

REACTION KINETICS, CATALYSIS AND.....

Fenton试剂与双频超声波协同降解溶液中对氯苯酚的研究

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**摘要** 4-Chlorophenol (4-CP) solution was treated by dual-frequency ultrasound in conjunction with Fenton reagent, and obvious improvement in the 4-CP degradation rate was observed in this advanced oxidation process. Experimental results showed that ultrasonic intensity, saturating gas and pH value affected greatly the 4-CP removal rate. Among four different saturating gases (Ar, O<sub>2</sub>, air and N<sub>2</sub>), 4-CP degradation with Ar-saturated solution was the best. However, in the view of practical wastewater treatment, using oxygen as the saturating gas would be more economical. The addition of Fenton reagent followed the first-order kinetics and increased the 4-CP degradation rate. The 4-CP removal rate increased by around 126% within 15 min treatment. The synergetic effect of dual-frequency ultrasound with Fenton reagent on 4-CP degradation was obviously observed.

**关键词** 4-氯酚, 协同作用, Fenton试剂, 环境污染, 毒性, 废水处理工艺

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**Degradation of 4-Chlorophenol Solution by Synergetic Effect of Dual-frequency Ultrasound with Fenton Reagent**

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**Abstract** 4-Chlorophenol (4-CP) solution was treated by dual-frequency ultrasound in conjunction with Fenton reagent, and obvious improvement in the 4-CP degradation rate was observed in this advanced oxidation process. Experimental results showed that ultrasonic intensity, saturating gas and pH value affected greatly the 4-CP removal rate. Among four different saturating gases (Ar, O<sub>2</sub>, air and N<sub>2</sub>), 4-CP degradation with Ar-saturated solution was the best. However, in the view of practical wastewater treatment, using oxygen as the saturating gas would be more economical. The addition of Fenton reagent followed the first-order kinetics and increased the 4-CP degradation rate. The 4-CP removal rate increased by around 126% within 15 min treatment. The synergetic effect of dual-frequency ultrasound with Fenton reagent on 4-CP degradation was obviously observed.

**Key words** dual-frequency ultrasound with Fenton reagent; advanced oxidation process; synergetic effect

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