RECENT APPLICATION OF XANTHAN IN REMOVAL OF WATER CONTAMINANTS

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ABSTRACT

The global production of polymers has been constantly increasing, from 2 million tons in 1950 to 400.3 million metric tons in 2022. Up to 40% of conventional petroleum-based polymers end up in landfills, leading to serious ecological problems. Owing to the negative environmental impact of petroleum-based polymers, biopolymers, which have a lower or no negative effect on the environment, have been intensively explored. Xanthan represents a nontoxic, biocompatible, and biodegradable biopolymer of microbial origin. It is generally produced by aerobic submerged batch cultivation of the bacterium *Xanthomonas campestris* ATCC 13951 on the medium containing glucose or sucrose under optimal conditions and findings of researchers worldwide indicate that xanthan can be successfully biosynthesized on media containing different waste streams, using various *Xanthomonas* strains. The most common application of xanthan is in the food industry as a stabilizer, thickener, and emulsifier because of its high viscosity at lower concentrations and excellent solubility in hot and cold water. The application of xanthan is not only limited to the food and other branches of industry, but also to medicine, biomedical engineering, agriculture, and wastewater treatment. Recent studies have confirmed the excellent photocatalytic activity and emulsifying capacity of xanthan biosynthesized on waste-based media, which offers promising potential for its application in the decontamination of environment. The purpose of this study was to discuss data from available scientific and professional literature regarding the novel perspectives and application of xanthan in the removal of emerging water contaminants.

Keywords: biopolymer, xanthan, environmental application, water contaminants removal

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