National Institute of Technology Rourkela

Defence Seminar

Seminar Title	: Design and Synthesis of Polymeric nanocomposite material for Efficient Removal of Cr(VI) from Aqueous Solutions
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Venue	: Seminar Hall, Chemistry Department ,NIT,Rourkela
Date and Time	: 15 Jan 2025 (10.30 AM)
Abstract	: Water pollution has become a significant global issue due to the increased presence of heavy metal ions and various pollutants in aquatic systems giving a serious threat to living organisms. Cr(VI) is highly toxic among heavy metals pollutant which affects millions of people worldwide. Even minimal the exposure to Cr(VI) above permissible limit causes a number of diseases which include nausea, diarrhoea, respiratory disorders and also DNA mutations and genetic information damage, which can lead to malignant tumours and failure of kidney. So, the remediation of Cr(VI) is a necessary main focus for researchers. This research to aim synthesis and utilization of novel polymeric nanocomposite materials designed for the adsorptive sequestration of hexavalent chromium. Here, we have synthesized polymeric nanocomposite of polypyrrole zirconium phosphate, polyaniline zirconium tungstophosphate, polyaniline yttrium phosphate and polypyrrole modified layer double hydroxides by using pyrrole and aniline as an organic component and zirconium phosphate, zirconium tungstophosphate, yttrium phosphate and layer double hydroxides as inorganic components. The assessment of the structural, morphological, textural functional, and thermal stability of the synthesized materials is conducted using various analytical techniques like XRD, TEM, FESEM, EDX, Raman spectroscopy, TGA-DTA, FTIR, N_2 sorption isotherms, Zeta potential measurements, XPS and other instrumental analyses. Batch adsorption experiments were performed to found Cr(VI) adsorption capacity by nanocomposite material. Regeneration studies are carried out to know about better durable, sustainable and capable of composite material. These studies show that these nanocomposite have potential adsorbent for efficient removal of Cr(VI) from aqueous solution.