

COMPOSITES OF SURFACE MODIFIED *AGAVE AMERICANA* FIBERS AND SILVER NANO PARTICLES FOR REMOVAL OF METHYLENE DYE FROM WATER

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Abstract: - Nowadays, water contamination is a serious issue all over the world, dyes used in textile industries and the industrial wastes are the main source of such contamination. Rapid growth in industrial development has resulted in the generation of a wide range of harmful toxic pollutants such as dyes, heavy metals, cleansers, acids etc. Dyes are the significant class of contaminants which are tremendously used in several industries like plastic, paint, pharmaceuticals, textiles etc. Several conventional methods such as coagulation, flocculation, adsorption, etc. have been used for the elimination of dyes from wastewater. In present work, efforts were made to modify the surface of *Agave americana* fibers (AAFs) by utilizing a sequence of chemical techniques and their subsequent utilization as adsorbent to remove methylene blue dye from waste water. The surface modification of AAFs was carried out by utilizing polydopamine (PDA) coating agent, which were subsequently graft copolymerized with vinyl monomer acrylic acid (AAc), and finally doped with silver nano particles (AgNPs) to synthesize nano composites. The synthesized surface modified AAFs and nano composites were characterized by using SEM, FTIR and XRD technique and finally assessed for their potential in removal of dye from waste water. The grafting of PDA, polyacrylic acid, and silver nanoparticles onto the cellulosic fibre resulted in morphological changes and the formation of new bands in the FTIR spectra of the grafted samples. Thus, confirming the grafting of polydopamine, polyacrylic acid and silver nanoparticles onto the cellulosic fibre. Among different surface modified fibers, silver nanoparticles doped/polyacrylic acid/PDA/ *Agave Americana* composites have been found to have a high potential (91% removal efficiency) in removal of dye from wastewater.