

研究论文

氯金酸-小檗碱离子缔合物体系的共振瑞利散射光谱研究及其分析应用

彭敬东, 刘绍璞*, 刘忠芳, 石燕

(西南师范大学环境化学研究所 重庆 400715)

收稿日期 2004-4-30 修回日期 2004-12-21 网络版发布日期 接受日期

摘要 在pH=2.0的HCl-NaOAc缓冲溶液中, 小檗碱阳离子与氯金酸根阴离子由于静电引力和疏水作用力形成离子缔合物时, 将引起溶液共振瑞利散射(RRS)显著增强, 并产生新的RRS光谱, 其最大RRS波长位于370 nm, 另在277 nm也有一个较强的RRS峰. 在 $1.83 \times 10^{-8} \sim 5.0 \times 10^{-6}$ mol/L范围内小檗碱浓度与散射强度(ΔI)成正比; 反应有很高的灵敏度, 对小檗碱的检出限($3\sigma/K$)为 1.83×10^{-8} mol/L (7.5 ng/mL). 研究了共振瑞利散射光谱测定小檗碱的影响因素, 考察了共存物质的影响, 实验表明该方法有良好的选择性. 基于小檗碱与氯金酸反应产物的RRS光谱, 发展了一种高灵敏、简便、快速测定小檗碱的新方法, 用于中成药和中药饮片样品的测定, 结果满意. 本文还对反应机理进行了初步的探讨.

关键词 [氯金酸](#) [小檗碱](#) [共振瑞利散射光谱](#) [分析应用](#)

分类号

Interaction between Chloroauric Acid and Berberine Hydrochloride Investigated by Resonance Rayleigh Scattering Spectrum and Its Analytical Applications

PENG Jing-Dong, LIU Shao-Pu*, LIU Zhong-Fang, SHI Yan

(School of Chemistry and Chemical Engineering, Southwest China Normal University, Chongqing 400715)

Abstract In a pH=2.0 HCl-NaOAc buffer solution, when berberine cation reacted with chloroauric acid anion by electrostatic force and hydrophobic force to form an ion association complex, the Resonance Rayleigh Scattering (RRS) intensity could be enhanced greatly and a new RRS spectrum appeared. The maximum RRS peak was at 370 nm and the other RRS peak was located at 277 nm. There is a linear relationship between the RRS intensity and the berberine concentration in the range of $1.83 \times 10^{-8} \sim 5.0 \times 10^{-6}$ mol/L. The method is very sensitive and the detection limit ($3\sigma/K$) for berberine hydrochloride is 1.83×10^{-8} mol/L (7.5 ng/mL). The optimum condition and the effect of coexisting substances have been discussed and the results show that the method also has good selectivity. Based on RRS spectrum of the ion association complex, a highly sensitive, simple and rapid method for the determination of trace amounts of berberine has been developed and applied to the determination of berberine in pharmaceuticals and goldthread extracts with satisfactory results. Furthermore, the reasons for enhancement of RRS were discussed.

Key words [chloroauric acid](#) [berberine hydrochloride](#) [resonance Rayleigh scattering spectrum](#) [analytical application](#)

DOI:

通讯作者 刘绍璞 liusp@swnu.edu.cn

扩展功能

本文信息

▶ [Supporting info](#)

▶ [PDF\(577KB\)](#)

▶ [\[HTML全文\]\(0KB\)](#)

▶ [参考文献](#)

服务与反馈

▶ [把本文推荐给朋友](#)

▶ [加入我的书架](#)

▶ [加入引用管理器](#)

▶ [复制索引](#)

▶ [Email Alert](#)

▶ [文章反馈](#)

▶ [浏览反馈信息](#)

相关信息

▶ [本刊中 包含“氯金酸”的 相关文章](#)

▶ 本文作者相关文章

- [彭敬东](#)
- [刘绍璞](#)
- [刘忠芳](#)
- [石燕](#)