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Biotechnical systems and technology for hydrocarbon-containing waste water purifying in a controlled manner

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Abstract

Biotechnical systems and technologies are aimed at deep cleaning and purification of oil-contaminated natural and waste waters to comply with regulations for water recycling. The solution to this problem is possible using selected carbohydrate-containing microorganisms (SCM) with a wide range of various fractions of oil oxidation and oil products in a specially designed jet settling device (JSD) and constructed on the biotechnological scheme basis for oily waste water purification. Intensification of hydrocarbons oxidation by microorganisms in the adopted purification scheme is carried out by creating optimal conditions for SCM of the following variations: temperature 15-280C, pH 5-9, calculated amounts of nutrients (nitrogen of 2.5-20 mg/dm³ and phosphorus of 0.1-0.5 mg/dm³) and composite compounds (alanine, valine, glutamic and succinic acids, glucose, maltose 15.10⁻⁶ -35.10⁻⁶ M. Also found that in the process of oil biological destruction and oil products in sewage a significant role plays the ratio of strains in the consortium which corresponds to the following amount (%): Alcaligenes -14, Micrococcus - 6, Brevibacterium - 6, Pseudomonas - 25, Bacillus - 6, Flavobacterium - 6, Clostridium - 6, which comprises the titer of viable cells 5.10¹⁰-7. 10¹⁰ cells/dm³ in the drain. Managed bioremediation of oil-contaminated wastewater, adopted by the technological purifying system, also is provided by selected technical parameters and modes of neutralisation for each individual production.

Keywords

Biodegradation, Biotechnological systems and devices, Neutralization, Oil and hydrocarbon-oxidizing microorganisms, Technology