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# SYNTHESIS OF NOVEL ADSORBENT BY INTERCALATION OF BIOPOLYMER IN LAYERED DOUBLE HYDROXIDES FOR REMOVAL OF ARSENIC FROM AQUEOUS SOLUTION

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**T**his study focuses on the synthesis of nanocomposites (CCA and CZA) by incorporation of cellulose (CL) in the interlayers of a layered double hydroxide (LDH) structure. The synthesized nanocomposites were then used for As(III) and As(V) removal from aqueous medium. The CCA and CZA were characterized by X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), elemental chemical analysis (CHNS/O), the Brauner, Emmett and Teller method (BET), transmission electron microscopy (TEM), simultaneous thermogravimetric and differential thermal analyses (TGA - DTA) and Raman. XRD analysis represented the crystalline nature of LDH nanocomposite and TEM analysis demonstrates the formation of a sheet-like structure of LDH for both nanocomposites. Raman analysis indicated the successful functionalization of CCA and CZA. Various parameters including contact time, pH, adsorbent dosage, initial concentration and

temperature were optimized to achieve maximum adsorption capacity. Adsorption kinetics results showed good compliance with the pseudo second order model. The adsorption isotherm using Langmuir, Freundlich, Temkin and Dubinin–Radushkevich (D–R) have also been studied. The present adsorption process is capable to reduce the arsenic concentration from synthetic groundwater to below 10 µg/l, which is maximum contaminant level of this element in drinking water according to WHO guidelines.

## Biography

Hanan Bessaies is currently pursuing her PhD jointly in the department of chemistry, faculty of sciences of Tunisia, Tunis El Manar University, Tunisia and Laboratory of Green Chemistry, Lappeenranta University of Technology, Finland. She has published few papers in high repute international journals.

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