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## Water Purification using Nanotechnology

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In recent years, extensive efforts have been devoted to develop nanostructured materials with unique reactivity and functionality for environmental clean-up. The presence of heavy metals such as Cr, Hg, As, Pb, Ni, Co etc. in both fresh water sources and industrial wastewater, is a critical health and environmental issue due to their high toxicity and bioaccumulation through the food chain and hence in the human body. Nowadays, smart polymeric nanostructured materials based on polyaniline and polypyrrole are promising materials in water treatment because they are cheap, easy to prepare, non-toxic, it displays high adsorption capacity and it also has ion exchange property. Recently, we have developed conducting polymer based nanocomposites via in-situ polymerization technique, for the removal of highly toxic pollutants. Adsorption of pollutants on the surface of the adsorbent was confirmed by the ATR-FTIR and XPS. XPS studies also provided mechanistic aspects in detailed. Desorption studies showed that in spite of the limited recovery of the adsorbate from the adsorbent; the regenerated adsorbent could be reused successfully without appreciable loss of its original capacity. On the other hand, spent adsorbents could be re-used for different applications: catalysis, antimicrobial activity and gas sensor.

### Biography

Dr. Arjun Maity earned his PhD degree in chemistry from University of Calcutta, India. After that he joined at DST/CSIR National Centre for Nanostructured Materials (NCNSM), Materials Science and Manufacturing, Council for Scientific and Industrial Research (CSIR), as a post-doctoral fellow. In 2009, he joined at Polymers and Composites department, CSIR, as a senior Researcher. Currently he is principal researcher at NCNSM, CSIR. His research interests are synthesis and engineering of nanocomposites for environmental applications. He has published more than 88 papers in reputed journals.

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