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Adsorption studies of Cr (VI), and Cu (II) metal ions from aqueous solutions by synthesized Ag and Mg co-doped TiO_2 nanoparticles

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The present communication provides the eliminating of heavy metals from water resources using Ag-Mg/TiO2 nano particles. The Nanoparticles with a size of 15nm were synthesised using sol-gel technique .The doped oxide is subsequently used for the removal of Cr (VI) and Cu (II) from waste waters. Batch sorption studies were carried out to investigate the adsorption of the above trace metal ions for a concentration range of 0.1 mg/L to 10 mg/L. The maximum sorption capacity values were found to be 2.42 mg/g for Cr (VI) and 2.03mg/g for Cu (II) at a concentration of 0.1 ppm. The mechanism of adsorption was also investigated. Isothermal, kinetic and thermodynamic studies were also carried out to study the adsorption capacity . The value of the thermodynamic parameter ΔH° revealed the endothermic adsorption process and negative value of ΔG° shows the feasibility and spontaneity of material–anion interaction. In addition the method is considered to be simple and cost effective and shows excellent adsorption removal properties on heavy metals for industrial applications.

Keywords: Silver and Magnesium co-doped TiO_2, Sol-gel, isotherms, and Kinetic studies.

Recent Publications

1. Removal of heavy metals Pb(II), Cd(II) and Cu(II) from waste waters using synthesized chromium doped nickel oxide nano particles Bull. Chem. Soc. Ethiop, 32(2), 225-238. . 2018 (ISSN 1011-3924)
2. Synthesis and Characterization of Fe3+ and Ag+ Co-doped TiO_2 Nanoparticles and It's Photocatalytic Degradation of Rhodamine B under Visible Light Journal of Chemistry and Chemical Sciences, Vol. 5(7), 403-413, July 2015.
3. Synthesis and characterization of [Ni-Al-Fe] nanocomposite and its application for the removal of Cd(II) and Zn(II) ions. Indian journal of chemistry-A, Vol55A, 816-819July 2016 .
4. Iso-StructuralityInduced Phase Transformation :A case study with Lnalidomide.Crystal Growth& Design(ACS) ,Vol 17,612-628, Dec 2017.
5. Preliminary studies on unusual polymorphs of thymine: structural comparision with other nucleobases. Journal of molecular structure Vol 11120,86-99, Dec 2016

Biography

R Ravichandra Babu has completed his PhD from Andhra University, Visakhapatnam, India. He is the Director/Professor of Gitam University, India. He had several years of experience in the QA and QC departments of a chemical industry, where he has developed many analytical methods for process related impurities determination and monitoring of environmental pollution. Completed two major projects funded by Govt of India on Nano material synthesis and their applications for removal of trace metals and degradation of organic contaminats.He has over 40 publications and has been serving as an editorial board member of reputed journals.

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