

凝集剤添加・嫌気好気回分式活性汚泥方式 による生活排水の高度処理

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概 要

生活排水中の有機物と窒素・リンの同時除去を目的として、嫌気好気回分式活性汚泥法と汚泥濃縮機を組み合わせた実験装置を試作した。生下水を1日約17m³ずつ実験装置に導入し、580日間にわたり実験を行った。嫌気好気プロセスへの凝集剤添加の有無による処理機能、生物相、発生汚泥量等の比較検討を行うため、実験開始後284日目までは凝集剤を添加しない運転(RUN 1)を行い、285日目から回分反応槽に凝集剤(PAC)を添加する運転(RUN 2)を行った。実験によって得られた結果を以下に示す。流入原水のBOD, COD, SS, T-NおよびT-Pの平均値はそれぞれ、270, 80.4, 94.6, 48.1, 8.6 mg/lであった。BOD, COD, SS, T-N, T-Pの平均除去率は、すべての項目でRUN 2がRUN 1より高い値を示した。RUN 2における回分反応槽処理水のBOD, COD, SS, T-N, T-Pの平均値はそれぞれ4.4, 9.1, 6.0, 6.9, 0.8mg/lであった。凝集剤の添加によって発生汚泥は、添加前とくらべて約50%増加したが、汚泥濃縮機によって発生汚泥の容量は約5分の1となった。また、凝集剤の添加によって、回分反応槽の固液分離が良好に行われ、SVIが低下したほか、MLSS濃度が増加したため、硝化は進み、T-PだけでなくT-Nについても除去率は向上し、安定した。

Advanced Treatment of Domestic Wastewater by Adding Coagulant to Anaerobic-Aerobic Sequencing Batch Reactor

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Abstract

In order to remove not only BOD and COD but also nitrogen and phosphorus in domestic wastewater, an experimental investigation was carried out using a fullscale apparatus. The experimental apparatus consisted of anaerobic - aerobic sequencing batch reactor activated sludge process (S.B.R), and a compact sludge thickening. The verification test was conducted by two operation methods, One (RUN - 1) was operation method without adding coagulant, and another (RUN - 2) was operation method adding coagulant. The fullscale verification test was conducted for 580 days by leading about 17m³/d of the domestic wastewater discharged from sewage system into the experimental apparatus. Results of the verification test are summarized as follows ; The average values of BOD, COD, SS, T - N and T - P in the raw water were 269.5mg/l, 80.4mg/l, 94.6mg/l, 48.1mg/l and 8.6mg/l, respectively. All removal of BOD, COD, SS, T - N and T - P in the water treated by RUN - 2 were higher than those of RUN - 1. Average values of BOD, COD, SS, T - N, T - P in the treated water of RUN - 2 were 4.4mg/l, 9.1mg/l, 6.0mg/l, 6.9mg/l and 0.8mg/l, respectively. By adding coagulant to the S.B.R, the amount of produced sludge in the S.B.R increased by 50% compared with that by treatment without PAC, nevertheless the sludge thickening equipment reduced the volume of sludge to 1 / 5. By adding PAC, solid - liquid separation were performed excellent, therefore stable effluent quality was achieved. Not only T - P but also T - N in the domestic wastewater were removed.

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