

双吲哚类光化学感应受体合成及其阴离子比色识别研究

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阴离子识别与传感研究是超分子化学中一个重要和活跃的前沿研究领域。双吲哚烯类化合物, 结构简单, 分子结构中包含的共轭双吲哚骨架本身是良好的发色基团, 同时还提供了氢键给体单元和氢键受体单元。作为新型光化学感应受体, 在一定条件下基于受体分子基态可逆质子转移信号模式比色识别阴离子。进一步研究表明, 对双吲哚烯类受体分子的结构改造和修饰能够改变其氢键作用位点的酸碱性和空间构象, 从而一定程度地调节阴离子识别与比色感应的选择性和灵敏度。

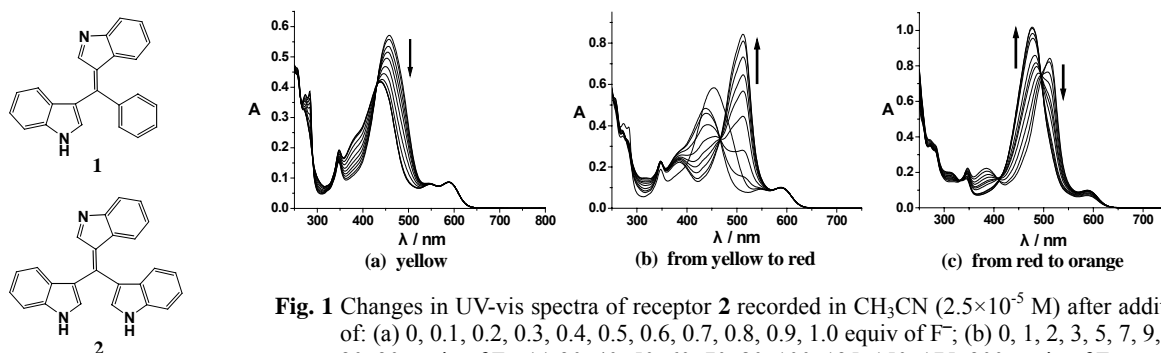


Fig. 1 Changes in UV-vis spectra of receptor 2 recorded in CH_3CN (2.5×10^{-5} M) after addition of: (a) 0, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0 equiv of F^- ; (b) 0, 1, 2, 3, 5, 7, 9, 15, 20, 30 equiv of F^- ; (c) 30, 40, 50, 60, 70, 80, 100, 125, 150, 175, 200 equiv of F^- .

关键词: 双吲哚化合物; 阴离子受体; 质子转移; 比色化学传感器

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Design and Synthesis of Bisindole-Based Neutral Receptors for Anion Recognition and Optic Chemical Sensing

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In the field of supramolecular chemistry, the development of synthetic receptors and chemosensors for anions has been attracting much attention in recent years. Tris(indolyl)methene, a new chromogenic molecule containing conjugated bisindole skeletons, proved an excellent colorimetric chemosensor for F^- by two stages of reversible deprotonation, and could also distinguish between AcO^- and H_2PO_4^- through spectral behaviors. The selectivity and sensitivity of such bisindole-based chemosensors could be tuned by modifying the skeleton to control the acidity and steric array of the H-bond sites, and the conjugated bisindole skeleton seems to be general for developing more anion receptors and sensors.