Chinese Journal of Chemistry 2006 24 (10): 1452—1457 ISSN: 0567-7351 CN: 31-1320/06

Full Papers

层状多核配合物自组装膜中金属离子对光致电子转移性质的影响

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收稿日期 2005-9-13 修回日期 2006-6-9 网络版发布日期 2006-12-14 接受日期

摘要

本文通过三种金属离子桥联的方式制备了一系列cis-RuL$_2$(SCN)$_2$

（L代表4,4'二羧基-2,2'联吡啶）自组装膜，并利用接触角,UV光谱，循环伏安法以及XPS对自组装功能膜进行了表征。通过对其光致电子转移特性的详细研究，得到了最大阳极稳定光电流为1773-1843

nA/cm^2，最大量子产率为3.2%。入射光强，
偏压以及电子给体对体系性能的影响也进行了研究。研究结果表明不同的金属离子桥联在自组装膜上能显著地改善电子传输特性。桥联金属离子在自组装膜中能同时起到功能和结构的两种作用。这种自组装的成膜方式提供了一种非常好的修饰此类相似体系的新途径。

关键词 自组装膜 光致电子转移 多核配合物

分类号

Novel Roles of Metal Ions in Layered Self-assembled Films of Polynuclear Complexes on Their Photoinduced Electron Transfer Properties

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Abstract Three metal ion bridged self-assembled (SA) films of *cis*-di(thiocyanato)-bis(2,2'-bipyridyl-4,4'-dicarboxylate) ruthenium were fabricated and characterized by contact angle, UV spectra, cyclic voltammetry and XPS. Their photoinduced electron transfer properties (PETP) were examined. Among the titled systems, the highest steady anodic photocurrent of 1773—1843 nA/cm^2 and the highest quantum yield of 3.2% were achieved. The effects of incident light intensity, bias voltage, and electron donor were also studied. The possible mechanism of electron transfer was proposed. The results reveal that different metal ion in SA films could affect significantly the photoinduced electron transfer property. Our experimental results clearly show that bridging metal ions can play both functional and structural roles in these self-assembled systems. This method of forming functional films can provide a new approach to regulate the property of similar systems.

Key words **Keywords** self-assembled film photoinduced electron transfer property polynuclear complex

DOI:

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