Sheet No.
GT200-WA013 Wastes

# Chlorine ion ( Chloride ) in tap water



Method : Precipitation titration
Apparatus : Automatic Titrator GT-200
Electrode: Reference electrode, double junction
Silver detection electrode
Reference electrode
inner solution: 1mol/L Potassium chloride
Outer solution: 1mol/L potassium nitrate
Titration mode : INF, Detection: mV
Related standard : Japanese standard method for the Examination of Water, Mohr method

*This sheet is provided as information. It is not to guarantee the analysis values. Please use under the ideal conditions considering external factors including the analysis environment and properties of the sample.

## Outline

Chlorine ion (Chloride) contaminate into the tap water by various reasons. When the tap water contain high amount of the ion, it cause worse taste of the water. Concentration of Chlorine ion is measured by precipitation titration with silver detection electrode.

## Reagents

[ Titrant ]
■0.01 mol/L silver nitrate solution (for volumetric analysis)
[ Reagents ]
■0.01 mol/L sodium chloride solution:Take 0.5844g of sodium chloride (standard reagent) that is dried in a muffle furnace, 550degC for one hour, into 1L measuring flask. Melt and dilute it in the flask to 1L total by pure water.

## Analytical Procedure

[ Blank test ]
(1) Take 100ml of pure water into a 200ml beaker by a measuring cylinder.
(2) Add 5.0mL of 0.01mol/L Sodium Chloride Solution into the beaker by a transfer pipette.
(3) Titrate by 0.01mol/L Silver Nitrate Titrant.
[ Sample measurement ]
(1) Take 100ml of tap water into a 200ml beaker by a measuring cylinder.
(2) Titrate by 0.01mol/L Silver Nitrate Titrant.

[ Equation ]
**Chlorine ion ( Cl mg / L ) = ( A1- ( BL - 5 / f )) x f x 1000 / 100 x 0.3545**

A1 : Consumption of 0.01mol/L Silver Nitrate Titrant (mL) of the sample measurement
BL : Consumption of 0.01mol/L Silver Nitrate Titrant (mL) of the blank test (4.9759)
f : Factor of 0.01mol/L Silver Nitrate Titrant (1.000)

Sheet No.
GT200-WA013

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## Other Requirements

■Tap water temperature must be the room temperature before measurement.
■Change the inner solution and outer solution of the Reference Electrode before measurement.
■Polish the silver part of the Detection Electrode before measurement.
■Handle measurement reagents with care after reading through and understanding their labels and safety data sheets.
■Wear personal protective equipment such as protective goggles and gloves when handling the reagents.

## Measurement Results

| | Sample size (mL) | Titration Volume (mL) | Results (mg/L) |
|---|---|---|---|
| 1 | 100 | 2.5914 | 9.3 |
| 2 | | 2.5896 | 9.3 |
| 3 | | 2.5885 | 9.3 |

| | | |
|---|---|---|
| Number of data | (n) | 3 |
| Average | | 9.3 |
| Standard deviation | (SD) | 0.0052 |
| Relative standard deviation | (RSD%) | 0.0560 |

Blank value 4.9759ml

Chlorine ion in tap water is measured by GT-200. Average of the three measurement is 9.3mg/L.
The value is enough repeatable on 0.06% of relative standard deviation, RSD%.

Sheet No.
GT200-WA013

# Chlorine ion ( Chloride ) in tap water

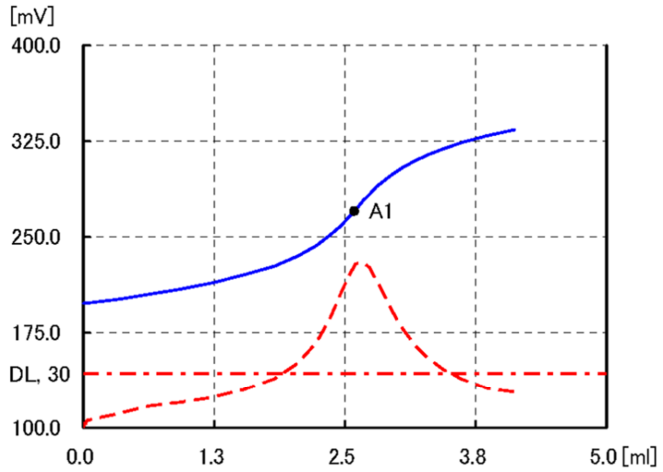


ID No. : 8 GT No.1

User : GT-200

Measurement date : 2013/03/07 15:23
Sample name : Tap water

Measurement type : Sample Titr
Sample size (S) : 100 [ml]




C1 : 9.26 [mg/L]

A1 : 2.5885 [ml] 270 [mV]

| | | | | | |
|---|---|---|---|---|---|
| Pi | : 198 | [mV] | | | |
| Start | : 0 | [ml] | 198 | [mV] | |
| End | : 4.122 | [ml] | 334 | [mV] | Time : 2’ 2” |

Run File No. : 0 Quick Mode
Tiotration File No. : 25 Examination of water (Chlorine ion)

| | | | |
|---|---|---|---|
| Mode | : INF | | End1 End1 Width : 350 [mV] ± 500 [mV] |
| Detect | : mV1 | | |
| BRT No. | : 1 | | |
| Reagent | : 21 | | |
| WTint | : 0 | [sec] | |
| Vup | : 300 | [µl] | |
| Vlow | : 10 | [µl] | |
| dE | : 2 | [mV] | |
| dT | : 3 | [sec] | |
| DL | : 30 | [mV/ml] | |
| DetCnt | : 6 | | C1 : (A1-(BL-5/f))*f*1000/100*0.3545 |
| Vmax | : 10 | [ml] | |
| Vover | : 1 | [ml] | [mg/L] |

| | | | | | |
|---|---|---|---|---|---|
| Reag | : AgNO3 | E | : 1 | Molarity(M) | : 0.01 [Mol/l] |
| f | : 1.000 | BL | : 4.9759 [ml] | | |

Buret Injection Speed : 500 [ul/sec]