

A COMPARATIVE STUDY OF ACTIVATED CARBON AND HUMIC SUBSTANCES TO REMOVE MICRO-POLLUTANTS BY ADSORPTION

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INTRODUCTION

According to the United States Environmental Protection Agency, "An emerging contaminant is a chemical or material that is characterized by a perceived, potential or real threat to human health or the environment or by a lack of published health standards". A micropollutant is also emerging contaminant which will affect human, aquatic system potentially. In comparison to other treatments, adsorption comes out as a favourable treatment option for contaminated water since it consumes less energy and has easier operating requirements.

METHODOLOGY

- Design of laboratory prototype.
- Decide depth and calculate weight of media i.e., Activated carbon, fine sand, gravels, rock sand, humic substance, coco coir.
- Collecting test samples.
- Analyzing different parameters.
- Compare results.

RESULTS

- Humic substances exchange the ions, so they reduce hardness.
- Coco coir act as a filter for humic substance and reduce TDS.
- Heavy metals and microplastic are not detected.

DISCUSSION & OUTLOOK

- Strips used are not useful to detect low concentrate metals.
- Sensors failed to detect high concentrated microplastic.
- Filter required supporting system like coagulation combined with Sedimentation for removing micropollutants.



Fig 1: Prototype

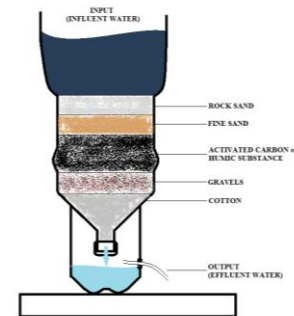


Fig2: Schematic diagram of prototype

Analysis results

Parameters	Influent quality	Activated carbon with coco	Activated carbon without coco	humic substance with coco	humic substance without coco
pH	7,3	6,5	7,5	7,2	7,5
Hardness (mg/l)	150	100	120	115	120
Total alkalinity (mg/l)	120	110	100	100	120
TDS (mg/l)	292	309	293	524	990

Reference

R. de Andrade, J., Oliveira, M., G. C. da Silva, M., G.A. Vieira, M. 2018. Adsorption of Pharmaceuticals from Water and Wastewater Using Nonconventional Low-Cost Materials: A Review. American Chemical Society

Scan for further information

