



## ALBUMIN

### Bromocresol green (BCG)

Quantitative determination of albumin  
For *In-Vitro* and professional use only  
Store at 2-8 °C

#### INTENDED USE

For the determination of Albumin concentration in human serum or plasma.

#### PRINCIPLE

The method is based on the specific binding of bromocresol green (BCG), an anionic dye, and the protein at acid pH produce a color change of the indicator from yellow –green to green –blue with the resulting shift in the absorption wavelength of the complex. The intensity of the color formed is proportional to the concentration of albumin in the sample.

BCG + Albumin  $\xrightarrow{\text{PH 4.3}}$  BCG-albumin complex

#### CLINICAL SIGNIFICANCE

One of the most important serum proteins produced in the liver is albumin.

This molecule has an extraordinarily wide range of functions, including nutrition, maintenance of oncotic pressure and transport of Ca<sup>++</sup>, bilirubin, free fatty acid, drugs and steroids .

Variation in albumin levels indicate liver diseases, malnutrition, skin lesions such as dermatitis and burns or dehydration.

Clinical diagnosis should not be made on a single test result ; it should integrate clinical and other laboratory data.

#### MATERIALS PROVIDED

1. Bromocresol green PH 4.2 (0.12mmol/L) reagent .
2. Albumin standard. Albumin aqueous primary standard 5g/dL.

#### MATERIALS REQUIRED BUT NOT PROVIDED

- Spectrophotometer or colorimeter capable of measuring absorbance at 630 nm.
- Matched cuvettes 1.0 cm light path.
- General laboratory equipment.

#### STORAGE AND STABILITY

- Store at 2-8 °C.
- The Reagents are stable until the expiry date on the label.
- Protected the reagent from light.
- **Signs of reagent deterioration :**  
Presence of particales and turbidity.  
Blank absorbance (A) at 630 nm  $\geq 0.40$ .

#### REAGENT PREPARATION

The Reagent and Standard are ready to use.

#### SAMPLES

- Serum or EDTA plasma.
- Albumin in serum and plasma is stable for 2 weeks at 2-8 °C, and for up to 4 months at –20°C.

#### INTERFERENCES

- Heparin interferes with this dye binding method.
- Specimens containing dextran should be avoided.
- Lipemic samples (triglycerides > 10 g/L), require a blank correction. Use the same volume of sample with isotonic saline in the place of the reagent.
- Hyperbilirubinemia or hemolysis does not affect the assay since the absorption maximum of the complex absorbs at a wavelength distinct from those at which bilirubin and hemoglobin interfere.

#### PROCEDURE

1. Assay conditions :  
Wavelength .....630 nm(600-650)  
Cuvette .....1 cm light path  
Temperature .....15-25 °C
2. adjust the instrument to zero with distilled water.
3. Pipette into a cuvette :

TUBES	Blank	Sample	Standard
Reagent	1.0 mL	1.0 mL	1.0 mL

Sample	-	5 µL	-
Standard	-	-	5 µL

4. Mix and incubate for 10 minutes at room temperature (15-25°C).
5. Read the absorbance (A) of the samples and standard, against the blank.  
The color is stable for 60 minutes at room temperature.

#### CALCULATIONS

( A) Sample  
\_\_\_\_\_ X 5 ( Standard conc) = g/dL albumin  
(A) Standard

In the sample

**Conversion factor: g/dl X 144.9 = µmol/L**

#### NOTE

Samples with concentrations higher than 8 g/L should be diluted 1:2 with saline and assayed again. Multiply the results by 2.

If results are to be expressed as SI units apply:

g/dL x 10 = g/L

#### REFERENCE VALUES

3.5 to 5.0 g/dl

These values are for orientation purpose; each laboratory should establish its own reference range.

#### PERFORMANCE CHARACTERISTICS

##### Measuring range:

from detection limit of 0.04 g/dl to linearity limit of 6 g/dL.  
If the results obtained were greater than linearity limit ,  
dilute the sample 1/2 with 9 NaCl g/L and multiply the result by 2.

##### Precision

	Intra-assay (n=20)		Inter-assay (n=20)	
Mean (g/dL)	3.38	5.80	3.30	5.67
SD	0.02	0.03	0.26	0.04
CV (%)	0.52	0.49	0.78	0.69

### **Sensitivity**

1g/dL = 0.126 A

### **Accuracy**

Results obtained using Atlas reagent (Y) did not show systemic differences when compared with other commercial reagents (X).

The results obtained using 50 samples were the following :

Correlation coefficient (r) : 0.99.

Regression equation:  $y=0.98x + 0.09$

The results of the performance characteristics depend on the analyzer used.

### **REFERENCES**

1. Dumas, B.T., Watson, W.A. and Biggs, H.G. Clin. Chim. Acta. 31 : 87 (1971).
2. Bonvicini, P., Ceriotti, G., Plebani, M. and Volpe, G. Clin. Chem. 25 : 1459 (1979).
3. Tietz, N.W. Fundamentals of Clinical Chemistry, p. 940. W.B. Saunders Co. Philadelphia, PA. (1987).
4. Wolf, R.L. Methods and Techniques in Clinical Chemistry, Willey, Interscience, N.Y. (1972).

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