



Dependable Products From People You Trust



Chloride Ion Content

Part No. 144-40

Instruction Manual

Updated 1/19/2017

Ver. 2.0

OFI Testing Equipment, Inc.

11302 Steeplecrest Dr. · Houston, Texas · 77065 · U.S.A.
Tele: 832.320.7300 · Fax: 713.880.9886 · www.ofite.com

©Copyright OFITE 2013

Table of Contents

Intro.....	2
Components	2
Water Based Mud	3
Oil Based Mud	4
Warranty and Return Policy	5

Intro

This test measures the total soluble chloride ion concentrations in the mud filtrate. These chlorides can come from sodium chloride, calcium chloride or potassium chloride. For the titration to work correctly, the pH of the filtrate needs to be slightly basic, around pH = 8.3. Two chemical reactions take place simultaneously during the titration procedure.

1. $\text{Ag}^+ + \text{Cl}^- \rightarrow \text{AgCl}$
2. $2\text{Ag}^+ + \text{CrO}_4^{2-} \rightarrow \text{Ag}_2\text{CrO}_4$

The first reaction, the formation of silver chloride, accounts for the appearance of the white specs or milky appearance during the titration. The formation of silver chromate, which is red in color, will not start until all of the chloride ions are tied up as silver chloride. The silver nitrate will then react with the chromate from the potassium chromate indicator to form silver chromate. So, for the above two reactions to occur, the filtrate needs to be weakly basic (pH = 8.3). High pH will precipitate out silver oxide.

Components

Equipment:

- #153-26 Titration Dish, Polyethylene
- #153-28 Stirring Rod, 4", Polyethylene
- #153-34 Pipette, 1 mL × 1/100 mL, Glass
- #153-40 Pipette, 10 mL × 1/10 mL, Glass

Reagents:

- #206-01 Deionized Water, 8 oz
- #215-00 Potassium Chromate Solution, 2 oz
- #220-00 Phenolphthalein Solution, 2 oz
- #230-08 Sulfuric Acid, N/50, 8 oz
- #265-02 Silver Nitrate Solution, .001 g, 0.0282N, 16 oz
- #265-06 Silver Nitrate Solution, .01 g, 0.282N, 8 oz
- #285-00 Calcium Carbonate Powder, Precipitated, 35 g

Case:

- #144-35 Stainless Steel Case
- #134-36-1 Red knob

Water Based Mud

Procedure:

1. Add at least 1 mL filtrate to a clean titration dish.
2. Add two or three drops of phenolphthalein solution. If the sample turns pink, add sulfuric acid (N/50), drop by drop, until it turns clear again.
3. If the filtrate is colored, add an additional 2 mL of sulfuric acid (N/50) and stir. Add 1 gram of calcium carbonate and stir.
4. Add 25 to 50 mL deionized water and 5 to 10 drops of potassium chromate solution.
5. While stirring continuously, add silver nitrate solution (0.282N) from a pipette until the color changes from yellow to deep red. The color must stay red for at least 30 seconds.
6. Record the volume (in mL) of silver nitrate required to reach the end point.



Tip

If over 10 mL of silver nitrate are used, repeat the test using a smaller initial volume of filtrate.

Calculation:

$$\text{Chloride (mg / L)} = \frac{\text{mL Silver Nitrate} \times 10,000}{\text{mL Filtrate}}$$



Tip

If the chloride ion concentration is less than 10,000 ppm, use the silver nitrate concentration equivalent to 0.019 chloride ion/mL (0.0282N). The multiplication factor in the equation then becomes 1,000.

$$\text{Chloride (mg / L)} = \frac{\text{mL Silver Nitrate} \times 1,000}{\text{mL Filtrate}}$$

Oil Based Mud

Procedure:

1. Add 100 mL of Arcosolv PNP solvent to a 400 mL beaker.
2. Fill a 5 mL syringe with at least 3 mL of whole mud. Discharge 2 mL into the beaker. Swirl the mixture until it is homogenous.
3. Add 200 mL of deionized water.
4. Add 15 drops of phenolphthalein indicator solution.
5. While stirring with the magnetic stirrer, slowly titrate with N/10 sulfuric acid until the pink color disappears. Continue stirring for one more minute. If the pink color does not reappear, stop stirring.
6. Let the sample stand for 5 minutes. If the pink color does not reappear, the end point has been reached. If the pink color returns, continue titrating with sulfuric acid. Repeat this process until the pink color remains gone.
7. Calculate the alkalinity (see below).
8. After running the alkalinity test make sure the sample is acidic (pH < 7) by adding one or two drops of N/10 sulfuric acid.
9. Add 3 mL of potassium chromate indicator solution.
10. While stirring with a magnetic stirrer, slowly titrate with 0.282N silver nitrate solution until a salmon pink color remains stable for at least one minute.

It may be necessary to stop stirring the sample and allow the two phases to separate in order to see the color in the aqueous phase.
11. Record the volume (mL) of 0.282N silver nitrate required to reach the end point.

Calculations:

$$\text{Alkalinity} = P_m = \frac{\text{Volume Sulfuric Acid (mL)}}{\text{Sample Volume (mL)}}$$

$$\text{Chloride Concentration (mg / L)} = \frac{10,000 \times \text{Volume Silver Nitrate (mL)}}{\text{Sample Volume (mL)}}$$

Warranty and Return Policy

Warranty:

OFI Testing Equipment, Inc. (OFITE) warrants that the products shall be free from liens and defects in title, and shall conform in all respects to the terms of the sales order and the specifications applicable to the products. All products shall be furnished subject to OFITE's standard manufacturing variations and practices. Unless the warranty period is otherwise extended in writing, the following warranty shall apply: if, at any time prior to twelve (12) months from the date of invoice, the products, or any part thereof, do not conform to these warranties or to the specifications applicable thereto, and OFITE is so notified in writing upon discovery, OFITE shall promptly repair or replace the defective products. Notwithstanding the foregoing, OFITE's warranty obligations shall not extend to any use by the buyer of the products in conditions more severe than OFITE's recommendations, nor to any defects which were visually observable by the buyer but which are not promptly brought to OFITE's attention.

In the event that the buyer has purchased installation and commissioning services on applicable products, the above warranty shall extend for an additional period of twelve (12) months from the date of the original warranty expiration for such products.

In the event that OFITE is requested to provide customized research and development for the buyer, OFITE shall use its best efforts but makes no guarantees to the buyer that any products will be provided.

OFITE makes no other warranties or guarantees to the buyer, either express or implied, and the warranties provided in this clause shall be exclusive of any other warranties including ANY IMPLIED OR STATUTORY WARRANTIES OF FITNESS FOR PURPOSE, MERCHANTABILITY, AND OTHER STATUTORY REMEDIES WHICH ARE WAIVED.

This limited warranty does not cover any losses or damages that occur as a result of:

- Improper installation or maintenance of the products
- Misuse
- Neglect
- Adjustment by non-authorized sources
- Improper environment
- Excessive or inadequate heating or air conditioning or electrical power failures, surges, or other irregularities
- Equipment, products, or material not manufactured by OFITE
- Firmware or hardware that have been modified or altered by a third party
- Consumable parts (bearings, accessories, etc.)

Returns and Repairs:

Items being returned must be carefully packaged to prevent damage in shipment and insured against possible damage or loss. OFITE will not be responsible for equipment damaged due to insufficient packaging.

Any non-defective items returned to OFITE within ninety (90) days of invoice are subject to a 15% restocking fee. Items returned must be received by OFITE in original condition for it to be accepted. Reagents and special order items will not be accepted for return or refund.

OFITE employs experienced personnel to service and repair equipment manufactured by us, as well as other companies. To help expedite the repair process, please include a repair form with all equipment sent to OFITE for repair. Be sure to include your name, company name, phone number, email address, detailed description of work to be done, purchase order number, and a shipping address for returning the equipment. All repairs performed as "repair as needed" are subject to the ninety (90) day limited warranty. All "Certified Repairs" are subject to the twelve (12) month limited warranty.

Returns and potential warranty repairs require a Return Material Authorization (RMA) number. An RMA form is available from your sales or service representative.

Please ship all equipment (with the RMA number for returns or warranty repairs) to the following address:

OFI Testing Equipment, Inc.
Attn: Repair Department
11302 Steeplecrest Dr.
Houston, TX 77065
USA

OFITE also offers competitive service contracts for repairing and/or maintaining your lab equipment, including equipment from other manufacturers. For more information about our technical support and repair services, please contact techservice@ofite.com.