

Project Title: Biological treatment of leachate



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Abstract:

This work was carried out as part of my final project in collaboration with the Abdelmalek Essâadi University', Faculty of Sciences in Tetouan,-Morocco and the company by name Ecomed Mohammedia, which specializes in treatment, valorization of solid wastes and responsible for the management of the intercommunal landfill site of Mohammedia and the province of Benslimane. The purpose of this thesis is to conduct a study of leachate treatment of the supervised landfill of Mohammedia-Benslimane by biological means. Aeration is used to reduce the pollutant load of leachate from household wastes destined for Mohammedia-Benslimane landfill.

is a technique that gives variable results by the pollutant load and the chemical nature of the non-organic constituents. In this respect, we took a raw leachate sample for a chemical-physical and microbiological characterization. The following parameters were analyzed: chemical –physical properties such as pH, conductivity, main anions and cations; Biochemical analysis: BOD₅ and COD, Microbiological analysis such as total germs at 20 ° C, total germs at 37 ° C, staphylococci, *pseudomonas aeroginisa*.

These parameters were monitored on the leachate by tests carried out in the laboratory to determine biological treatment methods, namely: the effect of aeration on leachate at time 0 and 15 days, the aeration effect with the addition of the strains of the isolated bacteria namely Exochems at time 0 and 15 days, the aeration effect with the addition of the strains of the isolated bacteria namely Biochop at time 0 and 15 days.

The aim of this work is to make a scientific comparison of the efficiency of the three processes. The following parameters were analyzed: Temperature, pH, Conductivity, dissolved oxygen, HCT, COD, BOD₅, MES, forms of nitrogen, phosphorus, chloride,sulphate , Total germs at 20 ° C, and total germs at 37 ° C, staphylococci, *Pseudomonass aeroginisa* .

Keywords: Leachate, Mohammedia-Benslimanemland fill, Biochop, Exochems, aeration,

Principal activities

1.Characterization of untreated leachate.



Photo of taking some volume of leachate on 5April 2017

We have followed the following physical-chemical parameters: Temperature, pH, Conductivity,, COD, BOD₅, nitrogenous forms, chloride, sulfate etc

2. A leachate treatment test by Aeration. Aeration is used with a power source of electricity.
3. A leachate treatment test with bacterial strains developed by Exochems.
4. A leachate treatment trial with bacterial strains developed by a Biochop company. microbiological parameters as total germs at 20 ° C, total germs at 37 ° C, staphylococci, Pseudomonas aeroginisa.

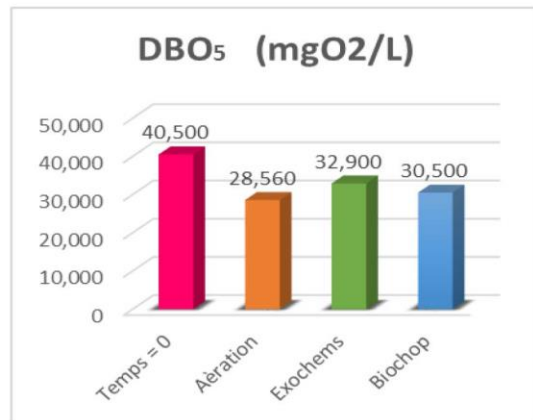
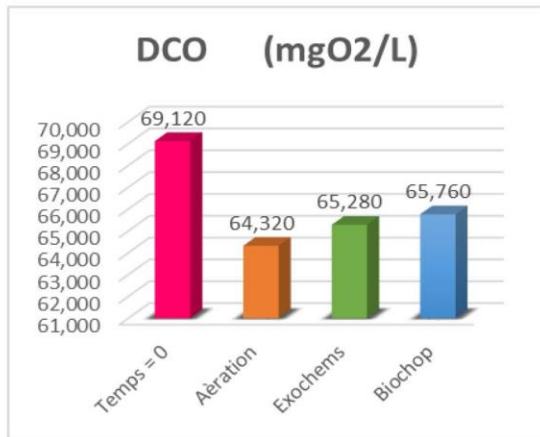
This phase is the time of departure. So we call it time equals 0. We will use this time for the scientific comparison after 15 days for the three tests



Photo of three methods used on 8 June 2017

Results:

Micro-biology Parameters	T=0	Aeration	Exochems	Biochop
Total Germ at 22°C UFC/1mL	8×10^6	$4,8 \times 10^8$	$3,52 \times 10^8$	$9,2 \times 10^8$
Total Germ at 37°C UFC/1mL	$6,4 \times 10^6$	$4,5 \times 10^8$	3×10^8	$8,6 \times 10^8$
Staphylocoques UFC/100mL	8×10^5	$7,3 \times 10^5$	$4,4 \times 10^5$	$1,6 \times 10^6$
Pseudomonas aeruginosa UFC/100mL	2×10^2	$3,1 \times 10^3$	$1,9 \times 10^3$	$4,6 \times 10^3$



Conclusion :

According to this report, given the results obtained, we recommend only the aeration technique for the leachate treatment of the Benslimane-Mohammedia controlled landfill followed by physical-chemical treatment. It can be concluded that the leachate that comes out of the engineered landfill of Mohammedia-Benslimane is well treated because the physical-chemical analysis show that the leachate can be allowed into the natural environment with conformity to Morocco standards.

I am looking forward to working with any company in the water, sanitation, hygiene sector and also if i can continue my studies in any laboratory or university with a thesis on leachate treatment, recycling of solid and electronic waste, treatment of solid and liquid waste, treatment of hospital waste and industrial waste.

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