

研究论文

七、八元瓜环对萘二胺异构体相互作用的考察

曾启华^{1,2}, 王娅¹, 祝黔江^{*1}, 薛赛凤¹, 牟兰¹, 陶朱¹

(¹贵州大学理学院应用化学研究所 贵阳 550025)

(²遵义师范学院化学系 遵义 563002)

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摘要 利用紫外吸收光谱、荧光光谱以及¹H NMR方法考察了七、八元瓜环(Q[7], Q[8])与1,8-萘二胺(g1), 2,3-萘二胺(g2), 1,5-萘二胺(g3)的相互作用. 实验结果表明: Q[7]与客体g1发生端口作用, 作用比为1: 1; Q[7]与客体g2, g3相互作用也形成1: 1的包结配合物. Q[8]与三种客体相互作用情况各不相同, 除Q[8]与客体g2相互作用形成1: 2的包结配合物; Q[8]与客体g1或g3可发生相互作用, 形成溶解性较差的作用产物, 其表现相互作用的比例为1: 1. 考察溶液酸度对主客体相互作用的影响还表明: 当pH大于某一值之后, 如Q[7]主客体体系, pH大于6.0; Q[8]主客体体系, pH大于12.0, 用光谱方法观察不到瓜环与客体的相互作用. Q[7], Q[8]为主体的上述主客体作用产物分别与金刚烷胺盐酸盐、1,10-癸二胺盐酸盐的竞争反应结果表明, 已作用的萘二胺异构体容易被所选用的竞争客体所取代, 只有g2与Q[8]形成的包结配合物被1,10-癸二胺盐酸盐部分取代.

关键词 [紫外吸收光谱](#) [荧光光谱](#) [¹H NMR技术](#) [主客体包结作用](#) [pH影响](#)

分类号

Interaction between Cucurbit(*n*)uril (*n* = 7 or 8) and Diaminonaphthalene Isomers

ZENG Qi-Hua^{1,2}, WANG Ya¹, ZHU Qian-Jiang^{*1}, XUE Sai-Feng¹, MU Lan¹, TAO Zhu¹

(¹ Institute of Applied Chemistry, Guizhou University, Guiyang 550025)

(² Department of Chemistry, Zunyi Normal College, Zunyi 563002)

Abstract The interaction between cucurbit[*n*]uril (*n* = 7 or 8) (Q[7], Q[8]) and diaminonaphthalene isomers, such as 1,8-diaminonaphthalene (g1), 2,3-diaminonaphthalene (g2), 1,5-diaminonaphthalene (g3) was studied by UV spectroscopy, fluorescence spectrophotometry and ¹H NMR technique. The experimental results revealed that the diaminonaphthalene isomers g2 and g3 as molecular guests were bound in the cavity of Q[7] in a ratio of 1: 1 while a portal interaction of the isomer g1 with Q[7] in a ratio of 1: 1 was observed. Interaction ratios of Q[8] with the three guest compounds were different: Q[8] bind g2 to form an inclusion complex in a ratio of 1: 2, and Q[8] bind g1 or g3 to form a less soluble host-guest product in a ratio of 1: 1. The results also showed that the stability of the inclusion complexes was related to the pH of solution: the inclusion complexes of Q[7] with g1, g2 or g3 were decomposed completely at pH > 6.0, and the inclusion complexes of Q[8] with g1, g2 or g3 were decomposed completely at pH > 12.0. Competitive experiments showed that the guests g1, g2 and g3 bound by Q[7] can be substituted by competitive guest 1-amineadmantane•HCl, and the guests g1 and g3 bound by Q[8] can be substituted by competitive guest 1,10-diaminodecane•2HCl completely, however, only part of g3 bound by Q[8] can be substituted by competitive guest 1,10-diaminodecane•2HCl.

Key words [UV absorption spectroscopy](#) [fluorescence spectrophotometry](#) [¹H NMR technique](#) [interaction of host-guest](#) [pH influence](#)

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通讯作者 祝黔江 gzutao@263.net

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