

## SELECTION OF EFFICIENT MICROBIAL COMMUNITIES: IMPACT OF THE VOLUMETRIC LOAD

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Two laboratory-scale (1m high) biofilters were packed with peat and used to treat a complex mixture of VOCs (oxygenated, aromatic and halogenated compounds). A vertical community composition gradient, in terms of both density and diversity, was clearly established and was directly connected to a vertical gradient of biodegradation activities. It is now essential to better understand the complex interactions between microbial community structure and biodegradation functions. Hence, first it appears interesting to consider the selection of efficient microbial communities. This step concerns the activated sludge acclimatization to the VOC mixture. It is realized according to an empiric method and consists in supplying a reactor containing activated sludge with the VOC mixture. The growth of micro-organisms colonizing activated sludge and able to metabolize pollutants is then favored. Does this enrichment step involve a loss of microorganism diversity? Does this loss depend on the concentration of each compound introduced in the reactor?

The aim of this research is to evaluate the impact of the applied volumetric load on this acclimatization phase. Two reactors were used and were supplied with a gaseous effluent containing a complex mixture of eleven VOCs with different concentrations.

Three different sorts of chemical groups are studied: oxygenated, aromatic and halogenated compounds. Hence, it is essential to measure, as a function of time, the removal of the pollutants in the gas and liquid phases and to link the results obtained to the microbial ecology of this ecosystem in terms of microflora density and diversity.

These results will provide interesting information on the removal efficiency of activated sludge and on the potentialities of the treatment system of VOCs using biological processes.