Design, Synthesis, and Fabrication of Chemosensor Materials of Innovative Application

Prof. Dilip K. Maiti, *FRSC*

Catalysis and Materials Division, University of Calcutta, 92 A. P. C. Road, Kolkata-700009, India

E-mail: dkmchem@caluniv.ac.in

Organic materials have several advantages including high degree of purity, rigid crystalline structure, non-suffering from magnetic interference, toxicity and liquid junction potential due to interface of different solvents and electrolytes over inorganic counterpart. The organic electronic products are also lighter, more flexible, biodegradable, inexpensive, and ease to purify, fabricating devices and modify electronic environment. Thus, semiconducting, electronic and optoelectronic properties can easily be modified through changing size, shape, chemical structure, morphology and installation of a wide range of functional groups, which in turn generates innovative semiconducting, conducting, photoluminescence, storage, display and chemosensing performances to achieve highly efficient new generation electronic devices.[1] Thus, design and synthesis of new organic compounds as varied probes, their fabricated unidirectional materials and development of especially new chemosensing property are desirable for achieving sensor devices of ultimate sensitivity. We have developed several organic probes and materials for sensing poisonous gases. phosphates, hydrazines, metal ions and other analytes.[2] For instance, fabrication of organic nanofibrils using 3-oxime-4-hydroxy-1,8-naphthalic-nbutylimide (**R1**)-doped polycaprolactone (PCL) electrospun used as a gaseous phosgene-specific sensing device. Herein, the higher surface to volume ratio and innovative properties of the nanofiber mats exhibits diminution of response time in comparison to the composite film of the same materials. Proficient gas penetration confers a fast chemical reaction, which is linear to the phosgene concentration and delivers a very low detection limit of 0.087 ppm. Importantly, LOD of gaseous phosgene in all type of solid-protocols used is far lower than the safety level phosgene concentration to human exposure.[2g]

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