

## Magnetic cellulose composite for cyanide adsorption from water

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In this study, aluminium doped mesoporous magnetic cellulose (AMMC) has been synthesized by co-precipitation method. The prepared adsorbent has been utilized for the adsorption of cyanide. The characteristic changes in the structural specifics of the adsorbent have been analyzed by techniques like FTIR, SEM, EDX, XRD, BET, VSM and TGA-DTA. The magnetic behavior of the material contributes in easy handling during its utilization in the adsorption process. Adsorption studies have been carried out at pH 8.0 with 0.1 g of adsorbent through batch adsorption process. Isotherm studies reveal that adsorption of cyanide on AMMC proceeds through monolayer phenomenon with adsorption capacity of 34.46 mg/g. Adsorption kinetics of the process have been explained through pseudo second order model. Adsorption of cyanide shows spontaneity with enthalpy driven process. Effect of interfering anions on adsorption have also been studied. Large quantities of cyanide containing water samples can be treated with AMMC through column adsorption method. Regeneration of the material and the number of adsorption-desorption cycles have proven that the adsorption of cyanide through AMMC is an ecofriendly process.

**Keywords:** Mesoporous, Magnetic cellulose, Biopolymer, Cyanide, Optimization, Regeneration