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CONTENTS

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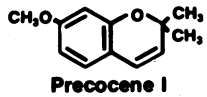
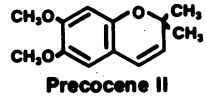
Precocenes

Juvenile hormones are necessary throughout most stages of the insect life cycle for development of ovaries, sex pheromone production and larval diapause.[1] Application of



Precocene I



Precocene II

exogenous juvenile hormones to insect populations can upset development only during the brief period of metamorphosis that occurs when an immature insect molts to the adult stage.[2,3]

Bowers and co-workers[4] have found that introduction of some anti-juvenile hormones (antiallatotropins) into an insect colony terminates juvenile hormone secretion and induces:

1) precocious molting of insects to sterile adults,
2) inability of larvae which are dependent on a high titer of juvenile hormones to diapause,
3) sterility in adult insects which are dependent on juvenile hormone for ovarian development, and
4) artificial diapause in species which diapause through a lack of juvenile hormones.

Bowers isolated 7-methoxy-2,2-dimethylchromene and 6,7-dimethoxy-2,2-dimethylchromene from extracts of the plant *Ageratum houstonianum*. Since these compounds were found to induce precocious metamorphosis in insects, he named them **Precocene I** and **Precocene II**, respectively.[4]

In tests performed by Bowers[4] with the **Precocenes**, milkweed bugs underwent precocious metamorphosis, and in several other species of insects, sterilization was induced. **Precocene II** was also found to induce diapause in Colorado potato beetles.

In these tests, the biological effect of the **Precocenes** is equivalent to that of the surgical removal of the corpora allata which produce juvenile hormones in insects. Indeed, **Precocene II** was found to inhibit the biosynthesis of juvenile hormone by the cockroach corpora allata.[5] Thus, the **Precocenes** depress juvenile hormone titer and can be highly effective insecticides. Moreover, Bowers,[4] in some instances, succeeded in reversing the antiallatotropic activity in precocious adults by treatment with exogenous juvenile hormones.

We believe that this remarkable discovery of antiallatotropic activity could guide the way to safe, economical and insect-specific pesticides.[6]

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4) W.S. Bowers, T. Ohta, J.S. Cleere, and P.A. Marsella, *Science*, **193**, 542 (1976); *Chem. Eng. News*, **54** (16), 19 (1976).
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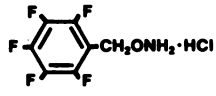
6) W.S. Bowers in "Yearbook of Agriculture," Department of Agriculture, Washington, D.C., 1968, pp 94-98.

19,491-3 Precocene II 250mg $8.75; 1g $23.00

Precocene I will be available from Aldrich in the near future.

Pentafluorobenzylhydroxylamine



PFBHA·HCl

***O*-(2,3,4,5,6-Pentafluorobenzyl)hydroxylamine hydrochloride (PFBHA · HCl)** has recently been introduced as a very sensitive derivatizing agent for the *gas chromatographic analysis of ketosteroids* using electron capture detection.[1,2] For this type of detection technique to be effective, the compound to be analyzed must contain a strong electron-withdrawing group. Since most ketosteroids do not contain a sufficiently strong electron-withdrawing group, a suitable derivative must be prepared.

Clark and Wotiz[3] first suggested the use of heptafluorobutyrate ester derivatives for the chromatography of hydroxysteroids such as testosterone. Although these derivatives are sensitive to electron capture detection, they suffer from the difficulty encountered in controlling the reaction to prepare selectively the 17-hydroxy mono ester, the 3-enol mono ester or the 3-enol-17-hydroxy diester. As a result, one steroid may be resolved into several peaks in the chromatogram, leading to confusion and error in the analysis. Koshy and co-workers have shown **PFBHA·HCl** to be a more effective derivatizing reagent. **PFBHA·HCl** converts ketosteroids to their oximes, and glc conditions can be chosen such that both the *syn* and *anti* oximes appear as one peak.[1]

Steroid *O*-(2,3,4,5,6-pentafluorobenzyl) oximes are readily prepared under mild conditions by treating the ketosteroid with a solution of **PFBHA·HCl** in pyridine at 60 to 65°C.[1] After evaporation of the solvent, the oxime is extracted into cyclohexane, and the cyclohexane solution is washed with water and dried over Na_2SO_4. Derivatives can be prepared from less than one nanogram of steroid. PFB-oxime derivatives of testosterone have been detected with samples as small as 5 picograms.

Nambara and co-workers have used **PFBHA·HCl** for the determination of dehydroepiandrosterone in human plasma with satisfactory results.[2] It has been suggested that this analytical technique may also be applicable to the determination of specific prostaglandins in tissues, and the analysis of ketosteroid levels in meat carcasses to ascertain if they fall within federal standards.[4]

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19,448-9 *O*-(2,3,4,5,6-Pentafluorobenzyl)-hydroxylamine hydrochloride 250mg $17.00 1g $45.00

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