



MEMBRANE-SUPPORTED SILVER PARTICLES TO BE USED AS A RESIDUAL WATER FILTER

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ABSTRACT

In the present invention, the support of silver nanoparticles in membrane modified with epoxidized acrylated soybean oil and its application in the filtration and inhibition of coliform microorganisms present in residual water are reported.

BACKGROUND

The silver in colloidal state is divided in particles whose size is between 1 and 100 nm. Its obtainment can be realized as by reduction of silver ions. In both cases, metallic silver particles are obtained and not ions. The importance of the use of silver is because since time immemorial this metal has been used to combat infections and control microbial contamination, mainly in biology and food. This metal retards the growth of microorganisms that spoil food and beverages. At the end of the 19th century appeared the first silver products in which, due to the small sizes of the metallic silver particles that compose it accentuate its antimicrobial properties. In parallel, other applications of silver are being developed as an industrial and food type biocide. Silver is very effective against a wide range of bacteria, fungi and yeasts. The action of silver consists of inhibiting the enzymes involved in the respiratory process of cellular oxidation-reduction of bacteria causing death in a few minutes. For this reason, microorganisms cannot develop mechanisms of resistance as with antibiotics.



DESCRIPTION

This invention relates to the synthesis of silver nanoparticles using the metal ion impregnation method with subsequent reduction supported on a polypropylene membrane modified with epoxidized acrylated soybean oil. The bactericidal property of the silver was taken for filtering residual water, thus diminishing the growth of coliform microorganisms.

STAGE OF RESEARCH

The synthesis of the silver nanoparticles and their support in the membranes was carried out. Afterwards, they were tested with residual water, measuring parameters such as color, turbidity and Chemical Demand of Oxygen, as well as the number of microorganisms after passing the water through the filter.

It was also determined if the silver supported on the membrane was detached from it and it was concluded that the membrane is a good support for retention of the silver, since there was no detachment of the metal.

APPLICATIONS FIELDS

This invention can be used in several areas such as in Biology, Food industry or in the treatment of water for many other industries.

ADVANTAGES

This methodology has the advantages of:

- ◇ Being simple
- ◇ Being Eco-friendly
- ◇ Being cheap
- ◇ Decrease the number of coliform microorganisms considerably.
- ◇ Antimicrobial efficiency against commercial products has been compared and better results have been obtained with this invention.