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Recent development of surface engineering of nanoparticles in suspension for applications in bio-sensors

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The fabrication of nanoporous/nanoparticulate composites and their applications via surface patterning with chemicals and bio-chemicals has a direct impact in bio-sensing and bio-separation. Surface patterning on nanoparticles in suspension can be a complex process due to the aggregation of the particles and their Brownian motion in the suspension. An overview of group's research on nanomaterials and their applications in the separation of nucleic acids (DNA and RNA) from the biological cells will be presented in connection with an industrial collaboration with Q-Bioanalytic, Germany where we have commercialized our nanoparticles for DNA separation. The possibility of affinity interaction of biomolecules i.e., nucleic acid, protein, antibody, microorganisms, etc., through hybrid capture will also be discussed in the context of food quality and hygiene in bio-sensing which has recently been published in Nature publishing group. Separation of toxic and microbial contaminants from water and soil using nanotechnology tool will be discussed with respect to an on-going multinational project with the top researchers from China and an industry from UK. Recent on sensing antimicrobial nanocomposites will be discussed in connection with water technology.

Biography

Tapas Sen has a PhD in Materials Chemistry and more 20 years' experience in developing novel nanocomposites and their surface patterning for applications in bio-sensors, bio-separations, nanomedicine, industrial catalysis, and food technology. Currently, he is leading the surface patterning group, Institute of Nanotechnology and Bio-engineering, University of Central Lancashire, UK. He is the member of the Editorial board of ISRN Nanotechnology and Journal of Nanoparticles and a fellow of the Higher Education Academy (FHEA) in UK. He is the principal inventor of two Great Britain Patents and very active in publishing high quality research papers with high citation.

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