

论文

氨基酸多金属氧酸盐纳米粒子复合膜的制备及抗菌活性

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摘要:

用水热微乳法制备了Keggin结构(CTA)_{0.2}(HGly)_{2.8}[PMo₁₂O₄₀]·nH₂O(1) 纳米粒子(nano-1), 并通过元素分析, XPS, IR, XRD, TEM和CV进行表征. 利用层接层自组装技术, 将已制备的纳米粒子装配成纳米复合膜, 用紫外-可见光谱监测膜的生长, 用电化学方法分析膜的成分. 测定了纳米粒子对致病Escherichia coli(E. coli)的拮抗性, 结果显示, 纳米粒子及其复合膜具有显著的抗菌活性.

关键词: (CTA)_{0.2}(HGly)_{2.8}[PMo₁₂O₄₀]; 纳米粒子; 合成; 自组装多层膜; 抗菌活性

Preparation and Antibacterial Activity of Amino Acid Polyoxometalate Self-assembled Multilayer Films

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Abstract:

(CTA)_{0.2}(HGly)_{2.8}[PMo₁₂O₄₀]·nH₂O(1) nanoparticles(nano-1) with an average diameter of 30 nm were prepared by using reverse micelles under mild hydrothermal conditions and characterized by TEM (HRTEM), IR, XRD, XPS and CV. To enhance the application of the nanoparticles, multilayer films of nano-1 and polycation polyethyleneimine(PEI) were prepared by the layer by layer(LBL) self-assembled technique. UV-Vis spectroscopy was used to monitor the layer-by-layer assembling process of the films which were also verified by CV. The antibacterial activities of the nanoparticles and the as-prepared multilayer films against Escherichia coli(E. coli) were investigated. Antibacterial tests indicate that both the nanoparticles and the multilayer films exhibited an efficient antibacterial activity, and the films have more merit.

Keywords: Polyoxometalate; Nanoparticle; Synthesis; Self-assembled multilayer films; Antibacterial activity

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