

POTENTIAL OF CYCLODEXTRINS TO INCREASE THE PETROLEUM HYDROCARBONS BIODEGRADATION

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Abstract

Pollution phenomena cause important changes in the phytosphere and zoosphere, as well as in microorganisms, leading to the disappearance of a large number of species, causing a decrease in soil fertility, its most important property, which allows the support of plant and animal life. In this paper will be presented a review concerning the potential of cyclodextrins to increase the petroleum hydrocarbons biodegradation. Cyclodextrins are natural compounds, non-toxic for microorganisms existing in the soil with great use in medical applications. Their involvement in microbial degradation, such as the purification of pesticide or phenol waste water, was also investigated. Cyclodextrins absorb very little or not at all on solid soil particles. In unsaturated soils, they increase the desorption of contaminants from the solid particles. The low bioavailability of polluting hydrocarbons is a limiting factor of biodegradation by existing microorganisms in the soil. Cyclodextrins have the role of promoting the desorption of non-polar compounds from the surface of solid particles and their mobilization in the aqueous phase where hydrocarbon-degrading microorganisms carry out their activity. Cyclodextrins have the role of activating a series of bacteria, such as: *Bacillus macerans*, *B. subtilis*, *B. coagulans*, *Flavobacterium* spp., but also soil fungi such as *Trichoderma* spp.

Key words: biodegradation, cyclodextrins, petroleum hydrocarbons