

NANO TECHNOLOGY AND NANO ENGINEERING & World Congress on ALLERGY, IMMUNOLOGY AND INFECTIOUS DISEASES

July 24-25, 2019 | Vancouver, Canada



Fatemeh Zabihi

Donghua University, China

Functional thin films and fiber-based membranes, assembled in room temperature, for flexible energy packs

The new generation of photovoltaic and electronic devices, assembled on flexible substrates such as papers, textiles and polymers promise daily application of miniaturized, portable and wearable power sources. However, commercialization of the technology is hindered by several tough challenges. A serious concern in this line arises from tough manufacturing issues. Particularly, deposition of the typical semi-conductors such as a metal oxide (SnO₂, TiO₂, NiOx, ZrO₂ and ZnO), organic/ inorganic perovskite and conjugated and doped donor-acceptor polymers, are necessarily associated with thermal annealing, which is incompatible with a flexible background. Alternative low-temperature techniques e.g. magnetron sputtering, photochemical

activation by UV and atomic-layer plasma-assisted deposition (ALD) are assisted by chemical processes or need a vacuum atmosphere, which is costly, utility consuming and environmentally unfriendly. With this background, we pioneered a versatile, low-cost and potentially room-temperature strategy, which is applicable with all the features of solution processing (spin/ spray/ drop casting and jet printing). A fast exposure to the acoustic streams and ultrasonic waves allows evenly deposition of a compact, pin-hole free and highly functional solid layer from collide solutions, free of heating and chemical processing. Ultrasonic assisted solution processing revolutionizes the status of flexible and wearable energy resources in our routine life, in the near future.

Biography

Fatemeh Zabihi is a faculty member in College of Material Science and Engineering in DHU. She has been working as a Post-doctorate Fellow and senior researcher at the University of Michigan-Shanghai Jiao Tong University Joint Institute (2012-2014). According to her strong chemical and engineering background her multidisciplinary research is focused on Thin film Technology and Thin Film Solar Cells, Solution Processing and Solution Engineering, Surface Sciences and surface Phenomena, Coating and Spray Pyrolysis, Thermodynamic and Phase Equilibrium studies.

fzabihi@dhu.edu.cn