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Research areas : Nanomaterials, Thin Films

Title of the research :

Preparation of Nanosized Zeolite materials for removal of Automobile Exhaust flue gases applications



Current position : Research Scholar, Coimbatore Institute of Technology, India

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Description of current and past research:

My research area mainly focuses on the potential for advanced physisorbents based on mesoporous and microporous materials coordination networks, particularly Zeolites. Zeolites are typical naturally occurring nanoporous inorganic materials with a regular and open microporous structure composed of a three-dimensional network of $[\text{SiO}_4]^{4-}$ and $[\text{AlO}_4]^{5-}$ tetrahedra, they can also be synthesized in the laboratory. At present, I am working on the synthesis of zeolites materials by using both chemical and natural wastes. Natural wastes such as Rice husk, Sugarcane bagasse, Bamboo leaves, etc., are rich in silicon source and were used for synthesis to reduce the toxicity. Zeolites have a great potential for industrial applications due to their high thermo-chemical stability, ion exchange property and molecular dimension pores. The removal of carbon dioxide (CO_2) from industrial emissions has become essential in the fight against climate change. Due to zeolites possessing special pores and windows, which give access to molecules that are smaller than the zeolites themselves while excluding larger molecules and they are widely used for gas separation. The focus is currently on adsorbents for the separation or reduction of carbon dioxide from the automobile exhaust. The post-combustion adsorption method is chosen for my application.