

Poster

Pharmaceutical contaminated water treatment with immobilized bacteria in zeolite



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ABSTRACT

Pollution is one of the top three global challenges, along with biodiversity loss and climate change. Among the pollutants, emerging contaminants are attracting more attention. These are natural or synthetic products that have either recently appeared in the environment and there are concerns about their effects.

Pharmaceuticals can be found in these contaminants because they have increased in use over the last few decades, with more than 3000 active ingredients.

These products can reach receiving waters and contaminate them, causing adverse effects in aquatic ecosystems. The low efficiency of their treatment in wastewater treatment plants leads to the investigation of new methods to deal with this pollutant. One of them is absorption by absorbents such as zeolite and another is biodegradation by living organisms such as bacteria.

In this study, we aimed to combine both approaches. To do this, we extracted silicate from rice husk ash under different conditions to find the best one. With this silicate, zeolite is synthesised under different parameters to determine the most suitable ones. This is verified by X-ray diffraction to see if the synthesised zeolite contains only zeolite X. Three different treatments are then used to attach the zeolite to a polycarbonate substrate so that bacteria can form a biofilm on it. The successful attachment of the zeolite to the polycarbonate is expected to promote bacterial growth and biodegradation studies will then be carried out under these conditions.

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