

# 改良聚酰胺吸附-高效毛细管电泳内标法测定饮料中的亮蓝和苋菜红

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## Determination of Brilliant Blue and Amaranth in drinks by modification of polyamide adsorption-high performance capillary electrophoresis with internal standard method

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**摘要** 以日落黄为内标物,建立了碳酸饮料中亮蓝和苋菜红的高效毛细管电泳内标测定方法。毛细管有效长度40 cm,内径75 μm,分离电压20 kV,进样量14 kPa×3 s,室温下分离,缓冲溶液为10 mmol/L磷酸氢二钠(pH 8.56),检测波长390 nm。亮蓝与苋菜红的相对校正因子分别为0.8329(相对标准偏差(RSD)为3.3%) and 1.2253(RSD为2.6%);定量限(S/N=10)分别为1.629 mg/L和4.160 mg/L;回收率分别为97.87%~102.1%(RSD为1.8%)和94.07%~103.8%(RSD为4.1%);方法的精密度分别为3.2%和2.0%。对样品预处理的优化使该法更适用于碳酸类饮料中亮蓝和苋菜红的高效毛细管电泳分析。以样品空白为基液进行内标法定量测定,基本上消除了背景带来的系统误差。将该方法应用于实际样品的测定,结果准确。

**关键词:** 高效毛细管电泳 内标法 亮蓝 苋菜红 饮料

**Abstract:** A high performance capillary electrophoresis (HPCE) method has been established for the separation of Brilliant Blue and Amaranth in carbonated beverages. Sunset Yellow was added into the sample as the internal standard. The separation was carried out on a fused-silica uncoated capillary column (40 cm×75 μm). The sample was injected by air pressure injection (14 kPa×3 s) at room temperature. The analysis was completed in 10 mmol/L Na<sub>2</sub>HPO<sub>4</sub> buffer (pH 8.56) at 20 kV of separation voltage and 390 nm of detection wavelength. The relative correction factors of Brilliant Blue and Amaranth were 0.8329 and 1.2253, and the relative standard deviations (RSDs) were 3.3% and 2.6%, respectively. The respective quantification limits (S/N=10) were 1.629 mg/L and 4.160 mg/L, the recoveries were in the ranges of 97.87%~102.1% (RSD=1.8%) and 94.07%~103.8% (RSD=4.1%), and the method precisions were 3.2% and 2.0%. The optimization of the pretreatment made the method more suitable for the determination of Brilliant Blue and Amaranth in carbonated beverages by capillary electrophoresis. The systematic error brought by the background was eliminated basically by using the blank sample as the base solution. The relative factors of Brilliant Blue and Amaranth were reproducible in the ranges of 1.629~228.8 mg/L and 4.16~401.6 mg/L, respectively. So this method can be used to quantify the two synthetic pigments in carbonated beverages accurately.

**Keywords:** high performance capillary electrophoresis (HPCE) internal standard method Brilliant Blue Amaranth drinks

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