Assessment of oxidation rates and oxidation degrees at adaptation of iron-oxidizing bacterial strain *Acidithiobacillus ferrooxidans* JCM 3863 to 16 g/L ferrous ions

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Abstract

*Acidithioacillus ferrooxidans* is an autotrophic, acidophilic, mesophile occurring in single or occasionally in pairs or chains, depending on growth conditions. Among the group of Acidithiobacillus, *Acidithioacillus ferrooxidans* has emerged as an economically significant bacterium in the field of leaching of sulfide ores. They oxidize ferrous ions and used in waste water, tail gas treatment. The use of bacteria in environmentally friendly technologies of wastewater treatment, it may fall in areas with high concentrations of iron and lead, and this is toxic for the strain. In order to avoid inhibition of the bacterial action, it is necessary to adapt *Acidithiobacillus ferrooxidans* to high initial concentrations of iron ions. The aim of present work is to compare the assessed oxidation rates and oxidation degrees of the strain at determined hours of batch cultivation. The bacterial cells were adapted to substrate concentration near 16g/L. There are statistically significant influence of the high substrate concentrations on oxidation rates and oxidation degrees. The obtained experimental results show stability in the strains behavior at the begining stages of cells adaptation to high concentrations of ferrous ions.

Keywords: Oxidation rate, oxidation degree, ferrous ions, biooxidation, *Acidithiobacillus ferrooxidans*