Manual Procedure

Automated procedure on request

MEDICHEM MIDDLE EAST
Clinical Chemistry Reagents
Liquid Stable Reagents

Cat. No. 12200 R 1 x 50 ml
For 50 tests

Chloride

Colorimetric method

Liquid Reagent

Test principle

$$Hg(SCN)_2 + 2\,CL^- \longrightarrow HgCL_2 + 2SCN^-$$

$$3SCN^- + Fe^{+3} \longrightarrow Fe(SCN)_3 \quad \text{(Red Complex)}$$

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.

Concentrations in the test

Reagent R		
Mercury (II) thiocyanate	1	mmol/L
Iron (III) Nitrate	30	mmol/L
Nitric acid	29	mmol/L
Standard : The concentration as indicated on vial.		

Stability of reagent

Reagent R: *liquid, ready to use.*
The reagent is stable up to expiry date given on the label when stored at +2 ➔ + 25 °C.

Note: The reagent should be a clear, pale-yellow solution. Don't use if the reagent is a cloudy or red brown colored.

Specimen collection and handling

1. Non-hemolyzed serum, or heparinized plasma.
2. Separate serum or plasma from erythrocytes soon after drawing.
3. Avoid contamination of blood with tissue liquid.
4. Store serum and heparinized plasma in tightly stoppered tubes.
5. Chloride is stable in serum and plasma for 4 days at 20 - 25°C, for 7 days at 2 - 8 °C and for 3 months at - 20 °C when stored tightly capped, protect from evaporation.
6. Cerebrospinal fluid (CSF).
7. Urine.

Calibrator / Standard

MediCal U Cat. No. 15011
Chloride STD. Cat. No. 16061

Quality control

Meditrol N Cat. No. 15171
Meditrol P Cat. No. 15181

Procedure

Wavelength	Hg 492 (450 - 510 nm)
Spectrophotometer	480 nm
Cuvette	1 cm light path
Temperature	37°C / 20 - 25 °C
Measurement	against reagent blank
Reaction	end point

Assay

	Blank	Calibrator / Standard	Sample
Double dist. water	10 µl	--	--
Calibrator / Standard	--	10 µl	--
Sample	--	--	10 µl
Reagent R	1000 µl	1000 µl	1000 µl
Mix, incubate for 5 min. at 37 °C, or 10 min. at 20 - 25 °C. Read the absorbance (A).The final color is stable for 1 hour.			

Calculation

$$\text{Conc.}_{\text{Chloride}}\,(\text{mmol/L}) = \frac{A_{\text{Sample}}}{A_{\text{Cal./ STD.}}} \times \text{Conc.}_{\text{Cal./ STD.}}\,(\text{mmol/L})$$

Linearity

Up to 120 mmol/L (426 mg/dl).
If the result exceeds 120 mmol/L, repeat the test using diluted sample (1+1) with distilled water and multiply the result by 2 .

Interferences

1. Bromide and fluoride can cause falsely elevated chloride values.
2. Other substances can influence chloride determination. For a comprehensive list see Young, D.S. et al.
3. Lipemic and/or icteric serums don't interfere in the reaction.
4. Grossly hemolyzed serum should not be used as it may create falsely decreased values.

Precautions

1. This reagent is a TOXIC POSION as well as CAUSTIC. Avoid all contact with skin or clothing. Flush with water if contact occurs.
2. Don't pipette by mouth. Call physician if taken internally.
3. The equipment used in the test must be free from chloride ions.

Reference range

Serum

1 d. – 4 wk.	95 – 116	mmol/L
2 – 12 mth.	93 – 112	mmol/L
≥ 1 yr.	96 – 111	mmol/L
Adults	98 - 106	mmol/L

Urine

Urine /24 hr.	85 – 170	mmol/24hr.
1st morning urine	46 – 168	mmol/L

CSF

Infant	110 –130	mmol/L
Adults	118 –132	mmol/L

References

1. Schoenfeld, R. G. et al., Clin. Chem., 10, (1964), 533.
2. Young, DS., Effects of Drugs on Clinical Laboratory Tests, fifth edition 2000, AACC Press, Washington, D.C.