Lifechem™ SGPT (ALT) - LR

(MODIFIED IFCC – UV KINETIC METHOD)

CLINICAL SIGNIFICANCE :

Serum Glutamate Pyruvate Transaminase (SGPT), also called Alanine Aminotransferase (ALT), belongs to the Transferase class of enzymes. It is found to be distributed mainly in the liver and to a lesser extent in the kidney and muscles. In Hepatitis of different etiologies, SGPT is an important indicator not only in the diagnosis of the ailment but also in assessing the prognosis and progress of the disease. An elevated SGPT level is characteristic of Acute Hepatitis. It is useful to monitor liver function in cases of liver cirrhosis and in alcoholics.

In comparison to the colorimetric, End Point Method of Reitman & Frankel, the Modified IFCC Method is superior in terms of it's linearity, specificity, reproducibility and rapidity.

TEST PRINCIPLE:

SGPT catalyses the transfer of amino groups from L-Alanine to 2-Oxoglutarate. The rate of reaction is monitored using a coupling enzyme Lactate dehydrogenase (LDH), where by the Pyruvate formed is converted to Lactate in the presence of NADH. The Oxidation of NADH is measured by monitoring the decrease in absorbance at 340 nm.

$$\text{L-Alanine + 2-Oxoglutarate} \xrightleftharpoons{\text{SGPT}} \text{Pyruvate + L-Glutamate}$$

$$\text{Pyruvate + NADH + H}^{+} \xrightleftharpoons{\text{LDH}} \text{L-Lactate + NAD}^{+}$$

NORMAL RANGES:

MALE : Up to 40 IU/L at 37^{0}C

FEMALE : Up to 30 IU/L at 37^{0}C

The expected value should be used as a reference only and it is recommended that each laboratory should establish its own normal range.

KIT CONTENTS:	**Code No.**
	KPTL1 (1x50 ml)
Reagent 1. Enzyme Reagent (Ready to use single reagent)	50 ml

SPECIMEN:

a. Unhemolysed Serum / EDTA Plasma.

b. Blood samples may be collected any time, although morning samples are preferred.

Samples are stable for a week at 2-8^{0}C and for one month at –10^{0}C. Samples should be brought to room temperature prior to use.

WORKING REAGENT STABILITY :

The reagent is ready to use and are stable at 2-8^{o}c till the expiry date mentioned on the labels.

PROCEDURE:

Pre warm the required amount of SGPT reagent at 37^{0}C before use.

Pipette into test tubes as follows:

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Enzyme reagent	1.0 ml
Serum/ Plasma	0.1 mL

Mix thoroughly and transfer the assay mixture immediately to the thermostated cuvette and read the absorbance against distilled water at 340 nm as follows:

A_0 - Exactly after 1 minute

A_1, A_2, A_3 - Exactly after every 30 seconds for 1 minute 30 seconds.

CALCULATIONS:

Calculate the average change in absorbance per minute (Δ A/ min).

Activity of SGPT in IU/L

At 340 nm in IU/L = Δ A/ min x 1746 x tf

At 334 nm in IU/L = Δ A/ min x 1780 x tf

At 365 nm in IU/L = Δ A/ min x 3235 x tf

Temperature Conversion factor(tf):

Assay temperature	**Factor tf**
25^{0}C	1.82
30^{0}C	1.39
37^{0}C	1.00

QUALITY CONTROL:

It is recommended to include Assayed Quality control serum (Level I & II) with each assay batch to verify the performance of the procedure. Failure to obtain the proper range of values in the assay of control sera may indicate reagent deterioration, instrument malfunction or procedural errors.

SYSTEM PARAMETERS:

Reaction type (Mode)	: U.V Kinetic	Wave length	: 340 nm
Flow Cell Temp.	: 37^{0}C	Sample volume	: 100µL
Reagent volume	: 1000µL	Factor	: 1746
Delay Time	: 60 Sec	Kinetic interval	: 30 Sec
No. of Readings	: 4	Units	: IU/L
Low normal	: 0	High normal	: 40
Blank	: D. Water	Linearity	: 450
Abs. Minima	: 1.0	Abs. Maxima	: —
Reaction direction	: Decreasing		

NOTES:

1. Do not leave the unused reagent at Room Temperature when not in use. Take only the required amount of the reagent and keep the reagent back at 2-8^{0}C immediately.
2. The reagent and sample volumes may be altered proportionally to accommodate different spectrophotometer requirements.
3. If the change of absorbance is greater than 0.26 / min repeat the assay with diluted sample (diluted with saline) and remember to multiply the final result by the dilution factor.
4. Using hemolysed sample is strictly restricted and the same may interfere with the original result.
5. The SGPT reagent should not be used if the absorbance is less than 0.800 at 340 nm against distilled water.

LINEARITY: 450 IU/L

BIBLIOGRAPHY:

1. IFCC methods for the measurement of catalytic concentrations of enzymes(1986) ,J.Clin.Chem.Clin.Biochem) 24:481.
2. Bergmeyer ,H,U. *et al* (1978) Clin.Chem 24:58.
3. IFCC Expert Panel on enzymes, *et al* part 3, (1986) J.Clin.Chem. Clin.Biochem.; 24:481.

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