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## Note

# The use of the liquid phase Poly A-103 in toxicology

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Since their introduction in 1970[1,2] the polyamide liquid phases have been used for the analysis of a number of drugs[3]. In our laboratory the Poly A-103 phase (Applied Science Lab., State College, Pa., U.S.A.) is used principally for the analysis of the more volatile bases of the amphetamine type which, when acetylated, are well resolved. The particular advantage of Poly A-103 is its relatively high operating temperature which enables it to be used simultaneously with an OV-1 (or SE-30) phase for the analysis of a wide range of drugs.

In our system, two 1.2-m U-shaped glass (0.6 cm O.D.) columns are used, one containing 3% Poly A-103 on Gas-Chrom Q, 80–100 mesh (Applied Science Lab.), and the other 3% OV-1 on Gas-Chrom Q, 80–100 mesh. Both columns are set in the oven of a Varian 2100 (Varian, Walnut Creek, Calif., U.S.A.) equipped with two flame ionization detectors, a dual electrometer and twin-pen recorder.

TABLE I

THE RETENTION TIMES $t_R$, (RELATIVE TO ACETYLATED (Ac) TRANYLCYPROMINE) OF SOME COMMON DRUGS ON 3% POLY A-103

| *Drug* | $t_R$ |
|---|---|
| Methamphetamine Ac | 0.35 |
| Amphetamine Ac | 0.38 |
| Meperidine | 0.40 |
| Phenylethylamine Ac | 0.45 |
| Methyprylone | 0.47 |
| Diphenhydramine | 0.61 |
| Phencyclidine | 0.68 |
| Phenmetrazine Ac | 0.87 |
| *p*-Methoxyamphetamine Ac | 0.98 |
| Tranylcypromine Ac | 1.00 |
| Phenacetin | 1.34 |
| Methadone | 1.42 |
| Dimethyltryptamine | 1.47 |
| Glutethimide | 1.49 |
| Methylenedioxyamphetamine | 1.63 |
| Cocaine | 2.47 |

The oven temperature is set at 215° with the initial flow-rates (≈50 ml/min of $N_2$) adjusted so that acetylated tranylcypromine has a retention time of approximately 6 min on the Poly A-103 column and codeine a retention time of 5 min on the OV-1 column.

Table I lists the relative retention times of some common drugs on the Poly A-103 column. For a comprehensive list of the retention times (relative to codeine) of common drugs on the silicone SE-30 phase see Finkle *et al.*[4].

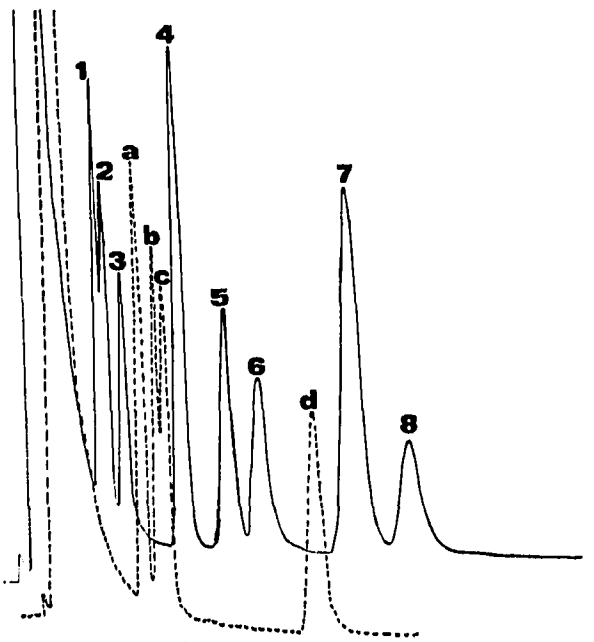


Fig. 1. The simultaneous analysis of drugs on two columns. (———), Poly A-103: 1= methamphetamine (16.6 mg.%); 2= amphetamine (16.6 mg.%); 3= phenylethylamine (16.6 mg.%); 4= phencyclidine (33.3 mg.%); 5= phenmetrazine (33.3 mg.%); 6= tranylcypromine (33.3 mg.%); 7= methadone (50 mg.%); 8= methylenedioxyamphetamine (50 mg.%). (. . . . . ), OV-1: a= methadone (10 mg.%); b= amitriptyline (10 mg.%); c= imipramine (10 mg.%); d= chlorpromazine (20 mg.%).

Acetylation of the amines is necessary; the free amines tail badly on Poly A-103. In Fig. 1 the solid line represents the chromatogram of a mixture of acetylated drugs. 1 ml of a mixture of the drug salts in aqueous solution was made alkaline and extracted with 1 ml of di-isopropyl ether (IPE). To the organic phase was added 15 $\mu$l of acetic anhydride, and a few $\mu$l of the mixture were injected. The dotted line represents the chromatogram of a mixture of common drugs in IPE on the OV-1 column.

The use of the dual electrometer and twin-pen recorder enable the analyst to run both columns simultaneously, a useful arrangement when considerable numbers of blood and urine extracts have to be screened for a wide range of drugs. The application of the above system in a general screen procedure for blood and urine will be reported later.

## REFERENCES

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