

论文

荧光探针5-羰基咪唑苯并吡啶酮的合成及其LC-APCI-MS法测定胺

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摘要:

在不加任何催化剂条件下, 2-(12-苯并吡啶酮)-乙酸(BAAA)与*N,N'*-羰基双咪唑(CDI)缩合生成新型荧光探针5-羰基咪唑苯并吡啶酮(IEBA)。IEBA在DMF溶剂中与胺类化合物形成的酰胺类衍生物不仅可发出强烈的荧光, 还具有较高的质谱离子化能力。该衍生物在乙腈和甲醇-水溶液中的百分离子化 δ 值分别在0~57.32% 和0~62.14%范围内。最大激发和发射波长 $\lambda_{ex}/\lambda_{em}=272$ nm/505 nm。12种胺类衍生物的荧光检出限范围为0.15~0.50 ng/mL, 在线APCI-MS检出限范围为1.43~8.51 ng/mL。

关键词: 液相色谱-离子阱质谱; 百分离子化; 2-(苯并吡啶酮)-乙酸; 5-羰基咪唑苯并吡啶酮

Syntheses of Fluorescence Probe 5-[2-(1*H*-imidazol-1-yl)-2-oxoethyl]benzo[*b*]acridin-12(5*H*)-one and Its Application for the Determination of Aliphatic Amines with LC-APCI-MS

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Abstract:

2-{12-Oxobenzo[*b*]acridin-5(12*H*)-yl}-acetic acid(BAAA) reacted with coupling agent *N,N'*-carbonyldiimidazole(CDI) to form an activated amide intermediate 5-[2-(1*H*-imidazol-1-yl)-2-oxoethyl]benzo[*b*]acridin-12(5*H*)-one(IEBA), which was a novel fluorescence probe. The amide intermediate (IEBA) reacted preferably with amines in DMF solvent in the absence of catalysts to give the high yields of derivatives, which not only have high fluorescence sensitivity but also have strong ionizable ability. The optimum excitation and emission wavelengths were at $\lambda_{ex}/\lambda_{em}=272$ nm/505 nm. The percent ionization δ values in aqueous acetonitrile and aqueous methanol were in the range of 0—57.32% and 0—62.14%, respectively. The fluorescence detection limits of twelve amine derivatives(at a signal-to-noise ratio of 3) were in the range of 0.15—0.50 ng/mL. The online APCI-MS detection limits were at levels of 1.43—8.51 ng/mL(*S/N*=3).

Keywords: High performance liquid chromatography/ion-trap mass spectrometry; Percent ionization; 2-{12-Oxobenzo[*b*]acridin-5(12*H*)-yl}-acetic acid; 5-[2-(1*H*-imidazol-1-yl)-2-oxoethyl]benzo[*b*]acridin-12(5*H*)-one

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