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ZHONGNAN DAXUE XUEBAO(ZIRAN KEXUE BAN)

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高浓度镍环境中不同培养条件对浸矿微生物群落的影响

管 昊，尹华群，刘 杰，罗焱杰，刘学端，邱冠周

(中南大学 资源加工与生物工程学院，湖南 长沙，410083)

摘 要：为了解高浓度镍环境中不同能源条件对浸矿微生物群落组成的影响，以59 g/L(1 mol/L)的镍离子作为选择压力，在不同培养条件下富集酸性环境中的微生物，并通过聚合酶链式反应-限制性片段长度多态性(PCR-RFLP)技术分析微生物群落多样性。研究结果表明：在高浓度镍离子胁迫下仍存在多种微生物，分别属于变形菌门、酸杆菌和厚壁菌门。此外，研究还发现，不同的富集条件对微生物群落影响很大。当pH值为4时，以亚铁为能源的富集物中，其微生物群落主要以*Acidiphilium*属和*Acidobacterias*属为主；在以单质硫为能源的富集物中，90%的微生物属于*Acidiphilium*；在以硫酸亚铁、单质硫及酵母粉为能源的富集条件下，*Acidiphilium*和 *Pseudomonas*为优势种群。

关键字：生物冶金；微生物群落；镍抗性；PCR-RFLP；酸性矿坑水

Effect of culture conditions on microbial community with high concentration of nickel ion

GUAN Hao, YIN Hua-qun, LIU Jie, LUO Yan-jie, LIU Xue-duan, QIU Guan-zhou

（School of Minerals Processing and Bioengineering, Central South University, Changsha 410083, China）

Abstract: The influence of energy resources on leaching microbial community was studied. AMD (Acid mine drainage) microbes was cultivated and selected. In high concentration (59 g /L) of nickel sulphate, with different energy resources, the microbial community diversity was analyzed by polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP) technique. The results show that there are several kinds of bacteria in high-concentration nickel ion, which are close to *Firmicutes*, *Acidobacteria*, and *Proteobacteria* in affinity respectively. Moreover, the results indicate that the different culture conditions show great impact in the microbial community. *Acidiphilium* and *Acidobacterias* are the dominant species in microfloras enriched in pH=4 media with ferrous iron as energy sources. In microfloras enriched in pH=4 media with sulfur as energy sources, about 90% of the bacterium are *Acidiphilium*. With the energy source including ferrous iron, sulfur and yeast extract, *Acidiphilium* and *Pseudomonas* are the dominant species.

Key words:microbial metallurgy; microbial community; nickel-resistance; PCR-RFLP; acid mine drainage

地 址：湖南省长沙市中南大学 邮编： 410083
电 话： 0731-88879765 传真： 0731-88877727
电子邮箱： zngdxb@mail.csu.edu.cn 湘ICP备09001153号