عنوان مقاله:

Biosynthesis of jarosite by Acidithiobacillus ferrooxidans isolated from Sarcheshmeh copper mine

محل انتشار:

بیستمین کنگره بین المللی میکروب شناسی ایران (سال: 1398)

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خلاصه مقاله:

Introduction and objectives: Jarosite process is one of the most widely used methods in removing iron. Acidithiobacillus ferrooxidans are a chemoautotrophic and acidophilic bacterium, which can obtain energy for growth from the oxidation of a variety of inorganic sulfur compounds and have an important effect on formation of jarosite. In the copper bioleaching process, the formation of jarosite on the surface of the biooxidized metal sulfide particle significantly decreases the rate of bioleaching. The main goal of this study to investigate the formation mechanism of ammonium jarosite, by Acidithiobacillus ferrooxidans isolated from Sarcheshmeh copper mine. Materials and methods: A. ferrooxidans, has been isolated from pregnant leaching solution (PLS) of the Sarcheshmeh copper mine. The A. ferrooxidans was identified using specific amplification of 16S rDNA sequences by PCR. the formation of jarosite was determined by Fourier transform infrared spectroscopy (FTIR) and scanning electron microscope (SEM) analysis.Result: The SEM and XRD results showed that biosynthetic jarosite had smooth surface and mainly consisted of ammonium jarosite [NH4Fe3(SO4)2(OH)6]. The ammonium jarosite crystals were clearly grown by the two-dimensional nucleation mechanism and/or the spiral growth mechanism.Conclusion: The results will be of significant importance for the further research in the copper bioleaching.

کلمات کلیدی:

Acidithiobacillus ferrooxidans; jarosite; biooxidation; pH