

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（第2報）

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概 要

生活排水中の有機物と窒素，リンの同時除去の方法として，これまで嫌気好気回分式活性汚泥法の研究を進めてきた。前報では凝集剤添加の有無による比較を行ったが，本報では添加する凝集剤の違いによる処理機能，汚泥発生量等の比較を行った。使用した凝集剤はPAC，ポリ硫酸鉄，塩化第二鉄の3種類を用い，凝集剤添加回分式活性汚泥法の実験装置を試作し，生下水を1日約23m³ずつ実験装置に導入し240日間にわたり実験を行った。実験開始後，181日目までは回分反応槽に凝集剤としてPAC (RUN 1)，182日目から218日目まではポリ硫酸鉄 (RUN 2)，219日目以降は塩化第二鉄 (RUN 3) を流入水リン濃度 (5 mg/ℓとして計算) に対してモル比としてAl/P, Fe/P≒1.5となるように添加して実験を行った。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，266, 85.5, 74.9, 45.1, 7.1mg/ℓであった。BOD, COD, SS, T-NおよびT-Pの平均除去率はそれぞれRUN 1で97.5%, 88.0%, 90.7%, 81.7%, 91.5%, RUN 2で97.2%, 87.7%, 90.3%, 83.6%, 92.6%, RUN 3で97.6%, 86.2%, 89.1%, 80.9%, 93.6%とほとんど差がなく，凝集剤による処理機能の違いはみられなかった。発生汚泥量に関してはPACと比べてポリ硫酸鉄の場合約25%増加した。また，実験期間中全般を通じて，回分反応槽の固液分離は良好に行われ，凝集剤による硝化阻害もみられず安定的に処理が行われた。

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

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Abstract

As a method of removing nitrogen and phosphorous together with BOD and COD in domestic wastewater, an experimental investigation using anaerobic-aerobic sequencing batch reactor activated sludge process (S.B.R.) has been carried out. In the previous report, the effect of adding coagulant vs. not adding coagulant was investigated. However, this time another experimental investigation was carried out to see if the type of coagulant would make any difference in the performance of treatment and amount of sludge produced. A full-scale apparatus of S.B.R. was used with three types of coagulants: PAC, Poly iron(III) sulfate and Iron(III) chloride. By leading about 23m³ per day of the domestic wastewater discharged from sewage system into the experimental apparatus, the verification test was conducted for 240 days with three stages. PAC from the first day to the 181st (RUN-1), Poly iron(III) sulfate from the 182nd to the 218th (RUN-2), and Iron(III) chloride from the 219th to the 240th (RUN-3) was added to S.B.R. with the mole ratio of 1.5 as Al/P and Fe/P. (This experiment was carried out with the hypothesis that phosphorous in raw wastewater was 5 mg / ℓ.) Results of the verification test are summarized as follows; the average value of BOD, COD, SS, T-N and T-P in the raw water were 266mg/ℓ, 85.5mg/ℓ, 74.9mg/ℓ, 45.1mg/ℓ, and 7.1mg/ℓ, respectively. The average rate of removal of BOD, COD, SS, T-N and T-P were 97.5%, 88.0%, 90.7%, 81.7%, 91.5% with RUN-1, and 97.2%, 87.7%, 90.3%, 83.6%, 92.6%, with RUN-2, and 97.6%, 86.2%, 89.0%, 80.9%, 93.6%, with RUN-3, respectively. This proved that there is no significant difference in the effect of three types of coagulant added. As to the amount of sludge produced, those treated with Poly iron(III) sulfate had 25% more than those treated with PAC. Throughout the experiment, the solid-liquid separation performance was excellent, therefore stable effluent quality was achieved.

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