

Process modeling of a hybrid system to treat malodorous waste-air

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Experiment and its mathematical modeling were performed in order to predict the operation of a reactor combined of an aerobic and an anaerobic reactor to remove ammonia from waste-air stream. The aerobic reactor is identical to a three phase fluidized-bed biofilm reactor whereas the anaerobic one is a two phase fluidized-bed biofilm reactor. The model was built based upon some basic processes of chemical engineering and biotechnology such as mass transfer and biochemical reaction. According to the experimental results it has been shown that a high removal efficiency of ammonia can be achieved higher than 90% at early state of the reactor-performance. However it was found that this value decreases and maintains at ca. 80% when it reaches the steady state of operation. With slight difference less than 12% between model-prediction and the experimental data, the results of this study have shown the relevant correlation between them.