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研究论文

有机金属聚合物/多酸纳米杂化LB膜的制备与光电性质研究

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摘要 以含有共轭大π键的有机金属聚合物(OMP)作有机组分, 以Keggin结构和Dawson结构钨(钼)磷杂多酸作无机组分, 以十八胺为辅助成膜剂, 用LB技术制备了3种新型有机金属聚合物/十八铵/杂多阴离子OMP/ODA/HPA (HPA＝PMo_{12}, PW_{12}, P_2Mo_{18})杂化LB膜. 用π-A曲线、UV-vis吸收光谱、荧光光谱、原子力显微镜(AFM)、扫描隧道显微镜(STM)和表面光电压谱(SPS)对标题LB膜的成膜性能及光电性质进行了研究, 结果表明标题杂化LB膜的崩溃压为26.8 mN/m, 在可见光区有较强的光电压响应, 并有好的发光性质. 当电压为±8.0 V时, 隧道电流是－0.1～－2.3 nA.

关键词 多金属氧酸盐 有机金属聚合物 LB膜 制备 光电性质

分类号

Studies on the Preparation and Photo-electric Properties of Nanohybrid LB Films of Organometallic Polymer/ Octadecylammonium/Heteropolyanions

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Abstract Three new hybrid LB films consisting of organometallic polymers (OMP) containing conjugated large π bond as organic composite, tungsto(molybdo)phosphoric heteropoly acids (HPA, HPA＝PMo_{12}, PW_{12}, P_2Mo_{18}) with Keggin and Dawson structure as inorganic composite, and octadecylammonium (ODA) as auxiliary film forming agent were prepared and characterized by *π-A* isotherms, UV-vis absorption spectra, fluorescence spectra, atomic force microscopy, scanning tunneling microscopy, and surface photovoltage spectroscopy. The experimental results indicate that the collapse pressure of the title nanohybrid LB films was 26.8 mN/m. The fluorescence spectra showed that strong emission of OMP appeared in the films and the title LB films also had strong photoelectric response. Tunneling current was －0.1～－2.3 nA, when voltage was ±8.0 V.

Key words polyoxometalate organometallic polymer Langmuir-Blodgett film preparation photo-electric property

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