

嫌気・好気汙床法による生活排水の処理特性に関する研究

——処理水中のN - BODおよびP - BODの影響——

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概 要

小規模合併処理浄化槽が開発されているが, 実際には処理水質が 20mg/l を超えるものも少なくない。これは設計負荷条件と実負荷条件の違いや, 施工および維持管理上の問題などとともに, BOD測定自体にも問題点があることが指摘できる。

本研究では, 実際に使用されている12の嫌気汙床接触ばっ気方式の合併処理浄化槽の処理水を対象として, 処理水のBODに対するN - BODおよびP - BODの影響について検討を行なった。BODとATU - BODの差をN - BODとし, 精密汙過膜(細孔径: $0.1\mu\text{m}$)を通過しないBODをP - BODとした。

N - BOD/BODおよびP - BOD/BOD比の平均値がそれぞれ0.41, 0.93であり, 処理水においてN - BOD, P - BODの寄与が大きいことが明らかとなった。N - BODは処理水のpHおよび硝化細菌数に影響されるとともに, BOD測定における希釈水添加量にも影響されることが示された。したがって, 処理性能の評価にはC - BODを用いる方が適切であるといえる。さらに, 処理水質の改善には懸濁態成分の除去が重要であることも指摘できた。

Characteristics of the Effluent from Anaerobic - Aerobic Bio - filter for Domestic Wastewater Treatment

Effects of N - BOD and P - BOD in Secondary Treatment Effluent

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Abstract

On-site domestic wastewater treatment systems so called small size gappei jokasou were developed and these systems enable to reduce BOD of the effluent less than 20 mg/L. In some facilities, however, BOD of the effluent are more than 20 mg/L. The facts may not be caused only by both differences between planning and real conditions and inappropriate maintenance operation but by BOD measurement itself.

In this work, the contributions of nitrogenous BOD (N - BOD) and particulate BOD (P - BOD) were examined for the effluents from twelve facilities of small size gappei jokasou. Carbonaceous BOD (C - BOD) was measured by addition of aryl thiourea and N - BOD was defined as the difference between BOD and C - BOD. P - BOD was assumed as BOD rejected with microfiltration membrane (pore size : $0.1\mu\text{m}$).

It was clarified that P - BOD and N - BOD occupied large portion of BOD, because the average N - BOD/BOD and P - BOD/BOD ratios were 0.41 and 0.92, respectively. N - BOD was affected by pH and nitrifying bacteria in the effluent. In addition, N - BOD was also affected by the amount of seed for BOD measurement. From these results, it was recognized that C - BOD is more appropriate descriptor in order to assess the performance of the facilities. It was also pointed out that effective removal of particulate matter from the effluent is very important for improvement of effluent quality.