

ADMI Weighted Ordinate Method^{1, 2}

Method 10048

5 to 300 Pt-Co units³

Scope and application: For water and wastewater. Turbid samples are filtered during the analysis.

¹ Adapted from Allen, et al., 1972. 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.

² Procedure is equivalent to Standard Method 2120 F.

³ DR 5000: 5 to 250 Pt-Co units





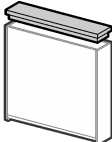
Test preparation

Instrument-specific information

Table 1 shows all of the instruments that have the program for this test. The table also shows the sample cell options and orientation requirements.

To use the table, select an instrument, then read across to find the applicable information for this test.

Table 1 Instrument-specific information

Instrument	Sample cell orientation	1-inch sample cell	10-mm sample cell	50-mm sample cell
DR 6000	The fill line is to the right (1-inch cell) The clear side is to the right (10-mm, 50-mm cells)	2495402 	2095100 	2629250 
DR 5000 DR 3900	The fill line is toward the user (1-inch cell) The clear side is toward the user (10-mm, 50-mm cells)			

Before starting

Review the Safety Data Sheets (MSDS/SDS) for the chemicals that are used. Use the recommended personal protective equipment.

Dispose of reacted solutions according to local, state and federal regulations. Refer to the Safety Data Sheets for disposal information for unused reagents. Refer to the environmental, health and safety staff for your facility and/or local regulatory agencies for further disposal information.

Items to collect

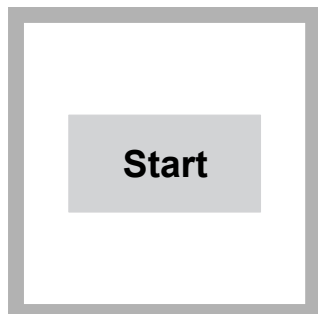
Description	Quantity
Beaker, 250 mL polypropylene	2
Cylinder, graduated, 100 mL polypropylene	1
Filtration apparatus: funnel/filter holder, 0.45 µm filter, flasks (2) and aspirator	1
pH meter with electrode	1
Sodium hydroxide or sulfuric acid solution, 10 N and 0.100 N	varies
Water, deionized	varies
Sample cells (For information about sample cells, adapters or light shields, refer to Instrument-specific information on page 1.)	2

Refer to [Consumables and replacement items](#) on page 4 for order information.

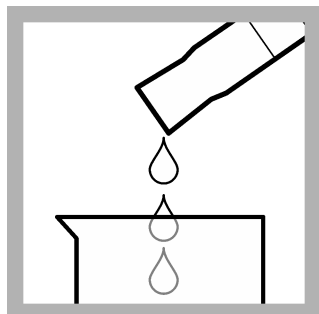
Sample collection

- Collect samples in clean glass or plastic bottles with tight-fitting caps. Completely fill the bottle and immediately tighten the cap.
- Prevent agitation of the sample and exposure to air.
- Analyze the samples as soon as possible for best results.
- If immediate analysis is not possible, keep the samples at or below 6 °C (43 °F) for a maximum of 24 hours.
- Let the sample temperature increase to room temperature before analysis.

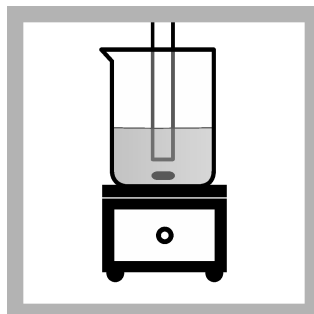
Test procedure



1. Start program **97 Color ADMI 1 inch, 96 Color ADMI 10 mm or 98 Color ADMI 50 mm**. For information about sample cells, adapters or light shields, refer to [Instrument-specific information](#) on page 1.

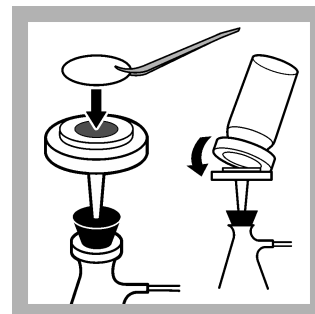


2. Pour 100 mL of sample into each of two beakers.

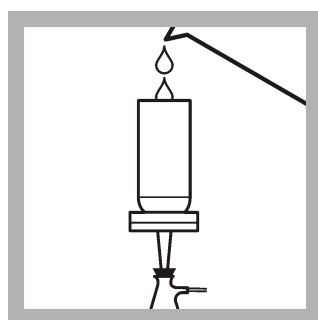


3. Adjust the pH of the sample in one of the beakers to pH 7.6 with a minimum volume of sodium hydroxide or sulfuric acid solution. Use a 10 N solution to make large pH adjustments and a 0.1 N solution to make small pH adjustments.

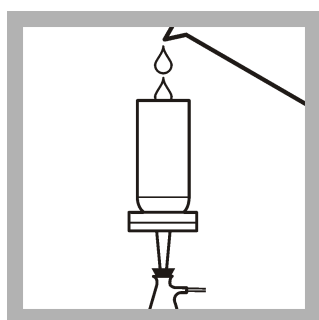
Note: Sodium hydroxide increases the pH value and sulfuric acid decreases the pH value.



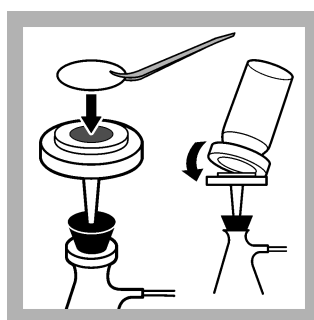
4. If the sample is turbid, set up the filtration apparatus (0.45 micron membrane filter, filter holder/funnel, filter flask, and aspirator). If the sample is not turbid, go to step 10.



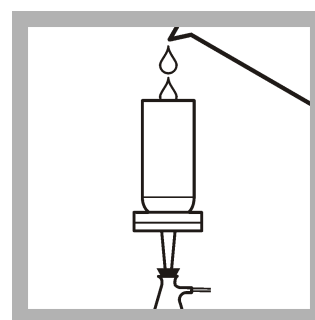
5. Pour approximately 50 mL of the original sample through the filter to rinse the filter. Discard the rinse water.



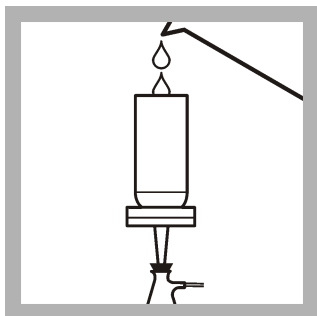
6. Pour the remaining 50 mL of original sample through the filter. Write "original" on the flask.



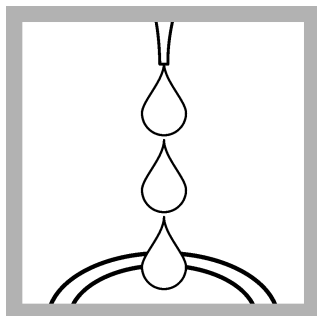
7. Install a clean filter flask for the pH-adjusted sample.



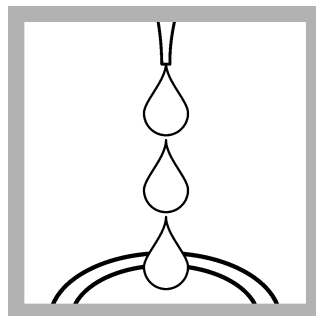
8. Pour approximately 50 mL of the pH-adjusted sample through the filter. Discard the rinse water.



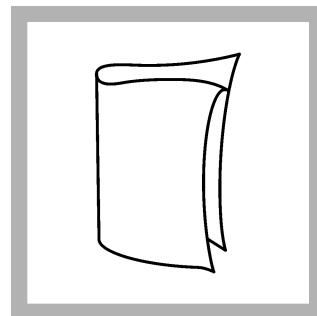
9. Pour the remaining 50 mL of pH-adjusted sample through the filter. Write "pH-adjusted" on the flask.



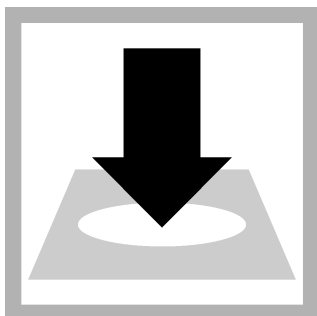
10. Prepare the blank: Fill a sample cell with deionized water.



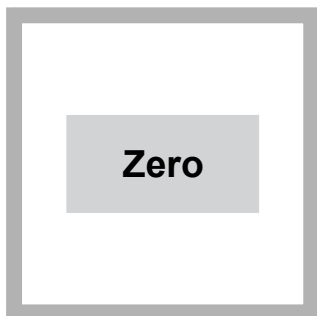
11. Prepare the sample: Fill a second sample cell with the pH-adjusted sample. Discard the remaining sample in the flask.



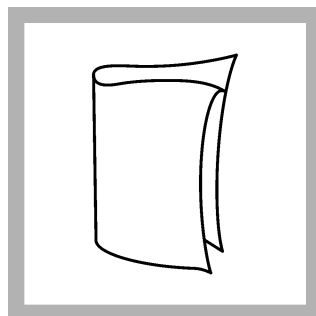
12. Clean the blank sample cell.



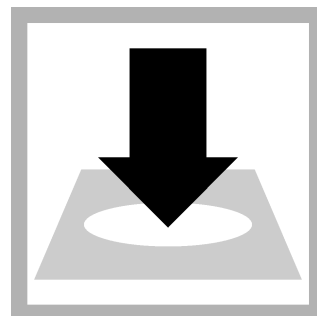
13. Insert the blank into the cell holder.



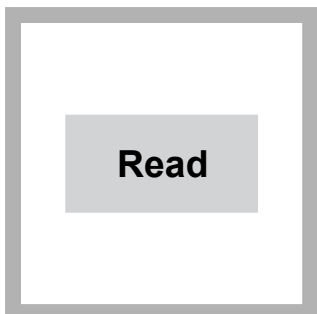
14. Push **ZERO**. The display shows the scan status, then 0 ADMI Value.



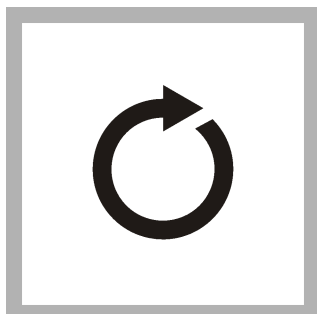
15. Clean the prepared sample cell.



16. Insert the prepared sample into the cell holder.



17. Push **READ**. Results show in ADMI Value.



18. Do steps **11** to **17** again for the original sample. For USEPA reporting, report both results.

Interferences

Turbidity interferes directly. The filtration steps in the test procedure remove turbidity.

Accuracy check

Standard solution method

Use the standard solution method to validate the test procedure, the reagents and the instrument.

Items to collect:

- Color standard solution, 500 platinum-cobalt units
- 100-mL volumetric flask, Class A
- 20-mL volumetric pipet, Class A and pipet filler

- Deionized water
1. Prepare a 100 platinum-cobalt units standard solution as follows:
 - a. Use a pipet to add 20.00 mL of a 500 platinum-cobalt units standard solution into the volumetric flask.
 - b. Dilute to the mark with deionized water. Mix well.
 2. Use the test procedure to measure the concentration of the prepared standard solution.
 3. Compare the expected result to the actual result.

Note: The factory calibration can be adjusted slightly with the standard calibration adjust option so that the instrument shows the expected value of the standard solution. The adjusted calibration is then used for all test results. This adjustment can increase the test accuracy when there are small variations in the reagents or instruments.

Summary of method

The three properties of color are hue, chroma and value. Hue is the color name, such as blue, red, green or yellow. Chroma is the color intensity (e.g., bright or dull). Value is how light or dark the color is. This method measures the color value independently of the hue and the chroma.

The sample transmittance is measured from 400 to 700 nm. The transmittance values are calculated to give a set of numbers for the color that is seen by typical humans. Further calculations give a single number for the color value. This number can be found on a scale used by the American Dye Manufacturers Institute (ADMI) for color value. The ADMI uses the platinum-cobalt standard from the American Public Health Association (APHA) as the standard for color value. Although this standard is yellow, the ADMI method is applicable to all hues.

Consumables and replacement items

Required reagents

Description	Quantity/test	Unit	Item no.
Sodium Hydroxide Solution, 10 N	varies	500 mL	2545049
Sodium Hydroxide Standard Solution, 0.100 N	varies	1000 mL	19153
Sulfuric Acid, 10 N	varies	1000 mL	93153
Sulfuric Acid Standard Solution, 0.100 N	varies	100 mL MDB	20232H
Water, deionized	varies	4 L	27256

Required apparatus

Description	Quantity/test	Unit	Item no.
Beaker, polypropylene, 250 mL	2	each	108046
Cylinder, graduated, polypropylene, 100 mL	1	each	108142
pH meter with electrode	1	each	HQ11d

Recommended standards

Description	Unit	Item no.
Color standard solution, 500 platinum-cobalt units	1 L	141453

Optional reagents and apparatus

Description	Unit	Item no.
Filter pump, aspirator	each	213100
Filter holder, magnetic	each	1352900
Filter membrane, 0.45-micron, 47-mm	100/pkg	1353000
Flask, filtering, 500 mL	each	54649
Flask, volumetric, Class A, 100 mL	each	1457442
Pipet, volumetric Class A, 20 mL	each	1451520
Pipet filler, safety bulb	each	1465100
Stopper, rubber, one-hole, No. 7	6/pkg	211907
Tubing, rubber, 5/16-in. inside diameter	3.66 m (12 ft)	56019



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