Fabrication of Supersand for Water Purification

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Fluoride is an essential constituent for both human and animal health that depends on concentration in the medium. The sand is conventionally used in water treatment plants to control water turbidity. This project is aimed at improving its performance using a chemical modification to remove other water contaminants as well. Thus improved substrate is designated as "Super sand". Super sand has proven to be a better adsorbent for the removal of certain heavy metals and dyes from water. Among several treatment technologies applied for fluoride removal, adsorption process has been explored widely and offers satisfactory results especially with mineral-based and/or surface modified adsorbents. Graphene Oxide was synthesized using the modified Hummer's method. Super sand was synthesized by heating a mixture of sand and graphene oxide/deionized water in an oven for two hours. The process was repeated five times for multiple coating. Graphene oxide and super sand were characterized using Scanning Electron Microscope (SEM), Energy Dispersive X-ray Spectrometry (EDS), Fourier Transform Infrared Spectroscopy (FT-IR) analysis and X-Ray Diffraction (XRD). The applicability of the synthesized material in the water industry for fluoride removal was studied utilizing sand, GO-sand and GO multiple coated sand at varying pH conditions. These results are to be confirmed by conducting further scientific studies.

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