

**A Review on Applicability of Naturally Available  
Adsorbents for the Removal of Hazardous Dyes from  
Waste Water**

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## Abstract

The effluent water of many industries, such as textiles, leather, paper, printing, cosmetics, etc., contains large amount of hazardous dyes. There is huge number of treatment processes as well as adsorbent which are available for the processing of this effluent water-containing dye content. The applicability of naturally available low cost and eco-friendly adsorbents, for the removal of hazardous dyes from aqueous waste by adsorption treatment, has been reviewed. In this review paper, we have provided a compiled list of low-cost, easily available, safe to handle, and easy-to-dispose-off adsorbents. These adsorbents have been classified into five different categories on the basis of their state of availability: (1) waste materials from agriculture and industry, (2) fruit waste (3) plant waste, (4) natural inorganic materials, and (5) bio adsorbents. Some of the treated adsorbents have shown good adsorption capacities for methylene blue, congo red, crystal violet, rhodamine B, basic red, etc., but this adsorption process is highly pH dependent, and the pH of the medium plays an important role in the treatment process. Thus, in this review paper, we have made some efforts to discuss the role of pH in the treatment of wastewater.

**Keywords** Adsorption · Low-cost adsorbents · Dyes · Wastewater treatment · Column studies