

Use of waste biomass for colour removal in textile industry

The discharge of colored wastewater is not only aesthetically displeasing but also impedes light penetration thus upsetting various biological reactions such as photosynthesis within a stream. Adsorption is an effective method for colour removal from wastewater and activated carbon is the commonly used adsorbent for this purpose. Due to the inconvenience and relatively high cost of continuously transporting solid particles in steady state operation, usually state fixed bed adsorbers are widely used in practice.

In this work, utilization of waste solids, saw dust and tea dust, as decolourization agents for textile dye effluent, has been studied. Data necessary for design and scale-up of industrial fixed bed adsorption units were determined.

The waste solid was chemically activated using ZnCl_2 to produce the adsorbent. The batch tests showed that the equilibrium data follow standard Langmuir and Freundlich isotherms for both types of adsorbents. The coefficients in the isotherms were obtained and the values were compared with those for commercial activated carbon. Typical S-shape *breakthrough curves* were obtained from fixed bed isothermal adsorption experiments. *Breakthrough time* decreases with decreased bed height, increased rate of flow of fluid through the bed and increased initial colour of the feed. Break through time, length of the unused bed and degree of saturation at break point were determined.