

论文

meso-四(4-酰肼基苯基)卟啉及其金属配合物共价和非共价修饰多壁碳纳米管

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摘要:

采用新方法合成了*meso*-四(4-酰肼基苯基)卟啉及其金属配合物, 通过化学键将酰肼卟啉上的酰肼基与活化的多壁碳纳米管(MWNTs)发生酰胺化反应, 从而得到卟啉共价化学修饰的多壁碳纳米管复合物; 利用卟啉环上的 n 电子与多壁碳纳米管管壁上的 n 电子通过 n - n 堆积效应, 得到卟啉非共价化学修饰的碳纳米管复合物. 通过红外光谱、紫外和荧光光谱对比分析, 发现在卟啉与碳纳米管间存在强烈的电子效应, 且非共价修饰的卟啉-碳纳米管复合物的荧光猝灭率更高.

关键词: 酰肼卟啉; 多壁碳纳米管; 共价修饰; 非共价修饰; 复合物

Covalently and Non-covalently Modification of Multi-walled Carbon Nanotubes with Tetra-(4-hydrazidephenyl)porphyrin and Metalloporphyrin

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Abstract:

Tetra-(4-hydrazidephenyl)porphyrin and its Cu, Zn complexes were synthesized with new techniques. The covalent porphyrins-functionalized MWNTs were gained by amidation reaction between the oxidized multi-walled carbon nanotubes(MWNTs) and the hydrazide porphyrins. The non-covalent porphyrins-functionalized MWNTs were obtained through n - n pileup with tetra-(4-hydrazidephenyl)porphyrin and MWNTs. The structures of the resultant products were characterized by FTIR. Strong electronic effects between porphyrins and MWNTs were found from UV-Vis absorption and fluorescence spectroscopy. Moreover, non-covalent composites provide a higher emission quenching compared with covalent composites.

Keywords: Hydrazide porphyrin; Multi-walled carbon nanotubes; Covalently chemical functionalized; Noncovalently chemical functionalized; Composite

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