

CHLORIDE

(THIOCYANATE METHOD)

CHEMPAK

Last update 04-2023

Ref. CC3-CLD.039, 2x60 ml

INTENDED USE

Reagent kit for quantitative estimation of chloride in serum or plasma.

INTRODUCTION

Chloride is a major extra cellular anion. It plays a significant role in maintaining water and electrolyte balance in the extra cellular compartment.

Earlier titrimetric methods of chloride estimation were based on the reactions of chloride with silver and mercuric salts. Schales and Schales (1) described a titration method using mercuric thiocyanate and diphenyl carbazone. The method was modified by Schoenfeld and Lewellen (2) in which diphenyl carbazone was replaced by ferric nitrate. Thus mercuric thiocyanate reacts with 'Cl' ions to form mercuric chloride. The liberated thiocyanate ions form a red-brown colored ferric thiocyanate. The colour thus generated by ferric thiocyanate is proportional to the chloride content in the sample and can be measured photometrically.

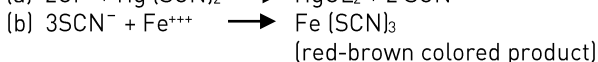
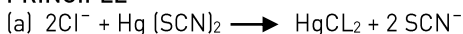
Chloride estimation method is based on the modification of Schoenfeld and Lewellen technique.

DIAGNOSTIC SIGNIFICANCE

Chloride may be lost through sweating and urination. Chloride concentration in body is very well controlled. The losses are made up partly by dietary intake and partly by reabsorption of chloride ions. In conditions like, chronic pyelonephritis, diabetic acidosis, renal failure and prolonged vomiting due to any cause there is a loss of chloride ions and hence serum chloride level may decrease.

High serum chloride values may be observed in dehydration, congestive heart failure, renal tubular pathology etc.

PRINCIPLE



Chloride ions in the sample react with mercuric thiocyanate to form mercuric chloride, an undissociated salt and free thiocyanate ions. These free thiocyanate ions react with ferric ions in the reagent to form red-brown colored ferric thiocyanate. The absorbance of ferric thiocyanate at 480 nm is proportional to the concentration of chloride in the sample.

PRESENTATION

	No. of Bottle 2x60ml
• Chloride Reagent (Store at room temperature)	2
• Chloride Standard, 100 mmol/L (Store at 2-8°C) Separately Provided	1

FINAL REAGENT COMPOSITION

Active Ingredients	Concentration
• Mercuric Thiocyanate	0.2 mmol/L
• Ferric Nitrate	30 mmol/L
• Mercuric Chloride	0.2 mmol/L

Chloride Standard (100 mmol/L)

Also contains non-reactive fillers and Stabilizers.

PRECAUTION

- Chloride is for *IN-VITRO* diagnostic use only.
- The use of disposable plastic ware is recommended.
- All the glasswares should be decontaminated by soaking in 0.1N HNO₃. Rinse the glasswares thoroughly with distilled water prior to use.

PREPARATION OF WORKING REAGENT

Chloride reagent is ready to use.

REAGENT STORAGE AND STABILITY

Chloride reagent is stable at room temperature until the expiry date stated on the label.

Chloride Standard (100 mmol/L) is stable at 2-8°C until the expiry date stated on the label.

SPECIMEN COLLECTION

Fresh, clear, unhemolysed serum is the specimen of choice. Heparinized plasma may be used.

REACTION PARAMETERS

- Type of reaction : End Point
- Wavelength : 480 nm (470-510 nm)
- Flow cell Temperature : 30°C
- Sample volume : 0.01 ml (10 µl)
- Working Reagent Volume : 1.0 ml
- Incubation : 5 min at R.T
- Std. Concentration : 100 mmol/L
- Light path : 1 cm
- Zero setting with : Distilled water

TEST PROCEDURE

Pipette into Test Tubes	Blank	Standard	Test
Reagent (ml)	1.0	1.0	1.0
Sample (ml)	-	-	0.01
Standard (ml)	-	0.01	-

Mix well and incubate at room temperature (25-30°C) for 5 minutes and read absorbance at 480 nm (470-510 nm) or with blue green filter against reagent blank.

STABILITY OF FINAL REACTION MIXTURE

The colour of the final reaction mixture is stable for 30 minutes.

TEST RESULT

$$\text{Chloride concentration (mmols/L)} = \frac{\text{Absorbance of test}}{\text{Absorbance of Standard}} \times 100$$

Chloride is expressed as mmol/L or mEq/L.
mmol/L = mEq/L.

NORMAL VALUE

98-109 mmols/L (mEq/L)

These values are suggested guidelines. It is recommended that each laboratory establishes its own normal range.

LINEARITY

This method is suitable and linear between 75 mmols/L to 150 mmol/L concentration of chloride. For values higher than 150 mmol/L, dilute the sample with distilled or deionized water and incorporate a suitable dilution factor in the final test results. For values below 75 mmols/L, increase the sample volume suitably and apply the necessary correction.

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NOTE

For washing or decontaminating glasswares from chloride ions, acid chromate solution may be used. The acid chromate solution for washing glasswares can be prepared by dissolving 10 gms of potassium dichromate in 100 ml of 1N sulfuric acid.

REFERENCES

Schaes o., Schaes S.S., A simple and accurate method for the determination of chloride in biological fluids, J. Biol.Chem, 140, 879, (1941).

1. Schoenfeld R.C., Lewellen C.J.,A colorimetric method



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