

## **Influence of nitrogen assimilation on biomigration and transformation of arsenic in the groundwater systems**

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Arsenic is a toxic metalloid. Long-term exposure to arsenic environment can lead to arsenicosis. In this study, *Shewanella Oneidensis* MR-1 (*S. Oneidensis* MR-1) was applied to investigate the effects of nitrogen assimilation on biomigration and biotransformation of arsenic in the groundwater system.  $\text{NH}_4\text{Cl}$  and  $\text{NaNO}_3$  were used as nitrogen nutrient source. It was found that *S. Oneidensis* MR-1 had rapider growth in the medium with  $\text{NH}_4\text{Cl}$  than with  $\text{NaNO}_3$ , showing that  $\text{NH}_4\text{Cl}$  may promote the bacterial growth or be used as directly nitrogen nutrient for bacterial growth. As(III) was oxidized to As(V) by *S. Oneidensis* MR-1. Nevertheless, the bacterial oxidation of arsenite abated with increasing arsenite concentration, indicating that arsenite was toxic for bacteria and restrained bacterial oxidation. In anaerobic condition, nitrite and ammonium was found, and arsenic removed from sediment into aqueous phase in the microcosm with nitrate and *S. Oneidensis* MR-1. However, ammonium had little effect on arsenic migration. Hence, we can come to the conclusion that the bacterial strain is helpful for nitrate reduction and arsenite oxidation, and then arsenate released from sediment into groundwater.