



## Chloride Fluid Monoreagent

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

REF	88 72 72	2x100ml
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### CALIBRATION

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

### QUALITY CONTROL

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

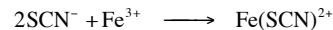
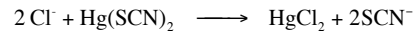
The control intervals and limits must be adapted to the individual laboratory and country-specific requirements. Values obtained should fall within established limits. Each laboratory should establish corrective measures to be taken if values fall outside the limits.

### SUMMARY

Chloride is the most abundant extracellular anion. Together with sodium chloride 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<sup>-</sup>-concentrations (hypochloremia) can result from salt-losing nephritis, persistent gastric secretion, prolonged vomiting and metabolic acidosis that are caused by increased production or reduced secretion of organic acids. Increased plasma Cl<sup>-</sup>-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 urinary 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 HNO<sub>3</sub> and FE III – ions and effect a red colour. The increasing extinction is directly proportional to the concentration of chloride ions.



### NOTES

For in vitro diagnostic use.  
Exercise 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

Serum: 97 – 108 mmol/l  
Urine : 24 h urine 95 – 240 mmol/24h  
          morning urine 54 – 158 mmol/l

Conversion between conventional and SI units: 1 mEq/l = 1 mmol/l

Conversion between mmol/ and mg/dl: mmol/l = 0.282 x mg/dl

Each laboratory should investigate the transferability of the expected values to its own patient population and if necessary determine its own reference range.

For diagnostic purposes the chloride results should always be assayed in conjunction with the patient's medical history, clinical examinations and other findings.

### IMPRECISION

Reproducibility was determined using samples in an internal protocol. The following results were obtained.

Within run			
Sample	Mean mg/gl	SD mg/dl	CV %
Sample 1	102.04	0.80	0.78
Sample 2	104.15	0.75	0.66
Sample 3	113.15	0.75	0.72

Between run			
Sample	Mean mg/gl	SD mg/dl	CV %
Sample 1	101.32	1.28	1.26
Sample 2	103.03	1.13	1.10
Sample 3	105.83	1.43	1.35

### REAGENT CONCENTRATION

#### R1:

Hg – II - thiocyanate 2 mmol/l  
Fe – III - nitrate 30 mmol/l  
HNO<sub>3</sub> 40 mmol/l

### 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

<b>Manual procedure:</b>			
Wavelength	Hg 492 nm (460 – 500 nm)		
Temperature	+25°C / +30°C / +37°C		
Cuvette	1cm light path		
Zero adjustment	against reagent blank		
	<i>blank</i>	<i>Standard / Calibrator</i>	<i>Sample</i>
<i>Working reagent</i>	1000 µl	1000 µl	1000 µl
<i>Standard</i>	---	10 µl	---
<i>Sample</i>	---	---	10 µl
Mix and after 5 minutes read absorbance of sample and standard against reagent blank. Determine the absorbance change as $\Delta A \text{ sample} = (A \text{ sample} - A \text{ blank})$ $\Delta A \text{ standard} = (A \text{ standard} - A \text{ blank})$ and use this for the calculation.			
<b>Calculation:</b>			
$\frac{\Delta A \text{ sample}}{\Delta A \text{ standard}} \times \text{standard conc.} = \text{Chloride conc. (mmol/l)}$			
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)			

Temperature permanency throughout the measurement is extremely important!

#### DISPOSAL

Please note the legal regulations.

#### LITERATURE

1. Bablok W. et al. A General Regression Procedure for Method Transformation. J Clin Chem Clin Biochem 1988;26:783-790.
2. Batlle DC. et al. The use of the urinary anion gap in the diagnosis of hyperchloremic metabolic acidosis. N Engl J Med 1988, 318:594-599.
3. Krieg M. et al. Comparative quantitative clinico-chemical analysis of the characteristics of 24-hour urine and morning urine (in German). J Clin Chem Clin Biochem 1986, 24:863.
4. Passing H., Bablok W. A New Biometrical Procedure for Testing the Equality of Measurements from Two Different Analytical Methods. J Clin Chem Clin Biochem 1983;21:709-720.
5. Schönfeld, RG. Lewellen, CJ. A colorimetric method for determination of serum chloride. Clin Chem., 10, 533 (1964)
6. Tietz N.W. Clinical Guide to Laboratory Tests, 3rd Philadelphia: W.B. Saunders Company, 1995:516-519.

### AXIOM Product range Clinical Chemistry

Enzymes	Ions	Other Metabolites
Acid Phosphatase	Ammonium fluid	Bilirubin T/D
Alkaline Phosphatase	Copper fluid	Creatinine fluid
α-Amylase direct	Calcium fluid	Glucose GOD-PAP fluid
CK-NAC actived	Chloride fluid	Glucose Hexokinase fluid
CK-MB (NAC- actived)	Inorganic Phosphorus UV fluid	Urea Enzymatic fluid
γ-GT fluid	Iron fluid	Urea UV fluid
LDH fluid	TIBC	Uric Acid PAP fluid
Cholinesterase	Magnesium fluid	
GOT/ASAT fluid	Potassium fluid	
GPT/ALAT fluid	Sodium fluid	<b>Controls</b>
Lipase UV fluid		Control Serum N
Lactate PAP		Control Serum P
α-HBDH	<b>Proteins</b>	
	Albumin	
<b>Lipids</b>	CSF-Protein fluid	
Cholesterol fluid	Microprotein fluid	
HDL Cholesterol	Hemoglobin	
LDL Cholesterol	Protein Total fluid	
Triglycerides fluid		