

ALBUMIN 

CONTENTS			
REF	1101000	Albumin	2 x 50 mL
	1101010	Albumin	4 x 100 mL
For <i>in vitro</i> diagnostic use only			

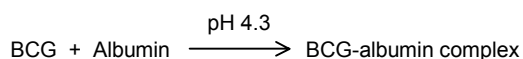
ALBUMIN

Colorimetric method

ENDPOINT

PRINCIPLE


The method¹ is based on the specific binding of bromocresol green (BCG), an anionic dye, and the protein at acid pH 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.

**REAGENT COMPOSITION**

R1 **Bromocresol reagent.** Succinate buffer 75 mmol/L pH 4.2, BCG 0.12 mmol/L, tensioactive 2 g/L (w/v).

CAL **Albumin standard.** Bovine serum albumin 5 g/dL (50 g/L) Secondary standard traceable to SRM 927b.

STORAGE AND STABILITY

 Store at 2-8°C.
The Reagents are stable until the expiry date stated on the label.

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.²
- 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.³

MATERIALS REQUIRED

- Photometer or colorimeter capable of measuring absorbance at 630 ± 20 nm.
- Pipettes to measure reagent and samples.
- Timer. This is not necessary if the assay is performed in an automated instrument.

PROCEDURE

1. Bring reagents and samples to room temperature.
2. Pipette into labelled tubes:

TUBES	Blank	Sample	Standard
Reagent	2.0 mL	2.0 mL	2.0 mL
Sample	-	10 µL	-
Standard	-	-	10 µL

3. Mix and let stand the tubes 10 minutes at room temperature.
4. Read the absorbance (A) of the samples and the standard at 630 nm against the reagent blank.

The color is stable for 30 minutes protected from light.

CALCULATIONS

$$\frac{A_{\text{Sample}}}{A_{\text{Standard}}} \times C_{\text{Standard}} = \text{g/dL albumin}$$

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 VALUES¹

Serum, plasma

Adults	3.81-4.65 g/dL (38.1-46.5 g/L)
--------	--------------------------------

The range of values for hospitalized individuals varies between 1.4 and 4.8 g/dL.

It is recommended that each laboratory establishes its own reference range.

QUALITY CONTROL

The use of a standard to calculate results allows to obtain an accuracy independent of the system or instrument used.

To ensure adequate quality control (QC), each run should include a set of controls (normal and abnormal) with assayed values handled as unknowns.

REF 1980005 HUMAN MULTISERA NORMAL
Borderline level of albumin. Assayed.

REF 1985005 HUMAN MULTISERA ABNORMAL
Elevated level of albumin. Assayed.

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, Wiley, Interscience, N.Y. (1972).

CLINICAL SIGNIFICANCE⁴

The serum content of the soluble proteins, those circulating in extracellular and intracellular fluids, has been used as a marker to aid in clinical diagnosis. The main diagnostic tests are those measuring serum total protein and serum albumin.

Collectively, serum total protein including albumin is mainly involved in the maintenance of normal water distribution between tissues and the blood and responsible for maintaining the oncotic pressure of plasma and is used to transport many substances including macromolecules.

Hiperproteinemia o hiperalbuminemia, usually occurs during multiple mieloma caused by high levels of the monoclonal immunoglobulins, dehydration, excessive water loss, as in severe vomiting, diarrhea, Addison's disease or diabetic acidosis. The *hemoconcentration*, decrease in the volume of plasma water, is reflected as a relative hyperproteinemia since concentration of all the individual plasma proteins are increased to the same degree.

Hypoproteinemia o hypoalbuminemia usually occurs in edema, malnutrition, nephrotic syndrome, malabsorption and severe liver cirrhosis. Since albumin is present in such high concentration low levels of this protein alone may also cause hypoproteinemia.

ANALYTICAL PERFORMANCE

- **Linearity.** Up to 7.0 g/dL

- **Precision**

g/dL	Within-run			Between-run		
	Mean	SD	CV%	Mean	SD	CV%
3.7	0.02	0.80	10	3.7	0.03	0.80
5.1	0.02	0.39	10	5.1	0.05	0.98
6.9	0.05	0.70	10	7.0	0.07	0.75
N	10	10	10	10	10	10

Replicates: 10 for each level.

Replicates: 10 for each level

Instrument: CECIL CE 2021

for 8 days.

- **Sensitivity.** Using a 1:200 sample/reagent at 630 nm, 1 g of albumin will produce a net absorbance of approximately 0.1865.

- **Correlation.** This assay (y) was compared with a similar commercial method (x). The results were:

N = 40 r = 0.994 y = 1.035 + 1.040

B1101-1/0312
R1.ing