

# Analysis of Benzalkonium Chloride Using the Hitachi Chromaster® HPLC System with DAD Detection

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**B**enzalkonium chloride (BAC) is a mixture of alkylbenzyltrimethylammonium chloride salts that is frequently used as a bacteriocidal agent due to its ability to disrupt bacterial cell membrane function. It is found in topical antiseptics, disinfectants, and eye and nasal drops. Benzalkonium chloride mixtures consist of quaternary ammonium salts with one alkyl chain that is between eight and eighteen carbons in length, although mixtures are often composed of primarily one component, such as benzyltrimethyldecylammonium chloride. Due to the varying composition of BAC, it is advantageous to use diode array detection so that multiple components can be detected by one analytical method.

Here we describe a method for analysis of benzalkonium chloride by HPLC with diode array detection. The data here replicates that described by Labranche et al.<sup>1</sup> Specifically, this data represents the analysis of benzalkonium chloride in eye drops in under 10 minutes.

## Experimental Conditions

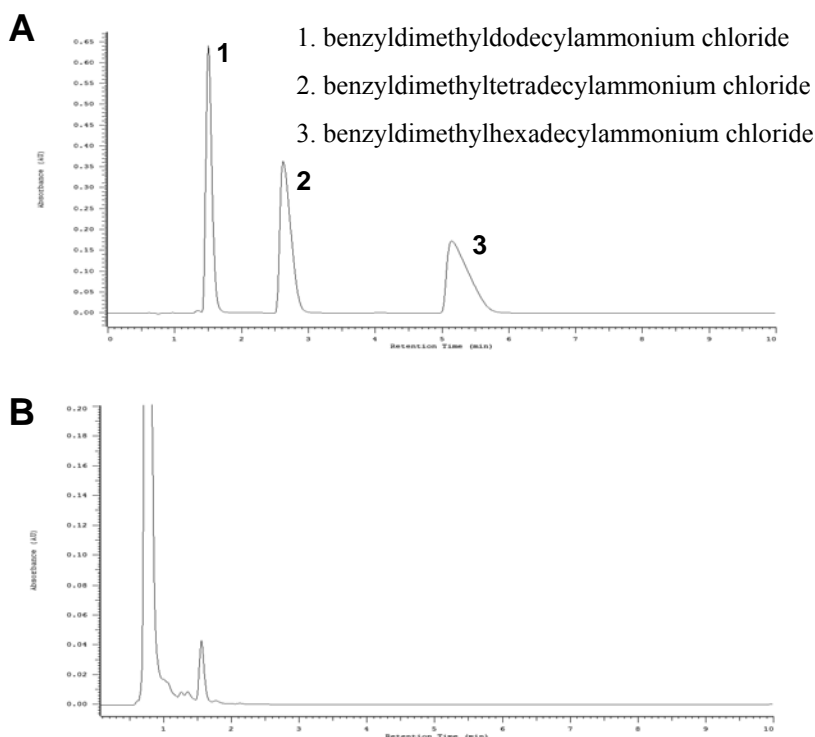
Module	Conditions
Pump (Model 5110)	Mobile Phase: 68% CH <sub>3</sub> OH, 32% 7.5 mM phosphate buffer, pH 3.0  Flow Rate: 1.0 mL/min
Autosampler (Model 5210)	Injection Volume: 10 µL
Column Oven (Model 5310)	Temperature: 50 °C
Detector (Model 5430)	DAD, 200-400 nm, Extracted 208 nm
Column	Waters SymmetryShield™ RP18 3.5 µm, 4.6 x 75 mm

## Reference:

<sup>1</sup> Labranche, L., Dumont, S., Levesque, S., and Carrier, A. J. Pharm. Biomed. Anal. 43 (2007) 989-993.

\* Chromaster is a registered trademark of Hitachi High-Technologies Corporation.

**Results** –Chromatograms of (A) benzalkonium chloride and (B) eye drops



**Results-** Reproducibility, Linearity, and Limit of Detection

Reproducibility (100 µM, N = 8)	RSD = 0.13 %
Linearity (0.5 µM – 250 µM)	R <sup>2</sup> = 0.9999
Limit of Detection (S/N ≥ 3)	0.1 µM

## Discussion

Hitachi's Chromaster® liquid chromatography system with diode array detection is extremely effective at analysis of multiple benzalkonium chloride components in under 10 minutes.

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