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## Synthesis, characterization and adsorption properties of microcrystalline cellulose based nanogel for dyes and heavy metals removal

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### Abstract

Recently, naturally occurring biopolymers have attracted the attention as potential adsorbents for the removal of water contaminants. In this work, we present the development of microcrystalline cellulose (MCC)-based nanogel grafted with acrylamide and acrylic acid in the presence of methylene bisacrylamide and potassium persulphate as a crosslinking agent and initiator, respectively. World-class facilities such as X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FT-IR), surface analysis, field emission scanning electron microscopy (FE-SEM), high resolution transmission electron microscopy (HR-TEM) and zeta sizer were used to characterize the synthesized MCC based nanogel. The prepared nanogel was applied to remove reactive red 195 (RR195) dye and Cd (II) from aqueous medium at different operational conditions. The adsorption experiments showed that the feed concentration of monomers has a significant effect on the removal of RR195 which peaked (93 % removal) after 10 minutes of

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