

分离工程

## 超声波作用下柠檬酸盐溶液中SO<sub>2</sub>的解吸机理

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**摘要** 本文从超声波作用特点出发, 利用数值计算研究了在超声解吸SO<sub>2</sub>过程中, 超声波的作用机理, 从理论上阐明了影响超声解吸SO<sub>2</sub>的主要因素, 并对此进行了实验验证, 实验结果与理论分析吻合较好。研究表明, 超声场下脱除柠檬酸盐溶液中SO<sub>2</sub>在理论和实验室规模下是可行的; 超声频率、溶液中气体含量以及溶液性质对超声解吸SO<sub>2</sub>影响较大; 给溶液中增加空化气泡核如通入微量惰性气体, SO<sub>2</sub>解吸效率显著提高; 超声频率越低, 超声脱除SO<sub>2</sub>效果越好; 给溶液施加适当搅拌, SO<sub>2</sub>解吸率提高20%~30%; 溶液中SO<sub>2</sub>初始浓度越高, 解吸效果越好。

**关键词** [超声作用](#); [SO<sub>2</sub>解吸](#); [机理研究](#); [超声化学](#)

分类号

## Mechanism of SO<sub>2</sub> ultrasonic desorption from citrate solution

### Abstract

The mechanism of ultrasonic desorption of sulfur dioxide from citrate solution was investigated mathematically based on the characteristics of ultrasonic wave. The factors influencing ultrasonic desorption of sulfur dioxide were discussed theoretically and the mechanism was verified by experiments. The results showed that it was feasible to remove sulfur dioxide from citrate solution with ultrasonic field in theory and on the laboratory scale. There was a greater effect of ultrasonic frequency and gas content in solution as well as solution properties on sulfur dioxide desorption. The sulfur dioxide desorption efficiency could be improved rapidly by introducing cavitation bubble nucleus, such as adding trace argon gas. A lower ultrasonic frequency might result in higher desorption efficiency. Giving a proper stirring to the solution, the SO<sub>2</sub> desorption efficiency enhancement could be increased by 20%—30% over the control value. The higher the initial concentration of sulfur dioxide in citrate, the higher the desorption efficiency.

**Key words** [ultrasonification](#) [desorption of sulfur dioxide](#) [mechanism research](#) [sonochemistry](#)

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