Effect of Energy Contents of Activated Sludge on its Acclimation to a Xenobiotic

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ABSTRACT

This study was to research on how the cultivation of activated sludge with different feeding or nutritional conditions had their effects on a xenobiotic acclimation period and also the degradation time. Feeding conditions included feeding activated sludge regularly (sludge feasting: sufficient food and oxygen) or starved (sludge fasting: insufficient food and sufficient oxygen).

In the case of regular feed, the activated sludge was fed everyday with sucrose and peptone; in the fasting case, feeding was withheld for different periods of time. The effects of feed condition on xenobiotic acclimation and degradation was preliminarily found that a xenobiotic is degraded faster in the feasting status, while acclimation takes a longer time (slower) when activated sludge was starved. The objective of this study is to determine the cause for the difference in acclimation time, basing on the postulation that the amount of ATP available in activated sludge cells, which ATP is to sustain cell vitality during acclimation, is responsible for the acclimation ability.

ATP was extracted from cell of activated sludge by TCA method, ATP measured by HPLC assay was used to examine the effect of some different of time to feed 2, 4-D and sugar on whole microbial communities in activated sludge mixed liquor samples. The ATP extraction of activated sludge, diluted to give samples with different period of time to adding 2, 4-D, the increase in MLSS (Mixed Liquor Suspended Solids) with increasing ATP, the long term to adding 2, 4-D with decreasing ATP.

Keywords : Acclimation、2、4-Dichlorophenoxyacetic acid. Sludge fasting/feasting、ATP content

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