

## Statistical Medium Optimization for Minimizing the Jarosite Formation During the Ferrous Iron Oxidation by the Chemolithoautotrophic bacteria, *Acidithiobacillus ferrooxidans*

김겸민<sup>1</sup>, 심명섭<sup>1</sup>, 정용배<sup>2</sup>, 김자경<sup>2</sup>, 김태완<sup>2,1,†</sup>

<sup>1</sup>전남대학교 바이오에너지및바이오소재 협동과정; <sup>2</sup>전남대학교 생물공학과  
(chekimtw@jnu.ac.kr<sup>†</sup>)

*Acidithiobacillus ferrooxidans* is a chemolithoautotrophic bacteria that generates its energy and reducing power for CO<sub>2</sub> fixation from the oxidation of iron- and sulfur-containing compounds. Because of these property, *A. ferrooxidans* is considered the potential biocatalyst for conversion of CO<sub>2</sub> into biochemicals and widely used in bioleaching of metals. During the ferrous iron oxidation by the *A. ferrooxidans*, the basic ferric sulfates called jarosite tends to be formed and negatively affects process performance including the decrease of ferric iron production, which is used as an oxidizing agent of metals in bioleaching process. Thus, in this study, the culture medium of *A. ferrooxidans* was statistically optimized to minimize the jarosite formation by using response surface methodology (RSM). As a result of RSM using four independent variables, which are initial pH and initial concentrations of KCl, MgSO<sub>4</sub>·7H<sub>2</sub>O and (NH<sub>4</sub>)<sub>2</sub>HPO<sub>4</sub>, it was predicted that jarosite formation would be minimized when the values of initial pH and concentrations of KCl, MgSO<sub>4</sub>·7H<sub>2</sub>O and (NH<sub>4</sub>)<sub>2</sub>HPO<sub>4</sub> were 1.7, 0.05g/L, 0.1g/L and 3.3g/L, respectively.