

AMMONIA REMOVAL FROM AQUEOUS SOLUTION IN PRESENCE OF ORGANIC COMPOUNDS USING MODIFIED BIOCHAR FROM BANANA LEAVES

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ABSTRACT

The scientific community has currently determined nine limits beyond which we cannot put pressure on terrestrial systems without putting their balance at risk and guarantee life on the planet, one of the nine boundaries humanity must respect to keep the planet habitable is biogeochemical flow of nitrogen and phosphorus; unfortunately, the data suggests that we cross the risk threshold at this limit due to the huge amount of fertilizers produced based on fossil fuels used in agriculture. Additionally, and without a doubt, we are facing the great challenge of the unbridled rate of water pollution. In order to face environmental challenges by implementing sustainable strategies like circular economy, the present work seeks to improve water quality by removing nutrients from it with the help of biochar obtained from agricultural waste, later using the recovered nutrients for the production of more environment-friendly fertilizers. The study involves adsorption experiments at different pH and initial concentrations of ammonium and the effect on the percentage of ammonium adsorbed in the presence of different organic compounds such as albumin bovine serum, acetic acid, lactose and humic acid as part of aqueous solutions. The ammonium concentration was measured in the UV-vis spectrophotometer and the results obtained show that biochar is an excellent material to recover nutrients and has excellent properties to be used as fertilizer later, however the presence of organic compounds limits the adsorption of ammonium in more than 30% of the removal percentage if the action of biochar is taken into account in solutions with the presence of ammonium only.

Keywords: ammonium removal, water treatment, biochar, adsorption.

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