SPECIAL LECTURE**Gas Chromatographic Methods for the Study of Steroid Hormones****Zvan C. HORNING**

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The separation, identification and estimation of steroids by gas chromatographic methods rests upon the use of thin-film column packings prepared from highly thermostable liquid phases and inactivated supports; microgram or sub-microgram samples are used with highly sensitive ionization detection devices. Separations are usually achieved by using the appropriate liquid phase, and derivatives may be prepared to aid in the qualitative or quantitative aspects of the separation. Non-selective liquid phases in current use include SE-30, F-60 and JXR; these are all siloxane polymers. Selective phases in current use include the siloxane polymers QF-1, CNSi and PhSi, and the polyesters NGS, EGSS-Z, and CHDMS. Many types of useful derivatives are known.

The identification and estimation of steroid hormones in materials of biological origin requires the development of an isolation procedure for a steroid fraction as well as a suitable gas chromatographic method. The best way to compare isolation methods is by gas chromatographic techniques.

The separation and estimation of urinary 17-ketosteroids may be carried out through use of trimethylsilyl ethers as derivatives. Pregnanediol may be estimated in the same way. Testosterone in urine may be determined either as the free steroid or as the propionyl derivative. DHIA in serum may be determined through use of an ion-exchange column procedure and a gas chromatographic measurement. Methods for the determination of THE and THF have been published, but these are not entirely satisfactory. Estrogens may be determined as the trimethylsilyl ethers or as acetyl derivatives. These methods may be used to study steroid metabolic pathways, responses to adrenal stimulation and alterations in steroid patterns produced by drugs.

Other types of hormones may also be studied by gas chromatographic techniques. For example, the catecholamines may be separated as acetyl derivatives with a JXR-CHDMS column.

Examples of separations of steroids will be presented.