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发光学应用及交叉前沿

水溶液银纳米晶聚集对表面增强拉曼散射的影响

张友林[1], 孔祥贵[1], 薛彬[1,2], 夏露[1,2], 涂浪平[1,2], 刘晓敏[1], 常钰磊[1], 李晓坤[1], 于沂[1], 孙雅娟[1], 吴飞[1,2], 王丹[1,2], 李翠霞[1,2], 赵慧颖[3]
1. 发光学及应用国家重点实验室 中国科学院长春光学精密机械与物理研究所, 吉林 长春 130033;
2. 中国科学院大学, 北京 100049;
3. 吉林大学第一医院, 吉林 长春 130021

摘要： 由于贵金属纳米粒子独特的光学性质，基于衬底的贵金属纳米粒子薄膜表面增强拉曼散射技术在分子生物学和医学免疫分析等研究领域中显现出非常好的应用优势和潜力。本项研究工作应用柠檬酸钠作聚集剂诱导水溶液中对巯基苯甲酸修饰的Ag纳米粒子聚集，并应用以此形成的"热点"增强SERS光谱，获得了对巯基苯甲酸修饰的Ag纳米粒子聚集非常有效的4-MBA分子的SERS信号，为未来建立生物待测物的分析检测奠定前期基础。结果证明，水溶液中的Ag纳米粒子的聚集形成的"热点"具有非常好的SERS光谱增强效应。

关键词： 银纳米粒子聚集 水溶液 热点 SERS光谱

本刊中的类似文章
1. $K_2O \cdot CaO \cdot 4B_2O_3 \cdot 12H_2O ： Nd^{3+}$的合成及发光性能[J]. 2011,32(6): 571-575
2. Cu^{2+}对luminol-碱性水溶液声致荧光的影响[J]. 2000,21(1): 55-60

Effect of Aggregation of Ag Nanoparticles Suspended in Aqueous Solution on Surface Enhanced Raman Scattering

ZHANG You-lin[1], KONG Xiang-gui[1], XUE Bin[1,2], XIA Lu[1,2], TU Lang-ping[1], LIU Xiao-min[1], CHANG Yu-lei[1], LI Xiao-kun[1], YU Yi[1], SUN Ya-juan[1], WU Fei[1,2], WANG Dan[1,2], LI Chui-xia[1,2], ZHAO Hui-ying[3]
1. State Key Laboratory of Luminescence and Applications, Changchun Institute of Optics, Fine Mechanics and Physics, Chinese Academy of Sciences, Changchun 130033, China;
2. University of Chinese Academy of Sciences, Beijing 100049, China;
3. Gerontology Department of First Bethune Hospital, Jilin University, Changchun 130021, China

Abstract: Technology of surface enhanced Raman scattering (SERS) on substrate based on film of noble metal nanoparticles has many advantages of application and potentiality in molecular biology, immunoassay of medicine and organic molecules, *etc.* In this work, in order to research SERS, sodium citrate was employed as aggregation reagent to induce the aggregation of Ag nanoparticles modified by 4-mercaptobenzoic acid. And the "hot spots" resulted from the aggregation were used to enhance the SERS spectra. Strong SERS spectra of 4-mercaptobenzoic acid molecules were observed. In conclusion, "hot spots" of aggregation of Ag nanoparticles modified by 4-mercaptobenzoic acid in aqueous solution has highly effect of SERS.

Keywords: aggregation of silver nanoparticles aqueous solution hot spot SERS spectra

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