TITLE: BIOPRODUCT COMPOSED BY BACTERIAL NANOCELLULOSE TO APPLY IN BIORREMEDIATION PROCESS

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ABSTRACT:

Contamination by heavy metals in the aquatic environment has attracted the attention of researchers. The importance of the contamination is mainly due to the toxicity of the compounds, even in low concentrations, the persistence in the environment, and the inefficiency of the conventional system of treatment of water and sewage. Thus increasing the development of environmentally friendly products that can be used in the biosorption of metals or as in this case, bioproducts derived from microorganisms. The objective of this work was produced a bioproduct to apply in the water bioremediation contaminated by heavy metals. For this reason the bacterial cellulose production was carried out through the cultivation of *Gluconacetobacter xylinus* in Hestrian & Schramm medium (HS) and biosurfactant (BS) production by culturing the *Bacillus subtilis* in Tryptone Soy Broth (TSB). For the extraction of the BS, the supernatant obtained was subjected to acid extraction followed by liquid - liquid extraction. After the BS was immobilized or not in bacterial cellulose. The adsorption kinetic assay were utilized 0.5g of Bacterial nanocellulose without and loaded with biosurfactant were added in 60 mL of the solution composed by lead acetate 100 ppm and were kept under agitation (100rpm) and in each time (10, 20, 30, 45, 60, 120, 240, 360, 720 until 1440 minutes) samples were collected, membranes were separated. The samples were characterized by Fourier Transform Infrared Spectroscopy - FTIR and the samples related to the adsorption kinetic were analyzed by Inductively coupled plasma mass spectrometry - ICP-MS. The results indicated that the bacterial cellulose has adsorption capacity of lead acetate, and can be used as a form of bioremediation of contaminated water. After 30 minutes of contact around 80% of the lead acetate were removed. The biosurfactant did not improve the adsorption. Bacterial cellulose can be an ecological alternative to bioremediation process.

Keywords: Bioproduct. Biosurfactant. Bioremediation. Bacterial cellulose.

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