

Abstract

Tetrapods based Smart Materials for Advanced Technologies

Yogendra Kumar Mishra

Professor WSR

Mads Clausen Institute, NanoSYD, Smart Materials

University of Southern Denmark, Alision 2, 6400, Sønderborg, DENMARK

Email: mishra@mci.sdu.dk

Considering the size dependent utilization complexities of nanoscopic dimensions towards real applications, the focus of nanomaterials community is merging to three-dimensional (3D) form of materials which are built out of interconnected anisotropic nanostructures. This talk will briefly introduce the importance of tetrapod shaped nanostructures towards smart 3D nanostructuring. A simple flame based single step approach was developed for synthesizing zinc oxide tetrapods which demonstrated many applications in different technologies. These tetrapods have been used as building blocks to construct highly porous interconnected 3D nanonetworks in form of flexible ceramics which offer many new application avenues. Additionally, these smart nanonetworks have been utilized as sacrificial templates to develop hollow tetrapodal 3D networks from almost any desired material (carbons, nitrides, oxides, polymers, hydrogels, etc.). The sacrificial template-based strategy offers new and unique opportunities in the direction of 3D nanomaterials engineering and accordingly advanced technological applications. Some examples of 3D nanomaterials engineering will be demonstrated along with their applications [1-10]. The scopes of 3D nanostructuring based smart materials in sensing, electronics, optoelectronics, energy, and biomedical engineering, etc. will be briefly highlighted in the talk.

Keywords: *Smart Materials, Tetrapods, Hybrid Nanomaterials, Advanced Technologies*

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Biography



Yogendra Kumar Mishra is Professor MSO at Mads Clausen Institute, NanoSYD, University of Southern Denmark (SDU), Denmark. Prior joining to SDU, he worked as group leader at Kiel University, Germany. He did Habilitation in Materials Science from Kiel University in 2015 and Ph. D. in Physics in 2008 from Jawaharlal Nehru University (Inter University Accelerator Centre), New Delhi, India. In Kiel, he introduced a new flame-based process for metal oxide tetrapod nanostructuring and their 3D networks which showed many applications in engineering and biomedical fields. Additionally, tetrapods can be used as templates to create hybrid and new 3D materials. At NanoSYD, he is heading 'Smart Materials' group with the focus to develop new materials for green and sustainable technologies. He is Humboldtian and recently honored with FRSC- Fellow of Royal Society of Chemistry.

- Publications > 300, Citations> 16800, H-index: 70
- Editorial Board Member/Associate Editor for several high impact for magazines

<https://portal.findresearcher.sdu.dk/en/persons/Mishra>

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