

## Removal and Recovery of Gold(III) by Biosorption and Biomineralization Using Microorganism

T. TSURUTA<sup>1</sup>, Y. ODAJIMA<sup>1</sup>, M. KATOH, I. MAEDA<sup>1</sup>, N. MIURA, R KUDOH, AND T. KIKUCHI<sup>1</sup>

<sup>1</sup>Aza-Ohbiraki 88-1, Myoh, Hachinohe, Aomori, 031-8501, Japan, tsuruta@hi-tech.ac.jp

In order to obtain basic information on the gold (III) removal by biosorption and biomineralization from aqueous systems using microbial cells, gold (III) removal and recovery by those using microbial cells was investigated.

Of microorganisms tested, high abilities of gold removal from a solution containing hydrogen tetrachloroaurate (III) were found in some species of the most of the microbial species, such as bacteria, fungi and yeasts, however, the amounts of gold removed by biosorption using gram-positive bacteria, fungi, and yeasts were smaller than those using gram-negative bacteria. Therefore, gold (III) removal by sorption and reduction was examined using *Pseudomonas saccharophila*, which was able to remove larger amounts of gold (III) by sorption and reduction, in detail.

In this research, time course and some factors affecting on the gold removal using *P. saccharophila*, were examined. At first, time course of gold (III) removal was examined. The amount of gold (III) removed using *P. saccharophila*. The amount of gold removed was increased very rapidly using *P. maltophilia* cells. It reached first equilibrium stage by biosorption until 6h, however, after that, the amount of gold removed was increase again, and the color of the solution was changed dark violet.

The repetition test of removal of gold (III) using immobilized *P. saccharpphila* cells and recovery of gold desorbed using aqueous thiourea solution was also examined. Immobilized *P. saccharophila* cells can be removed most of the gold (III) removed and most of the gold (0) on the immobilized *P. saccharophila* cells can be recovered using the aqueous thiourea solution. The removal and recovery can be recycled several times. Accordingly, immobilized microbial cells, such as *P. saccharophila*, can be used the removal and recovery of gold. The experimental data will be presented at the conference.