration of Carbon Nanocomposites on Textile for High Photothermal Conversion

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ABSTRACT (NO MORE THAN 500 WORDS:)

Owing to its environmentally friendly and low-cost process, solar-driven evaporation attracted tremendous research attention, and has been applied in sterilization, desalination, and power generation et al. to date, Compared to conventional bulk heating-based evaporation, solar-driven interfacial evaporation has been determinated as a promising technology, which can potentially reduce thermal losses and improve energy conversion efficiency. Despite tremendous efforts to improve solar-driven steam generation, the development of solar steam generators with durability, portability, and high photothermal performance remains a significant challenge. Here, solar absorbers based textile are produced by uniformly decorating carbon nanocomposites on the fibril skeletons of pristine textile. The unique fabric structure and the broadband absorption by carbon nanocomposites allowed the absorbers based textile to exhibit high light absorption in the wavelength range of 300 to 2500 nm. The special structural feature of textile, which multiplies available evaporation area and possesses superior air permeability, promote solar evaporation. Moreover, the solar steam evaporator based textile existed great washability, flexibility, and excellent mechanical strength for low-cost, durable, and portable solar-steam applications. This unexpected finding reveals the hidden potential of textile as a low-cost material and provides inspiration for the future design and development of high-performance solar-driven steam generators.