Chloride Fluid Monoreagent

**IN VITRO TEST FOR THE QUANTITATIVE DETERMINATION OF CHLORIDE IN HUMAN SERUM, PLASMA AND URINE BY THIOCYANATE METHOD**

**CALIBRATION**
Chloride standard (100 mmol/l) 5ml 88 19 21

**QUALITY CONTROL**
Control Serum N 6x5ml 88 41 48B
Control Serum P 6x5ml 88 46 85B

The control intervals and limits must be adapted to the individual laboratory and country-specific requirements. Values obtained should fall within established limits. Each laboratory should establish corrective measures to be taken if values fall outside the limits.

**SUMMARY**
Chloride is the most abundant extracellular anion. Together with sodium chloride it is responsible for the maintenance of osmotic pressure, the anion-cation balance and therefore of the water distribution in the extracellular fluid compartment. Decreased plasma Cl−-concentrations (hypochloremia) can result from salt-losing nephritis, persistent gastric secretion, prolongation of vomiting and metabolic acidosis that are caused by increased production or reduced secretion of organic acids. Increased plasma Cl−-concentrations (hyperchloremia) occur with dehydration, renal tubular acidosis, acute renal failure, in adrenocortical hyperfunction, salicylate intoxication and metabolic acidosis associated with prolonged diarrhoea and loss of sodium bicarbonate. Chloride is often analyzed in combination with sodium and potassium to determine the anion gap in serum and/or urine. The anion gap is useful in the initial evaluation of hyperchloremic metabolic acidosis. Due to the different reactivity equivalents of chloride and bromide the thiocyanate method is less disturbed by the presence of bromide than measurement with an ion-selective electrode.

**TEST PRINCIPLE**
Chloride ions and Hg II – thiocyanate form thiocyanate ions in acidic medium. These ions react with HNO3 and Fe III – ions and effect a red colour. The increasing extinction is directly proportional to the concentration of chloride ions.

2 Cl− + Hg(SCN)2 → HgCl2 + 2SCN−

2SCN− + Fe3+ → Fe(SCN)2+

**NOTES**
For in vitro diagnostic use. Exercice the normal precautions required for all laboratory reagents. Contains mercuric thiocyanate. Toxic, harmful if inhaled or absorbed through skin. Consider local disposal regulations.

**LIMITATIONS - INTERFERENCE**
Criterion: Recovery within ±10% of initial value.

- Icterus: No significant interference up to a bilirubin concentration of 30 mg/dl.
- Hemolysis: No significant interference up to a haemoglobin concentration of 1000 mg/dl.
- Lipemia (Intralipid): No significant interference up to a triglyceride concentration of 400 mg/dl.

**MEASURING/REPORTABLE RANGE**
As mentioned before urine has to be diluted threefold with aqua dist. If measured values exceed the linear range from 1 – 130 mmol/l dilute the sample 1+1 with the identical volume aqua dest. and multiply the result by a factor of 2.

**EXPECTED VALUES**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Mean mg/dl</th>
<th>SD mg/dl</th>
<th>CV %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample 1</td>
<td>102.04</td>
<td>0.80</td>
<td>0.78</td>
</tr>
<tr>
<td>Sample 2</td>
<td>104.15</td>
<td>0.75</td>
<td>0.66</td>
</tr>
<tr>
<td>Sample 3</td>
<td>113.15</td>
<td>0.75</td>
<td>0.72</td>
</tr>
</tbody>
</table>

**PREPARATION AND STABILITY**
All reagents are ready to use. Protect from direct sunlight. Stable up to the expiry date when stored at +2°C to +8°C.

**SPECIMEN**
- Serum: Separate serum from the clot and cells within 45 min.
- Urine: Urine has to be diluted 1+2 with distilled water. Multiply result by 3. Centrifuge samples containing precipitate before performing the assay.

**TESTING PROCEDURE**
- Working solutions as described above
- Additional materials required
- Calibrators and controls as indicated below
- 0.9% NaCl
**Manual procedure:**

Wavelength: Hg 492 nm (460 – 500 nm)  
Temperature: +25°C / +30°C / +37°C  
Cuvette: 1cm light path  
Zero adjustment: against reagent blank

<table>
<thead>
<tr>
<th>Working reagent</th>
<th>Standard / Calibrator</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000 µl</td>
<td>1000 µl</td>
<td>1000 µl</td>
</tr>
</tbody>
</table>

Mix and after 5 minutes read absorbance of sample and standard against reagent blank. Determine the absorbance change as:

ΔA sample = (A sample – A blank)  
ΔA standard = (A standard – A blank)  
and use this for the calculation.

**Calculation:**

\[
\text{Chloride concentration (mmol/l)} = \frac{\Delta A \text{ sample} \times \text{standard conc.}}{\Delta A \text{ standard}}
\]

Chloride concentration is calculated using the Chloride concentration is calculated using the supplied standard (100 mmol/l = 354.6 mg/dl). Linearity is up to 130 mmol/l (462 mg/dl)

**DISPOSAL**

Please note the legal regulations.

**LITERATURE**