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Note

Gas–liquid chromatographic separation of trifluoroacetamide amphetamine drugs

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The gas chromatographic analysis of amphetamine and methamphetamine as trifluoroacetamide derivatives has proven to be a very useful procedure due to the ease of formation of the derivatives, their excellent chromatographic properties, and the excellent separation of the derivatives on columns such as 3% OV-17 and 3% SE-30[1–3]. Although the procedure is excellent, complications have arisen from other commonly used amines such as ephedrine and phentermine, which are structurally very similar to amphetamine and methamphetamine. The ephedrine and phentermine are not separated from amphetamine and methamphetamine by normal extraction methods or as trifluoroacetamide derivatives by common columns such as 3% OV-17 and 3% SE-30. The magnitude of the problem is large (at least in the Los Angeles area where the total number of samples positive for ephedrine and/or phentermine exceeds the total number of samples positive for amphetamine and/or methamphetamine)[4].

Many columns have been tried in attempts to eliminate the interferences from ephedrine and phentermine. Partial success was obtained with a 3% OV-225 column[3], which eliminated interferences with amphetamine and methamphetamine, but the separation between these two was only fair, and the internal standard (*n*-propylamphetamine) was interfered by both ephedrine and β-phenethylamine, making accurate quantitation impossible.

TABLE I

RETENTION TIMES OF TRIFLUOROACETAMIDE AMPHETAMINE DRUGS

I = GP 2% SP-2510 DA on Supelcoport (100–120 mesh). II = 1% SP-1240 DA on Supelcoport (100–120 mesh).

Drug	*Retention time on column (min)*	
	I	*II*
Amphetamine	6.3	5.7
Methamphetamine	4.3	3.8
n-Propylamphetamine	5.9	4.3
Ephedrine	5.0, 7.6	3.0
β-Phenethylamine	7.5	7.9
Phentermine	4.1	3.1

Success has been achieved with both a 2% SP-2510-DA column (6 ft. × 2 mm I.D.) and a 1% SP-1240-DA column (6 ft. × 2 mm I.D.). The columns eliminate interferences with amphetamine, methamphetamine, and *n*-propylamphetamine (internal standard) by ephedrine, β-phenethylamine, and phentermine, and provide a satisfactory separation between amphetamine and methamphetamine.

The retention times of the amines on these two columns are illustrated in Table I.

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