

## 论文

### 基于全光谱分析的水质化学耗氧量在线监测技术

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#### 摘要:

针对水体中化学需氧量在线监测的迫切需求, 设计了一种基于全光谱分析的水质化学耗氧量监测系统. 该系统通过测量已知化学耗氧量的水质吸收光谱, 利用最小二乘法建立吸光度与化学耗氧量的传输方程; 针对待测水样, 通过已建立的传输方程来反演水体化学耗氧量的浓度. 通过模拟复杂水样进行化学耗氧量值测量, 并将测量值与实验室结果进行比较, 验证了该系统的可靠性. 结果表明, 该全光谱法水质监测系统不需要消耗任何试剂, 无二次污染, 测量准确度高、速度快, 可广泛应用于水质化学耗氧量的实时、现场监测分析.

关键词: 化学需氧量 全光谱 最小二乘法 在线监测

### On-line Monitoring Technology for Chemical Oxygen Demand Based on Full-spectrum Analysis

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#### Abstract:

An on-line monitoring system was developed for the determination of chemical oxygen demand in water based on full-spectrum analysis. In this system, least-square method was used to obtain the transmission equation between absorbance and chemical oxygen demand(COD) value by measuring absorption spectra of water with known COD value, and then the established equation could inverse the COD values of the unknown water samples. For the COD determination of simulated complicated water samples, the instrumental reliability was well validated by comparing the measurement values of the analyzer with that of laboratory results. The monitoring system provided advantages of simplicity, rapidity, high precision, low consumption and environmental benignity, and was demonstrated an ideal alternative to real-time and on-line monitoring of COD in water.

Keywords: Chemical Oxygen Demand(COD) Full spectrum Least square method On-line monitoring

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