

研究论文

以DDAB为模板的银纳米粒子多层膜制备及其表面增强拉曼效应

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摘要 通过离子交换和静电相互作用, 将银纳米粒子引入双十二烷基二甲基溴化铵(DDAB)模板中, 获得了有序的银纳米粒子多层膜. 用紫外-可见光谱(UV-Vis)、循环伏安(CV)和原子力显微镜(AFM)对其进行了表征, 并用小角X射线衍射(XRD)研究了DDAB模板和银纳米粒子多层膜的有序性结构. 以4-巯基吡啶(4-MPY)为探针分子研究了银纳米粒子多层膜在表面增强拉曼(SERS)方面的应用, 结果表明, 4-MPY吸附在银纳米粒子多层膜上呈现很强的SERS信号, 说明该多层膜可以用作高活性的SERS基底.

关键词 [DDAB模板](#) [银纳米粒子多层膜](#) [表面增强拉曼散射](#) [4-巯基吡啶](#)

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Fabrication of Silver Nanoparticle Multilayer Films by Using DDAB Films as a Template and Their Application to Surface-enhanced Raman Scattering

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Abstract Highly ordered silver nanoparticle multilayer films were achieved conveniently by using didodecyldimethylammonium bromide(DDAB) films as a template. The obtained thin films were characterized by UV-Vis spectroscopy, cyclic voltammerty(CV) and atomic force microscopy(AFM) in detail. The well-ordered superlattice structure of the DDAB template and the silver nanoparticle multilayer films were also identified by X-ray diffraction(XRD). The application of the as-prepared silver nanoparticle multilayer films in surface-enhanced Raman spectroscopy(SERS) was investigated by using 4-mercaptopyridine(4-MPY) as the probe molecules. It was found that the silver nanoparticle multilayer films exhibited a remarkable enhancement ability, and can be used as SERS substrates.

Key words [DDAB template](#) [Silver nanoparticle multilayer film](#) [Surface-enhanced Raman scattering](#) [4-Mercaptopyridine](#)

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