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蛋白质-铬天青S体系的弹性光散射及其初步分析应用

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摘要 在pH3.5左右的柠檬酸-NaOH介质中,
蛋白质与铬天青S可以通过以静电引力为主的分子间作用力结合生成大分子离子缔合物, 产生最大散射波长约为370nm的弹性光散射信号。基于这一现象可以测定低至0.02μg.mL^-^1的血清白蛋白, 工作曲线在0-1.0μg.mL^-^1范围内呈线性关系。这一新方法的灵敏度比Coomassie亮蓝法高50
倍。用普通的荧光分光光度计测量了这一体系的散射光谱, 研究了pH,
离子强度和试剂浓度等实验条件对散射光强的影响, 考察了阳离子、
阴离子和非离子表面活性剂以及氨基酸和常见金属离子对反应体系的作用。将这一方法用于测定尿中微量蛋白, 结果满意。

关键词 柠檬酸 铬天青S 光散射 蛋白质 氢氧化钠

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Elastic light-scattering of protein-chrome azurol S complex and its preliminary analytical application

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Abstract In the medium of citric acid-NaOH buffer (pH 3.5), proteins may combine with chrome azurol S(CAS) by intermolecular forces (mainly by electrostatic force) to form macromolecular ion-association complexes, causing an elastic light-scattering signal with a maximum wavelength of about 370nm. Based upon this, a new method for the determination of serum albumin with a detection limit of 0.02μg.mL^-^1 was proposed. Its calibration curve is linear over the range of 0-1.0μg.mL^-^1. The sensitivity of this method is fifty-fold higher than that of the Coomassie brilliant blue protein assay. The scattering spectra of this system were measured using an ordinary spectrofluorophotometer. Influence of experimental conditions, such as pH, ionic strength, and concentration of CAS, on the intensity of light-scattering was studied. Effects of surfactants (cationic, anionic, and nonionic), amino acids, and metal ions on the combination of CAS with protein were also investigated. This method has been used for the determination of urinary protein with good results.

Key words CITRIC ACID CHROME AZUROLS LIGHT SCATTERING PROTEIN SODIUM HYDROXIDE

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