PILOT PLANT FOR THE STUDY OF THE REDUCTION OF EXCESS SLUDGE PRODUCTION IN WASTEWATER TREATMENT PLANTS

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INTRODUCTION

In most biological wastewater treatment process such as CAS system, though they have been recognized to be effective for organic wastewater treatment, the large amount of excess sludge derived from microbial growth generates high costs in equipment, operation, and final disposal. The OSA process is a modification of CAS process which can reduce sludge production by an alternating exposure of activated sludge to oxic and anoxic environments (Chen *et al*, 2003; Rodriguez-Pérez *et al* 2009, Rodriguez-Pérez *et al* 2010). However, a better understanding of the cause of the process enabling excess sludge reduction is necessary for full scale experience. In this sense, the pilot plant studies are essential because laboratory test are insufficient.

METHODS

The materials used in the construction of the OSA pilot plant include aquarium, laboratory and plumbing supplies such as aquarium air compressors; aquarium air stones diffusers; cleanout plugs; flexible and rigid tubing; glass, PVC and stainless fittings; magnetic stirring; peristaltic pumps; PVC covers; PVC tubes; time switches and valves. A CAS pilot plant was also constructed as a reference system.

RESULTS AND DISCUSSION

The pilot plants are depicted in Fig. 1. The OSA system consists of an oxic completely mixed tank, followed by a settling tank and an anoxic tank, situated in the returned sludge circuit. The characteristics of the process units are summarized in Table 1. Fig. 2 shows a general view of the plants while Fig. 3 illustrates details of several parts of the experimental device.

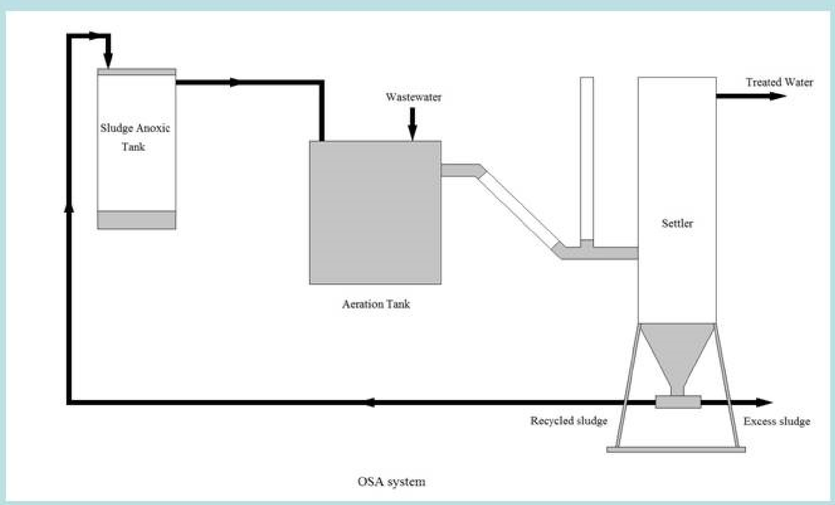

Figure 1. Schematic diagram of two experimental systems (the reference and OSA system).

Figure 2. Lab-scale pilot plants at the laboratory.

	Dimensions/mm Internal diameter/external diameter/heigh	Effective volume/L
Aerobic tank	160/168/17,5	2,5
Settler	102/110/61	3,5
Anoxic tank	102/110/21,5	1,3

Table 1. Characteristics of the process units.

Figure 3. Detail of the two pilot plants. Anoxic tank, aerobic tank and settler.

CONCLUSIONS

The developed project has allowed us to design a pilot plant to evaluate the reduction of excess sludge production in wastewater treatment plants. After one month of construction and two months of adjustment, the plant was operative. The plant is a moderate cost and easy constructed facility where the use of own technology and conventional laboratory and industrial supplies are on the basis of a significant economic and energetic saving.

REFERENCES

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