Waters
Lab Highlights
An Internal Communication of Applications and Techniques
LAH 0155 2/84
AN/FA/MD/IC/AX

LITERATURE CORNER

DETERMINATION OF IODINE IN MILK AND MILK CHOCOLATE

The widespread use of iodophors as disinfectants in the milk industry has resulted in concern that iodine cosumption by the public has increased, leading to a potential increase in thyroid disorders. There is also considerable interest in endogenous iodine levels in various foodstuffs. Traditional methods employed for the determination of iodine in milk and other foods are time-consuming, complex, and yield poor precision.

Researchers at Hershey Foods Technical Center recently reported (1) an HPLC method for the extraction and analysis of iodine as iodide in milk, cocoa beans, and milk chocolate. Prior to analysis, samples are finely ground and combusted in an oxygen combustion flask. The liberated iodide is absorbed in an alkaline-reducing medium, which is concentrated by evaporation. The HPLC analysis employed an 8 mm 5μ C_{18} Radial-PAK™ cartridge in an RCM-100® Radial Compression Module, with UV detection at 226 nm. An M6000A pump, M710B WISP™, Model 720 System Controller, and M730 Data Module were used. The mobile phase consisted of 0.0025M hexadecyltrimethylammonium chloride: 0.05M Na_2HPO_4:CH_3CN, pH 6.8 45:25:25.

Results of precision studies for standards, cocoa beans, and milk are shown in Table 1. Figures 1, 2, 3 and 4 show chromatograms of iodide standard, cocoa bean, milk chocolate and nonfat dry milk. The authors concluded that..."In summary, the method described is an accurate, precise, and cost effective alternative for the analysis of iodide...it is linear over a wide range with a lower limit of less than 100 ppb."

TABLE I

PRECISION STUDY

SAMPLE	n	CONC.	% CV
Standard	26	50 ng	2.27
Cocoa Bean	3	133.4 ng	8.4
Milk	4	3.8 μg	2.8

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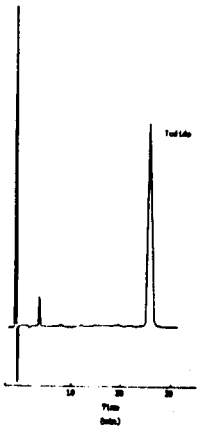

FIGURE 1

Sample Iodide Std
Column: Radial-PAK™ C_{18}, 8 mm X 10 cm
Mobile Phase: 45/25/25 (Buffer/Ion-Pairing Reagent/Acetonitrile)
Flow Rate: 2.5 ml/min
Detector: Variable UV @ 226 nm
(Conditions same for all figures)

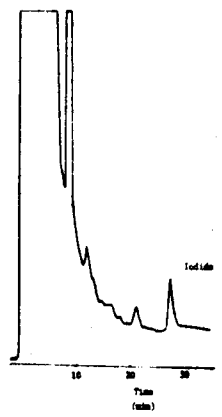

FIGURE 2

Sample: Cocoa Bean

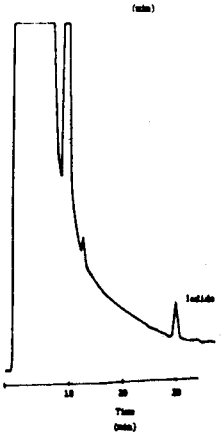

FIGURE 3

Sample: Milk Chocolate

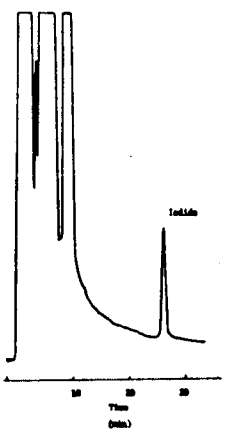

FIGURE 4

Sample: Nonfat Dry Milk

1. W. J. Hurst, K. P. Snyder, and R. A. Martin, Jr., J. Liquid Chrom., 6 (11), 2067-2077 (1983).