



THE UNIVERSITY *of* EDINBURGH

School of Engineering

IMP Seminar Series

13:00 – 14:00 / 14th Sept 2022

TBC

Periodic Nanoporous Materials for Energy and Environmental Applications (Parasuraman Selvam)



Abstract

The discovery and development of periodic porous materials of well-defined pore geometry with precise and easily controllable pore shape and size are of great importance in many areas of modern science and technology. In this regard, mesoporous and hierarchical (micro-meso-macro) molecular sieves including zeolite-like metal-organic framework structures (MOFs) are the new generation of ordered porous solids, analogous to conventional microporous (zeolitic) materials, with high surface area, large pore opening and huge pore volumes. In designing such materials, several characteristics of pore structure may be addressed, which include their shape, size, pore interconnectivity, etc. Likewise, traditional preparation methods of supported catalyst systems are neither efficient in generating/dispersing uniform-sized clusters nor chemically inert towards the guest molecules. Nevertheless, the confinement of nanoclusters/nanofilaments in the cavities/voids/pores of nanostructured matrices is attracting much attention as a way to stabilize highly dispersed materials in the form of atoms, clusters, colloids, or filaments, and prevent their coalescence into larger, ill-defined aggregates. In this context, self-assembly of nanoparticles into ordered pore structures, i.e., encapsulation of the nanosized materials in zeolitic pores, is considered one of the promising options. In this talk, the recent progress in the development of numerous nanoscale materials and their applications relating to energy and the environment will be discussed.

Bio

Dr. Parasuraman Selvam is currently Head, National Centre for Catalysis Research (NCCR), IIT-Madras, Chennai, and Professor in the Department of Chemistry, IIT-Madras, Chennai, India; Adjunct Faculty, International Research Organization for Advanced Science and Technology (IROAST), Kumamoto University, Kumamoto, Japan. His research work involves the development of novel synthetic routes for the preparation of nanostructured materials including highly organized nano-zeolites and hierarchical zeolites; size- and shape-controlled nanomaterials as well as supported metal catalyst systems.

Prof. Selvam has published over 345 original research papers and is a co-inventor of about 25 patents. He has also been bestowed with several national and international awards and honours. Details in: <http://nccr-iitm.com/selvam/>

