

## عنوان مقاله:

Removal of Brilliant green dye from aqueous solution using Au-Fe<sub>3</sub>O<sub>4</sub>,  $\beta$  cyclodextrin nanocomposite as a novel sorbent

## محل انتشار:

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## خلاصه مقاله:

Removal of polluting dyes from the effluents of dyeing industries before their discharge into environment is a recommended step to reduce their hazardous effect [1]. Several techniques were applied for the treatment of industrial wastewaters. One of the most effective techniques is adsorption since it is easy, inexpensive can treat concentrated dyes and the spent sorbent can be regenerated for further use [2]. In this work reports preparation Au-Fe<sub>3</sub>O<sub>4</sub>,  $\beta$  cyclodextrin nanocomposite as a sorbent and their application for a cationic dye (Brilliant green) removal from aqueous solutions. The composition, morphology and structure of Au-Fe<sub>3</sub>O<sub>4</sub>,  $\beta$  cyclodextrin nanocomposite were characterized by FTIR, SEM and EDX. Adsorption experiment was carried out under various conditions. Analysis of the adsorption data was performed using Langmuir, Freundlich and Temkin models. The results indicated that the adsorption system showed excellent correlation with the Langmuir isotherm model  $R^2(0.9999)$ . Adsorption of brilliant green onto the nanocomposite follows pseudo-second order rate kinetics. The thermodynamic parameters  $\Delta H^\circ$ ,  $\Delta S^\circ$  and  $\Delta G^\circ$  calculated from the temperature-dependent adsorption isotherms suggested that the adsorption isotherms process of brilliant green on synthesis nanocomposite was spontaneous and endothermic. The maximum adsorption capacity of the nanocomposite for BG dye were determined 111.1 mg/g. Overall, the simple synthesis, low cost, highly effective and stability in aqueous phase features enable prepared nanocomposite as excellent candidates to adsorptive removal process. The results of regeneration experiments confirmed that excellent recyclability of the nanocomposite has excellent potential application in BG adsorption.

## کلمات کلیدی:

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