



高碳海绵铁电化学絮凝处理铅锌冶炼厂制酸废水

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Treatment of wastewater from Pd-Zn smelting plant by the micro-electrolysis and flocculation process with high carbon sponge iron

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摘要 采用高碳海绵铁(含13.00% C,55.40% Fe)电化学-絮凝处理铅锌冶炼制酸废水,研究了pH和时间、海绵铁用量和粒径等反应条件对废水中铅和锌离子的去除效果及影响.结果表明:在废水初始pH=3.0,海绵铁用量为30 g/L和粒径<0.301 mm,反应时间为40 min的条件下,废水中的铅锌离子去除效果最佳,电化学处理去除率分别为98.87%和77.89%,废水中的铜、总镉和总砷等离子去除率分别为93.50%、91.50%和47.26%;采用电化学-絮凝耦合处理,在最佳条件下,铅锌的去除率分别达到99.90%和99.67%,同时总砷、总镉和铜离子等得到进一步去除,去除率分别为97.77%、99.56%和97.77%,废水可达到《污水综合排放标准》(GB 8978—1996)中一级标准要求.

关键词: 高碳海绵铁 电化学 絮凝 铅锌冶炼废水

Abstract: In order to support a new way for the metal-contained wastewater from metallurgical plants, in this paper the new combined flocculation process of the micro-electrolysis with high carbon sponge iron (including 13.00% C, 55.40% Fe) was used to treat the metal-contained wastewater from lead-zinc metallurgical plant, and the influence of pH, reaction time, and consumption as well as particle size of sponge iron on the removal effect of lead and zinc ions in acid wastewater from Pd-Zn smelting plant were also researched systematically and deeply. The results showed that the removal effect of lead ions and zinc ions in wastewater was optimum and the electrochemical removal rates of them were 98.87% and 77.89% respectively, the ion removal rates of copper, total cadmium and arsenic in waste water were 93.50%, 91.50% and 47.26% respectively when the initial pH of wastewater was 3.0, the consumption and particle size of sponge iron were 30 g/L, 0.301 mm respectively, and the reaction time was 40 min. Under optimal conditions by using micro-electrolysis and flocculation process, the removal rates of lead and zinc reached 99.90% and 99.67% respectively, at the same time, the total arsenic ions, cadmium ions and copper ions were further removed, the total removal rates of them were 97.77%, 99.56% and 97.77% respectively. The wastewater after the treatments could reach "Integrated Wastewater Discharge Standard" (GB 8978—1996) in requirements of primary standard in China.

Key words: high carbon sponge iron micro-electrolysis flocculation Pd-Zn smelting wastewater

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