

## Chloride Single Reagent

REF: 233 001 (2 x 25ml) 50 test  
REF: ZL-233 001 50 test

### Intended Use

Spectrum Chloride reagent is intended for the in-vitro quantitative diagnostic estimation of Chloride in human serum and urine.

### Background

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.

### Method

Colorimetric method.

### Assay Principle

The chloride ion displaces thiocyanate from non-ionized mercuric thiocyanate to form Mercuric chloride and thiocyanate ions. The released thiocyanate ions react with ferric ions to form a color complex that absorbs light at 480 nm. The intensity of the color produced is directly proportional to the chloride concentration.

### Reagents

<b>Reagent (R)</b>	
Hg II - thiocyanate	2 mmol/l
Fe III - nitrate	30 mmol/l
HNO <sub>3</sub>	40 mmol/l

<b>Standard (S)</b>	
Chloride	100 mmol/l (354.6 mg/dl)











### Precautions and Warnings

The reagent contains mercuric thiocyanate which is toxic and harmful if inhaled or absorbed through skin. Do not ingest or inhale. In case of contact with eyes or skin; rinse immediately with plenty of soap and water. In case of severe injuries; seek medical advice immediately.

### Reagent Storage and Stability

Reagents and standard are ready-to-use. When stored at 2 – 8 °C; they are stable up to the expiry date stated on the label. Once opened, the reagent and standard are stable for 2 months at the specified temperature.

### SYMBOLS IN PRODUCT LABELLING

	Authorised Representative		Use by/Expiration Date
	For in-vitro diagnostic use		CAUTION. Consult instructions for use
	Batch Code/Lot number		Manufactured by
	Catalogue Number		(Xi) - Irritant
	Consult instructions for use		Temperature Limitation

### Sample

#### Serum

Freshly drawn non hemolysed serum is the specimen of choice. Chloride in serum is stable for 7 days at 2-8°C.

#### Urine

Urine has to be diluted 1+2 with distilled water. Multiply result by 3.

### System Parameters

Wavelength	492 nm (460 - 500 nm)
Optical path	1 cm
Assay type	colorimetric end-point
Direction	Increase
Sample: Reagent Ratio	1:100
e.g.: Reagent volume	1 ml
Sample volume	10 µl
Temperature	25 °C, 30 °C, 37 °C
Zero adjustment	Against reagent blank
Linearity	130 mmol/l (462 mg/dl)
Incubation	5 min.

### Procedure

#### Pipette into clean test tubes:

	Blank	Standard	Sample
Reagent (R)	1 ml	1 ml	1 ml
Standard	.....	10 µl	.....
Sample	.....	.....	10 µl

Mix well, let stand for 5 minutes, then read absorbances. A standard and A sample against Reagent Blank at 492 nm.

### Calculation

$$\text{Serum Chloride Conc. (mmol/l)} = \frac{\Delta A_{\text{Sample}}}{\Delta A_{\text{Standard}}} \times 100$$

### 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/l and mg/dl: mmol/l = 0.282 x mg/dl

#### Note:

It is recommended for each laboratory to establish and maintain its own reference values. The given data are only an indication.

***Spectrum Diagnostics does not interpret the results of a clinical laboratory procedure; interpretation of the results is considered the responsibility of qualified medical personnel. All indications of clinical significance are supported by literature references.***

## Performance Characteristics

### Precision

Within run (Repeatability)

	Level 1	Level 2
n	20	20
Mean (mmol/L)	105	117
SD	2.2	1.5
CV%	2.1	1.28

Run to run (Reproducibility)

	Level 1	Level 2
n	20	20
Mean (mmol/L)	100	119
SD	2	1.3
CV%	2	1.09

### Methods Comparison

A comparison between Spectrum Chloride reagent and a commercial reagent of the same methodology was performed on 200 human sera. A correlation of 0.980 was obtained.

### Sensitivity

When run as recommended, the minimum detection limit of the assay 12 mmol/L

### Linearity

The assay is linear up to 130 mmol/l (462 mg/dl)

### Interfering substances

#### Bromide and Fluoride

They can cause falsely elevated chloride values.

#### Lipemia

Lipemic specimens do not interfere with the test.

#### Icterus

Icteric serums do not interfere with the reaction.

### Waste Disposal

This product is made to be used in professional laboratories. Please consult local regulations for a correct waste disposal.

**S56:** dispose of this material and its container at hazardous or special waste collection point.

**S57:** use appropriate container to avoid environmental contamination.

**S61:** avoid release in environment. refer to special instructions/safety data sheets.

## References

1. Bablok W. et al. A General Regression Procedure for Method Transformation. J Clin Chem Clin Biochem 1988;26:783-790.
2. Battle 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, 3<sup>rd</sup> Philadelphia: W.B. Saunders Company, 1995:516-519.

## ORDERING INFORMATION

CATALOG NO.	QUANTITY
233 001	50 test
ZL-233 001	50 test



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