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Modelling and simulation of energy-saving potential of sequential batch reactor (SBR) in the abatement of ammoniacal-nitrogen and organics (Article)

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Abstract

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The ammonical nitrogen removal in discharged effluents from a typical sewerage treatment plant has not been consistent with the stringent discharge standards. There is the need to optimize the energy consumption as well as improve the ammonical nitrogen removal in the treatment plant. This study reports the investigation of the behaviour of process dynamicity of ammoniacal-nitrogen (NH_3-N) removal in a Sequencing Batch Reactor (SBR) through Activated Sludge Model No.1 (ASM1) and standard SBR design computation for optimal aeration time, while meeting the treatment requirements. The study further evaluates the performance of NH_3-N removal based on the data obtained from an existing SBR system. The time profile of process dynamics and the minimum required aeration time with maximum nitrogen removal was studied while taking into account the system's energy consumption. Moreover, the simulation results by MATLAB Software suggested that the process dynamicity of the carbon and NH_3-N concentration is 7 hour batch time with one fill and 1.5 hours aeration time. For computation of SBR standard design, the reduction from current 1.5 hours to 1.35 hours of aeration for 80% to 93% of NH_3-N removal brought about the total energy saving of up to 10 percent.

Author keywords

Aeration time Ammoniacal-nitrogen ASM1 Energy Sequential batch reactor Simulation

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References (19)

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1 Amosa, M.K., Jami, M.S., Muyibi, S.A., Alkhatib, M.F.R., Jimat, D.N.
Zero liquid discharge and water conservation through water reclamation & reuse of biotreated palm oil mill effluent: A review
(2013) *Int. J. Acad. Res.*, 5, pp. 169-182. Cited 2 times.

2 Roberge, P.
(2008) *Corrosion Engineering: Principles and Practice*. Cited 162 times.
New York: McGraw Hill Professional

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(2014) Journal of the Chinese Chemical Society

Effects of recharge of chlorinated state water project waters to groundwaters in Lancaster area of California
Baqai, H.A.
(2002) Water Engineering and Management

3 Inglezakis, V.J., Poulopoulos, S.G.
Adsorption, Ion Exchange and Catalysis

(2006) *Adsorption, Ion Exchange and Catalysis*, p. 602. Cited 136 times.
http://www.sciencedirect.com/science/book/9780444527837
ISBN: 978-044452783-7
doi: 10.1016/B978-0-444-52783-7.X5000-9

View at Publisher

4 Hammer, M.J.
(2008) *Water and Wastewater Technology 6th Ed.*. Cited 298 times.
Upper Saddle River, NJ: Pearson Prentice Hall, page

5 Tchobanoglous, G., Burton, F.L., Stensel, H.D.
(2003) *Wastewater Engineering: Treatment and Reuse*. Cited 4364 times.
Metcalf, Eddy, I. McGraw-Hill Education

6 Surampalli, R.Y., Tyagi, R.D., Scheible, O.K., Heidman, J.A.
Nitrification, denitrification and phosphorus removal in sequential batch reactors

(1997) *Bioresource Technology*, 61 (2), pp. 151-157. Cited 48 times.
doi: 10.1016/S0960-8524(97)00034-5

View at Publisher

7 Lin, Y.L., Tay, J.H., Liu, Y., Hung, Y.T.
Biological nitrification and denitrification processes
(1986) *Handbook of Environmental Engineering, Biological Treatment Processes*, 3.
Wang LK, Pereira N, Hung Y-T, eds. NJ, USA: The Humana Press, Inc.

8 Wang, L.K., Pereira, N.C., Hung, Y.T.
(2009) *Biological Treatment Processes*, 8. Cited 17 times.
Springer

9 Al-Shididi, S., Henze, M., Ujang, Z.
Feasibility study of sequencing batch reactor system for upgrading wastewater treatment in Malaysia

(2004) *Water Science and Technology*, 48 (11-12), pp. 327-335. Cited 2 times.

View at Publisher

10 Jamieson, T.S., Stratton, G.W., Gordon, R., Madani, A.
The use of aeration to enhance ammonia nitrogen removal in constructed wetlands

(2003) *Canadian Biosystems Engineering / Le Genie des biosystems au Canada*, 45, pp. 1.9-1.14. Cited 23 times.

11 Mace, S., Mata-Alvarez, J.
Utilization of SBR technology for wastewater treatment: An overview

(2002) *Industrial and Engineering Chemistry Research*, 41 (23), pp. 5539-5553. Cited 125 times.

View at Publisher

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12 Mahvi, A.H.
Sequencing batch reactor: A promising technology in wastewater treatment
(2008) *Iranian Journal of Environmental Health Science and Engineering*, 5 (2), pp. 79-90. Cited 60 times.
http://www.bioline.org.br/pdf?se08017

13 Chiu, Y.-C., Lee, L.-L., Chang, C.-N., Chao, A.C.
Control of carbon and ammonium ratio for simultaneous nitrification and denitrification in a sequencing batch bioreactor
(2007) *International Biodeterioration and Biodegradation*, 59 (1), pp. 1-7. Cited 126 times.
doi: 10.1016/j.ibiod.2006.08.001
View at Publisher

14 Bodington, V., Langford, A., Dooley, M., Diamond, K.
(2009) *Aeration Optimization Through Scientific Control Water Services*
Wales: Strathkelvin Instruments Ltd.

15 Henze, M.
Activated Sludge Models-ASM1, ASM2, ASM2d, and ASM3
(2000) *IWA Scientific Technical Report*, p. 9. Cited 1078 times.

16 Gujer, W., Henze, M., Mino, T., Van Loosdrecht, M.
Activated Sludge Model No. 3
(1999) *Water Science and Technology*, 39 (1), pp. 183-193. Cited 574 times.
doi: 10.1016/S0273-1223(98)00785-9
View at Publisher

17 Chang, H.N., Moon, R.K., Park, B.G., Lim, S.-J., Choi, D.W., Lee, W.G., Song, S.L., (...), Ahn, Y.H.
Simulation of sequential batch reactor (SBR) operation for simultaneous removal of nitrogen and phosphorus
(2000) *Bioprocess Engineering*, 23 (5), pp. 513-521. Cited 39 times.
View at Publisher

18 (2005) *Standard Methods for the Examination of Water and Wastewater*. Cited 7572 times.
APHA, AWWA, WPCF Washington, DC: American Public Health Association

19 Jami, M.S., Amosa, M.K., Alkhatib, M.F.R., Jimat, D.N., Muyibi, S.A.
Boiler-feed and process water reclamation from biotreated palm oil mill effluent (BPOME): A developmental review
(2013) *Chemical and Biochemical Engineering Quarterly*, 27 (4), pp. 477-489. Cited 11 times.
http://pierre.fkit.hr/hdki/cabeq/pdf/27_4_2013/Cabeq2013-04-11.pdf
View at Publisher

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