

ALBUMIN

(BCG METHOD)

Reagent kit for quantitative estimation of serum albumin.

BACKGROUND & SYNOPSIS

Albumin is the major plasma protein synthesized in liver. Major functions of albumin includes regulation and distribution of extracellular fluid. Albumin contributes to the plasma colloidal osmotic pressure, counteracting the effect of the capillary blood pressure which tends to force water into the tissues. Albumin acts as a transport agent for a wide variety of substances such as hormones, lipids, vitamins, calcium and trace metals.

Several procedures are currently available for the determination of albumin which includes dye binding. Due to simplicity, the BCG dye binding method is most commonly used.

CHEMPAK Albumin is based on modification of the Doumas method with an extended linearity.

PRINCIPLE:

In an acidic medium, albumin binds with bromocresol green causing a shift in the absorption spectra of the yellow BCG dye. The blue green colour formed is directly proportional to the albumin present when measured at 630 nm (600-650nm or with RED filter).

Albumin + BCG \longrightarrow BCG Albumin Complex.

DIAGNOSTIC SIGNIFICANCE:

An elevated serum albumin is noted under the following conditions.

- Dehydration
- Stasis during venipuncture which causes fluid to escape into the extravascular compartment.
- A low level of albumin is normally associated with overhydration.
- Excessive protein loss (mainly albumin) from kidney, skin (burns) or intestine (bleedings).
- Decreased synthesis due to infection, liver diseases or malabsorption.
- Increased catabolism (breakdown) occurring in fever, in untreated diabetes mellitus and in hyperthyroidism.

REAGENT COMPOSITION:

Active Ingredients	Concentration
Reagent-1	
* Bromocresol Green	< 1 mmol/L
* Detergent	10 mmol/L

pH 4.2 \pm 0.1 at 25°C

Albumin Standard (5 gm/dl)

Also contains non-reactive fillers and Stabilizers.

PRESENTATION:

	No. of Bottles 4x50ml
• ALBUMIN REAGENT (BCG REAGENT) (Ready for use) Store at room temperature	4
• ALBUMIN STANDARD, (5 gm/dL.) Store at 2 - 8°C SEPARATELY PROVIDED	1

REAGENT STORAGE AND STABILITY:

Albumin reagent is stable at room temperature until expiry date printed on the label.

The standard is stable at 2-8°C until the expiry date indicated on the label.

SPECIMEN COLLECTION:

Fasting, clear serum is preferred. Plasma may be used.

GENERAL PROCEDURE :

- Type of Reaction : End Point
- Wavelength : 630 nm.
- Flowcell Temperature : 30° C
- Incubation Time : 10 min. at R. T.
- Standard : 5 gm/dL.
- Sample Volume : 10 μ l (0.01 ml)
- Reagent Volume : 1.0 ml.
- Zero setting with : Reagent
- Light Path : 1.0 cm.

PROCEDURE:

	Procedure for					
	1.0 ml			2.5 ml		
ADD INTO TUBES	BLK	STD	TEST	BLK	STD	TEST
REAGENT (ml)	1.0	1.0	1.0	2.5	2.5	2.5
SAMPLE (ml)	-	-	0.01	-	-	0.01
STANDARD (ml)	-	0.01	-	-	0.01	-

Mix and allow to stand at room temperature (not less than 25°C) for ten minutes. Read absorbance of test and standard after ten minutes against reagent blank at 630 nm (600-650 nm or with RED filter).

STABILITY OF FINAL REACTION MIXTURE:

The colour of the final reaction mixture is stable for one hour.

TEST RESULTS:

$$\text{Albumin concentration (gms/dl)} = \frac{\text{Absorbance of test}}{\text{Absorbance of standard}} \times 5$$

Many times a ratio of Albumin to Globulin is considered. For getting the ratio, calculate globulin by using

Globulin = Serum Total Protein - Serum Albumin.

NORMAL VALUES:

Serum Albumin: 3.2 to 5.5 gms/dL.

LINEARITY:

The procedure is linear upto 6 gms/dl for 1 ml procedure and upto 10 gms/dL for 2.5 ml procedure.

REFERENCE:

- RODKEY F. L., Direct Spectrophotometric Determination of Albumin in Human Serum, Clinical Chemistry 11, 478-487 (1965).
- KAPLAN A., SZABO L.L., Clinical Chemistry; Interpretation and Techniques, 2nd Edition (1983) Lea & Febiger, Philadelphia, P-403.



