Poster

FOLLOWING THE PHOSPHORUS SOLUBILIZATION BY VARYING DECANTATION TIMES IN A PILOT WWTP

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ABSTRACT

Motivation: Phosphorus and nitrogen are essential for organisms, but in quantities that imbalance the ecosystem, they promote the development of aquatic plants and algae to the detriment of others. This process is called Eutrophication. Wastewater treatment plants (WWTP) have an important role in reducing the flows of both elements in the waters they produce. With the main objective of knowing more in depth the biological elimination of phosphorus, two purification systems have been used: a pilot plant with SBR system (sequential biological reactor) and another with conventional system. As a complement, this behavior has also been studied in sewage samples as a function of the decantation time.

Methods:

With the purpose of promoting the growth of PAO organisms (polyphosphate-accumulating organism) responsible for the biological elimination of phosphorus, different aeration-not aeration cycles have been carried out in the pilot plant, since this type of organisms need aerobiosis-anaerobiosis. The concentration of soluble phosphorus and nitrate present in the water has been determined both in the pilot plant and in the samples of sewage treatment plants.

Results:

In the pilot plant, the different aeration-non-aeration cycles have been studied, achieving levels of phosphorus reduction that are around 15% in the conventional system and 16% in the SBR system.

These levels were insufficient, so it was decided to increase the concentration of nutrients by adding glucose to the incoming water. With this, reduction levels of approximately 95% were achieved. Samples from the treatment plants have given rise, depending on the decanting time, to very different behaviors, although with correlation between some of them, taking into account the mass load and mud age.

Conclusions: We can conclude therefore that the pilot plant was in nutrient deficit so it could not carry out a biological elimination process. This was solved thanks to the addition of glucose in small quantities. With respect to the samples we could say that the low mass loads are related to levels, more or less, constant of dissolved phosphorus but the behavior of the samples has been very different so we should investigate the reasons that lead to this produce in such a way.

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