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ProductInformation

L-Glutamate Oxidase
from *Streptomyces sp.*

Product Number **G 0400**
Storage Temperature 2-8 °C

Product Description
Molecular Weight: 140 kDa
Enzyme Commission (EC) Number: 1.4.3.11
CAS Number: 39346-34-4
Synonym: glutamic acid oxidase

This product was originally derived from a species of *Streptomyces* that was isolated from soil near the city of Choshi, Japan.[1] It is a lyophilized powder containing potassium phosphate buffer salts and lactose.

L-Glutamate Oxidase is a major enzyme in the synthesis or degradation of glutamic acid. It transfers an amine to α-ketoglutaric acid to form L-glutamic acid, or deamidates L-glutamic acid. Glutamate oxidase consists of two α chains, two β chains, and two γ chains of respective subunit molecular weights of about 44 kDa, 19 kDa and 9 kDa.[2] It contains 2 moles of flavin adenine dinucleotide (FAD) per mole of enzyme. The pH range of this enzyme is from 4-10, with the pH optimum occuring in the range of 7.0 - 8.0.[3]

Inhibitors of this enzyme include the following reagents:
- silver ion (Ag^+)
- mercuric ion (Hg^{2+})
- *p*-chloromercuribenzonate
- 4-chloro-7-nitrobenzo-2-oxa-1,3-diazol
- N-bromosuccinimide

The immobilization of this enzyme to solid supports and membranes for the assay of L-glutamate has been reported.[4,5,6] The immobilization of this enzyme to ultrathin and transparent NH_2-polymer films via L-ascorbic acid has been investigated.[7]

Precautions and Disclaimer
For Laboratory Use Only. Not for drug, household or other uses.

Preparation Instructions
This product is soluble in cold 0.1 M potassium phosphate, pH 7.4 (2.3 mg/ml), yielding a clear, colorless to light brown solution.

References
1. Kusakabe, H., et al., Occurrence of a new enzyme, L-glutamate oxidase in a wheat bran culture extract of *Streptomyces* sp. X-119-6. Agric. Biol. Chem., **47**, 179-182 (1983).
2. Kusakabe, H., et al., Purification and properties of a new enzyme, L-glutamate oxidase, from *Streptomyces* sp. X-119-6 grown on wheat bran. Agric. Biol. Chem., **47**, 1323-1328 (1983).
3. Enzyme Handbook 6, Class 1.2-1.4: Oxidoreductases, Schomburg, D., et al., eds., Springer-Verlag (Berlin: 1993).
4. Ghobadi, S., et al., Bienzyme carbon paste electrodes for L-glutamate determination. Current Separations, **14**, 94-102 (1996).
5. Hirano, A., et al., Detection and imaging of L-glutamate released from mouse-brain slices with an enzyme-based membrane. Anal. Sci., **16**, 25-29 (2000).
6. Yao, T., et al., Micro-flow *in vivo* analysis of L-glutamate with an on-line enzyme amplifier based on substrate recycling. Anal. Sci., **17(6)**, 703-708 (2001).
7. Tiller, J., et al., A novel efficient enzyme-immobilization reaction on NH_2 polymers by means of L-ascorbic acid. Biotechnol. Appl. Biochem., **30 (Pt 2)**, 155-162 (1999).

GCY/NSB/RXR 11/03