



ALBUMIN



Colorimetric determination with green bromocresol (BCG) of Albumin in serum and plasma



ORDER INFORMATION

REF	Kit size
GA4201 00	10x50 ml
KL2012 00	8x20 ml
BK2012 00	2x60 ml

INDICATION

Albumin concentration is an index of liver synthetic activity. While its increase is typically caused by a hemoconcentration (in vivo for dehydration, in vitro for sample evaporation or protracted stasis by tourniquet), causes of hypoalbuminemia are numerous: proteins loss (nephritic syndrome, burn, proteins-dispersing enteropathy), increased turnover (catabolic state, glucocorticoids), decreased protein uptake (malnutrition, low protein diets) and, liver disease. In particular, in chronic hepatitis its decrease is proportional to the progression to cirrhosis, representing a maker of prognosis and metabolic decompensation. Plasmatic concentration is lower in newborn (2.4-4.4 g/dl). Within the first week values of the adults are reached (3.5-5 g/dl); then its production increases up to 4.5-5.4 g/dl at an age of six years and remains unchanged during adolescence. No significant difference is found among male and female.

METHOD PRINCIPLE

In citrate buffer albumin forms with green bromocresol (BCG) a coloured compound with a colour intensity proportional to the albumin concentration present in the sample.

COMPOSITION

REAGENT A (liquid):

Citrate buffer	7.5 mmol/l
BCG	≥ 150 µmol/l
Sodium azide	0.05%

STANDARD (liquid):

Albumin	4 g/dl
Sodium azide	0.05%

Verified against NIST reference standard.

Storage and stability

Store at 15-25 °C.
Reagents are stable until the expiry date stated on the labels, if contamination and evaporation are avoided, protected from light. The above conditions are valid if the vials are opened just only for the time to take the reagent, closed immediately with their cap and stored at the indicated conservation temperature.

ANCILLARY EQUIPMENT

- Automatic pipettes
- Photometer
- Analysis cuvettes (optical path = 1 cm)
- NaCl solution 9 g/l

SAMPLES

Serum or plasma (heparin or EDTA).
Stable one month at 2-8 °C, or one week at 15-25 °C.

Specimen collection / Preanalytical factors

It is recommended that specimen collection should be carried out in accordance with NCCLS Document H11-A3.

INTERNAL QUALITY CONTROL

It is recommended to use commercial Quality Control sera with known Albumin concentration to check the correspondence of the obtained results with those expected and validate the data.

ANALYTICAL PROCEDURE

Allow the reagents to reach working temperature before using.

Pipette into disposable or well clean cuvettes :

	Blank	Standard	Sample
Reagent A	1000 µl	1000 µl	1000 µl
Standard	-	5 µl	-
Sample	-	-	5 µl

Mix and incubate for **5 minutes** at **room temperature** (20-25 °C). Read the absorbance (A) of the standard and samples at **546 (520-570) nm** against blank.
Colour is stable for 60 minutes.

Note:

Reaction volumes can be proportionally modified.

CALCULATION OF RESULTS

Utilize the following formula:

$$\text{Albumin, g/dl} = \frac{A_{\text{sample}}}{A_{\text{standard}}} \times 4$$

Values in g/dl can be modified to obtain g/l multiplying the results x 10.

REFERENCE VALUES

3.5 ÷ 5 g/dl

Each laboratory should establish reference ranges for its own patients population.

ANALYTICAL PERFORMANCES

Precision

Within-run and between-run coefficients of variation have been calculated on replicates of three samples at different Albumin concentrations. The obtained results are reported in the following table:

Sample	Mean (g/dl)	Within Run		Between Run	
		SD	%CV	SD	%CV
Serum 1	4.6	0.03	0.7	0.14	3.0
Serum 2	4.0	0.02	0.5	0.14	3.5
Serum 3	3.3	0.02	0.6	0.10	3.0

Linearity

The assay is linear up to 7 g/dl.

Sensitivity

Test sensitivity of the method, in terms of limit of detection, is 0.2 g/dl.

Correlation

A correlation study comparing the present method with a commercial one gave the following results:

$$y = 0.624x + 1.616 \text{ g/dl} \quad r = 0.9691$$

Interferences

In case of clear haemolysis or lipemia it is recommended the execution of a blank sample: mix 1 ml of physiological and 10 µl of sample, read absorbance against distilled water and subtract it to the absorbance value measured in the test.

Hemoglobin up to 20 mg/dl doesn't interfere.

PRECAUTIONS IN USE

The reagents contain inactive components such as preservatives (Sodium azide or others), surfactants etc. The total concentration of these components is lower than the limits reported by 67/548/EEC and 88/379/EEC directives about classification, packaging and labelling of dangerous substances. However, the reagents should be handled with caution, avoiding swallowing and contact with skin, eyes and mucous membranes. The use of laboratory reagents according to good laboratory practice is recommended.

Waste Management

Please refer to local legal requirements.

REFERENCES

1. PANTEGHINI M., "Interpretazione degli esami di laboratorio" pp. 179-180 Piccin (2008)
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4. NCCLS Document, "Procedures for the collection of arterial blood specimens", Appr. Std., 3rd Ed. (1999).
5. EU-Dir 1999/11 Commission Directive of 8 March 1999 adapting to technical progress the principles of good laboratory practice as specified in Council Directive 87/18/EEC