

Study on the buoyant media-type nitrification- denitrification process

Whole term

1999. 10 ~ 2001. 3

(Purpose)

Recently, a filter-type aerobic media including the aerobic filter process, which is easy to be maintained with economical land-use, has come to the spotlight and has been introduced to small-scale treatment plants. From the viewpoint of preventing contamination, the advanced treatment of nitrogen and phosphorus removal is necessary for closed water and the others.

The buoyant media-type nitrification-denitrification process, the focused process by this research, is one of the upward-flow organic-membrane filtrations using a buoyant extra-medium, having superior economical land-use and maintenance to the existing aerobic filter process. Moreover, the function of nitrogen removal is added (phosphorus removal is also available by adding coagulants), thus it is expected to be a water treatment system corresponding to the future needs.

In this research, from 1999 to 2000, the treatment-performance of this process was verified by using a pilot plant, and the applicability to small scale treatment plant which is required for the advanced treatment in the future, was investigated.

In addition, the applicability to a large-scale treatment plant (extension/reconstruction) was investigated and the technical data including design resources and the management of utilization were summarized.

(Results)

1. Investigation on the application to a small-scale treatment plant

In the investigation of the treatment-performance using experiments, the characteristics of this technology such as availability of nitrogen and phosphorus removal; absence of a final settling tank; economical land-use due to short duration and easy maintenance were verified. As a result, a clear rate limiting factor for the operation and the specific technical data for management were presented.

2. Investigation on the extension of the application

In order to seek the applicability of this technology to large-scale treatment plants (reconstruction), case studies of land-use and cost comparing with the existing methods were carried out, and the results implied that this technology would be more effective especially when the nitrogen removal would be required. The main issues for future investigations were summarized too.

3. Future assignment

This research dealt with the result from the first treatment process, and the evaluation of the treatment efficiency using data from the real treatment process is recommended as future studies. In addition, the investigation on the load fluctuation coping with the advanced treatment in the denitrification accelerating tank is recommended.

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Keywords

Advanced treatment, Nitrification-denitrification process, Biological membrane process, Suspended media