

1.Scope of Test

- 1) All Etched Foils
- 2) All Formed Foils for Cathode

2.Principle

Combust test-specimen in Argon-Oxygen stream, and the produced Hydrogen Chloride is lead to titration cell, then titrate with electrolytically-generated AG-ION.Using quantity of electricity required for titration, level of chlorine is calculated based on 'Faraday's Law'.

3.Test Apparatus

Automated titrator which is composed of AUTO-BOARD-CONTROLLER; test specimen on specimen-board is lead to electric furnace and combusted, and TITRATOR; produced Hydrogen Chloride is titrated with electrolytically-generated AG-ION and the endpoint detected with set-up final electric potential.

Applicable Unit : Chlorine Analysis Devices such as TOX-2100H

4.Reagents

- 1) 85% Acetic Acid Solution (Electrolyte Solution)
This solution is made by dissolving 0.8g of Gelatine (as specified in JIS K 6503 – first grade) in 150ml of deionized water, then, is warmed, stirred and stand cool.Secondly, put 1.35g (precise weighing) of Anhydrous Sodium Acetate (as specified in JIS K 8372-high grade reagent) and Acetic acid (as specified in JIS K 8355 – high grade reagent) into this solution and the total amount is adjusted to 1,000ml. After that, add 1ml of 0.01mol/L Hydrochloric Acid Solution.
(expire : 6months, keep in airtight container at cool and dark place)
- 2) 1mol/L Kalium Chloride Solution (inside-reference-extrode solution)
This solution is made by dissolving 7.46g (precise weighing) of Kalium Chloride (as specified in JIS K 8121 – high grade reagent) in 100ml of deionized water.
- 3) 1mol/L Potassium Nitrate Solution (outside-reference-electrode solution)
This solution is made by dissolving 10.1g (precise weighing) of Potassium Nitrate (as specified in JIS K8548 – high grade reagent) in 100ml of deionized water.
- 4) 10% Potassium Nitrate Solution (AG-generate electrode antipole solution)
This solution is made by dissolving 50g of Potassium Nitrate (as specified in JIS K 8548 – high grade reagent) in 500ml of deionized water.
- 5) Concentrated Sulfuric Acid (dewatering bath)
98% Sulfuric Acid (as specified in JIS K 8951 – high grade reagent) is used.
- 6) 0.01mol/L Hydrochloric Acid Solution (hydrochloric acid reference solution)
0.01mol/L Hydrochloric Acid for volumetric analyses (as conform to JIS K 8001-5) is used.

5.Test Specimen

10cm²(Projected Area) of Foil

6.Apparatus

- 1) Medicine Spoon
- 2) Analytical Balance
- 3) 25 μ l Microsyringe
- 4) Measuring Flask
- 5) Measuring Cylinder
- 6) AG-working electrode for chlorine, AG counter electrode for chlorine
- 7) AG-detection electrode for chlorine
- 8) Reference electrode

7. Measurement

1) Combustion Temperature

in Argon stream : 850°C

in Oxygen stream : 900°C

2) Test Titration

setup the end-electric potential of titration and titer coefficient.

end potential : 290–315mV

titer coefficient : within the range of 0.5–5.0

3) Coulometric Titration Yield (precision), exam 1

Put 10 μ l of Hydrochloric Acid reference solution in electrolysis cell directly using microsyringe, then titrate.

yield : examine within 95–105%

4) Coulometric Titration Yield (precision), exam 2

Put 10 μ l of Hydrochloric Acid reference solution on sample board using microsyringe, combust as same as real-sample, generate chlorine gas, dehydrate and titrate.

yield : examine within 93–103%

5) Measurement

After exam whether the yield (precision) of 3) and 4) is within the allowance, start to measure.

8. Calculation of Residential Chlorine Content

Chlorine analysis value of 10cm² reagent is analysed with μ g index.

analytical value : μ g/10cm² = mg/m²

effective digit : 2 digit

9. Determination

Etched Foil, low voltage : $\leq 2.0\text{mg/m}^2$: acceptable

Etched Foil, middle to high voltage : $\leq 1.0\text{mg/m}^2$: acceptable

Etched Foil for cathode : $\leq 1.0\text{mg/m}^2$: acceptable

Formed Foil for cathode : $\leq 0.8\text{mg/m}^2$: acceptable