Taylor's Molybdenum Test Kits

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INTRODUCTION

Molybdenum-based **corrosion inhibitors** are used in both boilers and cooling towers. In these aqueous systems, molybdenum combines with oxygen to form molybdate. Molybdate inhibits corrosion of low carbon steel. Taylor offers two **drop tests** to determine both low and high concentrations. Results can be expressed as either molybdenum, molybdate, or sodium molybdate.

MOLYBDENUM KITS

K-1805

Drop test (using complexometric method);
1 drop = 2, 5, 20, or 50 ppm Mo (liquid reagents)

K-1805P

Drop test (using complexometric method);
1 drop = 2, 5, 20, or 50 ppm Mo (liquid/powder reagents)

Note: The liquid indicator R-0891 in the K-1805 has a limited shelf life and should be checked against Molybdenum Standard (R-0887) periodically after it is four months old. A more stable, two-part reagent system replaces R-0891 in the K-1805P. This liquid/powder combination can be made up on a test-by-test basis, or in small quantities.

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.
- Test kits **come complete** with all necessary reagents and equipment.
- These test kits are practical for both **on- and off-site** testing.
- **Waterproof instructions** are printed on plastic-impregnated paper that resists fading and tearing.
- Custom-molded, durable plastic cases provide **safe storage** for all tests.
- **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.

Taylor's K-1805P molybdenum kit is favored by water treatment professionals because its two-part reagent system offers increased stability.

ALSO AVAILABLE

- **Molybdenum Standard** in 2 oz. bottle (R-0887-C).
- 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.
- Myron L Company portable instruments and calibration solutions (sold separately in reagent packs).
- 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.**

REPRESENTATIVE TEST PROCEDURE

Reproduced from K-1805P instruction:

DROP TEST
MOLYBDENUM (1 drop = 2, 5, 20 or 50 ppm)

Instr. #5359

COMPONENTS:

1 x 4029	Pipet, Calibrated 0.5 & 1.0 mL, plastic
2 x 4030	Pipets, Calibrated 0.5 & 1.0 mL, plastic w/cap
1 x 4078	Pipet, Graduated, 3 mL (0.5 mL div.), plastic
1 x 5359	Instruction
3 x 9198	Sample Tubes, Graduated, 25 mL, plastic w/cap
1 x R-0890	Molybdenum Buffer Solution
1 x R-0892	Molybdenum Titrating Solution, DB
1 x R-0900	Molybdenum Indicator Powder
1 x R-0901	Molybdenum Indicator Solvent

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.

Molybdenum Indicator Solution Preparation:

For 1 drop = 2, 20, or 50 ppm Mo

Using a 1.0 mL pipet (#4030), add 2.5 mL R-0901 Molydenum Indicator Solvent to a clean 25 mL sample tube. Add 5 level dippers R-0900 Molybdenum Indicator Powder. Swirl until solution turns a clear, red-orange color. Undissolved crystals will remain in the solvent-powder mixture (Fig. 1).

For 1 drop = 5 ppm Mo

Using a 1.0 mL pipet (#4030), add 1.5 mL R-0901 Molydenum Indicator Solvent to a clean 25 mL sample tube. Add 3 level dippers R-0900 Molybdenum Indicator Powder. Swirl until solution turns a clear, red-orange color. Undissovled crystals will remain in the solvent-powder mixture (Fig. 1).

For 1 drop = 2 ppm Mo

1. Rinse and fill a clean 25 mL sample tube (#9198) to 25 mL mark with distilled, deionized, or molybdenum-free tap water. This will be the blank.
2. Rinse and fill a second clean 25 mL sample tube to 25 mL mark with water to be tested (Fig. 2).
3. Using a 1.0 mL pipet (#4030), add 1.0 mL R-0890 Molybdenum Buffer Solution to each 25 mL sample tube. Swirl to mix.
4. Using a separate 1.0 mL pipet (#4029), add 1.0 mL Molybdenum Indicator Solution (prepared above) to each sample tube, transferring as few undissolved crystals as possible. However, a few crystals that may be transferred will not affect results. Swirl to mix. The blank should turn peach (Fig. 3) and the sample will turn red-orange to red (Fig. 4) if molybdenum is present.
5. Add R-0892 Molybdenum Titrating Solution, dropwise, swirling and counting after each drop, to sample tube containing water sample, until sample color matches blank color, or until no further change in color occurs. Always hold bottle in vertical position.
6. Multiply drops of R-0892 Molybdenum Titrating Solution by 2. Record as parts per million (ppm) molybdenum.

NOTE: To convert molybdenum (Mo) readings to molybdate (MoO_4), multiply Mo readings by 1.7; to convert to sodium molybdate dihydrate ($Na_2MoO_4 \cdot 2H_2O$), multiply by 2.52.

For 1 drop = 5 ppm Mo

1. Rinse and fill a clean 25 mL sample tube (#9198) to 10 mL mark with distilled, deionized, or molybdenum-free tap water. This will be the blank.
2. Rinse and fill a second clean 25 mL sample tube to 10 mL mark with water to be tested (Fig. 2).
3. Using a 1.0 mL pipet (#4030), add 0.5 mL R-0890 Molybdenum Buffer Solution to each 25 mL sample tube. Swirl to mix.

Fig. 1

Fig. 2

Fig. 3

DROP TEST
MOLYBDENUM (1 drop = 2, 5, 20 or 50 ppm)

Instr. #5359

4. Using a separate 1.0 mL pipet (#4029), add 0.5 mL Molybdenum Indicator Solution (prepared above) to each sample tube, transferring as few undissolved crystals as possible. However, a few crystals that may be transferred will not affect results. Swirl to mix. The blank should turn peach (Fig. 3) and the sample will turn red-orange to red (Fig. 4) if molybdenum is present.
5. Add R-0892 Molybdenum Titrating Solution, dropwise, swirling and counting after each drop, to sample tube containing water sample, until sample color matches blank color, or until no further change in color occurs. Always hold bottle in vertical position.
6. Multiply drops of R-0892 Molybdenum Titrating Solution by 5. Record as parts per million (ppm) molybdenum.

NOTE: To convert molybdenum (Mo) readings to molybdate (MoO_4), multiply Mo readings by 1.7; to convert to sodium molybdate dihydrate ($Na_2MoO_4 \cdot 2H_2O$), multiply by 2.52.

For 1 drop = 20 or 50 ppm Mo

1. Rinse and fill a clean 25 mL sample tube (#9198) to 25 mL mark with distilled, deionized, or molybdenum-free tap water. This will be the blank.
2. Using a 3 mL pipet (#4078), place water to be tested in a second clean 25 mL sample tube.

NOTE: For 1 drop = 20 ppm, fill pipet to 2.5 mL mark.
For 1 drop = 50 ppm, fill pipet to 1.0 mL mark.

3. Dilute to 25 mL mark with distilled, deionized, or molybdenum-free tap water (Fig. 2).
4. Using a 1.0 mL pipet (#4030), add 1.0 mL R-0890 Molybdenum Buffer Solution to each 25 mL sample tube. Swirl to mix.
5. Using a separate 1.0 mL pipet (#4029), add 1.0 mL Molybdenum Indicator Solution (prepared above) to each sample tube, transferring as few undissolved crystals as possible. However, a few crystals that may be transferred will not affect results. Swirl to mix. The blank should turn peach (Fig. 3) and the sample will turn red-orange to red (Fig. 4) if molybdenum is present.
6. Add R-0892 Molybdenum Titrating Solution dropwise, swirling and counting after each drop, to sample tube containing water sample, until sample color matches blank color, or until no further change in color occurs. Always hold bottle in vertical position.
7. For 2.5 mL sample, multiply drops of R-0892 Molybdenum Titrating Solution by 20. Record as parts per million (ppm) molybdenum.

   For 1.0 mL sample, multiply drops of R-0892 Molybdenum Titrating Solution by 50. Record as ppm molybdenum.

NOTE: To convert molybdenum (Mo) readings to molybdate (MoO_4), multiply Mo readings by 1.7; to convert to sodium molybdate dihydrate ($Na_2MoO_4 \cdot 2H_2O$), multiply by 2.52.

Fig. 4

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4/10