

CHLORIDES liquid

Direct thiocyanate method

2 x 100 ml

CL20-200S

INTENDED USE

Kit for quantitative determination of Chlorides in serum, plasma and urine according to mercury thiocyanate reaction.

CLINICAL MEANING

Chloride is the main inorganic anion of extracellular liquid: it is extremely important for the regulation and maintenance of hydro-electric balance, for acid base balance and for a regular osmolarity.

Stomach acids contain high levels of chlorine, mainly because of the presence of hydrochloric acid, essential for protein digestion and for the defense against food bacteria. Chlorine is especially absorbed in the proximal portion of the small intestine, through an exchange with bicarbonates.

PRINCIPLE

The chloride ions present in the sample react with mercuric ions, releasing the same quantity of thiocyanate ions which, in the presence of ferric ions, form a red colored complex. The color intensity is proportional to the chloride concentration present in the sample.

SAMPLE

Serum, heparinized plasma.

Urine (diluted 1:2 with distilled water).

Chlorides in serum, plasma and urine are stable up to 7 days at 2-8°C and 1 month at -20°C.

REAGENTS

Only for in Vitro diagnostic use. Liquid monoreagent ready to use.

Package content	CL20-200S
REAGENT 1 Mercuric thiocyanate 1,8 mmol/L, mercuric chloride 0,75 mmol/L, iron nitrate 25 mmol/L	2 x 100 ml
STANDARD (Std) Chlorides 100 mEq/L (100 mmol/L)	1 x 4 ml

Stability: Store at 15-30°C and protect from light to keep the reagents stable up to the expiration date on the label. Keep bottles closed when not in use to avoid oxidation and evaporation.

Once opened the reagents are stable for 2 months if contamination is avoided. Do not use turbid reagents.

NECESSARY ITEMS – NOT PROVIDED

Usual laboratory equipment: UV/VIS Spectrophotometer with temperature control; automatic micropipettes; Optical glass cuvettes or, alternatively, disposable ones in optical polystyrene; Saline solution.

MANUAL ASSAY PROCEDURE

Method:	increasing endpoint
Wavelength:	480 nm (460 - 500)
Optical path:	1 cm
Temperature:	15-25°C
Reaction Time:	5 minutes
Reading:	against blank reagent
Sample/Reagent Ratio:	1/100

Bring the reagent necessary to perform the test to chosen temperature for the analysis. **WARNING:** the reaction is particularly sensitive to temperature so be sure to always work with constant temperature.

Pipette in cuvette:

	Blank Reagent	Standard	Sample
Distilled water	10 µl	-	-
Standard	-	10 µl	-
Sample	-	-	10 µl
Reagent 1	1,0 ml	1,0 ml	1,0 ml

Mix and incubate for 5 minutes at 15-25°C. Then read the absorbance of the standard (AbsStd) and the sample (AbsS) against the blank reagent.

Reaction volumes can be proportionally varied without any change in calculation.

CALCULATION

Calculate the concentration in the sample using the following formula:

Serum / Plasma:

$$[\text{mEq/L}] \text{ chloride} = \text{AbsS} / \text{AbsStd} \times 100$$

$$[\text{mmol/L}] \text{ chlorides} = \text{AbsS} / \text{AbsStd} \times 100$$

Urine:

$$[\text{mEq/L}] \text{ chlorides} = \text{AbsS} / \text{AbsStd} \times 200 \times \text{L}/24\text{h}$$

$$[\text{mmol/L}] \text{ chlorides} = \text{AbsS} / \text{AbsStd} \times 200 \times \text{L}/24\text{h}$$

REFERENCE VALUES

Serum / Plasma:

$$95 \div 110 \text{ mEq/L (mmol/L)}$$

Urine:

$$170 \div 250 \text{ mEq/24h (mmol/24h)}$$

Each laboratory should define its own reference values for this method.

QUALITY CONTROL – CALIBRATION

All Clinical Chemistry laboratories should implement a quality control program.

Control serums of human origin are available for this purpose on request:

PRE-NORM serums with normal values

PRE-PATH serums with pathological values

If the method requires it, a multiparameter calibrator of human origin is available.

PERFORMANCE CHARACTERISTICS

Sensitivity: the sensitivity of the method is 1 mEq/L.

Linearity: from 80 to 120 mEq/L.

For higher values, dilute the sample 1:2 with distilled water, repeat the determination and multiply the result by 2.

With values below 80 mEq/L, the analysis values are not reliable.

Precision:

Within run (n=10)	Average [mEq/L]	SD	CV %
Sample 1	95	2,6	2,7
Sample 2	116	3,1	2,7

Between run (n=20)	Average [mEq/L]	SD	CV %
Sample 1	96,5	114,4	3
Sample 2	2,9	3,3	2,9

Interferences: lipids up to 300 mg/dl of triglycerides do not interfere. Up to 20 mg/dl of bilirubin does not interfere.

For particularly icteric, hemolyzed and lipemic samples, prepare a blank sample by adding 1000 µl of saline solution to 10 µl of sample. Read the absorbance of the blank sample (AbsSB) at 480 nm (460 - 500) nm against a saline solution and then deduct it from the sample absorbance (AbsS).

Correlation against a reference method: the correlation of FAR method (Y) against a reference method (X) gives this equation:

$$Y = 0,9878X + 1,0063 \quad r = 0,9871$$

DISPOSAL

The product must be used for professional analysis only. The product must be disposed of according to national/international laws.

WARNINGS AND PRECAUTIONS

The reagents may contain non-reactive components and various preservatives. Contact with the skin and ingestion should be avoided. Use the normal precautions expected with correct behaviour in laboratory.

REFERENCES

- Schaes O. and Schaes S., J. Biol. Chem. 140, 879, (1941)
- Giraudet P., Pre J. and Cornillot P., Clin Chim. Acta 28, 323 (1970)
- Kaplan LA, Pesce AJ: "Clinical Chemistry", Mosby Ed. 1989

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KEY SYMBOLS

	In Vitro diagnostic medical device
	batch number
	catalog number
	temperature limits
	use by
	caution
	consult accompanying documents