

Features of biofilm microbiocenosis in the treatment of waste water from production of cellulose nitrate

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Keywords: wastewaters, nitrates cellulose production, biofiltration, microbiocenosis activity.

Abstract

The article describes the features of the biofilm microbiocenosis development during process of nitrate cellulose's production wastewater biofiltration. Due to the fact that the waste waters of nitrate cellulose's production are characterized by variability of their composition, inoculation was carried out with help of specialized consortium. The consortium KT was produced by the Institute of Biochemistry and Genetics, Ufa Scientific Center, Russian Academy of Sciences and was recommended as an universal microbial community for treatment wastewaters with a wide range of contaminants. The periodic cultivation of consortium's microorganisms on real waste water, sterile real waste water and sterile model solution of waste water was carried out for estimation the consortium role in diversity of microorganisms community of biofilms during processes of nitrates cellulose's production waste waters biofiltration. The development of heterotrophic microorganisms, yeast, lactic bacteria, sulfur-oxidizing and sulfate-reducing bacteria was analyzed. The bacteria was seeding on selective mediums and their enzymatic activity was determined to analyze the growth of the biofilm microorganisms in a different conditions of cultivation. The participation of consortium within biofilm microbiocenosis during process of real wastewater and its model solution biofiltration was estimated. Revealed the ratio of heterotrophic microorganisms, yeast, lactobacterium and sulphate-reducing microorganisms within the consortium KT. On the base of results we can conclude that the main contribution to the microbiocenosis of biofiltration systems formation make the microorganisms of real waste waters which influent to the treatment plant from the nitrates cellulose production. Consortium KT forms microbiocenosis at the early stage of treatment process in the starting period of its operation. In the process of industrial waste water influent to the system microorganisms of consortium KT gradually displaced from the biocenosis by the aborigine microorganisms of real wastewaters due to the not optimal composition of the wastewater as a nutrient medium for the cultivation of specific microorganisms of the consortium KT.