



## 论文摘要

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### 采用复盐法脱除工业废水中的硫酸根

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**摘要:** 以水合铝盐及石灰乳为脱除剂, 采用实验室自行配制的模拟废水, 对工业废水中高浓度硫酸根的脱除进行研究。考察溶液pH值、铝盐加入量、反应时间、初始浓度以及反应温度等因素对硫酸根去除率的影响, 并设计三因素三水平正交实验。得出单因素和正交实验确定的最佳工艺条件为: 反应温度25 ℃, 反应时间60 min, 溶液pH值11.0, 与Al<sup>3+</sup>的物质的量比为1.11.0; 且各因素影响程度由大至小的顺序为: 溶液pH值、铝盐加入量、反应时间; 在最佳工艺条件下, 硫酸根离子质量浓度由1 720 mg/L降至100 mg/L以下, 达到生活饮用水卫生标准。沉淀物XRD检测结果表明: 其主要物相为钙矾石(Ca<sub>6</sub>Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>(OH)<sub>12</sub>·26H<sub>2</sub>O)。

**关键词:** 铝盐; 复盐沉淀; 工业废水; 硫酸根

### Removal of sulfate from industry wastewater by double salt method

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**Abstract:** Removal of sulfate from industry wastewater containing sulfate with high concentration were studied using hydrated aluminum salt and lime milk as remover. The effects of solution pH value, aluminum salt dosage, reaction time, initial concentration of and reaction temperature on the removal of were also investigated, and three factors and three levels orthogonal experiments were designed. The results determined by single factor and orthogonal experiments indicate that the optimum conditions for the removal of sulfate are as follows: reaction temperature is 25 ℃, reaction time is 60 min, pH value of solution is 11, the molar ratio of sulfate to aluminum is 1.11.0, and the influencing sequence of each factor from large to small is solution pH value, aluminum salt dosage, reaction time. By comparison between the wastewater and the purified water, the sulfate concentration decreased sharply from 1 720 mg/L to 100 mg/L or below under the optimum conditions, which is less than hygienic standard for drinking water. The X-ray diffraction pattern of the precipitation shows that the main composition of the solid phase is ettringite (Ca<sub>6</sub>Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>(OH)<sub>12</sub>·26H<sub>2</sub>O).

**Key words:** aluminum salt; double salt precipitation; industry wastewater; sulfate ion

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