

Semiconducting Nanostructures Based Organic Pollutant Degradation Using Natural Sunlight for Water Remediation

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Abstract : In this work we report an effective water filtration system based on the photo catalytic performance of semiconducting dense nano-brushes under natural sunlight. During thin-film photocatalysis usually performed by a deposited layer of photocatalyst, a stagnant boundary layer is created near the catalyst which adversely affects the rate of adsorption because of diffusional restrictions. One strategy that may be used is to disrupt this laminar boundary layer by creating a super dense nanostructure near the surface of the catalyst. Further it is adequate to fabricate a structured filter element for a through pass of the water with as grown nanostructures coming out of the surface of such an element. So, the dye remediation is performed through solar means. This remediation was initially limited to lower efficiency because of diffusional restrictions but has now turned around as a fast process owing to the development of the filter materials with standing out dense nanostructures. The effect of increased surface area due to microholes on fraction adsorbed is also investigated and found that there is an optimum value of hole diameter for maximum adsorption.

Keywords : nano materials, photocatalysis, waste water treatment, water remediation

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