

## Optimization of denitrification treatment of freshwater aquaculture tailwater based on distributed control technology

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Received 6 August 2021; Accepted 23 September 2021

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### ABSTRACT

Because the traditional freshwater aquaculture tailwater denitrification treatment method has the problems of poor tailwater denitrification effect and slow denitrification treatment efficiency, an optimization method for freshwater aquaculture tailwater denitrification treatment based on distributed control technology is proposed. Using distributed control technology to design the freshwater aquaculture tailwater denitrification treatment distributed control system (DCS) composed of the chlorination room circuit module, the reaction tank valve circuit module, the filter instrument control module and the flushing pump control circuit module; Through the DCS control system, the blower is used for dissolved oxygen control, two  $Al_2(SO_4)_3$  solution pools are designed for dosing control. Combining the advantages of proportion integral differential (PID) control and fuzzy control, the fuzzy control self-tuning PID intelligent control is used to construct a fuzzy control model to complete freshwater aquaculture tailwater removal nitrogen treatment optimization. The experimental results show that the freshwater aquaculture tailwater of this method has a higher denitrification rate and a faster denitrification treatment efficiency.

*Keywords:* Distributed control technology; Freshwater aquaculture; Tailwater denitrification; Fuzzy control

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