

研究论文

新型准轮烷的合成及性质研究——丁烷基紫精与葫芦[6]脲的超分子自组装

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收稿日期 2004-10-10 修回日期 2005-2-1 网络版发布日期 接受日期

摘要 通过葫芦[6]脲(CB[6])与丁烷基紫精(BV)在水溶液中于室温下进行超分子自组装, 得到一种新型的准轮烷(BVCB), 并通过¹H NMR, IR, 质谱, 元素分析对其结构进行了表征, 证实CB[6]位于BV的脂肪链上通过非共价键与BV结合, 并且 CB[6]与BV的结合摩尔比为2: 1; 通过热重分析(TGA)、紫外-可见吸收(UV-vis)和化学还原等方法对其性质进行了研究, 证实了BVCB比BV有更高的热稳定性、UV-vis吸收和更强的氧化能力; 盐效应表明 NaI是BVCB优良的沉淀剂; 环境扫描电镜(ESEM)证实BVCB比BV具有较强的刚性和较差的结晶能力.

关键词 [准轮烷](#) [紫精](#) [葫芦脲\[6\]](#) [超分子](#)

分类号

Synthesis and Study of Novel Pseudorotaxane. Supramolecular Self-assemblies of Cucurbituril [6] and Butyl Viologen

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Abstract A novel pseudorotaxane (BVCB) was synthesized by supramolecular self-assembly of cucurbituril[6] (CB[6]) with butyl viologen (*N,N'*-bi-*n*-butyl-4,4'-bipyridinium dibromide, BV) in water at room temperature. The chemical structure of BVCB was confirmed by elemental analysis, ¹H NMR, MS and IR spectra. CB[6] beads were localized on aliphatic chain to combine N⁺ of BV by non-covalent bonds, and the molar ratio of CB[6] to BV was 2: 1. Properties of BVCB were investigated by thermogravimetry analysis (TGA), UV-vis measurements and chemical reduction, and the results show that BVCB has higher thermal stability, stronger absorption band and higher oxidation ability than BV. The effect of salts on BVCB was studied by the transmittance with UV-vis, and the result shows that NaI is the precipitant to BVCB. The microscopical morphology of BV and BVCB was studied by environment scanning electron microscope, and the results show that BVCB has higher rigidity and lower crystallizability than BV.

Key words [pseudorotaxane](#) [viologen](#) [cucurbituril\[6\]](#) [supramolecule](#)

DOI:

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