INTENDED USE: For the quantitative determination of Sodium and Potassium levels in serum or plasma.

CLINICAL SIGNIFICANCE:
Sodium is the major cation of extracellular fluid. It plays a central role in the maintenance of the normal distribution of water and the osmotic pressure in the various fluid compartments. The main source of body sodium is sodium chloride contained in ingested foods. Only about one-third of the total body’s sodium is contained in the skeleton since most of it is contained in the extracellular body fluids.

Hypernatremia (low serum sodium level) is found in a variety of conditions including the following: severe polyuria, metabolic acidosis, Addison’s disease, diarrhea, and renal tubular disease.

Sodium and serum proteins:
Potassium is the principle cation of the intracellular fluid. It is also an important constituent of the extracellular fluid due to its influence on muscle activity. Its intracellular function parallels that of its extracellular function, namely influencing acid-base balance and osmotic pressure, including water retention.

Elevated potassium levels, hyperkalemia, are often associated with renal failure, dehydration shock or adrenal insufficiency. Decreased potassium levels, hypokalemia, are associated with malnutrition, negative nitrogen balance, gastrointestinal fluid losses and hyperactivity of the adrenal cortex.

PRINCIPLE:
The sodium and the protein in the serum are precipitated with magnesium uranyl acetate. After separation by centrifugation the excess of uranyl ions in the supernatant react with potassium ferricyanide forming a colored complex which absorbance varies inversely to the concentration of potassium in the sample.

Sodium and Potassium ions in a protein free alkaline medium react with potassium ferricyanide forming a colored complex which absorbance varies inversely to the concentration of potassium in the sample.

QUALITY CONTROL: To ensure adequate quality control, the use of commercial reference control serum is recommended with each assay batch.

PRECISION: Precision studies were performed with two controls using NCCLS protocol EPS-A. The results of the precision studies are shown below:

POTASSIUM ASSAY

Mix well and allow it to stand at room temperature for 5 minutes. Then measure the absorbance of Blank (B), standard (S), and Test (T) on a spectrophotometer at 530nm (S05 – 530 nm) within 10 minutes.

**CAUTIONS:**
Sodium in mmol/L = Abs of B - Abs of T x 150
Potassium in mmol/L = Abs of B - Abs of S

**Abs. T**

Mix well and Incubate for 5 minutes at RT. Read absorbance of the Standard (Abs.S) and Test Sample (Abs.T) against Distilled water at 620 nm.

**CALCULATIONS:**

<table>
<thead>
<tr>
<th>System Parameters</th>
<th>SODIUM</th>
<th>POTASSIUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reaction Type/Mode</td>
<td>End Point</td>
<td>End Point</td>
</tr>
<tr>
<td>Wave Length</td>
<td>530 nm (505-530)</td>
<td>620 (610 – 630)</td>
</tr>
<tr>
<td>Flow Cell Temp.</td>
<td>37°C</td>
<td>37°C</td>
</tr>
</tbody>
</table>

**LINEARITY:**
The procedure is linear upto 150 mmol/L for Sodium and 5 mmol/L for Potassium.

**REFERENCE:**