

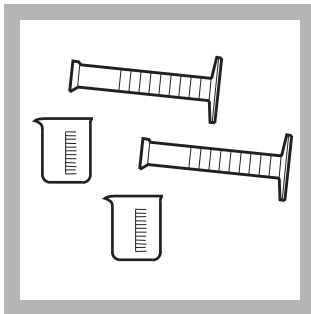
Method 10048

ADMI Weighted Ordinate Method*

(0 to 250 units Pt-Co)

Scope and Application: For colored waters and wastewaters having color characteristics significantly different from platinum-cobalt standards, as well as to those similar in hue to the standards. Turbid samples must be filtered prior to analysis. The estimated detection limit for program number 1660 is 3 ADMI (American Dye Manufacturers Institute) color value.

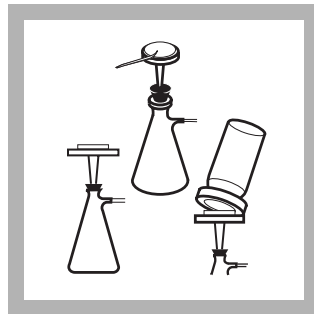
* Adapted from Allen, et. al., 1973. Determination of color of water and wastewater by means of ADMI Color Values. *Proc. 28th Ind. Waste Conf.*, Purdue Univ., Eng. Ext. Ser. No. 142:661



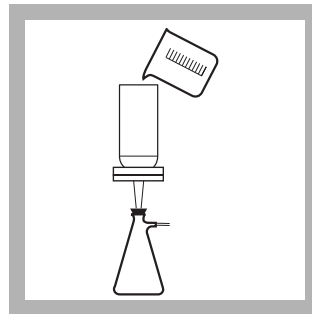
1. If the sample is not turbid, omit Steps 2–5. Pour two 100-mL aliquots of sample into separate beakers. Adjust the pH of one of the aliquots to 7.6; leave the other aliquot as is.

Note: Use 10 N sodium hydroxide or concentrated sulfuric acid to adjust the pH. Use 0.1 N acid or base near the end point.

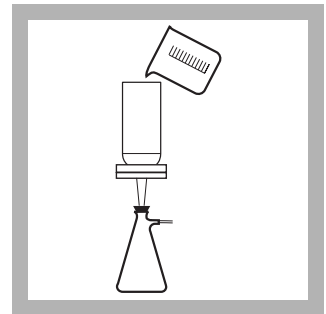
Note: If sample cannot be analyzed immediately, see *Sample Collection, Storage and Preservation* following these steps.



2. Assemble the filtering apparatus (membrane filter, filter holder, filter flask and aspirator).

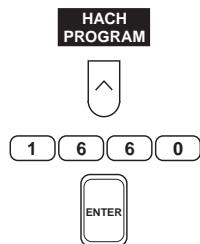


3. Rinse filter by pouring approximately 50 mL of original sample aliquot in the beaker through the filter. Discard the rinse.



4. Pour about 50 mL of original sample aliquot in the beaker through the filter. Label the flask “Original”.

Repeat Steps 2-4
for adjusted sample



HACH PROGRAM:1660
Color, ADMI



5. Repeat Steps 2–4 for the pH-adjusted sample. Label the flask “pH adjusted”.

6. Press the soft key under **HACH PROGRAM**. Select the stored program for ADMI color value by pressing **1660** with the numeric keys.

Press: **ENTER**

Note: The Flow Cell and Sipper Modules can be used with this procedure. The Carousel Module cannot be used.

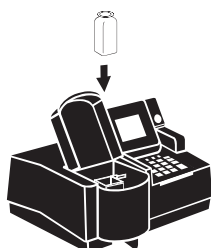
7. The display will show:
**HACH PROGRAM:
1660 Color, ADMI**
The starting wavelength (λ), **700 nm**, is automatically selected.

8. Fill a 1-inch square sample cell with the pH-adjusted filtered sample (the sample). Discard the excess.

Note: For proof of accuracy, use a 100-unit Co-Pt standard solution (preparation given in the Accuracy Check in place of sample).



9. Fill another sample cell with deionized water (the blank).

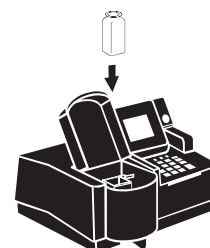


10. Place the blank into the cell holder and close the light shield.

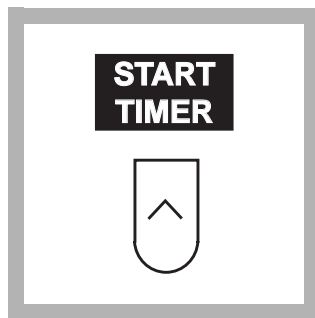
ZERO



11. Press the soft key under **ZERO**. Starting at 700 nm, the instrument will read the percent transmittance (%T) at 10 nm intervals until reaching 400 nm.



12. When prompted, place the sample in the cell holder and close the light shield.



13. Press the soft key under **START**.
Starting at 700 nm, the instrument will read the percent transmittance (%T) at 10-nm intervals until reaching 400 nm. Once finished, the instrument will display the ADMI color value of the pH adjusted sample.

14. Repeat Steps 8-13 for the original filtered sample. For USEPA reporting, report both results.

Interferences

Turbidity interferes directly and must be removed using filtration.

Sample Collection, Storage and Preservation

Collect samples in clean plastic or glass bottles. Most reliable results are obtained when samples are analyzed as soon as possible after collection. If prompt analysis is impossible, fill bottles completely and cap tightly. Avoid excessive agitation or prolonged contact with air. Samples can be stored for 24 hours by cooling to 4 °C (39 °F). Warm to room temperature before running the test.

Accuracy Check

Standard Solution Method

Prepare a 100-units Pt-Co standard solution by pipetting 20 mL of Color Standard Solution, 500 platinum-cobalt units, into a 100-mL volumetric flask. Dilute to the mark with deionized water. Perform the ADMI Color procedure as described above, omitting filtration Steps 2–5.

To adjust the calibration curve using the reading obtained with the 100-units Pt-Co standard, press the soft keys under **OPTIONS, (MORE)** then **STD: (OFF)**. Press **ENTER** to accept the default concentration, 100 units Pt-Co. If an alternate concentration is used, enter the actual concentration and press **ENTER** to return to the read screen. See Section 1.5.5 *Adjusting the Standard Curve* for more information.

Method Performance

Precision

Standard: 100 ADMI color value

For more information on determining precision data and method detection limits, refer to Section 1.5.

Estimated Detection Limit

Program	EDL
1660	3 ADMI color value

For more information on derivation and use of Hach's estimated detection limit, see Section 1.5.2. To determine a method detection limit (MDL) as defined by the 40 CFR part 136, Appendix B, see Section 1.5.1.

Sensitivity

Program Number: 1660

Portion of Curve	Δ Abs	Δ Concentration
0.010 Abs	0.010	5.2 ADMICV
125 ADMICV	0.010	6.1 ADMICV
225 ADMICV	0.010	6.8 ADMICV

See Section 1.5.3 *Sensitivity Explained* for more information.

Summary of Method

Three properties describe color: hue, chroma and value. Hue is "color", whether it be blue, red, green, yellow, etc. Chroma is color intensity (bright or dull). Value is the amount of color (light or dark). This method measures only the amount of color, or color value. It is independent of the hue and chroma.

This method determines the color value in a sample. Transmittance is measured from 400 to 700 nm and converted to a set of abstract numbers. These numbers describe the color as seen by an average human eye. They are converted to a single number that indicates the color value. This number is expressed on a scale used by the American Dye Manufacturers Institute to measure color value. The ADMI has adopted the Platinum-Cobalt standard of the American Public Health Association (APHA) as the standard for color value. Although this standard is yellow, the ADMI method works for all hues.

Safety

Good safety habits and laboratory techniques should be used throughout the procedure. Consult the *Material Safety Data Sheet* for information specific to the reagents used. For additional information, refer to Section 1.

Pollution Prevention and Waste Management

For information on pollution prevention and waste management, refer to Section 1.

REQUIRED REAGENTS AND STANDARDS

Description	Quantity Required per test	Unit	Cat. No.
Sodium Hydroxide Solution, 10 N.....	varies.....	500 mL.....	25450-49
Sodium Hydroxide Standard Solution, 0.100 N.....	varies.....	1000 mL.....	191-53
Sulfuric Acid, concentrated, ACS.....	varies.....	500 mL.....	979-49
Sulfuric Acid Standard Solution, 0.100 N.....	varies.....	100 mL MDB.....	202-32
Water, deionized.....	10 mL.....	4 liters.....	272-56

REQUIRED EQUIPMENT AND SUPPLIES

DR/4000 1-Inch Cell Adapter	1	each.....	48190-00
-----------------------------------	---------	-----------	----------

OPTIONAL REAGENTS AND STANDARDS

Color Standard Solution, 500 Pt-Co Units	1 liter.....		1414-53
--	--------------	--	---------

OPTIONAL EQUIPMENT AND SUPPLIES

Aspirator, Nalgene vacuum pump		each.....	2131-00
DR/4000 Carousel Module Kit		each.....	48070-02
DR/4000 Flow Cell Module Kit, 1-inch.....		each.....	48070-04
DR/4000 Flow Cell Module Kit, 1-cm.....		each.....	48070-05
DR/4000 Sipper Module Kit, 1-inch.....		each.....	48090-03
Filter Holder, 47-mm, 300-mL graduated		each.....	13529-00
Filter, membrane, 47-mm, 0.45-microns.....	100/pkg.....		13530-00
Flask, filtering, 500-mL		each.....	546-49
Flask, volumetric, Class A, 100-mL		each.....	14574-42
Pipet, volumetric, Class A, 20.00-mL.....		each.....	14515-20
Stopper, rubber, one hole. No. 7.....		each.....	2119-07
Tubing, rubber	12 ft.....		560-19



FOR TECHNICAL ASSISTANCE, PRICE INFORMATION AND ORDERING:

In the U.S.A. – Call toll-free 800-227-4224

Outside the U.S.A. – Contact the HACH office or distributor serving you.

On the Worldwide Web – www.hach.com; E-mail – techhelp@hach.com

HACH COMPANY
WORLD HEADQUARTERS
Telephone: (970) 669-3050
FAX: (970) 669-2932