Reactivos GPL

Barcelona, España

CE

- GPT/ALT-LQ -

GPT/ALT

LDH-NADH. Kinetic UV. Liquid

Store at: +2+8ºC.

Presentation:

Cod. EZ016LQ CONT: R1 1 x 100 R2 1 x 25 mL .
EZ016LQ-SP CONT: R1 1 x 40 R2 1 x 10 mL .
EZ017LQ CONT: R1 2 x 100 R2 2 x 25 mL .

Procedure

Quantitative determination of alanine aminotransferase GPT /ALT.

Only for *in vitro use in clinical laboratory* (IVD)

TEST SUMMARY

Alanine aminotransferase (ALT) o Glutamate pyruvate transaminase (GPT) catalyses the reversible transfer of an amino group from alanine to α-ketoglutarate forming glutamate and pyruvate.
The piruvate produced is reduced to lactate by lactate dehydrogenase (LDH) and NADH:

$$\text{Alanine} + \alpha\text{-Ketoglutarate} \xrightarrow{\text{ALT}} \text{Glutamate} + \text{Pyruvate}$$

$$\text{Pyruvate} + \text{NADH} + H^+ \xrightarrow{\text{LDH}} \text{Lactate} + NAD^+$$

The rate of decrease in concentration of NADH, measured photometrically, is proportional to the catalytic concentration of ALT present in the sample[1].

REAGENT COMPOSITION

R.1 (Buffer)	TRIS PH 7.8 L-Alanine Lactate dehydrogenase (LDH)	100 mmol/L. 500 mmol/L. 1200 U/L.
R.2 (Substrate)	NADH α-Ketoglutarate	0.18 mmol/L. 15 mmol/L.

PRECAUTIONS

R1: H290-May be corrosive to metals.
Follow the precautionary statements given in MSDS and label of the product.

REAGENT PREPARATION AND STABILITY

Working reagent (WR):
Mix 1 volume of R2 with 4 volumes of R1.
Stability: 21 days at 2-8ºC or 72 hours at room temperature (15-25ºC).
Signs of Reagent deterioration:
- Presence of particles and turbidity.
- Blank absorbance (A) at 340 nm. < 1.00

All the components of the kit are stable until the expiration date on the label when stored at 2-8º C, protected from light and contamination prevented during their use. Do not use reagents over the expiration date.

SPECIMEN

Serum or plasma[1]. Stability: 7 days at 2-8ºC.

MATERIAL REQUIRED BUT NOT PROVIDED

- Spectrophotometer or colorimeter measuring at 340 nm.
- Thermostatic bath at 25ºC, 30ºC o 37ºC (± 0.1ºC).
- Matched cuvettes 1.0 cm. light path.

General laboratory equipment.

TEST PROCEDURE

1. Assay Conditions
   - Wavelength: ..... 340 nm.
   - Cuvette: ..... 1 cm light path.
   - Constant temperature .....25ºC / 30ºC / 37ºC.
2. Adjust the instrument to zero with distilled water or air.
3. Pipette into a cuvette (note 1):

WR (mL)	1.0
Sample (µL.)	100

4. Mix and incubate for 1 minute.
5. Read the absorbance (A) of the sample, start the stopwatch and read absorbance at 1 min interval thereafter for 3 min.
6. Calculate the difference of absorbance and the average absorbance difference per minute (ΔA/min.)

CALCULATIONS

GPT/ALT U/L. = ΔA/min. x 1750 (note 2)

Units: One international unit (IU) is the amount of enzyme that transforms 1 µmol of substrate per minute, in standard conditions. The concentration is expressed in units per litre of sample (U/L).

Temperature conversion factors
To correct results to other temperatures multiply by:

Assay temperature	Conversion factor to		
	25ºC	30ºC	37ºC
25ºC	1.00	1.32	1.82
30ºC	0.76	1.00	1.39
37ºC	0.55	0.72	1.00

QUALITY CONTROL

Control sera are recommended to monitor the performance of the procedure, Control H Normal Ref. QC003 and Control H Pathological Ref. QC004. If control values are found outside the defined range, check the instrument, reagents and calibrator for problems.

Serum controls are recommended for internal quality control. Each laboratory should establish its own Quality Control scheme and corrective actions

REFERENCE VALUES[4,5]

	25ºC	30ºC	37ºC
Men up to	22 U/L	29 U/L	40 U/L
Women up to	18 U/L	22 U/L	32 U/L

Normal new-borns have been reported to show a reference range of up to double the adult, attributed to the neonate's hepatocytes. These values decline to adult levels by approximately 3 months of age.
(These values are for orientation purpose).

It is suggested that each laboratory establish its own reference range.

CLINICAL SIGNIFICANCE

The ALT is a cellular enzyme, found in highest concentration in liver and kidney. High levels are observed in hepatic disease like hepatitis, diseases of muscles and traumatisms, its better application is in the diagnosis of the diseases of the liver.
When they are used in conjunction with ast aid in the diagnosis of infarcts in the myocardium, since the value of the alt stays within the normal limits in the presence of elevated levels of ast[1,4,5].
Clinical diagnosis should not be made on a single test result; it should integrate clinical and other laboratory data.

REAGENT PERFORMANCE

- *Measuring Range*:
  From detection limit of 0.000 U/L. to linearity limit of 400 U/L.
  If results obtained were greater than linearity limit, dilute the sample 1/10 with NaCl 9 g/L. and multiply result by 10.

Precision:	Intra-assay n= 20		Inter-assay n= 20	
Mean (U/L)	42.0	116	41.1	115
SD	0.47	0.42	0.76	1.61
CV (%)	1.11	0.36	1.85	1.40

- *Sensitivity:* 1 U/L = 0.00052 ΔA/min
- *Accuracy:* Results obtained GPL (x) reagents did not show systematic differences when compared with other commercial reagents (y).
  The results obtained using 100 samples were the following:
  Correlation coefficient $(r)^2$: 0.99597
  Regression Equation: y= 1,1209x + 1.390
  The results of the performance characteristics depend on the analyser used.

INTERFERING SUBSTANCES

- Anticoagulants currently in use like heparin, EDTA, oxalate and fluoride do not affect the results. Haemolysis interferes with the assay[1]
- A list of drugs and other interfering substances with AST determination has been reported [2,3].

NOTES

1. Use clean disposable pipette tips for its dispensation.
2. Formulation to reach constant:

$$\Delta A/\text{min} \times 1750^* = \text{U/L of ALT}$$

$$^* \frac{Tv \times 1000}{\varepsilon \times LP \times Sv}$$

Tv= Total Volume in mL
ε NAD= 6.22 at 340 nm
LP= Light path
Sv= Simple volume in mL

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