

研究论文

流动注射在线氧化荧光法结合透析采样研究盐酸硫利达嗪与牛血清白蛋白的结合作用

马建, 张志琪

陕西师范大学化学与材料科学学院, 陕西省生命分析化学重点实验室, 西安 710062

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摘要 利用流动注射在线氧化结合在线透析采样技术建立了荧光法测定血浆中游离盐酸硫利达嗪的新方法, 并将其应用于盐酸硫利达嗪与牛血清白蛋白作用机制的研究. 将盐酸硫利达嗪与牛血清白蛋白以不同比例混合并在37℃下培养, 以流动注射透析采样技术从混合液中分离出游离盐酸硫利达嗪, 在线氧化为强荧光化合物后测定其浓度; 应用Scatchard方程分析所测数据, 求得盐酸硫利达嗪和牛血清白蛋白的结合常数为 1.2×10^4 L/mol, 结合位点数为0.98; 根据热力学参数推断, 盐酸硫利达嗪与牛血清白蛋白之间以疏水作用力为主; 进一步基于荧光猝灭现象和Förster非辐射能量转移理论, 得到盐酸硫利达嗪小分子与牛血清白蛋白之间的能量转移效率($E=0.497$)和结合距离($r_0=3.27$ nm).

关键词 [流动注射荧光法](#) [透析采样](#) [盐酸硫利达嗪](#) [牛血清白蛋白](#) [结合常数](#)

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Flow Injection On-line Oxidizing Fluorometry Coupled to Dialysis Sampling for Studying Thioridazine Hydrochloride-Bovine Serum Albumin Binding

MA Jian, ZHANG Zhi-Qi*

Key Lab of Analytical Chemistry for Life Science of Shaanxi Province, School of Chemistry and Materials Science, Shaanxi Normal University, Xi'an 710062, China

Abstract A new flow injection on-line oxidization fluorometry coupled to the technique of dialysis sampling was established for the determination of free thioridazine hydrochloride in serum, and applied to the investigation of binding action of thioridazine hydrochloride with bovine serum albumin(BSA). The thioridazine hydrochloride and BSA were mixed in different molar ratios in 0.050 mol/L phosphate buffer(containing 0.9% NaCl, pH=7.4), and incubated at (37 ± 0.5) °C in a water bath. The dialysis sampler was utilized to sample free thioridazine hydrochloride from mixed solution with a relative dialytic efficiency of 8.3%. Then the thioridazine hydrochloride in dialysis solution was injected into carrier and on-line oxidized by lead dioxide solid-phase reactor into fluorescent product with a maximum excitation wavelength of 349 nm and a maximum emission wavelength of 429 nm. The fluorescence intensity measured was linear proportional with the concentration of free thioridazine hydrochloride in mixed solution over the range from 1×10^{-5} to 2×10^{-4} mol/L with the detection limit of 6×10^{-6} mol/L. According to the fluorescence measurement results from mixed solution, the association constant(K) estimated for thioridazine hydrochloride-BSA binding and the number of the binding site(n) with Scatchard analysis were 1.2×10^4 L/mol and 0.98, respectively. The acting force was suggested to be mainly hydrophobic and the distance between the acceptor and donor was 3.27 nm.

Key words [Flow injection fluorometry](#) [Dialysis sampling](#) [Thioridazine hydrochloride](#) [Bovine serum albumin](#) [Association constant](#)

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