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IAPME Seminar

Construction of Highly Oriented Ceramic Nanofiber-Integrated Polymer Composites via External Field-Assisted Electrospinning Strategy

7 January 2026

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Venue: N23-1004b
Time: 14:00 - 15:00
Hosted by: Prof. Binmeng CHEN

Abstract

Nanofiber-integrated polymer composite materials combining advantages of the high porosity and well-connected pore channels of nanofibers with the flexibility and easy processing of polymer materials demonstrate multi functions and diverse applications. However, the critical issues including the random distribution of conventional nanofibers and poor organic-inorganic interface compatibility remain major bottlenecks limiting the overall performance. Herein, we begin with the microstructure design of highly oriented ceramic nanofibers by involving the external field-assisted electrospinning strategy, which enables the low-tortuosity lithium-ion transport pathways within the ceramic electrolyte phase. Furthermore, the organic-inorganic interfacial interactions are precisely engineered by in-situ polymerization or physical assemblies to accelerate the ion-selectively transport kinetics at the interface. Collectively, these advances enable the achievement of ceramic nanofiber-integrated polymer composite solid electrolytes with excellent electrochemical performance and high safe features for potential applications in next-generation solid-state energy storage.

Biography

Prof. Yue-e MIAO is now a Professor at College of Materials Science and Engineering, Donghua University. She received her BS degree from Southeast University and PhD degree from Fudan University. During 2013-2014, she was a joint-training PhD candidate at Nanyang Technological University. She has published over 50 research papers as the corresponding author in journals such as Angewandte Chemie and led over 10 research projects including National Excellent Youth Science Fund of China. She now serves as the Academic Editor of Advanced Fiber Materials, and Young Editorial Board Member of Composites Communications and eScience. Her research interests mainly focus on design and construction of functional polymer nanofiber composite materials to impart new structure-to-function properties in electrochemical energy storage applications.