

The treatment of micro-polluted source waters by micro-vortex clarification

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ABSTRACT

The integrated micro-vortex clarifier is used for intensive conventional treatment of raw water from micro-polluted water source as well as from water plants with common water quality problems. The results showed that when the influent flow of integrated micro-vortex clarifier is $8 \text{ m}^3 \text{ h}^{-1}$, the influent turbidity was 21.7 NTU, and when the dosage was 10 mg L^{-1} , then the effluent turbidity of clarification tank maintained stable below 3 NTU. The removal rates of ultraviolet UV_{254} and chemical oxygen demand Mn (COD_{Mn}) were 25% and 41%, respectively. When the working conditions remained unchanged, the dosage was increased to 16 mg L^{-1} . The effluent turbidity of clarifier was stable at 0.5 NTU, and the removal rates of UV_{254} and COD_{Mn} increased to 40% and 60%. As the dosage was increased within a certain range, Zeta potential rose gradually and equivalent diameter of floc became larger, and then effluent turbidity decreased, while the removal rates of UV_{254} and COD_{Mn} increased, which were measured by the flocculation control device and the Zeta potential instrument. This study compares other clarification technologies; the micro-vortex clarification process deserves wide application for its various advantages, such as a higher coagulation efficiency, a shorter reactivity time, a better quality of finished water, and a stronger adaptive capability.

Keywords: Micro-vortex clarification; Vortex reactor; Micro-polluted water; Water quality

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