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Topic of the Speech:
Visualization of Polymer Fiber Microstructures by AIEgens

Professor Yanhua Cheng
Donghua University
China

Professor Yanhua Cheng has been selected for the National High-level Youth Talent Program and the Shanghai Science and Technology Youth 35 Leading Program Nomination Award. In recent years, her main research focus has been on aggregation-induced emission (AIE) smart fibers and functional fiber composite materials, as well as research on intelligent fibers and functional flexible composite systems adapted to extreme environments.

She has published more than 50 SCI papers in journals such as Adv. Mater., Angew. Chem. Int. Ed., and Natl. Sci. Rev. Yanhua Cheng also serve as the Secretary-General of the China Materials Research Society Women's Science and Technology Working Committee, editor of Advanced Fiber Materials, youth editor of Chinese Chemical Letters, and early career consultant of Chemistry-An Asian Journal. She has also led more than 10 national and corporate projects, including the National Natural Science Foundation, National Key R&D Program sub-projects, and Shanghai Natural Science Foundation. She has been honored with the 2021 China Textile Industry Federation Technical Invention Award (ranked 3/6), the 2020 National Technical Invention Second Prize (ranked 5/6), the 2019 China Textile Industry Federation Science and Technology Award-Second Prize for Technological Progress (ranked 3/10), and the 2019 Textile Industry Military-Civilian Dual-use Technology Innovation Achievement Award (ranked 3/10).

ABSTRACT SUBMISSION
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Visualization of Polymer Fiber Microstructures by AIEgens

Yanhua Cheng
State Key Laboratory for Modification of Chemical Fibers and Polymer Materials, College of Materials Science and Engineering, Donghua University, Shanghai, 201620, China
*Presenter's email: cyh@dhu.edu.cn

ABSTRACT (NO MORE THAN 500 WORDS:)

The chain structure, condensed matter structure and hybrid structure of polymer fibers are the keys to link molecular information and macroscopic properties. Therefore, how to track the structural evolution in the material processing process, and improve the material production efficiency are the key issues in the material design and preparation process. Although many advanced equipment and methods have successfully achieved the characterization of polymer structures, most of these techniques are limited to a fixed state, and it is difficult to track the dynamic evolution process. In order to address above problems, aggregation-induced emission (AIE) organic molecules are used as intelligent building units, and they are heterogeneously assembled with polymer networks through physical or chemical bonds. The macroscopic optical signal is used to reversely perceive the changes of the polymer microenvironment, realize the online visualization of the polymer chain structure (resolution: 30 μm, response time: < 1 s), condensed matter structure and its hybrid structure, establish the structure-activity relationship between the polymer material structure and the macroscopic optical signal. The intelligent application of optically responsive materials provides theoretical guidance and data support for the processing and preparation of polymer fibers and their composites.