

**Sulfamic acid and ammonia removal study to enhance nitrogen removal of a nitrate removal method using sulfamic acid along with zinc metal**

장정화, 양끝가르<sup>1</sup>, 김미리<sup>1</sup>, 박진원<sup>1,\*</sup>  
연세대학교 대학원; <sup>1</sup>연세대학교  
(jwpark@yonsei.ac.kr\*)

Among different approaches to improve nitrate reduction, sulfamic acid has been used as a nitrite reductant along with zinc metal. While sulfamic acid is a cheap reductant and accelerates nitrate reduction enhancing rapid-indirect denitrification reaction between sulfamic acid and nitrite reduced from the nitrate reduction by zinc metal, small amount of sulfamic acid and ammonia remain in the treated solution. To use this nitrate reduction method as a total nitrogen removal technology, the unspent sulfamic acid and converted ammonia should be removed. In this study, we compared sulfamic acid and ammonia removal efficiencies of chlorination using sodium hypochlorite, electrolytic oxidation and nitrite addition method. From our analysis, chlorination and electrolytic oxidation methods completely removed ammonia but large quantity of sulfamic acid remained. Nitrite addition method rapidly removed all remaining sulfamic acid. Therefore, to remove sulfamic acid and ammonia efficiently, sulfamic acid should be removed first by the nitrite addition method and the remaining ammonia could be treated by chlorination or electrolytic oxidation methods.