

An overview of dye removal via activated carbon adsorption process

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ABSTRACT

Water scarcity and pollution rank equal to climate change as the most intricate environmental turmoil for the 21st century. Today, the percolation of textile effluents into the waterways and ecosystems remain a fastidious conundrum towards the public health and food chain interference. In such circumstances, it becomes mandatory for each dye emitting industry or facility to opt for proper dye control measures. With the renaissance of activated carbon, there has been a steadily growing interest in this research field. This paper attempts to postulate a state of the art review of dye processing industry, its fundamental characteristics and environmental implications. Moreover, the key advance of proposed precursors, activated agents, together with the effects of adsorbent dosage, concentration, contact time, pH, particle size, temperature competition, and isotherms, kinetic and thermodynamic studies for adsorption of dyes onto activated carbons are summarized and discussed. Conclusively, the expanding of adsorption science in dye treatment represents a plausible tool for accruing the worldwide environmental benefit and shaping the national economy.

Keywords: Activated carbon; Adsorption; Dye; Isotherm; Kinetics; Thermodynamics

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