TOTAL PROTEIN

PRINCIPLE OF THE METHOD

Proteins give an intensive violet-blue complex with copper salts in an alkaline medium. Iodide is included as an antioxidant. The intensity of the color formed is proportional to the total protein concentration in the sample.

CLINICAL SIGNIFICANCE

The proteins are macromolecular organic compounds, widely distributed in the organism. They act like structural and transport elements. The proteins of the serum are divide in two fractions, albumin and globulins. The determination of total proteins is useful in the detection of:
- High protein levels caused by hemodilution by an impaired synthesis or loss (as by hemorrhage) or excessive protein catabolism.
- Low protein level caused by hemodilution by an impaired synthesis or loss (as by hemorrhage) or excessive protein catabolism.

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

REAGENTS

<table>
<thead>
<tr>
<th>R</th>
<th>Biuret</th>
<th>T PROTEIN CAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium potassium tartrate</td>
<td>15 mmol/L</td>
<td>Bovine albumin primary standard 7 g/dL</td>
</tr>
<tr>
<td>Sodium iodide</td>
<td>100 mmol/L</td>
<td></td>
</tr>
<tr>
<td>Potassium iodide</td>
<td>5 mmol/L</td>
<td></td>
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<tr>
<td>Copper (II) sulphate</td>
<td>19 mmol/L</td>
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</tbody>
</table>

PRECAUTIONS

Copper (II) sulphate: Environmentally dangerous (N); RS52/53: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S60: This material and its container must be disposed of as hazardous waste.

S61: Avoid release to the environment. Refer to special instructions/safety data sheets.

PREPARATION

The reagents are ready to use.

STORAGE AND STABILITY

All the components of the kit are stable until the expiration date on the label when stored tightly up to 1 month at refrigerator (2-8°C). The reagents are ready to use.

T PROTEIN CAL: Once open is stable up to 1 month when stored tightly closed at 2-8°C, protected from light and contaminations prevented during their use.

Signs of reagent deterioration:
- Presence of particles and turbidity.
- Blank absorbance (A) at 540 nm ≤ 0.22.

ADDITIONAL EQUIPMENT

- Spectrophotometer or colorimeter measuring at 540 nm.
- Matched cuvettes 1.0 cm light path.
- General laboratory equipment.

SAMPLES

Serum or heparinized plasma:
- Stability of the sample: 1 month at refrigerator (2-8°C).

PROCEDURE

1. Assay conditions:
   - Wavelength: 540 (530-550) nm
   - Cuvette: 1.0 cm light path
   - Temperature: 37°C / 15-25°C

2. Adjust the instrument to zero with distilled water.

3. Pipette into a cuvette:

4. Mix and incubate 5 min at 37°C or 10 min at room temperature.

5. Read the absorbance (A) of the samples and Standard, against the Blank. The colour is stable for at least 30 minutes.

CALCULATIONS

\[
\text{Total Protein (g/dL)} = \frac{\text{Sample absorbance}}{\text{Blank absorbance}} \times \text{Standard conc.} \times 7
\]

QUALITY CONTROL

Control sera are recommended to monitor the performance of assay procedures. Each laboratory should establish its own Quality Control scheme and corrective actions if controls do not meet the acceptable tolerances.

REFERENCE VALUES:

Adults: 6.6 – 8.3 g/dL

Newborn: 5.2 – 9.1 g/dL

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

PERFORMANCE CHARACTERISTICS

Measuring range: From detection limit of 0.20 g/dL to linearity limit of 15 g/dL.