



Determination of serum protein fractions

INTRODUCTION

The method allows determination of relative amounts of albumin and globulins in human serum using capillary electrophoresis methods.

MEASUREMENT METHOD

Determination of albumin and globulins of the human serum is based on their migration and separation in the electric field due to different electrophoretic mobility. Identification and quantitative determination of the analysed proteins is performed by direct detection by measuring the UV absorption at 215 nm wavelength.



REFERENCE VALUES OF PROTEIN FRACTIONS DISTRIBUTION IN BLOOD SERUM

Fraction	Percent of total protein content, %
γ -globulin (γ -G1)	10.7–19.2
β -globulin (β -G1)	8.6–13.7
α_2 -globulin (α_2 -G1)	5.2–10.7
α_1 -globulin (α_1 -G1)	3.7–7.8
Albumin (Alb)	54.7–68.7

EQUIPMENT AND REAGENTS

The Capel capillary electrophoresis system is used in measurements. Data acquisition, collection, processing, and output are performed using a personal computer running under Windows® operating system with Elforun software installed. All reagents must be of analytical grade or better.

ADVANTAGES OF CAPILLARY ELECTROPHORESIS METHOD

Compared with other methods for determination of serum proteins using electrophoresis and acetate cellulose and agarose gels, capillary electrophoresis has several advantages:

- no special sample preparation;
- real-time detection;
- easy to make;
- quantitative determination;
- low analysis cost.

EXAMPLE OF A REAL ANALYSIS

BGE: borate (pH 9.2), with SDS

Capillary: $L_{\text{eff}}/L_{\text{tot}}$ 50/60 cm, ID 75 μm

Injection: 150 mbar \times s

Voltage: 15 kV

Detection: 215 nm, direct

Sample: human serum (normal)

