Waters
Lab Highlights
An Internal Communication of Applications and Techniques
LAH 0094 2/83
Doc # M1031
AN/FA,/OC,MD/FF/BT

QUALITY CONTROL FOR CAFFEINE-FREE SOFT DRINKS

Growing public concern over caffeine intake has prompted the soft drink industry to introduce a number of caffeine-free products. A recent article in the Wall Street Journal (11/11/82) addressed this topic by claiming there will soon be a dozen caffeine-free brands available which will capture between 8% and 10% of the soft drink market. Since many major soft drink producers offer franchises to independent bottlers as a means of achieving nationwide distribution, the quality control and assurance of caffeine-free production are of major concern. The QA-1™ Quality Analyzer and the proper chemistry can provide a rapid and reliable determination of caffeine levels in beverages.

Figure 1 shows the separation of common additives in a soft drink. Peak 1 represents 0.03% (w/v) sodium saccharin, Peak 2 is the response from 0.025% caffeine and Peak 3 is 0.03% benzoic acid. The remaining chromatograms were generated with samples of a brand name soft drink which were produced by an independent bottler with a franchise from the parent company and were purchased directly off the store shelf.

Figure 2 represents a diluted (7/10 v/v) sugar-sweetened, caffeine-containing soft drink. Caffeine is indeed present (Peak 2) at 0.01%. Figure 3 was generated from an equally diluted sample of supposedly sugar-free and caffeine-free soft drink. As expected, saccharin (Peak 1) is present at sweetening levels (0.048%). Surprisingly, however, caffeine in a caffeine-free product is found at the same level (0.01%) as a caffeine-containing product. This represents an apparent error in the formulation of this product.

One must realize that a QA-1™ Quality Analyzer in the bottler's facility with routine batch-to-batch analysis could have detected this apparent error and prevented the distribution of caffeine-free products which actually contained caffeine.

Peak 1 = Saccharin
Peak 2 = Caffeine
Peak 3 = Benzoic Acid

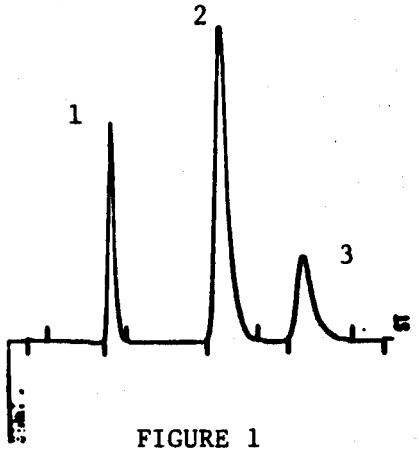

FIGURE 1

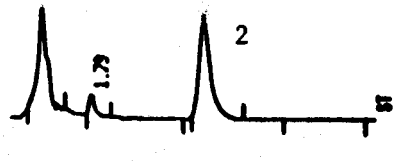

FIGURE 2

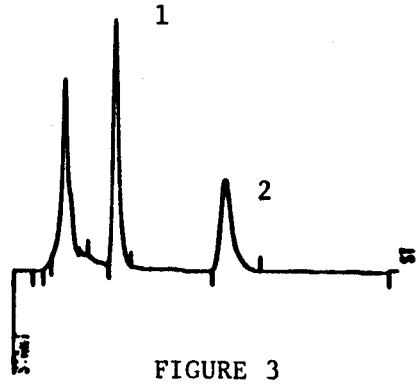

FIGURE 3

See reverse side for conditions.

John Morawski

LAH 0094 2/83
Doc # M1031
AN/FA,/OC,MD/FF/BT

CONDITIONS

Instrument:	Waters QA-1™ Quality Analyzer
Column:	μBONDAPAK™ C_{18} Radial-PAK™
Mobile Phase:	10% CH_3CN/ 90% 2.0% Ammonium Acetate with 2.5% Acetic Acid
Elution Volume:	30 ml
Flow Rate:	4.0 ml/min
Detector:	UV 254 nm @ 0.1 AUFS
Injection Volume:	10 μl
Sample:	Soft Drink diluted 7/10 (v/v) with eluent