SIGMA offers

Microbial

DECARBOXYLASES

UNIT DEFINITION: For Amino Acid Decarboxylases, one unit will release 1.0µMole of CO2 from the Amino Acid substrate per minute, at the indicated pH and temperature. For other Decarboxylases, see unit definitions under individual listings.

L-ARGININE DECARBOXYLASE (E.C. No. 4.1.1.19)

A5381 From Escherichia coli. Powder.
Activity: 0.6-0.9 unit per mg solid 75 units 17.42
at pH 5.2 at 37°C. 750 units 126.66

L-GLUTAMIC DECARBOXYLASE (E.C. No. 4.1.1.15)

G2376 From Clostridium welchii. Powder.
Activity: 0.8-1.5 units per mg solid 25 units 34.20
at pH 5.0 at 37°C. 100 units 150.00

G2126 From Escherichia coli. Powder.
Activity: 2.5-5.5 units per mg solid 150 units 6.84
at pH 5.0 at 37°C. 1500 units 38.00

G3757 From Escherichia coli. Powder.
Activity: 20-40 units per mg Protein (Biuret) at pH 5.0 at 37°C.
500 units 19.95
2000 units 70.30

L-HISTIDINE DECARBOXYLASE (E.C. No. 4.1.1.22)

H8375 From Clostridium welchii. Powder.
Activity: Approx. 0.1 unit per mg 1 unit 7.60
Protein (Biuret) at pH 4.5 at 37°C. 2 units 12.67

L-LYSINE DECARBOXYLASE (E.C. No. 4.1.1.18)

L0862 From Bacillus megaterium. Powder.
Activity: 1-3 units per mg solid 250 units 41.16
at pH 6.0 at 37°C. 1000 units 113.99

L1007 From Bacillus megaterium. Powder.
Activity: 10-15 units per mg solid 25 units 11.40
at pH 6.0 at 37°C. 250 units 62.06

L9502 From Escherichia coli. Powder.
Activity: 0.2-0.3 unit per mg solid at pH 6.0 at 37°C.
8 units 5.70
15 units 9.50

L-ORNITHINE DECARBOXYLASE (E.C. No. 4.1.1.17)

O3001 From Escherichia coli. Powder.
Activity: 0.05-0.2 unit per mg Protein (Biuret) at pH 5.0 at 37°C.
5 units 31.67
25 units 153.90

PYRUVATE DECARBOXYLASE (E.C. No. 4.1.1.1)

P0133 From Brewers Yeast. Suspension in 3.2M (NH4)2SO4 solution, pH 6.0
Activity: 10-20 units per mg Protein (Biuret).
500 units 113.99

OXALATE DECARBOXYLASE (E.C. No. 4.1.1.2)

O3500 From Flammulina (Collybia) velutipes. Powder.
Activity: Approx. 5 units per mg Protein (Biuret).
20 units 60.16

UNIT DEFINITION: One unit will convert
1.0µM Oxalate to Formate and CO2 per minute at pH 3.0 at 37°C.

SIGMA also offers a number of crude Acetone powder Decarboxylase sources. Please inquire.

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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. Application of 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.1,2

Bowers and co-workers3 have found that introduction of some anti-juvenile hormones (antiallactotropins) 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 hormone 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-dimethylchromone 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 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,6 in some instances, succeeded in reversing the antiallactotropic activity in precocious adults by treatment with exogenous juvenile hormones.

We believe that this remarkable discovery of antiallactotropic activity could guide the way to safe, economical and insect-specific pesticides.7

References:
2. C.M. Williams, ibid., 178, 212 (1956).
7. 19,585-5 Precocene I....................1g $12.10; 5g $49.50
7. 19,491-3 Precocene II...................250mg $7.45; 1g $19.80

Pentafluorobenzylhydroxylamine

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.8,9 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 Wotiz10 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 gcic conditions can be chosen such that both the syn and anti oximes appear as one peak.11

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.12 After evaporation of the solvent, the oxime is extracted into cyclohexane, and the cyclohexane solution is washed with water and dried over Na2SO4. 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.13 It has been suggested that this analytical technique may also be applicable to the determination of specific proglandinins in tissues, and the analysis of ketosteroid levels in meat carcasses to ascertain if they fall within federal standards.14

References:
5. 19,448-4 O-(2,3,4,5,6-Pentafluorobenzyl)-
250mg $18.70
hydroxylamine hydrochloride
1g $49.50

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