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论文

七元瓜环与*N*,*N*'-二烷基-1,3-(4,4'-二吡啶基)丙烷衍生物的相互作用

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摘要:

以1,3-(4,4'-二吡啶基)丙烷为母体, 合成了*N*,*N*'-二乙基、二丁基、二己基以及二辛基1,3-(4,4'-二吡啶基)丙烷衍生物. 利用^{1}H NMR技术和紫外吸收光谱法, 考察了Q[7]与上述链状吡啶衍生物的相互作用. 实验结果表明, Q[7]与客体PC0, PC2作用, 瓜环包结客体的二吡啶基丙烷部分形成1∶1的包结配合物; 对于取代烷基碳链数大于4的*N*,*N*'-二烷基-1,3-(4,4'-二吡啶基)丙烷衍生物, 随着主体与客体摩尔比值的增加, 体系中主-客体相互作用的主导模式是Q[7]逐渐包结了客体二吡啶基丙烷部分, 进而形成Q[7]包结客体两端取代烷基, 甚至形成一个客体分子上“挂满”3个主体瓜环的包结物.

关键词: 七元瓜环 1,3-(4,4'-二吡啶基)丙烷衍生物 作用模式 ^{1}H NMR技术 紫外吸收光谱法

Interaction of Cucurbituril with *N*,*N*'-Bisalkyl-1,3-(4,4'-bispyridyl)propanes

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Abstract:

A series of *N*,*N*'-bisalkyl-1,3-(4,4'-bispyridyl)propane guests were synthesized from 1,3-(4,4'-bispyridyl) propane. The interaction and the models of self-assembly psedorotaxanes of cucurbit[7] uril with these synthetic guests were investigated *via* ^{1}H NMR technique and electronic absorption spectroscopy method. The experimental results reveal that the pseudorotaxane structure in which the host Q[7] included the 1,3-(4,4'-bispyridyl)propane core was the dominant model for the Q[7]-PC0 and Q[7]-PC2 interaction systems. For the guests having identical aliphatic substituents with chains longer than four carbon atoms, the dominant interaction models could start from Q[7] including the 1,3-(4,4'-bispyridyl) propane core, to including the substituted chains of the guest, and then a guest bearing three host Q[7] with the increase of the ratio of $N_{Q[7]}/N_{guest}$.

Keywords: Cucurbit[7] uril 1,3-(4,4'-Bispyridyl)propane and its derivative Interaction model ^{1}H NMR technique UV absorption spectroscopy

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