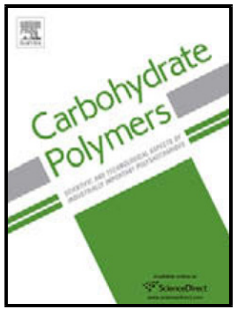

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Carboxymethyl cellulose prepared from Mesquite tree: New source for promising nanocomposite materials

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Highlights

- CMC prepared from mesquite tree was applied for synthesizing CMC/Fe_3O_4
- nanocomposite.
- The nanocomposite showed homogenous spherical magnetic nanoparticles with diameter ~25 nm.
- CMC/Fe_3O_4 was investigated as cost effective and sustainable adsorbent for dye removal.
- 3-The adsorption capacity of the nanocomposite for MB removal is 1597 mg/g.

Abstract

In the current article cellulose pulp extracted from mesquite tree was characterized and used as a raw material for preparation of carboxymethyl cellulose (CMC) which further used for preparing nanocomposite. CMC/Fe_3O_4 nanocomposite was synthesized by co-precipitation of iron (II) and (III) salts by aqueous ammonia in CMC solution. Cellulose pulp, CMC and CMC/ Fe_3O_4 materials were characterized by using FTIR, XRD, TGA, SEM and TEM analysis. The results showed that homogenous spherical magnetic nanoparticles with diameter ~25 nm were formed. The nanocomposite was further applied to remove methylene blue (MB) from aqueous solutions. The adsorption experiments showed the maximum adsorption capacity at pH 7. The adsorption results were analyzed by different isotherm and kinetic models and the results were fitted well with the