

过程系统工程

间歇用水系统中废水回用与集中再生处理的调度优化设计方法

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摘要

针对间歇用水系统建立了废水回用与废水集中再生处理协调运行和调度优化的数学规划设计模型。在多周期运行条件下, 以保证循环周期中水系统最优运行为目标, 提出了消除不同操作周期下储罐中水量和浓度波动的多周期反算求解策略, 并确定了多周期操作下优化的用水网络。通过单杂质间歇用水系统实例阐明了所提出方法的有效性, 为具有废水集中再生处理的间歇用水系统从启动到稳定的多周期操作和设计提供依据。

关键词

[间歇用水系统](#) [废水回用](#) [集中再生](#) [多操作周期](#) [调度](#)

分类号

Optimal design of batch water-using system with wastewater reuse and centralized treatment through scheduling

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Abstract

A mathematical programming model was proposed to optimize a batch water-using system with wastewater reuse and centralized treatment in coordination. In order to achieve an optimal operation in the repeated cycle under multiple cycles, a back-calculation strategy was proposed to dampen fluctuations of residual water and contaminant concentrations in buffer tanks. Optimal water-using schemes could be obtained for different operating cycles. A case study of a batch water-using system with a single contaminant was used to illustrate the effectiveness of the proposed method. It provided insight into the design and operation of the batch water-using system with centralized treatment running from start-up to steady state during multiple operating cycles.

Key words

[batch water-using system](#) [water reuse](#) [centralized treatment](#) [multiple operating cycles](#) [scheduling](#)

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