

NATURAL ATTENUATION AND BIODEAUGMENTATION OF BIODIESEL-DIESEL BLENDS

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Abstract:

Energy is a concept that is increasingly in evidence worldwide. According to International Energy Agency the natural gas, oil and their derivatives are currently the most used energy sources and are not renewable. Due to shortage of these fossil fuels, high-energy needs in the country, and environmental pressures combined with the growing technological production, biodiesel becomes an alternative source of energy and is introduced in the economic system as an important fuel. Watching this new policy and consciousness that renewable resources are better rated, a new problem emerges, the contamination by such products. Oil spills and/or its derivatives and leaks in storage tanks cause considerable damage to the environment, generating a huge public concern, and a pressure for fast and economical solutions. There are several technologies to treat contaminated environments using chemical and physical techniques, however biological processes are considered clean technologies of decontamination that combine simplicity and cost-effectiveness. Therefore, as new strategy, bioremediation emerges as a less aggressive and more adequate technique for ecological maintenance balance. In this study it was tested microbial activity of 2,6-dichlorophenol-indophenol (DCPIP) from a blend of 10% and 25% of biodiesel in diesel. It was compared their natural biodegradation and their biodegradation with addition of *Bacillus subtilis* inoculum. Treatments were conditioned at 35 °C and 180 rpm, the absorbance was measured in Hach Odyssey DR-2500 spectrophotometer each 12 hours until the DCPIP was totally reduced, totaling 348 hours (until samples changed from blue coloring to colorless). The treatments presented different biodegradation's behavior, being higher in 25% of biodiesel in diesel with the inoculum. The study concluded that *B. subtilis* inoculum and the amount of biodiesel in diesel influences the biodegradation of the fuel.

Key words: diesel, biodiesel, *Bacillus subtilis*

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