



## Standard Test Method for Color of Halogenated Organic Solvents and Their Admixtures (Platinum-Cobalt Scale)<sup>1</sup>

This standard is issued under the fixed designation D 2108; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

*This standard has been approved for use by agencies of the Department of Defense.*

### 1. Scope

1.1 This test method covers the visual measurement of the color of halogenated organic solvents and their admixtures. It is valid for values of 50 platinum-cobalt (Pt-Co) units or less.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

### 2. Significance and Use

2.1 Color may be indicative of the quality of the solvent because any color present is due to the presence of contaminants.

### 3. Apparatus

3.1 *Color Comparison Tubes*—Matched 50 or 100-mL, tall-form Nessler tubes, provided with ground-on, optically clear, glass caps.

3.2 *Color Comparator*—A color comparator constructed to permit visual comparison of light transmitted through tall-form, Nessler tubes in the direction of their longitudinal axes. The comparator should be constructed so that white light is passed through or reflected off a white glass plate and directed with equal intensity through the tubes and should be shielded so that no light enters the tubes from the side.

NOTE 1—There are numerous colorimeters and comparators commercially available that measure the color of liquids and take some of the subjectivity out of the measurement. These instruments may be calibrated with the platinum-cobalt color standards listed in Table 1 or with optically standardized color filter disks such as those available for the Hellige Aqua Tester. Many of these instruments take the measurement across a relatively narrow range of wave lengths, and their readings may be in error if the color of the sample is significantly different from the amber color of the color standards.

### 4. Reagents

4.1 *Purity of Reagents*—Reagent grade chemicals shall be

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D-26 on Halogenated Organic Solvents and Fire Extinguishing Agents and is the direct responsibility of Subcommittee D26.04 on Test Methods.

Current edition approved Dec. 10, 1997. Published May 1998. Originally published as D 2108 – 62. Last previous edition D 2108 – 93.

TABLE 1 Platinum-Cobalt Color Standards

Color Standard Number	Stock Solution, mL	Color Standard Number	Stock Solution, mL
5	1	35	7
10	2	40	8
15	3	50	10
20	4	60	12
25	5	70	14
30	6	100	20
		500	100

used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available.<sup>2</sup> Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

4.2 *Purity of Water*—Unless otherwise indicated, references to water shall be understood to mean distilled water or water of equal purity.

4.3 *Cobaltous Chloride* —( $\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$ ).

4.4 *Hydrochloric Acid* (sp gr 1.19)—Concentrated hydrochloric acid (HCl).

4.5 *Potassium Chloroplatinate* —( $\text{K}_2\text{PtCl}_6$ ).

### 5. Preparation of Color Standards

5.1 *Platinum-Cobalt Stock Solution*—Dissolve 1.245 g of  $\text{K}_2\text{PtCl}_6$  and 1.000 g of  $\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$  in water. Add 100 mL of HCl (sp gr 1.19) and dilute to 1 L with water. This solution has a color of 500.

NOTE 2—Stock solutions of Pt-Co 500 color may be purchased from reagent supply houses. The stock solution should be certified reagent or verified by the user as being correct.

5.2 *Platinum-Cobalt Standards*—For 100-mL Nessler tubes, prepare color standards as given in Table 1. Dilute the

<sup>2</sup> *Reagent Chemicals, American Chemical Society Specifications*, American Chemical Society, Washington, DC. For suggestions on the testing of reagents not listed by the American Chemical Society, see *Analar Standards for Laboratory Chemicals*, BDH Ltd., Poole, Dorset, U.K., and the *United States Pharmacopeia and National Formulary*, U.S. Pharmacopeial Convention, Inc. (USPC), Rockville, MD.

required volumes of the stock solution with water to 100 mL in the Nessler tubes. Cap the tubes and seal the caps with shellac or a waterproof cement.

5.3 For 50-mL Nessler tubes, prepare color standards by using half the volume of stock solution given in Table 1. The stock solution shall then be diluted with water to 50 mL in the Nessler tubes. Cap the tubes and seal the caps with shellac or a waterproof cement.

## 6. Procedure

6.1 Introduce required sample volume into the Nessler tube, passing the sample through a filter if it has any visible turbidity. Cap the tube, place in the comparator, and compare with the standards.

## 7. Report

7.1 Report the following information:

7.1.1 Report as the color, the number of the standard that most nearly matches the sample. In the event that the color lies midway between the two standards, report the darker of the two.

7.1.2 If, owing to differences in hue between the sample and the standards, a definite match cannot be obtained, report the range over which an apparent match is obtained, and report the sample as “off-hue.”

## 8. Precision and Bias <sup>3</sup>

8.1 *Precision*—The intralaboratory precision (one standard deviation) of this test method is less than 2 Pt-Co units. The interlaboratory precision is about 5 Pt-Co units (30 to 40 % relative standard deviation). The precision was determined by 100-mL Nessler tubes.

8.2 *Bias*—The bias of this test method was not determined as a result of the lack of known standards of color in solvent.

## 9. Keywords

9.1 color; halogenated organic solvent; platinum-cobalt scale; Pt-Co color; Pt-Co scale

---

<sup>3</sup> Research report available from ASTM Headquarters. Request RR:D26-1013.

*The American Society for Testing and Materials takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.*

*This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.*

*This standard is copyrighted by ASTM, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or service@astm.org (e-mail); or through the ASTM website (www.astm.org).*