OYC IVD News vol. 6 – Biochemicals for UN assay –

OYC Biochemicals

for Urea Nitrogen assay

OYC's Biochemicals are the most suitable for the development and manufacture of IVD reagents.
In addition to rGlDH, NADPH and NADH (listed in published Vol. 5) required for the measurement of ammonia, this news focus here on rUrease and rICDH as raw materials for Urea Nitrogen (UN) assays. rICDH is an enzyme useful for maintaining and extending the measurement range by regenerating the coenzyme consumed in the ammonia scavenging reaction.
Would you like to try a better UN reagent with these combinations?

Assay Principle

Urea Nitrogen, UN

Renal function tests

■ Urease・GlDH method

(GlDH-based kinetic assay)

$$\textbf{Urea} + H_2O \xrightarrow{\text{Urease}} 2NH_3 + CO_2$$

$$NH_3 + 2\text{-Oxoglutarate} + \text{NADH} + H^+ \xrightarrow{\text{GlDH}} \text{L-Glutamate} + NAD^+ + H_2O$$

■ Urease・GlDH method

(Urease-based kinetic assay)

$$NH_3 + 2\text{-Oxoglutarate} + \text{NADPH} + H^+ \xrightarrow{\text{GlDH}} \text{L-Glutamate} + NADP^+ + H_2O$$

$$\textbf{Urea} + H_2O \xrightarrow{\text{Urease}} 2NH_3 + CO_2$$

■ Urease・GlDH・ICDH method

(Urease-based kinetic assay)

Elimination of endogenous ammonia

+

Enzyme cycling by ICDH

*Major ingredients in the reagent are colored **red** .*
OYC's available product is highlighted in .

1st Reaction (Ammonia Elimination)

$$NH_3 + 2\text{-Oxoglutarate} \xrightarrow{\text{GlDH}} \text{L-Glutamate} + H_2O$$

$$\text{NADPH} \rightarrow NADP^+$$

$$2\text{-Oxoglutarate} + CO_2 \xleftarrow{\text{ICDH}} \text{Isocitrate}$$

2nd Reaction (Urea Nitrogen Measurement)

$$\textbf{Urea} + H_2O \xrightarrow{\text{Urease}} 2NH_3 + CO_2$$

$$NH_3 + 2\text{-Oxoglutarate} + \text{NADPH} + H^+ \xrightarrow{\text{GlDH}} \text{L-Glutamate} + NADP^+ + H_2O$$

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OYC's PRODUCTS for UN assay

CHECK!

Please refer to "OYC IVD News Vol. 5" for detailed information on rGlDHs and Coenzymes.

- Enzymes : rGIDH(Y), rGIDH(NAD)
- Coenzymes : NADPH, NADH

Special Products for UN assays

rUrease

Product Item	Catalog No.	Properties: pH stability (37℃, 1 week)	Thermal stability (pH 8.0, 10 min)	Optimum pH	Optimum temp.	Km value (Urea)
rUrease	46753900	8.0-9.5	≦ 65℃	6.0	≧ 37℃	1.9 x 10^{-1} mol/L

rICDH

Product Item	Catalog No.	Properties: pH stability (25℃, 1 week)	Thermal stability (pH 8.0, 10 min)	Optimum pH	Optimum temp.	Km value (Isocitrate)	Km value ($NADP^+$)
rICDH(Taq)	46745903	6.5-8.5	≦ 65℃	8.5	≧ 37℃	6.0 x 10^{-5} mol/L	5.5 x 10^{-5} mol/L

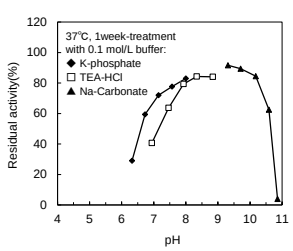
REFERENCE DATA -rUrease

Most suited to Urease-based UN kinetic assay

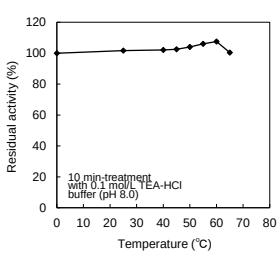
- Unique enzyme (Designed mutant)
- Higher Km for Urea than that of Urease derived from Jack bean
- Ready to direct use (not require the addition of boric acid (Urease inhibitor))

rUrease

pH stability



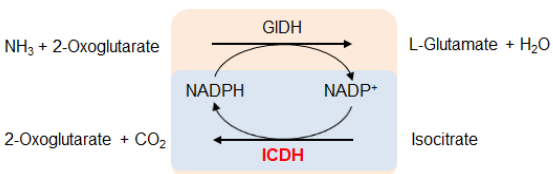
Thermal stability



REFERENCE DATA -rICDH

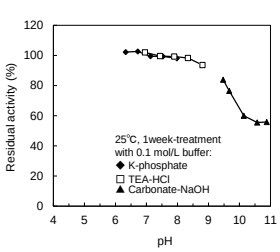
NADPH regeneration reaction by ICDH

- Ensure the measurement range of UN reagents
- Improve the liquid stability of reagents

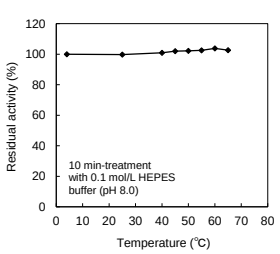


rICDH(Taq)

pH stability



Thermal stability



OYC supports the development and manufacture of IVD reagents for our customers.

ORIENTAL YEAST CO.,LTD.

Please contact our sales representative or visit the following website.
http://www.oyc-bio.jp/pages/info/english