Lifechem™ CREATINE KINASE-NAC

(Mod.IFCC Method)

CLINICAL SIGNIFICANCE :

Creatine Kinase (CK) is an enzyme and its activity is highest in brain, heart muscle and skeletal muscle. It plays an important role in storing energy in the tissues. Elevated serum CK activity is of diagnostic importance in Myocardial infarction and muscular dystrophy.

Increased levels are also found in cerebro vascular diseases, pulmonary infarction, polymyositis, motor-neuron disorders. Elevated levels may also be due to intra muscular injections, strenuous exercise and recent surgeries.

TEST PRINCIPLE :

Creatine Kinase catalyses the reactions between creatine phosphate and ADP with formation of creatine and ATP. The ATP formed in presence of Glucose and Hexokinase (HK) gives ADP and glucose-6-phosphate. Glucose-6-phosphate, in presence of Glucose-6-phosphate dehydrogenase (G_6PDH) reacts with NADP forming 6-phosphogluconate and NADPH. The increase in absorbance due to the reduction of NADP to NADPH measured at 340 nm is proportional to the activity of CK in the sample. The presence of N-Acetylcysteine (NAC) in the reaction mixture allows the optimal activation of the enzyme.

$$\text{Creatine Phosphate} + \text{ADP} \xrightarrow{\text{Creatine Kinase (CK)}} \text{Creatine} + \text{ATP}$$

$$\text{ATP} + \text{Glucose} \xrightarrow{\text{Hexokinase (HK)}} \text{ADP} + \text{Glucose-6-phosphate}$$

$$\text{Glucose-6-phosphate} + NADP^{+} \xrightarrow{\text{G6PDH}} \text{6- phosphogluconate} + \text{NADPH} + H^{+}$$

NORMAL RANGE :

SERUM	MALES	FEMALES
	24 – 195 IU/L	24 – 170 IU/L

It is recommended that laboratories should establish their own normal range.

KIT CONTENTS :

	CODE No. KNA1 20 ml
1. REAGENT – A	2 ml
2. REAGENT – B	18 ml

SPECIMEN :

Un-hemolysed serum

REAGENT PREPARATION :

All the reagents are ready to use and are stable till the expiration date mentioned on the labels when stored at 2-8°C.
Mix 1 volume of Reagent **A** with 9 volumes of Reagent **B** according to the requirement.
0.1 ml (100µl) of Reagent **A** and 0.9 ml (900µl) of Reagent **B** are mixed for preparing 1 ml of working reagent.

WORKING REAGENT IS STABLE FOR 15 DAYS AT 2-8°C.
Reagent solution should be protected from light.
Do not freeze the reagents

PROCEDURE :

Allow the working reagent to reach room temperature before use.
Perform the assay as given below :

Working Reagent	1.0 ml
Serum Sample	0.020 ml (20µl)

Mix well and aspirate. Read the Initial absorbance after 1 minute. Repeat the absorbance readings exactly after 1, 2 and 3 minutes. Calculate the mean of Δ A / min.

CALCULATIONS :

CK conc. in IU / L = Δ A / min x 8095

QUALITY CONTROL :

It is recommended to include Assayed Quality Control Serum (Level 1 & 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 either reagent deterioration, instrument malfunction or procedural errors.

SYSTEM PARAMETERS :

Reaction Type	:	Kinetic
Wavelength	:	340 nm
Flow cell temperature	:	37°C
Blank	:	Distilled water
Factor	:	8095
Reaction slope	:	Increasing
Delay time	:	60 seconds
Measuring time	:	180 seconds
Reagent volume	:	1000 µl
Sample volume	:	20 µl
Units	:	IU / L
Low Normal	:	24
High Normal	:	195
Linearity	:	2000

NOTE :

1. Do not leave reagents at room temperature when not in use.
2. Use always new tips for working reagent preparation in order to avoid contamination of reagents.
3. No interference of Bilirubin upto 20 mg/dl and Hemoglobin upto 10 gm/L

LINEARITY :

Linearity of the kit is up to 2000 IU/L

BIBLIOGRAPHY

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