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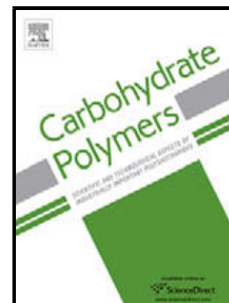
Title: Cellulose based cationic adsorbent fabricated via radiation grafting process for treatment of dyes waste water

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Highlights

- The textile cotton cellulose waste was transformed in to a functional adsorbent for treatment of textile dye wastewater.
- A green synthesis route, *viz.* one step-aqueous based radiation grafting process was employed.
- Critical scientific analysis of equilibrium and kinetic dye adsorption experimental data presented.
- Recyclable radiation grafted adsorbent offers a promising method for treatment of textiles dye effluents.

Cellulose based cationic adsorbent fabricated via radiation grafting process for treatment of dyes waste water

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Abstract

A cationized adsorbent was prepared from cellulosic cotton fabric waste via a single step-green-radiation grafting process using gamma radiation source, wherein poly[2-(Methacryloyloxy) ethyl]trimethylammonium chloride (PMAETC) was covalently attached to cotton cellulose substrate. Radiation grafted (PMAETC-g-Cellulose) adsorbent was investigated for removal of acid dyes from aqueous solutions using two model dyes: Acid Blue 25 (AB25) and Acid Blue 74 (AB74). The equilibrium adsorption data were analyzed by Langmuir and Freundlich isotherms, whereas kinetic data was analyzed by pseudo first order, pseudo second order, intra particle diffusion and Boyd's models. The PMAETC-g-Cellulose adsorbent with 25% grafting yield exhibited equilibrium adsorption capacities of ~540.0 mg/g and ~340.0

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