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Enhanced Degradation In Grease Interception Systems Using A Peat Humic Substances

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ABSTRACT

A study was done on the efficacy of a Peat Humic Substances (PHS) manufactured by Prodex, in enhancing the degradation of fats, oils and greases (FOG). Our results indicate PHS can enhance degradation and microbial growth rates. .

MATERIALS & METHODS

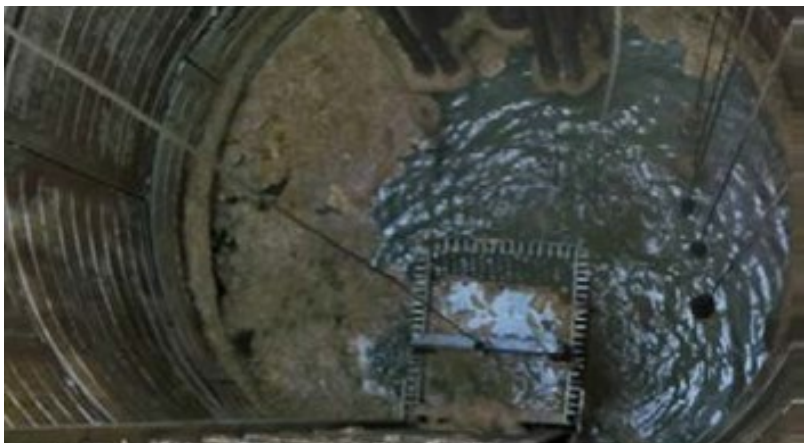
A 10% concentration of PHS and two bioreactors with water circulators with operating in a range of -10°C to 70°C providing uniform temperature and agitated at 100 to 1200 RPM for 24-hours.

Microbial Quantification

Quantifying for the colony-forming microbiological units (CFU's) that were present at the start and end of the trials, were each assayed.

Wastewater Study

Samples obtained in both January and July came from Monroe Township Utility Authorities pumping stations. All Samples were used in the 18-day study and in the 23-day study



EXPERIMENTAL DESIGN

An experiment investigated two factors with PHS, temperature and concentration on degradation for 24-hours. To measure concentration, a environmental sample detector was mounted between the two reactors.

Grease Sample Analysis

Grease samples were taken from the grease interceptor at the Salt Creek Grille, in Rumson New Jersey, before business hours and stored a 4°C at the university laboratory.

Wastewater FOG Sample

Both water temperature and the PHS concentration had a significant effect on degradation. Water temperature being more significant is noteworthy to indicate the interactions of temperature and PHS.

RESULTS

FOG concentration as a function of time indicates, there is an increase and reduction. One possible explanation is the extracellular enzymes such as lipases or hydrolases.

Dissolved Oxygen (DO) and pH was observed under aerobic conditions. DO may have contributed to the high chemical and BOD demand. The pH range was between 5.3 - 6.9. **PHS provided stimulation by three mechanisms. 1st: functioned as an electron donor and acceptor** and replaced sulfate as a terminal electron acceptor for microbial respiration. **2nd: Increased degradation of organic compounds, 3rd: Thermodynamically was more favorable as an electron donor**.

CONCLUSION

Degradation rates increased with temperature and PHS concentration and ranged from 10% to 110%. relative to control. Data suggest **PHS enhanced degradation up to 120% and increased microbial growth rate of both experiments by up to a factor of 5.**

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