

# ENZYMES

## Urease

**ORIGIN** Jack Bean

**CAT# 70-6734-01**  
**EC# 3.5.1.5**

### ► SPECIFICATIONS

**Appearance** Clear, slightly yellow solution, essentially free from particulate matter  
**Activity** 8000 ± 1000 U/ml at 37°C  
**pH** 7.10 ± 0.20  
**Contaminants** **Ammonia Content** ≤0.0008 μmoles of ammonia per unit of Urease  
**Microbial Counts** ≤150 CFU/mL

### ► APPLICATION

Urease is used in combination with glutamate dehydrogenase to determine the level of urea in clinical analysis.

### ► UNIT DEFINITION

One unit of activity is defined as the amount of enzyme that will convert 1.0 micromole of urea per minute at 37°C under the standard assay method conditions. Refer to Table 1 (below) for guidance on factors to adjust units according to temperature of assay.

### ► ASSAY PRINCIPLE

Urease catalyses the following reaction:



**TABLE 1: TEMPERATURE FACTORS FOR UNIT CONVERSION**

ASSAY TEMPERATURE	FACTOR RELATIVE TO 37°C RESULT
25°C	0.54
30°C	0.70
37°C	1.00
45°C	1.35

## CHARACTERISTICS

Urease is formulated as a liquid product with glycerol and so does not freeze at -20°C. Its main characteristics are as follows:

<b>Native Structure<sup>(1)</sup>:</b>	91kD subunit arranged as a hexamer, 2 Ni ions per subunit
<b>Isoelectric point<sup>(2)</sup>:</b>	5.0 - 5.1
<b>K<sub>m</sub> Value (Eadie-Hofstee):</b>	4 x 10 <sup>-3</sup> M (Urea)
<b>Optimum pH (Fig. 1):</b>	pH 7.5
<b>Optimum Temp. (Fig. 2):</b>	At least 50°C
<b>pH Stability (Fig. 3):</b>	pH 5.5 to 11.0 (25°C for 20 hours)
<b>Thermal Stability (Fig. 4):</b>	Stable at 70°C and below (pH 7.5 for 15 minutes)

FIGURE 1: OPTIMUM pH

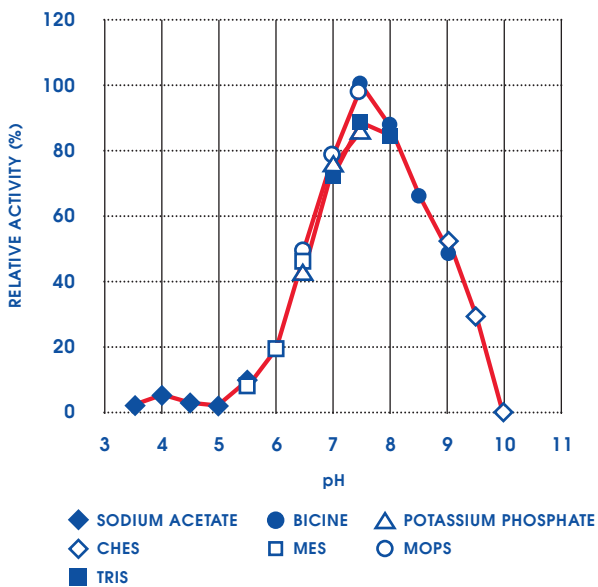
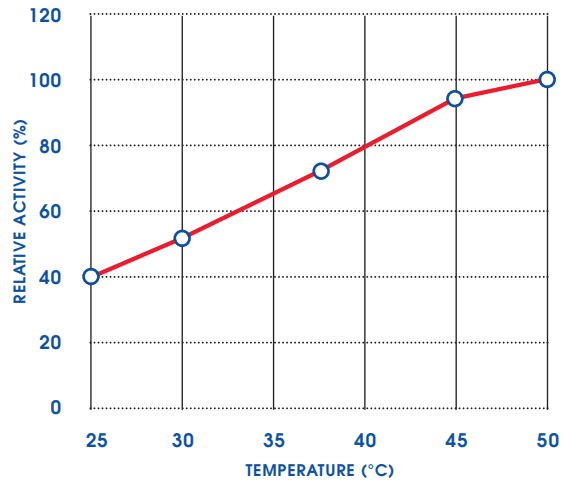
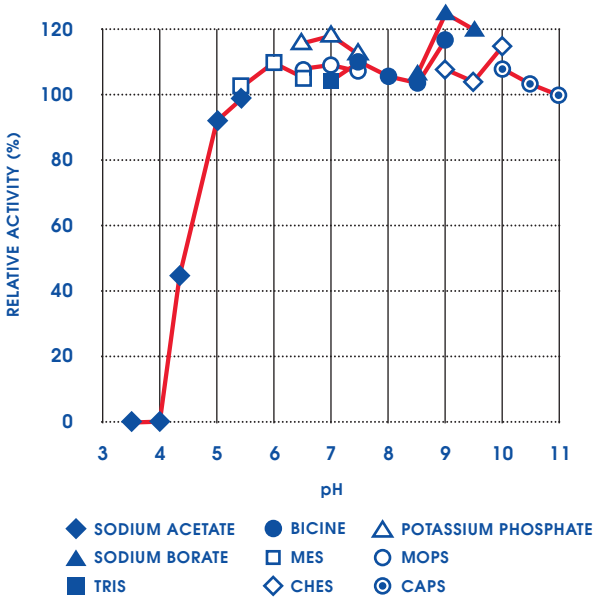


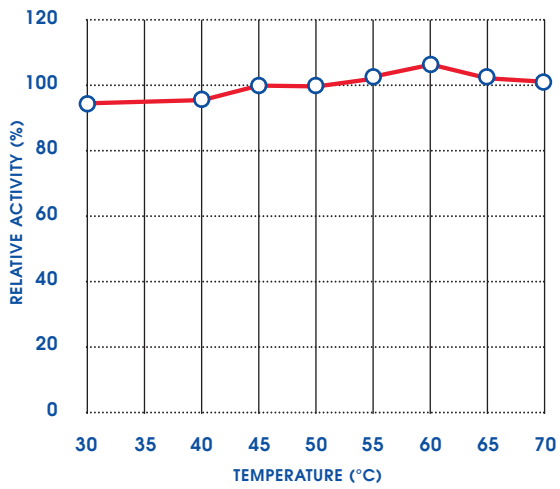
FIGURE 2: OPTIMUM TEMPERATURE



**FIGURE 3: pH STABILITY  
(0.1M BUFFER AT 25°C FOR  
20 HOURS)**



**FIGURE 4: THERMAL STABILITY  
(0.1M POTASSIUM PHOSPHATE  
pH 7.0 FOR 15 MINS.)**



(1) Takishima, K et al. (1988) The structure of jack bean urease. The complete amino acid sequence, limited proteolysis and reactive cysteine residues. Eur.J.Biochem., 175 (1), pp.151-65  
 (2) Sumner, J.B. and Hand, D.B (1929) The isoelectric point of crystalline urease. J.Am.Chem.Soc., 51, pp.1255-60

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