



UČINAK PRISILNE AERACIJE NA POBOLJŠANJE PROCESA KOMPOSTIRANJA

EFFECT OF FORCED AERATION ON IMPROVEMENT OF COMPOSTING PROCESS


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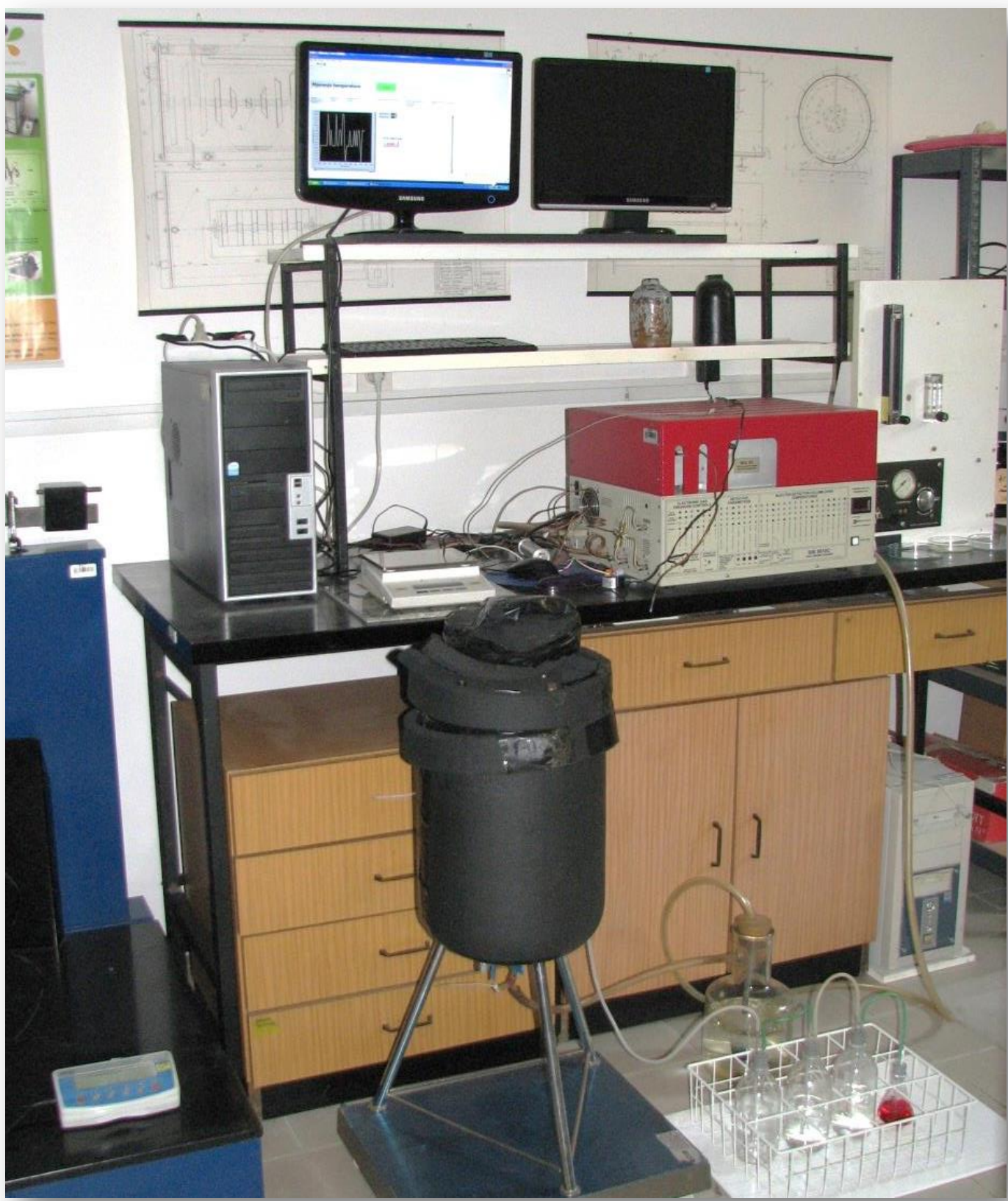
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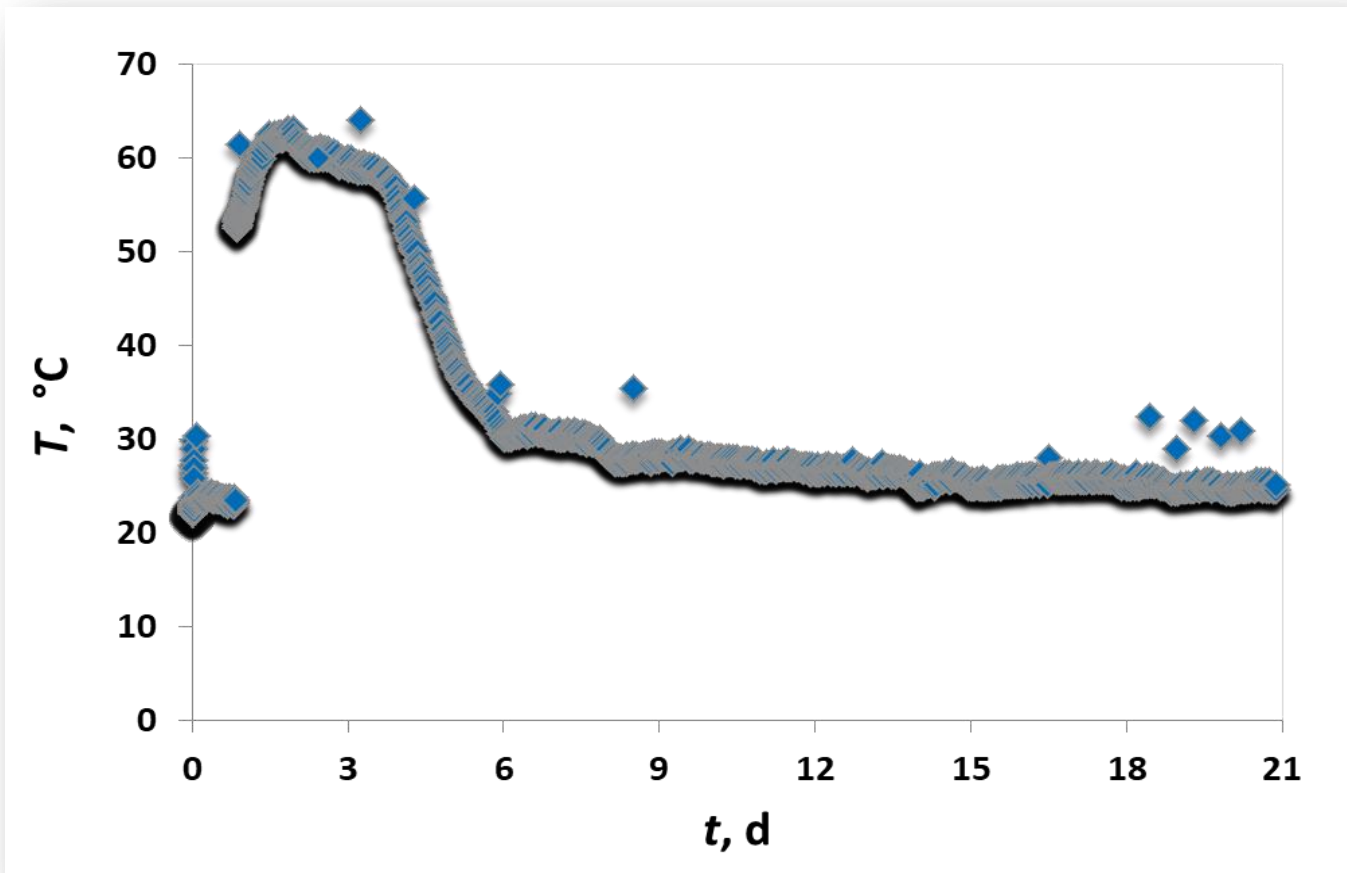
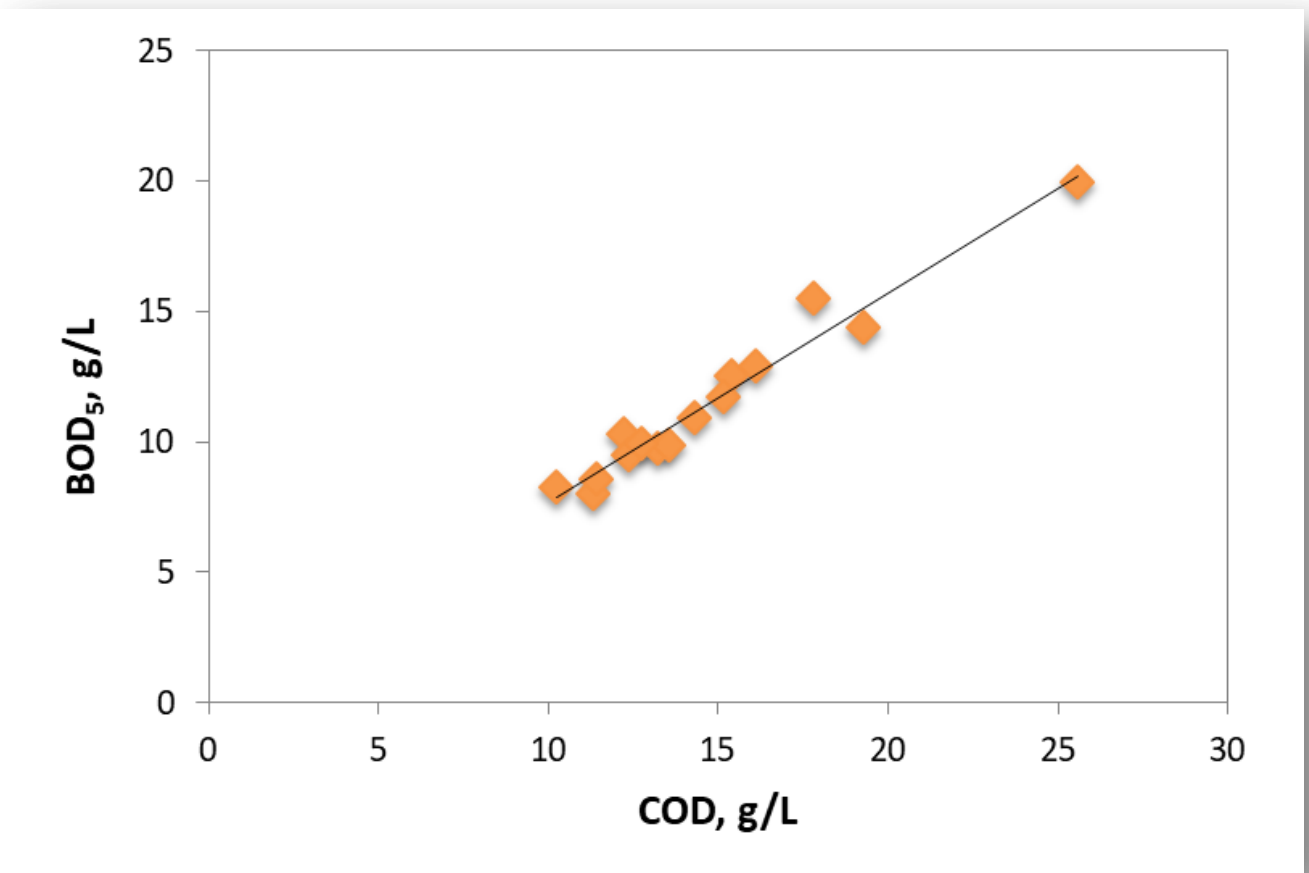
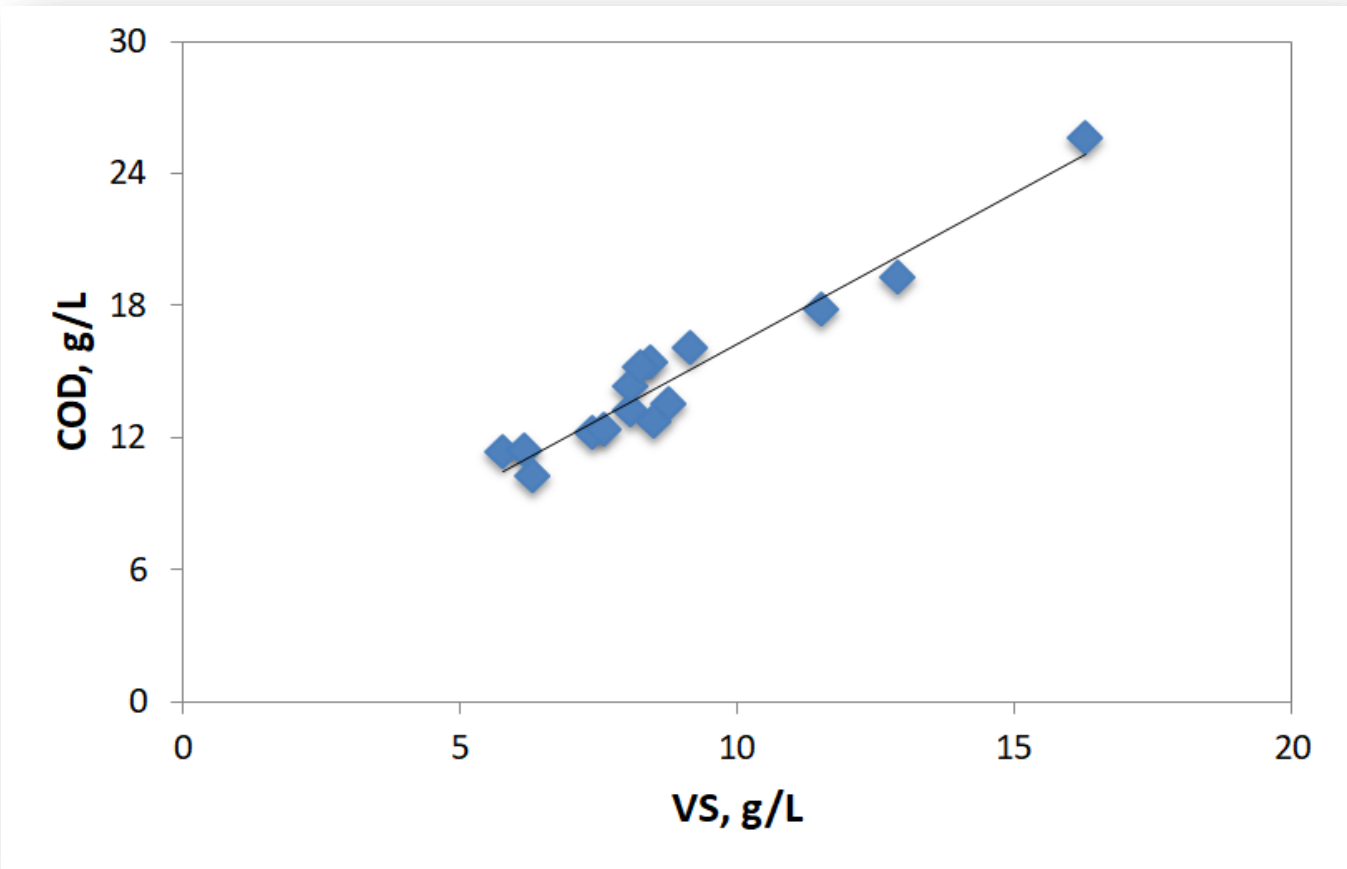
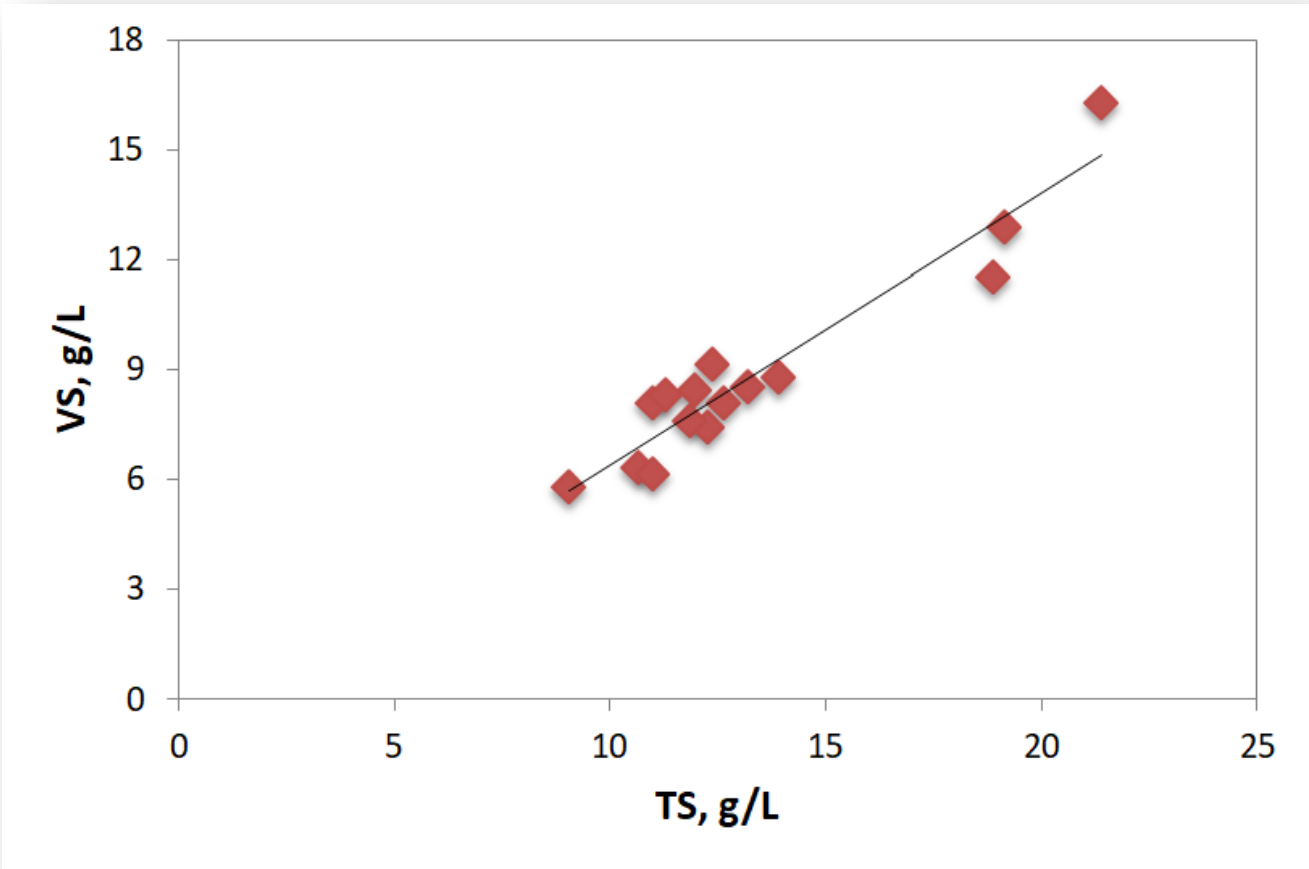
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Improving the management of solid waste is seen as an environmental challenge. Particular attention is paid to reducing consumption, reducing food waste and converting waste into resources. The management of biodegradable waste has become an increasing challenge in recent decades. Composting is one of the safest and most natural ways to manage biodegradable waste. This process is an efficient and sustainable technology for processing a wide range of organic waste with significant environmental, economic and social benefits.

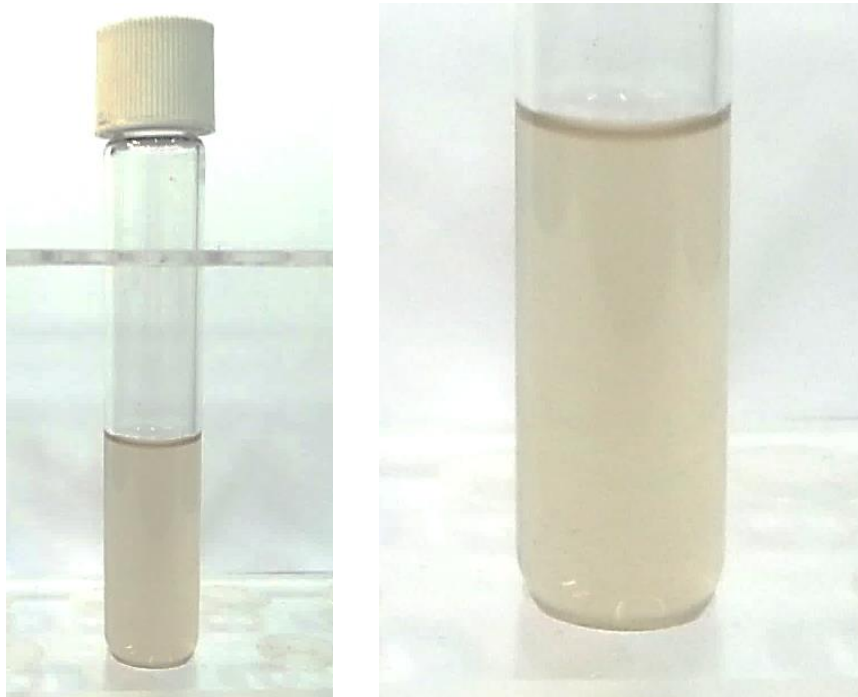
In this work, the composting process of a real sample of a heterogeneous mixture of biodegradable waste was carried out with a forced aeration of 0.9 m³/day for 21 days. The initial C/N ratio and volatile matter content were 21 and 55 %, respectively. Based on the parameters estimated by the optimization and using mathematical models to describe the material balance and enthalpy, a process was simulated to compare it with the results of the experiment performed, where the variable aeration affected the temperature control. Aeration is an important factor in regulating composting efficiency.



COMPOSTING PROCESS - BIOREACTOR



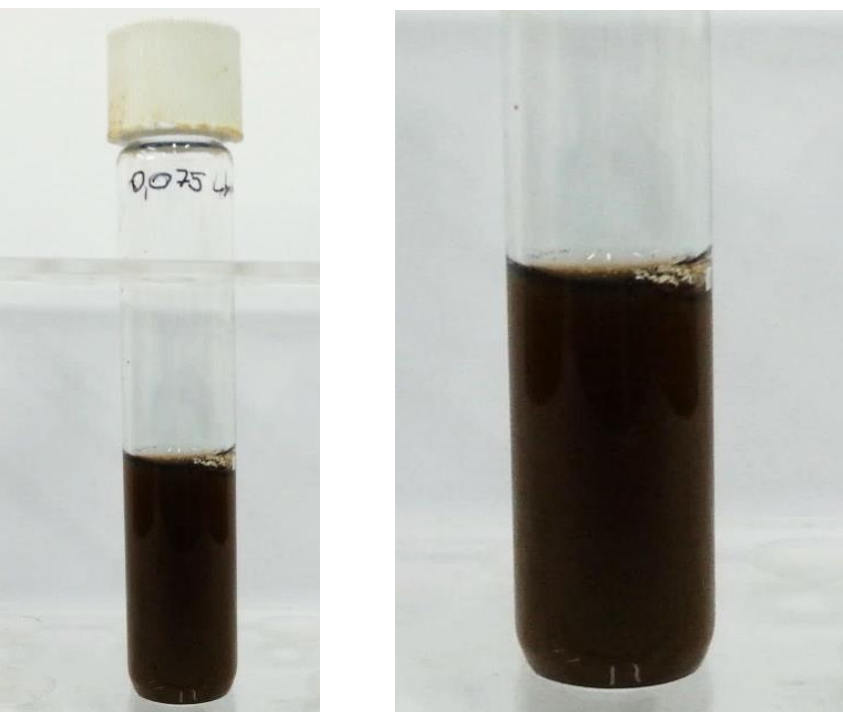
REAL BMSW SAMPLE



ELUATE FROM REAL SAMPLE



SAMPLE - AFTER COMPOSTING



ELUATE - AFTER COMPOSTING

RESULTS OF COMPOSTING PROCESS

Exp. #	0. day	21. day
V(reactor), L	10	
pH, -	6.6	8.3
w(H ₂ O), %	56.5	62.0
w(DS), -	0.44	0.38
w(VS), %	54.6	33.0
C/N, -	21.3	10.3
m(substrate), kg	4.5	3.8
m(CO ₂), g/kg VS	228	
m(NH ₃), mg/kg VS	472	
BOD ₅ /COD, -	0.97	0.24
Conversion, %	55.7	

The results show that the percentage of biodegradable substances is high on average and amounts to 73.62±1.50 %. The high average value of the BOD₅/COD ratio of 0.78±0.04 indicates the possibility of biological treatment. The evaluation of the biodegradability of the biodegradable organic fraction provides information about the initial conditions of the process and the quality selection of biological treatment as an environmentally friendly solution. The microbial conversion of the biodegradable waste was around 56 %. By controlling the aeration regime, the thermophilic phase in the heterogeneous system studied can be kept above 60 °C more than 72 hours.