

论文

新类型酸性色素定量胺类化合物的研究:二甲苯蓝测定胺类药物

俞永祥;郭庆东

军事医学科学院,北京

摘要:

为提高色素萃取法的灵敏度,用苯乃辛作检样,先从四大类的70种色素中选出新类型酸性色素:二甲苯蓝。再用苯乙托品与苯乃辛两种胺对二甲苯蓝进行了吸收峰、pH值的选定、检出限、检量线、此蓝与两种胺分子的配合比、本测定法的精密密度,五种胺配合物的吸收系数比较等各项研究。并讨论了这一新类型色素的基本分子构造与测定灵敏度提高的原由。

关键词: 二甲苯蓝 新类型酸性色素 胺类药物 酸性色素定量法

STUDIES ON A NEW TYPE ACID DYE—XYLENE CYANOL FOR THE DETERMINATION OF AMINES

YU Yong-Xiang and GUO Qing-Dong

Abstract:

In order to increase the sensitivity of the acid dye determination method, we have tested 70 kinds of acid dyes which possess sulfonic acid or carboxylic acid radical. These dyes, including sulfonphthaleins, azo dyes, triarylmethanes, nitrophenylamines, etc., have not yet been reported in the literature for the determination of amines. It is observed that only the dyes which possess sulfonic acid radical are useful in this method. Among these dyes, 10 kinds were selected for further examination, the result shows that xylene cyanol (XC) is one of two best dyes. The limits of identification of this dye for benethtropine [1, 1-diphenyl-2 (3-tropanyl) ethene] and benactyzine (benzilic acid 2-diethylamino-ethyl ester) are 17 ng/ml and 36 ng/ml respectively, The extinction coefficients ($E_{1cm}^{1\%}$) of these dye-amine complexes are 4.2~6.2 times as high as those of bromothymol blue (BTB), but for more hydrophilic amines, $E_{1cm}^{1\%}$ are lower than those obtained from ETB. Chloroform extract of the complex shows greenish blue color, λ_{max} 628.5 nm. For the determination of amines, the suitable concentration of XC is 4×10^{-3} M. The calibration curve is a straight line in the range of 0~10 μ g/ml. With XC concentration of 4×10^{-3} M, the mole ratio of dye-amine complex in the chloroform extract for benactyzine is XC: Benactyzine=2: 1, and with concentration of 4×10^{-4} M=1: 1. But, in the case of benethtropine, the mole ratio with different dye concentration(4×10^{-3} M~ 4×10^{-4} M) remains 2.7: 1 (XC: amine). The coefficient of variance for the determination of 0.2 μ g/ml benethtropine or benactyzine is within $\pm 5\%$ and $\pm 1\sim 2\%$ for 2.5 μ g/ml and 5.0 μ g/ml. This dye is a new type acid dye for the determination of amines, and the following portion is considered to be the fundamental structure:

Keywords: New type acid dye Amine drugs Acid dye determination method Xylene cyanol

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