

# CAPSULES

preliminary notes and applications from Bioanalytical Systems, Inc.

## Soft Drink Additives

### Introduction

The recent concern over the dangers involved with consuming certain soft drink additives has caused a significant change in the marketplace. Manufacturers have begun to offer caffeine-free drinks. In most cases, saccharin has been replaced by aspartame.

### Purpose

This isocratic procedure allows the quantitation of four major soft drink additives in less than 10 minutes. These include saccharin (SAC), benzoic acid (BA), caffeine (CAF) and aspartame (ASP).

### Conditions

Liquid Chromatograph: BAS 400

Detector: BAS UV-8 at 214 nm

Mobile Phase: 17% MeOH:83% 0.5%  $\text{NH}_4\text{H}_2\text{PO}_4$   
(pH=5.38)

Stationary Phase: Phase II ODS 3  $\mu\text{m}$  (100 x 3.2 mm) guard cartridge (15 x 3.2 mm)

Flow: 1.0 mL/min Injection Volume: 20  $\mu\text{L}$

### Standard Preparation

Weigh out 10.0 mg each of caffeine, saccharin and aspartame. Place together in a 100 mL volumetric flask. Weight out 25.0 mg of benzoic acid and place it in the same 100 mL flask. Dilute to volume with methanol. Inject 20  $\mu\text{L}$  of this solution.

### Sample Preparation

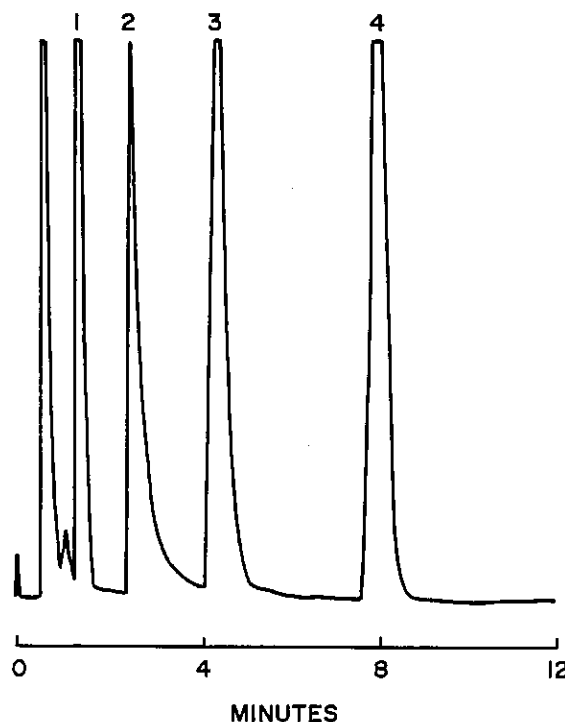
Dilute soft drink 10-fold and inject.

### Results

A popular diet soft drink was analyzed according to this method as illustrated in Figure 1. From current literature, the results are very close to expected values. The concentrations of the sample were interpolated from the calibration plot. The soft drink contained: 0.12 mg/mL saccharin, 0.55 mg/mL aspartame, 0.21 mg/mL benzoic acid and 0.12 mg/mL caffeine.

### Discussion

Calibration curves were constructed by plotting peak area vs. concentration of the compound of interest. Correlation coefficients were calculated by linear regression for each compound. Benzoic acid, caffeine and aspartame are quite linear within the range of detection. Each have a correlation coefficient exceeding 0.999. Saccharin however is not as linear, with a correlation coefficient of 0.972. A more accurate method for quantitating saccharin would be by standard addition.



**Figure 1.** Analysis of a popular diet soft drink (10-fold dilution). Integrator printout. 1 = SAC (1.45 min.); 2 = BA (2.66 min.); 3 = CAF (4.53 min.); 4 = ASP (8.05 min.)

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