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能源和环境工程

利用硫化亚铁从污酸废水中回收砷

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摘要 针对铜冶炼过程中产生的高浓度的含砷酸性废水，研究了一种新的处理方法：采取两段操作的方式，一段利用硫化亚铁作为除砷剂，使砷生成硫化砷沉淀去除。二段利用石灰调节pH,进一步除砷。通过两段能够使污酸废水在处理后达到国家排放标准，同时能够回收废水中的砷。研究了投药量、pH、反应时间和曝气时间等因素对除砷率的影响。实验结果表明：在硫化亚铁的投加量为理论计算所需摩尔质量的2倍时，一段室温下反应3h，二段曝气反应30min后，水中砷含量由进水时的6240 mg·L^{-1}降低至0.5 mg·L^{-1}以下，水中砷的平均去除率可以达到99.9%以上，渣中砷含量可以达到15% 以上。

关键词

硫化亚铁 砷 污酸废水

分类号

Recovering arsenic from waste acid water with ferrous sulfide in producing vitriol

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Abstract

For the recovery of arsenic in waste acid water produced in copper smelting, a two-stage operation was investigated, in which arsenic from waste acid water was first precipitated by ferrous sulfide, then lime was used to adjust the pH, and arsenic was removed further.The experiment showed that the parameters including dosage of material, pH of solution, reaction and aeration time affected the efficiency of arsenic removal.The experimental results indicated that the first stage required 3 h for the precipitation by ferrous sulfide at room temperature, the second stage required 30 min for aeration, and the best dosage of ferrous sulfide was two times of the calculated molar quantity.In this condition, after the two-stage treatment, the arsenic concentration in waste acid water was reduced from 6240 mg·L^{-1} to 0.5 mg·L^{-1}.The average removal rate of arsenic from waste acid water was more than 99.9%, and the content of arsenic in the sludge was above 15%.

Key words

ferrous sulfide arsenic acid water

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