



Design and creation of composites between bacterial cellulose and cellulose of *E. crassipes* modified with iron chloride and carbon disulfide for the removal of chromium (VI)

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Abstract:

The contaminated with Chromium (VI) for part of the tannery in San Benito South to Bogotá was very trade danger environmental and society. The consequence environmental are the big impact about the river Bogota for more of 40 years ago because to duping of chromium hade for tanning of skins and also to the irresponsibility of sector productive for it doesn't try of this water contaminated, they argument high cost in the system of treatment conventional.

The serious social consequences are due to the closure of this productive process, leading to more than 500 families living directly and indirectly from the tanneries in the south of Bogotá. For this reason, economic treatment systems should be sought, easy to use and easily accessible for this sector.

An alternative is the biomass of *E. crassipes* and the bacterial cellulose due to its great abundance and important contribution of cellulose. The objective of this research proposal is to design "composite" composite materials between bacterial cellulose and *E. crassipes* cellulose modified with iron chloride and carbon disulfide for the removal of chromium (VI).

16 composites will be created with different mixtures with these modified biomasses. Each one of these composites will be evaluated its percentage of removal and capacity of adsorption of (Cr) through experimentation in Batch, together with the capacity of desorption and reuse of each of these. After evaluating these design variables, the 4 best composites will be selected through an optimization programming model.

Subsequently, each of these 4 selected composites will be evaluated in continuous experimentation, the percentages of removal and flow velocities, obtaining ideal flow behaviors. The best composite will be chosen to create a biofilter on an industrial scale, economical and easy to use for the sector.

Biography:

Uriel Fernando Carreño Sayago is an engineer in biotechnology and holds Master's degree in environmental sciences and



sustainability and doing his Ph.D. in environmental sciences and sustainability. His researched systems of alternative water treatment and been a professor in Colombia for 10 years in different universities. His research in this event is about an aquatic plant called "*Eichhornia crassipes*" and its benefits in phytoremediation.

Publication of speakers:

- Uriel Fernando Carreño Sayago et al; Estimation of equilibrium times and maximum capacity of adsorption of heavy metals by *E. crassipes* (review), Jan 2018
- Uriel Fernando Carreño Sayago et al; Design of a sustainable development process between phytoremediation and production of bioethanol with *Eichhornia crassipes*, Jan 2017
- Uriel Fernando Carreño Sayago et al; Design and Implementation of a Sustainable Development Process Between Fitorremediation and Production of Bioethanol with *E. crassipes*, Dec 2016
- Uriel Fernando Carreño Sayago et al; Design and construction of an integrated phytoremediation and bioethanol production system with the biomass of *eichhornia crassipes*, Dec 2016
- Uriel Fernando Carreño Sayago et al; "Design, development, and evaluation of a laboratory-scale phytoremediation system using *eichhornia crassipes* for the treatment of chromium-contaminated waters", Dec 2016

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