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Design & Development of Graphene-based Materials for Electrocatalytic Application

Benchmark materials like Pt/C were used as references in the electrocatalytic applications of materials. However, it is an expensive and precious metal with less abundance. Therefore, to provide cost and efficient alternative design & development of electrocatalytic materials is the need of an hour. Owing to this fact & due to astonishing properties, 2D materials like graphene have emerged as scaffolds with numerous active sites. These hybrid graphene-based materials can truly act as an electrocatalyst for hydrogen evolution reaction (HER), oxygen evolution reaction (OER) and oxygen reduction reaction (ORR). As prepared catalyst has been widely characterized by using sophisticated analytical techniques such as near-edge X-ray adsorption spectroscopy (NEXAS), ¹³C solid-state NMR, HR-XPS, HR-TEM, SAED, XRD, SEM, AFM, Raman, TG-DTA, FTIR, UV-Vis etc. Furthermore, structural features have revealed the potential of these materials as an advanced functional material towards metal-free supercapacitor application. Apart from all these things, and environmental impact of newly prepared catalysts need to be explored for the confirmation of their biocompatibility. Biological studies have ascertained the same. Hence, in present studies, the emphasis is given to the design & development of benign materials for electrocatalytic applications for energy conservation and storage.

Biography

Shrikant S Maktedar is an Assistant Professor at the Department of Chemistry, National Institute of Technology, Srinagar, J&K, India. He received B.Sc. Degree in Chemistry from Ramkrishna Paramhansa Mahavidyalaya, Osmanabad (Babasaheb Ambedkar Marathwada University, Aurangabad) in 2008 and M.Sc. Degree in Physical Chemistry from Dept. of Chemistry, Babasaheb Ambedkar Marathwada University, Aurangabad in 2010. He has completed his PhD from Central University of Gujarat, Gandhinagar, India. In the last 10 years, he has been working in the field of carbonaceous materials with emphasis on their multifunctional applications. Shrikant has published more than 10 research publications in peer-reviewed international journals of repute, one book chapter and two full-length conference papers. He has served as a reviewer for a few international journals of repute. After his joining NIT Srinagar he is serving as PhD supervisor and has established the Materials Research Laboratory at Dept. of Chemistry.

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