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OPTIMIZATION OF COAGULATION AND OZONATION PROCESSES FOR DISINFECTION BY-PRODUCTS FORMATION POTENTIAL REDUCTION

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Optimization of coagulation and ozonation processes for removal of disinfection by-products (DBP) formation potential in raw water was conducted by a pilot scale system. Proper poly-aluminum-chloride-sulfates (PACS), pre-ozone and post-ozone dosages are required for improving the removal performance of DBP formation potential to guarantee the safety of drinking water. Considering the treatment performances and economic costs, the optimum PACS, pre-ozone and post-ozone dosages for treating raw water with high organic concentration should be around 8.9 mg/L Al_2O_3, 0.5 and 2.5 mg/L, respectively. The combined drinking water treatment system of pre-ozonation, coagulation/sedimentation, sand filtration, post-ozonation, granular activated carbon filtration and disinfection is a promising process to reduce DBP formation potential from raw water in southern China. Under the optimum conditions, this combined system removed total trihalomethanes and haloacetic acids formation potential 50.16 and 69.10%, respectively.

Keywords: coagulation, pre-ozonation, post-ozonation, DBP formation potential.

Introduction

Since the beginning of the 20th century, disinfection has been an integral part of drinking water treatment due to its crucial role in preventing the spread of diseases caused by waterborne pathogens. Chlorine is by far the most common disinfectant in drinking water treatment because it inactivates a wide variety of microbial pathogens in the water supply and its effects are relatively long lasting. Furthermore, chlorination is a simple and inexpensive instrument for disinfection of drinking water in the world. However, potentially harmful

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