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A study on the removal of highly concentrated organic matters in saline lake water and the mechanism of magnesium ion loss in water treatment

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ABSTRACT

Nafine Chemical Industry Group Co. Ltd. extracted inorganic salts from the saline lake of Shanxi Yuncheng, China. Because of the complexity of component and the high content of organic matters in the saline lake water, the purity of the inorganic salts was influenced directly. As a result, the organic matters in the saline lake water were needed to be removed. In order to solve this problem, different water treatment processes were utilized to remove the organic matters in saline lake water, but some valuable metal ions would lose, especially the magnesium ion in water treatment processes. The purpose of this paper is to study the treatability of high concentrated organic matters in saline water by O_3/H_2O_2 oxidation, O_3/H_2O_2 oxidation followed coagulation and activated carbon adsorption respectively, and the mechanisms of magnesium ion loss were analyzed. The results showed that O_3/H_2O_2 oxidation can change the structure of organic matter and increase the content of carboxylic groups in organic matters which resulted in the complexation with magnesium ion. So that magnesium ion would be lost along with the removal of organic matters by coagulation or activated carbon adsorption following oxidation. However, it indicated that the magnesium ion loss could be decreased effectively through pH adjusting after oxidation.

Keywords: Saline lake water; Organic matter removal; Magnesium ion loss; Advanced oxidation process; Coagulation; Complexation

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