

Product Information

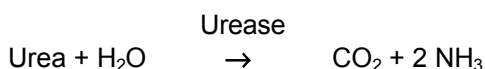
Urease, Type IX from *Canavalia ensiformis* (Jack Bean)

Catalog Number **U4002**
Storage Temperature 2–8 °C

E.C. 3.5.1.5
CAS RN 9002-13-5
Synonym: Jack Bean Urease

Product Description

Urease is involved in purine metabolism and the urea cycle. It catalyzes the hydrolysis of urea to produce ammonia and carbon dioxide:



Hydroxyurea is also a substrate of the enzyme.¹

Jack bean urease was the first enzyme to be crystallized and the first enzyme found to contain nickel. It is a multi-subunit enzyme, consisting of 91 kDa subunits in three protein forms. The major protein form has a molecular mass range of 440–480 kDa and two lesser forms have molecular mass ranges of 230–260 kDa and 660–740 kDa.^{2,3}

Isoelectric point:⁴ 5.0–5.2

Optimal pH:² 7.4

Optimal temperature: 60 °C
Urease begins to denature at temperatures above 45 °C for 60 minutes.

K_M :² 1.3 mM (in Tris HCl)

Inhibitors:

2-mercaptoethanol⁵

acetohydroxamate⁶

EDTA⁷

phosphoramidate⁵

fluoride ion⁵

1,4-benzoquinone

2,5-dimethyl-1,4-benzoquinone⁸

This product is supplied as a lyophilized powder.

Specific activity: 50,000–100,000 units/g solid

Unit definition: one unit will liberate 1.0 μmole of NH₃ from urea per minute at pH 7.0 at 25 °C. One unit is equivalent to 1.0 I.U. or 0.054 Sumner unit (1.0 mg ammonia nitrogen released in 5 minutes at pH 7.0 at 20 °C)

“Free” ammonia ≤0.1 μg/unit

Sigma's titrimetric assay uses a 1.10 ml reaction mix. The final concentrations are 684 mM sodium phosphate, 455 mM urea, 0.05% (w/v) bovine serum albumin and 25–50 units of urease.

A FTIR method used to monitor either the disappearance of substrate or the appearance of product has been published.⁹

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Preparation Instructions

The enzyme is soluble in 0.2 M sodium phosphate buffer, pH 7.0, (10 mg/ml) yielding a clear to hazy solution. The following buffers have been shown not to inhibit urease activity: MES, HEPES, and CHES.²

Storage/Stability

The recommended storage temperature is 2–8 °C.

References

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6. Dixon, N.E. *et al.*, Metal ions in enzymes using ammonia or amides. Science, **191**, 1144-1150 (1976).
7. Dixon, N.E. *et al.*, Jack bean urease (EC 3.5.1.5). II. The relationship between nickel, enzymatic activity, and the "abnormal" ultraviolet spectrum. The nickel content of jack beans. Can. J. Biochem., **58**, 474-480 (1980).
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GY,KAD,RGB,JWM,MAM 03/14-1