The use of cysteic acid as an internal standard in amino acid analysis

Norleucine is commonly used as an internal standard in automated amino acid analysis since it emerges separate from other compounds found in normal plasma or urine and has a good color yield, similar to that of other leucines[1]. Use of norleucine does have several disadvantages. First, it emerges rather late from the column and, if only the early emerging substances are of interest, time is wasted in waiting for the appearance of the standard; especially with urine, another internal standard is difficult to find that does not emerge coincident with a component, either normal or pathological[2]. Second, if the ninhydrin reagent has lost some reactivity, it may not be obvious until the standard emerges. Finally, we have noticed that on several occasions when urine was being chromatographed a dip before or an actual split of the norleucine peak occurs which makes the standard useless. The reason for this is not known but it would appear to reflect the almost simultaneous emergence of a ninhydrin-negative compound. The above mentioned problems are obviated by the use of cysteic acid as standard. The cysteic acid to be used as standard is applied to the column before the introduction of the sample and is eluted for 15 min with the equilibrating buffer. The sample to be analyzed is then introduced and the procedure completed as usual. The standard emerges at one void volume, about 5 min before the front of the applied sample; therefore, there is no possibility of interference of sample and standard. The color yield of cysteic acid is equivalent to that of leucine (or norleucine)[1].

This investigation was supported by research grants from the National Institutes of Health.

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1 P. B. HAMILTON AND R. A. ANDERSON, *Anal. Chem.*, 31 (1959) 1504.
2 J. S. KING, *Clin. Chim. Acta*, 9 (1964) 441.

Received March 15th, 1965

Verhalten einiger 2,4-Dinitro-6-*sek.*-butylphenylcarbonate bei der Gaschromatographie

In den letzten Jahren wurden einige Derivate der 2,4-Dinitro-6-alkylphenylcarbonate[1–4] infolge deren akariziden und fungiziden Eigenschaften als wirksame Bestandteile einiger pestizider Präparate herangezogen (Dinobuton, Dinocton, Dinoterbon)[5].

Grundlage für die Ausarbeitung einer selektiven analytischen Methode der Bestimmung von Derivaten der 2,4-Dinitro-6-*sek.*-butylphenylcarbonate wurde das