Taylor's QAC & Polyquat Test Kits

INTRODUCTION

Quaternary ammonium compounds, often referred to as "quats" and abbreviated as QAC, and their structurally longer cousins the polyquats are **nonoxidizing biocides**. In commercial and industrial water treatment programs they are widely used to control algae, bacteria, and fungi in **open recirculating water systems** (e.g., cooling towers and evaporative condensers). They interfere with cell membrane function, which eventually causes the organism to die. These surface-active chemicals may be used in combination with other microbial control agents, such as chlorine.

Determination is based upon direct neutralization of the QAC or polyquat.

QAC & POLYQUAT KITS

K-1582

Drop test for **high** QAC & polyquat levels
(using direct neutralization);
1 drop = 10 or 25 ppm QAC/
1 drop = 3.5 or 9 ppm polyquat

K-9065

Drop test for **low** QAC & polyquat levels
(using direct neutralization);
1 drop = 1.25 ppm QAC/
1 drop = 0.5 ppm polyquat

USER BENEFITS

- Titrations do not require the ability to match colors, only the ability to see the **permanent color change** at the end-point of the reaction.
- These test kits are practical for both **on- and off-site** testing.
- Test kits **come complete** with all necessary reagents and equipment.
- **Waterproof instructions** are printed on plastic-impregnated paper that resists fading and tearing.
- **Picture guides** to color transitions in the test reassure new users.
- Custom-molded, durable plastic cases provide **safe storage** for tests.

The K-1582 drop test for determining quaternary ammonium compounds is valued by HVAC cooling water service and control personnel.

- **Proven chemistries** are based on *Standard Methods for the Examination of Water and Wastewater,* APHA, Washington, DC, and/or *American Society for Testing and Materials,* ASTM, Philadelphia, PA. Some methods use proprietary chemistry developed by Taylor Technologies.

ALSO AVAILABLE

- Tests for **oxidizing biocides**.
- Myron L Company portable instruments and calibration solutions (sold separately in reagent packs).
- A wide array of single- and multiparameter kits featuring color-matching and/or drop-count tests.
- Taylor's TTi® Colorimeter (M-3000); test 30+ parameters commonly encountered in commercial and industrial settings and transfer results to a PC database.
- Testing supplies and kit replacement parts (e.g., burets, flasks, test tubes, and test cells).
- **Video demonstrations** for new users posted on our website.
- Toll-free technical assistance at **800-TEST KIT**.

taylor *the most trusted name in water testing*

Taylor Technologies, Inc.
410-472-4340
800-TEST KIT (837-8548)
www.taylortechnologies.com

ISO 9001:2008 Certified

REPRESENTATIVE TEST PROCEDURE

Reproduced from K-1582 instruction:

DROP TEST
QUATERNARY AMMONIUM COMPOUND (QAC) (1 drop = 10 or 25 ppm) & POLYQUAT (1 drop = 3.5 or 9 ppm)

Instr. #5256

COMPONENTS:

1 x 5256	Instruction
1 x 9012	Pipet, Calibrated (0.5 & 1.0 mL) w/ brown cap, plastic
1 x 9198BR	Sample Tube, Graduated (25 mL) w/ cap & brown dot, plastic
1 x R-0638BR-C	Phenolphthalein Indicator, 2 oz w/ brown cap, DB
1 x R-0736BR-C	Sulfuric Acid .6N, 2 oz w/ brown cap, DB
1 x R-0881-A	Toluidine Blue O Indicator, .75 oz, DB
1 x R-0884-C	QAC Titrating Solution (high range), 2 oz, DB
1 x R-0950-C	Complexing Reagent, 2 oz

TO ORDER REPLACEMENT PARTS AND REAGENTS CALL TOLL-FREE 800-TEST KIT (800-837-8548).

PROCEDURE:

CAREFULLY READ AND FOLLOW PRECAUTIONS ON REAGENT LABELS. KEEP REAGENTS AWAY FROM CHILDREN.

NOTE: When dispensing reagents from dropper bottles, **always** hold bottle in a vertical position.

Quaternary Ammonium Compound (QAC)/Polyquat Test

For 1 drop = 10 ppm QAC or 3.5 ppm Polyquat

NOTE: Run a blank using water containing no QAC or polyquat. Record drops of R-0884 QAC Titrating Solution (high range) used.

1. Rinse and fill 25 mL sample tube (#9198BR) to 25 mL mark with water to be tested.

2. Using 1.0 mL pipet (#9012), add 1.0 mL R-0950 Complexing Reagent. Swirl to mix.

NOTE: If sample water contains a hardness concentration above 500 ppm, add 2.0 mL (2 x 1.0 mL) R-0950 Complexing Reagent.

3. Add 1 drop R-0638BR Phenolphthalein Indicator. Swirl to mix. If sample is colorless, proceed to Step 4. If pink (Fig. 1), add R-0736BR Sulfuric Acid .6N dropwise, swirling after each drop, until color changes from pink to colorless.

4. Add 3 drops R-0881 Toluidine Blue O Indicator. Swirl to mix. Sample will be light blue (Fig. 2).

5. Add R-0884 QAC Titrating Solution (high range) dropwise, swirling and counting after each drop, until color changes from light blue to violet pink (Fig. 3).

NOTE: Further addition of R-0884 QAC Titrating Solution (high range) should produce no additional color change.

6. Subtract drops of R-0884 QAC Titrating Solution (high range) used in blank from drops used in sample (Step 5). Multiply by 10. Record as parts per million (ppm) QAC as n-alkyl(60% C_{14}, 30% C_{16}, 5% C_{12}, 5% C_{18})dimethylbenzylammonium chloride/n-alkyl(68% C_{12}, 32% C_{14})dimethylethylbenzylammonium chloride. For results as polyquat, multiply by 3.5. Record as ppm polyquat as poly[oxyethylene(dimethyliminio)ethylene(dimethyliminio)ethylene dichloride].

NOTE: Equivalences for quaternary ammonium compounds and polyquats other than those listed must be determined by titration with a known standard.

(OVER)

Fig. 1

Fig. 2

Fig. 3

DROP TEST
QUATERNARY AMMONIUM COMPOUND (QAC) (1 drop = 10 or 25 ppm) & POLYQUAT (1 drop = 3.5 or 9 ppm)

Instr. #5256

For 1 drop = 25 ppm QAC or 9 ppm Polyquat

NOTE: Run a blank using water containing no QAC or polyquat. Record drops of R-0884 QAC Titrating Solution (high range) used.

1. Rinse and fill 25 mL sample tube (#9198BR) to 10 mL mark with water to be tested.

2. Using 1.0 mL pipet (#9012), add 0.5 mL R-0950 Complexing Reagent. Swirl to mix.

NOTE: If sample water contains a hardness concentration above 500 ppm, add 1.0 mL R-0950 Complexing Reagent.

3. Add 1 drop R-0638BR Phenolphthalein Indicator. Swirl to mix. If sample is colorless, proceed to Step 4. If pink (Fig. 1), add R-0736BR Sulfuric Acid .6N dropwise, swirling after each drop, until color changes from pink to colorless.

4. Add 1 drop R-0881 Toluidine Blue O Indicator. Swirl to mix. Sample will be light blue (Fig. 2).

5. Add R-0884 QAC Titrating Solution (high range) dropwise, swirling and counting after each drop, until color changes from light blue to violet pink (Fig. 3).

NOTE: Further addition of R-0884 QAC Titrating Solution (high range) should produce no additional color change.

6. Subtract drops of R-0884 QAC Titrating Solution (high range) used in blank from drops used in sample (Step 5). Multiply by 25. Record as parts per million (ppm) QAC as n-alkyl(60% C_{14}, 30% C_{16}, 5% C_{12}, 5% C_{18})dimethylbenzylammonium chloride/n-alkyl(68% C_{12}, 32% C_{14})dimethylethylbenzylammonium chloride. For results as polyquat, multiply by 9. Record as ppm polyquat as poly[oxyethylene(dimethyliminio)ethylene(dimethyliminio)ethylene dichloride].

NOTE: Equivalences for quaternary ammonium compounds and polyquats other than those listed must be determined by titration with a known standard.

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5/17