THE SIMULTANEOUS DETERMINATION OF ARTIFICIAL SWEETENERS SACCHARIN, CYCLAMATE, AND ASPARTAME IN FOODS AND BEVERAGES

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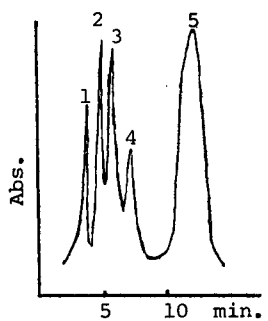
In Australia the artificial sweeteners saccharin, cyclamate and aspartame are permitted to be added to food and beverages. These sweeteners are approximately 300, 30 and 180 times respectively as sweet as sucrose. They are most commonly used in low energy foods and beverages and as table top sweeteners. The maximum levels permitted in foods are governed by state food laws, but there is no convenient analytical method which can assay the amounts of these three sweeteners. We report the development of a high performance liquid chromatographic procedure (hplc) for the simultaneous determination of saccharin, cyclamate and aspartame in food and beverages.

A recently reported hplc method for the determination of the three sweeteners (Hermann et al. 1983) has several disadvantages including a relatively long analysis time, a lack of a suitable internal standard and limited sensitivity. We have developed a technique which does not suffer the above drawbacks. The sweeteners in aqueous solution are ion-paired with benzyltrimethyl ammonium hydroxide at pH 5.5 and separated on a C_{18} reverse phase column (Figure 1). Quantitation is achieved using *p*-toluic acid as internal standard and plots of peak height ratios against concentration are linear over the range 0.5 mg mL^{-1} to 3 mg mL^{-1}. The sensitivity limits are 4.0 µg for cyclamate, 0.5 µg for saccharin and 8.0 µg for aspartame. The procedure is now being applied to foods and beverages, samples of the latter being directly injected after degassing.

Figure 1.



1. Saccharin
2. Cyclamate
3. Benzoic acid
4. Aspartame
5. *p*-Toluic acid

HPLC CONDITIONS

Flow rate :	1.2 ml/min
Chart speed :	3 mm/min
Injection amount :	25 µl
	63:37 H_2O:Methanol
	pH 5.5
	0.006M Benzyl-trimethylammonium hydroxide.
Column :	µ Bondapak C_{18} (Waters)

Absorption was read at 254 nm

HERMANN, A., DAMAWANDI, E. and WAGMAN, M. (1983). J. Chromatog. 280 : 85.

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